

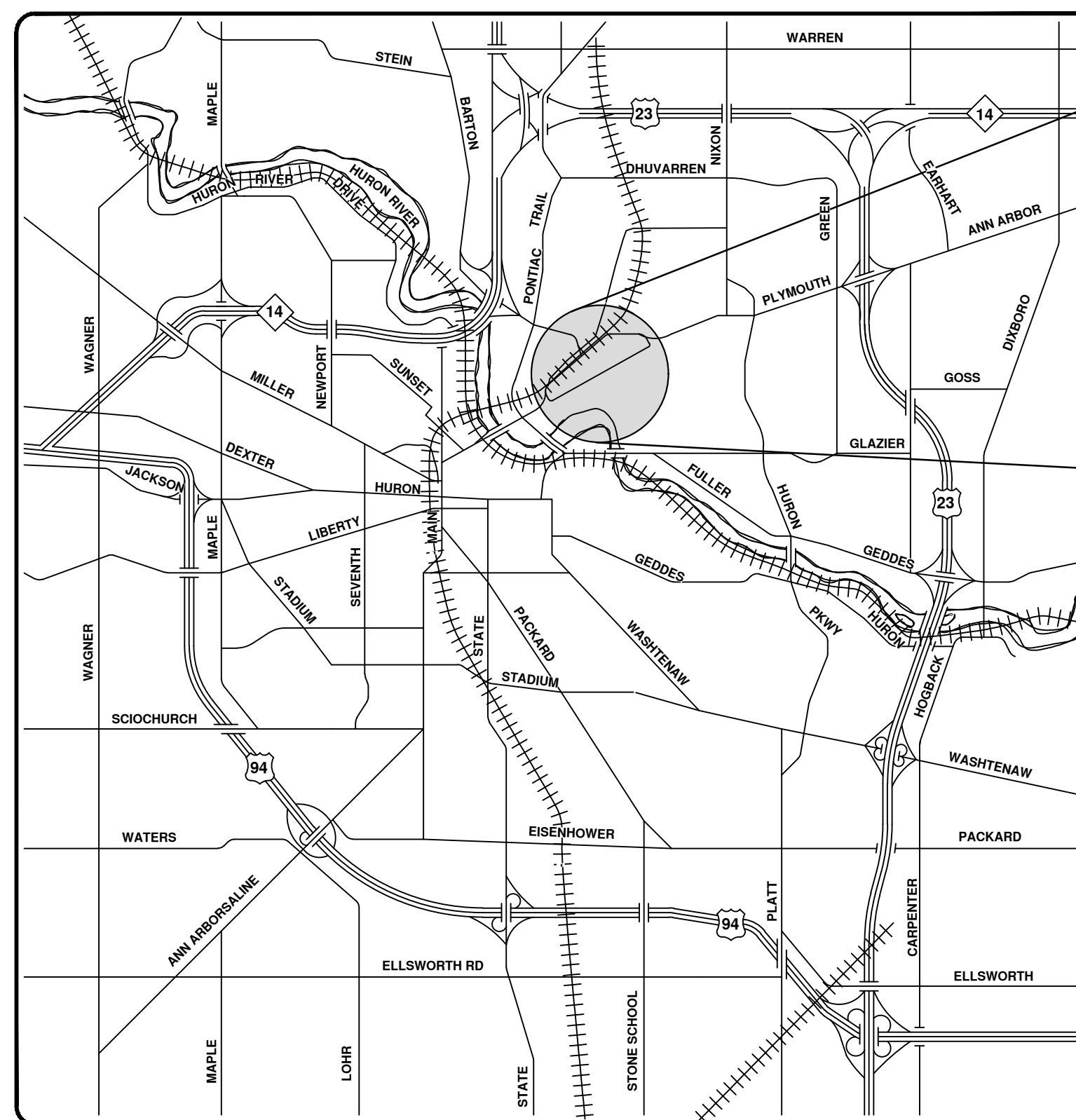
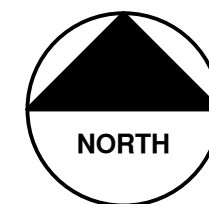


CITY OF ANN ARBOR ENGINEERING

BROADWAY STREET WATER MAIN REPLACEMENT AND RESURFACING PROJECT

RFP #23-04, FILE No. 2020030

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VICINITY MAP

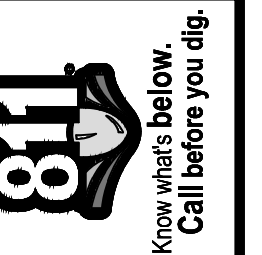


NOTES

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174 OF 2013, THE CONTRACTOR SHALL CALL 811 OR 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 THUS 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.

THE UNDERGROUND LOCATIONS SHOWN FOR NATURAL GAS, TELEPHONE, ELECTRICAL POWER, CABLE TV AND FIBER OPTIC LINES ARE APPROXIMATE. THE CITY OF ANN ARBOR ASSUMES NO RESPONSIBILITY FOR THEIR ACCURATE REPRESENTATION IN THIS DRAWING. MISS DIG MUST BE CONTACTED PRIOR TO CONSTRUCTION TO LOCATE THESE UTILITIES.

THE CONSTRUCTION COVERED BY THESE PLANS SHALL CONFORM TO THE 1994 EDITION OF THE CITY OF ANN ARBOR PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS, IT'S DETAILS, WHICH ARE INCLUDED BY REFERENCE, AND THIS PROJECT'S CONTRACT DOCUMENTS. THE OMISSION OF ANY CURRENT STANDARD DETAIL DOES NOT RELIEVE THE CONTRACTOR FROM THIS REQUIREMENT.



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

CITY OF ANN ARBOR
PUBLIC SERVICES
301 EAST HURON STREET
ANN ARBOR, MI 48106-8647
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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
COVER SHEET
SCALE
DRAWING No. 2020030-1
SHEET No. 1 OF 50



PREPARED UNDER THE SUPERVISION OF
Michael Leppek
MIKE LEPEK, P.E. - MI LICENSE No. 6201067425
CONSULTING ENGINEER - FISHBECK



12/16/2022
DATE

Michael Leppek

CONSTRUCTION NOTES:

- 1. 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. It shall be the Contractor's responsibility to coordinate all necessary driveway closures with the property owner(s) and resident(s) in the areas of construction.
2. The location and depth of all existing utilities and service leads are to be field verified by the Contractor prior to construction.
3. Location and depth of utilities as depicted on the plans is approximate and shown according to the best information available. It is the Contractor's responsibility to excavate ahead and adjust depth of conflict utilities accordingly. Any damage to utilities is the Contractor's responsibility to avoid and/or repair as necessary.
4. The Contractor is to take special care to protect the existing water main and be responsible for maintaining consistent water service.
5. During non-working hours no trench shall remain open; any open trench shall be properly secured with protective fencing. This work shall be included in the item of work "General Conditions".
6. Trenches for new water services shall be excavated to MIOSHA and City of Ann Arbor Public Works requirements.
7. City of Ann Arbor Public Works will install the corporation and copper service lead(s) to transfer the connection(s). If an existing water service is found to be failing or is not copper, the lead will be replaced to the curb box by Public Works.
8. For the installation of corporations, or any other related activities, the Contractor shall not receive additional compensation for delays due to the scheduling of or coordination with the City of Ann Arbor Public Works.
9. The Contractor shall backfill trenches in accordance with Trench Detail specified on plans. This work shall be included in the item of work "Excavate and Backfill for Water Service Tap and Lead". All concrete removals and replacements required for this work will be paid for separately.
10. All ductile iron pipe and fittings shall be polyethylene wrapped per ANSI/AWWA C105/A21.5.
11. Cor-blw bolts to be used at all mechanical water main joints at hydrants and Megalug fittings
12. The Contractor shall construct, flush, and bacteriologically test the water main per Detailed Specification "Water Main Installation and Testing" and as approved by the Engineer. All chlorinated water shall be discharged directly into an approved sanitary sewer. The Contractor shall supply all necessary hoses, fittings and the like to accomplish this work.
13. Water main fittings, other than those specifically listed as separate pay items, which are required to complete the work, such as blow-off assemblies, concrete thrust blocks, solid sleeves and mechanical plugs, shall not be paid for separately, but shall be included in the pipe pay items.
14. "No Parking" signs shall be installed by the Contractor at locations as approved or directed by the Engineer. All signs shall be installed in accordance with the detailed specifications.

- 15. Postal delivery and refuse pickup service shall be maintained at all times by the Contractor.
16. All fittings, hydrants, valves and castings removed during construction are the property of the City of Ann Arbor. The Contractor within 48 hours shall deliver to City of Ann Arbor Public Works Facility at the W.R. Wheeler Service Center located at 4251 Stone School Road.
17. Where street curbs are undermined due to construction activities, they shall be removed and replaced as directed by the Engineer.
18. The Contractor shall be responsible for the continuous maintenance of the temporary road surface and soil erosion control measures within the construction area until the full completion of the project. This work shall be included in the item of work "General Conditions".
19. All curb, sidewalk, driveway approach removals shall be approved by Engineer before the work is done.
20. Sawed sewer pipe connections shall be coupled with a Fernco flexible coupling and a stainless steel shear ring.
21. The location of material stock piles and on-site staging areas to be approved by the Engineer.
22. For mainline paving, the width of the mat for each pass of the paver shall be not less than 10.5' or greater than 15', as directed by the Engineer. The Engineer will direct the layout of the longitudinal joints during construction.
23. All structures shall receive new castings as directed by the Engineer, as specified on the standard casting schedule. The existing castings are the property of the City of Ann Arbor. The Contractor shall deliver to City of Ann Arbor Public Works Facility at the W.R. Wheeler Service Center located at 4251 Stone School Road.
24. Payment for drainage structure sumps, where specified, shall be included in the payment for the various drainage structure sizes and or types.
25. Where sewer pipes of different sizes or materials are joined, Fernco flexible couplings with stainless steel shear rings shall be used. The Contractor's purchase price for these 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 other costs associated with the installation of these devices shall be included in the payment for the sewer.
26. Where sewer and water main are to be removed & replaced or added, all pipe shall be installed using Trench Detail detailed in the specifications or shown on Plans. Backfill for sewer and water construction shall be MDOT Granular Material, Class II, Modified.
27. Existing street name, guide, and regulatory signs, and mailboxes 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. This work will not be paid for separately, but shall be included in "Machine Grading, Modified"
28. In areas where edge drain cannot be installed in accordance with City of Ann Arbor Detail SD-TD-11, the edge drain shall be installed at the depth as indicated on the plans, or as directed by Engineer. In no case shall the edge drain be installed at a grade less than 0.50% or at a depth of less than 2' below top of proposed pavement.

GENERAL
NOTIFY THE CITY OF ANN ARBOR SOIL EROSION CONTROL OFFICE 48 HOURS PRIOR TO BEGINNING WORK ON THE PROJECT. PHONE: 734-794-6265.

- 1. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER AT ALL TIMES DURING CONSTRUCTION. ANY MODIFICATIONS OR ADDITIONS TO THE SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS SHALL BE AS DIRECTED AND APPROVED BY THE ENGINEER.
2. ALL SOIL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE PERMIT REQUIREMENTS OF THE CITY OF ANN ARBOR, CHAPTER 55 ANN ARBOR UNIFIED DEVELOPMENT CODE, CITY OF ANN ARBOR STANDARDS DIVISION VII, THE LAWS OF THE STATE OF MICHIGAN, AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
3. DAILY, OR AFTER ANY STORM EVENT, INSPECTIONS OF EROSION CONTROL MEASURES SHALL BE MADE BY THE CONTRACTOR. PERIODIC INSPECTIONS MAY BE MADE BY THE ENGINEER TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY CORRECTIONS SHALL BE MADE WITHOUT DELAY, AND WITHOUT ADDITIONAL COST TO THE CITY OF ANN ARBOR.
4. EROSION AND SEDIMENTATION FROM WORK ON THE SITE SHALL BE CONTAINED ON THE SITE AND NOT BE ALLOWED TO COLLECT ON ANY OFF-SITE AREAS, ROADWAYS OR WATERWAYS.
5. ALL MUD/SOIL TRACKED ONTO ROADWAYS FROM THE SITE DUE TO CONSTRUCTION, SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR. IF SO ORDERED, THE CONTRACTOR SHALL PROVIDE AND OPERATE A VACUUM-TYPE STREET SWEEPER, AT NO ADDITIONAL COST TO THE CITY OF ANN ARBOR.
6. RESTORATION OF ALL DISTURBED AREAS, INCLUDING PLACEMENT OF TOPSOIL, SEED, FERTILIZER AND MULCH AND/OR SOD SHALL BE PERFORMED WITHIN FIVE (5) DAYS OF THE COMPLETION OF FINAL GRADE.
7. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE SOIL EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION IN CRITICAL AREAS AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACKFILLING OPERATIONS.
8. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
9. PROPER DUST CONTROL SHALL BE MAINTAINED DURING CONSTRUCTION BY USE OF WATER TRUCKS AND/OR DUST PALLIATIVE AS REQUIRED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND REMOVAL OF SOME MEASURES UPON AUTHORIZED COMPLETION OF THE PROJECT. FINAL COMPLETION OF PROJECT WILL NOT BE AUTHORIZED UNTIL ALL SITE WORK AND UTILITY CONSTRUCTION IS COMPLETE AND ALL SOILS ARE STABILIZED.
11. THE CONTRACTOR SHALL NOT GRADE INTO ADJACENT PROPERTIES. SILT AND PROTECTIVE FENCE SHALL BE INSTALLED AND MAINTAINED TO PREVENT GRADING, EROSION AND SEDIMENTATION INTO THE ADJACENT PROPERTIES.
12. TREE PROTECTION FENCING MUST REMAIN INTACT UNTIL RESTORATION OF THE SITE IS COMPLETE.

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.

SAMPLE 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. INSTALL WATER MAINS, STORM AND SANITARY SEWERS, AND OTHER ENCLOSED DRAINAGE FEATURES. NEW INLET FILTERS SHALL BE INSTALLED IMMEDIATELY FOLLOWING INSTALLATION OF NEW DRAINAGE INLETS.
1.4. PERFORM MACHINE GRADING OPERATIONS AND CONSTRUCT PAVEMENTS (MAINLINE, SIDEWALKS, DRIVES, ETC.).
1.5. CONTINUALLY MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES, AS REQUIRED TO ALLOW DRAINAGE AND SEDIMENT REMOVAL. REMOVE ANY ACCUMULATED SEDIMENT IMMEDIATELY.
1.6. COMPLETE ALL FINE GRADING.
1.7. TEMPORARY SEED AND INSTALL EROSION CONTROL BLANKET IN ALL DISTURBED AREAS.
1.8. REFER TO LANDSCAPE PLANTING PLANS FOR PERMANENT SITE STABILIZATION.
1.9. CLEAN OUT STORM SEWER SYSTEMS.
1.10. REMEDY ANY NOTED DEFECTS TO THE SATISFACTION OF THE CITY OF ANN ARBOR'S SOIL EROSION AND SEDIMENTATION CONTROL OFFICIAL.
1.11. 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.

TEMPORARY SEEDING:

- 1. SEED IN ACCORDANCE WITH PROJECT DRAWINGS AND SPECIFICATIONS.
2. ANY DISTURBED AREA NOT PAVED, SEEDED, MULCHED, SODDED OR BUILT UPON BY NOVEMBER 15TH OR JUNE 30TH IS TO BE TEMPORARILY STABILIZED PER SPECIFICATIONS.

THE ESTIMATED COST OF SOIL EROSION AND SEDIMENTATION CONTROL MEASURES, TOPSOIL, SEEDING, AND MULCH = \$xxx,xxx

ESTIMATE OF EXCAVATION AND FILL FROM EXISTING TO FINAL GRADE:
EXCAVATION = x CY, FILL = x CY

- ON SITE SOILS PER THE USDA SOIL SURVEY OF WASHTENAW COUNTY, MICHIGAN:
Sb - SEBEWA LOAM - IN DEPRESSION AREAS, BROAD LOW-LYING AREA, AND DRAINAGEWAYS OF OUTWASH PLAINS, VALLEY TRAINS, AND TERRACES. SLOPE IS 0% TO 2%
FoB - FOX SANDY LOAM - IN UPLAND AREAS AND ON OUT WASH PLAINS, KAMES, VALLEY TRAINS, TERRACES, AND MORAINES. SLOPES ARE UNIFORM OR SHORT AND COMPLEX.
Mda - MATHERTON SANDY LOAM - IN DEPRESSION AREAS, BROAD LOW-LYING AREAS, AND ALONG DRAINAGEWAYS, OUTWASH PLAINS, VALLEY TRAINS, AND TERRACES. NEARLY LEVEL TO GENTLY SLOPING.
Mfa - METAMORA SANDY LOAM - IN DEPRESSION AREAS, BROAD, LOW-LYING AREAS, AND ALONG DRAINAGEWAYS OF TILL PLAINS AND MORAINES.
NoB - NAPPANEE SILTY CLAY LOAM - ON FOOT SLOPES AND ALONG DRAINAGEWAYS OF TILL PLAINS, MORAINES, AND LAKE PLAINS. NEARLY LEVEL TO GENTLY SLOPING.

Table with 2 columns: IMPERVIOUS PROJECT AREA, PRIOR TO CONSTRUCTION (4.28 ACRES), POST CONSTRUCTION (4.31 ACRES)

AREA OF PROPOSED DISTURBANCE = 4.35 ACRES

PERMITS REQUIRED TO BE OBTAINED BY THE CONTRACTOR PRIOR TO THE BEGINNING OF CONSTRUCTION.

Table with 2 columns: PERMIT, ISSUING AUTHORITY. Rows include LANE CLOSURE PERMIT, NO PARKING SIGNS PERMIT, GRADING/SOIL EROSION & SEDIMENTATION CONTROL PERMIT, RIGHT-OF-WAY PERMIT. Note: * NO COST TO CONTRACTOR

PERMITS REQUIRED TO BE OBTAINED BY THE CITY OF ANN ARBOR PRIOR TO THE BEGINNING OF CONSTRUCTION.

Table with 2 columns: PERMIT, ISSUING AUTHORITY. Row: EGLE WATER MAIN CONSTRUCTION PERMIT, MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

CONTACT INFORMATION

Table with 3 columns: PUBLIC UTILITIES, OWNER, CONTACT. Rows include WATER, SANITARY, STORM, FORESTRY, SIGNS SIGNALS STREET LIGHTS, PRIVATE UTILITIES, GAS, ELECTRIC, CABLE, PHONE, FIBER OPTIC, FIBER OPTIC, STREET LIGHTING

PROJECT NAME BENCHMARKS

Table with 3 columns: BM #, ELEV, DESCRIPTION. Lists 11 benchmarks for roadway street water main project.



Table with 3 columns: ISSUED FOR BIDS, 100% OWNER REVIEW, 95% OWNER REVIEW, 60% OWNER REVIEW, CHECKED, REV.

CITY OF ANN ARBOR PUBLIC SERVICES
301 EAST HURON STREET
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734-794-6410
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CITY OF ANN ARBOR - ENGINEERING
BROADWAY STREET WATER MAIN
STANDARD NOTES

SCALE: NTS
DRAWING No. 2020030-2

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EXISTING LEGEND

- FIRE HYDRANT
- GATE VALVE IN BOX
- GATE VALVE IN WELL
- STOP BOX
- WATER VAULT
- WELL
- CATCH BASIN (SQ)
- CATCH BASIN (RD)
- STORM MANHOLE
- NON-CURB CATCH BASIN (SQ)
- END SECTION
- SANITARY MANHOLE
- CLEAN-OUT
- POST
- PEDESTRIAN SIGNAL
- SIGN
- HAND HOLE
- ORNAMENTAL LIGHT
- FLOOD LIGHT
- UNKNOWN MANHOLE
- TELEPHONE MANHOLE
- TELEPHONE RISER
- GAS VALVE
- GAS VENT
- GAS BOX
- ELECTRICAL RISER
- TRANSFORMER
- UTILITY POLE
- LAMP POLE
- GUY ANCHOR
- GUY POLE
- MONITORING WELL
- MAILBOX
- SOIL BORING
- TRAVERSE POINT
- BENCH MARK
- IRON PIPE
- MON BOX

- WATER MAIN
- WATER MAIN ABANDONED
- STORM SEWER
- STORM SEWER ABANDONED
- SANITARY SEWER
- SANITARY SEWER ABANDONED
- GAS MAIN
- GAS MAIN (DEAD)
- ELECTRICAL OVER HEAD
- ELECTRICAL UNDER GROUND
- ELECTRICAL DUCT BANK
- TELEPHONE OVER HEAD
- TELEPHONE UNDER GROUND
- TELEPHONE DUCT BANK
- CABLE TV OVER HEAD
- CABLE TV UNDER GROUND
- FIBER OPTIC
- FIBER OPTIC DUCT BANK
- BOUNDARY
- BUILDING
- CENTERLINE OF DITCH
- CENTERLINE/CROWN OF ROAD
- CONTOUR MAJOR
- CONTOUR MINOR
- EDGE OF WATER
- FLOODPLAIN
- FENCE
- GRAVEL
- GUARDRAIL
- STONE WALL
- R.O.W.
- TREELINE
- WETLAND
- EDGE OF BRUSH
- HEDGE

- TREE (DECIDUOUS)
- TREE (CONIFEROUS)
- SHRUB (DECIDUOUS)
- STUMP
- TREE TO REMAIN & PROTECT (DECIDUOUS)
CRITICAL ROOT ZONE (C.R.Z.) = DIAMETER BREST HEIGHT (INCHES) X 10
- TREE TO REMAIN & PROTECT (CONIFEROUS)
CRITICAL ROOT ZONE (C.R.Z.) = DIAMETER BREST HEIGHT (INCHES) X 10

PROPOSED LEGEND

- HYDRANT (PLAN)
- WATER GATE WELL
- REDUCER
- WATER GATE VALVE
- WATER STOP BOX
- WATER VAULT
- INLET
- DOUBLE INLET
- INLET JUNCTION CHAMBER
- ROUND CATCH BASIN
- STORM MANHOLE
- DRAIN ARROW
- FLARED END SECTION
- SANITARY MANHOLE
- CLEAN-OUT
- BARREL
- SIGN
- PUSH BUTTON
- HAND HOLE
- WATER MAIN
- STORM SEWER
- SANITARY SEWER
- FIBER OPTIC
- ELECTRICAL
- CENTERLINE OF DITCH
- CENTERLINE OF ROAD
- FENCE
- GRAVEL
- SILT FENCE
- PROTECTIVE FENCE
- GUARDRAIL
- LOT/UNIT
- CURB
- TEMPORARY GRADING PERMIT
- CONTOUR MAJOR
- CONTOUR MINOR
- WATER EASMENT
- STORM EASEMENT
- SANITARY EASEMENT
- R.O.W.
- LIMITS OF CONSTRUCTION
- LIMIT OF GRADING
- STONE WALL

- DETECTABLE WARNING
- ASPHALT
- CONCRETE
- SIDEWALK
- TREE (DECIDUOUS)
- TREE (CONIFEROUS)
- TREE TO BE REMOVED (DECIDUOUS)
- TREE TO BE REMOVED (CONIFEROUS)
- STUMP TO BE REMOVED

Know what's below.
Call before you dig.

REV.	DATE	DRAWN	CHECKED
03	12/16/2022	ML2	ML2
02	7/15/2022	PK2	PK2
01	6/16/2022	ML2	ML2
00	5/26/2022	ML2	ML2

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING

BROADWAY STREET WATER MAIN

SCALE: NTS

DRAWING No. 2020030-3

SHEET No. 3 OF 50

CITY OF ANN ARBOR
PUBLIC SERVICES
301 EAST HURON STREET
ANN ARBOR, MI 48106-6647
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PK2	ML2	PK2	PK2	PK2	CHECKED

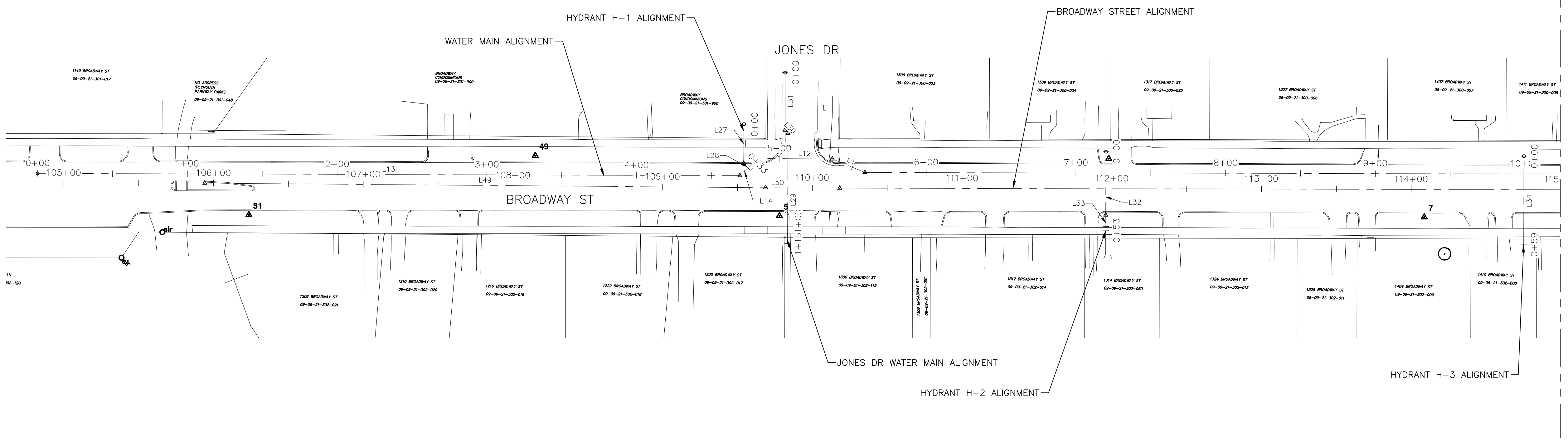
REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022		
02	100% OWNER REVIEW	7/15/2022		
01	95% OWNER REVIEW	6/16/2022		
00	60% OWNER REVIEW	5/26/2022		

CITY OF ANN ARBOR
PUBLIC SERVICES
301 EAST HURON STREET
ANN ARBOR, MI 48106-1667
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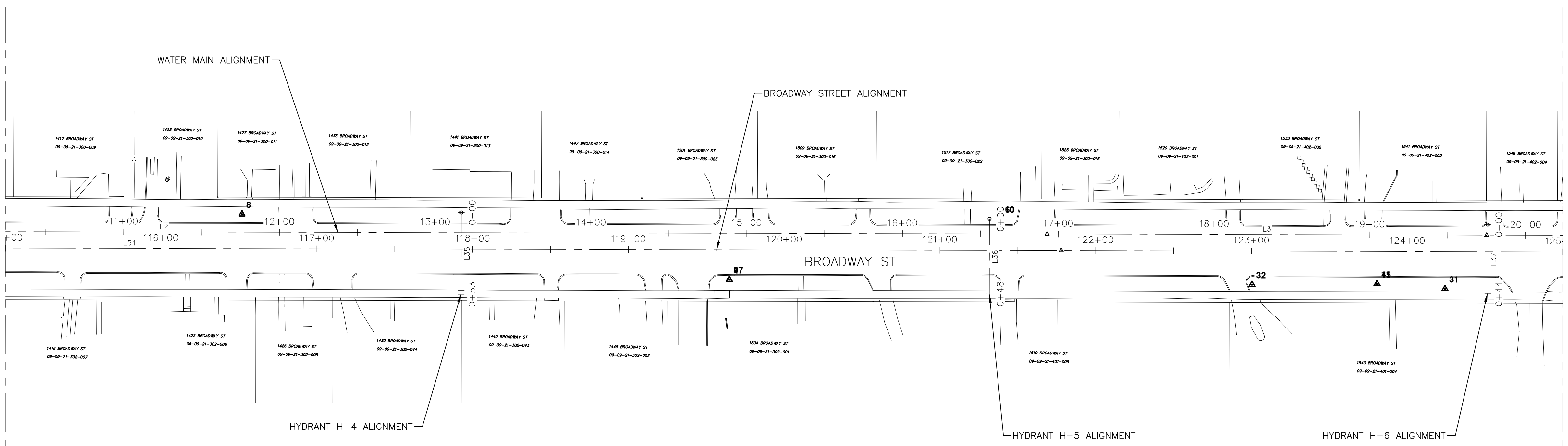


CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ALIGNMENTS

SCALE: PLAN: 1" = 40'
DRAWING No.



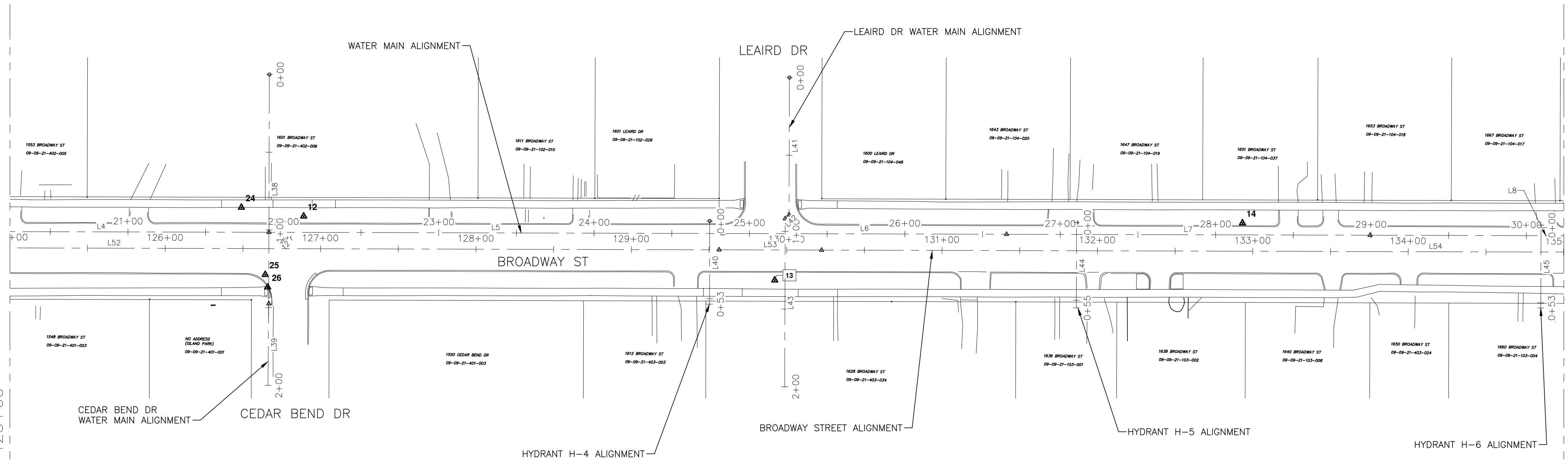
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STA: 115+00



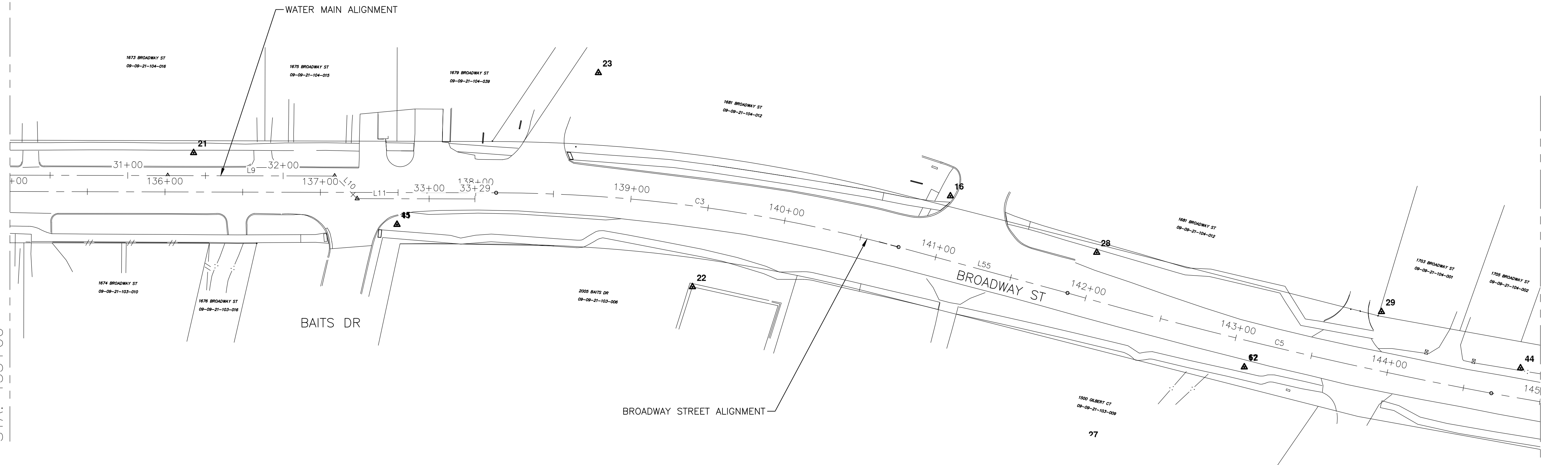
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SEE SHEET 5
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SEE SHEET 4
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SEE ABOVE
STA: 135+00



SEE SHEET 6
STA: 145+00

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ALIGNMENTS

SCALE: PLAN: 1" = 40'

DRAWING No. _____

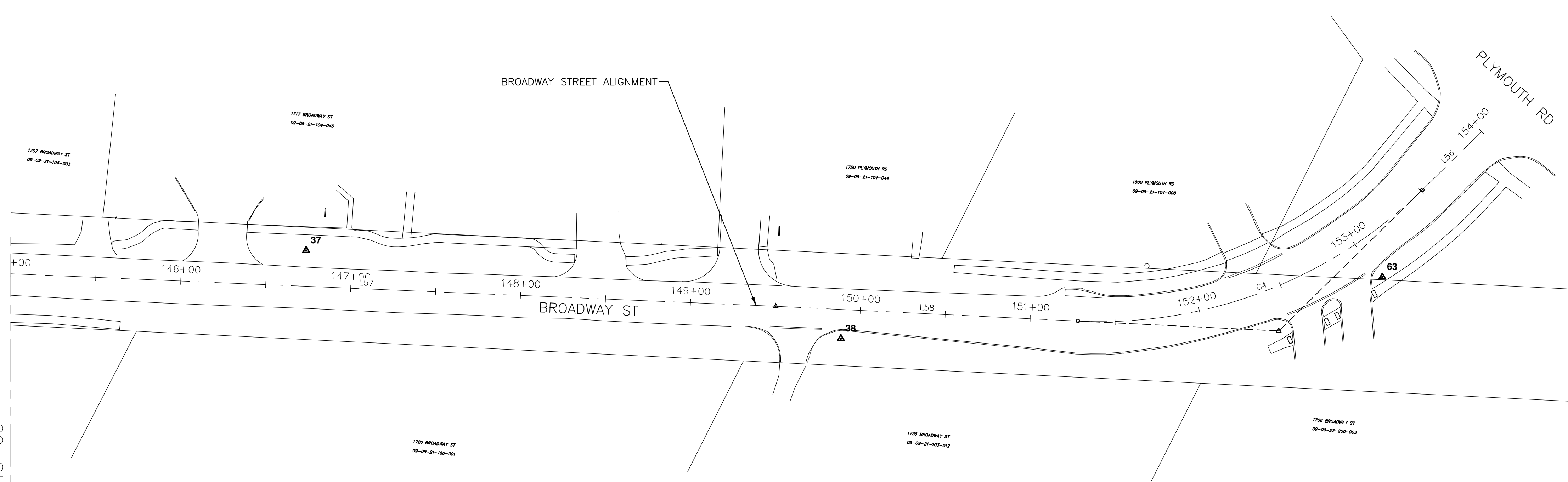
811
Know what's below.
Call before you dig.

REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

CITY OF ANN ARBOR
PUBLIC SERVICES
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SHEET No. **5 OF 50**

SEE SHEET 5
STA: 145+00



ROADWAY LINE DATA				
LINE #	DIRECTION	LENGTH	START	END
L49	N55°02'00"E	374.53'	N 288818.1045 E 13293941.1168	N 289032.7472 E 13294248.0396
L50	N54°51'41"E	49.60'	N 289032.7472 E 13294248.0396	N 289061.2946 E 13294288.6002
L51	N54°41'18"E	1159.63'	N 289061.2946 E 13295234.8800	N 289731.5900 E 13295234.8800
L52	N54°42'51"E	778.54'	N 289731.5900 E 13295234.8800	N 290181.3206 E 13295870.3878
L53	N54°42'51"E	66.00'	N 290181.3206 E 13295870.3878	N 290219.4460 E 13295924.2622
L54	N54°42'51"E	790.67'	N 290219.4460 E 13295924.2622	N 290676.1801 E 13296569.6664
L55	N69°45'47"E	112.73'	N 290676.1801 E 13296569.6664	N 290797.8996 E 13296906.6744
L56	N17°30'22"E	48.99'	N 290797.8996 E 13297904.7161	N 291389.1586 E 13297919.4528
L57	N64°26'58"E	481.94'	N 291389.1586 E 13297919.4528	N 291942.4841 E 13297601.0717
L58	N64°49'32"E	177.90'	N 291942.4841 E 13297601.0717	N 291150.3486 E 13297601.0717
L1	N77°11'18"E	23.56'	N 291150.3486 E 13297601.0717	N 291226.0226 E 1329762.0730
L2	N54°41'18"E	1133.74'	N 291226.0226 E 1329762.0730	N 289074.3398 E 13294273.2548
L3	N54°42'48"E	282.27'	N 289074.3398 E 13294273.2548	N 289734.8969 E 13295221.3831
L4	N54°42'51"E	215.65'	N 289734.8969 E 13295221.3831	N 289897.9558 E 13295451.7921
L5	N54°42'51"E	292.10'	N 289897.9558 E 13295451.7921	N 290022.5287 E 13295627.8243
L6	N54°42'51"E	182.62'	N 290022.5287 E 13295627.8243	N 290191.2621 E 13295866.2591
L7	N54°42'51"E	233.98'	N 290191.2621 E 13295866.2591	N 290296.7525 E 13296015.3260
L8	N54°42'51"E	226.31'	N 290296.7525 E 13296015.3260	N 290431.9130 E 13296206.3192
L9	N54°42'51"E	107.45'	N 290431.9130 E 13296206.3192	N 290562.6420 E 13296391.0505
L10	S80°17'09"E	20.51'	N 290562.6420 E 13296391.0505	N 290624.7099 E 13296478.7577

ROADWAY LINE DATA				
LINE #	DIRECTION	LENGTH	START	END
L11	N54°43'08"E	75.81'	N 290624.7099 E 13296498.9698	N 290665.0347 E 13296560.8527
L12	N54°51'41"E	50.20'	N 290665.0347 E 13296560.8527	N 289045.4454 E 13294232.2013
L13	N54°45'04"E	469.00'	N 289045.4454 E 13294232.2013	N 288758.7180 E 13293846.4008
L14	N9°51'31"E	16.29'	N 288758.7180 E 13293846.4008	N 289029.3923 E 13294229.4114
L38	S35°17'09"E	147.43'	N 289029.3923 E 13294229.4114	N 289045.4454 E 13294232.2013
L39	S34°52'39"E	52.57'	N 289045.4454 E 13294232.2013	N 290105.3805 E 13295569.1925
L41	S35°17'09"E	88.29'	N 290105.3805 E 13295569.1925	N 289985.0348 E 13295654.3577
L42	S9°42'51"W	3.54'	N 289985.0348 E 13295654.3577	N 289941.9094 E 13295684.4174
L43	S35°17'09"E	108.17'	N 289941.9094 E 13295684.4174	N 290297.8932 E 13295843.0209
L29	S35°08'16"E	73.78'	N 290297.8932 E 13295843.0209	N 290225.8202 E 13295894.0249
L30	S80°08'19"E	2.95'	N 290225.8202 E 13295894.0249	N 290225.8202 E 13295894.0249
L31	S35°15'36"E	38.42'	N 290225.8202 E 13295894.0249	N 290134.0385 E 13295955.9135
L27	S34°57'44"E	26.11'	N 290134.0385 E 13295955.9135	N 289071.1547 E 13294239.1928
L28	S78°23'16"E	6.43'	N 289071.1547 E 13294239.1928	N 289103.0348 E 13294214.1078
L32	S35°14'16"E	42.28'	N 289103.0348 E 13294214.1078	N 289059.0158 E 13294211.7525
L33	S36°09'45"E	10.52'	N 289059.0158 E 13294211.7525	N 289037.6162 E 13294226.7157
L34	S35°18'47"E	59.21'	N 289037.6162 E 13294226.7157	N 289184.2044 E 13294419.3457
L44	S35°16'55"E	54.87'	N 289184.2044 E 13294419.3457	N 289149.6710 E 13294443.7404
L45	S35°16'47"E	53.27'	N 289149.6710 E 13294443.7404	N 289141.1796 E 13294449.9467
L35	S35°18'42"E	52.51'	N 289141.1796 E 13294449.9467	N 289343.6397 E 13294648.5267

ROADWAY LINE DATA				
LINE #	DIRECTION	LENGTH	START	END
L36	S35°18'45"E	48.11'	N 289343.6397 E 13294648.5267	N 289682.1016 E 13295213.4727
L37	S35°22'48"E	44.42'	N 289682.1016 E 13295213.4727	N 289903.9562 E 13295448.4144
L40	S35°17'09"E	53.49'	N 289903.9562 E 13295448.4144	N 290192.9473 E 13295854.7662

ROADWAY CURVE TABLE					
CURVE #	RADIUS	LENGTH	CHORD DIRECTION	START	END
C3	997.78'	262.07'	N62°14'19"E	N 290676.1801 E 13296569.6664	N 290797.8996 E 13296800.9049
C4	270.00'	222.99'	N41°09'57"E	N 291226.0226 E 1329762.0730	N 291389.1586 E 13297904.7161
C5	2985.00'	280.35'	N67°51'55"E	N 290836.8927 E 13296906.6744	N 290942.4841 E 13297166.2647



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	ML2
02	100% OWNER REVIEW	7/15/2022	PK2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	ML2
00	60% OWNER REVIEW	5/26/2022	ML2	ML2

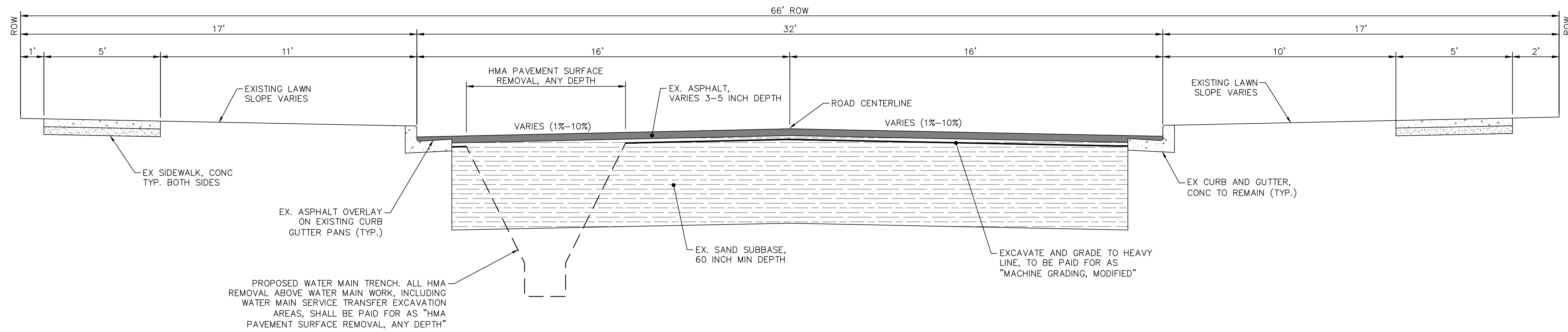
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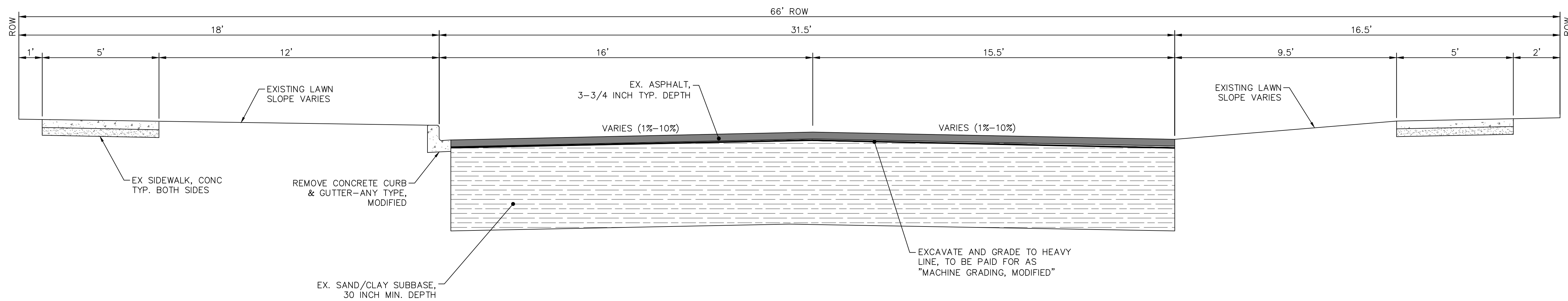
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ALIGNMENTS

SCALE: PLAN: 1" = 40'
DRAWING No.

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BROADWAY STREET EXISTING TYPICAL SECTION
 STA 106+18 TO STA 138+18
 NO SCALE



BROADWAY STREET EXISTING TYPICAL SECTION
 STA 138+18 TO STA 141+87
 NO SCALE



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

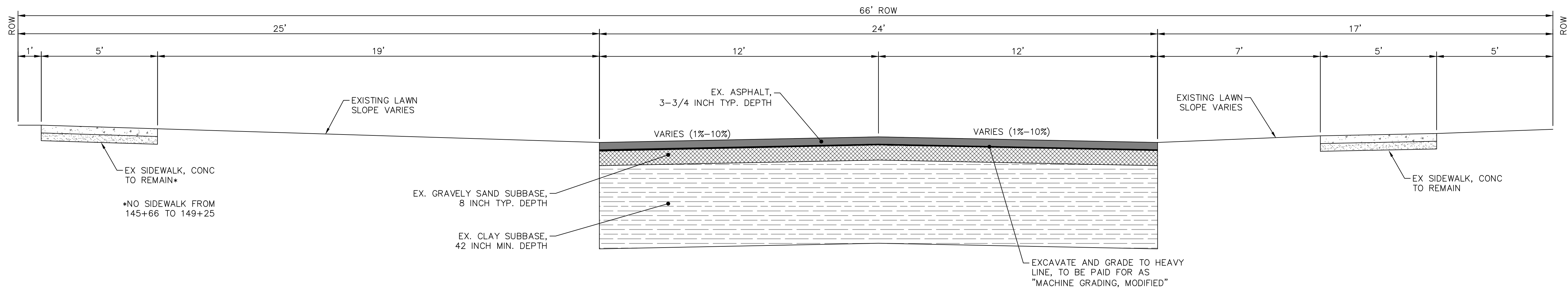
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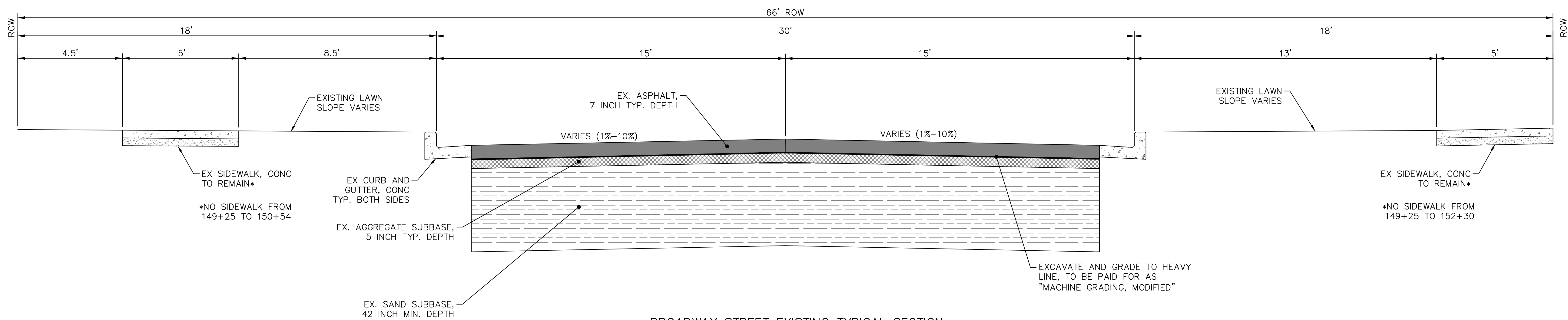
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 EXISTING TYPICAL ROAD SECTIONS

SCALE: NTS
 DRAWING No. 2020030-7

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BROADWAY STREET EXISTING TYPICAL SECTION
 STA 141+87 TO STA 149+25
 NO SCALE



BROADWAY STREET EXISTING TYPICAL SECTION
 STA 149+25 TO STA 153+21
 NO SCALE



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

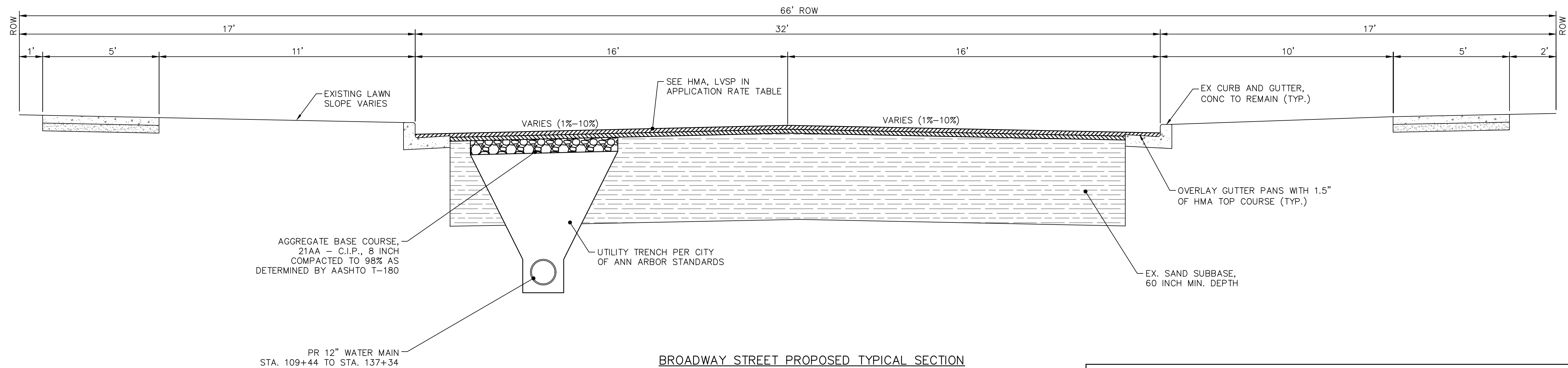
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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 EXISTING TYPICAL ROAD SECTIONS

SCALE: NTS
 DRAWING No. 2020030-8

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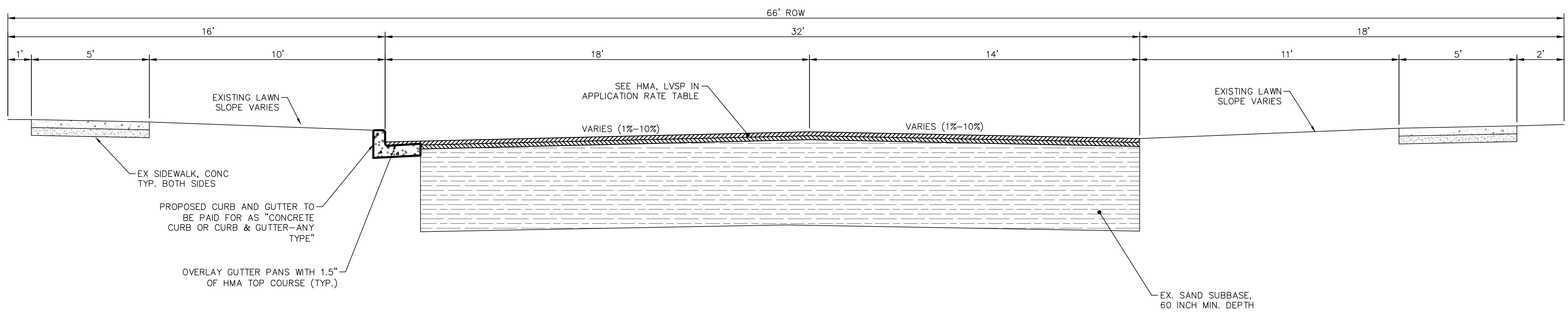


AGGREGATE BASE COURSE,
21AA - C.I.P., 8 INCH
COMPACTED TO 98% AS
DETERMINED BY AASHTO T-180

PR 12" WATER MAIN
STA. 109+44 TO STA. 137+34

BROADWAY STREET PROPOSED TYPICAL SECTION
STA 106+18 TO STA 137+34
NO SCALE

HMA APPLICATION ESTIMATE						
HMA PAVEMENT	HMA MIX	RATE OF APPLICATION	THICKNESS (INCHES)	AWI (MIN.)	BINDER	LOCATION/NOTES
HMA PAVEMENT TOP	LVSP	220 LB/SYD	2	260 (TOP)	PG 58-28	TOP COURSE
HMA PAVEMENT LEVELING	LVSP	220 LB/SYD	2	-	PG 58-28	LEVELING COURSE
ASPHALT EMULSION	SS-1h	0.05 - 0.15 GAL/SYD	-	-	-	INCLUDE IN COST OF HMA ITEM



PROPOSED CURB AND GUTTER TO BE PAID FOR AS "CONCRETE CURB OR CURB & GUTTER-ANY TYPE"

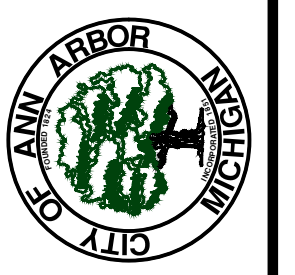
OVERLAY GUTTER PANS WITH 1.5" OF HMA TOP COURSE (TYP.)

BROADWAY STREET PROPOSED TYPICAL SECTION
STA 137+44 TO STA 141+87
NO SCALE



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

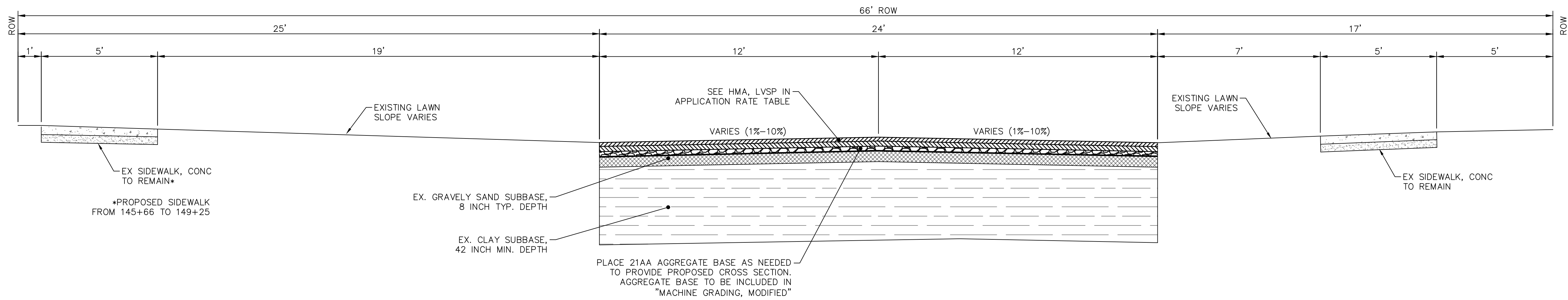
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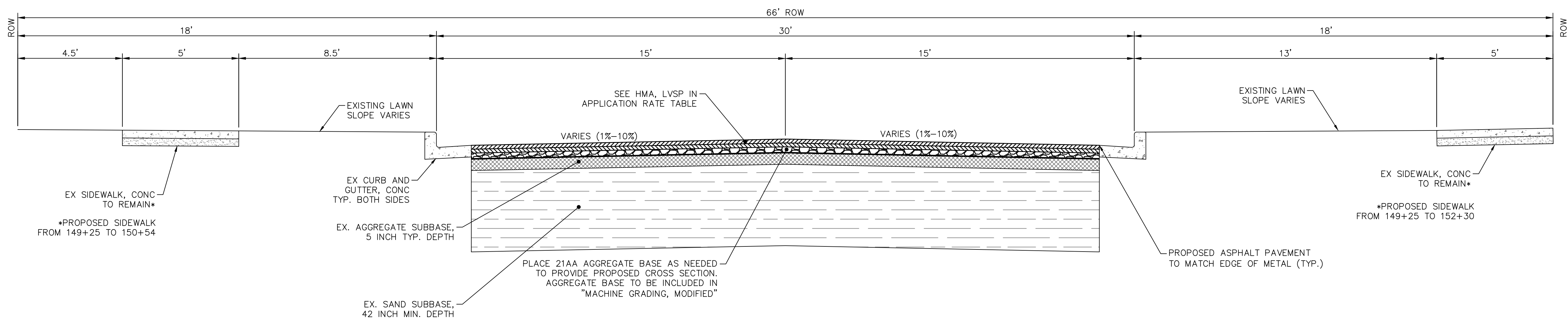
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED TYPICAL ROAD SECTIONS

SCALE: NTS
DRAWING No. 2020030-9

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BROADWAY STREET PROPOSED TYPICAL SECTION
 STA 137+20 TO STA 141+88
 NO SCALE



BROADWAY STREET EXISTING TYPICAL SECTION
 STA 149+25 TO STA 153+21
 NO SCALE



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

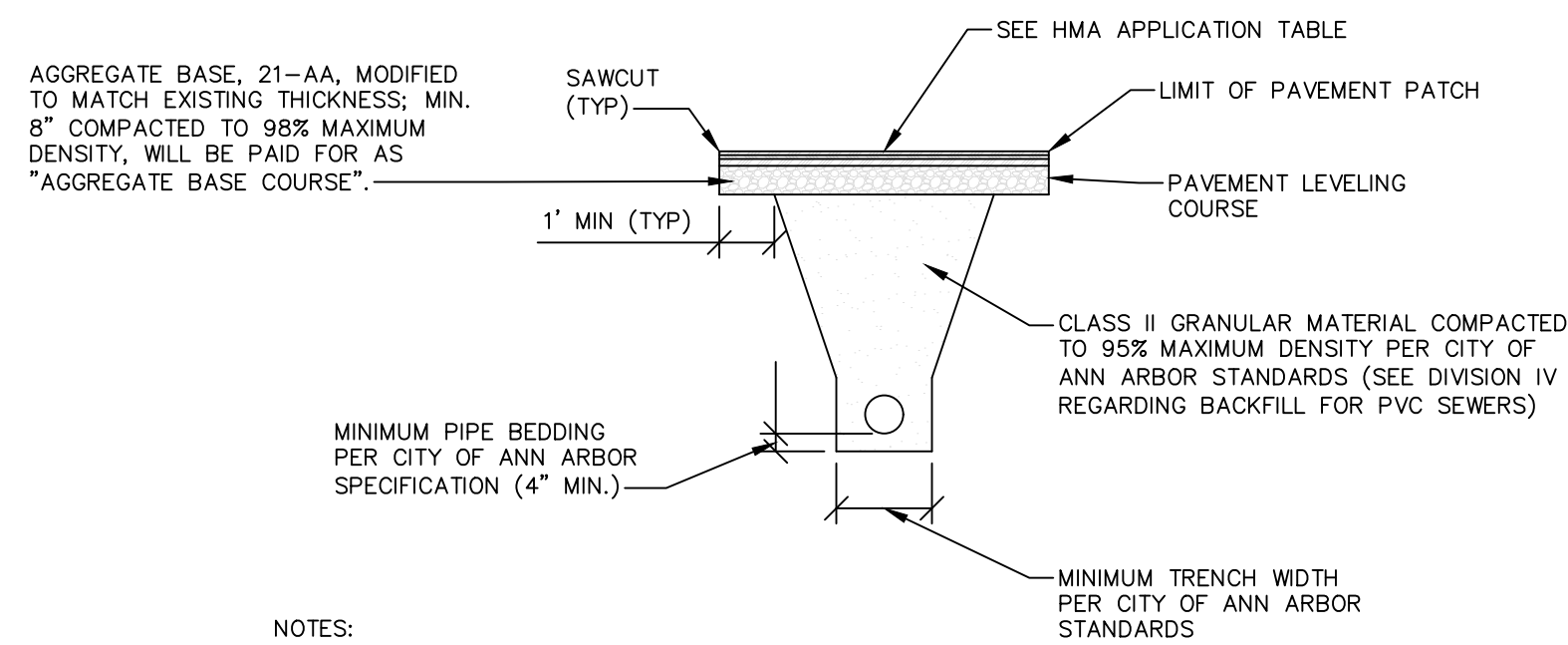
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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED TYPICAL ROAD SECTIONS

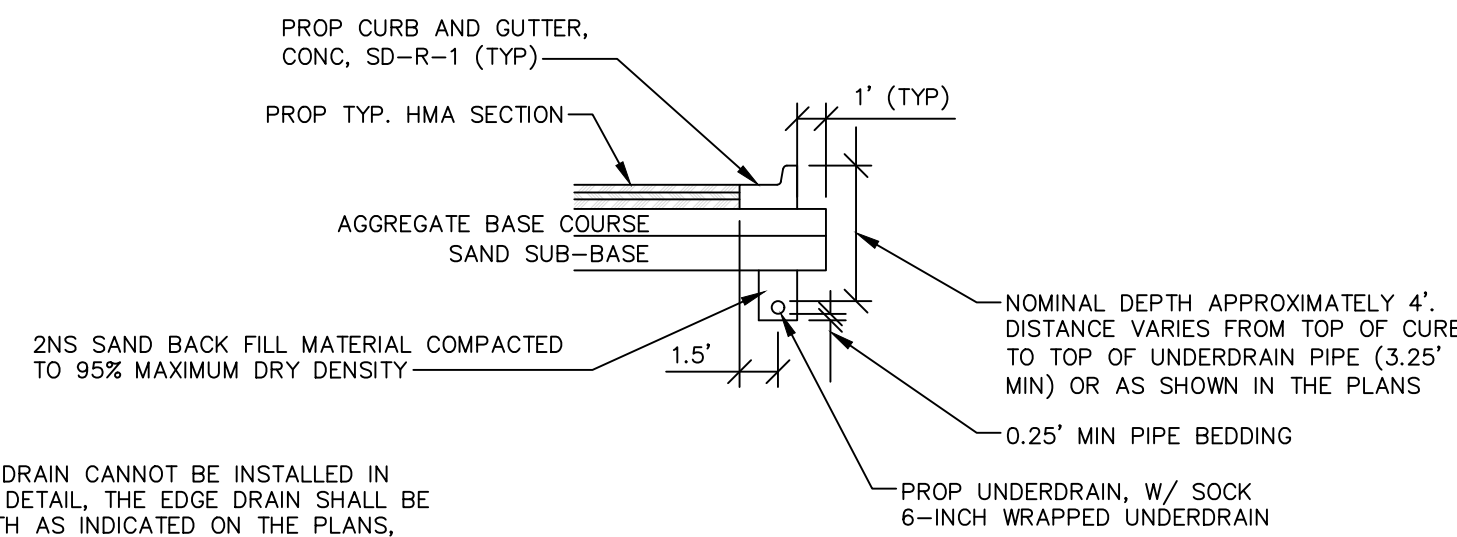
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 DRAWING No. 2020030-10

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NOTES:
DENSITY TESTING PER CITY ANN ARBOR SPECIFICATION
TRENCH DETAILS SHOW TYPE OF BACKFILL AND SURFACE RESTORATION ONLY.
ALL TRENCHING TO CONFORM TO ALL APPLICABLE MIOSHA STANDARDS

UTILITY TRENCH-TYPE I
SD-TD-1 (MODIFIED)
(UNDER HMA PAVEMENT)



BASED ON CITY OF ANN ARBOR STANDARD SD-TD-10
APPLIES TO: HMA PAVEMENT

TRENCH DETAIL FOR UNDER DRAIN
(UNDER HMA PAVEMENT)

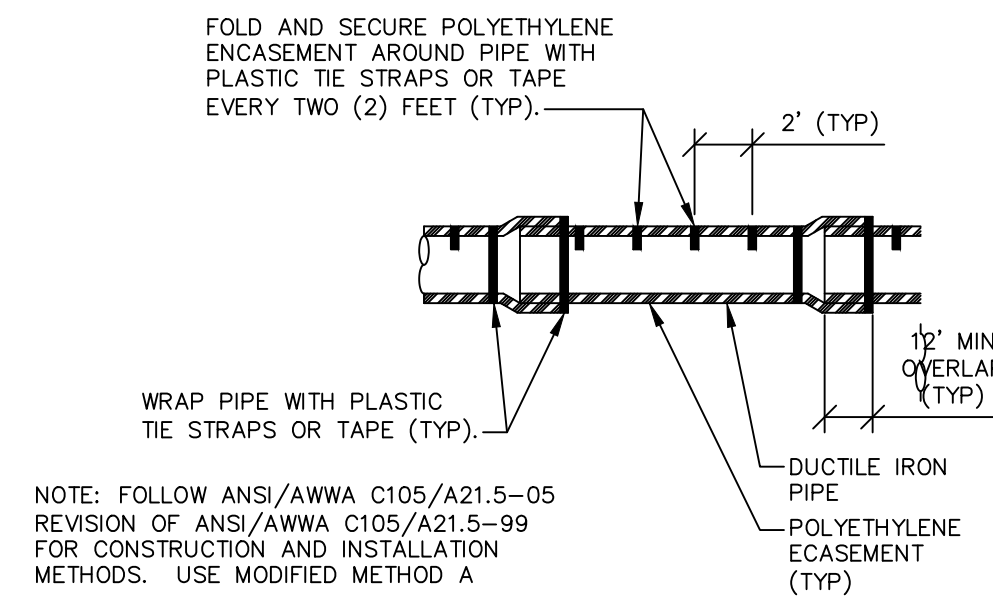
NOTES:
IN AREAS WHERE EDGE DRAIN CANNOT BE INSTALLED IN ACCORDANCE WITH THE DETAIL, THE EDGE DRAIN SHALL BE INSTALLED AT THE DEPTH AS INDICATED ON THE PLANS, OR AS DIRECTED BY ENGINEER. IN NO CASE SHALL THE EDGE DRAIN BE INSTALLED AT A GRADE LESS THAN 0.50% OR AT A DEPTH OF LESS THAN 2' BELOW TOP OF PROPOSED PAVEMENT.

FOR PAVEMENT BASE AND SUBBASE THICKNESS, SEE TYPICAL PAVEMENT CROSS-SECTION(S).

TRENCH DETAILS SHOW TYPE OF BACKFILL AND SURFACE RESTORATION ONLY.
ALL TRENCHING TO CONFORM TO ALL APPLICABLE MIOSHA STANDARDS.

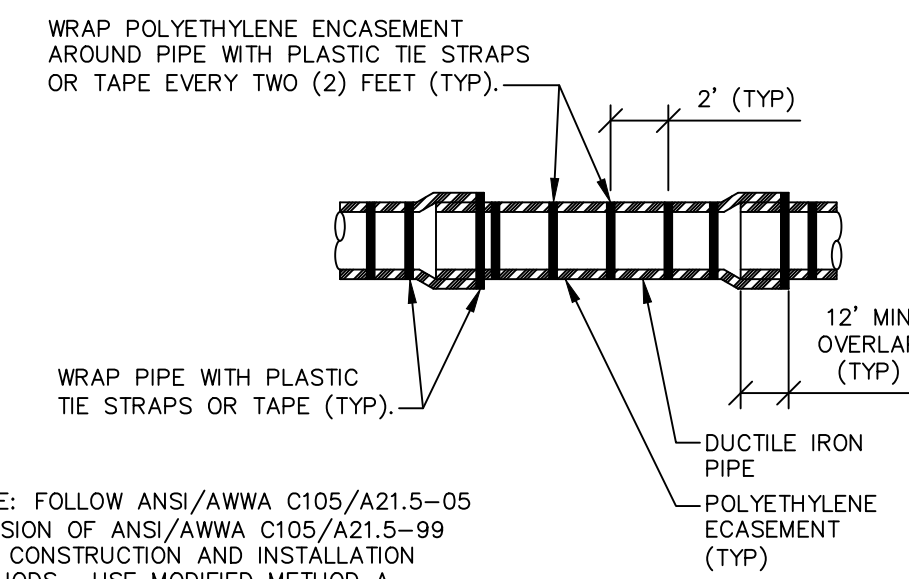
EDGE DRAINS SHALL BE CONNECTED TO A DRAINAGE STRUCTURE AND WILL EXTEND A MINIMUM OF 100 FEET UP SLOPE FROM THE STRUCTURE.

ADDITIONAL LENGTHS OF EDGE DRAIN MAY BE REQUIRED BY THE ENGINEER BASED ON EXISTING SITE CONDITIONS, INCLUDING CONDITION OF THE SUBGRADE.



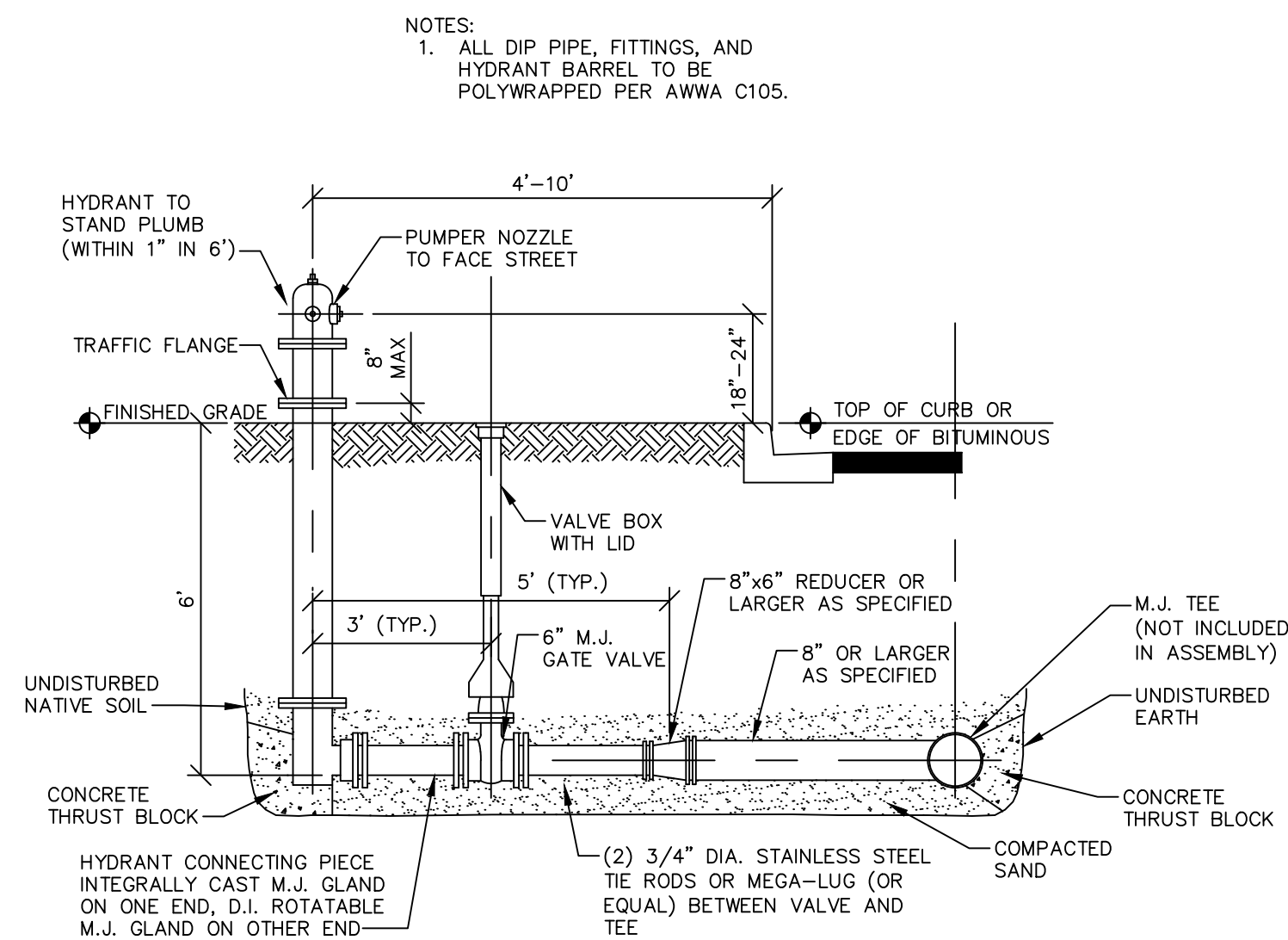
NOTE: FOLLOW ANSI/AWWA C105/A21.5-05 REVISION OF ANSI/AWWA C105/A21.5-99 FOR CONSTRUCTION AND INSTALLATION METHODS. USE MODIFIED METHOD A
APPLIES TO: POLYETHYLENE WRAPPED D.I. WATER MAIN. SEE PLANS FOR LOCATION.

POLYETHYLENE ENCASEMENT
(DRY INSTALLATION)



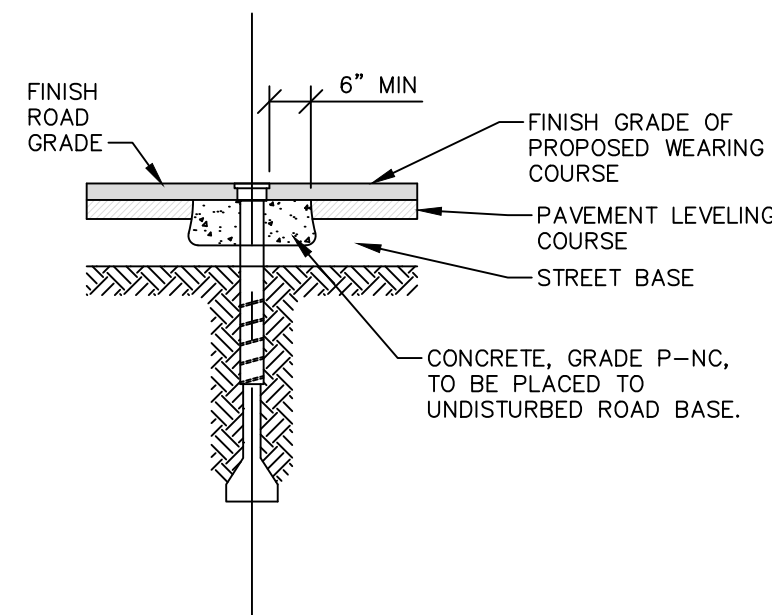
NOTE: FOLLOW ANSI/AWWA C105/A21.5-05 REVISION OF ANSI/AWWA C105/A21.5-99 FOR CONSTRUCTION AND INSTALLATION METHODS. USE MODIFIED METHOD A
APPLIES TO: POLYETHYLENE WRAPPED D.I. WATER MAIN. SEE PLANS FOR LOCATION.

POLYETHYLENE ENCASEMENT
(WET INSTALLATION)



NOTES:
1. ALL DIP PIPE, FITTINGS, AND HYDRANT BARREL TO BE POLYWRAPPED PER AWWA C105.

STANDARD HYDRANT
ASSEMBLY
NO SCALE



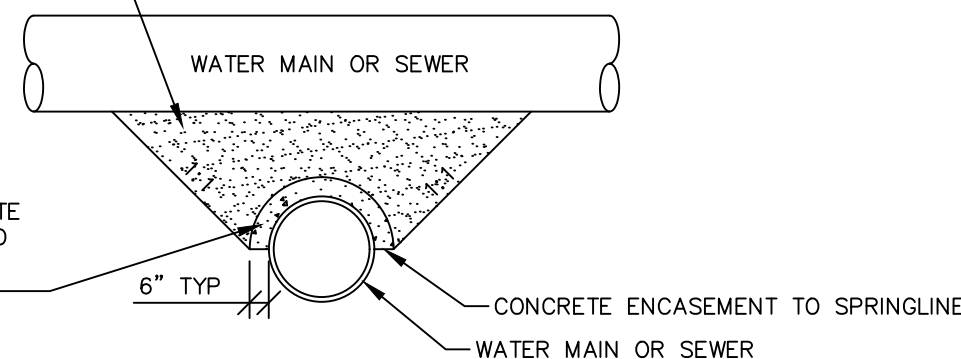
NOTES:
1. RAISE CASTING TO PROPOSED FINISH STREET GRADE AFTER PLACEMENT OF LEVELING COURSE(S) AND PRIOR TO PLACING FINAL SURFACE COURSE

WATER VALVE BOX
ADJUSTMENT
NO SCALE

CLASS II GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM DRY DENSITY PER CITY OF ANN ARBOR STANDARDS (SEE DIVISION IV REGARDING BACKFILL FOR PVC SEWERS).

WATER/SEWER CROSSINGS:
GRADE P-NC HIGH EARLY STRENGTH CONCRETE TO BE PLACED AROUND BOTTOM PIPE. EXTEND CONCRETE 1' IN EACH DIRECTION BEYOND OUTSIDE EDGE OF TOP PIPE.

APPLIES TO: WATER AND/OR SEWER CROSSINGS WITH LESS THAN 1.5' OF VERTICAL CLEARANCE



CONCRETE UTILITY SADDLE
NO SCALE



PK2	ML2	PK2	ML2	PK2	ML2	PK2	ML2	DATE	CHECKED
03	ISSUED FOR BIDS								
02	100% OWNER REVIEW								
01	95% OWNER REVIEW								
00	60% OWNER REVIEW								

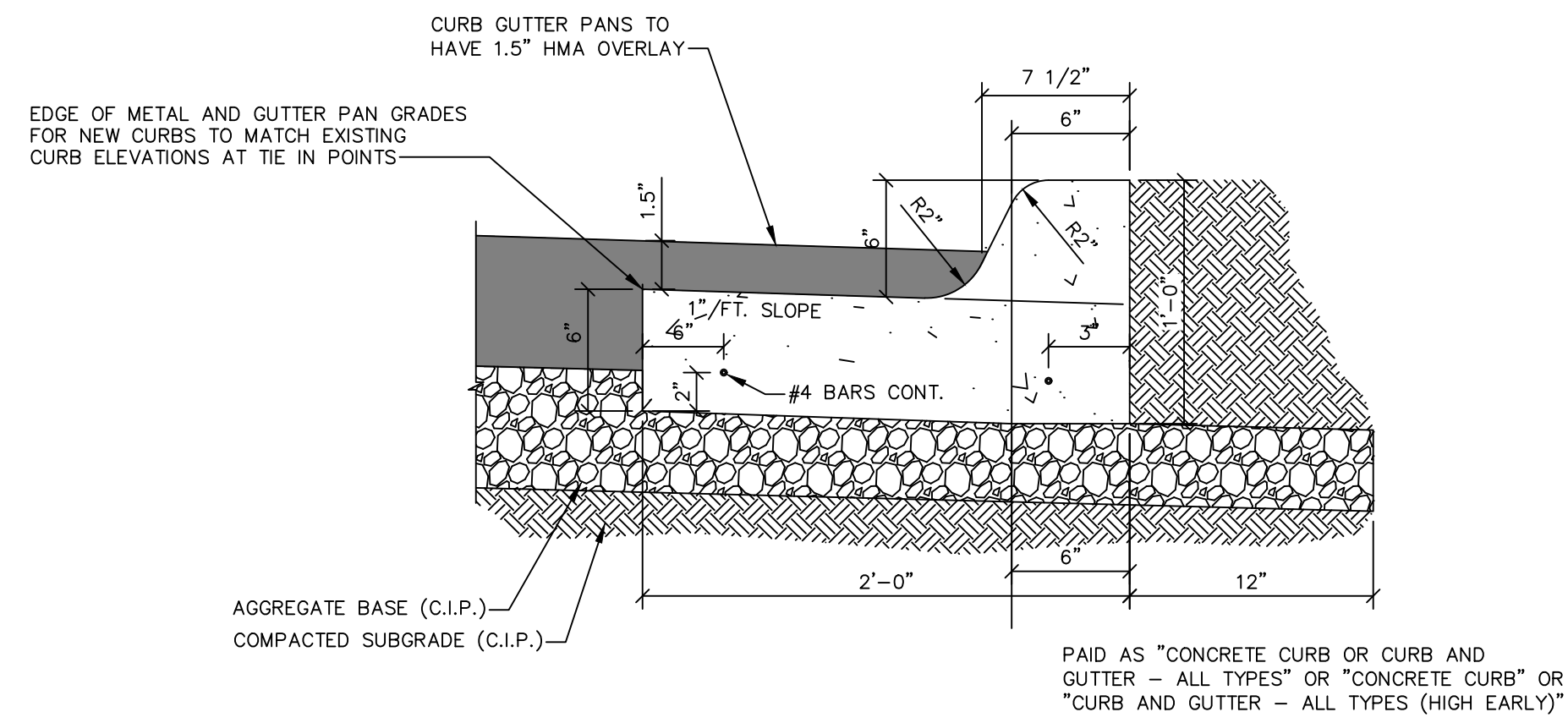
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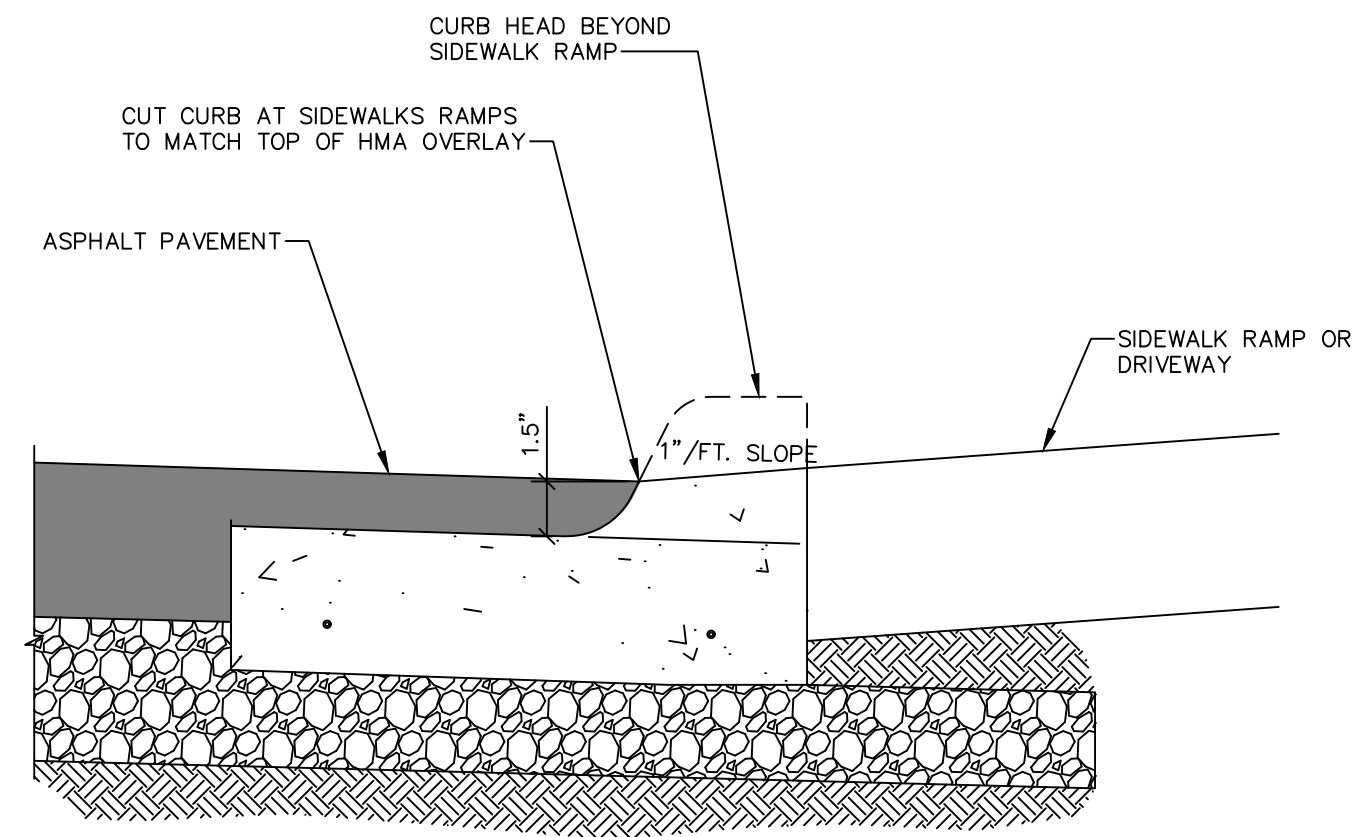
CITY OF ANN ARBOR - ENGINEERING
BROADWAY STREET WATER MAIN
DETAILS

SHEET No. 11 OF 50
SCALE: NTS
DRAWING No. 2020030-11

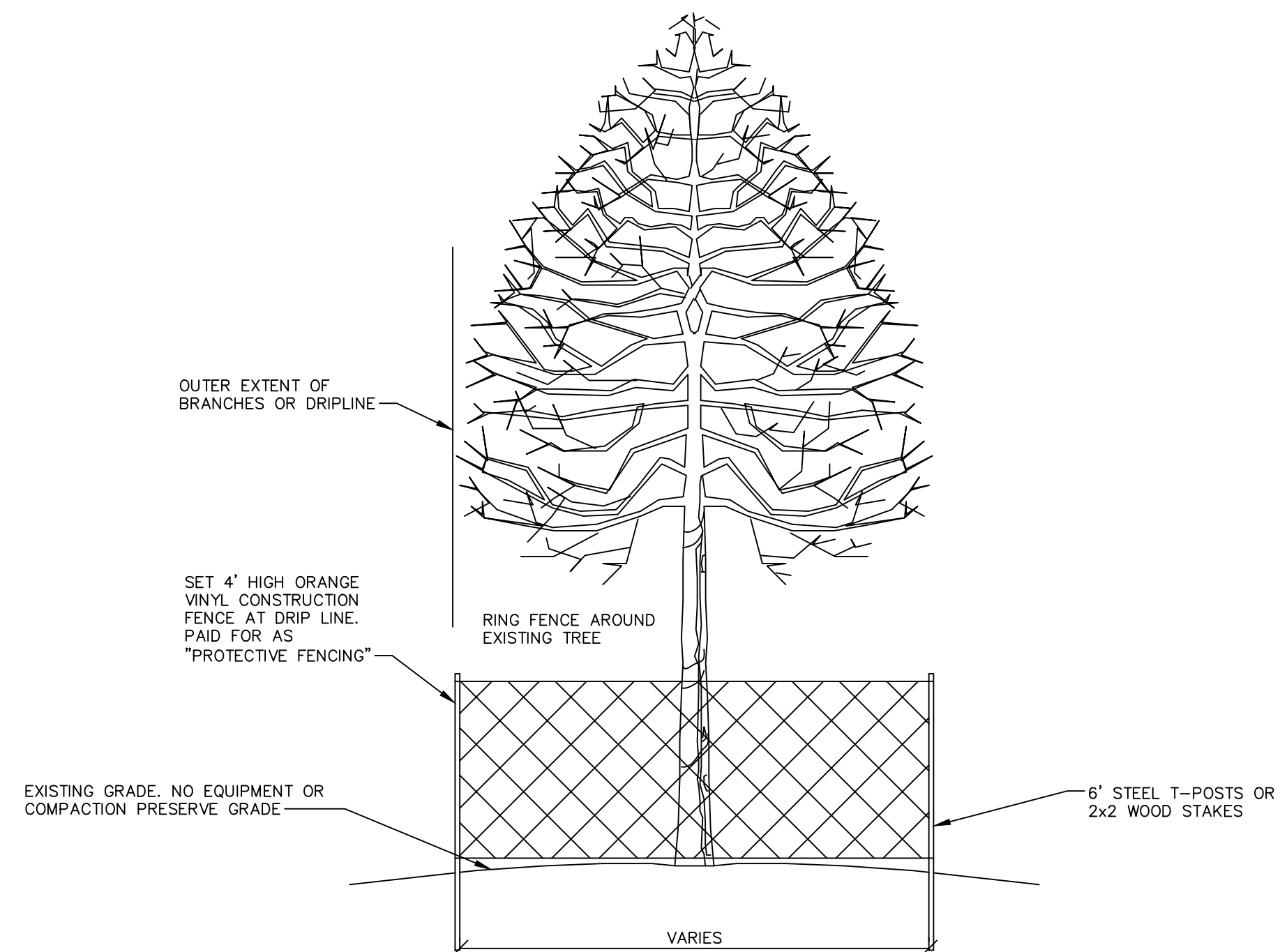
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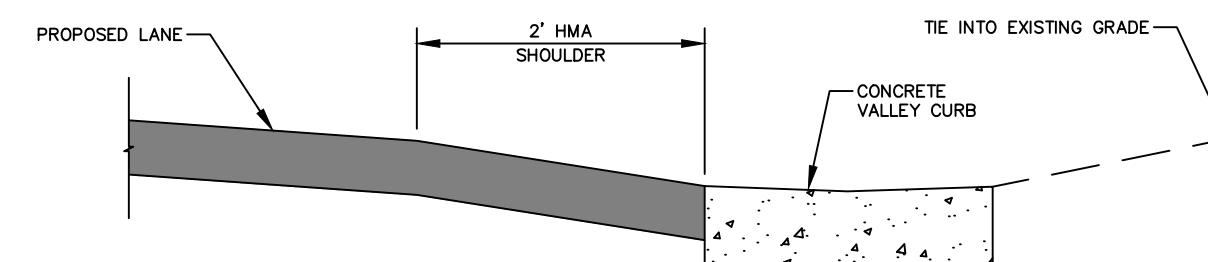
CURB AND GUTTER, CONC, DET F4, SPECIAL (WITH GUTTER PAN OVERLAY)
NO SCALE



CURB AND GUTTER, CONC, DET F4, SPECIAL (WITH GUTTER PAN OVERLAY)
NO SCALE



TREE PROTECTION DETAIL
NO SCALE



CONCRETE VALLEY CURB DETAIL
NO SCALE



REV	DATE	DESCRIPTION	DRAWN	CHECKED
03	12/16/2022	ISSUED FOR BIDS	ML2	PK2
02	7/15/2022	100% OWNER REVIEW	ML2	PK2
01	6/16/2022	95% OWNER REVIEW	ML2	PK2
00	5/26/2022	60% OWNER REVIEW	ML2	PK2

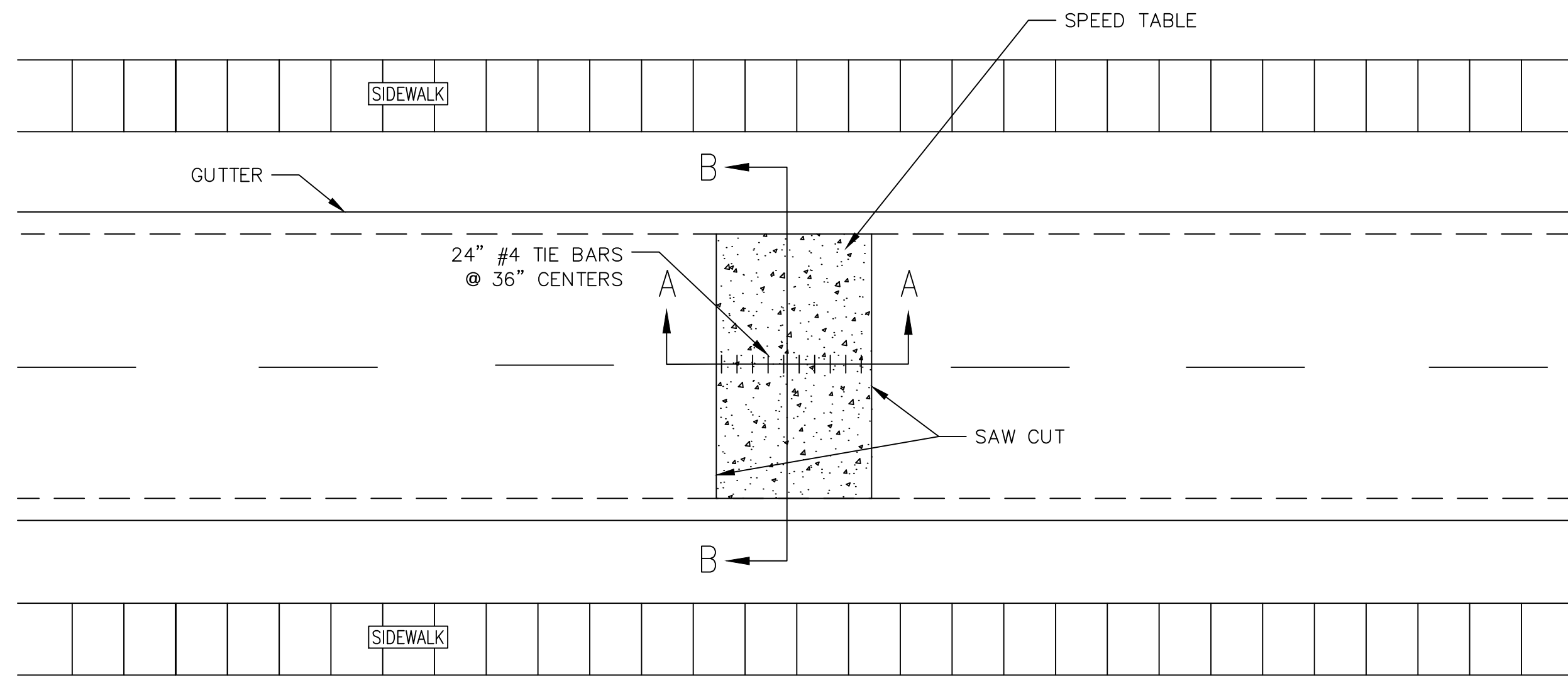
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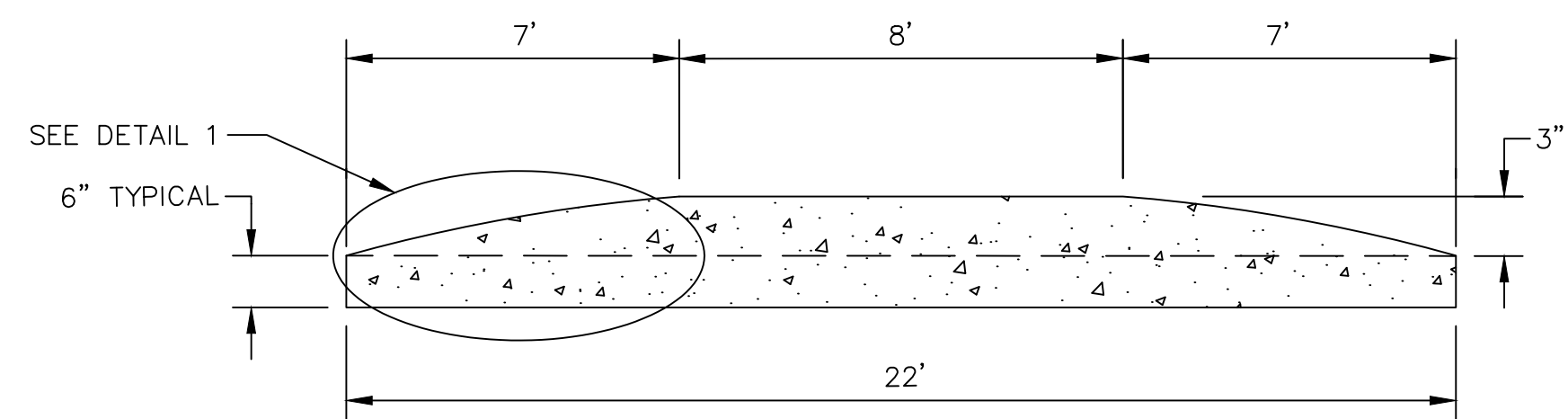
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
DETAILS_2

SCALE: NTS
DRAWING No. 2020030-12

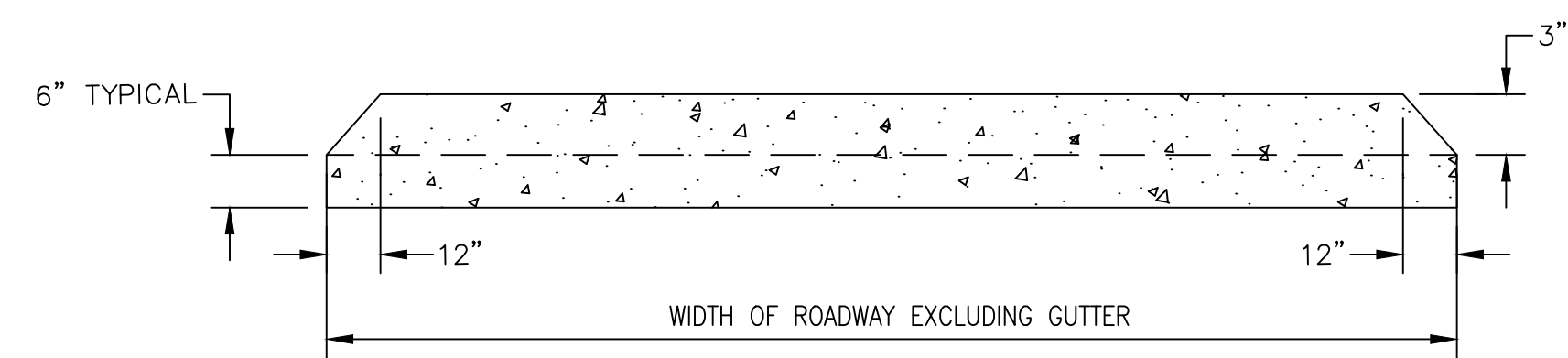
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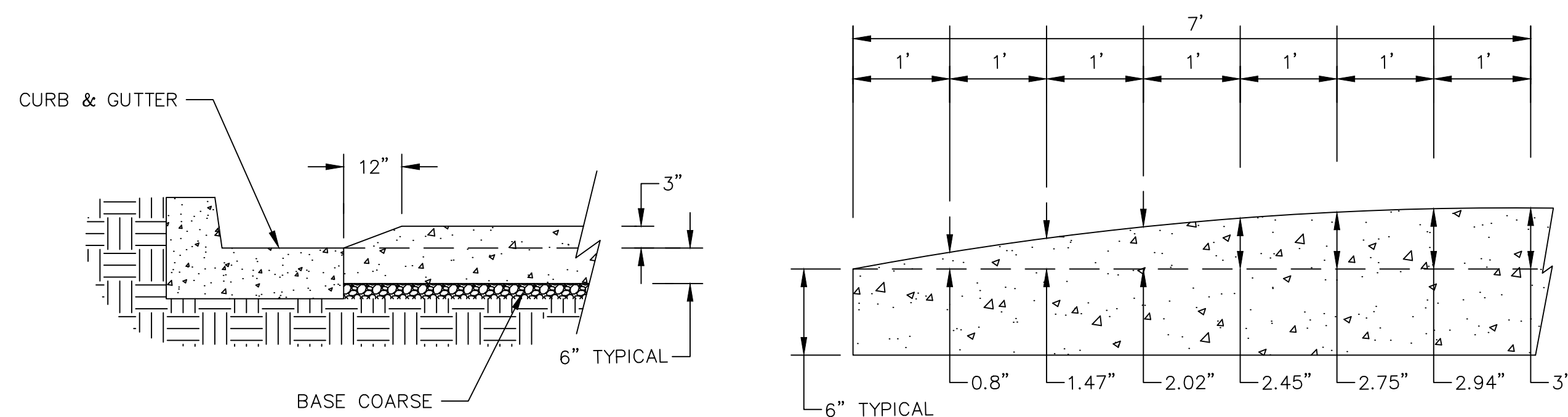
PLAN VIEW



SECTION AA



SECTION BB

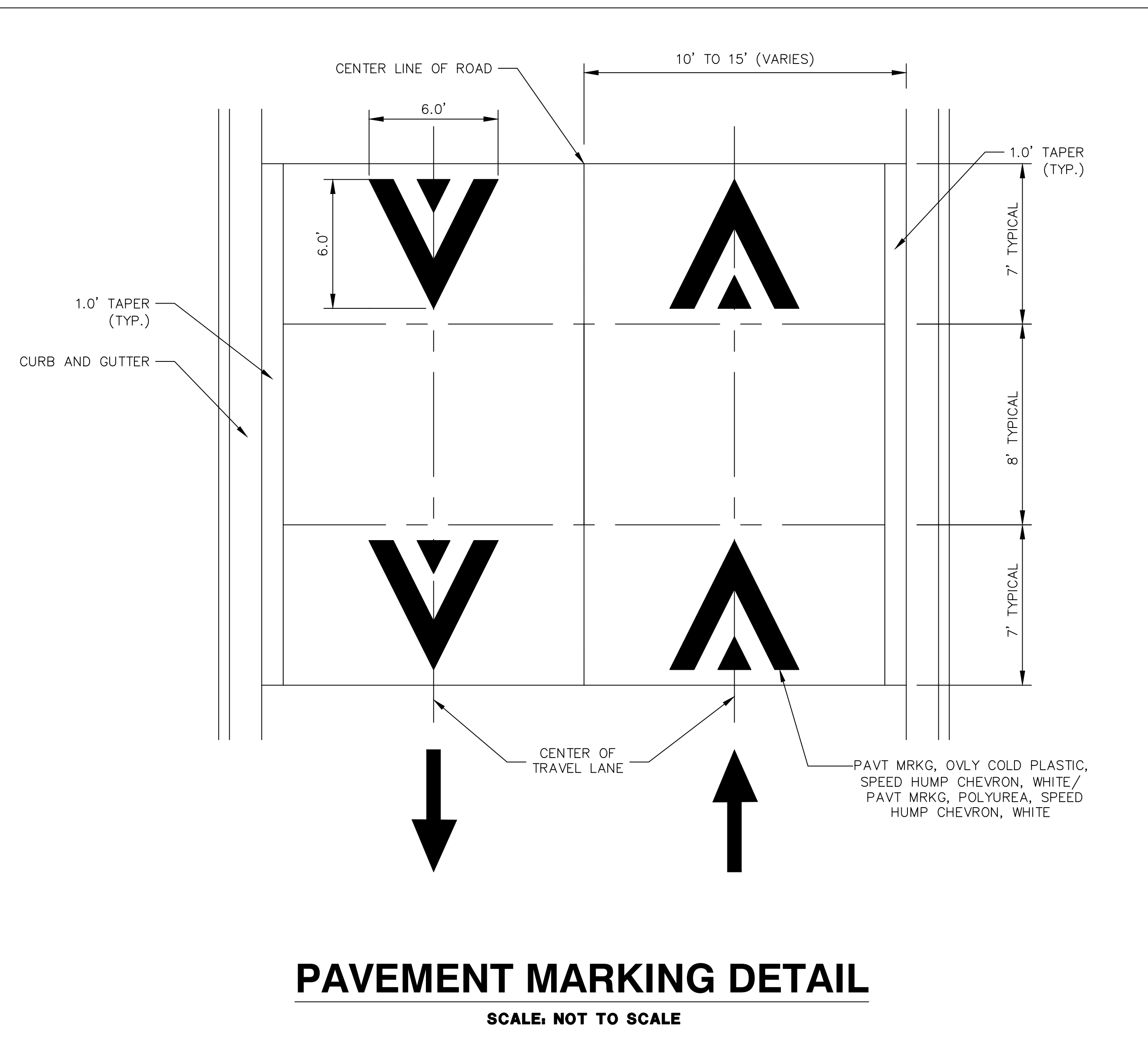


CURB DETAIL

DETAIL 1

CONCRETE SPEED TABLE DETAIL

SCALE: NOT TO SCALE



PAVEMENT MARKING DETAIL

SCALE: NOT TO SCALE

GENERAL NOTES

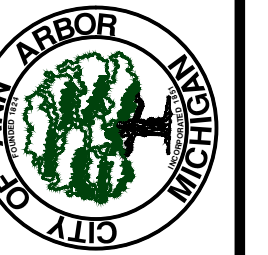
1. PAYMENT FOR PAVEMENT MARKINGS FOR SPEED HUMPS AND RAISED INTERSECTIONS SHALL BE INCLUDED IN THE RESPECTIVE BID ITEMS AND SHALL NOT BE PAID FOR SEPARATELY.



Know what's below. Call before you dig.

REV.	DATE	DRAWN	CHECKED	DESCRIPTION
03	12/16/2022	ML2	ML2	ISSUED FOR BIDS
02	7/15/2022	ML2	PK2	100% OWNER REVIEW
01	6/16/2022	ML2	PK2	95% OWNER REVIEW
00	5/26/2022	ML2	PK2	60% OWNER REVIEW

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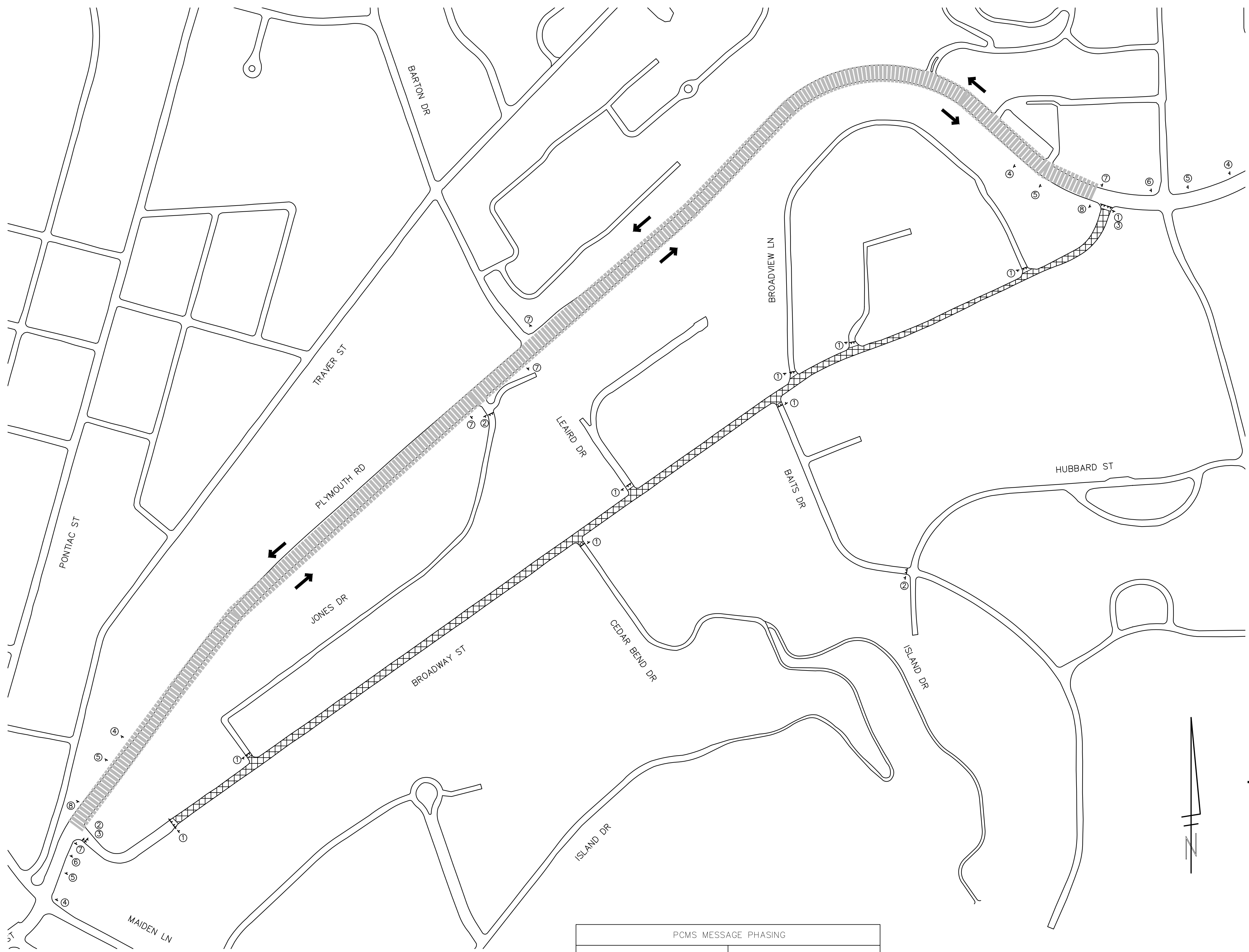
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN

SHEET No.

13 OF 50

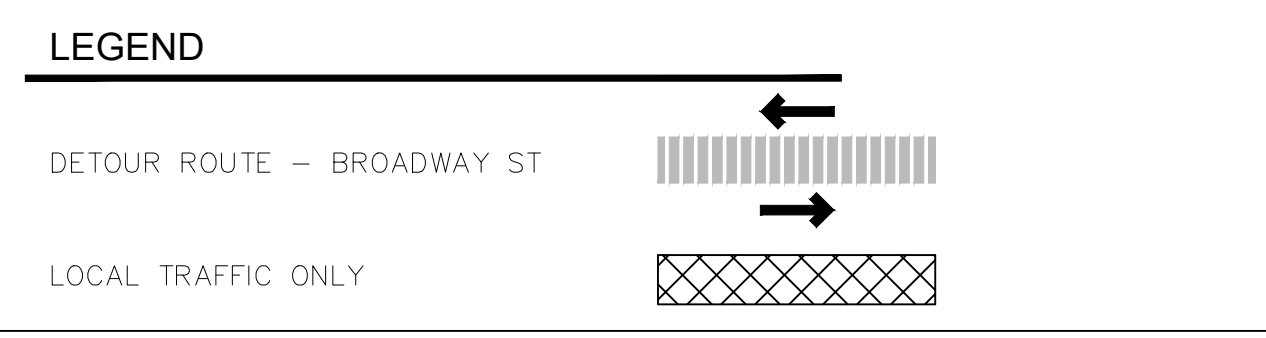
DETAILS_3

DRAWING No.
2020030-13



PCMS MESSAGE PHASING	
PRIOR TO CONSTRUCTION	DURING CONSTRUCTION
BROADWAY STREET CONST	CLOSED TO THRU TRAFFIC
BEGINS MONTH DATE	FOLLOW POSTED DETOUR

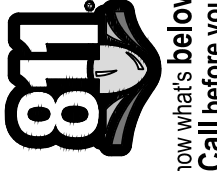
BROADWAY STREET			
SIGN	NUMBER	QUANTITY	
① ROAD CLOSED R11-2 48"x30"		9	
② ROAD CLOSED TO THRU TRAFFIC R11-4 60"x30"		3	
③ DETOUR M4-10 (L/R)	R4-10 48"x18"	1 (LEFT) 1 (RIGHT)	
④ ROAD WORK AHEAD BROADWAY ST W20-1 D3-1 36"x36" 30"x8"		4	
⑤ ROAD CLOSED AHEAD BROADWAY ST W20-3 D3-1 36"x36" 30"x8"		4	
⑥ DETOUR AHEAD BROADWAY ST W20-2 D3-1 36"x36" 30"x8"		4	
⑦ DETOUR BROADWAY ST M4-9S D3-1 30"x24" 30"x8"		6	
⑧ END DETOUR BROADWAY ST M4-8a D3-1 24"x18" 30"x8"		2	
BARRICADE, TYPE III, LIGHTED, FURNISH AND OPERATE - 13 EA			
SIGN, PORTABLE CHANGEABLE MESSAGE, FURNISH AND OPERATE - 2 EACH VERIFY EXACT QUANTITY AND LOCATION WITH ENGINEER PRIOR TO ORDERING			




NOTE: PCMS LOCATIONS AND MESSAGES WILL BE AS DIRECTED BY THE ENGINEER. TO BE PLACED ONE WEEK PRIOR TO CONSTRUCTION

*THE CONTRACTOR SHALL PLACE THE APPROPRIATE DATE AS APPROVED BY THE ENGINEER.

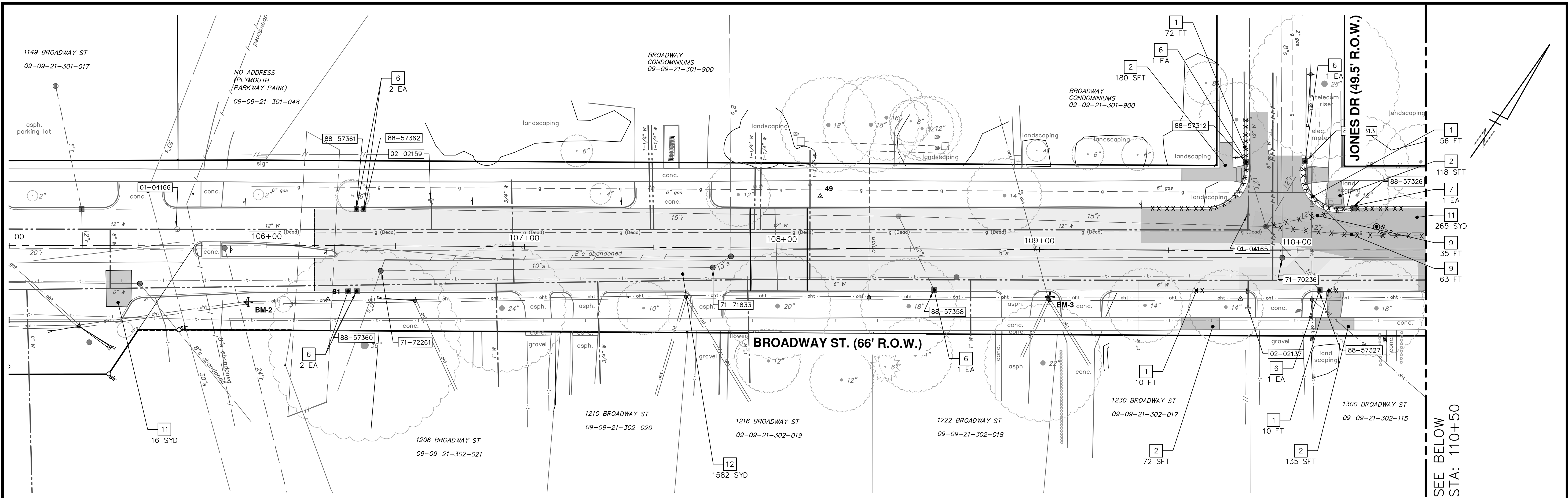
- NOTES**
1. DEPENDING ON THE DETOUR ROUTE THAT IS PUT IN PLACE, CONFLICTING SIGNS MAY BE PRESENT. PRIOR TO THE ORDERING OR PLACEMENT OF ANY SIGNS, MEET WITH THE ENGINEER TO VERIFY THE EXACT NUMBER AND LOCATION OF THE SIGNS TO BE PLACED. THE ENGINEER AND THE CONTRACTOR SHALL WORK TOGETHER TO ELIMINATE ALL CONFLICTS.
 2. THE CITY RESERVES THE RIGHT TO ORDER ADDITIONAL SIGNS AND PLACE THEM INTO SERVICE IN ORDER TO SAFELY MAINTAIN TRAFFIC. ADJUSTMENTS IN THE UNIT PRICE FOR THESE ITEMS OF WORK SHALL NOT BE ALLOWED FOR THESE OCCURRENCES.
 3. THE CONTRACTOR SHALL COORDINATE HIS OPERATIONS WITH THOSE OF THE CITY OF ANN ARBOR'S SIGNS AND SIGNALS UNIT DURING THE COURSE OF THE DETOUR ROUTE ESTABLISHMENT TO EFFECTIVELY AND SAFELY MAINTAIN TRAFFIC. DO NOT ERRECT ANY SIGNS UNTIL ITS LOCATION AND PROPOSED DATE OF INSTALLATION IS APPROVED BY THE ENGINEER.
 4. THE DETOUR IS TO BE PLACED DURING BROADWAY AVENUE IMPROVEMENTS. AS DIRECTED BY THE ENGINEER, THE CONTRACTOR WILL CLOSE AND DETOUR BROADWAY AVENUE TRAFFIC. SEE "SPECIAL PROVISION FOR MAINTAINING TRAFFIC AND CONSTRUCTION SEQUENCING" FOR DETAILS ON CONSTRUCTION STAGING, SEQUENCING, CLOSURE AND DETOUR LIMITATIONS, AND OTHER DETAILS.
 5. REFERENCE THE "SPECIAL PROVISION FOR MAINTAINING TRAFFIC AND CONSTRUCTION SEQUENCING" FOR ADDITIONAL PROJECT REQUIREMENTS. THE CONTRACTOR'S ATTENTION IS SPECIFICALLY DIRECTED TO THE SECTION OF SAME SPECIAL PROVISION REGARDING COORDINATION WITH THE CITY SIGNS AND SIGNALS UNIT FOR MODIFICATIONS TO TRAFFIC SIGNALS FOR THE DETOUR.
 6. THE CONTRACTOR SHALL FURNISH, ERECT, AND MAINTAIN SIGNS AS SHOWN ON THE PLANS OR OTHERWISE DIRECTED BY THE ENGINEER.
 7. CONSTRUCTION WARNING SIGNS SHALL HAVE AN ORANGE, HIGH-INTENSITY, REFLECTORIZED BACKGROUND.
 8. SIGNS SHALL CONFORM TO THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
 9. THE CONTRACTOR SHALL DRIVE ALL SIGNS INTO EXPOSED GROUND OR INSERT INTO A BORED HOLE IN PAVEMENT AS NECESSARY TO PERMANENTLY SECURE. ALL HOLES IN PAVEMENT SHALL BE FILLED WITH ENGINEER-APPROVED MORTAR WHEN THE SIGN IS REMOVED AND NO LONGER NEEDED. COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PAY ITEM "TEMPORARY SIGN, TYPE B, FURNISH AND OPERATE".
 10. ADVANCE WARNING SIGNS SHALL BE PROVIDED WITH TWO (2) TYPE A FLASHING LIGHTS AND ONE (1) DAY-GLOW ORANGE FLAG.
 11. CITY TO BE NOTIFIED A MINIMUM OF 7 DAYS PRIOR TO IMPLEMENTING BROADWAY AVENUE DETOUR. MESSAGE BOARDS TO BE PLACED 7 DAYS PRIOR TO IMPLEMENTATION OF DETOUR.



Know what's below.
Call before you dig.

PK2	PK2	PK2	PK2	PK2	PK2	PK2	PK2	PK2	CHECKED
ML2	ML2	ML2	ML2	ML2	ML2	ML2	ML2	ML2	DRAWN
12/16/2022	7/15/2022	6/16/2022	5/26/2022						DATE
03	02	01	00						REV.
ISSUED FOR BIDS 100% OWNER REVIEW 95% OWNER REVIEW 60% OWNER REVIEW									
CITY OF ANN ARBOR PUBLIC SERVICES 301 EAST HURON STREET P.O. BOX 8647 ANN ARBOR, MI 48107-8647 734.794.4410 www.aagov.org									
									
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING BROADWAY STREET WATER MAIN TRAFFIC CONTROL									
SCALE DRAWING No. 2020030-14 SHEET No. 14 OF 50									

Z:\2021\211210\CAD\CD\211210_removals.dwg Dwg Created: 15-Dec-22 - _a2 standard bw.stb - Plot Date: 16-Dec-22



SEE ABOVE
STA: 110+50

SEE SHEET 16
STA: 115+00

SEE BELOW
STA: 110+50

SYMBOL LEGEND

- SAWCUT
- XXXXXXXX CURB REMOVAL
- XXXXXXXX UTILITY REMOVAL
- HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
- MACHINE GRADING, MODIFIED

REMOVAL KEY

KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE, MODIFIED
2	REMOVE CONCRETE SIDEWALK, RAMP, & DRIVES - ANY THICKNESS, MODIFIED
3	NOT USED
4	NOT USED
5	PROTECTIVE FENCING
6	EROSION CONTROL, INLET FILTER
7	DRAINAGE STRUCTURE, ANY SIZE OR DEPTH, REMOVE
8	NOT USED
9	SEWER, ANY SIZE OR DEPTH, REMOVE
10	NOT USED
11	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
12	MACHINE GRADING, MODIFIED

811
Know what's below.
Call before you dig.

PK2	12/16/2022	ML2	12/16/2022
PK2	7/15/2022	ML2	7/15/2022
PK2	6/16/2022	ML2	6/16/2022
PK2	5/26/2022	ML2	5/26/2022
PK2	DATE	ML2	DATE
PK2	DRAWN	ML2	DRAWN
PK2	CHECKED	ML2	CHECKED

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CITY OF ANN ARBOR MICHIGAN

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED REMOVALS

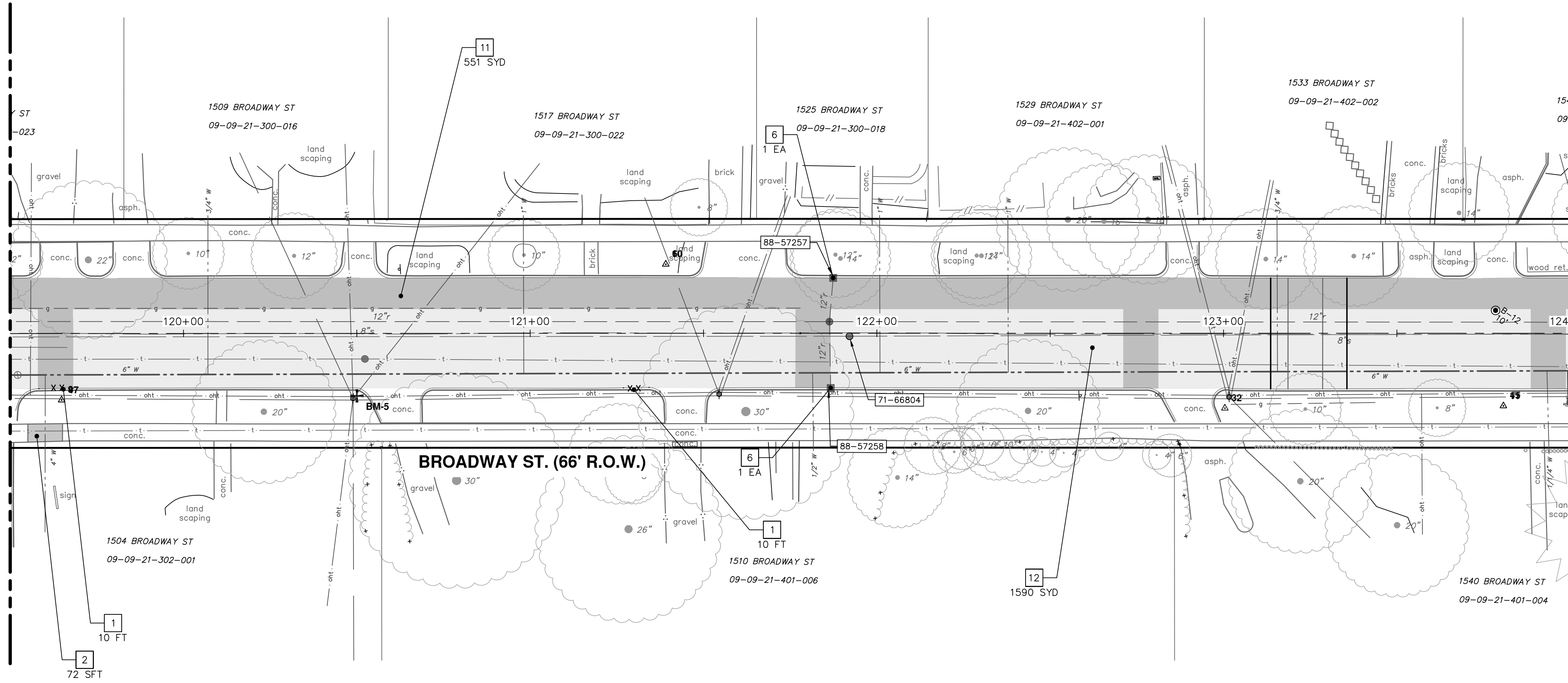
STA. 106+00 TO STA. 115+00

SHEET No. 15 OF 50

DRAWING No. 2020030-15

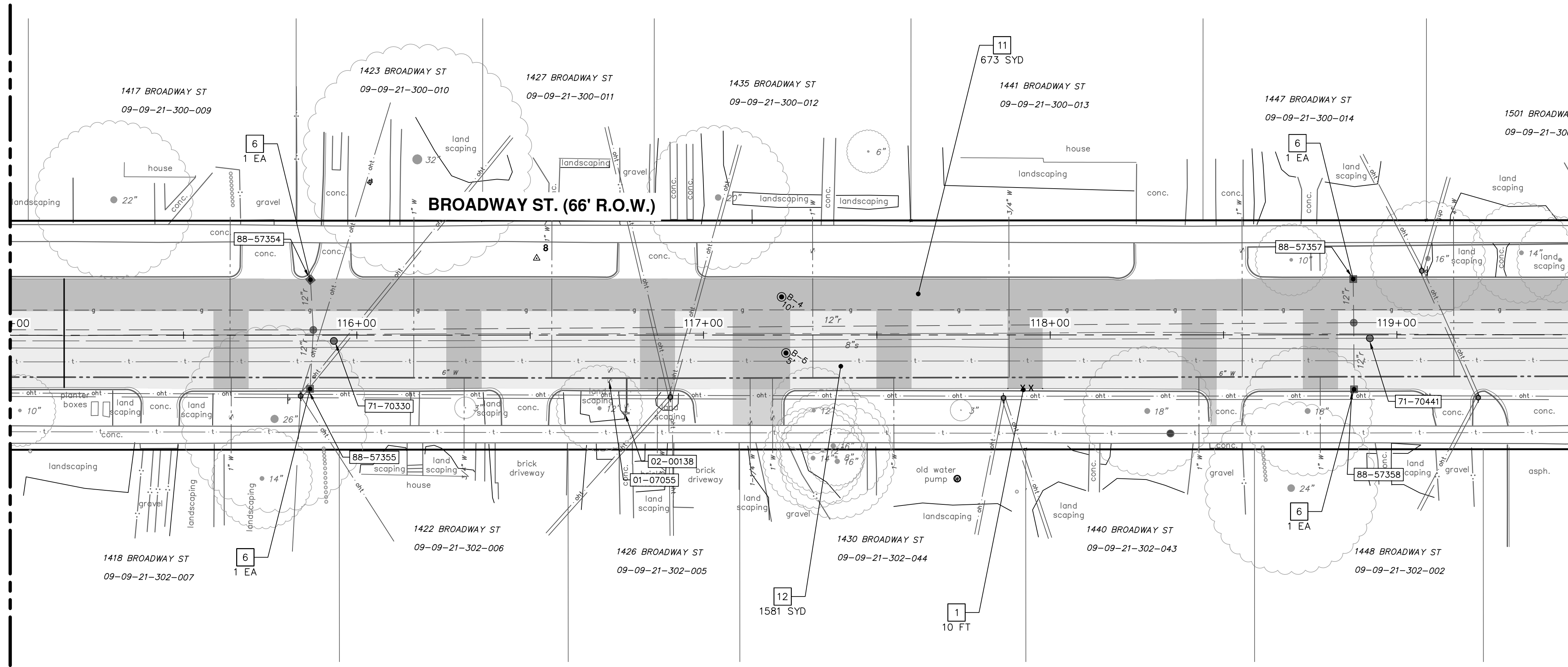
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SEE ABOVE
STA: 119+50



SEE SHEET 17
STA: 124+00

SEE SHEET 15
STA: 115+00



SEE BELOW
STA: 119+50

SYMBOL LEGEND

- SAWCUT
- XXXXXX CURB REMOVAL
- XXXXXX UTILITY REMOVAL
- HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
- MACHINE GRADING, MODIFIED

REMOVAL KEY

KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE, MODIFIED
2	REMOVE CONCRETE SIDEWALK, RAMP, & DRIVES - ANY THICKNESS, MODIFIED
3	NOT USED
4	NOT USED
5	PROTECTIVE FENCING
6	EROSION CONTROL, INLET FILTER
7	DRAINAGE STRUCTURE, ANY SIZE OR DEPTH, REMOVE
8	NOT USED
9	SEWER, ANY SIZE OR DEPTH, REMOVE
10	NOT USED
11	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
12	MACHINE GRADING, MODIFIED

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED REMOVALS
STA. 115+00 TO STA. 124+00

SHEET No. 16 OF 50

811
Know what's below.
Call Before you dig.

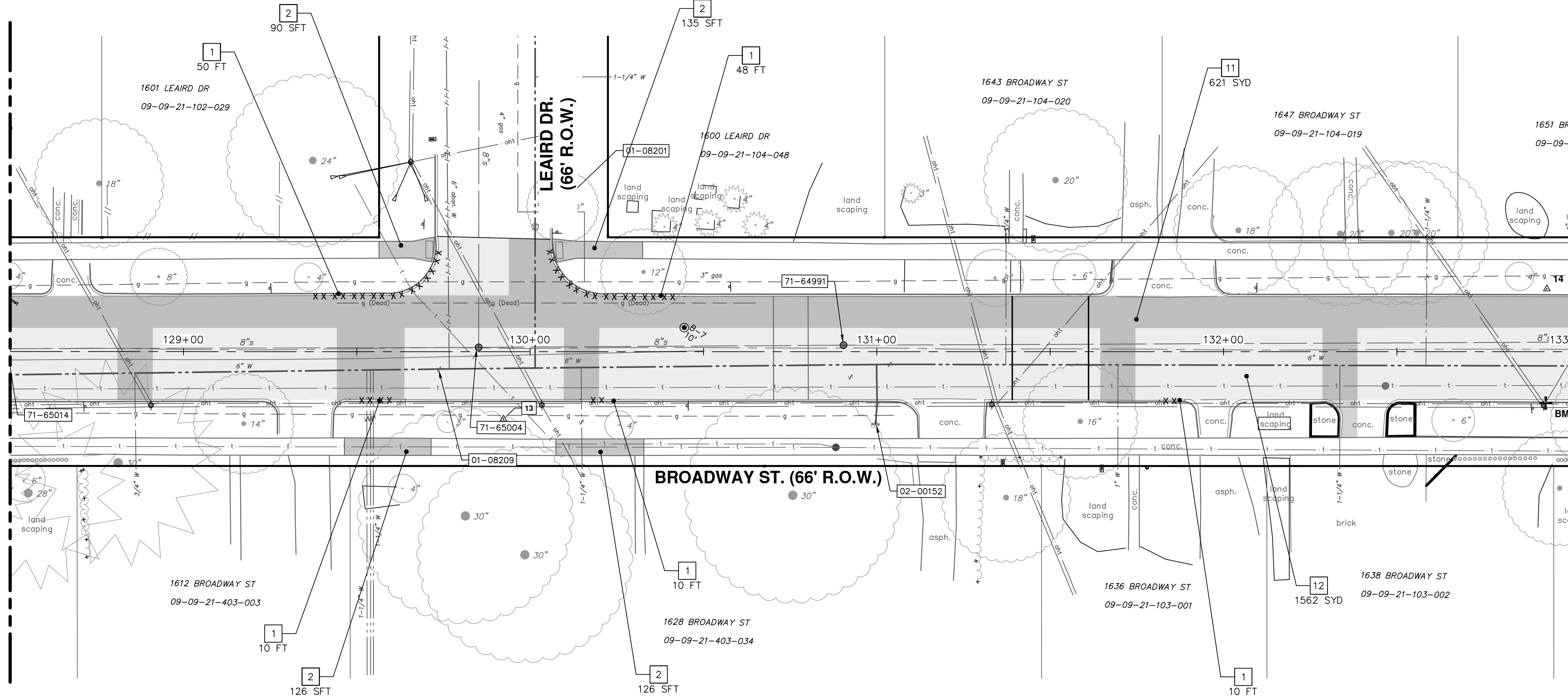
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02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

CITY OF ANN ARBOR
 PUBLIC SERVICES
 301 EAST HURON STREET
 ANN ARBOR, MI 48106-0647
 WWW.A2gov.org

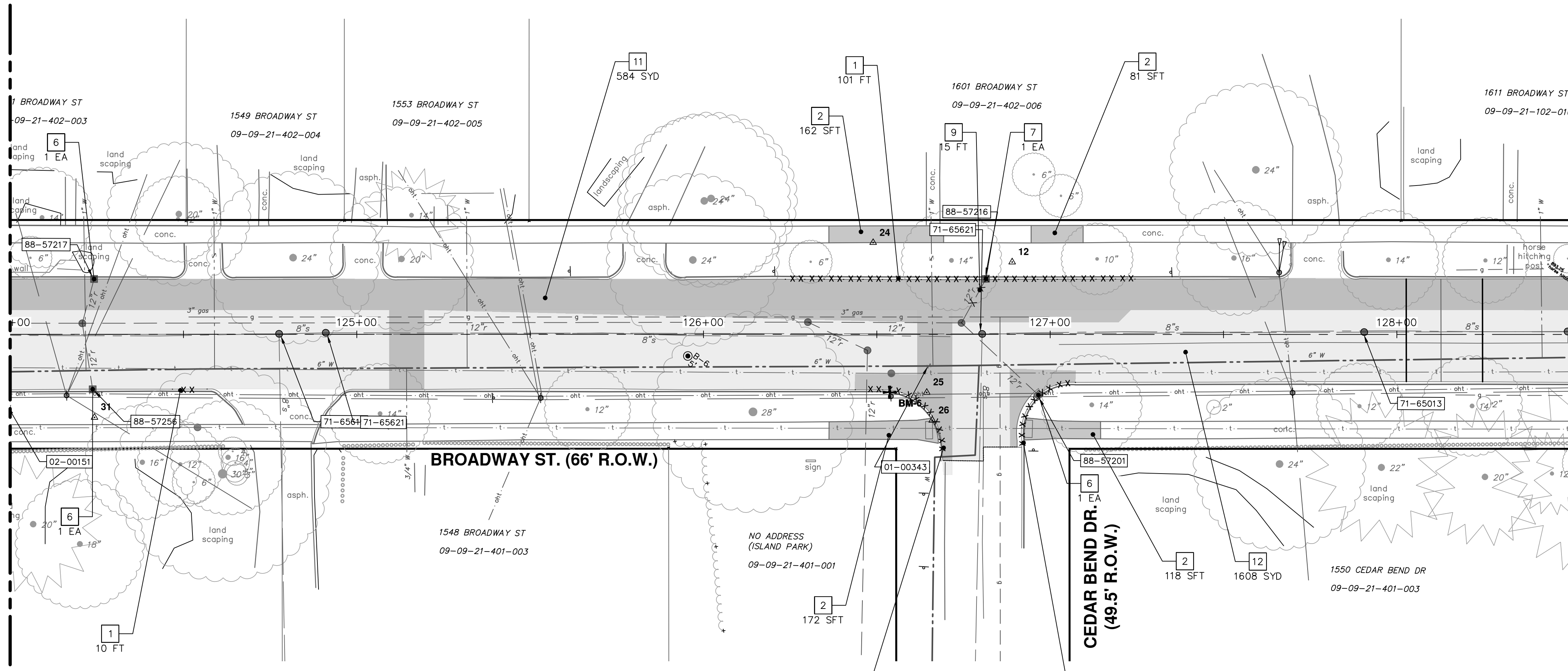
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SEE ABOVE
STA: 128+50

SEE SHEET 16
STA: 124+00



SEE SHEET 18
STA: 133+00



SEE BELOW
STA: 128+50

SYMBOL LEGEND

	SAWCUT
	CURB REMOVAL
	UTILITY REMOVAL
	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
	MACHINE GRADING, MODIFIED

REMOVAL KEY

KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE, MODIFIED
2	REMOVE CONCRETE SIDEWALK, RAMP, & DRIVES - ANY THICKNESS, MODIFIED
3	NOT USED
4	NOT USED
5	PROTECTIVE FENCING
6	EROSION CONTROL, INLET FILTER
7	DRAINAGE STRUCTURE, ANY SIZE OR DEPTH, REMOVE
8	NOT USED
9	SEWER, ANY SIZE OR DEPTH, REMOVE
10	NOT USED
11	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
12	MACHINE GRADING, MODIFIED



REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
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01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

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CITY OF ANN ARBOR - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED REMOVALS

SCALE PLAN: 1" = 20'
DRAWING NO. 2020030-17

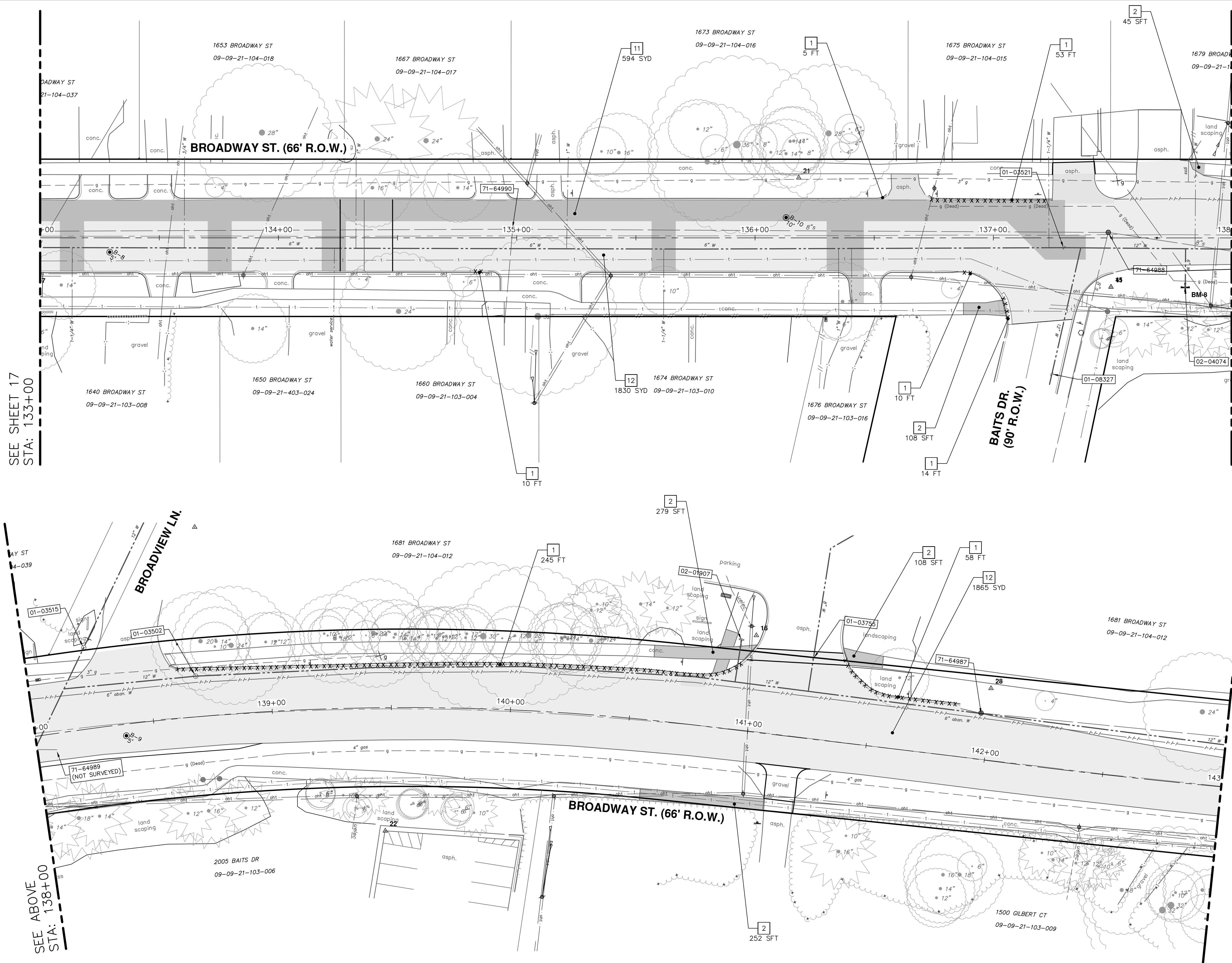
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SEE SHEET 17
STA: 133+00

SEE ABOVE
STA: 138+00

SEE BELOW
STA: 138+00

SEE SHEET 19
STA: 143+00



SYMBOL LEGEND

	SAWCUT
	CURB REMOVAL
	UTILITY REMOVAL
	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
	MACHINE GRADING, MODIFIED

REMOVAL KEY

KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE, MODIFIED
2	REMOVE CONCRETE SIDEWALK, RAMP, & DRIVES - ANY THICKNESS, MODIFIED
3	NOT USED
4	NOT USED
5	PROTECTIVE FENCING
6	EROSION CONTROL, INLET FILTER
7	DRAINAGE STRUCTURE, ANY SIZE OR DEPTH, REMOVE
8	NOT USED
9	SEWER, ANY SIZE OR DEPTH, REMOVE
10	NOT USED
11	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
12	MACHINE GRADING, MODIFIED

811
Know what's below. Call before you dig.

REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED REMOVALS

STA. 133+00 TO STA. 143+00

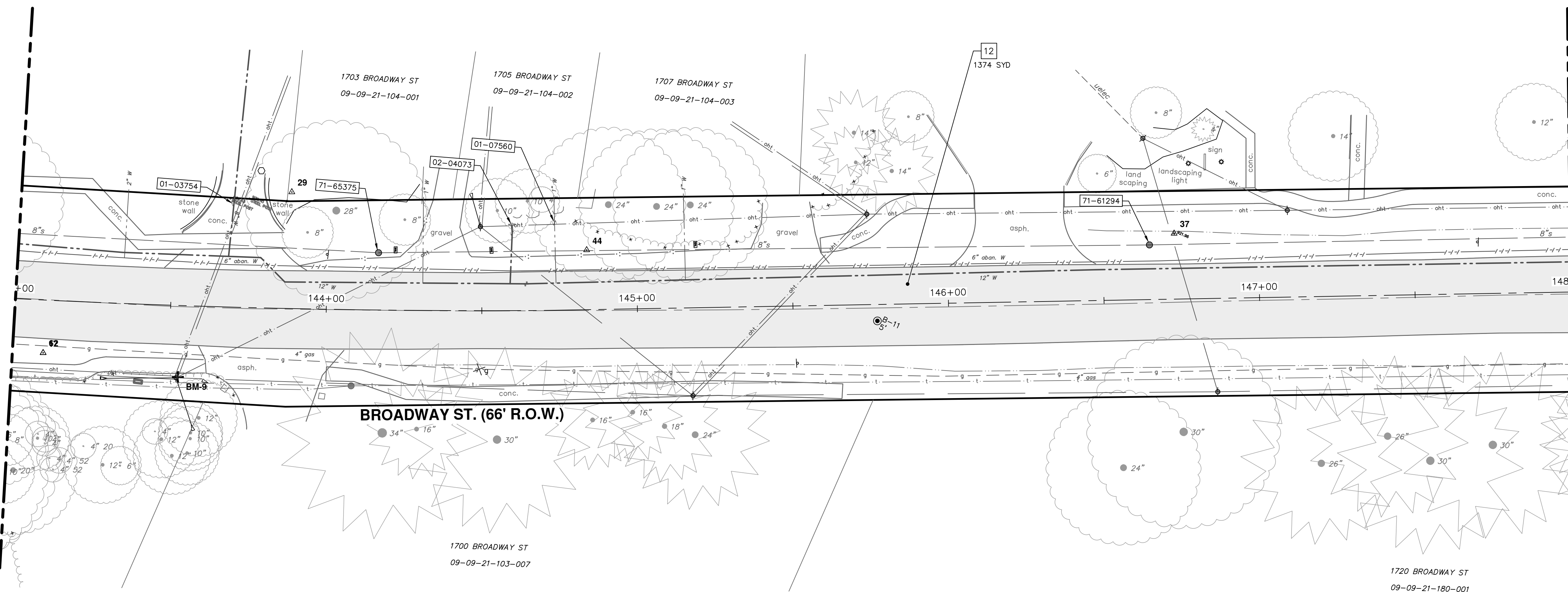
SCALE PLAN: 1" = 20'
DRAWING No. 2020030-18

SHEET No. 18 OF 50

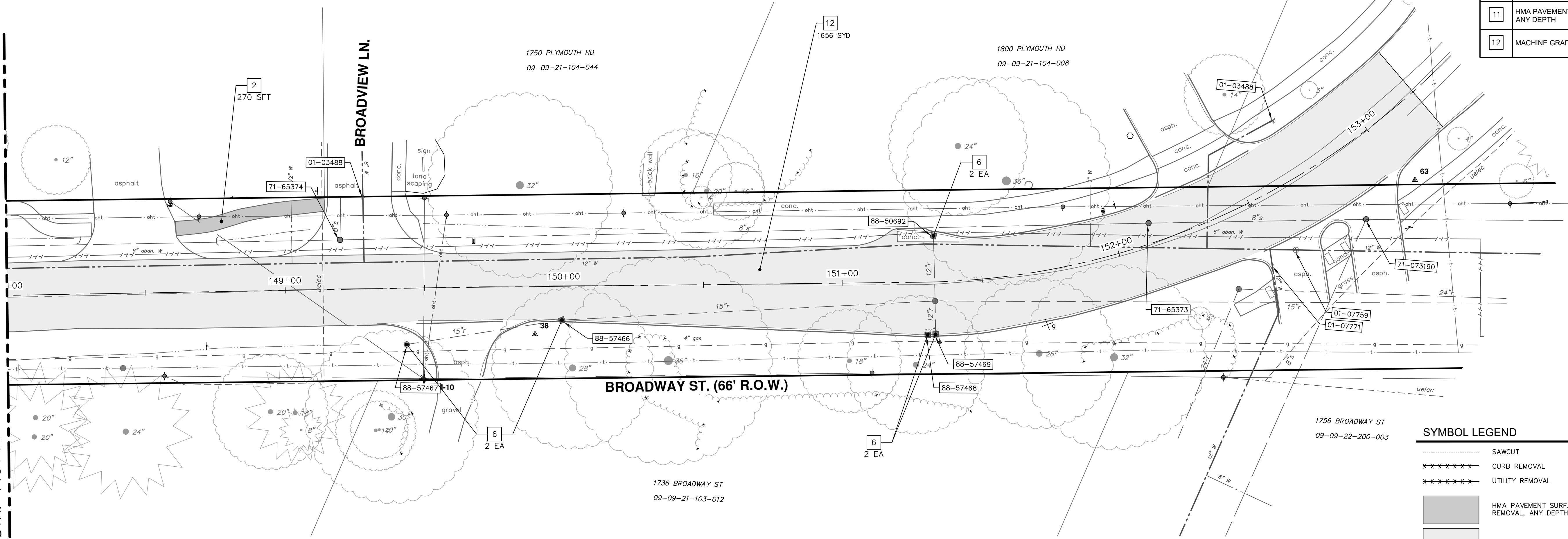
CITY OF ANN ARBOR
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SEE ABOVE
STA: 143+00

SEE ABOVE
STA: 148+00



SEE BELOW
STA: 148+00



REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE, MODIFIED
2	REMOVE CONCRETE SIDEWALK, RAMP, & DRIVES - ANY THICKNESS, MODIFIED
3	NOT USED
4	NOT USED
5	PROTECTIVE FENCING
6	EROSION CONTROL, INLET FILTER
7	DRAINAGE STRUCTURE, ANY SIZE OR DEPTH, REMOVE
8	NOT USED
9	SEWER, ANY SIZE OR DEPTH, REMOVE
10	NOT USED
11	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
12	MACHINE GRADING, MODIFIED

SYMBOL LEGEND

- SAWCUT
- ***** CURB REMOVAL
- ***** UTILITY REMOVAL
- HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
- MACHINE GRADING, MODIFIED

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING

BROADWAY STREET WATER MAIN

PROPOSED REMOVALS

STA. 143+00 TO END

SHEET No. 19 OF 50

811

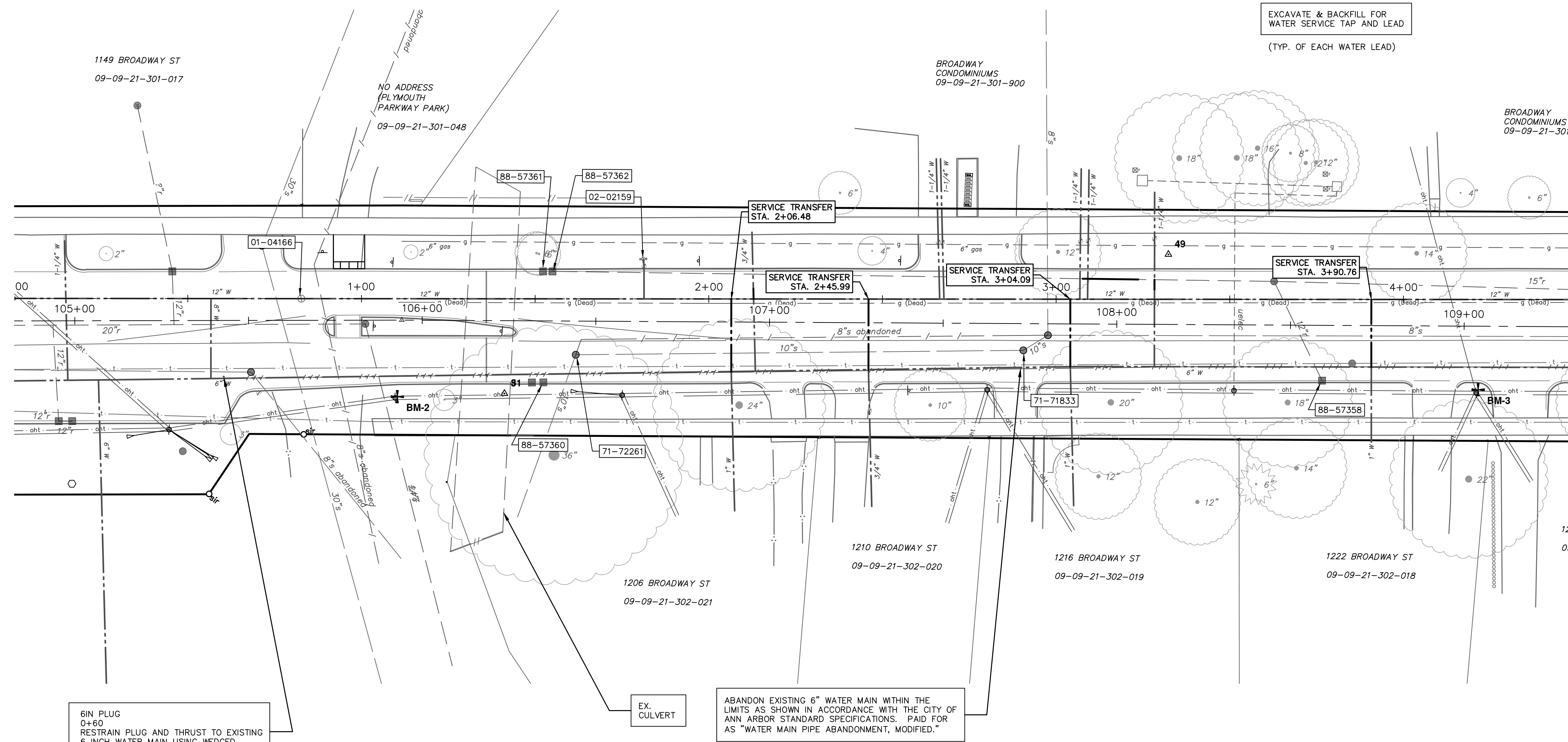
Know what's below. Call before you dig.

REV	DATE	DESCRIPTION
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02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

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DRAWING No. 2020030-19
 SCALE PLAN: 1" = 20'

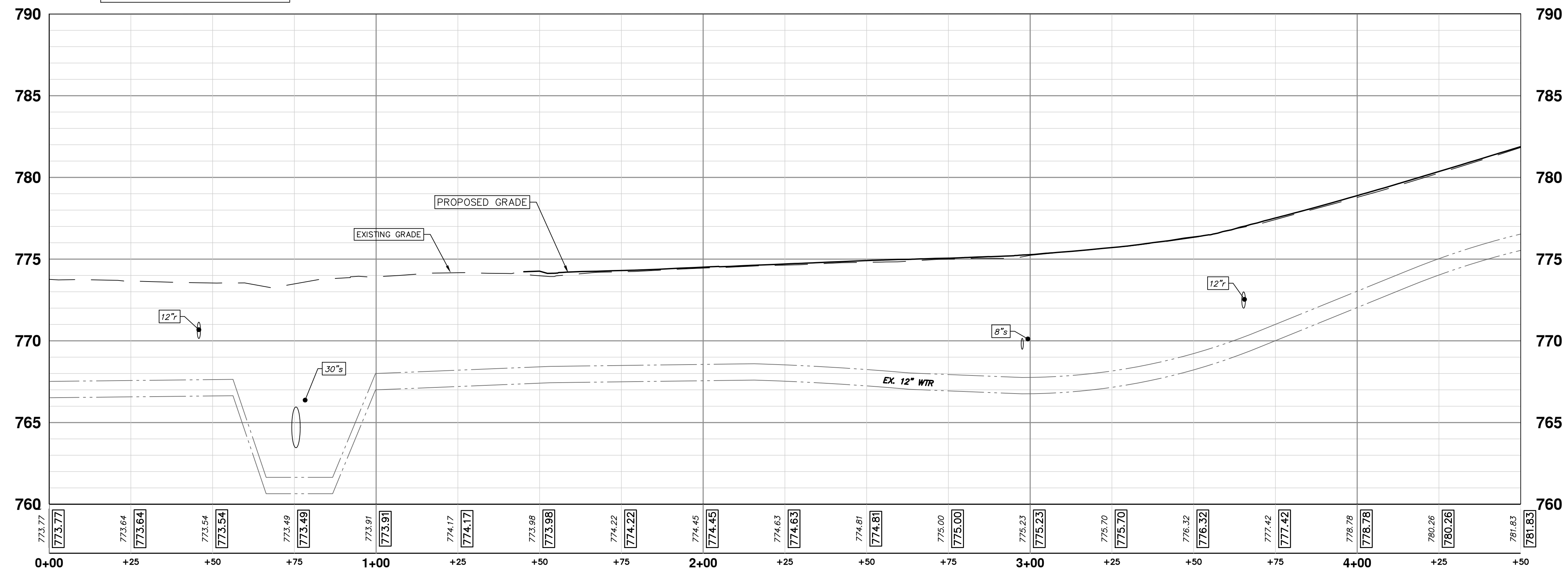
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6IN PLUG
 0+60
 RESTRAIN PLUG AND THRUST TO EXISTING
 6 INCH WATER MAIN USING WEDGED
 BLOCK AND CONCRETE. ALL COSTS
 ASSOCIATED WITH THE PLUG SHALL BE
 INCLUDED IN THE PAY ITEM "WATER MAIN
 PIPE ABANDONMENT, MODIFIED"

EX. CULVERT
 ABANDON EXISTING 6" WATER MAIN WITHIN THE
 LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF
 ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR
 AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

SEE SHEET 21
 STA. 4+50




WATER MAIN QUANTITIES
 EXCAVATE & BACKFILL FOR WATER SERVICE TAP AND LEAD
 WATER MAIN PIPE ABANDONMENT, MODIFIED 90 FT
 1 LS



Know what's below.
Call before you dig.

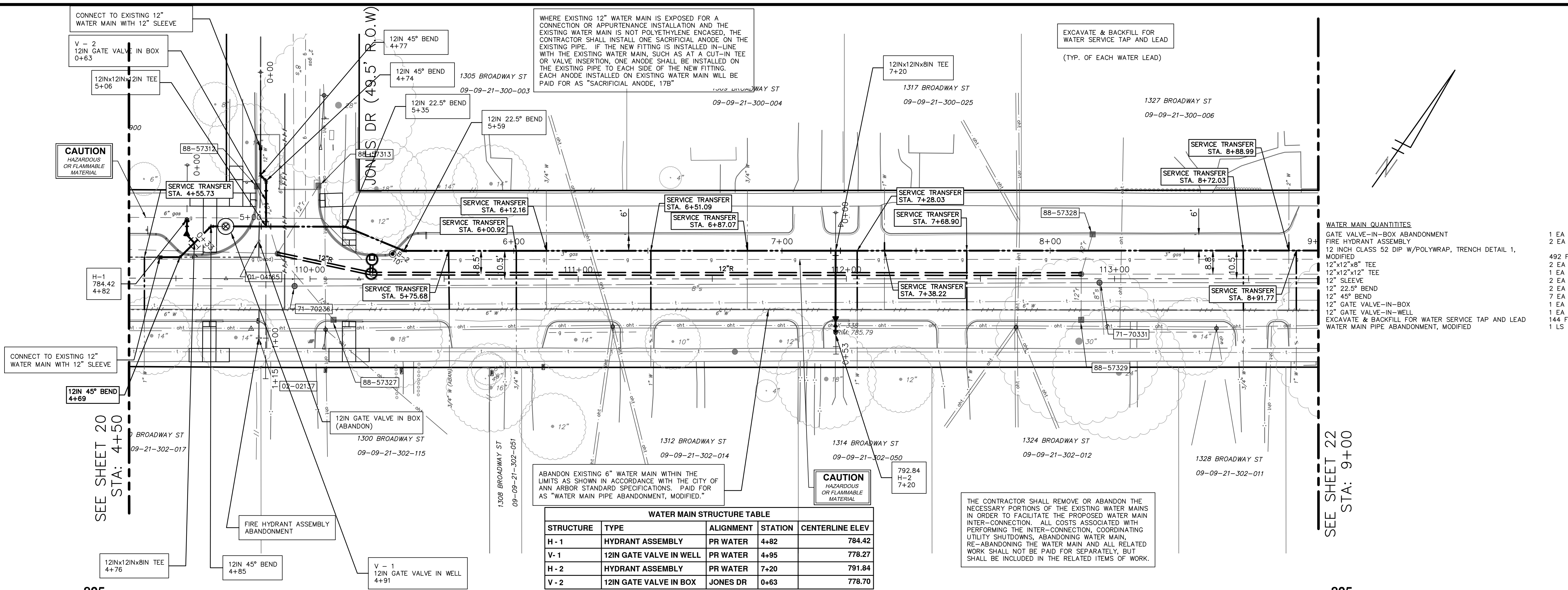
REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW



CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED WATER MAIN
 STA. 0+00 TO STA. 4+50

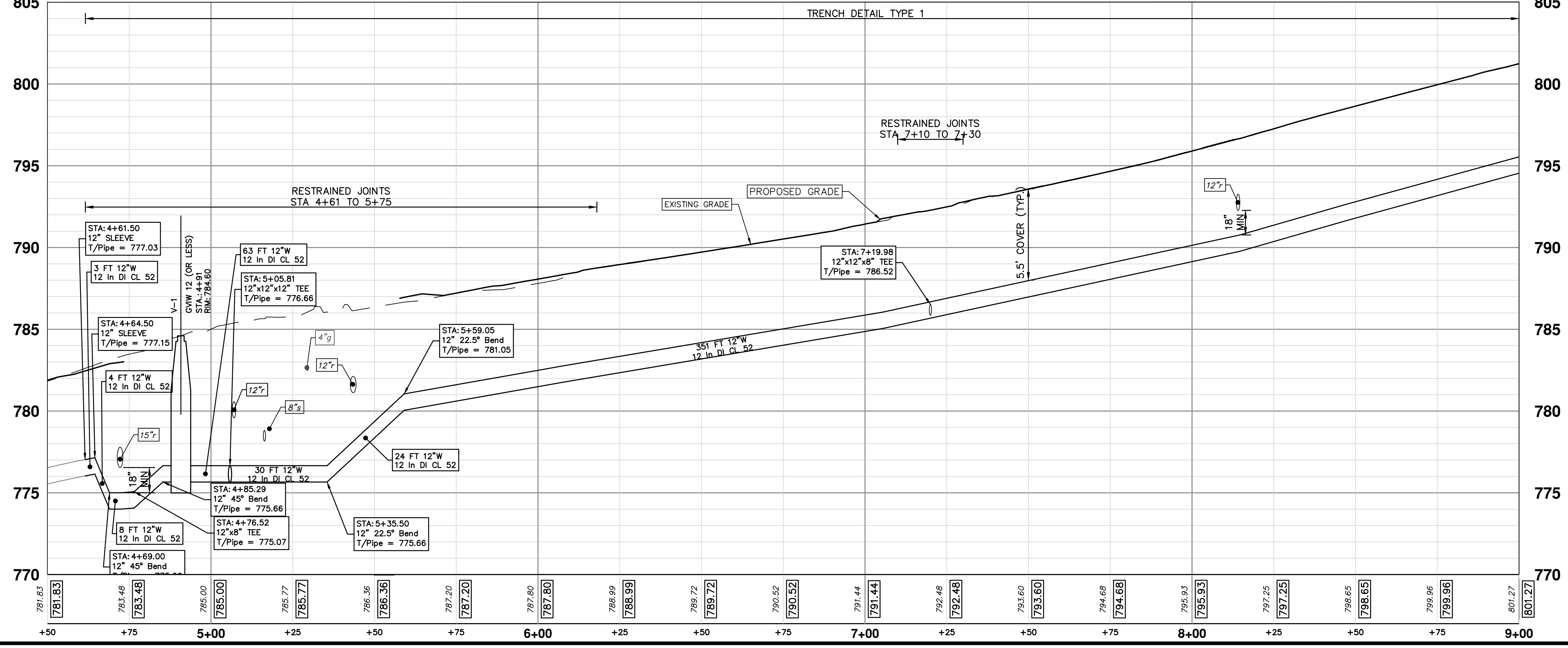
SHEET No. **20 OF 50**

Z:\2021\211210\CAD\CD\211210_water_rev.dwg - Plot Date: 12/16/2022 3:19:21 PM




WATER MAIN STRUCTURE TABLE

STRUCTURE	TYPE	ALIGNMENT	STATION	CENTERLINE ELEV
H-1	HYDRANT ASSEMBLY	PR WATER	4+82	784.42
V-1	12IN GATE VALVE IN WELL	PR WATER	4+85	778.27
H-2	HYDRANT ASSEMBLY	PR WATER	7+20	791.84
V-2	12IN GATE VALVE IN BOX	JONES DR	0+63	778.70




WATER MAIN QUANTITIES

GATE VALVE-IN-BOX ABANDONMENT	1 EA
FIRE HYDRANT ASSEMBLY	2 EA
12 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	492 FT
12"x12"x8" TEE	2 EA
12" SLEEVE	1 EA
12" 22.5" BEND	2 EA
12" 45" BEND	7 EA
12" GATE VALVE-IN-BOX	1 EA
12" GATE VALVE-IN-WELL	1 EA
EXCAVATE & BACKFILL FOR WATER SERVICE TAP AND LEAD	144 FT
WATER MAIN PIPE ABANDONMENT, MODIFIED	1 LS



Know what's below.
Call before you dig.

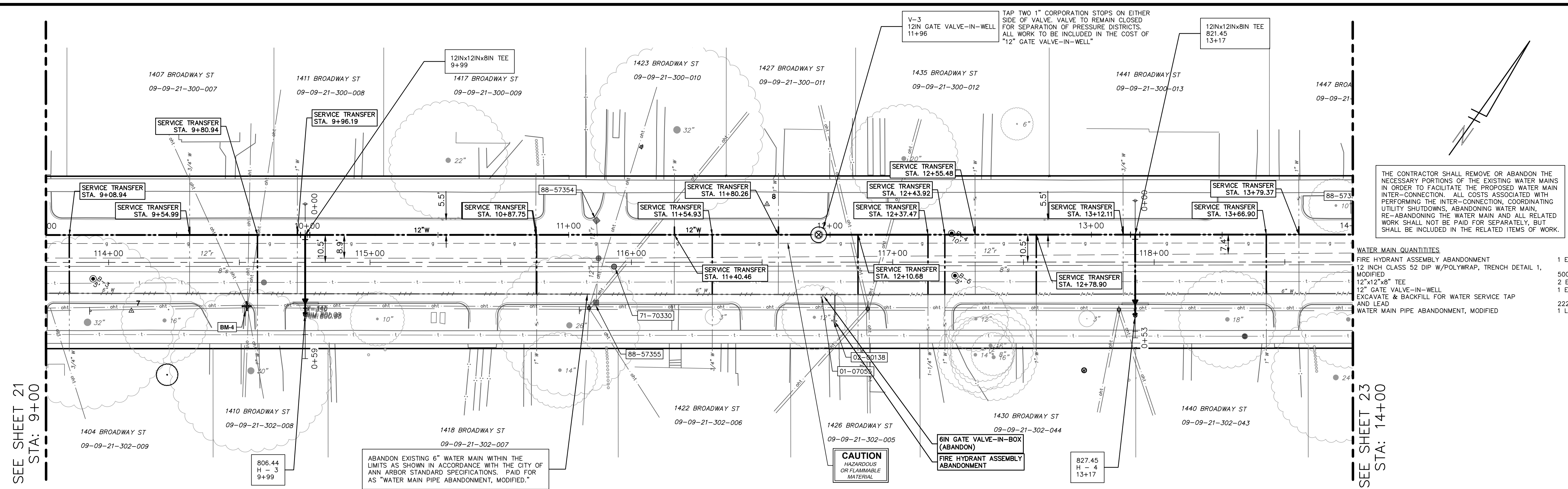
REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW



CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED WATER MAIN
 STA. 4+50 TO STA. 9+00

SCALE: PLAN: 1"=20'
 PROFILE: 1"=4'
 DRAWING NO.: 2020030-21
 SHEET NO.: 21 OF 50

Z:\2021\211210\CAD\CD\211210_water_rev.dwg - Plot Date: 12/16/2022 3:20:13 PM



THE CONTRACTOR SHALL REMOVE OR ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

WATER MAIN QUANTITIES

FIRE HYDRANT ASSEMBLY ABANDONMENT	1 EA
12 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	500 FT
12"x12"x8" TEE	2 EA
12" GATE VALVE-IN-WELL	1 EA
EXCAVATE & BACKFILL FOR WATER SERVICE TAP AND LEAD	222 FT
WATER MAIN PIPE ABANDONMENT, MODIFIED	1 LS

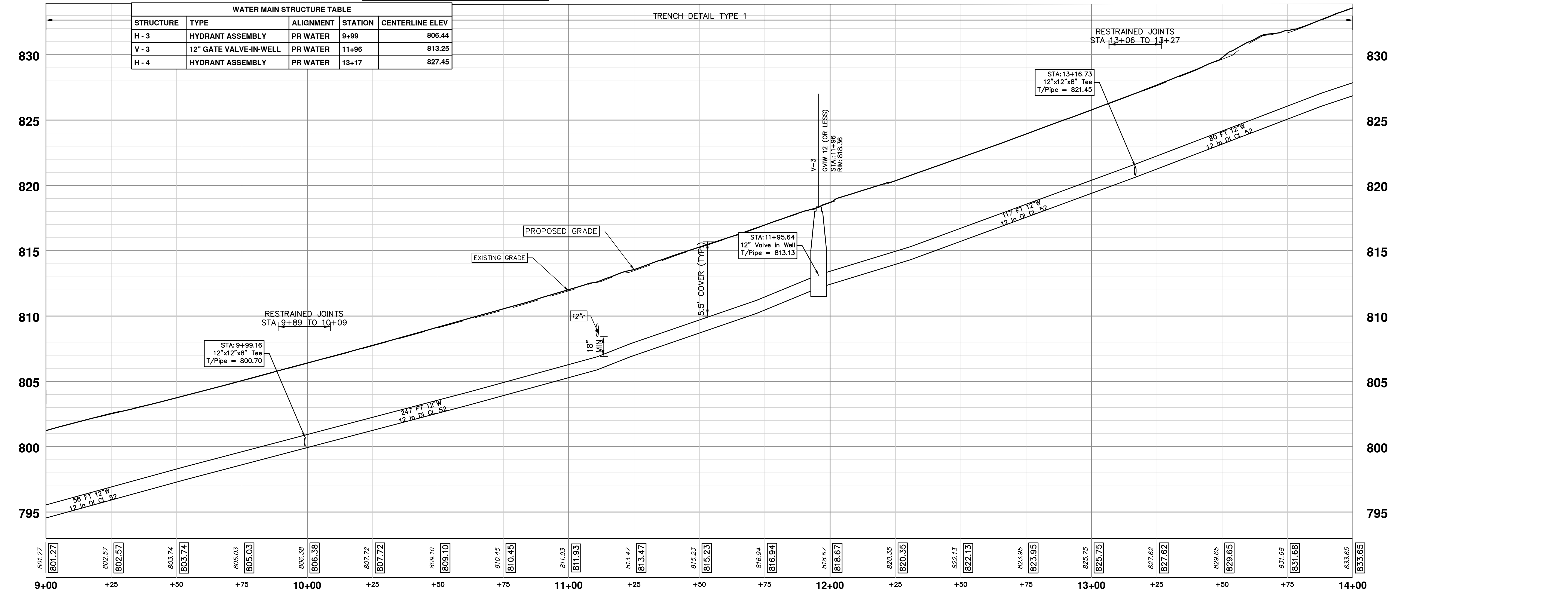
SEE SHEET 21
STA: 9+00


SEE SHEET 23
STA: 14+00

WATER MAIN STRUCTURE TABLE

STRUCTURE	TYPE	ALIGNMENT	STATION	CENTERLINE ELEV
H - 3	HYDRANT ASSEMBLY	PR WATER	9+99	806.44
V - 3	12" GATE VALVE-IN-WELL	PR WATER	11+96	813.25
H - 4	HYDRANT ASSEMBLY	PR WATER	13+17	827.45

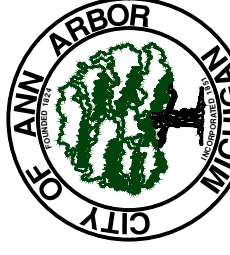
TRENCH DETAIL TYPE 1





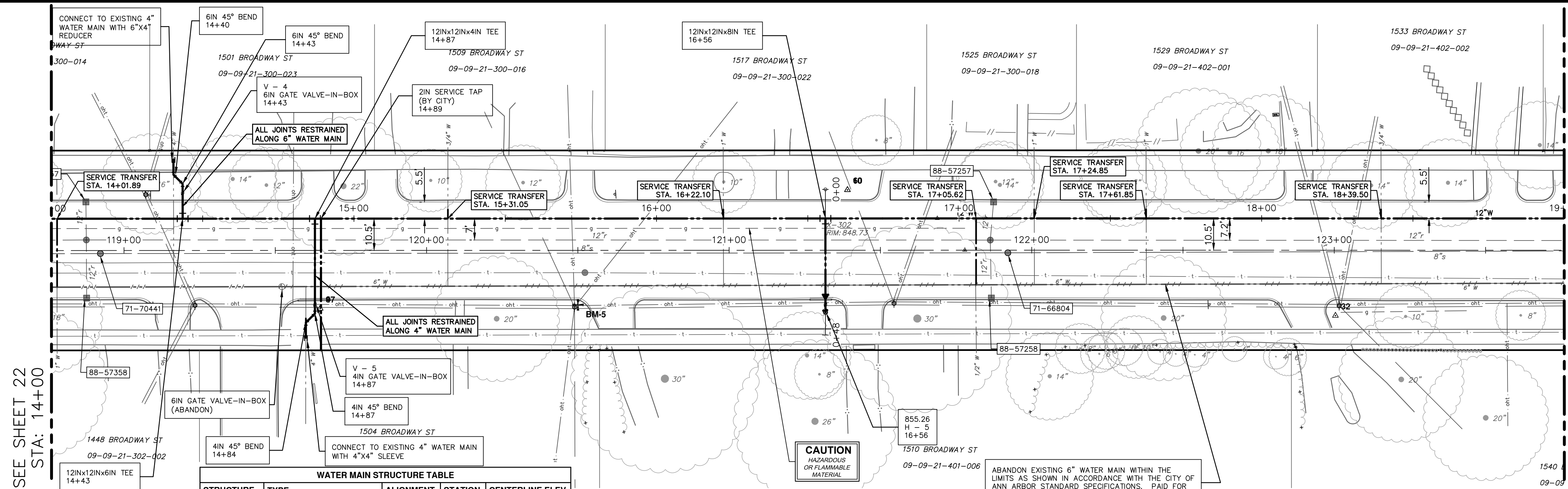
Know what's below.
Call before you dig.

REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW



CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED WATER MAIN
 STA. 9+00 TO STA. 14+00

SHEET No. **22 OF 50**
 DRAWING No. **2020030-22**
 PROFILE: 1" = 4'
 SCALE: PLAN: 1" = 20'

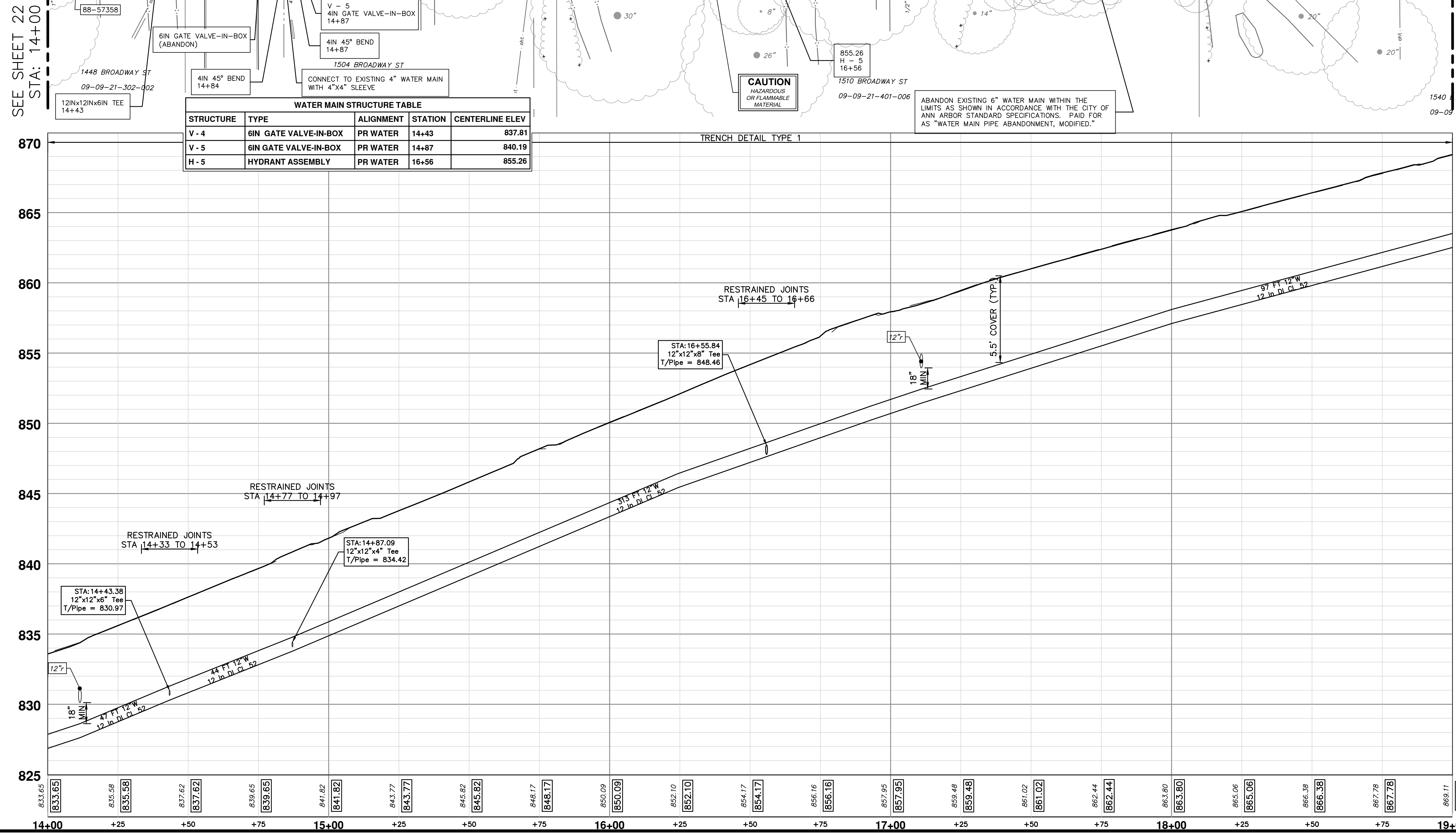


WATER MAIN QUANTITIES


GATE VALVE-IN-BOX ABANDONMENT	1 EA
4 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	41 FT
6 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	65 FT
12 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	500 FT
12"x12"x4" TEE	1 EA
12"x12"x6" TEE	1 EA
12"x12"x8" TEE	1 EA
4" 45° BEND	6 EA
6" 45° BEND	2 EA
6"x4" REDUCER	1 EA
4" GATE VALVE-IN-BOX	1 EA
6" GATE VALVE-IN-BOX	1 EA
EXCAVATE & BACKFILL FOR WATER SERVICE TAP AND LEAD	185 FT
WATER MAIN PIPE ABANDONMENT, MODIFIED	1 LS

WATER MAIN STRUCTURE TABLE

STRUCTURE	TYPE	ALIGNMENT	STATION	CENTERLINE ELEV
V - 4	6IN GATE VALVE-IN-BOX	PR WATER	14+43	837.81
V - 5	6IN GATE VALVE-IN-BOX	PR WATER	14+87	840.19
H - 5	HYDRANT ASSEMBLY	PR WATER	16+56	855.26



THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.



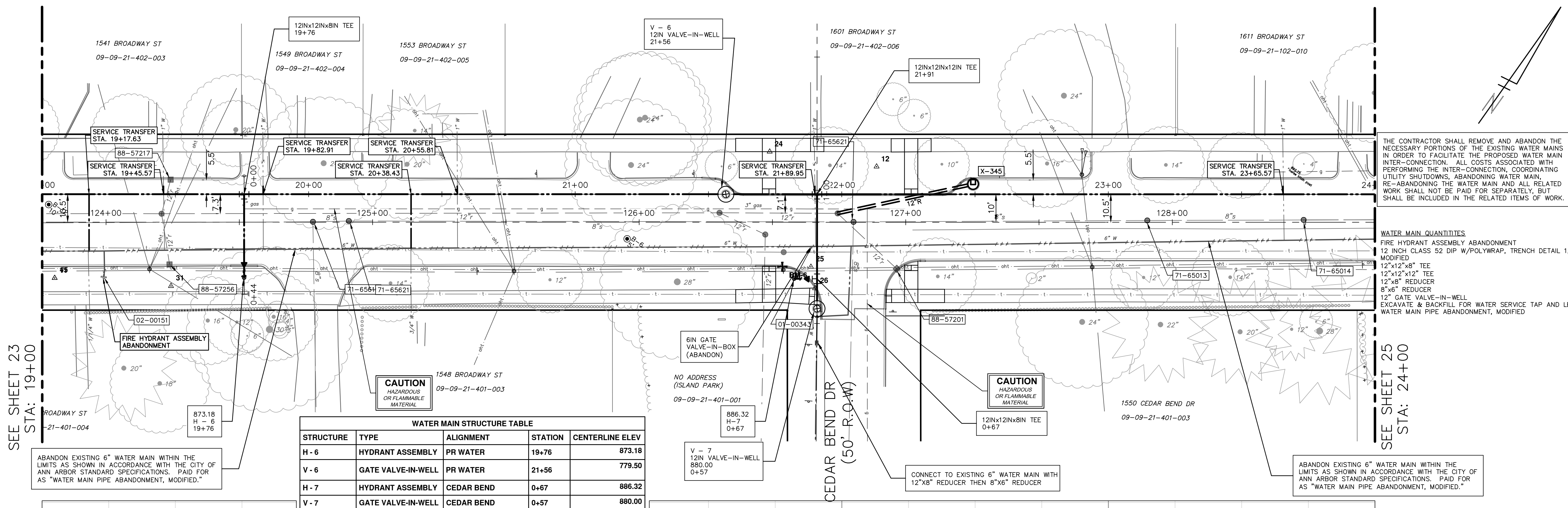
Know what's below.
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03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED WATER MAIN
 STA. 14+00 TO STA. 19+00

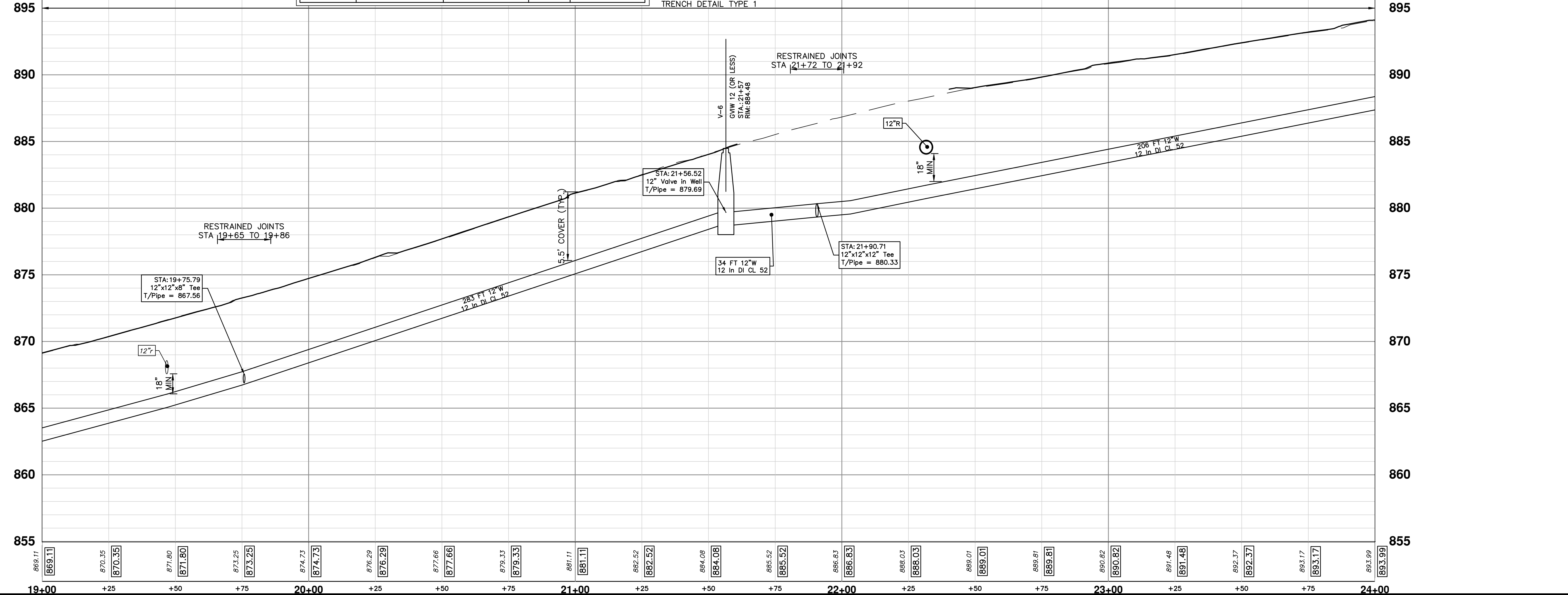
SCALE: PLAN: 1" = 20'
 PROFILE: 1" = 4'
 DRAWING No. 2020030-23
 SHEET No. 23 OF 50

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WATER MAIN STRUCTURE TABLE

STRUCTURE	TYPE	ALIGNMENT	STATION	CENTERLINE ELEV
H - 6	HYDRANT ASSEMBLY	PR WATER	19+76	873.18
V - 6	GATE VALVE-IN-WELL	PR WATER	21+56	779.50
H - 7	HYDRANT ASSEMBLY	CEDAR BEND	0+67	886.32
V - 7	GATE VALVE-IN-WELL	CEDAR BEND	0+57	880.00




THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

WATER MAIN QUANTITIES
 FIRE HYDRANT ASSEMBLY ABANDONMENT 1 EA
 12 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED 546 FT
 12"x12"x8" TEE 2 EA
 12"x12"x12" TEE 1 EA
 12"x8" REDUCER 1 EA
 8"x6" REDUCER 1 EA
 12" GATE VALVE-IN-WELL 2 EA
 EXCAVATE & BACKFILL FOR WATER SERVICE TAP AND LEAD 49 FT
 WATER MAIN PIPE ABANDONMENT, MODIFIED 1 LS

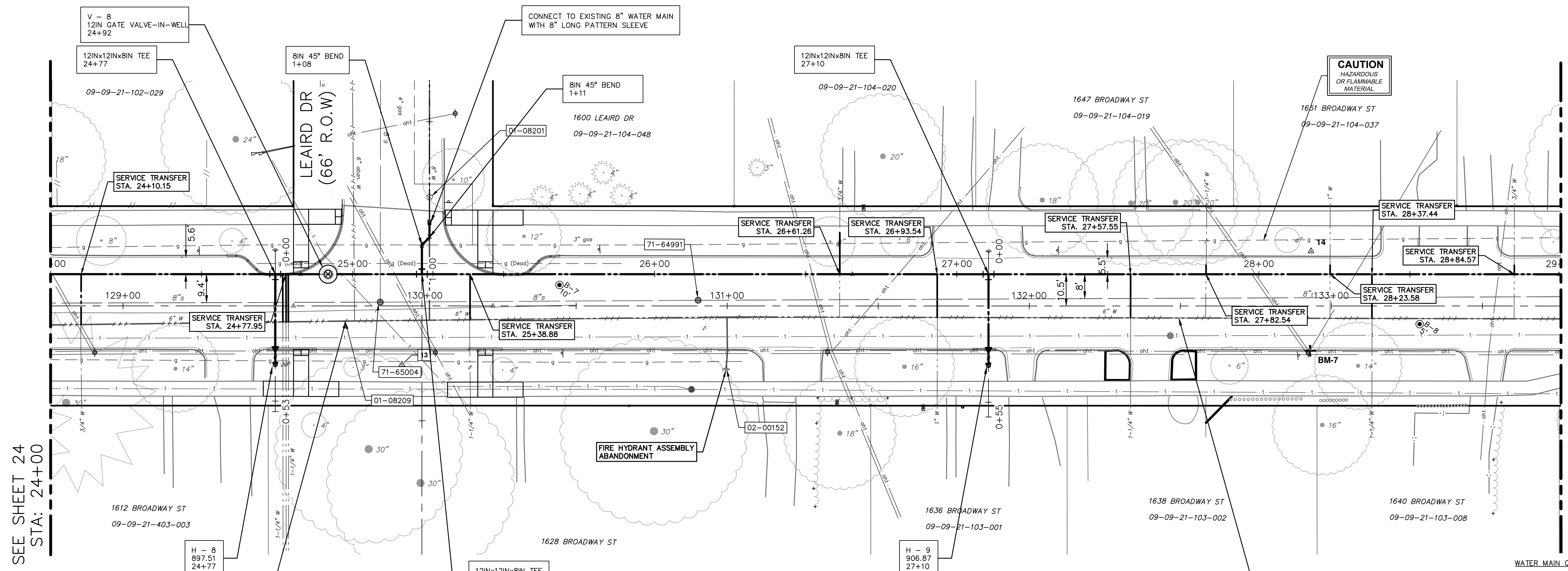


Know what's below.
Call before you dig.

REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED WATER MAIN
 STA. 19+00 TO STA. 24+00
 SHEET No. 24 OF 50
 DRAWING No. 2020030-24
 SCALE: PLAN: 1"=20'
 PROFILE: 1"=4'


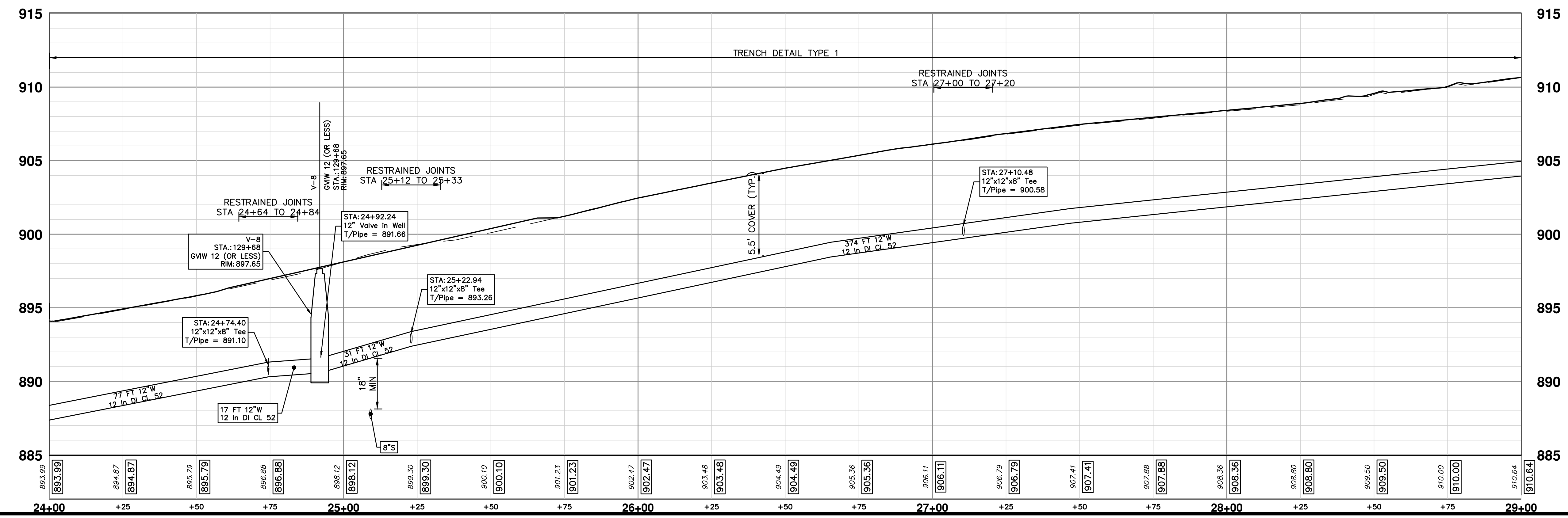
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THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	ALIGNMENT	STATION	CENTERLINE ELEV
H - 8	HYDRANT ASSEMBLY	PR WATER	24+77	897.51
V - 8	GATE VALVE-IN-BOX	PR WATER	24+83	891.16
H - 9	HYDRANT ASSEMBLY	PR WATER	27+10	906.87


- WATER MAIN QUANTITIES
- GATE VALVE-IN-BOX ABANDONMENT 1 EA
 - FIRE HYDRANT ASSEMBLY ABANDONMENT 1 EA
 - 12 INCH CLASS S2 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED 500 FT
 - 12"x12"x8" TEE 3 EA
 - 12" GATE VALVE-IN-WELL 1 EA
 - EXCAVATE & BACKFILL FOR WATER SERVICE TAP AND LEAD 114 FT
 - WATER MAIN PIPE ABANDONMENT, MODIFIED 1 LS





Know what's below.
Call Before you dig.

REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW



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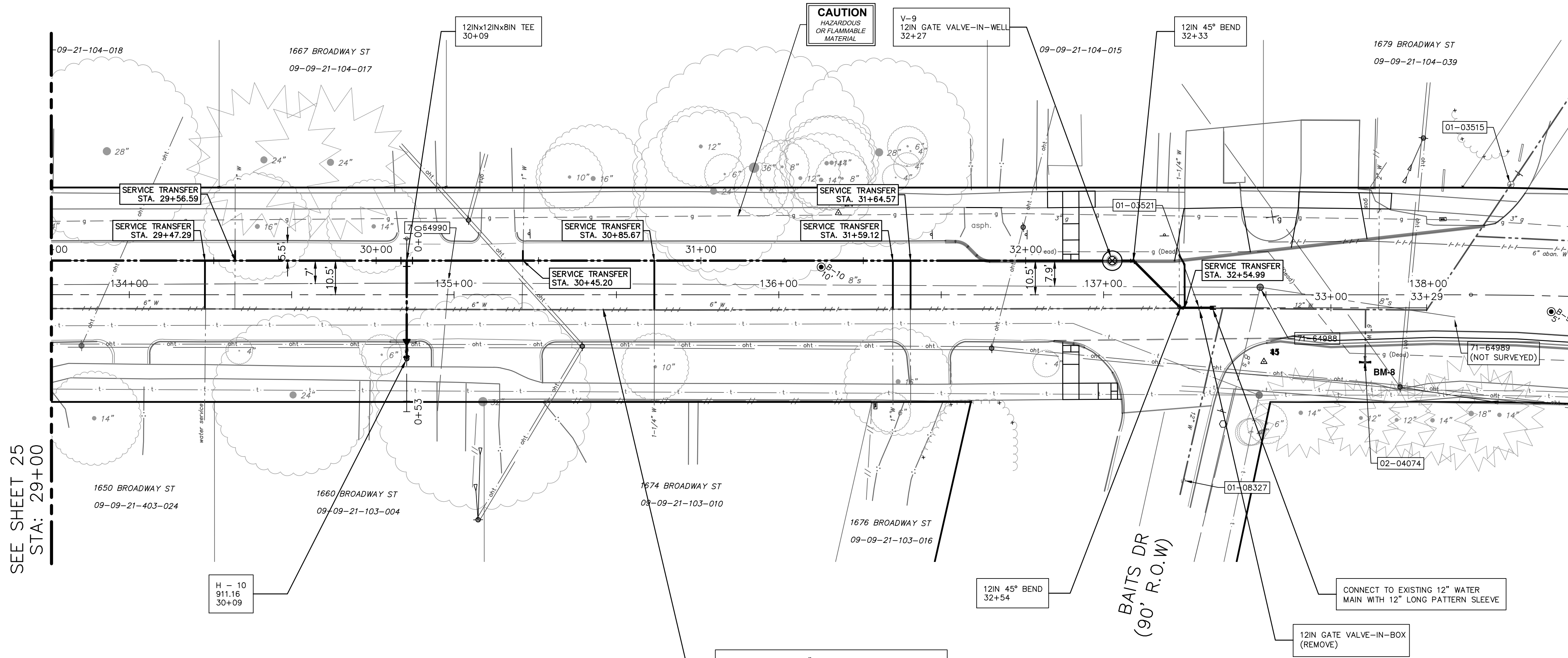
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED WATER MAIN
STA. 24+00 TO STA. 29+00

SCALE: PLAN: 1" = 20'
PROFILE: 1" = 4'

DRAWING No. 2020030-25

SHEET No. 25 OF 50

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SEE SHEET 25
STA: 29+00

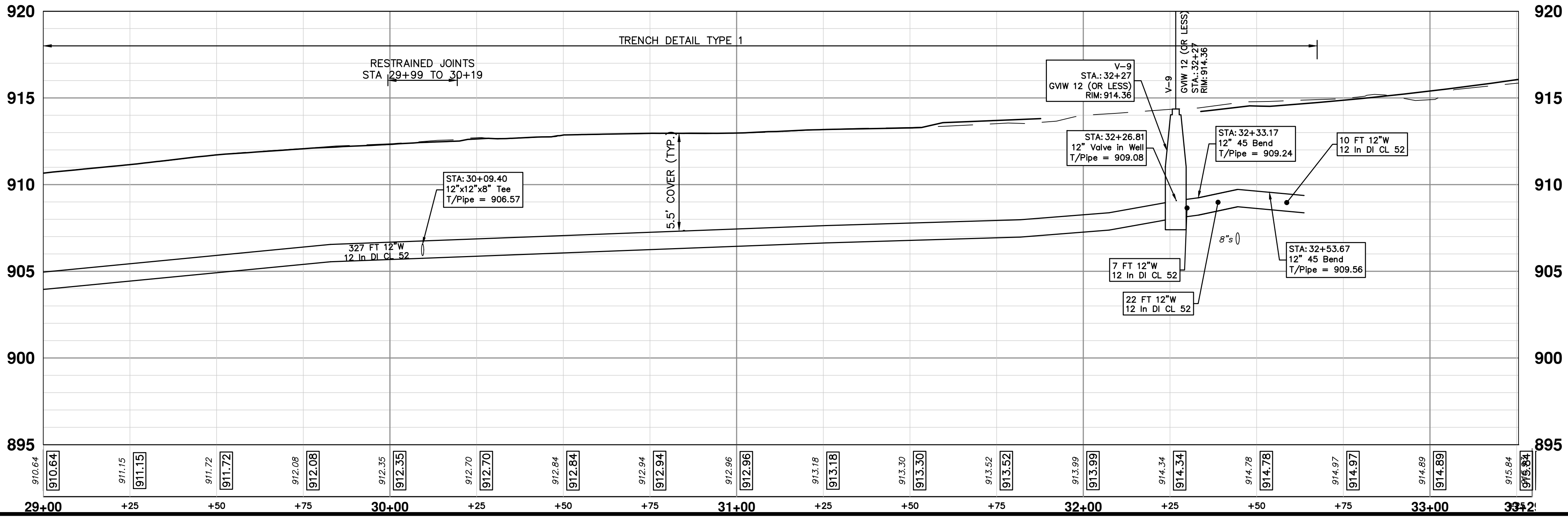
ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

WATER MAIN QUANTITIES

- GATE VALVE-IN-BOX ABANDONMENT 1 EA
- 12 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED 364 FT
- 12"x12"x8" TEE 1 EA
- 12" SLEEVE 1 EA
- 12" 45° BEND 2 EA
- 12" GATE VALVE-IN-WELL 1 EA
- EXCAVATE & BACKFILL FOR WATER SERVICE TAP AND LEAD 72 FT
- WATER MAIN PIPE ABANDONMENT, MODIFIED 1 LS

THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	ALIGNMENT	STATION	CENTERLINE ELEV
H - 10	HYDRANT ASSEMBLY	PR WATER	30+09	911.16
V - 8	GATE VALVE-IN-BOX	PR WATER	32+27	914.32



REV	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

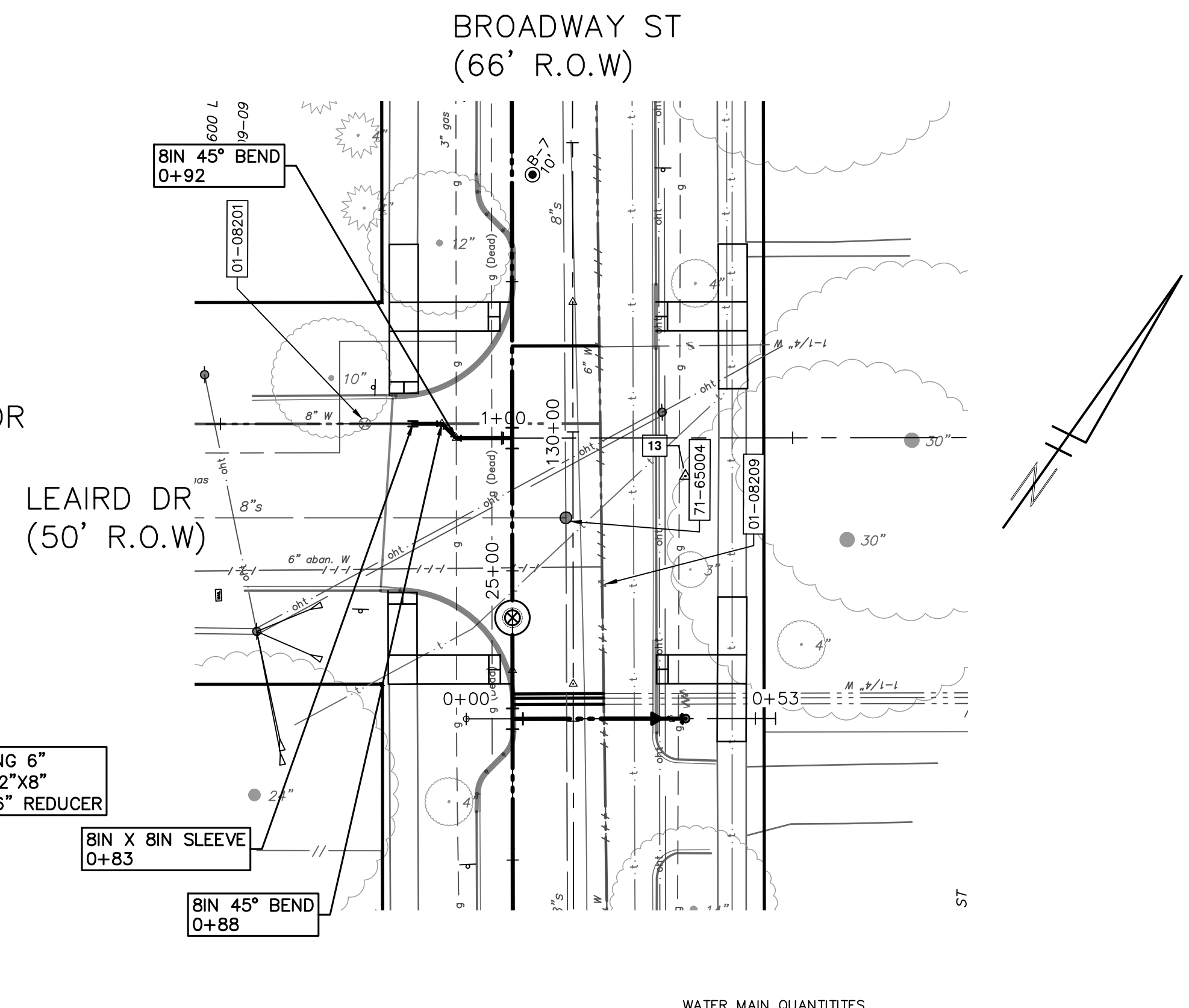
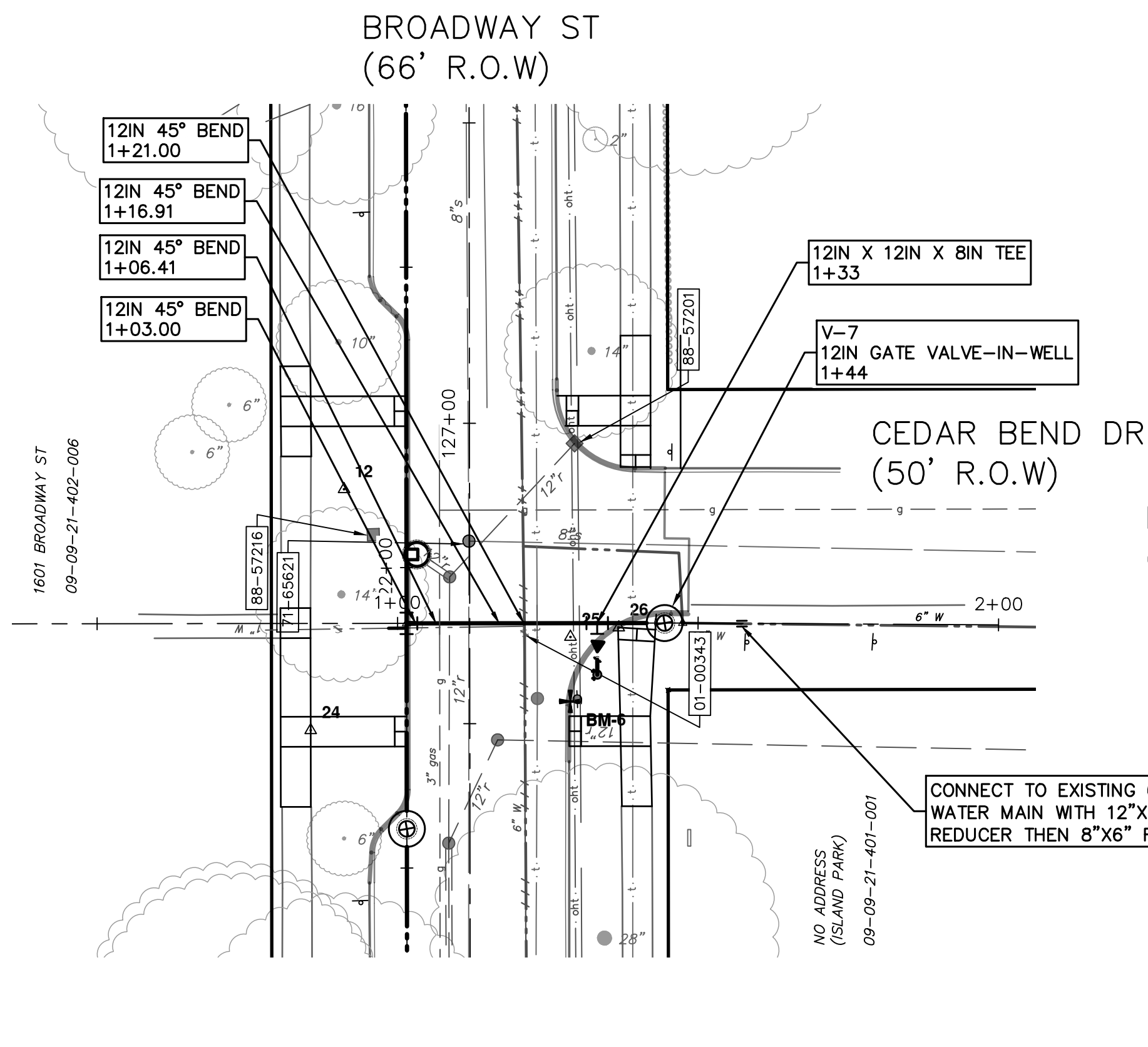
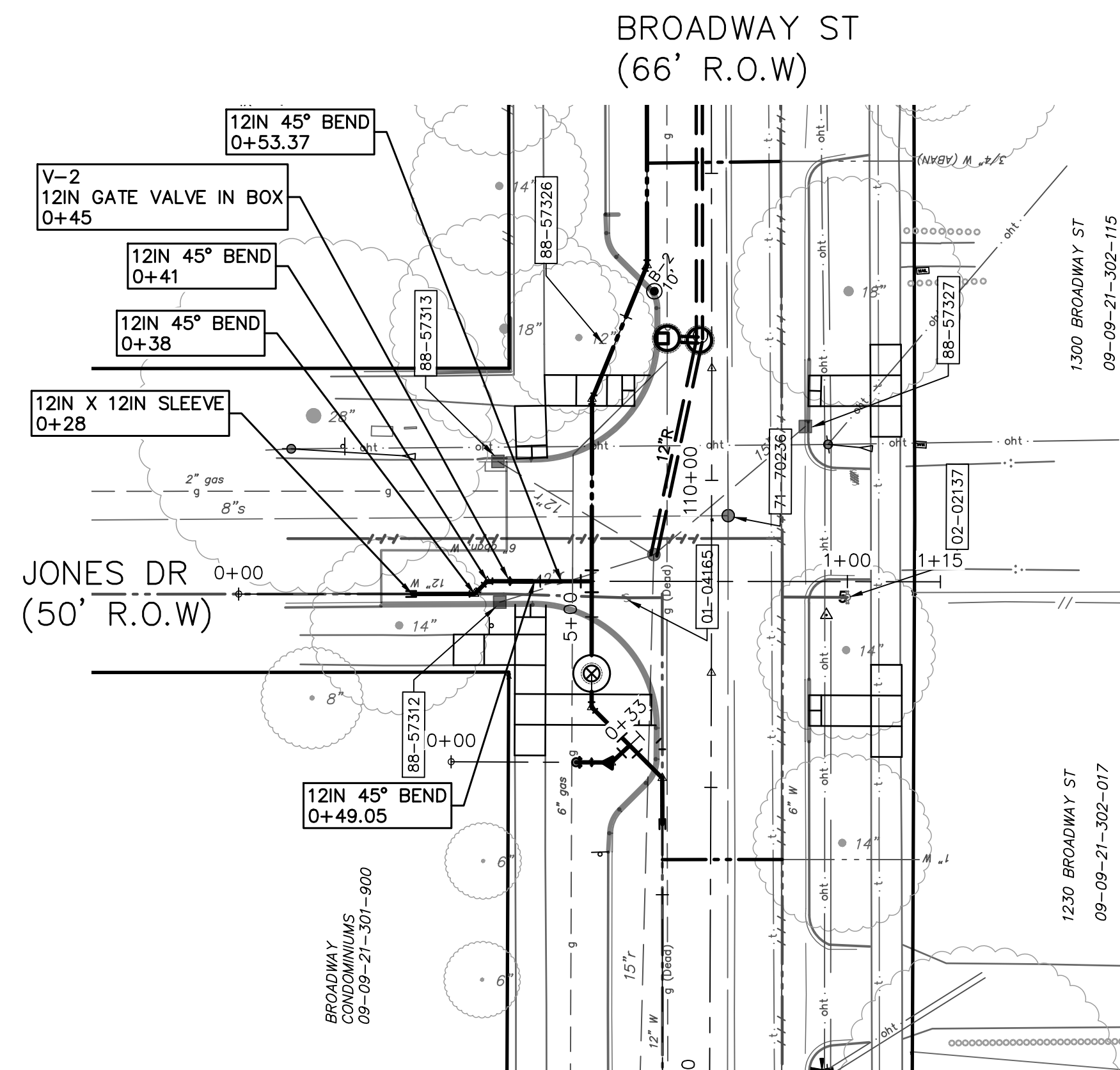
CITY OF ANN ARBOR
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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED WATER MAIN
STA. 29+00 TO STA. 33+50

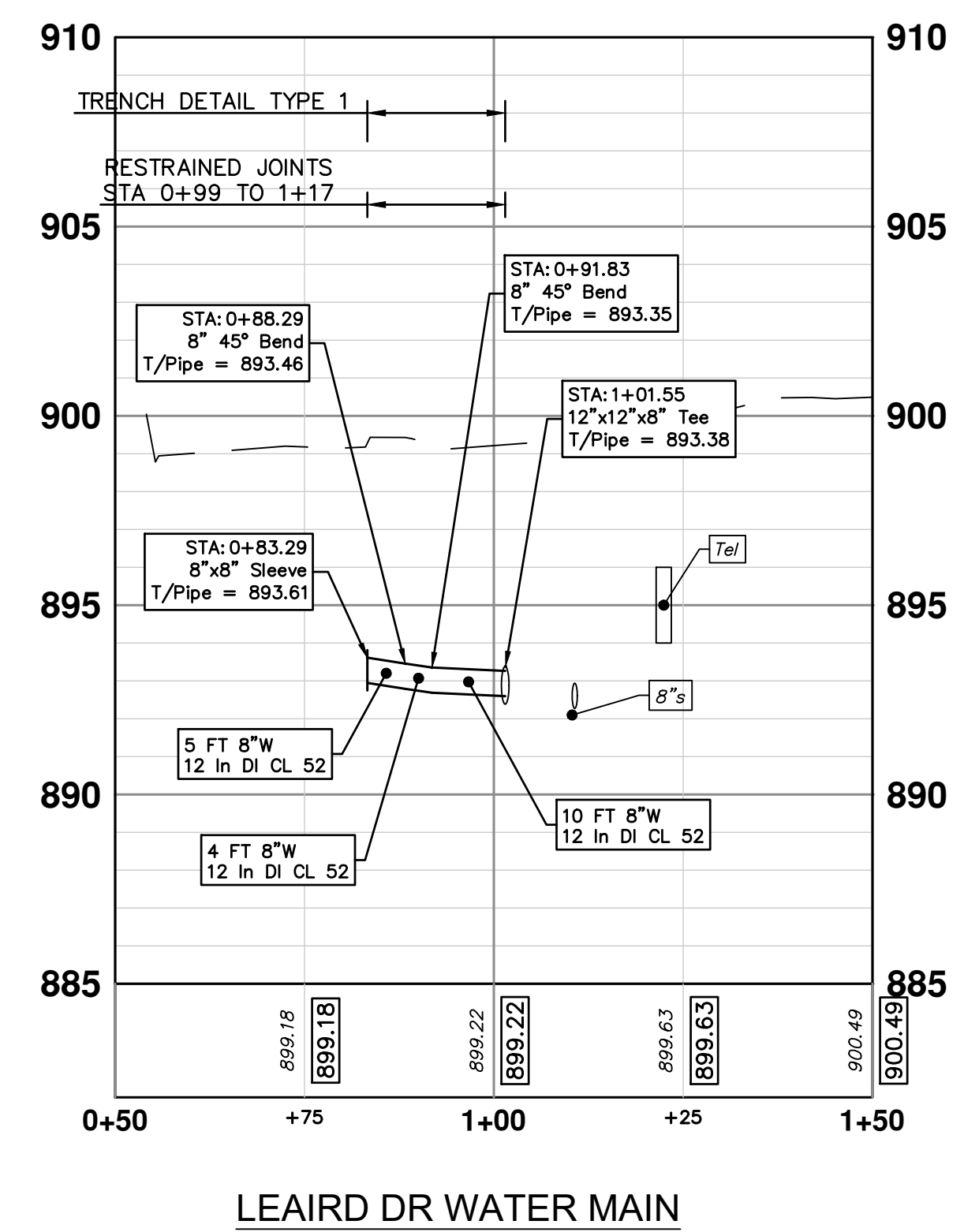
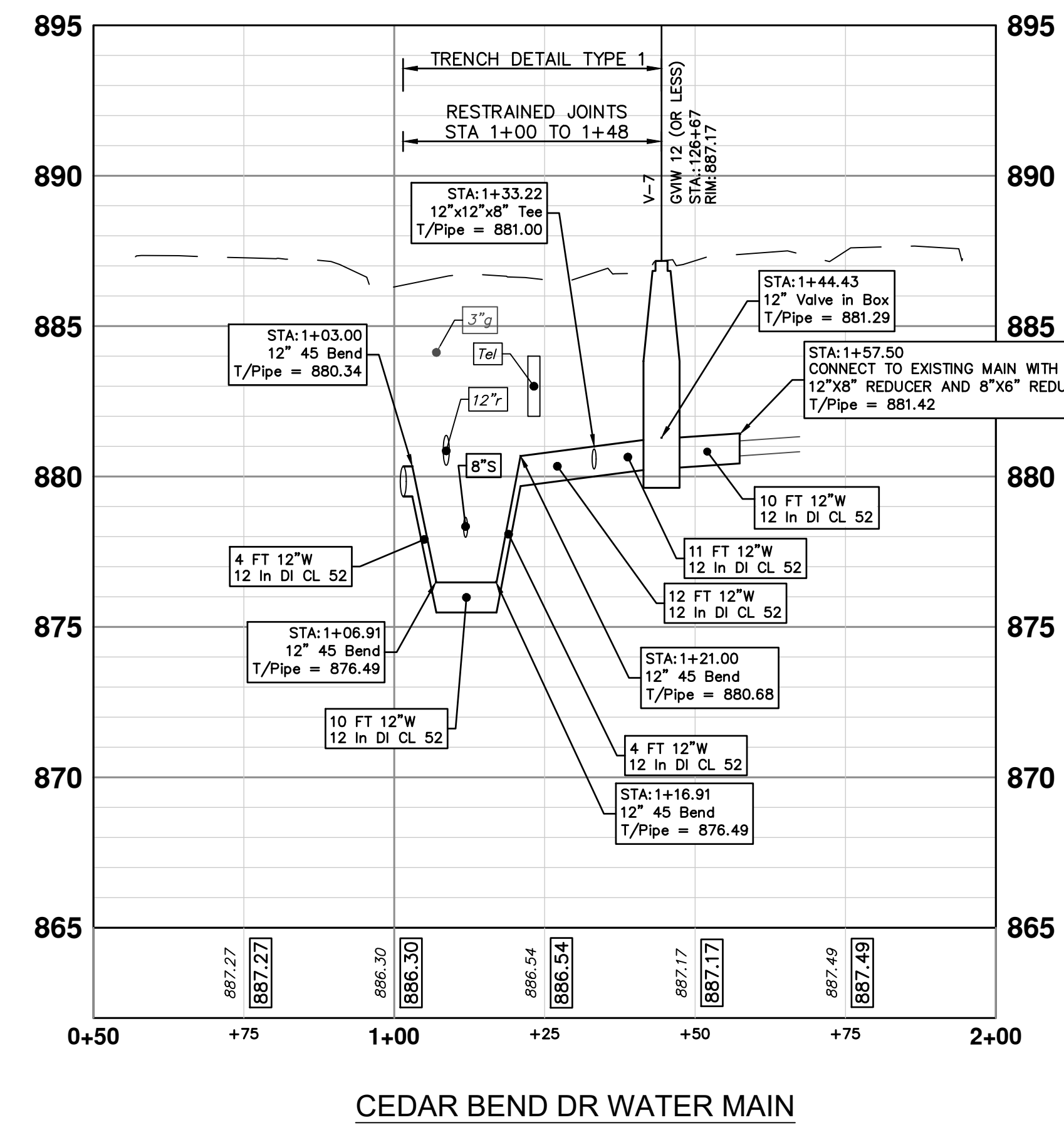
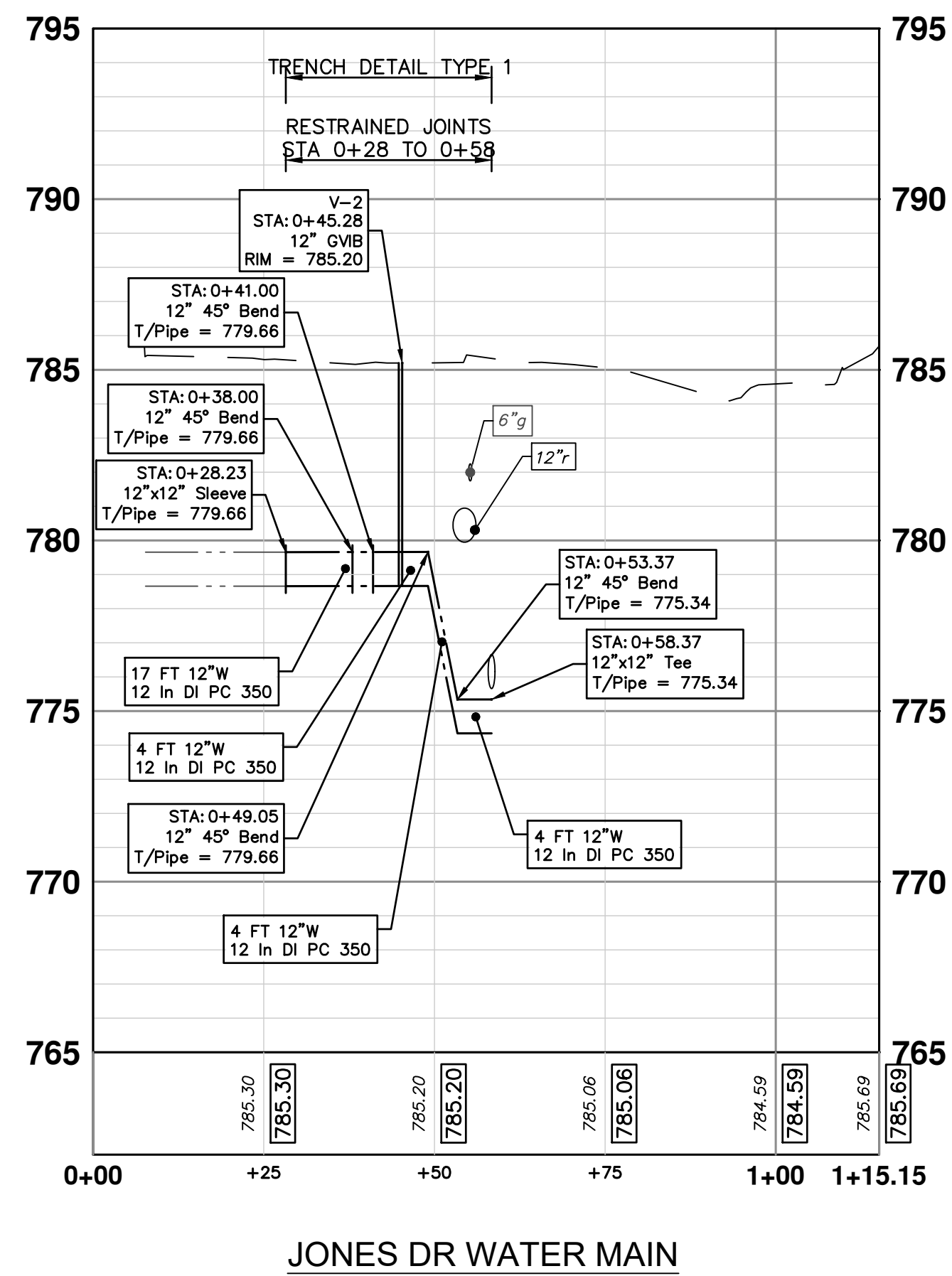
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PROFILE: 1" = 4'
DRAWING No. 2020030-26
SHEET No. 26 OF 50


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WATER MAIN QUANTITIES


FIRE HYDRANT ASSEMBLY	1 EA
6 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	5 FT
8 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	23 FT
12 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	70 FT
12"x12"x8" TEE	1 EA
8" SLEEVE	1 EA
12" SLEEVE	1 EA
6" 45° BEND	2 EA
12" 45° BEND	8 EA
12" GATE VALVE-IN-BOX	1 EA
12" GATE VALVE-IN-WELL	1 EA
12"x8" REDUCER	1 EA
8"x6" REDUCER	1 EA
WATER MAIN PIPE ABANDONMENT, MODIFIED	1 LS





Know what's below. Call before you dig.

REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW



CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING

BROADWAY STREET WATER MAIN

PROPOSED WATER MAIN

AUXILIARY PROFILES

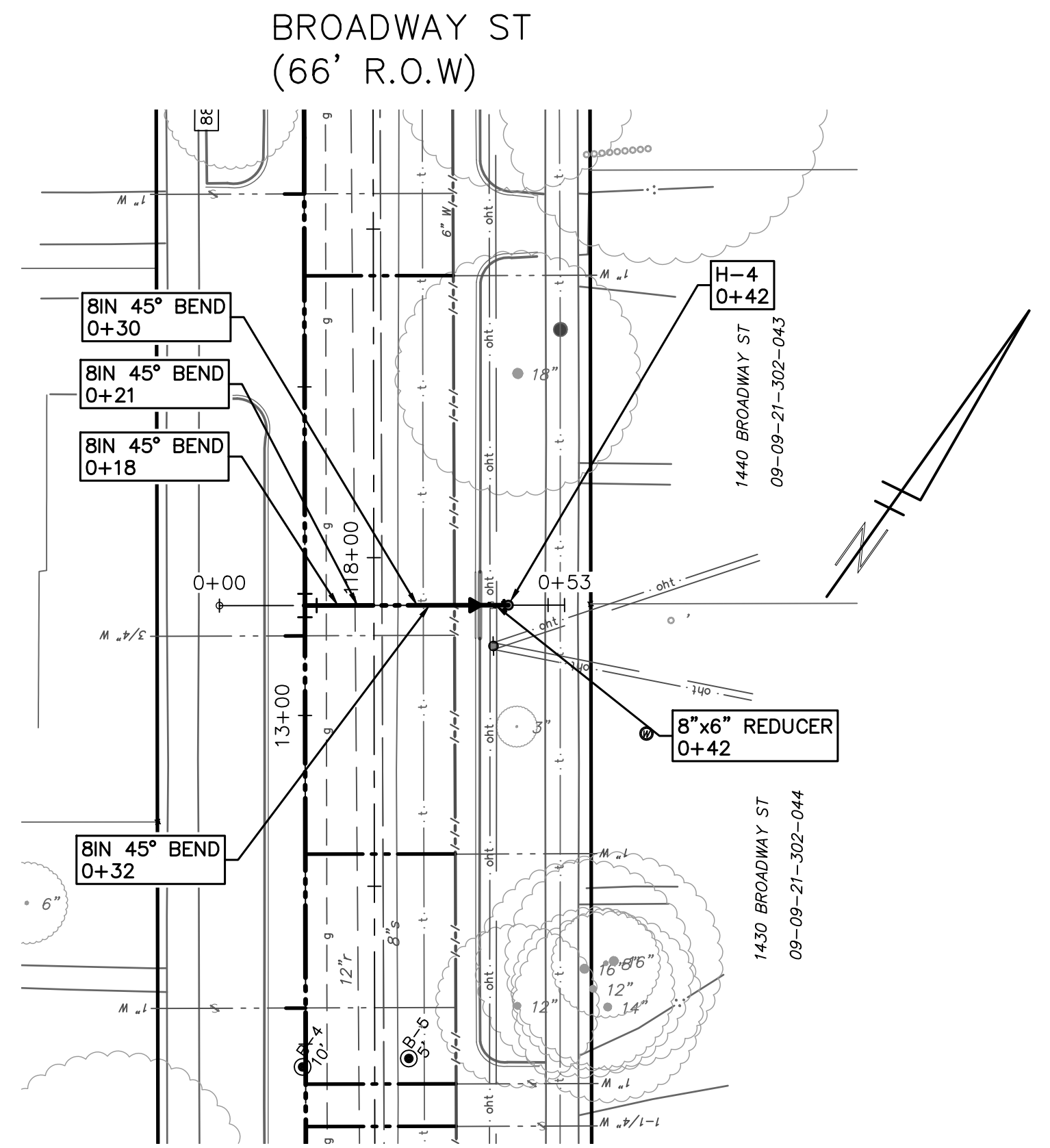
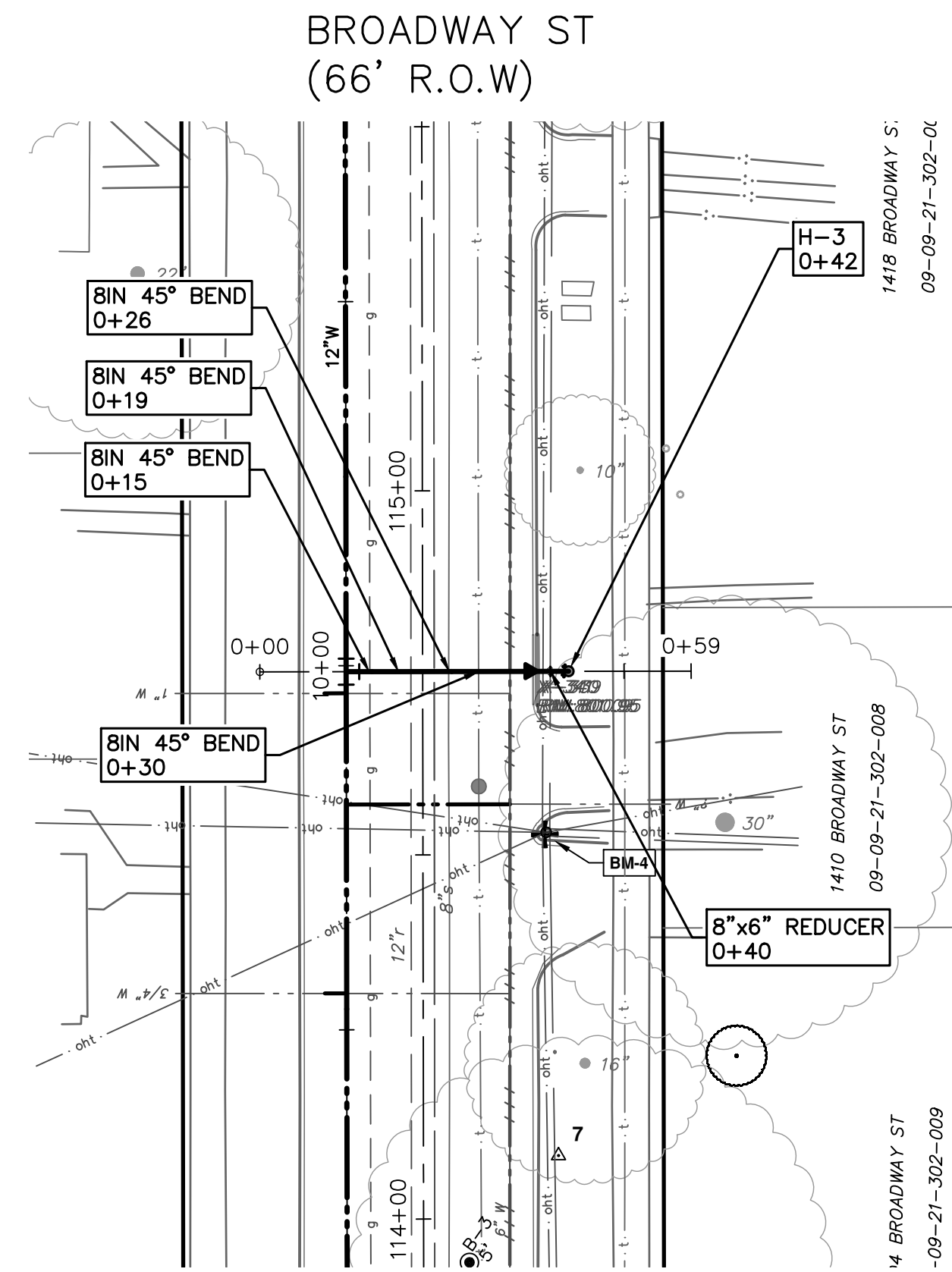
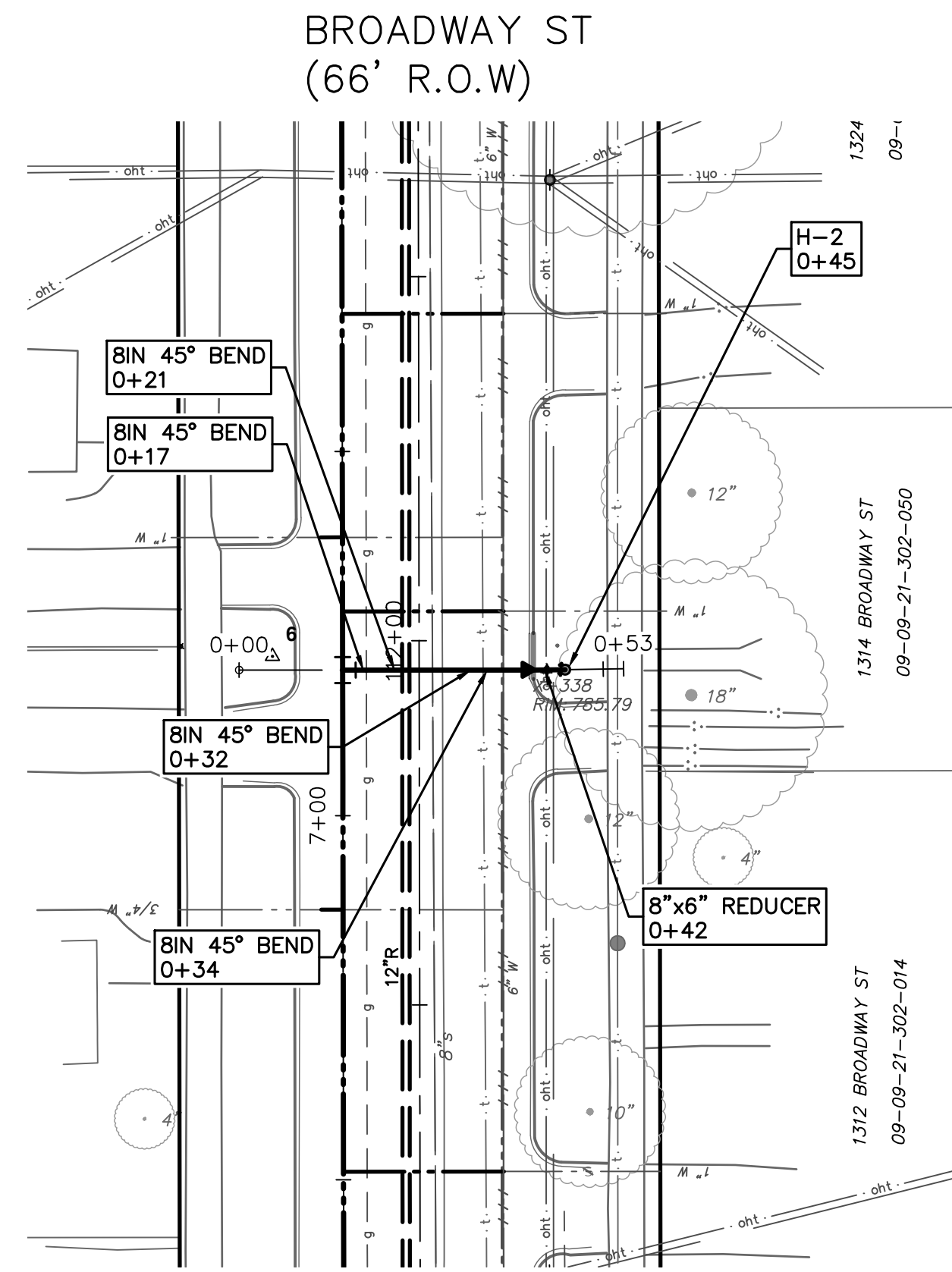
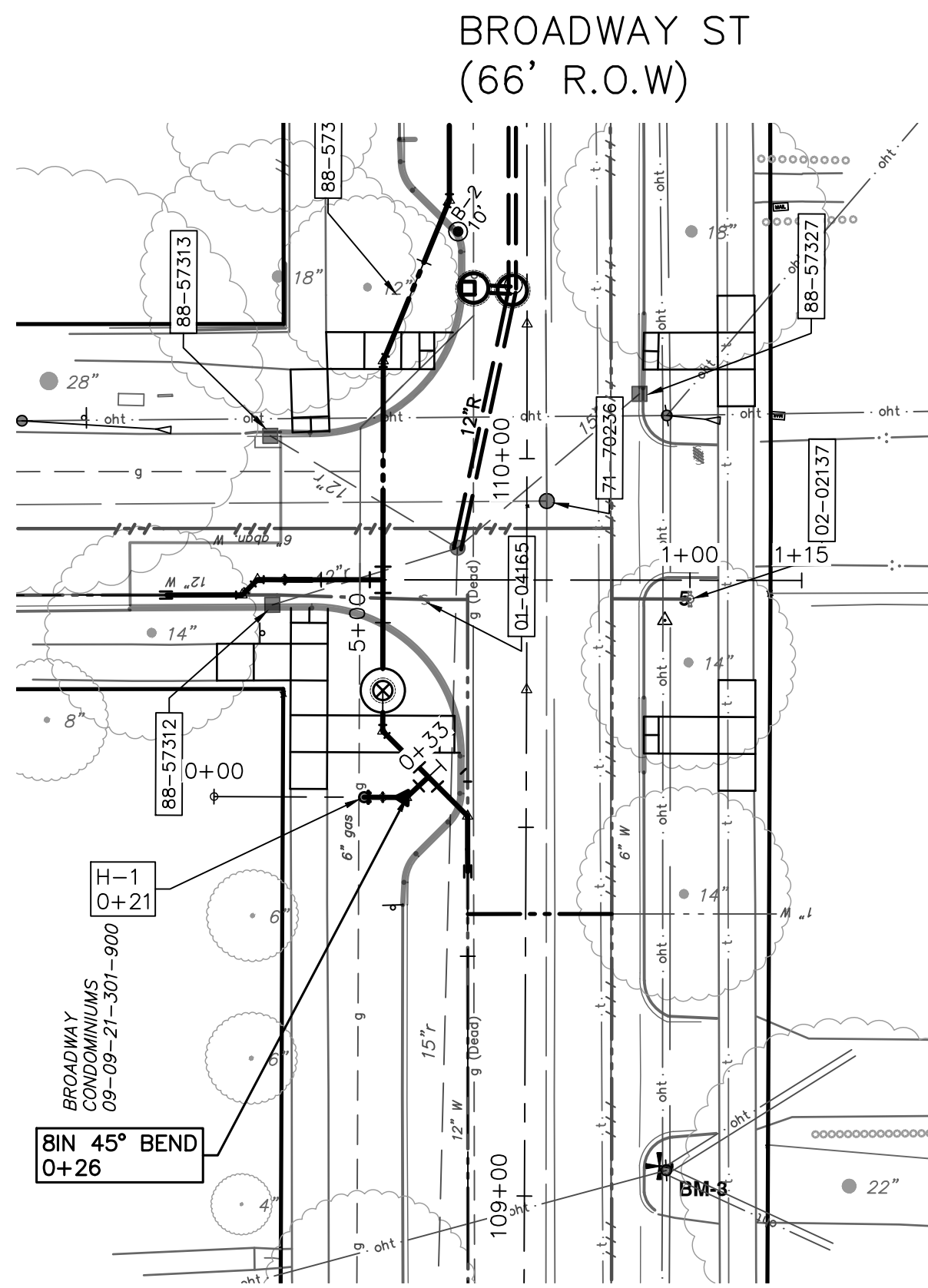
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PROFILE: 1" = 4'

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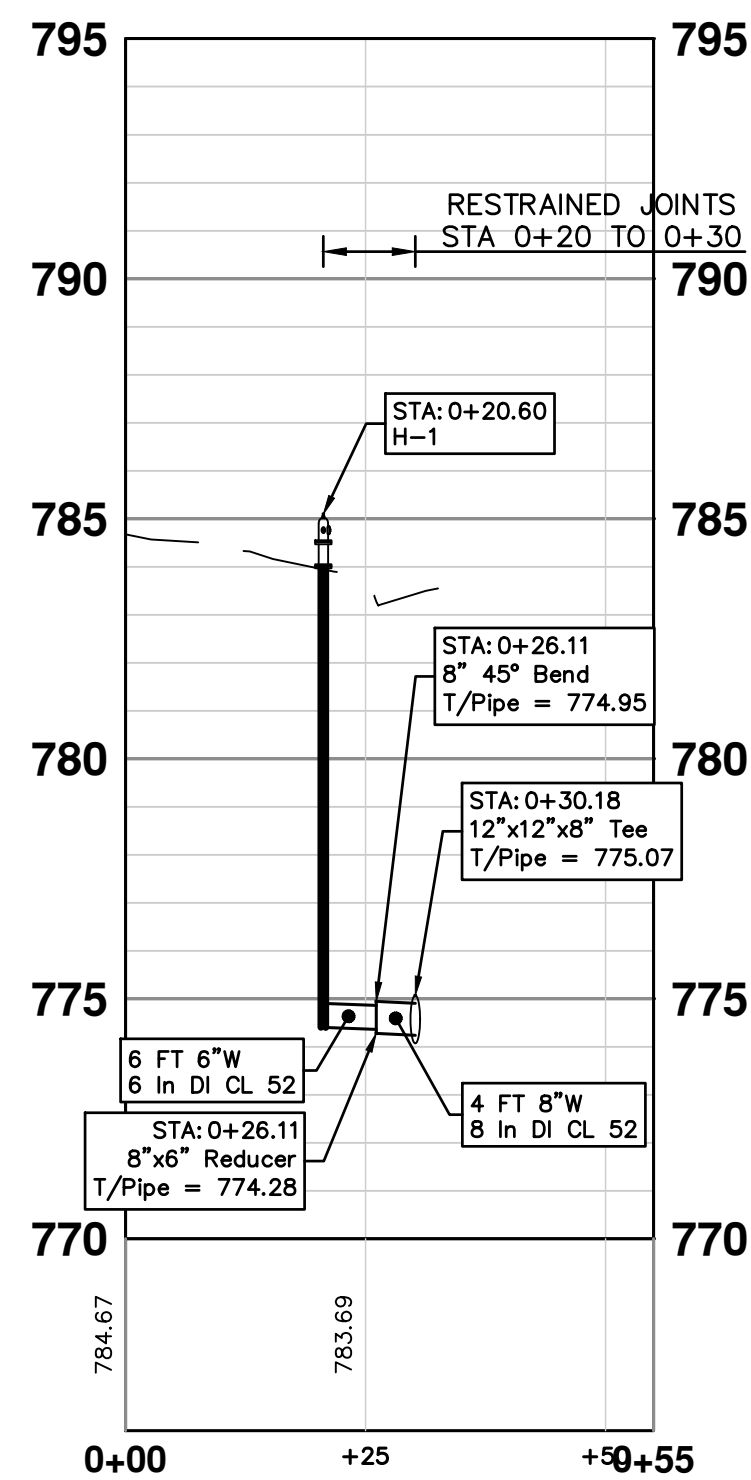
SHEET NO. 27 OF 50

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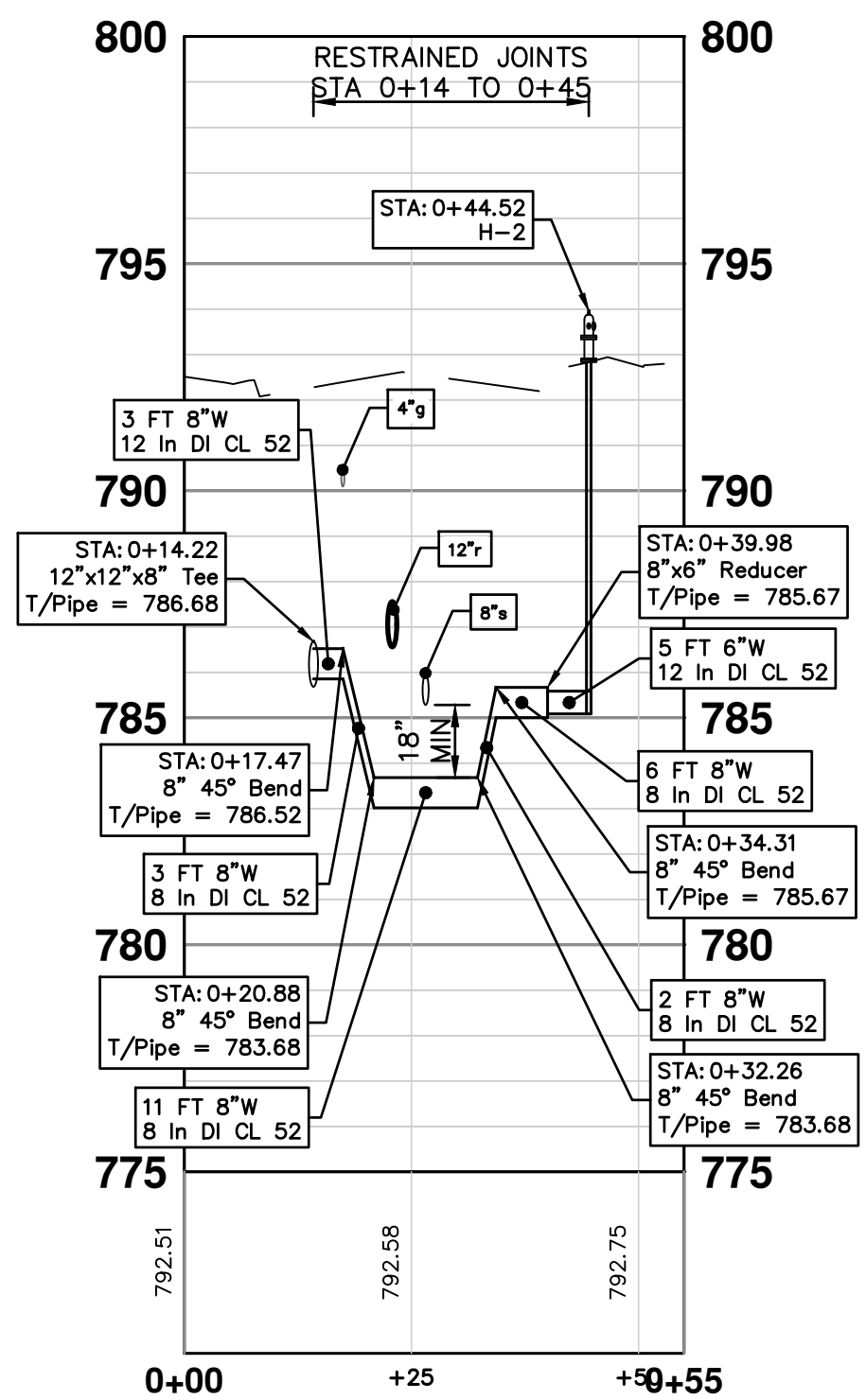


WATER MAIN QUANTITIES

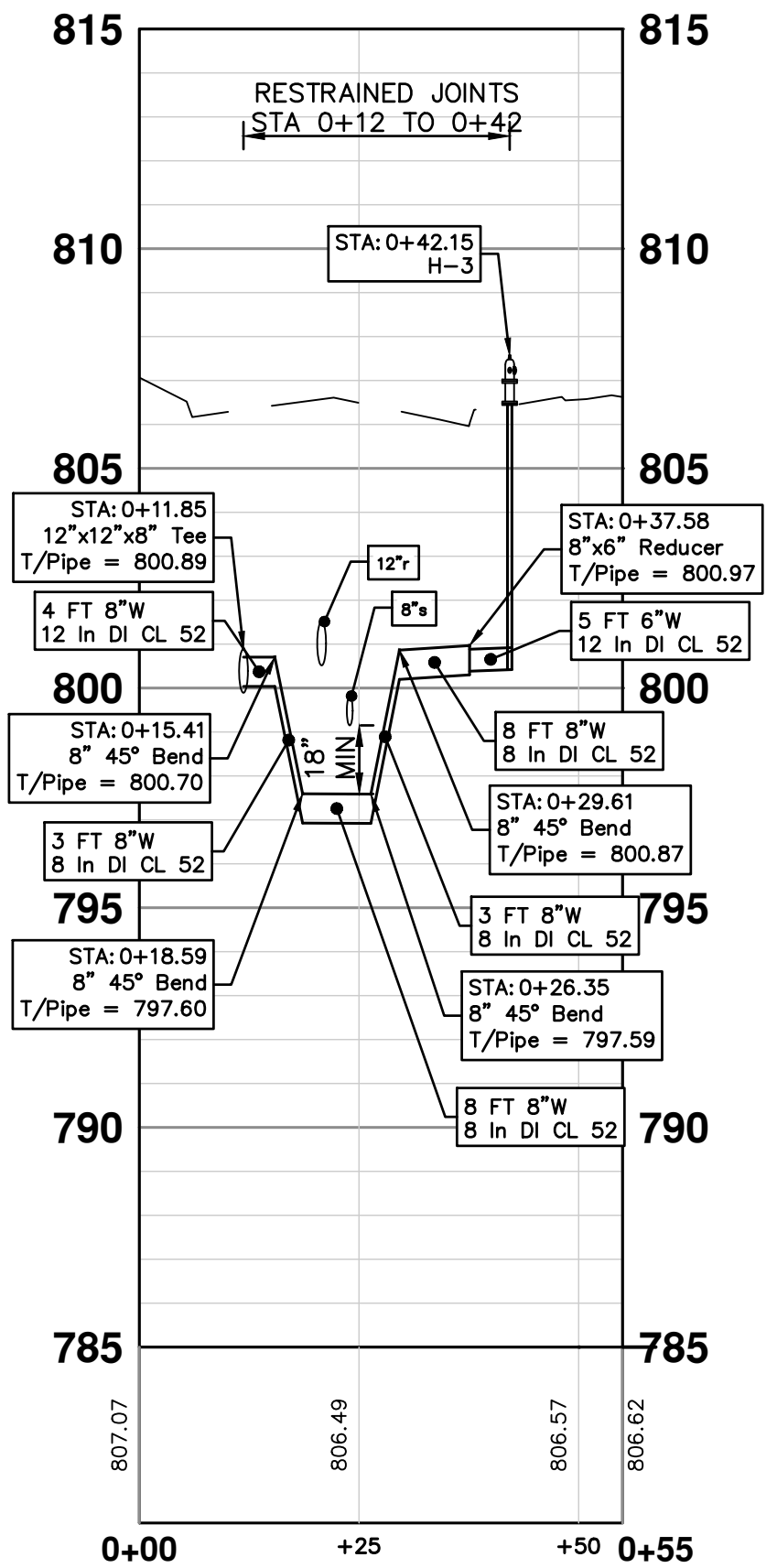
FIRE HYDRANT ASSEMBLY	4 EA
6 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	21 FT
8 INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	82 FT
8" 45° BEND	13 EA
8"x6" REDUCER	4 EA



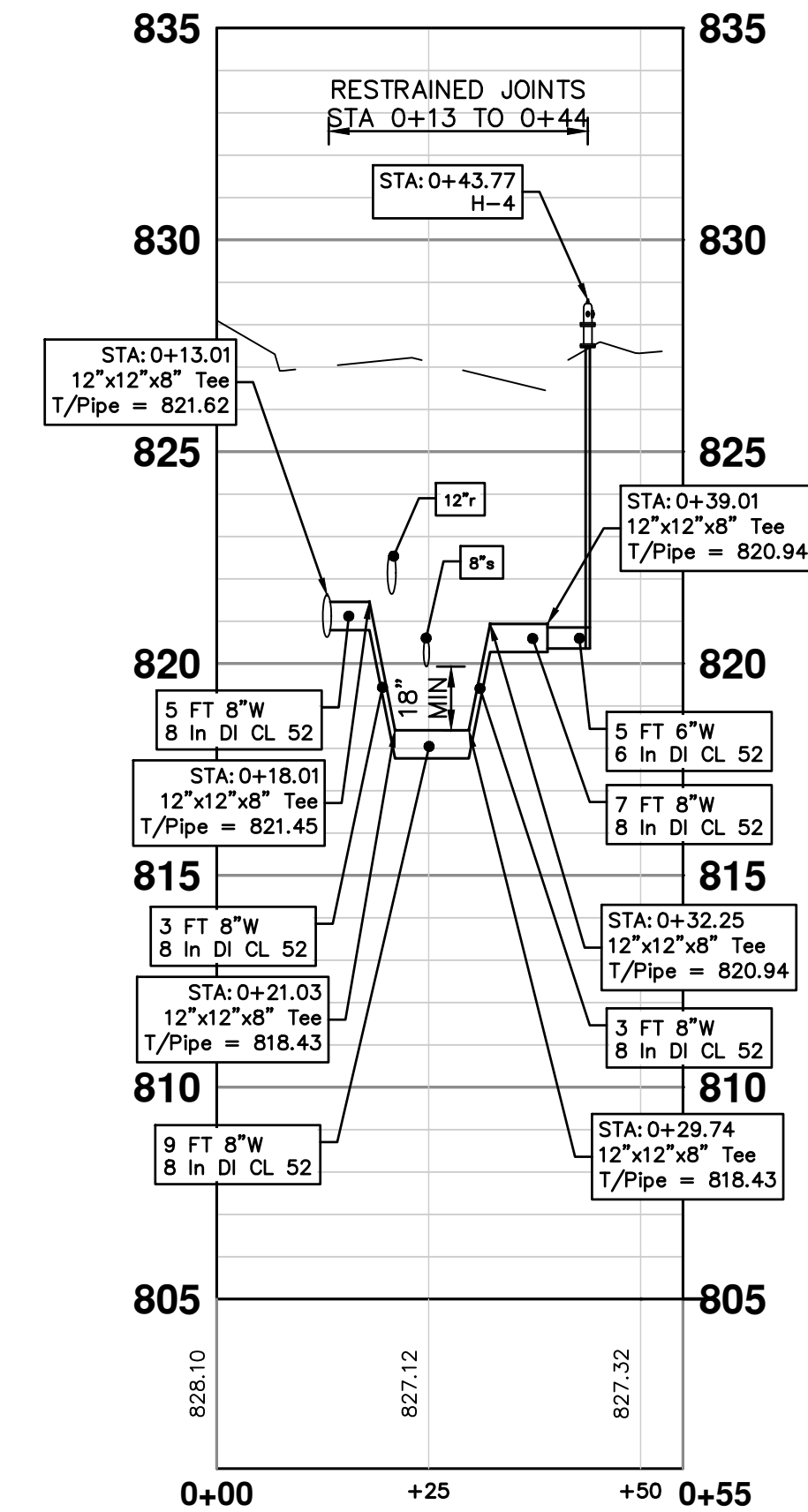
HYDRANT H-1



HYDRANT H-2



HYDRANT H-3



HYDRANT H-4



REV.	DATE	DESCRIPTION	DRAWN	CHECKED
03	12/16/2022	ISSUED FOR BIDS	ML2	PK2
02	7/15/2022	100% OWNER REVIEW	ML2	PK2
01	6/16/2022	95% OWNER REVIEW	ML2	PK2
00	5/26/2022	60% OWNER REVIEW	ML2	PK2

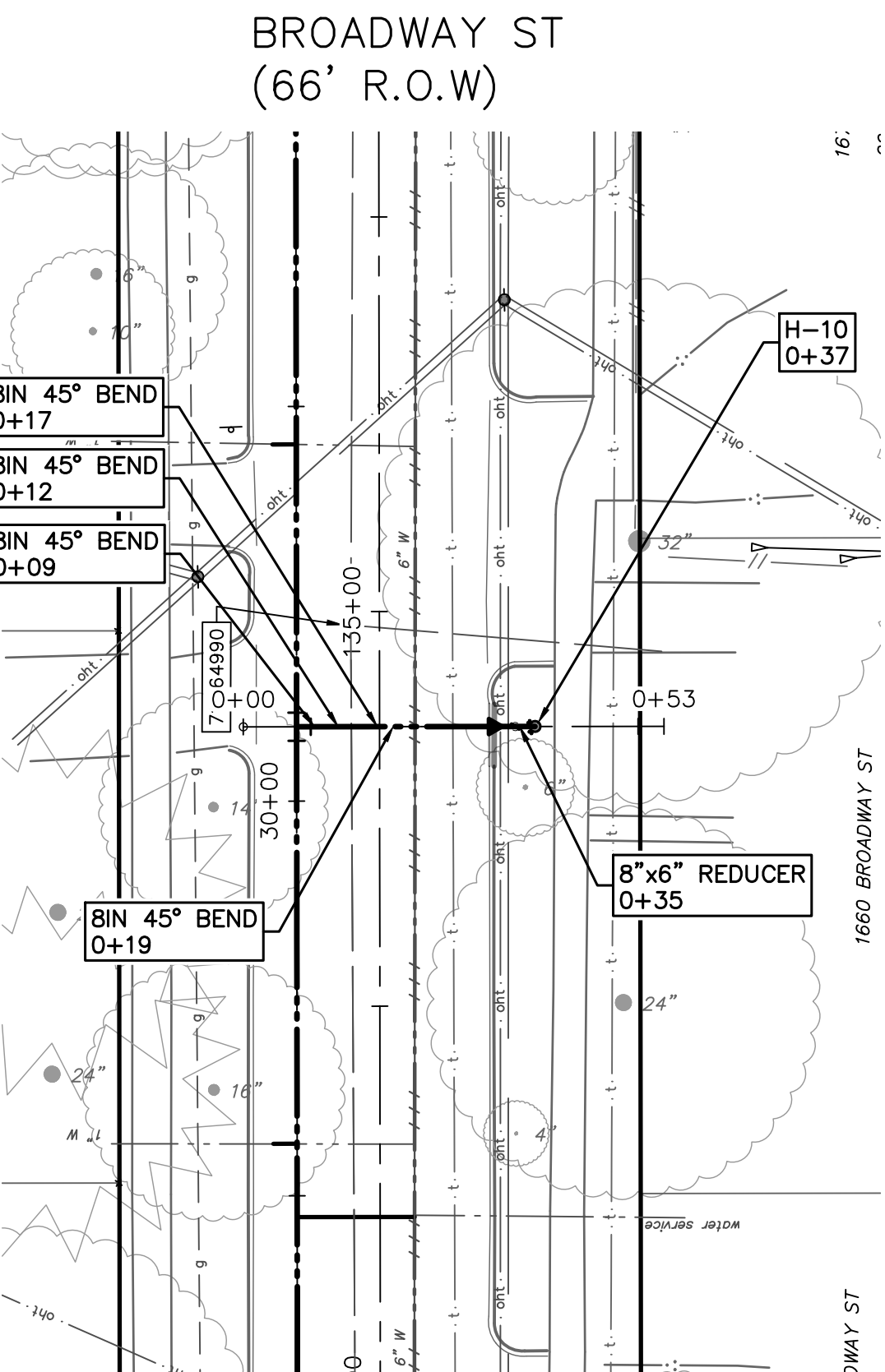
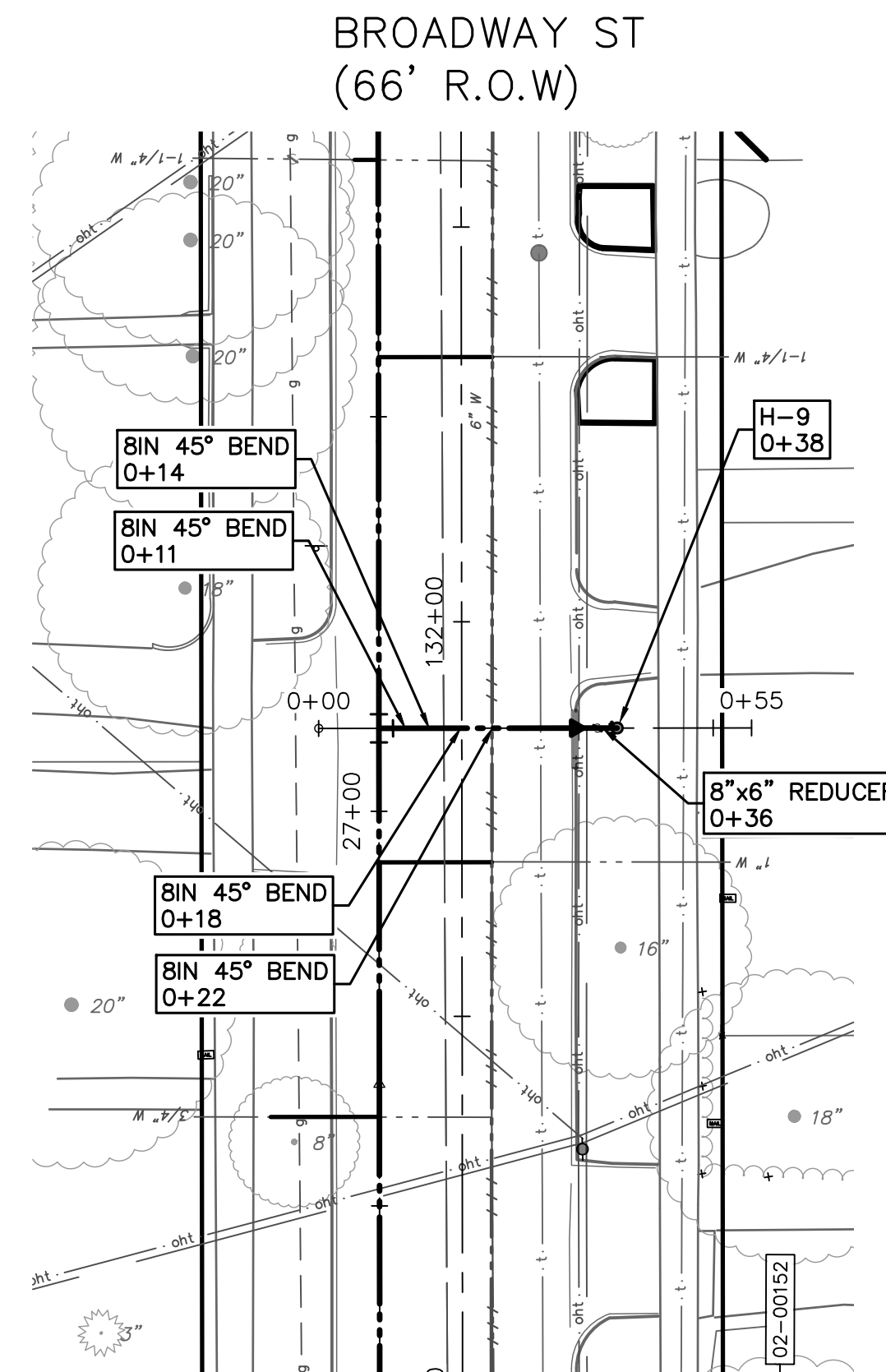
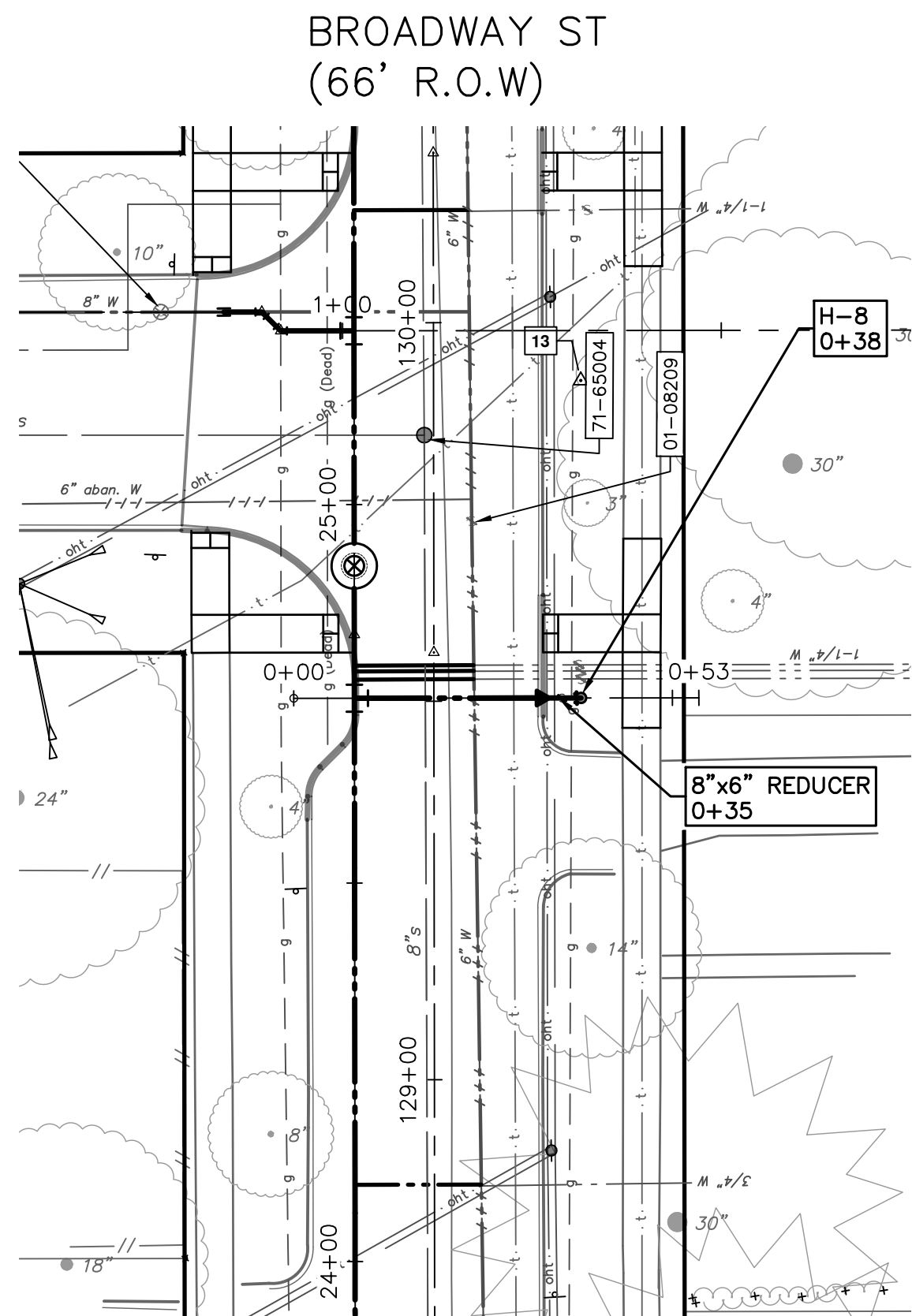
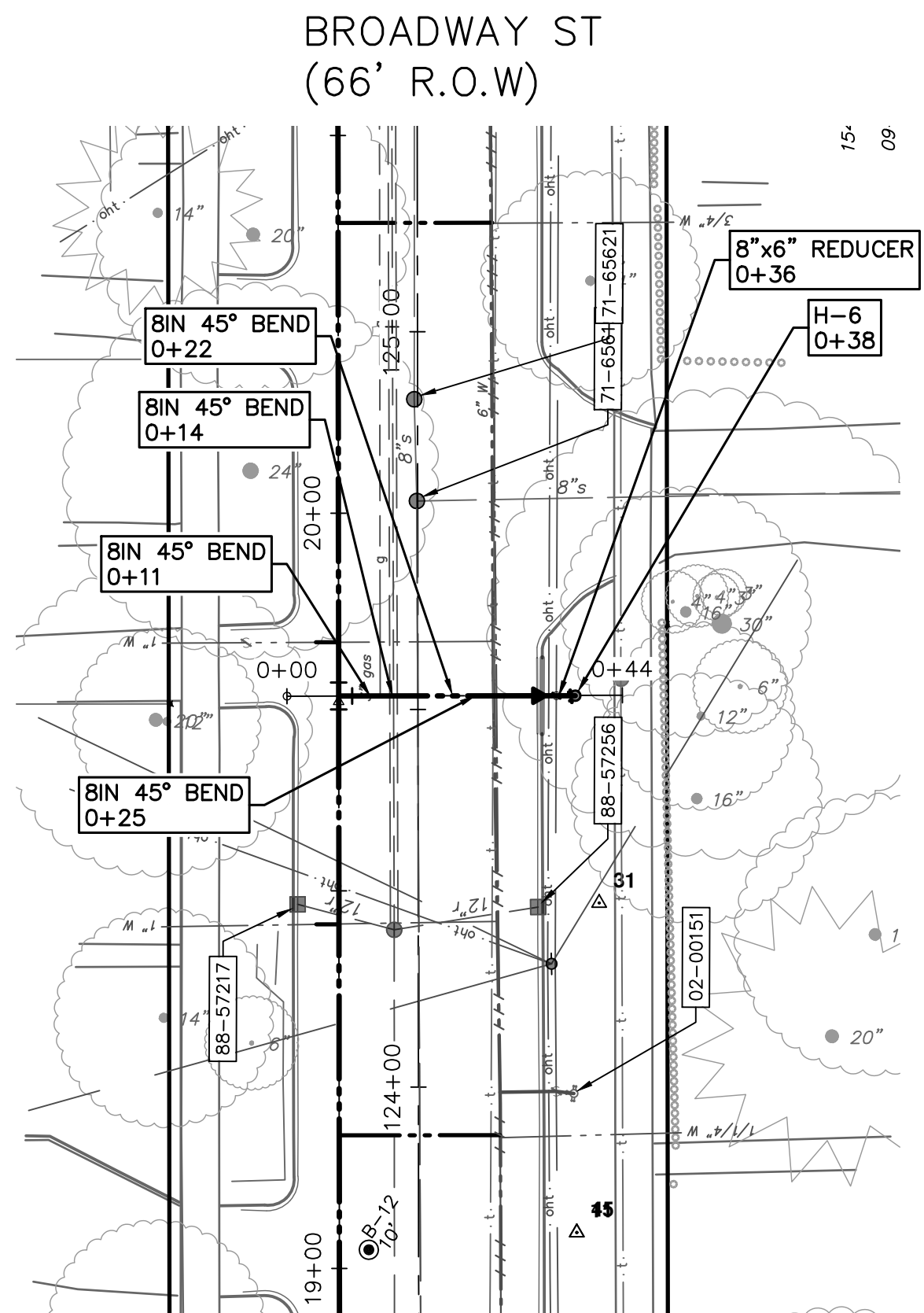
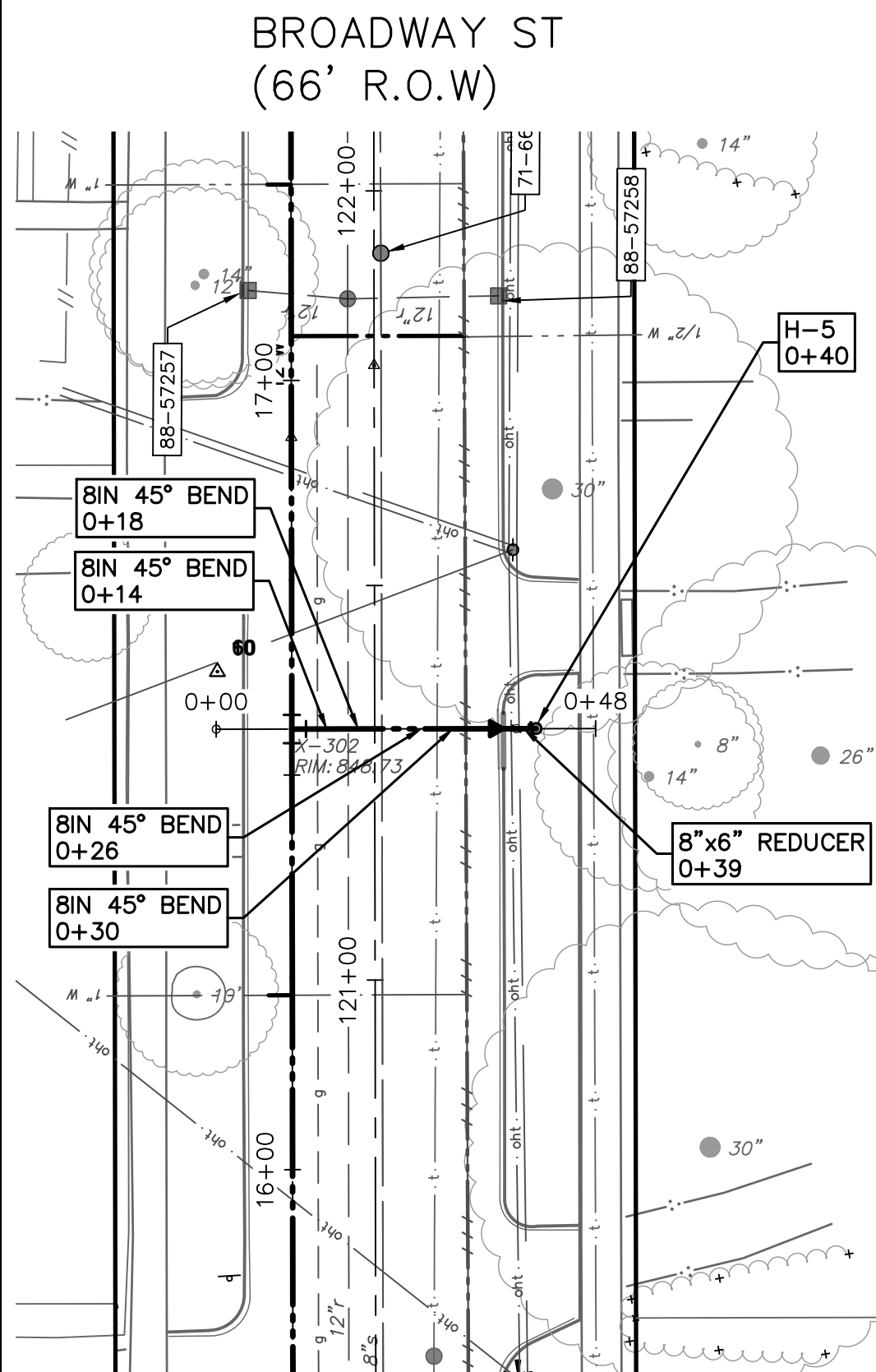
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PUBLIC SERVICES
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ANN ARBOR, MI 48106-6647
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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED WATER MAIN
HYDRANT PROFILES

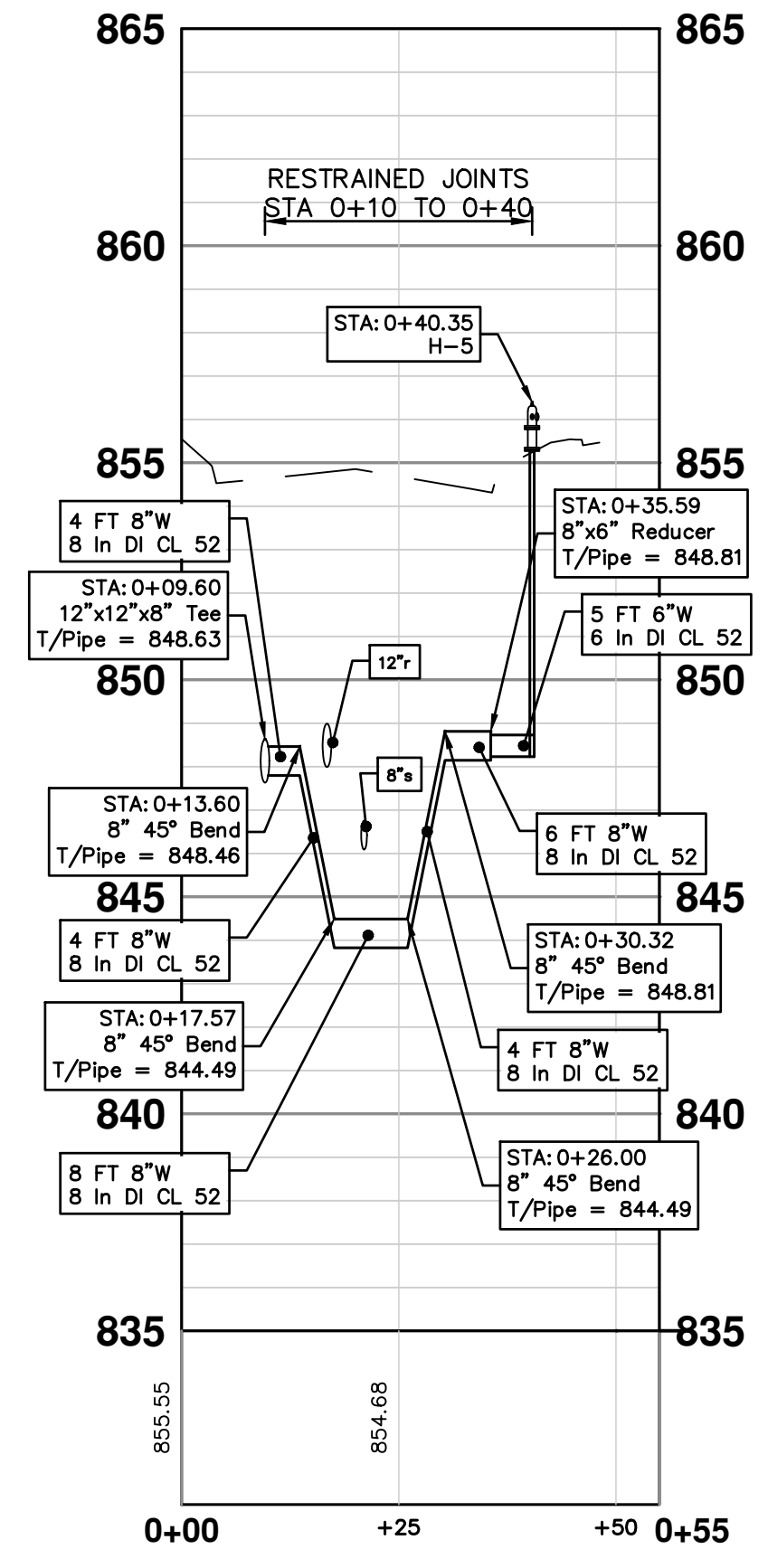
SCALE: PLAN: 1" = 20'
PROFILE: 1" = 4'
DRAWING NO. 2020030-28

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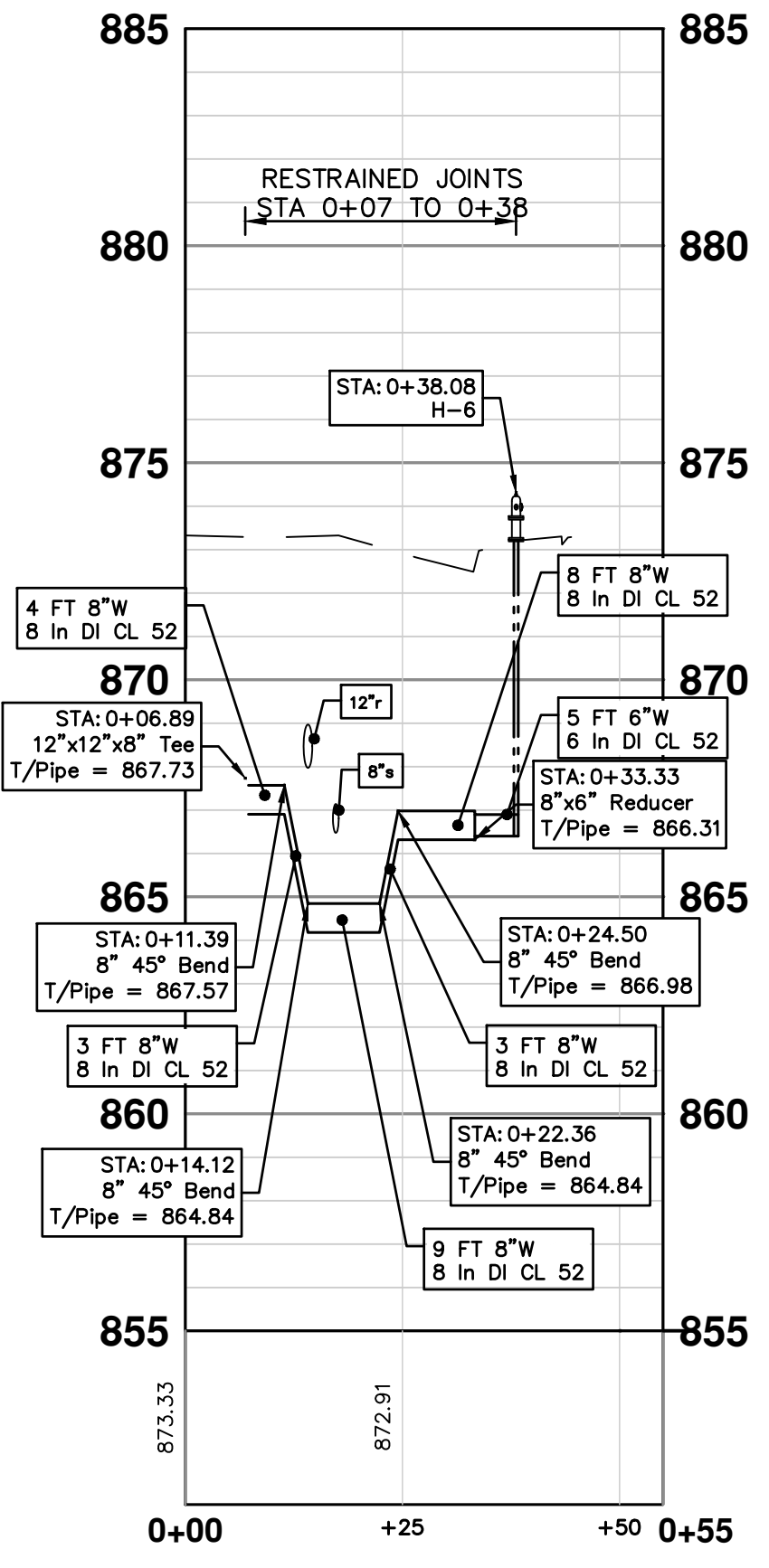


WATER MAIN QUANTITIES

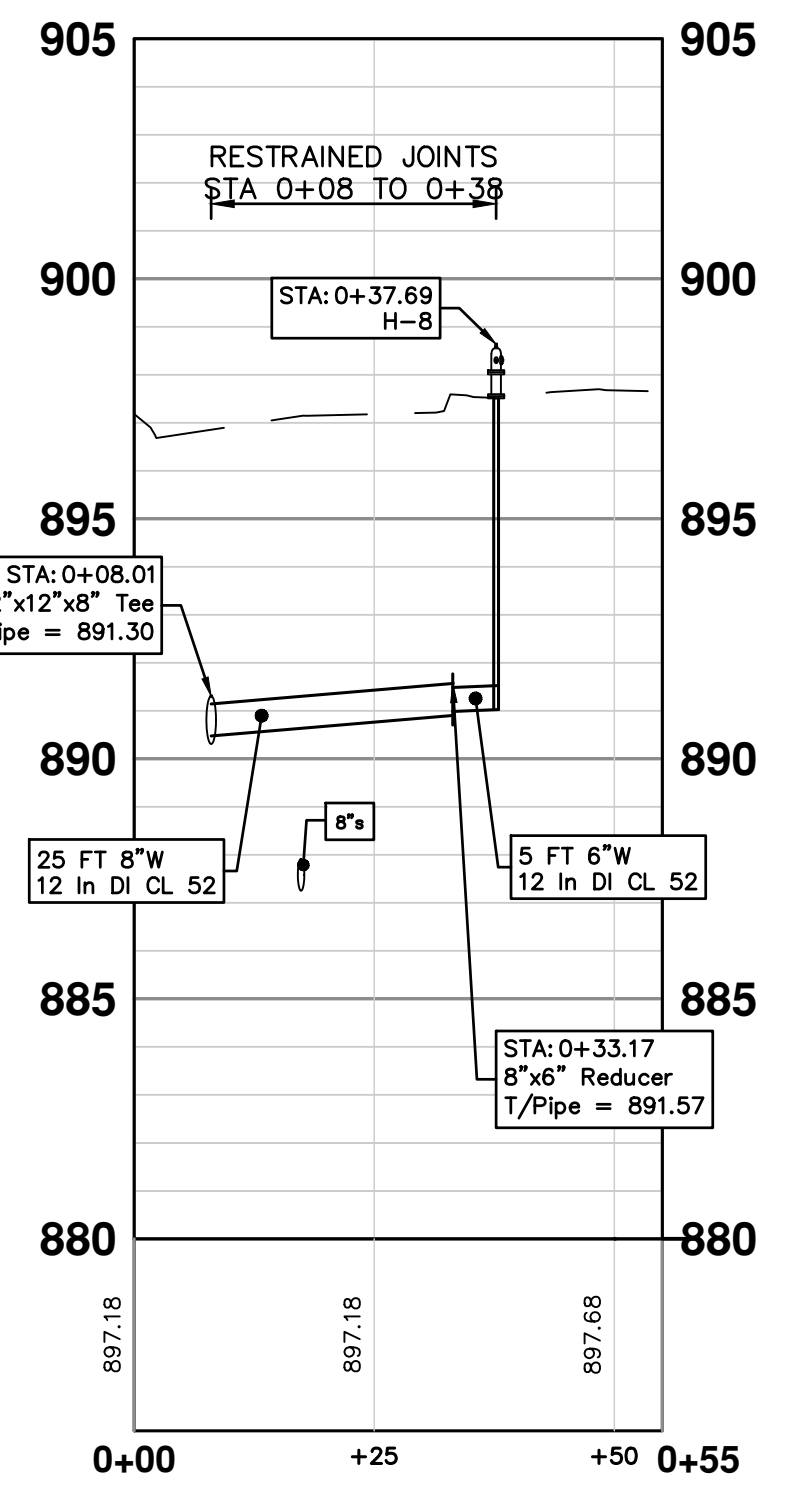
FIRE HYDRANT ASSEMBLY	5 EA
6-INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	25 FT
8-INCH CLASS 52 DIP W/POLYWRAP, TRENCH DETAIL 1, MODIFIED	127 FT
8" 45° BEND	16 EA
8"x6" REDUCER	5 EA



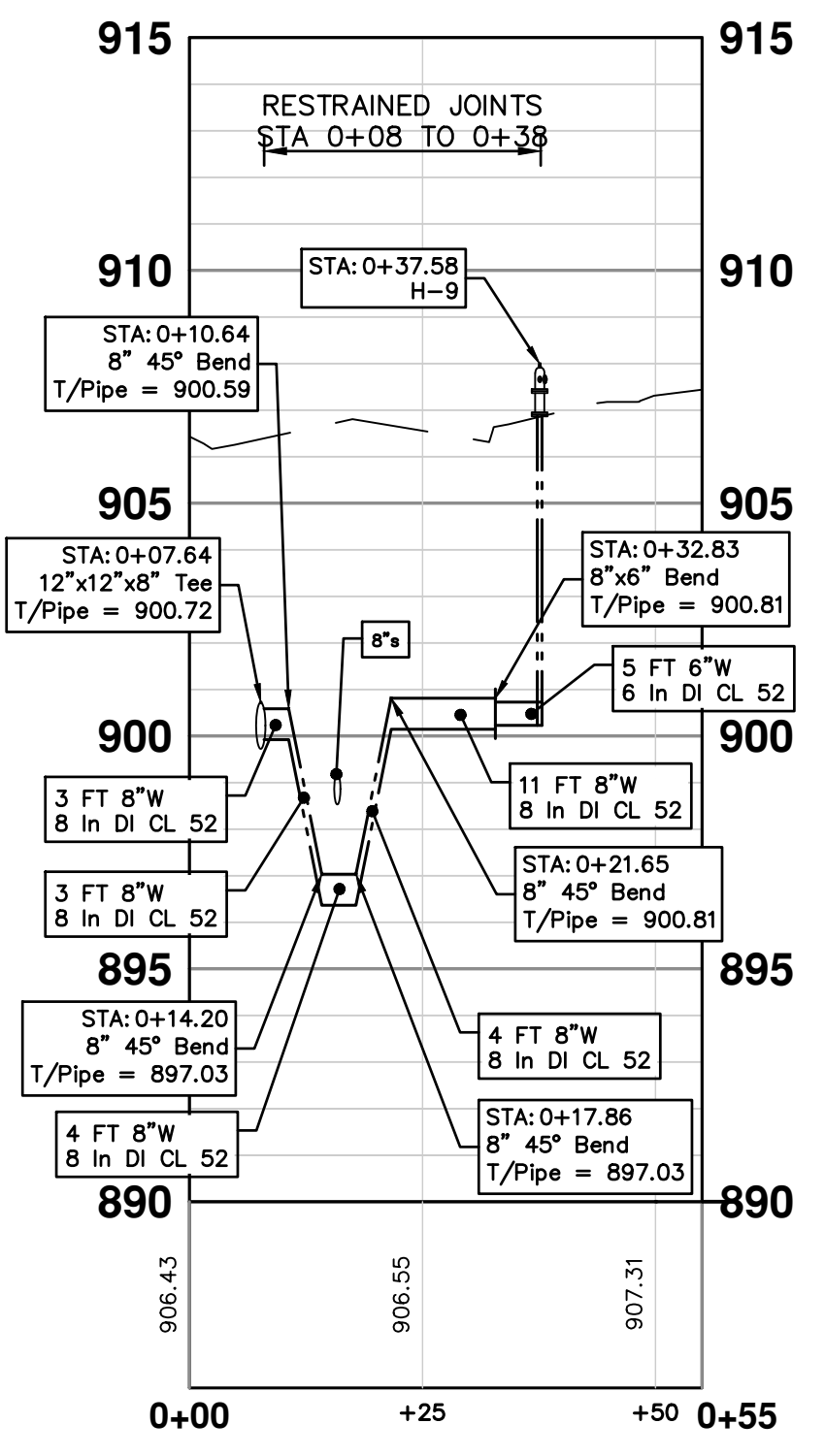
HYDRANT H-5



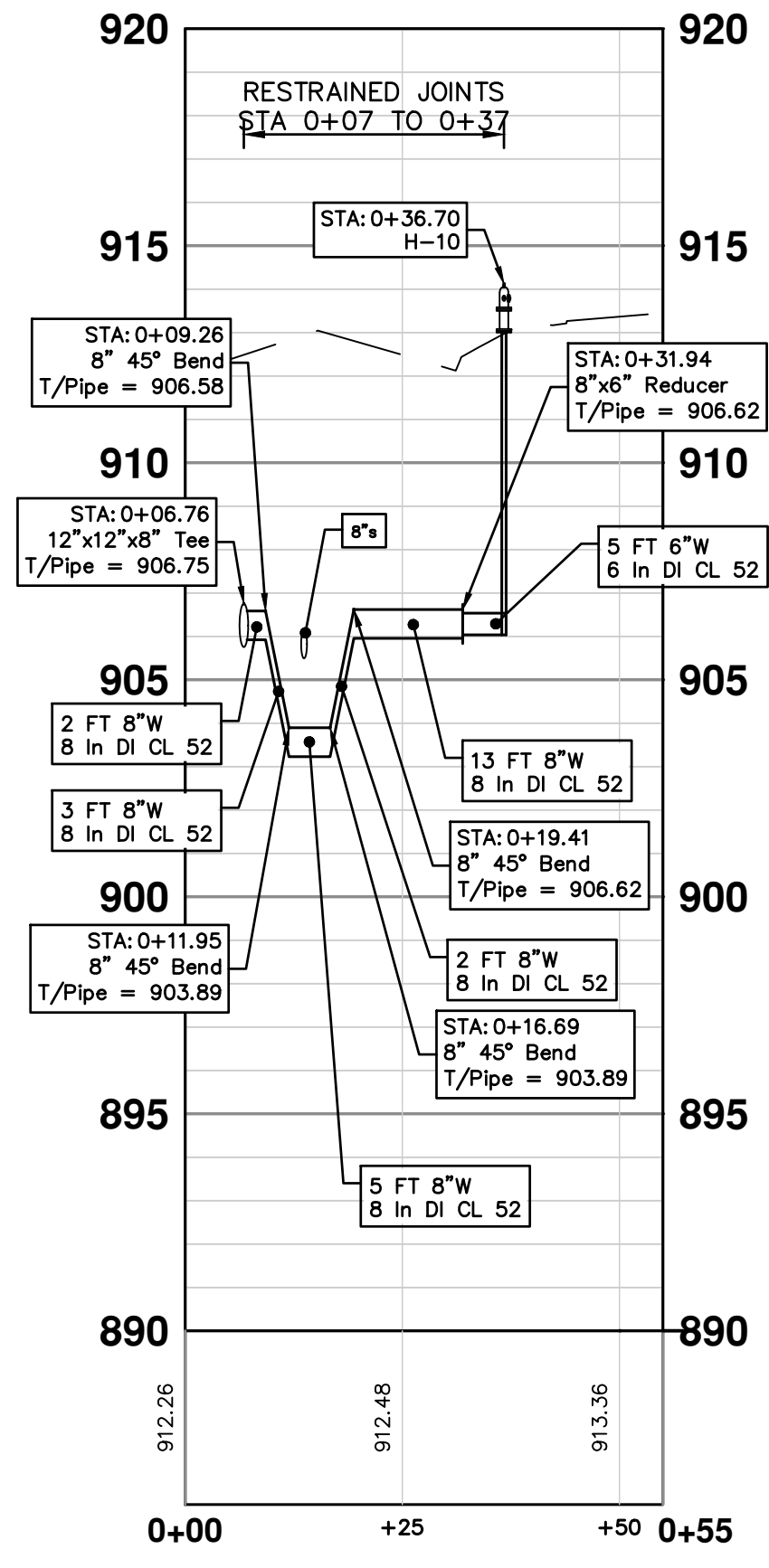
HYDRANT H-6



HYDRANT H-8



HYDRANT H-9



HYDRANT H-10

811
Know what's below. Call before you dig.

REV.	DATE	DESCRIPTION	DRAWN	CHECKED
03	12/16/2022	ISSUED FOR BIDS	ML2	PK2
02	7/15/2022	100% OWNER REVIEW	ML2	PK2
01	6/16/2022	95% OWNER REVIEW	ML2	PK2
00	5/26/2022	60% OWNER REVIEW	ML2	PK2

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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED WATER MAIN
HYDRANT PROFILES

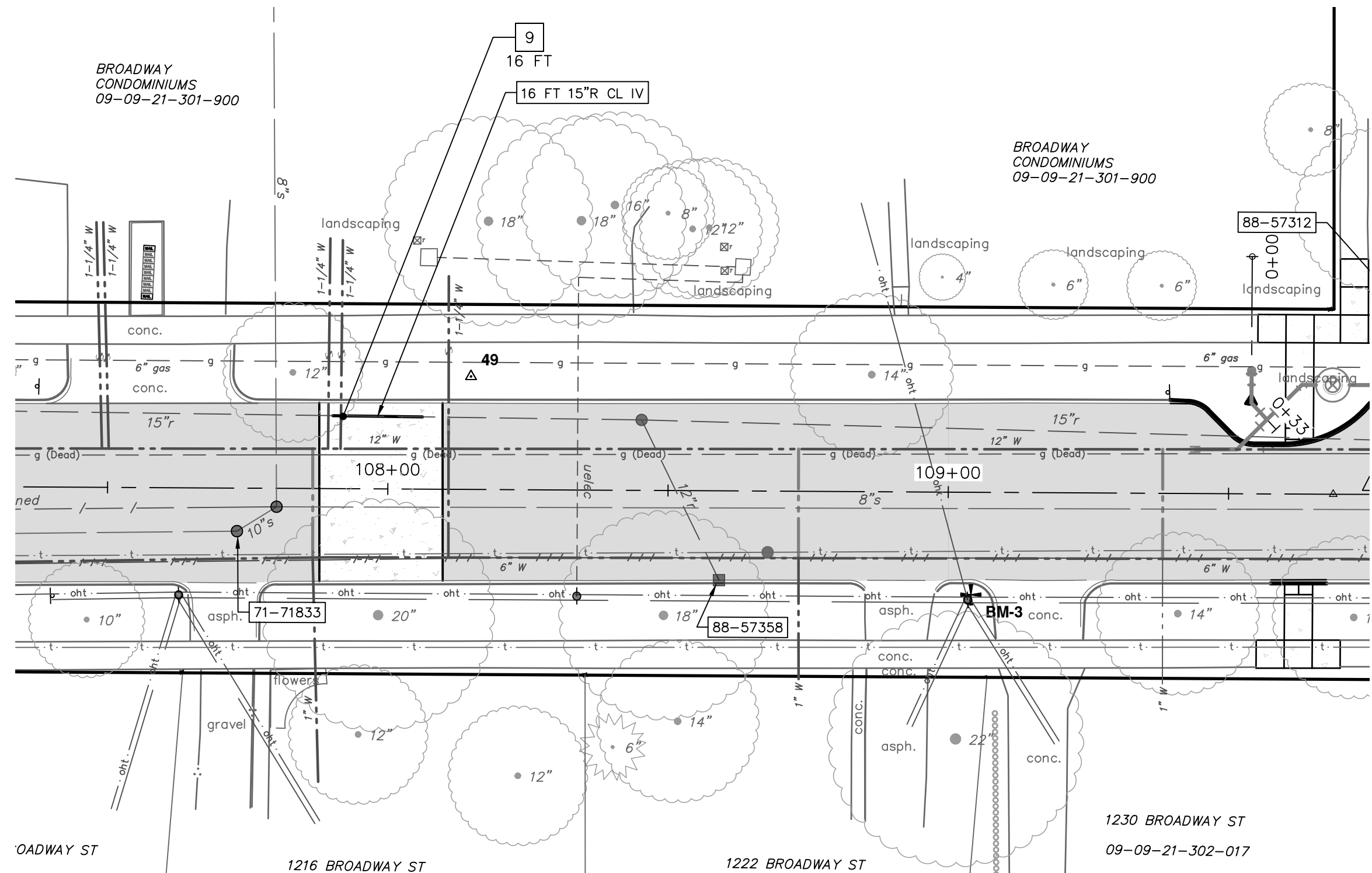
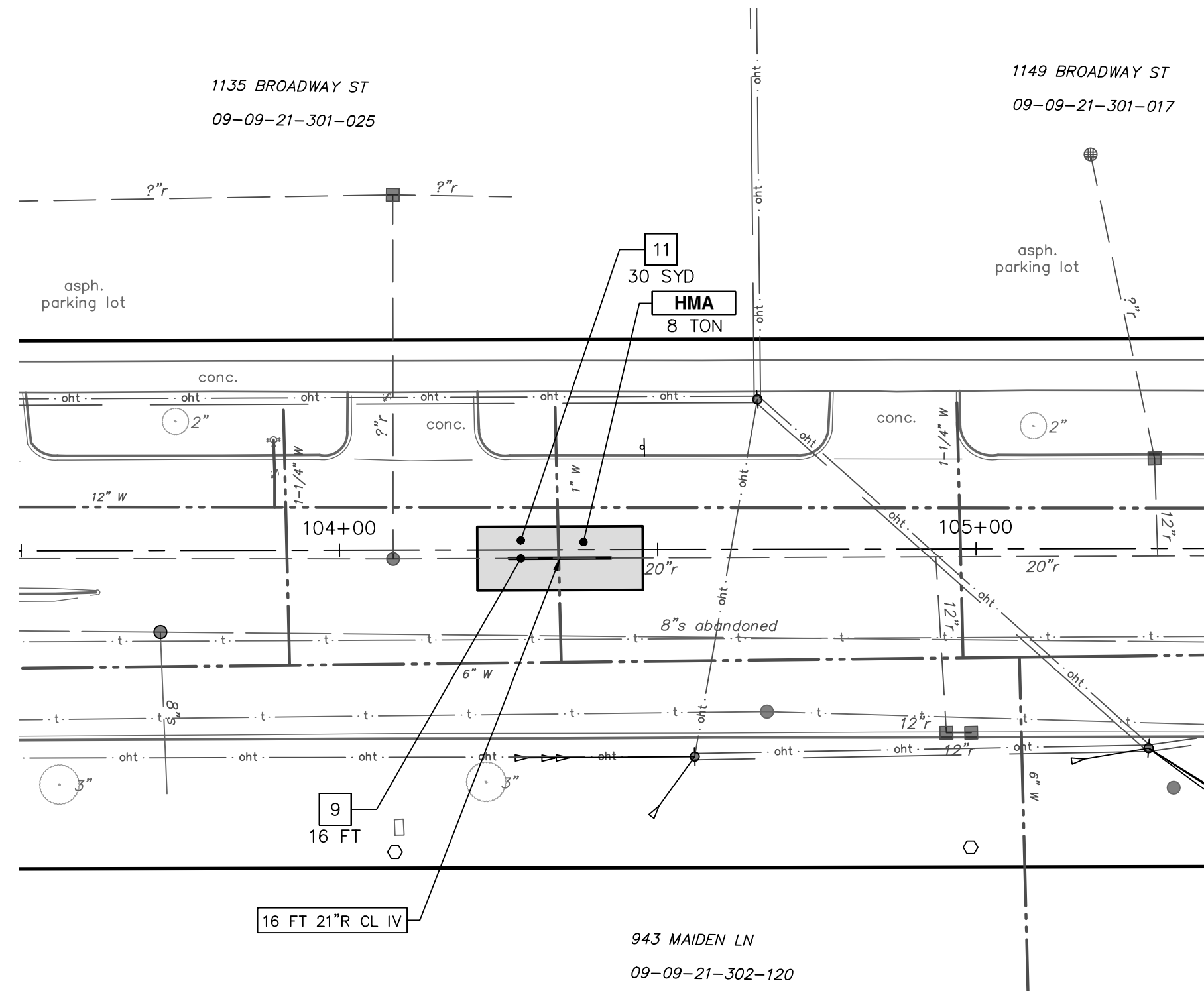
SCALE: PLAN: 1" = 20'
PROFILE: 1" = 4'

DRAWING NO. 2020030-29

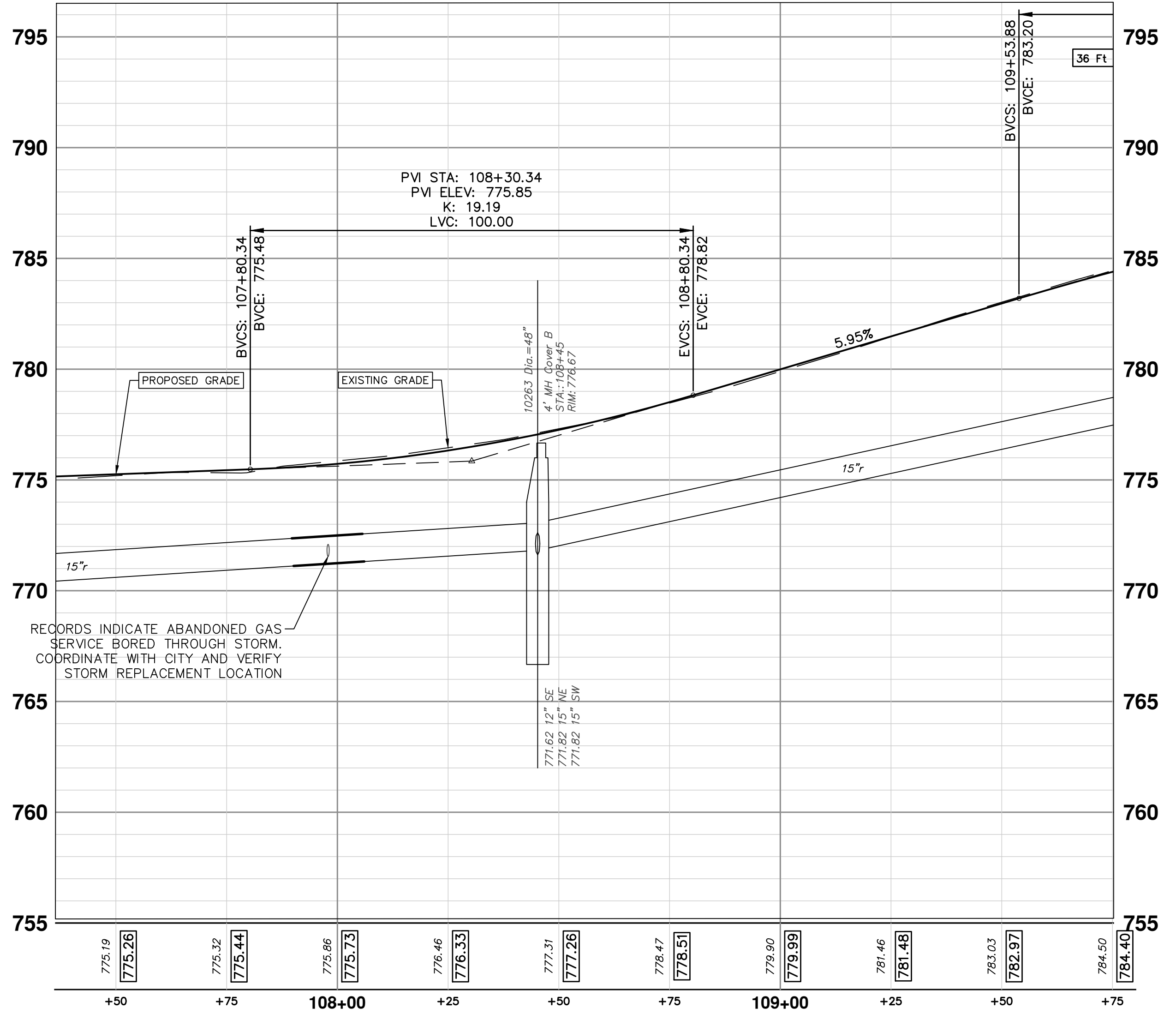
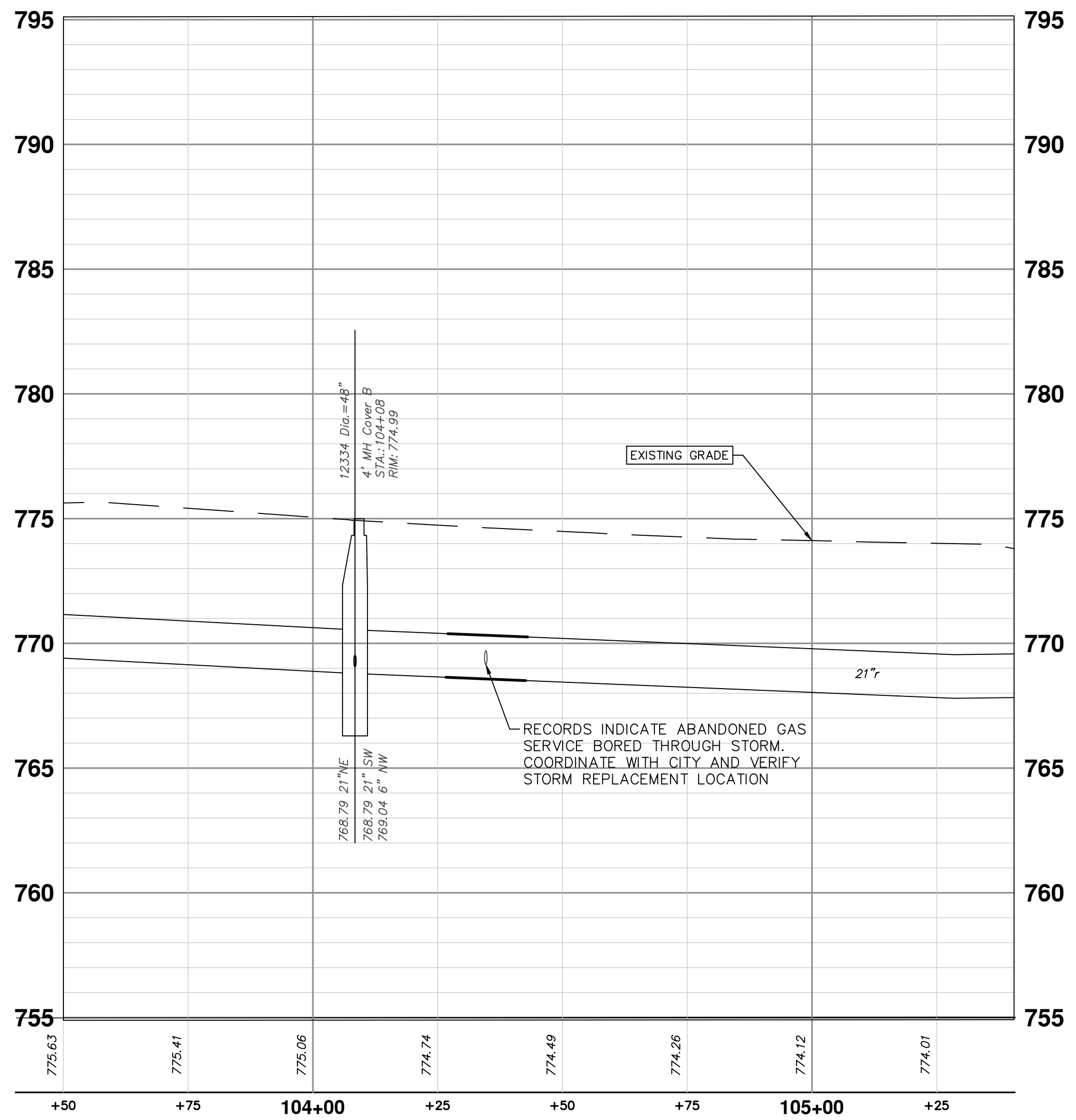
SHEET NO. 29 OF 50

1660 BROADWAY ST
3/1/21


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REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE MODIFIED
2	REMOVE CONCRETE SIDEWALK, RAMP, & DRIVES - ANY THICKNESS, MODIFIED
3	NOT USED
4	NOT USED
5	PROTECTIVE FENCING
6	EROSION CONTROL, INLET FILTER
7	DRAINAGE STRUCTURE, ANY SIZE OR DEPTH, REMOVE
8	NOT USED
9	SEWER, ANY SIZE OR DEPTH, REMOVE
10	NOT USED
11	HMA PAVEMENT SURFACE REMOVAL, ANY DEPTH
12	MACHINE GRADING, MODIFIED




CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NC
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT



Know what's below.
Call before you dig.

REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

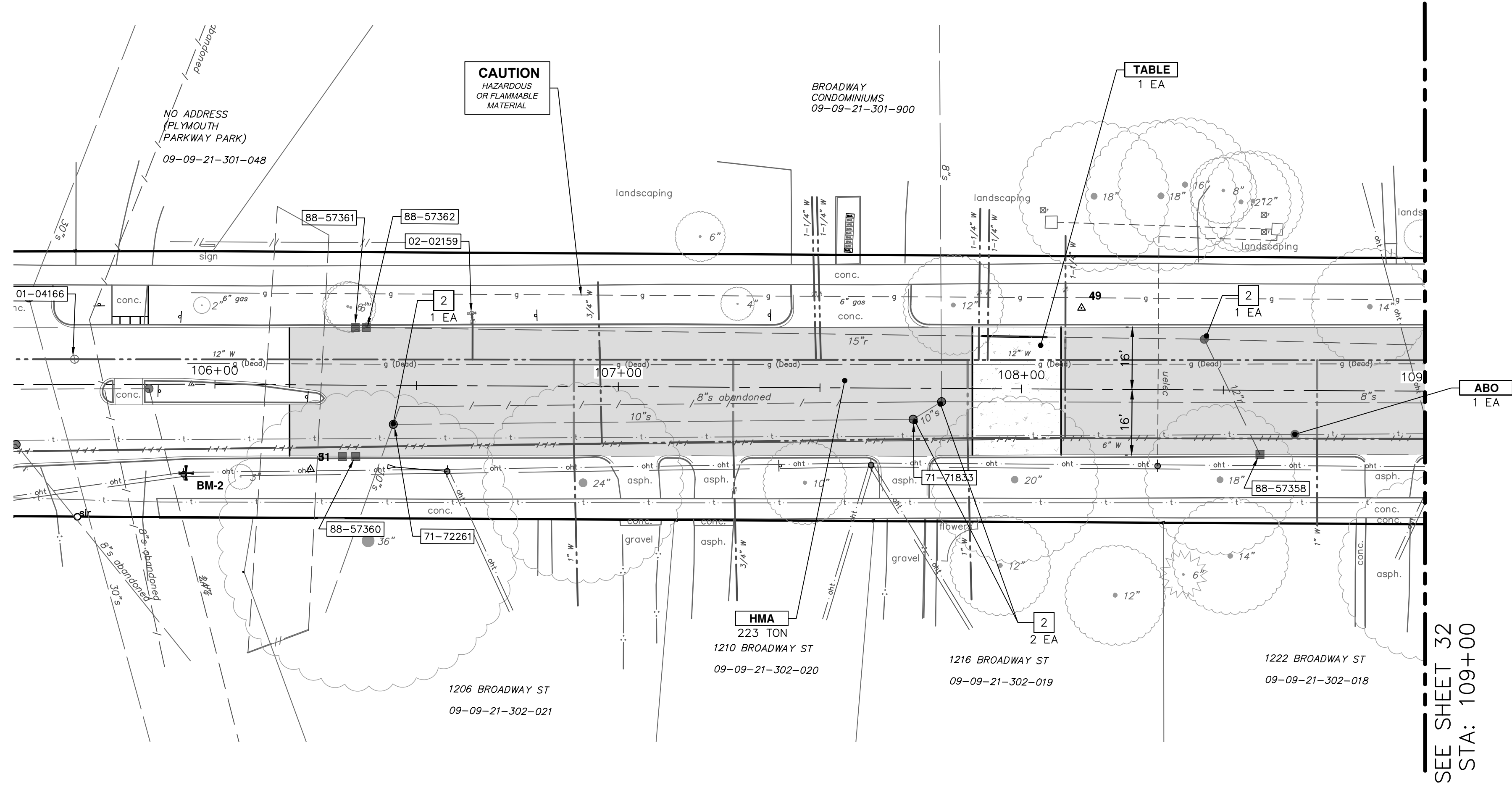
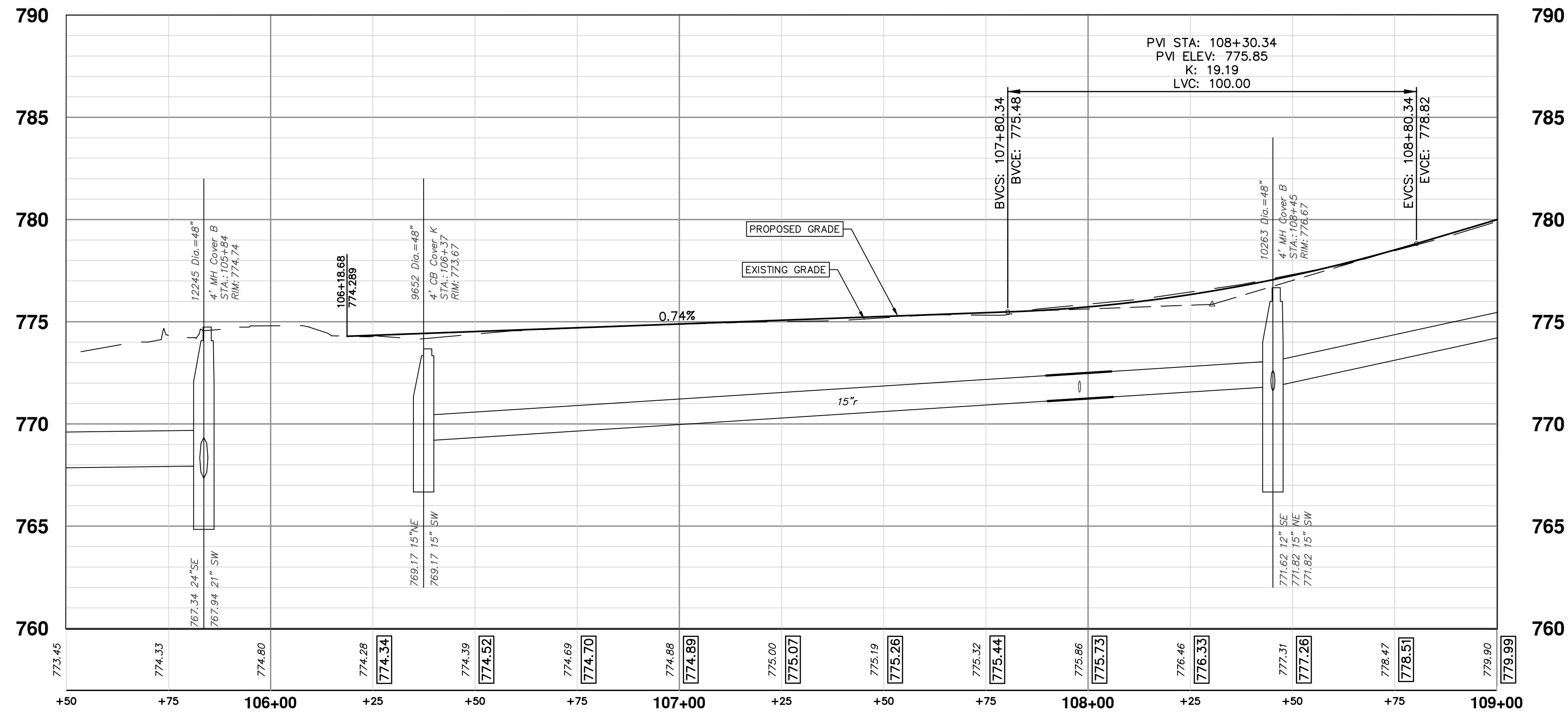


CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED ROAD AND STORM
 STORM SEWER REPLACEMENT

SHEET No. **30 OF 50**

SCALE: PLAN: 1" = 20'
 PROFILE: 1" = 4'

DRAWING No. **2020030-30**



SEE SHEET 32
STA: 109+00

CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT

811
Know what's below.
Call before you dig.

REV	DATE	DRAWN	CHECKED
03	12/16/2022	ML2	PK2
02	7/15/2022	ML2	PK2
01	6/16/2022	ML2	PK2
00	5/26/2022	ML2	PK2

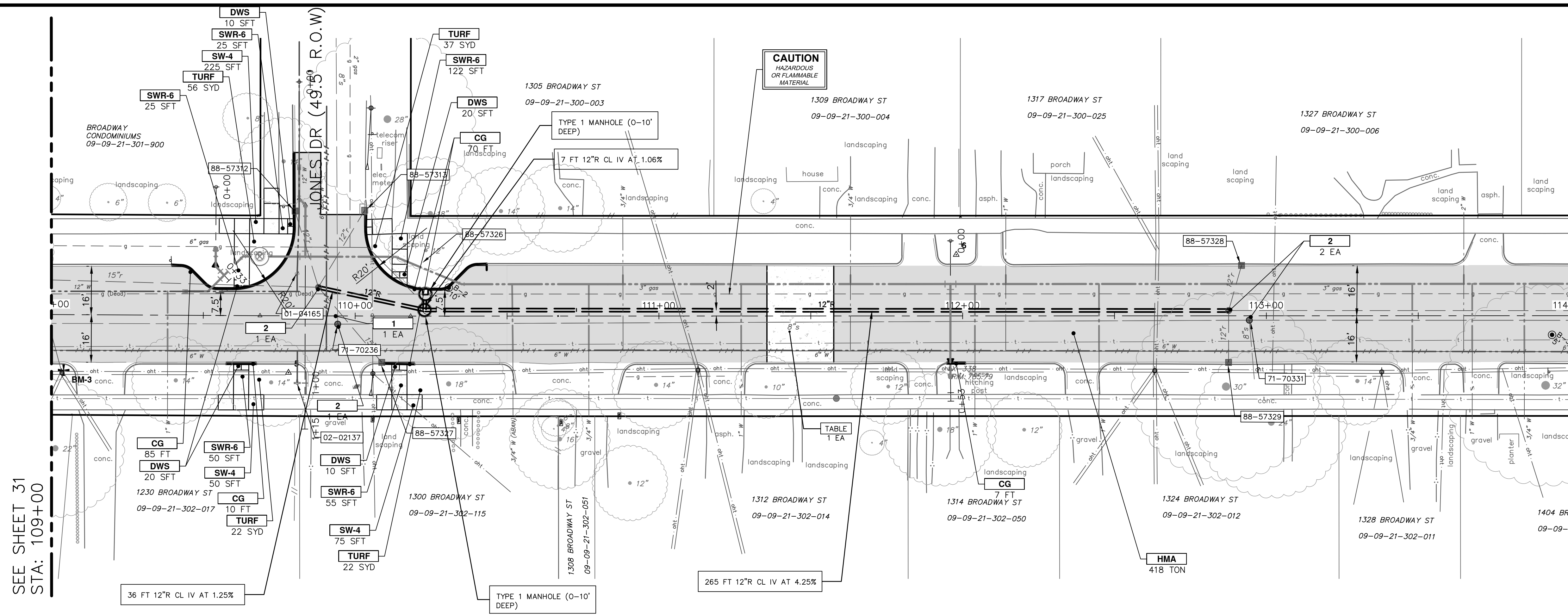
CITY OF ANN ARBOR
PUBLIC SERVICES
301 EAST HURON STREET
P.O. BOX 864
ANN ARBOR MI 48106-0864
www.a3gov.org

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ROAD AND STORM
STA. 105+50 TO STA. 109+00

SHEET No. **31 OF 50**

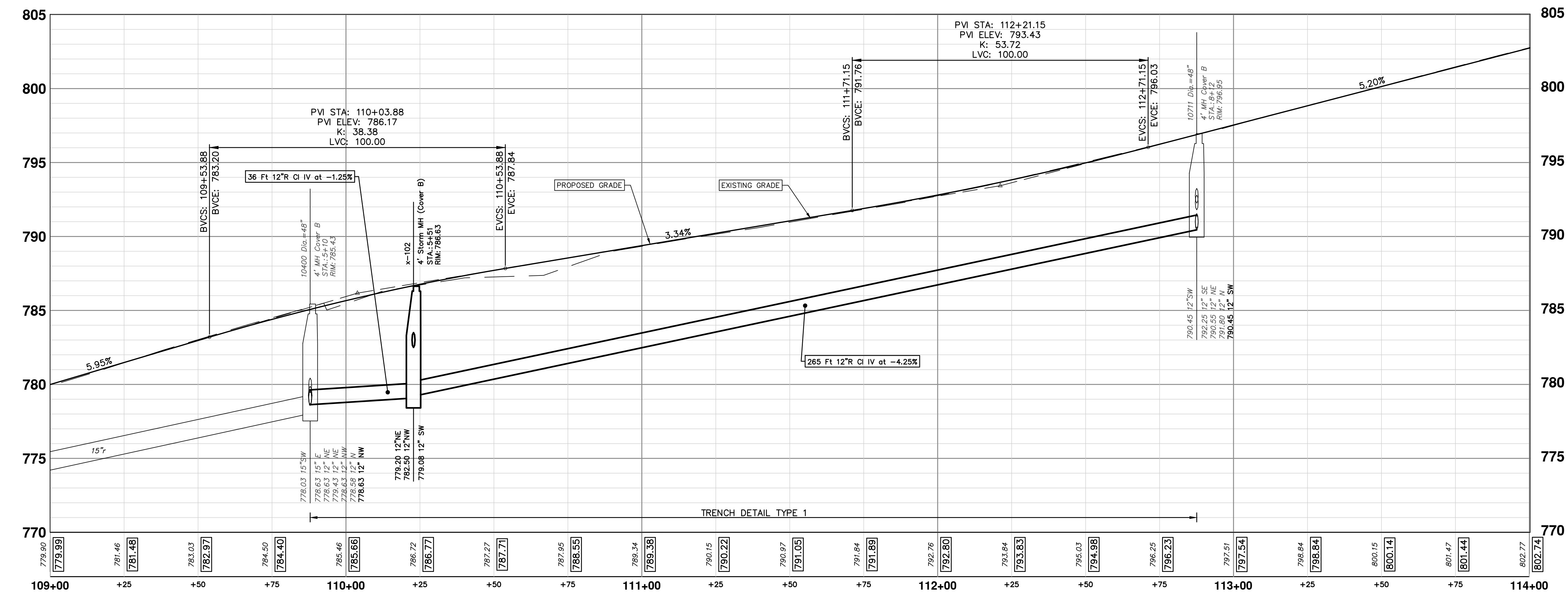
DRAWING No. **2020030-31**

SCALE: PLAN: 1"=20' PROFILE: 1"=4'



SEE SHEET 31
STA: 109+00

SEE SHEET 33
STA: 114+00



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT

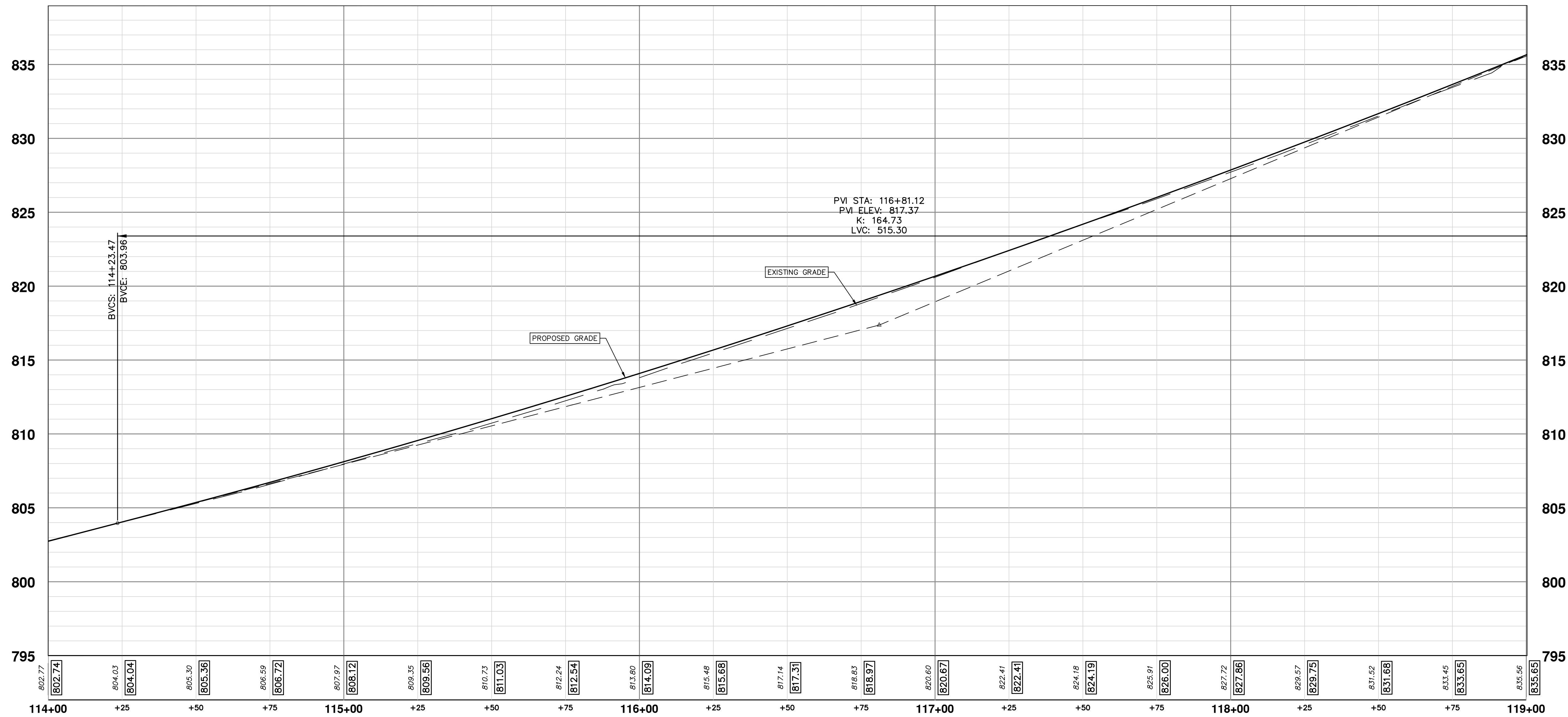
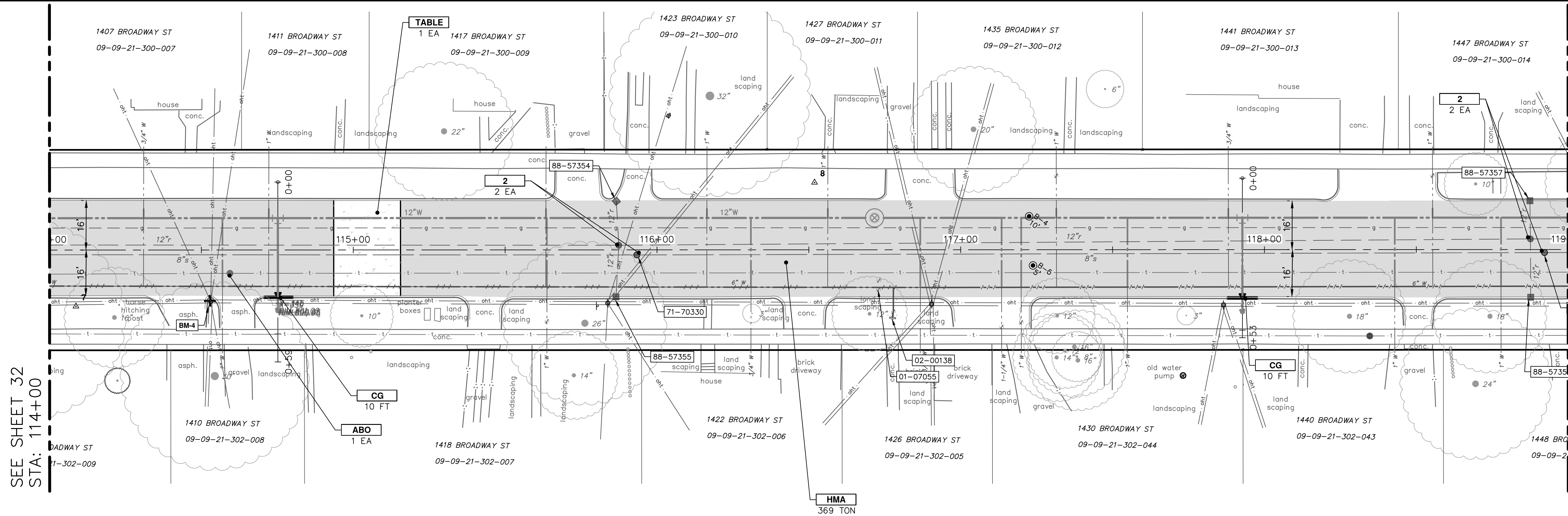
811
Know what's below.
Call before you dig.

REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ROAD AND STORM
STA. 109+00 TO STA. 114+00

SCALE: PLAN: 1"=20'
PROFILE: 1"=4'

DRAWING No. 2020030-32
SHEET No. 32 OF 50



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NC
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT

SEE SHEET 34
STA: 119+00

SEE SHEET 32
STA: 114+00



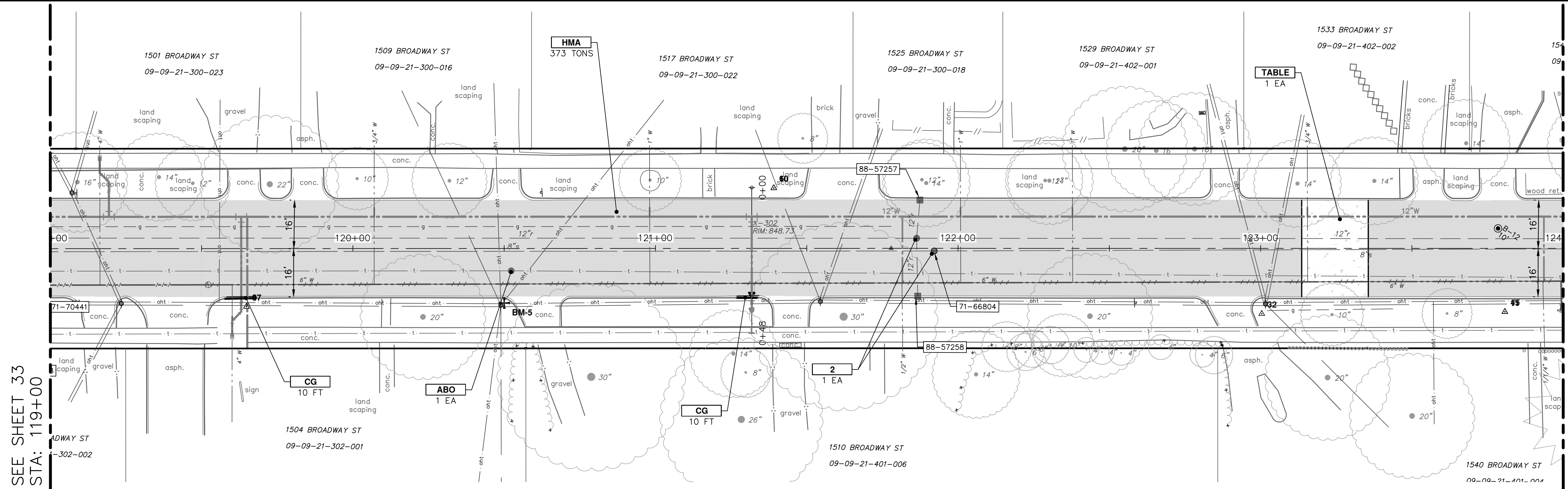
REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

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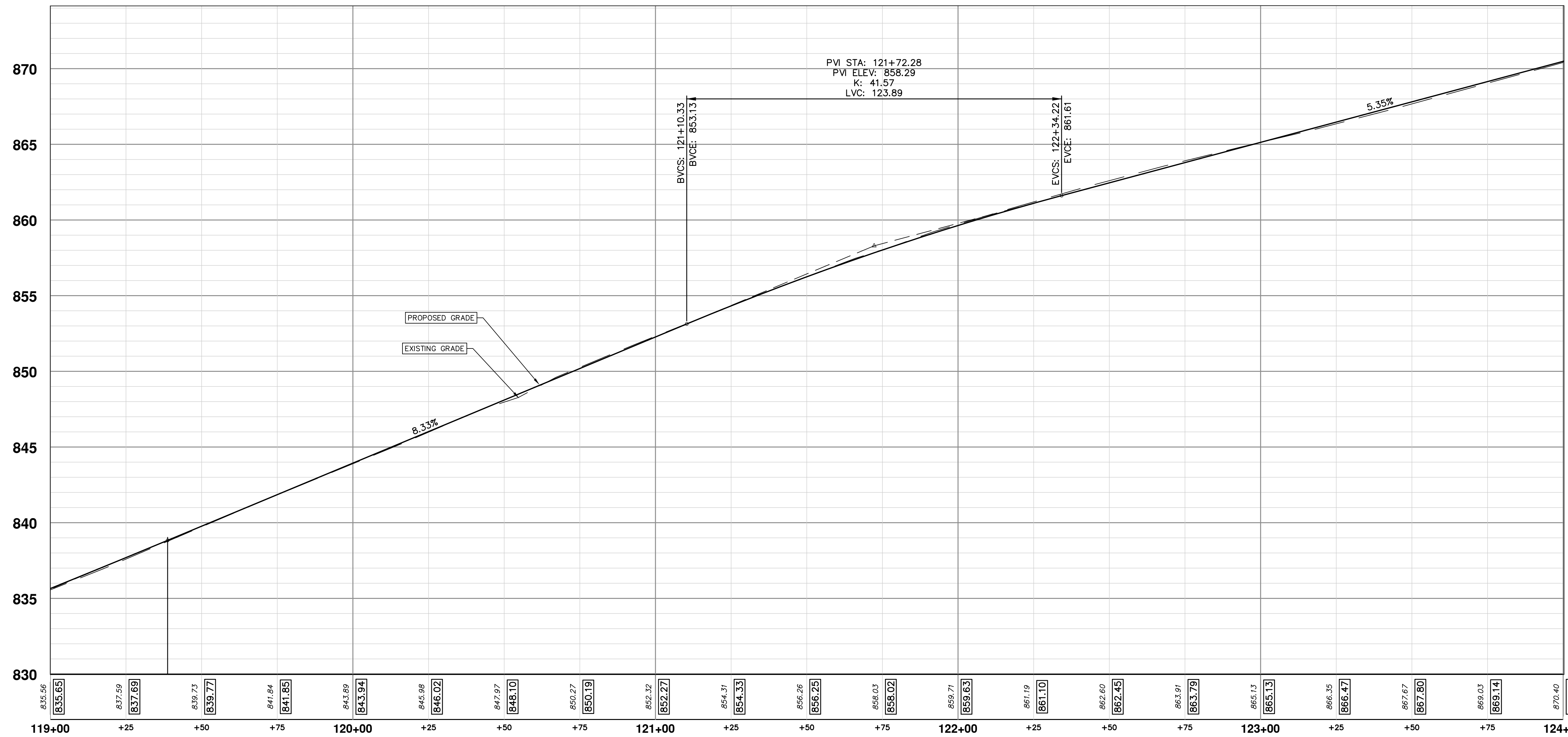
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ROAD AND STORM
STA. 114+00 TO STA. 119+00

SCALE: PLAN: 1" = 20'
PROFILE: 1" = 4'
DRAWING No. 2020030-33



SEE SHEET 33
STA: 119+00

SEE SHEET 35
STA: 124+00



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT

811
Know what's below. Call before you dig.

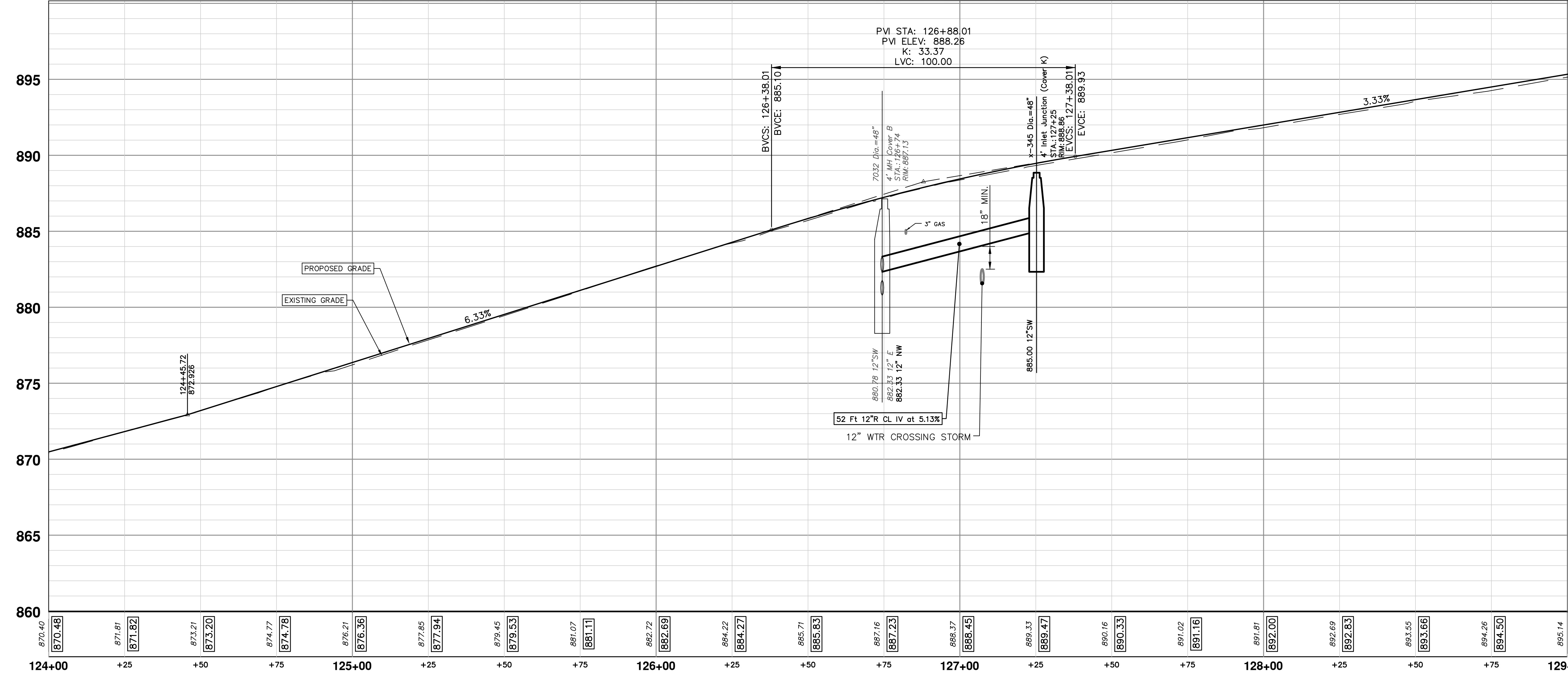
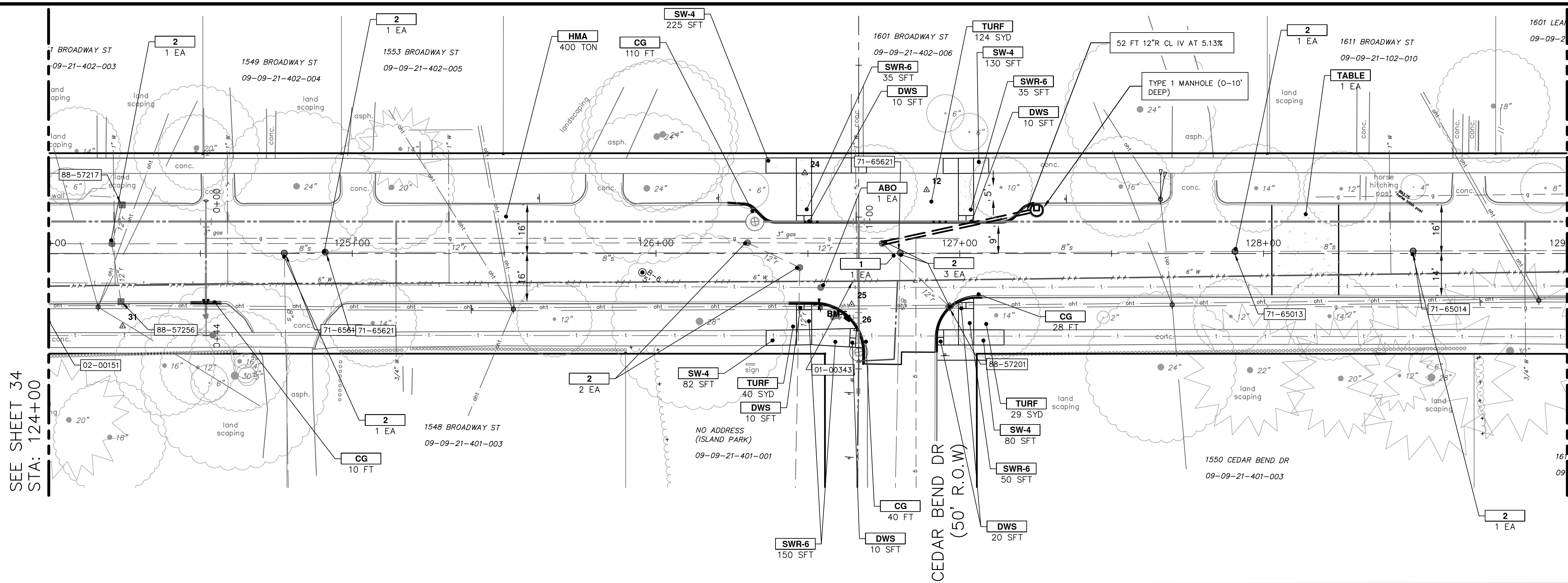
ISSUED FOR BIDS 12/16/2022
100% OWNER REVIEW 7/15/2022
95% OWNER REVIEW 6/16/2022
60% OWNER REVIEW 5/26/2022

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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ROAD AND STORM
STA. 119+00 TO STA. 124+00

SCALE: PLAN: 1" = 20'
PROFILE: 1" = 4'

DRAWING No. 2020030-34
SHEET No. 34 OF 50



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DC-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT



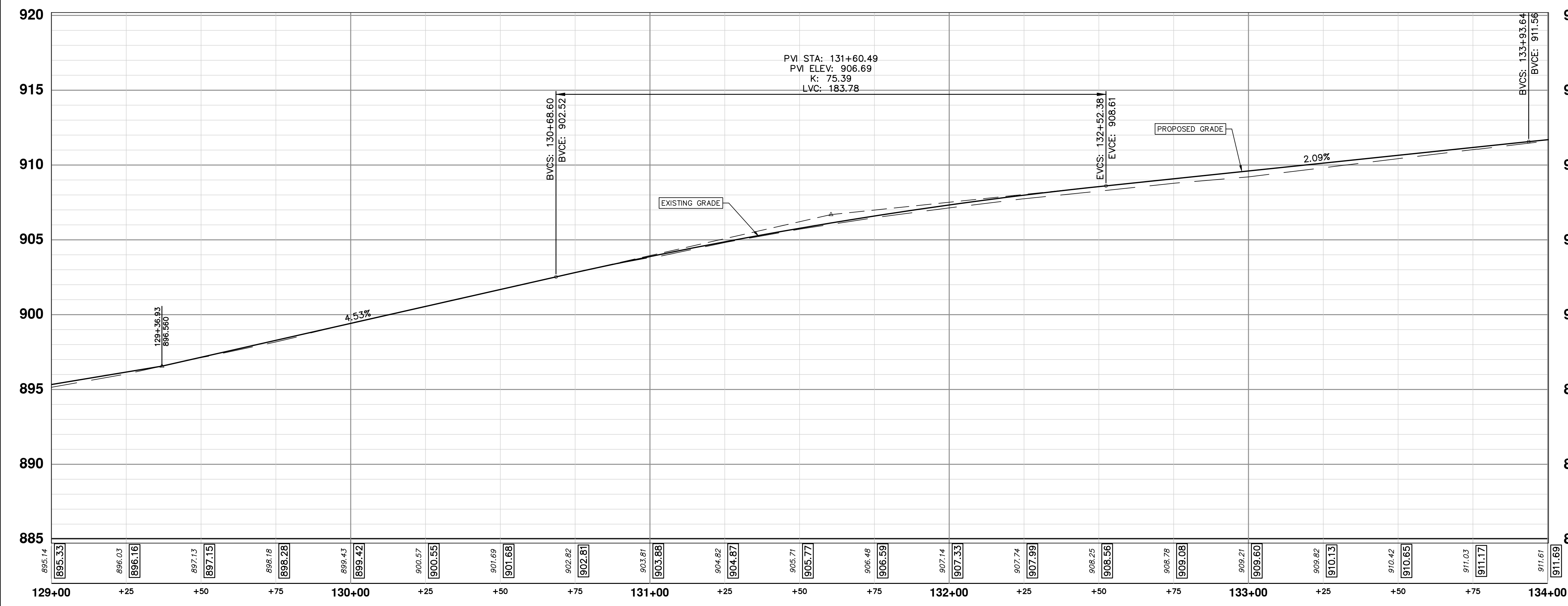
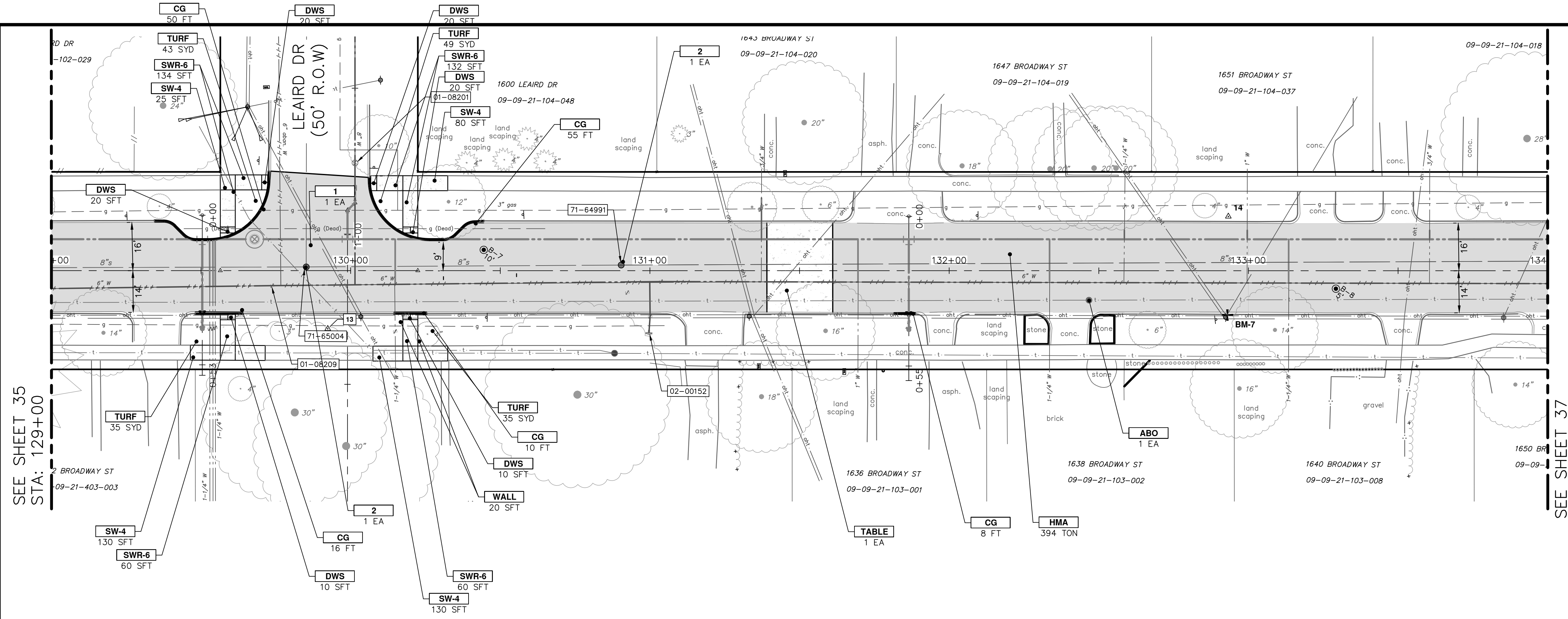
Know what's below.
Call before you dig.

REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

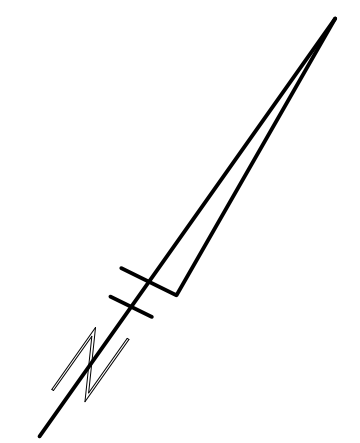


CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED ROAD AND STORM
 STA. 124+00 TO STA. 129+00

SHEET No. **35 OF 50**
 DRAWING No. **2020030-35**
 SCALE: PLAN: 1" = 20'
 PROFILE: 1" = 4'



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT
WALL	INTEGRAL SIDEWALK RETAINING WALL, UNDER 6 INCH



SEE SHEET 35
STA: 129+00

SEE SHEET 37
STA: 134+00

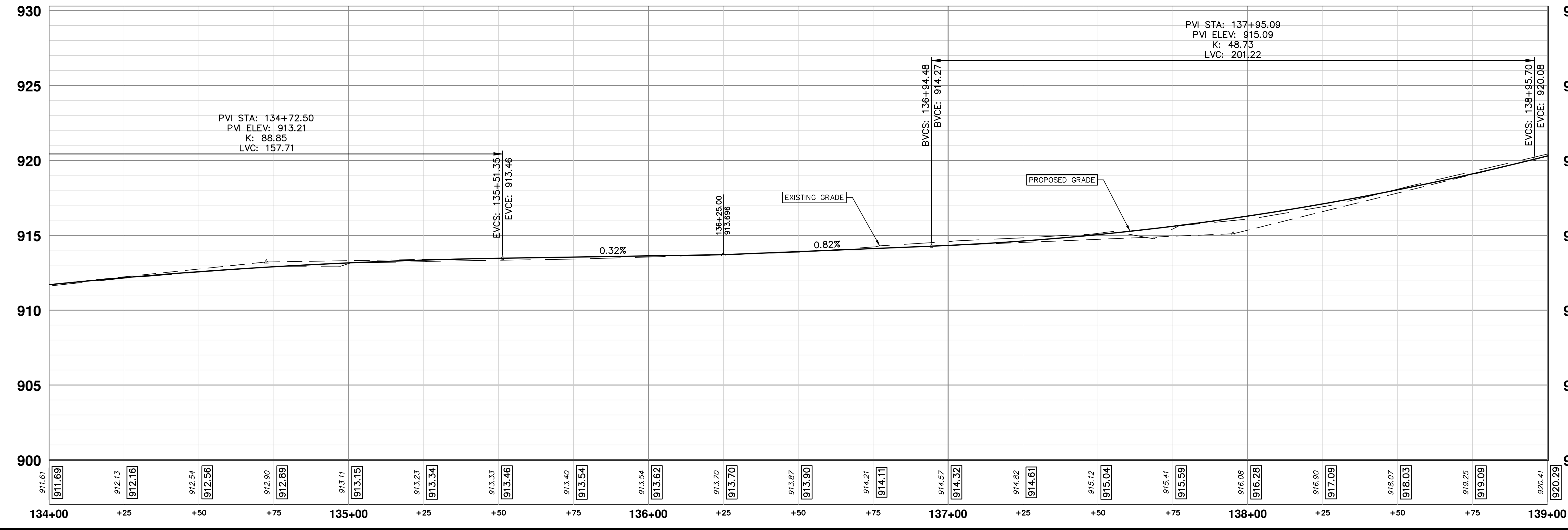
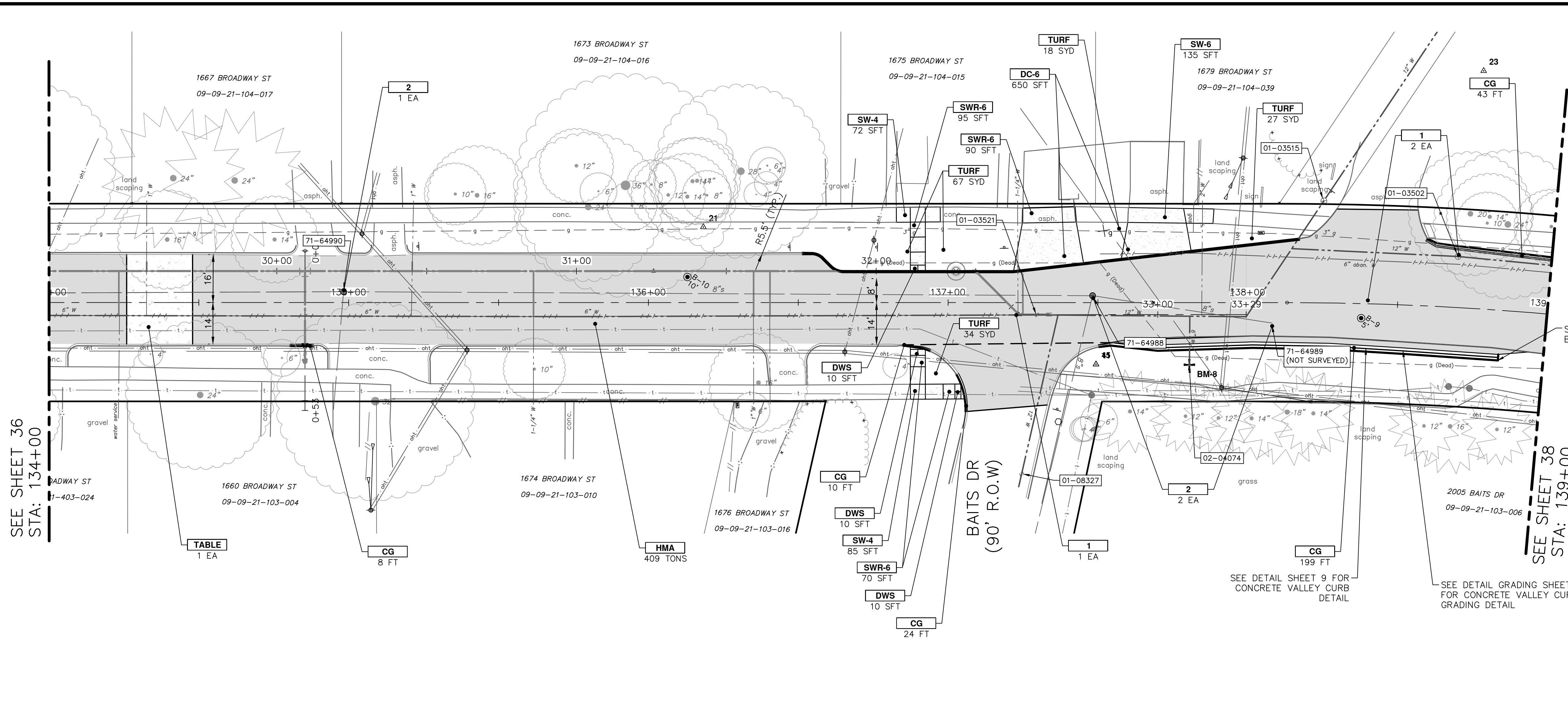
811
Know what's below.
Call before you dig.

REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ROAD AND STORM
STA. 129+00 TO STA. 134+00

DRAWING No. 2020030-36
SHEET No. 36 OF 50

Z:\2021\211210\CAD\CD\211210_storm.dwg - _o2_standard bw.stb - Plot Date: 12/16/2022 3:36:56 PM



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT

811
Know what's below. Call before you dig.

REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

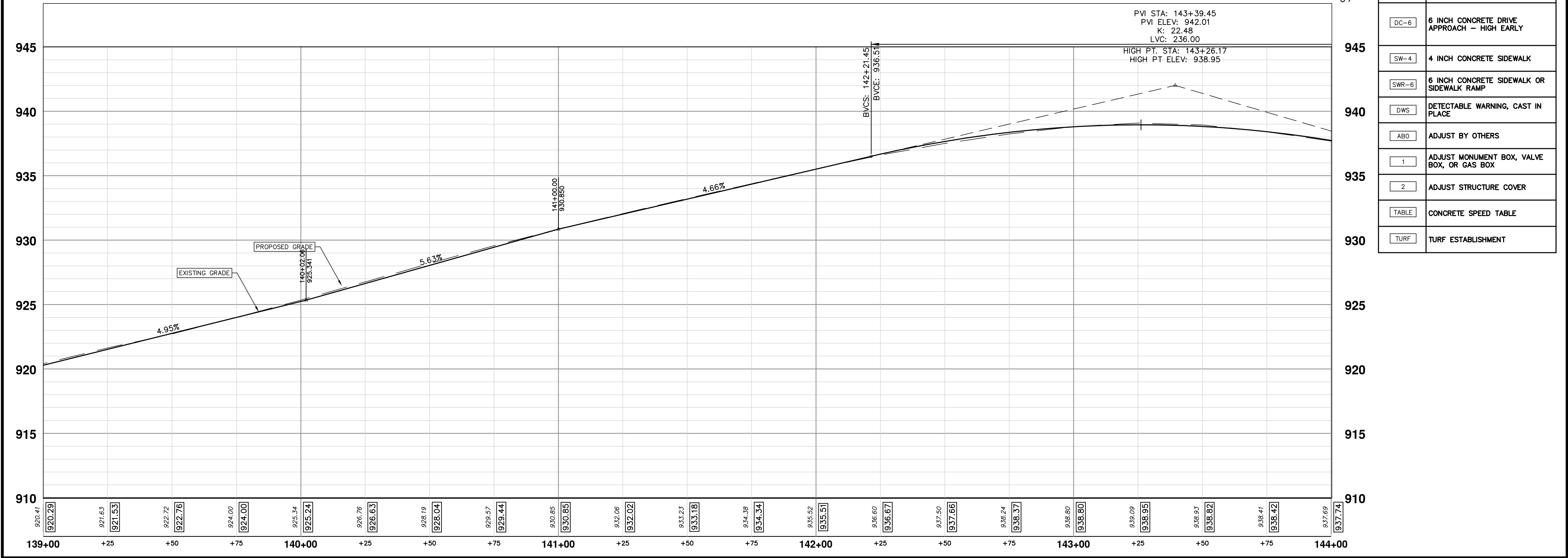
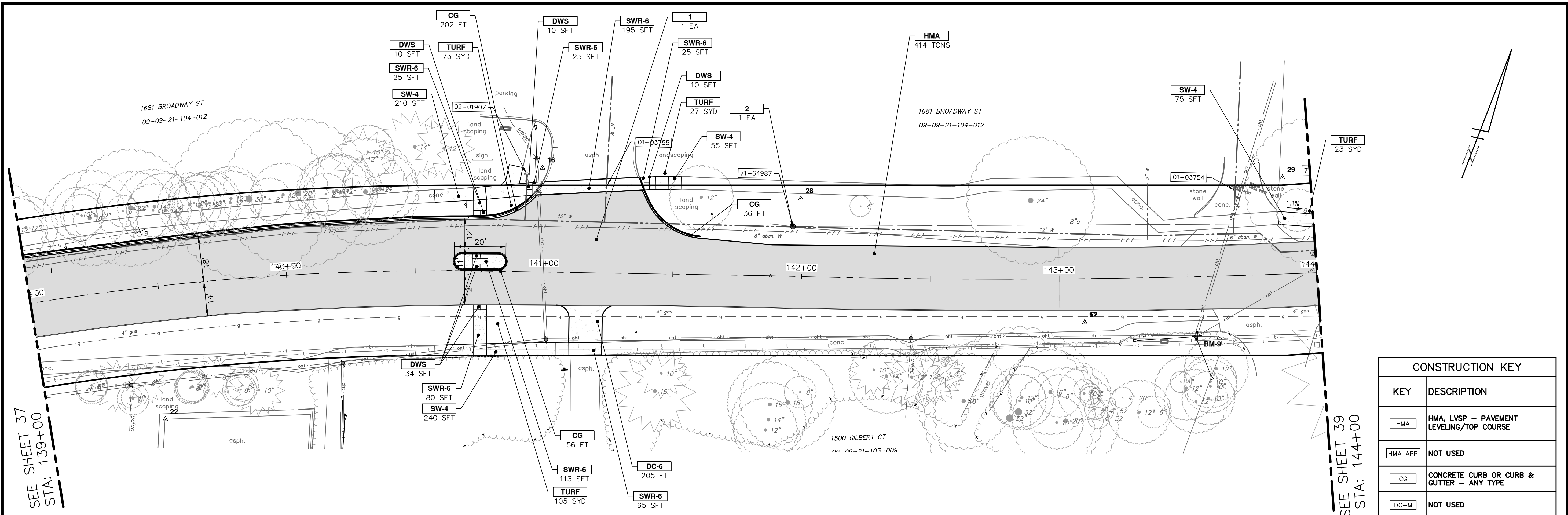
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED ROAD AND STORM
 STA. 134+00 TO STA. 139+00

SCALE: PLAN: 1"=20'
 PROFILE: 1"=4'


DRAWING No. 2020030-37

SHEET No. 37 OF 50

Z:\2021\211210\CAD\CD\211210_storm.dwg - _o2_standard bw.stb - Plot Date: 12/16/2022 3:52:16 PM




CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT



Know what's below.
Call before you dig.

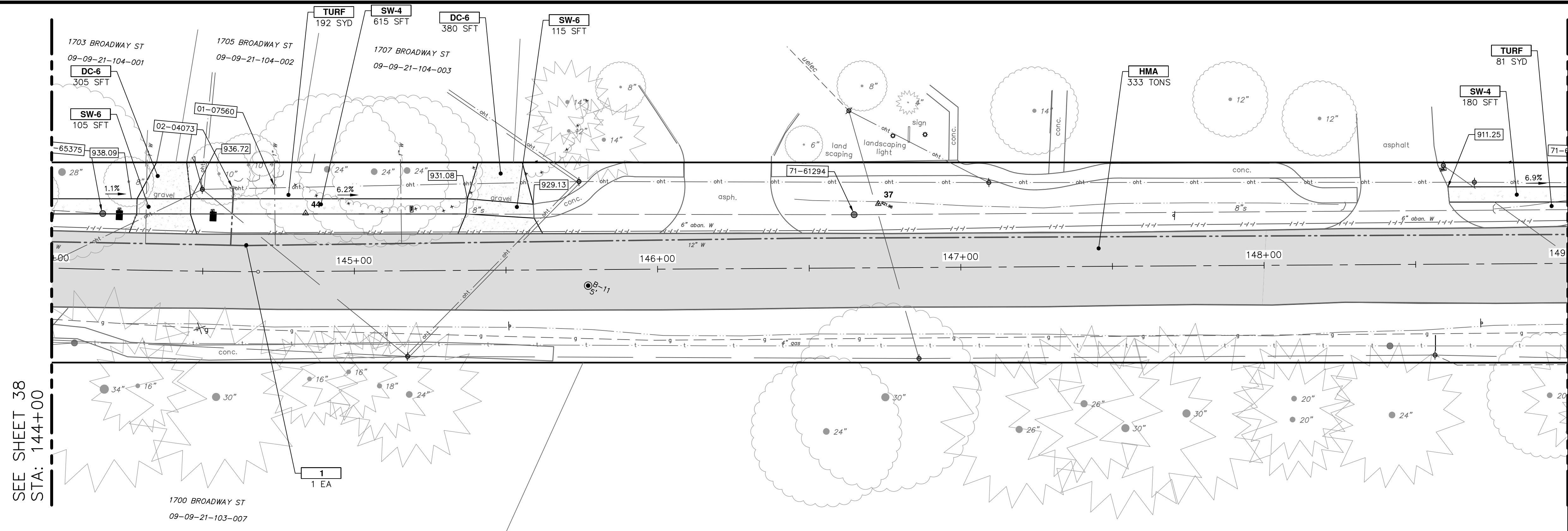
REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW



CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED ROAD AND STORM
 STA. 139+00 TO STA. 144+00

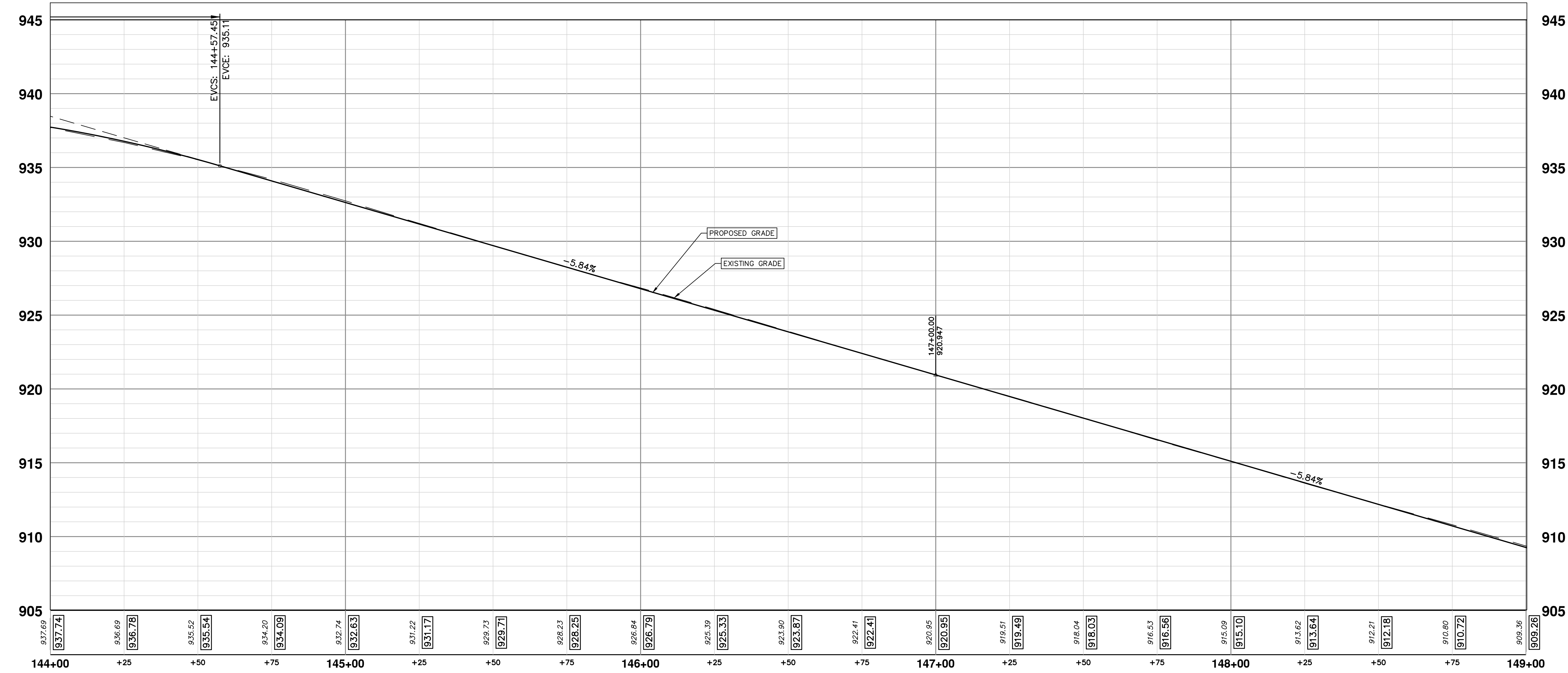
SHEET No. **38 OF 50**
 DRAWING No. **2020030-38**
 PROFILE: 1" = 4'
 SCALE: PLAN: 1" = 20'

Z:\2021\211210\CAD\CD\211210_storm.dwg - _o2_standard bw.stb - Plot Date: 12/16/2022 3:38:41 PM



SEE SHEET 38
STA: 144+00

SEE SHEET 40
STA: 149+00



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT

811
Know what's below. Call before you dig.

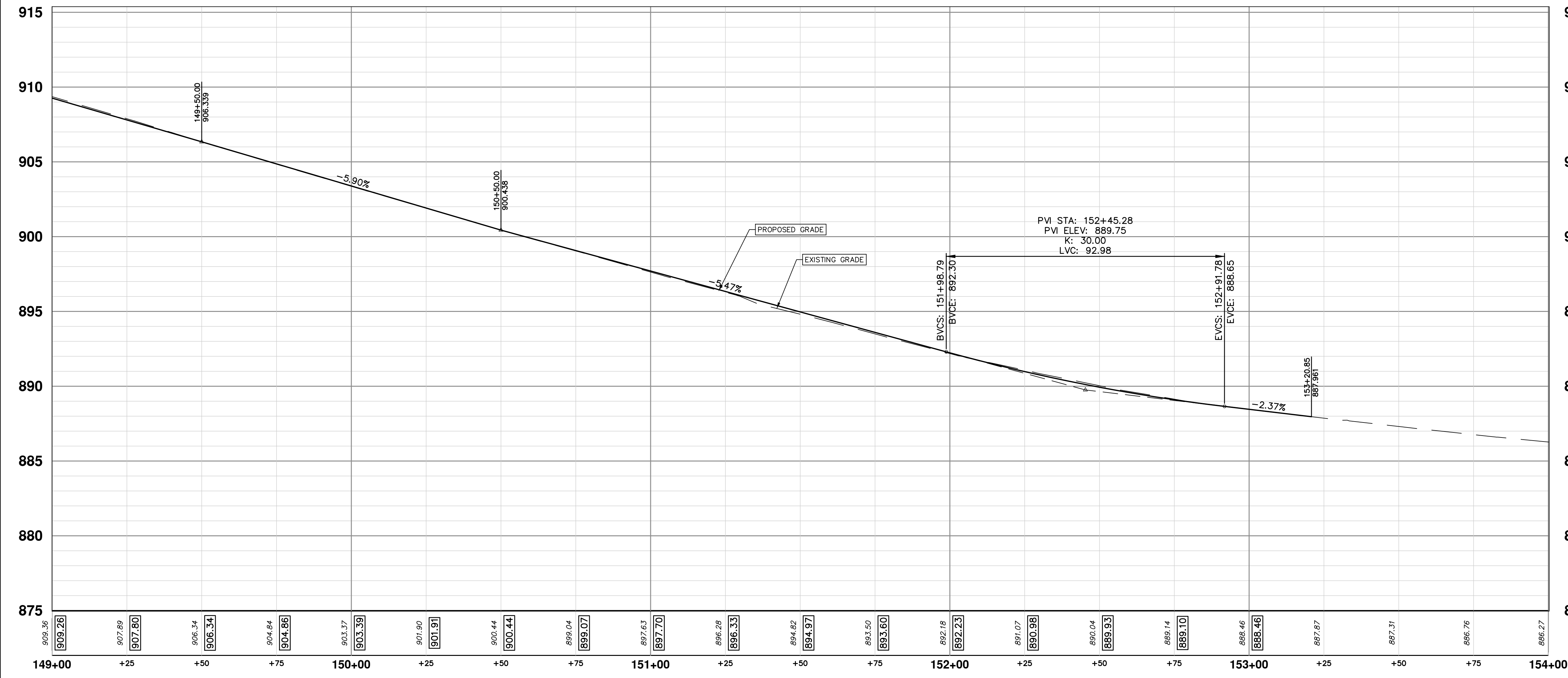
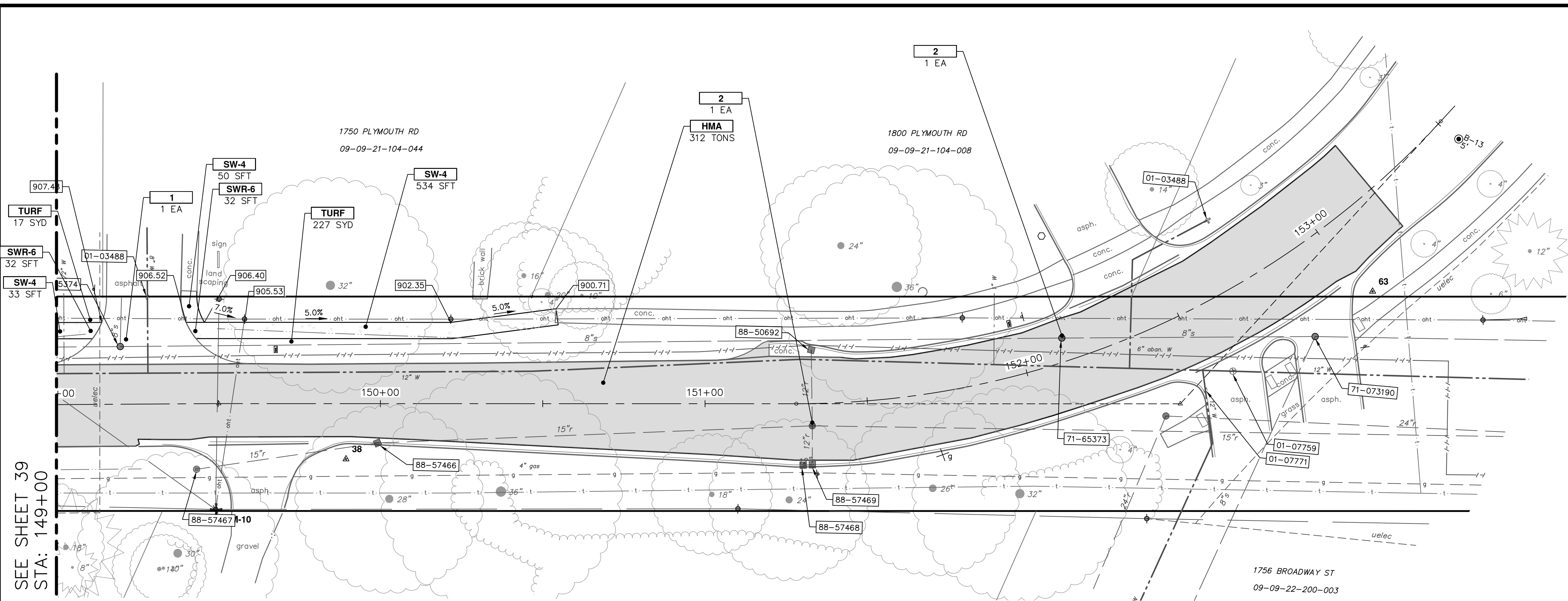
REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PROPOSED ROAD AND STORM
STA. 144+00 TO STA. 149+00

SHEET No. **39 OF 50**
DRAWING No. **2020030-39**
PROFILE: 1" = 4'
SCALE: PLAN: 1" = 20'

Z:\2021\211210\CAD\CD\211210_storm.dwg - _o2_standard bw.stb - Plot Date: 12/16/2022 3:39:31 PM




CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	HMA, LVSP - PAVEMENT LEVELING/TOP COURSE
HMA APP	NOT USED
CG	CONCRETE CURB OR CURB & GUTTER - ANY TYPE
DO-M	NOT USED
DC-6	6 INCH CONCRETE DRIVE APPROACH - HIGH EARLY
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST MONUMENT BOX, VALVE BOX, OR GAS BOX
2	ADJUST STRUCTURE COVER
TABLE	CONCRETE SPEED TABLE
TURF	TURF ESTABLISHMENT



Know what's below.
Call before you dig.

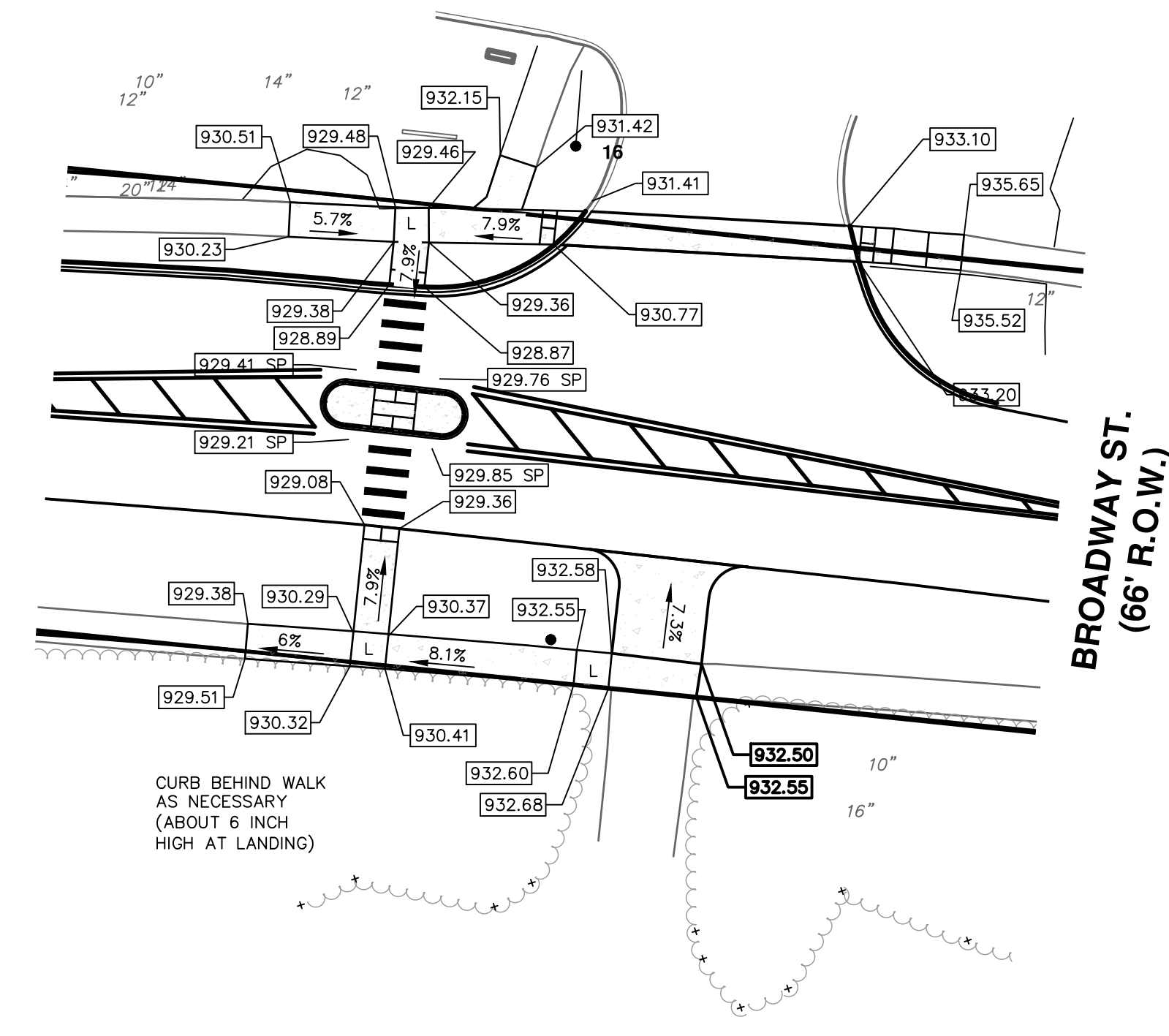
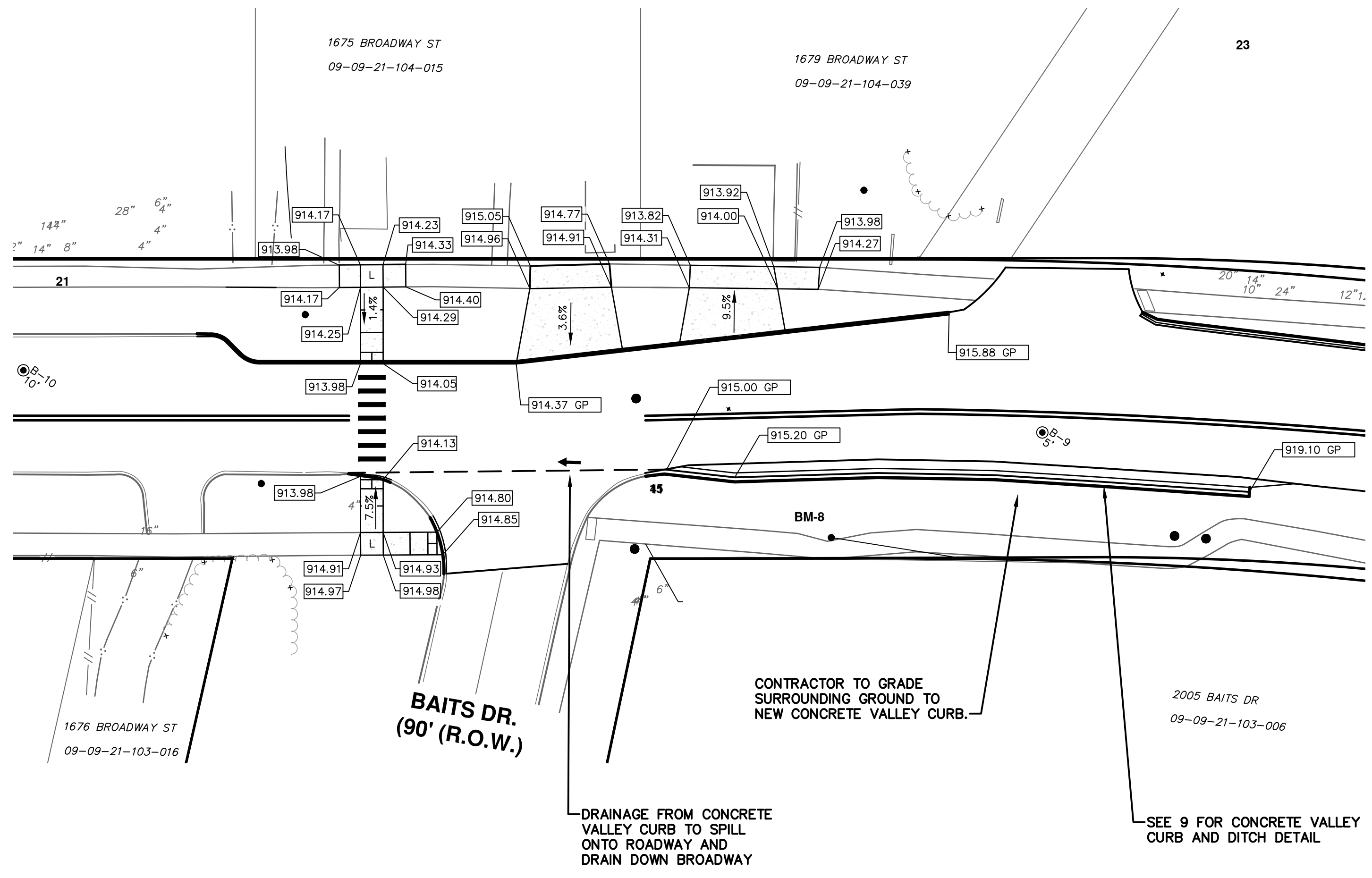
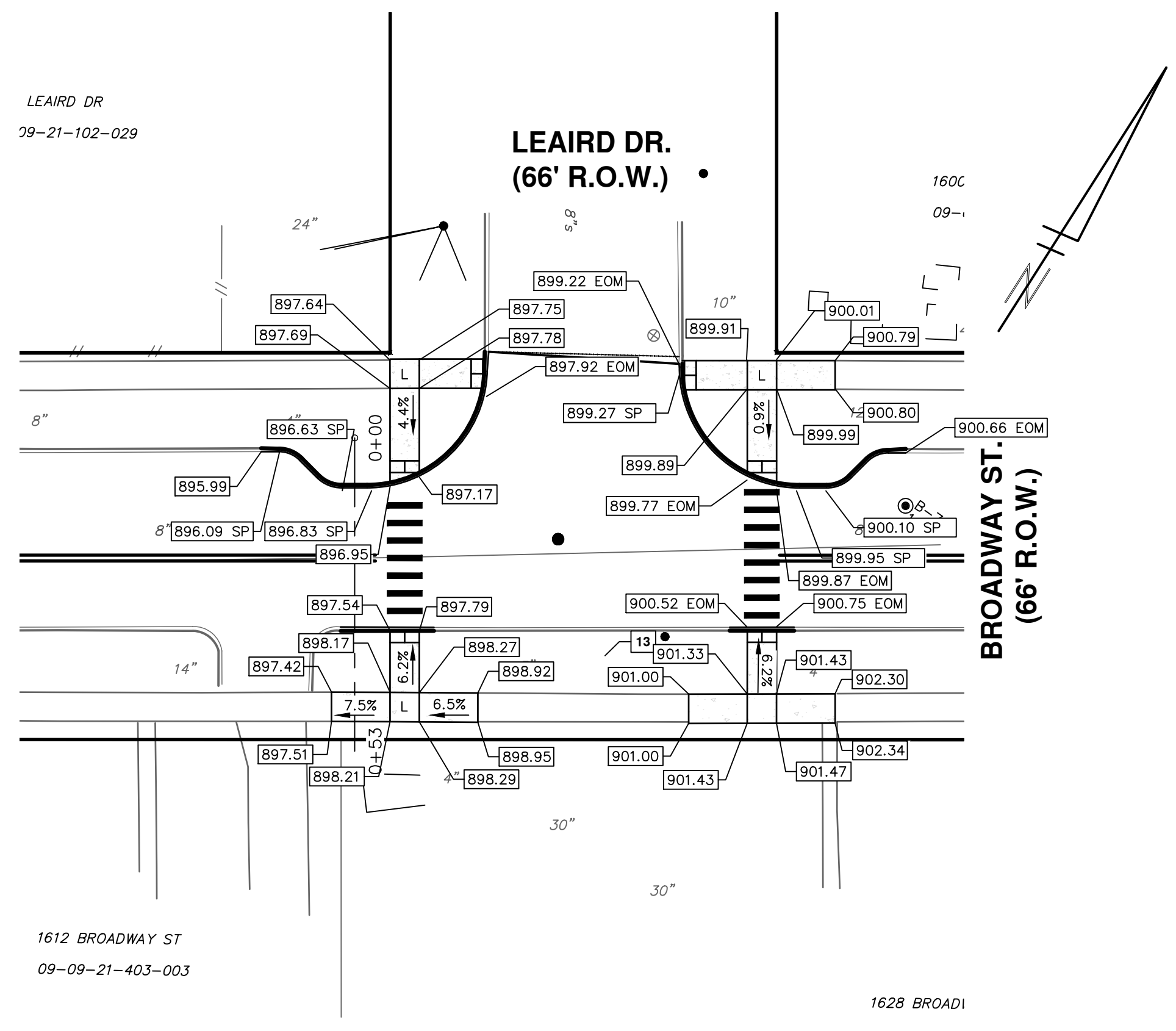
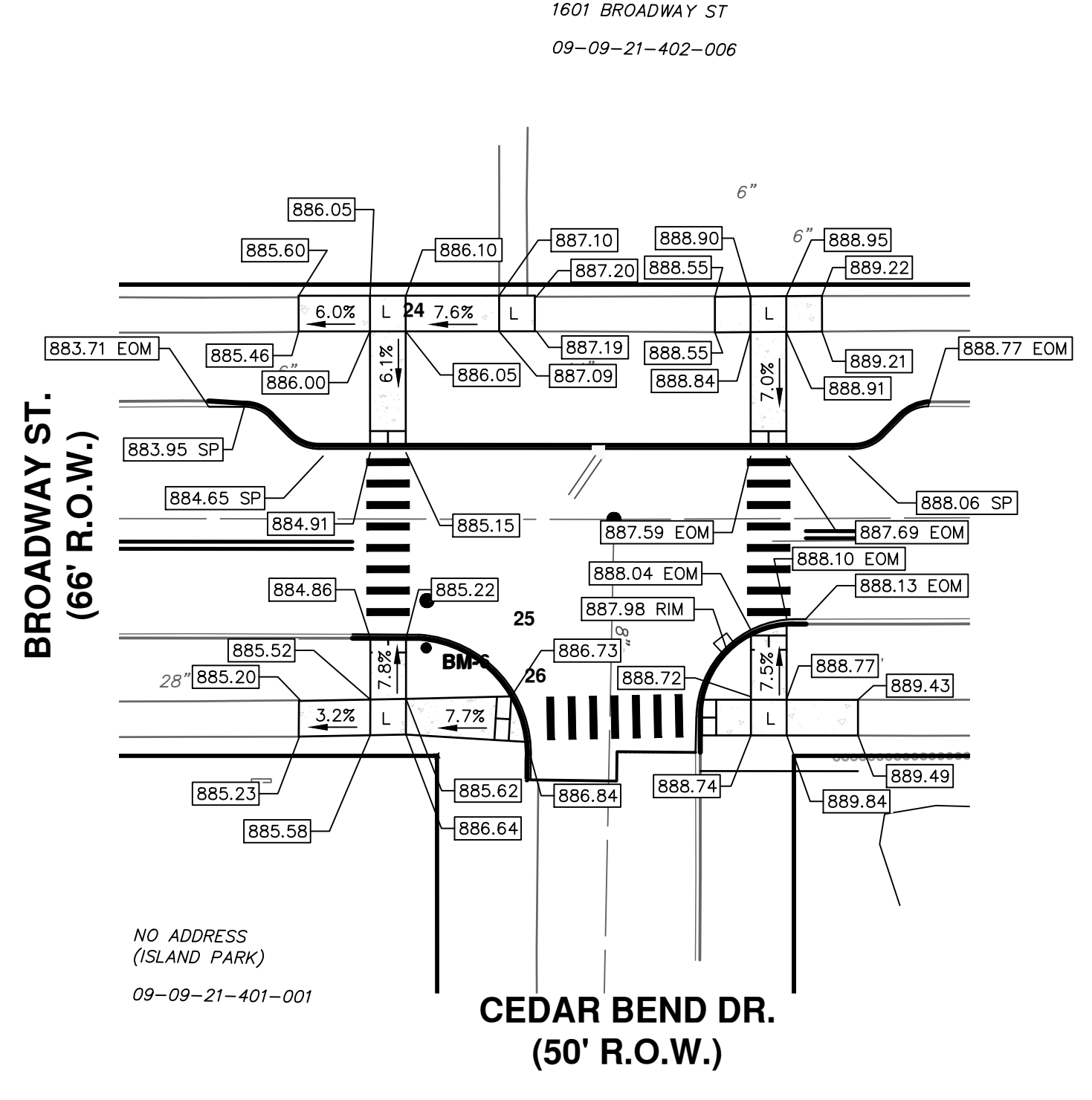
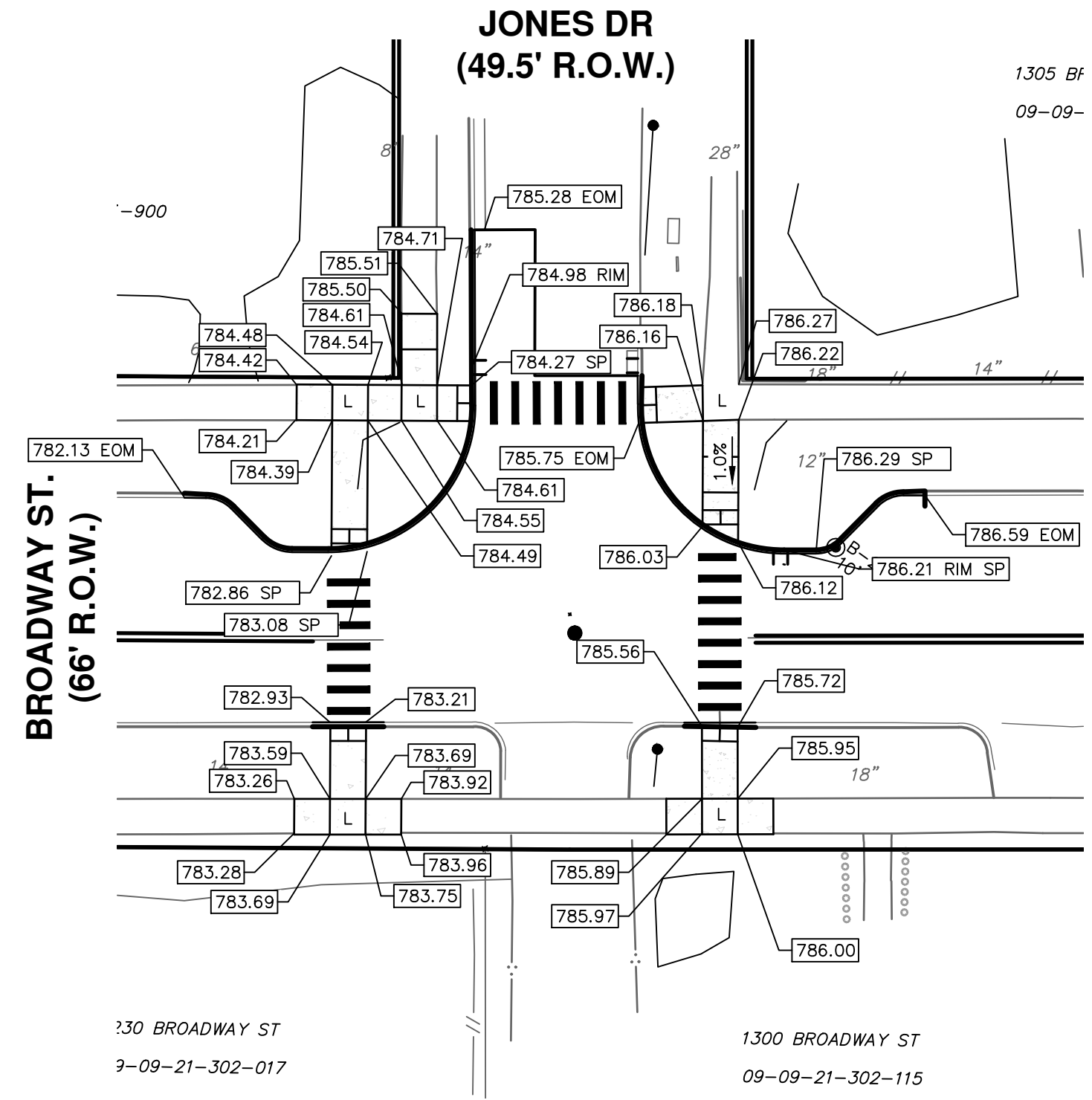
REV	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW



CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
 PROPOSED ROAD AND STORM
 STA. 149+00 TO STA. 154+00

SHEET No. **40 OF 50**
 DRAWING No. **2020030-40**
 PROFILE: 1" = 4'
 SCALE: PLAN: 1" = 20'

Z:\2021\211210\CAD\CD\211210_detail_grading.dwg Dwg Created: 4-Aug-22 - _a2 standard bw.stb - Plot Date: 16-Dec-22



REV.	DATE	DESCRIPTION	DRAWN	CHECKED
03	12/16/2022	ISSUED FOR BIDS	ML2	PK2
02	7/15/2022	100% OWNER REVIEW	ML2	PK2
01	6/16/2022	95% OWNER REVIEW	ML2	PK2
00	5/26/2022	60% OWNER REVIEW	ML2	PK2

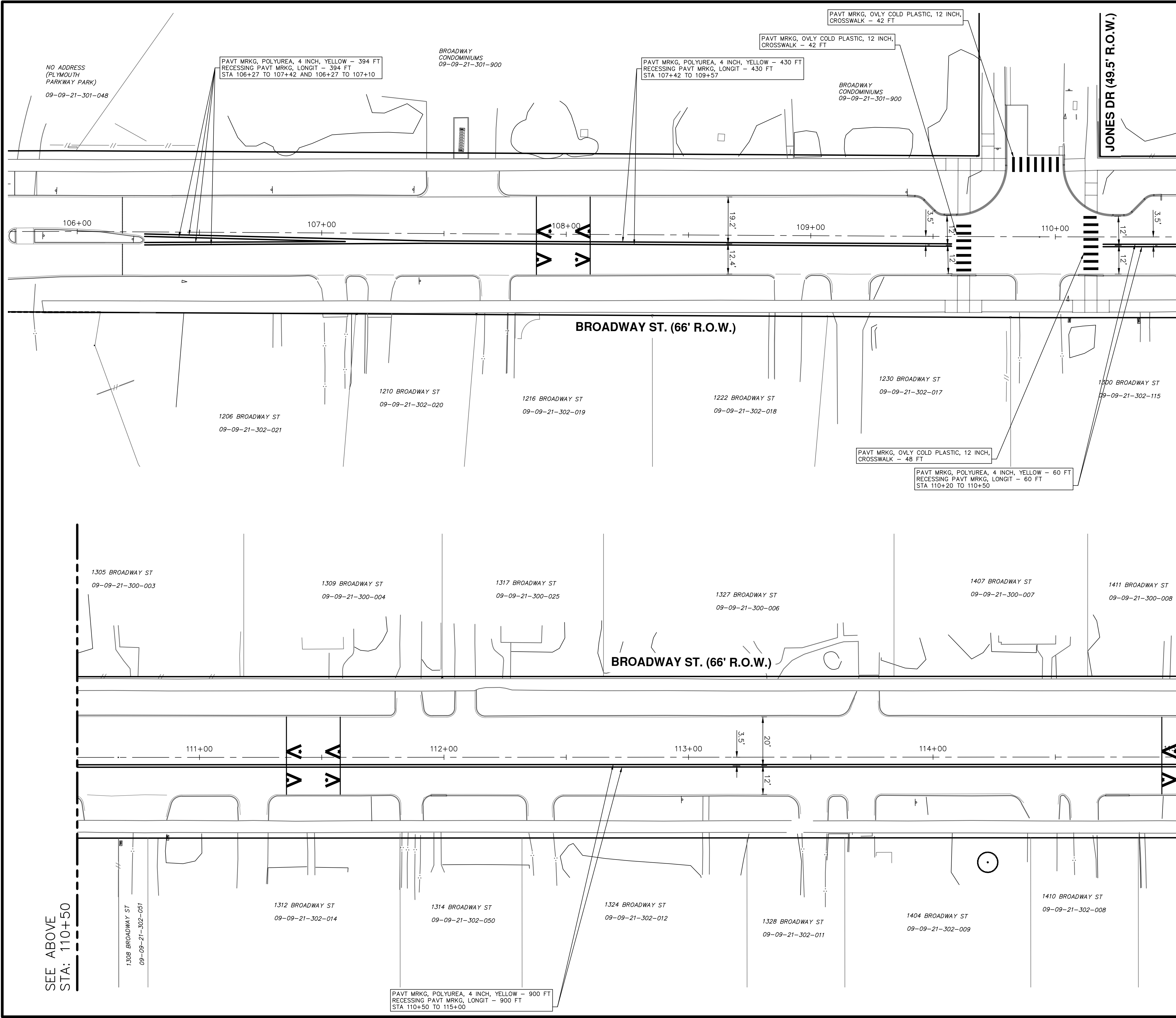
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 www.a2gov.org



CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
 BROADWAY STREET WATER MAIN
 INTERSECTION GRADES
 DETAIL GRADING

SCALE PLAN: 1" = 20'
 DRAWING No. 2020030-41

Z:\2021\211210\CAD\CD\211210_pavt marking.dwg Dwg Created: 22-Nov-22 - _a2 standard bw.stb - Plot Date: 16-Dec-22



SEE BELOW
STA: 110+50

SEE SHEET 43
STA: 115+00

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING

BROADWAY STREET WATER MAIN

PAVEMENT MARKINGS

STA. 106+00 TO STA. 115+00

SCALE PLAN: 1" = 20'

DRAWING No. 2020030-42

811

Know what's below.
Call before you dig.

REV.	DATE	DESCRIPTION
03	12/16/2022	ISSUED FOR BIDS
02	7/15/2022	100% OWNER REVIEW
01	6/16/2022	95% OWNER REVIEW
00	5/26/2022	60% OWNER REVIEW

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PK2
PK2
PK2
PK2

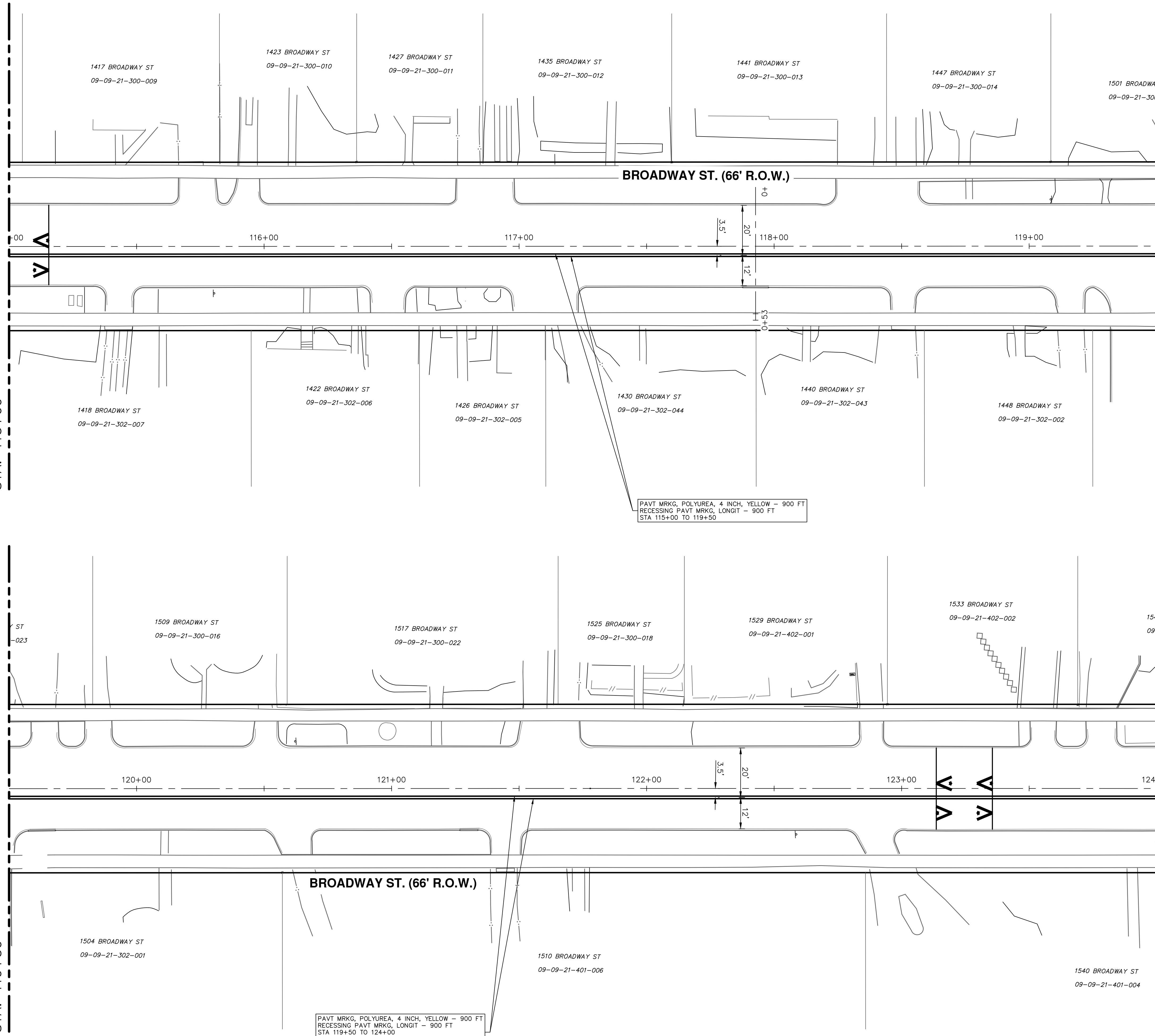
ML2
ML2
ML2
ML2

CHECKED
DRAWN

Z:\2021\211210\CAD\CD\211210_pavt marking.dwg Dwg Created: 22-Nov-22 - _a2 standard bw.stb - Plot Date: 16-Dec-22

SEE ABOVE
STA: 119+50

SEE SHEET 42
STA: 115+00



SEE BELOW
STA: 119+50

SEE SHEET 44
STA: 124+00



Know what's below.
Call Before you dig.

REV	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

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www.a3gov.org

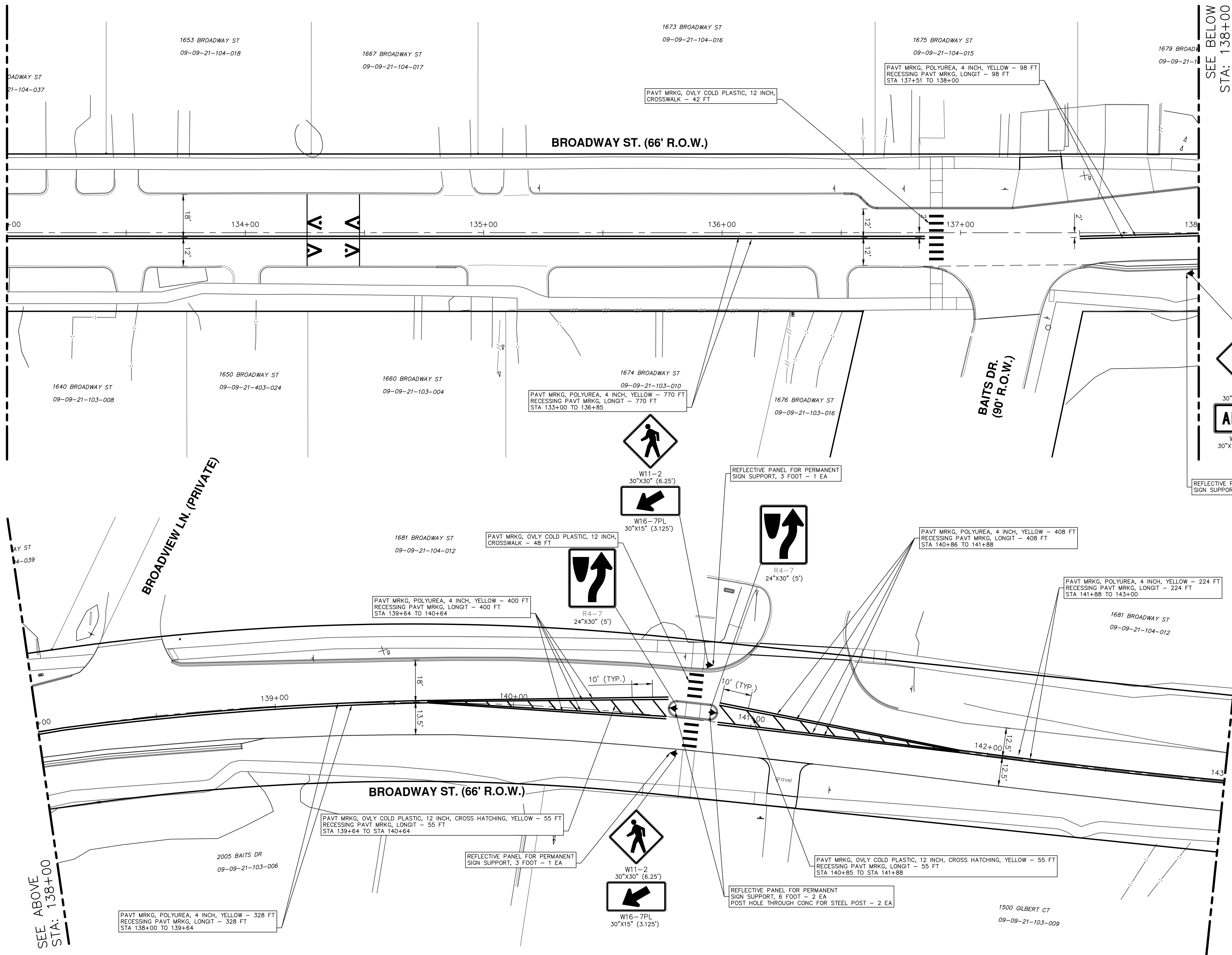


CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PAVEMENT MARKINGS
STA. 115+00 TO STA. 124+00

SCALE PLAN: 1" = 20'
DRAWING No. 2020030-43

Z:\2021\211210\CAD\CD\211210_pavt marking.dwg Dwg Created: 22-Nov-22 - _a2 standard bw.stb - Plot Date: 16-Dec-22

SEE SHEET 44
STA: 133+00



SEE ABOVE
STA: 138+00

SEE SHEET 46
STA: 143+00

SEE BELOW
STA: 138+00

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING
BROADWAY STREET WATER MAIN
PAVEMENT MARKINGS
STA. 133+00 TO STA. 143+00

SCALE PLAN: 1" = 20'
DRAWING No. 2020030-45

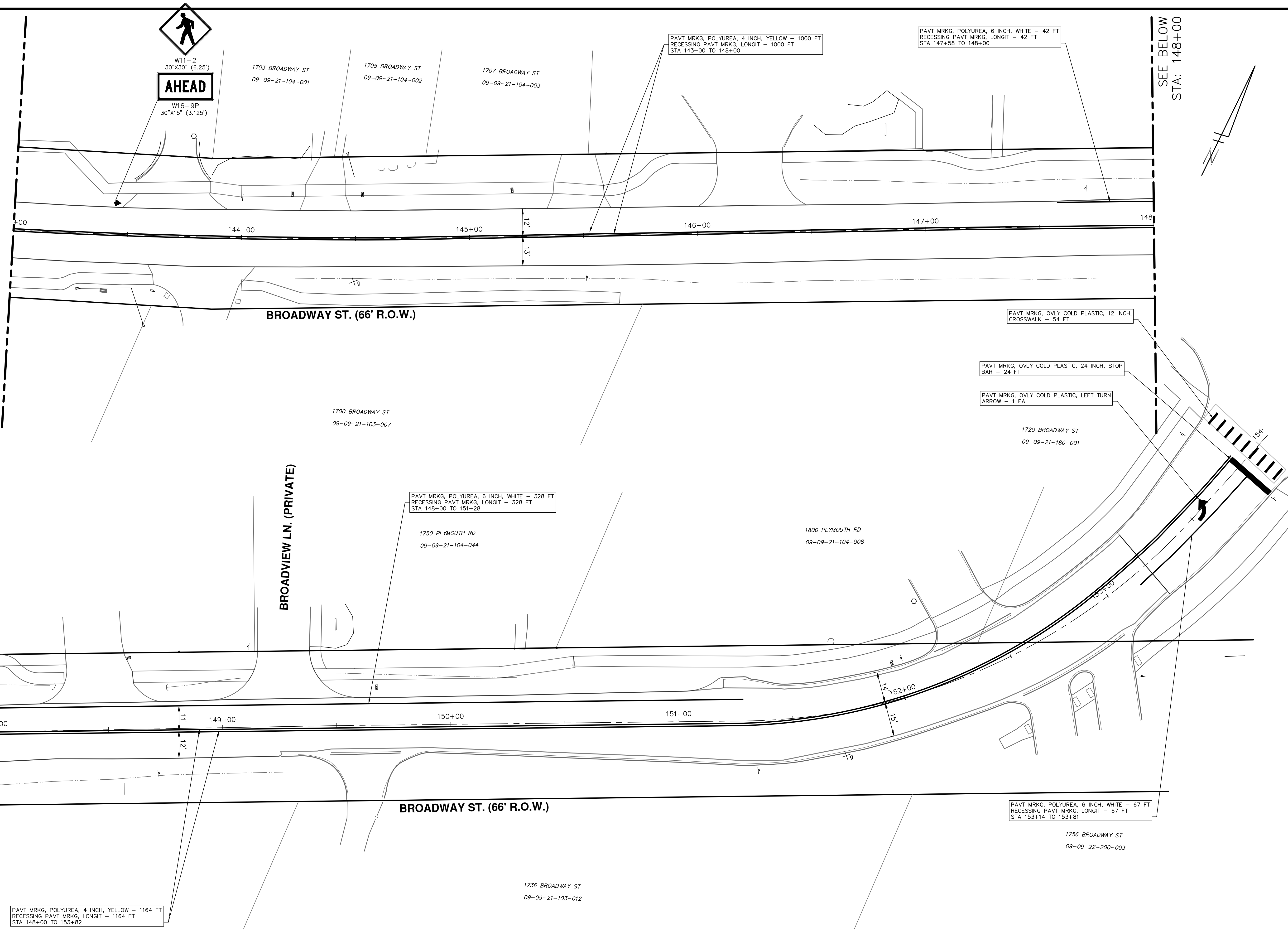
811
Know what's below.
Call Before you dig.

REV.	DATE	DESCRIPTION	DRAWN	CHECKED
03	12/16/2022	ISSUED FOR BIDS	ML2	PK2
02	7/15/2022	100% OWNER REVIEW	ML2	PK2
01	6/16/2022	95% OWNER REVIEW	ML2	PK2
00	5/26/2022	60% OWNER REVIEW	ML2	PK2

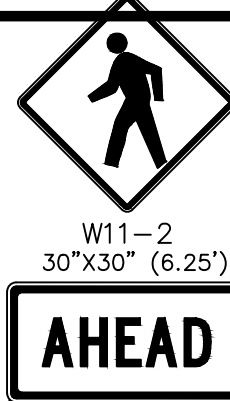
Z:\2021\211210\CAD\CD\211210_pavt_marking.dwg Dwg Created: 22-Nov-22 - _a2_standard_bw.stb - Plot Date: 16-Dec-22

SEE ABOVE
STA: 148+00


SEE SHEET 45
STA: 143+00



PAVT MRKG, POLYUREA, 4 INCH, YELLOW - 1164 FT
RECESSING PAVT MRKG, LONGIT - 1164 FT
STA 148+00 TO 153+82



W11-2
30"X30" (6.25')
AHEAD
W16-9P
30"X15" (3.125')

	
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING BROADWAY STREET WATER MAIN PAVEMENT MARKINGS STA. 143+00 TO STA. 153+21	
SCALE PLAN: 1" = 20' DRAWING No. 2020030-46	SHEET No. 46 OF 50
CITY OF ANN ARBOR PUBLIC SERVICES 301 EAST HURON STREET P.O. BOX 8647 ANN ARBOR, MI 48107-8647 www.a2gov.org	
03 ISSUED FOR BIDS 02 100% OWNER REVIEW 01 95% OWNER REVIEW 00 60% OWNER REVIEW	PK2 ML2 ML2 ML2 ML2 DATE DRAWN CHECKED



Testing Engineers & Consultants, Inc.
 1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
 (248) 588-6200 or (313) T-E-S-T-I-N-G
 Fax (248) 588-6232

Boring No.: B-2		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.25	ASPHALT (3")			
2.5	LS 3 2 4			Loose Moist Brown Fine SAND With Trace Of Gravel & Clay	6.8	127	
5.0	LS 2 2 4				6.5	128	
7.5	LS 9 13 17		5.75	Medium Compact Moist Brown Fine SAND With Trace Of Gravel	4.2	139	
10.0	LS 9 13 14		10		4.7	138	
				Bottom of Boring at 10'			

"N" - Standard Penetration Resistance w - H2O, % of dry weight
 SS - 2" I.D. Split Spoon Sample d - Bulk Density, pcf
 LS - Sectional Liner Sample qu - Unconfined Compression, tsf
 ST - Shelby Tube Sample DP - Direct Push
 AS - Auger Sample RC - Rock Core

Water Encountered: None
 At Completion: None
 Boring No. B-2



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 (248) 588-6200 or (313) T-E-S-T-I-N-G
 Fax (248) 588-6232

Boring No.: B-3		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.25	ASPHALT (3")			
2.5	LS 3 8 6		.67	Moist Brown Sand With Some Gravel-FILL (5")	17.9	130	
5.0	LS 2 3 4		3	Medium Compact Moist Brown SAND With Trace Of Gravel & Clay	11.5	129	
			5	Loose Moist Brown SAND With Clayey Seams			
				Bottom of Boring at 5'			

"N" - Standard Penetration Resistance w - H2O, % of dry weight
 SS - 2" I.D. Split Spoon Sample d - Bulk Density, pcf
 LS - Sectional Liner Sample qu - Unconfined Compression, tsf
 ST - Shelby Tube Sample DP - Direct Push
 AS - Auger Sample RC - Rock Core

Water Encountered: None
 At Completion: None
 Boring No. B-3



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Boring No.: B-4		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			1	ASPHALT			
2.5	LS 3 5 5		2.08	Stiff Moist Brown Clay With Some Silt & Trace Of Gravel-FILL	11.1	133	4120
5.0	LS 2 2 3		3.5	Loose Moist Brown Fine Sand With Trace Of Gravel-FILL	11.5	129	
7.5	LS 5 6 9		6	Loose Moist Brown Fine Sand With Trace Of Gravel & Crushed Asphalt-FILL	6.3	137	
10.0	LS 10 12 12		10	Medium Compact Moist Brown Fine SAND With Trace Of Gravel	4.4	130	
				Bottom of Boring at 10'			

"N" - Standard Penetration Resistance w - H2O, % of dry weight
 SS - 2" I.D. Split Spoon Sample d - Bulk Density, pcf
 LS - Sectional Liner Sample qu - Unconfined Compression, tsf
 ST - Shelby Tube Sample DP - Direct Push
 AS - Auger Sample RC - Rock Core

Water Encountered: None
 At Completion: None
 Boring No. B-4



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03	ISSUED FOR BIDS	12/16/2022	ML2	PK2	CHECKED
02	100% OWNER REVIEW	7/15/2022	ML2	PK2	DRAWN
01	95% OWNER REVIEW	6/16/2022	ML2	PK2	DRAWN
00	60% OWNER REVIEW	5/26/2022	ML2	PK2	CHECKED
		DATE			

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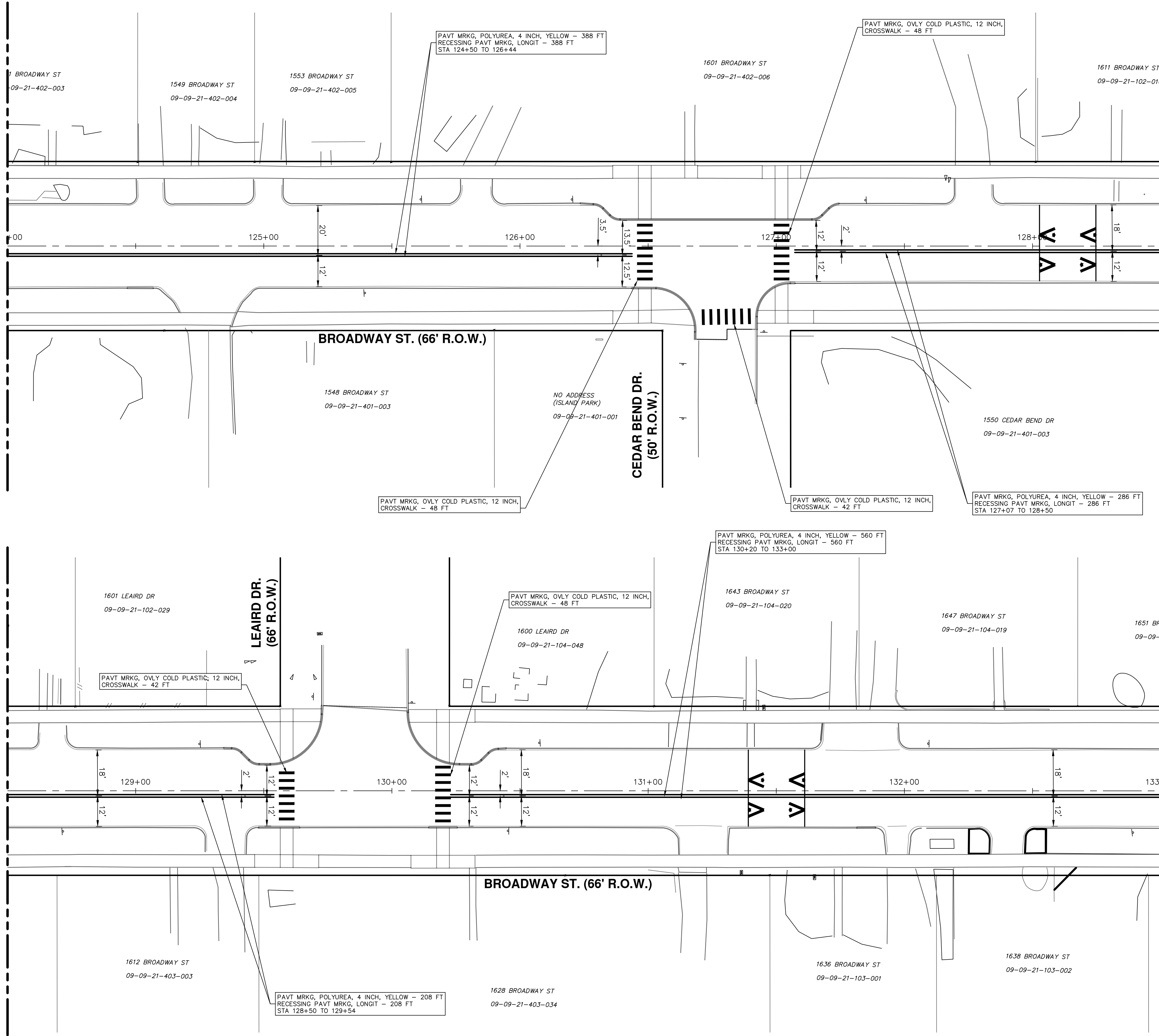
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 SOIL BORINGS

SCALE: NTS
 DRAWING No. 2020030-47

Z:\2021\211210\CAD\CD\211210_pavt marking.dwg Dwg Created: 22-Nov-22 - _a2 standard bw.stb - Plot Date: 16-Dec-22

SEE ABOVE
STA: 128+50

SEE SHEET 43
STA: 124+00



SEE SHEET 45
STA: 133+00

SEE BELOW
STA: 128+50



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REV.	DESCRIPTION	DATE	DRAWN	CHECKED
03	ISSUED FOR BIDS	12/16/2022	ML2	PK2
02	100% OWNER REVIEW	7/15/2022	ML2	PK2
01	95% OWNER REVIEW	6/16/2022	ML2	PK2
00	60% OWNER REVIEW	5/26/2022	ML2	PK2

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Boring No.: B-5		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
0.0			2.9	ASPHALT (3 1/2")			
2.5	LS 4 6 7			Medium Compact Moist Brown SAND With Some Gravel & Clayey Seams	6.8	136	
5.0	LS 4 5 7		5	Bottom of Boring at 5'	5.1	139	
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-5
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Boring No.: B-6		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
0.0			4.8	ASPHALT (5 1/2")			
2.5	LS 4 8 7			Moist Brown Sand With Some Gravel-FILL (4 1/2")	11.9	137	
5.0	LS 4 7 10		5	Stiff Moist Brown CLAY With Some Silt	26.5	118	7420
5.0				Bottom of Boring at 5'			
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-6
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Boring No.: B-7		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
0.0			2.3	ASPHALT (2 3/4")			
2.5	LS 3 4 4		.58	Moist Brown Clayey Sand With Some Gravel-FILL (4 1/4")	10.8	138	2880
5.0	LS 5 4 3		3	Firm Moist Brown CLAY With Some Silt	8.9	133	
5.0			5.5	Loose Moist Brown SAND With Some Gravel			
7.5	LS 5 7 10			Medium Compact Moist Brown SAND With Some Gravel	9.6	140	
7.5			8	Medium Compact Moist Brown Clayey SAND With Trace Of Gravel	11.4	137	
10.0	LS 4 8 8		10	Bottom of Boring at 10'			
12.5							
15.0							
17.5							
20.0							
22.5							

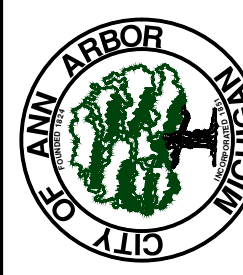
"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-7
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03	ISSUED FOR BIDS	12/16/2022	ML2	PK2	CHECKED
02	100% OWNER REVIEW	7/15/2022	ML2	PK2	DRAWN
01	95% OWNER REVIEW	6/16/2022	ML2	PK2	DRAWN
00	60% OWNER REVIEW	5/26/2022	ML2	PK2	CHECKED
		DATE			

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SCALE: NTS
 DRAWING No. 2020030-48



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Boring No.: B-8		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.35	ASPHALT (4 1/4")			
2.5	LS 9 15 12			Medium Compact Moist Brown Clayey SAND With Trace Of Gravel & Clay Layers	9.9	140	
5.0	LS 7 9 7		5		13.8	134	
				Bottom of Boring at 5'			

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-8
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Boring No.: B-9		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.31 .32	ASPHALT (3 3/4")			
2.5	LS 2 2 2			Moist Brown Sand With Some Gravel-FILL (7 1/4")	12.2	130	
5.0	LS 3 4 6		5	Soft Moist Brown CLAY With Some Silt	7.5	119	
				Loose Moist Brown SAND With Trace Of Gravel			
				Bottom of Boring at 5'			

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-9
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Boring No.: B-10		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road			
Client: City of Ann Arbor		Location: Ann Arbor, Michigan					
Type of Rig: Truck		Drilled By: I. Mickle					
Drilling Method: Solid Stem Augers		Started: 8/28/2021					
Ground Surface Elevation:		Completed: 8/28/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.31	ASPHALT (3 3/4")			
2.5	LS 3 5 4			Loose Moist Brown Clayey SAND With Trace Of Gravel	12.6	128	
5.0	LS 3 4 4		5.5		14.8	125	
				Compact Moist Brown SAND With Some Gravel & Clayey Seams	5.1	139	
7.5	LS 11 15 21				7.1	136	
10.0	LS 17 21 22		10				
				Bottom of Boring at 10'			

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-10
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Know what's below.
Call Before you dig.

03	ISSUED FOR BIDS	12/16/2022	ML2	PK2	CHECKED
02	100% OWNER REVIEW	7/15/2022	ML2	PK2	DRAWN
01	95% OWNER REVIEW	6/16/2022	ML2	PK2	DRAWN
00	60% OWNER REVIEW	5/26/2022	ML2	PK2	CHECKED
	REV.	DATE			

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 SOIL BORINGS
 SCALE: NTS
 DRAWING No. 2020030-49

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Boring No.: B-11		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road	
Client: City of Ann Arbor		Location: Ann Arbor, Michigan			
Type of Rig: Truck		Drilled By: I. Mickle			
Drilling Method: Solid Stem Augers		Started: 8/28/2021			
Ground Surface Elevation:		Completed: 8/28/2021			

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.31	ASPHALT (3 3/4")			
2.5	LS	2 3 2		Moist Brown Sand With Some Gravel & Crushed Stone-FILL (8 1/4")	19.0	122	
5.0	LS	2 2 3	5	Plastic Moist Brown CLAY With Some Silt	16.3	126	
5.0				Bottom of Boring at 5'			

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-11
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Boring No.: B-12		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road	
Client: City of Ann Arbor		Location: Ann Arbor, Michigan			
Type of Rig: Truck		Drilled By: I. Mickle			
Drilling Method: Solid Stem Augers		Started: 8/28/2021			
Ground Surface Elevation:		Completed: 8/28/2021			

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.27	ASPHALT (3 1/4")			
2.5	LS	4 4 4		Loose Moist Brown Clayey SAND With Trace Of Gravel	8.5	133	
5.0	LS	3 4 4	5.5	Very Loose Moist Brown Clayey SAND With Trace Of Gravel	17.9	121	
5.0	LS	2 2 2		Very Loose Moist Brown Clayey SAND With Trace Of Gravel	9.7	132	
7.5	LS	7 12 29	10	Compact Moist Brown SAND With Trace Of Gravel & Pebble	4.9	139	
10.0				Bottom of Boring at 10'			

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-12
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Boring No.: B-13		Job No.: 62013		Project: Broadway Street Roundabout To Plymouth Road	
Client: City of Ann Arbor		Location: Ann Arbor, Michigan			
Type of Rig: Truck		Drilled By: I. Mickle			
Drilling Method: Solid Stem Augers		Started: 8/28/2021			
Ground Surface Elevation:		Completed: 8/28/2021			

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			.58	ASPHALT (7")			
2.5	LS	12 16 18		Crushed Stone-FILL (5")	5.0	139	
5.0	LS	7 8 8	5	Medium Compact Moist Brown SAND With Trace Of Gravel			
5.0				Bottom of Boring at 5'			

"N" - Standard Penetration Resistance SS - 2" I.D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample	w - H2O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core	Water Encountered: None At Completion: None Boring No. B-13
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PK2	ML2	12/16/2022	ISSUED FOR BIDS
PK2	ML2	7/15/2022	100% OWNER REVIEW
PK2	ML2	6/16/2022	95% OWNER REVIEW
PK2	ML2	5/26/2022	60% OWNER REVIEW
CHECKED	DRAWN	DATE	DESCRIPTION

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