

SEH PROJECT NUMBER

126064

CITY

SUPERIOR

# CITY OF SUPERIOR DEPARTMENT OF PUBLIC WORKS

PLAN OF PROPOSED IMPROVEMENT

## LIFT STATION 4 IMPROVEMENTS AND FORCEMAIN REPLACEMENT

N 3RD ST - N 9TH ST (WINTER ST)

### BAXTER AVE

SEH PROJECT NUMBER  
126064

#### SHEET INDEX

1	Title
2	General Notes
C1-C3	Lift Station Plans and Details
E1-E5	Electrical Details
11-14	Quantities and Construction Details
15-19	Plan and Profile

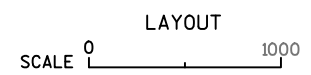
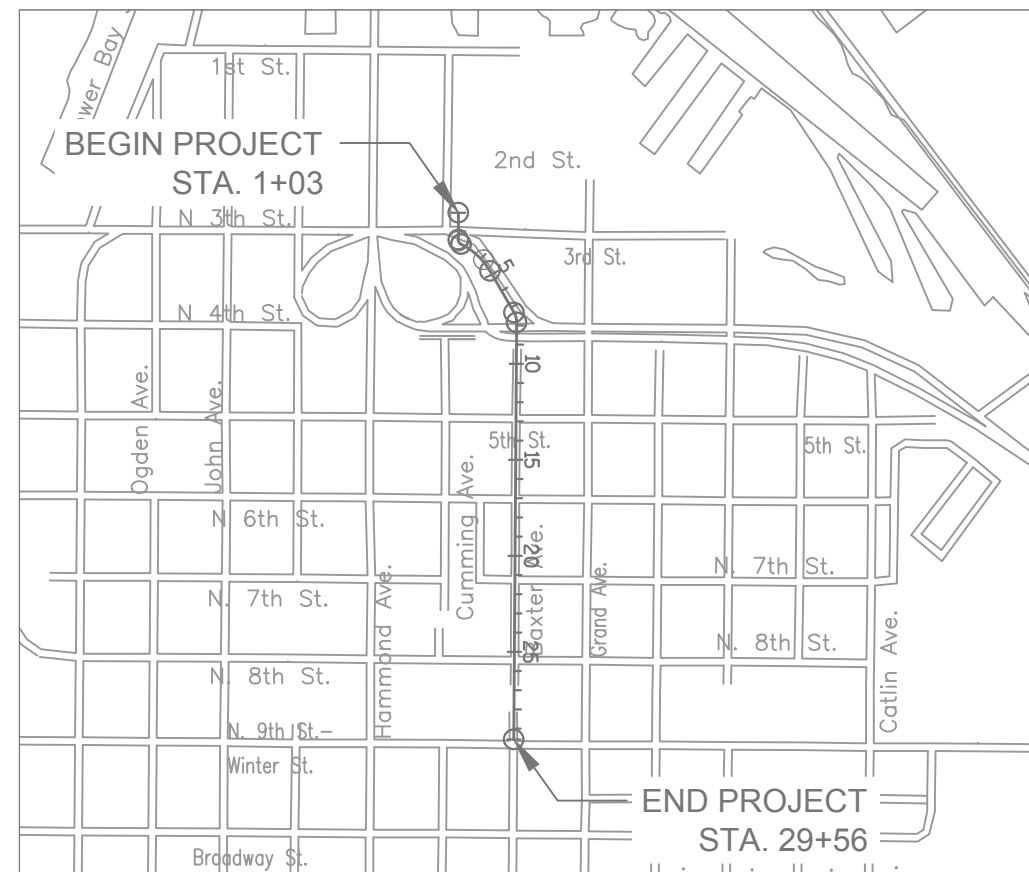
TOTAL SHEETS = 19

**ENGINEER**  
**PROJECT ENGINEER**  
**RESIDENT PROJECT REP.**  
**SURVEYOR**  
**GENERAL CONTRACTOR**  
**SUBCONTRACTORS**  
 DIRECTIONAL PIPE BORING  
 BITUMINOUS  
 EXCAVATING & GRADING  
 EROSION CONTROL  
 TURF ESTABLISHMENT  
 UNDERGROUND UTILITIES  
 (SANITARY FORCEMAIN)  
 ELECTRICAL UPGRADES  
 (LIFT STATION 4)  
 HDPE PIPE FUSING  
 CONCRETE REPAIRS  
 TESTING-UTILITIES  
 YEAR OF CONSTRUCTION

**SHORT ELLIOTT HENDRICKSON INC.**  
**DAN HINZMANN**  
**JEROLD HALDORSON**  
**SHORT ELLIOTT HENDRICKSON INC.**  
**RJS CONSTRUCTION GROUP**

**HANCO UTILITIES**  
**MONARCH PAVING**  
**RJS CONSTRUCTION GROUP**  
**RJS CONSTRUCTION GROUP**  
**RJS CONSTRUCTION GROUP**  
**HANCO-BORE,RJS-MH's/CONNECTS**

**BENSON ELECTRIC**  
**HANCO UTILITIES, RJS**  
**HOVLAND MASONRY**  
**RJS,SEH-SANITARY**  
**2015 & 2016 (RESTORATION)**



TOTAL NET LENGTH OF CENTERLINE = 2,863.36FT

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COUNTY COORDINATES, DOUGLAS COUNTY, NAD83, IN U.S. SURVEY FEET. VALUES ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.

**RECORD DRAWINGS  
UPDATED 03/2016**

#### CONVENTIONAL SYMBOLS

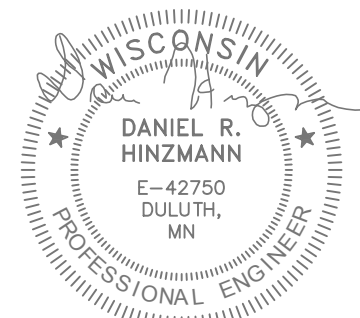
- PLAN
- CORPORATE LIMITS
- PROPERTY LINE
- LOT LINE
- LIMITED HIGHWAY EASEMENT
- EXISTING RIGHT OF WAY
- PROPOSED OR NEW R/W LINE
- SLOPE INTERCEPT
- REFERENCE LINE
- EXISTING CULVERT
- PROPOSED CULVERT (Box or Pipe)
- COMBUSTIBLE FLUIDS
- MARSH AREA
- WOODED OR SHRUB AREA

- PROFILE
- GRADE LINE
- ORIGINAL GROUND
- MARSH OR ROCK PROFILE (To be noted as such)
- SPECIAL DITCH
- GRADE ELEVATION
- CULVERT (Profile View)
- UTILITIES
- ELECTRIC
- FIBER OPTIC
- GAS
- SANITARY SEWER
- STORM SEWER
- TELEPHONE
- WATER
- UTILITY PEDESTAL
- POWER POLE
- TELEPHONE POLE

- ROCK
- LABEL
- 95.36
- E
- FO
- G
- SAN
- SS
- T
- W

**DIGGERS HOTLINE**  
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 TOLL FREE 1-800-242-8511  
 MILW. AREA (414) 259-1181  
 TDD 1-800-542-2289

PLANS PREPARED BY:



05/05/2015

CITY OF SUPERIOR  
DEPARTMENT OF PUBLIC WORKS

PREPARED BY

Designer DRH  
 Project Manager CMW

APPROVED FOR THE CITY

DATE: \_\_\_\_\_ (Signature)

**E**

STANDARD ABBREVIATIONS

ABUT	ABUTMENT	MIN	MINIMUM
AC	ACRE	mm	MILLIMETER
ADT	AVERAGE DAILY TRAFFIC	M/L	MATCH LINE
AEW	APRON ENDWALL	MV	MEDIUM VOLUME
AH	AHEAD	N	NORTH
APPRX	APPROXIMATELY	N	NORTH GROUND COORDINATE
ASPH	ASPHALTIC	NB	NORTHBOUND
AV	AVENUE	NO	NUMBER
BK	BACK	NOM	NOMINAL
BLDG	BUILDING	NOR	NORMAL
BLVD	BOULEVARD	OD	OUTSIDE DIAMETER
BM	BENCHMARK	OGBC	OPEN GRADED BASE COURSE
BR	BRIDGE	PAVT	PAVEMENT
C	CURVE	PC	POINT OF CURVATURE
CABC	CRUSHED AGGREGATE BASE COURSE	PCC	POINT OF COMPOUND CURVATURE
CB	CATCH BASIN	PCC	PORTLAND CEMENT CONCRETE
CC	CENTER-TO-CENTER	PCP	PIPE CATTLE PASS
CE	COMMERCIAL ENTRANCE	PE	PRIVATE ENTRANCE
C & G	CURB AND GUTTER	PI	POINT OF INTERSECTION
CL	CLASS	PK	PARKER-KALON NAIL
CL	CENTERLINE	PL	PROPERTY LINE
CMP	CORRUGATED METAL PIPE	PLE	PERMANENT LIMITED EASEMENT
CO	COUNTY	POC	POINT ON CURVE
CONC	CONCRETE	POT	POINT ON TANGENT
CP	CULVERT PIPE	PRC	POINT OF REVERSE CURVATURE
CR	CREEK	PSD	PASSING SIGHT DISTANCE
CTH	COUNTY TRUNK HIGHWAY	PT	POINT
CWT	HUNDREDWEIGHT	PT	POINT OF TANGENT
CY	CUBIC YARD	PVC	POINT OF VERTICAL CURVATURE
D	DEGREE OF CURVE	PVC	POLYVINYL CHLORIDE
D	DIRECTIONAL DISTRIBUTION	PVI	POINT OF VERTICAL INTERSECTION
DG	DITCH GRADE	PVT	POINT OF VERTICAL TANGENT
DHV	DESIGN HOUR VOLUME	R	RADIUS
DIA	DIAMETER	R	RIVER
DR	DRIVEWAY	RCCP	REINFORCED CONCRETE CULVERT PIPE
E	EAST GROUND COORDINATE	RD	ROAD
E	EAST	RCPS	REINFORCED CONCRETE PIPE STORM SEWER
E	UNDER GROUND ELECTRIC	REQ'D	REQUIRED
EA	EACH	RES	RESIDENCE OR RESIDENTIAL
EB	EASTBOUND	RHF	RIGHT-HAND FORWARD
EBS	EXCAVATION BELOW SUBGRADE	RP	RADIUS POINT
ELEV	ELEVATION	RP	REFERENCE POINT
ESALS	EQUIVALENT SINGE AXLE LOADS	RR	RAILROAD
EW	ENDWALL	RT	RIGHT
EXIST	EXISTING	R/L	REFERENCE LINE
FE	FIELD ENTRANCE	R/W	RIGHT-OF-WAY
FERT	FERTILIZE	S	SOUTH
FF	FACE TO FACE	SAN	SANITARY SEWER
FL	FLAG LINE	SAN S	SANITARY SEWER SERVICE
F/L	FLOW LINE	SB	SOUTHBOUND
FO	FIBER OPTIC	SDD	STANDARD DETAIL DRAWINGS
FT	FEET	SF	SQUARE FEET
G	GAS	SHLDR	SHOULDER
GN	GRID NORTH	SQ	SQUARE
GRAV	GRAVEL	SS	STORM SEWER
GV	GATE VALVE	SSD	STOPPING SIGHT DISTANCE
		SST	STAINLESS STEEL
ha	HECTARE	STA	STATION
HR	HANDICAP RAMP	STH	STATE TRUNK HIGHWAY
HV	HIGH VOLUME	SW	SIDEWALK
HYD	HYDRANT	SY	SQUARE YARD
ID	INSIDE DIAMETER	T	TANGENT
INL	INLET	T	TELEPHONE
INV	INVERT	T	TRUCKS
IP	IRON PIPE OR PIN	TC	TOP OF CURB
kg	KILOGRAM	TEMP	TEMPORARY
km	KILOMETER	TLE	TEMPORARY LIMITED EASEMENT
kPa	KILOPASCAL	TOC	TOP OF CASTING
L	LITER	TYP	TYPICAL
L	LENGTH OF CURVE	UG	UNDERGROUND CABLE
Lb	POUND	USH	UNITED STATES HIGHWAY
LC	LONG CHORD OF CURVE	V	DESIGN SPEED
LF	LINEAR FOOT	VAR	VARIABLE
LHE	LIMITED HIGHWAY EASEMENT	VC	VERTICAL CURVE
LHF	LEFT-HAND FORWARD	VP	VITRIFIED CLAY PIPE
LS	LUMP SUM	W	WEST
LT	LEFT	WB	WESTBOUND
LV	LOW VOLUME	WM	WATER MAIN
m	METER	WS	WATER SERVICE
m2	SQUARE METER	WV	WATER VALVE
m3	CUBIC METER	X	EAST GRID COORDINATE
MAX	MAXIMUM	Y	NORTH GRID COORDINATE
MH	MANHOLE		
Mg	MEGAGRAM	YD	YARD

GENERAL NOTES:

THE LOCATION OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.

CONTRACTOR TO VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. ANY REQUIRED UTILITY WORK SHALL BE COORDINATED BY THE CONTRACTOR.

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT THE APPROVAL OF THE ENGINEER OUTSIDE OF THOSE SPECIFIED IN THIS PLAN.

A VERTICAL SAWCUT SHALL BE MADE THROUGH EXISTING DRIVEWAYS AND PAVEMENTS AT REMOVAL LIMITS.

ALL AREAS DISTURBED OUTSIDE OF THE PROJECT LIMITS SHALL BE RESTORED TO THE ORIGINAL CONDITION AT NO COST TO THE CITY. THIS SHALL INCLUDE AREAS DESIGNATED FOR STAGING AND ANY SWEEPING AS DIRECTED BY THE ENGINEER.

DESIGN CONTACT

SEH INC.  
418 WEST SUPERIOR ST  
SUITE 200  
DULUTH, MN 55802-1512  
TELEPHONE: 218.279.3000  
ATTENTION: DAN HINZMANN  
EMAIL: DHINZMANN@SEHINC.COM

DIGGERS HOTLINE  
2040 WEST WISCONSIN AVENUE  
SUITE 10  
MILWAUKEE, WISCONSIN 53233  
TELEPHONE: 1.800.242.8511

UTILITY CONTACTS

SUPERIOR WATER, LIGHT & POWER CO.  
2915 HILL AVENUE  
P.O. BOX 519  
SUPERIOR, WISCONSIN 54880  
TELEPHONE: 218.355.5949  
ATTENTION: JAMIE MEHLE (WATER & GAS), KEVIN HABERMAN (ELECTRIC)  
EMAIL: JMEHLE@SWLP.COM, KHABERMAN@MNPOWER.COM

CHARTER COMMUNICATIONS  
302 E, SUPERIOR STREET  
DULUTH, MINNESOTA 55802  
TELEPHONE: 218.529.7961  
ATTENTION: ALAN SEIFERT

CITY OF SUPERIOR  
PUBLIC WORKS  
SUPERIOR, WISCONSIN 54880  
TELEPHONE: 715.935.7334  
ATTENTION: TODD JANIGO  
EMAIL: PUBLICWORKS@CI.SUPERIOR.WI.US

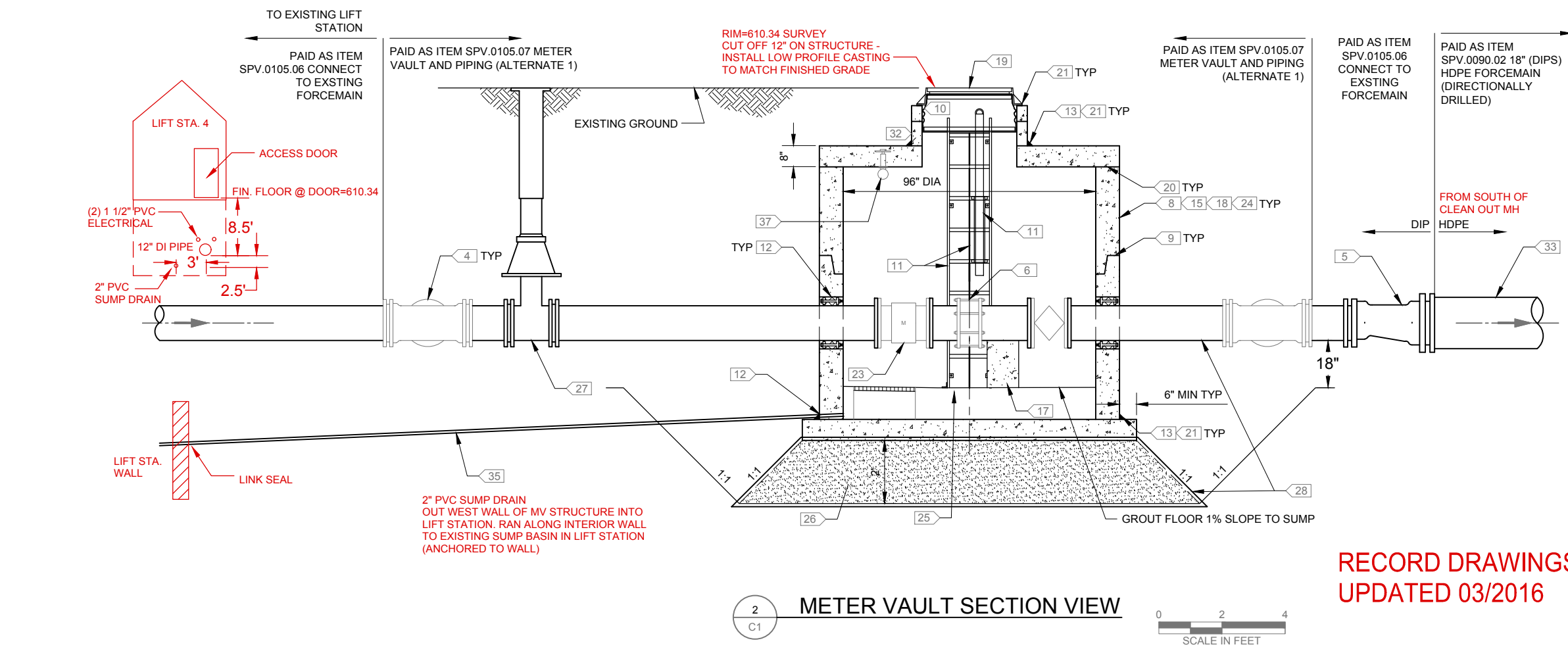
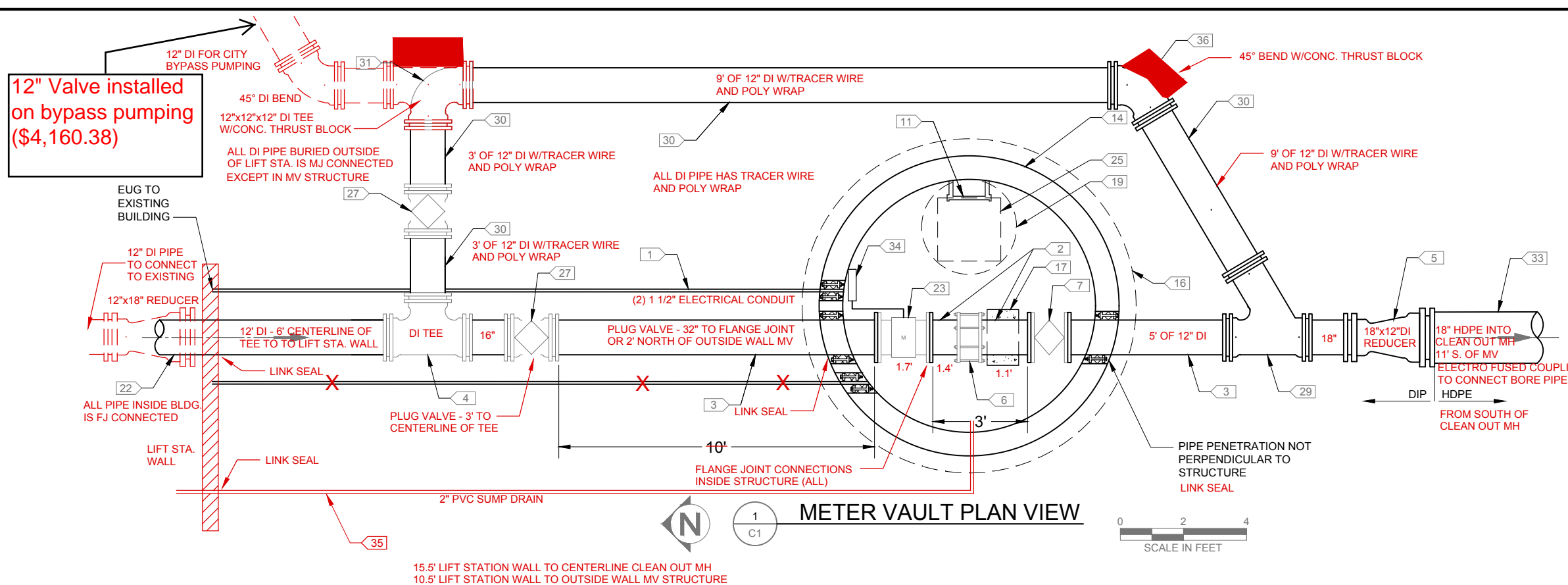
CENTURYTEL SERVICE GROUP  
135 N. 21ST STREET  
SUPERIOR, WISCONSIN 54880  
ENGINEERING TELEPHONE: 715.392.0033  
ATTENTION: ARNOLD MILLER  
EMAIL: ARNOLD.MILLER@CENTURYTEL.COM

WISCONSIN DEPARTMENT OF TRANSPORTATION  
1701 N. 4TH STREET  
SUPERIOR, WISCONSIN 54880  
TELEPHONE: 715.392.7925

**RECORD DRAWINGS  
UPDATED 03/2016  
NO SHEET CHANGES**

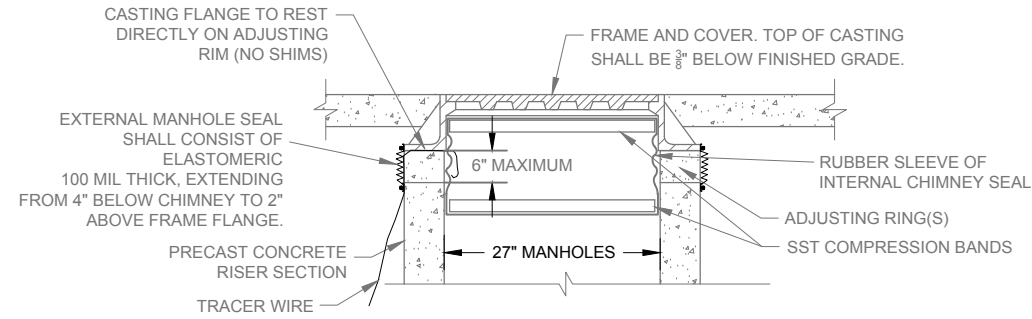
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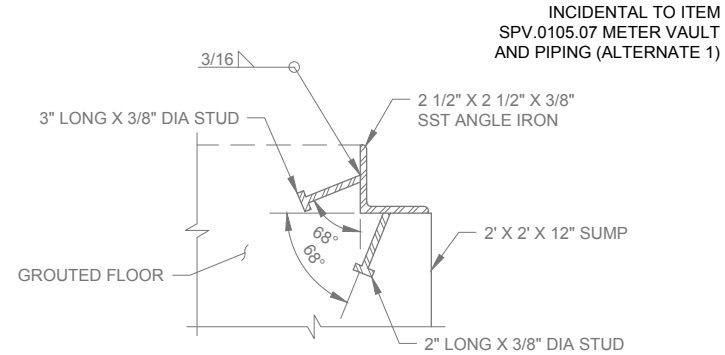


- GENERAL NOTES:**
- ALL FITTINGS OUTSIDE OF STRUCTURE (BURIED) SHALL BE MJ.
  - ALL FITTINGS INSIDE OF STRUCTURE SHALL BE FJ.
  - ALL GASKETS FOR DIP SHALL BE STYRENE BUTADIENE COPOLYMER (SBR).
  - METER STATION TO BE PRECAST CONCRETE.
  - ALL BURIED BENDS SHALL HAVE JOINT RESTRAINTS.
  - ALL BURIED FITTINGS SHALL HAVE RESTRAINED MJ.
  - ENSURE POSITIVE AND UNIFORM SLOPE THROUGH METER VAULT.
- KEYNOTES:**
- PROVIDE TWO (2) 1" CONDUITS TO EXISTING BUILDING. SEE ELECTRICAL SHEET.
  - PROVIDE 12" FJ X FE CLASS 250 DIP.
  - PROVIDE 12" MJ X FJ DIP. POLY WRAP.
  - PROVIDE 12" X 12" CLASS 250 DIP MJ TEE
  - PROVIDE 18" X 12" ECCENTRIC MJ CLASS 250 DIP REDUCER. MATCH CROWN ELEVATIONS. 3  
C3
  - PROVIDE 12" DIP COUPLING.
  - PROVIDE 12" CLASS 250 DIP FJ PLUG VALVE.
  - CONTRACTOR SHALL VERIFY DEPTH OF STRUCTURE PRIOR TO ORDERING.
  - STRUCTURE JOINT. CORE DRILLING AT JOINTS IS NOT PERMITTED. PROVIDE BUTYL RUBBER MASTIC STRIP SEAL, RUBBER GASKET AND EXTERNAL WRAP SEAL AT ALL CONCRETE JOINTS. 1  
C2
  - PROVIDE INTERNAL AND EXTERNAL CHIMNEY SEAL. 1  
C3
  - PROVIDE ACCESS LADDER AND SST CHAIN TO FRP GRATING. 4  
C3
  - LINK SEAL
  - MODULAR MECHANICAL SEAL WALL PENETRATION AND CONNECTION. VERIFY PIPE ELEVATION PRIOR TO CORE DRILLING. 4  
C3
  - CEMENT MORTAR ALL AROUND.
  - METER STRUCTURE. APPLY PROTECTIVE COATINGS TO ENTIRE METER STRUCTURE INTERIOR. SEE SPEC. 13.3.30
  - PROVIDE 96" DIA PRECAST CONCRETE SECTIONS.
  - PROVIDE 127" DIA PRECAST REINFORCED CONCRETE BASE SLAB - 8" THICK. 4  
C2
  - PROVIDE CONCRETE PIPE SUPPORT. **MODIFIED TO FIT**
  - LIFTING HOLES WHICH PENETRATE THROUGH SECTION WALLS ARE NOT PERMITTED. (LOW PROFILE TYPE)
  - PROVIDE FRAME AND COVER, HEAVY DUTY 32" SOLID LID TOP SLAB/STRUCTURE JOINT. PROVIDE BUTYL RUBBER MASTIC STRIP SEAL AND EXTERNAL WRAP SEAL AT JOINT.
  - PROVIDE 2 RINGS OF 1/4" GASKET MATERIAL UNDER CASTING AND AT BASE SLAB CONNECTION.
  - 12" DIP FORCEMAIN. CONNECT TO EXISTING 8" PIPE IN DRY WELL. 2  
C3
  - INSTALL 12" MAGNETIC FLOW METER. PROVIDED BY OWNER
  - CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO ACI DESIGNATION 318. PRECAST SECTIONS SHALL CONFORM TO ASTM DESIGNATION C-478.
  - PROVIDE REMOVABLE 2" FRP GRATING OVER 2' X 2' X 12" SUMP. 2  
C2
  - BACKFILL WITH OPEN GRADED ROCK WRAPPED IN TYPE SAS GEOTEXTILE WISDOT 645.
  - PROVIDE 12" CLASS 250 DIP MJ PLUG VALVE AND BOX.
  - WRAP TYPE SAS GEOTEXTILE FABRIC AROUND EXCAVATION TO TYPICAL FORCEMAIN PIPE BEDDING.
  - PROVIDE 12" X 12" WYE CONNECTION
  - PROVIDE 12" MJ CLASS 250 DIP. POLY WRAP.
  - PROVIDE 12" DIP 90° MJ BEND. DI TEE FOR BYPASS CONNECT
  - PROVIDE 36" DIA PRECAST CONCRETE RISER.
  - 18" HDPE FORCEMAIN. **WATER TIGHT FLOW METER PULL BOX**
  - INSTALL METER BOX. SEE ELECTRICAL FOR DETAILS.
  - PROVIDE 2" SDR-35 PVC AT STRUCTURE SUMP. ENSURE PIPE DRAINS TO LIFT STATION DRY WELL (1.0% MIN.) PIPE FLOW DIRECTLY TO SUMP PUMP WITHIN DRY WELL. CONTRACTOR SHALL USE CRUSHED ROCK BEDDING WRAPPED IN TYPE SAS GEOTEXTILE WISDOT 645.
  - PROVIDE 12" DIP 45° MJ BEND. 6  
C2
  - PROVIDE SHOULDER NUT EYEBOLT.

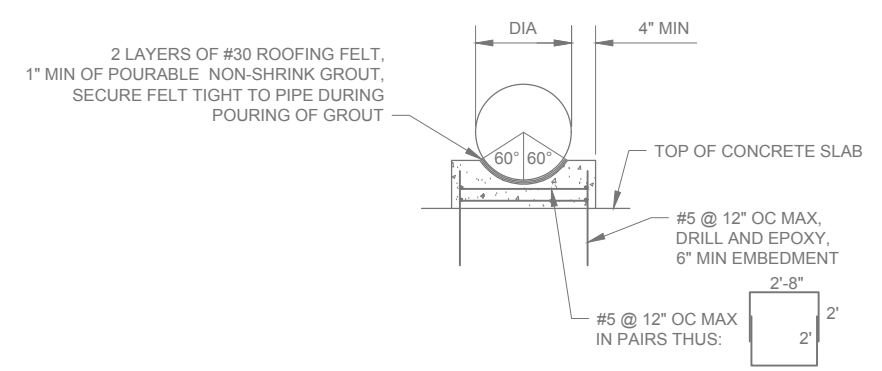
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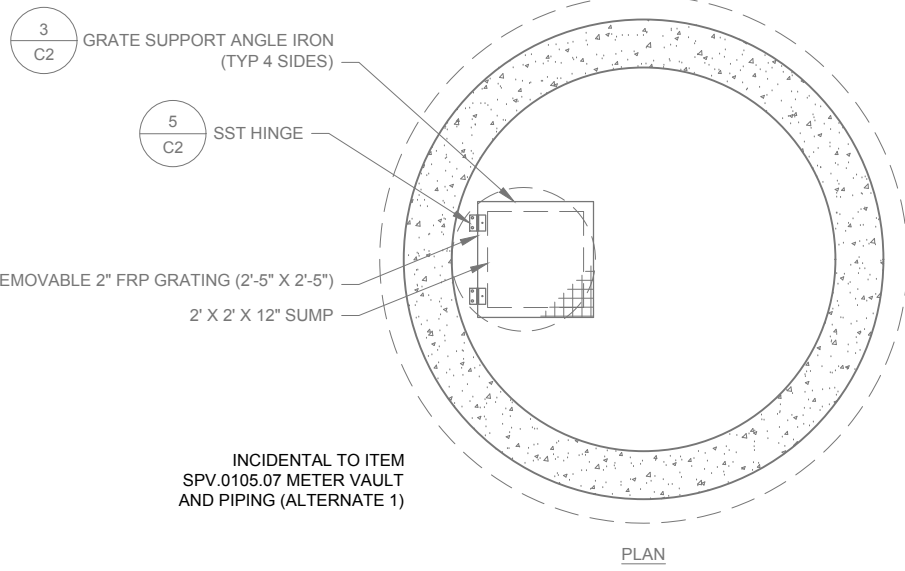
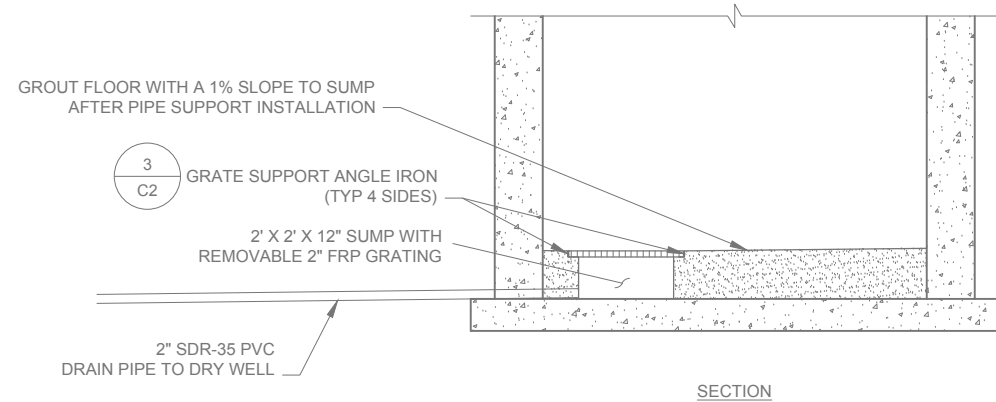
1 INTERNAL & EXTERNAL CHIMNEY SEAL  
NO SCALE



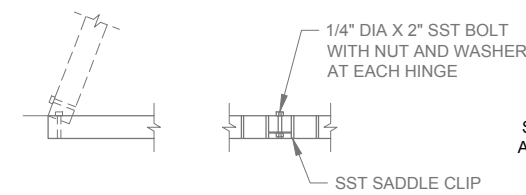
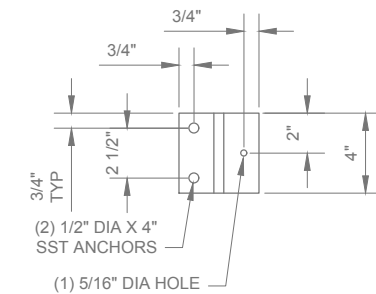
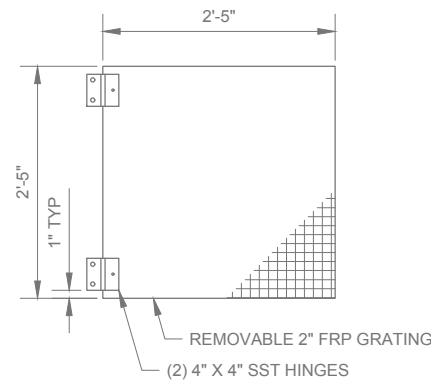
3 GRATE SUPPORT ANGLE IRON  
NO SCALE



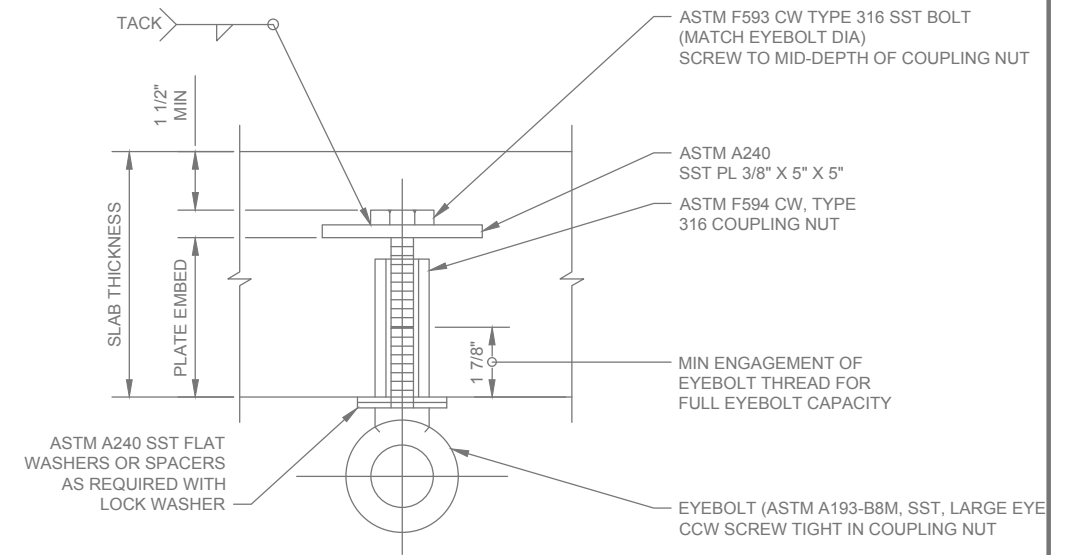
4 CONCRETE PIPE SUPPORT  
NO SCALE



2 METER VAULT SUMP & FRP GRATING  
NO SCALE



5 SST HINGE CONNECTION  
NO SCALE



TYPICAL EYEBOLT NOTES:

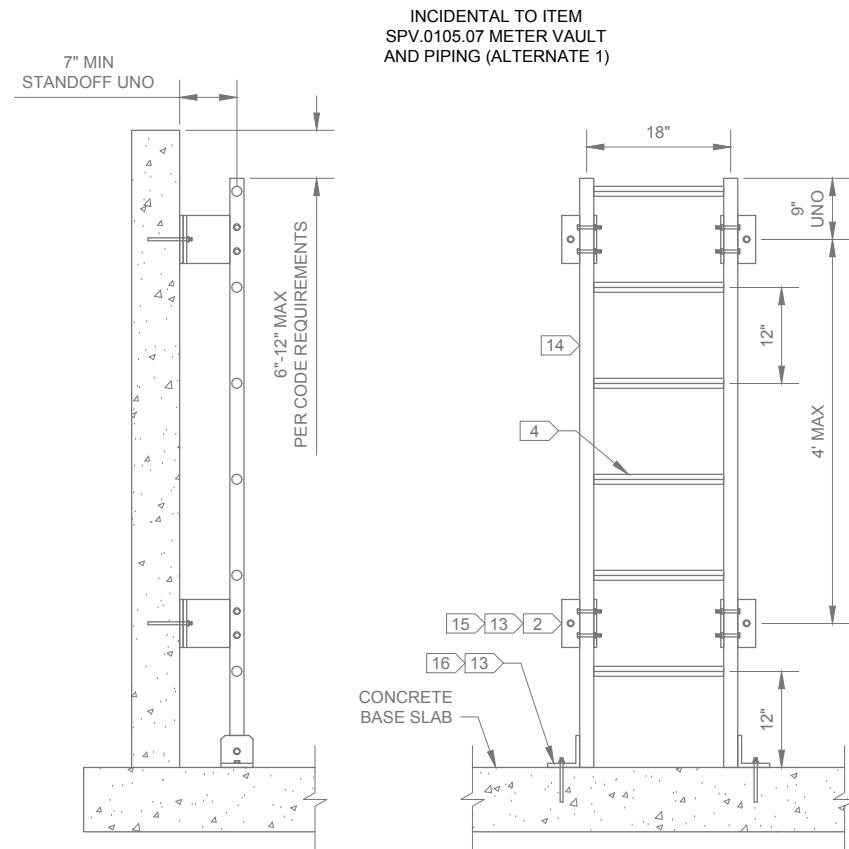
1. ALIGN EYEBOLT PLANE WITH DIRECTION OF LOADING. SEAT SHOULDER FIRMLY AGAINST MATING SURFACE; USE WASHERS OR SPACERS AS REQUIRED.
2. DO NOT PAINT OR GALVANIZE EYEBOLT.
3. TAG EYEBOLT WITH SAFE WORK LOAD. TAG AND WIRE TO BE CORROSION RESISTANT METAL.

SAFE VERTICAL WORK LOAD (LBS)	SAFE WORKING LOAD @ 45% MAX (LBS)	MIN SLAB THICKNESS (IN)	MIN PLATE EMBED (IN)	COUPLING NUT SIZE DIA X MIN LENGTH (IN)	EYEBOLT SIZE (IN)
8000	2000	8	6	1 X 4	1 1/2

6 TYPICAL STAINLESS STEEL EYEBOLT  
NO SCALE

INCIDENTAL TO ITEM SPV.0105.07 METER VAULT AND PIPING (ALTERNATE 1)  
**RECORD DRAWINGS  
UPDATED 03/2016**



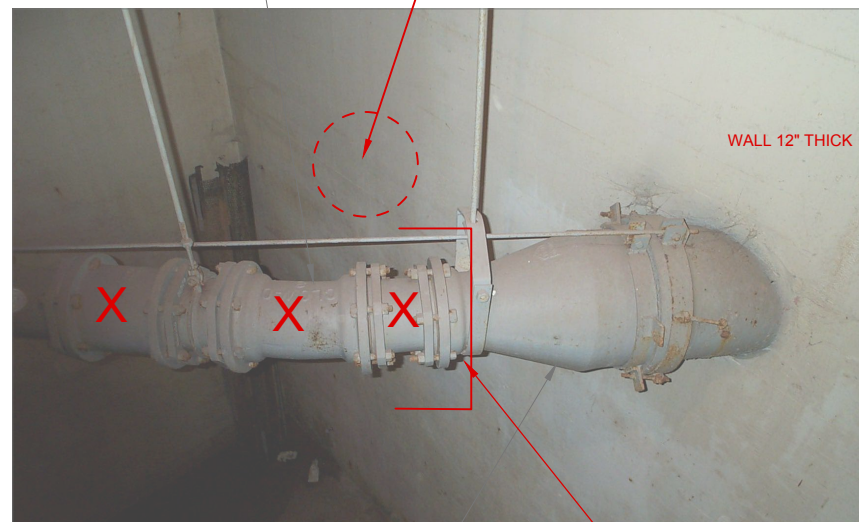


1 FRP ACCESS LADDER  
C3 NO SCALE

CONNECT TO EXISTING 8" PIPE IN DRY WELL. EXACT LOCATION OF CONNECTION TO BE DETERMINED BY CONTRACTOR AND APPROVED BY THE ENGINEER

INSTALLED SLEEVE TO ALIGN/SEAL CONNECTION FROM WALL. INSTALLED PIPE HANGER SUPPORTS

NEW PIPE 12" THRU WALL. REDUCER TO 8" DI PIPE (FJ) TO EXISTING 8" AT WYE

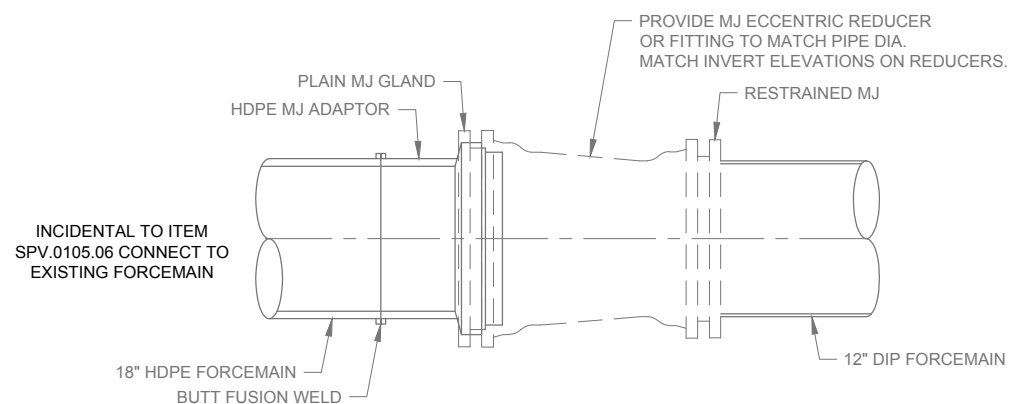


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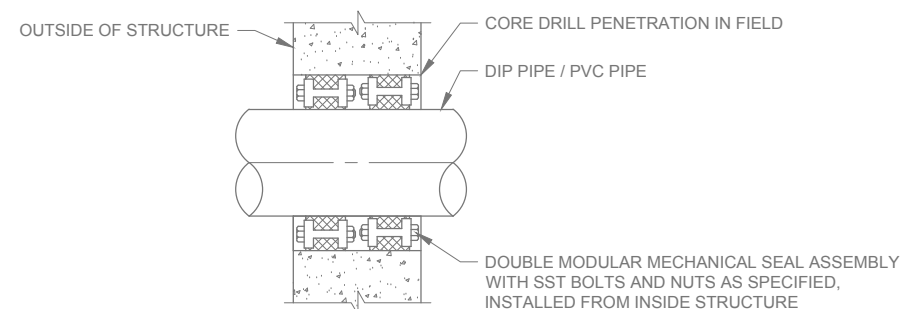
- SHALL BE INCIDENTAL TO SPV.0105.06 CONNECT TO EXISTING FORCEMAIN.
  - WORK INCLUDES NEW PENETRATIONS THROUGH EXISTING DRY WELL WALL FOR NEW 12" DIP AND 2" PVC.
- FITTINGS AND BENDS REQUIRED TO CONNECT TO EXISTING 8" PIPE ARE INCIDENTAL. ALL PENETRATIONS THROUGH LIFT STATION SEAL WALLS SHALL INCLUDE CORE DRILLING AND MODULAR SEAL. MECHANICAL WALL PENETRATION SEAL - DETAIL

4  
C3

2 CONNECTION TO EXISTING FORCEMAIN  
C3 NO SCALE



3 HDPE TO DIP TRANSITION  
C3 NO SCALE



MODULAR MECHANICAL WALL PENETRATION SEAL NOTES:

- EACH CONDUIT/PIPE SHALL HAVE A SEPARATE CORE DRILLED HOLE.
- DEPENDING ON LOCATION, SHALL BE INCIDENTAL TO EITHER SPV.0105.06 CONNECT TO EXISTING FORCEMAIN OR SPV.0105.07 METER VAULT AND PIPING.

4  
C3

MODULAR MECHANICAL WALL PENETRATION SEAL  
NO SCALE

KEYNOTES:

- NOT USED.
- 1/2" DIA MOUNTING HOLES.
- NOT USED.
- 1 1/4" DIA FLUTTED FRP RUNGS.
- NOT USED.
- SQUARE TUBING.
- BALANCING SPRING.
- CLAMP BRACKET WITH STAINLESS STEEL MOUNTING BOLTS (3/8"-16 X 2").
- ADJUSTABLE MOUNTING CHANNEL.
- LOCK UP BRACKET.
- PULL UP LOOP.
- RELEASE ROD WITH VINYL LIFT HANDLE.
- 1/2" DIA X 5 1/2" LONG SST EXP ANCHOR BOLT.
- 1 3/4" X 1 3/4" SIDE RAILS.
- WALL MOUNTING BRACKET: 4" X 8" X 3/8" FRP ANGLE - 6" LONG.
- FLOOR MOUNTING BRACKET: 4" X 4" X 1/2" FRP ANGLE - 2 3/4" LONG.

RECORD DRAWINGS  
UPDATED 03/2016

**POWER & LIGHTING SYMBOLS**

BRANCH CIRCUIT HOME RUN TO PANELBOARD, PANEL NAME SHOWN ABOVE CIRCUIT NUMBER(S) AND TAGGED TO INDICATE CONDUIT AND CONDUCTOR SIZES. CIRCUITING SIZES NOT SHOWN SHALL BE MINIMUM 3/4" C. WITH #12 AWG. CONDUCTORS AND SIZED PER NEC REQUIREMENTS.

LP-1  
1,3  
3/4" C., 2#12

CONDUIT EXPOSED  
CONDUIT CONCEALED  
CONDUIT TURNING UP  
CONDUIT CAPPED  
OVERHEAD ELECTRICAL LINE  
UNDERGROUND CONCRETE ENCASED ELECTRICAL DUCT BANK  
UNDERGROUND CONCRETE ENCASED ELECTRICAL BANK ROUTED BENEATH SLAB-ON-GRADE  
DIRECT BURIED CONDUIT  
GROUND CONDUCTOR

INDICATES THAT ALL OR PART OF CIRCUIT MAY BE ROUTED IN DUCT BANK OR UNDERGROUND. CONDUIT SIZE SHOWN ON ONE-LINE IS ABOVE GROUND AND/OR INSIDE OF STRUCTURE. SEE DUCT BANK SCHEDULE AND SECTIONS FOR CONDUIT SIZE OF UNDERGROUND PORTION OF CIRCUIT.

2X4 LIGHT FIXTURE  
UPPER CASE INDICATES FIXTURE TYPE  
NUMBER INDICATES CIRCUIT LOWER CASE  
INDICATES SWITCH DESIGNATION

1X4 LIGHT FIXTURE  
4' INDUSTRIAL LIGHT FIXTURE  
2X2 LIGHT FIXTURE  
WALL MOUNTED LIGHT FIXTURE  
SURFACE MOUNTED LIGHT FIXTURE  
RECESSED LIGHT FIXTURE  
EXIT LIGHT (WITH FACES & DIRECTION  
ARROWS INDICATED)  
WALL MOUNTED EXIT LIGHT (WITH FACES & DIRECTION  
ARROWS INDICATED)  
WALL MOUNTED BATTERY PACK EMERGENCY LIGHT  
SHADED FIXTURE = EMERGENCY LIGHT  
POLE MOUNTED LUMINAIRE  
HANDRAIL MOUNTED LUMINAIRE

SWITCH SYMBOL

SINGLE POLE (IF BLANK) M = MANUAL MOTOR  
2 = DOUBLE POLE STARTER  
3 = THREE-WAY P = WITH PILOT LIGHT  
4 = FOUR-WAY WP = WEATHERPROOF  
D = DIMMER x = SMALL LETTER INDICATES  
K = KEY OPERATED LUMINARIES CONTROLLED  
LV = LOW VOLTAGE XP = EXPLOSION PROOF

DISCONNECT  
POWER OR DISTRIBUTION CABINET  
POWER OR LIGHTING PANELBOARD  
MOTOR AND MOTOR SWITCH  
METER  
DISCONNECT SWITCH  
MOTOR STARTER  
COMBINATION STARTER/DISCONNECT  
TRANSFORMER  
RELAY  
SINGLE RECEPTACLE  
DUPLEX RECEPTACLE  
CEILING RECEPTACLE  
CEILING RECEPTACLE  
SPECIAL PURPOSE RECEPTACLE  
DOUBLE DUPLEX RECEPTACLE  
FLOOR BOX OR POKE-THROUGH AS NOTED  
JUNCTION BOX  
THERMOSTAT  
PHOTOCELL  
TELEPHONE OUTLET  
COMBINATION VOICE/DATA OUTLET  
DATA OUTLET  
CCTV (CLOSED CIRCUIT TV CAMERA)

**SCHEMATIC SYMBOLS**

◇ AT MOTOR (SCHEMATIC DEVICE LOCATION)  
◇ AT PLC (SCHEMATIC DEVICE LOCATION)  
● CONNECTION POINT  
■ EXTERNAL CONNECTION POINT  
GROUND  
CIRCUIT BREAKER  
SWITCH  
FUSE  
NORMALLY OPEN PUSH-BUTTON  
NORMALLY CLOSED PUSH-BUTTON  
SELECTOR SWITCH  
NORMALLY CLOSED CONTACTS  
NORMALLY OPEN CONTACTS  
FIXED CAPACITOR  
MUSHROOM HEAD PUSH-BUTTON  
NORMALLY CLOSED LIMIT SWITCH  
NORMALLY OPEN LIMIT SWITCH  
SOLENOID  
FLOAT SWITCH (OPENING ON RISING LEVEL)  
FLOAT SWITCH (CLOSING ON RISING LEVEL)  
SWITCH (OPENING ON INCREASE) P=PRESSURE,  
V=VACCUM, DP=DIFFERENTIAL PRESSURE  
SWITCH (CLOSING ON INCREASE) P=PRESSURE,  
V=VACCUM, DP=DIFFERENTIAL PRESSURE  
TEMPERATURE SWITCH (OPENING ON RISING LEVEL)  
TEMPERATURE SWITCH (CLOSING ON RISING LEVEL)  
ON TIME DELAY SWITCH (NORMALLY CLOSED WITH  
TIME DELAY OPENING AFTER COIL IS ENERGIZED)  
ON TIME DELAY SWITCH (NORMALLY OPEN WITH TIME  
DELAY CLOSING AFTER COIL IS ENERGIZED)  
FLOW SWITCH (OPENING ON INCREASE IN FLOW)  
FLOW SWITCH (CLOSING ON INCREASE IN FLOW)  
TORQUE SWITCH (NORMALLY CLOSED)  
TORQUE SWITCH (NORMALLY OPEN)  
ENGINE DRIVEN GENERATOR  
MOTOR- NUMBER DENOTES HORSEPOWER  
CURRENT TRANSFORMER  
POTENTIAL TRANSFORMER  
METERING DEVICE  
FUSED DISCONNECT  
MAGNETIC STARTER  
THERMAL OVERLOAD RELAY  
SURGE SUPPRESSION  
TRANSFORMER  
KEY INTERLOCK  
PILOT LIGHT  
STARTER, CONTACTOR OR RELAY COIL  
MISC. SYSTEM COMPONENT:  
LE = LEVEL ELEMENT  
LIT = LEVEL INDICATING TRANSMITTER  
FE = FLOW ELEMENT  
FIT = FLOW INDICATING TRANSMITTER  
FS = FLOW SWITCH  
ATS = AUTOMATIC TRANSFER SWITCH  
HOA = HAND OFF AUTO SELECTOR SWITCH  
VFD = VARIABLE FREQUENCY DRIVE  
SV = SOLENOID VALVE

**ELECTRICAL ABBREVIATIONS**

A	AMBER, AMPERE, ALARM	HH	HANDHOLE
AC	ALTERNATING CURRENT	HOA	HAND-OFF-AUTO
ACB	AIR CIRCUIT BREAKER	HOR	HAND-OFF-REMOTE
AFF	ABOVE FINISHED FLOOR	HP	HORSEPOWER
AM	AMMETER	HTR	HEATER
ANN	ANNUNCIATOR	HVMH	HIGH VOLTAGE ELECTRIC MANHOLE
AR	ALARM RELAY	HWCO	HIGH WATER CUTOFF
AS	AMMETER SWITCH	HZ	HERTZ (CYCLES PER SECOND)
ATO	AUTOMATIC THROW OVER	I/O	INPUT/OUTPUT
ATS	AUTOMATIC TRANSFER SWITCH	INST	INSTANTANEOUS
AWG	AMERICAN WIRE GAUGE	IS	INTRINSICALLY SAFE
		ISO	ISOLATION
		J	JUNCTION BOX
BC	BATTERY CHARGER	K	KEY INTERLOCK
BLDG	BUILDING	KAIC	KILOAMPERE
C	CLOSE, COUNTER OR CONTACTOR	KCMIL	THOUSAND CIRCULAR MILS
CAP	CAPACITOR	KV	KILIVOLT
CB	CIRCUIT BREAKER	KVA	KILIVOLT AMPERE
CB"A"	CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN OR TRIPPED, CLOSED WHEN BREAKER IS CLOSED)	KVAR	KILOVAR
		KW	KILOWATT
CB"B"	CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN OR TRIPPED, OPEN WHEN BREAKER IS CLOSED)	KWH	KILOWATT HOUR
		L	LOW, LEVEL
CD	CONTROL DAMPER	LA	LIGHTNING ARRESTER
CGD	COMBUSTIBLE GAS DETECTOR	LAN	LOCAL AREA NETWORK
CHH	COMMUNICATION HANDHOLE	LC	LIGHTING CONTACTOR
CI	CELL INTERLOCK	LP	LIGHTING PANEL
CKT	CIRCUIT	LS	LIMIT OR LEVEL SWITCH
CL2	CHLORINE	LTG	LIGHTING
CP	CONTROL PANEL	LWCO	LOW WATER CUTOFF
CPT	CONTROL POWER TRANSFORMER	M	MAGNETIC MOTOR STARTER
CR	CURRENT OR CONTROL RELAY	MA	MILLIAMPERE
CS	CONTROL STATION	MCB	MAIN CIRCUIT BREAKER
CT	CYCLE TIMER OR CURRENT TRANSFORMER	MCC	MOTOR CONTROL CENTER
		MCLU	MOTOR CONTROL LINEUP
CV	CONTROL VALVE	MD	MOISTURE DETECTOR
2/C	2 CONDUCTOR	MFM	MAGNETIC FLOW METER
4"C	4" CONDUIT	MFR	MANUFACTURER
		MH	MANHOLE OR MOUNTING HEIGHT
DC	DIRECT CURRENT	MO	MOTOR OPERATOR
DI	DOOR INTERLOCK	MOV	MOTOR OPERATED VALVE
DM	DAMPER MOTOR OR DEMAND METER	MS	MANUAL MOTOR STARTER
		MSH	MOTOR SPACE HEATER
DPDT	DOUBLE POLE DOUBLE THROW	MTR	MOTOR
DPST	DOUBLE POLE SINGLE THROW	MTS	MANUAL TRANSFER SWITCH
DPR	DIFFERENTIAL PRESSURE REGULATOR	MV	MILLIVOLT, MEDIUM VOLTAGE
DPS	DIFFERENTIAL PRESSURE SWITCH	MVA	MEGA VOLT AMPERE
DS	DISCONNECT SWITCH	N	NEUTRAL
DVLS	DISCHARGE VALVE LIMIT SWITCH	NC	NORMALLY CLOSED
DWG	DRAWING	NO	NORMALLY OPEN
E	EMERGENCY OR DAMPER OPERATOR	O	OPEN
EC	EMPTY CONDUIT	OL	OVERLOAD
ECP	EQUIPMENT CONTROL PANEL	OOA	ON-OFF-AUTO
EG	ENGINE GENERATOR	OOR	ON-OFF-REMOTE
EL	ELEVATION OR EMERGENCY LIGHT	OH	OVERHEAD
EMH	ELECTRICAL MANHOLE	P	PRIMARY
EO	ELECTRICALLY OPERATED	PB	PUSHBUTTON OR PULL BOX
ES	END SWITCH	PLC	PROGRAMMABLE LOGIC CONTROLLER
ETM	ELAPSED TIME METER	PF	POWER FACTOR
EUH	ELECTRICAL UNIT HEATER	PFCC	POWER FACTOR CORRECTION CAPACITOR
EVS	EMERGENCY VENTILATION SHUTOFF	PH	PHASE, CHEMICAL TERM
EX	EXISTING	PRS	PROXIMITY SWITCH
		PRV	POWER ROOF VENTILATOR
F	FORWARD	PS	PRESSURE SWITCH OR PUMP STATION
FA	FIRE ALARM	PT	POTENTIAL TRANSFORMER OR PROGRAM TIMER
FACP	FIRE ALARM CONTROL PANEL	2P	2 POLE
FDR	FEEDER	R	RED, RAISE RELAY OR REVERSE
FO	FIBER OPTIC	RECP	RECEPTACLE
FS	FLOW SWITCH	RGS	RIGID GALVANIZED STEEL
FPSP	FIRE PROTECTION SIGNALING PANEL	RTD	RESISTANCE TYPE TEMP DETECTOR
G	GREEN OR GROUND OR GENERATOR	RTU	REMOTE TERMINAL UNIT
GD	GROUND DETECTOR OR GAS DETECTOR	SA	SURGE SUPPRESSOR
GEN	GENERATOR	SCC	SHORT CIRCUIT CURRENT
GFI	GROUND FAULT INTERRUPTER	SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
GFCI	GROUND FAULT CKT INTERRUPTER	S2	SIZE 2 STARTER
GLS	GEARED LIMIT SWITCH	SN	SOLID NEUTRAL
GND	GROUND	SD	SMOKE DETECTOR
GUH	GAS UNIT HEATER	SDBC	SOFT DRAWN BARE COPPER
H	HIGH OR HUMIDISTAT	SN	SOLID NEUTRAL

**AREA DESIGNATIONS**

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE I AND MINIMUM NEMA TYPE I ENCLOSURES.

**AREA TYPE 1A**  
CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES AND ACCESSORIES.

**AREA TYPE 4**  
INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDOWN AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.

**AREA TYPE 7A**  
CLASS I, DIVISION I AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.

**AREA TYPE 7B**  
CLASS I, DIVISION II, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.

**AREA TYPE 7C**  
CLASS II, DIVISION I, GROUP F (CARBON DUST) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.

**AREA TYPE 12**  
INDOOR, DRY DIRTY AREA, REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.

**AREA TYPE 4X**  
CORROSIVE CHEMICAL FEED AND STORAGE ROOM. CONDUIT SYSTEM SHALL BE PVC COATED RIGID STEEL CONDUIT WITH PVC COATED FITTINGS, BOXES AND ACCESSORIES.

**DEFINITIONS**

THE TERMS LISTED BELOW ARE DEFINED AS FOLLOWED:

- FURNISH: OBTAIN, COORDINATE, DELIVER TO THE JOB SITE AND GUARANTEE.
- INSTALL: FURNISHED BY OTHERS, RECEIVE ON SITE, UNLOAD, STORE, SET IN PLACE, CONNECT, PLACE IN OPERATION AND GUARANTEE WORKMANSHIP OF INSTALLATION.
- PROVIDE: FURNISH AND INSTALL.
- CONNECT: BRING SERVICE TO THE EQUIPMENT AND MAKE FINAL ATTACHMENTS, INCLUDING NECESSARY DISCONNECT SWITCHES, CONTROL SWITCHES, OUTLETS, ETC.
- CONDUIT: IN ADDITION TO CONDUIT INCLUDES FITTINGS, HANGERS, PULLBOXES, SUPPORTS, ETC. AS REQUIRED FOR A COMPLETE AND PROPER INSTALLATION.
- CONCEALED: HIDDEN FROM SIGHT IN WALLS, CEILINGS OR FLOORS..
- EXPOSED: SURFACE MOUNTED, NOT HIDDEN FROM SITE.
- BUILDING STRUCTURE: COLUMNS BEAMS, JOIST BRIDGING SHALL NOT BE USED FOR SUPPORTING ELECTRICAL EQUIPMENT.
- RELOCATE: EXISTING EQUIPMENT TO BE RELOCATED TO NEW LOCATION AND EXISTING CONDUIT AND BRANCH CIRCUITING (CONDUCTORS) TO BE EXTENDED TO NEW LOCATION AND RECONNECTED.

**RECORD DRAWINGS  
UPDATED 03/2016  
NO SHEET CHANGES**





GENERAL NOTES:

- A. THE INTENT IS TO UPSIZE INCOMING SERVICE FROM 100A TO 300A. PROVIDE A NEAT AND ORDERLY INSTALLATION WITH REPLACEMENT OF WIREWAY AND FUSED DISC. (LTG PANEL) WITH PANELBOARD TO FEED EXIST. LOADS.

KEYNOTES:

- 1. SUPERIOR WATER, LIGHT & POWER (SWL&P) TO UPSIZE 240V, 3Ø POLE MOUNTED TRANSFORMERS AND OVERHEAD LINES TO SERVICE HEAD ABOVE BLDG FOR NEW 300A SERVICE. SEE ELECTRICAL PLANS.

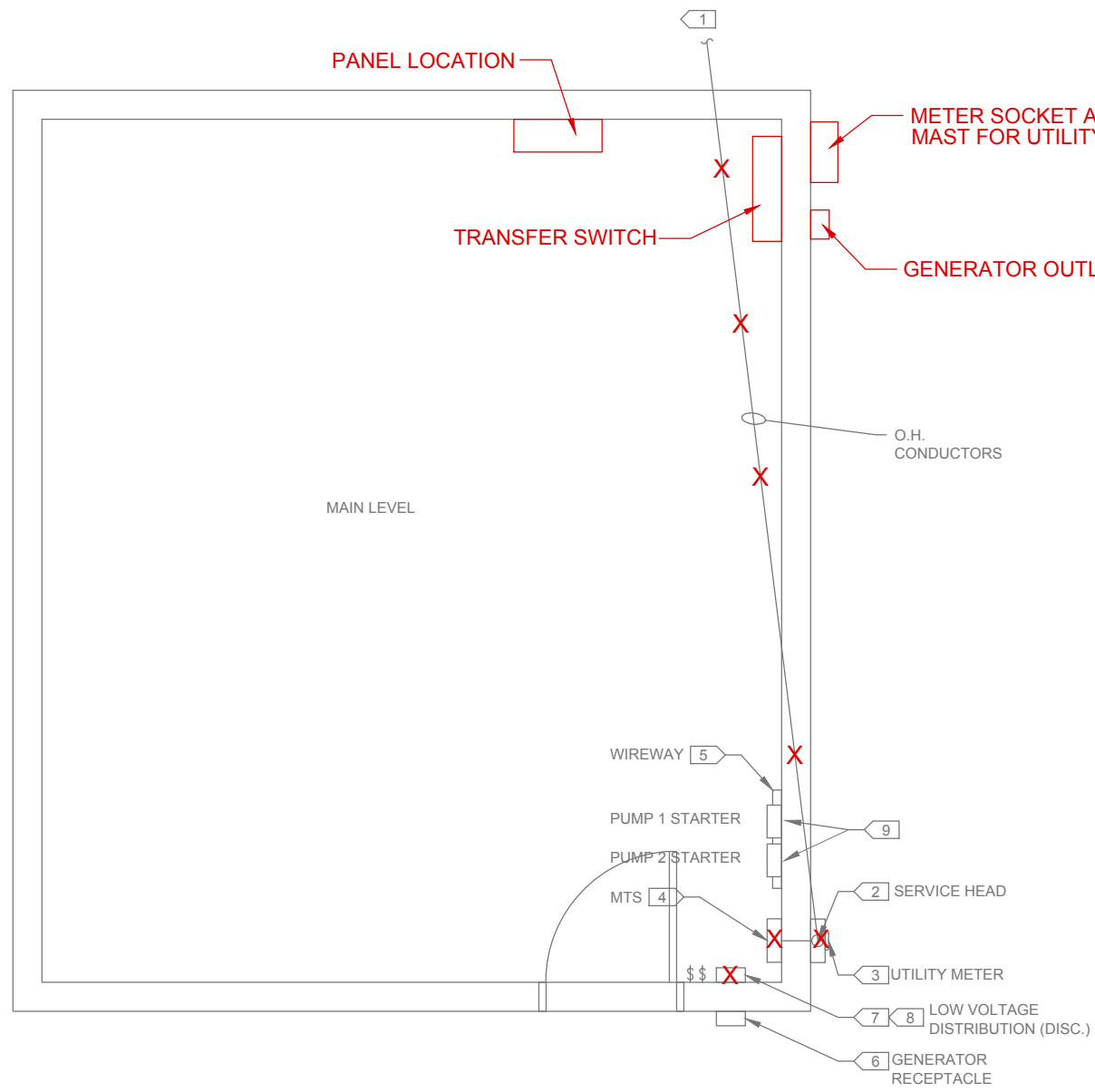
**RECORD DRAWINGS  
UPDATED 03/2016**



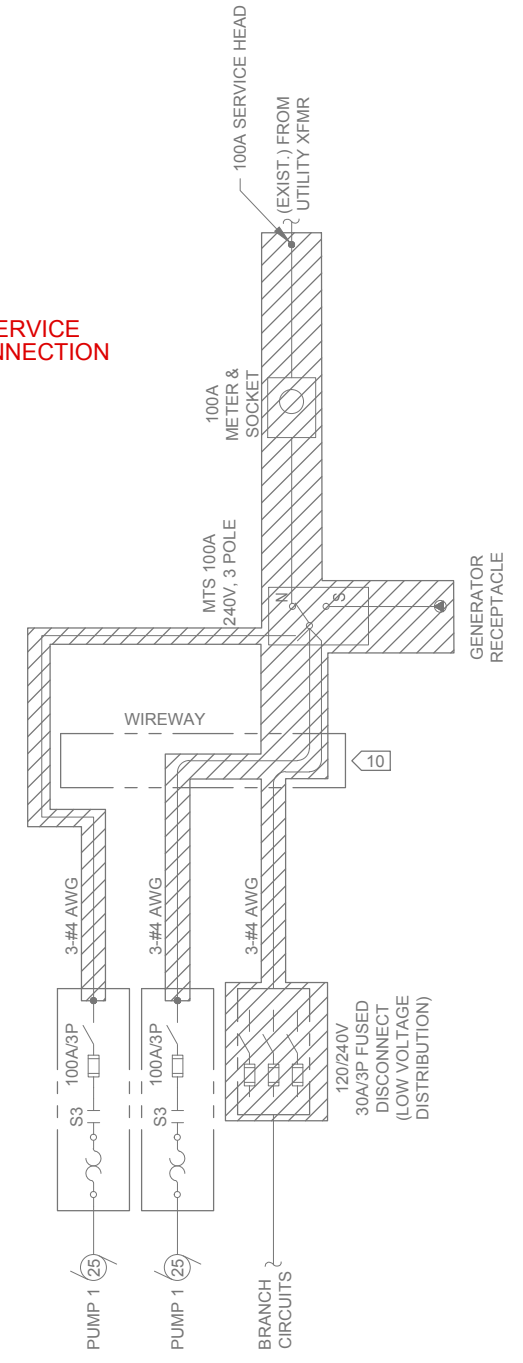
1  
E2

**ELECTRICAL SITE PLAN**

SCALE: 1"=20' (11X7 PRINTS HALF SCALE)



**1**  
E3  
**ELECTRICAL DEMO PLAN**  
SCALE: 1/2"=1'-0" (11X17 PRINTS HALF SCALE)



**2**  
E3  
**ELECTRICAL ONE-LINE DIAGRAM**  
NO SCALE

**GENERAL NOTES:**

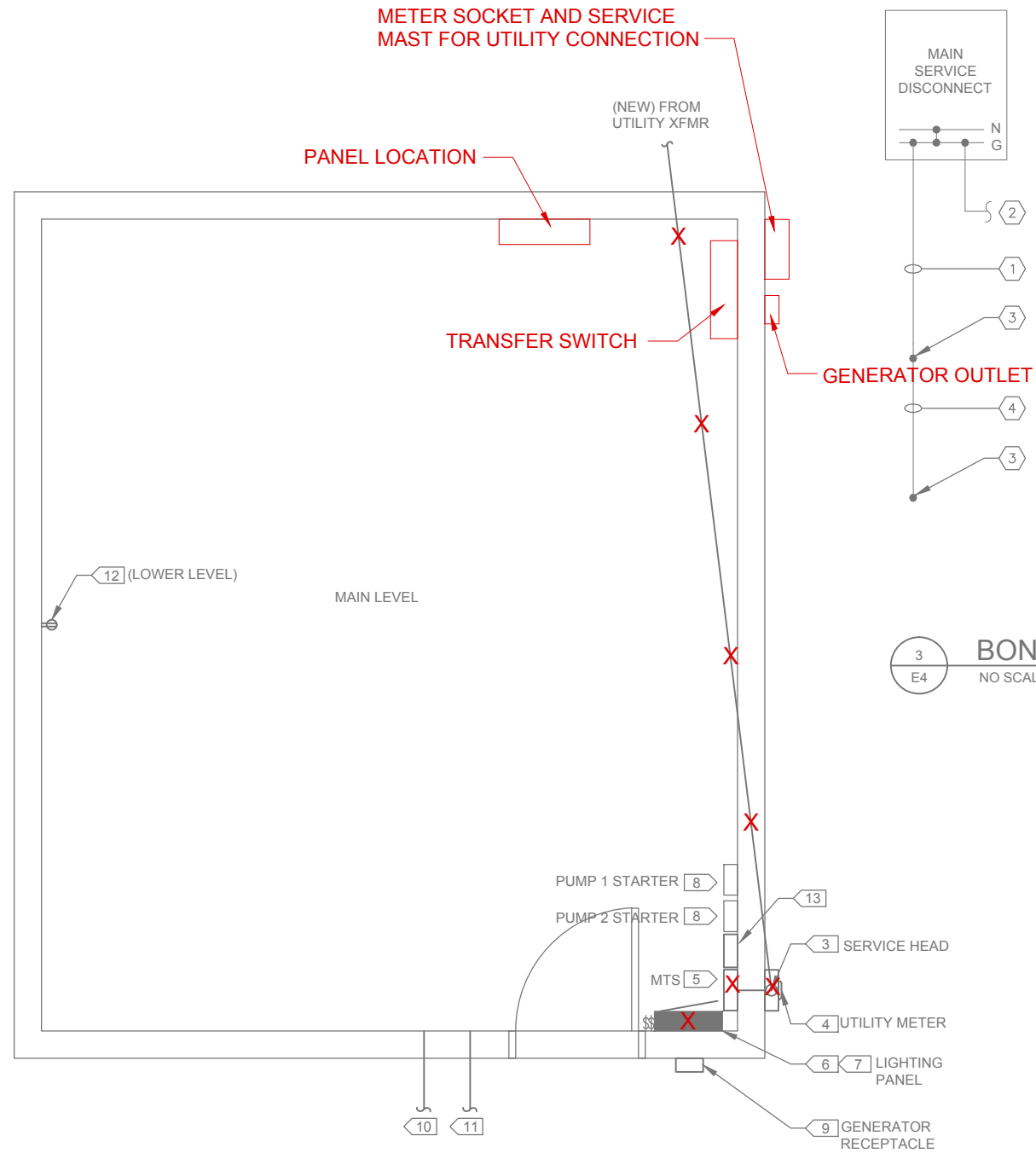
- A. THE INTENT IS TO UPSIZE INCOMING SERVICE FROM 100A TO 300A, PROVIDE A NEAT AND ORDERLY INSTALLATION WITH REPLACEMENT OF FUSED DISC. WITH PANELBOARD TO FEED EXIST. LOADS INCLUDING PUMPS.
- B. PANEL BOARD SHALL BE USED TO DISTRIBUTE POWER TO ALL DEVICES. DO NOT TAP ONTO SERVICE TO FEED PUMPS.

**KEYNOTES:** □

- 1. INCOMING UTILITY SERVICE FROM POLE MOUNTED TRANSFORMERS. SEE ELECTRICAL SITE PLAN.
- 2. DISCONNECT AND REMOVE SERVICE HEAD AND CONDUCTORS TO METER. CONDUIT CAN BE RE-USED IF CURRENT CODE REQUIREMENTS ARE MET.
- 3. DISCONNECT AND REMOVE METER, SOCKET AND CONDUCTORS TO MANUAL TRANSFER SWITCH (MTS).
- 4. DISCONNECT AND REMOVE MTS, POWER CONDUCTORS AND CONDUIT FEEDING PUMP STARTERS AND FUSED DISCONNECT. CAP UNUSED OPENINGS.
- 5. WIREWAY TO REMAIN. SEE ELECTRICAL PLAN FOR RE-ROUTING CONDUIT AND RE-CONNECTING CONDUCTORS. CAP UNUSED OPENINGS.
- 6. DISCONNECT AND REMOVE GENERATOR RECEPTACLE AND CONDUCTORS.
- 7. REMOVE FUSED DISC. (LOW VOLTAGE DISTRIBUTION), CONDUIT AND CONDUCTORS BACK TO MTS.
- 8. FUSED DISCONNECT HAS MULTIPLE LOW VOLTAGE CIRCUITS CONNECTED TO DISCONNECT. CIRCUIT WILL BE RECONNECTED TO NEW LIGHTING.
- 9. CONTROL CIRCUIT AND CONDUCTORS FROM STARTER TO MOTOR SHALL REMAIN FOR EACH PUMP. DEMO FEEDER TO EACH STARTER AND PROVIDE NEW FEEDER FROM NEW PANEL.
- 10. CONDUIT FROM WIREWAY TO EACH STARTER SHALL REMAIN.

**RECORD DRAWINGS  
UPDATED 03/2016**





1  
E4

**ELECTRICAL PLAN**  
SCALE: 1/2"=1'-0" (11X17 PRINTS HALF SCALE)

**DETAIL NOTES:**

- ① SIZE MAIN GROUNDING CONDUCTOR PER NEC OR 12.5% OF TOTAL CROSS SECTIONAL AREA OF MAIN SERVICE CONDUCTORS PER PHASE.
- ② BONDING CONDUCTOR TO GROUND BAR PER NEC FOR CONNECTION OF ALL OTHER AREAS REQUIRED TO BE BONDED TO GROUNDING.
- ③ 3/4"x10" COPPER CLAD STEEL GROUND ROD. GROUND RODS SHALL BE SPACED A MINIMUM OF 10 FEET APART. EXOTHERMIC WELD ALL CONNECTIONS OF CONDUCTORS TO GROUND RODS.
- ④ CONDUCTOR CONNECTING THE GROUND RODS SHALL BE A MINIMUM OF #2/0 AWG BARE CU.

3  
E4

**BONDING AND GROUNDING DETAIL**

NO SCALE

2  
E4

**ELECTRICAL ONE-LINE DIAGRAM**

NO SCALE

PHASE		PANELBOARD: LP-1		BUS: COPPER		MAINS: 3P-300A MAIN BREAKER		PHASE		
"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	"C"
V.A.	V.A.	V.A.	V.A.	V.A.	V.A.	V.A.	V.A.	V.A.	V.A.	V.A.
9411		25HP PUMP 1 **		1	100	1	2	20	1	TELEMETRY PANEL **
	9411			1		3	4	20	1	FLOW METER
				1		5	6	20	1	LIGHTING *
9411		25HP PUMP 2 **		1	100	7	8	20	1	RECEPTACLES *
	9411			1		9	10	20	1	UNIT HEATER *
				1		11	12			SPACE
						13	14			SPACE
						15	16			SPACE
						17	18			SPACE
						19	20			SPACE
						21	22			SPACE
						23	24			SPACE
						25	26			SPACE
						27	28			SPACE
						29	30			SPACE
						31	32			SPACE
						33	34			SPACE
						35	36			SPACE
				1	20	37	38			SPACE
				1	20	39	40			SPACE
				1	20	41	42			SPACE
18822		TOTAL "A"				19362				TOTAL "A"
	18822	TOTAL "B"				19102				TOTAL "B"
		TOTAL "C"				19022				TOTAL "C"
						TOTAL =				TOTAL

\* - EXISTING CIRCUIT EXTENDED  
\*\* - NEW CIRCUIT TO EXISTING DEVICE/EQUIPMENT

**GENERAL NOTES:**

- A. THE INTENT IS TO UPSIZE INCOMING SERVICE FROM 100A TO 300A. PROVIDE A NEAT AND ORDERLY INSTALLATION WITH REPLACEMENT OF FUSED DISC. WITH PANELBOARD TO FEED EXIST. LOADS INCLUDING PUMPS.
- B. PANEL BOARD SHALL BE USED TO DISTRIBUTE POWER TO ALL DEVICES. DO NOT TAP ONTO SERVICE TO FEED PUMPS.

**KEYNOTES:**

- 1. SUPERIOR WATER, LIGHT & POWER (SWL&P) TO UPSIZE 240V, 3Ø POLE MOUNTED TRANSFORMERS FOR NEW 300A SERVICE. SEE SITE PLAN.
- 2. SWL&P TO UPSIZE OVERHEAD LINES ON UTILITY POLE FOR NEW 300A SERVICE. SEE SITE PLAN.
- 3. PROVIDE SERVICE HEAD AND 4-#350KCMIL CONDUCTORS TO METER VIA EXIST. 3" CONDUIT. LEAVE SUFFICIENT LOOP AT HEAD FOR UTILITY TO MAKE CONNECTION.
- 4. PROVIDE 300A METER, SOCKET AND 3" - 4#350KCMIL TO MANUAL TRANSFER SWITCH (MTS).
- 5. PROVIDE 300A MTS AND 3" - 4#350KCMIL TO PANELBOARD.
- 6. PROVIDE 400A PANELBOARD WITH 300 AMP MCB. SEE PANELBOARD SCHEDULE SHOWN BELOW.
- 7. EXTEND EXIST. LOW VOLTAGE BRANCH CIRCUITING AND CONNECT TO NEW PANELBOARD. FIELD VERIFY AND PROVIDE CIRCUIT BREAKERS FOR EACH EXIST. CIRCUIT TO MATCH CIRCUIT AMPACITY. (APPROXIMATELY 5 CIRCUITS)
- 8. PROVIDE (2) 100A CIRCUIT BREAKERS IN NEW PANELBOARD. PROVIDE NEW CIRCUITRY FROM PUMP STARTERS TO NEW PANELBOARD AND MAKE CONNECTIONS.
- 9. PROVIDE 300A GENERATOR RECEPTACLE AND 3" - 4#350KCMIL TO MTS.
- 10. PROVIDE 1"-1-PR#16S FROM PLC OUT TO METER VAULT FOR FLOW METER ANALOG SIGNAL. SEE SITE PLAN FOR VAULT LOCATION.
- 11. PROVIDE 1"-2#12, #12G FROM PANELBOARD OUT TO METER VAULT FOR FLOW METER POWER. SEE SITE PLAN FOR VAULT LOCATION.
- 12. REPLACE EXISTING RECEPTACLE WITH NEW 20A, GFCI, WP RECEPTACLE HAVING WEATHERPROOF IN-USE COVER.
- 13. EXIST. PLC/TELEMETRY PANEL BELOW WIREWAY.

**RECORD DRAWINGS  
UPDATED 03/2016**

ELECTRICAL INDEX OF SECTIONS

SECTION NUMBER SECTION NAME

26 00 00	GENERAL PROVISIONS - ELECTRICAL
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
26 24 16	PANELBOARDS
26 27 13	ELECTRICAL SERVICE
26 27 26	WIRING DEVICES
26 36 00	TRANSFER SWITCHES

SECTION 26 00 00 GENERAL PROVISIONS - ELECTRICAL

1. GENERAL
  - A. PROVIDE LABOR, MATERIALS, EQUIPMENT AND NECESSARY OPERATIONS REQUIRED TO PROVIDE COMPLETE AND OPERATIONAL ELECTRICAL INSTALLATION IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE ACCOMPANYING DRAWINGS.
  - B. MATERIAL SHALL BE NEW, UL LISTED AND APPROVED FOR THE PURPOSE, AND INSTALLED PER CODE IN A WORKMANLIKE MANNER.
  - C. SECURE AND PAY FOR PERMITS, LICENSES AND INSPECTION FEES, AND COORDINATE WORK WITH LOCAL UTILITIES AND AUTHORIZES HAVING JURISDICTION.
  - D. SYSTEMS SHALL BE COMPLETELY FUNCTIONAL AND WIRING SYSTEMS SHALL TEST FREE OF DEFECTS USING MEGGER, CONTINUITY, GROUND, VOLTAGE, CURRENT AND PHASE ROTATION TESTS. BALANCE SYSTEM PHASE CURRENT TO WITHIN 10% OF EACH OTHER.
  - E. PROVIDE CUTTING AND PATCHING NECESSARY FOR INSTALLATION OF ELECTRICAL WORK AND RESTORE FINISHED SURFACES DISTURBED BY THIS CONTRACTOR. CUTTING OR DRILLING STRUCTURAL MEMBERS SHALL NOT BE ALLOWED UNLESS AUTHORIZED BY THE STRUCTURAL ENGINEER.
  - F. THE DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO INDICATE EXACT INSTALLATION DETAILS OR LOCATIONS. REFER TO THE ARCHITECTURAL, CIVIL, PROCESS, STRUCTURAL AND MECHANICAL DRAWINGS FOR COORDINATION. FIELD VERIFICATION OF EQUIPMENT, LIGHT FIXTURES AND DEVICE LOCATIONS SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
  - G. PROVIDE GENERAL CLEANUP OF WASTE AND RUBBISH IN THE WORK AREA, AND CLEAN REMOVED AND REINSTALLED ELECTRICAL EQUIPMENT, LIGHTING FIXTURES AND DEVICES. CLEAN ELECTRICAL EQUIPMENT THAT HAS BECOME DIRTY DURING CONSTRUCTION.
  - H. SEE DIV 1 FOR SCHEDULE OF WORK.
2. CODES & REGULATIONS
  - A. PROVIDE ELECTRICAL SYSTEMS IN ACCORDANCE WITH THESE DESIGN CRITERIA, THE FOLLOWING SPECIFICATIONS, AND THE LATEST ADOPTED CITY AND STATE CODES AND STANDARDS:
    - NATIONAL ELECTRIC CODE (NEC)
    - NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
    - STATE AND LOCAL ELECTRICAL AND FIRE CODES
    - UNIFORM BUILDING CODE (UBC)
    - OCCUPATION AND SAFETY AND HEALTH ACT (OSHA)
    - STATE ENERGY CODES
    - STATE ELEVATOR CODE
    - AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
    - AMERICANS WITH DISABILITIES ACT (ADA)
    - AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
    - INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
    - UNDERWRITERS' LABORATORIES, INC. (UL)
    - STATE BOARD OF HEALTH
3. EQUIPMENT SUPPORT
  - A. PROVIDE SUPPORT OF ELECTRICAL WORK THROUGH THE USE OF HANGER RODS, CLAMPS, STRUCTURAL FRAMING, FASTENING DEVICES, AND BACKBOARDS. PROVIDE VIBRATION ISOLATION IN SUPPORTING HARDWARE FOR VIBRATION ELECTRICAL EQUIPMENT INSTALLED BY THIS CONTRACTOR.
4. IDENTIFICATION
  - A. PROVIDE PANEL AND CIRCUIT INFORMATION ON: TYPED VINYL TAPE FOR J-BOX COVERS, WIRE AND CABLE MARKERS, EMBOSSED TAPE AND TYPED VINYL TAPE FOR NEW DEVICE PLATE COVERS (LOCATE LABEL ON INSIDE OF COVERS). PROVIDE ENGRAVED NAMEPLATES FOR NEWLY INSTALLED ELECTRICAL DISTRIBUTION EQUIPMENT, SPECIAL SYSTEM CABINETS, MOTOR CONTROL CENTERS, MOTOR STARTERS AND VARIABLE FREQUENCY DRIVES, CAPACITORS, AND DISCONNECT SWITCHES. PROVIDE NEW TYPED PANEL DIRECTORIES FOR PANELS WHERE CIRCUIT USAGE'S ARE CHANGED.
  - B. PULL BOXES SHALL IDENTIFY VOLTAGE.
  - C. PROVIDE NEW TYPED DIRECTORIES FOR EXISTING PANELS WHERE CIRCUIT RECONNECTED/RECONFIGURED.
5. GUARANTEE
  - A. GUARANTEE THE ENTIRE INSTALLATION AND PARTS THEREOF AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER FINAL ACCEPTANCE. REPAIR OR REPLACE ANY PRIMARY SERVICE EQUIPMENT THAT MAY SHOW SIGN OF FAILURE IN THAT TIME. LAMPS FOR FIXTURES ARE AN EXCEPTION AND NO WARRANTY SHALL EXIST AFTER ACCEPTANCE OF THE PROJECT.
6. TEMPORARY ELECTRIC SERVICES
  - A. PROVIDE TEMPORARY POWER REQUIRED TO COMPLETE WORK.
  - B. PROVIDE GENERATOR FOR TEMPORARY POWER DURING SERVICE CUT OVER, PUMP CAN ONLY BE OUT OF POWER FOR A MAXIMUM OF 30 MINUTES.
7. OUTAGES
  - A. REQUEST OUTAGES IN WRITING, SCHEDULE WITH THE OWNER, AND COORDINATE WITH THE ELECTRIC UTILITY WHERE APPLICABLE. WORK SHALL BE DONE TO MINIMIZE DOWN TIME AND INCONVENIENCE TO THE OWNER.
  - B. PUMPS AND CONTROLS SHALL BE CAPABLE OF OPERATING AT ALL TIMES WITH ONLY MINIMAL POWER OUTAGE.
8. SHOP DRAWINGS
  - A. PROVIDE SHOP DRAWINGS, OPERATION AND MAINTENANCE MANUALS, AND OPERATING INSTRUCTIONS FOR THE OWNER FOR MAJOR EQUIPMENT ITEMS SUCH AS LIGHTING FIXTURES, PANELBOARDS, TRANSFORMERS, STARTERS AND SPECIAL SYSTEMS.
9. PRODUCT SPECIFICATION
  - A. CATALOG NUMBERS USED TO IDENTIFY SPECIFIC PRODUCTS SHALL NOT BE CONSTRUED AS PRODUCT ORDERING OR PURCHASE NUMBERS. PROVIDE SPECIFIED PRODUCTS TO COMPLY WITH DESCRIPTION AND CATALOG NUMBERS WHERE INDICATED.
10. REMODELING
  - A. PROVIDE REMOVAL AND REMODEL WORK NECESSARY FOR THE INSTALLATION OF NEW ELECTRICAL WORK. DE-ENERGIZE CIRCUIT CONDUCTORS FOR REMOVAL AND REMOVE BACK TO SOURCE. EXPOSED RACEWAY SYSTEM SHALL BE REMOVED AND CONCEALED RACEWAYS MAY BE ABANDONED. MODIFY OR PROVIDE CIRCUITING TO EXISTING EQUIPMENT AND CIRCUITS THAT ARE TO REMAIN IN A REMODELED AREA. TURN OVER TO THE OWNER EQUIPMENT, DEVICES AND LIGHTING FIXTURES DESIRED FOR OWNERS STOCK. PROPERLY DISPOSE OF OTHER EQUIPMENT, DEVICES, LIGHTING FIXTURES AND LAMPS OFF OF THE CONSTRUCTION SITE AND OWNERS PROPERTY INCLUDING ANYTHING OFFERED TO AND DECLINED BY THE OWNER. CONTRACTOR SHALL ASSUME A LIMITED AMOUNT OF UNFORESEEN CONDITIONS AND SHALL PROVIDE NECESSARY MATERIAL AND LABOR FOR A COMPLETE AND OPERATIONAL SYSTEM.

SECTION 26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

1. BRANCH CIRCUIT CONDUCTORS SHALL BE THWN/THHN STRANDED COPPER. FEEDER CONDUCTORS #6 AND LARGER SHALL BE XHHW OR THWN/THHN. MINIMUM WIRE SIZE IS #12 AWG. CONDUCTOR SIZING AND CONDUIT FILL SHALL CONFORM TO NEC. INSTALL CONDUCTORS IN RACEWAYS WITH COLOR CODED INSULATION AND SEPARATELY IDENTIFY EACH VOLTAGE SYSTEM.
  - A. REQUIREMENTS
    - 98% CONDUCTIVE SOFT DRAWN COPPER.
    - STRANDED CONDUCTORS.
    - XHHW OR THHN/THWN INSULATION.
    - 600 VOLT RATED.
2. BRANCH CIRCUITS SHALL BE COLOR CODED. THE COLOR OF THE INSULATION COVERING, THE NEUTRAL OR GROUNDED CONDUCTOR OF BRANCH CIRCUITS REQUIRING A NEUTRAL CONDUCTOR OF #6 AWG AND SMALLER SHALL BE WHITE IN COLOR, DISTINCTLY DIFFERENT FROM THAT OF THE OTHER CONDUCTORS. COLOR CODING TO BE AS FOLLOWS:
 

A	120/240V, 3Ø, 4W	277/480V, 3Ø, 4W
	PHASE A BLACK	PHASE A BROWN
	PHASE B RED	PHASE B ORANGE
	PHASE C BLUE	PHASE C YELLOW
	NEUTRAL WHITE	NEUTRAL WHITE
	GROUND GREEN	GROUND GREEN
3. CONTROL CIRCUIT CONDUCTORS SHALL BE:
  - A. ANALOG: TWISTED, SINGLE SHIELDED PAIR DESIGNED FOR NOISE REJECTION FOR PROCESS CONTROL APPLICATIONS MEETING NEMA W/C 55 REQUIREMENTS.
    - OUTER JACKET: 45-MIL NOMINAL THICKNESS
    - INDIVIDUAL PAIR SHIELD: 1.35-MIL, DOUBLE-FACED ALUMINUM/SYNTHETIC POLYMER OVERLAPPED TO PROVIDE 100 PERCENT COVERAGE
    - DIMENSION: 0.31-INCH NOMINAL, OD.
  - CONDUCTORS: TIN COATED COPPER, CLASS B SEVEN-STRANDED CONCENTRIC, MEETING REQUIREMENTS OF ASTM B8. 20AWG, SEVEN-STRANDED TINNED COPPER DRAIN WIRE. 15-MIL NOMINAL PVC INSULATION. 4-MIL NOMINAL NYLON JACKET. COLOR CODE PER PAIR, BLACK AND WHITE
  - MANUFACTURES: OKONITE CO, ALPHA WIRE CORP, OR BELDON.
  - B. DIGITAL THHN/THHW SINGLE CONDUCTORS MEETING THE FOLLOWING REQUIREMENTS:
    - MINIMUM #14 AWG.
    - 600 VOLT RATED.
    - 98% CONDUCTIVE SOFT DRAWN COPPER.
    - STRANDED CONDUCTORS.
4. CONNECTIONS AND SPLICES SHALL BE MADE IN TERMINAL AND JUNCTION BOXES ONLY. CONNECTIONS AND SPLICES FOR WIRES #6 AWG AND SMALLER SHALL BE MADE WITH 3M PRE-INSULATED "SCOTCHLOK" SPRING TYPE CONNECTORS. CONNECTIONS FOR LARGER WIRES SHALL BE MADE WITH BURNDY CONNECTORS.
5. CONTROL CIRCUIT CONDUCTORS SHALL BE CONTINUOUS FROM EQUIPMENT TO CONTROL CABINET, SPLICING NOT ALLOWED.

SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1. PROVIDE A PERMANENT GROUNDING SYSTEM WITH METHODS AND MATERIALS IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS, ABLE TO CONDUCT GROUND FAULT CURRENTS TO THE GROUNDED NEUTRAL OF ELECTRICAL DISTRIBUTION SYSTEMS, AND LIMIT POTENTIAL DIFFERENCES BETWEEN GROUNDING CONDUCTORS, RACEWAYS AND ENCLOSURES.
2. GROUND CONDUCTIVE RACEWAYS AND ENCLOSURES FOR ELECTRICAL SYSTEMS WIRING. MAKE ALL GROUND CIRCUITS COMPLETE TO FORM PERMANENT CONDUCTIVE PATHS. SOLIDLY GROUND EACH LOW VOLTAGE ELECTRICAL SYSTEM. PROVIDE BARE CONDUCTORS WHEN IN OPEN AIR OR SOIL AND PROVIDE 600VOLT, GREEN INSULATED CONDUCTORS WHEN IN RACEWAY.
3. PROVIDE GROUNDING CONDUCTORS FOR EACH EQUIPMENT FEEDER IN METALLIC OR NONMETALLIC CONDUIT SYSTEM.
4. BOND EXISTING GROUND TO NEW GROUND SYSTEM PER DETAIL ON DRAWINGS.

SECTION 26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1. PROVIDE MATERIAL, SIZES, AND TYPES OF ANCHORS, FASTENERS AND SUPPORTS TO CARRY THE LOADS. CONSIDER WEIGHT OF CONDUIT(S) AND WIRE(S) WHEN SELECTION PRODUCTS.
  - A. ANCHORS AND FASTENERS: CONCRETE STRUCTURE TO BE EXPANSION AND PRESET INSERTS, CONCRETE SURFACE SHALL BE SELF-DRILLED ANCHORS AND EXPANSION ANCHORS.
  - B. SUPPORT AND FRAMING CHANNELS: MALLEABLE IRON HANGERS, CLAMPS, AND ASSOCIATED FITTINGS.
  - C. SUPPORT RODS AND HARDWARE: MALLEABLE-IRON.

SECTION 26 05 33 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

1. CONDUITS
  - A. EXPOSED CONDUIT SHALL BE RIGID GALVANIZED STEEL CONDUITS WITH APPROVED FITTINGS AND AS INDICATED BELOW.
  - B. BELOW GRADE CONDUIT SHALL BE NONMETALLIC CONDUIT WITH APPROVED FITTINGS AS INDICATED BELOW. CONVERT TO RIGID STEEL BELOW GRADE WITH A MANUFACTURES RIGID STEEL ELBOW PRIOR TO EXITING GRADE.
  - C. PROVIDE COMPLETE RACEWAY SYSTEMS INCLUDE OUTLET BOXES, PULL BOXES, AND FITTINGS. ROUTE CONDUIT AS REQUIRED BY JOB CONDITIONS. COORDINATE ROUTING WITH MECHANICAL PIPING AND EQUIPMENT. SIZE CONDUITS, BOXES, AND BENDS PER THE NEC WHERE NOT SPECIFIED ON PLAN. PROVIDE EXPANSION FITTINGS, CONDUIT SEALS, DRAIN TEES, CONDUIT HUBS, FIRE/SMOKE BARRIERS WHERE REQUIRED. METAL CONDUITS SHALL HAVE CONTINUOUS GROUNDING INTEGRITY AND SHALL BE COMPLETE WITH A PROPERLY SIZED CIRCUIT GROUNDING CONDUCTOR.
  - D. MINIMUM SIZE ¾" EXPOSED, 1" BELOW GRADE.
  - E. RIGID GALVANIZED STEEL. CONDUIT SHALL MEET THE FOLLOWING REQUIREMENTS:
    - ANSI C60.1 AND UL 6.
    - MATERIAL: HOT-DIP GALVANIZED WITH CHROMATE PROTECTIVE LAYER.
    - MANUFACTURES: ALLIED TUBE AND CONDUIT CORP., WHEATLAND TUBE CO., AND REPUBLIC CONDUIT.
  - F. NONMETALLIC RIGID GALVANIZED STEEL. CONDUIT SHALL MEET THE FOLLOWING REQUIREMENTS:
    - NEMA TC2 AND UL 651
    - RIGID NON METALLIC CONDUIT: PVC SCHEDULE 40.
2. PULL & JUNCTION BOXES
  - A. JUNCTION BOXES SHALL BE CAST IRON, COMPLY WITH NEMA FB 1 AND UL 1773. CAST ALUMINUM, TYPE FD, WITH GASKETED COVER. PROVIDE BOXES TO COMPLY WITH CODE AND TO PROVIDE EASE OF CONDUCTOR INSTALLATION.
3. OUTLET BOXES & FITTINGS
  - A. INDOOR OUTLET BOXES SHALL BE CAST IRON, COMPLY WITH NEMA FB 1, FERROUS ALLOY, TYPE FD, WITH GASKETED COVER. PROVIDE BOXES TO COMPLY WITH CODE AND TO PROVIDE EASE OF CONDUCTOR INSTALLATION.
  - B. FLOOR BOXES SHALL BE ROUND LISTED AND LABELED FOR INTENDED USE, PROVIDED WITH A FLUSH BRASS COVER.
  - C. INSTALLATION SHALL MEET CURRENT NEC AND LOCAL CODE REQUIREMENTS.
4. GENERATOR BOX
  - A. CROUSE-HINDS AJ WITH 400 AMP ANGLE ADAPTOR WITH 3" HUB.

SECTION 26 24 16 PANELBOARDS

1. MAIN PANELBOARD
  - A. SERVICE RATED, 240 VOLT, 3 PHASE, 4 WIRE, 400AMP, MINIMUM 65,000AIC RATING.
  - B. EATON CORP POW-R-LINE 1a OR EQUAL.
2. GENERAL REQUIREMENTS
  - A. MAIN CIRCUIT BREAKER.
  - B. COPPER PHASE, NEUTRAL, AND GROUND BUSES.
  - C. FULLY RATED, MAIN CIRCUIT BREAKER.
  - D. BRANCH OVERCURRENT SHALL BE BOLT-ON MOLDED CASE CIRCUIT BREAKERS WITH MECHANICAL LUGS.
  - E. SURFACE MOUNTED WITH HINGED COVER.
  - F. 20% MINIMUM SPARE BREAKER.
  - G. MANUFACTURES: SQUARE D, EATON CORPORATION, GENERAL ELECTRIC COMPANY, SIEMENS ENERGY.

SECTION 26 27 13 ELECTRICAL SERVICE

1. COORDINATE WITH UTILITY COMPANY TO PROVIDE NEW 300AMP SERVICE TO BUILDING.
2. CONTRACTOR SHALL INCLUDE IN BASE BID UTILITY COST ASSOCIATED WITH NEW SERVICE.
3. PROVIDE NEW 300AMP METER SOCKET, MOUNT AS INDICATED ON PLANS.
4. ELECTRICAL UTILITY COMPANY IS SUPERIOR WATER, LIGHT, & POWER (SWL&P), CONTACT: KEVIN HABERMAN, 715-395-6315.
5. PROVIDE NEW OVERHEAD RACEWAY AND WEATHERHEAD, AS INDICATED ON PLANS.

SECTION 26 27 26 WIRING DEVICES

1. WIRING DEVICES SHALL CONFORM TO FEDERAL SPECIFICATIONS, ANSI AND NEMA STANDARDS.
2. SWITCHES SHALL BE 20 AMP; 120-277 VOLT, A.C ONLY; SINGLE POLE UNLESS OTHERWISE NOTED. ACCEPTABLE MANUFACTURES: ARROW-HART, BRYANT, GENERAL ELECTRIC, HUBBELL, LUTRON, PASS & SEYMOUR.
3. WIRING DEVICES COVER PLATES SHALL BE STAINLESS STEEL.
4. RECEPTACLES SHALL BE 20 AMP; 125 VOLT, A.C. DUPLEX TYPE UNLESS OTHERWISE NOTED. ACCEPTABLE MANUFACTURES: ARROW-HART, BRYANT, GENERAL ELECTRIC, HUBBELL, LUTRON, PASS & SEYMOUR
5. GENERATOR RECEPTACLE: CROUSE-HINDS ARKTITE AR HEAVY DUTY, 400 AMP, 240VOLT, 4-WIRE + GROUND, 4-POLE, WITH SPRING DOOR. VERIFY WITH OWNER IF 5-POLE IS USED BY CITY PRIOR TO ORDERING.

SECTION 26 36 00 TRANSFER SWITCHES

1. COMPLY WITH UL 1008, NEMA ICS 6 AND UL 508A
2. COPPER BUSES.
3. COMPRESSION LUGS.
4. MANUAL TRANSFER SWITCH, RATES AS SHOWN ON PLANS.
5. SERVICE RATED TRANSFER SWITCH, NEMA 12 INDOOR, NEMA 3R OUTDOOR.
6. ACCEPTABLE MANUFACTURES: GE ZENITH, ASCO, EATON CORP., KOHLER, CUMMINGS POWER, CATERPILLAR.

RECORD DRAWINGS  
UPDATED 03/2016  
NO SHEET CHANGES

STATEMENT OF ESTIMATED QUANTITIES

NOTE	ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY
4,5	465.0310	ASPHALTIC CURB	LIN FT	127 <del>400</del>
	619.1000	MOBILIZATION	LUMP SUM	1 <del>4</del>
7	628.7015	INLET PROTECTION TYPE C	EACH	2 <del>2</del>
1	643.0100	TRAFFIC CONTROL (PROJECT)	LUMP SUM	1 <del>4</del>
2	690.0150	SAWING ASPHALT	LIN FT	108 <del>443</del>
	SPV.0035.01	ABANDONING SANITARY SEWER	LUMP SUM	1 <del>455</del>
2	SPV.0060.01	BORING PIT	EACH	5 <del>5</del>
	SPV.0060.02	CONNECT TO EXISTING SANITARY SEWER	EACH	2 <del>2</del>
	SPV.0060.03	SEALING SANITARY PIPES	EACH	0 <del>2</del>
	SPV.0060.04	SANITARY SEWER CASTING	EACH	108 <del>4</del>
	<del>SPV.0060.05</del>	<del>MANHOLE LINER</del> ELIMINATED - MH STRUCTURE LINING	<del>EACH</del>	0 <del>4</del>
	SPV. 0060.06	CLEANOUT MANHOLE	EACH	4 <del>4</del>
8	SPV.0090.01	SANITARY MANHOLE, 60-INCH	LIN FT	10.26 <del>40.26</del>
3,9	SPV.0090.02	18" (DIPS) DR-11 HDPE SEWER PIPE (DIRECTIONALLY DRILLED)	LIN FT	2569 <del>2569</del>
3,9	SPV.0090.03	18" (DIPS) DR-11 HDPE SEWER PIPE (OPEN CUT)	LIN FT	123 <del>423</del>
3,9	SPV.0090.04	18" (DIPS) DR-11 HDPE SEWER PIPE (CARRIER PIPE)	LIN FT	130 <del>430</del>
6	SPV.0090.05	AUGER BORING	LIN FT	130 <del>430</del>
	SPV.0090.06	SANITARY SEWER PIPE, 24-INCH	LIN FT	9 <del>42</del>
	SPV.0090.07	SEWER FIELD QUALITY CONTROL - TELEVISION	LIN FT	0 <del>2022</del> BY CITY
	SPV.0105.01	RESTORATION	LUMP SUM	1 <del>4</del>
	SPV.0105.02	ELECTRICAL UPGRADES	LUMP SUM	1 <del>4</del>
	SPV.0105.03	SEWER FIELD QUALITY CONTROL - AIR TEST	LUMP SUM	0 <del>4</del> HYDRO TEST
	SPV.0105.04	SEWER FIELD QUALITY CONTROL - DEFLECTION TEST	LUMP SUM	0 <del>4</del>
	SPV.0105.05	CONNECT TO EXISTING FORCEMAIN	LUMP SUM	1 <del>4</del>
	SPV.0105.06	CONSTRUCTION STAKING	LUMP SUM	1 <del>4</del>
ALTERNATE 1				
9, 10	SPV.0105.07	METER VAULT AND PIPING	LUMP SUM	1 <del>4</del>
ALTERNATE 2				
<del>9, 10</del>	<del>SPV.0105.07</del>	<del>18" (DIPS) DR-11 HDPE SEWER PIPE (OPEN CUT)</del> ELIMINATED	<del>LUMP SUM</del>	0 <del>30</del>

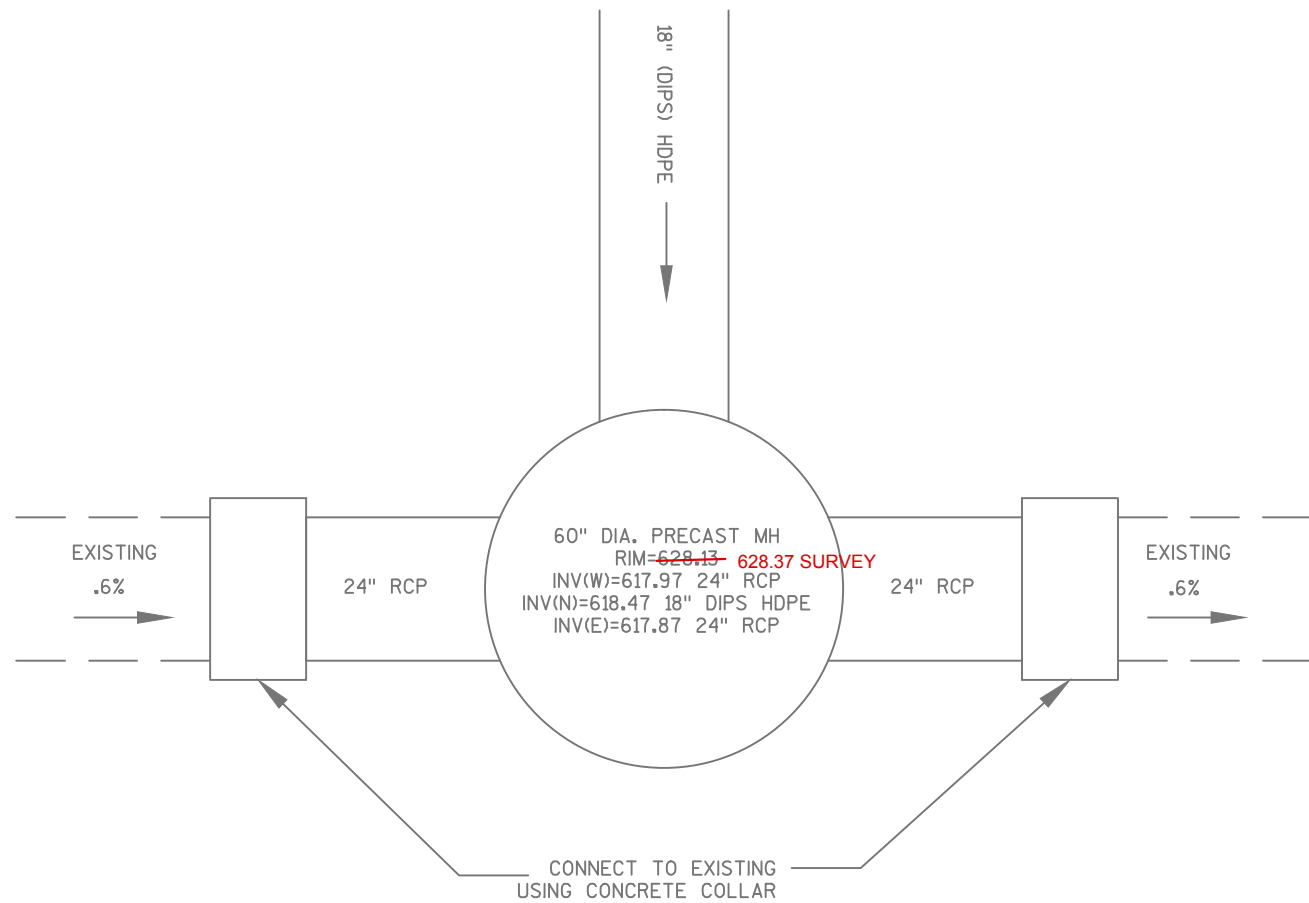
CHANGE ORDER NO. 1 (MATERIALS COST FOR ROAD RESTORATION)  
CHANGE ORDER NO. 2 (RELOCATE ELECTRICAL, MH RISER MODIFICATIONS)  
CHANGE ORDER NO. 3 (PIPE TESTING, PIPE MATERIALS MODIFICATIONS, ASSIST TV INSPECTIONS)  
CHANGE ORDER NO. 4 (INSTALL VALVE AND BYPASS PUMPING)

NOTES:	
1	CONTRACTOR TO SUBMIT TRAFFIC CONTROL PLAN FOR APPROVAL BY THE ENGINEER
2	ALL BORING PIT SAWCUTS, REMOVALS, EXCAVATION, BACKFILL, AND SURFACE RESTORATION ITEMS ARE TO BE INCIDENTAL. ALL PAVEMENT SECTIONS TO BE RESTORED IN KIND (INCIDENTAL).
3	TRACER WIRE SHALL BE INSTALLED ALONG THE PROPOSED SANITARY SEWER (INCIDENTAL). TRACER WIRE BOX TYPE AND LOCATION SHALL BE APPROVED IN THE FIELD BY THE ENGINEER
4	INCLUDES ALL PAVEMENT MATERIAL AS REQUIRED FOR INSTALLATION OF CURB AND MATCHING EXISTING ROADWAY
5	ASPHLTIC MATERIAL TO MEET REQUIREMENTS OF HMA PAVEMENT TYPE E-1 PG64-24
6	SHALL MEET ALL RAILROAD PERMIT REQUIREMENTS.
7	TO BE INSTALLED AS DIRECTED BY THE ENGINEER IN THE FIELD.
8	INCLUDES INTERNAL AND EXTERNAL CHIMNEY SEAL.
9	ALL NECESSARY BYPASS PUMPING SHALL BE INCIDENTAL.
10	ONLY ONE OF EITHER ALTERNATE 1 OR ALTERNATE 2 WILL BE AWARDED.

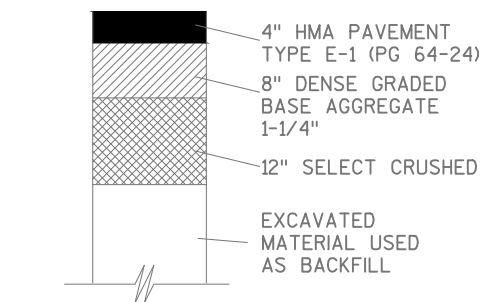
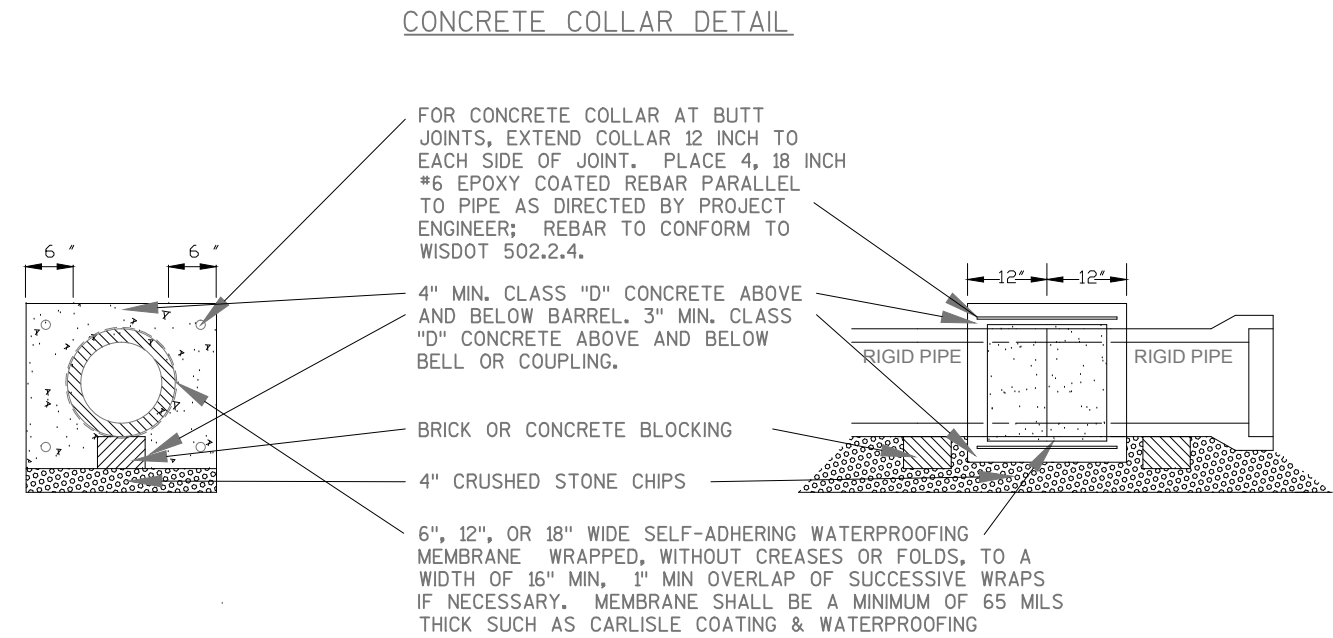
METER VAULT STRUCTURE - PAINTED INTERIOR PER NOTE 14 SHEET C-1

**RECORD DRAWINGS  
UPDATED 03/2016**



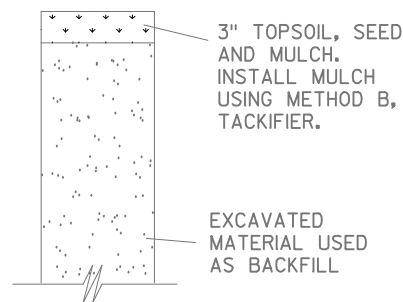


CONNECTION DETAIL



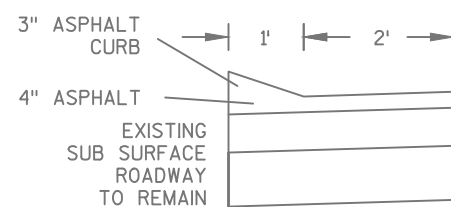
NOTE: ALL RESTORATION ITEMS INCIDENTAL TO RESTORATION PAY ITEM

ROAD RESTORATION

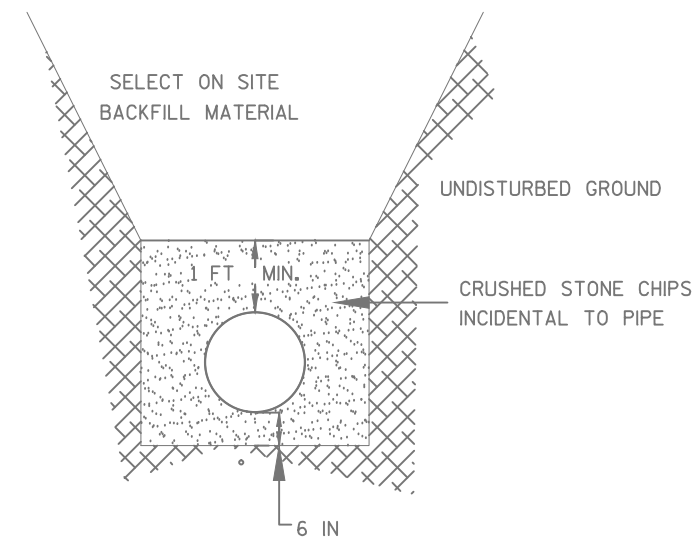


NOTE: ALL RESTORATION ITEMS INCIDENTAL TO RESTORATION PAY ITEM

RESTORATION DETAIL



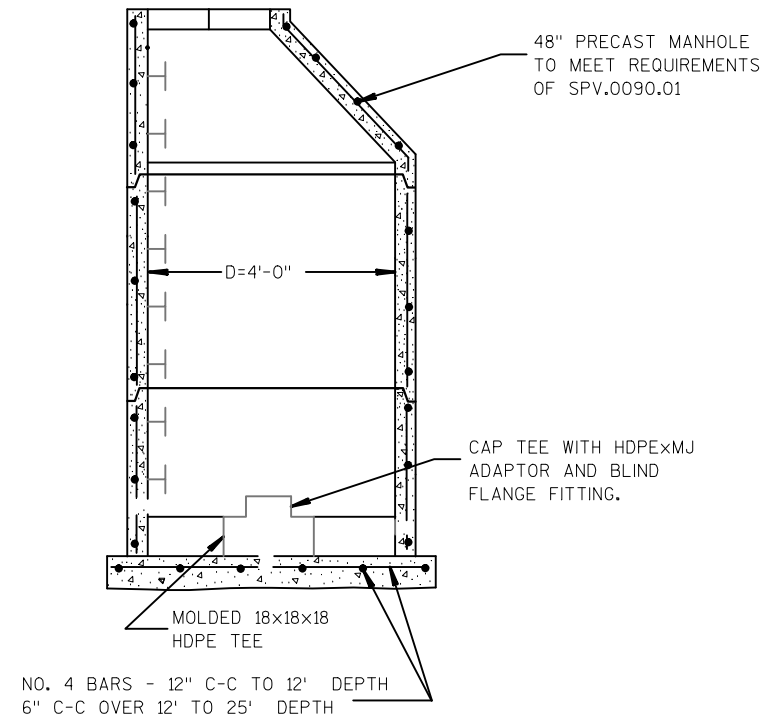
BITUMINOUS CURB DETAIL



PIPE BEDDING DETAIL

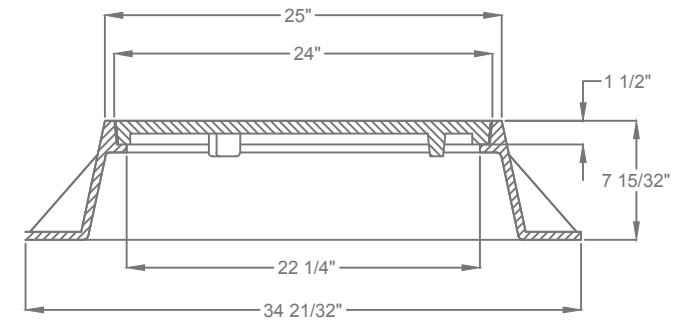
**RECORD DRAWINGS  
UPDATED 03/2016  
NO SHEET CHANGES**

3



1  
13  
**CLEAN OUT MANHOLE**  
NO SCALE

3



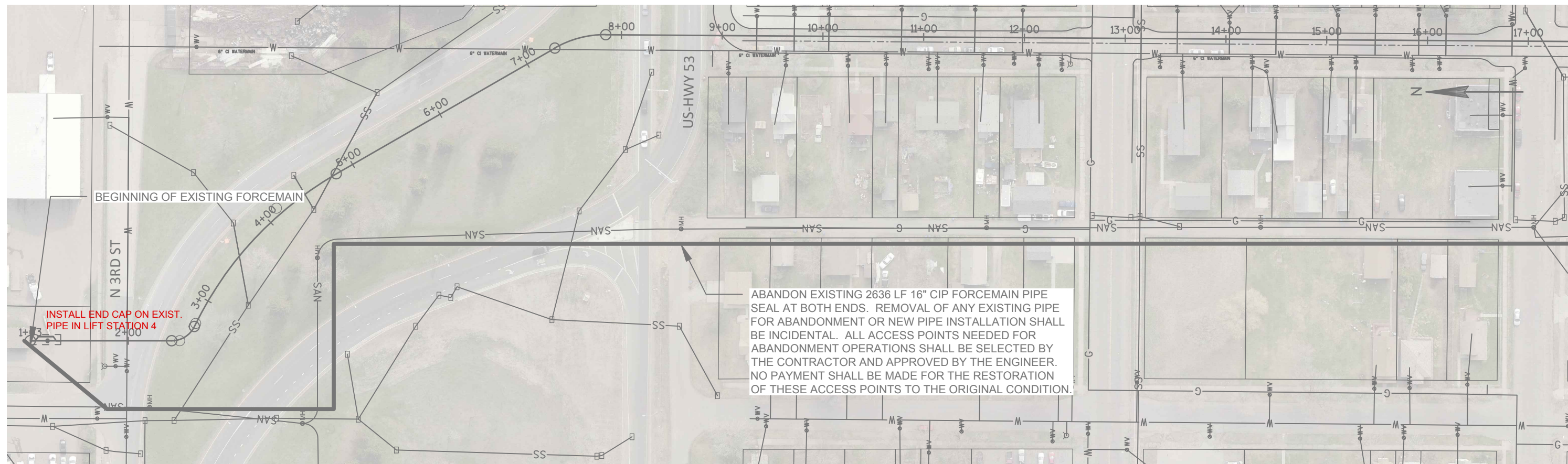
ALL MANHOLE CASTINGS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-48, CLASS NO. 30-B AND SHALL BE FREE FROM CRACKS, HOLES, SWELLS, AND COLD SHUTS.

COVERS SHALL BE "SELF-SEALING", "T-SEAL" OR "GASKET SEALED" COVERS WITH "SANITARY" OR "STORM" LABELS AS APPLICABLE, OR OTHER LABELS APPROVED AS EQUAL.

2  
13  
**MANHOLE CASTING DETAIL**  
NO SCALE

**RECORD DRAWINGS  
UPDATED 03/2016  
NO SHEET CHANGES**

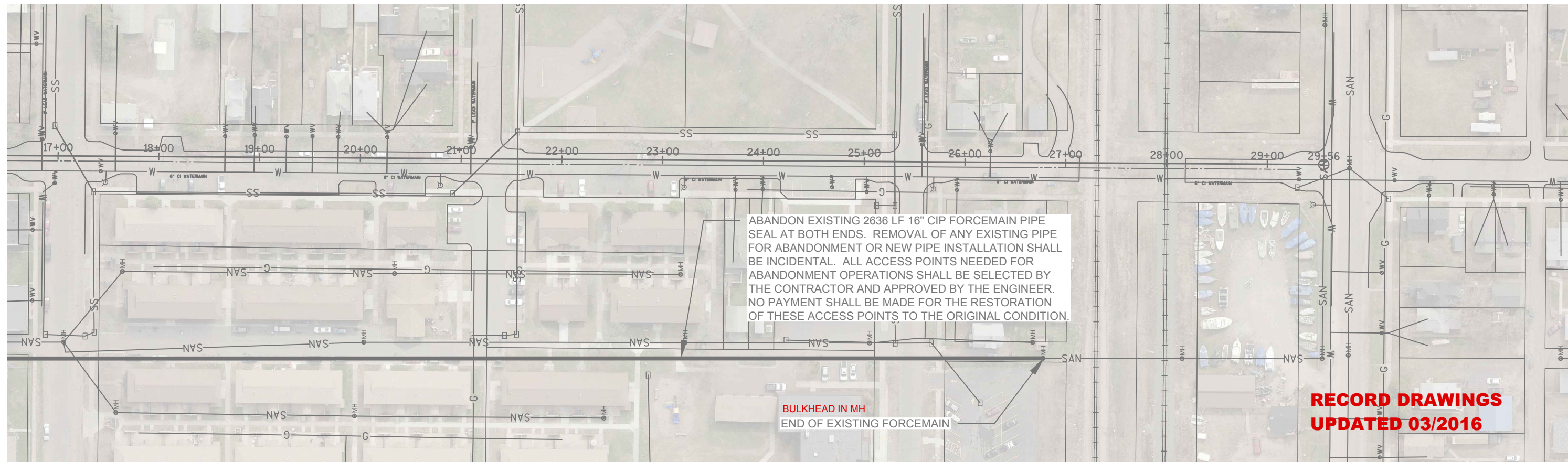




BEGINNING OF EXISTING FORCEMAIN

INSTALL END CAP ON EXIST.  
PIPE IN LIFT STATION 4

ABANDON EXISTING 2636 LF 16" CIP FORCEMAIN PIPE  
SEAL AT BOTH ENDS. REMOVAL OF ANY EXISTING PIPE  
FOR ABANDONMENT OR NEW PIPE INSTALLATION SHALL  
BE INCIDENTAL. ALL ACCESS POINTS NEEDED FOR  
ABANDONMENT OPERATIONS SHALL BE SELECTED BY  
THE CONTRACTOR AND APPROVED BY THE ENGINEER.  
NO PAYMENT SHALL BE MADE FOR THE RESTORATION  
OF THESE ACCESS POINTS TO THE ORIGINAL CONDITION.

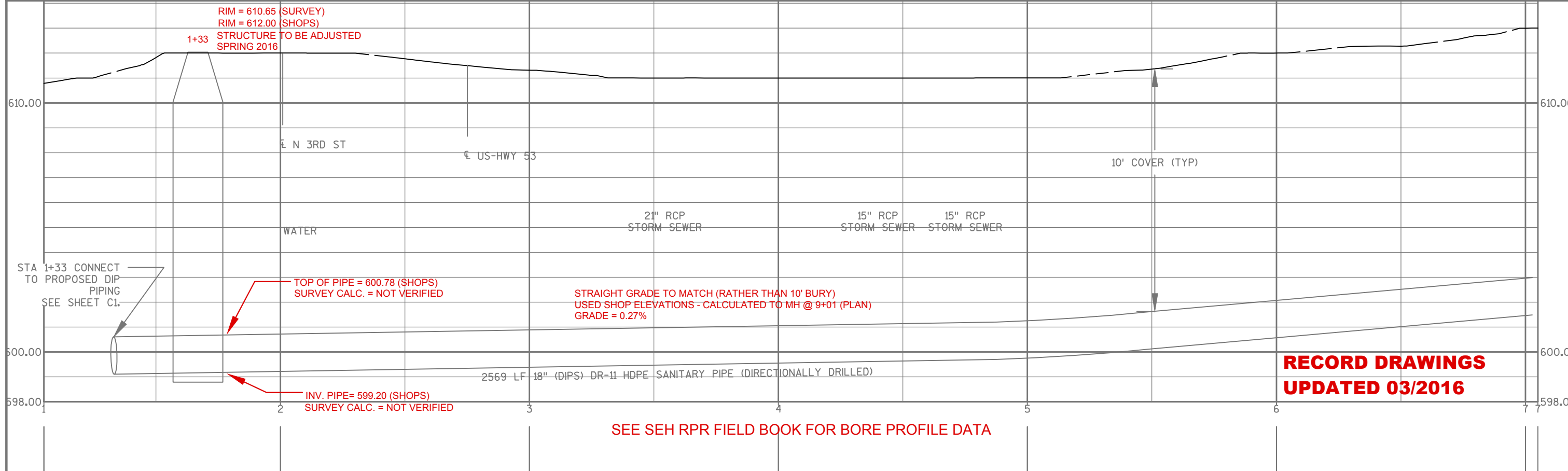
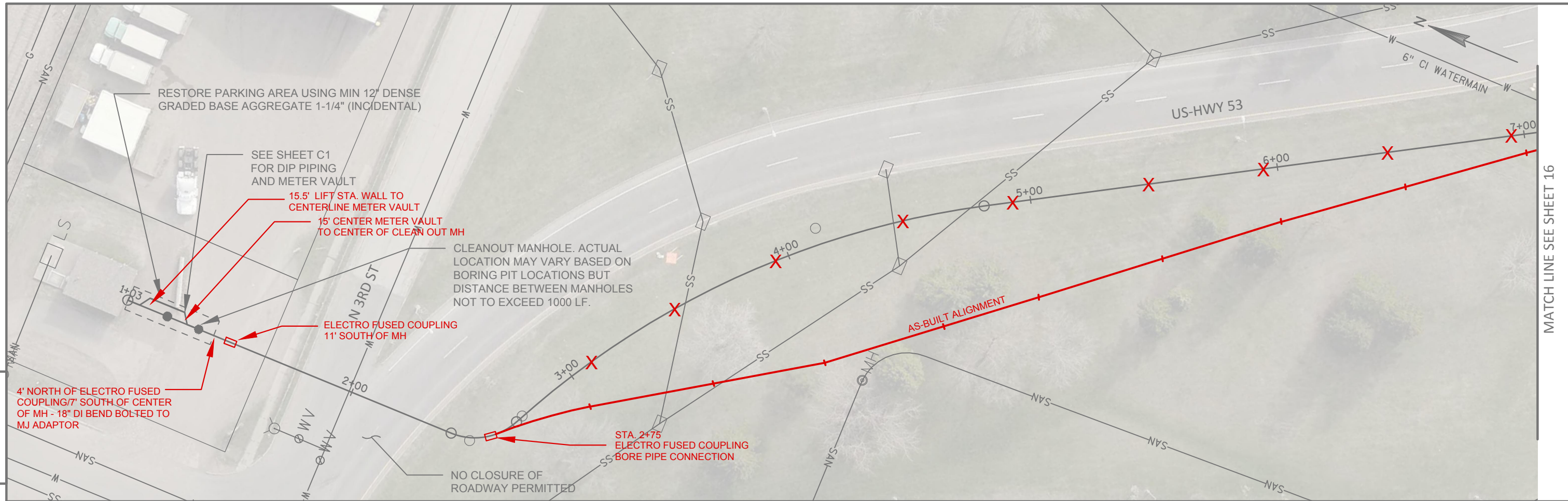


ABANDON EXISTING 2636 LF 16" CIP FORCEMAIN PIPE  
SEAL AT BOTH ENDS. REMOVAL OF ANY EXISTING PIPE  
FOR ABANDONMENT OR NEW PIPE INSTALLATION SHALL  
BE INCIDENTAL. ALL ACCESS POINTS NEEDED FOR  
ABANDONMENT OPERATIONS SHALL BE SELECTED BY  
THE CONTRACTOR AND APPROVED BY THE ENGINEER.  
NO PAYMENT SHALL BE MADE FOR THE RESTORATION  
OF THESE ACCESS POINTS TO THE ORIGINAL CONDITION.

BULKHEAD IN MH  
END OF EXISTING FORCEMAIN

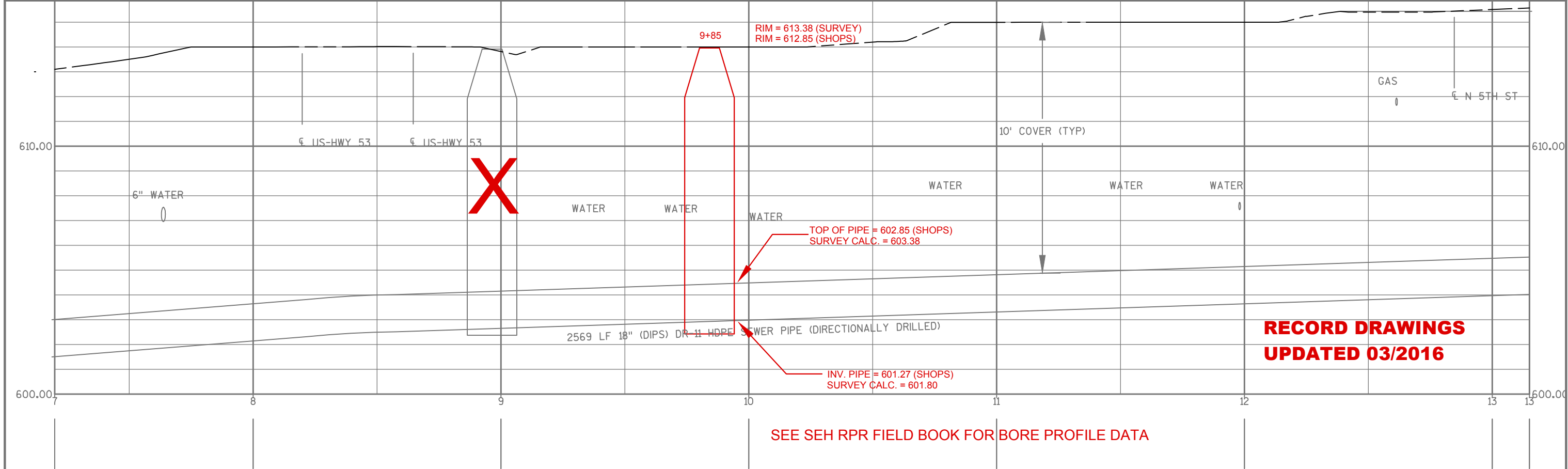
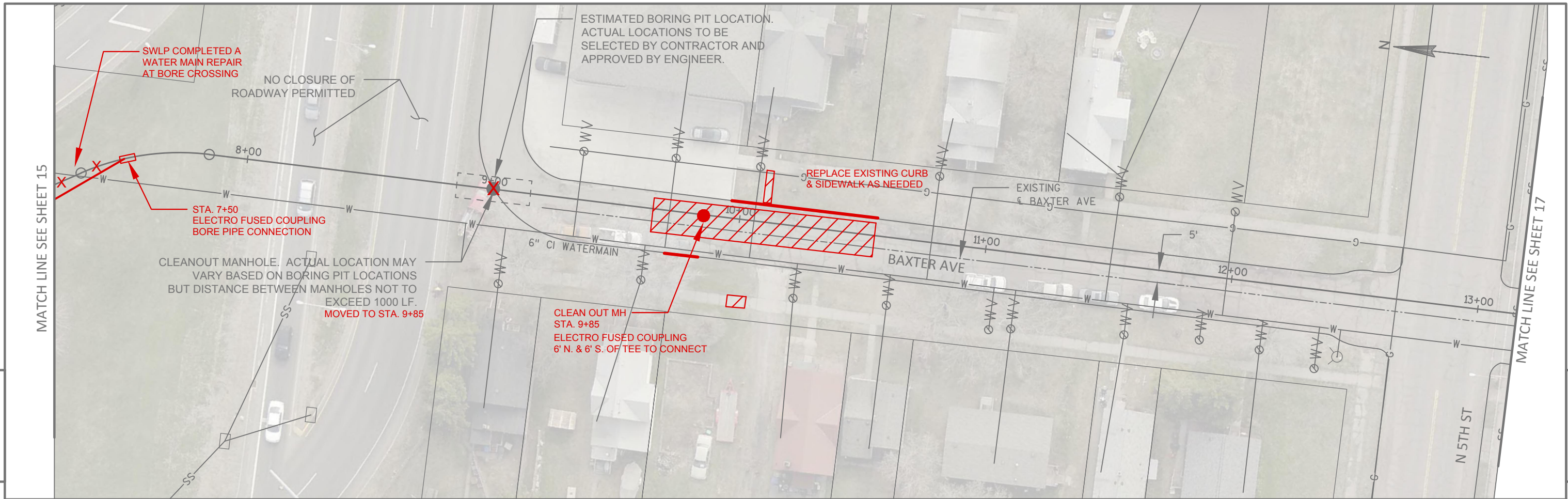
**RECORD DRAWINGS  
UPDATED 03/2016**



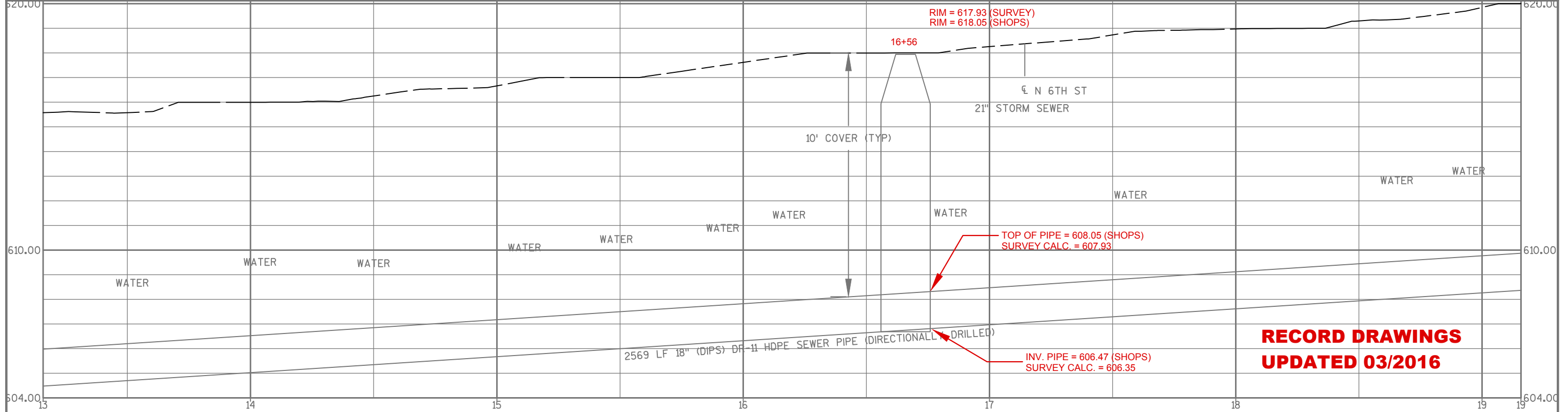
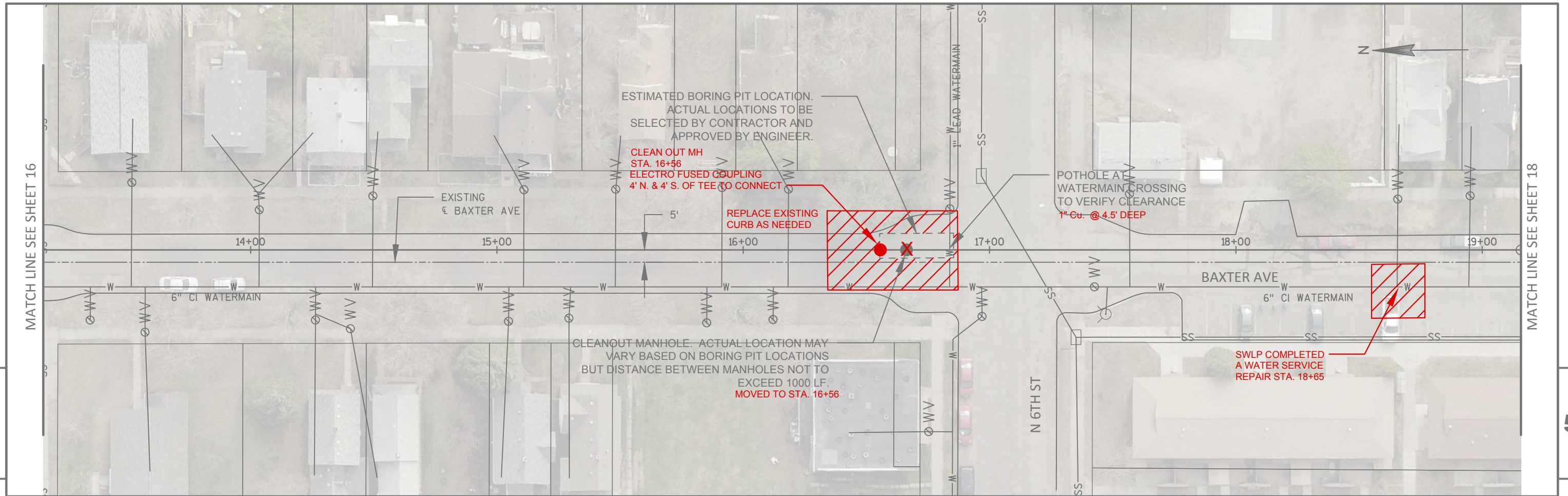


SEE SEH RPR FIELD BOOK FOR BORE PROFILE DATA

**RECORD DRAWINGS  
UPDATED 03/2016**



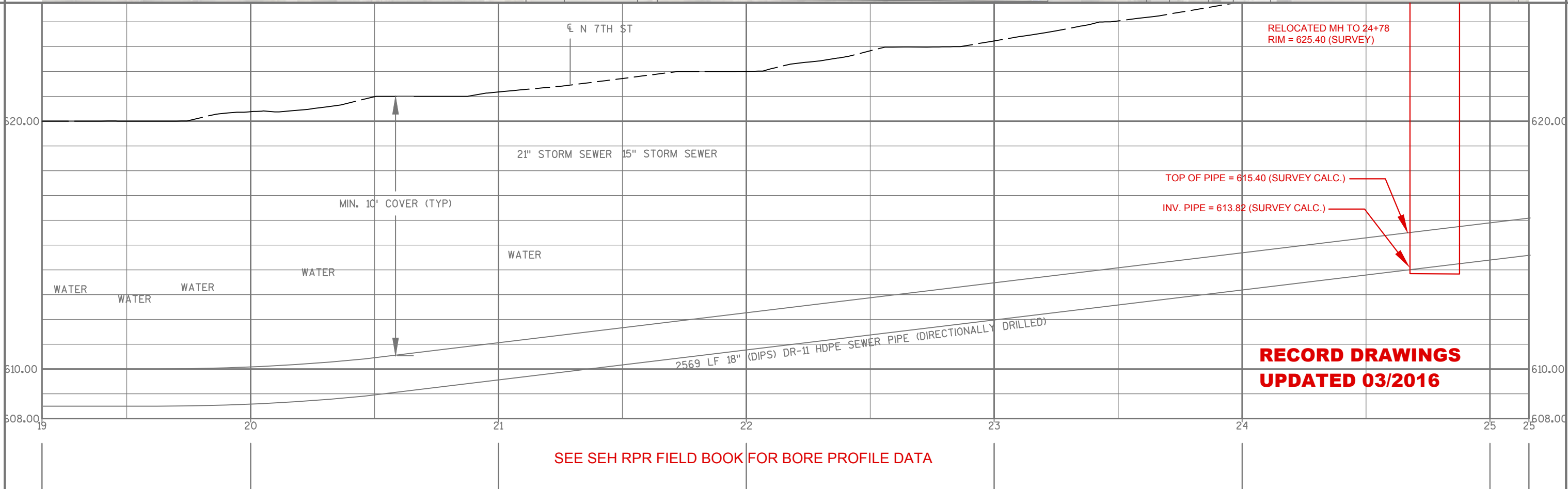
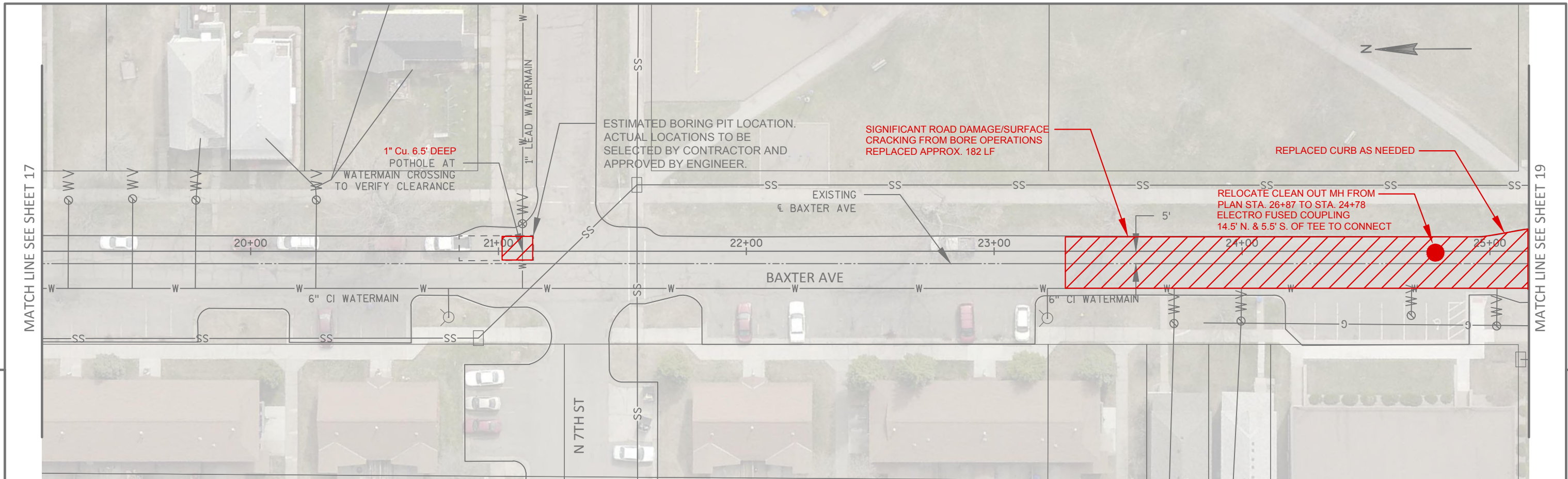




SEE SEH RPR FIELD BOOK FOR BORE PROFILE DATA

**RECORD DRAWINGS  
UPDATED 03/2016**





SEE SEH RPR FIELD BOOK FOR BORE PROFILE DATA

**RELOCATED MH TO 24+78  
RIM = 625.40 (SURVEY)**

**TOP OF PIPE = 615.40 (SURVEY CALC.)**

**INV. PIPE = 613.82 (SURVEY CALC.)**

**RECORD DRAWINGS  
UPDATED 03/2016**

