CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT PROJECT

710 AVIS DRIVE, SUITE 100
ANN ARBOR, MI 48108
Tel. 734.665.6000 Fax. 734.213.3003
www.tetratech.com

TETRA TECH

PROJECT LOCATION:
4350 S. STATE ST.
ANN ARBOR, MI 48108

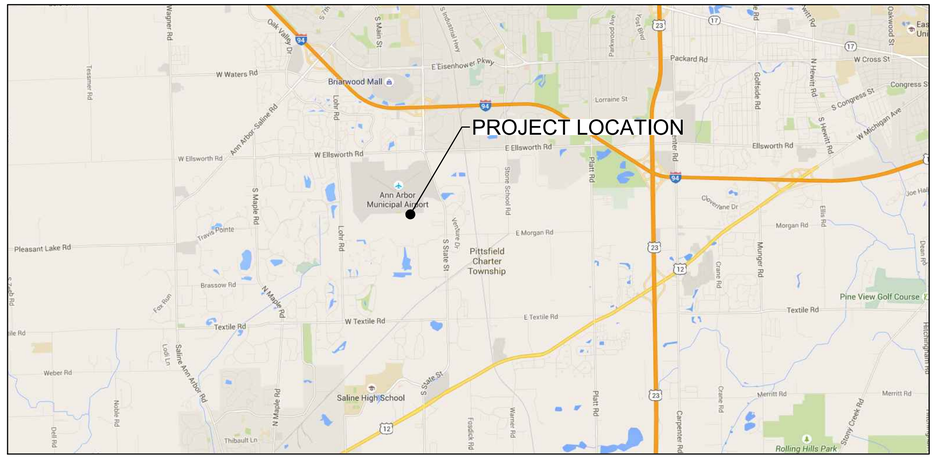
CLIENT INFORMATION:
CITY OF ANN ARBOR
WATER TREATMENT SERVICES UNIT

Tt PROJECT No.:
200-31537-15005

CLIENT PROJECT No.:
ITB #: 4440, FILE #: 17001

PROJECT DESCRIPTION / NOTES:

ISSUED:
APRIL 15, 2016 - BID SET



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VICINITY MAP:

SITE LEGEND

SITE SYMBOLS

FEATURES

- EXISTING SIGN
- PROPOSED SIGN
- TRASH RECEPTACLE (TR)
- PICNIC TABLE
- POST (P)
- MAIL BOX (MB)
- POWER METER (PM)
- FLAG POLE (FLAG)
- ROCK (R)
- GUY WIRE
- UTILITY POLE
- DECIDUOUS TREE
- EVERGREEN TREE
- PALM TREE
- BUSH
- STUMP

STORM / DRAINAGE

- EXISTING MANHOLE (SD)
- PROPOSED MANHOLE (SD)
- EXISTING CULVERT
- PROPOSED CULVERT
- EXISTING INLET BASIN (SD)
- PROPOSED INLET BASIN (SD)
- PROPOSED INLET BASIN (SD)

MISCELLANEOUS

- MONITORING WELL (MW-)
- SOIL BORING (B-)
- MANHOLE W/ ID (MH-??)
- SPOT ELEVATION (×???.??)
- SLOPE ARROW (1%)
- SLOPE ARROW (1%)
- HANDICAP MARKING
- FUTURE IMPROVEMENTS (F)

SURVEY

- FOUND PROPERTY CORNER (FI)
- SET PROPERTY CORNER (SI)
- FOUND MONUMENT (FM)
- SET MONUMENT (SM)
- OWNERSHIP TIE
- SECTION CORNER
- BENCHMARK (BM#)
- KEY NOTE (X)
- SOIL EROSION AND SEDIMENTATION CONTROL NOTE (YY)

UTILITY SYMBOLS

WATER

- DRINKING FOUNTAIN (DF)
- EXISTING VALVE IN BOX (WV)
- PROPOSED VALVE IN BOX (WV)
- EXISTING CURB STOP (WCS)
- PROPOSED CURB STOP (WCS)
- METER (WM)
- EXISTING VALVE MANHOLE (W)
- PROPOSED VALVE MANHOLE (W)
- EXISTING WELL (WELL)
- PROPOSED WELL (WELL)
- EXISTING FIRE HYDRANT (FH)
- PROPOSED FIRE HYDRANT (FH)
- SPRINKLER HEAD (SH)
- IRRIGATION BOX (IJ)
- SPIGOT (SPIG)
- LOCATION FLAG (W)

SANITARY SEWER

- EXISTING MANHOLE (SS)
- PROPOSED MANHOLE (SS)
- EXISTING AIR RELEASE STRUCTURE (ARS)
- PROPOSED AIR RELEASE STRUCTURE (ARS)
- EXISTING IN-LINE FLUSH CONNECTION (ILFC)
- PROPOSED IN-LINE FLUSH CONNECTION (ILFC)
- EXISTING IN-LINE FLUSH CONNECTION (TFC)
- PROPOSED IN-LINE FLUSH CONNECTION (TFC)
- EXISTING CLEAN OUT (CO)
- PROPOSED CLEAN OUT (CO)
- EXISTING SEWER VALVE (SV)
- PROPOSED SEWER VALVE (SV)
- EXISTING CURB STOP (SCS)
- PROPOSED CURB STOP (SCS)
- PUMP STATION (SIMPLEX)
- PUMP STATION (DUPLEX)
- SEWER LATERAL
- LOCATION FLAG (SS)

NATURAL GAS

- MARKER (G)
- LOCATION FLAG (G)
- VALVE (GV)
- POINT OF CONNECTION (POC)

CABLE TV

- RISER (TV)
- LOCATION FLAG (TV)
- JUNCTION BOX (CJ)

COMMUNICATIONS

- TELEPHONE (TEL)
- BOX OR RISER (TB)
- JUNCTION BOX (TJ)
- FIBER OPTIC BOX (FO)
- LOCATION FLAG (T)
- FIBER OPTIC FLAG (FO)
- MANHOLE (TEL)
- VAULT (TEL)
- SATELLITE DISH

UTILITY SYMBOLS (CONT'D.)

ELECTRICAL

- METER (EM)
- TRANSFORMER (ET)
- BOX OR RISER (EB)
- LOCATION FLAG (E)
- LIGHT POLE
- EXTERIOR BUILDING LIGHT
- TRAFFIC SIGNAL POLE (TSP)
- TRAFFIC SIGNAL CONTROL (BOX) (TS)
- RAIL ROAD SIGNAL (RR)
- MANHOLE (ELEC)
- JUNCTION BOX (EJ)

FEATURE HATCHING

- EXISTING TO BE DEMOLISHED
- EXISTING CONCRETE TO BE DEMOLISHED
- PROPOSED PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED LIGHT DUTY ASHPALT PAVEMENT
- PROPOSED HEAVY DUTY ASHPALT PAVEMENT
- PROPOSED GRAVEL
- WETLAND AREA
- PROPOSED SOD

FEATURES & FEATURE LINES

- GRADING LIMITS
- RIGHT OF WAY LINE
- SECTION LINE
- UTILITY EASEMENTS
- 900 EXISTING CONTOUR - MAJOR
- 899 EXISTING CONTOUR - MINOR
- 899 PROPOSED CONTOUR - MAJOR
- 899 PROPOSED CONTOUR - MINOR
- SF EROSION SILT FENCE
- SSF EROSION SUPER SILT FENCE
- FENCE (WOOD)
- FENCE (STEEL)
- FLOOD HAZARD AREA
- FLOW ARROW
- GUARD RAILING
- GRAVEL ROAD OR DRIVE
- RAIL ROAD TRACKS
- ROCK RETAINING WALL
- TREE / BRUSH LINES
- CLEARING & GRUBBING LIMITS
- WATER EDGES
- DITCH CENTER LINE
- WETLAND BOUNDARY
- PROPOSED SUPERSTRUCTURE
- EXISTING SUPERSTRUCTURE
- STRUCTURE (TANKS, ETC.)
- EXISTING UNDERGROUND STRUCTURE
- FUTURE STRUCTURE

UTILITY LINES

- OTV CABLE TV OVERHEAD
- UTV CABLE TV UNDERGROUND
- FO COMMUNICATION FIBER OPTIC
- OT COMMUNICATION OVERHEAD
- UT COMMUNICATION UNDERGROUND
- OE ELECTRIC OVERHEAD
- UE ELECTRIC UNDERGROUND
- G NATURAL GAS
- HPG NATURAL GAS HIGH PRESSURE
- JT JET FUEL
- FM SANITARY FORCEMAIN
- SS SANITARY SEWER LINE
- SD STORM DRAIN
- RD STORM ROOF DRAIN
- SM STEAM
- F FIRE PROTECTION
- W WATER MAIN
- 36"SS UTILITY LINE 36" AND LARGER

NOTE: HEAVIER LINE WEIGHTS INDICATE PROPOSED WORK.

GENERAL NOTES

1. THREE FULL WORKING DAYS PRIOR TO ANY EXCAVATION; THE CONTRACTOR SHALL CONTACT MISS DIG (1-800-482-7171) FOR LOCATION OF UNDERGROUND UTILITIES LOCATED IN THE VICINITY OF THE WORK. THE CONTRACTOR MAY NEED TO COORDINATE UTILITY COMPANY ACCESS TO AIRPORT PROPERTY, OR CONTRACT OUTSIDE AGENCY TO PERFORM LOCATING UNDERGROUND UTILITIES IF REQUIRED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MARKING ANY UNDERGROUND LINES IN THE VICINITY OF THE WORK NOT OWNED BY A UTILITY.
2. THE CONTRACTOR SHALL MAKE ANY NECESSARY ARRANGEMENTS WITH UTILITY COMPANIES FOR RELOCATION OF EXISTING UTILITIES, IF REQUIRED.
3. UNLESS SPECIFICALLY NOTED FOR REMOVAL ON THE CONSTRUCTION PLANS, ALL SIDEWALK, DRIVES, CULVERTS, GUARDRAILS AND ABOVE GROUND UTILITIES DAMAGED OR DESTROYED DURING CONSTRUCTION SHALL BE REMOVED AND REPLACED, INCIDENTAL TO THE COST OF CONSTRUCTION, AT NO EXPENSE TO THE OWNER.
4. EXISTING WATER MAINS, GAS MAINS AND UNDERGROUND TELEPHONE, ELECTRIC AND CABLE TELEVISION CONDUITS AND/OR LINES ARE SHOWN ONLY IN THE PLAN VIEW OF THE CONSTRUCTION DRAWINGS. THE EXACT DEPTH OF THESE UTILITIES IS NOT KNOWN AND NO ATTEMPT HAS BEEN MADE TO SHOW SUCH UTILITIES IN THE PROFILE OF THE CONSTRUCTION DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THESE UTILITIES WHICH ARE NOT WITHIN THE SPACE OCCUPIED BY COMPLETED PIPES OR STRUCTURES THAT ARE A PART OF THIS CONTRACT. DURING CONSTRUCTION, IF DAMAGED OR DESTROYED DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COSTS TO REPAIR OR REPLACE THEM AT NO ADDITIONAL EXPENSE TO THE OWNER.
5. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES IN A MANNER ACCEPTABLE TO THE ENGINEER DURING THE PROPOSED CONSTRUCTION. ANY UTILITY, WHICH IS TO REMAIN IN SERVICE, THAT IS DAMAGED OR DESTROYED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. IF THE EXISTING 30-INCH WATER MAIN IS DAMAGED DUE TO THE CONTRACTOR'S CONSTRUCTION ACTIVITIES, EXTENSIONS TO THE CONTRACT TIME WILL NOT BE GRANTED WHILE THE CONTRACTOR IS REPAIRING THE 30-INCH WATER MAIN, IF IT IS DETERMINED THAT THE CONTRACTOR'S ACTIVITIES HAVE CAUSED OR WERE RELATED TO, THE BREAKING OF THE WATER MAIN.
6. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT POINTS OF POSSIBLE CONFLICT SO THAT THESE CONFLICTS CAN BE RESOLVED.
7. CONTRACTOR SHALL KEEP WORK, MATERIALS, EQUIPMENT INSIDE THE DEFINED WORK AREA FOR THE DURATION OF THE PROJECT.
8. CONTRACTOR SHALL KEEP ALL EQUIPMENT OFF OF ALL PAVED AREAS WITHIN THE AIRPORT PROPERTY.
9. ANY DAMAGE DONE BY THE CONTRACTOR OUTSIDE THE WORK AREA WILL BE REPAIRED AT THE SOLE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.
10. CONTRACTOR SHALL HAVE NO MORE THAN 25 LF OF OPEN TRENCH AT THE END OF EACH DAY IN AREAS OTHER THAN THE RUNWAY PROTECTION ZONES. IN RUNWAY PROTECTION ZONES THE CONTRACTOR SHALL HAVE NO MORE THAN 5 LF OF OPEN TRENCH AT THE END OF ANY DAY.
11. DURING CONSTRUCTION IN RUNWAY PROTECTION ZONES, THE CONTRACTOR MAY BE ASKED TO BRIEFLY STOP CONSTRUCTION AND LOWER ALL EQUIPMENT TO ALLOW AIRCRAFT TO LAND OR TAKEOFF. ANY ADDED EXPENSES THAT THE CONTRACTOR INCURS TO SATISFY THESE REQUIREMENTS SHALL BE INCLUDED IN THE BID PRICE AND WILL NOT BE PAID SEPARATELY.
12. THE CONTRACTOR MUST COORDINATE ALL WORK PROPOSED CONSTRUCTION IN THE RUNWAY PROTECTION AREAS WITH AIRPORT AND CONTROL TOWER PERSONNEL BEFORE STARTING WORK IN THESE AREAS.
13. THE CONTRACTOR MUST BE IN CONSTANT TWO-WAY RADIO CONTACT WITH THE CONTROL TOWER AT ALL TIMES WHEN WORKING IN THE RUNWAY PROTECTION ZONES.
14. ANY DAMAGE TO THE LIGHTING ON-SITE DURING CONSTRUCTION SHALL BE REPORTED TO THE AIRPORT IMMEDIATELY. ALL REPAIRS MUST BE ACCORDING TO NFPA NATIONAL ELECTRIC CODE SECTION 110.014(B), 300, 5(E) AND 300.50. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS. REPAIRS MUST BE MADE WITHIN 24 HOURS.
15. THE CONTRACTOR SHALL HAND DIG ALL AREAS OF ELECTRICAL LINES AND ALL HAZARDOUS AND FLAMMABLE LINES.
16. THE CONTRACTOR IS ONLY ALLOWED TO BE ON-SITE AND WORKING BETWEEN THE HOURS OF 8:30AM AND 7:30PM. THE CONTRACTOR SHALL CAREFULLY EVALUATE THESE CONTRACT REQUIREMENTS AND TAKE THEM INTO ACCOUNT DURING THE PREPARATION OF THEIR BID. THE CONTRACTOR SHALL COMPLETE ALL CONSTRUCTION AND RESTORATION WITHIN THE CONTRACT TIME ALLOWED.
17. AT THE COMPLETION OF THE PROJECT, CONTRACTOR SHALL TOP DRESS OR FILL RUTTING AND POTHOLES ALONG THE FULL LENGTH OF THE GRAVEL ACCESS DRIVE. REGRADE AS NECESSARY TO LEAVE A SMOOTH SURFACE.

NATURAL FEATURES IMPACT STATEMENT:

NATURAL FEATURES IMPACTED AS A RESULT OF THE WELL HOUSE 25W IMPROVEMENTS INCLUDE TREES AND BRUSH REQUIRING REMOVAL. BASED ON SITE INVESTIGATION, SURVEY BELIEVES ALL TREES NEAR WELL HOUSE 25W TO BE BOX ELDER, POPLAR AND COTTONWOOD (POPULUS DELTOIDES). THESE TREES ARE ALL BELIEVED TO FALL WITHIN THE PROHIBITED WEEDS AND INVASIVE PLANT LIST AS ADOPTED BY THE TOWNSHIP BOARD. TWO (2) CLUMPS OF SMALL DIAMETER (<6") AND TWO (2) LOW QUALITY TREES WERE SURVEYED FOR REMOVAL. THERE DO NOT APPEAR TO BE ANY HERITAGE TREES OR WOODLANDS.

THE TREE AND BRUSH REMOVAL IS NECESSARY AS PART OF THE OPERATION OF ESSENTIAL SERVICE FACILITIES OF THE CITY OF ANN ARBOR WATER TREATMENT SERVICES UNIT. IN ADDITION, THE 28" COTTONWOOD WAS SURVEYED AS BEING LOCATED WITHIN FALLING DISTANCE OF THE WELL HOUSE.

PITTSFIELD CHARTER TOWNSHIP SOIL EROSION AND SEDIMENTATION CONTROL NOTES:

1. NO EARTH CHANGE MAY TAKE PLACE UNTIL A TOWNSHIP SOIL EROSION PERMIT APPLICATION AND FEE ARE SUBMITTED AND THE SOIL EROSION CONTROL PERMIT IS ISSUED.
2. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AT ALL TIMES DURING CONSTRUCTION ON THIS PROJECT. ANY MODIFICATION OR ADDITIONS TO THE SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS, SHALL BE COMPLIED WITH AS REQUIRED OR DIRECTED BY THE OWNER, ENGINEER OR PITTSFIELD TOWNSHIP.
3. ALL SOIL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE PERMIT REQUIREMENTS OF PITTSFIELD TOWNSHIP AND THE LAWS OF THE STATE OF MICHIGAN.
4. AN NPDES CONSTRUCTION ACTIVITY PERMIT IS REQUIRED FOR ALL SITES GREATER THAN 5 ACRES.
5. DAILY INSPECTIONS OF THE SOIL EROSION CONTROL DEVICES SHALL BE MADE BY THE CONTRACTOR. PERIODIC INSPECTIONS MAY BE MADE BY THE OWNER/ENGINEER/TOWNHIP TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY CORRECTIONS SHALL BE MADE WITHOUT DELAY OR ADDITION EXPENSE TO THE PROJECT.
6. 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 IN WATERWAYS.
7. ALL MUD/DIRT TRACKED ONTO ROADS FROM THE SITE DUE TO CONSTRUCTION, SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR. THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUR SHALL BE IN INCLUDED IN THE ITEM "GENERAL CONDITIONS".
8. RESTORATION OF ALL DISTURBED AREAS INCLUDING PLACEMENT OF TOPSOIL, SEED, FERTILIZER AND MULCH AND/OR SOD SHALL BE DONE WITHIN 5 DAYS OF THE COMPLETION OF FINAL GRADE.
9. CONSTRUCTION OPERATIONS SHALL BE SCHEDULE 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.
10. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATION THAT PROMOTE EROSION.
11. PROPER DUST CONTROL SHALL BE MAINTAINED DURING CONSTRUCTION BY USE OF WATER TRUCKS AND/OR CHLORIDE AS REQUIRED.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND REMOVAL OF SAME UPON AUTHORIZED COMPLETION OF PROJECT. COMPLETION OF PROJECT WILL NOT BE AUTHORIZED UNTIL ALL SITE WORK, ROAD WORK AND UTILITY CONSTRUCTION IS COMPLETE AND ALL SOILS ARE STABILIZED.
13. TREE PROTECTION FENCING MUST REMAIN INTACT UNTIL RESTORATION TO THE SITE IS COMPLETE.
14. CONTRACTOR RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF ALL TEMPORARY AND PERMANENT SOIL EROSION AND SEDIMENTATION CONTROL (SESC) MEASURES DURING CONSTRUCTION. CONTRACTOR SHALL REMOVE ANY TEMPORARY SESC MEASURES AFTER PROJECT COMPLETION. CONTRACTOR RESPONSIBLE FOR OBTAINING, EXERCISING AND PERFORMING ALL WORK IN ACCORDANCE WITH THE CONDITIONS PROVIDED BY THE ISSUER OF THE SOIL EROSION AND SEDIMENTATION CONTROL PERMIT.
15. ENGINEER TO VERIFY PROPER INSTALLATION OF APPROVED SESC MEASURES PRIOR TO COMMENCEMENT OF EARTH DISTURBANCE ON SITE.
16. CONTRACTOR SHALL INSTALL SILT FENCING ALONG THE DOWN SLOPE SIDE OF ALL EXCAVATIONS INCLUDING SEWER/UTILITY TRENCHES.

SITE BENCHMARKS: (LOCAL ANN ARBOR DATUM)

BM1 - TOP OF BOLT LOCATED AT SW CORNER OF MIDDLE HANGAR SE CORNER OF ANN ARBOR AIRPORT. ELEV. 821.42

BM2 - NORTH EDGE OF RIM, GATE VALVE WELL, NORTH SIDE OF WELL HOUSE 25W. ELEV. 822.67

BM3 - NORTH EDGE OF RIM, GATE VALVE WELL, NORTH SIDE OF WELL HOUSE 21W. ELEV. 823.51

BM4 - ARROW ON FIRE HYDRANT 30' EAST OF WELL HOUSE 741. ELEV. 822.60

HORIZONTAL DATUM NOTE:

THIS DRAWING AND ALL COORDINATES SHOWN HEREON ARE BASED ON MICHIGAN STATE PLANE COORDINATES, SOUTH ZONE (2113) NAD83 (2011).

SOIL EROSION/SEDIMENT CONTROLS
SEE DETAILS SHEET C502

3	PERMANENT/TEMPORARY SEEDING	Inexpensive but effective erosion control measure to stabilize flat areas and mild slopes. Permits runoff to infiltrate soil, reducing runoff volumes. Proper preparation of the seed bed, fertilizing, mulching and watering is critical to its success.	•		•		•	•
14	GRAVEL ACCESS APPROACH	Provides a stable access to roadways minimizing fugitive dust and tracking of materials onto public streets and highways.					•	•
26	SILT FENCE	A permeable barrier erected below disturbed areas to capture sediment in sheet flow. Can be used to divert small volumes of water to stable outlets. Ineffective as a filter and should never be placed across streams or ditches where flow is concentrated.	•				•	•
29	INLET PROTECTION FABRIC DROP	Provides settling and filtering of silt laden water prior to its entry into the drainage system. Can be used in median and side ditches where vegetation will be disturbed. Allows for early use of drainage systems prior to project completion.			•		•	
33	MULCH BLANKETS AND HIGH VELOCITY MULCH BLANKETS	Mulch blankets provide an immediate and effective cover over raw erodible slopes affording excellent protection against rain and wind erosion. High velocity mulch blankets work well for stabilizing the bottom of ditches in waterways.	•		•		•	•
37	CHECK DAM	Can be constructed across ditches or any area of concentrated flow. Protects vegetation in early stages of growth. A Check Dam is intended to reduce water velocities and capture sediment. A Check Dam is not a filtering device.	•		•			•

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN — BRIAN M. PURSLEY — REGISTERED PROFESSIONAL ENGINEER — No. 39195 — LICENSED PROFESSIONAL

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

SITE
LEGEND AND NOTES

Project No.:	200-31537-15005
Designed By:	EMS
Drawn By:	EMS
Checked By:	BMR

C-001

Bar Measures 1 inch

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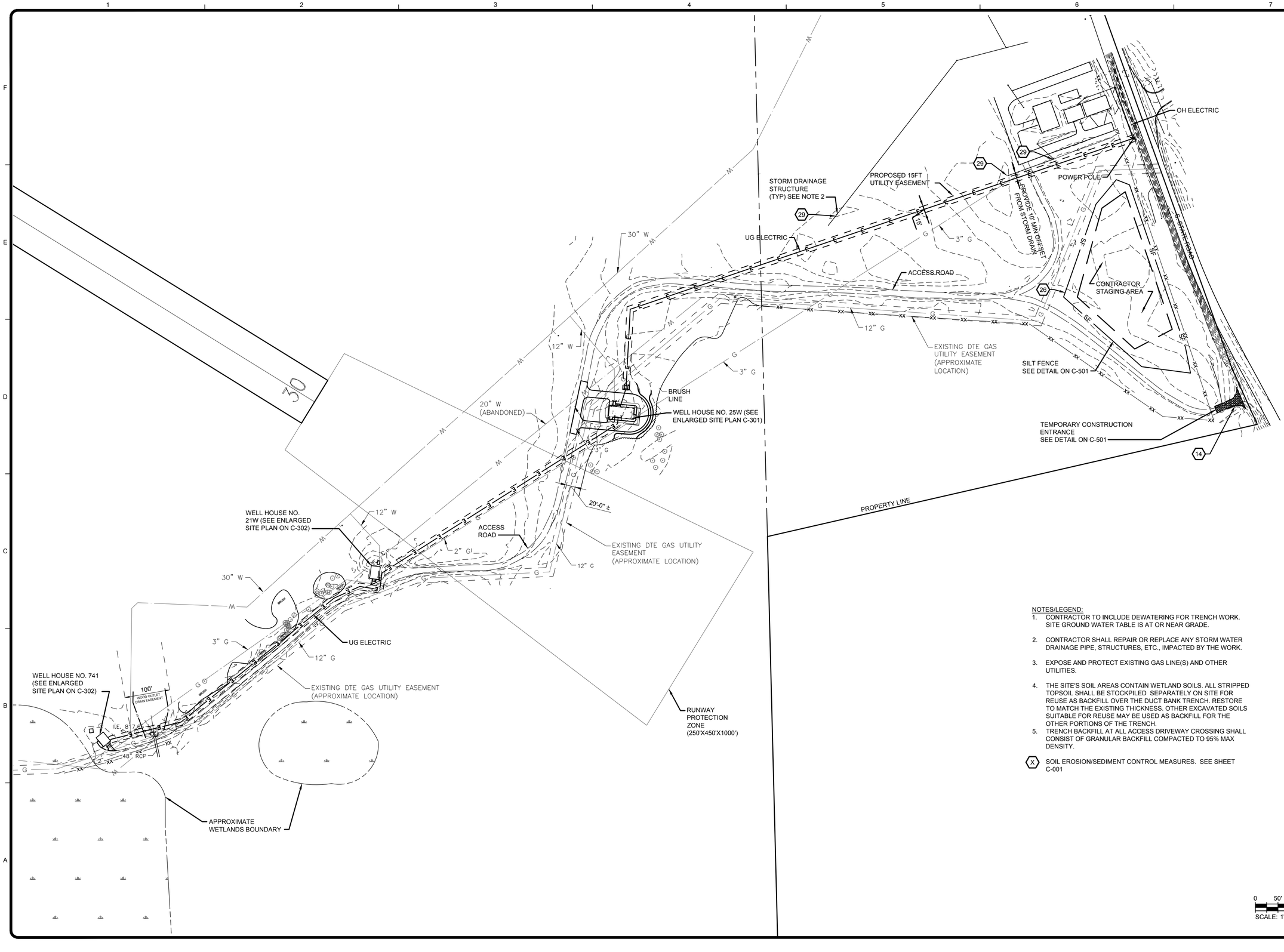


NOTES/LEGEND:

1. CONTRACTOR TO INCLUDE DEWATERING FOR TRENCH WORK. SITE GROUND WATER TABLE IS AT OR NEAR GRADE.
2. CONTRACTOR SHALL REPAIR OR REPLACE ANY STORM WATER DRAINAGE PIPE, STRUCTURES, ETC., IMPACTED BY THE WORK.
3. EXPOSE AND PROTECT EXISTING GAS LINE(S) AND OTHER UTILITIES.
4. THE SITE'S SOIL AREAS CONTAIN WETLAND SOILS. ALL STRIPPED TOPSOIL SHALL BE STOCKPILED SEPARATELY ON SITE FOR REUSE AS BACKFILL OVER THE DUCT BANK TRENCH. RESTORE TO MATCH THE EXISTING THICKNESS. OTHER EXCAVATED SOILS SUITABLE FOR REUSE MAY BE USED AS BACKFILL FOR THE OTHER PORTIONS OF THE TRENCH.
5. TRENCH BACKFILL AT ALL ACCESS DRIVEWAY CROSSING SHALL CONSIST OF GRANULAR BACKFILL COMPACTED TO 95% MAX DENSITY.

(X) SOIL EROSION/SEDIMENT CONTROL MEASURES. SEE SHEET C-001

N

0 50' 100' 200'

SCALE: 1" = 100'

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

BRIAN M. RICHTER ENGINEER No. 39193

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

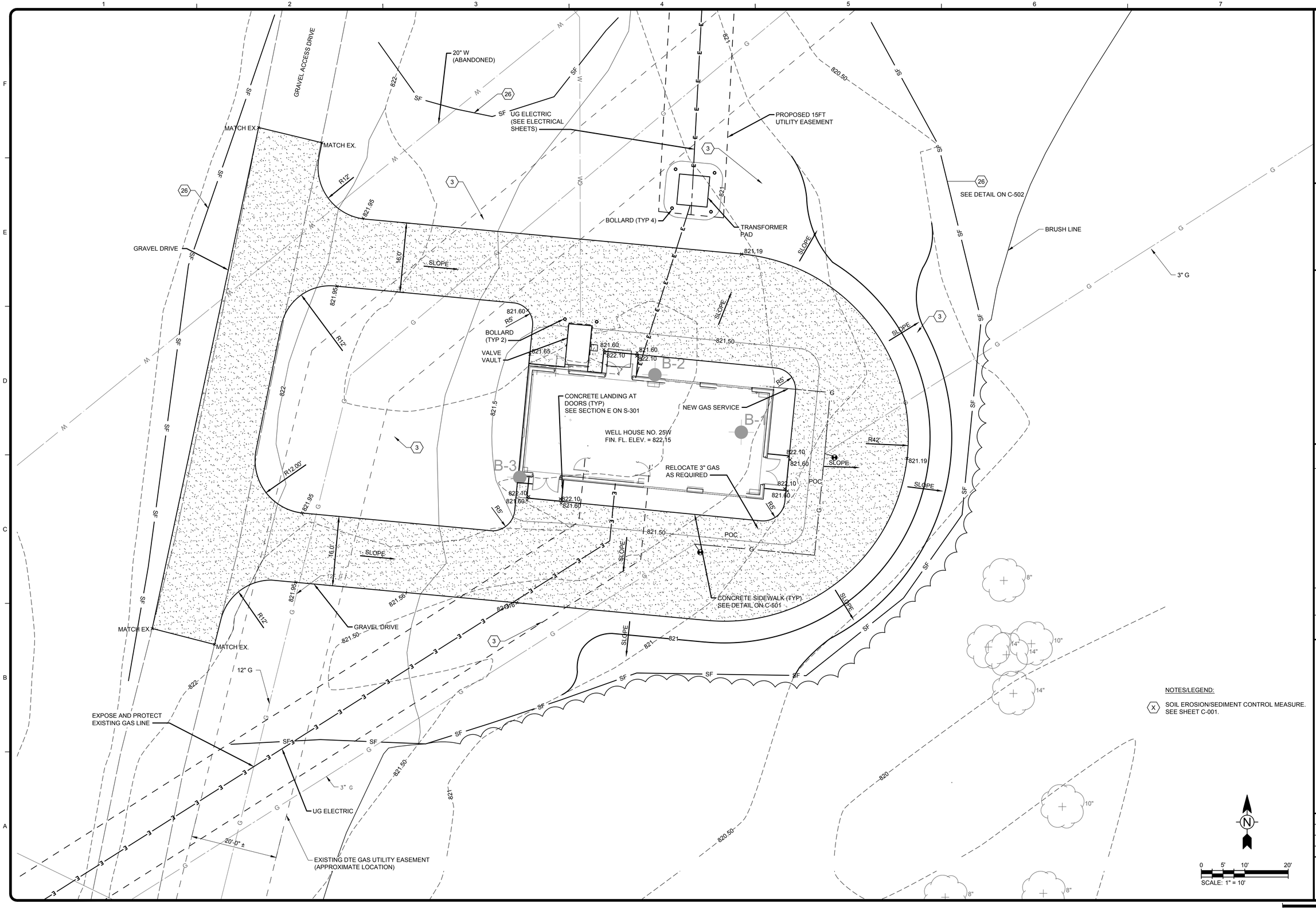
SITE PLAN

Project No.:	200-31537-15005
Designed By:	EMS
Drawn By:	EMS
Checked By:	BMR

C-101

Bar Measures 1 inch

4/14/2016 4:47:09 PM - P:\IER\31537\200-31537-15005\CAD\SHEETFILES\C-101, 301-2 SITE PLAN.DWG - MOORE., JOSH



NOTES/LEGEND:

(X) SOIL EROSION/SEDIMENT CONTROL MEASURE. SEE SHEET C-001.

SCALE: 1" = 10'

Bar Measures 1 inch

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

BRIAN M. RIPPEL PROFESSIONAL ENGINEER No. 38195 STATE OF MICHIGAN LICENSED PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

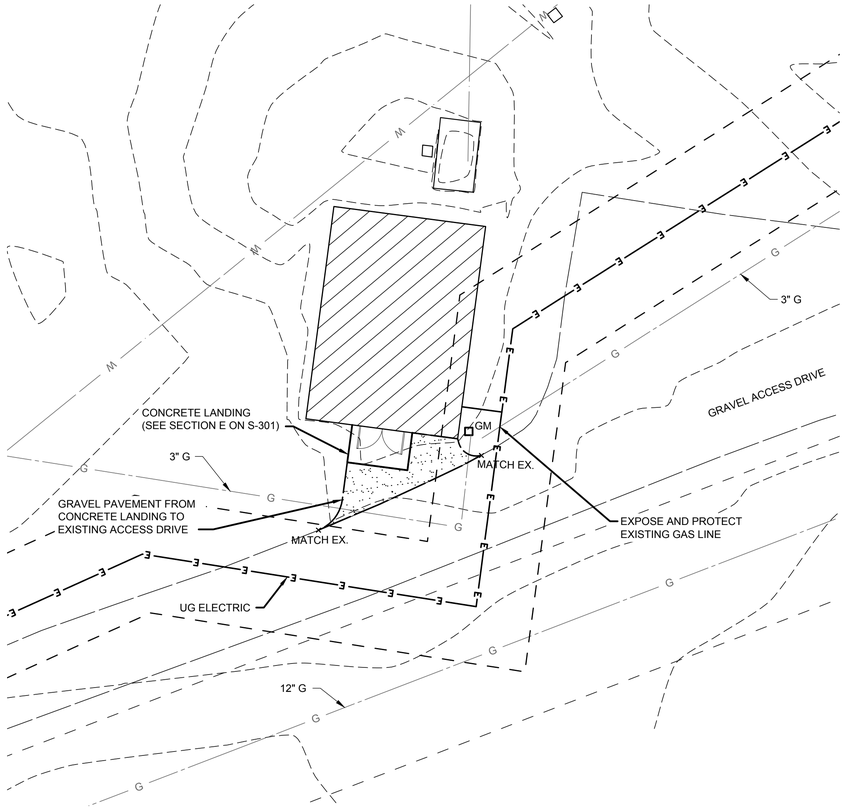
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

ENLARGED SITE PLAN WELL HOUSE 25W

Project No.:	200-31537-15005
Designed By:	EMS
Drawn By:	EMS
Checked By:	BMR

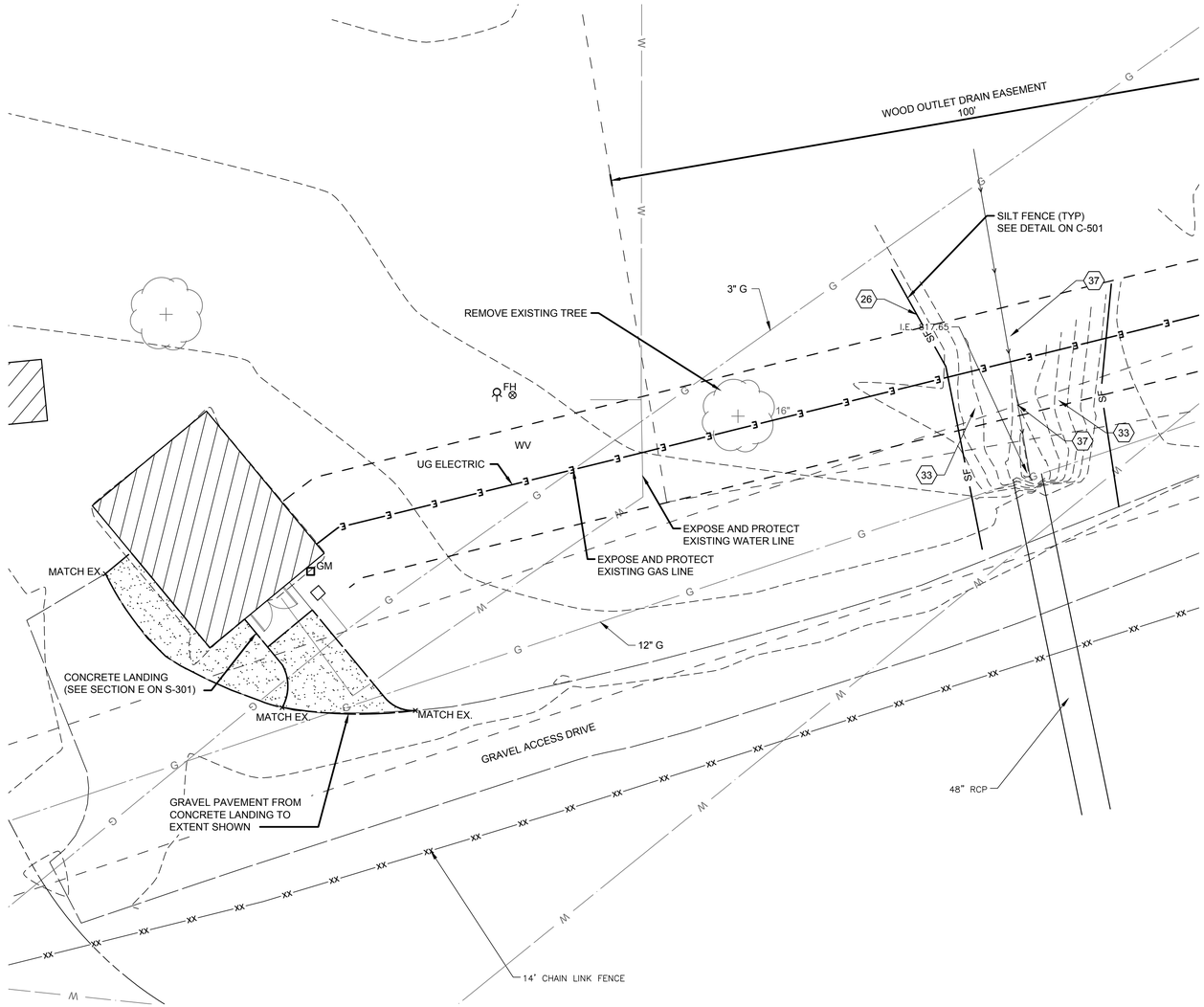
C-301

4/14/2016 10:12:27 AM - P:\IER\31537\200-31537-15005\CAD\SHEETFILES\C-101, 301-2 SITE PLAN.DWG - MOORE, JOSH



WELL HOUSE 21W SITE PLAN

SCALE: 1"=10'



WELL HOUSE 741 SITE PLAN

SCALE: 1"=10'

NOTES/LEGEND:

(X) SOIL EROSION/SEDIMENT CONTROL MEASURE. SEE SHEET C-001.

1. CONTRACTOR SHALL REPLACE 16" TREE REMOVED WITH TREES TOTALING 150% OF DIAMETER LOST. LOCATION OF REPLACEMENT TREES TO BE COORDINATED WITH AIRPORT MANAGER AND MAY REQUIRE INSTALLATION AT ANOTHER LOCATION ON AIRPORT GROUNDS.

N

0 5' 10' 20'

SCALE: 1" = 10'

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

BRIAN J. MOORE
PROFESSIONAL ENGINEER
No. 39193
STATE OF MICHIGAN

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN

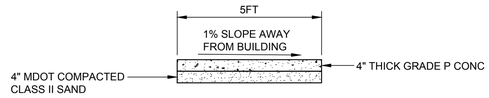
STEERE FARM ENGINE REPLACEMENT

ENLARGED SITE PLANS
WELL HOUSE 21W AND 741

Project No.:	200-31537-15005
Designed By:	EMS
Drawn By:	EMS
Checked By:	EMS

C-302

Bar Measures 1 inch



NOTES:

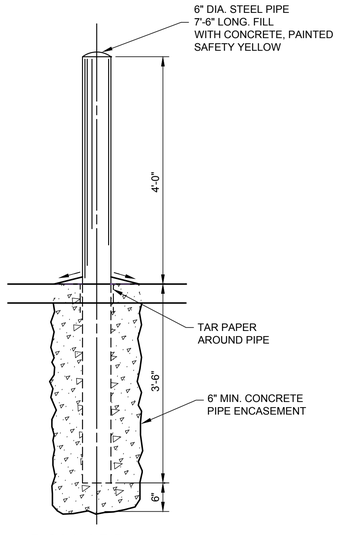
1. PROVIDE ½" EXPANSION JOINTS BETWEEN WALKS AND OTHER CONCRETE OR RIGID STRUCTURES.

CONCRETE WALK SECTION

SCALE: NONE

GRAVEL DRIVE SECTION

SCALE: NONE



BOLLARD

SCALE: NONE

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
BRIAN W. MOORE
PROFESSIONAL ENGINEER
No. 38195
REGISTERED PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

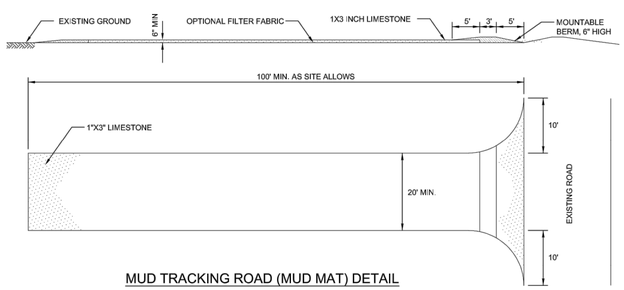
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

SITE DETAILS

Project No.:	200-31537-15005
Designed By:	EMS
Drawn By:	EMS
Checked By:	

C-501

Bar Measures 1 inch



MUD TRACKING ROAD (MUD MAT) DETAIL

PITTSFIELD CHARTER TOWNSHIP
SOIL EROSION AND SEDIMENTATION CONTROL NOTES

GENERAL

1. The contractor shall implement and maintain the soil erosion control measures as shown on the plans at all times during construction on this project. Any modifications or additions to the soil erosion control measures due to construction or changed conditions, shall be complied with as required or directed by the owner, project engineer or Pittsfield Township.
2. All soil erosion and sedimentation control work shall conform to the permit requirements of Pittsfield Township and the laws of the State of Michigan.
3. A NPDES construction activity permit is required for all sites greater than 5 acres.
4. Daily inspections shall be made by the contractor. Periodic inspections may be made by the owner/project engineer/Township to determine the effectiveness of erosion and sedimentation control measures. Any necessary corrections shall be made without delay.
5. 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 or in waterways.
6. All mud/dirt tracked onto roads from the site due to construction, shall be promptly removed by the contractor.
7. Restoration of all disturbed areas, including placement of topsoil, seed, fertilizer and mulch and/or sod shall be done within 5 days of the completion of final grade.
8. 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.
9. Special precautions will be taken in the use of construction equipment to prevent situations that promote erosion.
10. Proper dust control shall be maintained during construction by use of water trucks and/or chloride as required.
11. The contractor shall be responsible for maintaining all temporary soil erosion control measures and removal of some upon authorized completion of project. Completion of project will not be authorized until all site work, home building, road work and utility construction is complete and all soils are stabilized.
12. The contractor shall not grade in existing wetland or conservation areas to be protected. Silt fence shall be installed and maintained adjacent to existing wetland and conservation areas to prevent grading, erosion and sedimentation into them.
13. Tree protection fencing must remain intact until restoration of the site is complete.

SEQUENCE OF CONSTRUCTION

1. Install sediment fence and tree protection fencing prior to any grading operation.
2. Install mud-tracking pad.
3. Construct temporary sediment/detention basin.
4. Place topsoil, fertilizer, seed and mulch over the entire detention basin area.
5. Rough grade site, stockpile topsoil and begin building construction.
6. Install storm drainage system including riprap and parking lot inlet filters and detention basin standpipe.
7. Maintain erosion and sedimentation control measures, as required.
8. Install sanitary sewer and water systems.
9. Bring pavement areas to sub-base grade, place sub-base and bituminous pavement.
10. Install franchised utilities.
11. Finish grade, redistribute topsoil, seed and mulch all disturbed areas.
12. Remove any accumulated sediment within the detention basin and replace clean washed stone around standpipe.
13. Complete construction of site.
14. Insure all soil is stabilized. Remove all temporary soil erosion control measures.

SEEDING/SOD

1. Seed or sod in accordance with project specifications.
2. All areas of disturbed earth that are not to be paved or sodded shall have 4 inches of topsoil, seed, fertilizer and mulch.
3. Immediately after seeding, mulch all seeded areas with unweathered small grain straw (preferably wheat) or hay spread. Spread uniformly at the rate of 1 ½ to 2 tons or 100 pounds (2 to 3 bales) per 1,000 square foot. This mulch should be anchored with a disc-type mulch-anchoring tool.
4. Any disturbed area not paved, seeded or mulched, sodded or built upon by November 15, is to be mulched in the manner as specified above, in order to provide soil erosion protection during the winter and early spring.
5. All erosion and sedimentation control prevention procedures and structures are to comply with the Standards and Specifications for soil erosion and sediment control of the Washtenaw County Soil Conservation District.
6. Drainage ditches and slopes steeper than 1:4 (25%) shall be stabilized with erosion control blankets.
7. Steep slopes that do not take upon initial seeding must be re-seeded and stabilized with erosion control blankets.
8. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.

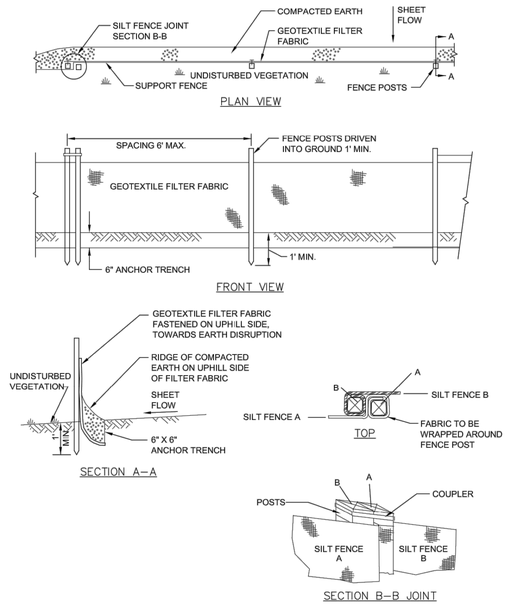
CATCH BASIN/MANHOLE PROTECTION

1. Protect storm sewer catch basins with Siltsack. or approved equivalent as follows:

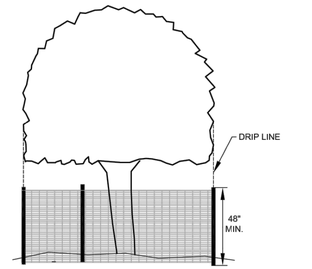
ROADS

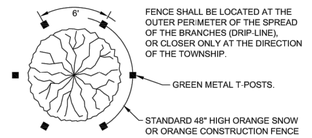
1. During construction, all roads shall be protected from unvegetated areas washing onto road surfaces by placement of silt fence behind curb or a 10 foot wide straw mulch bank behind the curb or other approved method and/or as shown on the plans.
2. During construction of any portion of the project, roads shall be maintained free of dirt, silt and construction debris.

Pittsfield SEC 9/22/2009



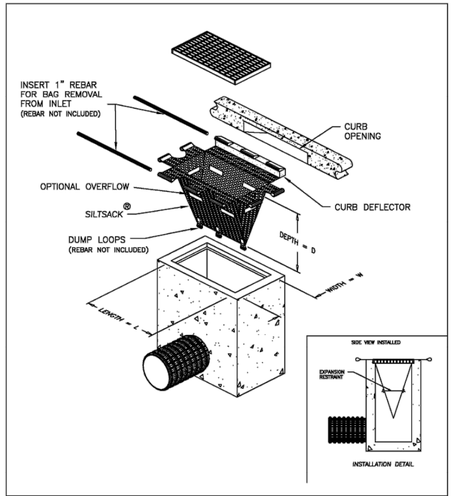
SILT FENCE
NOT TO SCALE





NOTES:
1. ALL TREES TO BE REMOVED WILL BE IDENTIFIED BY RED FLAGGING.
2. TREE PROTECTION FENCING IS TO BE ERECTED PRIOR TO ANY EARTHWORK OR CONSTRUCTION AND IS TO REMAIN IN PLACE UNTIL CONSTRUCTION AND GRADING IS COMPLETE.
3. ALL DEBRIS, FILL, EQUIPMENT OR MATERIAL IS TO BE KEPT CLEAR OF AREA WITHIN PROTECTIVE FENCE. NO CLEANING OF EQUIPMENT OR MATERIAL OR STORAGE OR DISPOSAL OF ANY MATERIAL WITHIN THE DRIP LINE OF ANY TREES TO BE SAVED.

TREE PROTECTION FENCE DETAIL
NOT TO SCALE



DETAIL OF INLET SEDIMENT CONTROL DEVICE
TYPE B – WITH CURB DEFLECTOR

ACF Environmental
Your Complete Source for Geosynthetic Solutions

ACF Environmental, Inc.
2831 Cardwell Rd.
Richmond, Virginia 23234
(800) 448-3636

SILTSACK®
SPECIFICATIONS

NOTE: THE SILTSACK® WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS.

REGULAR FLOW SILTSACK®
(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS	
GRAB TENSILE STRENGTH	ASTM D-4632		300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632		20 %
PUNCTURE	ASTM D-4833		120 LBS
MULLEN BURST	ASTM D-3786		600 PSI
TRAPEZOID TEAR	ASTM D-4533		120 LBS
UV RESISTANCE	ASTM D-4355		90 %
APPARENT OPENING SIZE	ASTM D-4751		40 US SIEVE
FLOW RATE	ASTM D-4491		40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491		0.53 SEC -1

* HI-FLOW SILTSACK®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS	
GRAB TENSILE STRENGTH	ASTM D-4632		265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632		20 %
PUNCTURE	ASTM D-4833		135 LBS
MULLEN BURST	ASTM D-3786		450 PSI
TRAPEZOID TEAR	ASTM D-4533		45 LBS
UV RESISTANCE	ASTM D-4355		90 %
APPARENT OPENING SIZE	ASTM D-4751		20 US SIEVE
FLOW RATE	ASTM D-4491		200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491		1.5 SEC -1

OIL-ABSORBANT SILTSACK®
(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL-ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK ●WITH A WOVEN PILLOW INSERT.

(* HI-FLOW SILT SACK SHALL BE USED FOR ALL APPLICATIONS WITHIN PITTSFIELD TOWNSHIP)

SILTSACK DISTRIBUTORS:
PRICE & COMPANY
(www.priceandcompany.com)

METRO GRAND RAPIDS, MI
425 36TH STREET SW
WYOMING, MI 49548-2108
1-800-248-8230

METRO DETROIT, MI
29165 WALL STREET
WIXOM, MI 48393-3525
1-866-960-4300

SILTSACK
NOT TO SCALE

PITTSFIELD CHARTER TOWNSHIP

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

BRIAN J. VOPPEN
PROFESSIONAL ENGINEER
39188
STATE OF MICHIGAN
REGISTERED PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

SILTSACK	BWA	DRW	12.01.03
TWP REV	BWA	DRW	11.04.27
UPDATES	TTN	DRW	10.01.20
Revision	By	Appd.	YY.MM.DD
Issued	By	Appd.	YY.MM.DD
File Name: SE-01	TTN	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

Title
SOIL EROSION DETAILS AND NOTES

Project No.
2075001300

Scale
NOT TO SCALE

Revision
1

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

SESC DETAILS

Project No.:	200-31537-15005
Designed By:	EMS
Drawn By:	EMS
Checked By:	

C-502

Bar Measures 1 inch

4/14/2016 10:47:27 PM - P:\IER\31537\200-31537-15005\CAD\SHEETFILES\C-500 & 502.DWG - MOORE, JOSH

20" W
(ABANDONED)

821.50

820.50

821

822

821.50

REMOVE
GRAVEL DRIVE

PROTECT
EXISTING
VALVE VAULT

B-2

WELL HOUSE NO. 25W
FIN. FL. ELEV. = 822.15

SEE ARCHITECTURAL
SHEETS FOR WELL HOUSE
NO. 25W DEMOLITION NOTES

B-1

RELOCATE GAS
SERVICE (SEE
MECHANICAL SHEETS)

B-3

BRUSH LINE

3" G

APPROXIMATE CLEARING LIMITS

20'-0" ±

12" G

EXISTING DTE GAS UTILITY EASEMENT
(APPROXIMATE LOCATION)

822

821.50

REMOVE SMALL
DIAMETER TREE
CLUMPS (TYP 2)

CLUMP

CLUMP

28"

6"

REMOVE
TREES (TYP)

8"

14"

14"

10"

14"

10"

3" G

821.50

GENERAL NOTES

1. CONTRACTOR SHALL REPLACE 28" TREE REMOVED WITH TREES TOTALING 150% OF DIAMETER LOST. LOCATION OF REPLACEMENT TREES TO BE COORDINATED WITH AIRPORT MANAGER AND MAY REQUIRE INSTALLATION AT ANOTHER LOCATION ON AIRPORT GROUNDS.

N

0 5' 10' 20'

SCALE: 1" = 10'

Bar Measures 1 inch

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

BRIAN M. ROMER
PROFESSIONAL ENGINEER
No. 39195
STATE OF MICHIGAN

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

DEMOLITION SITE PLAN

Project No.:	200-31537-15005
Designed By:	EMS
Drawn By:	EMS
Checked By:	BMR

CD-101

4/14/2016 11:02:44 AM - P:\IER\31537\200-31537-15005\CAD\SHEETFILES\CD-101 DEMO SITE PLAN.DWG - MOORE, JOSH

ABBREVIATIONS

A	
A LABEL	A LABEL CLASS DOOR
A/C	AIR CONDITIONING UNIT
AB	ANCHOR BOLT
ABDN	ABANDON
ACC	ACCESSIBLE
ACI	AMERICAN CONCRETE INSTITUTE
ACOUST	ACOUSTIC(AL)
ACP	ACOUSTICAL CEILING PANEL
ACS	AUTOMATIC CONTROL SYSTEM
ACT	ACOUSTICAL CEILING TILE
ACU	AIR CONDITIONING UNIT
ADA	AMERICANS WITH DISABILITIES ACT
ADD	ADDITIONAL
ADMIN	ADMINISTRATION
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AHU	AIR HANDLING UNIT
AIB	AIR INFILTRATION BARRIER
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZE
APPROX	APPROXIMATE(LY)
APVD	APPROVED
AR	AS REQUIRED
ARCH	ARCHITECT(URAL)
ASC	ABOVE SUSPENDED CEILING
ASSY	ASSEMBLY
ATFP	ANTI-TERRORISM / FORCE PROTECTION
AVG	AVERAGE
AW	ARCHITECTURAL WOODWORK
AWT	ACOUSTICAL WALL TREATMENT
B	
B LABEL	B LABEL CLASS DOOR
BALC	BALCONY
BB	BASEBOARD
BCT	
BD	BOARD
BET	BETWEEN
BFF	BELOW FINISH FLOOR
BHMA	BUILDER'S HARDWARE MANUFACTURER'S ASSOCIATION
BL	BASELINE
BLDG	BUILDING
BLKG	BLOCKING
BLT IN	BUILT-IN
BM	BEAM
BN	BULLNOSE
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BP	BUILDING PAPER
BRG	BEARING
BRKT	BRACKET
BSMT	BASEMENT
BTWN	BETWEEN
BUR	BUILT UP ROOF
C	
C CONC	CAST CONCRETE
C LABLE	C LABEL CLASS DOOR
C-C	CENTER TO CENTER
CAB	CABINET
CAB	CABLE
CATW	CATWALK
CAV	CAVITY
CB	CEMENTITIOUS (BACKER) BOARD
CBB	CEMENTITIOUS BACKER BOARD
CD	CONSTRUCTION DOCUMENT(S)
CDW	CHILLED DRINKING WATER
CEM PLAS	CEMENT PLASTER
CER	CERAMIC
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/ CONTRACOR INSTALLED
CFE	CONTRACTOR FURNISHED EQUIPMENT
CFLG	COUNTERFLASHING
CFM	CUBIC FEET PER MINUTE
CFMF	COLD FORM METAL FRAMING
CFS	CUBIC FEET PER SECOND
CFT	CERMIC FLOOR TILE
CG	CORNER GUARD
CI	CAST IRON
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLG DIFF	CEILING DIFFUSER
CLG HT	CEILING HEIGHT
CLL	COLUMN LINE
CLO	CLOSET
CLR	CLEAR
CLR	COLOR
CLRM	CLASSROOM
CMU	CONCRETE MASONRY UNIT
CNDS	CONDENSATE
CO	COLUMN
CO	CLEANOUT
COL	COLUMN
COMM	COMMUNICATIONS
CONC	CONCRETE
CONC FLR	CONCRETE FLOOR
CONF	CONFERENCE
CONST	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE
CORR	CORRIDOR
CP	CONCRETE PIPE
CP	CENTER POINT
CPT	CARPET
CR	CONTROL ROOM
CS	CAST STONE
CSWK	CASEWORK
CT	CERAMIC TILE
CTB	CERAMIC TILE - BASE
CTF	CERAMIC TILE - FLOOR
CTR	CENTER
CTW	CERAMIC TILE - WALL
CU FT	CUBIC FEET
CW	CASEMENT WINDOW
CWT	CERAMIC WALL TILE
D	
D	
D	DEPTH
D LABEL	D LABEL CLASS DOOR
DBL	DOUBLE
DEMO	DEMOLISH
DEPT	DEPARTMEN
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DK	DECK
DN	DOWN
DOC	DOCUMENT
DR	DOOR
DS	DOWNSPOUT
DWG(S)	DRAWING(S)
E	
E	EAST
E LABEL	E LABEL CLASS DOOR
EA	EACH
EF	EACH FACE
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATOR
ELEC	ELECTRIC(AL)
ELEV	ELEVATION
ENGR	ENGINEER
ENTR	ENTRY
EOG	EDGE OF GUTTER
EP	EXPLOSTION PROOF
EP	EXTERIOR PAINT
EPS	EXPANDED POLYSTYRENE BOARD
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXP	EXPOSED
EXP	EXPANSION
EXP AB	EXANSION ANCHOR BOLT
EXT	EXTERIOR
EXT GR	EXTERIOR GRADE
F	
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUCIATIOR PANEL
FAS BD	FASCIA BOARD
FC BRK	FACE BRICK
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FDTN	FOUNDATION
FEC	FIRE EXTINGUISHER CABINET
FED	FEDERAL
FF	FINISH FLOOR
FF INSUL	FOIL FACED INSULAITON
FFE	FINISH FLOOR ELEVATION
FG	FINISH GRADE
FGL	FIBERGLASS
FH	FIRE HOSE
FIG	FIGURE
FIN	FINISH (ED)
FIXT	FIXTURE
FL	FLOOR
FLDG	FOLDING
FLEX	FLEXIBLE
FLMT	FLUSH MOUNTED
FLR	FLOOR
FLUOR	FLUORESCENT
FM	FACTORY MUTUAL
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STEEL
FR	FIRE RESISTANT
FRG	FIBER REINFORCED GYPSUM
FRMG	FRAMING
FRP	FIBERGLASS REINFORCED PLASTIC
FRT	FIRE RETARDANT TREATED
FT	FOOT
FTG	FOOTING
FUR	FURRING
FWC	FABRIC WALLCOVERING
G	
GA	GAGE, GAUGE
GAL	GAL
GALV	GALVANIZED
GB	GRAB BAR
GFCI	GOVERMENT FURNISHED / CONTRACTOR INSTALLED
GFCMU	GROUND FACE CONCRETE MASONRY UNIT
GL	GRID LINE
GL	GLASS
GLZ	GLAZING
GR FL	GROUND FLOOR
GRTG	GRATING
GS	GRATING SUPPORT
GV	GRAVEL
GWB	GYPSUM WALL BOARD
GYBD	GYPSUM WALL BOARD
GYP	GYPSUM
H	
H	HORN
HB	HOSE BIBB
HC	HOLLOW CORE
HC	HANDICAP
HDPE	HIGH DENSITY POLYETHYLENE
HDW	HARDWARE
HDWD	HARDWOOD
HEPA	HIGH EFFICIENCY PARTICULATE AIR FILTER
HGT	HEIGHT
HK	HOOK
HM	HOLLOW METAL
HMD	HOLLOW METAL DOOR
HORIZ	HORIZONTAL
HT	HEIGHT
HVAC	HEATING VENTILATION AND AIR CONDITIONING
HW, HDWR	HARDWARE
HYD	HYDRAULIC
I	
IBC	INTERNATIONAL BUILDING CODE
ICF	INSULATED CONCRETE FORM
IF	INSIDE FACE
IG	INSULATING GLASS
IJ	ISOLATION JOINT
ILO	IN LIEU OF
IN	INCH
INCAND	INCANDENSCENT
INSUL	INSULATION
IRP	INSULATED ROOF PANEL
ITG	INSULATED TEMPERED GLASS
IWP	INSULATED WALL PANEL
J	
J	JUNCTION BOX
JAN	JANITOR
JST	JOIST
JT	JOINT
K	
KIT	KITCHEN
KPD	KEYPAD
KPL	KICKPLATE
L	
LAM	LAMINATE
LAV	LAVATORY
LBR	LUMBER
LBS	POUNDS
LDG	LANDING
LF	LINEAR FOOT (FEET)
LG	LONG
LIB	LIBRARY
LIN	LINEAR
LKR	LOCKER
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LNT	LINTEL
LOC	LOCATION
LP	LIGHT POLE
LS	LABORATORY SINK
LT	LIGHT
LVDR	LOUVER DOOR
LVR	LOUVER
M	
M	METERS
MAT	MATERIAL
MATL	MATERIAL
MAX	MAXIMUM
MB	MOISTURE BARRIER
MC	MOISTURE CONTNET
MD	METAL DECK
MECH	MECANICAL (ROOM)
MEMB	MEMBRANE
MF	MILL FINISH
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM, MINUTE
MIRR	MIRROR
MO	MASONRY OPENING
MOD	MODIFY
MRGWB	MOISTURE RESISTANT GYPSUM WALLBOARD
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MWP	MEMBRANE WATERPROOFING
N	
N	NORTH
NA	NOT APPLICABLE
ND	NAPKIN DISPOSAL
NDS	NAPKIN DISPENSER
NE	NORTH EAST
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NP	NO PAINT
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
NW	NORTHWEST
O	
O TO O	OUT TO OUT
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFD	OVERFLOW DRAIN
OFF	OFFICE
OFOI	OWNER FURNISHED OWNER INSTALLED
OGL	OBSCURE GLASS
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OPQ	OPAQUE
OPR	OPERABLE
ORIG	ORIGINAL
OSB	ORIENTED STRAND BARD
OTS	OPEN TO STRUCTURE
OWSJ	OPEN WEB STEEL JOINT
OZ	OUNCE
P	
PA	PUBLIC ADDRESS
PAR	PARAPET
PAT	PATTERN
PB	PULL BOX
PBD	PARTICLEBOARD
PCC	PRECAST CONCRETE
PCF	POUND PER CUBIC FOOT
PCT	PERCENT
PEMB	PRE-ENGINEERED METAL BUILDING
PERF	PERFORATED
PERM	PERMETER
PERP	PERPENDICULAR
PH	PHASE
PIL	PILASTER
PL	PROPERTY LINE
PL GL	PLATE GLASS
PLAM	PLASTIC LAMINATE
PLAS	PLASTIC
PLBG	PLUMBING
PLG	PILING
PLYWD	PLYWOOD
PNL	PANEL
POC	POINT OF CONTACT
POLY	POLYSTYRENE
PP PL	PUSH/PULL PLATE
PR	PAIR
PRCST	PRECAST
PREFAB	PREFABRICATED
PRKG	PARKING
PS CONC	PRESTRESSED CONCRETE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PTD	PAPER TOWEL DISPENSER
PTDR	PAPER TOWEL DISPENSER AND RECEPTACLE
PTN	PARTITION
PWR	POWER
Q	
QT	QUARRY TILE
QTY	QUANTITY
R	
R	RISER
RB	RUBBER BASE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REC	RECESSED
REF	REFERENCE
REFR	REFRIGERATOR
REM	REMOVABLE
REP	REPAIR
REQ	REQUIRE
REQ'D	REQUIRED
RES	RESILIENT
RESIL	RESILIENT
REV	REVISION
RF	RESILIENT FLOORING
RH	ROOF HATCH
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
RL	ROOF LEADER
RLG	RAILING
RM	ROOM
RO	ROUGH OPENING
RR	RESTROOM
RSD	ROLLING STEEL DOOR
RV	ROOF VENT
RVL	REVEAL
S	
S	SOUTH
S2S	SURFACE TWO SIDES
S4S	SURFACE FOUR SIDES
SAPC	SUSPENDED ACOUSTICAL PANEL CEILING
SATC	SUSPENDED ACOUSTICAL TILE CEILING
SB	SPLASH BLOCK
SC	SHOWER CURTAIN
SCH	SCHEDULE
SCHED	SCHEDULE
SCR	SHOWER CURTAIN ROD
SCW	SOLID CORE WOOD
SCWD	SOLID COUR WOOD DOOR
SD	SMOKE DETECTOR
SE	SOUTH EAST
SF	SQUARE FOOT
SF	SQUARE FEET
SFTWD	SOFT WOOD
SGL	SINGLE
SH	SOAP HOLDER
SHR	SHOWER
SHT MTL	SHEET METAL FLASHING
SHTHG	SHEATHING
SHV	SHELVING
SIM	SIMILAR
SJ	SCORED JOINT
SKLT	SKYLIGHT
SLNT	SEALANT
SLR	SEALER
SM	SQUARE METER
SMHD	SHELF METAL HEAVY DUTY
SMK	SMOKE
SMLS	SEAMLESS
SND	SANITARY NAPKIN AND TAMPON DISPENSER
SP EL	SPOT ELEVATION
SPEC	SPECIFICATIONS
SQ	SQUARE
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SQFT	SQUARE FOOT (FEET)
SQM	SQUARE METER
SS	STAINLESS STEEL
SSMR	STANDING SEAM METAL ROOF
SST	STAINLESS STEEL
ST	STAIRS
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STL JST	STEEL JOIST
STL RF DK	STEEL ROOF DECK
STOR	STORAGE
STR	STRINGER
STRB/HRN	STROBE / HORN
STRUCT	STRUCTURE(AL)
SUB FL	SUB FLOOR
SUSP	SUSPENDED
SV	SHEET VINYL
SW	SOUTHWEST
SYM	SYMMETRICAL
T	
T	TREAD
T&G	TOUNGE AND GROOVE
T/S	TUB / SHOWER
TB	TOWEL BAR
TC	TERRA COTTA
TD	TRAVEL DISTANCE
TEL	TELEPHONE
TEMP	TEMPORARY
TER	TERRAZZO
TFF	TOP OF FINISH FLOOR
THK	THCKNESS
TK BD	TACK BOARD
TLT	TOILET
TMPD GL	TEMPERED GLASS
TN	TRUE NORTH
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOP	TOP OF PARAPET
TOPO	TOPOGRAPHY
TOS	TOP OF SLAB
TRANS	TRANSOM
TRT	TREATED
TRTD	TREATED
TS	TUBE STEEL
TV	TELEVISION
TYP	TYPICAL
U	
UNF	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UR	URNINAL
V	
VB	VAPOR BARRIER
VCT	VINYL COMOSITION TILE
VERT	VERTICAL
VR	VAPOR RETARDER
VTC	VIDEO TELECONFERENCE
VTR	VENT THROUGH ROOF
W	
W	WEST
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WOOD
WG	WIRE GLASS
WOM	WALK OFF MAT
WR	WASTE RECEPTACLE
WRB	WEATHER RESISTANT BARRIER
WRGWB	WATER RESISTANT GYPSUM WALLBOARD
WS	WATER STOP
WTP	WATER TREATMENT PLANT
WWTP	WASTE WATER TREATMENT PLANT

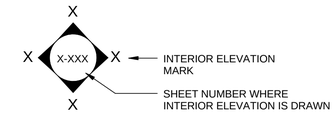
SYMBOLS LEGEND

L	ANGLE
&	AND
@	AT
°	DEGREE
Ø	DIAMETER
=	EQUALS
-	MINUS
%	PERCENT
+	PLUS
± , +/-	PLUS OR MINUS

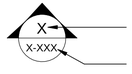
DRAFTING MATERIAL LEGEND

- CONCRETE
- MASONRY
- GROUT
- WOOD STUDS, BLOCKING
- EARTHWORK
- GRAVEL
- STEEL
- SAND
- RIGID INSULATION
- ACOUSTICAL TILE
- FINISH LUMBER
- PLYWOOD
- BATT INSULATION

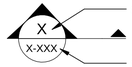
ANNOTATIONS LEGEND



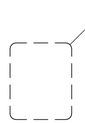
- INTERIOR ELEVATION MARK
- SHEET NUMBER WHERE INTERIOR ELEVATION IS DRAWN



- EXTERIOR ELEVATION MARK
- SHEET NUMBER WHERE EXTERIOR ELEVATION IS DRAWN



- SECTION MARK
- SHEET NUMBER WHERE SECTION IS DRAWN



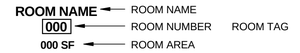
- DETAIL CALLOUT MARK
- SHEET NUMBER WHERE DETAIL IS DRAWN

VIEW NAME
SCALE: NTS

TYPICAL VIEW TITLE STRING WITH REF. BUBBLE

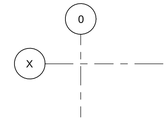
VIEW NAME
SCALE: NTS

TYPICAL VIEW TITLE STRING WITHOUT REF. BUBBLE

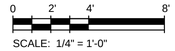


- ROOM NAME
- ROOM NUMBER
- ROOM AREA

ROOM TAG



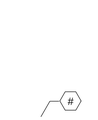
GRID / COLUMN LINE DESIGNATOR



SCALE: 1/4" = 1'-0"

GRAPHIC SCALE

NORTH ARROW



- KEYNOTE

- DOOR TAG

- WINDOW TAG

- SPOT ELEVATION

- REVISION TAG

- REVISION CLOUD

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN JAMES QUINTIN BIAGI, JR. ARCHITECT No. 1301054644 LICENSED ARCHITECT
4-22-16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE

ABBREVIATIONS AND LEGENDS

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-001

Bar Measures 1 inch

4/15/2016 10:45:57 AM C:\Users\Quintin.Biagi\Documents\A-ENGINE BUILDING_quintin.biagi@tetratech.com.rvt

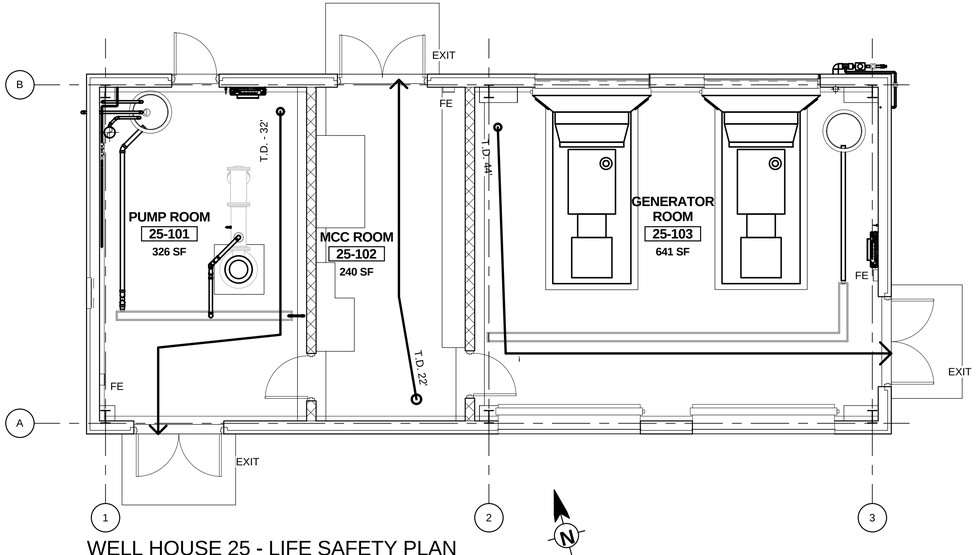
GENERAL NOTES

1. THE DRAWINGS INDICATE THE GENERAL EXTENT OF WORK. THE DRAWINGS ARE NOT INTENDED TO INDICATE OR DESCRIBE ALL WORK REQUIRED FOR THE FULL PERFORMANCE AND COMPLETION OF THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. REPETITIVE FEATURES NOT NOTED ON THE DRAWINGS SHALL BE COMPLETELY PROVIDED AS IF DRAWN IN FULL.
2. GRID LINES INDICATE THE CENTER LINE OF PRIMARY COLUMNS ONLY, SEE STRUCTURAL PLANS FOR EXACT LOCATION AND SIZES OF INDIVIDUAL COLUMNS.
3. CHAMFER EXTERNAL CORNERS OF EXPOSED CONCRETE WALLS 3/4" (20mm) TYPICAL. UNLESS OTHERWISE NOTED.
4. MECHANICAL, ELECTRICAL, CIVIL, STRUCTURAL AND PROCESS INFORMATION ON THE ARCHITECTURAL DRAWINGS IS PROVIDED FOR CLARITY AND / OR LOCATION PURPOSES ONLY, SEE RELEVANT DISCIPLINE DRAWINGS FOR SPECIFIC INFORMATION.
5. FLASHING COLOR TO MATCH ADJACENT WALL COLOR UNLESS NOTED OTHERWISE.
6. BUILDING HEIGHTS AND ELEVATIONS ARE BASED UPON PROJECT FINISH ELEVATION OF 0'-0" AT THE FIRST FLOOR. REFERENCE CIVIL DRAWINGS FOR FIRST FLOOR ELEVATIONS RELATIVE TO SEA LEVEL.
7. PERFORMANCE OF WORK SHALL COMPLY WITH APPLICABLE BUILDING CODES, ORDINANCES AND REGULATORY AGENCIES.
8. ROOM AND DOOR NUMBERS SHOWN ON DRAWINGS ARE FOR CONSTRUCTION PURPOSES ONLY.
9. ROOF PITCHES INDICATED ARE NOMINAL. SEE STRUCTURAL DRAWINGS FOR BEARING HEIGHTS.
10. WORK SHALL CONFORM TO APPLICABLE INDUSTRY AND MANUFACTURER'S PUBLISHED STANDARDS FOR QUALITY OF MATERIALS AND WORKMANSHIP, AS WELL AS REQUIREMENTS IN THESE DRAWINGS AND SPECIFICATIONS. ANY CONFLICTING REQUIREMENTS OF THE SOURCES LISTED ABOVE SHALL BE BROUGHT TO THE ARCHITECTS ATTENTION PRIOR TO PROCEEDING WITH THE WORK. IF CONTRACTOR PERFORMS WORK KNOWING IT TO BE CONTRARY TO LAWS, STATUTES, ORDINANCES, BUILDING CODES, AND RULES AND REGULATIONS WITHOUT SUCH NOTICE TO THE ARCHITECT AND OWNER, THE CONTRACTOR SHALL ASSUME APPROPRIATE RESPONSIBILITY FOR SUCH WORK AND SHALL BEAR THE COSTS ATTRIBUTABLE TO CORRECTION.
11. THE CONTRACTOR SHALL PROTECT EXISTING, IN-PLACE AND NEW WORK.
12. THE CONTRACTOR SHALL VERIFY DIMENSIONS AND SHALL VERIFY EXISTING CONDITIONS, SHOWN ON THESE DRAWINGS, AT THE SITE, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES, OMISSIONS AND OR CONFLICTS BEFORE COMMENCEMENT OF WORK. COMMENCEMENT OF WORK SHALL CONSTITUTE ACCEPTANCE OF ALL NEW OR EXISTING CONDITIONS.
13. NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION,AND ALTERATION OPERATIONS SHALL BE APPLIED TO THIS PROJECT.
14. PROVIDE EXPANSION AND CONTROL JOINTS IN ALL WORK AS PER PRODUCT MANUFACTURER'S STANDARDS.
15. ALL DISSIMILAR MATERIALS SHALL BE ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.
16. PROVIDE ACCESS PANELS AS REQUIRED BY APPLICABLE CODES AND AS REQUIRED FOR MECHANICAL EQUIPMENT AND PLUMBING WORK. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED WITH THE ARCHITECT OR ARCHITECTS REPRESENTATIVE PRIOR TO PROCEEDING.
17. PIPE DUCTS AND BUSS DUCTS THAT PENETRATE FLOOR SLABS OR WALL PARTITIONS SHALL BE INSTALLED IN A MANNER THAT WILL PRESERVE THE MOISTURE RESISTANCE, FIRE RATING, AIR AND/OR VAPOR BARRIER, AND STRUCTURAL INTEGRITY OF THE BUILDING.
18. INTERIOR PARTITION MOVEMENT CONTROL: (A). VERTICAL CONTROL JOINTS FOR ANY WALL ARE TO OCCUR AT NOT MORE THAN 30'-0" O.C. IN THE HORIZONTAL DIRECTION, UNO. (B). THE TYPICAL MOVEMENT OF THE STRUCTURE DUE TO DEFLECTION AT THE HEAD OF THE WALL CONSTRUCTION RUNNING TO THE UNDERSIDE OF THE STRUCTURE SHALL BE +/- 1/2".
19. AT EXTERIOR MASONRY WALLS, CMU SHALL BE EXTENDED TIGHT TO FLOOR AND / OR ROOF DECKS, INCLUDING AROUND ALL PENETRATIONS SUCH AS BEAMS, JOIST ENDS, AND ETC. FILLING VOIDS IN EXT. CMU BACK-UP WITH INSULATION IN LIEU OF A SOLID MASONRY ENCLOSURE SHALL NOT BE PERMITTED.
20. VERTICAL COURSING FOR NEW MASONRY WALL CONSTRUCTION SHALL EQUAL EIGHT INCHES (8") FOR ONE CONCRETE MASONRY UNIT PLUS ONE MORTAR JOINT AND THREE BRICK COURSES PLUS THREE MORTAR JOINTS, UNLESS NOTED OTHERWISE.
21. PROVIDE CONTROL JOINTS (C.J.) IN MASONRY WALL CONSTRUCTION AS INDICATED. WHERE NOT SHOWN, PROVIDE MAXIMUM SPACING BETWEEN JOINTS OF 40'-0" AND MAXIMUM DISTANCE BETWEEN OUTSIDE CORNERS AND JOINTS OF 10'-0." PROVIDE JOINTS BETWEEN INTERIOR LOAD BEARING AND NON-LOAD BEARING PARTITIONS, AT ALL ABRUPT CHANGES IN WALL HEIGHT, AT CHANGES IN PARTITION THICKNESS AND AT PILASTER LOCATIONS. VERIFY FINAL CONTROL JOINT LOCATIONS WHETHER OR NOT INDICATED ON THE DRAWINGS WITH ARCHITECT PRIOR TO STARTING WORK.
22. PROVIDE SEALANT BETWEEN HOLLOW METAL FRAME PERIMETERS AND SURROUNDING WALL CONSTRUCTION UNLESS OTHERWISE INDICATED.
23. PROVIDE SEALANT BETWEEN INTERIOR AND EXTERIOR WINDOW AND STOREFRONT FRAME PERIMETERS AND SURROUNDING CONSTRUCTION UNLESS OTHERWISE INDICATED.
24. DO NOT BEGIN WORK THAT MAY REQUIRE COORDINATION, SUCH AS CEILING INSTALLATION, PRIOR TO FINAL SUBMITTAL OF MECHANICAL AND ELECTRICAL COORDINATION DRAWINGS TO ARCHITECT NOR PRIOR TO RESOLUTION AND APPROVAL OF COORDINATION ISSUES.
25. REFER TO LIFE SAFETY DRAWINGS FOR FIRE-RATED FLOOR, WALL, CEILING AND ROOF LOCATIONS. INSTALL FIRESTOPPING AT PENETRATIONS IN RATED CONSTRUCTION AND AT TOPS OF RATED WALLS.
26. PROVIDE UNDERSLAB TERMITE PROTECTION AS REQUIRED BY GOVERNING BUILDING CODE REQUIREMENTS.
27. CONFIRM QUANTITY, TYPE AND PLACEMENT OF ALL FIRE EXTINGUISHERS WITH THE FIRE MARSHALL. COORDINATE FINAL LOCATIONS WITH THE ARCHITECT PRIOR TO PLACEMENT. FIRE EXTINGUISHER BASIS OF DESIGN: LARSEN SURFACE MOUNTED OR APPROVED EQUAL.
28. MANUFACTURERS ARE REFERENCED TO ESTABLISH STYLE, SIZE, COLOR AND MATERIAL CHARACTERISTICS AND ARE NOT INTENDED TO LIMIT SELECTIONS FROM OTHER MANUFACTURERS. WHEN AN ALTERNATE SELECTION IS SUBMITTED, SUBMITTALS SHALL HAVE INCLUDED THE MATERIAL LISTED FOR COMPARISION.
29. "ALIGN" AS USED IN THESE DOCUMENTS SHALL MEAN TO ACCURATELY LOCATE FINISHED FACES IN THE SAME PLAN AND/OR TO INSTALL NEW CONSTRUCTION ADJACENT TO EXISTING CONSTRUCTION WITHOUT ANY VISIBLE JOINTS OR SURFACE IRREGULARITIES.
30. "CLEAR" AS USED IN THESE DOCUMENTS SHALL MEAN THAT THE CONDITION IS NOT ADJUSTABLE WITHOUT APPROVAL OF THE ARCHITECT. CLEAR DIMENSIONS ARE TYPICAL
31. "MAXIMUM" OR "MAX" AS USED IN THESE DOCUMENTS SHALL MEAN THAT THE CONDITION IS SLIGHTLY ADJUSTABLE BUT MAY NOT VARY TO A DIMENSION OR QUANTITY GREATER THAN THAT SHOWN WITHOUT APPROVAL OF THE ARCHITECT.
32. "MINIMUM" OR "MIN" AS USED IN THESE DOCUMENTS SHALL MEAN THAT THE CONDITION IS SLIGHTLY ADJUSTABLE BUT MAY NOT VARY TO A DIMENSION OR QUANTITY LESS THAN THAT SHOWN WITHOUT APPROVAL OF THE ARCHITECT.
33. "TYPICAL" AS USED IN THESE DOCUMENTS SHALL MEAN THAT THE CONDITION OR DIMENSION IS THE SAME OR REPRESENTATIVE FOR SIMILAR CONDITIONS THROUGHOUT.
34. "+/-" AS USED IN THESE DOCUMENTS SHALL MEAN THAT THE DIMENSION OR QUALITY IS SLIGHTLY ADJUSTABLE TO ACCOMMODATE ACTUAL CONDITIONS, FIELD VERIFICATION AND COORDINATION WITH OTHER ELEMENTS AS MIGHT BE NECESSARY.

LIFE SAFETY PLAN LEGEND

EXIT PATH — T.D. (TRAVEL DISTANCE) — TD = X'-X"

SURFACE MOUNTED FIRE EXTINGUISHER AND CABINET — FE



WELL HOUSE 25 - LIFE SAFETY PLAN

SCALE: 3/16" = 1'-0"

BUILDING CODE ANALYSIS

BUILDING CODE ANALYSIS	
BUILDING NAME	STEERE FARM ENGINES REPLACEMENT PROJECT
BUILDING DESCRIPTION	RETROFIT OF TWO EXISTING PRE-ENGINEERED METAL WELL HOUSES AND CONSTRUCTION OF NEW REPLACMENT WELL AND GENERATOR BUILDING. NEW BUILDING IS A PEMB WITH INSULATED WALL PANEL (R-19) AND INSULATED METAL ROOF PANEL (R-30). THE BUILDINGS ARE UNOCCUPIED AND ACCESSED ONLY PERIODICALLY FOR MAINTENACE AND MONITORING.
	EXISTING BUILDINGS ARE NOT CHANGING USE, CONSTRUCTION TYPE OR OCCUPANCY. THE NEW WELL BUILDING 25 IS THE SUBJECT OF THE CODE INFORMATION BELOW.
OWNER	
LOCATION	CITY OF ANN ARBOR, MI - ADMINISTERING SERVICE AREA PUBLIC SERVICES AREA
APPLICABLE CODES	
MICHIGAN BUILDING CODE - 2012	
MICHIGAN PLUMBING CODE - 2012	
MICHIGAN MECHANICAL - 2012	
MICHIGAN FIRE PREVENTION CODE - 2012	
NFPA 70 NATIONAL ELECTRICAL CODE 2011	
MICHIGAN UNIFORM ENERGY CODE 2009	
2010 AMERICANS WITH DISABILITY ACT ACCESSIBILTY GUIDELINES	
GENERAL INFORMATION	
USE AND OCCUPANCY CLASSIFICATION (MBC CHAPTER 3)	"U" UTILITY AND MISCELLANEOUS GROUP
CONSTRUCTION TYPE (MBC CHAPTER 5)	IIB
MAXIMUM ALLOWABLE AREA (MBC TABLE 503)	8,500 SF
ACTUAL AREA PROVIDE	1,435 SF
BASEMENT	
FIRST FLOOR	
SECOND FLOOR	
MAXIMUM ALLOWABLE HEIGHT (MBC TABLE 503)	
ACTUAL HEIGHT PROVIDED	
MAXIMUM ALLOWABLE STORIES (MBC TABLE 503)	2
ACTUAL STORIES PROVIDE	1
DESIGN OCCUPANCY (MBC TABLE 1004.1.2)	
ACTUAL NUMBER OF OCCUPANTS	NO FULL TIME OCCUPANTS, PERIODIC TRAINED SERVICE PERSONEL ONLY
EGRESS WIDTH BASE ON OCCUPANCY (MBC TABLE 1005.1)	
ALLOWABLE DEAD ENDS (MBC TABLE 1013.3)	
NUMBER OF EXITS (MBC 1018.2)	2
ACTUAL NUMBER OF EXITS PROVIDED	3
ALLOWABLE COMMON PATH OF TRAVEL (MBC 1014.3)	100' PERMITTED <30' PROVIDED
ALLOWABLE EXIT ACCESS TRAVEL DISTANCE (MBC TABLE 1016.2)	300 FT
FIRE RESISTANT RATINGS	
BUILDING ELEMENTS	0
PRIMARY STRUCTURAL FRAME	0
BEARING WALLS	
EXTERIOR	0
INTERIOR	0
NONBEARING WALLS	
EXTERIOR	0
INTERIOR	0
FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS	0
ROOF CONSTRUCTION AND ASSOICATED SECONDARY MEMBERS	0
OCCUPANCY SEPARATION (MBC 302.3.2)	NA
INCIDENTAL USE AREAS (MBC 302.2)	NA
FIRE SEPARATION DISTANCE (MBC TABLE 602)	
DISTANCE FROM ADJACENT BUILDING OR PROPERTY LINE	<30'
FIRE PROTECTION	DETECTOR AND ALARM
SPRINKLERS	NO
FIRE EXTINGUISHERS	YES
EXIT LIGHTING	YES
EMERGENCY LIGHTING	YES
PANIC HARDWARE	YES

WELL HOUSE 25 PERSPECTIVE

SCALE:

TETRA TECH
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003
www.tetratech.com

STATE OF MICHIGAN — JAMES QUINTIN BIAGI, JR. — ARCHITECT — 1301058886 — LICENSED

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN

STEERE FARM ENGINE REPLACE

GENERAL NOTES & LIFE SAFETY

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-002

Bar Measures 1 inch

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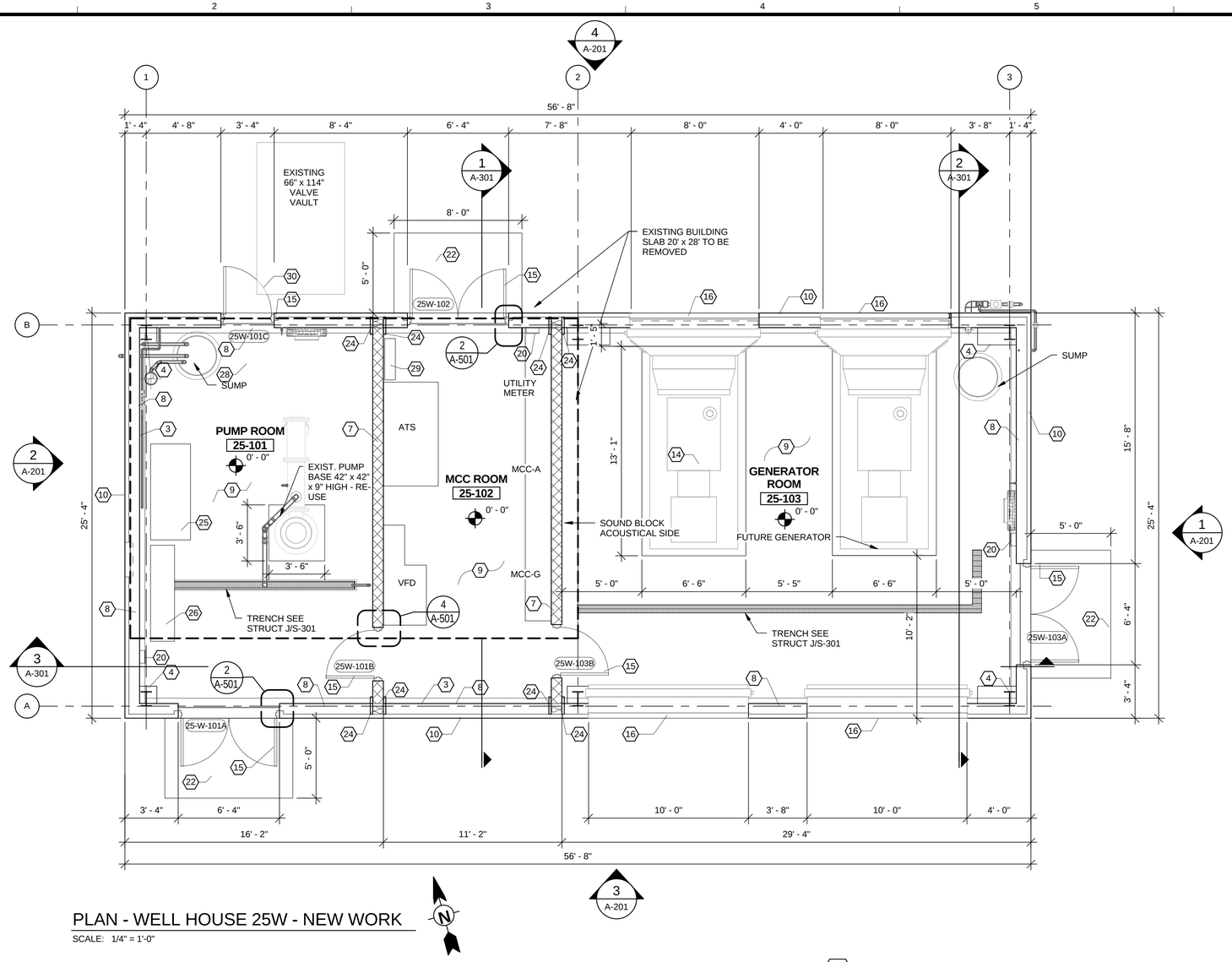

PLAN - WELL HOUSE 25W - NEW WORK

SCALE: 1/4" = 1'-0"

EXISTING WELL HOUSE 25 EXTERIOR

NEW WORK KEY NOTES

3 NEW PEMB GIRTS - SEE SPECIFICATIONS "13341 METAL BUILDING SYSTEMS" FOR REQUIREMENTS.

4 NEW PEMB COLUMNS - SEE SPECIFICATIONS "13341 METAL BUILDING SYSTEMS" FOR REQUIREMENTS.

7 NEW 8" CMU WALL - EXTEND FROM FLOOR TO ROOF DECK. 8" SOUND ACOUSTICAL BLOCK AT GENERATOR ROOM (BOD SOUNDBLOX) - SEE STRUCTURAL.

8 NEW 4' HIGH 8" SPLIT FACED CMU WATERTABLE WALL WITH INTEGRAL COLOR AND WATER REPELLENT MORTAR AND BLOCK. FILL WALL CAVITY WITH SPRAY APPLIED CLOSED CELL POLYURETHANE FOAM INSULATION. PROVIDE KYNAR COATED G90 BREAK METAL CAP AT TOP OF WALL.

9 EPOXY PAINT FLOOR SLABS AND PADS. BROADCAST SAND IN FLOOR FOR SLIP RESISTANCE.

10 NEW INSULATED METAL WALL PANEL (R-20). PROVIDE ALL COMPONENTS REQUIRED FOR COMPLETE WEATHER TIGHT INSTALLATION. WALL PANEL BASIS OF DESIGN KINGSPAN 300R SERIES 3"x42" INSULATED WALL PANEL G90 GLAVANIZED STEEL.

14 MECHANICAL EQUIPMENT - SEE MECHANICAL DRAWINGS FOR DETAILS.

15 HOLLOW METAL DOOR AND FRAME

16 DRAINABLE ALUMINUM LOUVER WITH REMOVABLE SCREEN ON EXTERIOR SIDE.

20 FIRE EXTINGUISHER - SEE SHEET A-002 GENERAL NOTE 27. COORDINATE LOCATION WITH ELECTRICAL PANEL INSTALLATION, SEE ELECTRICAL, E-105.

22 CONCRETE SLAB. SEE STRUCTURAL E/S301.

24 SCRIBE 1X WOOD PANEL TO PROVIDE ENCLOSURE AT WALL ENDS EACH SIDE. COVER WITH KYNAR COATED BREAK METALON EXPOSED FACE. FILL CAVITY WITH BATT FIBERGLASS INSULATON

25 6' LONG X 2'-6" DEEP 36" HIGH HEAVY DUTY INDUSTRIAL WOOD TOP WORK BENCH ON STEEL TUBE FRAME. PROVIDE HEAVY DUTY VICE MOUNTED TO WORK BENCH. BOD ULINE MODEL H-1137.

26 HEAVY DUTY UNISTRUT INDUSTRIAL SHELVING. 72" HIGH X 24" DEEP X 72" LONG.

28 PROVIDE THRESHOLD, WEATHER STRIPPING AT ALL EXTERIOR DOORS AND FRAMES.

29 CONTRACTOR TO PROVIDE ONE (1) HEAVY DUTY, TWIN STEP LADDER. THE STEP LADDER SHALL BE FIBERGLASS CONSTRUCTION, 375 LB. LOADING CAPACITY, ANSI TYPE IAA, STEPS ON BOTH SIDES, AND 10'-0" HIGH. STEP LADDER SHALL BE WERNER MODEL T7410, GRAINGER ITEM #4XP51, OR EQUAL.

30 CONTRACTOR SHALL GRIND THE TOP OF THE VALVE VAULT, LEVEL WITH ADJACENT SURFACE, AS REQUIRED TO CLEAR DOOR SWING.

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

TETRA TECH
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710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN JAMES QUINTIN BIAGI, JR. ARCHITECT 1301058 LICENSED

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN

STEERE FARM ENGINE REPLACE

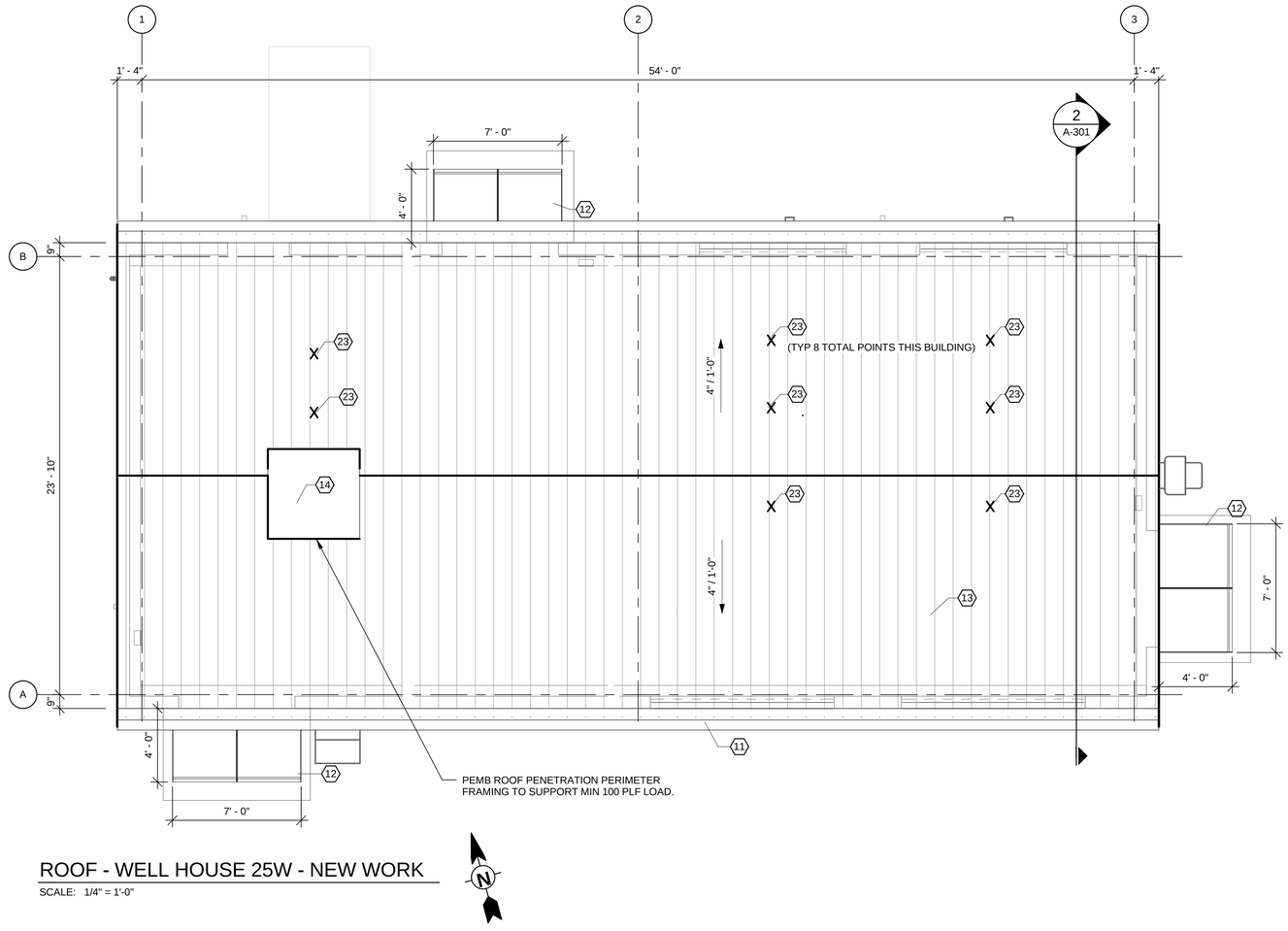
WELL HOUSE 25W - FLOOR PLAN

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-101

4/15/2016 10:46:52 AM C:\Users\Quintin.Biagi\Documents\A-ENGINE BUILDING_quintin.biagi@tetratech.com.rvt

Bar Measures 1 inch



ROOF - WELL HOUSE 25W - NEW WORK

SCALE: 1/4" = 1'-0"

KEY NOTES

11 G90 GALVANIZED FASCIA AND RAKE TRIM WITH FACTORY APPLIED KYNAR FINISH - PEMB MANUFACTURE STANDARD TRIM STYLE.

12 ALUMINUM AWNING WITH OVERHEAD BRACES - 24" WIDE W-SHAPE PANEL. BASIS OF DESIGN GENERAL AWNING IMPERIAL MARQUEE AWNING W/ W-SHAPED PANELS

13 INSULATED METAL ROOF PANEL (R-37) BASIS OF DESIGN KINGSPAN 900 HIGH RIB G90 GALVANIZED

14 MECHANICAL EQUIPMENT - SEE MECHANICAL DRAWINGS FOR DETAILS.

23 PEMB MFR TO PROVIDE 1,000 LB PICK POINTS ON UNDERSIDE OF STEEL FRAMING FOR LIFTING COMPONENTS. COORDINATE LOCATION WITH OWNER. (RE: DTL 7/S-502)

(TYP 8 TOTAL POINTS THIS BUILDING, RE: DTL 7/S-502)

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

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www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN
JAMES QUINTIN BIAGI, JR.
ARCHITECT
No. 1301058
LICENSED

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN

STEERE FARM ENGINE REPLACE

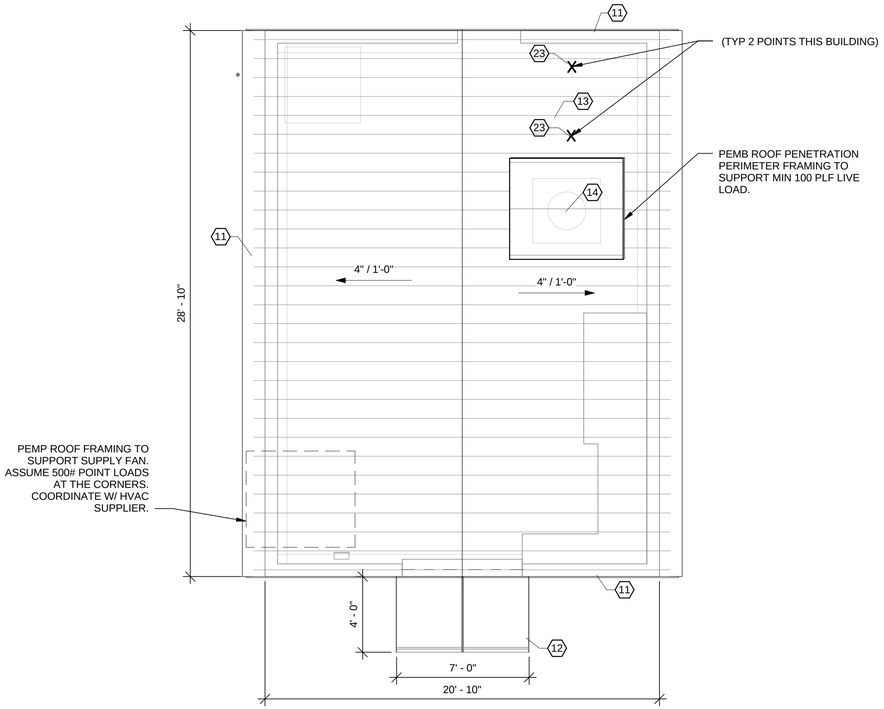
WELL HOUSE 25W - ROOF PLAN

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-102

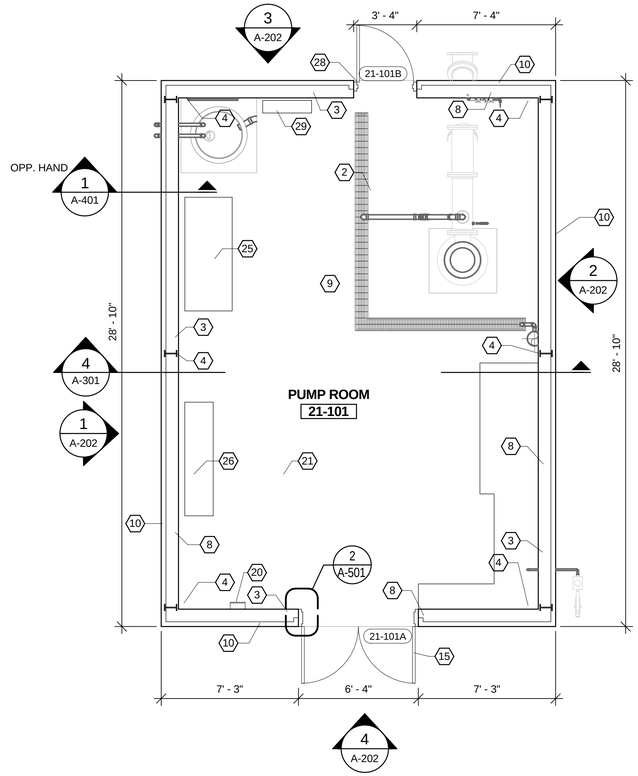
Bar Measures 1 inch

4/15/2016 10:46:58 AM C:\Users\Quintin.Biagi\Documents\A-ENGINE BUILDING_quintin.biagi@tetratech.com.rvt



ROOF - WELL HOUSE 21W - NEW WORK

SCALE: 1/4" = 1'-0"



PLAN - WELL HOUSE 21W - NEW WORK

SCALE: 1/4" = 1'-0"

EXISTING WELL HOUSE 21W EXTERIOR

EXISTING WELL HOUSE 21W EXTERIOR

EXISTING WELL HOUSE 21W EXTERIOR

NEW WORK KEY NOTES

2 PATCH CONCRETE SLAB AS REQUIRED TO PROVIDE SMOOTH LEVEL FINISH FOR NEW EPOXY FLOOR COATING.

3 NEW PEMB GIRTS - SEE SPECIFICATIONS "13341 METAL BUILDING SYSTEMS" FOR REQUIREMENTS.

4 NEW PEMB COLUMNS - SEE SPECIFICATIONS "13341 METAL BUILDING SYSTEMS" FOR REQUIREMENTS.

8 NEW 4' HIGH 8" SPLIT FACED CMU WATERTABLE WALL WITH INTEGRAL COLOR AND WATER REPELLENT MORTAR AND BLOCK. FILL WALL CAVITY WITH SPRAY APPLIED CLOSED CELL POLYURETHANE FOAM INSULATION. PROVIDE KYNAR COATED G90 BREAK METAL CAP AT TOP OF WALL.

9 EPOXY PAINT FLOOR SLABS AND PADS. BROADCAST SAND IN FLOOR FOR SLIP RESISTANCE.

10 NEW INSULATED METAL WALL PANEL (R-20). PROVIDE ALL COMPONENTS REQUIRED FOR COMPLETE WEATHER TIGHT INSTALLATION. WALL PANEL BASIS OF DESIGN KINGSPAN 300R SERIES 3"x42" INSULATED WALL PANEL G90 GLAVANIZED STEEL.

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20 FIRE EXTINGUISHER - SEE SHEET A-002 GENERAL NOTE 27. COORDINATE LOCATION WITH ELECTRICAL PANEL INSTALLATION, SEE ELECTRICAL, E-105.

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SCALE: 1/4" = 1'-0"

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STATE OF MICHIGAN JAMES QUINTIN BIAGI, JR. ARCHITECT 1301058

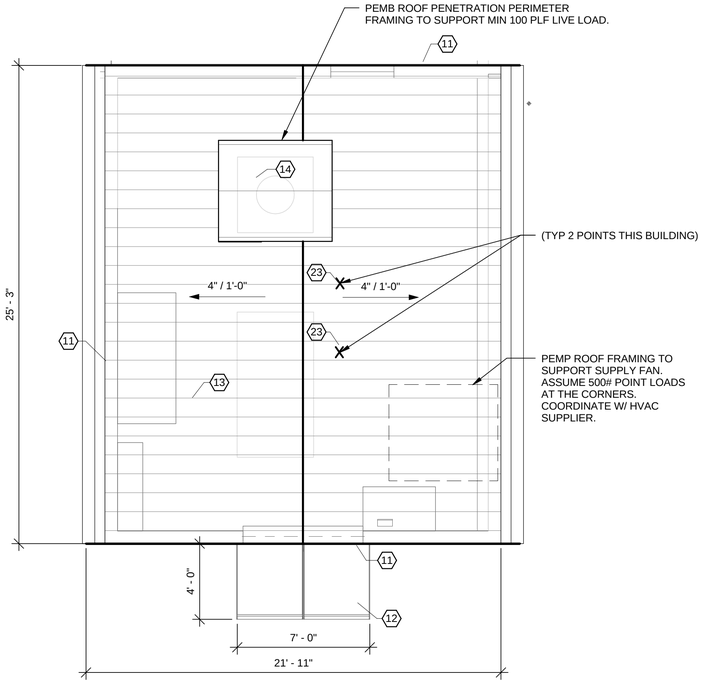
MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
WELL HOUSE 21W

Project No.:	200-31537-15005
Designed By:	Q.BIAGI
Drawn By:	T.HOURIGAN
Checked By:	D. GALANTE

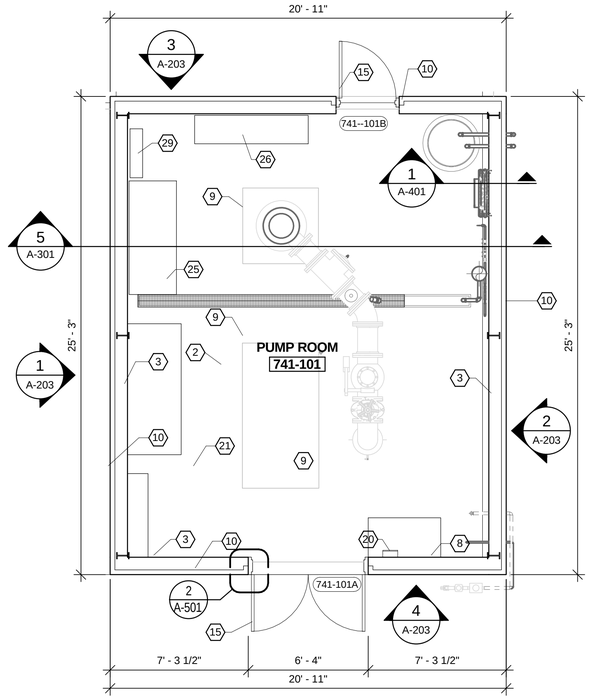
A-103

Bar Measures 1 inch



ROOF - WELL HOUSE 741 - NEW WORK

SCALE: 1/4" = 1'-0"



PLAN - WELL HOUSE 741 - NEW WORK

SCALE: 1/4" = 1'-0"

EXISTING WELL HOUSE 741 EXTERIOR

NEW WORK KEY NOTES

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0 2' 4' 8'

SCALE: 1/4" = 1'-0"

Bar Measures 1 inch

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Ann Arbor, MI 48108
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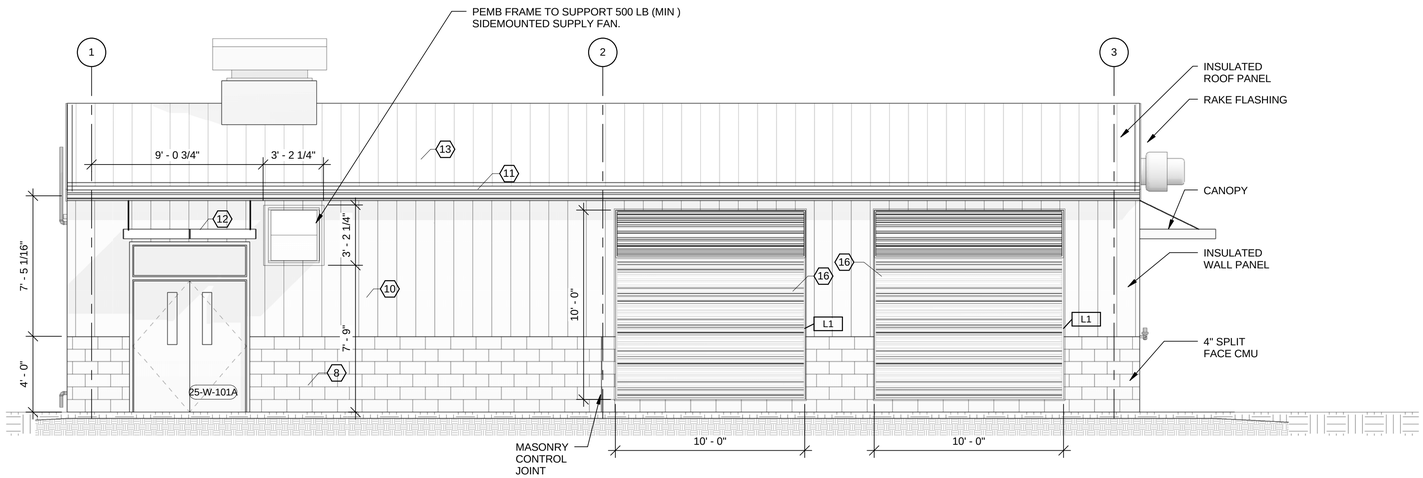
STATE OF MICHIGAN JAMES QUINTIN BIAGI JR. ARCHITECT 1301058###

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

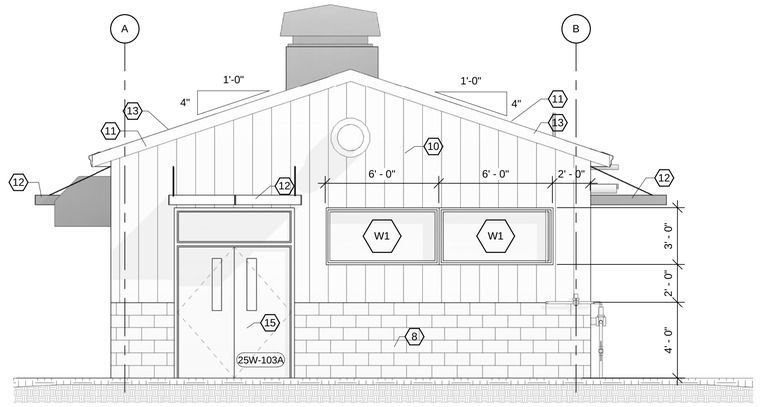
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
WELL HOUSE 741

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

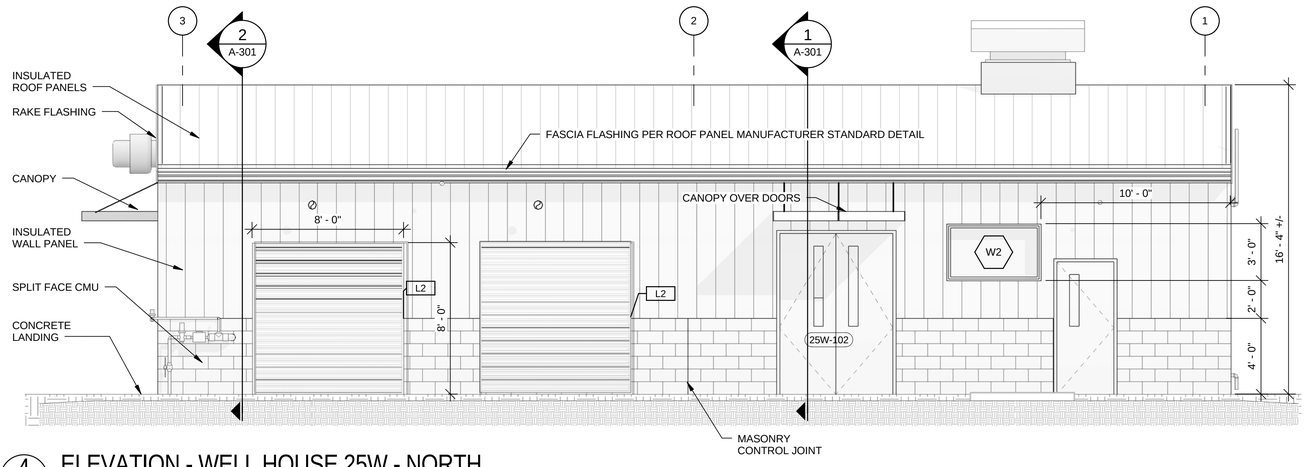
A-104



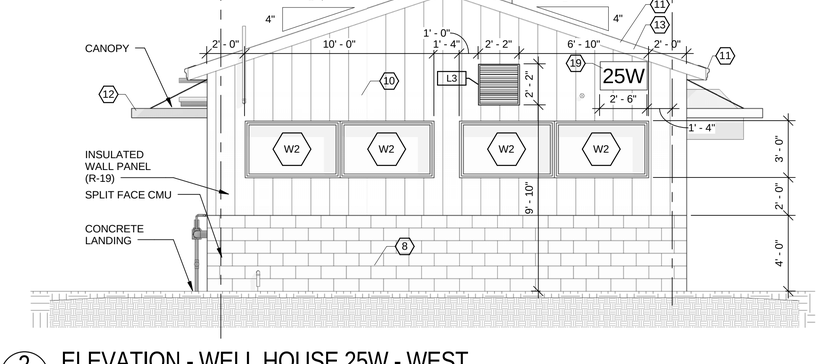
3 A-201 **ELEVATION - WELL HOUSE 25W- SOUTH**
1/4" = 1'-0"



1 A-201 **ELEVATION - WELL HOUSE 25W - EAST**
1/4" = 1'-0"



4 A-201 **ELEVATION - WELL HOUSE 25W - NORTH**
1/4" = 1'-0"



2 A-201 **ELEVATION - WELL HOUSE 25W - WEST**
1/4" = 1'-0"

NEW WORK KEY NOTES (#)

8 NEW 4' HIGH 8" SPLIT FACED CMU WATERTABLE WALL WITH INTEGRAL COLOR AND WATER REPELLENT MORTAR AND BLOCK. FILL WALL CAVITY WITH SPRAY APPLIED CLOSED CELL POLYURETHANE FOAM INSULATION. PROVIDE KYNAR COATED G90 BREAK METAL CAP AT TOP OF WALL.

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15 HOLLOW METAL DOOR AND FRAME

16 DRAINABLE ALUMINUM LOUVER WITH REMOVABLE SCREEN ON EXTERIOR SIDE.

19 BUILDING IDENTIFICATION SIGN. (12" X 30" ALUMINUM SIGN WITH BUILDING NUMBER IN 8" ARIAL FONT, WHITE SIGN, BLUE LETTERING)

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

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710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN JAMES QUINTIN BIAGI, JR. ARCHITECT 1301058888 LICENSED

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

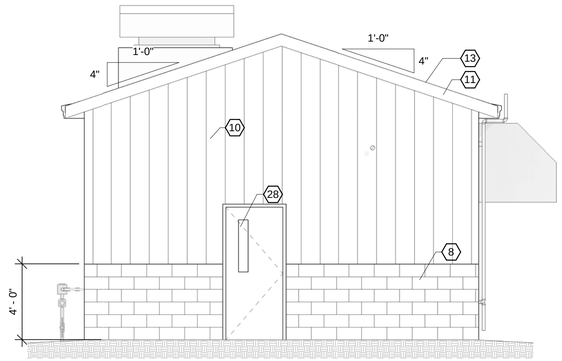
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
ELEVATIONS WELL HOUSE 25W

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

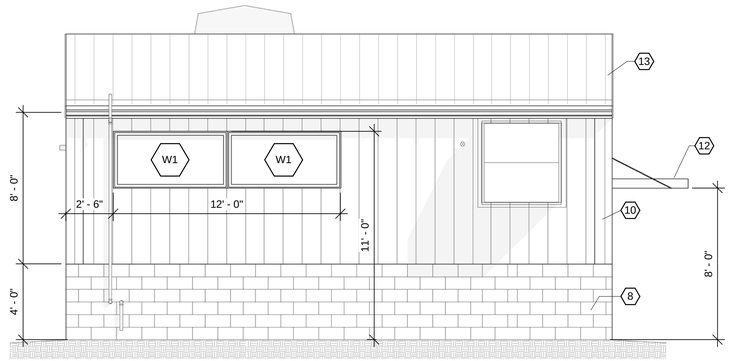
A-201

Bar Measures 1 inch

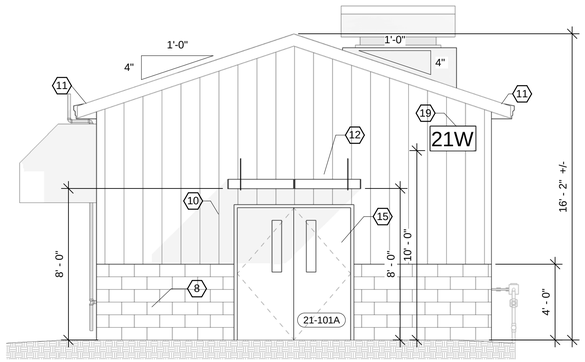
4/15/2016 10:48:03 AM C:\Users\Quintin.Biagi\Documents\A-ENGINE BUILDING_quintin.biagi@tetratech.com.rvt



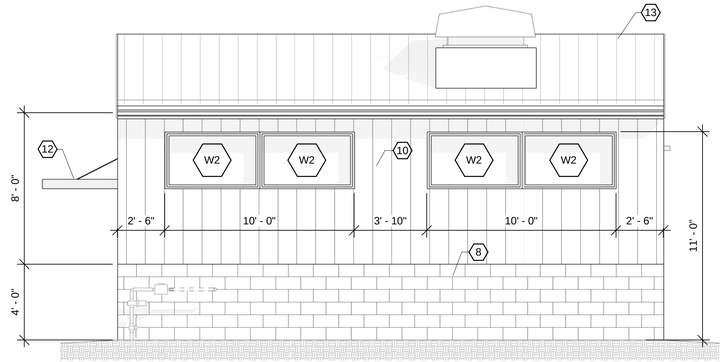
3 A-202 ELEVATION - WELL HOUSE 21W - NORTH
1/4" = 1'-0"



1 A-202 ELEVATION - WELL HOUSE 21W - WEST
1/4" = 1'-0"



4 A-202 ELEVATION - WELL HOUSE 21W - SOUTH
1/4" = 1'-0"



2 A-202 ELEVATION - WELL HOUSE 21W - EAST
1/4" = 1'-0"

NEW WORK KEY NOTES (#)

8 NEW 4' HIGH 8" SPLIT FACED CMU WATERTABLE WALL WITH INTEGRAL COLOR AND WATER REPELLENT MORTAR AND BLOCK. FILL WALL CAVITY WITH SPRAY APPLIED CLOSED CELL POLYURETHANE FOAM INSULATION. PROVIDE KYNAR COATED G90 BREAK METAL CAP AT TOP OF WALL.

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19 BUILDING IDENTIFICATION SIGN. (12" X 30" ALUMINUM SIGN WITH BUILDING NUMBER IN 8" ARIAL FONT, WHITE SIGN, BLUE LETTERING)

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0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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STATE OF MICHIGAN
JAMES QUINTIN BIAGI, JR.
ARCHITECT
LICENSED
13010536

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
ELEVATIONS WELL HOUSE 21W

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-202

Bar Measures 1 inch

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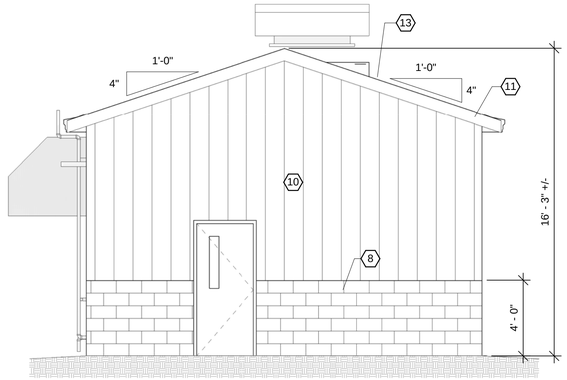
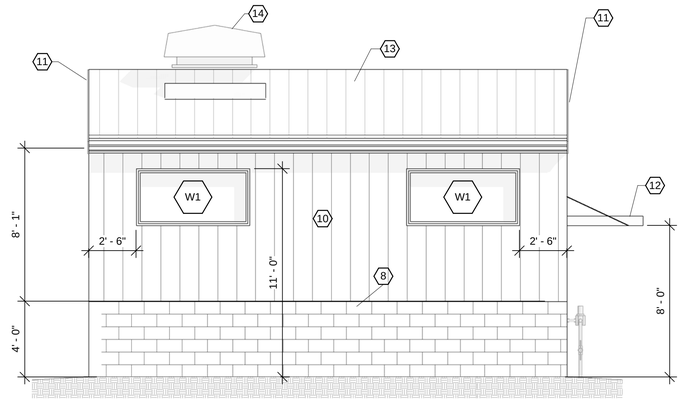
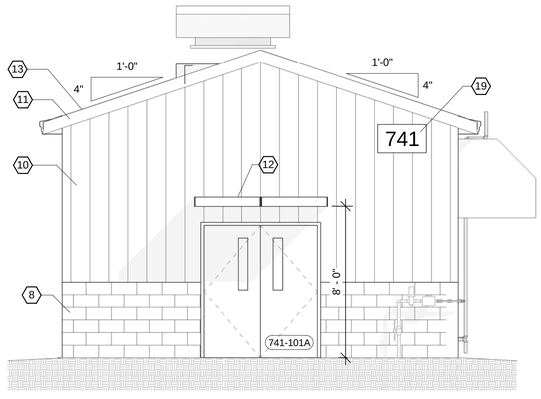


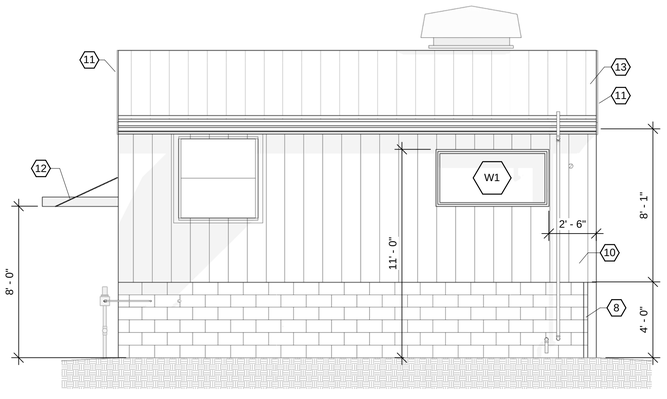
3 A-203 ELEVATION - WELL HOUSE 741 - NORTH
1/4" = 1'-0"



1 A-203 ELEVATION - WELL HOUSE 741 - WEST
1/4" = 1'-0"



4 A-203 ELEVATION - WELL HOUSE 741 - SOUTH
1/4" = 1'-0"



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NEW WORK KEY NOTES

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STATE OF MICHIGAN
JAMES QUINTIN BIAGI, JR.
ARCHITECT
LICENSED
13010536

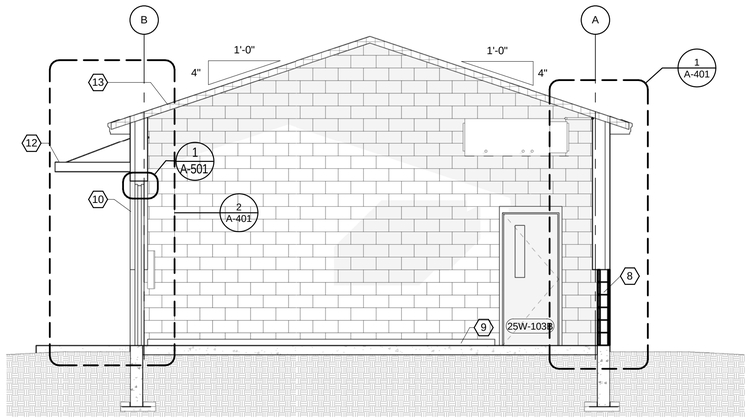
MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
ELEVATIONS WELL HOUSE 741

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

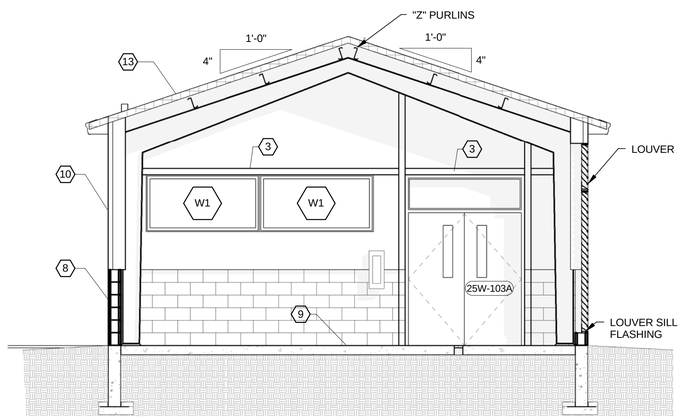
A-203

Bar Measures 1 inch



1 A-101 SECTION A - WELL HOUSE 25

SCALE: 1/4" = 1'-0"



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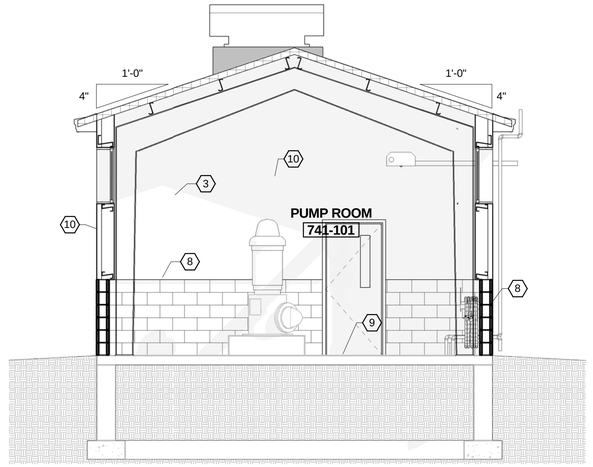

5 A-104 SECTION E - WELL HOUSE 741

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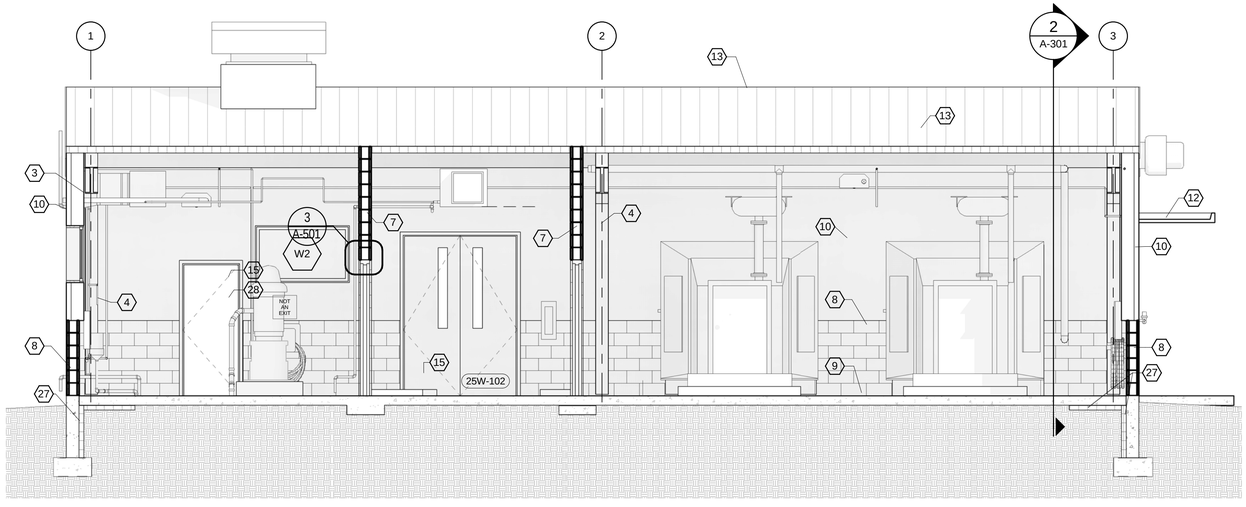

3 A-101 SECTION C - WELL HOUSE 25

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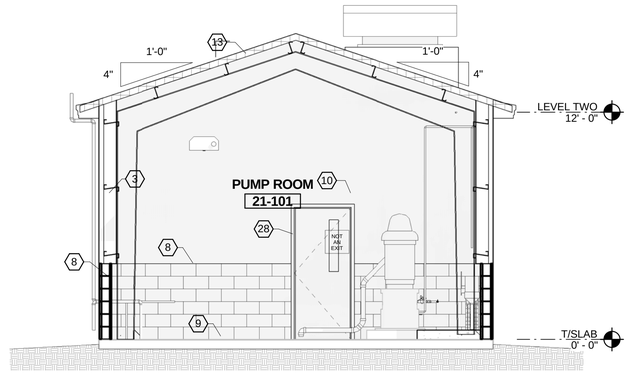

4 A-103 SECTION D - WELL HOUSE 21

SCALE: 1/4" = 1'-0"

NEW WORK KEY NOTES (#)

3 NEW PEMB GIRTS - SEE SPECIFICATIONS "13341 METAL BUILDING SYSTEMS" FOR REQUIREMENTS.

4 NEW PEMB COLUMNS - SEE SPECIFICATIONS "13341 METAL BUILDING SYSTEMS" FOR REQUIREMENTS.

7 NEW 8" CMU WALL - EXTEND FROM FLOOR TO ROOF DECK. 8" SOUND ACOUSTICAL BLOCK AT GENERATOR ROOM (BOD SOUNDBLOX) - SEE STRUCTURAL.

8 NEW 4' HIGH 8" SPLIT FACED CMU WATERTABLE WALL WITH INTEGRAL COLOR AND WATER REPELLENT MORTAR AND BLOCK. FILL WALL CAVITY WITH SPRAY APPLIED CLOSED CELL POLYURETHANE FOAM INSULATION. PROVIDE KYNAR COATED G90 BREAK METAL CAP AT TOP OF WALL.

9 EPOXY PAINT FLOOR SLABS AND PADS. BROADCAST SAND IN FLOOR FOR SLIP RESISTANCE.

10 NEW INSULATED METAL WALL PANEL (R-20). PROVIDE ALL COMPONENTS REQUIRED FOR COMPLETE WEATHER TIGHT INSTALLATION. WALL PANEL BASIS OF DESIGN KINGSPAN 300R SERIES 3"x42" INSULATED WALL PANEL G90 GLAVANIZED STEEL.

12 ALUMINUM AWNING WITH OVERHEAD BRACES - 24" WIDE W-SHAPE PANEL. BASIS OF DESIGN GENERAL AWNING IMPERIAL MARQUEE AWNING W/ W-SHAPED PANELS

13 INSULATED METAL ROOF PANEL (R-37) BASIS OF DESIGN KINGSPAN 900 HIGH RIB G90 GALVANIZED

15 HOLLOW METAL DOOR AND FRAME

27 PROVIDE 2" RIGID PERIMETER INSULATION FROM BOTTOM OF SLAB TO TOP OF FOOTING VERTICAL, AND 2" X 24" HORIZONTAL.

28 PROVIDE THRESHOLD, WEATHER STRIPPING AT ALL EXTERIOR DOORS AND FRAMES.

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

TETRA TECH
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003
www.tetratech.com

STATE OF MICHIGAN
JAMES QUINTIN BIAGI, JR.
ARCHITECT
LICENSED
13010598

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
BUILDING SECTIONS

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-301

Bar Measures 1 inch

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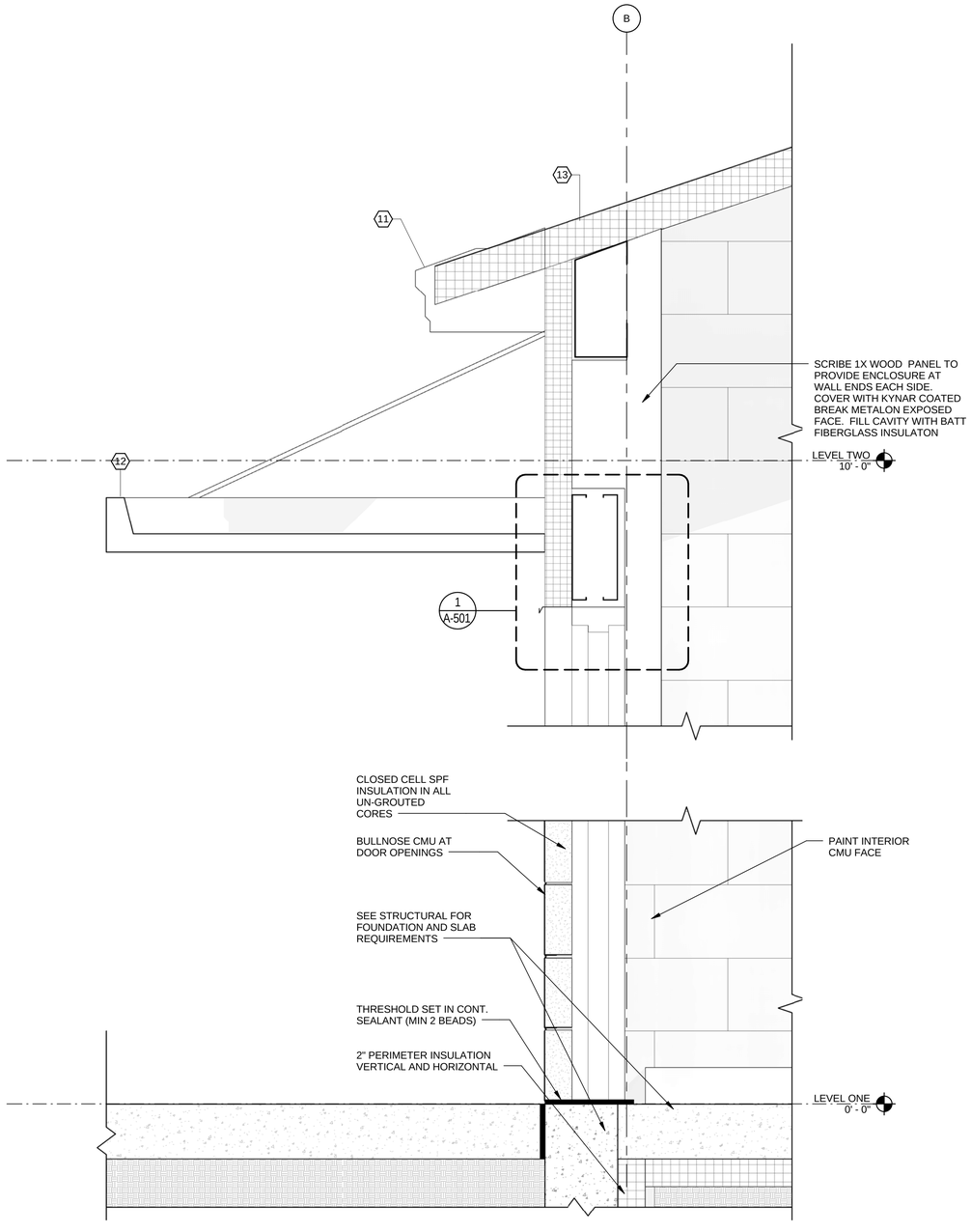
NEW WORK KEY NOTES (#)

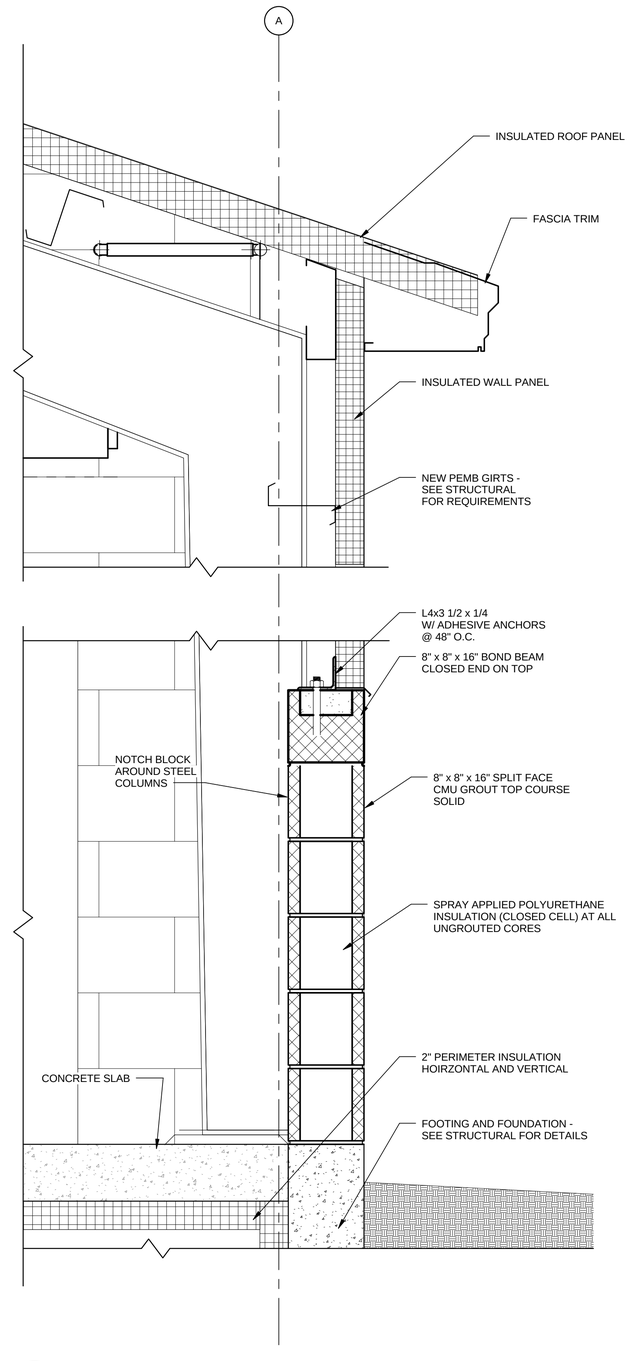
11 G90 GALVANIZED FASCIA AND RAKE TRIM WITH FACTORY APPLIED KYNAR FINISH - PEMB MANUFACTURE STANDARD TRIM STYLE.

12 ALUMINUM AWNING WITH OVERHEAD BRACES - 24" WIDE W-SHAPE PANEL. BASIS OF DESIGN GENERAL AWNING IMPERIAL MARQUEE AWNING W/ W-SHAPED PANELS

13 INSULATED METAL ROOF PANEL (R-37) BASIS OF DESIGN KINGSPAN 900 HIGH RIB G90 GALVANIZED



2 A-301 ENLARGED WALL SECTION
SCALE: 1 1/2" = 1'-0"



1 A-103 ENLARGED WALL SECTION
SCALE: 1 1/2" = 1'-0"

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Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN JAMES QUINTIN BIAGI, JR. ARCHITECT 1301058###

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
ENLARGED SECTIONS

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-401

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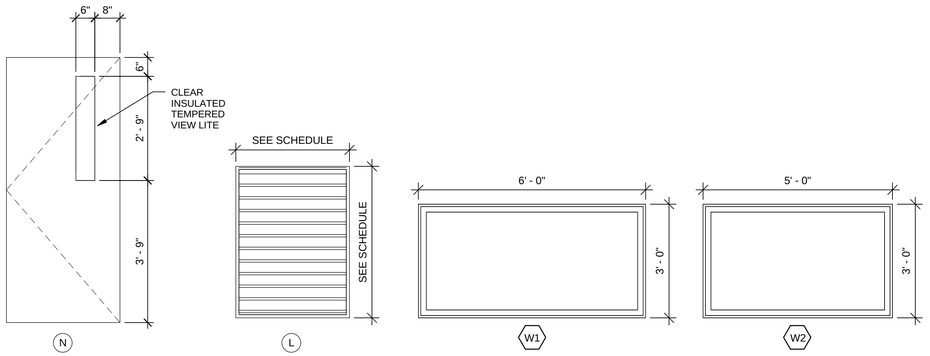
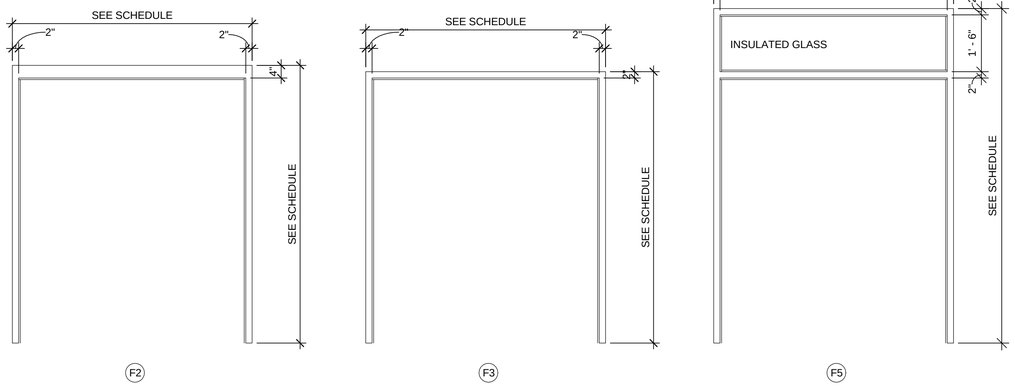
Bar Measures 1 inch



DOOR, WINDOW, & LOUVER TYPES

SCALE: 1/2" = 1'-0"



FRAME TYPES

SCALE: 1/2" = 1'-0"

WINDOW SCHEDULE

MARK	R.O. WIDTH	R.O. HEIGHT	REMARKS (SEE NOTES)
W1	6' - 0"	3' - 0"	INSULATED FIXED ALUMINUM WINDOW
W2	5' - 0"	3' - 0"	INSULATED FIXED ALUMINUM WINDOW

LOUVER SCHEDULE

TAG	HEIGHT	WIDTH	Comments
L1	12' - 6"	10' - 0"	SEE MECH. DWGS FOR DETAILS
L2	8' - 0"	8' - 0"	SEE MECH. DWGS FOR DETAILS
L3	2' - 0"	2' - 0"	SEE MECH. DWGS FOR DETAILS

ROOM SCHEDULE

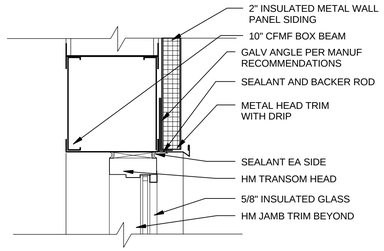
NUMBER	NAME	FLOOR	CMU BASE & CMU WALLS	METAL WALLS	CEILING	COMMENTS
21-101	PUMP ROOM	EPOXY (NONSLIP)	EPOXY	FACT. FINISH INSULATED PANEL	FACT. FINISHED INSULATED PANEL - NO EXPOSED FASTENERS	INTERIOR WALLS AND CEILINGS PC-1
25-101	PUMP ROOM	EPOXY (NONSLIP)	EPOXY	FACT. FINISH INSULATED PANEL	FACT. FINISHED INSULATED PANEL - NO EXPOSED FASTENERS	INTERIOR WALLS AND CEILINGS PC-1
25-102	MCC ROOM	EPOXY (NONSLIP)	EPOXY	FACT. FINISH INSULATED PANEL	FACT. FINISHED INSULATED PANEL - NO EXPOSED FASTENERS	INTERIOR WALLS AND CEILINGS PC-1
25-103	GENERATOR ROOM	EPOXY (NONSLIP)	EPOXY	FACT. FINISH INSULATED PANEL	FACT. FINISHED INSULATED PANEL - NO EXPOSED FASTENERS	INTERIOR WALLS AND CEILINGS PC-1
741-101	PUMP ROOM	EPOXY (NONSLIP)	EPOXY	FACT. FINISH INSULATED PANEL	FACT. FINISHED INSULATED PANEL - NO EXPOSED FASTENERS	INTERIOR WALLS AND CEILINGS PC-1

CONCRETE SEALER (NONSLIP) — BID ALTERNATE #4 (FLOOR COATING, APPLIES TO ALL FLOORS)

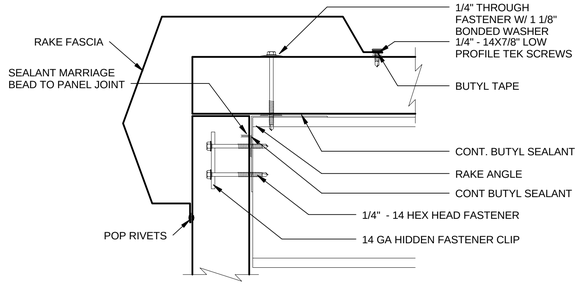
PC-1 BOD TNEMEC DELFT BLUE 39BL - HIGH-GLOSS FINISH
PC-2 BOD TNEMEC SLATE GRAY 31GR - SEMI-GLOSS FINISH

DOOR SCHEDULE

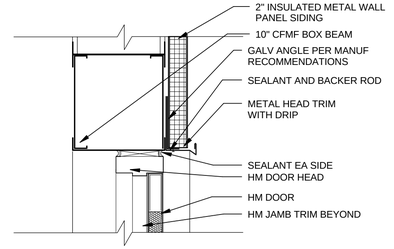
NUMBER	DOOR TYPE	DOOR WIDTH	DOOR HEIGHT	DOOR THICKNESS	DOOR MATERIAL	DOOR FINISH	DOOR GLAZING TYPE	FIRE RATING	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	HARDWARE SET	DETAILS HEAD	DETAILS JAMB	COMMENTS
21-101A	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F2	HM	PC-2	1	1/A-501	2/A-501	DOUBLE DOOR
21-101B	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F3	HM	PC-2	2	1/A-501	2/A-501	
25-W-101A	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F5	HM	PC-2	1	5/A-501	2/A-501	DOUBLE DOOR
25W-101B	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F3	HM	PC-2	2	1/A-501	2/A-501	
25W-101C	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F3	HM	PC-2	2	1/A-501	2/A-501	
25W-102	N	3' - 0"	8' - 6"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F2	HM	PC-2	1	1/A-501	2/A-501	DOUBLE DOOR
25W-103A	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F5	HM	PC-2	1	5/A-501	2/A-501	DOUBLE DOOR
25W-103B	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F3	HM	PC-2	2	1/A-501	2/A-501	
741-101A	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F2	HM	PC-2	1	1/A-501	2/A-501	DOUBLE DOOR
741--101B	N	3' - 0"	7' - 0"	0' - 1 3/4"	HM	PC-2	5/8" TEMPERED / GAS FILLED	NA	F3	HM	PC-2	2	1/A-501	2/A-501	



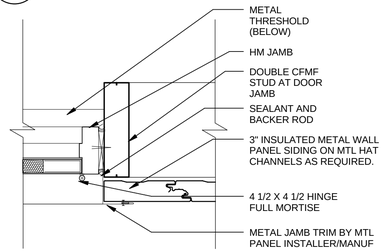
5 DOOR HEAD TYPE 3 TRANSOM
SCALE: NTS



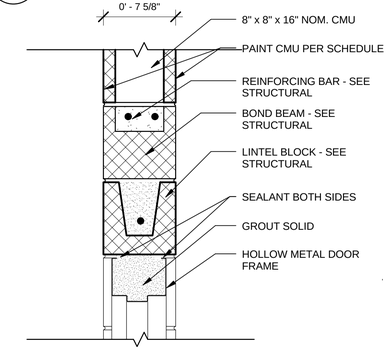
6 RAKE DETAIL
SCALE: 3/4" = 1'-0"



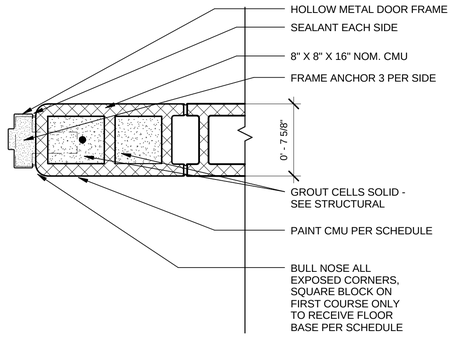
1 A-301 DOOR HEAD TYPE 1
SCALE: NTS



2 A-101 DOOR JAMB TYPE 1
SCALE: NTS"



3 A-301 DOOR HEAD TYPE 2
SCALE: NTS



4 A-101 DOOR JAMB TYPE 2
SCALE: NTS

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STATE OF MICHIGAN * JAMES QUINTIN BIAGI JR. * ARCHITECT * 1301058 * LICENSED

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE

SCHEDULES & DETAILS

Project No.:	200-31537-15005
Designed By:	Q. BIAGI
Drawn By:	T. HOURIGAN
Checked By:	D. GALANTE

A-501

Bar Measures 1 inch

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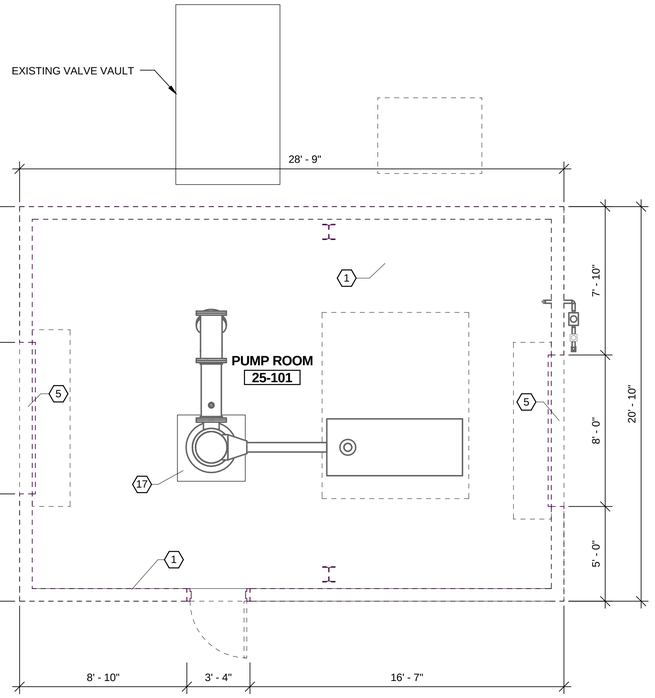
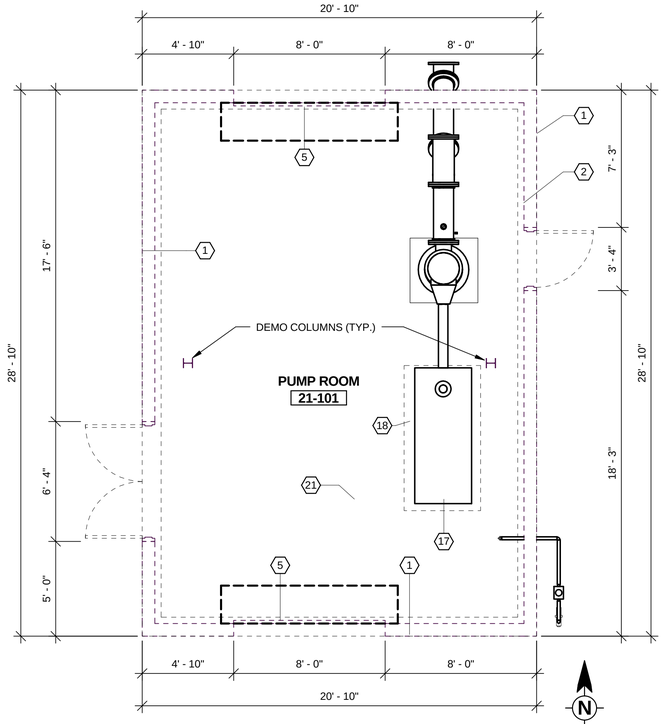


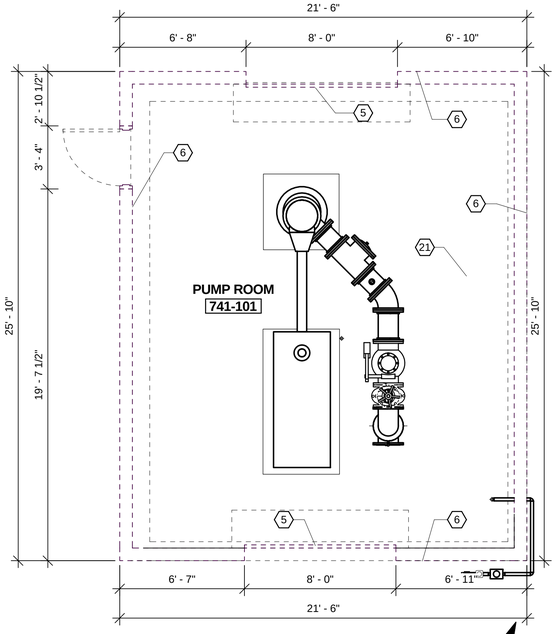
PLAN - WELL HOUSE 25W - DEMO

SCALE: 1/4" = 1'-0"



PLAN - WELL HOUSE 21W - DEMO

SCALE: 1/4" = 1'-0"

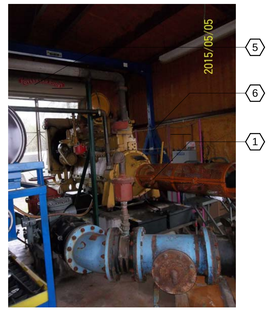


PLAN - WELL HOUSE 741 - DEMO

SCALE: 1/4" = 1'-0"

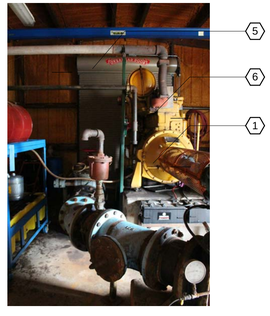
WELL HOUSE 25 INTERIOR

WELL HOUSE 21W - INTERIOR



WELL HOUSE 741 INTERIOR

WELL HOUSE 21W - INTERIOR



WELL HOUSE 741 INTERIOR

DEMOLITION PHOTOS

SCALE: NTS

DEMOLITION GENERAL NOTES

A ALL AREAS DESIGNATED BY DASHED LINES ARE TO BE REMOVED.

B ALL AREAS, EQUIPMENT, PADS, AND COMPONENTS NOT DASHED OR NOTED TO BE REMOVED SHALL REMAIN INTACT. PATCH AND REPAIR EXISTING ADJACENT SURFACES AS REQUIRED AFTER DEMOLITION TO MATCH EXISTING OR IN ACCORDANCE WITH PROPOSED RENOVATIONS.

C PROVIDE INTERIOR AND EXTERIOR SHORING, BRACING, OR OTHER SUPPORT TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF ELEMENTS TO BE DEMOLISHED AND ADJACENT EXISTING ELEMENTS TO REMAIN.

D LOCATE AND IDENTIFY EXISTING UTILITIES, INCLUDING SANITARY SEWER SYSTEM, AND ASCERTAIN THEIR CONDITION TO ENSURE ADEQUATE PERFORMANCE OF ALL UTILITIES IN NEW CONSTRUCTION. PROTECT UTILITY LINES AND HARDWARE DURING DEMOLITION AND CONSTRUCTION PHASES.

E LEAD PAINT HAS BEEN IDENTIFIED ON THE PROJECT. ALL OTHER HAZARDOUS MATERIALS HAVE BEEN ADDRESSED BY OWNER. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING DEMOLITION OPERATIONS IT SHALL BE BROUGHT TO OWNER ATTENTION.

F REMOVE DECAYED, VERMIN-INFESTED OR OTHERWISE DANGEROUS OR UNSUITABLE MATERIALS AND PROMPTLY DESPOSE OF OFF-SITE.

G CONTRACTOR IS RESPONSIBLE TO REMOVE FROM BUILDING SITE DEBRIS, TRASH, AND OTHER DISCARDED MATERIALS AND/OR EQUIPMENT RESULTING FROM DEMOLITION OPERATIONS. TRANSPORT AND LEGALLY DISPOSE OFF SITE

H SEE M/P/E DRAWINGS FOR COORDINATION AND FURTHER INFORMATION ON MECHANICAL, PLUMBING AND ELECTRICAL DEMOLITION. INCLUDING BUT NOT LIMITED TO EXISTING PLUMBING FIXTURES, DRAINAGE AND VENT PIPING, AND SURFACE MOUNTED CONDUIT AND WIREMOLD. REMOVE OR RELOCATE INTERIOR SURFACE MOUNTED ITEMS WHERE THEY CONFLICT WITH NEW WORK.

I COORDINATE ALL DEMOLITION WITH OWNER AND OTHER TRADES.

J IN ALL AREAS OF CONSTRUCTION REMOVE ALL EXG WALL MOUNTED ITEMS INCLUDING BUT NOT LIMITED TO TACKBOARDS, PHOTOGRAPHS, FRAMED ITEMS, SIGNAGE, SAFETY EQUIPMENT AND ALL ASSOCIATED HANGERS AND SUPPORTS. TURN OVER TO OWNER OR CAREFULLY STORE FOR REUSE/REINSTALLATION AS DIRECTED BY OWNER. PATCH AND FINISH EXG WALL SURFACE AS REQUIRED TO MATCH EXG ADJACENT CONDITIONS.

K DO NOT DEMO ANY I.T. CABLING. PROTECT ALL I.T. CABLING TO REMAIN DURING CONSTRUCTION. COORDINATE WITH OWNER'S REPRESENTATIVE.

L VERIFY DIMENSIONS AND LOCATIONS. IT IS ANTICIPATED THAT EXISTING CONDITIONS SHALL REQUIRE SLIGHT ADJUSTMENTS.

M IN ALL AREAS OF CONSTRUCTION REMOVE ALL EXISTING WALL MOUNTED ITEMS INCLUDING BUT NOT LIMITED TO TACKBOARDS, PHOTOGRAPHS, FRAMED ITEMS, SIGNAGE, SAFETY EQUIPMENT AND ALL ASSOCIATED HANGERS AND SUPPORTS TURNED OVER TO OWNER. PATCH AND FINISH EXISTING WALL SURFACES AS REQUIRED TO MATCH EXISTING ADJACENT CONDITIONS. ANY HANGERS, NAILS SUPPORTS, ETC THAT ARE NOT REMOVED PRIOR TO INSTALLATION OF FINAL WALL FINISH WILL BE NOTED AND REMOVED , PATCH AND THE WALL REPAIRED AT CONTRACTOR'S EXPENSE.

N DEMOLISH PEMB TO SLAB. RETAIN SLAB AND FOUNDATIONS FOR RE-USE.

DEMOLITION KEY NOTES

#

1 DEMOLISH EXISTING PEMB AND SLAB AS INDICATED IN STRUCTURAL REMOVAL DRAWINGS. REMOVE ALL STRUCTURAL FRAMING MEMBERS, EXTERIOR CLADDING INCLUDING WALL PANELS, ROOF PANELS, DOORS AND FRAMES AND ALL COMPONENTS AND ACCESSORIES.

2 PATCH CONCRETE SLAB AS REQUIRED TO PROVIDE SMOOTH LEVEL FINISH FOR NEW EPOXY FLOOR COATING.

5 REMOVE OVERHEAD DOOR AND COMPONENTS.

6 REMOVE METAL WALL PANEL, STRUCTURAL SYSTEM AND SPRAY FOAM INSULATION TO SLAB.

17 LEAD HAS BEEN IDENTIFIED IN PAINT. SEE SPECIFICATIONS FOR SURVEY.

18 REMOVE ENGINE FOUNDATION FLUSH WITH FINISH FLOOR.

21 DEMOLISH PEMB TO SLAB. RETAIN SLAB AND FOUNDATIONS FOR RE-USE.

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

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1301056

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

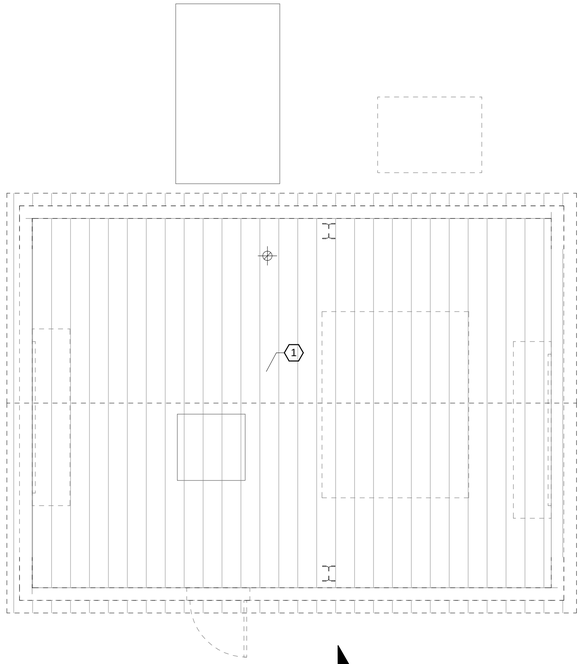
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE

FLOOR PLAN DEMOLITION

Project No.:	200-31537-15005
Designed By:	Q.BIAGI
Drawn By:	T.HOURIGAN
Checked By:	D.GALANTE

AD-101

0 2' 4' 8'
SCALE: 1/4" = 1'-0"
Bar Measures 1 inch

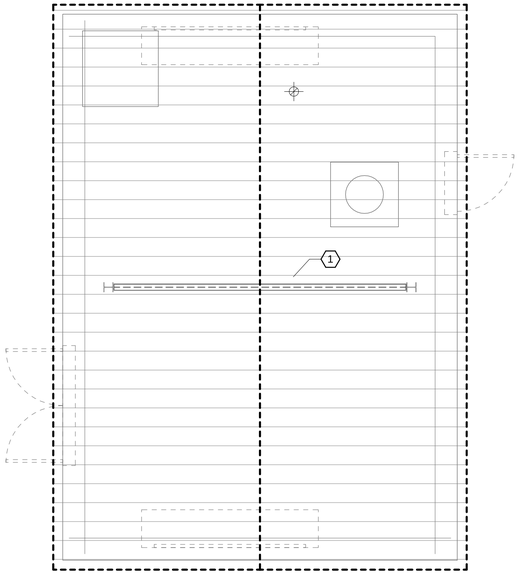


ROOF - WELL HOUSE 25W - DEMO

SCALE: 1/4" = 1'-0"

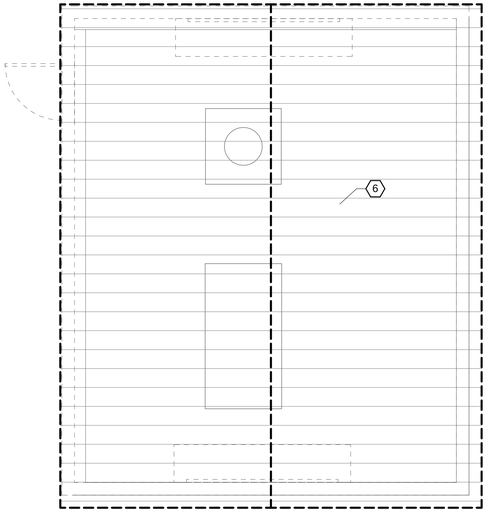
WELL HOUSE 25 - INTERIOR ROOF

WELL HOUSE 25 - INTERIOR ROOF



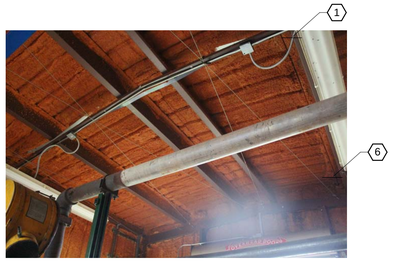
ROOF - WELL HOUSE 21W - REMOVAL

SCALE: 1/4" = 1'-0"



ROOF - WELL HOUSE 741 - REMOVAL

SCALE: 1/4" = 1'-0"



WELL HOUSE 741 - INTERIOR ROOF

WELL HOUSE 21W - INTERIOR ROOF

WELL HOUSE 741 - INTERIOR ROOF

WELL HOUSE 21W - INTERIOR ROOF

WELL HOUSE 21W - INTERIOR ROOF

DEMO PHOTOS

SCALE: NTS

DEMOLITION GENERAL NOTES

A ALL AREAS DESIGNATED BY DASHED LINES ARE TO BE REMOVED.

B ALL AREAS, EQUIPMENT, PADS, AND COMPONENTS NOT DASHED OR NOTED TO BE REMOVED SHALL REMAIN INTACT. PATCH AND REPAIR EXISTING ADJACENT SURFACES AS REQUIRED AFTER DEMOLITION TO MATCH EXISTING OR IN ACCORDANCE WITH PROPOSED RENOVATIONS.

C PROVIDE INTERIOR AND EXTERIOR SHORING, BRACING, OR OTHER SUPPORT TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF ELEMENTS TO BE DEMOLISHED AND ADJACENT EXISTING ELEMENTS TO REMAIN.

D LOCATE AND IDENTIFY EXISTING UTILITIES, INCLUDING SANITARY SEWER SYSTEM, AND ASCERTAIN THEIR CONDITION TO ENSURE ADEQUATE PERFORMANCE OF ALL UTILITIES IN NEW CONSTRUCTION. PROTECT UTILITY LINES AND HARDWARE DURING DEMOLITION AND CONSTRUCTION PHASES.

E LEAD PAINT HAS BEEN IDENTIFIED ON THE PROJECT. ALL OTHER HAZARDOUS MATERIALS HAVE BEEN ADDRESSED BY OWNER. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING DEMOLITION OPERATIONS IT SHALL BE BROUGHT TO OWNER ATTENTION.

F REMOVE DECAYED, VERMIN-INFESTED OR OTHERWISE DANGEROUS OR UNSUITABLE MATERIALS AND PROMPTLY DESPOSE OF OFF-SITE.

G CONTRACTOR IS RESPONSIBLE TO REMOVE FROM BUILDING SITE DEBRIS, TRASH, AND OTHER DISCARDED MATERIALS AND/OR EQUIPMENT RESULTING FROM DEMOLITION OPERATIONS. TRANSPORT AND LEGALLY DISPOSE OFF SITE

H SEE M/P/E DRAWINGS FOR COORDINATION AND FURTHER INFORMATION ON MECHANICAL, PLUMBING AND ELECTRICAL DEMOLITION. INCLUDING BUT NOT LIMITED TO EXISTING PLUMBING FIXTURES, DRAINAGE AND VENT PIPING, AND SURFACE MOUNTED CONDUIT AND WIREMOLD. REMOVE OR RELOCATE INTERIOR SURFACE MOUNTED ITEMS WHERE THEY CONFLICT WITH NEW WORK.

I COORDINATE ALL DEMOLITION WITH OWNER AND OTHER TRADES.

J IN ALL AREAS OF CONSTRUCTION REMOVE ALL EXG WALL MOUNTED ITEMS INCLUDING BUT NOT LIMITED TO TACKBOARDS, PHOTOGRAPHS, FRAMED ITEMS, SIGNAGE, SAFETY EQUIPMENT AND ALL ASSOCIATED HANGERS AND SUPPORTS. TURN OVER TO OWNER OR CAREFULLY STORE FOR REUSE/REINSTALLATION AS DIRECTED BY OWNER. PATCH AND FINISH EXG WALL SURFACE AS REQUIRED TO MATCH EXG ADJACENT CONDITIONS.

K DO NOT DEMO ANY I.T. CABLING. PROTECT ALL I.T. CABLING TO REMAIN DURING CONSTRUCTION. COORDINATE WITH OWNER'S REPRESENTATIVE.

L VERIFY DIMENSIONS AND LOCATIONS. IT IS ANTICIPATED THAT EXISTING CONDITIONS SHALL REQUIRE SLIGHT ADJUSTMENTS.

M IN ALL AREAS OF CONSTRUCTION REMOVE ALL EXISTING WALL MOUNTED ITEMS INCLUDING BUT NOT LIMITED TO TACKBOARDS, PHOTOGRAPHS, FRAMED ITEMS, SIGNAGE, SAFETY EQUIPMENT AND ALL ASSOCIATED HANGERS AND SUPPORTS TURNED OVER TO OWNER. PATCH AND FINISH EXISTING WALL SURFACES AS REQUIRED TO MATCH EXISTING ADJACENT CONDITIONS. ANY HANGERS, NAILS SUPPORTS, ETC THAT ARE NOT REMOVED PRIOR TO INSTALLATION OF FINAL WALL FINISH WILL BE NOTED AND REMOVED , PATCH AND THE WALL REPAIRED AT CONTRACTOR'S EXPENSE.

N DEMOLISH PEMB TO SLAB. RETAIN SLAB AND FOUNDATIONS FOR RE-USE.

DEMOLITION KEY NOTES

1 DEMOLISH EXISTING PEMB AND SLAB AS INDICATED IN STRUCTURAL REMOVAL DRAWINGS. REMOVE ALL STRUCTURAL FRAMING MEMBERS, EXTERIOR CLADDING INCLUDING WALL PANELS, ROOF PANELS, DOORS AND FRAMES AND ALL COMPONENTS AND ACCESSORIES.

5 REMOVE OVERHEAD DOOR AND COMPONENTS.

6 REMOVE METAL WALL PANEL, STRUCTURAL SYSTEM AND SPRAY FOAM INSULATION TO SLAB.

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN
JAMES QUINTIN BIAGI JR.
ARCHITECT
LICENSED
1301056866

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
ROOF DEMOLITION

Project No.:	200-31537-15005
Designed By:	Q.BIAGI
Drawn By:	T.HOURIGAN
Checked By:	D.GALANTE

AD-102

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

Bar Measures 1 inch

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STRUCTURAL GENERAL NOTES

A. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.

B. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWING

C. ALL ELEVATIONS ARE REFERENCED TO FIRST FLOOR EL. = 0'-0" UNLESS NOTED OTHERWISE.

D. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN PROJECT SPECIFICATIONS.

E. ABBREVIATIONS:

A.B.	ANCHOR BOLT	EL / ELEV.	ELEVATION	O.D.	OUTSIDE DIAMETER
ADD'L	ADDITIONAL	ENGR	ENGINEER	OPNG	OPENING
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	EQ	EQUAL	ORIG	ORIGINAL
		EW	EACH WAY	PERP	PERPENDICULAR
ALT.	ALTERNATE	EXIST	EXISTING	PL	PLATE
APPROX.	APPROXIMATE	EXP	EXPANSION	REF	REFERENCE
ARCH.	ARCHITECTURAL	F.V.	FIELD VERIFY	REINF.	REINFORCEMENT
B.O.	BOTTOM OF	FLR	FLOOR	REQ'D	REQUIRED
BLDG.	BUILDING	FND.	FOUNDATION	SCHED	SCHEDULE
BOT.	BOTTOM	FTG	FOOTING	SF	SQUARE FOOT
BRG.	BEARING	GA	GAGE, GAUGE	SHT.	SHEET
BTWN	BETWEEN	GALV	GALVANIZED	SIM.	SIMILAR
CCJ	CRACK CONTROL JOINT	H.R.	HAND RAIL	SPA.	SPACE
CFS	COLD FORMED STEEL	HK	HOOK	SPEC	SPECIFICATIONS
CJ	CONSTRUCTION JOINT	HORIZ	HORIZONTAL	SS	STAINLESS STEEL
CL	CENTER LINE	I.D.	INSIDE DIAMETER	STD	STANDARD
CLR	CLEAR	I.F.	INSIDE FACE	STL	STEEL
CMU	CONCRETE MASONRY UNIT	I.J.	ISOLATION JOINT	STRUCT	STRUCTURE(AL)
		IN.	INCH	SYM	SYMMETRICAL
COL	COLUMN	L	ANGLE	T	TREAD
CONC	CONCRETE	L.P.	LOW POINT	T/	TOP OF
CONST	CONSTRUCTION	LLH	LONG LEG HORIZONTAL	TEMP	TEMPORARY
CONT	CONTINUOUS	LLV	LONG LEG VERTICAL	TOF	TOP OF FOOTING
COORD	COORDINATE	LOC	LOCATION	TOS	TOP OF SLAB
CTR	CENTER	MATL	MATERIAL	TRANSV.	TRANSVERE
DIA	DIAMETER	MAX	MAXIMUM	TYP	TYPICAL
DIM	DIMENSION	MFR	MANUFACTURER	UNO	UNLESS NOTED OTHERWISE
DWG(S)	DRAWING(S)	MTL	METAL		
DWL	DOWEL	N.T.S.	NOT TO SCALE	V.I.F.	VERIFY IN FIELD
EA	EACH	NA	NOT APPLICABLE	VERT	VERTICAL
EF	EACH FACE	NO	NUMBER	W/	WITH
EJ	EXPANSION JOINT	NOM	NOMINAL	W/O	WITHOUT
		O.C.	ON CENTER	WWF	WELDED WIRE FABRIC

DESIGN CRITERIA

A. REFERENCES:

1. ICC INTERNATIONAL BUILDING CODE, 2012 EDITION
   RISK CATEGORY III IN ACCORDANCE WITH TABLE 1604.5
2. STATE BUILDING CODE: 2012 MICHIGAN BUILDING CODE
3. ASCE/SEI 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

B. DEAD LOADS:

ROOF SUPERIMPOSED DEAD LOAD	= 20 PSF
ROOF COLLATERAL* LOAD	= 5 PSF
AVAILABLE TO RESIST UPLIFT	= SELF WEIGHT OF STRUCTURAL FRAMING ONLY

* COLLATERAL LOAD INCLUDES PROVISION FOR HANGING LOADS INCLUDING SPRINKLERS, DUCTWORK, PLUMBING, CEILING AND OTHER COMPONENTS. REFER TO OTHER DISCIPLINE DRAWINGS FOR CONCENTRATED LOADING.

C. LIVE LOADS (U.N.O.):

TYPICAL GROUND FLOORS	= 100 PSF
ROOF	= 20 PSF

D. SNOW LOAD:

GROUND SNOW LOAD, Pg	= 25 PSF
BALANCED SNOW LOAD, Ps	= 15.3 PSF
SNOW EXPOSURE FACTOR, Ce	= 1.0
SNOW LOAD IMPORTANCE FACTOR, I	= 1.1
THERMAL FACTOR, Ct	= 1.0
FROST DEPTH	= 42"

E. WIND LOAD:

ULTIMATE WIND SPEED, V	= 120 MPH
WIND EXPOSURE	= C
DIRECTIONALITY FACTOR, Kd	= 0.85
TOPOGRAPHY	= 1.0
INTERNAL PRESSURE COEFFICIENT, GCpi	= ± 0.18
BUILDING ENCLOSURE CLASSIFICATION	= ENCLOSED

FOR COMPONENTS & CLADDING PRESSURES REFER TO CHART ON SHEET S-002

F. SEISMIC DESIGN DATA:

SEISMIC IMPORTANCE FACTOR, I	= 1.1
SDS	= 0.101
SD1	= 0.077
SITE CLASS	= 'D' (ASSUMED)
SEISMIC DESIGN CATEGORY	= 'B'
RESPONSE MODIFICATION FACTOR, R	= 3 (STRUCTURAL STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE)
DESIGN BASE SHEAR:	= 0.042 *W
ANALYSIS PROCEDURE:	= EQUIVALENT LATERAL FORCE

FOUNDATIONS

A. SEE GEOTECHNICAL/SUBSURFACE INVESTIGATION REPORT BY TTL ASSOCIATES INC. DATED 10-30-15. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHETHER OR NOT ADDITIONAL GEOTECHNICAL INFORMATION IS REQUIRED AND TO PROVIDE SUCH INFORMATION AS THE CONTRACTOR DEEMS NECESSARY.

B. ALLOWABLE BEARING PRESSURES AS FOLLOWS:

STRIP FOOTINGS = 1,500 PSF
SQUARE FOOTINGS = 2,000 PSF
SOG SUBGRADE MODULES = 150 PCI

C. PRIOR TO PLACING ENGINEERED FILL, THE SITE SHALL BE STRIPPED AND PROOF ROLLED. ANY SOFT SPOTS ENCOUNTERED SHALL BE REMOVED AND REPLACED WITH ENGINEERED FILL. REFER TO EARTHWORK SPECIFICATION FOR ADDITIONAL INFORMATION.

STRUCTURAL CONCRETE

A. REFERENCES:

1. ACI 318-11 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
3. ACI SP-66 ACI DETAILING MANUAL
4. CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE
5. CRSI REINFORCING BAR DETAILING
6. CRSI PLACING REINFORCING BARS

B. MATERIALS

1. STRUCTURAL CONCRETE
   a) MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (f'c).....4000 PSI
   b) ALL CONCRETE EXPOSED TO THE ELEMENTS SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM C260 SEE SPECIFICATIONS. ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT)
   c) ALL CONCRETE IN 8" WALLS OR COLUMNS WITH TWO PLANES OF REINFORCEMENT SHALL HAVE MAXIMUM 3/4" AGGREGATE. IT IS RECOMMENDED THAT THE CONTRACTOR CONSIDER SUPER-PLASTICIZED CONCRETE PER SPECIFICATIONS.
2. REINFORCEMENT
   a) REINFORCING BARS: ASTM A615, GRADE 60
3. ACCESSORIES
   a) BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW
4. ANCHOR RODS
   a) SHALL BE GALVANIZED, FURNISHED WITH CHAMFERED ENDS, AND SHALL MEET STRENGTH AND DUCTILITY REQUIREMENTS EQUIVALENT ASTM F1554, GR 55 WELDABLE MATERIAL.
5. ADHESIVE ANCHORS
   a) APPROVED SYSTEMS INCLUDE HILTI RE 500-SD (ICC ESR 2322) OR HIT-HY 200 (ICC ESR 3187) OR EQUAL CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OR COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ADHESIVE ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 308. CURRENT ICC-ESR SHALL BE SUBMITTED
   b) FOR MASONRY INSTALLATION, APPROVED SYSTEM INCLUDE HILTI HIT-HY 70 ADHESIVE (ICC ESR 3342)
   c) ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST.
   d) ADHESIVE ANCHORS SHALL BE PROOF LOADED IN ACCORDANCE WITH ACI 355.4 AS REQUIRED BY SPECIAL INSPECTION.
6. GROUT: HIGH STRENGTH, NON-SHRINK STRUCTURAL GROUT. SEE SPECIFICATIONS.

C. REINFORCEMENT DETAILING

1. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 OR 350 - CURRENT EDITIONS).
2. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR AND MESH SUPPORTS MUST BE CLEARLY DETAILED
3. CONCRETE COVER FOR REINFORCING SHALL BE INDICATED ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. HOWEVER, NO REINFORCING IN AREAS EXPOSED TO EARTH, WEATHER ,SEWAGE OR WATER SHALL HAVE COVER LESS THAN TWO INCHES.
4. SPECIFIED COVER FOR REINFORCING PER ACI 318 (BUILDING STRUCTURES):
   FOUNDATIONS .....3.0" (CAST AGAINST EARTH)
   FOUNDATIONS.....2.0" (FORMED)
   SLAB-ON-GRADE (REBAR)..... 2" FROM TOP OF SLAB (U.N.O.)
5. REINFORCEMENT IN WALLS AND STRIP FOOTINGS SHALL BE CONTINUOUS. HORIZONTAL BAR LAP SPLICES SHALL BE STAGGERED
6. PROVIDE CORNER BARS AT ALL WALL AND FOUNDATION CORNERS TO BE LAPPED WITH THE HORIZONTAL BARS. CORNER BARS ARE TO MATCH THE HORIZONTAL BARS IN SIZE, GRADE AND SPACING UNLESS OTHERWISE SHOWN.
7. HOOKS AND BENDS SHALL MEET ACI STANDARD UNLESS OTHERWISE INDICATED.
8. SPLICES: CONTINUOUS REINFORCING BARS SHALL BE FURNISHED WITH CLASS 'B' TENSION LAPS SPLICES INCLUDING CORNER BARS, UNLESS NOTED OTHERWISE.
9. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER
10. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
11. REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
12. WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPLICE WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
13. PIER REINFORCEMENT SHALL BE DOWELED TO THE FOOTING. PROVIDE DOWELS EQUAL IN SIZE, NUMBER AND GRADE TO THE PIER REINFORCEMENT UNLESS OTHERWISE INDICATED. DOWELS SHALL BE HOOKED 90 DEGREES AT THE BOTTOM LEVEL OF FOOTING REINFORCEMENT. DOWELS SHALL BE LAPPED WITH THE PIER REINFORCEMENT
14. SPREAD BARS AROUND SMALL OPENINGS AND SLEEVES IN SLABS AND WALLS WHERE POSSIBLE AND WHERE BAR SPACING WILL NOT EXCEED 1.5 TIMES THE NORMAL SPACING. DISCONTINUE BARS AT LARGE OPENINGS WHERE NECESSARY AND PROVIDE AN AREA OF REINFORCEMENT EQUAL TO THE INTERRUPTED REINFORCEMENT DISTRIBUTING ONE-HALF OF THIS REINFORCEMENT EACH SIDE OF THE OPENING (TENSION LAP SPLICED). HOLES LARGER THAN 12 INCHES IN ANY DIRECTION SHALL HAVE (1) #6 X 4'-0" DIAGONAL BARS IN BOTH FACES AT EACH CORNER
15. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE
16. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
17. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS, IE. A36, F1554, WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.
18. ALL OPENINGS THROUGH WALLS, SLABS OR OTHER STRUCTURAL ELEMENTS NOT DETAILED ON THE STRUCTURAL DRAWINGS MUST BE LOCATED BY THE CONTRACTOR AND SHOWN ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. THE FINAL LOCATION OF ALL OPENINGS MUST BE REVIEWED BY THE ENGINEER BEFORE THE CONCRETE IS POURED.

STRUCTURAL CONCRETE (CONT'D)

19. MODIFICATION AND REPAIR TO EXISTING CONCRETE: (A) SEE CONCRETE SPECIFICATIONS FOR COMPLETE EXPLANATION. (B) CONNECTION METHODS - METHOD A - BONDING TO SATURATED SURFACE METHOD B - BONDING BY USING BONDING AGENT METHOD C - DOWELS USING EPOXY BONDING AGENT

D. FOOTINGS

1. PROVIDE 2x4 SHEAR KEYS (U.N.O.) IN THE TOPS OF WALL FOOTINGS SUPPORTING CONCRETE WALLS AND IN THE TOPS OF COLUMN FOOTINGS AT CONCRETE WALLS.
2. CENTER ALL FOOTINGS ON WALL, PIER OR COLUMN ABOVE UNLESS OTHERWISE INDICATED.

E. FORMWORK

1. SEE SPECIFICATIONS
2. KEYS INDICATED ARE TO BE 2x4 NOMINAL CONTINUOUS, U.N.O.
3. CAMBER: PROVIDE CAMBER TO COMPENSATE FOR DISPLACEMENT OF FORMS (SEE ALSO SPECS.) AND TO PROVIDE AS-CAST MEMBER CAMBER AS NOTED ON DRAWINGS.
4. RUSTICATION STRIPS, CHAMFERS, DRIPS, MISC. EMBEDS, ETC. SEE DRAWINGS AND/OR ARCHITECTURAL DRAWINGS.
5. PROVIDE 3/4" CHAMFER AT ALL EXPOSED CORNERS OF BEAMS, WALLS ETC. UNLESS OTHERWISE NOTED.
6. OPENINGS FOR MEP TRADES ARE TO BE INCLUDED IN THE BID. ALL HOLES FOR OTHER TRADES WHICH MUST BE CUT OR FORMED AND WHICH ARE NOT SHOWN ON THE STRUCTURAL DESIGN(S) DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER DESIGNER FOR REVIEW AND APPROVAL. ANY STRENGTHENING OR ADDITIONAL REINFORCEMENT REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.

F. CONCRETE FINISHES: SEE SPECIFICATIONS

1. FORMED SURFACES:
   a) EXPOSED TO VIEW: APPLY SIKAGARD 550W OVER GROUT-CLEANED FINISH SURFACES (NON TRAFFIC) PER MANUFACTURER'S SPECIFICATIONS.
   b) COVERED OR AS NOTED ON PLANS: AS-CAST
2. FLATWORK:
   a) EXPOSED TO VIEW: TROWELED
   b) TILED OR CARPETED: TROWELED
   c) STAIRS OR RAMPS: BROOMED
   d) SIDEWALKS, DRIVEWAYS: BROOMED

G. CURING AND PROTECTION: SEE SPECIFICATIONS.

H. SEE THE MECHANICAL, ELECTRICAL AND SUPPLIERS DRAWINGS AND THE SPECIFICATIONS FOR THE LOCATIONS OF SPECIAL ANCHORS, CHAMFERS, SLEEVES, PIPES, CONDUITS AND OTHER DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

J. EMBEDDED PIPES OR CONDUIT. MAXIMUM DIAMETER ONE THIRD x SLAB OR WALL THICKNESS, SPACED MINIMUM OF 3 TIMES DIAMETER ON CENTER.

K. SIZE AND LOCATION OF EQUIPMENT PADS AND ANCHOR BOLTS SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER.

L. SUBMITTALS

1. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING THE FOLLOWING DOCUMENTS TO THE ENGINEER OF RECORD:
   a) CONCRETE MIX DESIGN
   b) CONCRETE REINFORCING DRAWINGS

TENSION DEVELOPMENT / LAP SPLICE SCHEDULE (UNCOATED BARS)

DEVELOPMENT / LAP SPLICE LENGTH IN CONCRETE (f'c = 4000 PSI)

BAR SIZE	DEVELOPMENT LENGTH (IN)		CLASS 'B' LAP SPLICE LENGTH (IN)	
	BAR TYPE 1	BAR TYPE 2	BAR TYPE 1	BAR TYPE 2
3	15	22	19	28
4	19	29	25	37
5	24	36	31	47
6	29	43	37	56
7	42	63	54	81
8	48	72	62	93
9	54	81	70	105
10	61	91	79	118
11	74	111	97	145

BAR TYPE 1 - CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN BAR DIA., CLEAR COVER NOT LESS THAN BAR DIA., AND STIRRUPS OR TIES THROUGHOUT DEV. LENGTH NOT LESS THAN CODE MINIMUM

OR

CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2 BAR DIA. AND CLEAR COVER NOT LESS THAN BAR DIA..

BAR TYPE 2 - TOP BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW **AND** OTHER CASES

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN
CHRISTOPHER COLEMAN
NUMBER PE-6201058671
LICENSED PROFESSIONAL ENGINEER
4/14/16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
GENERAL NOTES

Project No.:	200-31537-15005
Designed By:	P. FLEMING
Drawn By:	P. FLEMING
Checked By:	J. BURKETT

S-001

Bar Measures 1 inch

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CONCRETE MASONRY

A. REFERENCES

1. TMS 402/ACI 530-08/ASCE 5-08 BUILDING CODE REQUIREMENTS AND SPECIFICATIONS FOR MASONRY STRUCTURES.

MATERIALS:

1. MASONRY WALLS SHALL CONSIST OF ASTM C-90, GRADE N-1, HOLLOW CONCRETE MASONRY UNIT
2. MASONRY SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH f'm =1500 PSI.
3. MORTAR SHALL COMPLY WITH ASTM C-270, AND SHALL BE TYPE S (1800 PSI)
4. CORE FILL GROUT SHALL COMPLY WITH ASTM C-476, WITH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

C. MASONRY SHALL BE LAID IN A RUNNING BOND PATTERN UNLESS OTHERWISE NOTED. NO CONTINUOUS VERTICAL JOINTS ARE PERMITTED AT WALL CORNERS, INTERSECTIONS, AND OPENING EDGES. SAW TOOTH BLOCK EACH ALTERNATE COURSE AT THESE LOCATIONS TO ACHIEVE MONOLITHIC CONSTRUCTION.

D. VERTICAL REINFORCEMENT: LOCATION, SIZE AND SPACING SHALL BE AS INDICATED ON THE STRUCTURAL DRAWINGS. WALLS SHALL BE REINFORCED FULL HEIGHT IN GROUT FILLED CELLS AT ALL WALL CORNERS, INTERSECTIONS, ENDS, AND ADJACENT TO OPENINGS.

E. PROVIDE REINFORCING STEEL DOWELS INTO STRUCTURE ABOVE AND BELOW WITH SIZE AND SPACING TO MATCH VERTICAL REINFORCEMENT, UNLESS OTHERWISE NOTED.

F. DOWELS TO THE FOUNDATIONS WITH SIZE AND SPACING TO MATCH VERTICAL REINFORCING. LAP SPLICES SHALL BE MEASURED ABOVE THE STEM WALL.

G. VERTICAL REINFORCEMENT SHALL BE CENTERED IN GROUT FILLED CELLS UNLESS NOTED OTHERWISE. REINFORCEMENT SHALL BE HELD SECURELY IN POSITION AT THE TOP AND BOTTOM OF WALL.

H. HORIZONTAL JOINT REINFORCEMENT: SHALL BE 9 GAGE GALVANIZED DUR-O-WAL LADDER TYPE OR ENGINEER APPROVED SUBSTITUTE, LOCATED AT SIXTEEN (16) INCHES VERTICALLY.

J. PROVIDE HORIZONTAL JOINT REINFORCING IN PARAPETS AND FREE STANDING WALLS AT EIGHT (8) INCHES VERTICALLY.

K. CONTROL JOINTS: SHALL BE PROVIDED AS SPECIFIED BY THE ARCHITECT. TERMINATE REINFORCEMENT EACH SIDE OF CONTROL JOINTS. SEE ARCHITECTURAL DRAWINGS FOR SEALANT REQUIREMENTS AT CONTROL JOINTS.

L. GROUTING: CONTRACTOR SHALL SUBMIT PROPOSED GROUT MIX DESIGN FOR ENGINEER REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. GROUT SLUMP SHALL BE BETWEEN 8 AND 11 INCHES. USE OF SUPERPLASTICIZER IS PROHIBITED. CELLS WHICH ARE TO RECEIVE GROUT SHALL BE VERTICALLY ALIGNED WITH A CLEAR, UNOBSTRUCTED AND CONTINUOUS VERTICAL SPACE. CELLS SHALL BE FILLED COMPLETELY AND VIBRATION CONSOLIDATED. GROUTING OPERATIONS SHALL BE CONTINUOUS AND SHALL NOT BE STOPPED FOR A PERIOD EXCEEDING ONE HOUR. WALL SHALL BE CONSTRUCTED IN MAXIMUM 5'-0" LIFTS BETWEEN GROUT POURS.

M. GROUTING AND REINFORCING: ALL MASONRY AND GROUTING AND REINFORCING WORK SHALL BE PERFORMED BY MASONRY CRAFTWORKERS WHO HAVE SUCCESSFULLY COMPLETED THE INTERNATIONAL MASONRY INSTITUTE (1-800-IMI-0988) TRAINING COURSE FOR GROUTING AND REINFORCED MASONRY CONSTRUCTION, OR EQUAL."

TENSION DEVELOPMENT / LAP SPLICE LENGTH IN MASONRY (INCHES)				
BAR #	MIN. CLEAR COVER TO FACE OF CMU:			
	1 1/2"	2"	> 3 1/4"	> 5 1/4"
3	19	18	18	18
4	34	26	24	24
5	45	40	30	30
6	54	54	46	36
7	63	63	62	42
8	72	72	72	58

PRE-ENGINEERED METAL BLDG

A THE STRUCTURAL DRAWINGS FOR THIS PROJECT SPECIFY FOUNDATION REQUIREMENTS TO ACCOMMODATE A PRE-ENGINEERED METAL BUILDING. FOUNDATIONS HAVE BEEN DESIGNED FOR PINNED CONDITIONS, WITHOUT COLUMN BASE MOMENTS. LATERAL BRACING SHALL BE DESIGNED AND PROVIDED BY THE MANUFACTURER WHERE INDICATED ON THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL SUBMIT THE DESIGN REACTIONS FROM THE METAL BUILDING MANUFACTURER TO CONFIRM THE FOUNDATION CAPACITY.

B ENGINEER IS NOT RESPONSIBLE FOR THE DESIGN OF ANY ASPECTS OF THIS BUILDING OTHER THAN ITS SLAB ON GRADE AND FOOTING AS SHOWN. OTHER STRUCTURAL ELEMENTS INCLUDING ROOF FRAMING, WIND FRAMES AND BRACING, METAL BUILDING COLUMNS, ANCHOR BOLTS, BRIDGE CRANE SUPPORTS, AND METAL BUILDING COLUMN BASE PLATES ARE TO BE DESIGNED BY THE METAL BUILDING ENGINEER.

C SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE WHERE THE BUILDING IS INSTALLED. SHOP DRAWING SUBMITTALS SHALL INCLUDE DRAWINGS OF THE FRAMING MEMBERS WITH THE CONNECTIONS, THE ANCHOR BOLT PLAN, AND REACTIONS.

D THE PRE- ENGINEERED METAL BUILDING SYSTEM SHALL BE DESIGNED AND DETAILED BY THE MANUFACTURER TO SUSTAIN THE LOADS SPECIFIED IN THE DESIGN CRITERIA. THE DESIGN SHALL BE IN ACCORDANCE WITH "AISC" AND "AISI" SPECIFICATIONS AND MBMA "METAL BUILDING SYSTEMS MANUAL" DESIGN PRACTICES, LATEST EDITIONS. THE MANUFACTURER SHALL BE REGULARLY ENGAGED IN METAL BUILDING DESIGN AND MANUFACTURING. CURRENT MBMA MEMBERS ARE APPROVED, OTHER MANUFACTURERS SHALL SUBMIT PRODUCT DATA FOR APPROVAL.

E THE PRE- ENGINEERED METAL BUILDING SHALL BE DESIGNED SUCH THAT LATERAL DRIFT SHALL BE LIMITED TO H/240 FOR 10-YEAR WIND OCCURRENCE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

F THE METAL BUILDING SHALL BE DESIGNED FOR MATERIALS HANDLING EQUIPMENT LOADING FROM BRIDGE CRANES. PROVIDE TENSION/COMPRESSION BRACING AT BRIDGE CRANE SUPPORT FRAMES TO RESIST THE LONGITUDINAL FORCE ON CRANE RUNWAY BEAMS; BRACING SHALL MEET KL/R < 200

WELL HOUSE 25W ASSUMED BUILDING REACTIONS (UNFACTORED)	
HORIZONTAL (TRUST)	VERTICAL
DL = 1.7 KIPS	DL = 12.5 KIPS
LL = 1.0 KIPS	LL = 15.0 KIPS
WL = 8.0 KIPS	WL (DOWNWARD) = 3.9 KIPS
	WL (UPLIFT) = -13.0 KIPS

WELL HOUSE W21 ASSUMED BUILDING REACTIONS (UNFACTORED)	
HORIZONTAL (TRUST)	VERTICAL
DL = 2.4 KIPS	DL = 8.4 KIPS
LL = 1.8 KIPS	LL = 4.5 KIPS
WL = 4.9 KIPS	WL (DOWNWARD) = 4.0 KIPS
	WL (UPLIFT) = -8.7 KIPS

WELL HOUSE 741 ASSUMED BUILDING REACTIONS (UNFACTORED)	
HORIZONTAL (TRUST)	VERTICAL
DL = 1.8 KIPS	DL = 7.5 KIPS
LL = 1.3 KIPS	LL = 3.9 KIPS
WL = 4.3 KIPS	WL (DOWNWARD) = 4.2 KIPS
	WL (UPLIFT) = -7.4 KIPS

STRUCTURAL STEEL

A. REFERENCES:

1. AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
2. AWS D1.1 STRUCTURAL WELDING CODE - STEEL

B. MATERIALS:

1. GRADE STEEL
   WIDE FLANGES.....ASTM A992, GRADE 50
   CHANNELS, ANGLES, AND PLATES.....ASTM A36
   SHEAR CONNECTOR PLATES.....ASTM A572, GRADE 50
   STRUCTURAL PIPE.....ASTM A53, GRADE B, Fy=35 KSI
   ROUND HSS.....ASTM A500, GRADE B, Fy=42 KSI
   SQUARE OR RECTANGLE HSS.....ASTM A500, GRADE B, Fy=46 KSI
2. WELDED STUDS: ASTM A108, GRADE 60
3. ANCHOR BOLTS: ASTM F1554, GRADE 55, HOT-DIP GALVANIZED, WELDABLE.
4. STRUCTURAL BOLTS: ASTM A325-N
5. WELDS: E70XX ELECTRODES

C. CONNECTIONS

1. AISC MANUAL STANDARD CONNECTIONS UNLESS NOTED. HIGH-STRENGTH BOLTS: ASTM A325-N, 3/4" UNLESS NOTED OTHERWISE. BEARING TYPE INSTALLED IN CONFORMANCE WITH "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS. UNLESS NOTED OTHERWISE, STANDARD AISC "USUAL GAGE" DIMENSIONS SHALL BE USED FOR LOCATING HOLES FOR BOLTS, EXPANSION ANCHORS, ETC. IN ALL ANGLES, BEAM FLANGES, ETC.
2. THE ASSEMBLY SURFACE, INCLUDING THOSE ADJACENT TO THE WASHER, SHALL BE FREE OF MILL SCALE, OIL, PAINT OR OTHER COATINGS.
3. ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT SPECIFICATION IN THE AISC MANUAL. FULL TENSIONING SHALL BE BY THE TURN OF NUT METHOD, BY A DIRECT TENSION INDICATOR, OR BY PROPERLY CALIBRATED WRENCHES. PROVIDE HARDENED WASHERS UNDER THE NUT OR BOLT HEAD, WHICHEVER IS THE ELEMENT TURNED IN TIGHTENING.
4. WELDING - PERFORM ALL WELDING IN ACCORDANCE WITH AWS D1.1 CODE, LATEST EDITION, WELDS SHALL BE MADE ONLY BY OPERATORS CERTIFIED BY AWS IN PERFORMING THE TYPE OF WORK INDICATED.
5. ALL BEAMS SHALL HAVE SIMPLE SHEAR CONNECTIONS DESIGNED TO SUPPORT 1/2 THE TOTAL UNIFORM LOAD LISTED IN THE AISC MANUAL OF STEEL CONSTRUCTION OR THE REACTION NOTED ON THE DRAWINGS, WHICHEVER IS GREATER.
6. WHERE INDICATED ON THE DRAWINGS, CONNECTIONS SHALL BE DESIGNED FOR THE REACTIONS SHOWN. WHERE NO REACTIONS ARE INDICATED, REFER TO NOTE #5 ABOVE OR DESIGN FOR A MINIMUM REACTION OF 10 KIPS.

D. TOLERANCES: AISC CODE OF STANDARD PRACTICE (LATEST EDITION)

E. CAMBER: PROVIDE POSITIVE CAMBER AS NOTED ON DRAWINGS. WHERE NO CAMBER IS NOTED, RESIDUAL MILL CAMBER IS TO BE UPWARDS.

F. SHOP DRAWINGS

1. SUBMIT ERECTION AND FABRICATION SHOP DRAWINGS. SEE SPECS.
2. SUBMIT ERECTION PROCEDURES AND TEMPORARY BRACING PLAN FOR A/E REVIEW.
3. SUBMIT CONNECTION CALCULATIONS FOR ALL BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS
4. SHOP DRAWINGS AND CALCULATIONS MUST BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHERE STRUCTURAL STEEL WILL BE INSTALLED.

G. ALL EXPOSED ANGLE AND PLATE LINTELS FOR BLOCK/BRICK SUPPORT SHALL BE HOT DIPPED GALVANIZED.

H. PAINTING: AFTER MATERIAL HAS BEEN PROPERLY CLEANED AND TREATED, APPLY SHOP PRIME COAT TO ALL SURFACES, EXCEPT THOSE INTENDED FOR EMBEDMENT INTO CONCRETE OR TO RECEIVE FIELD WELDING, SLIP CRITICAL BOLTS, OR CEMENTITIOUS FIREPROOFING.

COMPONENTS & CLADDING WIND PRESSURES

FACTORED ULTIMATE COMPONENTS & CLADDING WIND PRESSURES (PSF)

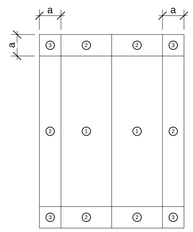
ROOF			
ROOF ZONES	EFFECTIVE TRIBUTARY AREA*		
	10 SF	50 SF	100 SF
NEGATIVE ZONE 1	-40	-36	-34
NEGATIVE ZONE 2	-48	-40	-37
NEGATIVE ZONE 3	-82	-66	-58
ALL POSITIVE ZONES	16	16	16

WALLS			
WALL ZONES	EFFECTIVE TRIBUTARY AREA*		
	10 SF	50 SF	100 SF
NEGATIVE ZONE 4	-34	-30	-30
NEGATIVE ZONE 5	-42	-36	-33
POSITIVE ZONE 4 & 5	32	29	27

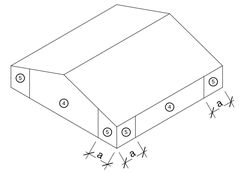
NOTES:

1. EDGE DISTANCE 'a' = 3'-0"
2. * EFFECTIVE TRIBUTARY AREA: SPAN LENGTH MULTIPLIED BY AN EFFECTIVE WIDTH THAT NEED NOT BE LESS THAN 1/3 THE SPAN LENGTH
3. NEGATIVE VALUE DENOTES PRESURE ACTING AWAY FROM THE SURFACE
4. UNFACTORED (NOMINAL) COMPONENTS AND CLADDING PRESSURES MAY BE OBTAINED BY MULTIPLYING THE VALUES IN THE TABLE BY 0.60

LOCATION OF WIND PRESSURE ZONES



ROOFS



WALLS

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Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN
CHRISTOPHER COLEMAN
NUMBER PE-6201058671
LICENSED PROFESSIONAL ENGINEER
4/14/16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
GENERAL NOTES

Project No.:	200-31537-15005
Designed By:	P. FLEMING
Drawn By:	P. FLEMING
Checked By:	J. BURKETT

S-002

Bar Measures 1 inch

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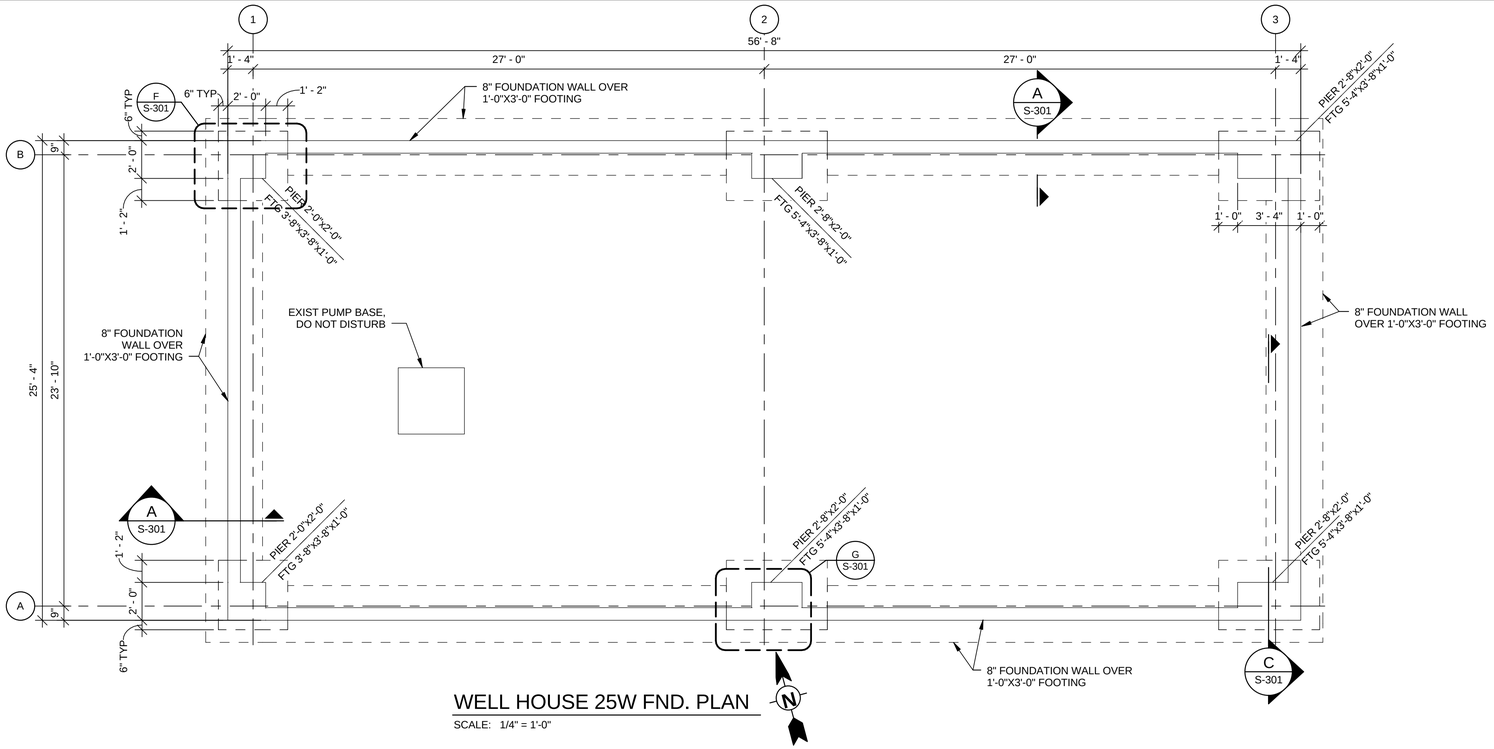
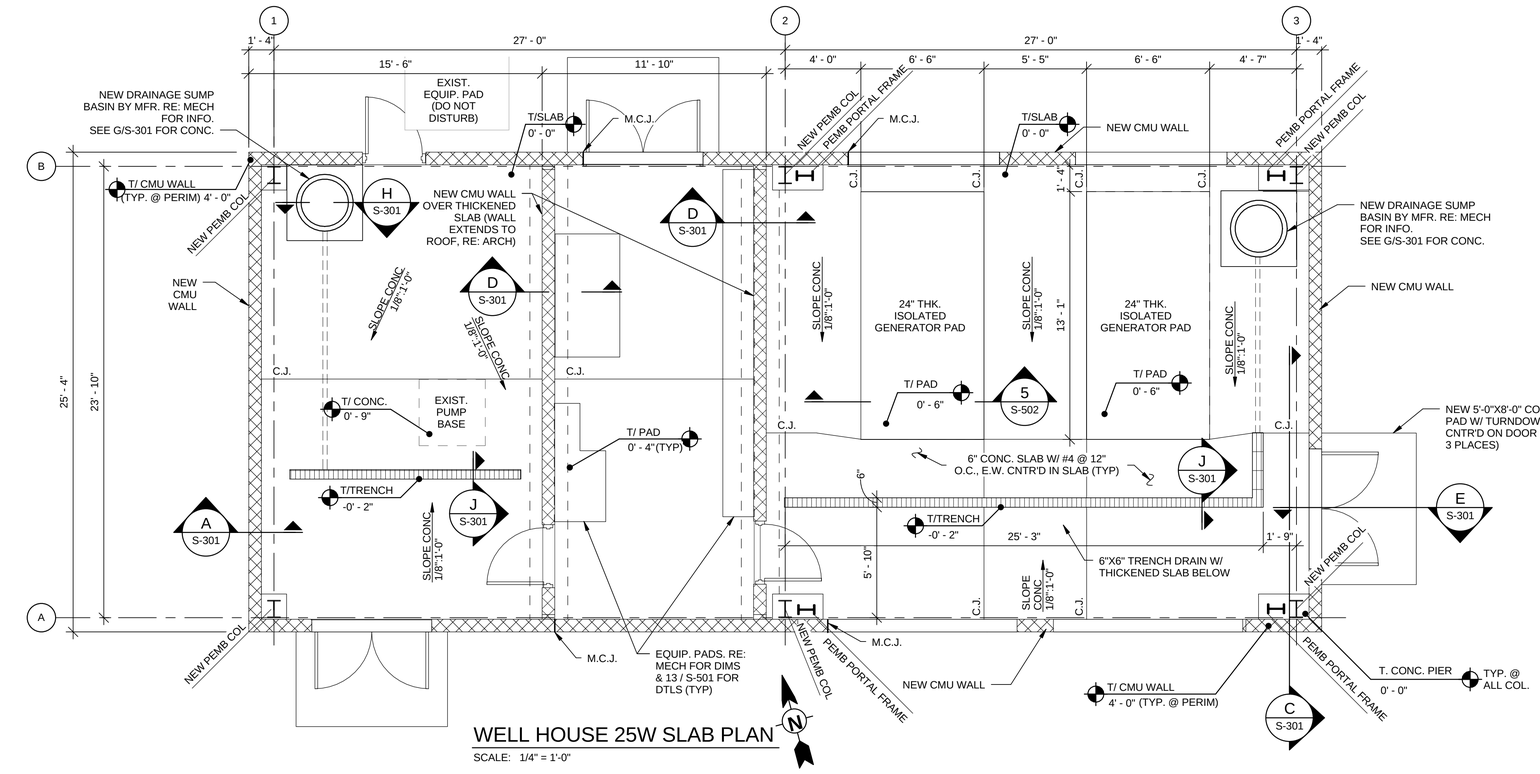


WELL HOUSE 25W FND. PLAN

SCALE: 1/4" = 1'-0"

PLAN NOTES:

1. REFER TO S-001 & S-002 FOR GENERAL STRUCTURAL NOTES
2. REFER TO S-500'S FOR TYP. STRUCTURAL DETAILS
3. METAL BUILDING REACTIONS SHALL BE PROVIDED TO THE ENGINEER OF RECORD PRIOR TO REBAR AND ANCHOR ROD SHOP DWG SUBMITTAL.
4. CONTRACTOR REQUIRED TO DEWATER GROUND WATER AS NEEDED DUE TO HIGH WATER TABLE.



WELL HOUSE 25W SLAB PLAN

SCALE: 1/4" = 1'-0"

PLAN NOTES:

1. REFER TO S-001 & S-002 FOR GENERAL STRUCTURAL NOTES
2. REFER TO S-500'S FOR TYP. STRUCTURAL DETAILS
3. METAL BUILDING REACTIONS SHALL BE PROVIDED TO THE ENGINEER OF RECORD PRIOR TO REBAR AND ANCHOR ROD SHOP DWG SUBMITTAL.
4. REFER TO OTHER DISCIPLINE DRAWINGS FOR ROOF AND WALL PENETRATION LOCATIONS.
5. SLOPE PUMP ROOM AND GENERATOR ROOM FLOOR SLABS TO TRENCH DRAINS.
6. NEW CONCRETE SLAB SHALL BE POURED OVER 10 MIL VAPOR BARRIER AND 6" CRUSHED STONE

LEGEND:

- INDICATES 8" CMU W/ #5 VERT. (CENTERED) IN GROUT FILLED CELLS @ 32" O.C. MAX., CORNERS, AND INTERSECTIONS U.N.O. OPENINGS < 4'-0" WIDE SHALL RECEIVE (2) #5 (CTRD) EA. SIDE, OPENINGS > 4'-0" WIDE SHALL BE REINF. AS NOTED. TOP OF WALL ELEVATIONS VARY, SEE PLAN.

C.J. - INDICATES CONTROL JOINT IN SLAB ON GRADE, RE: TYP DTL'S

M.C.J. - DENOTES MASONRY CONTROL JOINTS, RE: TYP DTL'S

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

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Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN
CHRISTOPHER COLEMAN
NUMBER PE-6201058671
LICENSED PROFESSIONAL ENGINEER
4/14/16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE

WELL HOUSE 25W PLANS

Project No.:	200-31537-15005
Designed By:	P. FLEMING
Drawn By:	P. FLEMING
Checked By:	J. BURKETT

S-101

Bar Measures 1 inch

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PLAN NOTES:

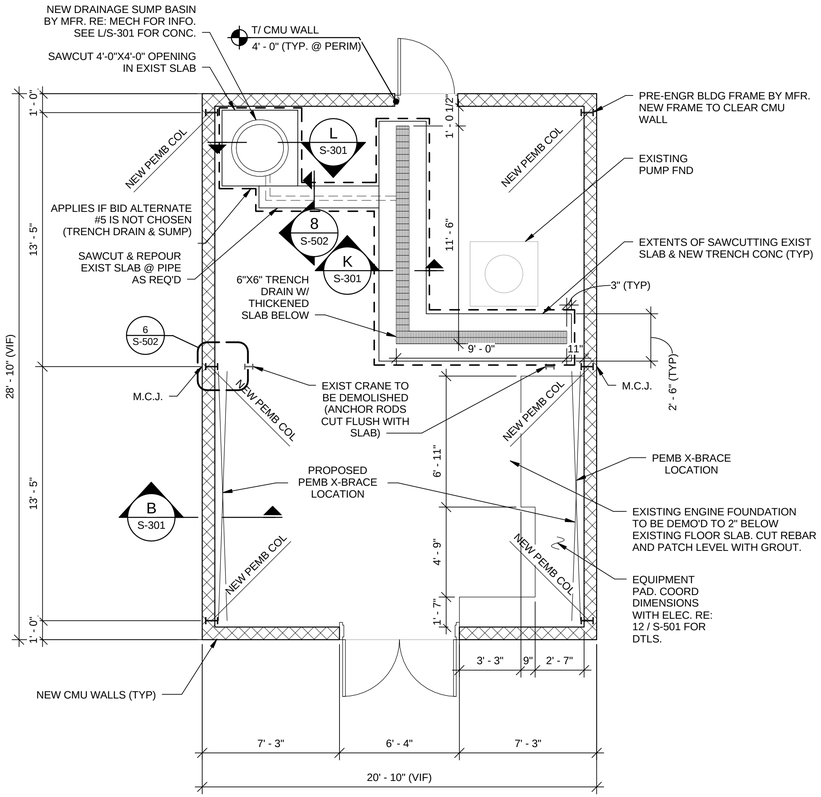
1. REFER TO S-001 & S-002 FOR GENERAL STRUCTURAL NOTES
2. REFER TO S-500'S FOR TYP. STRUCTURAL DETAILS
3. ALL EXISTING STRUCTURE ABOVE FINISH FLOOR SHALL BE DEMOLISHED. THE EXISTING FLOOR SLAB AND FOUNDATION SHALL REMAIN.
4. A NEW WELL HOUSE STRUCTURE OF THE SAME FOOTPRINT SHALL BE CONSTRUCTED UTILIZING THE EXISTING SLAB AND FOUNDATION. REFER TO ARCHITECTURE FOR ELEVATIONS.
5. METAL BUILDING REACTIONS SHALL BE PROVIDED TO THE ENGINEER OF RECORD PRIOR TO REBAR AND ANCHOR ROD SHOP DWG SUBMITTAL.
6. REFER TO OTHER DISCIPLINE DRAWINGS FOR ROOF AND WALL PENETRATION LOCATIONS.

LEGEND:

- INDICATES 8" CMU W/ #5 VERT. (CENTERED) IN GROUT FILLED CELLS @ 32" O.C. MAX., CORNERS, AND INTERSECTIONS U.N.O. OPENINGS < 4'-0" WIDE SHALL RECEIVE (2) #5 (CTRD) EA. SIDE, OPENINGS > 4'-0" WIDE SHALL BE REINF. AS NOTED. TOP OF WALL ELEVATIONS VARY, SEE PLAN.

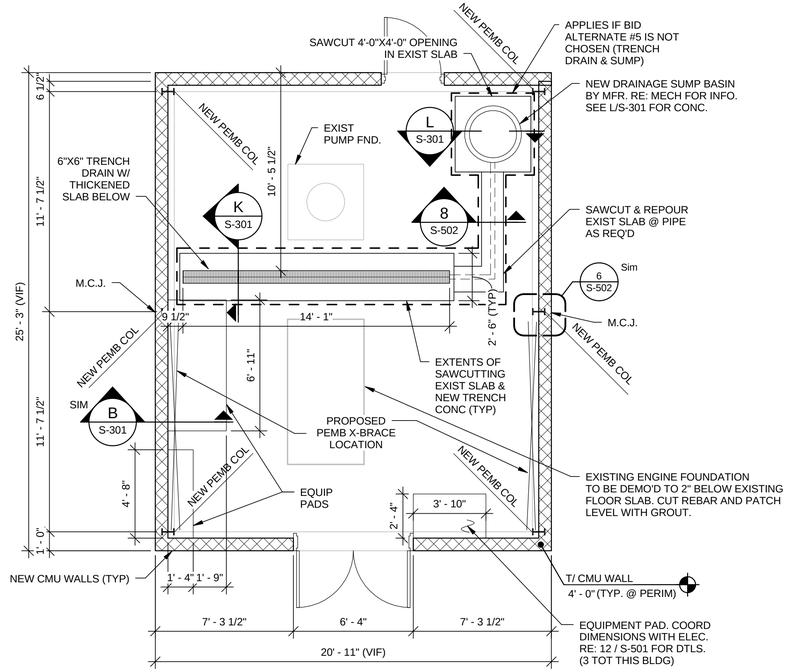
- INDICATES BID ALTERNATE #5

M.C.J. - DENOTES MASONRY CONTROL JOINTS, RE: TYP DTL'S



WELL HOUSE 21W - PLAN

SCALE: 1/4" = 1'-0"



WELL HOUSE 741 - PLAN

SCALE: 1/4" = 1'-0"

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

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Ann Arbor, MI 48108
Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN
LICENSED PROFESSIONAL ENGINEER
CHRISTOPHER COLEMAN
NUMBER PE-6201058671
4/14/16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN

STEERE FARM ENGINE REPLACE

WELL HOUSE 21W & 741 PLANS

Project No.:	200-31537-15005
Designed By:	P. FLEMING
Drawn By:	P. FLEMING
Checked By:	J. BURKETT

S-102

Bar Measures 1 inch

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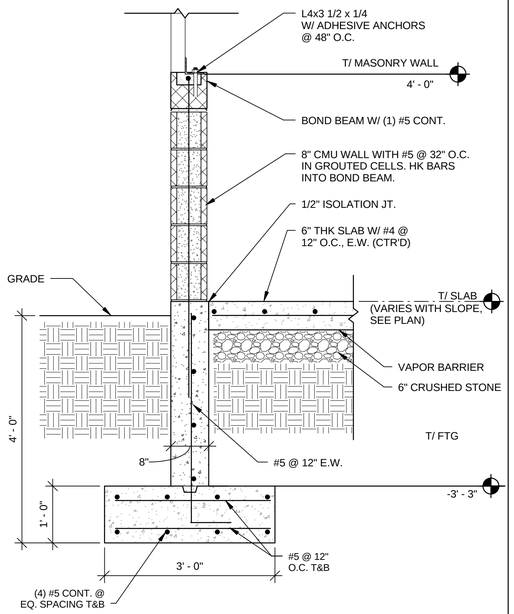
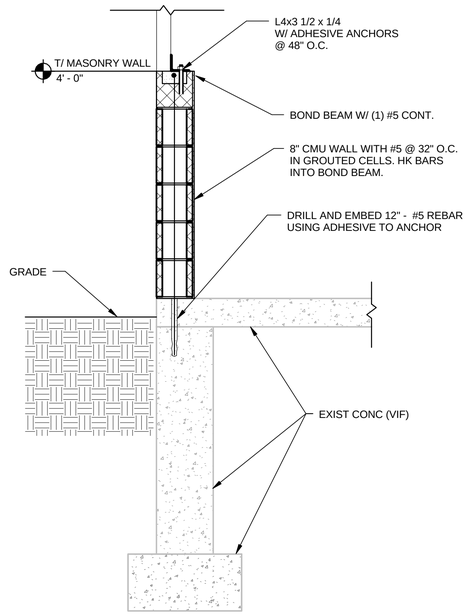
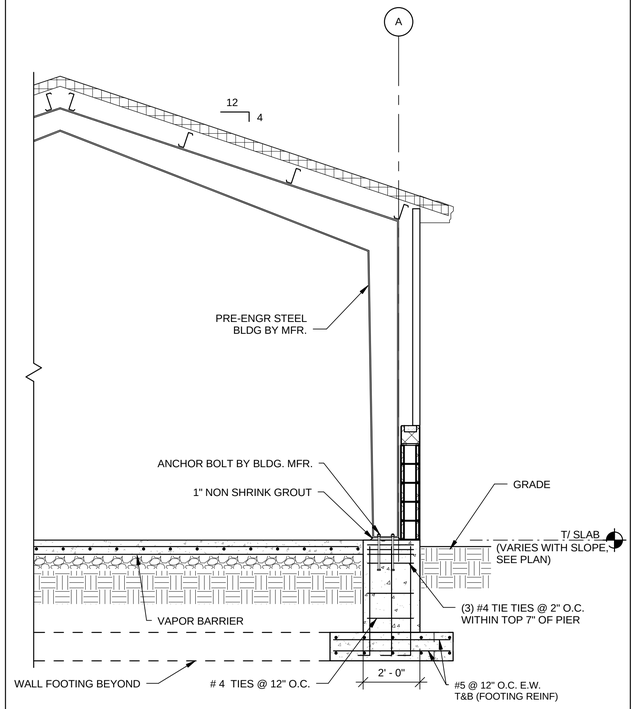


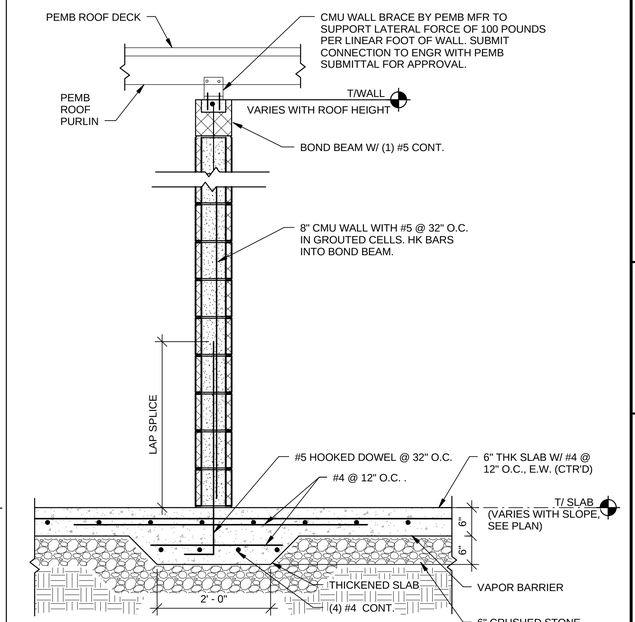
A WALL SECTION
S-101 SCALE: 3/4" = 1'-0"



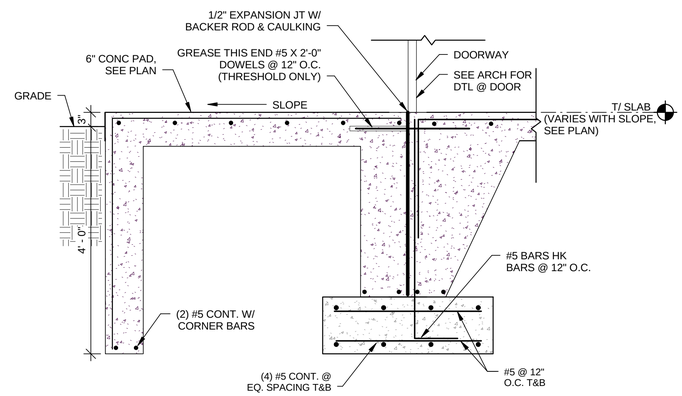
B WALL SECTION ON EXIST. FOUNDATION
S-102 SCALE: 3/4" = 1'-0"



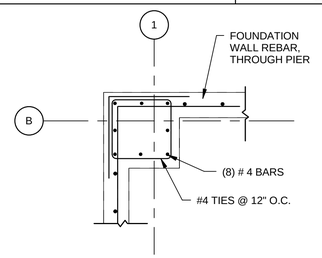
C WALL SECTION @ PIER
S-101 SCALE: 3/8" = 1'-0"



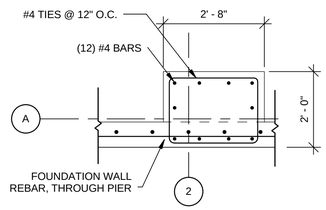
D INTERIOR CMU WALL SECTION
S-101 SCALE: 3/4" = 1'-0"



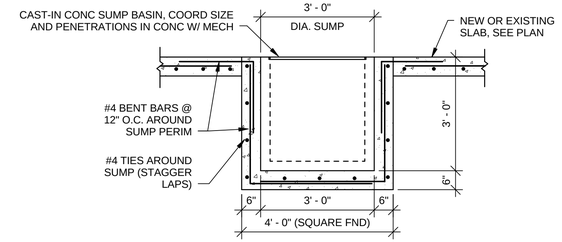
E DOOR THRESHOLD & EXTERIOR PAD SECTION
S-101 SCALE: 3/4" = 1'-0"



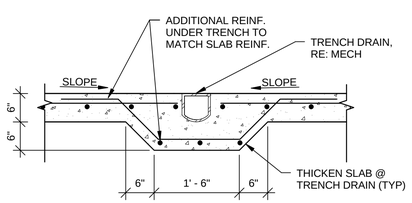
F 24x24 PIER DETAIL
S-101 SCALE: 1/2" = 1'-0"



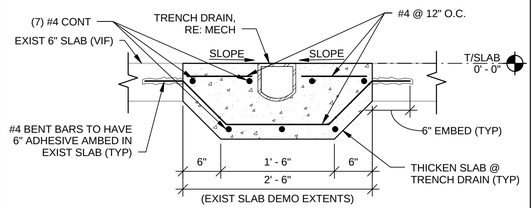
G 32x24 PIER DETAIL
S-101 SCALE: 1/2" = 1'-0"



H CAST-IN PLACE SUMP IN NEW SLAB
S-101 SCALE: 1/2" = 1'-0"

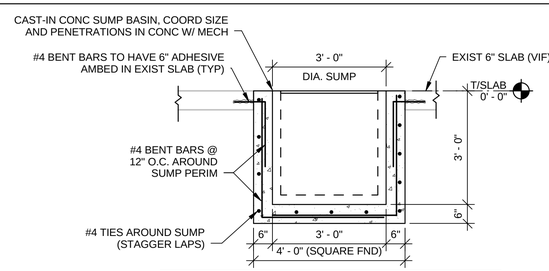


J TRENCH SECTION IN NEW SLAB
S-101 SCALE: 3/4" = 1'-0"



NOTE: SECTION APPLIES IF BID ALTERNATE #5 IS NOT CHOSEN.

K TRENCH SECTION IN EXIST SLAB
S-102 SCALE: 1" = 1'-0"



NOTE: SECTION APPLIES IF BID ALTERNATE #5 IS NOT CHOSEN.

L CAST-IN PLACE SUMP IN EXIST SLAB
S-102 SCALE: 1/2" = 1'-0"

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STATE OF MICHIGAN
CHRISTOPHER COLEMAN
NUMBER PE-6201058671
PROFESSIONAL ENGINEER
4/14/16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
STRUCTURAL SECTIONS

Project No.:	200-31537-15005
Designed By:	P. FLEMING
Drawn By:	P. FLEMING
Checked By:	J. BURKETT

S-301

Bar Measures 1 inch

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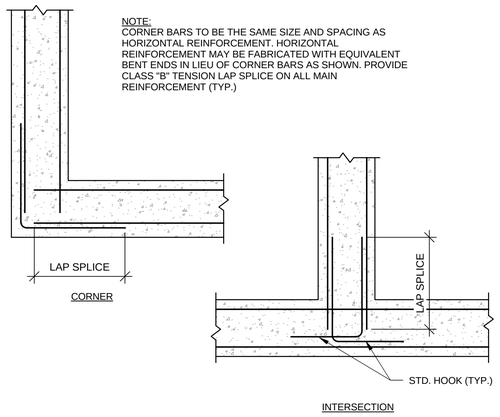
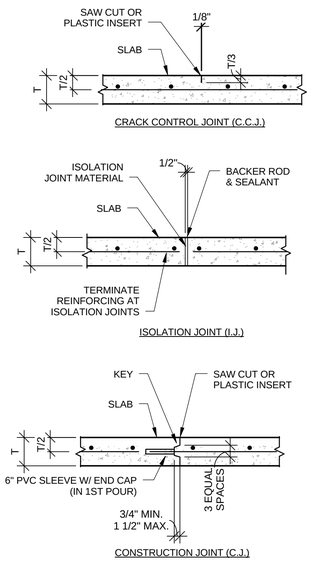
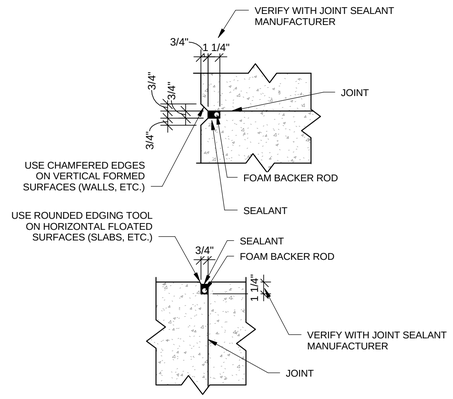


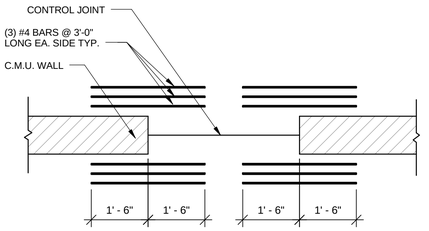
1 S-501 WALL CORNERS @ BLDG WALLS
SCALE 3/4" = 1'-0"



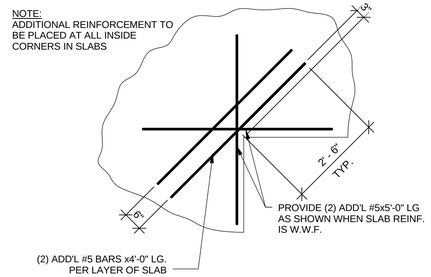
2 S-501 TYP. REINF SLAB DETAILS
SCALE 3/4" = 1'-0"



3 S-501 CONTROL JOINT SEALANT
SCALE 1 1/2" = 1'-0"

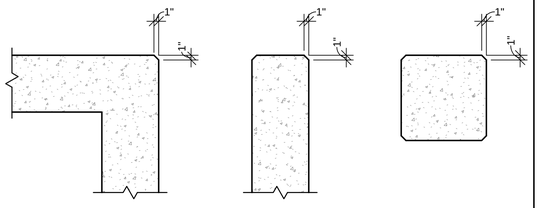


4 S-501 SLAB REINF. @ DOOR OPNG
SCALE 1/2" = 1'-0"

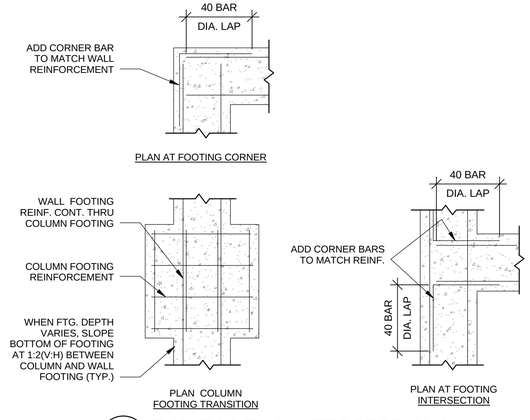


5 S-501 REINF. SLAB RE-ENTRANT CORNER
SCALE 1/2" = 1'-0"

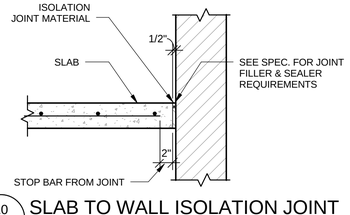
6 S-501 STANDARD CONSTRUCTION JOINT
SCALE 3/4" = 1'-0"



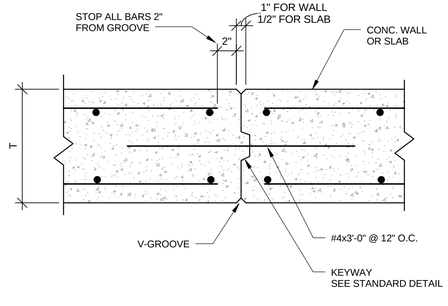
7 S-501 CHAMFER DETAILS
SCALE 3/4" = 1'-0"



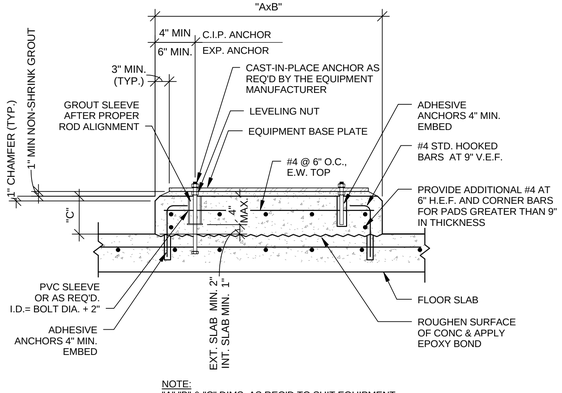
8 S-501 TYP. FOOTING INTERSECTIONS
SCALE 3/4" = 1'-0"



10 S-501 SLAB TO WALL ISOLATION JOINT
SCALE 1" = 1'-0"



11 S-501 CONSTRUCTION JOINT
SCALE 1 1/2" = 1'-0"



12 TYP. EQUIPMENT PAD
SCALE: 3/4" = 1'-0"

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STATE OF MICHIGAN
CHRISTOPHER COLEMAN
NUMBER PE-6201058671
PROFESSIONAL ENGINEER
4/14/16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
STRUCTURAL DETAILS

Project No.:	200-31537-15005
Designed By:	P. FLEMING
Drawn By:	P. FLEMING
Checked By:	J. BURKETT

S-501

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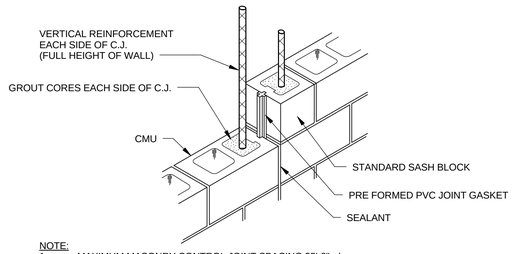
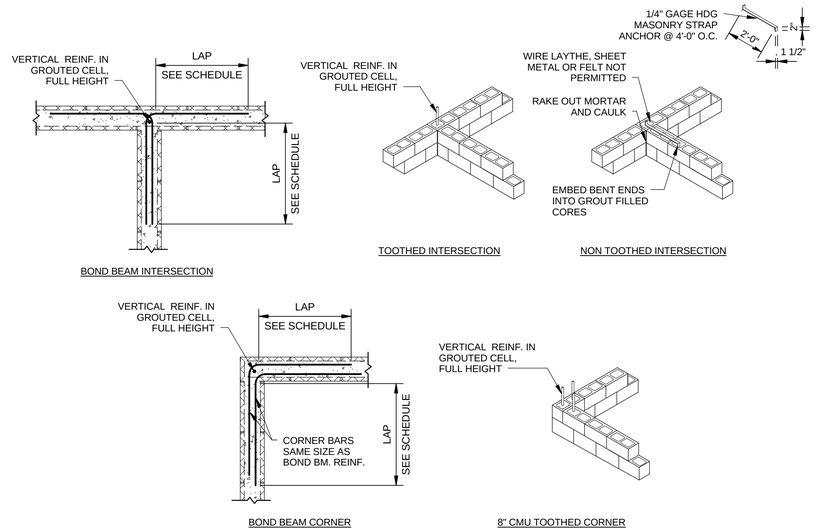
Bar Measures 1 inch

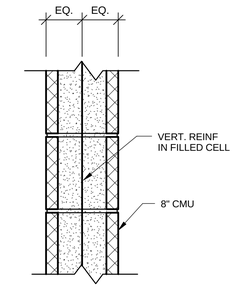


NOTE:
1. MAXIMUM MASONRY CONTROL JOINT SPACING 25'-0" o/c
2. BOND BEAM HORIZONTAL REINFORCEMENT RUNS CONTINUOUS THROUGH CONTROL JOINT
3. COORDINATE CONTROL JOINT LOCATIONS WITH ARCHITECT.
4. PROVIDE DOWELS IN FOUNDATION TO MATCH VERTICAL BARS

1 S-502 TYP. MASONRY CONTROL JOINT
SCALE 3/4" = 1'-0"

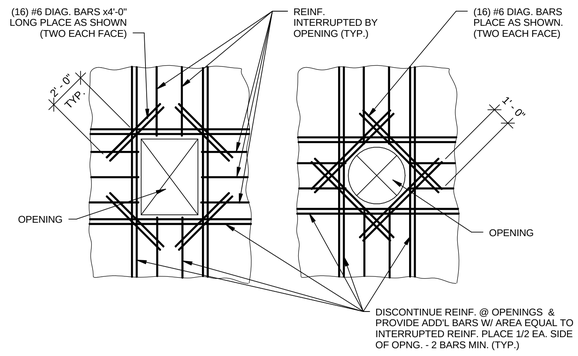


2 S-502 TYP. MASONRY INTERSECTIONS
SCALE 1/2" = 1'-0"



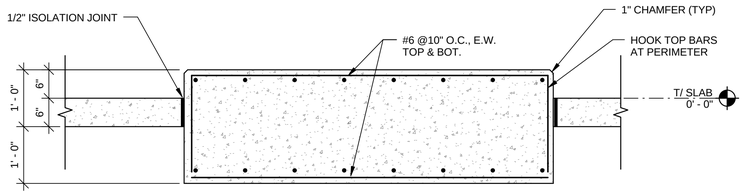
SECTION - REINF. CTR'D

3 S-502 TYP. CMU REINF. DETAIL
SCALE 1 1/2" = 1'-0"

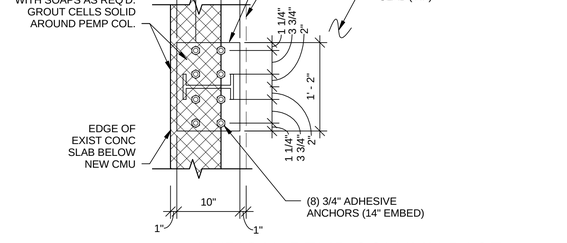


NOTE:
WHERE REQ'D. LAPS ARE NOT POSSIBLE DUE TO PRESENCE OF ADJACENT HOLES OR CORNERS, PROVIDE STANDARD END HOOK

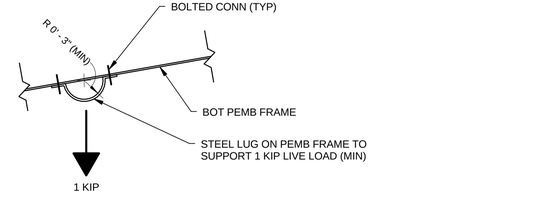
4 REINF. STEEL @ OPENING
SCALE: 1/4" = 1'-0"



5 S-101 GENERATOR PAD SECTION
SCALE: 3/4" = 1'-0"



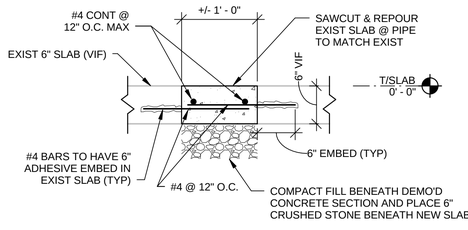
6 S-102 TYPICAL PEMB COLUMN BASE CONNECTION TO EXIST FOUNDATION
SCALE: 1" = 1'-0"



NOTES:

-REFER TO ARCH ROOF PLANS FOR PICK POINT LOCATIONS.
-PROVIDE PLASTIC LABEL INDICATING LOAD CAPACITY AT ALL PICK POINTS.

7 PICK POINT ON PEMB FRAME DETAIL
SCALE: 1" = 1'-0"



NOTE: DETAIL APPLIES IF BID ALTERNATE #5 IS NOT CHOSEN.

8 S-102 CONCRETE SLAB REPLACEMENT @ PIPE BETWEEN TRENCH AND SUMP
SCALE: 1" = 1'-0"

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Tel:734-665-6000 Fax: 734-213-3003

STATE OF MICHIGAN
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4/14/16

MARK	DATE	DESCRIPTION	BY
1	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
STRUCTURAL DETAILS

Project No.:	200-31537-15005
Designed By:	P. FLEMING
Drawn By:	P. FLEMING
Checked By:	J. BURKETT

S-502

Bar Measures 1 inch

4/14/2016 10:08:08 AM C:\Users\phil.fleming\Documents\A-ENGINE BUILDING_PHILFLEMING.rvt

MECHANICAL LEGEND

- 20x12 — DUCT SIZE, FIRST FIGURE IS DIMENSION SHOWN ON PLAN
- DUCT SECTION, POSITIVE PRESSURE
- DUCT SECTION, NEGATIVE PRESSURE
- NEW DUCTWORK
- FLEXIBLE DUCTWORK
- DUCT TRANSITION
- TURNING VANES
- FD — FIRE DAMPER (1.5 HR) AND SLEEVE, PROVIDE ACCESS DOOR
- 3 HR — FIRE DAMPER (3 HR) AND SLEEVE, PROVIDE ACCESS DOOR
- VOLUME DAMPER
- AIR FLOW DIRECTION
- GRILLE OR REGISTER, SIDEWALL
- SUPPLY GRILLE OR REGISTER, CEILING
- RETURN GRILLE OR REGISTER, CEILING
- EXHAUST GRILLE OR REGISTER, CEILING
- LOUVER AND SCREEN
- PIPE CAP
- PIPE CONNECTION, BOTTOM
- PIPE CONNECTION, TOP
- PIPE ELBOW, TURNED UP
- PIPE ELBOW, TURNED DOWN
- PIPE TEE
- ANCHOR, INTERMEDIATE
- GATE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- STRAINER VALVE
- CHECK VALVE
- PRESSURE GAUGE
- THERMOMETER
- THREE-WAY CONTROL VALVE
- TWO-WAY CONTROL VALVE
- UNION
- MANUAL AIR VENT
- AUTOMATIC AIR VENT
- PUMP
- T — THERMOSTAT
- CO2 — CO2 SENSOR
- M — MOTORIZED DAMPER
- S — EMERGENCY SHUTDOWN SWITCH

MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION
AAV	AUTOMATIC AIR VENT
ABS	ABSOLUTE
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFG	ABOVE FINISHED GRADE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
BHP	BREAK HORSEPOWER
CAP	CAPACITY
CP-1	CONTROL PANEL WITH DESIGNATION
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CU	CONDENSING UNIT
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CW	CITY WATER
D	DRAIN
DB	DRY BULB
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EMCS	ENERGY MANAGEMENT AND CONTROL SYSTEM
ENT	ENTERING
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EXH	EXHAUST
F	FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FFE	FINISHED FLOOR ELEVATION
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
GAL	GALLONS
GH	GRAVITY HOOD
GPM	GALLONS PER MINUTE
HD	HEAD
HP	HORSEPOWER
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IN	INCH
LAT	LEAVING AIR TEMPERATURE
MAX	MAXIMUM
MIN	MINIMUM
L	LOUVER
LP	LOUVERED PENTHOUSE
NTS	NOT TO SCALE
NG	NATURAL GAS
OA	OUTDOOR AIR
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
PW	POTABLE WATER
RA	RETURN AIR
REFRIG	REFRIGERANT
RL	REFRIGERANT LIQUID LINE
RS	REFRIGERANT SUCTION LINE
SA	SUPPLY AIR
SB	SECURITY BARS
SP	STATIC PRESSURE
SPEC	SPECIFICATION
STD	STANDARD
TA	TRANSFER AIR
TEMP	TEMPERATURE
TSTAT	THERMOSTAT
TYP	TYPICAL
UH	UNIT HEATER
V	VOLTS
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
W	WATT
WB	WET BULB
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
Ø	DIAMETER

MECHANICAL GENERAL NOTES:

1. THESE DRAWINGS ARE SCHEMATIC IN NATURE AND ARE NOT INTENDED TO SHOW ALL POSSIBLE CONDITIONS. IT IS INTENDED THAT A COMPLETE SYSTEM BE PROVIDED WITH ALL NECESSARY EQUIPMENT, APPURTENANCES, AND CONTROLS, COMPLETELY COORDINATED WITH ALL DISCIPLINES. ALL PARAMETERS GIVEN IN THESE DOCUMENTS SHALL BE STRICTLY CONFORMED WITH. ANY ITEMS AND LABOR REQUIRED FOR A COMPLETE SYSTEM IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS, AND THESE CONTRACT DOCUMENTS SHALL BE FURNISHED WITHOUT OCCURING ANY ADDITIONAL COST TO THE OWNER. CAREFULLY REVIEW ALL CONTRACT DOCUMENTS AND THE DESIGN OF OTHER TRADES BEFORE PREPARING SHOP DRAWINGS.
2. BOTTOM OF DUCTWORK SHALL BE MOUNTED BETWEEN 12-24 INCHES OF CEILINGS EXCEPT TO AVOID INTERFERENCES WITH OTHER CONSTRUCTION.
3. OUTSIDE AIR INTAKES SHALL BE A MINIMUM OF 10'-0" ABOVE GRADE LEVEL.
4. COORDINATE EQUIPMENT AND PIPING WITH ALL OTHER DISCIPLINES AND TRADES. MAKE ALL OFFSETS AND TRANSITIONS TO COORDINATE WITH OTHER TRADES WITHOUT ANY ADDITIONAL EXPENSE TO THE OWNER.
5. COORDINATE THE EXACT LOCATION AND SIZE OF ALL ROOF, WALL, AND SLAB PENETRATIONS WITH THE ARCHITECTURAL DRAWINGS.
6. MAINTAIN PIPING A MININUM OF 8'-0" A.F.F IN ALL MECHANICAL ROOMS. ALL PIPING SHALL BE LOCATED AS HIGH AS POSSIBLE.
7. MOUNT THERMOSTATS WHERE INDICATED ON PLANS, 4'-0" A.F.F. UNLESS NOTED OTHERWISE.
8. COORDINATE WITH ELECTRICAL CONTRACTOR TO VERIFY CONTROL VOLTAGES WITH EQUIPMENT AND PROVIDE ACCORDINGLY.
9. ALL EQUIPMENT, PIPING, AND RELATED APPURTENANCES SHALL BE INSTALLED TO THE LATEST EDITION OF THE MICHIGAN MECHANICAL CODE, MICHIGAN PLUMBING CODE, AND INTERNATIONAL FUEL GAS CODE.

DUCTWORK NOTES:

1. ALL DUCTWORK IS SHOWN AS FREE AREA INSIDE DIMENSIONS.
2. USE 45 DEG. TAPS FOR ROUND TO ROUND TAKE OFF'S PROVIDE VOLUME DAMPER AT EACH TAKE OFF.
3. DO NOT CONSTRUCT OR INSTALL TAPS OUT OF REDUCERS, TEES AND OR ELBOWS.
4. ALLOW FOR FIELD MEASURED OFFSETS OR TRANSITIONS, ELBOWS ETC.
5. SUPPORT ALL FLEXIBLE DUCTWORK AS SHOWN IN SMACNA FIGURE 3-9, 1985, BUT NOT LESS THAN 6.0' CENTERS.
6. DO NOT USE FLEX DUCT IN EXPOSED AREAS. FLEX DUCT SHALL BE USED TO CONNECT ALL DIFFUSERS TO SUPPLY DUCT. MAXIMUM FLEX DUCT LENGTH TO DIFFUSERS SHALL NOT EXCEED FIVE FEET. MAXIMUM FLEX DUCT LENGTH AT ANY OTHER CONNECTION SHALL NOT EXCEED TWO FEET. FLEX DUCT SHALL NOT BE USED FOR ELBOWS.
7. GRILLES, REGISTERS AND DIFFUSERS CONNECTED BY FLEXIBLE DUCT SHALL BE SUPPORTED INDEPENDENTLY OF THE FLEXIBLE DUCT.
8. STRAIGHT DUCT LENGTH PRIOR TO VAV BOX CONNECTION SHALL BE MINIMUM OF THREE MULTIPLIED BY THE INLET DUCT DIAMETER (3 X D).
9. RECTANGULAR ELBOWS SHALL BE RADIUS FITTINGS WITH CENTERLINE RADIUS EQUAL TO 1.5 TIMES THE DUCT WIDTH WHERE SPACE PERMITS. OTHERWISE, RECTANGULAR DUCTS SHALL BE 90 DEG. ELLS WITH DOUBLE THICKNESS TURNING VANES. NO OTHERS WILL BE ALLOWED.
10. COORDINATE FINAL LOCATION OF ALL REGISTERS, GRILLES, DIFFUSERS ETC. WITH ARCHITECTURAL DRAWINGS AND LIGHTING PLANS.

NATURAL GAS NOTES:

1. ALL NEW EXPOSED GAS PIPING SHALL BE PRIMED. ALL NEW GAS PIPING WITHIN FINISHED SPACES SHALL BE PAINTED YELLOW AND LABELED IN ACCORDANCE WITH APPLICABLE CODE. ALL EXTERIOR GAS PIPING SHALL BE PAINTED OVER 100% OF THE SURFANCE OF THE PIPE AND FITTINGS. PAINT BEHIND PIPE CLAMPS AND SUPPORTS.
2. COORDINATE NEW METER LOCATION FOR BUILDING WITH LOCAL UTILITIES.
3. ALL GAS PIPING SHALL BE LABELED AT BEGINNING, ALL ENDS, AND AT 6'-0" INTERVALS DESIGNATING GAS & PRESSURE. LABELS SHALL BE PER SPECIFICATIONS.
4. PROVIDE & INSTALL THRU-WALL PIPE PENETRATIONS AS REQUIRED WHERE PIPE ENTERS BUILDING. SLEEVE AND SEAL PENETRATION.

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

STATE OF MICHIGAN
WILLIAM S. KRAMER
ENGINEER
No. 45628
LICENSED PROFESSIONAL ENGINEER
4/14/2016

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
MECHANICAL NOTES AND LEGEND

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-001

Bar Measures 1 inch

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KEY NOTES:

1.) DEMOLISH EXISTING NATURAL GAS ENGINE AND DRIVE ASSEMBLY. REFER TO BID TAB OPTION FOR ENGINE SALVAGE. DEMOLISH ENGINE BASE PAD FLUSH WITH FLOOR.

2.) DEMOLISH EXISTING ENGINE EXHAUST, MUFFLER, AND STAND.

3.) DEMOLISH EXISTING GAS HEATER AND CONTROLS.

4.) DEMOLISH EXISTING NATURAL GAS PIPING FROM ENGINE AND HEATER BACK TO EXISTING SERVICE METER. NATURAL GAS METER, REGULATOR, AND SERVICE MAIN SHALL BE DISCONNECTED AND REMOVED BY UTILITY PROVIDER.

5.) REMOVE RIGHT ANGLE DRIVE AND ASSOCIATED COOLING/DRAIN PIPING FROM EXISTING PUMP. PUMP AND COUPLING SHAFT THROUGH THE RIGHT ANGLE DRIVE SHALL REMAIN.

6.) REMOVE EXISTING AIR RELIEF VALVE ASSEMBLY. EXISTING PIPE TAP SHALL BE REUSED FOR NEW AIR RELIEF VALVE.

7.) REPAINT EXISTING 12" PIPING, SEE SPECIFICATION 09900.

8.) COORDINATE DUCTWORK CONNECTIONS BETWEEN DAMPER AND GENERATOR, EXHAUST PIPING, AND NATURAL GAS CONNECTIONS WITH APPROVED GENERATOR SHOP DRAWINGS.

9.) NEW NATURAL GAS METER AND REGULATOR BY UTILITY, COORDINATE FINAL GAS PRESSURE WITH APPROVED GENERATOR SHOP DRAWINGS. SEE SHEET C-301 FOR CONTINUATION:
- SERVICE: 4,675 CFH @ 15" - 20" WG
- FUTURE: 9,300 CFH @ 15" - 20" WG

10.) PROVIDE PRESSURE REDUCING REGULATOR PRV-1 TO REDUCE GAS PRESSURE TO BUILDING HEATING SYSTEM.

11.) PROVIDE 14"x48" HINGED ACCESS DOOR ON EACH SIDE OF EXHAUST SHROUD (TYP. BOTH GENERATORS)

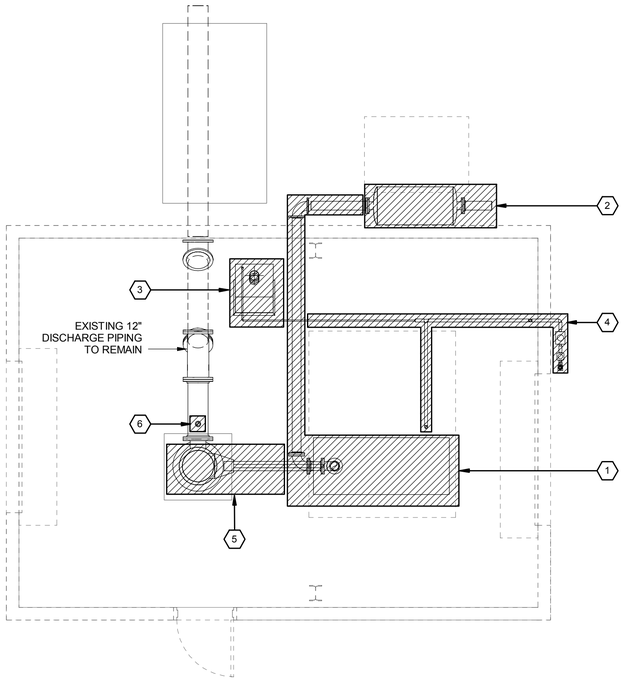
12.) EXTEND GENERATOR EXHAUST 12" BEYOND ROOF OVERHANG. EXHAUST PIPE SHALL BE SCH 10 (MIN.) 304 STAINLESS STEEL.

13.) DO NOT RUN PIPING ABOVE ELECTRICAL EQUIPMENT.

14.) INSTALL NEW 200 HP MOTOR ON EXISTING PUMP. SEE SPECIFICATION 16220 FOR MOTOR. PROVIDE REQUIRED MOUNTING HARDWARE TO INSTALL MOTOR ON PUMP BASE. ADJUST MOTOR BEARINGS AND CLUTCHES AS RECOMMENDED BY MOTOR SUPPLIER AND PUMP MANUFACTURER REPRESENTATIVE.

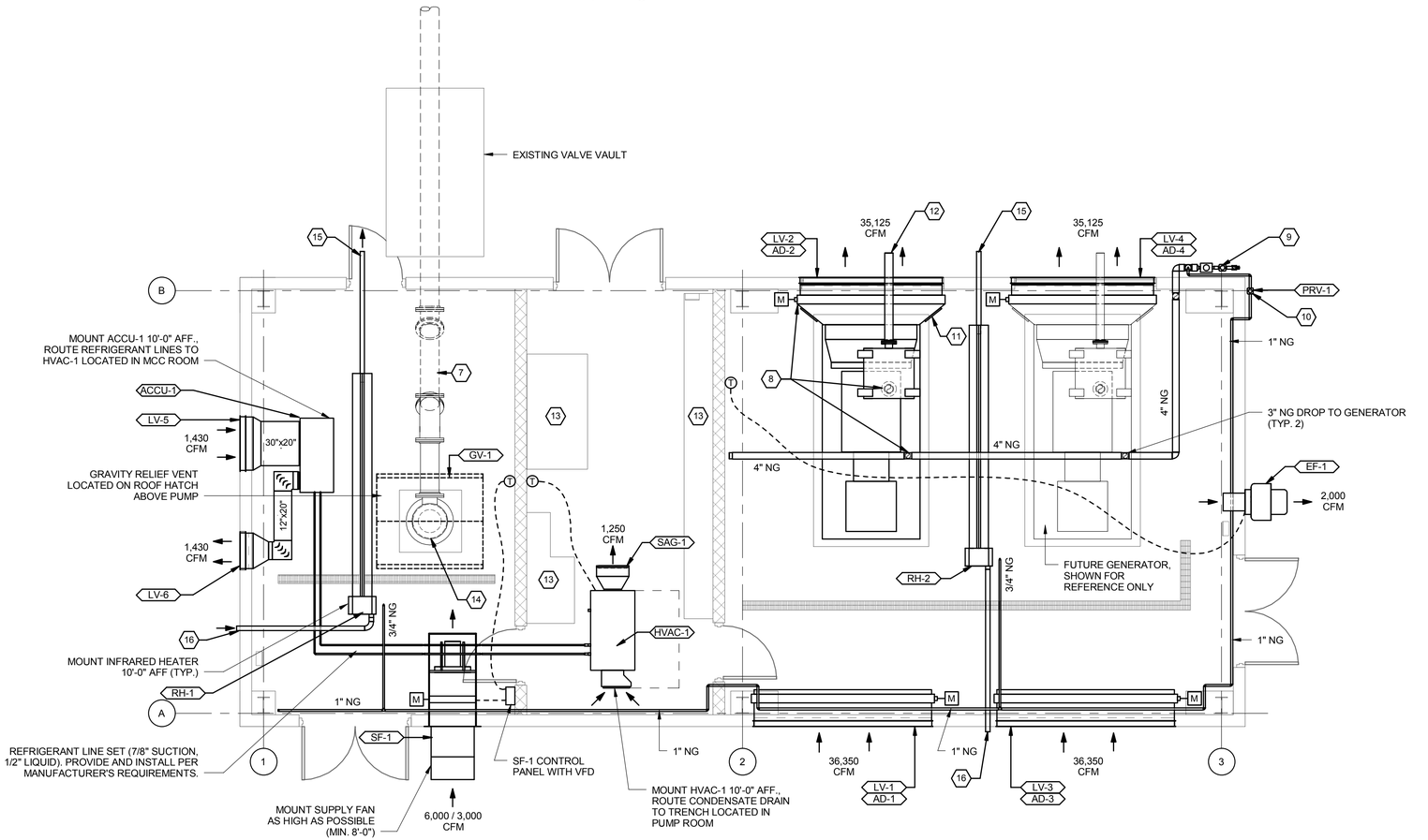
15.) COMBUSTION AIR EXHAUST, PROVIDE MANUFACTURER'S VENT CAP TERMINATION KIT WITH REMOVABLE S.S. BIRD SCREEN. EXTEND 12" BEYOND ROOF OVERHANG. SEE DETAIL 3 ON SHEET M-502.

16.) COMBUSTION AIR INLET, PROVIDE MANUFACTURER'S VENT CAP TERMINATION KIT WITH REMOVABLE S.S. BIRD SCREEN. SEE DETAIL 3 ON SHEET M-502.



WELL HOUSE 25W - DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



WELL HOUSE 25W - MECHANICAL NEW WORK PLAN

SCALE: 1/4" = 1'-0"

SCALE: 1/4" = 1'-0"

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Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

STATE OF MICHIGAN
WILLIAM S. KRAMER
ENGINEER
No. 45628
LICENSED PROFESSIONAL ENGINEER
4/14/2016

MARK	DATE	DESCRIPTION	BY
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CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE

WELL HOUSE 25W - MECHANICAL PLANS

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-101

Bar Measures 1 inch

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KEY NOTES:

1.) REPAINT EXISTING 12" PIPING, SEE SPECIFICATION 09900.

2.) DO NOT RUN PIPING ABOVE ELECTRICAL EQUIPMENT.

3.) INSTALL 3/4" SERVICE TAP ON EXISTING 12" UNDERGROUND WATER MAIN. PROVIDE CURB STOP. NOT APPLICABLE IF BID ALTERNATE NO. 6 IS SELECTED.

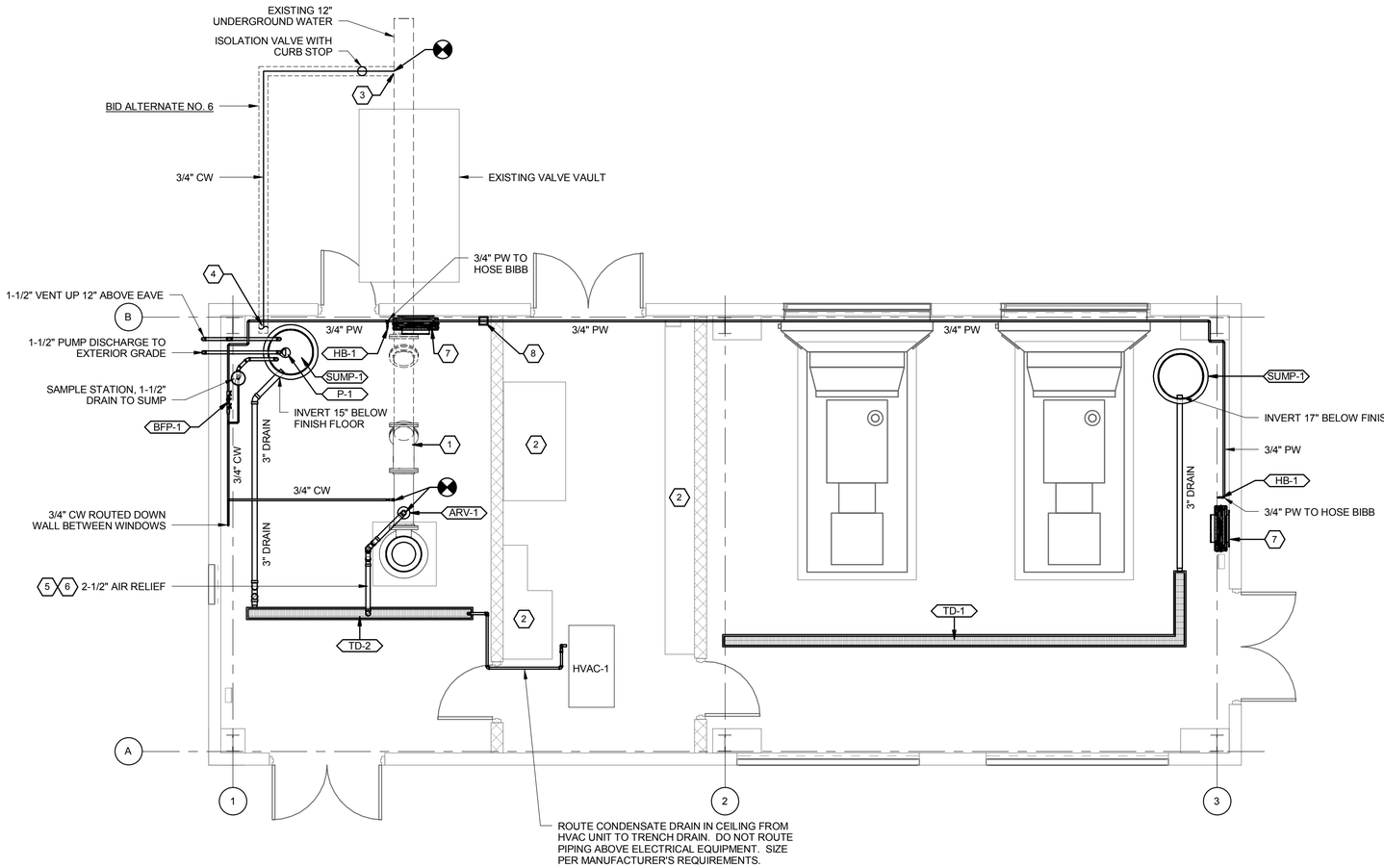
4.) PROVIDE 3/4" CW TO THE SAMPLE STATION, TIE IN UPSTREAM OF BFP-1. SEE WATER MAIN TAPPING DIAGRAM ON M-501. NOT APPLICABLE IF BID ALTERNATE NO. 6 IS SELECTED.

5.) ROUTE DISCHARGE OF AIR RELIEF VALVE TO TRENCH DRAIN. PITCH PIPE TOWARDS THE TRENCH TRAIN. USE 45 DEGREE ELBOWS, NOT 90 ELBOWS. MAXIMUM OF FOUR (4) 45 DEGREE FITTINGS.

6.) PROVIDE PIPE SUPPORTS FOR AIR RELIEF PIPING. ANCHOR SUPPORT TO THE FLOOR WITH EPOXY SET ANCHORS.

7.) PROVIDE HOSE RACK AND 100 FEET OF 3/4" HEAVY DUTY GARDEN HOSE.

8.) PROVIDE ISOLATION VALVE AND DRAIN VALVE. SLOPE 3/4" PW PIPING TO HOSE BIBB IN GENERATOR ROOM BACK TOWARD DRAIN FOR WINTER SYSTEM DRAINING.



WELL HOUSE 25W - PLUMBING NEW WORK PLAN

SCALE: 1/4" = 1'-0"

N

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

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www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

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WILLIAM S. KRAMER
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4/14/2016

MARK	DATE	DESCRIPTION
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CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
WELL HOUSE 25W - PLUMBING PLAN

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-102

Bar Measures 1 inch

4/13/2016 2:41:59 PM C:\Users\scott.ulrey\Documents\REVIT Projects\M-ENGINE BUILDING_v2015_scott.ulrey.rvt

KEY NOTES:

1.) DEMOLISH EXISTING NATURAL GAS ENGINE AND DRIVE ASSEMBLY. REFER TO BID TAB OPTION FOR ENGINE SALVAGE. DEMOLISH ENGINE BASE PAD FLUSH WITH FLOOR.

2.) DEMOLISH EXISTING ENGINE EXHAUST, MUFFLER, AND STAND.

3.) DEMOLISH EXISTING GAS HEATER AND CONTROLS.

4.) DEMOLISH EXISTING NATURAL GAS PIPING FROM ENGINE AND HEATER BACK TO EXISTING SERVICE METER.

5.) REMOVE RIGHT ANGLE DRIVE AND ASSOCIATED COOLING/DRAIN PIPING FROM EXISTING PUMP. PUMP AND COUPLING SHAFT THROUGH THE RIGHT ANGLE DRIVE SHALL REMAIN.

6.) REMOVE EXISTING AIR RELIEF VALVE ASSEMBLE, EXISTING PIPE TAP SHALL BE REUSED FOR NEW AIR RELIEF VALVE

7.) REPAINT EXISTING 12" PIPING, SEE SPECIFICATION 09000.

8.) INSTALL 3/4" SERVICE TAP ON EXISTING 12" UNDERGROUND WATER PAIN. PROVIDE ISOLATION VALVE WITH CURB STOP. NOT APPLICABLE IF BID ALTERNATE NO. 6 IS SELECTED.

9.) ROUTE DISCHARGE OF AIR RELIEF VALVE TO TRENCH DRAIN. PITCH PIPE TOWARDS THE TRENCH TRAIN. USE 45 DEGREE ELBOWS, NOT 90 ELBOWS. MAXIMUM OF THREE (3) 45 DEGREE FITTINGS.

10.) PROVIDE PIPE SUPPORTS FOR AIR RELIEF PIPING. ANCHOR SUPPORT TO THE FLOOR WITH EPOXY SET ANCHORS.

11.) PROVIDE HOSE RACK AND 100 FEET OF 3/4" HEAVY DUTY GARDEN HOSE.

12.) IF BID ALTERNATE NO. 5 IS SELECTED, DO NOT INSTALL TRENCH DRAIN SYSTEM, SUMP OR PUMP. ROUTE THE AIR RELIEF VALVE TO THE EXTERIOR OF BUILDING. INCREASE TO 2-1/2" PIPE AND SLOPE PIPING TO EXTERIOR OF BUILDING. PROVIDE PIPE SUPPORTS.

13.) PROVIDE 45 ELBOW DOWN AND PROVIDE BIRD SCREEN ON OPENING OF AIR RELIEF.

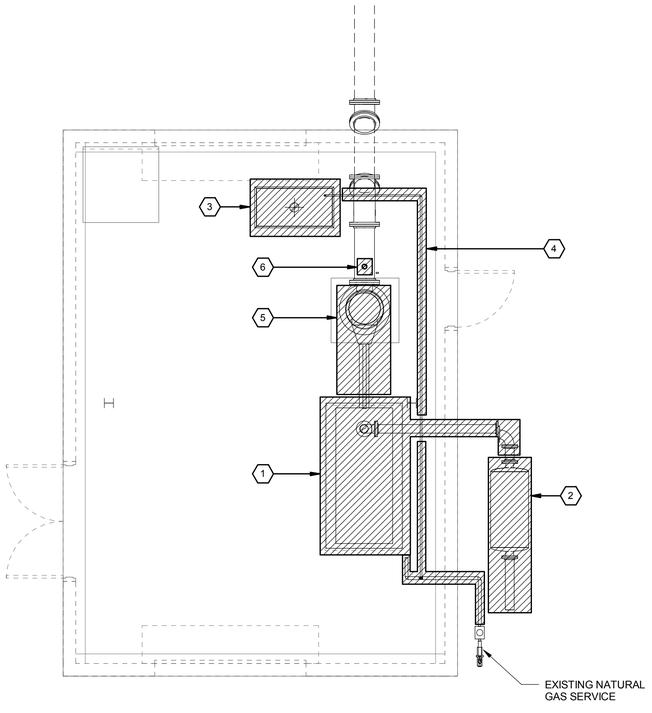
14.) ROUTE 3/4" CW UPSTREAM OF BFP-1. SEE DETAIL FOR CONFIGURATION AND ISOLATION VALVES.

15.) INSTALL NEW 200 HP MOTOR ON EXISTING PUMP. SEE SPECIFICATION 16220 FOR MOTOR. PROVIDE REQUIRED MOUNTING HARDWARE TO INSTALL MOTOR ON PUMP BASE. ADJUST MOTOR BEARINGS AND CLUTCHES AS RECOMMENDED BY MOTOR SUPPLIER AND PUMP MANUFACTURER REPRESENTATIVE.

16.) COMBUSTION AIR EXHAUST, PROVIDE MANUFACTURER'S VENT CAP TERMINATION KIT WITH REMOVABLE S.S. BIRD SCREEN. EXTEND 12" BEYOND ROOF OVERHANG. SEE DETAIL 3 ON SHEET M-502.

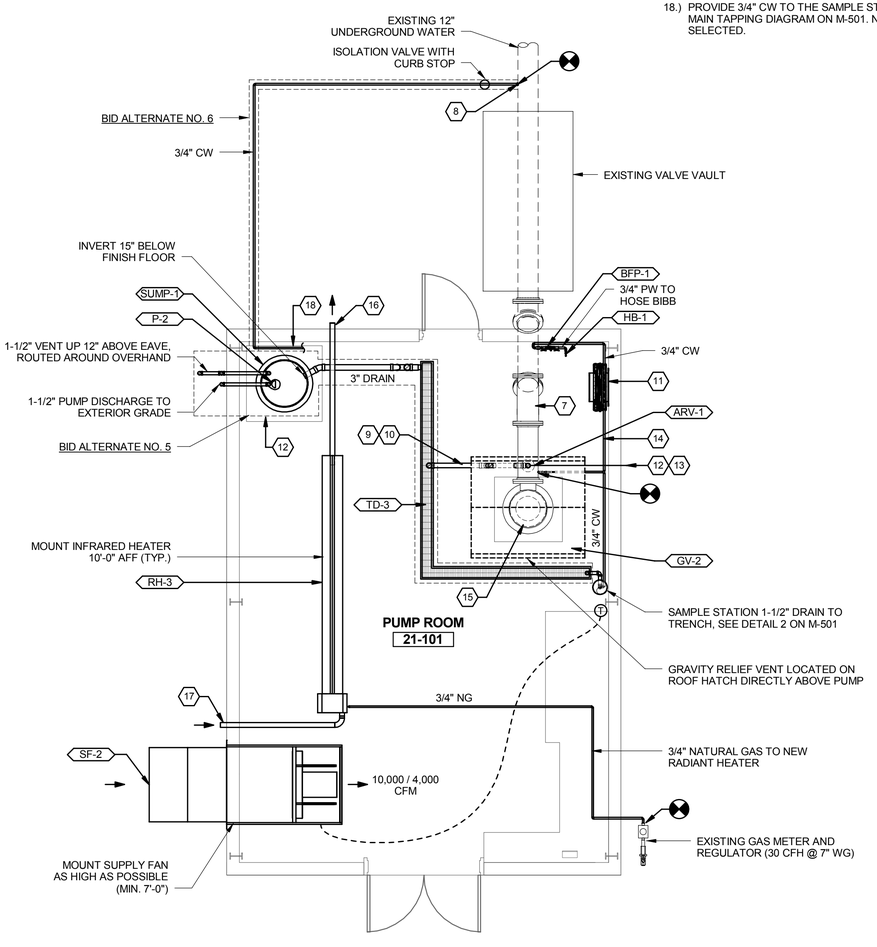
17.) COMBUSTION AIR INLET, PROVIDE MANUFACTURER'S VENT CAP TERMINATION KIT WITH REMOVABLE S.S. BIRD SCREEN. SEE DETAIL 3 ON SHEET M-502.

18.) PROVIDE 3/4" CW TO THE SAMPLE STATION, TIE IN UPSTREAM OF BFP-1. SEE WATER MAIN TAPPING DIAGRAM ON M-501. NOT APPLICABLE IF BID ALTERNATE NO. 6 IS SELECTED.



WELL HOUSE 21W - DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



WELL HOUSE 21W - NEW WORK PLAN

SCALE: 1/4" = 1'-0"

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

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www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

STATE OF MICHIGAN
WILLIAM S. KRAMER
ENGINEER
No. 45628
LICENSED PROFESSIONAL ENGINEER
4/14/2016

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
WELL HOUSE 21W - MECHANICAL PLANS

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-103

Bar Measures 1 inch

4/13/2016 2:42:03 PM C:\Users\scott.ulrey\Documents\REVIT Projects\M-ENGINE BUILDING_v2015_scott.ulrey.rvt

PHOTO #1

KEY NOTES:

1.) DEMOLISH EXISTING NATURAL GAS ENGINE AND DRIVE ASSEMBLY. REFER TO BID TAB OPTION FOR ENGINE SALVAGE. DEMOLISH ENGINE BASE PAD FLUSH WITH FLOOR.

2.) DEMOLISH EXISTING ENGINE EXHAUST, MUFFLER, AND STAND.

3.) DEMOLISH EXISTING GAS HEATER AND CONTROLS.

4.) DEMOLISH EXISTING NATURAL GAS PIPING FROM ENGINE AND HEATER BACK TO EXISTING SERVICE METER.

5.) REMOVE RIGHT ANGLE DRIVE AND ASSOCIATED COOLING/DRAIN PIPING FROM EXISTING PUMP. PUMP AND COUPLING SHAFT THROUGH THE RIGHT ANGLE DRIVE SHALL REMAIN.

6.) REMOVE EXISTING AIR RELIEF VALVE ASSEMBLE, EXISTING PIPE TAP SHALL BE REUSED FOR NEW AIR RELIEF VALVE.

7.) REPAINT EXISTING 12" PIPING, SEE SPECIFICATION 09000.

8.) CONNECT 3/4" CW TO EXISTING VALVE ON 12" WATER MAIN LOCATED NEAR THE FLOOR. PROVIDE 3/4" CW LINE TO BFP-1. SEE PHOTO #1.

9.) ROUTE DISCHARGE OF AIR RELIEF VALVE TO TRENCH DRAIN. PITCH PIPE TOWARDS THE TRENCH TRAIN. USE 45 DEGREE ELBOWS, NOT 90 ELBOWS. MAXIMUM OF THREE (3) 45 DEGREE FITTINGS.

10.) PROVIDE PIPE SUPPORTS FOR AIR RELIEF PIPING. ANCHOR SUPPORT TO THE FLOOR WITH EPOXY SET ANCHORS.

11.) PROVIDE HOSE RACK AND 100 FEET OF 3/4" HEAVY DUTY GARDEN HOSE.

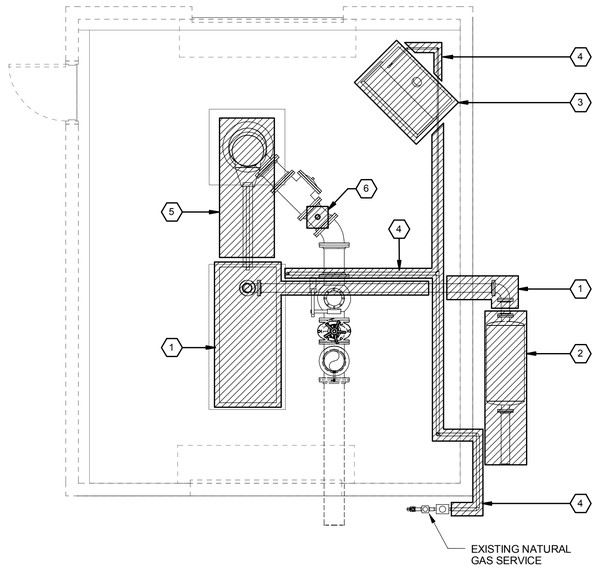
12.) IF BID ALTERNATE NO. 5 IS SELECTED, DO NOT INSTALL TRENCH DRAIN SYSTEM, SUMP OR PUMP. ROUTE THE AIR RELIEF VALVE TO THE EXTERIOR OF BUILDING. INCREASE TO 2-1/2" PIPE AND SLOPE PIPING TO EXTERIOR OF BUILDING. PROVIDE PIPE SUPPORTS.

13.) PROVIDE 45 ELBOW DOWN AND PROVIDE BIRD SCREEN ON OPENING OF AIR RELIEF.

14.) INSTALL NEW 200 HP MOTOR ON EXISTING PUMP. SEE SPECIFICATION 16220 FOR MOTOR. PROVIDE REQUIRED MOUNTING HARDWARE TO INSTALL MOTOR ON PUMP BASE. ADJUST MOTOR BEARINGS AND CLUTCHES AS RECOMMENDED BY MOTOR SUPPLIER AND PUMP MANUFACTURER REPRESENTATIVE.

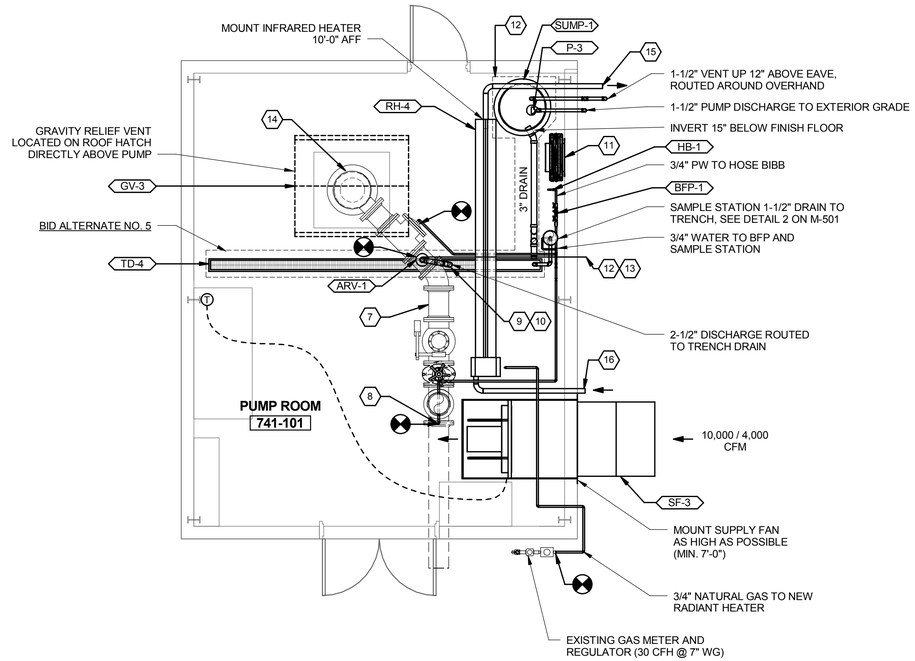
15.) COMBUSTION AIR EXHAUST, PROVIDE MANUFACTURER'S VENT CAP TERMINATION KIT WITH REMOVABLE S.S. BIRD SCREEN. EXTEND 12" BEYOND ROOF OVERHANG. SEE DETAIL 3 ON SHEET M-502.

16.) COMBUSTION AIR INLET, PROVIDE MANUFACTURER'S VENT CAP TERMINATION KIT WITH REMOVABLE S.S. BIRD SCREEN. SEE DETAIL 3 ON SHEET M-502.



WELL HOUSE 741 - DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



WELL HOUSE 741 - NEW WORK PLAN

SCALE: 1/4" = 1'-0"

N

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

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710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

STATE OF MICHIGAN
WILLIAM S. KRAMER
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No. 45628
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4/14/2016

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN

STEERE FARM ENGINE REPLACE

WELL HOUSE 741 - MECHANICAL PLANS

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-104

Bar Measures 1 inch

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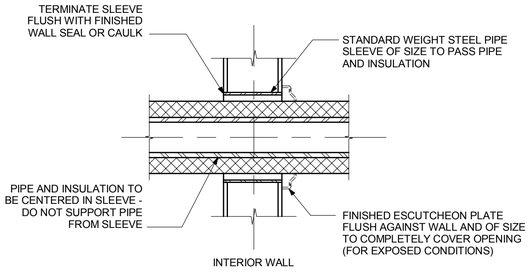
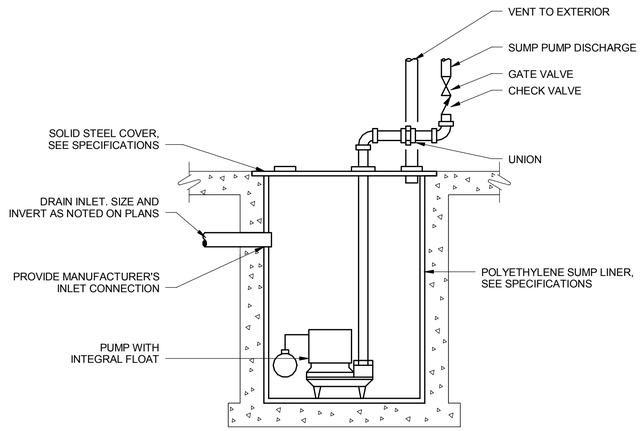
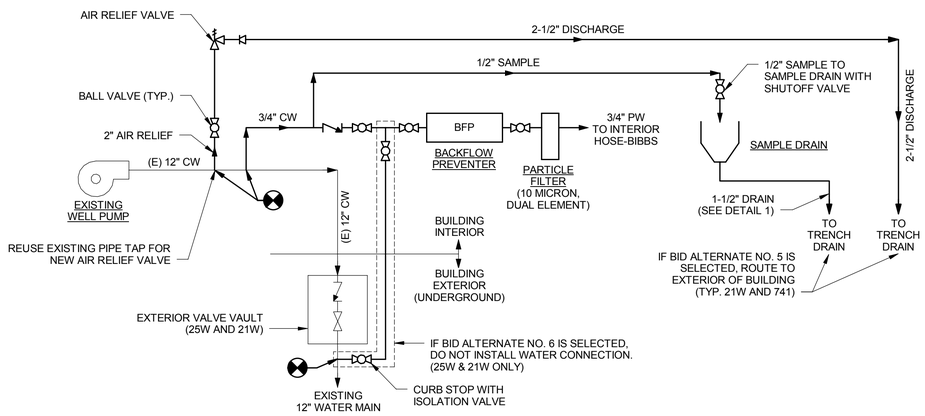


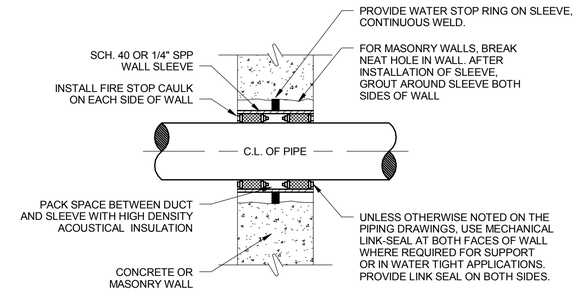
1 DETAIL - INTERIOR WALL PIPE PENETRATION
M-501 SCALE: NTS



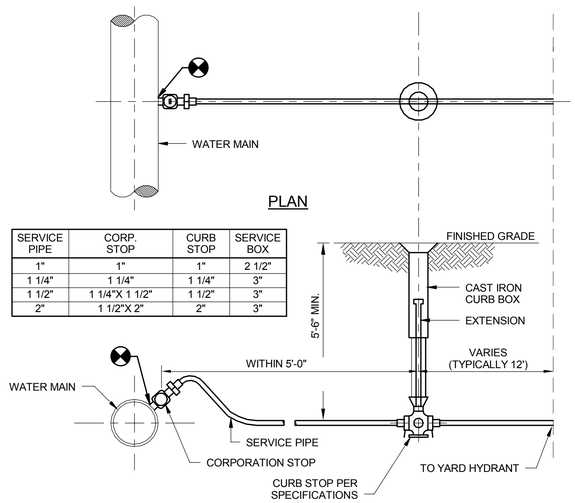
2 SIMPLEX SUMP PUMP WITH INTEGRAL FLOAT AND HIGH LEVEL ALARM
M-501 SCALE: NTS



3 WATER MAIN TAPPING DIAGRAM
M-501 SCALE: NTS



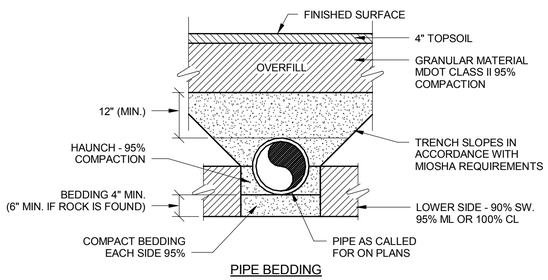
4 PIPE SLEEVES THRU WATER TIGHT WALLS
M-501 SCALE: NTS



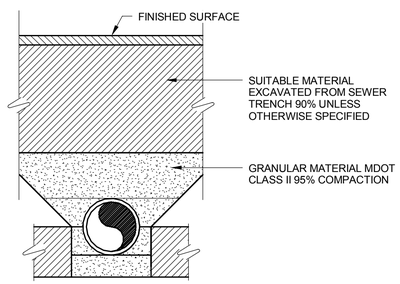
NOTES:
1. THE FOLLOWING WORK IS TO BE PERFORMED BY THE CONTRACTOR
   A. WATER MAIN TAP, INCLUDING EXCAVATION, TAP, AND BACKFILL.
   B. PROCUREMENT AND INSTALLATION OF CORPORATION STOP, CURB STOP, AND BOX.
   C. SITE RESTORATION.

5 DETAIL - WATER SERVICE CONNECTION
M-501 SCALE: NTS

6 DETAIL - SAMPLE STATION
M-501 SCALE: NTS



PIPE BEDDING



PIPE NOT UNDER DRIVEN SURFACE

NOTES:
1. COMPACTION PRESENTED AS MINIMUM STANDARD PROCTOR VALUES.
2. MATERIALS AROUND THERMO PLASTIC PIPE WITH DIAMETER < 6 INCHES SHALL PASS 0.5" SIEVE, MATERIALS AROUND OTHER PIPES SHALL PASS 1-1/2" SIEVE.
3. MATERIALS AROUND HDPE PIPE TO BE MDOT 6A OR 21AA.

7 PIPE TRENCHING / BEDDING DETAIL
M-501 SCALE: NTS

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710 Avis Drive, Suite 100
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Tel:Tel 734-665-6000 Fax: fax 734-213-3003

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MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
MECHANICAL DETAILS

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-501

Bar Measures 1 inch

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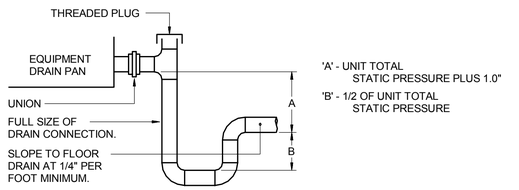
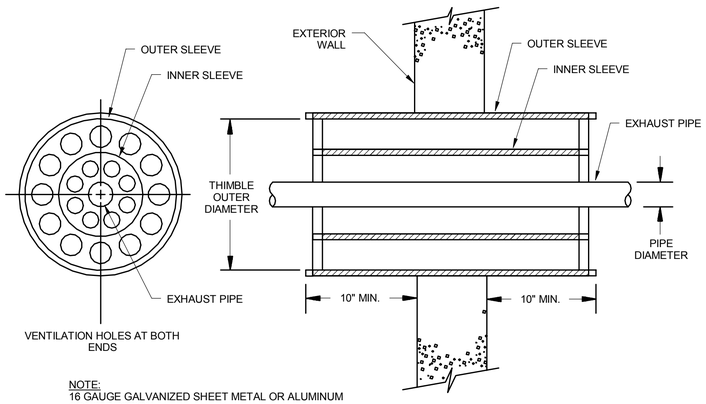


1 M-502 DETAIL - EQUIPMENT DRAIN

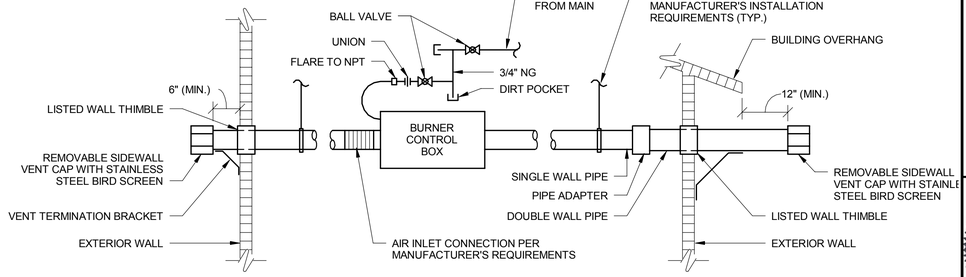
SCALE: NTS



NOTE:
16 GAUGE GALVANIZED SHEET METAL OR ALUMINUM CONSTRUCTION.

2 M-502 GENERATOR EXHAUST WALL THIMBLE DETAIL

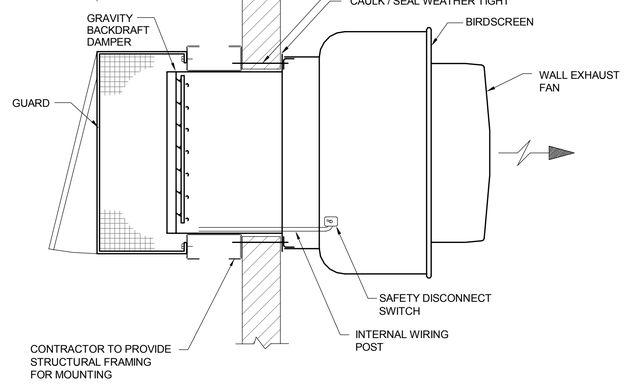
SCALE: NTS



3 M-502 INFRARED TUBE HEATER DETAIL

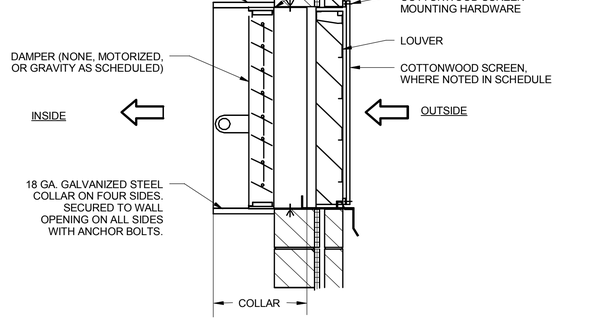
SCALE: NTS

NOTE:
MOUNT AND SECURE TO WALL IN ACCORDANCE WITH MANUFACTURERS INSTALLATION PROCEDURES



5 M-502 SIDEWALL CENTRIFUGAL EXHAUST FAN

SCALE: NTS



4 M-502 LOUVER/DAMPER WITH COTTONWOOD SCREEN DETAIL

SCALE: NTS

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www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

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4/14/2016

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
MECHANICAL DETAILS

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-502

Bar Measures 1 inch

4/15/2016 9:13:11 AM C:\Users\scott.ulrey\Documents\REVIT Projects\M-ENGINE BUILDING_v2015_scott.ulrey.rvt

GENERAL NOTES:

1. THE VFD, CONTROLS, AND MOTORIZED DAMPERS FOR SF-1, SF-2, AND SF-3 ARE THE RESPONSIBILITY OF THE MECHANICAL/TEMPERATURE CONTROL CONTRACTOR, COORDINATE WITH ELECTRICAL CONTRACTOR. THESE ITEMS ARE NOT SHOWN ON ELECTRICAL PLANS.
2. ALL CONDUIT AND WIRE FOR THE THERMOSTAT, CONTROL PANEL, MOTORIZED DAMPER, VFD, AND FAN ARE THE RESPONSIBILITY OF THE MECHANICAL/TEMPERATURE CONTROL CONTRACTOR. A SINGLE POWER SUPPLY WILL BE PROVIDED AT EACH FAN BY THE ELECTRICAL CONTRACTOR. MECHANICAL/TEMPERATURE CONTROLS CONTRACTOR SHALL COORDINATE REQUIRED CONTROLS, TRANSFORMER, CONDUIT AND WIRE WITH OTHER TRADES. THIS EQUIPMENT IS NOT SHOWN ON THE ELECTRICAL PLANS.

SEQUENCE OF OPERATION

AUTOMATIC DAMPERS

AD-1 & AD-2:
- AUTOMATIC DAMPERS AD-1 & AD-2 SHALL BE INTERLOCKED WITH GENERATOR #1.
- DAMPERS SHALL BE MOTORIZED CLOSED, FAIL OPEN.
- DAMPERS SHALL OPEN UPON ANY OF THE FOLLOWING CONDITIONS
  - UTILITY POWER FAILURE
  - GENERATOR #1 CALLED TO RUN
- AD-1 SHALL OPEN UPON CALL FOR COOLING FROM EF-1

LIMIT SWITCHES ON DAMPER BLADES OF AD-1 AND AD-2 SHALL INDICATE DAMPER IS OPEN. GENERATOR SHALL NOT START UNTIL BOTH DAMPERS ARE INDICATED OPEN.

AD-3 & AD-4
- THESE DAMPERS ARE FOR FUTURE GENERATOR.
- DAMPERS SHALL BE FIXED TO CLOSED POSITION.

EXHAUST AND SUPPLY FANS

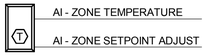
EF-1
- EXHAUST FAN EF-1 SHALL BE CONTROLLED BY ROOM COOLING THERMOSTAT
- UPON RISE IN ROOM TEMPERATURE ABOVE 85°F (USER ADJUSTABLE) THE FOLLOWING SHALL OCCUR:
  - AUTOMATIC DAMPER AD-1 SHALL OPEN
  - WHEN AD-1 OPEN LIMIT SWITCH IS SATISFIED, EXHAUST FAN EF-1 SHALL ENERGIZE.
- UPON DROP IN ROOM TEMPERATURE BELOW THE COOLING SET POINT (5 DEGREE DEAD BAND) THE FOLLOWING SHALL OCCUR:
  - EXHAUST FAN EF-1 SHALL DE-ENERGIZE
  - AUTOMATIC DAMPER AD-1 SHALL CLOSE

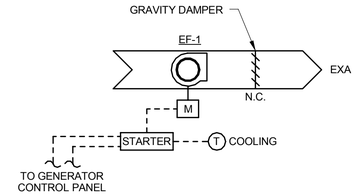
SF-1
- THE SUPPLY FAN SHALL BE CONTROLLED BY TWO-STAGE COOLING THERMOSTAT
- THE SUPPLY FAN SHALL HAVE A VFD WITH TWO-SPEED CONTROL UTILIZING DIGITAL INPUTS FROM THE TWO-STAGE COOLING THERMOSTAT.
- UPON TEMPERATURE RISE ABOVE THE FIRST STAGE COOLING SETPOINT OF 85°F (USER ADJUSTABLE), THE FOLLOWING SHALL OCCUR:
  - AUTOMATIC DAMPERS AD-XX SHALL ENERGIZE OPEN
  - WHEN DAMPER OPEN LIMIT SWITCH IS SATISFIED, SUPPLY FAN SF-1 SHALL OPERATE AT LOW SPEED (ADJUSTABLE AT THE VFD)
- UPON TEMPERATURE RISE ABOVE THE SECOND STAGE COOLING SETPOINT OF 95°F (USER ADJUSTABLE), SUPPLY FAN SF-1 SHALL OPERATE AT FULL SPEED (ADJUSTABLE AT THE VFD)
- UPON TEMPERATURE DROP BELOW THE SECOND STAGE COOLING SET POINT DEAD BAND, SUPPLY FAN SF-1 SHALL REDUCE TO LOW SPEED.
- UPON TEMPERATURE DROP BELOW THE FIRST STAGE COOLING SET POINT DEAD BAND, SUPPLY FAN SF-1 SHALL BE DE-ENERGIZED AND THE DAMPER SHALL CLOSE.
- MONITORING:
  - A PRESSURE DIFFERENTIAL GAUGE WITH SWITCH SHALL BE PROVIDED ACROSS THE FILTER BANK.
  - WHEN PRESSURE DROP EXCEEDS THE DIRT FILTER PRESSURE SET POINT OF 0.3 in/wc (ADJUSTABLE), A CONTACT CLOSURE SHALL BE MONITORED BY THE BUILDING PLC SYSTEM.
  - THE BUILDING'S PLC SYSTEM SHALL SEND A WARNING TO THE CENTRAL SYSTEM TO INDICATE SERVICE IS REQUIRED.

PLUMBING FIXTURE SCHEDULE

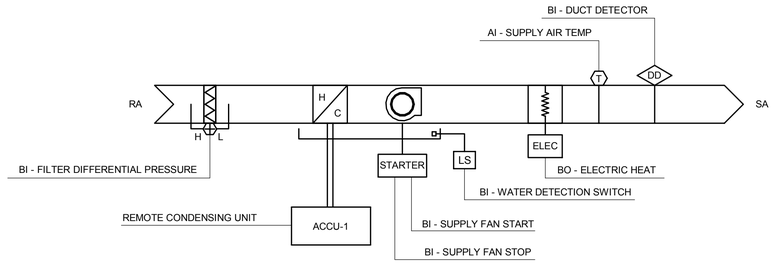
MARK	QUANTITY	DESCRIPTION	CONNECTIONS	CAPACITY	ELECTRICAL	MANUFACTURER	MODEL	NOTES
ARV-1	3	AIR RELIEF VALVE ASSEMBLY	2"	-	N/A	CRISPIN	AL-20	
BFP-1	3	BACKFLOW PREVENTER	3/4"	12 GPM @ 7.5 FPS	N/A	WATTS	LF009QTS	LEAD FREE, PROVIDE WITH MANUFACTURER'S STANDARD AIR GAP FITTING
HB-1	4	HOSE BIBB	3/4"	-	N/A	ZURN	195 SERIES	
P-1	1	SUMP PUMP - 25W	1-1/2"	30 GPM @ 10 FT TDH	115 / 1 / 60	ZOELLER	SERIES 59	0.33 HP
P-2	1	SUMP PUMP - 21W	1-1/2"	30 GPM @ 10 FT TDH	115 / 1 / 60	ZOELLER	SERIES 59	0.33 HP, SEE NOTE 1
P-3	1	SUMP PUMP - 741	1-1/2"	30 GPM @ 10 FT TDH	115 / 1 / 60	ZOELLER	SERIES 59	0.33 HP, SEE NOTE 1
PRV-1	1	PRESSURE REDUCING VALVE	1"	60 CFH @ 7" WG	N/A	N/A	N/A	FOR BUILDING 25W HEATING SYSTEM
SUMP-1	4	DRAINAGE SUMP BASIN	3"	36"x36" / 150 GAL	N/A	TOPP INDUSTRIES	B5100RT	PROVIDE WITH SOLID COVER, SEE NOTES 2, 5
TD-1	1	TRENCH DRAIN	3"	-	N/A	ZURN	Z886	6" WIDE TRENCH WITH 3" DISCHARGE CONNECTION TO SUMP, SEE NOTE 4
TD-2	1	TRENCH DRAIN	3"	-	N/A	ZURN	Z886	6" WIDE TRENCH WITH 3" DISCHARGE CONNECTION TO SUMP, SEE NOTE 4
TD-3	1	TRENCH DRAIN	3"	-	N/A	ZURN	Z886	6" WIDE TRENCH WITH 3" DISCHARGE CONNECTION TO SUMP, SEE NOTES 1, 4
TD-4	1	TRENCH DRAIN	3"	-	N/A	ZURN	Z886	6" WIDE TRENCH WITH 3" DISCHARGE CONNECTION TO SUMP, SEE NOTES 1, 4

NOTES:
1. THIS ITEM IS PART OF BID ALTERNATE NO. 5
2. TWO (2) OF THE SUMP-1 ITEMS ARE PART OF BID ALTERNATE NO. 5
3. PROVIDE HOSE RACK AND 100 FT OF HEAVY DUTY GARDEN HOSE AT EACH HOSE BIBB. PROVIDE VACUUM RELIEF FITTINGS FOR ALL HOSE BIBBS.
4. TRENCH DRAIN MATERIALS: TRENCH = HDPE, GRATING = GALVANIZED DUCTILE IRON BAR GRATE, CLASS C RATING.
5. SUMP MATERIAL: SUMP BASIN = POLYETHYLENE, COVER = GALVANIZED OR STAINLESS STEEL.

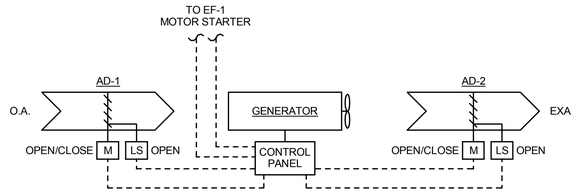




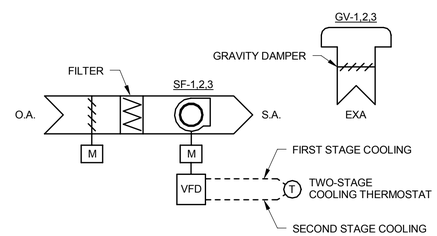
EXHAUST FAN CONTROL DIAGRAM (EF-1)



HEATING VENTILATING & COOLING UNIT CONTROL DIAGRAM (HVAC-1)



GENERATOR VENTILATION CONTROL DIAGRAM



SUPPLY FAN CONTROL DIAGRAM (SF-1,2,3)

RUN CONDITIONS - CONTINUOUS:
THE UNIT SHALL RUN CONTINUOUSLY AND SHALL MAINTAIN:
- A 80°F (ADJ.) COOLING SETPOINT
- A 60°F (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- DUCT SMOKE DETECTOR
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.)
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LOWER THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.)

ZONE SETPOINT ADJUST:
THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SMOKE DETECTOR STATUS.

SUPPLY FAN:
THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING,T HE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

COOLING - 1 COMPRESSOR STAGE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND CYCLE THE COMPRESSOR TO MAINTAIN ITS SETPOINT. TO PREVENT SHORT CYCLING, THE STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. THE COMPRESSOR SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

THE COOLING SHALL BE ENABLED WHENEVER:
- ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.

ELECTRIC HEATING STAGE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE HEATING TO MAINTAIN ITS HEATING SETPOINT. TO PREVENT SHORT CYCLING, THE STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

THE HEATING SHALL BE ENABLED WHENEVER:
- ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.

FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

DISCHARGE AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FAN FAILURE

WATER DETECTION SWITCH:
- THE CONTROLLER SHALL MONITOR THE WATER LEVEL SENSOR IN THE SECONDARY OVERFLOW PAN.
- ON DETECTION OF WATER, THE COOLING STAGE SHALL BE DE-ENERGIZED AND SUPPLY FAN SHALL SHUT DOWN.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- WATER DETECTION

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

STATE OF MICHIGAN
WILLIAM S. KRAMER
ENGINEER
No. 45628
LICENSED PROFESSIONAL ENGINEER
4/14/2016

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE
MECHANICAL SEQUENCE OF OPERATION

Project No.:	200-31537-15005
Designed By:	W. KRAMER
Drawn By:	S. ULREY
Checked By:	M. GRAF

M-601

Bar Measures 1 inch

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HEATING, VENTILATING, AND COOLING UNIT (HVAC)

MARK	LOCATION	MAX AIR FLOW (CFM)	MIN AIR FLOW (CFM)	EXT. S.P. (IN. WG)	CLEAN FILTER (IN. WG)	DIRTY FILTER (IN. WG)	FAN MOTOR HP	COOLING			VOLTS / PH / HZ	MANUFACTURER	MODEL	NOTES
								TOTAL CAPACITY (MBH)	SENS. CAPACITY (MBH)	E.A.T. DB/WB (°F)				
HVAC-1	BLDG 25W MCC ROOM	1,250	1,000	0.125	0.3	1.0	0.5	31.9	31.0	80 / 85	208 / 3 / 60	LIEBERT	MMD36E7Y0SDB	SEE NOTES

NOTES:
1. PROVIDE WITH MANUFACTURER'S STANDARD RETURN FILTER BOX.
2. PROVIDE WITH OPTIONAL SCR REHEAT AND SMOKE SENSOR.

AIR COOLED CONDENSING UNIT SCHEDULE (ACCU)

MARK	TONS	AIR FLOW (CFM)	MCA (A)	MOP (A)	FLA (A)	VOLTS / PH / HZ	PIPE CONNECTION (IN)	COMPRESSOR TYPE	REFRIGERANT TYPE	MANUFACTURER	MODEL	NOTES
ACCU-1	3.0	1,430	18.7	30	15.7	208 / 3 / 60	7/8" SUCTION 1/2" LIQUID	SCROLL	R-407C	LIEBERT	MCD36ALYH7	SEE NOTES

NOTES:
1. CONDENSING UNIT PAIRED WITH HVAC-1.

FAN SCHEDULE

MARK	LOCATION	AIR FLOW (CFM)	E.S.P. (IN WG)	FAN RPM	HP	VOLTS / PH / HZ	TYPE	DRIVE	DAMPER TYPE	SERVICE	MANUFACTURER	MODEL	NOTES
EF-1	BLDG 25W GENERATOR ROOM	2,000	0.25	1300	0.5	208 / 1 / 60	SIDEWALL - CENTRIFUGAL	DIRECT	BACKDRAFT	EXHAUST	GREENHECK	CW-141-VG	
SF-1	BLDG 25W PUMP ROOM	6,000 / 3,000	0.35	1750	2.0	460 / 3 / 60	SIDEWALL - PROPELLER	DIRECT	ELECTRIC	SUPPLY	GREENHECK	SCS3-24-407-A5	SEE NOTES 1, 2, 3, 4, 5
SF-2	BLDG 21W	10,000 / 4,000	0.35	1750	3.0	460 / 3 / 60	SIDEWALL - PROPELLER	DIRECT	ELECTRIC	SUPPLY	GREENHECK	SCS3-48-614-C30	SEE NOTES 1, 2, 3, 4, 5
SF-3	BLDG 741	10,000 / 4,000	0.35	1750	3.0	460 / 3 / 60	SIDEWALL - PROPELLER	DIRECT	ELECTRIC	SUPPLY	GREENHECK	SCS3-48-614-C30	SEE NOTES 1, 2, 3, 4, 5

NOTES:
1. PROVIDE WITH MANUFACTURER'S WALL HOUSING, EXTERIOR FLUSHED MOUNTED, WITH 2" ALUMINUM FILTERS AND GUARD, AND 90 DEGREE WEATHER HOOD WITH INSECT SCREEN.
2. PROVIDE WITH 2-WAY DIFFUSER AND GUARD.
3. PROVIDE WITH VFD FOR TWO-SPEED CONTROL USING DIGITAL INPUTS
4. PROVIDE WITH HEAVY DUTY COMMERCIAL GRADE COTTONWOOD FILTER, "AIR SOLUTION COMPANY" OR EQUAL, TO BE INSTALLED ON EXTERIOR OF INTAKE. SEE SPECIFICATION 10200 "ALUMINUM LOUVERS AND VENTS" ARTICLE "COTTONWOOD FILTERS".
5. PROVIDE WITH MOTORIZED DAMPER.

GRAVITY VENTILATOR (GV)

MARK	LOCATION	TYPE	AIR FLOW (CFM)	SIZE	THROAT AREA (SQ FT)	VELOCITY (FPM)	AIR PRESSURE DROP (IN WG)	MOUNTING	MATERIAL	MANUFACTURER	MODEL	NOTES
GV-1	BLDG 25W PUMP ROOM	HOODED GRAVITY RELIEF	6,000	48" x 48"	16.0	375	0.034	ROOF CURB	ALUMINUM	GREENHECK	FGR	SEE NOTE 1
GV-2	BLDG 21W	HOODED GRAVITY RELIEF	10,000	48" x 48"	16.0	625	0.094	ROOF CURB	ALUMINUM	GREENHECK	FGR	SEE NOTE 1
GV-3	BLDG 741	HOODED GRAVITY RELIEF	10,000	48" x 48"	16.0	625	0.094	ROOF CURB	ALUMINUM	GREENHECK	FGR	SEE NOTE 1

NOTES:
1. PROVIDE WITH GRAVITY BACKDRAFT DAMPER - GREENHECK: WD-100-PB

LOUVER SCHEDULE (LV)

MARK	LOCATION	TYPE	AIR FLOW (CFM)	SIZE W X H (IN)	FREE AREA (SQ FT)	VELOCITY (FPM)	AIR PRESSURE DROP (IN WG)	MOUNTING	FRAME	FINISH	MATERIAL	MANUFACTURER	MODEL	NOTES
LV-1	BLDG 25W GENERATOR ROOM	STATIONARY EXTRUDED - INTAKE	36,350	96" x 120"	46.1	<800	0.05	WALL	ALUMINUM	MILL	ALUMINUM	GREENHECK	ESD-403	SEE NOTE 1, 2
LV-2	BLDG 25W GENERATOR ROOM	STATIONARY EXTRUDED - EXHAUST	35,125	96" x 96"	36.0	<1000	0.08	WALL	ALUMINUM	MILL	ALUMINUM	GREENHECK	ESD-403	SEE NOTE 1
LV-3	BLDG 25W GENERATOR ROOM	STATIONARY EXTRUDED - INTAKE	36,350	96" x 120"	46.1	<800	0.05	WALL	ALUMINUM	MILL	ALUMINUM	GREENHECK	ESD-403	SEE NOTE 1, 2
LV-4	BLDG 25W GENERATOR ROOM	STATIONARY EXTRUDED - EXHAUST	35,125	96" x 96"	36.0	<1000	0.08	WALL	ALUMINUM	MILL	ALUMINUM	GREENHECK	ESD-403	SEE NOTE 1
LV-5	BLDG 25W PUMP ROOM	STATIONARY EXTRUDED - INTAKE	1,430	36" x 24"	2.8	<525	0.05	WALL	ALUMINUM	MILL	ALUMINUM	GREENHECK	ESD-403	SEE NOTE 1, 2
LV-6	BLDG 25W PUMP ROOM	STATIONARY EXTRUDED - EXHAUST	1,430	24" x 24'	1.9	<750	0.08	WALL	ALUMINUM	MILL	ALUMINUM	GREENHECK	ESD-403	SEE NOTE 1

NOTES:
1. PROVIDE WITH ALUMINUM INSECT SCREEN
2. PROVIDE WITH HEAVY DUTY COMMERCIAL GRADE COTTONWOOD FILTER, "AIR SOLUTION COMPANY" OR EQUAL TO BE INSTALLED ON EXTERIOR OF LOUVER. SEE SPECIFICATION 10200 "ALUMINUM LOUVERS AND VENTS" ARTICLE "COTTONWOOD FILTERS".

DAMPER SCHEDULE (AD)

MARK	LOCATION	CFM	NOMINAL SIZE (W x H)	DESCRIPTION	MATERIAL	OPERATOR (VOLTS)	OPERATOR QUANTITY	TYPE	FAIL POSITION	MANUFACTURER	MODEL	NOTES
AD-1	BLDG 25W GENERATOR ROOM	36,350	96" x 120"	INSULATED CONTROL DAMPER	ALULMINUM	120	4	INTAKE	OPEN	GREENHECK	ICD-44	
AD-2	BLDG 25W GENERATOR ROOM	35,125	96" x 96"	INSULATED CONTROL DAMPER	ALUMINUM	120	4	EXHAUST	OPEN	GREENHECK	ICD-44	
AD-3	BLDG 25W GENERATOR ROOM	36,350	96" x 120"	INSULATED CONTROL DAMPER	ALUMINUM	120	4	INTAKE	OPEN	GREENHECK	ICD-44	SEE NOTE 1
AD-4	BLDG 25W GENERATOR ROOM	35,125	96" x 96"	INSULATED CONTROL DAMPER	ALUMINUM	120	4	EXHAUST	OPEN	GREENHECK	ICD-44	SEE NOTE 1

NOTES:
1. REVERSE THE ACTUATOR SO DAMPER IS FAILED CLOSED UNTIL FUTURE GENERATOR IS INSTALLED.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

MARK	DESCRIPTION	PANEL SIZE (IN)	NECK (IN)	AIR FLOW (CFM)	DEFLECTION (DEGREES)	STYLE	FINISH	MATERIAL	MAX NC	MANUFACTURER	MODEL	NOTES
SAG-1	SUPPLY AIR GRILLE	20" x 20"	-	1,250	DOUBLE - 45	LOUVERED FACE SUPPLY	WHITE	ALUMINUM	30	TITUS	300FS	

RADIANT HEATER SCHEDULE (RH)

MARK	LOCATION	GAS	MAX. HEATING CAPACITY (MBH)	MIN. HEATING CAPACITY (MBH)	SIZE L x W (IN)	MOUNTING ANGLE (°F)	COMBUSTION CHAMBER MATERIAL	RADIANT TUBE MATERIAL	ELECTRICAL	WEIGHT (LBS)	MANUFACTURER	MODEL	NOTES
RH-1	BLDG 25W PUMP ROOM	NATURAL	30	30	168" x 18"	0	BLACK COATED TITANIUM TREATED STEEL	BLACK COATED ALUMINIZED STEEL	120 / 1 / 60 4.8A	70	RE-VERBER-RAY	LS3-10-30	PROVIDE WITH MANUFACTURER'S SIDWALL VENT PACKAGE
RH-2	BLDG 25W GENERATOR ROOM	NATURAL	30	30	168" x 18"	0	BLACK COATED TITANIUM TREATED STEEL	BLACK COATED ALUMINIZED STEEL	120 / 1 / 60 4.8A	70	RE-VERBER-RAY	LS3-10-30	PROVIDE WITH MANUFACTURER'S SIDWALL VENT PACKAGE
RH-3	BLDG 21W	NATURAL	30	30	168" x 18"	0	BLACK COATED TITANIUM TREATED STEEL	BLACK COATED ALUMINIZED STEEL	120 / 1 / 60 4.8A	70	RE-VERBER-RAY	LS3-10-30	PROVIDE WITH MANUFACTURER'S SIDWALL VENT PACKAGE
RH-4	BLDG 741	NATURAL	30	30	168" x 18"	0	BLACK COATED TITANIUM TREATED STEEL	BLACK COATED ALUMINIZED STEEL	120 / 1 / 60 4.8A	70	RE-VERBER-RAY	LS3-10-30	PROVIDE WITH MANUFACTURER'S SIDWALL VENT PACKAGE

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel:Tel 734-665-6000 Fax: fax 734-213-3003

STATE OF MICHIGAN
WILLIAM S. KRAMER
ENGINEER
No. 45628
LICENSED PROFESSIONAL ENGINEER
4/14/2016

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACE

MECHANICAL SCHEDULES

Project No.: 200-31537-15005
Designed By: W. KRAMER
Drawn By: S. ULREY
Checked By: M. GRAF

M-602

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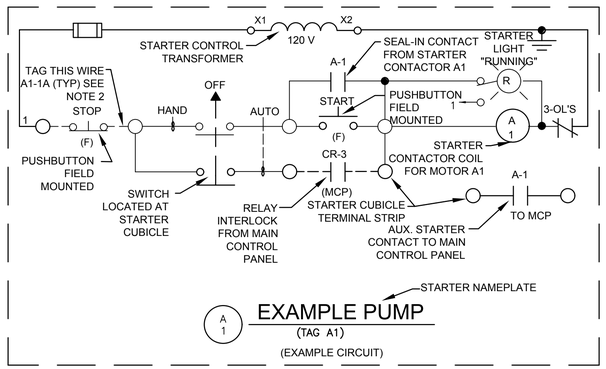
Bar Measures 1 inch

BACKGROUND PLAN AND ONE LINE SYMBOLS

SYMBOL	DESCRIPTION
	CONTROL SWITCH (SEL. OR P.B.) SEE CIRCUITS FOR SPECIFIC TYPE
F FL	SEE CIRCUITS FOR SPECIFIC TYPE FLOAT SWITCH - FLOW SWITCH
T M	TEMPERATURE - HUMIDISTAT SWITCH (SUBSCRIPT = NO. OF STAGES)
L P V	LIMIT - PRESSURE - VACUUM SWITCH
ALT	ELECTRICAL OR MECHANICAL ALTERNATOR (SEE WIRING)
OS	OVERLOAD SWITCH OR DEVICE
TB	TERMINAL BOX
	SOLENOID VALVE
PC	PHOTOCELL LINE VOLTAGE
IM	ITEM NO. INTERCOM EQUIPMENT
A WS LB	INTERCOMMUNICATION SYSTEM AMPLIFIER - WALL STATION - LINE BALANCE
DS	INTERCOMMUNICATION DESK SET
	INTERCOM. SPEAKER (CEILING LAY-IN)
	TELEPHONE OUTLET OR JUNCTION BOX
	WELDING RECEPTACLE - NEMA L9-50R 600V, 2P, 3W, SIMPLEX
HS	INTERCOM HANDSET - SURFACE MOUNTED WITH REMOTE SPEAKER AMPLIFIER
VC	INTERCOM VOLUME CONTROL
	INTERCOM SPEAKER - SURFACE MOUNTED
HS	INTERCOM HANDSET - FLUSH MOUNTED WITH REMOTE SPEAKER AMPLIFIER
	AS NOTED (LIGHTING PANEL, CONTROL PANEL, DISTRIBUTION PANEL ETC.) WALL MOUNTED
JB	JUNCTION BOX
	HEATER
	TRANSFORMER
	CONDUIT WITH CONDUIT SEAL FITTING
	CONDUIT EXPOSED
	CONDUIT CONCEALED
E	DIRECT BURIED CONDUIT
UG	DIRECT BURIED CABLE
OH	OVERHEAD LINE
DB	UNDERGROUND DUCT BANK
1 2 3 4 5 6	CONCRETE ENCASED DUCT BANK, WITH CABLE LOCATIONS AND SPARE DUCTS AS INDICATED ON DRAWINGS
1	DUCT BANK CONDUIT WITH 2-4" 3-CELL MAXCELL FABRIC INNERDUCT
	CABLE REEL
CH	COMMUNICATION HANDHOLE
EH	ELECTRICAL HANDHOLE
	DEMOLISH

SYMBOL	DESCRIPTION
	LOW VOLTAGE DISCONNECT SWITCH
	LOW VOLTAGE FUSE (BELOW 600V)
1 RV 2 FVR 3 2S,2W	ALL STARTERS SHALL BE FULL VOLTAGE NON-REVERSING UNLESS OTHERWISE INDICATED (FVR) FULL VOLTAGE REVERSING (RV) REDUCED VOLTAGE (2S,2W) TWO SPEED, TWO WINDING
	600V, 3 POLE MOLDED CASE CIRCUIT BREAKER, FRAME & RATING AS SHOWN
1/2 A–3	SINGLE PHASE, FRACTIONAL HP MOTOR TO LOCATION INDICATED (SEE GEN. NOTE 4)
A 1	THREE PHASE LOAD WITH IDENTIFICATION
	HIGH VOLTAGE FUSE (ABOVE 600 V)
FT 10	TAG NO. (BALLOON) FOR DEVICE INDICATED
A–3 FT 10 MCP OR CP–1	FOR POWER (SEE GEN. NOTE 4) 3/4"C(2/C#18 SHLD.)CONDUIT AND WIRE RUN FROM DEVICE INDICATED TO LOCATION INDICATED
	CAPACITOR, 3 PHASE, SIZE AS INDICATED
F C	DISCONNECT SWITCH (F) = FUSED (C) = CIRCUIT BREAKER, POLE QUANTITY, RATING AND FUSING AS INDICATED
	MAGNETIC STARTER (BACKGROUND DRAWINGS ONLY)
SIZE 2	COMBINATION MAGNETIC STARTER FUSED UNLESS NOTED (CIRCUIT BREAKER)
LC	COMBINATION LIGHTING CONTACTOR WITH HAND-OFF-AUTO SWITCH
R	MANUAL STARTER (R) = REVERSING
CP	CONTROL PANEL
TCP	TEMPERATURE CONTROL PANEL
1/8 UH–19	UNIT HEATER, 1/8 HORSEPOWER
BUS DUCT	600 VOLT FEEDER BUS DUCT (AMPERAGE AS INDICATED)
	LIGHTNING ARRESTOR
A–3	LOW VOLTAGE HOME RUNS 120/208 V 120/240 V (SEE GEN. NOTE 4)
NEMA 4	WATERTIGHT
NEMA 4X	WATERTIGHT AND CORROSION PROOF
NEMA 7	EXPLOSION PROOF - CLASS I, DIVISION I, GROUP D
NEMA 9	EXPLOSION PROOF - CLASS II, DIVISION 1
K	KEYLOCK
SD	SMOKE DETECTOR
	FLUORESCENT FIXTURE
	INCANDESCENT FIXTURE
	HIGH INTENSITY DISCHARGE FIXTURE
	EXIT LIGHT
EM EXIT	EMERGENCY BATTERY PACK/EXIT
	DATA JACK
	GROUND FRAME TO REBAR
	AIR TERMINAL / GROUND ROD

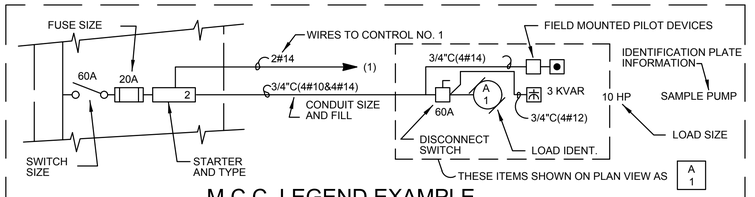


CONTROL CIRCUIT & PILOT DEVICE LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	PRESS. ACTUATED SWITCH	H O A	SELECTOR SWITCH OPERATOR WITH FUNCTION SHOWN
	FLOAT ACTUATED SWITCH		MOMENTARY PUSHBUTTON OPERATOR-NORMALLY OPEN
	FLOW ACTUATED SWITCH		MOMENTARY PUSHBUTTON OPERATOR-NORMALLY CLOSED
	TEMP. ACTUATED SWITCH		PUSHBUTTON OPERATOR WITH MUSHROOM HEAD
	LIMIT SWITCH-NORMALLY OPEN	(F)	FIELD LOCATED STOP BUTTON
	LIMIT SWITCH-NORMALLY CLOSED		MAINTAINED PUSH-PULL OPERATOR
	LIMIT SWITCH-NORMALLY CLOSED-HELD OPEN		MAINTAINED STOP-START PUSHBUTTON OPERATOR
	LIMIT SWITCH-NORMALLY OPEN-HELD CLOSED		
	LATCHING CABLE SWITCH		
	TIME-DELAY FUSE		SOLENOID OR CLUTCH
CR	CONTROL RELAY COIL	R 1	PUSH-TO-TEST INDICATING LIGHT
	CONTROL RELAY CONTACT-NORMALLY OPEN		MAINTAINED STOP-MOMENTARY START PUSHBUTTON (JOG)
	CONTROL RELAY CONTACT-NORMALLY CLOSED		
CR L CR U	TWO COIL LATCHING RELAY		ZERO SPEED OR ANTI-PLUGGING SWITCH
			LOCAL TERMINALS WITH EXTERNAL WIRING
T	TIMING RELAY COIL	ETI	ELAPSED TIME INDICATOR
	TIMED CLOSED CONTACT ON ENERGIZATION	INST.	TIMING RELAY INSTANTANEOUS CONTACTS
	TIMED OPEN CONTACT ON ENERGIZATION	INST.	
	TIMED OPEN CONTACT ON DE-ENERGIZATION		
	TIMED CLOSED CONTACT ON DE-ENERGIZATION		
X1 X2	120 VAC TRANSFORMER		

GENERAL NOTES:

1. THE FOLLOWING COMPONENT IDENTIFICATION SHALL BE USED AS APPROPRIATE:
   - 1.1. (F) FIELD MOUNTED NOT AT STARTER OR OTHER CONTROL PANELS.
   - 1.2. (S) STARTER PANEL MOUNTED.
   - 1.3. (TCP) AT TEMPERATURE CONTROL PANEL.
   - 1.4. (MCP) AT MAIN CONTROL PANEL.
2. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN LIGHT LINE WEIGHTS ON THE DRAWINGS ARE EXISTING ITEMS TO REMAIN. ELECTRICAL MATERIALS AND EQUIPMENT ITEMS SHOWN IN HEAVY LINE WEIGHTS ARE NEW TO THIS CONTRACT.
3. ITEMS SHOWN IN CROSSHATCH ON THE DRAWINGS ARE EXISTING ITEMS TO BE REMOVED.
4. FOR ITEMS INDICATED AS 'FIELD LOCATE' CHECK DRAWINGS OF OTHER TRADES (IN PARTICULAR PIPING AND STRUCTURAL) FOR INTERFERENCES AND FOR LOCATIONS OF MOUNTING FLANGES, CONNECTION POINTS, ETC.
5. INSTALL A SINGLE CONDUCTOR INSULATED (RHW, THHN OR XHHW) COPPER GROUND WIRE IN EACH CONDUIT, SIZE AS SHOWN ON DRAWINGS OR AS A MINIMUM PER THE NATIONAL ELECTRICAL CODE. THIS GROUND WIRE SHALL BE CONNECTED AT EACH END TO THE EQUIPMENT GROUND. CONDUIT SHALL BE 3/4" MIN.
6. WIRE NUMBERS (1,3 & 5) ETC. SHALL BE PREFIXED WITH STARTER TAG NUMBERS. THE WIRE NUMBER AFTER THE PREFIX, MAY BE THE MANUFACTURERS WIRE NUMBERING SYSTEM. WIRE MARKERS MAY BE USED AT EACH WIRE TERMINATION POINT.
7. PROVIDE SIGNAGE/PLACARD/TAGS AS INDICATED ON THE DRAWINGS DETAILS.
8. OUTSIDE EQUIPMENT MUST BE RATED FOR -40 TO 150 DEG F.
9. CONDUIT FILL MUST MEET NFPA REQUIREMENTS. (WHERE NFPA IS SILENT CONDUIT FILL MUST NOT EXCEED 40%)
   - 9.1. INSTRUMENT SIGNAL CONDUIT: SHIELDED SIGNAL WIRES FOR 4-20 MA TYPE INSTRUMENTS OR THERMOCOUPLE WIRES ASSIGNED TO THE SAME CONTROL PANEL MAY BE RUN IN THE SAME CONDUIT. NO OTHER WIRES WILL BE PERMITTED IN AN INSTRUMENT SIGNAL/2-WIRE CONDUIT.
   - 9.2. CONTROL CIRCUIT CONDUIT (120VAC). 120VAC CONTROL CIRCUIT WIRES USED FOR DISCRETE PLC INPUT OR MCC CONTROL ASSIGNED TO THE SAME CONTROL PANEL/MCC MAY BE RUN IN THE SAME CONDUIT. NO OTHER WIRES WILL BE PERMITTED IN THE CONTROL CIRCUIT CONDUIT.
   - 9.3. CONTROL CIRCUIT CONDUIT (24VDC). 24VDC CONTROL CIRCUIT WIRES USED FOR DISCRETE PLC INPUT OR MCC CONTROL ASSIGNED TO THE SAME CONTROL PANEL/MCC MAY BE RUN IN THE SAME CONDUIT. NO OTHER WIRES WILL BE PERMITTED IN THE CONTROL CIRCUIT CONDUIT.
   - 9.4. COMMUNICATION CONDUIT (ETHERNET). COMMUNICATION WIRE USED FOR ETHERNET, FIBER OPTIC, OR MODBUS MAY BE RUN IN THE SAME CONDUIT. NO OTHER WIRES WILL BE PERMITTED IN THE COMMUNICATION CONDUIT (ETHERNET).
   - 9.5. COMMUNICATION CONDUIT (FIELD BUS). FIELD BUS WIRE USED FOR CONTROLNET OR DEVICENET MAY BE RUN IN THE SAME CONDUIT. NO OTHER WIRES WILL BE PERMITTED IN THE COMMUNICATION CONDUIT (FIELD BUS).
10. EQUIPMENT SHOWN INSIDE SHALL BE RATED NEMA 12 AND EQUIPMENT SHOWN OUTSIDE SHALL BE RATED NEMA 4X, UNLESS OTHERWISE INDICATED.
11. MINIMUM CONTROL WIRE SIZE SHALL BE EITHER #14 AWG OR 2/C#18SH AND MINIMUM POWER WIRE SIZE SHALL BE #12 AWG.
12. MINIMUM CONDUIT SIZE SHALL BE 3/4".



M.C.C. LEGEND EXAMPLE

ABBREVIATIONS:

A	AMPERE(S)	HOA	HAND-OFF-AUTO	SCHED	SCHEDULE
A/C	AIR CONDITIONING	HORIZ	HORIZONTAL	SEL	SELECTOR
AI	ANALOG INPUT	HP	HORSEPOWER	SH	SHIELDED
ALT	ALTERNATE	HTR	HEATER	SKD	SKID
AO	ANALOG OUTPUT	HZ	HERTZ	SS	STAINLESS STEEL
ASB	ALARM SILENCE BUTTON			STA	STATION
AWG	AMERICAN WIRE GAUGE	I/O	INPUT/OUTPUT	SPD	SURGE PROTECTION DEVICE
C	CONDUIT	M	MOTOR	T	THERMOSTAT
CAT	CATEGORY	MA	MILLIAMP	TNK	TANK
CB	CIRCUIT BREAKER	MB	MAIN BREAKER	TRN	TRAIN
CLAR	CLARIFIER	MCB	MAIN CIRCUIT BREAKER	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
CP	CONTROL PANEL	MCC	MOTOR CONTROL CENTER		
CR	CONTROL RELAY	MCP	MAIN CONTROL PANEL	TYP.	TYPICAL
CSF	CARBON STORAGE & FEED	MIN	MINIMUM		
		MLO	MAIN LUG ONLY	UPS	UNINTERRUPTIBLE POWER SUPPLY
DB	DUCTBANK	MS	MOTOR STARTER		
DI	DISCRETE INPUT	MTR	MASTER		
DO	DISSOLVED OXYGEN			V	VOLTAGE
		N	NEUTRAL	VAC	VOLTAGE ALTERNATING CURRENT
EFF	EFFLUENT	NO.	NUMBER		
EM	EMERGENCY			VDC	VOLTAGE DIRECT CURRENT
ENET	ETHERNET	O.C.	ON CENTER	VERT	VERTICLE
ETI	ELAPSED TIME INDICATOR	OL	OVERLOAD	VFD	VARIABLE FREQUENCY DRIVE
		ORP	OXIDATION REDUCTION POTENTIAL		
FB	FUSE BLOCK			W	WATT / WIRE
FO	FIBER OPTIC			W/	WITH
FOC	FIBER OPTIC CONVERTER	P	POLE		
FOPP	FIBER OPTIC PATCH PANEL	PDB	POWER DISTRIBUTION BLOCK	XFMR	TRANSFORMER
FVNR	FULL VOLTAGE NON-REVERSING	P.B.	PUSHBUTTON		
		PLC	PROGRAMMABLE LOGIC CONTROLLER	Ø	PHASE
G / GND	GROUND				
GA	GAUGE	PM	PHASE MONITOR		
GAL	GALLON(S)	PVC	POLYVINYL CHLORIDE		
GALV	GALVANIZED				
GEN	GENERATOR	RAD	RADIANT		
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	RL	RUNNING LIGHT		
		RPM	ROTATIONS PER MINUTE		

WIRING DEVICE SCHEDULE

SYMBOL	DESCRIPTION	NEMA TYPE
	125V, 2P, SIMPLEX, CLOCK HANGER	1-15 R
	125V, 2P, SIMPLEX, 3W	5-20 R
	125V, 2P, DUPLEX, 3W	5-20 R
	125/250V, 3P, SIMPLEX, 3W, RANGE TYPE	10-50 R
S	20A, 120/277 V SWITCH	SPST
S 2P	20A, 120/277 V SWITCH	2PDT
S 3	20A, 120/277 V SWITCH	3 WAY
S 4	20A, 120/277 V SWITCH	4 WAY
S D	20A, 120/277 V DIMMER SWITCH	
S WP	20A, 120/277 V WEATHERPROOF SWITCH	
	250V, 2P, SIMPLEX, 3W, 50A	6-50R
	125V, 2P, MULTI-RECEPTACLE	5-15R
	250V, 2P, SIMPLEX, 3W, 20A	6-20R
	600V, 2P, 3W, SIMPLEX WELDING	L9-50R
	208V, 3P, SIMPLEX, 4W, LOCKING	L14-20R
	277V, 2P, DUPLEX, 3W	7-15R

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A. PAJSON
ENGINEER
No. 50423
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT
LEGEND

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-001

Bar Measures 1 inch

4/14/2016 1:18:07 PM - \\ERS008FS1\ PROJECTS\ER\31537\200-31537-15005\CADSHEETFILES\E-001 LEGEND.DWG - SHANK, JASON

REFER TO E-503 FOR DB DETAILS. (TYP.)

④ ③ ● ② ①

DUCTBANK SECTION A
NO SCALE — E-101

1. 4"C(PULL-STRING) UTILITY POWER, POLE TO UTILITY METER
2. 4"C(PULL-STRING) UTILITY POWER, POLE TO UTILITY METER
3. 4"C(PULL-STRING), SPARE
4. 4"C(PULL-STRING), SPARE

④ ③ ● ② ①

DUCTBANK SECTION B
NO SCALE — E-101

1. 4"C(PULL-STRING) UTILITY POWER, POLE TO UTILITY METER
2. 4"C(PULL-STRING) UTILITY POWER, POLE TO UTILITY METER
3. 4"C(PULL-STRING), SPARE
4. 4"C(PULL-STRING), SPARE

#4/0 BARE GROUND (TYP.)

⑤ ⑥ ● ⑨
⑦ ⑧ ⑩

DUCTBANK SECTION C
NO SCALE — E-101

5. 4"C(3#250KCMIL,1#3) WELL HOUSE 21 POWER, MCC-A TO IPC#1
6. 4"C(3#250KCMIL,1#3) WELL HOUSE 21 POWER, MCC-A TO IPC#1
7. 4"C(3#500KCMIL,1#3) WELL HOUSE 741 POWER, MCC-A TO IPC#2
8. 4"C(3#500KCMIL,1#3) WELL HOUSE 741 POWER, MCC-A TO IPC#2
9. 2"C(12-STRAND SM FIBER) COMMUNICATIONS, MCP TO RIO#1
10. 2"C(12-STRAND SM FIBER) COMMUNICATIONS, MCP TO RIO#2

#4/0 BARE GROUND (TYP.)

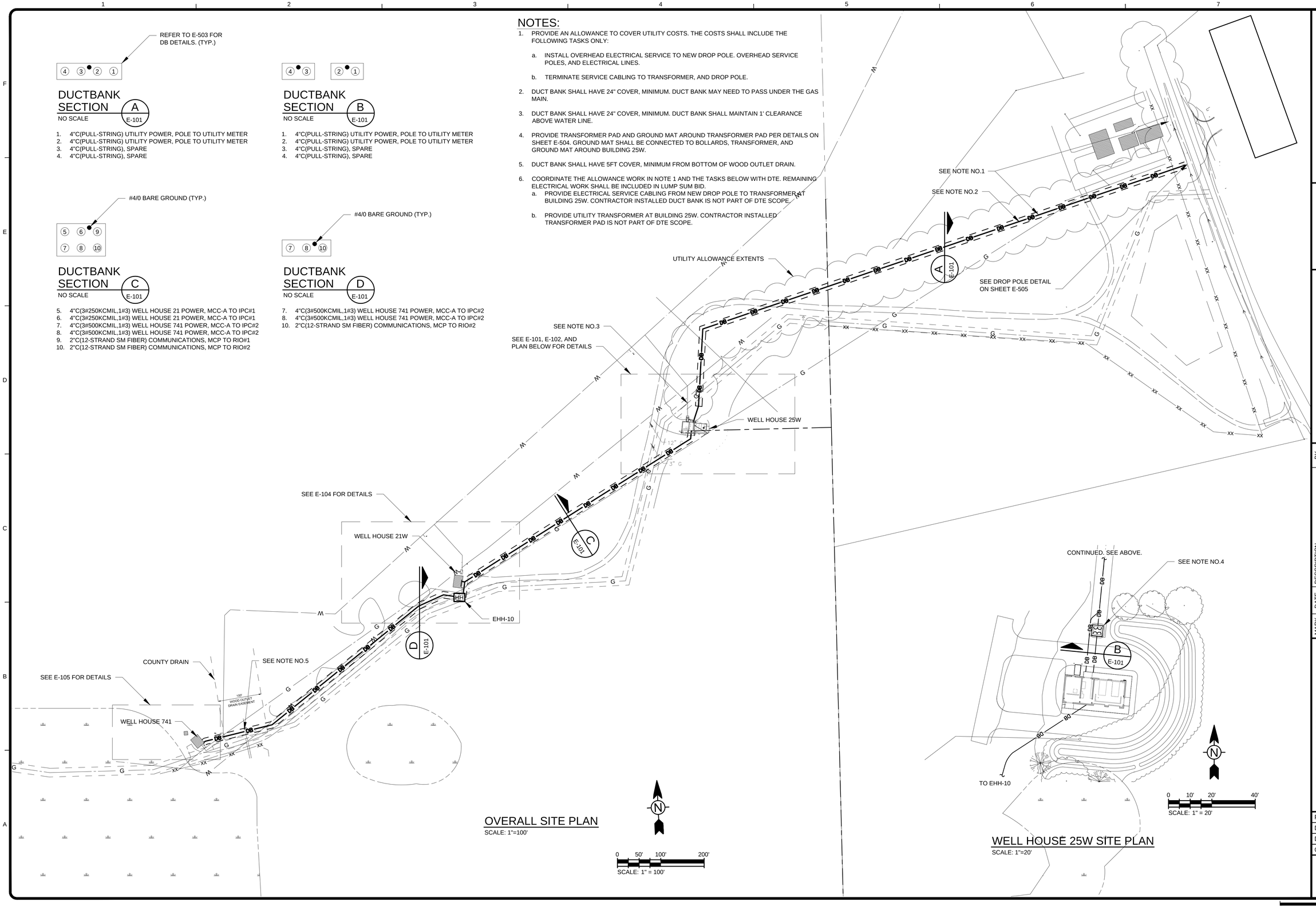
⑦ ⑧ ● ⑩

DUCTBANK SECTION D
NO SCALE — E-101

7. 4"C(3#500KCMIL,1#3) WELL HOUSE 741 POWER, MCC-A TO IPC#2
8. 4"C(3#500KCMIL,1#3) WELL HOUSE 741 POWER, MCC-A TO IPC#2
10. 2"C(12-STRAND SM FIBER) COMMUNICATIONS, MCP TO RIO#2

NOTES:

1. PROVIDE AN ALLOWANCE TO COVER UTILITY COSTS. THE COSTS SHALL INCLUDE THE FOLLOWING TASKS ONLY:
   a. INSTALL OVERHEAD ELECTRICAL SERVICE TO NEW DROP POLE. OVERHEAD SERVICE POLES, AND ELECTRICAL LINES.
   b. TERMINATE SERVICE CABLING TO TRANSFORMER, AND DROP POLE.
2. DUCT BANK SHALL HAVE 24" COVER, MINIMUM. DUCT BANK MAY NEED TO PASS UNDER THE GAS MAIN.
3. DUCT BANK SHALL HAVE 24" COVER, MINIMUM. DUCT BANK SHALL MAINTAIN 1' CLEARANCE ABOVE WATER LINE.
4. PROVIDE TRANSFORMER PAD AND GROUND MAT AROUND TRANSFORMER PAD PER DETAILS ON SHEET E-504. GROUND MAT SHALL BE CONNECTED TO BOLLARDS, TRANSFORMER, AND GROUND MAT AROUND BUILDING 25W.
5. DUCT BANK SHALL HAVE 5FT COVER, MINIMUM FROM BOTTOM OF WOOD OUTLET DRAIN.
6. COORDINATE THE ALLOWANCE WORK IN NOTE 1 AND THE TASKS BELOW WITH DTE. REMAINING ELECTRICAL WORK SHALL BE INCLUDED IN LUMP SUM BID.
   a. PROVIDE ELECTRICAL SERVICE CABLING FROM NEW DROP POLE TO TRANSFORMER AT BUILDING 25W. CONTRACTOR INSTALLED DUCT BANK IS NOT PART OF DTE SCOPE.
   b. PROVIDE UTILITY TRANSFORMER AT BUILDING 25W. CONTRACTOR INSTALLED TRANSFORMER PAD IS NOT PART OF DTE SCOPE.



OVERALL SITE PLAN
SCALE: 1"=100'

0 50' 100' 200'
SCALE: 1" = 100'

WELL HOUSE 25W SITE PLAN
SCALE: 1"=20'

0 10' 20' 40'
SCALE: 1" = 20'

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-8000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON ENGINEER No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

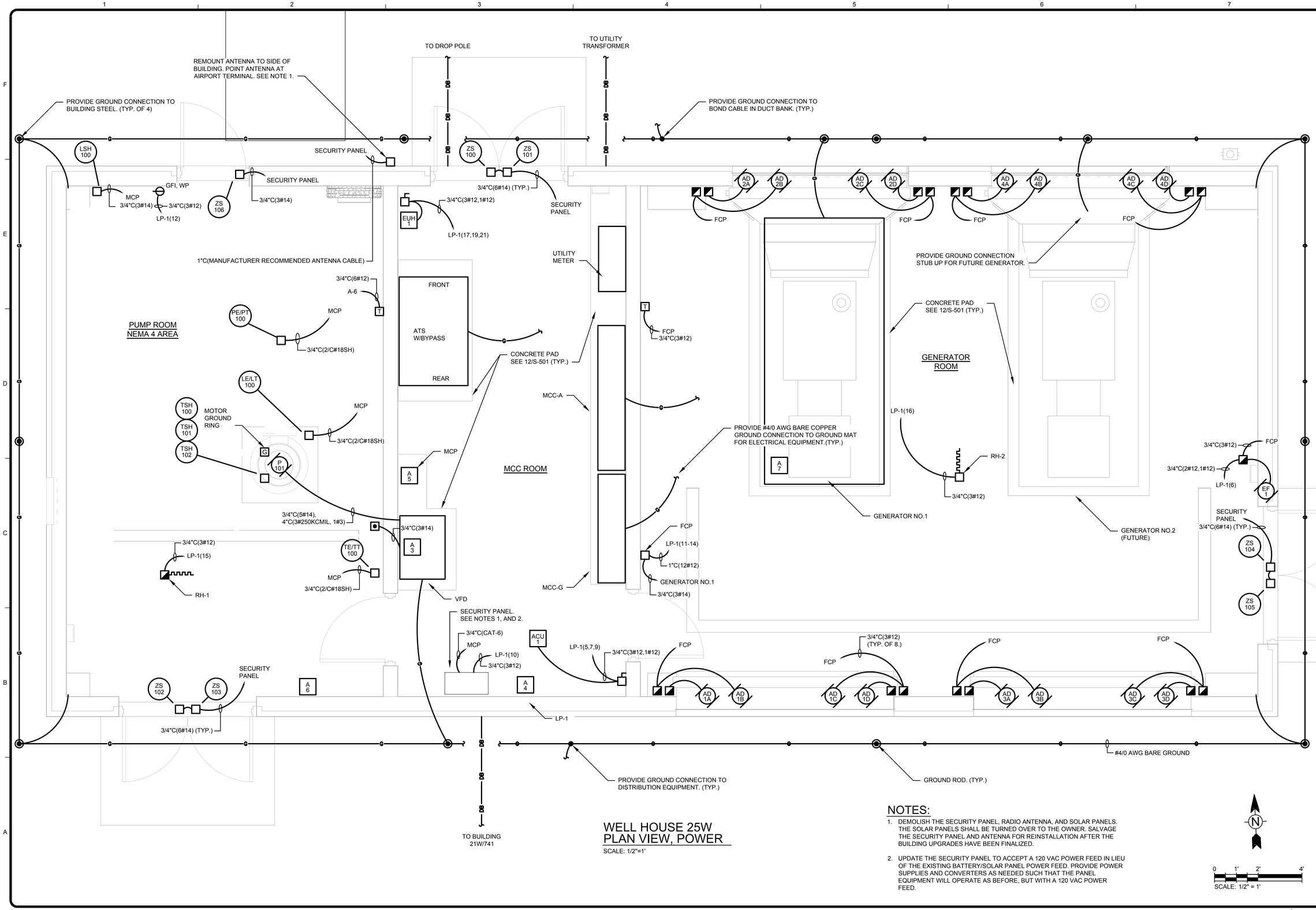
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT
SITE PLAN

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-101

Bar Measures 1 inch

4/15/2016 1:31:26 PM - \\IERSX08FS1\PROJECTS\IER\31537\200-31537-15005\CAD\SHEETFILES\E-101 SITE PLAN.DWG - PAISON, WILLIAM



WELL HOUSE 25W PLAN VIEW, POWER

SCALE: 1/2"=1'

NOTES:

1. DEMOLISH THE SECURITY PANEL, RADIO ANTENNA, AND SOLAR PANELS. THE SOLAR PANELS SHALL BE TURNED OVER TO THE OWNER. SALVAGE THE SECURITY PANEL AND ANTENNA FOR REINSTALLATION AFTER THE BUILDING UPGRADES HAVE BEEN FINALIZED.
2. UPDATE THE SECURITY PANEL TO ACCEPT A 120 VAC POWER FEED IN LIEU OF THE EXISTING BATTERY/SOLAR PANEL POWER FEED. PROVIDE POWER SUPPLIES AND CONVERTERS AS NEEDED SUCH THAT THE PANEL EQUIPMENT WILL OPERATE AS BEFORE, BUT WITH A 120 VAC POWER FEED.

0 1' 2' 4'
SCALE: 1/2" = 1'

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www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM M PAISON JR ENGINEER No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

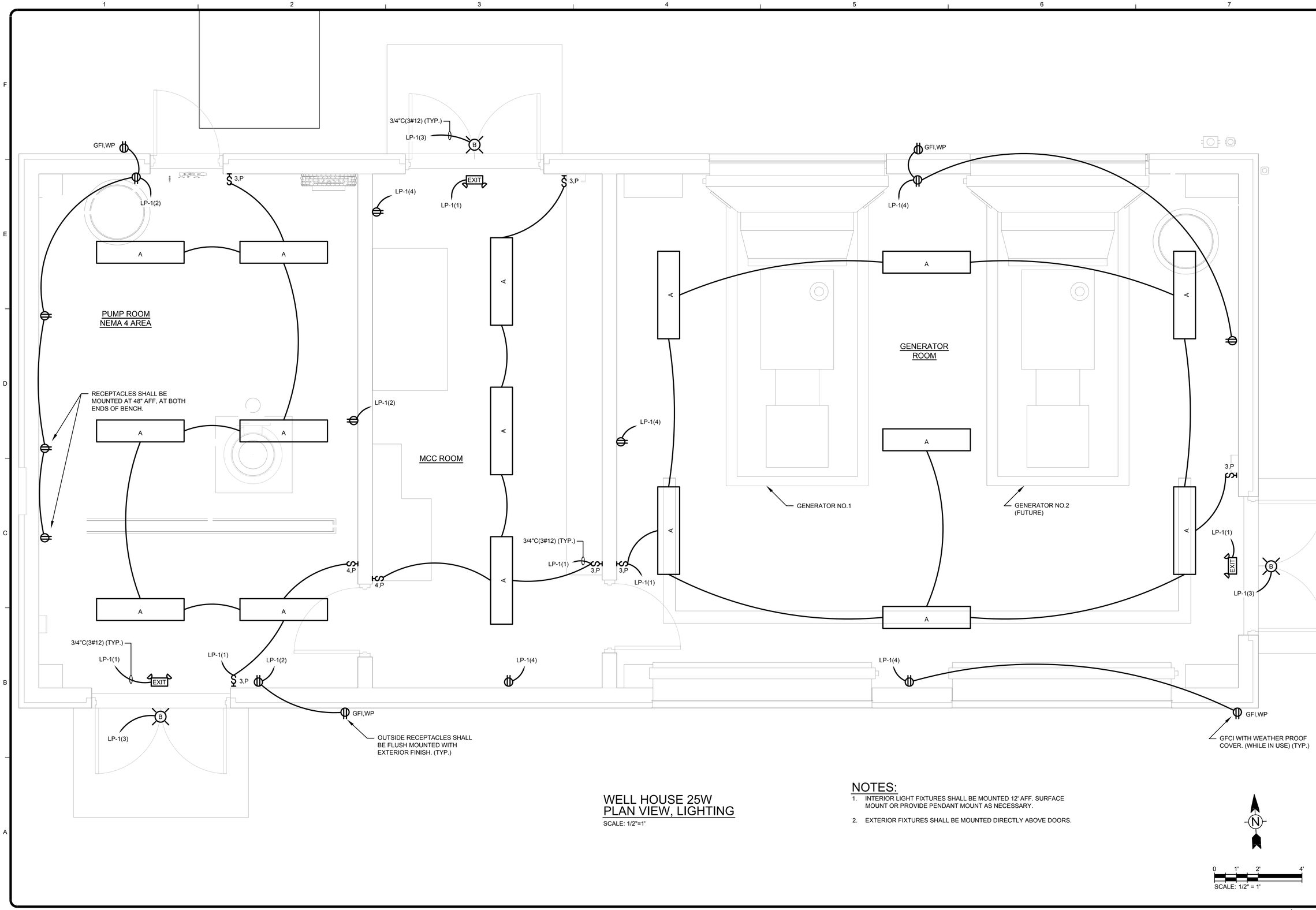
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT
WELL HOUSE 25W
PLAN VIEW, POWER

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-102

Bar Measures 1 inch

4/14/2016 2:12:49 PM - \\ERS\008FS1 :ROJECTS\IER\31537\200-31537-15005\CAD\SHEETFILES\E-102 25W PLAN VIEW POWER.DWG - SHANK, JASON



WELL HOUSE 25W
PLAN VIEW, LIGHTING

SCALE: 1/2"=1'

NOTES:

1. INTERIOR LIGHT FIXTURES SHALL BE MOUNTED 12' AFF. SURFACE MOUNT OR PROVIDE PENDANT MOUNT AS NECESSARY.
2. EXTERIOR FIXTURES SHALL BE MOUNTED DIRECTLY ABOVE DOORS.

0 1' 2' 4'
SCALE: 1/2" = 1'

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710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A. PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

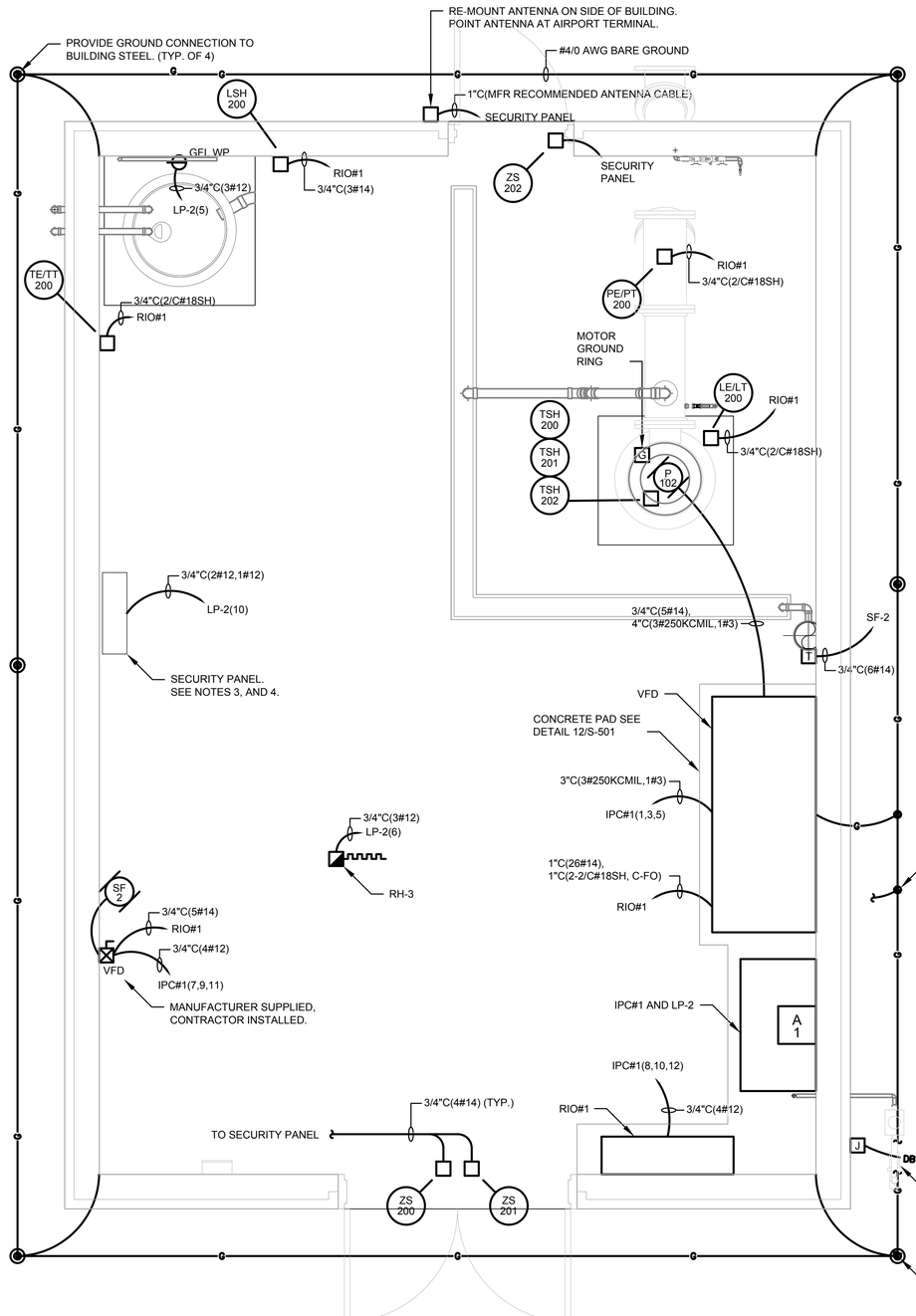
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

WELL HOUSE 25W
PLAN VIEW, LIGHTING

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

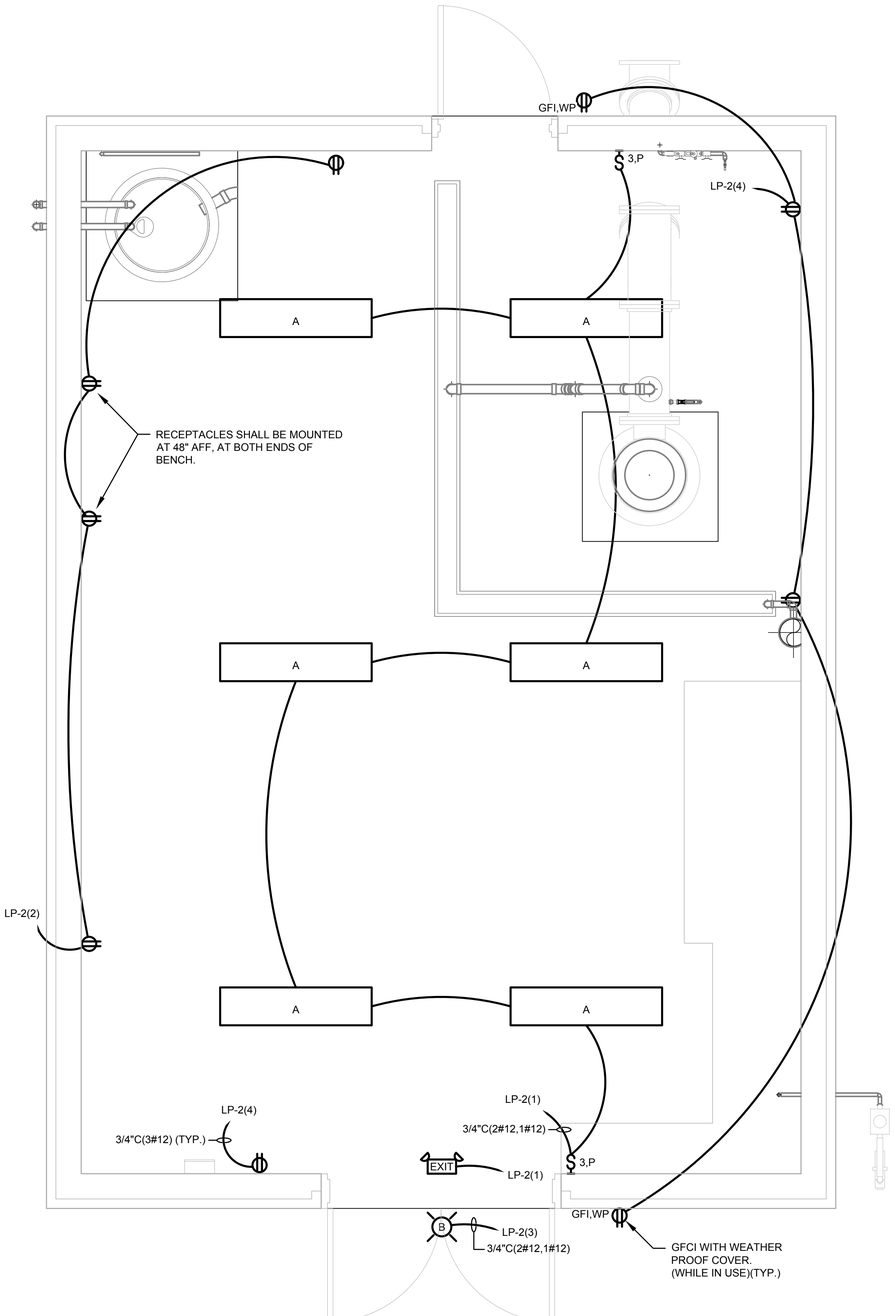
E-103

Bar Measures 1 inch



WELL HOUSE 21W PLAN VIEW, POWER

SCALE: 1/2"=1'



WELL HOUSE 21W PLAN VIEW, LIGHTING

SCALE: 1/2"=1'

NOTES:

1. INTERIOR LIGHT FIXTURES SHALL BE MOUNTED 9' AFF. SURFACE MOUNT OR PROVIDE PENDANT MOUNT AS NECESSARY.
2. EXTERIOR FIXTURES SHALL BE MOUNTED DIRECTLY ABOVE DOORS.
3. DEMOLISH THE SECURITY PANEL, RADIO ANTENNA, AND SOLAR PANELS. THE SOLAR PANELS SHALL BE TURNED OVER TO THE OWNER. SALVAGE THE SECURITY PANEL AND ANTENNA FOR REINSTALLATION AFTER THE BUILDING UPGRADES HAVE BEEN FINALIZED.
4. UPDATE THE SECURITY PANEL TO ACCEPT A 120 VAC POWER FEED IN LIEU OF THE EXISTING BATTERY/SOLAR PANEL POWER FEED. PROVIDE POWER SUPPLIES AND CONVERTERS AS NEEDED SUCH THAT THE PANEL EQUIPMENT WILL OPERATE AS BEFORE, BUT WITH A 120 VAC POWER FEED.

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

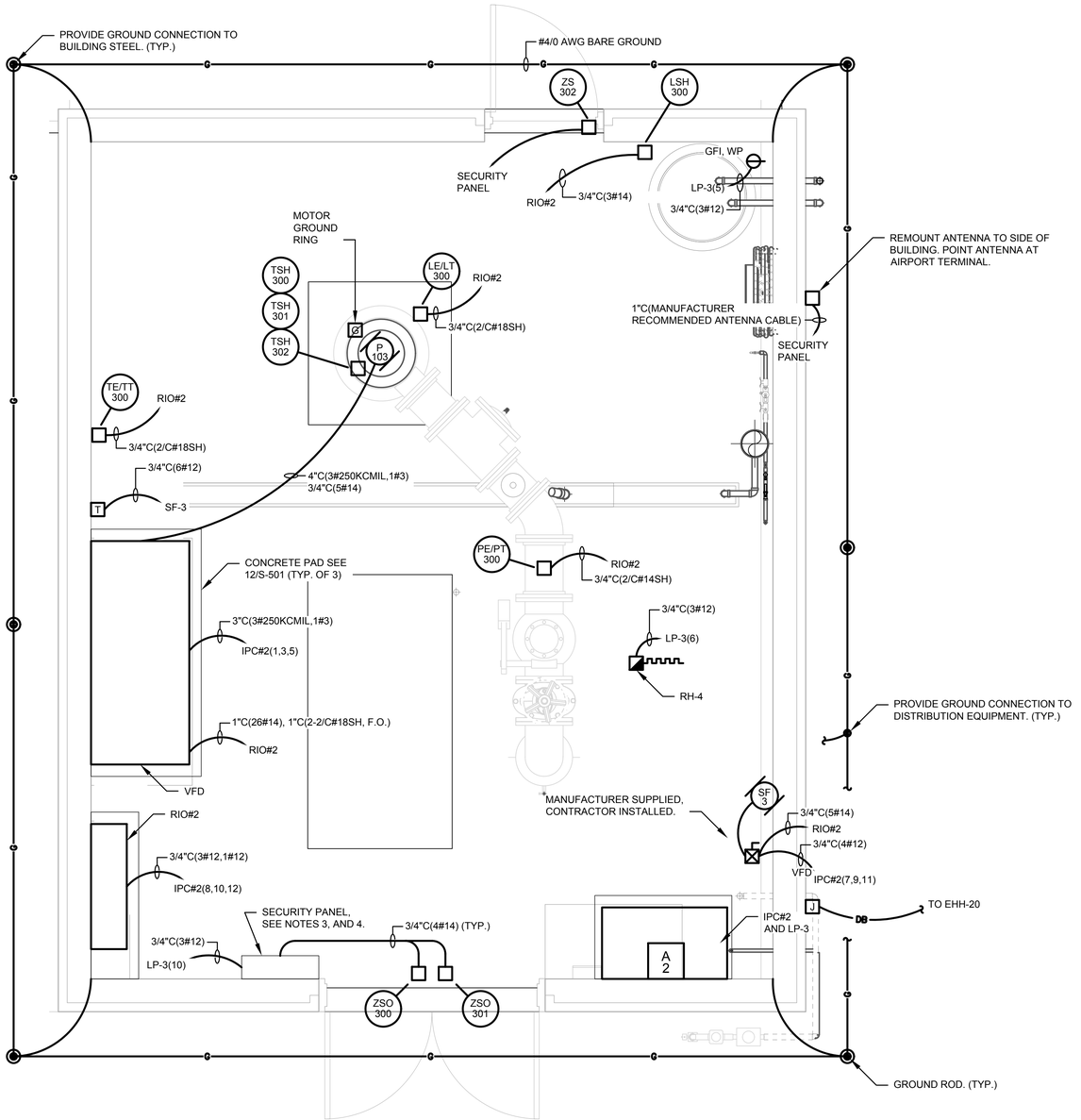
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

WELL HOUSE 21W PLAN VIEW

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

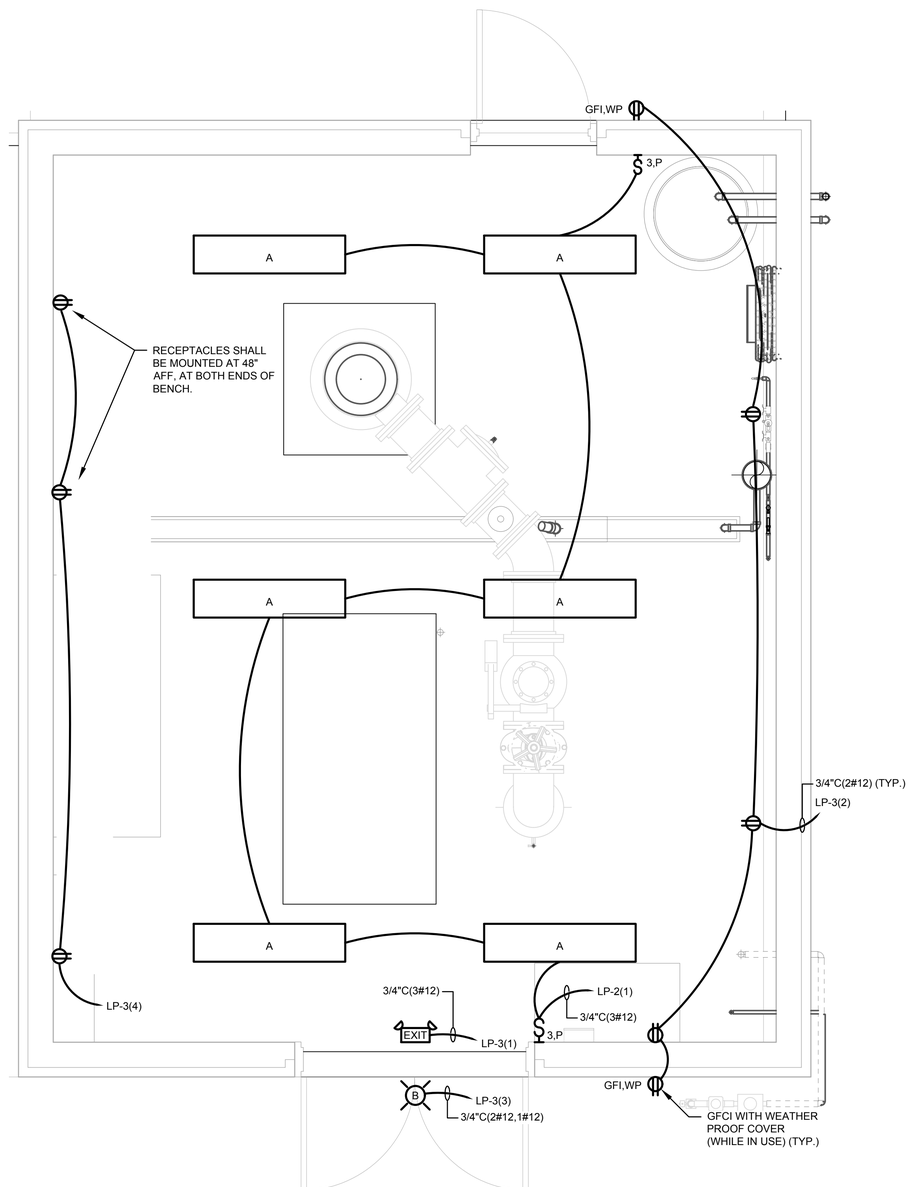
E-104

Bar Measures 1 inch



WELL HOUSE 741
PLAN VIEW, POWER

SCALE: 1/2"=1'



WELL HOUSE 741
PLAN VIEW, LIGHTING

SCALE: 1/2"=1'

NOTES:

1. INTERIOR LIGHT FIXTURES SHALL BE MOUNTED 9' AFF. SURFACE MOUNT OR PROVIDE PENDANT MOUNT AS NECESSARY.
2. EXTERIOR FIXTURES SHALL BE MOUNTED DIRECTLY ABOVE DOORS.
3. DEMOLISH THE SECURITY PANEL, RADIO ANTENNA, AND SOLAR PANELS. THE SOLAR PANELS SHALL BE TURNED OVER TO THE OWNER. SALVAGE THE SECURITY PANEL AND ANTENNA FOR REINSTALLATION AFTER THE BUILDING UPGRADES HAVE BEEN FINALIZED.
4. UPDATE THE SECURITY PANEL TO ACCEPT A 120 VAC POWER FEED IN LIEU OF THE EXISTING BATTERY/SOLAR PANEL POWER FEED. PROVIDE POWER SUPPLIES AND CONVERTERS AS NEEDED SUCH THAT THE PANEL EQUIPMENT WILL OPERATE AS BEFORE, BUT WITH A 120 VAC POWER FEED.

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www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

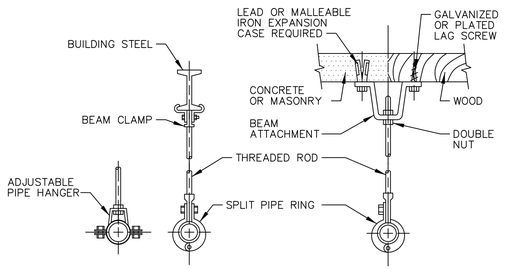
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

WELL HOUSE 741
PLAN VIEW

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

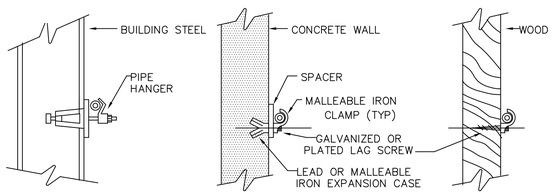
E-105

Bar Measures 1 inch



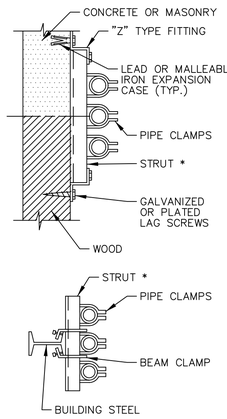
SINGLE CONDUIT HANGERS

NO SCALE



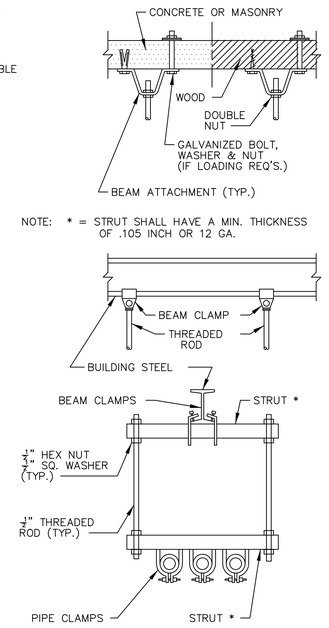
VERTICAL AND HORIZONTAL CONDUIT RACKS AND HANGERS

NO SCALE



VERTICALLY RACKED AND VERTICAL RUNS

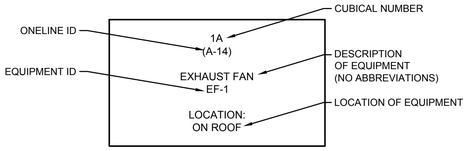
NO SCALE



NOTE: * = STRUT SHALL HAVE A MIN. THICKNESS OF .105 INCH OR 12 GA.

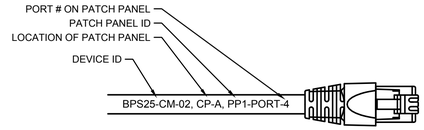
HORIZ. RACKED SUSPENDED RUN

NO SCALE



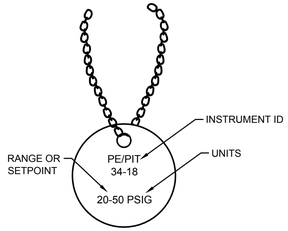
MOTOR CONTROL CENTER CUBICAL NAMEPLATE

NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND



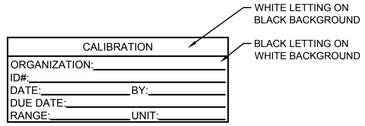
FIELD ETHERNET CABLE

NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND
2. DEPENDING ON PATCH PANEL STYLE AND/OR END DEVICE, ENDS MAY OR MAY NOT BE REQUIRED.

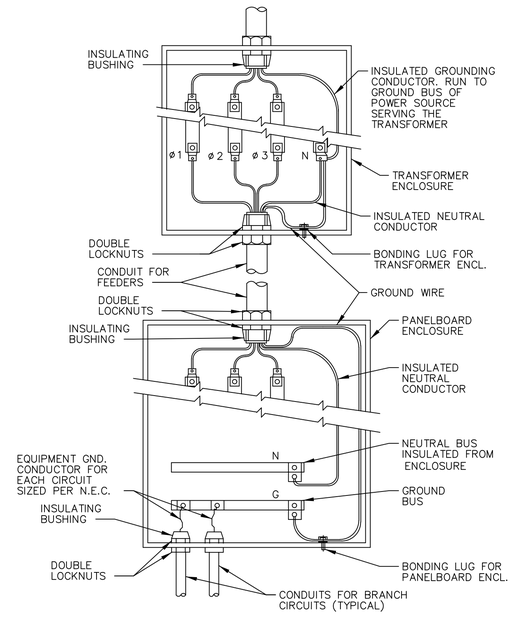


INSTRUMENT TAG

NOTE:
1. STAINLESS STEEL TAG
2. STAINLESS STEEL CHAIN
3. BLACK LETTERING
4. INSTALL TAG ON ELEMENTS AND INSTRUMENTS.

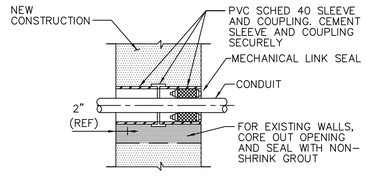


INSTRUMENT CALIBRATION



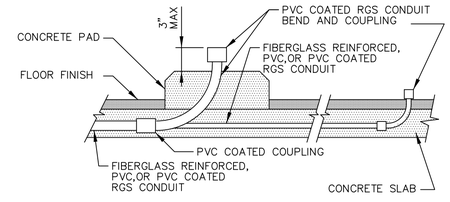
CONDUIT GROUNDING DETAILS FOR TRANSFORMERS,DISTRIBUTION PANELS, AND WALL MOUNTED ENCLOSURES

NO SCALE



EXTERIOR WALL CONDUIT SLEEVE DETAIL

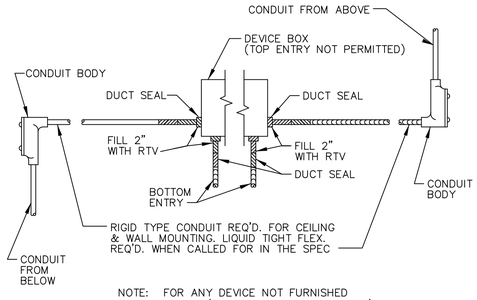
DO NOT USE BELOW GRADE
NO SCALE



NOTE:
PVC COATED CONDUIT BENDS AND FITTINGS SHALL BE USED WHERE CONCEALED CONDUIT RUNS ARE STUBBED UP FROM THE SLAB. RISERS ON POLES SHALL BE PVC COATED RGS INCLUDING WEATHERHEADS.

CONDUIT STUB-UP DETAIL

NO SCALE



NOTE: FOR ANY DEVICE NOT FURNISHED BY ELECTRICAL (EXCEPT HVAC AND MOTORS.)

DEVICE BOX CONDUIT DETAIL

NEMA 4 AREA ONLY
NO SCALE

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A. PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

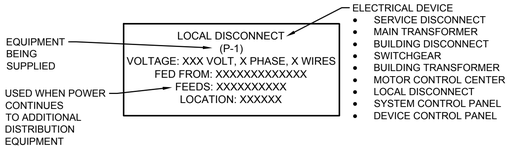
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

INSTALLATION DETAILS (SHEET 1 OF 5)

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

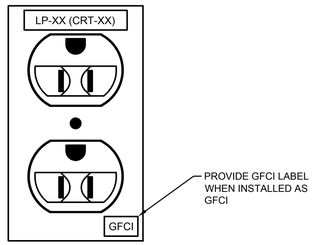
E-501

Bar Measures 1 inch



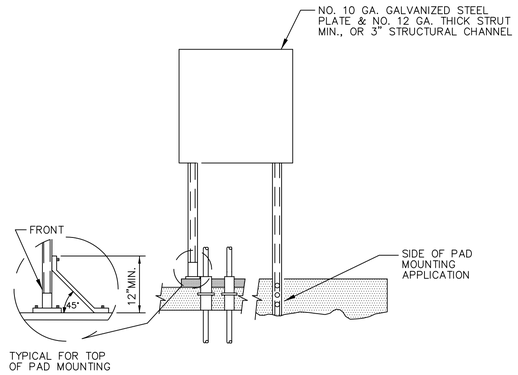
EQUIPMENT NAMEPLATE

NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND



RECEPTICAL

NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND



RACK MOUNTED EQUIPMENT DETAIL

NO SCALE

WHITE BACKGROUND BLACK LETTERS

CONTROL PANEL
*
SUPPLY XXX VOLTS: **
Disconnect Current Rating: _____
XXXXXXXXXXXXXXXX
Drawing No. ***
Built By: ****
Equipment Model No. ****
Equipment Serial No. ****
OKC. Contract ****
Date of Manufacture ****

YELLOW BACKGROUND
BLACK LETTERS

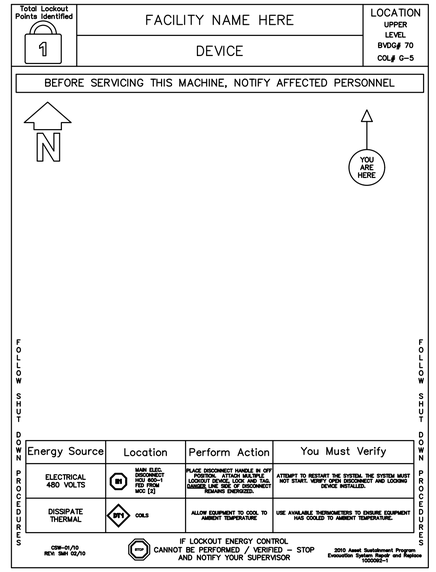
DANGER

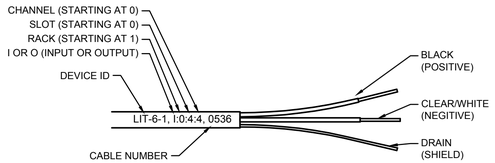
YELLOW WIRING
IS NOT
DE-ENERGIZED
BY DISCONNECT

AUTHORIZED
PERSONNEL ONLY
ALLOWED TO ENTER

WARNING

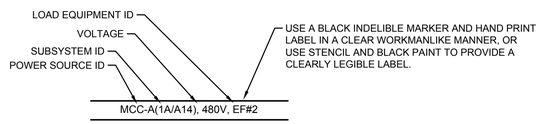
Arc Flash and Shock Hazard	
Appropriate PPE Required	
76.2 millimeters	Flash Hazard Boundry
0.08 cal/cm^2	Flash Hazard at 18 inches
Category 0	Untreated Cotton
480 VAC	Shock Hazard when cover is removed
00	Clove Class
107 centimeters	Limited Approach
30.5 centimeters	Restricted Approach
2.54 centimeters	Prohibited Approach
Location:	**EUH-1**





TWO CONDUCTOR CABLE

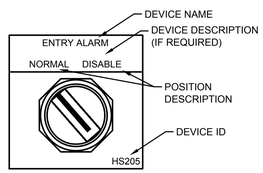
NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND



FEEDER & BRANCH CIRCUIT RACEWAY LABELS

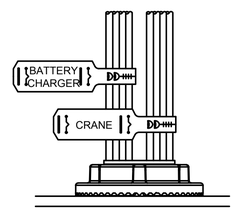
NOTE:
1. NO LABELING REQUIRED FOR RACEWAYS WITH READILY IDENTIFIABLE TERMINATIONS WITHIN THE SAME ROOM.
2. IN ACCESSIBLE CEILING SPACES AND EXPOSED IN UNFINISHED AREAS, LABEL CONDUIT WITH PANEL AND CIRCUIT NUMBERS OF CONDUCTORS ROUTED THROUGH THE CONDUIT. LABEL CONDUIT AT WALL PENETRATIONS AND CONNECTIONS TO ALL PANELS, JUNCTION BOXES, AND EQUIPMENT SERVED.

NOTES:
1. **CONTRACTOR TO PROVIDE AND IMPLEMENT COORDINATION STUDY RESULTS.**
2. **STUDY TO INCLUDE**
   - 2.1. **LOW VOLTAGE (BELOW 600VAC)**
   - 2.2. **COMPUTER MODEL**
   - 2.3. **SHORT CIRCUIT STUDY**
   - 2.4. **PROTECTIVE DEVICE COORDINATION STUDY**
   - 2.5. **ARC FLASH LEVELS, PPE LEVELS, DISTANCE NUMBERS**
3. **CONTRACTOR TO PROVIDE ARC FLASH PLACARD, LOCKOUT/TAGOUT PLACARD**
4. **CONTRACTOR TO PLACARD ALL CONTROL PANELS, POWER PANELS, MCC BUCKETS, DISCONNECTS, LIGHTING PANELS, AND TERMINATION PANELS INSTALLED OR CONNECTED TO DURING THIS PROJECT.**



PANEL TAG
PUSH BUTTON/SWITCH

NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND



WIRE/CABLE BUNDLE TAG

NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND (POWER)
2. BLACK LETTERING ON YELLOW BACKGROUND (SIGNAL)
3. BUNDLE AND LABEL WIRES/CABLES GOING TO A COMMON PANEL/EQUIPMENT/DEVICE
4. LABEL IN PANELS, MCC, MANHOLES, HAND HOLES, AND BOXES OVER 0.227 CUBIC METERS (8 CUBIC FEET).

ORANGE WITH BLACK LETTERING

Less than 50 volts
No Arc Flash Hazard
No Shock Hazard Boundary
No Electrical PPE Required

Brady PN: 110170

SAFETY/PLACARD DETAIL

NO SCALE

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON ENGINEER No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

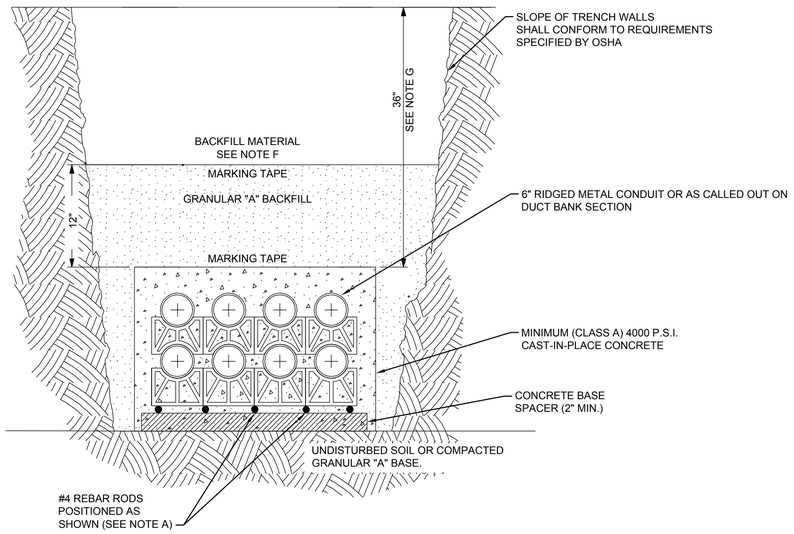
INSTALLATION DETAILS (SHEET 2 OF 5)

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-502

Bar Measures 1 inch

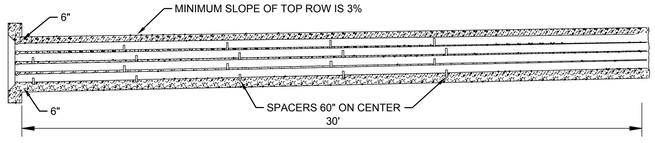
4/14/2016 1:34:35 PM - \\ERS008FS1\ PROJECTS\IER\31537\200-31537-15005\CAD\SHEET FILES\E-501 DETAILS.DWG - SHANK, JASON



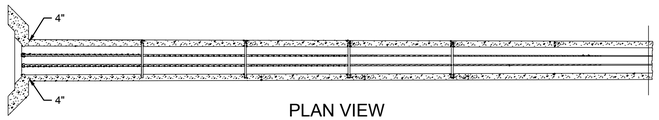
TYPICAL CONCRETE DUCT BANK SECTION VIEW

NOTES

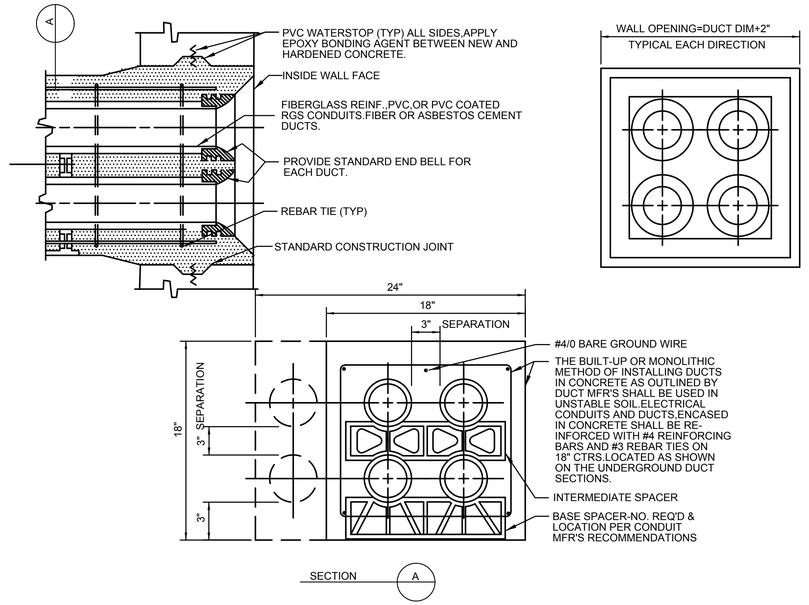
A. REINFORCING RODS FULL LENGTH OF CONCRETE ENCASED DUCTS. OVERLAP JOINTS BY 6" ON BASE SPACERS AND TIE BOTH ENDS. DRILL AND DOWEL RODS 3.5" INTO WALL(S) OF CONCRETE STRUCTURE.
B. DUCT SPACERS TO BE PLACED AT A MAXIMUM OF 60" AND WITHIN 6" OF COUPLING. PLASTIC DUCT SPACERS TO BE USED ONLY IF CONCRETE DUCT SPACERS ARE UNAVAILABLE.
C. FORMS REQUIRED FOR BOTH SIDES OF THE FULL LENGTH OF CONCRETE ENCASED DUCT STRUCTURE.
D. DUCTS AND TRENCHES MUST BE INSPECTED BY ENGINEER BEFORE ANY CONCRETE IS POURED.
E. CONTRACTOR MUST ENSURE THAT DUCTS ARE CLEANED, RODDED AND THAT A 3/8" POLYPROPYLENE ROPE IS LEFT IN EACH DUCT.
F. BACKFILL MATERIAL MUST BE APPROVED BY ENGINEER INSPECTOR; FOR ACCEPTABLE BACKFILL MATERIAL, SEE SPECIFICATION DOCUMENTS
G. STEEL PLATES ARE TO BE USED IF THE COVER OVER THE DUCT BANK IS LESS THAN 24". THE PLATES ARE TO BE 1/4" THICKNESS AND THE WIDTH OF THE DUCT BANK BEING COVERED. ANY DEVIATION FROM THE STANDARD COVER OF 24" MUST BE APPROVED BY THE ENGINEER.
H. BELL END TERMINATORS SHALL BE USED WHEN TERMINATING DUCTS IN STRUCTURES.
I. DTE REQUIREMENTS SHALL APPLY, AND TAKE PRECEDENCE IF IN CONFLICT WITH THE PLANS.



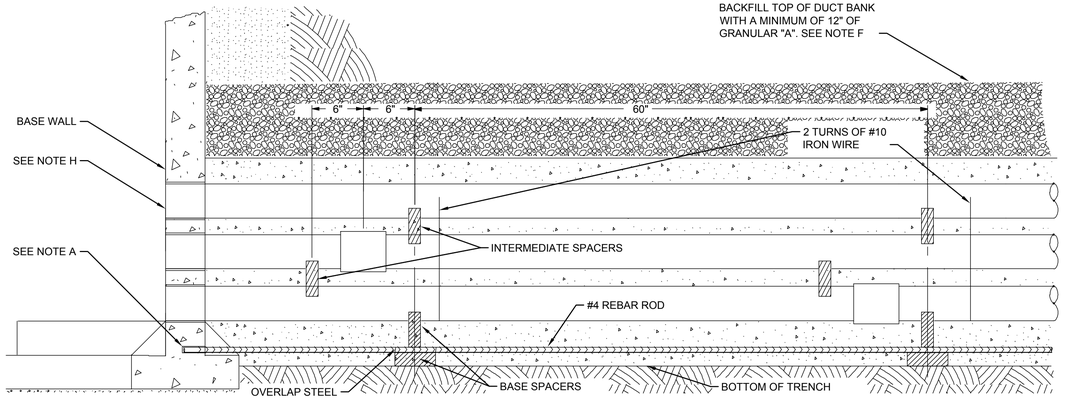
ELEVATION VIEW



PLAN VIEW



DUCT DETAILS
NO SCALE



CONCRETE DUCT BANK ELEVATION VIEW

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISONE
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

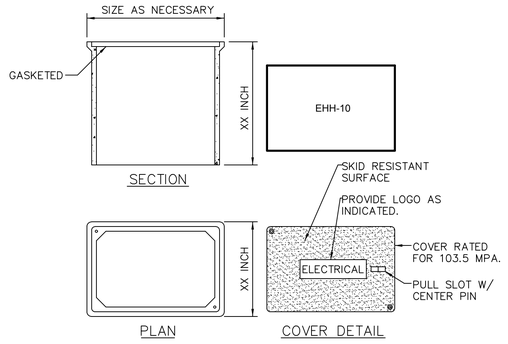
INSTALLATION DETAILS (SHEET 3 OF 5)

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-503

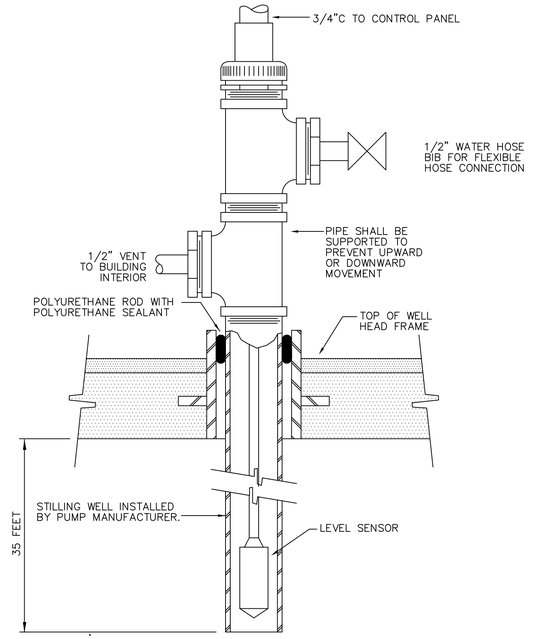
Bar Measures 1 inch

4/14/2016 1:35:18 PM - \\ERS008FS1\PROJECTS\ER\31537\200-31537-15005\CAD\SHEETFILES\E-501 DETAILS.DWG - SHANK, JASON



HANDHOLE DETAIL

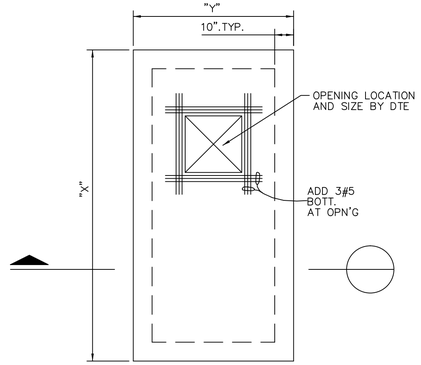
NO SCALE
QUAZITE COMPOSOLITE OR EQUAL



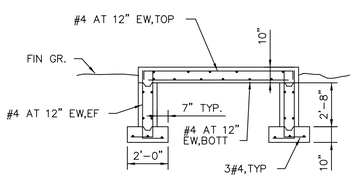
LE/LT 100
LE/LT 200
LE/LT 300

SUBMERSIBLE LEVEL SENSOR DETAIL

NO SCALE

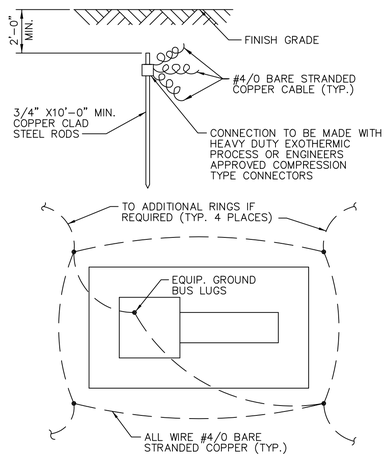


PLAN
SCALE 1/4"=1'0"



SECTION
SCALE 1/4"=1'0"

TRANSFORMER PAD



NOTE:
ADDITIONAL CONCENTRIC RINGS SHALL BE ADDED AS REQUIRED TO MEET THE (5) OHM SPECIFIED RESISTANCE. EACH RING TO HAVE 4 GROUND RODS AND SPACED 10 FEET FROM THE INNER RING.

GROUND MAT DETAIL

NO SCALE

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A. PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

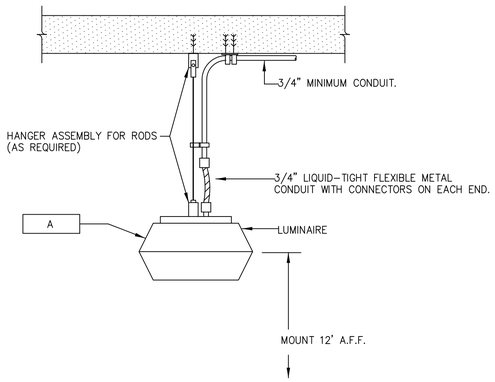
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

INSTALLATION DETAILS (SHEET 4 OF 5)

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

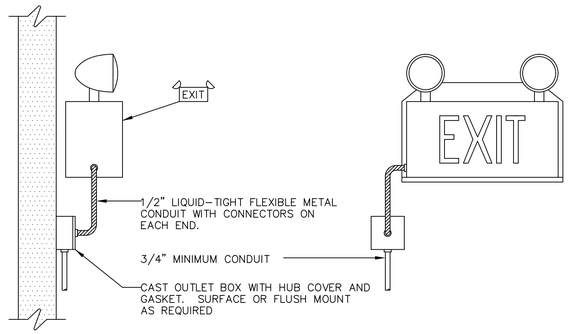
E-504

Bar Measures 1 inch



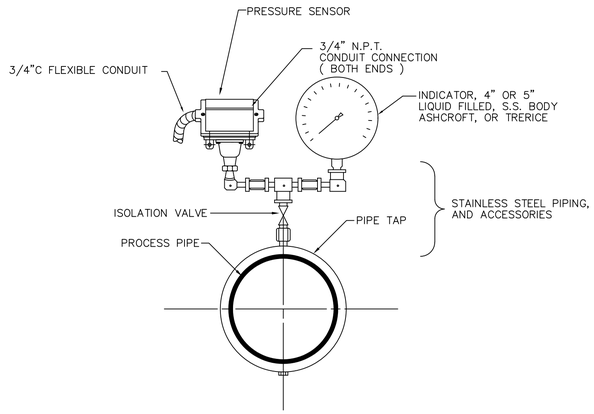
PENDANT MOUNTED LED LIGHT DETAIL

NO SCALE



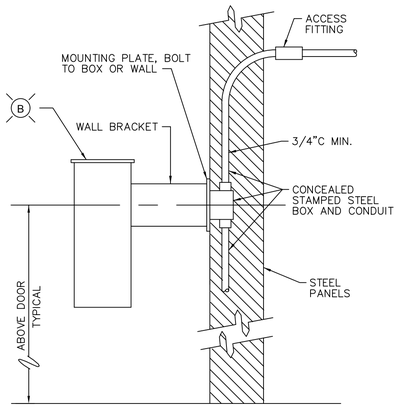
EMERGENCY LIGHT MOUNTING DETAIL

NO SCALE



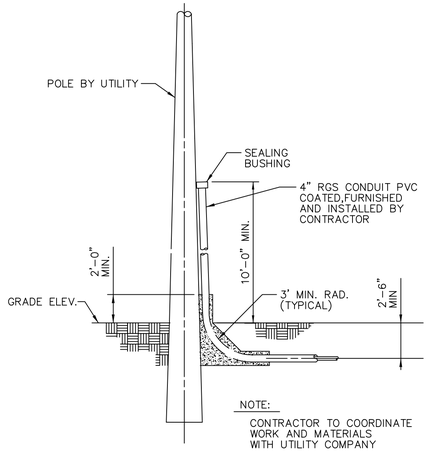
PE/PT 100 PE/PT 200 PE/PT 300 PRESSURE SENSOR DETAIL

NO SCALE



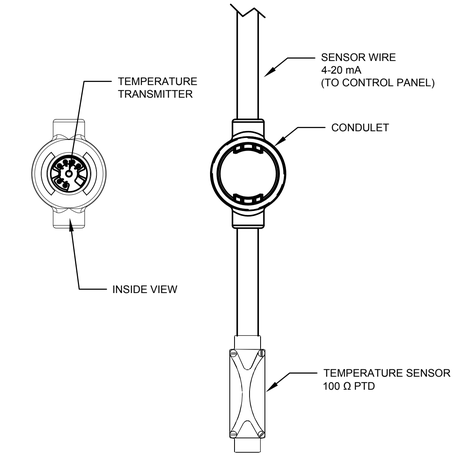
DOORWAY DOWNLIGHT DETAIL

NO SCALE



DROP POLE DETAIL

NO SCALE



TE/TT 100 TE/TT 200 TE/TT 300 ROOM TEMPERATURE SENSOR

NO SCALE

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www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON ENGINEER No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

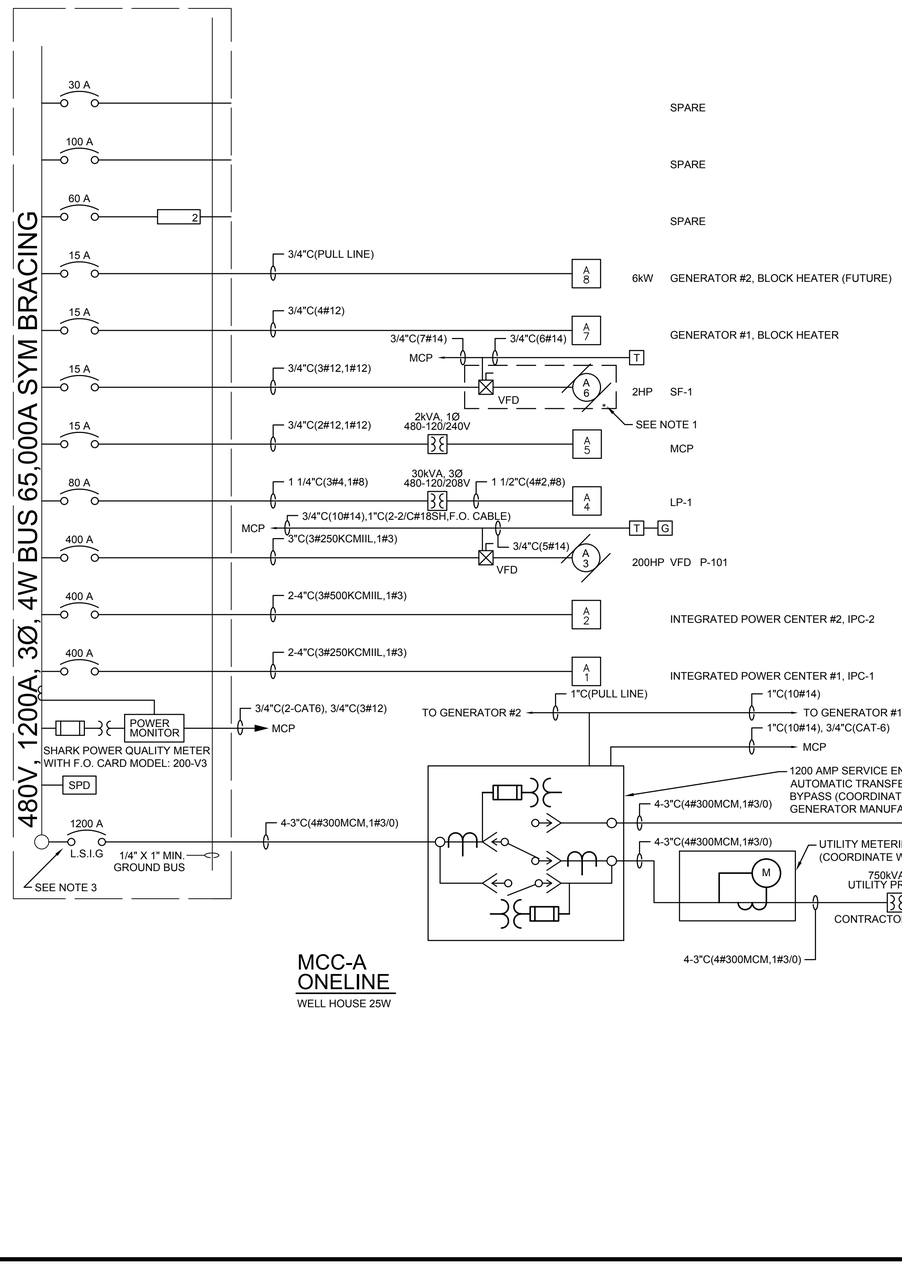
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

INSTALLATION DETAILS (SHEET 5 OF 5)

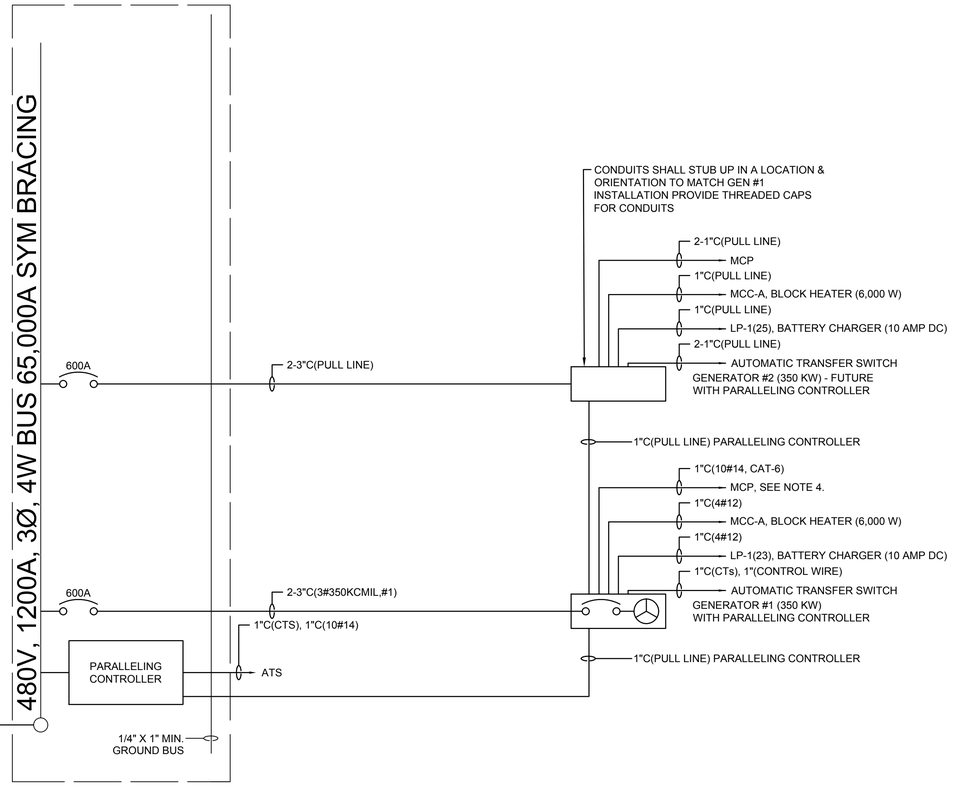
Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-505

Bar Measures 1 inch



MCC-A
ONELINE
WELL HOUSE 25W



MCC-G
ONELINE
WELL HOUSE 25W

NOTES:

1. FAN MANUFACTURER SUPPLIED, CONTRACTOR INSTALLED.
2. INTEGRATED POWER CENTER IS A SINGLE ENCLOSURE CONTAINING 480V PANELBOARD, TRANSFORMER, AND 120/208V PANELBOARD.
3. PROVIDE NEUTRAL BUS IN MAIN BREAKER, AND POWER MONITORING NEUTRAL SECTIONS TO ALLOW FOR NEUTRAL ACCESS.
4. GENERATOR MANUFACTURER SHALL PROVIDE AN REMOTE AUXILIARY INFORMATION DISPLAY TO SHOW MULTIVARIABLES FROM THE GENERATOR CONTROL PANEL. THE DISPLAY SHALL BE MOUNTED TO THE FACE OF MCP. COORDINATE WITH OWNER FOR THE ENTIRE LIST OF DESIRED VARIABLES TO DISPLAY.

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

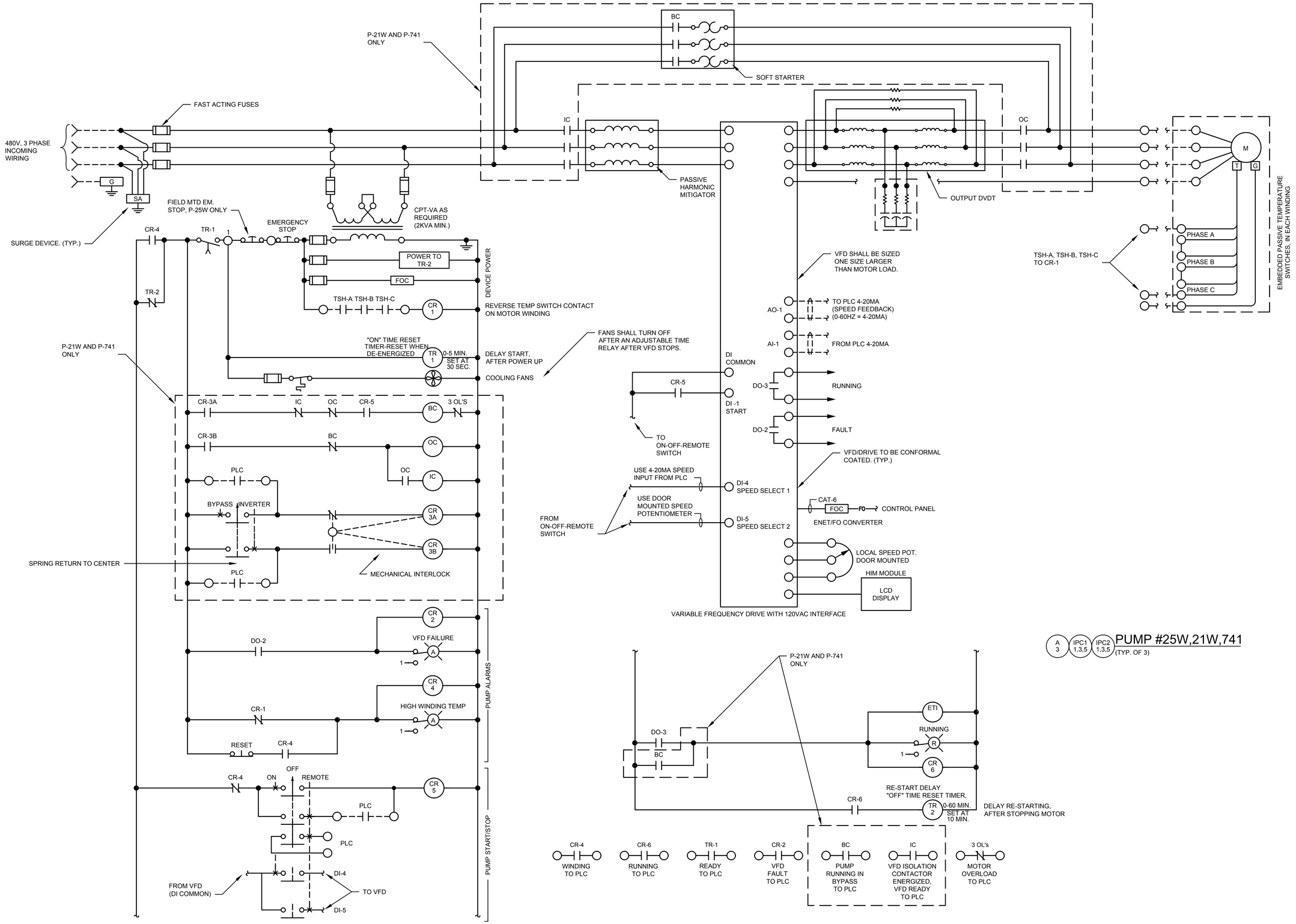
MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT
ONE LINE

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-601

Bar Measures 1 inch



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Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON ENGINEER No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

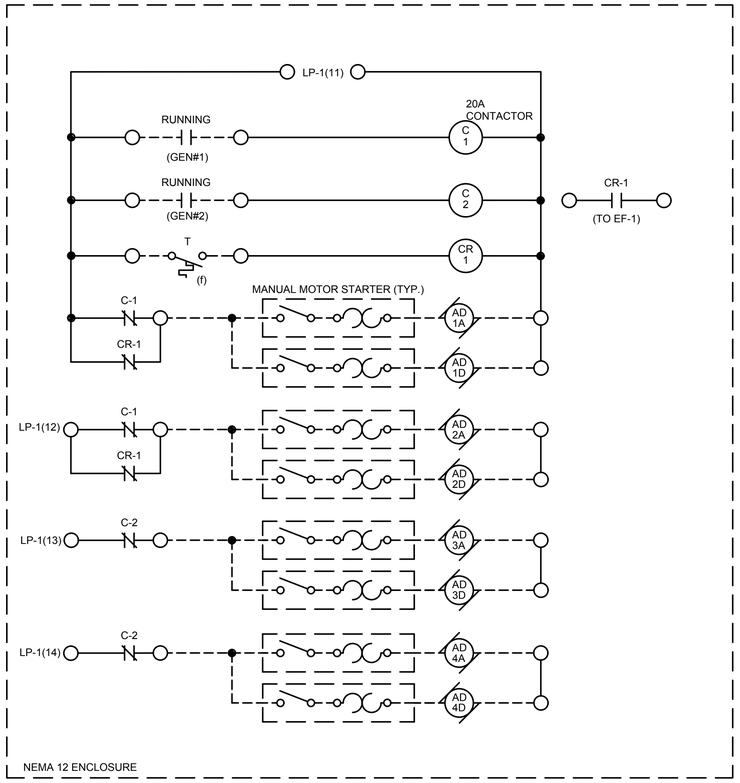
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

VFD WIRING SCHEMATIC

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-701

Bar Measures 1 inch



FAN CONTROL PANEL, FCP

(LOCATED IN PUMP HOUSE 25W)

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48106
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

WIRING SCHEMATICS

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-702

Bar Measures 1 inch

IPC#1 — PANEL SCHEDULE

PROJECT: WELL HOUSE 21W

277/480V, 3Ph, 4W. | 400A BUS | 400A M.C.B. | SURFACE MOUNTED | 15-Feb-16

CKT NO	DESCRIPTION/ LOCATION	LOAD (VA)	LOAD TYPE	CB AMP	CB POLE	PHASE	CB AMP	CB POLE	LOAD (VA)	LOAD TYPE	DESCRIPTION/ LOCATION	CKT NO
1	P-102 VFD	77,700	LM	400	3	a	100	3	1,083	G	LP-2 15KVA TRANSFORMER	2
3	-	77,700	LM	300	3	b	20	3	572	G	-	4
5	-	77,700	LM	300	3	c	20	3	600	G	-	6
7	SF-2 (3 HP)	12,000	M	15	3	a	15	3	667		RIO #1 (CONTROL PANEL)	8
9	-	12,000	M	15	3	b	15	3	667		-	10
11	-	12,000	M	15	3	c	15	3	667		-	12
13	SPARE			20	3	a						14
15	-			20	3	b						16
17	-			20	3	c						18
19						a						20
21						b						22
23						c						24
25						a						26
27						b						28
29						c						30
31						a						32
33						b						34
35						c						36
37						a						38
39						b						40
41						c						42

TOT CONN LOAD:	Ph A	91,450 VA	330 A		
TOT CONN LOAD:	Ph B	90,939 VA	328 A	19,748	A RMS AVAILABLE FAULT DUTY
TOT CONN LOAD:	Ph C	90,967 VA	328 A		
"MAX" PHASE CONN LOAD:	Ph A	91,450 VA			
TOTAL CONNECTED LOAD (3 X MAX):		274.4 KVA	330.0 AMPS	TOTAL DEMAND LOAD:	329.6 KVA 396.5 AMPS

IPC#2 — PANEL SCHEDULE

PROJECT: WELL HOUSE 741

277/480V, 3Ph, 4W. | 400A BUS | 400A M.C.B. | SURFACE MOUNTED | 15-Feb-16

CKT NO	DESCRIPTION/ LOCATION	LOAD (VA)	LOAD TYPE	CB AMP	CB POLE	PHASE	CB AMP	CB POLE	LOAD (VA)	LOAD TYPE	DESCRIPTION/ LOCATION	CKT NO
1	P-103 VFD	77,700	LM	400	3	a	100	3	1,083	G	LP-3 15KVA TRANSFORMER	2
3	-	77,700	LM	-	-	b	-	-	572	G	-	4
5	-	77,700	LM	-	-	c	-	-	600	G	-	6
7	SF-3 (3 HP)	12,000	M	15	3	a	15	3	667	G	RIO #2 (CONTROL PANEL)	8
9	-	12,000	M	-	-	b	-	-	667	G	-	10
11	-	12,000	M	-	-	c	-	-	667	G	-	12
13	SPARE			20	3	a						14
15	-			-	-	b						16
17	-			-	-	c						18
19						a						20
21						b						22
23						c						24
25						a						26
27						b						28
29						c						30
31						a						32
33						b						34
35						c						36
37						a						38
39						b						40
41						c						42

TOT CONN LOAD:	Ph A	91,450 VA	330 A		
TOT CONN LOAD:	Ph B	90,939 VA	328 A	19,748	A RMS AVAILABLE FAULT DUTY
TOT CONN LOAD:	Ph C	90,967 VA	328 A		
"MAX" PHASE CONN LOAD:	Ph A	91,450 VA			
TOTAL CONNECTED LOAD (3 X MAX):		274.4 KVA	330.0 AMPS	TOTAL DEMAND LOAD:	331.6 KVA 398.9 AMPS

LP-1 — PANEL SCHEDULE

PROJECT: WELL HOUSE 25W

120/208V, 3Ph, 4W. | 200A BUS | 150A M.C.B. | SURFACE MOUNTED | 25-Nov-15

CKT NO	DESCRIPTION/ LOCATION	LOAD (VA)	LOAD TYPE	CB AMP	CB POLE	PHASE	CB AMP	CB POLE	LOAD (VA)	LOAD TYPE	DESCRIPTION/ LOCATION	CKT NO
1	LIGHTS - INTERIOR	359	L	20	1	a	20	1	720	R	PUMP RM RECEPTACLES - INTERIOR	2
3	LIGHTS - EXTERIOR	36	L	20	1	b	20	1		R	GEN ROOM RECEPS	4
5	ACU-1 (1/3 HP)	380	H	20	3	c	20	1	600	H	EF-1 (1/2 HP)	6
7	-	380	H	-	3	a	20	1		R	MCC ROOM RECEPS	8
9	-	380	H	-	3	b	20	1	500	G	SECURITY PANEL	10
11	FCP					c	20	1	240	N	FCP	12
13	FCP					a	20	1	240	N	FCP	14
15	RH-1 (4.8 AMPS)	600	H	20	1	b	20	1	600	H	RH-2 (4.8 AMPS)	16
17	EUH-1 (3KW)	1,000	H	20	3	c	20	1		N	P-1	18
19	-	1,000	H	-	3	a	20	1			SPARE	20
21	-	1,000	H	-	3	b	20	1			SPARE	22
23	GEN#1 BATTERY CHARGER	240	N	20	1	c	20	1			SPARE	24
25	GEN#2 BATTERY CHARGER	240	N	20	1	a	20	1			SPARE	26
27	SPARE			20	1	b	20	1			SPARE	28
29	SPARE			20	1	c	20	1			SPARE	30
31	SPARE			20	1	a	20	1			SPARE	32
33	SPARE			20	1	b	20	1			SPARE	34
35	SPARE			20	1	c	20	1			SPARE	36
37	SPARE			20	1	a	20	1			SPARE	38
39	SPARE			20	1	b	20	1			SPARE	40
41	SPARE			20	1	c	20	1			SPARE	42

TOT CONN LOAD:	Ph A	2,939 VA	24 A		
TOT CONN LOAD:	Ph B	3,116 VA	26 A	4,912	A RMS AVAILABLE FAULT DUTY
TOT CONN LOAD:	Ph C	2,460 VA	21 A		
"MAX" PHASE CONN LOAD:	Ph B	3,116 VA			
TOTAL CONNECTED LOAD (3 X MAX):		9.3 KVA	26.0 AMPS	TOTAL DEMAND LOAD:	7.7 KVA 21.3 AMPS

LP-2 — PANEL SCHEDULE

PROJECT: WELL HOUSE 21W

120/208V, 3Ph, 4W. | 100A BUS | 100A M.C.B. | SURFACE MOUNTED | 25-Nov-15

CKT NO	DESCRIPTION/ LOCATION	LOAD (VA)	LOAD TYPE	CB AMP	CB POLE	PHASE	CB AMP	CB POLE	LOAD (VA)	LOAD TYPE	DESCRIPTION/ LOCATION	CKT NO
1	LIGHTS - INTERIOR	363	L	20	1	a	20	1	720	R	RECEPTACLES - INTERIOR	2
3	LIGHTS - EXTERIOR	72	L	20	1	b	20	1		R	RECEPTACLES	4
5	P-2		N	20	1	c	20	1	600	H	RH-3	6
7	SPARE			20	1	a	20	1			SPARE	8
9	SPARE			20	1	b	20	1	500	G	SECURITY PANEL	10
11	SPARE			20	1	c	20	1			SPARE	12
13	SPARE			20	1	a	20	1			SPARE	14
15	SPARE			20	1	b	20	1			SPARE	16
17						c						18
19						a						20
21						b						22
23						c						24
25						a						26
27						b						28
29						c						30
31						a						32
33						b						34
35						c						36
37						a						38
39						b						40
41						c						42

TOT CONN LOAD:	Ph A	1,083 VA	9 A		
TOT CONN LOAD:	Ph B	572 VA	5 A	4,740	A RMS AVAILABLE FAULT DUTY
TOT CONN LOAD:	Ph C	600 VA	5 A		
"MAX" PHASE CONN LOAD:	Ph A	1,083 VA			
TOTAL CONNECTED LOAD (3 X MAX):		3.2 KVA	9.0 AMPS	TOTAL DEMAND LOAD:	2.4 KVA 6.6 AMPS

LUMINAIRE SCHEDULE

SYMBOL	DESCRIPTION	MOUNTING	LAMPS			MANUFACTURERS (OR EQUAL)	
			NO.	WATTAGE	TYPE	NAME	MODEL OR SERIES
A	11" X 50" ONE-PIECE 5VA RATED FIBERGLASS ENCLOSED AND GASKETED LUMINAIRE WITH CLEAR ACRYLIC LENS, 4100K (WET LOCATION FITTINGS SURFACE)	PENDANT	1	59.2W	LED	LITHONIA OR EQUAL	FHE LED SERIES OR EQUAL
B	D-SERIES SIZE 1, 20 LEDs, SINGLE FUSE, 530mA, SURFACE MOUNTED, 3000K, 120V, BLACK, WITH MOTION SENSOR	WALL	1	36W	LED	LITHONIA OR EQUAL	DSXW1 LED OR EQUAL
EXIT	LED EXIT/UNIT COMBO INJECTION-MOLDED, FLAME-RETARDANT, HIGH-IMPACT, THERMOPLASTIC HOUSING	WALL	2	3.8W	LED	LITHONIA OR EQUAL	ECR LED M6 OR EQUAL

LP-3 — PANEL SCHEDULE

PROJECT: WELL HOUSE 741

120/208V, 3Ph, 4W. | 100A BUS | 100A M.C.B. | SURFACE MOUNTED | 18-Nov-15

CKT NO	DESCRIPTION/ LOCATION	LOAD (VA)	LOAD TYPE	CB AMP	CB POLE	PHASE	CB AMP	CB POLE	LOAD (VA)	LOAD TYPE	DESCRIPTION/ LOCATION	CKT NO
1	LIGHTS - INTERIOR	363	L	20	1	a	20	1	720	R	RECEPTACLES - INTERIOR	2
3	LIGHTS - EXTERIOR	72	L	20	1	b	20	1		R	RECEPTACLES	4
5	P-3			20	1	c	20	1	600	H	RH-4	6
7	SPARE			20	1	a	20	1			SPARE	8
9	SPARE			20	1	b	20	1	500	G	SECURITY PANEL	10
11	SPARE			20	1	c	20	1			SPARE	12
13	SPARE			20	1	a	20	1			SPARE	14
15	SPARE			20	1	b	20	1			SPARE	16
17						c						18
19						a						20
21						b						22
23						c						24
25						a						26
27						b						28
29						c						30
31						a						32
33						b						34
35						c						36
37						a						38
39						b						40
41						c						42

TOT CONN LOAD:	Ph A	1,083 VA	9 A		
TOT CONN LOAD:	Ph B	572 VA	5 A	4,740	A RMS AVAILABLE FAULT DUTY
TOT CONN LOAD:	Ph C	600 VA	5 A		
"MAX" PHASE CONN LOAD:	Ph A	1,083 VA			
TOTAL CONNECTED LOAD (3 X MAX):		3.2 KVA	9.0 AMPS	TOTAL DEMAND LOAD:	2.4 KVA 6.6 AMPS

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
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Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON ENGINEER No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

PANEL BOARD SCHEDULE

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

E-703

Bar Measures 1 inch

4/14/2016 1:46:26 PM - \\ERS008FS1 - ROJECTS\IER\31537\200-31537-15005\CAD\SHEET FILES\E-703 PANEL BOARD SCHEDULE.DWG - SHANK, JASON

GRAPHIC SYMBOL FOR INSTRUMENTATION ITEMS

	LOGIC IN PLC DISPLAYED ON OIP & SCADA (INCLUDING INPUTS & OUTPUTS)		CONTROL RELAY CONTACT-NORMALLY OPEN
	LOGIC IN PLC		CONTROL RELAY CONTACT-NORMALLY CLOSED
	FIELD OR LOCALLY MOUNTED DEVICE		LIGHTNING ARRESTOR
	PROGRAMMED FUNCTION NOT NORMALLY ACCESSIBLE TO OPERATOR	ETI	ELAPSED TIME INDICATOR
	PROGRAMMED FUNCTION ACCESSIBLE THROUGH OPERATOR'S INTERFACE DEVICE	T	TIMING RELAY COIL
	LOGIC IN PLC DISPLAYED ON OIP (INCLUDING INPUTS AND OUTPUTS)	T	TIMED RELAY COIL (OFF-DELAY)
	INTERLOCKING	G	INDICATING LIGHT
XOR	EXCLUSIVE OR		PUSH-TO-TEST INDICATING LIGHT
A	ALTERNATOR		BATTERY
OR	OR	X1 X2	SECONDARY TRANSFORMER
AND	AND		VARIABLE RESISTOR
S	MOTOR STARTER		RESISTOR
P	PURGE		MOLDED CASE CIRCUIT BREAKER
L	COMPLEX LOGIC		SPEED SWITCH
	COMPUTER LOGIC SYSTEM		MOMENTARY PUSHBUTTON OPERATOR- NORMALLY CLOSED
	TERMINAL OR TRANSITION POINT		MOMENTARY PUSHBUTTON OPERATOR- NORMALLY OPEN
	FLOAT SWITCH		SELECTOR SWITCH-NORMALLY OPEN
	PARSHALL FLUME		PUSHBUTTON OPERATOR WITH MUSHROOM HEAD
	MIXER		SOLENOID OR CLUTCH
	SEAL		THERMAL OVERLOAD
	OFF PAGE CONNECTOR		A-C SURGE PROTECTOR
	PROCESS MACHINERY MOTOR		HORN
	VENTURI OR INSERT FLOW TUBE	(F)	FIELD LOCATED
	IN-LINE FLOW ELEMENT (PROPELLER TYPE)		TERMINAL POINT
	IN-LINE FLOW ELEMENT (MAGNETIC TYPE)		TERMINAL POINT ARROW
	IN-LINE FLOW ELEMENT (ULTRA SONIC)		LOW VOLTAGE FUSE
	FLOW ORIFICE		CIRCUIT BREAKER WITH STAB CONNECTION
	TURBIDIMETER		CONTROL POWER TRANSFORMER
	ROTAMETER	CR L / CR U	TWO COIL LATCHING RELAY
	PUMP		
	BLOWER		RECEPTACLE
	GENERAL USE DISCONNECTING SWITCH		SELECTOR SWITCH OPERATOR WITH FUNCTION SHOWN
	TIMED CLOSED CONTACT ON ENERGIZATION		
	TIMED OPEN CONTACT ON ENERGIZATION		MAINTAINED PUSH-PULL OPERATOR
	TIMED OPEN CONTACT ON DE-ENERGIZATION		
	TIMED CLOSED CONTACT ON DE-ENERGIZATION		MAINTAINED STOP-START PUSHBUTTON OPERATOR
	FLOAT ACTUATED SWITCH-NO		
	FLOAT ACTUATED SWITCH-NC		DIODE RECTIFIER OR D-C SURGE PROTECTOR
	PRESSURE ACTUATED SWITCH-NC		LIMIT SWITCH - NORMALLY OPEN
	PRESSURE ACTUATED SWITCH-NO		LIMIT SWITCH - NORMALLY OPEN - HELD CLOSED
	FLOW ACTUATED SWITCH-NO		LIMIT SWITCH - NORMALLY CLOSED - HELD OPEN
	FLOW ACTUATED SWITCH-NC		LIMIT SWITCH - NORMALLY CLOSED
	TEMPERATURE SWITCH-NO		
	TEMPERATURE SWITCH-NC		

GRAPHIC SYMBOLS FOR VALVES

SYMBOL	DESCRIPTION
	STROKE OR POSITION ACTUATOR CYLINDER (OPEN-SHUT)
	STROKE OR POSITION ACTUATOR CYLINDER (THROTTLING)
	PNEUMATIC DIAPHRAGM OR POSITIONER (OPEN-SHUT)
	PNEUMATIC DIAPHRAGM OR POSITIONER (THROTTLING)
M	MOTOR OPERATED (THROTTLING)
M	MOTOR OPERATED (OPEN-SHUT)
	SLIDE-STOP GATE
	SLUICE GATE
	AIR SET ASSEMBLY
	BALL VALVE
	GLOBE VALVE
	GATE VALVE OR KNIFE GATE
	CHECK VALVE
	PLUG VALVE
	BUTTERFLY VALVE, DAMPER OR LOUVER
S	TWO-WAY SOLENOID VALVE OPERATOR
M	ELECTRONICALLY CONTROLLED CHECK VALVE
S D	TWO-WAY SOLENOID VALVE OPERATOR-DETENTED
S	THREE-WAY SOLENOID VALVE OPERATOR
S	FOUR-WAY SOLENOID VALVE OPERATOR

ABBREVIATIONS

SYMBOL	DESCRIPTION
R	RESET
T	TRIP
AS	AIR SUPPLY
DO	DISSOLVED OXYGEN
GS	GAS SUPPLY
HS	HYDRAULIC SUPPLY
NS	NITROGEN SUPPLY
ORP	OXYGEN REDUCTION POTENTIAL
SS	STEAM SUPPLY
SP	SET POINT
WS	WATER SUPPLY
PV	PROCESS VARIABLE
F.O.	FAIL OPEN
F.C.	FAIL CLOSE
%	GAIN OR PROPORTIONAL CONTROL
∫	INTEGRAL OR RESET CONTROL
D	DERIVATIVE OR RATE CONTROL
V	VELOCITY ALGORITHM
1-0	ON-OFF CONTROL
√	SQUARE ROOT EXTRACTOR
Σ	ADD OR TOTALIZE
Δ	SUBTRACT OR DIFFERENCE
>	HIGHEST MEASURED VARIABLE
<	LOWEST MEASURED VARIABLE
E/I , I/P	CONVERT ONE TO ANOTHER
X , ÷	MULTIPLY , DIVIDE
□	BIAS OR REVERSING
f(x)	CHARACTERIZE - (EQUATION / /D/%/ETC.)

INSTRUMENTATION LINE SYMBOLS

SYMBOL	DESCRIPTION
	ELECTRICAL SIGNAL
	AIR LINE
	HYDRAULIC SIGNAL
	ELECTROMAGNETIC OR SONIC SIGNAL
	SOFTWARE SIGNAL
	CONNECTION TO PROCESS, OR MECHANICAL LINK

I.S.A. STANDARD LETTER FUNCTIONS

SYMBOL	FIRST LETTER	SUCEEDING LETTERS
A	ANALYSIS , ANALOG	ALARM
B	BURNER , FLAME	BATCH
C	CONDUCTIVITY , COMMAND	CONTROL (FEEDBACK TYPE)
D	DENSITY , SPECIFIC GRAVITY	
E	VOLTAGE	PRIMARY ELEMENT
F	FLOW RATE	RATIO
G	GAGING	GLASS
H	HAND , MANUAL	HIGH
I	CURRENT	INDICATE
J	POWER	SCAN
K	TIME , TIME SCHEDULE	CONTROL (NO FEEDBACK)
L	LEVEL , LIGHT	LOW
M	MOISTURE , HUMIDITY	MIDDLE , MODULATE
N		
O	OVERLOAD	ORIFICE
P	PRESSURE , VACUUM	POINT
Q	QUANTITY	TOTALIZE , INTEGRATE
R	RADIOACTIVITY	RECORD , PRINT , RECEIVE
S	SPEED , FREQUENCY , SOLENOID	SWITCH
T	TEMPERATURE , TURBIDITY	TRANSMIT , TRANSFORM
U	MULTIVARIABLE	MULTIFUNCTION
V	VIBRATION , VISCOSITY	VALVE , DAMPER , LOUVER
W	WEIGHT , FORCE	
X		
Y		RELAY , COMPUTE
Z	POSITION	DRIVE , ACTUATE

ABBREVIATIONS

SYMBOL	DESCRIPTION
MCC	MOTOR CONTROL CENTER
CP-A	MAIN CONTROL PANEL
RCP-1	REMOTE CONTROL PANEL 1 (NEAR STORAGE TANK)
DC-LP	DIRECT CURRENT- LIGHTING/DISTRUBUTION PANEL
LP	LIGHTING/DISTRUBUTION PANEL
LC	LIGHTING CONTACTOR PANEL
ANT	ANTENNA
RD	RADIO
NS	NETWORK SWITCH
CM	CAMERA
UP	UNINTERRUPTIBLE POWER SUPPLY
DS	DATA STORAGE
OP	OPERATOR INTERFACE
PL	PROGRAMMABLE LOGIC CONTROLLER
RO	REMOTE I/O
VD	VARIABLE FREQUENCY DEVICE - DISPLAY
VP	VARIABLE FREQUENCY DEVICE - PROTECTION
FB	FEEDER BREAKER
MB	MAIN BREAKER
IRR	IRRIGATION CONTROLLER

NOTES:

1. NEW WORK IS SHOWN IN BOLD.
2. PROVIDE SURGE SUPPRESSION NETWORKS ACROSS RELAYS, SOLENOIDS, CONTACTORS, STARTERS, ETC., AS RECOMMENDED BY PLC MANUFACTURER.
3. NO WIRES SHALL BE TERMINATED TO TERMINAL STRIPS, OR OTHER EQUIPMENT WITHOUT FIRST VERIFYING SIGNAL TYPE. DAMAGES RESULTING IN LACK OF VERIFICATION SHALL BE BORNE BY THE CONTRACTOR. CONTRACTOR SHALL COORDINATE SIGNAL TYPE AND VOLTAGE WITH I/O CARDS SHOWN.
4. CONTROL PANELS SHALL HAVE DOOR HANDLES WITH LOCKS. LOCKS SHALL BE KEYED ALIKE AS COORDINATED WITH OWNER.
5. POINTS ON CARDS SHOWN TO BE USED, AND SHOWN AS SPARE SHALL BE WIRED TO TERMINAL STRIPS.
6. SCALES/RANGES NOT SHOWN ON P & ID'S SHALL BE OBTAINED FROM THE ENGINEER DURING THE SHOP DRAWING REVIEW PROCESS.
7. SIGNALS SHOWN ON P & ID'S AND I/O CARDS COMPRISE I/O WIRING REQUIRED FOR THE INSTALLATION OF THE NEW CONTROL SYSTEM. REFER TO ELECTRICAL SITE PLAN/BACKGROUND DRAWINGS FOR ADDITIONAL INFORMATION.
8. WITHIN CONTROL PANELS, NAMEPLATES SHALL BE PROVIDED TO INDICATE DIFFERENT VOLTAGE LEVELS WITHIN PANELS. ALSO, A NAME TAG (YELLOW BACKGROUND, RED LETTERING) SHALL BE LOCATED ON THE FRONT OF EVERY PANEL INDICATING THAT WHEN MAIN PANEL IS DISCONNECTED 120V IS STILL PRESENT FROM FIELD DEVICES (YELLOW WIRING/ISOLATED INPUT CARDS.)
9. CONTROL PANELS ARE TO BE PROVIDED WITH THERMOSTATICALLY CONTROLLED AIR CONDITIONERS WHERE SHOWN WITH CARBON FILTERS, ADEQUATELY SIZED FOR PROPER PANEL COOLING. PROVIDE 30' OF PLASTIC DRAIN LINE TUBING (TYP.) AIR CONDITIONERS TO BE THE PRODUCT OF MCLEAN GENESIS SERIES (PROVIDE STEP DOWN TRANSFORMER AND SECONDARY CIRCUIT BREAKER PROTECTION AS REQUIRED TO SUIT VOLTAGE REQUIREMENTS OF AIR CONDITIONER.)
10. PAINT CONTROL PANELS; COLOR AS DIRECTED BY OWNER/ENGINEER. SUBMIT COLOR SELECTION CHART DURING SHOP DRAWING REVIEW PROCESS.
11. PHENOLIC TAGS ON FACE OF CONTROL PANELS TO HAVE WHITE BACKGROUND AND BLACK LETTERING (EXCEPT WARNING TAGS; YELLOW BACKGROUND RED LETTERING).
12. SIGNALS SHOWN ON P & ID'S AND I/O CARDS COMPRISE WIRING AND FIELD DEVICES REQUIRED FOR THE CONTROL SYSTEM. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
13. FIBER OPTIC CABLE INSTALLATION AND TERMINATIONS SHALL BE PERFORMED BY A QUALIFIED ORGANIZATION WHICH SPECIALIZES IN THIS TYPE OF WORK. ONCE INSTALLED, FO CABLE SHALL BE TESTED AS OUTLINED IN THE SPECIFICATIONS BY A QUALIFIED TESTING ORGANIZATION.
14. ETHERNET AND PLC FIBER OPTIC CABLE SHALL NOT BE SPLICED BETWEEN PANELS.
15. REFER TO ELECTRICAL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION ON ISOLATED I/O. A COMMON NEUTRAL MAY BE USED FOR SEVERAL ISOLATED INPUTS FROM THE SAME STARTER. PROVIDE NEUTRAL JUMPER WIRES WITHIN THE PANEL AS REQUIRED.
16. TERMINAL BLOCKS TO BE 12" MINIMUM ABOVE FLOOR. HIGH DENSITY TERMINAL BLOCKS MAY BE USED.
17. BELDEN 9463 I/O CABLE WHERE TERMINATED SHALL HAVE ITS ENDS HEAT SHRINK WITH BLACK TUBING, AND THE DRAIN WIRE SHALL BE COVERED WITH GREEN INSULATION.
18. PROVIDE SAFETY COVERS ON ALL 480V MOLDED CASE MAIN CIRCUIT BREAKERS TO INSULATE THE INCOMING CONDUCTORS AND LOAD SIDE CONDUCTORS FROM CONTACT. (TYP. FOR ALL CONTROL PANELS)
19. UPS SELECTED TO BE COMPATIBLE WITH SOLA MCR TRANSFORMERS. (TYP).
20. THE FIELD DEVICES SHOWN ON THE P&ID'S, I/O CARD DRAWINGS, ELECTRICAL BACKGROUNDS, AND DETAIL SHEETS MAKE UP THE FIELD DEVICE EQUIPMENT REQUIREMENTS. NOT ALL FIELD DEVICES REQUIRED ARE SHOWN ON THE P&ID'S.
21. PROVIDE SUN SHADE AROUND ALL CONTROL PANELS AND INSTRUMENTS THAT ARE MOUNTED OUTSIDE.
22. OUTSIDE EQUIPMENT MUST BE RATED FOR -40 TO 150 DEG F.
23. PROVIDE ANALOG SURGE SUPPRESSOR FOR ALL FIELD MOUNTED TRANSMITTERS.

TETRA TECH
www.tetratech.com
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A. PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

LEGEND

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-001

Bar Measures 1 inch

REMOUNT SALVAGED ANTENNA

REMOUNT SALVAGED SECURITY PANEL, CONNECT IN NEW DOOR CONTACTS (TYP. OF 3)

NEW ANTENNA CABLE

E-NET

CAT-6

PHOENIX CONTACT RADIO

EXISTING SECURITY PANEL

DEVICE OPERATOR INTERFACE
STYLE: PANELVIEW 1000
MANUFACTURER: ALLEN BRADLEY
PART #: 2Z11P-T10C4A9

CAT 6

12 STRAND SINGLE MODE FIBER, 9/125 MICRON ALL DIELECTRIC, WATER BLOCK GEL.

FO

FOPP

SINGLE MODE DUPLEX FIBER PATCH CABLE

POWER MONITOR

4-STRAND ZIP CORD

DEVICE: NETWORK SWITCH
STYLE: STRATIX 8300, LAYER 3
MANUFACTURER: ALLEN BRADLEY

IP: XXX.XXX.XXX.XXX

AT MCP

1756-L71	1756-EN2T	1756-IA16	1756-IA16	1756-OW16I	1756-IF16	1756-OF8
0	1	2	3	4	5	6

7-SLOT RACK
LOCATION: MCP
AB CONTROL LOGIX
IP: XXXXX

WELL PUMP HOUSE 25W (MCP)

REMOUNT SALVAGED ANTENNA

NEW ANTENNA CABLE

PHOENIX CONTACT RADIO

EXISTING SECURITY PANEL

E-NET — E-NET — E-NET → TO EXISTING CITY NETWORK SWITCH

EXISTING RADIO PANEL (RP-2)

INSIDE AIRPORT TERMINAL

12 STRAND SINGLE MODE FIBER, 9/125 MICRON ALL DIELECTRIC WATER BLOCK GEL.

DUPLEX FIBER PATCH CABLE. (TYP.)

SINGLE MODE DUPLEX FIBER PATCH CABLE

FOPP

DEVICE: NETWORK SWITCH
STYLE: STRATIX 2000, UNMANAGED
MANUFACTURER: ALLEN BRADLEY

IP: XXX.XXX.XXX.XXX

4-STRAND ZIP CORD

CAT 6

1756-EN2T	1756-IA16	1756-N2	1756-N2	1756-OW16I	1756-IF16	1756-OF8
0	1	2	3	4	5	6

7-SLOT RACK
LOCATION: RIO 21W
AB CONTROL LOGIX
IP: XXXXX

WELL HOUSE 21W (RIO#1)

REMOUNT SALVAGED ANTENNA

NEW ANTENNA CABLE

PHOENIX CONTACT RADIO

EXISTING SECURITY PANEL

FIBER PATCH PANELS SHALL BE SURFACE MOUNT 12-PORT, AND ST CONNECTORS. (TYP.)

DUPLEX FIBER PATCH CABLE. (TYP.)

SINGLE MODE DUPLEX FIBER PATCH CABLE

FOPP

DEVICE: NETWORK SWITCH
STYLE: STRATIX 2000, UNMANAGED
MANUFACTURER: ALLEN BRADLEY

IP: XXX.XXX.XXX.XXX

CAT 6

1756-EN2T	1756-IA16	1756-N2	1756-N2	1756-OW16I	1756-IF16	1756-OF8
0	1	2	3	4	5	6

7-SLOT RACK
LOCATION: RIO 741W
AB CONTROL LOGIX
IP: XXXXX

WELL HOUSE 741W (RIO#2)

TETRA TECH
www.tetratech.com
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Tel 734-665-6000, Fax 734-213-3003

STATE OF MICHIGAN
WILLIAM A PAISON ENGINEER No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

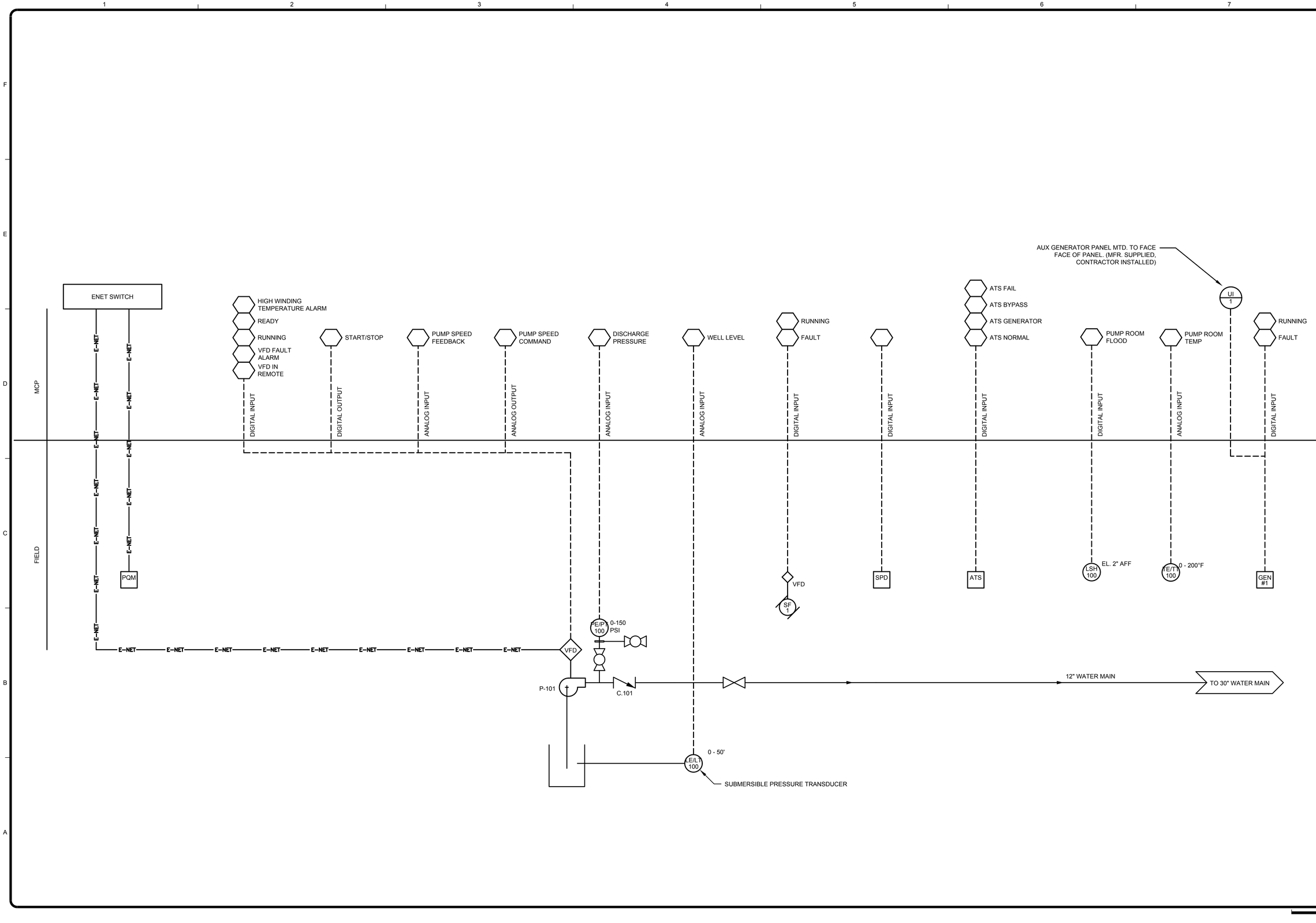
NETWORK ARCHITECTURE

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-600

Bar Measures 1 inch

4/14/2016 1:49:24 PM - \\ERS008FS1 - ROJECTS\IER\31537\200-31537-15005\CAD\SHEETFILES\I-600 NETWORK DIAGRAM.DWG - - SHANK, JASON



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MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

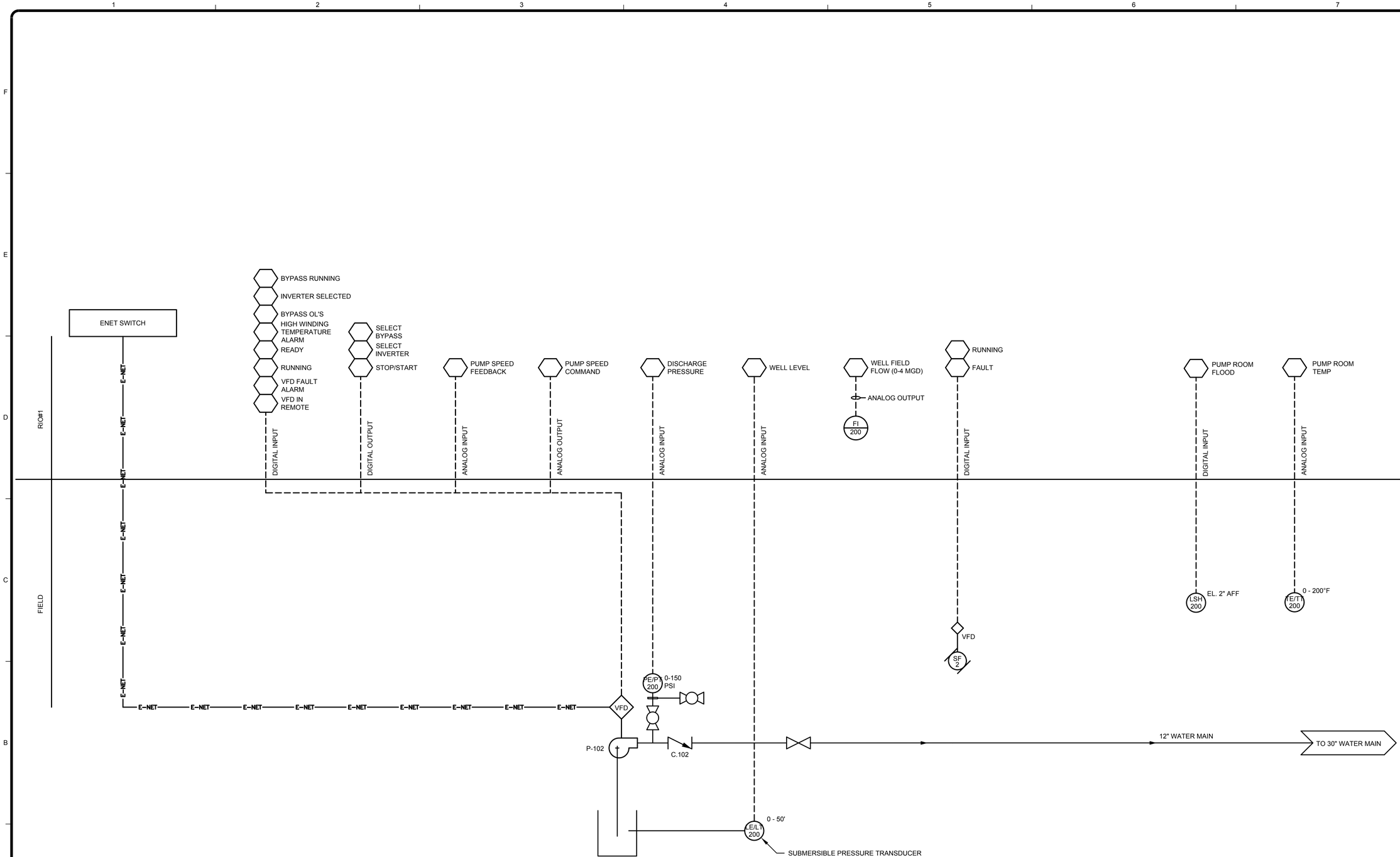
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

P&ID
WELL HOUSE 25W

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-601

Bar Measures 1 inch



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STATE OF MICHIGAN
WILLIAM A PAISON
ENGINEER
No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

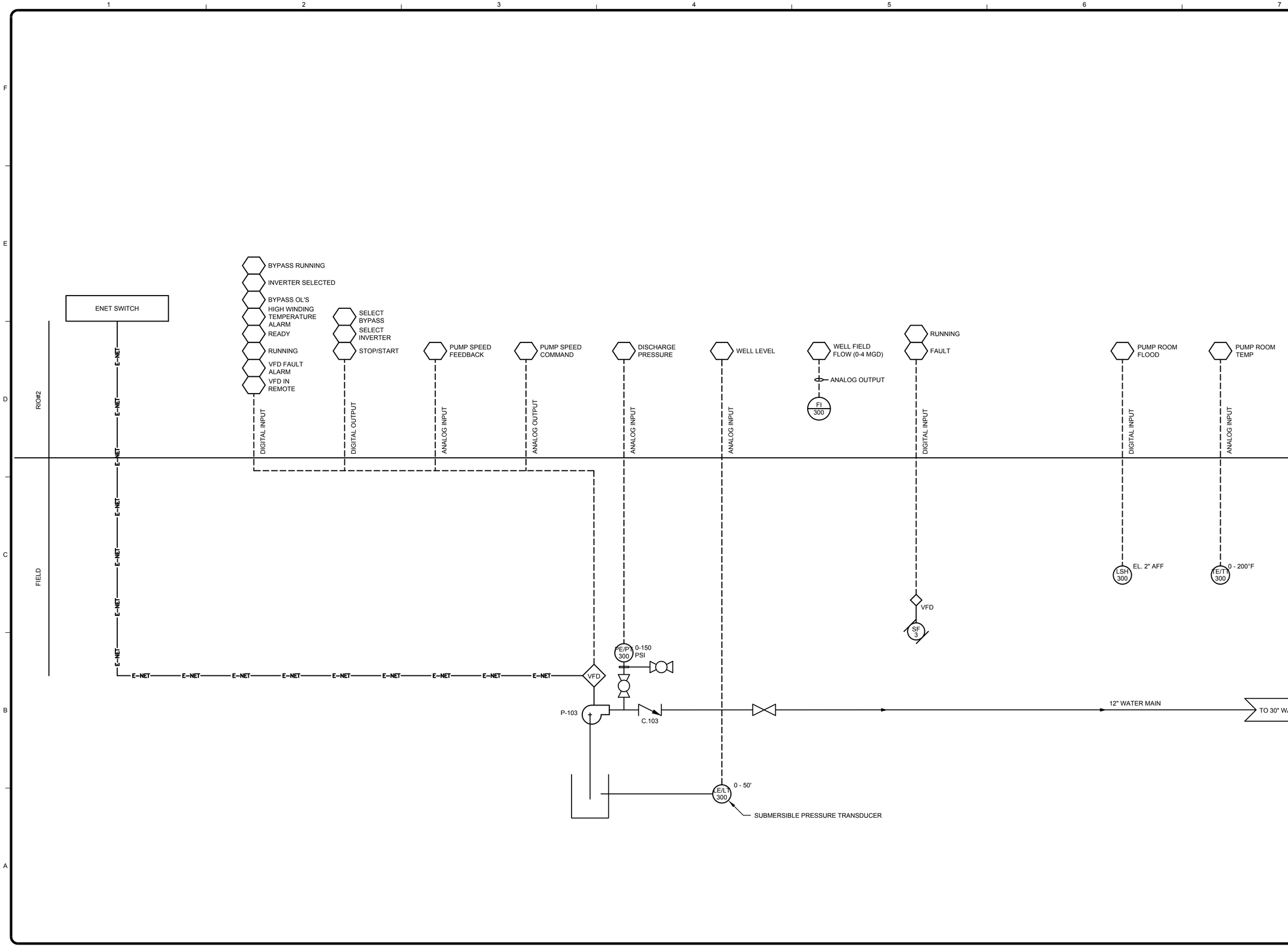
P&ID
WELL HOUSE 21W

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-602

Bar Measures 1 inch

4/14/2016 1:53:16 PM - \\ERS008FS1 - ROJECTS\IER\31537\200-31537-15005\CAD\SHEETFILES\I-602 PNID.DWG - SHANK, JASON



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STATE OF MICHIGAN
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No. 50403
LICENSED PROFESSIONAL ENGINEER
4/15/16

MARK	DATE	DESCRIPTION	BY
	4/15/16	ISSUED FOR BID	

CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

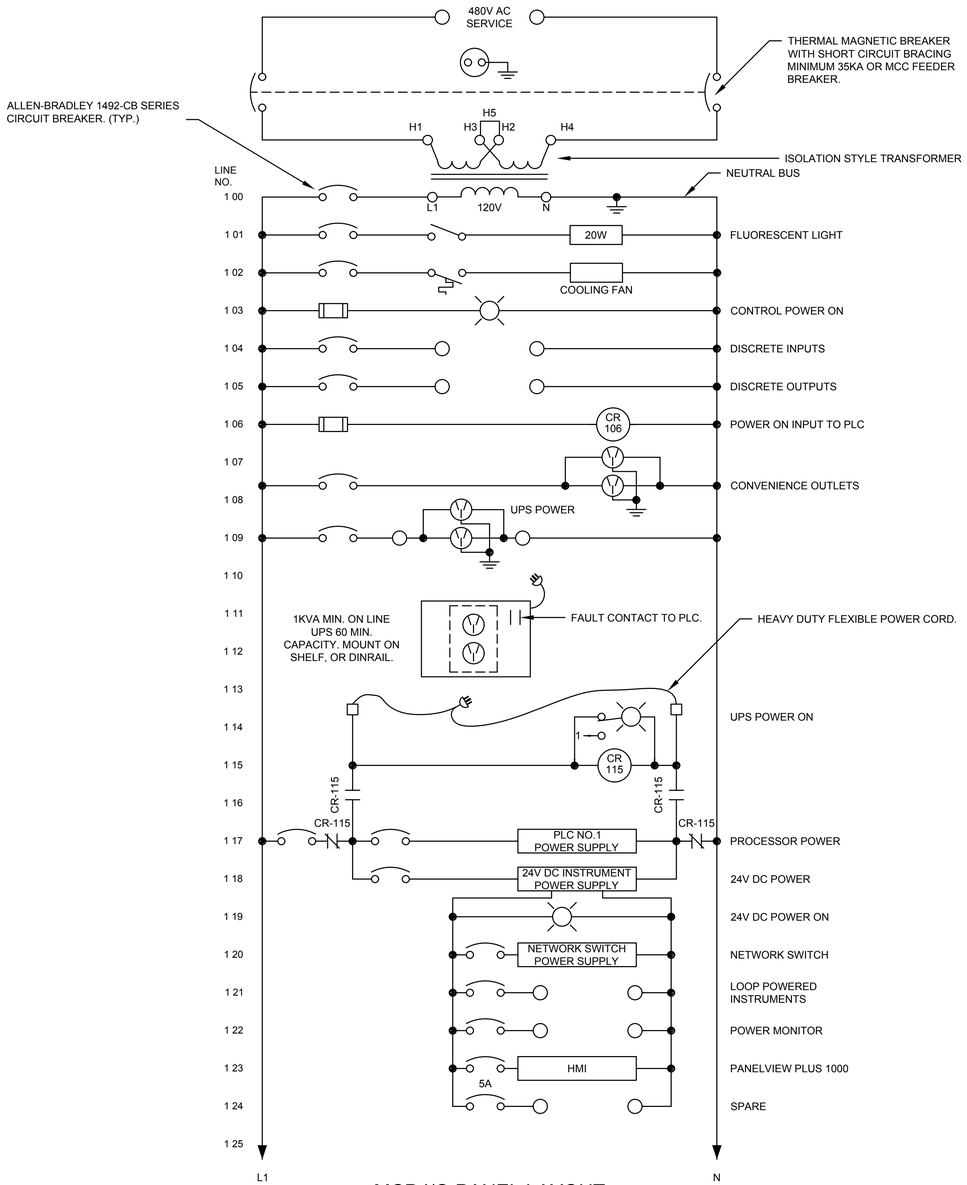
P&ID
WELL HOUSE 741

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-603

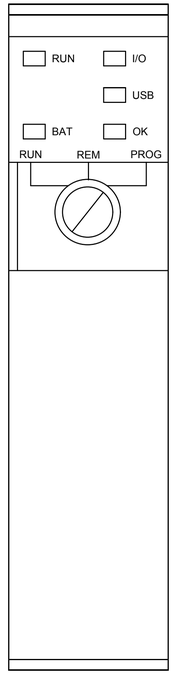
Bar Measures 1 inch

4/14/2016 1:54:29 PM - \\ERS008FS1 - ROJECTS\IER\31537\200-31537-15005\CAD\SHEETFILES\I-603 PNID.DWG - SHANK, JASON

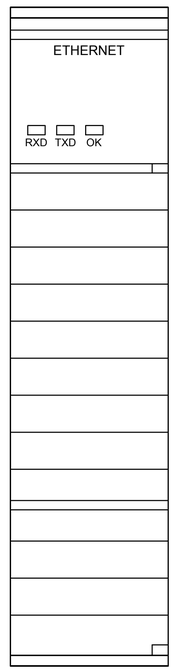


MCP I/O PANEL LAYOUT

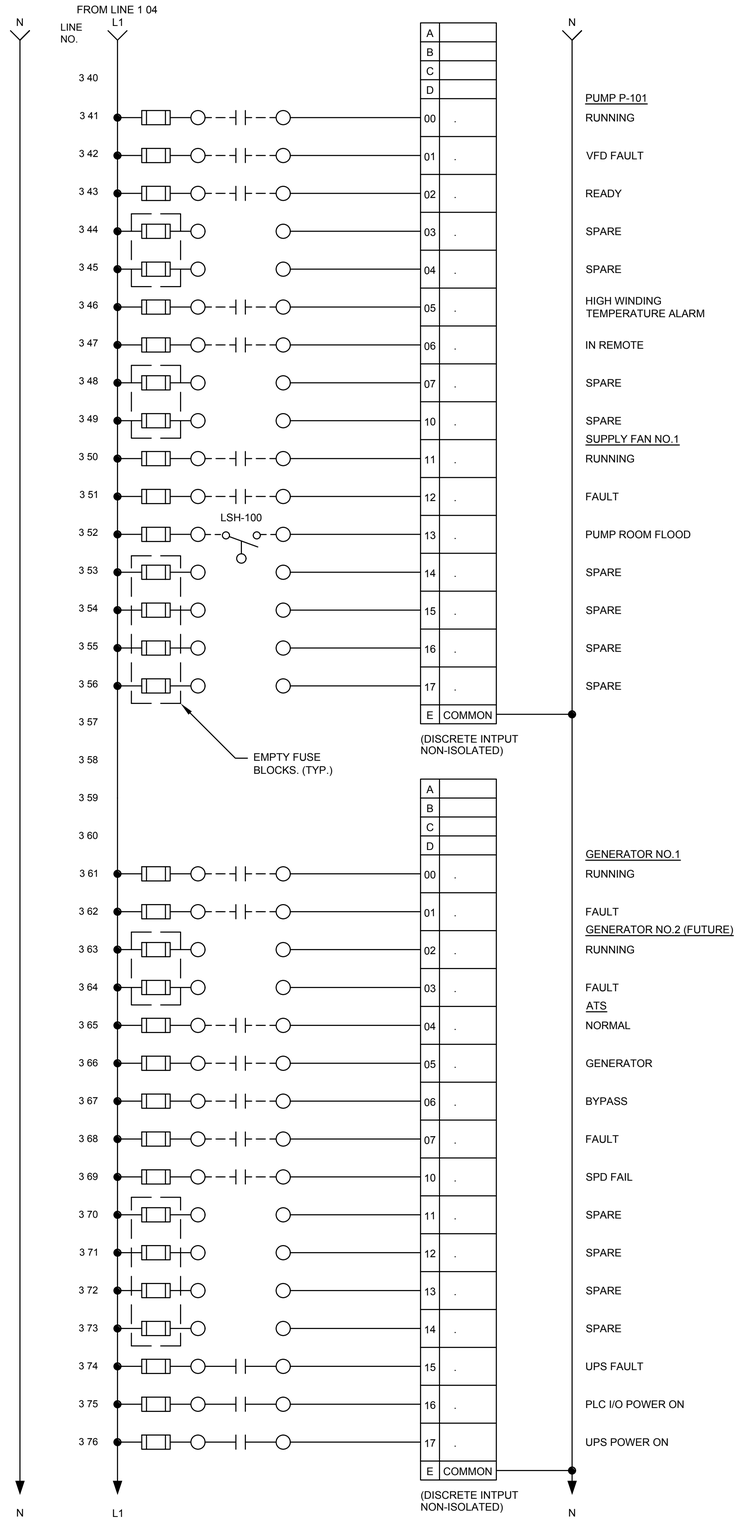
120V AC



SLOT: 0
RACK: 0
1756-L71



SLOT: 1
RACK: 0
1756-EN2T



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710 Avis Drive, Suite 100
Ann Arbor, MI 48106
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CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

MCP I/O LAYOUT

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-701

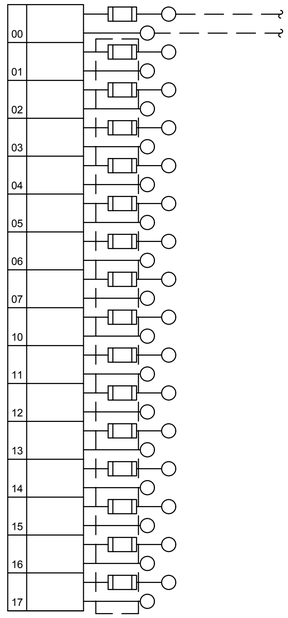
Bar Measures 1 inch

4/14/2016 1:55:55 PM - \\ERS008FS1\...\PROJECTS\IER\31537\200-31537-15005\CAD\SHEETFILES\I-701 MCP I_O.DWG - SHANK, JASON

FRM LINE 1 05

LINE NO. L1

3 80
3 81
3 82
3 83
3 84
3 85
3 86
3 87
3 88
3 89
3 90
3 91
3 92
3 93
3 94
3 95
3 96
3 97
3 98
3 99
4 00
4 01
4 02
4 03
4 04
4 05
4 06
4 07
4 08
4 09
4 10
4 11
4 12
4 13
4 14
4 15
4 16



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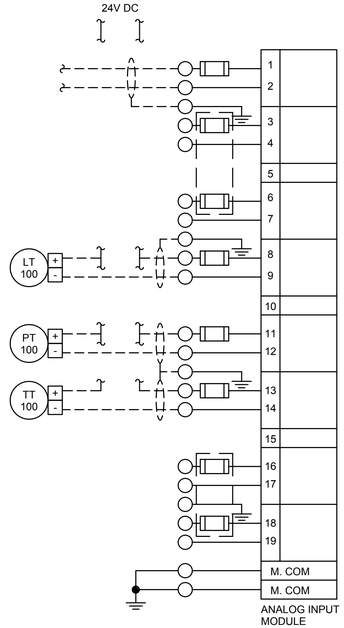

ANALOG INPUT MODULE

L1

N

P-101 START/STOP

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

P-101 SPEED FEEDBACK

SPARE

SPARE

WELL LEVEL (0-50')

DISCHARGE PRESSURE (0-150 PSI)

PUMP ROOM TEMPERATURE (0-200°F)

SPARE

SPARE

N

LINE NO. L1

4 20
4 21
4 22
4 23
4 24
4 25
4 26
4 27
4 28
4 29
4 30
4 31
4 32
4 33
4 34
4 35
4 36
4 37
4 38
4 39
4 40
4 41
4 42
4 43
4 44
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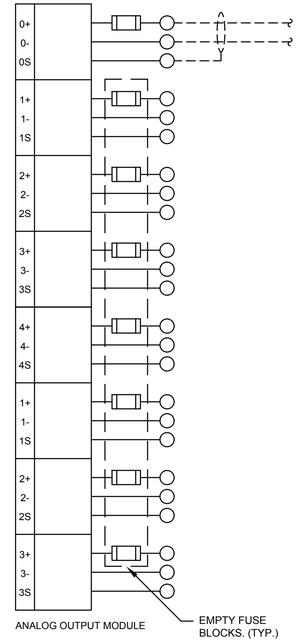
4 51
4 52
4 53
4 54
4 55
4 56



ANALOG OUTPUT MODULE

EMPTY FUSE BLOCKS. (TYP.)

N

P-101 SPEED COMMAND

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

SPARE

L1

N

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710 Avis Drive, Suite 100
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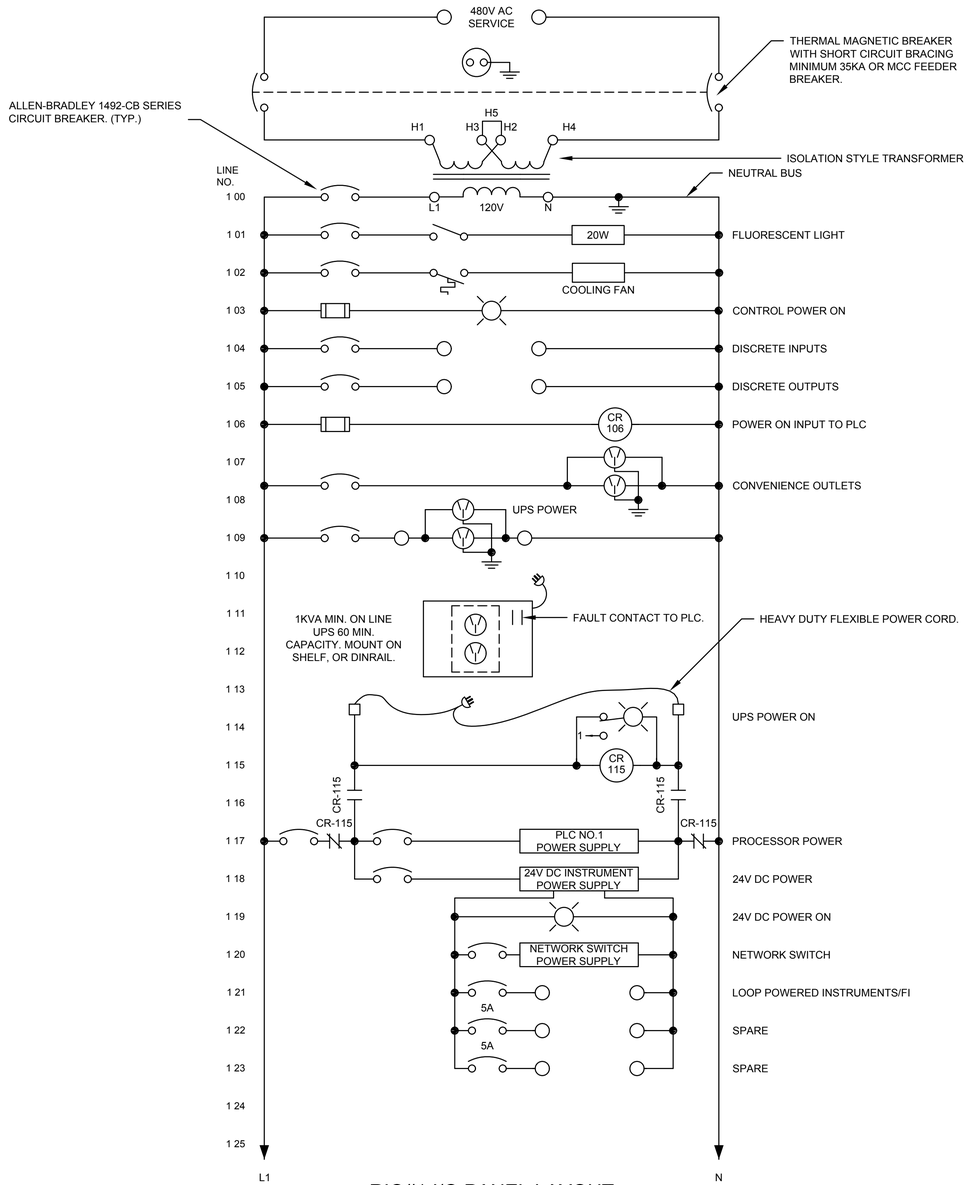
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

MCP I/O LAYOUT

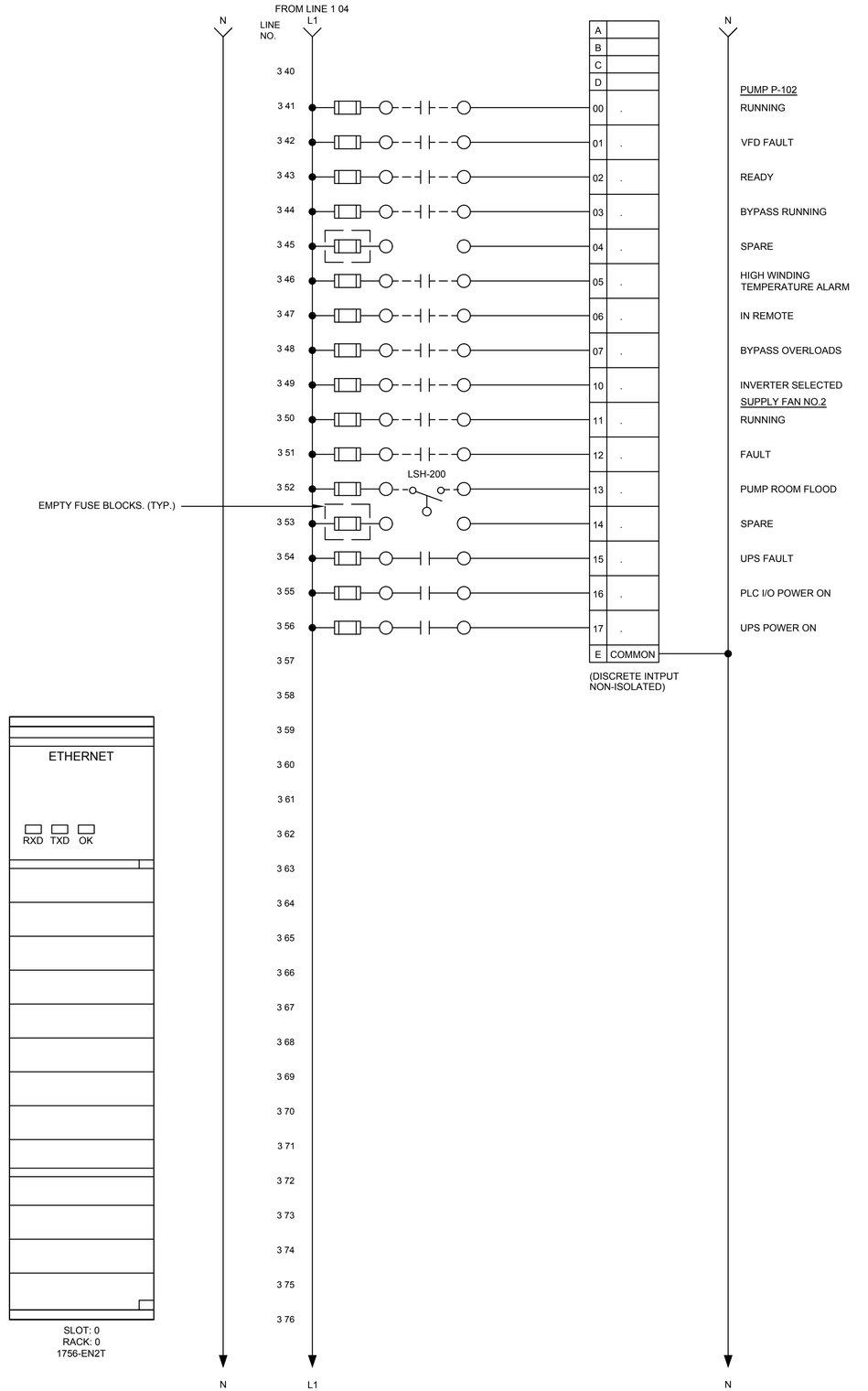
Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-702

Bar Measures 1 inch



RIO#1 I/O PANEL LAYOUT



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Tel 734-665-6000, Fax 734-213-3003

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CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT
RIO#1 I/O LAYOUT

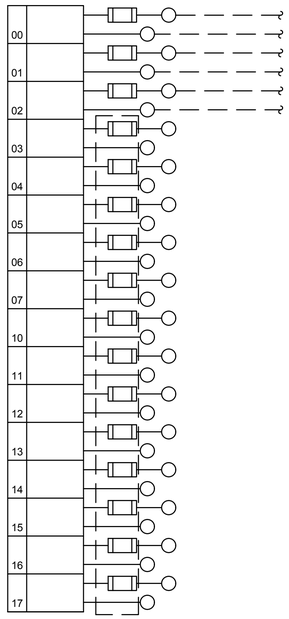
Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-703

Bar Measures 1 inch

FROM LINE 1 05

LINE NO.	L1	N
3 80		
3 81		P-102 START/STOP
3 82		SELECT BYPASS
3 83		SELECT INVERTER
3 84		SPARE
3 85		SPARE
3 86		SPARE
3 87		SPARE
3 88		SPARE
3 89		SPARE
3 90		SPARE
3 91		SPARE
3 92		SPARE
3 93		SPARE
3 94		SPARE
3 95		SPARE
3 96		SPARE
3 97		
3 98		
3 99		
4 00		
4 01		P-102 SPEED FEEDBACK
4 02		SPARE
4 03		
4 04		SPARE
4 05		
4 06		WELL LEVEL (0-50')
4 07		
4 08		DISCHARGE PRESSURE (0-150 PSI)
4 09		
4 10		PUMP ROOM TEMPERATURE (0-200°F)
4 11		
4 12		SPARE
4 13		
4 14		SPARE
4 15		
4 16		



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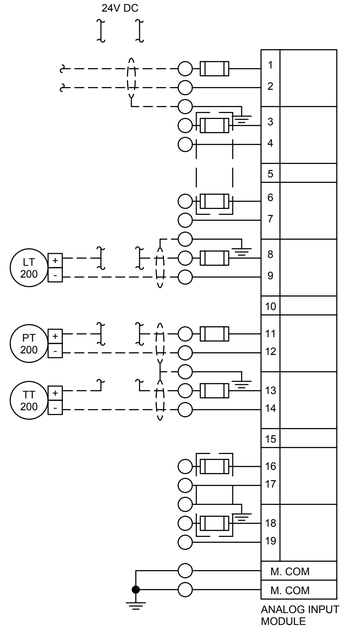
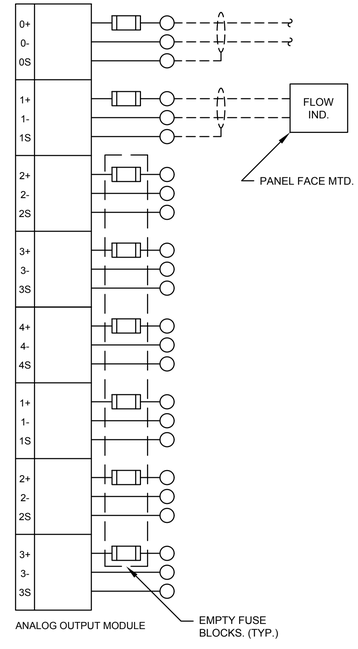


ANALOG INPUT MODULE

LINE NO.	L1	N
4 20		
4 21		
4 22		
4 23		
4 24		
4 25		
4 26		
4 27		
4 28		
4 29		
4 30		
4 31		
4 32		
4 33		
4 34		
4 35		
4 36		
4 37		
4 38		
4 39		P-102 SPEED COMMAND
4 40		
4 41		WELL FIELD FLOW INDICATION (0-4 MGD)
4 42		
4 43		SPARE
4 44		
4 45		SPARE
4 46		
4 47		SPARE
4 48		
4 49		SPARE
4 50		
4 51		SPARE
4 52		
4 53		SPARE
4 54		
4 55		
4 56		



ANALOG OUTPUT MODULE

EMPTY FUSE BLOCKS. (TYP.)

L1 N L1 N

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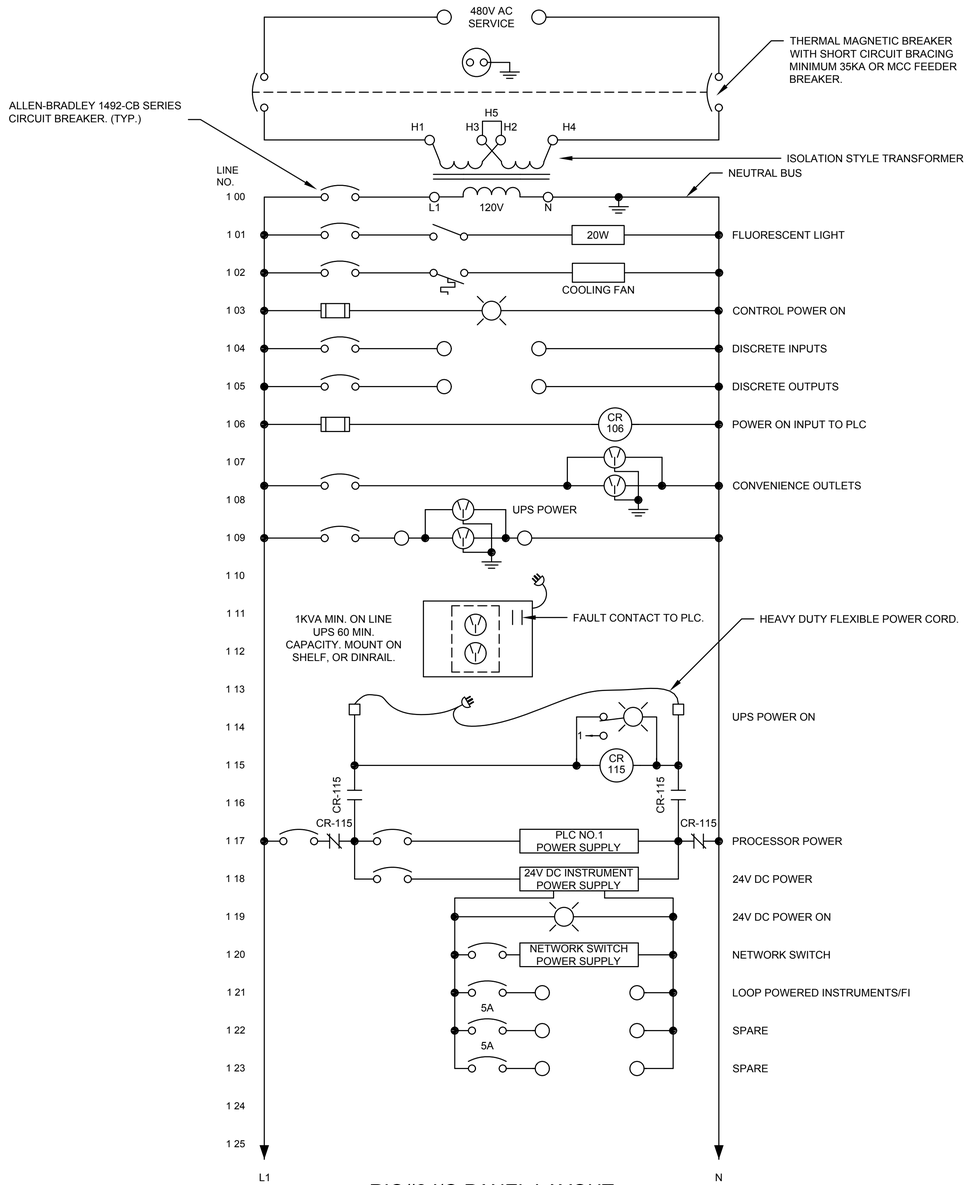
CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

RIO#1 I/O LAYOUT

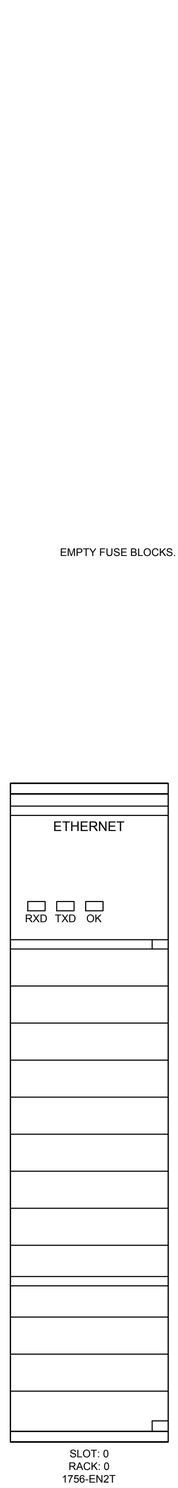
Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-704

Bar Measures 1 inch



RIO#2 I/O PANEL LAYOUT



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CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

RIO#2 I/O LAYOUT

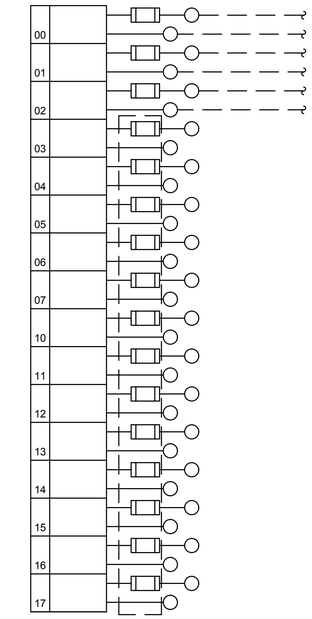
Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-705

Bar Measures 1 inch

FROM LINE 1 05

LINE NO.	L1		N
3 80			
3 81			P-103 START/STOP
3 82			SELECT BYPASS
3 83			SELECT INVERTER
3 84			SPARE
3 85			SPARE
3 86			SPARE
3 87			SPARE
3 88			SPARE
3 89			SPARE
3 90			SPARE
3 91			SPARE
3 92			SPARE
3 93			SPARE
3 94			SPARE
3 95			SPARE
3 96			SPARE
3 97			
3 98			
3 99			
4 00			
4 01			P-103 SPEED FEEDBACK
4 02			SPARE
4 03			
4 04			SPARE
4 05			
4 06			WELL LEVEL (0-50')
4 07			
4 08			DISCHARGE PRESSURE (0-150 PSI)
4 09			
4 10			PUMP ROOM TEMPERATURE (0-200°F)
4 11			
4 12			SPARE
4 13			
4 14			SPARE
4 15			
4 16			



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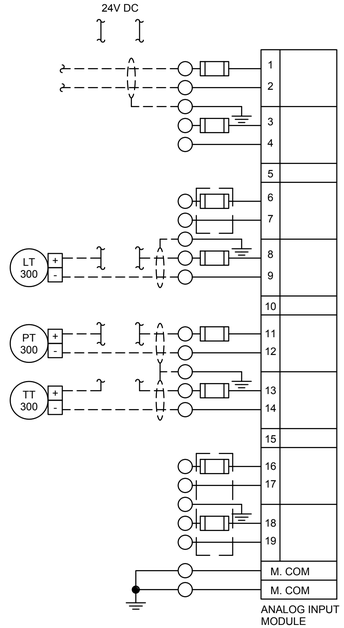
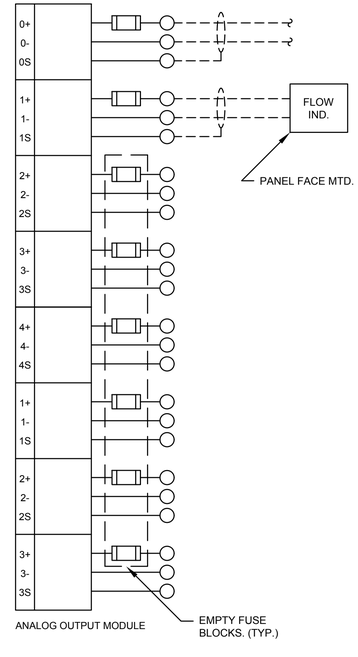


ANALOG INPUT MODULE

LINE NO.	L1		N
4 20			
4 21			
4 22			
4 23			
4 24			
4 25			
4 26			
4 27			
4 28			
4 29			
4 30			
4 31			
4 32			
4 33			
4 34			
4 35			
4 36			
4 37			
4 38			
4 39			P-103 SPEED COMMAND
4 40			
4 41			WELL FIELD FLOW INDICATION (0-4 MGD)
4 42			
4 43			SPARE
4 44			
4 45			SPARE
4 46			
4 47			SPARE
4 48			
4 49			SPARE
4 50			
4 51			SPARE
4 52			
4 53			SPARE
4 54			
4 55			
4 56			



ANALOG OUTPUT MODULE

EMPTY FUSE BLOCKS. (TYP.)

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CITY OF ANN ARBOR, MICHIGAN
STEERE FARM ENGINE REPLACEMENT

RIO#2 I/O LAYOUT

Project No.:	200-31537-15005
Designed By:	WAP
Drawn By:	JLS
Checked By:	GCJ

I-706

Bar Measures 1 inch