

REQUEST FOR PROPOSAL

RFP # 22-77

Project Management and Construction Engineering Services for EMCD Bridge

City of Ann Arbor
Public Services - Engineering



Due Date: November 14, 2022 by 2:00 p.m. (local time)

Issued By:

City of Ann Arbor
Procurement Unit
301 E. Huron Street
Ann Arbor, MI 48104

TABLE OF CONTENTS

SECTION I: GENERAL INFORMATION	3
SECTION II: SCOPE OF SERVICES.....	10
SECTION III: MINIMUM INFORMATION REQUIRED	16
SECTION IV: ATTACHMENTS	21
APPENDIX A: SAMPLE PROFESSIONAL SERVICES AGREEMENT... APX A - 1 to 13	

SECTION I - GENERAL INFORMATION

A. OBJECTIVE

The City of Ann Arbor is seeking the services of a Professional Engineering firm to provide full-time project management and construction engineering services in connection with the East Medical Center Drive Bridge Rehabilitation and Widening Project. The project manager will work with, and report to, the City's Project Manager/Project Engineer as described in detail in Section II – Scope of Work.

The City is seeking these services for the duration of the construction of these project that are expected to be performed in March 1, 2023 to December 2023 and May/June of 2023.

Plans and contract documents for this project have been prepared (as noted below), are provided as an attachment to this RFP, and must be reviewed prior to the submittal of a proposal for the work. It is expected that final contract documents, addendums or other revisions for this project will be completed in late December/January when Contractor is selected.

B. QUESTIONS AND CLARIFICATIONS / DESIGNATED CITY CONTACTS

All questions regarding this Request for Proposal (RFP) shall be submitted via e-mail. Questions will be accepted and answered in accordance with the terms and conditions of this RFP.

All questions shall be submitted on or before November 1, 2022 at 2:00 p.m. and should be addressed as follows:

Scope of Work/Proposal Content questions shall be e-mailed to **Francisca Chan, Project Manager - fchan@a2gov.org**

RFP Process and Compliance questions shall be e-mailed to **Colin Spencer, Buyer - CSpencer@a2gov.org**

Should any prospective offeror be in doubt as to the true meaning of any portion of this RFP, or should the prospective offeror find any ambiguity, inconsistency, or omission therein, the prospective offeror shall make a written request for an official interpretation or correction by the due date for questions above.

All interpretations, corrections, or additions to this RFP will be made only as an official addendum that will be posted to a2gov.org and MITN.info and it shall be the prospective offeror's responsibility to ensure they have received all addenda before submitting a proposal. Any addendum issued by the City shall become part of the RFP, and must be incorporated in the proposal where applicable.

C. PRE-PROPOSAL MEETING

A pre-proposal meeting will be held:

WHEN: October 31, 2022 at 10:00 a.m.

WHERE: This meeting will be held virtually through Microsoft Teams. Interested parties shall contact to receive an invitation Francisca Chan, Project Manager - fchan@a2gov.org

The meeting is not mandatory; however, it is highly recommended that interested offerors attend the meeting. The purpose of this meeting is to discuss the project with prospective offerors and to answer any questions concerning RFP 22-77. Any questions and answers furnished in the pre-proposal meeting will not be official until verified in writing through an addendum.

D. PROPOSAL FORMAT

To be considered, each firm must submit a response to this RFP using the format provided in Section III. No other distribution of proposals is to be made by the prospective offeror. An official authorized to bind the offeror to its provisions must sign the proposal. Each proposal must remain valid for at least ninety days from the due date of this RFP.

Proposals should be prepared simply and economically providing a straightforward, concise description of the offeror's ability to meet the requirements of the RFP. No erasures are permitted. Mistakes may be crossed out and corrected and must be initialed in ink by the person signing the proposal.

E. SELECTION CRITERIA

Responses to this RFP will be evaluated using a point system as shown in Section III. A selection committee comprised of staff from the City will complete the evaluation.

The fee proposals will not be reviewed at the initial evaluation. After initial evaluation, the City will determine top proposals, and open only those fee proposals. The City will then determine which, if any, firms will be interviewed. During the interviews, the selected firms will be given the opportunity to discuss their proposal, qualifications, past experience, and their fee proposal in more detail. The City further reserves the right to interview the key personnel assigned by the selected offeror to this project. If the City chooses to interview any respondents, the interviews will be tentatively held the **November 17 to 22, 2022**. Offeror must be available on these dates.

All proposals submitted may be subject to clarifications and further negotiation. All agreements resulting from negotiations that differ from what is represented within the RFP or in the proposal response shall be documented and included as part of the final contract.

F. SEALED PROPOSAL SUBMISSION

All proposals are due and must be delivered to the City on or before, November 14, 2022 at 2:00 p.m. (local time). Proposals submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

Each respondent must submit in a sealed envelope

- **one (1) original proposal**
- **one (1) additional proposal copies**
- **one (1) digital copy of the proposal preferably on a USB/flash drive as one file in PDF format**

Each respondent must submit in a single separate sealed envelope marked Fee Proposal

- **two (2) copies of the fee proposal**

The fee proposal and all costs must be separate from the rest of the proposal.

Proposals submitted should be clearly marked: **“RFP No.22-77 – Project Management and Construction Engineering Services for EMCD Bridge”** and list the offeror’s name and address.

Proposals must be addressed and delivered to:
City of Ann Arbor
c/o Customer Service
301 East Huron Street
Ann Arbor, MI 48107

All proposals received on or before the due date will be publicly opened and recorded on the due date. No immediate decisions will be rendered.

Hand delivered bids may be dropped off in the Purchasing drop box located in the Ann Street (north) vestibule/entrance of City Hall which is open to the public Monday through Friday from 8am to 5pm (except holidays). The City will not be liable to any prospective offeror for any unforeseen circumstances, delivery, or postal delays. Postmarking on the due date will not substitute for receipt of the proposal. Offerors are responsible for submission of their proposal. Additional time will not be granted to a single prospective offeror. However, additional time may be granted to all prospective offerors at the discretion of the City.

A proposal may be disqualified if the following required forms are not included with the proposal:

- **Attachment C - City of Ann Arbor Non-Discrimination Declaration of Compliance**
- **Attachment D - City of Ann Arbor Living Wage Declaration of Compliance**
- **Attachment E - Vendor Conflict of Interest Disclosure Form of the RFP Document**

Proposals that fail to provide these forms listed above upon proposal opening may be deemed non-responsive and may not be considered for award.

Please provide the forms outlined above (Attachments C, D and E) within your narrative proposal, not within the separately sealed Fee Proposal envelope.

All proposed fees, cost or compensation for the services requested herein should be provided in the separately sealed Fee Proposal envelope only.

G. DISCLOSURES

Under the Freedom of Information Act (Public Act 442), the City is obligated to permit review of its files, if requested by others. All information in a proposal is subject to disclosure under this provision. This act also provides for a complete disclosure of contracts and attachments thereto.

H. TYPE OF CONTRACT

A sample of the Professional Services Agreement is included as Appendix A. Those who wish to submit a proposal to the City are required to review this sample agreement carefully. **The City will not entertain changes to its Professional Services Agreement.**

The City reserves the right to award the total proposal, to reject any or all proposals in whole or in part, and to waive any informality or technical defects if, in the City's sole judgment, the best interests of the City will be so served.

This RFP and the selected offeror's response thereto, shall constitute the basis of the scope of services in the contract by reference.

I. NONDISCRIMINATION

All offerors proposing to do business with the City shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the Section 9:158 of the Ann Arbor City Code. Breach of the obligation not to discriminate as outlined in Attachment C shall be a material breach of the contract. Contractors are required to post a copy of Ann Arbor's Non-Discrimination Ordinance attached at all work locations where its employees provide services under a contract with the City.

J. WAGE REQUIREMENTS

The Attachments provided herein outline the requirements for payment of prevailing wages or of a “living wage” to employees providing service to the City under this contract. The successful offeror must comply with all applicable requirements and provide documentary proof of compliance when requested.

K. CONFLICT OF INTEREST DISCLOSURE

The City of Ann Arbor Purchasing Policy requires that the consultant complete a Conflict of Interest Disclosure form. A contract may not be awarded to the selected offeror unless and until the Procurement Unit and the City Administrator have reviewed the Disclosure form and determined that no conflict exists under applicable federal, state, or local law or administrative regulation. Not every relationship or situation disclosed on the Disclosure Form may be a disqualifying conflict. Depending on applicable law and regulations, some contracts may awarded on the recommendation of the City Administrator after full disclosure, where such action is allowed by law, if demonstrated competitive pricing exists and/or it is determined the award is in the best interest of the City. A copy of the Conflict of Interest Disclosure Form is attached.

L. COST LIABILITY

The City of Ann Arbor assumes no responsibility or liability for costs incurred by the offeror prior to the execution of a Professional Services Agreement. The liability of the City is limited to the terms and conditions outlined in the Agreement. By submitting a proposal, offeror agrees to bear all costs incurred or related to the preparation, submission, and selection process for the proposal.

M. DEBARMENT

Submission of a proposal in response to this RFP is certification that the Respondent is not currently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from participation in this transaction by any State or Federal departments or agency. Submission is also agreement that the City will be notified of any changes in this status.

N. PROPOSAL PROTEST

All proposal protests must be in writing and filed with the Purchasing Manager within five (5) business days of any notices of intent. The offeror must clearly state the reasons for the protest. If an offeror contacts a City Service Area/Unit and indicates a desire to protest an award, the Service Area/Unit shall refer the offeror to the Purchasing Manager. The Purchasing Manager will provide the offeror with the

appropriate instructions for filing the protest. The protest shall be reviewed by the City Administrator or designee, whose decision shall be final.

Any inquiries or requests regarding this procurement should be only submitted in writing to the Designated City Contacts provided herein. Attempts by the offeror to initiate contact with anyone other than the Designated City Contacts provided herein that the offeror believes can influence the procurement decision, e.g., Elected Officials, City Administrator, Selection Committee Members, Appointed Committee Members, etc., may lead to immediate elimination from further consideration.

O. SCHEDULE

The proposals submitted should define an appropriate schedule in accordance with the requirements of the Proposed Work Plan in Section III.

The following is the schedule for this RFP process.

Activity/Event	Anticipated Date
Pre-proposal Meeting	October 31, 2022, 10:00 a.m.
Written Question Deadline	November 1, 2022, 2:00 p.m.
Addenda Published (if needed)	Week of November 7 th , 2022
Proposal Due Date	November 14, 2022, 2:00p.m. (Local Time)
Tentative Interviews (if needed)	November 17 to 22, 2022
Selection/Negotiations	November/December 2022
Expected City Council Authorizations	January 2023

The above schedule is for information purposes only and is subject to change at the City’s discretion.

P. IRS FORM W-9

The selected offeror will be required to provide the City of Ann Arbor an IRS form W-9.

Q. RESERVATION OF RIGHTS

1. The City reserves the right in its sole and absolute discretion to accept or reject any or all proposals, or alternative proposals, in whole or in part, with or without cause.
2. The City reserves the right to waive, or not waive, informalities or irregularities in of any proposal if determined by the City to be in its best interest.
3. The City reserves the right to request additional information from any or all offerors.
4. The City reserves the right to reject any proposal that it determines to be unresponsive and deficient in any of the information requested within RFP.

5. The City reserves the right to determine whether the scope of the project will be entirely as described in the RFP, a portion of the scope, or a revised scope be implemented.
6. The City reserves the right to select one or more consultants to perform services.
7. The City reserves the right to retain all proposals submitted and to use any ideas in a proposal regardless of whether that proposal is selected. Submission of a proposal indicates acceptance by the firm of the conditions contained in this RFP, unless clearly and specifically noted in the proposal submitted.
8. The City reserves the right to disqualify proposals that fail to respond to any requirements outlined in the RFP, or failure to enclose copies of the required documents outlined within RFP.

R. ENVIRONMENTAL COMMITMENT

The City of Ann Arbor recognizes its responsibility to minimize negative impacts on human health and the environment while supporting a vibrant community and economy. The City further recognizes that the products and services the City buys have inherent environmental and economic impacts and that the City should make procurement decisions that embody, promote, and encourage the City's commitment to the environment.

The City encourages potential vendors to bring forward emerging and progressive products and services that are best suited to the City's environmental principles.

SECTION II - SCOPE OF SERVICES

BACKGROUND

The City of Ann Arbor (City), in conjunction with the University of Michigan (UM), have undertaken the rehabilitation and widening of East Medical Center Drive Bridge over the Michigan Line (the Bridge).

It is the City's intent to widen and improve the Bridge in order to return it to a State of Good Repair and prolong its life for the foreseeable future. We also must be sensitive to the many daily activities and functions that occur at the University of Michigan Regional Medical Center (Medical Center) as part of the proposed construction activities. The maintenance of both vehicular and pedestrian traffic to, and around, the hospital, and the surrounding university community is a vital part of the coordination required during construction.

East Medical Center Drive is a collector street in the City of Ann Arbor. The Bridge carries a four-lane road and is located immediately south of the East Medical Center Drive/Fuller Road intersection and north of the East Medical Center Drive/West Medical Center Drive intersection. The road is the primary access to the University of Michigan Medical Center. The three-span bridge was constructed in 1982 with twelve rolled steel wide flange beams with welded cover plates and a composite, reinforced concrete deck. The bridge length is 160'-0" from reference line to reference line with an out-to-out width of 70'-11 ¼" and an approximate skew of 36° left. The alignment of East Medical Center Drive is in a horizontal curve across the bridge. To accommodate the curve, the alignment of the beams changes direction at both piers. The Bridge's cross section includes two sidewalks, four vehicular lanes of traffic consisting of three northbound lanes (right turn, through and left turn lanes) and one southbound lane, with 3-tube steel railings mounted to the top of concrete parapet railings. The clear roadway width is 47'-0". There is a deck expansion joint device located above the south pier and a rubber seal joint located above the north pier. The existing substructure consists of two, reinforced concrete stub abutments and two, reinforced concrete, column bent piers with crash walls.

The proposed rehabilitation and widening construction project will involve piece wise construction of the Bridge in order to facilitate installation of new beams, clean and restore existing beams, new deck, railing and sidewalks, extensions to the existing bridge abutments and piers, additional retaining walls, and grading as necessary to facilitate construction. Coordination with various utilities to remove and relocate utilities as detailed in the project plans and detailed specifications (Appendix A).

SCOPE OF SERVICES

The following Services be provided by the Consultant in conjunction with the delivery of the East Medical Center Bridge Rehabilitation and Widening Project. The Consultant may elect to propose to perform Services in addition to those described below, however, these services should be considered the minimum that is required as part of the project's tasks.

The Consultant shall perform all needed project tasks in conformance with the requirements of the City of Ann Arbor and if applicable as specified on detailed specifications/plans the University of Michigan requirements and the Michigan Department of Transportation.

1. Project Management and Resident Engineering: This task includes all functions and activities necessary to manage and coordinate the project in a capacity as **the City's agent**.

The functions and activities of this task include those typically associated with a bridge rehabilitation and widening project of this nature, including, but not limited to; establish and maintain lines of communication between all involved parties; meet with the City's Project Manager to review all aspects of the project; review all project documents (plans and proposal) and the applicable City and MDOT detailed specifications or special provisions to insure a full and complete understanding of the scope of work, staging, and schedule; prior to bidding, review the project plans and proposal to identify potential design/detailing issues and make written recommendations to the City relative to these issues; provide oversight and coordination of the Consultant's "project oversight team" including inspection, survey, material testing, shop fabrication, public relations, and any other personnel whether described herein or not; plan and facilitate regular "oversight team" meetings; respond to inquiries and/or requests for information; resolve issues that arise during construction of the project with the various City departments, the University of Michigan, police agencies, fire department, emergency response agencies, utility companies, local business interests, other formal and informal community groups, and the general public; as needed updating of written content on the project website (created by the City of Ann Arbor) for major project updates to the general public.

Special and time sensitive coordination with the contractor, the City of Ann Arbor, the University of Michigan, ATT, DTE and any other utilities that are affected in this project area and that will be working in the area during Project construction. Notes on type of utility relocation installation coordination that will be needed is provided in the construction specifications and plans.

Coordinate and consult with the City's Project Manager as needed; attend meetings as requested; review proposals/claims and make recommendations related to contract modifications, extra work, extra compensation, and/or extensions of contract time; maintain proper records on issues involving disputed claims for compensation; inspect the project work for acceptance for traffic and substantial completion of work for interim and final contract completion dates; daily oversight, management, and coordination of all surveying, inspection (on-site/off-site), testing, and project documentation activities; plan and conduct the pre-construction meeting, the weekly progress/planning meetings, and others as necessary (prepare and distribute written minutes); review and approve the Contractor's Testing Orders; review and approve the monthly construction estimate; properly measure, calculate, and document all material quantities; document the project consistent with City requirements, and; review and approve shop drawings; maintain records related to shop drawing submittal and approval; review and approve contractor

submittals for proposed construction methods; maintain records related to contractor construction methods submittal and approval; verify that the contractor uses equipment and methods approved in or specified by the contract; daily oversight of the contractor's activities to verify that the project is being constructed in conformance with the project plans and specifications; verify that the contractor complies with all contract requirements related to the protection of utilities, property, and the environment, safety and health, prevailing wage policy, verify that the contractor complies with all permit requirements as they pertain to City of Ann Arbor, MDOT, Amtrak Office of Rail, etc.; resolve daily contractor disputes and prepare work orders as necessary.

Regular communications with various City Areas and/or Units relative to maintenance of traffic and current or planned work activities; daily communication (only if needed) with emergency response agencies relative to existing, planned, or changing maintenance of traffic situations.

Coordination and communication with University of Michigan's assigned Project Manager for important updates as they pertain to project schedule, UM ROW, access to the medical campus, traffic detours.

2. Office Engineering: The office engineering and contract administration tasks include those typically associated with a reconstruction project of this nature, including: establish, maintain, and utilize a project documentation filing system; initialize and update material source files associated with FieldManager/FieldBook (or the City's current software); import, review, and post Inspector's Daily Reports (IDR) and any associated calculation/drawings; track materials (certification/testing) and material quantities; create all needed project performance, monitoring, and milestone reporting and monitoring records for submittal to the City and/or MDOT; follow City of Ann Arbor's Prevailing Wage and Certified Payroll Policy as detailed in Attachment A, determining construction types, obtaining Davis-Bacon Act wage determinations, wage rate interviews, obtain and review of certified payroll, delinquent and deficient notice(s) and data collection process; process and maintain records for contract modifications and/or work orders; monitor project progress vs. the planned critical path method schedule; track and maintain status of miscellaneous submittals and Requests for Information; and balance final quantities of pay items as the project progresses.

4. Project Surveying & "As-Built" Plans: These tasks will include all survey layout and staking activities necessary for the Contractor's use in constructing the project as detailed on the plans and in the specifications, and all activities associated with developing "as-built" plans. The specific project surveying tasks include: check and verify horizontal and vertical control; establish permanent witnessed monuments to serve as primary project control; monument proposed right-of-way as required; stake all earthwork items at maximum intervals of 50 feet; stake roadway centerlines at maximum intervals of 50 feet, and at all PVI's, PC's, PT's; layout of retaining wall limits and elevations; stake centerline of all proposed or existing structures as needed or requested; stake other miscellaneous structure locations and grades; establish curb and gutter locations and grades; establish back and/or top of curb locations and elevations in integral concrete

pavement areas; layout concrete barrier wall locations and limits; layout concrete pavement jointing; stake/layout demolition and/or removal limits of all work that is to remain in place; stake any required fence relocations, clearing limits, erosion control device locations, driveway approaches, sidewalks, bike paths, sidewalk ramps, and miscellaneous sign locations; stake earthwork and site layout; layout and stake proposed bridge centerlines and reference lines; layout and stake substructure corners and elevations; provide/verify line and grade of bridge seats; verify span lengths; establish beam elevations; establish deck slab and screed rail grades; verify screed grades; layout all stairway footing corners with elevations, horizontal and vertical deflection points, and top and bottom landing elevations; provide line, grade, pivot points, and column locations for all permanent retaining walls; verify formwork of cast-in-place retaining walls and/or construction of MSE walls for verticality and horizontal alignment; develop, check, and distribute cut sheets; and, maintain field notes in bound books and daily logs.

The specific tasks associated with the development of the “as-built” plans include: obtain “original” (electronic format) contract plans from the City; document all plan changes, extra work, “revisions to” notes, etc. as project work progresses; collect and confirm all field changes; develop the appropriate “as-constructed” notes; develop/draft the “as-built” drawings; review and approve the “as-built” plans. The “as-built” plans will conform to the City’s Standard Specifications and the Public Services Department’s AutoCAD drafting standards and will be provided to the City on flashdrive or other approved media.

All construction staking will be performed in accordance with the current edition of the City of Ann Arbor Public Services Department Standard Specifications and as approved by the City. **The Consultant will provide the necessary resources to stake out the project features more than one time due to the length of the project, weather conditions, obliterating of the staking by the contractor, and other related factors.**

5. On-Site Inspection: Activities associated with this task will be dedicated to verifying that all materials provided and work performed is in conformance with the project plans and specifications, and they include: providing inspection personnel that possess the necessary, current, accreditations consistent City of Ann Arbor and project specifications requirements; thorough review of the plans and specifications and other project related documents prior to construction start up; daily communication with contractor supervision to coordinate inspection activities and to properly inspect, test, measure, and document the work; daily communication with the contractor, advising of needed corrections to the work, i.e. traffic control or soil erosion device maintenance, etc.; daily communication with the survey crew(s) to obtain proper interpretation of stakes and coordinate daily staking needs; daily communication with testing personnel to properly sample and test the materials and work; attend the weekly progress/planning meeting; inspect materials to be used in the work, verifying they meet the project specifications; document material usage and quantities on the IDR using FieldBook; review/inspect the Contractor’s equipment to confirm it meets the project specifications, and document the specific type and amount of equipment used on the IDR; inspect the contractor’s workmanship to verify that it meets the methods, tolerances, time requirements, temperature requirements etc., of the specifications, and document this on the IDR; inspect and document that the work is

performed and completed to the lines, grades, and elevations required by the project plans and specifications; document the contractor workforce and weather conditions on the IDR; document daily contractor activities, including any description and explanation of downtime, damage to the work, any actions taken by others including utilities, City forces, adjacent property owners, etc. on the IDR; where possible final measure work as it's done by the contractor, calculate quantities and document this on the IDR or in field books as appropriate; conduct daily review/inspection of temporary traffic control devices and the maintenance of traffic throughout the construction influence area; conduct periodic nighttime review/inspection of temporary traffic control devices and the maintenance of traffic throughout the construction influence area; provide certified storm water operators and conduct daily inspection of all soil erosion and sedimentation control devices for proper maintenance and effectiveness as placed; perform and document NPDES inspections at the required frequencies; suspend any work and/or reject any materials not conforming to the contract requirements; perform and document wage rate interviews; document changes, extra work, "revisions to" notes etc. on the plans kept in the office trailer to assist in the preparation of "as built" plans; develop and maintain the project "punch list"; keep all needed force account documentation, as required.

The Consultant shall furnish its inspectors with equipment and materials as necessary to properly perform their work. This will include, but is not limited to, laptop computers equipped with FieldBook, cell phones, proposal, plans, project detailed specifications, MDOT Standard Specifications for Construction 2020, City of Ann Arbor standard plans and specifications, industry standard survey equipment, and any other tools needed to inspect the work.

Once assigned to the project, inspection personnel will not be removed from, or added to, the project without the written authorization of the City's Project Manager. .

6. Materials Testing & Fabrication Inspection: All testing will be performed in conformance with current MDOT, and City standards, methods, and requirements. The work of this project is on an expedited schedule and as such the material testing consultant shall be expected to perform all required testing such that the project schedule is not negatively impacted by the material testing operations. This shall be deemed to include any and all required costs associated with expedited testing to obtain test results to meet the project requirements. In addition to the aforementioned requirement, asphalt testing results and the required written reports shall be returned to the City's Project Manager within 5 business days of the original paving.

The testing and inspection activities associated with these tasks include: proctor and sieve analyses; in-place density control; concrete testing including, compressive and flexural strength tests (cylinders and beams), air, temperature and slump tests; bituminous materials testing including, in-place density, extractions, crush count verification, asphaltic cement content; volumetric testing including, air voids, voids in mineral aggregate, voids filled with asphalt, maximum specific gravity, fines to binder ratio, percent within limits, flow, and performance grade binder verification.

Inspect precast beds and forms; check/verify dimensions of members, number, size, and positions of tendons, reinforcing steel, other incorporated materials, openings, blockouts, etc; inspect and document strand stressing operation/results; inspect/monitor batching, mixing, placing, finishing, and curing of precast elements; inspect, monitor, and document strand release, product removal from beds, handling and storage activities; inspect, accept, and approve precast (concrete) and prefabricated (steel) elements for shipment; verify that all precast and prefabricated elements are constructed in conformance with “approved” shop drawings and project specifications; establish and maintain a documentation system to establish evidence of proper monitoring and manufacturing.

7. Technical Support: The technical support activities associated with this task include: review and approve shop drawing submittals; provide design engineering, specification and design drawing development when approved changes or modifications are not considered “Construction Design Services”; review and make recommendations relative to methods of construction submittals by the contractor; provide technical support in resolving disputes and issues that arise during construction and documentation of the project.

8. Project Close-Out: The project close-out tasks include: Resolve all outstanding disputes and issues relative to pay item quantities and materials documentation; prepare, review, and balance all final pay item quantities; prepare all final contract modifications; provide complete project documentation and files, specifically as they relate to correspondence, meeting minutes, submittals, contract modifications, work orders, material certifications, test reports, certified payrolls, and interim progress estimates; prepare the contractor’s evaluation report; generate and process the final estimate package; coordinate submittal of project files and “as-built” plans to the City. Refer to as-built procedure in Attachment A for further information.

The Consultant will obtain City approval of all required files, material certifications, certified payrolls, pay estimates, and the like. The project files will be purged of all duplicate and extraneous materials and organized in a neat and professional manner. An index detailing the location of project materials will be provided.

SECTION III - MINIMUM INFORMATION REQUIRED

PROPOSAL FORMAT

Offerors should organize Proposals into the following Sections:

- A. Professional Qualifications
- B. Past Involvement with Similar Projects
- C. Proposed Work Plan
- D. Fee Proposal (include in a separate sealed envelope clearly marked "Fee Proposal")
- E. Authorized Negotiator
- F. Attachments

The following describes the elements that should be included in each of the proposal sections and the weighted point system that will be used for evaluation of the proposals.

A. Professional Qualifications – 20 points

1. State the full name and address of your organization and, if applicable, the branch office or other subsidiary element that will perform, or assist in performing, the work hereunder. Indicate whether it operates as an individual, partnership, or corporation. If as a corporation, include whether it is licensed to operate in the State of Michigan.
2. Include the name of executive and professional personnel by skill and qualification that will be employed in the work. Show where these personnel will be physically located during the time they are engaged in the work. Indicate which of these individuals you consider key to the successful completion of the project. Identify only individuals who will do the work on this project by name and title. Resumes and qualifications are required for all proposed project personnel, including all subcontractors. Qualifications and capabilities of any subcontractors must also be included.
3. State history of the firm, in terms of length of existence, types of services provided, etc. Identify the technical details that make the firm uniquely qualified for this work.

B. Past involvement with Similar Projects – 30 points

The written proposal must include a list of specific experience in the project area and indicate proven ability in implementing similar projects for the firm **and** the individuals to be involved in the project. A complete list of client references must be provided for similar projects recently completed. The list shall include the firm/agency name, address, telephone number, project title, and contact person.

C. Proposed Work Plan – 30 points

Provide a detailed and comprehensive description of how the offeror intends to provide the services requested in this RFP. This description shall include, but not be limited to: how the project(s) will be managed and scheduled, how and when data and materials will be delivered to the City, communication and coordination, the working relationship between the offeror and City staff, and the company's general philosophy in regards to providing the requested services.

Offerors shall be evaluated on the clarity, thoroughness, and content of their responses to the above items.

D. Fee Proposal - 20 points

Fee schedules shall be submitted in a separate, sealed, envelope as part of the proposal. Fee quotations are to include the names, title, hourly rates, overhead factors, and any other relevant details. The proposal should highlight key staff and positions that would likely be involved with projects. Offerors shall be capable of justifying the details of the fee proposal relative to personnel costs, overhead, how the overhead rate is derived, material and time.

E. Authorized Negotiator

Include the name, phone number, and e-mail address of persons(s) in your organization authorized to negotiate the agreement with the City

F. Attachments

Legal Status of Offeror, Conflict of Interest Form, Living Wage Compliance Form, and the Non-Discrimination Form should be returned with the proposal. These elements should be included as attachments to the proposal submission.

PROPOSAL EVALUATION

1. The selection committee will evaluate each proposal by the above-described criteria and point system (A through C) to select a short-list of firms for further consideration. The City reserves the right to reject any proposal that it determines to be unresponsive and deficient in any of the information requested for evaluation. A proposal with all the requested information does not guarantee the proposing firm to be a candidate for an interview. The committee may contact references to verify material submitted by the offerors.

2. The committee then will schedule interviews with the selected firms if necessary. The selected firms will be given the opportunity to discuss in more detail their qualifications, past experience, proposed work plan and fee proposal.
3. The interview must include the project team members expected to complete a majority of work on the project, but no more than six members total. The interview shall consist of a presentation of up to thirty minutes (or the length provided by the committee) by the offeror, including the person who will be the project manager on this contract, followed by approximately thirty minutes of questions and answers. Audiovisual aids may be used during the oral interviews. The committee may record the oral interviews.
4. The firms interviewed will then be re-evaluated by the above criteria (A through D), and adjustments to scoring will be made as appropriate. After evaluation of the proposals, further negotiation with the selected firm may be pursued leading to the award of a contract by City Council, if suitable proposals are received.

The City reserves the right to waive the interview process and evaluate the offerors based on their proposals and fee schedules alone and open fee schedules before or prior to interviews.

The City will determine whether the final scope of the project to be negotiated will be entirely as described in this RFP, a portion of the scope, or a revised scope.

Work to be done under this contract is generally described through the detailed specifications and must be completed fully in accordance with the contract documents.

Any proposal that does not conform fully to these instructions may be rejected.

PREPARATION OF PROPOSALS

Proposals should have no plastic bindings but will not be rejected as non-responsive for being bound. Staples or binder clips are acceptable. Proposals should be printed double sided on recycled paper. Proposals should not be more than 30 sheets (60 sides), not including required attachments and resumes.

Each person signing the proposal certifies that they are a person in the offeror's firm/organization responsible for the decisions regarding the fees being offered in the Proposal and has not and will not participate in any action contrary to the terms of this provision.

ADDENDA

If it becomes necessary to revise any part of the RFP, notice of the addendum will be posted to Michigan Inter-governmental Trade Network (MITN) www.mitn.info and/or the City of Ann Arbor web site www.A2gov.org for all parties to download.

Each offeror must acknowledge in its proposal all addenda it has received. The failure of an offeror to receive or acknowledge receipt of any addenda shall not relieve the offeror of the responsibility for complying with the terms thereof. The City will not be bound by oral responses to inquiries or written responses other than official written addenda.

SECTION IV - ATTACHMENTS

Attachment A –

- A1. Project Plans and Contract Documents
- A2. Prevailing Wage Policy and Procedures
- A3. Prevailing Wage Training Manual
- A4. IDR Template Summary
- A5. As-Built Procedure

Attachment B - Legal Status of Offeror

Attachment C – Non-Discrimination Ordinance Declaration of Compliance Form

Attachment D – Living Wage Declaration of Compliance Form

Attachment E – Vendor Conflict of Interest Disclosure Form

Attachment F – Non-Discrimination Ordinance Poster

Attachment G – Living Wage Ordinance Poster

ATTACHMENT A
(PROJECT SPECIFIC ATTACHMENTS)

- A1. Project Plans and Contract Documents
- A2. Prevailing Wage Policy and Procedures
- A3. Prevailing Wage Training Manual
- A4. IDR Template Summary
- A5. As-Built Procedure

NOTES:

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS, OR IN THE CONTRACT DOCUMENTS AND DETAILED SPECIFICATIONS CONTAINED HEREIN, ALL MATERIALS AND WORKMANSHIP SHALL BE ACCORDING TO THE LATEST REVISIONS OF THE CITY OF ANN ARBOR PUBLIC SERVICE DEPARTMENT STANDARD SPECIFICATIONS AND THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION 2020 EDITION AS APPLICABLE.

THE PROPOSED IMPROVEMENTS COVERED BY THESE PLANS ARE DESIGNED IN ACCORDANCE WITH THE 2018 AASHTO "POLICY ON THE GEOMETRIC DESIGN OF HIGHWAYS AND STREETS", THE 2012 AASHTO "GUIDE FOR THE PLANNING, DESIGN, AND OPERATION OF BICYCLE FACILITIES", AND THE 2011 "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

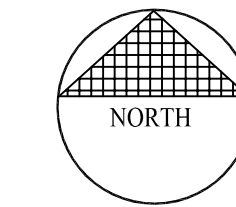
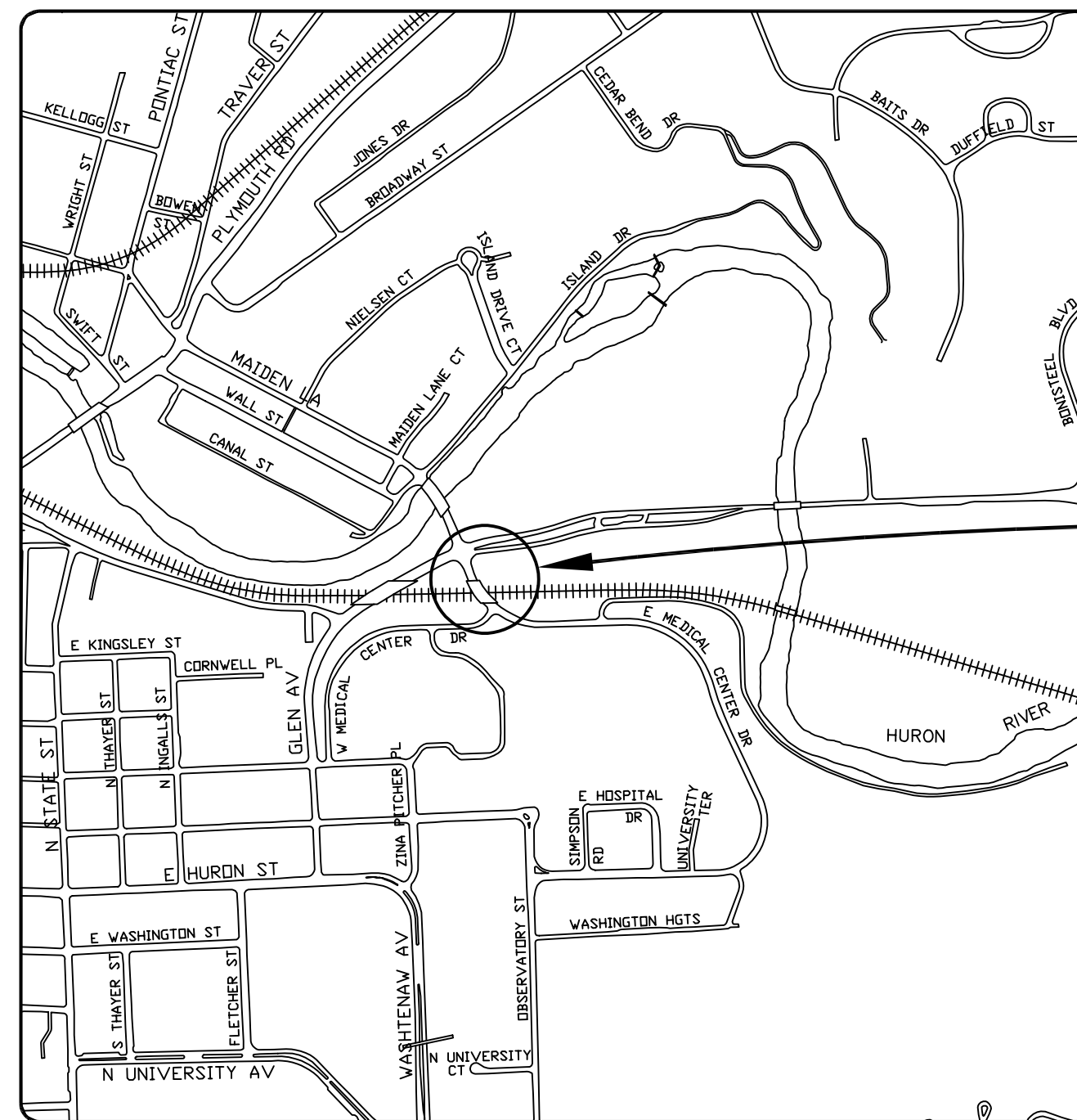
CITY OF ANN ARBOR ENGINEERING

IN COOPERATION WITH THE
UNIVERSITY OF MICHIGAN

2022 E. MEDICAL CENTER DRIVE BRIDGE REHABILITATION AND WIDENING

TRAFFIC DATA	
PRESENT ADT	18,500 (2021)
FUTURE ADT	20,000 (2041)
% COMMERCIAL	2.0%
POSTED SPEED	25 MPH
DESIGN SPEED	30 MPH

PERMITS REQUIRED TO BE OBTAINED BY THE CONTRACTOR PRIOR TO THE BEGINNING OF CONSTRUCTION AT NO COST TO CONTRACTOR.	
PERMIT	ISSUING AUTHORITY
LANE CLOSURE PERMIT	CITY OF ANN ARBOR ENGINEERING UNIT
"NO PARKING" SIGNS PERMIT	CITY OF ANN ARBOR ENGINEERING UNIT
GRADING/ SOIL EROSION & SEDIMENTATION CONTROL PERMIT	CITY OF ANN ARBOR PLANNING AND DEVELOPMENT SERVICES UNIT
ACCESS AGREEMENT	UNIVERSITY OF MICHIGAN



STR 11065
EAST MEDICAL CENTER DRIVE OVER NORFOLK SOUTHERN RAILROAD

CITY FILE NO. 2021-008

CONTRACT FOR: DECK REPLACEMENT AND WIDENING, STRUCTURAL STEEL REPAIRS, BEAM GALVANIZATION, PIER CAP REPLACEMENT, SUBSTRUCTURE PATCHING, SUBSTRUCTURE WIDENING.

PREPARED UNDER THE SUPERVISION OF

CARRIE HAMEL, P.E., MICHIGAN LICENSE NO.

DATE

CONTRACT FOR: APPROACH WORK, ROADWAY WIDENING, SIDEWALK REPLACEMENT, HMA RESURFACING AND RECONSTRUCTION, SIGNAL WORK AND MAINTENANCE OF TRAFFIC.

PREPARED UNDER THE SUPERVISION OF

LEIGH MERRILL P.E., MICHIGAN LICENSE NO.

10/13/2022

DATE

SEAL

DRAWING NO.

2021-008-C1

SHEET 1 OF 153

3 WORKING DAYS!
**BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)**

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, THE CONTRACTOR SHALL DIAL 1-800-482-7171 A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

X:\Projects\2021\2141\736500_AA - EMCD_Bridge_01_ConstrDecs\CAD\EMCD_Project_Index_Sheet

PUBLIC UTILITY CONTACT INFORMATION		
WATER	CITY OF ANN ARBOR FIELD OPERATIONS SERVICE UNIT W.R. WHEELER SERVICE CENTER 4251 STONE SCHOOL ROAD ANN ARBOR, MI 48108	DAN WOODEN (734) 794-6350
SANITARY		TRAVIS CONLEY (734) 794-3304
STORM		KEVIN SCHNEIDER (734) 794-6350
SIGNS SIGNALS STREET LIGHTS		MARC MORENO (734) 794-6350

PRIVATE UTILITY CONTACT INFORMATION		
GAS	DTE ENERGY 3150 E. MICHIGAN AVE YPSILANTE TOWNSHIP, MI 48198	ROBERT CZAPIEWSKI (734) 544-7818
ELECTRIC	DTE ELECTRIC	RAFAEL RAMIREZ-INCIARTE (313) 597-4411 rafael.ramirezinciart2@ dteenergy.com
CABLE	COMCAST 25626 TELEGRAPH ROAD SOUTHFIELD, MI 48034	JEFF DOBIES (734) 359-1669
PHONE	AT&T 550 S. MAPLE ROAD ANN ARBOR, MI 48103	MICHAEL ZAREMA (734) 277-4855
FIBER OPTIC	VERIZON BUSINESS/MCI 3 PARKLANE BOULEVARD DEARBORN, MI 48126	MARLON REDD (313) 588-0849 marlon.redd@verizon.com
FIBER OPTIC	FIBER LINK, INC.	JOEL JARVIS Missdigdsg@ fiberlink.com
FIBER OPTIC	WINDSTREAM COMMUNICATIONS	JEFF WEBB (734) 790-6556 jeff.webb@windstream.com
FIBER OPTIC	LUMEN/CENTURYLINK 19675 WEST 10 MILE ROAD SOUTHFIELD, MI 48075	DAVE HUCKFELDT (517) 812-2592 dave.huckfeldt@lumen.com
ITS/FIBER OPTIC	UNIVERSITY OF MICHIGAN	KEVIN MCLAUGHLIN (734) 615-5699 mckevin@umich.edu

SHEET INDEX		
DRAWING NUMBER	SHEET NUMBER	SHEET TITLE
2021-008-C1	1	TITLE SHEET
2021-008-C2	2	PROJECT INFORMATION
2021-008-C3	3	PROJECT NOTES
2021-008-C4	4	MISCELLANEOUS QUANTITIES
		ROAD PLANS
2021-008-TSCS	5	ROADWAY CROSS SECTIONS
2021-008-TS1	6	EXISTING CONDITIONS (E. MED. CNTR. DR.)
2021-008-TS2	7	EXISTING CONDITIONS (FULLER RD.)
2021-008-SECM	8	SOIL EROSION AND SEDIMENTATION CONTROL PLAN
2021-008-R1	9	ROADWAY REMOVAL PLAN
2021-008-R2	10	ROADWAY CONSTRUCTION
2021-008-MOT1 TO MOT2	11-12	BRIDGE CONSTRUCTION STAGING DETAILS
2021-008-MOT1	13	ADVANCED WARNING SIGNAGE PLAN
2021-008-MOT2-MOT4	14 - 16	TEMPORARY SIGNAGE PLAN (STG. I AND II)
2021-008-MOT5	17	DETOUR PLAN
2021-008-MOT6	18	TEMPORARY SIGNAGE PLAN (STG.III)
2021-008-MOT7	19	M.O.T. QUANTITIES
2021-008-MOT8	20	SIGN DETAILS
2021-008-MOT9-MOT14	21 - 26	PAVEMENT MARKING PLANS
2021-008-MOT16 TO MOT18	27 - 51	TRAFFIC SIGNAL PLANS
2021-008-GD1-GD3	52 - 54	DETAIL GRADES
2021-008-PM1-PM2	55-56	PAVEMENT MARKING PLAN
2021-008-UT1	57	UTILITY REMOVAL PLAN
2021-008-UT2	58	OVERALL UTILITY PLAN
2021-008-UT4	60	TELECOMMUNICATIONS CONDUIT PLAN
2021-008-UT5	61	TELECOMMUNICATIONS CONDUIT DETAILS
2021-008-UT6	62	STREET LIGHT ELECTRICAL PLAN
2021-008-UT6	63	UM HOSPITAL SIGN RELOCATION

SHEET INDEX		
DRAWING NUMBER	SHEET NUMBER	SHEET TITLE
		BRIDGE PLANS
2021-008-BR1	64	GENERAL PLAN OF SITE
2021-008-BR2	65	LAYOUT DIAGRAM
2021-008-BR3 TO BR5	66-68	SOIL BORING DATA
2021-008-BR6 TO BR8	69-71	GENERAL PLAN OF STRUCTURE
2021-008-BR9 TO BR16	72-79	EXISTING PLANS (REMOVALS)
2021-008-BR17 TO BR18	80-81	MICROPILE PLANS
2021-008-BR19 TO BR23	82-86	ABUTMENT DETAILS
2021-008-BR24 TO BR27	87-90	PIER DETAILS
2021-008-BR28 TO BR36	91-99	STRUCTURAL STEEL DETAILS
2021-008-BR37	100	BEARING DETAILS
2021-008-BR38 TO BR48	101-111	SUPERSTRUCTURE DETAILS
2021-008-BR49	112	EXPANSION JOINT DETAILS
2021-008-BR50 TO BR51	113-114	RETAINING WALL DETAILS
2021-008-BR52 TO BR58	115-121	STEEL REINFORCEMENT DETAILS
2021-008-BR59	122	SOIL NAIL STABILIZATION DETAILS
		STANDARD PLANS
2021-008-STD1 TO STD2	123-125	ANN ARBOR STANDARD DETAILS
2021-008-STD3 TO STD4	126-127	U OF M STANDARD DETAILS
2021-008-STD5 TO STD9	128-132	MDOT ROAD STANDARD DETAILS
2021-008-STD10 TO STD13	133-136	MDOT BRIDGE STANDARD DETAILS
2021-008-SSD1 TO SSD9	137-153	MDOT TRAFFIC SIGNAL SPECIAL DETAILS

STANDARD PLANS

WHERE THE FOLLOWING ITEMS ARE CALLED FOR ON PLANS, THEY ARE TO BE CONSTRUCTED ACCORDING TO THE STANDARD PLAN GIVEN BELOW OPPOSITE EACH ITEM UNLESS OTHERWISE INDICATED.

STD. PLAN NO.	ITEM OF WORK
ANN ARBOR STANDARD PLANS	
SD-SESC-1 SC-SESC-3 SD-GU-5 SD-GU-5 SD-GU-8 SD-M-1 SD-R-1 SD-R-4 SD-R-10 SD-R-15 SD-SL-1 SD-TD-1A SD-TD-6 SD-TD-7 SD-TD-9	INLET PROTECTION SILT FENCE STANDARD CASTING SCHEDULE MANHOLE CASTING ADJUSTMENT MANHOLE & VALVE/MOMUMENT BOX LOWERING TREE PROTECTION BARRIER CURB & GUTTER SPILL-OUT BARRIER CURB & GUTTER SIDEWALK & CURB & GUTTER JOINTS URBAN GUARDRAIL LOCATION STREETLIGHT FOUNDATION UTILITY TRENCH - TYPE I UTILITY TRENCH - TYPE VI UTILITY TRENCH - TYPE VII UTILITY TRENCH - TYPE IX
UNIVERSITY OF MICHIGAN STANDARD PLANS	
	EXPANSION JOINT REPLACEMENT PAVEMENT EXPANSION JOINT (E.J.) 18" CURB & GUTTER, SPILLOUT 18" CURB & GUTTER (U OF M STANDARD) SIDEWALK CONTROL JOINT LAYOUT MILLED EDGE MANHOLE COVER ADJUSTMENT & STRUCTURE REBUILD SIGN MOUNT - TURF SIGN MOUNT - CONCRETE SURFACE BICYCLE HOOP - CONCRETE BICYCLE HOOP - MULCH BICYCLE HOOP - CORED BICYCLE HOOP - PAVERS BICYCLE HOOP - SURFACE MOUNT MULCH BLANKET INSTALLATION SILT FENCE INLET FILTER SACK SEEDED AREA
M.D.O.T. STANDARD PLANS	
R-28-J R-53-A* B-25-K B-102-C B-103-E MOT TYPICAL A 163-INT-LD-OUT	SIDEWALK RAMP & DETECTABLE WARNING DETAILS TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION BRIDGE RAILING, AESTHETIC PARAPET TUBE STANDARD SLOPE PAVING DETAILS MOLDING, BEVEL, LIGHT STANDARD ANCHOR BOLT ASSEMBLY AND NAME PLATE DETAILS SIGNAL WORK AT INTERSECTION LONGER THAN 1 HOUR ON E. MEDICAL CENTER DR. AT W. MEDICAL CENTER DR. OR CANCER CENTER SIGNAL WORK AT INTERSECTION OUTSIDE ROADWAY LONGER THAN 1 HOUR ON A 4-LANE UNDIVIDED ROADWAY
* DENOTES SPECIAL DETAIL	

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(TOLL FREE)

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
PROJECT INFORMATION SHEET	
SCALE NONE	INCH 0 1
DRAWING NO. 2021-008-C2	
SHEET NO. <u> 2 </u> OF <u> 153 </u>	
APPROVED BY _____	

NOTES:

GENERAL

THE UNDERGROUND LOCATIONS AND DEPTH SHOWN FOR ALL PUBLIC AND PRIVATE UTILITIES ARE APPROXIMATE. THE CITY OF ANN ARBOR, THE UNIVERSITY OF MICHIGAN, AND DLZ ASSUME NO RESPONSIBILITY FOR THEIR ACCURATE REPRESENTATION IN THIS DRAWING. THE CONTRACTOR SHALL CONTACT MISS-DIG TO LOCATE ALL MARKED AND UNMARKED UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY DELAYS, DAMAGES, COSTS AND/OR CHARGES INCURRED DUE TO AND/OR BY REASON OF ANY UTILITY, STRUCTURE, FEATURES AND/OR SITE CONDITION, WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL REPAIR AND/OR REPLACE, AT ITS SOLE EXPENSE, TO AS GOOD OR BETTER CONDITION, ANY AND ALL UTILITIES, STRUCTURES, FEATURES AND/OR SITE CONDITIONS WHICH ARE IMPACTED BY REASON OF THE WORK, OR INJURED BY ITS OPERATIONS, OR DURING THE OPERATIONS OF ITS SUBCONTRACTORS OR SUPPLIERS.

DRIVEWAYS AND ENTRANCES TO BUILDINGS, REAL PROPERTY, AND THE LIKE SHALL NOT BE BLOCKED EXCEPT FOR SHORT DURATIONS AND ONLY WHEN APPROVED BY THE ENGINEER. VEHICULAR AND PEDESTRIAN ACCESS SHALL BE MAINTAINED AT ALL TIMES AS SPECIFIED IN MAINTAINING TRAFFIC PLANS AND SPECIFICATIONS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTINUOUS MAINTENANCE OF THE TEMPORARY TRAFFIC CONTROL DEVICES AND SOIL EROSION CONTROL MEASURES WITHIN THE CONSTRUCTION AREA AND APPROACHES TO PROJECT SITE, UNTIL THE FINAL COMPLETION OF THE PROJECT. THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

THE LOCATION OF MATERIAL STOCK PILES AND ON-SITE STAGING AREAS ARE TO BE APPROVED BY THE ENGINEER IN ADVANCE. ANY MATERIALS STOCKPILED OR STORED SHALL NOT CREATE AN EROSION PROBLEM, INTERFERE WITH DRAINAGE, OR CREATE INSUFFICIENT SIGHT DISTANCE.

EXISTING STREET NAME, GUIDE, REGULATORY SIGNS, BRIDGE LIGHTING, ETC, WHICH CONFLICT WITH THE PROPOSED CONSTRUCTION SHALL BE REMOVED PRIOR TO CONSTRUCTION, STORED IN A MANNER WHICH WILL PREVENT DAMAGE, AND RE-SET IN LOCATIONS AS DIRECTED BY THE ENGINEER OR THE UNIVERSITY OF MICHIGAN. THE WORK TO COMPLY WITH THESE REQUIREMENTS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE OTHER BID ITEMS OF WORK.

A RAILROAD PERMIT IS REQUIRED TO ACCESS THE TRACK SIDE OF THE PIERS TO PERFORM THE SUBSTRUCTURE REPAIRS.

THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES AND SERVICE LEADS ARE TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

DURING NON-WORKING HOURS NO MORE THAN TEN(10) FEET OF TRENCH SHALL REMAIN OPEN. ANY OPEN TRENCH SHALL BE PROPERLY SECURED WITH PROTECTIVE FENCING. THIS WORK SHALL BE INCLUDED IN THE ITEMS OF WORK BEING UNDERTAKEN AND WILL NOT BE PAID FOR SEPARATELY.

FOR MAINLINE HMA PAVING, THE WIDTH OF THE MAT FOR EACH PASS OF THE PAVER SHALL BE NOT LESS THAN 10.5', NOR GREATER THAN 16', EXPECT AS NOTED IN THE PLANS AND AS DIRECTED BY THE ENGINEER. THE ENGINEER WILL DIRECT THE LAYOUT OF ALL HMA LONGITUDINAL JOINTS DURING CONSTRUCTION.

ALL EXCAVATION REQUIRED FOR PROJECT GRADING WITHIN THE PROJECT LIMITS, INCLUDING PROPOSED PAVEMENT, BIOSWALES, SIDEWALK, AND SIDEWALK RAMPS SHALL BE INCLUDED IN "MACHINE GRADING, MODIFIED,_____".

EXCAVATION AND BACKFILL BEHIND CURB AND GUTTER SHALL BE INCLUDED IN "MACHINE GRADING, MODIFIED,_____". ALL BACKFILL UNDER PROPOSED CONCRETE PAVEMENTS SUCH AS DRIVE APPROACHES, RAMPS, SIDEWALK, ETC., SHALL BE MDOT CLASS II GRANULAR MATERIAL, COMPACTED TO 95% OF ITS MAX. DRY DENSITY AND WILL BE PAID FOR AS "SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED." BACKFILL FOR OTHER AREAS MUST BE APPROVED BY THE ENGINEER AND COMPACTED TO 95% OF ITS MAX. DRY DENSITY. NO PAYMENT WILL BE MADE FOR SUB-BASE OR AGGREGATE BASE THAT EXTENDS BEYOND 12" BEHIND THE BACK OF CURB. REFERENCE THE TYPICAL CROSS-SECTIONS.

SOME STORM SEWER MAY UNAVOIDABLY BECOME DAMAGED DURING CONSTRUCTION, OR IT MAY BE DETERMINED BY THE ENGINEER THAT EXISTING STORM SEWER NEEDS TO BE REPLACED. IN EITHER CASE THE ENGINEER MAY DIRECT THE SEWER TO BE REMOVED AND REPLACED. THE REMOVAL OF THE EXISTING SEWER AND/OR DRAINAGE STRUCTURES SHALL BE INCLUDED IN THE CONTRACT WORK ITEMS "SEWER, ANY SIZE OR DEPTH, REM" OR "DR STRUCTURE, ANY SIZE OR DEPTH, REM", AND THE REPLACEMENT SEWER SHALL BE INSTALLED AND PAID FOR AT THE CORRESPONDING CONTRACT UNIT PRICE, IF CONTAINED WITHIN THE CONTRACT, FOR THE VARIOUS TYPES AND SIZES OF SEWER TO BE REPLACED.

ALL STRUCTURES SHALL RECEIVE NEW CASTINGS, EITHER TYPE B, TYPE K, TYPE Q, OR TYPE R AS SPECIFIED ON THE STANDARD CASTING SCHEDULE. THE EXISTING CASTINGS SHALL BE NEATLY STACKED ON-SITE IN A SINGLE LOCATION SO THAT CITY OF ANN ARBOR FORCES CAN RETRIEVE THEM AT A LATER DATE. THE CONTRACTOR SHALL ASSIST CITY FORCES BY LOADING THEM INTO CITY TRUCKS. ALL COSTS ASSOCIATED WITH STORING, STOCKPILING, AND LOADING CASTINGS INTO CITY VEHICLES SHALL BE INCLUDED IN THE ITEM OF WORK "GENERAL CONDITIONS, MAX \$650,000" AND WILL NOT BE PAID FOR SEPARATELY.

ALL FITTINGS, HYDRANTS, VALVES AND CASTINGS REMOVED DURING CONSTRUCTION SHALL BECOME THE PROPERTY OF THE CITY OF ANN ARBOR. THE CONTRACTOR SHALL COORDINATE PICK UP BY THE CITY OF ANN ARBOR FIELD OPERATIONS UNIT AT W.R. WHEELER SERVICE CENTER YARD.

PAYMENT FOR DRAINAGE STRUCTURE SUMPS WHERE SPECIFIED SHALL BE INCLUDED IN THE PAYMENT FOR THE VARIOUS DRAINAGE STRUCTURES SIZES AND/OR TYPES.

WHERE PIPES OF DIFFERENT SIZES OR MATERIALS ARE JOINED OR SAWED SEWER PIPE CONNECTIONS ARE MADE, FRENCO FLEXIBLE COUPLINGS WITH STAINLESS STEEL SHEAR RINGS SHALL BE USED. THE CONTRACTOR'S PURCHASE PRICE FOR THE DEVICES, INCLUDING SHIPPING, SHALL BE PAID AS AN EXTRA. PRIOR TO PAYMENT FOR THIS ITEM, THE CONTRACTOR SHALL SUBMIT RECEIPTS FOR THE ENGINEER'S REVIEW AND APPROVAL. ALL OTHERS COSTS ASSOCIATED WITH THE INSTALLATION OF THESE DEVICES SHALL BE INCLUDED IN THE PAYMENT FOR THE SEWER.

WHERE STORM SEWER IS TO BE REMOVED AND REPLACED OR ADDED, ALL PIPE SHALL BE INSTALLED USING THE UTILITY TRENCH DETAILS SHOWN ELSEWHERE IN THE PLAN SHEETS AND/OR DETAILED IN THE SPECIFICATIONS. TRENCH DETAILS I AND V REQUIRE THE USE OF MDOT CLASS II GRANULAR MATERIAL.

IF THE CONTRACTOR ENCOUNTERS EXISTING EDGE DRAIN(S) DURING CONSTRUCTION OF THE PROPOSED EDGE DRAINS, INLET LEADS, OR CATCH BASINS, IT SHALL BE CAPPED AT EACH END TO PREVENT MATERIAL FROM ENTERING THE PIPE. THE COST OF THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE PARTICULAR ITEM OF WORK BEING PERFORMED WHEN EXISTING EDGE DRAIN(S) ARE ENCOUNTERED.

IN AREAS WHERE EDGE DRAIN CANNOT BE INSTALLED IN ACCORDANCE WITH THE DETAILS, THE EDGE DRAIN SHALL BE INSTALLED AT THE DEPTH AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. IN NO CASE SHALL THE EDGE DRAIN BE INSTALLED AT A GRADE LESS THAN 0.50% OR AT A DEPTH LESS THAN 3.25' BELOW THE TOP OF PAVEMENT.

ALL CURB, SIDEWALK, DRIVEWAY APPROACH REMOVALS SHALL BE APPROVED BY THE ENGINEER BEFORE THE WORK IS PERFORMED. ALL CONCRETE AND BITUMINOUS MATERIALS SHALL BE SAW-CUT FULL-DEPTH AT THEIR REMOVAL LIMITS PRIOR TO REMOVAL. SAW-CUTTING WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE ITEM OF WORK "MACHINE GRADING, MODIFIED,_____".

PLACE 4" (MINIMUM) OR 6" (MINIMUM) THICKNESS CLASS II GRANULAR MATERIAL COMPACTED TO 95% OF ITS MAX. DRY DENSITY UNDER CONCRETE SIDEWALK AS SHOWN ON THE DETAILS. THIS WORK SHALL BE INCLUDED IN THE CONTRACT ITEMS "SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED."

PLACE 6" (MINIMUM) CLASS II GRANULAR MATERIAL COMPACTED TO 95% OF ITS MAX. DRY DENSITY UNDER DRIVE APPROACHES. THIS WORK SHALL BE INCLUDED IN THE CONTRACT ITEM "SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED."

BRIDGE

THE RECONSTRUCTION DESIGN OF THE SUPERSTRUCTURE, PIER CAPS, AND WIDENED SUBSTRUCTURE UNITS IS BASED ON 1.2 TIMES THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING WITH THE EXCEPTION THAT THE DESIGN TANDEM PORTION OF THE HL-93 LOAD DEFINITION IS REPLACED BY A SINGLE 60 KIP AXLE LOAD BEFORE APPLICATION OF THIS 1.2 FACTOR. THE RESULTING LOAD IS DESIGNATED HL-93 MOD. LIVE LOAD PLUS IMPACT DEFLECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH. THE ORIGINAL STRUCTURE WAS DESIGNED FOR HS25 LOADING.

THE DESIGN OF THE STRUCTURAL MEMBERS IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES: CONCRETE:

GRADE 3500	f _c = 3,000 psi
GRADE 4500	f _c = 4,000 psi

STEEL REINFORCEMENT: f_y = 60,000 psi

STRUCTURAL STEEL:

AASHTO M270, GRADE 50 OR 50W	F _y = 50,000 psi
AASHTO M270, GRADE 36	F _y = 36,000 psi

BEVEL ALL EXPOSED CONCRETE CORNERS SHOWN SQUARE ON THE PLANS WITH 1/2" TRIANGULAR MOLDINGS EXCEPT AS OTHERWISE NOTED.

UNLESS OTHERWISE SHOWN ON THE PLANS PROVIDE MINIMUM CONCRETE CLEAR COVER FOR REINFORCEMENT ACCORDING TO THE FOLLOWING:

CONCRETE CAST AGAINST EARTH:	3 IN.
ALL OTHER UNLESS SHOWN ON PLANS:	2 IN.

REMOVAL OF EXISTING HMA PATCHES AS A RESULT OF REMOVAL OF OTHER SUPERSTRUCTURE ITEMS SHALL BE INCLUDED IN THE REMOVAL OF THOSE ITEMS AND SHALL NOT BE PAID FOR SEPARATELY.

NO PORTION OF THE FORMWORK OR FALSEWORK SHALL ENCROACH ON THE EXISTING UNDERCLEARANCE.

THIS PROJECT HAS BEEN EVALUATED USING THE FAA NOTICE CRITERIA TOOL FOR A TEMPORARY STRUCTURE HEIGHT OF 232 FEET ABOVE A GROUND LEVEL ELEVATION OF 771 FEET AND NO PERMITS ARE REQUIRED.

UM CONDUIT

PULL A SOLID MANDREL AND A STIFF BRISTLED BRUSH THROUGH EACH DUCT TO CLEAN THEM AND ENSURE THE ABSENCE OF KINKS AND FLAT SPOTS. A MINIMUM 3-1/4" DIAMETER BY 5" MINIMUM LONG MANDREL SHALL BE USED FOR 4" CONDUIT AND A MINIMUM 4" DIAMETER BY 6" MINIMUM LONG MANDREL SHALL BE USED FOR 5" DIAMETER CONDUIT. THE MADREL PULL SHALL BE WITNESSED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH THIS WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE CONDUIT PAY ITEMS.

LIGHTING

THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND LABOR AS INDICATED ON PLANS AND AS REQUIRED FOR A COMPLETE ELECTRICAL SYSTEM.

THE CONTRACTOR SHALL VISIT THE JOB SITE, THOROUGHLY CHECK THE EXISTING FIELD CONDITIONS AND EXISTING ELECTRICAL INSTALLATIONS AND CLARIFY ALL DISCREPANCIES WITH THE ENGINEER BEFORE SUBMITTING A BID AS NO EXTRAS WILL BE ALLOWED FOR OMITTED WORK DUE TO FAILURE TO INSPECT THE SITE.

ALL ELECTRICAL WORK SHALL COMPLY WITH N.E.C., LOCAL CODES, ORDINANCES AND REGULATIONS INCLUDING THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT.

ALL MATERIALS SHALL BE NEW AND BEAR THE UL LABEL.

ELECTRICAL ENCLOSURES, SUPPORT RACKS, CONDUIT SYSTEMS, ETC., SHALL BE THOROUGHLY GROUNDED IN ACCORDANCE WITH THE N.E.C. AND ALL LOCAL CODES. INCLUDED IN THE PAY ITEM "DB CABLE IN CONDUIT, 600V, 1/C#6".

COORDINATE ALL ELECTRICAL UNDERGROUND WORK WITH NEW AND EXISTING UNDERGROUND UTILITIES BEFORE INSTALLATION.

HAND DIG WHERE REQUIRED TO LOCATE EXISTING UTILITIES PRIOR TO INSTALLATION OF THE PROPOSED ROADWAY LIGHTING CONDUIT. INCLUDED IN THE PAY ITEM "EXPLORATORY EXCAVATION, VERTICAL".

ALL LIGHT POLES SHALL BE STORED WITH WOOD BLOCKING SEPARATION AND CARE SHALL BE TAKEN SO AS NOT TO DAMAGE THE FACTORY FINISH OF POLES AND LUMINAIRES. ALL DAMAGE SHALL BE TOUCHED UP WITH FACTORY APPROVED TOUCH-UP PAINT.

CARE SHALL BE EXERCISED DURING POLE BASE & POLE PLACEMENT, SO THAT ANCHOR BOLTS ARE CORRECTLY ALIGNED, POLES ARE PLUMB, LUMINAIRES ARE POSITIONED AND ORIENTED PROPERLY.

FINAL LOCATIONS OF LIGHT STANDARDS, CONDUIT AND HANDHOLES SHALL BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER PRIOR TO CONSTRUCTION TO AVOID CONFLICTS THAT MAY BE ENCOUNTERED.

PROVIDE A COMPLETE UNDERGROUND SYSTEM AS SHOWN INCLUDING ALL EXCAVATION AND BACKFILL. ALL CONDUIT JOINTS SHALL BE MADE WATERTIGHT.

ALL THREADED ELECTRICAL EQUIPMENT (CONDUIT, COUPLINGS, JUNCTION BOXES, ETC.) INSTALLED OUTDOORS SHALL BE COATED WITH ANTI-SEIZE COMPOUND PRIOR TO INSTALLATION.

ELECTRICAL SERVICE SHALL BE 120 VOLT, SINGLE PHASE, 2 WIRE, WITH GROUND.

STREET LIGHTING LUMINAIRES SHALL BE LED TYPE II DISTRIBUTION, 58 WATT, 120/277 VOLT, 8,201 DELIVERED LUMENS, 3000K CCT, LUMECON WORKMEN SERIES LWS-LSL-60-GR-1-T2-OW-7P.

STREET LIGHTING POLES SHALL BE ROUND TAPERED COMPOSITE, ANCHOR BASE POLE, 30' MOUNTING HEIGHT, VALMONT SHAKESPEARE AS SERIES, AS30-01S1DB01/OPAR6-BK-H, SMOOTH FINISH, BLACK IN COLOR. POLE SHALL HAVE 4"X12" HANDHOLE AND ONE-PIECE BASE COVER, POWDER COATED BLACK. POLE TO BE DRILLED FOR 6' ALUMINUM MAST ARM AND SUPPLIED WITH 1" DIAMETER ANCHOR BOLTS.

LUMINAIRE MAST ARM SHALL BE ALUMINUM WITH 6' LENGTH.

SMOOTH SURFACE PVC, SCHEDULE 40 OR SCHEDULE 80, CONDUIT ONLY IS ALLOWED ON THIS JOB.

ALL WIRE AND CABLE SHALL BE INSTALLED IN CONTINUOUS UN CUT LENGTH BETWEEN HANDHOLES OR LIGHT STANDARDS.

ALL WORK ASSOCIATED WITH COMPLYING WITH THE ABOVE REQUIREMENTS SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RESPECTIVE ITEMS BID FOR INSTALLING AND MAKING THE LIGHTING SYSTEM READY FOR OPERATION.

RAILROAD

ALL UNDERGROUND UTILITIES, CABLE, AND FACILITIES LOCATED WITHIN THE MDOT/AMTRAK ROW MUST BE LOCATED AND PROTECTED BEFORE ANY EXCAVATING, DRILLING, BORING/DIRECTIONAL DRILLING, GROUND PENETRATING ACTIVITIES, OR CONSTRUCTION TAKES PLACE. THIS INCLUDES RAILROAD AND COMMERCIAL UTILITIES, CABLES, DUCT LINES, AND FACILITIES. THESE ACTIVITIES WILL NOT BE PERFORMED IN CLOSE PROXIMITY TO THE AMTRAK DUCT LINES UNLESS MONITORED BY ON-SITE AMTRAK COMMUNICATIONS AND SIGNAL (C&S) DEPARTMENT PERSONNEL. HAND DIGGING MAY BE REQUIRED, AS DIRECTED BY AMTRAK THROUGH THE ON-SITE AMTRAK C&S SUPPORT PERSONNEL. AMTRAK MAINTAINS THE RIGHT TO ACCESS ALL EXISTING CABLES AND CONDUITS THROUGHOUT CONSTRUCTION. AMTRAK ALSO RESERVES THE RIGHT TO UPGRADE AND INSTALL NEW CABLES AND CONDUITS IN THE AFFECTED AREA. THE CALL BEFORE YOU DIG 811 "ONE-CALL" PROCESS MUST BE FOLLOWED. PLEASE NOTE THAT AMTRAK IS NOT A PART OF THE "ONE-CALL" PROCESS; CONTACT AMTRAK ENGINEERING TO HAVE ALL AMTRAK UNDERGROUND UTILITIES AND ASSETS LOCATED. IF REQUESTED BY AMTRAK, EXISTING DEPTHS OF UTILITIES BEING CROSSED MUST BE VERIFIED THROUGH TEST PITS PERFORMED BY THE CONTRACTOR PERSONNEL. HAND DIGGING MAY BE REQUIRED. PRECAUTIONS MUST BE TAKEN TO PREVENT ANY INTERRUPTION TO AMTRAK'S OPERATION.

AMTRAK C&S PERSONNEL MUST FIELD-VERIFY THAT THERE IS NO SIGNAL EQUIPMENT IN THE WAY OF THE PROJECT AND THAT SIGNAL REVIEW IS NOT BEING OBSTRUCTED.

ALL WORK MUST BE COMPLETED IN ACCORDANCE WITH AMTRAK EP3014 "MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS", INCLUDING BUT NOT LIMITED TO, DESIGN REQUIREMENTS FOR TEMPORARY SHIELDING, SHORING AND BARRIERS.

SEQUENCE OF EROSION CONTROL MEASURES:

1. THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER, A SEQUENCE OF CONSTRUCTION WITH RESPECT TO THE SOIL EROSION CONTROL MEASURES FOR REVIEW, COMMENT AND APPROVAL. THIS SCHEDULE IS TO INCLUDE INSPECTION AND REPAIR OF ALL TEMPORARY EROSION CONTROL MEASURES DAILY AND WITHIN 24 HOURS OF A STORM EVENT.

SOIL EROSION AND SEDIMENTATION CONTROL INSTALLATION MINIMUM REQUIREMENTS:

- 1.1. INSTALL SILT FENCE, TREE PROTECTION FENCING, MUD MATS, INLET FILTERS ON EXISTING DRAINAGE FEATURES, AND ALL OTHER TEMPORARY SOIL EROSION CONTROLS, PRIOR TO ANY CLEARING OR EARTH MOVING OPERATION.
- 1.2. STRIP AND STOCKPILE TOPSOIL. STABILIZE STOCKPILE AS REQUIRED.
- 1.3. CONTINUALLY MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES, AS REQUIRED TO ALLOW DRAINAGE AND SEDIMENT REMOVAL. REMOVE ANY ACCUMULATED SEDIMENT IMMEDIATELY.
- 1.4. COMPLETE ALL FINE GRADING.
- 1.5. TEMPORARY SEED AND INSTALL EROSION CONTROL BLANKET IN ALL DISTURBED AREAS.
- 1.6. REFER TO LANDSCAPE PLANTING PLANS FOR PERMANENT SITE STABILIZATION.
- 1.7. REMEDY ANY NOTED DEFECTS TO THE SATISFACTION OF THE CITY OF ANN ARBOR'S SOIL EROSION AND SEDIMENTATION CONTROL OFFICIAL.
- 1.8. ALL TEMP. SOIL EROSION CONTROL MEASURES MUST BE REMOVED, WITH ENGINEERS APPROVAL, PRIOR TO FINAL INSPECTION

NOTE: THIS SEQUENCE IS FOR INFORMATION ONLY. IT IS INTENDED TO SHOW THE SEQUENCE OF CONSTRUCTION WITH RESPECT TO THE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING THEIR OWN DETAILED CONSTRUCTION SEQUENCE AND SCHEDULE TO THE ENGINEER FOR REVIEW, COMMENT, AND APPROVAL.

ON SITE SOILS PER THE USDA SOIL SURVEY OF WASHTENAW COUNTY, MICHIGAN:

- BnB - Boyer Loamy Sand.

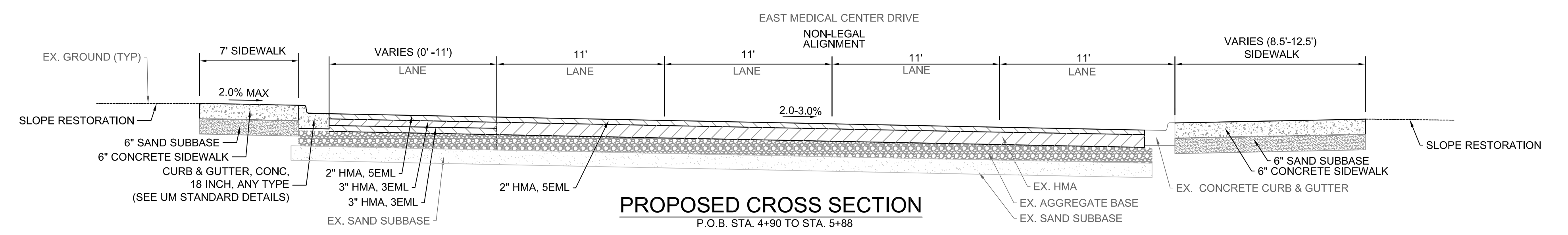
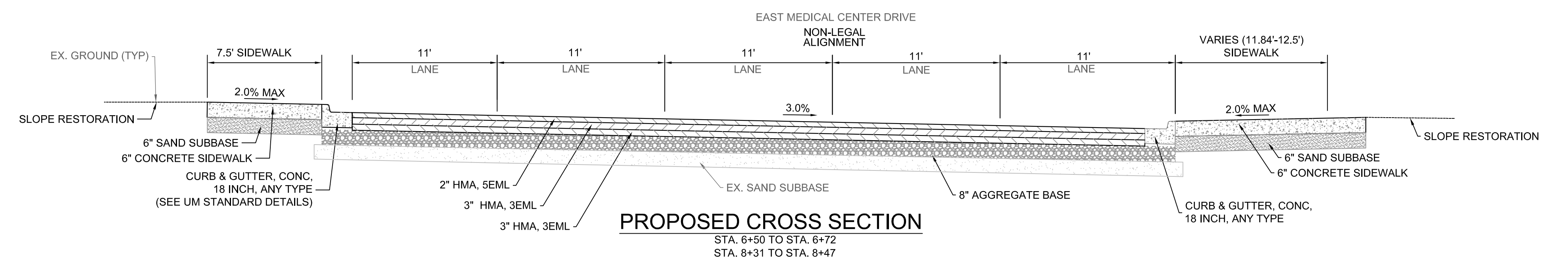
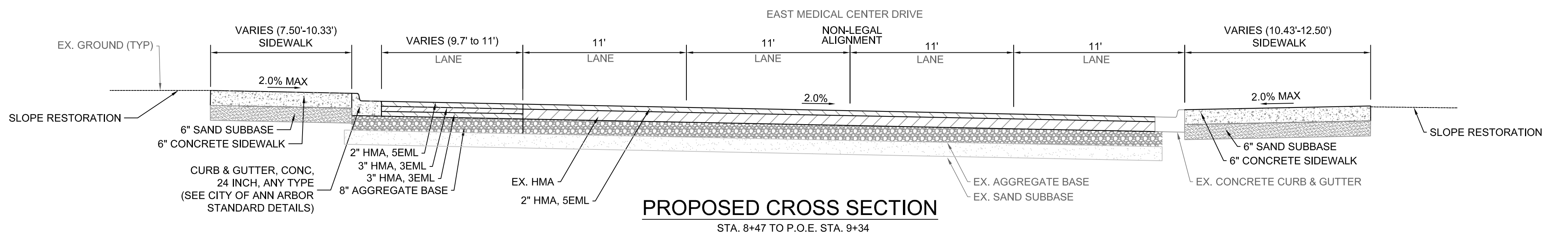
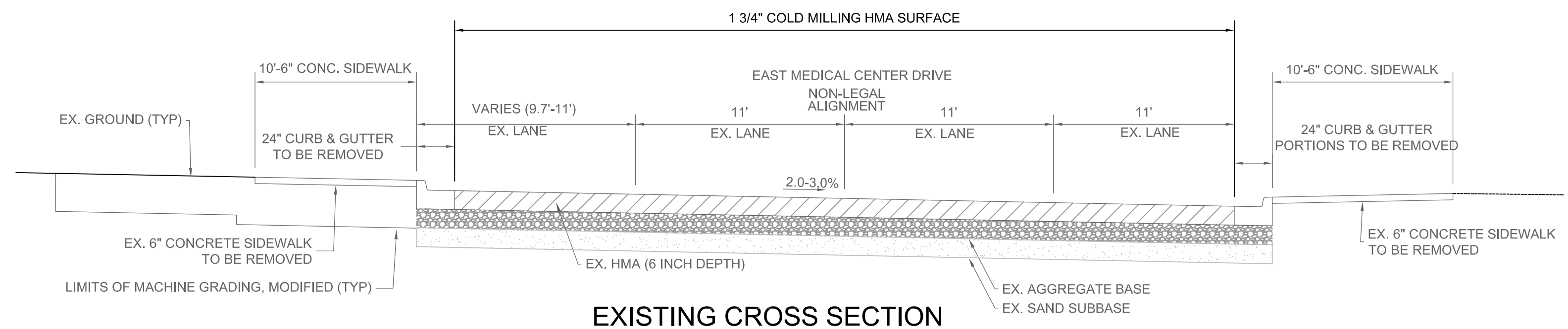
3 WORKING DAYS!
**BEFORE YOU DIG
CALL MISS DIG**
800-482-7171
(TOLL FREE)



					PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
					EAST MEDICAL CENTER DRIVE	
PROJECT NOTE SHEET					SCALE NONE	INCH 0 1
					DRAWING NO. 2021-008-C3	
REV. NO.	DESCRIPTION	DATE	DR.BY	CH.BY	APPROVED BY _____	SHEET NO. <u> 3 </u> OF <u> 153 </u>

PROJECT: 2022 E. MEDICAL CENTER DRIVE BRIDGE REHABILITATION AND WIDENING QUANTITY SHEET

ROADWAY/MOT ITEMS							ROADWAY/MOT ITEMS							STRUCTURE ITEMS						
CODE NO.	WORK ITEM	UNITS	CONTRACT			AS-BUILT	CODE NO.	WORK ITEM	UNITS	CONTRACT			AS-BUILT	CODE NO.	WORK ITEM	UNITS	CONTRACT			AS-BUILT
			CATG 0001	CATG 0002	CATG 0003					TOTAL	CATG 0001	CATG 0002					CATG 0003	TOTAL	CATG 0001		CATG 0002	CATG 0003	TOTAL
1047051	Certified Payroll & Compliance	LSUM	1			1	8120330	Sign, Portable, Changeable Message, Furn	Ea	1			1	1077060	Relocation and Site Cleanup	Dir			15,000	15,000
1047051	Project Supervision	LSUM	1			1	8120331	Sign, Portable, Changeable Message, Furn	Ea	1			1	2040061	Structures, Rem Portions (STR 11065)	LSUM	0.9	0.1		1
2010001	Clearing	Acre	0.2			0.2	8120340	Sign, Type A, Temp, Prismatic, Furn	Sft	27			27	2060002	Backfill, Structure, CIP	Cyd	300	300	340	940
2040035	Guardrail, Rem	Ft	176			176	8120341	Sign, Type A, Temp, Prismatic, Oper	Sft	27			27	2060010	Excavation, Fdn	Cyd	300	300	400	1,000
2040050	Pavt, Rem	Syd	192			192	8120350	Sign, Type B, Temp, Prismatic, Furn	Sft	926			926	2067050	Dewatering System, Excavation	Ea		2		2
2040080	Exploratory Investigation, Vertical	Ft	50	150		200	8120351	Sign, Type B, Temp, Prismatic, Oper	Sft	926			926	3027021	Sand Subbase Course, Class II, CIP	Cyd			34	34
2047001	Curb and Gutter, Any Type or Size, Rem	Ft	70	311		381	8120352	Sign, Type B, Temp, Prismatic, Spec, Furn	Sft	315			315	7040001	Steel Sheet Piling, Permanent	Sft			6,690	6,690
2047011	Sidewalk and Drive, Any Type or Thickness, Rem	Syd	70	575		645	8120353	Sign, Type B, Temp, Prismatic, Spec, Oper	Sft	315			315	7040002	Steel Sheet Piling, Temp	Sft	360			360
2057011	Machine Grading, Modified	Syd		2.3		2.3	8120370	Traf Regulator Control	LSUM	1			1	7040003	Steel Sheet Piling, Temp, Left in Place	Sft		360		360
2057021	Non-Hazardous Contaminated Material Handling and Disposal, LM	Cyd	200		200	400	8121000	Conc Barrier, Temp, Limited Deflection, Det 1, Furn	Ft	160			160	7057050	Micropile, Type B, Furn and Install, LRFD	Ea		18		18
2087036	Erosion Control, Silt Fence	Ft	1,289			1,289	8121001	Conc Barrier, Temp, Limited Deflection, Det 1, Oper	Ft	160			160	7057050	Micropile, Load Test, Proof, LRFD	Ea		4		4
2087050	Erosion Control, Inlet Protection	Ea	5	2		7	8121100	Conc Barrier, Temp, Limited Deflection, Det 2, Furn	Ft	75			75	7057050	Micropile, Load Test, Verification, LRFD	Ea		1		1
2090001	Project Cleanup	LSUM	1			1	8121101	Conc Barrier, Temp, Limited Deflection, Det 2, Oper	Ft	75			75	7057051	Micropile Mobilization, LRFD (STR 11065)	LSUM			1	1
3027021	Aggregate Base Course, 21AA, Modified	Cyd	43	56		99	8121102	Conc Barrier, Temp, Limited Deflection, Det 2, Adj	Ft	75			75	7060001	Bridge Ltg, Furn and Rem (STR 11065)	LSUM	0.9	0.1		1
3027021	Sand Subbase Course, Class II, CIP	Cyd	16	91		107	8121200	Conc Barrier, Temp, Limited Deflection, Det 3A, Furn	Ft	160			160	7060002	Bridge Ltg, Oper and Maintain	Cyd	375	54		429
4030005	Dr Structure Cover, Adj, Case 1	Ea		2		2	8121201	Conc Barrier, Temp, Limited Deflection, Det 3A, Oper	Ft	160			160	7060050	Expansion Joint Device	Ft	162	29		191
4030050	Dr Structure Cover, Type K	Ea	2	2		4	8122012	Pavt Mrkg, Wet Reflective, Type R, Tape, 12 Inch, White, Temp	Ft	86			86	7060060	False Decking	Sft	19,840			19,840
4030390	Dr Structure, Temp Lowering	Ea	2	2		4	8122111	Pavt Mrkg, Wet Reflective, Type R, Tape, Only	Ea	4			4	7060092	Reinforcement, Steel, Epoxy Coated	Lb	135,940	33,985	1,423	171,348
4037050	Dr Structure Cover, Adj	Ea	2			2	8122145	Pavt Mrkg, Wet Reflective, Type R, Tape, Rt & Lt Turn Arrow Sym	Ea	2			2	7060100	Substructure Conc	Cyd	160	129		289
5012013	HMA, 3EML	Ton	64	82		146	8122148	Pavt Mrkg, Wet Reflective, Type R, Tape, Thru & Rt Turn Arrow Sym	Ea	11			11	7060110	Superstructure Conc	Cyd	101			101
5012037	HMA, 5EML	Ton	222	22		244	8127050	Pedestrian Type II Barricade, Temp	Ea	2			2	7060111	Superstructure Conc, Form, Finish, and Cure (STR 11065)	LSUM	1			1
5017011	Hand Patching, Modified	Ton	35	35		70	8167011	Slope Restoration	Syd	40	210		250	7060112	Superstructure Conc, Form, Finish, and Cure, Night Casting (STR 11065)	LSUM	0.9	0.1		1
5017011	Cold Milling, HMA Surface, Modified	Syd	1,527			1,527	8182000	Conduit, Rem	Ft	498	12		510	7060113	Superstructure Conc, Night Casting	Cyd	375	54		429
8027001	Curb and Gutter, Conc, 18 Inch, Any Type	Ft	50	227		277	8182016	Conduit, Encased, 1, 4 Inch	Ft			204	204	7060140	Water Repellent Treatment, Penetrating	Syd	51			51
8027001	Curb and Gutter, Conc, 24 Inch, Any Type	Ft	34	77		111	8182021	Conduit, Encased, 6, 4 Inch	Ft		126		126	7062003	Conc, Grade 4500	Cyd			33	33
8037001	Detectable Warning Surface	Sft		64		64	8182034	Conduit, Directional Bore, 1, 1 1/2 Inch	Ft	60			60	7067001	Expansion Joint Device, Cover Plate, Modified	Ft	50			50
8037010	Concrete Sidewalk, 6 Inch	Sft	819	5,077		5,896	8182035	Conduit, Directional Bore, 1, 3 Inch	Ft	365			365	7070019	Bearing, Elastomeric, 2 3/4 inch	Sin	5,796	900		6,696
8037010	Sidewalk Ramp, Concrete, 8 Inch	Sft		229		229	8182048	Conduit, DB, 1, 1 1/2 Inch	Ft	90			90	7070021	Bearing, Elastomeric, 3 1/4 inch	Sin	5,310	880		6,190
8070004	Guardrail, Type MGS-8	Ft	144			144	8182133	Conduit, Schedule 40, 2 Inch	Ft		233		233	7070040	Shear Developers (STR 11065)	LSUM		0.7	0.3	1
8070044	Guardrail Approach Terminal, Type 2M	Ea	2			2	8182135	Conduit, Schedule 40, 3 Inch	Ft			740	740	7070050	Structural Steel, Mixed, Erect	Lb	51,984	14,162		66,146
8077050	Guardrail Departing Terminal, Type MGS	Ea	2			2	8182187	DB Cable, In Conduit, 600V, 1/C#6	Ft	2,220	699		2,919	7070051	Structural Steel, Mixed, Furn and Fab	Lb	51,984	14,162		66,146
8087001	Fence, Temp	Ft	774			774	8182309	Hh, Polymer Conc	Ea	2			2	7070070	Structural Steel, Rolled Shape, Erect	Lb		40,000		40,000
8087001	Post and Chain Fence, Salvage	Ft		84		84	8182330	Hh, Rem	Ea	2			2	7070071	Structural Steel, Rolled Shape, Furn and Fab	Lb		40,000		40,000
8087001	Tree Fence, Protective	Ft	47			47	8182349	Wood Pole, Cl 4, 30 Foot	Ea	5			5	7077051	Structural Steel, Galvanizing (STR 11065)	LSUM	1			1
8087050	Gate, Temp	Ea	2			2	8182363	Wood Pole, Rem	Ea	5			5	7100001	Joint Waterproofing	Sft	740			740
8100398	Sign, Type IIA	Sft	20			20	8182387	Wood Pole, Fit Up, TS Cable Pole	Ea	3			3	7100003	Joint Waterproofing, Expansion	Sft	10			10
8100399	Sign, Type IIB	Sft	20			20	8187001	Conduit, DB, 1, 2 Inch	Ft		8		8	7100030	Substructure Horizontal Surface Sealer (STR 11065)	Syd	90			90
8100402	Sign, Type III, Erect Salv	Ea	4			4	8187050	Handhole, Assembly, 17 inch x 30 inch	Ea	2	3	7	12	7110005	Bridge Railing, Aesthetic Parapet Tube	Ft	321			321
8107050	Hospital Sign and Foundation, Relocate	Ea		2		2	8187050	Handhole, Adjust, Any Size	Ea		1		1	7120007	Hand Chipping, Other Than Deck	Cft	112			112
8110091	Pavt Mrkg, Polyurea, 4 Inch, White	Ft	675			675	8187050	Hh, Tap, 4 Inch	Ea			2	2	7120017	Patch, Forming	Sft	447			447
8110092	Pavt Mrkg, Polyurea, 4 Inch, Yellow	Ft	504			504	8197050	Luminaire Installation	Ea	5			5	7120020	Epoxy Ovlv	Syd	1,050			1,050
8110110	Pavt Mrkg, Polyurea, 12 Inch, Crosswalk	Ft	55			55	8197050	Pole Fit-Up	Ea	5			5	7120028	Adhesive Anchoring of Horizontal Bar, 3/4 inch	Ea		68		68
8110114	Pavt Mrkg, Polyurea, 24 Inch, Stop Bar	Ft	69			69	8197050	Pole Installation	Ea	5			5	7120034	Adhesive Anchoring of Vertical Bar, 3/4 inch	Ea		8		8
8110153	Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	Ft	396			396	8197050	Streetlight, Rem	Ea	5			5	7120084	Reinforcement, Mechanical Splice	Ea	794			794
8110154	Pavt Mrkg, Sprayable Thermopl, 4 Inch, Yellow	Ft	602			602	8200100	Pedestal, Alum	Ea	2	1		3	7120098	Flushing Cracks, Water	Ft	124			124
8110307	Rem Curing Compound, for Longit Mrkg, 4 Inch	Ft	791			791	8200101	Pedestal, Alum, Salvage	Ea	1			1	7120099	Structural Conc, Repr	Ft	124			124
8110321	Rem Curing Compound, for Spec Mrkg	Sft	211			211	8200105	Pedestal, Fdn	Ea	2	1		3	7120112	Patching Conc, C-L	Cyd	5			5
8110343	Rem Spec Mrkg	Sft	1,000			1,000	8200106	Pedestal Fdn, Rem	Ea	3	1		4	7120120	Embedded Galvanic Anode	Ea	555			555
8110405	Pavt Mrkg, Polyurea, LT Turn Arrow Sym	Ea	7			7	8200110	Pedestal, Rem	Ea	3	1		4	7130010	Beam Plate, Seal Perimeter	Ft	1,660			1,660
8110410	Pavt Mrkg, Polyurea, Only	Ea	12			12	8200121	Pushbutton and Sign	Ea	2	1		3	8037010	Concrete Sidewalk, 6 Inch	Sft			1,830	1,830
8110412	Pavt Mrkg, Polyurea, RT Turn Arrow Sym	Ea	5			5	8200122	Pushbutton, Rem	Ea	3	1		4	8127060	Railroad Inspection and Flagging	Dir	180,000	20,000		200,000
8110418	Pavt Mrkg, Polyurea, Thru Arrow Sym	Ea	3			3	8200126	Pushbutton and Sign, Salvage	Ea	1			1	8130015	Slope Paving Header	Ft		100	131	231
8117001	Recessing Pavt Mrkg, Longitudinal	Ft	2,219			2,219	8200140	Span Wire	Ea	4			4	8130020	Slope Paving, Conc	Syd		55	30	85
8117001	Recessing Pavt Mrkg, Transverse	Ft	119			119	8200141	Span Wire, Rem	Ea	4			4	8182097	Conduit, Schedule 80, 4 inch, Structure	Ft	2920			2920
8120012	Barricade, Type III, High Intensity, Double Sided, Lighted, Furn	Ea	4			4	8200168	Strut Guy	Ea	2			2	8182133	Conduit, Schedule 40, 2 inch	Ft		170		170
8120013	Barricade, Type III, High Intensity, Double Sided, Lighted, Oper	Ea	4			4	8200177	TS, Mast Arm Mtd, Rem	Ea	1			1	8182135	Conduit, Schedule 40, 3 inch	Ft			330	330
8120027	Pedestrian Type II Channelizer, Temp	Ft	60			60	8200251	TS, One Way Mast Arm Mtd, Salv	Ea	1			1	8507010	Soil Nails for Slope Stabilization	Sft		2,723		2,723
8120035	Channelizing Device, 42 Inch, Fluorescent, Furn	Ea	50			50	8200376	Bracket, Truss, With 12 Foot Arm	Ea	1			1							
8120036	Channelizing Device, 42 Inch, Fluorescent, Oper	Ea	50			50	8200444	Hemispherical Video Detection Camera	Ea	1		2	3							
8120040	Conc Barrier Ending, Temp, Det 2, Adj	Ea	2			2	8200445	Hemispherical Video Detection System	Ea			1	1							
8120041	Conc Barrier Ending, Temp, Det 2, Furn	Ea	2			2	8200446	Hemispherical Video Detection Camera, Rem	Ea	1			1							
8120042	Conc Barrier Ending, Temp, Det 2, Oper	Ea	2			2	8200452	TS Head, Adj												



HMA APPLICATION ESTIMATE			
PAY ITEM	RATE (LBS/SYD)	PERFORMANCE GRADE	REMARKS
HMA, 5EML	220	64-22	HMA, 5EML TOP COURSE AWI=260.
HMA, 3EML	330	64-22	HMA, 3EML LEVELING COURSE
HMA, 3EML	330	58-22	HMA, 3EML BASE COURSE
BOND COAT	0.10 GAL/SYD		FOR INFORMATION ONLY. SHALL NOT BE PAID SEPARATELY BUT IS INCLUDED IN PAY ITEM OF HMA COURSE BEING APPLIED

3 WORKING DAYS | BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

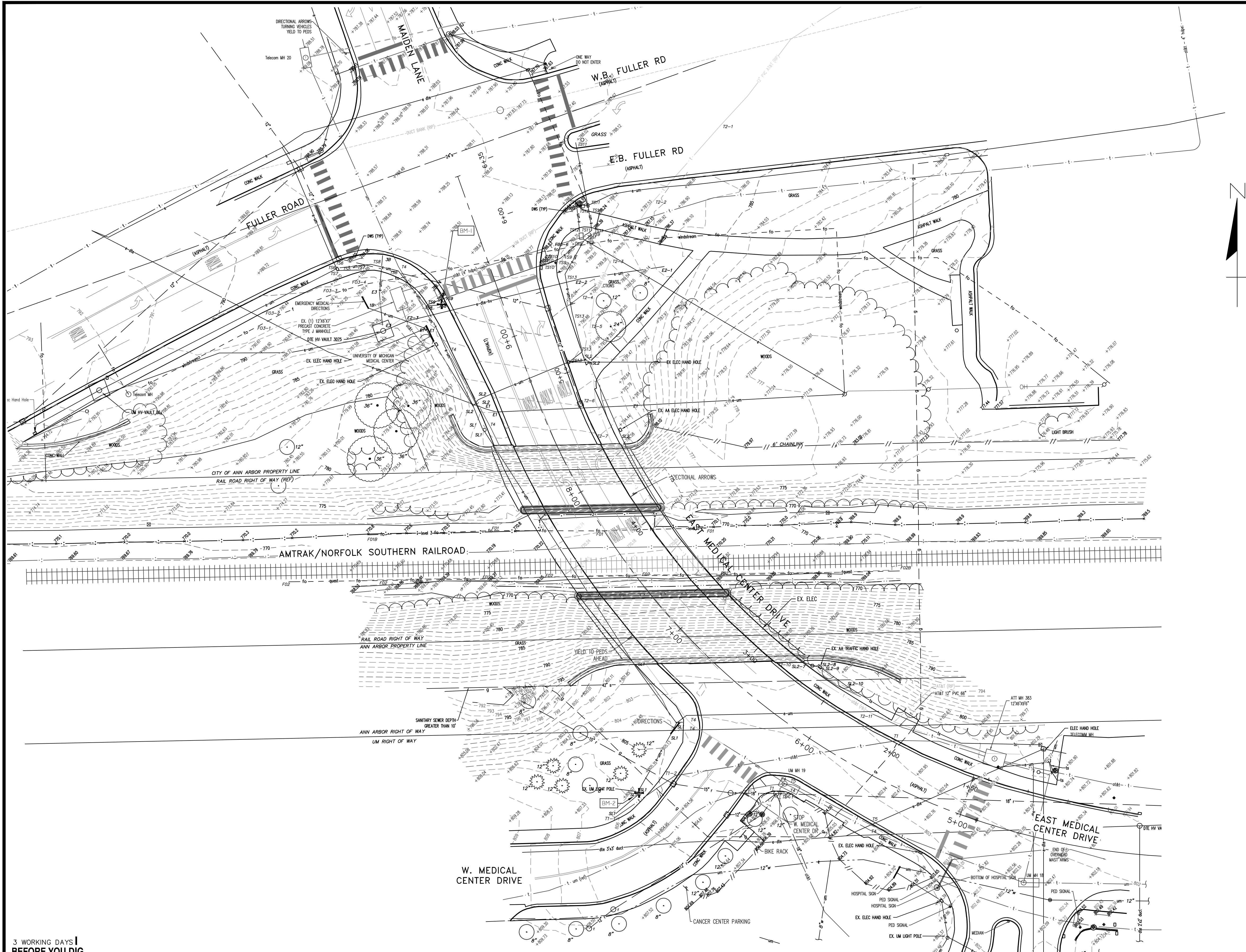
E. MEDICAL CENTER DRIVE ROADWAY CROSS SECTIONS

SCALE: 0 INCH = 1 FT

DRAWING NO. **2021-008-TSCS**

SHEET NO. 5 OF 153

APPROVED BY: _____



BENCHMARKS

BM#1
ELEV=790.619'
TOP OF SW TRAFFIC SIGNAL BASE BOLT AT THE SW CORNER OF THE INTERSECTION OF FULLER AVE AND MAIDEN AVENUE/E. MEDICAL CENTER DRIVE

BM#2
ELEV=806.437'
TOP OF NE LIGHT POLE BASE BOLT ON NORTH SIDE OF W MEDICAL CENTER DRIVE +/- 40' FROM THE INTERSECTION OF E. MEDICAL CENTER DRIVE

NOTE

FOR UTILITY STRUCTURE INFORMATION, SEE STRUCTURE TABLE - SHEET 59

NOTES

VERTICAL DATUM: NAVD 1988, BASED ON NGS CONCRETE MONUMENT DESIGNATED AS 0014A AND HAVING A PID OF AAS177.

HORIZONTAL DATUM: MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE 2113, INTERNATIONAL FEET, NAD 83, 2011 ADJUSTMENT YEAR

UTILITIES SHOWN ARE BASED OFF MARKED LOCATIONS PROVIDED BY T2 UTILITY ENGINEERS AND PLAN INFORMATION RECEIVED FROM UTILITY OWNERS IN RESPONSE TO A MISS DIG TICKET. UTILITY INFORMATION SHOULD BE CONSIDERED APPROXIMATE AND WILL NEED TO BE VERIFIED PRIOR TO ANY CONSTRUCTION.

MISS DIG TICKET #: B13010469

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	EXISTING HAND HOLE	DECIDUOUS TREE
- CONTOUR	- UTILITY POLE & GUY	- GAS LINE	- LEFT EDGE/RD. GRADE	- EXISTING PEDESTRIAN SIGNAL	(Circle with diagonal lines)
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	- BENCHMARK	(Circle with cross)
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	- TREE/BRUSH LINE	(Circle with dots)
- WATER MAIN & VALVE-IN-BOX	- END SECTION	- SIGN	- EDGE/GRAVEL		



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
EXISTING CONDITIONS (E MED CNTR DR)**

SCALE	1"=30'
DRAWING NO.	2021-008-TS1
SHEET NO.	6 OF 153

SEE ABOVE				
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE
			ORIGINAL ISSUE	10/12/22
			DR.BY	INB
			CH.BY	LCM

APPROVED BY _____

Coordinate System: State Plane Grid
 Zone: Michigan Southern 2113
 Ellipsoid: GRS 80
 Horizontal Datum: NAD 83 (NRS 2011)
 Vertical Datum: Geoid 128
 Units: International Feet

Control

CONTROL POINT # 1

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the north side of the Amtrak tracks.

COORDINATES: N=287044.0144 E=1324949.5600 EL=770.64'
 COMBINED FACTOR: 0.99992963

WITNESSES:

1. N7844'E 50.75' TO WEST SIDE OF NORTHERN PIER OF E MEDICAL CENTER DRIVE BRIDGE.
2. S545'E 22.51' TO THE NORTHERN AMTRAK RAIL
3. S8646'W 93.43' TO REBAR CONTROL POINT 8
4. N22202'W 34.24' TO REBAR CONTROL POINT 3

CONTROL POINT # 2

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the north side of the Amtrak tracks, EAST OF THE EAST MEDICAL CENTER DRIVE BRIDGE.

COORDINATES: N=287046.5865 E=13295189.4300 EL=769.97'
 COMBINED FACTOR: 0.99992966

WITNESSES:

1. N01043'W 45.47' TO 6' HIGH CHAINLINK FENCE
2. N830 05'E 93.12' TO UTILITY POLE
3. S01009'E TO NORTHERN AMTRAK RAIL
4. N85020'W 105.09 FEET TO THE EAST SIDE OF THE NORTHERN PIER FOR THE E MEDICAL CENTER DRIVE BRIDGE OVER AMTRAK.

CONTROL POINT # 3

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the north side of the Amtrak tracks, WEST OF THE EAST MEDICAL CENTER DRIVE BRIDGE.

COORDINATES: N=287075.7543 E=13294936.7100 EL=779.11'
 COMBINED FACTOR: 0.99992921

WITNESSES:

1. N0441'W 39.31' TO 36" TREE
2. S20028'E 66.70' TO THE WEST SIDE OF THE NORTHERN PIER TO THE EAST MEDICAL CENTER BRIDGE OVER AMTRAK
3. S22002'E 34.24' TO CONTROL POINT 1 (REBAR)
4. N72053'W 27.10' TO 36" TREE.

CONTROL POINT # 4

Set a 5/8" Diameter by 24" long rebar flush with the existing ground at the SW CORNER OF THE INTERSECTION OF EAST MEDICAL CENTER DRIVE AND FULLER AVENUE.

COORDINATES: 287188.4723 E=13294921.5700 EL=790.30'
 COMBINED FACTOR: 0.99992819

WITNESSES:

1. S79009'E 27.63' TO THE SW CORNER OF DETECTABLE WARNING SURFACE
2. S40039'E 34.41' TO NORTH CORNER OF UNIVERSITY OF MICHIGAN MEDICAL SIGN
3. S59031'W 17.89 FEET TO THE NORTH CORNER OF UNIVERSITY OF MICHIGAN MEDICAL SIGN
4. N48020'W 20.58' TO THE SE CORNER OF DETECTABLE WARNING SURFACE

CONTROL POINT # 5

MAG NAIL SET IN CONCRETE BRIDGE EXPANSION JOINT ON THE EAST SIDE OF THE BRIDGE OVER THE NORTH PIER.

COORDINATES: N=287055.2003 E=13295078.6000 EL=797.58'
 COMBINED FACTOR: 0.99992838

WITNESSES:

1. N56024'E 1.79' TO BOTTOM OF PARAPET WALL
2. S29024'E 57.80' TO BRIDGE EXPANSION JOINT AT EDGE OF SIDEWALK
3. S88021'W 9.97 FEET TO BRIDGE EXPANSION JOINT AT EDGE OF SIDEWALK
4. N57044'W 14.52' TO DIRECTIONAL ARROWS SIGN

CONTROL POINT # 6

SET MAG IN CONCRETE SIDEWALK JOINT AT SOUTHERN CORNER OF EAST MEDICAL CENTER DRIVE AND WEST MEDICAL CENTER DRIVE

COORDINATES: N=286890.9640 E=13295149.6300 EL=804.56'
 COMBINED FACTOR: 0.99992806

WITNESSES:

1. N76005'E 5.59' TO CENTER OF TELEPHONE MANHOLE
2. S59041'W 32.80' TO CENTER OF CATCH BASIN
3. S74054'W 17.52' TO STOP SIGN
4. S81014'W 26.42' TO CENTER OF SANITARY MANHOLE.

CONTROL POINT # 7

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the SOUTHWEST CORNER OF THE EAST MEDICAL CENTER DRIVE BRIDGE.

COORDINATES: N=286959.8056 E=13295063.1500 EL=802.00'
 COMBINED FACTOR: 0.999928174

WITNESSES:

1. S42016'E 43.83 FEET TO A DIRECTION SIGN
2. S7038'E 48.10' TO A 12" TREE
3. S28052'W TO A 8" TREE
4. S72054'W 35.50 TO SW CORNER OF RETAINING WALL

CONTROL POINT # 8

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the north side of the Amtrak tracks, WEST OF THE EAST MEDICAL CENTER DRIVE BRIDGE.

COORDINATES: N=287038.7366 E=13294856.2800 EL=770.34'
 COMBINED FACTOR: 0.999929648

WITNESSES:

1. N86046'E 93.43' TO CONTROL POINT 1
3. S01006'E TO NORTH AMTRAK RAIL
3. N62021'W 86.12' TO CONTROL POINT 11
4. N01019'E 29.05' TO A 12" TREE

CONTROL POINT # 9

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the south side of the Amtrak tracks, EAST OF THE EAST MEDICAL CENTER DRIVE BRIDGE.

COORDINATES: N=287006.6709 E=13295259.7600 EL=769.98'
 COMBINED FACTOR: 0.999929683

WITNESSES:

1. N01012'W 16.30' TO THE SOUTHERN AMTRAK RAIL
2. N83051'W 78.32' TO A TELEPHONE HAND HOLE
3. S35003'W 62.92' TO THE NE CORNER OF RETAINING WALL

CONTROL POINT # 10

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the south side of the Amtrak tracks, WEST OF THE EAST MEDICAL CENTER DRIVE BRIDGE.

COORDINATES: N=287005.0369 E=13295024.8000 EL=769.98'
 COMBINED FACTOR: 0.999929683

WITNESSES:

1. N01009'W 13.09' TO THE SOUTHERN AMTRAK RAIL
2. S70038'E 7.08' TO THE WEST EDGE OF THE SOUTHERN PIER OF THE EAST MEDICAL CENTER BRIDGE OVER AMTRAK
3. S02045'E 53.30' TO THE NE CORNER OF RETAINING WALL.

CONTROL POINT # 11

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the south side of the Amtrak tracks, WEST OF THE EAST MEDICAL CENTER DRIVE BRIDGE.

COORDINATES: N=287078.6776 E=13294780.0000 EL=781.27'

COMBINED FACTOR: 0.999929105

WITNESSES:

1. N21030'W 28.36' TO THE SE CORNER OF RETAINING WALL
2. N14056'W 44.52' TO THE CENTER OF TELEPHONE MANHOLE
3. S62021'E 86.12' TO CONTROL POINT 8.
4. S0048'E 33.68' TO CENTER OF TELEPHONE HAND HOLE.

CONTROL POINT # 12

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the south side of FULLER AVENUE APPROXIMATELY 225' EAST OF EAST MEDICAL CENTER DRIVE.

COORDINATES: N=287233.2356 E=13295233.0800 EL=780.90'
 COMBINED FACTOR: 0.999929048

WITNESSES:

1. N06013'W 30.95' TO THE SOUTHERN EDGE OF FULLER AVENUE.
2. N78020'E 43.39' TO THE INTERSECTION OF THE CURB AND SIDEWALK.
3. S19002'E TO THE NORTHERN EDGE OF SIDEWALK
4. S730 55'W 49.55 TO THE CENTER OF TELEPHONE HAND HOLE.

CONTROL POINT # 13

Set a 5/8" Diameter by 24" long rebar flush with the existing ground on the EAST/SOUTHEAST SIDE OF PARKING LOT ALONG THE SOUTH SIDE OF FULLER AVENUE.

COORDINATES: N=287133.8876 E=13295231.2700 EL=776.44'
 COMBINED FACTOR: 0.99992931

WITNESSES:

1. N45009'E 36.14' TO LAMP POST
2. S62059'E TO SW CORNER OF PARKING LOT
3. S44005'E 12.92' TO UTILITY POLE
4. S73021'W TO UTILITY POLE

BENCHMARKS:

BENCHMARK # 1

DESCRIPTION: TOP OF THE SW TRAFFIC SIGNAL BASE BOLT AT THE SW CORNER OF THE INTERSECTION OF FULLER AVENUE AND MAIDEN AVENUE/EAST MEDICAL CENTER DRIVE.

COORDINATES: N=287174.7856 E=13294953.2000 EL=806.619'

BENCHMARK # 2

DESCRIPTION: TOP OF NE LIGHT POLE BASE BOLT ON NORTH SIDE OF WEST MEDICAL CENTER DRIVE +/- 40' FROM THE INTERSECTION OF EAST MEDICAL CENTER DRIVE.

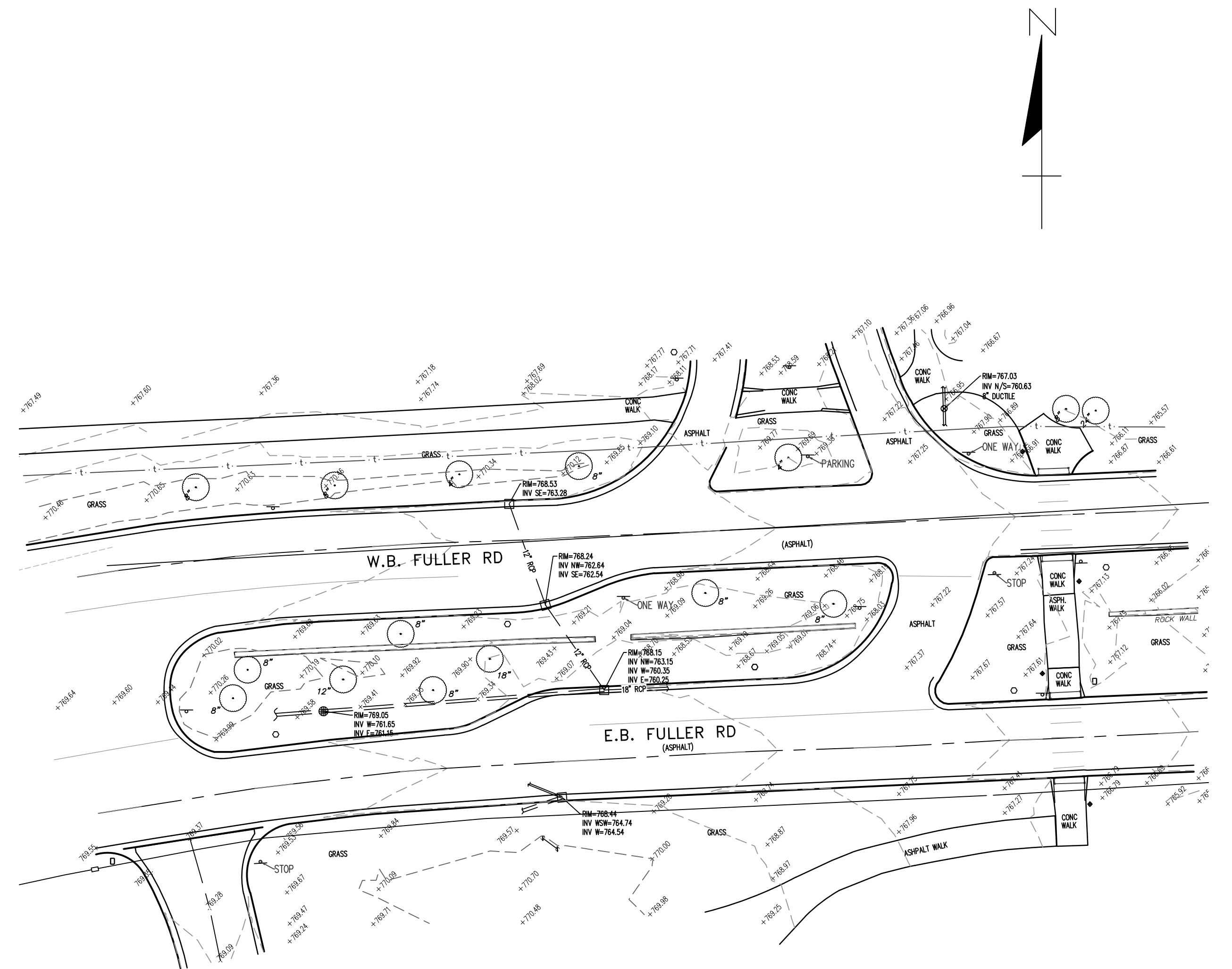
COORDINATES: N=286886.7248 E=13295069.5700 EL=806.437'

GOVERNMENT CORNERS:

DESIGNATION: 0014A

PROJ: A45137

DESCRIPTION: STATION 0014A IS LOCATED ON THE EASTERLY SIDE OF MAIDEN LANE APPROXIMATELY 140 FT (42.7 M) NORTHERLY OF THE NORTHERLY BACK OF CURB OF FULLER ROAD, SAID STATION BEING IN THE SOUTHWEST 1/4 OF SECTION 21, ANN ARBOR TOWNSHIP IN THE CITY OF ANN ARBOR, MICHIGAN. THE STATION IS LOCATED 5 FT (1.5 M) EASTERLY OF THE EASTERLY EDGE OF THE STONE WALL AND 71 FT (21.6 M) SOUTHEASTERLY OF THE SOUTHERLY MOST POINT OF THE CONCRETE BRIDGE ABUTMENT ON THE EASTERLY SIDE OF MAIDEN LANE. SAID STATION IS A PRIMARY CONTROL MONUMENT AND IS DESCRIBED AS THE 1993 EDITION OF THE CITY OF ANN ARBOR BRASS DISC, SET IN CONCRETE PER DETAIL AND IS FLUSH WITH THE GROUND. THIS POINT WAS SET BY THE CITY OF ANN ARBOR IN 1993 AND IS PAIRED WITH POINT 0014B.



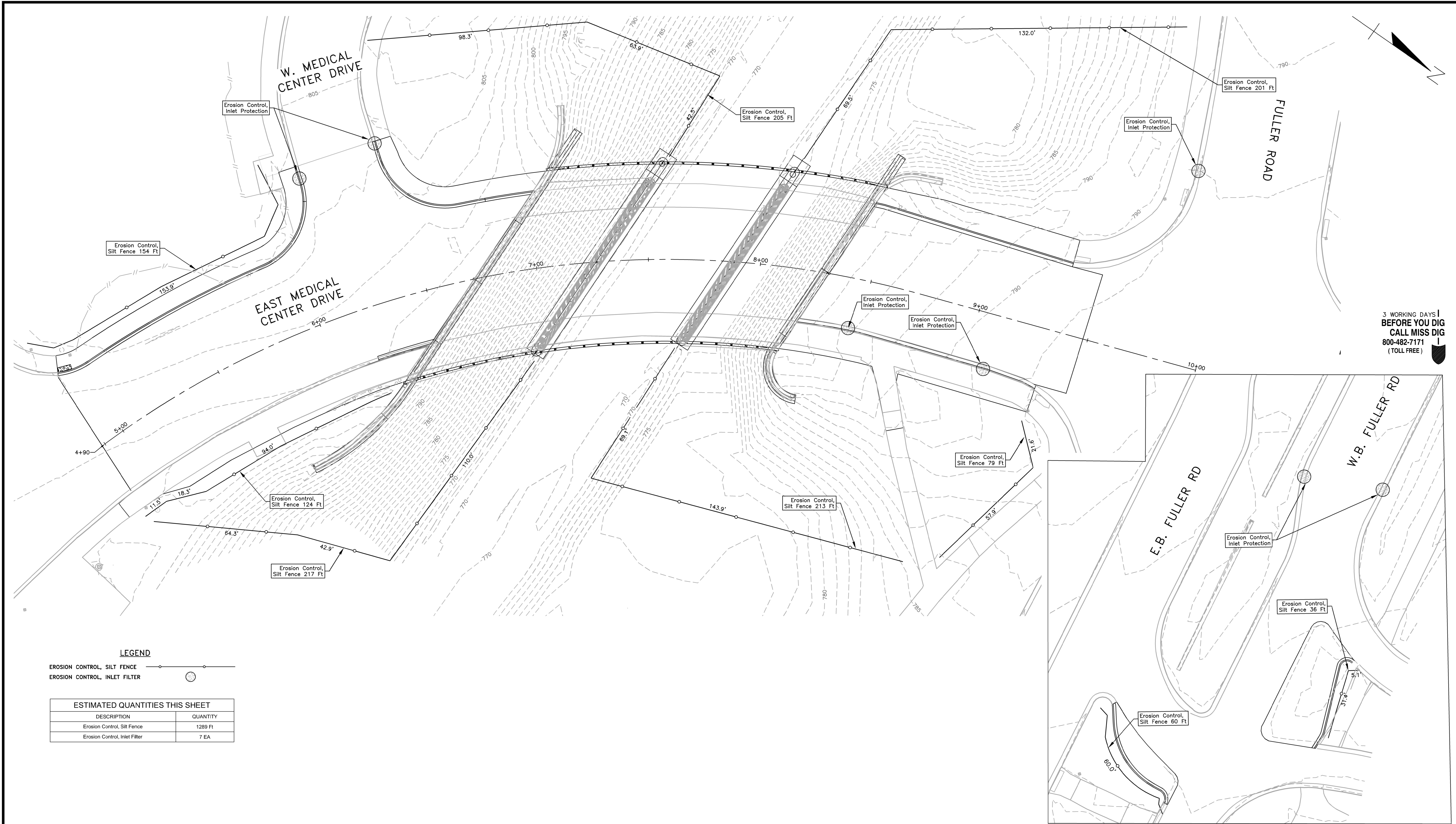
3 WORKING DAYS!
BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	EXISTING HAND HOLE	DECIDUOUS TREE
- - - - -	- S -	- t -	- - - - -	□	(circle)
- CONTOUR	- UTILITY POLE & GUY	- GAS LINE	- LEFT EDGE/RD. GRADE	EXISTING PEDESTRIAN SIGNAL	(circle with cross)
- B47	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	BENCHMARK	(circle with cross and dot)
- STORM SEWER & CAT. BAS.	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	TREE/BRUSH LINE	(circle with cross and dot)
- WATER MAIN & VALVE-IN-WELL	- END SECTION	- SIGN	- EDGE/GRAVEL		(circle with cross and dot)
- WATER MAIN & VALVE-IN-BOX					

DLZ					
SEE ABOVE					
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE	DR.BY
			ORIGINAL ISSUE	10/12/22	INB
					LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
E. MEDICAL CENTER DRIVE EXISTING CONDITIONS (FULLER RD.)			
SCALE	INCH		
1"=30'	0 1		
DRAWING NO.			
2021-008-TS2			
SHEET NO.	7	OF	139
APPROVED BY			



3 WORKING DAYS
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LEGEND

- EROSION CONTROL, SILT FENCE
- EROSION CONTROL, INLET FILTER

ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Erosion Control, Silt Fence	1289 Ft
Erosion Control, Inlet Filter	7 EA

LEGEND

- | | | | | | |
|---|---|--|---|---|---|
| <ul style="list-style-type: none"> EXISTING FENCE CONTOUR STORM SEWER & CAT. BAS. WATER MAIN & VALVE-IN-WELL WATER MAIN & VALVE-IN-BOX | <ul style="list-style-type: none"> EXISTING SANITARY SEWER & MANHOLE UTILITY POLE & GUY FIRE HYDRANT ASSEMBLY LIGHT POLE END SECTION | <ul style="list-style-type: none"> EXISTING TELEPHONE GAS LINE CABLE T.V. ELECTRIC SIGN | <ul style="list-style-type: none"> EXISTING RD. & GRADE LEFT EDGE/RD. GRADE RIGHT EDGE/RD. GRADE CURB & GUTTER EDGE/GRAVEL | <ul style="list-style-type: none"> PROPOSED SANITARY SEWER & MANHOLE STORM SEWER & CAT. BAS. WATER MAIN W/F.H. ASSEM. CONTOUR ROAD & GRADE | <ul style="list-style-type: none"> PROPOSED CURB & GUTTER PROPOSED SILT FENCE |
|---|---|--|---|---|---|



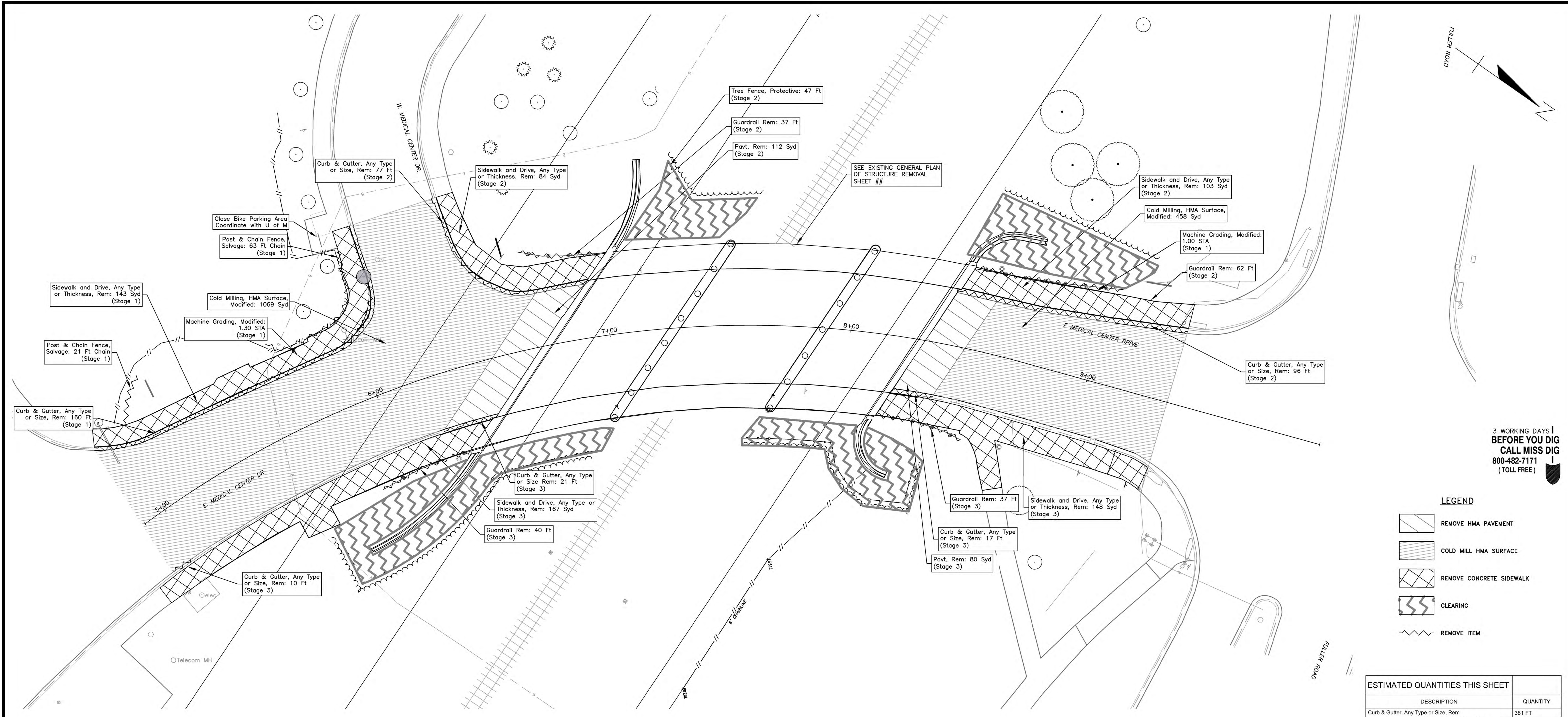
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
 SOIL EROSION CONTROL MEASURES**

SCALE 1"=20'	INCH
DRAWING NO. 2021-008-SECM	
SHEET NO. 8 OF 153	

SEE ABOVE				
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE
			ORIGINAL ISSUE	10/12/22
			DR.BY	INB
			CH.BY	LCM

APPROVED BY: _____



3 WORKING DAYS |
BEFORE YOU DIG
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LEGEND

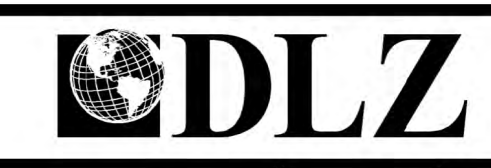
- REMOVE HMA PAVEMENT
- COLD MILL HMA SURFACE
- REMOVE CONCRETE SIDEWALK
- CLEARING
- REMOVE ITEM

ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Curb & Gutter, Any Type or Size, Rem	381 FT
Sidewalk and Drive, Any Type or Thickness, Rem	645 SYD
Pavt, Rem	192 SYD
Guardrail, Rem	176 FT
Cold Milling, HMA Surface, Modified	1527 SYD
Tree Fence, Protective	47 FT
Post and Chain Fence, Salvage	84 FT
Machine Grading, Modified	2.3 STA
Clearing	0.20 ACRE

NOTE:
 THE CONTRACTOR SHALL NOTE THAT THIS WORK IS TO BE DONE IN STAGES IN ACCORDANCE WITH THE MAINTENANCE OF TRAFFIC PLANS AND CONSTRUCTION SEQUENCE DEFINED ELSEWHERE IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL ONLY REMOVE THOSE ITEMS THAT ARE COMPATIBLE WITH THE PHASE OF WORK CURRENTLY BEING UNDERTAKEN WITH NO ADJUSTMENT IN THE UNIT PRICE AS BID FOR THE WORK. ALL REMOVALS PERFORMED SHALL PROVIDE FOR THE SAFE AND ORDERLY MAINTENANCE OF TRAFFIC.

LEGEND

- | | | | | | |
|---|---|--|---|---|--|
| <ul style="list-style-type: none"> EXISTING FENCE CONTOUR STORM SEWER & CAT. BAS. WATER MAIN & VALVE-IN-WELL WATER MAIN & VALVE-IN-BOX | <ul style="list-style-type: none"> EXISTING SANITARY SEWER & MANHOLE UTILITY POLE & GUY FIRE HYDRANT ASSEMBLY LIGHT POLE END SECTION | <ul style="list-style-type: none"> EXISTING TELEPHONE GAS LINE CABLE T.V. ELECTRIC SIGN | <ul style="list-style-type: none"> EXISTING RD. @ GRADE LEFT EDGE/RD. GRADE RIGHT EDGE/RD. GRADE CURB & GUTTER EDGE/GRAVEL | <ul style="list-style-type: none"> PROPOSED SANITARY SEWER & MANHOLE STORM SEWER & CAT. BAS. WATER MAIN W/F.H. ASSEM. CONTOUR ROAD @ GRADE | <ul style="list-style-type: none"> PROPOSED CURB & GUTTER |
|---|---|--|---|---|--|



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE ROADWAY REMOVAL PLAN

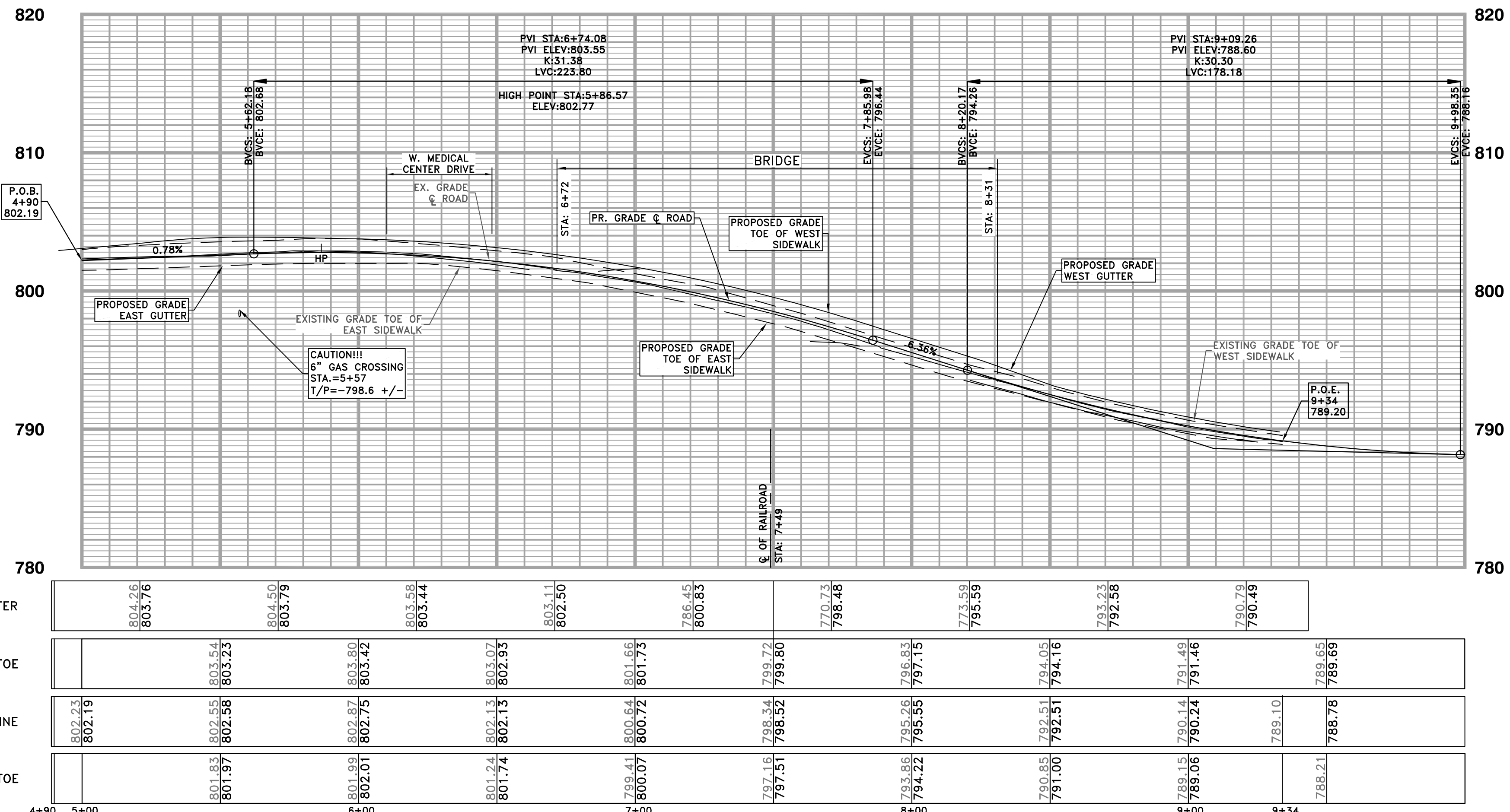
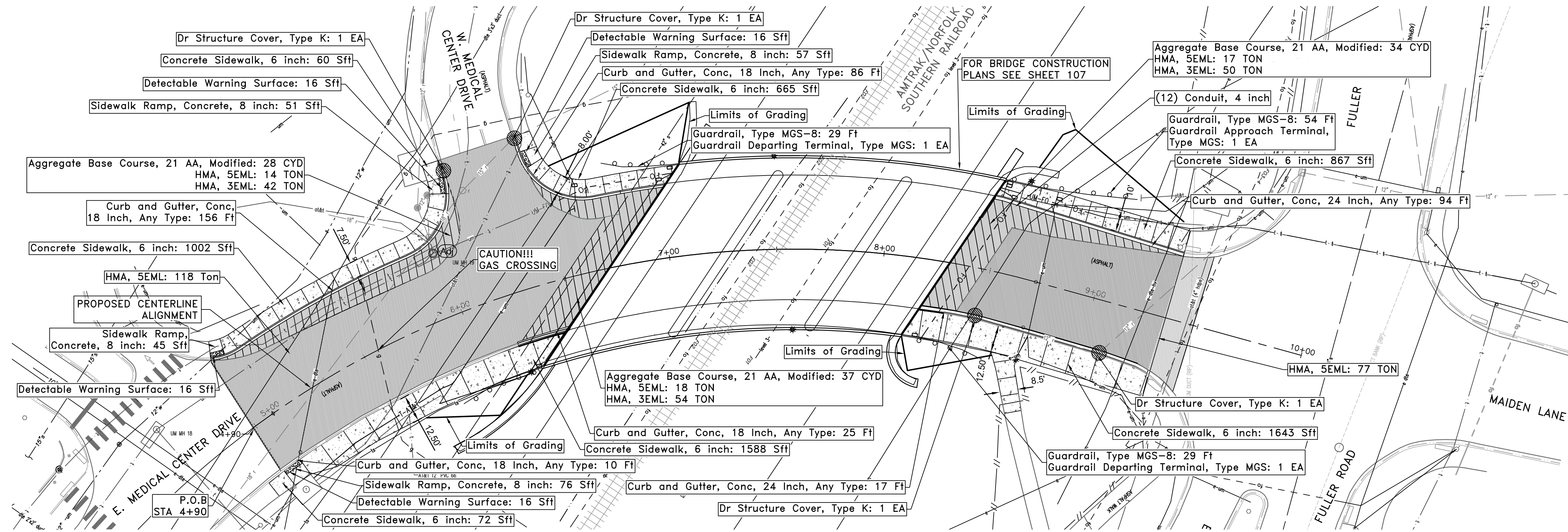
SCALE
 1"=20'

DRAWING NO.
2021-008-R1

SHEET NO. 9 OF 153

SEE ABOVE	BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
				ORIGINAL ISSUE	10/12/22	INB	LCM

APPROVED BY _____



PROFILE ALONG ROAD CENTERLINE
STATIONING PER ROAD CENTERLINE

PROPOSED WEST GUTTER	804.26 803.76	804.50 803.79	803.58 803.44	803.11 802.50	786.45 800.83	770.73 796.46	773.59 795.59	793.23 792.56	790.79 790.49
SIDEWALK WEST TOE		803.54 803.23	803.80 803.42	803.07 802.93	801.66 801.73	799.72 799.80	796.83 797.15	794.05 794.16	789.65 789.69
E MEDICAL CENTER DRIVE CENTERLINE	802.23 802.19	802.55 802.58	802.87 802.75	802.13 802.13	800.64 800.72	798.84 798.52	795.26 795.35	792.51 792.51	789.10 788.78
SIDEWALK EAST TOE		801.83 801.97	801.99 802.01	801.24 801.74	799.41 800.07	797.16 797.51	793.86 794.22	791.00 791.00	788.21 788.21

NOTE:
CONTRACTOR TO SAW-CUT ALL CONCRETE AT THE REMOVAL LIMITS. CONTRACTOR TO SEAL CONCRETE JOINTS IN ACCORDANCE WITH UM STANDARD SIDEWALK DETAIL. INCLUDED IN "Concrete Sidewalk, 6 inch" AND "Sidewalk Ramp, Concrete, 8 inch" SEE SHEETS 52-53 FOR SIDEWALK DETAILED GRADES.

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

(1) HORIZONTAL CURVE DATA (ROAD CENTERLINE)

L	71°58'59.16"
D	N44°46'59.86"W
R	422.00'
T	306.51
L	530.18'
P.C.	-1+58.25 (286848.74 N, 13295414.37 E)
P.I.	1+06.84
P.T.	3+71.93
P.C. TO P.I.	N73°31'19"W

LEGEND

- HMA Reconstruction
- HMA & Resurfacing
- Adjust Structure
- Inlet Protection, Fabric Drop

ESTIMATED QUANTITIES THIS SHEET

DESCRIPTION	QUANTITY
HMA, 3EML	146 TON
HMA, 5EML	244 TON
Curb and Gutter, Conc, 18 Inch, Any Type	277 FT
Curb and Gutter, Conc, 24 Inch, Any Type	111 FT
Concrete, Sidewalk, 6 Inch	5896 SFT
Aggregate Base Course, 21AA, Modified	99 CYD
Curb Ramp Opening, Conc, 6 Inch	40 FT
Detectable Warning Surface	64 SFT
Sidewalk Ramp, Concrete, 8 Inch	229 SFT
Guardrail, Type MGS-8	144 FT
Guardrail Departing Terminal, Type MGS	2 EA
Guardrail Approach Terminal, Type 2M	2 EA
Dr Structure, Temp Lowering	4 EA
Dr Structure Cover, Adj	2 EA
Dr Structure Cover, Type K	4 EA
Dr Structure Cover, Adj, Case 1	2 EA
Sand Subbase Course, Class II, CIP	110 CYD
Slope Restoration	250 SYD

LEGEND

- EXISTING FENCE
- CONTOUR
- STORM SEWER & CAT. BAS.
- WATER MAIN & VALVE-IN-WELL
- WATER MAIN & VALVE-IN-BOX
- EXISTING SANITARY SEWER & MANHOLE
- UTILITY POLE & GUY
- FIRE HYDRANT ASSEMBLY
- LIGHT POLE
- END SECTION
- EXISTING TELEPHONE
- GAS LINE
- CABLE T.V.
- ELECTRIC
- SIGN
- EXISTING RD. & GRADE
- LEFT EDGE/RD. GRADE
- RIGHT EDGE/RD. GRADE
- CURB & GUTTER
- EDGE/GRAVEL
- PROPOSED SANITARY SEWER & MANHOLE
- STORM SEWER & CAT. BAS.
- WATER MAIN W/F.H. ASSEM.
- CONTOUR
- ROAD & GRADE
- PROPOSED CURB & GUTTER

DLZ

SEE ABOVE

BENCH MARK SURVEY BOOK

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

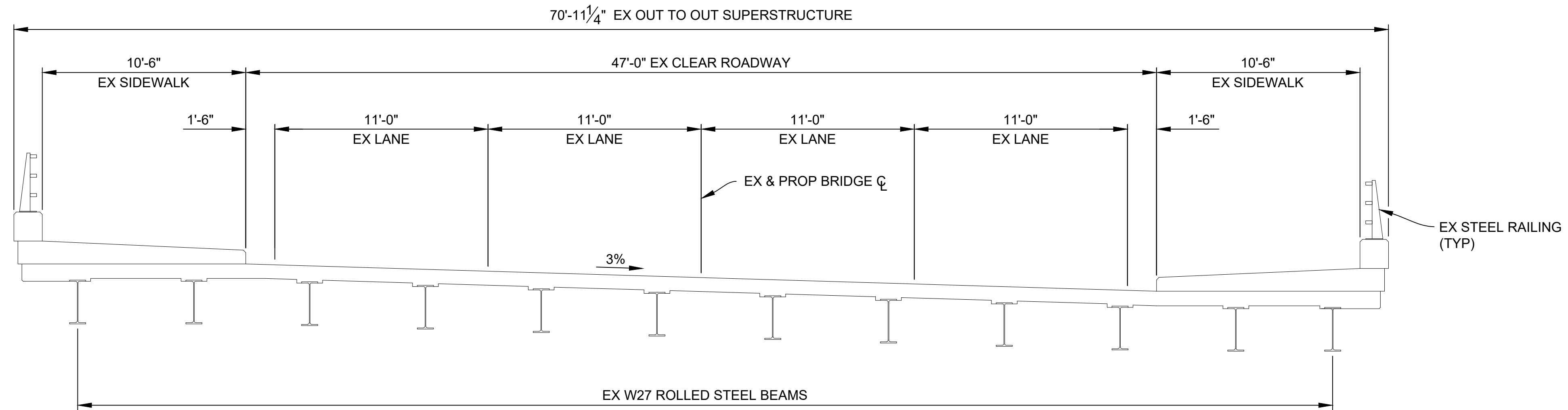
E. MEDICAL CENTER DRIVE ROADWAY CONSTRUCTION

SCALE
HOR. 1"=40'
VERT. 1"=4'

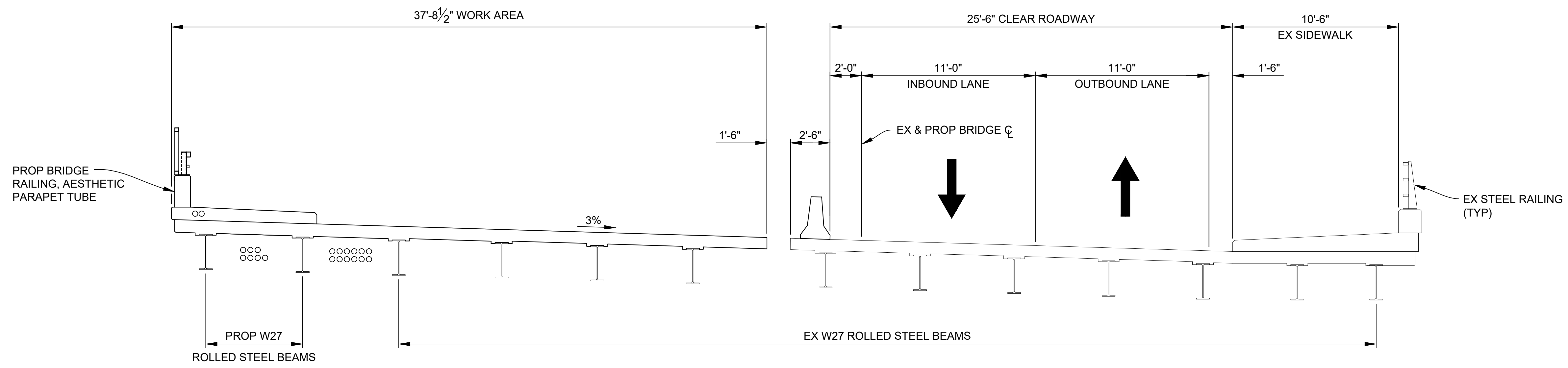
DRAWING NO.
2021-008-R2

SHEET NO. 10 OF 153

APPROVED BY: _____



EXISTING SECTION
(LOOKING UPSTATION)



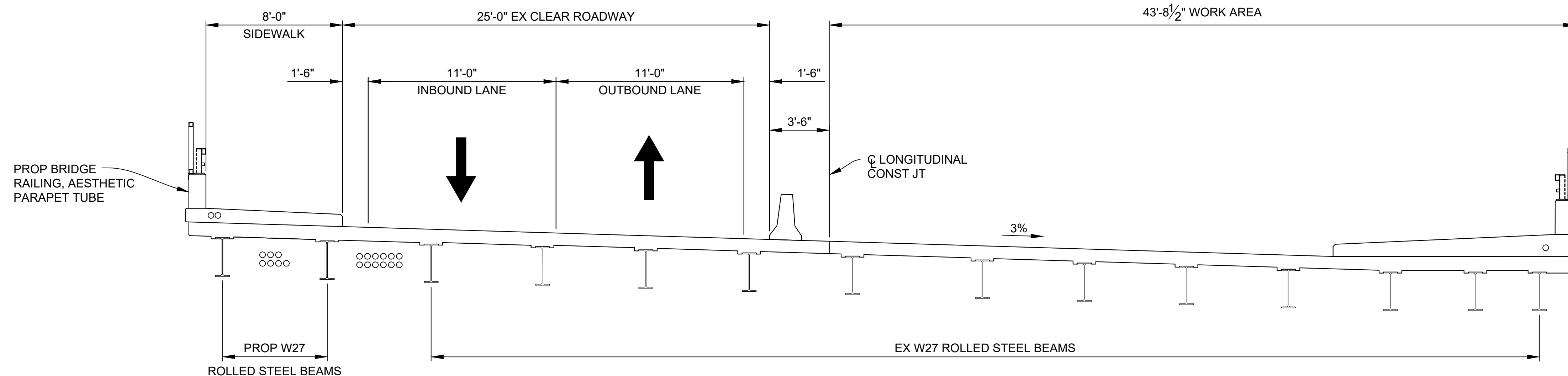
STAGE 2
(LOOKING UPSTATION)

NOTES:

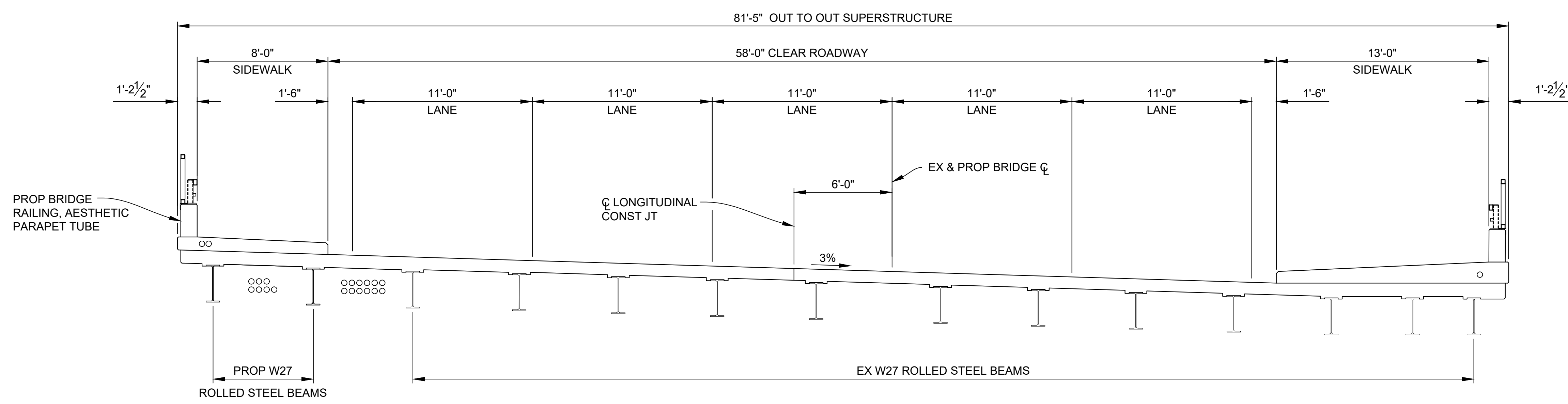
STAGE 1 IS A PREPARATORY STAGE
PLACE LIMITED DEFLECTION TEMPORARY BARRIER ACCORDING TO STANDARD PLAN R-53 SERIES.

DLZ					PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
					EAST MEDICAL CENTER DRIVE	
					BRIDGE CONSTRUCTION STAGING DETAILS	
					SCALE HOR. 1/4" = 1'-0"	INCH 0 1
					DRAWING NO. 2021-008-	
					SHEET NO. <u> 11 </u> OF <u> 139 </u>	
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY _____	
	ORIGINAL ISSUE	10/12/22	INB	LCM		

X:\Projects\2021\2141\736300_AA - EICD Bridge\01_Constr\Draws\CAD\EMCD_mpl_001



STAGE 3
(LOOKING UPSTATION)

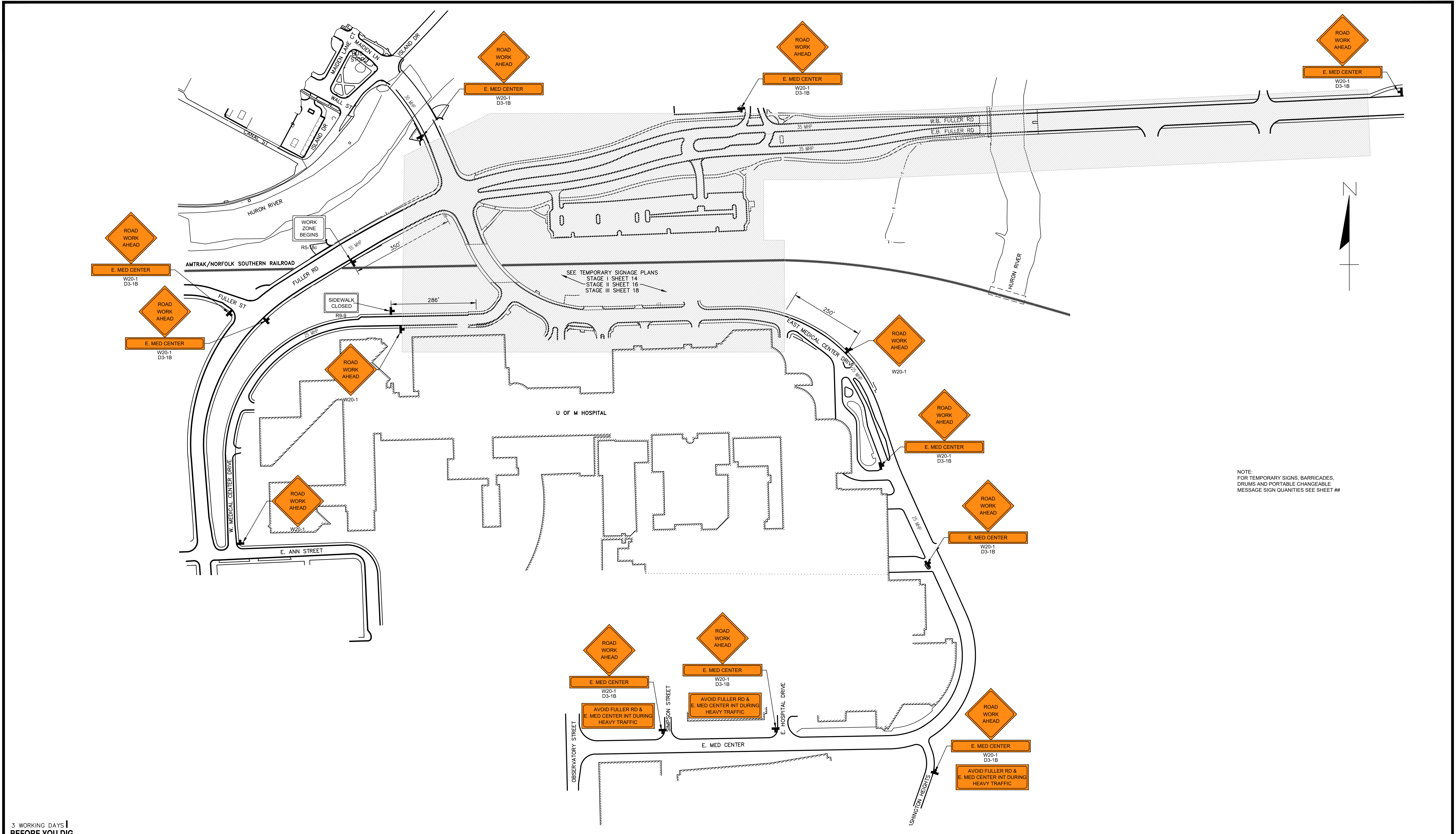


PROPOSED SECTION
(LOOKING UPSTATION)

NOTES:
PLACE LIMITED DEFLECTION TEMPORARY BARRIER ACCORDING TO STANDARD PLAN R-53 SERIES.

X:\Projects\2021\2141\736500_AA - EMCD Bridge\01_Constr\Draws\CAD\EMCD_rmt_002

DLZ					PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
					EAST MEDICAL CENTER DRIVE	
					BRIDGE CONSTRUCTION STAGING DETAILS	
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY	
	ORIGINAL ISSUE	10/12/22	INB	LCM		
					SCALE	INCH
					HOR. 1/4" = 1'-0"	0 1
					DRAWING NO.	
					2021-008-	
					SHEET NO.	12 OF 139

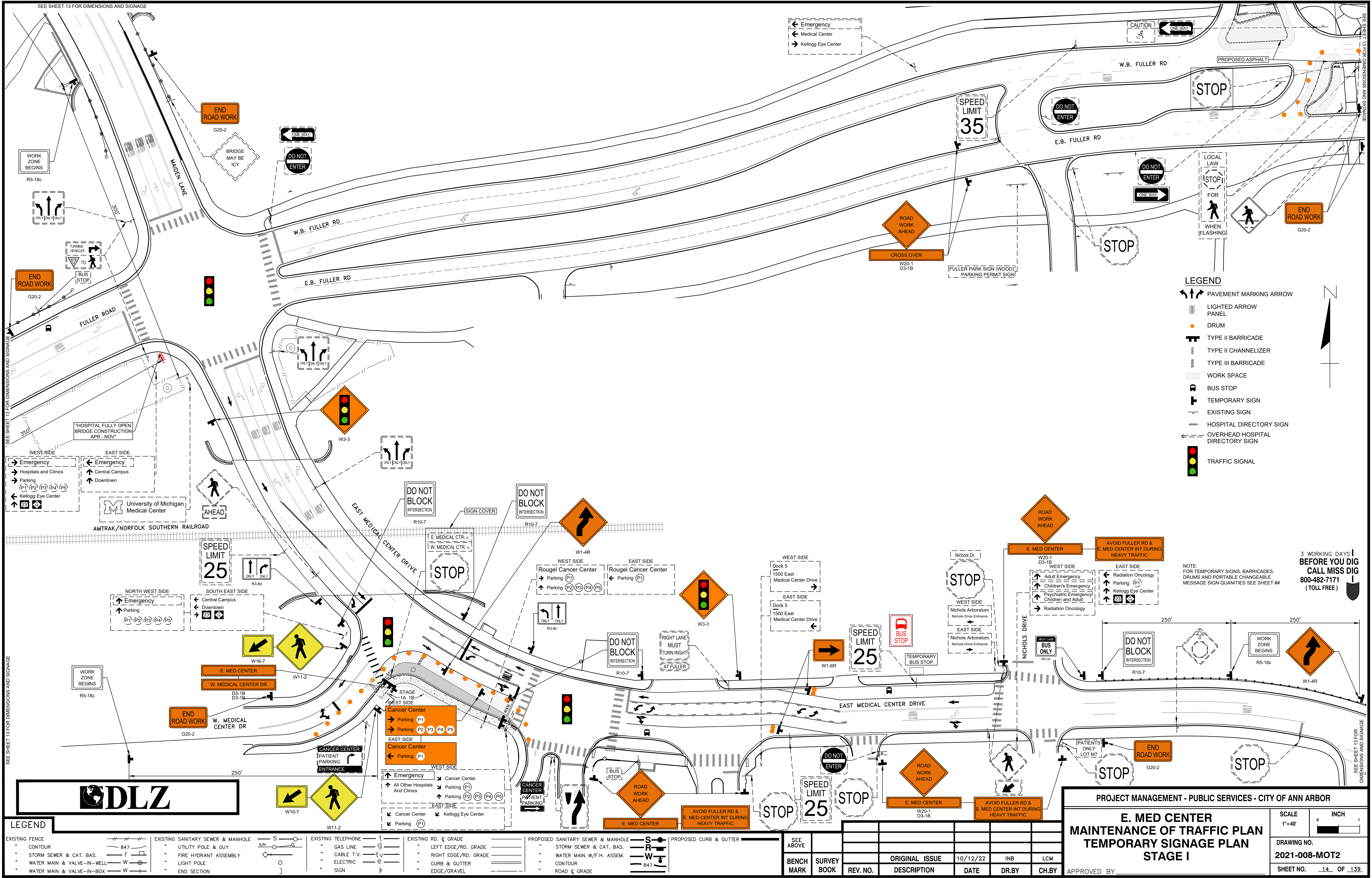


3 WORKING DAYS!
BEFORE YOU DIG
CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND

EXISTING FENCE	---|---|---|	EXISTING SANITARY SEWER & MANHOLE	—S—	EXISTING TELEPHONE	—t—	EXISTING RD. & GRADE	—|—	PROPOSED SANITARY SEWER & MANHOLE	—S—	PROPOSED CURB & GUTTER	—|—			
CONTOUR	---|---|	UTILITY POLE & GUY	—o—	GAS LINE	—g—	LEFT EDGE/RD. GRADE	—|—	STORM SEWER & CAT. BAS.	—S—	SEE ABOVE	XXX			
STORM SEWER & CAT. BAS.	—r—	FIRE HYDRANT ASSEMBLY	—h—	CABLE T.V.	—v—	RIGHT EDGE/RD. GRADE	—|—	WATER MAIN W/F.H. ASSEM.	—W—	BENCH MARK	SURVEY BOOK			
WATER MAIN & VALVE-IN-WELL	—w—	LIGHT POLE	—o—	ELECTRIC	—e—	CURB & GUTTER	—|—	CONTOUR	—r—	REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
WATER MAIN & VALVE-IN-BOX	—w—	END SECTION	—)---	SIGN	—t—	EDGE/GRAVEL	—|—	ROAD & GRADE	—|—	APPROVED BY				

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR					
E. MED CENTER MAINTENANCE OF TRAFFIC PLAN ADVANCED WARNING SIGNAGE PLAN					
SCALE	1"=150'	INCH	0 1		
DRAWING NO.	2021-008-MOT1				
SHEET NO.	13 OF 139				



- LEGEND**
- PAVEMENT MARKING ARROW
 - LIGHTED ARROW PANEL
 - DRUM
 - TYPE II BARRICADE
 - TYPE II CHANNELIZER
 - TYPE III BARRICADE
 - WORK SPACE
 - BUS STOP
 - TEMPORARY SIGN
 - EXISTING SIGN
 - HOSPITAL DIRECTORY SIGN
 - OVERHEAD HOSPITAL DIRECTORY SIGN
 - TRAFFIC SIGNAL

3 WORKING DAYS!
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

NOTE:
FOR TEMPORARY SIGNS, BARRICADES,
DRUMS AND PORTABLE CHANGEABLE
MESSAGE SIGN QUANTITIES SEE SHEET ##

- LEGEND**
- EXISTING FENCE
 - CONTOUR
 - STORM SEWER & CAT. BAS.
 - WATER MAIN & VALVE-IN-WELL
 - WATER MAIN & VALVE-IN-BOX

- EXISTING SANITARY SEWER & MANHOLE
- UTILITY POLE & GUY
- FIRE HYDRANT ASSEMBLY
- LIGHT POLE
- END SECTION

- EXISTING TELEPHONE
- GAS LINE
- CABLE T.V.
- ELECTRIC
- SIGN

- EXISTING RD. & GRADE
- LEFT EDGE/RD. GRADE
- RIGHT EDGE/RD. GRADE
- CURB & GUTTER
- EDGE/GRAVEL

- PROPOSED SANITARY SEWER & MANHOLE
- STORM SEWER & CAT. BAS.
- WATER MAIN W/F.H. ASSEM.
- CONTOUR
- ROAD & GRADE

- PROPOSED CURB & GUTTER

SEE ABOVE					
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE	DR. BY
			ORIGINAL ISSUE	10/12/22	INB
					LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MED CENTER
MAINTENANCE OF TRAFFIC PLAN
TEMPORARY SIGNAGE PLAN
STAGE I**

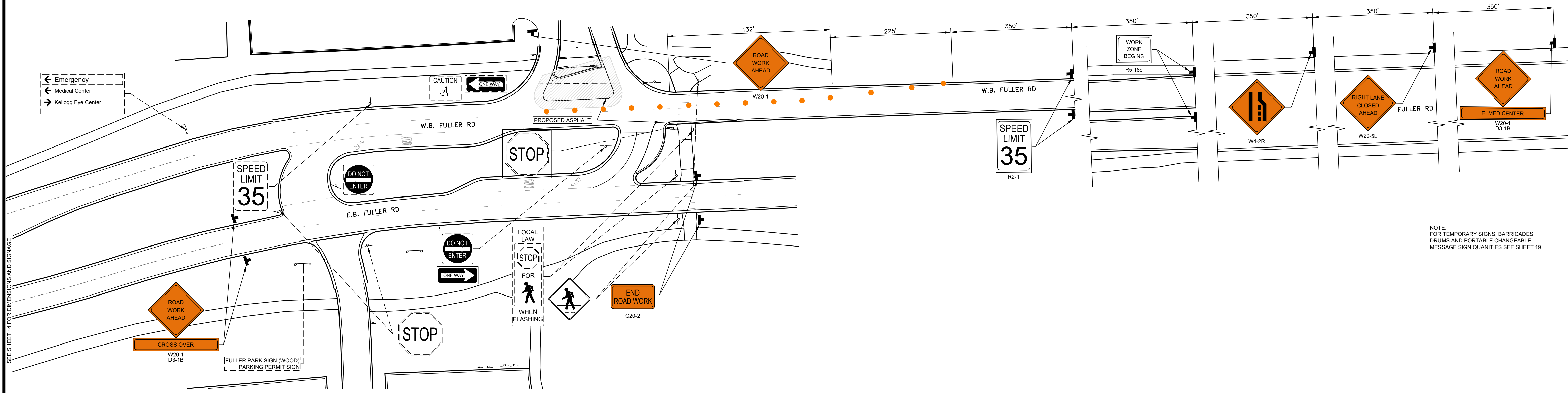
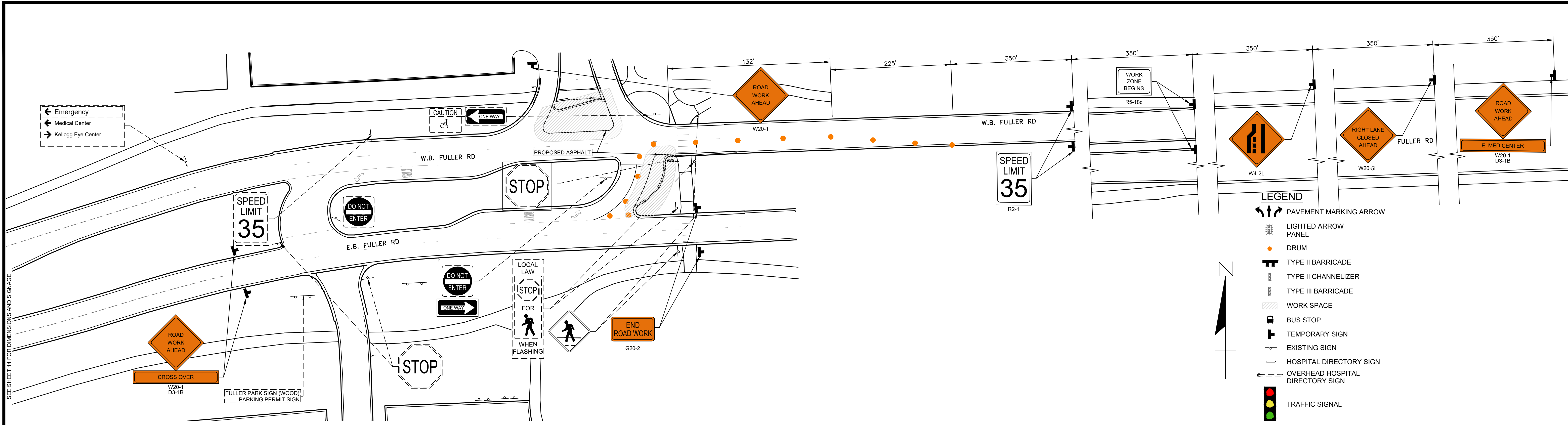
SCALE 1"=40'

DRAWING NO. 2021-008-MOT2

SHEET NO. 14 OF 139

APPROVED BY: _____

LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



NOTE:
FOR TEMPORARY SIGNS, BARRICADES,
DRUMS AND PORTABLE CHANGEABLE
MESSAGE SIGN QUANTITIES SEE SHEET 19

3 WORKING DAYS!
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND	
EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE
- CONTOUR	- UTILITY POLE & GUY
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE
- WATER MAIN & VALVE-IN-BOX	- END SECTION
EXISTING TELEPHONE	EXISTING RD. & GRADE
- GAS LINE	- LEFT EDGE/RD. GRADE
- CABLE T.V.	- RIGHT EDGE/RD. GRADE
- ELECTRIC	- CURB & GUTTER
- SIGN	- EDGE/GRAVEL
PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- STORM SEWER & CAT. BAS.	- SEE ABOVE
- WATER MAIN W/F.H. ASSEM.	BENCH MARK
- CONTOUR	SURVEY BOOK
- ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

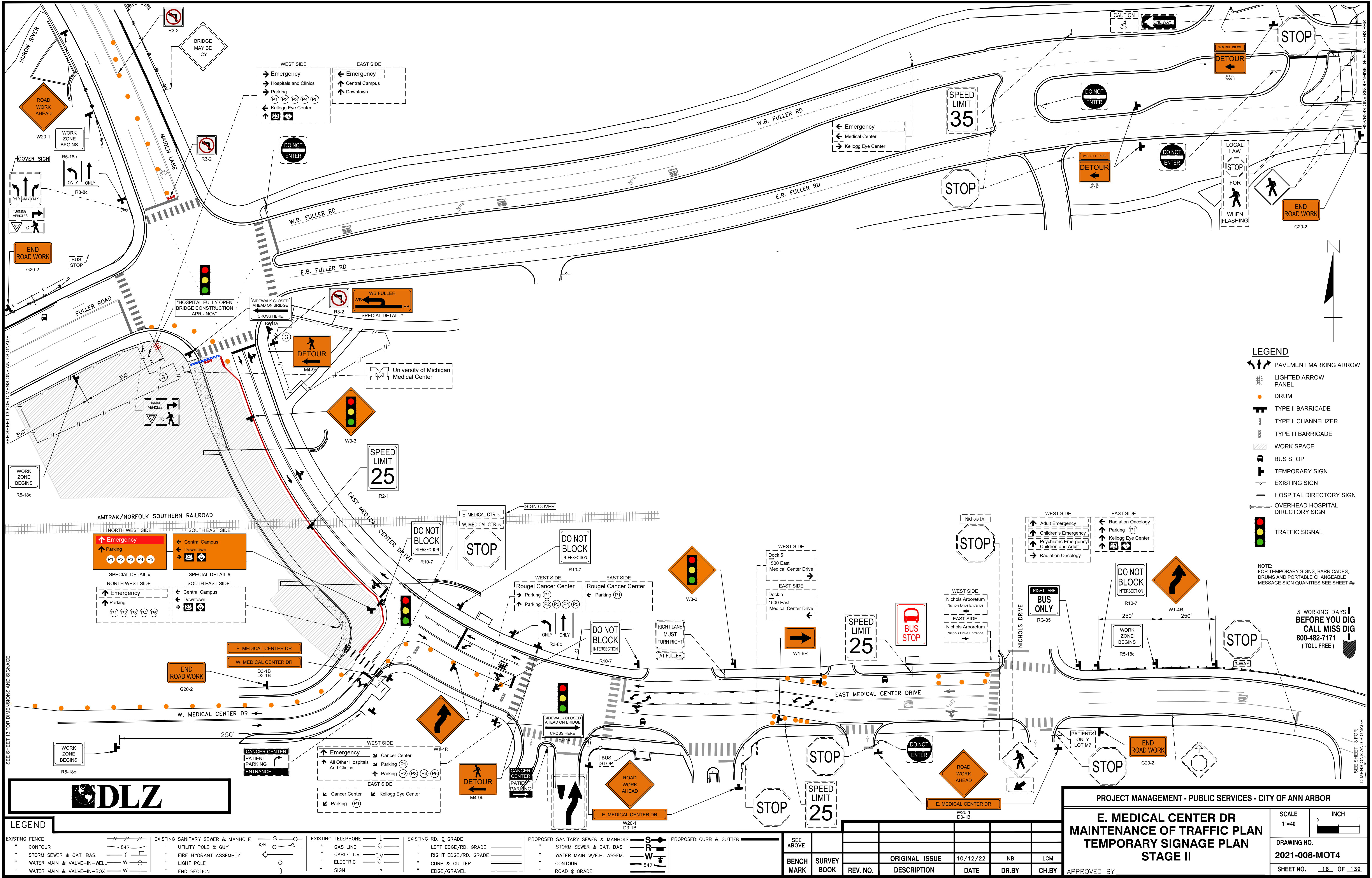
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MED CENTER MAINTENANCE OF TRAFFIC PLAN TEMPORARY SIGNAGE (FULLER) STAGE I

SCALE: 1"=40'

DRAWING NO. 2021-008-MOT3

SHEET NO. 15 OF 139



SEE SHEET 13 FOR DIMENSIONS AND SIGNAGE

SEE SHEET 13 FOR DIMENSIONS AND SIGNAGE

SEE SHEET 13 FOR DIMENSIONS AND SIGNAGE

SEE SHEET 13 FOR DIMENSIONS AND SIGNAGE

- LEGEND**
- PAVEMENT MARKING ARROW
 - LIGHTED ARROW PANEL
 - DRUM
 - TYPE II BARRICADE
 - TYPE II CHANNELIZER
 - TYPE III BARRICADE
 - WORK SPACE
 - BUS STOP
 - TEMPORARY SIGN
 - EXISTING SIGN
 - HOSPITAL DIRECTORY SIGN
 - OVERHEAD HOSPITAL DIRECTORY SIGN
 - TRAFFIC SIGNAL

NOTE: FOR TEMPORARY SIGNS, BARRICADES, DRUMS AND PORTABLE CHANGEABLE MESSAGE SIGN QUANTITIES SEE SHEET ##

**3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)**



EXISTING FENCE		EXISTING SANITARY SEWER & MANHOLE		EXISTING TELEPHONE		EXISTING RD. & GRADE		PROPOSED SANITARY SEWER & MANHOLE		PROPOSED CURB & GUTTER	
CONTOUR	847	UTILITY POLE & GUY	S	GAS LINE	t	LEFT EDGE/RD. GRADE	S	STORM SEWER & CAT. BAS.	S	SEE ABOVE	
STORM SEWER & CAT. BAS.	847	FIRE HYDRANT ASSEMBLY	dh	CABLE T.V.	g	RIGHT EDGE/RD. GRADE	S	WATER MAIN W/F.H. ASSEM.	W	BENCH MARK	
WATER MAIN & VALVE-IN-WELL	W	LIGHT POLE	o	ELECTRIC	e	CURB & GUTTER	W	CONTOUR	847	SURVEY BOOK	
WATER MAIN & VALVE-IN-BOX	W	END SECTION	)	SIGN	h	EDGE/GRAVEL	847	ROAD & GRADE	847	REV. NO.	

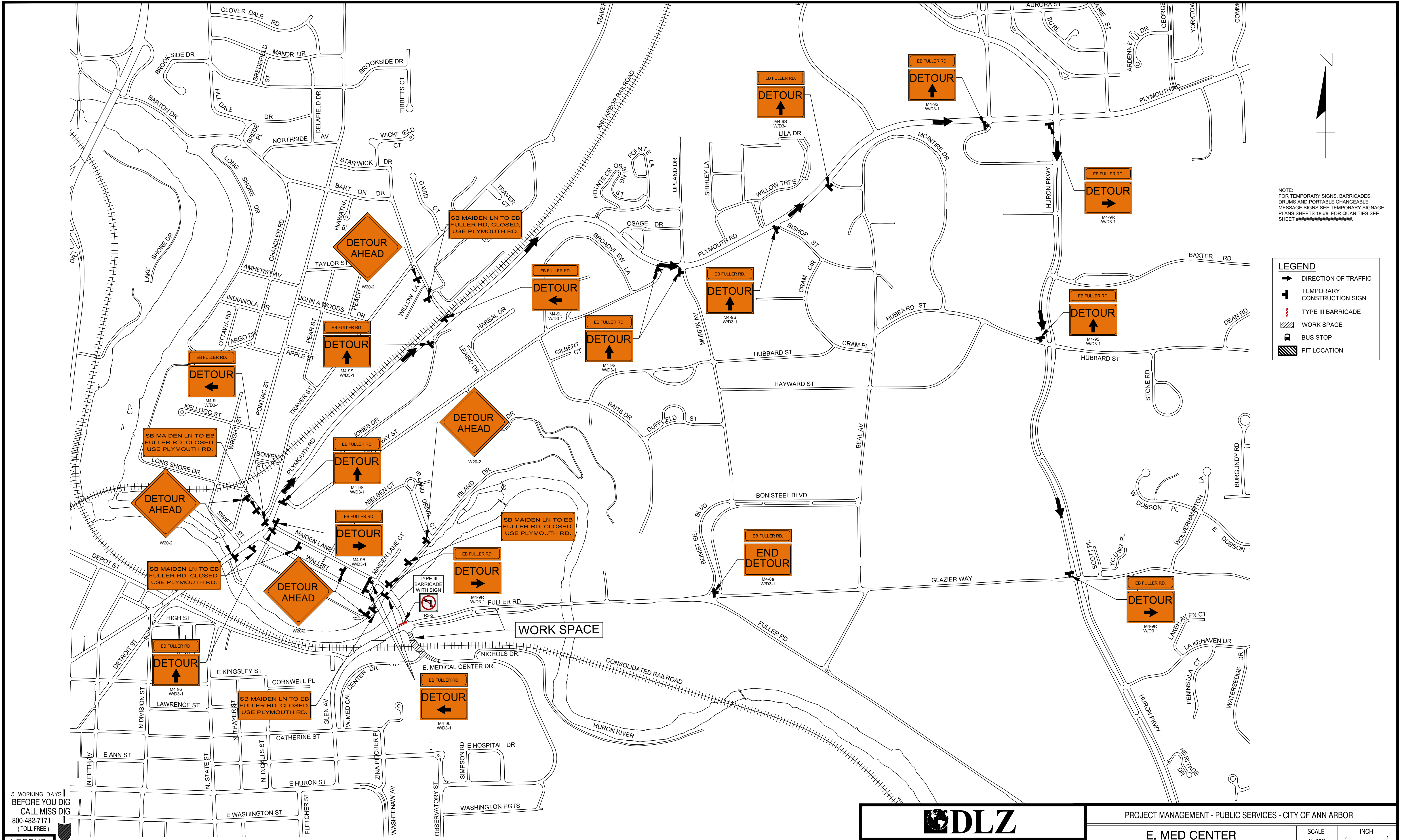
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DR
MAINTENANCE OF TRAFFIC PLAN
TEMPORARY SIGNAGE PLAN
STAGE II**

SCALE 1"=40'	INCH
DRAWING NO. 2021-008-MOT4	
SHEET NO. 16 OF 139	

APPROVED BY: _____

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY



NOTE:
FOR TEMPORARY SIGNS, BARRICADES,
DRUMS AND PORTABLE CHANGEABLE
MESSAGE SIGNS SEE TEMPORARY SIGNAGE
PLANS SHEETS 10-##. FOR QUANTITIES SEE
SHEET #####.

LEGEND

- ➔ DIRECTION OF TRAFFIC
- ⊥ TEMPORARY CONSTRUCTION SIGN
- ▬ TYPE III BARRICADE
- ▨ WORK SPACE
- ⊞ BUS STOP
- ⊞ PIT LOCATION

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

- EXISTING FENCE
- CONTOUR
- STORM SEWER & CAT. BAS.
- WATER MAIN & VALVE-IN-WELL
- WATER MAIN & VALVE-IN-BOX
- EXISTING SANITARY SEWER & MANHOLE
- UTILITY POLE & GUY
- FIRE HYDRANT ASSEMBLY
- LIGHT POLE
- END SECTION
- EXISTING TELEPHONE
- GAS LINE
- CABLE T.V.
- ELECTRIC
- SIGN
- EXISTING RD. & GRADE
- LEFT EDGE/RD. GRADE
- RIGHT EDGE/RD. GRADE
- CURB & GUTTER
- EDGE/GRAVEL
- PROPOSED SANITARY SEWER & MANHOLE
- STORM SEWER & CAT. BAS.
- WATER MAIN W/F.H. ASSEM.
- CONTOUR
- ROAD & GRADE
- PROPOSED CURB & GUTTER

DLZ		PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
SEE ABOVE	BENCH MARK	SURVEY BOOK	REV. NO.
ORIGINAL ISSUE	10/12/22	INB	LCM
DESCRIPTION	DATE	DR.BY	CH.BY
APPROVED BY			

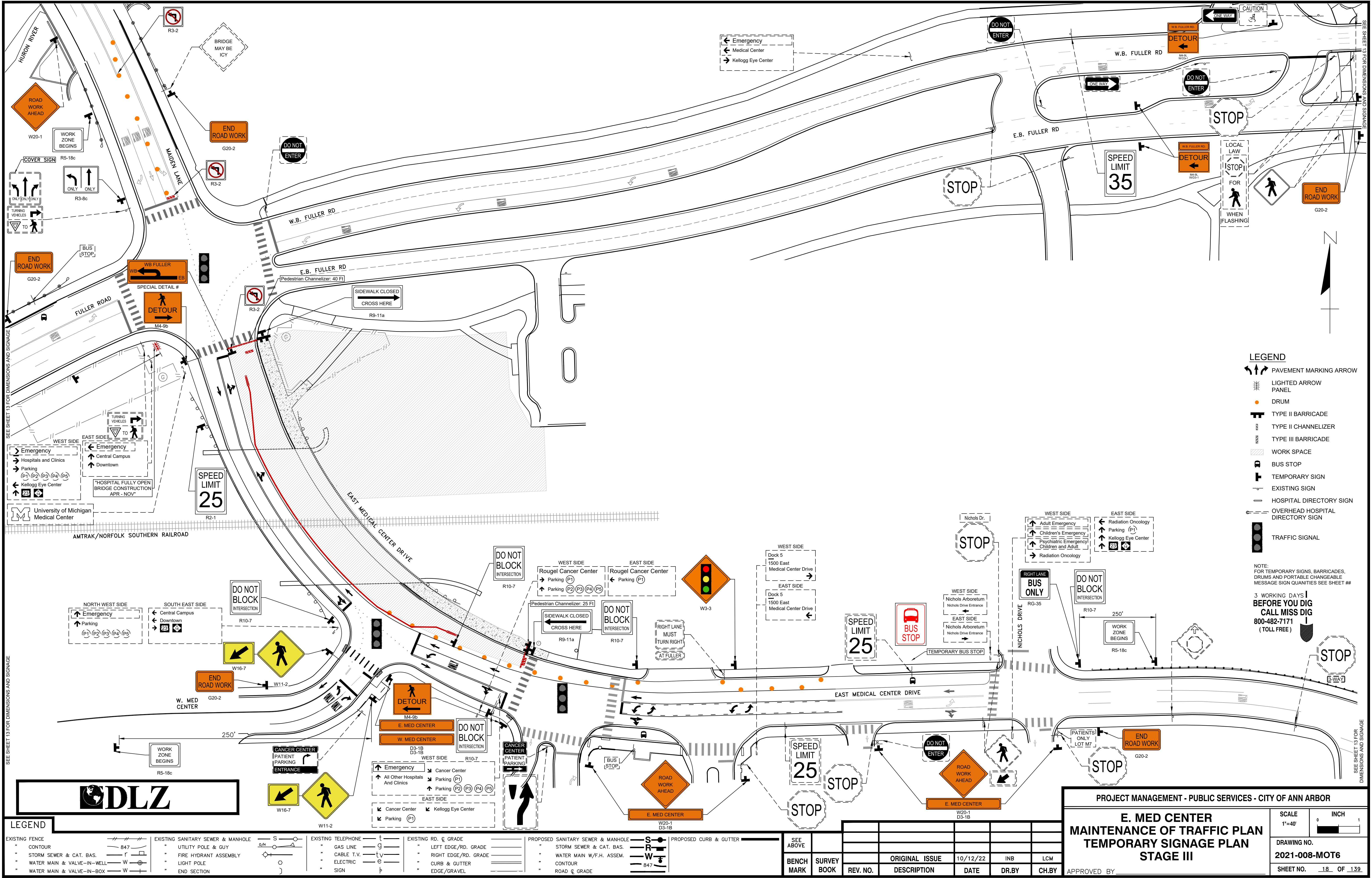
**E. MED CENTER
MAINTENANCE OF TRAFFIC PLAN
DETOUR PLAN**

SCALE 1"=500'

DRAWING NO. 2021-008-MOT5

SHEET NO. 17 OF 139

APPROVED BY _____



SEE SHEET 13 FOR DIMENSIONS AND SIGNAGE

SEE SHEET 13 FOR DIMENSIONS AND SIGNAGE

- LEGEND**
- PAVEMENT MARKING ARROW
 - LIGHTED ARROW PANEL
 - DRUM
 - TYPE II BARRICADE
 - TYPE II CHANNELIZER
 - TYPE III BARRICADE
 - WORK SPACE
 - BUS STOP
 - TEMPORARY SIGN
 - EXISTING SIGN
 - HOSPITAL DIRECTORY SIGN
 - OVERHEAD HOSPITAL DIRECTORY SIGN
 - TRAFFIC SIGNAL

NOTE:
FOR TEMPORARY SIGNS, BARRICADES,
DRUMS AND PORTABLE CHANGEABLE
MESSAGE SIGN QUANTITIES SEE SHEET ##

**3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)**



LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- CONTOUR	- UTILITY POLE & GUY	- GAS LINE	- LEFT EDGE/RD. GRADE	- STORM SEWER & CAT. BAS.	- SEE ABOVE
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	- WATER MAIN W/F.H. ASSEM.	BENCH MARK
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	- CONTOUR	SURVEY BOOK
- WATER MAIN & VALVE-IN-BOX	- END SECTION	- SIGN	- EDGE/GRAVEL	- ROAD & GRADE	REV. NO.

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MED CENTER
MAINTENANCE OF TRAFFIC PLAN
TEMPORARY SIGNAGE PLAN
STAGE III**

APPROVED BY: _____

SCALE	1"=40'
DRAWING NO.	2021-008-MOT6
SHEET NO.	18 OF 139

ITEM NUMBER	ITEM DESCRIPTION	QUANTITY	UNIT	PHASE	BRIDGE				MAX COUNT	QUANTITY	NOTES						
					ADV	1	2	3				4					
JN																	
LENGTH																	
LENGTH/AREA/NUMBER PER STAGE(Ft/Sft/Ea)																	
8120012	Barricade, Type III, High Intensity, Double Sided, Lighted, Furn - \$Ea	4	Ea						3	4	2		4	4			
8120013	Barricade, Type III, High Intensity, Double Sided, Lighted, Oper - \$Ea	4	Ea										4	4			
8120026	Pedestrian Type II Barricade, Temp - \$Ea	2	Ea						2	2	2		2	2			
8120027	Pedestrian Type II Channelizer, Temp - \$Ft	60	Ft						30	60	60		60	60			
8120252	Plastic Drum, Fluorescent, Furn - \$Ea	50	Ea						39	50	23		50	50			
8120253	Plastic Drum, Fluorescent, Oper - \$Ea	50	Ea										50	50			
SIGNS																	
				SIGN NUMBER	SIGN DESCRIPTION		Sign Area (Sft)		NUMBER PER STAGE (Ea)								
8120340	Sign, Type A, Temp, Prismatic, Furn - \$\$ft	27	Sft											27			
8120341	Sign, Type A, Temp, Prismatic, Oper - \$\$ft	27	Sft											27			
				R1-1	Stop	36	x	36	9			1			1	9	
				R3-2	No Left Turn	36	x	36	9				2	1		2	18
8120350	Sign, Type B, Temp, Prismatic, Furn - \$\$ft	926	Sft												926		
8120351	Sign, Type B, Temp, Prismatic, Oper - \$\$ft	926	Sft												926		
				G20-2	End Road Work	48	x	24	8			6			6	48	
				W20-1	Road Work Ahead	48	x	48	16	15		6	4	4	21	336	
				R5-18c	Work Zone Begins	48	x	48	16	6					6	96	
				W20-2	Detour Ahead	48	x	48	16				4	4	4	64	
				W3-3	Signal Ahead	48	x	48	16			1	1	1	1	16	
				M4-8	Detour	24	x	12	2						0	0	
				M4-8a	End Detour	24	x	18	3				1		1	3	
				M4-9b	Pedestrian Detour	30	x	24	5				2	2	2	10	
				M4-9R	Detour R	30	x	24	5				4	4	4	20	
				M4-9L	Detour L	30	x	24	5				8	8	8	40	
				M4-9S	Detour Straight	30	x	24	5				8	8	8	40	
				M5-1L	Ahead-Left Arrow	21	x	15	2.2						0	0	
				M5-1R	Ahead-Right Arrow	21	x	15	2.2						0	0	
				M5-2R	Ahead-Angle-Right Arrow	21	x	15	2.2						0	0	
				M6-2R	Angle-Right Arrow	21	x	15	2.2						0	0	
				M6-1L	Left	21	x	15	2.2						0	0	
				M6-1R	Right	21	x	15	2.2						0	0	
				M6-3b	Straight	21	x	25	3.6						0	0	
				R2-1	Speed Limit (35)	30	x	36	7.5			2			2	15	
				R3-8d	Thru-Right Only	36	x	30	7.5			1			1	8	
				R3-8c	Thru-Left Only	36	x	30	7.5			2	1	1	2	15	
				R9-11a	Sidewalk Closed	48	x	24	8				1	2	2	16	
				R9-11	Sidewalk Closed Ahead	48	x	24	8						0	0	
				R10-7	Do Not Block Intersection	24	x	24	4			5	5	5	5	20	
				RG-35	Right Lane Bus Only	24	x	24	4			1	1	1	1	4	
				W1-4R	Shift Right	48	x	48	16			1	2		2	32	
				W1-6L	One-Direction Large Arrow Left	60	x	30	12.5						0	0	
				W1-6R	One-Direction Large Arrow Right	60	x	30	12.5			2	2		2	25	
				W4-2L	Left Lane Ends	48	x	48	16			1			1	16	
				W4-2R	Right Lane Ends	48	x	48	16			1			1	16	
				W11-2	Pedestrian Crossing	48	x	48	16			2	3	3	3	48	
				W16-7P	Diagonal Arrow	24	x	12	2			2		2	2	4	
				W16-9P	Ahead	24	x	12	2				1	1	1	2	
				W20-5L	Left Lane Closed Ahead	48	x	48	16			1			1	16	
				W20-5R	Right Lane Close Ahead	48	x	48	16			1			1	16	
				MISC	Engineer's Discretion				1						0	0	
8120352	Sign, Type B, Temp, Prismatic, Spec, Furn - \$\$ft	315	Sft												315		
8120353	Sign, Type B, Temp, Prismatic, Spec, Oper - \$\$ft	315	Sft												315		
				D3-1B	E. MEDICAL CENTER DR.	48	x	12	4	11		4		1	15	60	
				D3-1B	W. MEDICAL CENTER DR.	48	x	12	4					1	1	4	
					Cancer Center Information	60	x	48	20			1			1	20	
					Sidewalk Closed Ahead on Bridge	48	x	24	8						1	8	
				R3-2	Fuller Left Turn	60	x	36	15				1	1	1	15	
					EB Fuller Rd	48	x	12	4				19	19	19	76	
					WB Fuller Rd	48	x	12	4				3		3	12	
					Alternate Route	60	x	36	15	3					3	45	
					SB Maiden Lane to EB Fuller Closed	60	x	36	15				5		5	75	

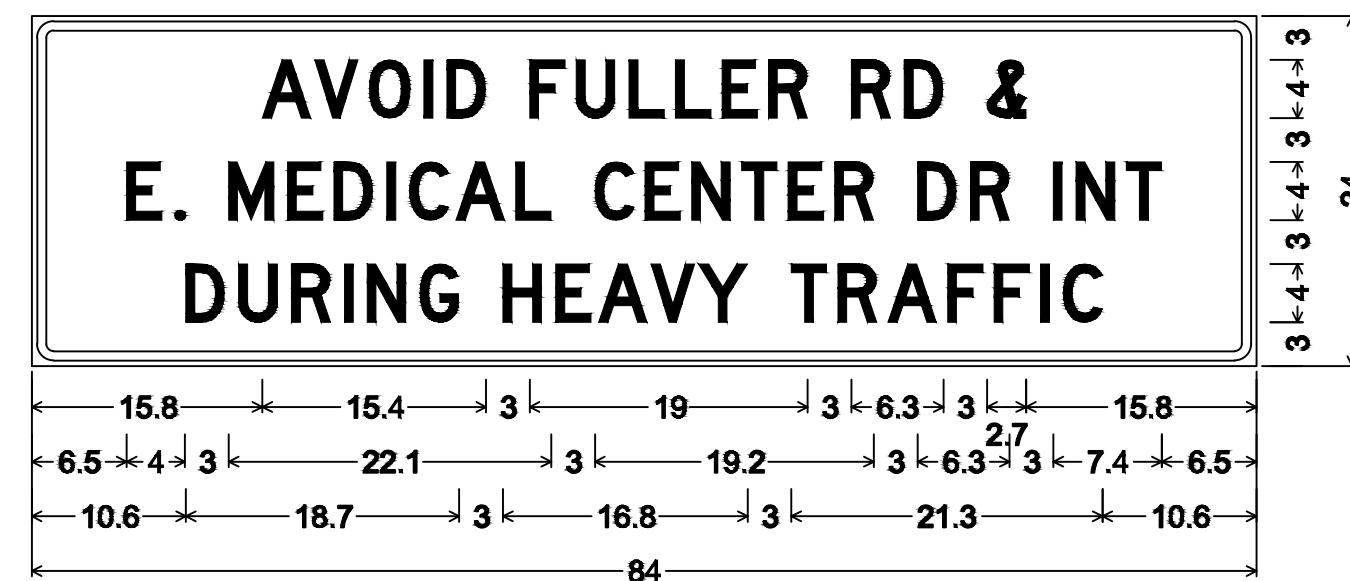
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LEGEND

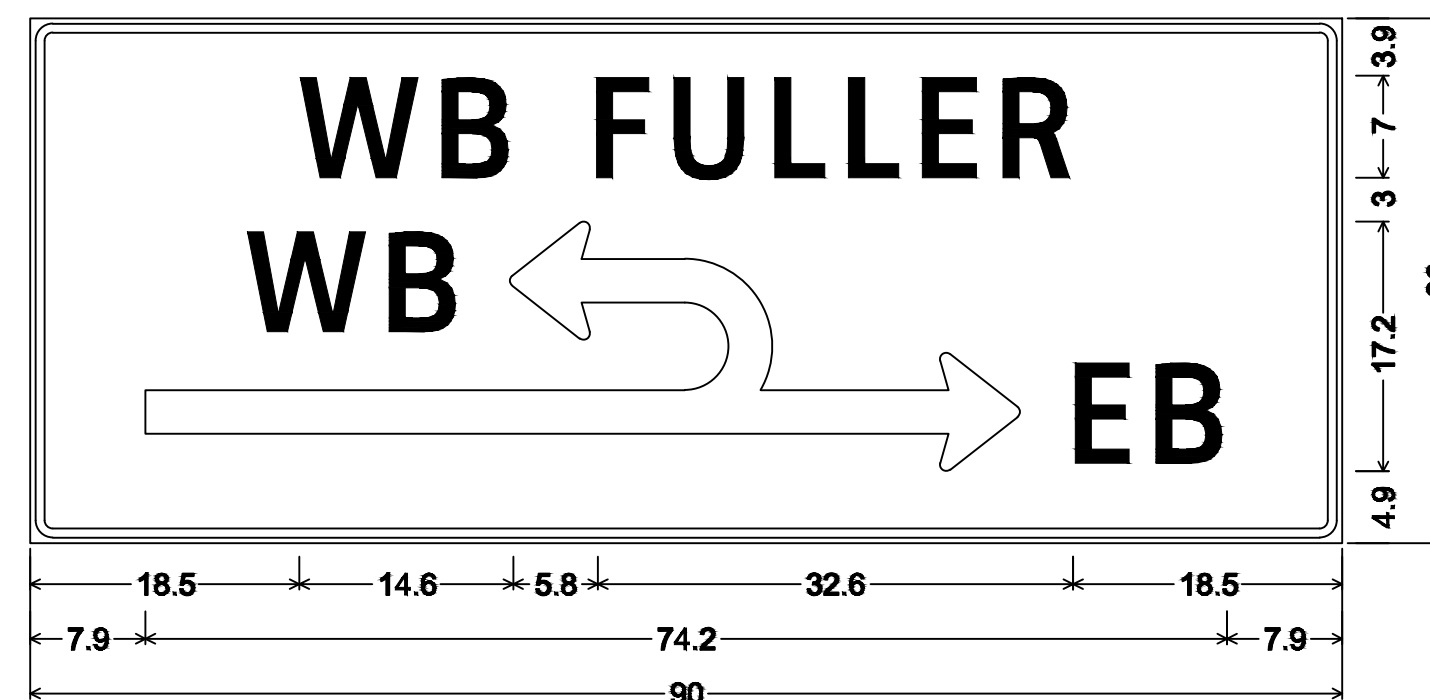
EXISTING FENCE	---//---//---	EXISTING SANITARY SEWER & MANHOLE	— S —	EXISTING TELEPHONE	— t —	EXISTING RD. & GRADE	—	PROPOSED SANITARY SEWER & MANHOLE	— S —	PROPOSED CURB & GUTTER	—
CONTOUR	— 847 —	UTILITY POLE & GUY	— o —	GAS LINE	— g —	LEFT EDGE/RD. GRADE	—	STORM SEWER & CAT. BAS.	— S —	SEE ABOVE	
STORM SEWER & CAT. BAS.	— r —	FIRE HYDRANT ASSEMBLY	— h —	CABLE T.V.	— tv —	RIGHT EDGE/RD. GRADE	—	WATER MAIN W/F.H. ASSEM.	— W —	BENCH MARK	
WATER MAIN & VALVE-IN-WELL	— W —	LIGHT POLE	— o —	ELECTRIC	— e —	CURB & GUTTER	—	CONTOUR	— 847 —	SURVEY BOOK	
WATER MAIN & VALVE-IN-BOX	— W —	END SECTION	—) —	SIGN	— p —	EDGE/GRAVEL	—	ROAD & GRADE	—	REV. NO.	

DLZ	
ORIGINAL ISSUE	10/12/22
DATE	INB
DR.BY	LCM
CH.BY	

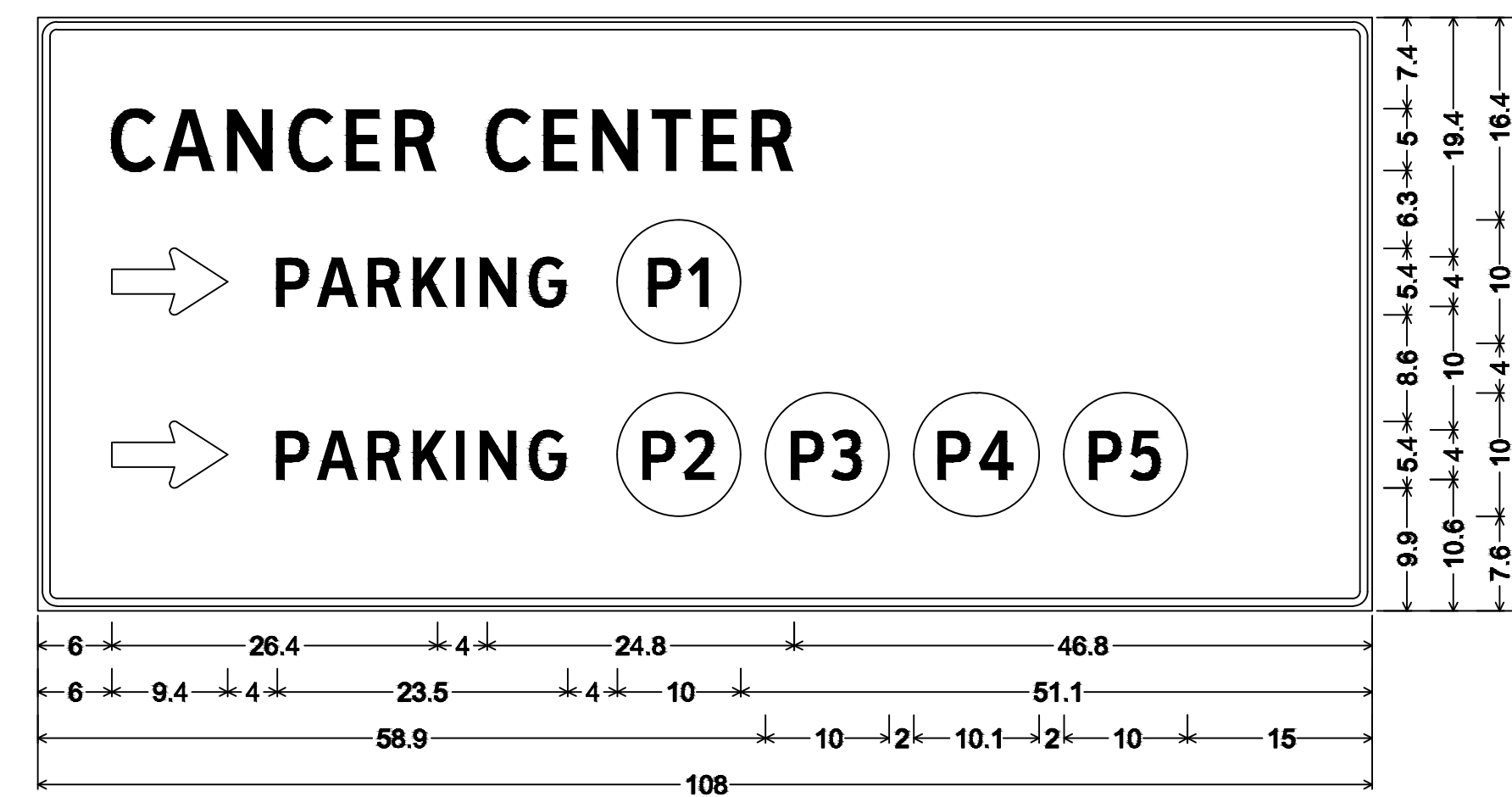
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE MAINTENANCE OF TRAFFIC PLAN M.O.T. QUANTITIES	
SCALE NTS	0 INCH 1
DRAWING NO. 2021-008-MOT7	
SHEET NO. <u>19</u> OF <u>139</u>	
APPROVED BY	



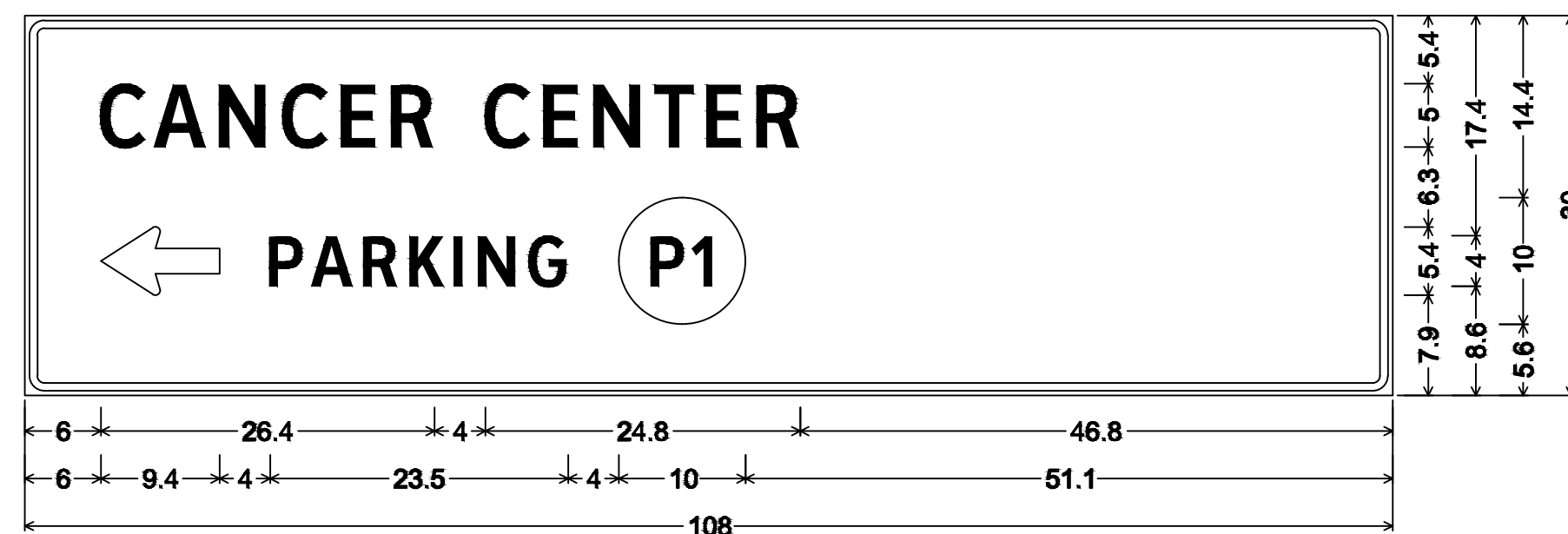
SPECIAL DETAIL A;
 1.5" Radius, 0.6" Border, 0.4" Indent, Black on Orange;
 "AVOID", D; "FULLER", D; "RD", D; "&", D; "E.", D; "MEDICAL", D;
 "CENTER", D; "DR", D; "INT", D; "DURING", D; "HEAVY", D;
 "TRAFFIC", D;



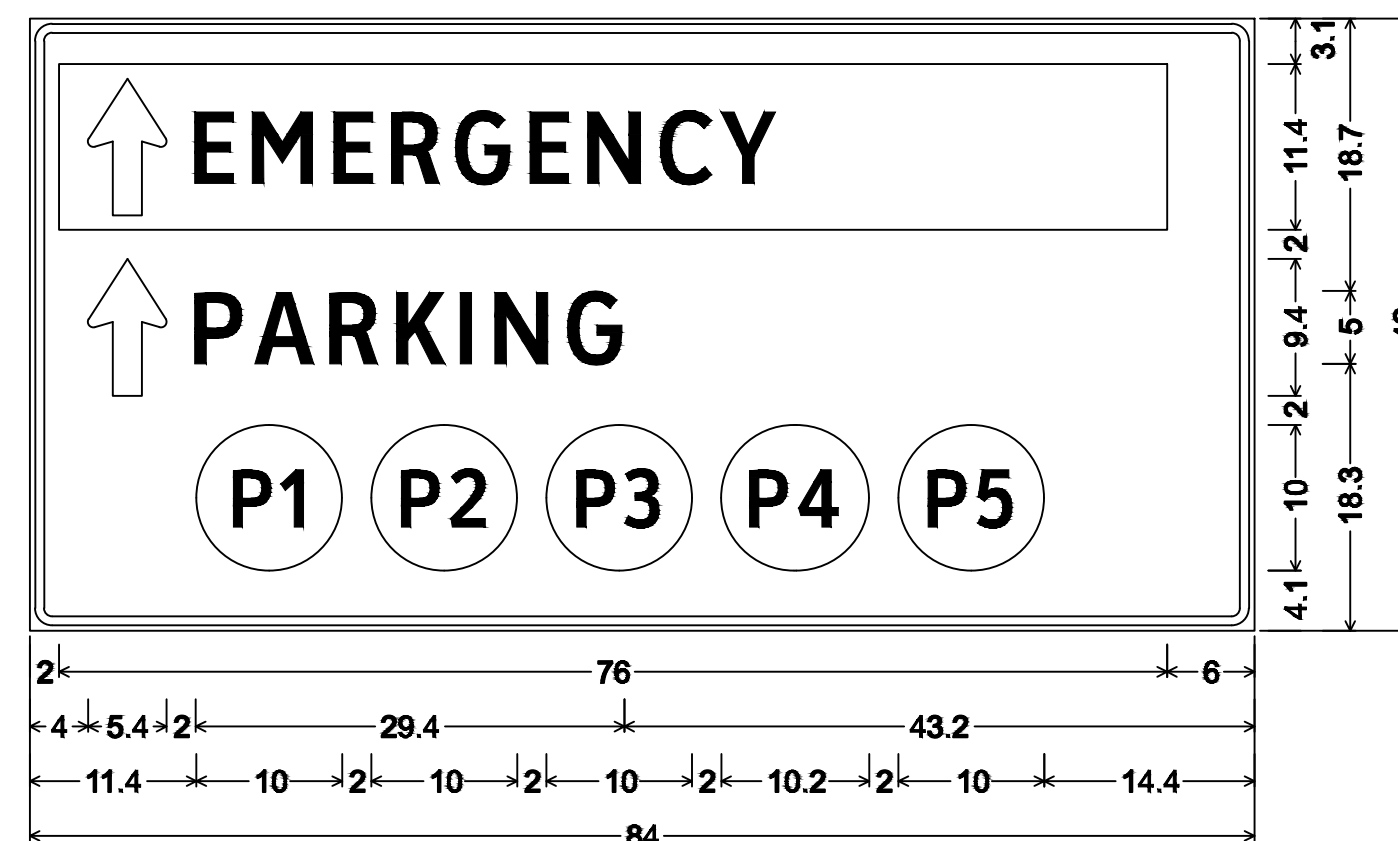
SPECIAL DETAIL B;
 0.6" Border, 0.4" Indent, Black on Orange;
 "WB FULLER", ClearviewHwy-3-W;



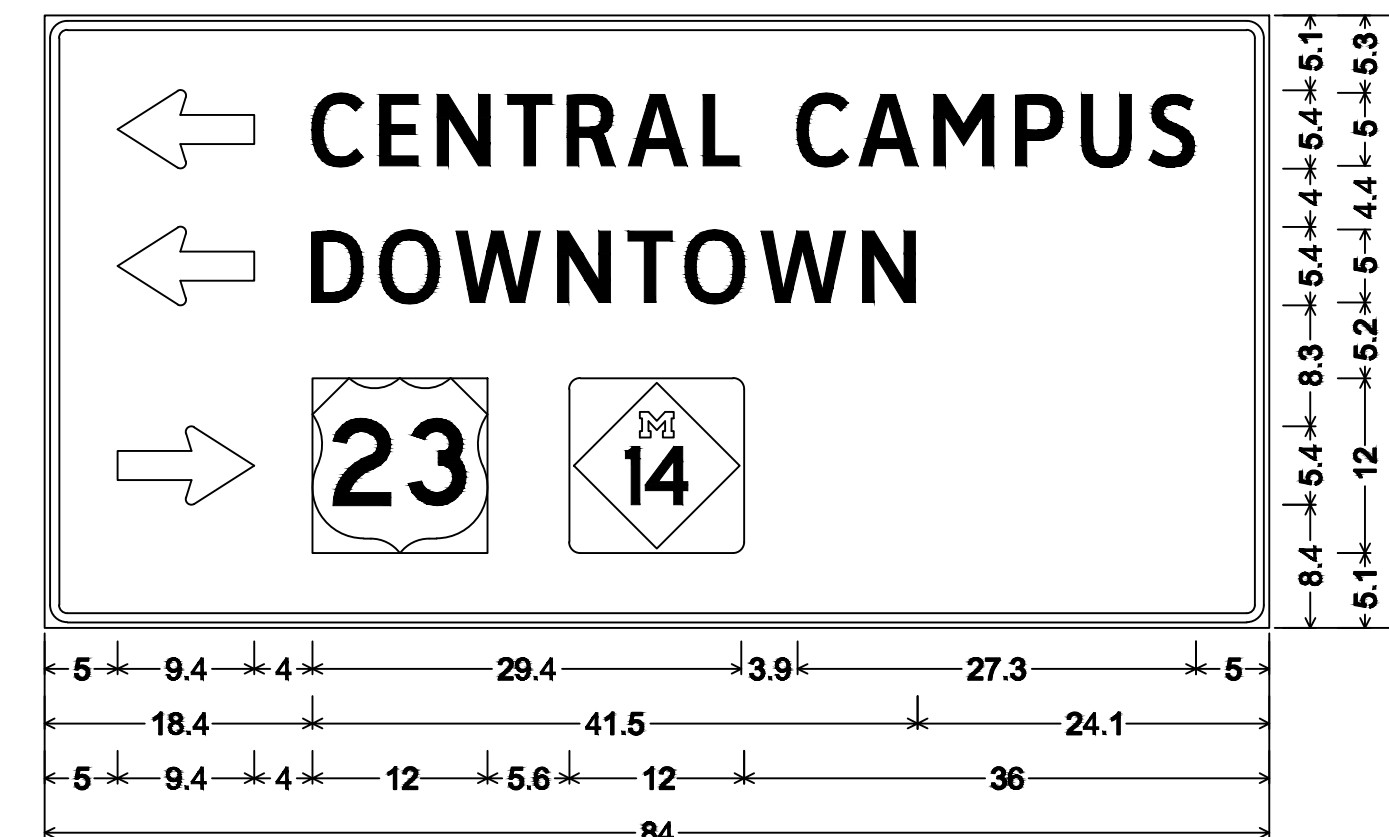
SPECIAL DETAIL B;
 0.6" Border, 0.4" Indent, Black on Orange;
 "CANCER CENTER", ClearviewHwy-3-W; Standard Arrow Custom 9.4" X 5.4" 0";
 "PARKING", ClearviewHwy-3-W; Rounded Rectangle 5.0" Radius;
 Standard Arrow Custom 9.4" X 5.4" 0"; "PARKING", ClearviewHwy-3-W; Rounded Rectangle 5.0" Radius;
 Rounded Rectangle 5.0" Radius;
 Rounded Rectangle 5.0" Radius;
 Rounded Rectangle 5.0" Radius;



SPECIAL DETAIL B;
 0.6" Border, 0.4" Indent, Black on Orange;
 "CANCER CENTER", ClearviewHwy-3-W; Standard Arrow Custom 9.4" X 5.4" 180°;
 "PARKING", ClearviewHwy-3-W; Rounded Rectangle 5.0" Radius;



SPECIAL DETAIL B;
 0.6" Border, 0.4" Indent, Black on Orange;
 Rectangle Red;
 " " White, E Mod; Standard Arrow Custom 9.4" X 5.4" 90°;
 "PARKING", ClearviewHwy-3-W; " " White, E Mod;
 Rounded Rectangle 5.0" Radius;
 Rounded Rectangle 5.0" Radius;
 Rounded Rectangle 5.0" Radius;
 Rounded Rectangle 5.0" Radius;



SPECIAL DETAIL B;
 0.6" Border, 0.4" Indent, Black on Orange;
 Standard Arrow Custom 9.4" X 5.4" 180°;
 "CENTRAL CAMPUS", ClearviewHwy-3-W;
 Standard Arrow Custom 9.4" X 5.4" 180°; "DOWNTOWN", ClearviewHwy-3-W;
 Standard Arrow Custom 9.4" X 5.4" 0°;
 State Highway 14 M1-6b;

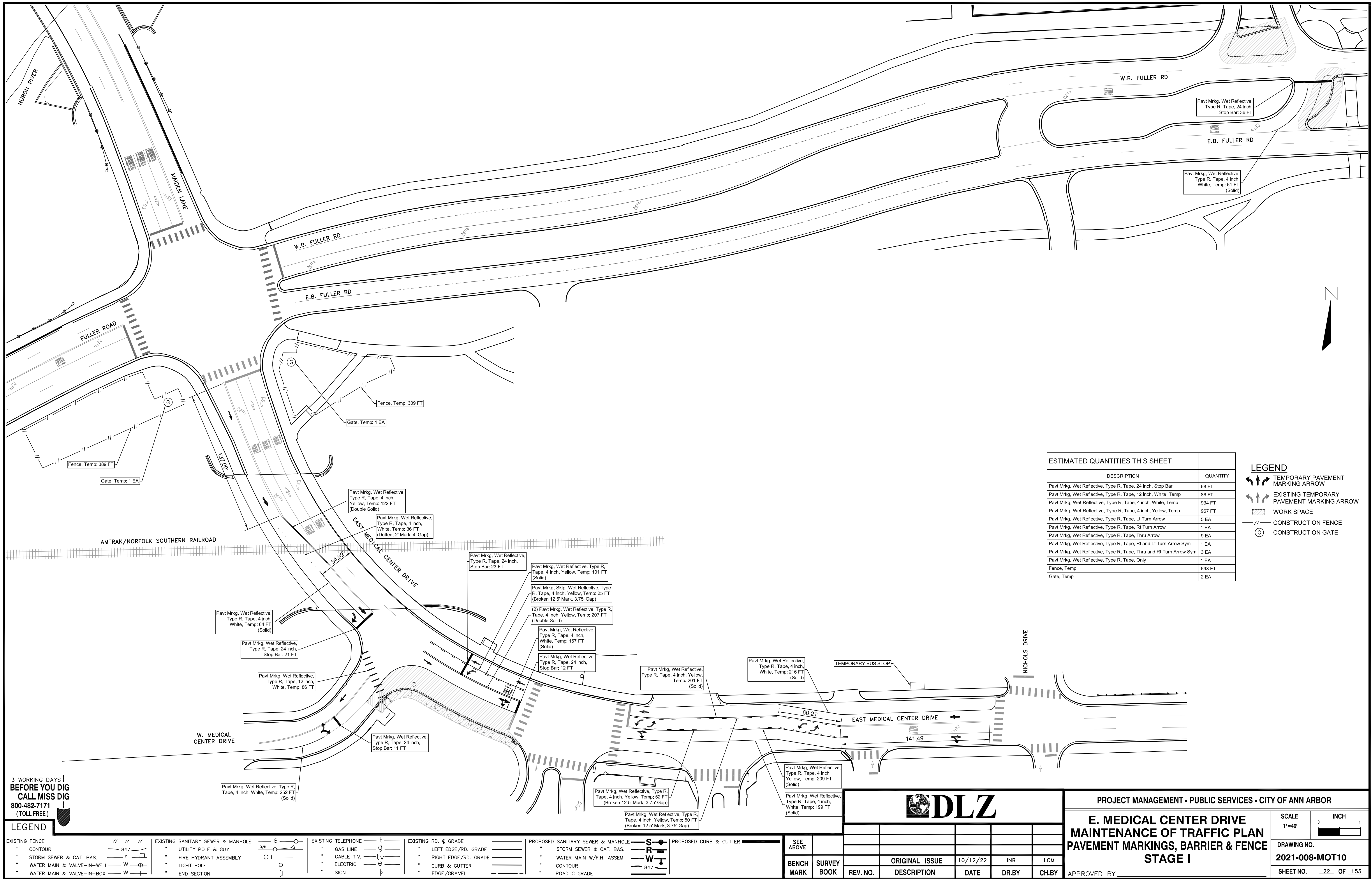
3 WORKING DAYS!
 BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. @ GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER	SEE ABOVE
" CONTOUR	" UTILITY POLE & GUY	" GAS LINE	" LEFT EDGE/RD. GRADE	" STORM SEWER & CAT. BAS.	"	"
" STORM SEWER & CAT. BAS.	" FIRE HYDRANT ASSEMBLY	" CABLE T.V.	" RIGHT EDGE/RD. GRADE	" WATER MAIN W/F.H. ASSEM.	"	"
" WATER MAIN & VALVE-IN-WELL	" LIGHT POLE	" ELECTRIC	" CURB & GUTTER	" CONTOUR	"	"
" WATER MAIN & VALVE-IN-BOX	" END SECTION	" SIGN	" EDGE/GRAVEL	" ROAD @ GRADE	"	"

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE FULLER RD AT E. MEDICAL CENTER RD	
SCALE HOR. 1"=40' VERT. 1"=4'	INCH 0 1
DRAWING NO. 2021-008-M0078	
SHEET NO. <u>20</u> OF <u>139</u>	
APPROVED BY _____	



ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Pavt Mrkg, Wet Reflective, Type R, Tape, 24 inch, Stop Bar	68 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, 12 inch, White, Temp	86 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, White, Temp	934 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, Yellow, Temp	967 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, Li Turn Arrow	5 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt Turn Arrow	1 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru Arrow	9 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt and Lt Turn Arrow Sym	1 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru and Rt Turn Arrow Sym	3 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Only	1 EA
Fence, Temp	698 FT
Gate, Temp	2 EA

LEGEND	
	TEMPORARY PAVEMENT MARKING ARROW
	EXISTING TEMPORARY PAVEMENT MARKING ARROW
	WORK SPACE
	CONSTRUCTION FENCE
	CONSTRUCTION GATE

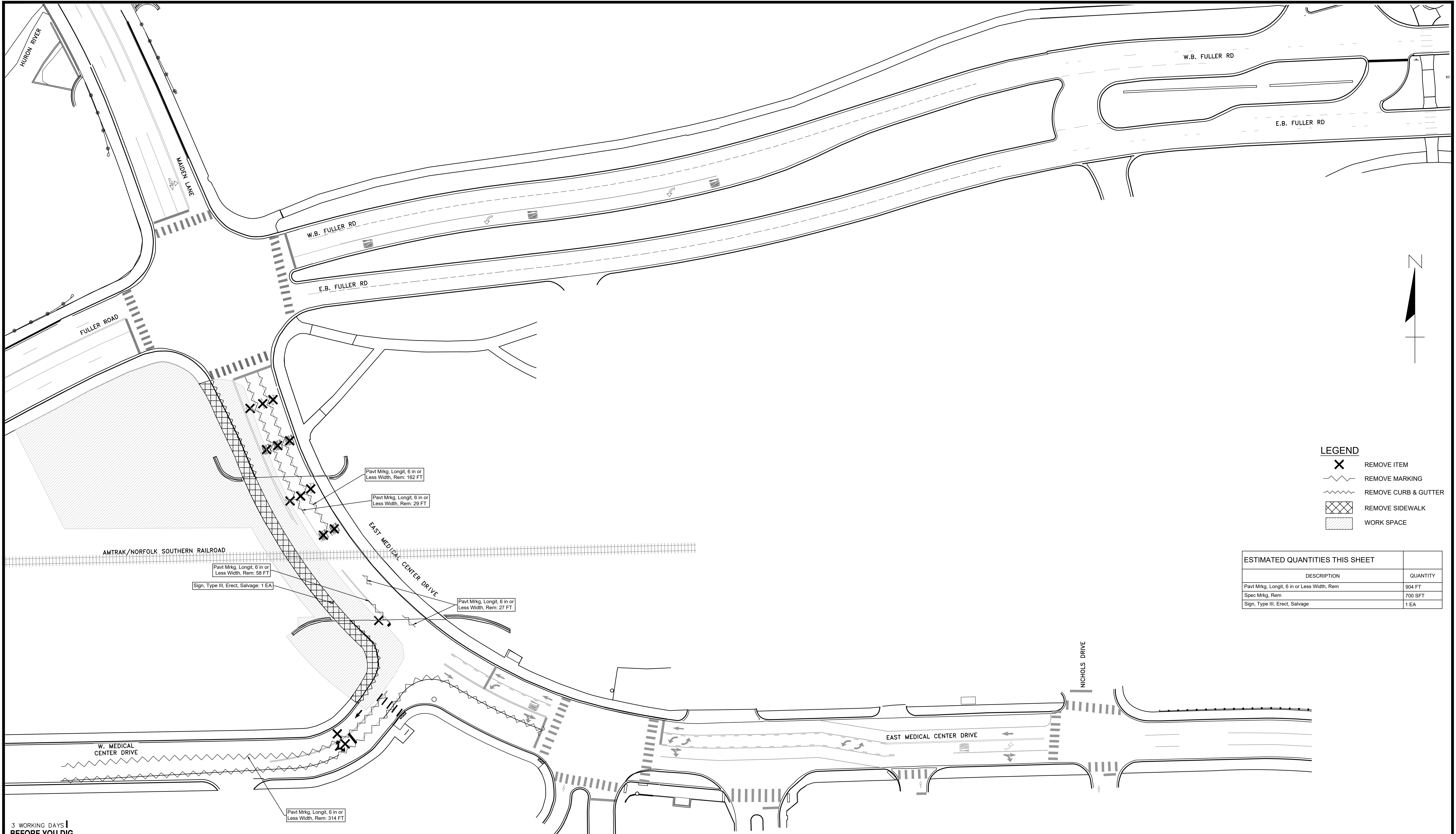
3 WORKING DAYS BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- CONTOUR	- UTILITY POLE & CUY	- GAS LINE	- LEFT EDGE/RD. GRADE	- STORM SEWER & CAT. BAS.	SEE ABOVE
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	- WATER MAIN W/F.H. ASSEM.	BENCH MARK
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	- CONTOUR	SURVEY BOOK
- WATER MAIN & VALVE-IN-BOX	- END SECTION	- SIGN	- EDGE/GRAVEL	- ROAD & GRADE	REV. NO.

DLZ	
ORIGINAL ISSUE	10/12/22
DATE	INB
DR.BY	LCM
CH.BY	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE MAINTENANCE OF TRAFFIC PLAN PAVEMENT MARKINGS, BARRIER & FENCE STAGE I	
SCALE	1"=40' INCH
DRAWING NO.	2021-008-MOT10
SHEET NO.	22 OF 153
APPROVED BY:	LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



LEGEND

- REMOVE ITEM
- REMOVE MARKING
- REMOVE CURB & GUTTER
- REMOVE SIDEWALK
- WORK SPACE

ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Pavt Mrkg, Longit, 6 in or Less Width, Rem	904 FT
Spec Mrkg, Rem	700 SFT
Sign, Type III, Erect, Salvage	1 EA

3 WORKING DAYS!
BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. C GRADE	PROPOSED SANITARY SEWER & MANHOLE
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD C GRADE

DLZ

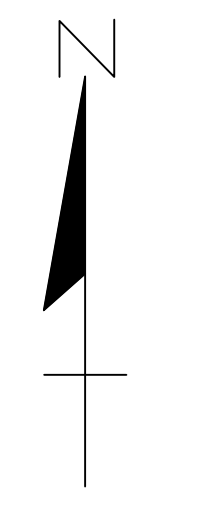
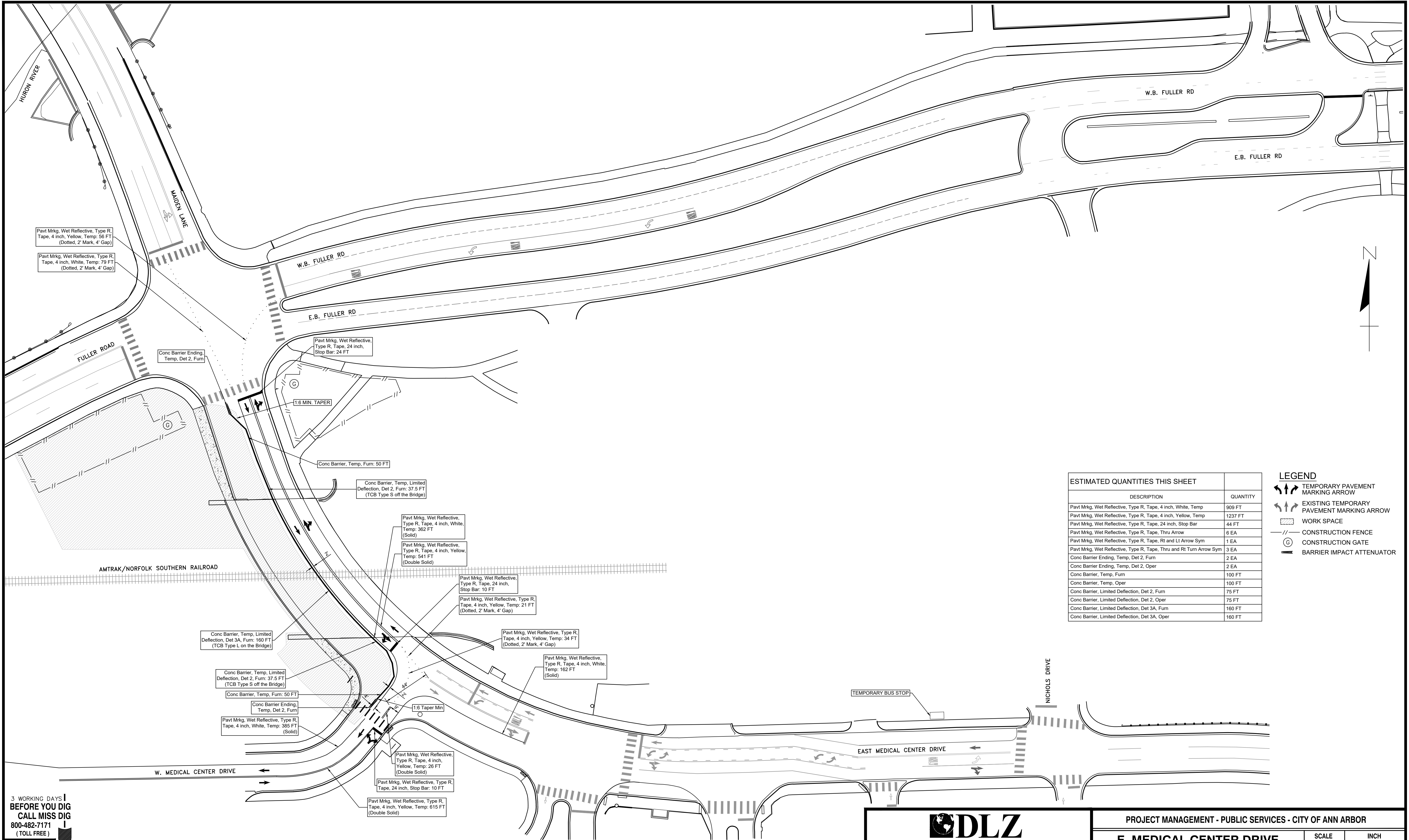
SEE ABOVE					
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE	DR. BY
			ORIGINAL ISSUE	10/12/22	INB
					LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
 MAINTENANCE OF TRAFFIC PLAN
 PAVEMENT MARKING REMOVAL PLAN
 STAGE II**

APPROVED BY: _____

SCALE	INCH
1"=40'	0 1
DRAWING NO.	
2021-008-MOT11	
SHEET NO.	23 OF 139



ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, White, Temp	909 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, Yellow, Temp	1237 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, 24 inch, Stop Bar	44 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru Arrow	6 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt and Lt Arrow Sym	1 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru and Rt Turn Arrow Sym	3 EA
Conc Barrier Ending, Temp, Det 2, Furn	2 EA
Conc Barrier, Temp, Furn	100 FT
Conc Barrier, Temp, Oper	100 FT
Conc Barrier, Limited Deflection, Det 2, Furn	75 FT
Conc Barrier, Limited Deflection, Det 2, Oper	75 FT
Conc Barrier, Limited Deflection, Det 3A, Furn	160 FT
Conc Barrier, Limited Deflection, Det 3A, Oper	160 FT

LEGEND	
	TEMPORARY PAVEMENT MARKING ARROW
	EXISTING TEMPORARY PAVEMENT MARKING ARROW
	WORK SPACE
	CONSTRUCTION FENCE
	CONSTRUCTION GATE
	BARRIER IMPACT ATTENUATOR

3 WORKING DAYS!
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND	
EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE
CONTOUR	UTILITY POLE & GUY
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY
WATER MAIN & VALVE-IN-WELL	LIGHT POLE
WATER MAIN & VALVE-IN-BOX	END SECTION

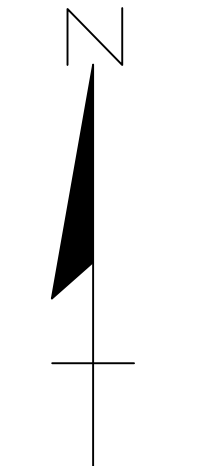
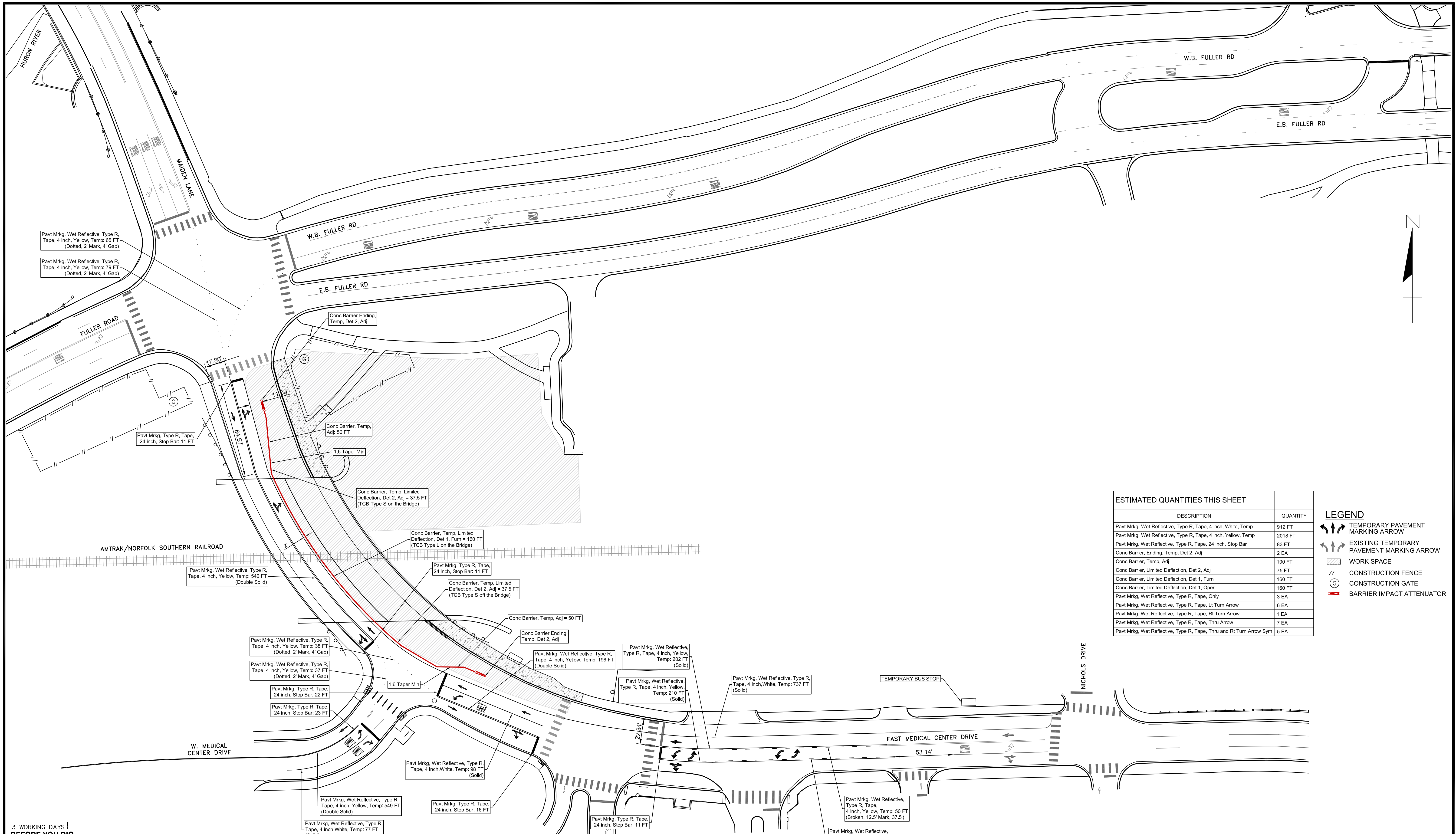
EXISTING TELEPHONE	EXISTING RD. C GRADE
GAS LINE	LEFT EDGE/RD. GRADE
CABLE T.V.	RIGHT EDGE/RD. GRADE
ELECTRIC	CURB & GUTTER
SIGN	EDGE/GRAVEL

PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
STORM SEWER & CAT. BAS.	
WATER MAIN W/F.H. ASSEM.	
CONTOUR	
ROAD C GRADE	

SEE ABOVE					
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE	DR. BY

DLZ					

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR					
E. MEDICAL CENTER DRIVE MAINTENANCE OF TRAFFIC PLAN PAVEMENT MARKINGS, BARRIER & FENCE STAGE II					
SCALE 1"=40'		INCH			
DRAWING NO. 2021-008-MOT12					
SHEET NO. 24 OF 139					
APPROVED BY: _____					



ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, White, Temp	912 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, Yellow, Temp	2018 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, 24 inch, Stop Bar	83 FT
Conc Barrier, Ending, Temp, Det 2, Adj	2 EA
Conc Barrier, Temp, Adj	100 FT
Conc Barrier, Limited Deflection, Det 2, Adj	75 FT
Conc Barrier, Limited Deflection, Det 1, Furn	160 FT
Conc Barrier, Limited Deflection, Det 1, Oper	160 FT
Pavt Mrkg, Wet Reflective, Type R, Tape, Lt Turn Arrow	3 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt Turn Arrow	6 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru Arrow	1 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru and Rt Turn Arrow Sym	7 EA
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru and Lt Turn Arrow Sym	5 EA

LEGEND	
	TEMPORARY PAVEMENT MARKING ARROW
	EXISTING TEMPORARY PAVEMENT MARKING ARROW
	WORK SPACE
	CONSTRUCTION FENCE
	CONSTRUCTION GATE
	BARRIER IMPACT ATTENUATOR

3 WORKING DAYS
BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)










































LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.










DLZ	
SEE ABOVE	REV. NO.
BENCH MARK	DESCRIPTION
SURVEY BOOK	DATE
	DR. BY
	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE MAINTENANCE OF TRAFFIC PLAN PAVEMENT MARKINGS, BARRIER & FENCE STAGE III	
SCALE 1"=40'	INCH
DRAWING NO. 2021-008-MOT14	
SHEET NO. <u>26</u> OF <u>153</u>	
APPROVED BY	

SIGNALS

	ANTENNA		SIGNAL HEAD PEDESTRIAN - EXISTING
	CASE SIGN (1-WAY OR 2-WAY)		SIGNAL HEAD PEDESTRIAN 1-WAY
	CASE SIGN (4-WAY)		SIGNAL HEAD PEDESTRIAN 2-WAY
	DEDICATED SHORT RANGE COMMUNICATIONS		SIGNAL HEAD VEHICLE 1-WAY - EXISTING
	CONTROLLER CABINET - POLE MOUNTED		SIGNAL HEAD VEHICLE 2-WAY - EXISTING
	CONTROL EMERGENCY PREEMPTION OPTICOM		SIGNAL HEAD VEHICLE 3-WAY - EXISTING
	DILEMMA ZONE DETECTION		SIGNAL HEAD VEHICLE 4-WAY - EXISTING
	GLOBAL POSITIONING SYSTEM MODULE		SIGNAL HEAD VEHICLE 1-WAY
	GUY ANCHOR		SIGNAL HEAD VEHICLE 2-WAY
	PEDESTRIAN PEDESTAL		SIGNAL HEAD VEHICLE 3-WAY
	PEDESTRIAN PUSHBUTTON		SIGNAL HEAD VEHICLE 4-WAY
	POLE MAST ARM (LENGTH VARIES) - EXISTING		SIGNAL HEAD VEHICLE BAGGED
	POLE MAST ARM (LENGTH VARIES)		SIGNAL HEAD VEHICLE PROGRAMMABLE
	POLE STRAIN		VEHICLE DETECTION CAMERA
	ROAD SIGN W/ FLASHING SIGN OPTICAL (1-WAY)		VEHICLE DETECTION CAMERA - HEMISPHERICAL
	SIGNAL HANDHOLE - POLYMER CONCRETE		VEHICLE DETECTION LOOP
	SIGNAL HANDHOLE - 2 FOOT ROUND		VEHICLE DETECTION - RADAR
	SIGNAL HANDHOLE - 3 FOOT ROUND		WIRELESS VEHICLE DETECTION RADIO RECEIVER
	SIGNAL HANDHOLE - 2 FOOT SQUARE		WIRELESS VEHICLE DETECTION RADIO REPEATER
	SIGNAL HANDHOLE - 4 FOOT SQUARE		WIRELESS VEHICLE DETECTION SENSOR - EXISTING
			WIRELESS VEHICLE DETECTION SENSOR

CABLING / WIRING DIAGRAM

	CIRCUIT BREAKER
	COILED WIRE
	FUSE
	FUSE SWITCH
	GROUND
	ILLUMINATED CASE SIGN
	METER
	SERVICE DISCONNECT
	SIGNAL HEAD

NOTE:

EXISTING ITEMS ARE REPRESENTED BY THIN LINE WEIGHTS.
PROPOSED ITEMS ARE REPRESENTED BY HEAVIER LINE WEIGHTS.

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

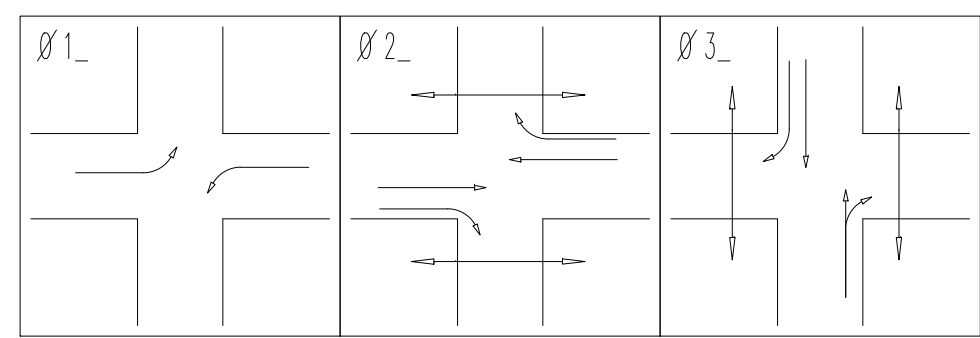
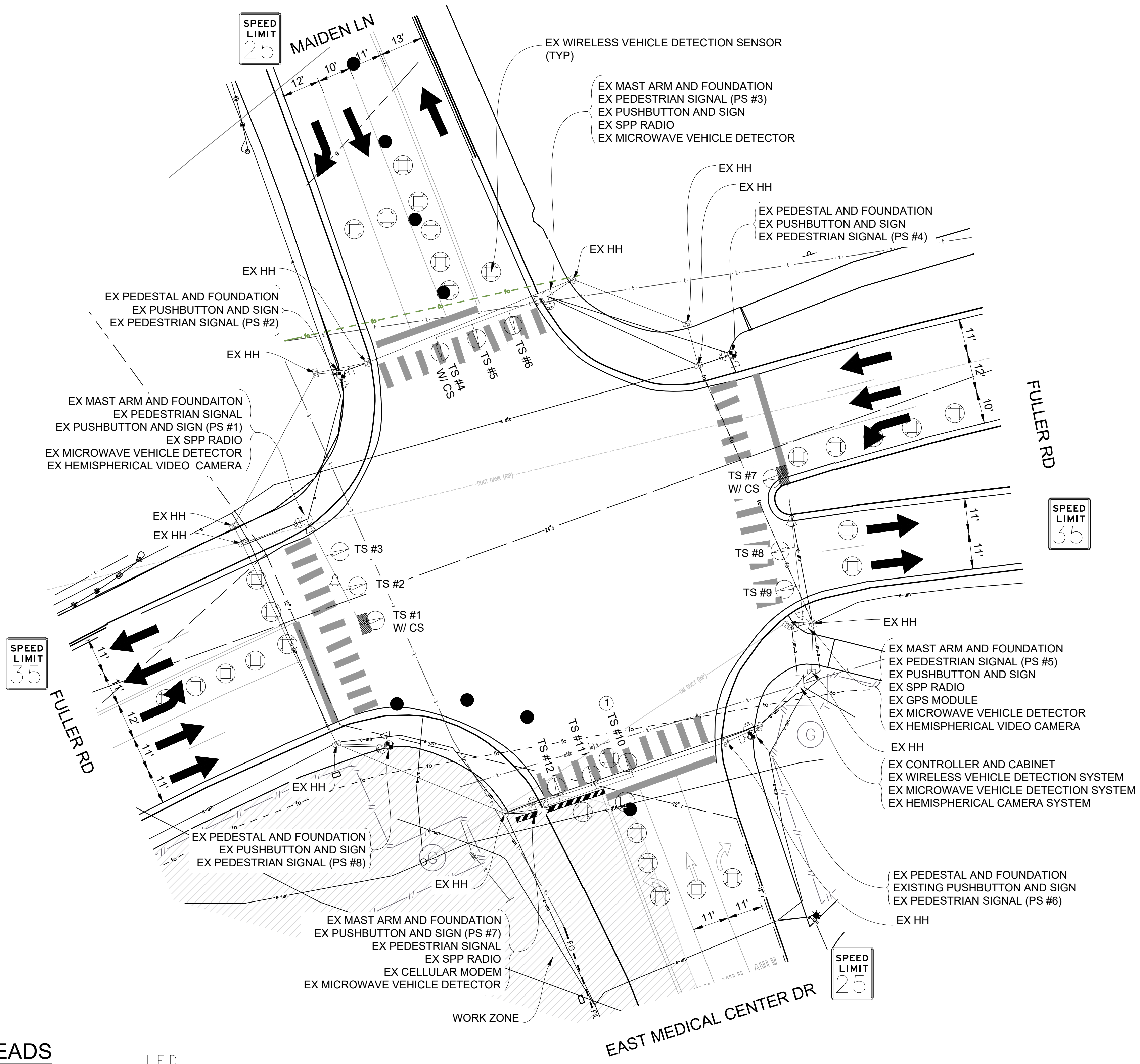
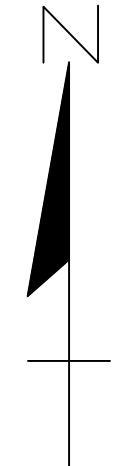
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS LEGEND

SCALE NO SCALE 0 INCH 1

DRAWING NO. 2021-008-MOT23

SHEET NO. 27 OF 153

APPROVED BY	DATE	DR. BY	CH. BY
	10/12/22	INB	LCM



PHASE DIAGRAM

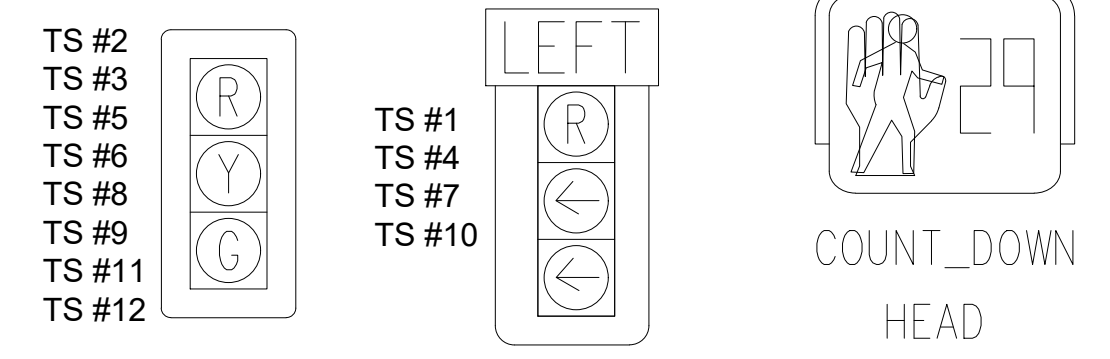
CONTRACTOR TO UTILIZE NOT TYPICAL 163-INT-LD-OUT FOR ALL SIGNAL WORK RELATED TO THIS INTERSECTION

ROW WAS NOT SURVEYED AND IS NOT MARKED ON PLANS

TIME OF REMOVAL OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER

LIST OF MATERIAL		
NO.	ITEM	QUANTITIES
1	TS Mast Arm Mtd, Rem	1 Ea.

SIGNAL HEADS



STAGE 2 REMOVAL PLAN

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	
OPENINGS:	40
CYCLIC WATTS:	516
STEADY WATTS:	45

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

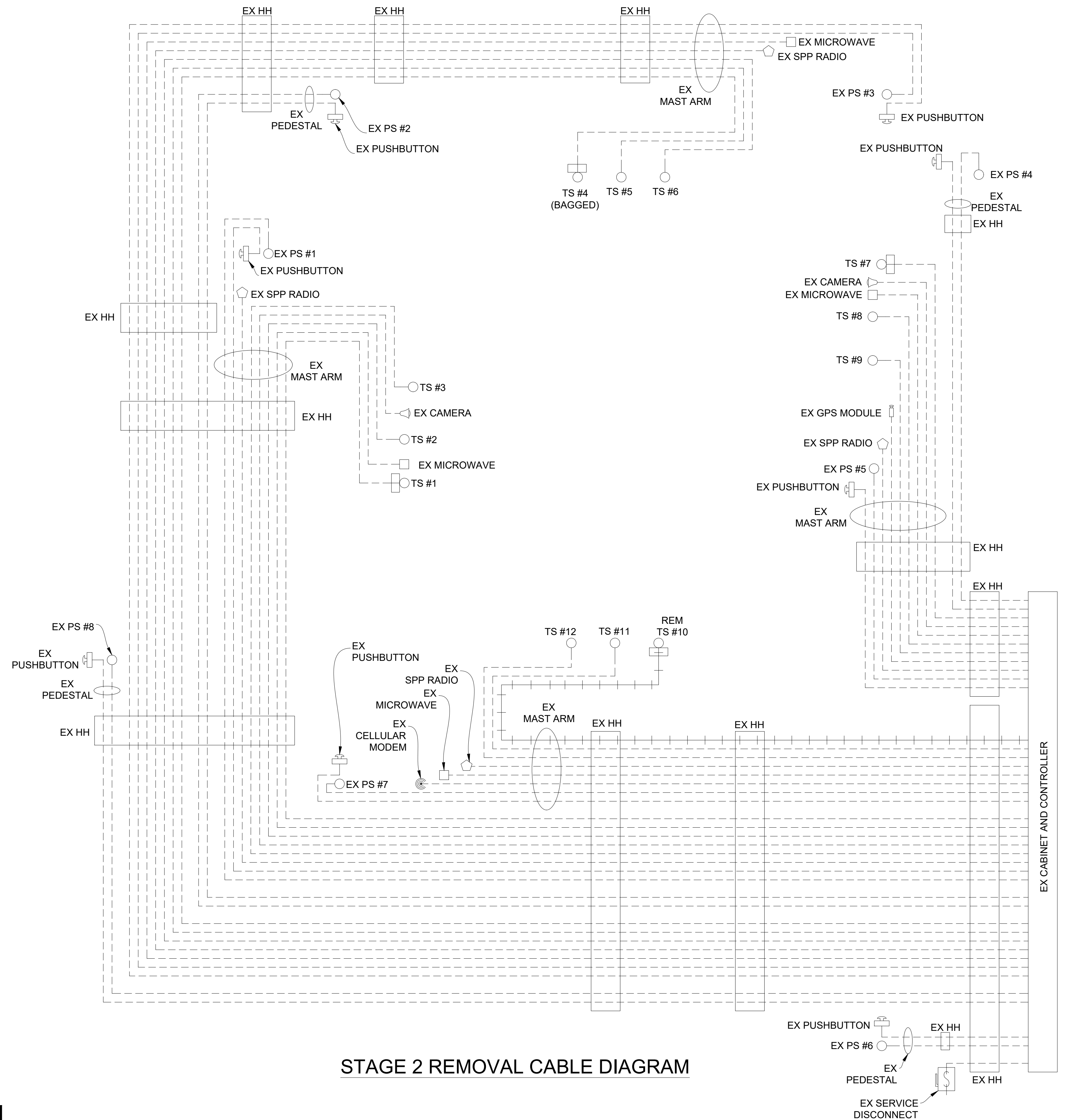
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
FULLER ED AT E. MED. CENTER RD
STAGE 2**

SCALE: 1"=20'

DRAWING NO. 2021-008-MOT26

SHEET NO. 30 OF 153



STAGE 2 REMOVAL CABLE DIAGRAM

**CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE**

- 1W-3C TRAFFIC SIGNAL CABLES ARE 5/C#16 PJ.
- 1W-3C TRAFFIC SIGNALS WITH 12"/27" CASE SIGN CABLES ARE 7/C#16 PJ.
- HEMISPHERICAL VIDEO DETECTION CAMERA CABLES ARE CAT5e 600V.

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

NOTE:
FIBER OPTIC CABLES ARE PRESENT WITHIN EXISTING HANDHOLES BUT SIZE AND ROUTING IS UNKNOWN

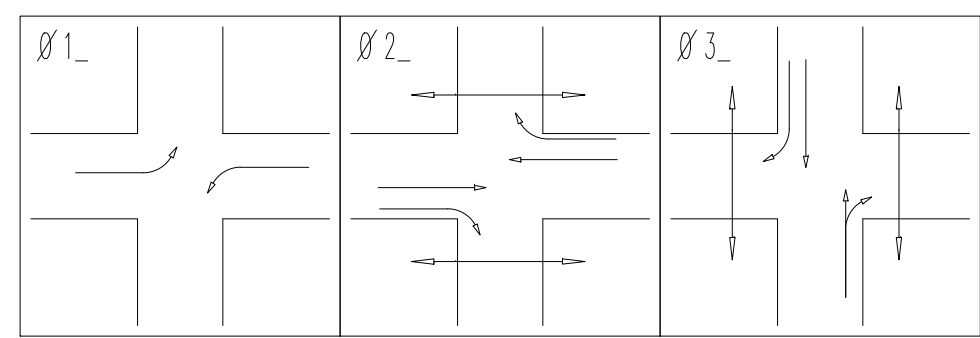
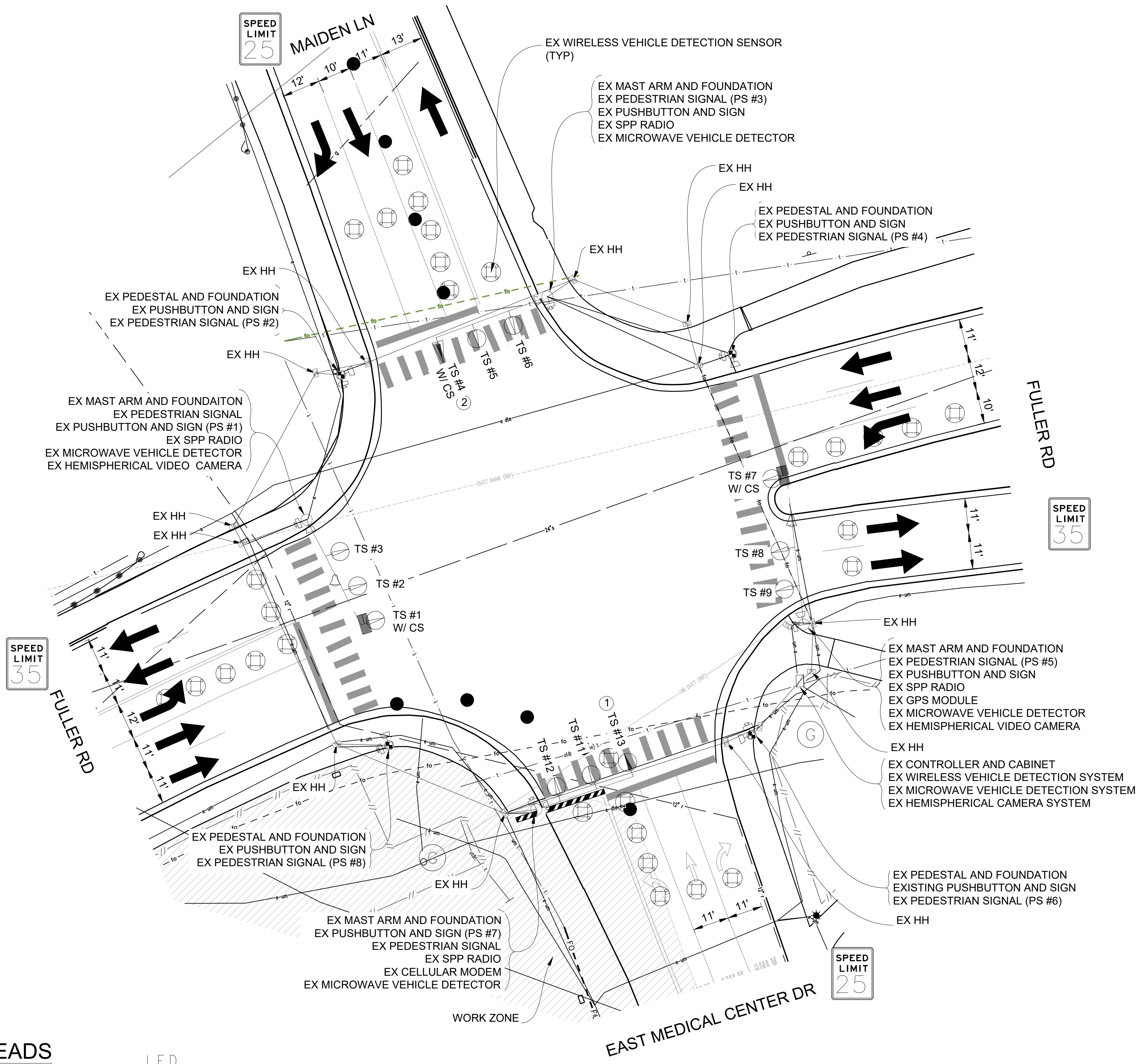
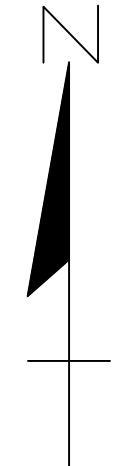
SIGNALS	
OPENINGS:	40
CYCLIC WATTS:	516
STEADY WATTS:	45

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR					
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER ED AT E. MED. CENTER RD STAGE 2					
SCALE	NTS	0	INCH	1	
DRAWING NO.	2021-008-MOT27				
SHEET NO.	31	OF	153		



PHASE DIAGRAM

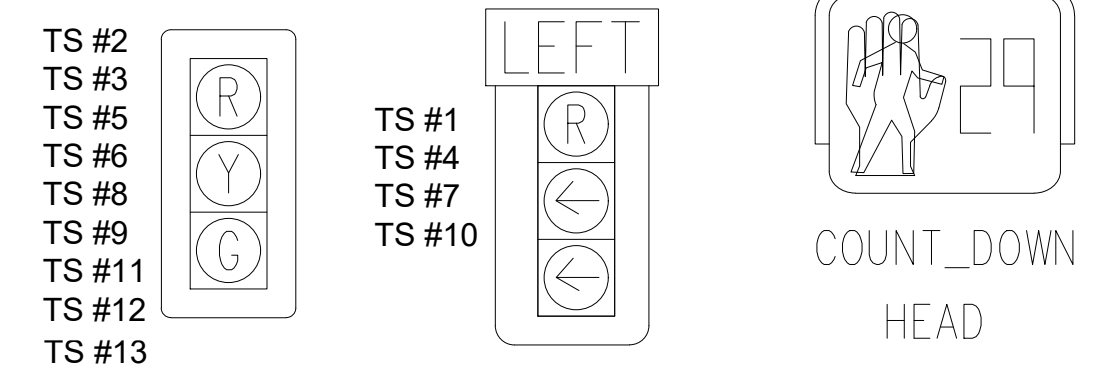
CONTRACTOR TO UTILIZE NOT TYPICAL 163-IN-TD-OUT FOR ALL SIGNAL WORK RELATED TO THIS INTERSECTION

ROW WAS NOT SURVEYED AND IS NOT MARKED ON PLANS

TIME OF REMOVAL OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER

LIST OF MATERIAL		
NO.	ITEM	QUANTITIES
①	TS Head, Temp	1 Ea.
②	TS Face, Bag	1 Ea.

SIGNAL HEADS



STAGE 2 INSTALLATION PLAN

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

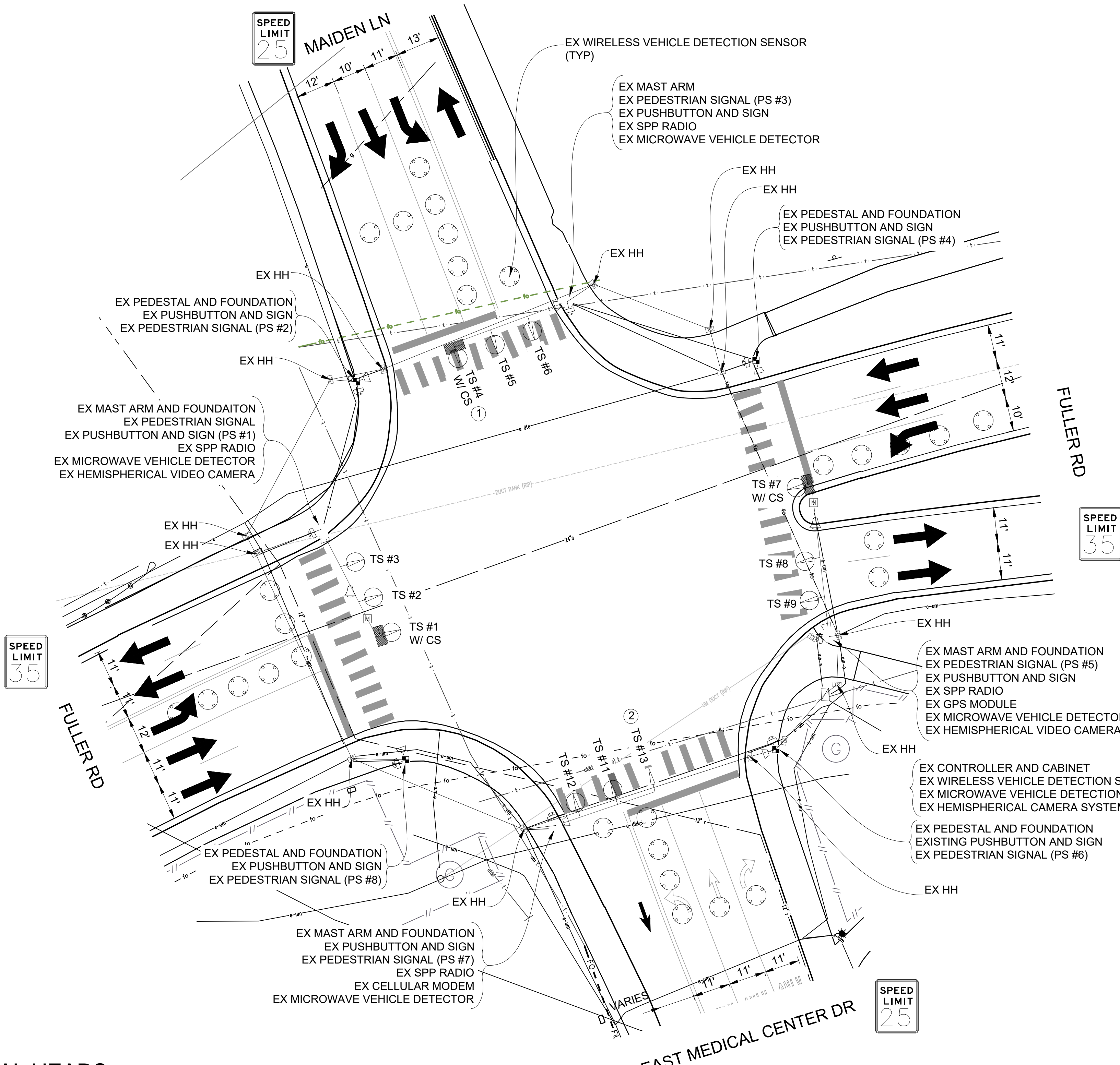
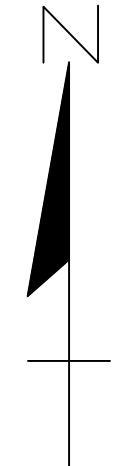
3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

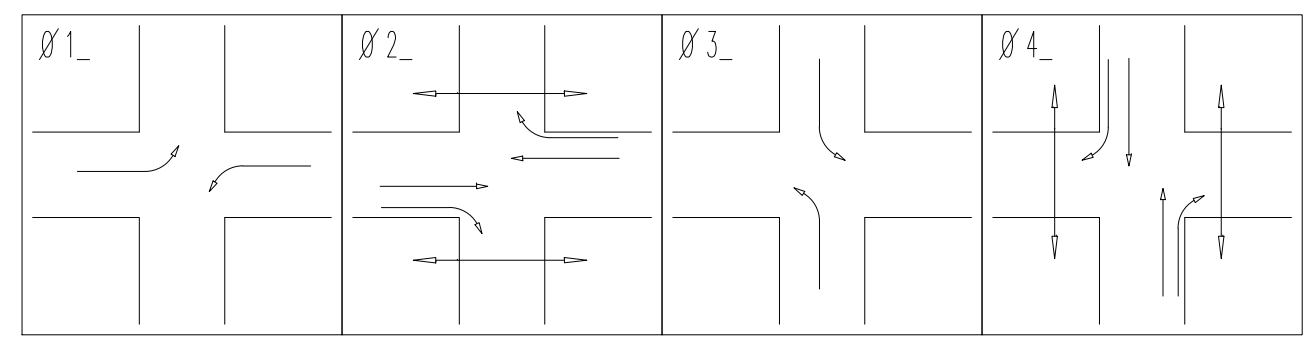
EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE FULLER ED AT E. MED. CENTER RD STAGE 2	
SCALE 1"=20'	INCH 0 1
DRAWING NO. 2021-008-MOT28	
SHEET NO. <u>32</u> OF <u>153</u>	



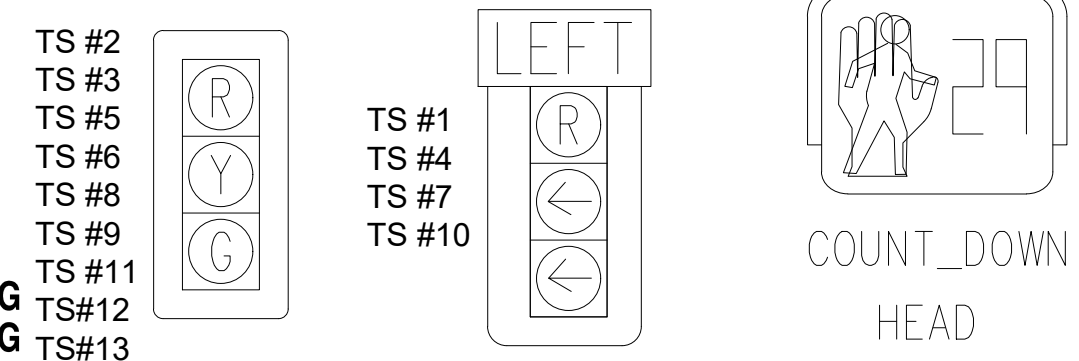
CONTRACTOR TO UTILIZE MOT TYPICAL 163-INT-LD-OUT FOR ALL SIGNAL WORK RELATED TO THIS INTERSECTION



PHASE DIAGRAM

LIST OF MATERIAL		
NO.	ITEM	QUANTITIES
①	TS Face, Bag, Rem	1 Ea
②	Remove Traffic Signal (Paid for Under "TS Head, Temp")	1 Ea

SIGNAL HEADS



STAGE 4 REMOVAL PLAN

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	
OPENINGS:	40
CYCLIC WATTS:	432
STEADY WATTS:	60

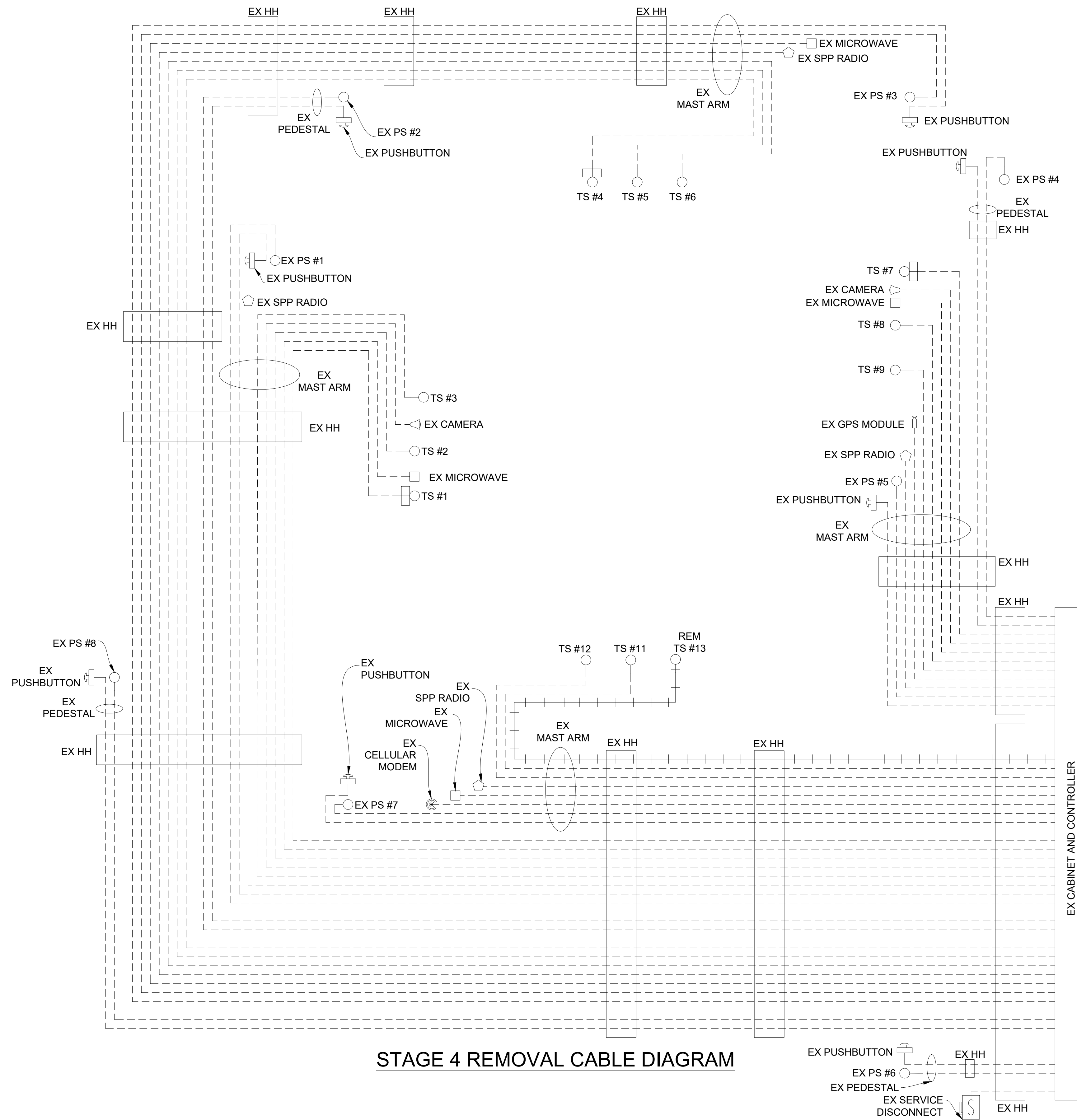
3 WORKING DAYS!
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER ED AT E. MED. CENTER RD STAGE 4	
SCALE 1"=20'	INCH 0 1
DRAWING NO. 2021-008-MOT30	
SHEET NO. 34 OF 153	



STAGE 4 REMOVAL CABLE DIAGRAM

**CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE**

1. 1W-3C TRAFFIC SIGNAL CABLES ARE 5/C#16 P.J.
2. 1W-3C TRAFFIC SIGNALS WITH 12"/27" CASE SIGN CABLES ARE 7/C#16 P.J.
3. HEMISPHERICAL VIDEO DETECTION CAMERA CABLES ARE CAT5e 600V.

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

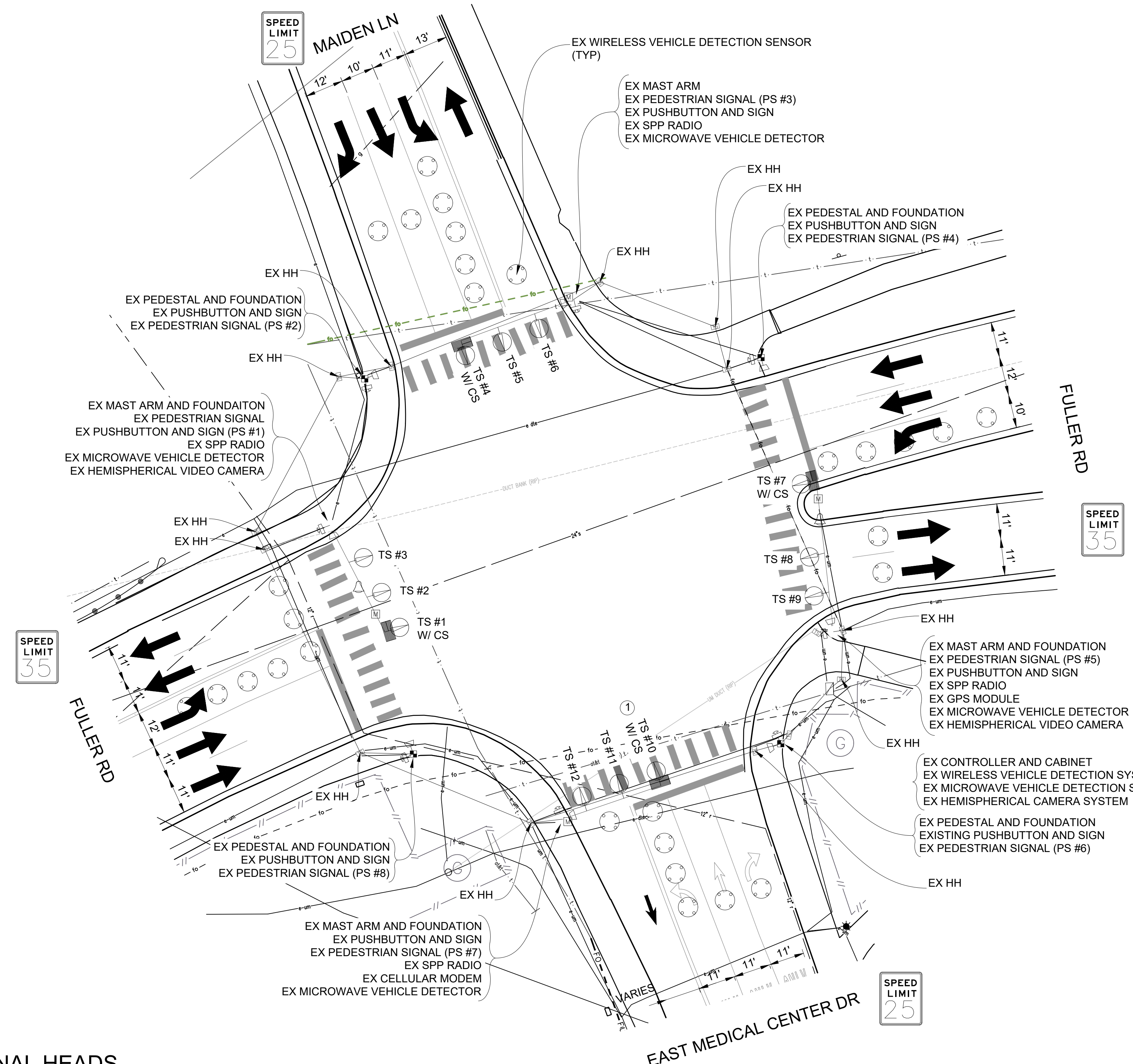
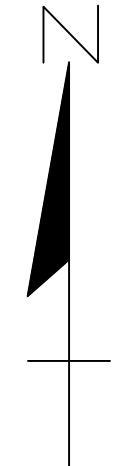
NOTE:
FIBER OPTIC CABLES ARE PRESENT WITHIN EXISTING HANDHOLES BUT SIZE AND ROUTING IS UNKNOWN

LEGEND

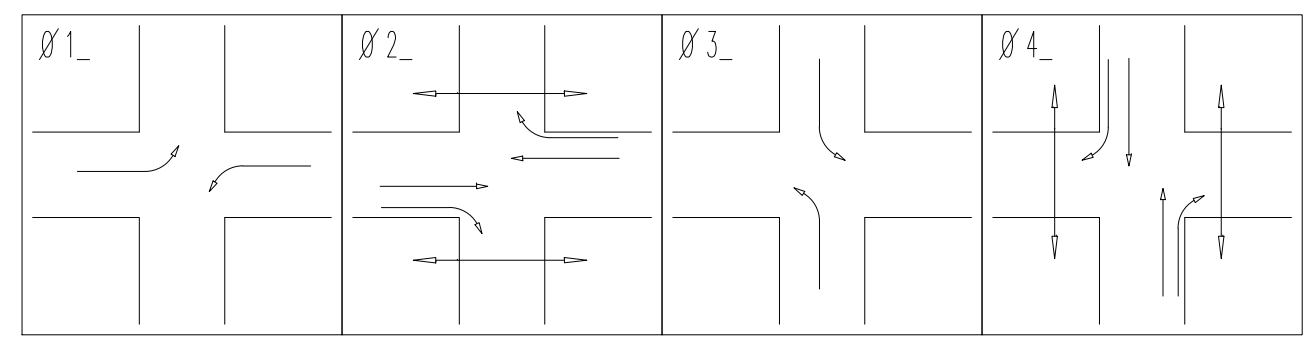
EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER ED AT E. MED. CENTER RD STAGE 4	
SCALE NTS	INCH 0 1
DRAWING NO. 2021-008-MOT31	
SHEET NO. 35 OF 153	



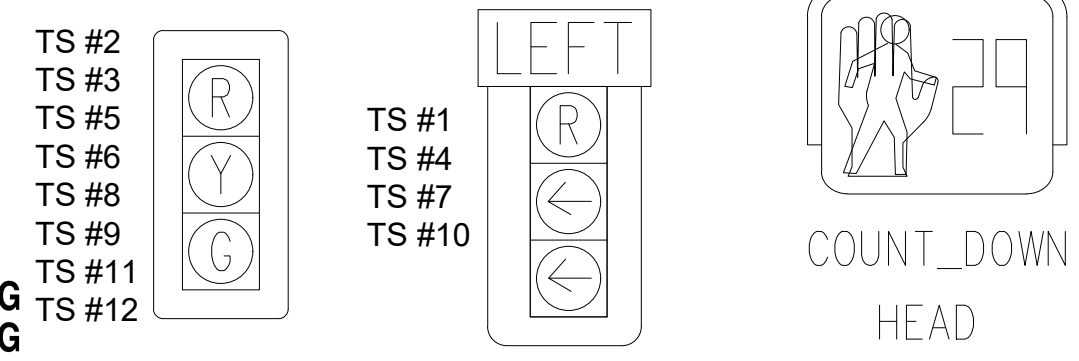
CONTRACTOR TO UTILIZE MOT TYPICAL 163-INT-LD-OUT FOR ALL SIGNAL WORK RELATED TO THIS INTERSECTION



PHASE DIAGRAM

LIST OF MATERIAL		
NO.	ITEM	QUANTITIES
①	TS, One Way Mast Arm Mtd, Salv	1 Ea.

SIGNAL HEADS



STAGE 4 INSTALLATION PLAN

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	
OPENINGS:	40
CYCLIC WATTS:	432
STEADY WATTS:	60

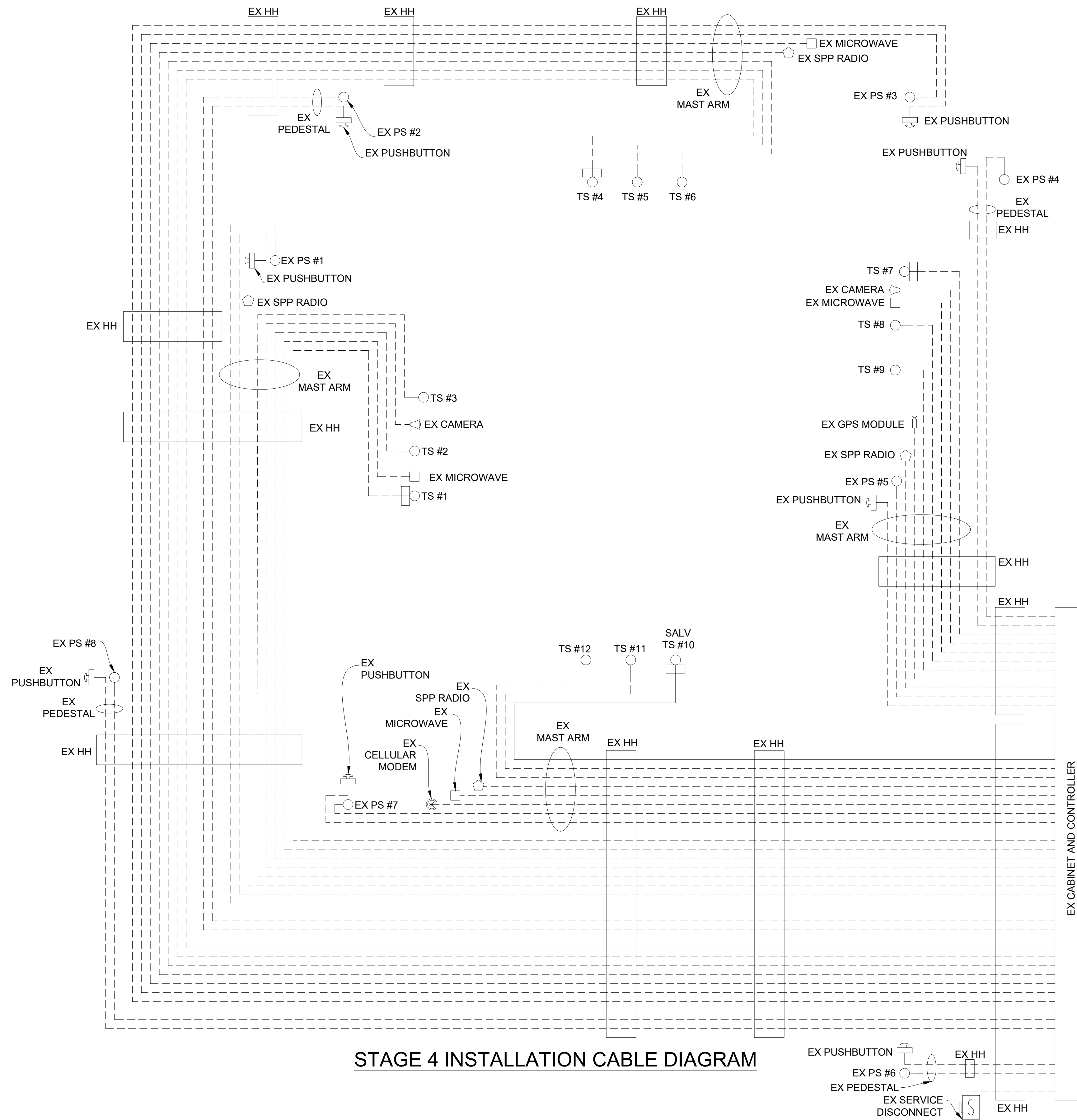
3 WORKING DAYS!
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER RD AT E. MED. CENTER RD STAGE 4	
SCALE 1"=20'	INCH 0 1
DRAWING NO. 2021-008-MOT32	
SHEET NO. <u>36</u> OF <u>153</u>	



STAGE 4 INSTALLATION CABLE DIAGRAM

**CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE**

1. 1W-3C TRAFFIC SIGNAL CABLES ARE 5/C#16 P.J.
2. 1W-3C TRAFFIC SIGNALS WITH 12"/27" CASE SIGN CABLES ARE 7/C#16 P.J.
3. HEMISPHERICAL VIDEO DETECTION CAMERA CABLES ARE CAT5e 600V.

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

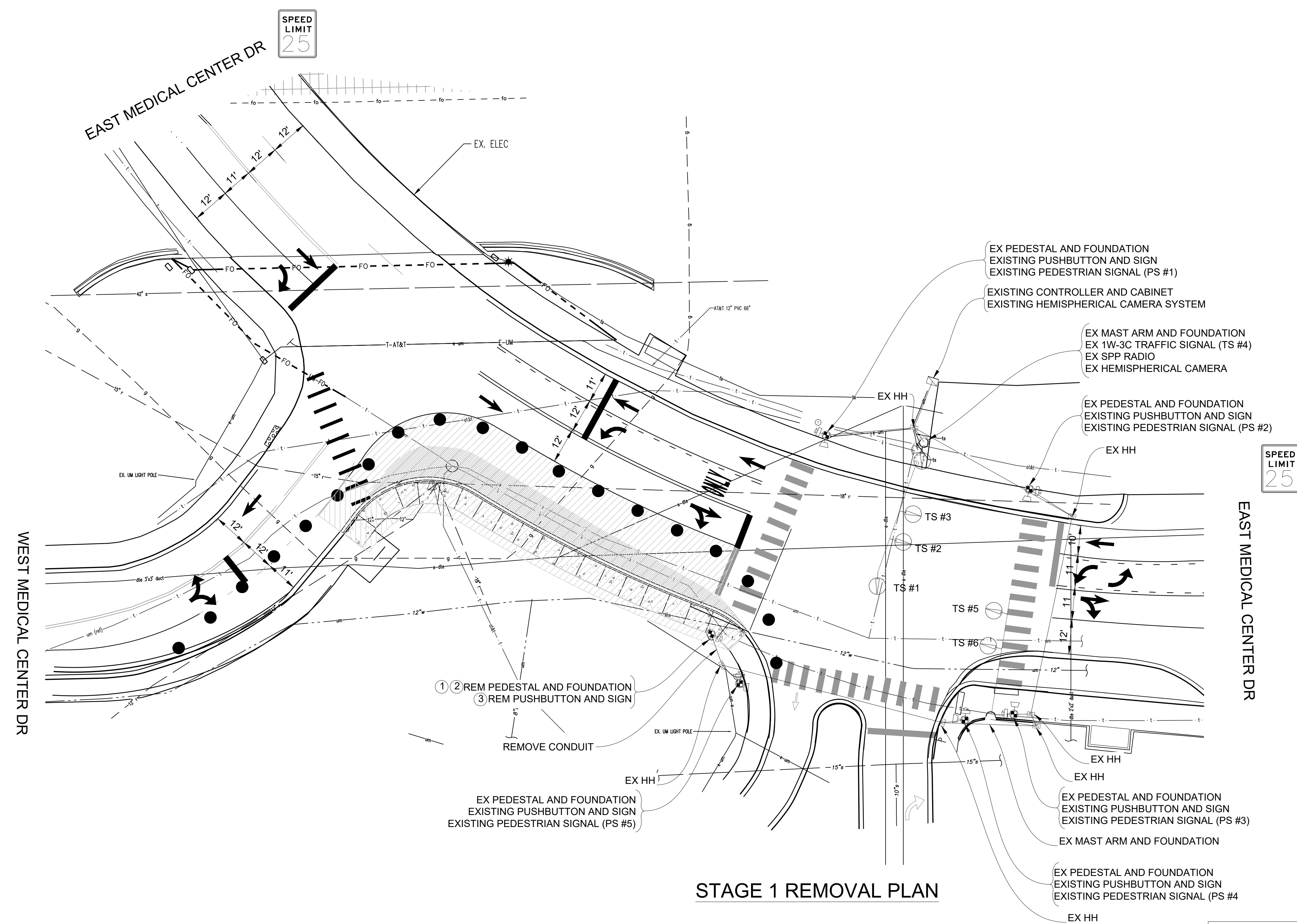
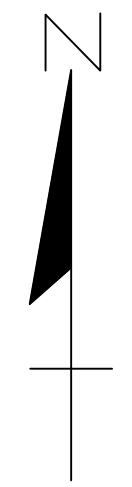
NOTE:
FIBER OPTIC CABLES ARE PRESENT WITHIN EXISTING HANDHOLES BUT SIZE AND ROUTING IS UNKNOWN

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER ED AT E. MED. CENTER RD STAGE 4	
SCALE NTS	INCH 0 1
DRAWING NO. 2021-008-MOT33	
SHEET NO. <u>37</u> OF <u>153</u>	



SPEED LIMIT 25

SPEED LIMIT 25

STAGE 1 REMOVAL PLAN

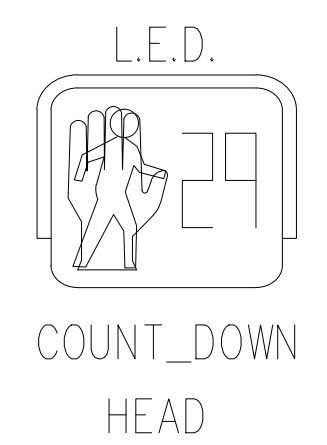
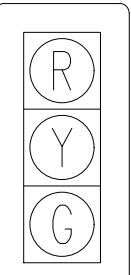
CONTRACTOR TO UTILIZE MOT TYPICAL A FOR INSTALLATION OF TEMPORARY SIGNALS PRIOR TO STAGE 1

TIME OF BAGGING AND UNBAGGING OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER.

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNAL HEADS

- TS #1
- TS #2
- TS #3
- TS #4
- TS #5
- TS #6



LIST OF MATERIAL

NO.	ITEM	QUANTITIES
①	Pedestal Fdn, Rem	1 Ea
②	Pedestal, Rem	1 Ea
③	Pushbutton, Rem	1 Ea
	Conduit, Rem	12 Ft

_ SIGNALS _	
OPENINGS:	55
CYCLIC WATTS:	733
STEADY WATTS:	45

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

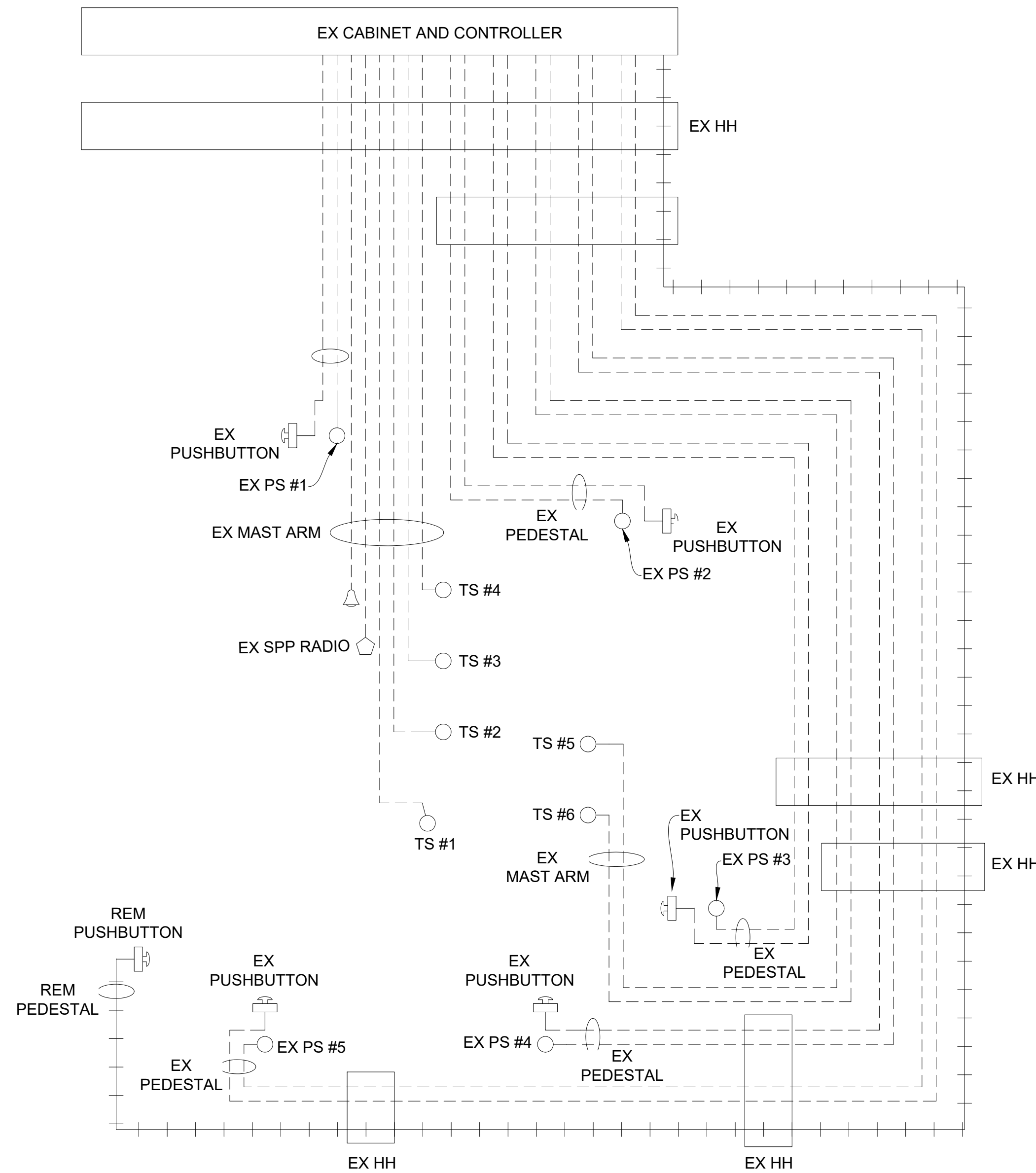
**E. MEDICAL CENTER DRIVE
TRAFFIC SIGNAL PLANS
FULLER ED AT E. MED. CENTER RD
STAGE 1**

SCALE: 1"=20'

DRAWING NO. 2021-008-MOT34

SHEET NO. 38 OF 153

LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



NOTE:
 PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS
 AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN.
 CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE
 ORDERING ANY MATERIAL OR MAKING ANY CHANGES

_ SIGNALS _	
OPENINGS:	55
CYCLIC WATTS:	733
STEADY WATTS:	45

STAGE 1 REMOVAL CABLE DIAGRAM

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



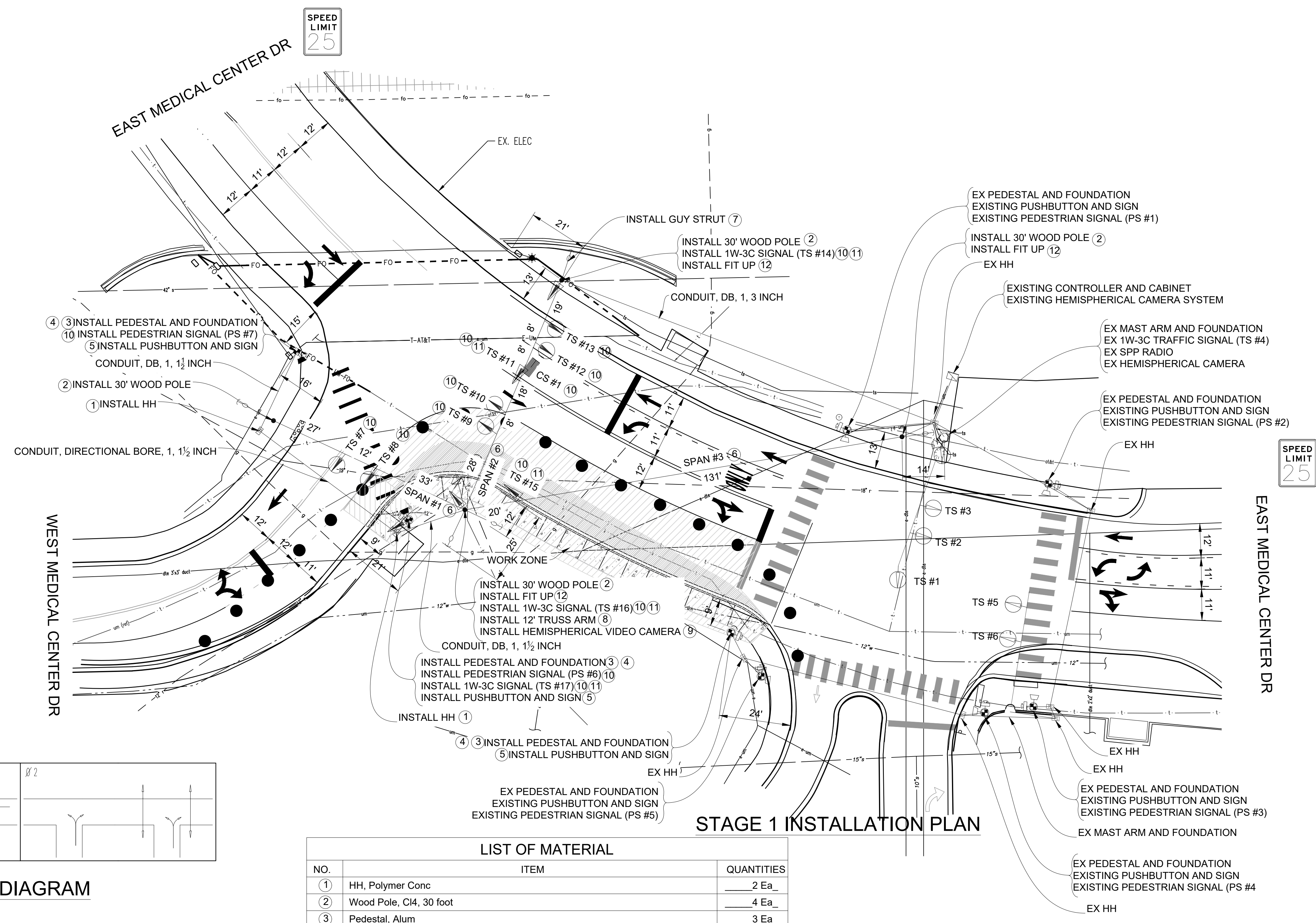
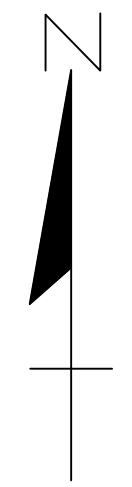
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
 TRAFFIC SIGNAL PLANS
 FULLER ED AT E. MED. CENTER RD
 STAGE 1**

SCALE	0	1
NTS	INCH	
DRAWING NO.	2021-008-MOT35	
SHEET NO.	39	OF 153

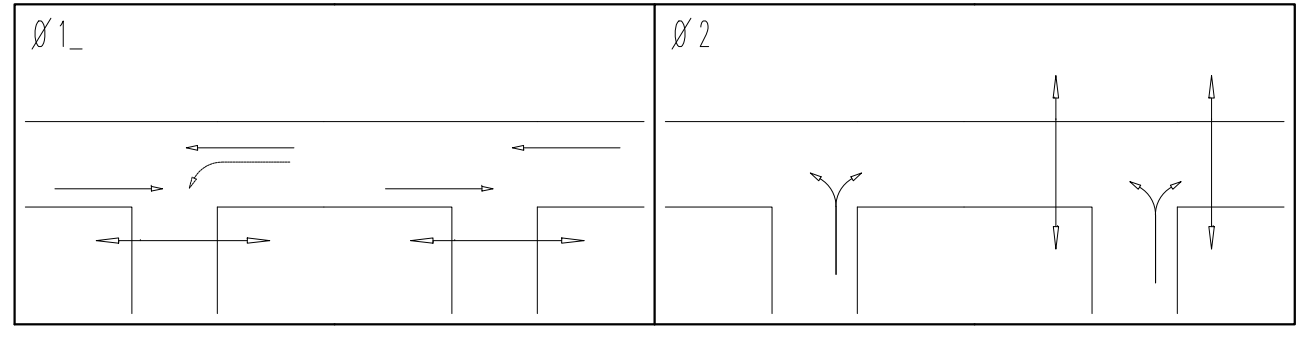
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

APPROVED BY

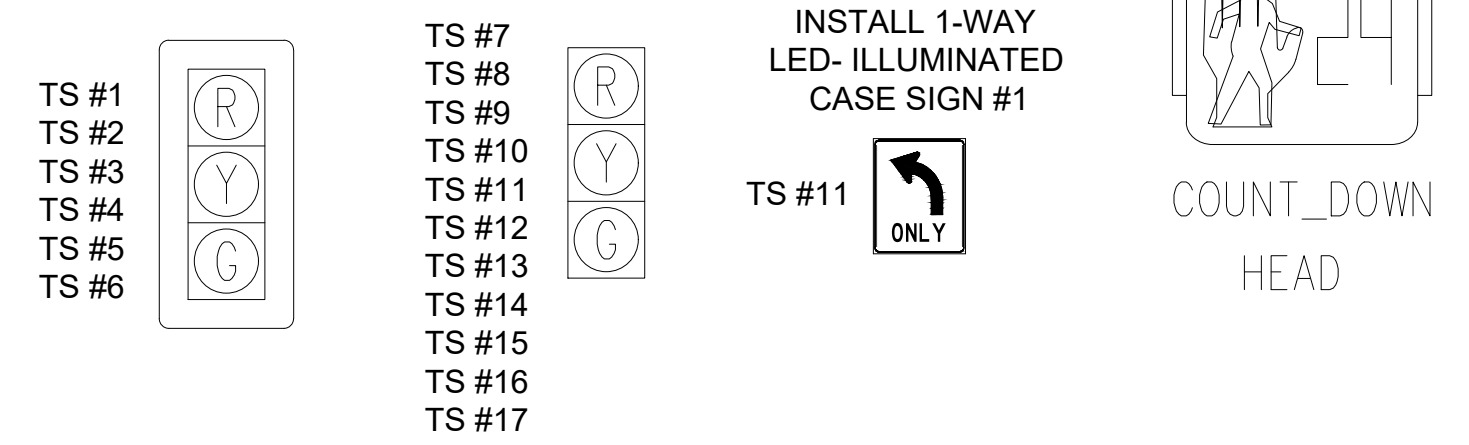


STAGE 1 INSTALLATION PLAN

PHASE DIAGRAM



SIGNAL HEADS



NO.	ITEM	QUANTITIES
1	HH, Polymer Conc	2 Ea
2	Wood Pole, C14, 30 foot	4 Ea
3	Pedestal, Alum	3 Ea
4	Pedestal, Fdn	3 Ea
5	Pushbutton and Sign	3 Ea
6	Span Wire	3 Ea
7	Strut Guy	1 Ea
8	Bracket, Truss, With 12 Foot Arm	1 Ea
9	Hemispherical Video Detection Camera	1 Ea
10	TS Head, Temp	13 Ea
11	TS Face, Bag	5 Ea
12	Wood Pole, Fit Up, TS Cable Pole	3 Ea
	Conduit, Directional Bore, 1, 1 1/2 inch	60 Ft
	Conduit, DB, 1, 1 1/2 inch	80 Ft
	Conduit, DB, 1, 3 inch	150 Ft

CONTRACTOR TO UTILIZE MOT TYPICAL A FOR INSTALLATION OF TEMPORARY SIGNALS PRIOR TO STAGE 1

TIME OF BAGGING AND UNBAGGING OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER.

NOTE: PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

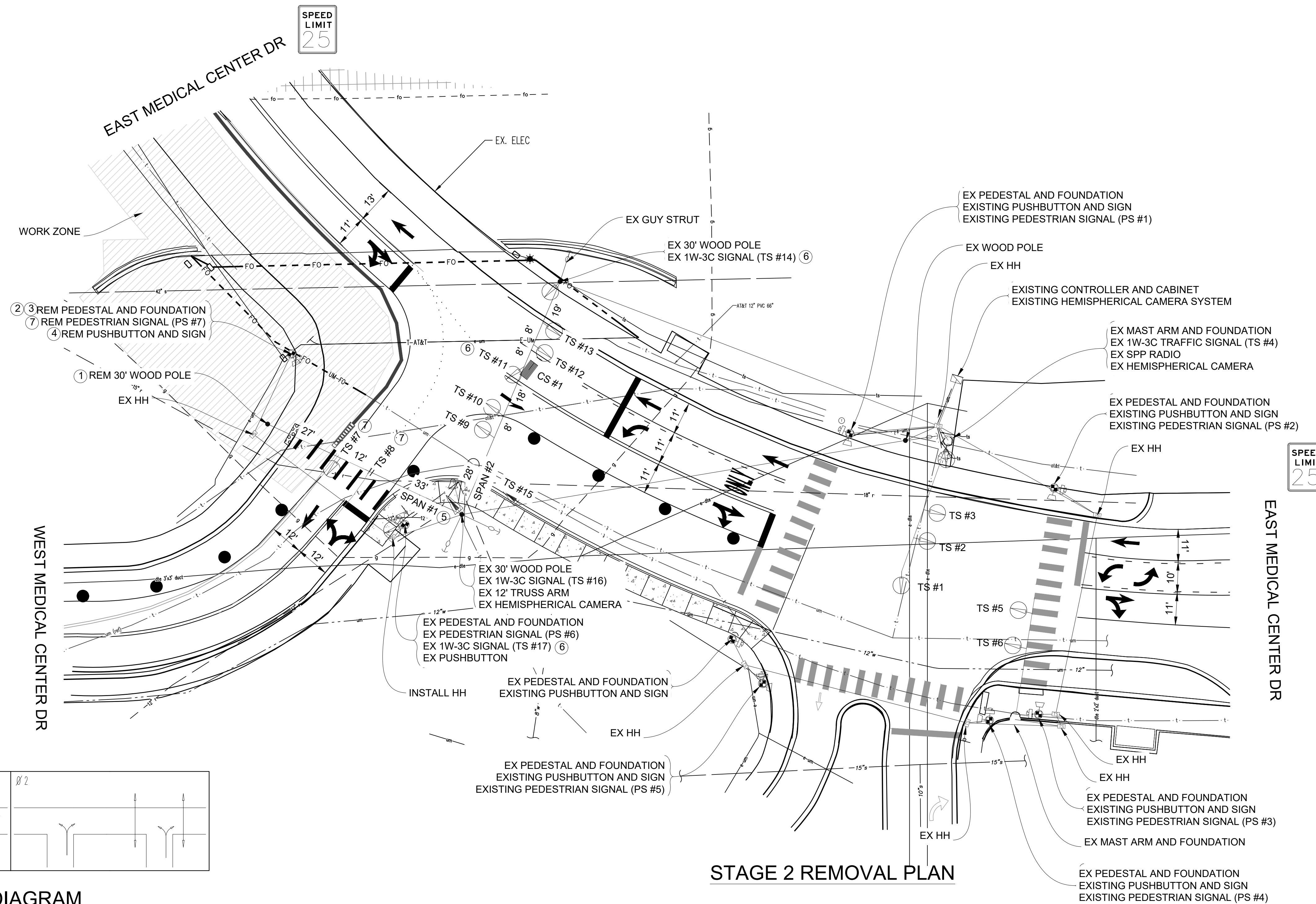
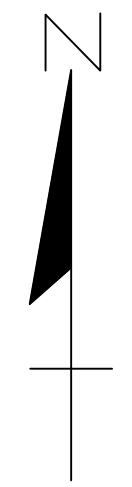
SIGNALS	
OPENINGS:	55
CYCLIC WATTS:	733
STEADY WATTS:	45

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND	
EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE
CONTOUR	UTILITY POLE & GUY
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY
WATER MAIN & VALVE-IN-WELL	LIGHT POLE
WATER MAIN & VALVE-IN-BOX	END SECTION
EXISTING TELEPHONE	EXISTING RD. & GRADE
GAS LINE	LEFT EDGE/RD. GRADE
CABLE T.V.	RIGHT EDGE/RD. GRADE
ELECTRIC	CURB & GUTTER
SIGN	EDGE/GRAVEL
PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
STORM SEWER & CAT. BAS.	
WATER MAIN W/F.H. ASSEM.	
CONTOUR	
ROAD & GRADE	

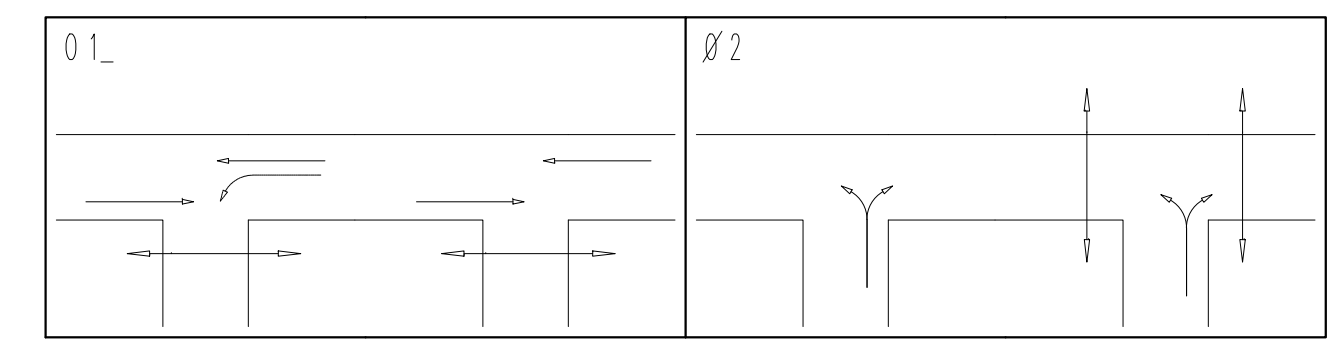
DLZ	
SEE ABOVE	
BENCH MARK	
SURVEY BOOK	
REV. NO.	
DESCRIPTION	
DATE	
DR. BY	
CH. BY	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER ED AT E. MED. CENTER RD STAGE 1	
SCALE	1"=20'
DRAWING NO.	2021-008-MOT36
SHEET NO.	40 OF 153
APPROVED BY	



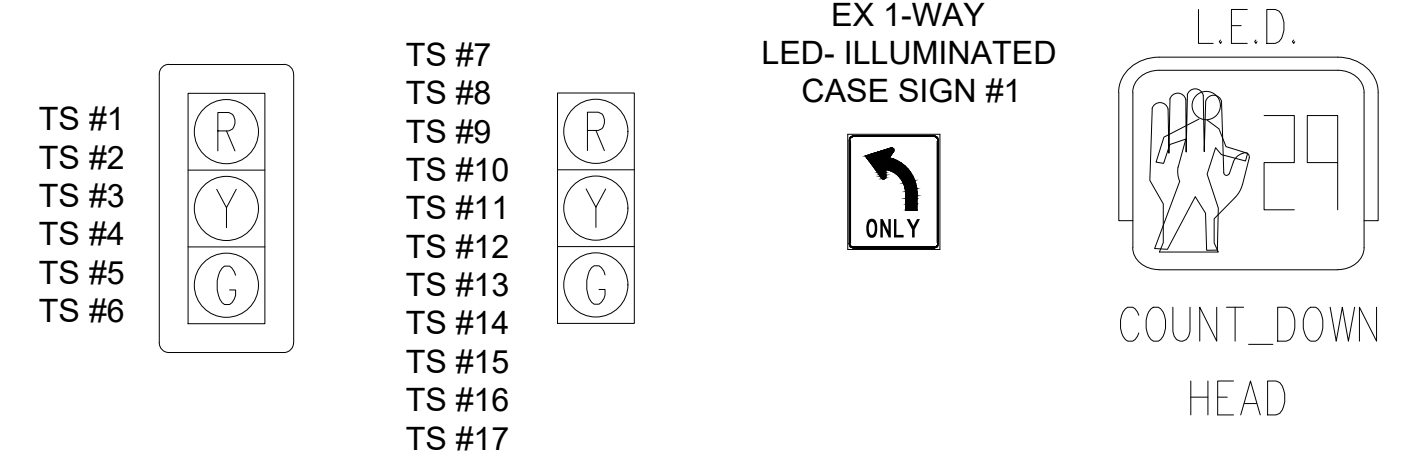
SPEED LIMIT 25

SPEED LIMIT 25



PHASE DIAGRAM

SIGNAL HEADS



LIST OF MATERIAL		
NO.	ITEM	QUANTITIES
1	Wood Pole, Rem	1 Ea
2	Pedestal Fdn, Rem	1 Ea
3	Pedestal, Rem	1 Ea
4	Pushbutton, Rem	1 Ea
5	Span Wire, Rem	1 Ea
6	TS Face, Bag, Rem	3 Ea
7	Remove Traffic Signal (Paid for Under "TS Head, Temp")	3 Ea
	Conduit, Rem	30 Ft

CONTRACTOR TO UTILIZE WORK ZONES AND LANE CLOSURES FOR INSTALLATION OF TRAFFIC SIGNALS PRIOR TO STAGE 2

TIME OF REMOVAL OR ADJUSTMENT OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER

TIME OF BAGGING AND UNBAGGING OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER.

NOTE: PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLELY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	
OPENINGS:	52
CYCLIC WATTS:	690
STEADY WATTS:	15

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

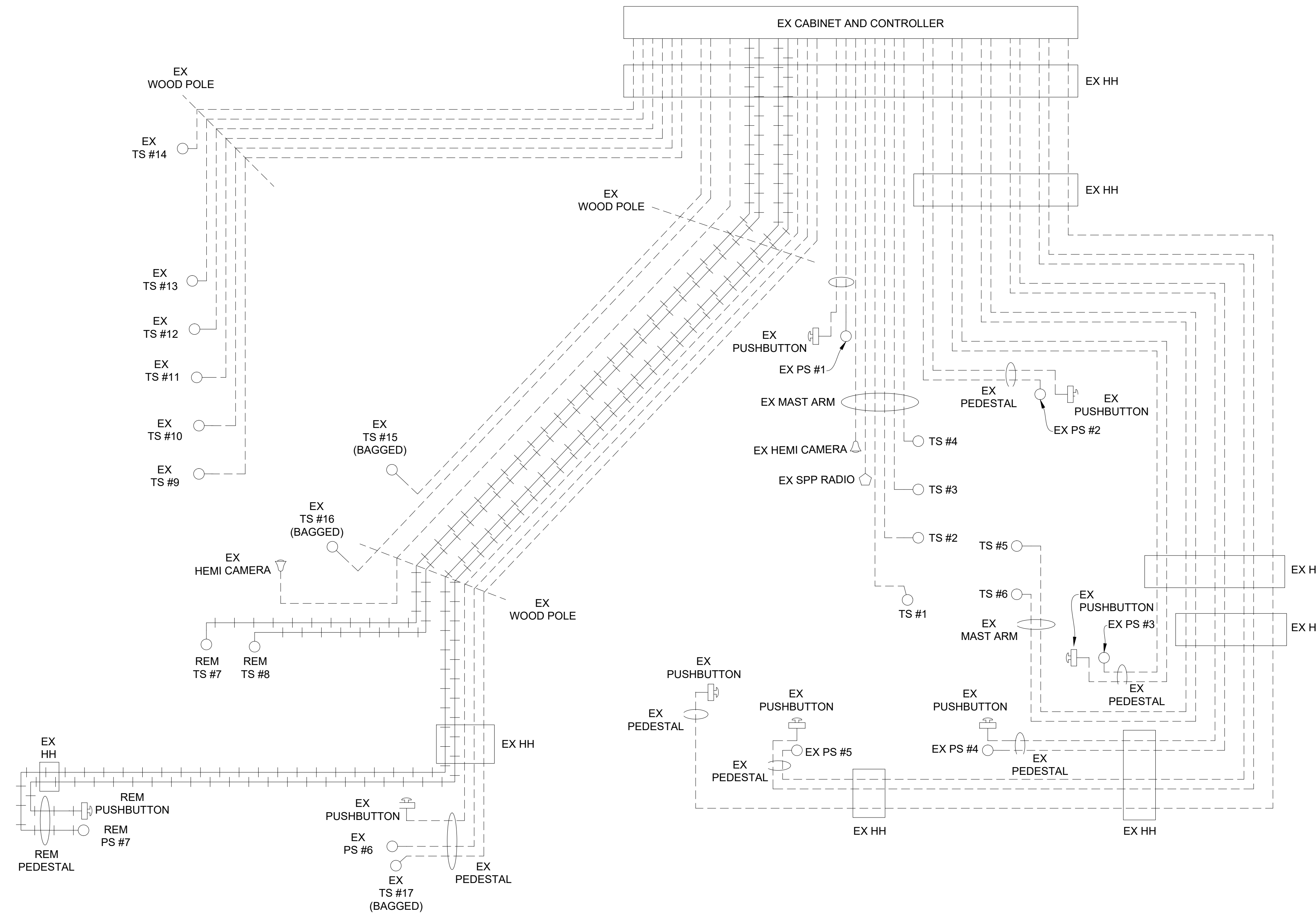
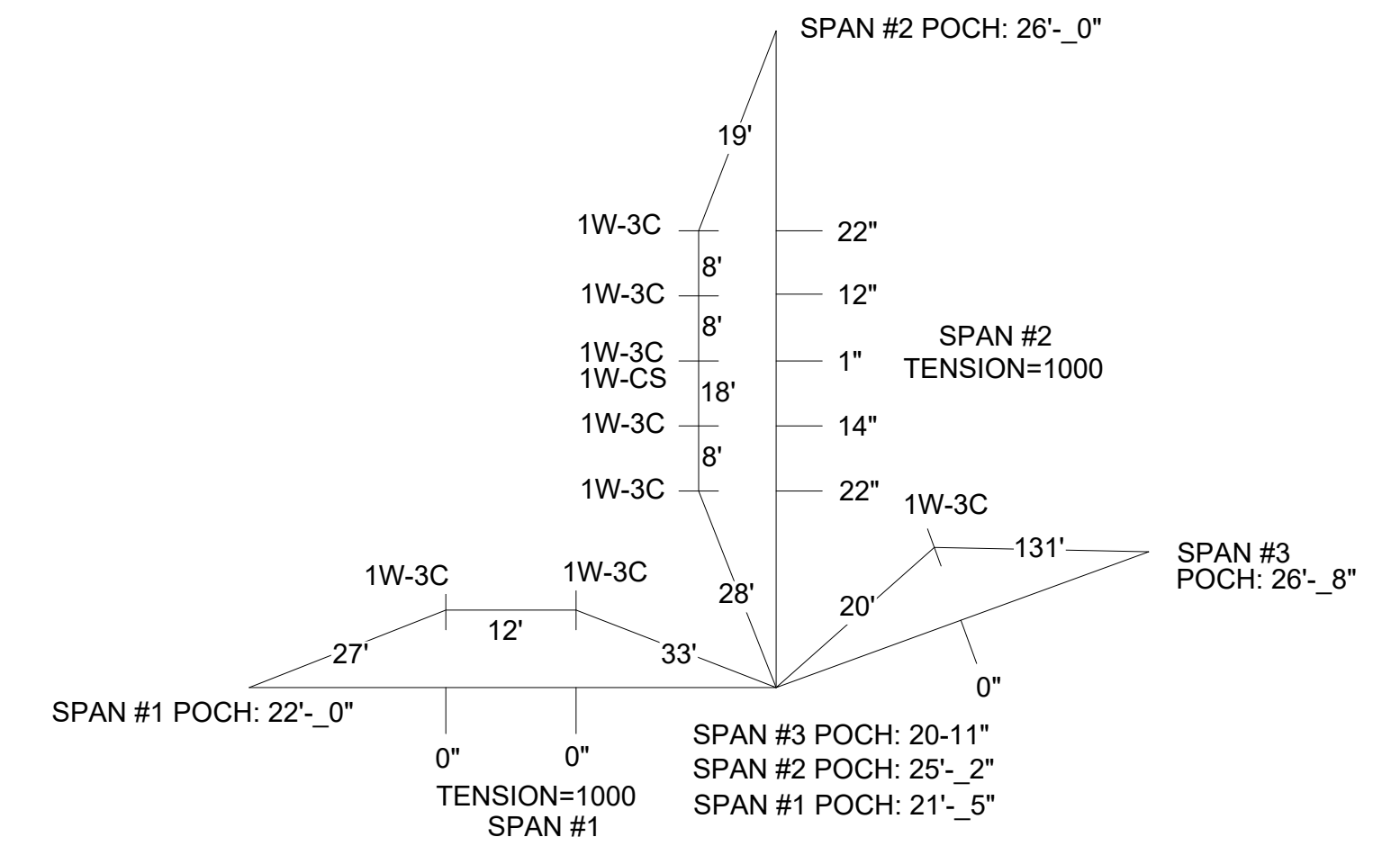
DLZ	
REV. NO.	DESCRIPTION
DATE	DR. BY
CH. BY	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER ED AT E. MED. CENTER RD STAGE 2			
SCALE	1"=20'	INCH	1
DRAWING NO.	2022-008-MOT38		
SHEET NO.	42 OF 153		

**CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE**

1. TRAFFIC SIGNAL CABLES ARE 5/C#16 PJ.
2. 24" X 30" L.E.D. CASE SIGNS ARE 4/C#16 PJ.
3. PEDESTRIAN SIGNALS CABLES ARE 7/C#16 PJ.
4. PUSHBUTTON CABLES ARE 2/C#16 SHIELDED PJ.

**SPAN CALCULATIONS
NOT TO SCALE**



STAGE 2 REMOVAL CABLE DIAGRAM

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS
AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN.
CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE
ORDERING ANY MATERIAL OR MAKING ANY CHANGES

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

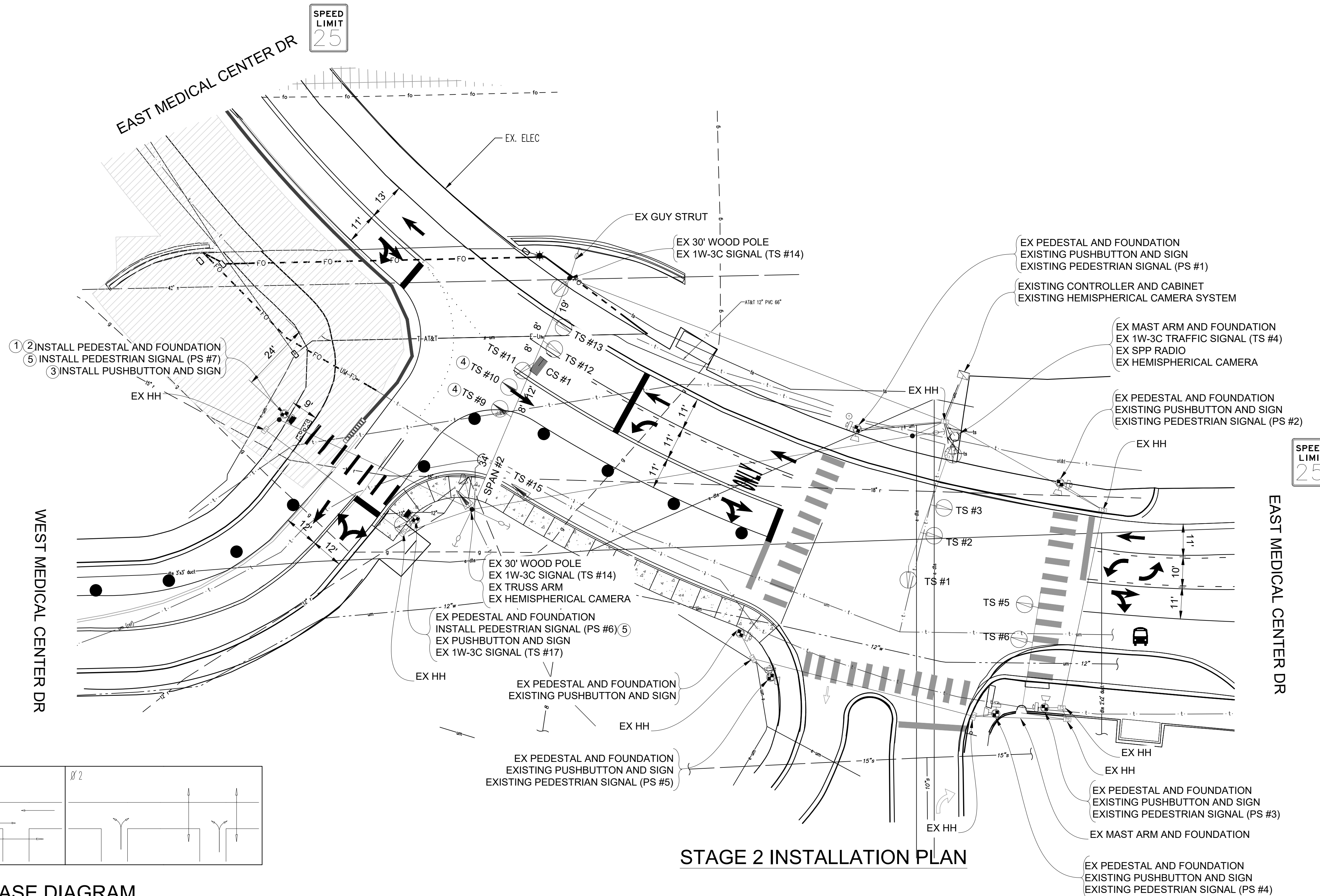
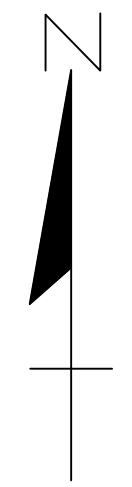
**E. MEDICAL CENTER DRIVE
TRAFFIC SIGNAL PLANS
FULLER ED AT E. MED. CENTER RD
STAGE 2**

SIGNALS	
OPENINGS:	55
CYCLIC WATTS:	733
STEADY WATTS:	45

SCALE	0 INCH 1
DRAWING NO.	2021-008-MOT39
SHEET NO.	43 OF 153

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

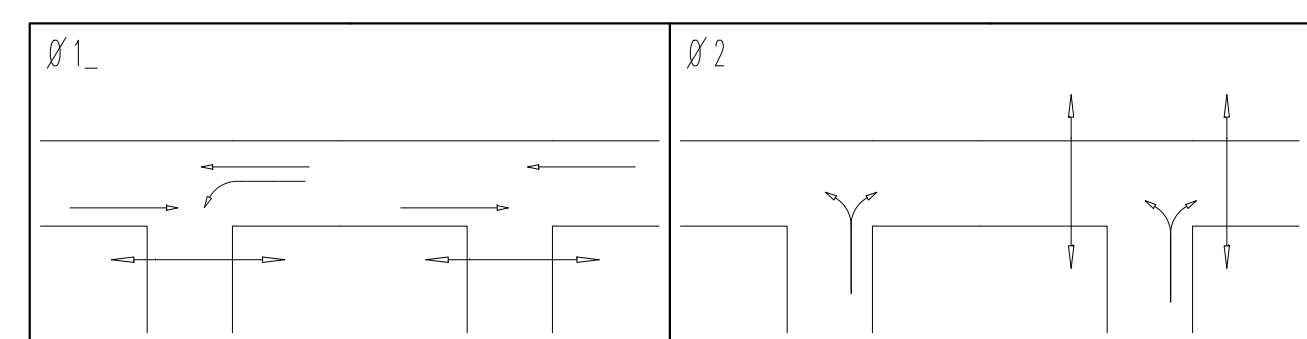
APPROVED BY:



- 1 INSTALL PEDESTAL AND FOUNDATION
- 2 INSTALL PEDESTRIAN SIGNAL (PS #7)
- 3 INSTALL PUSHBUTTON AND SIGN

SPEED LIMIT 25

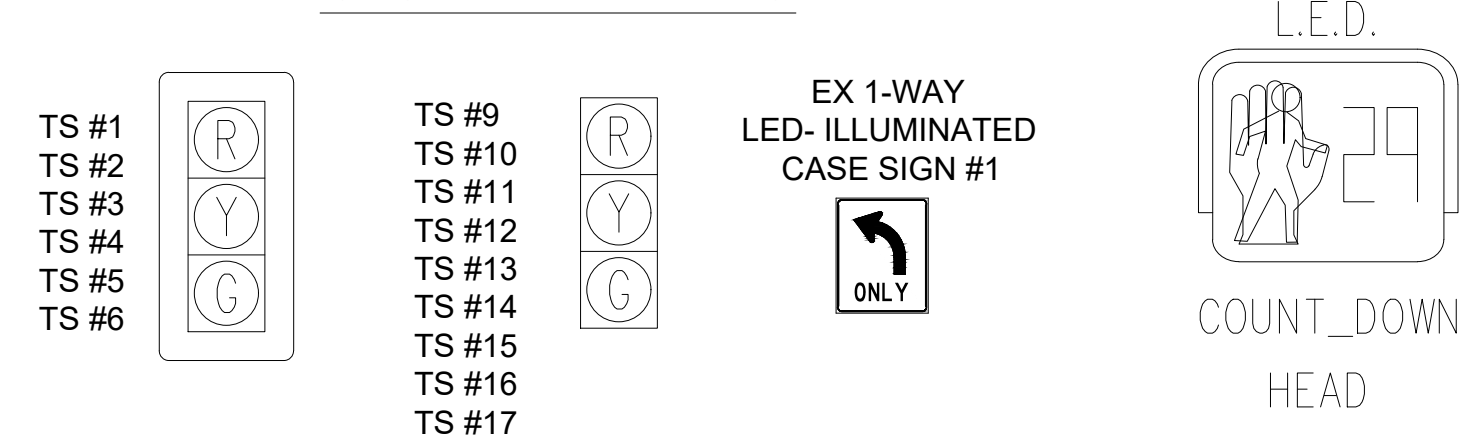
SPEED LIMIT 25



PHASE DIAGRAM

STAGE 2 INSTALLATION PLAN

SIGNAL HEADS



LIST OF MATERIAL

NO.	ITEM	QUANTITIES
1	Pedestal, Alum, Salv	1 Ea
2	Pedestal, Fdn	1 Ea
3	Pushbutton and Sign, Salv	1 Ea
4	TS Head, Adj	2 Ea
5	TS Head, Temp	2 Ea
	Conduit, DB, 1, 1 1/2 inch	10 Ft

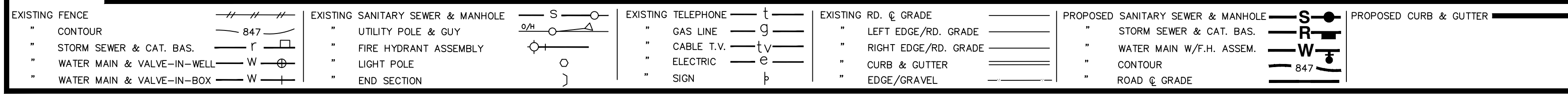
CONTRACTOR TO UTILIZE WORK ZONES AND LANE CLOSURES FOR INSTALLATION OF TRAFFIC SIGNALS PRIOR TO STAGE 2
 TIME OF REMOVAL OR ADJUSTMENT OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER

NOTE:
 PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	
OPENINGS:	49
CYCLIC WATTS:	647
STEADY WATTS:	45

3 WORKING DAYS BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
 FULLER ED AT E. MED. CENTER RD
 STAGE 2**

SCALE	1"=20'
DRAWING NO.	2021-008-MOT40
SHEET NO.	44 OF 153

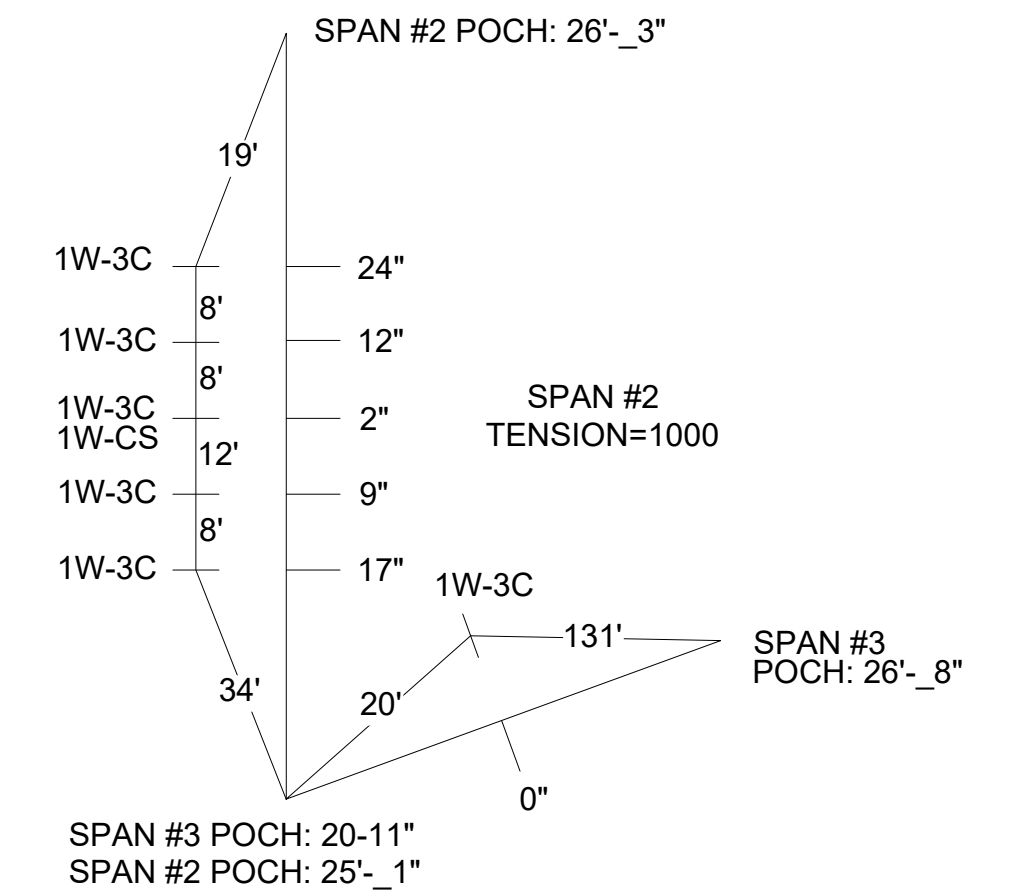
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
ORIGINAL ISSUE		10/12/22	INB	LCM

APPROVED BY: _____

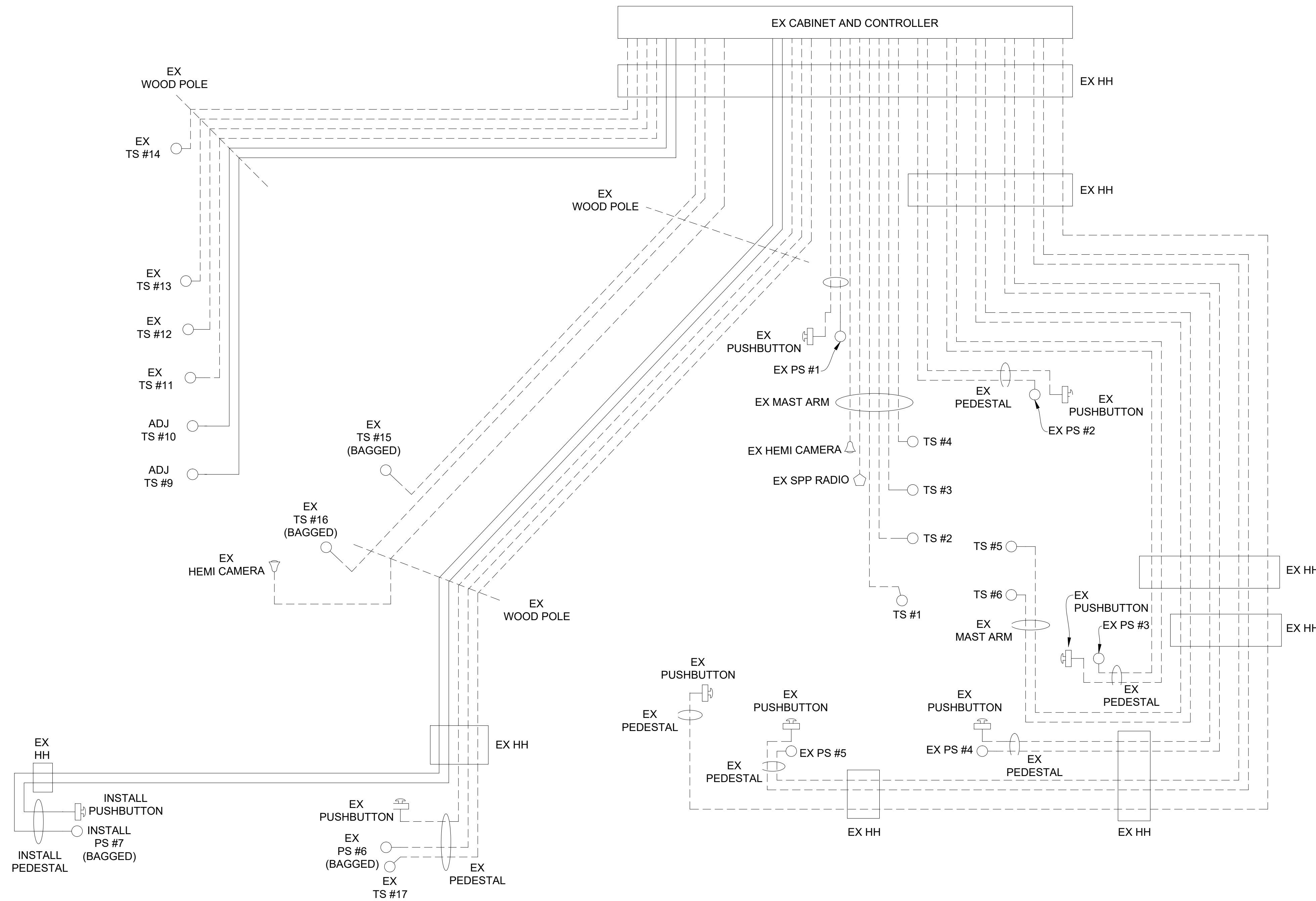
**CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE**

1. TRAFFIC SIGNAL CABLES ARE 5/C#16 PJ.
2. 24" X 30" L.E.D. CASE SIGNS ARE 4/C#16 PJ.
3. PEDESTRIAN SIGNALS CABLES ARE 7/C#16 PJ.
4. PUSHBUTTON CABLES ARE 2/C#16 SHIELDED PJ.

**SPAN CALCULATIONS
NOT TO SCALE**



SHOWN STEMS LENGTH ARE SUGGESTED ONLY



STAGE 3 CABLE DIAGRAM

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	
OPENINGS:	49
CYCLIC WATTS:	647
STEADY WATTS:	45

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

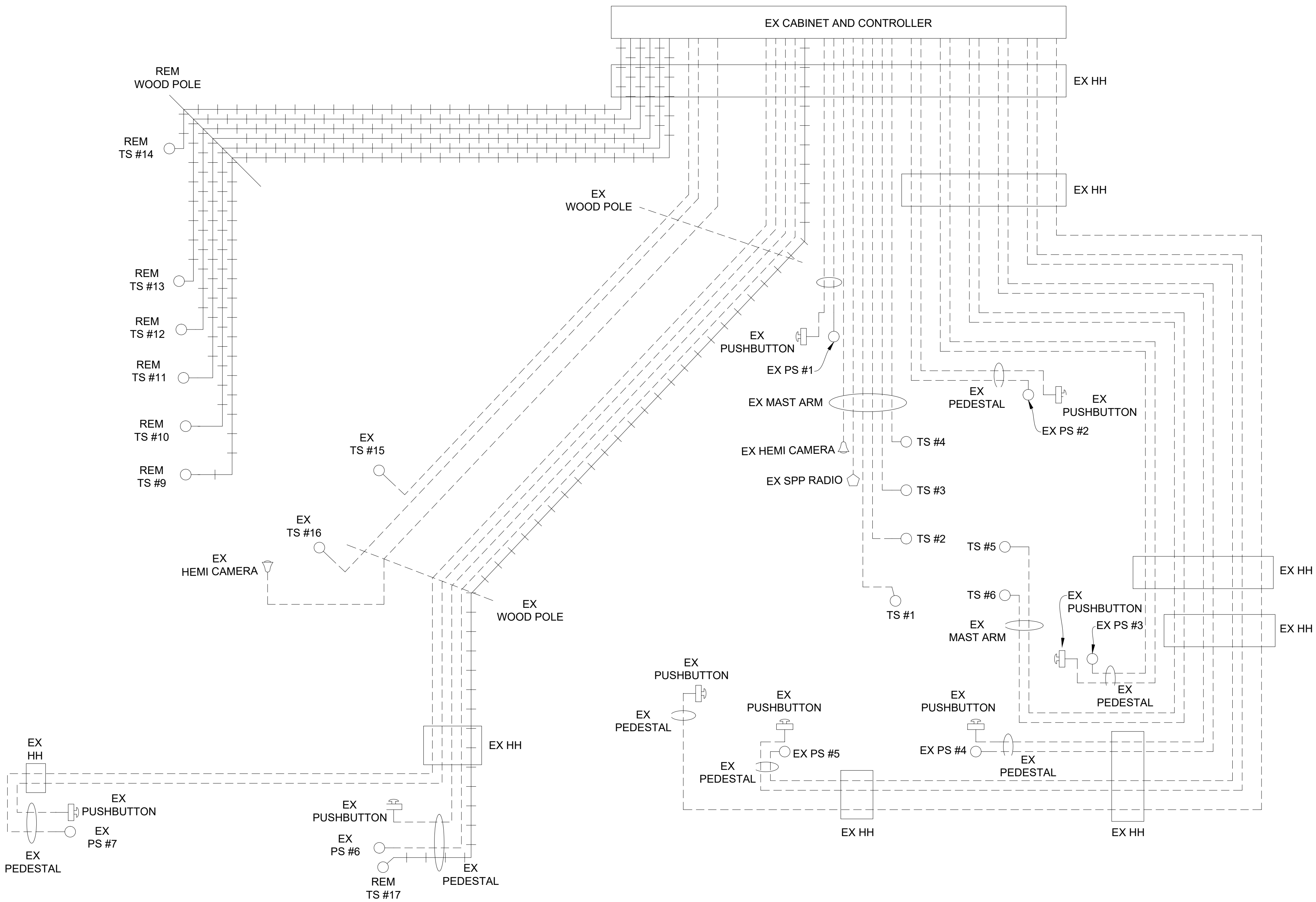
**E. MEDICAL CENTER DRIVE
TRAFFIC SIGNAL PLANS
FULLER ED AT E. MED. CENTER RD
STAGE 3**

SCALE	0	1
NTS	INCH	
DRAWING NO.	2021-008-MOT41	
SHEET NO.	45	OF 153

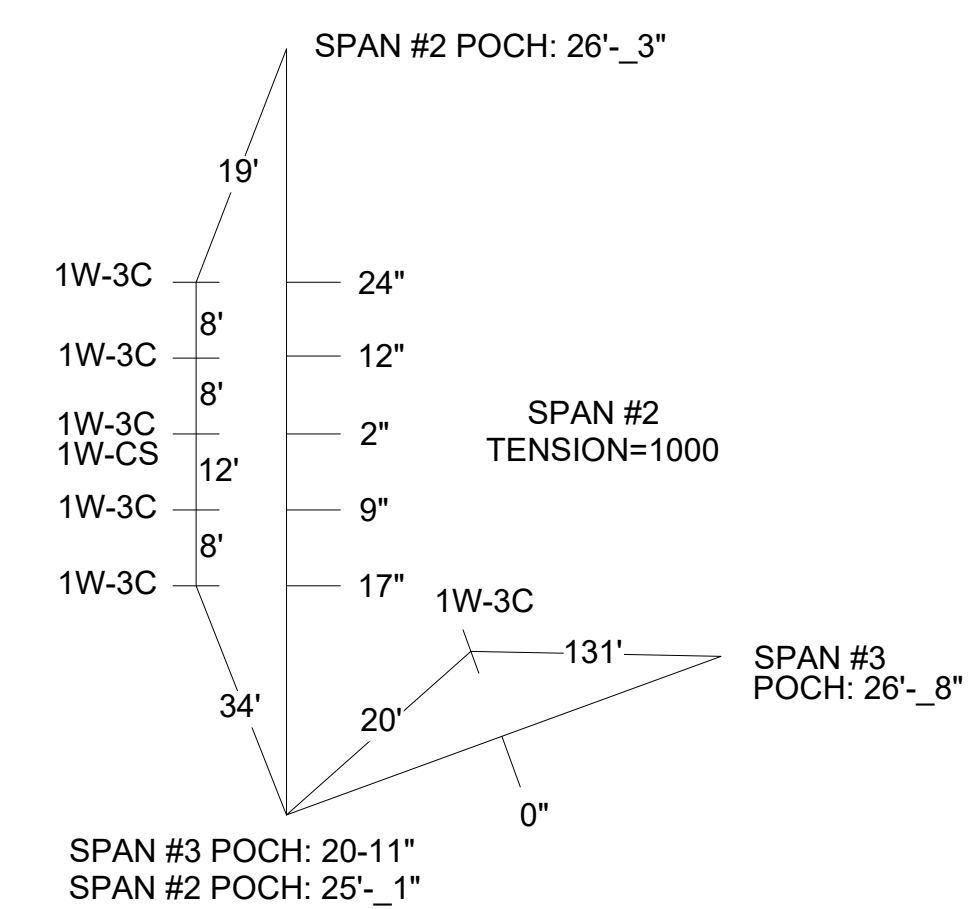
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

**CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE**

1. TRAFFIC SIGNAL CABLES ARE 5/C#16 PJ.
2. 24" X 30" L.E.D. CASE SIGNS ARE 4/C#16 PJ.
3. PEDESTRIAN SIGNALS CABLES ARE 7/C#16 PJ.
4. PUSHBUTTON CABLES ARE 2/C#16 SHIELDED PJ.



**SPAN CALCULATIONS
NOT TO SCALE**



SHOWN STEMS LENGTH ARE SUGGESTED ONLY

STAGE 3 REMOVAL CABLE DIAGRAM

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	49
OPENINGS:	647
CYCLIC WATTS:	45
STEADY WATTS:	45

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



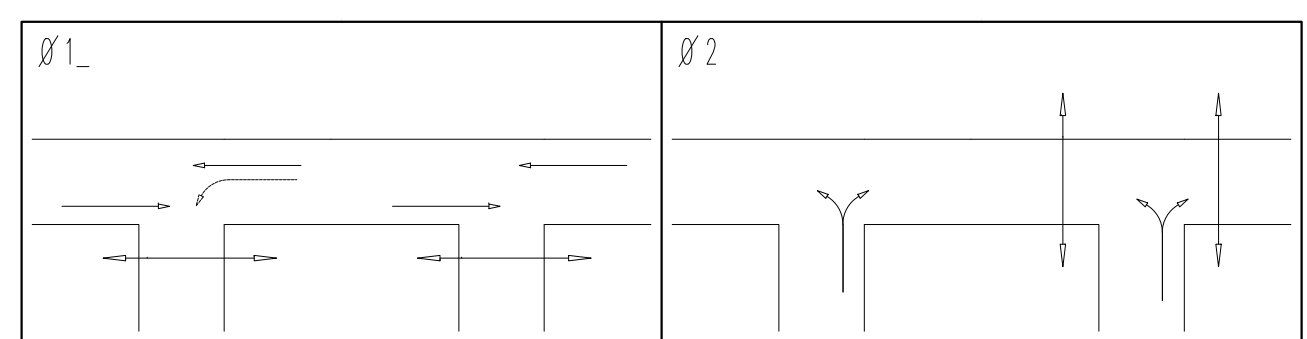
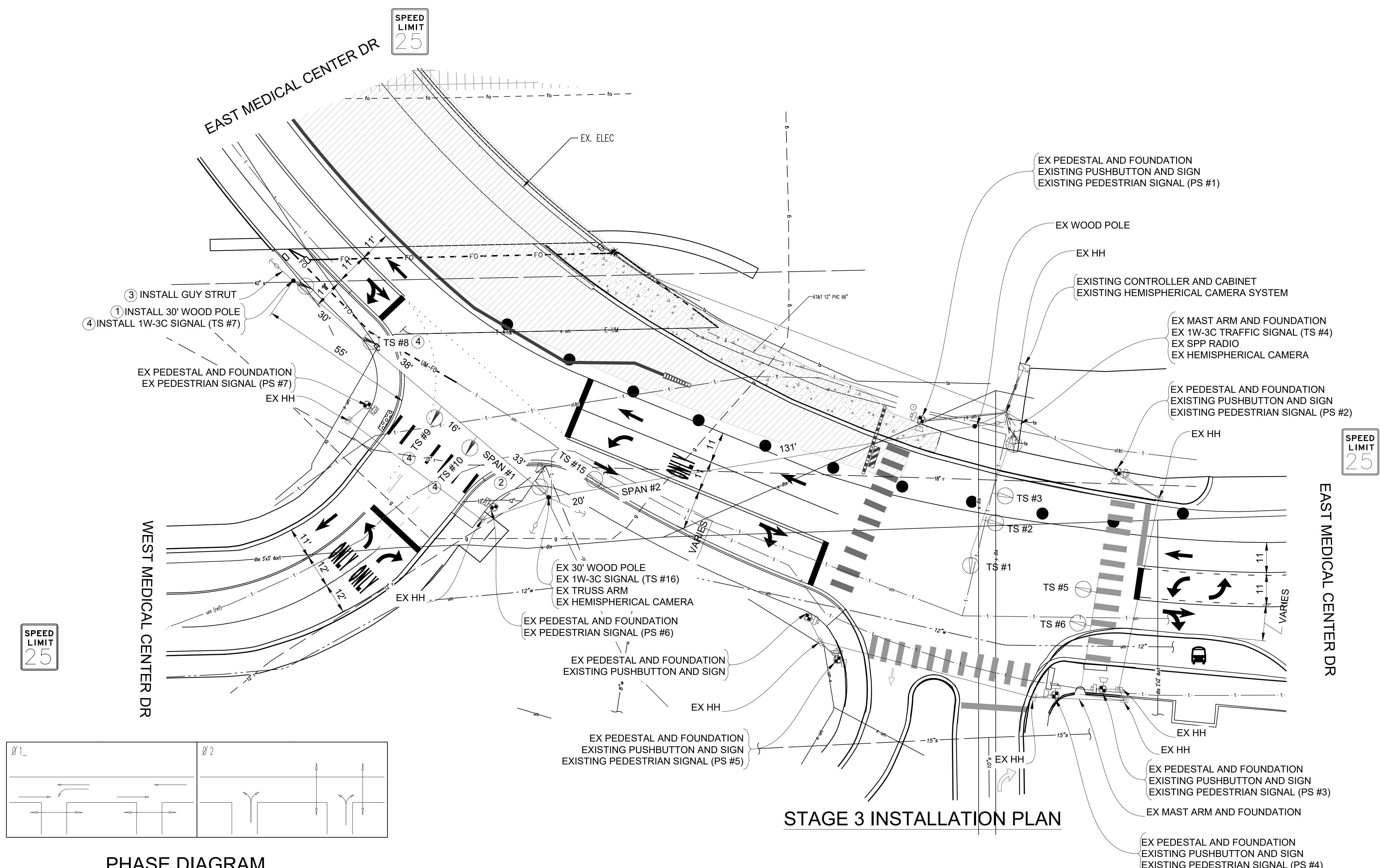
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
TRAFFIC SIGNAL PLANS
FULLER ED AT E. MED. CENTER RD
STAGE 3**

SCALE	0 INCH 1
DRAWING NO.	2021-008-MOT43
SHEET NO.	47 OF 153

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

APPROVED BY:



PHASE DIAGRAM

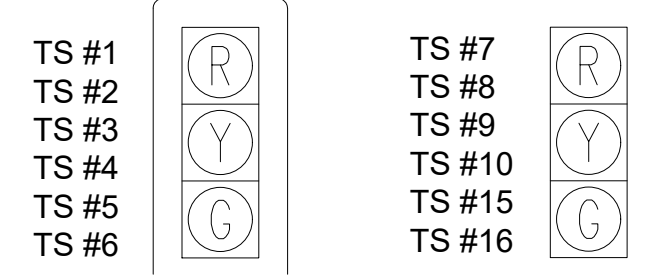
STAGE 3 INSTALLATION PLAN

LIST OF MATERIAL		
NO.	ITEM	QUANTITIES
①	Wood Pole, C14, 30 foot	1 Ea.
②	Span Wire	1 Ea.
③	Strut Guy	1 Ea.
④	TS Head, Temp	4 Ea.

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS
AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN.
CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE
ORDERING ANY MATERIAL OR MAKING ANY CHANGES

_ SIGNALS _	
OPENINGS:	49
CYCLIC WATTS:	647
STEADY WATTS:	45

SIGNAL HEADS



3 WORKING DAYS!
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

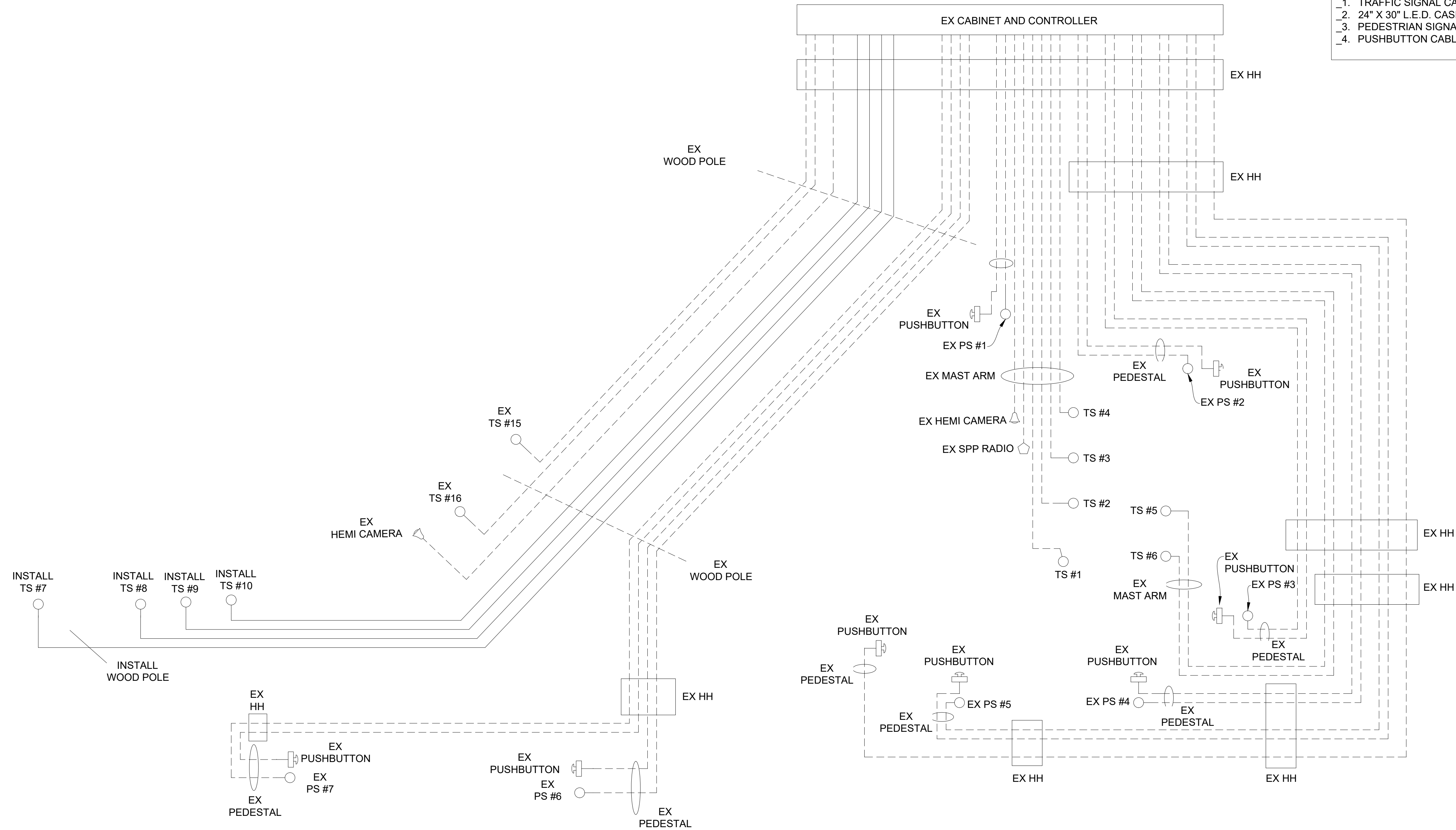
CONTRACTOR TO UTILIZE WORK ZONES
AND MOT TYPICAL 163-INT-LD-OUT
FOR INSTALLATION OF TRAFFIC
SIGNAL S PRIOR TO STAGE 3

DLZ	
REV. NO.	DESCRIPTION
DATE	DR. BY
CH. BY	

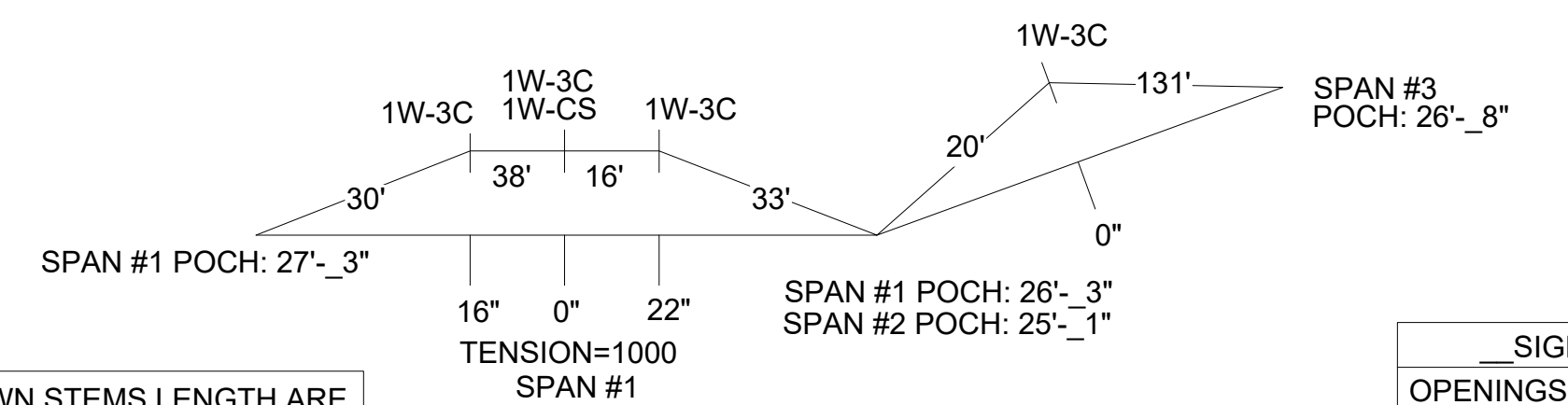
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL PLANS FULLER ED AT E. MED. CENTER RD STAGE 3			
SCALE 1"=20'	INCH	DRAWING NO. 2022-008-MOT44	
APPROVED BY:		SHEET NO. 48 OF 153	

**CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE**

- _1. TRAFFIC SIGNAL CABLES ARE 5/C#16 P.J.
- _2. 24" X 30" L.E.D. CASE SIGNS ARE 4/C#16 P.J.
- _3. PEDESTRIAN SIGNALS CABLES ARE 7/C#16 P.J.
- _4. PUSHBUTTON CABLES ARE 2/C#16 SHIELDED P.J.



SPAN CALCULATIONS
NOT TO SCALE



SHOWN STEMS LENGTH ARE
SUGGESTED ONLY

STAGE 3 INSTALLATION CABLE DIAGRAM

NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS
AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN.
CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE
ORDERING ANY MATERIAL OR MAKING ANY CHANGES

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



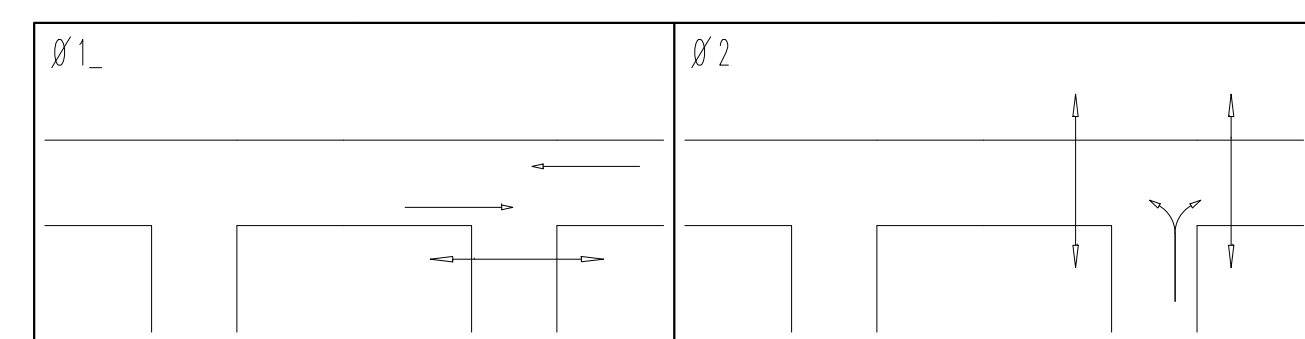
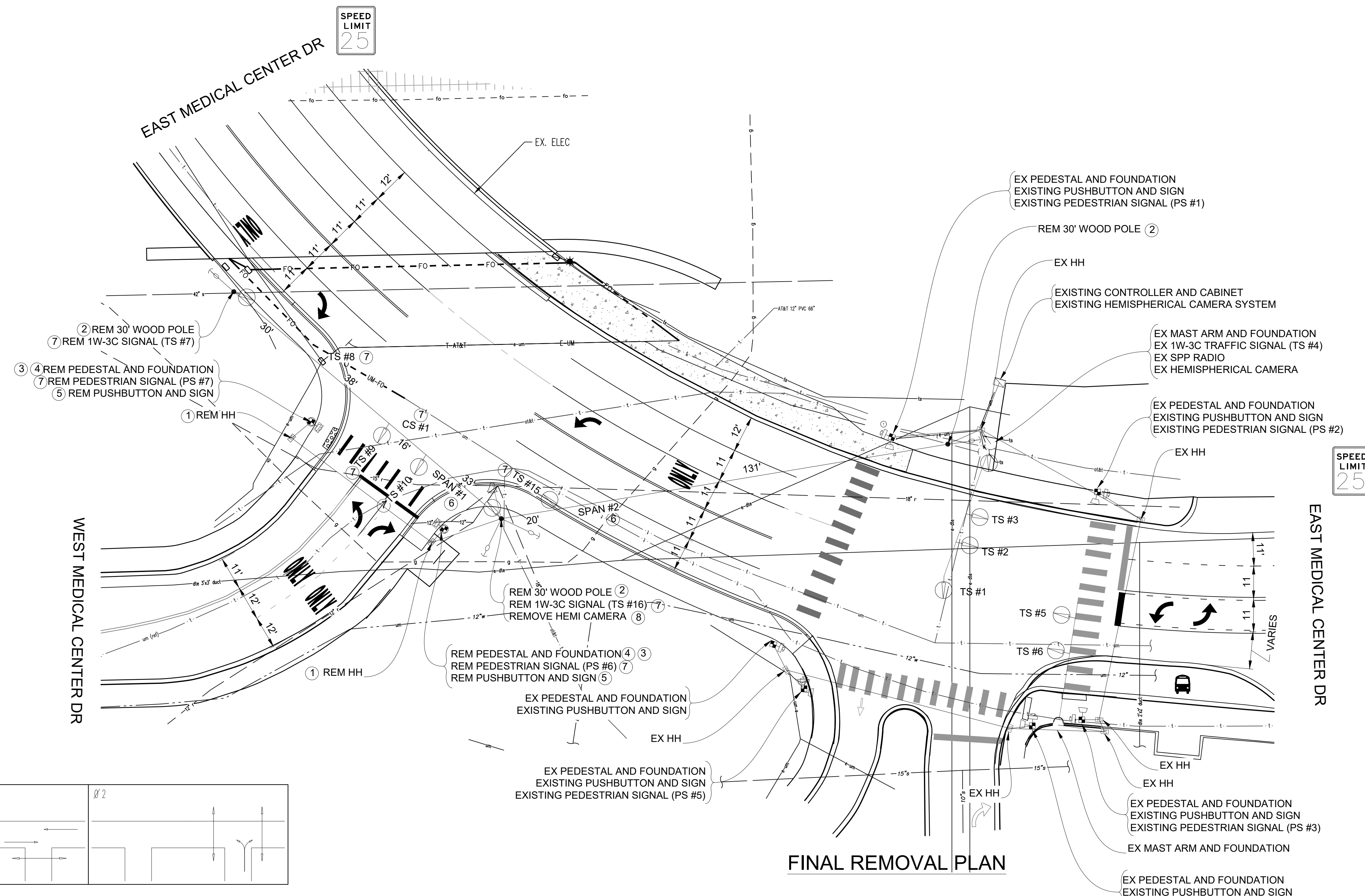
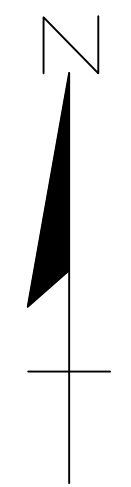
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
TRAFFIC SIGNAL PLANS
FULLER ED AT E. MED. CENTER RD
STAGE 3**

SCALE	0 INCH 1
DRAWING NO.	2021-008-MOT45
SHEET NO.	49 OF 153

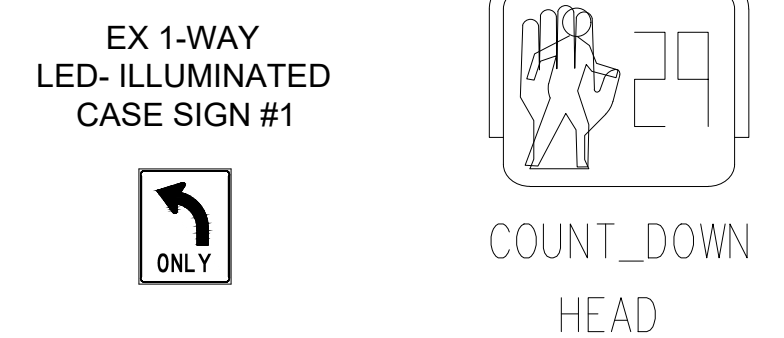
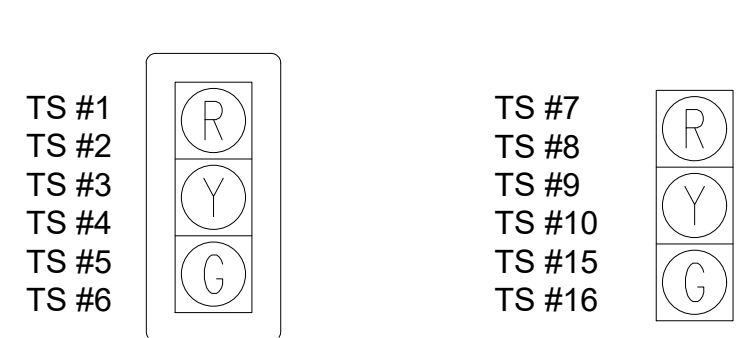
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

APPROVED BY: _____



PHASE DIAGRAM

SIGNAL HEADS



LIST OF MATERIAL		
NO.	ITEM	QUANTITIES
①	HH, Rem	2 Ea
②	Wood Pole, Rem	3 Ea
③	Pedestal Fdn, Rem	2 Ea
④	Pedestal, Rem	2 Ea
⑤	Pushbutton, Rem	2 Ea
⑥	Span Wire, Rem	2 Ea
⑦	Rem Traffic Signal (Included in "TS Head, Temp")	9 Ea
⑧	Hemispherical Video Detection Camera, Rem	1 Ea
	Conduit, Rem	80 Ft

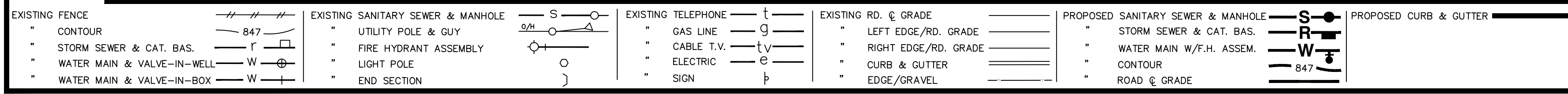
CONTRACTOR TO UTILIZE MOT TYPICAL 163-INT-LD-OUT FOR REMOVAL OF TRAFFIC SIGNALS AFTER COMPLETION OF STAGE 3
 TIME OF REMOVAL OR ADJUSTMENT OF TRAFFIC SIGNALS TO BE AS DIRECTED BY THE ENGINEER

NOTE:
 PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN. CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE ORDERING ANY MATERIAL OR MAKING ANY CHANGES

SIGNALS	
OPENINGS:	49
CYCLIC WATTS:	647
STEADY WATTS:	45

3 WORKING DAYS
BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND



DLZ

SEE ABOVE				
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MED CENTER TRAFFIC SIGNAL PLANS FULLER RD. AT E. MED. CENTER RD FINAL REMOVAL

SCALE 1"=20'

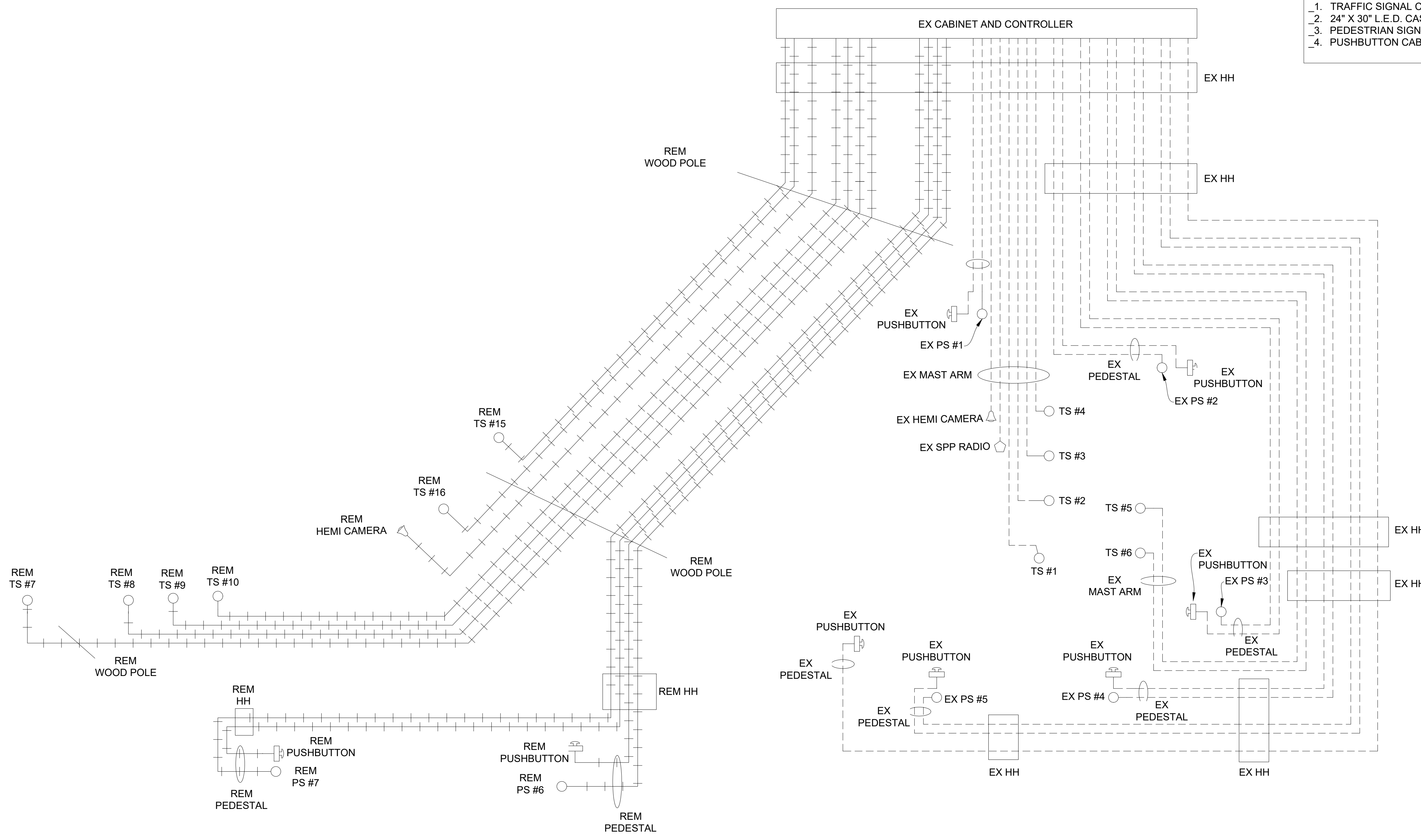
DRAWING NO. 2022-008-MOT46

SHEET NO. 50 OF 153

APPROVED BY: _____

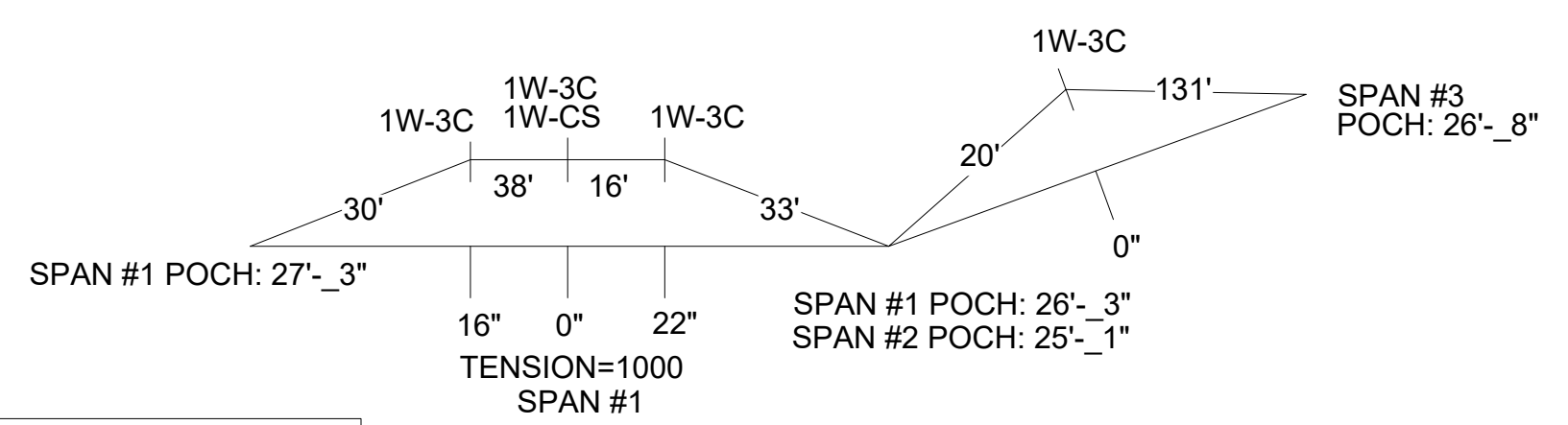
CABLES TO BE USED
UNLESS SPECIFIED OTHERWISE

1. TRAFFIC SIGNAL CABLES ARE 5/C#16 PJ.
2. 24" X 30" L.E.D. CASE SIGNS ARE 4/C#16 PJ.
3. PEDESTRIAN SIGNALS CABLES ARE 7/C#16 PJ.
4. PUSHBUTTON CABLES ARE 2/C#16 SHIELDED PJ.



FINAL REMOVAL CABLE DIAGRAM

SPAN CALCULATIONS
NOT TO SCALE



SHOWN STEMS LENGTH ARE
SUGGESTED ONLY

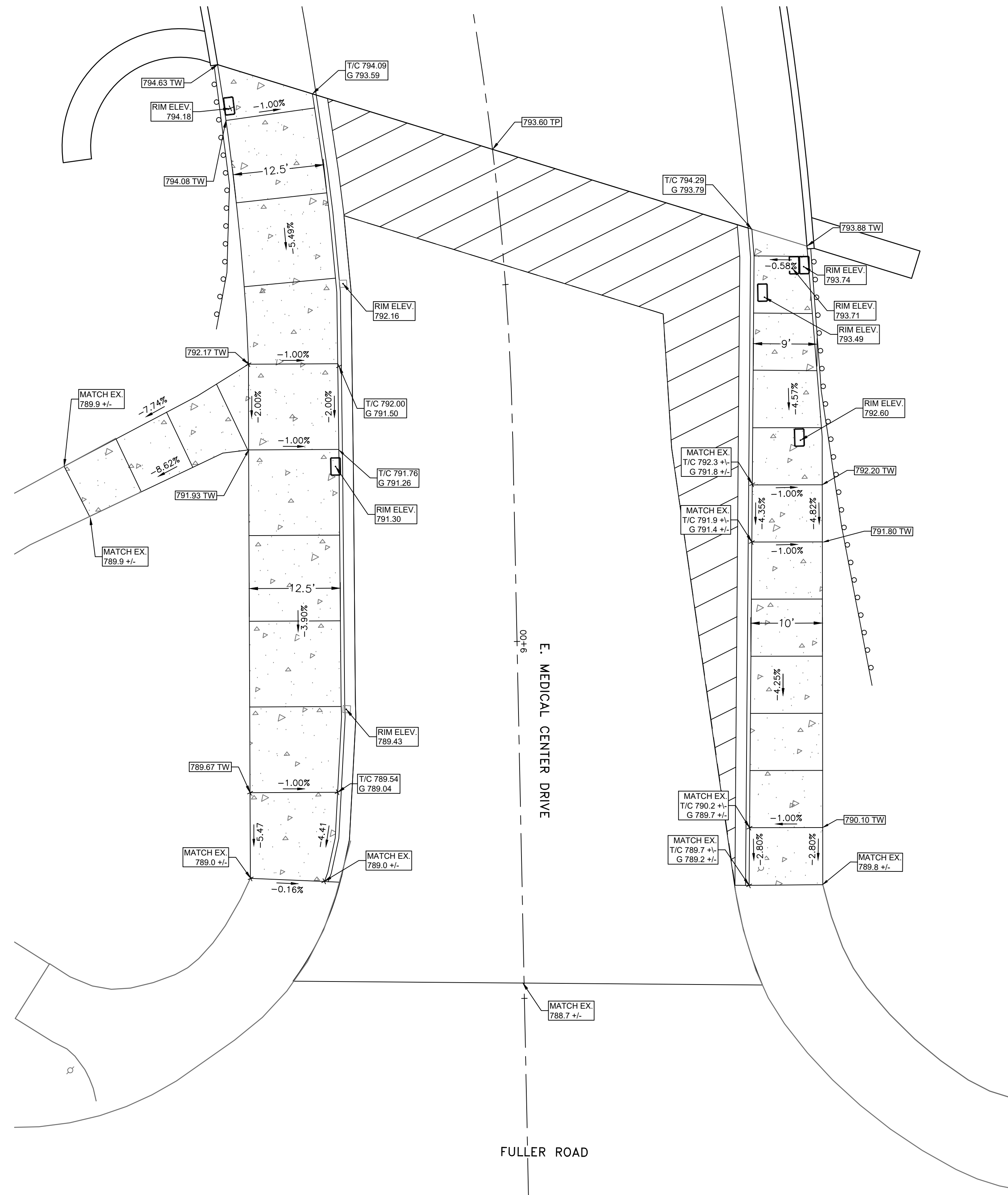
NOTE:
PLANS HAVE BEEN PREPARED WITHOUT THE AIDE OF RECORD DRAWINGS
AND ARE SOLEY BASED ON FIELD OBSERVATIONS. CONDUIT SIZE IS UNKNOWN.
CONTRACTOR TO VERIFY ANY CONDUIT AND CABLE ROUTING BEFORE
ORDERING ANY MATERIAL OR MAKING ANY CHANGES

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MED CENTER TRAFFIC SIGNAL PLANS FULLER RD AT E. MED. CENTER RD FINAL REMOVAL	
SCALE NTS	INCH 0 1
DRAWING NO. 2021-008-MOT47	
SHEET NO. 51 OF 153	



FULLER ROAD & E. MEDICAL CENTER DRIVE

SCALE: 1"=10'

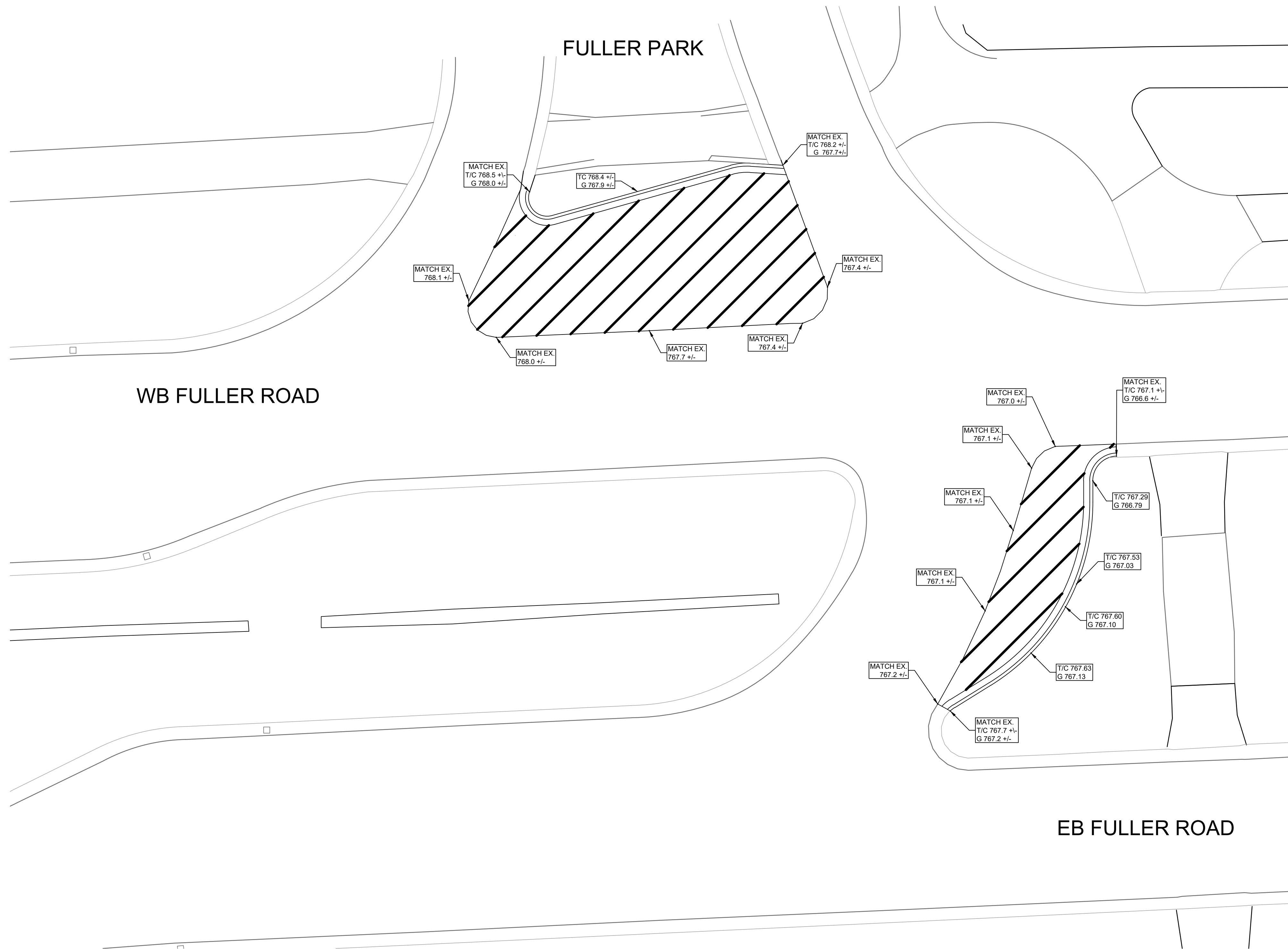
3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. @ GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- CONTOUR	- UTILITY POLE & GUY	- GAS LINE	- LEFT EDGE/RD. GRADE	- STORM SEWER & CAT. BAS.	- SEE ABOVE
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	- WATER MAIN W/F.H. ASSEM.	- BENCH MARK
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	- CONTOUR	- SURVEY BOOK
- WATER MAIN & VALVE-IN-BOX	- END SECTION	- SIGN	- EDGE/GRAVEL	- ROAD @ GRADE	- REV. NO.

DLZ				

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR				
E. MEDICAL CENTER DRIVE DETAIL GRADES				
SCALE	0	INCH	1	
1"=10'				
DRAWING NO.				
2021-008-GD2				
SHEET NO.	53	OF	139	
APPROVED BY				
	LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025			



FULLER ROAD CROSS OVER

SCALE: 1"=10'

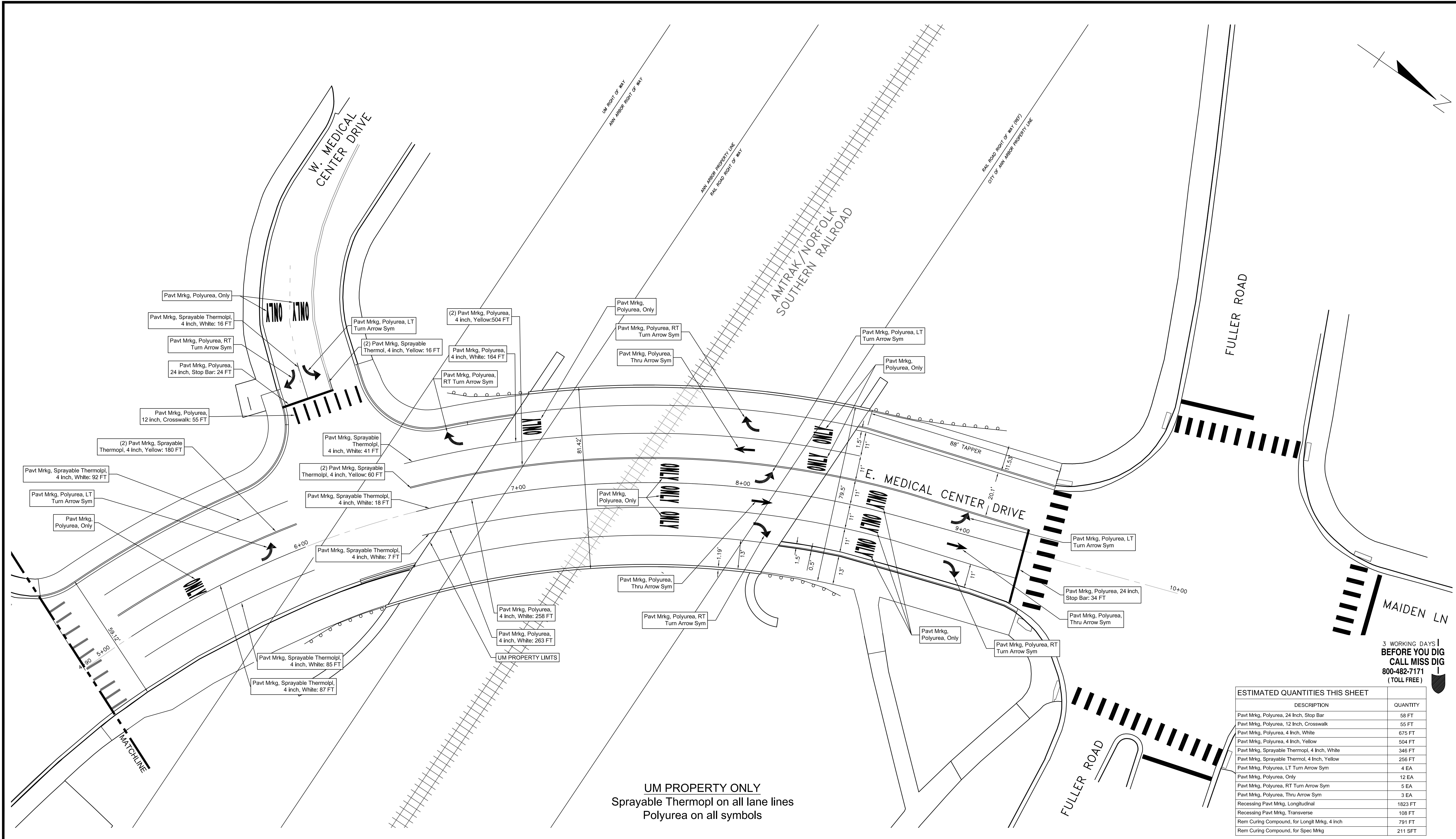
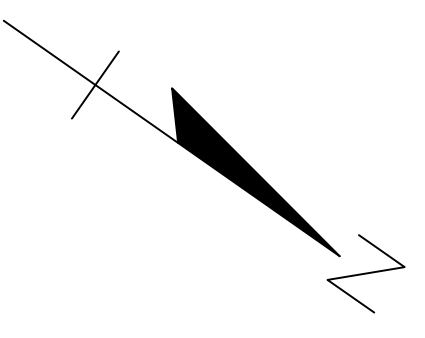
3 WORKING DAYS!
BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. @ GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- CONTOUR	- UTILITY POLE & GUY	- GAS LINE	- LEFT EDGE/RD. GRADE	- STORM SEWER & CAT. BAS.	- SEE ABOVE
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	- WATER MAIN W/F.H. ASSEM.	- BENCH MARK
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	- CONTOUR	- SURVEY BOOK
- WATER MAIN & VALVE-IN-BOX	- END SECTION	- SIGN	- EDGE/GRAVEL	- ROAD @ GRADE	- REV. NO.

DLZ				

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR				
E. MEDICAL CENTER DRIVE DETAIL GRADES				
SCALE	0	INCH	1	
1"=10'				
DRAWING NO.				
2021-008-GD3				
SHEET NO.	54	OF	139	
APPROVED BY				



UM PROPERTY ONLY
 Sprayable Thermopl on all lane lines
 Polyurea on all symbols

3 WORKING DAYS
BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Pavt Mrkg, Polyurea, 24 Inch, Stop Bar	58 FT
Pavt Mrkg, Polyurea, 12 Inch, Crosswalk	55 FT
Pavt Mrkg, Polyurea, 4 Inch, White	675 FT
Pavt Mrkg, Polyurea, 4 Inch, Yellow	504 FT
Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	346 FT
Pavt Mrkg, Sprayable Thermopl, 4 Inch, Yellow	256 FT
Pavt Mrkg, Polyurea, LT Turn Arrow Sym	4 EA
Pavt Mrkg, Polyurea, Only	12 EA
Pavt Mrkg, Polyurea, RT Turn Arrow Sym	5 EA
Pavt Mrkg, Polyurea, Thru Arrow Sym	3 EA
Recessing Pavt Mrkg, Longitudinal	1823 FT
Recessing Pavt Mrkg, Transverse	108 FT
Rem Curing Compound, for Longt Mrkg, 4 inch	791 FT
Rem Curing Compound, for Spec Mrkg	211 SFT

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY

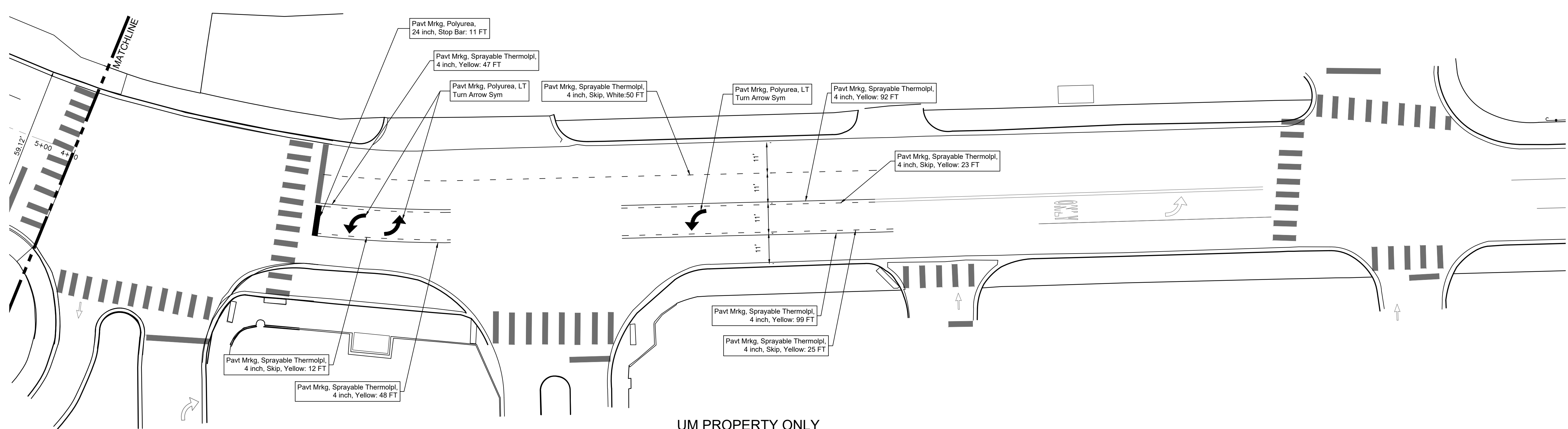
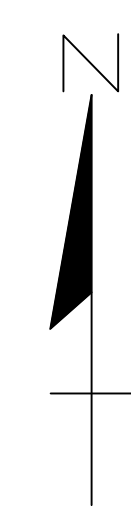
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
 PERMANENT PAVEMENT
 PAVEMENT MARKING PLAN**

SCALE: 1"=20'

DRAWING NO. **2021-008-PM1**

SHEET NO. **55** OF **153**



UM PROPERTY ONLY
 Sprayable Thermopl on all lane lines
 Polyurea on all symbols

3 WORKING DAYS
 BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171
 (TOLL FREE)

ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Pavt Mrkg, Polyurea, 24 Inch, Stop Bar	11 FT
Pavt Mrkg, Sprayable Thermopl, 4 Inch, White	50 FT
Pavt Mrkg, Sprayable Thermopl, 4 Inch, Yellow	346 FT
Pavt Mrkg, Polyurea, LT Turn Arrow Sym	3 EA
Recessing Pavt Mrkg, Longitudinal	396 FT
Recessing Pavt Mrkg, Transverse	11 FT

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. @ GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- CONTOUR	- UTILITY POLE & GUY	- GAS LINE	- LEFT EDGE/RD. GRADE	- STORM SEWER & CAT. BAS.	- SEE ABOVE
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	- WATER MAIN W/F.H. ASSEM.	- BENCH MARK
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	- CONTOUR	- SURVEY BOOK
- WATER MAIN & VALVE-IN-BOX	- END SECTION	- SIGN	- EDGE/GRAVEL	- ROAD @ GRADE	

DLZ

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

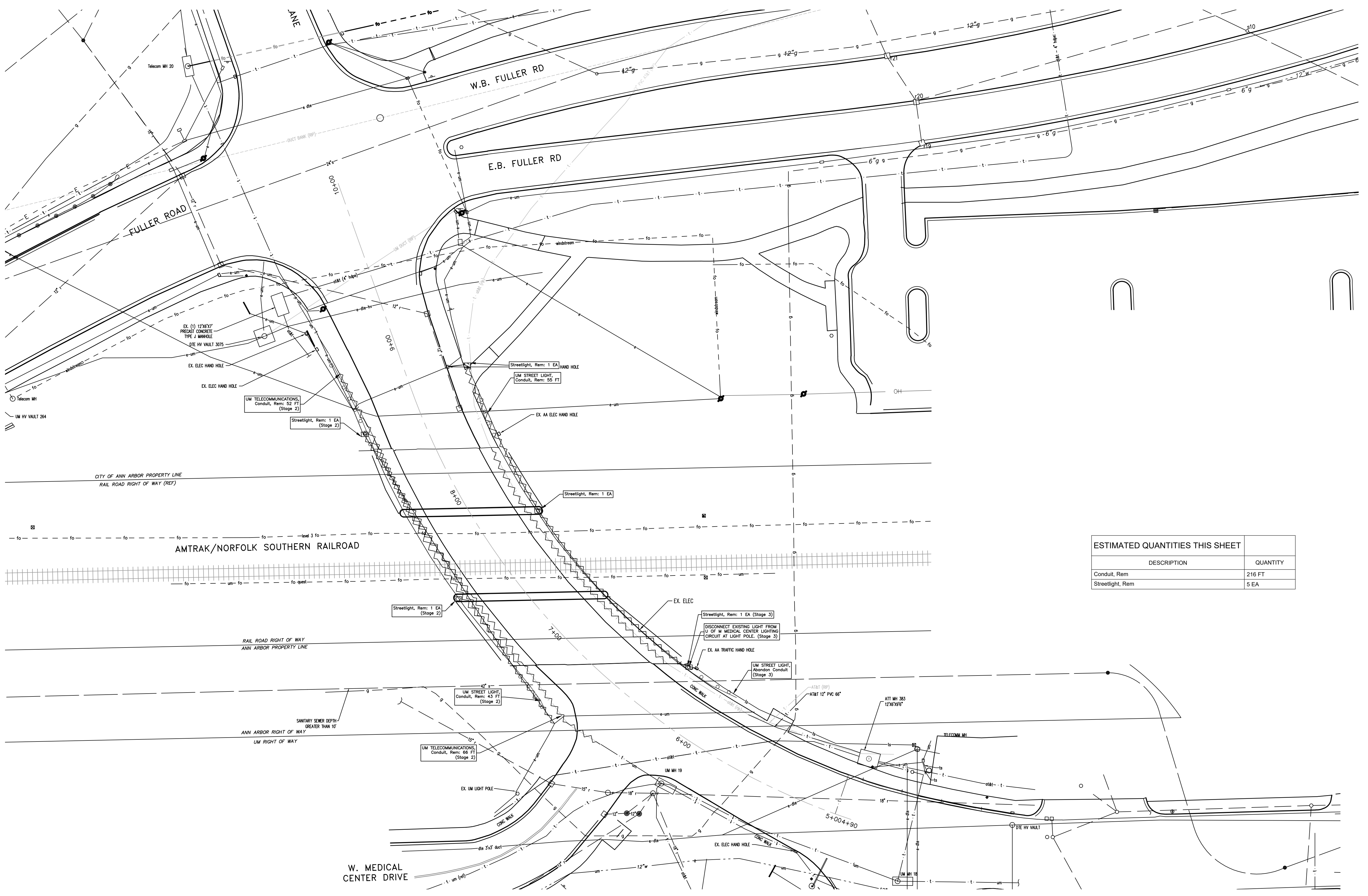
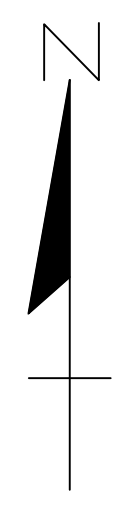
**E. MEDICAL CENTER DRIVE
 PERMANENT PAVEMENT
 PAVEMENT MARKING PLAN**

SCALE: 1"=20' INCH

DRAWING NO. **2021-008-PM2**

SHEET NO. 56 OF 139

APPROVED BY: LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Conduit, Rem	216 FT
Streetlight, Rem	5 EA

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	---|---|---|	EXISTING SANITARY SEWER & MANHOLE	S	EXISTING TELEPHONE	t	EXISTING RD. & GRADE	---	PROPOSED SANITARY SEWER & MANHOLE	S	PROPOSED CURB & GUTTER	---
CONTOUR	---|---|	UTILITY POLE & GUY	U/G	GAS LINE	g	LEFT EDGE/RD. GRADE	---	STORM SEWER & CAT. BAS.	S	REMOVE ITEM	---
STORM SEWER & CAT. BAS.	---|---|	FIRE HYDRANT ASSEMBLY	F	CABLE T.V.	t	RIGHT EDGE/RD. GRADE	---	WATER MAIN W/F.H. ASSEM.	W		
WATER MAIN & VALVE-IN-WELL	W	LIGHT POLE	L	ELECTRIC	e	CURB & GUTTER	---	CONTOUR	---		
WATER MAIN & VALVE-IN-BOX	W	END SECTION	]	SIGN	h	EDGE/GRAVEL	---	ROAD & GRADE	---		



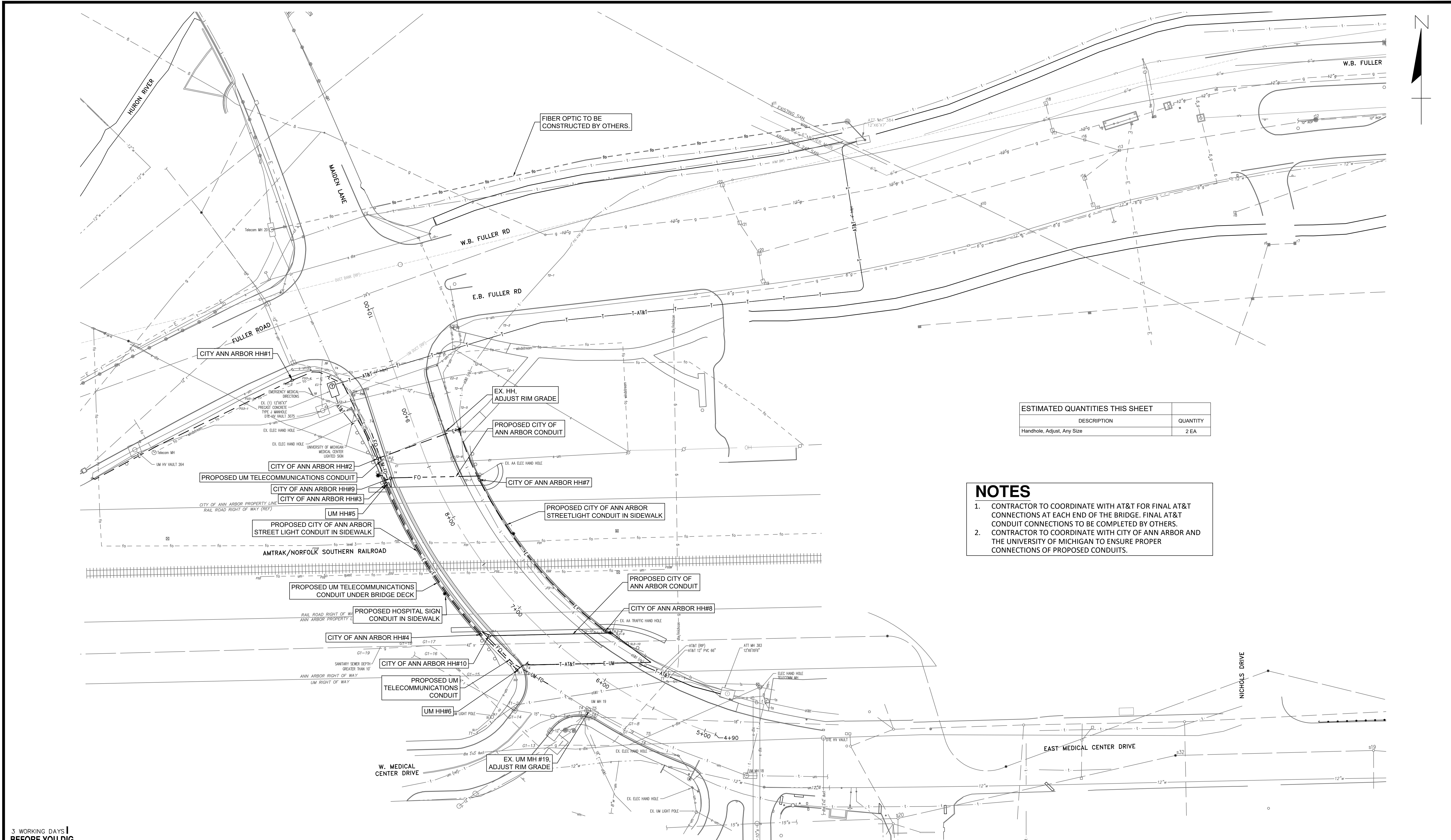
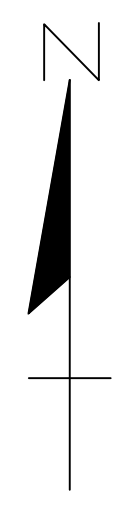
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
UTILITY REMOVAL PLAN**

SCALE	1"=30'
DRAWING NO.	2021-008-UT1
SHEET NO.	57 OF 153

SEE ABOVE				
BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE
			ORIGINAL ISSUE	10/12/22
			DR. BY	INB
			CH. BY	LCM

APPROVED BY: _____
LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



FIBER OPTIC TO BE
CONSTRUCTED BY OTHERS.

ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Handhole, Adjust, Any Size	2 EA

- NOTES**
1. CONTRACTOR TO COORDINATE WITH AT&T FOR FINAL AT&T CONNECTIONS AT EACH END OF THE BRIDGE. FINAL AT&T CONDUIT CONNECTIONS TO BE COMPLETED BY OTHERS.
 2. CONTRACTOR TO COORDINATE WITH CITY OF ANN ARBOR AND THE UNIVERSITY OF MICHIGAN TO ENSURE PROPER CONNECTIONS OF PROPOSED CONDUITS.

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	STREET LIGHT CONDUIT
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	TELECOM. CONDUIT
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	LIGHT POLE
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	HANDHOLE

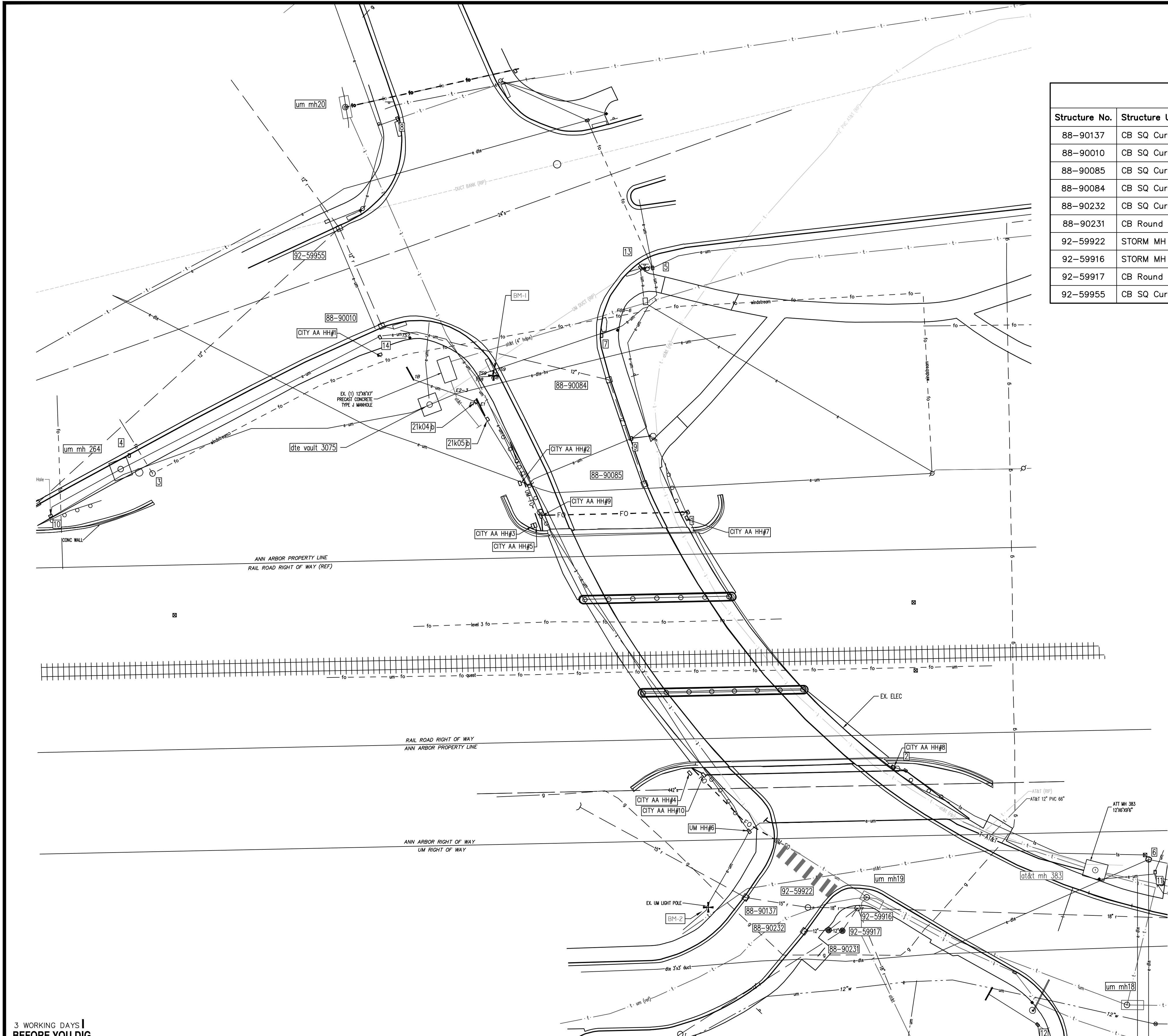


PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DRIVE
OVERALL UTILITY PLAN**

SCALE	1"=40'
DRAWING NO.	2021-008-UT2
SHEET NO.	58 OF 153

SEE ABOVE	BENCH MARK	SURVEY BOOK	REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
				ORIGINAL ISSUE	10/12/22	INB	LCM
APPROVED BY:							



STORM STRUCTURE						
Structure No.	Structure Use	Structure Size	Rim Elevation	Northing	Easting	Description
88-90137	CB SQ Curb	4' CB	804.06	286892.023	13295089.7900	301
88-90010	CB SQ Curb	3' CB	788.84	287201.663	13294892.6900	301
88-90085	CB SQ Curb	3' CB	791.90	287116.064	13295034.9700	301
88-90084	CB SQ Curb	3' CB	789.28	287172.451	13295015.7300	301
88-90232	CB SQ Curb	4' CB	804.21	286873.760	13295121.4300	301
88-90231	CB Round	2' CB	804.71	286874.376	13295134.7800	302
92-59922	STORM MH	4' CB	804.04	286886.665	13295123.5300	302
92-59916	STORM MH	5' CB	804.68	286886.312	13295150.4080	300
92-59917	CB Round	4' CB	805.56	286874.054	13295142.1600	302
92-59955	CB SQ Curb	4' CB	788.66	287254.656	13294869.7500	301

CATCH BASIN INVERTS	
Structure Number	Invert Elevations
92-59922	15" NW 790.04 18" SE 709.04
92-59916	18" E 789.48 18" SE 790.58 18" SW 789.58 12" W 789.88
88-90137	15" N 789.96 15" SE 789.96
88-90010	12" N 783.24 12" SE 783.34
88-90085	12" N 785.90
88-90084	12" NW 783.78 12" S 783.88
88-90232	12" SE 799.91
88-90231	- -
92-59917	- -
92-59955	12" S 782.36 12" W 782.66 15" N 774.66

UTILITY STRUCTURE						
Structure No.	Structure Use	Structure Size	Rim Elevation	Northing	Easting	Description
city ann arbor hh #2	PR. ELEC AA HH#2	17" x 30"	792.63	287116.297	13294967.5351	PR. ELEC AA HH#2
city ann arbor hh#10	PR. TELECOM AA HH#10	17" x 30"	802.26	286958.499	13295067.0269	PR. TELECOM AA HH#10
city ann arbor hh#8	PR. ELEC AA HH#8	17" x 30"	802.43	286962.749	13295169.8262	PR. ELEC AA HH#8
city ann arbor hh#7	PR. ELEC AA HH#7	17" x 30"	794.23	287097.240	13295058.0200	PR. ELEC AA HH#7
um hh#6	PR. ELEC UM HH#6	17" x 30"	803.31	286927.841	13295091.6267	PR. ELEC UM HH#6
um hh #5	PR. ELEC UM HH#5	17" x 30"	793.74	287093.700	13294975.7714	PR. ELEC UM HH#5
city ann arbor hh#4	PR. ELEC AA HH#4	17" x 30"	802.12	286959.348	13295059.5666	PR. ELEC AA HH#4
city ann arbor hh#3	PR. ELEC AA HH#3	17" x 30"	793.75	287093.269	13294974.8398	PR. ELEC AA HH#3
city ann arbor hh#9	PR. TELECOM AA HH#9	17" x 30"	793.52	287098.678	13294978.8558	PR. TELECOM AA HH#9
city ann arbor hh#1	PR. ELEC AA HH#1	17" x 30"	789.88	287186.079	13294891.5943	PR. ELEC AA HH#1
um mh20	Telecom MH 20	12' x 6'	788.71	287320.170	13294872.9900	160
at&t mh 383	at&t mh 383	12' x 6'	801.74	286906.869	13295279.2100	125
um mh 264	UM HV VAULT 264	12' x 6'	792.28	287124.100	13294751.2900	125
um mh18	TELECOM MH 18	12' x 6'	802.19	286833.846	13295296.3500	160
um mh19	TELECOMM MH 19	12' x 6'	804.45	286892.126	13295155.4100	160
dte vault 3075	UM HV VAULT 265	10' x 10'	789.69	287159.068	13294918.6700	125
1	EX. AA ELEC HAND HOLE	17" x 30"	794.70	287100.786	13295058.5572	127
2	EX. AA TRAFFIC HAND HOLE	17" x 30"	803.06	286960.816	13295176.3530	127
3	Telecom MH	2' MH	792.26	287121.696	13294768.5300	160
4	Elec Hand Hole	17" x 30"	792.00	287131.508	13294755.9200	127
5	Elec Hand Hole	17" x 30"	788.11	287233.067	13295039.4000	127
6	TELECOMM MH	2' MH	802.38	286912.694	13295308.0300	160
7	Elec Hand Hole	17" x 30"	789.02	287196.412	13295011.8200	127
8	Elec Hand Hole	17" x 30"	788.00	287313.913	13294901.1500	127
9	Elec Hand Hole	17" x 30"	791.11	287140.692	13295027.9100	127
10	Elec Hand Hole	17" x 30"	794.30	287098.775	13294713.3500	127
11	Elec Hand Hole	17" x 30"	802.23	286905.796	13295311.5800	127
12	Elec Hand Hole	17" x 30"	803.81	286823.120	13295247.9400	127
13	Elec Hand Hole	17" x 30"	788.22	287233.332	13295032.7900	127
14	HH #127	17" x 30"	789.38	287195.605	13294891.6700	127
21k05b	ELEC HAND HOLE	17" x 30"	791.25	287151.159	13294950.0421	127
21k04b	ELEC HAND HOLE	17" x 30"	791.65	287160.527	13294943.6400	127

* [H] SYMBOL LABELS STRUCTURES WITHOUT AS-BUILT IDENTIFICATION NUMBERS

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(TOLL FREE)

LEGEND

EXISTING FENCE - - - - - - CONTOUR - STORM SEWER & CAT. BAS. - WATER MAIN & VALVE-IN-WELL - WATER MAIN & VALVE-IN-BOX	EXISTING SANITARY SEWER & MANHOLE - S - - UTILITY POLE & GUY - FIRE HYDRANT ASSEMBLY - LIGHT POLE - END SECTION	EXISTING TELEPHONE - t - - GAS LINE - CABLE T.V. - ELECTRIC - SIGN	EXISTING RD. & GRADE - - - - - - LEFT EDGE/RD. GRADE - RIGHT EDGE/RD. GRADE - CURB & GUTTER - EDGE/GRAVEL	PROPOSED SANITARY SEWER & MANHOLE - S - - STORM SEWER & CAT. BAS. - WATER MAIN W/F.H. ASSEM. - CONTOUR - ROAD & GRADE	PROPOSED CURB & GUTTER -
--	--	---	--	--	--

SEE ABOVE		BENCH MARK		SURVEY BOOK		REV. NO.		DESCRIPTION		DATE		DR. BY		CH. BY	
								ORIGINAL ISSUE		10/12/22		INB		LCM	
														APPROVED BY	

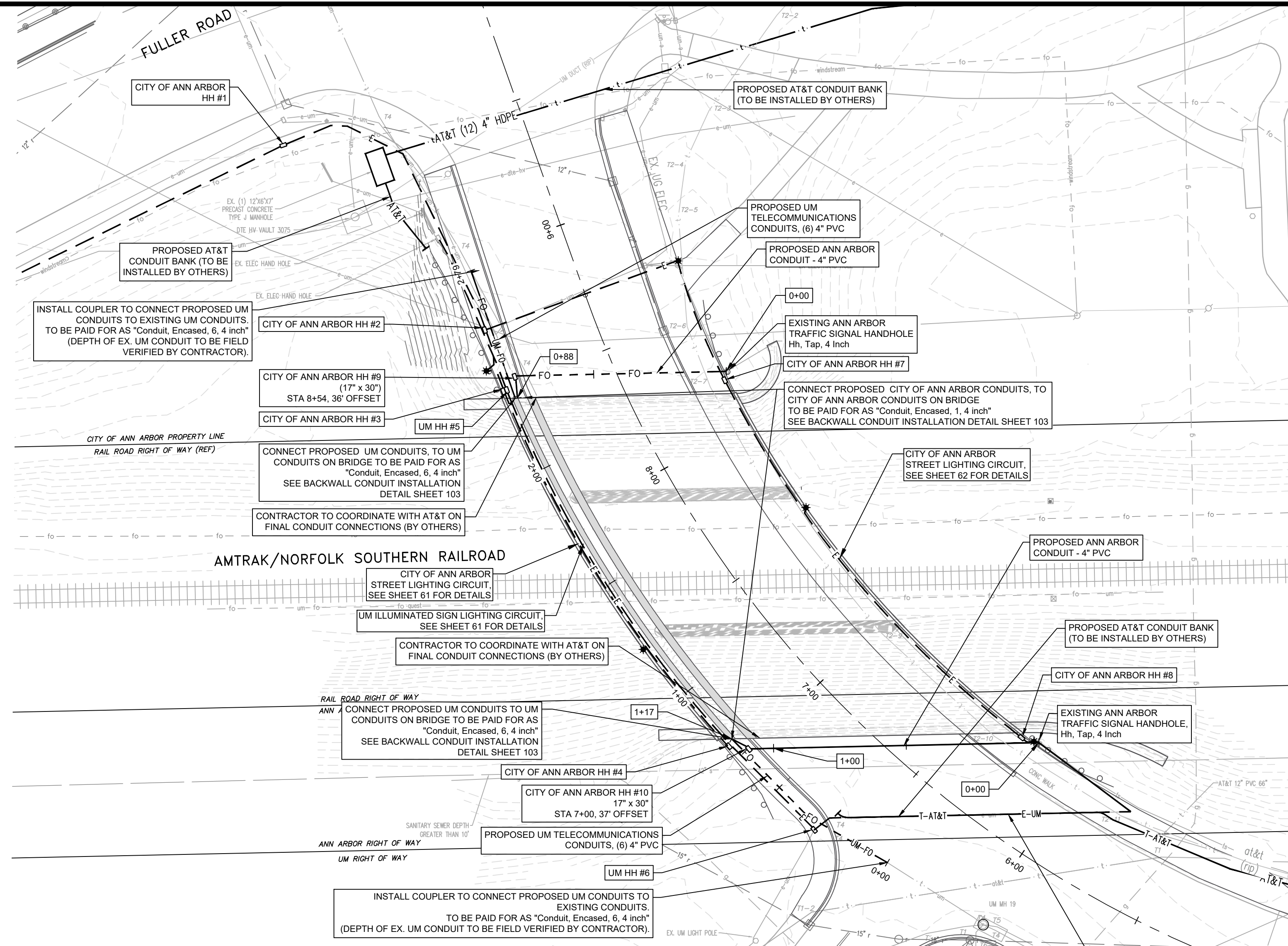
DLZ

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

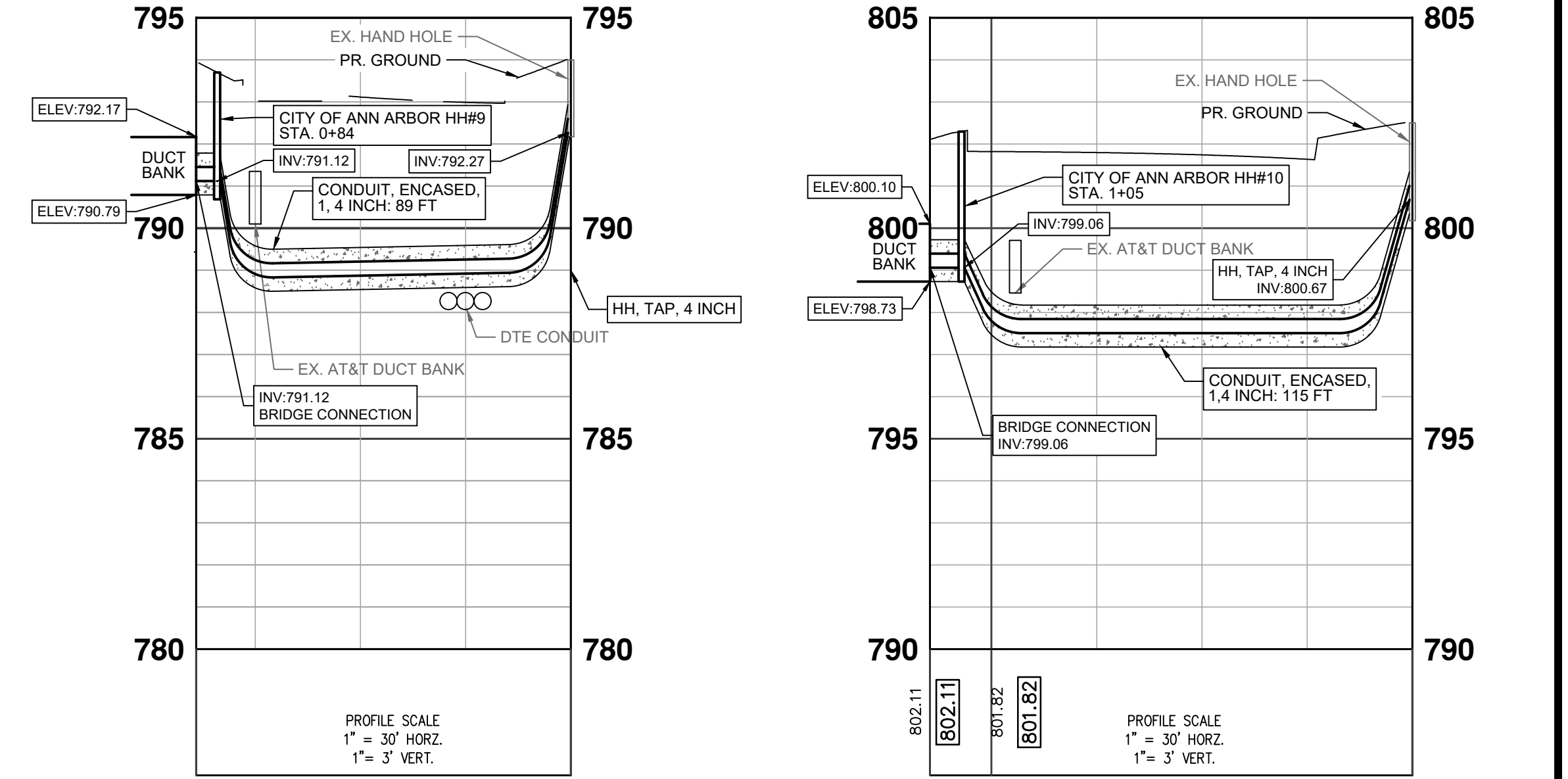
**EAST MEDICAL CENTER DRIVE
STRUCTURE TABLE**

SCALE 1"=40'	INCH 0 1
DRAWING NO. 2021-008-UT3	
SHEET NO. 59 OF 153	

LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



ANN ARBOR CONDUIT (NORTH) **ANN ARBOR CONDUIT (SOUTH)**



NOTES

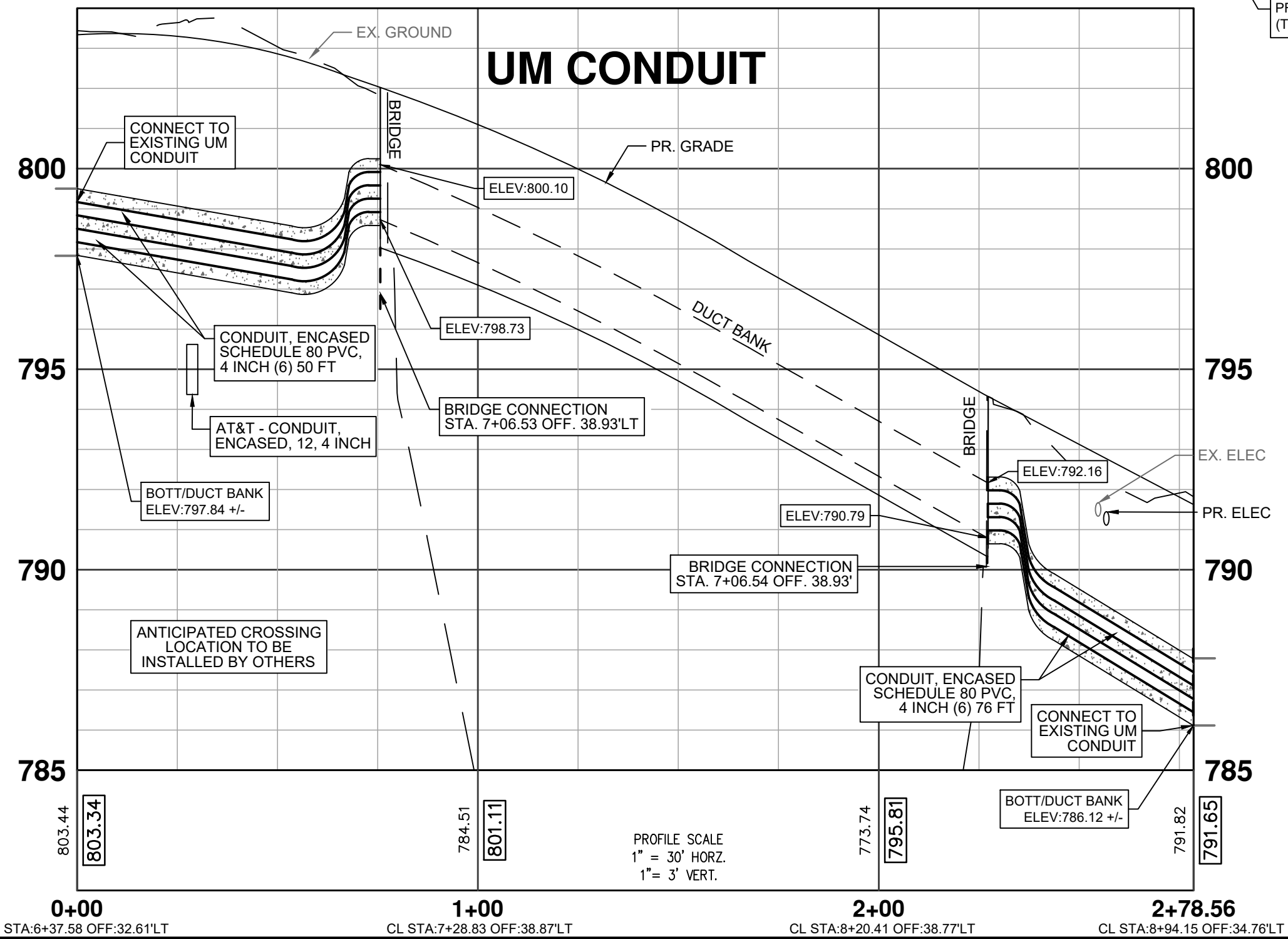
- UM TELECOMMUNICATIONS DUCT BANK SHALL CONSIST OF SIX 4" I.D. SCH. 80 PVC CONDUITS, CONCRETE ENCASED. A 3" THICK MINIMUM CONCRETE COVER SHALL PROTECT DUCTS OVER THE ENTIRE LENGTH AND WIDTH OF THE DUCT BANK. FIBER AND INSTALLATION OF FIBER BY OWNER.
- CITY OF ANN ARBOR TELECOMMUNICATIONS DUCT BANK SHALL CONSIST OF ONE 4" SCH. 80 PVC CONDUIT, CONCRETE ENCASED. A 3" THICK MINIMUM CONCRETE COVER SHALL PROTECT DUCTS OVER THE ENTIRE LENGTH AND WIDTH OF THE CONDUIT. FIBER AND INSTALLATION OF FIBER BY OWNER.
- CONTACT CITY OF ANN ARBOR REPRESENTATIVE MARC MARENO (734)794-6350 PRIOR TO ACCESSING CITY OF ANN ARBOR HANDHOLES. CONTACT UM-ITS REPRESENTATIVE KEVIN MCLAUGHLIN, PE, RCDD (734) 615-5699 PRIOR TO ACCESSING UM HANDHOLES. CITY OF ANN ARBOR AND/OR UM REPRESENTATIVE TO BE ON-SITE WHEN ACCESSING HANDHOLES.
- CONTACT UM-ITS REPRESENTATIVE KEVIN MCLAUGHLIN, PE, RCDD (734) 615-5699 FOR INSPECTIONS AND ACCEPTANCE OF DUCT BANK CONSTRUCTION. THE CITY OF ANN ARBOR WILL INSPECT RESTORATION OF DISTURBANCES WITHIN THE PUBLIC RIGHT OF WAY.
- 17 INCH X 30 INCH HANDHOLE ASSEMBLIES SHALL CONSIST OF TWO, STACKED "QUAZITE" BOXES. THE COVER SHALL BE A LOCKING HEAVY-DUTY BOLT-DOWN TYPE WITH A LOGO THAT READS "TRAFFIC SIGNAL" OR "STREET LIGHTING", BASED ON THEIR INTENDED USE. THE TOTAL DEPTH OF THE HANDHOLE SHALL BE 18 INCHES.
- DUCT BANKS SHALL BE SUPPORTED ON UNDISTURBED SOIL OR ON PIERS EXTENDING DOWN TO UNDISTURBED SOIL.
- CHANGES IN DUCT BANK DIRECTION SHALL BE MADE WITH 10' MINIMUM RADIUS WITH MANUFACTURED SWEEPS.
- DUCT BANKS SHALL BE SLOPED DOWNWARD TOWARD MANHOLES AND AWAY FROM BUILDINGS A MINIMUM OF 6" PER 100'. DUCT BANKS SHALL NOT CONTAIN TRAPS WHERE WATER MAY ACCUMULATE.
- PULL A SOLID MANDREL AND A STIFF BRISTLED BRUSH THROUGH EACH DUCT TO CLEAN THEM AND INSURE THE ABSENCE OF KINKS AND FLAT SPOTS. A MINIMUM 3-1/4" DIAMETER BY 5' MINIMUM LONG MANDREL SHALL BE USED FOR 4" CONDUIT. THE MANDREL PULL SHALL BE WITNESSED BY THE OWNER'S REPRESENTATIVE. WHEN MANDREL PULLS DETECT CRUSHED, FLATTENED, KINKED, OR OBSTRUCTED DUCTS OR CONDUITS, ADDITIONAL DUCTS OR CONDUITS SHALL BE PROVIDED. TO BE PAID FOR IN "Conduit, Encased, 6, 4 inch" AND "Conduit, Encased, 1, 4 inch".
- DUCT BANKS SHALL BE MARKED WITH A 6" WIDE RED PLASTIC MARKER STRIP PLACED IN THE BACKFILL APPROXIMATELY 12" ABOVE THE ENTIRE LENGTH OF THE DUCT BANK. TO BE PAID FOR IN "Conduit, Encased, 6, 4 inch" AND "Conduit, Encased, 1, 4 inch".
- CONDUIT EXPANSION COUPLINGS SHALL BE INSTALLED ON ALL CONDUITS AT EACH END OF THE BRIDGE.
- COPPERHEAD™ COPPER COATED STEEL LOCATING WIRE, (#12 CCS EXTRA HIGH STRENGTH HARD DRAWN 1150# (SOLOSHOT)), OR EQUIVALENT, SHALL BE PLACED OUTSIDE THE DUCT AND INSTALLED WHEN DUCT PULLBACK/ PLACEMENT IS PERFORMED. TRACER WIRE IS NOT TO BE PLACED INSIDE THE DUCT. WHERE MULTIPLE DUCTS ARE PLACED, ONLY 1 TRACER WIRE SHALL BE REQUIRED PER PACKAGE. A MINIMUM OF 60" OF TRACER WIRE SHALL EXTEND FROM THE ENDPOINT OF THE DUCT AND BE NEATLY COILED AT THE DUCT PATHWAY TERMINATION ENDPOINT. TO BE PAID FOR IN "Conduit, Encased, 6, 4 inch" AND "Conduit, Encased, 1, 4 inch".
- #1250 LB. MULE TAPE WITH FOOTAGE MARKINGS OR EQUIVALENT SHALL BE PLACED IN ALL NEW DUCT. A MINIMUM OF 60" OF MULE TAPE SHALL EXTEND FROM THE ENDS OF THE DUCT, COILED AND SECURED TO THE END OF THE DUCT WITH TAPE OR SOME OTHER MEANS. TO BE PAID FOR IN "Conduit, Encased, 6, 4 inch" AND "Conduit, Encased, 1, 4 inch".
- OPEN DUCTS IN MAN HOLES SHALL BE PLUGGED WITH REMOVABLE PLUGS AFTER MANDREL PROOFING TO PREVENT DIRT AND MOISTURE FROM ENTERING THE DUCTS. TO BE PAID FOR IN "Conduit, Encased, 6, 4 inch" AND "Conduit, Encased, 1, 4 inch".
- CONTRACTOR TO PROVIDE SCH. 80 PVC EXPANSION JOINT EVERY 100' UNDER THE BRIDGE DECK, AS WELL AS AT EACH END OF THE BRIDGE. SEE SHEET 103 FOR DETAIL. TO BE PAID FOR IN "Conduit, Encased, 6, 4 inch" AND "Conduit, Encased, 1, 4 inch".
- SWEEP ACCESS ROADS TO ELIMINATE DEBRIS CAUSED BY EQUIPMENT AND CONSTRUCTION ACTIVITIES.

TELECOMMUNICATIONS PHASING PLAN

- PHASE 2:
- CONTRACTOR TO INSTALL CITY OF ANN ARBOR HH#9 AND HH#10.
 - CONTRACTOR TO INSTALL (1) 4" SCH. 80 PVC CONDUIT FROM HH#9 TO NORTH END OF THE BRIDGE AND FROM HH#10 TO SOUTH END OF THE BRIDGE. CONTRACTOR TO INSTALL (1) 4" SCH. 80 PVC CONDUIT FROM HH#9 TO HH#10 TO THE EAST EDGE OF PHASE 2 CONSTRUCTION. CONDUITS TO BE ENCASED IN CONCRETE PER DETAIL.
 - CONTRACTOR TO INSTALL (6) 4" I.D. SCH. 80 PVC UM CONDUITS FROM COUPLERS AT EXISTING UM CONDUITS TO END OF BRIDGE ON NORTH AND SOUTH SIDES OF THE BRIDGE. CONDUITS TO BE ENCASED IN CONCRETE PER DETAIL.
 - CONTRACTOR TO COORDINATE WITH AT&T CONTRACTOR FOR THE CONSTRUCTION OF THE AT&T CONDUIT CONNECTIONS AT EACH END OF THE BRIDGE.
- PHASE 3:
- CONTRACTOR TO INSTALL (1) 4" SCH. 80 PVC CONDUIT FROM THE EAST EDGE OF PHASE 2 CONSTRUCTION TO THE EXISTING CITY OF ANN ARBOR TRAFFIC SIGNAL HANDHOLES NORTH AND SOUTH OF THE BRIDGE.

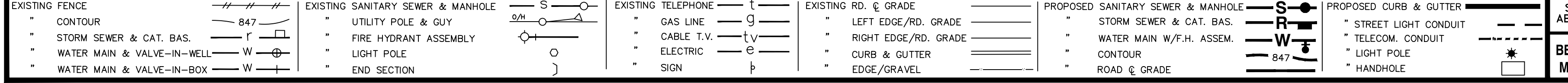
MISCELLANEOUS QUANTITIES THIS SHEET

PAY ITEM	DESCRIPTION	UNITS	QUANTITY
8182021	Conduit, Encased, 6, 4 inch	FT	126
8182016	Conduit, Encased, 1, 4 inch	FT	204
8187050	Handhole Assembly, 17 inch x 30 inch	EA	2
8187050	Hh, Tap, 4 inch	EA	2



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LEGEND



DLZ

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE

TELECOMMUNICATIONS CONDUIT PLAN

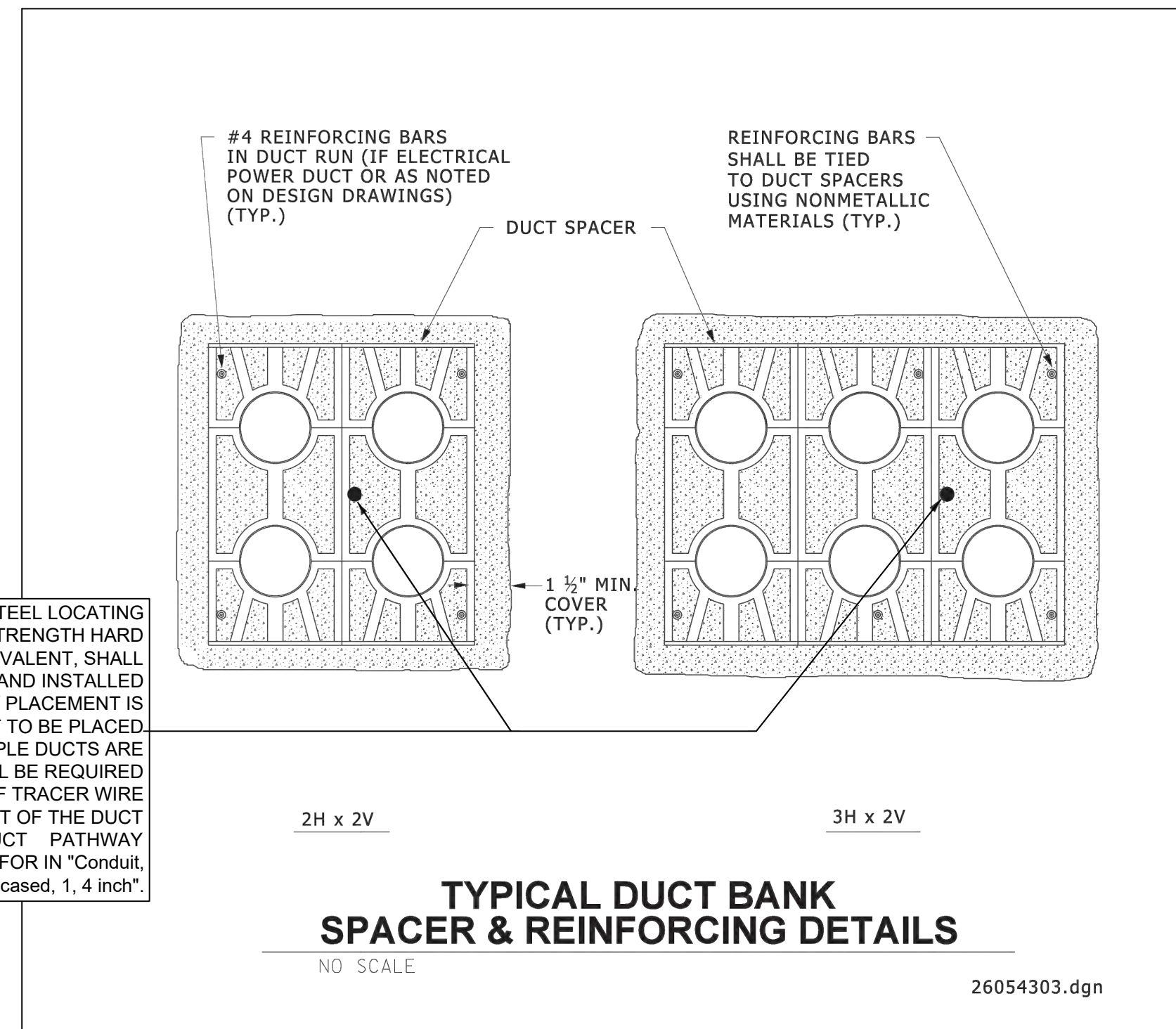
SCALE 1"=30'

DRAWING NO. 2021-008-UT4

SHEET NO. 60 OF 153

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

APPROVED BY: _____

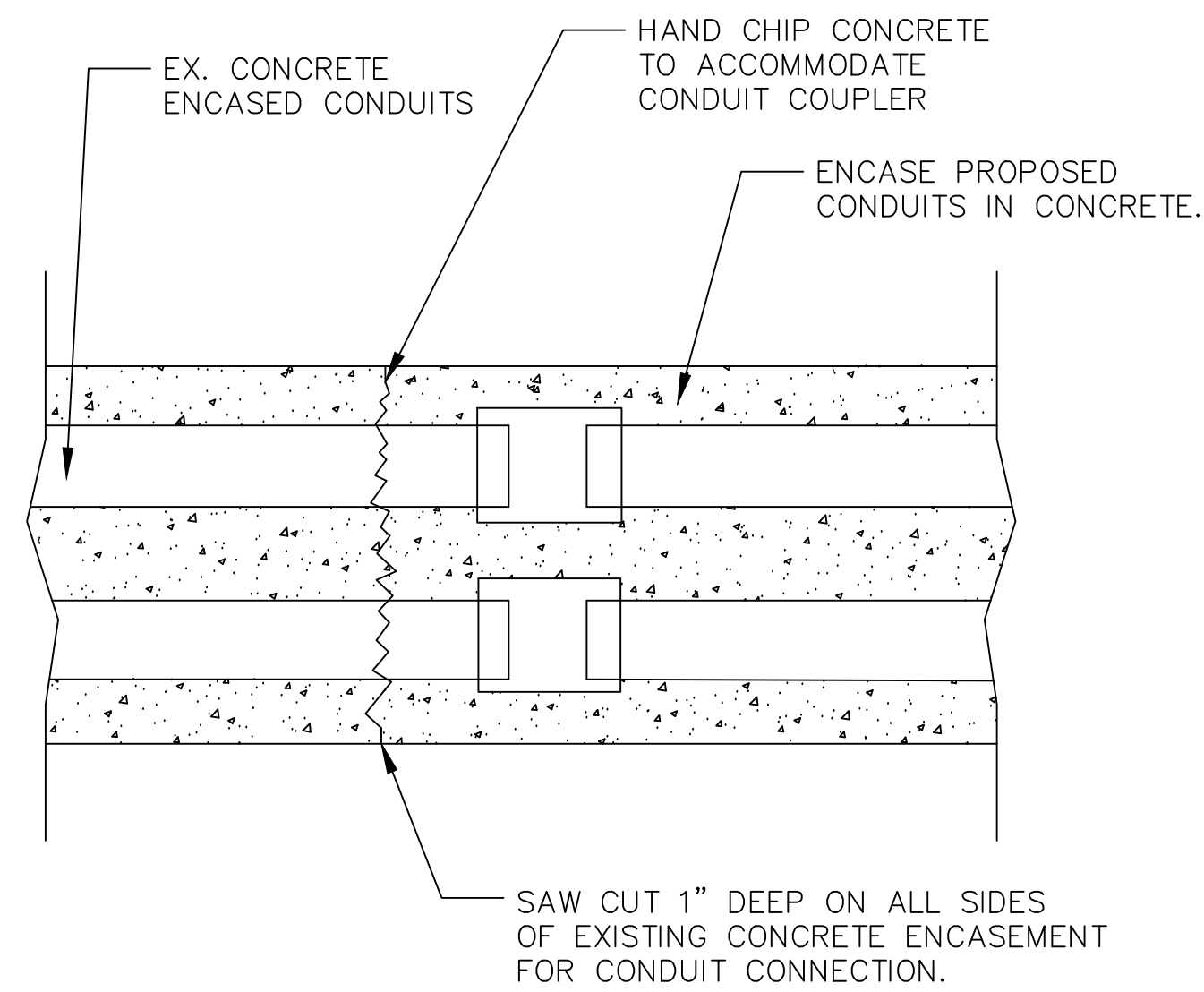


COPPERHEAD™ COPPER COATED STEEL LOCATING WIRE, (#12 CCS EXTRA HIGH STRENGTH HARD DRAWN 1150# (SOLOSHOT), OR EQUIVALENT, SHALL BE PLACED OUTSIDE THE DUCT AND INSTALLED WHEN DUCT PULLBACK/ PLACEMENT IS PERFORMED. TRACER WIRE IS NOT TO BE PLACED INSIDE THE DUCT. WHERE MULTIPLE DUCTS ARE PLACED, ONLY 1 TRACER WIRE SHALL BE REQUIRED PER PACKAGE. A MINIMUM OF 60" OF TRACER WIRE SHALL EXTEND FROM THE ENDPOINT OF THE DUCT AND BE NEATLY COILED AT THE DUCT PATHWAY TERMINATION ENDPOINT. TO BE PAID FOR IN "Conduit, Encased, 6, 4 inch" AND "Conduit, Encased, 1, 4 inch".

TYPICAL DUCT BANK SPACER & REINFORCING DETAILS

NO SCALE

26054303.dgn



CONDUIT CONNECTION ENCASEMENT DETAIL

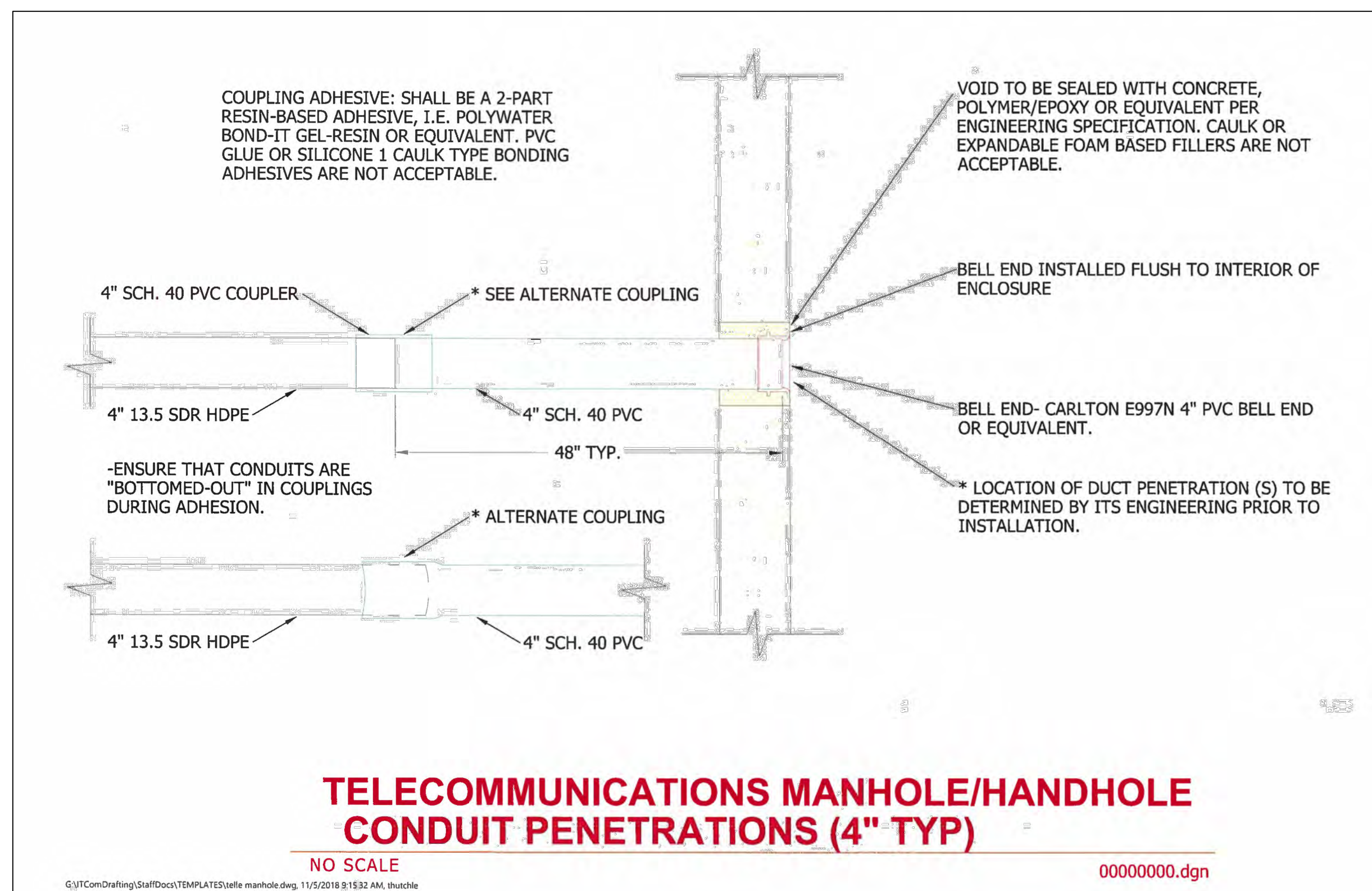
REV	CHANGE	DATE
B	IMAGE ENHANCEMENT	09/02/15

REMOVABLE CAP SEAL
O-RING
ROTATING COMPRESSION WING NUT
WASHER
5.946
O-RING & HOLLOW STEM
EXPANSION RANGE 3.940 - 4.330

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		HUIZAR	06/02/14
TOLERANCES:		CHECKED	F.GRO
FRACTIONAL ± 1/64		ENG APPR.	06/02/14
ANGULAR ± 0.10°		MFG APPR.	
TWO PLACE DECIMAL ±0.010		Q.A.	
THREE PLACE DECIMAL ±0.005		COMMENTS:	
INTERPRET GEOMETRIC TOLERANCING PER:			
MATERIAL:			
SEE BOM			
NEXT ASSY	USED ON	FINISH	
APPLICATION		DO NOT SCALE DRAWING	

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CALAM MANUFACTURING
TITLE: 4" KWIKIE HOLLOW STEM
SIZE A DWG. NO. 5120-40 REV B
SCALE: WEIGHT: SHEET 1 OF 1



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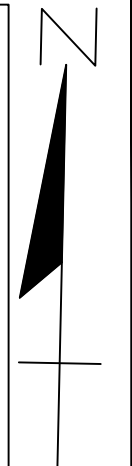
LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

DLZ	
REV. NO.	DESCRIPTION
DATE	DR. BY
CH. BY	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE	
TELECOMMUNICATIONS CONDUIT DETAILS	
SCALE 1"=30'	INCH 0 1
DRAWING NO. 2021-008-UT5	
SHEET NO. 61 OF 153	

APPROVED BY: _____
LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



NOTES

- SEE SHEET 107 FOR CONDUIT DETAILS AT BRIDGE APPROACHES.
- CONDUIT SHALL BE 2 INCH OR 3 INCH SCH. 80 PVC. CONDUITS SHALL BE FITTED WITH EXPANSION JOINTS AT EACH END OF THE BRIDGE, TO BE PAID FOR IN "CONDUIT, SCHEDULE 40 PVC, 2 INCH" AND "CONDUIT, SCHEDULE 40 PVC, 3 INCH".
- ALL STREET LIGHT AND ILLUMINATED SIGN WIRING IN CONDUIT TO BE THREE (3) 6 AWG XLP/USE-2/RHH/RHW-2, IN BLACK, WHITE AND GREEN.
- CONTACT CITY OF ANN ARBOR REPRESENTATIVE MARC MARENO (734)794-6350 PRIOR TO ACCESSING CITY OF ANN ARBOR HANDHOLES. CONTACT UM-ITS REPRESENTATIVE KEVIN MCLAUGHLIN, PE, RCDD (734) 615-5699 PRIOR TO ACCESSING UM HANDHOLES. CITY OF ANN ARBOR AND/OR UM REPRESENTATIVE TO BE ON-SITE WHEN ACCESSING HANDHOLES.
- 17 INCH X 30 INCH HANDHOLE ASSEMBLIES SHALL CONSIST OF TWO, STACKED "QUAZITE" BOXES. THE COVER SHALL BE A LOCKING HEAVY-DUTY BOLT-DOWN TYPE WITH A LOGO THAT READS "TRAFFIC SIGNAL" OR "STREET LIGHTING", BASED ON THEIR INTENDED USE. THE TOTAL DEPTH OF THE HANDHOLE SHALL BE 18 INCHES.
- EXISTING UNIVERSITY OF MICHIGAN MEDICAL CENTER STREET LIGHTS AT PROPOSED LIGHT LOCATIONS L1 THROUGH L5 ARE TO BE REMOVED AND REPLACED WITH CITY OF ANN ARBOR LIGHT POLES, LUMINAIRES AND FOUNDATIONS. THE PROPOSED LIGHTS SHALL BE CONNECTED TO THE CITY OF ANN ARBOR'S EXISTING LIGHTING CIRCUIT.
- CONDUIT FOR BOTH THE ANN ARBOR STREET LIGHT CIRCUIT AND THE UNIVERSITY OF MICHIGAN MEDICAL CENTER ILLUMINATED SIGNS CIRCUIT TO BE INSTALLED IN THE NEW BRIDGE SIDEWALK AS SHOWN. CONTRACTOR SHALL INSTALL NEW WIRES BETWEEN HANDHOLE #5 AND #6 AND RECONNECT THE ILLUMINATED SIGNS CIRCUIT, TO BE PAID FOR IN "CONDUIT, SCHEDULE 40 PVC, 2 INCH" TO BE PAID FOR IN "Conduit, Schedule 80 PVC, 2 inch".
- LOCATE PROPOSED AND EXISTING UNDERGROUND PIPES AND UTILITIES AND PROPOSED GUARDRAIL POSTS PRIOR TO INSTALLING LIGHTING. FIELD ADJUSTMENTS MAY BE NECESSARY AS DIRECTED BY THE ENGINEER.
- COPPERHEAD COPPER COATED STEEL LOCATING WIRE, (#12 CCS EXTRA HIGH STRENGTH HARD DRAWN 1150# (SOLOSHT)), OR EQUIVALENT, SHALL BE PLACED OUTSIDE THE DUCT OR CONDUIT AND INSTALLED WHEN DUCT/CONDUIT PULLBACK/PLACEMENT IS PERFORMED. TRACER WIRE IS NOT TO BE PLACED INSIDE THE DUCT OR CONDUIT. WHERE MULTIPLE DUCTS ARE PLACED, ONLY 1 TRACER WIRE SHALL BE REQUIRED PER PACKAGE. A MINIMUM OF 60" OF TRACER WIRE SHALL EXTEND FROM THE ENDPOINT OF THE DUCT AND BE NEARLY COILED AT THE DUCT OR CONDUIT PATHWAY TERMINATION ENDPOINT.
- STREET LIGHT POLES SHALL BE SHAKESPEARE AS30-10S1DB01/OPAR6-BK-H WITH THE FOLLOWING SPECIFICATIONS: 30' SMOOTH FINISH, ANCHOR BASE POLE WITH 4"X 12" HANDHOLE, POLE TO BE DRILLED FOR 6" ALUMINUM MAST ARM AND BASE COVER, BASE COVER TO BE 1-PIECE POWDERED COATED BLACK, AND ANCHOR BOLTS TO BE 1" DIAMETER.
- LUMINAIRE TO BE LUMICON LWS-LSL-60-GR-1-T2-OW-7P WITH THE FOLLOWING SPECIFICATIONS: 58 WATT LED STREET LUMINAIRE, 8,201 DELIVERED LUMENS, TYPE II DISTRIBUTION, 120 VOLT-277 VOLT, 3000K COLOR TEMPERATURE, 7-PIN RECEPTACLE, 20K-AMP SURGE SUPPRESSION.

MISCELLANEOUS QUANTITIES THIS SHEET			
PAY ITEM	DESCRIPTION	UNITS	QUANTITY
8182133	Conduit, Schedule 40 PVC, 2 inch	Ft	233
8182135	Conduit, Schedule 40 PVC, 3 inch	Ft	740
8190211	DB Cable, in Conduit, 600V, 1/1C#6	Ft	2958
8187050	Handhole Assembly, 17 inch x 30 inch	Ea	8
8197050	Pole Installation	Ea	5
8197050	Luminaire Installation	Ea	5
8197050	Pole Fill-Up	Ea	5

STREET LIGHT PHASING PLAN

PRIOR TO PHASE 1:

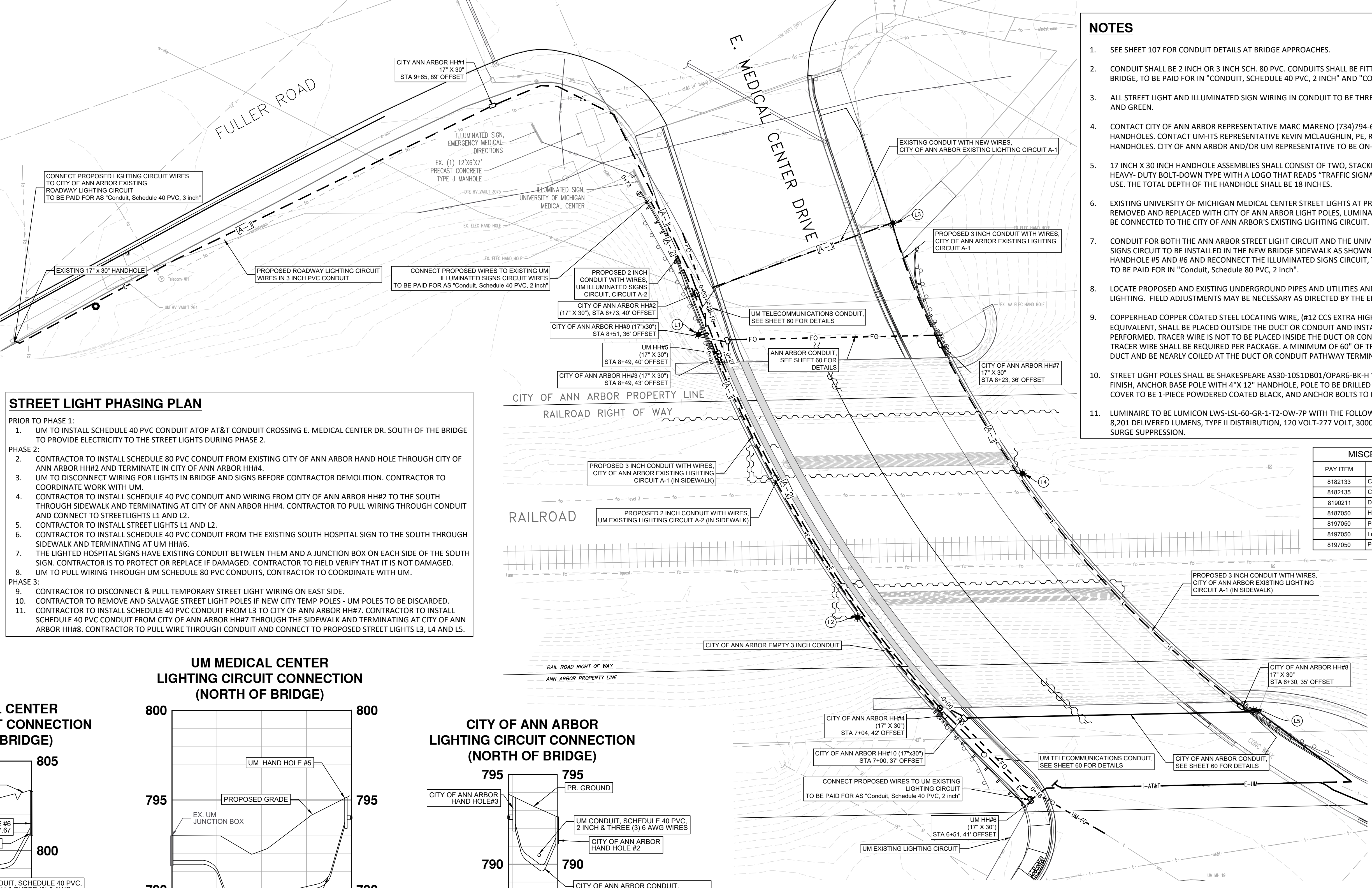
- UM TO INSTALL SCHEDULE 40 PVC CONDUIT ATOP AT&T CONDUIT CROSSING E. MEDICAL CENTER DR. SOUTH OF THE BRIDGE TO PROVIDE ELECTRICITY TO THE STREET LIGHTS DURING PHASE 2.

PHASE 2:

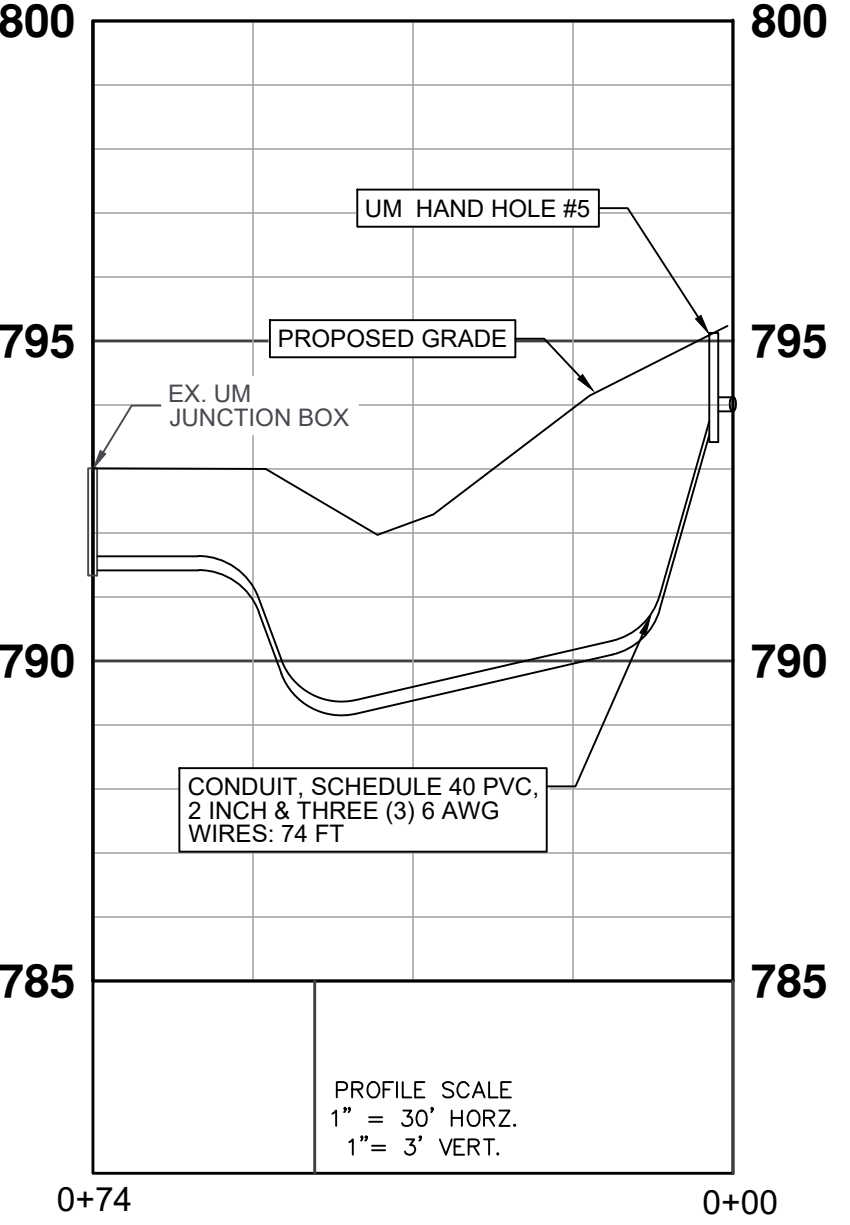
- CONTRACTOR TO INSTALL SCHEDULE 80 PVC CONDUIT FROM EXISTING CITY OF ANN ARBOR HAND HOLE THROUGH CITY OF ANN ARBOR HH#2 AND TERMINATE IN CITY OF ANN ARBOR HH#4.
- UM TO DISCONNECT WIRING FOR LIGHTS IN BRIDGE AND SIGNS BEFORE CONTRACTOR DEMOLITION. CONTRACTOR TO COORDINATE WORK WITH UM.
- CONTRACTOR TO INSTALL SCHEDULE 40 PVC CONDUIT AND WIRING FROM CITY OF ANN ARBOR HH#2 TO THE SOUTH THROUGH SIDEWALK AND TERMINATING AT CITY OF ANN ARBOR HH#4. CONTRACTOR TO PULL WIRING THROUGH CONDUIT AND CONNECT TO STREETLIGHTS L1 AND L2.
- CONTRACTOR TO INSTALL STREET LIGHTS L1 AND L2.
- CONTRACTOR TO INSTALL SCHEDULE 40 PVC CONDUIT FROM THE EXISTING SOUTH HOSPITAL SIGN TO THE SOUTH THROUGH SIDEWALK AND TERMINATING AT UM HH#6.
- THE LIGHTED HOSPITAL SIGNS HAVE EXISTING CONDUIT BETWEEN THEM AND A JUNCTION BOX ON EACH SIDE OF THE SOUTH SIGN. CONTRACTOR IS TO PROTECT OR REPLACE IF DAMAGED. CONTRACTOR TO FIELD VERIFY THAT IT IS NOT DAMAGED.
- UM TO PULL WIRING THROUGH UM SCHEDULE 80 PVC CONDUITS, CONTRACTOR TO COORDINATE WITH UM.

PHASE 3:

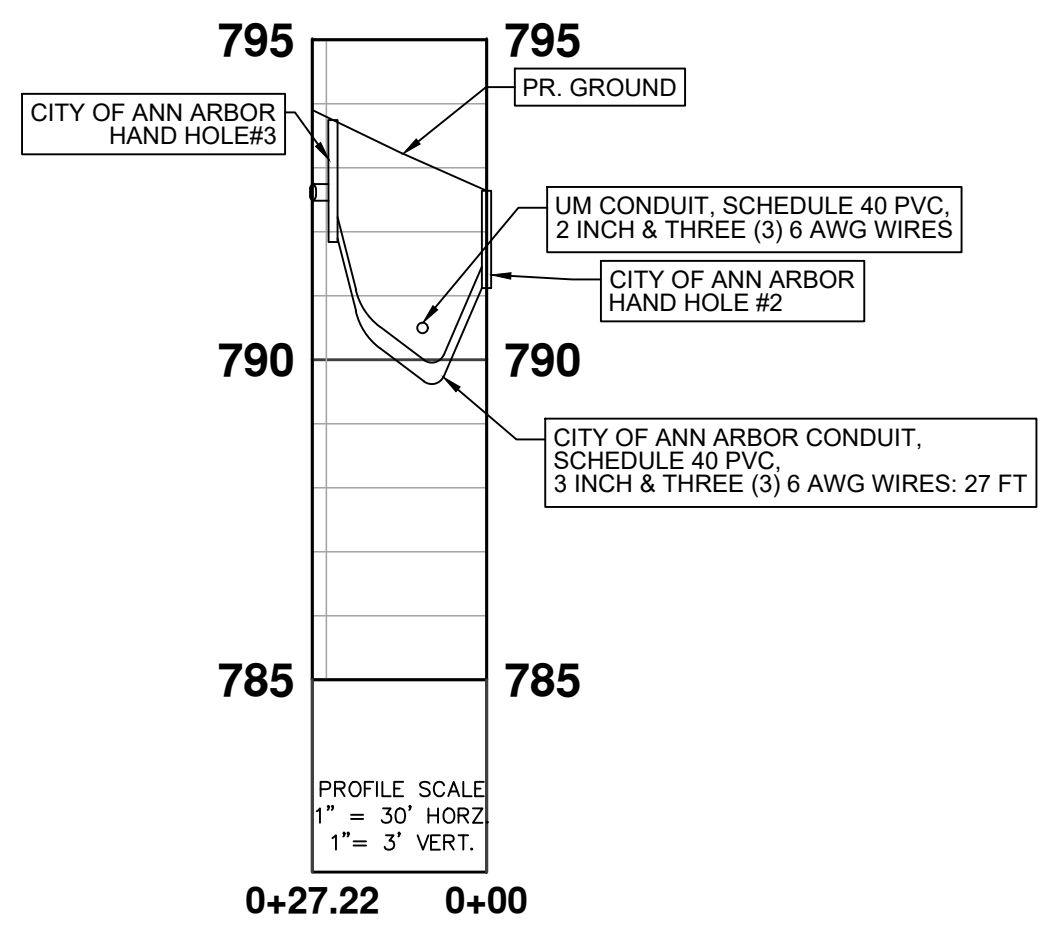
- CONTRACTOR TO DISCONNECT & PULL TEMPORARY STREET LIGHT WIRING ON EAST SIDE.
- CONTRACTOR TO REMOVE AND SALVAGE STREET LIGHT POLES IF NEW CITY TEMP POLES - UM POLES TO BE DISCARDED.
- CONTRACTOR TO INSTALL SCHEDULE 40 PVC CONDUIT FROM L3 TO CITY OF ANN ARBOR HH#7. CONTRACTOR TO INSTALL SCHEDULE 40 PVC CONDUIT FROM CITY OF ANN ARBOR HH#7 THROUGH THE SIDEWALK AND TERMINATING AT CITY OF ANN ARBOR HH#8. CONTRACTOR TO PULL WIRE THROUGH CONDUIT AND CONNECT TO PROPOSED STREET LIGHTS L3, L4 AND L5.



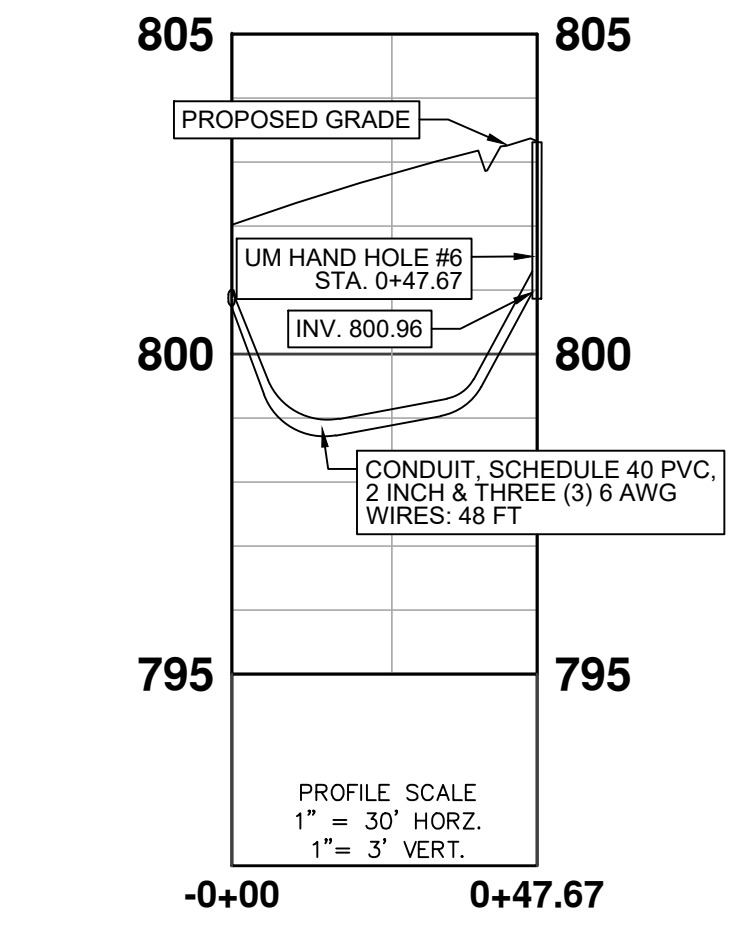
UM MEDICAL CENTER LIGHTING CIRCUIT CONNECTION (NORTH OF BRIDGE)



CITY OF ANN ARBOR LIGHTING CIRCUIT CONNECTION (NORTH OF BRIDGE)



UM MEDICAL CENTER LIGHTING CIRCUIT CONNECTION (SOUTH OF BRIDGE)



LEGEND

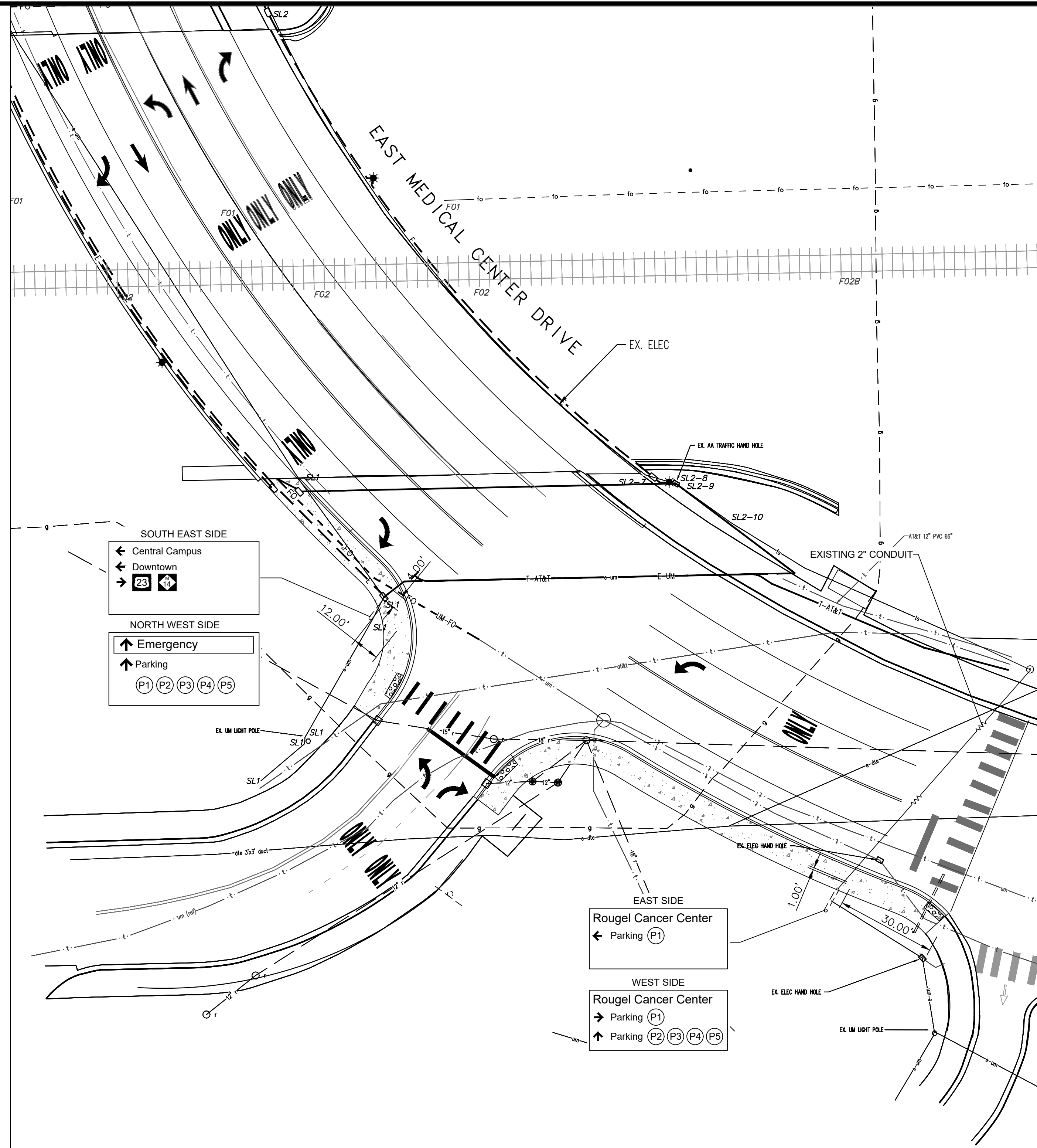
EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	STREET LIGHT CONDUIT
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	TELECOM. CONDUIT
WATER MAIN & VALVE-IN-WELL	END SECTION	ELECTRIC	CURB & GUTTER	CONTOUR	LIGHT POLE
WATER MAIN & VALVE-IN-BOX		SIGN	EDGE/GRAVEL	ROAD & GRADE	HANDHOLE

DLZ		PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
SEE ABOVE	BENCH MARK	SURVEY BOOK	REV. NO.
ORIGINAL ISSUE	10/12/22	INB	LCM
DATE	DR.BY	CH.BY	APPROVED BY:

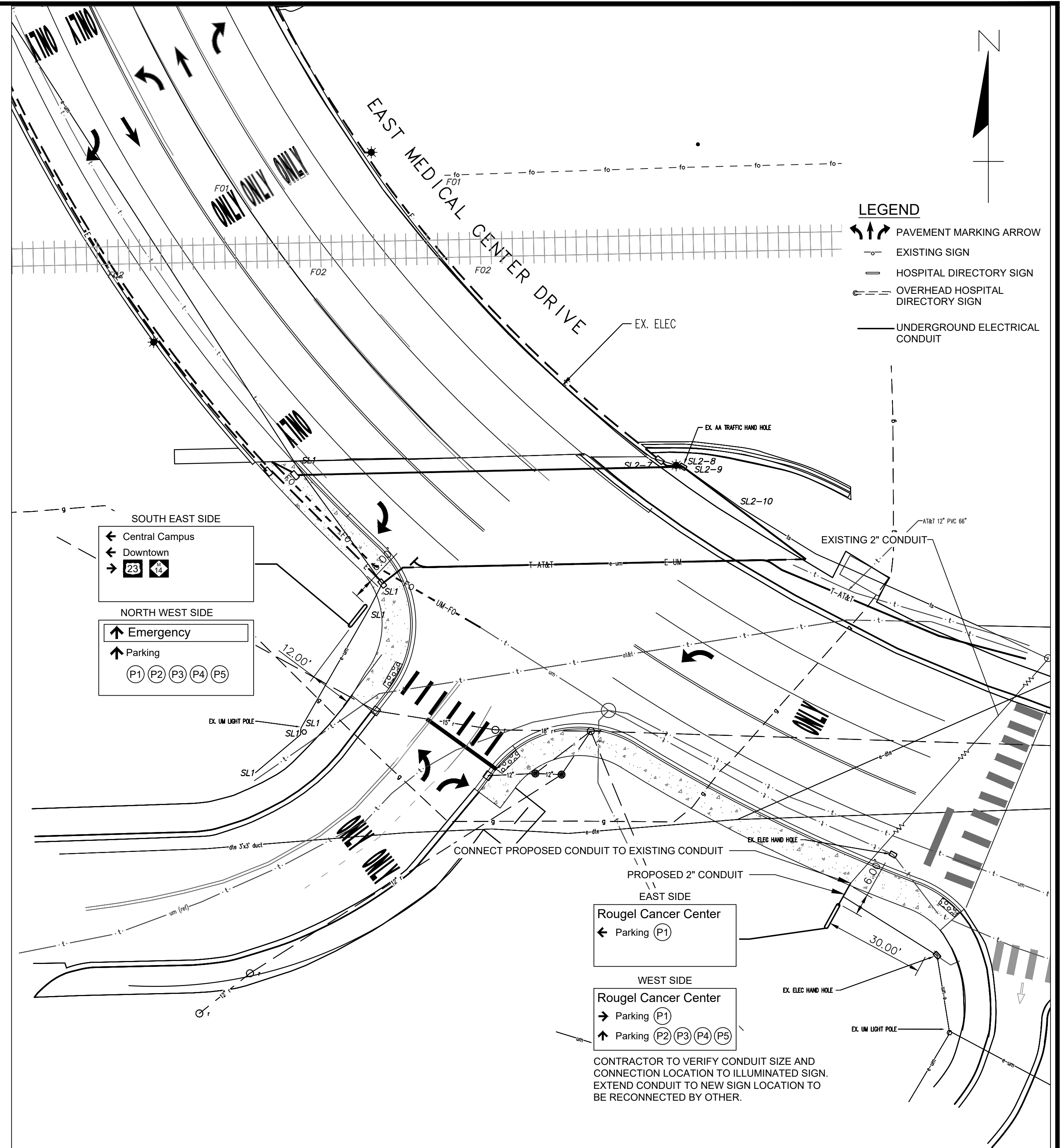
EAST MEDICAL CENTER DRIVE		SCALE 1"=20'
STREET LIGHT ELECTRICAL PLAN		DRAWING NO. 2021-008-UT6
SHEET NO. 62 OF 153		

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EXISTING SIGN LOCATION



PROPOSED SIGN LOCATION

- LEGEND**
- PAVEMENT MARKING ARROW
 - EXISTING SIGN
 - HOSPITAL DIRECTORY SIGN
 - OVERHEAD HOSPITAL DIRECTORY SIGN
 - UNDERGROUND ELECTRICAL CONDUIT

ESTIMATED QUANTITIES THIS SHEET	
DESCRIPTION	QUANTITY
Conduit, DB, 1.2 Inch	8 FT
Hospital Sign and Foundation, Relocate	2 Ea

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- LEGEND**
- | | | | | | |
|----------------|-----------------------------------|--------------------|------------------------|-----------------------------------|------------------------|
| EXISTING FENCE | EXISTING SANITARY SEWER & MANHOLE | EXISTING TELEPHONE | EXISTING RD. @ GRADE | PROPOSED SANITARY SEWER & MANHOLE | PROPOSED CURB & GUTTER |
| - - - - - | - S - | - t - | - - - - - | - S - | - - - - - |
| - CONTOUR | - UTILITY POLE & GUY | - GAS LINE | - LEFT EDGE/RD. GRADE | - STORM SEWER & CAT. BAS. | - SEE ABOVE |
| - 847 - | - FIRE HYDRANT ASSEMBLY | - CABLE T.V. | - RIGHT EDGE/RD. GRADE | - WATER MAIN W/F.H. ASSEM. | - BENCH MARK |
| - r - | - LIGHT POLE | - ELECTRIC | - CURB & GUTTER | - CONTOUR | - SURVEY BOOK |
| - W - | - END SECTION | - SIGN | - EDGE/GRAVEL | - 847 - | - REV. NO. |
| - W - | | | | | - DESCRIPTION |
| | | | | | - DATE |
| | | | | | - DR. BY |
| | | | | | - CH. BY |



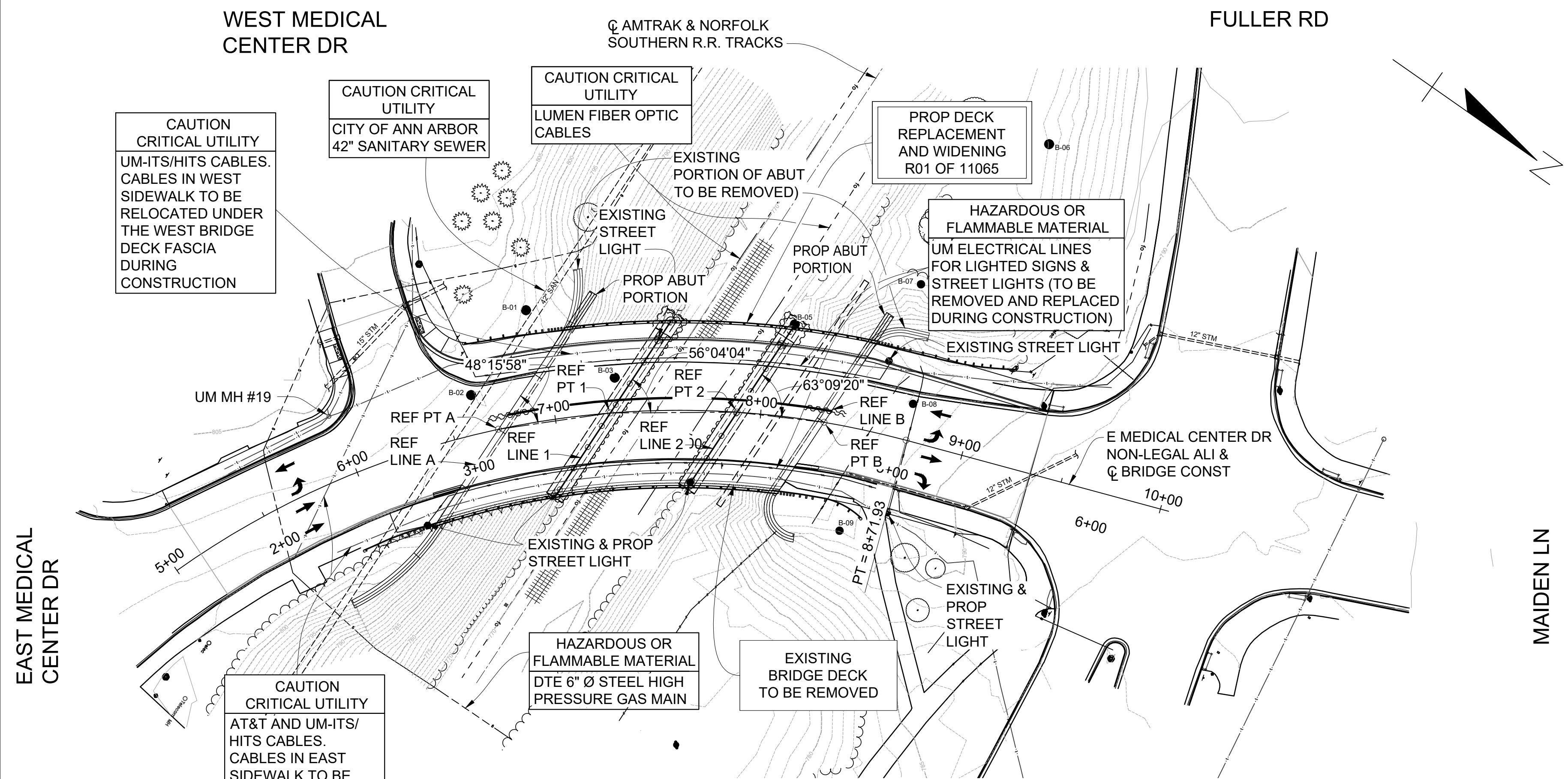
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

**E. MEDICAL CENTER DR
HOSPITAL SIGN
RELOCATION PLAN**

SCALE 1"=20'	INCH 0 1
DRAWING NO. 2021-008-UT7	
SHEET NO. 63 OF 153	

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

APPROVED BY: _____



SITUATION PLAN

SURVEY CONTROL AND BENCH MARKS

SEE SURVEY INFORMATION SHEET FOR SURVEY CONTROL AND BENCHMARKS

UTILITIES

SEE ROAD PLANS AND PROJECT INFORMATION AND NOTE SHEET FOR ADDITIONAL UTILITY INFORMATION

COORDINATES

REF PT	NORTH	EAST	ELEV
A	286,963.50	13,295,113.75	801.54
1	287,003.70	13,295,076.30	799.47
2	287,054.16	13,295,040.91	795.96
B	287,091.74	13,295,020.96	793.32

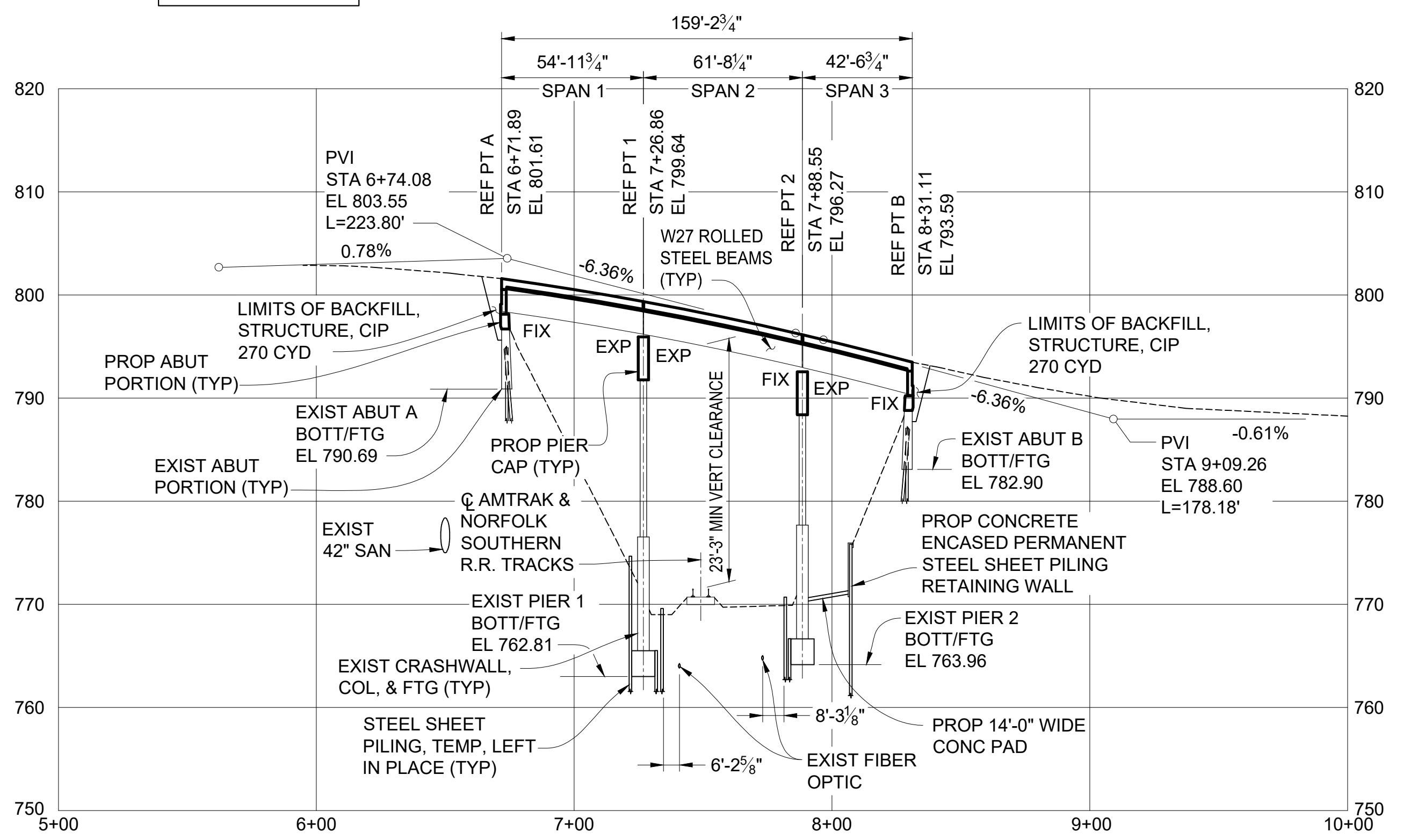
COORDINATES PROVIDED ARE TO ESTABLISH THE GEOGRAPHIC LOCATION OF THE STRUCTURE. HOWEVER SHALL NOT TAKE PRECEDENCE OVER STRUCTURAL DIMENSIONS.

EXISTING STRUCTURE

THE EXISTING STRUCTURE IS A THREE SPAN STEEL MULTI-STRINGER STRUCTURE WITH A CLEAR ROADWAY WIDTH OF 47'-0", AN OUT-TO-OUT WIDTH OF 70'-11 1/4", AND AN OVERALL LENGTH OF 130'-2 1/2". THE STRUCTURE WAS ORIGINALLY BUILT IN 1982 AND DESIGNED FOR HS25 LOADING.

EAST MEDICAL CENTER DRIVE CURVE DATA

Δ	= 71°58'59" (RT)		
D	= 44°46'59.86"		
T	= 306.51'		
L	= 530.18'		
R	= 422.00'		
E	= 99.565'		
PC	= 3+41.75	N = 286,848.74	E = 13,295,414.37
PI	= 6+06.84	N = 286,840.62	E = 13,295,107.97
PT	= 8+71.93	N = 287,129.46	E = 13,295,005.49
EXIST SUPER	= 3%		
PROP SUPER	= 3%		



PROFILE ALONG BRIDGE CENTERLINE

NOTES:

- THE WORK COVERED BY THESE PLANS INCLUDES REMOVAL OF THE EXISTING BRIDGE DECK, REMOVAL AND SALVAGING OF THE EXISTING BEAMS, REMOVAL OF PORTIONS OF THE SUBSTRUCTURE UNITS, CONSTRUCTION OF THE PROPOSED WIDENED BRIDGE AND PLACING SLOPE PROTECTION TO THE LIMITS SHOWN.
- LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND CONDUCT OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.
- MAINTAIN EAST MEDICAL CENTER DRIVE TRAFFIC OVER THE BRIDGE BY PART-WIDTH CONSTRUCTION.
- PLAN ELEVATIONS REFER TO NAVD88 DATUM.
- THE TRAIN MOVEMENT AND SPEED INFORMATION SHOWN IN THE PROPOSAL DOES NOT REPRESENT A COMMITMENT BY AMTRAK AND IS SUBJECT TO CHANGE WITHOUT NOTICE.
- IMPLEMENT MEASURES TO PREVENT DEBRIS FROM FALLING FROM THE STRUCTURE. ALL MEASURES IMPLEMENTED BY THE CONTRACTOR MUST BE EFFECTIVE. THE CONTRACTOR SHALL IMMEDIATELY REMOVE ANY DEBRIS THAT FALLS WITHIN 15 FEET OF THE RAILROAD TRACKS. REMOVAL AND DISPOSAL OF ALL DEBRIS OFF-SITE SHALL NOT BE PAID FOR SEPARATELY, BUT IS INCLUDED IN OTHER ITEMS OF WORK.

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REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
GENERAL PLAN OF SITE	
SCALE HOR. 1"=40'-0" VER. 1"=4'-0"	INCH 0 1
DRAWING NO. 2021-008-BR1	
SHEET NO. 64 OF 153	

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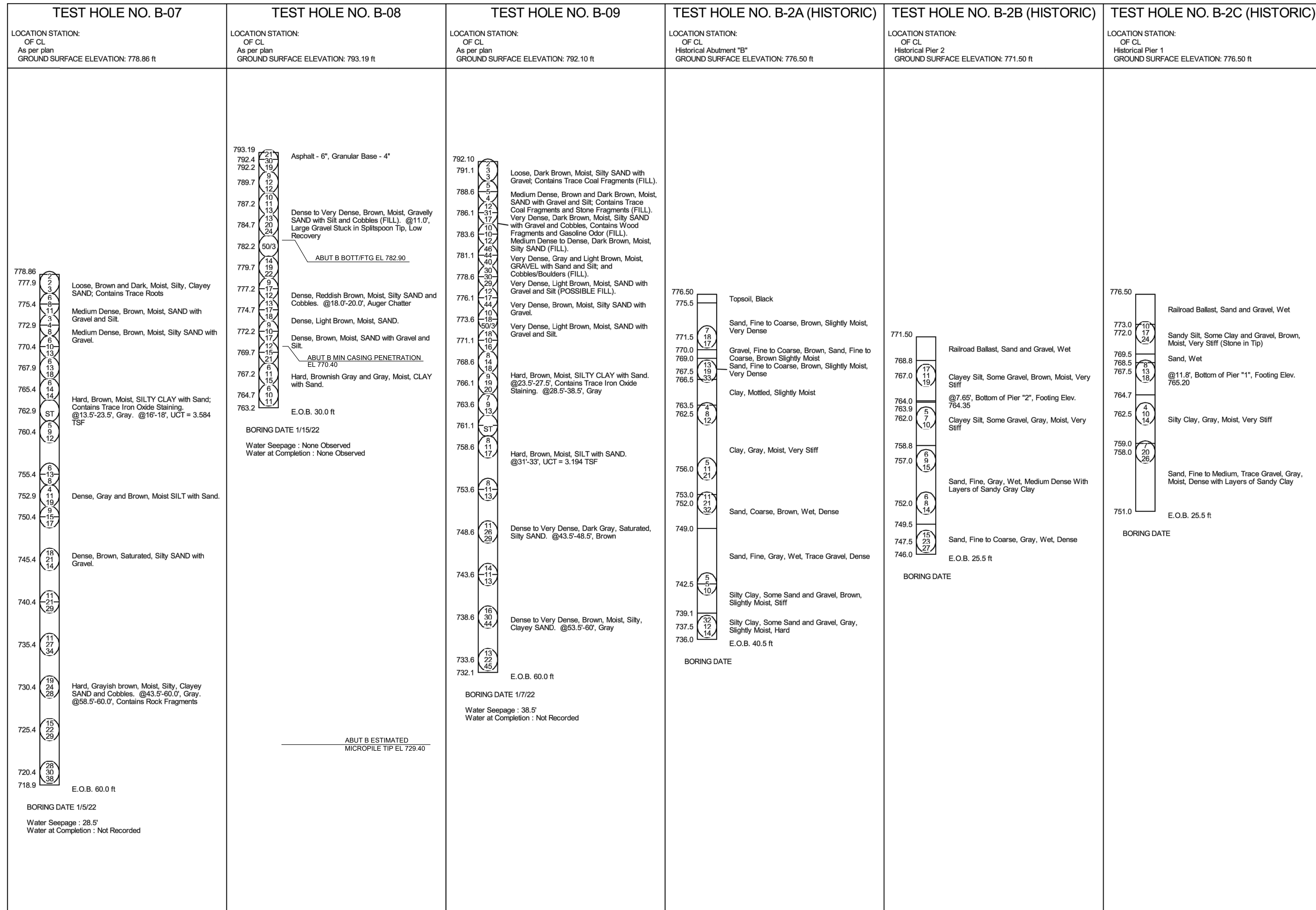
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TEST HOLE NO. B-01	TEST HOLE NO. B-02	TEST HOLE NO. B-03	TEST HOLE NO. B-04	TEST HOLE NO. B-05	TEST HOLE NO. B-06
<p>LOCATION STATION: OF CL As per plan GROUND SURFACE ELEVATION: 802.31 ft</p> <p>BORING DATE 1/16/22 Water Seepage : 43.5' Water at Completion : 46.1'</p> <p>ABUT A ESTIMATED MICROPILE TIP EL 733.69</p>	<p>LOCATION STATION: OF CL As per plan GROUND SURFACE ELEVATION: 801.69 ft</p> <p>BORING DATE 1/15/22 Water Seepage : 33.5' Water at Completion : 33.2'</p> <p>ABUT A ESTIMATED MICROPILE TIP EL 733.69</p>	<p>LOCATION STATION: OF CL As per plan GROUND SURFACE ELEVATION: 774.70 ft</p> <p>BORING DATE 1/29/22 Water Seepage : 8.5' Water at Completion : 13.9' (11.0' Prior to Adding Water) Notes: Concrete Deck = 9", Top of Ground at Boring = 25.0' Below Top of Deck</p>	<p>LOCATION STATION: OF CL As per plan GROUND SURFACE ELEVATION: 776.71 ft</p> <p>BORING DATE 1/6/22 Water Seepage : 6' Water at Completion : None Observed</p>	<p>LOCATION STATION: OF CL As per plan GROUND SURFACE ELEVATION: 772.02 ft</p> <p>BORING DATE 1/4/22 Water Seepage : 6' Water at Completion : 30'</p>	<p>LOCATION STATION: OF CL As per plan GROUND SURFACE ELEVATION: 782.04 ft</p> <p>BORING DATE 1/3/22 Water Seepage : None Observed Water at Completion : None Observed</p>

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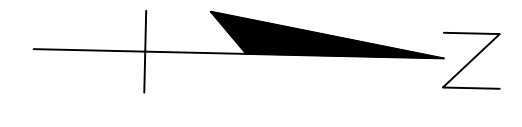
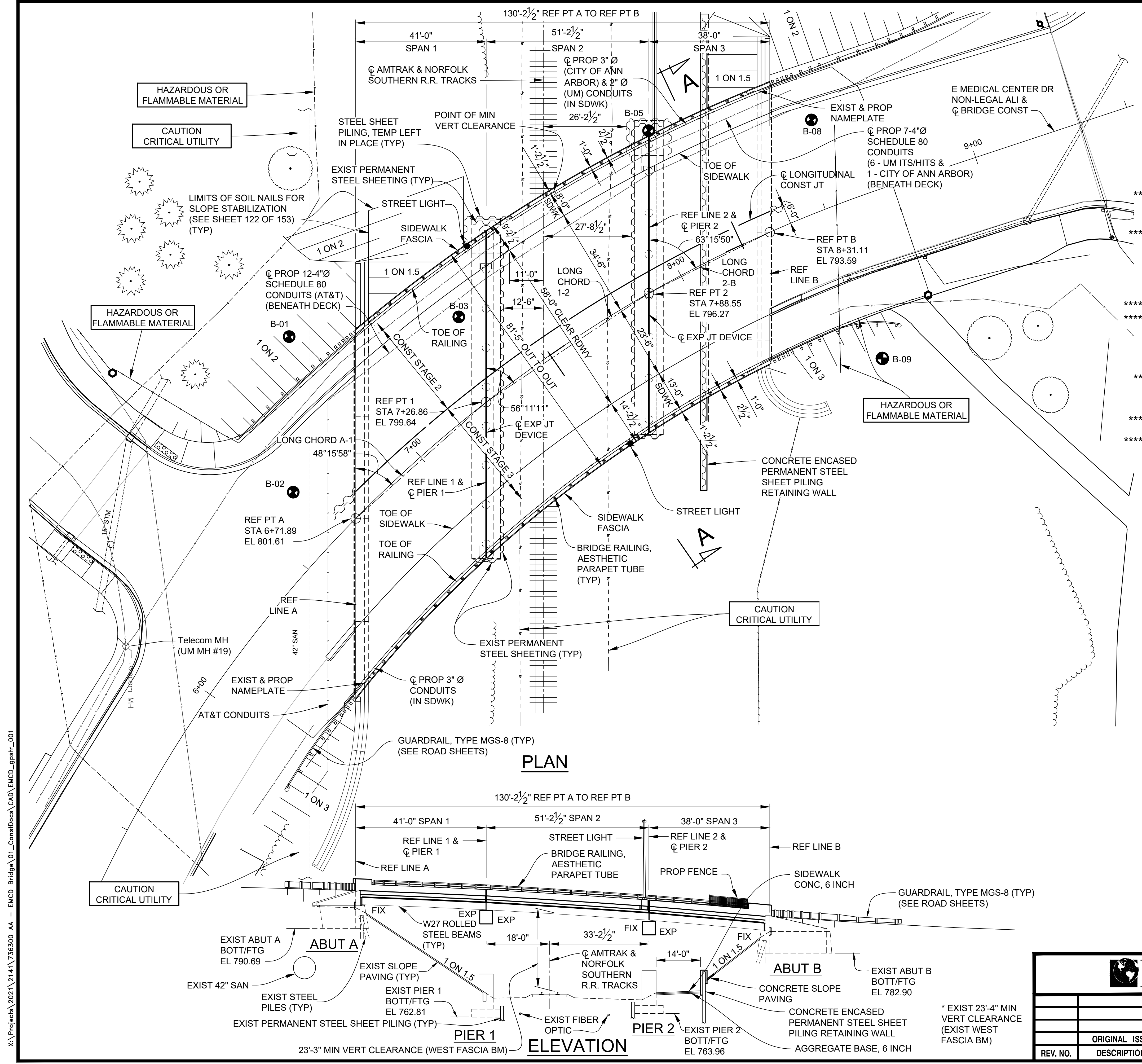
DLZ				PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
				EAST MEDICAL CENTER DRIVE			
				SOIL BORINGS			
SCALE NONE		INCH 0 1		DRAWING NO. 2021-008-BR3			
REV. NO.		DESCRIPTION		DATE		DR.BY CLH	
		ORIGINAL ISSUE		10-9-22		DAF	
						CH.BY	
APPROVED BY				SHEET NO. 66 OF 153			

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		PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE		SCALE NONE	INCH 0 1
SOIL BORINGS		DRAWING NO. 2021-008-BR4	
REV. NO.	DESCRIPTION	DATE	DR. BY CH. BY
1	ORIGINAL ISSUE	10-9-22	DAF CLH
APPROVED BY		SHEET NO. 67 OF 153	



ESTIMATED QUANTITIES THIS SHEET					
DESCRIPTION	UNITS	CATG 0001	CATG 0002	CATG 0003	TOTAL
Relocation and Site Cleanup	Dlr			15,000	15,000
Structures, Rem Portions (STR 11065)	LSUM	0.9	0.1		1
Backfill, Structure, CIP	Cyd	300	300	340	940
Excavation, Fdn	Cyd	300	300	400	1,000
Dewatering System, Excavation	Ea		2		2
Steel Sheet Piling, Temp	Sft	360			360
Steel Sheet Piling, Temp, Left in Place	Sft		360		360
False Decking	Sft	19,840			19,840
Railroad Inspection and Flagging	Dlr	180,000	20,000		200,000
Slope Paving Header	Ft		100	131	231
Slope Paving, Conc	Syd		55	30	85
Conduit, Schedule 80, 4 inch, Structure	Ft	2,920			2,920
Conduit, Schedule 40, 2 inch	Ft		170		170
Conduit, Schedule 40, 3 inch	Ft			330	330

** INCLUDES REMOVAL OF EXISTING RAILINGS, SIDEWALKS, DECK, PIER CAPS, PORTIONS OF CRASHWALLS AND ABUTMENTS, PORTIONS OF SLOPE PAVING BEHIND PIER 2, AND THE EXIST 10'-0" WIDE CONCRETE PAD BEHIND PIER 2.

*** FOR DEWATERING OF PERMANENT STEEL SHEET PILING ENCLOSURES FOR PROPOSED PIER WIDENING.

**** CATG 0002 QUANTITY IS FOR WIDENED PORTIONS OF SLOPE PAVING ON WEST SIDE OF BRIDGE. CATG 0003 QUANTITY IS FOR REPAIRS TO SLOPE PAVING BEHIND PIER 2 AFTER CONSTRUCTION OF CONCRETE ENCASED STEEL SHEET PILING RETAINING WALL.

NOTES:

THE RECONSTRUCTION DESIGN OF THE SUPERSTRUCTURE, PIER CAPS, AND WIDENED SUBSTRUCTURE UNITS IS BASED ON 1.2 TIMES THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING WITH THE EXCEPTION THAT THE DESIGN TANDEM PORTION OF THE HL-93 LOAD DEFINITION IS REPLACED BY A SINGLE 60 KIP AXLE LOAD BEFORE APPLICATION OF THIS 1.2 FACTOR. THE RESULTING LOAD IS DESIGNATED HL-93 MOD. LIVE LOAD PLUS IMPACT DEFLECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH. THE ORIGINAL STRUCTURE WAS DESIGNED FOR HS25 LOADING.

FOR DETAILS OF CONCRETE SLOPE PAVING PROTECTION, SEE MDOT STANDARD PLAN B-102-SERIES.

FALSE DECKING INCLUDES THE AREA BOUNDED BY REFERENCE LINES A & B AND OUTSIDE FLANGE FASCIA'S OF FASCIA BEAMS. THE ESTIMATED AREA IS 9237 SFT DURING REMOVAL AND 10,602 SFT DURING CONSTRUCTION.

INSTALL SHEET PILING USING EITHER AN IMPACT HAMMER OR A VARIABLE MOMENT DRIVER/EXTRACTOR OPERATED TO MINIMIZE VIBRATIONS. DO NOT USE VIBRATORY HAMMERS THAT ARE NOT VARIABLE MOMENT.

SHOES SHALL BE REQUIRED FOR PROP SHEET PILING DUE TO THE ANTICIPATED PRESENCE OF COBBLES/BOULDERS DURING DRIVING.

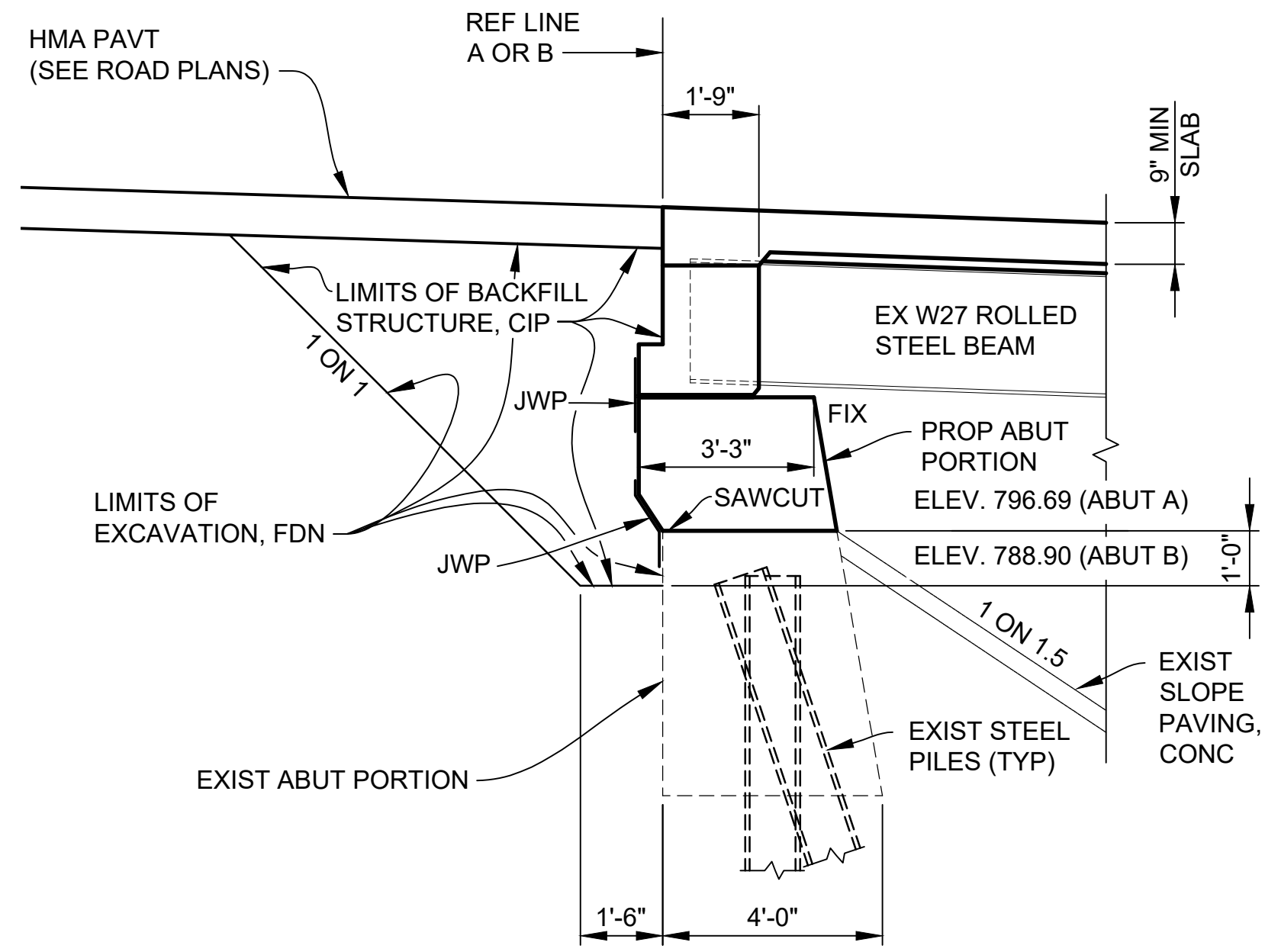
GROUNDWATER MAY BE PRESENT WITHIN THE PROPOSED STEEL SHEETING ENCLOSURES FOR THE PIER WIDENING. THE COST OF DEWATERING IS INCLUDED IN THE PAY ITEM "DEWATERING SYSTEM, EXCAVATION"

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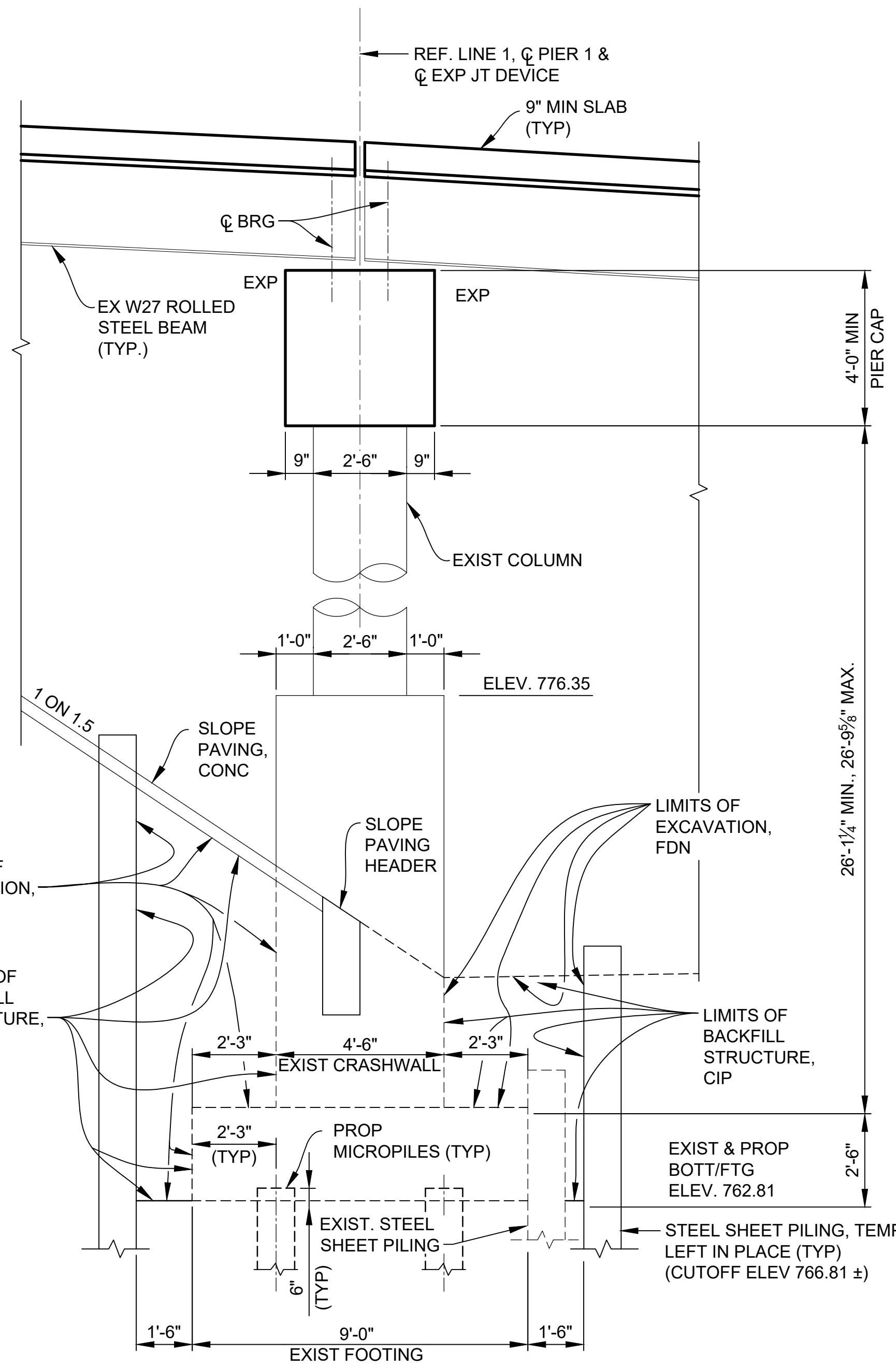
DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
GENERAL PLAN OF STRUCTURE	
SCALE HOR. 1/16"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR6	
SHEET NO. <u>69</u> OF <u>153</u>	
APPROVED BY CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734	

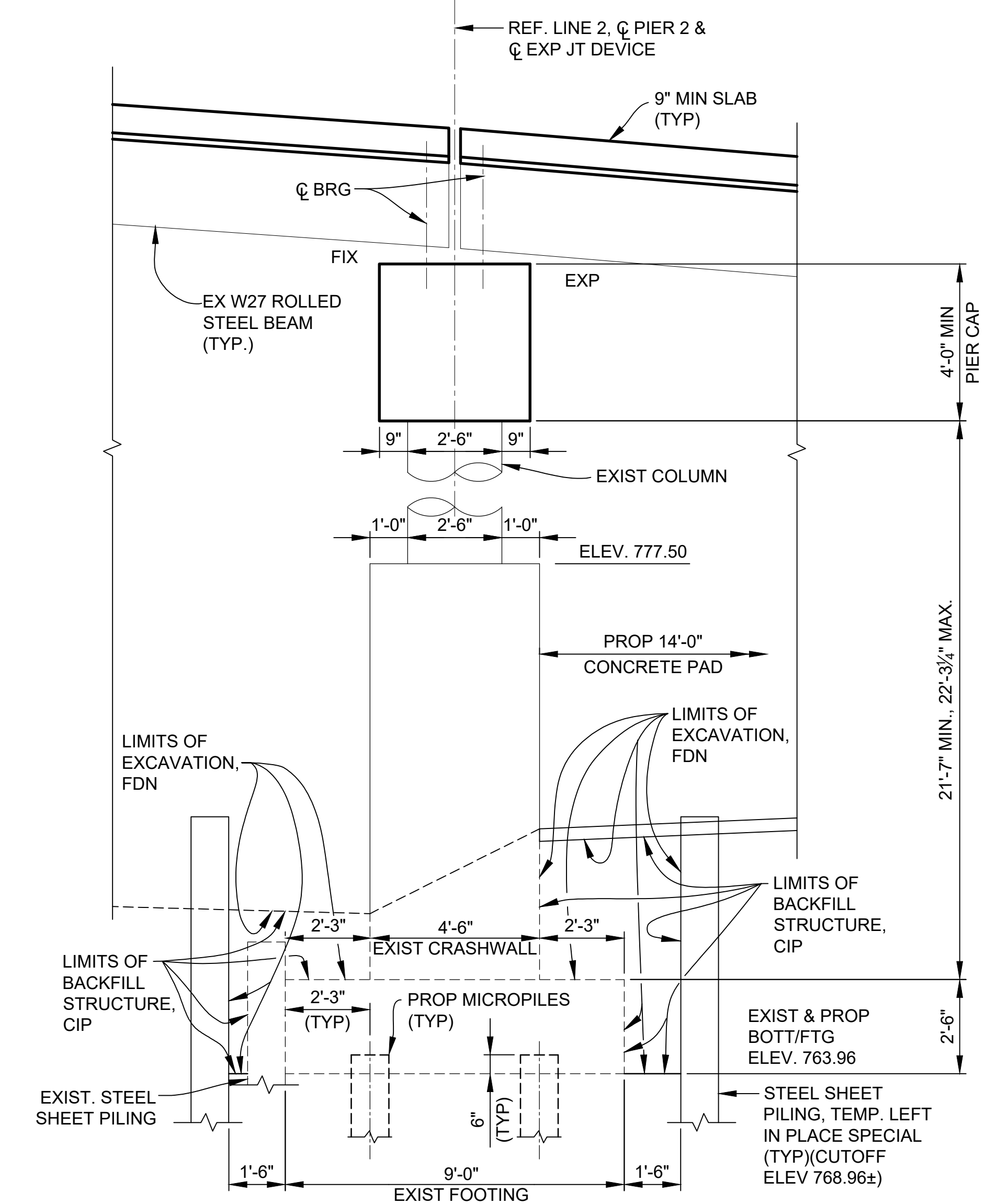
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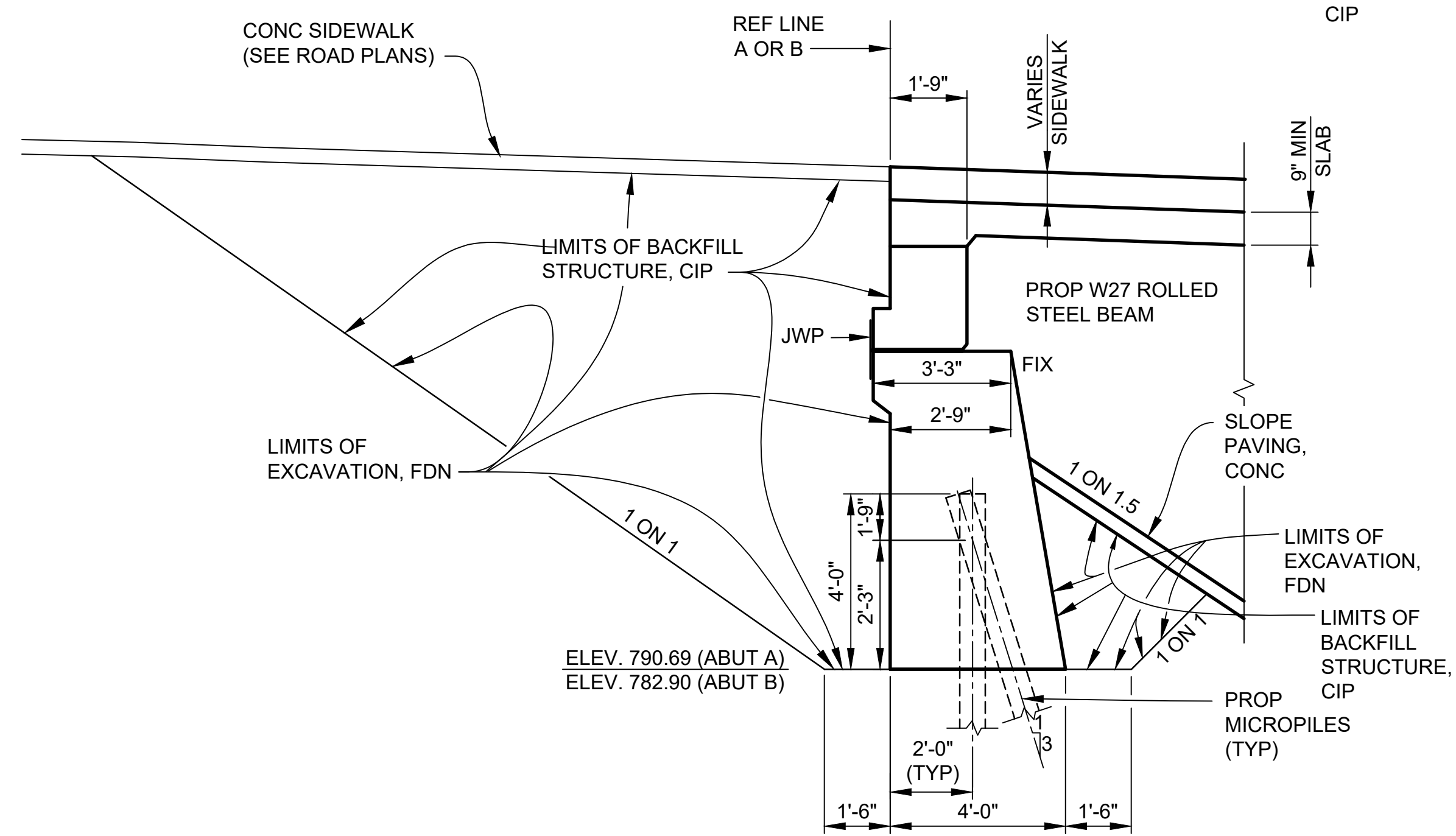
**TYPICAL ABUTMENT SECTION
(PARTIAL REPLACEMENT)**



SECTION AT PIER 1



SECTION AT PIER 2



**TYPICAL ABUTMENT SECTION
(FULL REPLACEMENT)**

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800-482-7171
(TOLL FREE)

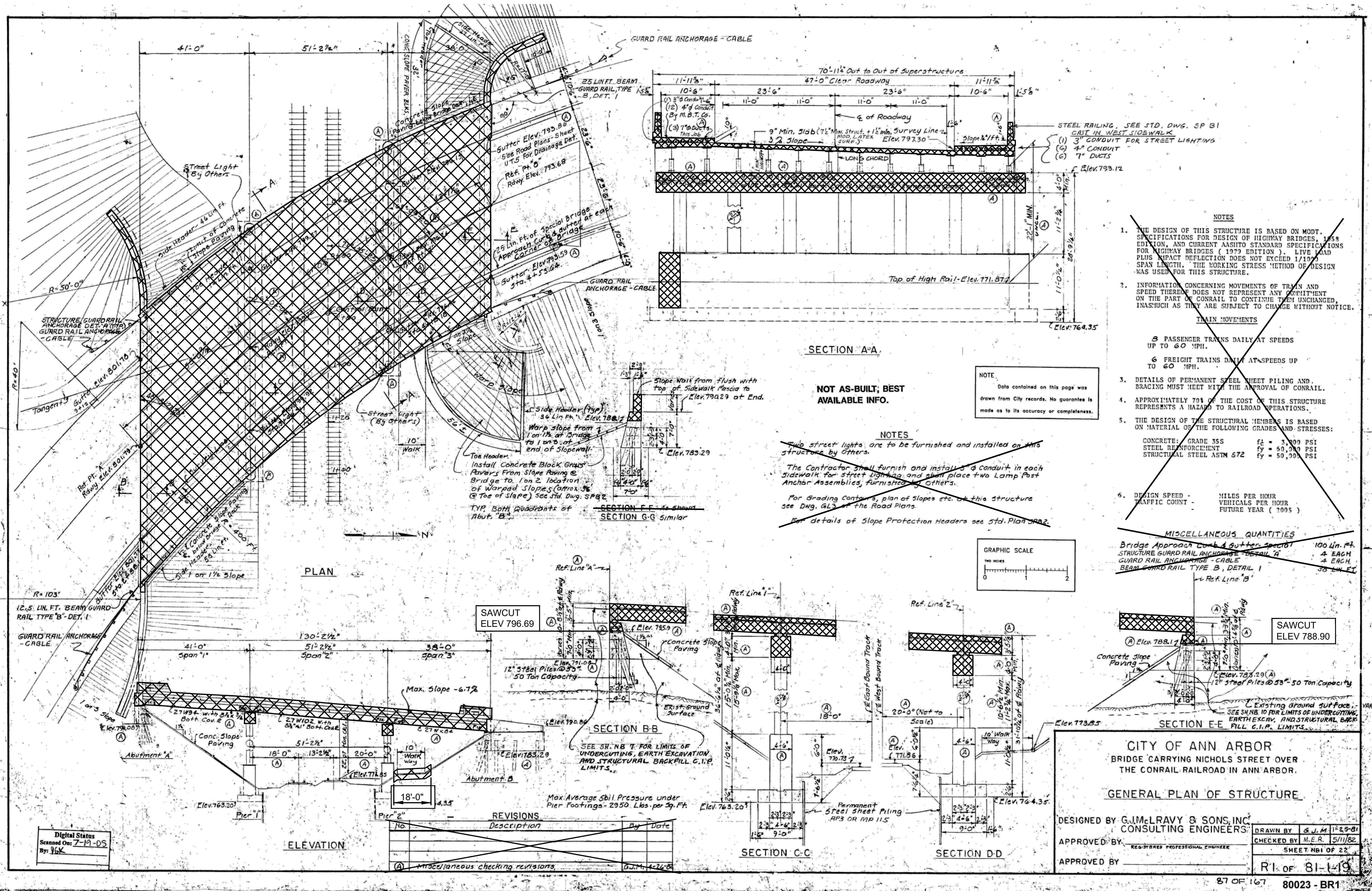
DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
GENERAL PLAN OF STRUCTURE	
SCALE HOR. 3/8"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR8	
SHEET NO. <u>71</u> OF <u>153</u>	

APPROVED BY
CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

X:\Projects\2021\2141\736300 AA - EMCD Bridge\01_Constr\Docs\CAD\EMCD_gpstr_003

X:\Projects\2021\2141\736500_AA - E.M.C.D. Bridge\01_Constr\Docs\CAD\EMCD_rem_001



NOTES:

REMOVE EXISTING RAILINGS, SIDEWALKS, STRUCTURE LIGHTING, AND DECK. CARE SHALL BE TAKEN TO SALVAGE EXISTING SHEAR DEVELOPERS. WHERE EXISTING SHEAR DEVELOPERS ARE DAMAGED THEY SHALL BE REPLACED IN KIND. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".

SAW-CUT THE DECK ON BOTH THE TOP AND BOTTOM SURFACE PRIOR TO DECK REMOVAL PROCEDURES.

EXISTING STRUCTURE NAME PLATES AND TRAFFIC SIGNS SHALL BE SALVAGED, CLEANED AND REINSTALLED ON PROPOSED STRUCTURE. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".

REMOVE EXISTING PIER CAPS AND PORTIONS OF THE CRASH WALL. SALVAGE BLAST CLEAN, AND STRAIGHTEN EXISTING VERTICAL REINFORCEMENT IN PIER COLUMNS AND EMBED IN PROPOSED PIER CAP. SALVAGE BLAST CLEAN, AND STRAIGHTEN EXISTING HORIZONTAL REINFORCEMENT IN THE CRASH WALL. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".

REMOVE PORTIONS OF EXISTING ABUTMENTS. EXISTING REINFORCING STEEL SHALL BE BLAST CLEANED, STRAIGHTENED AND EMBEDDED IN PROPOSED ABUTMENTS. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".

EXISTING BEAMS SHALL BE REMOVED AND PLACED ASIDE FOR REHABILITATION AND GALVANIZING. EXISTING DIAPHRAGMS AND CONNECTION PLATES SHALL BE REMOVED. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".

PLAN ELEVATIONS REFER TO NAVD88 DATUM. ELEVATION EQUATION: PROP ELEV. = EXIST. PLAN ELEV. - 0.39 FT

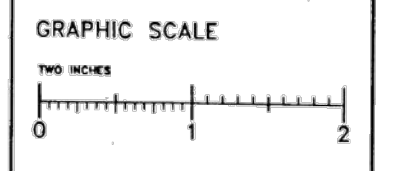
THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY USING THE LEGEND BELOW.

PROPOSED WORK
 DENOTES REMOVAL PORTIONS

- NOTES**
- THE DESIGN OF THIS STRUCTURE IS BASED ON MODT. SPECIFICATIONS FOR DESIGN OF HIGHWAY BRIDGES, 1988 EDITION, AND CURRENT AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (1979 EDITION). LIVE LOAD PLUS IMPACT DEFLECTION DOES NOT EXCEED 1/100 SPAN LENGTH. THE WORKING STRESS METHOD OF DESIGN WAS USED FOR THIS STRUCTURE.
 - INFORMATION CONCERNING MOVEMENTS OF TRAIN AND SPEED THEREOF DOES NOT REPRESENT ANY COMMITMENT ON THE PART OF CONRAIL TO CONTINUE THEM UNCHANGED, INASMUCH AS THEY ARE SUBJECT TO CHANGE WITHOUT NOTICE.
- TRAIN MOVEMENTS**
- 8 PASSENGER TRAINS DAILY AT SPEEDS UP TO 60 MPH.
 - 6 FREIGHT TRAINS DAILY AT SPEEDS UP TO 60 MPH.
- DETAILS OF PERMANENT STEEL SHEET PILING AND BRACING MUST MEET WITH THE APPROVAL OF CONRAIL.
 - APPROXIMATELY 70% OF THE COST OF THIS STRUCTURE REPRESENTS A HAZARD TO RAILROAD OPERATIONS.
 - THE DESIGN OF THE STRUCTURAL MEMBERS IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES:

CONCRETE: GRADE 355	f _c = 3,000 PSI
STEEL REINFORCEMENT	f _y = 60,000 PSI
STRUCTURAL STEEL ASTM 572	f _y = 50,000 PSI
 - DESIGN SPEED - TRAFFIC COUNT -

NILES PER HOUR	VEHICLES PER HOUR
FUTURE YEAR (2005)	



CITY OF ANN ARBOR
BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR.

GENERAL PLAN OF STRUCTURE

DESIGNED BY G.J. McLAVY & SONS, INC.
CONSULTING ENGINEERS

APPROVED BY: _____
REGISTERED PROFESSIONAL ENGINEER

APPROVED BY: _____

DRAWN BY: G.J.M. 11-29-81
CHECKED BY: M.E.R. 5/11/82
SHEET NO. 1 OF 23

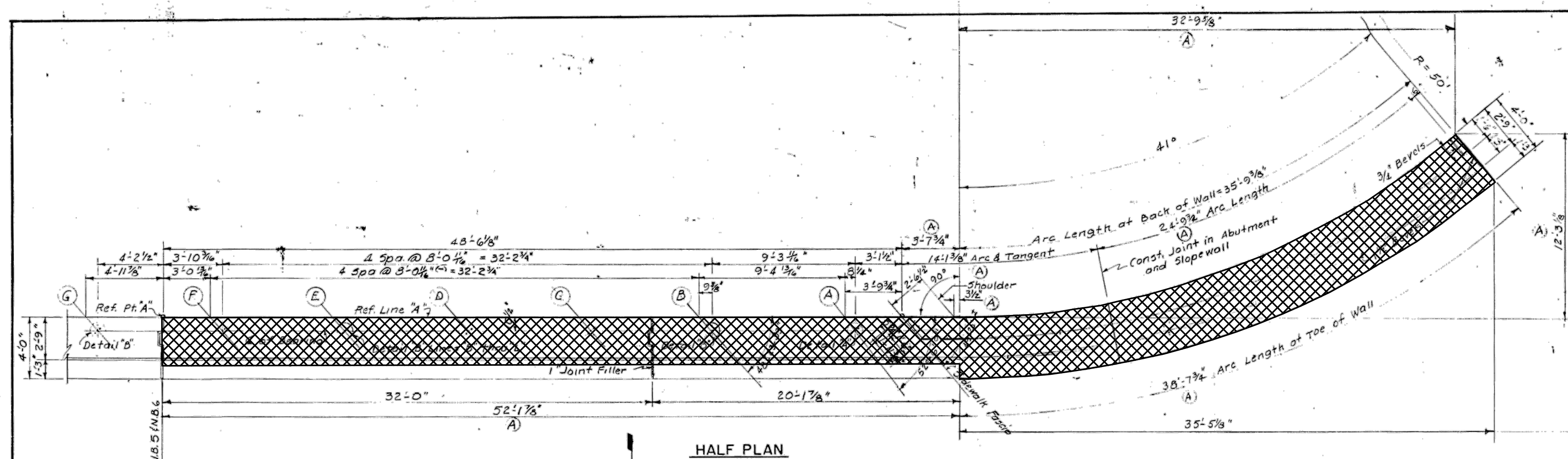
R1 of 81-1-19

87 OF 167 80023 - BR1

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
EAST MEDICAL CENTER DRIVE			
EXISTING GENERAL PLAN OF STRUCTURE REMOVAL			
SCALE	NONE	INCH	0 1
DRAWING NO.	2021-008-BR9		
SHEET NO.	72	OF	153
REV. NO.	DESCRIPTION	DATE	DR. BY CH. BY
	ORIGINAL ISSUE	10-9-22	DAF CLH
APPROVED BY: _____			
CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734			



POUR	LOCATION	CU YDS
A	Wall	35.6
B	Wall	36.9
C	Wall	29.4
D	Wall	29.0
E	Wall	27.1
F	Wall	23.0
G	Sloped Wall	4.6
H	Sloped Wall	4.9
J	Sloped Wall	3.1
K	Sloped Wall	2.9
Total		196.5

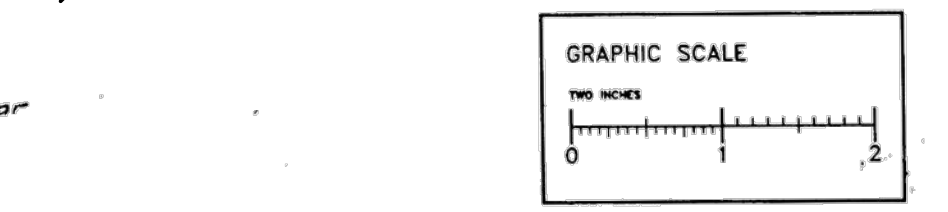
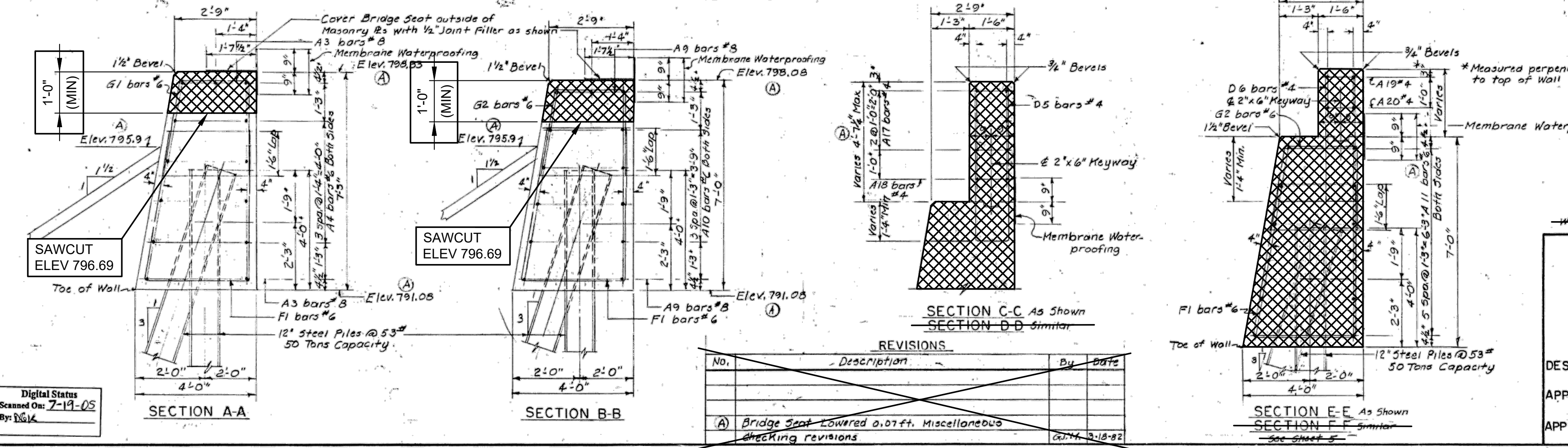
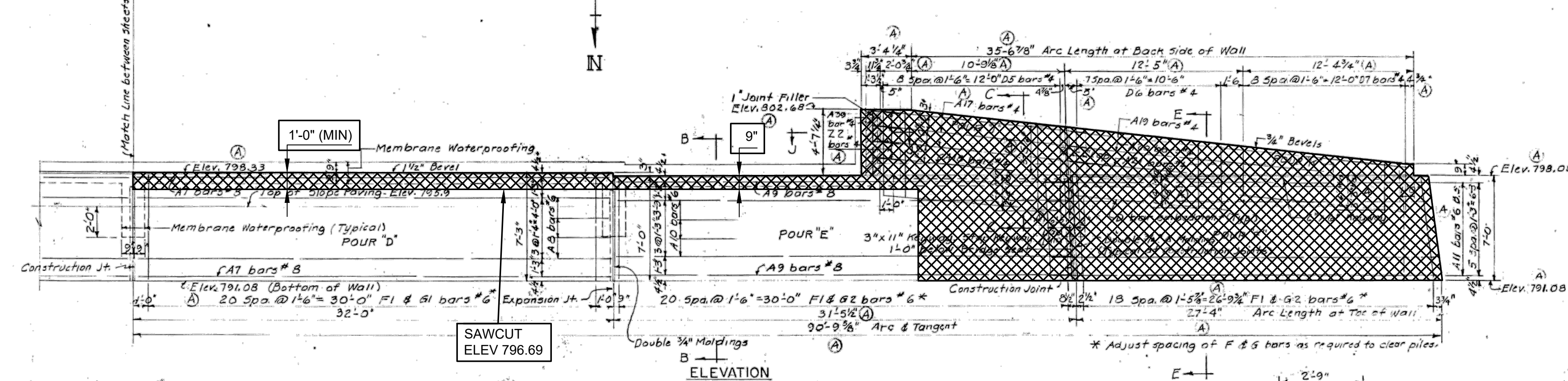
Membrane Waterproofing	320 Sq. Ft.
Concrete Slope Forming 4" Thick	502 Sq. Yds.
Headers - Slope Protection	132 Lin. Ft.
Low Temperature Protection	148 Cu. Yds.

1/2" Joint Filler	152 Sq. Ft.
1" Joint Filler	62 Sq. Ft.

NOTES:
 REMOVE PORTIONS OF EXISTING ABUTMENTS. EXISTING REINFORCING STEEL SHALL BE BLAST CLEANED, STRAIGHTENED AND EMBEDDED IN PROPOSED ABUTMENTS. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".
 PLAN ELEVATIONS REFER TO NAVD88 DATUM. ELEVATION EQUATION: PROP ELEV. = EXIST. PLAN ELEV. -0.39 FT

THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY USING THE LEGEND BELOW.

NOTES:
 Bridge Seats shall be finished to provide true planes at the elevations shown and shall not vary more than 1/8" under a 10' straight edge nor more than 1/16" under any bearing.
 Sloped walls shall not be cast until the superstructure is complete to the tops of the railing bases.
 For molding and bevel details see Std. Dwg. R11.
 After the steel piles are driven and cut off the portions to be embedded in concrete shall be thoroughly cleaned of all loose paint, scale and dirt to ensure that a satisfactory bond between the steel and concrete will be obtained.
 Pile driving equipment shall be in accordance with Art. 5.03 of the Standard Specifications.
 Piles shall be driven with such accuracy that the ends of the piles to be embedded in concrete are within 3 inches of the locations shown on the Plans.
 Joint Filler shall be incidental to Substructure Concrete and will not be paid for separately.



NOTE: Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

NOT AS-BUILT, BEST AVAILABLE INFO.

Work this Sheet with Sheets 5 & 6

CITY OF ANN ARBOR
 BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

ABUTMENT "A" DETAILS

DESIGNED BY G.J. McLAVY & SONS, INC. CONSULTING ENGINEERS
 APPROVED BY [Signature] REGISTERED PROFESSIONAL ENGINEER
 APPROVED BY [Signature]

DRAWN BY [Signature] 10/14/91
 CHECKED BY [Signature] 3/26/92
 SHEET 156 OF 22
 R1 of 81-1-19

No.	Description	By	Date
(A)	Bridge Seat Lowered 0.07 ft. Miscellaneous checking revisions	cd/rl	3-18-92

Digital Status Scanned On: 7-19-05 By: [Signature]

92 OF 167 80023 - BR6

X:\Projects\2021\2141\736300_AA - EMCD Bridge\01_Constr\Docs\CAD\EMCD_rem_003

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

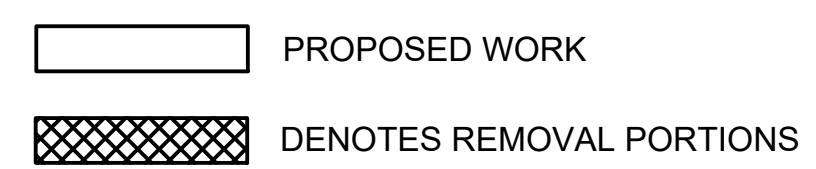
EAST MEDICAL CENTER DRIVE
 EXISTING ABUTMENT A DETAILS
 REMOVAL

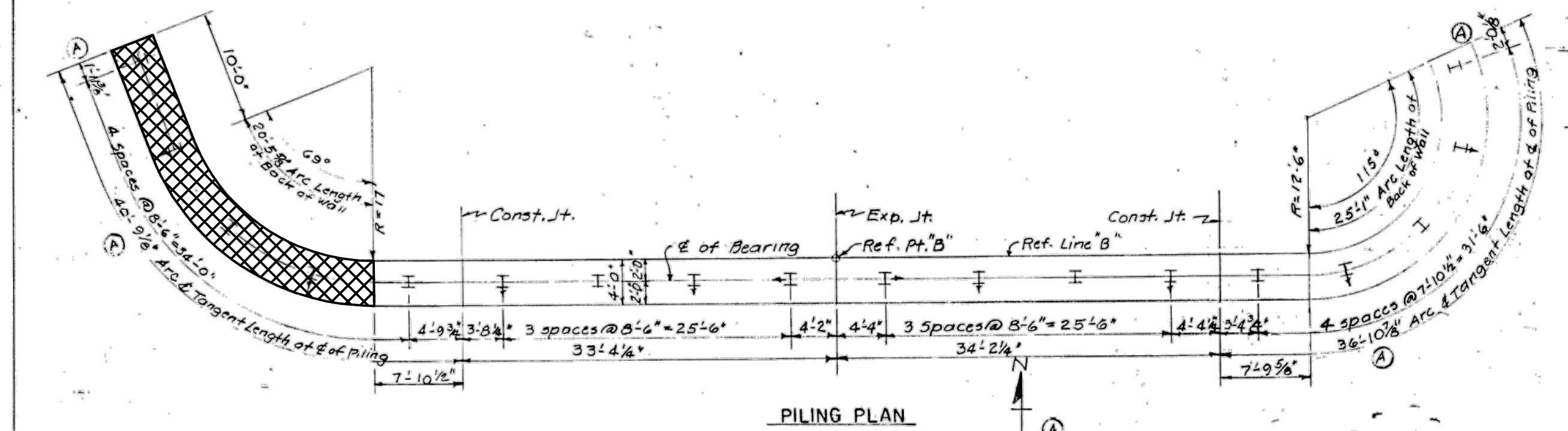
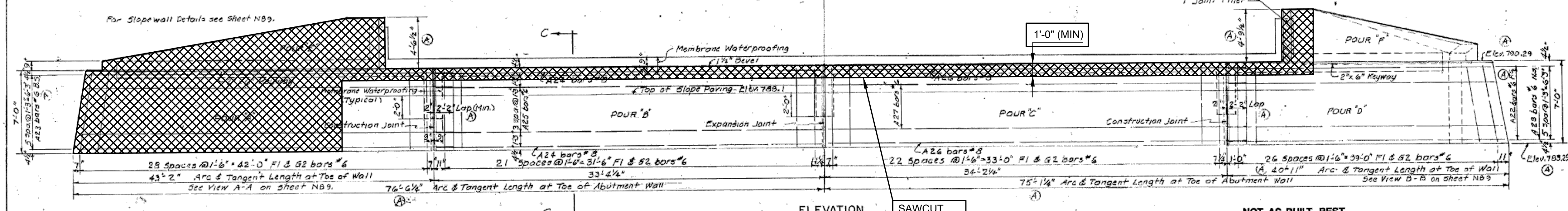
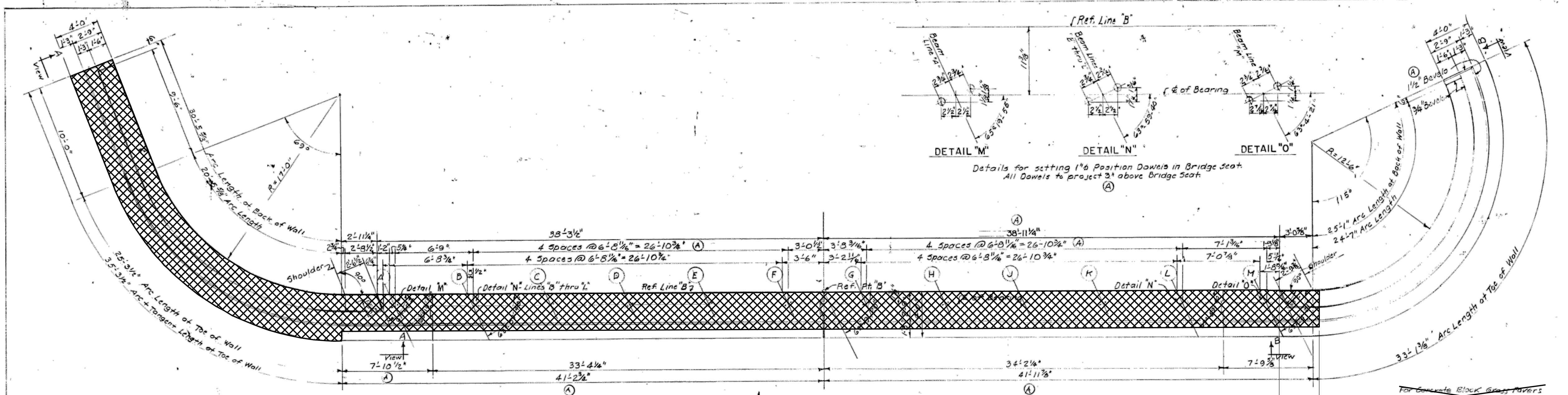
SCALE NONE 0 INCH 1

DRAWING NO. 2021-008-BR11
 SHEET NO. 74 OF 153

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

NOTES:
 REMOVE PORTIONS OF EXISTING ABUTMENTS. EXISTING REINFORCING STEEL SHALL BE BLAST CLEANED, STRAIGHTENED AND EMBEDDED IN PROPOSED ABUTMENTS. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".
 PLAN ELEVATIONS REFER TO NAVD88 DATUM. ELEVATION EQUATION: PROP ELEV. = EXIST. PLAN ELEV. -0.39 FT

THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY USING THE LEGEND BELOW.




BILL OF 12" STEEL PILES AT 53 LBS. 55 TON CAPACITY-ABUTMENT "B"

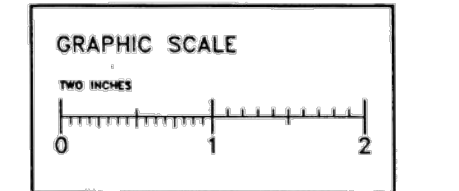
PILING LEGEND	Number Required	Est. Length - Lin. Ft. - Furnished and Driven		Splices
		Each	Total	
Vertical Pile	1	22	22	5
Batter Pile - Perp. to E of Bearing	1	25	25	5
Batter Pile - Parallel with E of Bearing	2	25	50	1
Totals		442	442	11

MISCELLANEOUS QUANTITIES

Membrane Waterproofing	220 Sq. Ft.
Concrete Slope Paving - 1" Min. Thickness	358 Sq. Yds.
Headers - Slope Paving & Grass Pavers	274 Lin. Ft.
Low Temperature Protection - Subst. Concrete	126 Cu. Yds.
3" Thick Concrete Black Grass Pavers	270 Sq. Yds.
INCIDENTAL QUANTITIES	
1/2" Joint Filler	113 Sq. Ft.
1" Joint Filler	57 Sq. Ft.
Total	137.0

SUBSTRUCTURE CONCRETE ABUTMENT "B"

POUR	LOCATION	CU. YDS.
A	Wall	25.7
B	Wall	29.2
C	Wall	29.9
D	Wall	32.3
E	Sloped Wall	5.3
F	Spillway	4.6
Total		137.0



NOTE
 Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

CITY OF ANN ARBOR
 BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

ABUTMENT "B" DETAILS

DESIGNED BY GJM LRAVY & SONS, INC. CONSULTING ENGINEERS
 APPROVED BY: [Signature] REGISTERED PROFESSIONAL ENGINEER
 SHEET 18B OF 22

REVISIONS

No.	Description	By	Date
(A)	Bridge seat ELEV. changed. Also miscellaneous stacking. Revisions in Dimensions and Quantities	GJM	3-12-82

Digital Status
 Scanned On: 7-10-05
 By: DKG

94 OF 167
 80023 - BR8

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE
 EXISTING ABUTMENT B DETAILS
 REMOVAL

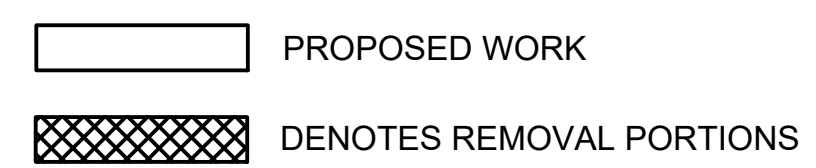
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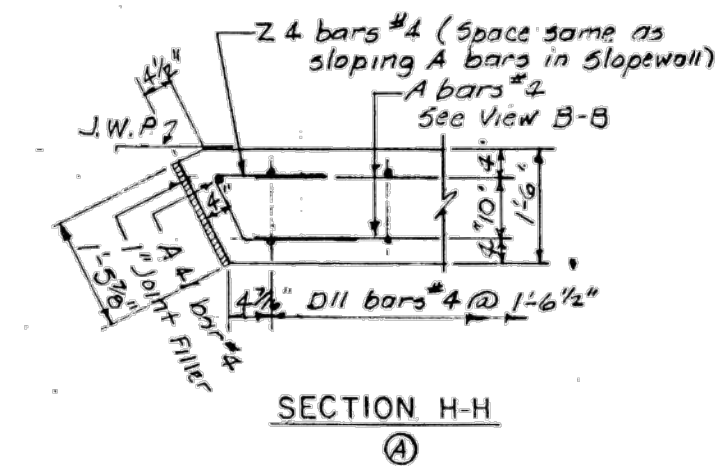
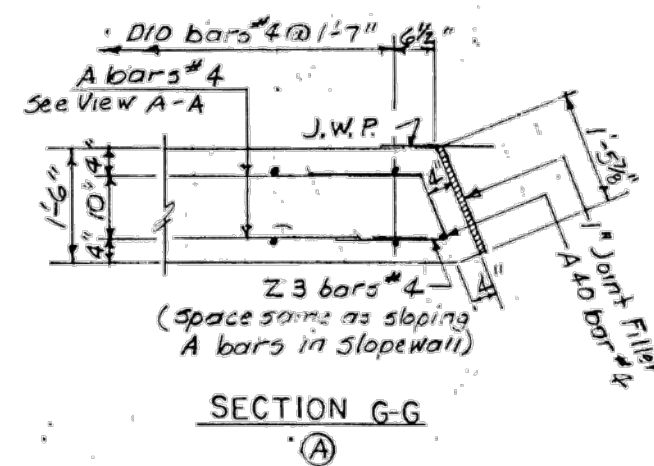
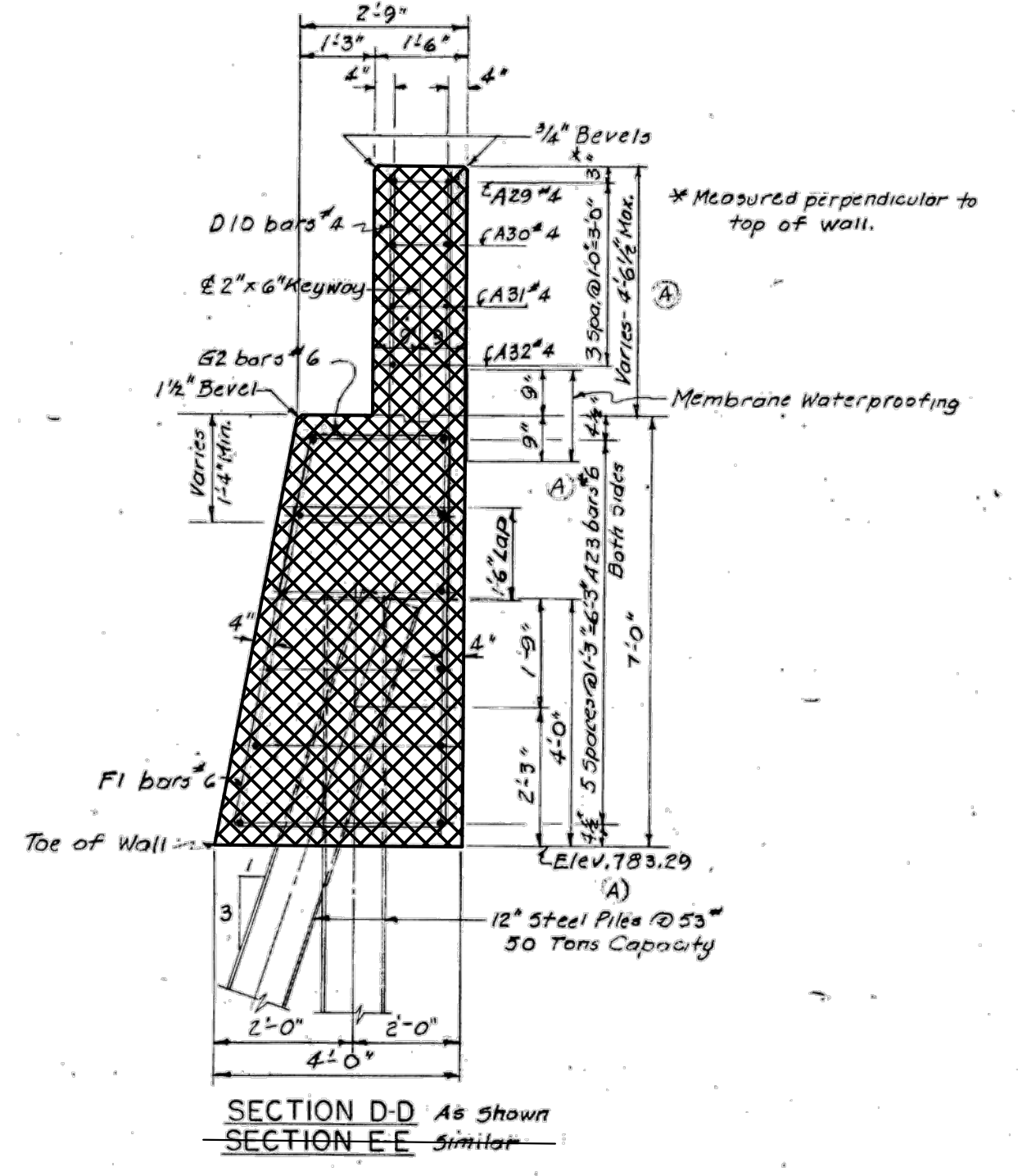
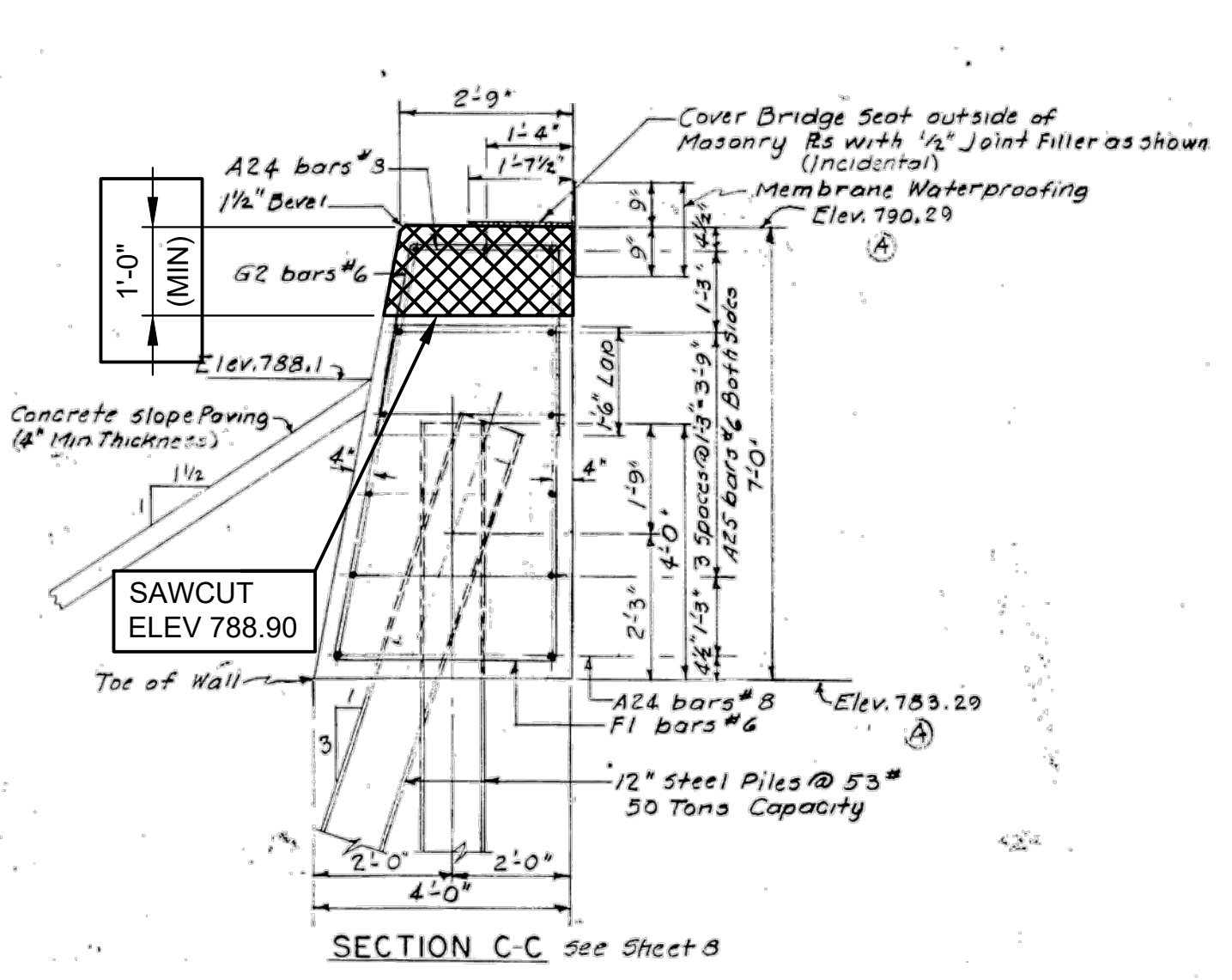
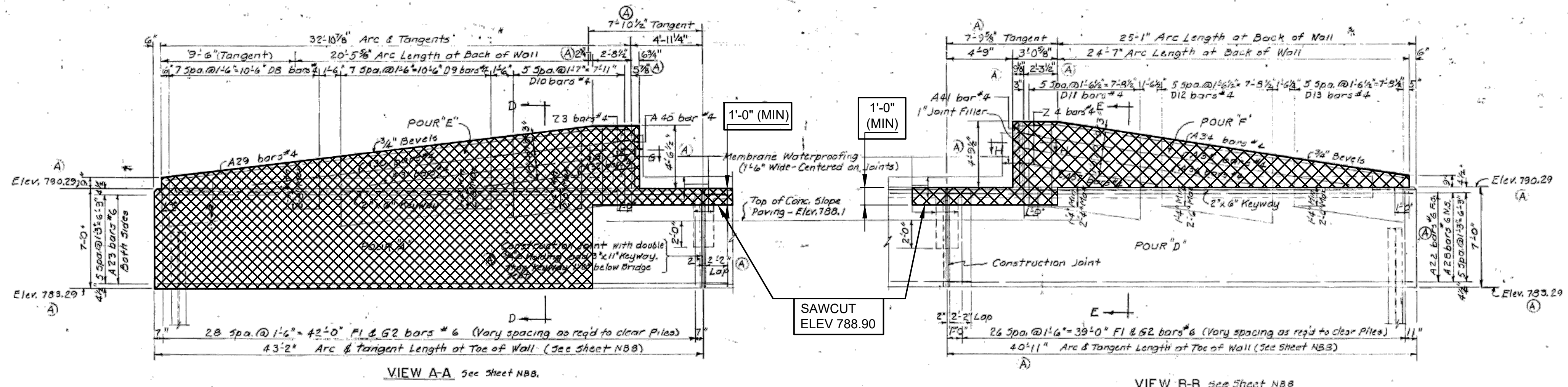
DRAWING NO. **2021-008-BR12**

SHEET NO. 75 OF 153

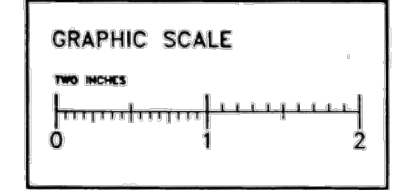
APPROVED BY: [Signature]

NOTES:
 REMOVE PORTIONS OF EXISTING ABUTMENTS. EXISTING REINFORCING STEEL SHALL BE BLAST CLEANED, STRAIGHTENED AND EMBEDDED IN PROPOSED ABUTMENTS. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".
 PLAN ELEVATIONS REFER TO NAVD88 DATUM. ELEVATION EQUATION: PROP ELEV. = EXIST. PLAN ELEV. -0.39 FT

THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY USING THE LEGEND BELOW.




NOTE
 Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.



NOT AS-BUILT, BEST AVAILABLE INFO.

Work this Sheet with Sheet NBB & NB10

CITY OF ANN ARBOR
 BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

ABUTMENT "B" DETAILS

DESIGNED BY G.J.McLRAVY & SONS, INC. CONSULTING ENGINEERS
 APPROVED BY _____ REGISTERED PROFESSIONAL ENGINEER
 APPROVED BY _____

DRAWN BY G.J.M. 10-23-91
 CHECKED BY M.ROBINSON 4/1/92
 SHEET NBB OF 22

RI of 81-1-19

95 OF 167 80023 - BR9

REVISIONS			
No.	Description	By	Date
(A)	Bridge seat lowered 0.07 ft. and miscellaneous checking revisions. Sections G-G and H-H added.	GJM	8-20-92

Digital Status
 Scanned On: 7-19-05
 By: D.G.K.

X:\Projects\2021\2141\736300_AA - EMCD Bridge\01_Constr\Docs\CAD\EMCD_rem_005

3 WORKING DAYS BEFORE YOU DIG
 CALL MISS DIG
 800-482-7171 (TOLL FREE)

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

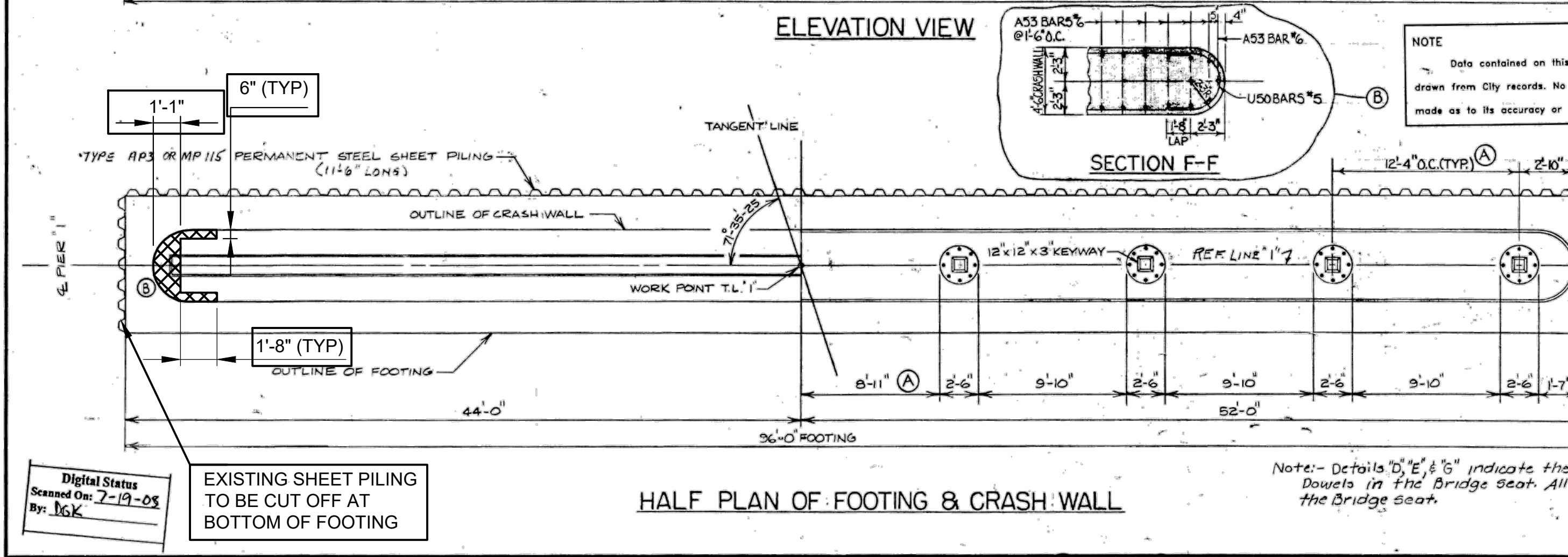
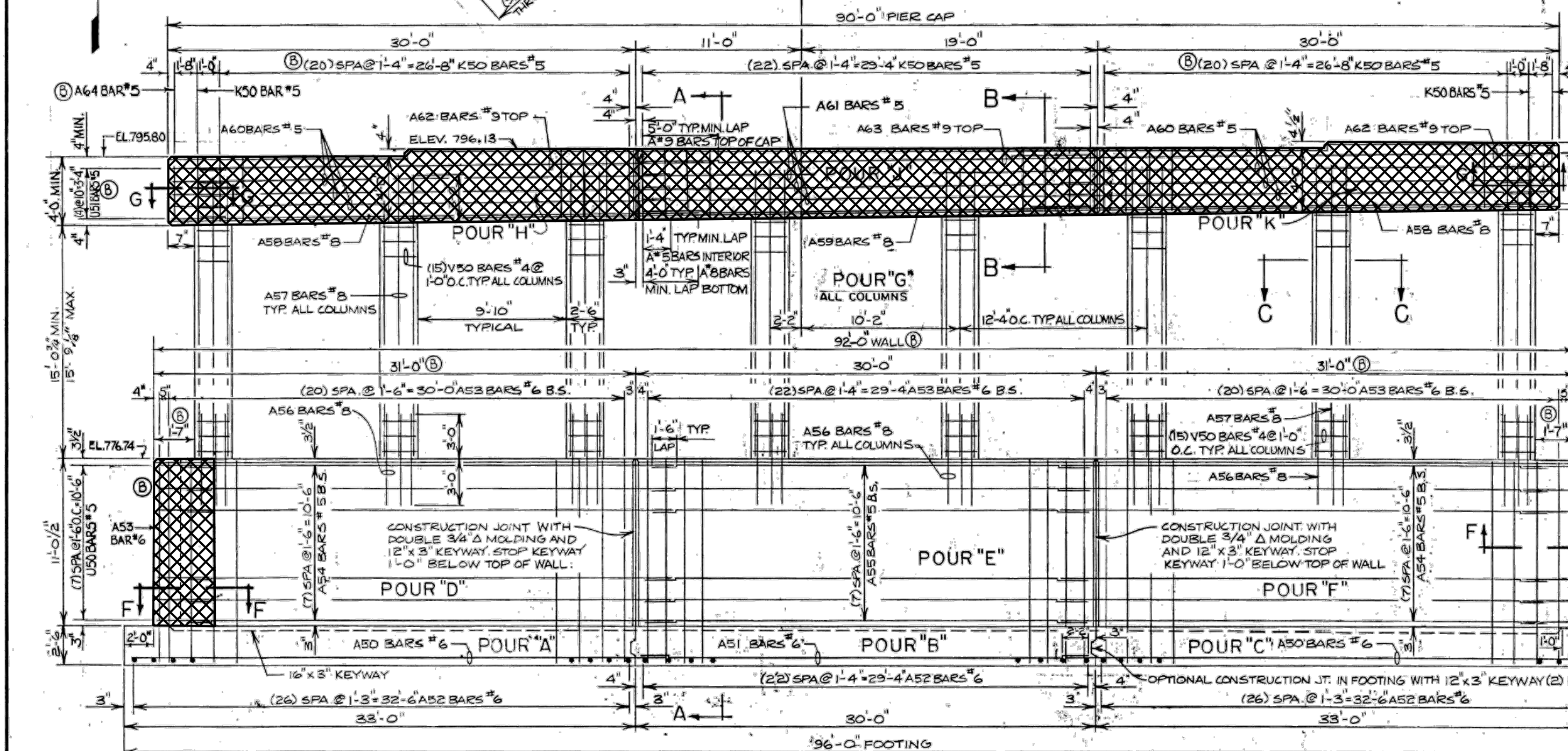
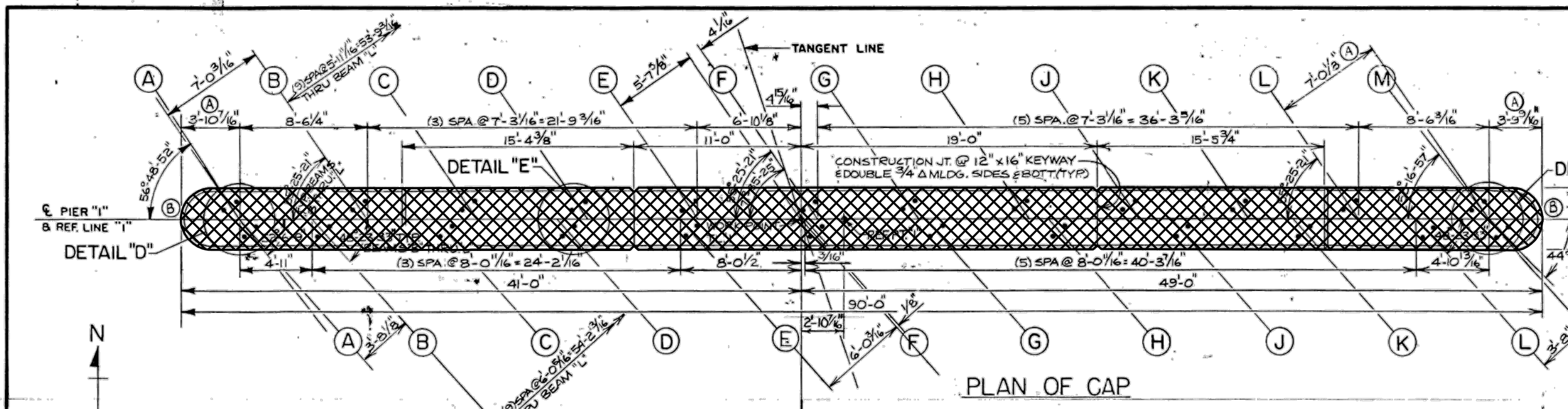
EAST MEDICAL CENTER DRIVE
 EXISTING ABUTMENT B DETAILS
 REMOVAL

SCALE NONE 0 INCH 1

DRAWING NO. 2021-008-BR13
 SHEET NO. 76 OF 153

APPROVED BY _____

CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



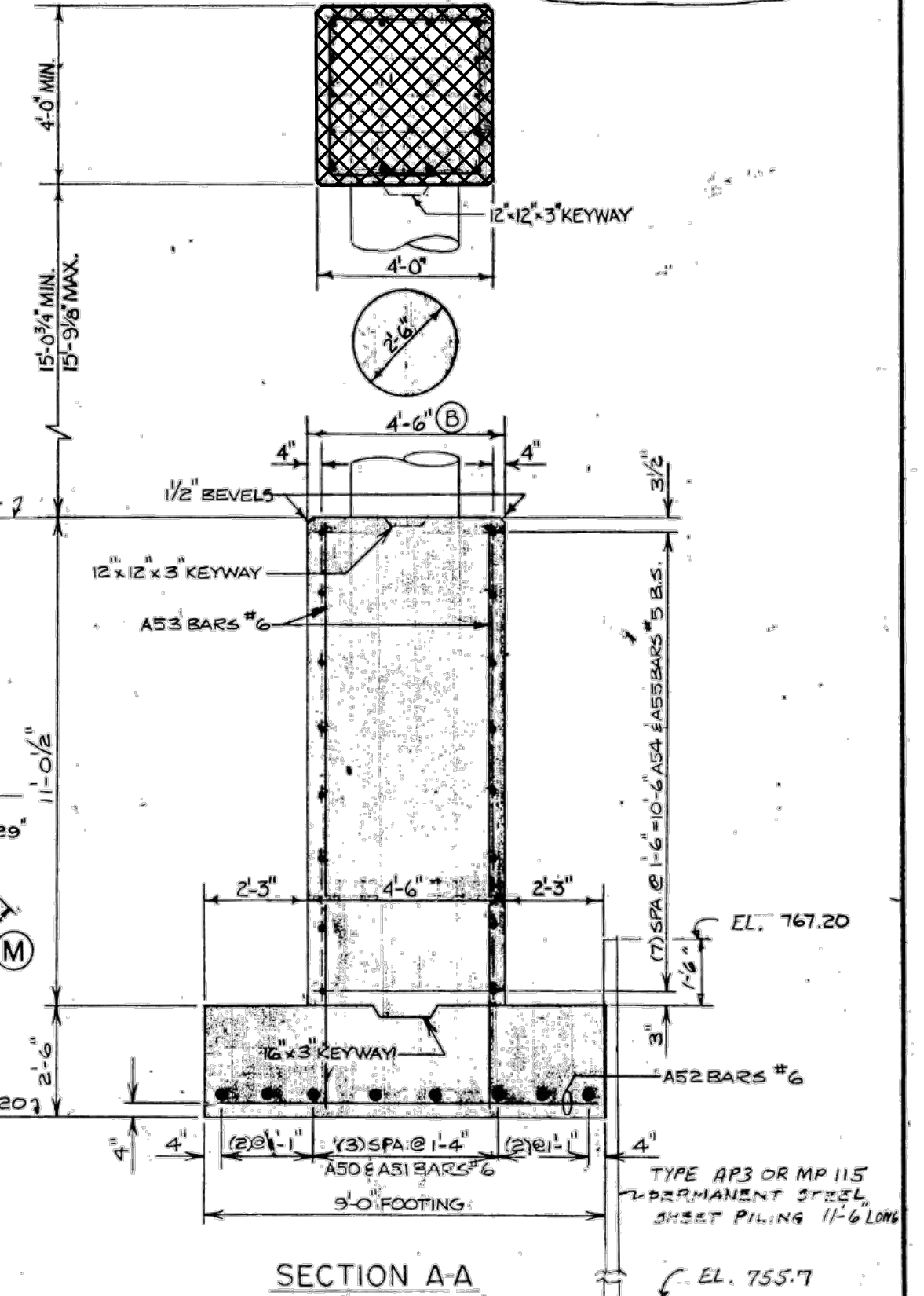
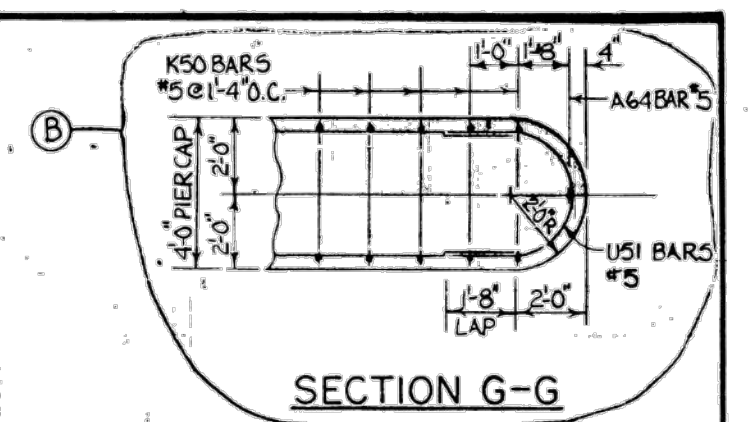
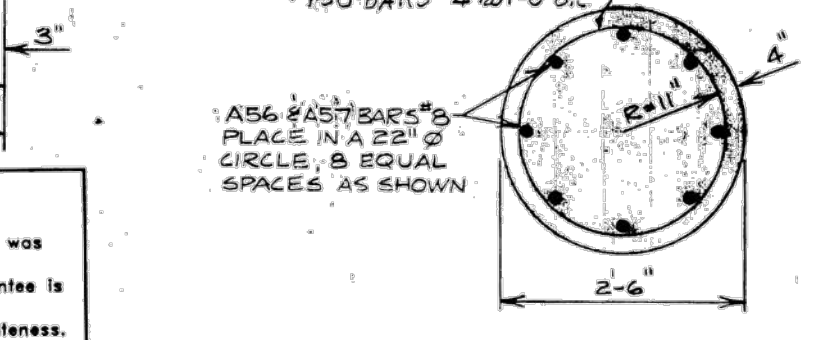
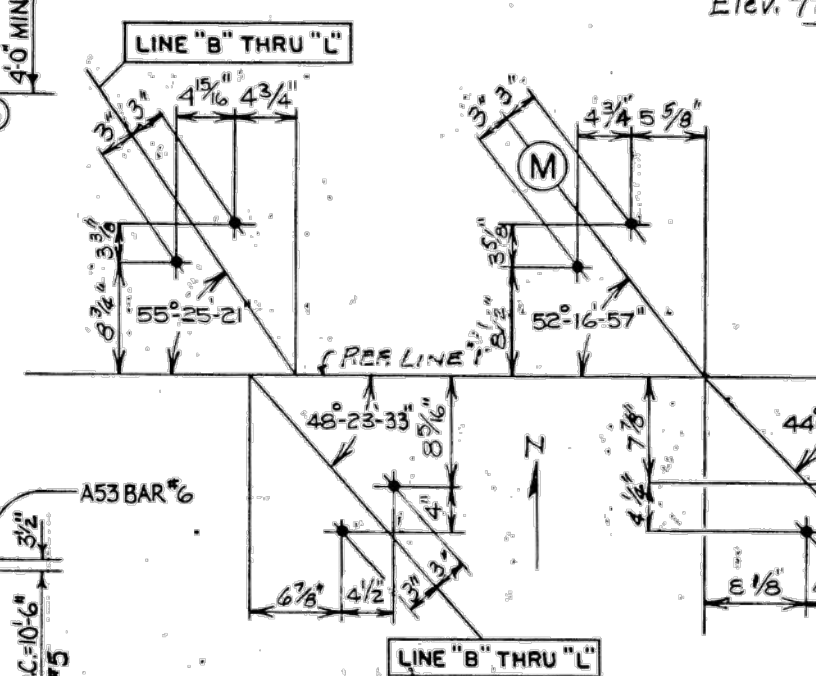
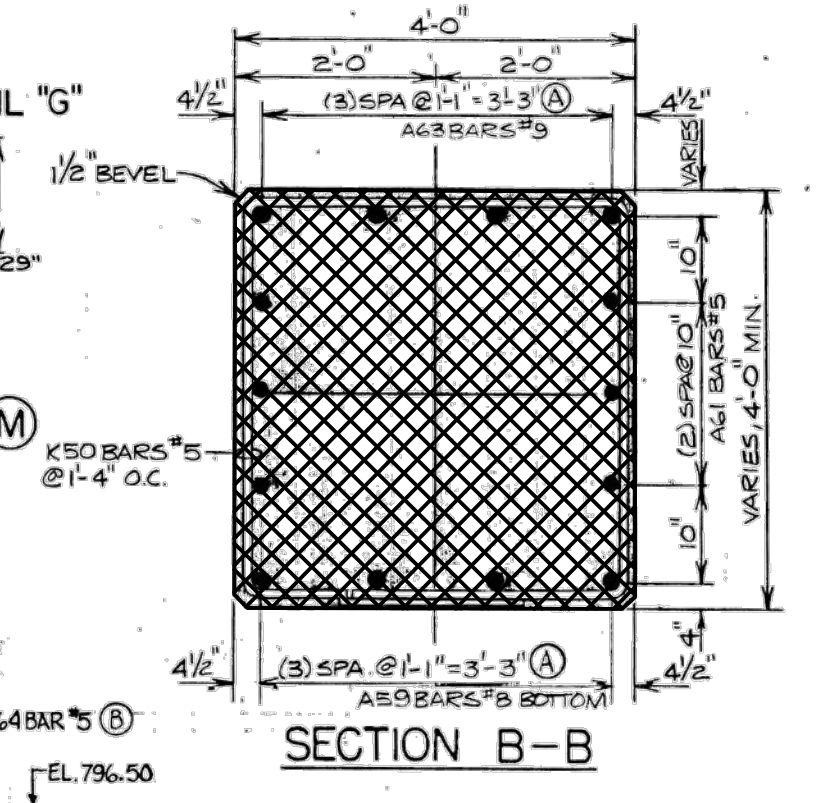
Digital Status
Scanned On: 7-19-08
By: JCK

EXISTING SHEET PILING
TO BE CUT OFF AT
BOTTOM OF FOOTING

HALF PLAN OF FOOTING & CRASH WALL

Note: Details "D", "E", & "G" indicate the locations of 1/2" Position
Dowels in the Bridge Seat. All Dowels to project 1/2" above
the Bridge Seat.

NOT AS-BUILT, BEST
AVAILABLE INFO.



POUR	LOCATION	CU. YDS.
A	Footing	27.5
B	Footing	25.0
C	Footing	27.5
D	Wall	57.0
E	Wall	55.2
F	Wall	57.0
G	Columns	22.2
H	Cap	18.0
J	Cap	18.5
K	Cap	18.0
Total		325.9

MISCELLANEOUS QUANTITIES	
Permanently Steel Sheet Piling	131 Sq. Ft.
Protective Sealant Coating for Concrete	360 Sq. Ft.
Low Temperature Protection Substructure Concrete	316.7 Cu. Yds.

NO.	DESCRIPTION	BY	DATE
1	CRASH WALL & PIER CAP ENDS ROUNDED	MER	4/18/02
2	CHECKING REVISIONS	6MC	4/18/02

CITY OF ANN ARBOR
BRIDGE CARRYING NICHOLS STREET OVER
THE CONRAIL RAILROAD IN ANN ARBOR

PIER "I" DETAILS

DESIGNED BY G.J. McLRAY & SONS, INC. CONSULTING ENGINEERS
APPROVED BY [Signature]
APPROVED BY [Signature]

DRAWN BY GMC 4/01
CHECKED BY M. ROBINSON 3/26/02
SHEET NB01 OF 23
RI OF 81-1-19

NOTES:
REMOVE EXISTING PIER CAPS AND PORTIONS OF THE CRASH WALL. SALVAGE BLAST CLEAN, AND STRAIGHTEN EXISTING VERTICAL REINFORCEMENT IN PIER COLUMNS AND EMBED IN PROPOSED PIER CAP. SALVAGE BLAST CLEAN, AND STRAIGHTEN EXISTING HORIZONTAL REINFORCEMENT IN THE CRASH WALL. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".
PLAN ELEVATIONS REFER TO NAVD88 DATUM.
ELEVATION EQUATION:
PROP ELEV. = EXIST. PLAN ELEV. -0.39 FT

THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY USING THE LEGEND BELOW.

PROPOSED WORK
DENOTES REMOVAL PORTIONS

X:\Projects\2021\2141\736500_AA - EMCD Bridge\01_Constr\Docs\CAD\EMCD_rem_006

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

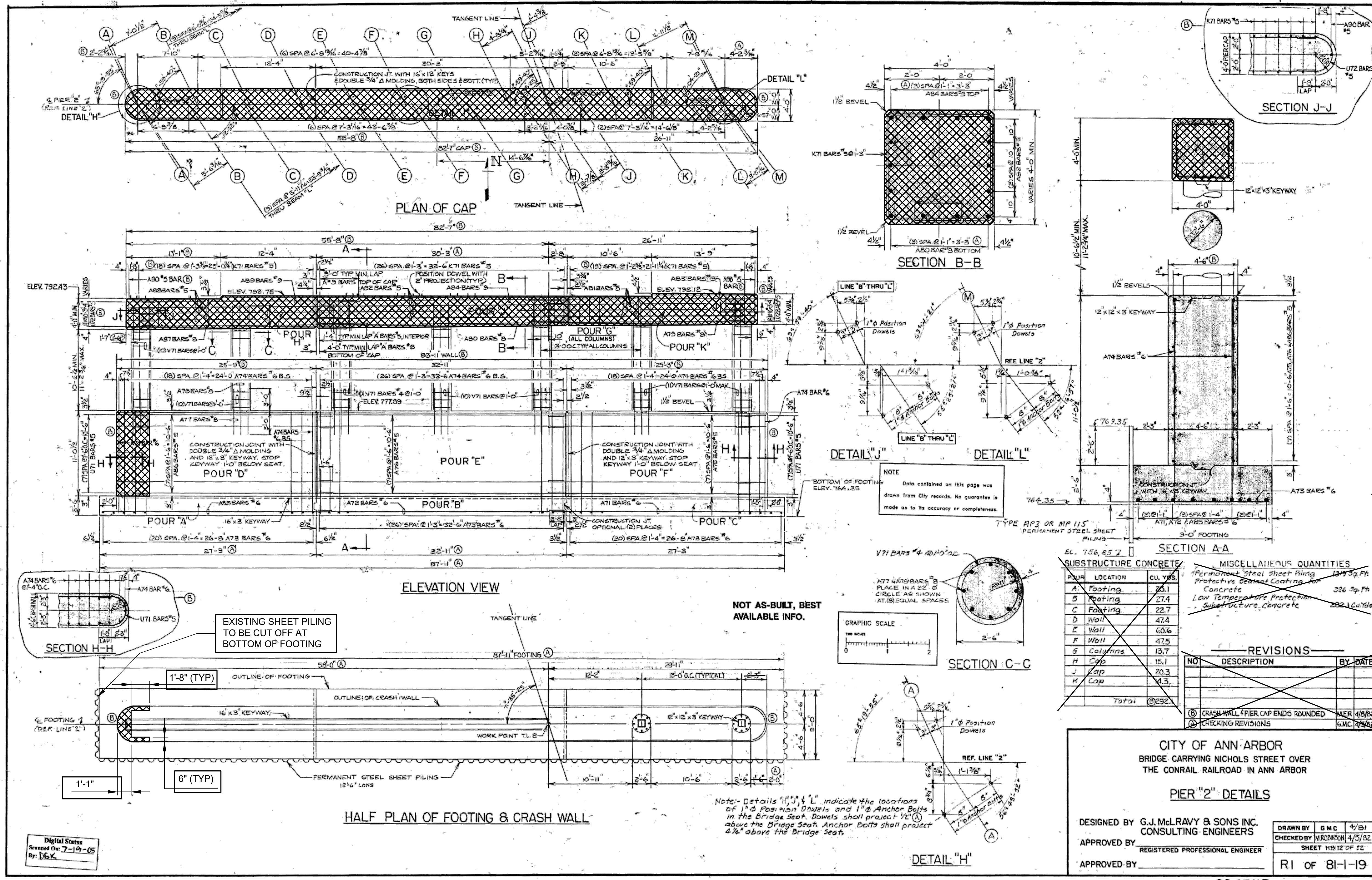
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE
EXISTING PIER 1 DETAILS
REMOVAL

SCALE NONE 0 INCH 1
DRAWING NO. 2021-008-BR14
SHEET NO. 77 OF 153

APPROVED BY [Signature]
CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

X:\Projects\2021\2141\736300_AA - EMCD Bridge\01_Constr\Docs\CAD\EMCD_rem_007



NOTES:

REMOVE EXISTING PIER CAPS AND PORTIONS OF THE CRASH WALL. SALVAGE BLAST CLEAN, AND STRAIGHTEN EXISTING VERTICAL REINFORCEMENT IN PIER COLUMNS AND EMBED IN PROPOSED PIER CAP. SALVAGE BLAST CLEAN, AND STRAIGHTEN EXISTING HORIZONTAL REINFORCEMENT IN THE CRASH WALL. INCLUDED IN THE BID ITEM "STRUCTURES, REHABILITATION, REM PORTIONS (STR 11065)".

PLAN ELEVATIONS REFER TO NAVD88 DATUM.
ELEVATION EQUATION:
PROP ELEV. = EXIST. PLAN ELEV. -0.39 FT

THE ONLY ITEMS OF WORK TO BE DONE FROM THIS SHEET ARE IDENTIFIED BY USING THE LEGEND BELOW.

EL. 756.857

POUR	LOCATION	CU. YDS.
A	Footing	23.1
B	Footing	27.4
C	Footing	22.7
D	Wall	47.4
E	Wall	60.6
F	Wall	47.5
G	Columns	13.7
H	Cap	15.1
J	Cap	20.3
K	Cap	4.3
Total		292.1

MISCELLANEOUS QUANTITIES

- Permanent Steel Sheet Piling 137.39 Ft
- Protective Seamat Coating for Concrete 386 Sq. Ft
- Low Temperature Protection - Substructure Concrete 682.1 Cu Yds

REVISIONS		
NO	DESCRIPTION	BY DATE
1	CRASH WALL & PIER CAP ENDS ROUNDED	NER 4/18/22
2	CHECKING REVISIONS	GMC 7/5/22

CITY OF ANN ARBOR
BRIDGE CARRYING NICHOLS STREET OVER
THE CONRAIL RAILROAD IN ANN ARBOR

PIER "2" DETAILS

DESIGNED BY G.J. McLAVY & SONS INC.
CONSULTING ENGINEERS

APPROVED BY _____
REGISTERED PROFESSIONAL ENGINEER

APPROVED BY _____

DRAWN BY GMC 4/21
CHECKED BY M.ROBINSON 4/21/22
SHEET 119 OF 22

RI OF 81-19

Digital Stamp
Scanned On: 7-19-05
By: [Signature]

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REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

EXISTING PIER 2 DETAILS
REMOVAL

SCALE: NONE

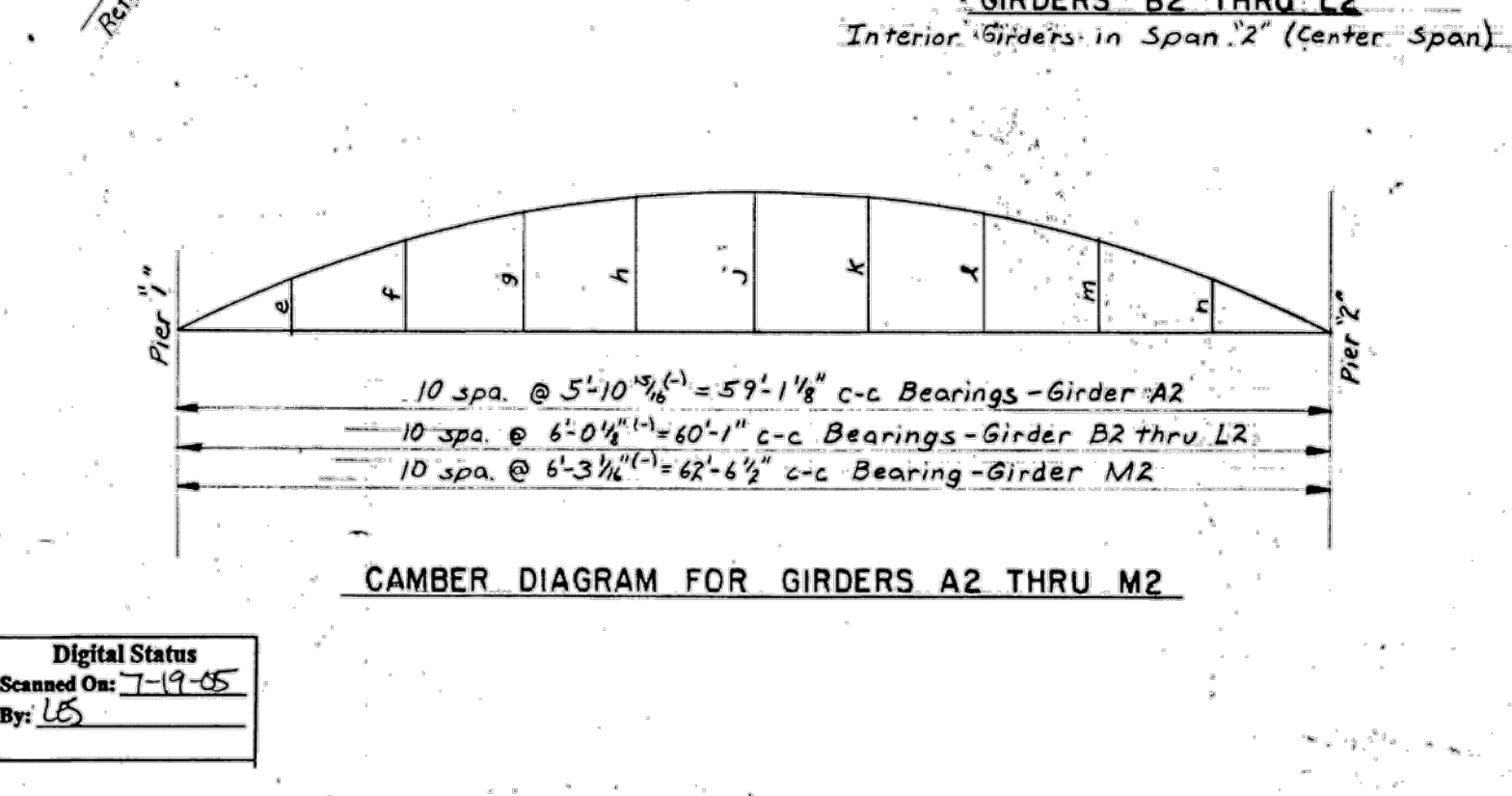
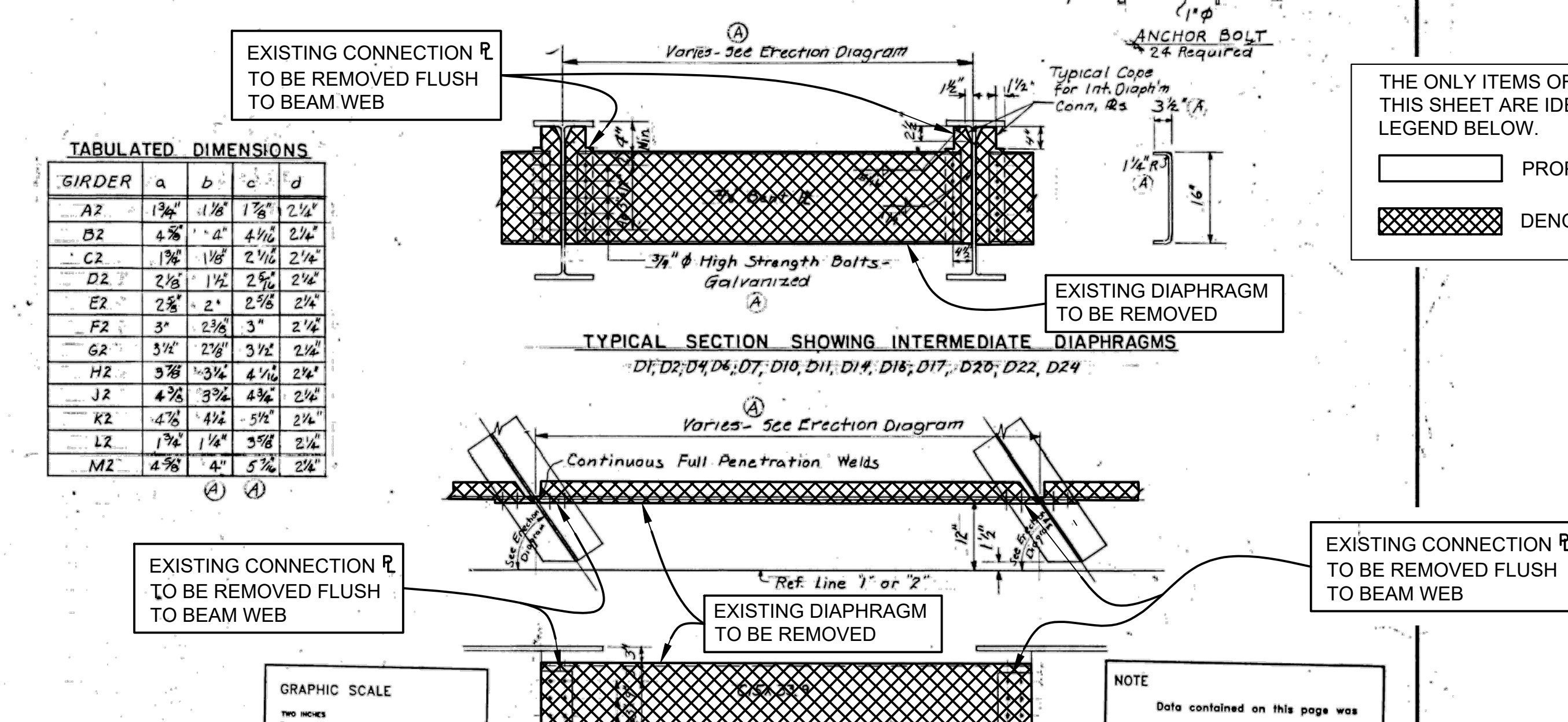
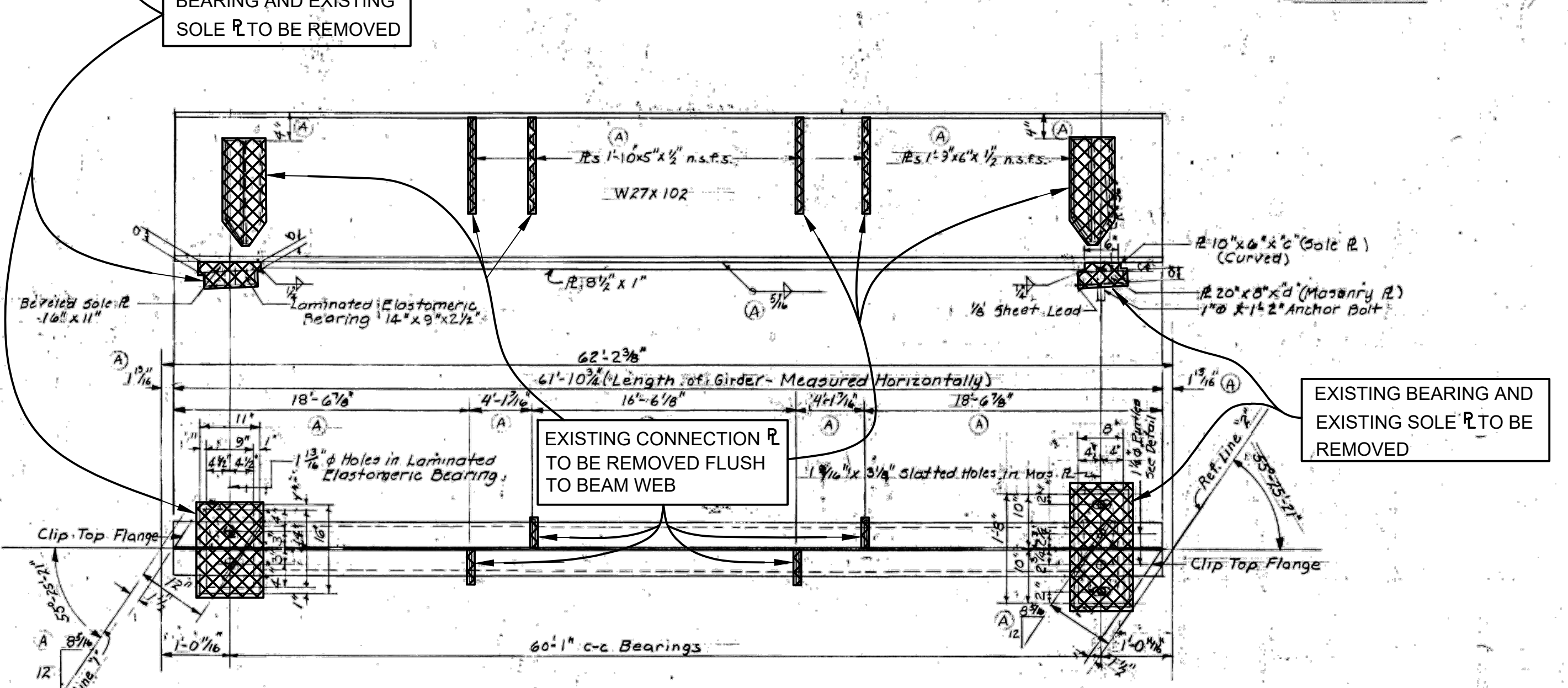
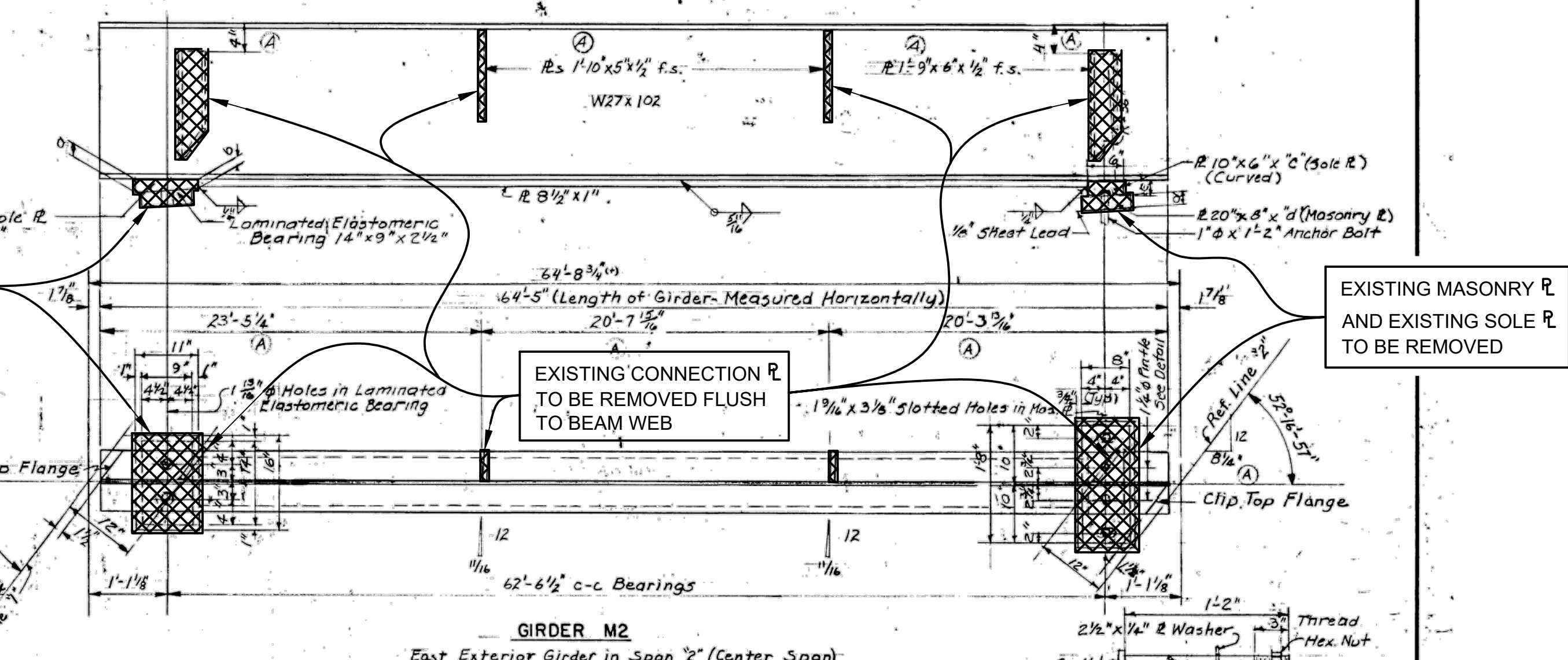
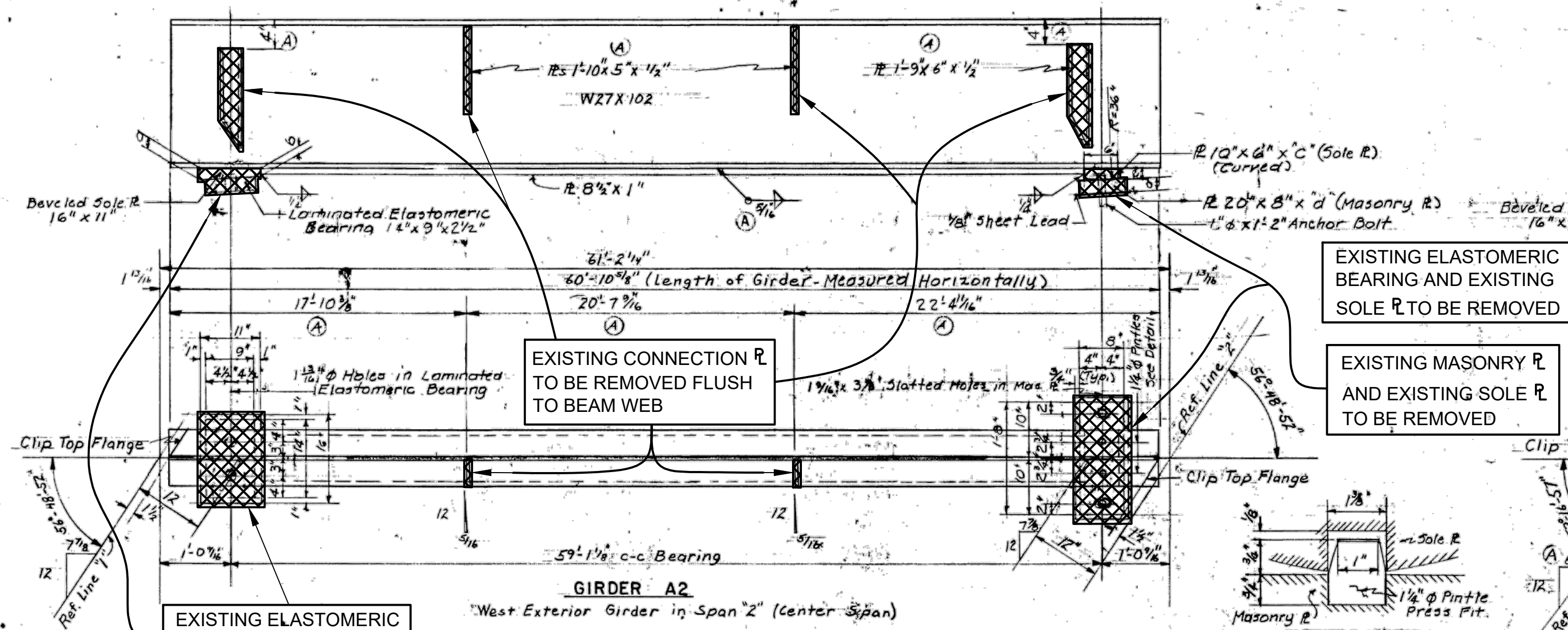
DRAWING NO. 2021-008-BR15

SHEET NO. 78 OF 153

APPROVED BY: _____

CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

X:\Projects\2021\2141\736500_AA - EMCD Bridge\01_Constr\Docs\CAD\EMCD_rem_008



TABULATED DIMENSIONS FOR CAMBER DIAGRAMS

GIRDER	a	f	g	h	j	k	r	m	n
A2	1'	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
B2	1'	1 1/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
C2	1'	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
D2	1'	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
E2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
F2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
G2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
H2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
J2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
K2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
L2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4
M2	1 1/4	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 1/4	1 3/4	3/4

TABULATED DIMENSIONS

GIRDER	a	b	c	d
A2	1 3/4	1 1/8	1 1/4	2 1/4
B2	4 5/8	1'	4 1/2	2 1/4
C2	1 7/8	1 1/8	2 1/4	2 1/4
D2	2 1/8	1 1/2	2 3/4	2 1/4
E2	2 3/8	2'	2 3/8	2 1/4
F2	3'	2 3/8	3'	2 1/4
G2	3 1/4	2 3/8	3 1/2	2 1/4
H2	3 3/8	3 3/4	4 1/4	2 1/4
J2	4 3/8	3 3/4	4 3/4	2 1/4
K2	4 7/8	4 3/4	5 1/4	2 1/4
L2	1 3/4	1 1/4	3 3/8	2 1/4
M2	4 3/8	4'	5 3/4	2 1/4

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By: LBS

NOT AS-BUILT, BEST AVAILABLE INFO.

Note: The Intermediate Diaphragm locations shown are suggested locations only.

CITY OF ANN ARBOR
BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

STRUCTURAL STEEL DETAILS
SPAN "2"

DESIGNED BY: G.J. McLAVY & SONS, INC. CONSULTING ENGINEERS
APPROVED BY: REGISTERED ENGINEER

DRAWN BY: G.J.M. 7-20-01
TRACED BY: TLD 8-13-01
CHECKED BY: M.E.R. 4/20/02
SHEET NO. 19 OF 22

APPROVED BY: R1 OF 81-1-19

REVISIONS

No.	Description	By	Date
(A)	Miscellaneous checking revisions	B.J.H.	4-9-02

DLZ

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

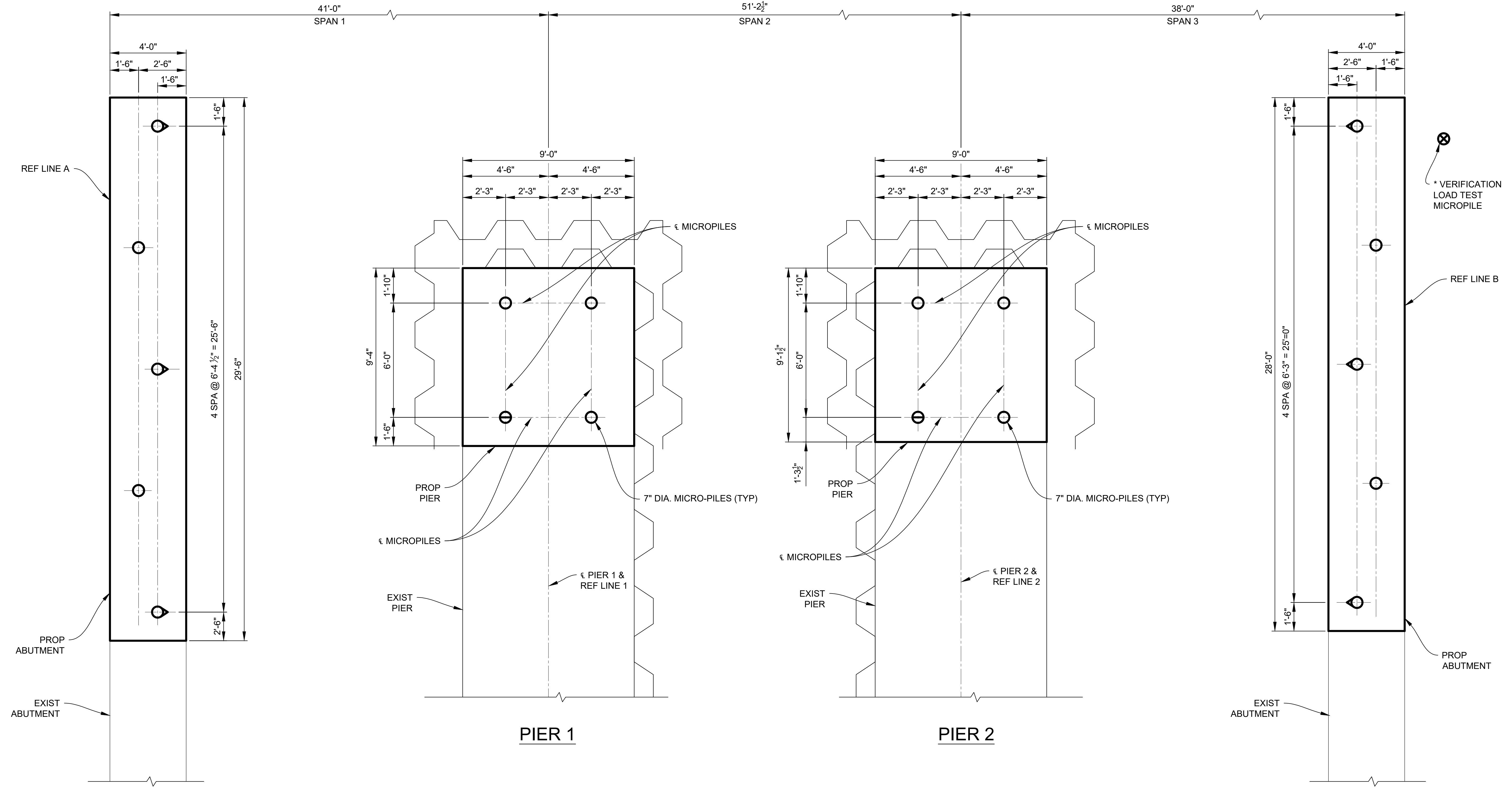
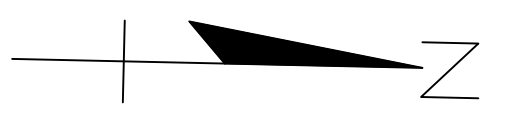
EAST MEDICAL CENTER DRIVE
EXISTING STRUCTURAL STEEL DETAILS
REMOVAL

SCALE: NONE INCH

DRAWING NO. 2021-008-BR16
SHEET NO. 79 OF 153

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

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* VERIFICATION
LOAD TEST
MICROPILE

REF LINE B

PROP
ABUTMENT

ABUTMENT B

3 WORKING DAYS
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800-482-7171
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ESTIMATED QUANTITIES THIS SHEET					
DESCRIPTION	UNITS	CATG 0001	CATG 0002	CATG 0003	TOTAL
Micropile, Type B, Furn and Install, LRFD	Ea		18		18
Micropile, Load Test, Proof, LRFD	Ea		4		4
Micropile, Load Test, Verification, LRFD	Ea		1		1
Micropile Mobilization, LRFD (STR 11065)	LSUM		1		1

* LOCATION OF VERIFICATION LOAD TEST MICROPILE SHALL BE NEAR, EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

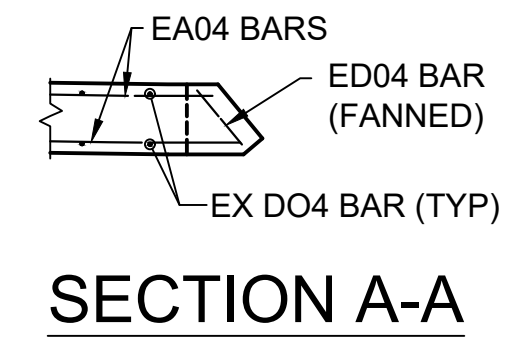
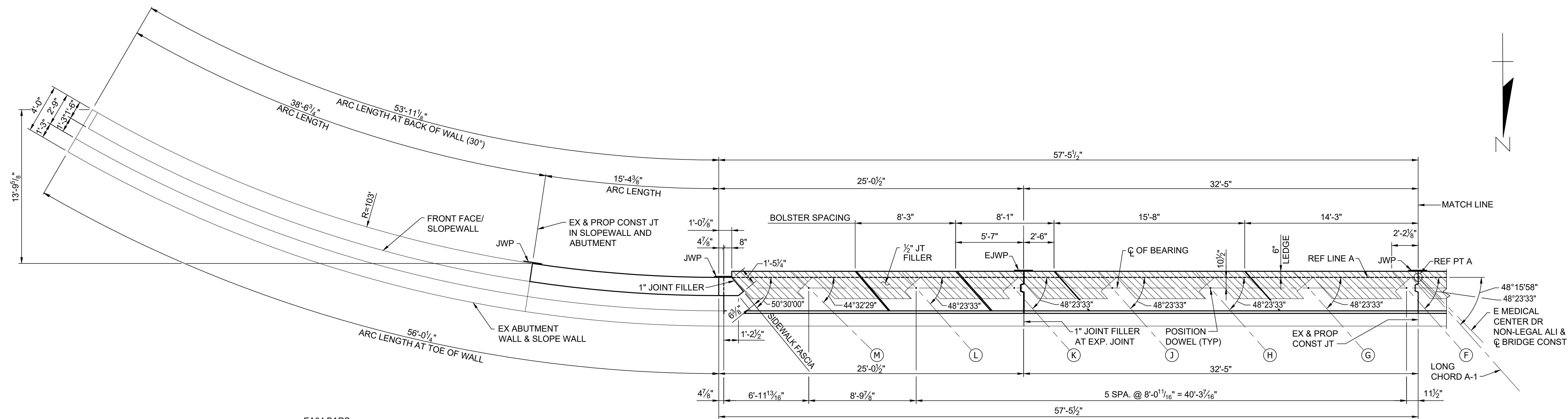
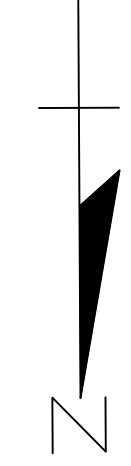
MICROPILE PLAN

DRAWING NO.
2021-008-BR17

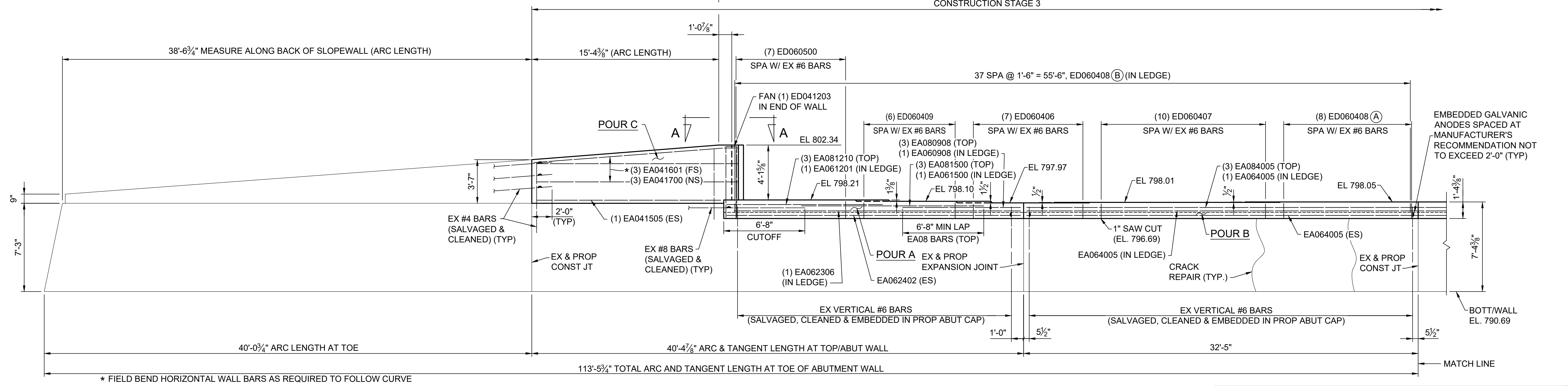
SHEET NO. 80 OF 153

APPROVED BY
CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

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HALF PLAN



ELEVATION

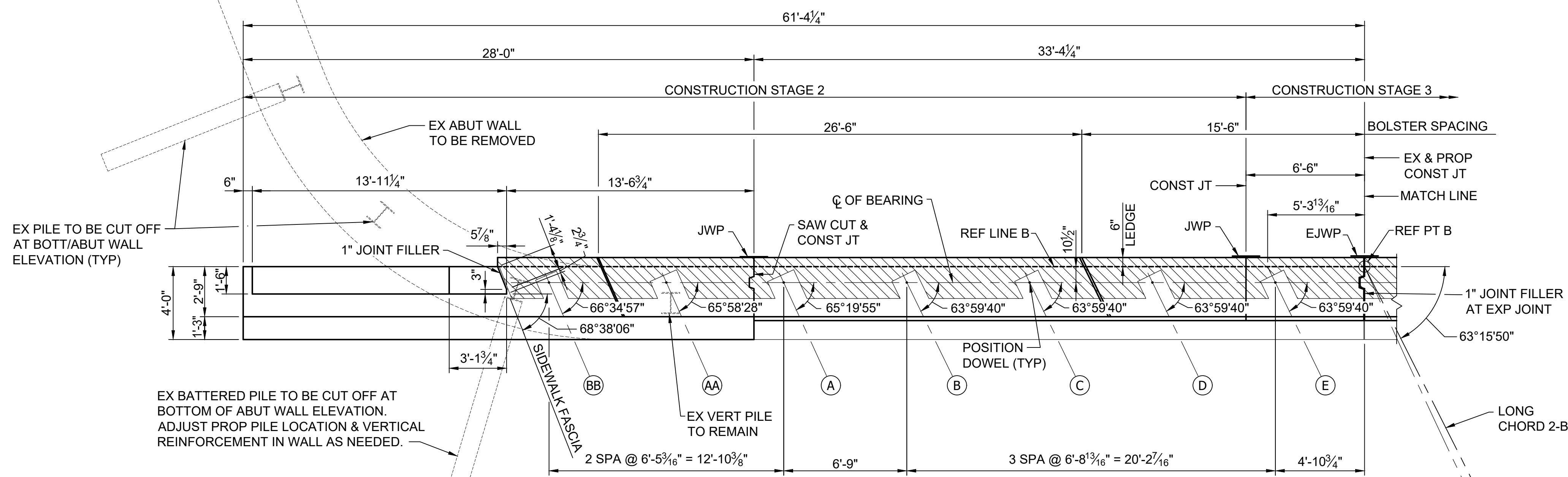
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REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

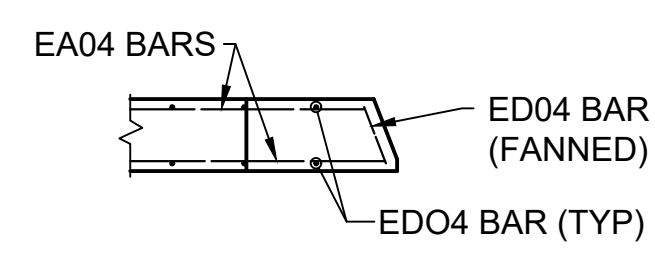
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
ABUTMENT A DETAILS	
SCALE HOR. 1/4"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR19	
SHEET NO. <u>82</u> OF <u>153</u>	

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

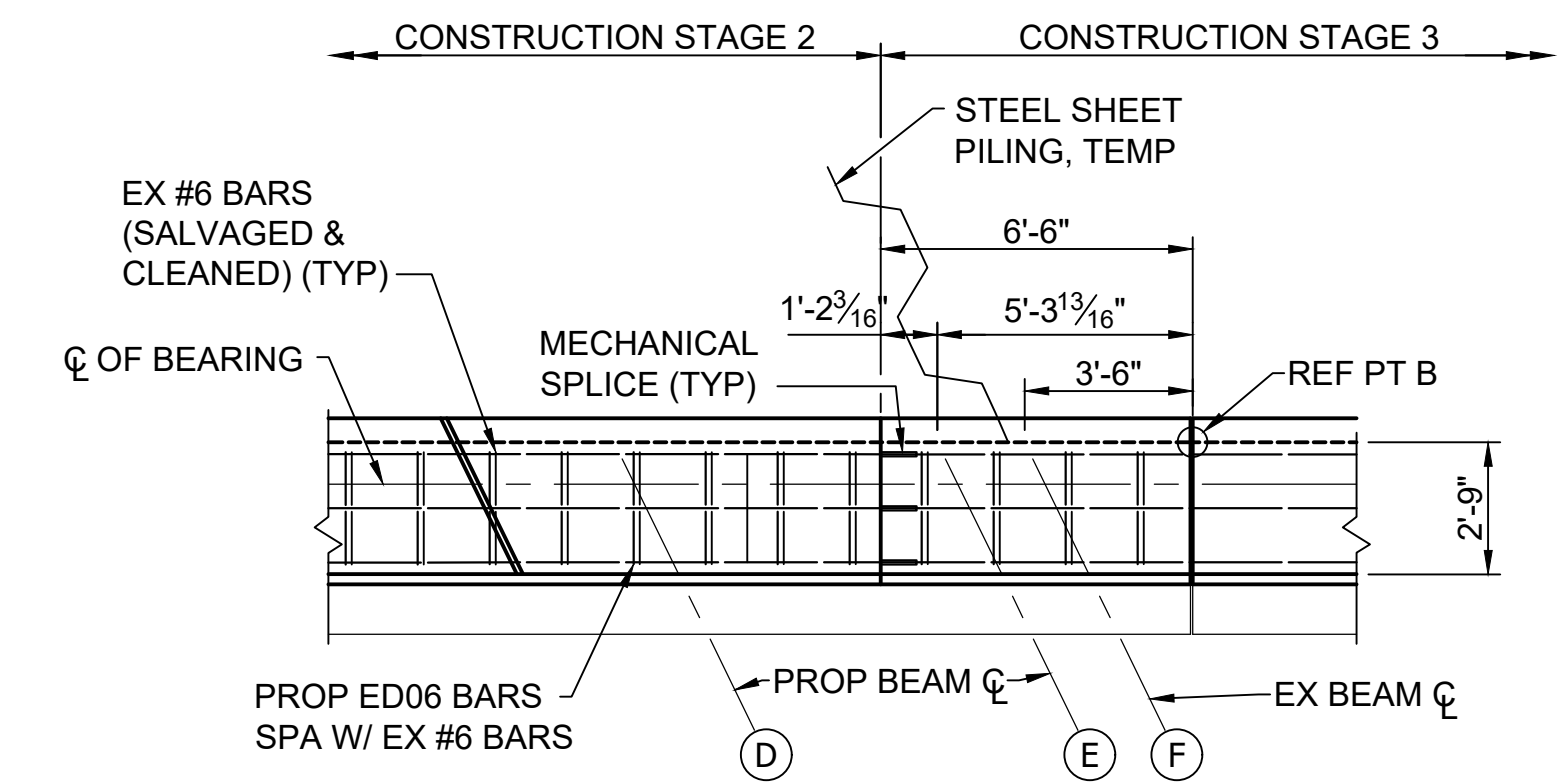
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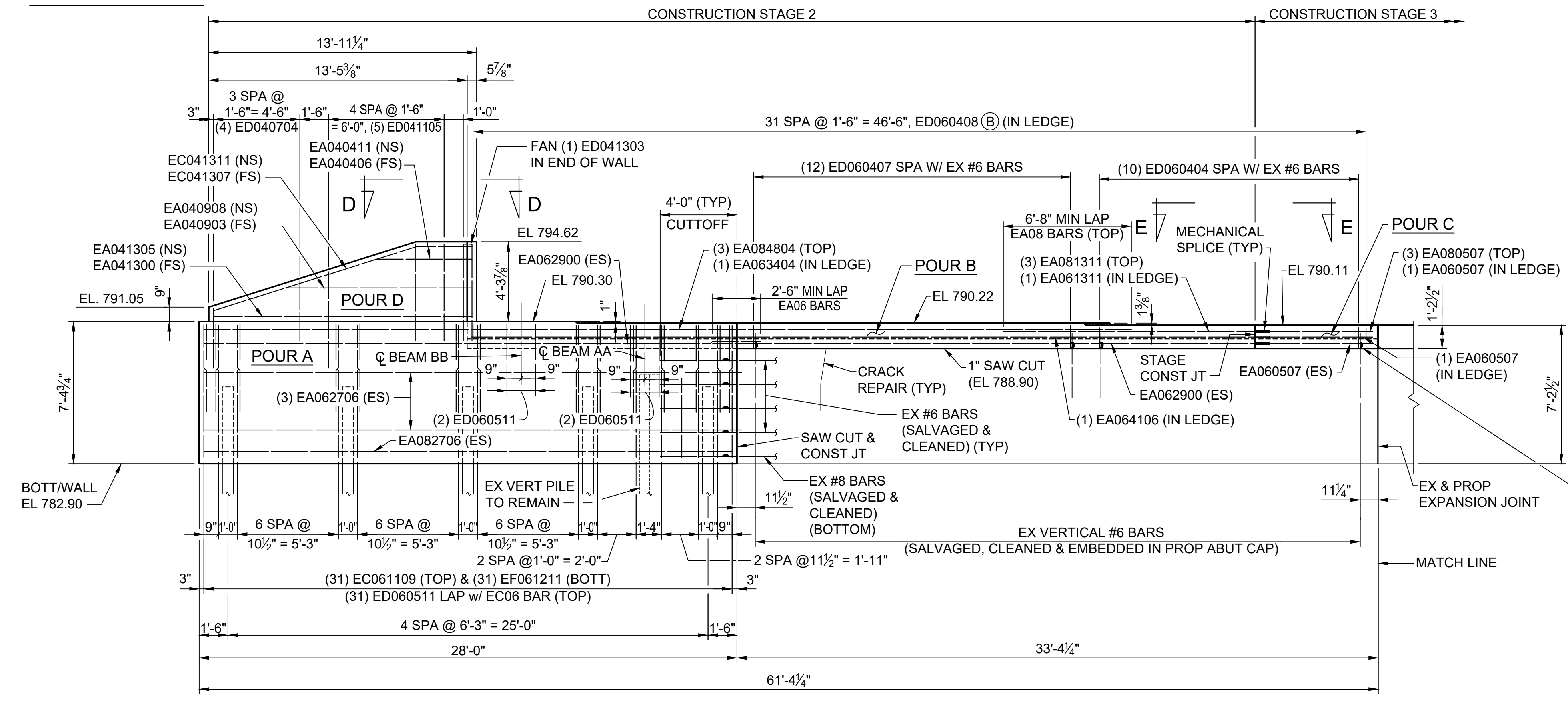
HALF PLAN



SECTION D-D



SECTION E-E



ELEVATION

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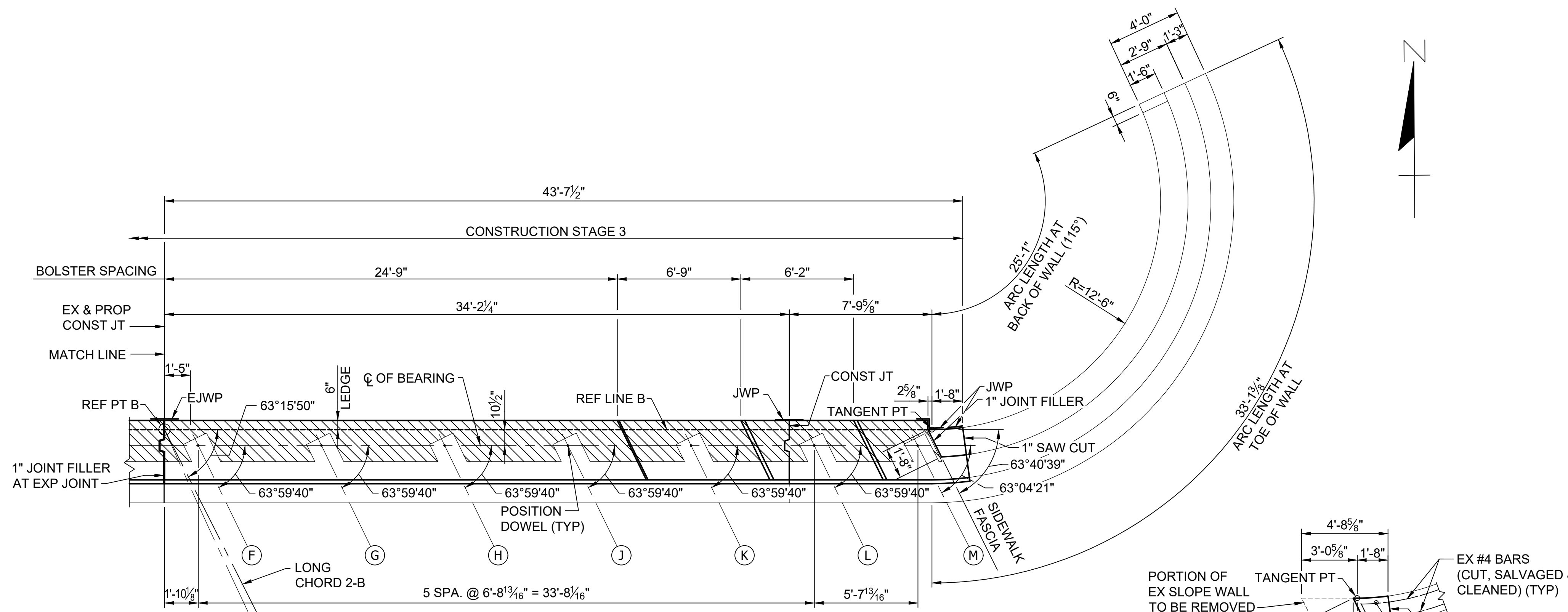
DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
ABUTMENT B DETAILS	
SCALE HOR. 1/4"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR21	
SHEET NO. <u>84</u> OF <u>153</u>	

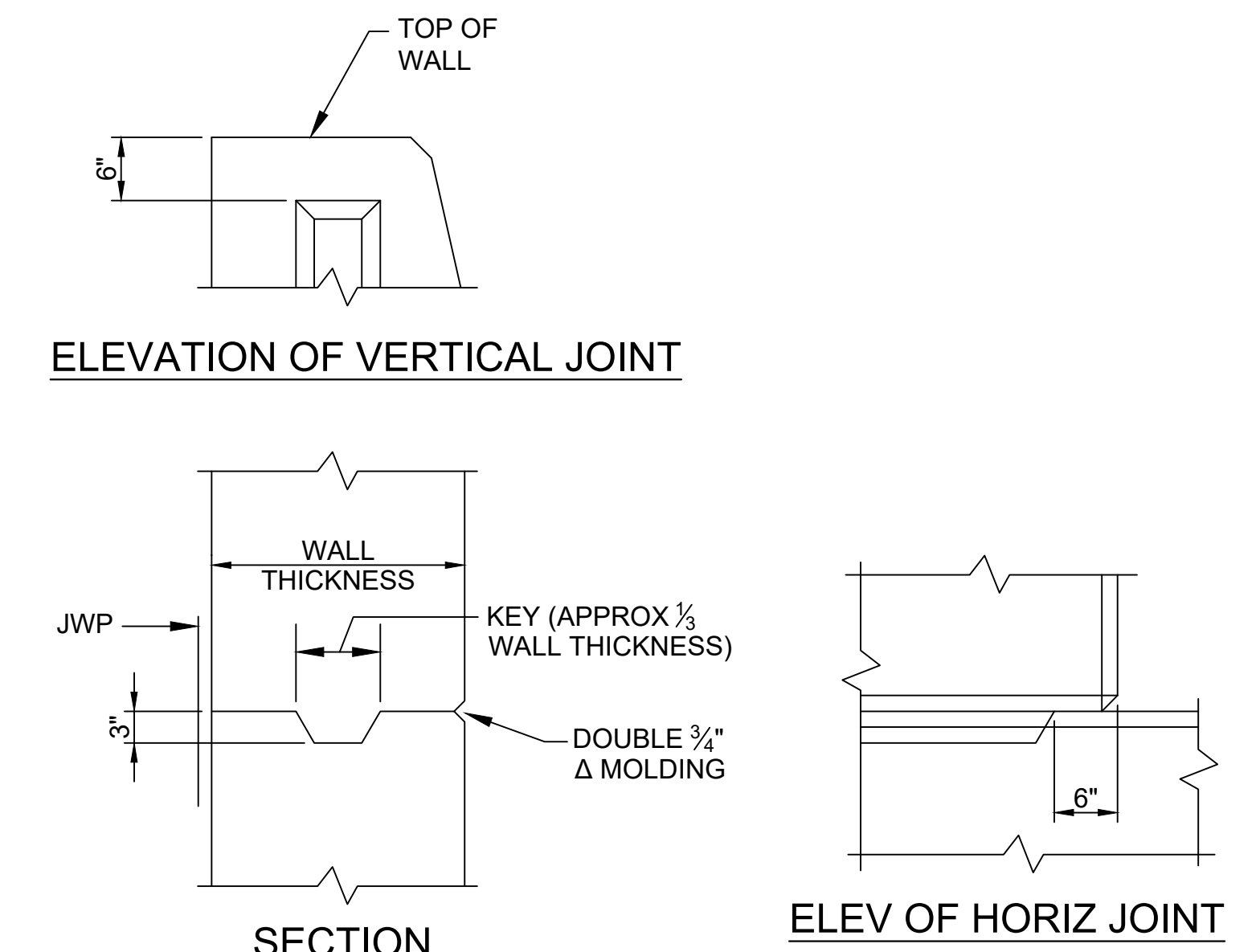
APPROVED BY: _____
CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

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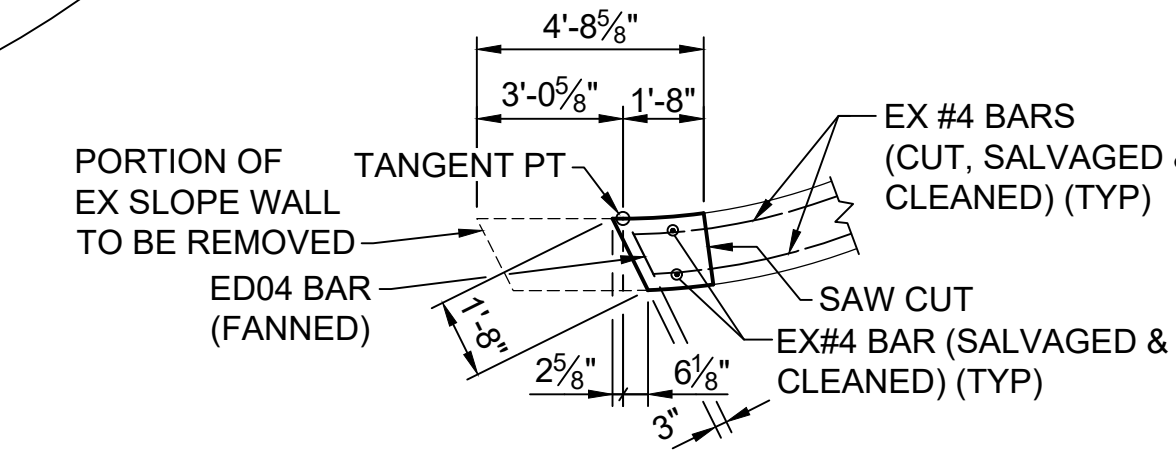


HALF PLAN

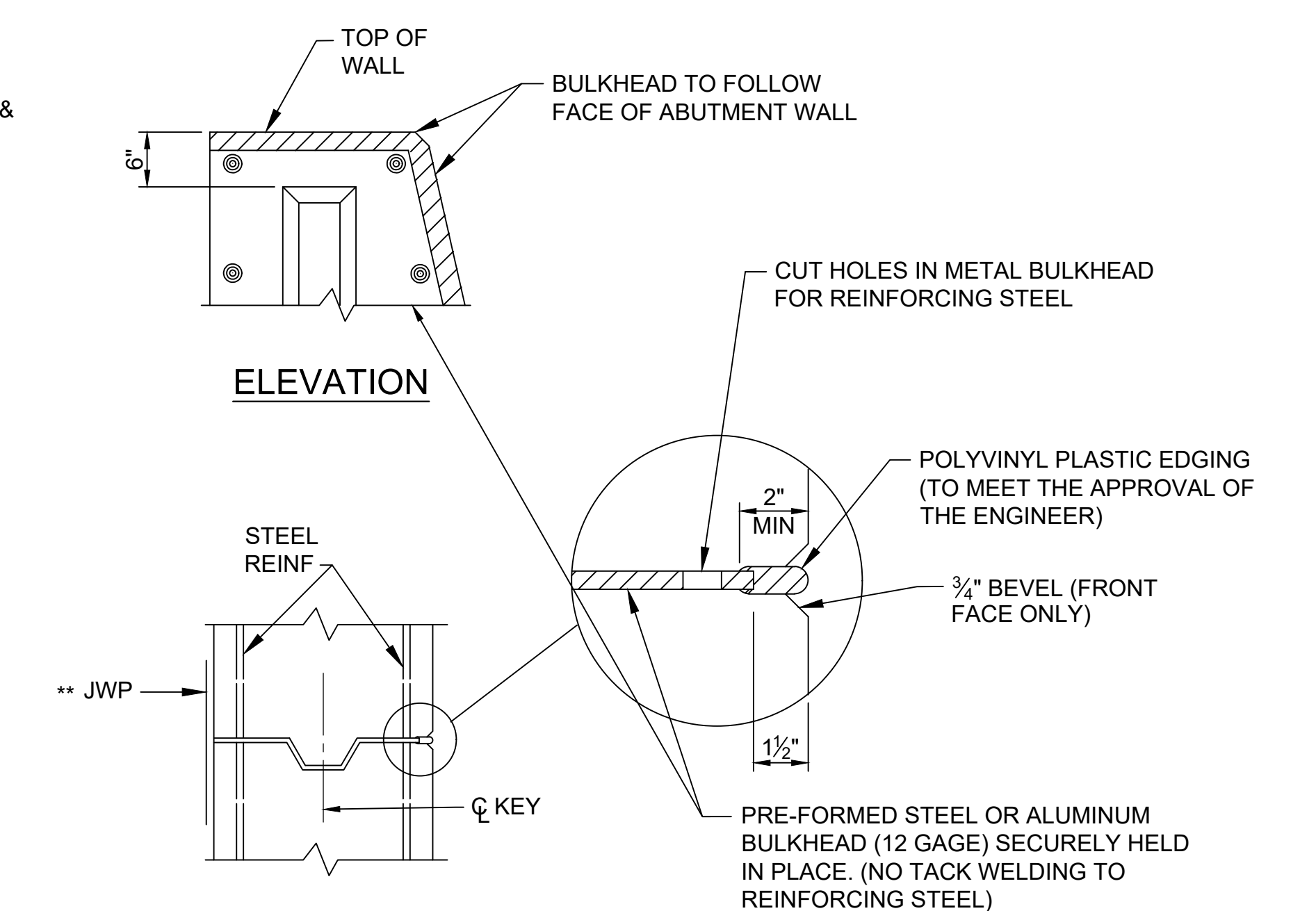


CONSTRUCTION JOINT DETAILS

NOTE: WHERE OPTIONAL CONSTRUCTION JOINTS ARE USED, THERE WILL BE NO PAYMENT FOR THE REQUIRED JOINT WATERPROOFING.



SECTION F-F

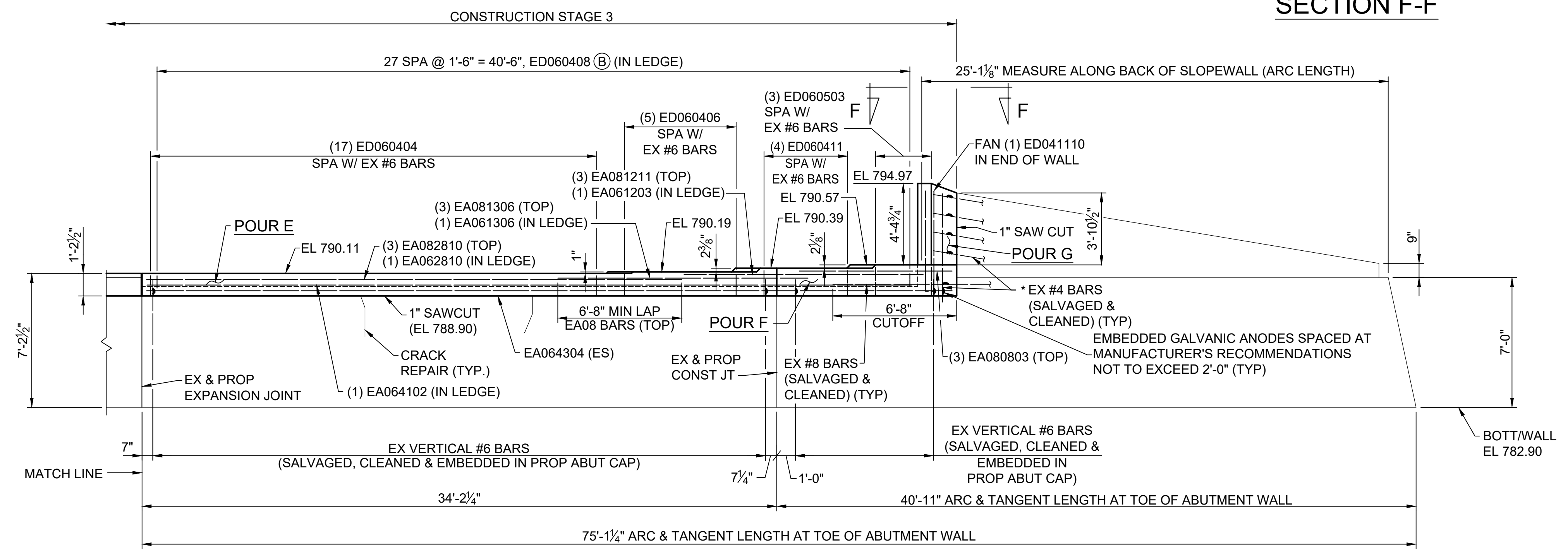


METAL BULKHEAD DETAILS

METAL BULKHEAD MAY BE USED AS ALTERNATE CONSTRUCTION JOINT AT CONTRACTOR'S EXPENSE. CARE IS TO BE USED IN CASTING CONCRETE TO PREVENT DISLOCATION OR MISALIGNMENT OF BULKHEAD.

NOTES:

JOINT AND BULKHEAD DETAILS ARE FOR BOTH ABUTMENTS.



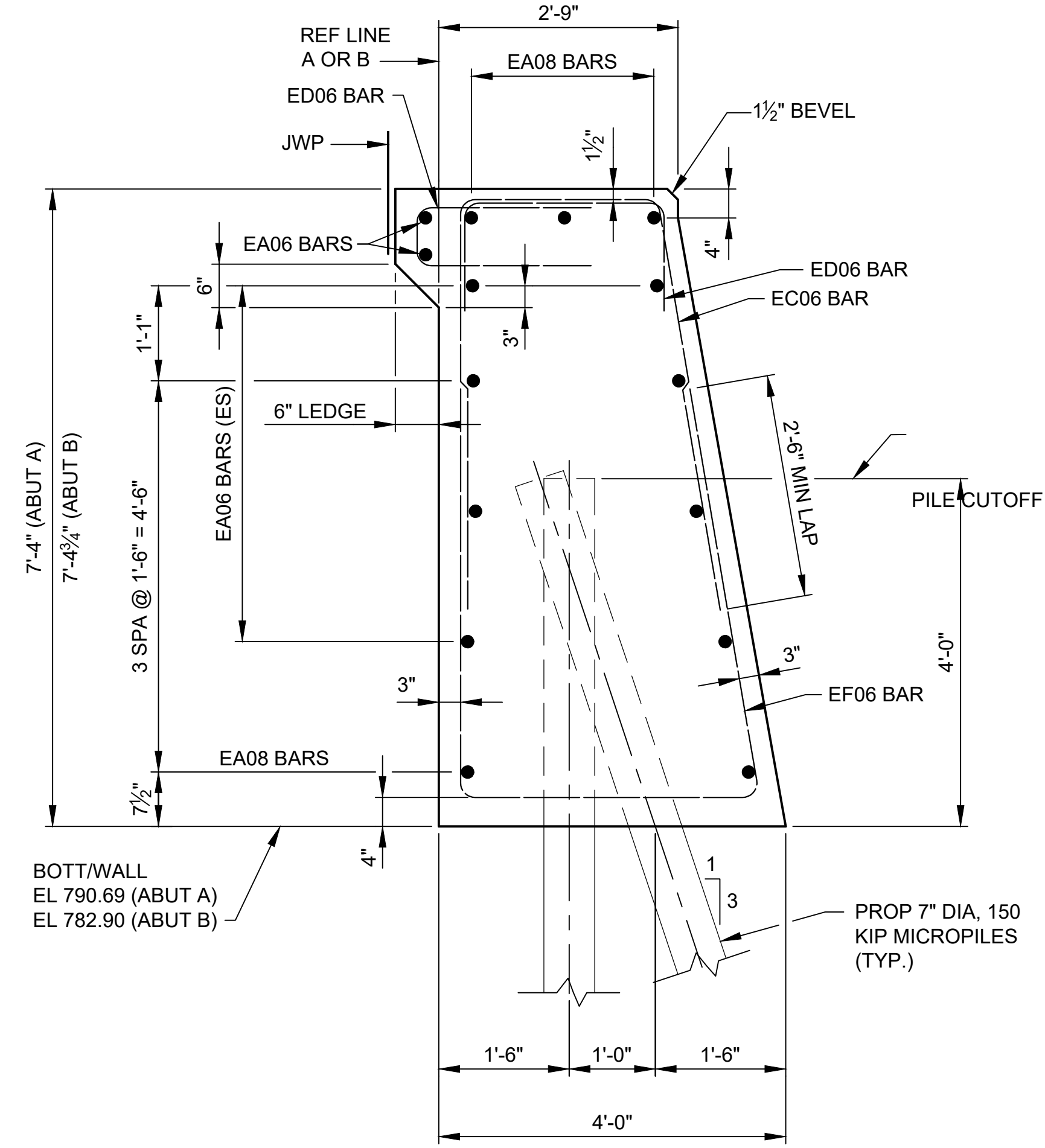
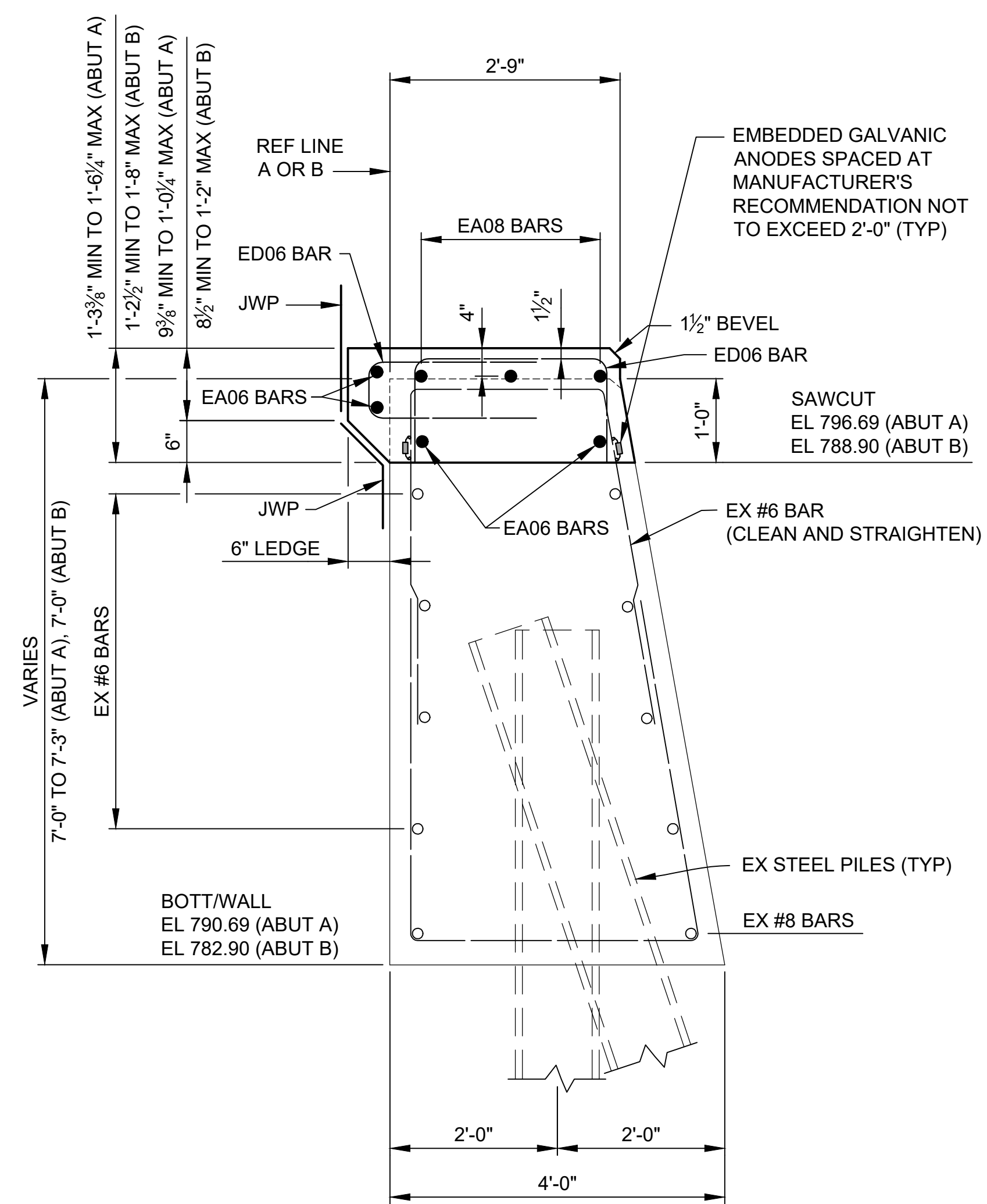
ELEVATION

* TRIM BARS AS NEEDED TO ACHIEVE 2" COVER.

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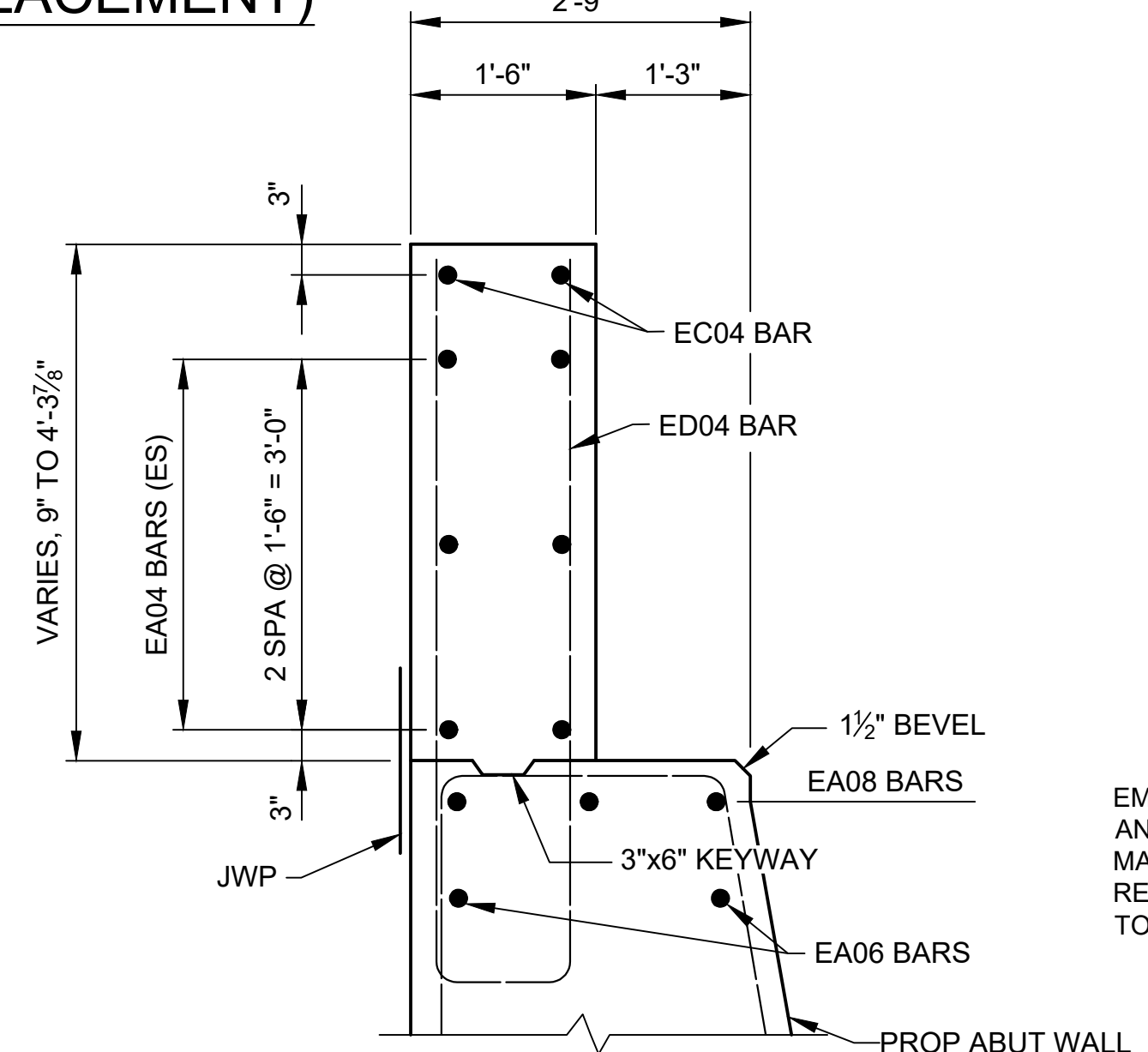
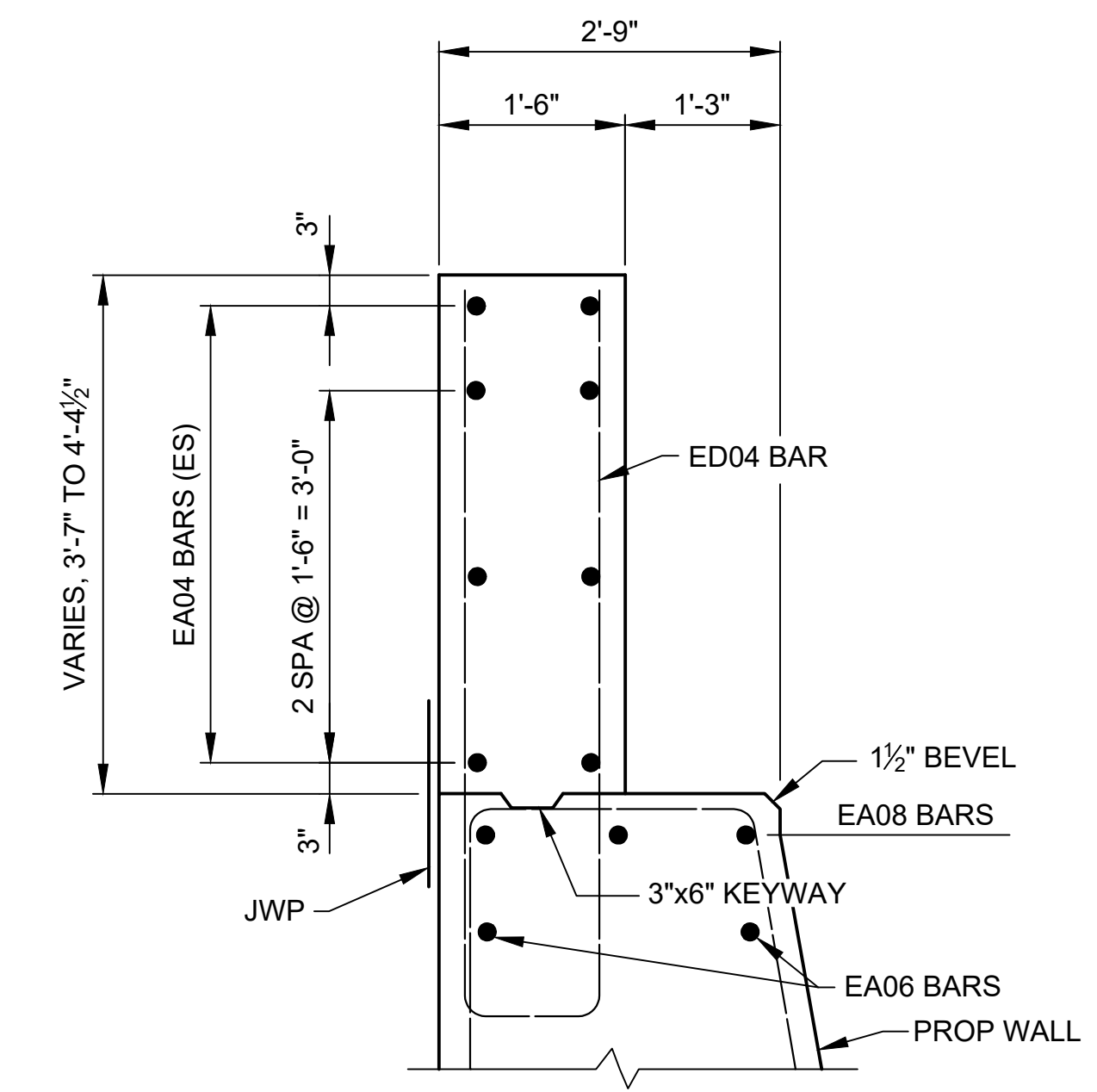
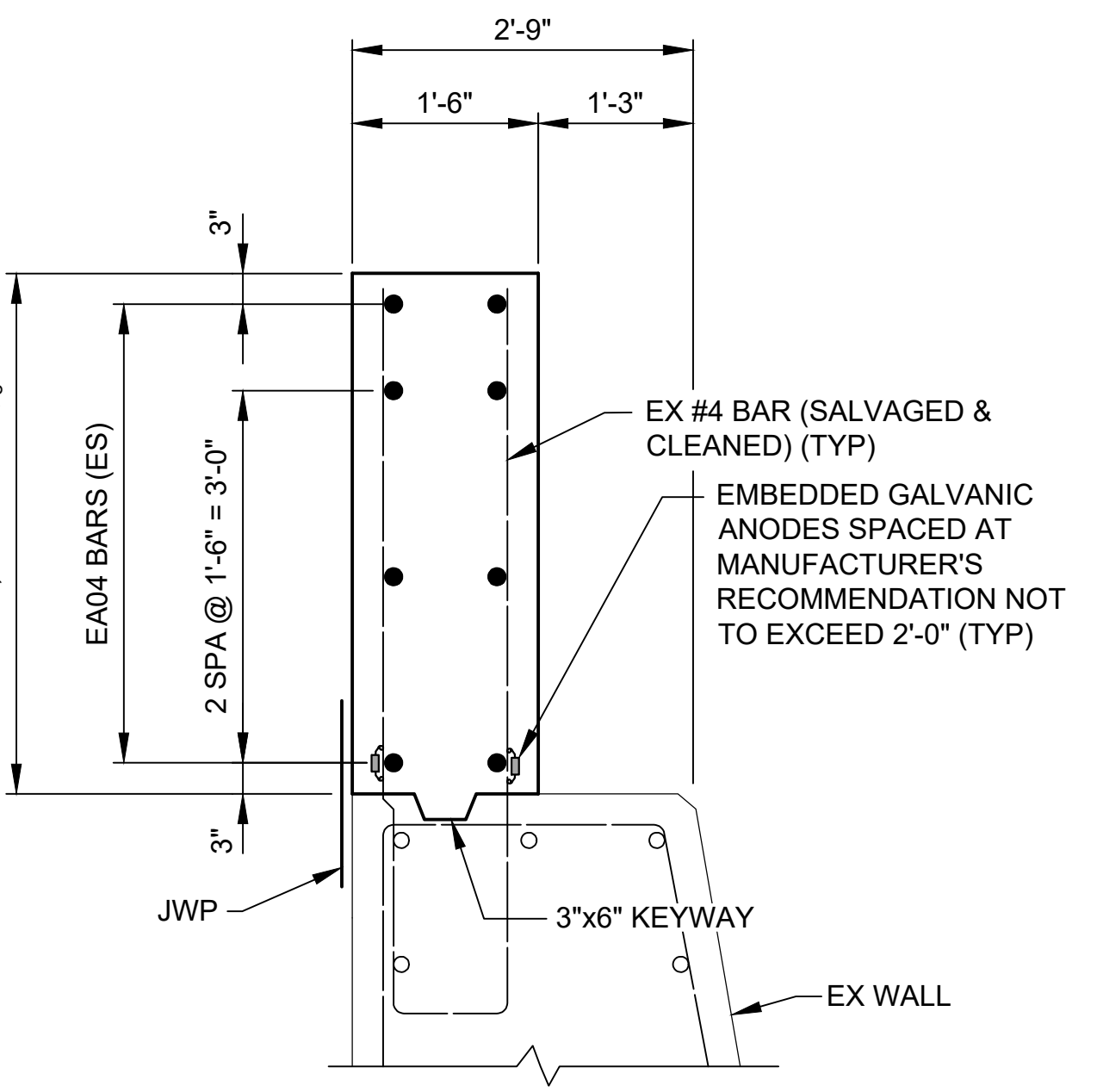
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	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
ABUTMENT B DETAILS	
SCALE HOR. 1/4"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR22	
SHEET NO. <u>85</u> OF <u>153</u>	

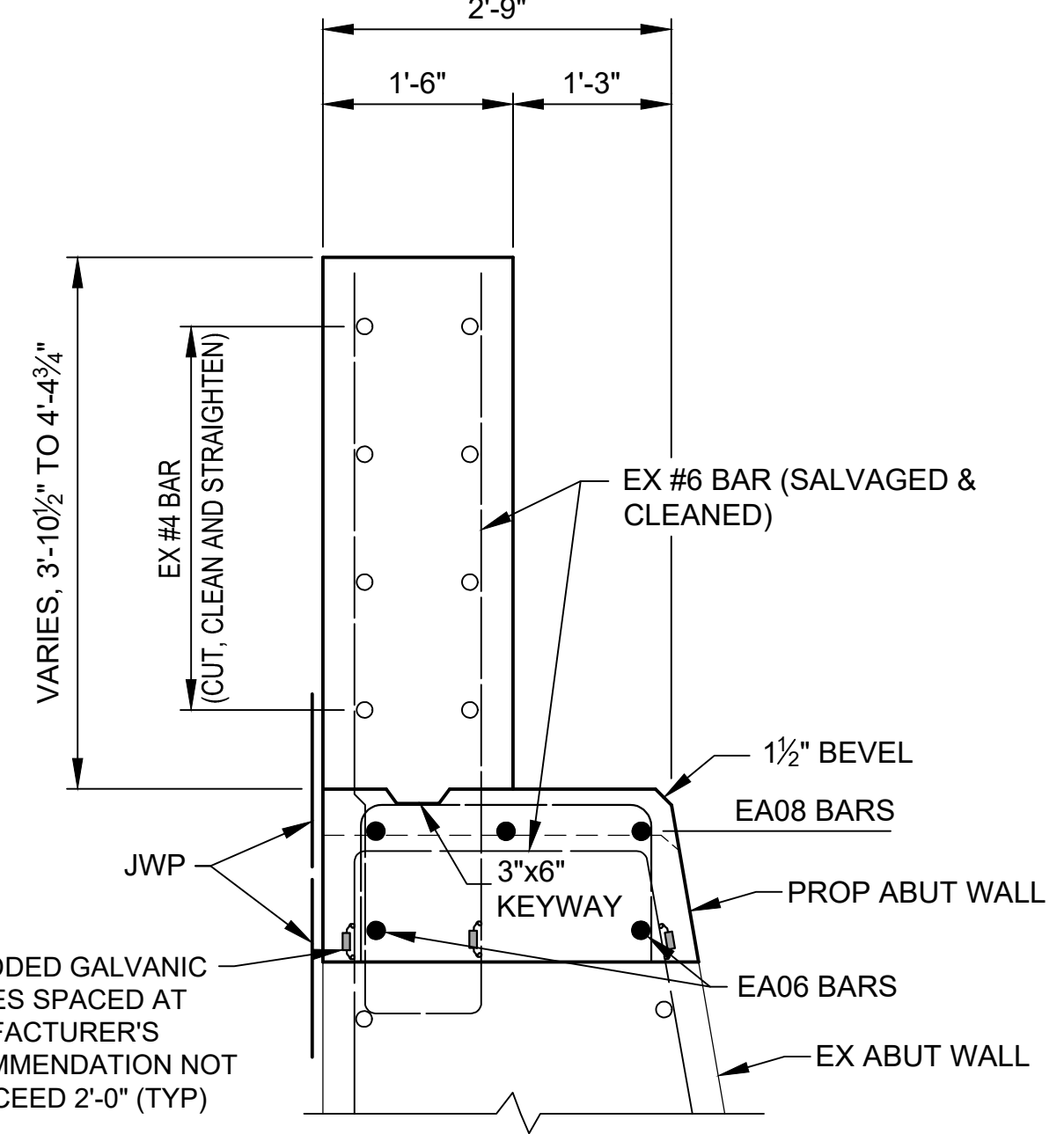


**TYPICAL ABUTMENT SECTION
(FULL REPLACEMENT)**

**TYPICAL ABUTMENT SECTION
(PARTIAL REPLACEMENT)**



**TYPICAL SLOPEWALL SECTION
ABUTMENT B (CONSTRUCTION STAGE 2)**



**TYPICAL SLOPEWALL SECTION
ABUTMENT B (CONSTRUCTION STAGE 3)**

ESTIMATED QUANTITIES THIS SHEET					
DESCRIPTION	UNITS	CATG 0001	CATG 0002	CATG 0003	TOTAL
Substructure Conc	Cyd	32	62		94
Water Repellent Treatment, Penetrating	Syd	1			1
Joint Waterproofing	Sft	740			740
Joint Waterproofing, Expansion	Sft	10			10
Hand Chipping, Other Than Deck	Cft	1			1
Patch, Forming	Sft	3			3
Reinforcement, Mechanical Splice	Ea	14			14
Flushing Cracks, Water	Ft	84			84
Structural Crack, Repr	Ft	84			84
Patching Conc, C-L	Cyd	0.4			0.4
Embedded Galvanic Anode	Ea	275			275

NOTES

- NS DENOTES NEAR SIDE.
- FS DENOTES FAR SIDE.
- ES DENOTES EACH SIDE.
- JWP DENOTES JOINT WATERPROOFING.
- EJWP DENOTES EXPANSION JOINT WATERPROOFING.
- REPAIR AREAS/CRACKS SHOWN ARE APPROXIMATIONS BASED ON A BRIDGE INSPECTION THAT TOOK PLACE IN OCTOBER, 2021.
- ABUTMENTS SHALL BE SOUNDED PRIOR TO CONSTRUCTION AND ADDITIONAL AREAS SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER.
- PENETRATING WATER REPELLENT TREATMENT SHALL BE APPLIED TO THE ABUTMENT REPAIR AREAS AS DIRECTED BY THE ENGINEER.
- INSTALL GALVANIC ANODES ON EXPOSED REBAR ALONG PERIMETER OF REPAIR, SPACED PER MANUFACTURER'S RECOMMENDATIONS (24 INCH MAX).
- A CRACK THAT EXTENDS BELOW THE GROUND LINE SHALL, WITH PRIOR APPROVAL OF THE ENGINEER, BE REPAIRED. ALL EXCAVATION, BACKFILL, WORK, AND MATERIAL REQUIRED SHALL BE INCLUDED IN PAYMENT FOR "STRUCTURAL CRACK, REPR".
- FOR BEVEL AND MOLDING DETAILS, SEE MDOT STANDARD PLAN B-103-SERIES.
- FOR MICROPILE QUANTITIES, LAYOUT, AND NOTES, SEE SHEETS 80 & 81 OF 153.
- THE CONTRACTOR MAY ADHESIVE ANCHOR POSITION DOWELS IN HOLES DRILLED IN THE CONCRETE AT ABUTMENTS.
- LOW TEMPERATURE PROTECTION OF CONCRETE SHALL BE APPLIED ACCORDING TO SECTION 706.03J OF THE MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE CONCRETE BID ITEMS.

SUBSTRUCTURE CONCRETE QUANTITIES (CYD)		
POUR	ABUT A	ABUT B
A	3.8	* 27.9
B	4.6	3.8
C	3.8	1.0
D	1.4	* 2.1
E	3.5	4.7
F	2.9	2.0
G	* 27.4	0.5
H	* 4.6	
TOTAL	52	42

* DENOTES CATG 0002 (32 CYD @ ABUT A & 30 CYD @ ABUT B), ALL OTHER POURS INCLUDED IN CATG 001

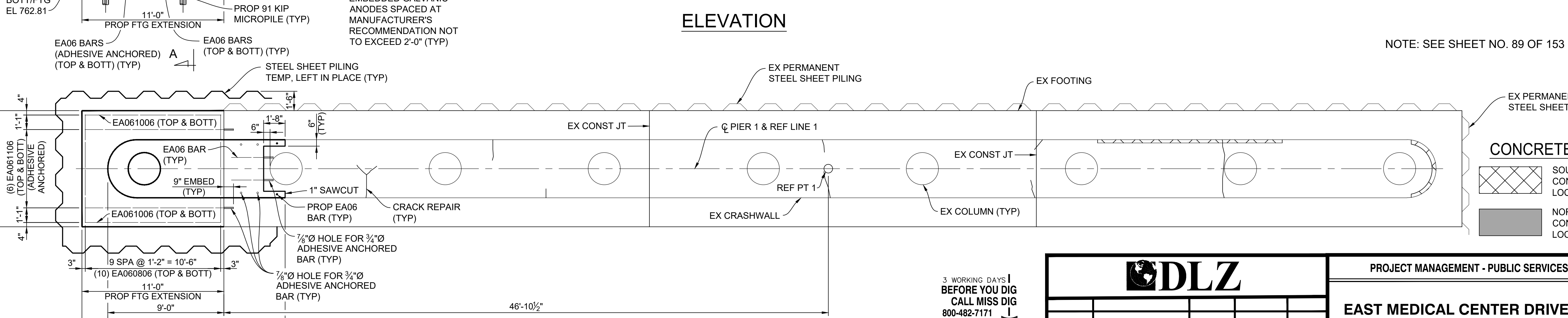
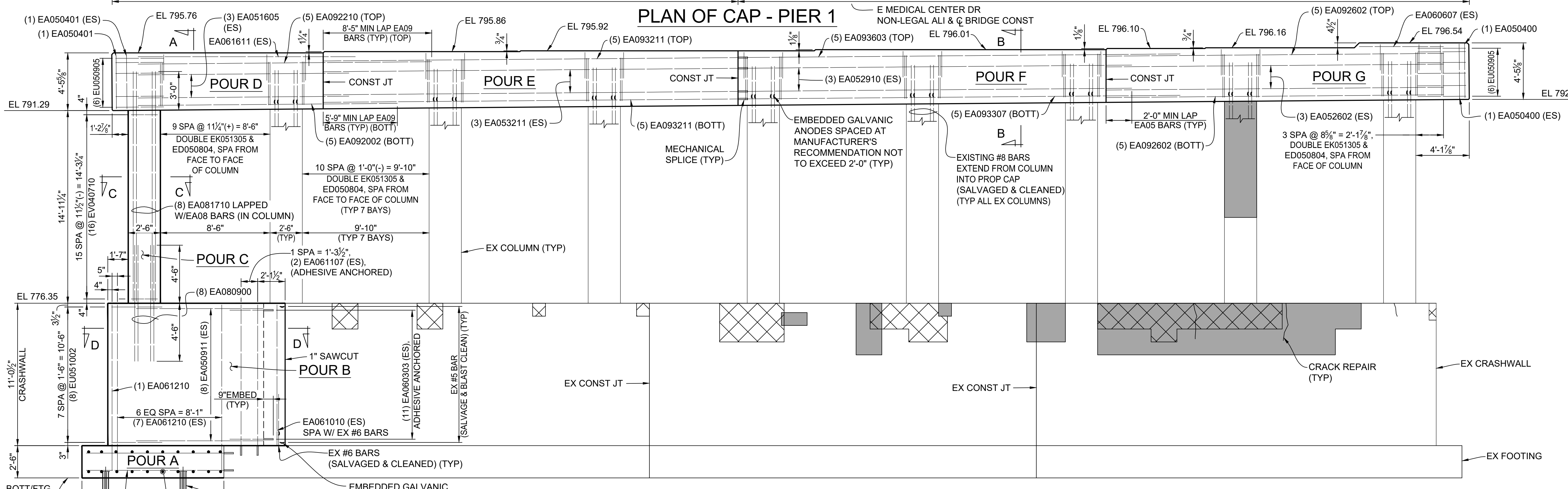
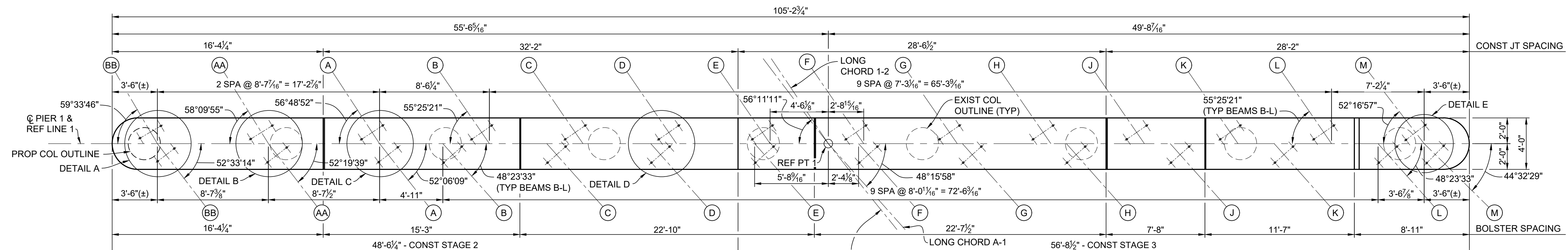
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	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
ABUTMENT DETAILS	
SCALE HOR. 3/4"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR23	
SHEET NO. <u>86</u> OF <u>153</u>	

CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



CONCRETE REPAIR LEGEND:

- SOUTH FACE PIER DETERIORATED CONCRETE AREA (PROP PATCHING LOCATIONS)
- NORTH FACE PIER DETERIORATED CONCRETE AREA (PROP PATCHING LOCATIONS)

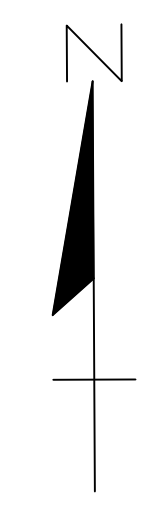
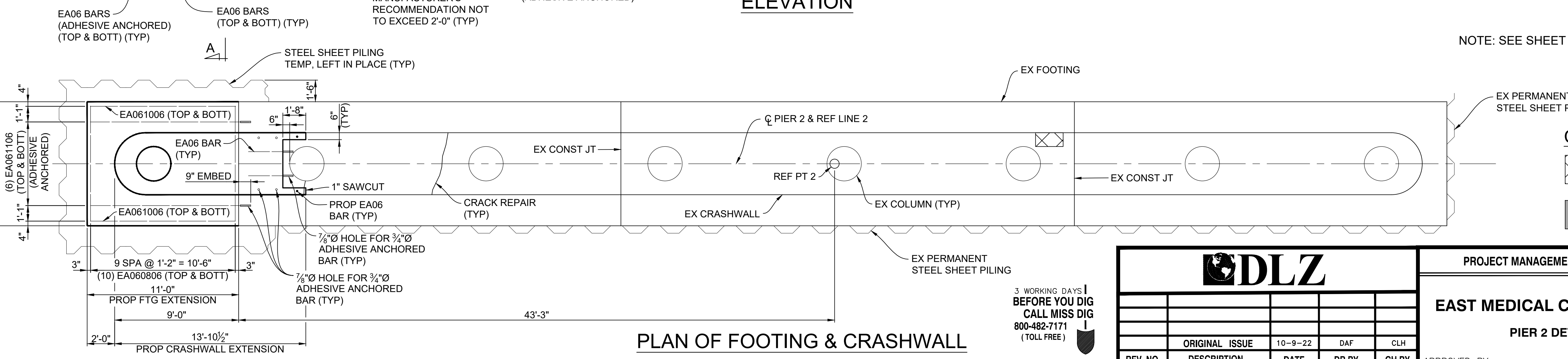
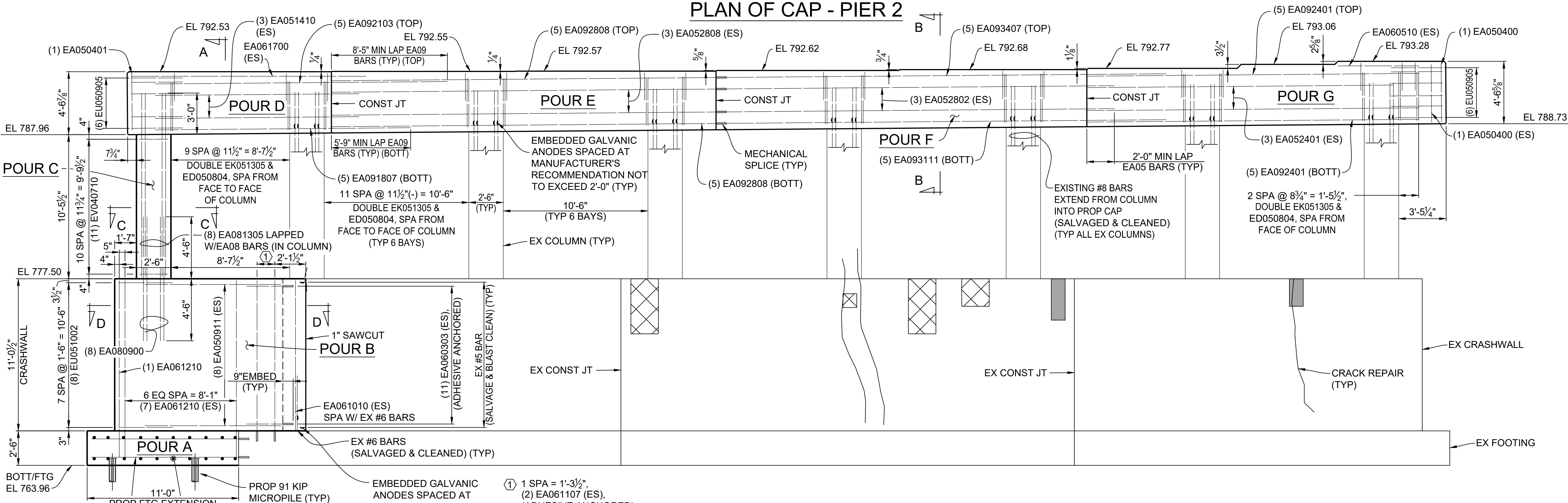
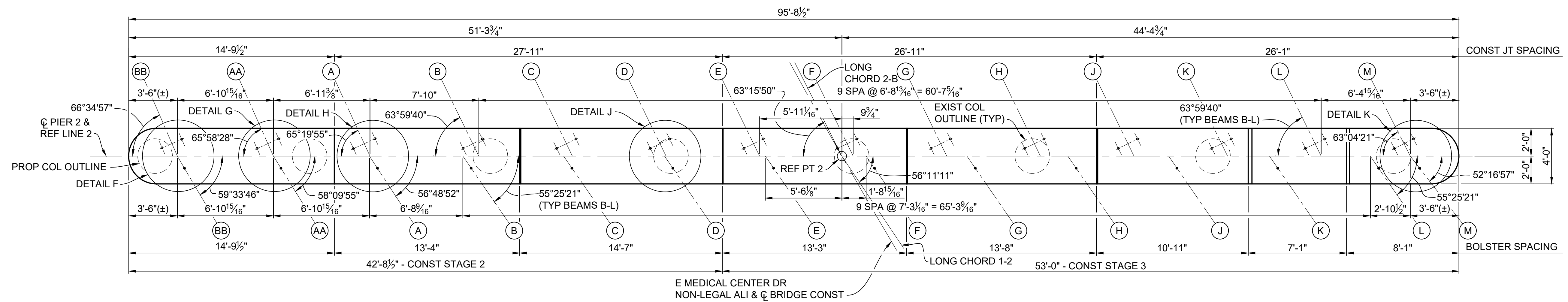
NOTE: SEE SHEET NO. 89 OF 153 FOR DETAILS A THRU E.

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DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
PIER 1 DETAILS	
SCALE NTS	INCH 0 1
DRAWING NO. 2021-008-BR24	
SHEET NO. <u> 87 </u> OF <u> 153 </u>	

PLAN OF FOOTING & CRASHWALL



PLAN OF CAP - PIER 2

ELEVATION

PLAN OF FOOTING & CRASHWALL

NOTE: SEE SHEET NO. 89 OF 153 FOR DETAILS F THRU K.

CONCRETE REPAIR LEGEND:

- SOUTH FACE PIER DETERIORATED CONCRETE AREA (PROP PATCHING LOCATIONS)
- NORTH FACE PIER DETERIORATED CONCRETE AREA (PROP PATCHING LOCATIONS)

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DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

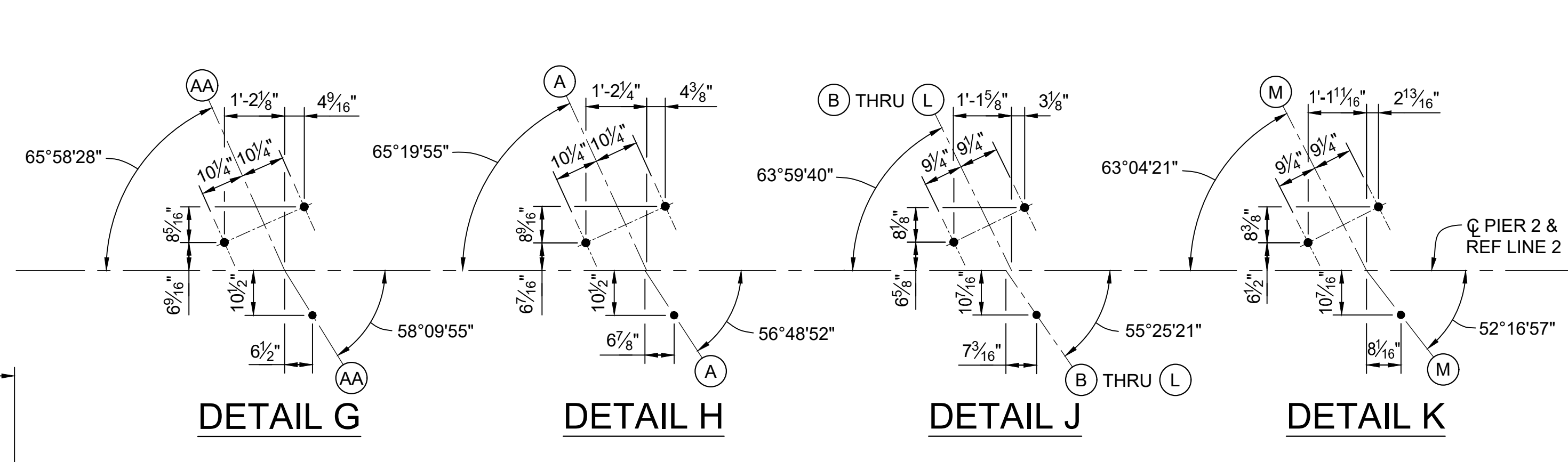
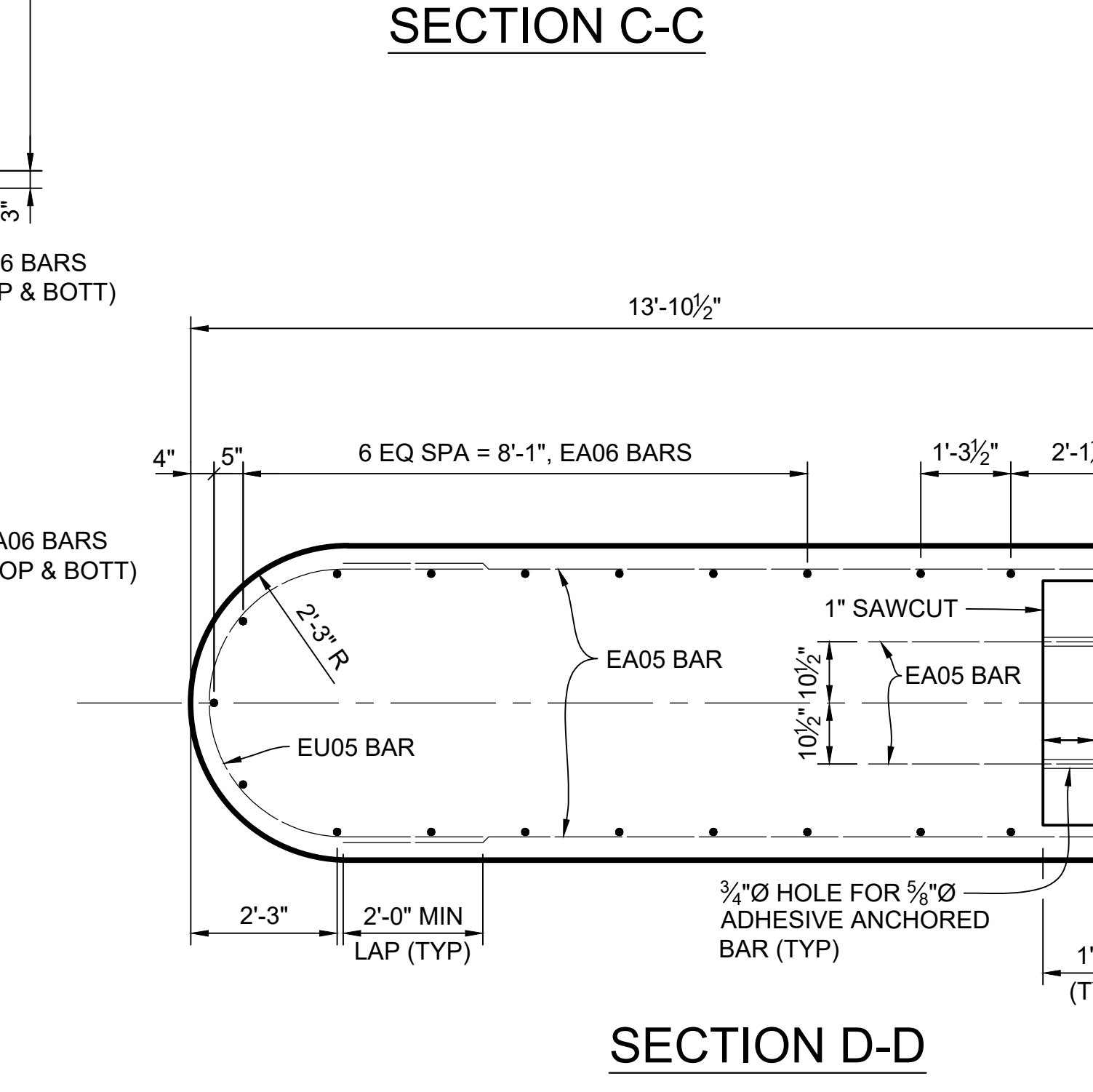
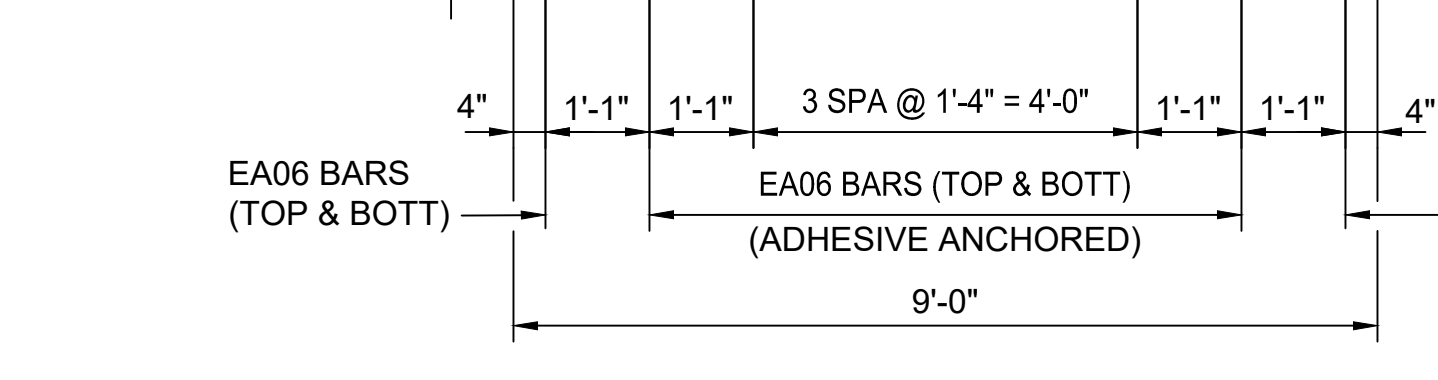
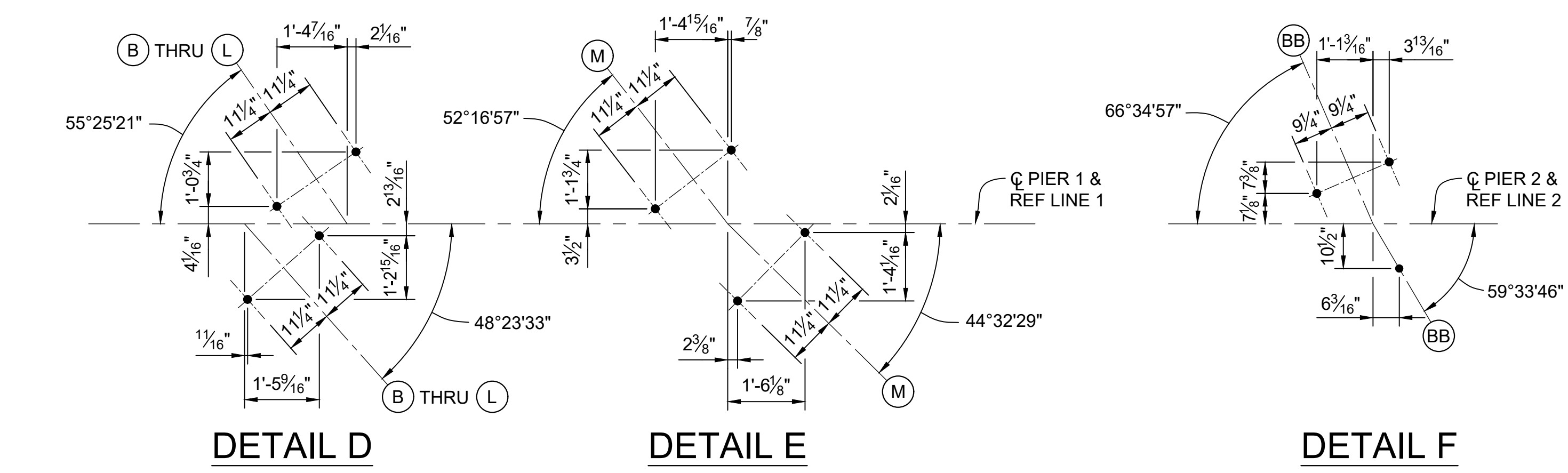
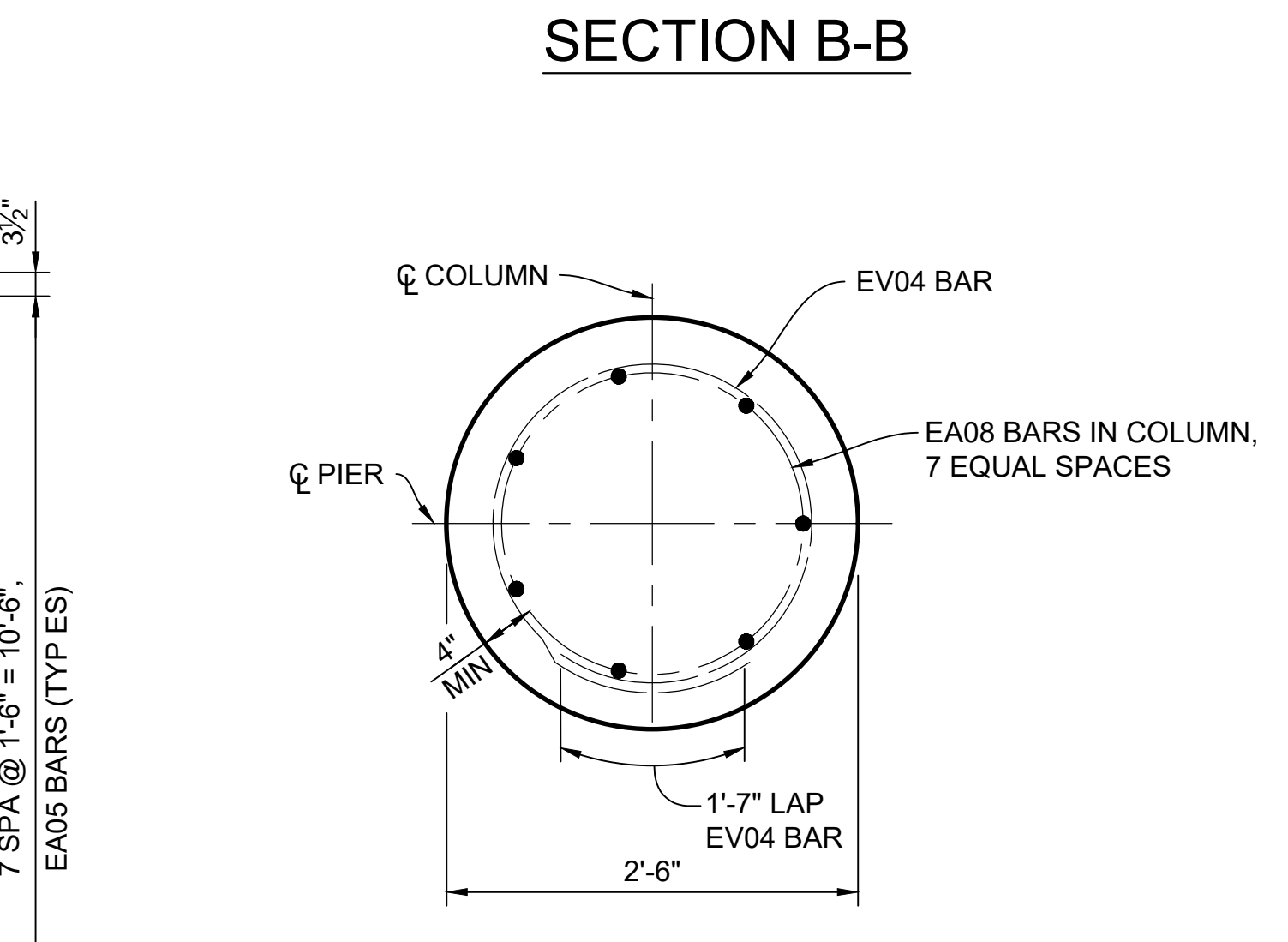
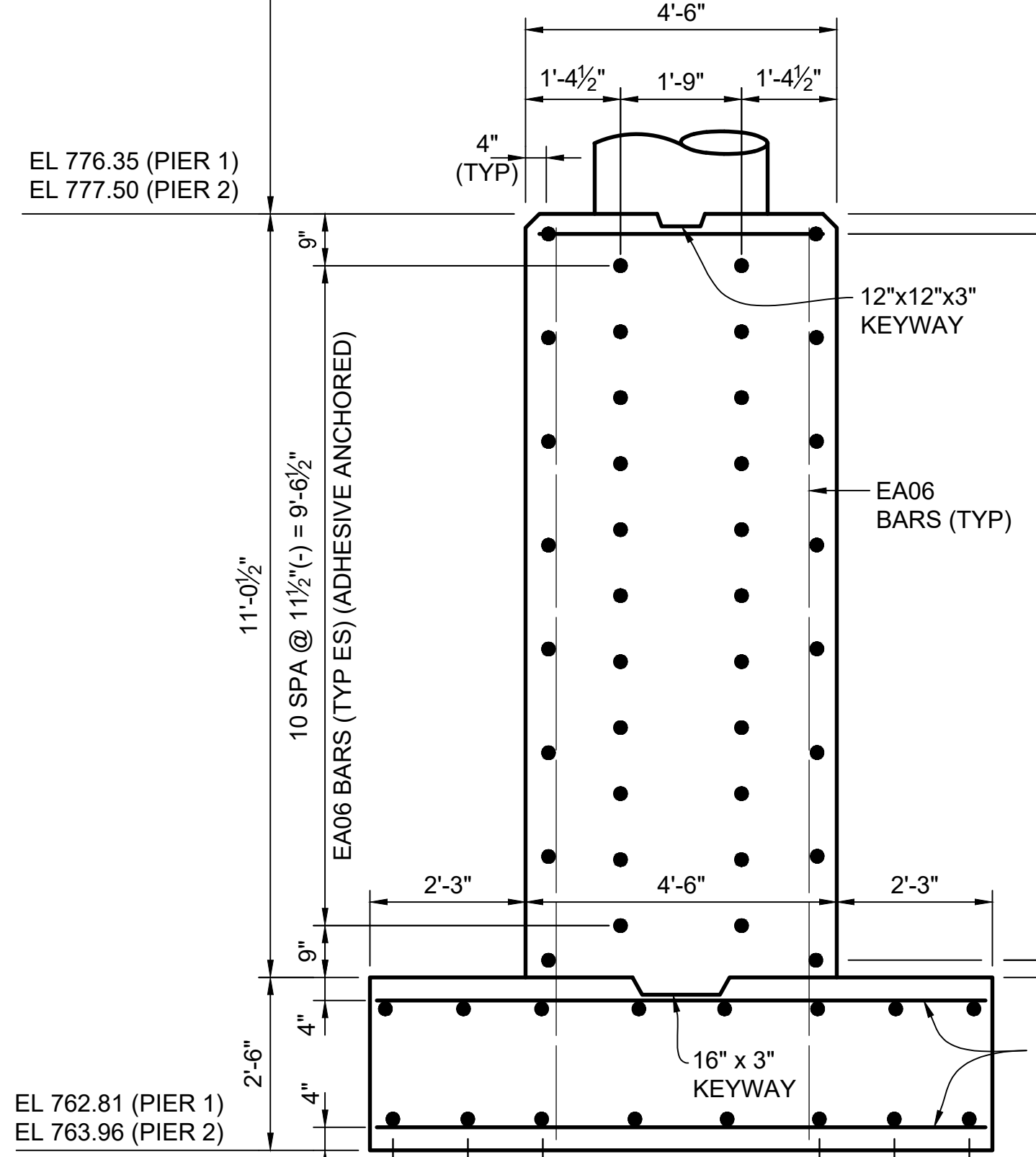
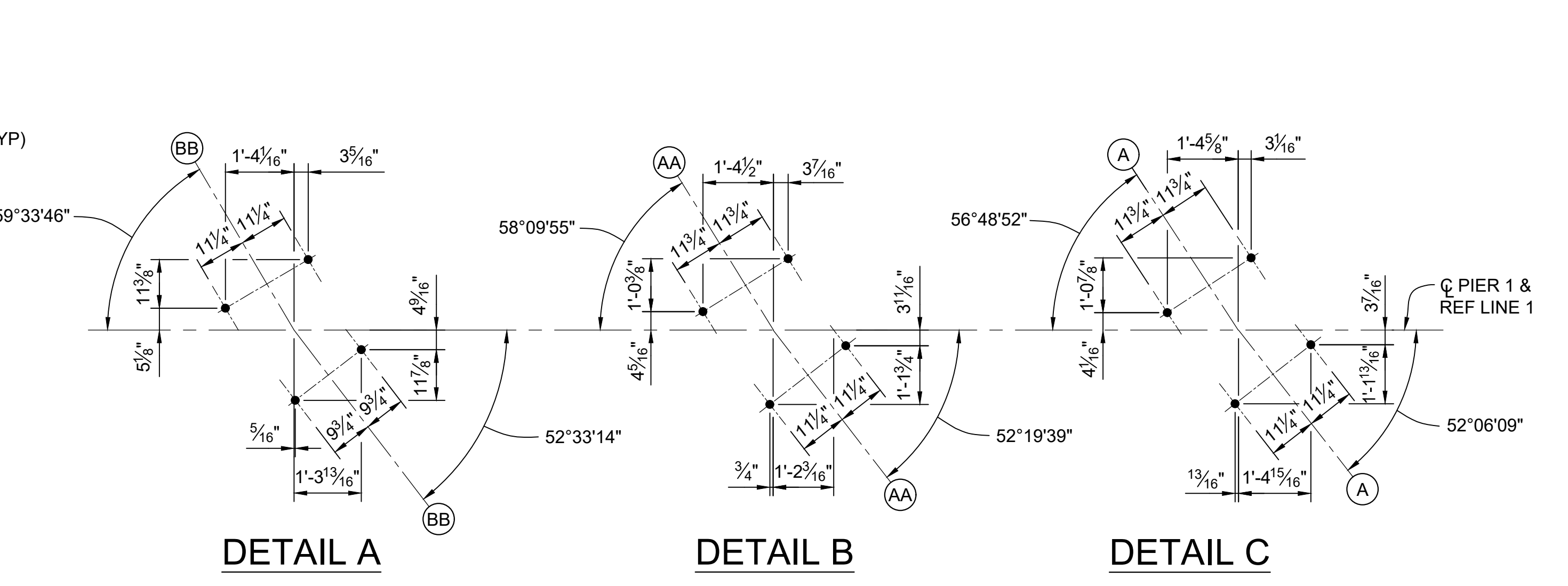
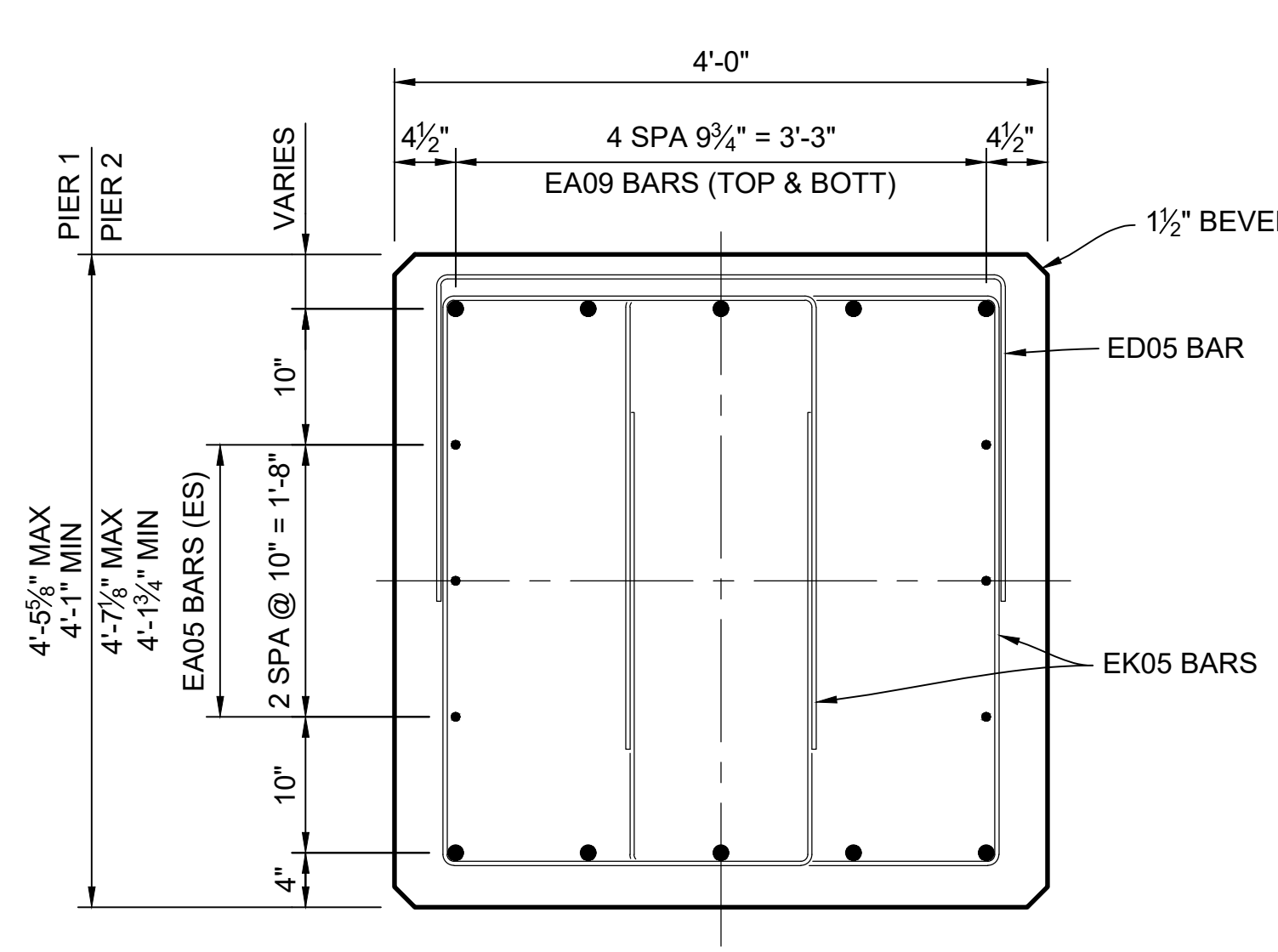
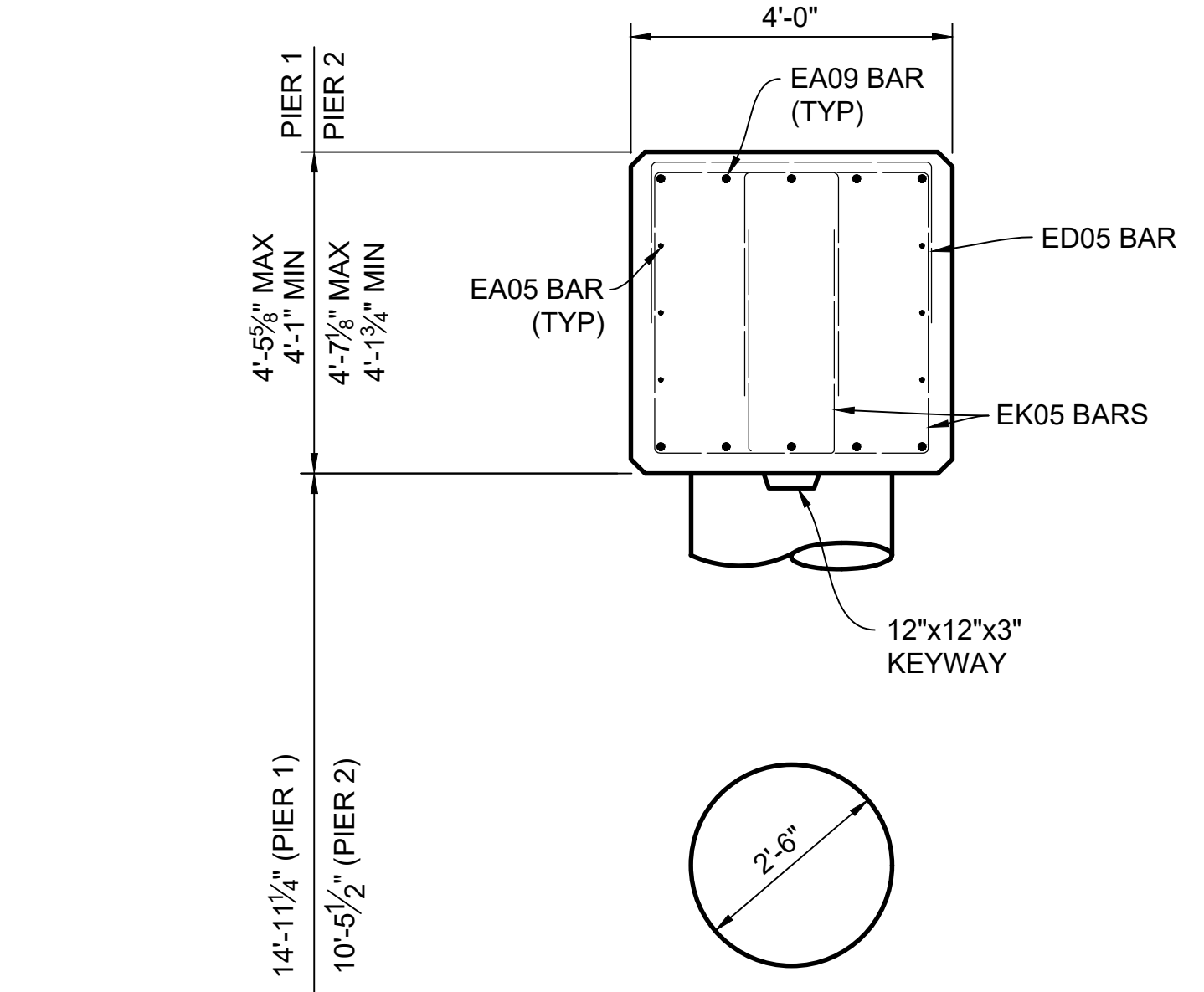
PIER 2 DETAILS

SCALE	NTS	INCH	0	1
DRAWING NO.				
2021-008-BR25				
SHEET NO. <u>88</u> OF <u>153</u>				

APPROVED BY _____

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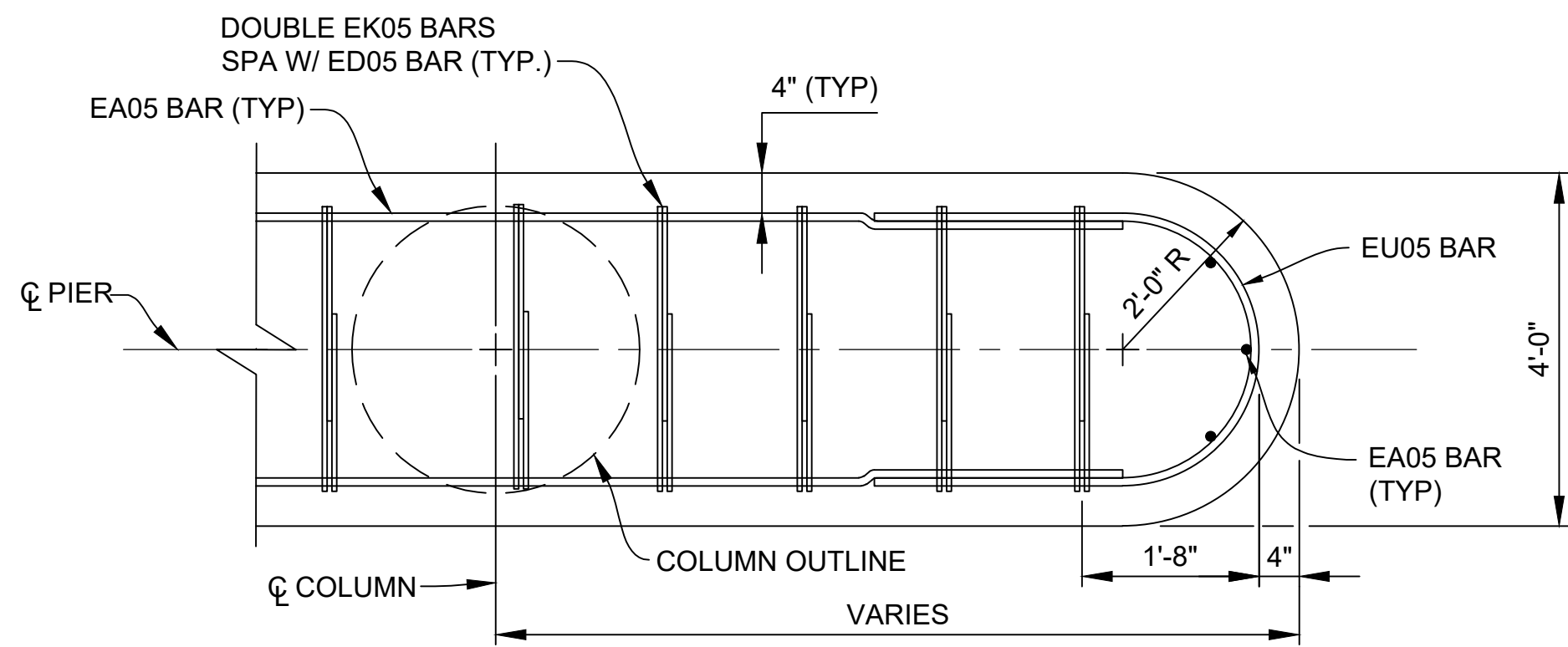
NOTE:
SEE PLAN OF PIER CAP FOR PIERS 1 & 2 FOR DETAIL LOCATIONS.

3 WORKING DAYS!
**BEFORE YOU DIG
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800-482-7171
(TOLL FREE)

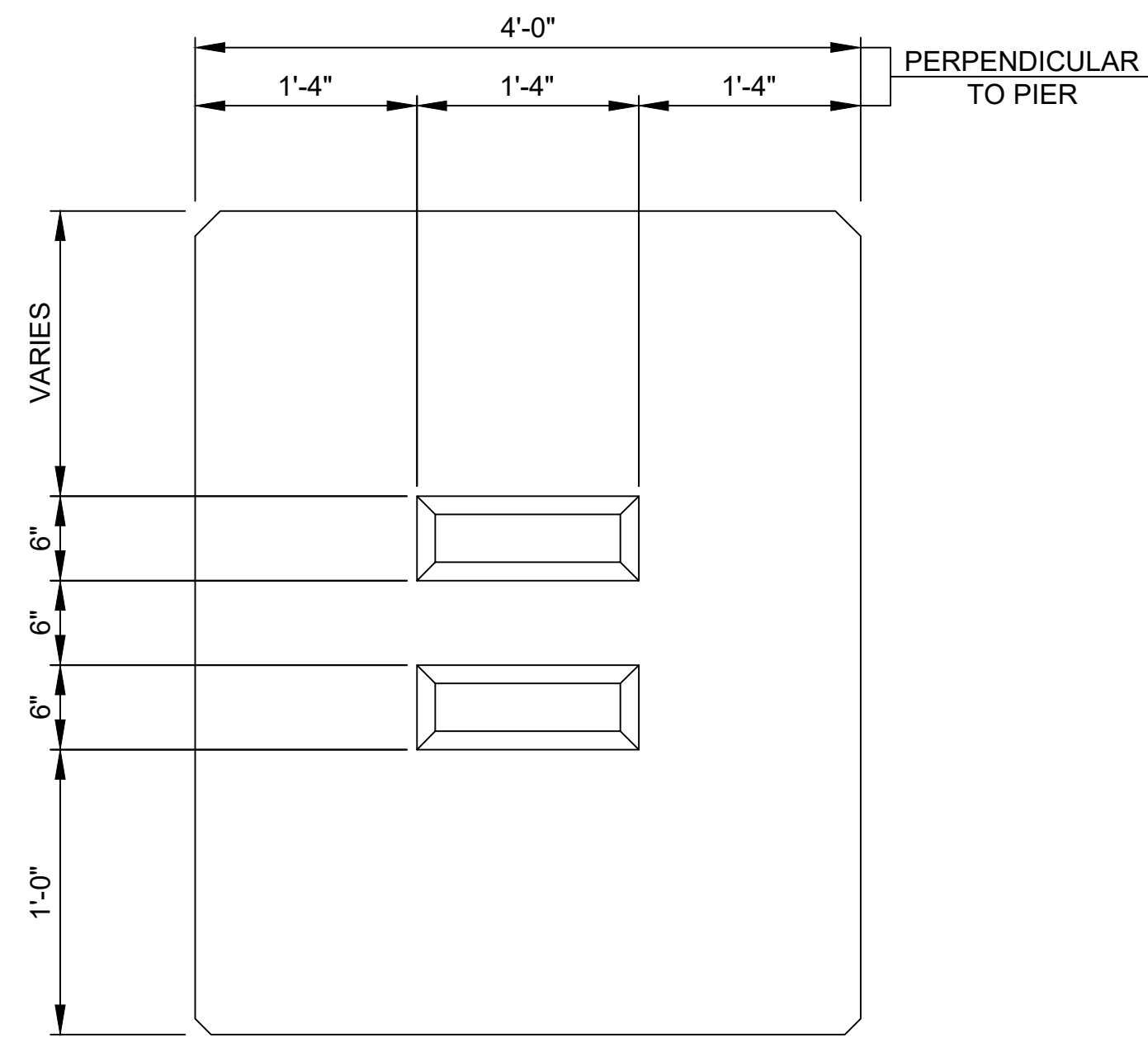
DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
PIER DETAILS	
SCALE NTS	INCH 0 1
DRAWING NO. 2021-008-BR26	
SHEET NO. <u>89</u> OF <u>153</u>	

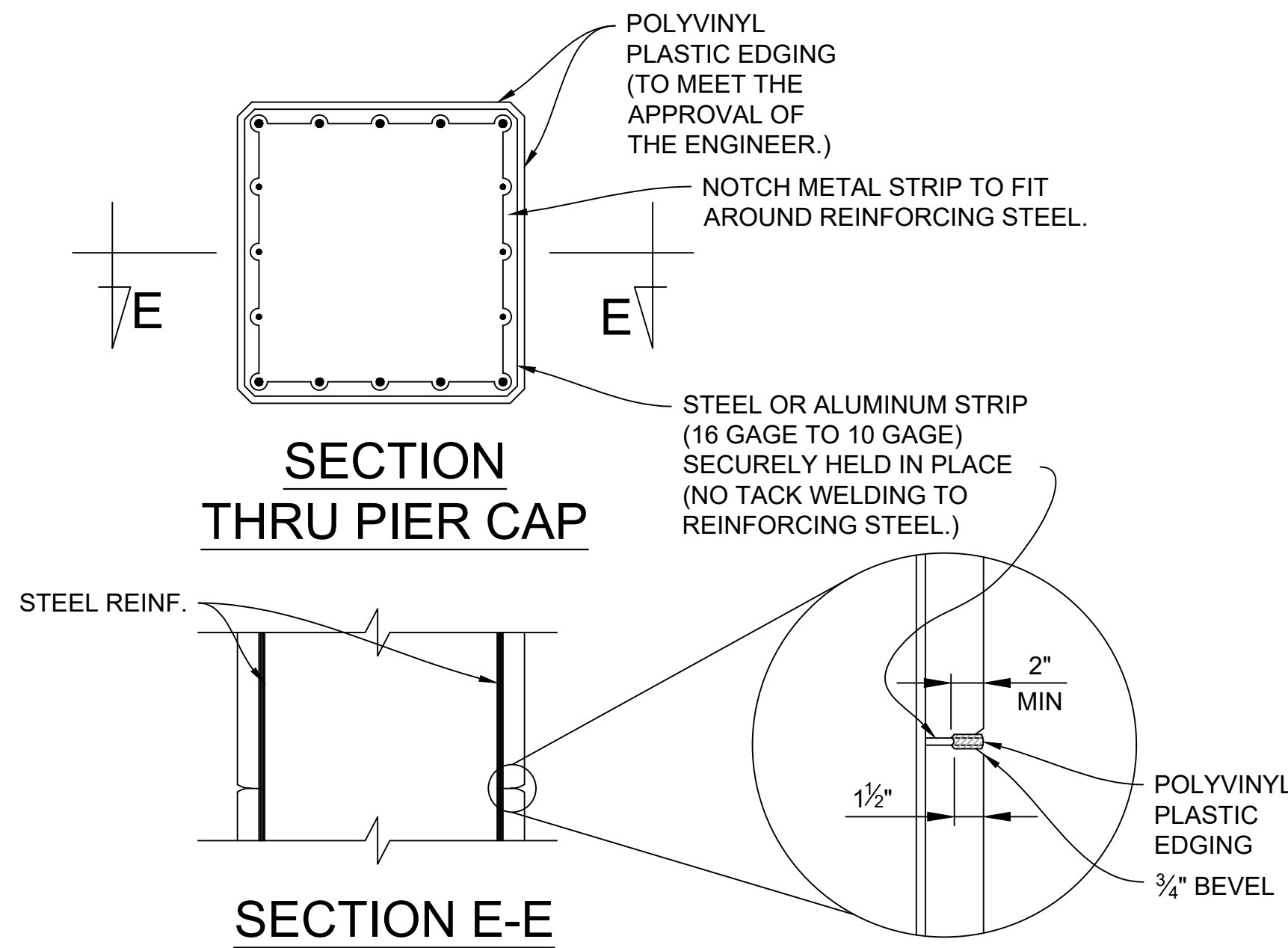
APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



TYPICAL CAP END-SECTION



SHEAR KEY DETAIL

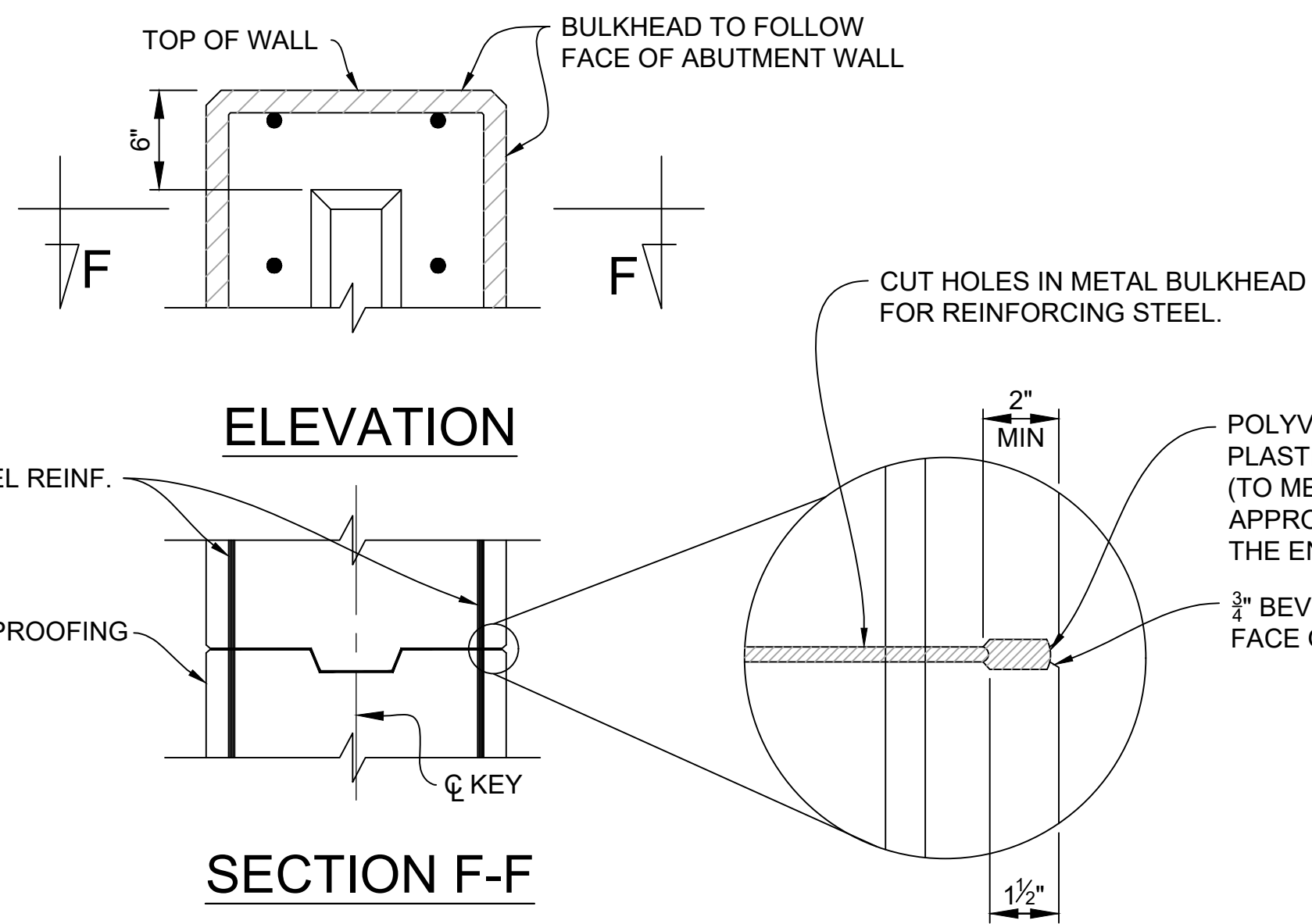


SECTION THRU PIER CAP

SECTION E-E

CAP PARTIAL METAL BULKHEAD DETAILS

NOTES: PARTIAL METAL BULKHEAD MAY BE USED AS ALTERNATE CONSTRUCTION JOINT AT CONTRACTOR'S EXPENSE. CARE IS TO BE USED IN CASTING CONCRETE TO PREVENT DISLOCATION OR MISALIGNMENT OF THE BULKHEAD.



ELEVATION

SECTION F-F

CRASHWALL METAL BULKHEAD DETAILS

NOTES: METAL BULKHEAD MAY BE USED AS ALTERNATE CONSTRUCTION JOINT AT CONTRACTOR'S EXPENSE. CARE IS TO BE USED IN CASTING CONCRETE AROUND BULKHEAD TO PREVENT DISLOCATION OR MISALIGNMENT OF THE BULKHEAD.

** PERFORATED WATERPROOFING MEMBRANE MAY BE USED AS AN ALTERNATE.

SUBSTRUCTURE CONCRETE QUANTITIES (CYD)		
POUR	PIER 1	PIER 2
* A	9.5	9.5
* B	21.5	21.5
* C	3.0	2.0
D	10.4	9.4
E	21.0	18.2
F	18.1	17.0
G	17.5	16.4
TOTAL	101	94

* DENOTES CATG 0002 (34 CYD @ PIER 1 & 33 CYD @ PIER2), ALL OTHER POURS INCLUDED IN CATG 0001

NOTES:

REPAIR AREAS/CRACKS SHOWN ARE APPROXIMATIONS BASED ON A BRIDGE INSPECTION THAT TOOK PLACE IN OCTOBER, 2021.

ABUTMENTS SHALL BE SOUNDED PRIOR TO CONSTRUCTION AND ADDITIONAL AREAS SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER.

PENETRATING WATER REPELLENT TREATMENT SHALL BE APPLIED TO THE ABUTMENT REPAIR AREAS AS DIRECTED BY THE ENGINEER.

FORMS FOR LARGE PATCHES SHALL BE INSTALLED IN 2'-0" TO 4'-0" HIGH SECTIONS WITH THE TOP OF THE FORM NO MORE THAN 4'-0" ABOVE THE LEVEL OF CONCRETE AS THE POUR PROGRESSES.

INSTALL GALVANIC ANODES ON EXPOSED REBAR ALONG PERIMETER OF REPAIR, SPACED PER MANUFACTURER'S RECOMMENDATIONS (24 INCH MAX).

A CRACK THAT EXTENDS BELOW THE GROUND LINE SHALL, WITH PRIOR APPROVAL OF THE ENGINEER, BE REPAIRED. ALL EXCAVATION, BACKFILL, WORK, AND MATERIAL REQUIRED SHALL BE INCLUDED IN PAYMENT FOR "STRUCTURAL CRACK, REPR".

APPLY SUBSTRUCTURE HORIZONTAL SURFACE SEALER TO THE TOP HORIZONTAL SURFACE OF PIERS 1 & 2 AFTER THE ELASTOMERIC BEARINGS HAVE BEEN PLACED IN FINAL POSITION ON THE STRUCTURE. CLEAN ACCIDENTALLY COATED VERTICAL SURFACES AT THE CONTRACTOR'S EXPENSE.

APPLY LOW TEMPERATURE PROTECTION OF CONCRETE ACCORDING TO SECTION 706.03J OF THE MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE IS INCLUDED IN THE RELATED ITEMS OF WORK.

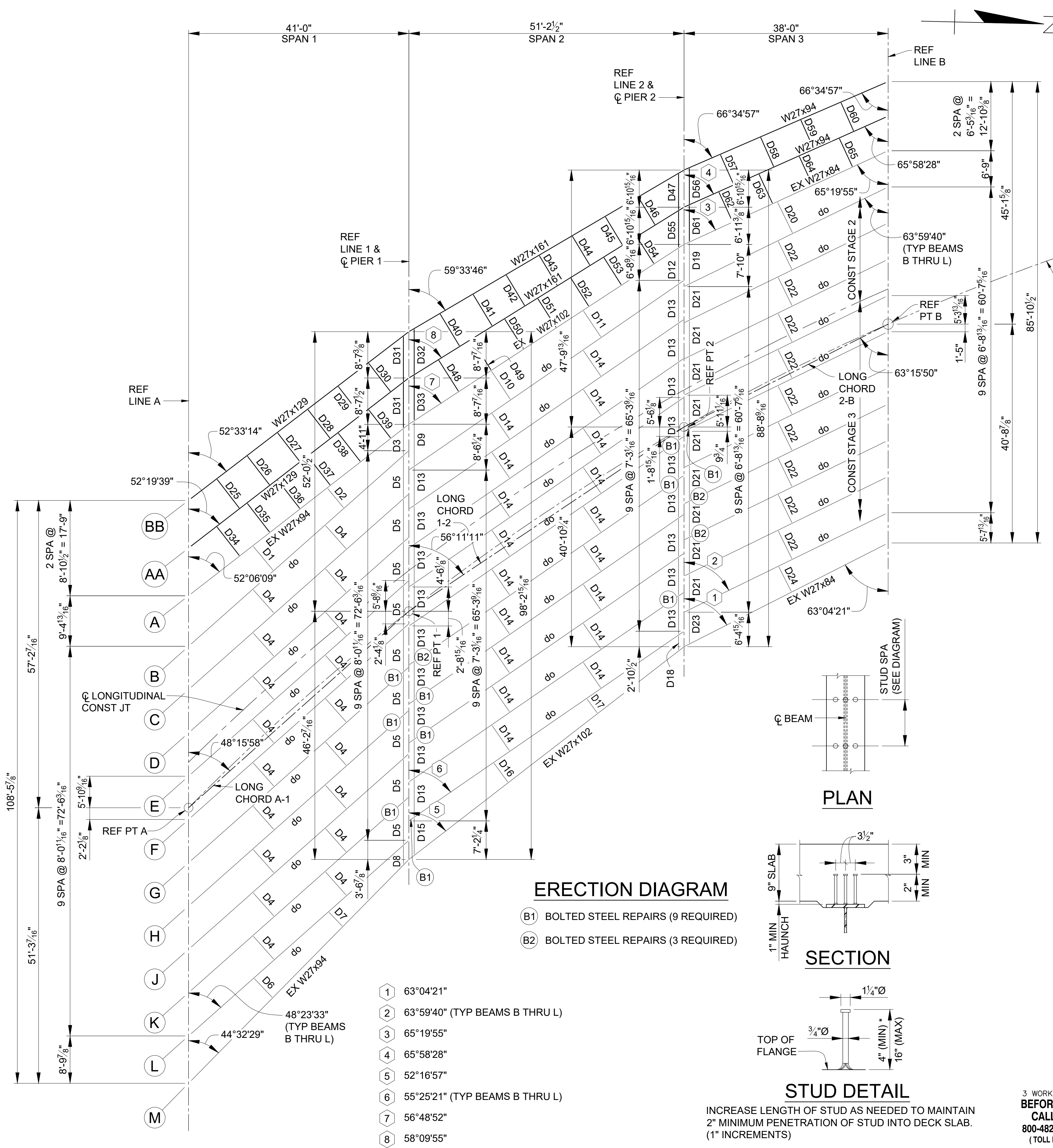
FOR MICROPILE QUANTITIES, LAYOUT AND NOTES, SEE SHEETS 80 AND 81 OF 153.

ESTIMATED QUANTITIES THIS SHEET					
DESCRIPTION	UNITS	CATG 0001	CATG 0002	CATG 0003	TOTAL
Substructure Conc	Cyd	128	67		195
Water Repellent Treatment, Penetrating	Syd	50			50
Substructure Horizontal Surface Sealer (STR 11065)	Syd	90			90
Hand Chipping, Other Than Deck	Cft	111			111
Patch, Forming	Sft	444			444
Adhesive Anchoring of Horizontal Bar, 3/4 inch	Ea		68		68
Adhesive Anchoring of Vertical Bar, 3/4 inch	Ea		8		8
Reinforcement, Mechanical Splice	Ea	32			32
Flushing Cracks, Water	Ft	40			40
Structural Crack, Repr	Ft	40			40
Patching Conc, C-L	Cyd	4.6			4.6
Embedded Galvanic Anode	Ea	280			280

3 WORKING DAYS
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(TOLL FREE)

DLZ					PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR				
					EAST MEDICAL CENTER DRIVE				
					PIER DETAILS				
					SCALE: NTS 0 1 INCH				
					DRAWING NO. 2021-008-BR27				
					SHEET NO. 90 OF 153				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734				

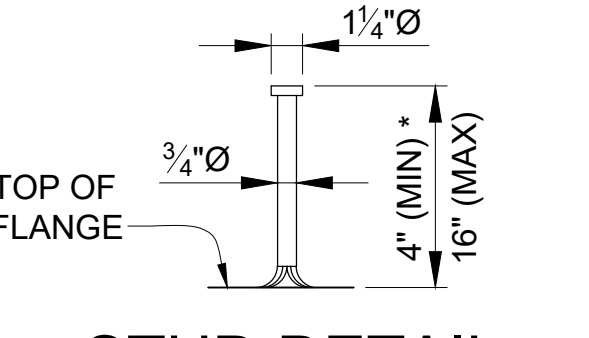
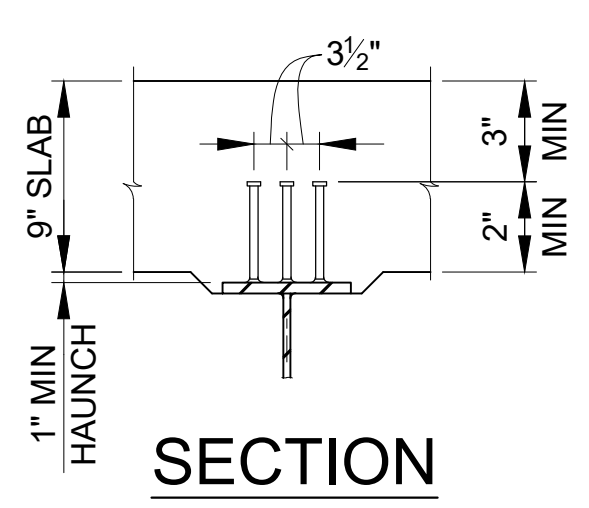
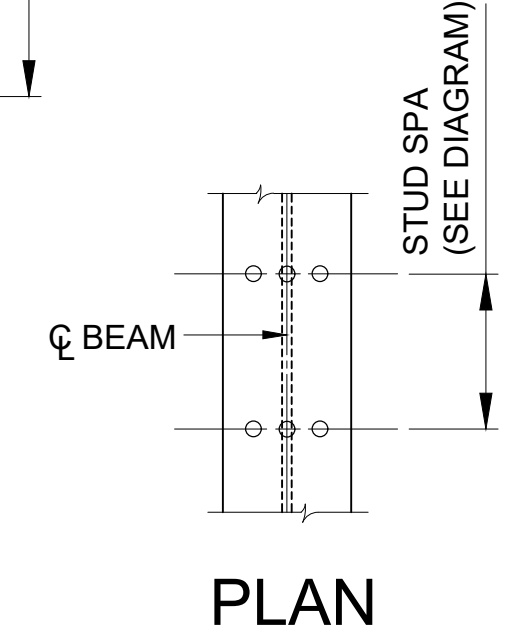
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ERECTION DIAGRAM

- (B1) BOLTED STEEL REPAIRS (9 REQUIRED)
- (B2) BOLTED STEEL REPAIRS (3 REQUIRED)

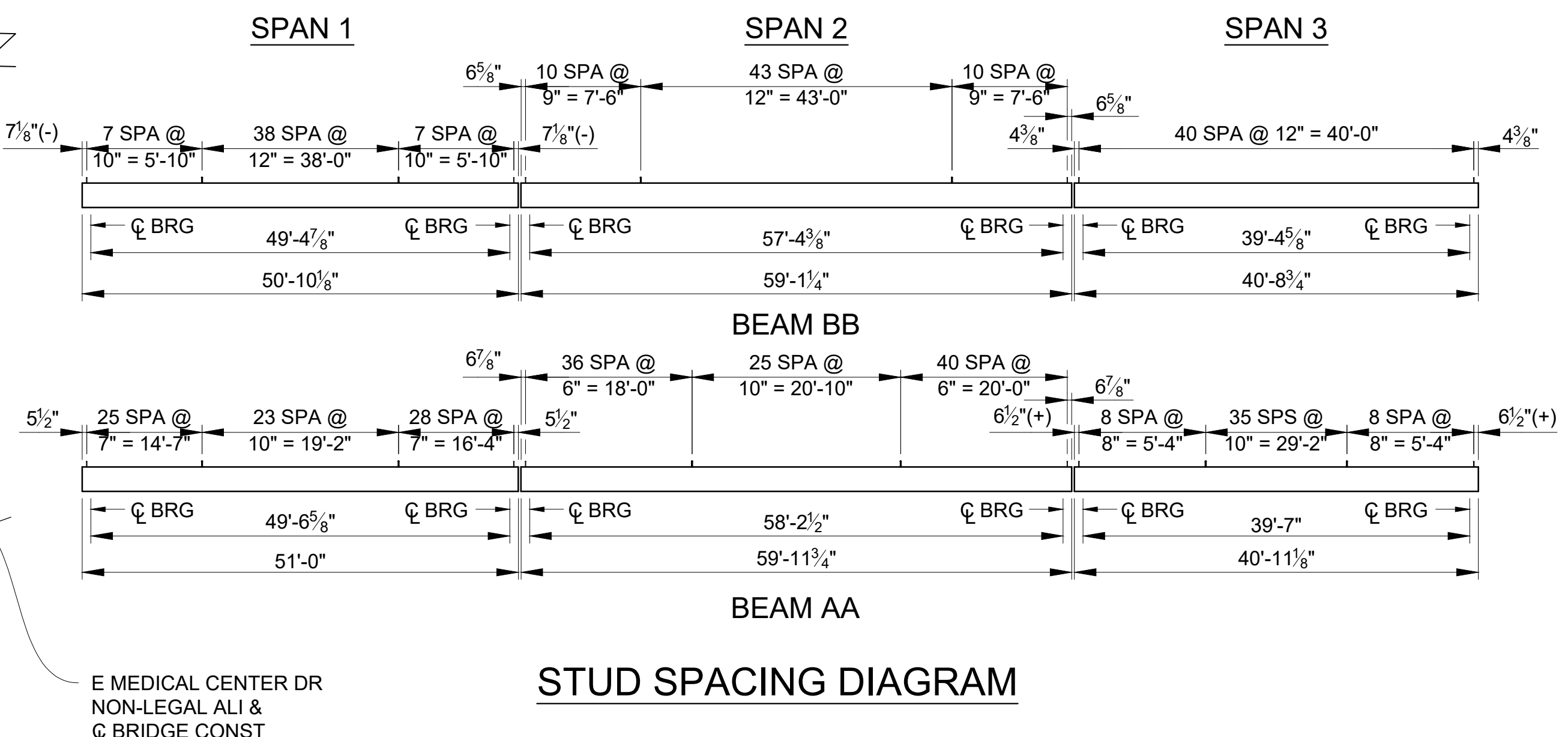
- 1 63°04'21"
- 2 63°59'40" (TYP BEAMS B THRU L)
- 3 65°19'55"
- 4 65°58'28"
- 5 52°16'57"
- 6 55°25'21" (TYP BEAMS B THRU L)
- 7 56°48'52"
- 8 58°09'55"



STUD DETAIL

INCREASE LENGTH OF STUD AS NEEDED TO MAINTAIN 2" MINIMUM PENETRATION OF STUD INTO DECK SLAB. (1" INCREMENTS)

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)



STUD SPACING DIAGRAM

ESTIMATED QUANTITIES THIS SHEET

DESCRIPTION	UNITS	CATG 0001	CATG 0002	CATG 0003	TOTAL
Shear Developers (STR 11065)	LSUM		0.7		0.7
Structural Steel, Mixed, Erect	Lb	32,419	14,162		46,581
Structural Steel, Mixed, Furn and Fab	Lb	32,419	14,162		46,581
Structural Steel, Rolled Shape, Erect	Lb		40,000		40,000
Structural Steel, Rolled Shape, Furn and Fab	Lb		40,000		40,000
Structural Steel, Galvanizing (STR 11065)	LSUM	1			1
Beam Plate, Seal Perimeter	Ft	1,660			1,660

NOTES:

- ES DENOTES EACH SIDE.
- NS DENOTES NEAR SIDE.
- FS DENOTES FAR SIDE.
- CONTRACTOR MUST VERIFY ALL DIMENSIONS PRIOR TO STEEL FABRICATION.
- CONNECTIONS SHALL BE BOLTED WITH 3/4" HIGH STRENGTH BOLTS.
- ANCHOR BOLT LENGTHS SHOWN ARE MINIMUM. BOLTS LONGER THAN THOSE SHOWN MAY BE FURNISHED AT NO ADDITIONAL COST.
- EXISTING AND PROPOSED STRUCTURAL STEEL SHALL BE GALVANIZED ACCORDING TO SECTION 716.03.B.4 OF THE MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- PROVIDE STRUCTURAL STEEL CONFORMING TO AASHTO M270, GRADE 50. AASHTO M270, GRADE 36 STEEL MAY BE USED IN LIEU OF THIS STEEL FOR BEARINGS AND DIAPHRAGMS.
- PROVIDE STRUCTURAL STEEL CONFORMING TO AASHTO M270, GRADE 36 FOR BOLTED STEEL BEAM REPAIRS.
- THIS BRIDGE IS COATED WITH A ZINC BASED COATING SYSTEM. THE STRUCTURAL STEEL HAS BEEN BLAST CLEANED PRIOR TO COATING. THE ADDITIONAL EFFORT TO CLEAN THE STRUCTURAL STEEL WILL NOT BE PAID FOR SEPARATELY BUT WILL BE CONSIDERED INCLUDED IN THE BID ITEMS.
- THE ENGINEER WILL INSPECT THE STRUCTURAL STEEL PARTS THAT HAVE BEEN BLAST CLEANED FOR EVIDENCE OF CRACKS OR LOSS OF SECTION DUE TO CORROSION OF MORE THAN 25 PERCENT.
- APPLY SEALANT AROUND THE CONNECTION OF NEW STRUCTURAL STEEL MEMBER TO EXISTING STRUCTURAL STEEL MEMBER.
- THE PAYMENT FOR PROPOSED DIAPHRAGMS, CONNECTION PLATES, STEEL SUPPORT ANGLES FOR CONDUIT HANGER ASSEMBLIES, AND BOLTED BEAM END REPAIRS SHALL BE INCLUDED IN THE PAY ITEMS "STRUCTURAL STEEL, MIXED, ERRECT" AND "STRUCTURAL STEEL, MIXED, FURN AND FAB".
- THE PAYMENT FOR PROPOSED BEAMS SHALL BE INCLUDED IN THE PAY ITEMS "STRUCTURAL STEEL, ROLLED SHAPE, ERRECT" AND "STRUCTURAL STEEL, ROLLED SHAPE, FURN AND FAB".
- THE PAYMENT FOR THE CONDUIT HANGER ASSEMBLY WILL BE INCLUDED IN THE PAY ITEM "CONDUIT, SCHEDULE 80, 4 INCH, STRUCTURE".

DLZ

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

STRUCTURAL STEEL DETAILS

ERECTION DIAGRAM

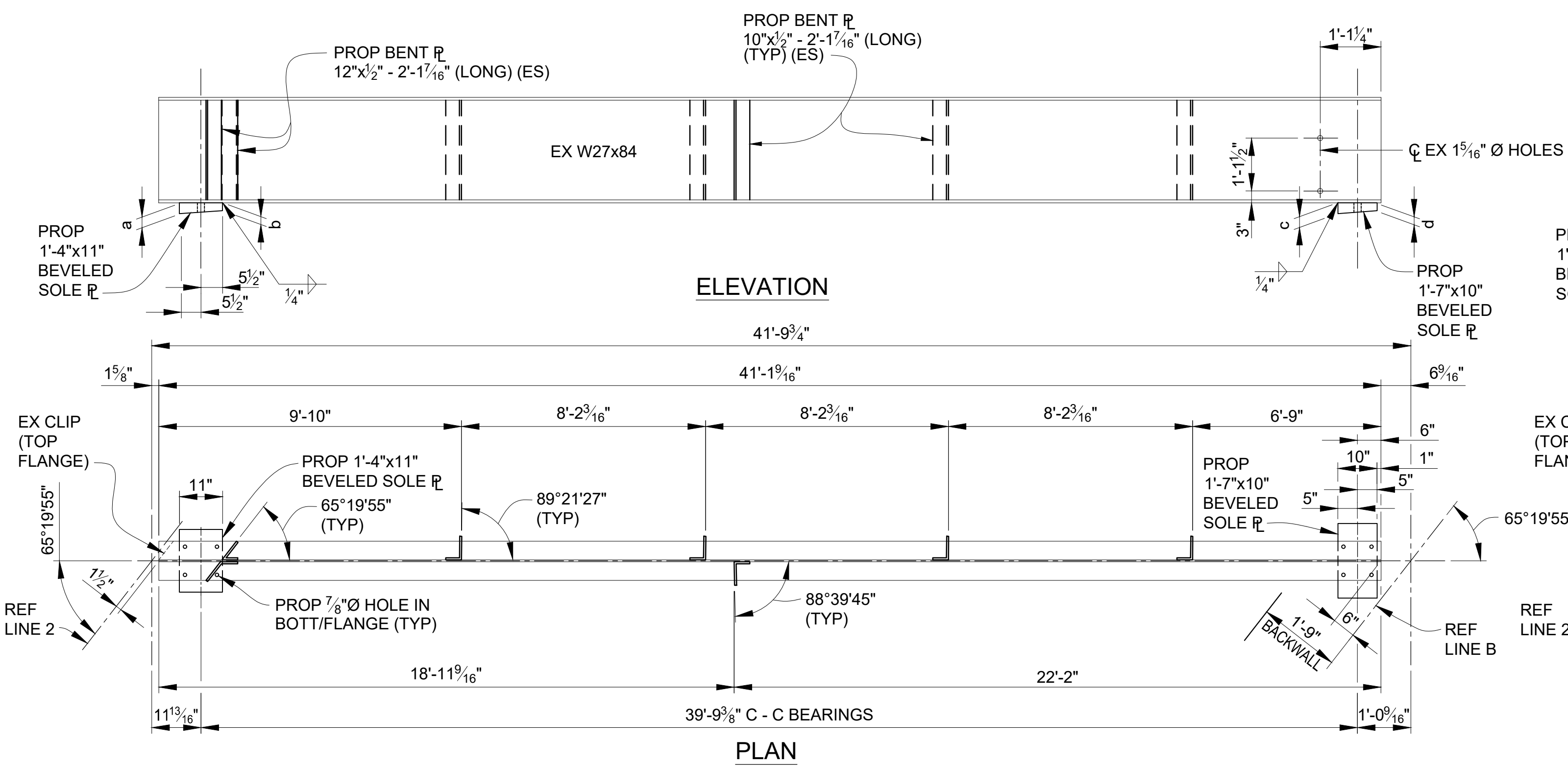
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DRAWING NO. **2021-008-BR28**

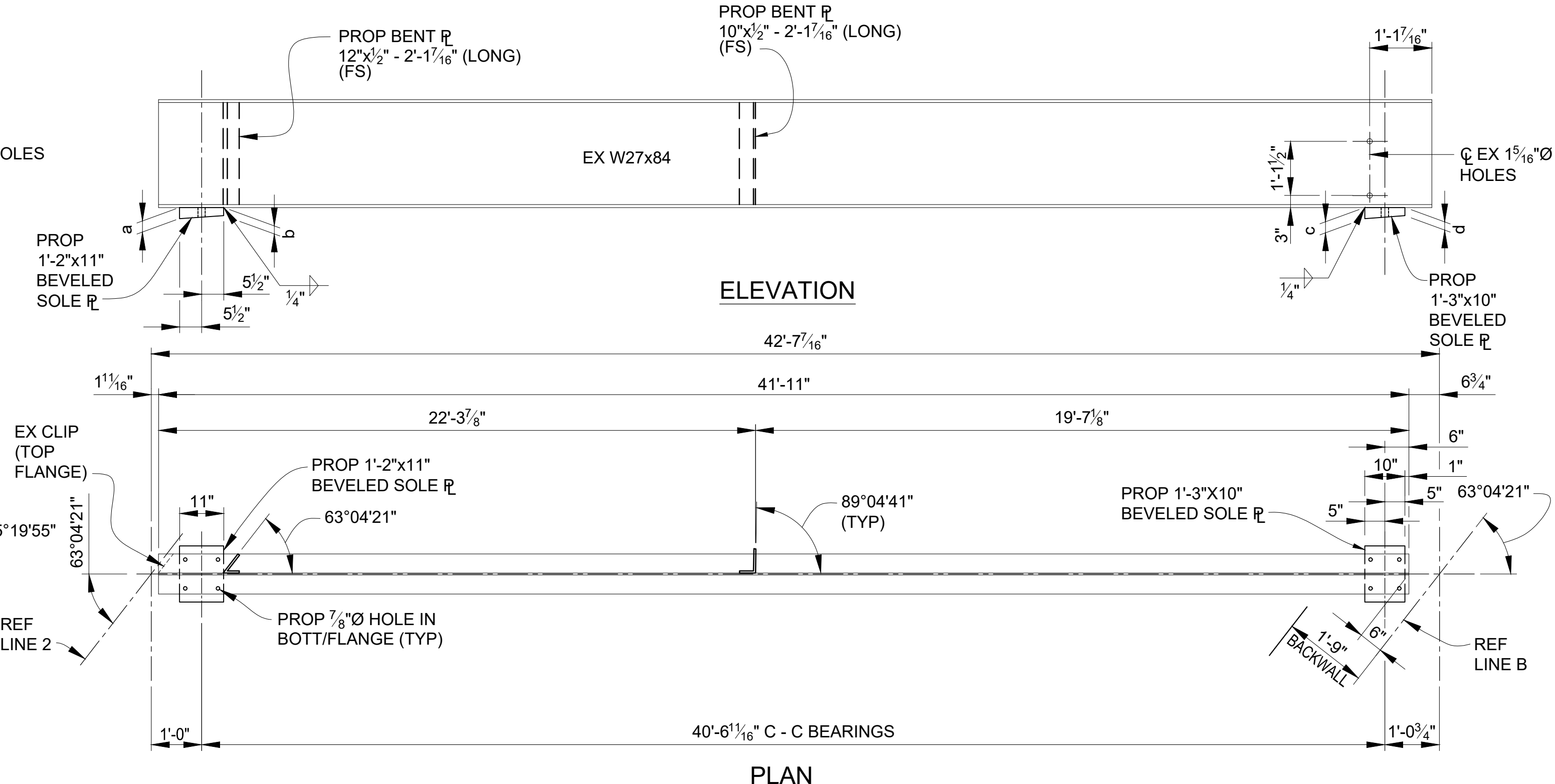
SHEET NO. **91** OF **153**

APPROVED BY: _____

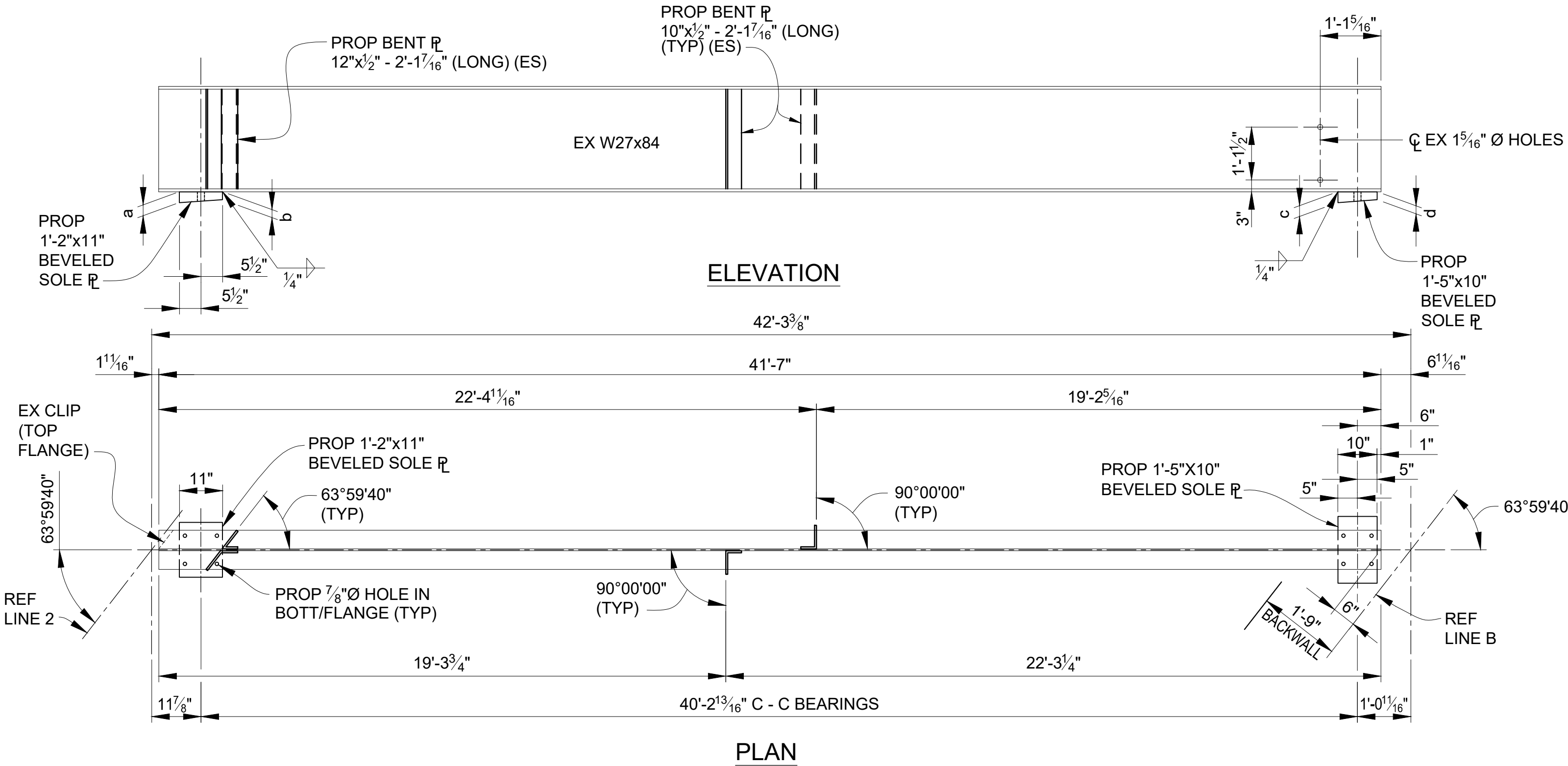
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EXISTING BEAM A



EXISTING BEAM M



EXISTING BEAMS B THRU L

SPAN 3 - SOLE PLATE TABULATED DIMENSIONS

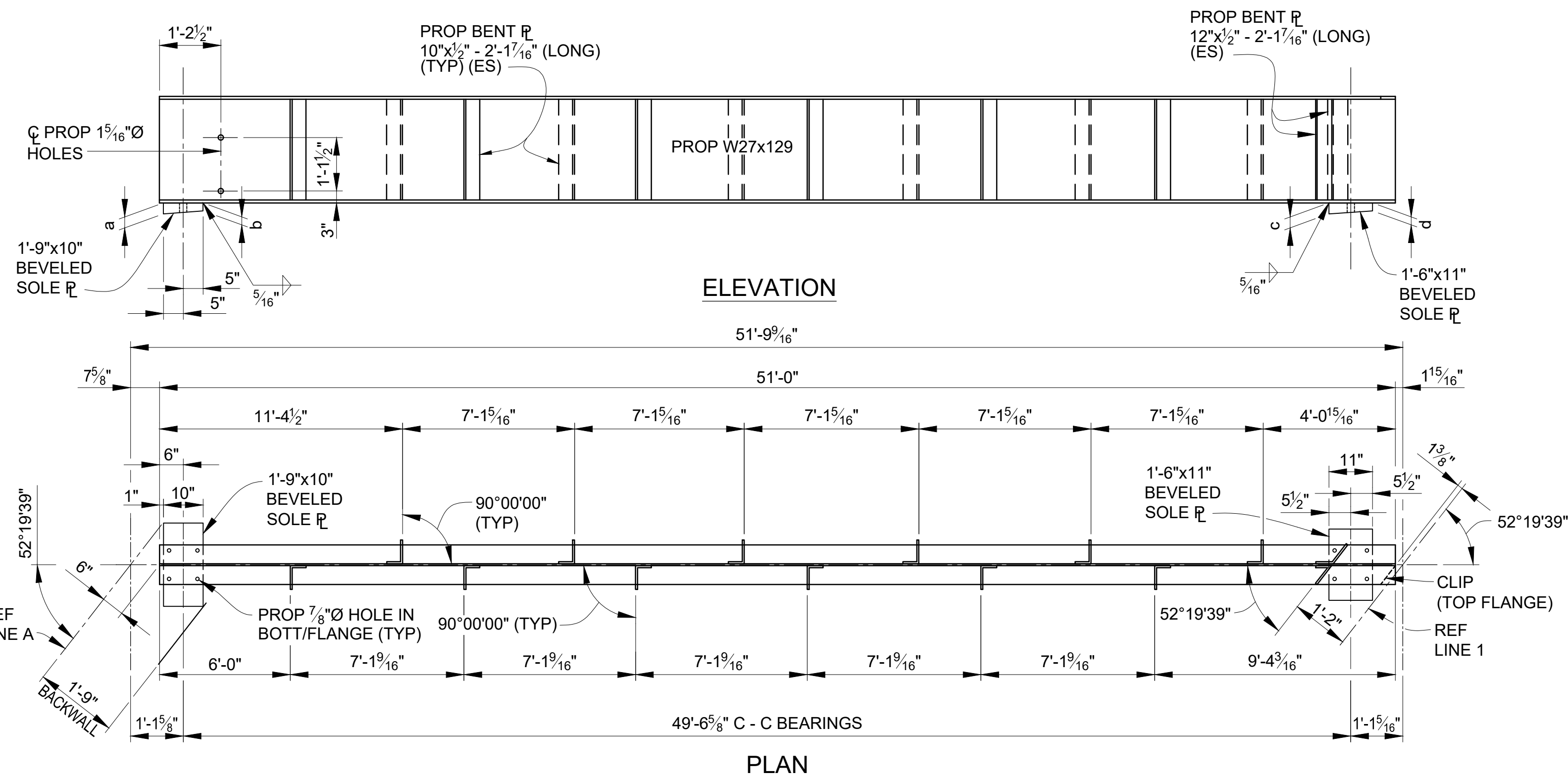
BEAM	REF LINE 2		REF LINE B	
	a	b	c	d
A	2 1/16"	2"	3 1/16"	3 1/16"
B	2 13/16"	2 1/8"	3 3/8"	2 1/2"
C	2 1/16"	2"	2 5/8"	2"
D	2 15/16"	2 1/4"	3 7/16"	2 13/16"
E	2 1/16"	2"	3 3/8"	2 1/2"
F	2 15/16"	2 1/4"	2 7/8"	2 1/4"
G	2 1/16"	2"	2 3/4"	2 1/8"
H	3 5/16"	2 5/8"	2 5/8"	2"
J	2 1/16"	2"	2 5/8"	2"
K	3 1/2"	2 13/16"	2 5/8"	2"
L	2 1/16"	2"	2 5/8"	2"
M	2 1/16"	2"	2 5/8"	2"

3 WORKING DAYS
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(TOLL FREE)

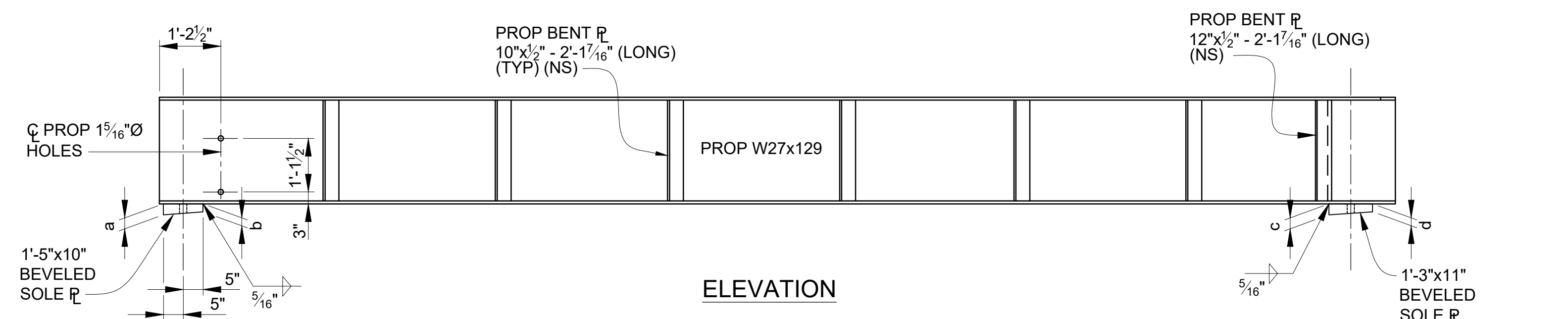
DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
STRUCTURAL STEEL DETAILS	
EXISTING BEAMS - SPAN 3	
SCALE	HOR. 3/32" = 1'-0"
DRAWING NO.	2021-008-BR31
SHEET NO.	94 OF 153

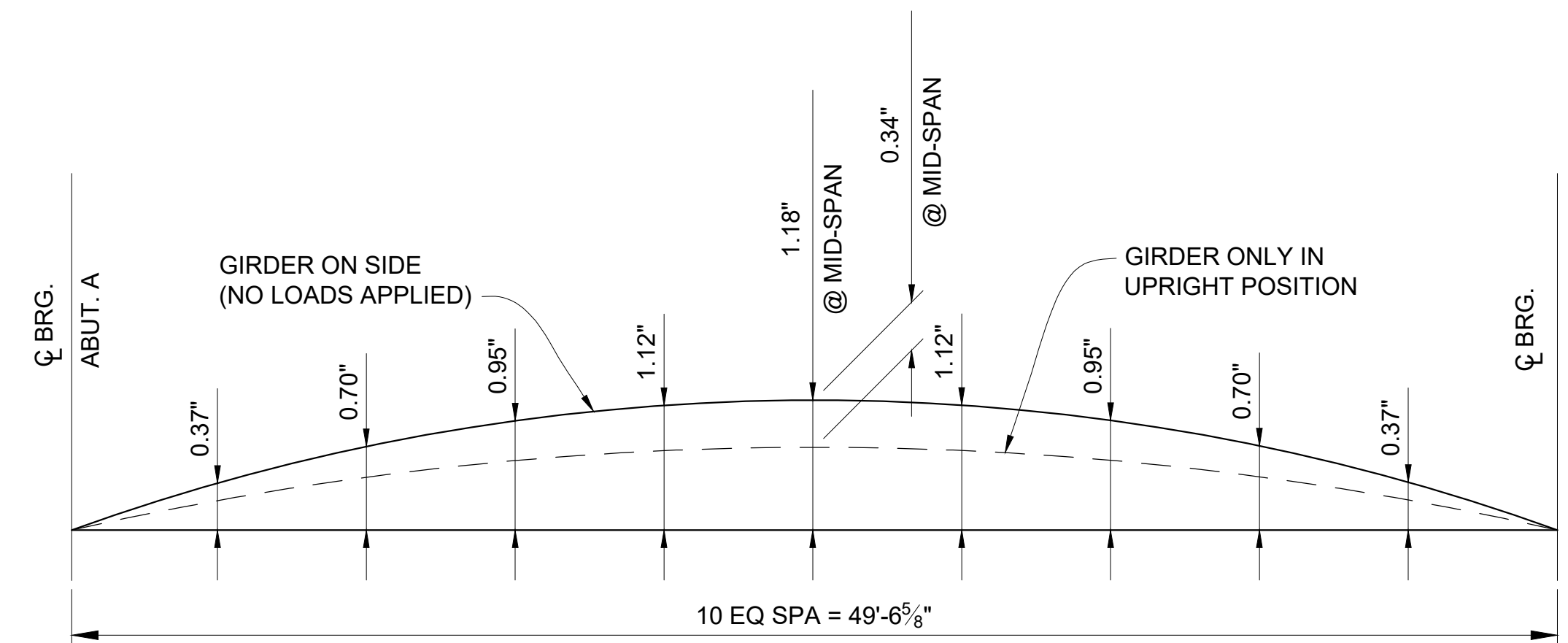
APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



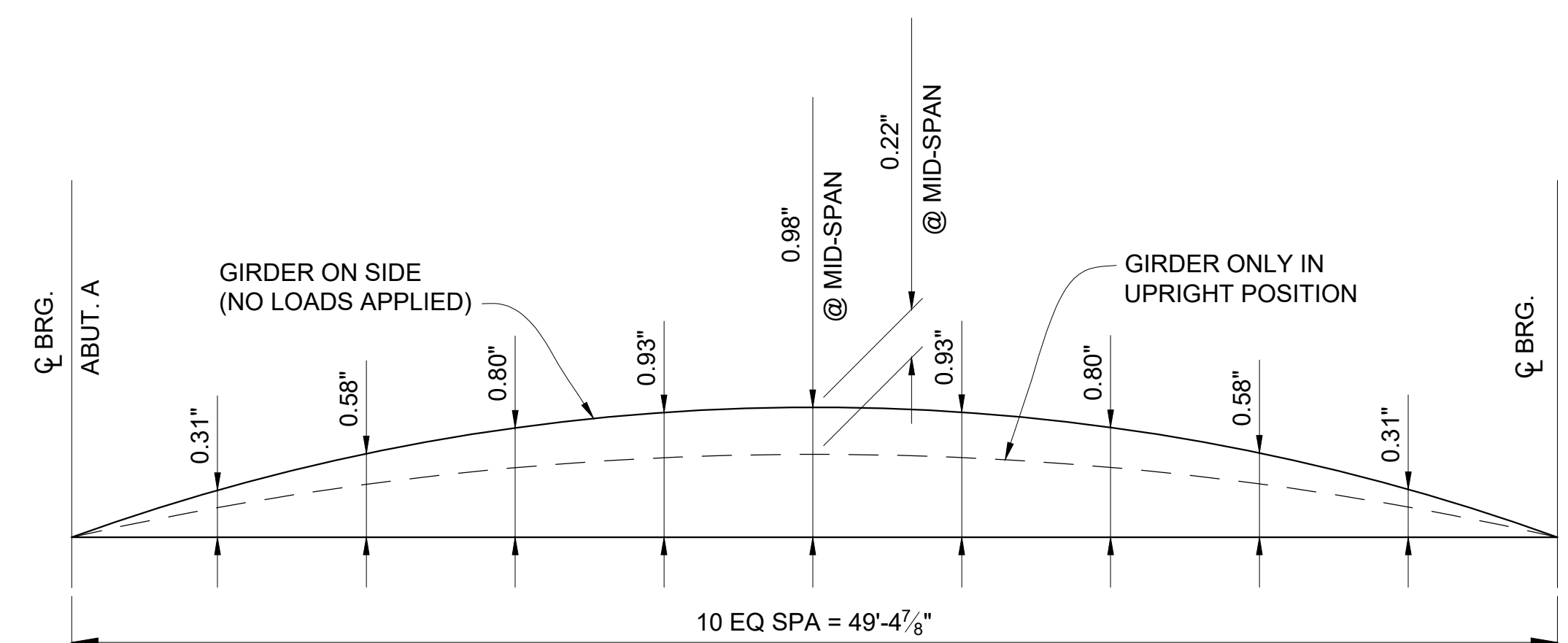
PROPOSED BEAM AA



PROPOSED BEAM BB



CAMBER DIAGRAM - BEAM AA



CAMBER DIAGRAM - BEAM BB

SPAN 1 - SOLE PLATE TABULATED DIMENSIONS

BEAM	REF LINE A		REF LINE 1	
	a	b	c	d
AA	2 7/16"	2"	4 1/16"	3 9/16"
BB	2 7/16"	2"	4 5/16"	3 13/16"

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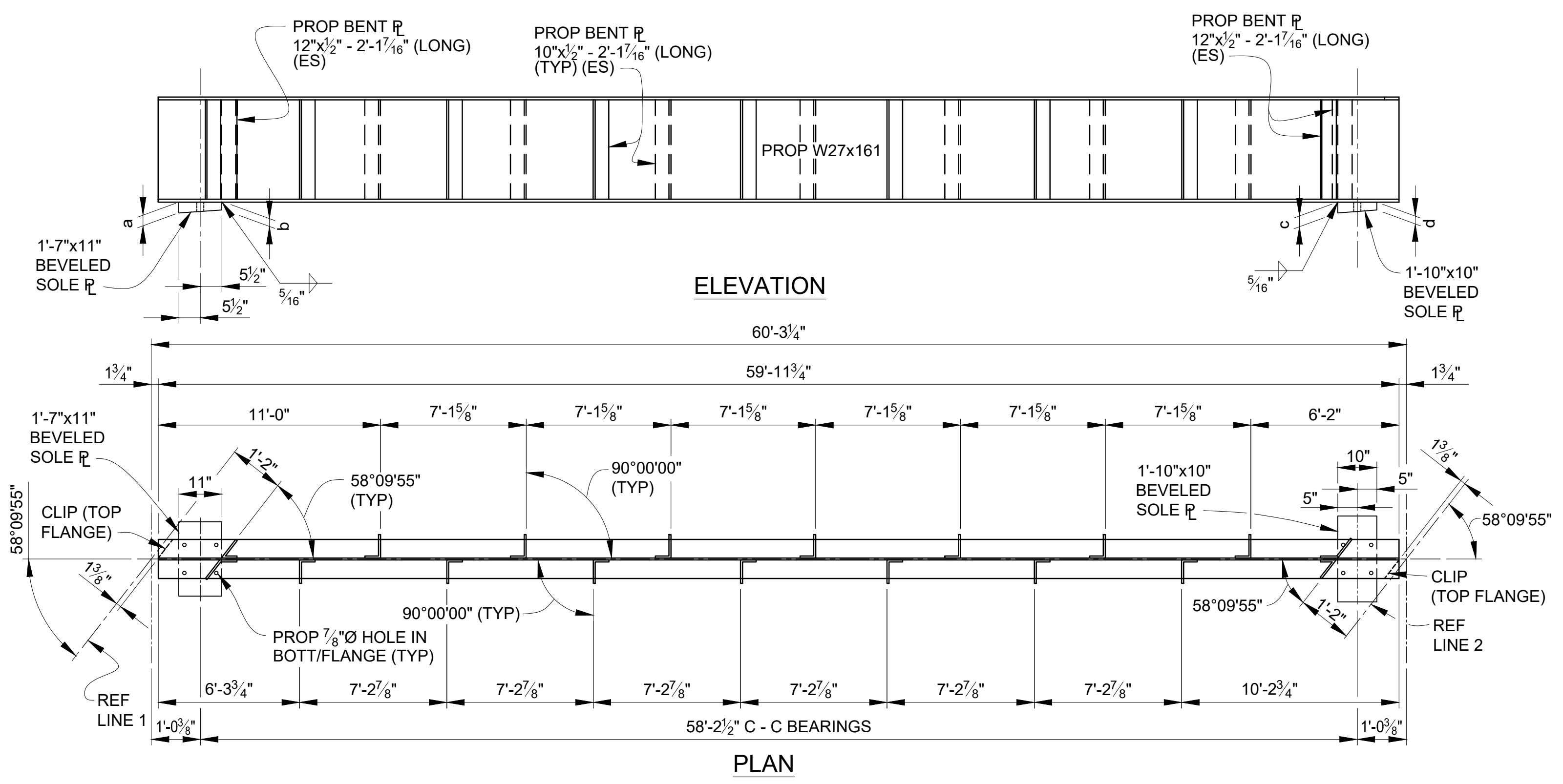
3 WORKING DAYS | BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

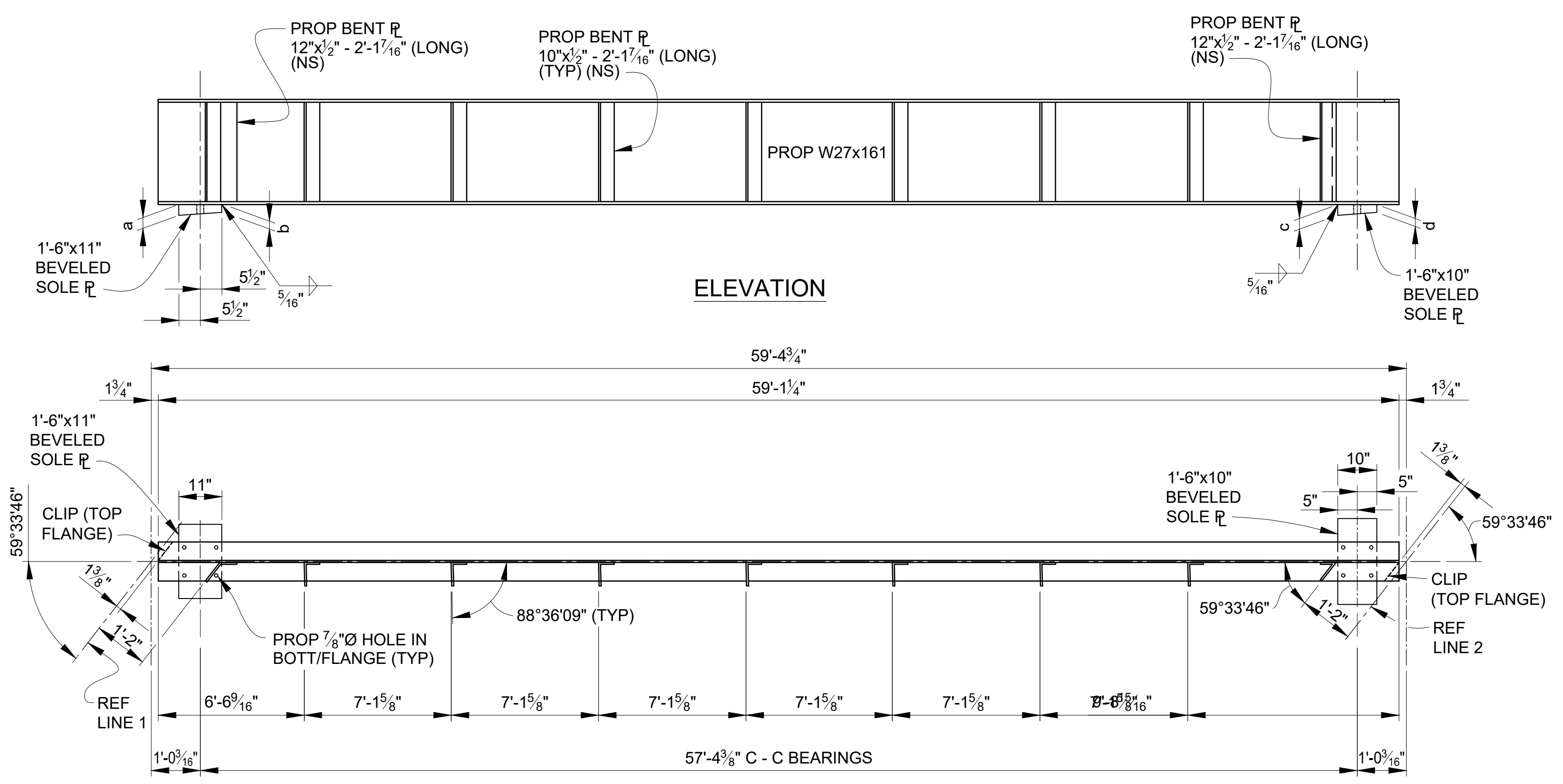
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
STRUCTURAL STEEL DETAILS	
PROPOSED BEAMS SPAN 1	
SCALE	HOR. 3/32" = 1'-0"
DRAWING NO.	2021-008-BR32
SHEET NO.	95 OF 153

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

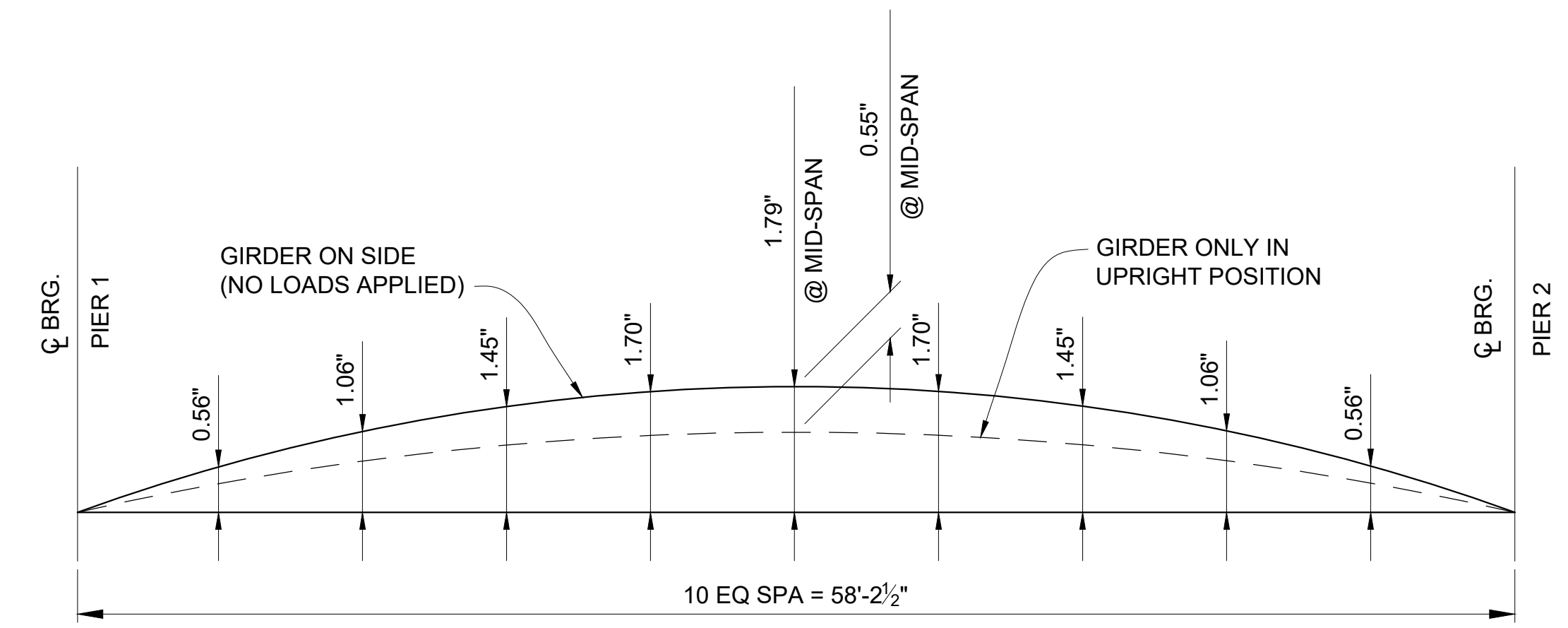
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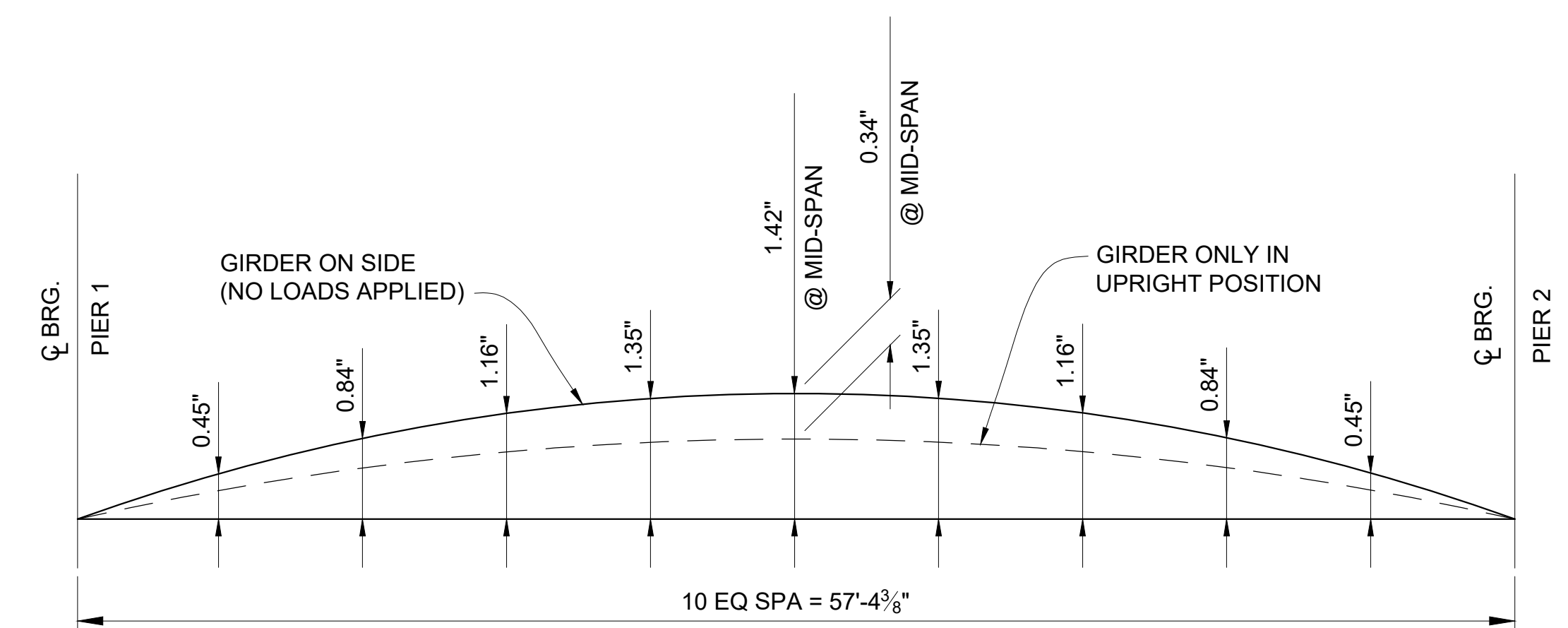
PROPOSED BEAM AA



PROPOSED BEAM BB



CAMBER DIAGRAM - BEAM AA



CAMBER DIAGRAM - BEAM BB

SPAN 2 - SOLE PLATE TABULATED DIMENSIONS

BEAM	REF LINE 1		REF LINE 2	
	a	b	c	d
AA	2 1/16"	2"	3 13/16"	3 3/16"
BB	3"	2 3/8"	3 13/16"	3 3/16"

3 WORKING DAYS
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DLZ

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

STRUCTURAL STEEL DETAILS

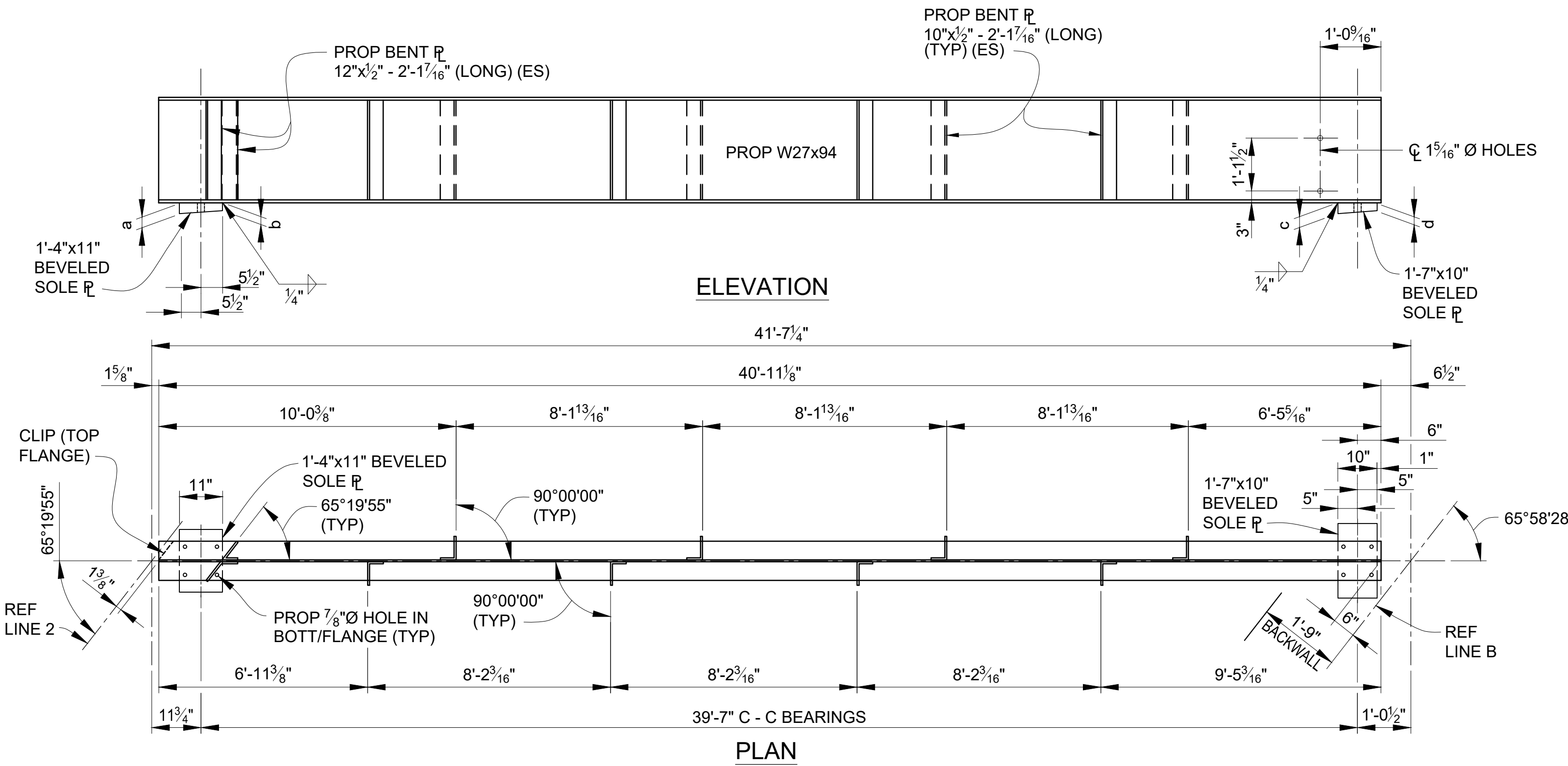
PROPOSED BEAMS SPAN 2

SCALE: HOR. 3/32"=1'-0"

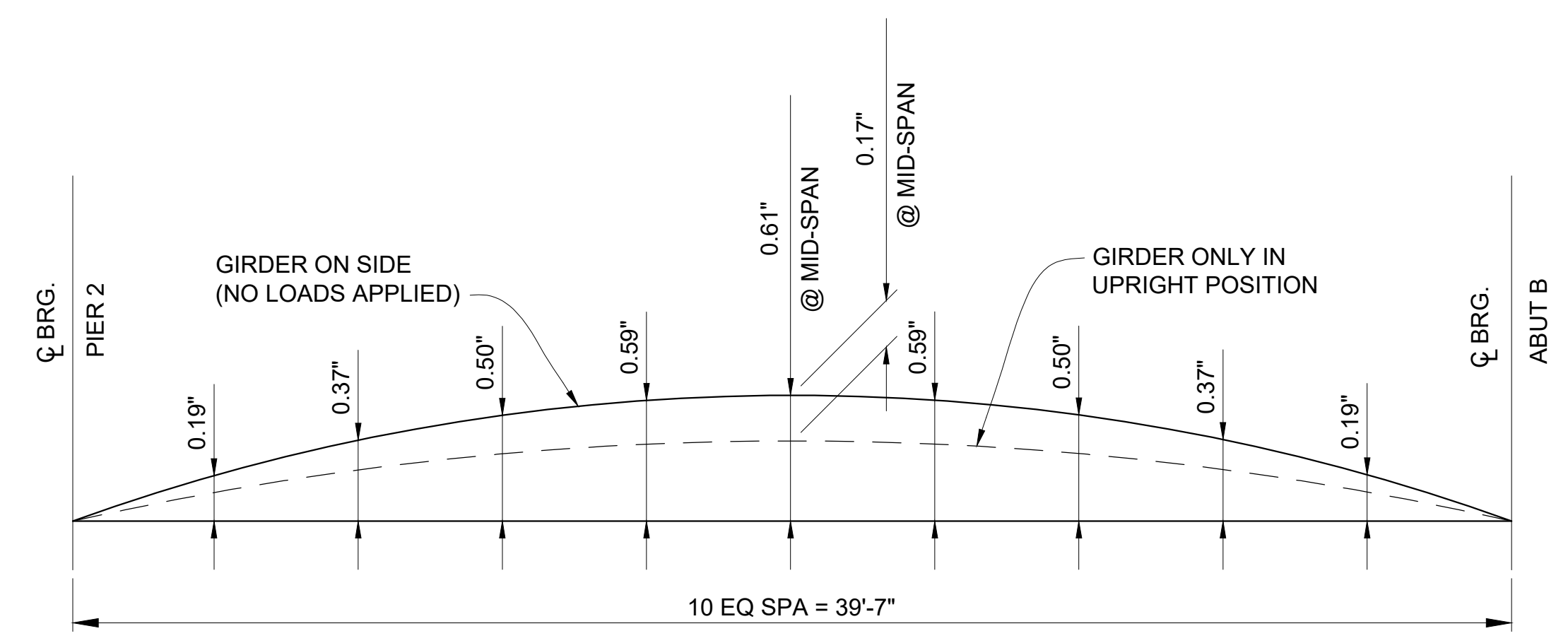
DRAWING NO. **2021-008-BR33**

SHEET NO. 96 OF 153

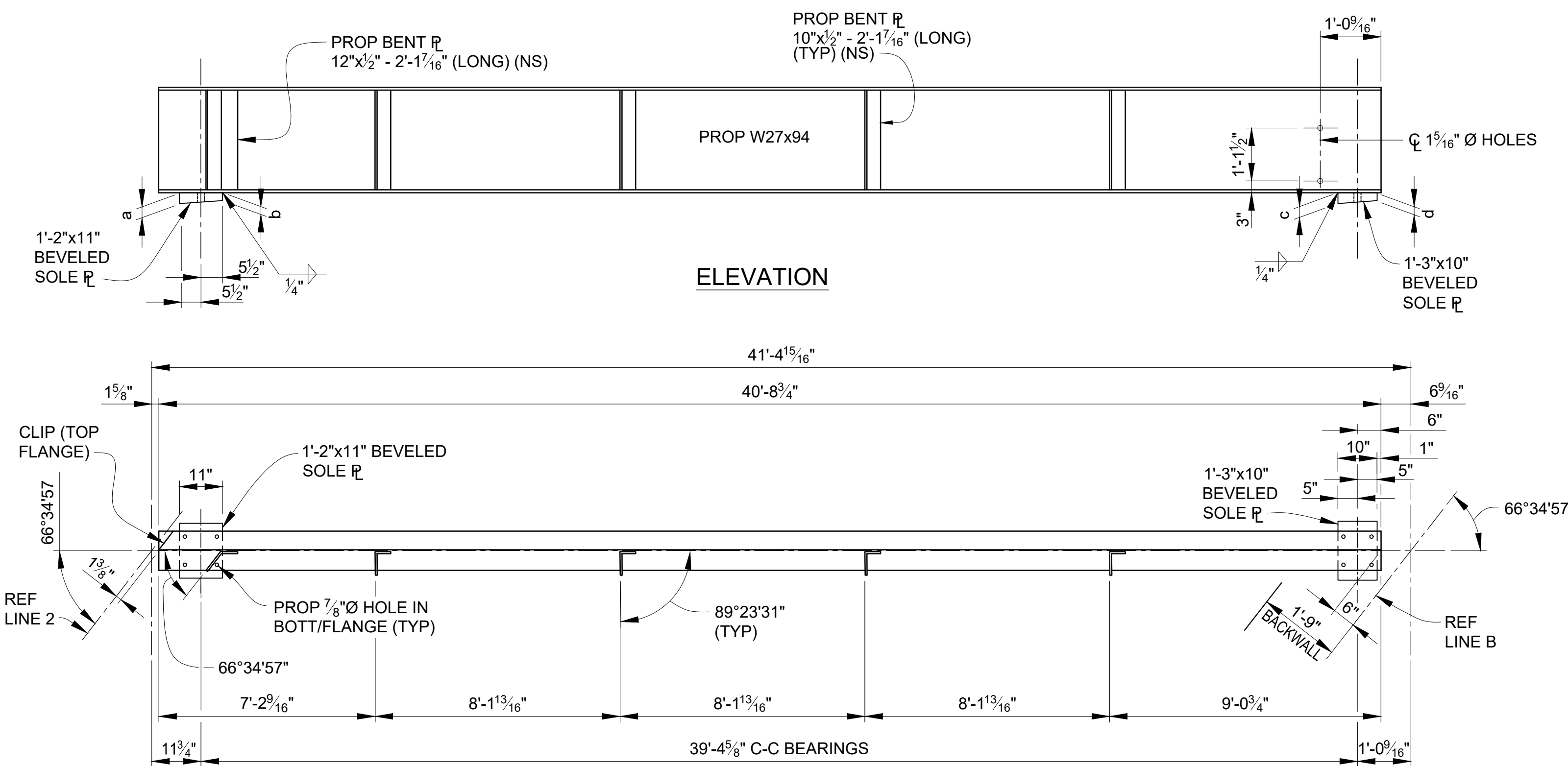
APPROVED BY: _____



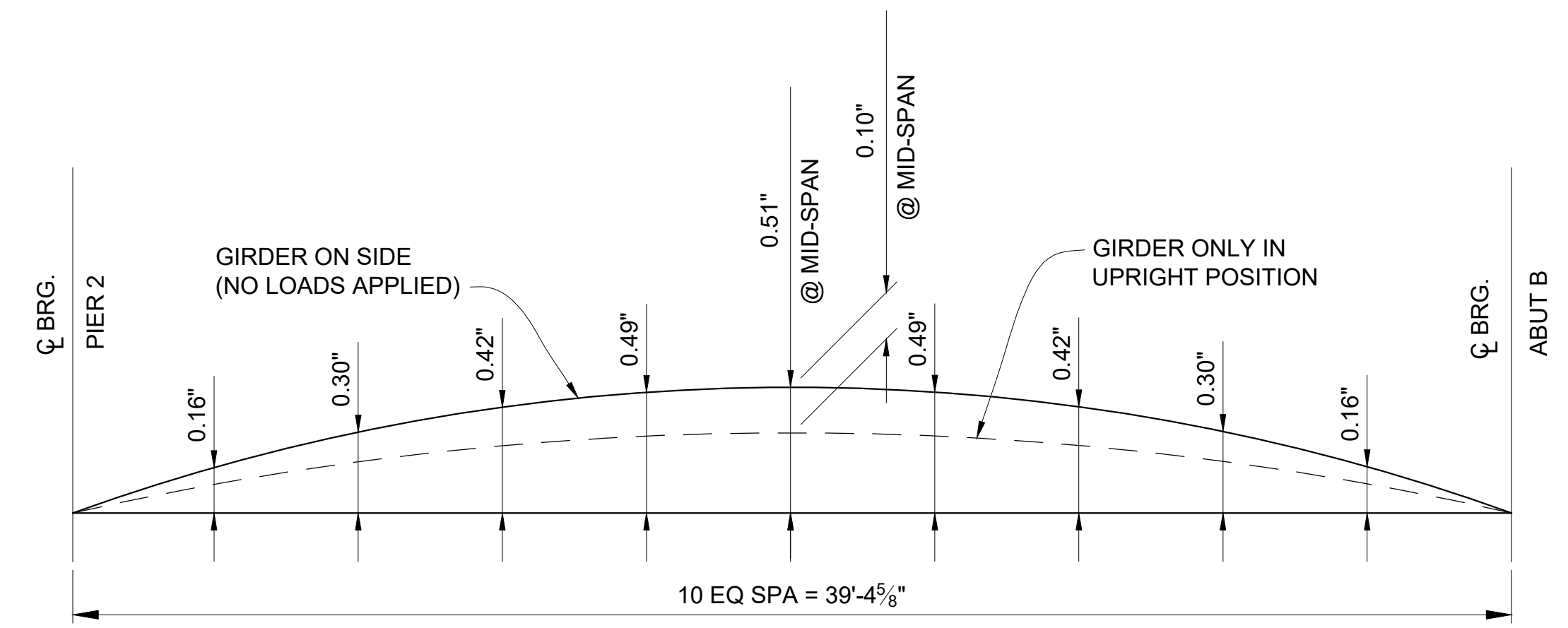
PROPOSED BEAM AA



CAMBER DIAGRAM - BEAM AA



PROPOSED BEAM BB



CAMBER DIAGRAM - BEAM BB

SPAN 3 - SOLE PLATE TABULATED DIMENSIONS

BEAM	REF LINE 2		REF LINE B	
	a	b	c	d
AA	2 1/16"	2"	3 3/16"	3 3/16"
BB	2 1/16"	2"	4 1/16"	3 7/16"

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DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

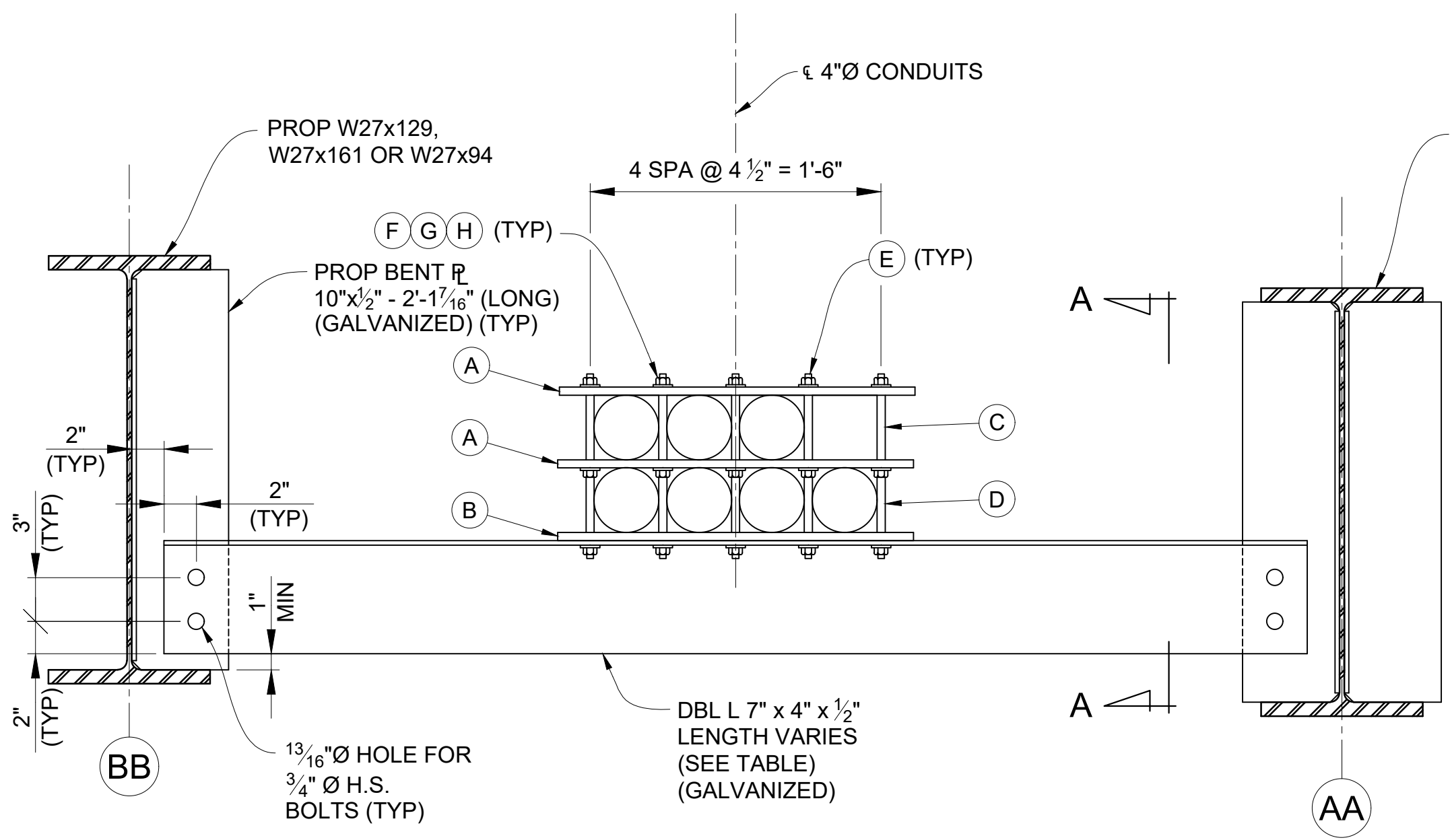
EAST MEDICAL CENTER DRIVE
STRUCTURAL STEEL DETAILS
PROPOSED BEAMS SPAN 3

SCALE: HOR. 3/32"=1'-0"

DRAWING NO. **2021-008-BR34**

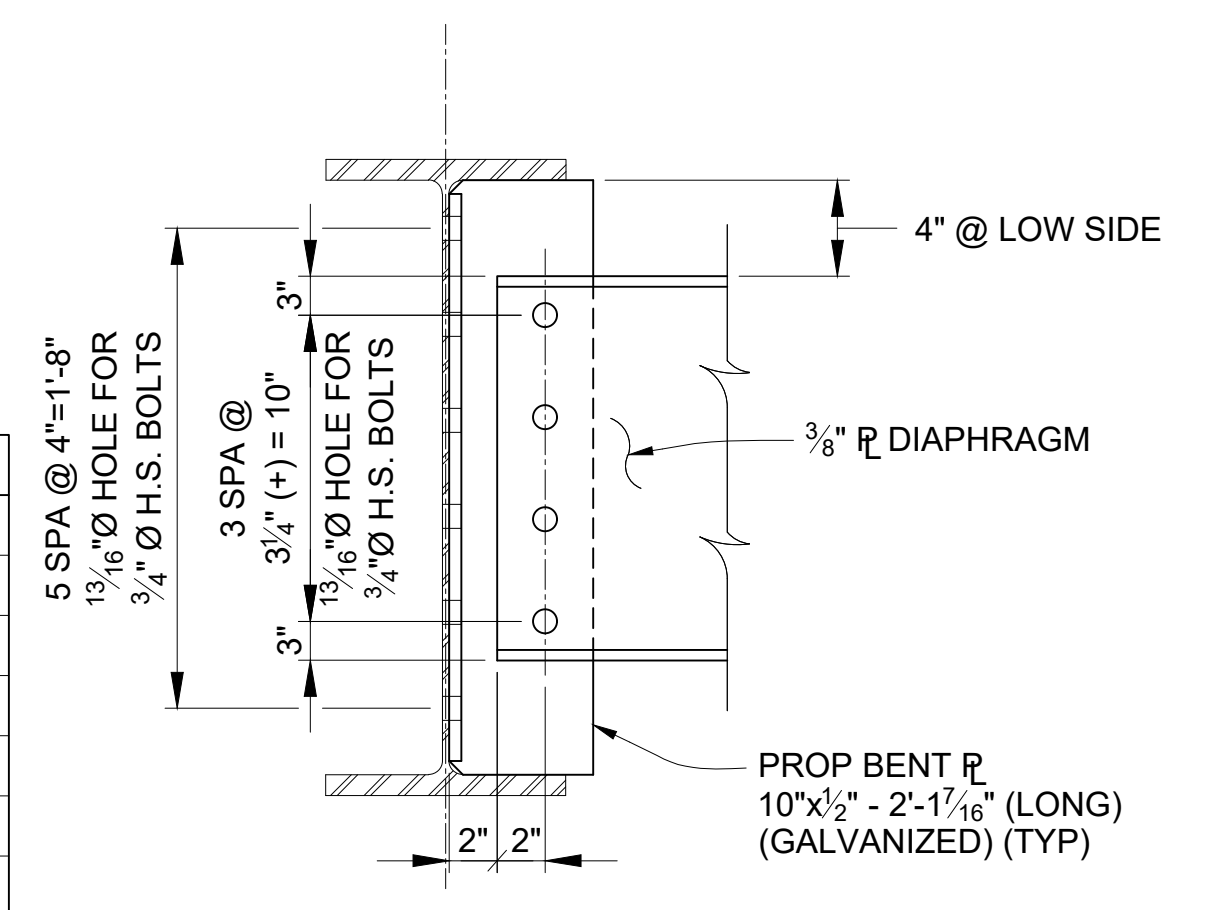
SHEET NO. 97 OF 153

APPROVED BY: _____

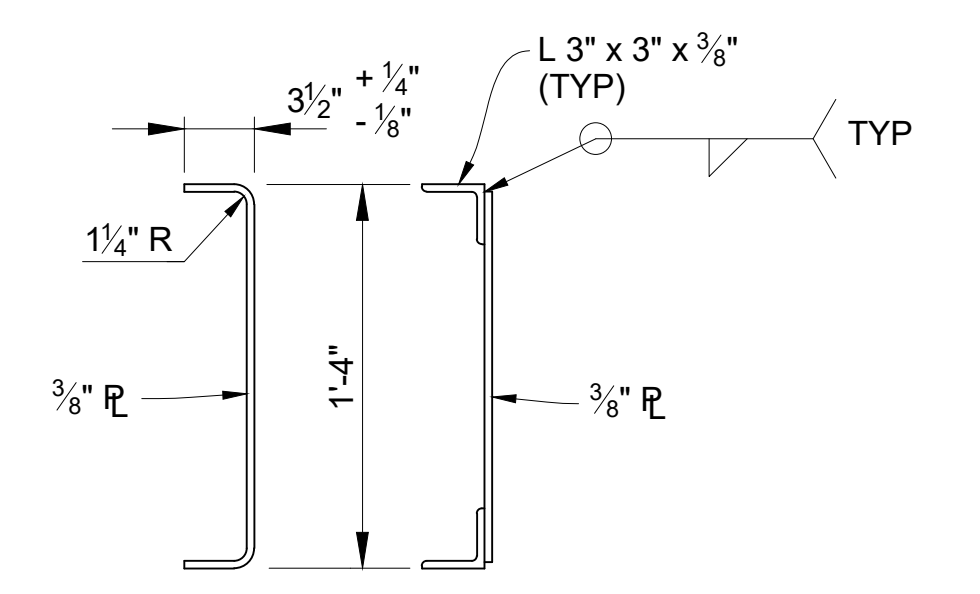


DIAPHRAGM D25 - D32, D40 - D47 & D56 - D60
(21 REQUIRED)

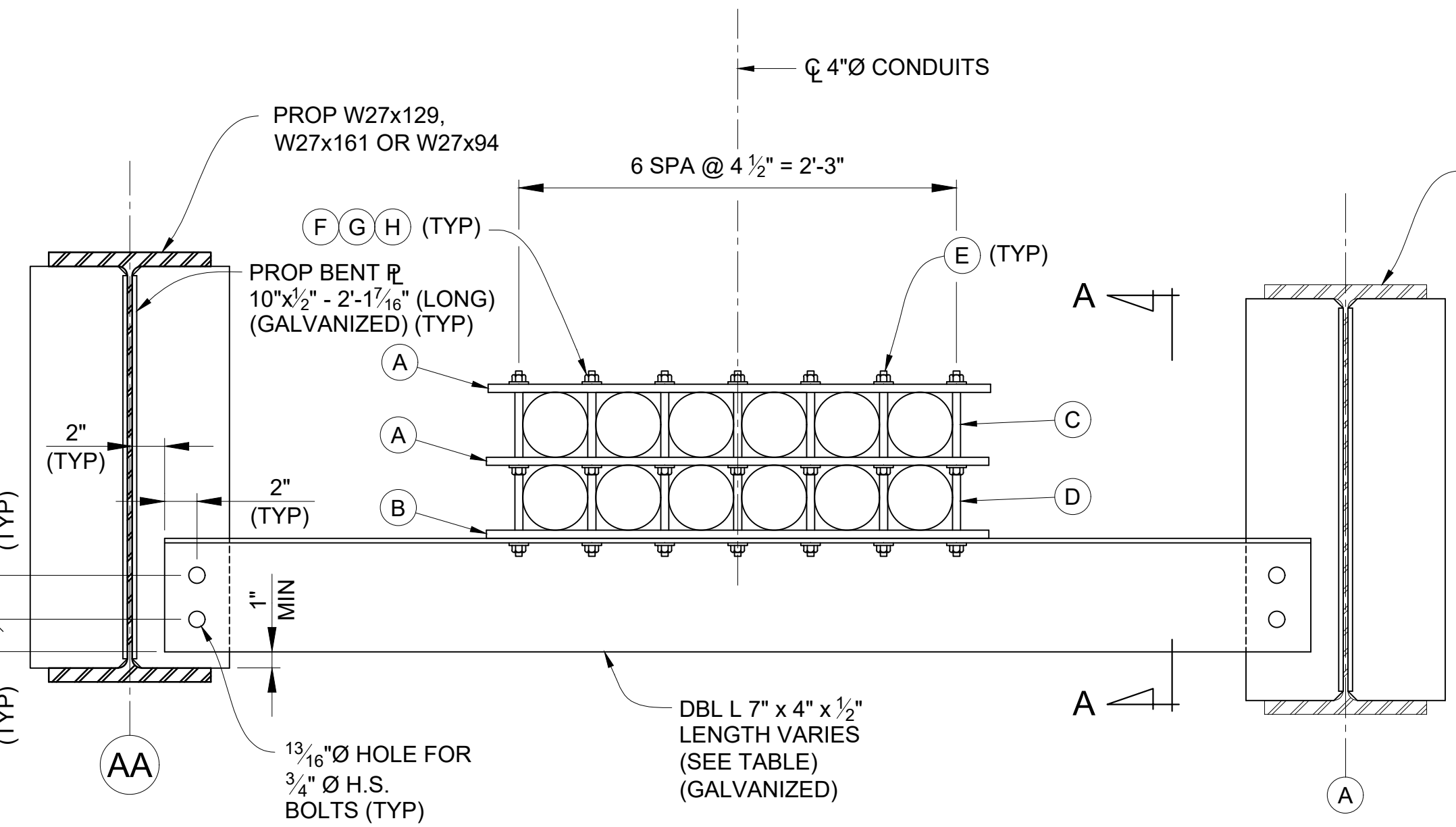
CONDUIT HANGAR ASSEMBLY BILL OF MATERIALS	
A	1/2" x 2 1/2" x 1'-10" FIBERGLASS PLATE
B	1/2" x 10" x 1'-10" STEEL PLATE
C	1/2" x 5" FIBERGLASS SPACER TUBE
D	1/2" x 4 1/2" FIBERGLASS SPACER TUBE
E	1/2" x 1'-2" HOT DIP GALVANIZED THREADED ROD
F	1/2" HOT DIP GALVANIZED HEX NUT
G	1/2" HOT DIP GALVANIZED FLAT WASHER
H	1/2" HOT DIP GALVANIZED LOCK WASHER



BOLTED CONNECTION DETAIL
INTERMEDIATE DIAPHRAGMS
APPLIES TO: D1, D2, D4, D6, D7, D10, D11, D14, D16, D17, D20, D22, D24

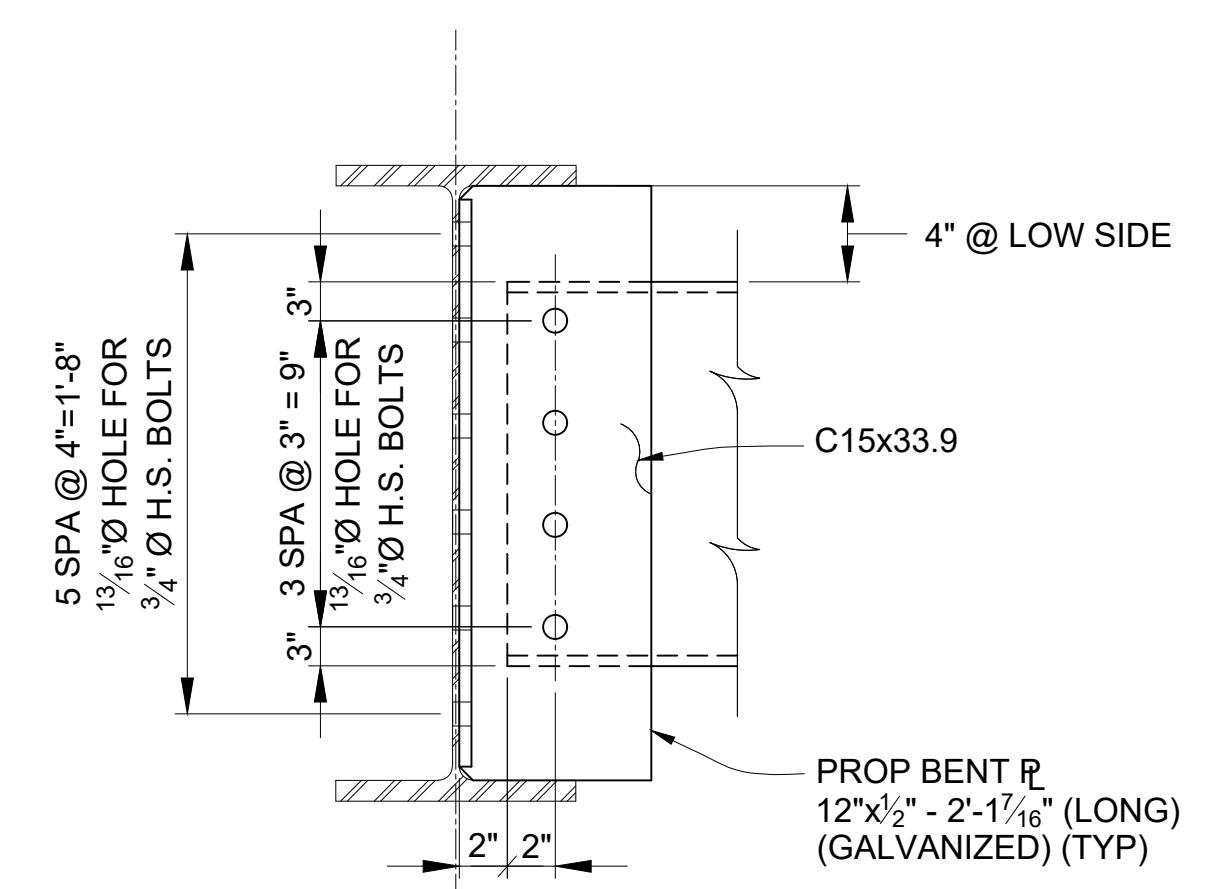


ALTERNATE
TYPICAL INTERMEDIATE DIAPHRAGM
APPLIES TO: D1, D2, D4, D6, D7, D10, D11, D14, D16, D17, D20, D22, D24



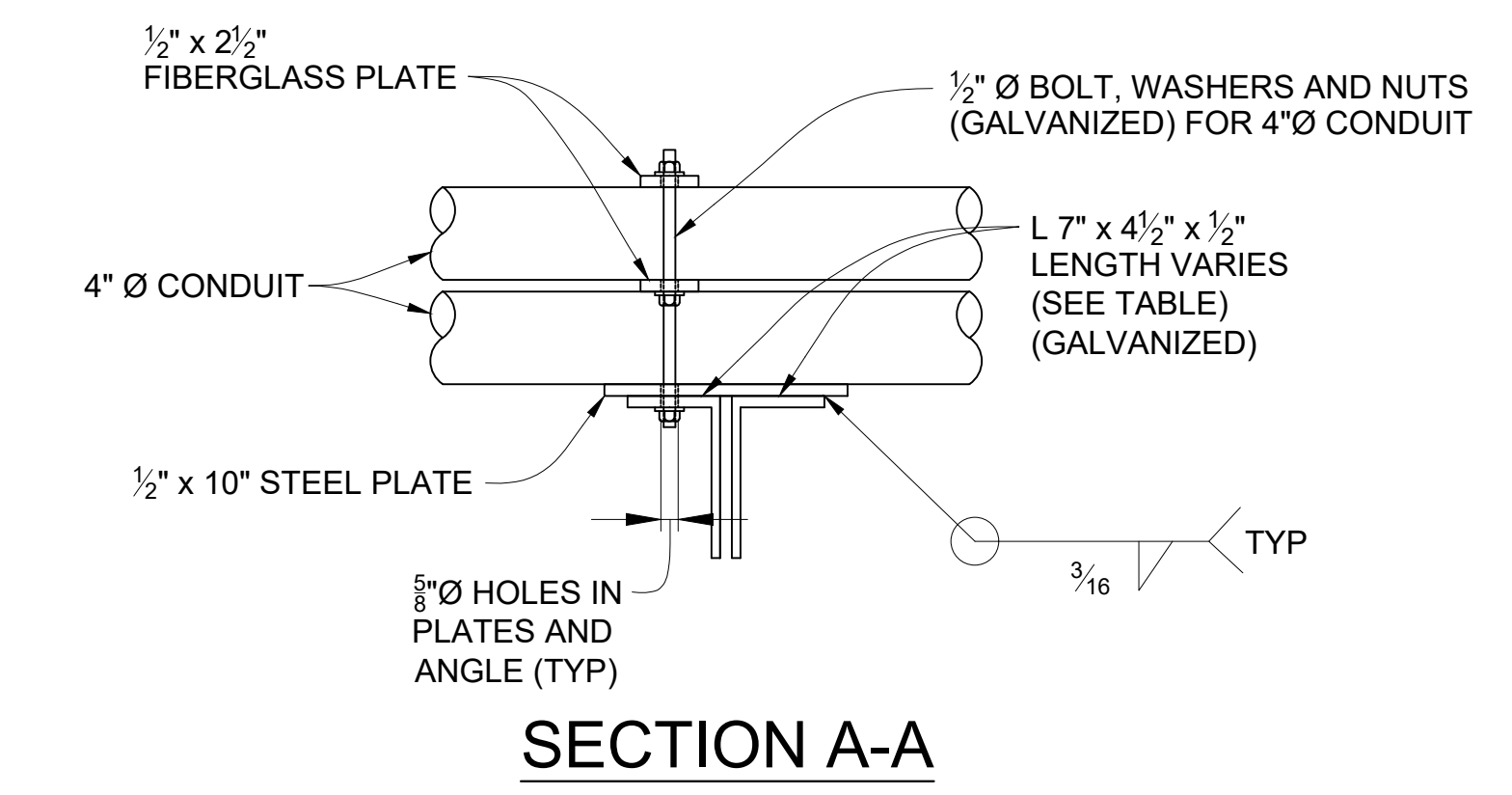
DIAPHRAGM D31, D33, D34 - D39, D48 - D55 & D61 - D65
(21 REQUIRED)

CONDUIT HANGAR ASSEMBLY BILL OF MATERIALS	
A	1/2" x 2 1/2" x 2'-7" FIBERGLASS PLATE
B	1/2" x 10" x 2'-7" STEEL PLATE
C	1/2" x 5" FIBERGLASS SPACER TUBE
D	1/2" x 4 1/2" FIBERGLASS SPACER TUBE
E	1/2" x 1'-2" HOT DIP GALVANIZED THREADED ROD
F	1/2" HOT DIP GALVANIZED HEX NUT
G	1/2" HOT DIP GALVANIZED FLAT WASHER
H	1/2" HOT DIP GALVANIZED LOCK WASHER

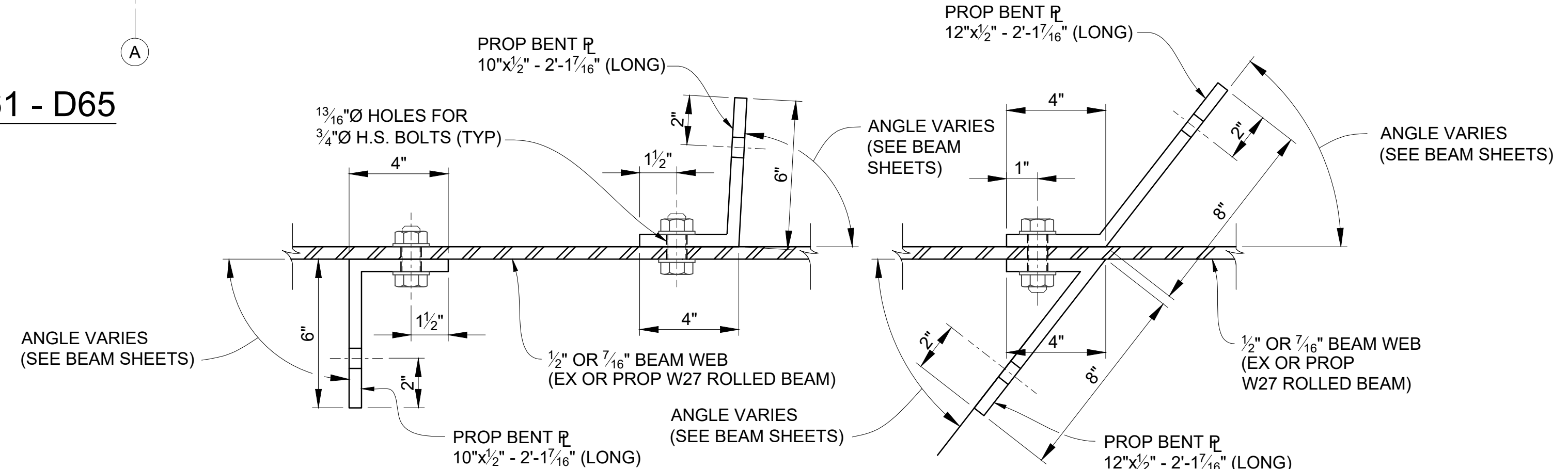


BOLTED CONNECTION DETAIL
END DIAPHRAGMS
APPLIES TO: D3, D5, D8, D9, D12, D13, D15, D18, D19, D21, D23

DIAPHRAGM LENGTH TABLE			
DIAPHRAGM	LENGTH	DIAPHRAGM	LENGTH
D1	5'-8 5/8"	D34	6'-7 13/16"
D2	4'-7"	D35	6'-7 7/8"
D3	4'-6 15/16"	D36	6'-7 1/8"
D4	5'-8 5/8"	D37	6'-6 3/4"
D5	7'-7 5/8"	D38	6'-6 1/16"
D6	4'-9 3/16"	D39	6'-6 1/8"
D7	3'-6 3/16"	D40	6'-9 7/8"
D8	3'-2 7/8"	D41	6'-7 13/16"
D9	8'-1"	D42	6'-5 3/4"
D10	6'-2 5/8"	D43	6'-3 5/8"
D11	5'-8 5/8"	D44	6'-1 9/16"
D12	6'-4 3/16"	D45	5'-11 1/16"
D13	6'-10 3/16"	D46	5'-9 3/8"
D14	5'-7 1/16"	D47	6'-6 1 1/16"
D15	6'-8 1/4"	D48	6'-8 5/8"
D16	4'-3 5/8"	D49	6'-6 5/8"
D17	3'-1 3/4"	D50	6'-4 9/16"
D18	2'-6 9/16"	D51	6'-2 1/2"
D19	7'-5 1/4"	D52	6'-0 1/16"
D20	6'-3 1/8"	D53	5'-10 7/16"
D21	6'-4 3/8"	D54	5'-8 3/8"
D22	5'-8 5/8"	D55	6'-6 5/8"
D23	6'-0 1/4"	D56	6'-6 7/16"
D24	5'-0 13/16"	D57	5'-10 13/16"
D25	6'-7 15/16"	D58	5'-9 13/16"
D26	6'-7 5/8"	D59	5'-8 3/4"
D27	6'-7 1/4"	D60	5'-7 3/4"
D28	6'-6 15/16"	D61	6'-6 13/16"
D29	6'-6 9/16"	D62	5'-10 13/16"
D30	6'-6 1/4"	D63	5'-9 1 1/16"
D31	8'-2 1/16"	D64	5'-8 9/16"
D32	8'-2 5/16"	D65	5'-7 1/2"
D33	8'-2 3/16"		



SECTION A-A



BENT PLATE DETAILS
INTERMEDIATE DIAPHRAGMS
END DIAPHRAGMS

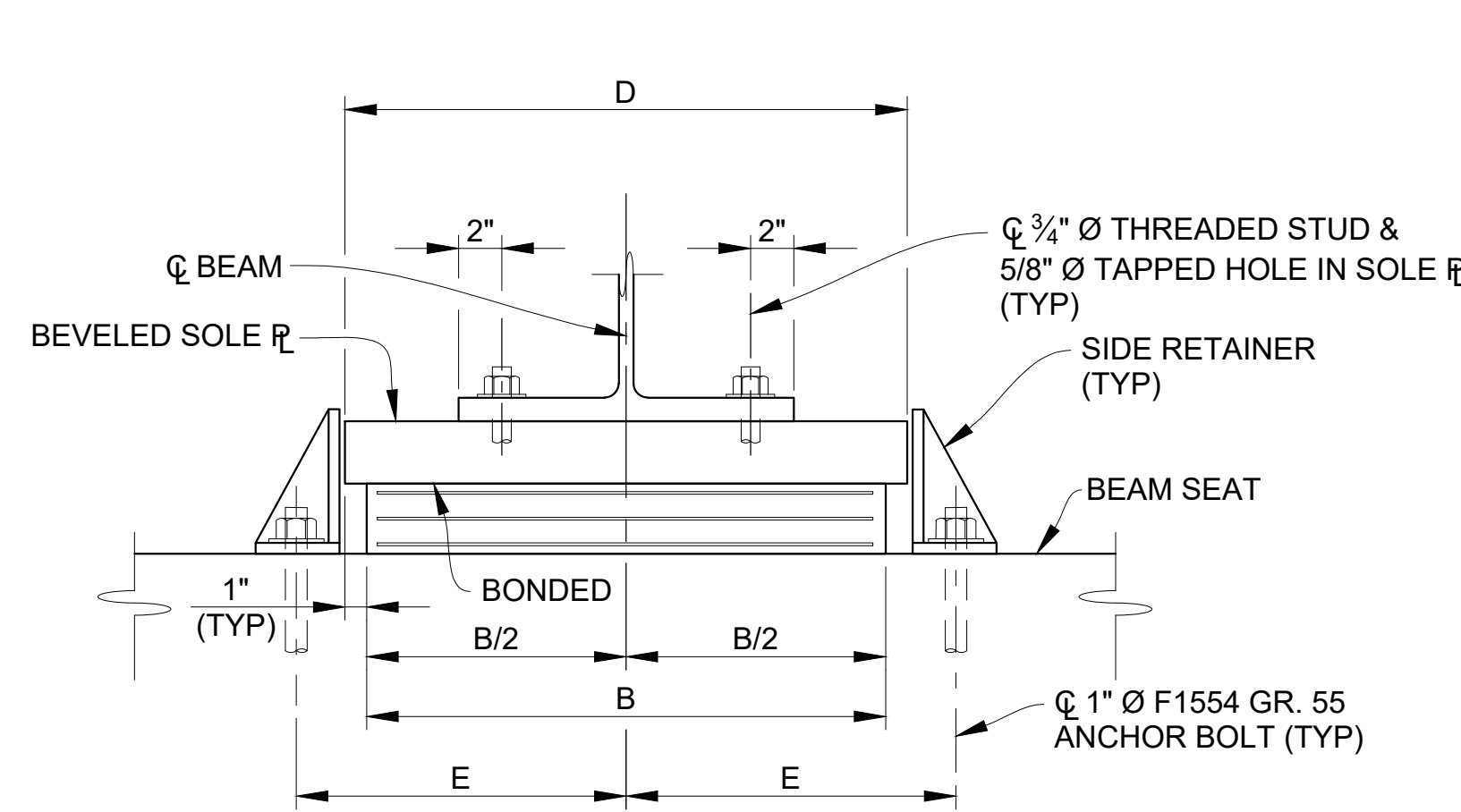
3 WORKING DAYS BEFORE YOU DIG
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800-482-7171
(TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

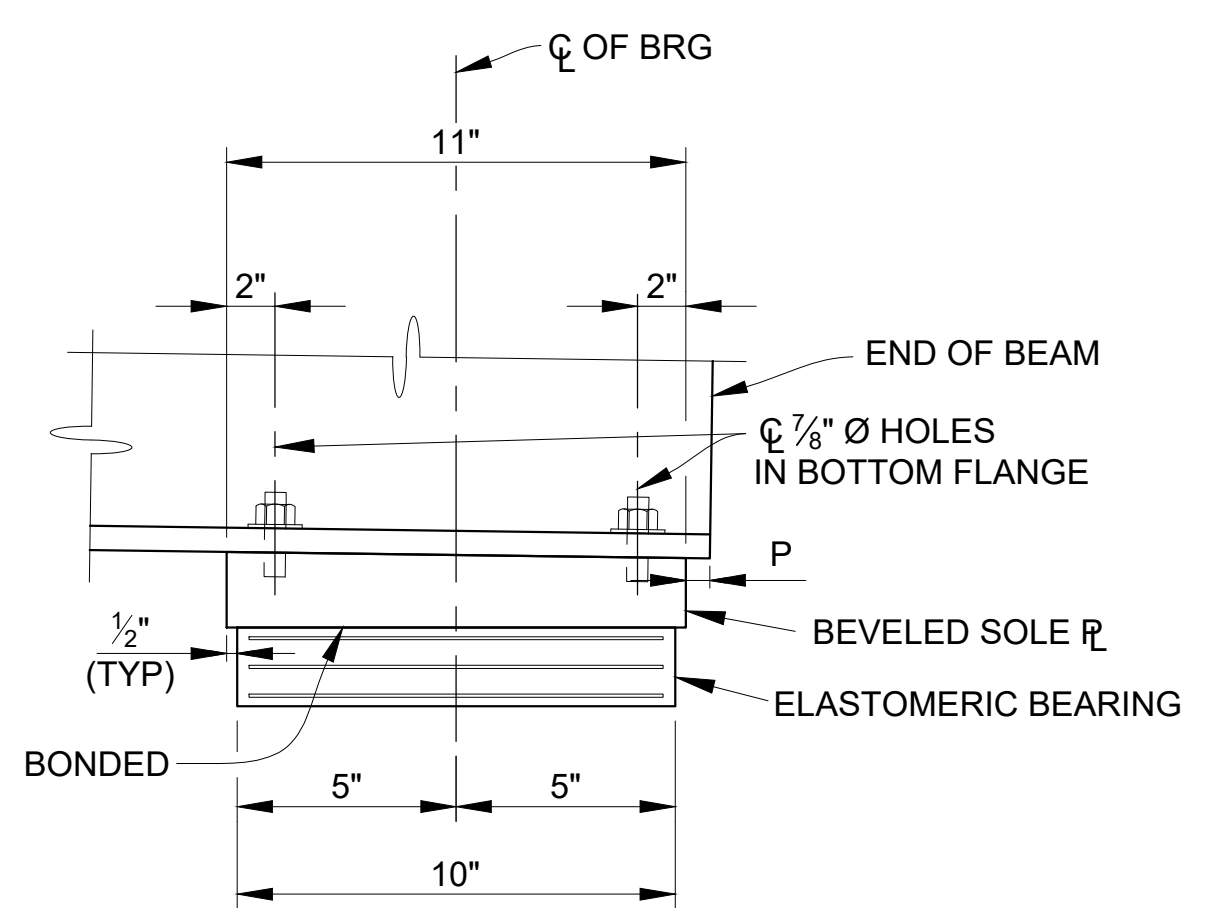
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	SCALE HOR. 3/32" = 1'-0"
STRUCTURAL STEEL DETAILS	DRAWING NO. 2021-008-BR35
DIAPHRAGM DETAILS	SHEET NO. <u> 98 </u> OF <u> 153 </u>

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

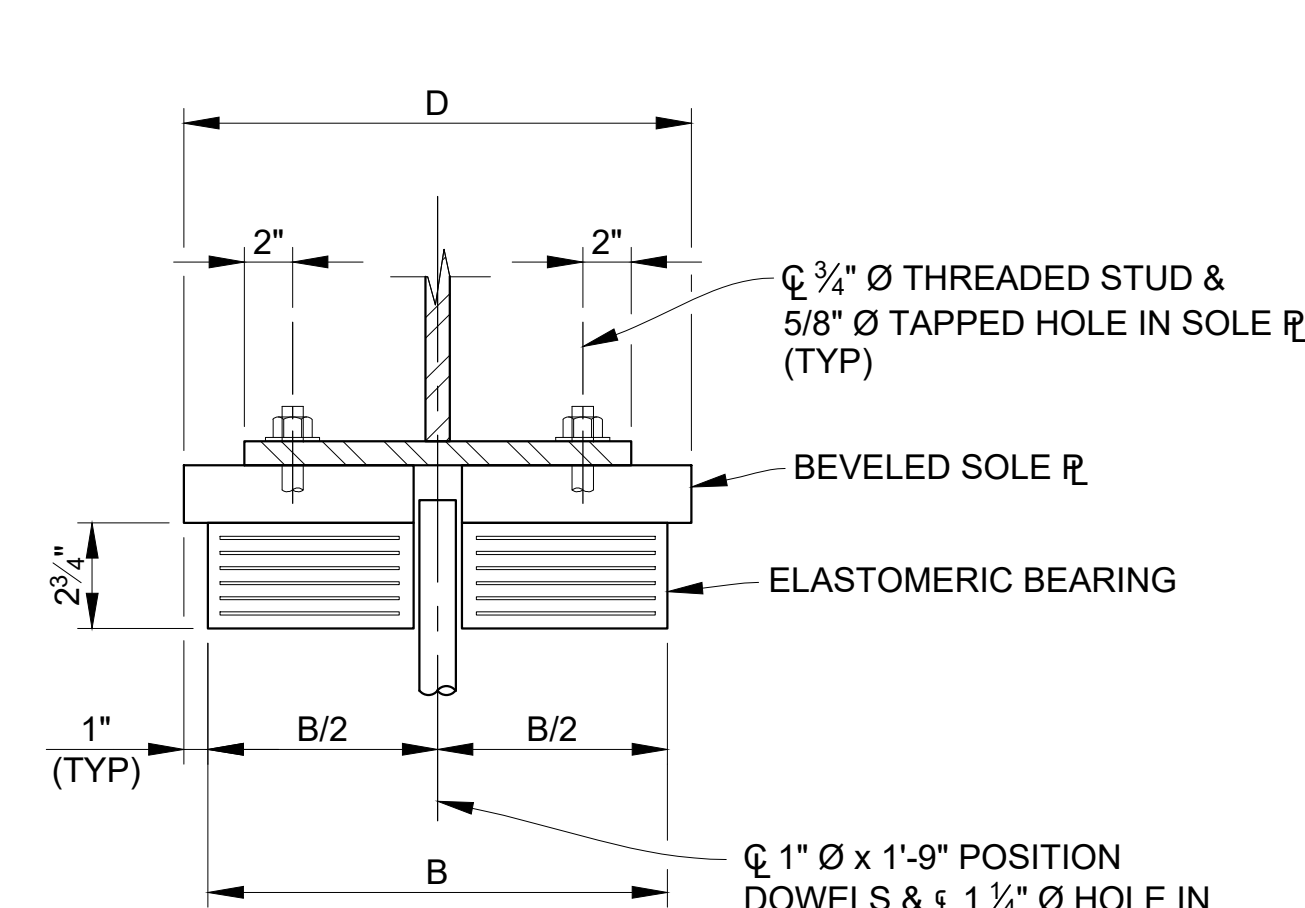
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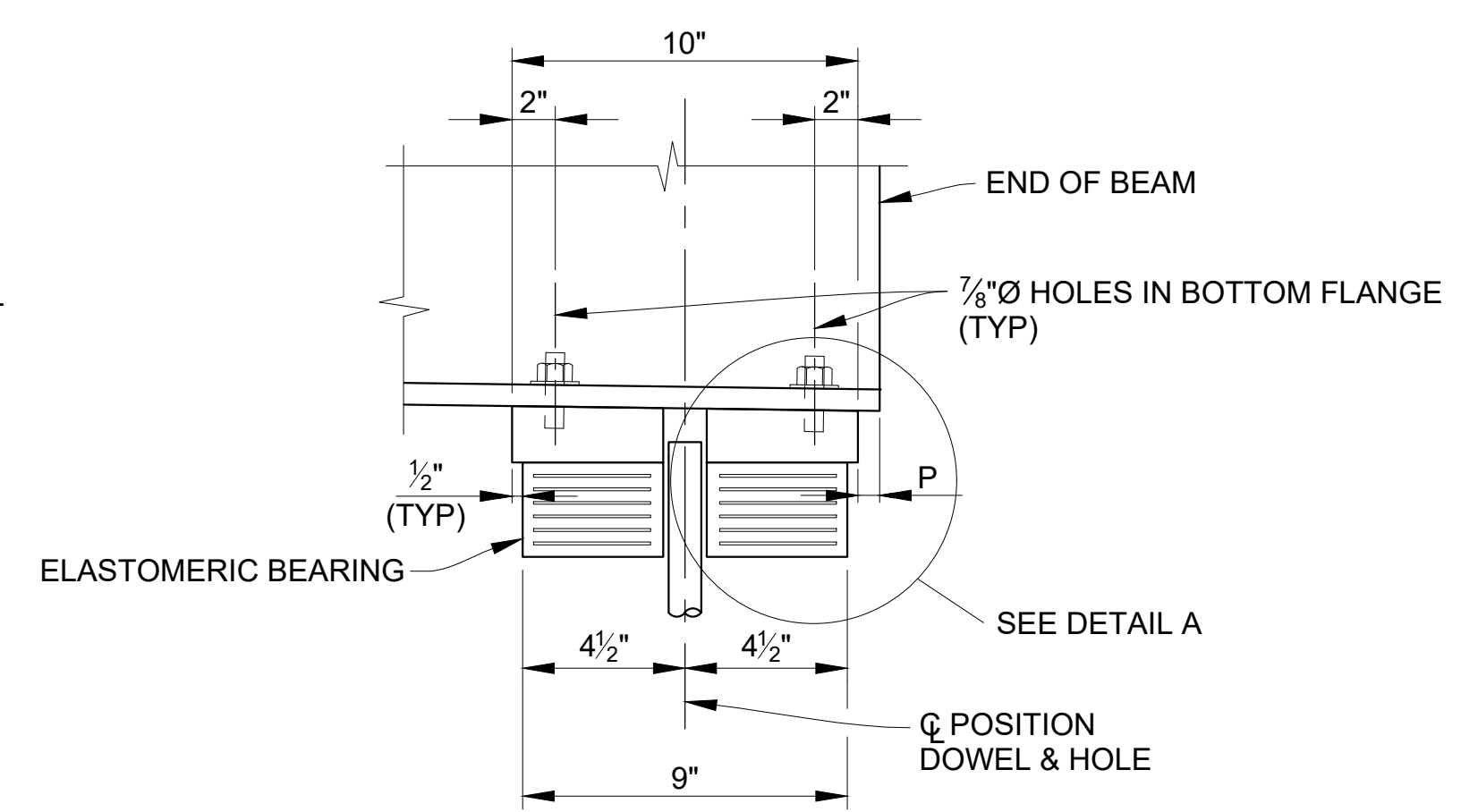
ELASTOMERIC EXPANSION BEARING
END VIEW



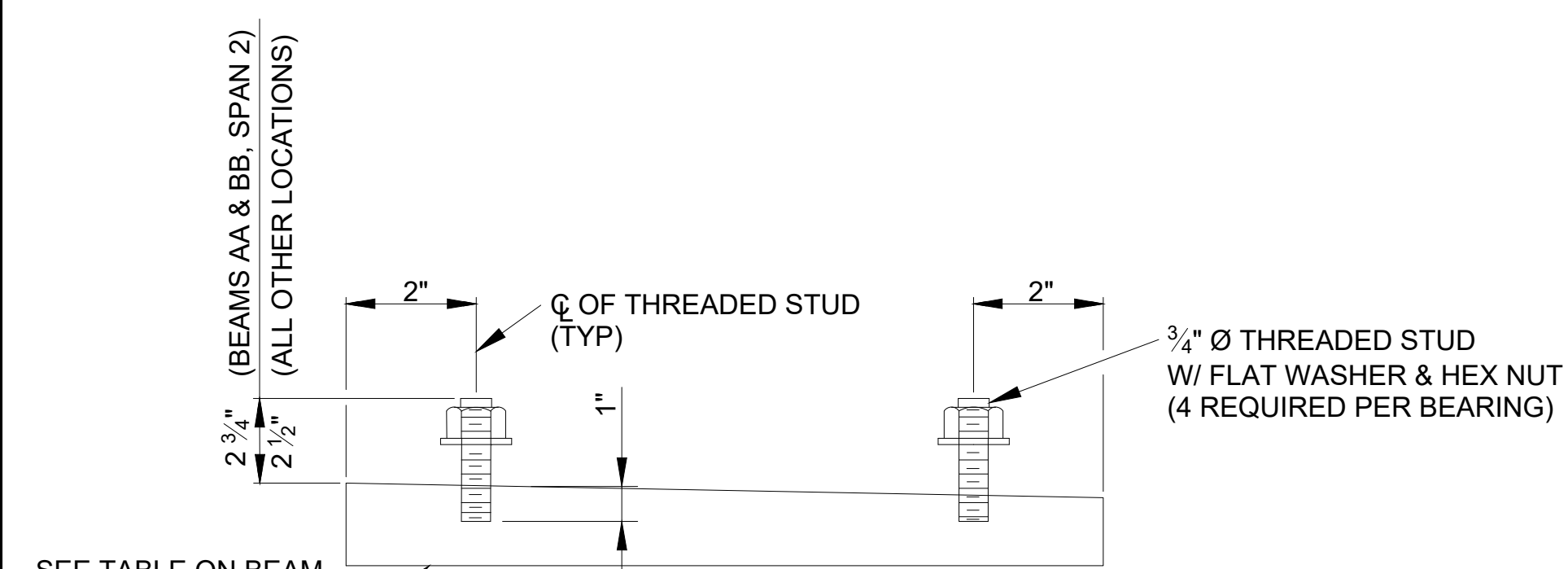
ELASTOMERIC EXPANSION BEARING
SIDE VIEW



ELASTOMERIC FIXED BEARING
END VIEW



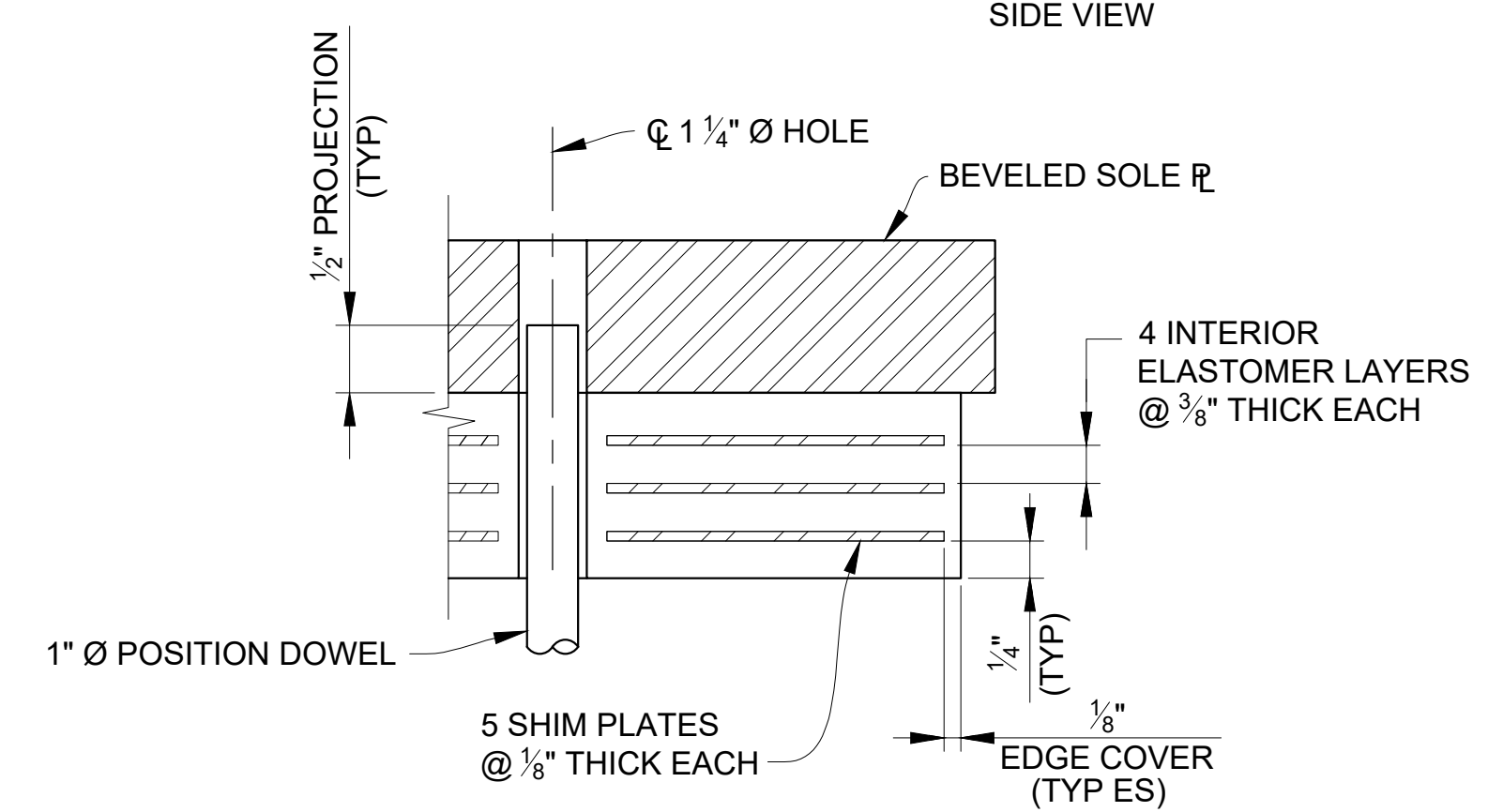
ELASTOMERIC FIXED BEARING
SIDE VIEW



BEVELED SOLE PLATE DETAILS

SIDE VIEW

BEARING ASSEMBLY DIMENSIONS									
ABUTMENT A (FIXED)					PIER 1 (EXPANSION)				
BEAM	B	D	E	P	B	D	E	P	
BB	15"	17"		1"	13"	15"	9 3/4"	5 7/8"	
AA	19"	21"		1"	16"	18"	11 1/4"	5 3/4"	
A	19"	21"		1"	16"	18"	11 1/4"	5 3/4"	
B-L	19"	21"		1"	16"	18"	11 1/4"	6 1/4"	
M	19"	21"		1"	16"	18"	11 1/4"	6 3/4"	
PIER 1 (EXPANSION)					PIER 2 (FIXED)				
BEAM	B	D	E	P	B	D	E	P	
BB	16"	18"	11 1/4"	5 1/8"	16"	18"		5 5/8"	
AA	17"	19"	11 3/4"	4 15/16"	20"	22"		5 7/16"	
A	17"	19"	11 3/4"	5 1/4"	20"	22"		5 3/4"	
B-L	16"	18"	11 1/4"	5 3/8"	20"	22"		5 7/8"	
M	16"	18"	11 1/4"	5 3/4"	16"	18"		6 1/4"	
PIER 2 (EXPANSION)					ABUTMENT B (FIXED)				
BEAM	B	D	E	P	B	D	E	P	
BB	12"	14"	9 1/4"	4 5/8"	13"	15"		1"	
AA	14"	16"	10 1/4"	4 5/8"	17"	19"		1"	
A	14"	16"	10 1/4"	4 11/16"	17"	19"		1"	
B-L	12"	14"	9 1/4"	4 11/16"	15"	17"		1"	
M	12"	14"	9 1/4"	4 13/16"	13"	15"		1"	

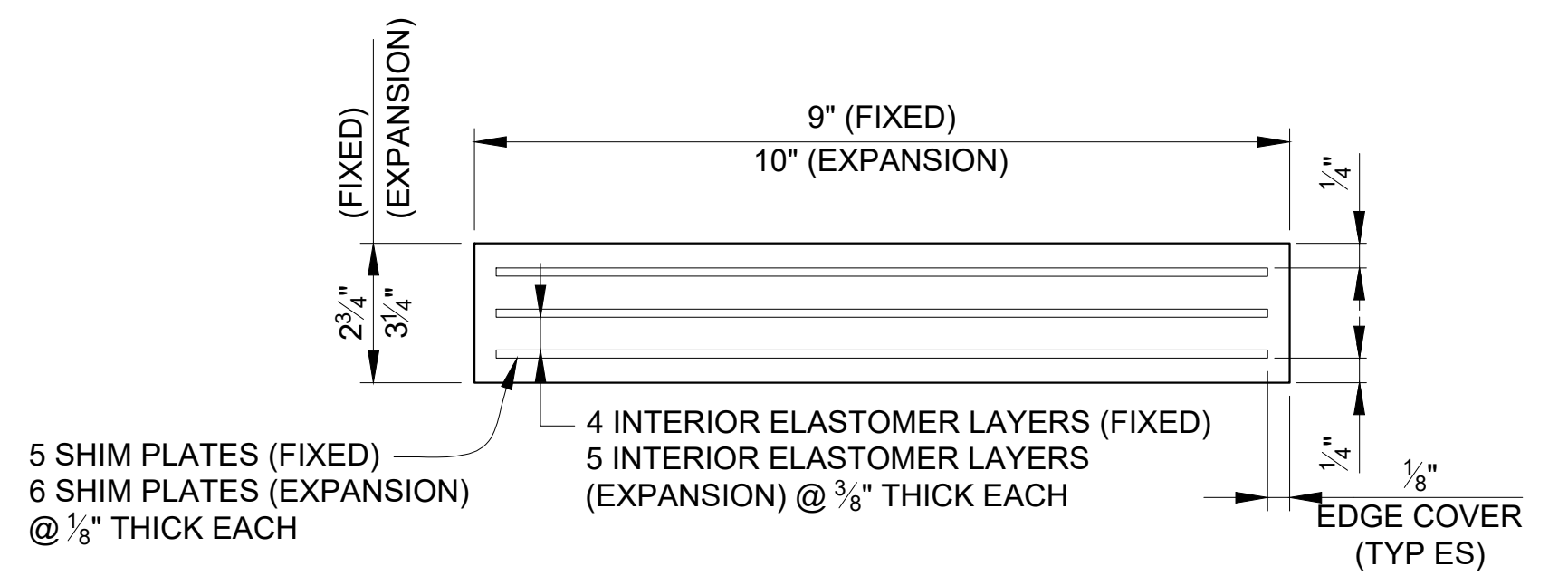


DETAIL A

ELASTOMERIC BEARING DETAILS - FIXED

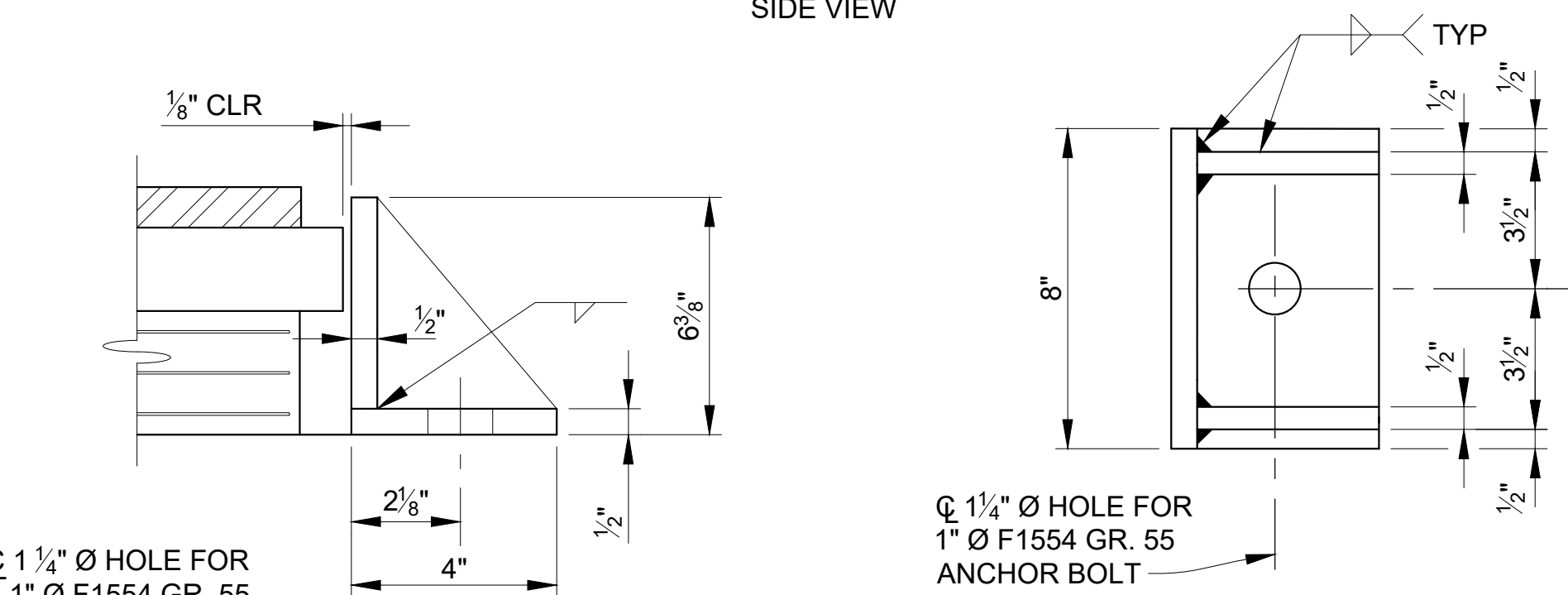
NOTES:

- ES DENOTES EACH SIDE.
- USE NON-DEFORMED STEEL RODS IN ACCORDANCE WITH AASHTO M 270 GRADE 36 AND HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111, AS POSITION DOWELS FOR PRECAST BEAMS.
- STEEL FOR SOLE PLATES AND OTHER BEARING COMPONENTS SHALL MEET THE REQUIREMENTS OF AASHTO M 270 GRADE 36.
- ANCHOR BOLT LENGTHS SHOWN ARE MINIMUM. BOLTS LONGER THAN THAT SHOWN MAY BE FURNISHED AT NO ADDITIONAL COST. ANCHOR BOLTS AND POSITION DOWELS SHALL BE GALVANIZED ACCORDING TO MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 716.03.B.4.
- ANCHOR BOLTS SHALL CONFORM TO MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 908.14.
- ANCHOR BOLTS SHALL BE INSTALLED AFTER BEAMS ARE ERECTED IN PLACE.



ELASTOMERIC BEARING DETAILS

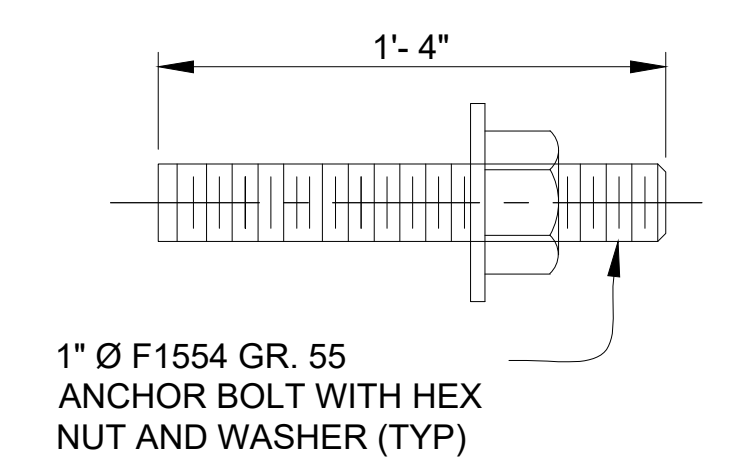
SIDE VIEW



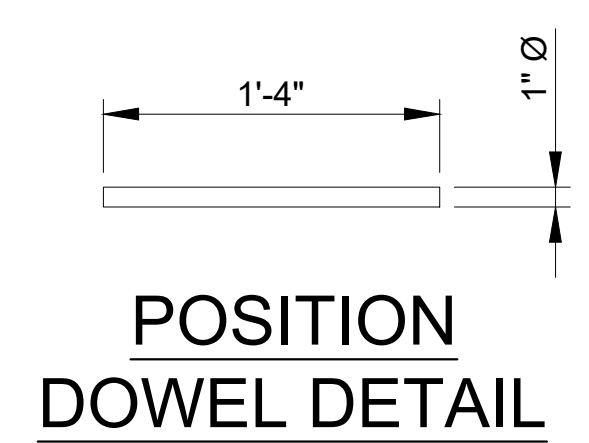
ELEVATION

PLAN

SIDE RETAINER



ANCHOR BOLT DETAIL



POSITION DOWEL DETAIL

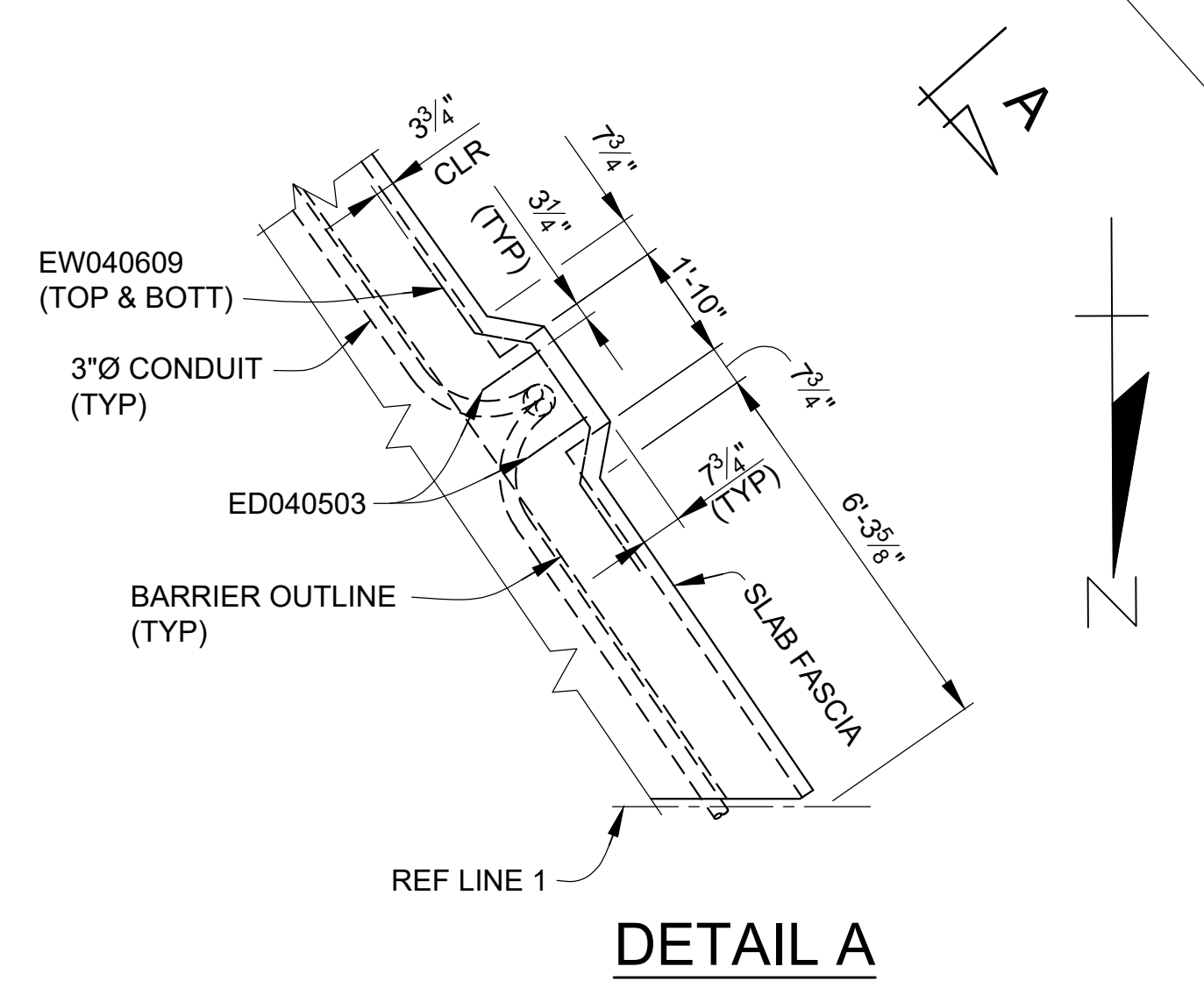
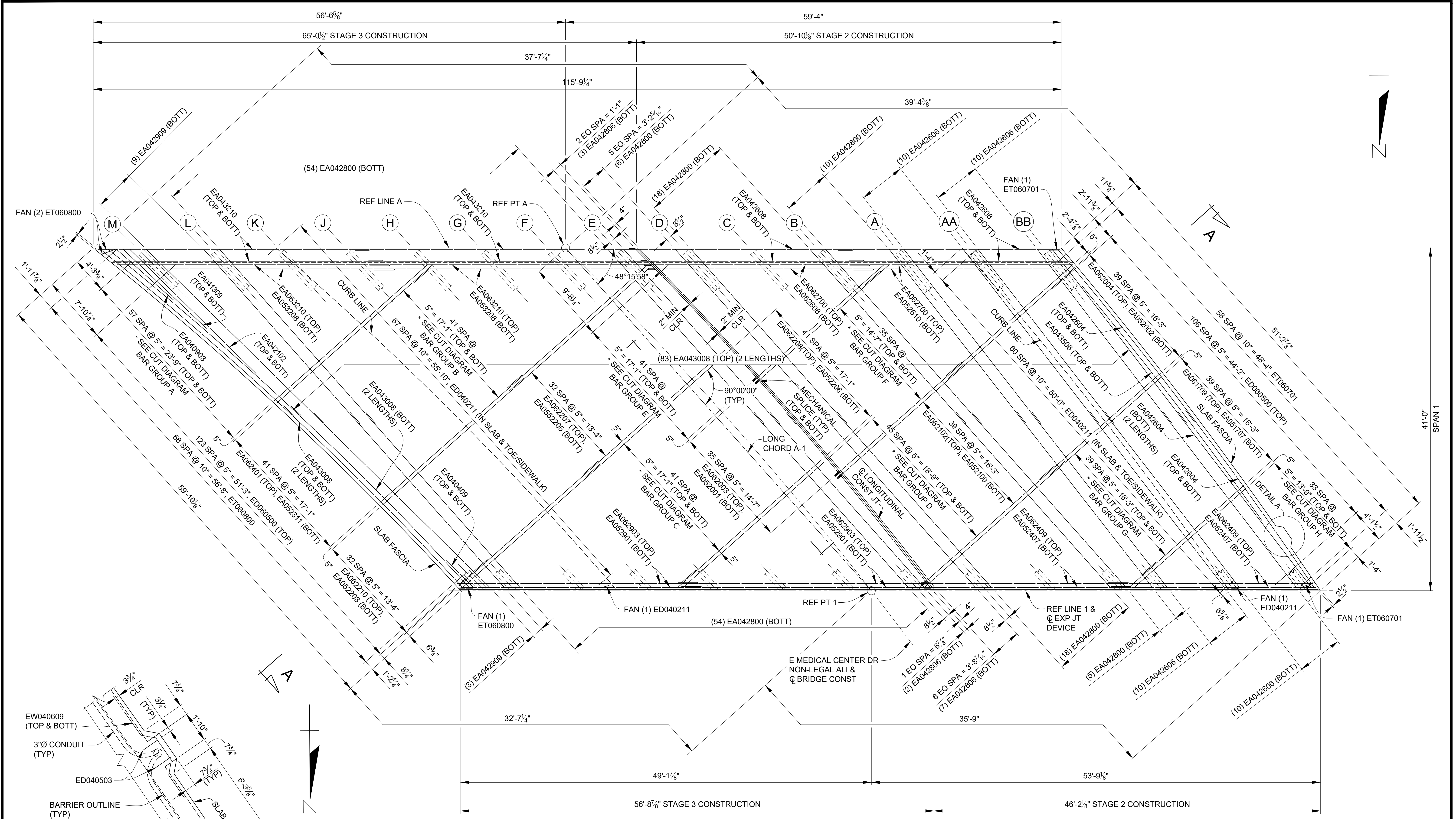
ESTIMATED QUANTITIES THIS SHEET					
DESCRIPTION	UNITS	CATG 0001	CATG 0002	CATG 0003	TOTAL
Bearing, Elastomeric, 2 3/4 inch	Sin	5,796	900		6,696
Bearing, Elastomeric, 3 1/4 inch	Sin	5,310	880		6,190

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	JNJ	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
BEARING DETAILS	
SCALE HOR. 3/32" = 1'-0"	INCH
DRAWING NO. 2021-008-BR37	
SHEET NO. <u>100</u> OF <u>153</u>	

X:\Projects\2021\2141\736300_AA - EMCD Bridge\01_Constr\Docs\CAD\EMCD_deck_001



MIN LAP TABLE	
EA03 BARS	1'-2"
EA04 BARS	1'-7"
EA05 BARS	2'-0"
EA06 BARS	2'-4"

* SEE STEEL REINFORCEMENT SHEETS FOR BAR CUT DIAGRAM DETAILS.

PLAN - SPAN 1

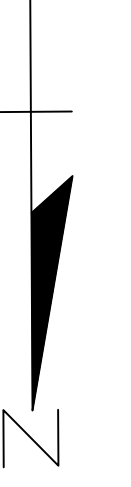
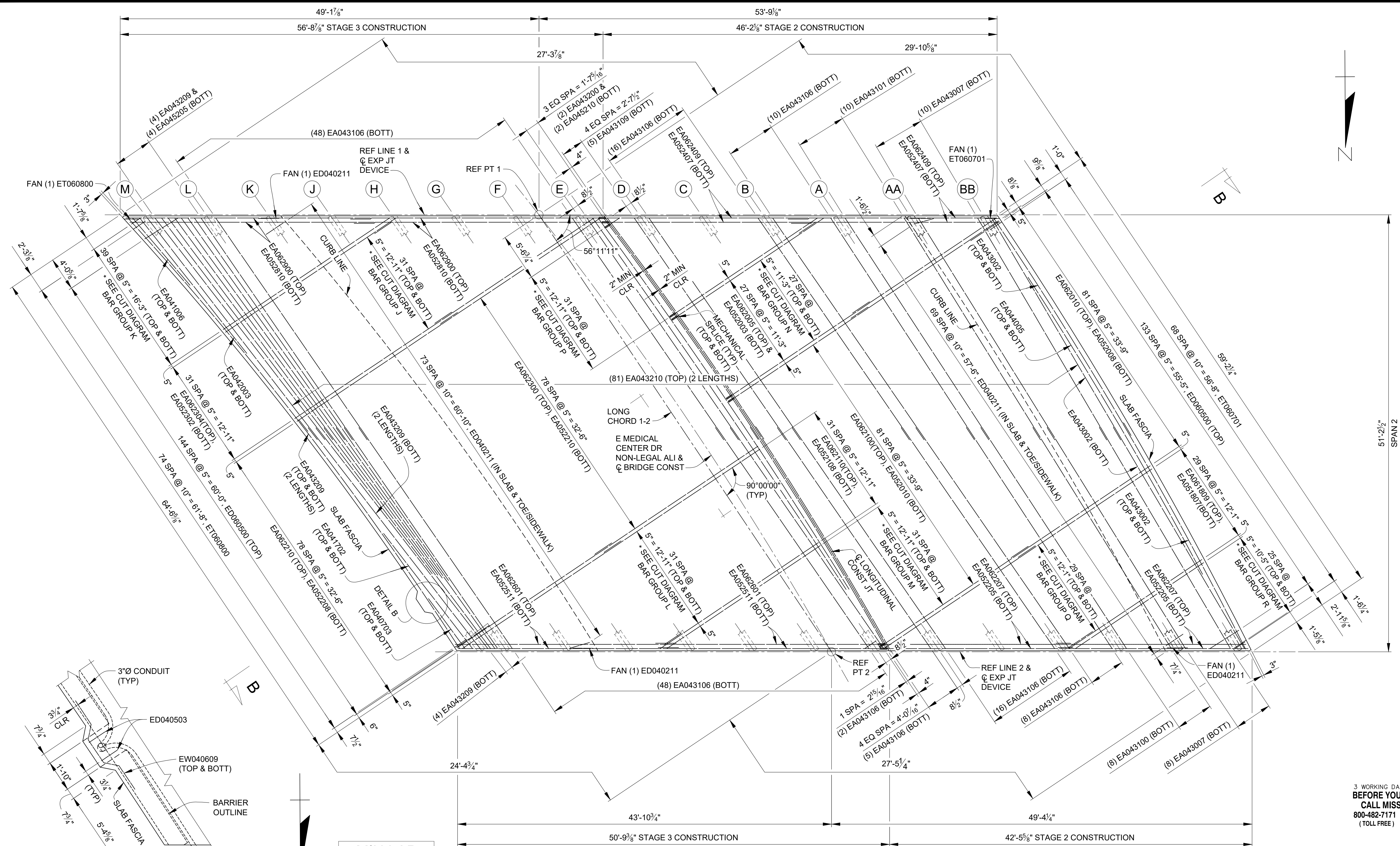
3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAILS	
SCALE HOR. 3/16"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR38	
SHEET NO. <u>101</u> OF <u>153</u>	

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

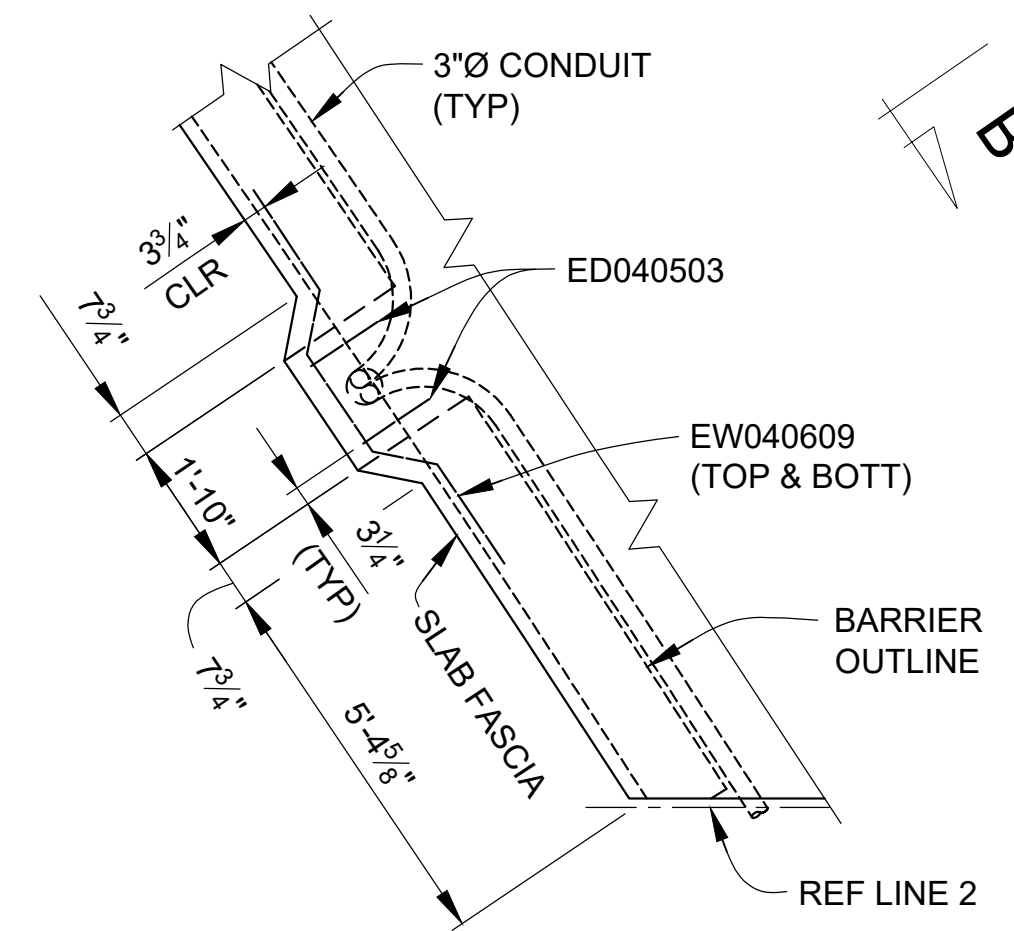
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SPAN 2

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

DETAIL B



MIN LAP TABLE

EA03 BARS	- 1'-2"
EA04 BARS	- 1'-7"
EA05 BARS	- 2'-0"
EA06 BARS	- 2'-4"

* SEE STEEL REINFORCEMENT SHEETS FOR BAR CUT DIAGRAM DETAILS.

PLAN - SPAN 2

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

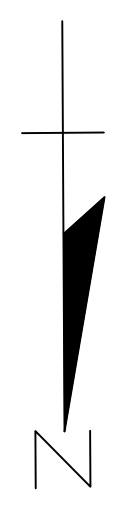
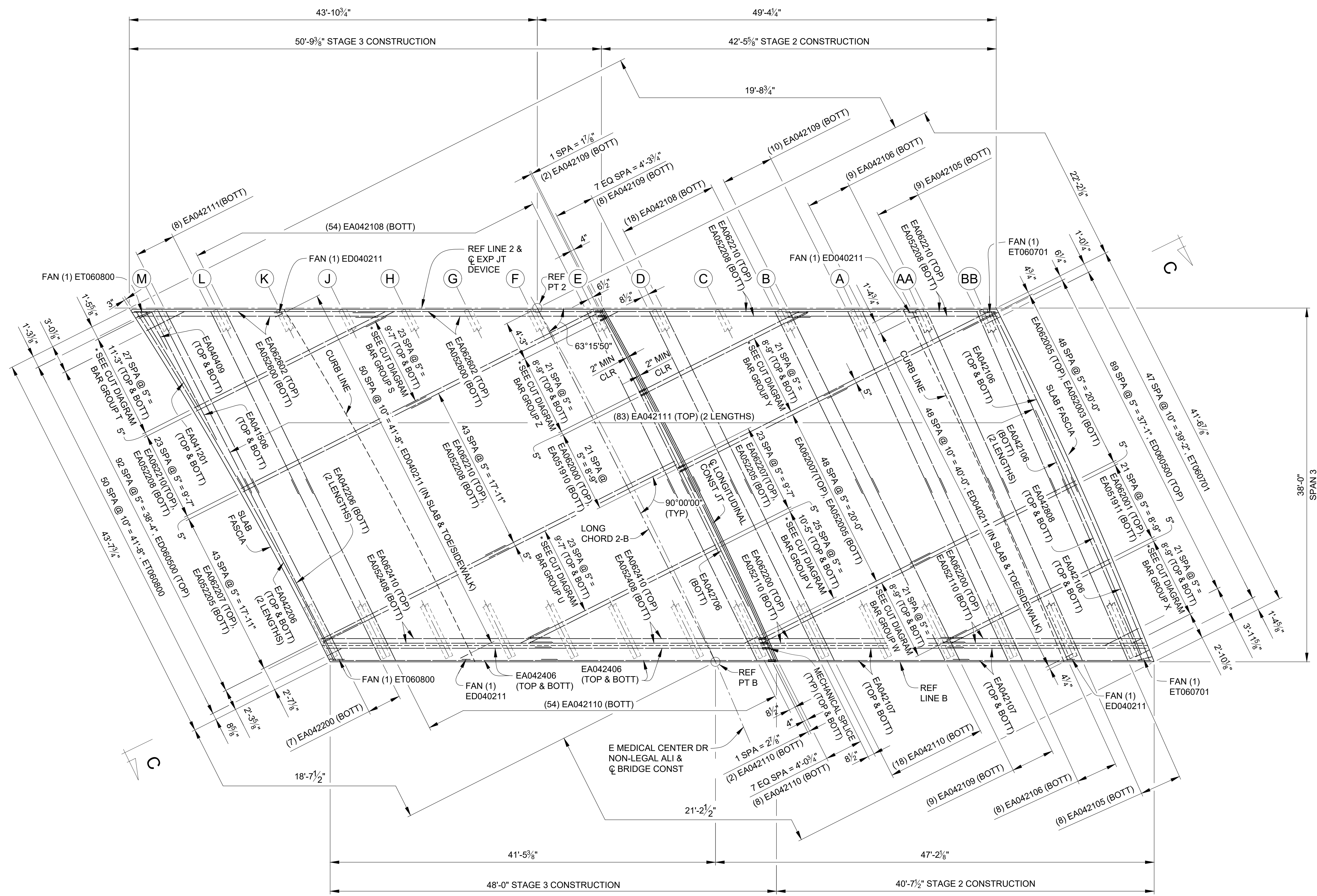
EAST MEDICAL CENTER DRIVE

SUPERSTRUCTURE DETAILS

SCALE	INCH
HOR. 3/16"=1'-0"	0 1
DRAWING NO.	2021-008-BR39
SHEET NO.	_102_ OF _153_

APPROVED BY: _____

CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



MIN LAP TABLE

EA03 BARS	- 1'-2"
EA04 BARS	- 1'-7"
EA05 BARS	- 2'-0"
EA06 BARS	- 2'-4"

* SEE STEEL REINFORCEMENT SHEETS FOR BAR CUT DIAGRAM DETAILS.

PLAN - SPAN 3

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

SUPERSTRUCTURE DETAILS

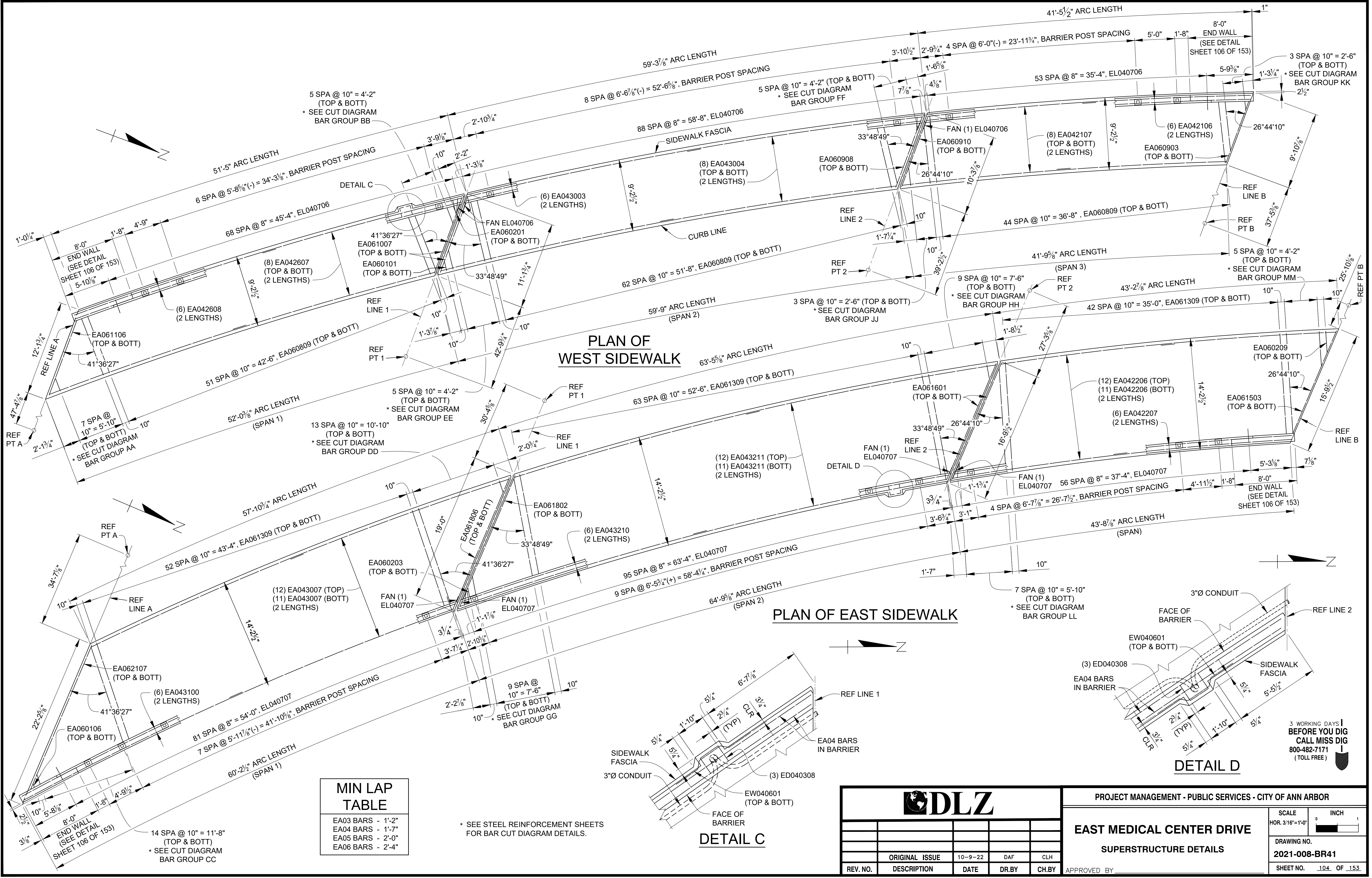
SCALE	INCH
HOR. 3/16"=1'-0"	0 1
DRAWING NO.	2021-008-BR40
SHEET NO.	103 OF 153

APPROVED BY: _____

3 WORKING DAYS
BEFORE YOU DIG
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(TOLL FREE)

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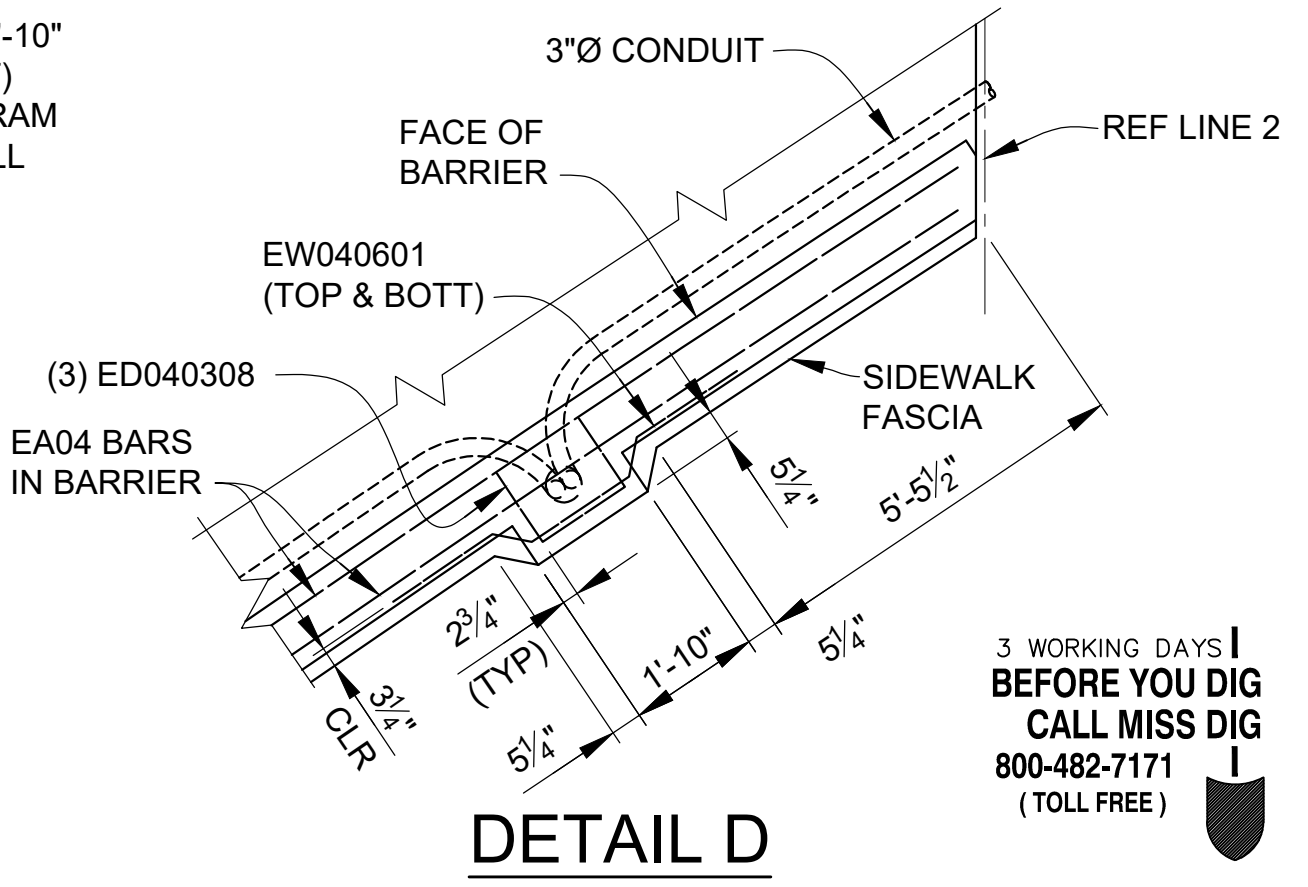
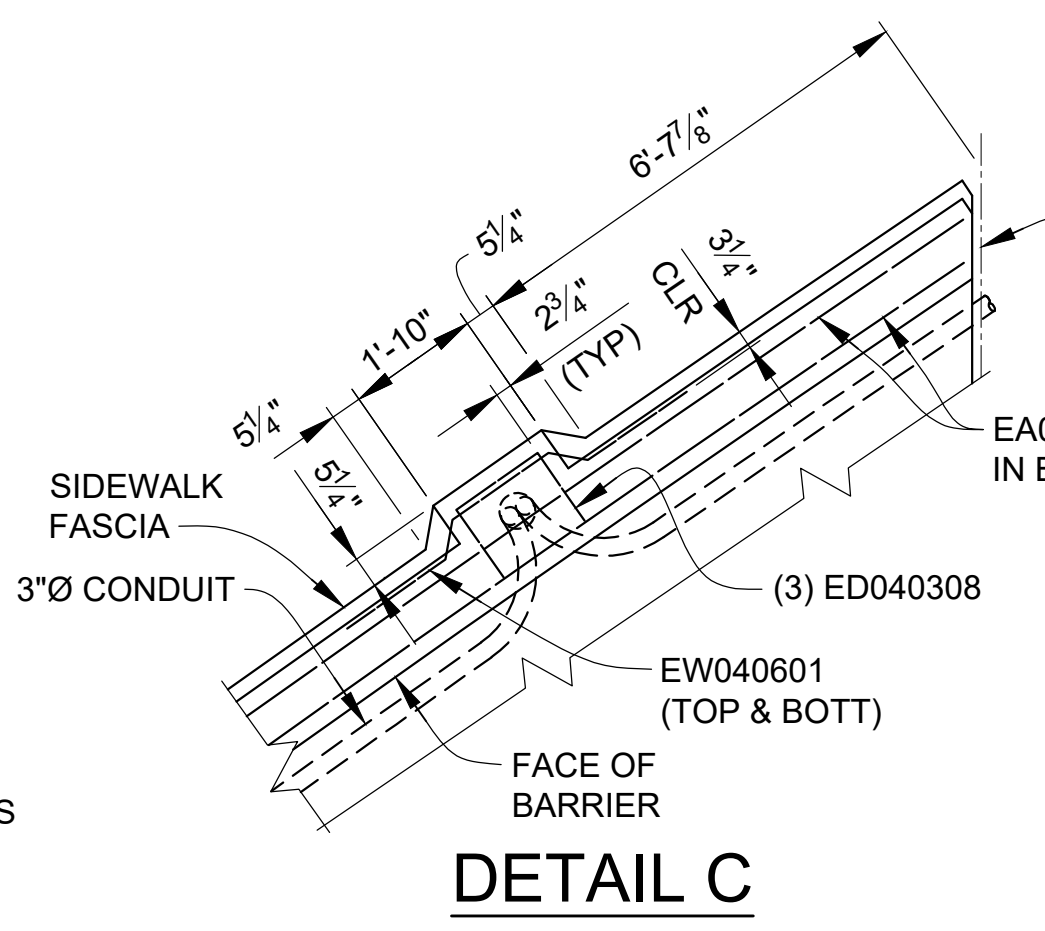
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MIN LAP TABLE

EA03 BARS	- 1'-2"
EA04 BARS	- 1'-7"
EA05 BARS	- 2'-0"
EA06 BARS	- 2'-4"

* SEE STEEL REINFORCEMENT SHEETS FOR BAR CUT DIAGRAM DETAILS.



DLZ

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

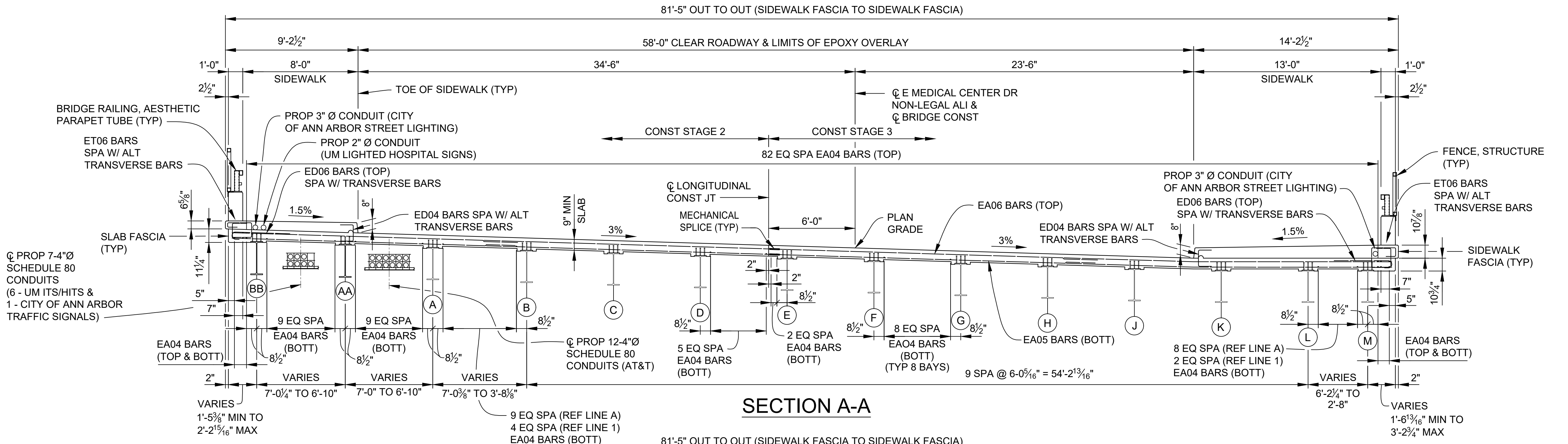
SUPERSTRUCTURE DETAILS

APPROVED BY: _____

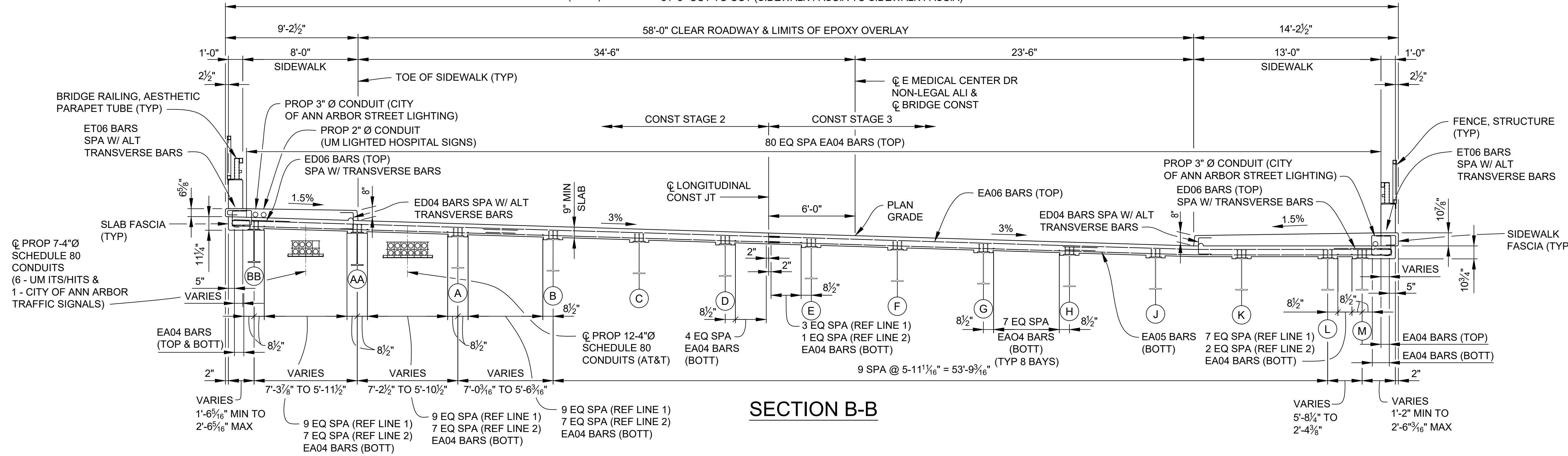
CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

SCALE	INCH
HOR. 3/16"=1'-0"	0 1
DRAWING NO.	2021-008-BR41
SHEET NO.	104 OF 153

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
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(TOLL FREE)



SECTION A-A



SECTION B-B

MIN LAP TABLE

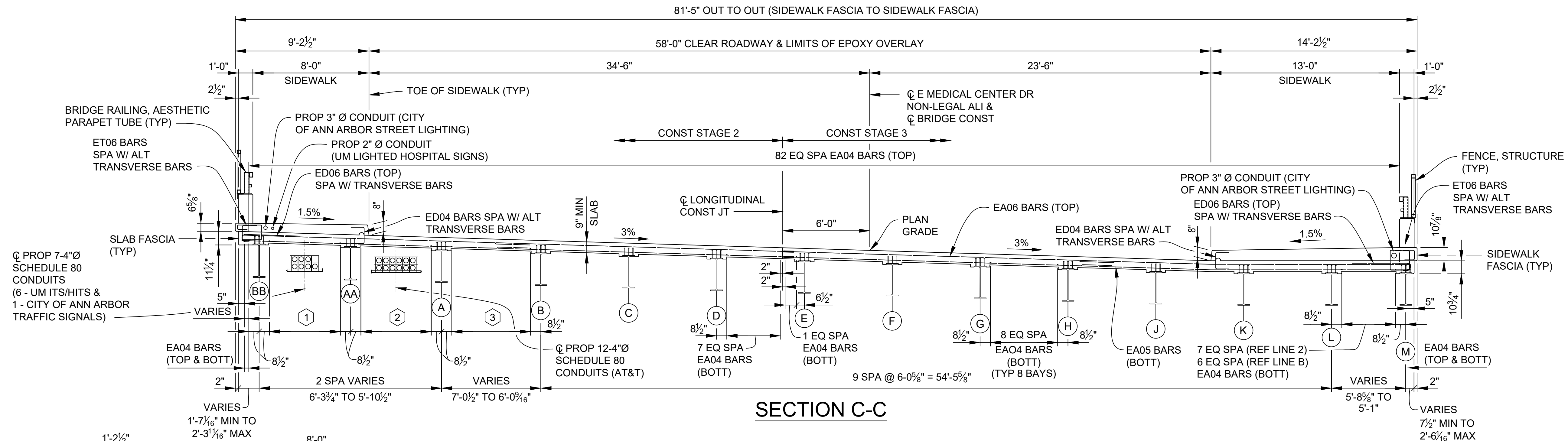
EA03 BARS	- 1'-2"
EA04 BARS	- 1'-7"
EA05 BARS	- 2'-0"
EA06 BARS	- 2'-4"

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

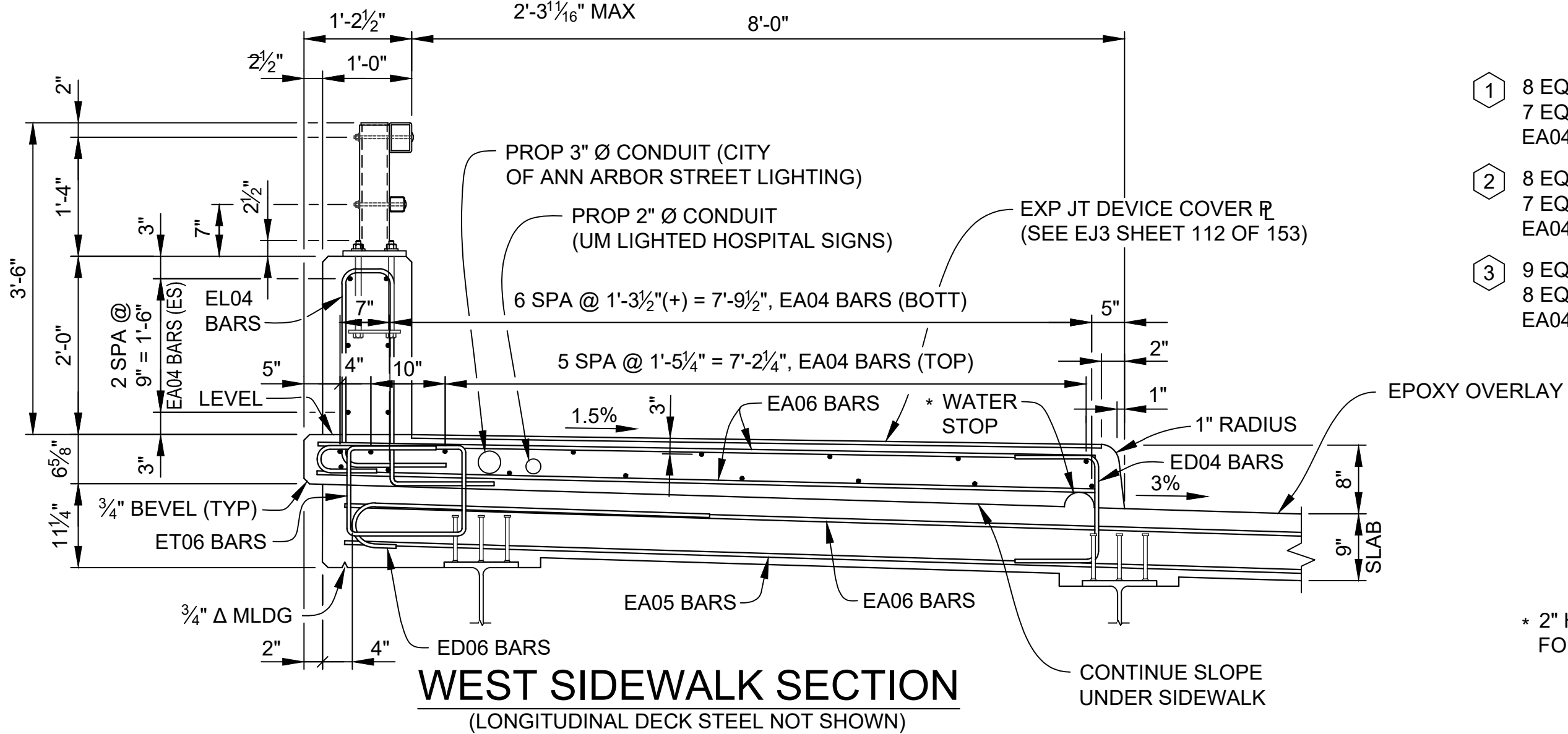
DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAILS	
SCALE HOR. 1/4" = 1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR42	
SHEET NO. <u>105</u> OF <u>153</u>	

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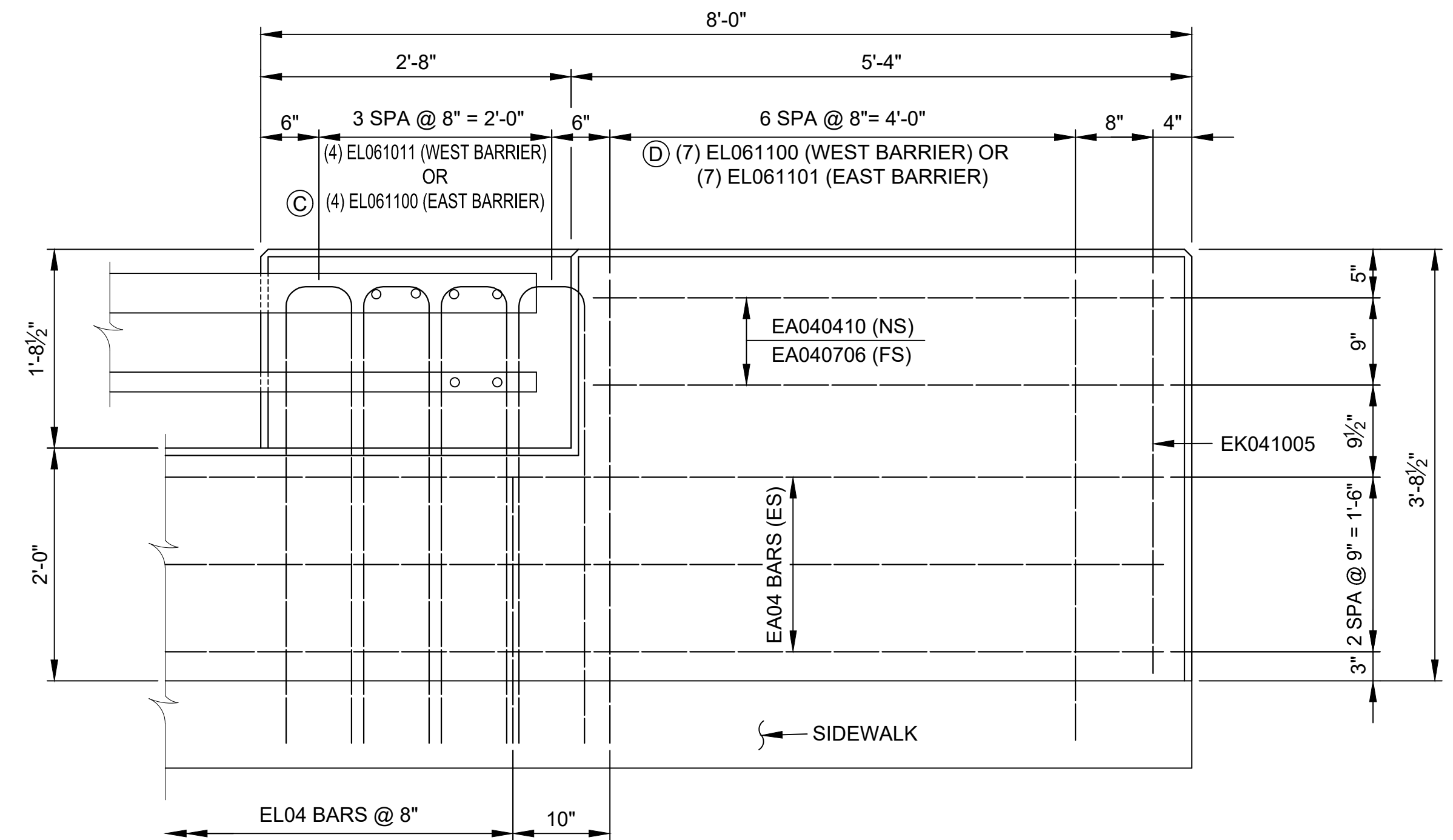


SECTION C-C



WEST SIDEWALK SECTION
(LONGITUDINAL DECK STEEL NOT SHOWN)

- ① 8 EQ SPA (REF LINE 2)
7 EQ SPA (REF LINE B)
EA04 BARS (BOTT)
- ② 8 EQ SPA (REF LINE 2)
7 EQ SPA (REF LINE B)
EA04 BARS (BOTT)
- ③ 9 EQ SPA (REF LINE 2)
8 EQ SPA (REF LINE B)
EA04 BARS (BOTT)

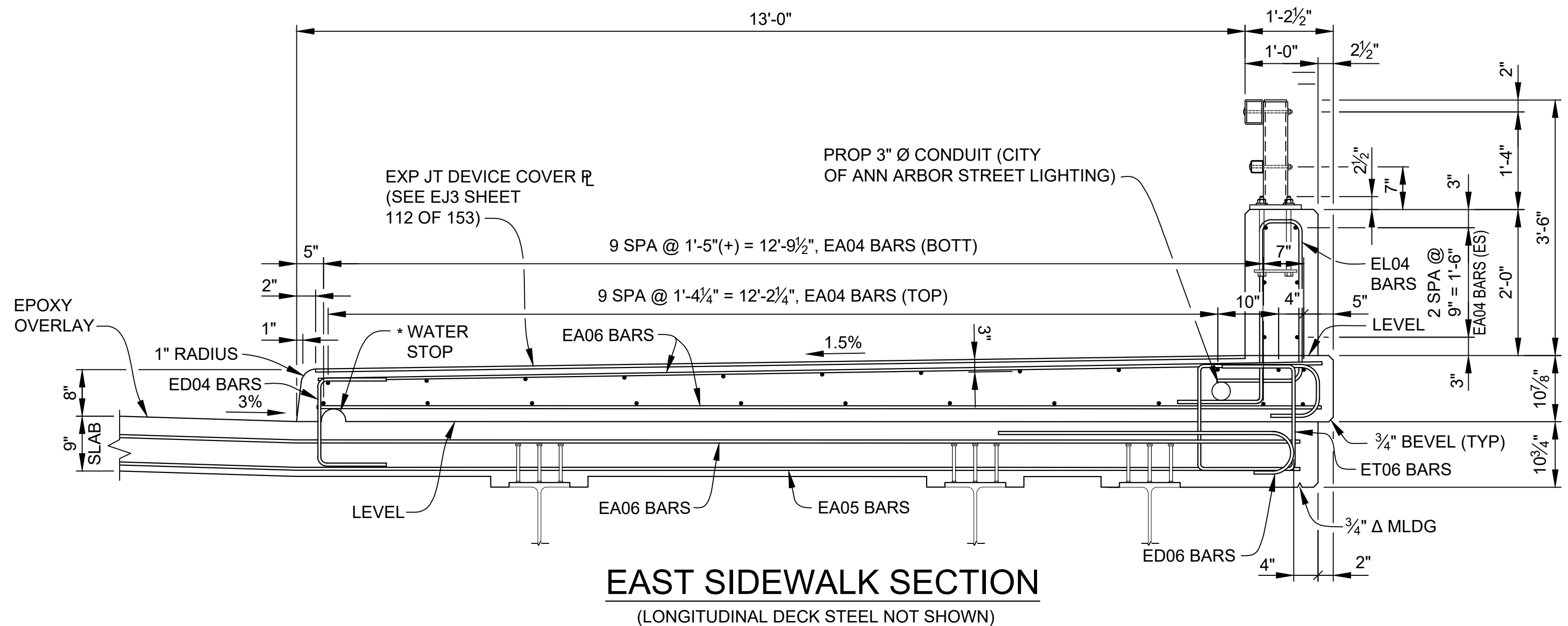


ELEVATION
END WALL DETAIL
(AESTHETIC PARAPET TUBE)

MIN LAP TABLE

EA03 BARS	- 1'-2"
EA04 BARS	- 1'-7"
EA05 BARS	- 2'-0"
EA06 BARS	- 2'-4"

NOTE:
FOR ADDITIONAL DETAILS OF RAILING, SEE MDOT STANDARD PLAN B-25-K ON SHEETS 133 - 134 OF 153.



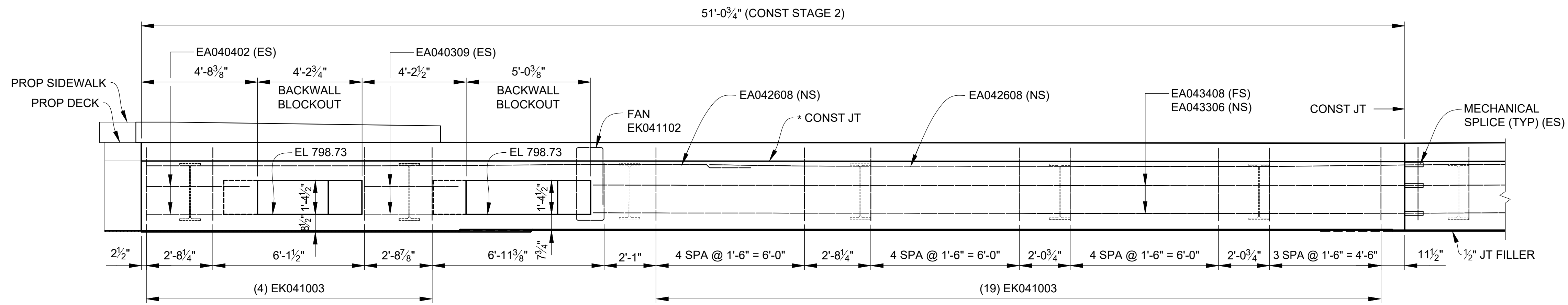
EAST SIDEWALK SECTION
(LONGITUDINAL DECK STEEL NOT SHOWN)

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
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(TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAILS	
SCALE HOR. 1/4"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR43	
SHEET NO. <u>106</u> OF <u>153</u>	

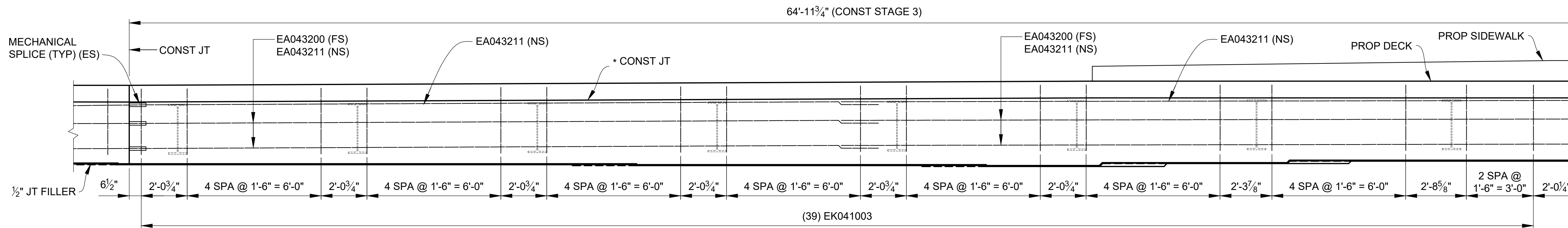
APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



BACKWALL ELEVATION ABUTMENT A - CONST STAGE 2

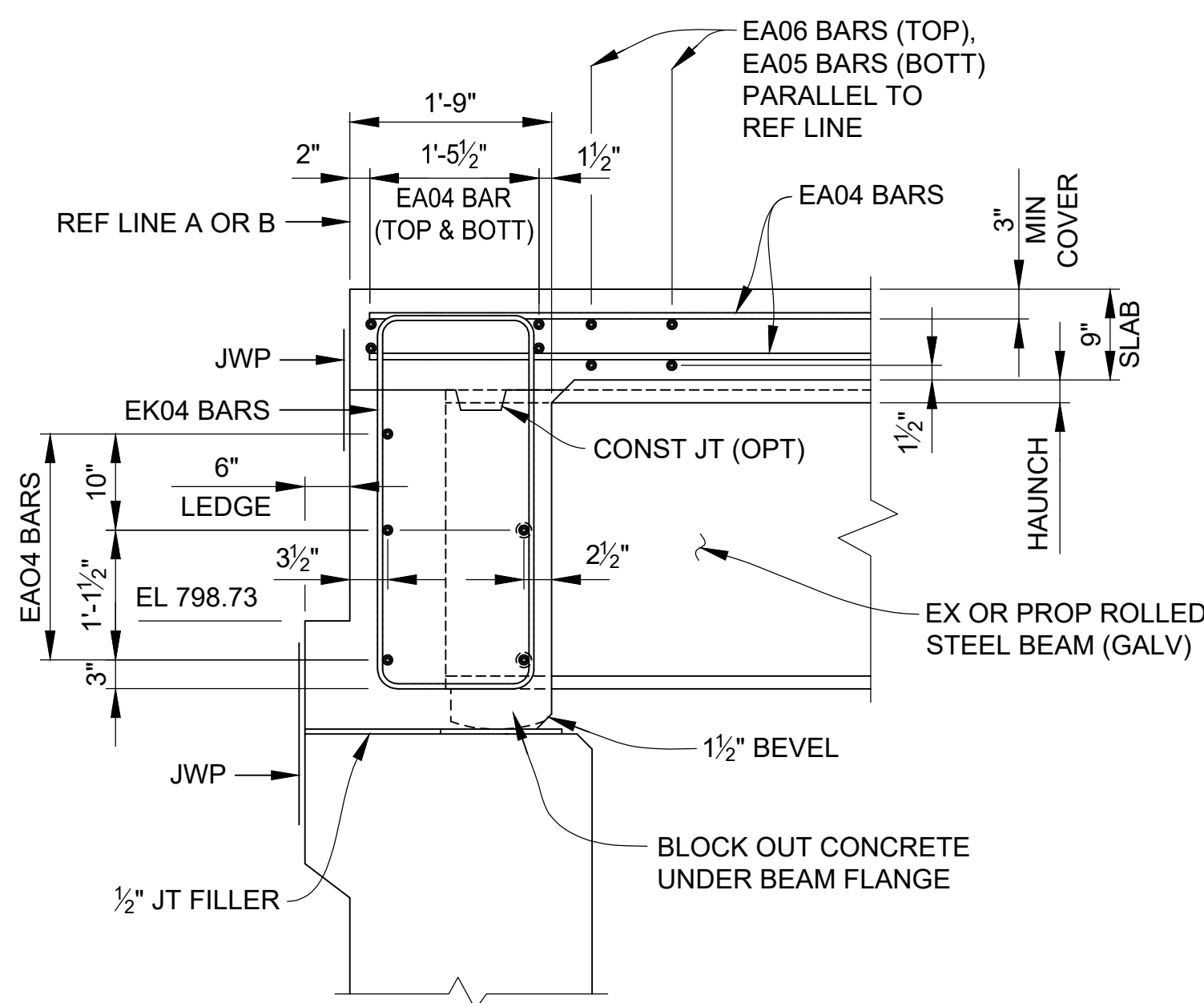
(LOOKING UP STATION)

* OPTIONAL CONSTRUCTION JOINT IF BACKWALL IS POURED WITH DECK.



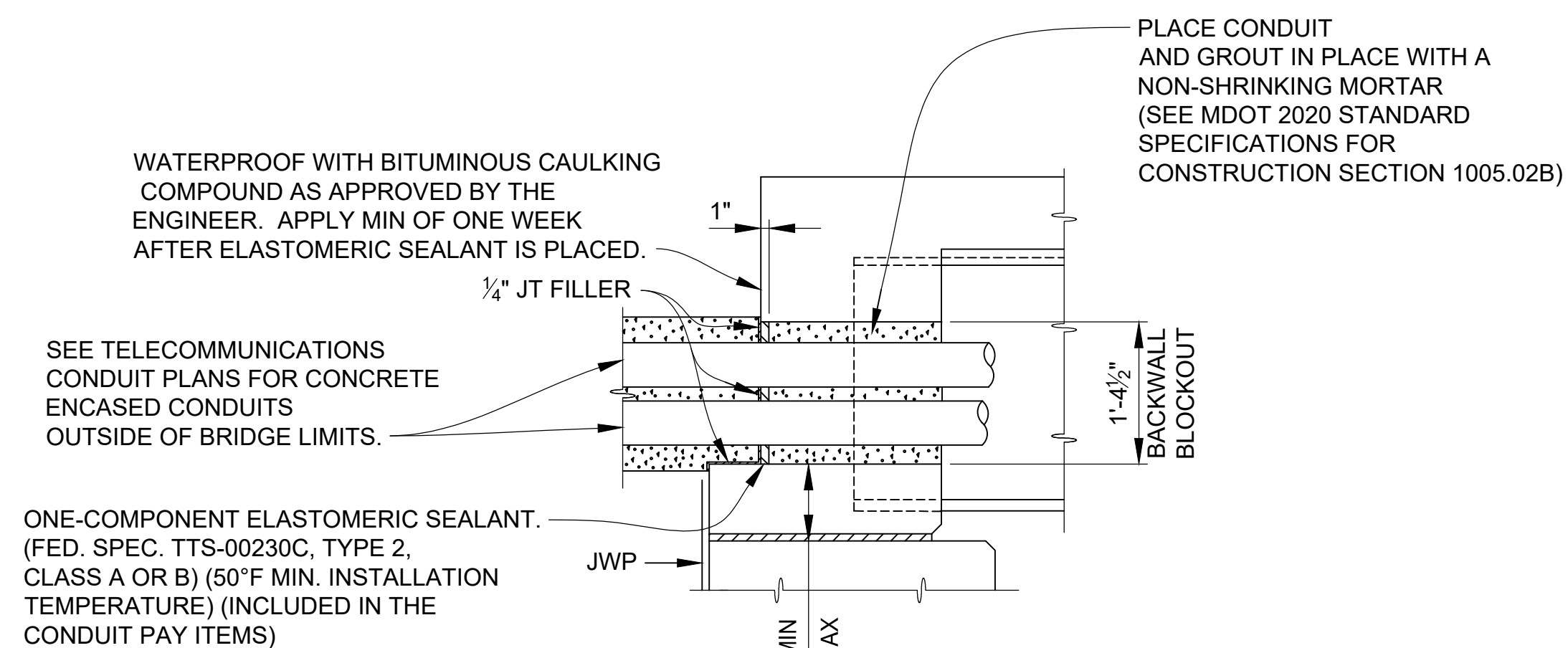
BACKWALL ELEVATION ABUTMENT A - CONST STAGE 3

(LOOKING UP STATION)



TYPICAL BACKWALL SECTION

IF A CONSTRUCTION JOINT IS USED, CAST THE LOWER PORTION OF THE BACKWALL PRIOR TO PLACING DECK REINFORCEMENT. THERE WILL BE NO PAYMENT FOR THE REQUIRED JOINT WATERPROOFING.



BACKWALL CONDUIT INSTALLATION

MIN LAP TABLE	
EA03 BARS	- 1'-2"
EA04 BARS	- 1'-7"
EA05 BARS	- 2'-0"
EA06 BARS	- 2'-4"

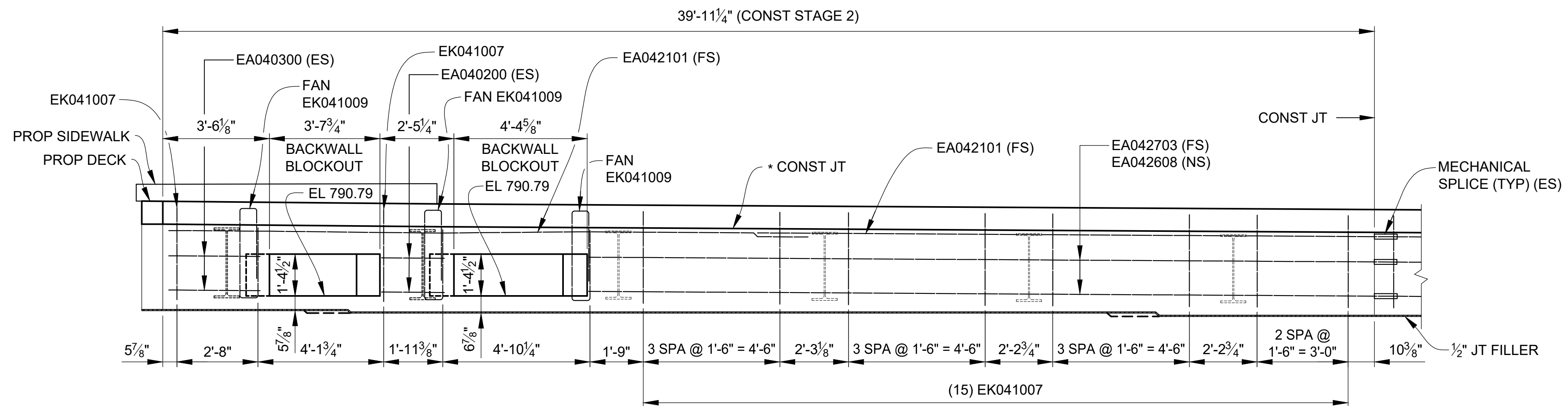
X:\Projects\2021\2141\738300_AA - EMCD Bridge\01_Constr\Drawings\CAD\EMCD_deck_007

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
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(TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAILS	
SCALE HOR. 3/16"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR44	
SHEET NO. <u>107</u> OF <u>153</u>	

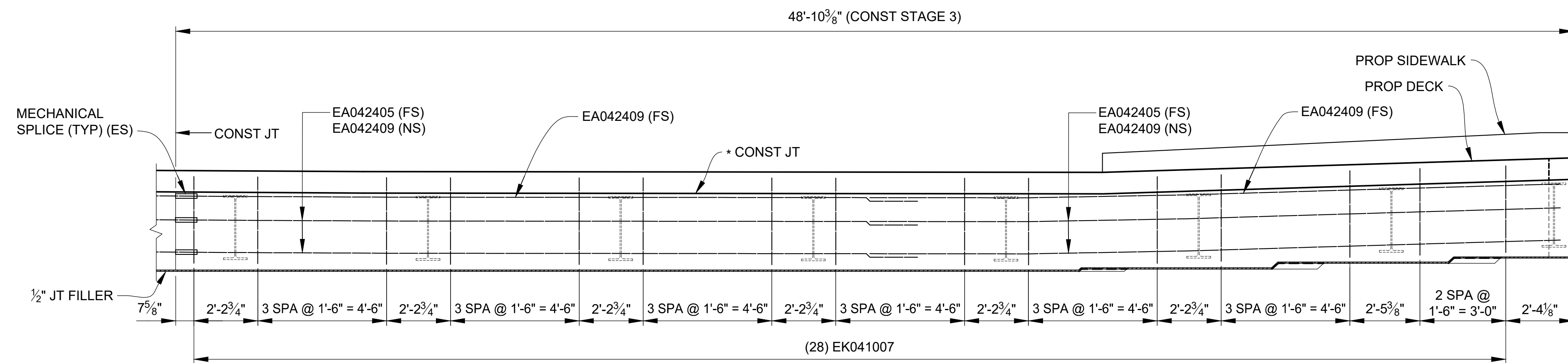
APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



BACKWALL ELEVATION ABUTMENT B - CONST STAGE 2

(LOOKING UP STATION)

* OPTIONAL CONSTRUCTION JOINT IF BACKWALL IS POURED WITH DECK.



BACKWALL ELEVATION ABUTMENT B - CONST STAGE 3

(LOOKING UP STATION)

MIN LAP TABLE

EA03 BARS - 1'-2"
EA04 BARS - 1'-7"
EA05 BARS - 2'-0"
EA06 BARS - 2'-4"

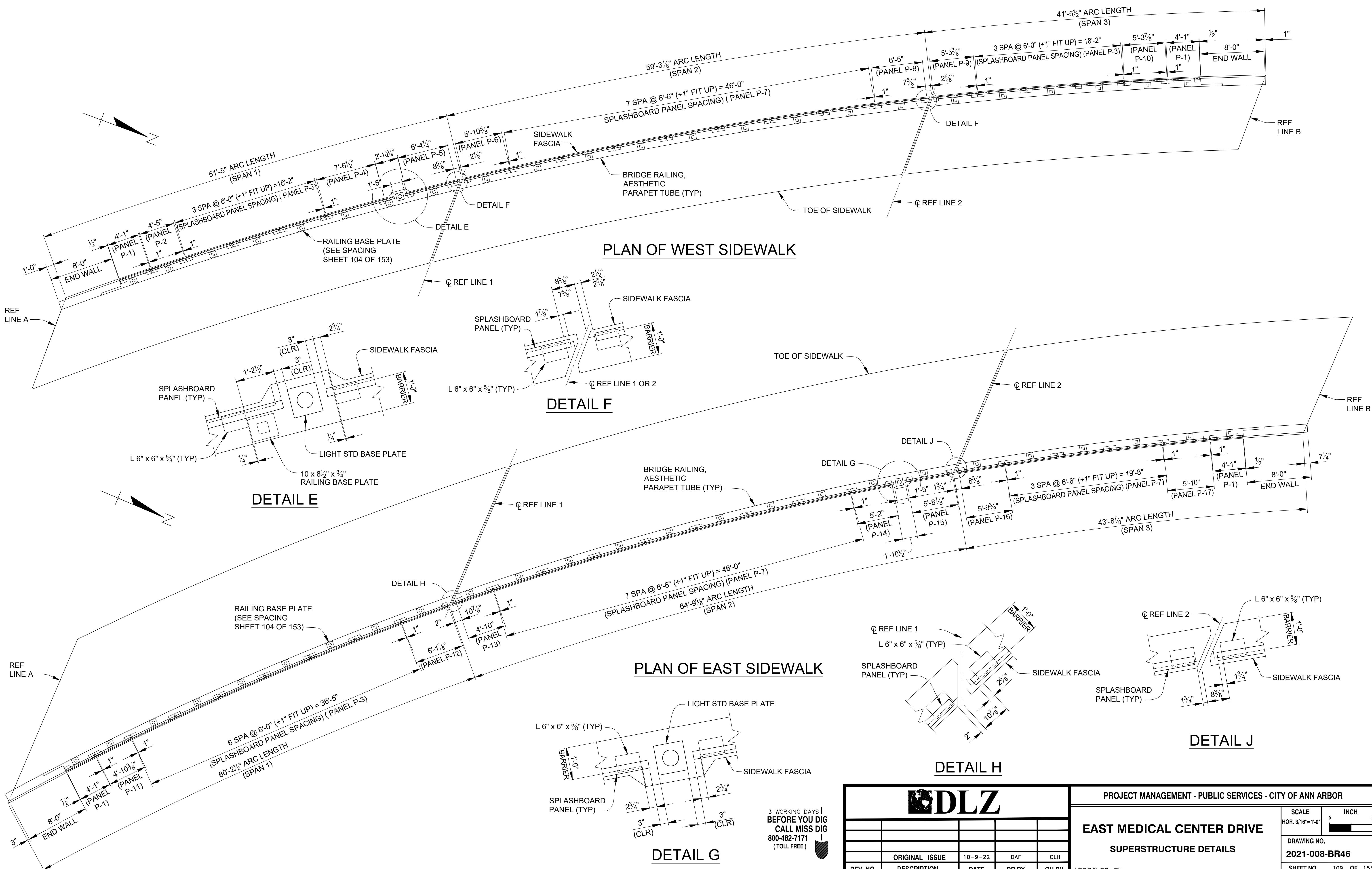
3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
800-482-7171
(TOLL FREE)

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAILS	
SCALE HOR. 3/16"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR45	
SHEET NO. <u>108</u> OF <u>153</u>	

APPROVED BY: _____
CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

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PLAN OF WEST SIDEWALK

DETAIL F

PLAN OF EAST SIDEWALK

DETAIL G

DETAIL H

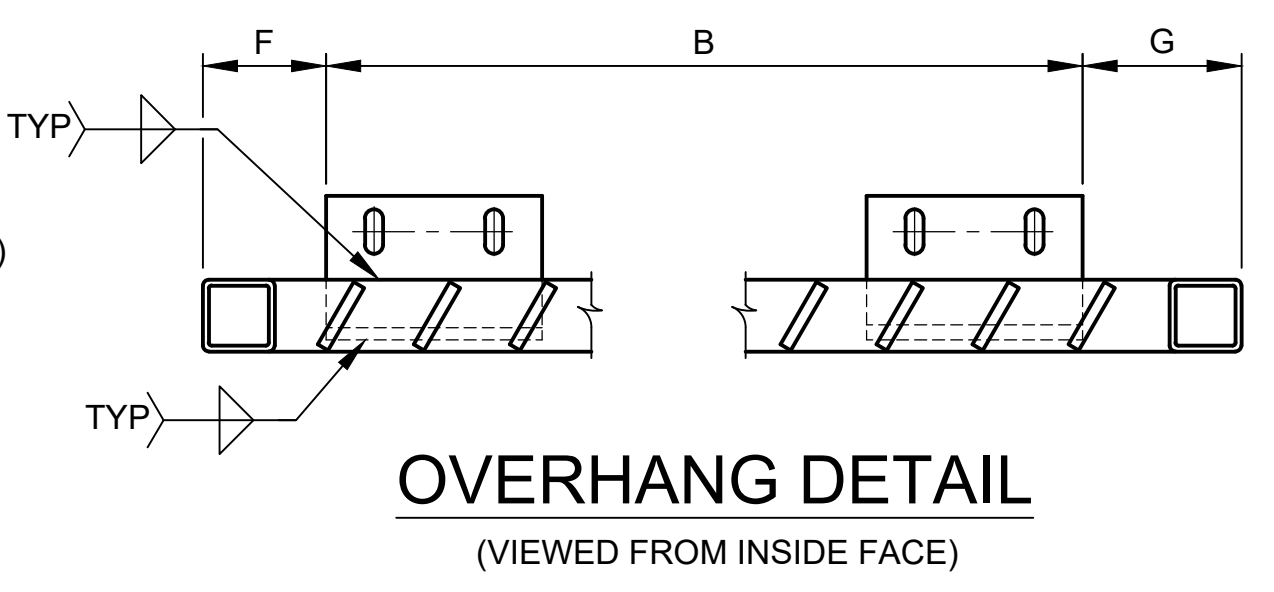
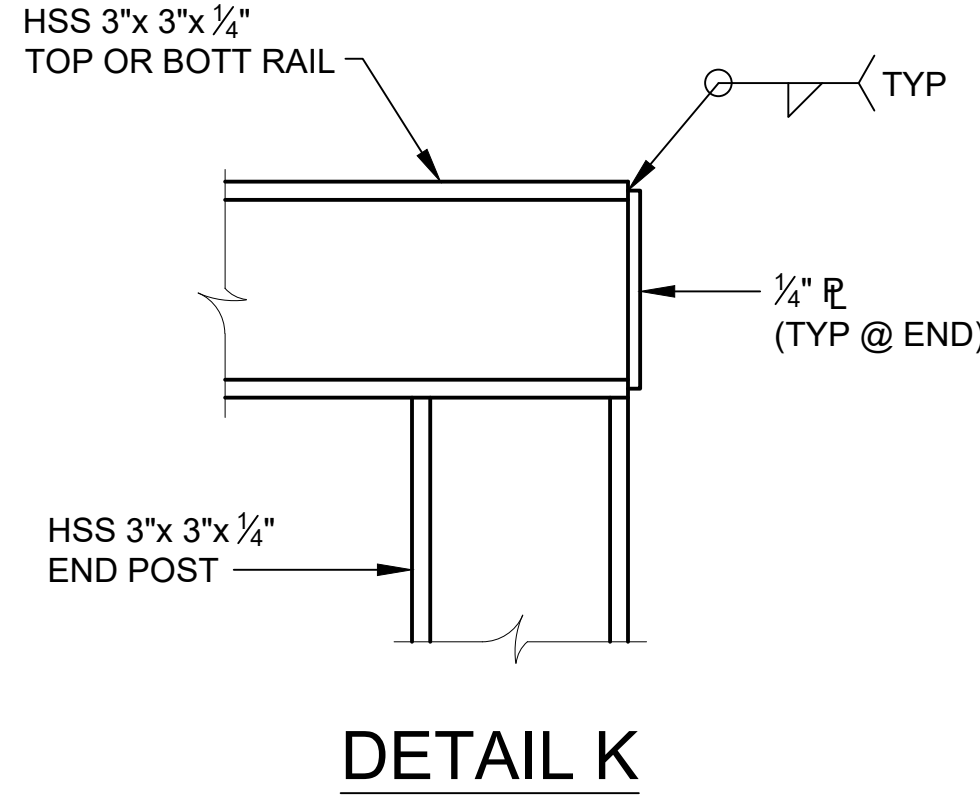
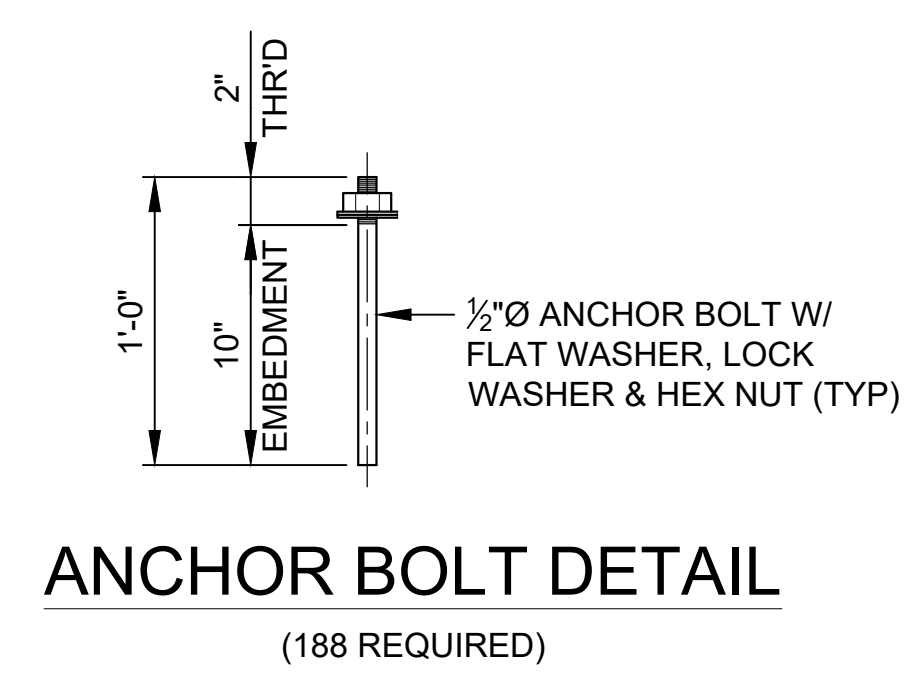
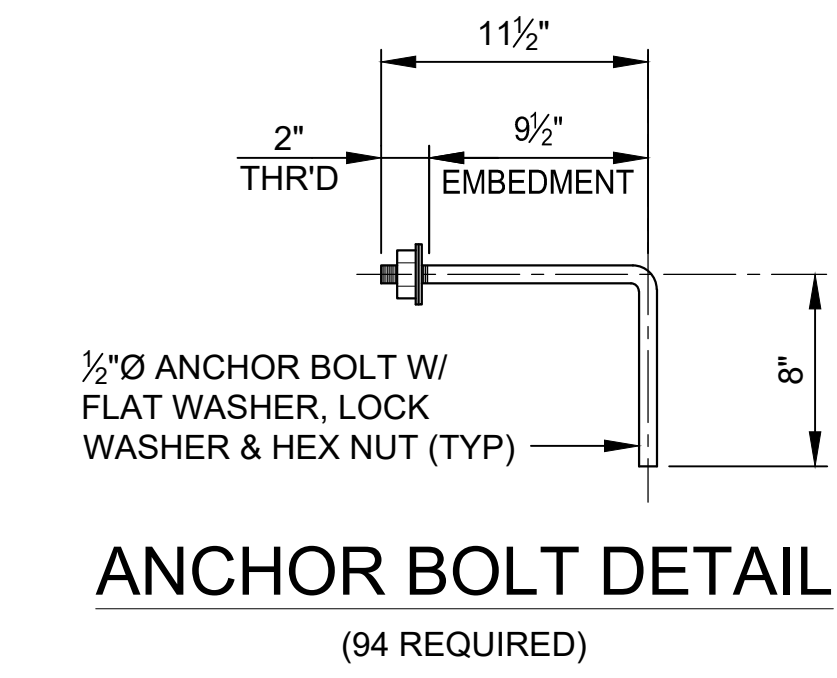
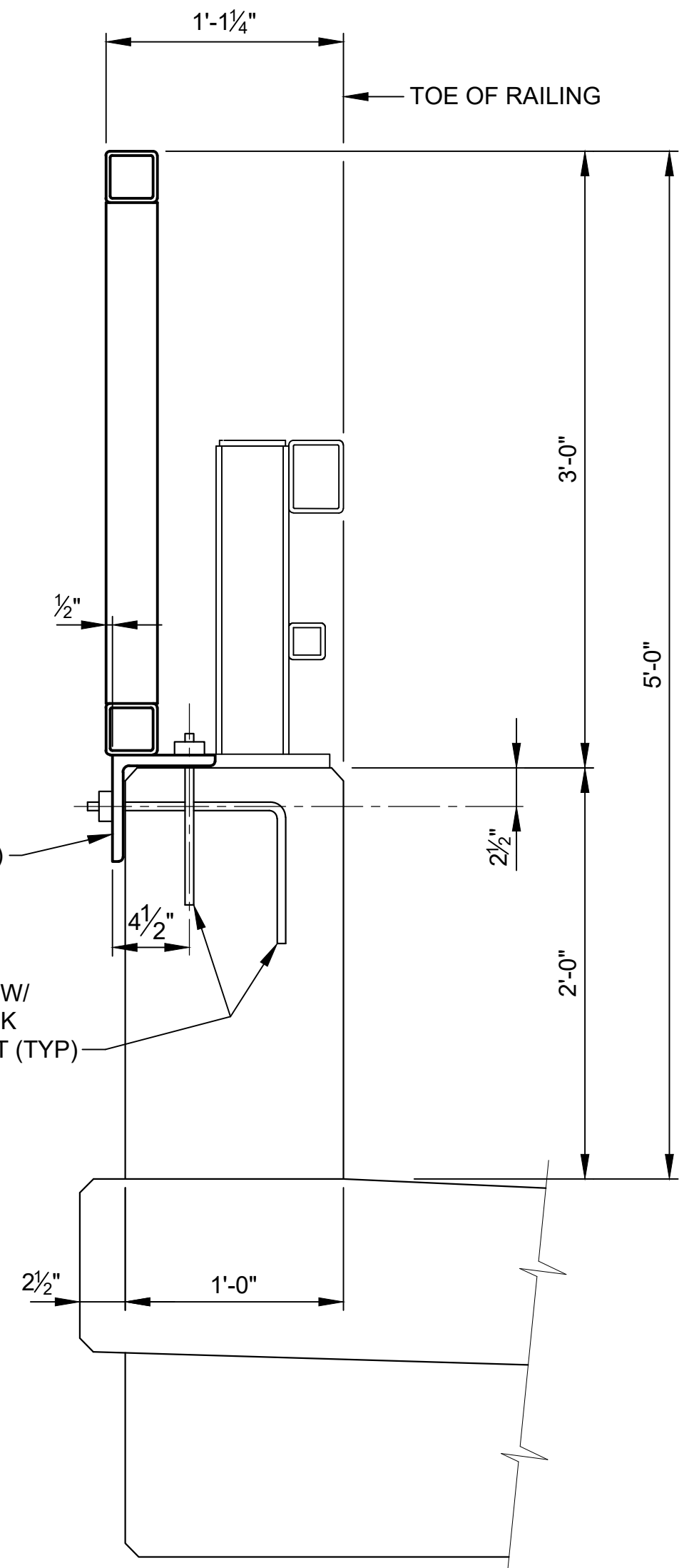
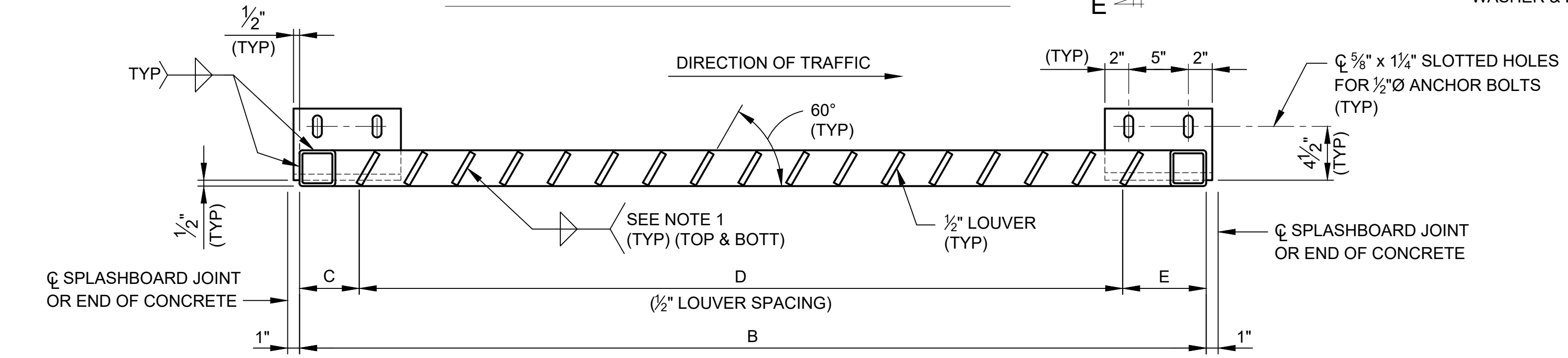
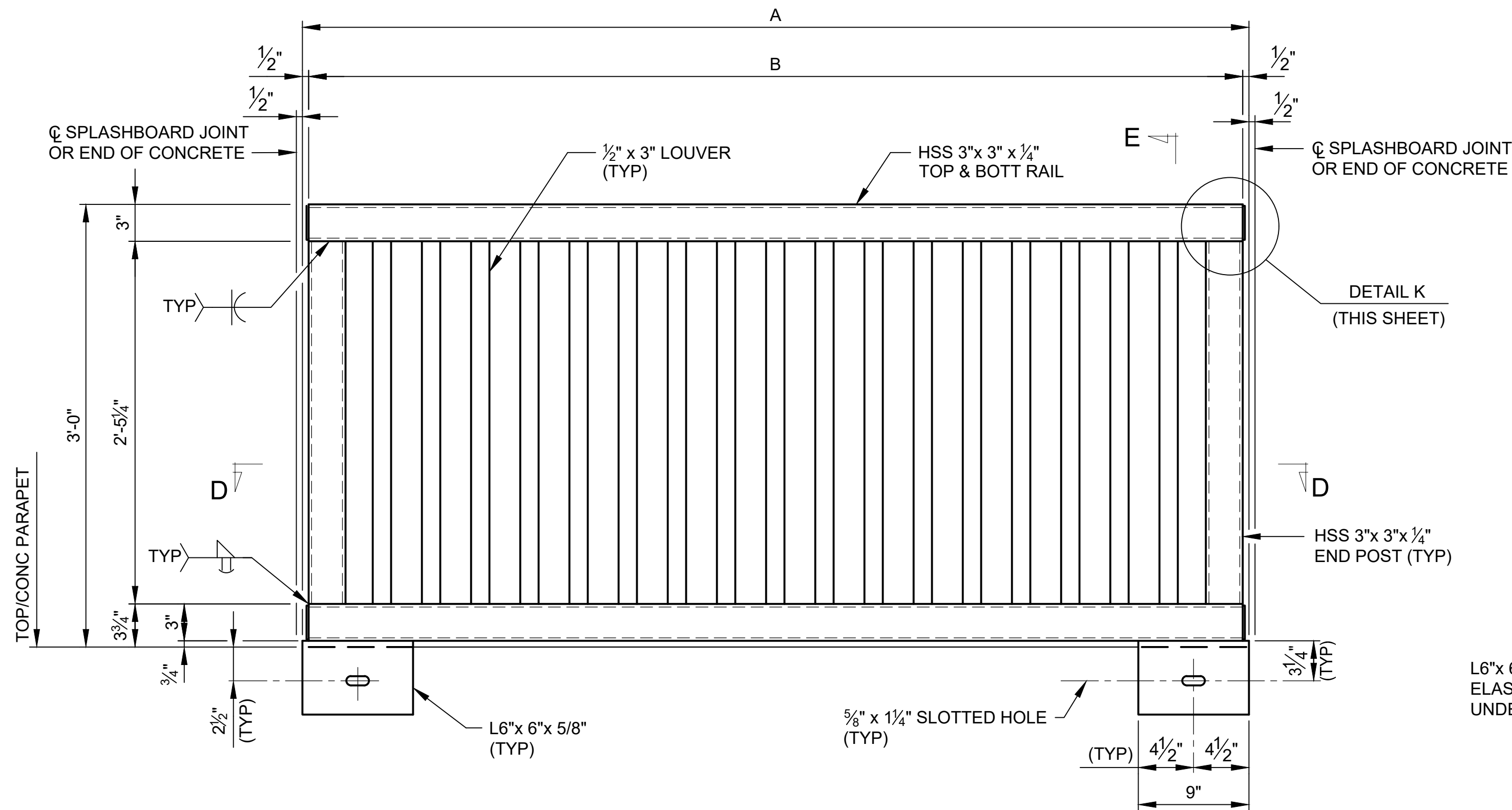
DETAIL J

3 WORKING DAYS
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DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAILS	
SCALE HOR. 3/16"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR46	
SHEET NO. <u>109</u> OF <u>153</u>	

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734



SPLASHBOARD PANEL DIMENSIONS								
PANEL	QUANTITY	A	B	C	D	E	F	G
P-1	4	4'-1"	4'-0"	5 1/2"	9 SPA @ 4" = 3'-0"	6 1/2"		
P-2	1	4'-5"	4'-4"	6"	10 SPA @ 4" = 3'-4"	6"		
P-3	12	6'-0"	5'-11"	5"	15 SPA @ 4" = 5'-0"	6"		
P-4	1	7'-6 1/2"	8'-8 1/2"	5 3/4"	23 SPA @ 4" = 7'-8"	6 3/4"		1'-2 1/2"
P-5	1	6'-4 1/4"	6'-8 7/8"	6"	17 SPA @ 4" = 5'-8"	6 7/8"	2 3/4"	1 1/8"
P-6	1	5'-10 5/8"	5'-9 5/8"	6 1/4"	14 SPA @ 4" = 4'-8"	7 3/8"		
P-7	17	6'-6"	6'-5"	6"	16 SPA @ 4" = 5'-4"	7"		
P-8	1	6'-5"	6'-6 3/8"	5"	17 SPA @ 4" = 5'-8"	5 3/8"		1 1/8"
P-9	1	5'-5 3/8"	5'-4 3/8"	6"	13 SPA @ 4" = 4'-4"	6 3/8"		
P-10	1	5'-3 3/8"	5'-2 7/8"	5"	13 SPA @ 4" = 4'-4"	5 7/8"		
P-11	1	4'-10 3/8"	4'-9 3/8"	6 1/4"	11 SPA @ 4" = 3'-8"	7 1/8"		
P-12	1	6'-1 1/8"	6'-0 7/8"	5 7/8"	15 SPA @ 4" = 5'-0"	7"		
P-13	1	4'-10"	5'-0"	5 1/2"	12 SPA @ 4" = 4'-0"	6 5/8"		2 5/8"
P-14	1	5'-2"	5'-4 1/4"	5 1/2"	13 SPA @ 4" = 4'-4"	6 3/4"	2 3/4"	
P-15	1	5'-8 7/8"	5'-11 1/8"	5 1/8"	15 SPA @ 4" = 5'-0"	6"		2 3/4"
P-16	1	5'-9 3/8"	5'-10 5/8"	4 7/8"	15 SPA @ 4" = 5'-0"	5 3/4"		1 3/4"
P-17	1	5'-10"	5'-9"	6"	14 SPA @ 4" = 4'-8"	7"		

NOTES:

PROPOSED SPLASHBOARD PANELS AND ANCHOR BOLTS ARE INCLUDED IN THE BID ITEMS "STRUCTURAL STEEL, MIXED, FURN AND FAB" AND "STRUCTURAL STEEL, MIXED, ERECT".

ELASTOMERIC BEARING PAD (1/8") USED UNDER THE ANGLES SHALL NOT BE PAID FOR SEPARATELY BUT INCLUDED IN THE QUANTITY FOR STRUCTURAL STEEL.

STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270, GRADE 36.

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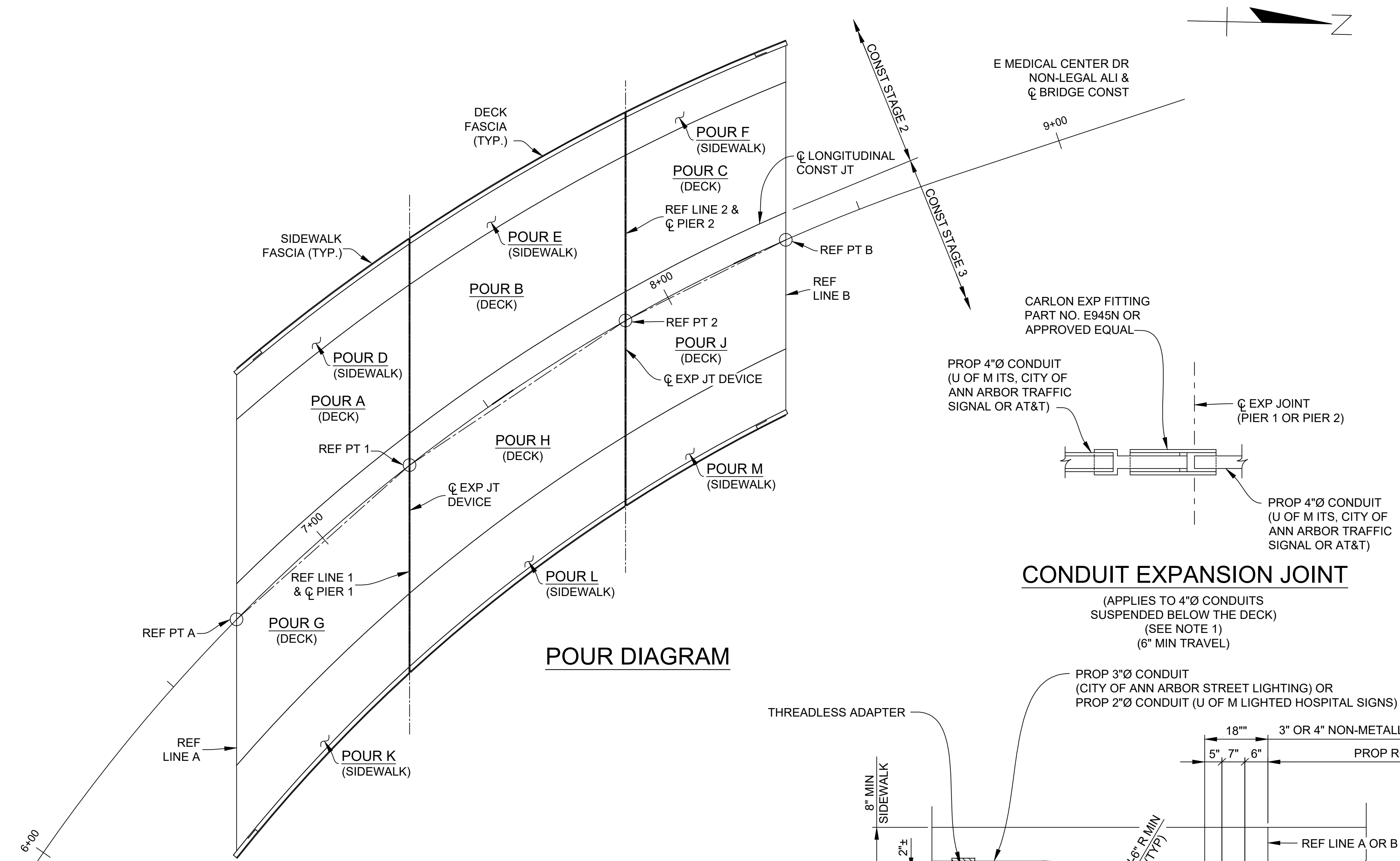
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REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAIL	
SCALE HOR. 1/16" = 1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR47	
SHEET NO. 110 OF 153	

CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

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SUPERSTRUCTURE CONCRETE QUANTITIES	
POUR	QUANTITY (CYDS)(CATG 0001)
D	10.8
E	12.3
F	8.7
K	24.7
L	26.5
M	18.0
TOTAL	101

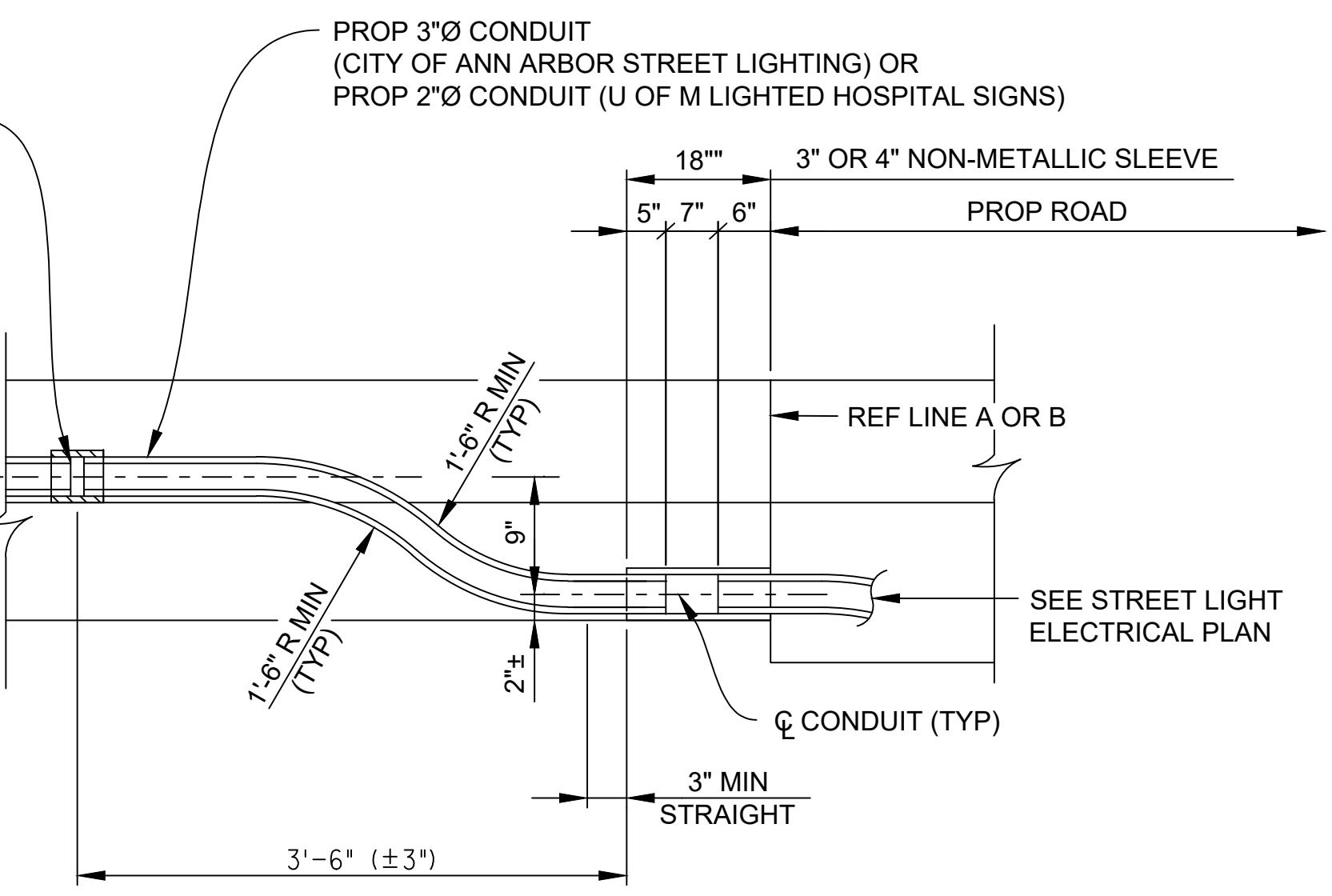
SUPERSTRUCTURE CONCRETE NIGHT CASTING QUANTITIES		
POUR	QUANTITY (CYDS)(CATG 0001)	QUANTITY (CYDS)(CATG 0002)
* A	50.2	19.3
B	48.8	19.2
* C	38.6	15.5
* G	89.1	
H	83.2	
* J	65.1	
TOTAL	375	54

* BACKWALL INCLUDED IN THE POUR.

ESTIMATED QUANTITIES THIS SHEET					
DESCRIPTION	UNITS	CATG 0001	CATG 0002	CATG 0003	TOTAL
Bridge Ltg, Furn and Rem (STR 11065)	LSUM	0.9	0.1		1
Bridge Ltg, Oper and Maintain	Cyd	375	54		429
Superstructure Conc	Cyd	101			101
Superstructure Conc, Form, Finish, and Cure (STR 11065)	LSUM	1			1
Superstructure Conc, Form, Finish, and Cure, Night Casting (STR 11065)	LSUM	0.9	0.1		1
Superstructure Conc, Night Casting	Cyd	375	54		429
Structural Steel, Mixed, Erect	Lb	19,565			19,565
Structural Steel, Mixed, Furn and Fab	Lb	19,565			19,565
Bridge Railing, Aesthetic Parapet Tube	Ft	321			321
Epoxy Ovly	Syd	1,050			1,050
Reinforcement, Mechanical Splice	Ea	748			748

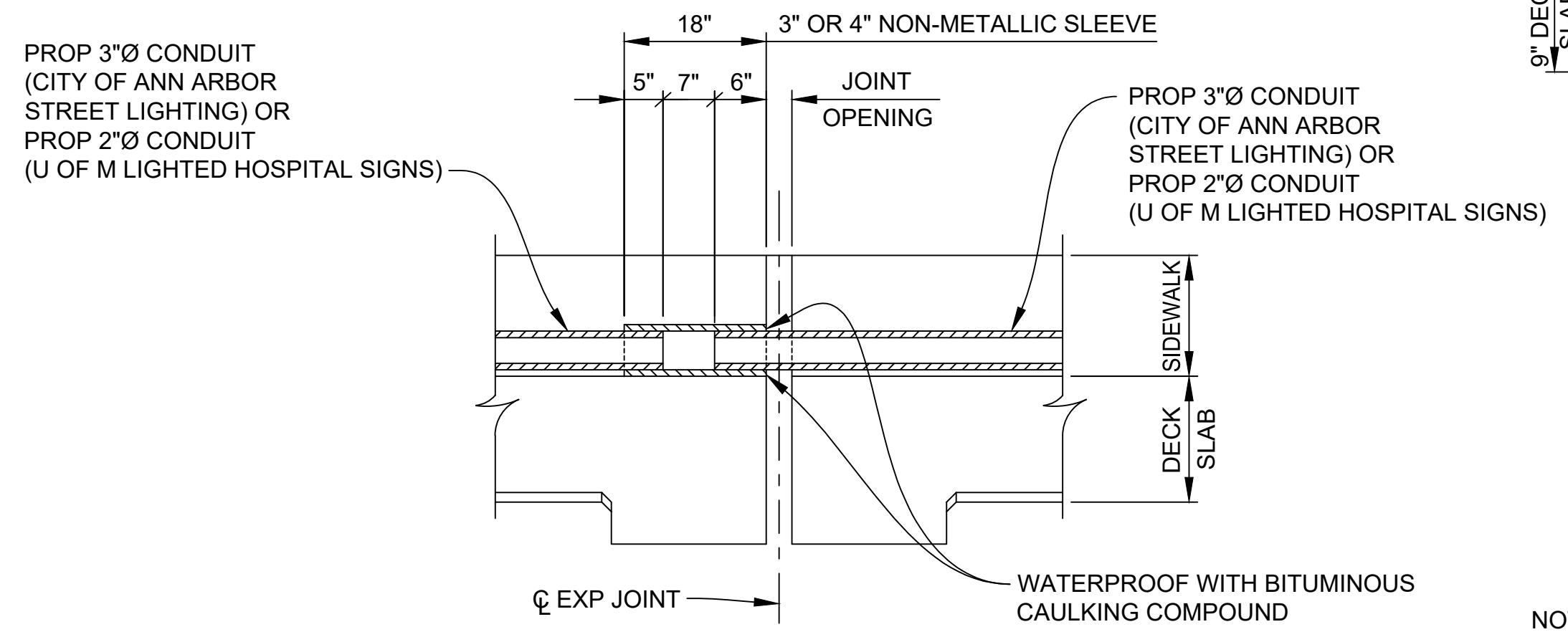
CONDUIT EXPANSION JOINT

(APPLIES TO 4"Ø CONDUITS SUSPENDED BELOW THE DECK) (SEE NOTE 1) (6" MIN TRAVEL)



CONDUIT DETAILS AT APPROACHES

(SEE NOTE 1)



LIGHTING CONDUIT AT TRANSVERSE EXPANSION JOINT

(SEE NOTE 1)

NOTE 1: SLEEVES, ADAPTERS, COUPLINGS, CONDUIT, PLUGS AND WATERPROOFING ARE INCLUDED IN THE BID ITEM "CONDUIT, SCHEDULE 40, 2 INCH", "CONDUIT, SCHEDULE 40, 3 INCH" OR "CONDUIT, SCHEDULE 80, 4 INCH, STRUCTURE"

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DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22	DAF	CLH

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
SUPERSTRUCTURE DETAIL	
SCALE HOR. 1/16"=1'-0"	INCH 0 1
DRAWING NO. 2021-008-BR48	
SHEET NO. <u>111</u> OF <u>153</u>	

APPROVED BY: CARRIE L. HAMEL, P.E. MICHIGAN NO. 6201056734

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BAR	DIMENSIONS												NO.	TOTAL
	A	B	C	D	E	F	G	H	J	K	M	P	REQ'D	WT.
EA050400	4'-0"												3	13
EA050401	4'-1"												3	13
EA050911	9'-11"												16	165
EA051605	16'-5"												6	103
EA052602	26'-2"												6	164
EA052910	29'-10"												6	187
EA053211	32'-11"												6	206
EA060303	3'-3"												22	107
EA060607	6'-7"												2	20
EA060806	8'-6"												20	255
EA061006	10'-6"												4	63
EA061010	10'-10"												2	33
EA061106	11'-6"												12	207
EA061107	11'-7"												4	70
EA061210	12'-10"												15	289
EA061611	16'-11"												2	51
EA080900	9'-0"												8	192
EA081710	17'-10"												8	381
EA092002	20'-2"												5	343
EA092210	22'-10"												5	388
EA092602	26'-2"												10	890
EA093211	32'-11"												10	1119
EA093307	33'-7"												5	571
EA093603	36'-3"												5	616
ED050804	2'-6"	3'-4"	2'-6"										91	791
EK051305	2'-2 1/2"	2'-9"	2'-9"	3'-6"									182	2547
EU050905	3'-5"	2'-0 1/4"	5'-4 1/2"	2'-0 1/4"	1'-8 1/2"								12	118
EU051002	3'-11"	2'-0 1/8"	6'-1 3/4"	2'-0 1/8"	1'-11 1/2"								8	85
EV040710	6'-3"	1'-7"	1'-11 1/4"	0'-0"	0'-0"								16	84

PER 2

BAR	DIMENSIONS												NO.	TOTAL
	A	B	C	D	E	F	G	H	J	K	M	P	REQ'D	WT.
EA050400	4'-0"												3	13
EA050401	4'-1"												1	4
EA050911	9'-11"												16	165
EA051410	14'-10"												6	93
EA052401	24'-1"												6	151
EA052802	28'-2"												6	176
EA052808	28'-8"												6	179
EA060303	3'-3"												22	107
EA060510	5'-10"												2	18
EA060806	8'-6"												20	255
EA061006	10'-6"												4	63
EA061010	10'-10"												2	33
EA061106	11'-6"												12	207
EA061107	11'-7"												4	70
EA061210	12'-10"												15	289
EA061700	17'-0"												2	51
EA080900	9'-0"												8	192
EA081305	13'-5"												8	287
EA091807	18'-7"												5	316
EA092103	21'-3"												5	361
EA092401	24'-1"												10	819
EA092808	28'-8"												10	975
EA093111	31'-11"												5	543
EA093407	34'-7"												5	588
ED050804	2'-6"	3'-4"	2'-6"										85	739
EK051305	2'-2 1/2"	2'-9"	2'-9"	3'-6"									170	2379
EU050905	3'-5"	2'-0 1/4"	5'-4 1/2"	2'-0 1/4"	1'-8 1/2"								12	118
EU051002	3'-11"	2'-0 1/8"	6'-1 3/4"	2'-0 1/8"	1'-11 1/2"								8	85
EV040710	6'-3"	1'-7"	1'-11 1/4"	0'-0"	0'-0"								11	58

*Threaded

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PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

STEEL REINFORCEMENT DETAILS

SCALE
HOR. 1"=40'
VERT. 1"=4'

DRAWING NO.
2021-008-BR53

SHEET NO. 116 OF 153

APPROVED BY: _____

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DECK-SPAN 1

BAR	DIMENSIONS												NO. REQ'D	TOTAL WT.
	A	B	C	D	E	F	G	H	J	K	M	P		
EA040309	3'-9"												4	10
EA040402	4'-2"												4	11
EA040409	4'-9"												2	6
EA040410	4'-10"												4	13
EA040706	7'-6"												4	20
EA040903	9'-3"												2	12
EA041309	13'-9"												2	18
EA042102	21'-2"												2	28
EA042604	26'-4"												6	106
EA042606	26'-6"												40	708
EA042607	26'-7"												32	568
EA042608	26'-8"												22	393
EA042800	28'-0"												159	2974
EA042806	28'-6"												18	342
EA042909	29'-9"												12	239
EA043007	30'-7"												46	940
EA043008	30'-8"												172	3524
EA043100	31'-0"												12	248
EA043200	32'-0"												4	86
EA043210	32'-10"												8	175
EA043211	32'-11"												6	132
EA043306	33'-6"												2	45
EA043408	34'-8"												2	46
EA043506	35'-6"												2	47
EA051707	17'-7"												40	734
EA051810	18'-10"												17	334
EA052001	20'-1"												36	754
EA052002	20'-2"												40	841
EA052100	21'-0"												40	876
EA052205	22'-5"												33	772
EA052206	22'-6"												42	986
EA052208	22'-8"												33	780
EA052301	23'-1"												21	506
EA052309	23'-9"												18	446
EA052311	23'-11"												42	1048
EA052400	24'-0"												23	576
EA052407	24'-7"												4	103
EA052505	25'-5"												21	557
EA052507	25'-7"												29	774
EA052511	25'-11"												21	568
EA052610	26'-10"												4	112
EA052705	27'-5"												20	572
EA052901	29'-1"												4	121
EA053208	32'-8"												4	136

DECK-SPAN 1 (CONT.)

BAR	DIMENSIONS												NO. REQ'D	TOTAL WT.
	A	B	C	D	E	F	G	H	J	K	M	P		
EA060106	1'-6"												2	5
EA060201	2'-1"												2	6
EA060809	8'-9"												104	1367
EA061002	10'-2"												8	122
EA061007	10'-7"												2	32
EA061106	11'-6"												8	139
EA061309	13'-9"												106	2189
EA061504	15'-4"												30	690
EA061709	17'-9"												40	1066
EA061806	18'-6"												2	56
EA061810	18'-10"												17	481
EA062003	20'-3"												36	1095
EA062004	20'-4"												40	1222
EA062102	21'-2"												40	1272
EA062107	21'-7"												2	65
EA062207	22'-7"												33	1119
EA062208	22'-8"												42	1430
EA062210	22'-10"												33	1132
EA062301	23'-1"												21	728
EA062309	23'-9"												18	642
EA062400	24'-0"												23	829
EA062401	24'-1"												42	1519
EA062409	24'-9"												4	149
EA062505	25'-5"												21	802
EA062507	25'-7"												29	1114
EA062511	25'-11"												21	817
EA062700	27'-0"												4	162
EA062705	27'-5"												20	824
EA062903	29'-3"												4	176
EA063210	32'-10"												4	197
ED040211	0'-10 3/4"	1'-1 1/2"	0'-10 3/4"										131	255
ED040308	1'-1 3/4"	1'-4 1/2"	1'-1 3/4"										3	7
ED040503	1'-1 1/2"	3'-0"	1'-1 1/2"										2	7
ED060500	4'-0"	0'-6"	0'-6"										231	1735
EK041003	1'-4 1/2"	2'-3 1/2"	2'-3 1/2"	2'-11"									62	424
EK041005	0'-7 1/4"	2'-11 3/4"	2'-11 3/4"	3'-3"									2	14
EK041102	1'-10"	2'-3 1/2"	2'-3 1/2"	2'-11"									1	7
EL040706	2'-2"	0'-7"	2'-5"	1'-2"	1'-2"	0'-7"	0'-0"						70	351
EL040707	2'-2"	0'-7"	2'-6"	1'-2"	1'-2"	0'-7"	0'-0"						83	420
EL061011	3'-10 1/2"	0'-6 3/4"	4'-1 1/2"	1'-2 1/8"	1'-2 1/8"	0'-0"	0'-6 3/4"						4	66
EL061100	3'-10 1/2"	0'-6 3/4"	4'-2 1/2"	1'-2 1/8"	1'-2 1/8"	0'-0"	0'-6 3/4"						4	66
EL061101	4'-1 1/2"	0'-7 1/4"	3'-10 1/2"	1'-2 3/8"	1'-2 3/8"	0'-7 1/4"	0'-0"						7	116
EL061101	4'-2 1/2"	0'-7 1/4"	3'-10 1/2"	1'-2 3/8"	1'-2 3/8"	0'-7 1/4"	0'-0"						7	117
ET060701	1'-0"	1'-4"	1'-0"	1'-8"	0'-4"	0'-9"							61	649
ET060800	1'-0"	1'-4"	1'-4 1/2"	1'-8"	0'-7"	0'-8"							72	865
EW040601	1'-8"	0'-4 3/4"	1'-7 1/2"	0'-4 3/4"	1'-8"	0'-4 3/4"	0'-6 3/4"	0'-6 3/4"	0'-4 3/4"				2	8
EW040609	1'-8"	0'-7 3/4"	1'-7"	0'-7 3/4"	1'-8"	0'-7 7/8"	0'-11"	0'-11"	0'-7 7/8"				2	9

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PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

STEEL REINFORCEMENT DETAILS

APPROVED BY:

SCALE HOR. 1"=40' VERT. 1"=4'	INCH 0 1
DRAWING NO. 2021-008-BR54	
SHEET NO. 117 OF 153	

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DECK-SPAN2

BAR	DIMENSIONS												NO.	TOTAL	
	A	B	C	D	E	F	G	H	J	K	M	P			REQ'D
EA040703	7'-3"													2	10
EA041006	10'-6"													2	14
EA041702	17'-2"													2	23
EA042003	20'-3"													2	27
EA043002	30'-2"													6	121
EA043003	30'-3"													12	242
EA043004	30'-4"													32	648
EA043007	30'-7"													18	367
EA043100	31'-0"													8	166
EA043101	31'-1"													10	208
EA043106	31'-6"													153	3219
EA043109	31'-9"													5	106
EA043200	32'-0"													2	43
EA043209	32'-9"													14	307
EA043210	32'-10"													174	3816
EA043211	32'-11"													46	1011
EA044005	40'-5"													2	54
EA045205	52'-5"													4	140
EA045210	52'-10"													2	71
EA051807	18'-7"													30	581
EA051906	19'-6"													13	264
EA052003	20'-3"													28	591
EA052008	20'-8"													82	1768
EA052010	20'-10"													82	1782
EA052205	22'-5"													4	94
EA052208	22'-8"													79	1868
EA052210	22'-10"													79	1881
EA052211	22'-11"													16	382
EA052302	23'-2"													32	773
EA052307	23'-7"													14	344
EA052401	24'-1"													16	402
EA052407	24'-7"													4	103
EA052409	24'-9"													20	516
EA052410	24'-10"													15	389
EA052506	25'-6"													16	426
EA052508	25'-8"													16	428
EA052511	25'-11"													4	108
EA052810	28'-10"													4	120
EA060101	1'-1"													2	3
EA060203	2'-3"													2	7
EA060809	8'-9"													126	1656

DECK-SPAN 2 (CONT.)

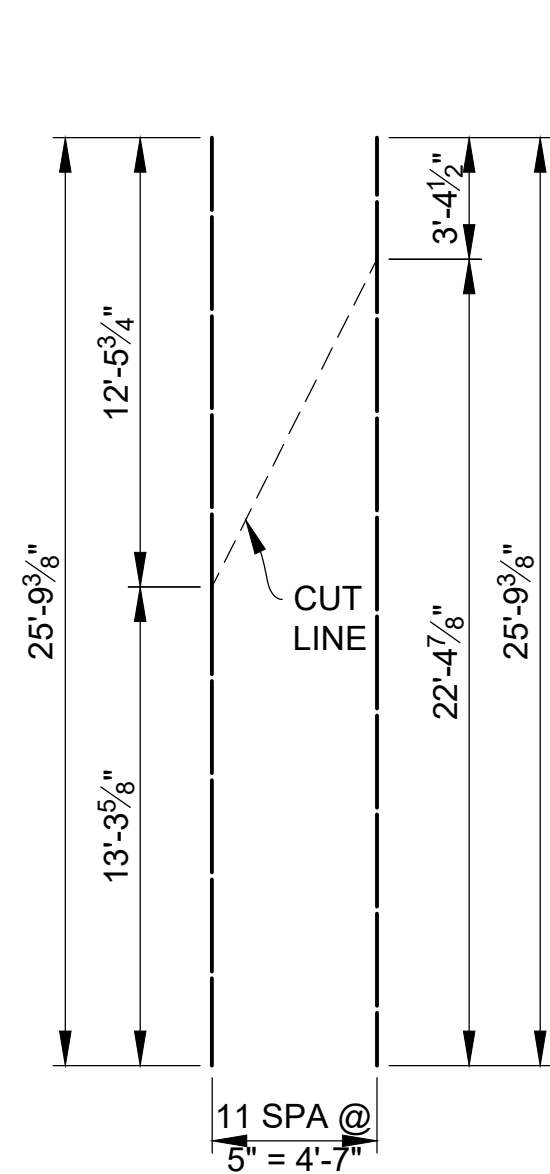
BAR	DIMENSIONS												NO.	TOTAL		
	A	B	C	D	E	F	G	H	J	K	M	P			REQ'D	WT.
EA060908	9'-8"														2	29
EA061001	10'-1"														6	91
EA061007	10'-7"														2	32
EA061009	10'-9"														6	97
EA061309	13'-9"														128	2644
EA061501	15'-1"														10	227
EA061601	16'-1"														2	48
EA061700	17'-0"														10	255
EA061802	18'-2"														2	55
EA061809	18'-9"														30	845
EA061906	19'-6"														13	381
EA062005	20'-5"														28	859
EA062010	20'-10"														82	2566
EA062100	21'-0"														82	2586
EA062108	21'-8"														32	1041
EA062110	21'-10"														32	1049
EA062207	22'-7"														4	136
EA062210	22'-10"														79	2709
EA062211	22'-11"														16	551
EA062300	23'-0"														79	2729
EA062304	23'-4"														32	1121
EA062307	23'-7"														14	496
EA062401	24'-1"														16	579
EA062409	24'-9"														24	892
EA062410	24'-10"														15	559
EA062506	25'-6"														16	613
EA062508	25'-8"														16	617
EA062601	26'-1"														4	157
EA062900	29'-0"														4	174
ED040211	0'-10 3/4"	1'-1 1/2"	0'-10 3/4"												147	286
ED040308	1'-1 3/4"	1'-4 1/2"	1'-1 3/4"												3	7
ED040503	1'-1 1/2"	3'-0"	1'-1 1/2"												2	7
ED060500	4'-0"	0'-6"	0'-6"												279	2095
EL040706	2'-2"	0'-7"	2'-5"	1'-2"	1'-2"	0'-7"	0'-0"								90	451
EL040707	2'-2"	0'-7"	2'-6"	1'-2"	1'-2"	0'-7"	0'-0"								98	496
ET060701	1'-0"	1'-4"	1'-0"	1'-8"	0'-4"	0'-9"									70	745
ET060800	1'-0"	1'-4"	1'-4 1/2"	1'-8"	0'-7"	0'-8"									76	913
EW040601	1'-8"	0'-4 3/4"	1'-7 1/2"	0'-4 3/4"	1'-8"	0'-4 3/4"	0'-6 3/4"	0'-6 3/4"	0'-4 3/4"						2	8
EW040609	1'-8"	0'-7 3/4"	1'-7"	0'-7 3/4"	1'-8"	0'-7 7/8"	0'-11"	0'-11"	0'-7 7/8"						2	9

*Threaded

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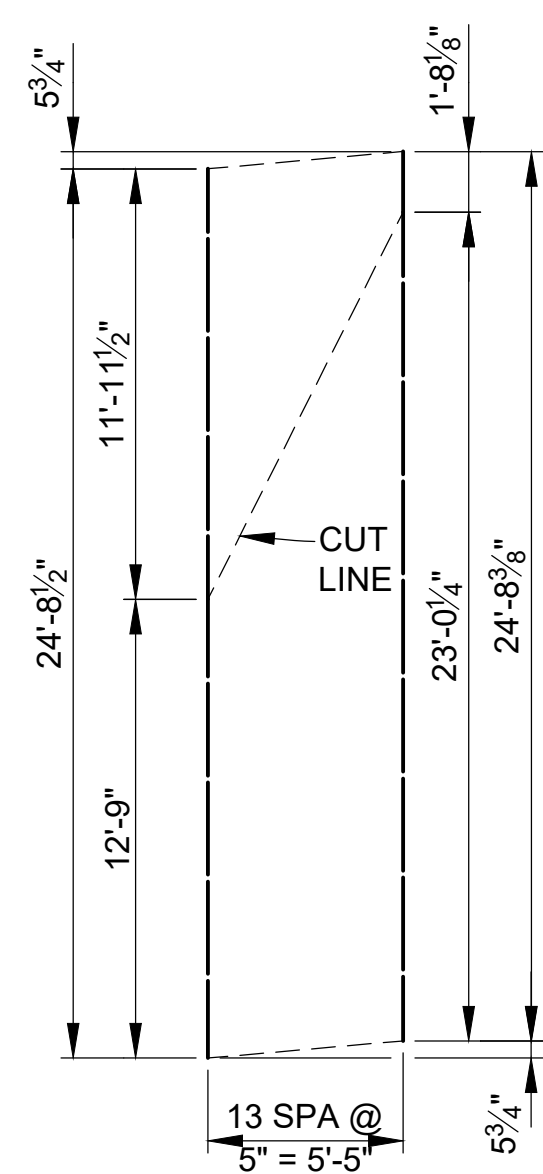
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	SCALE HOR. 1"=40' VERT. 1"=4'
STEEL REINFORCEMENT DETAILS	DRAWING NO. 2021-008-BR55
APPROVED BY _____	SHEET NO. <u>118</u> OF <u>153</u>



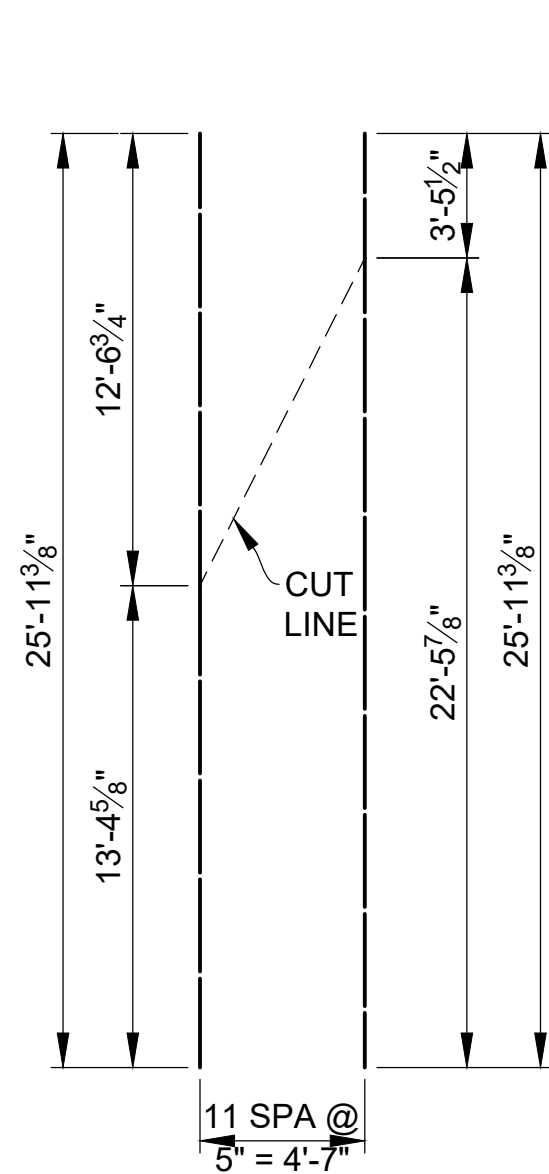
BAR GROUP S

EA052510 (TOTAL 12 BARS) (BOTT)
EA062510 (TOTAL 12 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 3 CONSTRUCTION)



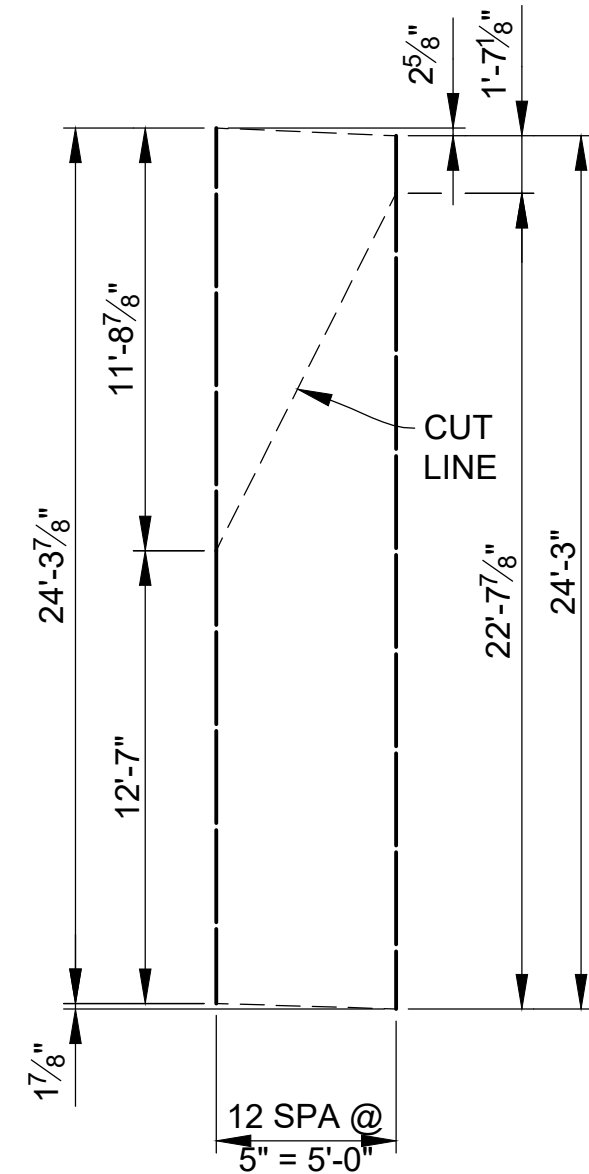
BAR GROUP T

EA052409 (TOTAL 14 BARS) (BOTT)
EA062409 (TOTAL 14 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 3 CONSTRUCTION)



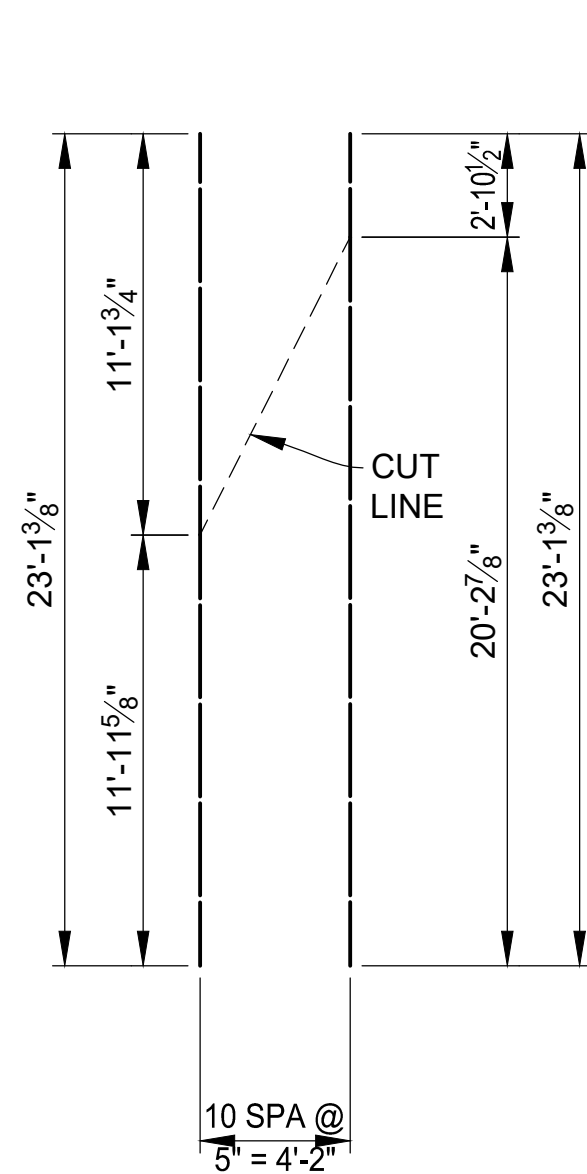
BAR GROUP U

EA052600 (TOTAL 12 BARS) (BOTT)
EA062600 (TOTAL 12 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 3 CONSTRUCTION)



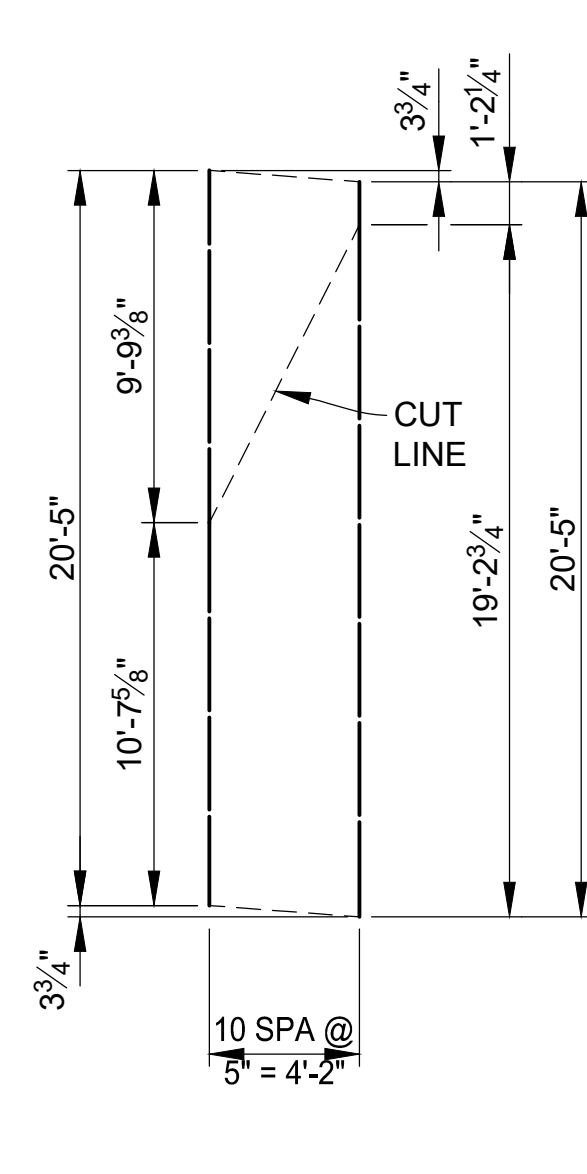
BAR GROUP V

EA052404 (TOTAL 13 BARS) (BOTT)
EA062404 (TOTAL 13 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 3 CONSTRUCTION)



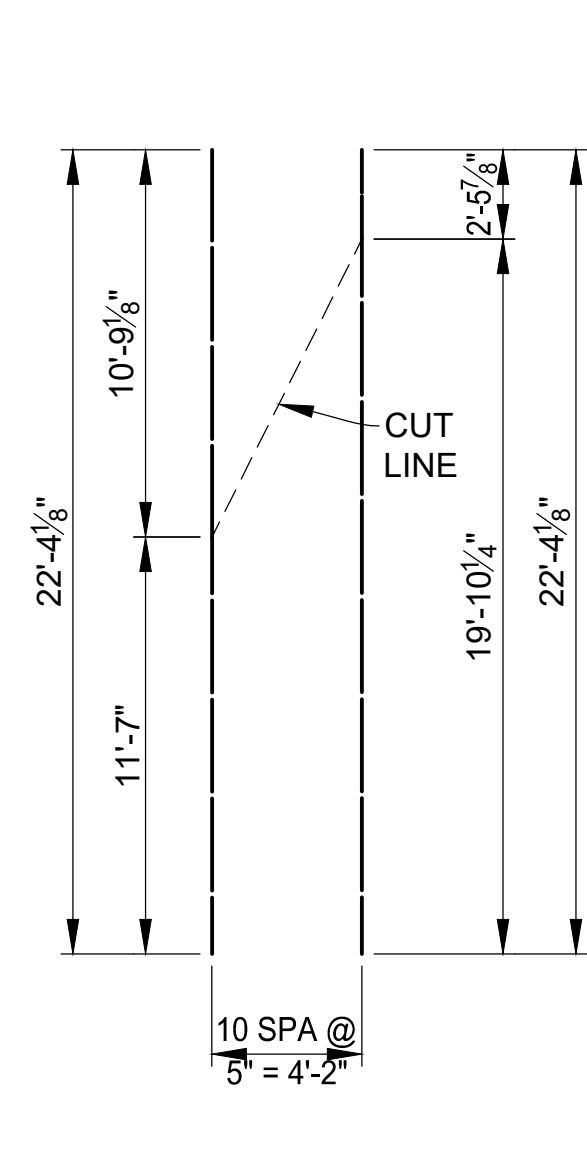
BAR GROUP W

EA052302 (TOTAL 11 BARS) (BOTT)
EA062302 (TOTAL 11 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 2 CONSTRUCTION)



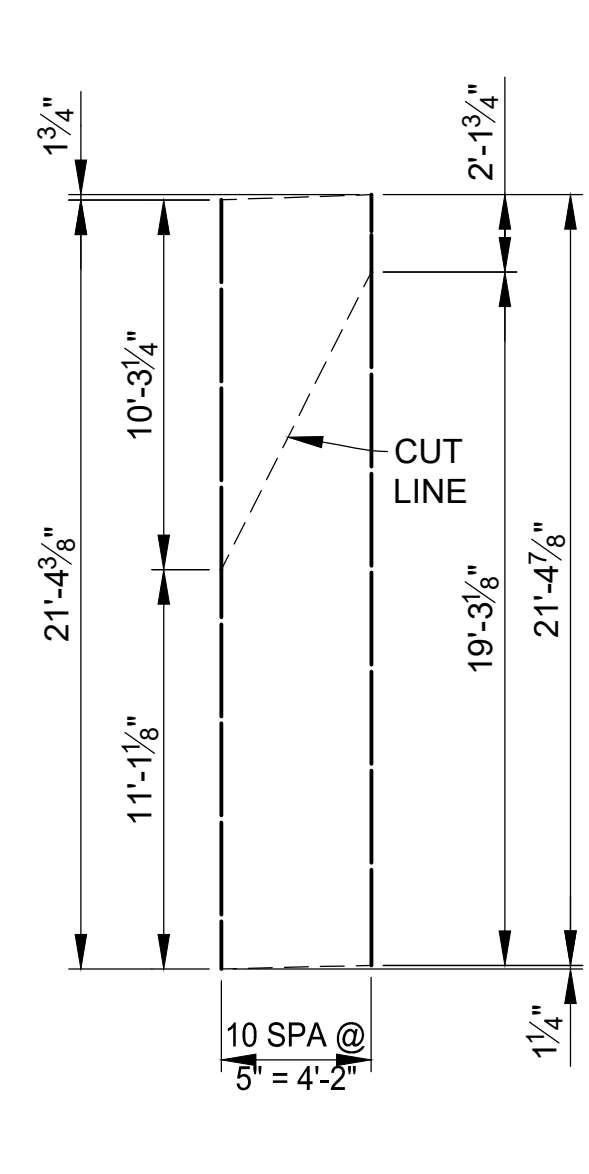
BAR GROUP X

EA052005 (TOTAL 11 BARS) (BOTT)
EA062005 (TOTAL 11 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 2 CONSTRUCTION)



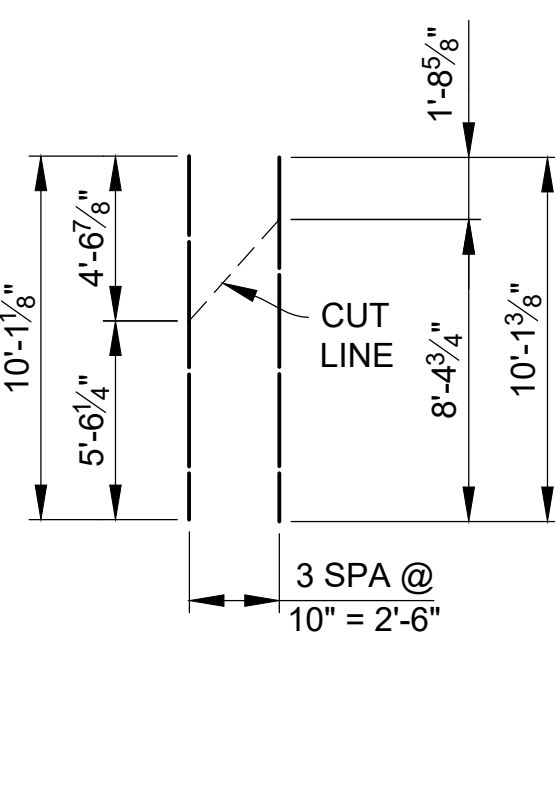
BAR GROUP Y

EA052204 (TOTAL 11 BARS) (BOTT)
EA062204 (TOTAL 11 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 2 CONSTRUCTION)



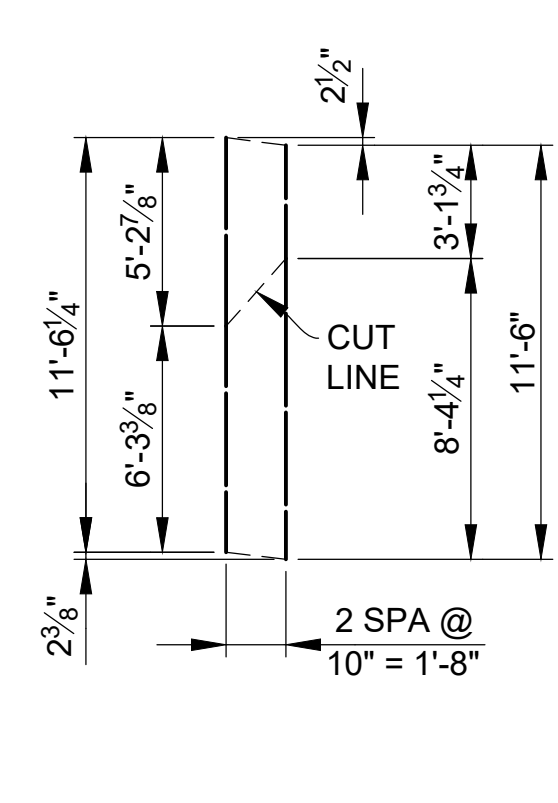
BAR GROUP Z

EA052105 (TOTAL 11 BARS) (BOTT)
EA062105 (TOTAL 11 BARS) (TOP)
(QUANTIFIED IN DECK,
SPAN 3, STAGE 2 CONSTRUCTION)



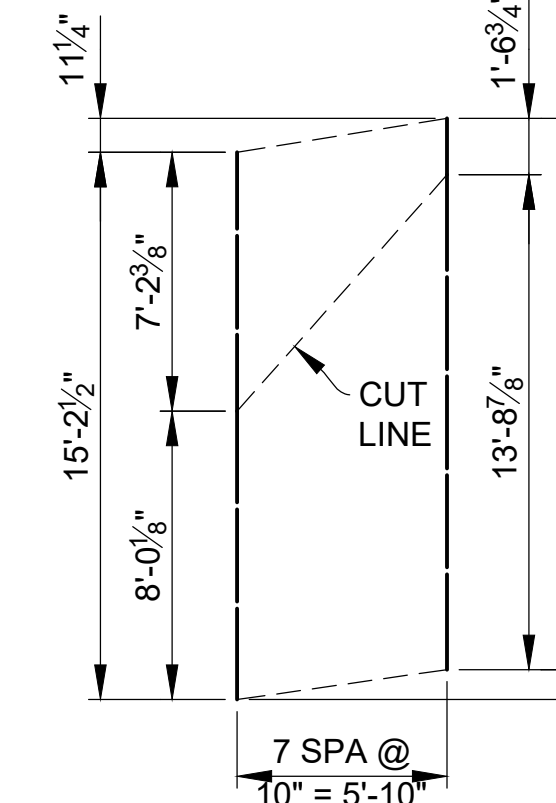
BAR GROUP AA

EA061002 (TOTAL 4 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 1, STAGE 2 CONSTRUCTION)



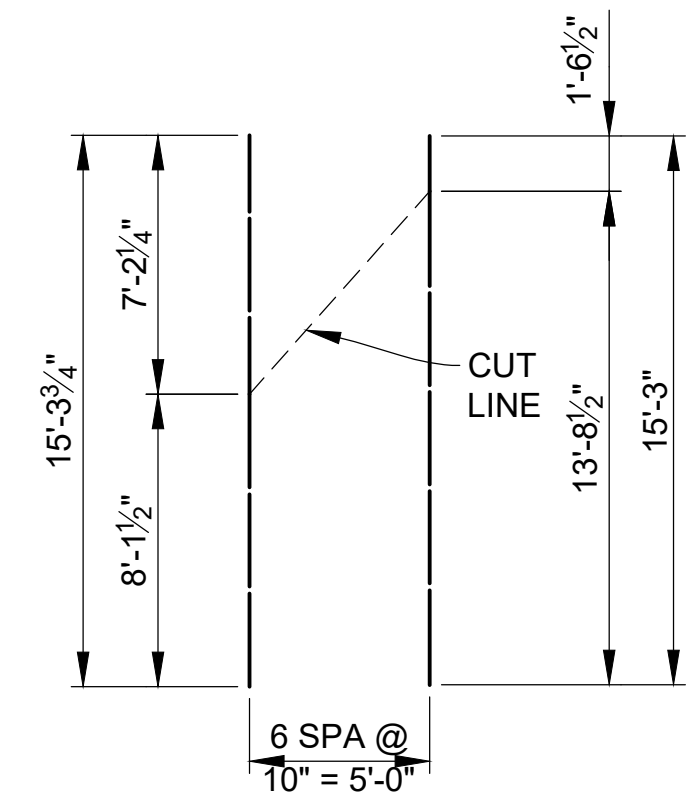
BAR GROUP BB

EA061106 (TOTAL 3 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 1, STAGE 2 CONSTRUCTION)



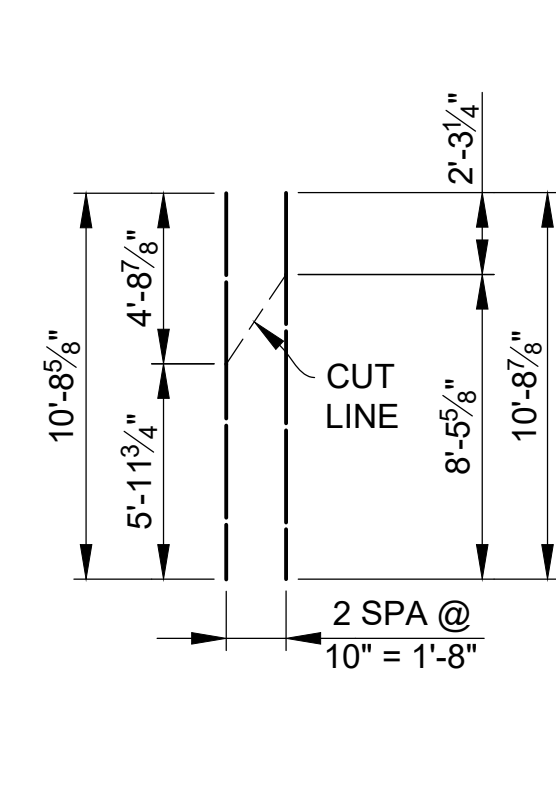
BAR GROUP CC

EA061504 (TOTAL 8 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 1, STAGE 3 CONSTRUCTION)



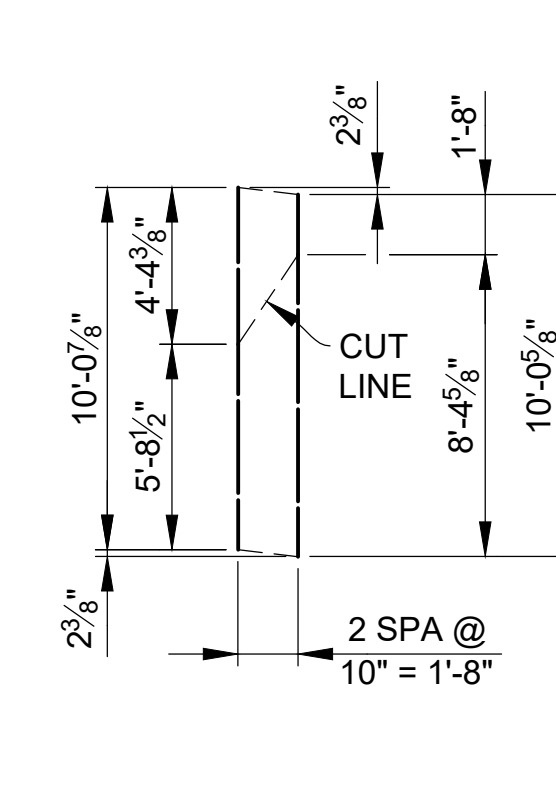
BAR GROUP DD

EA061504 (TOTAL 7 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 1, STAGE 3 CONSTRUCTION)



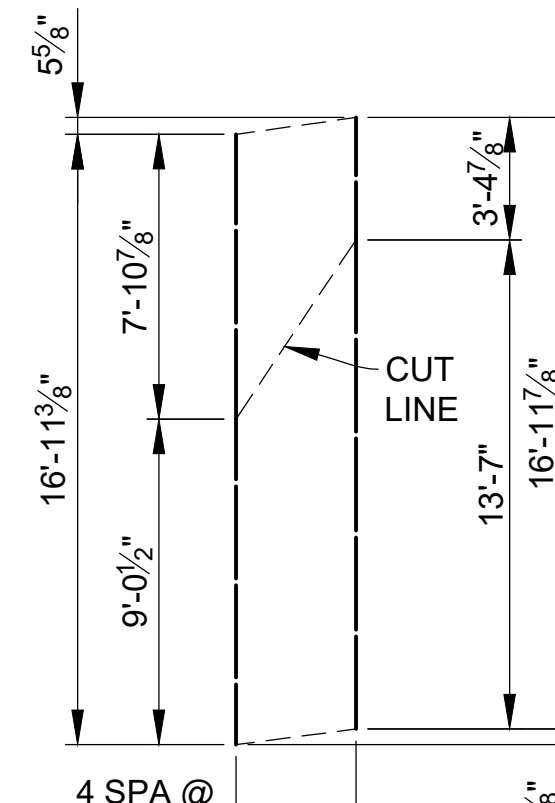
BAR GROUP EE

EA061009 (TOTAL 3 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 2, STAGE 2 CONSTRUCTION)



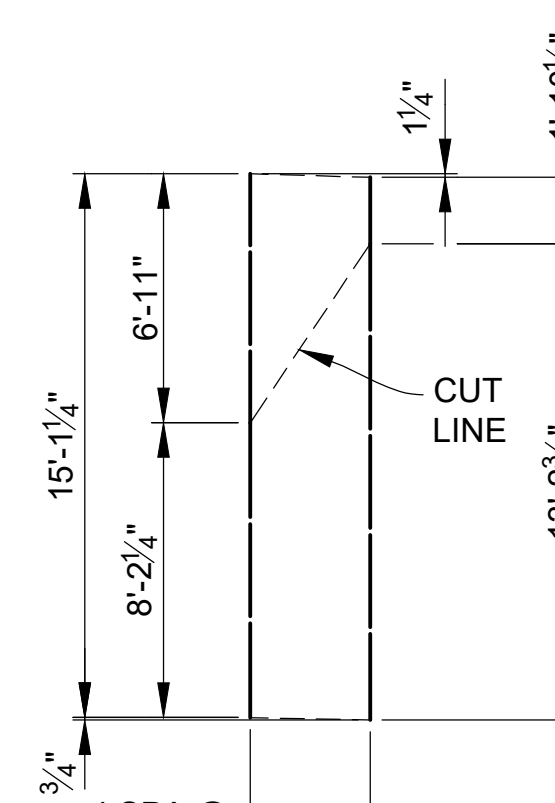
BAR GROUP FF

EA061001 (TOTAL 3 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 2, STAGE 2 CONSTRUCTION)



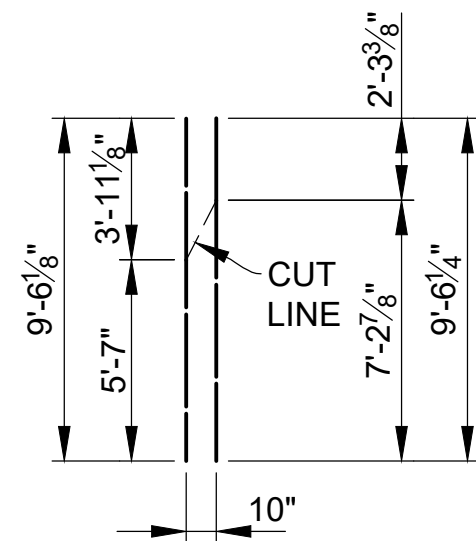
BAR GROUP GG

EA061700 (TOTAL 5 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 2, STAGE 3 CONSTRUCTION)



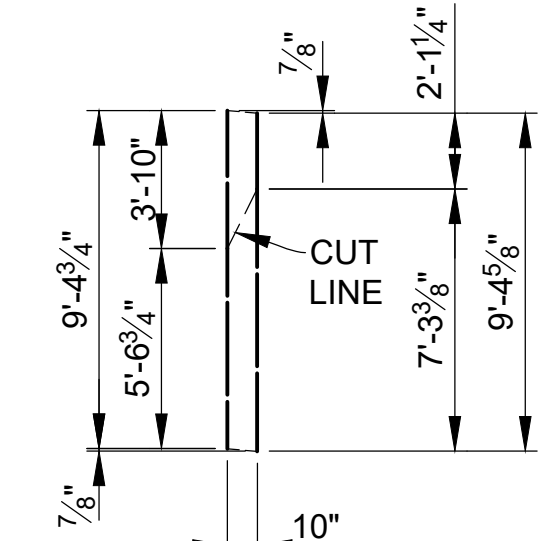
BAR GROUP HH

EA061501 (TOTAL 5 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 2, STAGE 3 CONSTRUCTION)



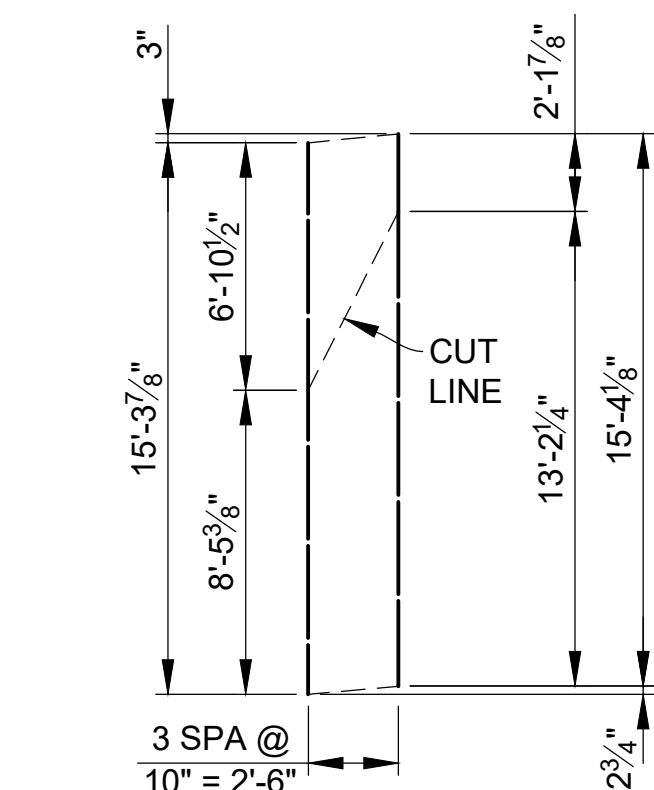
BAR GROUP JJ

EA060906 (TOTAL 2 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 3, STAGE 2 CONSTRUCTION)



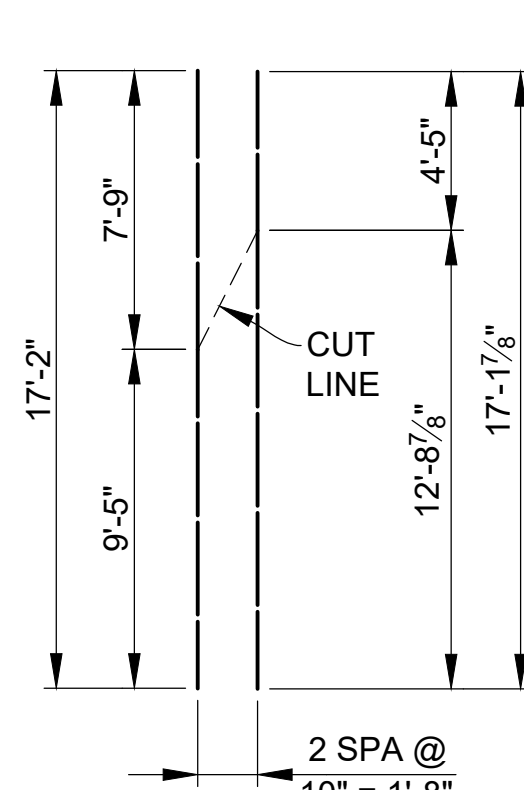
BAR GROUP KK

EA060905 (TOTAL 2 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 3, STAGE 2 CONSTRUCTION)



BAR GROUP LL

EA061504 (TOTAL 4 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 3, STAGE 3 CONSTRUCTION)



BAR GROUP MM

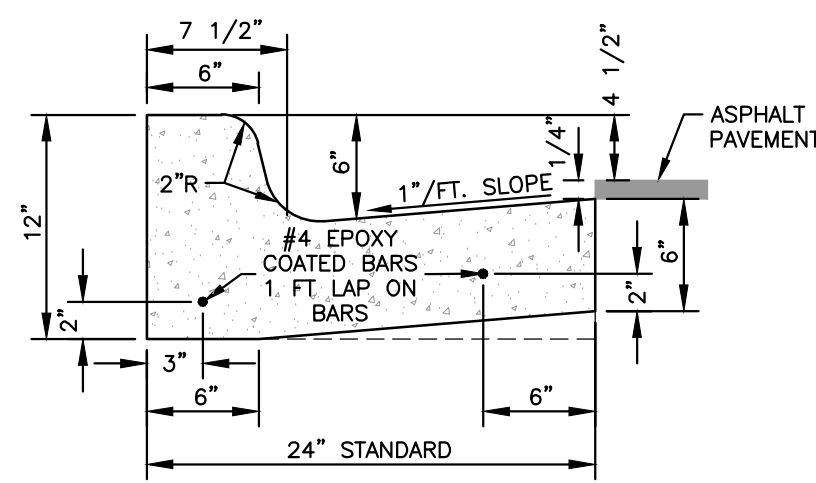
EA061702 (TOTAL 3 BARS) (TOP & BOTT)
(QUANTIFIED IN SIDEWALK,
SPAN 3, STAGE 3 CONSTRUCTION)

NOTE:

REINFORCEMENT IS TO BE SHOP CUT AS SHOWN. THE EPOXY COATING SHALL BE REPAIRED ACCORDING TO SECTION 706.03E.8 OF THE MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION.

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DLZ				PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
EAST MEDICAL CENTER DRIVE				SCALE HOR. 1"=40' VERT. 1"=4'		INCH 0 1	
STEEL REINFORCEMENT DETAILS				DRAWING NO. 2021-008-BR58			
REV. NO. DESCRIPTION DATE DR. BY CH. BY				APPROVED BY			
ORIGINAL ISSUE 10-9-22 DAF CLH				SHEET NO. 121 OF 153			



- NOTES:
1. BARRIER CURB AND GUTTER ON ASPHALT STREETS SHALL CONFORM TO THIS DETAIL.
 2. BARRIER CURB AND GUTTER ON CONCRETE STREETS SHALL CONFORM TO MDOT CURB AND GUTTER DETAIL F3.

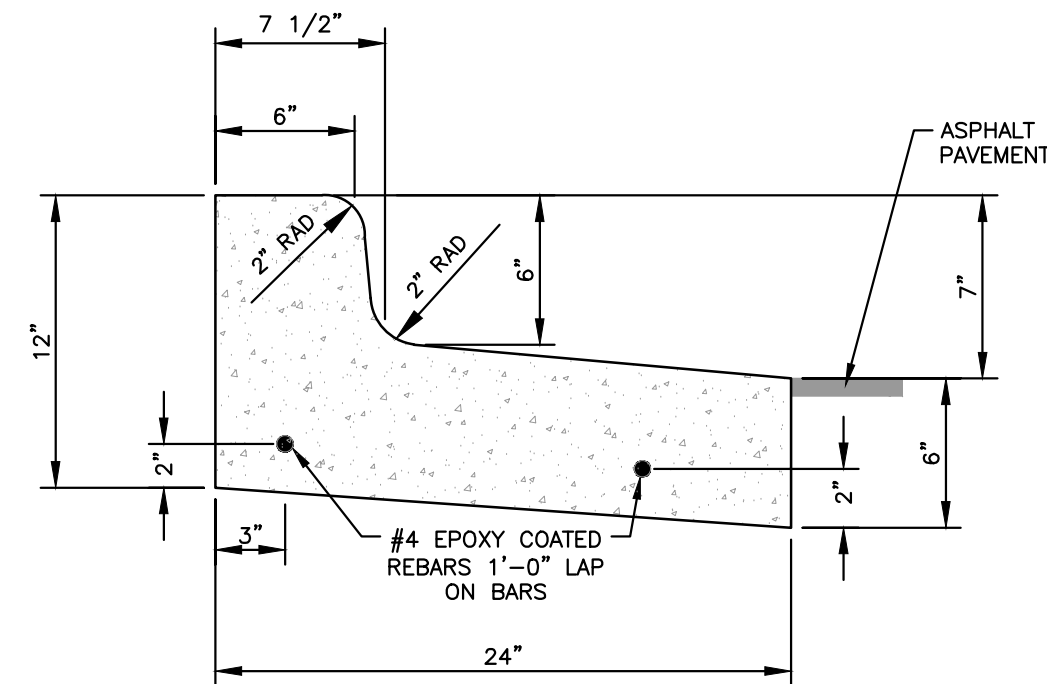
BARRIER CURB AND GUTTER SD-R-1



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REV. NO.	DATE	DRAWN BY	CHECKED BY

DR. ENG. CH. ENG. DRAWING NO. DATE 7/1/2022 DRAWING NO. SD-R-1



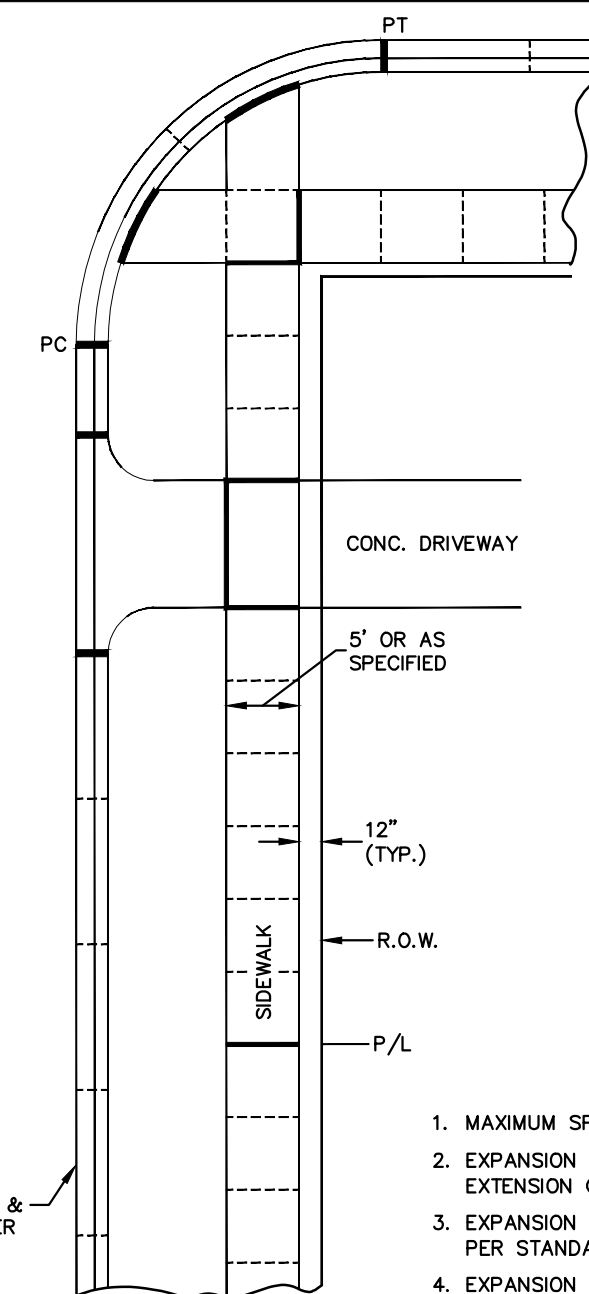
SPILL-OUT BARRIER CURB & GUTTER SD-R-4



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- LEGEND:
- CONTRACTION JOINTS
 - 1/2" EXPANSION JOINTS
 - 3/4" EXPANSION JOINTS

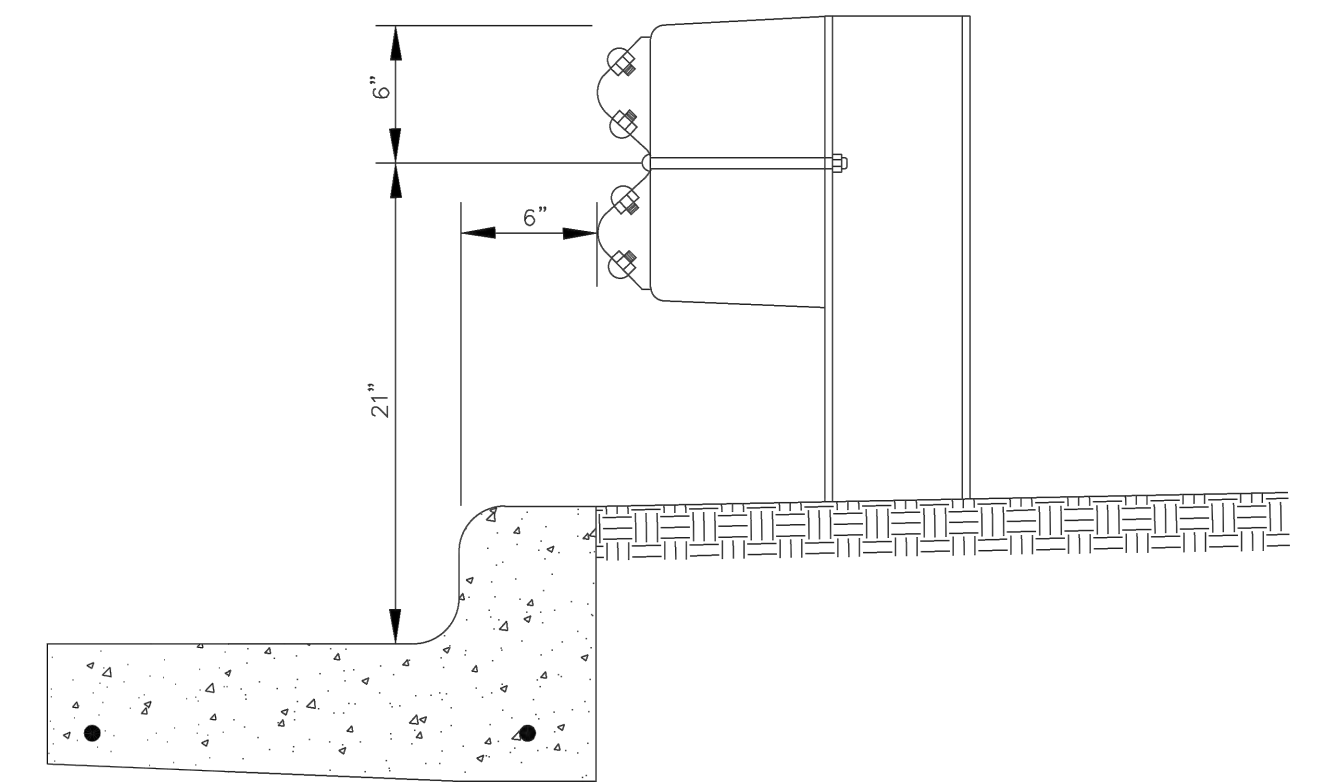
SIDEWALK AND CURB & GUTTER JOINTS SD-R-10



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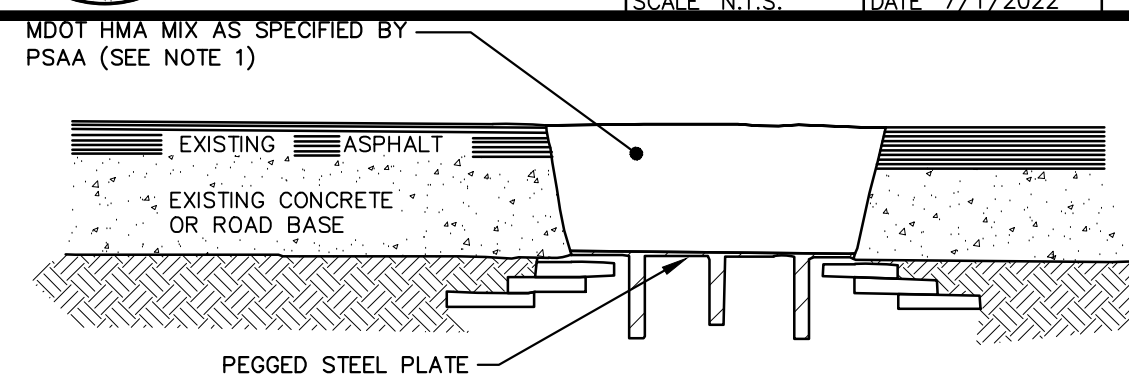
DR. ENG. CH. ENG. DRAWING NO. DATE 7/1/2022 DRAWING NO. SD-R-10



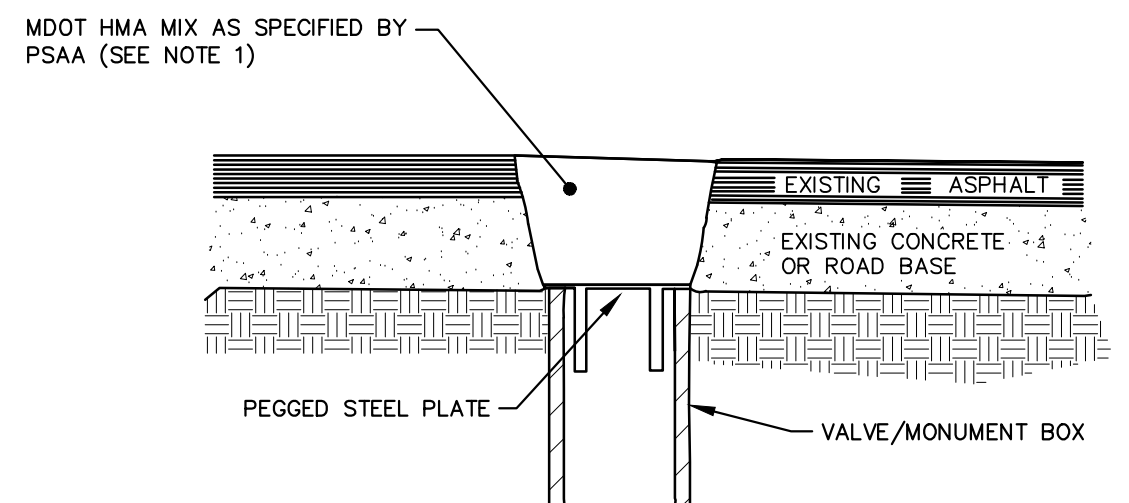
NOTE:
STANDARD GUARDRAIL CONSTRUCTION TO BE IN ACCORDANCE WITH MDOT BEAM GUARDRAIL TYPE B REQUIREMENTS

REV. NO.	DATE	DRAWN BY	CHECKED BY

DR. BY NCF CH. BY CSS DRAWING NO. SD-R-15
SCALE NONE DATE 1-31-94 SHEET NO. OF



MANHOLE LOWERING DETAIL



VALVE BOX/MONUMENT BOX LOWERING DETAIL (SEE NOTE 3)

- NOTES:
1. IF TRAFFIC IS TO BE MAINTAINED ON THE ROADWAY BEFORE OR AFTER THE COLD MILLING OPERATION, THE STRUCTURE SHALL BE LOWERED TO THE EXTENT THAT A MINIMUM OF THREE(3) INCHES ASPHALT MATERIAL MDOT HMA MIX AS SPECIFIED BY PSAA, OR ENGINEER APPROVED EQUAL, REMAINS TO SUPPORT TRAFFIC.
 2. IF THE ROADWAY BEING MILLED IS CLOSED TO TRAFFIC, THE STRUCTURE SHALL BE LOWERED SUCH THAT THE STEEL PLATE IS A MINIMUM OF FOUR(4) INCHES BELOW THE PROPOSED ROAD GRADE AND THE RESULTING VOID SHALL BE FILLED WITH MDOT HMA MIX AS SPECIFIED BY PSAA OR ENGINEER APPROVED EQUAL.
 3. WHERE A MONUMENT IS TO BE LOWERED, THE CONTRACTOR SHALL GIVE THE ENGINEER A MINIMUM OF 48 HOURS WRITTEN NOTICE SO THAT THE MONUMENT CAN BE PROPERLY WITNESSED OR PROTECTED. FAILURE TO DO SO SHALL RESULT IN THE ENGINEER REPLACING SAID MONUMENT AT THE CONTRACTOR'S EXPENSE.

MANHOLE & VALVE/MONUMENT BOX LOWERING SD-GU-8



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REV. NO.	DATE	DRAWN BY	CHECKED BY

DR. ENG. CH. ENG. DRAWING NO. DATE 7/1/2022 DRAWING NO. SD-GU-8

TYPE OF CASTING	MDOT DESIGNATION	EJ CASTING NO.	NEENAH CASTING NO.
MANHOLE AND GATE WELL FRAME AND COVER	Q/B	1040Z W/ TYPE A COVER*	R-1642 W/ TYPE C COVER*
BARRIER CURB INLET FRAME AND COVER	K	7045Z W/ TYPE M1 GRATE	R-3031-B W/ TYPE S GRATE
BARRIER CURB DOUBLE INLET FRAME AND COVER	K	7035Z W/ TYPE M2 GRATE	N/A
GUTTER INLET FRAME AND COVER	R	5080Z W/ TYPE 5000M2 GRATE	R-3448C, W/ TYPE S GRATE
GUTTER DOUBLE INLET FRAME AND COVER	R	7034Z W/ TYPE M GRATE	N/A
MOUNTABLE CURB INLET ASSEMBLY		7065	N/A
YARD DRAIN (BEE HIVE) FRAME AND COVER	G	1040Z, TYPE 02 GRATE	R-2560-E1
WATER VALVE BOX ASSEMBLY IN PAVEMENT		8560	N/A
MONUMENT BOX ASSEMBLY		8360	N/A

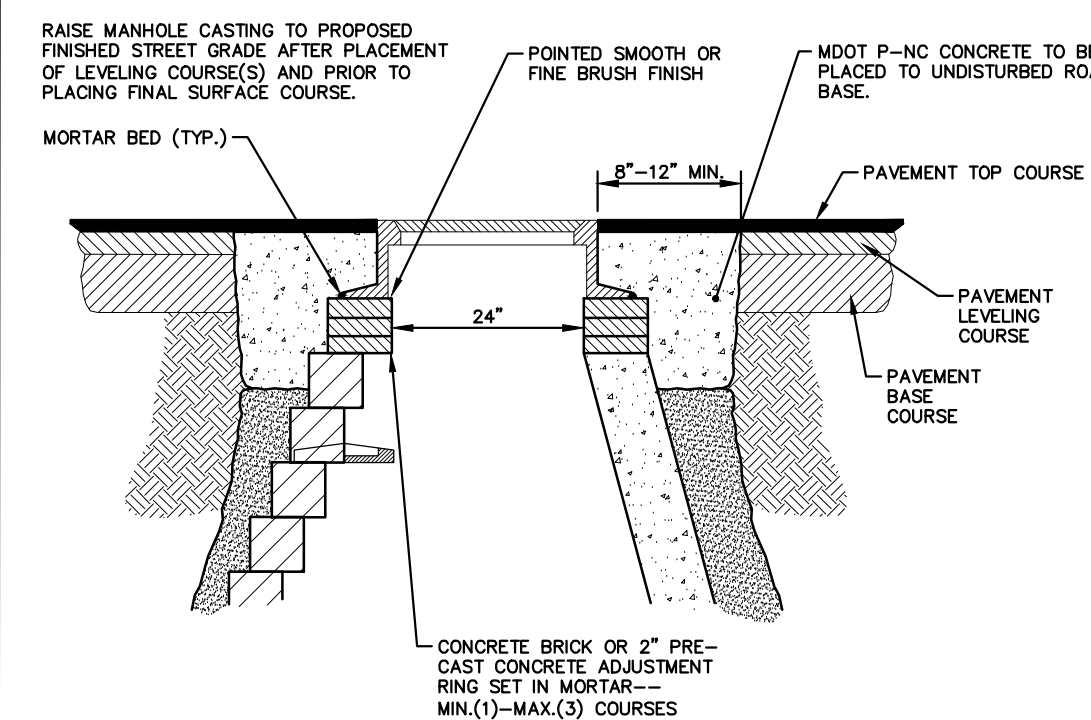
- NOTES:
*EACH COVER SHALL HAVE "SANITARY", "STORM", OR "WATER" CAST IN THE SURFACE, WHICHEVER IS APPLICABLE. SANITARY SEWER COVERS SHALL BE GASKETED IN FLOOD PRONE AREAS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE PSAA. FRAMES AND COVERS MUST HAVE MACHINED BEARING SURFACES.



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REV. NO.	DATE	DRAWN BY	CHECKED BY

DR. ENG. CH. ENG. DRAWING NO. DATE 10/1/2022 DRAWING NO. SD-GU-4



- NOTE:
1. IF MANHOLE WILL BE PLACED IN GRAVEL ROAD, CASTING TO BE SET 6" TO 8" BELOW ROADWAY GRADE. ALL CONSTRUCTION METHODS SHALL REMAIN AS SHOWN ABOVE.
2. P-NC CONCRETE MIXTURE SHALL CONTAIN 658 POUNDS PER CUBIC YARD (7 SACKS) OF CEMENT WHEN THE FORECASTED AIR TEMPERATURE IS ABOVE 59-F AND 752 POUNDS PER CUBIC YARD (8 SACKS) OF CEMENT WHEN THE FORECASTED AIR TEMPERATURE IS 59-F OR LESS.

MANHOLE CASTING ADJUSTMENT SD-GU-5



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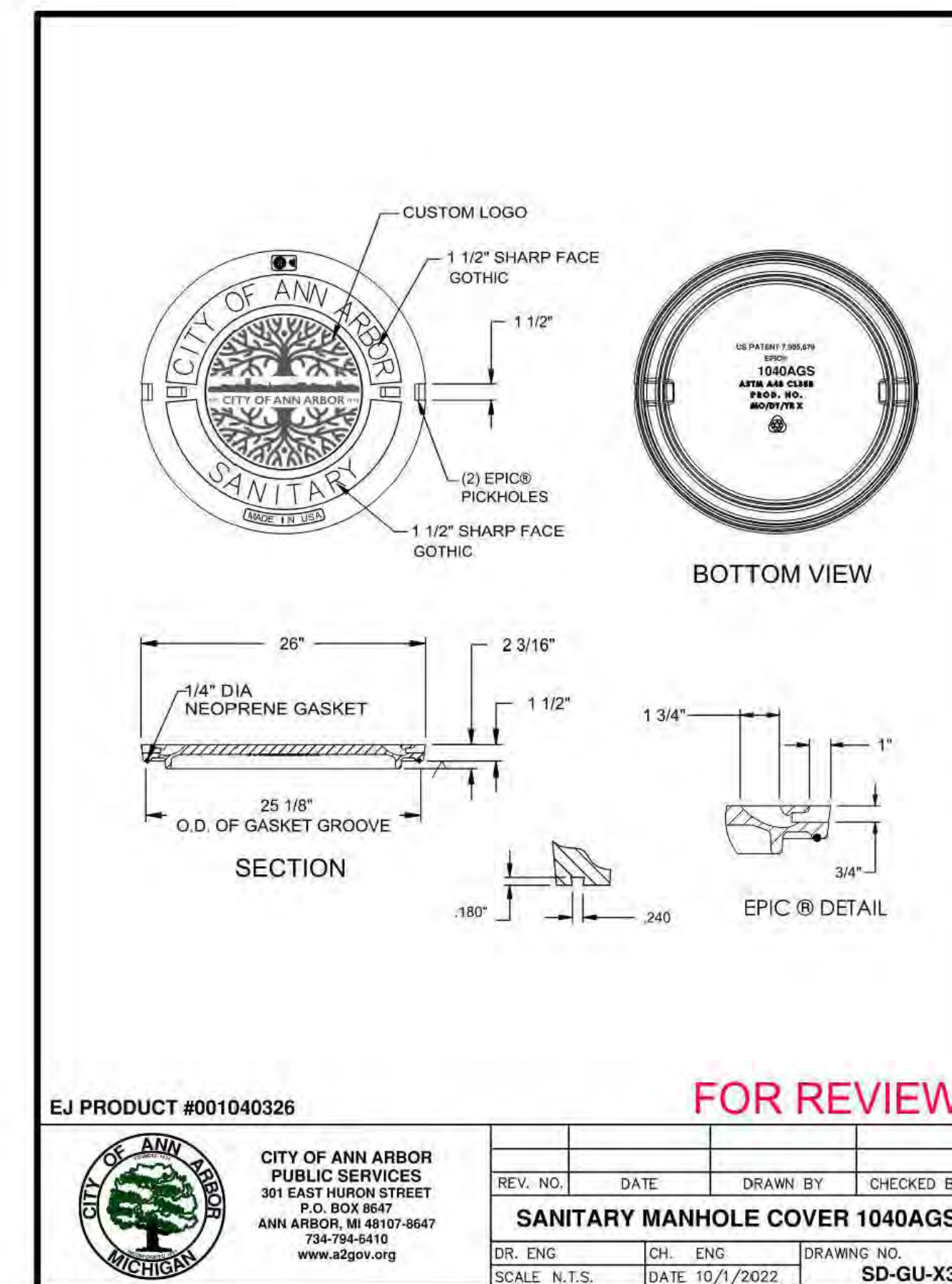
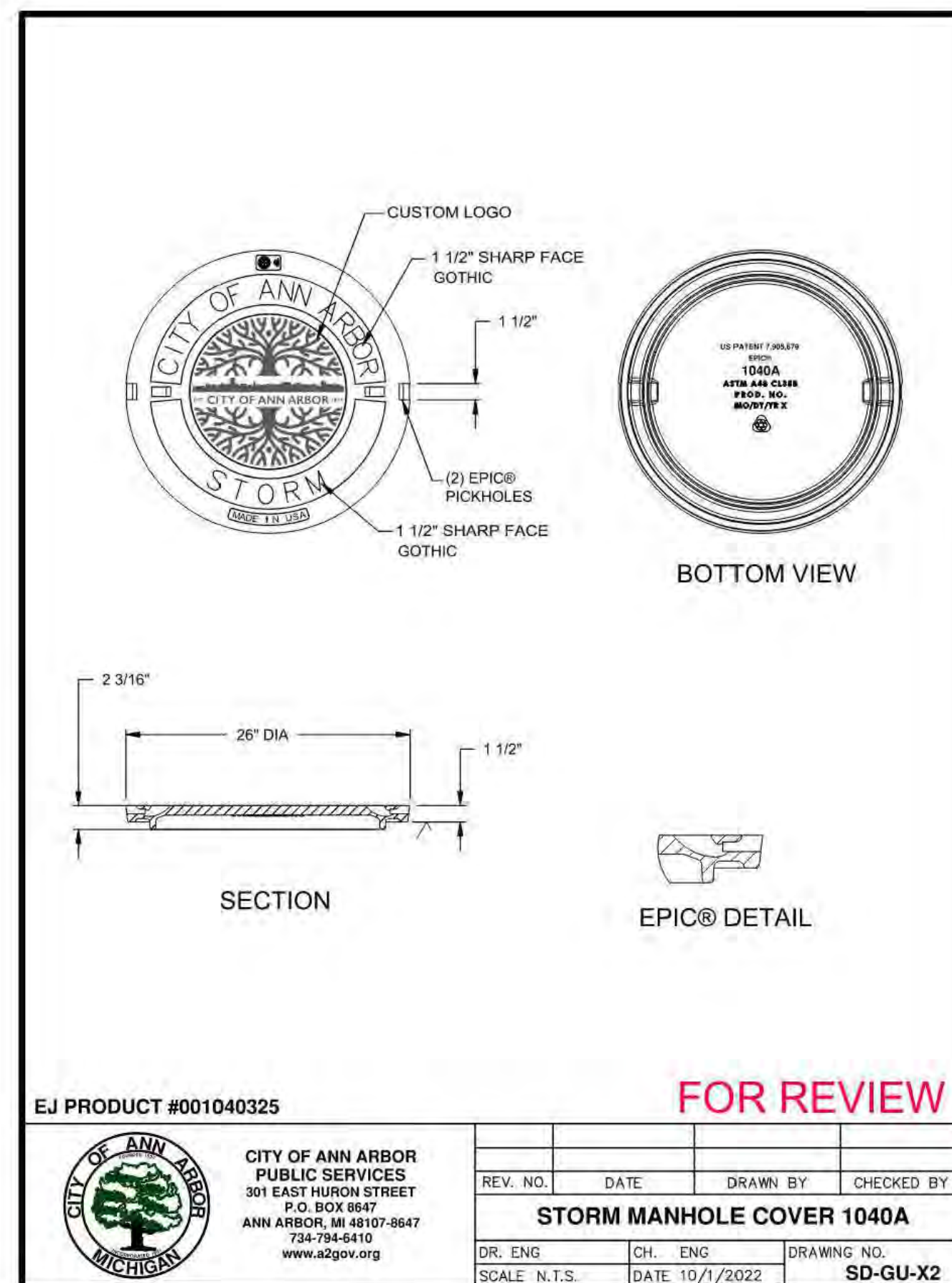
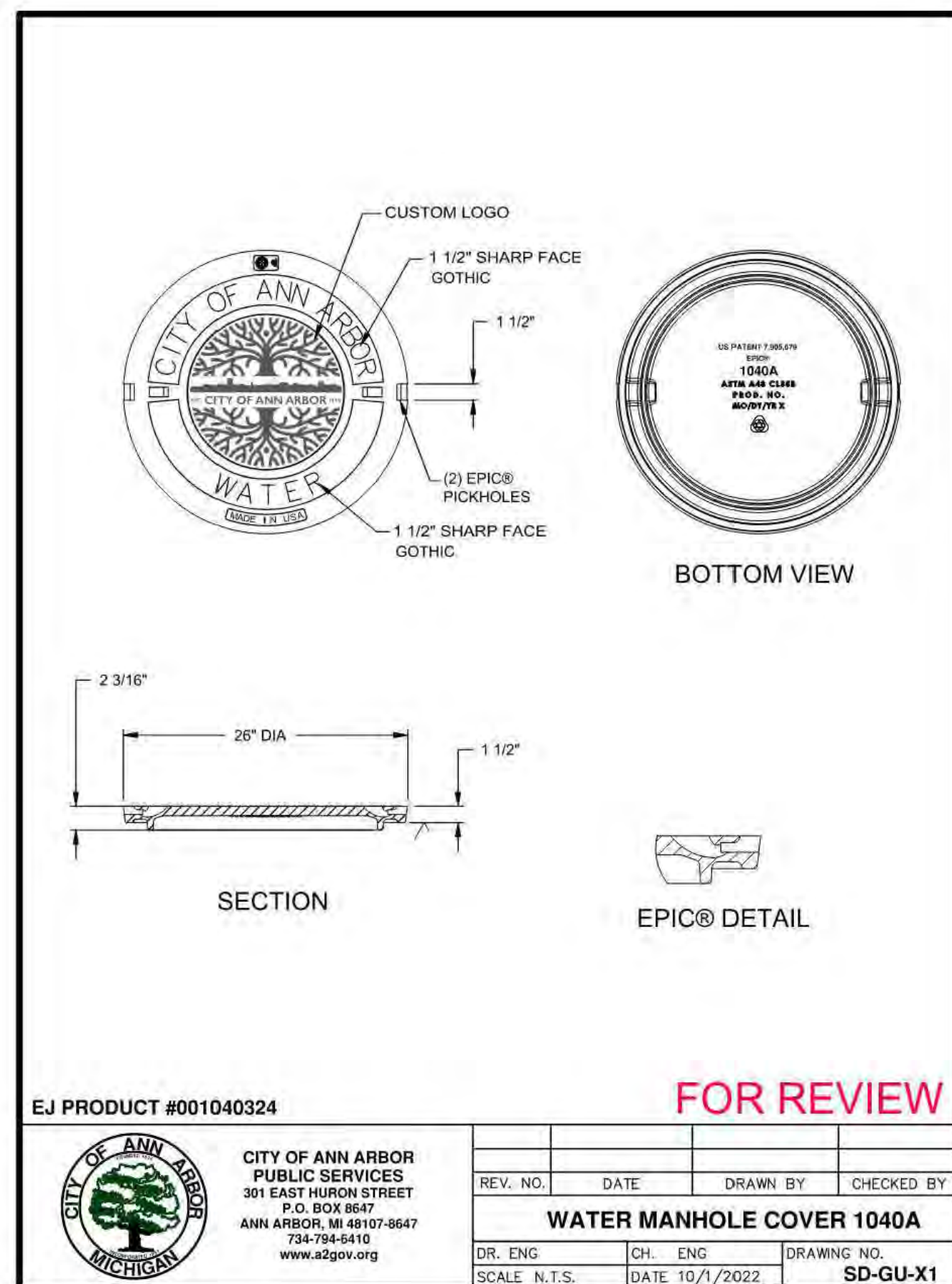
REV. NO.	DATE	DRAWN BY	CHECKED BY

DR. ENG. CH. ENG. DRAWING NO. DATE 7/1/2022 DRAWING NO. SD-GU-5

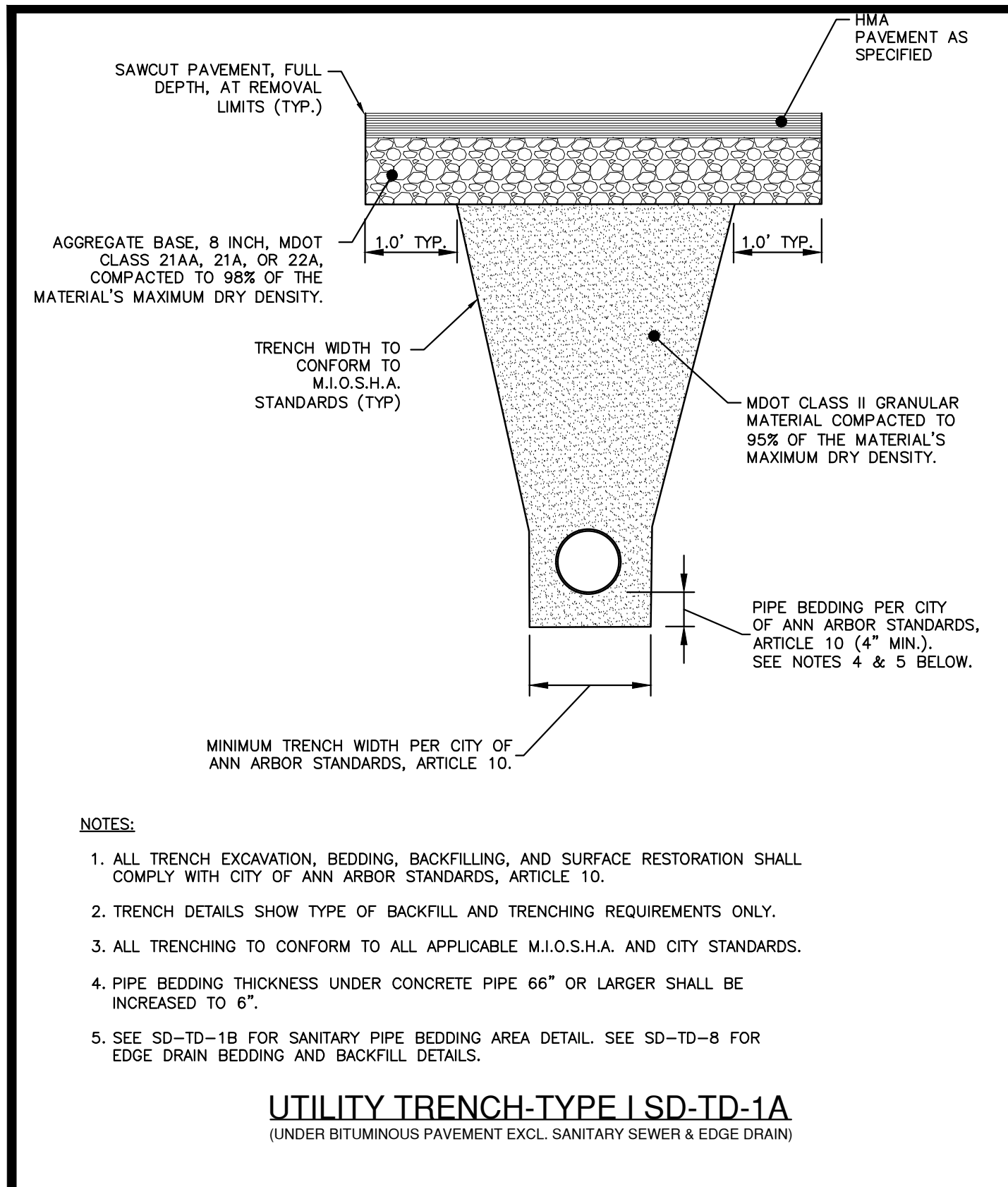


REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
E. MEDICAL CENTER DRIVE ANN ARBOR STANDARD DETAILS			
SCALE	N/A	0 INCH	1
DRAWING NO.	2021-008-STD1		
SHEET NO.	123	OF	153

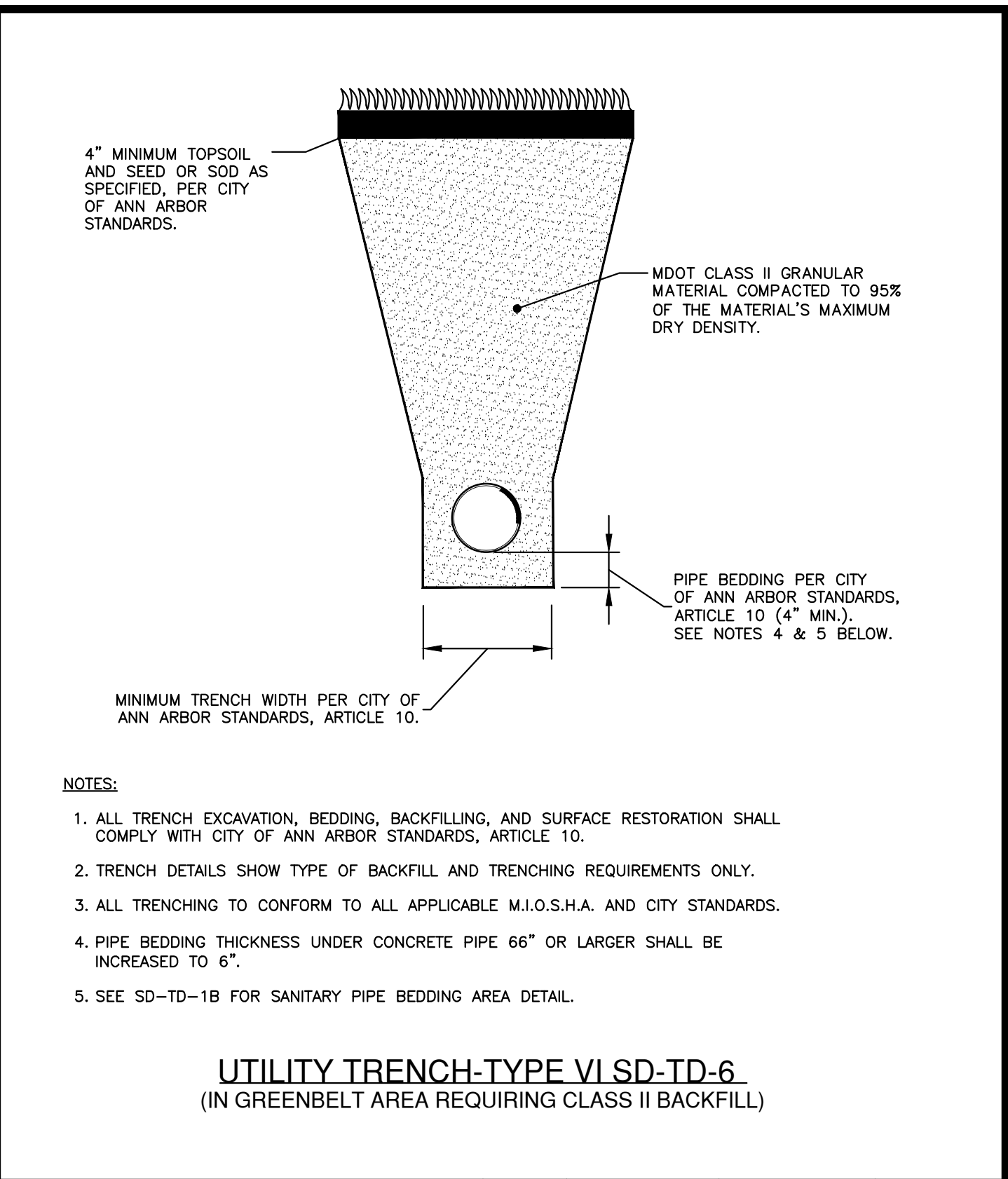


DLZ					PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR				
					E. MEDICAL CENTER DRIVE ANN ARBOR STANDARD DETAILS				
					SCALE	0 INCH		1	
					N/A	[Scale Bar]			
					DRAWING NO. 2021-008-STD2				
					SHEET NO. 124 OF 153				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY _____				
	ORIGINAL ISSUE	10/12/22	INB	LCM					



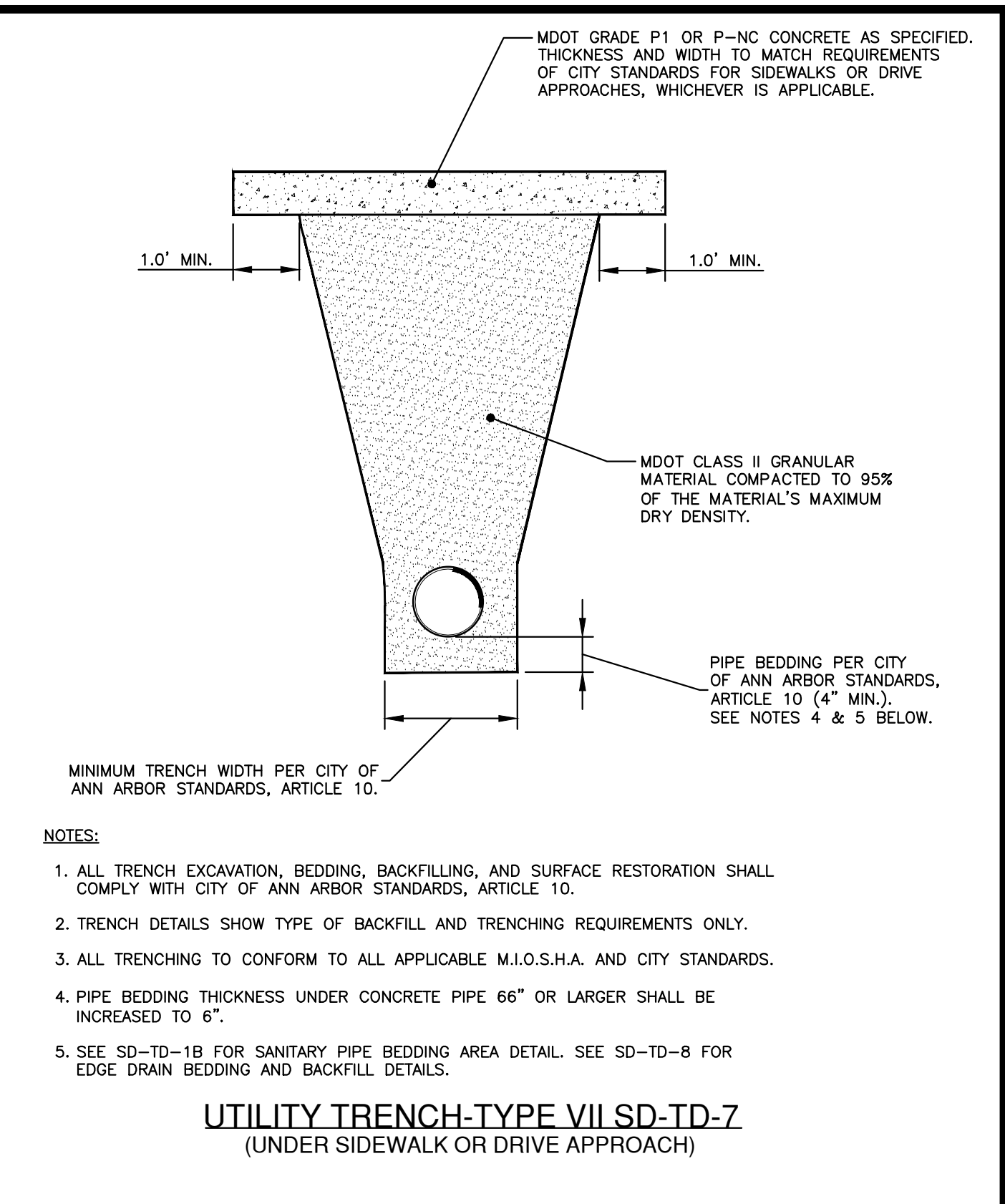
- NOTES:**
1. ALL TRENCH EXCAVATION, BEDDING, BACKFILLING, AND SURFACE RESTORATION SHALL COMPLY WITH CITY OF ANN ARBOR STANDARDS, ARTICLE 10.
 2. TRENCH DETAILS SHOW TYPE OF BACKFILL AND TRENCHING REQUIREMENTS ONLY.
 3. ALL TRENCHING TO CONFORM TO ALL APPLICABLE M.I.O.S.H.A. AND CITY STANDARDS.
 4. PIPE BEDDING THICKNESS UNDER CONCRETE PIPE 66" OR LARGER SHALL BE INCREASED TO 6".
 5. SEE SD-TD-1B FOR SANITARY PIPE BEDDING AREA DETAIL. SEE SD-TD-8 FOR EDGE DRAIN BEDDING AND BACKFILL DETAILS.

UTILITY TRENCH-TYPE I SD-TD-1A
(UNDER BITUMINOUS PAVEMENT EXCL. SANITARY SEWER & EDGE DRAIN)



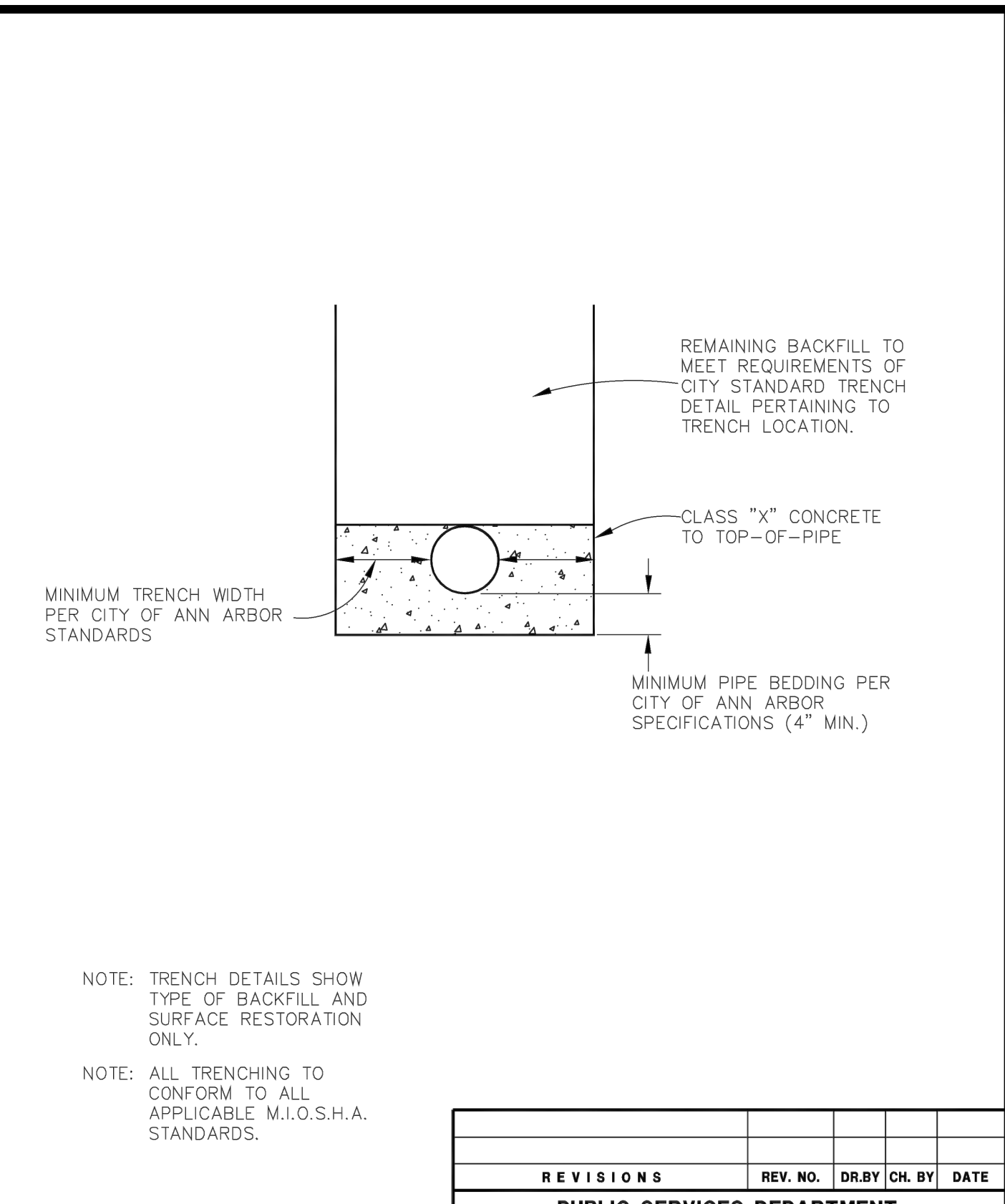
- NOTES:**
1. ALL TRENCH EXCAVATION, BEDDING, BACKFILLING, AND SURFACE RESTORATION SHALL COMPLY WITH CITY OF ANN ARBOR STANDARDS, ARTICLE 10.
 2. TRENCH DETAILS SHOW TYPE OF BACKFILL AND TRENCHING REQUIREMENTS ONLY.
 3. ALL TRENCHING TO CONFORM TO ALL APPLICABLE M.I.O.S.H.A. AND CITY STANDARDS.
 4. PIPE BEDDING THICKNESS UNDER CONCRETE PIPE 66" OR LARGER SHALL BE INCREASED TO 6".
 5. SEE SD-TD-1B FOR SANITARY PIPE BEDDING AREA DETAIL.

UTILITY TRENCH-TYPE VI SD-TD-6
(IN GREENBELT AREA REQUIRING CLASS II BACKFILL)



- NOTES:**
1. ALL TRENCH EXCAVATION, BEDDING, BACKFILLING, AND SURFACE RESTORATION SHALL COMPLY WITH CITY OF ANN ARBOR STANDARDS, ARTICLE 10.
 2. TRENCH DETAILS SHOW TYPE OF BACKFILL AND TRENCHING REQUIREMENTS ONLY.
 3. ALL TRENCHING TO CONFORM TO ALL APPLICABLE M.I.O.S.H.A. AND CITY STANDARDS.
 4. PIPE BEDDING THICKNESS UNDER CONCRETE PIPE 66" OR LARGER SHALL BE INCREASED TO 6".
 5. SEE SD-TD-1B FOR SANITARY PIPE BEDDING AREA DETAIL. SEE SD-TD-8 FOR EDGE DRAIN BEDDING AND BACKFILL DETAILS.

UTILITY TRENCH-TYPE VII SD-TD-7
(UNDER SIDEWALK OR DRIVE APPROACH)



- NOTE:** TRENCH DETAILS SHOW TYPE OF BACKFILL AND SURFACE RESTORATION ONLY.
- NOTE:** ALL TRENCHING TO CONFORM TO ALL APPLICABLE M.I.O.S.H.A. STANDARDS.

REVISIONS		REV. NO.	DR. BY	CH. BY	DATE
PUBLIC SERVICES DEPARTMENT CITY OF ANN ARBOR					
UTILITY TRENCH-TYPE IX (CONCRETE ENCASUREMENT)					
DR. BY	D.F.	CH. BY	C.S.S.	DRAWING NO.	
SCALE	NONE	DATE	11-6-92	SD-TD-9	
INCH	0	1		SHEET NO.	OF

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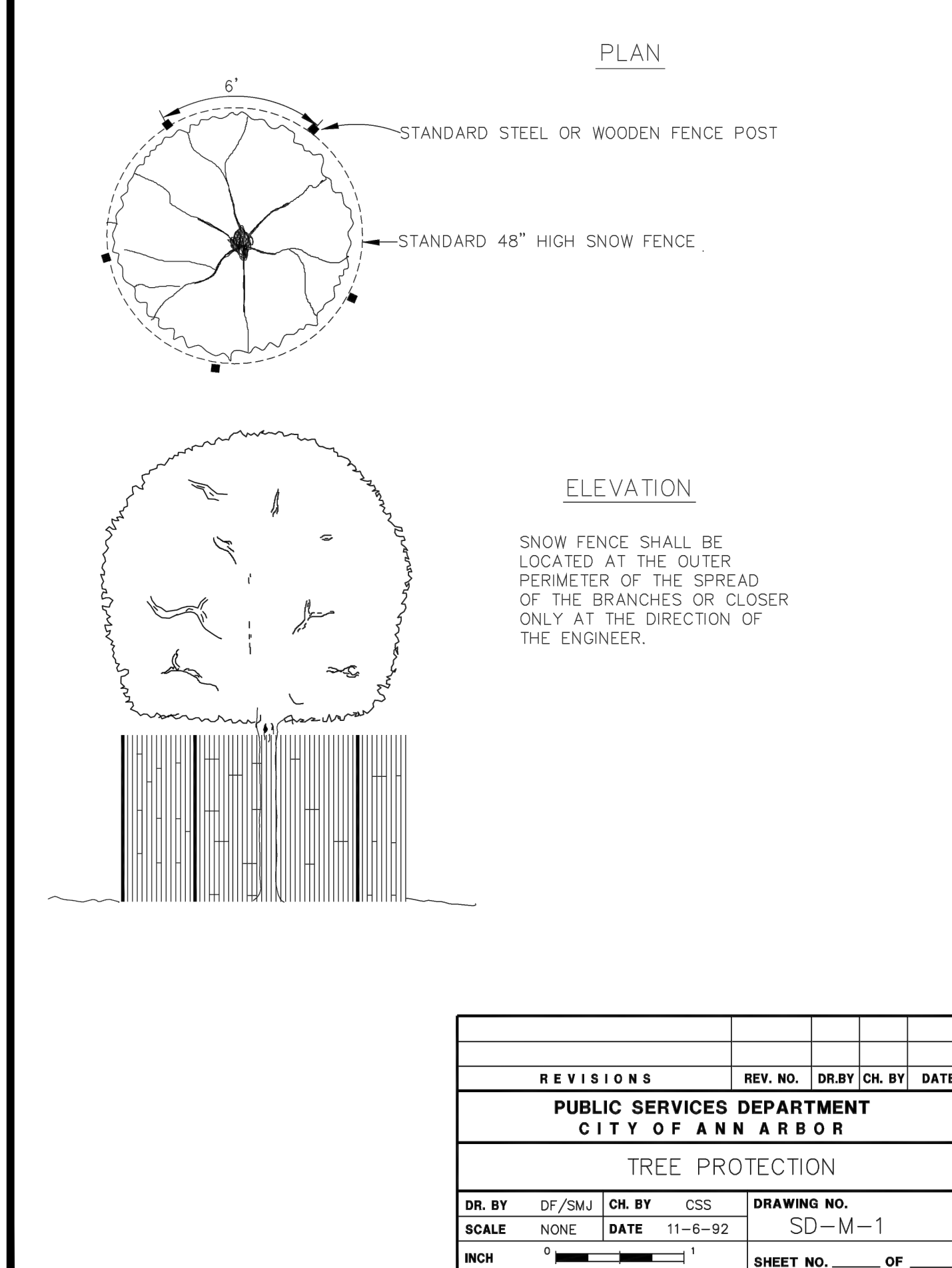
REV. NO.	DATE	DRAWN BY	CHECKED BY
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DR. ENG	CH. ENG	DRAWING NO.	
SCALE N.T.S.	DATE 7/1/2022	SD-TD-1A	

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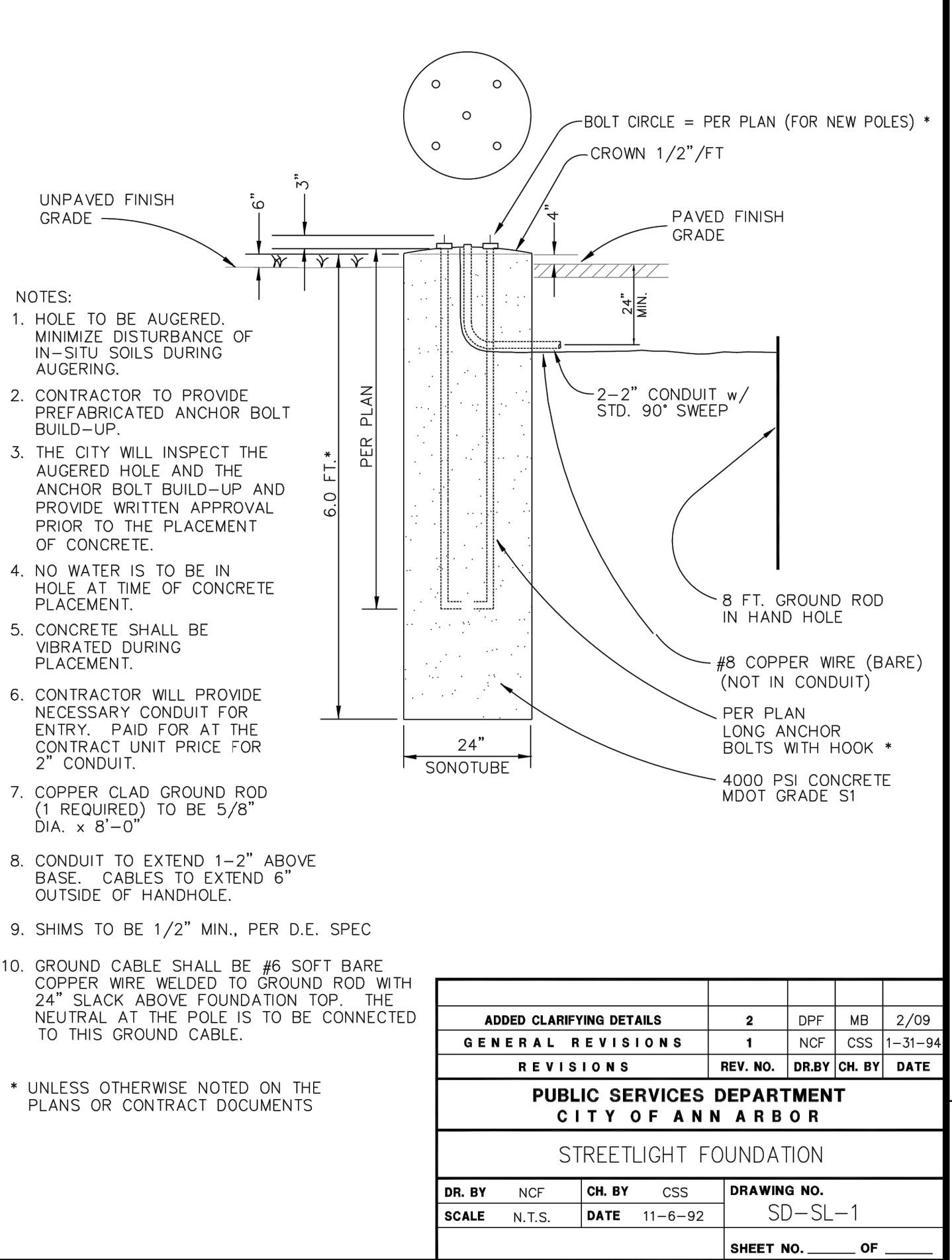
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DR. ENG	CH. ENG	DRAWING NO.	
SCALE N.T.S.	DATE 7/1/2022	SD-TD-6	

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UTILITY TRENCH - TYPE VII			
DR. ENG	CH. ENG	DRAWING NO.	
SCALE N.T.S.	DATE 7/1/2022	SD-TD-7	



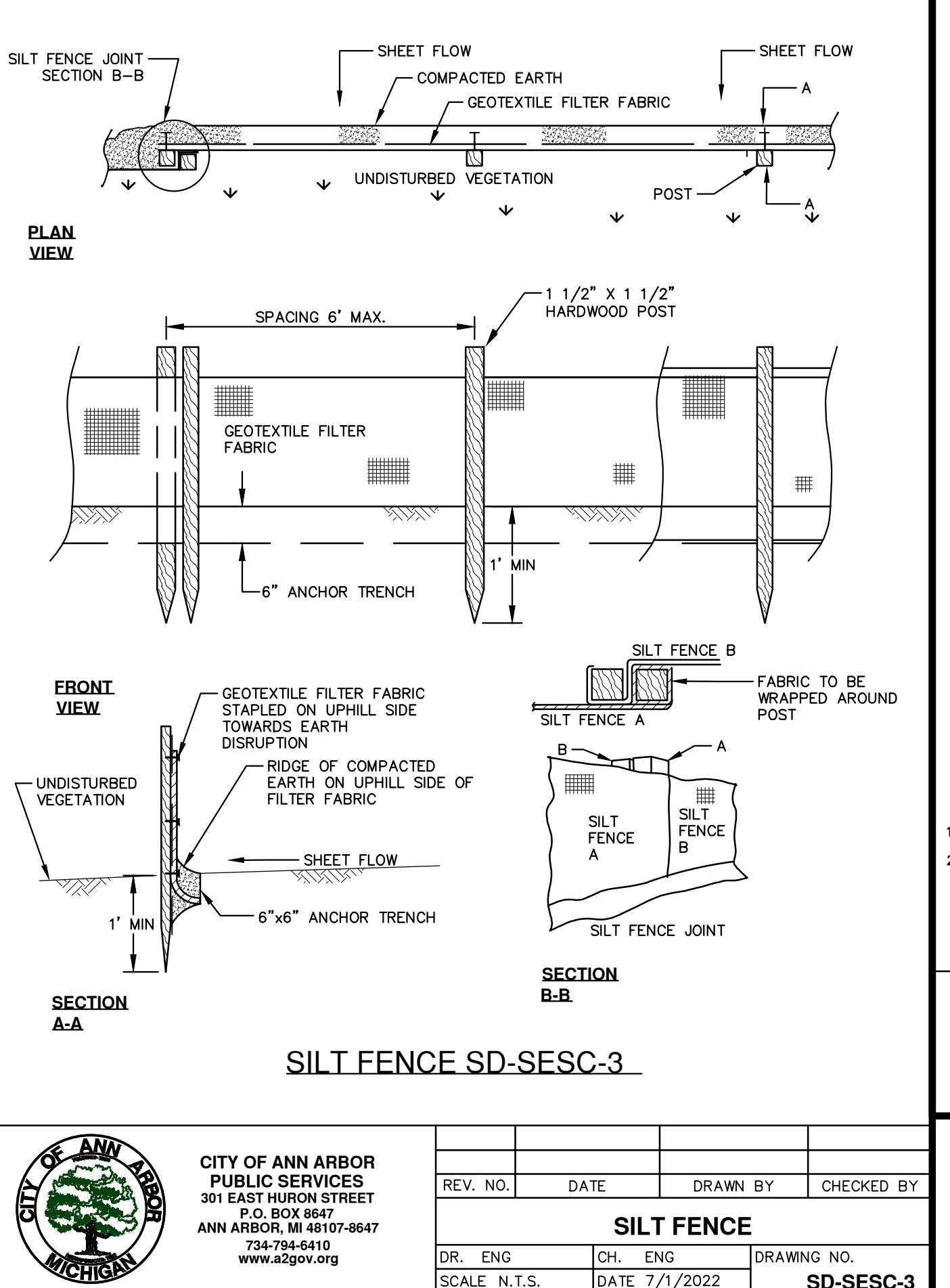
REVISIONS		REV. NO.	DR. BY	CH. BY	DATE
PUBLIC SERVICES DEPARTMENT CITY OF ANN ARBOR					
TREE PROTECTION					
DR. BY	DF/SMJ	CH. BY	CSS	DRAWING NO.	
SCALE	NONE	DATE	11-6-92	SD-M-1	
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- NOTES:**
1. HOLE TO BE AUGERED. MINIMIZE DISTURBANCE OF IN-SITU SOILS DURING AUGERING.
 2. CONTRACTOR TO PROVIDE PREFABRICATED ANCHOR BOLT BUILD-UP.
 3. THE CITY WILL INSPECT THE AUGERED HOLE AND THE ANCHOR BOLT BUILD-UP AND PROVIDE WRITTEN APPROVAL PRIOR TO THE PLACEMENT OF CONCRETE.
 4. NO WATER IS TO BE IN HOLE AT TIME OF CONCRETE PLACEMENT.
 5. CONCRETE SHALL BE VIBRATED DURING PLACEMENT.
 6. CONTRACTOR WILL PROVIDE NECESSARY CONDUIT FOR ENTRY. PAID FOR AT THE CONTRACT UNIT PRICE FOR 2" CONDUIT.
 7. COPPER CLAD GROUND ROD (1 REQUIRED) TO BE 5/8" DIA. x 8'-0"
 8. CONDUIT TO EXTEND 1-2" ABOVE BASE. CABLES TO EXTEND 6" OUTSIDE OF HANDHOLE.
 9. SHIMS TO BE 1/2" MIN., PER D.E. SPEC
 10. GROUND CABLE SHALL BE #6 SOFT BARE COPPER WIRE WELDED TO GROUND ROD WITH 24" SLACK ABOVE FOUNDATION TOP. THE NEUTRAL AT THE POLE IS TO BE CONNECTED TO THIS GROUND CABLE.

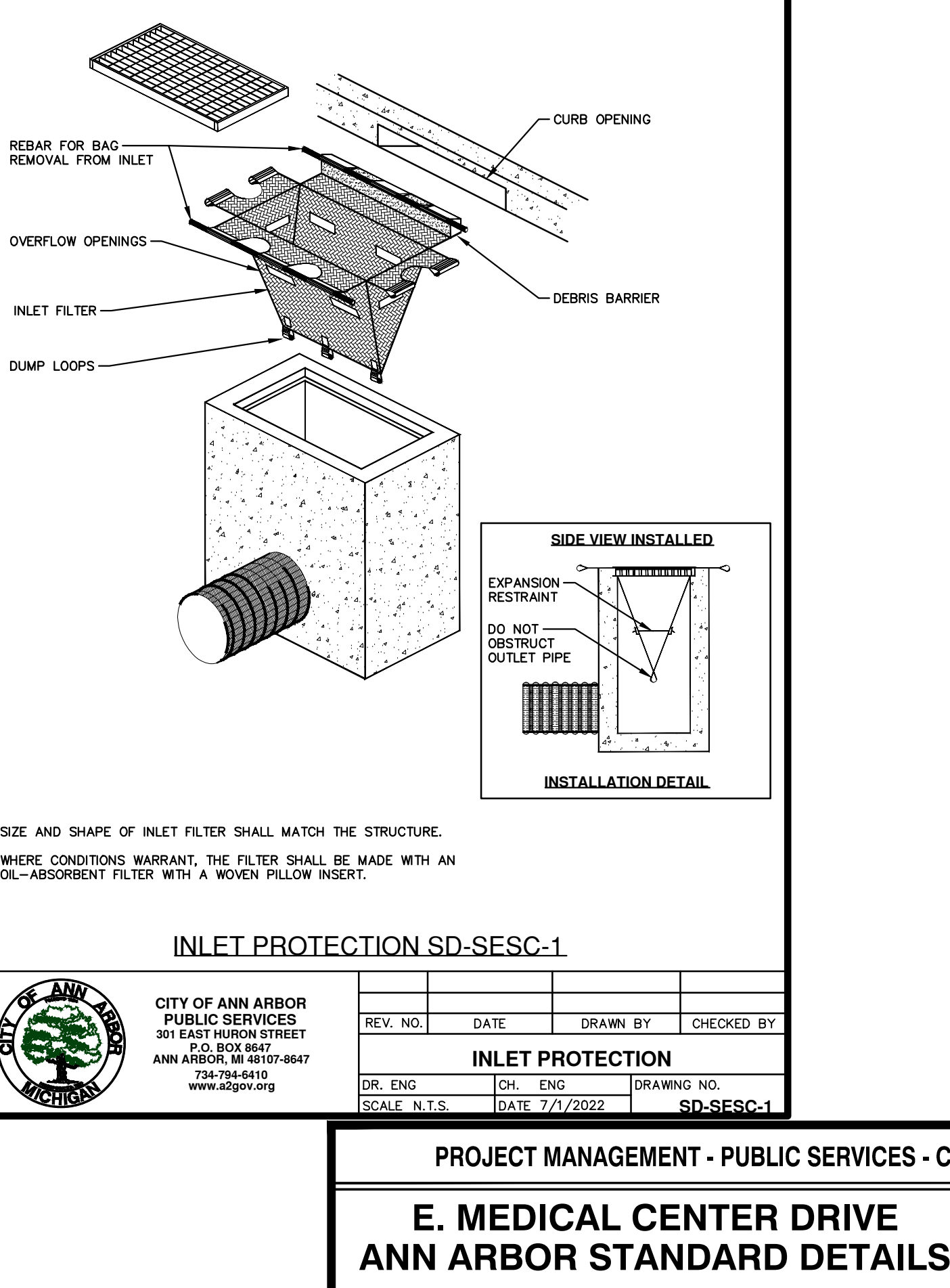
* UNLESS OTHERWISE NOTED ON THE PLANS OR CONTRACT DOCUMENTS

ADDED CLARIFYING DETAILS		2	DPF	MB	2/09
GENERAL REVISIONS		1	NCF	CSS	1-31-94
REVISIONS		REV. NO.	DR. BY	CH. BY	DATE
PUBLIC SERVICES DEPARTMENT CITY OF ANN ARBOR					
STREETLIGHT FOUNDATION					
DR. BY	NCF	CH. BY	CSS	DRAWING NO.	
SCALE	N.T.S.	DATE	11-6-92	SD-SL-1	
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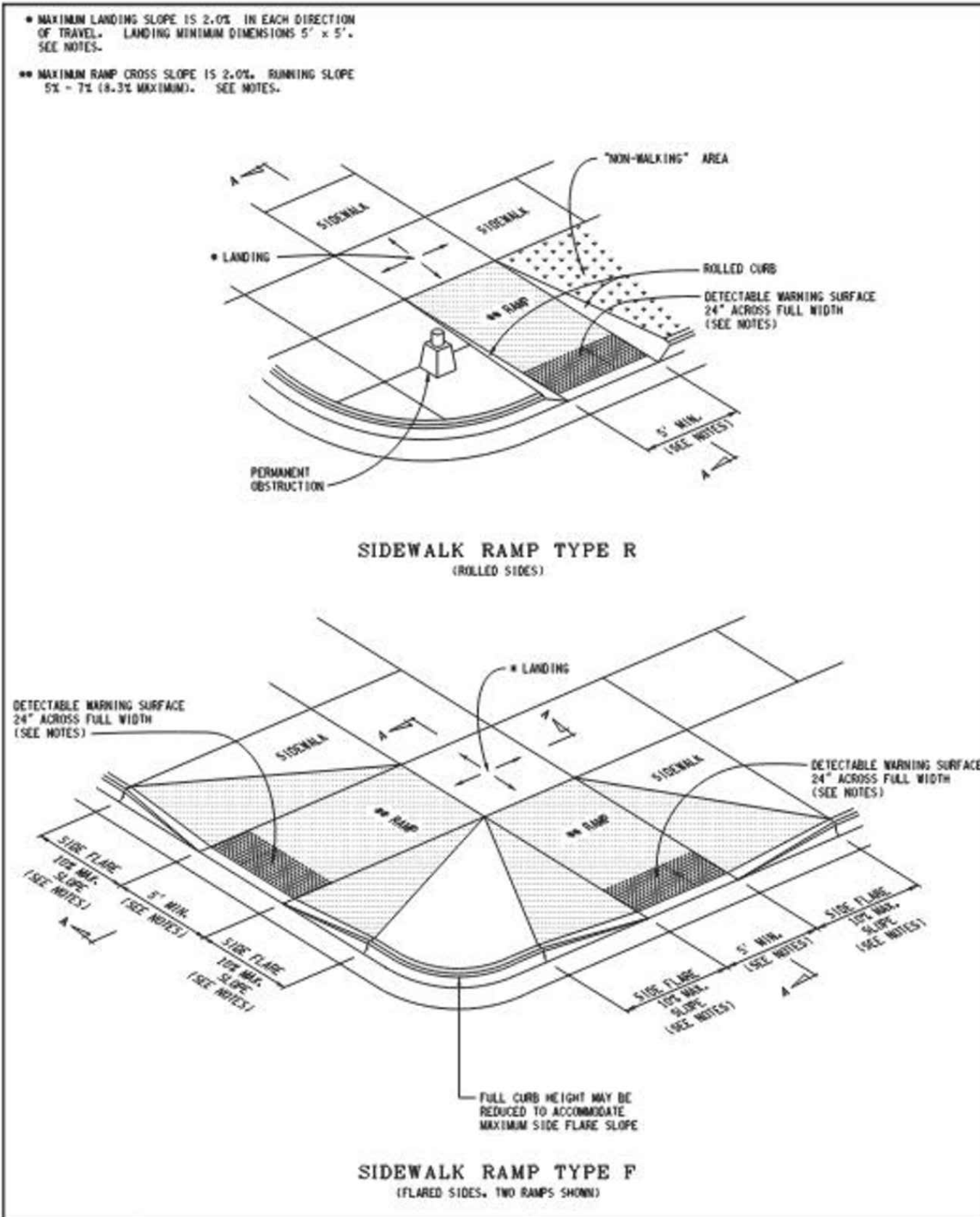


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REVISIONS		REV. NO.	DR. BY	CH. BY	DATE
PUBLIC SERVICES DEPARTMENT CITY OF ANN ARBOR					
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR					
E. MEDICAL CENTER DRIVE ANN ARBOR STANDARD DETAILS					
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MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

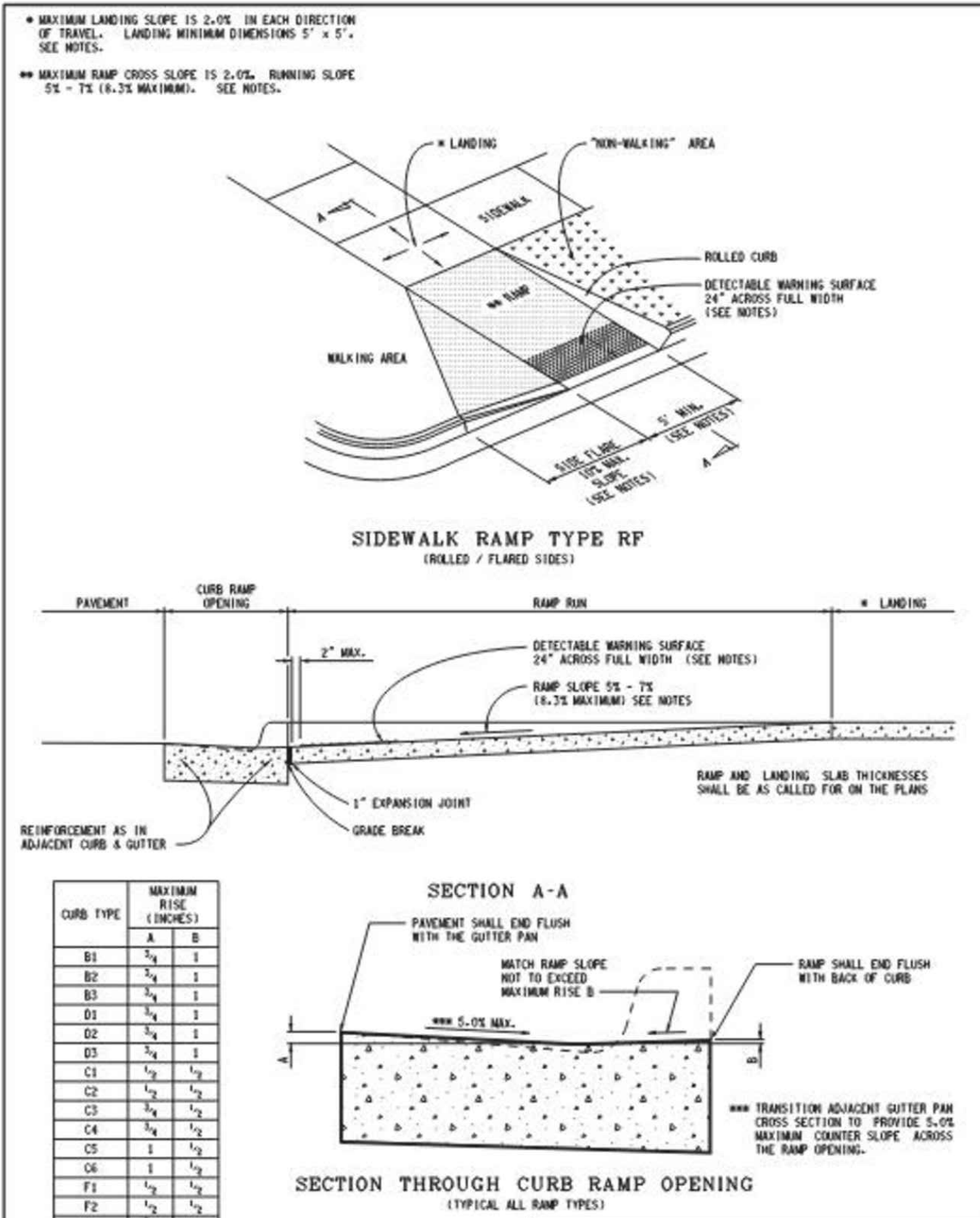
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES

DESIGN DIVISION

APPROVED BY: DIRECTOR, BUREAU OF DEVELOPMENT

F.A.L.L. APPROVE 12-11-2017 PLAN DATE R-28-J SHEET 1 OF 7



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

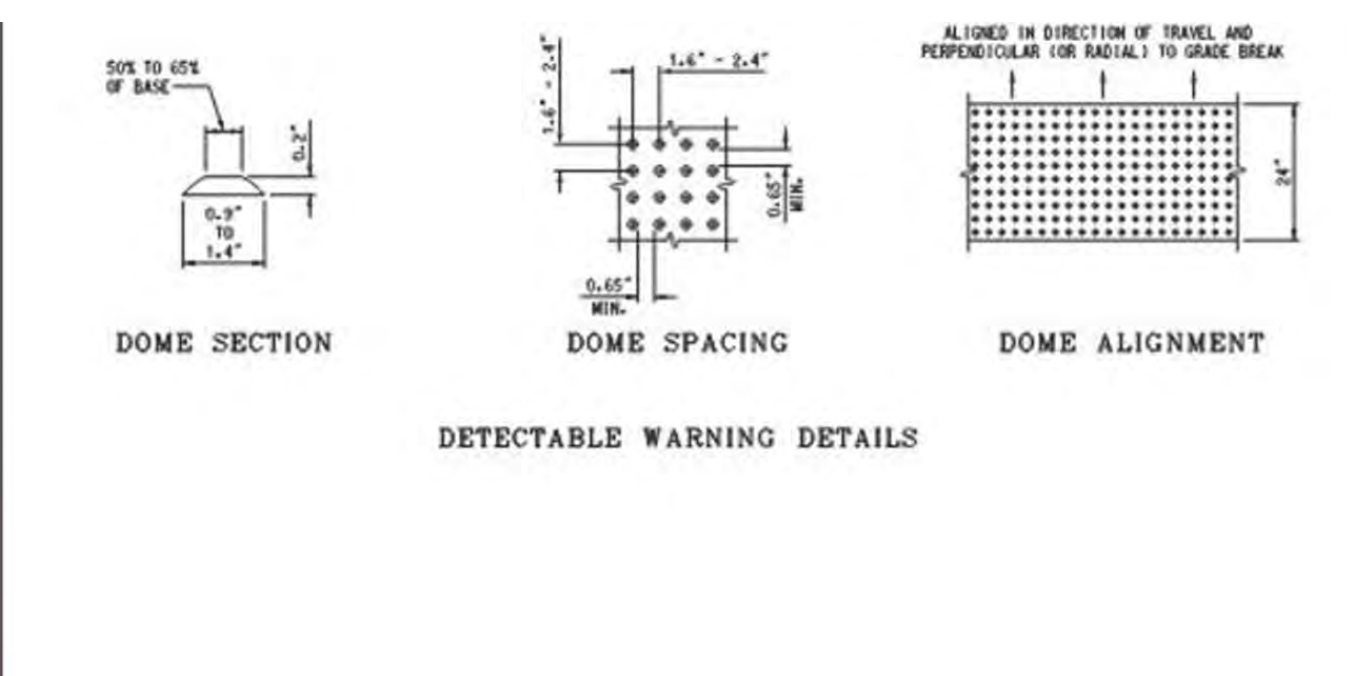
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

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F.A.L.L. APPROVE 12-11-2017 PLAN DATE R-28-J SHEET 2 OF 7



NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

SIDEWALK RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED WID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COURSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP, WHERE CONFLICTING PERMITS, IT IS DESIRABLE THAT THE GRADE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SWEEP REPAIRS NORMALLY USED BY THE MUNICIPALITY.

WHEN 5' MINIMUM WIDTHS ARE NOT PRACTICABLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND LANDINGS TO NOT LESS THAN 4' x 4'.

CURB RAMPS WITH A RUNNING SLOPE 5% DO NOT REQUIRE A TOP LANDING. HOWEVER, ANY CONTINUOUS SIDEWALK OR PEDESTRIAN ROUTE CROSSING THROUGH OR INTERSECTING THE CURB RAMP MUST INDEPENDENTLY MAINTAIN A CROSS SLOPE NOT GREATER THAN 2% PERPENDICULAR TO ITS OWN DIRECTION(S) OF TRAVEL.

DETECTABLE WARNING SURFACE CONCRETE IS 24" WITHIN IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBS OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADII.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.0%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 6.7% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH NOT INCLUDING LANDINGS OR TRANSITIONS.

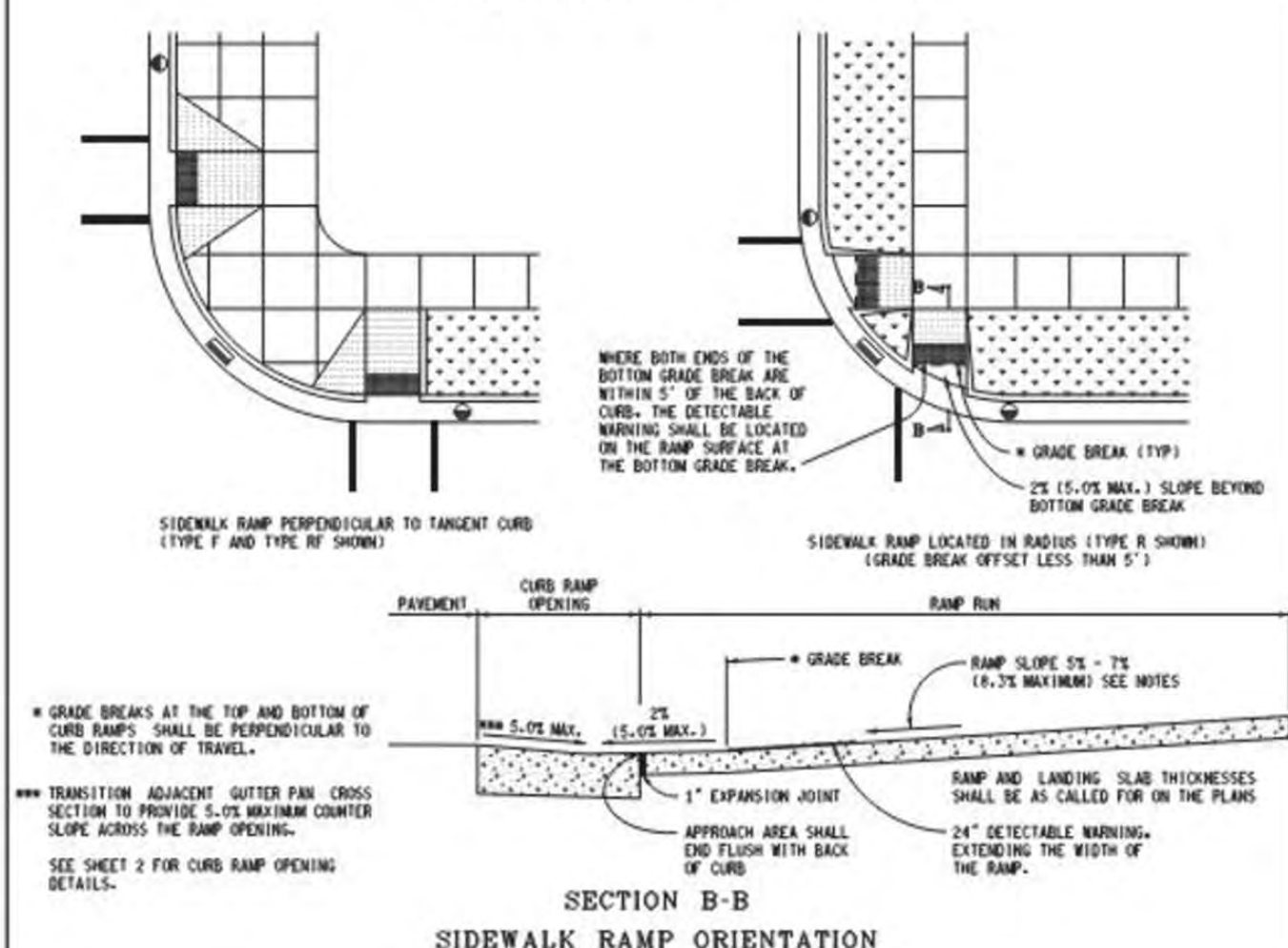
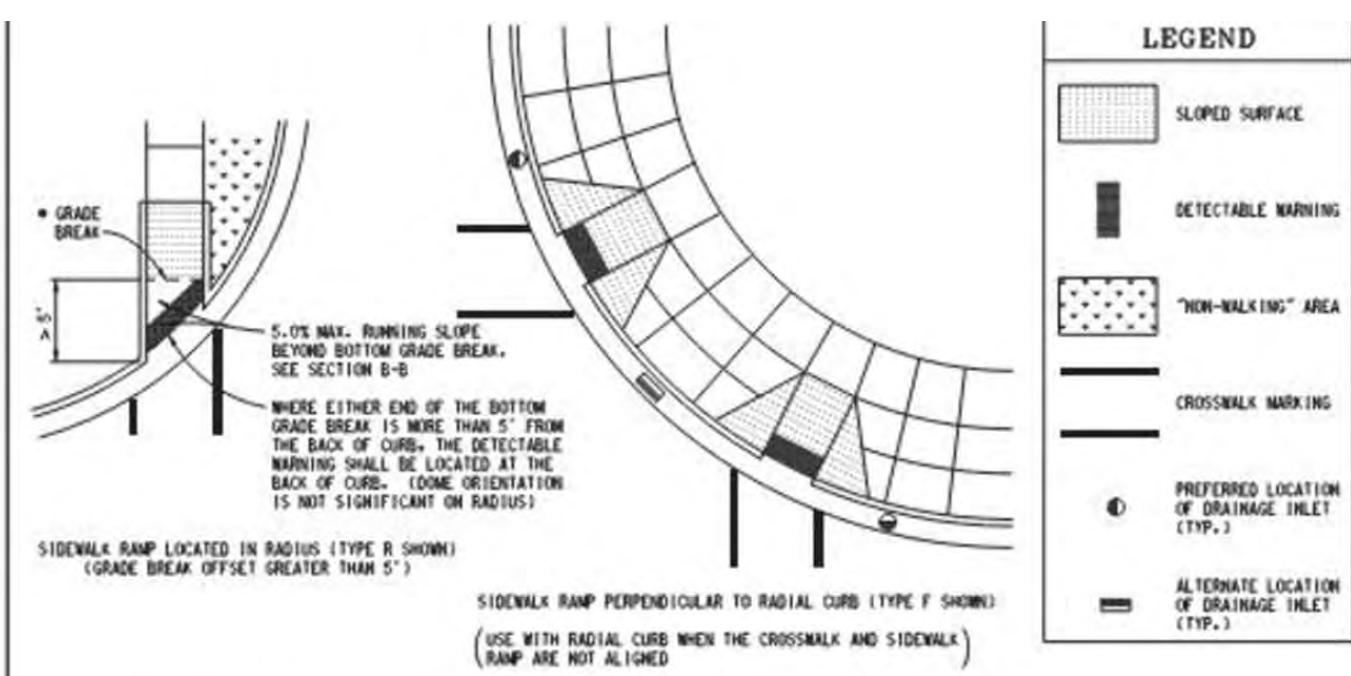
DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN 1/2". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE SIDEWALK RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, IMPAVED SURFACE OR PERMANENT FIXED OBJECTS, WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT BRICKS CAST AND/OR JOINTED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING.



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

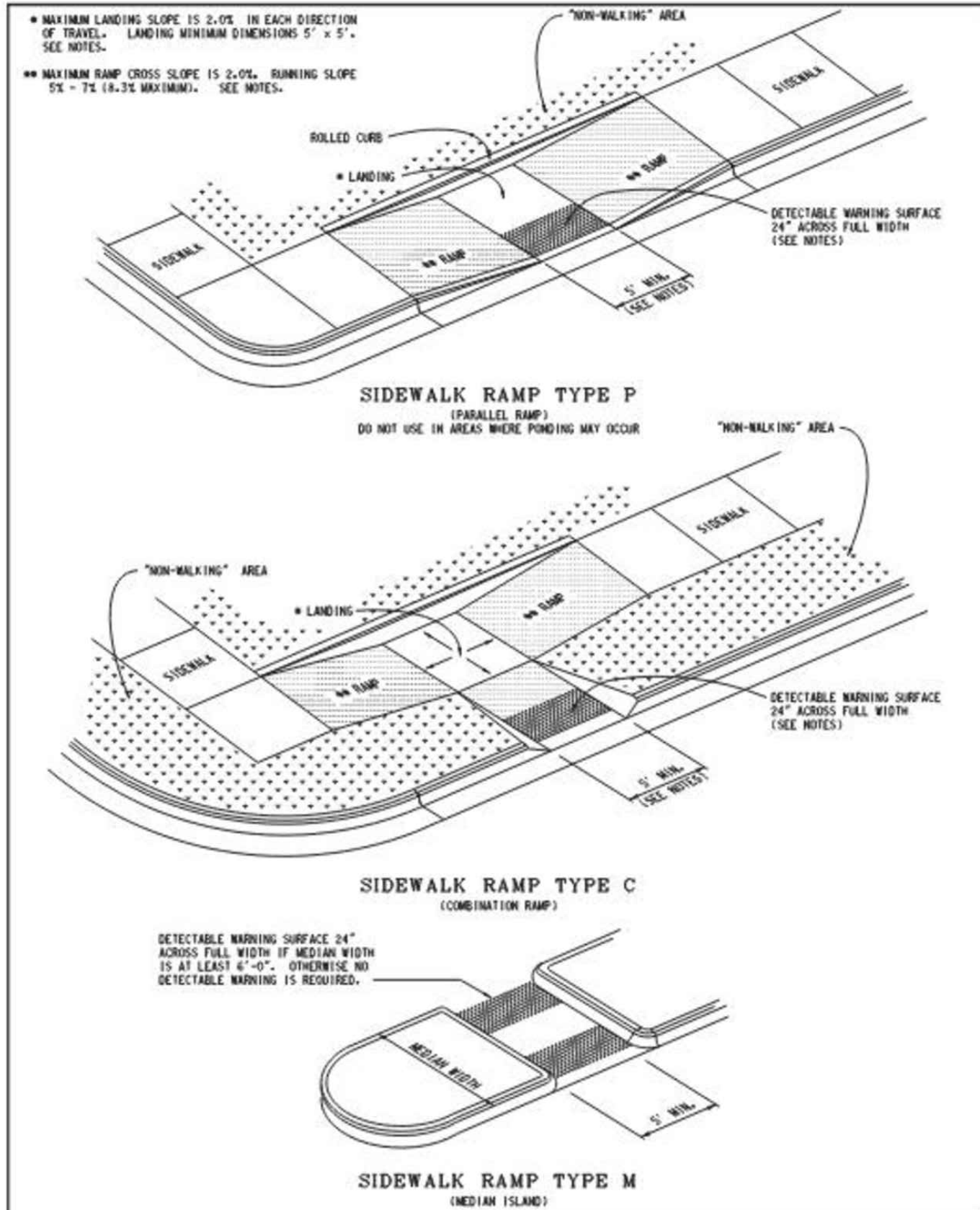
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES

DESIGN DIVISION

APPROVED BY: DIRECTOR, BUREAU OF DEVELOPMENT

F.A.L.L. APPROVE 12-11-2017 PLAN DATE R-28-J SHEET 4 OF 7



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

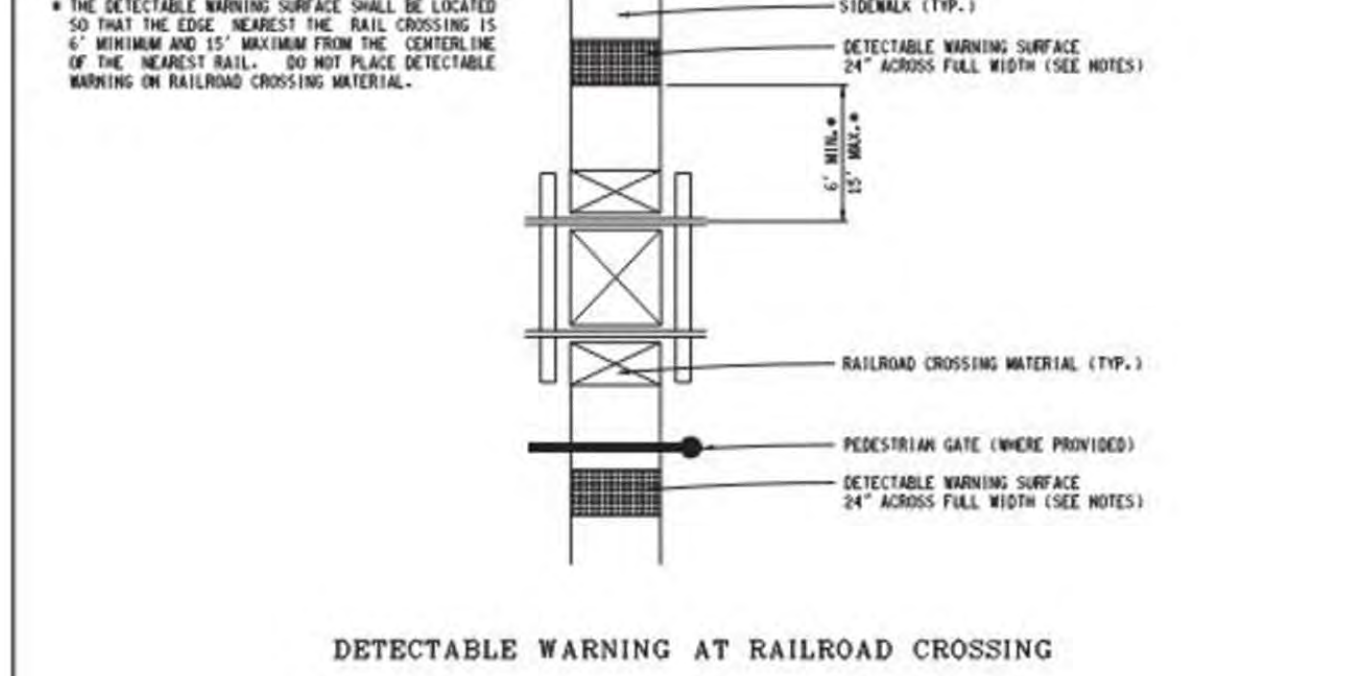
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

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MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

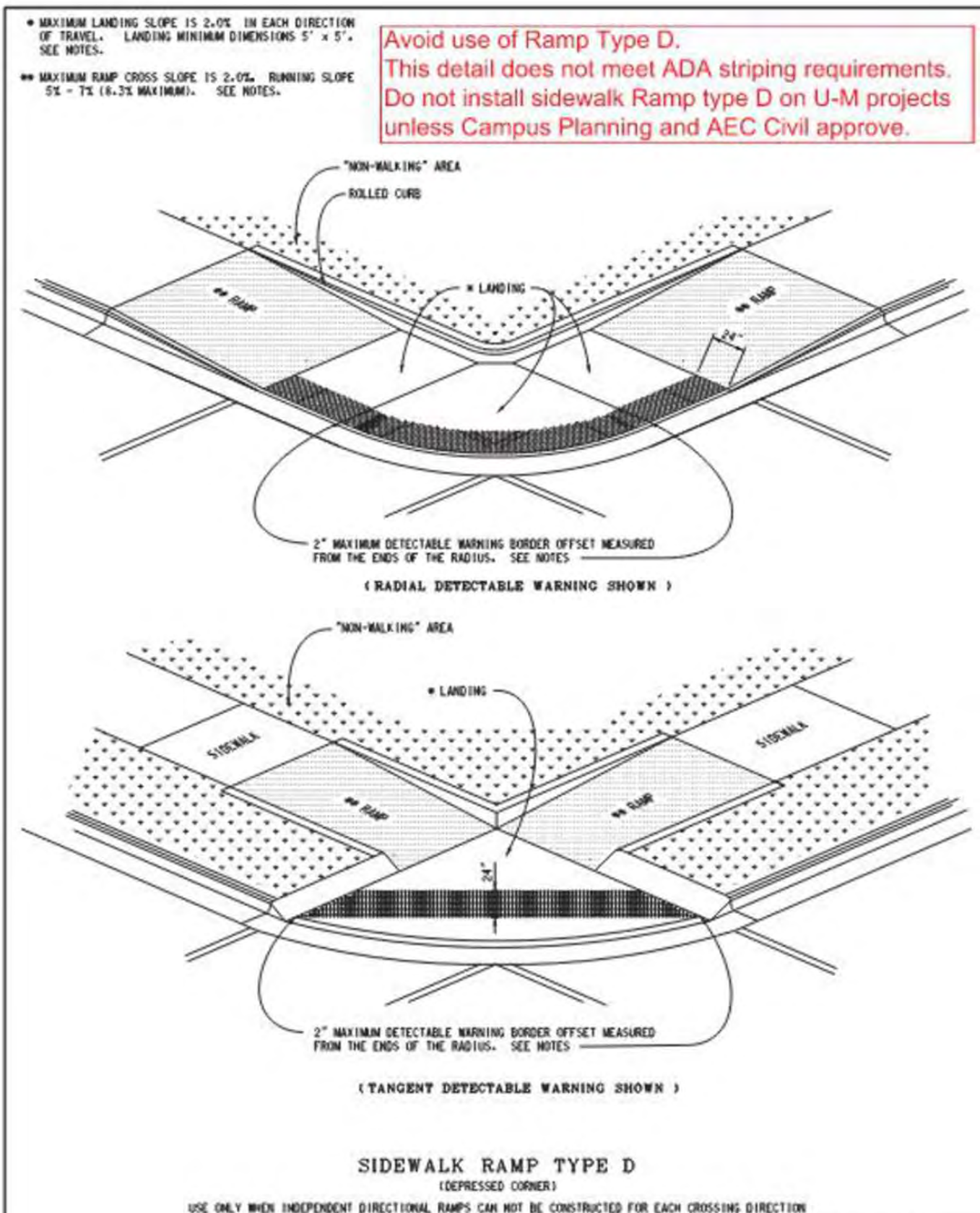
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES

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F.A.L.L. APPROVE 12-11-2017 PLAN DATE R-28-J SHEET 5 OF 7



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES

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F.A.L.L. APPROVE 12-11-2017 PLAN DATE R-28-J SHEET 4 OF 7

Avoid use of Ramp Type D. This detail does not meet ADA striping requirements. Do not install sidewalk Ramp type D on U-M projects unless Campus Planning and AEC Civil approve.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

SIDEWALK RAMP AND DETECTABLE WARNING DETAILS

APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES

DESIGN DIVISION

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F.A.L.L. APPROVE 12-11-2017 PLAN DATE R-28-J SHEET 7 OF 7

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE
MDOT STANDARD DETAILS

SCALE: N/A 0 INCH 1

DRAWING NO. 2021-008-STD6

SHEET NO. 128 OF 153

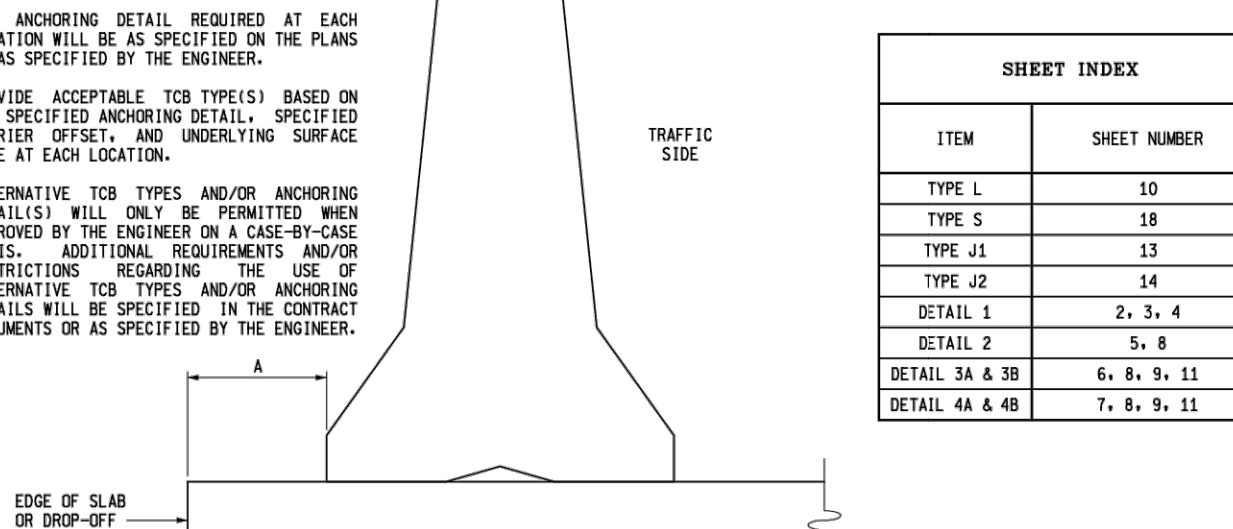
APPROVED BY: LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



UNDERLYING SURFACE	ACCEPTABLE TEMPORARY CONCRETE BARRIER (TCB) TYPES AND ANCHORING DETAILS BASED ON UNDERLYING SURFACE TYPE AND BARRIER OFFSET FROM DROP-OFF							
	BARRIER OFFSET							
	0" ≤ A < 6"		6" ≤ A < 12"		12" ≤ A < 26"		A ≥ 26"	
TCB TYPE	DETAIL	TCB TYPE	DETAIL	TCB TYPE	DETAIL	TCB TYPE	DETAIL	
BRIDGE DECK (CONCRETE)	L OR S	3A OR 4A	L OR S	3A OR 4A	L	1	***	N/A
BRIDGE DECK (CONCRETE WITH HMA OVERLAY)	L OR S	3B	L OR S	3B	L	1	***	N/A
ROADWAY (CONCRETE)	L OR S	4A	L OR S	4A	L	1	***	N/A
ROADWAY (HMA)	****	****	L OR S	2	L	1	***	N/A
ROADWAY (CONCRETE WITH HMA OVERLAY)	L OR S	4B	L OR S	4B	L	1	***	N/A

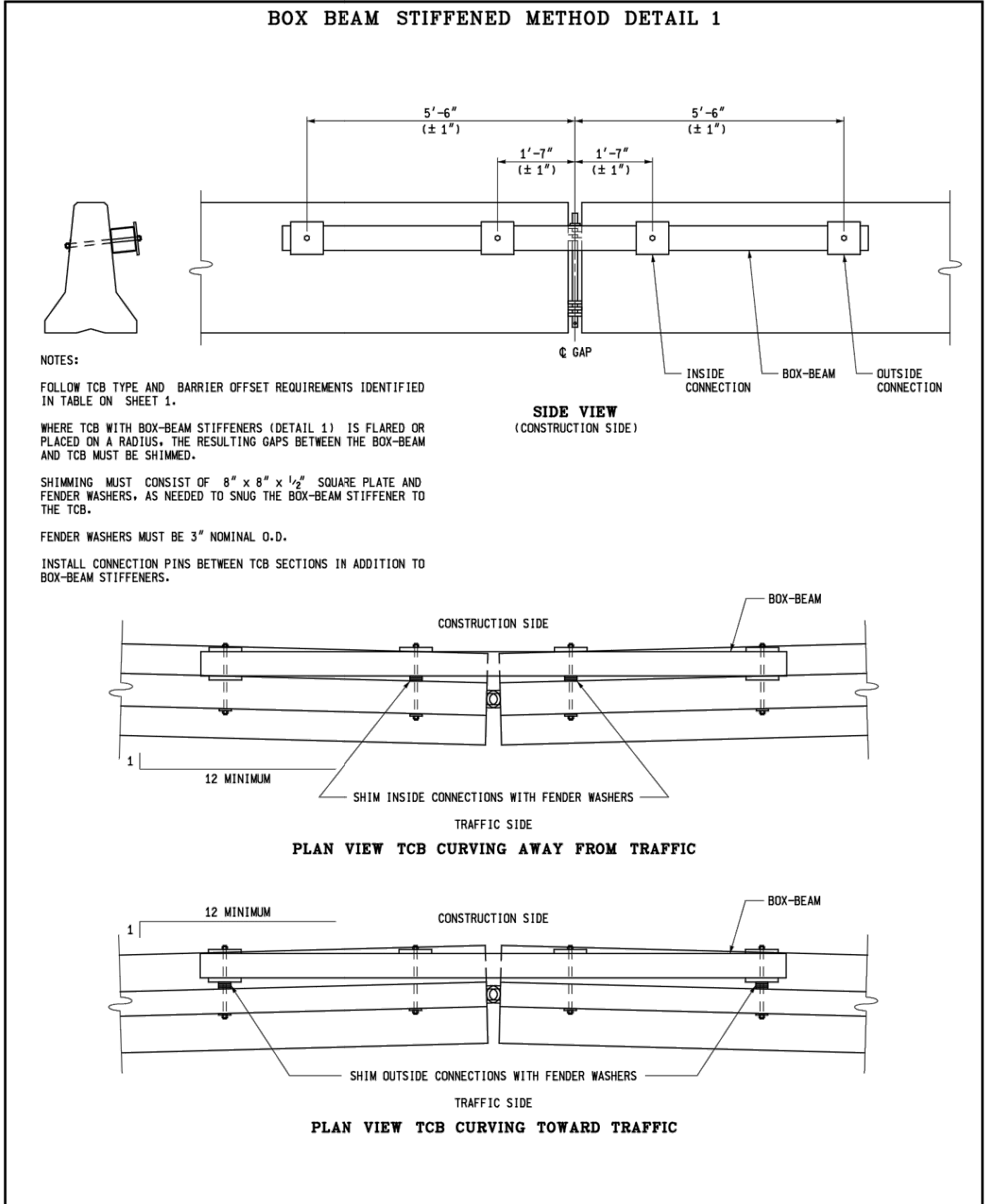
IN REGARDS TO BARRIER OFFSET, "A" IS THE DISTANCE FROM THE OUTSIDE EDGE OF THE TCB TO THE DROP OFF OR THE EDGE OF SLAB.

NOTES:
 THE CLEAR DIMENSION, A, BETWEEN THE TOE OF THE TCB AND THE DROP-OFF OR EDGE OF SLAB WILL BE AS SPECIFIED ON THE PLANS OR AS SPECIFIED BY THE ENGINEER.
 THE ANCHORING DETAIL REQUIRED AT EACH LOCATION WILL BE AS SPECIFIED ON THE PLANS OR AS SPECIFIED BY THE ENGINEER.
 PROVIDE ACCEPTABLE TCB TYPE(S) BASED ON THE SPECIFIED ANCHORING DETAIL, SPECIFIED BARRIER OFFSET, AND UNDERLYING SURFACE TYPE AT EACH LOCATION.
 ALTERNATIVE TCB TYPES AND/OR ANCHORING DETAIL(S) WILL ONLY BE PERMITTED WHEN APPROVED BY THE ENGINEER ON A CASE-BY-CASE BASIS. ADDITIONAL REQUIREMENTS AND RESTRICTIONS REGARDING THE USE OF ALTERNATIVE TCB TYPES AND/OR ANCHORING DETAILS WILL BE SPECIFIED IN THE CONTRACT DOCUMENTS OR AS SPECIFIED BY THE ENGINEER.

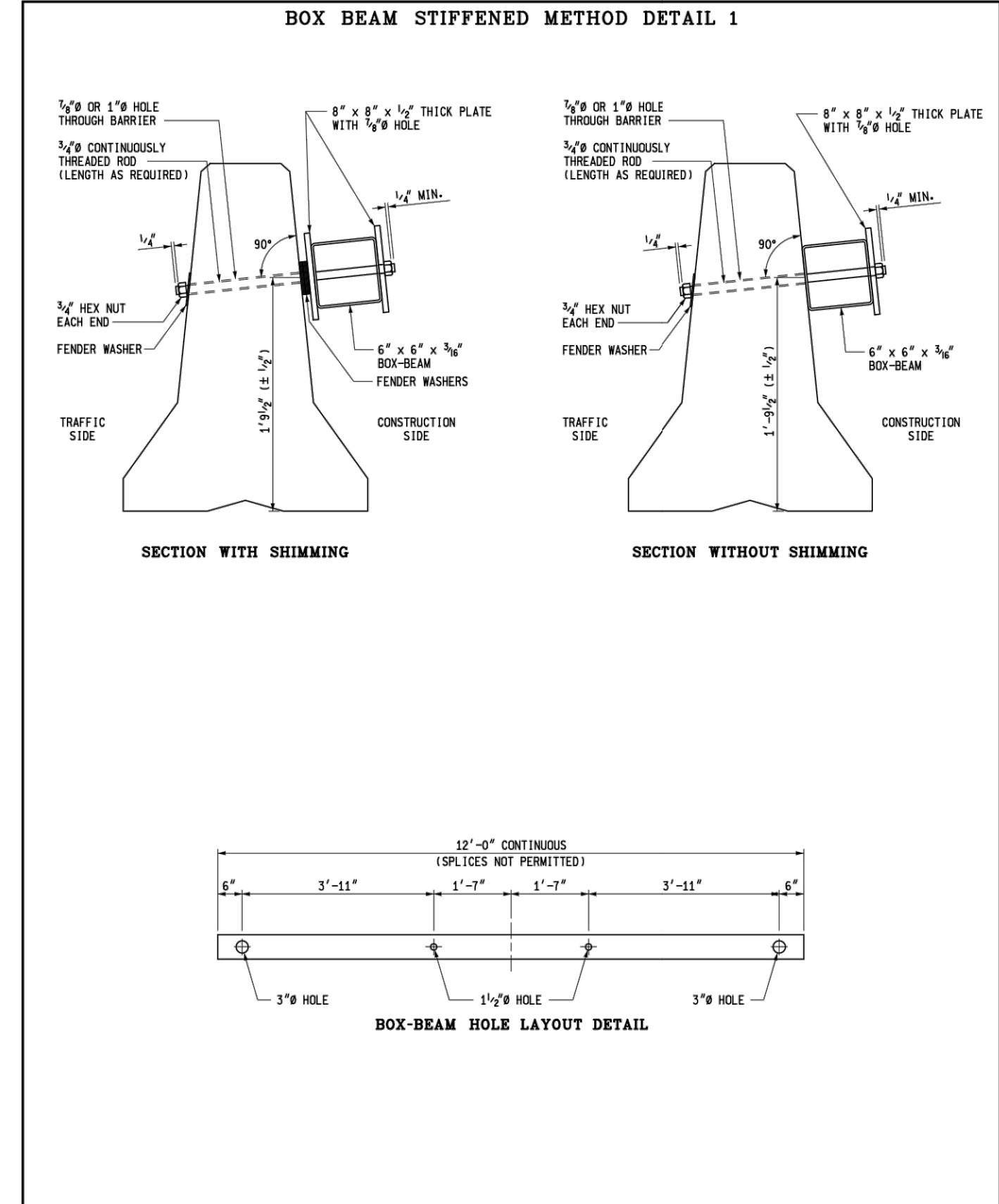


- USE TYPE J1 AND J2 TCB SECTIONS OVER BRIDGE DECK EXPANSION JOINTS WITH THERMAL EXPANSION FROM 1 1/2" TO 4". DO NOT USE DETAILS 3A, 3B, OR 4A, OVER BRIDGE DECK EXPANSION JOINTS WITH THERMAL EXPANSION GREATER THAN 4". INSTEAD, USE DETAIL 1 AND TYPE L TCB SECTIONS WITH "A" NOW BEING ≥ 12" OVER THE ENTIRE BRIDGE SPAN WHEN PLACING LIMITED DEFLECTION TCB SECTIONS OVER BRIDGE DECK EXPANSION JOINTS WITH THERMAL EXPANSION GREATER THAN 4". REFER TO TCB SECTION OVER BRIDGE EXPANSION JOINT DETAILS. FOR ADDITIONAL INFORMATION CONTACT THE TRAFFIC AND SAFETY CRASH BARRIER ENGINEER.
- PROVIDE THE ANCHORING DETAIL SPECIFIED ON THE PLANS OR AS SPECIFIED BY THE ENGINEER.
- USE OF LIMITED DEFLECTION TCB IS NOT REQUIRED WHEN "A" ≥ 26". TYPE L OR TYPE S TCB MAY BE USED WITHOUT ANCHORING TO THE UNDERLYING SURFACE OR BOX-BEAM STIFFENERS. OTHER MOST APPROVED STANDARD TEMPORARY BARRIER TYPES MAY ALSO BE USED WHEN "A" ≥ 26".
- DO NOT INSTALL LIMITED DEFLECTION TCB ON HMA ROADWAYS WHEN "A" < 6".

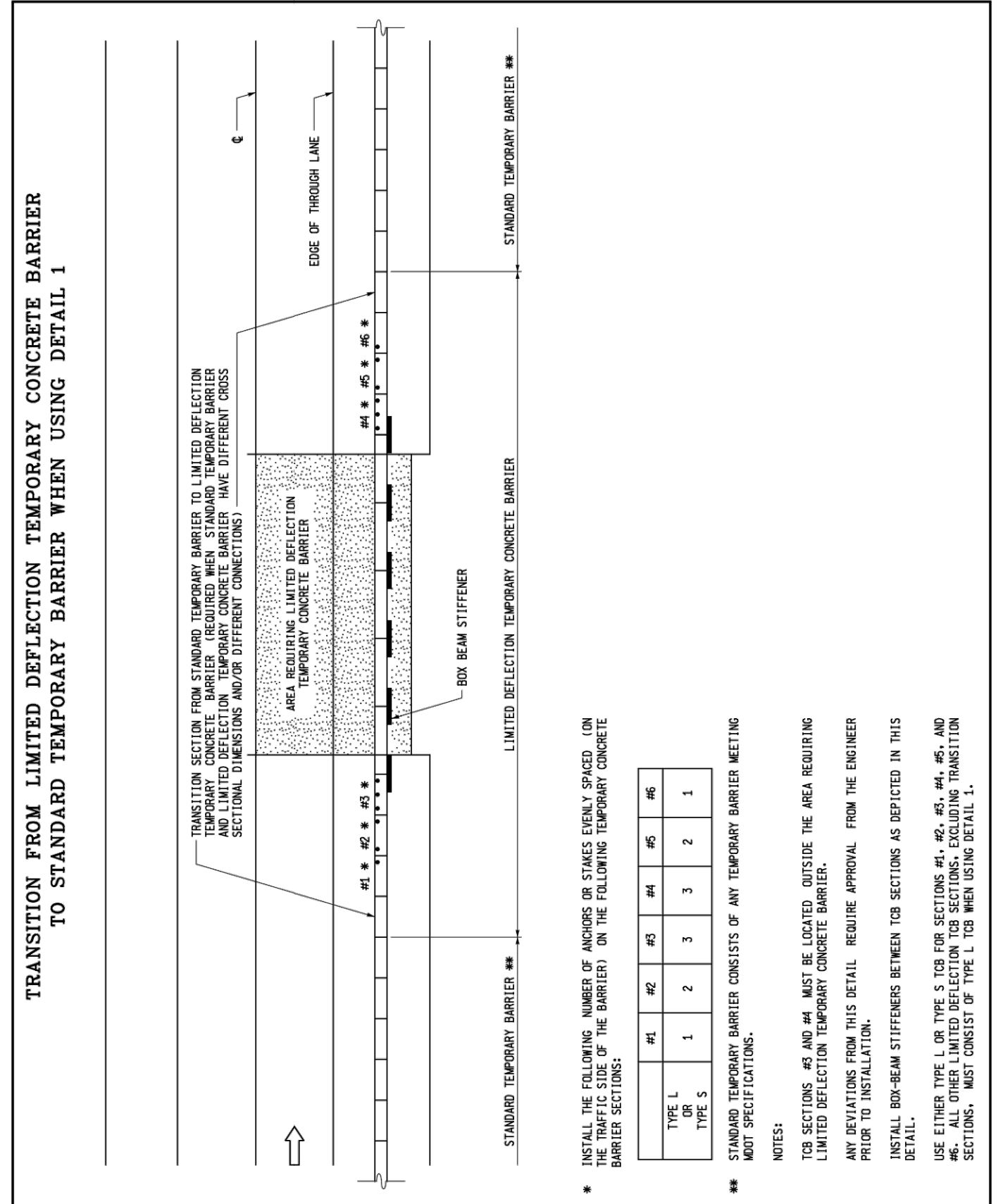
MDOT MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION
 8-14-2015 PLAN DATE R-53-A SHEET 1 OF 22



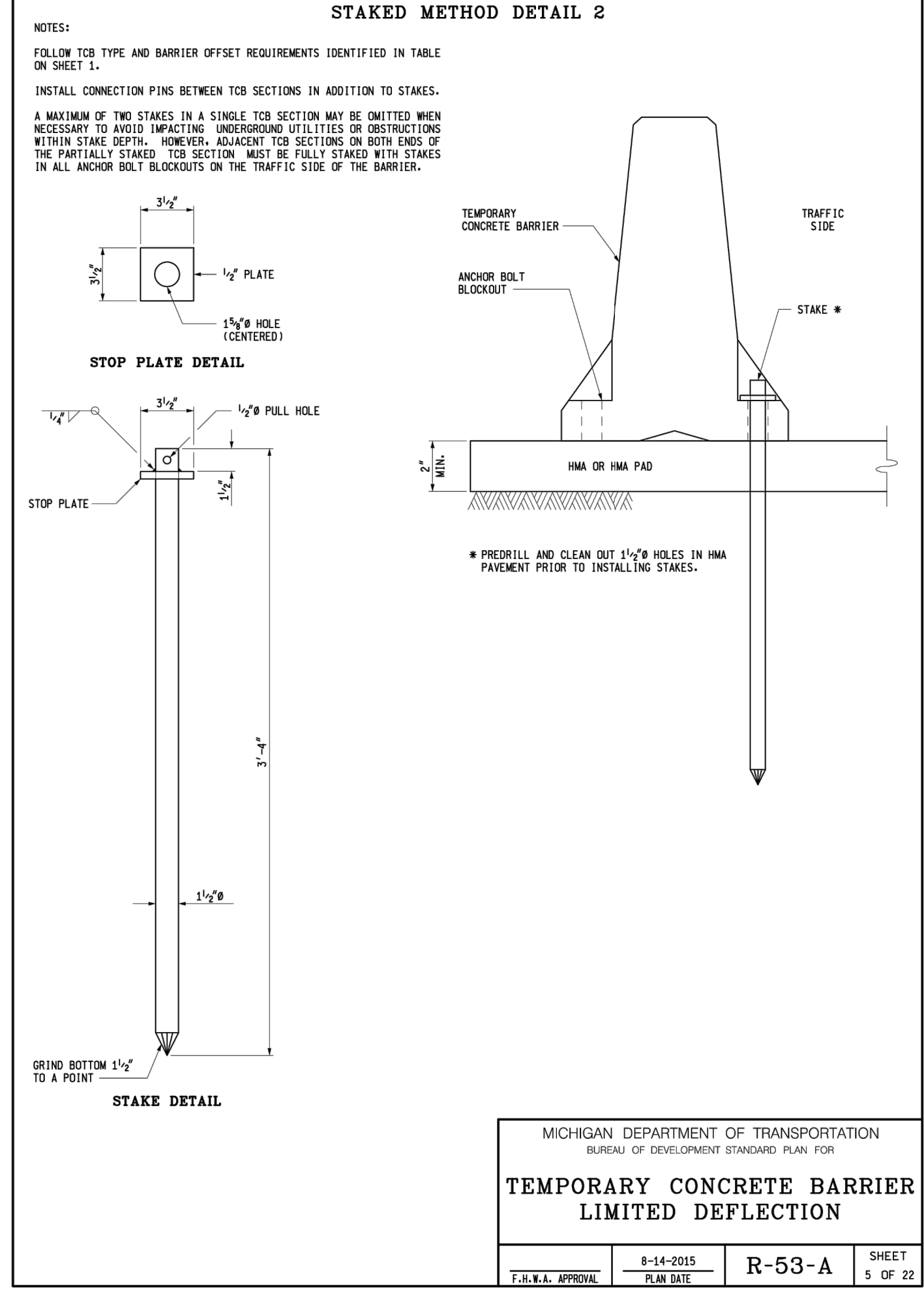
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION
 8-14-2015 PLAN DATE R-53-A SHEET 2 OF 22



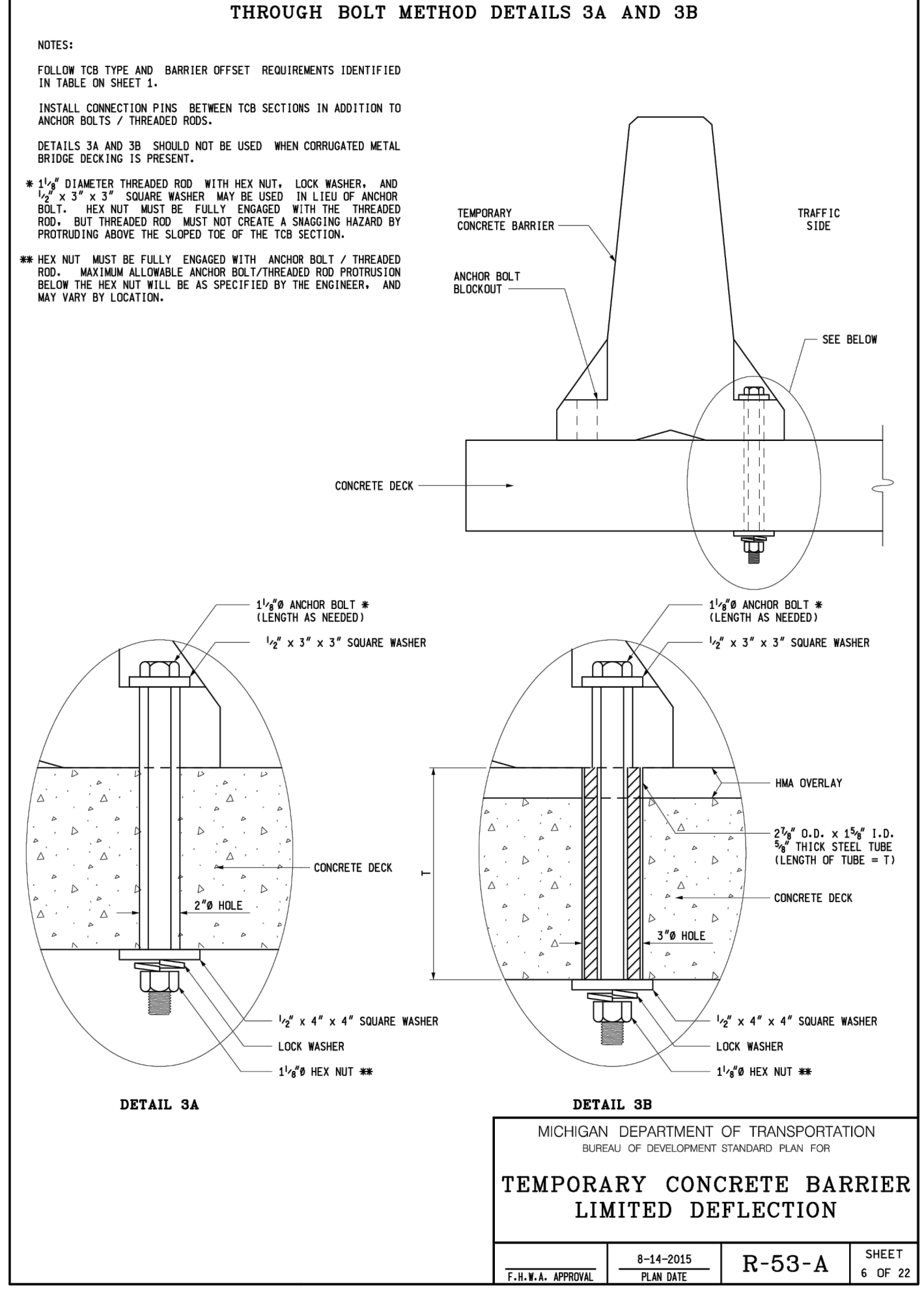
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION
 8-14-2015 PLAN DATE R-53-A SHEET 3 OF 22



MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION
 8-14-2015 PLAN DATE R-53-A SHEET 4 OF 22



MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION
 8-14-2015 PLAN DATE R-53-A SHEET 5 OF 22



MICHIGAN DEPARTMENT OF TRANSPORTATION
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TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION
 8-14-2015 PLAN DATE R-53-A SHEET 6 OF 22

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

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PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

MDOT STANDARD DETAILS

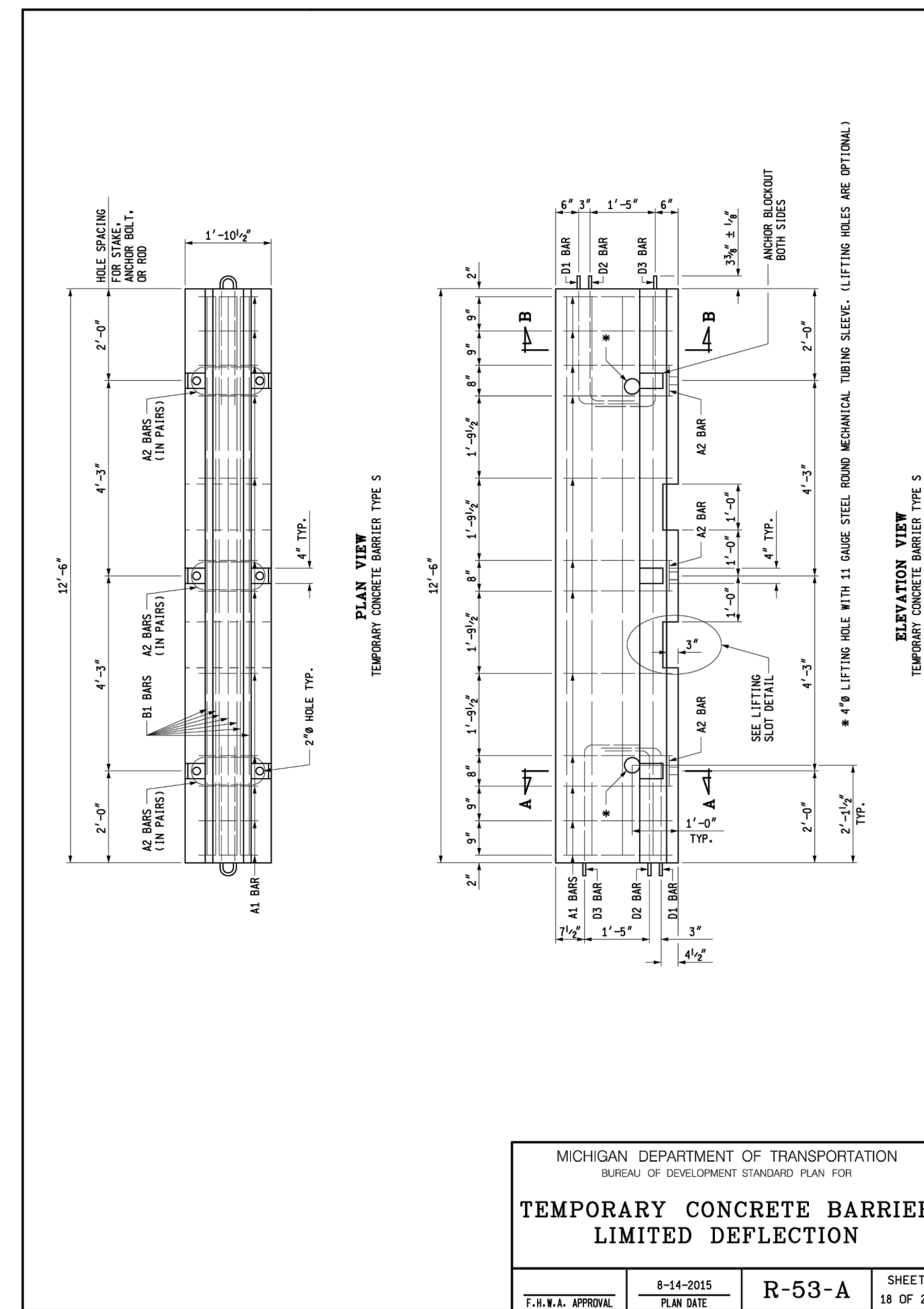
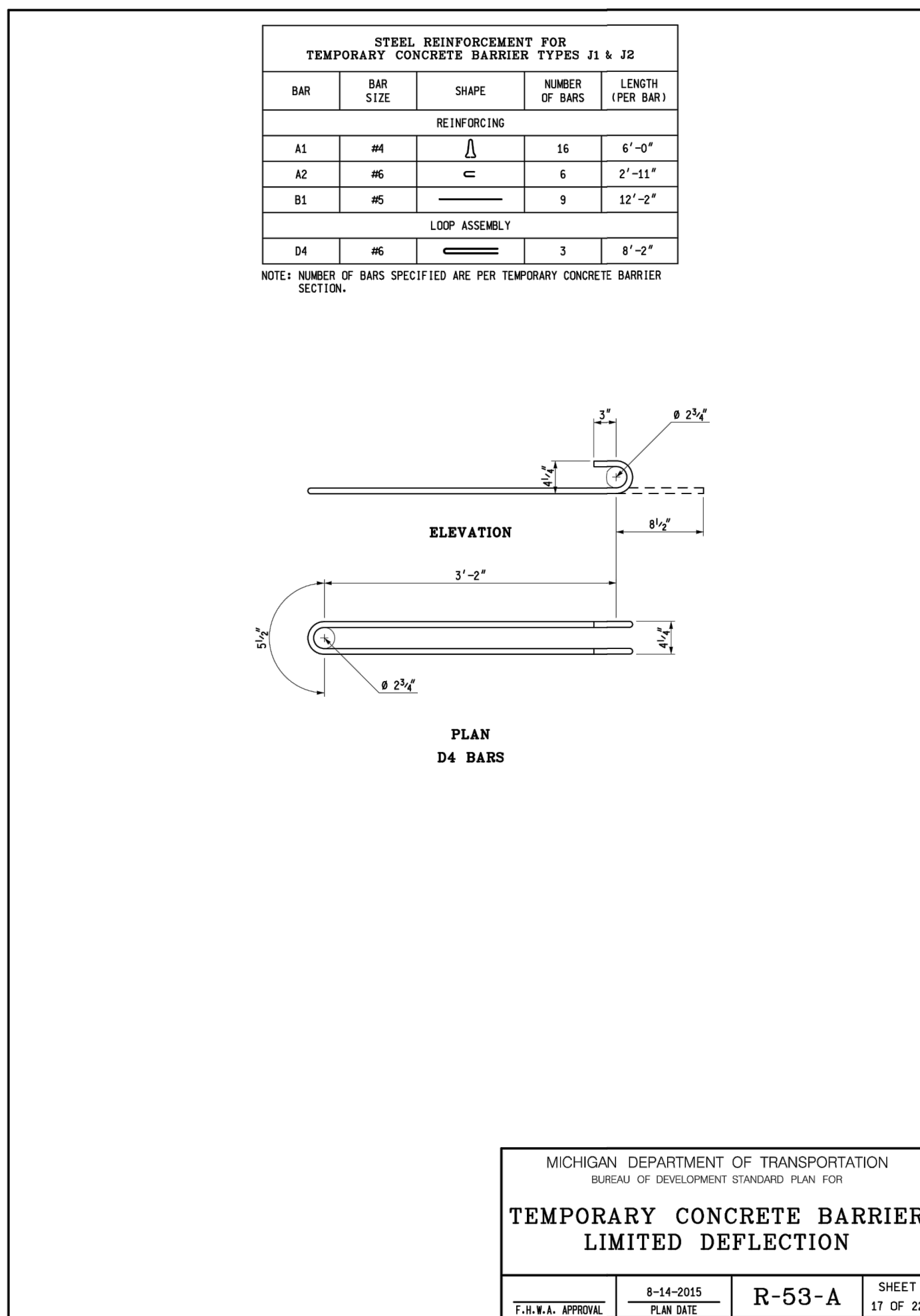
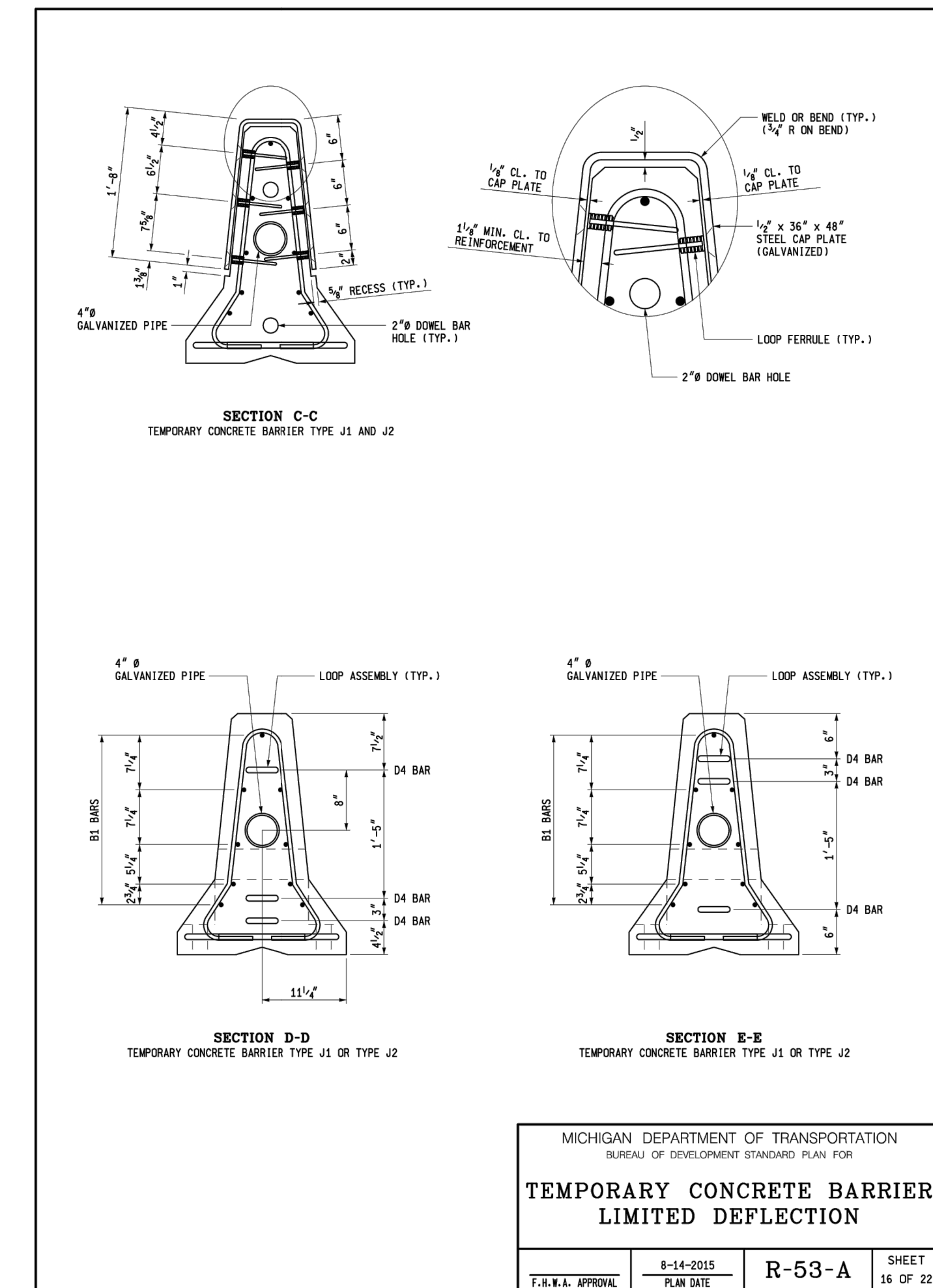
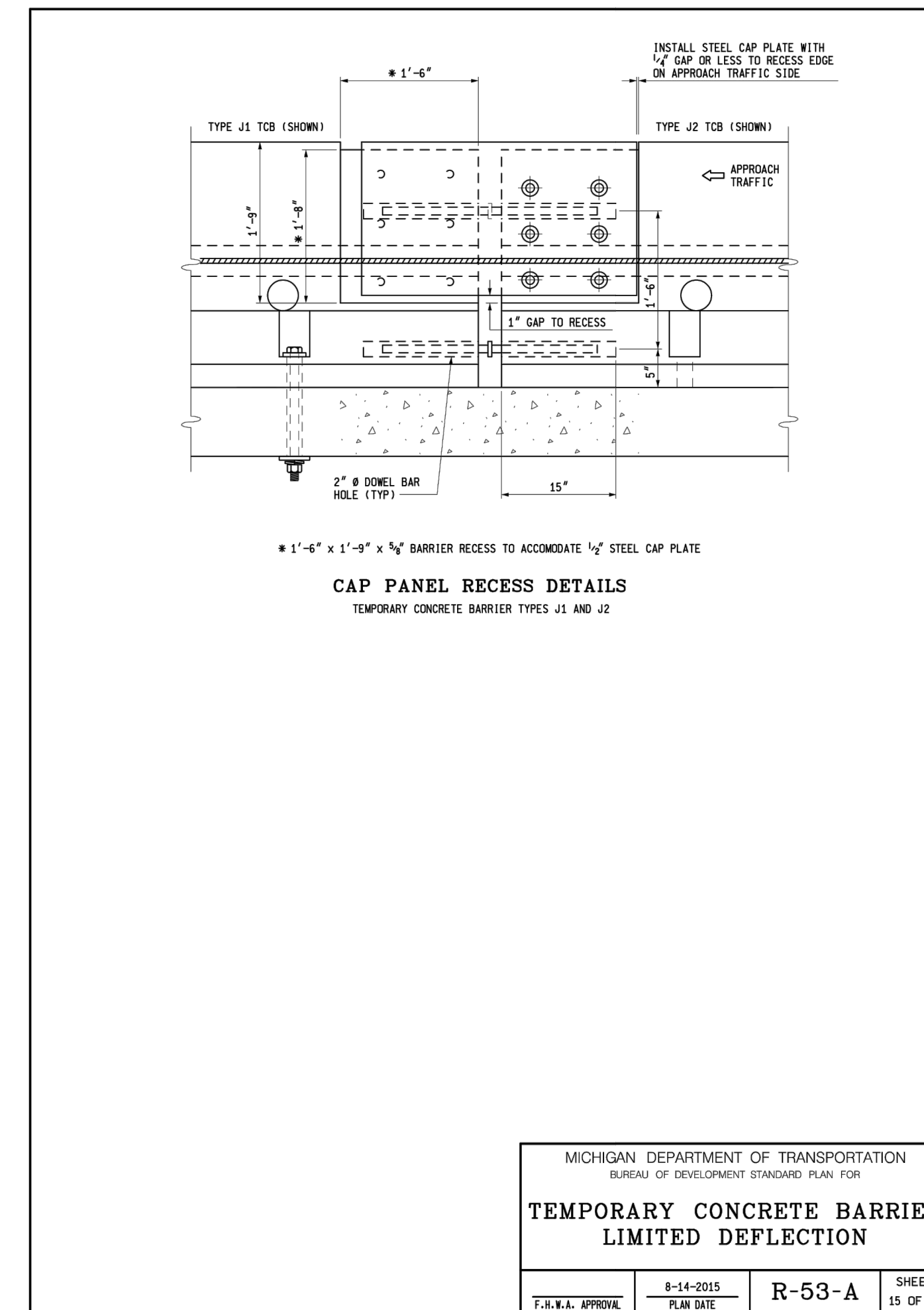
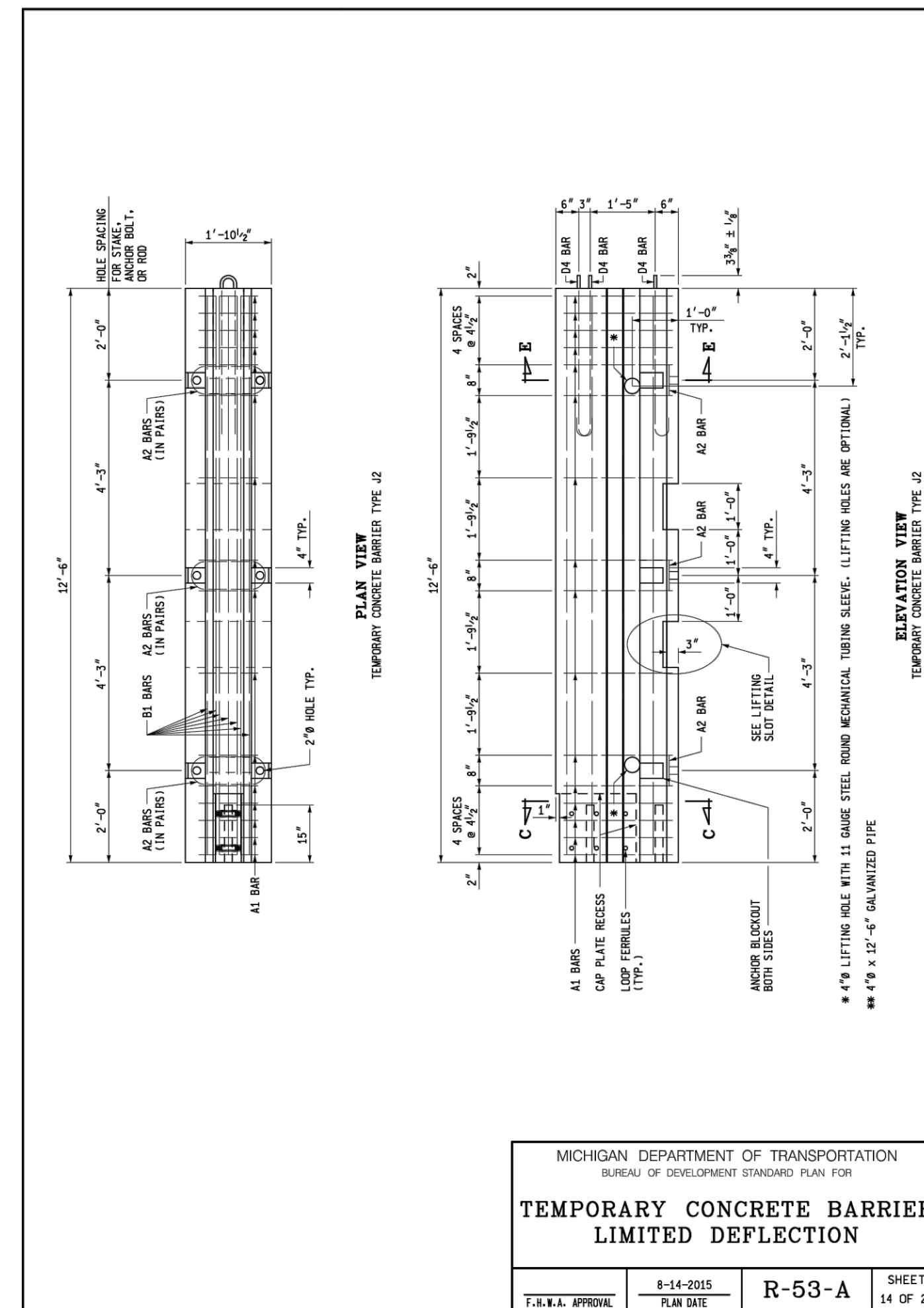
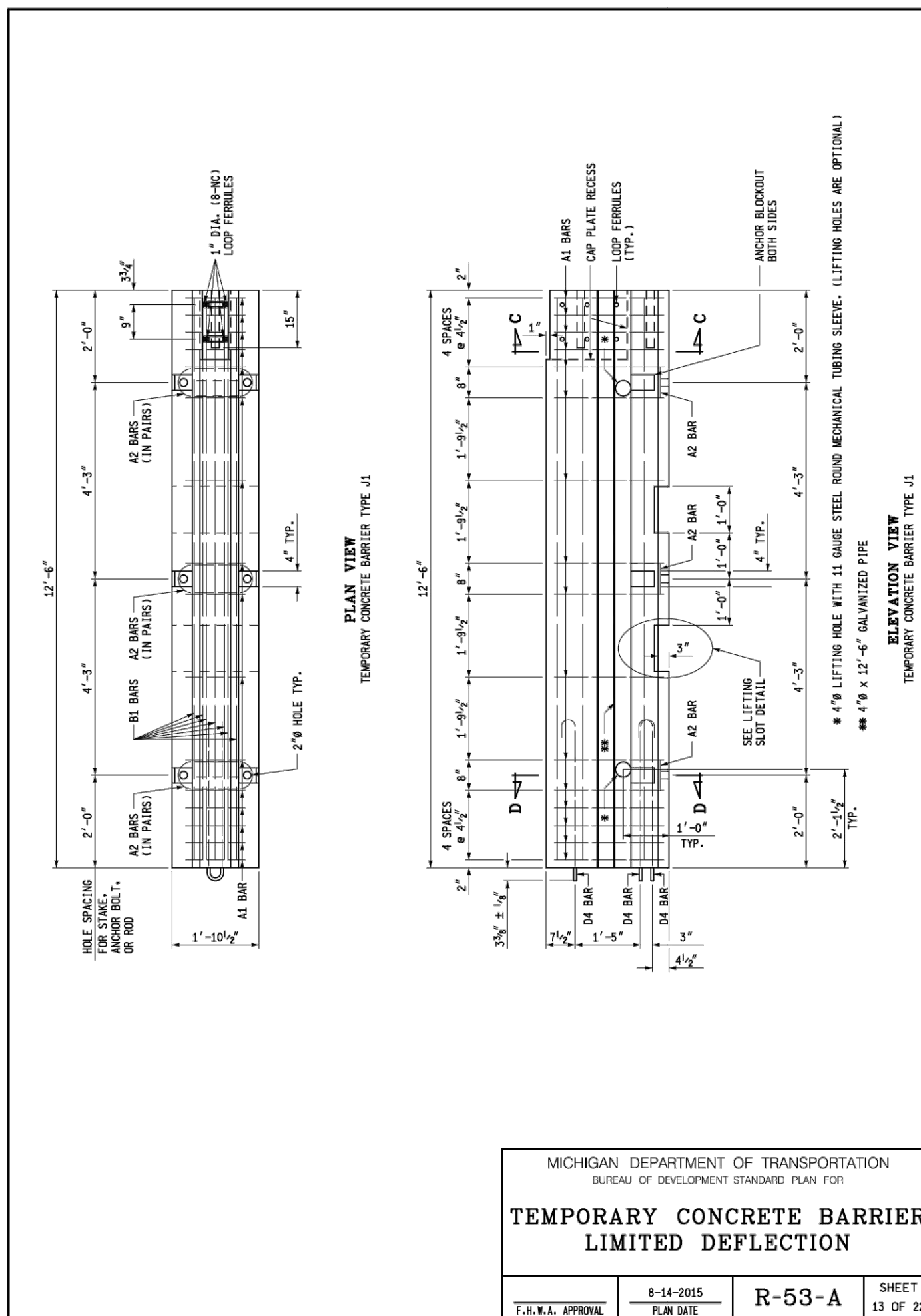
SCALE: HOR. 1"=40' VERT. 1"=4'

DRAWING NO. 2021-008-STD8

SHEET NO. 129 OF 153

APPROVED BY: _____

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PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
MDOT STANDARD DETAILS	
SCALE NTS	0 INCH 1
DRAWING NO. 2021-008-STD9	
SHEET NO. <u>130</u> OF <u>153</u>	

DRILLED AND GROUTED METHOD DETAILS 4A AND 4B

NOTES:
FOLLOW TCB TYPE AND BARRIER OFFSET REQUIREMENTS IDENTIFIED IN TABLE ON SHEET 1.
INSTALL CONNECTION PINS BETWEEN TCB SECTIONS IN ADDITION TO THREADED RODS.

DETAIL 4A
CONCRETE ROADWAY OR CONCRETE BRIDGE DECK
(DO NOT USE THIS DETAIL ON CONCRETE BRIDGE DECKS WITH HMA OVERLAY)

DETAIL 4B
CONCRETE ROADWAY WITH HMA OVERLAY
(DO NOT USE THIS DETAIL ON CONCRETE BRIDGE DECKS WITH HMA OVERLAY)

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

F.S.K.K.A. APPROVAL	8-14-2015 PLAN DATE	R-53-A	SHEET 7 OF 22
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TRANSITION FROM LIMITED DEFLECTION TEMPORARY CONCRETE BARRIER TO STANDARD TEMPORARY BARRIER WHEN USING DETAIL 2, 3A, 3B, 4A, OR 4B

NOTES:
TCB SECTIONS 4A AND 4B MUST BE LOCATED OUTSIDE THE AREA REQUIRING LIMITED DEFLECTION TEMPORARY CONCRETE BARRIER.
ALL LIMITED DEFLECTION TCB SECTIONS, EXCLUDING TRANSITION SECTIONS AND SECTIONS WITH TYPICAL TCB CONNECTIONS, MUST BE FULLY ANCHORED TO THE TRAFFIC SIDE OF THE ROADWAY. THE TYPICAL TCB CONNECTIONS WILL BE PERMITTED.
ANY EVALUATIONS FROM THIS LANDLOT REQUIRE APPROVAL FROM THE ENGINEER PRIOR TO INSTALLATION.

TYPE L	1	2	3	4	5
TYPE S	1	2	3	4	5

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

F.S.K.K.A. APPROVAL	8-14-2015 PLAN DATE	R-53-A	SHEET 8 OF 22
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TOP SECTION OVER BRIDGE DECK EXPANSION JOINT WITH THERMAL EXPANSION LESS THAN 1/2"

NOTES:
TYPE L TCB PLACED OVER BRIDGE EXPANSION JOINT WITH THERMAL EXPANSION LESS THAN 1/2"
TYPE S TCB PLACED OVER BRIDGE EXPANSION JOINT WITH THERMAL EXPANSION LESS THAN 1/2"

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

F.S.K.K.A. APPROVAL	8-14-2015 PLAN DATE	R-53-A	SHEET 9 OF 22
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PLAN VIEW
TEMPORARY CONCRETE BARRIER TYPE L

NOTES:
ANCHOR BOLTS MUST BE FULLY ANCHORED TO THE TRAFFIC SIDE OF THE ROADWAY. THE TYPICAL TCB CONNECTIONS WILL BE PERMITTED.
ANY EVALUATIONS FROM THIS LANDLOT REQUIRE APPROVAL FROM THE ENGINEER PRIOR TO INSTALLATION.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

F.S.K.K.A. APPROVAL	8-14-2015 PLAN DATE	R-53-A	SHEET 10 OF 22
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WIRE ROPE ASSEMBLY DETAIL

NOTES:
TYPE L AND TYPE S TCB SECTIONS MAY BE REVERSED IN ORDER TO MATCH CONNECTIONS OF ADJACENT TYPE L OR TYPE S TCB SECTIONS.
ANCHOR BOLTS MUST BE FULLY ANCHORED TO THE TRAFFIC SIDE OF THE ROADWAY. THE TYPICAL TCB CONNECTIONS WILL BE PERMITTED.
ANY EVALUATIONS FROM THIS LANDLOT REQUIRE APPROVAL FROM THE ENGINEER PRIOR TO INSTALLATION.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

F.S.K.K.A. APPROVAL	8-14-2015 PLAN DATE	R-53-A	SHEET 11 OF 22
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STEEL CAP PLATE DETAILS

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

F.S.K.K.A. APPROVAL	8-14-2015 PLAN DATE	R-53-A	SHEET 12 OF 22
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DLZ			
REV. NO.	DESCRIPTION	DATE	DR. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

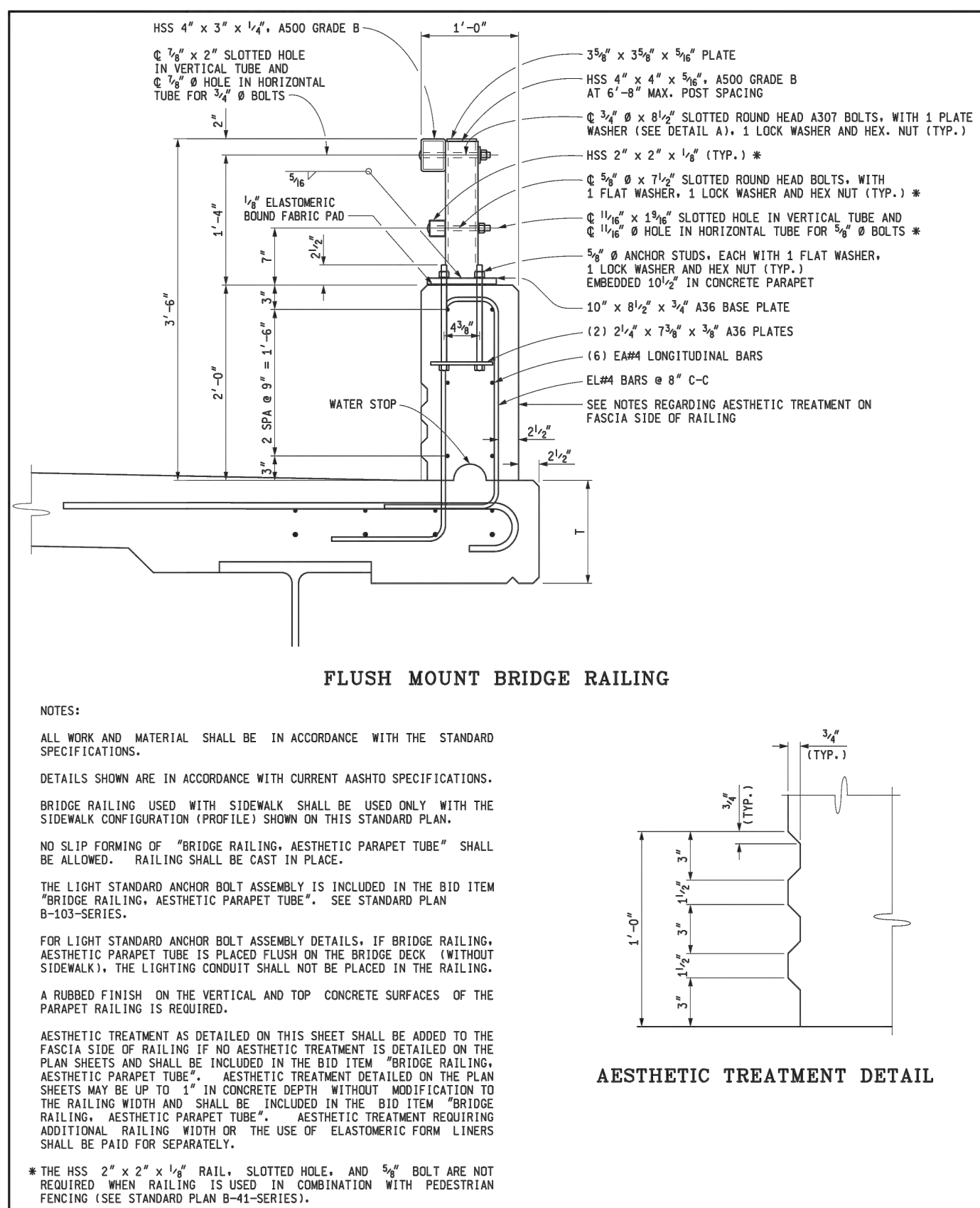
MDOT STANDARD DETAILS

SCALE
HOR. 1"=40'
VERT. 1"=4'

DRAWING NO.
2021-008-STD10

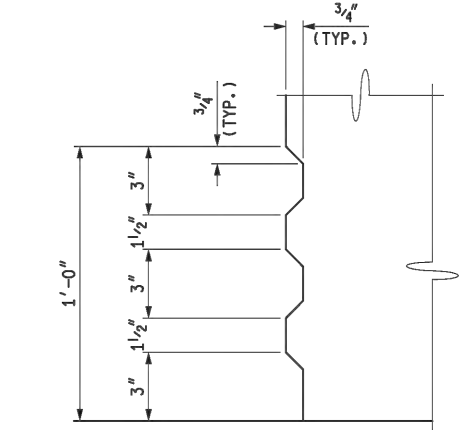
SHEET NO. 131 OF 153

APPROVED BY: _____



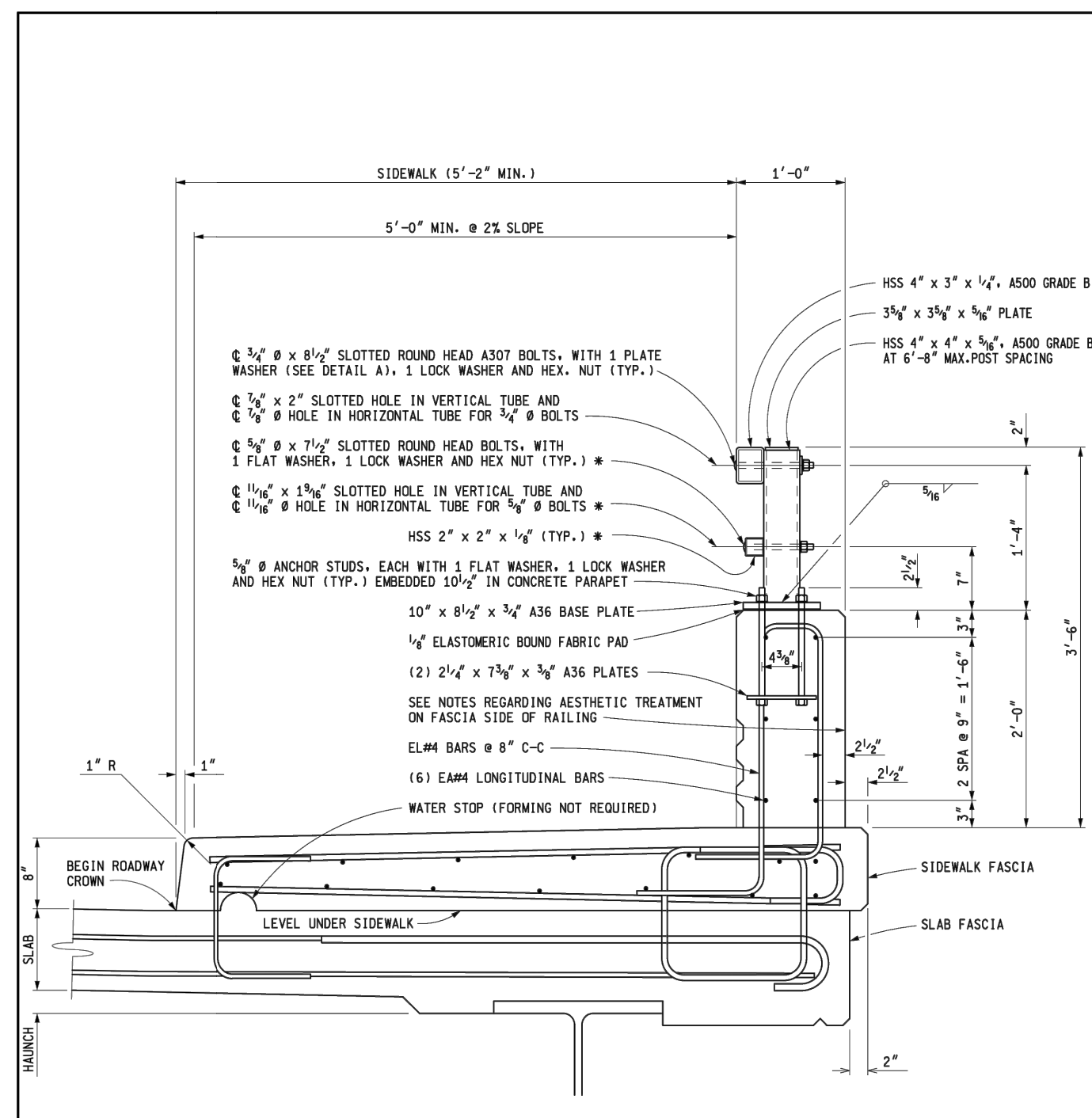
FLUSH MOUNT BRIDGE RAILING

NOTES:
 ALL WORK AND MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
 DETAILS SHOWN ARE IN ACCORDANCE WITH CURRENT AASHTO SPECIFICATIONS.
 BRIDGE RAILING USED WITH SIDEWALK SHALL BE USED ONLY WITH THE SIDEWALK CONFIGURATION (PROFILE) SHOWN ON THIS STANDARD PLAN.
 NO SLIP FORMING OF "BRIDGE RAILING, AESTHETIC PARAPET TUBE" SHALL BE ALLOWED. RAILING SHALL BE CAST IN PLACE.
 THE LIGHT STANDARD ANCHOR BOLT ASSEMBLY IS INCLUDED IN THE BID ITEM "BRIDGE RAILING, AESTHETIC PARAPET TUBE". SEE STANDARD PLAN B-103-SERIES.
 FOR LIGHT STANDARD ANCHOR BOLT ASSEMBLY DETAILS, IF BRIDGE RAILING, AESTHETIC PARAPET TUBE IS PLACED FLOOR ON THE BRIDGE DECK (WITHOUT SIDEWALK), THE LIGHTING CONDUIT SHALL NOT BE PLACED IN THE RAILING. A RUBBED FINISH ON THE VERTICAL AND TOP CONCRETE SURFACES OF THE PARAPET RAILING IS REQUIRED.
 AESTHETIC TREATMENT AS DETAILED ON THIS SHEET SHALL BE ADDED TO THE FASCIA SIDE OF RAILING IF NO AESTHETIC TREATMENT IS DETAILED ON THE PLAN SHEETS AND SHALL BE INCLUDED IN THE BID ITEM "BRIDGE RAILING, AESTHETIC PARAPET TUBE". AESTHETIC TREATMENT DETAILED ON THE PLAN SHEETS MAY BE UP TO 1" IN CONCRETE DEPTH WITHOUT MODIFICATION TO THE RAILING WIDTH AND SHALL BE INCLUDED IN THE BID ITEM "BRIDGE RAILING, AESTHETIC PARAPET TUBE". AESTHETIC TREATMENT REQUIRING ADDITIONAL RAILING WIDTH OR THE USE OF ELASTOMERIC FORM LINERS SHALL BE PAID FOR SEPARATELY.
 * THE HSS 2" x 2" x 1/4" RAIL, SLOTTED HOLE, AND 3/8" BOLT ARE NOT REQUIRED WHEN RAILING IS USED IN COMBINATION WITH PEDESTRIAN FENCING (SEE STANDARD PLAN B-41-SERIES).



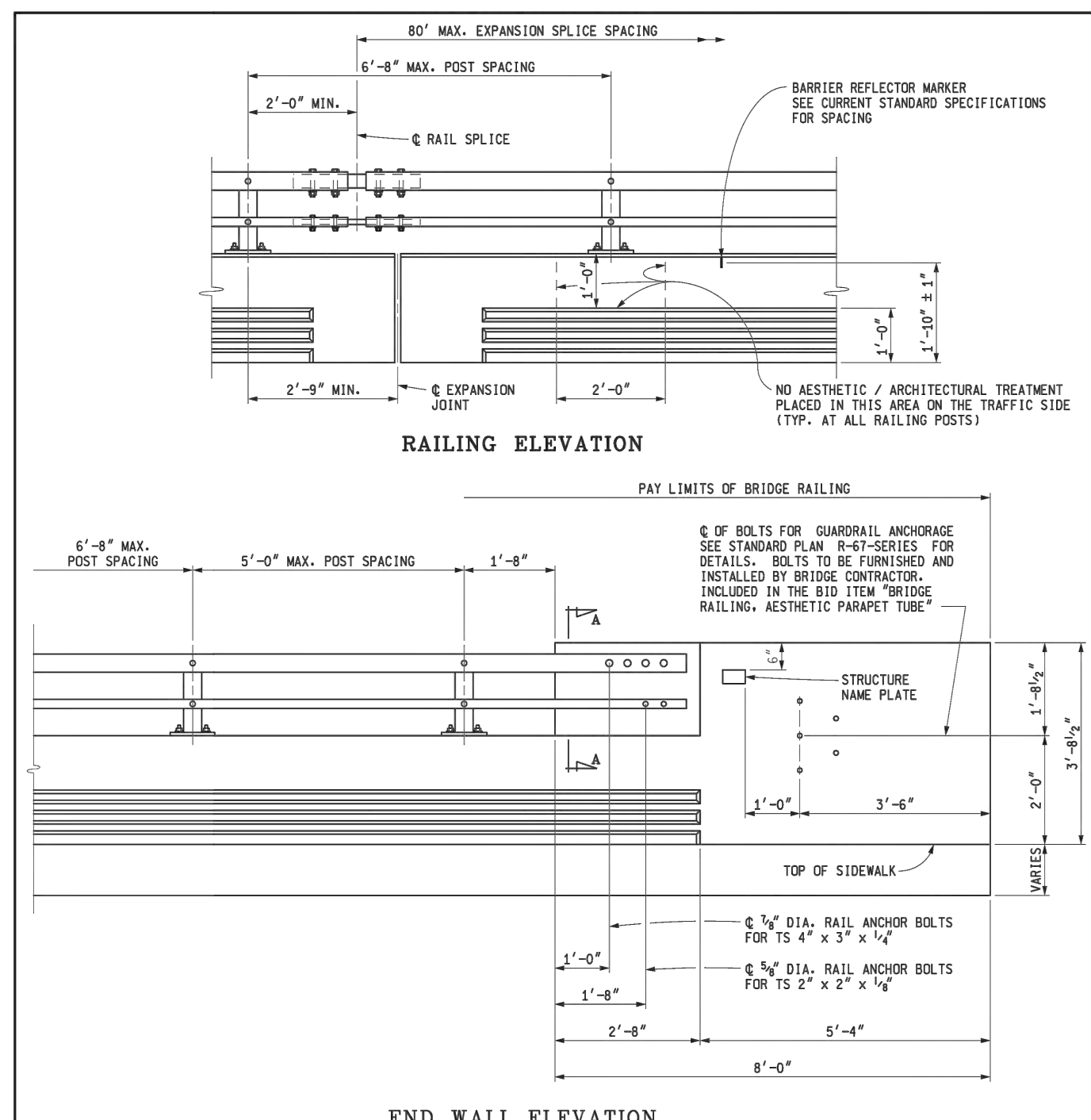
AESTHETIC TREATMENT DETAIL

	DEPARTMENT DIRECTOR Kirk T. Steudde	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		SHEET 1 OF 8
	PREPARED BY DESIGN DIVISION DRAWN BY: J.L.L. CHECKED BY: J.Z.C.	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES Bradley C. Wierlich	BRIDGE RAILING, AESTHETIC PARAPET TUBE	
	7-25-2017	11-2-2016	B-25-K	
	F.H.W.A. APPROVAL	PLAN DATE		

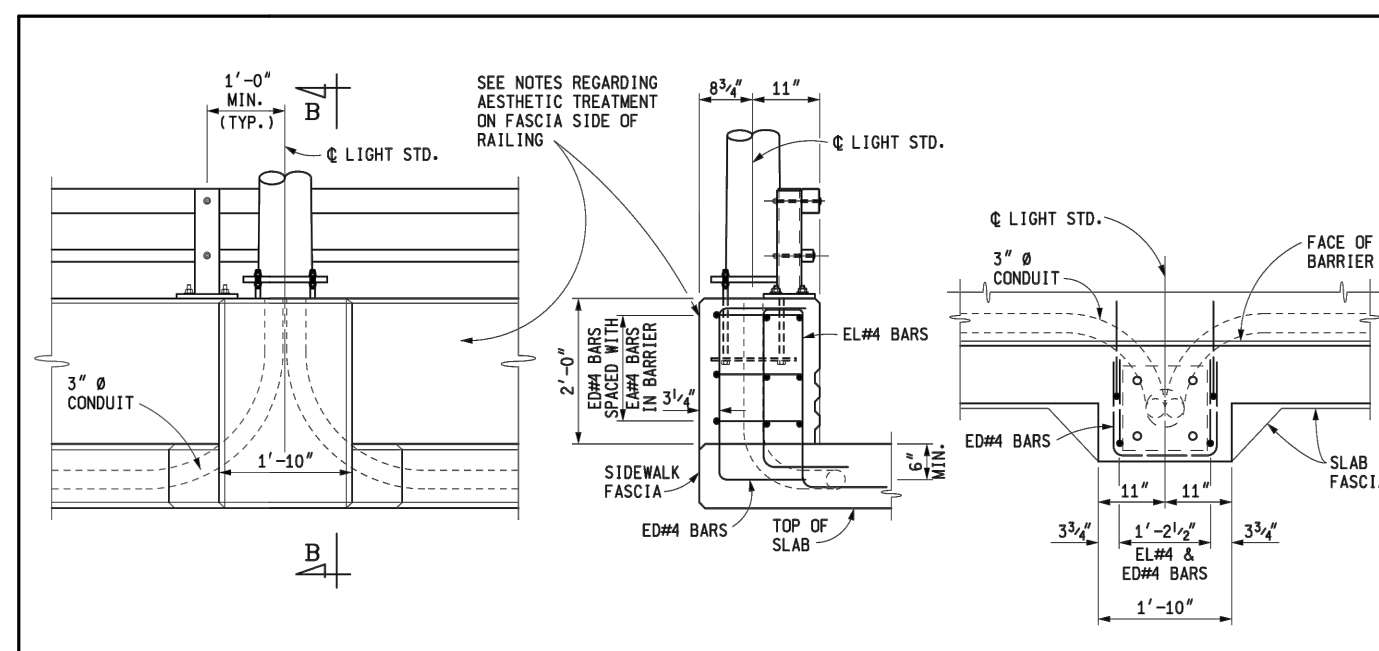


BRIDGE RAILING WITH SIDEWALK

	DEPARTMENT DIRECTOR Kirk T. Steudde	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		SHEET 2 OF 8
	PREPARED BY DESIGN DIVISION DRAWN BY: J.L.L. CHECKED BY: J.Z.C.	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES Bradley C. Wierlich	BRIDGE RAILING, AESTHETIC PARAPET TUBE	
	7-25-2017	11-2-2016	B-25-K	
	F.H.W.A. APPROVAL	PLAN DATE		

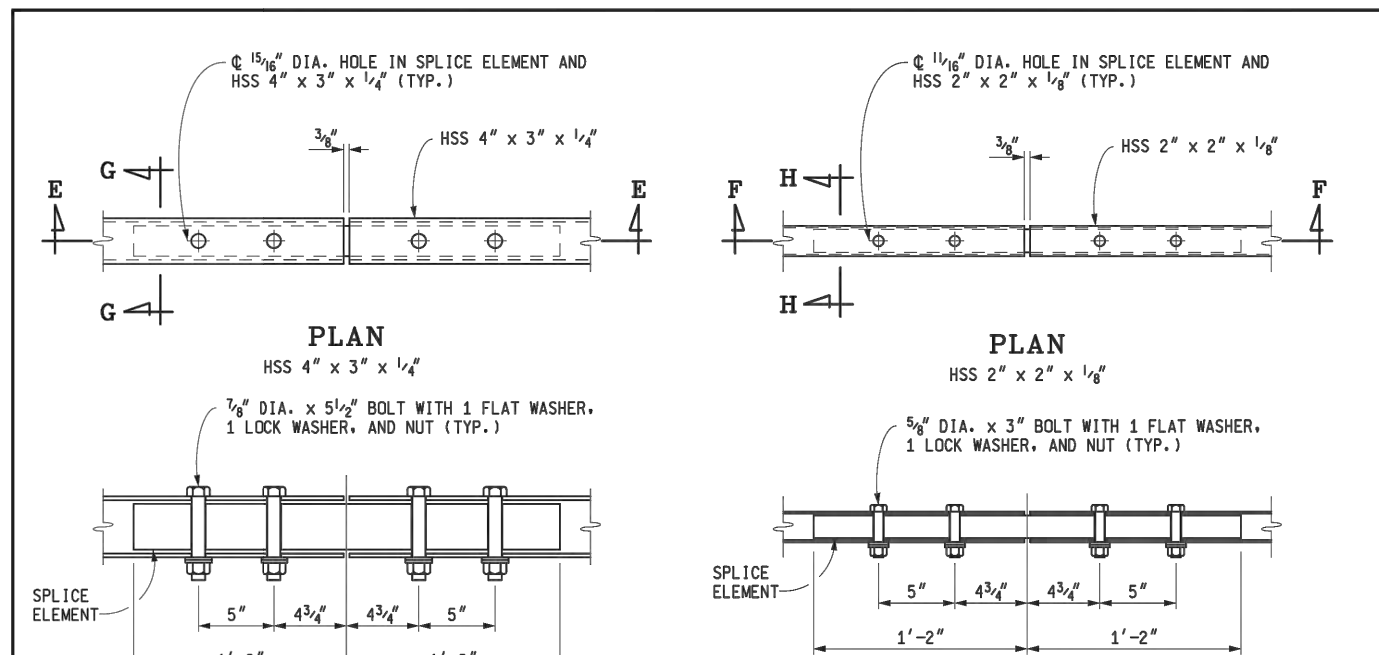


	DEPARTMENT DIRECTOR Kirk T. Steudde	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		SHEET 3 OF 8
	PREPARED BY DESIGN DIVISION DRAWN BY: J.L.L. CHECKED BY: J.Z.C.	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES Bradley C. Wierlich	BRIDGE RAILING, AESTHETIC PARAPET TUBE	
	7-25-2017	11-2-2016	B-25-K	
	F.H.W.A. APPROVAL	PLAN DATE		

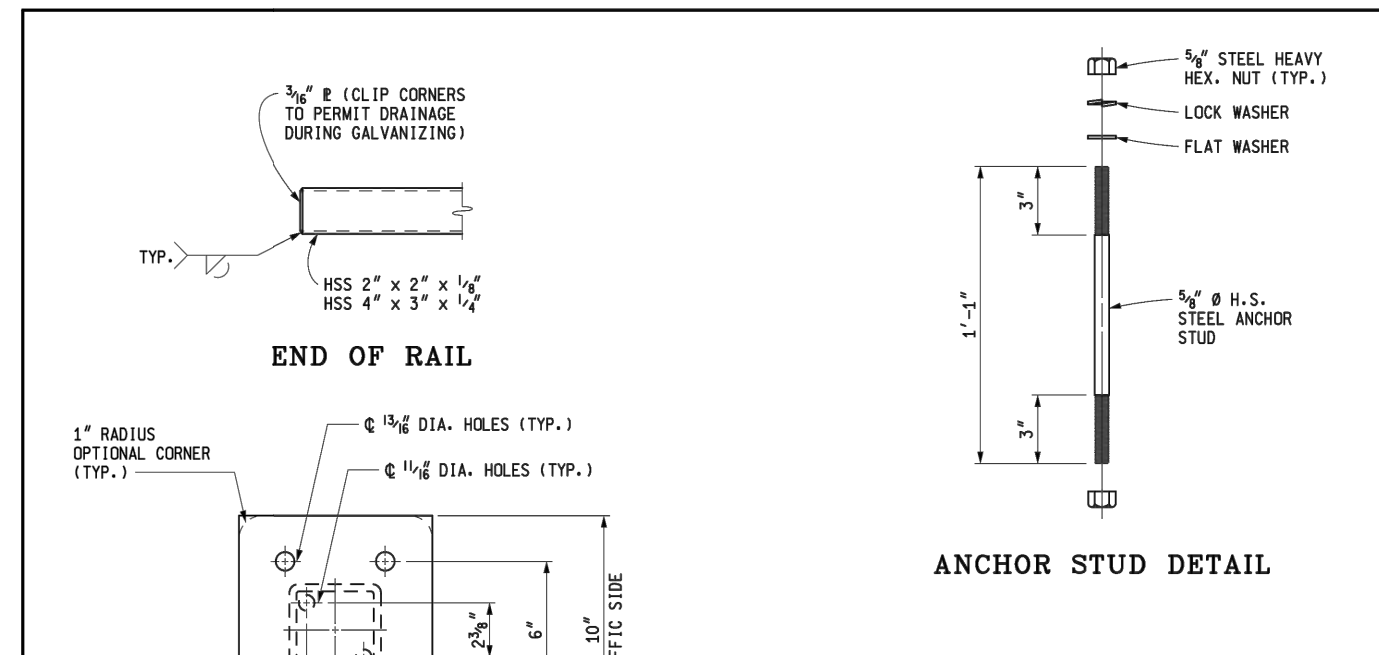


LIGHT STANDARD DETAILS

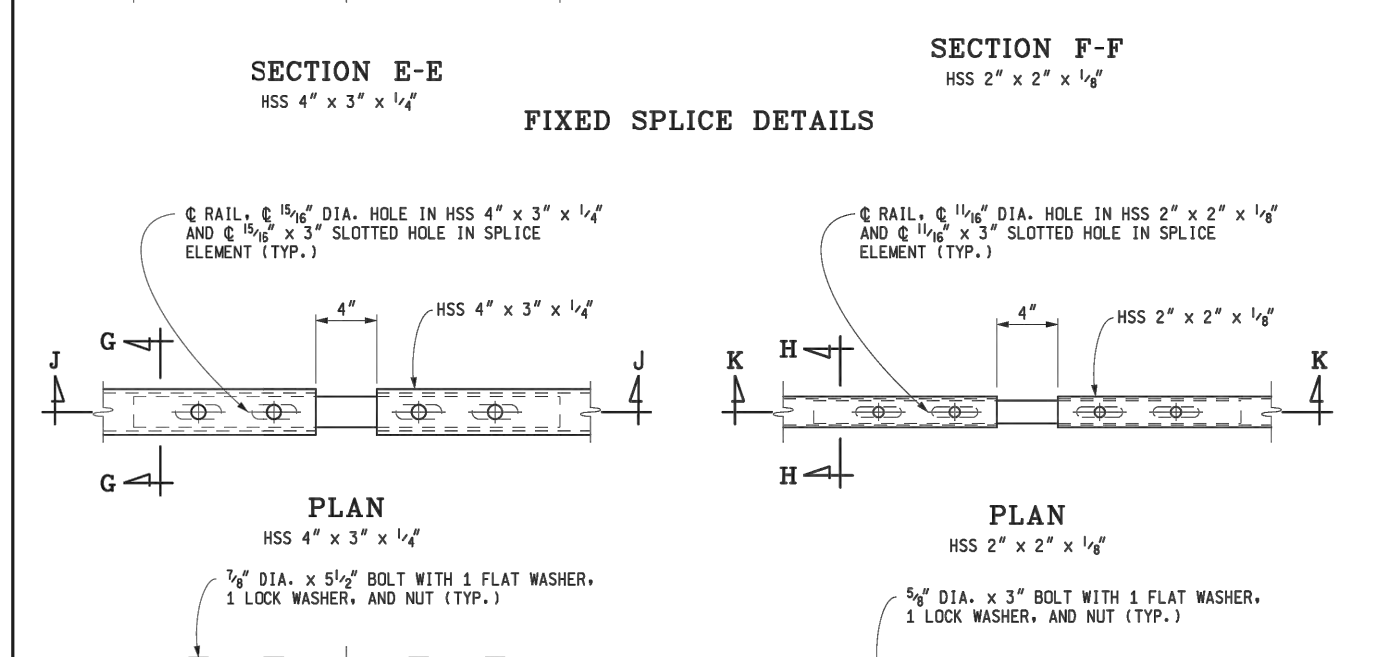
	DEPARTMENT DIRECTOR Kirk T. Steudde	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		SHEET 4 OF 8
	PREPARED BY DESIGN DIVISION DRAWN BY: J.L.L. CHECKED BY: J.Z.C.	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES Bradley C. Wierlich	BRIDGE RAILING, AESTHETIC PARAPET TUBE	
	7-25-2017	11-2-2016	B-25-K	
	F.H.W.A. APPROVAL	PLAN DATE		



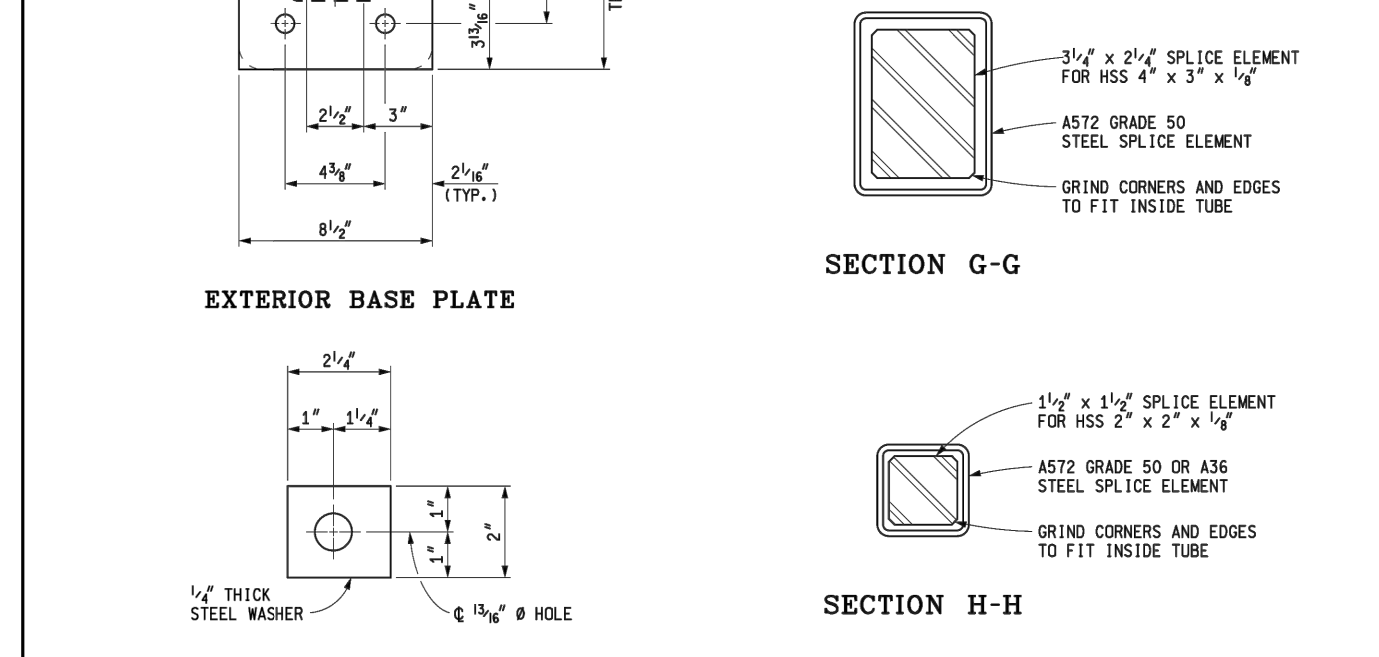
FIXED SPLICE DETAILS



ANCHOR STUD DETAIL



EXPANSION SPLICE DETAILS



EXTERIOR BASE PLATE

	DEPARTMENT DIRECTOR Kirk T. Steudde	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		SHEET 5 OF 8
	PREPARED BY DESIGN DIVISION DRAWN BY: J.L.L. CHECKED BY: J.Z.C.	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES Bradley C. Wierlich	BRIDGE RAILING, AESTHETIC PARAPET TUBE	
	7-25-2017	11-2-2016	B-25-K	
	F.H.W.A. APPROVAL	PLAN DATE		

	DEPARTMENT DIRECTOR Kirk T. Steudde	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		SHEET 6 OF 8
	PREPARED BY DESIGN DIVISION DRAWN BY: J.L.L. CHECKED BY: J.Z.C.	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES Bradley C. Wierlich	BRIDGE RAILING, AESTHETIC PARAPET TUBE	
	7-25-2017	11-2-2016	B-25-K	
	F.H.W.A. APPROVAL	PLAN DATE		

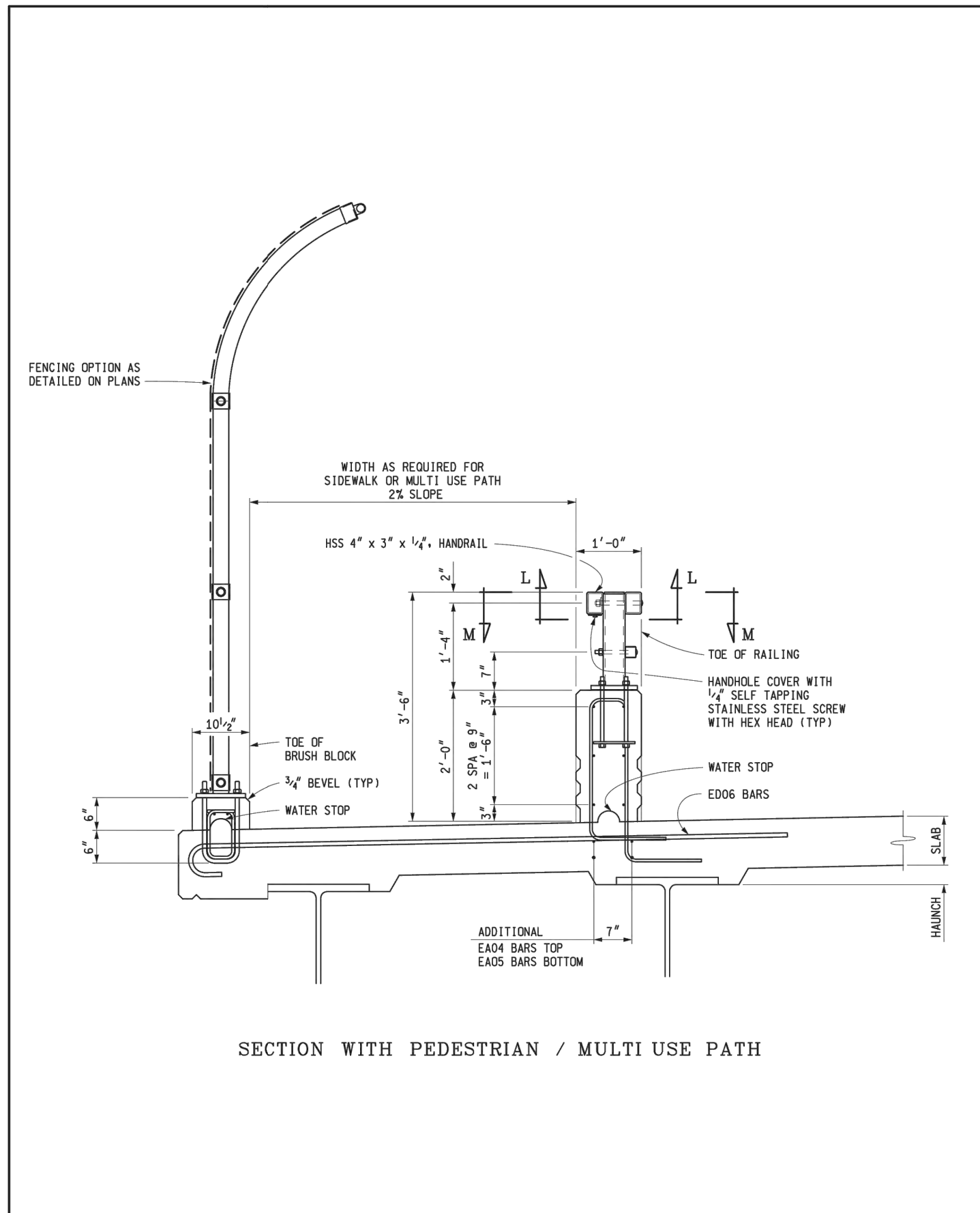


	DEPARTMENT DIRECTOR Kirk T. Steudde	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		SHEET 6 OF 8
	PREPARED BY DESIGN DIVISION DRAWN BY: J.L.L. CHECKED BY: J.Z.C.	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES Bradley C. Wierlich	BRIDGE RAILING, AESTHETIC PARAPET TUBE	
	7-25-2017	11-2-2016	B-25-K	
	F.H.W.A. APPROVAL	PLAN DATE		

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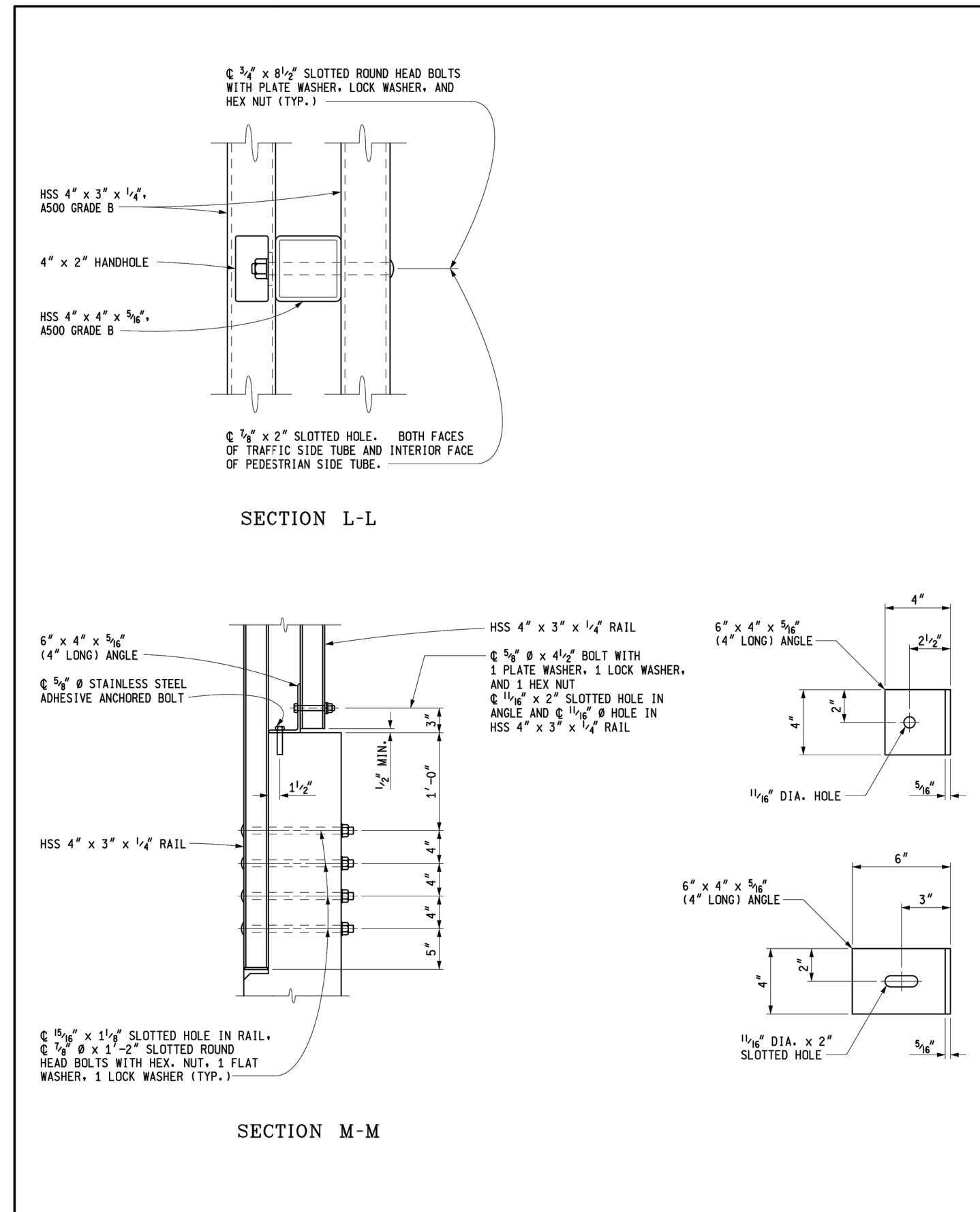
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22		

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
MDOT STANDARD DETAILS	
SCALE HOR. 1"=40' VERT. 1"=4' 	DRAWING NO. 2021-008-STD10
SHEET NO. 133 OF 153	



SECTION WITH PEDESTRIAN / MULTI USE PATH

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR			
BRIDGE RAILING, AESTHETIC PARAPET TUBE			
7-25-2017 F.H.W.A. APPROVAL	11-2-2016 PLAN DATE	B-25-K	SHEET 7 OF 8



SECTION L-L

SECTION M-M

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR			
BRIDGE RAILING, AESTHETIC PARAPET TUBE			
7-25-2017 F.H.W.A. APPROVAL	11-2-2016 PLAN DATE	B-25-K	SHEET 8 OF 8

3 WORKING DAYS
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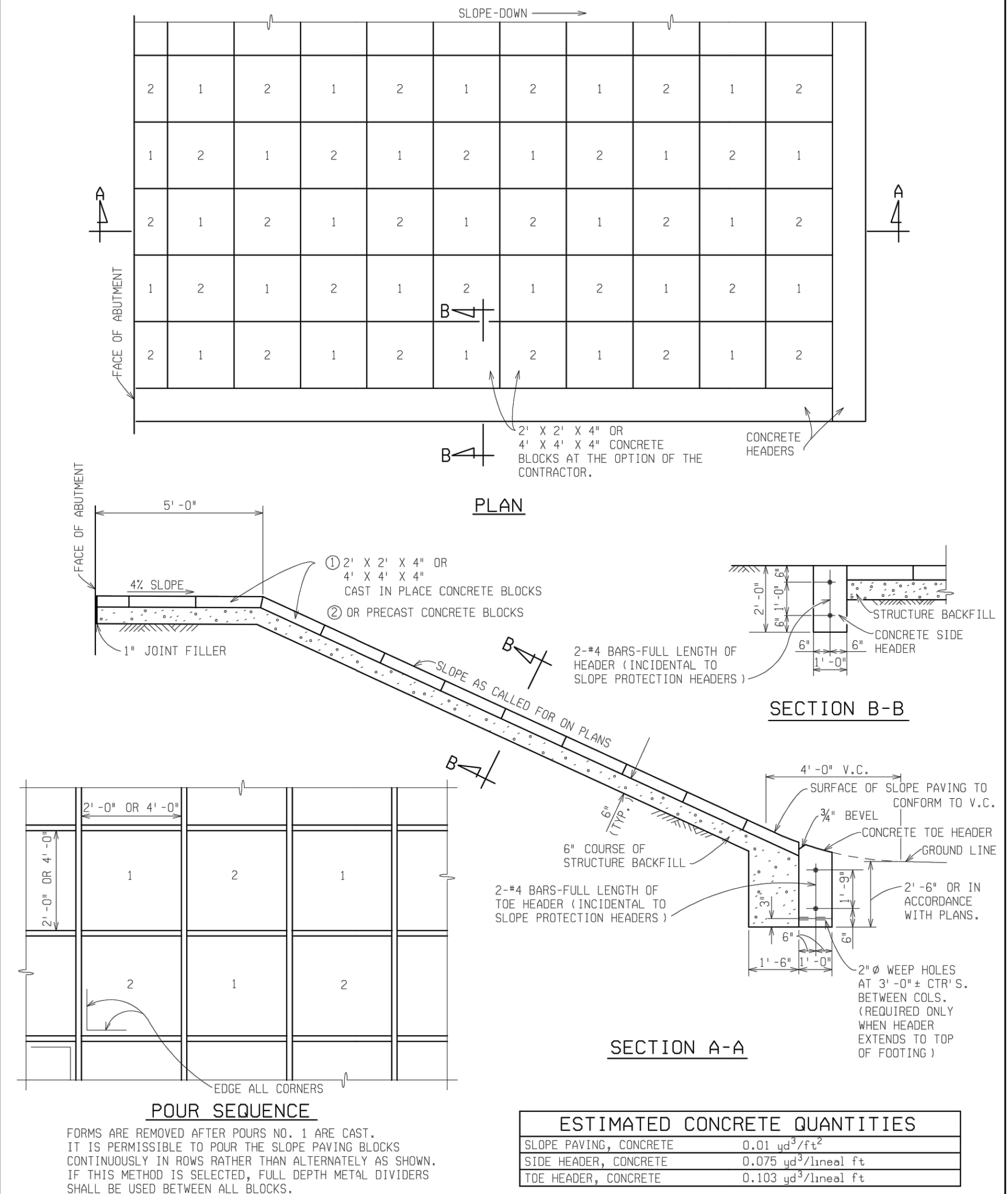


REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22		

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE	
MDOT STANDARD DETAILS	
SCALE HOR. 1"=40' VERT. 1"=4'	INCH 0 1
DRAWING NO. 2021-008-STD11	
SHEET NO. <u>134</u> OF <u>153</u>	

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SLOPE PAVING, CONCRETE



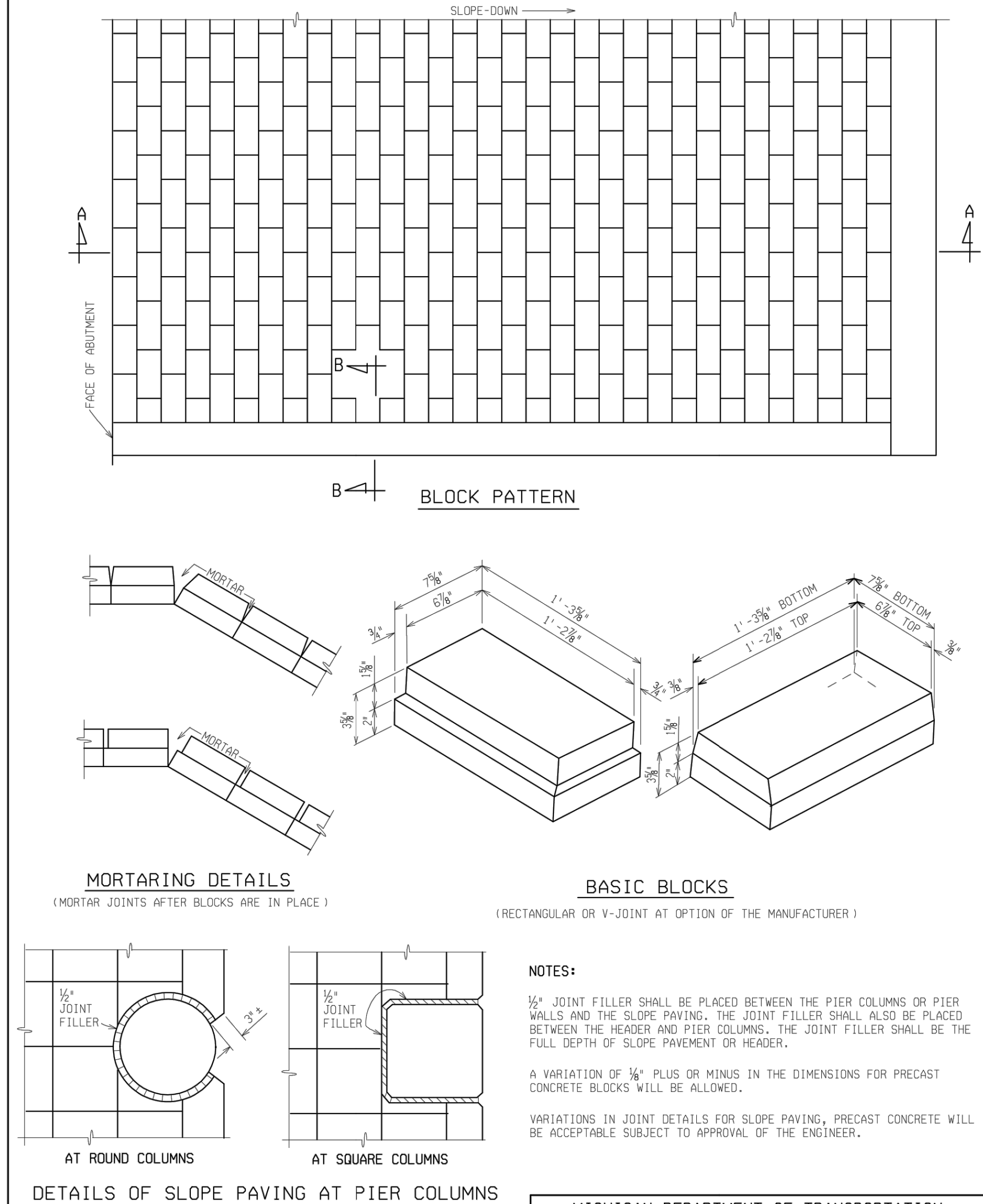
ESTIMATED CONCRETE QUANTITIES

SLOPE PAVING, CONCRETE	0.01 yd ³ /ft ²
SIDE HEADER, CONCRETE	0.075 yd ³ /lineal ft
TOE HEADER, CONCRETE	0.103 yd ³ /lineal ft

POUR SEQUENCE
FORMS ARE REMOVED AFTER POURS NO. 1 ARE CAST. IT IS PERMISSIBLE TO POUR THE SLOPE PAVING BLOCKS CONTINUOUSLY IN ROWS RATHER THAN ALTERNATELY AS SHOWN. IF THIS METHOD IS SELECTED, FULL DEPTH METAL DIVIDERS SHALL BE USED BETWEEN ALL BLOCKS.

MDOT MICHIGAN DEPARTMENT OF TRANSPORTATION	<i>James D. Culp</i> ENGINEER OF CONSTRUCTION & TECHNOLOGY	<i>Near A. ...</i> ENGINEER - BRIDGE DESIGN	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY TECHNICAL SERVICES STANDARD PLAN FOR STANDARD SLOPE PAVING DETAILS	11-26-2001	B-102-C	SHEET 1 OF 2
PREPARED BY DESIGN DIVISION	<i>Carvin Roberts</i> ENGINEER OF MAINTENANCE	<i>Gregory J. Rosine</i> DEPARTMENT DIRECTOR		F.H.W.A. APPROVAL	PLAN DATE	

SLOPE PAVING, PRECAST CONCRETE



NOTES:
1/2" JOINT FILLER SHALL BE PLACED BETWEEN THE PIER COLUMNS OR PIER WALLS AND THE SLOPE PAVING. THE JOINT FILLER SHALL ALSO BE PLACED BETWEEN THE HEADER AND PIER COLUMNS. THE JOINT FILLER SHALL BE THE FULL DEPTH OF SLOPE PAVEMENT OR HEADER.
A VARIATION OF 1/8" PLUS OR MINUS IN THE DIMENSIONS FOR PRECAST CONCRETE BLOCKS WILL BE ALLOWED.
VARIATIONS IN JOINT DETAILS FOR SLOPE PAVING, PRECAST CONCRETE WILL BE ACCEPTABLE SUBJECT TO APPROVAL OF THE ENGINEER.

DETAILS OF SLOPE PAVING AT PIER COLUMNS

MDOT MICHIGAN DEPARTMENT OF TRANSPORTATION	<i>James D. Culp</i> ENGINEER OF CONSTRUCTION & TECHNOLOGY	<i>Near A. ...</i> ENGINEER - BRIDGE DESIGN	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY TECHNICAL SERVICES STANDARD PLAN FOR STANDARD SLOPE PAVING DETAILS	11-26-2001	B-102-C	SHEET 2 OF 2
PREPARED BY DESIGN DIVISION	<i>Carvin Roberts</i> ENGINEER OF MAINTENANCE	<i>Gregory J. Rosine</i> DEPARTMENT DIRECTOR		F.H.W.A. APPROVAL	PLAN DATE	

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REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10-9-22		

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

EAST MEDICAL CENTER DRIVE

MDOT STANDARD DETAILS

SCALE
HOR. 1"=40'
VERT. 1"=4'

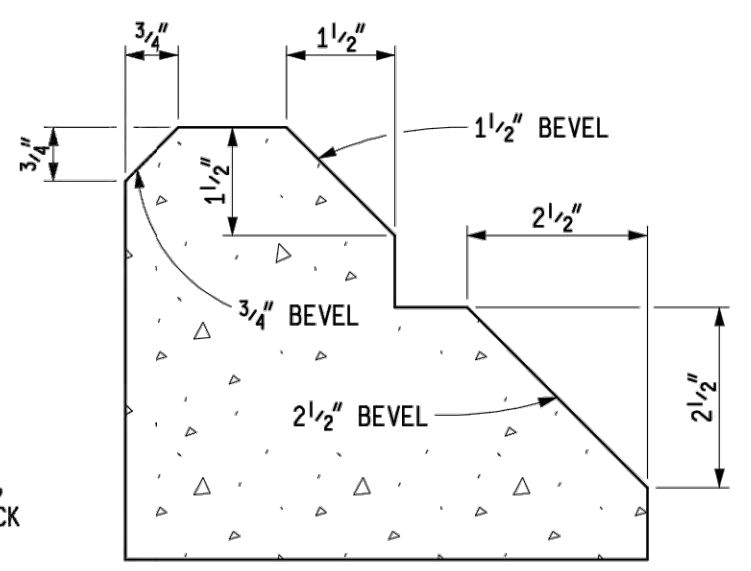
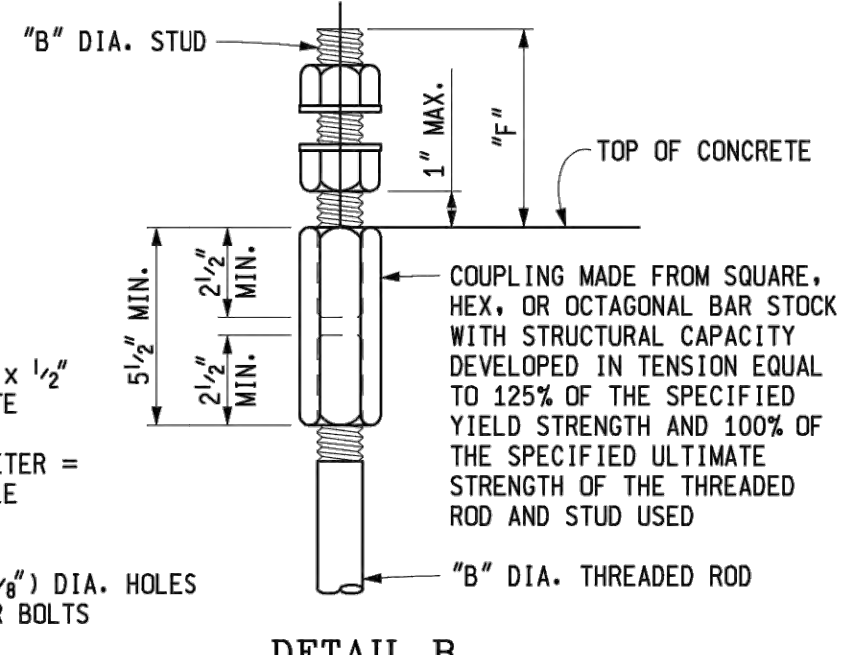
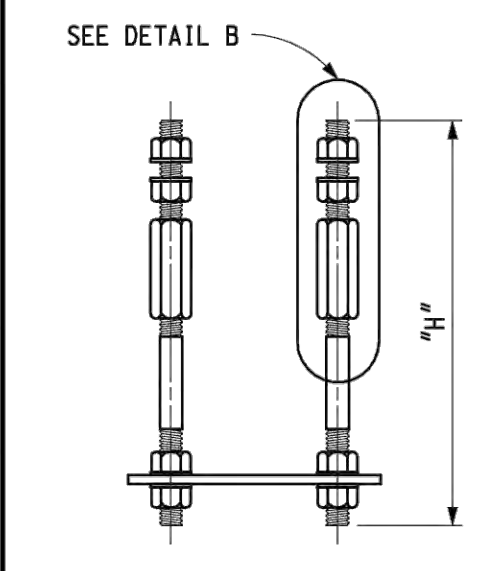
DRAWING NO.
2021-008-STD12

SHEET NO. 135 OF 153

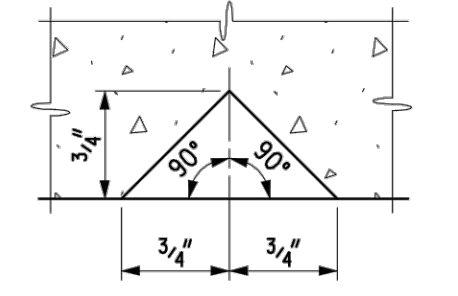
APPROVED BY _____

ANCHOR BOLT ASSEMBLY DIMENSIONS								
LIGHT STANDARD MOUNTING HEIGHT	BOLT CIRCLE "A"	ANCHOR BOLT DIA. "B"	"C"	"D"	"E"	STUD PROJECTION "F"	STUD LENGTH "G"	"H"
30'	11"	1"	11 1/2"	7 3/4"	1 1/8"	4 3/4"	7 1/4"	1' - 9 3/4"
30'	11"	1 1/4"	11 1/2"	7 3/4"	1 1/8"	5 1/2"	8"	1' - 10 1/2"
40'	1' - 1"	1 1/4"	1' - 2"	9 1/4"	2 3/8"	5 1/2"	8"	1' - 10 1/2"
45'	1' - 1"	1 1/4"	1' - 2"	9 1/4"	2 3/8"	5 1/2"	8"	1' - 10 1/2"

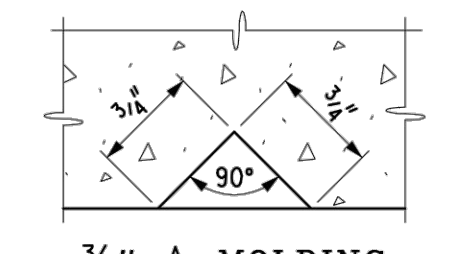
* UP TO 15' SINGLE OR DOUBLE BRACKET ARM
 ** UP TO 17' SINGLE OR DOUBLE BRACKET ARM
 ANCHOR BOLTS (4 REQUIRED):
 "B" DIA. x 1'-2" THREADED ROD AND "B" DIA. x "G" STUD
 WITH 4 NUTS, 4 WASHERS, AND ONE COUPLING.



BEVEL DETAILS

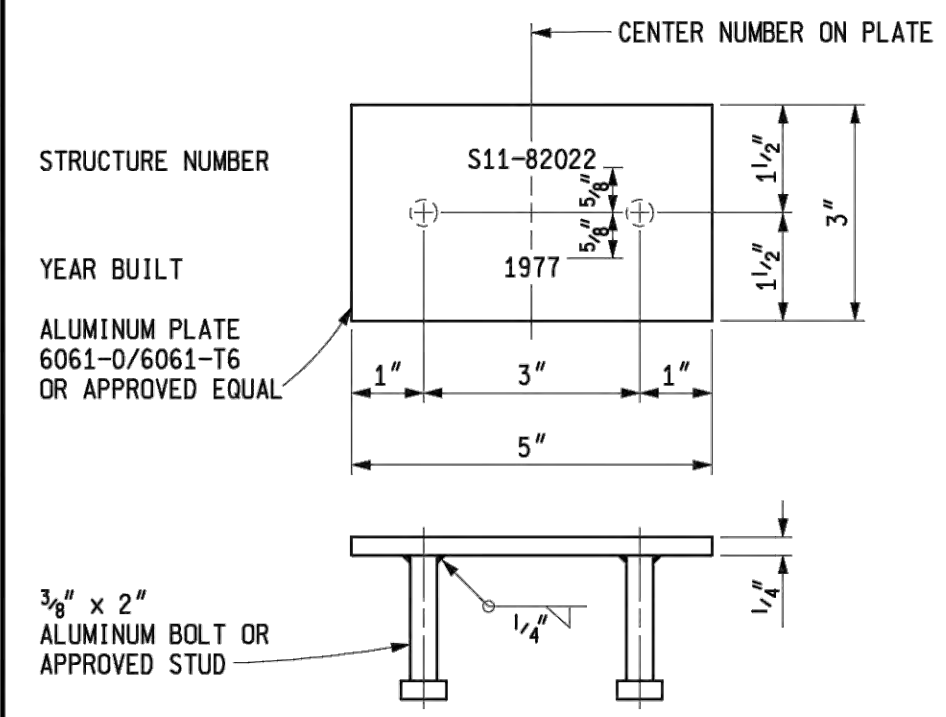


DOUBLE 3/4" Δ MOLDING



3/4" Δ MOLDING MOLDING DETAILS

LIGHT STANDARD ANCHOR BOLT ASSEMBLY



NAME PLATE

NOTES:
 DETAILS SHOWN ARE ACCORDING TO THE CURRENT AASHTO SPECIFICATIONS.
 LIGHT STANDARD ANCHOR BOLT ASSEMBLY STEEL PLATE SHALL BE ASTM A36.
 ALL STEEL SHALL BE HOT-DIP GALVANIZED ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS.
 ANCHOR BOLTS, WASHERS, COUPLINGS AND NUTS FOR LIGHT STANDARDS SHALL BE ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS.
 THE COUPLING SHALL BE RETAPPED AFTER GALVANIZING IN THE SAME MANNER AS SPECIFIED FOR NUTS.
 ALUMINUM PLATE SHALL MEET THE REQUIREMENTS OF ASTM B209.
 ALUMINUM BOLT SHALL MEET THE REQUIREMENTS OF ASTM F468.

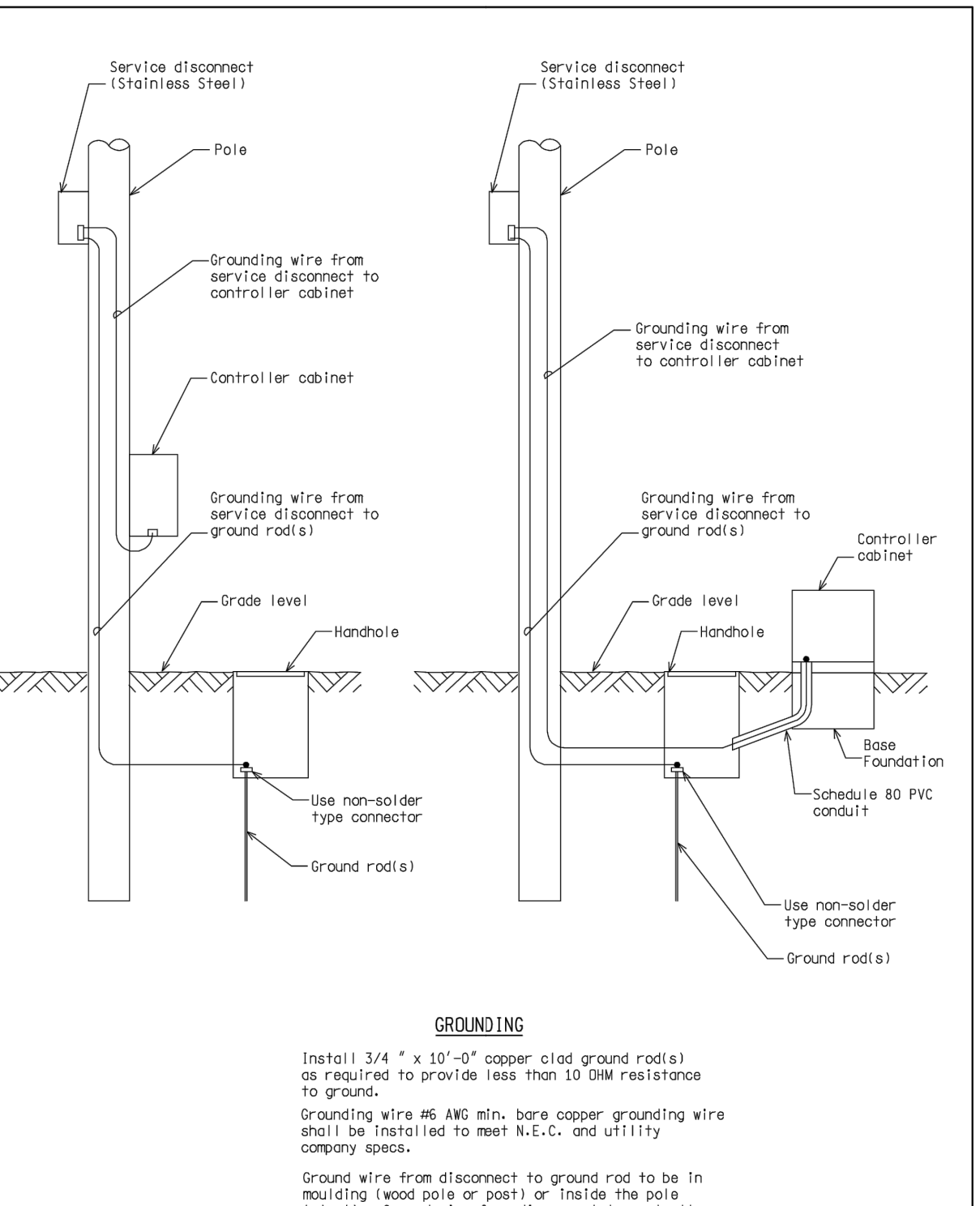
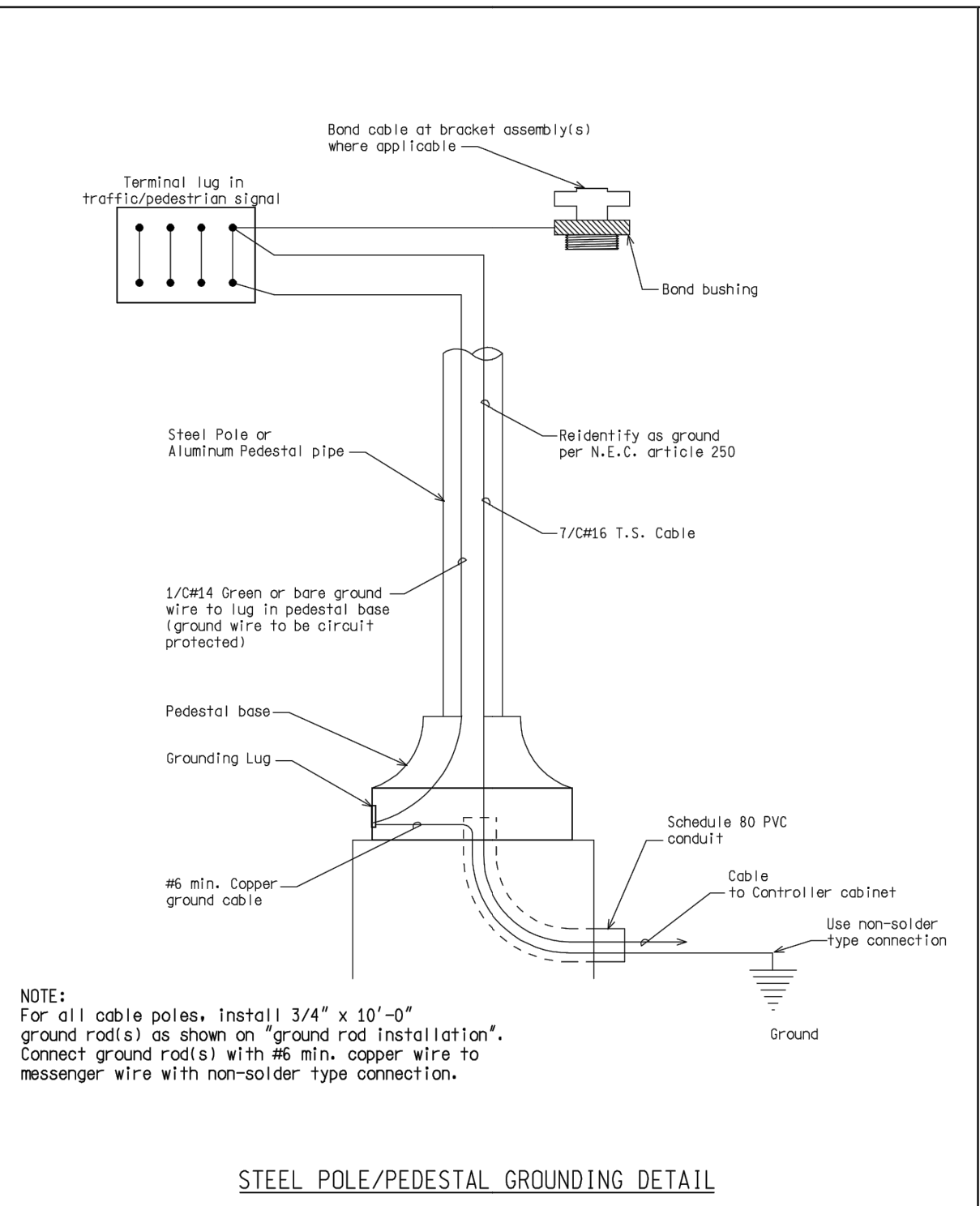
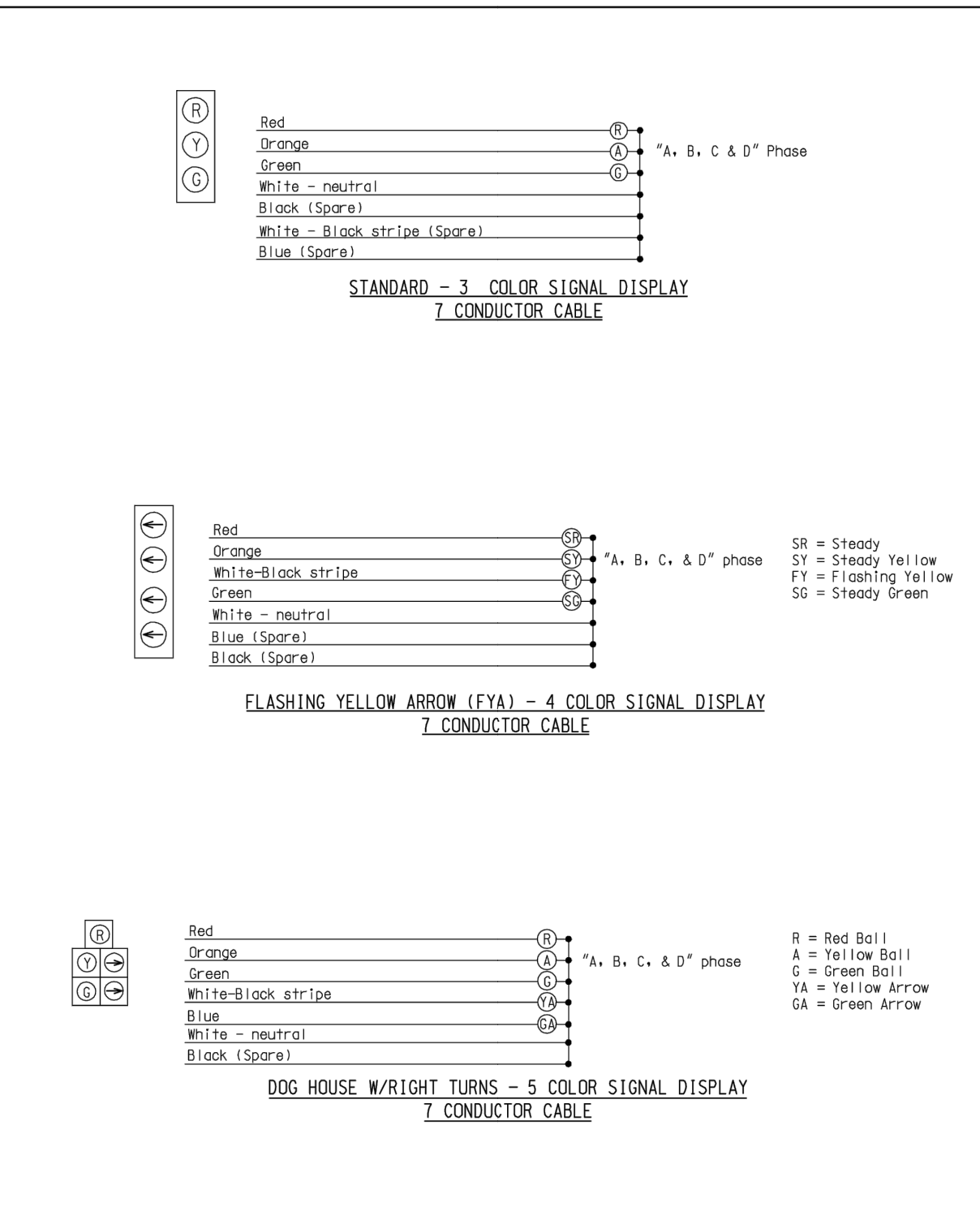
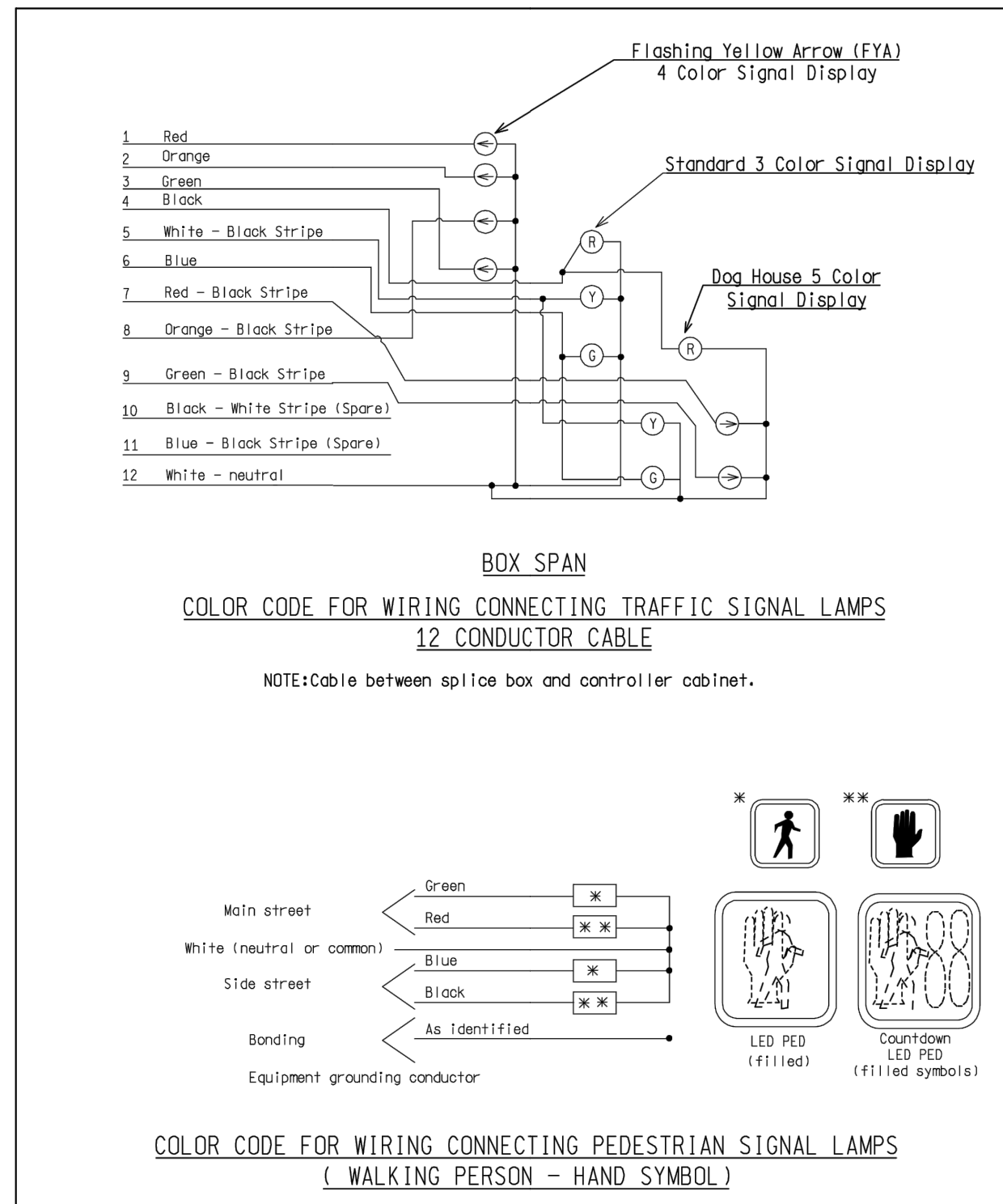
	DEPARTMENT DIRECTOR Kirk T. Stouffe 	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR MOLDING, BEVEL, LIGHT STD. ANCHOR BOLT ASSY., AND NAME PLATE DETAILS		
	PREPARED BY DESIGN DIVISION DRAWN BY: <u>B.L.T.</u> CHECKED BY: <u>V.Z.</u>	APPROVED BY: ENGINEER OF DELIVERY	APPROVED BY: ENGINEER OF DEVELOPMENT	10-21-2008 F.H.W.A. APPROVAL

B-103-E SHEET 1 OF 1

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REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
EAST MEDICAL CENTER DRIVE MDOT STANDARD DETAILS	
SCALE HOR. 1"=40' VERT. 1"=4' 	DRAWING NO. 2021-008-STD13 SHEET NO. <u>136</u> OF <u>153</u>
APPROVED BY _____	

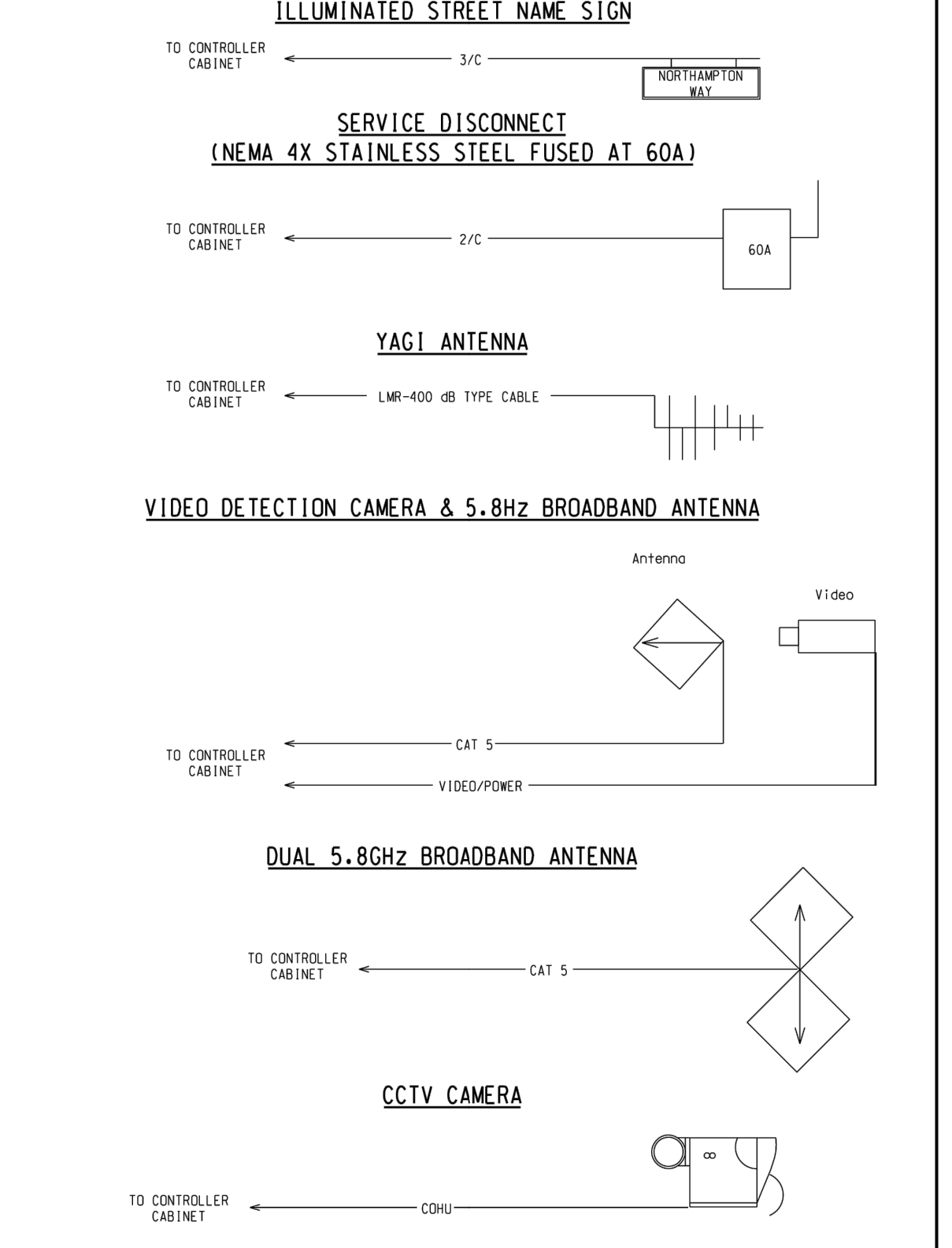
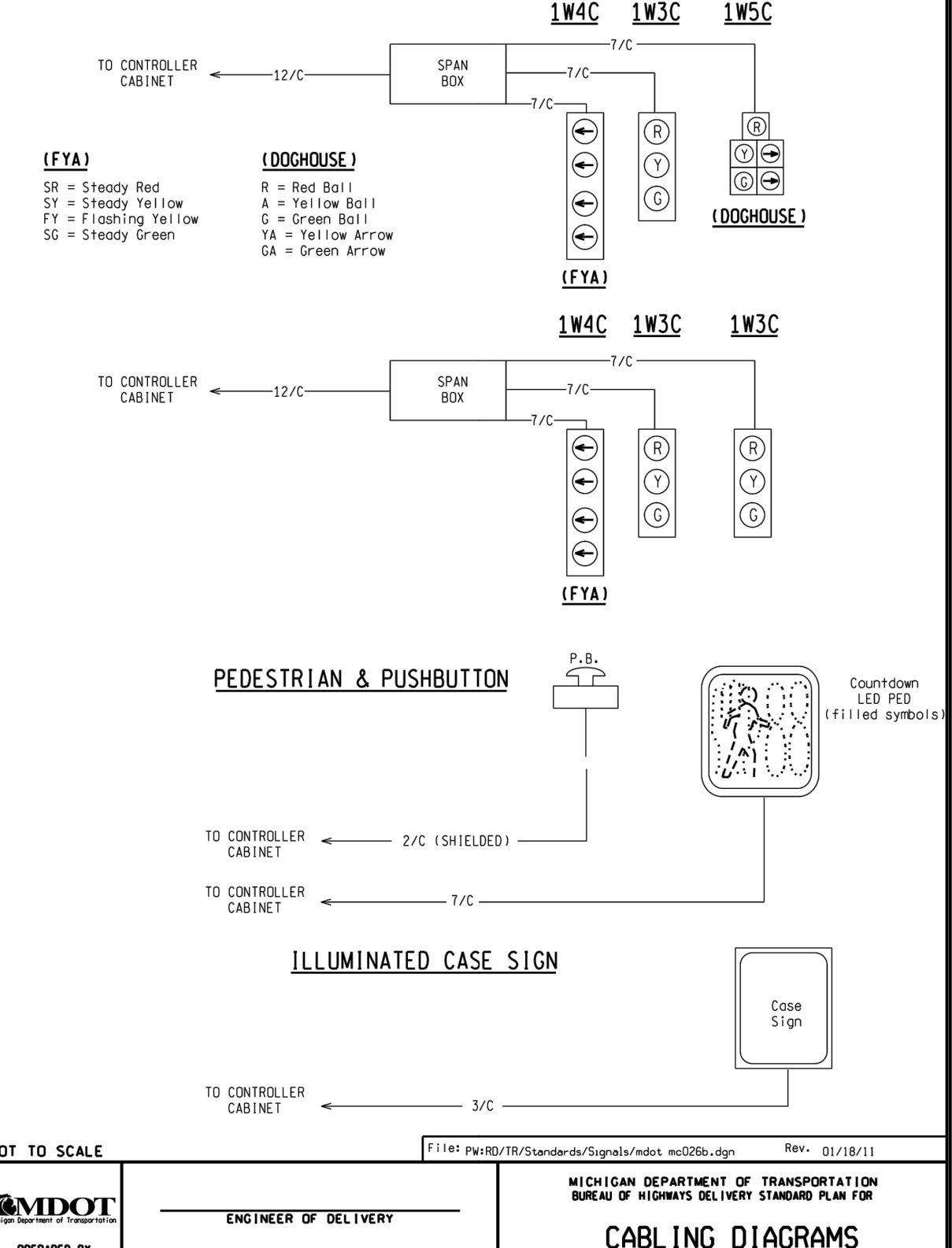
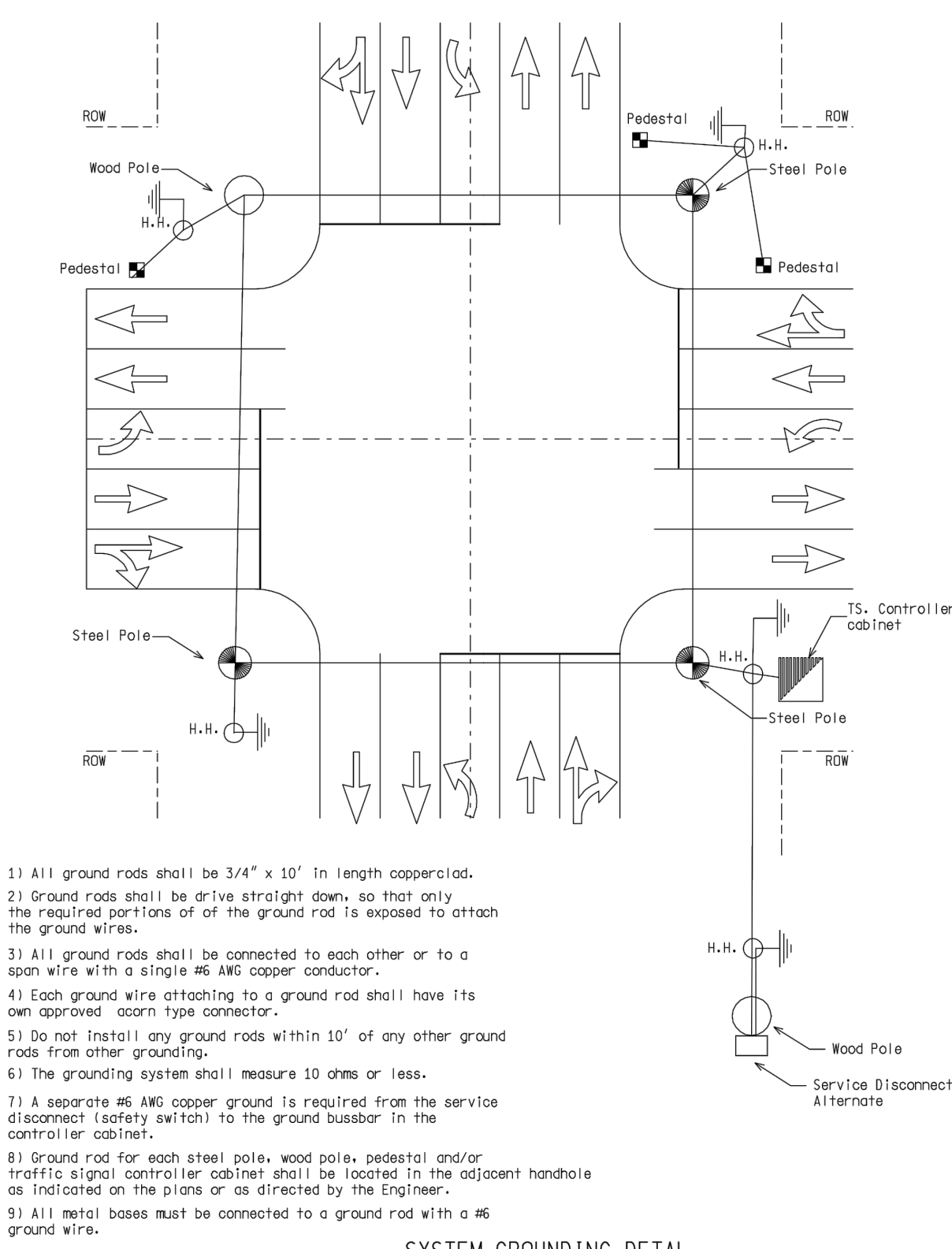
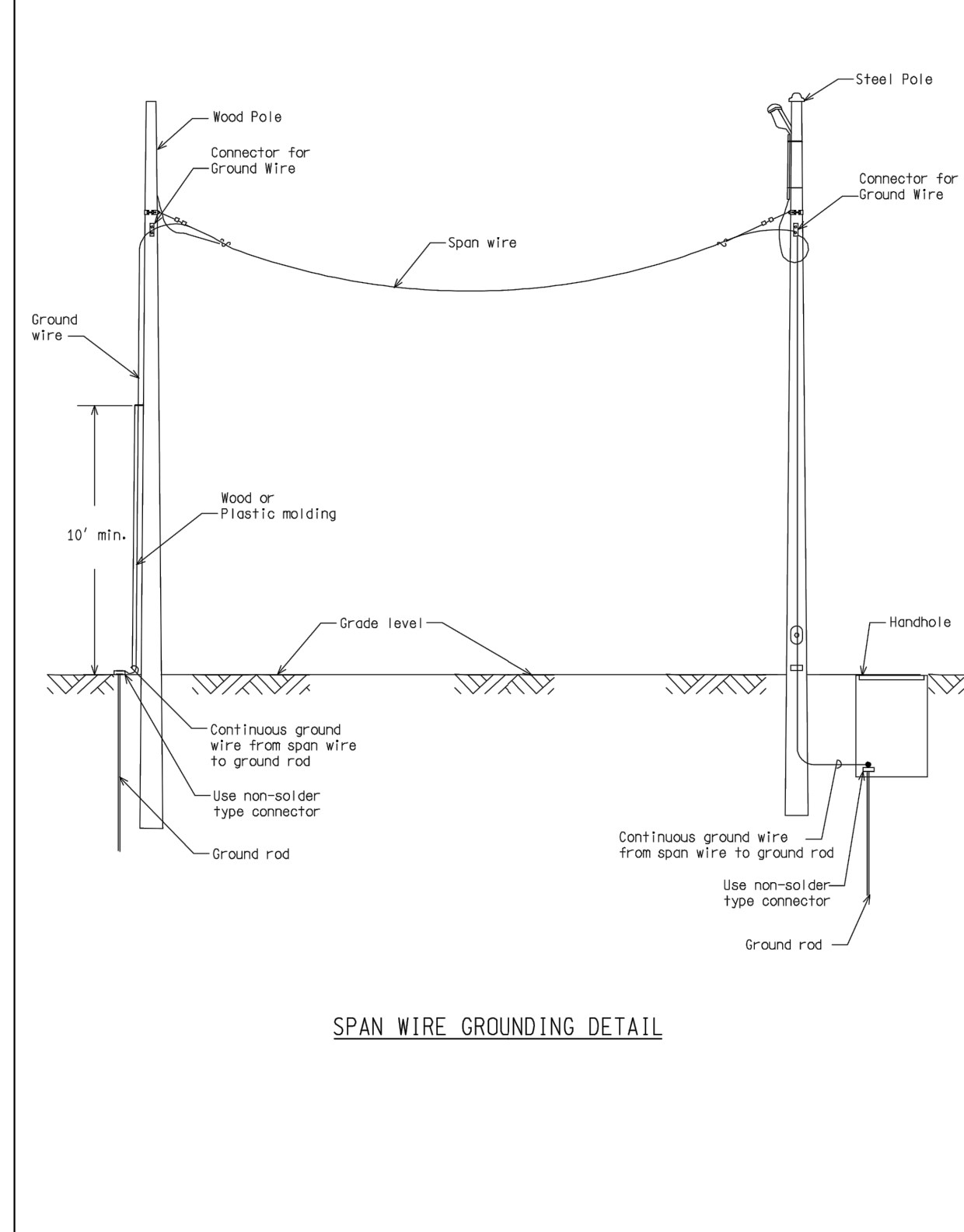


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MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	COLOR CODE WIRING/EQUIPMENT GROUNDING
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-A
		SHEET 1 OF 6

NOT TO SCALE	F:\141 Pw\RD\TR\Standards\Signals\ndot_sug202a.dgn	Rev. 11/16/10
MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN (SPECIAL DETAIL)
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	COLOR CODE WIRING/EQUIPMENT GROUNDING
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-A
		SHEET 2 OF 6

NOT TO SCALE	F:\141 Pw\RD\TR\Standards\Signals\ndot_sug202a.dgn	Rev. 11/16/10
MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN (SPECIAL DETAIL)
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	COLOR CODE WIRING/EQUIPMENT GROUNDING
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-A
		SHEET 3 OF 6

NOT TO SCALE	F:\141 Pw\RD\TR\Standards\Signals\ndot_sug202a.dgn	Rev. 11/16/10
MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN (SPECIAL DETAIL)
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	COLOR CODE WIRING/EQUIPMENT GROUNDING
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-A
		SHEET 4 OF 6



NOT TO SCALE	F:\141 Pw\RD\TR\Standards\Signals\ndot_sug202a.dgn	Rev. 11/16/10
MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN (SPECIAL DETAIL)
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	COLOR CODE WIRING/EQUIPMENT GROUNDING
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-A
		SHEET 5 OF 6

NOT TO SCALE	F:\141 Pw\RD\TR\Standards\Signals\ndot_sug202a.dgn	Rev. 11/16/10
MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN (SPECIAL DETAIL)
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	COLOR CODE WIRING/EQUIPMENT GROUNDING
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-A
		SHEET 6 OF 6

NOT TO SCALE	F:\141 Pw\RD\TR\Standards\Signals\ndot_sug202a.dgn	Rev. 01/18/11
MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	CABLING DIAGRAMS
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-B
		SHEET 1 OF 2

NOT TO SCALE	F:\141 Pw\RD\TR\Standards\Signals\ndot_sug202a.dgn	Rev. 01/18/11
MDOT	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR
PREPARED BY TRAFFIC AND SAFETY	ENGINEER OF DEVELOPMENT	CABLING DIAGRAMS
DRAWN BY: DJF	(SPECIAL DETAIL)	PLAN DATE
CHECKED BY:	FWHA APPROVAL DATE	MC-026-B
		SHEET 2 OF 2

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL SPECIAL DETAILS

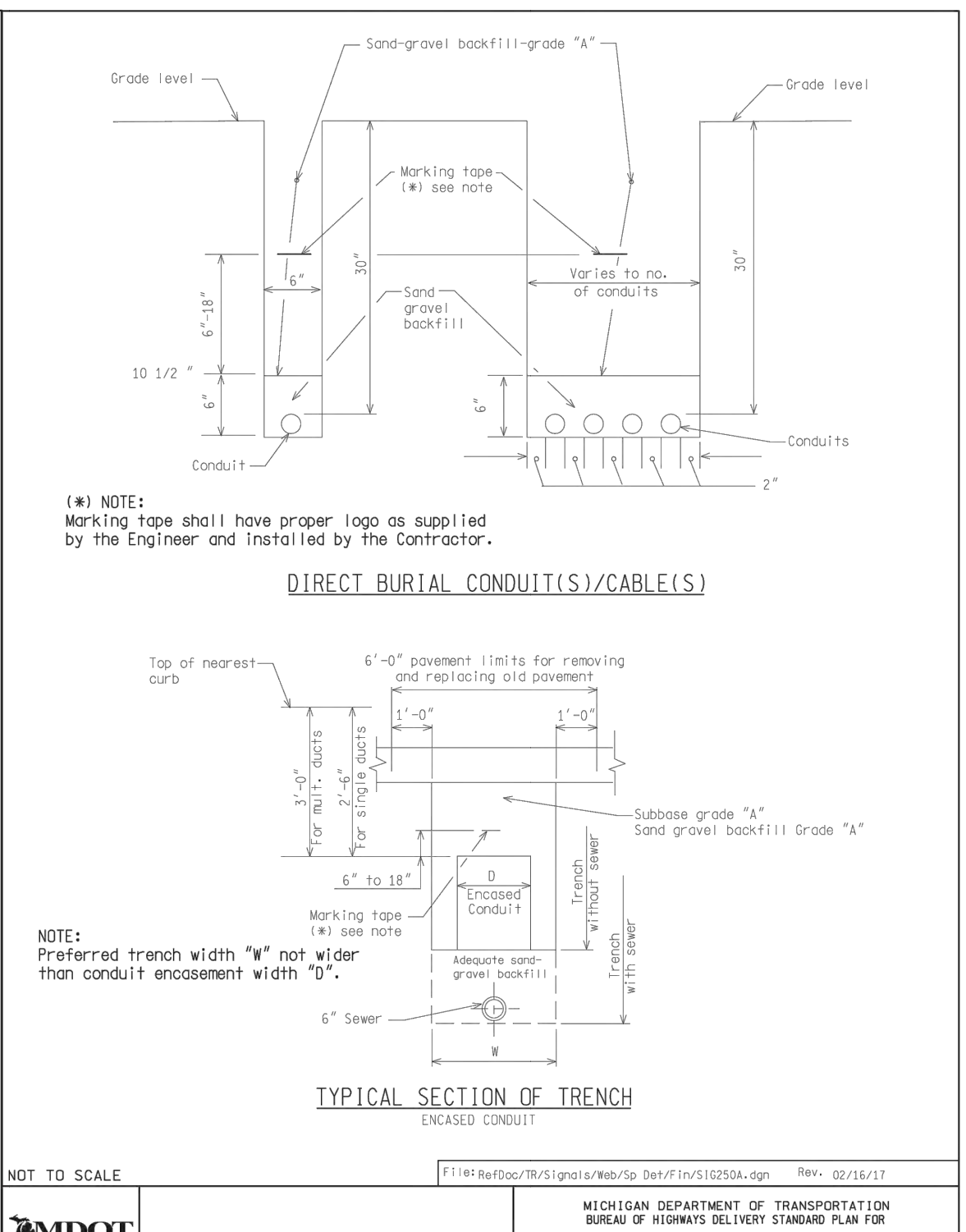
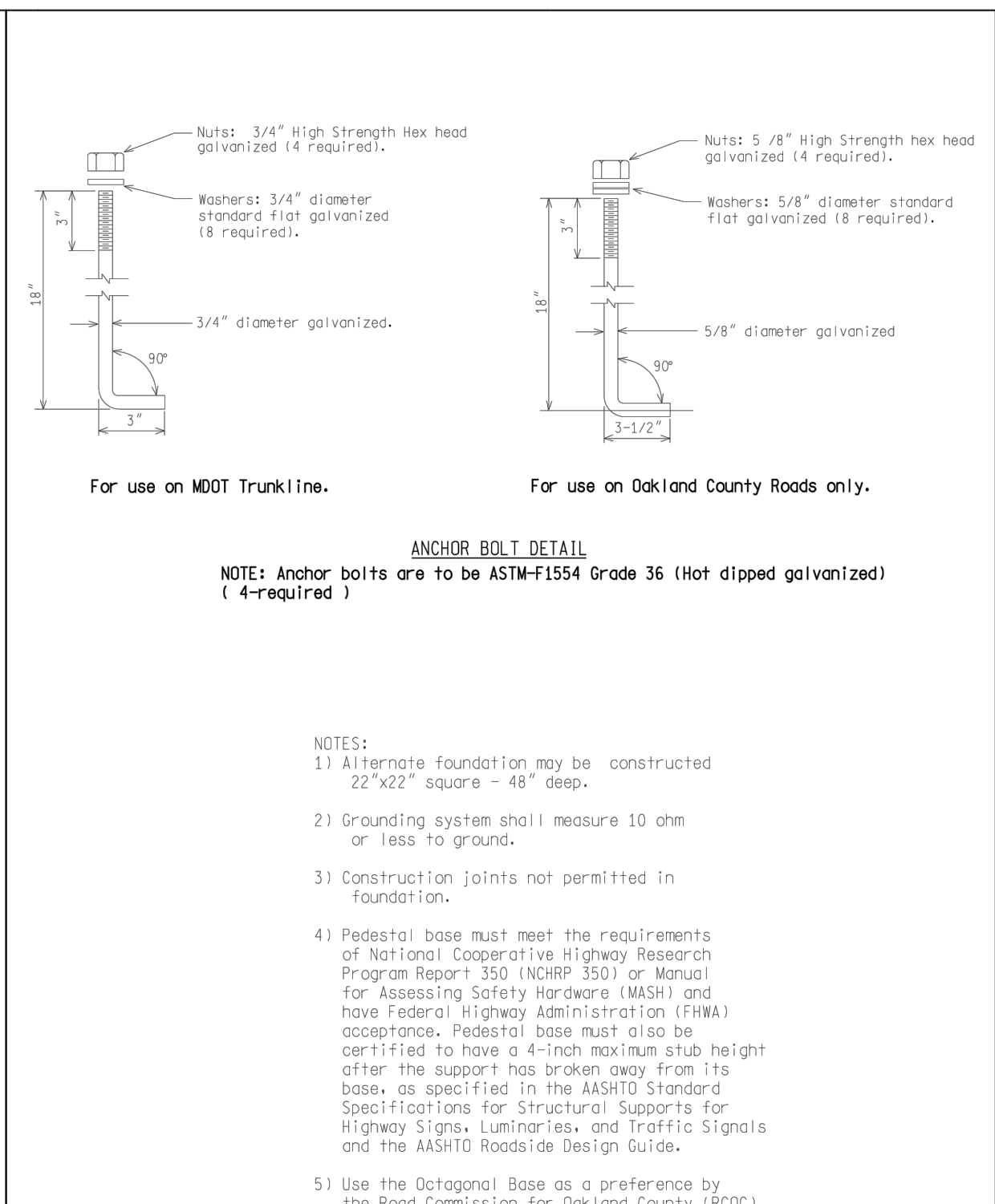
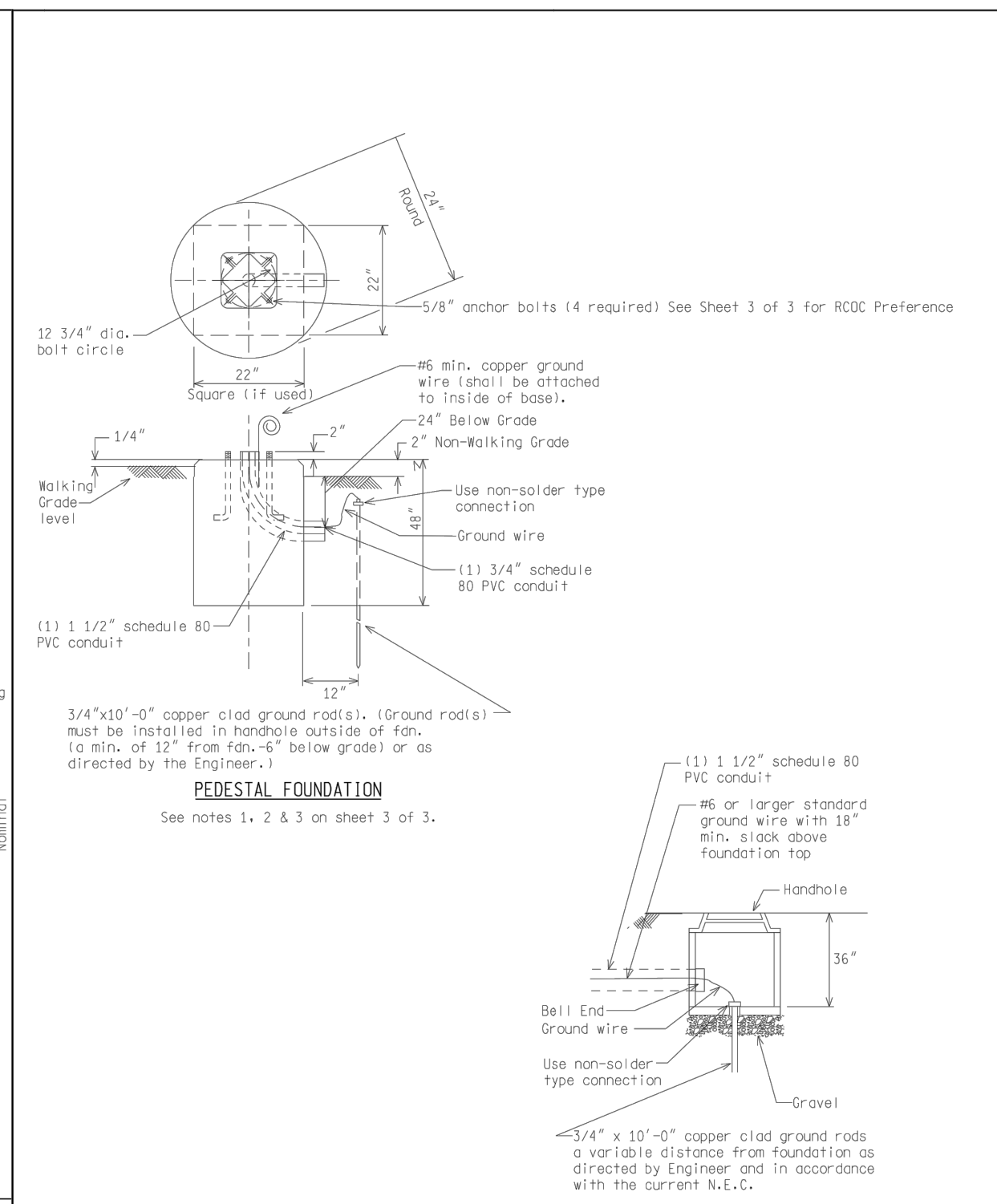
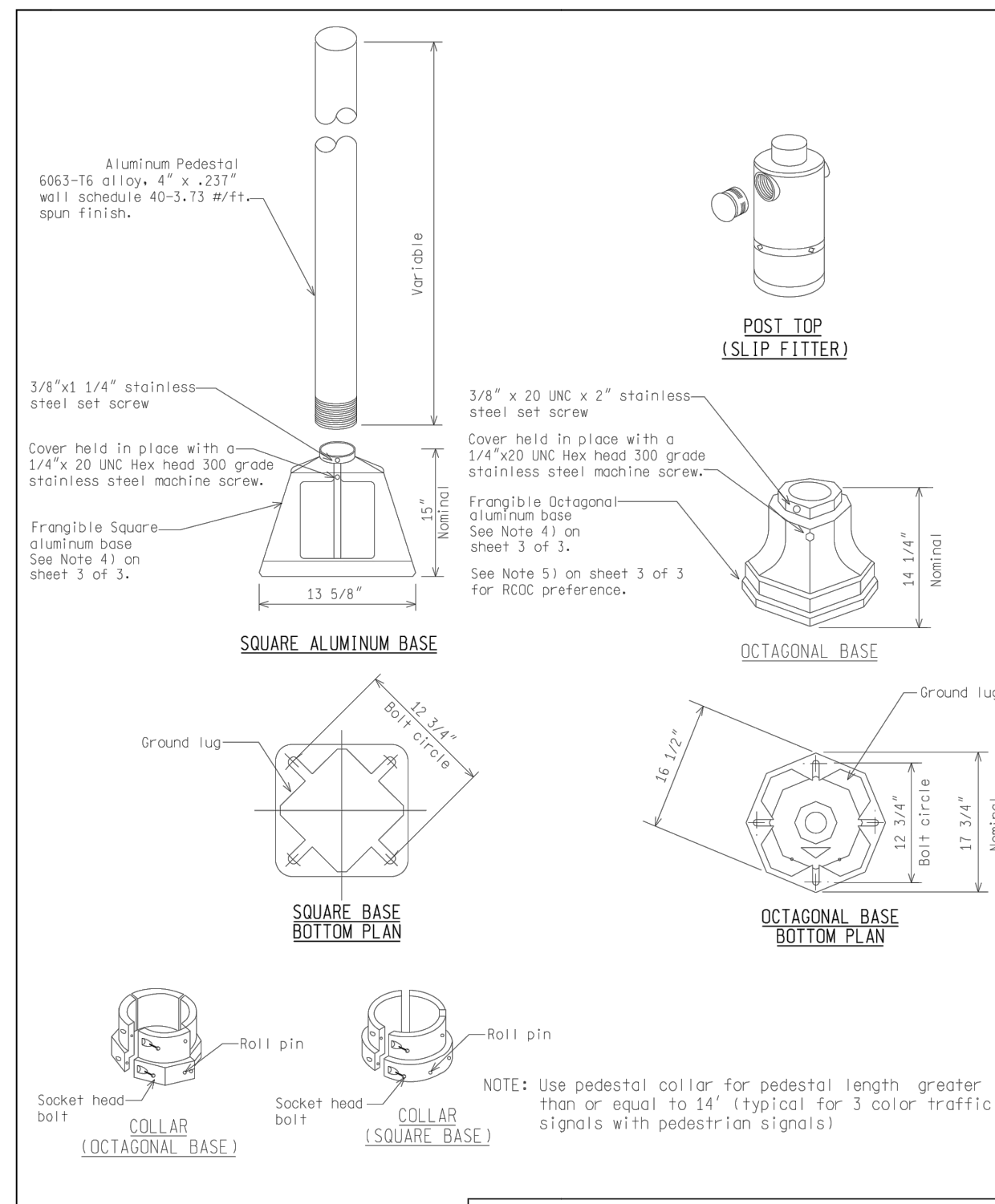
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DRAWING NO. 2021-008-SSD1

SHEET NO. 137 OF 153

APPROVED BY: _____

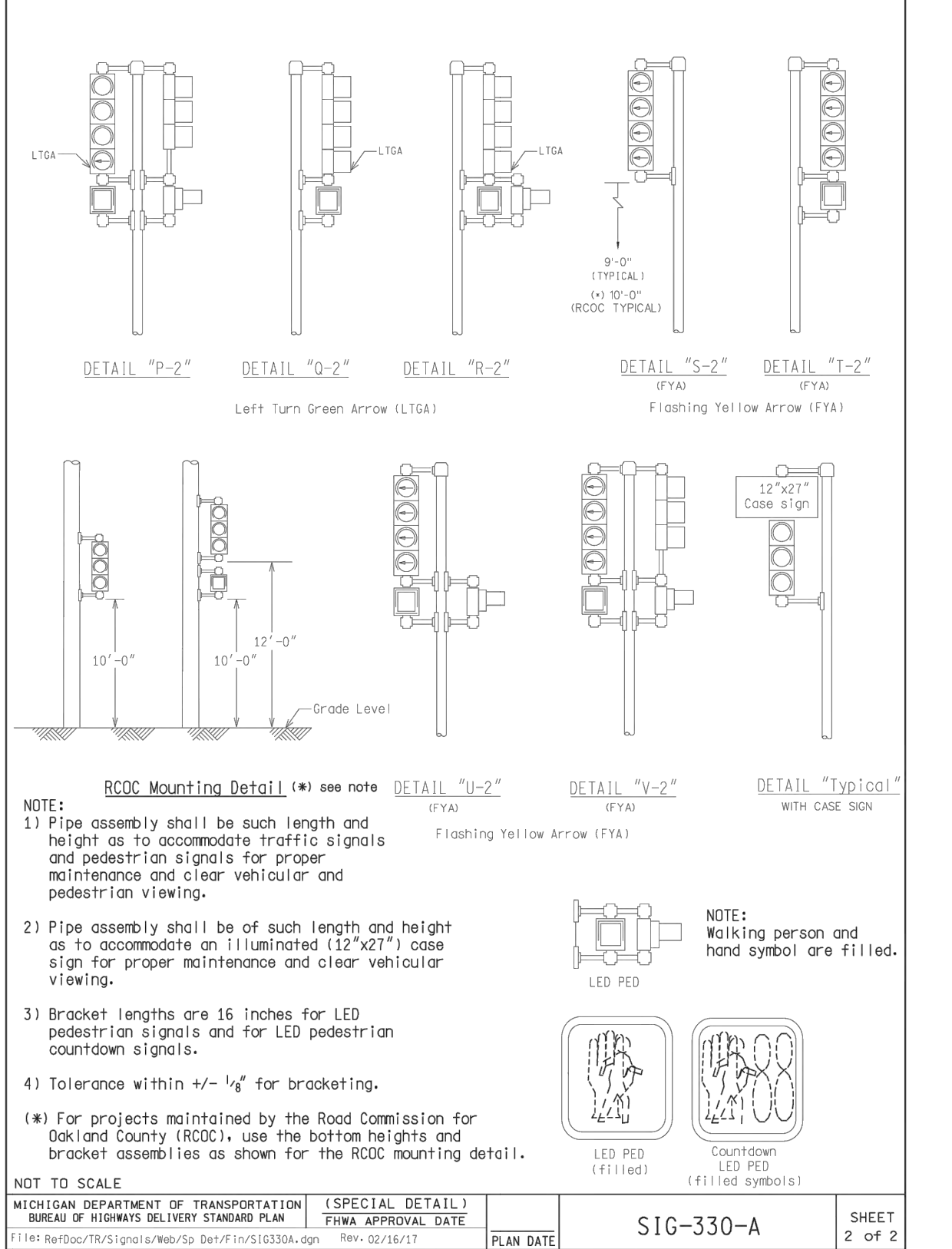
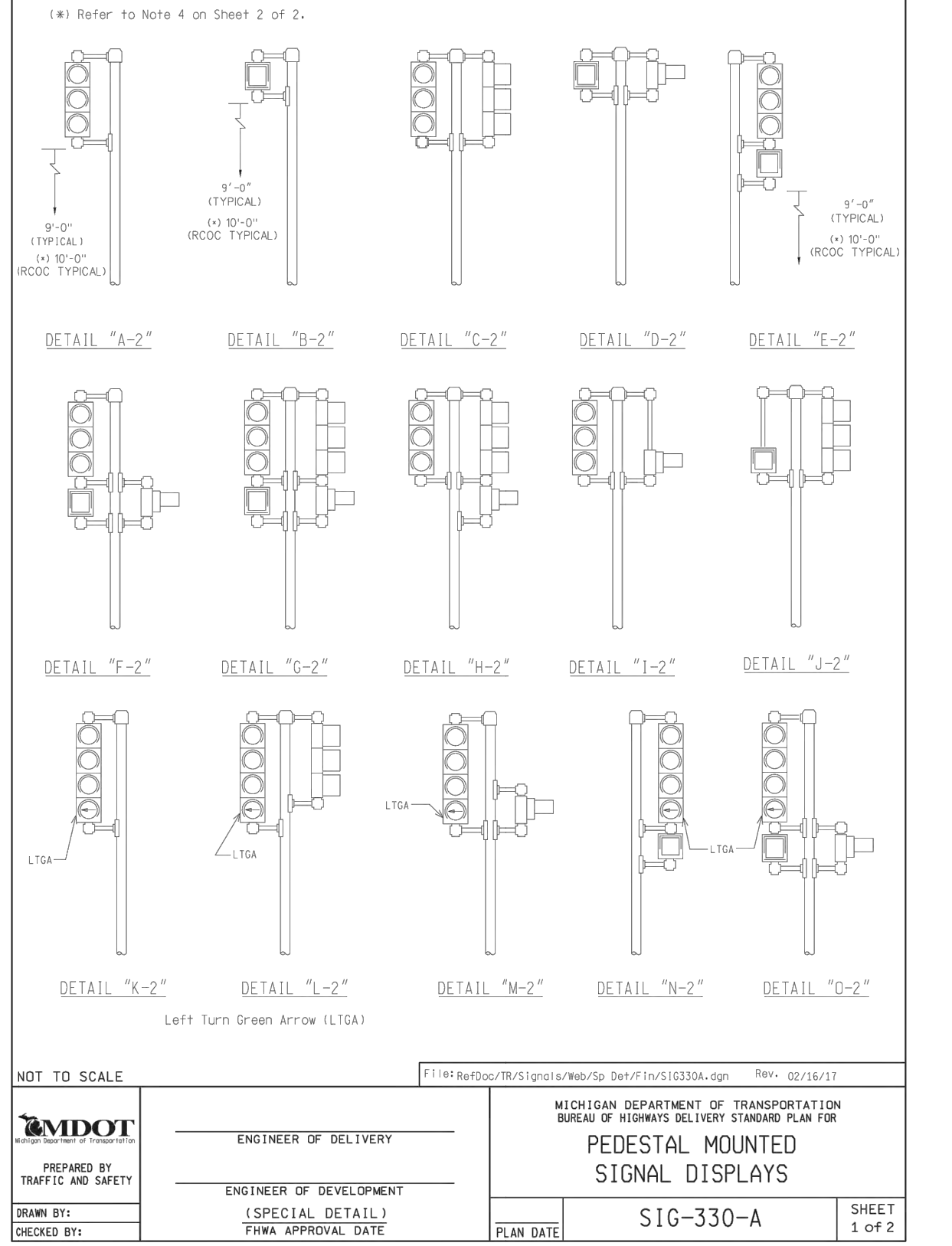
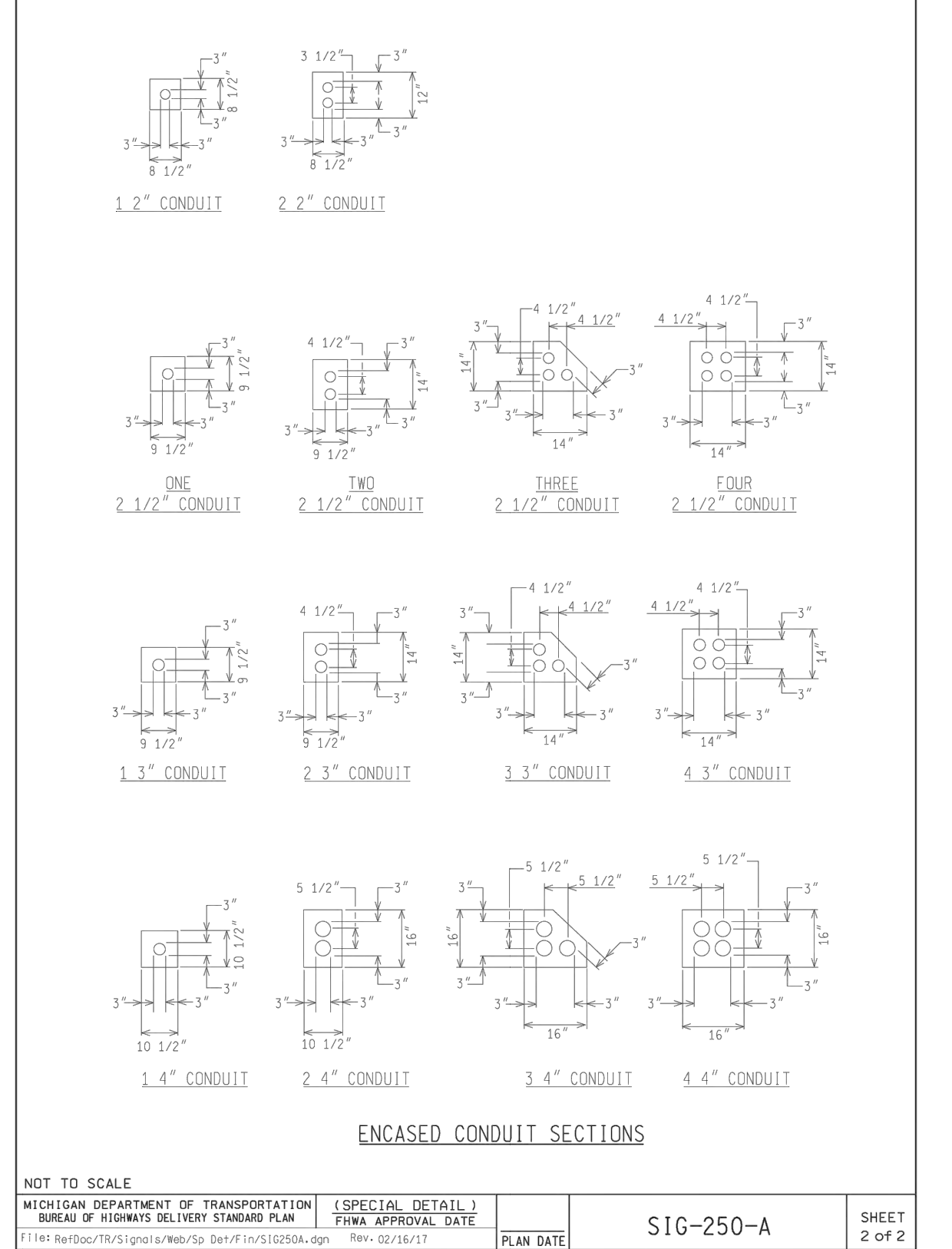
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REV. NO.	DESCRIPTION	DATE	DR. BY



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MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR PEDESTAL FOUNDATION	
ENGINEER OF DELIVERY	
ENGINEER OF DEVELOPMENT (SPECIAL DETAIL) FHWA APPROVAL DATE	
PLAN DATE	SIG-070-A
SHEET 1 OF 3	

NOT TO SCALE	FILE: RefDoc/TR/S/Signals/Ref/Sp/Dev/Fin/SIG070A.dgn Rev. 04/05/21
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR PEDESTAL MOUNTED SIGNAL DISPLAYS	
ENGINEER OF DELIVERY	
ENGINEER OF DEVELOPMENT (SPECIAL DETAIL) FHWA APPROVAL DATE	
PLAN DATE	SIG-070-A
SHEET 2 OF 3	

NOT TO SCALE	FILE: RefDoc/TR/S/Signals/Ref/Sp/Dev/Fin/SIG070A.dgn Rev. 04/05/21
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR PEDESTAL MOUNTED SIGNAL DISPLAYS	
ENGINEER OF DELIVERY	
ENGINEER OF DEVELOPMENT (SPECIAL DETAIL) FHWA APPROVAL DATE	
PLAN DATE	SIG-070-A
SHEET 3 OF 3	



NOT TO SCALE	FILE: RefDoc/TR/S/Signals/Ref/Sp/Dev/Fin/SIG330A.dgn Rev. 02/16/17
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR PEDESTAL MOUNTING FOR SIGNALS	
ENGINEER OF DELIVERY	
ENGINEER OF DEVELOPMENT (SPECIAL DETAIL) FHWA APPROVAL DATE	
PLAN DATE	SIG-330-A
SHEET 1 OF 1	

LEGEND	
EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE
CONTOUR	UTILITY POLE & GUY
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY
WATER MAIN & VALVE-IN-WELL	LIGHT POLE
WATER MAIN & VALVE-IN-BOX	END SECTION
EXISTING TELEPHONE	EXISTING RD. & GRADE
GAS LINE	LEFT EDGE/RD. GRADE
CABLE T.V.	RIGHT EDGE/RD. GRADE
ELECTRIC	CURB & GUTTER
SIGN	EDGE/GRAVEL
PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
STORM SEWER & CAT. BAS.	SEE ABOVE
WATER MAIN W/F.H. ASSEM.	BENCH MARK
CONTOUR	SURVEY BOOK
ROAD & GRADE	REV. NO.
	DESCRIPTION
	DATE
	DR. BY
	CH. BY

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL SPECIAL DETAILS

SCALE: 0 INCH 1

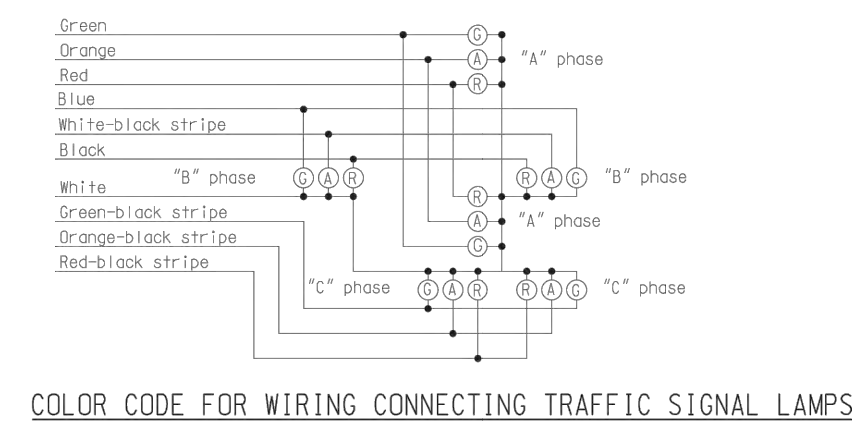
DRAWING NO. 2021-008-SSD4

SHEET NO. 140 OF 153

SEE ABOVE	REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
BENCH MARK	10/12/22	ORIGINAL ISSUE	INB	LCM	
SURVEY BOOK					

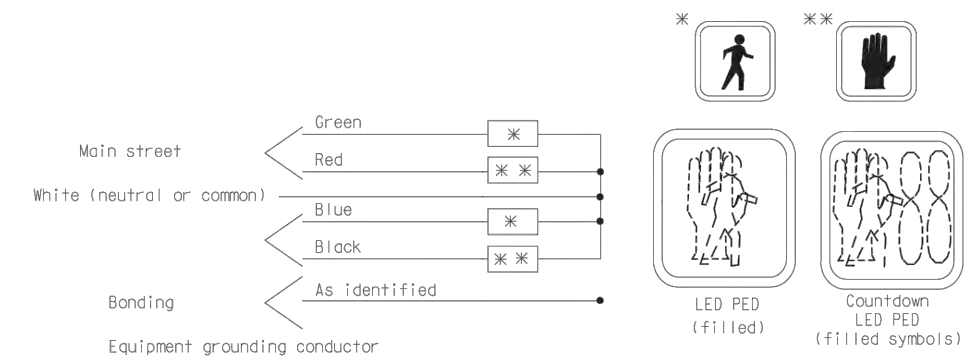
APPROVED BY: _____

LEIGH C. MERRILL P.E., MICHIGAN NO. 6201061025



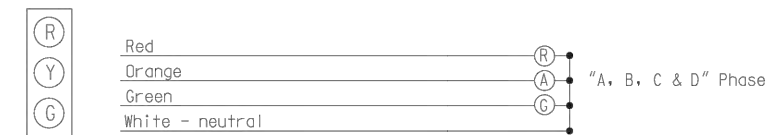
COLOR CODE FOR WIRING CONNECTING TRAFFIC SIGNAL LAMPS

NOTE: No splices allowed between traffic signal head and controller.

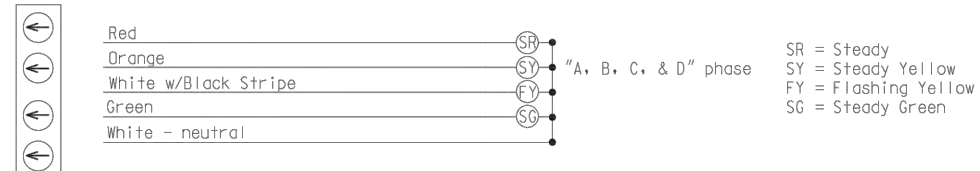


COLOR CODE FOR WIRING CONNECTING PEDESTRIAN SIGNAL LAMPS
(WALKING PERSON - HAND SYMBOL)

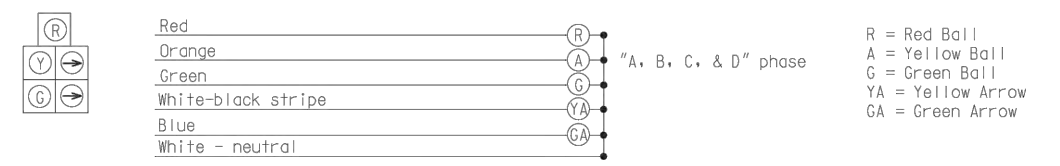
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ENGINEER OF DEVELOPMENT	(SPECIAL DETAIL)	FWMA APPROVAL DATE	PLAN DATE	SIG-230-A	SHEET 2 of 6



STANDARD - 3 COLOR SIGNAL DISPLAY



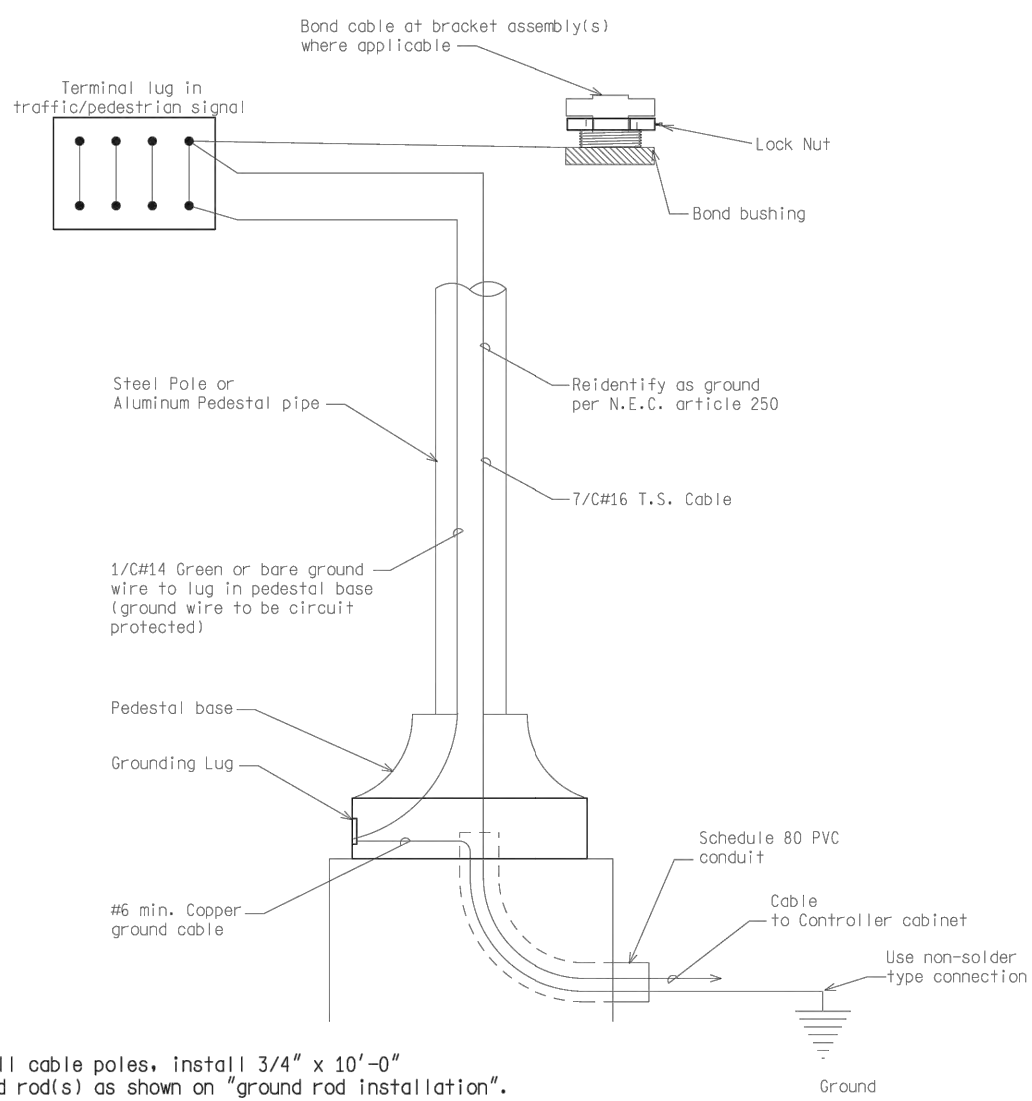
FLASHING YELLOW ARROW (FYA) - 4 COLOR SIGNAL DISPLAY



DOG HOUSE W/RIGHT TURNS - 5 COLOR SIGNAL DISPLAY

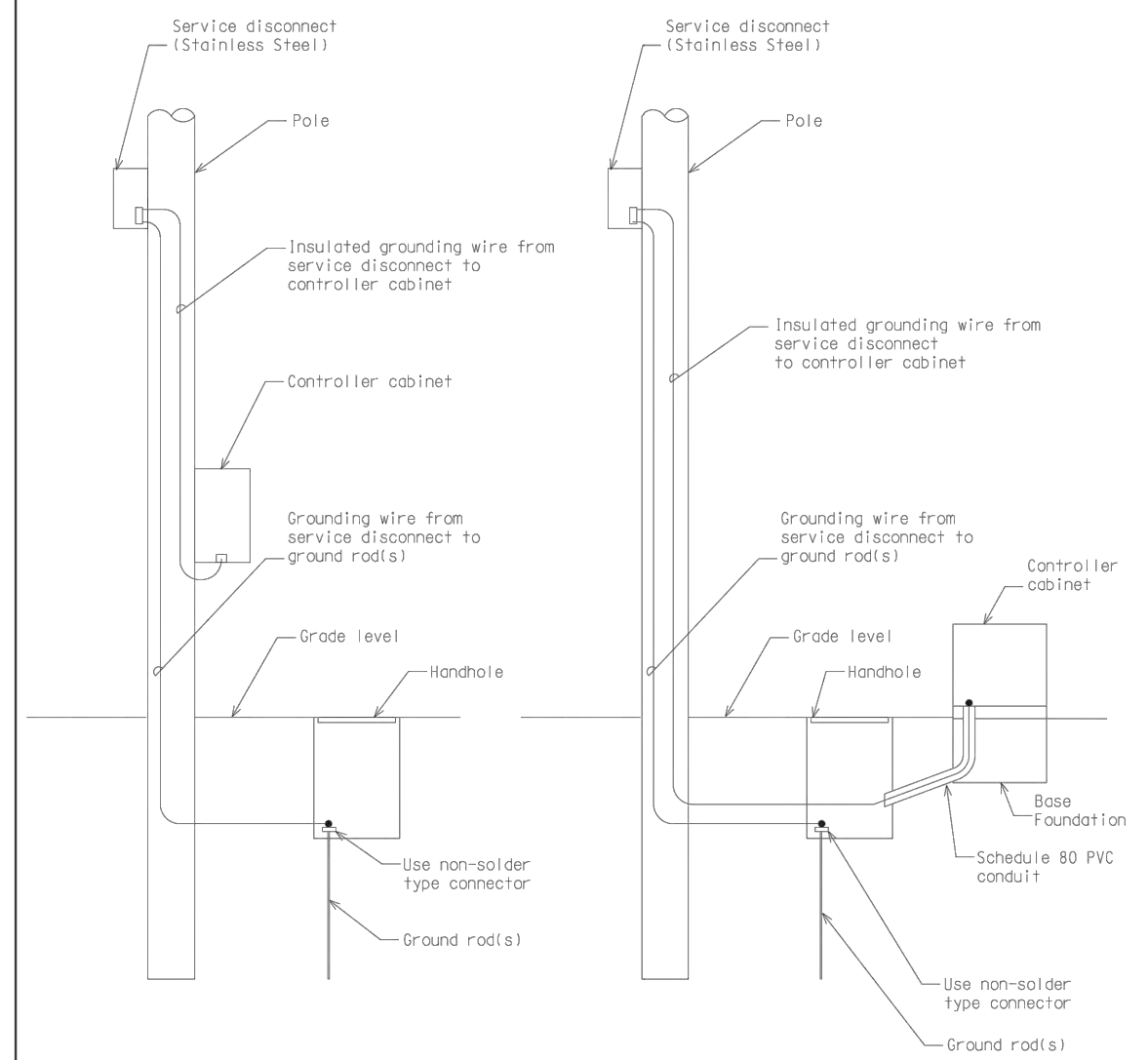
COLOR CODE FOR WIRING CONNECTING TRAFFIC SIGNAL LAMPS

NOT TO SCALE	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR COLOR CODE WIRING/ EQUIPMENT GROUNDING	PLAN DATE	SIG-230-A	SHEET 3 of 6
ENGINEER OF DEVELOPMENT	(SPECIAL DETAIL)	FWMA APPROVAL DATE	PLAN DATE	SIG-230-A	SHEET 4 of 6



STEEL POLE/PEDESTAL GROUNDING DETAIL

NOTE:
For all cable poles, install 3/4" x 10'-0"
ground rods) as shown on "ground rod installation".
Connect ground rods) with #6 min. copper wire to
messenger wire with non-solder type connection.

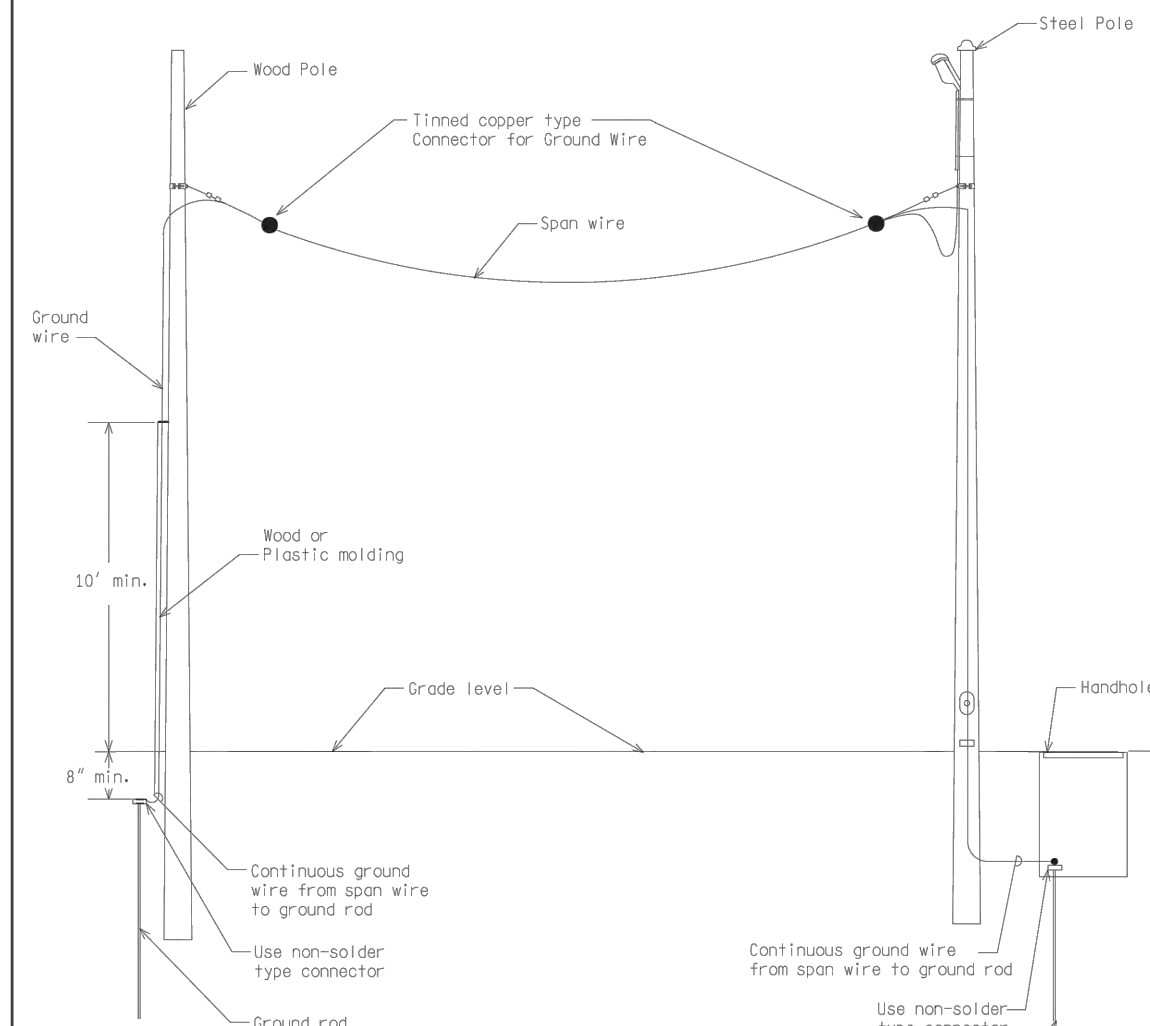


GROUNDING

Install 3/4" x 10'-0" copper clad ground rods as required to provide less than 10 OHM resistance to ground.
Grounding wire #6 AWG min. bare copper grounding wire shall be installed to meet N.E.C. and utility company specs.
Ground wire from disconnect to ground rod to be in routing (wood pole or post) or inside the pole (steel). Ground wire from disconnect to controller cabinet to be in conduit (wood pole, wood post, and steel pole).

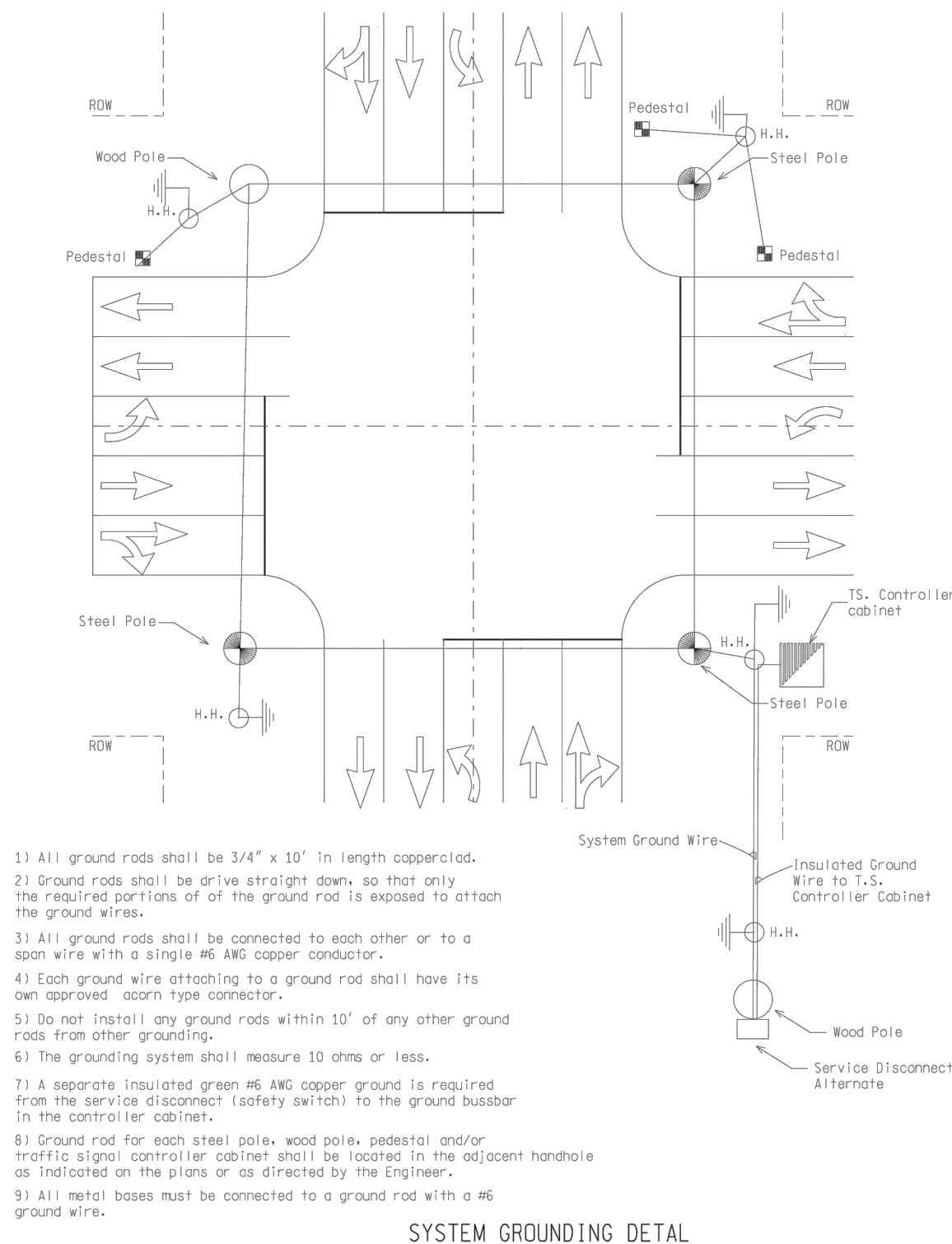
CONTROLLER CABINET GROUNDING DETAIL

NOT TO SCALE	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR COLOR CODE WIRING/ EQUIPMENT GROUNDING	PLAN DATE	SIG-230-A	SHEET 4 of 6
ENGINEER OF DEVELOPMENT	(SPECIAL DETAIL)	FWMA APPROVAL DATE	PLAN DATE	SIG-230-A	SHEET 5 of 6



SPAN WIRE GROUNDING DETAIL

NOT TO SCALE	ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR COLOR CODE WIRING/ EQUIPMENT GROUNDING	PLAN DATE	SIG-230-A	SHEET 5 of 6
ENGINEER OF DEVELOPMENT	(SPECIAL DETAIL)	FWMA APPROVAL DATE	PLAN DATE	SIG-230-A	SHEET 6 of 6



SYSTEM GROUNDING DETAIL

- All ground rods shall be 3/4" x 10' in length copper clad.
- Ground rods shall be driven straight down, so that only the required portions of the ground rod is exposed to attach the ground wires.
- All ground rods shall be connected to each other or to a span wire with a single #6 AWG copper conductor.
- Each ground wire attaching to a ground rod shall have its own approved acorn type connector.
- Do not install any ground rods within 10' of any other ground rods from other grounding.
- The grounding system shall measure 10 ohms or less.
- A separate insulated green #6 AWG copper ground is required from the service disconnect (safety switch) to the ground busbar in the controller cabinet.
- Ground rod for each steel pole, wood pole, pedestal and/or traffic signal controller cabinet shall be located in the adjacent handhole as indicated on the plans or as directed by the Engineer.
- All metal bases must be connected to a ground rod with a #6 ground wire.

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE
TRAFFIC SIGNAL SPECIAL DETAILS

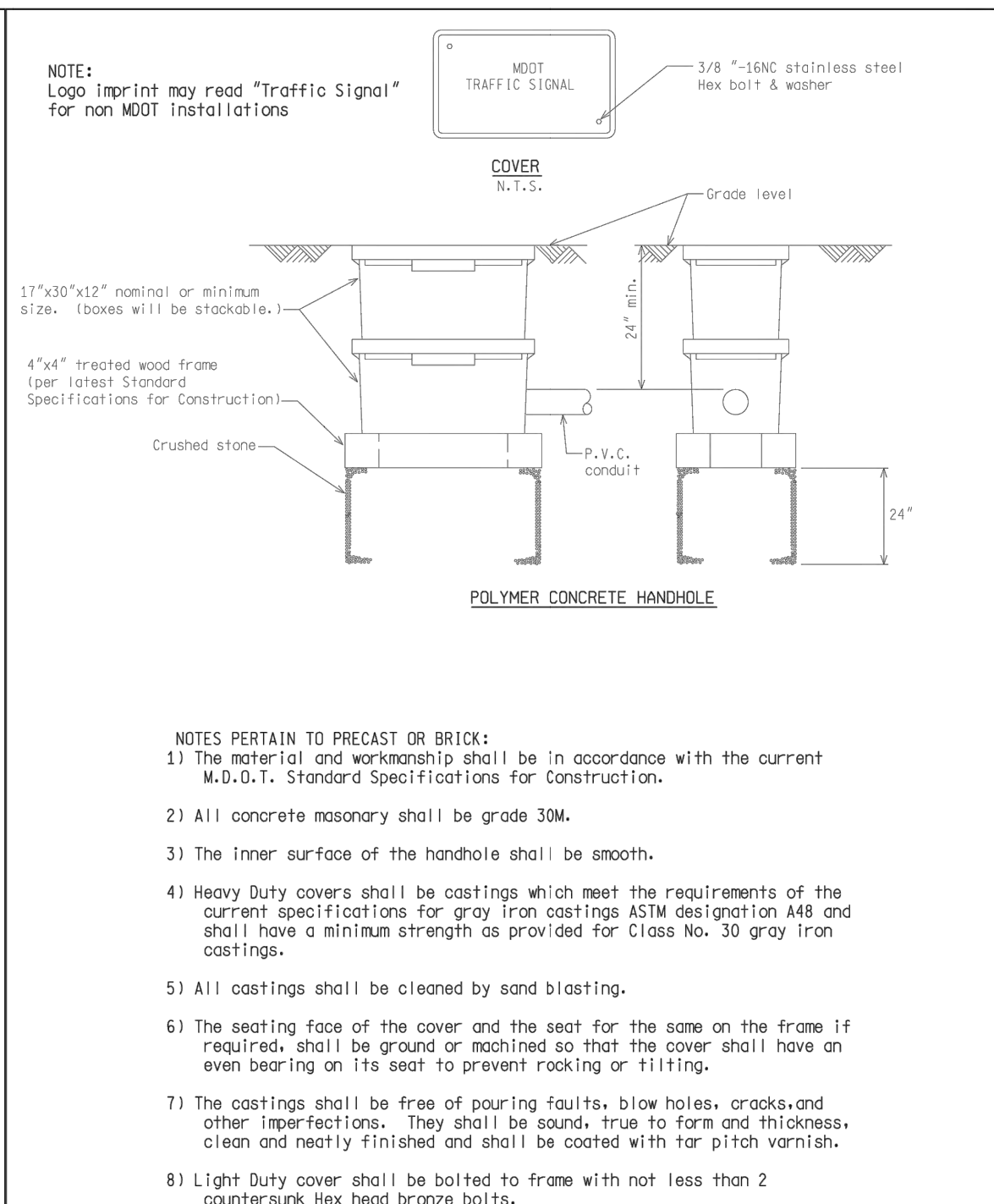
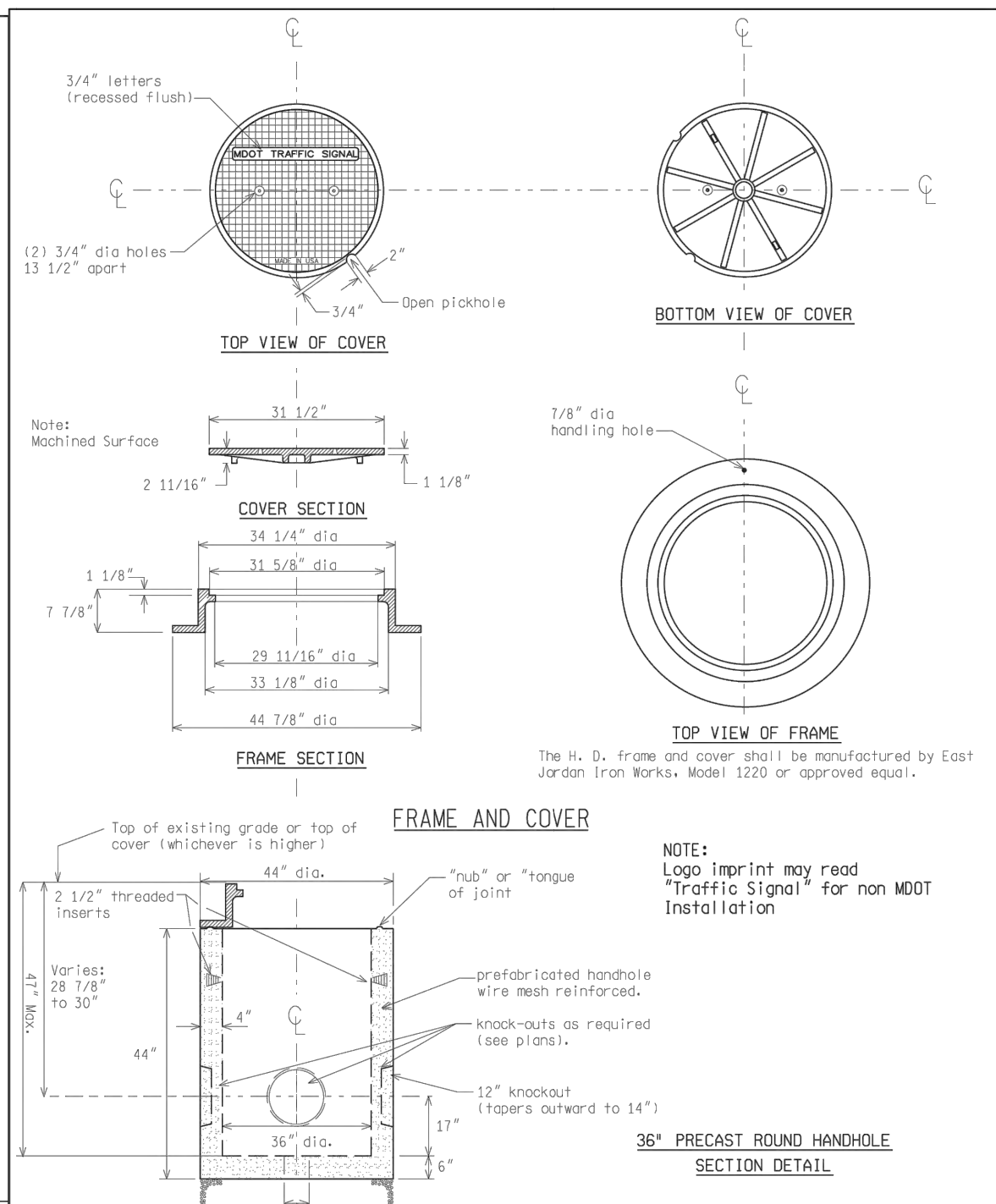
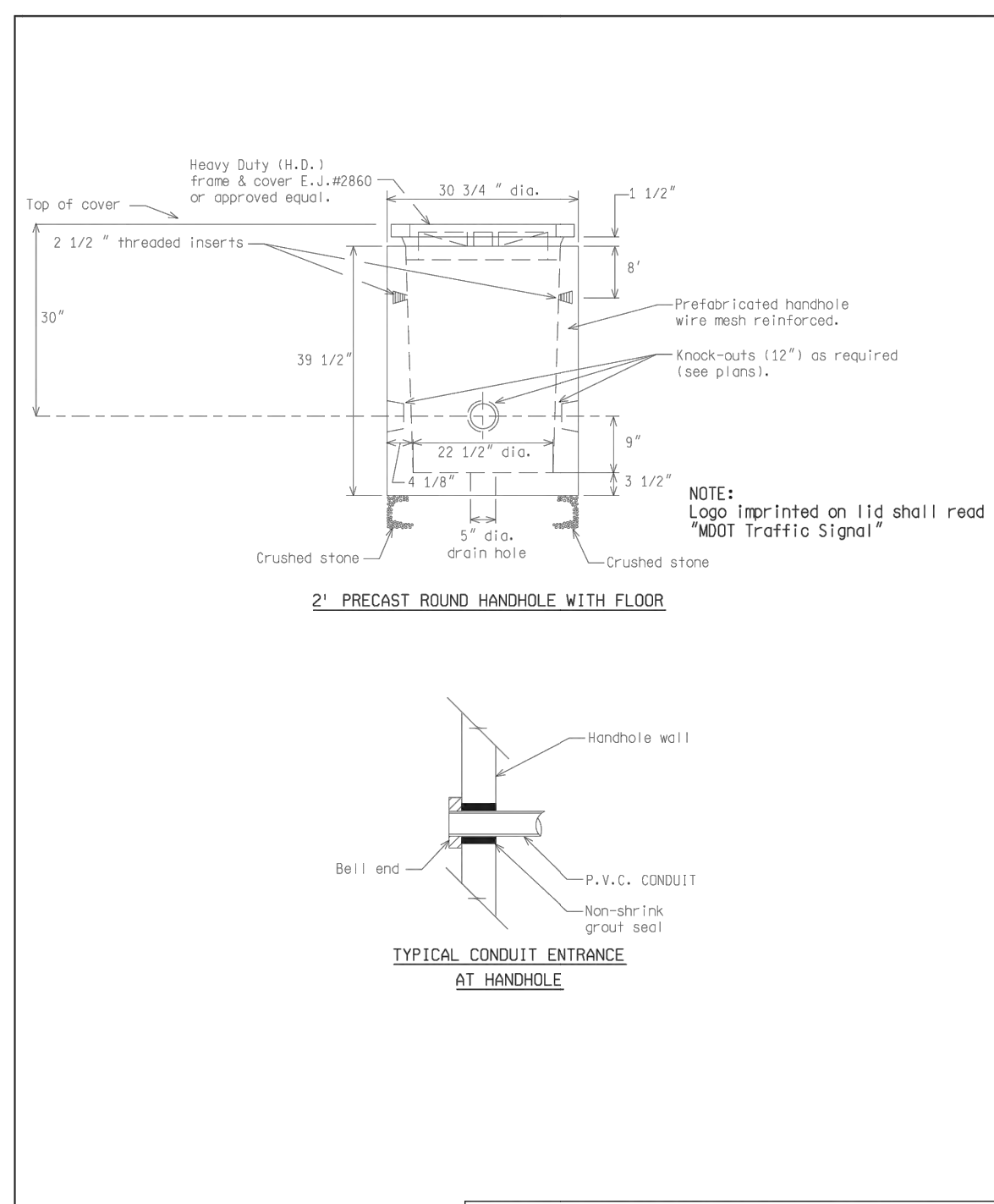
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DRAWING NO.
2021-008-SSD5

SHEET NO. 141 OF 153

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

APPROVED BY



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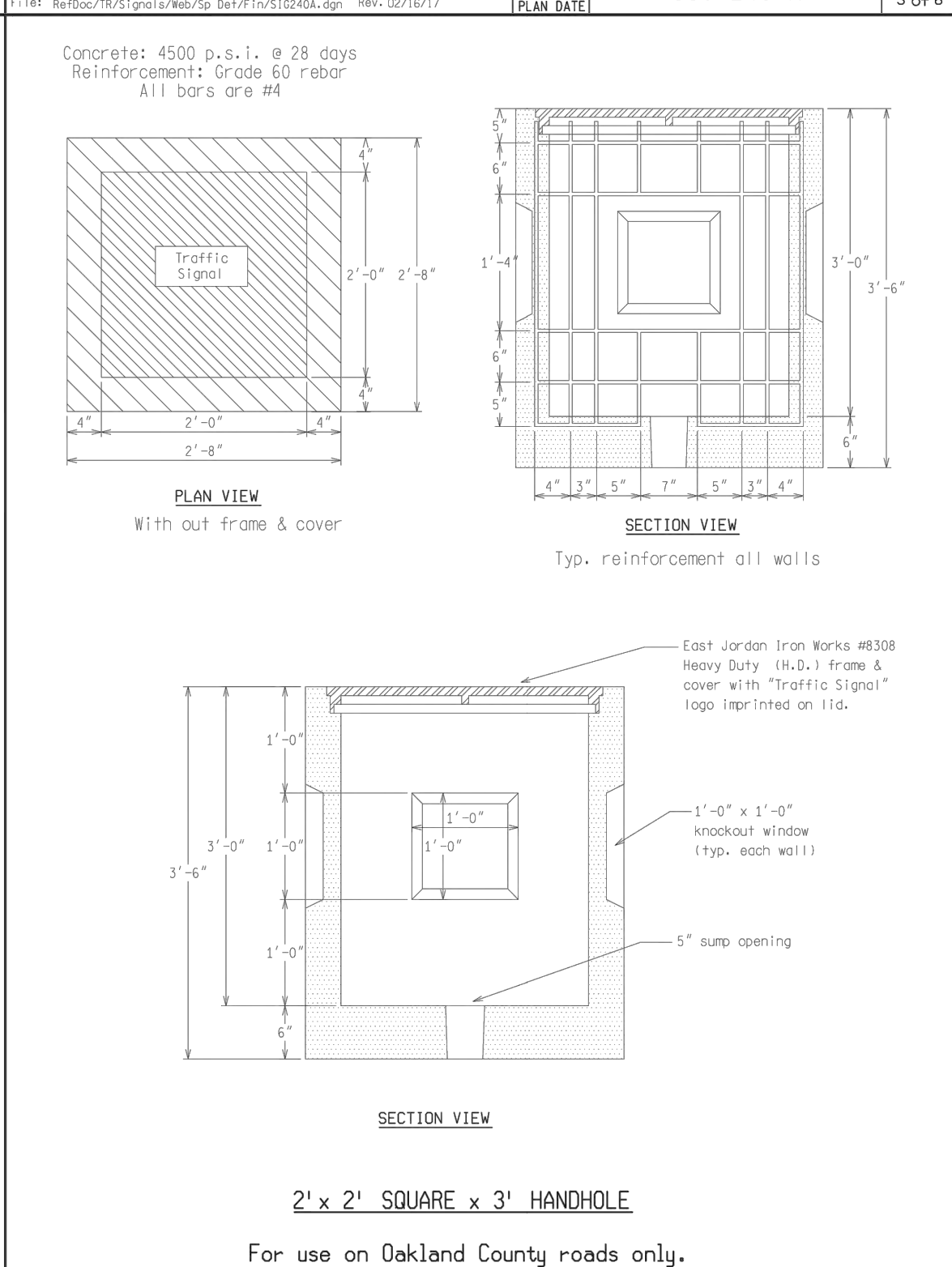
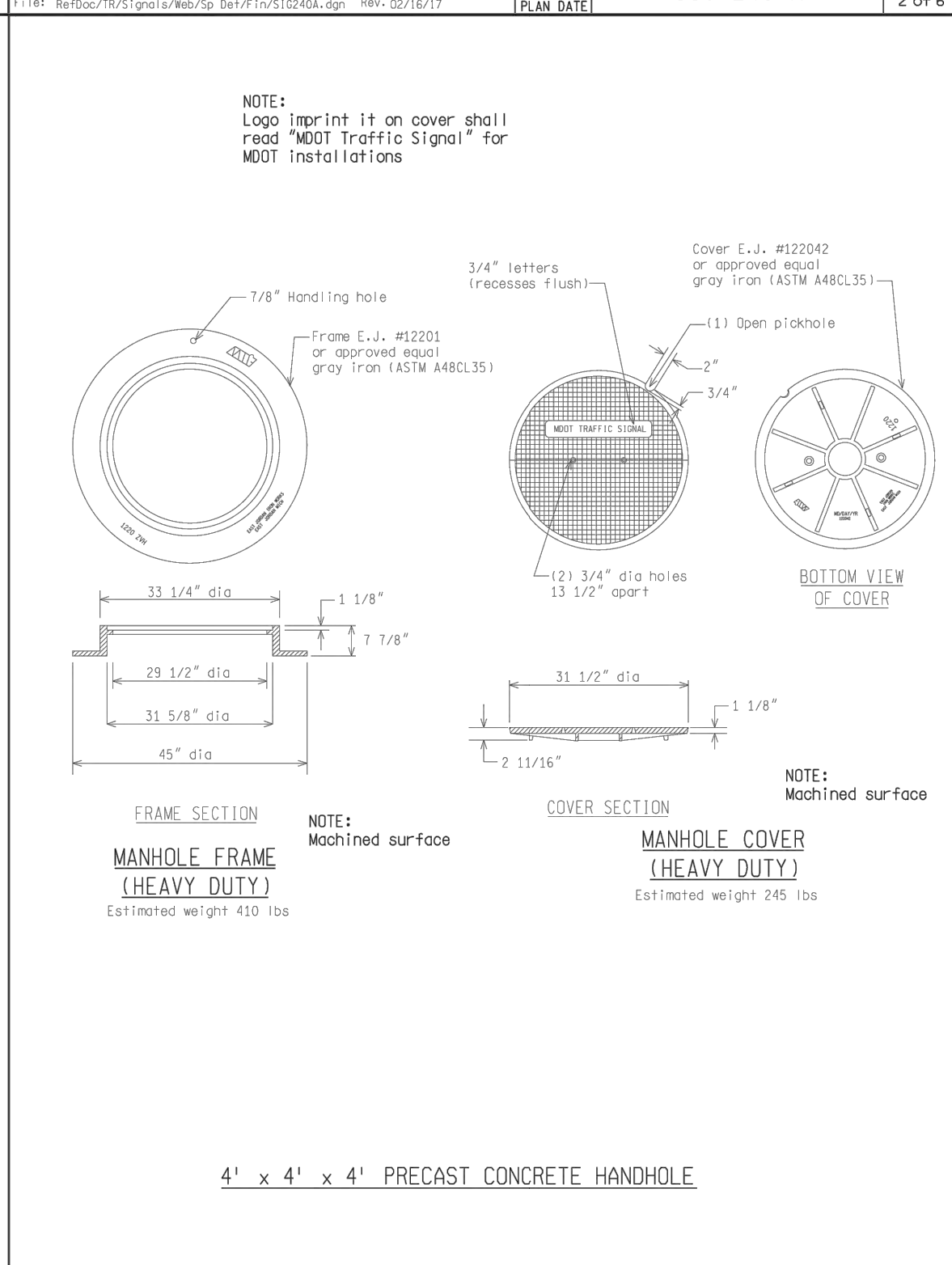
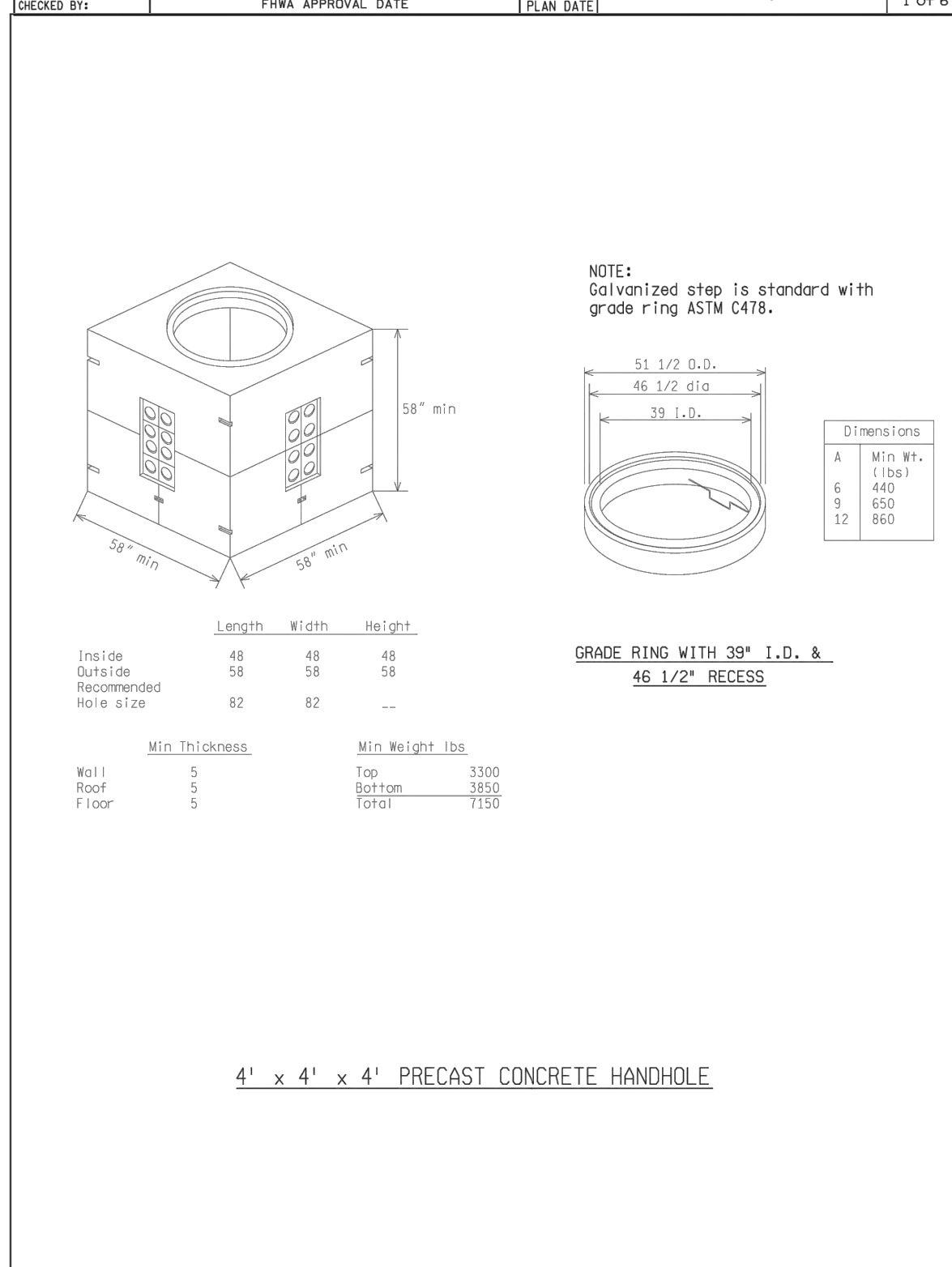
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MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-240-A
ENGINEER OF DELIVERY	SHEET 1 OF 6
ENGINEER OF DEVELOPMENT	PLAN DATE
(SPECIAL DETAIL.)	
FWMA APPROVAL DATE	

NOT TO SCALE

FILE: Re:\Doc\TR\Sigsal\Reb\Sp\Det\FIN\SIG240A.dgn	REV: 02/16/17
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-240-A
ENGINEER OF DELIVERY	SHEET 2 OF 6
ENGINEER OF DEVELOPMENT	PLAN DATE
(SPECIAL DETAIL.)	
FWMA APPROVAL DATE	

NOT TO SCALE

FILE: Re:\Doc\TR\Sigsal\Reb\Sp\Det\FIN\SIG240A.dgn	REV: 02/16/17
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-240-A
ENGINEER OF DELIVERY	SHEET 3 OF 6
ENGINEER OF DEVELOPMENT	PLAN DATE
(SPECIAL DETAIL.)	
FWMA APPROVAL DATE	



NOT TO SCALE

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MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-240-A
ENGINEER OF DELIVERY	SHEET 4 OF 6
ENGINEER OF DEVELOPMENT	PLAN DATE
(SPECIAL DETAIL.)	
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MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-240-A
ENGINEER OF DELIVERY	SHEET 5 OF 6
ENGINEER OF DEVELOPMENT	PLAN DATE
(SPECIAL DETAIL.)	
FWMA APPROVAL DATE	

NOT TO SCALE

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MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-240-A
ENGINEER OF DELIVERY	SHEET 6 OF 6
ENGINEER OF DEVELOPMENT	PLAN DATE
(SPECIAL DETAIL.)	
FWMA APPROVAL DATE	

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.

SEE ABOVE	REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
		ORIGINAL ISSUE	10/12/22	INB	LCM

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PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL SPECIAL DETAILS

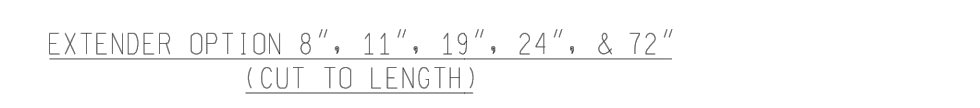
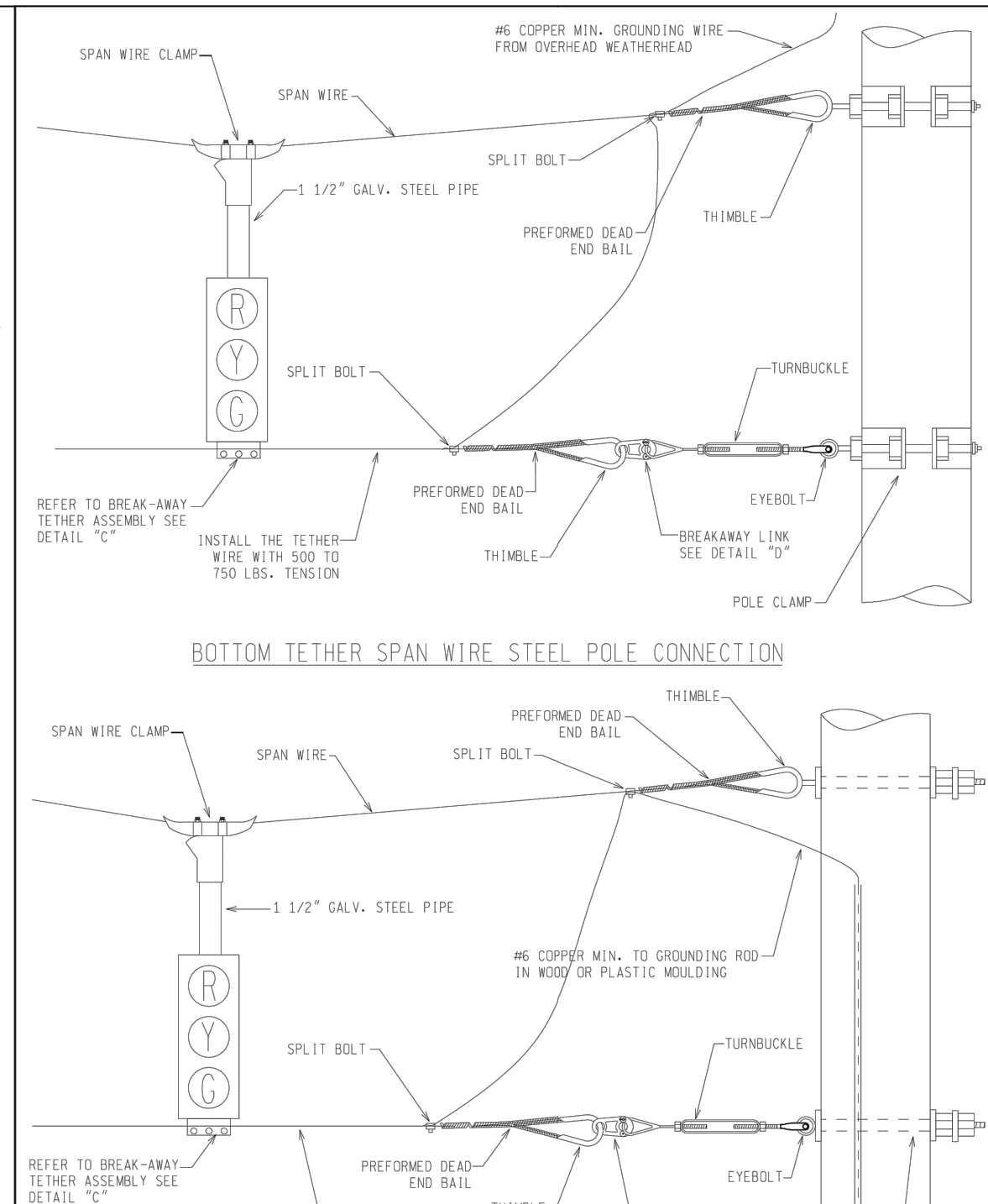
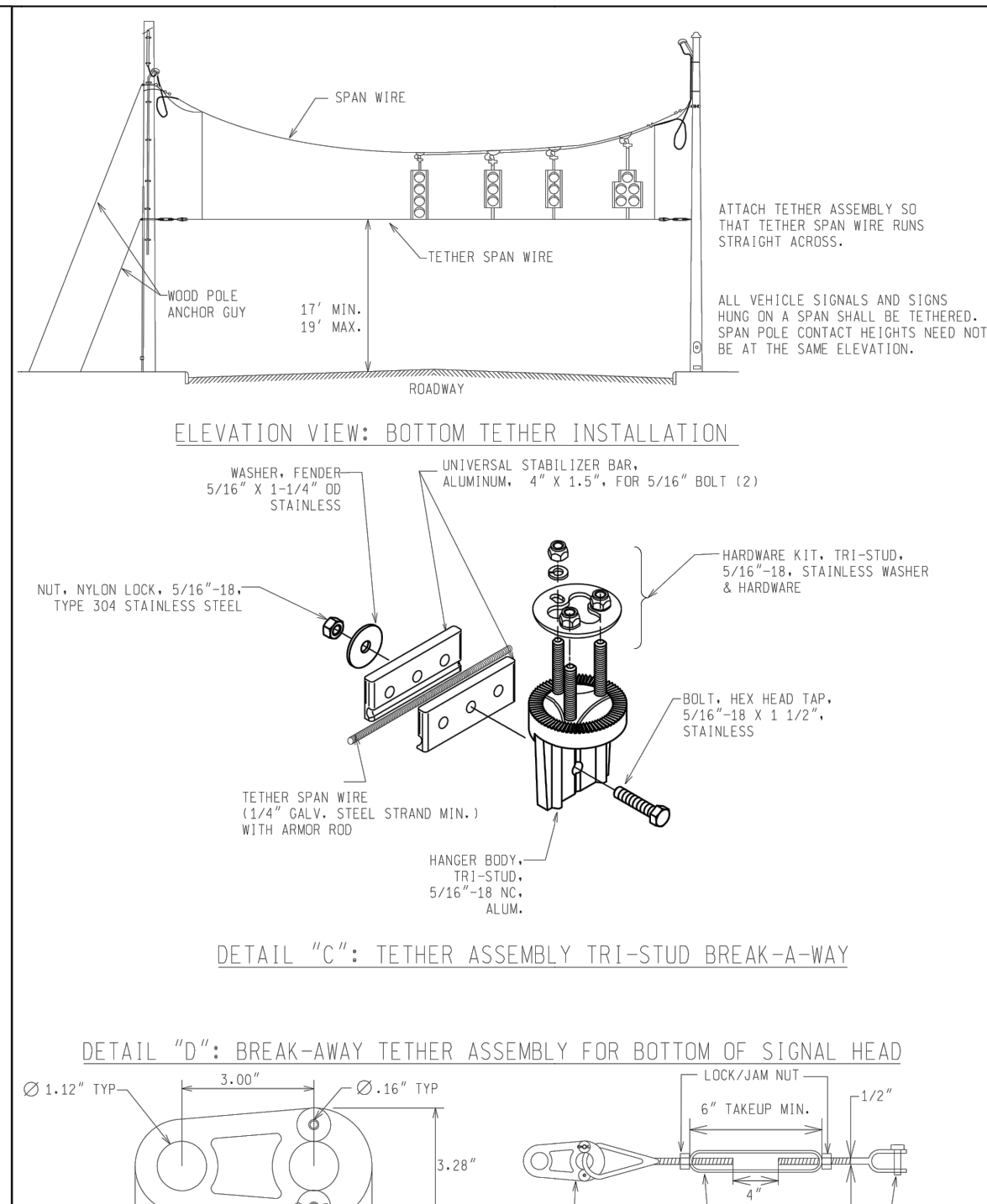
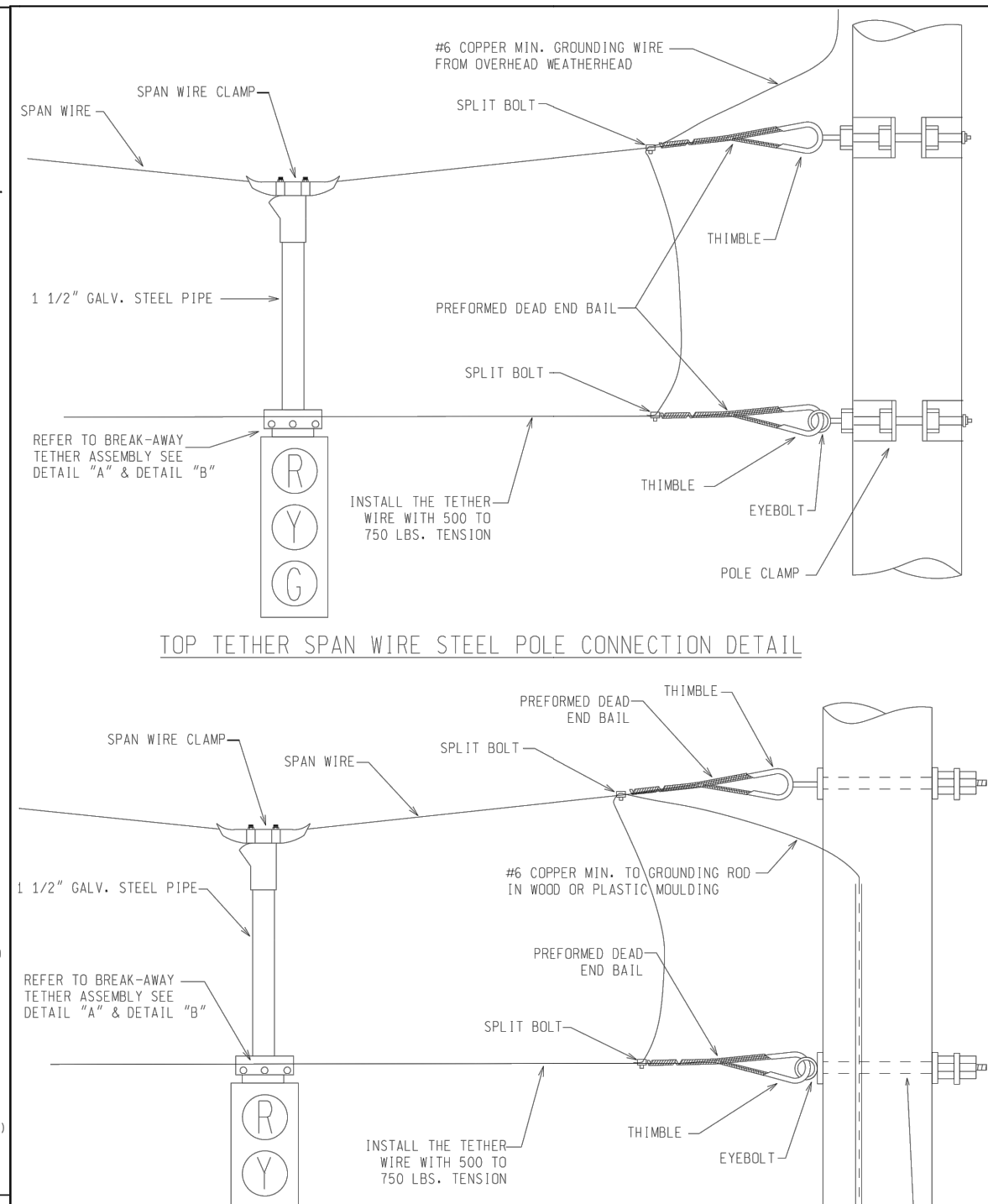
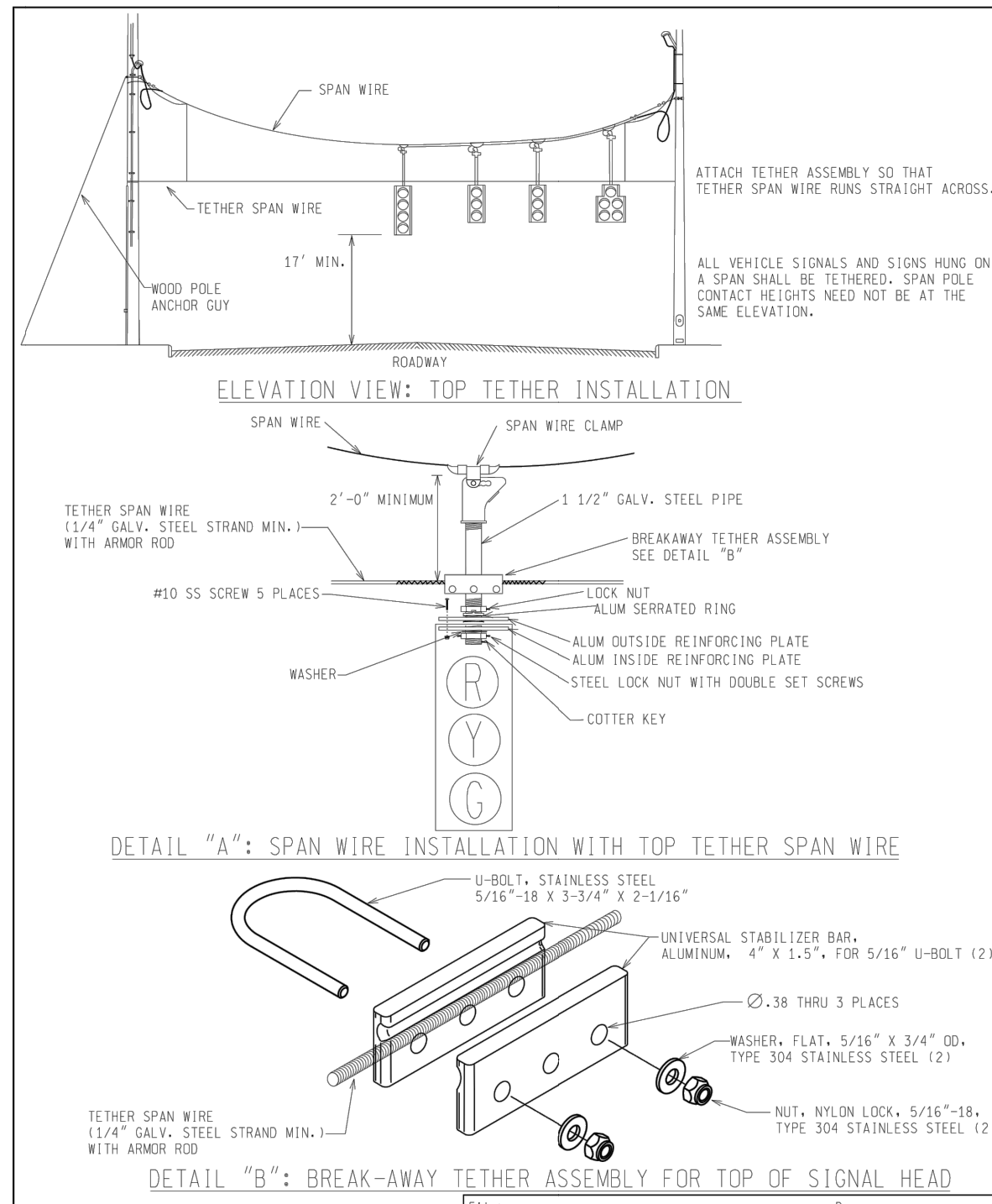
SCALE: 0 INCH 1

DRAWING NO. 2021-008-SSD6

SHEET NO. 142 OF 153

APPROVED BY: _____

SCALE	0 INCH 1
DRAWING NO.	2021-008-SSD6
SHEET NO.	142 OF 153



- NOTES**
- BREAKAWAY LINK AND TURNBUCKLE ARE REQUIRED AT BOTH ENDS OF ALL BOTTOM TETHER SPANS. IF BREAKAWAY LINK BEGINS TO YIELD DURING INSTALLATION, IT SHALL BE REMOVED AND REPLACED. THE WIRE TENSION SHALL BE ADJUSTED TO MINIMIZE MOVEMENT OF SIGNAL HEADS IN HIGH WINDS. TYPICAL TENSION IS 500 TO 750 LBS.
 - INSTALL GROUND WIRE AT BOTH ENDS OF TOP AND BOTTOM TETHERING.
 - IF SIGNAL ORIENTATION IS NOT PERPENDICULAR TO SPAN AND TETHER WIRES, THEN USE AN ANCHOR EXTENSION. CLAMP ASSEMBLY MUST BE ATTACHED TO THE FLAT SIDE OF THE EXTENDER BAR.
 - BREAKAWAY LINK SHALL YIELD AT 325 LBS OF TENSION.
 - TETHER WIRE SHALL BE 7-STRAND ASTM 4475 HS 1/4" INCH ON ALL SPANS. INSTALL TETHER HORIZONTALLY. MAINTAIN CLEARANCE OF 17" OVER ROADWAY.
 - GROUNDING WIRE ANCHOR HEIGHT TO THE SPAN WIRE IS ADJUSTED IN THE FIELD BEFORE BREAKAWAY LINK IS INSTALLED. GROUNDING WIRE LENGTH SHALL BE ADJUSTED SO THAT THE MINIMUM VERTICAL CLEARANCE OF THE SAGGING TETHER WIRE ABOVE THE PAVEMENT WITHOUT THE BREAKAWAY LINK INSTALLED IS AT LEAST 14". GROUNDING WIRE SHALL CONTAIN ENOUGH SLACK FOR HEAD TO SWAY IN HIGH WINDS. GROUNDING WIRE SHALL BE ATTACHED TO THE SPAN WIRE USING A TINED COPPER SPLIT BOLT.
 - TRAFFIC SIGNAL HOUSING REINFORCEMENT PLATES ARE REQUIRED WHEN TETHERING.
 - A. TOP TETHERING REQUIRES REINFORCEMENT PLATES AT THE TOP OF THE POLYCARBONATE HOUSING. (2 PLATES TOTAL)
 - B. BOTTOM TETHERING REQUIRES REINFORCEMENT PLATES AT THE TOP AND BOTTOM OF POLYCARBONATE HOUSING. (4 PLATES TOTAL)
 - C. BOTTOM TETHERING S-SECTION HEADS REQUIRES REINFORCEMENT PLATES ON THE TOP AND BOTTOM OF THE POLYCARBONATE HOUSING (8 TOTAL) AND AN ALUMINUM TRI-STUD UPPER ARM ASSEMBLY IN PLACE OF THE BOTTOM BRACKET.
 - D. IF POLYCARBONATE HOUSING CONNECTS TO AN ALUMINUM CASE SIGN, REINFORCEMENT PLATES MUST BE USED AT THE CONNECTION.

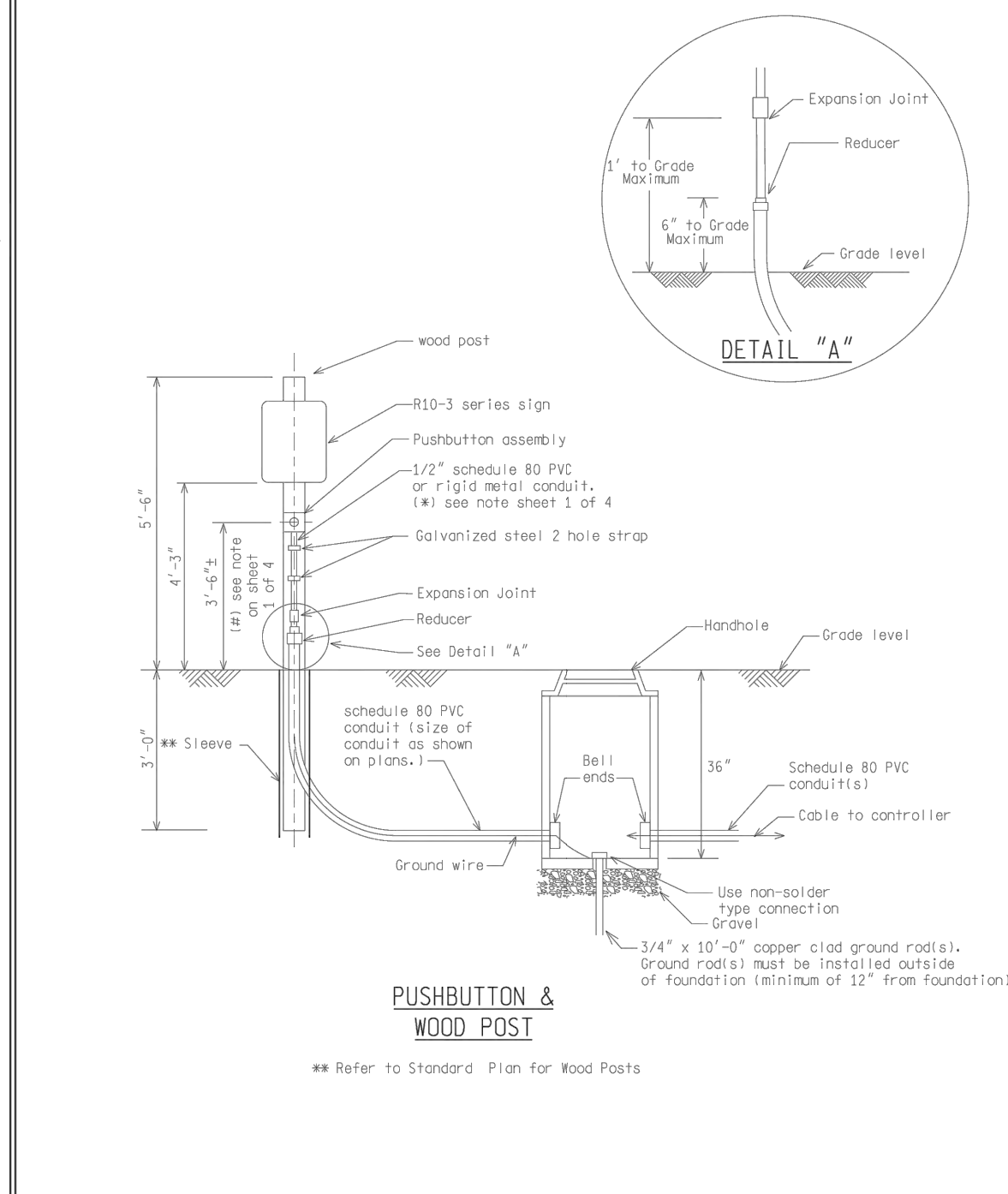
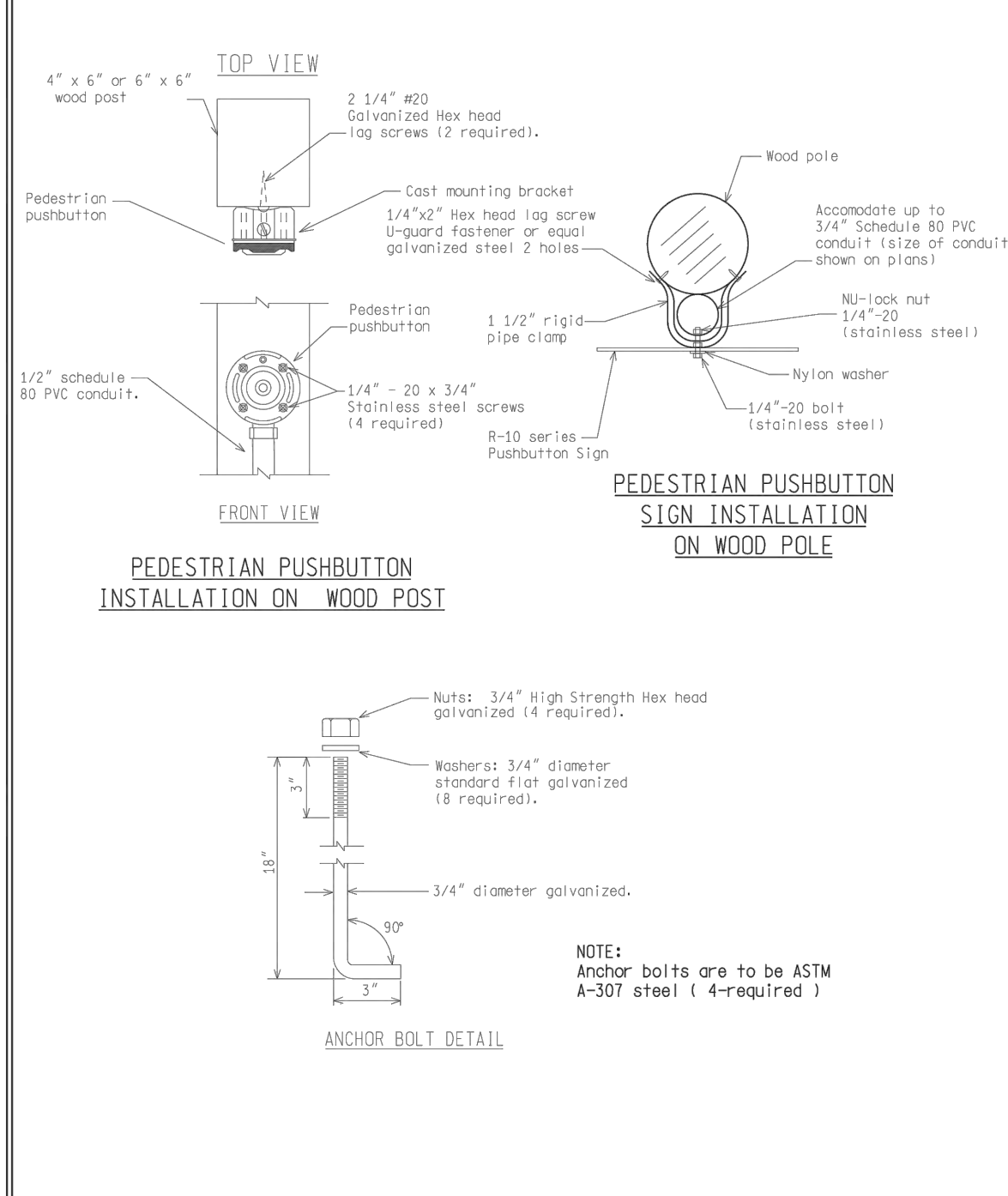
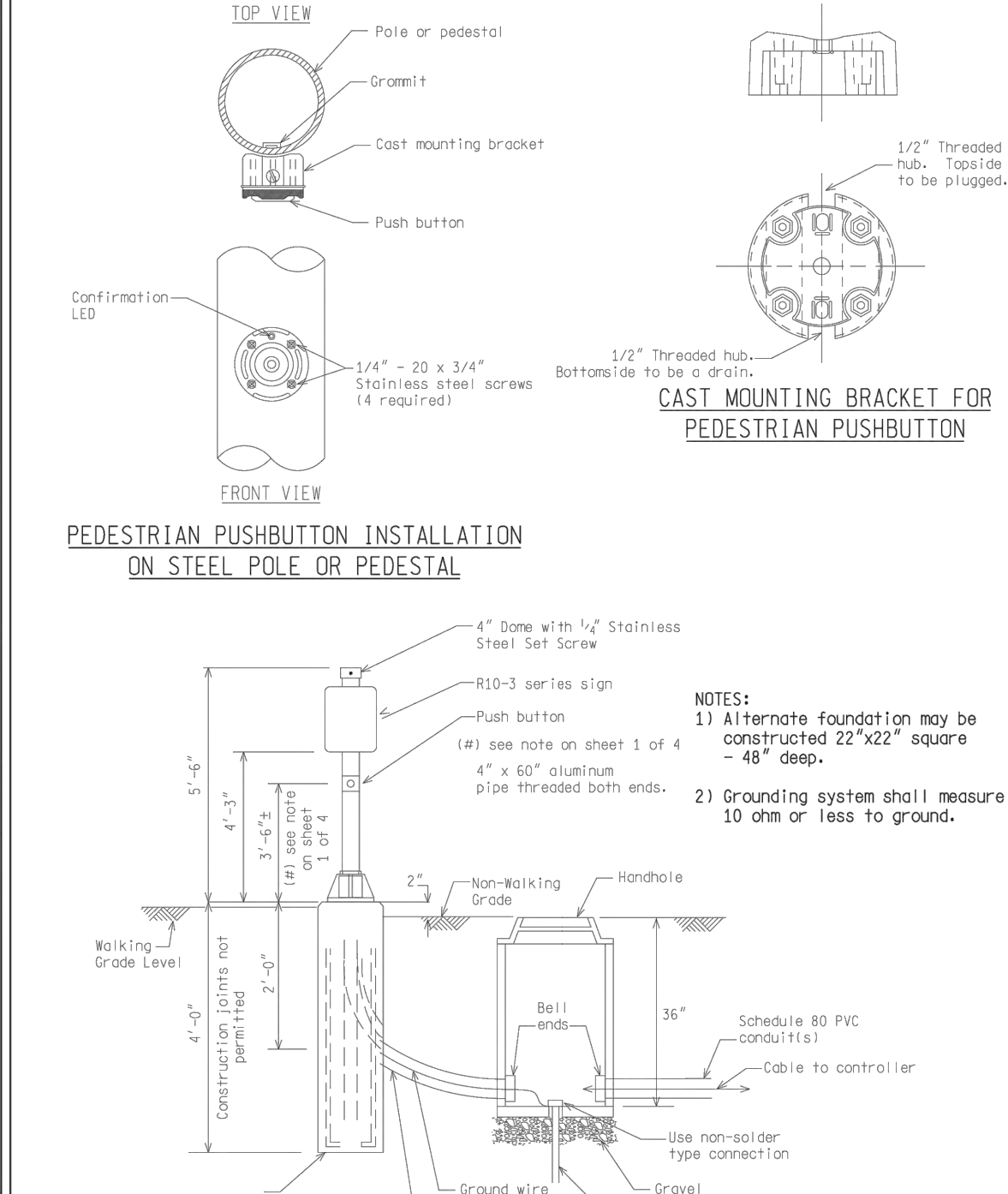
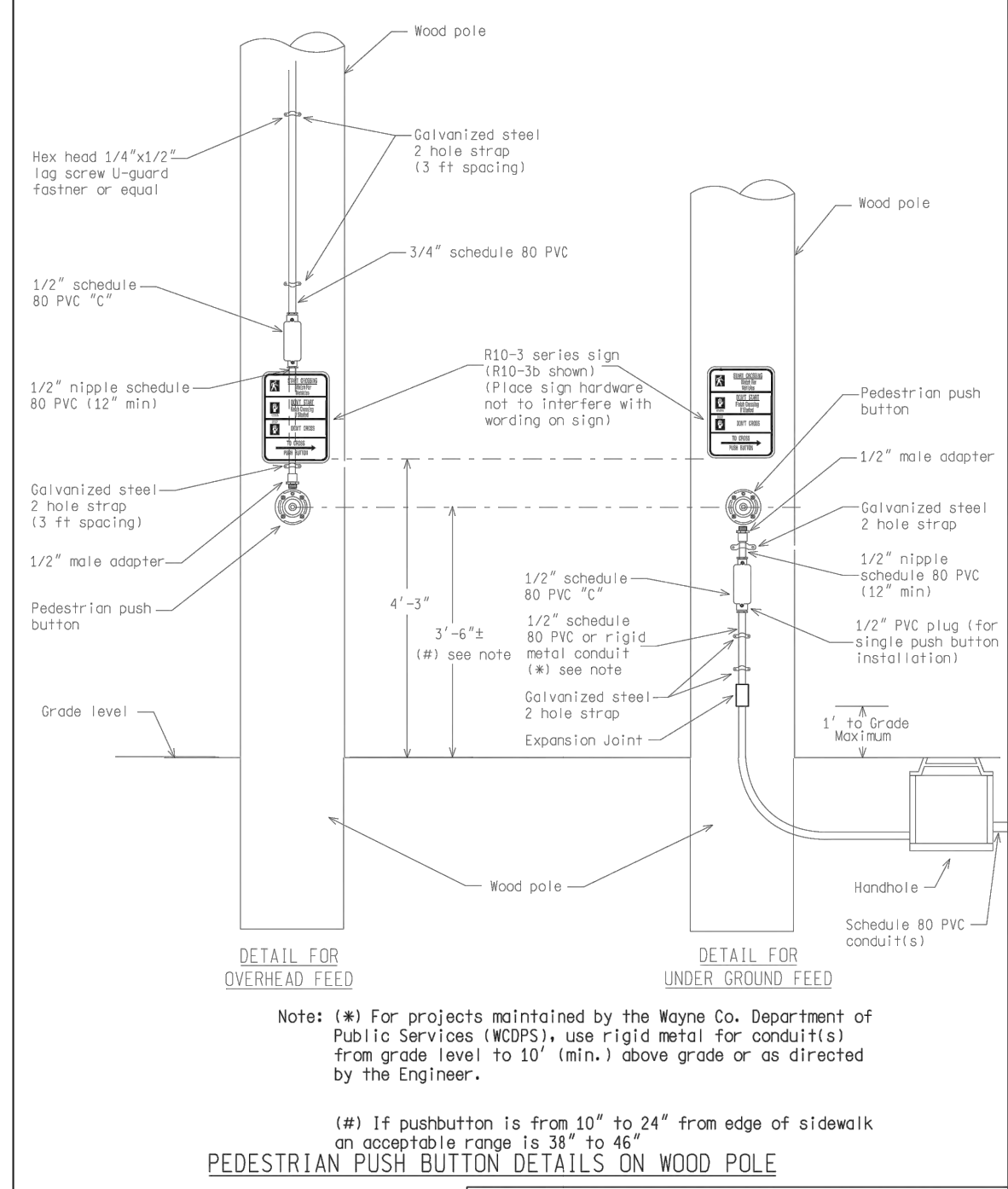
<p>PREPARED BY: ENGINEER OF DELIVERY TRAFFIC AND SAFETY DRAWN BY: ENGINEER OF DEVELOPMENT CHECKED BY: (SPECIAL DETAIL)</p>	<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR SPAN WIRE TETHER DETAILS</p>
<p>PLAN DATE: SIG-305-C SHEET 1 OF 5</p>	<p>PLAN DATE: SIG-305-C SHEET 1 OF 5</p>

<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN F:\1181\ref\hcr\181\signals\Ref/Sp Det/TF/181\510305C.dgn Rev. 04/08/19</p>	<p>PHVA APPROVAL DATE: _____ PLAN DATE: SIG-305-C SHEET 2 OF 5</p>
--	--

<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN F:\1181\ref\hcr\181\signals\Ref/Sp Det/TF/181\510305C.dgn Rev. 04/08/19</p>	<p>PHVA APPROVAL DATE: _____ PLAN DATE: SIG-305-C SHEET 3 OF 5</p>
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<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN F:\1181\ref\hcr\181\signals\Ref/Sp Det/TF/181\510305C.dgn Rev. 04/08/19</p>	<p>PHVA APPROVAL DATE: _____ PLAN DATE: SIG-305-C SHEET 4 OF 5</p>
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<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN F:\1181\ref\hcr\181\signals\Ref/Sp Det/TF/181\510305C.dgn Rev. 04/08/19</p>	<p>PHVA APPROVAL DATE: _____ PLAN DATE: SIG-305-C SHEET 5 OF 5</p>
--	--



<p>PREPARED BY: ENGINEER OF DELIVERY TRAFFIC AND SAFETY DRAWN BY: ENGINEER OF DEVELOPMENT CHECKED BY: (SPECIAL DETAIL)</p>	<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR PEDESTRIAN PUSH BUTTON DETAILS</p>
<p>PLAN DATE: SIG-400-A SHEET 1 OF 4</p>	<p>PLAN DATE: SIG-400-A SHEET 1 OF 4</p>

<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN F:\1181\ref\hcr\181\signals\Ref/Sp Det/TF/181\510400A.dgn Rev. 02/18/17</p>	<p>PHVA APPROVAL DATE: _____ PLAN DATE: SIG-400-A SHEET 2 OF 4</p>
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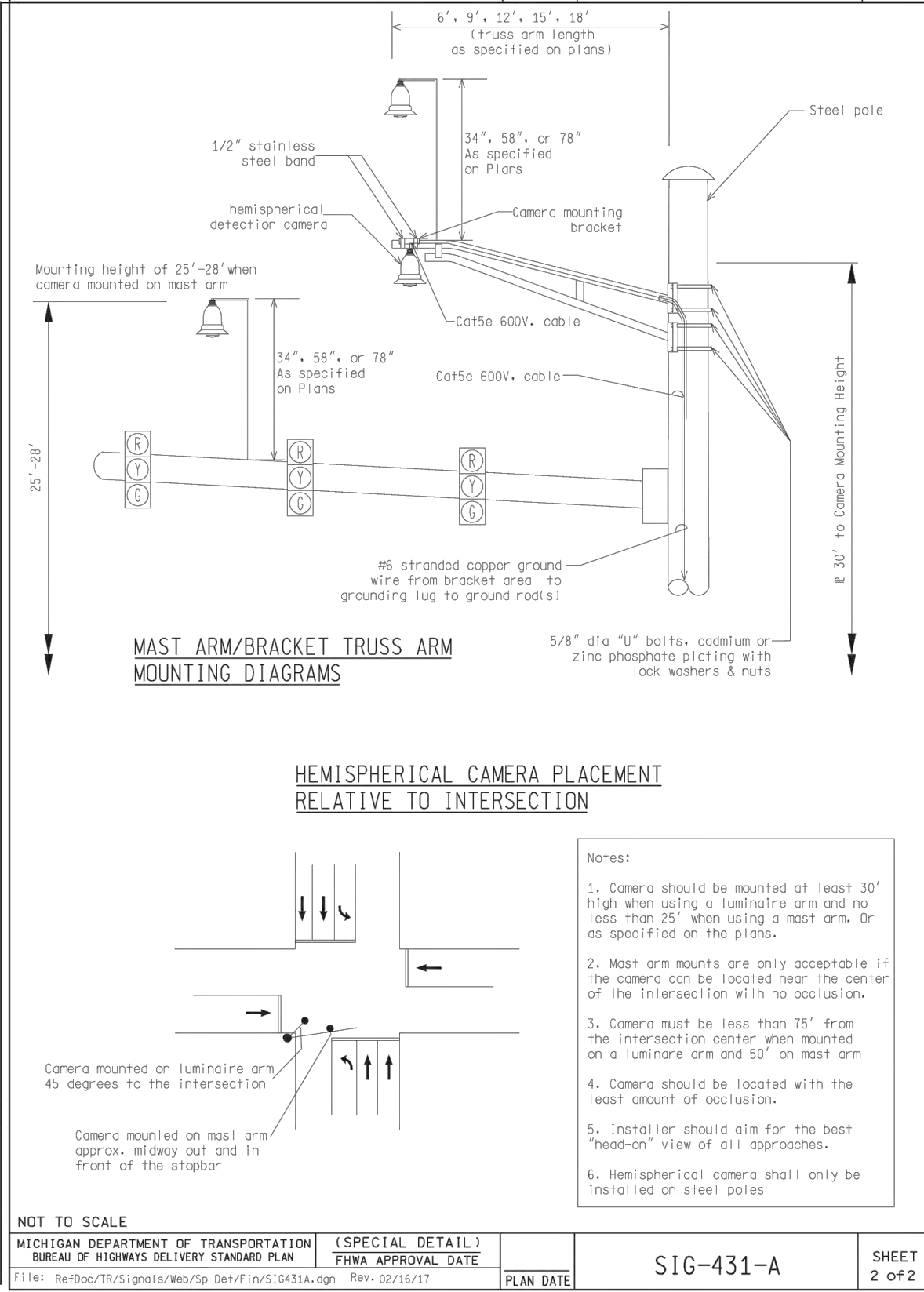
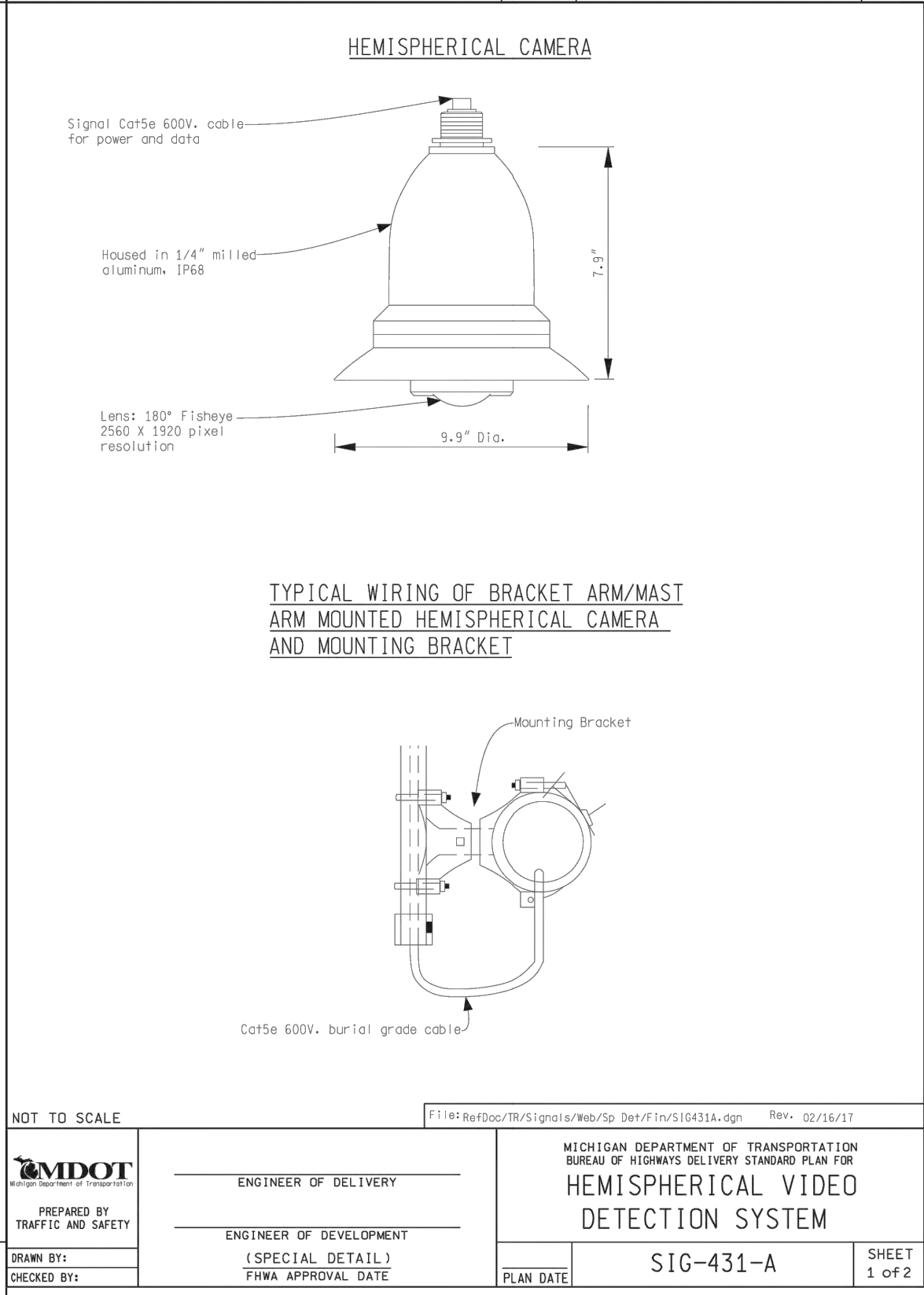
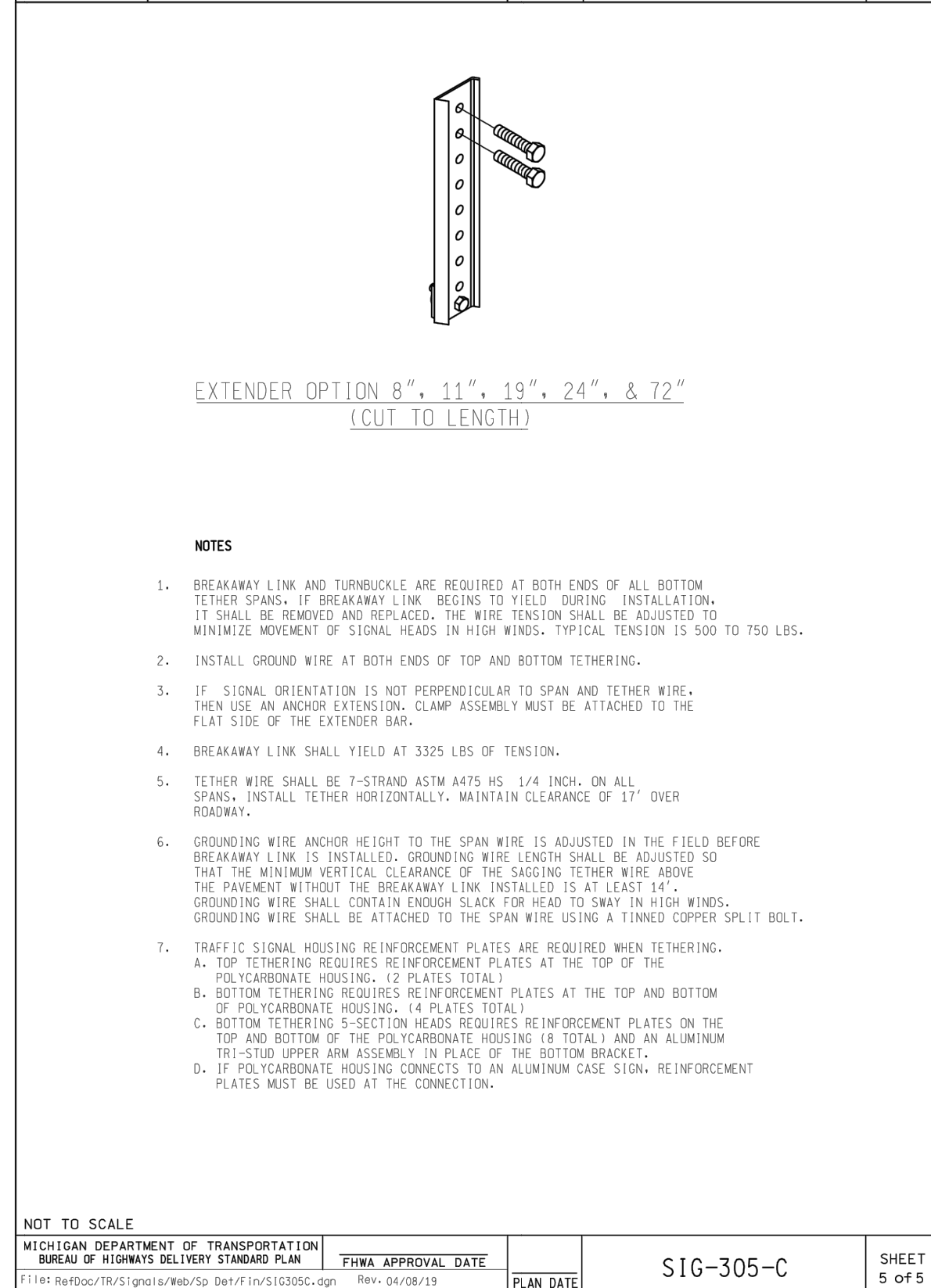
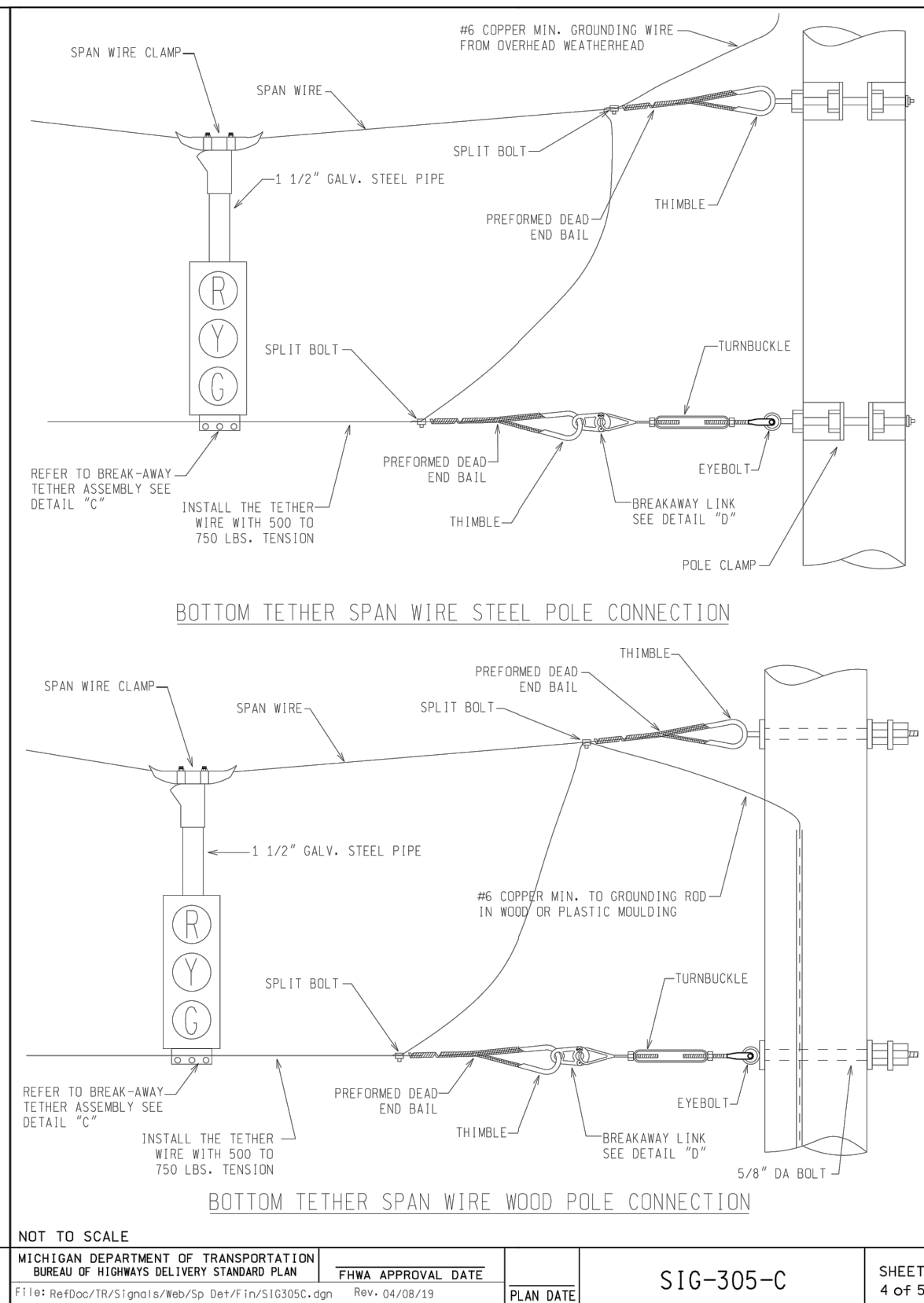
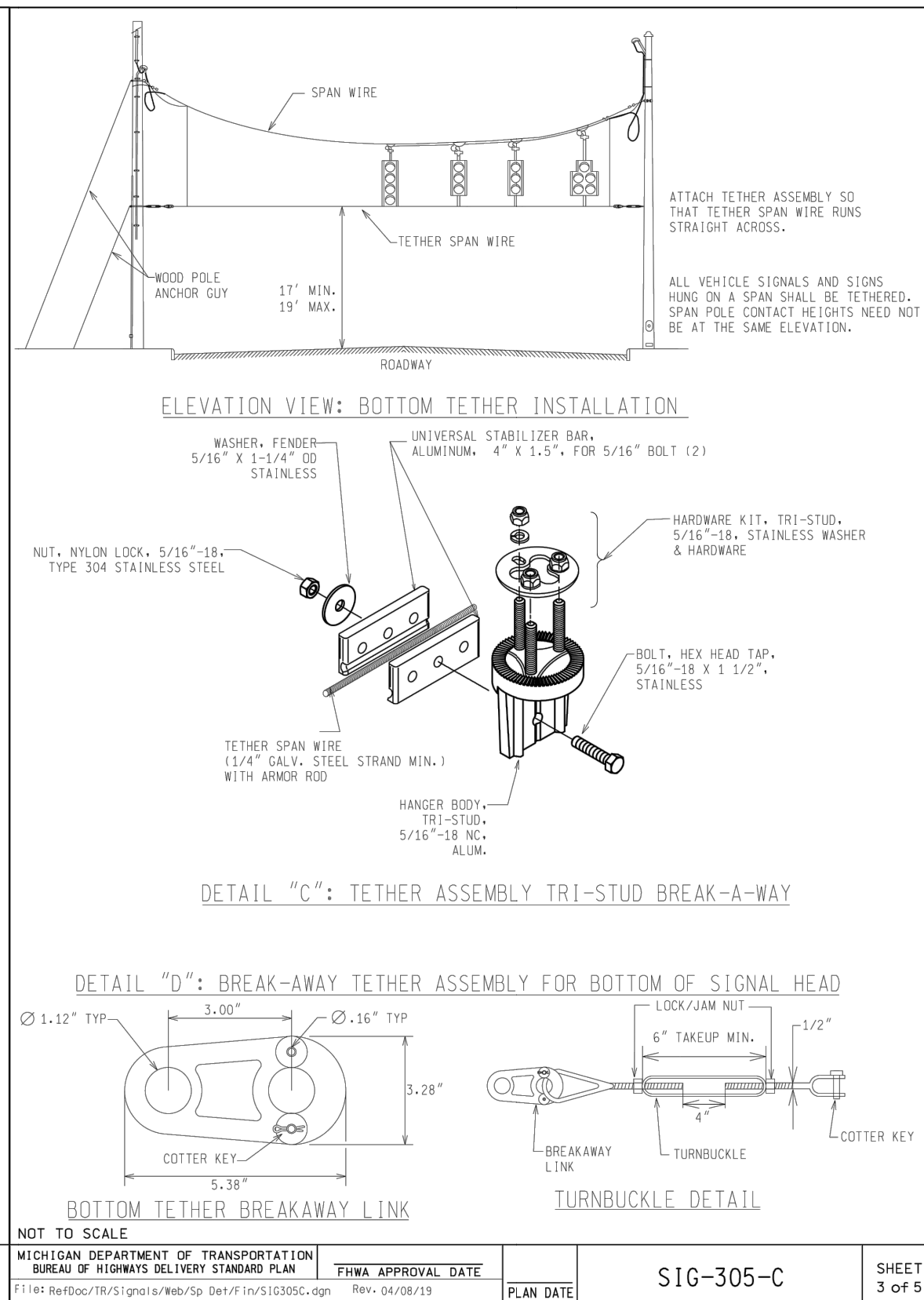
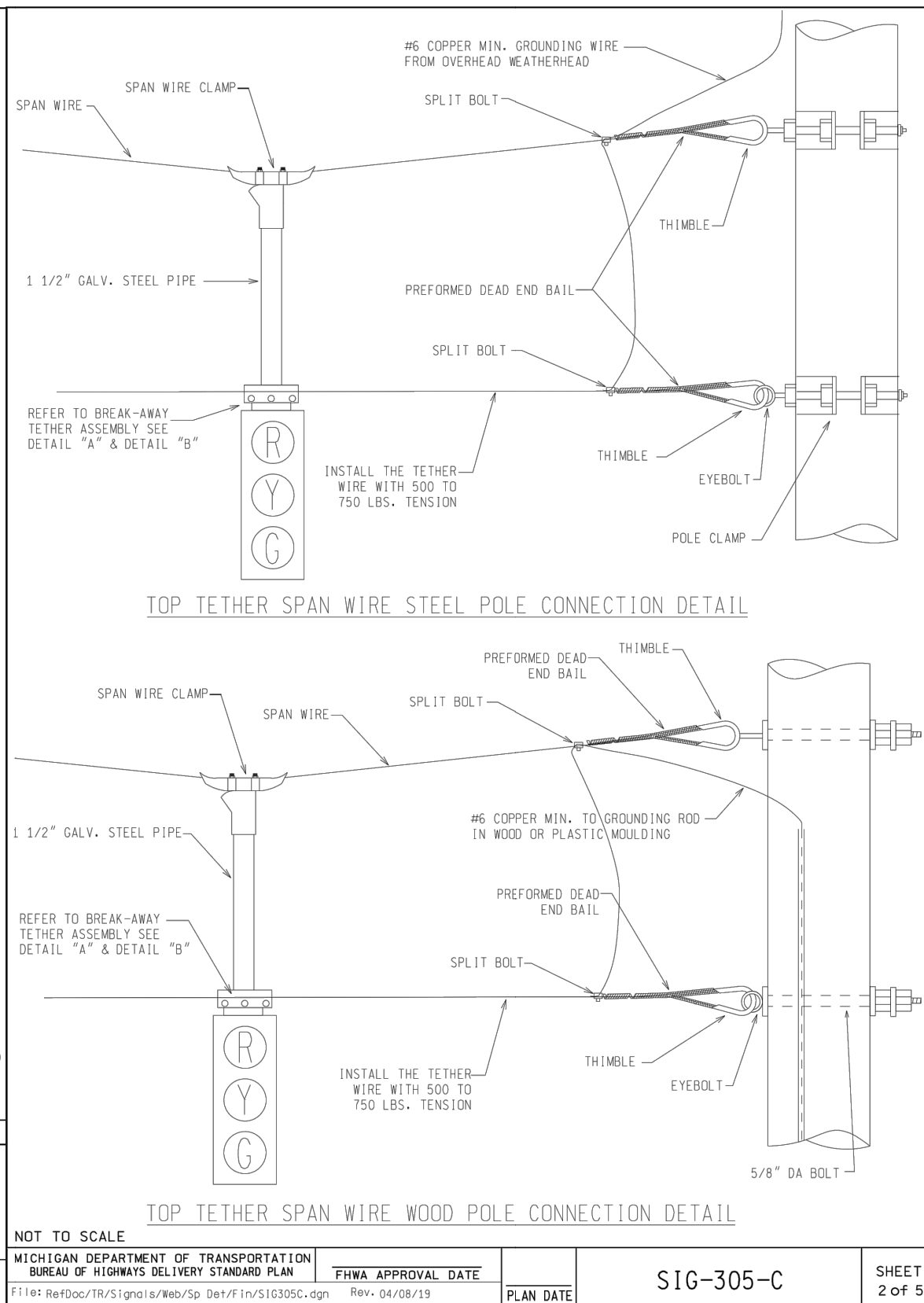
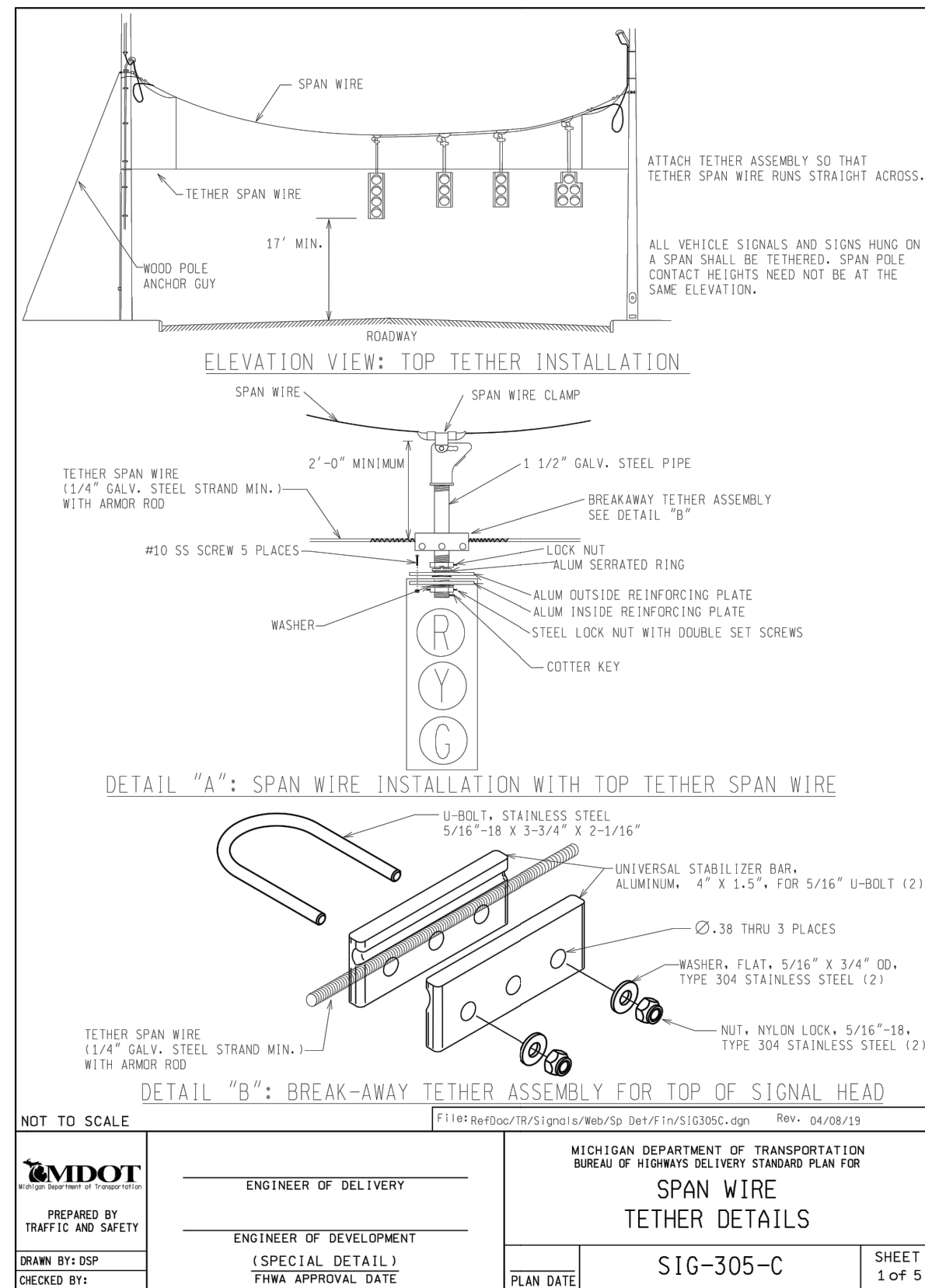
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<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN F:\1181\ref\hcr\181\signals\Ref/Sp Det/TF/181\510400A.dgn Rev. 02/18/17</p>	<p>PHVA APPROVAL DATE: _____ PLAN DATE: SIG-400-A SHEET 4 OF 4</p>
--	--

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	

		PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR					
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL SPECIAL DETAILS		SCALE	NTS		INCH	1	
		DRAWING NO.	2021-008-SSD7				
		SHEET NO.	143 OF 153				
REV. NO.	DESCRIPTION	DATE	INB	LCM	APPROVED BY:		



NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN

ENGINEER OF DELIVERY

ENGINEER OF DEVELOPMENT (SPECIAL DETAIL)

PLAN DATE

SIG-305-C

SHEET 1 of 5

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR
HEMISPHERICAL VIDEO DETECTION SYSTEM

ENGINEER OF DELIVERY

ENGINEER OF DEVELOPMENT (SPECIAL DETAIL)

PLAN DATE

SIG-431-A

SHEET 1 of 2

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR
HEMISPHERICAL VIDEO DETECTION SYSTEM

ENGINEER OF DELIVERY

ENGINEER OF DEVELOPMENT (SPECIAL DETAIL)

PLAN DATE

SIG-431-A

SHEET 2 of 2

LEGEND

EXISTING FENCE

CONTOUR

STORM SEWER & CAT. BAS.

WATER MAIN & VALVE-IN-WELL

WATER MAIN & VALVE-IN-BOX

EXISTING SANITARY SEWER & MANHOLE

UTILITY POLE & GUY

FIRE HYDRANT ASSEMBLY

LIGHT POLE

END SECTION

EXISTING TELEPHONE

GAS LINE

CABLE T.V.

ELECTRIC

SIGN

EXISTING RD. & GRADE

LEFT EDGE/RD. GRADE

RIGHT EDGE/RD. GRADE

CURB & GUTTER

EDGE/GRAVEL

PROPOSED SANITARY SEWER & MANHOLE

STORM SEWER & CAT. BAS.

WATER MAIN W/F.H. ASSEM.

CONTOUR

ROAD & GRADE

PROPOSED CURB & GUTTER

SEE ABOVE

BENCH MARK

SURVEY BOOK

REV. NO.

DESCRIPTION

DATE

DR. BY

CH. BY

DLZ

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

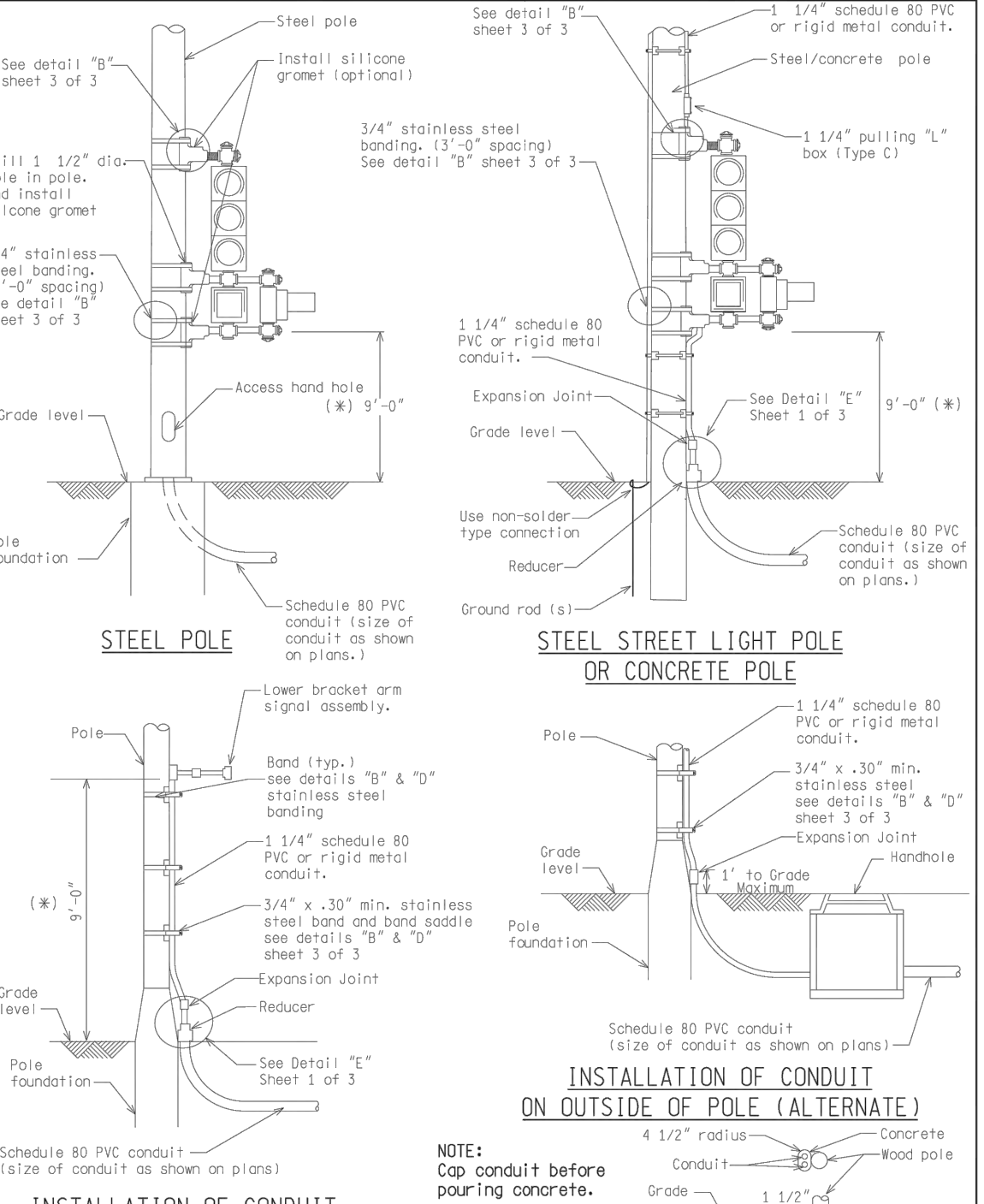
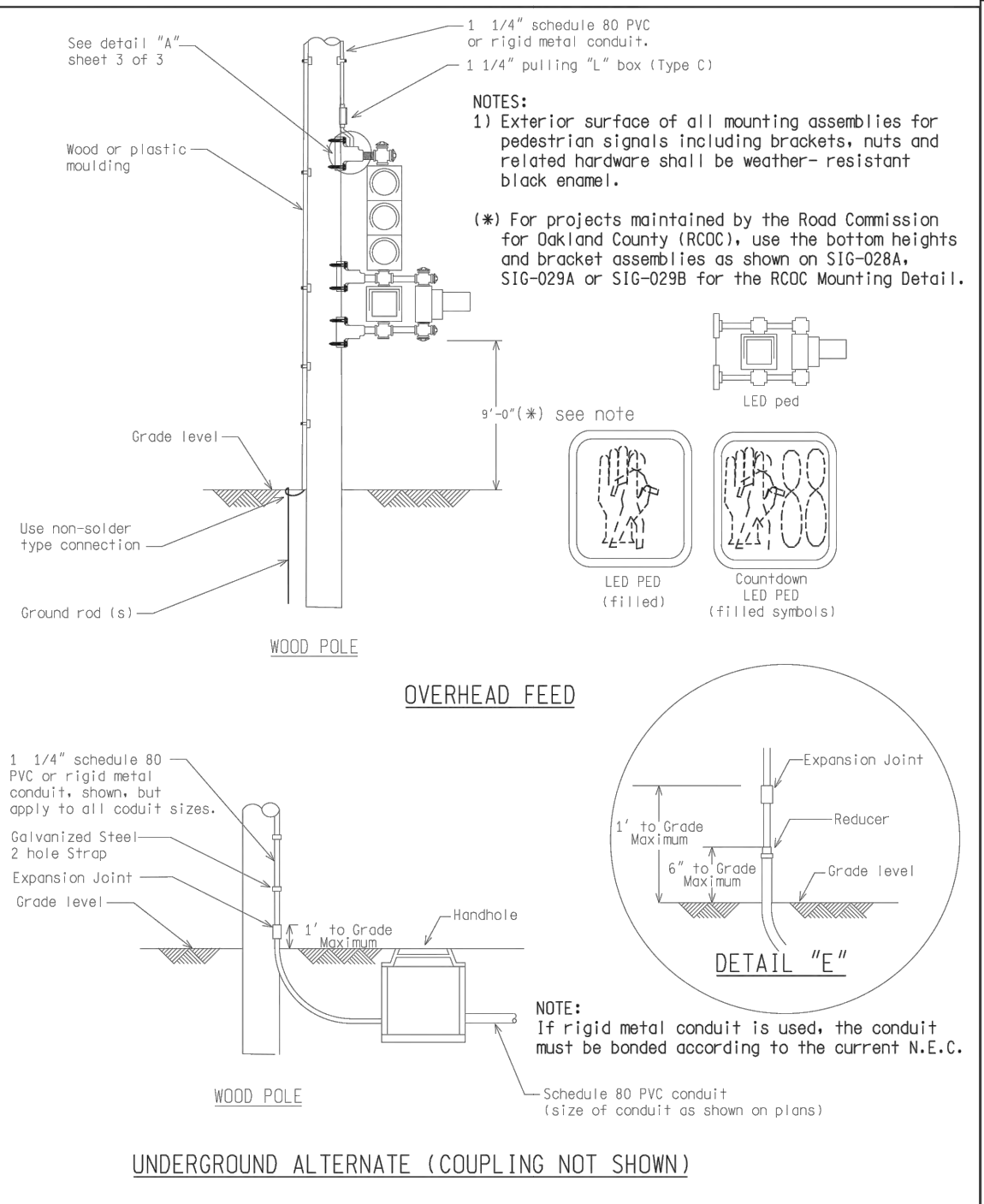
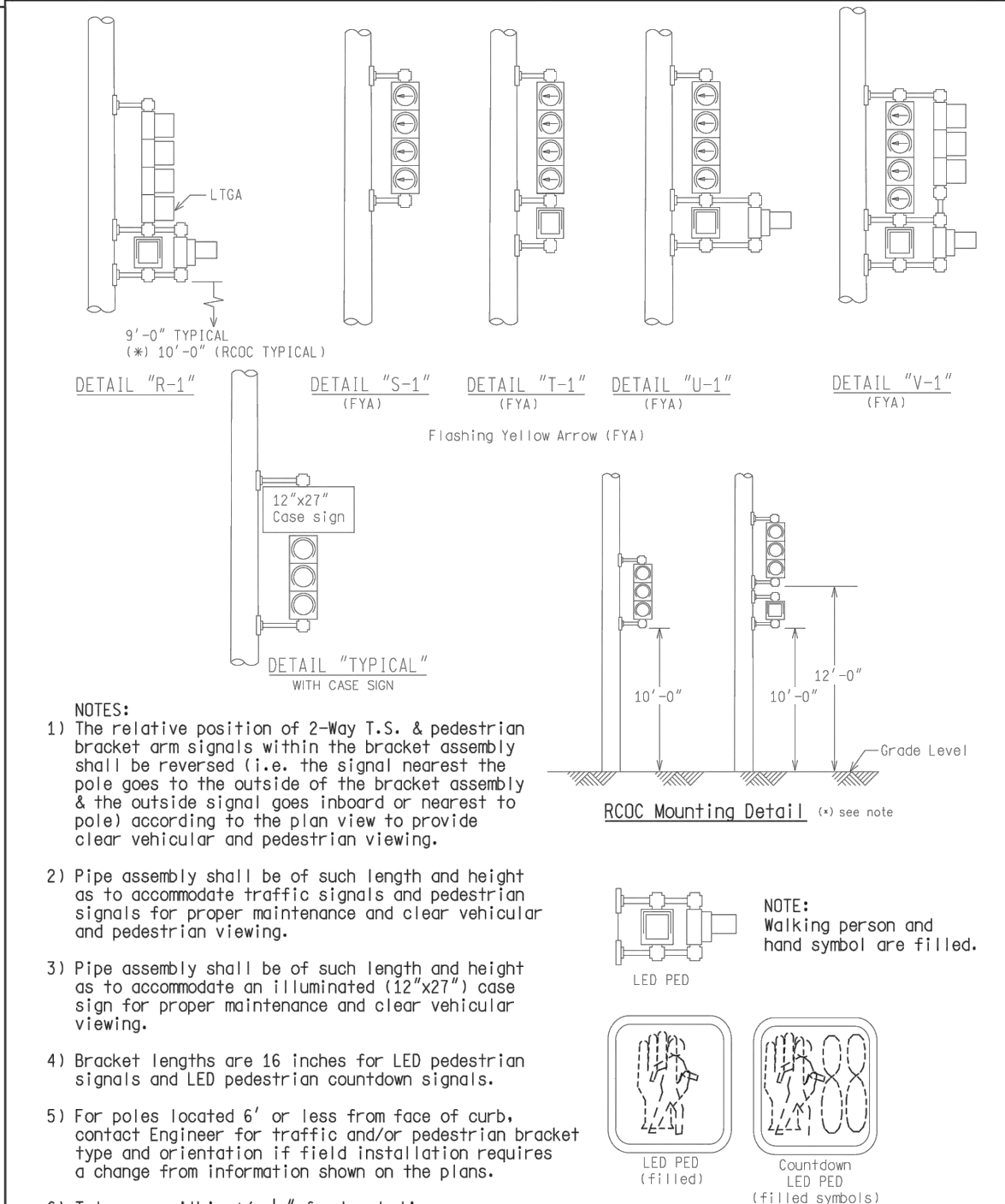
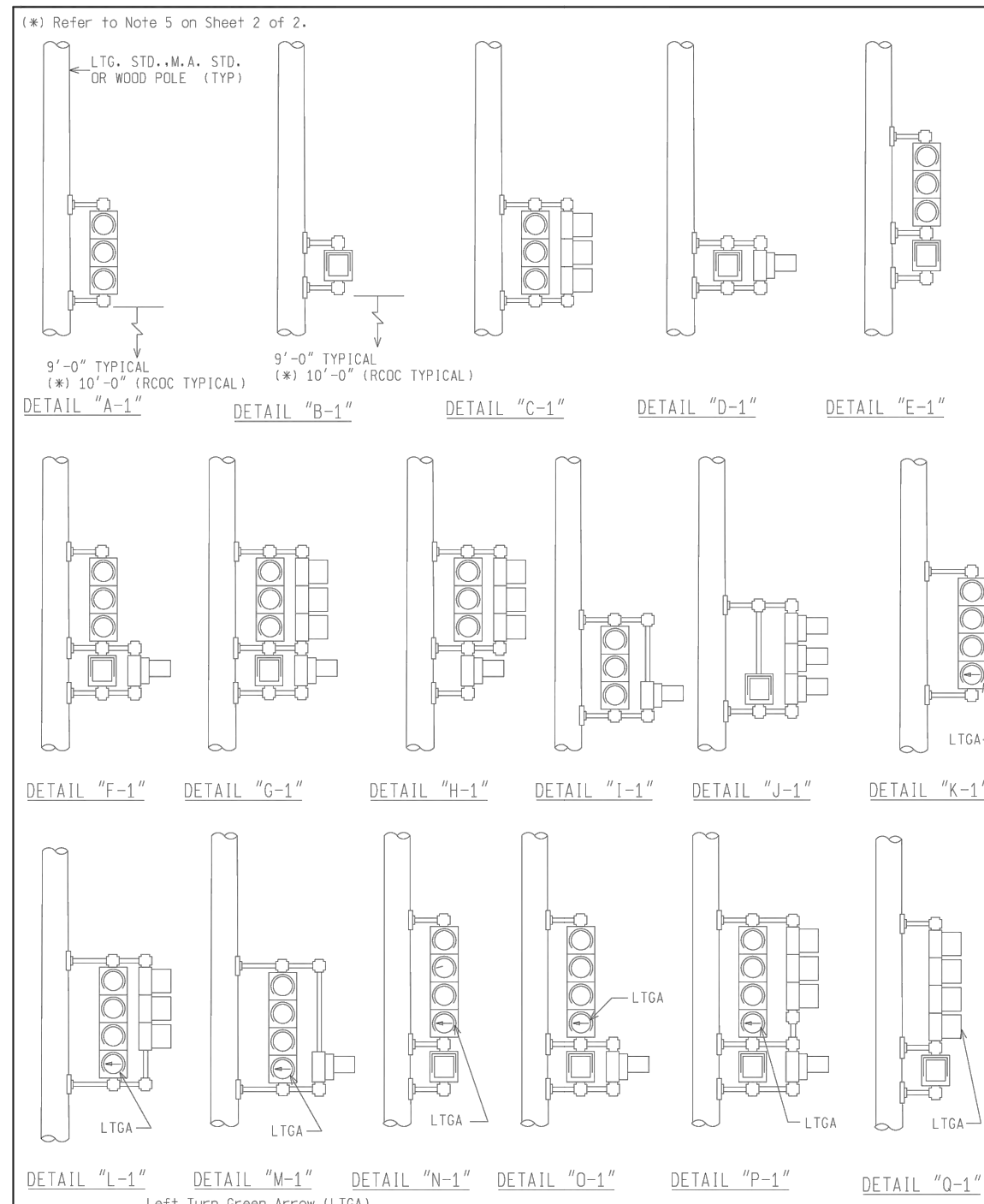
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL SPECIAL DETAILS

SCALE: NTS

DRAWING NO. 2021-008-SSD8

SHEET NO. 144 OF 153

APPROVED BY



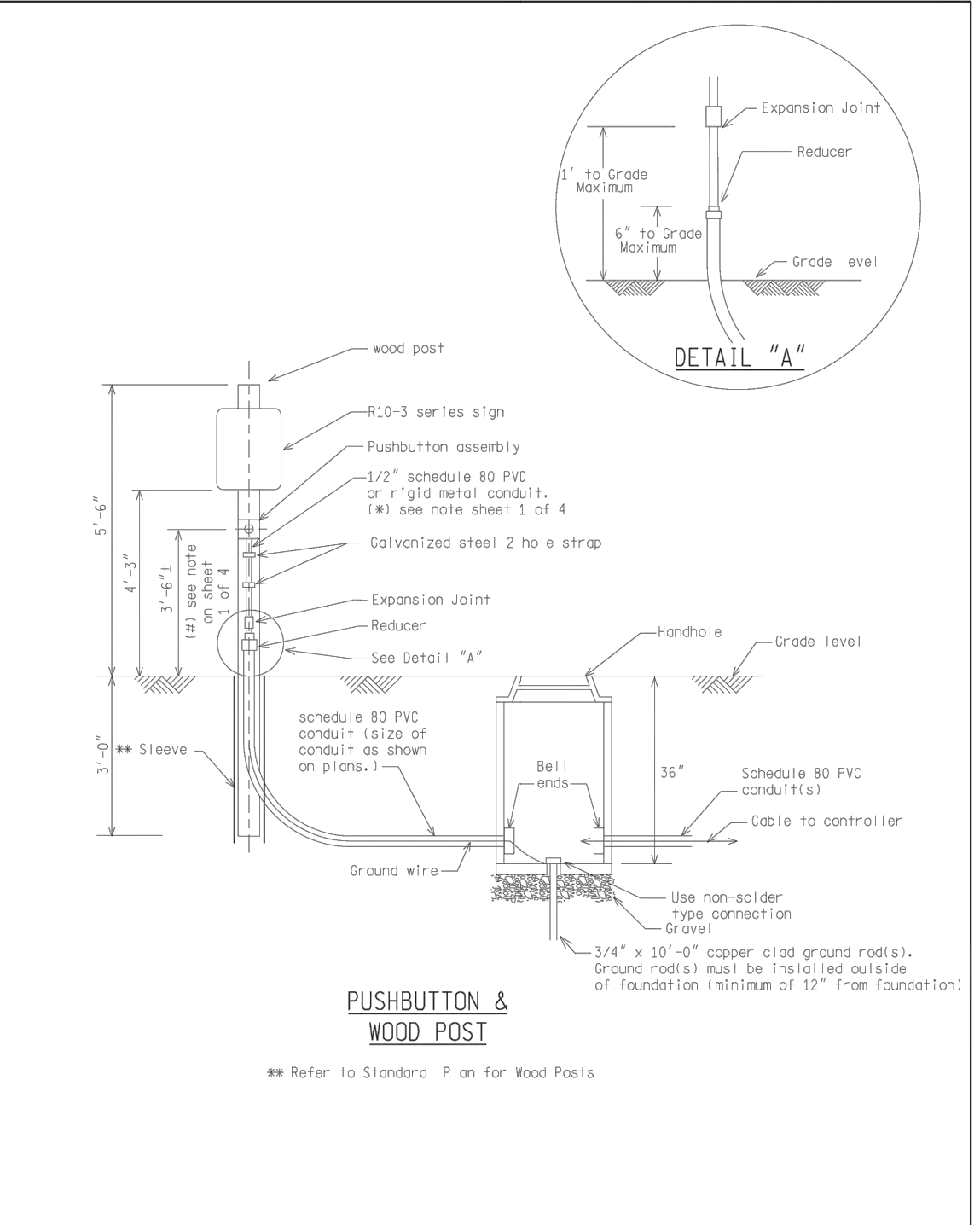
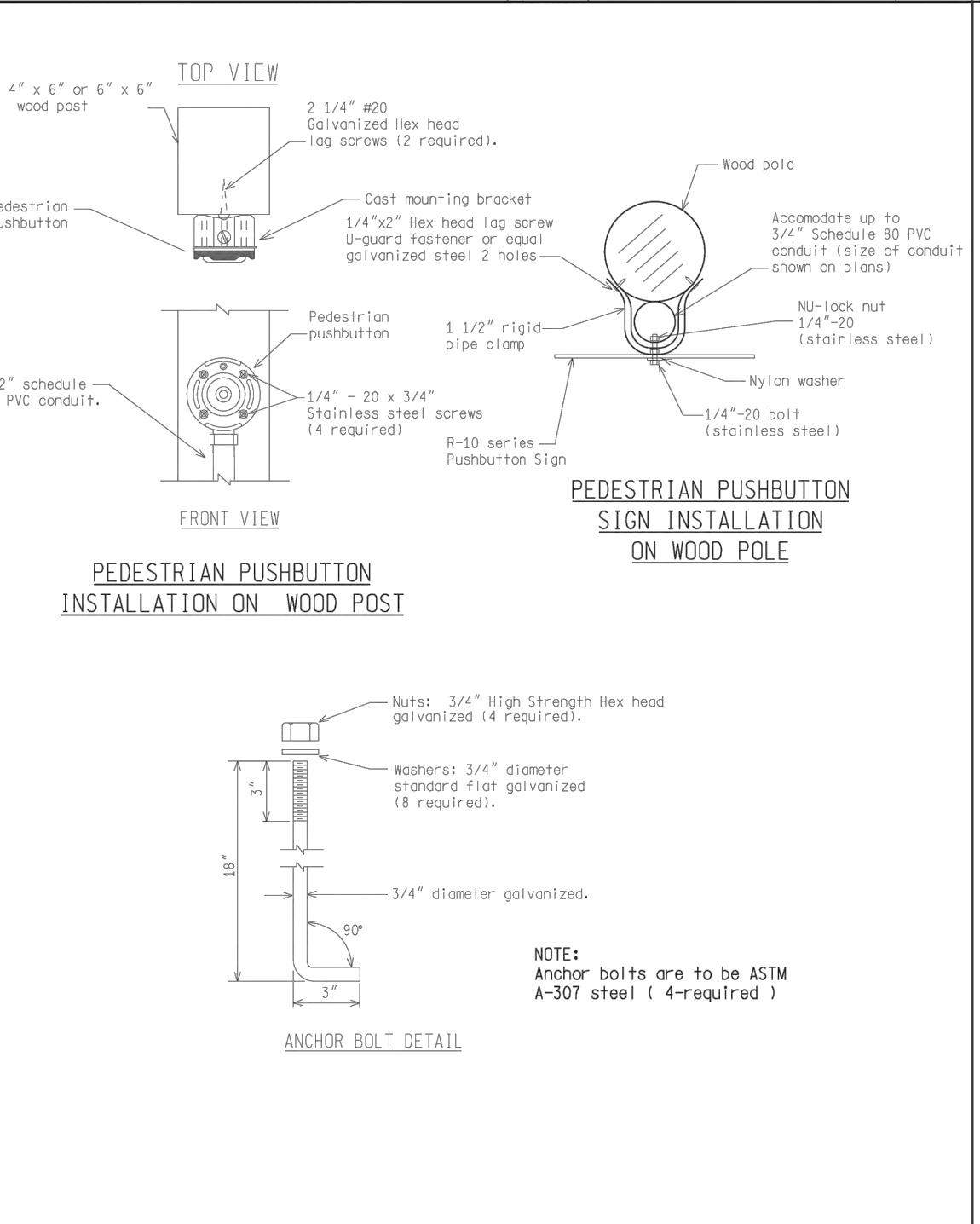
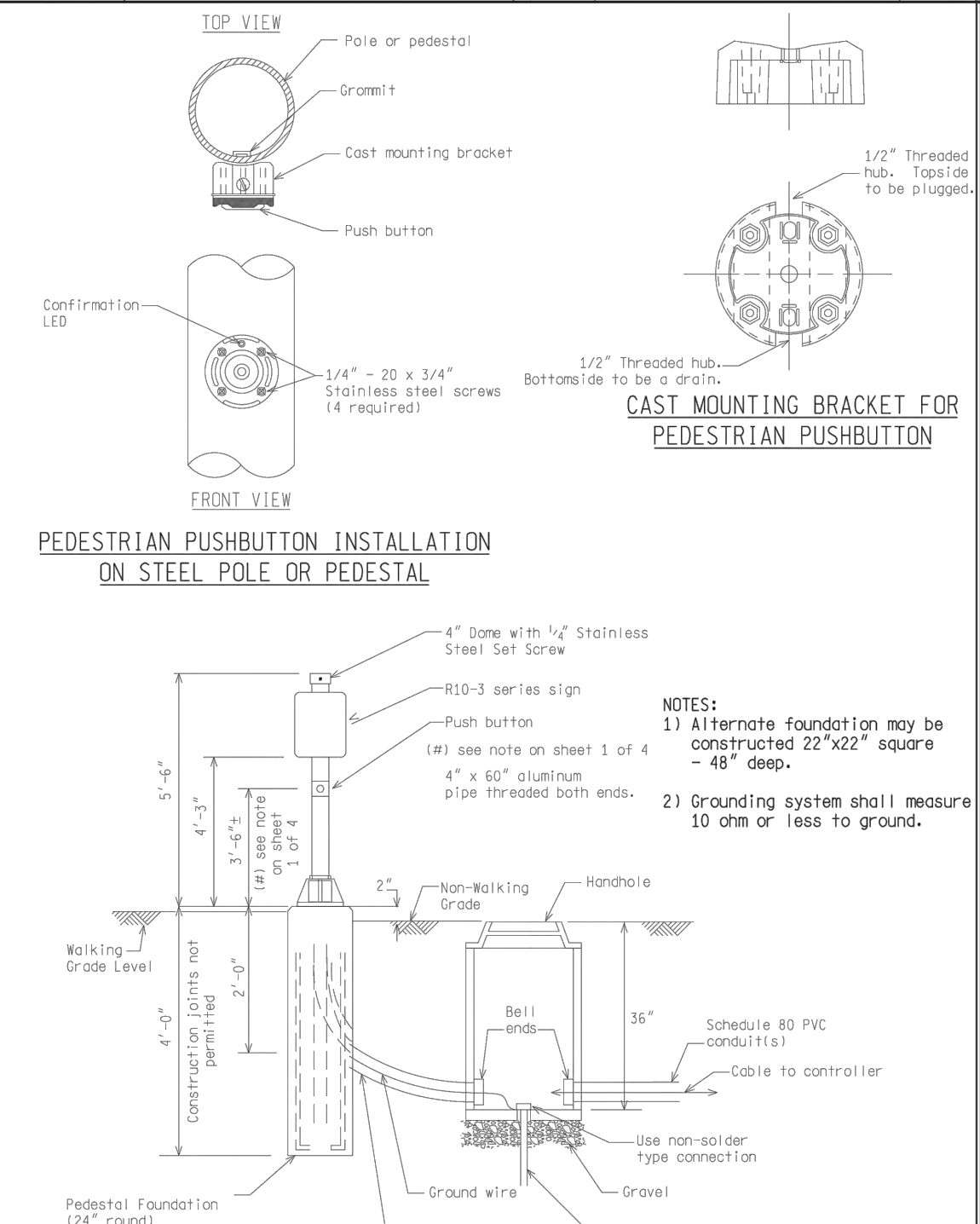
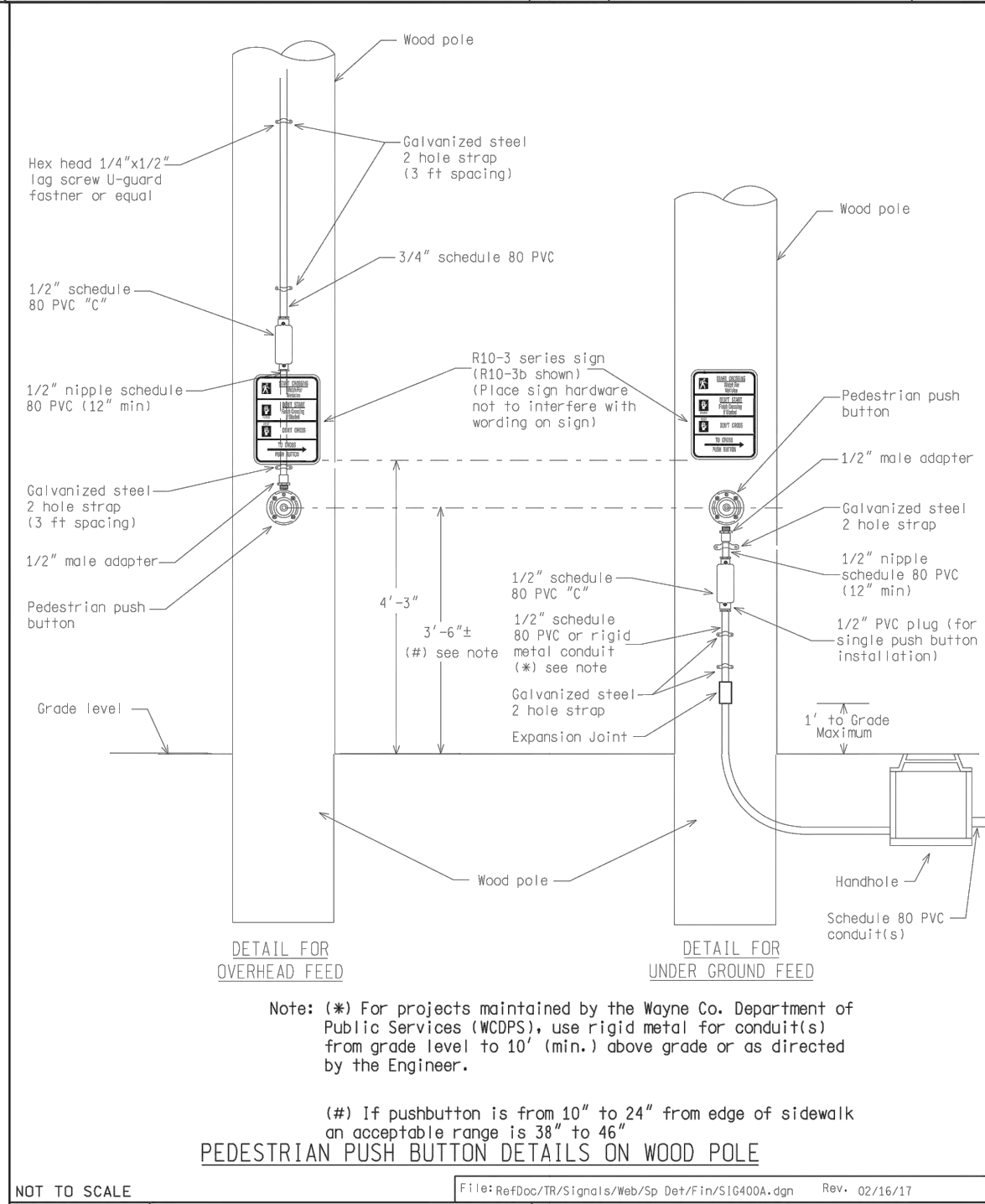
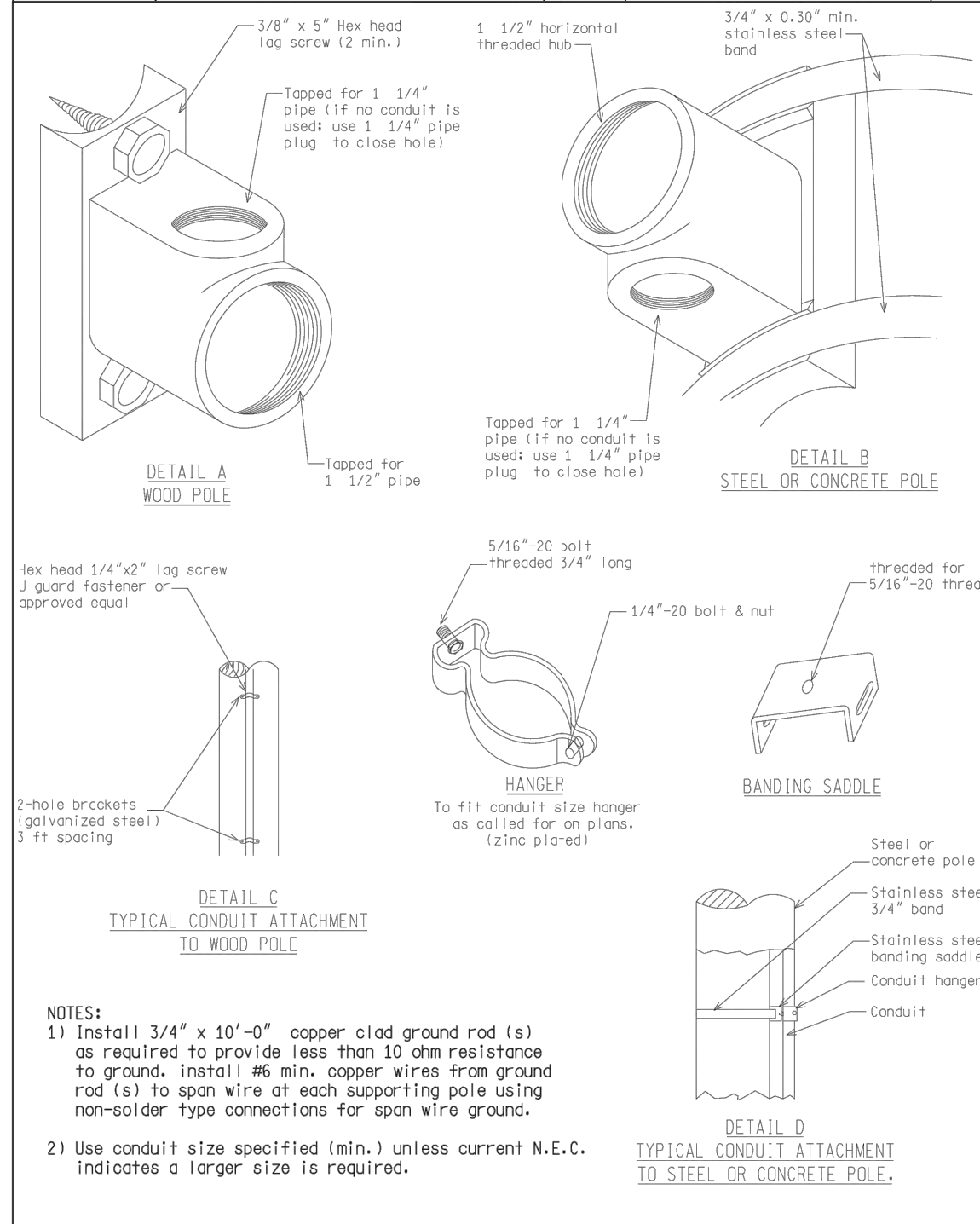
ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-340-A	SHEET 1 OF 2
ENGINEER OF DEVELOPMENT	POLE MOUNTED SIGNAL DISPLAYS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10340A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-340-A	SHEET 2 OF 2
ENGINEER OF DEVELOPMENT	POLE MOUNTED SIGNAL DISPLAYS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10340A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-341-A	SHEET 1 OF 3
ENGINEER OF DEVELOPMENT	POLE MOUNTING DETAILS FOR SIGNALS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10341A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-341-A	SHEET 2 OF 3
ENGINEER OF DEVELOPMENT	POLE MOUNTING DETAILS FOR SIGNALS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10341A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-341-A	SHEET 3 OF 3
ENGINEER OF DEVELOPMENT	POLE MOUNTING DETAILS FOR SIGNALS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10341A.dgn Rev. 02/16/17		
CHECKED BY			



ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-341-A	SHEET 3 OF 3
ENGINEER OF DEVELOPMENT	POLE MOUNTING DETAILS FOR SIGNALS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10341A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-400-A	SHEET 1 OF 4
ENGINEER OF DEVELOPMENT	PEDESTAL PUSH BUTTON DETAILS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10400A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-400-A	SHEET 2 OF 4
ENGINEER OF DEVELOPMENT	PEDESTAL PUSH BUTTON DETAILS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10400A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-400-A	SHEET 3 OF 4
ENGINEER OF DEVELOPMENT	PEDESTAL PUSH BUTTON DETAILS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10400A.dgn Rev. 02/16/17		
CHECKED BY			

ENGINEER OF DELIVERY	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR	SIG-400-A	SHEET 4 OF 4
ENGINEER OF DEVELOPMENT	PEDESTAL PUSH BUTTON DETAILS		
PREPARED BY	FILE# Ref/Doc/RS/Signal/Std/Sp Det/F in/S10400A.dgn Rev. 02/16/17		
CHECKED BY			

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
CONTOUR	UTILITY POLE & GUY	GAS LINE	LEFT EDGE/RD. GRADE	STORM SEWER & CAT. BAS.	SEE ABOVE
STORM SEWER & CAT. BAS.	FIRE HYDRANT ASSEMBLY	CABLE T.V.	RIGHT EDGE/RD. GRADE	WATER MAIN W/F.H. ASSEM.	BENCH MARK
WATER MAIN & VALVE-IN-WELL	LIGHT POLE	ELECTRIC	CURB & GUTTER	CONTOUR	SURVEY BOOK
WATER MAIN & VALVE-IN-BOX	END SECTION	SIGN	EDGE/GRAVEL	ROAD & GRADE	REV. NO.



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL SPECIAL DETAILS

SCALE	0 INCH 1
DRAWING NO.	2021-008-SSD9
SHEET NO.	145 OF 153

APPROVED BY	INB	LCM
DATE	10/12/22	
DR. BY		
CH. BY		

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8		TIMING INSTALLED
		EBWB		NB					NB		
MINIMUM GREEN		15		8					8		REMARKS This timing plan is for EMCD bridge construction Stage 1.
PASSAGE		0.0		3.0					3.0		
MAXIMUM NO. 1		99		41					41		
MAXIMUM NO. 2		0		0					0		
YELLOW CHANGE		3.1		3.1					3.0		
RED CLEARANCE		2.5		2.5					3.8		
WALK		8		8							
PEDESTRIAN CLEARANCE		16		12							
EXTENDED PED. CLEARANCE		3		3							
REST IN WALK		1		0							
INITIALIZATION		4		1					1		
NON-ACT RESPONSE		0		0					0		
VEHICLE RECALL		3		0					0		
PEDESTRIAN RECALL		0		0					0		
NON-LOCK MEMORY		0		0					0		
DUAL ENTRY		0		1					1	O1 O2 O3	
DIAL 1 SPLIT 1		90	55	35					35	65	
DIAL 2 SPLIT 1		120	87	33					33	79	
DIAL 3 SPLIT 1		140	99	41					41	13	
DIAL SPLIT											
DIAL SPLIT											
DIAL SPLIT											
MODE		1		0					0		
PHASE	Hours of Operation:										
1	D1/S1/O1: Normal										
2	D2/S1/O1: 07:00 to 09:00 Monday-Friday										
3	D3/S1/O1: 14:00 to 17:00 Monday-Friday										
4	Cancer Center	NB									
5	OVERLAPS										
	Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN			
6	=										
7	=										
8	WMCD	NB									
PREPARED BY: DLZ DATE: 09/09/22											
FLASH HOURS: _____ DAILY <input type="checkbox"/> NONE <input checked="" type="checkbox"/>											
NIGHT FLASH: _____ FR = _____											
CONFLICT FLASH: _____ FR = All Directions											
FY = _____											
CONTROLLER TYPE: <input checked="" type="checkbox"/> EPAC <input type="checkbox"/> PRE-EMPT <input type="checkbox"/>											
<input type="checkbox"/> Other: _____ COUNTDOWN PEDS <input checked="" type="checkbox"/>											
LOCATION: EMCD & WMCD & Cancer Center											
CITY/TWP: Ann Arbor											
COUNTY: Washtenaw											
MILE POINT _____ CONTROL SECTION-SPOT # 139											
Job # (If Applicable): _____											

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING				RING AND BARRIER STRUCTURE									
	Phase # / Description	Permissive-Protected	Protected-Only		R1	B1	B2	B3	B4					
Controller Type: <input type="checkbox"/> EPAC <input type="checkbox"/> Other: _____	Lead	Lag	Split											
System Type: <input type="checkbox"/> Closed Loop <input type="checkbox"/> Stand By <input type="checkbox"/> Group 1 <input type="checkbox"/> Group 2 <input checked="" type="checkbox"/> TBC <input type="checkbox"/> TBC/GPS <input type="checkbox"/> None <input type="checkbox"/> Other: _____														
VEHICULAR AND PEDESTRIAN DETECTION				DISAPPEARING LEGEND CASE SIGNS										
Approach	Vehicle Detection			Pedestrian Detection			Push-Button Crossing Locations							
	Left	Thru	Right	Loop	Video	Other								
NB (WMCD)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S Leg of WMCD							
NB (Cancer Center)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	W & E Legs of EMCD							
Address:							S Leg of Cancer Center							
ADDITIONAL DIAL SPLIT DATA														
DIAL	SPLIT	CYCLE	PHASE	1	2	3	4	5	6	7	8	O1	O2	O3
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
COORDINATION DATA														
Operation Mode 1														
Coordination Mode 0														
Maximum Mode 0														
Correction Mode 3														
Offset Mode 0														
Force Mode 0														
Max Dwell 0														
Yield Period 0														
ADDITIONAL OVERLAP DATA														
Overlap Phase		Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN						
=														
=														
=														
=														
REMARKS:														
PREPARED BY: DLZ DATE: 09/09/22														
LOCATION: EMCD & WMCD & Cancer Center														
CONTROL SECTION-SPOT # 139														
<input type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input checked="" type="checkbox"/> Consultant														
Primary Spot # _____														

CLEAR PAGE 2

LEGEND

EXISTING FENCE	---|---|---	EXISTING SANITARY SEWER & MANHOLE	—S—	EXISTING TELEPHONE	—t—	EXISTING RD. & GRADE	—|—	PROPOSED SANITARY SEWER & MANHOLE	—S—	PROPOSED CURB & GUTTER	—|—
CONTOUR	---|---|---	UTILITY POLE & GUY	—o—	GAS LINE	—g—	LEFT EDGE/RD. GRADE	—|—	STORM SEWER & CAT. BAS.	—S—	SEE ABOVE	
STORM SEWER & CAT. BAS.	—|---|---	FIRE HYDRANT ASSEMBLY	—h—	CABLE T.V.	—tv—	RIGHT EDGE/RD. GRADE	—|—	WATER MAIN W/F.H. ASSEM.	—W—	BENCH MARK	
WATER MAIN & VALVE-IN-WELL	—W—	LIGHT POLE	—o—	ELECTRIC	—e—	CURB & GUTTER	—|—	CONTOUR	---|---|---	SURVEY BOOK	
WATER MAIN & VALVE-IN-BOX	—W—	END SECTION	—)---	SIGN	—b—	EDGE/GRAVEL	—|—	ROAD & GRADE	—|—	REV. NO.	

DLZ					
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY	APPROVED BY
	ORIGINAL ISSUE	10/12/22	INB	LCM	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR			
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL TIMING PERMITS			
SCALE NTS	0 INCH 1		
DRAWING NO.	2021-08-TSTP1		
SHEET NO.	146 OF 153		

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8	TIMING INSTALLED			
		EB-Left	WB-Thru	SB-Left	NB-Thru	WB-Left	EB-Thru	NB-Left	SB-Thru				
MINIMUM GREEN		5	10	5	5	5	10	5	7				
PASSAGE		2.0	0.0	2.0	3.0	2.0	0.0	2.0	3.0				
MAXIMUM NO. 1		31	47	21	41	32	46	28	34				
MAXIMUM NO. 2													
YELLOW CHANGE		3.6	3.6	3.1	3.1	3.6	3.6	3.1	3.1				
RED CLEARANCE		2.5	2.5	3.3	3.3	2.5	2.5	3.3	3.3				
WALK			8		7		9		10				
PEDESTRIAN CLEARANCE			17		19		17		14				
EXTENDED PED. CLEARANCE			3		3		3		3				
REST IN WALK			0		0		0		0				
INITIALIZATION		1	4	1	4	1	4	1	4				
NON-ACT RESPONSE		0	0	0	0	0	0	0	0				
VEHICLE RECALL		2	3	0	0	2	3	0	0				
PEDESTRIAN RECALL			0		0		0		0				
NON-LOCK MEMORY		0	0	0	0	0	0	0	0				
DUAL ENTRY		0	1	0	1	0	1	0	1				
DIAL 1	SPLIT 1	90	12	33	12	33	12	33	12	33	0	0	0
DIAL 2	SPLIT 1	120	26	37	17	40	22	41	25	32	0	0	0
DIAL 3	SPLIT 1	140	31	47	21	41	32	46	28	34	0	0	0
DIAL	SPLIT												
DIAL	SPLIT												
DIAL	SPLIT												
	MODE	0	1	0	0	0	1	0	0				

REMARKS: This timing plan is for EMCD bridge construction Stage 1.

PREPARED BY: DLZ DATE: 09/09/22

FLASH HOURS: [] DAILY [] NONE []

NIGHT FLASH: FY = FR =

CONFLICT FLASH: FY = FR = All Directions

CONTROLLER TYPE: EPAC PRE-EMPT
 Other: COUNTDOWN PEDS

LOCATION: Fuller & Maiden/EMCD
 CITY/TWP: Ann Arbor
 COUNTY: Washtenaw
 MILE POINT: CONTROL SECTION-SPOT # 126
 Job # (If Applicable):

Hours of Operation:
 1 Fuller EB-Left D1/S1/O1: Normal
 D2/S1/O1: 07:00 to 09:00 Monday-Friday
 2 Fuller WB-Thru D3/S1/O1: 14:00 to 17:00 Monday-Friday
 3 Maiden SB-Left
 4 EMCD NB-Thru
 5 Fuller WB-Left
 6 Fuller EB-Thru
 7 EMCD NB-Left
 8 Maiden SB-Thru

OVERLAPS	Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-GY	+GRN
=								
=								
=								
=								

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING						RING AND BARRIER STRUCTURE							
	Permissive-Protected			Protected-Only			B1		B2		B3		B4	
Phase # / Description	Lead	Lag	Split	Lead	Lag		R1	1	2	3	4	B3	B4	
<input type="checkbox"/> EPAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		R2	5	6	7	8			
<input type="checkbox"/> Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		R3							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		R4							

System Type:	VEHICULAR AND PEDESTRIAN DETECTION						DISAPPEARING LEGEND CASE SIGNS					
	Vehicular Detection			Pedestrian Detection			Push-Button Crossing Locations					
<input type="checkbox"/> Closed Loop	Movements and Call Delay (s)			Type								
<input type="checkbox"/> Stand By	Approach	Left	Thru	Right	Loop	Video						
<input type="checkbox"/> Group 1	NB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All legs					
<input type="checkbox"/> Group 2	SB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<input type="checkbox"/> Address:	WB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<input checked="" type="checkbox"/> TBC	EB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<input type="checkbox"/> TBC/GPS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<input type="checkbox"/> None		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
<input type="checkbox"/> Other:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						

If TBC, Sync by: TOD Event

Interconnect Type:	ADDITIONAL DIAL SPLIT DATA								COORDINATION DATA				
	PHASE	1	2	3	4	5	6	7	8	O1	O2	O3	Operation Mode
<input type="checkbox"/> Hardwire	DIAL	SPLIT	CYCLE										1
<input type="checkbox"/> Fiber-Optic	DIAL	SPLIT	CYCLE										0
<input type="checkbox"/> Radio	DIAL	SPLIT	CYCLE										0
<input type="checkbox"/> Cell Modem	DIAL	SPLIT	CYCLE										0
<input type="checkbox"/> None	DIAL	SPLIT	CYCLE										0
<input checked="" type="checkbox"/> Other:	DIAL	SPLIT	CYCLE										0

If Cell Modem, Phone #:

Controller Status: Primary Secondary Isolated TBC

If Secondary, Primary Location:

PREPARED BY: DLZ DATE: 09/09/22 LOCATION: Fuller & Maiden/EMCD

Primary Spot #: MDOT County City Consultant CONTROL SECTION-SPOT # 126

CLEAR PAGE 2

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- CONTOUR	- UTILITY POLE & GUY	- GAS LINE	- LEFT EDGE/RD. GRADE	- STORM SEWER & CAT. BAS.	- SEE ABOVE
- STORM SEWER & CAT. BAS.	- FIRE HYDRANT ASSEMBLY	- CABLE T.V.	- RIGHT EDGE/RD. GRADE	- WATER MAIN W/F.H. ASSEM.	- BENCH MARK
- WATER MAIN & VALVE-IN-WELL	- LIGHT POLE	- ELECTRIC	- CURB & GUTTER	- CONTOUR	- SURVEY BOOK
- WATER MAIN & VALVE-IN-BOX	- END SECTION	- SIGN	- EDGE/GRAVEL	- ROAD & GRADE	- REV. NO.

DLZ

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL TIMING PERMITS

SCALE NTS 0 INCH 1

DRAWING NO. 2021-08-TSTP2

SHEET NO. 147 OF 153

APPROVED BY:

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8	TIMING INSTALLED
	SB-Left	SB	NB	WB						
MINIMUM GREEN PASSAGE		5	7	7	10					
MAXIMUM NO. 1		4.0	4.0	4.0	4.0					
MAXIMUM NO. 2		24	40	30	45					
YELLOW CHANGE		23	23	46	45					
RED CLEARANCE		3.1	3.1	3.1	3.1					
WALK				7	7					
PEDESTRIAN CLEARANCE				20	17					
EXTENDED PED. CLEARANCE				3	3					
REST IN WALK				1	0					
INITIALIZATION		1	4	4	1					
NON-ACT RESPONSE		0	0	0	0					
VEHICLE RECALL		0	0	0	0					
PEDESTRIAN RECALL		0	0	2	2					
NON-LOCK MEMORY		1	0	0	0					
DUAL ENTRY		0	1	1	0					
DIAL 1 SPLIT 1	CYCLE	80	15	46	31	34				O1 O2 O3
DIAL 2 SPLIT 1		80	24	52	28	28				0
DIAL 3 SPLIT 1		90	15	46	31	44				82
DIAL 3 SPLIT 2		90	15	46	31	44				0
DIAL SPLIT	MODE	0	1	1	0					

REMARKS: This timing plan is for EMCD bridge construction Stages 1, 2, and 3. Anything outside of the weekday peak hours, maintain existing timings. Phase 4 Leading Pedestrian Interval = 5 sec.

PREPARED BY: DLZ DATE: 09/09/22

FLASH HOURS: 20:00 to 05:45 DAILY NONE 20:00 to 06:30 Saturday & Sunday

NIGHT FLASH: FY = FR = All directions

CONFLICT FLASH: FY = FR = All directions

CONTROLLER TYPE: EPAC PRE-EMPT Other: COUNTDOWN PEDS

LOCATION: EMCD at Observatory

CITY/TWP: Ann Arbor

COUNTY: Washtenaw

MILE POINT: CONTROL SECTION-SPOT # 23

Job # (If Applicable):

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING				RING AND BARRIER STRUCTURE								
	Phase # / Description	Permissive-Protected	Protected-Only		R1	1	3	B1	B2	B3	B4		
Phase 1/SB Observatory LT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									

Controller Type: EPAC Other:

System Type: Closed Loop Stand By Group 1 Group 2

Address: TBC TBC/GPS None Other:

If TBC, Sync by: TOD Event

Interconnect Type: Hardware Fiber-Optic Radio Cell Modem None Other:

If Cell Modem: Phone #

Controller Status: Primary Secondary Isolated TBC

If Secondary, Primary Location:

Primary Spot #:

PHASE	1	2	3	4	5	6	7	8	O1	O2	O3	Operation Mode	1
DIAL SPLIT CYCLE												Coordination Mode	0
DIAL SPLIT CYCLE												Maximum Mode	0
DIAL SPLIT CYCLE												Correction Mode	3
DIAL SPLIT CYCLE												Offset Mode	0
DIAL SPLIT CYCLE												Force Mode	0
DIAL SPLIT CYCLE												Max Dwell	0
DIAL SPLIT CYCLE												Yield Period	0

ADDITIONAL OVERLAP DATA	Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
=								
=								
=								
=								

PREPARED BY: DLZ DATE: 09/09/22 LOCATION: EMCD at Observatory

CONTROL SECTION-SPOT # 23

MDOT County City Consultant

CLEAR PAGE 2

LEGEND

EXISTING FENCE	---|---|---	EXISTING SANITARY SEWER & MANHOLE	S --- O	EXISTING TELEPHONE	t ---	EXISTING RD. & GRADE	---|---|---	PROPOSED SANITARY SEWER & MANHOLE	S --- O	PROPOSED CURB & GUTTER	---|---|---
CONTOUR	847 ---	UTILITY POLE & GUY	U ---	GAS LINE	G ---	LEFT EDGE/RD. GRADE	---|---	STORM SEWER & CAT. BAS.	S ---	SEE ABOVE	
STORM SEWER & CAT. BAS.	847 ---	FIRE HYDRANT ASSEMBLY	F ---	CABLE T.V.	t ---	RIGHT EDGE/RD. GRADE	---|---	WATER MAIN W/F.H. ASSEM.	W ---	BENCH MARK	
WATER MAIN & VALVE-IN-WELL	W ---	LIGHT POLE	O ---	ELECTRIC	e ---	CURB & GUTTER	---|---	CONTOUR	847 ---	SURVEY BOOK	
WATER MAIN & VALVE-IN-BOX	W ---	END SECTION	) ---	SIGN	β ---	EDGE/GRAVEL	---|---	ROAD & GRADE	---|---	REV. NO.	

DLZ				
REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
	ORIGINAL ISSUE	10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL TIMING PERMITS	
SCALE NTS	0 INCH 1
DRAWING NO. 2021-08-TSTP3	
SHEET NO. 148 OF 153	
APPROVED BY:	

TRAFFIC SIGNAL TIMING PERMIT

TRAFFIC SIGNAL TIMING PERMIT form containing tables for PHASE, CYCLE, and MODE, along with timing parameters and remarks.

ADVANCED TIMING PARAMETERS FORM

ADVANCED TIMING PARAMETERS FORM with sections for SYSTEM INFORMATION, LEFT-TURN PHASING, RING AND BARRIER STRUCTURE, and VEHICULAR AND PEDESTRIAN DETECTION.

CLEAR PAGE 2

PREEMPTION INFORMATION FORM

PREEMPTION INFORMATION FORM with multiple tables for Preempt Description and Preempt System Data.

CLEAR PAGE 3

LEGEND

Legend table listing symbols for existing and proposed features like fences, sewers, telephones, and curbs.



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL TIMING PERMITS

SCALE NTS 0 INCH 1

DRAWING NO. 2021-08-TSTP4

SHEET NO. 149 OF 153

Table with columns for SEE ABOVE, BENCH MARK, SURVEY BOOK, REV. NO., DESCRIPTION, DATE, DR. BY, and CH. BY.

APPROVED BY

EPAC Permit 4-2-21

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8	TIMING INSTALLED	
		EBWB		NB					NB		
MINIMUM GREEN		15		8					8	REMARKS This timing plan is for EMCD bridge construction Stage 2.	
PASSAGE		0.0		3.0					3.0		
MAXIMUM NO. 1		99		41					41		
MAXIMUM NO. 2		0		0					0		
YELLOW CHANGE		3.1		3.1					3.0		
RED CLEARANCE		2.5		2.5					3.8		
WALK		8		8							
PEDESTRIAN CLEARANCE		16		12							
EXTENDED PED. CLEARANCE		3		3							
REST IN WALK		1		0							
INITIALIZATION		4		1					1		
NON-ACT RESPONSE		0		0					0		
VEHICLE RECALL		3		0					0		
PEDESTRIAN RECALL		0		0					0		
NON-LOCK MEMORY		0		0					0		
DUAL ENTRY		0		1					1		
DIAL 1 SPLIT 1	CYCLE	90	55	35					35 65		
DIAL 2 SPLIT 1		120	87	33					33 6		
DIAL 3 SPLIT 1		140	99	41					41 35		
DIAL SPLIT											
DIAL SPLIT											
DIAL SPLIT											
DIAL SPLIT											
DIAL SPLIT	MODE	1	0						0		
PHASE		Hours of Operation:								PREPARED BY: DLZ DATE: 09/09/22	
1		D1/S1/O1: Normal								FLASH HOURS:	
2	EMCD EBWB	D2/S1/O1: 07:00 to 09:00 Monday-Friday								<input type="checkbox"/> DAILY <input type="checkbox"/> NONE <input checked="" type="checkbox"/>	
3		D3/S1/O1: 14:00 to 17:00 Monday-Friday								NIGHT FLASH: FY = _____ FR = _____	
4	Cancer Center NB									CONFLICT FLASH: FY = _____ FR = All Directions	
		OVERLAPS								CONTROLLER TYPE: <input checked="" type="checkbox"/> EPAC <input type="checkbox"/> PRE-EMPT <input type="checkbox"/> <input type="checkbox"/> Other: <input type="checkbox"/> COUNTDOWN PEDS <input checked="" type="checkbox"/>	
		Overlap Phase	Lead Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-GY	+GRN	LOCATION: EMCD & WMCD & Cancer Center	
		=								CITY/TWP: Ann Arbor	
		=								COUNTY: Washtenaw	
		=								MILE POINT CONTROL SECTION-SPOT # 139	
		=								Job # (if Applicable):	

Page 1 of 3
Page 3 included only if Pre-Empt Checked

EPAC Permit 4-2-21

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING				RING AND BARRIER STRUCTURE									
	Permissive-Protected		Protected-Only		B1		B2							
Phase # / Description	Lead	Lag	Split	Lead	Lag	R1	R2	R3	R4					
Controller Type: <input checked="" type="checkbox"/> EPAC <input type="checkbox"/> Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
System Type: <input type="checkbox"/> Closed Loop <input type="checkbox"/> Stand By Group 1 <input type="checkbox"/> Group 2 <input checked="" type="checkbox"/> TBC <input type="checkbox"/> TBC/GPS <input type="checkbox"/> None <input type="checkbox"/> Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Vehicular Detection Approach: NB (WMCD) <input checked="" type="checkbox"/> Left <input type="checkbox"/> Thru <input checked="" type="checkbox"/> Right <input type="checkbox"/> Loop <input checked="" type="checkbox"/> Video <input type="checkbox"/> Other					Pedestrian Detection Push-Button Crossing Locations: S Leg of EMCD at Cancer Ctr <input type="checkbox"/> E Leg of EMCD at Cancer Ctr <input type="checkbox"/>									
DISAPPEARING LEGEND CASE SIGNS					COORDINATION DATA									
ADDITIONAL DIAL SPLIT DATA					ADDITIONAL OVERLAP DATA									
DIAL SPLIT CYCLE	PHASE	1	2	3	4	5	6	7	8	O1	O2	O3	Operation Mode	1
DIAL SPLIT CYCLE													Coordination Mode	0
DIAL SPLIT CYCLE													Maximum Mode	0
DIAL SPLIT CYCLE													Correction Mode	3
DIAL SPLIT CYCLE													Offset Mode	0
DIAL SPLIT CYCLE													Force Mode	0
DIAL SPLIT CYCLE													Max Dwell	0
DIAL SPLIT CYCLE													Yield Period	0
REMARKS: CLEAR PAGE 2					PREPARED BY: DLZ DATE: 09/09/22 <input type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input checked="" type="checkbox"/> Consultant									
LOCATION: EMCD & WMCD & Cancer Center CITY/TWP: Ann Arbor COUNTY: Washtenaw MILE POINT CONTROL SECTION-SPOT # 139					LOCATION: EMCD & WMCD & Cancer Center CONTROL SECTION-SPOT # 139									

Page 2 of 3

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- - - - -	- S - - - - -	- t - - - - -	- e - - - - -	- S - - - - -	- - - - -
" CONTOUR	" UTILITY POLE & GUY	" GAS LINE	" LEFT EDGE/RD. GRADE	" STORM SEWER & CAT. BAS.	SEE ABOVE
" STORM SEWER & CAT. BAS.	" FIRE HYDRANT ASSEMBLY	" CABLE T.V.	" RIGHT EDGE/RD. GRADE	" WATER MAIN W/F.H. ASSEM.	BENCH MARK
" WATER MAIN & VALVE-IN-WELL	" LIGHT POLE	" ELECTRIC	" CURB & GUTTER	" CONTOUR	SURVEY BOOK
" WATER MAIN & VALVE-IN-BOX	" END SECTION	" SIGN	" EDGE/GRAVEL	" ROAD & GRADE	REV. NO.

DLZ

REV. NO.	DESCRIPTION	DATE	DR. BY	CH. BY
ORIGINAL ISSUE		10/12/22	INB	LCM

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL TIMING PERMITS

SCALE: 1" = 100'

DRAWING NO. 2021-08-TSTP5

SHEET NO. 150 OF 153

APPROVED BY: _____

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8	TIMING INSTALLED
		EB-Left	WB-Thru		NB-Thru	WB-Left	EB-Thru		SB-Thru	
MINIMUM GREEN		5	10		5	5	10		7	
PASSAGE		2.0	0.0		3.0	2.0	0.0		3.0	
MAXIMUM NO. 1		24	45		70	25	45		70	
MAXIMUM NO. 2										
YELLOW CHANGE		3.6	3.6		3.1	3.6	3.6		3.1	
RED CLEARANCE		2.5	2.5		3.3	2.5	2.5		3.3	
WALK			8			8			10	
PEDESTRIAN CLEARANCE			17			19			14	
EXTENDED PED. CLEARANCE			3			3			3	
REST IN WALK			0			0			0	
INITIALIZATION		1	4		4	1	4		4	
NON-ACT RESPONSE		0	0		0	0	0		0	
VEHICLE RECALL		2	3		0	2	3		0	
PEDESTRIAN RECALL			0			0			0	
NON-LOCK MEMORY		0	0		0	0	0		0	
DUAL ENTRY		0	1		1	0	1		1	

DIAL	1	SPLIT	1	90	12	35	43	12	35	43	0	0	0
DIAL 2	SPLIT	1	120	22	42	56	23	41	56	0	0	0	0
DIAL 3	SPLIT	1	140	24	46	70	24	46	70	0	0	0	0

PHASE	Hours of Operation:
1 Fuller EB-Left	D1/S1/O1: Normal
2 Fuller WB-Thru	D2/S1/O1: 07:00 to 09:00 Monday-Friday
3	D3/S1/O1: 14:00 to 17:00 Monday-Friday
4 EMCD NB-Thru	
5 Fuller WB-Left	
6 Fuller EB-Thru	
7	
8 Maiden SB-Thru	

Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-GY	+GRN
=							
=							
=							

PREPARED BY: DLZ	DATE: 09/09/22
FLASH HOURS: _____	DAILY <input type="checkbox"/> NONE <input checked="" type="checkbox"/>
NIGHT FLASH: _____	FY = _____ FR = _____
CONFLICT FLASH: _____	FR = All Directions
CONTROLLER TYPE:	PRE-EMPT <input type="checkbox"/>
<input checked="" type="checkbox"/> EPAC	COUNTDOWN PEDS <input checked="" type="checkbox"/>
<input type="checkbox"/> Other:	
LOCATION:	Fuller & Maiden/EMCD
CITY/TWP:	Ann Arbor
COUNTY:	Washtenaw
MILE POINT	CONTROL SECTION-SPOT # 126
Job # (If Applicable):	

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING					RING AND BARRIER STRUCTURE				
	Phase # / Description	Permissive-Protected	Protected-Only	Protected-Only	Protected-Only	R1	B1	B2	B3	B4
Controller Type: <input checked="" type="checkbox"/> EPAC <input type="checkbox"/> Other:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

System Type:	Vehicular Detection				Pedestrian Detection			
	Approach	Movements and Call Delay (s)	Type	Other	Push-Button Crossing Locations			
<input type="checkbox"/> Closed Loop <input type="checkbox"/> Stand By <input type="checkbox"/> Group 1 <input type="checkbox"/> Group 2 Address: <input checked="" type="checkbox"/> TBC <input type="checkbox"/> TBC/GPS <input type="checkbox"/> None <input type="checkbox"/> Other:	NB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All legs	
	SB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	WB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	EB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

Additional Dial Split Data	PHASE	1	2	3	4	5	6	7	8	O1	O2	O3	COORDINATION DATA
		DIAL SPLIT CYCLE											
DIAL SPLIT CYCLE													Coordination Mode 0
DIAL SPLIT CYCLE													Maximum Mode 0
DIAL SPLIT CYCLE													Correction Mode 3
DIAL SPLIT CYCLE													Offset Mode 0
DIAL SPLIT CYCLE													Force Mode 0
DIAL SPLIT CYCLE													Max Dwell 0
DIAL SPLIT CYCLE													Yield Period 0

Additional Overlap Data	Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-GY	+GRN
				=				
=								
=								

PREPARED BY: DLZ	DATE: 09/09/22	LOCATION: Fuller & Maiden/EMCD
<input type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input checked="" type="checkbox"/> Consultant		CONTROL SECTION-SPOT # 126

CLEAR PAGE 2

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
" CONTOUR	" UTILITY POLE & GUY	" GAS LINE	" LEFT EDGE/RD. GRADE	" STORM SEWER & CAT. BAS.	" SEE ABOVE
" STORM SEWER & CAT. BAS.	" FIRE HYDRANT ASSEMBLY	" CABLE T.V.	" RIGHT EDGE/RD. GRADE	" WATER MAIN W/F.H. ASSEM.	" BENCH MARK
" WATER MAIN & VALVE-IN-WELL	" LIGHT POLE	" ELECTRIC	" CURB & GUTTER	" CONTOUR	" SURVEY BOOK
" WATER MAIN & VALVE-IN-BOX	" END SECTION	" SIGN	" EDGE/GRAVEL	" ROAD & GRADE	" REV. NO.

DLZ	
SEE ABOVE	
BENCH MARK	
SURVEY BOOK	
REV. NO.	
DESCRIPTION	
DATE	
DR. BY	
CH. BY	

PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR	
E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL TIMING PERMITS	
SCALE NTS	INCH 0 1
DRAWING NO.	2021-08-TSTP6
SHEET NO.	151 OF 153
APPROVED BY:	

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8	TIMING INSTALLED
		EB-Left	WB-Thru		NB-Thru	WB-Left	EB-Thru		SB-Thru	
MINIMUM GREEN		5	10		5	5	10		7	REMARKS This timing plan is for EMCD bridge construction Stage 3.
PASSAGE		2.0	0.0		3.0	2.0	0.0		3.0	
MAXIMUM NO. 1		25	45		70	25	45		70	
MAXIMUM NO. 2										
YELLOW CHANGE		3.6	3.6		3.1	3.6	3.6		3.1	
RED CLEARANCE		2.5	2.5		3.3	2.5	2.5		3.3	
WALK			8		7		9		10	
PEDESTRIAN CLEARANCE			17		19		17		14	
EXTENDED PED. CLEARANCE			3		3		3		3	
REST IN WALK			0		0		0		0	
INITIALIZATION		1	4		4	1	4		4	
NON-ACT RESPONSE		0	0		0	0	0		0	
VEHICLE RECALL		2	3		0	2	3		0	
PEDESTRIAN RECALL		0	0		0	0	0		0	
NON-LOCK MEMORY		0	0		0	0	0		0	
DUAL ENTRY		0	1		1	0	1		1	

DIAL	1	SPLIT	1	CYCLE	90	12	35	43	12	35	43	0	0	0
DIAL 2	2	SPLIT	1	120	22	41	57	23	40	57	0	0	0	0
DIAL 3	3	SPLIT	1	140	25	45	70	25	45	70	0	0	0	0

PHASE	Hours of Operation:
1 Fuller EB-Left	D1/S1/O1: Normal D2/S1/O1: 07:00 to 09:00 Monday-Friday
2 Fuller WB-Thru	D3/S1/O1: 14:00 to 17:00 Monday-Friday
3 Maiden SB-Left	
4 EMCD NB-Thru	
5 Fuller WB-Left	
6 Fuller EB-Thru	
7 EMCD NB-Left	
8 Maiden SB-Thru	

OVERLAPS	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
Overlap Phase							
=							
=							
=							
=							

PREPARED BY: DLZ	DATE: 09/09/22
FLASH HOURS:	<input type="checkbox"/> DAILY <input type="checkbox"/> NONE <input checked="" type="checkbox"/>
NIGHT FLASH:	FY = FR =
CONFLICT FLASH:	FY = FR = All Directions
CONTROL TYPE:	<input checked="" type="checkbox"/> EPAC <input type="checkbox"/> PRE-EMPT <input type="checkbox"/>
	<input type="checkbox"/> Other: COUNTDOWN PEDS <input checked="" type="checkbox"/>
LOCATION:	Fuller & Maiden/EMCD
CITY/TWP:	Ann Arbor
COUNTY:	Washtenaw
MILE POINT	CONTROL SECTION-SPOT #
	126
Job # (if Applicable):	

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING				RING AND BARRIER STRUCTURE			
	Phase # / Description	Permissive-Protected	Protected-Only		B1	B2	B3	B4
Controller Type:	<input checked="" type="checkbox"/> EPAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R1	R2	R3	R4
System Type:	<input type="checkbox"/> Closed Loop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	2	3	4
<input type="checkbox"/> Stand By					5	6	7	8
<input type="checkbox"/> Group 1								
<input type="checkbox"/> Group 2								
Address:								
<input checked="" type="checkbox"/> TBC								
<input type="checkbox"/> TBC/GPS								
<input type="checkbox"/> None								
<input type="checkbox"/> Other:								
<input checked="" type="checkbox"/> TOD								
<input type="checkbox"/> Event								
Interconnect Type:	<input type="checkbox"/> Hardwire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Fiber-Optic								
<input type="checkbox"/> Radio								
<input type="checkbox"/> Cell Modem								
<input checked="" type="checkbox"/> None								
<input type="checkbox"/> Other:								
If Cell Modem:								
Phone #								
Controller Status:	<input type="checkbox"/> Primary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Secondary								
<input type="checkbox"/> Isolated								
<input checked="" type="checkbox"/> TBC								
If Secondary:								
Primary Location:								
Primary Spot #:								

VEHICULAR AND PEDESTRIAN DETECTION	VEHICULAR DETECTION		PEDESTRIAN DETECTION	
Approach	Movements and Call Delay (s)	Type	Push-Button Crossing Locations	All legs
NB	<input checked="" type="checkbox"/> Left <input checked="" type="checkbox"/> Thru <input checked="" type="checkbox"/> Right	<input type="checkbox"/> Loop <input checked="" type="checkbox"/> Video <input type="checkbox"/> Other		
SB	<input checked="" type="checkbox"/> Left <input checked="" type="checkbox"/> Thru <input checked="" type="checkbox"/> Right	<input type="checkbox"/> Loop <input checked="" type="checkbox"/> Video <input type="checkbox"/> Other		
WB	<input checked="" type="checkbox"/> Left <input checked="" type="checkbox"/> Thru <input checked="" type="checkbox"/> Right	<input type="checkbox"/> Loop <input checked="" type="checkbox"/> Video <input type="checkbox"/> Other		
EB	<input checked="" type="checkbox"/> Left <input checked="" type="checkbox"/> Thru <input checked="" type="checkbox"/> Right	<input type="checkbox"/> Loop <input checked="" type="checkbox"/> Video <input type="checkbox"/> Other		

ADDITIONAL DIAL SPLIT DATA	COORDINATION DATA											
PHASE	1	2	3	4	5	6	7	8	O1	O2	O3	Operation Mode
DIAL SPLIT CYCLE												1
DIAL SPLIT CYCLE												0
DIAL SPLIT CYCLE												0
DIAL SPLIT CYCLE												3
DIAL SPLIT CYCLE												0
DIAL SPLIT CYCLE												0
DIAL SPLIT CYCLE												0
DIAL SPLIT CYCLE												0
DIAL SPLIT CYCLE												0
DIAL SPLIT CYCLE												0

ADDITIONAL OVERLAP DATA	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
Overlap Phase							
=							
=							
=							
=							

REMARKS:	
PREPARED BY: DLZ	DATE: 09/09/22
LOCATION:	Fuller & Maiden/EMCD
CONTROL SECTION-SPOT #	126
<input type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input checked="" type="checkbox"/> Consultant	

CLEAR PAGE 2

LEGEND

EXISTING FENCE	EXISTING SANITARY SEWER & MANHOLE	EXISTING TELEPHONE	EXISTING RD. & GRADE	PROPOSED SANITARY SEWER & MANHOLE	PROPOSED CURB & GUTTER
- - - - -	- S -	- t -	- - - - -	- S -	- - - - -
- CONTOUR	- UTILITY POLE & GUY	- G -	- LEFT EDGE/RD. GRADE	- STORM SEWER & CAT. BAS.	- SEE ABOVE
- 847 -	- FIRE HYDRANT ASSEMBLY	- C -	- RIGHT EDGE/RD. GRADE	- WATER MAIN W/F.H. ASSEM.	- BENCH MARK
- STORM SEWER & CAT. BAS.	- LIGHT POLE	- E -	- CURB & GUTTER	- CONTOUR	- SURVEY BOOK
- W -	- END SECTION	- b -	- EDGE/GRAVEL	- ROAD & GRADE	- REV. NO.
- WATER MAIN & VALVE-IN-WELL					- DESCRIPTION
- W -					- DATE
- WATER MAIN & VALVE-IN-BOX					- DR.BY
					- CH.BY



PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR

E. MEDICAL CENTER DRIVE TRAFFIC SIGNAL TIMING PERMITS

SCALE NTS	0	INCH	1
DRAWING NO.	2021-08-TSTP8		
SHEET NO.	153	OF	153

APPROVED BY:

CITY OF ANN ARBOR,
ENGINEERING,
in cooperation with THE UNIVERSITY OF MICHIGAN

East Medical Center Drive Bridge
Rehabilitation and Widening
RFP #22-76

DETAILED SPECIFICATIONS

**DETAILED SPECIFICATIONS TABLE
OF CONTENTS**

COORDINATION AND COOPERATION WITH OTHERS AND WORK BY OTHERS 3

DISPOSING OF EXCAVATED MATERIAL 5

PROTECTION OF UTILITIES 6

SOIL EROSION CONTROL..... 7

VACUUM TYPE STREET AND UTILITY STRUCTURE CLEANING EQUIPMENT 8

SITE CLEAN-UP..... 9

MATERIALS AND SUPPLIES CERTIFICATIONS 10

CONTRACT DRAWINGS/PLANS..... 11

SOIL BORING AND PAVEMENT SECTION DATA..... 13

WORKING IN THE RAIN 14

WORKING IN THE DARK..... 15

QUANTITIES AND UNIT PRICES 16

GENERAL CONSTRUCTION NOTES..... 17

CONCRETE DURABILITY 18

CITY OF ANN ARBOR NOTICE TO BIDDERS – EXISTING IN SITU SOILS 24

**DETAILED SPECIFICATION FOR
COORDINATION AND COOPERATION WITH OTHERS AND
WORK BY OTHERS**

NOTE: This project is being completed under a cooperative arrangement between the City of Ann Arbor (City) and the University of Michigan (UM). The contract holder will be the City of Ann Arbor. References to either entity, whether mentioned singularly or together, shall be considered to include both entities in their role as co-sponsors of the project. Under this arrangement, both the City and the UM have assigned project engineers to manage the project; therefore, references in these construction documents to “Engineer” shall be assumed to mean both engineer managers.

The Contractor is reminded as to the requirements of article 104.08 of the 2020 edition of the MDOT Standard Specifications, “Cooperation by the Contractor.”

The Contractor shall directly coordinate his/her work with the City of Ann Arbor, the University of Michigan and any other utilities that are affected in this area and that will be working in the area during Project construction. A table detailing some of the coordination for utility relocation installation that will be needed is included below. This list is not a complete detail of all the project coordination work. It is intended to indicate major utility coordination and assist the Contractor in developing, for the review and approval of the Engineer, the Progress Schedule for the project.

No additional compensation will be paid to the Contractor, and no adjustments to contract unit prices will be made, due to delays and/or the failure of others in the performance of their work, nor for delays due to the encountering of existing utilities that are, or are not, shown on the Plans.

The following Utility Owners may have overhead and/or underground facilities located within the Right-of-Way:

The City of Ann Arbor		
Travis Conley	Sewer	(734) 277-2090
Tracy Pennington	Streets	(734) 355-7233
Kevin Schneider	Storm	(734) 249-2531
Dan Wooden	Water	(734) 972-2413
Matt Waldsmith	Forestry	(734) 323-4561
Marc Moreno	Signs and Signals	(480) 628-9343

Kevin McLaughlin, PE, RCDD, Senior OSP Engineer - ITS – Infrastructure
University of Michigan - Telecommunications Facilities
Phone: (734) 615-5699
mckevin@umich.edu

Rafael J Ramirez-Inciarte, Regional Planning Supervisor SW
DTE Electric
Phone :(313) 597-4411
rafael.ramirezinciart2@dteenergy.com

Basel Djazmati PE., PMP - Senior Capital Project Manager
DTE GAS
Cell (248) 825-4636
basel.djazmati@dteenergy.com

Mike Jarema, OSP Design Engineer – Metro West
 AT&T
 ATO Midwest C & E
 550 S Maple, Ann Arbor, MI
 Phone: (734) 277-4855
mj1749@att.com

Marlon Redd, Sr Engr Spec-Outside Plant • OSP-CO CA
 Verizon Business/MCI
 3 Parklane Blvd Dearborn, MI 48126
 Phone: 313-588-0849
Marlon.redd@verizon.com

Dave Huckfeldt, Network Implementation Program Manager
 Lumen/CenturyLink
 19675 West 10 Mile Road, Southfield, MI 48075
 Phone: 517-812-2592
dave.huckfeldt@lumen.com

Jeff Dobies, Senior Manager Construction
 Comcast Cable
 25626 Telegraph Road
 Southfield, MI 48034
 Phone: 734-359-1669

Jeff Webb, Construction Manager- OSP/ Michigan
 Windstream Communications
 Phone: 734-790-6556
Jeff.webb@windstream.com

EMCD Bridge Conduits									
	Conduit	Number	Function	Owner	Existing Location	Relocator before bridge construction	Temporary Relocation	Timeframe	Note
Existing	3" Dia.	1	Street Lights	UM	Sidewalk (both sides)	NA			
	4" Dia.	12	Communication	ATT	Sidewalk (east side)				
	7" Dia.	6	Communication	UM	Sidewalk (west side)	UM	N.S. Fuller Rd.	Prior to Construction	
	7" Dia.	3	Communication	UM	Sidewalk (east side)	UM		Prior to Phase 3, once SIP forms are placed for deck	
	4" Dia.	1	Traffic Signals	City	Sidewalk (west side)	City of Ann Arbor Signs and Signals	wireless antennas installed by Signs and Signals	Contractor needs to give 1 week notice before bridge construction	
	Conduit	Number	Function	Owner	Permanent Relocation	Relocator during bridge construction	Temporary Relocation	Timeframe	Note
Proposed	3" Dia.	1	Street Lights	City	Sidewalk (west side)	Contractor	NA	After Phase 2	
	3" Dia.	1	Street Lights	City	Sidewalk (east side)	Contractor	NA	After Phase 3	
	2" Dia.	1	Hospital Signs	UM	Sidewalk (west side)	Contractor	NA	After Phase 2	
	4" Dia.	12	Communication	ATT	Under Bridge (2nd bay from West fascia)	ATT	NA	Prior to Phase 3, once SIP forms are placed for deck. ATT needs 6 weeks to complete their work.	ATT to install permanent conduit north and south of bridge prior to construction
	4" Dia.	6	Communication	UM	Under Bridge (1st Bay from West fascia)	UM	NA	Post Construction	
	4" Dia.	1	Traffic Signals	City	Under Bridge (1st Bay from West Fascia)	Contractor	NA	Post Construction	City of Ann Arbor Signs and Signals need to be notified to install fiber once its complete

On all projects:

“3 Working Days before you Dig - Call MISS DIG - Toll Free” Phone No. 1-800-482-7171.

The Owners of public or private utilities which will not interfere with the completed project and which do not present a hazard to the public or an extraordinary hazard to the Contractor's operations will not be required to move their facilities on or from the street right-of-way.

Stoppages created solely by the operations of the utility companies which delay utility revisions on any portion of this project may be considered as a basis of claim for an extension of time for project completion.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item “General Conditions.”

**DETAILED SPECIFICATION FOR
DISPOSING OF EXCAVATED MATERIAL**

The Contractor shall dispose of, at the Contractor's expense, all excavated material other than the Special Provision "Relocation and Site Cleanup" pay item. Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION FOR
PROTECTION OF UTILITIES**

Damages to utilities by the Contractor's operations shall be repaired by the utility owner at the Contractor's expense.

Delays to the work due to utility repairs are the sole responsibility of the Contractor.

The Contractor shall keep construction debris out of utilities at all times. The Contractor shall be back charged an amount of \$50.00 per day for each manhole/inlet/utility pipe that contains construction debris caused as a result of the Contractor's (including subcontractors and suppliers) work.

The Contractor is solely responsible for any damages to the utilities or abutting properties due to construction debris.

Certain sanitary and storm sewers within the influence of construction may have been cleaned and videotaped prior to construction. The City may also choose to videotape utility line(s) during or after the work of this Contract to inspect them for damages and/or construction debris. If such inspection shows damage and/or debris, then all costs of such inspection, cleaning, repairs, and etc, shall be the Contractor's sole responsibility. If such inspection is negative, the City will be responsible for the costs of such inspection.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION FOR
SOIL EROSION CONTROL**

The Contractor shall maintain and remove soil erosion and sedimentation control measures, including but not limited to, fabric filters at all drainage structures, all in accordance with all applicable City (and other governmental agencies) codes and standards, as directed by the Engineer, Supervising Professional, as detailed in the Standard Specifications, and as shown on the Plans.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION FOR
VACUUM TYPE STREET AND UTILITY STRUCTURE CLEANING EQUIPMENT**

The Contractor shall furnish and operate throughout the construction period, vacuum type street cleaning and utility structure cleaning equipment (Vac-All, Vactor, etc.) approved by the Engineer, as and when directed by the Engineer for dust control, for dirt/debris control, and for street cleaning immediately prior to, and for street and utility structure cleaning after any and all paving. The cleaning equipment shall be of sufficient power to remove dust, dirt, and debris from the pavement and from utility structures in and adjacent to the construction area.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION FOR
SITE CLEAN-UP**

Immediately after completion of construction on each phase, the Contractor shall clean the entire area within the influence of construction, including but not limited to all pavement, sidewalks, lawn areas, and underground utility structures, of all materials which may have accumulated prior to or during the construction.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION FOR
MATERIALS AND SUPPLIES CERTIFICATIONS**

The following materials and supplies shall be certified by the manufacturer or supplier as having been tested for compliance with the Specifications:

- HMA materials
- Hot-poured Joint Sealants
- Cements, coatings, admixtures and curing materials
- Sands and Aggregates
- Steel and Fabricated metal
- Portland Cement Concrete Mixtures
- Reinforcing Steel for Concrete
- Precast Concrete products
- High Density Polyethylene Pipe
- Polyvinyl Chloride Pipe
- Steel Sheet Piling for retaining walls
- Geotextile Filter Fabric and Stabilization Fabric/Grids

The Contractor shall submit all certifications to the Engineer for review and approval a minimum of three business days prior to any scheduled delivery, installation, and/or construction of same.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions."

**DETAILED SPECIFICATION FOR
CONTRACT DRAWINGS/PLANS**

The Contractor shall carefully check and review all Drawings/Plans and advise the Engineer of any errors or omissions discovered. The Drawings/Plans may be supplemented by such additional Drawings/Plans and sketches as may be necessary or desirable as the work progresses. The Contractor shall perform all work shown on any additional or supplemental Drawings/Plans issued by the Engineer.

**DETAILED SPECIFICATION FOR
EXISTING
SOIL BORING AND PAVEMENT SECTION DATA**

Data pertaining to existing soil borings and pavement sections which may be included in these Contract Documents are provided to help the Engineer and Contractor determine the soil conditions existing within the construction area. The City in no way guarantees existing conditions to be the same as shown in the data. The Contractor is solely responsible for any and all conclusions he/she may draw from the data.

**DETAILED SPECIFICATION FOR
WORKING IN THE RAIN**

The Contractor shall not work in the rain unless authorized in writing by the Engineer.

The Engineer may delay or stop the work due to threatening weather conditions.

The Contractor shall not be compensated for unused materials or downtime due to rain, or the threat of rain.

The Contractor is solely responsible for repairing all damages to the work and to the site, including road infrastructures, road subgrades, and any adjacent properties, which are caused as a result of working in the rain.

**DETAILED SPECIFICATION FOR
WORKING IN THE DARK**

The Contractor shall not work in the dark except as approved by the Engineer and only when lighting for night work is provided as detailed elsewhere in this contract.

The Engineer may stop the work, or may require the Contractor to defer certain work to another day, if, in the Engineer's opinion, the work cannot be completed within the remaining daylight hours, or if inadequate daylight is present to either properly perform or inspect the work.

The Contractor will not be compensated for unused materials or downtime, when delays or work stoppages are directed by the Engineer for darkness and/or inadequate remaining daylight reasons.

The Contractor is solely responsible for repairing all damages to the work and to the site, including road infrastructures, road subgrades, and any adjacent properties, which are caused as a result of working in the dark.

**DETAILED SPECIFICATION FOR
QUANTITIES AND UNIT PRICES**

Quantities as given are approximate and are estimated for bidding purposes. Quantities are not guaranteed and may vary by any amount. While it is the City of Ann Arbor and the UM's intent to complete the project substantially as drawn and specified herein, quantities may be changed or reduced to zero for cost savings or other reasons. **The City of Ann Arbor and the UM reserve the right to change the quantities and no adjustment in unit price will be made for any change in any quantity.**

**DETAILED SPECIFICATION FOR
GENERAL CONSTRUCTION NOTES**

The following notes pertain to all Plan sheets issued as part of this Contract, and these notes shall be considered part of each Plan sheet or Detailed Information Sheet.

1. All work shall conform to latest revision of the City Standard Specifications.
2. The Contractor shall maintain access to all drives throughout the course of construction. Drives shall never be closed during non-working hours, unless otherwise authorized in writing by the Engineer.
3. The Contractor shall completely restore all existing site features to better than, or equal to, their existing condition.
4. The Contractor shall be aware that there are above-ground and below-ground utilities existing in and on these streets which include, but are not limited to: gas mains and service leads; water mains and service leads; storm sewer mains and service leads; sanitary sewer mains and service leads; telephone poles, wires, cables and conduits; electrical poles, wires, cables and conduits; cable television wires, cables and conduits, and other various utilities. The Contractor shall conduct all of its work so as not to damage or alter in any way, any existing utility, except where specified on the Plans or where directed by the Engineer. The City has videotaped and cleaned all sanitary and storm sewers, including storm sewer inlet leads, and has found all of these facilities to be in good condition, with the exception of those shown on the Plans for repairs or replacement.
5. The Contractor is solely responsible for any delays, damages, costs and/or charges incurred due to and/or by reason of any utility, structure, feature and/or site condition, whether shown on the Plans or not, and the Contractor shall repair and/or replace, at its sole expense, to as good or better condition, any and all utilities, structures, features and/or site conditions which are impacted by reason of the work, or damaged by its operations, or damaged during the operations of its subcontractors or suppliers.
6. No extra payments or adjustments to unit prices will be made for damages, delays, costs and/or charges due to existing utilities, structures, features and/or site conditions not shown or being incorrectly shown or represented on the Plans.
7. The Contractor is solely responsible for furnishing the appropriate equipment and qualified personnel for the size and condition of the site and the requirements of the proposed work. Damage to buildings, amenities, utilities, paving, and facilities within and adjacent to the work area, and to work already performed by the Contractor shall be the responsibility of the Contractor to repair as needed, at no cost to the project.

DETAILED SPECIFICATION FOR CONCRETE DURABILITY

DESCRIPTION

The Contractor shall furnish a Portland cement concrete mixture for this project that has been tested under this specification and shown to be resistant to excessive expansion caused by alkali-silica reactivity (ASR) and provides adequate air entrainment for freeze thaw durability. The Contractor shall construct the project with practices outlined in this specification.

MATERIALS

Submit a job mix formula (JMF) to the Engineer for approval prior to concrete work commencing.

The materials provided for use on this project shall conform to the following requirements:

Portland cement	ASTM C 150
Fine Aggregate	ASTM C 33*
Coarse Aggregate	ASTM C 33*
Fly Ash, Class F	ASTM C 618
Slag Cement, Grade 100, 120	ASTM C 989 Silica
Fume	ASTM C 1240
Blended Cements	ASTM C-595
Air Entraining Admixtures	ASTM C-260
Chemical Admixtures	ASTM C-494
White Membrane Cure	ASTM C-309 Type 2

* Fine and coarse aggregates shall consist of natural aggregates as defined in the 2020 MDOT Standard Specifications Section 902.02.A.

The Contractor shall provide documentation that all materials to be incorporated into proposed mixed designs meet the requirements of this section.

Portland Cement

Furnish Type IL Portland cement in accordance with section 901 of the MDOT Standard Specifications for Construction meeting the chemical and physical requirements specified in ASTM C595/C595M, Standard Specifications for Blended Hydraulic Cements. Ensure the Type IL Portland cement proposed for substitution is from the same Approved Manufacturer as the Type I Portland cement in the approved JMF.

At least 7 days prior to concrete production, the concrete producer must provide test data (specified below) generated from a four cubic yard (minimum) trial batch of concrete using Type IL Portland cement for the Engineer's review and approval. The trial batch must represent a current approved JMF for either a standard MDOT Grade 3500, Grade 3500HP, Grade 4500, or Grade 4500HP concrete mixture produced using Type I Portland cement, as described in section 1004 of the Standard Specifications for Construction. Ensure the materials and mixture proportions for the Type IL JMF are the same as those documented in the above-mentioned JMF using Type I Portland cement. Minor adjustments to chemical admixture dosages are permitted in efforts to achieve the specified fresh concrete properties. Trial batch compliance

for applications other than Portland cement concrete mixtures will be in accordance with the contract.

The Engineer will review the trial batch test data to determine if the fresh and hardened concrete properties of the Type IL JMF meet specification requirements for the respective MDOT Grade o concrete represented by the trial batch. If the Engineer determines that the trial batch test data are in conformance with specification requirements, then the Type IL Portland cement will be permitted to be substituted in lieu of the Type I Portland cement for all approved concrete mixtures generated at the concrete production facility for the project. If the Engineer determines that the trial batch test data do not meet specification requirements for the respective MDOT Grade of concrete, the Contractor will not be permitted to substitute Type IL Portland cement in lieu of Type I Portland cement. Mix design and JMF documentation for concrete mixtures using Type IL Portland cement will then be required in accordance with subsection 1003.03.C of the Standard Specifications for Construction or the contract, where applicable.

Once Type IL Portland cement is approved for use on the project, reinstatement of Type I Portland cement into the JMF is not permitted. Substitution of other material types or sources, including admixtures, as documented in the initial Type I JMF is not permitted.

Alkali-Silica Reactivity

The Contractor shall supply to the Engineer preliminary concrete mix designs including a list and location of all suppliers of concrete materials. The Contractor shall evaluate the mixtures for the potential for excessive expansion caused by ASR and provide documentation to the Engineer. The Contractor's evaluation shall include a review of any previous testing of the material sources intended to be used for both the fine and coarse aggregates for the concrete mixtures. The previous testing may be from other projects or records provided by the material suppliers.

Aggregates shall be tested under ASTM C-1260. If the expansion of the mortar bars is less than 0.10%, at 14 days, the aggregates shall be considered innocuous and there are no restrictions for ASR mitigation required with this material.

Previous aggregate test data may be used. If no previous test data is available, for the concrete mix, that shows that it is resistant to ASR, a concrete mixture that will mitigate the potential for ASR must be designed using either method 1 or 2 as described below.

Method 1. Substitution of a portion of the cement with Class F Fly Ash, Slag Cement Grade 100 or 120 or a ternary mix (blended cement) containing a blend of Portland cement and slag cement, or Class F fly ash, or silica fume.

The maximum substitution of cement with the fly ash permitted shall be 25% by weight of total cementitious material (cement plus fly ash). Additional requirements for the Fly Ash, Class F are that the Calcium Oxide (CaO) percent shall be less than 10 % and the available alkalis shall not exceed a maximum of 1.5%. A copy of the most recent mill test report shall be submitted to verify. Note: a Class C fly ash with a minimum total oxides (SiO₂ + Al₂O₃ + Fe₂O₃) of 66% and a minimum SiO₂ of 38% may be used in lieu of Type F fly ash.

The maximum substitution of cement with the Slag Cement permitted shall be 40% by weight of total cementitious material (cement plus Slag Cement). The minimum replacement rate with Slag Cement shall be 25%.

For a ternary blend the total replacement of supplementary cementitious materials is 40% with a blend consisting of a maximum of 15% type F fly ash, and/or 8% silica fume and/or slag cement.

For method 1, the effectiveness of the proposed mix combination to resist the potential for excessive expansion caused by ASR shall be demonstrated using current or historic data. To demonstrate the effectiveness of the proposed mix the Contractor shall construct and test mortar bars per ASTM C1567 (14 day test) using both the fine and coarse aggregate along with the proposed cementitious material for the concrete mixture. If a mortar bar constructed of these materials produces an expansion of less than 0.10%, concrete mixture will be considered to be resistant to excessive expansion due to ASR.

If a mortar bar constructed produces an expansion of 0.10% or greater, concrete mixtures containing these materials shall not be considered resistant to the potential for excessive expansion due to ASR and shall be rejected. Additional testing, including alternate proportions or different materials will be required.

Method 2. Use low alkali cement and maintain the total alkali content from the cementitious at no more than 3.0 lbs/cyd (Na₂O_{eq}). The total alkali contribution is calculated by the quantity contained in the Portland cement only.

Requirements for Low Alkali Cement are that the alkali content does not exceed 0.60% expressed as Na₂O equivalent. Equivalent sodium oxide is calculated as: (percent Na₂O + 0.658 x percent K₂O).

For either method 1 or 2, if the Contractor intends to change any component material supplied after the mix design has been approved all concrete work will be suspended with no cost to the project or extensions of time, unless approved, until evaluation of the new mixtures and testing of the new materials demonstrates that it is resistant to excessive expansion due to ASR.

The Engineer and Contractor shall monitor the concrete that is delivered to the project site so as to insure that the approved mix design is being followed. The supplier shall include on the delivery ticket for each batch of concrete delivered to the job, the identification and proportions of each material batched.

When concrete is placed during cold weather, defined for the purposes of this Detailed Specification to be, air temperatures below 40° F, the use of accelerators, heated aggregates, silica fume and/or additional forms of cold weather protection will be required. Cold weather will not eliminate the requirement for furnishing and placing a concrete mix that is considered resistant to ASR attack. Prior to cool weather placement, defined for the purposes of this detailed specification to be, air temperatures between 40° and 60° F, the set time of the proposed mix shall be verified under anticipated field conditions. This information shall be used when scheduling pours and saw crews.

Air Entrainment

Air entrainment shall be accomplished by addition of an approved air entraining agent. Air content as determined by ASTM C 231 or ASTM C 173, shall be determined on each day of production as early and as frequently as necessary until the air content is consistently acceptable. If during the period of time while adjustments are being made to the concrete to create a mixture that is consistently acceptable, concrete is produced that does not meet the requirements of this Detailed Specification, the Engineer may reject the material and direct it to be removed from the jobsite. Any rejected material shall be removed from the jobsite at the Contractor's sole expense. Quality Control testing performed by the Contractor to ensure compliance with the project specifications shall be performed on the grade ahead of the placement operation.

Paver placement: During production, the plastic concrete material shall be tested for acceptance at a point ahead of the paver. The air content of the concrete mixture that the Contractor shall provide shall be known as the Acceptance Air Content (AAC). The Contractor shall also provide additional entrained air in the concrete mixture to account for the air loss which occurs in the concrete mixture experienced during transportation, consolidation and placement of the concrete. The “air loss” shall be added to the air content of the concrete mixture as established on the approved concrete mix design. The AAC for the project will be 6.0% plus an amount equal to the air loss.

For up to the first four loads, the air content measured on-site prior to placement shall be at least 8.0% and no more than 12.0%. To establish the initial AAC on the first day of paving, the air content of the first load shall be tested at the plant. After initial testing at the plant the Contractor shall provide at least two sample sets to determine the actual air loss during placement. A sample set shall consist of two samples of concrete from the same batch, one taken at the point of discharge and the other from the in-place concrete behind the paver. The air loss from the two sample sets shall be averaged and added to 6.0% to establish the AAC (rounded to the next higher 0.5%). After the testing and adjustment procedure(s) have been completed, the project acceptance air tests shall be taken prior to placement. The Contractor shall provide concrete to the jobsite that has an air content of plus 2.0%, or minus 1.0%, of the AAC.

After the AAC has been established, it shall be verified and/or adjusted through daily checks of the air loss through the paver. The Contractor shall check the air loss through the paver a minimum of two times a day. A Revised AAC shall be required to be established by the Contractor if the average air loss from two consecutive tests deviates by more than 0.5% from the current accepted air loss. The testing operations performed by the Contractor to establish a revised AAC shall be performed to the satisfaction of the Engineer. The Contractor shall be solely responsible for any delays and/or costs that occur to the project while establishing revised AACs.

Hand placed concrete: The air content for non-slip-form paving shall be 7.0% plus 1.5%, or minus 1.0%, at the point of placement.

CONSTRUCTION METHODS

Aggregate Control

Gradation control – The supplier shall provide a detailed stockpile management plan, describing their process control procedure for shipping, handling, and stockpiling of each aggregate including workforce training.

Moisture control – All aggregate materials must be conditioned to a moisture content of not less than saturated surface dry (SSD) prior to batching. A watering process using an effective sprinkler system designed and operated by the Contractor shall be required on all coarse aggregate material stockpiles.

The Contractor shall provide verification that these processes have been performed by the supplier. The Engineer reserves the right to independently verify that the supplier has complied with these standards.

Mixing

Central mix plants - The total volume of the batch shall not exceed the designated size of the mixer or the rated capacity as shown on the manufacturer's rating plate.

Drum Mix Plants: After all solid materials are assembled in the mixer drum; the mixing time shall be a minimum of 60 seconds and a maximum of 5 minutes. The mixing time may be decreased if the ASTM C-94 11.3.3 mixer efficiency tests show that the concrete mixing is satisfactory. The Engineer may require an increase in the minimum mix time if the mixer efficiency test determines that the concrete is not being mixed satisfactorily. The minimum mixing time shall start after the mixer is fully charged. Mixers shall be operated at the speed recommended by the manufacturer as mixing speed. The mixer shall be charged so that a uniform blend of materials reached the mixer throughout the charging cycle. Any additional slump water required shall be added to the mixing chamber by the end of the first 25% of the specified mixing time. Mixers shall not be used if the drum is not clean or if the mixing blades are damaged or badly worn

Ribbon mixers: After all solid materials are assembled in the mixer; the mixing time shall be a minimum of 30 seconds and a maximum of 2.5 minutes. The mixing time may be decreased if the ASTM C-94 11.3.3 mixer efficiency tests show that the concrete mixing is satisfactory. The Engineer may require an increase in the minimum mix time if the mixer efficiency test determines that the concrete is not being mixed satisfactorily. The minimum mixing time shall be indicated by an accurate timing device which is automatically started when the mixer is fully charged. Mixers shall be operated at the speed recommended by the manufacturer as mixing speed. The mixer shall be charged so that a uniform blend of materials reached the mixer throughout the charging cycle. After any additional slump water is added to the mixing chamber the mixing shall continue for a minimum of 10 seconds. Mixers shall not be used if the mixer is not clean or if the mixing blades are damaged or badly worn.

Truck Mixers -The capacities and mixing capabilities shall be as defined in ASTM C 94, and each unit shall have an attached plate containing the information described therein. The plate may be issued by the Truck Mixer Manufacturer. The mixer capacity shall not be exceeded, and the mixing speeds shall be within the designated limits. Truck mixers shall be equipped with a reliable reset revolution counter. If truck mixers are used for mixing while in transit, the revolution counter shall register the number of revolutions at mixing speed.

An authorized representative of the concrete producer shall certify that the interior of the mixer drum is clean and reasonably free of hardened concrete, that the fins or paddles are not broken or worn excessively, that the other parts are in proper working order, and that the unit has been checked by the representative within the previous 30 calendar day period to substantiate this certification. The current, signed certification shall be with the unit at all times.

The required mixing shall be between 70 and 90 revolutions. The mixing shall be at the rate designated by the manufacturer and shall produce uniform, thoroughly mixed concrete.

The Engineer may inspect mixer units at any time to assure compliance with certification requirements, and removal of inspection ports may be required. Should the Engineer question the quality of mixing, the Engineer may check the slump variation within the batch. Should the slump variation between two samples taken, one after approximately 20% discharge and one after approximately 90% discharge of the batch, show a variation greater than 3/4 inch (20 mm) or 25% of the average of the two, whichever is greater, the Engineer may require the mixing to be increased, the batch size reduced, the charging procedure be modified or the unit removed from the work.

The practice of adding water on the site shall be discouraged. After the slump of the concrete in the first round of trucks has been adjusted on-site, the amount of water added at the plant shall be adjusted accordingly for that day's work. All additions of water on site shall be approved by the Engineer.

Curing

Apply liquid curing compound in a fine atomized spray to form a continuous, uniform film on the horizontal surface, vertical edges, curbs and back of curbs immediately after the surface moisture has disappeared, but no later than 30 minutes after concrete placement. With approval of the Engineer, the timing of cure application may be adjusted due to varying weather conditions and concrete mix properties.

The cure system shall be on site and tested prior to concrete placement.

Apply a curing compound at a rate of application not less than 2 gallons per 25 square yards. The Contractor shall keep the material thoroughly mixed per the Manufacturer's recommendations. The curing compound shall not be diluted.

The finished product shall appear as a uniformly painted solid white surface. Areas exhibiting a blotchy or spotty appearance shall be recoated immediately.

COMPLIANCE WITH STANDARDS

The Engineer will review and approve all material test reports and mix designs supplied by the Contractor before any placement of concrete. The Engineer will visually inspect the placed concrete and review the concrete test reports prior to final acceptance.

Acceptance sampling and testing will be performed using the sampling method and testing option selected by the Engineer. Acceptance testing will be performed at the frequency specified by the Engineer. Quality control measures to insure job control are the responsibility of the Contractor. The Engineer's testing and/or test results will not relieve the Contractor from his/her responsibilities to produce, deliver, and place concrete that meets all project requirements. The Engineer's test results are for acceptance purposes only.

If the results of the testing are not in compliance with the project specifications, the Engineer shall determine appropriate corrective action(s). Time extensions will not be granted to the Contractor during the time that the Engineer is determining the necessary corrective actions.

If, in the Engineer's judgment, the rejected material must be replaced, the material in question will be removed and replaced at the Contractor's sole expense. The removal costs will be deemed to include all relevant and associated costs including, but not limited to; re-mobilization, traffic control, re-grading the aggregate base course, if required, placement of material meeting the project specifications, and all other expenses. Time extensions will not be granted to the Contractor for any required repair work to meet the requirements of this specification.

If the Engineer decides that the material in question can remain in place, an adjustment to the contract unit price(s) may be made of up to 100% of the bid price(s) for the affected items of work.

MEASUREMENT AND PAYMENT

The cost associated with complying with the requirements as described herein, including any required remedial action(s), shall be included in the cost of other items of work and shall not be paid for separately.

**CITY OF ANN ARBOR NOTICE TO BIDDERS
EXISTING IN SITU SOILS**

The Contractor shall be aware that soils within the City of Ann Arbor and Washtenaw County contain levels of naturally-occurring, regulated, elemental metals.

The City of Ann Arbor is unaware of any previous activities that would have contaminated the existing soils by a hazardous substance as a result of human activity.

In accordance with the applicable project requirements, all excavated material shall become the property of the Contractor. Any excavated material that cannot be incorporated into the project work, in accordance with the material requirements of the work being performed, must be properly disposed of off-site by the Contractor. Consequently, in-situ excavated soils that do not exhibit odors, discoloration, or other indications of contamination are not required to be disposed of in a landfill and may be disposed of by the Contractor by the method of their choice. The City of Ann Arbor suggests a disposal method that minimizes future human contact with the soil or the soil's contact with a water course or ground water sources. The Contractor shall ultimately be responsible for any disposal method they choose.

The Contractor's submittal of a bid for this project shall be considered prima facie evidence that they have considered these facts and have included all necessary resources to perform all work of this project and to properly dispose of excavated soils from this project off-site.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
CERTIFIED PAYROLL COMPLIANCE AND REPORTING

DLZ:LCM

1 of 2

09/16/22

- a. DESCRIPTION** - This specification covers all administrative requirements, payroll reporting procedures to be followed by Contractors performing work on City-sponsored public improvements projects, and all other miscellaneous and incidental costs associated with complying with the applicable sections of the City of Ann Arbor Code of Ordinances with regard to payment of prevailing wages and its Prevailing Wage Compliance policy.

This specification is **not** intended to include the actual labor costs associated with the payment of prevailing wages as required. Those costs should be properly incorporated in all other items of work bid.

- b. GENERAL** - The Contractor is expected to comply with all applicable sections of Federal and State prevailing wage laws, duly promulgated regulations, the City of Ann Arbor Code of Ordinances, and its Prevailing Wage Compliance Policy as defined within the contract documents. The Contractor shall provide the required certified payrolls, city-required declarations, and reports requested elsewhere in the contract documents within the timeline(s) stipulated therein.

The Contractor shall also provide corrected copies of any submitted documents that are found to contain errors, omissions, inconsistencies, or other defects that render the report invalid. The corrected copies shall be provided when requested by the Supervising Professional.

The Contractor shall also attend any required meetings as needed to fully discuss and ensure compliance with the contract requirements regarding prevailing wage compliance. The Contractor shall require all employees engaged in on-site work to participate in, provide the requested information to the extent practicable, and cooperate in the interview process. The City of Ann Arbor will provide the needed language interpreters in order to perform wage rate interviews or other field investigations as needed.

Certified Payrolls may be submitted on City-provided forms or forms used by the Contractor, as long as the Contractor's forms contain all required payroll information. If the Contractor elects to provide their own forms, the forms shall be approved by the Supervising Professional prior to the beginning of on- site work.

- c. UNBALANCED BIDDING** - The City of Ann Arbor will examine the submitted cost for this item of work prior to contract award. If the City determines, in its sole discretion, that the costs bid by the Contractor for complying with the contract requirements are not reasonable, accurately reported, or may contain discrepancies, the City reserves the right to request additional documentation that fully supports and justifies the price as bid. Should the submitted information not be determined to be reasonable or justify the costs, the City reserves the right to pursue award of the contract to the second low bidder without penalty.

or prejudice to any other remedies that it may have or may elect to exercise with respect to the original low-bidder.

The Contract Completion date will not be extended as a result of the City’s investigation of the as- bid amount for this item of work, even if the anticipated contract award date must be adjusted. The only exception will be if the Contractor adequately demonstrates that their costs were appropriate and justifiable.

If so, the City will adjust the contract completion date by the number of calendar days commensurate with the length of the investigation, if the published Notice to Proceed date of the work cannot be met. The contract unit prices for all other items of work will not be adjusted regardless of an adjustment of the contract completion date being made.

d. MEASUREMENT AND PAYMENT - The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Certified Payroll Compliance and Reporting.....	Lump Sum

The unit price for this item of work shall include all supervisory, accounting, administrative, and equipment costs needed to monitor and perform all work related to maintaining compliance with the tasks specified in this Detailed Specification, the City of Ann Arbor Code of Ordinances, its Prevailing Wage Compliance policy and the applicable Federal and State laws.

Payment for this work will be made with each progress payment, on a pro-rata basis, based on the percentage of construction completed. When all of the work of this contract has been completed, the measurement of this item shall be 1.0 times the Lump Sum bid amount. This amount will not be increased for any reason, including extensions of time, extra work, and/or adjustments to existing items of work.

DS-28

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
PROJECT SUPERVISION, MAX \$175,000

DLZ:LCM

1 of 4

09/16/22

- a. DESCRIPTION** - The Contractor shall designate a full-time Project Supervisor to act as the Contractor's agent/representative, and to be responsible for scheduling and coordination of all subcontractors, suppliers, other governmental agencies, and all public and private utility companies. The Project Supervisor shall also be responsible for communicating the work schedule with all impacted businesses.

The Project Supervisor shall not be an active crew member of the Contractor, shall not be an active member or employee of any subcontractor's work force, and shall not perform general or specialized labor tasks.

Prior to the pre-construction meeting, the Contractor shall designate a proposed Project Supervisor by name and shall furnish the City of Ann Arbor and the UM with a current, thorough, detailed summary of the proposed Project Supervisor's work history, outlining all previous supervisory experience on projects of a similar size and nature. The detailed work history shall include personal and professional references (names and phone numbers) of persons (previous owners or agents) who can attest to the qualifications and work history of the proposed Project Supervisor. Proposed candidates for Project Supervisor shall have a demonstrated ability to work harmoniously with the City, UM, the public, subcontractors, and all other parties typically involved with work of this nature. The Project Supervisor shall be able to demonstrate that they have filled a supervisory role on at least three projects of similar scope and size within the last 5 years. The Supervising Professional, Engineer, and UM will have the authority to reject a proposed Project Supervisor whom he/she considers unqualified.

The Project Supervisor shall be available 24 hours-per-day to provide proper supervision, coordination and scheduling of the project for the duration of the Contract. The Contractor shall furnish the City with telephone numbers of the Project Supervisor in order to provide 24 hour-per-day access during business and non-business hours, including weekends and holidays.

The Project Supervisor shall be equipped by the Contractor with a mobile telephone to provide the UM with 24 hour- per-day access to him/her during daily construction activities, during transit to and from the construction site, and during all non-business hours including weekends and holidays.

The Project Supervisor shall be equipped with assistants as necessary to provide project supervision as specified herein, and in accordance with the Contract.

- b. DUTIES AND RESPONSIBILITIES** - The Project Supervisor work harmoniously with the City, UM, the public, subcontractors, and all other parties typically involved with work of this nature.

The Project Supervisor shall have a thorough, detailed understanding and working knowledge of all construction practices and methods specified elsewhere herein, as well as the handling, placement, testing and inspection of aggregates, aggregate products, landscape materials, electrical equipment, pre-cast unit pavers, HMA concrete, and Portland cement concrete materials.

The Project Supervisor shall be responsible for all of the work of all of the Contractor's,

subcontractors' and suppliers' work forces.

The Project Supervisor shall be responsible for proper and adequate maintenance (emissions, safety, and general operation) of all of the Contractor's, subcontractors' and suppliers' equipment and vehicles.

The Project Supervisor is responsible to assure that mail delivery, solid waste, and recycling pick-ups are uninterrupted by the construction.

The Project Supervisor is responsible to coordinate deliveries to the local businesses.

The Project Supervisor shall be responsible for the legal, proper and safe parking/storage of all of the Contractor's, subcontractors' and suppliers' equipment, work vehicles, and employee's vehicles.

The Project Supervisor shall schedule and coordinate the work of all parties involved in the project, including utility companies, testing agencies, governmental agencies, all City departments (such as Utilities and Transportation), the DDA and/or City inspectors, and the impacted businesses.

The Project Supervisor shall coordinate and schedule the work of any independent survey crews that may be retained by the City or UM to witness and reset existing and new geographic/benchmark monuments. Failure to have existing monuments witnessed and reset may result in delays to the Contractor's work. Costs for such delays will be the Contractor's sole responsibility.

The Project Supervisor shall coordinate and schedule both testing inspectors and City and UM inspectors in a timely manner, to assure proper and timely testing and inspection of the work.

The Project Supervisor shall review the Inspector's Daily Reports (IDRs) for accuracy and shall sign all IDRs on a daily basis as the representative of the Contractor. Items to be reviewed include descriptions, locations and measurements of quantities of performed work, workforce, equipment, and weather. The Project Supervisor shall also be responsible for its subcontractors' review and initialing of IDRs containing work items performed by each respective subcontractor.

The Project Supervisor shall submit to the Engineer, an updated, detailed schedule of the proposed work on a weekly basis, and an update of all proposed changes on a daily basis, all in accordance with the Detailed Specification for Project Schedule contained elsewhere herein.

The Project Supervisor shall schedule and chair a weekly progress meeting with the Engineer and all subcontractors to discuss the work. Upon the completion of each meeting, the Project Supervisor shall prepare and distribute to all present, a written summary of the meeting's minutes. Those in attendance shall review the minutes and, if necessary, comment on any deficiencies or errors prior to or at the next scheduled progress meeting.

The Project Supervisor shall engage with the affected businesses to communicate expectations for the work and to adjust the construction methods and/or times to best accommodate the local businesses.

C. ADDITIONAL PERFORMANCE REQUIREMENTS - If, in the sole opinion of the Supervising Professional, the Project Supervisor is not adequately performing the duties as outlined in this Detailed Specification, the following system of notices will be given to the contractor with the associated penalties:

- First Notice – A warning will be issued in writing to the contractor detailing the deficiencies in the Project Supervision. The contractor must respond within 7 calendar days in writing with a plan to correct the stated deficiencies. Failure to respond within 7 calendar days will result in the issuing of a second notice.

- Second Notice – A second warning will be issued in writing to the contractor further detailing the deficiencies in the Project Supervision. The contractor must respond within 7 calendar days in writing with a plan to correct the stated deficiencies. Failure to respond within 7 calendar days will result in the issuing of a third notice. A deduction of 10% will be made from the original Project Supervision contract amount. At this time, the City reserves the right to meet with personnel with the necessary authority within the Contractor’s organization to discuss the deficiencies in the Project Supervision.

- Third Notice – An additional deduction of 25% will be made from the original Project Supervision contract amount, and the Project Supervisor shall be removed from the project and replaced immediately with another individual to be approved by the Supervising Professional.

Should, in the sole opinion of the Supervising Professional, the Project Supervisor fail to perform his/her duties and responsibilities as described herein to such a degree that the successful completion of the project is put in jeopardy, the above system of notices may be foregone, and the Contractor shall immediately replace the Project Supervisor upon receipt of written notice. Failure to provide adequate project supervision, as determined by the Engineer, shall be considered basis for the Supervising Professional to suspend work without extension of contract time or additional compensation.

d. MEASUREMENT AND PAYMENT - This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum, minus any deductions incurred for inadequate performance as described herein. This amount will not be increased for any reason, including extensions of time, extras, and/or additional work.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Project Supervision, Max \$175,000.....	Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the City Standard Specifications and as modified by this Detailed Specification.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
MACHINE GRADING, MODIFIED

DLZ:LCM

1 of 4

09/16/22

- a. DESCRIPTION** - This work shall consist of constructing earth grades by excavating, cutting, filling, trimming, and grading; general restoration, removal and salvage of miscellaneous site amenities, and maintaining the work in a finished condition until such time that it is accepted by the Engineer. This work shall be done as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer, and in accordance with Section 205 of the 2020 MDOT Standard Specification for Construction, except as specified herein.

The drawings indicate work to be completed outside of the right of way on property owned by private parties. This work is an extension of the right of way work and will be paid for based on the applicable unit prices. Machine Grading, Modified will be extended to the limits of grading as shown on the plans where work includes property adjacent to the right of way.

- b. MATERIALS** - All materials shall meet the requirements as specified in Section 205 of the MDOT 2020 Standard Specifications for Construction, except as specified herein.

c. CONSTRUCTION METHOD

Machine Grading: The Contractor shall construct earth grades as required to develop the typical and/or detailed cross-section(s) as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer. This shall include, but not be limited to, the excavation of soil, rocks of any size, stumps, logs, and bricks; the removal and proper disposal off-site of surplus excavated material; the scarifying, plowing, disking, moving and shaping of earth; the trimming, grading, compaction and proof-rolling of the prepared subgrade; the importing, furnishing, placement and compaction of embankment and/or fill materials; the full depth saw-cutting of pavement at the removal limits; the grading of side slopes; general restoration in accordance with the detailed Specifications elsewhere herein and the general items of the work as specified herein. Road subbase and base materials shall be paid for separately. The subgrade shall be constructed in accordance with Section 205.03.G (Earth Excavation) and Section 205.03 H (Roadway Embankment) of the MDOT 2020 SSC, as shown on the plans, and as specified herein.

The Contractor shall remove, add to, re-shape, re-grade, and re-compact the existing roadbed materials, and shall construct the roadway and sidewalk area to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer.

The existing site includes irrigation system that is to be abandoned. As part of Machine Grading the Contractor is to ensure that the system is no longer active with water pressure, then remove any remaining irrigation equipment uncovered during the work, and properly dispose of all materials off site.

As part of Machine Grading the Contractor shall remove other surface features, including, but not limited to, signs, concrete filled steel bollards, and bicycle parking hoops located within the

grading limits and not otherwise identified, as directed by the Engineer. Signs shall be salvaged and provided to City as directed by the Engineer.

The Contractor shall move excavated and/or imported materials longitudinally and/or transversely where necessary, and as directed by Engineer.

The Contractor shall keep the project site well graded and drained at all times. Foundation, roadway or sidewalk embankment or subgrade that becomes damaged by rain shall be undercut and backfilled, or otherwise remedied, by the Contractor, at his/her sole expense, as directed by the Engineer.

The Contractor shall not use rubber-tired equipment on the subgrade, when its use causes or may cause, in the opinion of the Engineer, damage to the subgrade. The Contractor shall conduct its operation(s), and provide all necessary equipment, to ensure the satisfactory completion of the work without damaging the subgrade. This includes the transporting, stockpiling, re-handling, and movement of materials over additional distances, in lieu of driving on an unprotected, or partially unprotected, subgrade.

The Contractor is solely responsible for the maintenance and protection of the subgrade. Further, any damage to the subgrade which, in the opinion of the Engineer, is caused as a result of the Contractor's operation(s), or its subcontractors' or suppliers' operation(s), shall be repaired by the Contractor at the Contractor's expense. This includes any additional earthwork and/or maintenance materials as directed by the Engineer, for the purposes of the Contractor's maintenance and protection of the subgrade. The Contractor shall not be entitled to any additional compensation for the implementation of these procedures.

The Contractor shall perform all rough and/or finish grading and compaction in the right of way to the grades shown on the Plans, as detailed in the Specifications, and as directed by the Engineer. The finished subgrade shall be placed to within 1 inch below and $\frac{3}{4}$ inch above plan grade. Variations within this tolerance shall be gradual.

The subgrade shall be compacted to a minimum of 95% of its maximum unit weight, as measured by the AASHTO T-180 method, to a depth of 10 inches. The Contractor shall proof roll all graded and compacted surfaces in the presence of the Engineer as detailed in the Specifications. The Engineer will monitor the proof rolling operation to locate deleterious and/or uncompacted materials and will direct undercuts as necessary.

The Contractor shall take any and all steps necessary to avoid interruption in the mail delivery, and solid waste, recycling, and compostable pick-up within the project limits. This shall include the temporary relocation of mailboxes, where required by the Engineer, as well as moving of all solid waste/recycling/compost containers to the nearest cross street.

The Contractor shall coordinate with the City Forester prior to the removal of any tree

roots 2 inches or larger in size.

Machine Grading includes reviewing the condition of existing sand base in sidewalk areas with the Engineer, and grading and compacting the subgrade and sand to meet grade requirements for the sidewalk zone. If the existing sand base must be removed due to poor condition, the removal will be paid for as part of Machine Grading, Modified, and the replacement sand base paid as Sand Subbase Course, Class II - C.I.P.

The Contractor shall restore all disturbed areas to better than or equal to their original condition. This includes the placement and compaction of 5 inches of topsoil, followed by the placement of grass seed, followed by the placement of 0.5 inches of topsoil at all turf restoration locations, and at locations where concrete items are removed and turf is to be established. All restoration work and materials shall be in accordance with the City Standard Specifications. Restoration work must be performed within one week of the placement of the wearing course for each street. Such restoration will be considered part of Machine Grading, Modified.

Pavement Sawcutting - The work shall include the full-depth saw-cutting of pavement at the construction limits, and elsewhere as required, if not paid for as part of another item of work. Pavement sawcutting will not be paid for separately.

Removal of Trees and Vegetation - The Contractor shall remove and properly dispose of off-site all vegetation; brush; roots; and trees and stumps less than 6 inch in diameter, as shown on the plans, and as directed by the Engineer as required to complete the project.

Removing and Salvaging Topsoil - The removal, salvaging and stockpiling of topsoil, and all related work, shall be performed in accordance with Section 205.03.A.1 (Removing and Salvaging Topsoil) of the MDOT 2020 SSC.

Protection of Utilities - Utility lines may become exposed at, above, or below, the foundation or subgrade elevation during machine grading or subgrade undercutting operations. If this occurs, the Contractor shall excavate around, above and/or below the utility lines, as directed, to complete the machine grading or subgrade undercutting operations. Payment, at contract unit prices, for "Machine Grading, Modified _" or "Subgrade Undercutting, Type _," whichever applies, will be considered as payment in full for this work.

Protection of Trees to Remain – Trees to remain shall be protected from damage due to mechanical equipment, tree root compaction and cutting, and removal of bark and branches.

- d. MEASUREMENT AND PAYMENT** – Measurement for payment for the item "Machine Grading Modified" shall be the computed by road station (as further described below). Embankment, fill, compaction, proof rolling, subgrade protection/maintenance, and drainage maintenance will not be paid for separately, and are included in this item of work.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

PAY ITEM

PAY UNIT

Machine Grading, Modified Station

“Station” in the **Machine Grading, Modified** pay unit is defined as a one hundred foot length of street as stationed on the plans; each “Station” pay unit is measure longitudinally for every 100 feet or fraction thereof, and is measure from the center line of the right of way to the edge of the right of way (that being one half of the right of way).

The pay item “Machine Grading, Modified” shall include all the work specified herein, including, but not limited to, the removal and offsite disposal of any surplus or unsuitable materials and the furnishing from off-site any additional Engineer approved fill materials necessary to construct the embankment and subgrade to the contours and cross-sections shown on the plans.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
NON-HAZARDOUS CONTAMINATED MATERIAL HANDLING AND DISPOSAL (LM)

DLZ:LCM

1 of 3

09/16/22

a. Description. This work shall include all labor, equipment, and materials necessary to handle, transport, and dispose of non-hazardous contaminated material as described herein, as directed by the Engineer.

An area within the project limits has been identified as a potential site of soils which include non-hazardous contaminated material. Should the City determine that soils in the project site include non-hazardous contaminated material these materials shall not be used elsewhere or disposed of in a manner inconsistent with this special provision, or applicable federal, state, or local regulations unless otherwise directed by the Engineer.

b. Method of Construction. This work shall be performed in accordance with Sections 204 and 205 of the MDOT 2020 Standard Specifications for Construction, except as modified herein or as directed by the Engineer.

The Contractor shall have all manifests signed by its representative, the Engineer's representative, the authorized representative of the waste hauler and the waste disposal facility.

c. Excavation of Non-Hazardous Contaminated Material. Non-Hazardous contaminated material shall be excavated as directed by the Engineer.

d. Temporary Storage of Non-Hazardous Contaminated Material. Excavated non-hazardous contaminated material which is to be temporarily stockpiled shall be placed on plastic sheeting or tarps having a minimum thickness of 6 mils or in trucks, roll-off boxes, or other containers, such that no liquid may escape from the containment. At the end of each work day, the non-hazardous contaminated material shall be covered securely with plastic sheeting of 6 mils thickness or greater.

Excavated non-hazardous material shall be disposed of as soon as approval is received from the disposal site. In no case shall this material be stockpiled for longer than 30 days prior to disposal.

The Contractor is responsible for the necessary coordination such that his/her work activities are not adversely impacted by the stockpiling of contaminated soil. Stockpiled soil shall not impair sight distance or drainage.

e. Sampling and Analysis of Non-Hazardous Contaminated Material. City staff and the Engineer shall be notified of excavation in the identified area of concern. Should the city determine that the materials being excavated potentially contain non-hazardous contaminated material, the Contractor shall excavate soils in the area, stock pile materials and/or leave the materials in-situ, as directed by the Engineer.

During the period following excavation and stockpiling, and prior to loading and removal of the soils, the Contractor will be directed to proceed with work in other areas of the project, should other areas be available for work within the project area and in compliance with the project schedule and Progress Clause. Any downtime related to the discovery, excavation, stockpiling, testing, loading and hauling of the non-hazardous contaminated material will not be paid for separately.

The City will be responsible for the costs associated with testing of the soils to determine the nature and extent of the contamination. Reports related to any testing will be provided to the Contractor.

The information contained in this report shall be utilized to secure a Type II disposal facility for disposal of the non-hazardous contaminated material. The contractor shall be responsible for preparing any forms or applications required by the disposal facility prior to their acceptance of the non-hazardous contaminated material for disposal.

The contractor shall also be responsible for familiarizing themselves with the information contained in the report and adjusting their operations accordingly to meet the safety and health requirements as set forth in Section 104.07.B of the MDOT 2020 Standard Specifications for Construction.

f. Disposal of Non-Hazardous Contaminated Material. Disposal of non-hazardous contaminated material shall be at a licensed Type II sanitary landfill. The Contractor shall submit at the preconstruction meeting the name of the Type II landfill to be used for disposal, the sampling and analysis requirements of the landfill, and verification that the use of the proposed landfill will meet the requirements of the County solid waste plan.

g. Measurement and Payment. The completed work as described will be paid for at the contract unit price for the following contract item (pay item):

PAY ITEM

PAY UNIT

Non-Hazardous Contaminated Material Handling and Disposal (LM)

Cubic Yard

Non-Hazardous Contaminated Material Handling and Disposal will be measured by volume in cubic yards, loose measure, as contained in the hauling unit. Under no circumstance will the Contractor be paid for quantities of this material that have not been approved for payment by the Engineer and as measured and tracked by the Engineer and the Contractor. The Contractor will not be paid "standard amounts" that have been determined by the disposal facility; only measured volumes as computed by the Engineer will be paid. Prior to payment, the Engineer shall be given receipts from the disposal facility for the number of cubic yards disposed of at that facility.
Payment

shall include all costs for materials, labor and equipment needed for storage, loading, transportation, and disposal of the non-hazardous contaminated material. Disposal costs shall include all documentation required by the landfill. Payment for this item shall be the same, regardless of whether or not the Contractor temporarily stores the contaminated material; the Contractor shall not be paid for re-handling of the material due to construction staging, stockpiling, or other related activities.

Payment for excavation of non-hazardous contaminated materials shall be included with the related items of work.

**CITY OF ANN ARBOR
DETAILED SPECIFICATION
FOR
EROSION CONTROL, INLET PROTECTION
EROSION CONTROL, SILT FENCE
Page 1 of 1**

DESCRIPTION

The Contractor shall furnish, place, maintain, and remove soil erosion and sedimentation control measures, including but not limited to, silt fence and fabric filter protection at all drainage structures, all in accordance with all applicable City (and other governmental agencies) codes and standards, as directed by the Engineer, as detailed in the Standard Specifications, and as shown on the Plans.

This work consists of installing and maintaining inlet filters and silt fence in accordance with Section 208 of the 2012 Michigan Department of Transportation Standard Specifications for Construction and as shown on the plans. Filters in existing and proposed inlets, as well as silt fence downstream of construction area, shall be installed in order to minimize the erosion of soil and the sedimentation of water courses. The related work includes the installation, maintenance, and removal of the filters and fence, cleaning as required during the performance of the project work, removing and disposing of accumulated sediment, and replacement of filters if required by the Engineer so as to provide a properly working inlet filter and a well-drained site.

MATERIALS

The inlet protection filters shall be in accordance with the REGULAR FLOW SILTSACK® manufactured by ACF Environmental (800) 448-3636; FLEXSTORM® Style FX manufactured by Advanced Drainage Systems, Inc. (800) 821-6710; CATCH-ALL® manufactured by Price & Company (866) 960-4300, SLOT GUARD® manufactured by Ertec Environmental Systems (866) 521-0724, or Engineer approved equal.

The Contractor shall submit product data sheets and a sample of the filter material for inlet filters and silt fence for Engineer approval prior to ordering materials.

METHODS OF CONSTRUCTION

The Contractor shall install, maintain, clean, and re-install and/or replace inlet filters and silt fence in accordance with the manufacturer's specifications and as directed by the Engineer. The Contractor shall dispose of debris off-site.

MEASUREMENT AND PAYMENT

Soil erosion and sedimentation control items shall be field measured and paid for at the Contract Unit Prices for their respective Contract (Pay) Items as follows:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Erosion Control, Inlet Protection	Each
Erosion Control, Silt Fence	Foot

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
AGGREGATE BASE COURSE, 21AA, MODIFIED

DLZ:LCM

1 of 2

09/16/22

a. Description. - This work shall consist of constructing aggregate base courses, on either a prepared subgrade or subbase as indicated on the Plans or where directed by the Engineer. This work shall be performed in accordance with Sections 301, 302, and 307 of the 2020 MDOT Standard Specification for Construction except as specified herein.

b. Materials. - The material used for this work shall meet the requirements of Sections 301, 302, 307, and 902 of MDOT 2020 Standard Specification for Construction, except that the aggregate base shall be either 21AA limestone (permanent and temporary applications) with a maximum loss by washing of 8%.

c. Construction Method. - Aggregate base courses shall not be placed when there are indications that the mixture may become frozen before the maximum unit weight is obtained, and in no case shall they be placed on a frozen subbase or subgrade.

The subbase and subgrade shall be shaped to the crown and grade specified on the plans and maintained in a smooth condition. The top of the subbase shall be placed to within ½ inch below and ½ inch above plan grade. The top of the aggregate base shall be placed to within ½ inch below and ¼ inch above plan grade. Variations within this tolerance shall be gradual. If in the opinion of the Engineer, the Contractor's equipment is causing or will cause any ruts in or damage to the subbase or subgrade, the equipment shall not be permitted on the subbase or subgrade.

Should the subgrade, subbase or aggregate base become damaged due to the Contractor's equipment or by local traffic, the subgrade, subbase, or aggregate base course shall be restored to the condition required by the Specifications without additional compensation to the Contractor.

No pavement course, concrete curb and gutter, or concrete driveway opening shall be placed until the subbase has been compacted to not less than 95 percent, and aggregate base course to not less than 98 percent of their respective maximum dry densities and until a "Permit to Place" has been issued by the Engineer.

Base course aggregate shall be handled and/or stockpiled on-site in a manner that minimizes segregation. Base course aggregate shall be deposited from trucks or through a spreader in a manner that will minimize segregation of material and that is approved by the Engineer. The re-handling of base course aggregate by the Contractor will not be considered sufficient cause to allow the material to become segregated. The Contractor may be required to wet the materials prior to and/or during placement to minimize segregation and to aid in compaction of the material should it be necessary.

All structures, including manholes, valve boxes, inlet structures and curbs shall be protected from damage and contamination by debris and construction materials. Structures shall be maintained clean of construction debris and properly covered at all times during the construction.

The Contractor may be charged for the cleaning by others of accumulated construction debris in the utility structures, and damages resulting from the uncleaned structures.

d. Measurement and Payment. - The completed work as measured will be paid for at the contract unit prices for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Aggregate Base Course, 21AA, Modified	Cubic Yard

“Aggregate Base Course, 21AA, Modified” will be measured in cubic yards based on plan installation. The item of work will be paid for at the contract unit price, which shall be payment in full for all labor, material and equipment needed to accomplish this work.

The provisions of Section 306.04 regarding excess moisture content, moisture corrections, and pay weights shall apply to this item of work.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
SAND SUBBASE COURSE, 21AA, CIP

DLZ:LCM

1 of 2

09/16/22

- a. DESCRIPTION** - This work shall consist of constructing an aggregate subbase on an existing aggregate surface, or on a prepared subgrade in accordance with Sections 301, 302 and 307 of the 2020 MDOT Standard Specifications for Construction, except as specified herein.
- b. MATERIAL** - The materials used for this work shall be MDOT Class II granular material meeting the requirements of the City Standard Specifications.
- c. CONSTRUCTION METHOD** - Sand or aggregate courses shall not be placed if, in the opinion of the Engineer, there are any indications that they may become frozen before their specified densities are obtained.

Sand or aggregate courses shall not be placed on a frozen base, subbase or subgrade.

The Contractor shall not use rubber-tired equipment on the grade, when its use causes, or may cause, in the opinion of the Engineer, damage to the grade. The Contractor shall conduct his/her operation(s), and provide all necessary equipment, to ensure the satisfactory completion of the work without damaging the grade. This includes the transporting, stockpiling, re-handling, and movement of materials over additional distances, in lieu of driving on an unprotected, or partially unprotected, grade.

The Contractor is solely responsible for the maintenance and protection of the grade. Further, any damage to the grade which, in the opinion of the Engineer, is caused as a result of the Contractor's operation(s), or his/her subcontractors' or suppliers' operation(s), shall be repaired by the Contractor at the Contractor's expense. This includes any additional earthwork and/or maintenance materials as directed by the Engineer, for the purposes of the Contractor's maintenance and protection of the grade.

The Contractor shall shape the base, subbase and subgrade to the elevations, crowns, and grades as specified on the Plans and as directed by the Engineer. This may include re-grading the subbase to provide different crown grades than those existing prior to the construction.

The Contractor shall remove, add to, re-shape, re-grade, and re-compact the existing roadbed materials (including the base bed under sidewalks), and shall construct the roadway and sidewalks to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer. The Contractor shall use blade graders, maintainers, vibratory rollers, and/or other equipment as necessary, and as directed by the Engineer, for this work. Use of each specific piece of equipment is subject to the approval of the Engineer.

The Contractor shall maintain the base, subbase, and subgrade in a smooth, well drained condition at all times.

Sand and aggregate courses shall be placed in uniform layers such that when compacted, they have the thicknesses shown on the Plans, or as directed by the Engineer. The loose measure of any layer shall not be more than 9-inches nor less than 4-inches.

Sand subbase and aggregate base courses shall be compacted to not less than 98% of their respective maximum unit weights, as determined by the AASHTO T-180 test.

All granular materials shall be deposited from trucks or through a spreader in a manner that will minimize segregation of material.

Manholes, valve boxes, inlet structures and curbs shall be protected from damage. Manholes & inlet structures shall be continuously cleaned of construction debris and properly covered at all times during the construction. Upon completion of each day's work, manholes, water valve boxes, inlets and catch basins shall be thoroughly cleaned of all extraneous material.

d. MEASUREMENT AND PAYMENT - Where granular materials are used as base, as subbase, or as fill for excavations in Machine Grading areas, item of work "Sand Subbase Course CL II " shall be measured and paid accordingly.

The completed work as measured for these items of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Items:

PAY ITEM

PAY UNIT

Sand Subbase Course Class II Cubic Yard

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
COLD MILLING, HMA SURFACE, MODIFIED

DLZ:LCM

1 of 1

09/16/22

- a. Description.** This work consists of cold milling the existing pavement, repairing areas of failed asphalt pavement, and/or placing new hot mix asphalt (HMA) material as directed by the Engineer and as described herein. Complete pavement repairs in the cold milled surface prior to placement of the first hot mix asphalt paving course.
- b. Materials.** Provide materials in accordance with subsection 501.02 of the MDOT 2020 Standard Specifications for Construction, detailed specifications and as shown on the plans.
- c. Construction.** Cold mill designated areas, repair pavement in locations as specified by the Engineer, and place "Hand Patching, Modified", in accordance with the details on the plans and according to subsection 501.03 of the MDOT 2020 Standard Specifications for Construction. The Engineer will designate repair locations after the pavement has been cold milled as shown on the plans. The milling machine must return to the designated repair locations to mill an additional depth of 3 inches. "Hand Patching, Modified" must be placed in the repair area and roller compacted prior to placement of the paving course.
- d. Measurement and Payment.** Measure and pay for the completed work, as described, at the respective contract unit prices using the following respective pay items:

<u>Pay Item</u>	<u>Pay Unit</u>
Item 250-02: Cold Milling HMA Surface, Modified	Square Yard

Measure **Cold Milling HMA Surface, Modified** area by the unit square yard and pay for it at the contract unit price, which price includes the cost for all labor, equipment and materials required to mill, perform multiple mill passes, re-mill, and remove, load, haul, and dispose of the cold milled material, and cleaning the cold milled pavement. The Engineer will not pay for material picked up by cleaning after cold milling.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
HMA, 3EML
HMA, 5EML
HAND PATCHING, MODIFIED

DLZ:LCM

1 of 4

09/16/22

a. DESCRIPTION - This work shall consist of constructing HMA pavement base, leveling, and wearing courses, and hand patching, in accordance with Division 5 and Section 501 of the 2020 MDOT Standard Specifications, current supplemental MDOT specifications, and the City Standard Specifications, except as modified herein, and as directed by the Engineer.

b. MATERIALS

General - The HMA mixtures to be used for this work shall be as follows:

<u>WORK ITEM</u>	<u>THICKNESS</u>	<u>MDOT HMA MIXTURE #</u>
HMA Pavement Wearing	2.0"	5EML
HMA Pavement Leveling	3.0"	3EML
HMA Pavement Base Course	3.0"	3EML
Hand Patching (Permanent)	3"	3EML
Hand Patching (Temporary)	as directed	see note

Binders for the bituminous mixes shall be PG 64-28 or as directed by the Engineer and shall meet the requirements specified in Section 904 of the 2020 MDOT Standard Specifications, and any current supplemental MDOT specifications.

Bond coat shall be an emulsified asphalt Type SS-1h and shall meet the requirements specified in Section 904 of the 2020 MDOT Standard Specifications, and any current supplemental MDOT specifications.

The use of Marshall Mixes and Cold Patch will be acceptable for use in Hand Patching for areas identified as temporary pavement, at the approval of the Engineer.

The Aggregate Wear Index (AWI) number for this project is 260. This AWI number applies to all aggregates used in all top course mixtures. Blending aggregates to achieve this AWI requirement is permitted in accordance with current MDOT Standards, and Supplemental Specifications.

Recycled Asphalt Pavement (RAP) in HMA Mixtures - The use of Recycled Asphalt Pavement (RAP) in HMA mixtures shall be in accordance with Section 501.

02. A. 2 of the 2012 MDOT Standard Specifications, and the City of Ann Arbor Standard Specifications.

c. CONSTRUCTION METHODS - All concrete work shall be completed prior to placing HMA mixtures.

The Contractor shall have a 10-foot long straight-edge, backhoe, air-compressor and jackhammer available during all paving operations.

Prior to placing the bond coat, the Contractor shall kill all vegetation (within the area to be paved) by applying an approved weed killer ("Round-Up" by Monsanto, or equal), shall thoroughly clean all joints & cracks in the existing pavement (and any gutter to be overlaid) with compressed air and/or vacuum-type street cleaning equipment to remove all dirt and debris to a depth of at least 1-inch, and shall thoroughly clean the entire surface to be paved, with a Vac-All or similar vacuum-type street cleaning equipment.

MDOT SS-1h bond coat shall be applied at a uniform rate of 0.10 gallons/square yard, on all exposed, existing HMA and concrete surfaces which will come in contact with the new HMA material. The Contractor shall take extra care to avoid covering surfaces which are not to be paved. After September 15, SS-1h bond coat shall not be diluted by more than 25%.

The Contractor shall place HMA wedges using the base, leveling, and wearing mixtures specified herein, as directed by the Engineer, prior to placing the wearing course. Such wedging shall be measured and paid for at the respective unit price of the appropriate HMA Pavement item.

Construction of butt joints, where directed by the Engineer, shall be measured and paid for as "Machine Grading Modified."

The Contractor shall construct the pavement courses to provide the final cross-slopes (crowns) specified by the Engineer.

The Contractor shall construct feather joints, and shall feather the leveling and wearing courses at structures, in drive approaches, and at intersection joints, as directed by the Engineer. Feather joints shall vary the thickness of the asphalt from 0.0-inches to the required full paving thickness (approximately 1½-inches) over a 5-foot to 15-foot distance, or as directed by the Engineer. The Contractor shall rake all large aggregates out of the HMA mixture in feather joints, prior to compaction.

The Contractor shall provide a minimum of two rakers during the placement of all wearing and leveling courses. Further, the Contractor shall provide, when directed by the Engineer, a second "Break-Down" roller in order to achieve the specified asphalt densities.

The Contractor shall provide a minimum of 24-hours' notice to the Engineer prior to paving and shall obtain a "Permit To Pave" from the Engineer in advance of scheduling paving.

The Contractor and Engineer shall carefully observe the paving operation for signs of faulty mixtures. Points of weakness in the surface shall be removed or corrected by the Contractor, at his/her expense, prior to paving subsequent lifts of HMA material. Such corrective action may

include the removal and replacement of thin or contaminated sections of pavement, including sections that are weak or unstable. Once the Contractor or his representative is notified by the Engineer that the material being placed is out of allowable tolerances, or there is a problem with the paving operation, the Contractor shall stop the paving operation at once, and shall not be permitted to continue placing HMA material until again authorized by the Engineer. Substandard work that, in the Engineer's opinion, requires removal and replacement, shall be completed as follows:

1. Remove and replace leveling and/or wearing course areas mixed with foreign materials and defective areas.
2. Sawcut full depth of existing pavement in perpendicular and parallel directions to adjoining surfaces to ensure a quality and aesthetically pleasing repair.
3. Replacement may need to extend beyond the area of repair. Cut out such areas and fill with fresh, hot mix asphalt.
4. Compact by rolling to specified density and smoothness.
5. Sawcut or route new joint and fill with specified Hot Poured Rubber Joint Sealer product.

During the placement of leveling and wearing courses, the speed of the paving machine(s) shall not exceed 50-feet per minute.

The Contractor shall furnish and operate enough materials and equipment so as to keep the paving machine(s) moving continuously at all times. Failure to do so shall be cause for the suspension of the paving operation until the Contractor can demonstrate to the satisfaction of the Engineer, that sufficient resources have been dedicated to perform the work in accordance with the specifications.

Each layer of HMA mixture shall be compacted to between 92 to 96 percent (or as determined acceptable by the Engineer) of the theoretical maximum density, as listed on the approved Job Mix Formula.

- d. MEASUREMENT AND PAYMENT** - Measurement of these HMA paving items shall be by the ton, in place. Unused portions of material loads shall be returned to the plant and re-weighed, and the corrected weight slip shall be provided to the Engineer. All weight slips must include the type of mixture (codes are not acceptable), as well as vehicle number, gross weight, tare weight and net weight.

The bond coat is included in the cost of the HMA Pavement Item.

Corrective action shall be enforced as described at Division 5 of the 2020 MDOT Standard Specifications and will be based on the City's or DDA's testing reports.

All costs for furnishing and operating vacuum-type street cleaning equipment, backhoes, jackhammers, and air compressors shall be included in the bid prices for these items of work or in the item of work "General Conditions."

The completed work as measured for these items of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Items:

<u>PAY ITEM</u>	<u>PAY UNIT</u>
All HMA Pavement Items	Ton

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this detailed Specification.

Payment Adjustment In Lieu Of Repair/Replacement - In the case that the work that is installed does not meet the specified quality of materials or installation, the DDA may opt to require the full removal and replacement of the substandard work, or, at their discretion, use the formulas listed below to reduce payment for the work.

A. Pavement Compaction:

1. Pavement

- a. If the daily average in place density is less than 94%, but greater than 93% of the mixture theoretical maximum density (TMD) the paving will be evaluated by the Engineer and Owner and at Owner’s discretion, the unit price of that days paving will be reduced to 90% of full payment.
- b. If the daily average in place density is less than 93% but greater than 92% of the mixture TMD the paving will be evaluated by the Engineer and Owner and at Owner’s discretion may either be removed or the unit price of that days paving will be reduced to 75% of full payment.
- c. If the daily average in place density is less than 92% of the mixture TMD the paving will be removed and replaced at no cost to Owner.

DS-140

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
**CURB AND GUTTER, CONC, ANY TYPE
CONCRETE SIDEWALK, 6 INCH
CONCRETE SIDEWALK, 8 INCH
SIDEWALK RAMP, CONCRETE, 8 INCH**

DLZ:LCM

1 of 4

09/16/22

- a. DESCRIPTION** - This work shall consist of constructing concrete items including concrete curb, gutter, curb and gutter, sidewalks, road concrete pavement base and crosswalks, steel reinforcement, mechanical anchors and hook bolts, all of any type and/or dimensions, all of either regular, fibermesh reinforced, and/or high-early concrete, in accordance with Sections 601, 602, 603, 802, and 803 of the 2020 MDOT Standard Specifications for Construction, except as specified herein, as shown on the Plans, as shown in this Detailed Specification, and as directed by the Engineer.

The Contractor is responsible to construct all sidewalks, sidewalk ramps, drives, curbs, and all other concrete items within ADAAG compliance. All sidewalks and curb ramps must be constructed in accordance with MDOT Standard Detail R-28-J (version in place at time of the bid letting).

- b. MATERIALS** - Refer to the Detailed Specification for Concrete Durability for additional requirements.

Concrete mixtures shall be as follows (or as directed by the Engineer), and concrete materials shall meet the requirements specified in the referenced sections of the MDOT Standard Specifications:

<u>Concrete Item</u>	<u>Concrete Mixture</u>	<u>MDOT Section</u>
Curb & Gutter	P-NC, P1, 6-sack	601
6" or 8" Sidewalk, Road, and Ramp	Fibermesh Reinforced P1, 6 sack	601
Type 1	Fibermesh Reinforced P-NC	
	Fibermesh Reinforced P-NC	

Fibermesh reinforced concrete shall have a polypropylene fibrillated fibers added at a rate of 1.5 pounds per cubic yard. The fibers shall meet the requirements of ASTM C116-89 "Specification for Fiber Reinforced Concrete and Shotcrete" Classification 4.1.3 Type III. The concrete shall be thoroughly mixed for a minimum of 5 minutes after the addition of the fibers to assure uniform distribution throughout the concrete.

CONSTRUCTION METHODS

General - Concrete items, including sidewalk, road pavement, non-integral curb/gutter, drives, and structure adjustments shall be completed prior to the placement of bituminous asphalt pavement. All subgrade work shall be completed prior to placing concrete items, unless directed or approved by the Engineer.

The subbase shall be trimmed to final elevation before placing curb. Curb shall not be placed on a pedestal or mound.

The Contractor is responsible for any damage to concrete items, including but not limited to vandalism; vehicular, pedestrian and/or miscellaneous structural damage; surface texture damage; and rain damage. Such damaged work will be removed and replaced at no additional cost.

The Contractor shall maintain on-site at all times, a sufficient quantity of adequate materials to protect concrete items. The Engineer may suspend or defer concrete placement if rain protection is not available. The Contractor shall not be entitled to any additional compensation due to work suspension or deferral resulting from a lack of adequate rain protection.

The subbase and adjacent concrete shall be sufficiently wet-down with water prior to placing concrete, to prevent water loss from the new concrete, and to form a better bond between old and new concrete. If a cold-joint becomes necessary, (the) existing concrete surface(s) shall be cleaned with compressed air to expose the aggregate in the concrete.

Where concrete items are placed adjacent to existing pavement that is within areas scheduled for subsequent pavement removal and/or milling, the adjacent pavement area shall, within 48-hours of the removal of concrete formwork, be backfilled with MDOT 21AA, Modified aggregate compacted in place to 95% up to the elevation of the bottom of the adjacent pavement and paid for as "Aggregate Base Course - 21AA - C.I.P."

Prior to compacting backfill in front of curb and gutter, the back of curb shall be backfilled with approved material and compacted by mechanical means to 95%.

Concrete surfaces are to have the finishes noted on the plans. Where no finish is noted, a Light Broom finish perpendicular to the street (for sidewalks), and a Medium Broom finish perpendicular to the street for the Concrete Crosswalks.

Reinforcement - All steel reinforcement, mechanical anchors and hook bolts, dowels, and all of any type and/or dimensions shall be provided and installed per the Engineer and plans. All costs associated with reinforcement, anchors, and hook bolts is considered incidental to the concrete work.

Pavements shall utilize fiber mesh reinforcing, made of 100 percent virgin homopolymer polypropylene graded multifilament fiber. Blend with concrete mix at the rate specified by the manufacturer for the depth of pavements and concrete mix specified.

Control Joints - Control joints shall be as located and detailed on the plans. The method of forming joints and spacing shall be approved by the Engineer prior to construction. Joints shall be evenly spaced, forming the pattern indicated on plans, and shall be perpendicular to the building face or curb line unless otherwise directed by the engineer.

Expansion Joints - $\frac{3}{4}$ -inch wide expansion joints shall be placed through concrete pavements in

line with the extension of all property lines or at the longitudinal ends of each block as directed by Engineer; at all expansion joints in the abutting curb, gutter, and combination curb and gutter, and as directed by the Engineer. Transverse expansion joints shall be placed through the sidewalks at uniform intervals of not more than 300- feet, or at a minimum, the center of each block.

½-inch wide expansion joints shall be placed between the sidewalk and road pavement and abutting curb or gutter, at the juncture of two sidewalks, between the sidewalk and buildings and other rigid structures, and as directed by the Engineer.

Expansion Joints in Curb and Gutter - ¾-inch wide expansion joints shall be placed at all street returns, at all expansion joints in an abutting pavement, at each side of all driveways (at radius points), elsewhere at 300-foot maximum intervals, and as directed by the Engineer.

Expansion joint material shall extend to the full depth of the joint. After installation, the top shall not be above the concrete nor be more than ½-inch below it. No reinforcing steel shall extend through expansion joints.

Plane of Weakness Joints in Curb and Gutter - Intermediate plane of weakness joints shall be placed to divide the structure into uniform sections, normally 10-feet in length, with a minimum being 8-feet in length, and shall be placed opposite all plane of weakness joints in the abutting concrete base course.

Plane of weakness joints shall be formed by narrow divider plates, which shall extend 3-inches into the exposed surfaces of the curb or curb and gutter. Plates shall be notched, if necessary, to permit the steel reinforcement to be continuous through the joint.

Project Mock-Up - Prior to concrete work commencing, the contractor will coordinate a review meeting with the Engineer and consultant team to discuss jointing details and layout, finishes, and logistics of the pour. Further, the Contractor will coordinate with the Engineer and consultant team so that the appropriate owner's representatives can observe the initial concrete pouring, jointing, and finishing for each concrete pavement and curb type to review and approve the work. These initial concrete installations will act as project mockups which the remaining work shall match in finishing, jointing, and quality.

- C. MEASUREMENT AND PAYMENT** - The work of furnishing and installing mechanical anchors and hook bolts will be considered incidental to the work item.

A deduction in length for catch basins and inlet castings will be made to measurements of Curb and Gutter. Curb and Gutter, Any Type, shall be measured at the center of the curb and gutter cross section.

All miscellaneous hand work is considered included in the pay items of work and shall not be paid for separately.

Completed work as measured for these items of work will be paid for at Contract Unit Price for the following Contract (Pay) Items:

PAY ITEMS

PAY UNIT

Curb and Gutter, Conc, 18 Inch, Ay Type	Linear Foot
Curb and Gutter, Conc, 24 Inch, Any Type	Linear Foot
Concrete Sidewalk, 6 Inch	Square Foot
Sidewalk Ramp, 8 Inch	Square Foot

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
DETECTABLE WARNING SURFACE

DLZ:LCM

1 of 2

09/16/22

- a. DESCRIPTION** - This work shall consist of furnishing and installing cast in place detectable warning units in compliance to the Americans with Disability Act (ADA). All work shall be in accordance with MDOT Standard Detail R- 28 (version in place at time of the bid letting).
- b. MATERIALS AND CONSTRUCTION METHODS** - The detectable warning tiles shall be ceramic cement or composite polymer concrete (CRC), colored as Federal Number 22144 (frequently referred to as "Colonial Red" or "Brick Red"). The detectable warning tiles shall meet the following dimensions and tolerances:
1. Dimensions: Cast In Place Detectable/tactile Warning Surface Tiles shall be held within the following dimensions and tolerances:
 - i. Length: 24"
 - ii. Width: The full width of the approaching walk (60" or typical sidewalk), or as indicated on plans.
 - iii. Depth: 1.375 (1-3/8") (+/-) 5% max.
 - iv. Face Thickness: 0.1875 (3/16") (+/-) 5% max. Warpage of Edge: 0.5% max. Embedment Flange Spacing: shall be no greater than 3.1"
 2. Water Absorption of Tile when tested by ASTM D 570-98 not to exceed 0.05%.
 3. Slip Resistance of Tile when tested by ASTM C 1028-96 the combined Wet and Dry Static Co- Efficient of Friction not to be less than 0.80 on top of domes and field area.
 4. Compressive Strength of Tile when tested by ASTM D 695-02a not to be less than 28,000 psi.
 5. Tensile Strength of Tile when tested by ASTM D 638-03 not to be less than 19,000 psi.
 6. Flexural Strength of Tile when tested by ASTM D 790-03 not to be less than 25,000 psi.
 7. Chemical Stain Resistance of Tile when tested by ASTM D 543-95 (re approved 2001) to withstand without discoloration or staining - 10% hydrochloric acid, urine, saturated calcium chloride, black stamp pad ink, chewing gum, red aerosol paint, 10% ammonium hydroxide, 1% soap solution, turpentine, Urea 5%, diesel fuel and motor oil.
 8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM D 2486-00 with reciprocating linear motion of 37± cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sandpaper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block is to be 3. 2 lb. Average wear depth shall not exceed 0.060 after 1000 abrasion cycles when measured on the top surface of the dome representing the average of three measurement locations per sample.
 9. Resistance to Wear of Unglazed Ceramic Tile by Taber Abrasion per ASTM C501-84 (re approved 2002) shall not be less than 500.
 10. Fire Resistance of Tile when tested to ASTM E 84-05 flame spread shall be less than 15.
 11. Gardner Impact to Geometry "GE" of the standard when tested by ASTM D 5420-04 to have a mean failure energy expressed as a function of specimen thickness of not less than 550 in. lbf/in. A failure is noted when a crack is visible on either surface or when any brittle splitting is observed on the bottom plaque in the specimen.
 12. Accelerated Weathering of Tile when tested by ASTM G 155-05a for 3000 hours shall exhibit the following result $-E < 4.5$, as well as no deterioration, fading or chalking of

surface.

- 13. Accelerated Aging and Freeze Thaw Test of Tile and Adhesive System when tested to ASTM D 1037-99 shall show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles or other detrimental defects.
- 14. Salt and Spray Performance of Tile when tested to ASTM B 117-03 not to show any deterioration or other defects after 200 hours of exposure.
- 15. AASHTO HB-17 single wheel HS20-44 loading "Standard Specifications for Highways and Bridges". The Cast In Place Tile shall be mounted on a concrete platform with a ½" airspace at the underside of the tile top plate then subjected to the specified maximum load of 10,400 lbs., corresponding to an 8000 lb individual wheel load and a 30% impact factor. The tile shall exhibit no visible damage at the maximum load of 10,400 lbs.
- 16. Embedment flange spacing shall be no greater than 3.1" center to center spacing as illustrated on the product Cast In Place drawing.

c. CONSTRUCTION METHODS - The contractor shall follow manufacturer specifications for installation, except where they conflict with MDOT Standard Detail R-28-J (version in place at time of the bid letting).

d. MEASUREMENT AND PAYMENT - The completed work as measured for this item of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Item:

PAY ITEM

PAY UNIT

Detectable Warning SurfaceSquare Foot

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
RECESSING PAVT MRKG, LONGITUDINAL
RECESSING PAVT MRKG, TRANSVERSE

DLZ:LCM

1 of 2

09/16/22

a. DESCRIPTION - This work consists of providing all equipment and labor required to prepare (grooving) the pavement surface for recessed longitudinal, transverse, and turning guideline pavement markings in accordance with the City of Ann Arbor Permanent Pavement Markings Detailed Specification, the plans, and this detailed specification.

b. MATERIALS - None specified.

c. CONSTRUCTION - Install a recess (groove) in accordance with the recessed pavement marking material manufacturer's installation instructions. Ensure all recessing configurations are in accordance with the Michigan Manual of Uniform Traffic Control Devices and the Michigan Department of Transportation Pavement Marking Standards.

Grooving Concrete and Hot Mix Asphalt Pavement. If there are no markings on the pavement, paint a temporary tracer line (with no beads) exactly where the permanent markings will be placed. Use these lines as a template for the grooving operation.

- a. Use equipment and methods approved by the manufacturer of the recessed pavement marking material to be recessed for forming grooves in pavement surfaces. Dry cut the grooves in a single pass using stacked diamond cutting heads on self-vacuuming equipment capable of producing a finished groove ready for pavement marking material installation.
- b. Ensure that the bottom of the groove has a fine corduroy finish. If a coarse tooth pattern results, increase the number of blades and decrease the spaces on the cutting head until the required finish is achieved.

Groove Dimensions. Ensure grooves for recessed pavement markings are in accordance with the following:

Longitudinal Markings

Groove Width:	Material width +1 inch, ($\pm 1/8$ inch)
Groove Depth:	As recommended by the manufacturer, (± 5 mils)
Position:	Groove Center/Lane Lines: 2 inches from joint line, ($\pm 1/8$ inch) Edge Lines: On lane, 2-4 inches in from the joint line, ($\pm 1/8$ inch) Edge Lines for 14-foot paved lanes: as directed by the Engineer

Transverse Markings

Groove Width:	Material width +1 inch, ($\pm 1/8$ inch)
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Groove Depth: As recommended by the manufacturer, (±5 mils)
 Groove Position: In the exact location where the transverse marking (crosswalk or stop bar) will be placed.

Turning Guideline Markings

Groove Width: Material width +1 inch, (±1/8 inch)
 Groove Depth: As recommended by the manufacturer, (±5 mils)
 Groove Position: In the exact location where the turning guideline markings will be placed.

Placing Recessed Pavement Markings. Place the pavement marking material in the grooves within 24 hours of the grooves being made. Ensure the grooves are clean and dry prior to placing pavement marking material. Locate the groove so the entire marking can be placed within the groove.

- d. MEASUREMENT AND PAYMENT** - The completed work, as described, will be measured, and paid for at the contract unit price using the following pay items:

PAY ITEM

PAY UNIT

Recessing Pavt Mrkg, Longitudinal	Linear Foot
Recessing Pavt Mrkg, Transverse.....	Linear Foot

Pavement marking materials, including retroreflective pavement marking required for traffic control, will be paid for separately using the appropriate pay items.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
PEDESTRIAN TYPE II BARRICADE, TEMP

DLZ:LCM

1 of 2

09/16/22

- a. Description.** This work consists of furnishing, installing, maintaining, relocating, and removing a temporary pedestrian Type II barricade section as identified in the proposal or on the plans. Use temporary pedestrian Type II barricades to close non- motorized facilities including sidewalks, bicycle paths, pedestrian paths, and shared use paths that are not part of the roadway. One pedestrian Type II barricade is defined as a barricade section at least 43 inches wide, including all supports, ballast, and hardware.
- b. Materials.** Provide a temporary pedestrian Type II barricade that meets the requirements of *National Cooperative Highway Research Program Report 350 (NCHRP 350)* or *Manual for Assessing Safety Hardware (MASH)*, in addition to meeting the following requirements:
1. Provide barricade sections at least 43 inches wide, designed to interconnect to ensure a continuous *Americans with Disabilities Act (ADA)* compliant tactile barrier. Ensure the connection includes provisions to accommodate non-linear alignment as well as variations in elevation at the installation area.
 2. Ensure the top surface of the barricade is designed to function as a hand- trailing edge, and has a height between 32 and 38 inches. Ensure the lower edge of the barricade is no more than 2 inches above the surface of the non-motorized facility. Ensure the top edge of the bottom rail of the barricade is a minimum of 8 inches above the surface of the non-motorized facility. The barricade may have a solid continuous face. Finally, all features on the front face of the barricade (the face in contact with pedestrians) must share a common vertical plane.
 3. Equip both sides of the barricade with bands of alternating 6-inch wide orange and white vertical stripes of reflective sheeting. Two bands of sheeting 6 inches tall and a minimum of 36 inches long containing at least two orange and two white stripes each are required. One band placed near the top and one near the bottom if the barricade section has a solid face. If the barricade consists of two rails, affix one band of sheeting to each rail. Ensure the stripes of reflective sheeting are aligned vertically. Ensure this sheeting meets or exceeds the requirements of *ASTM D 4956* Type IV sheeting.
- c. Construction.** Construct the temporary pedestrian Type II barricade in accordance with the manufacturer's recommendations, Michigan Manual on Uniform Traffic Control Devices (MMUTCD), the plans, and the following requirements:
1. Install the barricade as shown on the plans and as directed by the Engineer. Interconnect all barricade sections using hinge components if necessary to ensure a continuous detectable edge for the entire installation. Ensure the barricade is ballasted according to the manufacturer's recommendations to ensure stability during wind events and contact with pedestrians.
 2. When the barricade is installed near motor vehicle traffic, ensure reflective sheeting is visible to motorists.

- 3. When pedestrian Type II barricades are used to close a non-motorized facility, ensure a sufficient number of barricade sections are used to block the entire width of the facility. The barricade may extend outside the edge of the non-motorized facility but must not be less than the full width of the facility.
- 4. If sections of multiple colored barriers are used (i.e. safety orange and white) install the sections such that the colors alternate to increase conspicuity.
- 5. Ensure pedestrian Type II barricades are not used to close a motor vehicle facility. Ensure these barricades are not used to guide pedestrian traffic on a motor vehicle facility in the presence of active traffic. This prohibition includes bicycle/shared use lanes or shoulders in the presence of active traffic.

d. **Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Pedestrian Type II Barricade, Temp	Each

Pedestrian Type II Barricade, Temp, includes all labor, equipment, and materials to furnish, install, maintain, relocate, and remove one barricade section that is at least 43 inches wide. Additional payment will not be made if wider sections are provided. This includes all rails, supports, ballast, hinge points, reflective sheeting, and miscellaneous hardware needed to install and maintain a barricade section.

CITY OF ANN ARBOR
 DETAILED SPECIFICATION
 FOR
SLOPE RESTORATION

AA:DAD

1 of 3

04/09/19

a. Description. This work consists of preparing all manicured lawns and slopes on non-freeway projects designated for slope restoration on the plans or by the Engineer, and applying topsoil, fertilizer, seed, and mulch blankets to those areas. Turf establishment shall be in accordance with section 816 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction and Standard Plan Series R-100, except as modified herein or otherwise directed by the Engineer.

b. Materials. The materials and application rates shall meet the requirements specified in subsection 816.02 and section 917 of the MDOT 2012 Standard Specifications for Construction and as specified herein unless otherwise directed by the Engineer.

1. Topsoil Surface: Place 4 inches of topsoil in area disturbed areas designated for restoration. Topsoil shall be free of all stones one inch in diameter or greater.
2. Turf Seed Mixture: Use seed mixture shown in table below. Seed shall be fresh, clean, dry, new-crop seed complying with the AOSA's "Rules for Testing Seed", tested for purity and germination tolerances.

Species/Variety	Mix Proportions (percent by weight)	Purity (percent)	Germination (percent)
Baron Kentucky Bluegrass	25	90	80
Kentucky Bluegrass 98/80	15	98	80
Park Kentucky Bluegrass	15	90	80
Omega III Perennial Ryegrass	20	98	90
Creeping Red Fescue	25	95	90

Maximum weed content shall be 0.30%.

3. Chemical Fertilizer Nutrient: Use Class A fertilizer.
4. Mulch Blanket: Use excelsior mulch blanket free of chemical additives. The netting thread and anchoring devices must be 100 percent biodegradable. **Use no polypropylene or other non-biodegradable netting.** Provide wood or other biodegradable anchors, at least 6 inches in length, as approved by the Engineer. **Do not use steel wire staples or pins to anchor mulch blankets.**

c. Construction. Construction methods shall be in accordance to subsections 816.03 and 817.03 of the MDOT 2012 Standard Specifications for Construction. Begin this work as soon as possible after final grading of the areas designated for slope restoration but no later than the maximum time limitations stated in subsection 208.03 of the Standard Specifications for Construction. It may be necessary, as directed by the Engineer, to place materials by hand.

Restore all areas as shown on the plans and others disturbed by the Contractor's activity(s) and as identified by the Engineer. Slope restoration includes furnishing and placing topsoil, applying seed and fertilizer, placing mulch blankets, and watering as necessary for the establishment of turf.

Prior to placing topsoil, grade, shape, compact and assure all areas to be seeded are weed free. Place topsoil to the minimum depth required, to meet proposed finished grade. Spread and rake topsoil to provide a uniform surface free of large clumps, rocks, brush, roots, or other deleterious materials, as determined by the Engineer. Remove any stones greater than or equal

to 1 inch in diameter. If the area designated for restoration requires more than the minimum depth of topsoil to meet finished grade, the additional depth must be filled using topsoil. Furnishing and placing this additional material is included in this item of work.

Place topsoil that is weed and weed seed free and friable prior to placing seed. Apply seed mixture and fertilizer to prepared soil surface. Incorporate seed into top 1/2 inch of topsoil.

Use mulch blanket on all areas designated for restoration unless otherwise directed by the Engineer. Install mulch blanket per the manufacturer's published instructions.

Protect and maintain restored areas to establish a uniform, dense, vigorous, and weed free turf without mounds and/or depressions. Begin maintenance immediately upon completion of restoration work and continue up to final acceptance. This includes, but is not limited to, deposition of additional topsoil, re-seeding, fertilizing, and placement of mulch blankets to address areas damaged by washouts and soil erosion, non-uniform germination and bare spots. It also includes any other work required to correct all settlement, erosion, germination, and establishment issues.

If areas washout and/or erode after completing the work and obtaining approval by the Engineer, make the required corrections to prevent future washouts and erosion and replace the topsoil, fertilizer, seed and mulch as required and directed by the Engineer.

Scattered bare spots in seeded areas will not be allowed over three (3) percent of the area nor greater than 6"x 6" in size.

If the Engineer determines weeds cover more than ten percent of the total area of slope restoration, the Contractor will provide weed control in accordance to subsection 816.03.J of the MDOT 2012 Standard Specifications for Construction.

Prior to acceptance, the Engineer will inspect the restored areas to ensure the turf is well established, weed free, in a vigorous growing condition, and contains the species called for in the seeding mixture. If areas do not promote growth, the Contractor will apply new seed, fertilizer and mulch blankets, and water as required.

Upon fulfillment of the above requirements, the Engineer will accept the slope restoration.

Unless otherwise approved by the Engineer, final acceptance will occur no sooner than October 10 of the same year for areas initially restored during the spring (April 15 - June 15) planting season; or, no sooner than June 15 of the following year for areas initially restored during the prior summer/fall (after June 15) planting season.

d. Measurement and Payment. Measure and pay for the completed work, as described, at the contract unit price using the following pay item:

<u>Pay Item</u>	<u>Pay Unit</u>
Slope Restoration	Square Yard

Measure **Slope Restoration** area in place by the unit square yard and pay for it at the contract unit price, which price includes the costs for all labor, equipment and materials necessary to complete the work.

The Contractor will restore areas disturbed by its operations and not required by the Project at its own expense.

The Engineer will not pay for any labor, equipment and material costs for the Contractor to provide weed control.

The Contractor will repair and/or clean any damage or soiling to signs, fences, trees, pavements, structures, etc. at its own expense.

After initial placement of the slope restoration measures, the Engineer will certify for payment fifty (50) percent of the total quantity placed for each item. The Engineer will certify for payment the remaining fifty (50) percent of the total quantities upon full establishment and final acceptance of any restored area.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
ELECTRICAL AND COMMUNICATION HANDHOLES

DLZ:LCM

1 of 2

09/16/22

a. Description. This work shall consist of furnishing and installing handhole assemblies at the locations shown in the Plans, or as directed by the Engineer. All work shall be completed in accordance with the current National Electric Code (NEC), section 818 of the Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction, except as specified herein.

The Contractor shall excavate all trenches and pits to the required dimensions; sheet, brace, and properly support the adjoining ground or structures where necessary to comply with MIOSHA, Section 104.07.B of the MDOT 2012 Standard Specifications for Construction, and other relevant safety standards.

The work for all items shall include, but not be limited to; pavement saw-cutting; excavation and disposal of excavated material; the furnishing, installation, and removal of sheeting and/or shoring where needed; all items necessary for the protection of the trench and all persons employed in the work during the work day and "after-hours" periods; the furnishing, placement and compaction of approved bedding and backfill materials; additional labor and equipment costs associated with any required nighttime water main work; and any other required items to complete the work as shown on the plans, as detailed in this Detailed Specification, and as directed by the Engineer.

b. Materials. All materials shall be new and meet the requirements of the current IEEE, NEMA, ANSI Standards as applicable, and as specified herein.

The Contractor shall submit product data sheets for all conduit, handholes, covers and other parts for Engineer approval prior to ordering materials. The manufacturer "Quazite Composolite," referenced below, is located in Lenoir City, Tennessee.

17 inch x 30 inch handhole assemblies shall consist of two, stacked "Quazite" boxes. The box shall be #PG1730BA18. The cover shall be, #PG1730HA46, a locking heavy-duty bolt-down type with a logo that reads "Traffic Signal" or "Street Lighting" based on their intended use. The total depth of the handhole shall be 18 inches.

If directed by Engineer to stack the handholes for additional depth, the model used for the lower box shall be compatible with those specified herein and meet the same strength requirements.

Provide Granular Material, Cl II in accordance with section 902 of the MDOT 2012 Standard Specifications for Construction.

C. Construction. Handholes shall be placed at all junctions of traffic signal or electrical conduit, and as shown on the plans. Maximum distance between any two handholes shall be as shown on the Plans, but in no case shall exceed 500 feet.

Place foundation material consisting of four (4) inches of Granular Material, Cl II compacted to 95% of its maximum unit weight.

Set the handhole or stacked units to the proper depth and elevation.

Connect handholes to new and existing conduits, whether shown on the plans or not. All conduits shall be connected to the handholes in accordance with the latest revision of Article 346 of the National Electrical Code (NEC).

Backfill around the perimeter of the handhole with Granular Material, CI II compacted to 95% of its maximum unit weight.

Handhole Adjust, Any Size includes the vertical adjustment, either upwards or downwards, of an existing handhole to remain to meet proposed pavement grades and slopes.

- d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit prices for the following pay items:

Pay Item	Pay Unit
Handhole Assembly, _____ inch x _____ inch	.....Each
Handhole Adjust, Any Size.....	.....Each

Handhole Assembly, ___ inch x ___ inch shall be paid for at their contract unit prices and shall include all labor, equipment, and materials to complete the work as specified herein. The pay item shall also include the excavation and disposal of materials, furnishing, installing and compacting Granular Material, CI II, and all work related to connecting handholes to new and existing conduits, whether shown or not shown on the plans.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
**STREETLIGHT, REMOVE
LUMINAIRE INSTALLATION
POLE INSTALLATION
POLE FIT-UP**

DLZ:LCM

1 of 7

09/16/22

- a. DESCRIPTION** - This work shall include the furnishing, installation and testing of the street lighting fixtures at the locations shown in the plans, and as directed by the Engineer to provide a complete working system ready for use. All work shall be completed in accordance with the National Electric Code (NEC), Section 819 of the Michigan Department of Transportation 2012 Standard Specifications for Construction, the City of Ann Arbor Standard Specifications, and as specified herein.

Any costs associated with the obtaining a permit for the electrical work will be paid for by the Contractor, at no additional expense to the City.

- b. MATERIALS** - The Contractor shall furnish all materials and equipment required to install and place in operation Street Light Fixtures. All materials shall meet the requirements of the current IEEE, NEMA, ANSI Standards as applicable, MDOT 2020 Standard Specifications for Construction, the City of Ann Arbor Standard Specifications, and as specified herein. All electrical components shall be furnished new and be listed by, and bear the label of Underwriter’s Laboratories, Inc.

Street light fixtures shall be installed complete with wiring from the base to the luminaires including pole base fuse holders. Wiring installed in lighting standard poles between luminaires and taps in base shall be copper conductors type “XHHW” No. 10 AWG minimum, in conduit.

Cable and wire shall be manufactured by:

Collyer	Hatfield	Reynolds	
Esses	Kaiser	Rome	
Anaconda	General Cable	Okonite	Southwire
Cerro	General Electric	Phelps Dodge	Triangle

Conductors are to match the sizes of the wires being replaced, unless otherwise specified to be larger herein, or directed by the Engineer.

The connection of conductors from size #12 AWG and larger to terminal parts or other conductors shall be made with heavy-duty cast alloy solderless connectors of the pressure double indent type. Tap connectors at light standards shall be multiple aluminum connector with four positions for #2 AWG copper and a 5th position for #12 AWG or larger fixture wire. Connectors shall be Utilco Catalog No. SLC-4-0-1-L with cover for tap block.

Ground rods shall be copper clad steel, and shall be either two 1/2-inch diameter round by

6-foot long rods, or one 5/8-inch diameter round by 8-foot long rod, as shown on the plans.

Fuse holders shall be watertight, in-line, break-away type, 30A, 600V with insulating boots. Install one fast-acting fuse per phase conductor. Fuses shall be five ampere and/or sized for the fixtures being protected.

Provide 20A, 125VAC NEMA type 5-20R ground fault circuit interrupter (GFCI) receptacle with solid-state ground fault sensing and circuit interrupter Class A, Group 1. Per UL standard 943-2003, manufacturer after January 1, 2003 and five milliamperes ground fault trip level. Receptacles must be rated for outdoor use and meet current code requirements for the intended application.

Pole Fit-Up shall use 2-inch hot dipped galvanized ridged metal conduit and sweep (ERMC-S), rated at 350 pounds per 100 linear feet, in conformance with ANSI C80.1. Hold conduit in place with galvanized steel one-hole strap, rated for heavy duty use for exterior applications. All hardware to be hot dipped galvanized steel.

All fasteners shall consist of stainless steel tamperproof screws, bolts, nuts, washers, etc. All anchor bolts and associated washers, nuts, studs, and couplings shall conform to the requirements of the Michigan Department of Transportation 2012 Standard Specifications for Construction, Section 908.14, and shall be galvanized in accordance with ASTM A-153 or as noted on the Drawings.

Prior to beginning construction, the Contractor shall submit to the Engineer product data sheets and Manufacturer's certifications of all wiring, splices, lamps, rods, base plates, anchor bolts, and other parts used in the construction of the light and pole assembly. Certifications shall indicate that all materials meet the minimum requirements of these specifications.

For each submittal or resubmittal, the Contractor shall allow at least 14 calendar days from the date of the submittal to receive the Engineer's acceptance or request for revisions. The Engineer's comments shall be incorporated into the submitted plans, calculations and descriptions. The Engineer's acceptance is required before beginning the work. Resubmittals shall be reviewed and returned to the General Contractor within 14 calendar days. Required revisions will not be a basis of payment for additional compensation, extra work, or an extension of contract time. The Contractor shall include time for this entire review process in his/her schedule.

- C. CONSTRUCTION METHODS** - The Contractor shall provide temporary street lighting during the entire construction period, providing the equivalent of half of the current light levels on the street, either through the use of existing streetlights, installed lights as specified, or other temporary equipment and measures.

Remove conduits and wires as indicated in the plans and specifications, and where the

existing wires are replaced by new wires. Unused and unnecessary conduit that is located in undisturbed soils may remain in place.

The Contractor shall provide all labor, materials, tools, equipment, and supervision required for the furnishing and installing of the street lighting fixtures and new GFCI outlets. Connections to equipment, lighting standards, contactors, etc., shall be made in accordance with applicable building and electrical codes and the recommendations from manufacturers of the particular equipment furnished. Any and all additional connections called for by the equipment manufacturer's or otherwise required for the successful operation of the particular equipment furnished shall be installed by the Contractor as part of his Contract with no additional compensation.

The Contractor shall examine all fixtures and poles delivered to jobsite prior to installation to ensure all specification requirements and shop drawing notes & comments have been incorporated by manufacturer. Installation of fixtures signifies Contractor's acceptance and approval of fixtures from manufacturer.

Contractor must provide adequate storage space for all electrical equipment, conduit, and materials delivered to the job site under a weather-protected enclosure. Location of the space must be approved by the Engineer. Equipment set in place in unprotected areas must be provided with temporary protection.

The Contractor shall be responsible for maintenance of, and repair of damage as a result of accident or vandalism to, the light fixtures, bases, luminaries, and all other materials installed, or to be installed, related to, or necessary for the light fixture and pole installation on the project. This shall remain the Contractor's responsibility until the installation is complete, tested, and accepted by the Engineer.

All connections shall be per the manufacturer's recommendation. Where Utilco connections are not used, all joints in outlet or junction boxes shall be taped in such manner that the insulating value of the joint or splice will be at least equal to the insulating value of the conductor to which it is applied.

Wire brush and apply approved corrosion inhibiting compound all connections.

Ground cables shall be #6 AWG, soft drawn, bare, stranded copper wire. Pressure-type connectors shall be used to connect the ground cable to poles and electrical equipment. The cable shall be properly attached to the ground rods.

All fixtures and poles shall be thoroughly and permanently grounded at each location. Grounding shall be in accordance with the latest National Electric Code and as shown on the Drawings, as a minimum. At the disconnect cabinet, the Detroit Edison neutral, the disconnect cabinet, and the ground mat system shall all be permanently grounded together. The

resistance of the ground rod to ground shall not exceed 25 ohms when tested with a megger. In case the resistance is more than 25 ohms, additional or longer ground rods shall be installed.

Install concrete poles foundation where indicated on the drawings. Base of the foundation is to rest on undisturbed subgrade or on 21AA Limestone Aggregate (or pea stone) compacted to not less than 98% of its maximum unit weight. Backfill pole foundation with 21AA Limestone Aggregate (or peas stone) in 6 to 8 inch lifts, compacting each lift as the hole is filled. Precast concrete pole shall be set plumb and in- line with existing poles, with no more than one-half inch deviation from plumb in any direction.

All excavation for main conduit runs shall be of a depth to leave at least 30 inches from the top of the conduit encasement or top of direct buried rigid conduit to grade of top of curb or surrounding terrain. For lateral flexible conduit, the corresponding dimensions shall be 30 inches. The trench shall be graded to handhole and pole location so that the finished conduit run will contain no pockets where water might accumulate or drain into a handhole or pole.

Conduit shall be cut with a hacksaw or other approved tool. The ends shall be square after cutting and the conduit shall be reamed. All conduits must be securely fastened to boxes with locknuts and bushings of an approved make, care being taken that the full number of threads project into the bushings. Rigid galvanized conduit shall be assembled by means of approved threaded galvanized coupling, unions, and fittings. PVC conduit shall be assembled by means of approved threaded or solvent-welded fittings.

Conduits which are installed underground or concealed in concrete, foundations, or other structures, shall be cleared of foreign material and obstructions, after installation and before conductors or pull wire are drawn in, by wire brushing, swabbing and employing an iron or hardwood mandrel which is 1/4" smaller in diameter than the internal diameter of the duct or conduit.

Conduits shall be cut a minimum of 1 inch above the light pole base and not more than 2 inches above the base.

Cable shall be pulled into conduits using a proper cable grip for the purpose. The cable shall be so handled that it is not subjected to excessive strain or kinked when pulled through the conduit. Damaged or kinked cable shall not be used. Where more than one cable is to be installed in a conduit, all cables shall be pulled through simultaneously. Splices in ducts and conduit will not be permitted.

Cables shall be neatly racked and identified on cable racks in all handholes after being formed to their final position. Cables shall be racked slightly higher than the duct entrances so that they will not rest on the edges of the duct. Cables shall be properly tagged in all handholes and poles. All splices and connections shall be made as described herein and as

shown on the details. Where cable is installed but not immediately spliced, the cable ends shall be thoroughly sealed and racked out of the way of possible danger.

Conductors shall not be installed in conduit until all work which might cause damage to the conduits or cables has been completed. Street light conductors shall be installed in continuous lengths from light to light with connections in the base of lights or street light pull boxes. All splices shall be accessible through the pole handhole and shall extend 4"-6" outside the handhole. No splices will be allowed which are inaccessible inside the pole. Street lighting splices required in ground handholes shall be terminated using splice kits that insulate, seal, and protect the splices.

Printed color code phase identification shall be repeated at all connections. The printing of the conductor coding shall be repeated at all connections. The printing of the conductor coding shall adhere to covering and not be readily removed by rubbing.

Where Utilco connections are not used, all joints in outlet or junction boxes shall be taped in such manner that the insulating value of the joint or splice will be at least equal to the insulating value of the conductor to which it is applied.

Pole Fit-Up shall use 2-inch conduit (ERMC-S) from below grade to top of fit up, which is to be 10 feet above grade. Use galvanized ERMC-S sweep and conduit to provide underground feed from fit up to power cabinet. Install threaded conduit fittings between sections pursuant to the NEC. Hold conduit in place on pole with galvanized steel one-hole strap, spaced as need to secure conduit, but not more than 3 feet on center. Secure strap to pole with galvanized lag screws, sized as recommended by manufacturer.

All trenching and backfilling to install electrical work shall be by the Electrical Contractor. When backfilling the trenches under areas to be paved and around street light foundations, the earth must be compacted in place (in 6-8" layers) to 95% of the material's maximum dry density.

Any excess excavated native material that cannot be placed back into the trench from which it came is to be disposed of as detailed in the special provision entitled "Non Hazardous Contaminated Material". Any excess excavated fill material placed as part of this project is to be used or "wasted" on site as directed by the Engineer. If it is unable to be incorporated into the final work, at the sole discretion of the Engineer, the excess excavation shall be disposed of offsite at no additional cost.

The use of equipment, or any part thereof, for purposes other than testing, even with the Engineer's consent, shall not be construed to be an acceptance of the work on the part of the Engineer, nor shall it be construed to obligate the Engineer in any way to accept improper work or defective materials.

Upon completion of the underground work, the Contractor shall grade the work area smooth, filling any trench settlements, eliminating any large piles of earth and cleaning up any debris, or left-over construction materials and disposing of it offsite at an approved manner and location.

All factory finished equipment shall be cleaned at the completion of the work by the Contractor. Equipment showing marks or rust shall be refinished by the Contractor in a manner acceptable to the Engineer.

- d. MEASUREMENT AND PAYMENT** - The cost of providing temporary street lighting as specified herein shall not be paid for separately.

The completed work shall be paid for at the contract unit price for the following contract items (pay items):

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Streetlight, Remove.....	Each
Luminaire Installation	Each
Pole Installation.....	Each
Pole Fit-Up	Each

“Streetlight, Remove” shall be paid for at the Contract unit price each and shall include all labor, equipment, and materials, including, but not limited to excavation of pole foundation, removal of light pole fixture, and attached appurtenances, complete removal of the concrete foundation, and disposal of the light fixtures, poles and attached appurtenances, and backfilling the excavation with MDOT Class II fill, compacted in 6 inch layers to 95 % dry weight density.

“Luminaire Installation” shall be paid for at the Contract unit price each and shall include all labor, equipment, and materials, including, but not limited to luminaries, arms, new wiring from the base of the pole to the fixture and outlet, cable splicing, fittings, supports, hangers, connectors, tape, fuses, grounding equipment; new water proof outdoor rated GFCI outlets, and, any other materials required for complete installation of the light fixture and outlet onto the light pole and its foundation; all required testing; and, placing light fixtures and pole assemblies into service.

“Pole Installation” shall be paid for at the Contract unit price each and shall include all labor, equipment, and materials including, light pole, foundation, setting pole and anchor bolts and backfill. Install the pole such that the handhole is on the opposite side of vehicle traffic (i.e., a person accessing the handhole would be facing the traffic).

“Pole Fit-Up” shall be paid for at the Contract unit price each and shall include all labor,

equipment, and materials, including, but not limited to conduit installed to utility pole, sweeps, underground conduit from pole to power cabinet, hardware, fittings, and all other work and materials to make fit up. Contractor will be considered complete with this pay item once City of Ann Arbor has accepted the fit up for use. This pay item does not include wire, or installation of wire.

CITY OF ANN ARBOR
DETAILED SPECIFICATION
FOR
AUDIO-VIDEO RECORDING

DLZ:LCM

1 of 3

09/16/22

a. Description. - This work shall include providing a recording of the physical, structural, and aesthetic conditions of the construction site and adjacent areas as provided herein.

The audio-visual recording shall be:

1. Of professional quality, providing a clear and accurate audio and visual record of existing conditions.
2. Prepared during the three (3) week period immediately prior to the preconstruction meeting.
3. Furnished to the Engineer a minimum of two (2) weeks prior to bringing any materials or equipment within the areas described in this special provision.
4. Furnished to the Engineer either at, or prior to, the preconstruction meeting.
5. Carried-out under the supervision of the Engineer.

The Contractor shall furnish two (2) copies of the completed recording to the Engineer at, or prior to, the preconstruction meeting. An index of the recording, which will enable any area of the project to be easily found on the recording, shall be included. The Contractor shall retain a third copy of the recording for his/her own use.

Any portion of the recording determined by the Engineer to be unacceptable for the documentation of existing conditions shall be recorded again, at the Contractor's sole expense, and submitted to the Engineer prior to mobilizing onto the site.

b. Production. - The audio-visual recording shall be completed in accordance with the following minimum requirements:

1. DVD Format / No Editing. - The audio-visual recording shall be performed using equipment that allows audio and visual information to be recorded simultaneously and in color. The recording shall be provided on compact discs in DVD format. The quality of the recording shall be equal to or better than the standard in the industry. The recording shall not be edited.
2. Perspective / Speed / Pan / Zoom. - To ensure proper perspective, the distance from the ground to the camera lens shall not be less than 12 feet and the recording must proceed in the general direction of travel at a speed not to exceed 48 feet per minute (0.55 miles per hour). Pan and zoom rates shall be controlled sufficiently so that playback will ensure quality of the object viewed.
3. Display. - The recording equipment shall have transparent time, date stamp and digital annotation capabilities. The final copies of the recording shall continuously and simultaneously display the time (hours:minutes:seconds) and the date (month/date/year) in the upper left-hand corner of the frame. Accurate project stationing shall be included in the lower half of the frame in standard station format (i.e., 1+00). Below the stationing periodic information is to be shown, including project name, name of area shown, direction of travel, viewing direction, etc.

On streets or in areas where there is no project stationing, assumed stationing shall be used, starting with 0+00 and progressing from west to east or from north to south.

4. Audio Commentary / Visual Features. Locations relative to project limits and landmarks must be identified by both audio and video means at intervals no longer than 100 feet along the recording route. Additional audio commentary shall be provided as necessary during the recording to describe streets, buildings, landmarks, and other details, which will enhance the record of existing conditions.
5. Visibility / Ground Cover. - The recording shall be performed during a time of good visibility. The recording shall not be performed during periods of precipitation or when snow, leaves, or other natural debris obstruct the area being recorded.

C. Coverage. - The audio-visual recording coverage shall include the following:

1. General Criteria. - These general criteria shall apply to all recording and shall include all areas where construction activities will take place or where construction vehicles or equipment will be operated or parked and/or where materials will be stored or through which they will be transported. The recording shall extend an additional 50 feet outside of all areas. The recording shall include all significant, existing man-made and natural features such as driveways, sidewalks, utility covers, utility markers, utility poles, other utility features, traffic signal structures and features, public signs, private signs, fences, landscaping, trees, shrubs, other vegetation, and other similar or significant features.
2. Private Property. - Record all private property that may be utilized by the Contractor in conjunction with this project. These project areas must be disclosed by the Contractor prior to using them for the work of this project.
3. Road Construction Area. - The recording coverage shall:
 - a. Extend to 50 feet outside of the right-of-way and easements area as shown on the plans.
 - b. Extend 50 feet outside the construction limits on all streets, including side streets. Both sides of each street shall be recorded separately.
4. Detour Route / Maintenance of Traffic Areas. The entire detour route, if one is provided for on the project plans, and maintenance of traffic areas shall be recorded as indicated in this special provision except as follows:
 - a. The recording must proceed in the general direction of travel at a speed not exceeding 176 feet per minute (2 miles per hour).
 - b. The coverage area shall include the street and not go beyond the curb except in areas where there is a fair possibility that the detoured traffic will drive over the curb, such as at intersections.
 - c. The recording shall focus in particular at sidewalk ramps and other features likely to have been damaged or likely to be damaged as a result of existing traffic, temporary detoured traffic and or construction traffic. In these areas, recording may need to proceed much more slowly.

Only the side of street with the detoured traffic must be recorded. However, the Contractor is advised that portions of the detour routes may operate in opposite directions at different times. In these cases, both sides of the street shall be recorded separately.

- 5. Private Property bordering the project limits or work areas. Record all areas bordering the project where work is scheduled to occur or where construction traffic could damage the private property. This is to include buildings, driveways, decks, landscaping, trees, lawns, and all other similar features.
- 6. Other Areas. - The Contractor shall record at his sole expense other areas where, in his/her opinion, the establishment of a record of existing conditions is warranted. The Contractor shall notify the Engineer in writing of such areas.

The Engineer may direct the recording of other minor areas not specified herein at the Contractor's sole expense.

d. Audio-Visual Recording Services. - The following companies are known to be capable of providing the recording services required by this special provision and shall be utilized unless the Contractor receives prior written approval from the Engineer to utilize another company of comparable or superior qualifications.

Construction Video Media Midwest Company
 Topo Video, Inc. Video Media Corp. Paradigm 2000, Inc.
 Finishing Touch Photo and Video

e. Measurement and Payment. - The completed work shall be paid for at the contract unit price for the following contract item (pay item):

Contract Item (Pay Item)	Pay Unit
Audio-Visual Recording	Lump Sum

Audio-visual Recording shall include all labor, equipment, and materials required to perform the recording and to provide the finished recording the Engineer.

Payment will be made for Audio-visual Recording following the review and acceptance of the recording by the Engineer. Within 21 days following the receipt of the recording, the Engineer will either accept it and authorize payment or require that any discrepancies in the recording be addressed prior to making payment.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
GENERAL CONDITIONS, MAX \$650,000

DLZ:LCM

1 of 3

09/16/22

a. DESCRIPTION - This item shall include all work described and required by the Plans and Specifications for which no item of work is listed in the Bid Form, including but not limited to:

- Scheduling and organization of all work, subcontractors, suppliers, testing, inspection, surveying, and staking
- Coordination of, and cooperation with, other contractors, agencies, departments, and utilities
- Protection of Utilities
- Placing, maintaining, and removing all soil erosion and sedimentation controls
- Maintaining drainage
- Maintaining drives, drive openings, sidewalks, pedestrian building access, mail deliveries, and solid waste/recycle pick-ups
- Storing all materials and equipment in designated areas
- Coordination efforts to furnish various HMA mixtures as directed by the Engineer
- Furnishing and operation vacuum-type street cleaning equipment a minimum of once per week, or more frequently, if directed by the engineer;
- Furnishing and operating vacuum-type utility structure cleaning equipment
- Furnishing and operating both vibratory plate and pneumatic-type (“pogo-stick”) compactors
- Furnishing and operating all equipment required to complete the proposed work activities as specified
- Furnishing and operating a backhoe during all work activities;
- Furnishing and operating a jackhammer and air compressor during all work activities;
- Noise and dust control
- Furnish and install temporary barricades and fencing at excavation areas to protect workers and people in the work area.
- Mobilization(s) and demobilization(s)
- Furnishing submittals and certifications for materials and supplies
- Disposing of excavated materials and debris
- All miscellaneous and incidental items such as overhead, insurance, and permits.
- Interim and final site cleanup, including, but not limited to removal and disposal of excess materials, removal of all dirt and deleterious materials, power washing pavements, removal of all packing materials and labels, etc.
- Scheduling and organization of all work, subcontractors, suppliers, testing, inspection, and construction surveying and staking;
- coordination of, and cooperation with, other contractors, agencies, departments, and utilities;
- Coordination with City forces to stockpile and load used castings on City vehicles;
- Protection and maintenance of all existing utilities, including support, protection, capping, repair, replacement, connection or re-connection of existing pipes, and utilities damaged by the Contractor’s operations;
- Maintaining and removing all soil erosion and sedimentation controls (as specified herein or as shown on project plans) for which no pay item exists;

- Maintaining the site, and all areas within the Construction Influence Area, in a well-graded and drained state at all times during the course of the project. De-watering and drainage of all excavations as required to maintain a stable. Open hole;
- The continuous maintenance of the temporary road surface within the Construction Influence Area throughout the duration of the construction. This includes any needed grading to maintain the surface in a smooth condition free of potholes, ruts, bumps, or other objectionable conditions;
- Temporary sheeting, bracing, and shoring of excavations in accordance with the applicable MIOSHA Standards;
- Maintaining driveway openings. Sidewalks, bike paths, mail deliveries, and solid waste/recycle pick-ups. This includes the placement and maintenance of maintenance aggregate across sidewalk ramps all as needed and as directed by the Engineer;
- Using quantities of dust palliative, maintenance aggregate, and hot patching mixture for use as temporary base, surfacing, and dust control at utility crossings, side roads, and driveways;
- Storing all materials and equipment off lawn areas;
- Temporary removal/re-location, storage, and re-installation/re-setting of existing street name, guide, and regulatory signs, mailboxes, newspaper tubes, etc. which conflict with the proposed construction;
- Site clean-up on a daily basis during the course of the project's construction.
- Coordination efforts to furnish the various required HMA mixtures as directed by the Engineer;
- Coordination efforts to furnish and operate various-size vehicles/equipment as directed by the engineer;
- Noise and dust control in accordance with the applicable City of Ann Arbor Ordinances;
- Mobilization(s) and demobilization(s) of all needed materials. Equipment, and personnel;
- Furnishing all required shop drawing, information submittals, and material certifications for all needed materials and supplies incorporated into the project;
- The proper off-site disposal of all excavated materials and debris;
- Removal of shrubs, brush, and trees less than 8" diameter (DBH) as shown on the plan sheets or as directed by the engineer;
- Fencing to protect excavation over 1' in depth during non-work hours. The fencing must be a minimum of 36" high, be constructed of orange HDPE material, and reasonably secured to prevent unwarranted access;
- Submittal of Close-Out Documents at the conclusion of work and prior to final payment, including as-built documentation of field changes and manufacturer's product warrantee and maintenance instructions;
- All miscellaneous and incidental items such as overhead, insurance, and permits; and,
- Meeting all requirements relating to Debarment Certification, David Bacon Act, and Disadvantaged Business Enterprise, and providing the necessary documentation.

b. MEASUREMENT AND PAYMENT - This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

PAY ITEM

PAY UNIT

General Conditions, Max \$650,000Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the City Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION
FOR
PROGRESS CLAUSE**

PROGRESS CLAUSE: The Contract Award is expected on March 1, 2023. In no case shall any work be commenced prior to receipt of formal notice to proceed by the City of Ann Arbor.

The work shall be completed in a methodical sequence of activity (or “stages”) moving through the project site, as indicated in the *Detailed Specification for Maintaining Traffic and Construction Sequencing and the Maintenance of Traffic Plans*; and within the Stages noted on the plans and herein. The Contractor may propose alternative ideas to the phasing and scheduling of the work for consideration by the City of Ann Arbor. If, after consideration, the Engineer believes that the alternative proposed is beneficial to the City, they may opt to accept the proposed alternative.

In general, the project will proceed in five Stages and be completed over two construction seasons:

- Stage 1 (2023): Fuller Road crossover widening and East Medical Center Dr. widening.
- Stage 2 (2023): East Medical Center Dr. bridge and road construction (west side).
- Stage 3 (2023): East Medical Center Dr. bridge and road construction (east side).
- Stage 4 (2023): East Medical Center Dr. and West Medical Center Dr. Coldmilling, resurfacing, pavement marking, and signing.
- Stage 5 (2024): Final restoration and epoxy overlay on the East Medical Center Dr. bridge.

During all Stages, disruption to intersections shall be minimized and no work will be allowed during the dates and event listed herein.

The Project takes place within the entrance of a busy bridge to a University of Michigan Medical Campus. The Contractor is required to work with the City of Ann Arbor and the University of Michigan to sequence work to minimize disruptions as much as possible.

Pedestrian access to the hospital must be maintained throughout the construction period. At a minimum one sidewalk must be open at all times. All pedestrian access shall be ADA compliant.

Vehicular, solid waste, and pedestrian access must be provided to parking lots, service areas, and alleys at all times. Work in these areas will be coordinated to provide at a minimum, partial width and temporary access as needed. The Contractor will be required to coordinate and communicate with property owners and tenants that may be impacted.

The Contractor may propose to adjust the limits or sequencing of construction in order to complete the work more efficiently. Changes to the recommended construction sequence must be approved in writing by the Engineer prior to construction and must assure all required coordination with other projects and timelines.

The Contractor for the work covered by this proposal will be required to meet with the Engineer to work out a detailed Progress Schedule. The schedule for this meeting will be set within two weeks after the approved contractor is determined. Prior to this meeting the contractor will also submit for review and

approval a Project Schedule consisting of sequence of operations and staging plan to complete the work by the specified completion date.

The named subcontractor(s) for Specialty and/or Designed Items (if such items are designated in the proposal) which materially affect the work schedule shall also be present at the scheduled meeting, and they will be required to sign the Progress Schedule to indicate their approval of the scheduled dates of work set forth in the Progress Schedule.

The Engineer will arrange the time and place for the meeting.

The Plans and Detailed Specifications describe logistics, coordination and scheduling requirements of the Project which shall be included in the Progress Schedule and otherwise conformed to. Work will be allowed from 7am – 8pm, Monday – Saturday, except for night work required as detailed in plans and the specifications. Exceptions to work outside those hours are made on a case-by-case basis only and require City administration approval.

Work beyond these hours is subject to the approval of the Engineer, and subject to approval of an extended hours work permit application by the City of Ann Arbor.

Certain work activities such as hauling of material may be limited on home football Saturdays in the Fall due to closure of several streets/ traffic.

Project Stages Description:

As this project includes direct access to UM Medical campus and also serves as a bus route for both the University of Michigan and the AAATA, and experiences high volumes of pedestrian traffic, it is vital that each Stage of work and its completion be coordinated, efficient, and timely to ensure that roadway operations are safe to travel for all users.

Time is of the essence in the performance of the work of this contract. The Contractor is expected to mobilize sufficient personnel and equipment, and work within authorized hours in order to complete the project by the final completion date. Costs for the Contractor to organize, coordinate, and schedule all of the work of the project, will not be paid for separately, but shall be included in the bid price of the Contract Item “General Conditions.”

The Stages of construction are described in the *Detailed Specification for Maintaining Traffic and Construction Sequencing*, other detailed specifications, and on the plans.

At a minimum the following work must be completed by **December 1, 2023**, unless approved otherwise by the City of Ann Arbor:

- 1) Bridge and full depth roadway construction complete and fully open to traffic.
- 2) Sidewalks and sidewalk ramp construction, on and off the bridge, complete and fully open to pedestrians and bicycles
- 3) Lighting and electrical work
- 4) UM, City and AT&T conduit construction.

Liquidated Damages in the amount of **\$5,000 per calendar day** will be charged for delays beyond the completion date for the work listed above.

For Stages 4 and 5 nighttime work, Liquidated Damages in the amount of **\$1,000 per hour** will be charged for delays to fully opening all lanes to traffic and sidewalks to pedestrians and bicycles by 6:00 a.m.

The entire project must be fully complete by **July 1, 2024**, unless approved otherwise by the City of Ann Arbor.

Liquidated Damages in the amount of **\$5,000 per calendar day** will be charged for delays beyond the final completion date listed above.

If the Contractor shall fail to Complete the Work within the Contract Time, or extension of time granted by the City of Ann Arbor, then the Contractor will pay to the City of Ann Arbor the amount for liquidated damages as specified in the Agreement for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents. The liquidated damages charged shall be deducted from the Contractor's progress payments.

The Contractor shall not be charged with liquidated damages or any excess cost when the delay in Substantial Completion of the Work is due to the following and the Contractor has given written notice of such delay within seven (7) calendar days to the City of Ann Arbor or Engineer.

- A. To any preference, priority or allocation order duly issued by the City of Ann Arbor.
- B. To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the City of Ann Arbor, acts of another Contractor in the performance of a Contract with the City of Ann Arbor, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and
- C. To any delays of Subcontractors occasioned by any of the causes specified in Items A and B of this section.

Should the Engineer approve a request for extension of time and revise any contract completion date(s), the Liquidated Damages will be based on the revised date(s) for which the time extensions specifically apply.

Measurement and Payment.-

Liquidated Damages will be assessed until all required work is completed as defined herein. There are no maximum limits on the Liquidated Damages amounts that may be charged to the Contractor. There will be no seasonal suspension of Liquidated Damages except as otherwise provided for herein.

CITY OF ANN ARBOR DETAILED SPECIFICATION
FOR MAINTAINING TRAFFIC AND CONSTRUCTION SEQUENCING

Minor Traffic Devices, Max \$50,000
Traf Regulator Control
Barricade, Type III, High Intensity, Double Sided, Lighted, Furn & Oper
Pedestrian Type II Channelizer, Temporary
Plastic Drum, Fluorescent, Furn & Oper
Channelizing Device, 42 inch, Fluorescent, Furn & Oper
Conc Barrier Ending, Temp, Det 2, Furn & Oper & Adj
Conc Barrier, Temp, Furn & Oper & Adj
Conc Barrier, Temp, Limited Deflection, Det 1, Furn & Oper
Conc Barrier, Temp, Limited Deflection, Det 2, Furn & Oper & Adj
Conc Barrier, Temp, Limited Deflection, Det 3A, Furn & Oper
Pavt Mrkg, Longit, 6 inch or Less Width, Rem
Pavt Mrkg, Longit, Greater than 6 inch Width, Rem
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, White, Temp
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, Yellow, Temp
Pavt Mrkg, Wet Reflective, Type R, Tape, Lt Turn Arrow
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt Turn Arrow
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru Arrow
Pavt Mrkg, Wet Reflective, Type R, Tape, Only
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt and Lt Turn Arrow Sym
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru and Rt Turn Arrow Sym
Pavt Mrkg, Wet Reflective, Type R, Tape, 24 inch, Stop Bar
Lighted Arrow, Type C, Furn & Oper
Sign, Portable, Changeable Message, Furn & Oper
Sign, Type A, Temp, Prismatic, Furn & Oper
Sign, Type B, Temp, Prismatic, Furn & Oper
Sign, Type B, Temp, Prismatic, Spec, Furn & Oper

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1 of 11

10/7/2022

- a. **General.**- Traffic shall be maintained in accordance with Sections 104.11, 810, 811, 812, 919, and 920 of the Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction, the 2011 edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) as amended, applicable supplemental specifications, as directed by the Engineer, except as herein provided.

The following, and herein included Michigan Department of Transportation (MDOT) Maintaining Traffic Typicals and Work Zone Device Details apply to the project: 100-GEN-KEY, 101- GEN-SPACING-CHARTS, 102-GEN-NOTES, 103-GEN-SIGN, 107-GEN-SPEED, 110-TR-NFW-2L, 112-TR-CLT, 163-INT-LD-OUT, WZD-100-A, and WZD- 125-E.

These maintaining traffic provisions are subject to change in the event of special community activities.

The Contractor shall furnish, erect, maintain and upon completion of the work remove all traffic control devices and warning lights within the project and around the perimeter of the project for the safety and protection of through and local traffic. This includes, but is not limited to; advance, regulatory, and warning signs; barricades and channeling devices at intersecting streets on which traffic is to be maintained; barricades at the ends of the project and at right-of-way lines of intersecting streets, temporary concrete barriers, temporary pedestrian paths and ramps, and moving traffic control

devices for construction operations.

- b. Materials.-** The materials and equipment shall meet the requirements specified in the sections designated of the MDOT 2020 Standard Specifications for Construction, the MMUTCD, and all Special Provisions contained in these Contract Documents.

All signs shall be of sizes shown on the plans, unless otherwise directed by the Engineer. Install temporary signs that are to remain in the same place for 14 days or more on driven posts. Install all other temporary signs on portable supports. All signs shall have a minimum bottom height of 7.0 feet.

Channelizing devices required for all lane closures longer than a day shall be plastic drums. 42 inch channelizing devices are permissible for other work with approval from the Engineer. Ensure all devices have sufficient ballast to prevent moving or tipping. If moving or tipping occurs, place additional ballast, as directed by the Engineer, at no additional cost to the project. No more than two ballasts are allowed on each channelizing device. Spacing of drums and channelizing devices shall be 25 feet in curves, shifts, and tapers and 50 feet in tangents.

Do not use caution tape on this project.

Cold Patching Material shall meet the requirements of the City of Ann Arbor Standard Specifications for Construction and as approved by the Engineer.

Use Portable Changeable Message Signs (PCMS's) to warn traffic of upcoming and changing traffic control during the life of the project. Obtain approval from the Engineer for all sign locations.

Install PCMS's and make them operational a minimum of 7 calendar days prior to the start of work, unless otherwise directed by the Engineer. Messages displayed on the PCMS's must conform to MDOT's policy on PCMS's. Notify the Engineer if displaying a different message than those listed below for the project.

Do not leave PCMS's with a blank screen within the clear zone of any roadway at any time. Remove the PCMS or display flashing dots in each corner of the screen when there is no message to display. Update the PCMS messages at the end of each work period to reflect current traffic lane restrictions.

- c. Permits.-** Prior to the start of construction, the Contractor shall obtain a "Right-of-Way" Permit from City of Ann Arbor Planning and Development Services and a "Lane Closure" Permit from City of Ann Arbor Project Management Services Unit. The fees for these permits will be waived. The Contractor must also obtain an Access License Agreement with the University of Michigan prior to the start of construction. The lane closure permit must be obtained at least 48 hours in advance of any proposed street or lane closing.
- d. Work Restrictions.-** During non-working periods, any area with uncompleted work shall have plastic drums and barricades at specific locations and protective fencing, as directed by the Engineer, and at no additional cost to the project. Sidewalks/Paths shall also be closed, where shown in the plans, by a minimum of one Pedestrian Type II Barricade and sufficient Pedestrian Type II Channelizer to fully block access to the closed sidewalk and work zone as directed by the Engineer.

Contractor staging/lay down areas shall be fenced with a temporary 6-foot tall, gated chain-link fence, as directed by the Engineer, and at no additional cost to the project.

Do not impact traffic on major streets between the hours of 7:00 a.m. to 9:00 a.m. and from 3:30
October 10, 2022

p.m. to 6:00 p.m. or on University of Michigan Football Weekends unless otherwise approved by the Engineer or as specified on the Lane Closure Permit. Do not make any traffic control changes between 7:00 a.m. and 9:00 a.m. and 3:30 p.m. to 6:00 p.m. in order to minimize interference with rush hour traffic. All traffic controls must be in place and ready for traffic each day by 7:00 a.m. and 3:30 p.m. The Engineer will permit temporary obstruction of traffic for loading and unloading of trucks if the Contractor provides traffic regulators (flag persons) in conformance with Part VI of the MMUTCD. During temporary obstructions, a minimum of two traffic regulators are required.

Maintain access to the University of Michigan, businesses, residences, and side street(s) within the CIA for the duration of the project. The Contractor shall make every effort to coordinate its operations to minimize interruptions that may impact this access. The Contractor shall notify the Engineer forty-eight (48) hours in advance of any work planned on or near business or residential driveways, and stage work so that it is part-width when it is necessary to work in these areas. The Engineer will not allow the Contractor to prohibit access to businesses and residences during any phase of construction, unless agreed upon with the property owner(s). The Engineer may require traffic regulator (flag) control at its discretion and will direct the Contractor to provide it when necessary to maintain safe access to the University of Michigan, businesses, residences, and side street(s).

Contractor shall maintain street lighting at night on the traffic and pedestrian side of East Medical Center Dr. at all times.

- e. **Construction Influence Area (CIA).**- The CIA shall include the area within the Right-of-way along East Medical Center Dr. from Fuller Rd. to Nichols Dr., West Medical Center Dr. from 100 feet southwest of East Medical Center Dr. to East Medical Center Dr., Fuller Rd. from within the Fuller Rd./East Medical Center Dr./Maiden Ln. intersection to 1,100 feet east of the intersection, and Maiden Ln. within the Fuller Rd./East Medical Center Dr./Maiden Ln. intersection. The CIA shall also include the affected portions of the driveways, sidewalks, and construction staging/lay down areas along and contiguous with these roadways.

In addition, the CIA shall include the rights-of-way of all roadway segments used for detours and all locations that contain advance warning and/or regulatory signs, pavement markings, plastic drums, traffic delineators, and all other project related traffic maintenance items.

- f. **Police, Fire, and Huron Valley Ambulance** - The Contractor shall notify local police, fire departments and emergency response units a minimum of three business days (72 hours) prior to the closure of any roads, or traffic shifts causing restricted movements of traffic or restricted access.

Signal Modifications

Signal timing and phasing modifications are anticipated for construction at the Fuller Rd./East Medical Center Dr./Maiden Ln., the East Medical Center Dr./West Medical Center Dr., and the East Medical Center Dr./Cancer Center intersections. Modifications may also be required at adjacent intersections. Contractor shall coordinate work with the City of Ann Arbor's Signs and Signals Department ahead of changes in the traffic control.

- g. **Traffic Signals.**- Coordinate the removal or modification of existing traffic signals and installation of temporary or permanent signals with the Engineer.
- h. **Work Performed by City of Ann Arbor Signs and Signals Unit.**- No additional or extra compensation will be paid for any delays caused by City of Ann Arbor Signs and Signals.

Prior to each stage, all temporary and/or permanent traffic signal work necessary for traffic control during that stage must be complete and fully operational.

Adjust placement of temporary signal devices in the field, so that opposing traffic can be seen in a stopped condition where possible, as directed by the Engineer.

Prior to each stage, cover any signal indications or overhead signing in conflict with traffic movements during that stage. Methods of covering signs and signal indications require approval by the Engineer before placement.

If it becomes necessary to perform installation activities in the middle of an intersection where lane closures would be impractical, obtain police assistance. The Engineer will determine the times police assistance may be used at the intersection. Expedite work in the intersection to minimize the time police assistance is required.

i. Temporary Barrier (TB).

Perform barrier operations such as slip forming or placing temporary concrete barrier with the flow of the traffic. Place the end treatment first when deploying the TB and remove the end treatment last when removing the TB.

Do not place TB on slopes that are steeper than 1:10.

Place TB in accordance with Standard Plan R-126 Series. At no time will traffic be exposed to the blunt end of TB or permanent barrier wall without proper attenuation.

- j. Maintenance of Traffic, General.-** The Contractor shall maintain at least one 11-foot lane of through traffic in each direction along each street during the course of the Project's construction. Contractor shall schedule work in order to maintain traffic flow and under no circumstances stop traffic for prolonged periods as determined by the Engineer.

The Contractor shall coordinate their operations with all Utilities, Contractors and/or sub-Contractors performing work on this and other projects within, or adjacent to, the Construction Influence Area (CIA). The contractor shall avoid conflicts in maintaining traffic operations, signing, and orderly progress of other contract work.

- k. Maintenance.-** University of Michigan and City of Ann Arbor driveways shall be maintained at all times. A minimum of one (1) driveway shall be maintained at all times to all residences and businesses. Walks, driveways, and entrances to residences and businesses shall not be blocked. Vehicular and pedestrian access shall be maintained to all properties.

Exploratory Excavations, utility crossings, and all other openings created by the Work over which vehicular traffic will be maintained shall receive a minimum cover of 3 inches of Cold-Patching material that is thoroughly compacted in place.

- l. Signs and Pavement Markings.-** When lane closures are in place, the Contractor shall completely cover all conflicting warning, regulatory and guide signs in accordance with Section 812.03.D.2 of the Standard Specifications for Construction, 2020 edition, and all applicable details therein.

Remove conflicting pavement markings, pavement markings in taper/transition areas and other markings as directed by the Engineer, for operations occupying a location longer than 3 days. Durable markings in these areas should be covered rather than be removed.

Quantities for temporary tape to be placed during paving operations are based on the MDOT PAVE 900 Series standard plans.

When Type R tape is used, ensure that all temporary pavement markings adhere to the pavement surface until permanent markings are installed.

Complete temporary pavement markings in each stage prior to shifting traffic as directed by the Engineer.

Replace all existing pavement markings that are removed for traffic control or obliterated during construction.

- m. Traffic Regulator Control.-** Contractor will provide for Traffic Regulator Control as noted herein, and as directed by the Engineer. Flag Persons performing this work must have adequate professional experience and safety training to perform the work of directing and managing the movement of pedestrians, vehicles, and other sidewalk and street users in a manner that protects the safety of all those present on the job site.

Contractor is to coordinate with the Engineer on the timing and need for Traffic Regulator Control operations.

Crossroads must remain open to traffic at all times. Use intermediate traffic regulators at each intersection approach and commercial driveways within the closure limits, as directed by the Engineer. Use traffic regulator control as directed by the Engineer for cross street traffic while paving through intersections.

- n. Construction.- This provision does not detail all the project work. It is intended to indicate major project requirements and assist the Contractor in developing, for the review and approval of the Engineer, the Progress Schedule for the project.**

The Contractor shall notify the Engineer a minimum of 5 working days prior to the implementation of any detours, road closures, ramp or lane closures, and major traffic shifts. The Contractor shall also notify City of Ann Arbor Signs and Signals regarding signal work as specified in the section entitled "Work Performed by City of Ann Arbor Signs and Signals Unit."

Contractor required to perform dewatering required to construct utilities as required at no additional cost.

Stage 1: Fuller Road crossover widening and East Medical Center Drive widening.

Traffic:

1. On East Medical Center Dr., close the outside westbound lane and maintain one through lane in each direction and a center turn lane between West Medical Center Dr. and Nichols Dr. as shown in the plans.
2. On West Medical Center Dr., close the outside northbound lane and maintain one through lane in each direction at the East Medical Center Dr./West Medical Center Dr. intersection as shown in the plans.

3. On Fuller Rd., maintain two through lanes in each direction at all times between the hours of 7:00 a.m. to 9:00 a.m. and 3:30 p.m. to 6:00 p.m. During work directly adjacent to westbound Fuller Rd., close one lane at a time for a maximum of 48 cumulative hours as directed by the Engineer. Maintain access to the eastbound Fuller Rd. to the Fuller Park crossover as well as for the Fuller Park driveway.

Pedestrians and Bicyclists:

1. Maintain all existing sidewalks/paths and sidewalk ramps except for the northeast quadrant of the East Medical Center Dr./West Medical Center Dr. intersection as shown in the plans. In the northeast quadrant, maintain the existing sidewalk ramp and utilize Temporary Pedestrian Path and Pedestrian Type II Channelizer to maintain access until the proposed sidewalk ramp is complete as directed by the Engineer.
2. Detour pedestrians and bicyclists to the temporary sidewalk in the northeast quadrant of the East Medical Center Dr./West Medical Center Dr. intersection as shown in the plans and/or as directed by the Engineer.

Work Tasks:

1. Construct Contractor staging/lay down areas as shown in the plans and as directed by the Engineer.
2. Construct the temporary traffic signal at the East Medical Center Dr./West Medical Center Dr. intersection. Relocate the northwest pedestrian pushbutton at East Medical Center Dr./Cancer Center intersection.
3. Construct the permanent sidewalk ramp along the east side of West Medical Center Dr. prior to removing the existing sidewalk ramp in that location. Temporary sidewalk between West Medical Center Dr. and Cancer Center is being constructed by the University of Michigan.
4. Relocate the ground mounted University of Michigan sign at the Cancer Center driveway. Coordinate a temporary storage location of the sign after it is removed with the University of Michigan.
5. Adjust the University of Michigan telecommunication manhole in the northeast corner of the East Medical Center Dr./West Medical Center Dr. intersection.
6. Construct the additional turn lane and sidewalk along eastbound East Medical Center Dr. between West Medical Center Dr. and Cancer Center.
7. Widen the eastbound Fuller Rd. to Fuller Park crossover and the driveway island for the Fuller Park driveway.
8. Restore non-paved areas as shown in the plans.

Stage 2: East Medical Center Drive bridge and road construction (west side)

Traffic:

1. On East Medical Center Dr., close the outside westbound lane and maintain one through lane in each direction and a center turn lane between West Medical Center Dr. and Nichols Dr. as shown in the plans. Between West Medical Center Dr. and Fuller Rd. maintain one lane in each direction on the east side of the existing bridge as shown in the plans. Detour the northbound East Medical Center Dr. to westbound Fuller Rd. left turn to the widened crossover on Fuller Rd. east of the intersection as shown in the plans.
2. On West Medical Center Dr., close the existing southbound lane and maintain one through lane in each direction at the East Medical Center Dr./West Medical Center Dr. intersection as shown in the plans.
3. On Maiden Ln., close the southbound left turn lane at the Fuller Rd./East Medical Center Dr./Maiden Ln. intersection and detour the southbound Maiden Ln. to eastbound Fuller Rd. left turn as shown in the plans.

Pedestrians and Bicyclists:

1. Maintain all existing sidewalks/paths and sidewalk ramps except for the west side of East Medical Center Dr. between West Medical Center Dr. and Fuller Rd. and the north side of West Medical Center Dr.
2. Detour pedestrians and bicyclists for the closed sidewalks/paths to the east side of East Medical Center Dr. as shown in the plans.

Work Tasks:

1. Construct the temporary traffic signal at the Fuller Rd./East Medical Center Dr./Maiden Ln. intersection. Relocate traffic signal heads on the East Medical Center Dr./West Medical Center Dr. intersection temporary traffic signal.
2. Place temporary concrete barrier along East Medical Center Dr. and West Medical Center Dr. as shown in the plans.
3. Relocate the ground mounted University of Michigan sign at the East Medical Center Dr./West Medical Center Dr. intersection. Coordinate a temporary storage location of the sign after it is removed with the University of Michigan.
4. Construct the west half of the East Medical Center Dr. bridge as shown in the plans including the following:
 - a. Remove the existing deck, beams, pier cap and portions of the abutments.
 - b. Construct the proposed portions of the abutments, including widening.
 - c. Construct the proposed widened portion of piers and proposed pier cap.
 - d. Erect/Re-erect structural steel including beams: BB, AA, A, B, C, and D.
 - e. Construct the west portion of the deck to staging limits as shown on the plans, including backwalls, sidewalks and railings.
5. Construct University of Michigan conduit on the west side of East Medical Center Dr. as shown in the plans.
6. Coordinate with AT&T allowing them to complete their conduit connection and install their cable on the west side of East Medical Center Dr. AT&T has estimated needing a full 6 weeks for this task.
7. Coordinate with University of Michigan to disconnect electrical power to University of Michigan streetlights on the west side of the bridge and maintain power to the east side streetlights. Install the new streetlights on the west half of the East Medical Center Dr. Bridge.
8. Construct the western half of the City of Ann Arbor's conduits crossing East Medical Center Dr.
9. Construct the west half bridge approach roadway work and sidewalks for East Medical Center Dr. as shown in the plans.
10. Restore non-paved areas as shown in the plans.

Stage 3: East Medical Center Drive bridge and road construction (east side)**Traffic:**

1. On East Medical Center Dr., close the outside westbound lane and maintain one through lane in each direction and a center turn lane between West Medical Center Dr. and Nichols Dr. as shown in the plans. Between West Medical Center Dr. and Fuller Rd. maintain one lane in each direction on the west side of the existing bridge as shown in the plans. Detour the northbound East Medical Center Dr. to westbound Fuller Rd. left turn to the widened crossover on Fuller Rd. east of the intersection as shown in the plans.
2. On West Medical Center Dr., maintain all lanes as shown in the plans.
3. On Maiden Ln., close the southbound left turn lane at the Fuller Rd./East Medical Center Dr./Maiden Ln. intersection and detour the southbound Maiden Ln. to eastbound Fuller Rd. left turn as shown in the plans.

Pedestrians and Bicyclists:

1. Maintain all existing sidewalks/paths and sidewalk ramps except for the east side of East Medical Center Dr. between West Medical Center Dr. and Fuller Rd.
2. Detour pedestrians and bicyclists for the closed sidewalks/paths to the west side of East Medical Center Dr. as shown in the plans.

Work Tasks:

1. Relocate traffic signal heads at the Fuller Rd./East Medical Center Dr./Maiden Ln. intersection temporary traffic signal. Relocate the East Medical Center Dr./West Medical Center Dr. intersection temporary traffic signal.
2. Place temporary concrete barrier along East Medical Center Dr. as shown in the plans.
3. Construct the east half of the East Medical Center Dr. bridge as shown in the plans including the following:
 - a. Remove the existing deck, beams, pier cap and portions of the abutments.
 - b. Construct the proposed portions of the abutments.
 - c. Construct the proposed pier cap.
 - d. Re-erect structural steel including beams: E, F, G, H, J, K, L, and M.
 - e. Construct the east portion of the deck to staging limits as shown on the plans, including backwalls, sidewalks and railings.
4. Construct street lighting on east half of East Medical Center Dr. ensuring that the street lighting on west side of East Medical Center Dr. remains operational.
5. Construct the eastern half of the City of Ann Arbor's conduits crossing East Medical Center Dr.
6. Construct the east half bridge approach roadway work and sidewalks for East Medical Center Dr. as shown in the plans.
7. Restore non-paved areas as shown in the plans.

Stage 4: East Medical Center Dr. and West Medical Center Dr. coldmilling, resurfacing, pavement markings, and signing**Traffic:**

1. On East Medical Center Dr., maintain one lane in each direction utilizing traffic regulator control, lane closures, and lane shifts during the hours of 7 p.m. to 6 a.m. For the remainder of the day, maintain all lanes.
2. On West Medical Center Dr., maintain one bi-directional lane utilizing traffic regulator control, lane closures, and lane shifts during the hours of 7 p.m. to 6 a.m. For the remainder of the day, maintain all lanes.
3. All traffic controls for daytime traffic must be in place and ready by 6 a.m.
4. For nighttime work during this stage, the Contractor shall submit a lane-by-lane maintenance of traffic plan to the City of Ann Arbor, 30 working days in advance of beginning cold milling. This plan shall include drawings, traffic regulator locations, temporary signing, barricades, and channelization device locations.

Pedestrians and Bicyclists:

1. Maintain all existing sidewalks/paths and sidewalk ramps between 6 a.m. and 7 p.m.
2. Detour pedestrians and bicyclists as required using traffic regulators between 7 p.m. and 6 a.m. as directed by the Engineer.

Work Tasks:

1. Remove the Fuller Rd./East Medical Center Dr./Maiden Ln. intersection and the East Medical Center Dr./West Medical Center Dr. intersection temporary traffic signals.

2. Cold mill East Medical Center Dr. and West Medical Center Dr. as shown in the plans. Traffic shall not be allowed to drive on cold milled surfaces.
3. Pave the bituminous wearing course for East Medical Center Dr. and West Medical Center Dr. as shown in the plans. Adjust structures, if required, immediately prior to paving.
4. Place permanent pavement markings and signing.
5. Remove Contractor staging/lay down areas.
6. Restore non-paved areas as shown in the plans.

Stage 5: East Medical Center Dr. epoxy overlay, pavement markings on the bridge, and restoration

Traffic:

1. On East Medical Center Dr., maintain one lane in each direction utilizing traffic regulator control, lane closures, and lane shifts during the hours of 7 p.m. to 6 a.m. For the remainder of the day, maintain all lanes.
2. All traffic controls for daytime traffic must be in place and ready by 6 a.m.
3. For nighttime work in this stage, the Contractor shall submit a lane-by-lane maintenance of traffic plan to the City of Ann Arbor, 30 working days in advance of beginning epoxy overlay. This plan shall include drawings, traffic regulator locations, temporary signing, barricades, and channelization device locations.

Pedestrians and Bicyclists:

1. Maintain all existing sidewalks/paths and sidewalk ramps.

Work Tasks:

1. Apply epoxy overlay to the East Medical Center Dr. bridge.
2. Place permanent pavement markings on the East Medical Center Dr. bridge.
3. If needed, complete restoration of non-paved areas as shown on plans as directed by Engineer. No lane closures are allowed for this work and it does not need to be done between 7 p.m. to 6 a.m.

o. Work Tasks Common to all Stages - The following major work tasks are included in each stage of work in addition to work described above:

1. Implement the traffic control as shown on the project plans, and as directed by the Engineer for this stage of the construction. Coordinate with the City of Ann Arbor Signs and Signals Unit as needed.
2. Install all needed soil erosion and sedimentation control measures. The Contractor shall install only those devices necessary to perform the work of this particular stage or to meet the appropriate Federal, State, or Local regulations.
3. Coordinate with City when installing all signing. Temporarily cover signs in conflict with construction maintenance of traffic.
4. Reasonable access to all side streets and driveways shall be maintained at all times. The Contractor is to coordinate construction in front of driveways, and the actual driveway construction (where applicable), with affected property owners as detailed elsewhere herein.

p. Detours. - Signs should be on both sides of the roadway when the work is taking place on the freeway or a boulevard section.

Cover all detour signs installed prior to closing a road or ramp. Do not uncover detour signing until just before the closure is in effect. Immediately remove or cover all detour signing upon opening the road or ramp to traffic.

- q. Pedestrian or Non-Motorized Facilities.** - Maintain all facilities in accordance with *The Americans with Disability Act* (ADA) requirements, the Public Rights-of Way Accessibility Guidelines (PROWAG), and City of Ann Arbor and the University of Michigan requirements. Provide facilities equivalent to or better than the route a person would have encountered prior to construction activities.

Close and detour any sidewalk ramps and crosswalk areas to pedestrian traffic that are impacted by the work. Cover pedestrian signal heads when the crosswalk or ramp is affected.

Keep sidewalk areas clear of any equipment or materials at all times the sidewalks are open to pedestrian traffic.

- r. Earthwork and Excavation.** - Restore undercuts or excavations in the work areas within 3 feet of the active traffic lanes to no steeper than a 1 on 4 slope from the edge of the roadway at the end of each work day. If this condition is not met, provide a nighttime closure.

Delineate excavated areas located within 3 feet of traffic with channelizing devices at 20 feet spacing along the excavated area, and 100 feet before the area, or as shown on the maintaining traffic plans.

Use protective fencing to protect open excavations within the work zone during non-working hours.

- s. Bituminous Paving.**- The Contractor shall perform the work of this Contract while maintaining traffic in accordance with Contract Documents as specified herein. No traffic shall be allowed on newly placed asphalt surfaces until rolling has been satisfactorily completed and the surface has cooled sufficiently to prevent damage from traffic. This is to be accomplished by traffic regulators (flag persons) and by relocating traffic control devices to prevent traffic from entering the work area until such time that traffic can be safely maintained without damaging the new construction. The Contractor shall provide traffic regulators in sufficient number to maintain traffic as described herein, and to keep traffic off sections being surfaced, and provide for safe travel at all times as directed by the Engineer.

Each pressure distributor, paver and roller shall be equipped with at least one approved flasher light which shall be mounted on the equipment so as to give a warning signal ahead and behind.

The paving of the top course shall be conducted under traffic by utilizing traffic regulators (flag persons), lane closures, traffic shifts, channelizing devices and signs in accordance with Part VI of the current edition of the Michigan Manual of Uniform Traffic Control devices (MMUTCD) as amended. The installation and removal of minor traffic control devices needed for the maintenance of traffic during the paving of final wearing course and the furnishing of traffic regulators shall be paid as "Minor Traffic Devices" and "Traffic Regulator Control" as appropriate.

Resurface all HMA milled areas the same day as the HMA cold milling operation. No traffic is allowed on the HMA milled surface, unless directed by the Engineer.

- t. Bridge Work.** - Provide 28 days minimum for curing concrete prior to application of concrete surface coating, concrete healer sealer, or thin epoxy overlays.

The following bridge work items are designated night work. This list does not restrict other work from taking place at night, and additional work items may be required to take place at night per other restrictions and requirements:

1. Bridge deck pour.

- u. **Measurement and Payment.**- The estimated quantities for maintaining traffic is based on the maintenance of traffic plans. Any additional signing, traffic control devices, pavement markings, or the like required to expedite the construction, beyond that which is specified, shall be at the Contractor's sole expense.

The completed work as measured shall be paid at the contract unit price for the following contract pay items:

<u>Contract Pay Item</u>	<u>Pay Unit</u>
Minor Traffic Devices, Max \$50,000	LSUM
Traf Regulator Control	LSUM
Barricade, Type III, High Intensity, Double Sided, Lighted, Furn & Oper	Each
Pedestrian Type II Channelizer, Temporary	Linear Foot
Plastic Drum, Fluorescent, Furn & Oper	Each
Channelizing Device, 42 inch, Fluorescent, Furn & Oper.....	Each
Conc Barrier Ending, Temp, Det 2, Furn & Oper & Adj.....	Each
Conc Barrier, Temp, Furn & Oper & Adj	Linear Foot
Conc Barrier, Temp, Limited Deflection, Det 1, Furn & Oper	Linear Foot
Conc Barrier, Temp, Limited Deflection, Det 2, Furn & Oper & Adj	Linear Foot
Conc Barrier, Temp, Limited Deflection, Det 3A, Furn & Oper.....	Linear Foot
Pavt Mrkg, Longit, 6 inch or Less Width, Rem	Linear Foot
Pavt Mrkg, Longit, Greater than 6 inch Width, Rem	Linear Foot
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, White, Temp	Linear Foot
Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, Yellow, Temp	Linear Foot
Pavt Mrkg, Wet Reflective, Type R, Tape, Lt Turn Arrow	Each
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt Turn Arrow	Each
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru Arrow	Each
Pavt Mrkg, Wet Reflective, Type R, Tape, Only	Each
Pavt Mrkg, Wet Reflective, Type R, Tape, Rt and Lt Turn Arrow Sym	Each
Pavt Mrkg, Wet Reflective, Type R, Tape, Thru and Rt Turn Arrow Sym.....	Each
Pavt Mrkg, Wet Reflective, Type R, Tape, 24 inch, Stop Bar	Linear Foot
Lighted Arrow, Type C, Furn & Oper.....	Each
Sign, Portable, Changeable Message, Furn & Oper	Each
Sign, Type A, Temp, Prismatic, Furn & Oper	Square Foot
Sign, Type B, Temp, Prismatic, Furn & Oper.....	Square Foot
Sign, Type B, Temp, Prismatic, Spec, Furn & Oper	Square Foot

The unit price for this item of work shall include all labor, material, and equipment costs required to perform the work specified herein and includes both furnishing and operating the devices.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
MIXING PORTLAND CEMENT CONCRETE

CFS:JFS

1 of 1

APPR:CPM:TEB:12-17-21
FHWA:APPR:12-20-21

Add the following paragraph to subsection 1001.03.E.1 of the Standard Specifications for Construction:

Weigh and batch each material into its respective weighing device within the tolerance from the individual batch weights or quantities documented in the approved JMF as follows:

- a. Cementitious Materials. Provide cementitious materials within -2.0 percent to +5.0 percent of the required weight.
- b. Aggregates. Provide aggregate within ± 3.0 percent of the required weight.
- c. Water. Provide net water to not exceed the required water quantity and the required maximum water/cementitious ratio (w/cm).
- d. Air Entraining Admixtures. Provide the necessary quantity or dosage rate per 100 pounds of cementitious material to achieve the required air content of fresh concrete.
- e. Other Admixtures. Provide water-reducing and other admixtures within ± 3.0 percent of the required quantity.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**ALKALI SILICA REACTIVITY OF FINE AGGREGATE USED IN PORTLAND
CEMENT CONCRETE**

CFS:CPM

1 of 2

APPR:TES:JFS:05-19-20
FHWA:APPR:05-27-20

a. Description. This special provision sets out the requirements for all fine aggregate used in Portland cement concrete (PCC) mixtures to be tested by an independent testing laboratory and determined to be resistant to the potential for deleterious expansion caused by alkali-silica reactivity (ASR). ASR testing is not required for concrete pavement repairs, temporary concrete pavements, and other items covered by the contract.

Except as explicitly modified by this special provision, all materials, test methods, and PCC mixture requirements of the standard specifications and the contract apply.

b. Definition. ASR is a chemical reaction which occurs over time within concrete between highly alkaline cement paste and reactive forms of silica found in some aggregates. In the presence of moisture, an expansive ASR gel is formed which can exert pressure within the concrete, causing random cracking and premature deterioration of the concrete.

c. Laboratory Requirements. The independent laboratory, including all associated testing equipment and staff performing ASR testing of aggregates, must be proficient in ASR testing in accordance with the applicable test methods and procedures. The laboratory must provide documentation to the Regions that they are qualified and proficient to conduct ASR testing in accordance with the required test procedures.

d. Laboratory Testing Requirements. Perform testing on fine aggregate proposed to be used in any PCC Job Mix Formula (JMF). The Contractor must ensure the testing is conducted in accordance with a designated standard test procedure described herein. Test results must conform to the specified criterion for one of the following standard test methods. The Rounding Method described in *ASTM E29* must be used when reporting expansion test results.

(1) Method 1. *ASTM C1293*. Concrete Prism Test. If the expansion of concrete prisms is not greater than 0.040 percent (rounded to the nearest 0.001 percent) after 1 year, the fine aggregate is considered non-deleterious to ASR and may be used in the JMF.

(2) Method 2. *ASTM C1567*. Mortar Bar Test. If no previous test data are available for the fine aggregate that shows it is resistant to ASR using Method 1, above, replace 25 to 40 percent of the Portland cement in the concrete mixture with a supplementary cementitious material (slag cement or fly ash). A blended cement meeting the requirements of *ASTM C595/C595M* containing the above Portland cement and supplementary cementitious material proportions may also be used.

Demonstrate the ability of the supplementary cementitious material to control the deleterious expansion caused by ASR by molding and testing mortar bars in accordance with the standard

test method described in *ASTM C1567* using the mix proportions and constituent sources for both the aggregates and the cementitious materials that will be used for the project. Make at least three test specimens for each cementitious materials-aggregate combination. If the average of three mortar bars for a given cementitious materials-aggregate combination produces an expansion less than 0.10 percent (rounded to the nearest 0.01 percent) at 14 days of immersion, the JMF associated with that combination will be considered non-deleterious to ASR. If the average expansion is 0.10 percent (rounded to the nearest 0.01 percent) or greater, the JMF associated with that combination will be considered not sufficient to control the deleterious expansion caused by ASR and the JMF will be rejected.

(3) Method 3. *ASTM C1260*. Mortar Bar Test. If the expansion of the mortar bars is less than 0.10 percent (rounded to the nearest 0.01 percent) at 14 days of immersion, the fine aggregate is considered non-deleterious to ASR and may be used in the concrete without the need for ASR mitigation.

The Engineer will not approve the use of the JMF if the expansion exceeds the threshold limits for the respective *ASTM* test method used. The test results and report are valid for 2 years from the completion of testing.

e. Submittals. A current ASR test report for the fine aggregate proposed to be used in the Job Mix Formula (JMF) must accompany each JMF. Ensure the ASR test report is accompanied by a certification stating which test procedure was followed and that all testing was conducted in accordance with the designated standard test procedure.

f. Measurement and Payment. All materials, labor, equipment, and laboratory facilities necessary to complete the work in accordance with this special provision is included in other contract pay items and no additional compensation will be permitted.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**QUALITY INDEX FOR PORTLAND CEMENT CONCRETE (FOR LOCAL AGENCY
PROJECTS ONLY)**

CFS:CPM

1 of 4

APPR:TES:JFS:05-28-20
FHWA:APPR:06-04-20

a. Description. This special provision establishes pay factor and price adjustments for Portland cement concrete (PCC) based on Quality Assurance (QA) testing of 28-day compressive strength and fresh concrete air content of PCC. Perform all work in accordance with the standard specifications and this special provision.

b. Materials. Mixture requirements will be in accordance with section 1004 of the Standard Specifications for Construction, unless otherwise specified in the contract.

c. Sampling. Sampling will be in accordance with subsections 1003.03.H and 1003.03.L of the Standard Specifications for Construction, except as modified herein. A sample is defined as a representative quantity of concrete taken during production which is used to measure the quality characteristics for the concrete. Compressive strength specimens for each sample consist of two cylinders, either 4-inch by 8-inch or 6-inch by 12-inch. A random number will be generated for each respective subplot. The sampling frequency for a production lot is one QA sample per subplot.

See subsection 1003.03.J in the Standard Specifications for Construction for reduced sampling and testing for small incidental quantities.

d. Quality Index Analysis. The Engineer's QA test results will be used to determine the pay factor (PF) and price adjustment (ADJ). The Contractor QC test results will be not used for PF and ADJ analysis. The Engineer will complete PF and ADJ analysis within 7 working days after completion of all 28-day compressive strength testing for the represented production lot or quantity of concrete. All values of PF and OLPF in these formulas are decimal, not percent. All values of PF and OLPF are rounded to two decimal places.

Table 1: Quality Index Parameter Specification Limits

Quality Characteristic	Specification Limits
Air Content of Fresh Concrete (percent)	5.5 – 8.5
Rejection Limit (percent)	<5.0 or >9.0
Conc. Temp. (deg. F)	45 - 90 at time of placement
Slump (max.) (inch)	See footnotes a through l in Table 1004-1 of the Standard Specifications for Construction
28-day Compressive Strength (psi)	For LSL see Table 2
Rejection Limit - 28-day Compressive Strength	See Table 2

Table 2: Quality Index Parameter Specification Limits for 28-Day Compressive Strength

Parameter	Grade of Concrete						
	3000	3500	3500HP	4000	4000HP	4500	4500HP
Lower Specification Limit (psi)	3000	3500	3500	4000	4000	4500	4500
Rejection Limit for an Individual Strength Sample Test Result (psi)	2500	3000	3000	3500	3500	4000	4000

1. Pay Factor for 28-Day Compressive Strength (PF_s). (not to exceed 1.00)

$$PF_s = (\text{QA Test Strength})/\text{LSL}$$

Where:

QA Test Strength = QA 28-day compressive strength sample test result.

LSL = Lower specification limit (see Table 2).

If the tested strength does not meet the rejection limit specified in Table 2, the Engineer will require additional evaluation as described in section e of this special provision.

2. Pay Factor for Air Content of Fresh Concrete (PF_{ac}). The pay factor for air content of fresh concrete (PF_{ac}) will be in accordance with Table 3.

Table 3: Air Content of Fresh Concrete Pay Factor (PF_{ac})

Air Content of Fresh Concrete (percent)	Pay Factor (PF_{ac})
5.5 – 8.5	1.00
5.0 – 5.4	0.50
Below 5.0	Rejection
8.6 – 9.0	0.75
Above 9.0	Rejection

If the air content of fresh concrete is below 5.0 or above 9.0 percent, the Engineer will elect to do one of the following:

A. Require removal and replacement of the entire quantity of concrete represented by the test with new testing conducted on the replacement concrete and repeat the evaluation procedure.

B. Allow submittal of a corrective action plan for the Engineer's approval. If the Engineer does not approve the plan for corrective action, subsection d.2.A. will be applied. All costs associated with plan submittal and corrective action under this subsection will be borne by the Contractor.

3. Overall Lot Pay Factor (OLPF). Use the following formula to determine the OLPF and ADJ. The OLPF will not exceed 1.00:

$$\text{OLPF} = (0.60 \times \text{PF}_s) + (0.40 \times \text{PF}_{ac})$$

Where:

PF_{ac} = Pay factor for Air Content (see Table 3)

4. Price Adjustment (ADJ). Use the following formula to determine the ADJ.

$$\text{ADJ} = (\text{OLPF} - 1)(\text{Price})$$

5. Price Adjustment for Small Incidental Quantities. Price adjustment for 28-day compressive strength deficiencies will be based on test results for the corresponding weekly QA test specimens and the pay factor (PF_s) calculated in accordance with the formula defined in subsection d.1. The price adjustment is calculated by the following equation:

$$(\text{ADJ}) = (\text{PF}_s - 1)(\text{Price})$$

Where:

ADJ = Price adjustment per pay unit to be applied to the quantity represented by the QA test.

PF_s = Pay Factor for 28-day compressive strength (not to exceed 1.00).

Price = Base price when established for the pay item or the Contractors unit price bid when concrete is included in another pay item without a base price.

e. Evaluation of Rejectable Concrete. The Engineer will require additional evaluation to decide what further action may be warranted. Acceptance for air content of fresh concrete will be based on QA test results reported at the time of concrete placement.

If the Engineer determines that non-destructive testing (NDT) is appropriate, this work will be done by the Contractor in the presence of the Engineer within 45 calendar days of concrete placement. All costs associated with this work will be borne by the Contractor. Ensure complete set of non-destructive tests is conducted (in accordance with the respective standard test method) at a minimum three randomly selected locations. If NDT is used to estimate the in-situ strength, a calibrated relationship between the project job mix formula (JMF) under evaluation and the NDT apparatus must have been established prior to NDT testing in accordance with its respective standard test method.

If the 28-day compressive strength QA test results show that the rejection limit (as specified in Table 2) has not been achieved, the quantity of concrete under evaluation will be rejected and the Engineer will require additional evaluation to decide what further action may be warranted.

Propose an evaluation plan and submit it to the Engineer for approval before proceeding. The results from NDT will be used only to decide what further action is required. This determination will be made by the Engineer, as follows:

1. For Non-structural Concrete. If no test result from non-destructive testing falls below the lower specification limit (LSL) 28-day compressive strength, the represented quantity of

concrete under evaluation will remain in place and a pay factor for 28-day compressive strength (PF_s) of 1.00 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations in accordance with section d of this special provision.

2. For Structural Concrete (including overhead sign foundations). If no test result from non-destructive testing falls below the lower specification limit (LSL), the represented quantity of concrete under evaluation will remain in place and a pay factor for 28-day compressive strength (PF_s) of 0.85 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations will be in accordance with section d of this special provision.

3. If one or more of the non-destructive test results fall below the lower specification limit (LSL) 28-day compressive strength, the Engineer may elect to do one of the following:

A. Require removal and replacement of the entire rejected quantity of concrete, including new initial tests for quality index analysis conducted in accordance with section d of this special provision.

B. Allow the Contractor to submit a plan for corrective action, for the Engineer's approval, to address the disposition of the rejected concrete. If the Engineer does not approve the plan for corrective action, subsection e.3.A of this special provision will be applied. All costs associated with plan submittal and corrective action under this subsection will be borne by the Contractor.

C. Allow the in-situ quantity of concrete under evaluation to remain in place and a pay factor (PF_s) of 0.50 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations will be in accordance with section d of this special provision.

f. Measurement and Payment. If a price adjustment is made for reasons included in this special provision, that adjustment will be made using the base price established for the specific item. If a contract unit price requires adjustment for other reasons not described in this special provision, the adjustments will be made using the original unit price and the adjustments will be cumulative.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
RAILROAD INSPECTION AND FLAGGING

DLZ/CLH:COAA/FC

1 of 1

09-06-22

a. Description. This work consists of providing advance notice to the Railroad and the Engineer meeting the railroad notice requirements found in the contract for providing flaggers for work on, above, or below Railroad property.

b. Materials. None specified.

c. Construction. Ensure construction methods are in compliance with the requirements in the contract.

d. Measurement and Payment. The Contractor must pay or pre-pay (if required by the Railroad) to the Railroad the full amount of the Railroad’s invoice for inspection and flagging. Prior to submitting payment requests for reimbursement of flagging costs to the Engineer, review for accuracy the actual flagging costs and days worked against the billed or pre-paid amount. Resolve any inconsistencies with the Railroad prior to submitting to the Engineer. Provide to the Engineer a statement of costs paid for flagging and detailed itemization to support the actual cost paid or pre-paid amount. The Engineer will reimburse the Contractor upon satisfactory review and approval of submitted documentation for inspection and flagging services. This process will continue as long as the need for flagging services exists.

Costs incurred for inspection and flagging due to the failure of the Contractor to properly notify the Railroad in advance of beginning work which may require a flagger as stated in the contract, are the responsibility of the Contractor. Any dates invoiced beyond approved Progress Clause dates or approved extension of time dates without liquidated damages will not be reimbursed unless approved otherwise by the Engineer.

Provide the Railroad a documented notice 5 days in advance when flagging is no longer needed, with a copy to the Engineer and retain a copy of this documented notification. If the notification to the Railroad is not at least 5 days in advance of no longer needing flagging, the Railroad will schedule and the Contractor must pay such flagging services until said cancellation notice is confirmed by the Railroad. Before final payment is made by the Engineer to the Contractor for the project, satisfactory evidence must be submitted indicating all bills for inspection and flagging services furnished by the Railroad have been paid. This pay item covers only inspection, and flagging services provided by the Railroad.

Pay Item	Pay Unit
Railroad Inspection and Flagging	Dollar

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
DISSEMINATION OF PUBLIC RELATIONS INFORMATION

CFS:JJG

1 of 1

APPR:LFS:MRB:04-14-21
FHWA:APPR:04-14-21

a. Description. This special provision establishes the requirements for dissemination of any public relations communications and/or products intended for an external audience pertaining to this contract. Dissemination must not be made without prior written approval from the Department's Office of Communications, and then only in accordance with explicit instructions by the Department. This includes the use of the Michigan Department of Transportation (MDOT) logo.

A violation of this provision may be considered a default of contract and the Department may exercise its rights in accordance with subsection 108.11 of the Standard Specifications for Construction.

b. Public Relations Information. Examples of communications and/or products may include, but are not limited to: brochures, flyers, invitations, programs, postings on social media sites or web sites, new or updated video, digital versatile disk (DVD) productions, or video sharing productions, exhibits, presentations, or any other printed materials intended for an external audience.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
CONSTRUCTION DOCUMENT MANAGEMENT

COS:RJC

1 of 3

APPR:JJG:LFS:03-27-20
FHWA:APPR:03-30-20

a. Description. This work consists of meeting MDOT's construction document management (CDM) system requirements. Submit all project documentation for this contract in electronic format and place it in MDOT's CDM system, unless otherwise noted in this special provision. No paper documents, in printed format (faxes, letters, etc.) are permitted except as allowed by this special provision or specifically approved by the Engineer. The Contractor is responsible for keeping all information in the CDM system up to date throughout the execution of the contract.

b. Digitally Encrypted Electronic Signatures. All documents that require Contractor or subcontractor signatures or signed authorizations by the Contractor or subcontractor must be signed using an MDOT issued digitally encrypted electronic signature. The MDOT approved digital signature tool is the DocuSign Signature Appliance. Digital signatures and software are provided by MDOT at no cost. Instructions on how to acquire and use MDOT's digitally encrypted electronic signature can be obtained at the following website. The website also provides support for users.

www.michigan.gov/MDOT-esign

Scanned signatures, retail point of sale scribble capture, cursive fonts or other non-conforming signatures are not permitted in lieu of digitally encrypted electronic signatures.

All fillable forms must retain the ability to be fillable upon submission to the Engineer. Submitted documents are not to be locked (preventing further changes to the form) when placing a digitally encrypted signature. DocuSign Signature Appliance tracks all changes to a document after placing a digital signature (track changes) and this information is embedded into the document as part of the digital signature signing process. Locked documents do not allow additional processing (information entry) by the Engineer and all locked documents will be returned to the Contractor for resubmission.

Failure to submit documents utilizing the MDOT digitally encrypted electronic signature process (DocuSign Signature Appliance) will result in the documents being rejected by the Engineer and returned to the Contractor. No payment will be made for any affected work items until all required documents are received with validated digitally encrypted signatures.

c. Contractor Access to MDOT's Construction Document Management System (ProjectWise). The Contractor must use MDOT's current CDM system (ProjectWise). ProjectWise access is available at no cost to all contractors, suppliers and other vendors associated with the project. ProjectWise access is granted in two ways, a web based access portal or full version of the software installed on a company's computer. User account setup, installation details, and access to ProjectWise may be requested by sending an e-mail request to:

MDOT-ProjectWiseConst@michigan.gov

d. Contractor Authorized Requestors. Designate two authorized requestors at the preconstruction meeting. The authorized requestors are:

1. The only individuals that can request the Engineer to provide or withdraw ProjectWise access for this contract.
2. Responsible to designate contract roles in ProjectWise (submitter or read only).
3. Responsible for promptly notifying the Engineer of any ProjectWise user access changes for this contract.

e. Training. Additional documentation and training for CDM system processes, details of scheduled classes, and methods for requesting training are available at the following website:

<https://mdotjboss.state.mi.us/SpecProv/projectwisesupport.htm>

f. Technical Issue Resolution. Upon discovery of a ProjectWise access issue immediately notify the Engineer with a copy sent to the following e-mail resource:

MDOT-ProjectWiseConst@michigan.gov.

g. Document Format and Naming Standards. The Engineer may reject documents that are deemed to be unsuitable. This includes documents submitted that are named incorrectly, illegible, unreadable, locked, etc. Re-submit any corrected documents via ProjectWise. Failure to address rejected documents may delay progress payments.

Use the document naming conventions as documented by the Department and maintained on the Department's website:

https://www.michigan.gov/documents/mdot/MDOT_Contractor_Standard_Naming_Conventions_for_Document_Submittals_653665_7.pdf

h. Document Workflows. Electronic review/approval of documents will be accomplished through ProjectWise workflows and e-mail notifications. A workflow is an ordered group of milestones, or states, through which a document passes on its way to completion.

Documents placed in the ProjectWise Contractor In-Box folders will initially have a state of "Pending." Once the Contractor has finalized the document, change the state from "Pending" to "Submitted."

Complete the following actions:

1. Upload all documents into the corresponding Contractor In-Box folder.
 - A. Ensure all documents are named correctly per the document naming conventions.
2. Select the "Change State" option and then select "Next" to submit the document.
3. When the email message appears please send to the Engineer, or their approved

representative, providing notification that there are new documents submitted.

The Engineer will review all documents added to these folders and move them to the appropriate document folder for further review, processing, or records storage.

Furnish paper bills of lading/delivery tickets to the Engineer on the jobsite for any material that is paid based on weight or shipping volume, unless utilizing a Department approved e-ticketing process. Scanning of other manifests, seed tickets, or delivery confirmations will be as directed by the Engineer.

i. File/Document Retention. The electronic files stored in ProjectWise are the official project documentation and will be retained per the Department's document retention schedule.

j. Measurement and Payment. The work included in this special provision will not be paid for separately and is considered to be included in other items of work in the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
SOURCE OF STEEL AND IRON (BUY AMERICA)

CFS:JJG

1 of 3

APPR:MRB:DBP:06-28-21
FHWA:APPR:06-28-21

Delete subsection 105.10, on page 1-60 of the Standard Specifications for Construction, in its entirety and replace with the following:

105.10. Source of Steel and Iron. Provide steel and iron materials and products for permanent incorporation into the work that were produced only in the United States per Title 23 of the CFR Section 635.410, Buy America Requirements.

All steel and iron products and manufacturing processes of the steel and iron material in a product, including but not limited to the following steps; smelting, melting, rolling, extruding, machining, bending, grinding, drilling, welding, galvanizing, and coating, must occur within the United States.

Examples of products that are subject to Buy America coverage include, but are not limited to, the following:

- A. Steel or iron products used in pavements, bridges, tunnels, or other structures, which include, but are not limited to, the following: fabricated structural steel, hot or cold rolled structural steel shapes, reinforcing steel, piling, high strength bolts, anchor bolts, dowel bars, permanently incorporated sheet piling, bridge bearings, cable wire/strand, pre-stressing/post-tensioning wire, motor/machinery brakes and other equipment for moveable structures.
- B. Guardrail, guardrail posts, end sections, terminals, cable guardrail.
- C. Steel fencing material, fence posts.
- D. Steel or iron pipe, conduit, grates, manhole covers, risers.
- E. Mast arms, poles, standards, trusses, supporting structural members for signs, luminaires, or traffic control systems.
- F. Steel or iron components of precast concrete products, such as reinforcing steel, wire mesh and pre-stressing or post-tensioning strands or cables.
- G. Left-in-place structural steel formwork, falsework, and earth retaining system elements.

Manufactured products that are not predominantly (90 percent) steel and/or iron are not subject to Buy America. This may include commercially available off-the-shelf items including, but not limited to, controllers, hand dryers, faucets, hinges, light fixtures, etc.

These items are typically non-structural in nature and do not have an established or specified quality assurance and/or certification process. Provide documented certification that the manufactured product is less than 90 percent steel and/or iron.

Provide step certification for all steel and iron related pay items, materials, products, and components as specified on the Department website. The Department will maintain a list of these pay items, materials, products, and/or components on the following website.

http://www.michigan.gov/mdot/0,1607,7-151-9622_11044_11367---,00.html

Step certification is defined as the certification by the respective manufacturer or fabricator for their specific process (step) that the product, material, or component was fabricated, manufactured, and/or processed in the United States. The step certification documentation for these pre-defined pay items, materials, products, and/or components is to be submitted to the Engineer in a package covering each step prior to delivery or concurrent with material delivery on-site. Approved certification is required prior to incorporation of the materials into the project.

Buy America certification documentation for products and materials designated as fully compliant with the Buy America requirements on the Qualified Products List (QPL), Approved Manufacturers, and Tested Stock Suppliers Lists will be maintained by the MDOT Construction Field Services (CFS) Division. Buy America certification for these fully compliant items does not need to be submitted by the Contractor, but a bill of lading, product label, or shipping record to document that the products are from the respective source is to be provided to the Engineer. Buy America certification documentation for items that are partially compliant will be required to be submitted prior to delivery or concurrent with material delivery and prior to incorporation, noting the value of foreign steel/iron. The use of the Department maintained Buy America lists and notations does not relieve the Contractor from responsibility of ensuring Buy America compliance. The Contractor is ultimately responsible for Buy America compliance.

The Buy America lists maintained by the Department are solely for the benefit of the Department and may not be relied upon by the Contractor. The Contractor is solely responsible for the Buy America requirements for steel and iron as set forth in the CFR.

The above requirements do not preclude a minimal use of foreign steel and iron, provided the total invoice cost of foreign material permanently incorporated into the project does not exceed 0.1 percent of the total contract amount or \$2,500 whichever is greater. The Department defines the total invoice cost as the total value of the foreign steel and iron materials delivered to the project. The Department defines the total contract amount to be the total of the contract unit prices for items of road work and bridge work, any adjustments as provided for in the contract, and any assessment of incentive, disincentive or liquidated damages as provided for in the contract.

MDOT/Consultant fabrication facility inspectors are not responsible for approving the incorporation of foreign steel/iron prior to fabrication. It is the responsibility of the fabricator to notify and coordinate with the Contractor for all potential inclusion of foreign steel/iron in fabricated products.

For each item subject to meeting Buy America requirements, that doesn't fully meet Buy America requirements, the following documentation must be provided by the Contractor

to verify the foreign steel value. This documentation is to be placed in the project files to ensure that the threshold is not exceeded:

- Pay Item,
- Description of associated foreign steel/iron material, product, or component,
- Cost of associated foreign steel/iron material, product or component, and
- Cumulative list of all non-compliant Buy America items with the total dollar amount.

The minimal use of foreign steel/iron under the minimal usage amount will be approved by the Engineer. The use of foreign steel/iron under the minimal usage amount does not need to be approved by the FHWA. This amount is not considered a waiver to the Buy America requirements. The Contractor must ensure that the minimal usage amount is not exceeded.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
E-VERIFY

CSD:LFS

1 of 1

APPR:JJG:RJC:04-10-20
FHWA:APPR:04-13-20

a. Description. E-Verify is an Internet-based system that allows an employer, using information reported on an employee's Form I-9, Employment Eligibility Verification, to determine the eligibility of that employee to work in the United States. There is no charge to employers to use E-Verify. The E-Verify system is operated by the Department of Homeland Security (DHS) in partnership with the Social Security Administration. E-Verify is available in Spanish.

The State of Michigan is requiring all Contractors, and Subcontractors, to verify that new employees are legally present and authorized to work in the United States, using the E-Verify System.

Information on registration for and use of the E-Verify program can be obtained via the Internet at the DHS Web site: <http://www.dhs.gov/E-Verify>.

It is the responsibility of the Contractor to include this specification in all tiers of subcontracts.

Verification of the Contractors' use of E-verify will be a part of the random review of subcontract information performed by the Department.

The required use of the E-Verify system will not be paid for separately as part of the contract but is considered included in the costs for other pay items in the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
LABOR COMPLIANCE

COS:AS

1 of 3

APPR:JG:RJC:03-24-20
FHWA:APPR:03-30-20

a. Description. Ensure all levels of contracting (prime, sub, sub-sub, etc.) comply with all labor compliance requirements in this contract. The Contractor is responsible for subcontractors and lower tier subcontractor labor compliance. Job site poster requirements apply to state and federally funded projects. All Contractors must insert this special provision in each subcontract and further require its inclusion in lower tier subcontracts for federal prevailing wage projects.

b. Requirements.

1. Jobsite Posters. All jobsite posters and employment notices required by State and Federal regulations and the contract are to be posted on the jobsite in a conspicuous area prior to the commencement of work. Ensure jobsite postings are accessible at all times.

2. Federal Prevailing Wage Projects. The Davis-Bacon Related Acts apply to all Contractors, and subcontractors (all tiers) performing work on federally funded or assisted construction contracts where the total construction contract price is in excess of \$2,000. Contractors and subcontractors are required to comply with *29 Code of Federal Regulations Parts 1, 3, and 5*.

The Contractor must advise subcontractors of the requirement to pay the prevailing wage rates prior to commencement of work and that all employees must cooperate during wage rate interviews.

A. Certified Payroll Submittal Requirements. Contractors (all tiers) must submit their certified payrolls to the prime Contractor. The submitted payrolls must accurately and completely include all information required on MDOT Form CP-347, Certified Payroll. The required weekly payroll information may be submitted on a contractor generated form but must contain all information required on Form CP-347. The first certified payroll is to be received by the Engineer within 3 weeks from the week ending in which work is performed. The 3 week period is to allow for the processing and review of the certified payrolls by the prime Contractor. The review must ensure the certified payroll is complete and contains all information required on Form CP-347. Form CP-347 is available on the MDOT forms webpage. Certified payroll information must meet the requirements of this special provision unless the contract requires payroll to be submitted through the prevailing wage and labor compliance (PWLC) system. Payroll submitted via the PWLC system must be entered into the system, certified, and approved by the prime Contractor to be considered received by the Department.

Labor compliance issues must be resolved within 60 calendar days of receiving the Departments first documented notice. The 60-day requirement may be extended based on documented mutual agreement between the Department and the Contractor.

(1) Fringe Benefit Statements. Contractors making payments or incurring cost to provide bona fide benefits must submit an hourly breakdown of fringe benefits paid each worker, or work classification where applicable, that must accompany the first certified payroll where fringe benefits are credited towards the prevailing wage. The Contractor must update these documents as necessary to ensure they are current throughout the working life of the contract. Failure to submit or maintain the required fringe benefit statement will constitute a payroll deficiency.

(2) Delinquent Payroll. Certified payrolls not submitted per subsection b.2.A of this special provision will be considered delinquent.

(3) Deficient Payroll. Certified payrolls that are found to be incomplete, inaccurate, or inconsistent with other project records are considered deficient.

(4) Non-compliance Damages. A Contractor found to be in non-compliance with the requirements of this special provision will be assessed non-compliance damages listed in Table 1, proportional to the value of their work on the contract (including subcontract, purchase order (P.O.) or invoice amount).

Table 1: Schedule of Non-Compliance Damages

Contract/Subcontract/P.O./Invoice Amount (a)	Non-compliance damages per calendar day
\$0 to 49,999	\$200
50,000 to 99,999	400
100,000 to 499,999	600
500,000 to 999,999	900
1,000,000 to 1,999,999	1,300
2,000,000 to 4,999,999	1,550
5,000,000 to 9,999,999	2,650
10,000,000 and above	3,000
Trucker	\$200
a. "Contract" amount if offending contractor is the prime contractor. "Subcontract/P.O./Invoice" amount if offending contractor is a subcontractor/vendor.	

B. Record Keeping. Maintain payrolls and basic records relating thereto (i.e. employee names, occupation, hours worked, W2, canceled checks, bank statements, etc.) by all levels of contractors during the course of work and retain for a 3-year period from the date of final estimate for all employees working on the site of work. Make these records available for inspection, copying, or transcription by the Department or its representative.

C. Short Duration Projects. The following modifications apply if the project is less than 75 calendar days in duration.

(1) Submittal Requirements. On short duration projects the first certified payroll is to be received by the Engineer within 2 weeks from the week ending in which work is

performed. The 2-week period is to allow for the processing and review of the certified payrolls by the Contractor. The 2-week period allows the first estimate to be paid assuming the Contractor will submit certified payrolls in a timely manner. Ensure subsequent certified payroll submissions are made weekly. Payroll submissions failing to meet the above requirements will be considered delinquent.

Labor compliance issues are to be resolved within 30 days after receiving the Department's first documented notice. The 30-day requirement may be extended based on documented mutual agreement between the Department and the Contractor.

- c. Materials.** None specified.
- d. Construction.** None specified.
- e. Measurement and Payment.** Payment for compliance with this special provision will not be made separately. Payment will be considered as part of all other pay items in the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
FEDERAL AVIATION ADMINISTRATION NOTIFICATION FOR STRUCTURE WORK

BRG:BMW

1 of 1

APPR:JAB:JD:04-02-20
FHWA:APPR:04-03-20

a. Description. This work consists of obtaining any necessary permits and notifying the Federal Aviation Administration (FAA) and/or local airport zoning authority if any permanent structures or temporary structures (temporary scaffolding, forms, poles, crane booms, etc.) exceed the requirements listed in this special provision, no matter the duration.

A copy of any permits (FAA, Michigan Tall Structure and local or municipal airport zoning) obtained by the Department are included in the contract.

b. Materials. None specified.

c. Construction. The Contractor is required to provide notice to the FAA, and acquire any necessary permits, if the proposed construction or alteration of permanent or temporary structures meets any of the following criteria:

1. Anything over 200 feet above ground level (AGL) at the project site, including temporary construction and/or equipment.
2. Any changes or variations that exceed the heights or locations set forth in the permits, if permits are included in the contract.
3. Any changes or variations that exceed the height set forth on the contract plans, if permits are not included in the contract.

Schedule operations to allow for the maximum 45 day FAA review period. Extensions of time will not be granted for failure to submit the FAA notifications 45 days prior to commencement of construction activities subject to notification requirements.

d. Measurement and Payment. This work will not be paid for separately, but will be included in costs for other pay items in the contract. Payment for any/all FAA required safety equipment, obstruction lighting, flags, nighttime crane procedures, etc. will also be considered to be included in the costs for other pay items in the contract.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
RELOCATION AND SITE CLEANUP

DLZ/CLH:COAA/FC

1 of 2

03-04-22

a. Description. This work consists of relocation of unauthorized occupants and site cleanup. Complete this work as specified herein and as directed by the Engineer.

Take the following steps to ensure the orderly and safe relocation of unauthorized occupants on the site and to provide safe working conditions prior to the start of work:

1. Determine the number of unauthorized occupants and dwellings within the project limits.
2. Contact the Michigan Department of Health and Human Services at (517) 373-3500, at least 48 hours before commencing any removal of unauthorized occupants.
3. Notify the unauthorized occupants, verbally and in writing, at least 72 hours in advance to clear their belongings and vacate the site.
4. Contact the local police authority, if necessary, at least 48 hours in advance.
 - A. City of Ann Arbor Police Department (Non-Emergency). (734) 794-6920.
 - B. Washtenaw County Sheriff's Department (Non-Emergency). (734) 971-8400.
5. Provide an experienced specialty subcontractor qualified to clean up and dispose of regulated biohazardous and medical waste in a safe and appropriate manner meeting all applicable federal, state and MIOSHA requirements, and as approved by the Engineer. The minimum qualifications include MIOSHA blood borne pathogen training relative to worker safety and protection when handling, packaging, and disposing of biohazardous waste. A list of companies available to clean up and dispose of this type of waste is included herein.
6. Dispose of any regulated medical waste in accordance with all applicable federal, state, and local regulations. Upon proper disposal, the specialty subcontractor must provide to the Engineer a "Proof of Destruction" certification from the disposal facility.

b. Materials. None specified.

c. Construction. None specified.

d. Measurement and Payment. The completed work, as described, will be paid for based on original invoices from the disposal facility submitted to the Engineer using the following pay item:

Pay Item	Pay Unit
Relocation and Site Cleanup	Dollar

Relocation and Site Cleanup includes all labor, equipment, and materials necessary to complete the work as described. The cost for shoulder or lane closures, if necessary, are included in the payment for this item of work.

Elite Trauma Clean-Up, Inc.
43686 N. Gratiot Avenue
Clinton Township, MI 48036
Phone: (586) 954-4881

Stericycle
1315 W. Hill Road
Flint, MI 48507
Phone: (866) 783-6188

Bio Clean Services
P.O. Box 7191
Canton, OH 44705
Phone: (800) 901-2988

Steri-Clean
10171 Bergin Road
Howell, MI 48843
Phone: (734) 799-8030

Other local facilities that may offer assistance:

Shelter Association of Washtenaw County
312 W Huron St
Ann Arbor, MI 48103
Phone: (734) 662-2829 ext. 254

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
PROMPT PAYMENT

CFS:JGG

1 of 4

APPR:LFS:DBP:03-27-20
FHWA:APPR:03-30-20

Add the following subsection to section 109, of the Standard Specifications for Construction:

109.08 Prompt Payment.

A. Definitions.

Lower-tier subcontract. An agreement between a subcontractor of any tier and any individual or legal entity to perform a part of the subcontract work.

Lower-tier subcontractor. The individual or legal entity that performs part of the subcontract work through a lower-tier subcontract with a subcontractor.

Supplier. The individual or legal entity that agrees to provide materials or services to the prime Contractor, a subcontractor, or a lower-tier subcontractor for the performance of their contract work.

Sworn Statement. A written verification under oath reflecting all persons or entities, which have furnished labor, equipment, services or materials to a subcontractor or lower-tier subcontractor for performance of work on the project. The written verification includes union fringe benefit funds, original contract amount, current amount due, amounts paid to date and balance to finish the work for each person or entity.

Waiver of Lien. A written release and waiver of any claim or right to payment for payments actually received for labor, equipment, services or materials furnished for performance of work on the project.

The sworn statement and waiver of lien documents are used by the prime Contractor and its subcontractors for verifying payments made to lower-tier subcontractors/suppliers and are not to be submitted to the Engineer unless requested as an aid in determining an alleged prompt payment violation. These documents can be found at the following website under the Construction Field Services - Forms heading:

http://www.michigan.gov/mdot/0,1607,7-151-9622_11044_11367---,00.html

B. Progress Payments. For the first payment, or for a one time payment, the prime Contractor agrees to pay each subcontractor for the work associated with their subcontract no later than 10 calendar days from the date the prime Contractor receives payment from the Department.

For the second and subsequent payments, the prime Contractor agrees to pay each subcontractor for the work associated with their subcontract no later than 10 calendar days from the date the prime Contractor receives payment from the Department.

The Contractor is required to provide payment information for previous payments made to all first tier subcontractors and all DBE companies (sub-subcontractors, suppliers, truckers, etc.) at any tier before the Engineer will release the third and subsequent estimates. For all subsequent progress pay estimates if 1) the Engineer payment does not include any first tier subcontractors or any DBE company payments at any tier, and 2) the previously submitted payment reporting information remains unchanged, then payment reporting in the system is not required. Reporting is required when the prime Contractor makes payments to any first tier subcontractors and any DBE companies at any tier. The payment information is provided through submittal of the information via the 2124A reporting system (MERS). System information can be found at the following web link.

<https://milogin.michigan.gov/eai/login/authenticate?URL=/>

The prime Contractor must bring any concerns about the satisfactory completion of subcontractor or lower-tier subcontractor work items, to the Engineer's attention as soon as the concern is discovered. If the work meets the requirements of satisfactory completion and the prime Contractor has been paid for that work, the Engineer must determine whether:

1. The prime Contractor has demonstrated a valid reason for withholding payment from the subcontractor or supplier, or
2. The subcontractor has demonstrated a valid reason for withholding payment from the lower-tier subcontractor or supplier.

If the Engineer determines the reason for withholding payment is valid, the Engineer will process a negative estimate to withdraw the amount involved in the complaint. If payment has not been made for the work related to the complaint, the Engineer will not include those items of work on an estimate until the issue has been resolved.

The prime Contractor remains responsible to make prompt payments on this project to their subcontractors and suppliers except as noted in subsection 109.08.D of this special provision, even if the prime Contractor is in violation of other contractual obligations and the Department is withholding payment from the prime Contractor for those violations.

The prime Contractor must include language in all subcontracts that the Department prohibits prime Contractors from holding retainage from subcontractors. All provisions of this prompt payment subsection apply to all subcontracts, lower-tier subcontracts, and supplier agreements and must be included in each subcontract for the contract, including all lower-tier subcontracts and agreements.

This prompt payment provision is a requirement of 49 CFR 26.29 and does not confer third-party beneficiary rights or other direct rights to a subcontractor against the Department. This provision applies to both DBE and non-DBE subcontractors/suppliers at all tiers.

C. Satisfactory Completion. Progress and partial payments for contract work are issued based on the satisfactory completion of work. Satisfactory completion, for purposes of this prompt payment provision, is defined as:

1. Upon preliminary review, the Engineer finds the work completed in accordance with the contract, plans, and specifications; and,
2. Required documentation, including material certifications, payrolls, submission of 2124A, etc., has been received and reviewed and found to be acceptable by the Engineer; and,
3. Required subcontractor sworn statements and waivers of lien have been provided to the prime Contractor. The prime Contractor must provide notice to the Engineer if sworn statements and waivers of lien have not been received for completed work.

The Engineer will determine if the work meets the standards of satisfactory completion.

D. Less than full payment release. The Engineer may give written approval to:

1. Delay or postpone payment from the time frames specified herein,
2. Process partial payment from the prime Contractor to a subcontractor or supplier,
3. Process partial payment from a subcontractor to a lower-tier subcontractor or supplier.

The unpaid portion will be held by the Department.

The parties may initiate whatever dispute resolution procedure is specified in their agreement or is available under Michigan law. If dispute resolution or litigation is selected, the actions by both parties must proceed in a timely manner. The result of the dispute resolution proceeding or litigation must be provided to the Engineer promptly upon the conclusion of the proceeding. The Engineer will release the disputed payment being held by the Department in accordance with the outcome of the proceedings.

E. Non-Payment Claims. The prime Contractor, subcontractor, lower-tier subcontractor or supplier must notify the alleged offending party in writing of any prompt payment violations within 30 calendar days of the date the payment was to be received. Copies of the notifications must be provided to the Engineer and the prime Contractor (only if the prime Contractor is not the offending party).

The alleged offending party must respond in writing to the claimant within 10 calendar days of receipt of the notification of failure to meet prompt payment provisions. Provide copies of the response to the Engineer, the prime Contractor (only if the prime Contractor is not the offending party), and the Engineer of Construction Field Services. The prime Contractor, subcontractor, or supplier must also provide the required sworn statements and waivers of lien from the affected subcontractor or supplier to the Engineer within 10 days of receipt of the notification. The Department will consider the failure of the alleged offending party to respond to the notification from the claimant as an admission of the prompt pay violation which may result in sanctions.

The Engineer will review the written notice and response and will verify in writing if there is a valid prompt pay violation.

Independent of all procedures and requirements in this special provision the non-payment claimant has the additional option of submitting a lien claim to the MDOT Contract Services

Division. MDOT will notify the project surety of the non-payment issue. It is the responsibility of the surety to ensure that all legitimately due payments are made. The submission of a lien claim will not nullify or affect any other requirements, obligations or procedures in this special provision.

F. **Remedies.** When the Engineer verifies a prompt payment violation, the prime Contractor within 5 days must propose one or a combination of any of the following actions items for review and approval by the Engineer:

1. Issue payment to the subcontractor.
2. Issue payments to a subcontractor in the form of joint checks to the subcontractor and the subcontractor's lower-tier subcontractors and/or suppliers.
3. Issue payment directly to the subcontractor's lower-tier subcontractors or suppliers.
4. Request a negative estimate to withdraw the amount confirmed in the prompt payment violation.

If the prime Contractor fails to submit a timely remedy request or obtain an approved course of action within the 5 day time period, the Engineer will direct a course of action or issue a negative estimate to withdraw the amount confirmed in the prompt payment violation.

If the prime Contractor fails to fulfill the approved or directed course of action the Engineer will impose sanctions until such time as the approved or directed course of action is completed.

Any payments to a subcontractor's lower-tier subcontractor or supplier will be issued in the amounts reflected upon the subcontractor's sworn statements or in amounts independently verified by the Engineer as being due the subcontractor's lower-tier subcontractors and suppliers for work completed. Payments to a lower-tier subcontractor or supplier will be considered payment to the subcontractor directly so that payment for the same work cannot be claimed.

Any other use of joint checks must follow current Department procedures.

G. **Sanctions.** Failure to comply with any of the prompt payment requirements by the prime Contractor, subcontractor, lower-tier subcontractor, or supplier may result in sanctions against the offending party. These sanctions may include, but are not limited to: withholding of estimates on projects where prompt payment violations are confirmed; reduction or removal of prequalification; and/or suspension of bidding privileges.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
VERTICAL EXPLORATORY INVESTIGATION FOR RELOCATION

COS:MRB

1 of 2

APPR:DMG:NAL:04-30-20
FHWA:APPR:05-06-20

a. Description. When proposed work must be relocated as directed by the Engineer, this special provision is used to compensate the Contractor to locate and expose underground infrastructure and obstructions, such as culverts, sewers and utilities. Perform this work only when conflicts are found in the planned work location. This special provision is not to compensate for the Contractor’s responsibilities in subsection 107.12 of the Standard Specifications for Construction.

b. Materials. Use Granular Material Class III in accordance with section 902 of the Standard Specifications for Construction for backfill. Use material removed during exploratory investigation for backfill only if approved by the Engineer.

c. Construction. The owner of any sewer or utility to be exposed will not take the facilities out of service during the exploratory investigation. Contact utility owners in accordance with subsection 107.12 of the Standard Specifications for Construction.

Advance the exploratory excavation using vacuum excavation, hand digging, conventional machine excavation, or a combination thereof subject to approval of the Engineer. Allow the Engineer access to document the necessary information. If the technique used to advance the excavation causes any damage to the existing facilities, immediately contact the utility owner and cease all work until an alternate method is approved by the Engineer.

Take care to protect the exposed culvert, sewer or utility from damage during construction. The Contractor is responsible for all costs associated with the repair work and out of service time of all broken or damaged existing culverts, sewers or utilities as a result of any action by the Contractor. If the exploratory investigation results in damage to utilities, contact the owner of such utility to coordinate the repair. Repair or replace culvert, sewer or utility, damaged during exploratory excavation, in accordance with the standard specifications and as approved by the Engineer.

Obtain the Engineer's approval before backfilling the excavation. Complete backfilling no later than 24 hours after approval has been given. Backfill in accordance with subsection 204.03.C of the Standard Specifications for Construction. Dispose of excess material in accordance with the standard specifications.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Exploratory Investigation, Vertical.....	Foot

Exploratory Investigation, Vertical will be measured by the foot from top of existing grade vertically to the bottom of the excavation for up to a 4-foot maximum diameter hole, or as approved by the Engineer. The excavated depth of each 4-foot maximum diameter hole will be measured separately for payment.

Exploratory Investigation, Vertical includes all costs associated with repair or replacement resulting from the Contractor's activities. Providing necessary lane, shoulder and/or sidewalk closures required to perform work will be paid for by other associated items in the contract. Restoration work will be paid for by other associated items.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
NON-HAZARDOUS CONTAMINATED MATERIAL HANDLING AND DISPOSAL

ENV:JCW

1 of 2

APPR:DMG:DBP:02-26-20
FHWA:APPR:03-02-20

a. Description. This work consists of handling, transporting, disposing of non-hazardous contaminated material, including all laboratory testing required for the proper disposal of the material and site restoration of temporary storage locations. Ensure this special provision is not employed without authorization by the Engineer. The laboratory testing will be used to solicit landfill approval and is not intended to determine whether or not the material is contaminated. Soil delineated on the plans and classified as non-hazardous contaminated cannot be used elsewhere on the project regardless of the laboratory test results unless otherwise directed by the Engineer.

b. Materials. None specified.

c. Construction. Complete this work in accordance with sections 204 and 205 of the Standard Specifications for Construction, except as modified herein or as directed by the Engineer.

1. Excavation of Non-hazardous Contaminated Material. Excavate non-hazardous contaminated material as shown on the plans or as directed by the Engineer.

2. Temporary Storage of Non-hazardous Contaminated Material. Place excavated non-hazardous contaminated material which is to be temporarily stockpiled on plastic sheeting or tarps having a minimum thickness of 6 mils or in trucks, roll off boxes, or other containers, such that no liquid may escape from the containment. Cover the non-hazardous contaminated material securely with plastic sheeting of 6 mils thickness or greater at the end of each work day.

Dispose of excavated non-hazardous contaminated material as soon as approval is received from the disposal site. This material cannot be stockpiled for longer than 30 days prior to disposal.

Restore temporary storage locations to the condition prior to conducting the work.

3. Sampling and Analysis of Non-hazardous Contaminated Material. Sample and analyze non-hazardous contaminated material prior to disposal. The analysis required is dictated by the Type II disposal facility to be utilized for disposal. Should the results of the analysis show the material to be hazardous waste, as defined by the 1994 PA 451, Part 111, of the Natural Resources and Environmental Protection Act, notify the Engineer immediately. The material must then be disposed of as directed by the Engineer.

4. Disposal of Non-hazardous Contaminated Material. Dispose of non-hazardous contaminated material at a licensed Type II sanitary landfill. Submit at the preconstruction

meeting the name of the Type II landfill to be used for disposal, the sampling and analysis requirements of that landfill, and verification that use of the proposed landfill will meet the requirements of the county solid waste plan.

Ensure the proposed landfill is acceptable to the Department and approval is obtained from the Engineer prior to commencing disposal operations. Provide a copy of the laboratory analysis to the Engineer as a requirement of approval for disposal. Following disposal and prior to approval for payment provide to the Engineer landfill receipts for all non-hazardous contaminated material disposed of.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Non Haz Contaminated Material Handling and Disposal, LM.....	Cubic Yard

Non Haz Contaminated Material Handling and Disposal, LM will be measured by volume in cubic yards, LM. Provide to the Engineer receipts from the disposal facility for the number of cubic yards disposed of at that facility prior to payment. Payment will include all costs for materials, labor and equipment needed for storage, loading, transportation, testing, restoration of temporary storage locations and disposal of the non-hazardous contaminated material. Disposal costs will include all documentation required by the landfill.

Payment for excavation of non-hazardous contaminated material will be included with the related items of work.

Delays in testing and disposal of non-hazardous contaminated material that are not the fault of the Contractor may be considered valid reasons for extension of time. However, these delays and the resultant extensions of time will not be considered valid reasons for additional payment.

Should the analysis of the material document that it is hazardous waste, then payment for disposal of hazardous waste will be measured and paid for as extra work. Disposal includes hauling by a licensed hazardous waste hauler and disposal at an appropriate licensed disposal facility. Prequalification is waived.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
DEWATERING SYSTEM, EXCAVATION

DLZ/CLH:COAA/FC

1 of 2

09-07-22

a. Description. This work consists of lowering the groundwater table to facilitate the excavation. This work will require the use of pumps or well points, deep wells, or other measures that are utilized to control and manage groundwater.

b. Well Points and Deep Wells. Ensure groundwater control performed by deep well and/or well point pumping systems is done without damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic or the work of other contractors. Any pumping methods used for dewatering and control of groundwater and seepage must have properly designed filters to ensure that adjacent soil will not be pumped with the water, thus creating voids underground and around the face of the excavation or under existing structures. Ensure the loss of fines is limited to no more than 5 parts per million by volume in the extracted water. Ensure the filter design is reviewed and approved by the Engineer before placement.

Perform the dewatering operations in a proper and predetermined sequence with the excavation operation such that the perimeter, bottom and face of the excavation are stable. Dewatering well diameter, pumping rate and well spacing must provide adequate drawdown of the water level. Properly locate wells to intercept groundwater that otherwise would enter the excavation and interfere with the work. Install observation wells at key locations for observation of groundwater levels during the excavation. Submit a plan for locations and monitoring frequency of the observation wells to the Engineer a minimum of 7 calendar days in advance of placement of the dewatering system. Add additional wells as needed to dewater to the groundwater to the elevation shown on the plans.

Filters or settling devices may be required before discharge to ensure that storm sewers, sanitary sewer systems or surface waters are not adversely affected by construction debris or increased sediment load.

c. Storm Sewer, Sanitary Sewer or Surface Water Discharge. Monitor the volume of water discharged to the storm sewer system, sanitary sewer system or as surface water discharge by using a totalizing turbine type flow meter. Place the flow meter in-line on the dewatering system effluent line, ensure it is designed for high flow applications and has a flow totalizing register that is adequately sealed to eliminate fogging and condensation. Install the type of meter used in accordance with the manufacturer's instructions and be approved by the Engineer before placement.

Written permission from the wastewater treatment plant authority is required prior to discharge to the sanitary sewer system. Provide a copy of the written authorization to the Engineer prior to discharging any water to the system.

Secure a NPDES permit from the EGLE prior to any discharge to a storm sewer or directly to a surface water body.

Monitor and document the volume of flow being discharged to the storm sewer, sanitary sewer or the surface water daily by reading the register on the flow meter. Provide this information to the Engineer daily or as otherwise approved.

d. Construction. Lower the groundwater to a depth of at least 3 feet below the bottom of any excavation. Determine the methods and materials required to accomplish this work, subject to approval by the Engineer before initiation or installation of the dewatering system.

The Engineer may order corrective actions to the dewatering system at any time due to deficiencies in the system at no additional cost to the contract.

Remove dewatering system and all associated appurtenances when no longer needed and restore the area as directed by the Engineer.

Abandon deep wells and observation wells in accordance with current EGLE requirements when no longer needed.

e. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Dewatering System, Excavation	Each

Dewatering System, Excavation will be measured for each excavation area. The unit price includes all labor, equipment, materials, wells, piping, supplies, power, and fuel necessary for the installation, operation, maintenance, removal and the disposal of all surplus materials as described herein. This pay item includes the cost of disposal of all water pumped from below ground to facilitate underground construction.

All costs associated with obtaining an NPDES permit and any locally required permits are included in this pay item.

The installation, maintenance and removal of deep wells and observation wells are included in this pay item.

The cost for treatment of the water at the wastewater treatment plant is included with this pay item. There will be no compensation for idled personnel or equipment due to any system corrections ordered by the Engineer to remedy any deficiencies.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
SAMPLING ASPHALT BINDER ON LOCAL AGENCY PROJECTS

CFS:TRC

1 of 1

APPR:JWB:KPK:02-19-20
FHWA:APPR:02-19-20

a. Description. This work consists of the Contractor taking samples of the asphalt binder and delivering the samples to the Engineer prior to incorporation into the hot mix asphalt mixture.

b. Materials. For informational purposes, original samples of asphalt binder will be taken by the Contractor and delivered to the Engineer prior to incorporation into the mixture. The frequency of sampling will be determined by the Engineer.

The Contractor must certify in writing that the materials used in the HMA mixture are from the same source as the materials used in developing the HMA mixture design and the bond coat is from an approved supplier as stated in the *Material Quality Assurance Procedures Manual*.

c. Construction. None specified.

d. Measurement and Payment. The cost of obtaining and delivering the samples to the Engineer will be included in the hot mix asphalt (HMA) pay items in the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
RECYCLED HOT MIX ASPHALT MIXTURE ON LOCAL AGENCY PROJECTS

CFS:KPK

1 of 2

APPR:JWB:CJB:02-26-20
FHWA:APPR:03-02-20

Add the following subsection to subsection 501.02.A.2 of the Standard Specifications for Construction.

- c. **Reclaimed Asphalt Pavement (RAP) and Binder Grade Selection.** The method for determining the binder grade in HMA mixtures incorporating RAP is divided into three categories designated Tier 1, Tier 2 and Tier 3. Each tier has a range of percentages that represent the contribution of the RAP binder toward the total binder, by weight. The tiers identified below apply to HMA mixtures with the following exception: Superpave mixture types EML, EML High Stress, EMH, EMH High Stress, and EH, EH High Stress used as leveling or top course must be limited to a maximum of 27 percent RAP binder by weight of the total binder in the mixture.

Recycled materials may be used as a substitute for a portion of the new materials required to produce HMA mixtures in accordance with contract.

- **Tier 1 (0% to 17% RAP binder by weight of the total binder in the mixture).** No binder grade adjustment is made to compensate for the stiffness of the asphalt binder in RAP.
- **Tier 2 (18% to 27% RAP binder by weight of the total binder in the mixture).** For all mixtures no binder grade change will occur in Tier 2 for all shoulder and temporary road mixtures.

Ensure the required asphalt binder grade is at least one grade lower for the low temperature than the design binder grade required for the specified project mixture type. Lowering the high temperature of the binder one grade is optional. For example, if the design binder grade for the mixture type is PG 58-22, the required grade for the binder in the HMA mixture containing RAP would be a PG 52-28 or a PG 58-28.

For Marshall Mixes, no binder grade change will be required when Average Daily Traffic (ADT) is above 7000 or Commercial Average Daily Traffic (CADT) is above 700. No binder grade change will occur for EL mixtures used as leveling or top course.

The asphalt binder grade can also be selected using a blending chart for high and low temperatures. Supply the blending chart and the RAP test data used in determining the binder selection according to *AASHTO M323*.

- **Tier 3 ($\geq 28\%$ RAP binder by weight of the total binder in the mixture).** The binder grade for the asphalt binder is selected using a blending chart for high and low temperatures per *AASHTO M323*. Supply the blending chart and the RAP test data

used in determining the binder selection.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
TYPE B MICROPILE CONSTRUCTION - LRFD

DLZ/CLH:COAA/FC

1 of 13

04/29/2022

a. Description. This work consists of furnishing, installing, and testing Type B micropiles of the resistance, and to the dimensions, shown on the plans. Designing the grout mix. Designing, furnishing, installing, and removing load testing apparatuses. Complete this work in accordance with the standard specifications, except as modified herein.

Examine the plans and visit the site prior to bidding the work to assess the site geometry, equipment access conditions, subsurface conditions, location of existing structure(s), overhead restrictions, and any other factors which may influence the bid.

1. Contractor Qualifications. Below is the list of prequalified Micropile Contractors:

Hardman Construction, Inc. 242 South Brye Road Ludington, MI 49431 Contact: Martin E. Gamble Phone: 231-845-1236 Fax: 231-845-0422	Keller North America, Inc. 7550 Teague Road, Suite 300 Hanover, MD 21076 Contact: Phone: 410-551-8200 Fax: 410-799-8926
Malcolm Drilling Company, Inc. 102 Hill Court Mukwonago, WI 53149 Contact: Brady Frederick Phone: 415-901-4400 Fax: 415-901-4421	Nicholson Construction Company 4124 Douglas Avenue Kalamazoo, MI 49004 Contact: Dan Thome Phone: 412-221-4500 Fax: 412-221-7826
Spartan Specialties LTD 6250 Sims Drive Sterling Heights, MI 48313 Contact: Steve Maranowski Phone: 586-826-8811 Fax: 586-826-8699	

Other micropile Contractors will be considered but will need to submit their qualifications to the Engineer for review at the preconstruction meeting. Submit qualifications satisfying the requirements below. No micropile construction can begin until the Engineer has approved the Contractor’s qualifications.

A. Documented experience with at least 5 projects performed within the last 5 years involving at least 100 micropiles of capacity similar to those shown on the plans.

B. Documented experience in micropile drilling and grouting in subsurface conditions similar to the project site.

C. Documented experience of the Contractor’s supervisor, on-site foreman, and drill rig operators, who are employed by the Contractor or specialty subcontractor and who

have experience with at least three projects within the last 5 years that had subsurface conditions similar to the project site.

2. Definitions. The following definitions apply to this work:

Alignment Load (AL). A small load applied to a micropile during testing to keep the testing equipment correctly positioned.

Apparent Free Micropile Length. The length of the pile that is not bonded to the surrounding ground, as calculated from the elastic load extension data during testing.

Bond Breaker. A sleeve or coating placed over the bar reinforcement to prevent load transfer.

Bond Length. The length of the pile that is bonded to the surrounding ground and which is used to transfer the applied axial loads to the surrounding ground.

Casing. The steel pipe introduced during the drilling process to temporarily stabilize the drill hole. Depending on the details shown on the plans, the casing may be fully extracted during or after grouting; or may remain partially or completely in place permanently as part of the pile.

Centralizer. A device used to centrally locate the bar reinforcement within the drill hole.

Core Steel. Reinforcement bars used to strengthen or stiffen the pile, excluding any casing left in place.

Corrosion Inhibiting Compound. Material used to protect against corrosion and/or lubricate the reinforcement inside a bond breaker.

Coupler. The means by which the load can be transmitted from one partial length reinforcement to another.

Creep Movement. The movement that occurs during a creep test of a micropile under a constant load.

Duplex Drilling. A drilling system involving the simultaneous advancement of inner drill rod and outer drill casing. Flush from the inner drill rod is permitted to exit the drill hole via the annulus area between the drill rod and casing.

Elastic Movement. The recoverable movement measured during a micropile test.

Encapsulation. A corrugated tube protecting the reinforcement against corrosion.

Free (Unbonded) Length. The designed length of the micropile that is not bonded to the surrounding ground or grout during testing.

Micropile. A small diameter, bored, cast-in-place pile, in which most of the applied load is resisted by the reinforcement.

Nominal Resistance (R_n). The theoretical ultimate resistance of the micropile. The nominal resistance is shown on the plans. The nominal resistance is the resistance on which the load tests are based.

Overburden. Non-lithified material, natural or placed, which normally requires cased drilling methods to provide an open borehole to underlying strata.

Plunge Length. Transition zone between the upper cased section and the uncased portion of bond length.

Preloading. The principle whereby load is applied to the micropile, prior to the micropile's connection to the structure, to minimize any structural movement in service.

Primary Grout. Portland cement based grout that is injected into the micropile hole prior to or after the installation of the reinforcement to provide the load transfer to the surrounding ground along the micropile and affords a degree of corrosion protection in compression.

Production Pile. A micropile constructed for use in the final structure.

Proof Load Test. Incremental loading of a production pile, recording the total movement at each increment.

Reinforcement. The steel component of the micropile which accepts and/or resists applied loadings.

Residual Movement. The non-elastic (non-recoverable) movement of a micropile measurement during load testing.

Single Tube Drilling. The advancement of a steel casing through overburden usually aided by water flushing through the casing; also known as "external flush." The fluid may or may not return to the surface around the casing, depending largely on the permeability of the overburden.

Spacer. A device to separate elements of multiple element reinforcement.

Tremie Grouting. The placing of grout in a borehole via a grout pipe introduced to the bottom of the hole. During grouting, the exit of the pipe is kept at least 10 feet below the level of the grout in the hole.

Type B Micropile. A micropile constructed by injecting a neat cement grout under pressure (typically 40 to 150 psi) into the drilled hole while the drill casing is withdrawn.

Verification Load Test. A micropile load test performed to verify the micropile nominal resistance based on the construction methods proposed. Verification load tests are performed on non-production piles, prior to installation of production piles.

b. Materials.

1. Water. Use water in accordance with section 911 of the Standard Specifications for Construction.
2. Admixtures. Use admixtures in accordance with ASTM C 494.
3. Cement. Use Type I, Type II, Type III or Type V Portland cement in accordance with AASHTO M 85 from one manufacturer.
4. Fine Aggregate. Use sand in accordance with AASHTO M 45.
5. Reinforcement. Bend tests for the epoxy coating are not required. Use solid epoxy-coated deformed steel reinforcing bars conforming to AASHTO M 31 for Grade 60 and Grade 75 or AASHTO M 275 for Grade 150, as shown on the plans. When a bearing plate and nut are required to be threaded onto the top end of reinforcing bars for the pile top to footing anchorage, the threading may be continuous spiral deformed ribbing provided by the bar deformations (e.g. Dywidag or Williams continuous threadbars or approved equal) or may be cut into a reinforcing bar. If threads are cut into a reinforcing bar, the next larger bar number designation from that shown on the plans must be provided, at no additional cost. Bar tendon couplers, if required, must develop the ultimate tensile strength of the bars without any evidence of failure.
6. Permanent Casing. Use steel pipe in accordance with ASTM A 252, Grade 3 with a yield strength not less than 80 ksi and a minimum elongation of 15 percent. Threaded casing joints must develop at least the required nominal resistance used in the design of the micropile.
7. Structural Steel. Use structural steel in accordance with section 906 of the Standard Specifications for Construction.
8. Centralizers. Use schedule 40 PVC pipe or tube, or epoxy-coated steel in accordance with subsection 905.03.C of the Standard Specifications for Construction, or other materials that are not detrimental to the steel reinforcement and permanent casing. Do not use wood. Centralizers and spacers must be securely attached to the reinforcement; sized to position the reinforcement within 1/2 inch of plan location from center of pile and sized to allow grout to freely flow up the drillhole and casing and between the spacers and reinforcing bar.
9. Couplers. Use steel reinforcement couplers, meeting the approval of the Engineer, which can develop the ultimate tensile strength of the steel reinforcement without evidence of failure.
10. Grout Protection. Provide a minimum of 1 inch grout cover over bare or epoxy-coated bar and minimum of 1/4 inch grout cover over bar couplers.

c. Construction.

1. Equipment. Use duplex equipment and methods to provide a fully cased drill hole over the entire specified minimum length of micropile without advancing the inner drill beyond the temporary casing and without using air as a flushing medium. Use pressure grouting equipment capable of grouting the bonded zone at grouting pressures not less than

50 psi. Use equipment suitable for drilling through the conditions encountered without causing damage to any overlying or adjacent structures, utilities, services, or ground.

Use equipment capable of producing grout that is free of lumps and undispersed cement. Equip the grout pump with a pressure gauge to monitor grout pressures. Use a second pressure gauge at the point of injection at the top of the micropile. Pressure gauges must be capable of measuring pressures not less than 150 psi or twice the actual grout pressures, whichever is greater. Size grouting equipment to enable micropiles to be grouted in one continuous operation.

2. Submittals. Submit 5 copies of items A through C below to the Engineer not less than 21 calendar days prior to micropile construction. Submit 5 copies of items D through H below to the Engineer not less than 21 calendar days prior to load testing or incorporation of the respective materials into the work. The Department requires 14 calendar days to review a submittal after it has been received. Additional review time necessary due to incomplete or unacceptable submittals is not cause for a claim for additional time or compensation. All costs and delays associated with incomplete or unacceptable submittals will be borne by the Contractor.

A. Installation plan that includes a step-by-step description of the proposed micropile construction procedure, including drilling equipment, drilling methods, casings, flushing medium, grouting methods, personnel, testing, and testing equipment to ensure quality control. Include the step-by-step procedure on the working drawings in sufficient detail to allow the Engineer to monitor and validate the construction and quality of the micropiles.

B. Proposed start date and micropile installation schedule.

C. Information on headroom and space requirements for installation equipment to verify that the proposed equipment can perform at the site. If the micropiles will be installed to support an existing structure or installed adjacent to an existing structure, inspect the condition and site of the existing structure(s) in the presence of the Engineer. Provide a copy of photographic documentation of the pre-construction conditions to the Engineer.

D. Detailed description of proposed management procedures for the control and disposal of excess surface water, drill flush, grout, and any resultant product of the micropile installation. Do not excavate flush pits at or below the floodplain elevation in accordance with subsection 205.03.P of the Standard Specifications for Construction.

E. Certified mill test reports for bar reinforcement and permanent casing, or coupon test results for permanent casing without mill certification. Include ultimate strength, yield strength, elongation, and material properties composition with the reports.

F. Grouting Plan. Provide complete descriptions, details and supporting calculations for:

(1) Grout mix design and type of materials to be used, including certified test data and trial batch reports.

(2) Specific gravity of the grout mix.

(3) Methods and equipment for accurately monitoring and recording the grout depth, grout volume, and grout pressure as the grout is being placed.

(4) Grouting rate calculations, if requested by the Engineer. Base the calculations on the initial pump pressures or static head on the grout and losses throughout the placing system, including anticipated head of drilling fluid (if applicable) to be displaced.

(5) Estimated curing time for grout to achieve the required strength. Submit previous test results for the proposed grout mix. The test results must have been completed within 1 year of the start of grouting for initial verification load test. Test grout during production as specified herein.

(6) Procedure and equipment proposed for monitoring grout quality and consistency.

G. Detailed working drawings for the proposed micropile load testing. Include all drawings and details necessary to clearly describe the proposed test methods, reaction frame, reaction piles, system test load capacity, equipment setup, types and accuracy of apparatus to be used for applying and measuring the test loads, and pile top movements according to the load test requirements specified herein. Submit structural design calculations for all structural components of the test apparatus.

H. Calibration reports and data prepared by an independent testing laboratory within 90 calendar days of the date submitted for each test jack, pressure gauge, master pressure gauge, and electronic load cell to be used. Do not perform load testing until the Engineer has reviewed and accepted the calibration reports and data.

3. Fabrication.

A. Structural Steel. Fabricate footing connections meeting the details shown on the plans and in accordance with subsection 707.03 of the Standard Specifications for Construction.

B. Permanent Casing. Use casing with an outside diameter and wall thickness meeting the dimensions shown on the plans. Threaded casing joints must develop the nominal resistance of the pile cross-section strength. Threaded casing joints must be rigid enough to provide proper alignment so that no eccentricities or angles occur along the axis of the micropile. If welding of the casing is necessary, perform welding according to subsection 707.03 of the Standard Specifications for Construction.

C. Bar Reinforcement. When a bearing plate and nut (pile cap anchorage) are required to be threaded onto the top end of the reinforcement for the pile-to-footing connection, the threading may be continuous spiral bar deformations or may be cut into the reinforcement. If threads are cut into the reinforcement, use a reinforcing bar, meeting the approval of the Engineer, with a diameter larger than what is shown on the plans at no additional cost to the Department.

4. Installation.

A. Utilities. Field-verify the location of all utilities shown on the plans. Notify the Engineer of any utility locations different than what is shown on the plans that may require micropile relocations or structure design modifications. Additional costs due to micropile relocation and/or structure design modifications resulting from utility locations different than what is shown on the plans will be paid for extra work.

B. Excavation. Coordinate the work and excavations so the micropiles are safely constructed. Do not excavate slopes steeper than those shown on the plans. Do not perform excavations above or below the micropiles without approval from the Engineer.

C. Site Drainage Control. Control and properly dispose of drill flush, excess grout, and any other construction-related waste according to the *1994 PA 451, Part 115 - Solid Waste Management and Part 31 - Water Resources Protection* and all other applicable regulations. Repair damage caused by construction activity and waste at no additional cost to the Department. Immediately notify the Engineer if unanticipated existing subsurface drainage structures are discovered during excavation or drilling. Suspend work in these areas until remedial measures, meeting the approval of the Engineer, are implemented. The remedial measures or repair work resulting from encountering unanticipated subsurface drainage structures will be paid for as extra work.

D. Tolerances. Install micropiles with a variation of not more than 2 percent of total length from the vertical or batter line shown on the plans. After installation, the position of each micropile must be within 3 inches of the position shown on the plans. However, the distance between the edge of all micropiles and the outline of the superimposed concrete must not be less than 9 inches.

Cut off the micropiles normal to the longitudinal axis of the pile and within 1 inch of the elevation specified on the plans. Install core steel within 0.5 inches of the location shown on the plans.

E. Drilling. Select a duplex drilling method that does not cause distress to existing structures. The selected method must not compromise in situ ground conditions, the grouting procedure, and the grouting pressure used. Estimate the grout take. No additional compensation will be given for grout overruns. Do not use drilling fluid containing bentonite.

The drill hole must be open along its full length to at least the minimum hole diameter shown on the plans prior to placing grout and reinforcement. Use casing to support the pile drill hole from caving. Prevent detrimental ground movements. Detrimental ground movement is defined as ground movement which requires remedial repair measures at any time. Costs for remedial measures due to encountering unanticipated naturally occurring subsurface obstructions, such as cobbles and boulders, will be borne by the Contractor. Notify the Engineer if subsurface conditions vary from those shown on the plans at the bottom of the micropile.

F. Ground Heave or Subsidence. Monitor the conditions in the vicinity of micropile construction for signs of ground heave or subsidence. Notify the Engineer if signs of movements are observed and suspend construction if directed by the Engineer. If the

Engineer determines that the movements require corrective action, perform the necessary repairs to the site and damages to adjacent structure(s). Bear the cost of the corrective actions and repairs unless damages are a result of differing site conditions, as determined by the Engineer. Submit a description of modified construction methods to the Engineer for review, to avoid further heave, subsidence, and damage to adjacent structures(s).

G. Placing and Splicing Bar Reinforcement. Place reinforcement prior to grouting or insert reinforcement into grout. Ensure reinforcement is free from dirt and free from excessive rust, loose mill scale, or other foreign material when placed. When multiple reinforcing bars are used, ensure they will not be damaged or disturbed during installation and grouting. If necessary, use larger diameter reinforcing bars than what is shown on the plans at no additional cost to the Department. Place centralizers and spacers at a spacing not exceeding 10 feet. Space the uppermost and lowermost centralizer not more than 5 feet from the top and bottom of the micropile. Centralizers and spacers must permit the free flow of grout without misalignment of the reinforcing bar(s) and permanent casing. Do not drive or force partially inserted reinforcement into the drill hole. Re-drill and reinsert reinforcement, at no additional cost to the Department, when necessary to facilitate reinforcement placement. Secure splices in proper alignment and in a manner to avoid eccentricities or angle between the axis of the two lengths to be spliced. When multiple reinforcing bars are used in a group, stagger the splices not less than 12 inches apart. Reinforcing bar splices must not be less than two casing diameters from a permanent casing splice.

H. Grouting. Place the grout the same day the bonded length is drilled. Use a stable neat cement grout or sand cement grout with a 28-day compressive strength not less than 5000 psi. If used, proportion admixtures according to the manufacturer's recommendations. Continuously agitate grout prior to placement. Place grout within 30 minutes of initial mixing. Inject grout from the lowest point of the drill hole and continue until uncontaminated grout flows from the top of the pile.

Inject grout under pressure as the temporary casing is withdrawn. Extract temporary casing in stages ensuring that after each length of casing is removed, the grout level is brought back up to the ground level before the next length is removed. The tremie pipe or casing must always extend below the level of the existing grout in the drill hole. Control grout pressures and grout takes to prevent excessive heave or fracturing of surrounding ground. The grout tube may remain in the hole upon completion of grouting if the grout tube is filled with grout.

I. Pile Cutoff. Do not use a torch to cut the casing to the cutoff elevation shown on the plans after grouting. Use a method of cutting that does not damage the grout inside the casing.

J. Installation Records. Submit full length/depth installation records for each micropile installed to the Engineer. Submit the records within 24 hours after each micropile installation is complete. Record data on a micropile installation log as shown on page 8-14 of Report Number FHWA-NHI-05-039 Micropile Design and Construction Reference Manual. Use a separate installation log for each micropile.

5. Testing.

A. Grout Testing. Do not perform verification or proof load tests until the grout in the micropile has been in place for 3 days and has attained a compressive strength not less than 3000 psi.

During installation of production piles, make three 2-inch grout cubes from each plant each day of operation or per every 10 piles, whichever occurs more frequently. Test the grout cubes according to AASHTO T 106. The compressive strength will be determined from the average of the compressive strengths of the three grout cubes.

Immediately prior to pile grouting, measure grout density according to AASHTO T 133 or API RP-13B-1. Conduct at least one grout density test per pile.

Submit compressive strength and density test results to the Engineer within 24 hours of testing. If requested by the Engineer, make and test additional cubes to verify the 3-day compressive strength test, at no additional cost to the Department.

B. Micropile Testing. Perform verification and proof testing of micropiles according to ASTM D 1143, except as modified herein. Perform the testing under the direction of a Professional Engineer licensed in the State of Michigan. Summarize the test data in a report to be sealed by the Professional Engineer. Submit the report to the Engineer within 24 hours of each load test. Notify the Engineer in writing 3 working days prior to any load test. Do not perform load tests without a representative from the Department's Geotechnical Services Section being on site to witness the load test.

Do not exceed 80 percent of the following micropile structural elements during load testing: steel yield in tension, steel yield in compression, steel buckling in compression, and grout compressive strength. Costs associated with increasing the strength of the verification test pile structural elements above the strength required for production piles will be borne by the Contractor.

(1) Testing Equipment and Data Recording. Testing equipment includes, but is not limited to dial gauges, dial gauge supports, jack and pressure gauges, electronic load cell, reaction piles, and a reaction frame. The load cell is required only for the creep test portion of the verification test and proof test. Submit a written description of the load test setup and jack, pressure gauge and load cell calibration reports according to subsection c.2 herein. Design the testing reaction frame to be sufficiently rigid and of adequate dimensions to prevent excessive deformation of the testing equipment. Align the jack, bearing plates stressing anchorage such that unloading and repositioning of the equipment will not be required during the test. Apply the test load with a hydraulic jack and measure the load with a pressure gauge graduated in 50 psi increments or less. Use a jack and gauge with a pressure range not more than twice the anticipated maximum test pressure. Select a jack with ram travel sufficient to allow the test to be performed without repositioning during the test. Monitor the creep test load hold during verification tests and proof tests with both the pressure gauge and the electronic load cell. Use the load cell to accurately maintain a constant load hold during the creep test load hold increment of the verification test. Measure the pile top movement with a dial gauge capable of measuring to 0.001 inch and a travel sufficient to allow the test to be performed without having to reset the gauge. Align the gauge to be parallel to the axis of the micropile. Support the gauge

independent from the jack, pile or reaction frame. Use a minimum of four dial gauges evenly distributed around the test pile. Record the load test data.

(2) Verification Load Testing. Perform a pre-production verification load test to verify the design of the micropile and the construction methods used to install the micropile meet specifications. Do not use production piles as reaction piles during load tests. Unless otherwise specified on the plans, install one sacrificial verification test pile per structure. Install verification test piles at locations approved by the Engineer. The verification micropile must be identical to those used in production and installed using the same methods to be used for installing production piles.

Do not locate reaction piles closer than 5 feet to the verification pile. Reaction piles must meet the approval of the Engineer. Perform verification load tests by incrementally loading the micropile in compression according to Table 1. Depending on performance, the Engineer will determine whether a 10 minute or a 60-minute creep load hold is appropriate. If the pile top movement measured between 1 and 10 minutes exceeds 0.04 inches, maintain an additional 50 minutes of load hold during the creep test. Record pile top movements during each hold period at time intervals of 1, 2, 3, 4, 5, 6, 10, 20, 30, 50, and 60 minutes. Reset dial gauges to zero after the initial alignment load (AL) is applied. The acceptance criteria for micropile verification load tests are:

(a) Failure of the test pile does not occur before the maximum test load is applied. Failure is defined as the lesser of:

(i) The slope of the load versus deflection curve (at the end of the load increment) exceeds 0.025 inch/kip, or

(ii) Where attempts to further increase the test load simply results in continued pile movement.

(b) Test pile supports the nominal resistance (R_n) with not more than 1.00 inch of total vertical movement at the top of the pile from its position prior to testing.

(c) At the end of the creep test load period, a creep rate not greater than 0.04 inch/log cycle time (1 to 10 minutes) and not greater than 0.08 inch/log cycle time (6 to 60 minutes or the last log cycle if held longer) and linear or decreasing creep rate.

The Engineer will provide written approval or rejection of the micropile design and construction techniques within 7 working days of the completion of the verification load test.

Verification piles constructed using methods different from the methods submitted for production piles will be rejected and additional verification test pile(s) will be required at no additional cost to the Department. If the verification pile fails to meet the acceptance criteria, the Engineer may modify the design of the production piles or require the Contractor to make modifications to the construction methods, or both. Modifications may include, but not be limited to, modifying the installation methods,

increasing the bond length, or changing the micropile type. Any modification to the construction procedure that necessitates changes to the structure requires the Engineer's review and approval.

Do not install production piles until the verification load test results have been reviewed and accepted by the Engineer. At the completion of verification testing, remove testing equipment and remove test piles and reaction piles to an elevation directed by the Engineer.

Table 1: Verification Load Test Schedule

Step	Load (a)(b)	Hold Time, minutes	Step	Load (a)(b)	Hold Time, minutes
1	AL	-	19	AL	1
2	0.10 R _n	3	20	0.10 R _n	1
3	0.20 R _n	3	21	0.20 R _n	1
4	0.30 R _n	3	22	0.30 R _n	1
5	AL	1	23	0.40 R _n	1
6	0.10 R _n	1	24	0.50 R _n	1
7	0.20 R _n	1	25	0.60 R _n	1
8	0.30 R _n	1	26	0.70 R _n	1
9	0.40 R _n	3	27	0.80 R _n	3
10	0.50 R _n	3	28	0.90 R _n	3
11	AL	1	29	1.00 R _n	10
12	0.10 R _n	1	30	0.75 R _n	5
13	0.20 R _n	1	31	0.50 R _n	5
14	0.30 R _n	1	32	0.25 R _n	5
15	0.40 R _n	1	33	AL	5
16	0.50 R _n	1			
17	0.60 R _n	3			
18	0.70 R _n	10 or 60 (creep test)			
a. R _n denote nominal resistance. b. AL denotes alignment load. AL is equal to 0.025 R _n .					

(3) Proof Load Testing of Production Micropiles. Unless otherwise specified on the plans, perform proof load tests on one production pile per substructure unit or five percent of the production piles, whichever is greater. Do not install other production piles, except those designated for proof load testing, until the proof load test results have been reviewed and accepted by the Engineer. Repair damage to production proof load tested piles at no additional cost to the Department.

Perform proof load tests by incrementally loading the micropile in compression according to Table 2. Depending on performance, the Engineer will determine whether a 10 minute or a 60-minute creep load hold is appropriate. If the pile top movement measured between 1 and 10 minutes exceeds 0.04 inches, maintain an additional 50 minutes of load hold during the creep test. Record pile top movements during each hold period at time intervals of 1, 2, 3, 4, 5, 6, 10, 20, 30, 50, and 60 minutes. Reset dial gauges to zero after the initial alignment load (AL) is applied. The acceptance criteria for micropile verification load tests are:

(a) Failure of the test pile does not occur before the maximum test load is applied. Failure is defined as the lesser of:

(i) The slope of the load versus deflection curve (at the end of the load increment) exceeds 0.025 inch/kip, or

(ii) Where attempts to further increase the test load simply results in continued pile movement.

(b) Test pile supports the maximum test load with not more than 0.75 inches of total vertical movement at the top of the pile from its position prior to testing.

(c) At the end of the creep test load period, a creep rate not greater than 0.04 inch/log cycle time (1 to 10 minutes) and not greater than 0.08 inch/log cycle time (6 to 60 minutes or the last log cycle if held longer) and linear or decreasing creep rate.

If proof-tested micropile fails to meet the acceptance criteria, proof test another micropile within the same substructure unit as designated by the Engineer. For the failed piles and the construction of the remaining production piles, modify the construction methods. Modifications may include, but not be limited to, installing replacement piles; incorporating piles at not more than 50 percent of the maximum test load attained, post grouting; modifying installation methods; increasing the bond length; or changing micropile type. Any modification that necessitates changes to the structure design requires the approval of the Engineer. The cost of modifying construction methods, additional test piles, performing additional proof tests, and replacing production piles will be borne by the Contractor.

Table 2: Proof Load Test Schedule

Step	Load (a)(b)	Hold Time, minutes
1	AL	-
2	0.10R _n	3
3	0.20R _n	3
4	0.30R _n	3
5	0.40R _n	3
6	0.50R _n	3
7	0.60R _n	3
8	0.70R _n (Max. Test Load)	10 or 60 (Creep Test Load Hold)
9	0.55R _n	5
10	0.40R _n	5
11	0.25R _n	5
12	0.10R _n	5
13	AL	5

a. R_n denotes nominal resistance.
b. AL denotes alignment load. AL is equal to 0.025R_n

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

Pay Item

Pay Unit

Micropile Mobilization, LRFD (Structure No.).....	Lump Sum
Micropile, Type B, Furn and Install, LRFD	Each
Micropile, Load Test, Proof, LRFD.....	Each
Micropile, Load Test, Verification, LRFD.....	Each

1. **Micropile Mobilization, LRFD (Structure No.)** will be measured as a unit for each structure. **Micropile Mobilization, LRFD (Structure No.)** includes furnishing and removing equipment for installing micropiles, making submittals, obtaining approval or acceptance from the Engineer for submittals, and maintaining installation records.

2. **Micropile, Type B, Furn and Install, LRFD** will be measured per each micropile installed and accepted by the Engineer. **Micropile, Type B, Furn and Install, LRFD** includes furnishing micropile materials, installing micropiles, and disposing of excess materials and spoils. Furnishing, fabricating, and installing connections to the structure will not be paid for separately but included in the payment for **Micropile, Type B, Furn and Install, LRFD**. No additional compensation will be given for drilling through obstructions or for grout overruns.

3. **Micropile, Load Test, Proof, LRFD** will be measured per each micropile tested and accepted. **Micropile, Load Test, Proof, LRFD** includes the testing apparatus, data collection and reports, sacrificial micropiles serving as reaction piles that are not production piles, repairing damage to production piles, and obtaining acceptance from the Engineer.

4. **Micropile, Load Test, Verification, LRFD** will be measured per each micropile tested and accepted. **Micropile, Load Test, Verification, LRFD** includes the testing apparatus, data collection and reports, the sacrificial micropiles serving as reaction piles that are not production piles, the sacrificial micropile on which the verification load test is being performed, and obtaining acceptance from the Engineer.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
POLYURETHANE JOINT SEALANT FOR STRUCTURES

STM:JD

1 of 2

APPR:JAB:ARB:04-21-20
FHWA:APPR:04-23-20

a. Description. This work consists of sealing construction joints on structures with polyurethane or polyurethane hybrid sealants at the locations shown on the plans, or as directed by the Engineer. Perform all work in accordance with the standard specifications and standard plans, except as modified in this special provision.

b. Materials. Provide a solid, round, closed-cell, polyethylene foam backer rod meeting the requirements of *ASTM D5249, for Type 1*. Select a polyurethane or polyurethane hybrid sealant based on the performance requirements in Table 1 or as approved by the Engineer.

Table 1: Polyurethane or Polyurethane Hybrid Sealant Requirements

Property	Test Method	Minimum Result
Movement capability, %	<i>ASTM C719</i>	+35/-35
Tensile strength, psi	<i>ASTM D412</i>	175
Tear strength, pli	<i>ASTM D624</i>	35
Ultimate elongation at break, %	<i>ASTM D412</i>	400
Hardness, Shore A	<i>ASTM C661</i>	25
Tack-free time, hrs	<i>ASTM C679</i>	6
Adhesion in peel, pli	<i>ASTM C794</i>	20

Ensure non-sag polyurethane and polyurethane hybrids meet *ASTM C920, Type S, Grade NS, Class 35, Use NT, M, A, O*.

Ensure self-leveling polyurethane and polyurethane hybrids meet *ASTM C920, Type S, Grade P, Class 35, Use T₁, M, A, I*.

Provide general certification per the MDOT's *Materials Quality Assurance Procedures Manual* to the Engineer that the materials meet the requirements specified herein.

c. Construction.

1. Joint Preparation. Immediately prior to application of the polyurethane or polyurethane hybrid sealant, clean joint faces by abrasive blasting to remove all materials that may interfere with the bonding or curing of the sealant. Ensure the prepared joint faces meet the *International Concrete Repair Institute 310.2R, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays and Concrete Repair*, concrete surface profile (CSP) 3. Use a vacuum or oil-free moisture-free air blast to remove all dust and other

loose material. Remove any oil or other contamination after initial cleaning. Ensure there is no visible moisture present on the surface of the concrete at the time of application. Ensure that the fiber joint filler is secure and installed at the proper elevation relative to the joint reservoir. Place backer rod to a depth in accordance with the sealant manufacturer's recommendations.

2. Joint Sealing. Provide Engineer with manufacturer's recommended application procedures. Do not install sealant on concrete surfaces that are less than the age, specified by the manufacturer's recommendations. Horizontal applications with a cross slope less than or equal to 6 percent may use a self-leveling or non-sag sealant. Horizontal applications with a cross slope greater than 6 percent and vertical applications must use a non-sag sealant. Do not place sealant if weather or surface conditions are such that the material cannot be properly handled, placed, and cured within the manufacturer's requirements and specified requirements of traffic control.

d. Measurement and Payment. Payment for sealing construction joints with polyurethane or polyurethane hybrid sealants in accordance with this special provision is considered included in other items of work in the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
FINISHING AND CURING OF NIGHT CAST STRUCTURAL CONCRETE

BRG:JAB

1 of 1

APPR:NAP:BMW:08-06-20
FHWA:APPR:08-06-20

a. Description. This work consists of finishing and curing superstructure concrete paid for as night casting. Perform all work in accordance with the standard specifications and this special provision.

b. Materials. None specified.

c. Construction. Construct all work in accordance with the standard specifications and this special provision.

Ensure all superstructure concrete paid for as Superstructure Conc, Night Casting or Superstructure Conc, Night Casting, High Performance is finished with equipment meeting the requirements of subsection 706.03.A.2 of the Standard Specifications for Construction.

Ensure all superstructure concrete paid for as Superstructure Conc, Night Casting or Superstructure Conc, Night Casting, High Performance is cured in accordance with subsection 706.03.N.1.b of the Standard Specifications for Construction.

d. Measurement and Payment. All costs associated with this work is considered included in the associated form, finish, and cure pay items. No additional payment will be permitted.

CITY OF ANN ARBOR
DETAILED SPECIFICATION
FOR
EXPANSION JOINT COVER PLATE, MODIFIED

DLZ/CLH:COAA/FC

1 of 2

09/06/22

a. Description. This work shall include applying slip-resistant coating as described herein, and placing the cover plates after the slip-resistant coating has been applied.

b. Materials. Provide one of the following slip resistant coating systems:

1. Algrip
Ross Technology Corp.
104 N Maple Ave.
Leola, PA 17540
2. Mebac # 3
IKG
1514 South Sheldon Road
Houston, TX, 77015
3. Slipnot Grade 2, Steel
W.S. Molnar Company
2445 Beaufait St.
Detroit, MI, 48207

Provide new hardware that meets the requirements of Section 908 of the 2020 Standard Specifications for Construction.

c. Construction.

The approved slip-resistant surface shall be applied in the manufacturer's shop. Apply the slip-resistant surface to steel substrate using an all metal plasma stream deposition process to bond the surface to the substrate, resulting in the primarily Martensitic steel surface having a random hatch matrix.

After the slip-resistant surface has been applied to the substrate, hot-dip galvanize the entire piece in accordance with ASTM A123.

Use the following limits during hot-dip galvanizing: when pickled in heated sulfuric acid solution, do not exceed 3 minutes immersion. When pickled in hydrochloric acid solution at ambient temperature, do not exceed 10 minutes immersion.

Do not apply slip-resistant surfacing to countersunk surfaces for countersunk bolts or other areas shown on the plans. Do not bend plates, bars, or shapes after the slip-resistant surface has been applied.

Replace defective or damaged slip-resistant surfaces as directed by the Engineer.

After the slip resistant coating has been applied, install the expansion joint cover plates.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the Contract Unit Price using the following Contract (Pay) Item:

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Expansion Joint Cover Plate, Modified	Foot

Expansion Joint Cover Plate, Modified will be measured to the limits shown in the plans. Payment shall include all labor, shipping, material, and equipment required to apply the approved slip-resistant coating, galvanize, and install the cover plates.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
STRUCTURAL STEEL AND ALUMINUM CONSTRUCTION

STR:MJF

1 of 7

APPR:JSW:POJ:04-10-20
FHWA:APPR:04-13-20

a. Description. This special provision specifies the AWS Code year and associated revisions to the Code to be used for the project.

b. AASHTO/AWS D1.5M/D1.5:2015, Bridge Welding Code (hereafter called *AWS D1.5*). Ensure fabrication of structural steel bridge members is performed in accordance with *AWS D1.5* as modified herein:

2.8.8: Add the following sentence to the end of the existing paragraph:

An exception to this is for the case of a sole plate welded to the bottom flange of a beam or girder. In this case the welds must be continuous as shown on the contract drawings with corners ground to eliminate notches greater than 0.01 inch. Provide a smooth transition from the weld metal and base metal after grinding.

2.17.5.1: Change "...subject to tensile stress shall have a smooth transition..." to read "...subject to tensile and compressive stress must have a smooth transition..."

3.1.3: Change "...when the ambient temperature is lower than -20°C [0°F]..." to read "...when the ambient temperature is lower than 5 degrees C [40 degrees F]..."

3.2.1: Delete the existing paragraph in its entirety and replace with the following paragraph:

Surfaces and edges to be welded must be smooth, uniform, and free from fins, tears, cracks, all mill scale, and other discontinuities which would adversely affect the quality or strength of the weld. Surfaces to be welded and surfaces adjacent to a weld must also be free from loose or thick scale, slag, rust, moisture, grease, and other foreign material that would prevent proper welding or produce objectionable fumes.

All edges whether welded or not must be conditioned by very shallow grinding to remove the hardened layer left by resolidification.

3.13.3: Delete the existing paragraph in its entirety and replace with the following sentence:

Steel backing on welds must be removed and the joint must be ground smooth, unless otherwise directed by the Engineer.

3.13.6: Delete the word "copper" from the first sentence in the first paragraph and delete the second paragraph in its entirety.

4.1.4.1: Add the following sentence to the existing paragraph:

A filler metal log sheet must be available at all times for the Engineer to review.

4.2: Add the following sentence as a new paragraph:

Cooling welds using compressed air or water is not permitted.

4.2.5: Delete the word “-20°C [0°F]” in this subclause and replace with 5 degrees C [40 degrees F].

4.2.2: Add the following sentence:

For AASHTO M270 Grade 36, 50, 50W, and HPS 50W, the maximum preheat and interpass temperature must be 345 degrees C [650 degrees F].

4.6.8: The progression for all passes in the vertical position must be upward (including repairs).

4.13.1.7: The progression for all passes in the vertical position must be upward (including repairs).

Table 5.9: In the table under "1. Test on Plate" in the “Type of Weld” column, delete the “Fillet Option No. 2” and accompanying referenced Figure 5.22.

5.13: Delete the subclause in its entirety.

5.14: Delete the subclause in its entirety.

5.23.1.5: Delete the existing paragraph in its entirety and replace with the following paragraph:

Plug Weld Qualification Tests for Plug Welds Only. The joint must consist of a hole diameter the same size as that used in production in a plate the same thickness as that being welded. Backing must be of the same thickness and material as that to be used in production. In addition, Ultrasonic Testing (UT) inspection is required for plug weld qualification and must meet the requirements shown in Table 6.3. Conduct macroetch test according to subclause 5.27.6.2.

5.23.2.4(2)(b): Delete this subclause and accompanying referenced Figure 5.27.

5.27.1: In this subclause add the following requirements for visual inspection to the existing paragraph:

Discontinuities must not exceed 1/8 inch measured in any direction on the surface. Summation of all discontinuities exceeding 1/32 inch must not exceed 3/8 inch.

5.27.6.1: In this subclause add the following requirements to the existing requirements:

(7) Discontinuities must not exceed 1/8 inch measured in any direction on the surface.

(8) Summation of all discontinuities exceeding 1/32 inch must not exceed 3/8 inch.

5.27.6.2(3): Change "...in excess of 1/4 in [6 mm] total..." to read "... in excess of 1/8 inch [3 mm] total...".

6.3.1: Add the following sentence to the existing paragraph:

All WPSs are required to be approved by the Engineer prior to welding.

6.5.8: Add the following at the end of the existing paragraph:

Inspection and NDT records must contain at least the content and information shown in the sample forms of Annex O.

6.6.5: Add the following at the end of the existing paragraph:

Similarly, if such testing should disclose any deficiencies which require repair work, all costs associated with the original NDT and in addition to subsequent NDT for the repairs must be paid for by the Contractor.

6.7.7: Add the following at the end of the existing paragraph:

PT inspection must be performed at the ends of all CJP (butt, corner, and T) weld terminations for primary members.

6.7.8: Delete the existing paragraph in its entirety and replace with the following sentence:

Phased-array UT (PAUT) in accordance with the current MDOT PAUT Program document may be substituted for RT of complete joint penetration groove welds in butt joints.

6.19.8: Remove reference to Table 6.4.

6.20.1: Add the following at the end of the existing paragraph:

All discontinuities found by UT must be recorded on the NDT report.

6.26.2.1: In the first sentence, change "For welds subject to tensile stress under any condition of loading..." to read "For all welds under any condition of loading...".

6.26.2.2: Delete the subclause in its entirety.

6.26.3.1(1): Change "Welds subject to tensile stress under any condition of loading..." to read "Welds under any condition of loading...".

6.26.3.1(2): Delete this subclause in its entirety.

6.26.3.3: Change "Table 6.4" to "Table 6.3".

6.26.3.3(2): Delete this subclause in its entirety.

12.6.4.1: Add the following to the paragraph:

Electrodes for SMAW must be E7018, E8018, E9018, E10018, and E11018.

12.7.5: Add the following to the end of the paragraph:

Evidence must include third-party CWI witnessing the test and RT film available for the Engineer's review. If this evidence cannot be provided all costs associated with the procedure qualification must be at the Contractor's expense.

12.16.5.1: Add the following sentence to the existing paragraph:

Inspection and NDT records must contain at least the content and information shown in the sample forms of Annex O.

12.18: Add this subclause to the code:

The Contractor must provide documentation of all visual and NDT for timely review and confirmation by the Engineer prior to the weldment being covered.

Table 12.2: Delete Note a.

c. AWS D1.1/D1.1M:2015, Structural Welding Code - Steel (hereafter called *AWS D1.1*). Fabrication of structural steel elements (e.g. steel sign support structures, tower lighting units, Closed-Circuit Television (CCTV) towers, traffic signal mast arms and poles, drainage components, expansion dams, curb plates, bearings, bridge railings, and other miscellaneous structural steel members as determined by the Engineer) must be performed in accordance *AWS D1.1* as modified herein.

Tubular fracture critical members must follow clause 12 of *AWS D1.5* and specific provisions stipulated in the *AASHTO LRFD Guide Specification for Design of Pedestrian Bridges*.

3.5.2: Delete this subclause in its entirety and eliminate all references within *AWS D1.1* to alternate methods for establishing minimum preheat and interpass temperatures.**3.7.1:** Delete the existing subclause in its entirety and replace with the following paragraph:

The progression for all passes in the vertical position must be upward including repairs.

4.2.1.3: Delete the existing subclause in its entirety and replace with the following paragraph:

Charpy impact tests and all weld metal tensile tests are required for all groove weld procedure test plates. Additional plate lengths are required for these tests. This requirement is for all steels greater than ½ inch in thickness, used for structural supports for highway signs, luminaires, and traffic signals, that are main load carrying tension members. Specimens tested for impact values must have a minimum value of 20 ft-lb at -20 degrees C [0 degrees F]. All weld tensile specimens must have values not less than those shown in Table 3.1 with elongation in 2 inch gage length not less than 22 percent.

Table 4.11: In the table under the Type of Test Weld column, delete the Fillet Option 2 and accompanying referenced Figure 4.22.**4.9.4.1(4):** In this subclause add the following requirements to the existing requirements:

(e) Discontinuities must not exceed 1/8 inch measured in any direction on the surface.

(f) Summation of all discontinuities exceeding 1/32 inch must not exceed to 1/8 inch.

4.21.3: Delete this subclause in its entirety and replace with subclause 5.23.1.5 of *AWS D1.5* and as modified in section b herein.

4.22.2.1: Delete this subclause in its entirety and replace with subclause 5.23.1.5 of *AWS D1.5* and as modified in section b herein.

4.22.2.2: In this subclause add the following requirements to the existing requirements:

(4) Discontinuities must not exceed 1/8 inch measured in any direction on the surface.

(5) For discontinuities 1/32 inch or larger, accumulated discontinuity must not exceed 3/8 inch.

4.22.2.2(3)(c): Change "...in excess of 1/4 in [6 mm] total..." to read "...in excess of 1/8 inch [3 mm] total...".

Table 5.1: Delete and replace with Table 4.6 of *AWS D1.5*.

5.3.2.2: Delete the last sentence of this subclause and replace with subclause 4.5.2.2 of *AWS D1.5*.

5.3.2.3: Delete this subclause in its entirety and replace with subclause 4.5.2.1 of *AWS D1.5*.

5.11.2(1): In this subclause change "...when the ambient temperature is lower than 0°F [-20°C]..." to read "...when the ambient temperature is lower than 40 degrees F [5 degrees C]...".

5.13 Delete this subclause in its entirety and replace it with the last paragraph in subsection 707.03.C.2.a of the Standard Specifications for Construction.

5.25: Add the following sentences to the end of the existing paragraph:

Written weld repair procedures must be approved by the Engineer prior to any weld repairs.

6.1: Delete this subclause in its entirety and replace with subclause 6.1 of *AWS D1.5*.

6.3.3: Add the following sentence to the end of the existing paragraph:

Approved weld procedures are to be posted where work and welding are being performed.

6.5.4: Add the following sentence to the end of the existing paragraph:

Inspection and NDT records must contain at least the content and information shown in the sample forms of Annex M.

6.6.5: Delete this subclause in its entirety and replace with subclause 6.6.5 of *AWS D1.5* and as modified in section b herein.

6.9: In this subclause add the following requirements to the existing requirements:

No discontinuities exceeding 1/8 inch measured in any direction on the surface.

No discontinuities exceeding 3/8 inch - Sum of the greatest dimensions of all discontinuities exceeding 1/32 inch, but less than or equal to 1/8 inch.

6.12.2.1: In the title of this subclause, change "Cyclically Loaded Nontubular Connections in Tension" to read "Cyclically Loaded Nontubular Connections".

6.12.2.2 & Figure 6.3: Delete this subclause in its entirety and referenced Figure 6.3. See subclause 6.12.2.1 as modified herein.

6.13.2(1): Change "Welds subject to tensile stress under any condition of loading..." to read "All welds under any condition of loading...".

6.13.2(2) & Table 6.2: Delete this subclause in its entirety and referenced Table 6.2. See subclause 6.13.2(1) as modified herein.

6.19.2: In the third sentence of the paragraph, replace the word "painted" with the word "coated".

6.25.3: Replace the word "paint" with "coatings".

9.15.4.1(3)(f): Change "exceed 1/4 in [6 mm]" to read "exceed 1/8 inch [3 mm]".

9.15.4.1(3): In this subclause add the following requirements to the existing requirements:

(g) Discontinuities must not exceed 1/8 inch measured in any direction on the surface.

(h) Summation of all discontinuities exceeding 1/32 inch must not exceed to 1/8 inch.

d. AWS D1.2/D1.2M:2014, Structural Welding Code – Aluminum (hereafter referred to as *AWS D1.2*). Fabrication of structural aluminum must be performed in accordance with *AWS D1.2*.

3.5.3: Delete this subsection in its entirety.

3.6.3: Add the following requirements to the existing requirements:

(8) No discontinuities exceeding 1/8 inch measured in any direction on the surface.

(9) No discontinuities exceeding 3/8 inch - Sum of the greatest dimensions of all discontinuities exceeding 1/32 inch, but less than or equal to 1/8 inch.

3.11: Delete this subsection in its entirety.

3.21.6.3: Delete this subsection in its entirety and replace with the sentence:

RT must not be used in lieu of the bend test for qualification testing of welders or welding operators.

5.6.5: Delete this subsection in its entirety and replace it with subclause 6.6.5 of *AWS D1.5*

STR:MJF

7 of 7

20SP-707A-01
04-10-20

and as modified in section b herein.

CITY OF ANN ARBOR
DETAILED SPECIFICATION
FOR
STRUCTURAL STEEL GALVANIZING

DLZ/CLH:COAA/FC

1 of 2

09/07/22

a. Description. This work includes removing the existing rolled steel beams, transporting the existing beams from the East Medical Center Drive over NS RR structure to a fabricator, cleaning, galvanizing, storing, and re-erecting the beams on the East Medical Center Drive structure.

b. Materials.

1. Cleaning. Clean existing rolled steel beams according to section 716.03A of the MDOT 2020 Standard Specifications for Construction.
2. Galvanizing. Galvanize existing rolled steel beams according to section 716.03B.4 of the MDOT 2020 Standard Specifications for Construction.

c. Construction.

Remove the existing rolled steel beams from the structure and transport them to a fabrication shop in a manner that does not damage the beams.

Clean and install bolted steel repairs, as detailed on the plans.

After cleaning and repairs have been completed, transport the existing rolled steel beams to a galvanizer. Galvanize the beams according to the MDOT 2020 Standard Specifications for Construction.

Bridge construction shall be completed part-width. Existing Beam E will be removed during Construction Stage 2, but not re-erected until Construction Stage 3. Existing Beam E will be stored offsite, in a secured location until the existing beams are re-erected during Construction Stage 3.

After cleaning, repairing, and galvanizing are completed, transport the existing beams to the structure and re-erect, as detailed on the plans.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the Contract Unit Price using the following Contract (Pay) Item:

<u>Contract Item (Pay Item)</u>	<u>Pay Unit</u>
Structural Steel Galvanizing (Str No.).....	LSUM

Structural Steel Galvanizing (Str No.) payment shall include all labor, transportation, material, and equipment required to remove, clean, galvanize, store, and re-erect the existing rolled steel beams. The payment for repairing the beams will be included in the bid items “**Structural Steel, Mixed, Erect**” and “**Structural Steel, Mixed, Furn and Fab**”.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
SUBSTRUCTURE HORIZONTAL SURFACE SEALER

STM:JD

1 of 2

APPR:JAB:MTH:06-01-21
FHWA:APPR:06-03-21

a. Description. This work consists of preparing the substrate concrete surface, furnishing and applying a penetrating epoxy healer/sealer system to the top horizontal surface of concrete pier caps, abutment bridge seats, and other locations as specified on the plans. The standard specifications apply except as modified herein.

b. Materials. Use solvent-free, moisture insensitive, 100 percent solids, and two-component epoxy based healer sealer. Ensure containers are marked clearly "Part A" or "Part B". The epoxies that are approved for substructure horizontal surface sealers are in Table 1.

Table 1: Approved Two Component 100 Percent Solids Epoxy Based Healer Sealers

Supplier	Product	Telephone
Advanced Chemical Technologies	SIL-ACT EP 1000 HM	(405)-843-2585
E-Chem	EP100	(505) 217-2121
Euclid Chemical	Dural 335 Dural 50 LM	(800) 321-7628
Poly-Carb	Mark 127	(817) 797-1113
Sika	Sikadur 55 SLV	(248) 866-8956
Unitex	Pro-Poxy 40 LV LM	(800) 745-3700

c. Construction. Prepare surface and apply substructure horizontal surface sealer in accordance with the manufacturer's recommendations, except as modified by this special provision.

1. Surface Preparation. Ensure patching and cleaning operations are inspected and approved by the Engineer prior to surface sealer installation. Protect utilities, drainage structures, bearings, beams, vertical surfaces of substructure units and any other structure within or adjacent to the surface sealer location from surface preparation activities and application of the surface treatment materials.

Do not perform surface preparation or installation of surface sealer on concrete that is less than 28 days of age. Clean the entire concrete surface by abrasive blasting to remove all materials that may interfere with the bonding or curing of the binder. Water blasting or wire brushing is prohibited. The cleaned concrete surface must meet the *International Concrete Repair Institute Guideline 310.2R, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays and Concrete Repair*, concrete surface profile (CSP) 3. Ensure mortar is sound and sufficiently bonded to the coarse aggregate, and presents a

uniform CSP necessary for adequate bond. Use a vacuum truck or oil-free moisture-free air blast to remove all dust and other loose material. Brooms are prohibited. Remove any oil or other contamination after initial cleaning.

No visible moisture can be present on the surface of the concrete at the time of healer sealer application. Oil-free moisture-free compressed air may be used to dry the concrete surface. Use a plastic sheet left taped in place in accordance with *ASTM D4263* to identify moisture in the healer sealer area except as modified herein. Tape a 18 inch by 18 inch transparent polyethylene sheet (4 mil) to the concrete surface. Ensure all edges are sealed with tape that will stick to the concrete substrate. Leave the plastic sheet in place for a minimum of 3 hours or as directed by the manufacturer's recommendations for cure time for the conditions, whichever is longer. Ensure there is no moisture visible on the polyethylene sheet. Ensure alternate methods to detect moisture are approved by the Engineer.

2. Application. Apply the substructure horizontal surface sealer in accordance with the manufacturer's recommendations.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
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Substructure Horizontal Surface Sealer (Structure Identification)	Square Yard
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No compensation will be made to the Contractor for surplus materials.

MICHIGAN
DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION
FOR
THIN EPOXY POLYMER BRIDGE DECK OVERLAY

STM:JD

1 of 5

APPR:JAB:MTH:04-28-21
FHWA:APPR:04-28-21

a. Description. This work consists of cleaning/preparing entire deck surface and applying a two-coat epoxy overlay. Ensure all work is completed in accordance with section 712 of the Standard Specifications for Construction except as modified herein. Bring any discrepancies between the two to the attention of the Engineer

b. Materials. Use a solvent-free, moisture insensitive, 100 percent solids, low-modulus, and two-component epoxy system to overlay the structure. Ensure containers are marked clearly "Part A" or "Part B". The epoxies that are approved for thin overlays are in Table 1.

Table 1: Approved Two Component 100 Percent Solids Epoxy Systems

Supplier	Product	Telephone
BASF	MasterSeal 350	(800) 433-9517
E-Bond	526 Lo-Mod	(616) 532-0782
E-Chem	EP50	(505) 217-2121
Euclid Chemical	Flexolith Flexolith Summer Grade Flexolith HD	(800) 321-7628
Poly-Carb	Flexogrid Mark – 163 Flexogrid Mark - 154	(817) 797-1113
Sika	Sikadur 22-Lo Mod	(248) 866-8956
Transpo	T-48 Chip Seal	(573) 808-1040
Unitex	Propoxy Type III DOT	(800) 745-3700

Ensure aggregate meets the gradation requirements in Table 2 and has a hardness of seven or higher on the Mohs hardness scale. Ensure aggregate is angular, consists of natural silica sand, basalt, or other nonfriable aggregate, and contains less than 0.2 percent moisture when tested in accordance with *ASTM C566*.

Table 2: Angular Aggregates Gradation Requirements

Sieve Size	Minimum % Passing	Maximum % Passing
3/8	100	100
4	98	100
8	30	75
16	0	5
30	0	1
Pan	0	0

Provide general certification per the *MQAP Manual* to the Engineer that the aggregate meets the requirements specified herein.

c. Equipment. For the epoxy overlay, provide a distribution system or distributor capable of accurately blending the epoxy resin and hardening agent, and uniformly and accurately applying the epoxy materials at the specified rate to the bridge deck in such a manner as to cover 100 percent of the work area including 1 inch of the vertical face of curb/barrier. Provide a fine aggregate spreader capable of uniformly and accurately applying dry aggregate to cover 100 percent of the epoxy material. Provide a self-propelled vacuum truck.

For hand applications, provide calibrated containers, a Jiffy® type mixer, and notched squeegees which are suitable for mixing and applying the epoxy and aggregate.

For mechanical applications, provide mixing equipment that will automatically and accurately proportion the components in accordance with the manufacturer's recommendations, mix and continuously place the epoxy overlay. Ensure the operation proceeds in such a manner that will not allow the mixed material to segregate, dry, be exposed or otherwise harden in such a way as to impair the retention and bonding of broadcasted aggregate.

d. Construction.

1. Surface Preparation. The Engineer will inspect patching and cleaning operations. The Engineer's approval is required prior to placement of the overlay. Protect utilities, drainage structures, curbs, bridge joints, and any other structure within or adjacent to the epoxy overlay from surface preparation activities and application of the surface treatment materials. For the purposes of this special provision, the term *bridge joints* does not include sawed construction joints.

Verify that the compressed air used for any work is free of oil and moisture contamination in accordance with *ASTM D4285*. Use either an absorbent or a nonabsorbent white collector positioned within 24 inches of the air-discharge point, centered in the air stream. Allow air to discharge onto the collector for a minimum of 1 minute. Visually examine the collector for the presence of oil and/or water. Conduct the test at least one time per shift for each compressor system in operation in the presence of the Engineer. If air contamination is evident, make adjustments to achieve clean, dry air. Examine the work performed since the last acceptable test for evidence of defects or contamination due to contaminated compressed air. Repair contaminated work at no additional cost to the contract.

Do not perform surface preparation or installation of epoxy overlay on concrete less than 28 days of age. Ensure that traffic paint lines and surface texturing or grooving are removed. Clean the entire concrete surface by abrasive blasting or shotblasting to remove all materials that may interfere with the bonding or curing of the binder. The cleaned concrete surface must meet the *International Concrete Repair Institute Guideline 310.2R, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays and Concrete Repair*, concrete surface profile (CSP) 7. To ensure prepared surface is adequate for epoxy adhesion, perform a direct tension test per *ASTM C1583/C1583M*. Perform one direct tension test for every 400 square yards of overlay area. Minimum bond strength must be 250 psi for the surface preparation to be considered adequate. Use a vacuum truck or oil-free moisture-free air blast to remove all dust and other loose material. Brooms are prohibited. Remove any oil or other contamination after initial cleaning.

Ensure both courses of epoxy overlay are applied within 24 hours of the final cleaning, and prior to opening the area to traffic.

No visible moisture can be present on the surface of the concrete at the time of epoxy overlay application. Oil-free moisture-free compressed air may be used to dry the deck surface. Use a plastic sheet left taped in place in accordance with *ASTM D4263* to identify moisture in the epoxy overlay area except as modified herein. Tape an 18 inch by 18 inch transparent polyethylene sheet (4 mil) to the deck every 500 square feet. Ensure all edges are sealed with tape that will stick to the concrete substrate. Leave the plastic sheet in place for a minimum of 3 hours or the manufacturer's recommended cure time for the conditions, whichever is longer. Ensure there is no moisture visible on the polyethylene sheet. Ensure alternate methods to detect moisture are approved by the Engineer.

Remove all debris from the bridge joints. Protect the bridge joints, and any other areas not to be overlaid, from damage during preparation of the surface. Ensure the protection is removed once the epoxy and aggregate has been applied and prior to initial set. Ensure removing the protection is done soon enough to in no way harm the adjacent overlay. Ensure protection is applied again prior to the second coat and removed again prior to initial set as to not damage adjacent surfaces. Ensure the protection meets the approval of the Engineer.

2. Application. Ensure handling and mixing of the epoxy resin and hardening agent is performed in a safe manner to achieve the desired results in accordance with the manufacturer's recommendations for a two-coat system or as directed by the Engineer. Do not place epoxy overlay materials when the concrete surface is less than 50 °F or ambient air temperature is forecast to fall below 50 °F within 8 hours of application. Do not place epoxy overlay materials if weather or surface conditions are such that the material cannot be properly handled, placed, and cured in accordance with the manufacturer's requirements and the specified requirements of traffic control.

Apply the epoxy overlay in two separate courses in accordance with the manufacturer's recommendation for a two-coat system with the following rate of application. Ensure the first course is no less than 2½ gallons per 100 square feet. Ensure the second course is no less than 5 gallons per 100 square feet.

Ensure application of aggregate to both the first and second courses is of sufficient quantity so the entire surface is covered in excess. Ensure no bleed through, or wet spots are visible in the overlay. Remove and replace any areas within course applications with wet spots or where epoxy has bled through.

After the epoxy mixture has been prepared for the overlay, immediately and uniformly apply it to the surface of the bridge deck with a notched squeegee. Apply the dry aggregate in such a manner as to cover the epoxy mixture completely within 5 minutes. Minimize all foot traffic on the uncured epoxy and ensure any foot traffic will only be done with steel spiked shoes approved by the Engineer. Cure each course of epoxy overlay until vacuuming or brooming can be performed without tearing or damaging the surface. Do not allow traffic or equipment on the overlay surface during the curing period. Remove by vacuuming or brooming all loose aggregate after the first course curing period. Immediately apply the next overlay course to complete the overlay. Ensure the minimum curing periods are in accordance with the manufacturer's recommendations, as shown in Table 3, or as directed by the Engineer. Remove by vacuuming or brooming all loose aggregate after the second course curing period.

Ensure all bridge joints are free of loose aggregate, epoxy and other debris resulting from overlay operations. Excess aggregate may be reused if it is clean, dry, free from foreign matter, and meets gradation requirements. Blend the excess aggregate at a ratio of 3 parts virgin material to 1 part recycled material. Inspect aggregate recovery equipment prior to reclamation operation to prevent the introduction of foreign material. Collect excess aggregate within 24 hours of placement. Do not collect excess aggregate that has been rained on or driven on.

Table 3: Anticipated Cure Time (Hours)

Average Temperature of Deck, Epoxy and Aggregate Components, °F	1 st Course	2 nd Course
<60		(a)
60-64	2	2
65-69	2	2
70-74	1.75	1.75
75-79	1.75	1.75
80-84	1.5	1.5
>85	1	1
a. Second course must be cured for minimum of 8 hours if the air temperature drops below 60 °F during the curing period, or per the manufacturer's recommendations.		

Plan and execute the work to provide the minimum curing periods as specified in Table 3, or other longer minimum curing periods as recommended by the manufacturer prior to opening to public or construction traffic, unless otherwise permitted. Ensure first course applications are not opened to traffic. Remove any contamination, detrimental to adhesion of the second course, from the first course at Contractor's expense prior to the application of the second course.

Remove and replace any areas damaged or marred by the Contractor's operations in accordance with this special provision. All cost associated with this work will be borne by the Contractor.

Remove and replace areas as directed by the Engineer and in accordance with 20SP-712D – Removal of Thin Epoxy Polymer Bridge Deck Overlay.

Provide the Engineer with all records including, but not limited to, the following for each batch provided:

- batch numbers and sizes,
- location of batches as placed on deck, referenced by stations,
- epoxy yield, referenced by stations
- batch time,
- temperature of air, deck surface, epoxy components, including aggregates,
- loose aggregate removal time, and
- time open to traffic.

3. Clean Up. At the end of the project or a minimum 7 days after the epoxy polymer overlay has cured, remove, and dispose all loose aggregate that has shed from the epoxy binder by vacuuming or brooming. Do not re-use this aggregate.

e. Measurement and Payment. The completed work, as described, will be measured and

paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Epoxy Ovly	Square Yard

Epoxy Ovly includes preparing and cleaning the concrete surface, preparing and applying a two-coat epoxy overlay system on the concrete surface, and including miscellaneous clean-up. This pay item also includes cleaning and protecting bridge joints.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
GUARDRAIL APPROACH TERMINAL, TYPE 2M

GCB:CT

1 of 3

APPR:CAL:DBP:04-02-20
FHWA:APPR:04-03-20

a. Description. This work consists of furnishing and delivering a tangent *Manual for Assessing Safety Hardware* (MASH), Test Level 3 (TL-3) compliant guardrail approach terminal (Type 2M), selected from those listed herein, to the job site; submitting detailed drawings and installation manuals for the selected terminal(s) to the Engineer; and installing the device(s) as shown on the plans or as directed by the Engineer. Complete this work in accordance with manufacturer's details and specifications, and this special provision.

b. Materials. Select from the following guardrail approach terminals.

1. MSKT, manufactured by Road Systems, Inc.
2. Soft-Stop, manufactured by Trinity Highway Products, LLC.
3. MAX-Tension, manufactured by Lindsay Transportation Solutions, Inc.

Ensure all posts within the terminal limits are made of steel. Provide materials for the selected terminal(s) meeting manufacturer's specifications and the requirements of this special provision. Ensure the selected guardrail terminal meets MASH, TL-3 criteria and has an FHWA federal aid eligibility letter.

Provide detailed drawings of the selected guardrail approach terminal(s) prepared by the respective guardrail approach terminal manufacturer(s). The drawings must contain details depicting the terminal attached to MDOT Type MGS-8 guardrail, detailed in Standard Plan R-60-Series.

Provide materials meeting the requirements of subsection 807.02 of the Standard Specifications for Construction for transitions required for connecting Guardrail Approach Terminal, Type 2M to Type B or Type T guardrail, as depicted in Standard Plan R-60-Series.

Provide installation and maintenance manuals for the selected guardrail approach terminal(s) prepared by the respective guardrail approach terminal manufacturer(s).

Provide high intensity adhesive reflective sheeting for placement on the terminal's impact head. The reflective sheeting must meet the stripe dimensions, colors, and pattern, based on traffic conditions, as shown on Standard Plan R-62-Series. The three-inch stripes, alternating black and yellow, on the reflective sheeting must slope downward at an angle of 45 degrees toward the roadway. The yellow stripes on the reflective sheeting must meet *ASTM D4956* specifications for Type XI retroreflective sheeting and must meet the requirements of Section 2C.64 and 2C.65 of the *MMUTCD*.

c. Construction. At least 14 days prior to terminal installation, provide the Engineer one electronic copy of the detailed drawings, installation manuals, and maintenance manuals for the selected guardrail approach terminal(s). Before terminal installation commences, ensure all questions, comments, or concerns raised by the Engineer concerning the detailed drawings, installation manuals, and/or maintenance manuals are addressed.

The Contractor must ensure that the guardrail terminal manufacturer is available to consult, by telephone or e-mail, with the Engineer, the Engineer’s designated representative, at no additional cost to the Department. Consultation will encompass the installation of guardrail terminals. Provide the manufacturer’s name, telephone number, and e-mail address to the Engineer prior to terminal installation. Provide responses from the manufacturer to any telephone or e-mail inquiries from the Engineer, the Engineer’s designated representative, within 2 working days.

Provide staff that have been trained by the respective guardrail terminal manufacturer to install the guardrail terminals utilized on the project. Training materials and course content for guardrail installation crew training will be as determined by the respective manufacturer. Provide manufacturer issued and dated training certificates for all staff on the guardrail installation crew. Training must have occurred within the previous 3 years. Ensure training certificates are provided to the Engineer 14 days before guardrail installation work commences. Provide updated training certificates no later than 48 hours after personnel changes occur.

Construct guardrail terminals in accordance with section 807 of the Standard Specifications for Construction, the manufacturer’s installation manual(s), and the detailed drawings provided by the manufacturer.

Construct transitions for connecting Guardrail Approach Terminal, Type 2M to Type B or Type T guardrail in accordance with the appropriate details on Standard Plan R-60-Series and section 807 of the Standard Specifications for Construction.

Do not attach reflectors or other attachments within the limits of the guardrail approach terminal. Attach guardrail reflectors within the limits of transition sections, detailed on Standard Plan R-60-Series, when connecting Guardrail Approach Terminal, Type 2M to guardrail Type B or Type T.

Unless otherwise specified by the Engineer, install guardrail approach terminal with a 1 foot-0 inch offset, in relation to the rear of the terminal, measured at the nose (front) of the terminal.

Completely cover the portion of the impact head assembly facing traffic with high intensity adhesive reflective sheeting meeting the requirements of this special provision.

Provide the guardrail terminal manufacturer’s installation checklist, completed and signed by the Contractor, for each individual guardrail terminal installed. Upon completion of guardrail work, provide written certification from the Contractor that all guardrail terminal installations have been installed per the contract and the manufacturers’ specifications and guidelines.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Guardrail Approach Terminal, Type 2M.....	Each

Guardrail Approach Terminal, Type 2M includes furnishing and installing a guardrail approach terminal meeting the requirements of this special provision.

Payment for **Guardrail Approach Terminal, Type 2M** includes all materials, labor, and equipment within the length of each terminal, as defined in subsections d.1, d.2, and d.3 of this special provision, and also includes payment for all materials, labor, and equipment required to construct a transition section, per Standard Plan R-60-Series, for connecting Guardrail Approach Terminal, Type 2M to guardrail Type B or Type T.

The lengths specified in subsections d.1, d.2, and d.3 of this special provision do not include a transition section, per Standard Plan R-60-Series, for connecting Guardrail Approach Terminal, Type 2M to guardrail Type B or Type T.

1. MSKT. Overall length is 59 feet, 4½ inches, measured from Post 1.
2. Soft-Stop. Overall length is 50 feet, 9½ inches, measured from Post 0.
3. MAX-Tension. Overall length is 55 feet, ½ inch, measured from the soil anchor.

If the pay item lengths defined in this special provision conflict with the pay item lengths specified in the manufacturer's details and/or specifications, the pay item lengths defined in this special provision will take precedence.

Payment for all consultations between the manufacturer and the Engineer, the Engineer's designated representative, and/or Contractor, preparing and submitting detailed drawings, installation manuals, operation/maintenance manuals, and other required documentation will be included as part of this pay item, and will not be paid for separately.

The required reflective sheeting on the impact head is included as part of this pay item, and will not be paid for separately.

Unless otherwise specified by the Engineer, payment will be made after guardrail terminal installation has been completed and all required documentation has been submitted to the Engineer.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
TEMPORARY PEDESTRIAN TYPE II CHANNELIZER

COS:CRB

1 of 2

APPR:CAL:CT:02-05-21
FHWA:APPR:02-17-21

a. Description. This work consists of delivering, installing, maintaining, relocating, and removing temporary pedestrian channelizers as identified in the proposal or on the plans. Use temporary pedestrian channelizers to guide pedestrians along a temporary non-motorized facility, and to create separation of pedestrians from construction areas near existing facilities. Replace damaged temporary pedestrian Type II channelizers as directed by the Engineer.

b. Materials. Provide a temporary pedestrian channelizer that is crashworthy in accordance with the *National Cooperative Highway Research Program Report 350* (NCHRP 350) or *Manual for Assessing Safety Hardware* (MASH), in addition to meeting the following requirements:

1. Ensure the channelizer is designed to interconnect to maintain continuous delineation along the entire installation. This includes provisions to accommodate non-linear alignment as well as variations in elevation.

2. Ensure the top surface of the channelizer is designed to function as a hand-trailing edge and have a height between 32 and 38 inches. Ensure this top surface is designed to have a 2 inch horizontal gap between the top edge and the support (if so equipped), to allow for continuous hand-trailing without obstructions. Ensure the lower edge of the channelizer is no more than 2 inches above the surface of the non-motorized facility. Ensure the top edge of the bottom rail of the channelizer is a minimum of 8 inches above the surface of the non-motorized facility or the channelizer may have a solid continuous face. Finally, all features on the front face of the channelizers (the face in contact with pedestrians) must share a common vertical plane.

3. Equip both sides of the channelizer with bands of alternating 6-inch wide orange and white vertical stripes of reflective sheeting. Two bands of sheeting 6 inches tall and a minimum of 36 inches long containing at least two orange and two white stripes each are required. One band placed near the top and one near the bottom if the channelizer section has a solid face. If the channelizer consists of two rails, affix one band of sheeting to each rail. Ensure the stripes of reflective sheeting are aligned vertically. Ensure this sheeting meets or exceeds the requirements of *ASTM D4956, Type IV* sheeting.

c. Construction. Deploy the temporary pedestrian Type II channelizer in accordance with the manufacturer's recommendations, the MMUTCD, the plans, and the following requirements:

1. Install the channelizer as shown on the plans and as directed by the Engineer. Interconnect all channelizers using hinge components if necessary, to ensure a continuous detectable edge for the entire installation. Ensure the channelizers are ballasted in accordance with the manufacturer's recommendations to ensure stability during wind events and contact with pedestrians.

2. When the channelizers are installed near motor vehicle traffic, ensure reflective sheeting is visible to motorists providing appropriate delineation for the pedestrian path.

3. If sections of multiple-colored barriers are used (i.e safety orange and white), install the sections such that the colors alternate to increase conspicuity.

4. Ensure temporary pedestrian Type II channelizers are not used to guide pedestrian traffic on a motor vehicle facility in the presence of active traffic. This prohibition includes bicycle/shared use lanes or shoulders in the presence of active traffic. Ensure temporary pedestrian channelizers are not used to channelize motor vehicle traffic, or separate motor vehicle and pedestrian traffic.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Pedestrian Type II Channelizer, Temp.....	Foot

Pedestrian Type II Channelizer, Temp includes delivering, installing, maintaining, relocating and removing rails or wall sections, supports, ballast, and hinge points at the locations shown on the plans. Payment will be made on delivery for the quantity delivered to the project site, up to planned quantity. Any amount delivered exceeding plan quantity will not be paid unless approved by the Engineer. This includes all rails or wall sections, supports, ballast, hinge points, and miscellaneous hardware needed to construct the channelizer or system of channelizers.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
TEMPORARY PEDESTRIAN PATH

COS:CRB

1 of 2

APPR:MRB:CAL:06-25-21
FHWA:APPR:06-28-21

a. Description. This work consists of furnishing, installing, maintaining, and removing a temporary pedestrian path as identified in the proposal or on the plans. Temporary pedestrian paths, or segments thereof, will be repaired or replaced as directed by the Engineer.

b. Materials. Provide materials to construct a temporary pedestrian path in accordance with the contract, the *Public Rights-of-Way Accessibility Guidelines (PROWAG)*, the *MMUTCD*, as directed by the Engineer, and the following requirements:

1. Ensure the materials used to construct the temporary pedestrian path yields a continuous hard surface that is firm, stable and slip resistant. Ensure the path does not warp, buckle or otherwise become uneven, and materials support the weight of pedestrians as well as motorized scooters and wheelchairs. Suitable materials to construct the path include asphalt materials, Oriented Strand Board (OSB), plywood, dimensional lumber, reclaimed, or other as approved by the Engineer. Compacted soils, aggregate and sand are prohibited.

2. If asphalt materials are not used to construct the path, provide an antiskid coating, or surface treatment as directed by the Engineer.

c. Construction. Construct the temporary pedestrian path in accordance with *PROWAG*, the *MMUTCD*, the contract, the direction of the Engineer, and the following:

1. Ensure the useable surface of the path is a minimum of 48 inches wide. The maximum cross slope for the path is 2 percent. The path, including transitions to the adjacent surface at both ends, must be free of vertical discontinuities greater than 1/4 inch. Eliminate any vertical discontinuities greater than 1/4 inch up to 1/2 inch or bevel with a slope not steeper than 1:2. If a vertical discontinuity greater than 1/2 inch or a running slope greater than 1:20 occurs on the project, a Temporary Pedestrian Ramp (paid for separately) is required.

A. Ensure an anti-slip surface treatment is applied to the surface of the path, if not constructed with asphalt materials, as directed by the Engineer.

B. If the surface of the path is constructed from OSB, plywood, or dimensional lumber securely connect all sections with appropriate fasteners to ensure a continuous, uniform, and flat surface.

C. Ensure the temporary pedestrian path includes passing spaces at intervals of 200 feet maximum. The passing spaces are to be of the same material as the rest of the temporary pedestrian path. Dimension the passing spaces with a minimum width of 60 inches and minimum length of 60 inches. Passing spaces are not required if the path is already 60 inches wide.

2. Ensure all debris and construction material is cleared from the path throughout its use. Ensure snow and ice is removed; the use of an approved de-icing agent may be required.

3. Repair or replace the path, or segments thereof, if it becomes uneven, unstable, or displaces due to weather events, construction activities, or other causes as directed by the Engineer.

4. Following the use of the temporary path, the Contractor must remove and dispose all materials used to construct the path, and restore the area as directed by the Engineer.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Pedestrian Path, Temp.....	Foot

Pedestrian Path, Temp will be measured along the centerline of the path. **Pedestrian Path, Temp** includes all costs related to installation, maintenance, restoration, and removal of the path and disposal of all associated materials throughout the life of the contract. Temporary passing spaces are considered a part of the pedestrian path and are included in this pay item.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
TEMPORARY PEDESTRIAN RAMP

COS:CRB

1 of 2

APPR:MRB:CAL:02-09-21
FHWA:APPR:02-18-21

a. Description. This work consists of furnishing, installing, maintaining, relocating, and removing a temporary pedestrian ramp as identified in the proposal or on the plans. Use temporary pedestrian ramps to facilitate pedestrian travel on accessible facilities over curbs or other uneven terrain features with a vertical difference of 1/2 inch or greater. Damaged pedestrian ramps will be replaced as directed by the Engineer.

b. Materials. Provide materials to construct a temporary pedestrian ramp in accordance with the *Americans with Disabilities Act (ADA)*, *MMUTCD*, the standard specifications, and the following:

1. Ensure the material used to construct the temporary pedestrian ramp is firm, stable, slip resistant, and forms a continuous hard surface. Ensure the surface does not warp, buckle, or otherwise become uneven, and materials support the weight of pedestrians as well as motorized scooters and wheelchairs. Suitable materials to construct the surface of the ramp include asphalt materials, Oriented Strand Board (OSB) or plywood, dimensional lumber, certain reclaimed or other materials as approved by the Engineer. Compacted soils, aggregate and sand are prohibited.

2. Provide a handrail on both sides of the ramp if the ramp is not exposed to vehicle traffic and has a total rise greater than 6 inches, and a length greater than 72 inches. Ensure the handrail is between 1.25 and 1.5 inches wide and configured to be a "graspable" cross-section. See subsection c.1.A of this special provision for additional details. When the ramp is exposed to traffic, in lieu of handrails, use a protective edge 2.5 inches minimum height above the ramp surface or 1:10 flare on both sides of the ramp.

3. Ensure the surface of the ramp is free draining; in addition, provide features that allow drainage to move past the ramp installation (i.e. along the gutter pan underneath the ramp if the ramp is installed on a curb).

4. Provide materials to construct detectable edging along open sides of the ramp if required.

5. If asphalt materials are not used to construct the surface of the ramp, provide an anti-slip coating or surface treatment approved by the Engineer.

c. Construction. Construct the temporary pedestrian ramp in accordance with the manufacturer's recommendations (if applicable), *ADA*, *MMUTCD*, the plans, and the following:

1. Ensure the useable surface of the ramp is 48 inches wide and does not deflect due to pedestrian traffic. Ensure an anti-slip surface treatment is applied to the useable area of the

ramp if it is not made from asphalt materials. The maximum cross slope of the ramp is 2 percent. Ensure both ends of the ramp smoothly transitions to the adjacent surface, with 1/4 inch or less vertical difference.

Construct the ramp to maintain a longitudinal slope from 1:10 to 1:12 where possible. Otherwise, a longitudinal slope from 1:8 to 1:10 may be used for a maximum rise of 3 inches. Temporary pedestrian ramps with longitudinal slopes greater than 1:8 are prohibited.

A. Provide a handrail on both sides of the ramp if required as stated herein. Ensure the top of the handrail is between 34 and 38 inches above the surface of the ramp. Ensure a minimum width of 36 inches is maintained between the handrails, with a minimum clearance of 1.5 inches behind and 18 inches above.

Construct a structurally stable handrail that meets the requirements as defined in the *ADA* and *MMUTCD*.

2. Construct a detectable edging anytime a handrail is required, and anytime the path changes direction. This includes a turn onto the ramp from the path. Detectable edging must begin a maximum of 2.5 inches above the ramp surface and extend at least 6 inches above the ramp surface.

3. Ensure a clear space (minimum 48 inches by 48 inches) is provided above and below the ramp.

4. Avoid locating ramps in areas of drainage collection, ponding or running water, which can produce slippery or unsafe conditions. If the ramp is located over a gutter pan or other drainage structure, provide features to facilitate water movement around or under the ramp as approved by the Engineer.

5. Ensure all debris and construction material is cleared from the surface of the ramp throughout its use. Ensure snow and ice is removed; the use of an approved de-icing agent may be required. Repair or replace the ramp if it becomes uneven, unstable, or displaces due to weather events, construction activities, or other causes as directed by the Engineer.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Pedestrian Ramp, Temp.....	Each

Pedestrian Ramp, Temp includes furnishing, installing and removing a temporary pedestrian ramp at the locations shown on the plans, as well as all costs for maintaining, clearing debris, deicing, reconfiguring, and relocating the temporary pedestrian ramp throughout the life of the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**TEMPORARY CONCRETE BARRIER, LIMITED DEFLECTION FURNISHED AND
OPERATED**

GCB:CT

1 of 9

APPR:NAP:CAL:05-13-20

a. Description. This work consists of furnishing, installing, maintaining, operating, and removing limited deflection temporary concrete barrier (TCB) and connections meeting the requirements of Standard Plan R-53 Series or, if approved by the Engineer, alternative limited deflection temporary barrier systems meeting the requirements of this special provision. All barrier sections and connections must conform to the requirements of this special provision.

b. Alternatives to Standard Plan R-53 Series. Alternative limited deflection temporary barrier systems not conforming to Standard Plan R-53 Series will only be permitted after receiving approval by the Engineer for use at each proposed installation site.

Ensure alternative limited deflection temporary barrier systems meet the requirements of *National Cooperative Highway Research Program Report 350 (NCHRP 350)*, Test Level 3 (TL-3) or *Manual for Assessing Safety Hardware (MASH)*, Test Level 3 (TL-3). Ensure alternative limited deflection temporary barrier systems are adequate for installation at each location taking site-specific features and constraints into consideration, including, but not limited to, proposed barrier offset from the drop-off, underlying surface type, and expansion joints in the underlying surface. Provide a letter from the Federal Highway Administration (FHWA) specifying that the alternative limited deflection temporary barrier system is eligible for federal aid reimbursement.

Ensure alternative limited deflection temporary barrier systems are fabricated and installed as successfully crash tested under *NCHRP 350*, TL-3 or *MASH*, TL-3, or with modifications approved by FHWA. If the proposed alternative temporary barrier system has any modifications from the version that was successfully crash tested, obtain a signed letter from FHWA specifying that the modified limited deflection temporary barrier system is eligible for federal aid reimbursement. Provide a copy of the signed FHWA letter to the Engineer.

Submit requests for alternatives to Standard Plan R-53 Series, along with any shop drawings and supporting documents, to the Engineer at least 30 days prior to limited deflection temporary barrier installation. The Department will require up to 30 days for reviewing and approving each request. The Contractor must address any questions, comments, or concerns raised by MDOT personnel.

Alternative limited deflection temporary barrier systems that, as determined by the Engineer, may have an adverse effect on the underlying surface or other roadway features, or are deemed unacceptable for any reason, will be rejected.

The Department reserves the right to reject any proposed alternatives to Standard Plan R-53 Series, at the Department's discretion, and at no additional cost to the contract. Contract time extensions will not be granted due to rejection of any proposed alternatives by the Engineer.

If a proposed alternative is rejected by the Engineer, other alternatives may be presented to the Department for consideration but are subject to the requirements of this special provision. Each subsequent request for approval of a proposed alternative will require an additional 30 days for the Department to review the request, at no additional cost to the contract, and with no contract time extensions.

If all proposed alternatives are rejected by the Engineer, provide limited deflection TCB meeting the requirements of Standard Plan R-53 Series.

c. Materials. Provide materials in accordance with the requirements of this special provision. Provide written certification to the Engineer, prior to limited deflection TCB installation, certifying that the materials used to construct and install limited deflection TCB meet all of the requirements of this special provision. Provide all required documents, as specified in this special provision, to the Engineer prior to limited deflection TCB installation.

Ensure materials for alternatives to Standard Plan R-53 Series are approved by the Engineer.

Ensure welding for all steel components complies with AWS D1.5, *Bridge Welding Code*.

1. Condition of TCB Sections. Provide TCB sections meeting the requirements in the *ATSSA Quality Guidelines for Work Zone Traffic Control Devices*.

TCB sections that, as determined by the Engineer, do not meet the requirements in the *ATSSA Quality Guidelines for Work Zone Traffic Control Devices* will be rejected and must be replaced by the Contractor at no additional cost to the contract.

2. Concrete. Use Grade 4500 concrete meeting the requirements specified in section 1004 of the Standard Specifications for Construction, with the following exception:

A. Ensure the minimum 28-day compressive strength must be 5,000 pounds per square inch (psi).

Alternative concrete types will be permitted when all of the following requirements are satisfied:

B. Ensure the minimum 28-day compressive strength must be 5,000 psi, and;

C. The concrete type is equivalent to or exceeds the requirements of that used in similar TCB sections that were successfully crash tested in accordance with the requirements of *NCHRP 350*, TL-3 or the *MASH*, TL-3.

Provide the Engineer written certification that the concrete used to construct limited deflection TCB sections meets the requirements of this special provision, including the concrete mix design, compressive strength testing data and, if applicable, supporting documentation regarding alternative concrete types.

3. Steel Reinforcement and Loop Bars. Use steel reinforcement meeting the requirements specified in section 905 of the Standard Specifications for Construction.

Ensure loop bars (D1, D2, D3, and D4, respectively, as specified in Standard Plan R-53 Series) meet the following requirements:

- A. Constructed of smooth steel bars;
- B. Minimum yield strength of 60,000 psi;
- C. Minimum tensile strength of 80,000 psi, and;
- D. Capable of being bent 180 degrees using a 2.75 inch inside bend diameter without damaging the bar.

Install loop bars in TCB sections with a tolerance of $\pm 1/8$ inch of plan dimensions.

4. TCB Fabrication and Curing. Cast barriers in accordance with the weather and temperature limitations specified in subsection 602.3.T of the Standard Specifications for Construction.

Ensure a uniform, smooth finish on TCB surfaces.

Cure concrete in accordance with subsection 804.03.F of the Standard Specifications for Construction.

5. Box-Beam Elements and Related Hardware. Ensure box-beam elements meet the requirements of Standard Plan R-53 Series, be cold-formed welded and seamless structural steel tubing meeting *ASTM A500/A500M, Grade C*. Box-beam elements must not have any splices and must not have any welds made after fabrication. Ensure box-beam elements are hot-dip zinc coated in accordance with *ASTM A123/A123M* after fabrication.

If requested by the Engineer, the Department will test box-beam elements as specified in subsection 908.09.B of the Standard Specifications for Construction.

The box-beam element manufacturer must place identification on each box-beam element as specified in subsection 908.09.B of the Standard Specifications for Construction.

Ensure threaded rods for securing box-beam elements to TCB sections meet the requirements of *ASTM F1554 Grade 36*. Ensure hex nuts meet the requirements of *ASTM A563, Grade A*. Ensure washers meet the requirements of *ASTM F436/F436M*. Ensure square plates are made of steel meeting *ASTM A36/A36M*. Ensure threaded rods, nuts, and washers are hot-dip zinc coated in accordance with *ASTM A153/A153M*. Ensure square plates are hot-dip zinc coated in accordance with *ASTM A123/A123M*.

6. Connection Pins, Stakes, Anchors Bolts, and Related Hardware. Provide connection pins and stakes fabricated with *ASTM A36/A36M* steel. Ensure connection pins and stakes are free of corrosion, as determined by the Engineer, prior to installation.

Provide square washers made of *ASTM A36/A36M* steel and hot-dip zinc coated after fabrication in accordance with *ASTM A153/A153M*.

Provide zinc-coated anchor bolts and threaded rods meeting the requirements of *ASTM F1554, Grade 36*, with rolled threads in compliance with the thread series requirements of *ANSI B1.1 Coarse Thread Series*, and a tolerance class that accommodates the corrosion protective coating.

Provide zinc-coated Heavy Hexagonal series and Heavy Hexagonal Jam series nuts meeting the requirements of *ASTM A563* and intended for use with anchor bolts and/or threaded rods, as identified in Standard Plan R-53 Series for anchoring TCB sections to the underlying surface. Ensure nuts are also compatible with the strength requirements for the Grade of anchor bolt and/or threaded rod specified in accordance with the guidelines of *ASTM A563* for the Property Class and design style of the nut. Ensure all nuts comply with their respective Property Class requirements of *ASTM A563*.

Provide zinc-coated, steel lock washers that meet the requirements of *ANSI B18.21.1* for regular, helical spring lock washers.

Zinc coat anchor bolts, threaded rods, nuts, and lock washers in accordance with *ASTM A153/A153M*.

Provide steel tubes for reinforcing anchors in bridge decks made from Drawn Over Mandrel (DOM) steel tubing meeting the requirements of *ASTM A513/A153M, Type 5*, and having a minimum yield strength of 72,000 psi.

7. Miscellaneous Items. Provide an adhesive anchoring system from the Qualified Products List (712.03J) for securing anchor bolts and/or threaded rods to the underlying surface when using the Drilled and Grouted Method, Details 4A and/or 4B, from Standard Plan R-53 Series.

Provide Type H-1 (non-metallic) non-shrinking grout from the Qualified Products List (702.02B) or prepackaged hydraulic fast set mortar (without an extender) from the Qualified Products List (703), for repairing holes and other damages to all underlying surfaces (concrete, hot mix asphalt (HMA), or composite) as a result of pinning TCB to the underlying surface.

Provide reflectors, for attaching to TCB sections, meeting the requirements of subsection 922.04.A of the Standard Specifications for Construction.

Ensure bonding material used for adhering reflectors to TCB sections is approved by the Engineer before installing reflectors.

Select zinc-rich paint for repair of damaged galvanized surfaces from the Qualified Products List (915). Use a zinc-rich paint closely matching the color of the surface to be repaired.

8. Transition sections for interconnecting standard temporary barrier and limited deflection TCB with dissimilar cross-sections, materials, and/or connections. Interconnect TCB sections with dissimilar cross-sections and/or connections by using a transitional TCB section meeting the following requirements:

A. Ensure the transitional TCB section length is equal to or greater than the length of adjoining TCB sections. Ensure when adjoining TCB sections having dissimilar lengths, the transitional TCB section length is equal to or greater than the length of the longest adjoining TCB section.

B. The transitional TCB section must have the same cross-sectional dimensions and connection type of one TCB on one end, and the same cross-sectional dimensions and

connection type of the other TCB type on the other end.

C. The cross-section of the transitional TCB section must change gradually throughout the length of the section and must have a relatively smooth surface with no protruding corners or edges.

D. The transitional TCB section must contain reinforcing steel similar in layout and composition to the adjoining TCB sections.

E. Ensure concrete used to construct the transitional TCB section is similar to the concrete in adjoining TCB sections. If adjoining TCB sections are constructed with dissimilar concrete types, use the concrete type with the largest 28-day compressive strength to construct the transitional TCB section.

Interconnecting TCB and temporary steel barrier (TSB) sections on a specific run of temporary barrier will only be permitted if the Contractor provides documentation to the Engineer confirming that the connection between the TSB and TCB meets the crashworthy criteria of *NCHRP 350*, TL-3 or *MASH*, TL-3. In addition, any connection between TSB and TCB must meet manufacturer's specifications.

d. Construction. Furnish, install, operate, inspect, maintain, clean, and remove barrier sections in accordance with Standard Plan R-53 Series, Standard Plan R-126 Series, as specified on the plans, as specified in this special provision, and as specified by the Engineer.

Ensure construction and placement methods for alternatives to Standard Plan R-53 Series are approved by the Engineer prior to installation.

Place barrier sections before diverting traffic. Provide clean barriers meeting the requirements of this special provision. When placing barrier sections on pavement, clean the pavement of any material that would reduce friction between the barrier section and the underlying pavement. During barrier installation, protect traffic by using or installing standard warning and channelizing devices. After placing end treatment, place barriers in the direction of the flow of traffic. Remove barriers in the direction opposite to traffic flow.

Place barrier sections with an offset, measured from the nearest edge of the TCB to the drop-off or the edge of slab, as specified on the plans or by Engineer.

Prior to linking barrier sections together, place a 3⁵/₈ inch wide wood block between adjacent TCB sections and push the adjacent TCB sections toward each other until both TCB sections come in contact with the wood block. The resulting gap between TCB sections must be 3⁵/₈ inches with an acceptable tolerance of $\pm 1/8$ inch. Interconnect TCB sections with connection pins and other required hardware. Maintain the barrier with end-attachments engaged.

Ensure the gap between Type J1 and Type J2 TCB sections does not exceed 4 inches after barrier sections are fully engaged with cable assemblies and connection pins installed.

Field cutting threaded rods to length will be permitted so long as threads along the entire length of the rod are not damaged, and rods are not damaged, bent, or deformed during the cutting process. Ensure nuts attached to threaded rods are capable of being completely removed and reinstalled after rods are cut to length.

Inspect all installations periodically, as specified by the Engineer, to ensure all non-galvanized steel components remain free of corrosion while in service. Replace all non-galvanized steel components that appear to be damaged or corroded.

Repair all galvanized components where the galvanized surface has been damaged or where underlying steel has been exposed. Clean the damaged surface to near-white metal before applying zinc-rich paint. Do not damage barrier sections or connections as part of the cleaning process. Apply zinc-rich paint to exposed steel in accordance with the manufacturer's recommendations for temperature and dryness.

1. Box Beam Stiffened Method - Detail 1. Field drilling holes in box-beam elements will be permitted so long as the holes meet the requirements of Standard Plan R-53 Series, and zinc-rich paint is applied to exposed steel in accordance with the requirements of this special provision. Drilling additional holes and holes with different diameters in box-beam elements is prohibited. Do not damage any identification on box-beam elements while field drilling holes.

Field welding and splicing box-beam elements is prohibited.

Install box-beam elements in accordance with Standard Plan R-53 Series. Do not drill new holes in TCB sections adjacent to or near existing holes, unless otherwise specified by the Engineer. Do not damage steel reinforcement or steel connections while drilling holes in TCB sections.

If box-beam elements cannot be installed on existing TCB sections in accordance with this special provision, replace existing TCB sections with new TCB sections at no additional cost to the contract.

Shim resulting gaps between TCB sections and box-beam elements in accordance with Standard Plan R-53 Series. Tighten all nuts securing box-beam elements to TCB sections without cracking, damaging, or deforming TCB sections, box-beam elements and hardware.

Unless otherwise specified by the Engineer, anchor the beginning and ending limited deflection TCB sections to the underlying surface using the Drilled and Grouted Methods (Details 4A and 4B, respectively, from Standard Plan R-53 Series) when the TCB section is placed on concrete or composite (concrete and HMA) pavements, respectively, or the Staked Method (Detail 2, Standard Plan R-53 Series) when the TCB section is placed on HMA pavement. Obtain the Engineer's approval before anchoring TCB sections to bridge decks when using the Box Beam Stiffened Method (Detail 1, Standard Plan R-53 Series).

2. Staked Method - Detail 2. Drill 1.5 inch diameter holes through the entire thickness of the pavement before installing stakes.

Verify the location of underground utilities/obstructions prior to TCB placement. Follow the requirements of Standard Plans R-53 Series when stake omission is necessary to avoid impacting underground utilities/obstructions.

3. Through-Bolt Method in Concrete Bridge Deck - Detail 3A and Through-Bolt Method in Composite (concrete and HMA) Bridge Deck - Detail 3B.

Core drill anchor holes in bridge deck in accordance with Standard Plan R-53 Series.

Determine the location of steel reinforcement in the bridge deck with a pachometer, or other nondestructive method, to avoid cutting or damaging reinforcement while coring anchor holes. If possible, adjust placement of TCB sections longitudinally before coring anchor holes to avoid cutting or damaging steel reinforcement. Notify the Engineer immediately if the location of steel reinforcement in the bridge deck conflicts with proposed anchor hole locations. Obtain approval from the Engineer prior to drilling holes that may cut or damage steel reinforcement in the bridge deck.

Avoid spalling concrete during drilling. If spalling occurs, remove loose concrete before installing anchor bolts. Remove concrete fragments from the work area. Do not patch spalled areas.

Install steel tubes in anchor holes in accordance with Standard Plan R-53 Series when using the Through-Bolt Method in Composite (Concrete and HMA) Bridge Deck - Detail 3B.

Install anchor bolts or threaded rods in accordance with Standard Plan R-53 Series. Ensure nuts and bolts/threaded rod are fully engaged with at least one bolt/rod thread extending beyond nuts. Tighten nuts without cracking or damaging concrete near anchor bolt blockouts in TCB sections. Replace TCB sections with cracked or damaged concrete near anchor bolt blockouts at no additional cost to the contract.

4. Drilled and Grouted Methods - Details 4A and 4B. Install grouted anchors in accordance with Standard Plan R-53 Series and subsection 712.03.J of the Standard Specifications for Construction, with the exception that the field testing requirements of subsection 712.03.J.2 of the Standard Specifications for Construction will not be required.

Do not tighten nuts until adhesive has fully cured in accordance with the manufacturer's recommendations. Tighten nuts without cracking or damaging concrete near anchor bolt blockouts in TCB sections. Replace TCB sections with cracked or damaged concrete near anchor bolt blockouts at no additional cost to the contract.

Install Type B high intensity lights on barrier sections in accordance with Standard Plan R-126 Series.

Attach reflectors to barrier sections to delineate the barrier. Remove dirt and other material that could diminish adhesion from the barrier before installing reflectors. Attach reflectors in accordance with the manufacturer's recommended adhesive and installation procedures. Install reflectors near the center of the barrier, and at a height of 18 inches \pm 1 inch above the bottom of the barrier section to the top of the reflector. Ensure reflectors are installed on all barrier sides exposed to traffic. Provide a maximum longitudinal reflector spacing of 20 feet. Ensure the color of the reflector matches the color of the edgeline pavement marking in that location.

Remove and replace damaged reflectors. Position replacement reflectors directly in front of the damaged reflector.

Completely remove all pins and/or connecting hardware from the underlying pavement after removing the barrier. Remove grouted anchors by core drilling the anchor with a core barrel twice the diameter of the anchor to a depth equal to the installed depth and removing the resulting core.

Remove dust and debris from the resulting holes in the underlying pavement/bridge deck. Repair any holes, spalls, or damages to the underlying pavement/bridge deck to the Engineer's

satisfaction.

Replace barrier sections structurally damaged during handling or by traffic. If directed by the Engineer, repair non-structural damage to TCB sections affecting the performance of the TCB.

e. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

Pay Item	Pay Unit
Conc Barrier, Temp, Limited Deflection, Det __, Furn.....	Foot
Conc Barrier, Temp, Limited Deflection, Det __, Oper	Foot
Conc Barrier, Temp, Limited Deflection, Reflector Replacement	Each

1. **Conc Barrier, Temp, Limited Deflection, Det __, Furn** includes furnishing and installing limited deflection TCB meeting Standard Plan R-53 Series, of specified detail, or approved alternatives to Standard Plan R-53 Series. Additional payment will not be provided for furnishing multiple temporary barrier types for each detail. **Conc Barrier, Temp, Limited Deflection, Det __, Furn** will be measured as the maximum number of units required by the Engineer on one project, at one time during the life of the contract. Furnishing and installing reflectors on temporary barrier sections during initial temporary barrier installation is included in this pay item. Furnishing and installing transitional temporary barrier sections, as needed, is included in this pay item. Removing and replacing damaged reflectors after initial temporary barrier installation will be paid for separately.

Additional payment will not be provided for pinning TCB sections to the underlying surface as required when Detail 1 is specified.

Furnishing and installing J1/J2 TCB assemblies and associated hardware, when specified on the plans or by the Engineer, will be paid for separately.

2. **Conc Barrier, Temp, Limited Deflection, Det __, Oper** includes operating, cleaning, maintaining, and removing limited deflection TCB meeting Standard Plan R-53 Series, of specified detail, or approved alternatives to Standard Plan R-53 Series. Payment for repairing damaged galvanized surfaces where the underlying steel has been exposed is included in this pay item. Payment for repairing pavements/bridge decks as a result of anchoring temporary barrier sections to the underlying surface is included in this pay item. **Conc Barrier, Temp, Limited Deflection, Det __, Oper** will be measured as the maximum number of units required by the Engineer on one project, at one time during the life of the contract. Payment for cleaning reflectors throughout the life of the contract is included in this pay item.

Operating, cleaning, maintaining, and removing J1/J2 TCB assemblies and associated hardware will be included in this pay item.

3. **Conc Barrier, Temp, Limited Deflection, Reflector Replacement** includes removing a damaged marker from limited deflection temporary barrier, meeting Standard Plan R-53 Series or any alternatives approved by the Engineer, and any associated transition sections after initial placement, and furnishing and installing a new barrier reflector.

4. **Damage Compensation.** Notify the Engineer of damaged barrier sections. Before replacement and disposal, allow the Engineer to verify the condition of damaged barrier

sections eligible for payment. The Department will pay the furnished unit price for replacing limited deflection temporary barrier sections damaged by vehicular traffic, other than the Contractor's vehicles and equipment, to the extent that barrier section replacement is required or when repair costs exceed the furnished unit price of the damaged barrier sections.

The Department will pay for repairing limited deflection temporary barrier sections damaged by vehicular traffic, other than the Contractor's vehicles and equipment, when all of the following requirements have been met:

- A. The Engineer approves the repair of damaged barrier sections;
- B. The Contractor submits a written invoice to the Engineer detailing the material, labor, and equipment costs required to repair the damaged barrier sections; and
- C. The repair costs, as approved by the Engineer, do not exceed the furnished unit price of the barrier sections requiring repairs.

The Department will not pay for repairing or replacing damaged barrier sections and associated hardware caused by the Contractor's vehicles, equipment, operations, or negligence, as determined by the Engineer.

If the Contractor uses alternative construction methods or operations that require additional limited deflection temporary barrier quantities (furnished and operated) that exceed the quantities specified in the contract, the additional quantities will be provided at the Contractor's expense.

Furnishing and installing temporary attenuators, as needed, for shielding temporary barrier endings will be measured and paid for separately.

All costs associated with installing/removing pins and/or connecting hardware from the underlying pavement/bridge deck and repairing damages to the underlying pavement/bridge deck will be included in the pay items described in this special provision, and will not be paid for separately. This includes all costs associated with securing temporary barrier sections to the underlying pavement/bridge deck, as detailed in Standard Plan R-53 Series, or by other methods approved by the Engineer.

CITY OF ANN ARBOR
SPECIAL PROVISION
FOR
SOIL NAILS FOR SLOPE STABILIZATION

DLZ/DML:COAA/FC

1 of 16

09/20/2022

a. Description. This work consists of constructing a permanent soil nail retaining wall for slope stabilization as specified herein and at the location shown on the Plans. The Contractor shall furnish all labor, materials and equipment required for completing the work. The Contractor shall select the method of excavation, drilling method and equipment, drilled hole diameter(s), final soil nail length(s), and grouting procedures to meet the performance requirement specified herein. The required soil nail locations, orientations, and minimum lengths and the design loads are to be designed by the Soil Nail Engineer. The term "Soil Nail" as used in these specifications is intended as a generic term and refers to a reinforcing bar grouted into a drilled hole installed in any type of ground. Soil nail walls are built from the top down in existing ground.

Soil nails are typically solid bars. Hollow Bar Soil Nails (HBSN) shall not be used unless specifically allowed in the Plans. When HBSN are used, the subsections herein referring to HBSN shall supersede the preceding section where they differ. Otherwise, the requirements for HBSN are the same as for solid bar soil nails.

Soil nailing work shall include excavating as necessary for the work; drilling soil nail drilled holes; furnishing, placing, and grouting the encapsulated or epoxy coated nail bar tendons into the drilled holes; placing drainage elements; placing shotcrete reinforcement; applying shotcrete facing over the reinforcement; attaching bearing plates and nuts; performing nail testing; casting the final cast-in-place concrete facing, and backfilling as necessary to the finish grades shown on the plans to accommodate surface treatment, such as concrete slope paving, by the bridge contractor.

Examine the plans and visit the site prior to bidding the work to assess the site geometry, equipment access conditions, subsurface conditions, location of existing structure(s), overhead restrictions, and any other factors which may influence the bid.

1. Contractor Qualifications. Contractors will need to submit their qualifications to the Engineer for review at the preconstruction meeting. Submit qualifications satisfying the requirements below. No soil nail construction can begin until the Engineer has approved the Contractor's qualifications.

A. Documented experience verifying the successful construction completion of at least 5 soil nail retaining wall projects during the past 3 years totaling at least 1200 square feet of wall face area and the installation of at least 500 soil nails. At least 3 of these soil nailing projects shall include installing soil nail walls under the foundation of existing structures. Include a brief description of each project with the Owner's name and current phone number.

B. Documented experience in soil nail drilling and grouting in subsurface conditions with boulders and cobbles similar to the project site.

C. Documented experience of the Contractor's personnel who will be performing and supervising the soil nailing work. The Contractor shall not use consultants or manufacturer's representatives to satisfy the requirements of this section, with exception to the Design Engineer. The report shall include the names of a Soil Nail Engineer, Soil Nail Site Supervisor, Drill Operators, and Design Engineer. The report shall also contain a list of employer's names and telephone numbers, location and dates of previous permanent soil nailing or tieback projects, and the extent of work performed. This information must be verifiable. The personnel performing soil nailing work shall have acquired work experience, which is not less than the level of experience as defined below.

The Engineer will accept or reject the Contractor's personnel within thirty (30) calendar days following the submission of the report of names and verifiable resume information. Soil nailing work shall not commence until the Engineer has provided a written letter of acceptance. In the event the Contractor elects to substitute personnel, submit verifiable resume information to the Engineer prior to that individual's performance of soil nailing work. The Engineer will accept or reject the Contractor's proposed substitute within fifteen (15) calendar days. The Engineer may suspend the work if the contractor uses unacceptable personnel. If work is suspended for use of unacceptable personnel, no adjustment in contract costs or contract time attributed to the suspension will be made.

2. Soil Nail Engineer. The Soil Nail Engineer shall be a Michigan Registered Professional Engineer and is responsible for overseeing the soil nailing work and verifying the results of the testing. The Soil Nail Engineer shall have three (3) years of construction experience in the installation of permanent soil nails or tiebacks and shall have overseen the successful installation of over 100 permanent soil nails or tiebacks. The work experience time period is computed by the addition of all documented durations of soil nailing or tieback work time on construction projects.

3. Soil Nail Site Supervisor. The Soil Nail Site Supervisor shall be present at the job site at all times during the performance of soil nailing work. The Soil Nail Site Supervisor shall have one (1) year of construction experience in the installation of permanent soil nails or tiebacks and shall have supervised the successful installation of over 100 permanent soil nails or tiebacks. The work experience time period is computed by the addition of all documented durations of soil nailing or tieback work time on construction projects.

4. Drill Operators. Drill operators shall have successfully installed at least 50 permanent soil nails or tiebacks.

5. Design Engineer. The Design Engineer shall be a Michigan Registered Professional Engineer and is responsible for designing the soil nailing work and verifying the results of the testing. The Design Engineer shall have five (5) years of experience in the design of permanent soil nails or tiebacks and shall have designed the successful installation of at least 10 permanent soil nail walls or tieback walls. The work experience time period is computed by the addition of all documented durations of soil nailing or tieback work time on construction projects.

b. Submittals

1. Personnel. At least 45 calendar days before starting soil nail work, submit names of the Soil Nail Engineer, Soil Nail Site Supervisors, and Drill Operators assigned to the project, and a summary of each individual's experience. Only those individuals designated as meeting the experience requirements shall be used for the project. The Contractor cannot substitute for any of these individuals without written approval of the Owner or the Owner's Engineer. The Owner's Engineer shall approve or reject the Contractor qualifications and staff within 7 calendar days of receipt of the submission. Work shall not be started nor materials ordered until the Contractor's qualifications have been approved by the Owner's Engineer. The Owner's Engineer may suspend the work if the Contractor substitutes unapproved personnel for approved personnel during construction. If work is suspended due to the substitution of unqualified personnel, the Contractor shall be fully liable for all additional costs resulting from the suspension of work, and no adjustment in contract time resulting from the suspension of the work shall be allowed. The Contractor shall have overall contractual responsibility for both the design and construction.

2. Design Submittals**A. General**

(1) The Contractor shall submit the following items with their bid: global stability analysis results, estimated wall deformation and corrosion resistance category for their design to demonstrate that it meets the intent of the Contract Drawings and these Special Provisions.

(2) At least 30 calendar days before the planned start of the wall construction, the Contractor shall submit complete Design Calculations and Design Drawings to the Engineer for review and approval. Include all details, dimensions, quantities, ground profiles, and cross-sections necessary to conduct the work.

(3) Design Drawings and calculations shall be signed and sealed by the Contractor's Design Engineer, previously approved by the Owner's Engineer.

(4) Submit sets of the Design Drawings with the initial submission. The Design Drawings shall be submitted to the City of Ann Arbor. The Owner's Engineer will approve or reject the Contractor's submittal within 15 calendar days of the receipt of the complete submission.

(5) The Owner's Engineer will approve or reject the Contractor's submittals within 14 calendar days of the receipt of the complete submission.

(6) One set will be returned with any indicated corrections. If revisions are necessary, make the necessary changes and resubmit revised sets. When the drawings are approved, furnish sets of the approved drawings.

(7) The Contractor shall not begin the work until the submittal requirements are satisfied and found acceptable by the Engineer.

(8) Changes or deviations from the approved submittals must be re-submitted for approval. No adjustments in contract time or delay, or impact claims will be allowed due to incomplete submittals.

B. Design Calculations. Design calculations shall include, but not be limited to, the following items.

(1) A narrative describing the overall soil nail wall design.

(2) Applicable code requirements and references.

(3) Design criteria, including soil/rock shear strength parameters (friction angle and cohesion), unit weights, pullout resistances, steel resistances, and shotcrete resistance values. Any additional subsurface borings, laboratory work, or other subsurface data collected for the design shall also be included.

(4) Soil nail critical cross-section(s) including soil/rock strata, piezometric levels, and location, magnitude, and direction of applied loads.

(5) Values and associated load factors used in design for pullout resistance, surcharges, soil/rock unit weights, nail head strengths, and strengths of steel, shotcrete, and concrete materials. Global stability soil resistance/load factors used in LRFD verifications.

(6) Seismic design coefficient and other seismic design criteria applicable for the geographic area of the project.

(7) Design calculation sheets with the project number, structure location, designation, date of preparation, initials of designer and checker, and page number at the top of each page. Provide an index page with the design calculations.

(8) Design notes including an explanation of symbols and computer programs used in the design.

(9) Structural design calculations for wall facing(s) and nail head/facing connections including consideration of facing flexural and punching shear strength, headed stud tensile strength, upper cantilever, minimum reinforcement ratio, cover, and splice requirements.

(10) Other design calculations not considered above.

C. Design Drawings. Design Drawings shall include all information required for the construction and quality control of the work. Design Drawings shall include, but not be limited to, the following items unless provided in the Contract Drawings:

(1) A plan view of the structure(s) identifying:

(a) A reference baseline and elevation datum.

(b) The offset from the construction centerline or baseline to the face of the wall at its base at all changes in horizontal alignment.

- (c) Beginning and end station of wall.
 - (d) Soil nail locations.
 - (e) Right-of-way and permanent or temporary construction easement limits, location of all known active and abandoned existing utilities, adjacent structures or other potential interferences. The centerline of any drainage structure or drainage pipe behind, passing through, or passing under the wall.
 - (f) Subsurface exploration locations shown on a plan view of the proposed wall alignment with appropriate reference base lines to fix the locations of the explorations relative to the structure(s).
 - (g) Limit of longest nails.
 - (h) Existing and proposed pile locations.
 - (i) Existing utility locations.
- (2) An elevation view of the structure(s) identifying:
- (a) The elevation at the top of the wall, at all horizontal and vertical break points, and at least every 50 ft along the wall.
 - (b) Elevations at the base of the wall and the top of leveling pads for casting CIP facing (if applicable).
 - (c) Soil-nail elevations, vertical and horizontal spacing, and the location of wall drainage elements and permanent facing expansion/contraction joints (if applicable) along the wall length.
 - (d) Existing and finished grade profiles both behind and in front of the wall.
 - (e) Existing and proposed pile locations.
 - (f) Existing utility locations.
- (3) All necessary cross-section(s) to construct the wall.
- (4) General notes for constructing the soil nails including construction sequencing or other special construction requirements.
- (5) Design parameters and applicable codes.
- (6) Horizontal and vertical curve data affecting the wall and control points, including match lines or other details to relate to wall stationing to centerline stationing.

(7) A listing of the summary of quantities on the elevation drawing of each wall showing the estimated surface area expressed in square feet and other pay items.

(8) Nail wall typical sections including staged excavation lift elevations, wall and excavation face batter, nail spacing and inclination, sizes of nail bars (also referred to as tendons), and corrosion protection details.

(9) Typical details of production and test nails defining the nail length, minimum drill hole diameter, inclination, and test nail bonded and unbonded test lengths.

(10) Details, dimensions, and schedules for all nails, reinforcing steel, wire mesh, bearing plates, headed studs, etc. and/or attachment devices for shotcrete, cast-in-place or prefabricated facings.

(11) Dimensions and schedules of all reinforcing steel including reinforcing bar bending details.

(12) Details and dimensions for wall appurtenances such as barriers, coping, drainage gutters, fences, etc.

(13) Details for constructing walls around drainage facilities.

(14) Details for terminating walls and adjacent slope construction.

(15) Any backfill materials and details.

3. Construction Submittals

A. Construction Plan. At least 30 calendar days before starting the soil nail work, the Contractor shall submit a Construction Plan to the Owner's Engineer that includes the following:

(1) Project start date and proposed detailed soil nail construction sequence.

(2) Drilling and grouting methods and equipment, including the drill hole diameter proposed to achieve the specified nominal pullout resistance values and any variation of these along the wall alignment.

(3) Nail grout mix design, including compressive strength test results (per AASHTO T106/ASTM C109) supplied by a qualified independent testing lab verifying the specified minimum 3-day and 28-day grout compressive strengths. For neat cement grout include specific gravity test results of the fresh grout used for compressive testing.

(4) Nail grout placement procedures and equipment.

(5) Temporary shotcrete materials and methods. Provide the minimum 3-day and 28-day shotcrete compressive strengths.

(6) Soil nail testing methods and equipment setup.

(7) Identification number and certified calibration records for each test jack, pressure gauge, dial gauge, and load cell to be used. Jack and pressure gauge shall be calibrated as a unit. Calibration records shall include the date tested, the device identification number, and the calibration test results, and shall be certified for an accuracy of at least 2 percent of the applied certification loads by a qualified independent testing laboratory within 90 calendar days prior to submittal.

(8) Manufacturer's Certificates of Compliance for materials including: ultimate strength of the tendon, Portland cement, centralizers, bearing plates, epoxy coating, and encapsulation.

(9) The Owner's Engineer shall approve or reject the Contractor's Construction Plan within 15 calendar days of receipt of the submission. Approval of the Construction Plan does not relieve the Contractor of his responsibility for the successful completion of the work.

B. Monitoring Plan. At least 30 calendar days before starting the soil nail work, the Contractor shall submit a Monitoring Plan, if applicable for the project, to the Owner's Engineer for approval. The Owner's Engineer shall approve or reject the Contractor's Monitoring Plan within 14 calendar days of receipt of the submission.

4. Pre-Construction Meeting. A pre-construction meeting may be scheduled by the Engineer and held prior to the start of wall construction. The Engineer, prime Contractor, and soil nail specialty Contractor shall attend the meeting. The excavation Contractor, structure foundation installation Contractor, shotcreting Contractor, and survey Contractor, if different than the prime or soil nail specialty contractor, shall also attend. The pre-construction meeting will be conducted to clarify the construction requirements for the work, to coordinate the construction schedule and activities, and to identify contractual relationships and delineation of responsibilities amongst the prime Contractor and the various Subcontractors – particularly those pertaining to wall excavation, nail installation and testing, excavation and wall alignment survey control, and shotcrete and CIP facing construction. Soil nail wall construction requires excavation in staged lifts and excavation in the vicinity of the wall face requires special care and effort compared to general earthwork excavation.

c. **Definitions.** The following definitions apply to this work:

Alignment Load. The load maintained on a soil nail during testing to assure that the testing equipment remains in proper position, not to exceed 2.5 percent of the maximum test load (VTL or PTL).

Anchorage. The bearing plate, nut, and beveled washer that secure the concrete facing to the soil nail.

Bonded Test Length. The length of the test nail tendon that is bonded to the ground with grout and develops adhesion during testing.

Creep Curve. A semi logarithmic plot of the creep movement versus time, with the units of time plotted on the logarithmic axis.

Creep Movement. The time-dependent movements of the soil nail tendon at a constant load.

Creep Rate. The slope of the creep curve per log cycle of time over the final decade of the observation period.

Design Load. The maximum load anticipated to be applied to the soil nail during its service life. For soil nail walls designed under LRFD, this is expressed as the Factored Design Load (FDL).

Hollow Bar Soil Nail (HBSN). Hollow, steel threaded tendons that are drilled and grouted in a single operation. Grout is injected through the tendon as the drilling proceeds. The grout exits through ports that are located in a sacrificial drill bit, flushes soil cuttings out of the drill hole, and fills the annular space between the tendon and the drill hole.

Soil Nail Grout. Cement grout that is injected into the drilled hole by tremie methods to cover the full length of the soil nail and provide bonding of the soil nail to the surrounding ground.

Maximum Permissible Load. The maximum permissible load is the maximum load that may be applied to the soil nail during any stage of the work. The maximum permissible load is 90 percent of the yield strength for AASHTO M31/ASTM A615 Grade 60 through Grade 100 bars, or 80 percent of the ultimate strength for ASTM A722 Grade 150 bars.

Maximum Test Load. The largest load applied to the soil nail when stressing during a load test. This is defined as the Verification Test Load (VTL) for pre-production Verification Tests of sacrificial test nails, and this is defined as the Proof Test Load (PTL) for Proof Tests of production nails.

Proof Test. A soil nail load test that requires the application of defined incremental loads to the test soil nail up to the PTL and unloading of the test soil nail. The movement of the nail tendon is recorded at each load increment. At the PTL, the applied load is maintained constant for a defined time period while creep movement is recorded.

Unbonded Test Length. The length of the test nail tendon that is not bonded to the ground with grout and is free to elongate during testing.

Verification Test. This load test requires the application of defined incremental loads to the test soil nail up to the VTL and unloading of the test soil nail. The movement of the nail tendon is recorded at each loading and unloading increment. At 0.75 VTL, the applied load is maintained constant for a defined time period while creep movement is recorded.

d. Materials.

1. Soil Nail Tendon: AASHTO M31/ASTM A615 for Grade 60, 75, 80, or 100, or ASTM A722 for Grade 150. Deformed bar, continuous or spliced using approved bar couplers, new, straight, undamaged, bare or epoxy coated or encapsulated as shown on the Plans. Provide threading for a minimum of 6 inches on the wall anchorage end to allow proper attachment of bearing plate and nut. Threading may be continuous spiral deformed ribbing provided by the bar deformations (e.g. Dywidag or Williams continuous thread bars) or may

be cut into a reinforcing bar. If threads are cut into a reinforcing bar, provide the next larger bar number designation at no additional cost.

A. Hollow Bar Soil Nail (HBSN). Fully threaded, hollow steel tubing used as the drilling steel, grout transfer medium, and the reinforcing element of the soil nail. Tendons shall have a yield tensile strength between 60 ksi and 90 ksi. Tendons shall be new, straight, undamaged, bare, epoxy coated, galvanized, or encapsulated as shown on the Plans. The length of the threaded portion of the bar at the wall anchorage shall be as needed to allow proper attachment of the bearing plate and nut. Hollow bars shall meet the following requirements:

(1) The hollow bar shall be of a fine-grained structural steel.

(2) The ductility of the steel or the uniform elongation without necking shall be $Agt \geq 5\%$.

(3) The minimum Charpy impact resistance shall be 40 Joules at -20°C per ASTM E23.

B. HBSN Drill Bits. Drill bits shall be selected based on the subsurface information on site and the minimum grout column required in the design. Bits require a minimum of two ports to allow grout to exit the system. Additional ports (with smaller diameters) can be used to increase grout pressure and hole diameter.

2. Bar Couplers. Couplers shall develop the full ultimate tensile strength of the bar as certified by the manufacturer. Corrosion protection to the coupler shall be provided by means of a heat shrink sleeve or heavy duty cold applied coating tape.

3. HBSN Couplers. Couplers shall develop the nominal tensile capacity of the hollow bar as certified by the manufacturer and shall have a seal or a similar mechanism to ensure minimum grout loss through them. Couplers shall have a means of transferring the percussive forces when drilling, and tensile/compressive cyclic-loading forces when in service.

A. Centralizers. Centralizers shall be fabricated from Schedule 40 PVC pipe or tube, steel or other material not detrimental to the nail steel (wood shall not be used). They shall position the soil nails within 1 inch of the center of the drilled hole so as to provide a minimum required grout cover of 1 inch, allow tremie pipe insertion to the bottom of the drill hole, and allow grout to freely flow up the drill hole. Position centralizers along the soil nail so their maximum center-to-center spacing does not exceed 10 feet. Also locate centralizers within 1.5 feet from the top and bottom of the drill hole.

4. Grout. The cement for the grout shall be Type I, Type II, Type III, or Type V conforming to ASTM C150. The grout shall consist of a neat cement or sand/cement mixture with a minimum 3-day compressive strength of 1,500 psi and a minimum 28-day compressive strength of 3,000 psi per AASHTO T106/ASTM C109. Fine aggregate for the grout shall be per AASHTO M6/ASTM C33. The specific gravity of the grout shall range between 1.8 and 1.9.

A. HBSN Grout. The specific gravity of the grout used for drilling and installing the hollow bars may be lower than the final grout and range from 1.4 to 1.6. After the bar is installed to the desired depth, the final grout mixture shall be pumped through the hollow bar, and the nail is considered complete when the heavier mixture returns to the excavation face, signaling that the lighter drilling grout was flushed from the hole and that all drilling spoils have also been removed.

B. HBSN Grout Mixer and Pump. A high shear colloidal mixer with separate holding tank and water and cement dosing system should be used to ensure continuous grouting independent from mixing. Pumps should have flow rates of at least 15 gal/minute for the smaller diameter bars, and 45 gal/minute for the larger diameter bars (2 in. and above) shall be provided. A minimum of 250 psi pressure capability for sand and gravel and 1,500 psi capability should be available in clays and silts. To record the grout volume and pressure, an automated monitoring system may be used.

5. Admixtures. AASHTO M194/ASTM C494. Admixtures which control bleed, improve flowability, reduce water content and retard set may be used in the grout subject to review and acceptance by the Engineer. Accelerators are not permitted. Expansive admixtures may only be used in grout used for filling sealed encapsulations. Admixtures shall be compatible with the grout and mixed in accordance with the manufacturer's recommendations.

6. Encapsulation. Minimum 0.04-inch-thick corrugated HDPE tube conforming to AASHTO M252 or corrugated PVC tube conforming to ASTM D1784, Class 13464-B. Encapsulation shall provide at least 0.2 inches of grout cover over the nail bar. Factory fabrication of the encapsulation is preferred. Upon the Engineer's acceptance, the encapsulation may be field fabricated if done in strict accordance with the manufacturer's recommendations. The encapsulation shall be:

- A. Resistant to chemical attack from aggressive environments, grout, or grease.
- B. Fabricated from materials nondetrimental to the prestressing steel.
- C. Capable of withstanding abrasion, impact, and bending during handling and installation.
- D. Free of flaws which would permit water to enter into the soil nail system.
- E. Capable of transferring stresses from the grout inside the capsule to the grout outside the capsule.
- F. Resistant to ultraviolet light.

7. Film Protection. Polyethylene film per AASHTO M171.

8. Fusion Bonded Epoxy Coating. ASTM A775. Minimum 0.012 inch thickness electrostatically applied. Bend test requirements are waived. Coating at the wall anchorage end of epoxy-coated bars may be omitted over the length provided for threading the nut against the bearing plate.

9. Bearing Plate. The bearing plate shall conform to MDOT 2020 Standard Specifications for Construction Section 906.04 Structural Steel.

10. Anchorage. The steel nut and beveled washer used in the anchorage shall be the standard product of the bar manufacturer and conform to the requirements of MDOT 2020 Standard Specifications for Construction Section 906.07 High-Strength Steel Bolts, Nuts, and Washers for Structural Joints. The nut shall be hexagonal and fitted with beveled washer or spherical seat to provide uniform bearing. The anchorage shall be capable of transferring 100 percent of the guaranteed ultimate tensile strength (GUTS) from the soil nail tendon to the bearing plate.

11. Shear Connectors. Conform to MDOT 2020 Standard Specifications for Construction Section 906.09 Shear Developers.

12. Welded Wire Fabric. Conform to MDOT 2020 Standard Specifications for Construction Section 905.06 Steel-Welded Wire Reinforcement.

13. Reinforcing Steel. Conform to MDOT 2020 Standard Specifications for Construction Section 905 Steel Reinforcement.

14. Prefabricated Geocomposite Drain (PGD). Conform to MDOT 2020 Standard Specifications for Construction Section 910.05 Drainage Geocomposites.

15. Drain Pipe. Conform to MDOT 2020 Standard Specifications for Construction Section 909.07 Pipe for Underdrains.

16. Low Strength Mortar (Flowable Fill). Supply non-structural flowable fill consisting of a mixture of Portland cement, fly ash, sand (2NS) and water. Use materials in accordance with the standard specifications except as modified by this special provision. All non-structural flowable fill once cured is intended to be removable using conventional mechanical excavation methods.

Use either Type I or IA Portland cement in accordance with section 901 of the MDOT 2020 Standard Specifications for Construction and Class F or C fly ash as specified by ASTM C618 except that there is no limit on loss on ignition.

Produce a mix of cement, fly ash, sand, and water in the following proportions.

Portland Cement	50 pounds per cubic yard (lb/cyd)
Fly Ash	500 lb/cyd
Sand	2850 lb/cyd
Water	376 lb/cyd, approximately (sufficient to produce desired flowability)

17. Materials Handling and Storage. Store cement to prevent moisture degradation and partial hydration. Do not use cement that has become caked or lumpy. Store aggregates so that segregation and inclusion of foreign materials are prevented. Do not use the bottom 6 inches of aggregate piles in contact with the ground.

Store steel reinforcement on supports to keep the steel from contacting the ground. Damage to the nail steel as a result of abrasion, cuts, nicks, welds, and weld splatter shall be cause

for rejection. Do not ground welding leads to nail bars. Protect nail steel from dirt, rust, and other deleterious substances prior to installation. Heavy corrosion or pitting of nails shall be cause for rejection. Light rust that has not resulted in pitting is acceptable. Place protective wrap over the anchorage end of nail bars, to which bearing plates and nuts will be attached, to protect during handling, installation, grouting and shotcreting.

Do not move or transport encapsulated nails until the encapsulation grout has reached sufficient strength to resist damage during handling. Handle encapsulated nails in a manner that will prevent large deflections, distortions or damage. Repair encapsulated nails that are damaged or defective in accordance with the manufacturer's recommendations or remove them from the site.

Handle and store epoxy coated bars in a way that will prevent them from being damaged beyond what is permitted by ASTM 3963. Repair damaged epoxy coating in accordance with ASTM A775 and the coater's recommendations using an epoxy field repair kit approved by the epoxy manufacturer. Repaired areas shall have a minimum 0.012-inch coating thickness.

e. Construction Requirements

1. Storage. Tendons shall be stored and handled in a manner to avoid damage or corrosion. Tendons exhibiting abrasions, cuts, welds, weld splatter, corrosion, or pitting shall be replaced. Bars exhibiting damage to encapsulation or epoxy coating shall be repaired or replaced at no additional cost.

2. Excavation. The height of exposed unsupported final excavation face cut shall be established by the Contractor and shall not exceed the vertical nail spacing plus the required reinforcing lap or the short-term stand-up height of the ground, whichever is less.

Excavation to the final wall excavation line and shotcrete application shall be completed in the same work shift, unless otherwise approved by the Owner's Engineer.

Nail grout and shotcrete shall achieve sufficient strength before excavating the next underlying lift.

3. Soil Nail Installation. Drill holes for the soil nails shall be drilled at the locations, elevations, orientations, and lengths shown on the approved Design Drawings. The drilling equipment and methods shall be selected by Contractor to be suitable for the ground conditions and in accordance with the accepted installation methods submitted by the Contractor.

4. Protection of Adjacent Structures. Structures located within a horizontal distance equal to 30 feet shall be monitored for vertical and horizontal movement in a manner approved by the Engineer within an accuracy of 0.1 in. Monitoring of adjacent structures will be done by an independent party who must be approved by the Engineer and will work under the Contractor.

A monitoring plan, including the locations of measurement points and the frequency of recording measurements shall be submitted to the Engineer as part of the Construction Plan. Monitoring shall begin with a base-line measurement recorded no less than 10

calendar days prior to construction of the wall. In addition to monitoring for movement, the condition of the adjacent structure, including cracks and crack widths, before and after construction of the wall, shall be documented by visual inspection, photographs, and/or video. Structures owned by Owner shall be monitored for movement for a period of 180 days after completion of the work or as long as this requirement is called for on the Contract Drawings, whichever is longer.

As soon as the movements measured exceed action limit thresholds established for adjacent structures, not to exceed 0.15 inches and 0.25 inches for vertical and horizontal movement, respectively, the Contractor shall notify the Engineer.

As soon as the movements measured exceed maximum thresholds established for adjacent structures, not to exceed 0.3 inches and 0.5 inches for vertical and horizontal movement, respectively, the Contractor shall stop construction, notify the Engineer, and take any immediate remedial measures required to prevent damage to the adjacent structures. The Contractor and the Engineer shall then review the current installation procedures. If revisions to the installation procedures are deemed necessary, the Contractor shall submit a revised installation plan for approval by the Engineer before resuming work.

5. Soil Nail Testing

A. Tests. The Contractor shall perform both verification and proof testing of designated test soil nails. Verification tests on sacrificial test nails shall be conducted at locations shown on the approved Design Drawings. Proof tests on production nails shall be conducted at locations selected by the Owner's Engineer. Testing of any nail shall not be performed until the nail grout and shotcrete facing have cured for at least 72 hours or attained at least their specified 3-day compressive strength. The Contractor shall not apply loads greater than 80 percent of the minimum guaranteed ultimate tensile strength of the tendon for Grade 150 bars or 90 percent of the minimum guaranteed ultimate tensile strength of the tendon for Grade 60 or 75 bars. Preliminary results shall be submitted to the Owner and/or Owner's Engineer within 24 hours of the test completion. A full report containing test load results shall be submitted to the Owner and/or Owner's Engineer within 5 working days of the test completion.

Refer to FHWA Geotechnical Circular No. 7 "Soil Nail Walls," Chapter 9, for detailed guidance on soil nail testing.

B. Verification Testing. The Contractor shall perform a number of verification tests on sacrificial soil nails as established in the Design Drawings. Verification testing shall be conducted prior to installation of production soil nails on sacrificial soil nails to confirm the appropriateness of the Contractor's drilling and installation methods and verify the required nail pullout resistance.

The maximum test load in verification tests (VTL) shall be calculated based on as-built bonded lengths per FHWA Geotechnical Circular No. 7 "Soil Nail Walls," Chapter 9. The Load Schedule for Verification Testing shall comply with FHWA Geotechnical Circular No. 7 "Soil Nail Walls," Chapter 9.

C. Proof Testing. Successful proof testing shall be demonstrated on at least 5 percent of production soil nails in each nail row but no less than one per nail row. The

Owner's Engineer shall determine the locations and number of proof tests prior to nail installation in each row. For bidding purposes, the Contractor shall include a proof testing quantity equivalent to testing two production soil nails per row but no less than 5 percent of the total quantity of production soil nails. Verification tests shall not be counted towards the minimum of 5 percent production nails.

The maximum test load in proof tests (PTL) shall be calculated based on as-built bonded lengths per FHWA Geotechnical Circular No. 7 "Soil Nail Walls," Chapter 9. The Load Schedule for Proof Testing shall comply with FHWA Geotechnical Circular No. 7 "Soil Nail Walls," Chapter 9.

6. Acceptance Criteria

A. Verification Tests. Considering that pullout is defined as the load at which attempts to further increase the test load increments simply result in continued movement of the tested nail, a test nail shall be considered acceptable when all of the following criteria are met.

(1) The total creep movement is less than 0.08 in. between the 6- and 60-minute readings, and the creep rate is linear or decreasing throughout the creep test load hold period.

(2) The total movement (AVTL) measured at VTL exceeds 80 percent of the theoretical elastic elongation of the unbonded length of the test nail, as defined in FHWA Geotechnical Circular No. 7 "Soil Nail Walls," Chapter 9.

(3) Pullout does not occur before achieving $1.0 \times VTL$.

B. Proof Tests

(1) The creep movement between the 1- and the 10-minute readings is less than 0.04 in.

(2) In cases when the creep movement between the 1- and the 10-minute readings is greater than 0.04 in., the creep movement between the 6- and the 60-minute readings is less than 0.08 in., and the creep rate is linear or decreasing throughout the creep test load hold period.

(3) The total soil nail movement (APTL) measured at PTL exceeds 80 percent of the theoretical elastic elongation of the unbonded length, as defined in FHWA Geotechnical Circular No. 7 "Soil Nail Walls," Chapter 9.

(4) Pullout does not occur before the test load is $1.0 \times PTL$.

(5) The temporary unbonded test length in proof tests is successfully maintained for subsequent satisfactory grouting. If the unbonded test length of production proof test nails cannot be satisfactorily grouted after testing, the proof test nail shall become sacrificial and shall be replaced with an additional production nail installed at no additional cost to the Owner.

7. Rejection of Test Soil Nails

A. Verification Test Soil Nails. The Owner's Engineer will evaluate the results of each verification test. Installation methods that do not satisfy the nail testing requirements shall be rejected. The Contractor shall propose alternative methods for review by the Owner's Engineer and shall install replacement verification test nails. Replacement test nails shall be installed and tested at no additional cost.

8. Proof Test Soil Nails. For proof test nails, the Owner's Engineer may require the Contractor to replace some or all of the installed production nails between a failed proof test soil nail and the adjacent passing proof test nail. Alternatively, the Owner's Engineer may require the installation and testing of additional proof test nails to verify that adjacent previously installed production nails have sufficient nominal pullout resistance. Installation and testing of additional proof test nails or installation of additional or modified nails as a result of proof test nail failure(s) shall be at no additional cost.

9. Wall Drainage System (if applicable)

A. General. Provide all elements of a soil nail wall drainage system, if applicable, consisting of geocomposite drain strips, PVC connection pipes, soil nail wall footing drains, and weepholes, or similar, that will provide a continuous path for water flow and prevent pore water pressure from building up behind the wall.

B. Geocomposite Strip Drain. Provide geocomposite strip drain or similar to prevent pore water pressure from building up behind the wall and to convey the collected groundwater to the base of the wall behind the wall. Geocomposite strip drain shall have sufficient capacity to convey all drained groundwater, and sufficient resistance to prevent collapse during construction and operation.

C. Footing Drains. Footing drains shall collect groundwater from the drainage system and convey it to the existing ditch at the toe of the slope.

10. Shotcrete Facing

A. General. Initial shotcrete facing and final shotcrete facing shall be provided as required and as shown on the approved Design Drawings.

B. Shotcrete Facing Tolerances. Construction tolerances for the shotcrete facing from plan location and plan dimensions shall be as follows:

Table 1: Construction Tolerances for Shotcrete Facing

Item	Tolerance
Horizontal location of welded wire mesh, reinforcing bars, and headed studs	3/8 in.
Location of headed-studs on bearing plate	1/4 in.
Spacing between reinforcing bars	1 in.
Reinforcing lap	1 in.
Thickness of shotcrete, if troweled screeded	9/16 in.
Thickness of shotcrete, if left as shot	1-1/8 in.
Planeness of finish face surface, gap under 10-ft straightedge, if troweled or screeded	9/16 in.
Planeness of finish face surface, gap under 10-ft straightedge, if left as shot	1-1/8 in.
Nail head bearing plate deviation from parallel to wall face	10 degrees

11. Reinforcing Steel. The Contractor shall submit all order lists and reinforcement bending diagrams to the Owner's Engineer, and shall fabricate reinforcing steel, ship and protect material, place, fasten, and splice reinforcing steel as shown on the approved Design Drawings.

12. Structural Concrete. The Contractor shall design the concrete mix; store, handle, batch, and mix material; and deliver concrete; provide quality control; and construct concrete facing to meet the resistance requirements shown on the approved Design Drawings.

13. Corrosion Protection. Soil nails and soil nail head components shall be protected against corrosion consistent with the ground and groundwater conditions at the site with a minimum class A corrosion protection unless noted otherwise on the Contract Drawings.

f. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

Pay Item	Pay Unit
Soil Nails for Slope Stabilization	Square Feet

1. **Soil Nails for Slope Stabilization** shall be measured by the square foot. Measurement will be made on the face of the finished slope of the stabilized area as accepted by the Engineer in the final work. **Soil Nails for Slope Stabilization** shall include all excavation and backfill, all materials and installation, all testing and monitoring, as described on Design Plans and this Specification.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
SLOPE RESTORATION, NON-FREEWAY

RSD:JLB

1 of 4

APPR:DMG:NJM:08-25-21

a. Description. This work consists of preparing all lawns and slopes on non-freeway projects designated for slope restoration on the plans or as directed by the Engineer and applying topsoil, fertilizer, seed, mulch with mulch anchor, mulch blanket, high velocity mulch blanket, permanent turf reinforcement mat (TRM), bonded fiber matrix (BFM), or modified mulch blanket to those areas. Ensure turf establishment is in accordance with section 816 and 917 of the Standard Specifications for Construction and Standard Plan R-100 Series, except as modified herein or otherwise directed by the Engineer.

b. Materials. The materials and application rates specified in sections 816 and 917 of the Standard Specifications for Construction apply unless modified by this special provision or otherwise directed by the Engineer. Furnish the following materials on this project:

1. Seeding mixture as called for on the plans.
2. Chemical fertilizer nutrient, Class A.
3. Topsoil either furnished or salvaged. Remove any stones greater than 1/2 inch in diameter or other debris from all topsoil.
4. Mulching material.
5. Permanent Turf Reinforcement Mat (TRM) must be 100 percent synthetic and consist of 100 percent UV stabilized polyolefin fibers sewn between two layers of black UV stabilized polypropylene netting with polyolefin thread. The TRM must meet the following "minimum average roll value" requirements:

<u>Property</u>	<u>Test Method</u>	<u>Requirement</u>
Mass/Unit Area	ASTM D6566	10 oz/syd
Ultraviolet Stability @ 1000 hrs	ASTM D4355/D4355M	80 percent
Tensile Strength (MD)	ASTM D6818	165 lbs/ft

Acceptance. Supply a General Certification for the permanent TRM from one of the following manufacturers or approved equal:

Recyclex TRM	American Excelsior Co., Arlington, TX	(800) 777-7645
P300 TRM	North American Green, Poseyville, IN	(800) 772-2040
Landlok 450 TRM	Propex, Inc., Chattanooga, TN	(800) 621-1273
Excel PP5-10 TRM	Western Excelsior, Evansville, IN	(866) 540-9810
Vmax P550 TRM	North American Green, Poseyville, IN	(800) 772-2040

6. Bonded Fiber Matrix (BFM). Furnish a product from the list below or an approved

equal.

Soil Guard	Mat Inc., Floodwood, MN	(888) 477-3028
HydroStraw BFM	HydroStraw, LLC, Rockford, WA	(800) 545-1755
HydraMax	North American Green, Poseyville, IN	(800) 772-2040
Bindex BFM	American Excelsior Co., Arlington, TX	(800) 777-7645
ProMatrix EFM	Profile Products LLC, Buffalo Grove, IN	(800) 508-8681

If multiple grades of the selected product are available, use the grade appropriate for the application as approved by the Engineer.

Approved equal BFM must consist of long strand, virgin wood fibers (90 percent by weight) bound together by a pre-blended, high-strength polymer adhesive (10 percent by weight). The virgin wood fibers will be thermally refined from clean whole wood chips. Ensure the organic binders are a high-viscosity colloidal polysaccharide tackifier with activating agents to render the resulting matrix insoluble upon drying.

7. Modified Mulch Blanket. Where modified mulch blanket is required, provide an excelsior mulch blanket free of chemical additives. Ensure the netting thread is 100 percent biodegradable and manufactured with non-plastic materials such as jute, sisal, or coir fiber. Degradable, photodegradable, UV-degradable, oxo-degradable, or oxo-biodegradable plastic netting including polypropylene, nylon, polyethylene, and polyester is not an acceptable alternative. All netting materials must have a loose weave design with movable junctions between the machine and cross-machine direction twines that move independently and reduce the potential for wildlife entanglement.

c. Construction. Ensure construction methods are in accordance with subsection 816.03 of the Standard Specifications for Construction. Begin this work as soon as possible after final grading of the areas designated for slope restoration but no later than the maximum time frames specified in subsection 208.03 of the Standard Specifications for Construction. It may be necessary, as directed by the Engineer, to place materials by hand.

Shape, compact, and ensure all areas to be seeded are weed-free prior to placing topsoil. Place topsoil to the minimum depth indicated above to meet proposed finished grade. If the area being restored requires more than the minimum depth of topsoil to meet finished grade, fill this additional depth using topsoil or, at the Contractor's option, embankment. Furnishing and placing this additional material is included in this item of work.

Ensure topsoil is weed and weed seed free and friable prior to placing seed. Remove any stones greater than 1/2-inch in diameter or other debris. Apply seed mixture and fertilizer to prepared soil surface. Incorporate seed into top 1/2-inch of topsoil.

Apply mulch at a rate of two tons per acre. Place mulch anchoring over the mulch at a rate specified in subsection 816.03.F of the Standard Specifications for Construction. Place mulch blanket and high velocity mulch blanket in accordance with subsection 816.03.G of the Standard Specifications for Construction and Standard Plan R-100 Series.

Install areas constructed with the TRM on prepared (seeded) grades as shown on the plans in accordance with the manufacturer's published installation guidelines. Anchor the top edge of the TRM in a minimum six-inch deep trench. Operation of equipment on the slope is prohibited after placement of the TRM. No credit for splices, overlaps, tucks, or wasted material will be made.

Mix the BFM and organic binders thoroughly at a rate of 40 pounds for each 100 gallons of water or as otherwise recommended by the manufacturer. Hydraulically apply the BFM slurry in successive layers, from two or more directions, to fully cover 100 percent of the soil surface. Ensure the minimum application rate is at least 3000 pounds of BFM for each acre or otherwise apply in accordance with the manufacturer’s recommendations as appropriate depending on site conditions.

Do not apply BFM on saturated soils or immediately before, during, or after rainfall.

Install modified mulch blanket in accordance with the manufacturer’s published guidelines and as directed by the Engineer.

If an area washes out after this work has been properly completed and approved by the Engineer, make the required corrections to prevent future washouts and replace the topsoil, fertilizer, seed, and mulch treatment. This replacement will be paid for as additional work using the applicable contract pay items.

If an area washes out for reasons attributable to the Contractor’s activity or failure to take proper precautions, replacement will be at no cost to the contract.

The Engineer will inspect the seeded turf to ensure it is well-established, in a vigorous growing condition, and contains the species called for in the seeding mixture.

If the seeded turf is not well-established at the end of the first growing season, the Contractor is responsible to re-seed until the turf is well established and approved by the Engineer.

Provide weed control, if weeds are determined by the Engineer to cover more than 10 percent of the total area of slope restoration, in accordance with subsection 816.03.I of the Standard Specifications for Construction. Weed control will be at no additional cost to the contract.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

Pay Item	Pay Unit
Slope Restoration, Non-Freeway, Type __	Square Yard

1. Place **Slope Restoration, Non-Freeway, Type A** in all areas not described in the other types of slope restoration and will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type A** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; Mulch; and Mulch Anchoring.

2. Place **Slope Restoration, Non-Freeway, Type B** parallel (8 feet minimum) to the edge of the roadway, in areas that have a 1 on 3 slope and in any ditch with a grade less than 1.5 percent, as shown on the plans, or as directed by the Engineer. **Slope Restoration, Non-Freeway, Type B** will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type B** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Mulch Blanket.

3. Place **Slope Restoration, Non-Freeway, Type C** in areas that have a 1 on 2 slope, any ditch with a grade of 1.5 percent to 3 percent as shown on the plans, or as directed by the Engineer. **Slope Restoration, Non-Freeway, Type C** will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type C** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Mulch Blanket, High Velocity.

4. Place **Slope Restoration, Non-Freeway, Type D** in areas that have a slope steeper than 1 on 2, any ditch with a grade steeper than 3 percent as shown on the plans, or as directed by the Engineer. **Slope Restoration, Non-Freeway, Type D** will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type D** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Turf Reinforcement Mat.

5. Place **Slope Restoration, Non-Freeway, Type E** as shown on the plans, or as directed by the Engineer and measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type E** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Bonded Fiber Matrix.

6. Place **Slope Restoration, Non-Freeway, Type F** as shown on the plans, or as directed by the Engineer and measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type F** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and modified Mulch Blanket.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
STRUCTURE SURVEY DURING CONSTRUCTION

STR:BMW

1 of 4

APPR:KCK:JAB:04-21-22
FHWA:APPR:05-05-22

a. Description. This work consists of obtaining elevation observations along existing and proposed beams or girders at the stages of construction set forth in this special provision. Complete all work in accordance with section 824 of the Standard Specifications for Construction, except as modified herein.

Submit the qualifications of the survey crew chief used to complete this work for review and approval by the Engineer in accordance with subsection 824.01 of the Standard Specifications for Construction.

b. Materials. None specified.

c. Construction. Witness horizontal control points in accordance with subsection 824.03.A of the Standard Specifications for Construction and verify plan benchmarks and establish new benchmarks in accordance with subsection 824.03.B of the Standard Specifications for Construction prior to starting work.

Furnish the Engineer with elevation observations at the same points along the existing and proposed beams or girders as the bottom of slab and screed point locations included on the plans and at the stages of construction listed below. Measure the elevations requested to an accuracy of 0.01 feet. Furnish the information using the Bridge Elevation Table spreadsheet included in the Reference Information Documents (RID).

1. Deck Replacement Projects.

A. Elevation observations along the bottom of the bottom flange of the existing beams or girders prior to the removal of any of the existing superstructure and without any live load or materials or equipment stored on top of the existing superstructure.

As an alternative to bottom flange elevations, the Contractor may elect to remove portions of the deck to permit access to obtain the required elevations on the top flange. Deck concrete removal is limited to an area with length and width not exceeding the smaller of the flange width or 18 inches, at each survey location. Ensure access is sufficient to positively identify the top of the beam flange and to mark the beam at each survey location to ensure repeatability during successive stages. Core drilling is prohibited.

B. Elevation observations along the top of the top flange or bottom of the bottom flange of the existing beams or girders after the existing bridge deck has been removed and prior to installing forms or reinforcement. Include information regarding any false decking and/or fascia walkways in place. Submit to the Engineer and obtain approval prior to beginning installation of deck formwork.

C. Elevation observations along the top of the top flange or bottom of the bottom flange of the existing beams or girders after installing the forms and reinforcement and prior to placing the superstructure concrete. Include formwork information.

D. Elevation observations along the bottom of the bottom flange of the existing beams or girders after the proposed superstructure is complete and without any live load or materials or equipment stored on top of the proposed superstructure. Furnish these elevations no more than 7 calendar days after completing placement of all superstructure concrete, including deck slab, sidewalks, and concrete barriers.

2. Projects with a New Prestressed Concrete Superstructure.

A. Obtain the initial camber measurement and prestressing force release date from the precast concrete fabricator and submit along with item B, of this subsection.

B. Elevation observations relative to a local datum, with an elevation of 100.00 feet at one end of the proposed prestressed concrete beam, along the top of the proposed beams while they are still at the precaster's facility as soon after strand release as possible. Coordinate access to the precaster's facility. Measure the height of the beam at the point of each elevation observation and furnish this information to the Engineer. Complete this work within 14 days of release of prestressing force. Indicate the distance from the end of each beam to the support location at the time elevations are surveyed.

Prior to conducting any data collection/survey work at a precaster's facility furnish the precaster copies of completed certificates of insurance proving the workers carry Workers' Compensation Insurance and General Liability Insurance.

C. Elevation observations along the top of the proposed prestressed concrete beams after they have been erected on the abutments and piers and prior to installing forms or reinforcement. Include information regarding any false decking and/or fascia walkways in place.

Submit items A, B and C to the Engineer and obtain approval prior to beginning installation of deck formwork.

D. Elevation observations along the top of the top flange or bottom of the bottom flange of the proposed prestressed concrete beams after installing forms and reinforcement and prior to placing the superstructure concrete. Include formwork information.

E. Elevation observations along the bottom of the bottom flange of the proposed prestressed concrete beams after the proposed superstructure is complete and without any live load or materials or equipment stored on top of the proposed superstructure. Furnish these elevations no more than 7 calendar days after completing placement of the superstructure concrete, including deck slab, sidewalks, and concrete barriers.

3. Projects with a New Steel Superstructure.

A. Elevation observations along the top and bottom of the proposed steel beams or girders after they have been erected on the abutments and piers and prior to installing

forms or reinforcement. Height measurements may be utilized to calculate bottom elevations. Compare heights to plan dimensions and report any discrepancies. Include information regarding any false decking and/or fascia walkways in place. Submit to the Engineer and obtain approval prior to beginning installation of deck formwork.

B. Elevation observations along the top of the top flange or bottom of the bottom flange of the proposed beams or girders after installing the forms and reinforcement and prior to placing the superstructure concrete. Include formwork information.

C. Elevation observations along the bottom of the bottom flange of the proposed beams or girders after the proposed superstructure is complete and without any live load or materials or equipment stored on top of the proposed superstructure. Furnish these elevations no more than 7 calendar days after completing placement of the superstructure concrete.

4. Superstructure Widening Projects. Furnish the information specified above for deck replacement projects for the existing beams or girders that will remain in place. Furnish the information specified above for projects with a new prestressed concrete superstructure or for projects with a new steel superstructure for the proposed beams or girders.

5. Submit the following information with the elevation observations for all projects:

A. False Decking.

(1) Material type(s).

(2) Material dimension(s).

(3) False decking layout.

B. Formwork.

(1) Material type(s).

(2) Material dimension(s).

(3) Formwork layout.

For elevation observations required prior to placement of forms or reinforcement, submit a complete set of elevations and other required information to the Engineer for review and approval. The Engineer will have up to 7 calendar days to review for approval, and may elect to adjust the proposed bottom of slab and screed elevations following a review of the documentation. Do not place any deck formwork prior to Engineer review and approval of the required elevation observations.

d. Measurement and Payment. The completed work, as described, will be measured as a lump sum and paid for at the contract price using the following pay item:

Pay Item

Pay Unit

Structure Survey During Construction (Structure Identification) Lump Sum

Structure Survey During Construction (Structure Identification) includes all costs associated with access, coordination, traffic control, collection, and distribution of the surveyed measurements required by this special provision.

Any additional work associated with deck concrete removal to access the top flange for elevations prior to deck removal will not be paid separately but is included in payment for the deck removal pay item.

The pay item will include partial payments using the following milestone schedule.

1. Approval of all items required prior to placement of forms and reinforcement: 50 percent.
2. Acceptance of final grades after completion of superstructure concrete placement: 50 percent.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
INDUSTRIAL BY-PRODUCTS AND BENEFICIAL RE-USE

HYD:HLZ

1 of 1

APPR:JJG:JFS:04-02-20
FHWA:APPR:04-03-20

a. Description. For this project, regardless of the application, the use of industrial by-products covered in 2014 PA 178 is prohibited unless the use and application of a particular material is covered elsewhere in the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
PORTLAND CEMENT (TYPE IL)

CFS:JFS

1 of 2

APPR:TES:TEB:12-14-21
FHWA:APPR:12-16-21

a. Description. The Contractor may substitute Type IL Portland cement in lieu of Type I Portland cement for concrete mixtures and other applications where Type I Portland cement is specified, provided documentation showing specification compliance is provided as described herein.

The Contractor must provide the Engineer a minimum of 14 calendar days prior notification of their intent to substitute Type IL Portland cement in lieu of Type I Portland cement for the project.

b. Materials. Furnish Type IL Portland cement in accordance with section 901 of the Standard Specifications for Construction meeting the chemical and physical requirements specified in *ASTM C595/C595M, Standard Specifications for Blended Hydraulic Cements*. Ensure the Type IL Portland cement proposed for substitution is from the same Approved Manufacturer as the Type I Portland cement in the approved JMF.

c. Construction. At least 7 days prior to concrete production, the concrete producer must provide test data (specified below) generated from a four cubic yard (minimum) trial batch of concrete using Type IL Portland cement for the Engineer's review and approval. The trial batch must represent a current approved JMF for either a standard MDOT Grade 3500, Grade 3500HP, Grade 4500, or Grade 4500HP concrete mixture produced using Type I Portland cement, as described in section 1004 of the Standard Specifications for Construction. Ensure the materials and mixture proportions for the Type IL JMF are the same as those documented in the above mentioned JMF using Type I Portland cement. Minor adjustments to chemical admixture dosages are permitted in efforts to achieve the specified fresh concrete properties. Trial batch compliance for applications other than Portland cement concrete mixtures will be in accordance with the contract.

1. Fresh Concrete Properties.
 - A. Concrete temperature,
 - B. Air content of fresh concrete, and
 - C. Slump.
2. Hardened Concrete Properties.
 - A. 7-day compressive strength.

The Engineer will review the trial batch test data to determine if the fresh and hardened concrete properties of the Type IL JMF meet specification requirements for the respective MDOT Grade of

concrete represented by the trial batch. If the Engineer determines that the trial batch test data are in conformance with specification requirements, then the Type IL Portland cement will be permitted to be substituted in lieu of the Type I Portland cement for all approved concrete mixtures generated at the concrete production facility for the project. If the Engineer determines that the trial batch test data do not meet specification requirements for the respective MDOT Grade of concrete, the Contractor will not be permitted to substitute Type IL Portland cement in lieu of Type I Portland cement. Mix design and JMF documentation for concrete mixtures using Type IL Portland cement will then be required in accordance with subsection 1003.03.C of the Standard Specifications for Construction or the contract, where applicable.

Once Type IL Portland cement is approved for use on the project, reinstatement of Type I Portland cement into the JMF is not permitted. Substitution of other material types or sources, including admixtures, as documented in the initial Type I JMF is not permitted.

The Engineer will complete field sampling and testing for all production lots containing Type I Portland cement JMF prior to respective Type IL Portland cement substitution. Do not include concrete mixtures containing Type I and Type IL Portland cement types in the same production lot.

d. Acceptance. The Contractor may substitute Type IL Portland cement in lieu of Type I Portland cement for the project with no additional laboratory trial batch requirements, as described in subsection 1003.03.C.2.a of the Standard Specifications for Construction, provided the Engineer has reviewed the concrete producer's test data generated from a four cubic yard (minimum) trial batch of concrete, described above, and has determined that the fresh and hardened concrete properties of the Type IL JMF meet specification requirements for the respective MDOT Grade of concrete represented by the trial batch.

e. Measurement and Payment. The work included in this special provision will not be paid for separately and is included in other pay items in the contract.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
AGGREGATE, 46G

CFS:JJG

1 of 1

APPR:SAG:DMG:02-15-22
FHWA:APPR:02-16-22

Delete the last row of Table 902-2 in subsection 902 of the Standard Specifications for Construction in its entirety and replace with the following:

Open-graded aggregates	46G	80	45	—	—	—
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MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
MICRONIZED COPPER WATER BASED WOOD PRESERVATIVE SYSTEMS

STR:SCK

1 of 1

APPR:HLZ:POJ:04-13-20
FHWA:APPR:04-13-20

a. Description. Micronized copper water based wood preservative systems are an alternate to the preservative systems identified in section 912 of the Standard Specifications for Construction, except on wood posts used for signing. Micronized copper water based wood preservative systems are proprietary systems used to treat timber and lumber for resistance to insect attack, decay, and rot. Proprietary micronized copper based wood preservative systems are evaluated by the *International Code Council Evaluation Service, Inc (ICC-ES)*. This special provision covers the requirements for micronized copper azole (MCA) and micronized copper quaternary (MCQ).

b. Materials. *ICC-ES* requirements and specified commercial standards are incorporated herein by reference. Treated wood product reports issued by the *ICC-ES* as Evaluation Service Reports (ESRs) must be current as posted on the *ICC-ES* website www.icc-es.org and in compliance with AC326. The preservative(s) must not contain arsenic. The treated wood product's report must allow for the wood species and end use that is required by the project specifications. The Contractor must provide test data certification for each lot, that the treated timber and lumber meets the retention requirements of the appropriate *AWPA* Use Category.

Condition and treat timber and lumber for above ground use to the minimum preservative retention corresponding to *AWPA* Use Category 4A (UC4A). Condition and treat timber and lumber for ground contact to the minimum preservative retention corresponding to *AWPA* Use Category 4B (UC4B).

Condition and treat all round posts, except northern white cedar, to the minimum preservative retention corresponding to *AWPA* Use Category 4B (UC4B).

Incorporation of timber and lumber treated to the preservative retention in *AWPA* Use Category 3B (UC3B) or less is not permitted. Timber and lumber placed in violation of this special provision is cause for removal and replacement at the contractor's expense. No pay adjustments will be allowed for incorporation of timber and lumber treated to UC3B preservative retention. Removal is required.

c. Construction. Use stainless steel fasteners or hot dipped galvanized fasteners in accordance with *ASTM A653/A653M*, batch or post-dipped process, with a minimum coating thickness of 1.85 oz of Zinc per square foot of surface area (G185). Do not mix fastener types. Do not use aluminum fasteners. Aluminum must not be in direct contact with treated wood. Non metallic spacers are to be used where contact with aluminum could occur.

d. Measurement and Payment. Payment is included in other items of work.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**SAWN TIMBER POSTS AND BLOCKS FOR BEAM GUARDRAIL AND HIGHWAY
SIGNS**

STR:SCK

1 of 1

APPR:MWB:CT:04-02-20

FHWA:APPR:04-03-20

Delete subsection 912.08.C of the Standard Specifications for Construction in its entirety and replace with the following:

C. **Incising.** Incising blocks is not required. The Engineer may waive the incising requirement for posts if the Contractor can meet penetration and retention requirements without incising. Ensure the incisor has teeth a nominal $7/8$ inches long to make cuts spaced $2\frac{1}{2}$ inches apart lengthwise in rows $3/4$ inch apart. Ensure alternate rows are staggered by $1\frac{1}{4}$ inches to provide 60 diamond patterns of incisions per square foot. Ensure the diamonds are $2\frac{1}{2}$ inches long and $1\frac{1}{2}$ inches wide from center to center. The Contractor may incise southern pine with $3/4$ inch teeth.

As an alternative, the Contractor may incise posts in accordance with the *AREMA* Manual for Railway Engineering, Article 3.6.2.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
TEMPORARY PAVEMENT MARKING, TYPE R TAPE REVISION

COS:CRB

1 of 1

APPR:LLR:MKB:04-18-22
FHWA:APPR:05-05-22

Delete subsection 922.06.A.1 of the Standard Specifications for Construction, in its entirety and replace with the following:

1. **Pavement Marking, Wet Reflective, Type R.** Provide wet reflective Type R temporary pavement marking as preformed tape. Apply and remove preformed tape in accordance with the manufacturer's instructions. The tape must remain flexible and conform to the texture of the pavement surface during use. Select one of the following materials:
 - a. 3M™ Stamark™ Wet Reflective Removable Tape Series IR710 White manufactured by 3M Traffic Safety & Security Division, 3M Center, 225-4N-14 St. Paul, MN, 55144, (800)-553-1380.
 - b. 3M™ Stamark™ Wet Reflective Removable Tape Series IR711 Yellow manufactured by 3M Traffic Safety & Security Division, 3M Center, 225-4N-14 St. Paul, MN, 55144, (800)-553-1380.
 - c. Deltaline Temporary Wet Reflective/TWR-HP white manufactured by Brite-line LLC 10660 East 51st Ave. Denver, CO 80239, phone 303-375-1293.
 - d. Deltaline Temporary Wet Reflective/TWR-HP yellow manufactured by Brite-line LLC 10660 East 51st Ave. Denver, CO 80239, phone 303-375-1293.

Local Agencies may use a material listed above or select wet reflective Type R markings from the Qualified Products List (922.06A).

MICHIGAN
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION
FOR
ERRATA TO THE 2020 STANDARD SPECIFICATIONS

1 of 8

07-29-22

Page	Subsection	Errata
1-06	101.02	Delete the second abbreviation of the list on this page reading: “IES Illuminating Engineering Society
1-06	101.02	Add the abbreviation to the list on this page reading: “IESNA Illuminating Engineering Society of North America
1-83	108.05.A.2	In the first paragraph of this subsection change the language “MDOT Form 1130” to read “MDOT Form 1130A”.
1-88	108.08.D	Move the last paragraph of this subsection to the left one indent to align with the first paragraph of the subsection and not with the subsection 108.08.D.3.
2-29	205.03.P.1	Delete the first sentence of this subsection and replace with the following: “Do not dispose of material, temporarily or permanently, beyond the normal plan fill slope across wetlands or floodplains.”
2-30	205.03.P.2	Delete the first sentence of this subsection and replace with the following: “Do not dispose of material, temporarily or permanently, in wetlands or floodplains.”
2-30	205.03.P.3	Delete the second paragraph of this subsection and replace with the following: “Contact the appropriate regulatory agencies to determine whether an area is a regulated wetland or floodplain before disposing of surplus or unsuitable material in areas outside the right-of-way and not shown on the plans as disposal sites.”
2-30	205.03.P.3	Delete the first sentence of the third paragraph of this subsection and replace with the following: “Immediately move to an upland site any surplus or unsuitable material that was disposed of in portions of wetlands or floodplains not shown on the plans as disposal sites, at no additional cost to the Department.”
2-30	205.03.P.4	Delete the first sentence of this subsection and replace with the following:

“The Department will notify the applicable regulatory agencies if the Department becomes aware that the Contractor disposed of surplus or unsuitable material in portions of a wetland or floodplain not shown on the plans.”

- | | | |
|------|------------|---|
| 3-31 | 308.04.D | Change the subsection title from “D. General. ” to read “A. General. ” |
| 4-7 | 401.03.E | Delete the third sentence of the second paragraph of this subsection and replace with the following:
“Use precast or cast-in-place footings for precast end sections as required.” |
| 4-11 | 401.04 | Change the eighth pay item from the bottom of the list on this page to read as follows:
Culv End Sect __ inch, Grate.....Each |
| 4-12 | 401.04.C.4 | Change this subsection to read:
“The Engineer will measure Culv End Sect __ inch, Grate by each as shown on the plans for the size of grate required.” |
| 4-39 | 406.02 | Change the third line in the list of materials to read:
Coarse Aggregate 6A, 6AA, 17A.....902 |
| 4-41 | 406.03.A.3 | Delete the third paragraph of this subsection and replace with the following:
“Design joints between adjacent box culvert sections in accordance with Section 9 of ASTM C1577 and to accommodate the joint sealing material in accordance with section 914 as applicable.” |
| 4-50 | 406.03.G.3 | Change the first sentence of the first paragraph to read:
“Unless otherwise shown on the plans, construct culvert bedding for box culverts by placing a 9-inch-thick layer of 46G aggregate, covered with a 3-inch-thick layer of 34G, 34R aggregate, or approved equal.” |
| 4-52 | 406.04.B | In the second paragraph of this subsection delete the first sentence and replace with the following:
“The Department will pay separately for cast-in-place concrete, other than for culvert segments, headwalls, wingwalls, aprons, and curtain walls.” |
| 5-26 | 502.02 | Delete the first sentence of the subsection and the listed materials in this subsection. |
| 5-26 | 502.02.A | Add the following to the end of the first sentence in this subsection:
“(914.04A)” |
| 5-26 | 502.02.B | Add the following to the end of the first sentence in this subsection:
“(502.02B)” |

6-23	602.04.F	Add the following sentence to the end of the first paragraph of this subsection: Temporary concrete pavement, pavement within 4 feet of an obstruction, pavement areas less than 300 square yards, or pavement less than 3 feet wide will not be cored.
6-23	602.04.F	Delete the following language from this subsection on this page: "The Engineer will not core the following: 1. Temporary concrete pavement; 2. Pavement within 4 feet of an obstruction; 3. Pavement areas less than 300 square yards; or 4. Pavement less than 3 feet wide."
6-24	602.04	Rename the following subsections as follows: "1. Initial Core.
6-24	602.04	2. Additional Cores.
6-24	602.04	3. Price Adjustment for Thickness.
6-25	602.04	4. Price Adjustments for Steel Locations within the Pavement.
6-26	602.04	5. Remove and Replace."
7-107	709.04	Change the Pay Unit on the second pay item from the top of the list on this page to read as follows: Thousand Board Foot
8-12	804.03.B.2	Change the first sentence in this subsection to read: "Cast in place light standard and sign support foundations using fixed forms in accordance with the <i>MDOT Standard Plan R-50 series.</i> "
8-44	810.03.J.9	Add a period to the end of the third sentence in this subsection.
8-53	810.03.V	Add a period to the end of the second sentence of the first paragraph of this subsection.
8-53	810.04	Change the fourth pay item from the top of the list on this page to read as follows: Post, Steel, __ pound.....Foot
8-54	810.04	Delete the last pay item of the list on this page reading: "Bracket, H.....Each
8-56	810.04.F	Delete the last sentence of the second paragraph of this subsection reading: "H brackets will be paid for separately."
8-57	810.04.I	Delete the first paragraph of this subsection and replace with the following:

“The unit price for **Sign, Rem** of the type required includes the cost of removing signs from supports and stacking by shape and size.”

- 8-57 810.04.I Delete the second paragraph of this subsection and replace with the following:
“The unit prices for **Ground Mtd Sign Supports, Rem; Cantilever, Rem** and **Truss, Rem** include the cost of removing ground mounted sign supports, cantilever or truss supports.”
- 8-57 810.04.L Change this subsection to read:
“The unit price for Sign, Erect, Salv of the type required includes erecting the salvaged sign on a new sign support or existing sign support, as shown on the plans, and attaching devices, and hardware, including brackets.”
- 8-58 810.04.N Delete this subsection in its entirety.
- 8-110 812.04 Change the fifth and sixth pay item from the top of the list on this page to read as follows:
Sign, Type B, Temp, Prismatic, Spec, Furn Square Foot
Sign, Type B, Temp, Prismatic, Spec, Oper..... Square Foot
- 8-141 815.04.C.1.d Delete this subsection in its entirety.
- 8-142 815.04.C.2.d Change this subsection to read:
"During the first watering of the second growing season, remove and dispose of the guying material, identification tags, and inspection tags."
- 8-144 816.03.A Change the third sentence in this subsection to read:
“Use topsoil from within the project limits; or from off-site sources meeting the requirements in subsection 917.06.”
- 8-170 818.04.G Delete this subsection in its entirety.
- 8-170 818.04 Rename the following subsections as follows:
“G. **Handholes (Hh).**
H. **Service Disconnect.**
I. **Metered Service.**
J. **Unmetered Service.**
K. **Wood Pole.**
L. **Concrete Pole, Fit Up.**
M. **Steel Pole, Fit Up.**
N. **Bracket Arm.**”
- 8-171 818.04 H. **Service Disconnect.**
- 8-171 818.04 I. **Metered Service.**
- 8-171 818.04 J. **Unmetered Service.**
- 8-172 818.04 K. **Wood Pole.**
- 8-172 818.04 L. **Concrete Pole, Fit Up.**
- 8-172 818.04 M. **Steel Pole, Fit Up.**
- 8-172 818.04 N. **Bracket Arm.**”
- 8-185 820.01.B Add a period to the end of the first sentence of this subsection.
- 8-199 820.04 Add the pay item to the list on this page:
TS, (number) Way (type) Mtd (LED) Optic

8-200	820.04	Change the second pay item from the top of the list on this page to read as follows: TS Head, Temp .....Each
8-200	820.04	Change the eleventh pay item from the top of the list on this page to read as follows: TS, Lens, Pedestrian Sym (LED) .....Each
8-200	820.04	Delete the following pay items from the list: Strain Pole, Steel, 6 bolt, __ foot.....Each Mast Arm Pole, Cat__.....Each Mast Arm, __Foot, Cat.....Each
8-200	820.04	Change the eleventh pay item from the bottom of the list on this page to read as follows: Mast Arm, Rem.....Each
8-202	820.04	Add the following pay item to the list: Bracket, Truss, Salv.....Each
8-204	820.04.C	Delete the last paragraph of this subsection in its entirety.
8-204	820.04.D	Delete the first paragraph of this subsection in its entirety.
9-9	902.03.C.1.b	Delete the first sentence in this subsection and replace with the following: “The physical requirements for the coarse aggregate are as specified in Table 902-2 and as follows:”
9-16	Table 902-2	Delete the superscript footnote in the first through fourth rows under the header row that reads “(m)” in the column Loss, % max, LA Abrasion (MTM 102).
9-16	Table 902-2	Add the superscript footnote in the header row that reads “(m)” in the column Loss, % max, LA Abrasion (MTM 102).
9-15	Table 902-2	Delete the footnote (d) in one location in the table.
9-17	Table 902-2	Delete the footnote (d) in one location in the table.
9-21	Table 902-6	Delete the footnote (b) in two locations in the table.
9-21	Table 902-6	Change the footnote (c) to read (b) in two locations in the table.
9-21	Table 902-6	Change the footnote (d) to read (c) in two locations in the table.
9-70	909.05.D	Change the first sentence in this subsection to read: “Provide steel pipe for jacking in place meeting the requirements of ASTM A53/A53M for Type E or Type S, Grade B, or ASTM A139/A139M for Grade B.”


9-94	Table 910-01	Change the value in the fifth row under the header row in the Permittivity (min) (per second) column from 0.5 to read: "0.05"		
9-94	Table 910-01	Change the value in the seventh row under the header row in the Permittivity (min.) (per second) column from 0.5 to read: "0.05"		
9-95	Table 910-2	Change the second row under the Ultimate strength section to read: "CMD ^(c) 1950 lb/ft"		
9-119	913.06	Change this subsection to read: Circular precast concrete units with circular reinforcement for adjusting rings, tops, risers, and sump bases for manholes, catch basins, and inlets must meet the requirements of AASHTO M199 and the following additions and exceptions:		
9-133	917.03	Rename the four subsections following the first paragraph on this page as follows: D. Deciduous Shade Trees. E. Small Trees, Ornamentals, and Shrubs. F. Evergreen Trees. G. Vines, Ground Cover, and Herbaceous Ornamental Plants.		
9-170	920.02.C	Change the reference to Table 920-2 to read Table 920-3 in two locations.		
10-23	1003.03.B	Delete the last sentence of this subsection and replace with the following: "Aggregate sampling for concrete will be performed by an MCAT-certified Aggregate Technician Level II."		
10-43	Table 1006-02	Replace Table 1006-02 with the Table 1006-02 below.		
A2	Pay Item Index	Delete the following pay item reading: Bracket, H.....8-54	810	
A2	Pay Item Index	Add the following pay item reading: Bracket, Truss, Salv.....8-202	820	
6A	Pay Item Index	Change the following pay item to read: Culv End Sect __ inch, Grate.....4-11	401	
14A	Pay Item Index	Delete the following pay items reading: Mast Arm Pole, Cat__.....8-200 Mast Arm, __Foot, Cat.....8-200	820 820	
14A	Pay Item Index	Change the following pay item to read: Mast Arm, Rem.....8-200	820	
19A	Pay Item Index	Change the following pay item to read:		

		st, Steel, __ pound.....	8-53	810
22A	Pay Item Index	Change the following pay item to read:		
		Sign, Type B, Temp, Prismatic, Spec, Furn	8-110	812
		Sign, Type B, Temp, Prismatic, Spec, Oper.....	8-110	812
23A	Pay Item Index	Delete the following pay item reading:		
		Strain Pole, Steel, 6 bolt, __ foot.....	8-200	820
26A	Pay Item Index	Change the following pay item to read:		
		TS Head, Temp	8-200	820

**Table 1006-2:
Overlay Mixtures**

Mixture Type	Aggregate	Slump (inch)	Air Content	Admixture Required	Mixture Proportions lb/yd ³ , dry weight					
					Cement ^(a)	Dry Densified Silica Fume ^(b)	Net Mix Water	Fine Agg	Coarse Agg	Latex Admixture
SFMC	2NS and 26A ^(c)	4-6	6.5 ±1.5%	(d),(e),(f)	618	40	273 ^(g)	1273	1601	—
LMC	2NS and 26A ^(c)	(h)	4.5 ±1.5%	—	658	—	(h)	1490 ^{(i),(j)}	1300 ^{(i),(j)}	06

- (a) Use only Type I Portland cement.
- (b) For SFMC mixtures, the Contractor may use a blended silica fume Portland cement. However, if the silica fume content of the blended material is greater than 8% of the total cementitious material, submit to the Engineer modified mix proportions with Type I Portland cement added to the blended material to achieve the equivalent individual cementitious material mixture proportions.
- (c) Provide coarse aggregate, 95% minimum crushed materials in accordance with Michigan Test Method (MTM) 117, with an absorption no greater than 2.5%, in accordance with ASTM C127.
- (d) Water-reducing high-range admixture or water-reducing high-range and retarding admixture.
- (e) Virgin polypropylene collated fibers at 2 lb/yd³.
- (f) Air-entraining admixture.
- (g) Provide a net water to cementitious material ratio of 0.41 (cementitious material includes cement and silica fume).
- (h) Add water in addition to water in the latex admixture to control slump to within 3 to 5 inches. Measure slump from 4 to 5 minutes after discharge from the mixer. During the waiting period, deposit concrete on the deck and do not disturb. If placing mixtures on sections within superelevated curves, the Contractor may need to use the lower allowable range of the slump requirement, as determined by the Engineer. Do not exceed water-cement ratio, by weight, of 0.30 including water contained in the latex emulsion.
- (i) Aggregate proportions are approximate; due to gradation changes, the Contractor may increase proportions by no greater than 5% by weight of total aggregate if reducing coarse aggregate by an equivalent volume.
- (j) Aggregate weights specified in the table are based on a dry bulk specific gravity of 2.65 for gravel and stone. Adjust the weights if the specific gravity of the materials used varies by more than 0.02 from the specified values.

 ENGINEERING PRACTICES	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	
TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	RECOMMENDED <i>[Signature]</i> DATE 9/11/19	PAGE 1 OF 12
	APPROVED <i>[Signature]</i> DATE 11/14/19	

1. GENERAL

1.1. Introduction and Purpose

Track monitoring is a method of ensuring the integrity of track geometry during construction work that could affect track stability, called Roadbed Disturbing Work. This includes any earth disturbing construction activity either under the track (called underground crossing work) or within 50 feet of the centerline of the nearest track effecting the theoretical railroad embankment line as shown on Figure 1 (called parallel work).

Examples of the types of projects in which track monitoring is required:

- Underground pipe crossings by jacking or horizontal directional drilling
- Local work, such as for foundation excavation or ground dewatering.
- Excavation that is parallel to the track, such as construction of ditch or utility trench.
- Pile driving adjacent to the track, such as construction of an access road.

The purpose of track monitoring is to record railroad track geometry data before, during, and after the completion of construction. The collected geometry data is compared to determine if the track has been adversely affected by construction. If the track has been adversely affected, the data can be used to alert Amtrak personnel to take appropriate action and reestablish pre-construction conditions.

1.2. Related Documents

Amtrak Structures EP 3005 – Pipeline Occupancy

Amtrak Structures EP 3005, Spec. 02082A - Additional Requirements for Horizontal Directional Drilling (HDD) / Directional Boring

Amtrak Track Department Frac-Out Contingency Plan (FCP) (included in Structures EP 3005, Spec. 02082A)

Amtrak Structures EP 3014, Spec. 02261 - Requirements for Temporary Sheeting and Shoring to Support Amtrak Tracks

Amtrak Land Surveying Standards and Procedures Manual, Version 2.0

1.3. Responsibilities

Contractor responsibilities:

- Using proven surveying methods and materials to establish Remote Monitoring Points (RMPs) for collection of track data.
- Gathering and recording track data before construction starts.

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 2 OF 12

- Gather, recording, and report track geometry data at pre-determined time intervals during construction.
- Comparing pre-construction and during-construction data to determine if differential movement has occurred.
- Report track monitoring data and comparison to Amtrak Construction Project Manager, Assistant Division Engineer of Track, and System Track Contracting Office Technical Representative (COTR).
- Pay for any repairs required if track movement meets or exceeds 3/8-inch in any direction or creates conditions exceeding track geometry maintenance limits as defined in the MW1000 for the class of track concerned.

Amtrak responsibilities:

- Amtrak will identify and provide contact information for the following: System Track COTR for track monitoring, the Assistant Division Engineer of Track responsible for maintenance, and the Construction Project Manager.
- Prior to construction Amtrak will review/approve the submitted Track Monitoring Plan.
- Schedule Track Inspector to cover the anticipated duration of roadbed disturbing work.
- Monitor track movement and prescribe repairs, restrictions, or removal tracks from service to ensure the safety of train operations.

2. METHODS & MATERIALS

2.1. Surveying Requirements

Surveyor in charge of performing track monitoring must be working under the direct supervision of a professional land surveyor duly registered in the state. Contract Surveyors must have working knowledge of Amtrak Survey Specification and have current Contractor Orientation Training credentials.

Datum and accuracy will be in accordance with Amtrak Land Surveying Standards and Procedures Manual, Version 2.0:

Datums – NAD 83 with appropriate UTM Zone - NAVD 88

All coordinates in US survey feet.

Horizontal and vertical accuracy 0.01-feet (1/8-inch) for all reports.

Control must be verified before and during construction with frequency sufficiency to ensure continued accuracy.

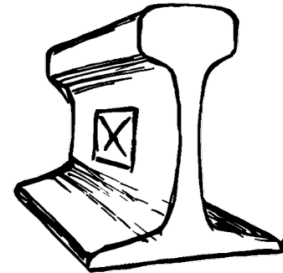
2.2. Equipment Requirements

Monitoring shall be performed by a total station instrument having a minimum angular accuracy of 1-second and an electronic distance measurement accuracy of 1.0mm + 2ppm. Total station will locate Remote Monitoring Points (RMPs) located on the track to be monitored.

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 3 OF 12

Points should be either commercially available calibrated reflective targets or small prisms. All targets shall be mounted a uniform elevation below top of rail.

- Reflective targets shall be less than 3-inches square and affixed by adhesive to the web of the rail (as shown). Common types are shown in figure 1 but are not exclusive. Minimum angle of 30° from instrument to target face is allowed. Therefore, multiple target types may be used to aid in visibility from the instrument. During application the rail should be spot cleaned and dried to allow good adhesion.
- Small precise prisms shall remain at least 1-inch below the top of rail. They are typically on a bracket clamped to the base of the rail and must not interfere with track components.



3. MONITORING POINT LOCATIONS

3.1. General Instructions

Benchmarks to be occupied including foresights and back sights, shall be outside of the ZOI for the roadbed disturbing work.

RMPs will be installed as pairs, with one target on each rail of the track to be monitored. The pairs shall be set perpendicular to the direction of the rails to allow for measurement of cross-level.

Pairs of RMPs will be spaced along the rails at 15.5-foot intervals. In locations of special track work (i.e.-turnouts, crossings, and miter rails) the System Track COTR will determine an alternate arrangement.

3.2. Underground Crossing Work

This method for RMPs is applicable for underground work that enters Zone 3 shown on Figure 2 and/or crosses under the tracks.

Determine the Zone of Influence for the underground crossing work at the elevation of the bottom of railroad tie. Calculate by taking the diameter or width of the underground work, extending to the ground surface at the soil angle of repose. Soil angle of repose should be taken from soil borings performed at the crossing location that cover the depth from track level to the depth of underground work. If soil boring data is not available or does not satisfy the System Track COTR, use 20° as a conservative soil angle of repose. See Figure 2 for an example.

In each direction starting from the intersection of the centerlines of underground work and track, place RMPs every 15.5-feet until the monitoring point pairs are outside the Zone of Influence. Continue the RMPs for five pairs outside of the ZOI for a tie-in with undisturbed track. Refer to Figure 3 for an example.

3.3. Work Parallel to Track

This method for placing RMPs is applicable for underground work that enters either Zone 2 or Zone 3 from figure 2, that does not cross under the tracks.

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 4 OF 12

Determine the Zone of Influence for the underground crossing work at the elevation of the bottom of railroad tie. Calculate by taking the lowest elevation limits of the underground work, extending to the ground surface at the soil angle of repose. Soil angle of repose should be taken from soil borings performed at the crossing location that cover the depth from track level to the depth of underground work. If soil boring data is not available or does not satisfy the System Track COTR, use 20° as a conservative soil angle of repose. See Figure 4 for an example.

Any place the ZOI intersects Zone 2 from Figure 1 requires monitoring for the track directly perpendicular to the intersection of ZOI and Zone 2. In each direction, place RMPs every 15.5-feet until the RMP pairs are outside the Zone of Influence. Continue the RMPs for five pairs outside of the ZOI for a tie-in with undisturbed track. See Figure 5 for an example.

4. PRECONSTRUCTION ACTIVITIES

4.1. Track Monitoring Plan Submittal

Track Monitoring Plan shall be submitted a minimum of 4-weeks prior to commencement of roadbed disturbing work. The System Track COTR will review and provide comments or approval. As a minimum, the package must include the following:

- Information on the registration and experience of the field surveyor in charge performing the track monitoring.
- Design specifications of the total station instrument to be used, including angular accuracy and distance measurement accuracy.
- Design specifications of the prisms or targets to be used. Include information on adhesives, if used.
- Plan views, cross sections, profile views, or diagrams showing the roadbed disturbing work and the relation to the Zones shown in Figure 1. Include soil boring logs and laboratory data related to the project site.
- Detailed plan showing control locations in relationship to the tracks, roadbed disturbing work, and zone of influence. Include details on methods and frequency of control verification.
- Detailed Track Monitoring Plan view showing the location of all RMP locations, control points to be occupied during monitoring, the ground disturbing work and the ZOI. Each RMP must be numbered, with the hundredth being the track number, even numbered points on right rail, odd numbered points on left rail in the direction of increasing milepost. See Figure 6 for an Example Track Monitoring Plan.

4.2. Contractor Safety Training

All contractors that work on Amtrak owned or leased property are required to complete Amtrak's Contractor Orientation Training available at: www.amtrakcontractor.com

Contractor identification badges must be worn / displayed on the outermost garment, above the waist, always while on Amtrak owned or leased property.

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 5 OF 12

5. CONSTRUCTION

5.1. Track Inspector

Amtrak person having current qualifications in MW1000 and Physical Characteristics for the area work is being performed. Can inspect track and repair, restrict, or remove track from service if necessary.

Must be on-site when the leading end of work enters Zone 2 as shown on Figure 1 or as directed by the System Track COTR. Shall remain on-site until the completion of roadbed disturbing work, including reaming and pullback operations of horizontal directional drilling as defined by EP3005 Spec. 02082.

The Track Inspector will be provided at the sole cost of the project.

Will restrict or remove track from service if necessary, based on the MW1000 standards of track geometry for the class of track(s) involved. The Track Inspector has the authority to halt construction at any time should construction activities jeopardize the safe movement of trains over the work area.

5.2. Monitoring Procedures

Initial baseline reading of all monitoring points shall be recorded within ten (10) to five (5) days prior to construction. During the initial baseline readings, the offset from top of rail to the target shall be recorded for use in Track Monitoring Reports.

During construction, track monitoring shall start when the leading end of work enters Zone 2 as shown on Figure 2 or as directed by the System Track COTR. All RPMs shall be measured and recorded each time monitoring occurs.

Monitoring shall be performed at the beginning and end of every work shift, a minimum of twice daily (12-hour intervals). If track geometry meets or exceeds 0.03-feet (3/8-inch) of movement in any direction, monitoring must be performed every 4-hours until roadbed disturbing work is complete.

After roadbed disturbing work is complete, measurements will continue once a day until movement less than 0.01-feet (1/8-inch) has been observed for 5 consecutive days. Field conditions may warrant additional RMPs or extending the duration of post-construction monitoring as directed by the Track Inspector or System Track COTR.

5.3. Communication

Track Monitoring Report shall be produced immediately after each monitoring event. Measurements shown will be based on top-of-rail elevations based on the offset measured during initial setup. This will include total displacement of each RMP and cross level between RMP pairs.

Track Monitoring Reports must be signed and sealed by the surveyor in charge and cross-signed by the Track Inspector during work requiring their presence on-site. See Figure 6.7 for a sample Track Monitoring Report. The quickness of reporting track conditions is paramount to the safety of Amtrak operations.

An online sharing platform, such as Microsoft SharePoint Excel or Google Drive Sheets, must be set up and utilized by the contractor to immediately host the track monitoring data. A read-only link must be made available to the System Track COTR for distribution to Amtrak personnel as necessary. This real-time access will allow Amtrak's engineers to track movement and plan corrective action, if required.

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 6 OF 12

5.4. Remediation Procedures for Track Movement

- As a reminder: any person MW1000 qualified can restrict or remove a track from service based on track geometry conditions. Any person can stop the work and trains should construction activities jeopardize the safe movement of trains over the work area.

Deficiencies in track surface and alignment caused by construction activities shall be corrected solely by Amtrak forces.

If track is measured to have met or exceeds the track geometry maintenance limits as defined in the MW1000 for the class of track concerned or moves 0.03-feet (3/8-inch) displacement from baseline in any direction, then all work shall cease immediately. The following two items must be undertaken:

- The Track Inspector must immediately inspect the track geometry and take any corrective action that may be required per MW1000.
- The contractor must immediately and continuously attempt to notify the Amtrak Construction Project Manager, Assistant Division Engineer of Track, and System Track COTR of the deviations and confirm that corrective action is being taken on-site.

It is assumed that subsidence will continue, and corrective actions should be taken before track geometry exceeds the safety limits set forth in MW1000.

Any repairs made to correct track geometry will be made at the sole cost of the contractor.

5.5. Construction Re-Start

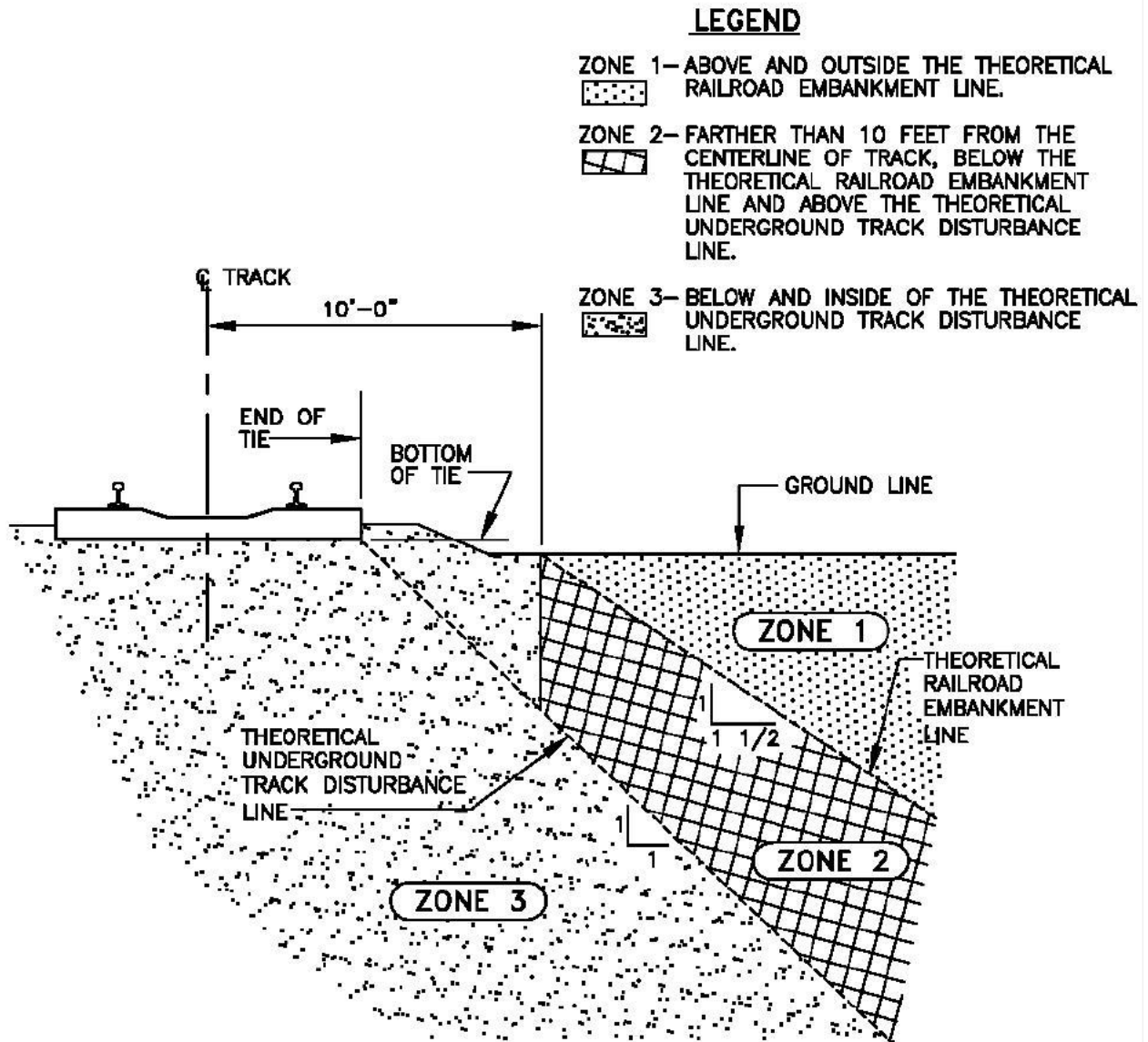
Work may not resume until the track inspector has inspected all tracks within the limits of disturbance and completed any appropriate action to repair, restrict, or remove the tracks from service. In addition, one of the following requirements must be met:

- If no further subsidence is expected, the Construction Manager must inspect the site and taken corrective action to ensure continued construction actives will not cause further track issues to the satisfaction of the System Track COTR.
- If further subsidence is expected, the Construction Manager, Assistant Division Engineer, and System Track COTR should agree on how to best protect train operations. Any further actions required to ensure the safe passage of trains, such as increased frequency of track monitoring, shall be at the sole expense of the contractor.

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 7 OF 12

6. FIGURES AND EXAMPLES

Figure 1, Zones of Influence under track (from Structures EP 3014)



TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 8 OF 12

Figure 2, Section View of Underground Crossing

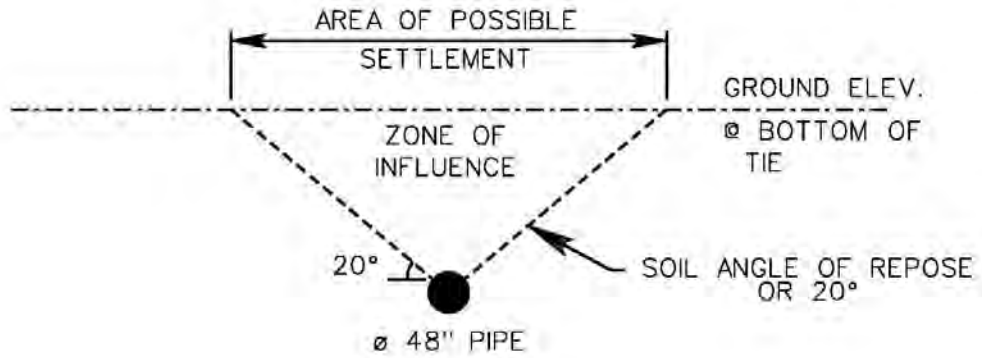
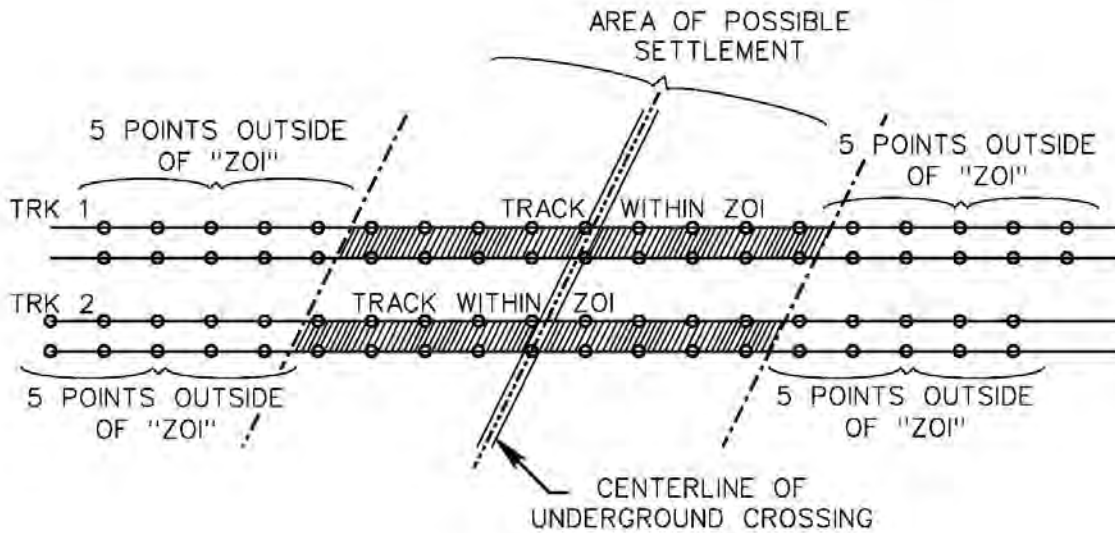


Figure 3, Plan View of Underground Crossing



TRACK MONITORING POINTS
SPACED 15.5 FEET ON BOTH RAILS

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 9 OF 12

Figure 4, Section View of Parallel Work

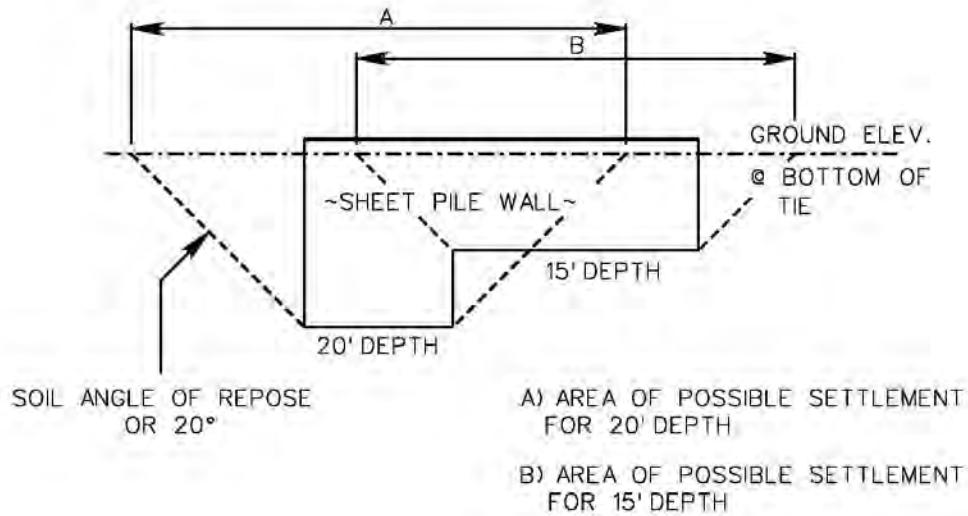
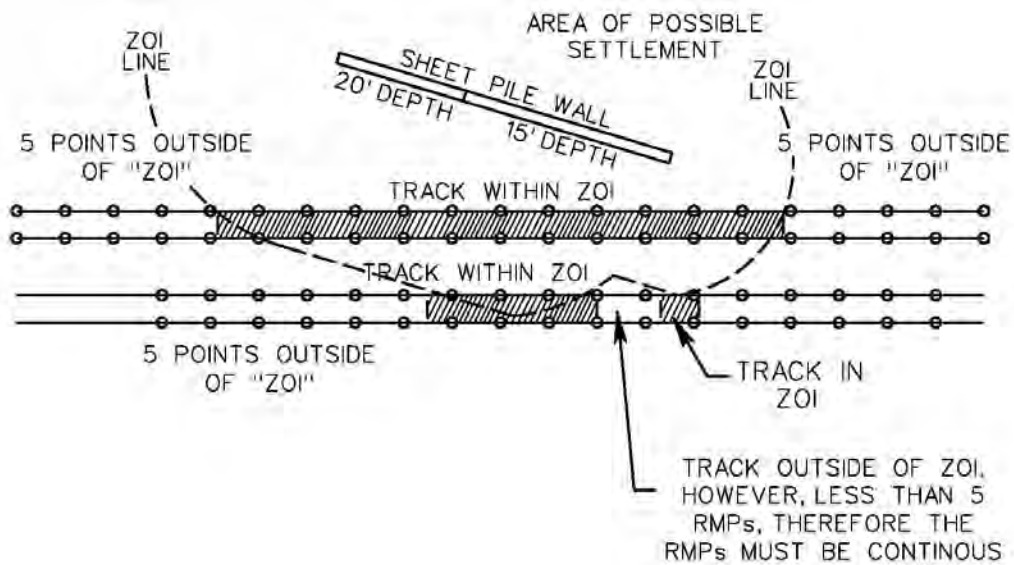
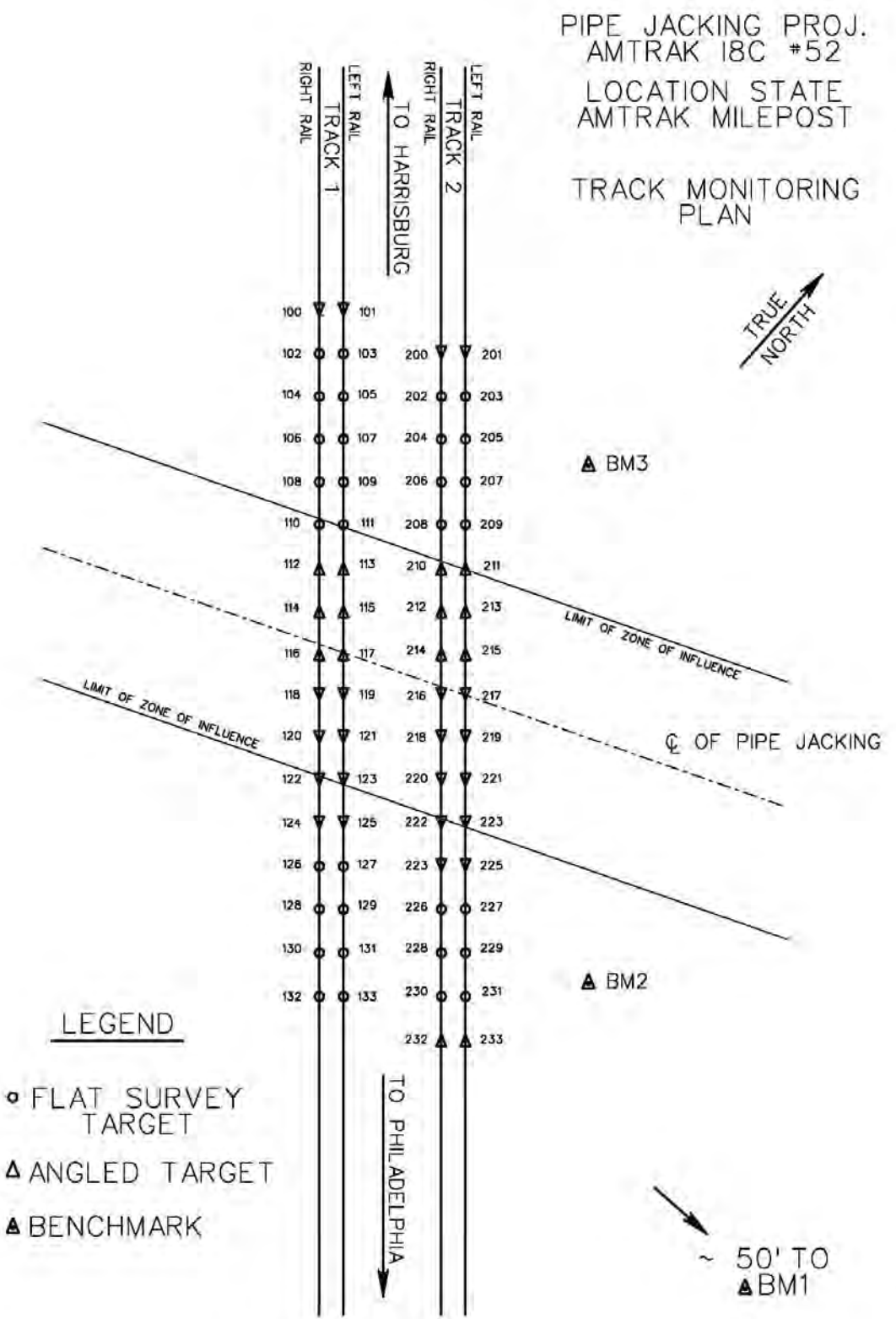


Figure 5, Plan View of Parallel Work



TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 10 OF 12

Figure 6, Example Track Monitoring Plan



TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 11 OF 12

Figure 7, Example Track Monitoring Report

Monitoring Location: _____

Date & Time: _____

Underground Work Complete: _____ ft

Track Number for this Sheet: _____

Right Rail			Left Rail			Cross Level (inches)	
RPM	Top of Rail Movement (inches) (displacement from baseline)		RPM	Top of Rail Movement (inches) (displacement from baseline)			
	North	East		Elev	North		East	Elev
100				101			
102				103			
104				105			
106				107			
108				109			
110				111			
112				113			
114				115			
116				117			
118				119			
120				121			
122				123			

Land Surveyor signature: _____ Seal: _____

Track Inspector signature: _____

Track Inspector SAP number: _____

TITLE TRACK MONITORING FOR WORK DISTURBING ROADBED	ORIGINAL ISSUE DATE 11/14/2019	NUMBER 2031
	REVISED DATE na	PAGE 12 OF 12

Figure 8, Example Zone of Influence (Subsidence) Calculation

Scenario

Pipe jacking, perpendicular under tracks. 48-inch diameter pipe, 11-feet from top of rail elevation to top of pipe. No soil boring data given, assume Angle of Repose = 20°.

Calculations

Pipe Work \varnothing 48-inch = 4.00 ft

Top of rail to bottom of tie 1.25 ft (typical)

Bottom of tie to center of pipe depth top rail to top pipe – typical track depth + 1/2 Work
 $11.00 \text{ ft} - 1.25 \text{ ft} + 2.00 \text{ ft} = 7.75 \text{ ft}$

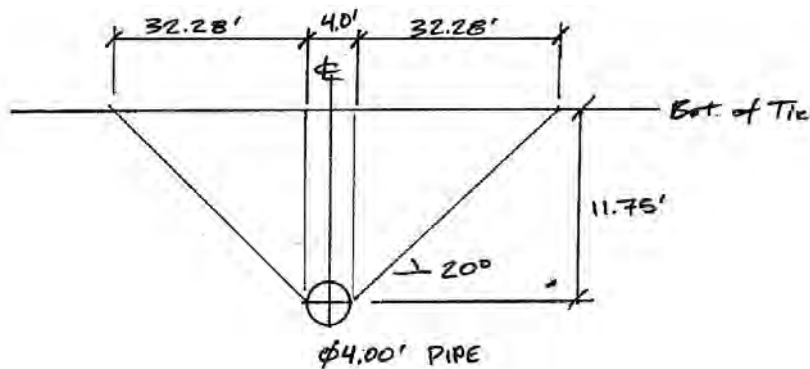
Half width of ZOI [depth * tan (angle of repose)] + 1/2 Work
 $[(11.75 \text{ ft}) \tan (90^\circ - 20^\circ)] + 2.00 \text{ ft} = 34.28 \text{ ft}$

Convert ZOI to stations $34.28 \text{ ft} / 15.5 \text{ ft} = 2.216$ -(round)-> 2 stations

Determine total RMP pairs on each track

Center station (1) + Stations in ZOI, each direction (2 + 2) + Five tie-in stations (5 + 5) = Total

Total pairs of RMPs = 15 (centered on crossing)



TITLE

MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS

 RECOMMENDED by
John Brun

 DATE
10/01/12

PAGE

1

 APPROVED by CHIEF ENGR, STRUCTURES
James Richter

 DATE
10/01/12

OF

2

SCOPE AND NATURE

This practice provides procedures for Contractors to follow, when working on Amtrak Right-of-Way, adjacent to Amtrak tracks, to assure the protection of trains and maintenance of scheduled railroad operations.

SPECIAL REFERENCE

Note: This information was included under former Engineering Practice 1305.

Contractors shall comply with procedures detailed in the following specifications, when applicable:

Section	Title	Revision No.	Revision Date
01141A	Safety and Protection of Railroad Traffic and Property	4	10/01/12
01142A	Submission Documentation Required for Amtrak Review and Approval of Plans for Bridge Erection, Demolition and Other Crane/ Hoisting Operations over Railroad Right-of-Way	1	12/15/05
01520A	Requirements for Temporary Protection Shields for Demolition and Construction of Overhead Bridges and Other Structures	1	08/07/01
02261A	Requirements for Temporary Sheeting and Shoring to Support Amtrak Tracks	3	06/20/08

SPECIAL MATERIALS

Not Applicable

PROCEDURE

1. The Contractor shall conform to the applicable specifications.
2. Amtrak I&C shall assure that agencies and other third parties proposing construction on or adjacent to Amtrak Right-of-Way conform to Amtrak requirements detailed herein.
3. Amtrak Design and Construction shall review the Contractor's proposed design and construction procedures for conformance with specifications, with sound engineering design practice and with the procedures detailed in the applicable Engineering Practice documents.

TITLE MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS	ORIGINAL ISSUE DATE 01/25/01	NUMBER EP3014
	REVISED DATE 10/01/2012	PAGE 2 OF 2

4. Amtrak Construction shall monitor the activities of the Contractor on-site to assure compliance/ adherence to approved procedures throughout the construction period.

REPORTING

As detailed in the specifications.

RESPONSIBILITY

Amtrak I&C Staff	Comply with Procedure
Director Project Initiation & Development	Assure Compliance
Amtrak Design Staff	Comply with Procedure
Director Structures Design	Assure Compliance
Amtrak Construction Staff	Comply with Procedure
Deputy Chief Engineer Construction	Assure compliance

SECTION 01141A – SAFETY AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY

PART 1 - GENERAL

1.1 SCOPE

- A. This specification describes the safety procedures and protection provisions for Contractors and Permittees entering and working upon railroad property.
- B. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PRE-ENTRY MEETING

- A. Before entry of Permittee and/or Contractors onto Railroad's property, a pre-entry meeting shall be held at which time Permittee and/or Contractors shall submit for written approval of the Chief Engineer, plans, computations and a detailed description of proposed methods for accomplishing the work, including methods for protecting Railroad's traffic. Any such written approval shall not relieve Permittee and/or Contractor of their complete responsibility for the adequacy and safety of their operations.

3.2 RULES, REGULATIONS AND REQUIREMENTS

- A. Railroad traffic shall be maintained at all times with safety and continuity, and Permittee and/or Contractors shall conduct their operations in compliance with all rules, regulations, and requirements of Railroad (including these Specifications) with respect to any work performed on, over, under, within or adjacent to Railroad's property. Permittee and/or Contractors shall be responsible for acquainting themselves with such rules, regulations and requirements. Any violation of Railroads safety rules, regulations, or requirements shall be grounds for the immediate suspension of the Permittee and/or Contractor work, and the re-training of all personnel, at the Permittee's expense.

3.3 MAINTENANCE OF SAFE CONDITIONS

- A. If tracks or other property of Railroad are endangered during the work, Permittee and/or Contractor shall immediately take such steps as may be directed by Railroad to restore safe conditions, and upon failure of Permittee and/or Contractor to immediately carry out such direction, Railroad may take whatever steps are reasonably necessary to restore safe conditions. All costs and expenses of restoring safe conditions, and of repairing any damage to Railroad's trains, tracks, right-of-way or other property caused by the operations of Permittee and/or Contractors, shall be paid by Permittee.

3.4 PROTECTION IN GENERAL

- A. Permittee and/or Contractors shall consult with the Chief Engineer to determine the type and extent of protection required to insure safety and continuity of railroad traffic. Any Inspectors, Track Foremen, Track Watchmen, Flagman, Signalmen, Electric Traction Linemen, or other employees deemed necessary by Railroad, at its sole discretion, for protective services shall be obtained from Railroad by Permittee and/or Contractors. The cost of same shall be paid directly to Railroad by Permittee. The provision of such employees by Railroad, and any other precautionary measures taken by Railroad, shall not relieve Permittee and/or Contractors from their complete responsibility for the adequacy and safety of their operations.

3.5 PROTECTION FOR WORK NEAR ELECTRIFIED TRACK OR WIRE

- A. Whenever work is performed in the vicinity of electrified tracks and/or high voltage wires, particular care must be exercised, and Railroad's requirements regarding clearance to be maintained between equipment and tracks and/or energized wires, and otherwise regarding work in the vicinity of electrified tracks, must be strictly observed. No employees or equipment will be permitted to work near overhead wires, except when protected by a Class A employee of Railroad. **Permittee and/or Contractors must supply an adequate length of grounding cable (4/0 copper with approved clamps) for each piece of equipment working near or adjacent to any overhead wire.**

3.6 FOULING OF TRACK OR WIRE

- A. No work will be permitted within twenty-five (25) feet of the centerline of track or the energized wire or have potential of getting within twenty-five (25) feet of track wire without the

approval of the Chief Engineer's representative. Permittee and/or Contractors shall conduct their work so that no part of any equipment or material shall foul an active track or overhead wire without the written permission of the Chief Engineer's representative. When Permittee and/or Contractors desire to foul an active track, they must provide the Chief Engineer's representative with their site-specific work plan a minimum of twenty-one (21) working days in advance, so that, if approved, arrangements may be made for proper protection of Railroad. Any equipment shall be considered to be fouling a track or overhead wire when located (a) within fifteen (15) feet from the centerline of the track or within fifteen (15) feet from the wire, or (b) in such a position that failure of same, with or without a load, would bring it within fifteen (15) feet from the centerline of the track or within fifteen (15) feet from the wire and requires the presence of the proper Railroad protection personnel.

- B. If acceptable to the Chief Engineer's representative, a safety barrier (approved temporary fence or barricade) may be installed at fifteen (15) feet from centerline of track or overhead wire to afford the Permittee and/or Contractor with a work area that is not considered fouling. Nevertheless, protection personnel may be required at the discretion of the Chief Engineer's representative.

3.7 TRACK OUTAGES

- A. Permittee and/or Contractors shall verify the time and schedule of track outages from Railroad before scheduling any of their work on, over, under, within, or adjacent to Railroad's right-of-way. Railroad does not guarantee the availability of any track outage at any particular time. Permittee and/or Contractors shall schedule all work to be performed in such a manner as not to interfere with Railroad operations. Permittee and/or Contractors shall use all necessary care and precaution to avoid accidents, delay or interference with Railroad's trains or other property.

3.8 DEMOLITION

- A. During any demolition, the Contractor must provide horizontal and vertical shields, designed by a Professional Engineer registered in the state in which the work takes place. These shields shall be designed in accordance with the Railroad's specifications and approved by the Railroad, so as to prevent any debris from falling onto the Railroad's right-of-way or other property. A grounded temporary vertical protective barrier must be provided if an existing vertical protective barrier is removed during demolition. In addition, if any openings are left in an existing bridge deck, a protective fence must be erected at both ends of the bridge to prohibit unauthorized persons from entering onto the bridge.
- B. Ballasted track structure shall be kept free of all construction and demolition debris. Geotextiles or canvas shall be placed over the track ties and ballast to keep the ballast clean.

3.9 EQUIPMENT CONDITION

- A. All equipment to be used in the vicinity of operating tracks shall be in "certified" first-class condition so as to prevent failures that might cause delay to trains or damage to Railroad's property. No equipment shall be placed or put into operation near or adjacent to operating tracks without first obtaining permission from the Chief Engineer's representative. **Under no**

circumstances shall any equipment or materials be placed or stored within twenty-five (25) feet from the centerline of an outside track, except as approved by the Site Specific Safety Work Plan. To insure compliance with this requirement, Permittee and/or Contractors must establish a twenty-five (25) foot foul line prior to the start of work by either driving stakes, taping off or erecting a temporary fence, or providing an alternate method as approved by the Chief Engineer's representative. Permittee and/or Contractors will be issued warning stickers which must be placed in the operating cabs of all equipment as a constant reminder of the twenty-five (25) foot clearance envelope.

3.10 STORAGE OF MATERIALS AND EQUIPMENT

- A. No material or equipment shall be stored on Railroad's property without first having obtained permission from the Chief Engineer. Any such storage will be on the condition that Railroad will not be liable for loss of or damage to such materials or equipment from any cause.
- B. If permission is granted for the storage of compressed gas cylinders on Railroad property, they shall be stored a minimum of 25 feet from the nearest track in an approved lockable enclosure. The enclosure shall be locked when the Permittee and/or Contractor is not on the project site.

3.11 CONDITION OF RAILROAD'S PROPERTY

- A. Permittee and/or Contractors shall keep Railroad's property clear of all refuse and debris from its operations. Upon completion of the work, Permittee and/or Contractors shall remove from Railroad's property all machinery, equipment, surplus materials, falsework, rubbish, temporary structures, and other property of the Permittee and/or Contractors and shall leave Railroad's property in a condition satisfactory to the Chief Engineer.

3.12 SAFETY TRAINING

- A. All individuals, including representatives and employees of Permittee and/or Contractor, before entering onto Railroad's property and before coming within twenty-five (25) feet of the centerline of the track or energized wire must first attend Railroad's Contractor Orientation Computer Based Training Class. The Contractor Orientation Class will be provided electronically at **www.amtrakcontractor.com**. Upon successful completion of the course and test, the individual taking the course will receive a temporary certificate without a photo that is valid for three weeks. The individual must upload a photo of himself/herself that will be embedded in the permanent ID card. The photo ID will be mailed to the individual's home address and must be worn/displayed while on Railroad property. Training is valid for one calendar year. All costs of complying with Railroad's safety training shall be at the sole expense of Permittee and/or Contractor. The Permittee and/or Contractor shall appoint a qualified person as its Safety Representative. The Safety Representative shall continuously ensure that all individuals comply with Railroad's safety requirements. All safety training records must be maintained with the Permittee's and/or Contractor's site specific work plan.

3.13 NO CHARGES TO RAILROAD

- A. It is expressly understood that neither these Specifications, nor any document to which they are attached, include any work for which Railroad is to be billed by Permittee and/or Contractors, unless Railroad gives a written request that such work be performed at Railroad's expense.

END OF SECTION 01141A

SECTION 01142A – SUBMISSION DOCUMENTATION REQUIRED FOR AMTRAK REVIEW AND APPROVAL OF PLANS FOR BRIDGE ERECTION, DEMOLITION AND OTHER CRANE/ HOISTING OPERATIONS OVER RAILROAD RIGHT-OF-WAY

PART 1 - GENERAL

1.1 SCOPE

- A. Amtrak requires that a site-specific work plan for accomplishing hoisting operations be prepared for every applicable project, and for each type of lift on a project.
 - 1. The plan shall demonstrate adherence to Amtrak safety rules.
 - 2. The plan shall demonstrate constructibility.
 - 3. The plan shall minimize impact to rail operations.
 - 4. The approved plan will provide the basis for field inspection/ verification of the actual work.
- B. Preparation, review and approval of the Crane/ Hoisting site-specific work plan does not relieve the Contractor from meeting other Amtrak requirements for adequate planning and documentation of proposed work procedures within the Right-of-Way of the railroad..
- C. Current Amtrak safety rules shall be adhered to in every respect.
- D. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Vice President, Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

1.4 SUBMISSION REQUIREMENTS

- A. Unless otherwise directed in the Contract, the Contractor shall submit five sets of plans and calculations to the authorized representative of the Chief Engineer, Structures, whose name and address will be provided at the project pre-construction meeting.
- B. Submitted calculations and plans shall be signed and sealed by a Professional Engineer, registered in the State in which the work will be performed.

- C. The Contractor shall revise and resubmit plans and calculations as many times as necessary, until a complete and correct site-specific work plan for crane/ hoisting operations has been approved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 THE CONTRACTOR SHALL PROVIDE, AT A MINIMUM, THE FOLLOWING INFORMATION FOR REVIEW AND APPROVAL BY AMTRAK ENGINEERING STRUCTURES:
 - A. Plan view showing location(s) of cranes, operating radii, with delivery and/or disposal locations shown. Provide all necessary dimensions for locating the elements of the plan.
 - B. Plans and computations showing the weight of the pick.
 - C. Crane rating sheets, demonstrating that cranes are adequate for 150% of the calculated pick weight. That is, the cranes shall be capable of picking 150% of the load, while maintaining normal, recommended factors of safety. The adequacy of the crane for the proposed pick shall be determined by using the manufacturer's published crane rating chart and not the maximum crane capacity. Crane and boom nomenclature is to be indicated.
 - D. Calculations demonstrating that slings, shackles, lifting beams, etc. are adequate for 150% of the calculated pick weight.
 - E. Location plan showing obstructions, indicating that the proposed swing is possible. "Walking" of load using two cranes will not be permitted. Rather, multiple picks and repositioning of the crane may be permitted to get the load to the needed location for the final pick, if necessary.
 - F. Data sheet listing types and sizes of slings and other connecting equipment. Include copies of catalog cuts for specialized equipment. Detail attachment methods on the plans.
 - G. A complete procedure, indicating the order of lifts and any repositioning or re-hitching of the crane or cranes.
 - H. Temporary support of any components or intermediate stages, as may be required.
 - I. A time schedule of the various stages, as well as a schedule for the entire lifting process.

END OF SECTION 01142A

SECTION 01520A – REQUIREMENTS FOR TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION OF OVERHEAD BRIDGES AND OTHER STRUCTURES

PART 1 - GENERAL

1.1 SCOPE

- A. This engineering practice describes items to be included in the design and construction of temporary protection shields for construction overhead and near to Amtrak tracks.
- B. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Vice President, Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

1.4 SUBMISSION REQUIREMENTS

- A. Unless otherwise directed in the Contract, the Contractor shall submit five sets of plans and calculations to the authorized representative of the Chief Engineer, Structures, whose name and address will be provided at the project pre-construction meeting.
- B. Submitted calculations and plans shall be signed and sealed by a Professional Engineer, registered in the State in which the work will be performed.
- C. The Contractor shall revise and resubmit plans and calculations as many times as necessary, until a complete and correct site-specific work plan for crane/ hoisting operations has been approved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 CONTRACTORS WORKING ON OVERHEAD OR NEARBY DEMOLITION AND/OR CONSTRUCTION ADJACENT TO AMTRAK TRACKS, SHALL CONFORM TO THE FOLLOWING

DESIGN AND CONSTRUCTION REQUIREMENTS FOR TEMPORARY PROTECTION SHIELDING:

- A. The Contractor shall maintain a specified level of protection to railroad facilities, during demolition and construction activities that occur overhead and nearby Amtrak tracks, as shown on the Contract Plans, as detailed in the Contract Specifications, and as described below.
- B. Prior to the start of construction, the Contractor shall submit to Amtrak for review and approval, detailed, site specific plans for temporary protection shields. The plans will be reviewed as to the methods of erection, and as to whether or not the proposed installation will provide the required level of protection. No construction shall proceed until the Contractor has received written approval of the Contractor's complete, site specific plans, from Amtrak.
- C. The Contractor shall design the protection shields to conform to all applicable and governing federal, state and local laws and regulations.
- D. Drawings for the proposed temporary protection shields shall be signed and sealed by a Licensed Professional Engineer. Complete design calculations, clearly referenced to the drawings, and easy to review, shall be provided with submission of drawings.
- E. Protection shields shall be designed for the following, minimum load and size criteria.
 - 1. The horizontal shield design liveload on horizontal surfaces shall be the greater of a minimum of 100 pounds per square foot (psf) [5000 Pascals] or the anticipated liveload to be produced by the Contractor's anticipated operations. When determining the appropriate design live load, the designer shall consider factors such as the physical capacity of proposed debris-catching platforms to retain materials, and the type of equipment the platforms might support. Positive means of demolition and construction controls shall be provided to assure that debris that may collect on the shield will not exceed the design live load. The horizontal protection shield, in plan view, shall cover no less than the area directly over the tracks plus ten feet minimum beyond the centerline of the outermost tracks.
 - 2. The vertical shield shall be designed to carry a minimum 30 psf [1500 Pascals] allowance for wind load. The vertical shield shall extend a minimum of 6'-6" [1950 millimeters] above the top of the adjacent surface, such as curb or sidewalk. Anti-climb wings shall be installed at each end, as necessary, to restrict access to the railroad property.
- F. The vertical and horizontal clearance envelopes required for maintenance of railroad operations, shall be indicated on the site specific work plans. These clearances are subject to review and approval by Amtrak. If applicable, both temporary and permanent envelopes shall be indicated on the plans. The temporary protection shields shall be installed outside the limits of these minimum vertical and horizontal clearances shown on the site specific work plans.
- G. In electrified territory, temporary protection shields shall be bonded and grounded.
- H. Temporary protection shields shall be designed and constructed to prevent dust, debris, concrete, formwork, paint, tools, or anything else from falling onto the railroad property below.
- I. The temporary protection shields shall be attached to the structure in accordance with site specific work plans submitted by the Contractor and approved by Amtrak. Drilling in structural members and welding will generally not be permitted in members that are scheduled to remain in place in the reconstructed structure. For existing members scheduled for demolition or for later reconstruction, any proposed attachment shall be designed with consideration of potential existing, deteriorated conditions.
- J. The Contractor shall provide the Amtrak on-site representative, for review and approval prior to any construction activity in the effected area, a proposed construction schedule for the installation, maintenance and removal of the temporary protection shields.

- K. The temporary protection shields shall be installed prior to the start of any other work over the railroad in the effected areas. No construction shall proceed until the Amtrak on-site representative reviews and approves the Contractor's installed protection. Before proceeding with the work, Amtrak must be satisfied, in its sole judgment, that sufficient protection has been provided to proceed with the work.
- L. The Contractor shall install and remove temporary protection shields only when an Amtrak representative is on-site.
- M. The Contractor shall not install or remove temporary protection shields during train operations.
- N. Temporary protection shields shall remain in place for the duration of construction activities over and nearby the railroad in the effected areas. The Contractor may remove temporary construction only after approved by Amtrak on-site representatives.
- O. Where site specific conditions impose insurmountable restrictions to the design of temporary construction conforming to the limitations listed above, the design of temporary construction shall be developed in close coordination with Amtrak design review personnel. The Chief Engineer, Structures shall provide final approval of temporary construction that does not conform to the above limitations.

END OF SECTION 01520A

SECTION 02261A – REQUIREMENTS FOR TEMPORARY SHEETING AND SHORING TO SUPPORT AMTRAK TRACKS

PART 1 - GENERAL

1.1 SCOPE

- A. This engineering practice describes items to be included in the design and construction of temporary sheeting and shoring construction adjacent and proximate to Amtrak tracks.
- B. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Vice President, Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

1.4 SUBMISSION REQUIREMENTS

- A. Unless otherwise directed in the Contract, the Contractor shall submit five sets of plans and calculations to the authorized representative of the Chief Engineer, Structures, whose name and address will be provided at the project pre-construction meeting.
- B. Submitted calculations and plans shall be signed and sealed by a Professional Engineer, registered in the State in which the work will be performed.
- C. The Contractor shall revise and resubmit plans and calculations as many times as necessary, until a complete and correct site-specific work plan for temporary sheeting and shoring has been approved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONTRACTORS INSTALLING TEMPORARY CONSTRUCTION SHEETING AND SHORING TO SUPPORT AMTRAK TRACKS SHALL CONFORM TO THE FOLLOWING:

- A. Footings for all piers, columns, walls, or other facilities shall be located and designed so that any temporary sheeting and shoring for support of adjacent track or tracks during construction, will not be closer than toe of ballast slope. The dimension from gage of rail to toe of ballast, along tangent track, is 7'-5"; see dimensions on Track standard plans for curved track dimensions.
- B. USE OF SHEETING: When support of track or tracks is necessary during construction of the above-mentioned facilities, interlocking steel sheeting, adequately braced and designed to carry Cooper E80 live-load plus 50 percent impact allowance is required. Soldier piles and lagging will be permitted for track support ONLY when required penetration of steel sheet piling cannot be obtained, due to site-specific conditions that make steel sheet piling placement impracticable, in the opinion of the authorized, Amtrak design review engineer.
1. For usual soil conditions and limited excavations, sheeting is required when the near-track excavation extends beneath or nearer to the track than the Theoretical Railroad Embankment Line. The Theoretical Railroad Embankment Line is defined as a line that starts at grade, ten foot from the centerline of the outer track, and extends downward, away from the track, at a slope of 1-1/2 horizontal to one vertical.
 2. For special soil conditions, such as soft organic soils and rock conditions, and for unusual excavation conditions, temporary supports for excavations may be necessary even when the limits fall beyond the Theoretical Railroad Embankment Line, requiring site specific analysis by a professional, geotechnical engineer.
 3. See Sketch SK-1, "Normal Requirements for Sheet Piling Adjacent to Tracks".
- C. Exploratory trenches, three feet deep and 15 inches wide in the form of an "H", with outside dimensions matching the proposed outside dimensions of sheeting, shall be hand dug, prior to placing and driving the sheeting, in any area where railroad or utility underground installations are known or suspected. These trenches are for exploratory purposes only, and shall be backfilled and immediately compacted, in layers. This work shall be performed only in the presence of a railroad inspector.
- D. Absolute use of track is required while driving sheeting adjacent to running track. Track usage shall be prearranged per standard procedures, through the Amtrak project representative.
- E. Cavities adjacent to sheet piling, created by pile driving, shall be filled with sand, and any disturbed ballast shall be restored and tamped immediately.
- F. Sheet piling cutoffs
1. During construction, sheeting shall be cut off at an elevation no higher than the top of tie.
 2. At the completion of construction activities involving the use of sheet piling, sheet piling may be pulled if there will be no adverse impact to the railroad track support bed, as determined by the Amtrak site engineer. This will generally be permitted when both of these conditions are met:
 - a. the sheeting face is at least ten feet distant from the centerline of track, and
 - b. the bottom of the excavation that the sheeting supported prior to backfilling, does not fall within an assumed influence zone under the tracks. The assumed influence

zone is defined as the area, as seen in cross-sectional view, falling beneath the Theoretical Underground Track Disturbance Line. This line is defined as a line that starts at the end and bottom of the ties, and extends from the track outward and downward at a one-to-one (45-degree) slope.

3. Sheet piling that is to be left in-place, shall be cut off below the ground line
 - a. at least eighteen inches below final ground line at the sheeting, and
 - b. no higher than 24 inches below the elevation of the bottom of the nearest ties
 4. See Sketch SK-1, "Normal Requirements for Sheet Piling Adjacent to Tracks".
- G. The excavation adjacent to the track shall be covered, ramped and protected by handrails, barricades and warning lights, as required by applicable safety regulations, and as directed by Amtrak.
- H. Final backfilling of excavation shall conform to project specifications.
- I. The Contractor shall provide Amtrak with a detailed schedule of proposed construction operations, detailing each step of the proposed temporary construction operations in proximity to Amtrak tracks, so that Amtrak may review and approve the proposed operations, and may properly inspect and monitor operations.
- J. Drawings for the proposed temporary sheeting and shoring shall be signed and sealed by a Licensed Professional Engineer. Complete design calculations, clearly referenced to the drawings, and easy to review, shall be provided with submission of drawings.
- K. Where site specific conditions impose insurmountable restrictions to the design of temporary construction conforming to the limitations listed above, the design of temporary construction shall be developed in close coordination with Amtrak design review personnel. The Chief Engineer, Structures shall provide final approval of temporary construction that does not conform to the above limitations.
1. When Amtrak grants approval for sheeting closer than standard minimum clearances, the Contractor shall develop a survey plan, if not already required by the project, for the adjacent tracks, to be conducted prior to, during, and after the temporary sheeting construction operations. If settlement is detected, construction operations shall be suspended until the track has been returned to its initial condition, and stabilized, as determined by the Amtrak project site representative.
2. The Contractor shall stockpile ten (10) tons of approved ballast at the project site, and maintain that amount in ready reserve, to allow for the possible need to restore track profile.
- L. Particular care shall be taken in the planning, design and execution of temporary construction, as relates to railroad slope protection and drainage facilities. Erosion and sediment control best management practices shall be designed and employed, as approved by Amtrak. Any unintended disruption to railroad drainage facilities, caused by the temporary construction, shall be promptly remedied, as directed by the Engineer, solely at the Contractor's cost.
- M. The following Information Sketch is attached:
1. Figure No. SK-1: Normal Requirements for Sheet Piling Adjacent to Track

END OF SECTION 02261A

LEGEND

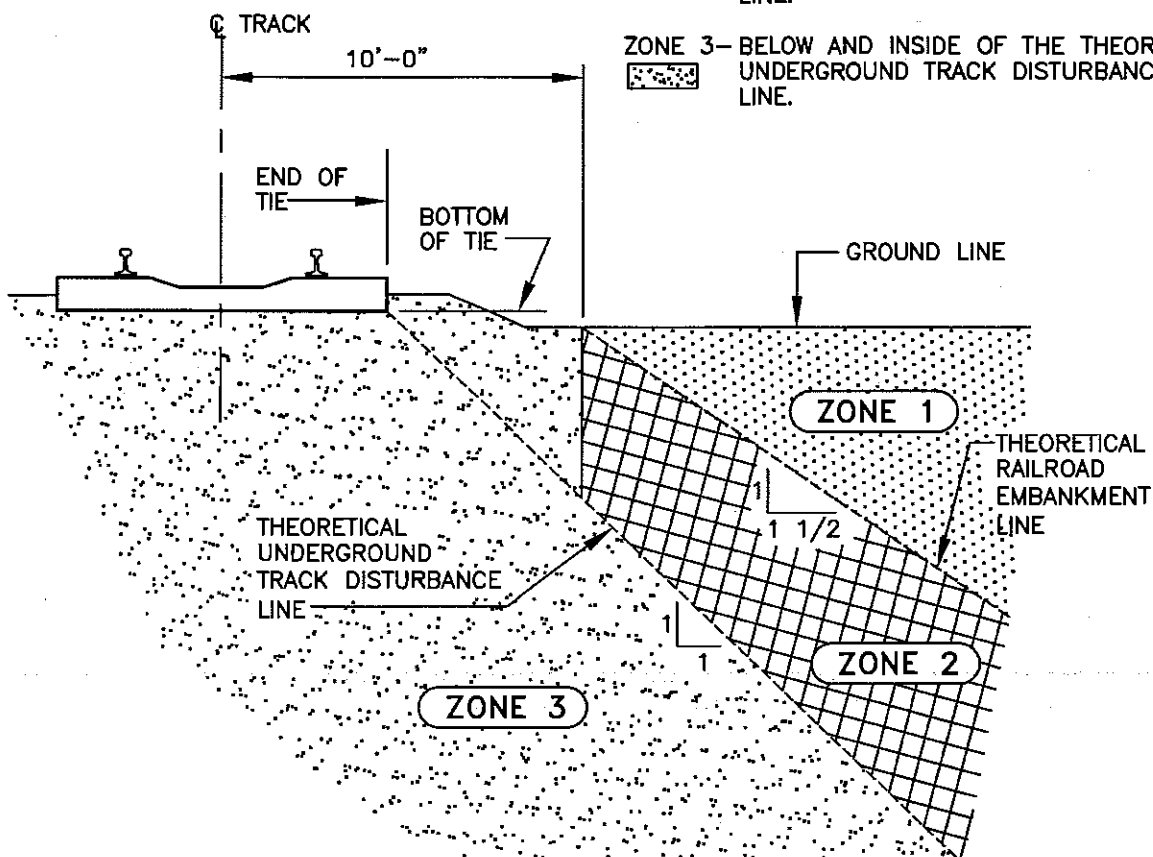
ZONE 1— ABOVE AND OUTSIDE THE THEORETICAL RAILROAD EMBANKMENT LINE.



ZONE 2— FARTHER THAN 10 FEET FROM THE CENTERLINE OF TRACK, BELOW THE THEORETICAL RAILROAD EMBANKMENT LINE AND ABOVE THE THEORETICAL UNDERGROUND TRACK DISTURBANCE LINE.



ZONE 3— BELOW AND INSIDE OF THE THEORETICAL UNDERGROUND TRACK DISTURBANCE LINE.



NORMAL REQUIREMENTS FOR SHEET PILING ADJACENT TO TRACK

- ① EXCAVATIONS WITHIN ZONE 1 — ABOVE AND OUTSIDE OF THE THEORETICAL RAILROAD EMBANKMENT LINE — DO NOT NORMALLY REQUIRE SHEETING TO PROTECT RAILROAD ROAD BED. SHEETING MAY BE REQUIRED FOR OTHER REASONS.
- ② EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 2 REQUIRE SHEETING, BUT THE SHEETING MAY NORMALLY BE PULLED AFTER THE EXCAVATION HAS BEEN BACKFILLED.
- ③ EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 3 WILL NORMALLY REQUIRE THE SHEETING TO BE LEFT IN PLACE AND CUT-OFF PER REQUIREMENTS.

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Office of Chief Engineer
STRUCTURES

National Railroad Passenger Corporation
30th Street Station, Philadelphia, Pennsylvania 19104

SKETCH 1
SPEC. 02261A - REV. 1

Designed CJR Drawn JLM Date 8/06/01

File No:	
Design No:	3501
Sheet No.:	1 of 1
SK-1	

 ENGINEERING PRACTICES	ORIGINAL ISSUE DATE 04/24/01	NUMBER EP3016	
	REVISED DATE N/A		
<small>TITLE</small> STORM WATER DRAINAGE AND DISCHARGE FROM ADJACENT PROPERTY ONTO AMTRAK RIGHT-OF-WAY	RECOMMENDED by Anthony Scorpio	DATE 4/25/01	PAGE 1
	APPROVED by CHIEF ENGR, STRUCTURES James Richter	DATE 4/27/01	OF 2

SCOPE AND NATURE

There are many areas along the railroad corridor that are receiving storm water from adjacent property that results in flooding during the smallest of storms. Increased storm water flow to the railroad property increases deposits of excessive amounts of sedimentation and could cause fouling of the track structure. With the introduction of the High Speed Rail Trains, passenger safety is of the utmost importance. Diminished track support from flooding and sedimentation will not be allowed.

It is Amtrak’s policy to limit the resultant discharge and drainage of storm water from the development of adjacent properties to no more than pre-existing conditions, as demonstrated by engineering analyses through governmental regulatory processes.

It is Amtrak’s policy to protect the railroad right-of-way from sediment, erosion and excess runoff during all stages of construction activities on adjacent properties, as demonstrated by engineering analyses through governmental regulatory processes.

SPECIAL REFERENCE

The following policy is to augment Specification 02861 of EP3005, Pipeline Occupancy Requirements and Specifications, and other Amtrak I&C, design and construction standards.

SPECIAL MATERIALS

N/A

PROCEDURE

The discharge of storm water onto railroad property will be prohibited for all construction projects on or adjacent to Railroad property, unless the applicant can demonstrate that there will be a “zero net runoff” result in the peak flow and total volume based on a 100 Year Storm event, and that receiving waters downstream will not be impacted.

Computations indicating this design and suitable topographic plans, prepared by a Professional Engineer, licensed in the state in which the work will be performed, shall be submitted to the Chief Engineer for approval at least 60 days in advance of construction. If the drainage is to discharge into an existing drainage channel on or under the Railroad Right of Way, a hydraulic analysis of the existing structures must be included.

Formal approval of the proposed design, by the appropriate governmental agency or agencies, must be submitted with the computations. Control of soil erosion and sedimentation must be demonstrated on the design plans in accordance with the appropriate state and local regulations.

TITLE STORM WATER DRAINAGE AND DISCHARGE FROM ADJACENT PROPERTY ONTO AMTRAK RIGHT-OF-WAY	ORIGINAL ISSUE DATE 04/24/01	NUMBER EP3016
	REVISED DATE N/A	PAGE 2 OF 2

The Contractor shall be responsible for control of the site and protection of railroad property during the entire construction project, through completion. The design of sedimentation, erosion and runoff control during construction shall accommodate conditions of every phase of construction.

Review, monitoring and approval process:

1. The Contractor shall conform to this Amtrak policy, and demonstrate conformance by standard Amtrak review submissions and approvals, as noted above.
2. Amtrak I&C shall assure that agencies and other third parties proposing construction on or adjacent to Amtrak Right-of-Way conform to Amtrak policy detailed herein.
3. Amtrak Design and Construction shall review the Contractor's proposed design and construction procedures for conformance with Amtrak policy, as demonstrated through appropriate engineering analyses and the government regulatory process.
4. Amtrak Construction shall monitor the activities of the Contractor on-site to assure compliance/ adherence to approved procedures throughout the construction period.

REPORTING

N/A

RESPONSIBILITY

Amtrak I&C Staff	Comply with Procedure
Director I&C	Assure Compliance
Amtrak Design Staff	Comply with Procedure
Director Structures Design	Assure Compliance
Amtrak Construction Staff	Comply with Procedure
Sr. Director Construction	Assure compliance

Prevailing Wage Policy & Procedure

Date: September 19, 2022

Contents

- Contracts for which only Price Quotations are provided 2
- Bid Documents & Pre-Bid Meetings 2
- Wage Rate Interviews 3
- Deficient Certified Payroll 3
- Dispute Resolution Process 4
- Data Collection 4
- ATTACHMENT A – WAGE RATE DECISIONS 5
- ATTACHMENT B – PREVAILING WAGE APPLICATION GUIDANCE 6
- ATTACHMENT C – DELINQUENT AND DEFICIENCY NOTICE TEMPLATES 8

Overview

The original direction from Council Resolution R-16-469 was to increase the awareness and enforcement of the City’s existing policies surrounding the payment of prevailing wages on public improvement projects and verifying compliance on City contracts for which the payment of prevailing wage is required.

Per Council Resolution R-22-240 the City Administrator was directed to draft and implement a revised administrative policy that would require periodic, on-site spot checks of contractor compliance with prevailing wage requirements and to continue to provide an annual report to the City Council for the next five years detailing contractor compliance with the City’s prevailing wage requirements, including the results of periodic, on-site spot checks, with the report to be provided each year prior to March 31st for the previous year’s construction season.

This policy applies to contracts not involving State or Federal prevailing wage oversight procedures. For purposes of this policy, “Public Improvement” means the construction of a permanent physical addition to or installation on real estate or infrastructure owned by the City, or the replacement or reconstruction of physical structures or infrastructure owned by the City through demolition and rebuilding, or resurfacing of all or a portion of the original structure or infrastructure. Public Improvements do not include general routine or periodic non-routine repairs or maintenance of existing structures or infrastructure, but do include major repairs, such as resurfacing and reconstruction of roads and bridges, and relining sewer pipes. Only those contracts for the construction of Public Improvements and for the purchase of goods and materials used for the purpose of constructing Public Improvements require best value procurement as provided in Chapter 14, 1:314(9).

This policy does not apply to contracts less than \$10,000 per Administrative Policy and Procedure (APP) 204.

This policy does apply to all prime contractors and first tier subcontractors.

Contracts for which only Price Quotations are provided

For Public Improvements that are over \$10,000 but less than \$25,000 and that only require written price quotations, the following procedure shall be followed:

Provide a prevailing wage package with the request for quote. The package shall include the certified payroll report template, the prevailing wage declaration of compliance, the specifications identifying the contractor's responsibilities for prevailing wage compliance, and applicable prevailing wage decision in place on the date of the request for the quote.

Bid Documents & Pre-Bid Meetings

For Public Improvements that are over \$25,000 the following procedure shall be followed:

The City of Ann Arbor's standard contract documents for Public Improvements will contain and make prominent the necessary language to communicate the requirement to pay prevailing wages and the procedures to be followed in the administration of this policy. The bid documents for each project shall address the following items:

1. The applicable wage rate decision should be filled in ("Highway", "Heavy", "Building", and/or "Residential") for each contract, based on the type of work being performed. The wage decision in place 10 days before bids are due shall apply. See Attachment A for definitions of the wage rate decisions.
2. For projects that require a pre-bid meeting be held, the prevailing wage requirements should be specifically listed as an agenda item for the meeting and discussed in detail.
3. Include a certified payroll report template within the formal solicitation document for submission to the City. Include language that contractors are welcome to use the certified payroll report template provided or a City-approved equivalent prior to project start.

Certified Payroll

The contractor shall be required to submit certified payroll reports within 2 weeks of beginning on-site work, then weekly thereafter. The reports shall clearly detail the payment of the appropriate wages and fringe benefits to all employees actively engaged in on-site work for every pay period that their employees are on site. The requirement to submit certified payrolls shall apply to the general contractor and all subcontractors actively performing on-site work. The payrolls shall be submitted on the provided template or a form approved by the City. The format of any contractor-supplied form(s) and their content shall be approved by the City prior to the beginning of on-site work.

If contractors are paying fringes to approved funds or plans (as opposed to paying fringes in cash as part of the employees' hourly wage), then a fringe breakdown package is required to be submitted with the first payroll.

City staff will review the certified payroll forms to determine compliance with the applicable wage rate decision and the prevailing wage laws. Discrepancies with the prevailing wage requirements and payments therefor shall be promptly reported to the contractor for their correction and re-submittal as outlined below.

Wage Rate Interviews

In order to verify compliance with prevailing wage requirements and the accuracy of contractors' submitted certified payroll information, City shall conduct periodic on-site spot checks, or "wage rate interviews" at least twice during the duration of a project. Wage rate interviews may be conducted at any time during the life of the project or as determined necessary by the City. Wage rate interviews will be conducted on-site with employees of each labor classification actively engaging in on-site work.

The City staff responsible for the performance and administration of the project will compare the information reported during the wage rate interviews to the certified payroll and wage rate decision in order to ensure compliance. A copy of all wage rate interview forms shall be kept in the project file.

For projects with a duration of on-site work of 7 days or less, the City will conduct only one wage rate interview per contractor and, the contractor will still be required to submit certified payroll reports with their invoice and/or payment request.

Prevailing wages are not required for suppliers of materials, equipment, or fuel when these employees do not spend 20% of their time on the project site. Therefore, no wage rate interviews are required for this group of employees.

The form used to record wage rate interview information will be the current MDOT Form No. 1156-T1.

The City will supply interpreters as needed to eliminate any language barrier issues that may arise.

Deficient Certified Payroll

When certified payroll reports are found to be incomplete, inaccurate or inconsistent with the other project records, these steps will be followed:

1. Send e-mail with "Request a Read Receipt" marked (important to know if email was received and read) to Prime Contractor notifying them they have 30 days to correct, revise and submit the corrected certified payroll to the City. See Attachment C for communication templates.
2. If a sub-contractor's certified payroll is deficient, it is the Prime Contractor's responsibility to pass the deficiency letter on to the appropriate sub-contractor. The 30-day period to correct, revise and be received by the City still apply.
3. If the contractor does not submit corrected certified payrolls to the City within 30 days, a second communication will be sent to the contractor notifying them that the City will not release any retainage on the project until the matter has been resolved to the satisfaction of the City. See Attachment C for communication templates.
4. Any issues associated with timely compliance with these requirements shall be documented on the Contractor Performance Evaluations (as applicable) completed at the end of the project.

5. For projects where only a single invoice is submitted, and/or where no retainage is held, all prevailing wage issues must be resolved *before* the invoice is paid.

Dispute Resolution Process

If any dispute between the Project Manager and the contractor arises related to prevailing wage rates or job classifications that they cannot resolve, the matter will be referred to the appropriate Service Area Administrator for resolution. The release of retainage monies will not be made until the Service Area Administrator has made a final decision regarding the dispute or has determined that the release of the retainage monies is not detrimental to the enforcement of this policy or the City's objectives regarding the performance of the project.

Data Collection

Resolution R-22-240 requires an annual report to City Council for the next five years detailing contractor compliance with the City's prevailing wage requirements, including the results of periodic, on-site spot checks (i.e. the Wage Rate Interviews), with the report to be provided each year prior to March 31st for the previous year's construction season.

The data collection database can be found at

<https://a2gov.sharepoint.com/dev/Lists/Prevailing%20Wage%20Weekly%20Submittals/AllItems.aspx>.

To meet the deadline for reporting to Council, the deadline to submit data will be December 31 each year.

A Prevailing Wage Training Manual has been created to assist staff in supplying the correct information in the data collection database (referenced above) reference page's 7-9. Prevailing Wage Training Manual can be found on a2Central by navigating to Resources > Instructions and Manuals > [Prevailing Wage](#) > Prevailing Wage Training Manual.

ATTACHMENT A – WAGE RATE DECISIONS

There are four Davis-Bacon Act (DBA) Construction Types: building, highway, residential and heavy. The following provides a brief overview of each type and to which projects they should be applied:

Building Construction includes construction of sheltered enclosures for the purpose of housing persons, machinery, equipment or supplies; all construction of such structures; the installation of utilities and of equipment, both above and below grade levels; as well as incidental grading, utilities and paving. Such structures need not be “habitable” to be building construction. Also, the installation of heavy machinery and/or equipment does not generally change the project’s character as a building.

Highway Construction includes construction, alteration or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction.

Residential Construction includes the construction, alteration or repair of single-family houses, and multi-family apartment or condominium buildings of no more than four stories in height. This includes all incidental items such as site work, parking areas, utilities, streets, and sidewalks. For residential multi-family buildings over 4 stories in height, use the Building Construction classification.

Heavy Construction includes those projects that are not properly classified as either “building”, “highway”, or “residential.” Unlike these classifications, heavy construction is not a homogenous classification. Because of this catch-all nature, projects within the heavy classification may sometimes be distinguished on the basis of their particular project characteristics, and separate schedules may be issued for dredging projects, water and sewer line projects, dams, bridges, and other projects.

ATTACHMENT B – PREVAILING WAGE APPLICATION GUIDANCE

City Code Section 1:320 requires that all craftsmen, mechanics and laborers employed directly on the site in connection with a public improvement, including subcontractors, must receive prevailing wage.

Public Improvement shall mean the construction of a permanent physical addition to or installation on real estate or infrastructure owned by the City, or the replacement or reconstruction of physical structures or infrastructure owned by the City through demolition and rebuilding, or resurfacing of all or a portion of the original structure or infrastructure. Public improvements do not include general routine or periodic non-routine repairs or maintenance of existing structures or infrastructure, but do include major repairs, such as resurfacing and reconstruction of roads and bridges, and relining sewer pipes. Only those contracts for the construction of Public Improvements and for the purchase of goods and materials used for the purpose of constructing Public Improvements require best value procurement as provided in Chapter 14, 1:314(9).

If a purchase order or contract does not involve a public improvement as defined above, it will not require the payment of prevailing wages.

The list below identifies typical situations that do not require the payment of prevailing wages. It is only intended to provide guidance with the application of prevailing wage requirements and is not all encompassing. Any questions related to the application of prevailing wage requirements shall be directed to the appropriate service area manager.

Common Contract Types NOT Requiring the Payment of Prevailing Wages

- Routine maintenance work such as changing light bulbs, cleaning and changing belts, etc.
- Material suppliers
- Equipment suppliers
- Professional services such as engineering, financial services, or studies.
- Janitorial Services
- Property Cleaning and Sanitation Services
- Contracts involving laborers working offsite. For example, mechanical equipment is removed from a building and shipped offsite for a retrofit. Only those laborers working onsite to remove and reinstall that equipment would be subject to prevailing wage requirements.
- Contracts involving apprentices or trainees when individually registered in an approved apprenticeship or training program. The proper wage rates to be paid to apprentices and trainees are those specified by the particular programs in which they are enrolled. The wage rates for apprentices and trainees shall be requested in advance of the work.
- Sewer Cleaning and Inspection - The cleaning and internal inspection of sewer lines is only considered a public improvement when that work is simultaneous to lining, sealing or repair of damage in the sewers. If the contract is only for inspection or cleaning, prevailing wage requirements do not apply.
- Divers and Dive Tenders –Routine inspection work by divers does not apply unless it is simultaneous to underwater construction.
- Contracts for the following types of work/services do not require prevailing wages unless these services are included as part of the scope of services pursuant to a Public Improvement contract, (e.g., landscaping included in a contract to construct a building would be included as part of the Public Improvement and require prevailing wages but a landscaping contract for mowing the grass at a park would not require prevailing wages):

- lawn mowing or grass cutting
- line trimming
- edging
- weeding
- cultivating beds
- mulch application
- core aeration
- sweeping and blowing of landscape materials
- pruning, planting, removal or replacement of shrubs, plants, and flowers
- pruning of trees and replacement of trees that are planted as a replacement due to the removal of diseased or irreparably damaged trees, or trees that constitute a hazard
- replacement of sod, the removal of diseased or irreparably damaged trees or trees that are a hazard
- seeding, including the preparation and application of erosion control blanket, application of fertilizer, herbicide, pesticide, fungicide
- raking
- watering of trees, shrubs, plants, flowers, bulbs, seeds and sod
- sweeping
- snow removal
- holiday light and seasonal decoration installation

ATTACHMENT C – DELINQUENT AND DEFICIENCY NOTICE TEMPLATES

Downloadable templates for Delinquent and Deficiency Notices can be obtained at a2Central Instructions and Manuals, Prevailing Wage section.

Delinquent Notice 1:

*** Fill in everything in red

*** Place on City letterhead

Subject: Project Identification Number / Name, Delinquent Notice 1

Mr./Mrs./Dear _____:

Your (company/subcontractor) performed work on (Contract ID) during the week(s) ending (____). As of (3 weeks from the date work was started) certified weekly payrolls have not been received for the work performed by your (company/subcontractor name) and are classified as delinquent. You are hereby notified that if payrolls are not received by this office within 30 calendar days from the receipt of this notice, retention will be withheld until certified payrolls have been received, reviewed and approved by this office.

Sincerely,

Name

Project Manager

(City of Ann Arbor or Consultant Name)

Cc: Unit Manager

Service Area Administrator

Attorney Office

Delinquent Notice 2:

*** Fill in everything in red

*** Place on City letterhead

Subject: Project Identification Number / Name, Delinquent Notice 2

Mr./Mrs./Dear _____:

Your (company/subcontractor) performed work on (Contract ID) during the week(s) ending (____). A notice was sent to you on (insert date here) regarding the delinquent Certified Payroll.

As the above delinquency has not been addressed within 30 calendar days, you are hereby notified that retention will not be released for this project until the certified payroll(s) are received by this office.

Sincerely,

Name
Project Manager
(City of Ann Arbor or Consultant Name)

Cc: Unit Manager
Service Area Administrator
Attorney Office

Deficient Notice 1:

- *** Fill in everything in red
- *** Delete instructions in *(blue)*
- *** Place on City letterhead

Subject: Project Identification Number / Name, Deficient Notice 1

Mr./Mrs./Dear _____:

The certified payroll(s) for week(s) ending (enter date) submitted by your (company/subcontractor, name) are deficient as noted below. The above dated certified payrolls must be corrected and resubmitted. Corrected certified payrolls of subcontractors must be resubmitted through your company. The following items must be addressed:

(Delete all items that do not apply).

- Name and address with the prime or subcontractor(s) identified
- Contract identification
- Payroll No., week ending, project location
- Employee full name and last four digits of social security number *(the city is required to return all certified payroll with full social security numbers and delete it from our records. DO NOT KEEP PAYROLL WITH FULL SOCIAL SECURITY NUMBERS ON THEM.)*
- Identification of minority and female employees
- Employee's full work classification, including group or class *(helps with checking payroll)*
- Identification of OJTs, apprentices and program levels (%) on payrolls
- Daily and weekly employee hours worked in each job classification
- Daily and weekly employee overtime or premium hours worked in each job classification
- Total weekly hours worked on all jobs *(prevailing and non-prevailing wage)*
- Base rate shown for each employee, overtime (or premium) rate shown when worked
- Project gross weekly wages
- Week's gross wages for all jobs

Week's itemized deductions
Week's Net wages paid for all jobs
Compliance statement attached
Explanation of itemized deductions if needed
Method of fringe benefit payment described by checking either box (4)(a) or (4)(b)
Exceptions explanation for fringe benefit (4)(c)
Other *(give detailed explanation or delete if it does not apply)*

You are hereby notified that if corrected and complete certified payrolls are not received by this office within 30 calendar days from the receipt of this notice, retention will be withheld until corrected and completed certified payrolls have been received by this office.

Sincerely,

Name
Project Manager
(City of Ann Arbor or Consultant Name)

Cc: Unit Manager
Service Area Administrator
Attorney Office

Deficient Notice 2:

***** Fill in everything in red**
***** Delete instructions in *(blue)***
***** Place on City letterhead**

Subject: **Project Identification Number / Name**, Deficient Notice 2

Mr./Mrs./Dear _____:

The certified payroll(s) for week(s) ending **(enter date)** submitted by your **(company/subcontractor, name)** are deficient as noted below. A notice was sent to you on (insert date here) regarding above dated certified payrolls indicating that the following items must be addressed:

(Copy into this area the deficiencies recorded in Notice 1).

As the above deficiencies have not been addressed within 30 calendar days, you are hereby notified that retention will not be released for this project until the corrected and completed certified payroll(s) are received by this office.

Sincerely,

Name
Project Manager
(City of Ann Arbor or Consultant Name)

Cc: Unit Manager
Service Area Administrator
Attorney Office



PREVAILING WAGE TRAINING MANUAL

September 23, 2022

Overview

This document is a training recourse on determining construction types, obtaining Davis-Bacon Act wage determinations, wage rate interviews, obtain and review of certified payroll, delinquent and deficient notice(s) and data collection process.

Contents

Terminology Abbreviation:	1
Determine Construction Type & Obtain Davis-Bacon Act Wage Determination(s):	2
Determine Construction Type:.....	2
Obtain Wage Determination(s):.....	2
Wage Rate Interviews:.....	4
Conducting Wage Rate interviews:.....	4
Certified Payroll Review:	6
Certified Payroll Form:	6
Delinquent and Deficient Notice Process:	10
Data Collection Requirement:.....	10

Terminology Abbreviation:

1. Davis-Bacon Act (DBA)
2. Wage Determination (WD)
3. Wage Rate Interview (WRI)
4. Certified Payroll (CP)

Determine Construction Type & Obtain Davis-Bacon Act Wage Determination(s):

Determine Construction Type:

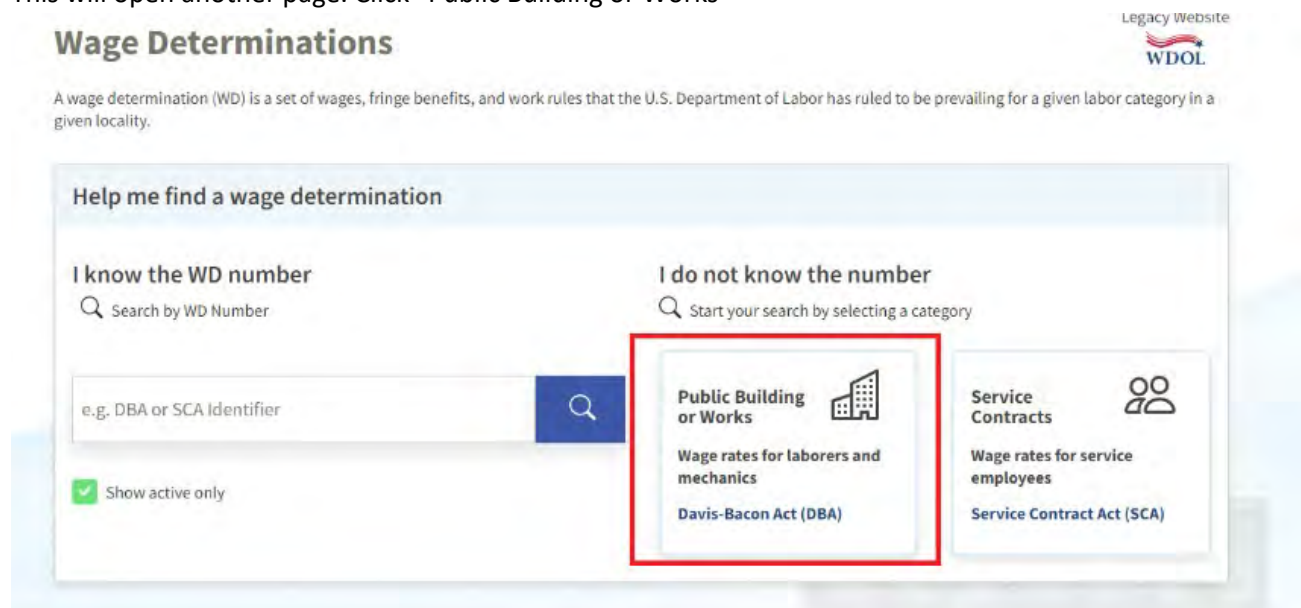
1. Determine the Construction Type associated with your project, Highway, Heavy, Residential, Building. Reference page 6 of the [“Prevailing Wage Policy & Procedure Guide”](#) for brief overview of each construction type.
2. Once construction type is determined go to www.Sam.gov to obtain your Davis-Bacon Wage Determination.

Obtain Wage Determination(s):

1. Go to www.Same.gov
2. Click “Wage Determinations”



3. This will open another page. Click “Public Building or Works”



- Choose "Construction (DBA) from the left panel. Fill in State, County/Independent City, and DBA Construction Type. The active Wage Determination will start filtering on the right side.

- Double-click the blue link associated with your applicable Wage Determination to open it. Scroll all the way to the bottom of the page to view the document history. Ensure that you have opened the Wage Determination version that was active 10 days prior to bid opening. Download and save the Wage Determination as a pdf in the project files. *Note: Wage Determinations are updated frequently. City contracts require the Wage Determination(s) must be the one active 10 days prior to bid opening. Obtaining Wage Determinations after they have been updated can be challenging, so it is easiest to save the Wage Determination file the day of your bid opening to avoid having to find the correct version later.*

Wage Rate Interviews:

Wage rate interviews must be conducted on site at a minimum of twice throughout the duration of a project for 50 percent of the workers for the prime contractor and first tier subcontractors.

Wage Rate Interview conducting schedule:

- I. 1st – the first week the contractor is on site
- II. 2nd – random week in the middle of your project’s duration.

Projects lasting less than one week should only conduct one wage rate interviews unless the project manager deems it necessary to conduct more.

Conducting Wage Rate interviews:

1. Use [MDOT form 1156-T1](#) to conduct wage rate interviews.
2. Fill out in the field sections: Contractor Name, Contract ID, Interview Date, Interviewer, Project Engineer, Project Location, Employee, Employee Reply, Work Description and Deductions.

(Field Review) ORIGINAL PROJECT FILE
This Form will meet the WRI Requirements of the Prevailing Wage Procedures

CONTRACTOR NAME <input type="checkbox"/> Prime Contractor <input type="checkbox"/> Subcontractor		PAYROLL PERIOD ENDING	
CONTRACT ID	REGION/TSC	INTERVIEW DATE	INTERVIEWER
PROJECT ENGINEER	PROJECT LOCATION	POSTINGS AND WAGE RATES POSTED IN CONSPICUOUS PLACE ON JOB? <input type="checkbox"/> YES <input type="checkbox"/> NO	

EMPLOYEE	EMPLOYEE REPLY	BASE HOURLY RATE PER CONTRACT	PAYROLL RECORDS
NAME	WHO PAYS YOU?	WAGE RATE DECISION # AND DATE:	PAID BY:
SS # (LAST FOUR DIGITS)			
CONTACT INFORMATION: (Needed for follow up information)			
CELL: _____	HOURLY RATE		HOURLY RATE
HOME: _____	Reg. \$ _____	Reg. \$ _____	Reg. \$ _____
ARE YOU A UNION EMPLOYEE <input type="checkbox"/> YES <input type="checkbox"/> NO	O.T. \$ _____	F.B. \$ _____	F.B. \$ _____
PAYMENT OF FRINGES: As Wages <input type="checkbox"/>		Total \$ _____	Total \$ _____
Approved Prog. <input type="checkbox"/> None <input type="checkbox"/>		O.T. \$ _____	O.T. \$ _____

WORK DESCRIPTION

DEDUCTIONS (Vacations, Savings, Personal Notes, Etc.)

COMMENTS

- Fill out in the office (once certified payroll is received correlated to the date the interview was conducted): Payroll Period Ending, Base Hourly Rate Per Contract, Payroll Record and Date Certified Payroll Examined & Compared by.

This Form will meet the WRI Requirements of the Prevailing Wage Procedures

CONTRACTOR NAME <input type="checkbox"/> Prime Contractor <input type="checkbox"/> Subcontractor		PAYROLL PERIOD ENDING	
CONTRACT ID	REGION/TSC	INTERVIEW DATE	INTERVIEWER
PROJECT ENGINEER	PROJECT LOCATION	POSTINGS AND WAGE RATES POSTED IN CONSPICUOUS PLACE ON JOB? <input type="checkbox"/> YES <input type="checkbox"/> NO	

EMPLOYEE	EMPLOYEE REPLY	BASE HOURLY RATE PER CONTRACT	PAYROLL RECORDS
NAME	WHO PAYS YOU?	WAGE RATE DECISION # AND DATE:	PAID BY:
SS # (LAST FOUR DIGITS)			
CONTACT INFORMATION: (Needed for follow up information)			
CELL: _____	HOURLY RATE		HOURLY RATE
HOME: _____	Reg \$ _____	Reg \$ _____	Reg \$ _____
ARE YOU A UNION EMPLOYEE <input type="checkbox"/> YES <input type="checkbox"/> NO	O.T. \$ _____	F.B. \$ _____	F.B. \$ _____
PAYMENT OF FRINGES: As Wages: <input type="checkbox"/>		Total \$ _____	Total \$ _____
Approved Prog. <input type="checkbox"/> None <input type="checkbox"/>		O.T. \$ _____	O.T. \$ _____

WORK DESCRIPTION:

DEDUCTIONS (Vacations, Savings, Personal Notes, Etc.):

COMMENTS

DATE CERTIFIED PAYROLL EXAMINED & COMPARED BY	DATE
---	------

Employees of the contractor are not to assist in language interpreting. MDOT has contracted over the phone interpretation services from Bromberg & Associates for these situations. A cell phone with speaker will be needed in order to use these services. **Instructions:** Turn cell phone speaker on and dial 1-866-908-6137. When the operator answers, tell them you are calling from MDOT. Give them this customer code – MDOTHDY and tell them the language that you need interpreted. Give them your name, phone number, and the name of your TSC, local agency, or consulting firm. The operator will connect you with an interpreter promptly.

Page _____ of _____	APPROVED BY (Project Engineer Signature)	DATE
---------------------	--	------

- Save all complete wage rate interviews in correlating project files.

Certified Payroll Review:

Collect all certified payroll throughout the duration of the project, but only review payroll associated with the weeks wage rate interviews are conducted. Submit reviewed certified payroll into the database.

If violations are found, issue notice 1 (Delinquent Notice for late payroll, Deficient Notice for insufficient payroll). Then continue to review payroll, complete **weekly** wage rate interviews, and submit **weekly** into the database until the contractor has **resolved** the issues.

Certified Payroll Form:

- Contractors should be using MDOT form [CP-347](#), Federal form [WH-347](#) or a format approved by the Project Manger that meets the standards of the two referenced forms.

Reviewing Certified Payroll:

- To review payroll, **three** components are required:
 - Wage Rate Decision (applicable to the project)
 - Wage Rate Interview
 - Certified Payroll (correlating to the wage rate interview date)
- Use the wage rate interview form to complete the review process. Specifically, sections “Base hourly rate per contract” and “Payroll Records”.

BASE HOURLY RATE PER CONTRACT	PAYROLL RECORDS
WAGE RATE DECISION # AND DATE:	PAID BY:
Reg. \$ _____	HOURLY RATE Reg. \$ _____
F.B. \$ _____	F.B. \$ _____
Total \$ _____	Total \$ _____
O.T. \$ _____	O.T. \$ _____

3. **Base Hourly Rate per Contract** section is filled in by using the wage rate decision in the contract and detailed work description to figure out which work classification the employee falls into.

BASE HOURLY RATE PER CONTRACT

WAGE RATE DECISION # AND DATE:
 MI 160001
 2/26/16
 LAB00465-001

LABORER (AREA 1)
 GROUP 1..... \$ 25.06
 FRINGE..... 13.00

Reg. \$ 25.06
 F.B. \$ 13.00
 Total \$ 38.06
 O.T. \$ 50.59

Rate + Fringe = Total
 $\$25.06 + \$13.00 = \$38.06$

Rate x 1.5 + (Fringe) = Overtime
 $\$25.06 \times 1.5 + (\$13.00) = \$50.59$

4. **Payroll Records** section is filled in by using the contractor submitted certified payroll.

PAYROLL RECORDS

(1) Name of Contractor or Subcontractor
 Fonson Company, Inc.

PAID BY:
 Fonson Company, Inc.

(c) Earn Code	(d) DAY AND DATE							(e) Total Hours on Project	(f) Project Rate of Pay	(g) Project Rate of Fringe Pay		(h) Gross Earned Project
	SUN	MON	TUE	WED	THU	FRI	SAT			Cash	Fund		Weekly
OT						4.00		4.00	37.59	13.00		1,724.76
REG		9.00	10.00	10.00	8.00	3.00		40.00	25.06	13.00		1,977.71

HOURLY RATE

Reg. \$ 25.06
 F.B. \$ 13.00
 Total \$ 38.06
 O.T. \$ 50.59

Rate + Fringe = Total
 $\$25.06 + \$13.00 = \$38.06$

Rate x 1.5 = Overtime
 $\$25.06 \times 1.5 = \37.59
 Overtime + Fringe = Total Overtime
 $\$37.59 + \$13.00 = \$50.59$

5. Compare **Base Hourly Rate per Contract** and **Payroll records** boxes. The total \$ category for Payroll Record must be **equal to or greater than** the Base Hourly Rate per Contract.

BASE HOURLY RATE PER CONTRACT	PAYROLL RECORDS
WAGE RATE DECISION # AND DATE: MI 160001 2/26/16 LAB 0405-001	PAID BY: Fonson Company, Inc.
HOURLY RATE Reg. \$ <u>25.00</u> F.B. \$ <u>13.00</u> Total \$ <u>38.00</u> O.T. \$ <u>50.59</u>	HOURLY RATE Reg. \$ <u>25.00</u> F.B. \$ <u>13.00</u> Total \$ <u>38.00</u> O.T. \$ <u>50.59</u>

6. Additional information to pay attention to on certified payroll:

Michigan Department of Transportation
CP-347 (04/10)

**MICHIGAN DEPARTMENT OF TRANSPORTATION
CERTIFIED PAYROLL**
COMPLETION OF CERTIFIED PAYROLL FORM FULFILLS THE MINIMUM MDOT PREVAILING WAGE REQUIREMENTS

(1) Name of Contractor <input checked="" type="checkbox"/> or Subcontractor <input type="checkbox"/> Fonson Company, Inc.			(2) Address 7044 Whitmore Lake Rd Brighton, MI 48116																			
(3) Payroll No. 4	(4) For Week Ending 06/18/16	(5) Project and Location 16773-Springwater Subdivision			(6) Contract ID																	
(a) Employee Information	(b) Work Classification	(c) Earn Code	(d) DAY AND DATE						(e) Total Hours on Project	(f) Project Rate of Pay	(g) Project Rate of Fringe Pay		(h) Gross Earned Project	(i) Total Hours All Jobs	(j) DEDUCTIONS					(k) Total Weekly Wage Paid All Jobs		
			SUN	MON	TUE	WED	THU	FRI			SAT	Cash			Fund	Weekly	FICA	Federal	State		Other	Total Deduct
Contreras, Cesar Y	LABO0465-001	OT	06/12	06/13	06/14	06/15	06/16	06/17	06/18	4.00	37.59	13.00	1,724.76	49.00	100.87	108.55	42.96	664.26	916.64	1,061.07		
ETH/GEN: H/ M ID #: 2629		REG		9.00	10.00	10.00	8.00	3.00		40.00	25.06	13.00	1,977.71									
													OTHER DETAIL:									
															Ded.	Amt.						
															S125	059.20						
															UNIFO	5.06						

Compare Employee name and SS# to WRI

Compare Work Classification to the work description

Total Earnings for this project

Total earnings for the week, including all projects worked on

All these boxes added up equal the Total Deduction

Michigan Department of Transportation
CP-347 (04/10)

**MICHIGAN DEPARTMENT OF TRANSPORTATION
CERTIFIED PAYROLL**
COMPLETION OF CERTIFIED PAYROLL FORM FULFILLS THE MINIMUM MDOT PREVAILING WAGE REQUIREMENTS

(1) Name of Contractor <input checked="" type="checkbox"/> or Subcontractor <input type="checkbox"/> Fonson Company, Inc.			(2) Address 7044 Whitmore Lake Rd Brighton, MI 48116																			
(3) Payroll No. 4	(4) For Week Ending 06/18/16	(5) Project and Location 16773-Springwater Subdivision			(6) Contract ID																	
(a) Employee Information	(b) Work Classification	(c) Earn Code	(d) DAY AND DATE						(e) Total Hours on Project	(f) Project Rate of Pay	(g) Project Rate of Fringe Pay		(h) Gross Earned Project	(i) Total Hours All Jobs	(j) DEDUCTIONS					(k) Total Weekly Wage Paid All Jobs		
			SUN	MON	TUE	WED	THU	FRI			SAT	Cash			Fund	Weekly	FICA	Federal	State		Other	Total Deduct
Contreras, Cesar Y	LABO0465-001	OT	06/12	06/13	06/14	06/15	06/16	06/17	06/18	4.00	37.59	13.00	1,724.76	49.00	100.87	108.55	42.96	664.26	916.64	1,061.07		
ETH/GEN: H/ M ID #: 2629		REG		9.00	10.00	10.00	8.00	3.00		40.00	25.06	13.00	1,977.71									
													OTHER DETAIL:									
															Ded.	Amt.						
															S125	059.20						
															UNIFO	5.06						

Checking Pay:
 Project Rate of reg. Pay + Fringe = \$/reg. hr.
 $\$25.06 + \$13.00 = \$38.06/\text{reg. hr.}$
 Rate of reg. pay per hr. x hrs. worked = Total reg. hrs.
 $\$38.06 \times 40\text{hrs} = \$1,522.40$
 Project rate of O.T. Pay + Fringe = \$/O.T. hr.
 $\$37.59 + \$13.00 = \$50.59/\text{O.T. hr.}$
 Rate of O.T. Pay per hr. x O.T. hrs. worked = Total O.T. hrs.
 $\$50.59 \times 4 \text{ hrs. O.T.} = \202.36
 Total reg. Pay + Total O.T. Pay = Total Pay
 $\$1,522.50 + \$202.36 = \mathbf{\$1,724.76 \text{ Total}}$

FICA + Federal + State + Other = Total Deductions
 $\$100.87 + \$108.55 + \$42.96 + \$664.26 = \mathbf{\$916.64}$

Gross Earned - Total Deductions = Total weekly Wage Paid all Jobs
 $\$1,977.71 - \$916.64 = \mathbf{\$1,061.07}$

Delinquent and Deficient Notice Process:

Delinquent and deficiency notices should be sent through email to the prime contractor for any issues found related to certified payroll for the prime contractor or first tier subcontractors. All notices should have the Unit Manager, Service Area Administrator and Attorney Office copied. Delinquent and Deficiency Notices can be obtained at a2Central Instructions and Manuals, Prevailing Wage section or following the below links:

[Delinquent Notice 1](#)

[Delinquent Notice 2](#)

[Deficiency Notice 1](#)

[Deficiency Notice 2](#)

Data Collection Requirement:

Collect all payroll throughout the duration of the project but only review payroll associated with the weeks wage rate interviews are conducted. Submit the reviewed certified payroll weeks into the database. If violations are found, issue Notice 1, continue to review payroll, complete wage rate interviews, submit weekly into the database until contractor has resolved issues. Additional details related to data collection can be found on page 3 of the [Prevailing Wage Policy and Procedure guide](#).

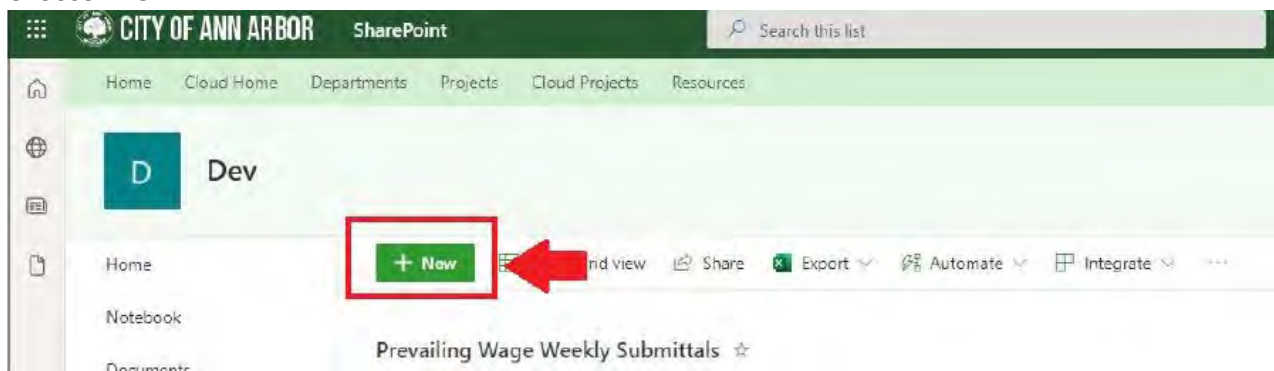
All certified payroll for each year must be reviewed and submitted by December 31st each year to meet the deadline for reporting to Council.

Submittal website can be found by clicking [here](#).

Payroll Website Navigation:

Note: Use a naming convention for contractors/projects consistent with other submissions in the spreadsheet.

1. Choose +New



2. Form will open on the right part of your screen. Fill in all information. Categories marked with an asterisk * are required to be filled in. To save, choose "Save" located at the bottom left of the form.

Save Cancel Copy link

Project Name

Project Name *

Project Name

Project ID/Number *

2022-000

Project Manager *

WA Wright, Andrea Enter a name or email address

Checked By *

WA Wright, Andrea Enter a name or email address

Record full name of employee who checked the certified payroll.

Unit *

Engineering

Week Ending *

3/13/2021

Last day of the payroll period.

Prime Contractor *

Prime Contractor Name

Subcontractor

Enter value here

Wage Rate Interview Date *

3/10/2021

Enter the date of the wage rate interview that falls in line with this submission.

Was there a violation? *

Yes


No

Violation Details

Enter value here

If yes to the questions above, what was the violation?

Save

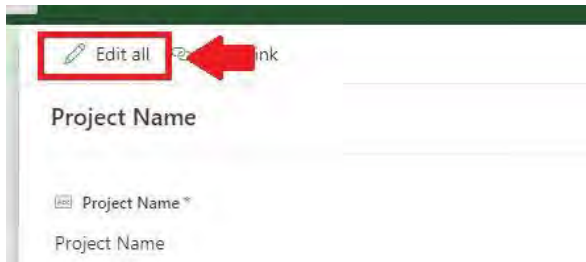


Editing Submitted Certified Payroll:

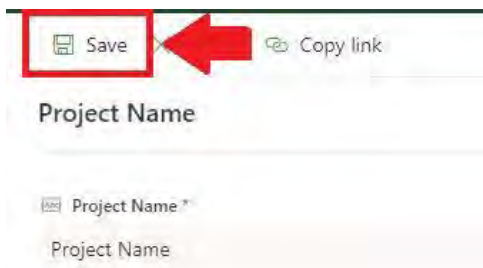
1. Click the "Project Name" of the submittal that needs to be updated. *Note: Users can only edit submittals they created but can view all.*



2. The form will open on the right part of your screen. Click "Edit all" located at the top left above Project Name. Update information.



3. To save changes click "Save" located at the top left of the form.



GUIDELINES FOR IDR CONTENT
Capital Improvement Projects
January 2017

Prior to the start of a new project, the project manager and the inspector(s) should meet and review these guidelines and how they specifically apply to the project at hand. This conversation should also include the procedural steps for submitting and generating/ungenerating IDRs, and the review of IDRs.

Minimum information for all IDRs:

- 1) Date
- 2) Project Name and File Number
- 3) Project Limits (as necessary)
- 4) Inspector(s) Name and time spent on the project site(s) that day.
- 5) Weather conditions throughout the day; temperature range (High and Low), especially if freezing conditions exist. Note any occurrences of precipitation during the work day.
- 6) A timeline of activities throughout the day, which would include such items as: time contractor arrived; start and end times of any work activities and/or delays/downtime; and time the contractor left the site.
- 7) Number of pieces of equipment (and specific description) on-site, either stored and/or being used (e.g. Komatsu PC 400 excavator; Case 580 Extend-a-hoe excavator, etc.) for all Contractors on-site. (Note: utilize the “equipment hours” field in Field Manager to keep track of active and inactive equipment.)
- 8) Specific number of personnel on-site and their labor description for all Contractors on-site (i.e. laborers, foremen, operators, etc.).
- 9) Specific location(s) where work was performed, for example: “placed 2NS sand subbase from Rd. Sta. 16+40 to 20+00 (Lt.)”
- 10) Description of material acceptance testing performed. Provide name of representative(s), company that employs them, and the time they arrived and left the site.

In addition to the basic information above, the following detailed information must also be included, depending on the specific work activities occurring:

1. Descriptions of each pay item that is documented for payment including item number, quantity accepted and posted, detailed limits of payment, and material documentation (signed delivery tickets, etc.) used in completing the work.
2. Legible, dimensioned sketches detailing the work being paid that is not clearly shown on the plan.
3. Description of work performed and its limits including:
 - description of soil conditions encountered during the work;
 - description of groundwater conditions, if any;
 - description of the condition of traffic control devices in place and their suitability for service;
 - special safety precautions utilized by the contractor;
 - description of SESC measures in-place or utilized by the contractor;
 - discussion of unsafe working conditions created by the contractor; discussion of unsafe working practices utilized by the contractor;
 - documentation of direction provided to the contractor;
 - documentation of direction received from the Project Engineer and/or the CES Supervisor;
 - documentation of work performed or direction provided to outside agencies such as city forces, private utility companies, or contractor(s) employed by other agencies;

- documentation of work (or work practices) being performed by the contractor that is contrary to the specifications;
 - documentation of damage to existing site features caused by contractor forces; include statement(s) regarding city participation, or lack thereof, in repairs, e.g. damage to trees/tree roots, mailboxes, existing curb and gutter, drive approaches, private utilities (gas, fiber, etc.), or private utility service leads, etc.;
 - description/documentation of any unusual site occurrences.
4. Description of information provided, or statements made, by the Contractor that indicate additional payment or time extensions may be sought at a later date. Include any specific responses of which you are aware that were provided to the Contractor in relation to these statements.
 5. Description of delays encountered while performing the work or delays or difficulties regarding material deliveries.
 6. Description of any unique or noteworthy event that may have occurred on or near the project. For example, a traffic accident that may have occurred within the traffic control of the project; vehicular damage (if you're aware that it occurred); or any other similar occurrence.
 7. Individuals that visited the site including their name and role on, or relating to, the project, and a thorough documentation of any interaction with those individuals, including the public.
 8. Description of deviations in the proposed work from the approved plans. Also include the name of the person that authorized the deviation.
 9. Document that work was performed in accordance with specifications and details (e.g. for storm sewer, note trench width at pipe, trench bedding depth with proper materials, backfilled with proper material in proper lifts; density checked per specs)
 10. Document materials such that all material delivered to the site is from the approved source and is accounted for – if placed, approximately how much; if remaining stockpiled, estimate amount. Materials and quantities reported should reflect daily tickets.

Procedure for submitting & reviewing IDRs:

1. IDRs should be completed by the inspector daily (ideally), or at a minimum every 2 days.
2. When submitted, the IDRs should show up as “generated” in Field Manager.
3. Project Managers (PMs) will review IDRs at a minimum interval of twice a week, depending on the schedule worked out between the PM and the inspector.
4. If there are changes to be made, the PMs will review them with the CES.
5. Changes made to an IDR need to be noted in the comment section with a description of the change, the individual making the change, and the date of change made.
6. The CES Supervisor will review disputed changes with the inspector and the PM. This review will be performed in a timely manner so that the material is still fresh in everyone's memory, and is not holding up payments to the contractor.
7. The CES Supervisor will review a sampling of IDRs each week to make sure these guidelines are being followed.



**CITY OF ANN ARBOR
PUBLIC SERVICES
CONSTRUCTION MARK UP PROCEDURE**

This Procedure should be used as a reference for doing Construction Mark ups to be turned in to Drafting and GIS for as-built purposes.

1. Prior to start of construction obtain a copy of the As-built check lists that is appropriate for your Project. There are different check lists for water, sanitary, storm, and road, sidewalks, bikepaths, walls and conduit.
2. Mark up changes to plans in red during construction on a daily basis or as soon as possible.
 - a. Completed mark-ups are to be turned in no more than **30 Days** after the utility is put in service. The goal is to have one set of completed mark ups per Project. If project is done in phases or work stoppage occurs for some reason the inspector inspecting this portion of project will be responsible to turn completed mark ups of what has been built to PM & CES Supervisor.
 - b. All items on plans that are built to plan need to be noted “AB” or outlined in red on mark ups.
 - c. Show top of pipe elevations every 50 feet and at fittings and valves.
 - d. Update all structure tables in plan and profile.
 - e. If manholes or fittings are eliminated, need to “X Out” in red on both plan and profile views.
 - f. If plan sheets have been changed or work was added to project make sure the most updated sheet is part of mark ups to be turned in.
 - g. Inquire with Project Manager for MDEQ number. Keep track of when utilities go into service and MDEQ permit numbers. This information will need to be placed on appropriate As-built Mark Up Checklist.

3. Once all or portion of new utility is put in service, fill out record sheets for valves, service valves, hydrants, sewer leads. Valve and hydrant numbers may be requested from System Planning GIS staff 4th floor City Hall Larcom. Record sheets need to be completely filled out along with location prior to any numbers being assigned. Place the assigned valve & hydrant numbers on the as-built mark-up. A copy of these sheets are to be given to the Project Manager and turned in with your as-built mark-up. Keep a copy for yourself, too.
 - a. Fill out record sheets for existing valves and hydrants that have been removed. Use same record sheet form for this, just clearly note on record sheet. Turn these sheets into Project Manager with as-built mark-up.

4. Once all construction is complete and review to make sure mark ups are as understandable as possible. Consider that someone else is going to have to understand changes made to plans. Finish filling in As-built check list items.

5. Attach record sheets and appropriate check lists to plans and submit to PM & CES Supervisor. Depending on if the Project is entirely finished or just a portion of work is done, a meeting will be set up by PM & CES Supervisor. CES's Inspectors on Project, Project Manager, and Drafting Dept will be invited to go over the as-built at this time. If the mark ups are determined complete, Drafting will take and start As-built Process and GIS staff will start GIS updating process. If CES Inspectors want original mark ups back, indicate this at meeting. If multiple Inspectors are involved with construction and mark ups for Project, PM & CES Supervisor may appoint one of these CES's at meeting to be in charge of gathering and organizing mark ups to be turned in to Drafting.

Electronic copies of checklists and record sheets available upon request.

CITY OF ANN ARBOR ENGINEERING
WATERMAIN AS-BUILT MARKUP CHECKLIST

PROJECT NAME _____ FILE NO. _____

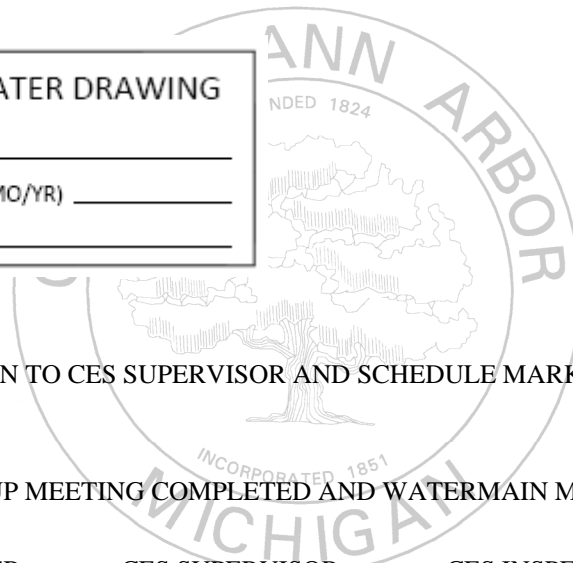
PROJECT MANAGER _____ INSPECTOR(s) _____, _____, _____

- USE RED OR GREEN INK PEN ONLY FOR CORRECTIONS
- STATIONING CORRECTED ON BOTH PLAN AND PROFILE VIEWS
- ALL ITEMS BUILT PER PLAN LABELED ON BOTH PLAN AND PROFILE VIEWS WITH "AB" IF WATERMAIN IS PRIVATE, LABEL IN PLAN AND PROFILE "PRIVATE"
- CROSSED OFF ITEMS ON BOTH PLAN AND PROFILE VIEWS THAT WERE ELIMINATED FROM PROJECT
- ADDITIONS OR CORRECTIONS MADE ON BOTH PLAN AND PROFILE VIEWS
- GATE VALVE RIM ELEVATIONS AND HYDRANT FINISH GRADE ELEVATIONS CORRECTED ON BOTH PLAN AND PROFILE VIEWS.
- BENDS CALLED OUT AS BEING HOR. OR VERT., ROLLED UP OR DOWN AND TOP OF PIPE ELEVATIONS ON EACH BEND
- TOP OF PIPE ELEVATIONS ADDED ON PROFILE VIEWS EVERY 50 FT, AT ALL FITTINGS AND AT ALL UTILITY CROSSINGS. VERTICAL CLEARANCE AT CROSSINGS SHOULD ALSO BE NOTED.
- LENGTH OF PIPE BETWEEN FITTINGS CORRECTED IN PROFILE VIEWS.
- ENLARGED PIPE SCHEMATIC ON BOTH PLAN AND PROFILE VIEWS WHERE NEEDED FOR CLARITY
- HYDRANTS, GATE VALVES, TAPPING SLEEVE & VALVE AND SERVICE VALVE NUMBERS LABELED ON BOTH PLAN AND PROFILE VIEWS. GIS WILL ASSIGN HYDRANT AND VALVE NUMBERS. SERVICE VALVES (SV) ARE DOMESTIC OR FIRE SERVICE LINES 2" OR LARGER; HYDRANT VALVES (HV) ARE ASSIGNED IF COMPANION VALVE IS GREATER THAN 3 FEET FROM HYDRANT. PLEASE MAKE THESE DISTINCTIONS CLEAR WHEN REQUESTING NUMBERS.
- CASTING SCHEDULES CORRECTED

CITY OF ANN ARBOR ENGINEERING
WATERMAIN AS-BUILT MARKUP CHECKLIST

- COPIES OF HYDRANT, GATE VALVE, TAPPING SLEEVE & VALVE AND SERVICE VALVE RECORD SHEETS TURNED IN WITH AS-BUILT MARK-UPS.
- ABANDONED HYDRANTS, GATE VALVES AND WATER MAIN CALLED OUT ON PLAN VIEWS.
- COPIES OF ABANDONED HYDRANT AND GATE VALVE RECORD SHEETS TURNED IN WITH AS-BUILT MARK-UPS.
- AS-BUILT WATER MAIN INFO FILLED IN BELOW

<p>AS-BUILT WATER DRAWING</p> <p>MDEQ PERMIT No. _____</p> <p>IN SERVICE DATE (MO/YR) _____</p> <p>CONTRACTOR _____</p>
--



- TURN MARK-UPS IN TO CES SUPERVISOR AND SCHEDULE MARK-UP REVIEW MEETING
- AS-BUILT MARK-UP MEETING COMPLETED AND WATERMAIN MARK-UPS APPROVED BELOW
PROJECT MANAGER _____ CES SUPERVISOR _____ CES INSPECTOR(s) _____, _____, _____

CITY OF ANN ARBOR ENGINEERING
SANITARY SEWER AS-BUILT MARKUP CHECKLIST

PROJECT NAME _____ FILE NO. _____

PROJECT MANAGER _____ INSPECTOR(s) _____, _____, _____

- USE RED OR GREEN INK PEN ONLY FOR CORRECTIONS
- STATIONING AND LOCATION OF ALL SANITARY STRUCTURES CORRECTED ON BOTH PLAN AND PROFILE VIEWS
- ALL ITEMS BUILT PER PLAN LABELED ON BOTH PLAN AND PROFILE VIEWS WITH "AB" IF SANITARY SEWER IS PRIVATE, LABEL IN PLAN AND PROFILE "PRIVATE"
- CROSSED OFF ITEMS ON BOTH PLAN AND PROFILE VIEWS THAT WERE ELIMINATED FROM PROJECT
- RIM AND INVERT ELEVATIONS OF STRUCTURES CORRECTED ON PROFILE VIEWS
- LENGTH OF PIPE AND GRADE CORRECTED BETWEEN STRUCTURES ON PROFILE VIEWS
- ENLARGED PIPE SCHEMATIC ON BOTH PLAN AND PROFILE VIEWS WHERE NEEDED FOR CLARITY
- CASTING SCHEDULES AND LEAD SCHEDULES CORRECTED
- SANITARY SEWER LEAD STATIONING, INVERTS, PIPE GRADE AND MATERIAL CORRECTED ON BOTH PLAN AND PROFILES VIEWS
- COPIES OF SEWER LEAD TAP RECORD SHEETS TURNED IN WITH AS-BUILT MARK-UPS.
- AS-BUILT SANITARY INFO FILLED IN BELOW

AS-BUILT SANITARY DRAWING
MDEQ PERMIT No. _____
IN SERVICE DATE (MO/YR) _____
CONTRACTOR _____

- TURN MARK-UPS IN TO CES SUPERVISOR AND SCHEDULE MARK-UP REVIEW MEETING
- AS-BUILT MARK-UP MEETING COMPLETED AND SANITARY SEWER MARK-UPS APPROVED BELOW

PROJECT MANAGER _____ CES SUPERVISOR _____ CES INSPECTOR(s) _____, _____, _____

CITY OF ANN ARBOR ENGINEERING
STORM SEWER AS-BUILT MARKUP CHECKLIST

PROJECT NAME _____ FILE NO. _____

PROJECT MANAGER _____ INSPECTOR(s) _____, _____, _____

- USE RED OR GREEN INK PEN ONLY FOR CORRECTIONS
- STATIONING AND LOCATION OF ALL STORM STRUCTURES CORRECTED ON BOTH PLAN AND PROFILE VIEWS
- ALL ITEMS BUILT PER PLAN LABELED ON BOTH PLAN AND PROFILE VIEWS WITH "AB" IF STORM SEWER IS PRIVATE, LABEL IN PLAN AND PROFILE "PRIVATE"
- CROSSED OFF ITEMS ON BOTH PLAN AND PROFILE VIEWS THAT WERE ELIMINATED FROM PROJECT
- RIM AND INVERT ELEVATIONS OF STRUCTURES CORRECTED ON PROFILE VIEWS
- LENGTH OF PIPE AND GRADE CORRECTED BETWEEN STRUCTURES ON PROFILE VIEWS
- EDGE DRAIN PIPE LENGTH AND INVERTS CORRECTED ON BOTH PLAN AND PROFILE VIEWS
- ENLARGED PIPE SCHEMATIC ON BOTH PLAN AND PROFILE VIEWS WHERE NEEDED FOR CLARITY
- CASTING SCHEDULES CORRECTED
- AS-BUILT STORM INFO FILLED IN BELOW

AS-BUILT STORM DRAWING
IN SERVICE DATE (MO/YR) _____
CONTRACTOR _____

- TURN MARK-UPS IN TO CES SUPERVISOR AND SCHEDULE MARK-UP REVIEW MEETING
- AS-BUILT MARK-UP MEETING COMPLETED AND STORM SEWER MARK-UPS APPROVED BELOW

PROJECT MANAGER _____ CES SUPERVISOR _____ CES INSPECTOR(s) _____, _____, _____

CITY OF ANN ARBOR ENGINEERING
AS-BUILT MARKUP CHECKLIST
FOR ROAD, SIDEWALKS, BIKEPATHS, WALLS AND CONDUIT

PROJECT NAME _____ FILE NO. _____

PROJECT MANAGER _____ INSPECTOR(s) _____, _____, _____

- USE RED OR GREEN INK PEN ONLY FOR CORRECTIONS
- ELEVATIONS, DISTANCES AND GRADES CORRECTED ON BOTH PLAN AND PROFILE VIEWS OF ROADS, INTERSECTIONS, SIDEWALKS, BIKEPATHS AND WALLS.
- ALL ITEMS BUILT PER PLAN LABELED ON BOTH PLAN AND PROFILE VIEWS WITH "AB"
- CROSSED OFF ITEMS ON BOTH PLAN AND PROFILE VIEWS THAT WERE ELIMINATED FROM PROJECT
- STATIONING AND LOCATION OF HANDHOLES CORRECTED ON PLAN VIEWS
- LENGTH OF CONDUIT RUNS CORRECTED ON PLAN VIEWS
- AS-BUILT LOCATION OF ALL MAST ARM AND PEDESTRIAN SIGNALS ON PLAN VIEWS
- TURN MARK-UPS IN TO CES SUPERVISOR AND SCHEDULE MARK-UP REVIEW MEETING

- AS-BUILT MARK-UP MEETING COMPLETED AND MARK-UPS APPROVED BELOW

PROJECT MANAGER _____ CES SUPERVISOR _____ CES INSPECTOR(s) _____, _____, _____



City of Ann Arbor
Public Services Department
Engineering
Gate Valve Record Sheet

Date _____ Page _____ of _____
Job No. _____ File No. _____
Job Name _____ Project Engineer _____
Job Location _____ Project Technician _____

Gate No. _____ Size _____ Street _____
Make _____ Type: RESILIENT WEDGE DOUBLE DISK BUTTERFLY
Number of Turns Opening to the RIGHT _____
Tapping Sleeve: Yes No Installed In: Well Box
Gate Location _____

Gate No. _____ Size _____ Street _____
Make _____ Type: RESILIENT WEDGE DOUBLE DISK BUTTERFLY
Number of Turns Opening to the RIGHT _____
Tapping Sleeve: Yes No Installed In: Well Box
Gate Location _____

Gate No. _____ Size _____ Street _____
Make _____ Type: RESILIENT WEDGE DOUBLE DISK BUTTERFLY
Number of Turns Opening to the RIGHT _____
Tapping Sleeve: Yes No Installed In: Well Box
Gate Location _____

Inspected by _____

Installed by _____



City of Ann Arbor
Public Services Department
Engineering
Fire Hydrant Record Sheet

Date _____ File No. _____ Project Engineer _____
Job No. _____ Project Technician _____
Job Name _____
Job Location _____

Type of Installation: New Abandoned Relocated

Hydrant No. _____ Street _____
Hydrant Location: _____

Hydrant:
Make: EJIW WATEROUS (TCIW)
Two 2 1/2", and One 4" Storz Outlet
Bury _____ ft. Valve Opening _____ in. Hub Opening _____ in.
Hydrant Extension: Yes No Height of Extension _____

Branch:
Size _____ in. Length _____ Connects to _____ on _____
Main Size Street

Branch Valve:
Make: _____ Size: _____ in.
Number of Turns Opening to the Right _____
Located _____ Feet _____ of the Hydrant
Direction

Installed By _____
Inspected By _____
Comments _____



CITY OF ANN ARBOR
PUBLIC SERVICES DEPARTMENT
ENGINEERING

SEWER SERVICE RECORD SHEET

DATE _____
JOB NO. _____
JOB NAME _____
JOB LOCATION _____

FILE NO. _____

SERVICE ADDRESS _____

TAP SIZE _____ MAIN SIZE _____

PLUMBER _____

TAP TO PROPERTY LINE _____

DIRECTION OF FLOW (COMPASS DIRECTION) _____

TYPE OF TAP SANITARY STORM

DESCRIPTION _____

LOT NO. _____

DEPTH OF MAIN SEWER _____

LICENSE NO. _____

STREET CUT PERMIT NO. _____

WATER IN SAME DITCH: _____

DISTANCE TO UPSTREAM M/H _____

DISTANCE TO DOWNSTREAM M/H _____

REMARKS/SKETCH:

INSTALLED BY _____
INSPECTED BY _____

SENT TO/RECEIVED BY UTILITIES _____

DATE _____

**ATTACHMENT B
LEGAL STATUS OF OFFEROR**

(The Respondent shall fill out the provision and strike out the remaining ones.)

The Respondent is:

- A corporation organized and doing business under the laws of the state of _____, for whom _____ bearing the office title of _____, whose signature is affixed to this proposal, is authorized to execute contracts on behalf of respondent.*

*If not incorporated in Michigan, please attach the corporation's Certificate of Authority

- A limited liability company doing business under the laws of the State of _____, whom _____ bearing the title of _____ whose signature is affixed to this proposal, is authorized to execute contract on behalf of the LLC.
- A partnership organized under the laws of the State of _____ and filed with the County of _____, whose members are (attach list including street and mailing address for each.)
- An individual, whose signature with address, is affixed to this RFP.

Respondent has examined the basic requirements of this RFP and its scope of services, including all Addendum (if applicable) and hereby agrees to offer the services as specified in the RFP.

_____, Date: _____,
Signature

(Print) Name _____ Title _____

Firm: _____

Address: _____

Contact Phone _____ Fax _____

Email _____

**ATTACHMENT D
CITY OF ANN ARBOR
LIVING WAGE ORDINANCE DECLARATION OF COMPLIANCE**

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that an employer who is (a) a contractor providing services to or for the City for a value greater than \$10,000 for any twelve-month contract term, or (b) a recipient of federal, state, or local grant funding administered by the City for a value greater than \$10,000, or (c) a recipient of financial assistance awarded by the City for a value greater than \$10,000, shall pay its employees a prescribed minimum level of compensation (i.e., Living Wage) for the time those employees perform work on the contract or in connection with the grant or financial assistance. The Living Wage must be paid to these employees for the length of the contract/program.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from compliance with the Living Wage Ordinance. If this exemption applies to your company/non-profit agency please check here No. of employees

The Contractor or Grantee agrees:

- (a) To pay each of its employees whose wage level is not required to comply with federal, state or local prevailing wage law, for work covered or funded by a contract with or grant from the City, no less than the Living Wage. The current Living Wage is defined as \$14.82/hour for those employers that provide employee health care (as defined in the Ordinance at Section 1:815 Sec. 1 (a)), or no less than \$16.52/hour for those employers that do not provide health care. The Contractor or Grantor understands that the Living Wage is adjusted and established annually on April 30 in accordance with the Ordinance and covered employers shall be required to pay the adjusted amount thereafter to be in compliance with Section 1:815(3).

Check the applicable box below which applies to your workforce

Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage without health benefits

Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits

- (b) To post a notice approved by the City regarding the applicability of the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.
- (c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.
- (d) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.
- (e) To take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee covered by the Living Wage Ordinance or any person contracted for employment and covered by the Living Wage Ordinance in order to pay the living wage required by the Living Wage Ordinance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services or agrees to accept financial assistance in accordance with the terms of the Living Wage Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Living Wage Ordinance, obligates the Employer/Grantee to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract or grant of financial assistance.

Company Name

Street Address

Signature of Authorized Representative

Date

City, State, Zip

Print Name and Title

Phone/Email address



ATTACHMENT E

VENDOR CONFLICT OF INTEREST DISCLOSURE FORM
--

All vendors interested in conducting business with the City of Ann Arbor must complete and return the Vendor Conflict of Interest Disclosure Form in order to be eligible to be awarded a contract. Please note that all vendors are subject to comply with the City of Ann Arbor's conflict of interest policies as stated within the certification section below.

If a vendor has a relationship with a City of Ann Arbor official or employee, an immediate family member of a City of Ann Arbor official or employee, the vendor shall disclose the information required below.

1. No City official or employee or City employee's immediate family member has an ownership interest in vendor's company or is deriving personal financial gain from this contract.
2. No retired or separated City official or employee who has been retired or separated from the City for less than one (1) year has an ownership interest in vendor's Company.
3. No City employee is contemporaneously employed or prospectively to be employed with the vendor.
4. Vendor hereby declares it has not and will not provide gifts or hospitality of any dollar value or any other gratuities to any City employee or elected official to obtain or maintain a contract.
5. Please note any exceptions below:

Conflict of Interest Disclosure*	
Name of City of Ann Arbor employees, elected officials or immediate family members with whom there may be a potential conflict of interest.	<input type="checkbox"/> Relationship to employee <hr/> <input type="checkbox"/> Interest in vendor's company <input type="checkbox"/> Other (please describe in box below)

*Disclosing a potential conflict of interest does not disqualify vendors. In the event vendors do not disclose potential conflicts of interest and they are detected by the City, vendor will be exempt from doing business with the City.

I certify that this Conflict of Interest Disclosure has been examined by me and that its contents are true and correct to my knowledge and belief and I have the authority to so certify on behalf of the Vendor by my signature below:		
Vendor Name	Vendor Phone Number	
Signature of Vendor Authorized Representative	Date	Printed Name of Vendor Authorized Representative

**ATTACHMENT F
CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE**

Relevant provisions of Chapter 112, Nondiscrimination, of the Ann Arbor City Code are included below.
You can review the entire ordinance at www.a2gov.org/humanrights.

Intent: It is the intent of the city that no individual be denied equal protection of the laws; nor shall any individual be denied the enjoyment of his or her civil or political rights or be discriminated against because of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight.

Discriminatory Employment Practices: No person shall discriminate in the hire, employment, compensation, work classifications, conditions or terms, promotion or demotion, or termination of employment of any individual. No person shall discriminate in limiting membership, conditions of membership or termination of membership in any labor union or apprenticeship program.

Discriminatory Effects: No person shall adopt, enforce or employ any policy or requirement which has the effect of creating unequal opportunities according to actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight for an individual to obtain housing, employment or public accommodation, except for a bona fide business necessity. Such a necessity does not arise due to a mere inconvenience or because of suspected objection to such a person by neighbors, customers or other persons.

Nondiscrimination by City Contractors: All contractors proposing to do business with the City of Ann Arbor shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All city contractors shall ensure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon any classification protected by this chapter. All contractors shall agree not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of any applicable protected classification. All contractors shall be required to post a copy of Ann Arbor's Non-Discrimination Ordinance at all work locations where its employees provide services under a contract with the city.

Complaint Procedure: If any individual believes there has been a violation of this chapter, he/she may file a complaint with the City's Human Rights Commission. The complaint must be filed within 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the allegedly discriminatory action. A complaint that is not filed within this timeframe cannot be considered by the Human Rights Commission. To file a complaint, first complete the complaint form, which is available at www.a2gov.org/humanrights. Then submit it to the Human Rights Commission by e-mail (hrc@a2gov.org), by mail (Ann Arbor Human Rights Commission, PO Box 8647, Ann Arbor, MI 48107), or in person (City Clerk's Office). For further information, please call the commission at 734-794-6141 or e-mail the commission at hrc@a2gov.org.

Private Actions For Damages or Injunctive Relief: To the extent allowed by law, an individual who is the victim of discriminatory action in violation of this chapter may bring a civil action for appropriate injunctive relief or damages or both against the person(s) who acted in violation of this chapter.

**THIS IS AN OFFICIAL GOVERNMENT NOTICE AND
MUST BE DISPLAYED WHERE EMPLOYEES CAN READILY SEE IT.**

ATTACHMENT G

CITY OF ANN ARBOR LIVING WAGE ORDINANCE

RATE EFFECTIVE APRIL 30, 2022 - ENDING APRIL 29, 2023

\$14.82 per hour

If the employer provides health care benefits*

\$16.52 per hour

If the employer does **NOT** provide health care benefits*

Employers providing services to or for the City of Ann Arbor or recipients of grants or financial assistance from the City of Ann Arbor for a value of more than \$10,000 in a twelve-month period of time must pay those employees performing work on a City of Ann Arbor contract or grant, the above living wage.

ENFORCEMENT

The City of Ann Arbor may recover back wages either administratively or through court action for the employees that have been underpaid in violation of the law. Persons denied payment of the living wage have the right to bring a civil action for damages in addition to any action taken by the City.

Violation of this Ordinance is punishable by fines of not more than \$500/violation plus costs, with each day being considered a separate violation. Additionally, the City of Ann Arbor has the right to modify, terminate, cancel or suspend a contract in the event of a violation of the Ordinance.

* Health Care benefits include those paid for by the employer or making an employer contribution toward the purchase of health care. The employee contribution must not exceed \$.50 an hour for an average work week; and the employer cost or contribution must equal no less than \$1/hr for the average work week.

The Law Requires Employers to Display This Poster Where Employees Can Readily See It.

**For Additional Information or to File a Complaint contact
Colin Spencer at 734/794-6500 or cspencer@a2gov.org**

("Services") in connection with the Project as described in Exhibit A. The City retains the right to make changes to the quantities of service within the general scope of the Agreement at any time by a written order. If the changes add to or deduct from the extent of the services, the compensation shall be adjusted accordingly. All such changes shall be executed under the conditions of the original Agreement.

- B. Quality of Services under this Agreement shall be of the level of quality performed by persons regularly rendering this type of service. Determination of acceptable quality shall be made solely by the Contract Administrator.
- C. The Contractor shall perform its Services for the Project in compliance with all statutory, regulatory, and contractual requirements now or hereafter in effect as may be applicable to the rights and obligations set forth in the Agreement. The Contractor shall also comply with and be subject to the City of Ann Arbor policies applicable to independent contractors.
- D. The Contractor may rely upon the accuracy of reports and surveys provided to it by the City (if any) except when defects should have been apparent to a reasonably competent professional or when it has actual notice of any defects in the reports and surveys.

IV. INDEPENDENT CONTRACTOR

The Parties agree that at all times and for all purposes under the terms of this Agreement each Party's relationship to any other Party shall be that of an independent contractor. Each Party will be solely responsible for the acts of its own employees, agents, and servants. No liability, right, or benefit arising out of any employer/employee relationship, either express or implied, shall arise or accrue to any Party as a result of this Agreement.

Contractor does not have any authority to execute any contract or agreement on behalf of the City, and is not granted any authority to assume or create any obligation or liability on the City's behalf, or to bind the City in any way.

V. COMPENSATION OF CONTRACTOR

- A. The Contractor shall be paid in the manner set forth in Exhibit B. Payment shall be made monthly, unless another payment term is specified in Exhibit B, following receipt of invoices submitted by the Contractor, and approved by the Contract Administrator.
- B. The Contractor will be compensated for Services performed in addition to the Services described in Article III, only when the scope of and compensation for those additional Services have received prior written approval of the Contract Administrator.
- C. The Contractor shall keep complete records of work performed (e.g. tasks performed, hours allocated, etc.) so that the City may verify invoices submitted by the Contractor. Such records shall be made available to the City upon request

and submitted in summary form with each invoice.

VI. INSURANCE/INDEMNIFICATION

- A. The Contractor shall procure and maintain from the Effective Date or Commencement Date of this Agreement (whichever is earlier) through the conclusion of this Agreement, such insurance policies, including those set forth in Exhibit C, as will protect itself and the City from all claims for bodily injuries, death or property damage that may arise under this Agreement; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor, or anyone employed by them directly or indirectly. Prior to commencement of work under this Agreement, Contractor shall provide to the City documentation satisfactory to the City, through City-approved means (currently myCOI), demonstrating it has obtained the policies and endorsements required by Exhibit C. Contractor shall add registration@mycoitracking.com to its safe sender's list so that it will receive necessary communication from myCOI. When requested, Contractor shall provide the same documentation for its subcontractor(s) (if any).

- B. Any insurance provider of Contractor shall be authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-authorized insurance companies are not acceptable unless approved in writing by the City.

- C. To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses, including attorney's fees, resulting or alleged to result, from any acts or omissions by Contractor or its employees and agents occurring in the performance of or breach in this Agreement, except to the extent that any suit, claim, judgment or expense are finally judicially determined to have resulted from the City's negligence or willful misconduct or its failure to comply with any of its material obligations set forth in this Agreement.

VII. COMPLIANCE REQUIREMENTS

- A. Nondiscrimination. The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of the Ann Arbor City Code and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

- B. Living Wage. If the Contractor is a “covered employer” as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Agreement a “living wage,” as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Agreement are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

VIII. WARRANTIES BY THE CONTRACTOR

- A. The Contractor warrants that the quality of its Services under this Agreement shall conform to the level of quality performed by persons regularly rendering this type of service.
- B. The Contractor warrants that it has all the skills, experience, and professional licenses (if applicable) necessary to perform the Services pursuant to this Agreement.
- C. The Contractor warrants that it has available, or will engage, at its own expense, sufficient trained employees to provide the Services pursuant to this Agreement.
- D. The Contractor warrants that it has no personal or financial interest in the Project other than the fee it is to receive under this Agreement. The Contractor further certifies that it shall not acquire any such interest, direct or indirect, which would conflict in any manner with the performance of the Services it is to provide pursuant to this Agreement. Further Contractor agrees and certifies that it does not and will not employ or engage any person with a personal or financial interest in this Agreement.
- E. The Contractor warrants that it is not, and shall not become overdue or in default to the City for any contract, debt, or any other obligation to the City including real and personal property taxes. Further Contractor agrees that the City shall have the right to set off any such debt against compensation awarded for Services under this Agreement.
- F. The Contractor warrants that its proposal for services was made in good faith, it arrived at the costs of its proposal independently, without consultation, communication or agreement, for the purpose of restricting completion as to any matter relating to such fees with any competitor for these Services; and no attempt has been made or shall be made by the Contractor to induce any other person or firm to submit or not to submit a proposal for the purpose of restricting competition.

- G. The person signing this Agreement on behalf of Contractor represents and warrants that she/he has express authority to sign this Agreement for Contractor and agrees to hold the City harmless for any costs or consequences of the absence of actual authority to sign.

IX. OBLIGATIONS OF THE CITY

- A. The City agrees to give the Contractor access to the Project area and other City-owned properties as required to perform the necessary Services under this Agreement.
- B. The City shall notify the Contractor of any defects in the Services of which the Contract Administrator has actual notice.

X. ASSIGNMENT

- A. The Contractor shall not subcontract or assign any portion of any right or obligation under this Agreement without prior written consent from the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under the Agreement unless specifically released from the requirement, in writing, by the City.
- B. The Contractor shall retain the right to pledge payment(s) due and payable under this Agreement to third parties.

XI. TERMINATION OF AGREEMENT

- A. If either party is in breach of this Agreement for a period of fifteen (15) days following receipt of notice from the non-breaching party with respect to a breach, the non-breaching party may pursue any remedies available to it against the breaching party under applicable law, including but not limited to, the right to terminate this Agreement without further notice. The waiver of any breach by any party to this Agreement shall not waive any subsequent breach by any party.
- B. The City may terminate this Agreement, on at least thirty (30) days advance notice, for any reason, including convenience, without incurring any penalty, expense or liability to Contractor, except the obligation to pay for Services actually performed under the Agreement before the termination date.
- C. Contractor acknowledges that, if this Agreement extends for several fiscal years, continuation of this Agreement is subject to appropriation of funds for this Project. If funds to enable the City to effect continued payment under this Agreement are not appropriated or otherwise made available, the City shall have the right to terminate this Agreement without penalty at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of termination to Contractor. The Contract Administrator shall give Contractor written notice of such non-appropriation within thirty (30) days after it receives

notice of such non-appropriation.

- D. The provisions of Articles VI and VIII shall survive the expiration or earlier termination of this Agreement for any reason. The expiration or termination of this Agreement, for any reason, shall not release either party from any obligation or liability to the other party, including any payment obligation that has already accrued and Contractor's obligation to deliver all Deliverables due as of the date of termination of the Agreement.

XII. REMEDIES

- A. This Agreement does not, and is not intended to, impair, divest, delegate or contravene any constitutional, statutory and/or other legal right, privilege, power, obligation, duty or immunity of the Parties.
- B. All rights and remedies provided in this Agreement are cumulative and not exclusive, and the exercise by either party of any right or remedy does not preclude the exercise of any other rights or remedies that may now or subsequently be available at law, in equity, by statute, in any agreement between the parties or otherwise.
- C. Absent a written waiver, no act, failure, or delay by a Party to pursue or enforce any rights or remedies under this Agreement shall constitute a waiver of those rights with regard to any existing or subsequent breach of this Agreement. No waiver of any term, condition, or provision of this Agreement, whether by conduct or otherwise, in one or more instances, shall be deemed or construed as a continuing waiver of any term, condition, or provision of this Agreement. No waiver by either Party shall subsequently affect its right to require strict performance of this Agreement.

XIII. NOTICE

All notices and submissions required under this Agreement shall be delivered to the respective party in the manner described herein to the address stated below or such other address as either party may designate by prior written notice to the other. Notices given under this Agreement shall be in writing and shall be personally delivered, sent by next day express delivery service, certified mail, or first class U.S. mail postage prepaid, and addressed to the person listed below. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; (2) the next business day when notice is sent next day express delivery service or personal delivery; or (3) three days after mailing first class or certified U.S. mail.

If Notice is sent to the CONTRACTOR, it shall be addressed and sent to:

If Notice is sent to the CITY, it shall be addressed and sent to:

City of Ann Arbor

(insert name of Administering Service Area Administrator)

301 E. Huron St.
Ann Arbor, Michigan 48104

With a copy to: The City of Ann Arbor
ATTN: Office of the City Attorney
301 East Huron Street, 3rd Floor
Ann Arbor, Michigan 48104

XIV. CHOICE OF LAW AND FORUM

This Agreement will be governed and controlled in all respects by the laws of the State of Michigan, including interpretation, enforceability, validity and construction, excepting the principles of conflicts of law. The parties submit to the jurisdiction and venue of the Circuit Court for Washtenaw County, State of Michigan, or, if original jurisdiction can be established, the United States District Court for the Eastern District of Michigan, Southern Division, with respect to any action arising, directly or indirectly, out of this Agreement or the performance or breach of this Agreement. The parties stipulate that the venues referenced in this Agreement are convenient and waive any claim of non-convenience.

XV. OWNERSHIP OF DOCUMENTS

Upon completion or termination of this Agreement, all documents (i.e., Deliverables) prepared by or obtained by the Contractor as provided under the terms of this Agreement shall be delivered to and become the property of the City. Original basic survey notes, sketches, charts, drawings, partially completed drawings, computations, quantities and other data shall remain in the possession of the Contractor as instruments of service unless specifically incorporated in a deliverable, but shall be made available, upon request, to the City without restriction or limitation on their use. The City acknowledges that the documents are prepared only for the Project. Prior to completion of the contracted Services the City shall have a recognized proprietary interest in the work product of the Contractor.

XVI. CONFLICTS OF INTEREST OR REPRESENTATION

Contractor certifies it has no financial interest in the Services to be provided under this Agreement other than the compensation specified herein. Contractor further certifies that it presently has no personal or financial interest, and shall not acquire any such interest, direct or indirect, which would conflict in any manner with its performance of the Services under this Agreement.

Contractor agrees to advise the City if Contractor has been or is retained to handle any matter in which its representation is adverse to the City. The City's prospective consent to the Contractor's representation of a client in matters adverse to the City, as identified above, will not apply in any instance where, as the result of Contractor's representation, the Contractor has obtained

sensitive, proprietary or otherwise confidential information of a non-public nature that, if known to another client of the Contractor, could be used in any such other matter by the other client to the material disadvantage of the City. Each matter will be reviewed on a case by case basis.

XVII. SEVERABILITY OF PROVISIONS

Whenever possible, each provision of this Agreement will be interpreted in a manner as to be effective and valid under applicable law. However, if any provision of this Agreement or the application of any provision to any party or circumstance will be prohibited by or invalid under applicable law, that provision will be ineffective to the extent of the prohibition or invalidity without invalidating the remainder of the provisions of this Agreement or the application of the provision to other parties and circumstances.

XVIII. EXTENT OF AGREEMENT

This Agreement, together Exhibits A, B, and C, constitutes the entire understanding between the City and the Contractor with respect to the subject matter of the Agreement and it supersedes, unless otherwise incorporated by reference herein, all prior representations, negotiations, agreements or understandings whether written or oral. Neither party has relied on any prior representations, of any kind or nature, in entering into this Agreement. No terms or conditions of either party's invoice, purchase order or other administrative document shall modify the terms and conditions of this Agreement, regardless of the other party's failure to object to such form. This Agreement shall be binding on and shall inure to the benefit of the parties to this Agreement and their permitted successors and permitted assigns and nothing in this Agreement, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Agreement. This Agreement may only be altered, amended or modified by written amendment signed by the Contractor and the City. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall be deemed to be one and the same agreement.

XIX. ELECTRONIC TRANSACTION

The parties agree that signatures on this Agreement may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this Agreement. This Agreement may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

XX. EFFECTIVE DATE

This Agreement will become effective when all parties have signed it. The Effective Date of this Agreement will be the date this Agreement is signed by the last party to sign it.

[REMAINDER OF PAGE LEFT BLANK; SIGNATURE PAGE FOLLOWS]

FOR _____

Contractor Name

By _____

Name: _____

Title: _____

Date: _____

FOR THE CITY OF ANN ARBOR

By _____
Christopher Taylor, Mayor

By _____
Jacqueline Beaudry, City Clerk

Date: _____

Approved as to substance

Service Area Administrator Type Name

Milton Dohoney Jr., City Administrator

Approved as to form and content

Atleen Kaur, City Attorney

**EXHIBIT A
SCOPE OF SERVICES**

(Insert/Attach Scope of Work & Deliverables Schedule)

EXHIBIT B COMPENSATION

General

Contractor shall be paid for those Services performed pursuant to this Agreement inclusive of all reimbursable expenses (if applicable), in accordance with the terms and conditions herein. The Compensation Schedule below/attached states nature and amount of compensation the Contractor may charge the City:

(insert/Attach Negotiated Fee Arrangement)

**EXHIBIT C
INSURANCE REQUIREMENTS**

From the earlier of the Effective Date or the Commencement Date of this Agreement, and continuing without interruption during the term of this Agreement, Contractor shall have, at a minimum, the following insurance, including all endorsements necessary for Contractor to have or provide the required coverage.

A. The Contractor shall have insurance that meets the following minimum requirements:

1. Professional Liability Insurance or Errors and Omissions Insurance protecting the Contractor and its employees in an amount not less than \$1,000,000.
2. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

Bodily Injury by Accident - \$500,000 each accident
Bodily Injury by Disease - \$500,000 each employee
Bodily Injury by Disease - \$500,000 each policy limit
3. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 04 13 or current equivalent. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the following minimum limits of liability are required:

\$1,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined
\$2,000,000 Per Project General Aggregate
\$1,000,000 Personal and Advertising Injury
4. Motor Vehicle Liability Insurance equivalent to, as a minimum, Insurance Services Office form CA 00 01 10 13 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.
5. Umbrella/Excess Liability Insurance shall be provided to apply in excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of \$1,000,000.

- B. Insurance required under A.3 and A.4 above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City for any insurance listed herein.
- C. Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional and unqualified 30-day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number(s); name of insurance company; name(s), email address(es), and address(es) of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions, which may be approved by the City in its sole discretion; (c) that the policy conforms to the requirements specified. Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. If any of the above coverages expire by their terms during the term of this Agreement, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.