

# Water and Wastewater System Improvements

## Confederate Memorial State Historic Site

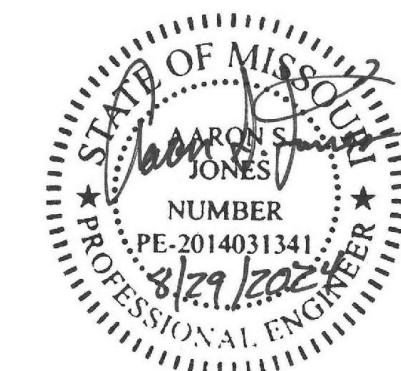
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DEPARTMENT OF  
 NATURAL RESOURCES/ STATE PARKS

PROJECT  
 MANAGEMENT: OFFICE OF ADMINISTRATION  
 DIVISION OF FACILITIES  
 MANAGEMENT, DESIGN AND  
 CONSTRUCTION

DESIGNER: TREKK DESIGN GROUP, LLC  
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PROJECT NUMBER: X230504

SITE NUMBER: 5106  
 ASSET NUMBER: 7815106026

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DIVISION OF FACILITIES  
MANAGEMENT,  
DESIGN AND CONSTRUCTION

DEPARTMENT OF  
NATURAL RESOURCES/  
STATE PARKS &  
HISTORIC PRESERVATION

WATER AND WASTEWATER  
SYSTEM IMPROVEMENTS  
PROJECT  
American Rescue Plan Act (ARPA)

CONFEDERATE MEMORIAL  
STATE HISTORIC SITE  
211 WEST FIRST STREET  
HIGGINSVILLE, MISSOURI

PROJECT # X230504  
SITE # 5106  
ASSET # 7815106026

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SHEET TITLE:  
GENERAL NOTES  
AND LEGEND

SHEET NUMBER:

C-000

2 OF 28 SHEETS  
8/29/2024

**GENERAL NOTES:**

- UTILITIES: LOCATIONS OF UTILITIES ARE SHOWN FOR INFORMATION ONLY AND ARE NOT GUARANTEED TO BE EITHER ACCURATE OR COMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL UTILITIES, OBTAIN UTILITY LOCATIONS, AND VERIFY THE FIELD LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
- DEVIATIONS FROM PLAN AND SPECIFICATIONS: ANY DEVIATIONS IN THE LOCATIONS OR NUMBER OF FACILITIES NOTED FOR INSTALLATION ON THESE PLANS, OR EXTENSION OR RE-ROUTING THE UTILITIES CONSTRUCTED UNDER THESE PLANS, REQUIRES WRITTEN AUTHORIZATION OF THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING. ITEMS INSTALLED IN CONFLICT WITH THE PLANS AND SPECIFICATIONS AND WITHOUT SUCH APPROVAL WILL NOT BE APPROVED FOR PAYMENT.
- SITE ACCESS: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE WORK AT ANY TIME FOR THE OWNER, ENGINEER, AND STATE AND LOCAL OFFICIALS.
- SAFETY ON THE JOB IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE TO REPLACE AND MAINTAIN PROPER BARRICADES AND/OR FENCES TO PREVENT INJURY TO HIS/HER AND OTHER PERSONNEL AND THE PUBLIC.
- THE CONTRACTOR SHALL LEAVE SUCH BARRICADES AND/OR FENCES IN PLACE AT ANY TIME HE/SHE IS ABSENT FROM THE JOB SITE. WORK IN THE RIGHT-OF-WAY SHALL HAVE ADEQUATE TRAFFIC CONTROL TO PROVIDE A SAFE WORK AREA IN ACCORDANCE WITH PART 6 OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES OF THE US DEPARTMENT OF TRANSPORTATION. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC WAYS (SIGNS AND DEVICES) DURING THE CONSTRUCTION WORK AND AT ALL TIMES UNDER THIS CONTRACT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF ANY PROPERTY MONUMENTS (IRONS) REMOVED OR DESTROYED BY THIS CONSTRUCTION. MONUMENTS BEING RESET SHALL BE PLACED BY A SURVEYOR, REGISTERED TO PRACTICE IN THE STATE OF MISSOURI.
- THIS SHALL BE CONSIDERED SUBSIDIARY WORK. EXISTING CURBS, SIDEWALKS, LANDSCAPING, STORM DRAINAGE STRUCTURES AND PIPES, WATERLINE AND SERVICES, SIGNAGE, AND UTILITIES WITHIN THE LIMITS OF CONSTRUCTION SHALL REMAIN AND BE PROTECTED FROM DAMAGE DURING CONSTRUCTION ACTIVITIES UNLESS NOTED OTHERWISE.
- THE CONTRACTOR WILL MINIMIZE ANY EQUIPMENT PARKING ON GRASS AREAS. IN THE EVENT THIS IS UNAVOIDABLE AND RESULTS IN RUTTING OF THE TURF AND SOIL, RESTORATION WILL NOT BE CONSIDERED COMPLETE UNTIL ANY RUTS HAVE BEEN LEVELED OUT AND GRASS SEED IS ADEQUATELY ESTABLISHED. CONTRACTORS WILL PLANT GRASS SEED TO MATCH THAT EXISTING AT THE SITE; FESCUE WITH FESCUE, BERMUDA WITH BERMUDA, ETC. (NO MORE THAN 10% ANNUAL RYE ALLOWED IN ANY CASE). SEED PLACED AFTER JUNE 15TH CANNOT BE EXPECTED TO SHOW A SUBSTANTIAL RE-GROWTH AND MUST BE RE-SEEDED IN THE FALL. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY DAMAGED YARD FEATURE OR EXISTING ITEM TO "PRE-EXISTING" OR "BETTER" CONDITION AT NO EXPENSE TO THE CITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORED SEED/SOD AREAS FOR UP TO 6 MONTHS FROM THE CONCLUSION OF THE WORK PERFORMED. IF THE LANDOWNER ACCEPTS THE WORK, THIS TIME SHALL END.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING.
- THE CONTRACTOR SHALL COORDINATE ALL EXCAVATION WITH THE ARCHAEOLOGIST AND FOLLOW THE GUIDELINES IF AN ARTIFACT IS FOUND.

**DEMO:**

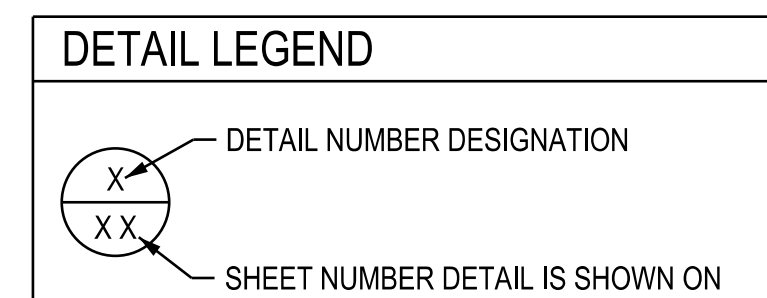
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL CURRENT CITY, STATE AND/OR FEDERAL STANDARD PLANS, GUIDELINES AND SPECIFICATIONS AS APPLICABLE.
- THE CONTRACTOR SHALL CONTACT THE DIGSAFE/DIGRITE UTILITY INFORMATION SERVICE. LOCATION OF EXISTING STRUCTURES AND UTILITIES LINES AS SHOWN ON THE PLANS ARE APPROXIMATE.
- THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES OF THE SCOPE OF WORK AND BE RESPONSIBLE FOR FIELD VERIFICATION OF ALL UTILITY LOCATIONS AND DEPTHS ON-SITE PRIOR TO ANY EXCAVATION. UTILITIES INCLUDE, BUT ARE NOT LIMITED TO STORM, SANITARY, GAS, ELECTRIC, WATER, TELEPHONE, CABLE AND FIBER.
- IN THE EVENT ANY UTILITY DISCONNECTION OR RELOCATION IS NECESSARY, THE CONTRACTOR SHALL COORDINATE AND ALLOW ACCESS FOR UTILITY COMPANIES TO PERFORM THE DISCONNECTION OR RELOCATION ACTIVITIES AS STATED IN THE CONTRACT DRAWINGS OR PER UTILITY COORDINATION EFFORTS. IN THE EVENT ANY UTILITY REQUIRES SHORING, BRACING OR TEMPORARY SUPPORT DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION, DETERMINATION, AND IMPLEMENTATION OF EACH UTILITY PROVIDERS REQUIREMENTS PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL TAKE PRECAUTIONS TO NOT DAMAGE ANY EXISTING PUBLIC INFRASTRUCTURE, INCLUDING SIGNING, SIDEWALKS, STREET LIGHTING, EXIST PUBLIC UTILITIES, STREET OR PARKING LOT PAVEMENT, CONCRETE OR ASPHALT CURBING. ANY ITEMS REMOVED AND STORED SHALL BE COORDINATED AND APPROVED BY CITY STAFF. THE CONTRACTOR SHALL AT HIS OWN EXPENSE, REMOVE, STORE, REPAIR OR REPLACE ANY DAMAGED PORTIONS OF THE PUBLIC INFRASTRUCTURE CAUSED BY DEMOLITION ACTIVITIES AND/OR HAULING ACTIVITIES.
- REMOVALS OF PORTIONS OF PAVEMENT, CURB AND GUTTERS, SIDEWALK, AND OTHER SIMILAR IMPROVEMENTS SHALL BE REMOVED TO AN EXISTING JOINT IF ONE IS WITHIN 5'. IF THERE IS NO EXISTING JOINT, A JOINT WILL BE SAWED TO A MINIMUM DEPTH OF 2" WITH TRUE LINE AND VERTICAL FACE PRIOR TO REMOVAL.
- IF DESIGNATED FOR REMOVAL, THE CONTRACTOR SHALL REMOVE TREES, SHRUBS, BRUSH, GROUND VEGETATION MARKED BY AN "X" LOCATED WITHIN THE DEMOLITION SITE UNLESS OTHERWISE INDICATED ON THE DEMOLITION PLANS. CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING TREES, SHRUBS, AND PLANTS UNLESS OTHERWISE NOTED.
- CARE SHALL BE EXERCISED TO PRESERVE AND/OR PROTECT EXISTING VEGETATION OUTSIDE OF AREAS TO BE GRADED. ANY OF THESE AREAS DAMAGED BY THE GENERAL CONTRACTOR AND/OR HIS ASSIGNEES SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO KEEP STREETS, PARKING LOT, & ENTRANCE FREE OF ALL MUD AND DEBRIS CREATED BY THE DEMOLITION WORK AND/OR HAULING TRUCKS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAUL-OFF AND DISPOSAL OF ALL ITEMS TO BE REMOVED. THE CONTRACTOR SHALL NOT USE ANY REMOVED PAVEMENT OR CURB AS BACKFILL.
- ALL WASTE EXCAVATION, CONSTRUCTION MATERIALS, DEMOLISHED STRUCTURES AND DEBRIS SHALL BE REMOVED FROM THE SITE AS SPECIFIED AND PER GOVERNING STANDARDS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO ESTABLISH, INSTALL AND MAINTAIN ALL APPURTENANCES OF THE SWPPP TO PREVENT SILT WASHOUT UNTIL COMPLETION AND FINAL ACCEPTANCE OF THE CONTRACT. ADDITIONALLY, THE CONTRACTOR SHALL INSTALL EROSION CONTROL AROUND ALL STORM INLETS, AREA INLETS AND CULVERT INLETS TO PREVENT SILTATION INTO THE SEWERS. (THE CONTRACTOR MAY BE REQUIRED TO INSTALL ADDITIONAL SILT FENCE EROSION CONTROL AS DIRECTED BY THE DESIGN PROFESSIONAL).

**GRADING:**

- THE CONTRACTOR'S OPERATIONS SHALL CONFORM TO OSHA CONSTRUCTION STANDARDS 29 CFR PERTAINING TO EXCAVATION AND TRENCHING. THE CONTRACTOR SHALL UTILIZE TRENCH BOXES TO MINIMIZE DISTURBANCE FROM TRENCHING OPERATIONS.
- CONTACT THE DIGSAFE/DIGRITE UTILITY INFORMATION SERVICE. LOCATION OF EXISTING STRUCTURES AND UTILITIES LINES AS SHOWN ON THE PLANS ARE APPROXIMATE.
- THE CONTRACTOR SHALL MINIMIZE LIMITS OF DISTURBANCE AND EXCAVATION. AN ON-SITE ARCHEOLOGIST IS REQUIRED DURING GRADING ACTIVITIES.
- IF THE CONTRACTOR ENCOUNTERS UNSUITABLE OR HAZARDOUS MATERIAL AT ANY TIME, THE CONTRACTOR SHALL STOP WORK AND IMMEDIATELY NOTIFY THE ENGINEER.
- ALL EXCAVATION SHALL BE CONSIDERED UNCLASSIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEWATERING.

**EROSION NOTES**

- ALL WORK SHALL CONFORM TO THE EROSION & SEDIMENT CONTROL SPECIFICATIONS CRITERIA SET FORTH BY THE STATE OF MISSOURI AND AS NOTED IN THE PROJECT DRAWINGS & SPECIFICATIONS. EROSION CONTROL MUST BE IN PLACE PRIOR TO ANY SITE WORK AND MUST BE MAINTAINED CONTINUOUSLY THROUGHOUT THE PROJECT.
- CONTRACTOR SHALL COMPLY WITH THE GOVERNING AGENCY CONSTRUCTION REQUIREMENTS AND NPDES REQUIREMENTS AND SHALL PROVIDE APPROPRIATE MITIGATION MEASURES FOR PROTECTION AND RESTORATION AT ALL LOCATIONS AS REQUIRED BY THEIR OPERATIONS AND AS REQUIRED BY THE CITY'S REPRESENTATIVE. SPECIAL CONSTRUCTION REQUIREMENTS, TEMPORARY PROTECTIVE FENCING OR BARRICADES, SHEETING, SHORING, EROSION PROTECTION, AND SURFACE RESTORATION AT CERTAIN LOCATIONS ARE INDICATED ON THE DRAWINGS TO BRING CONTRACTORS' ATTENTION TO SENSITIVE AREAS.
- THE CONSTRUCTION STAGING AREA AND ANY STOCK PILES SHALL HAVE SILT FENCE AROUND THE PERIMETER.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO ESTABLISH, INSTALL AND MAINTAIN ALL APPURTENANCES TO PREVENT SILT WASHOUT UNTIL COMPLETION AND FINAL ACCEPTANCE OF THE CONTRACT. ADDITIONALLY, THE CONTRACTOR SHALL INSTALL EROSION CONTROL AROUND ALL STORM INLETS, AREA INLETS AND CULVERT INLETS TO PREVENT SILTATION INTO THE SEWERS. (THE CONTRACTOR MAY BE REQUIRED TO INSTALL ADDITIONAL SILT FENCE EROSION CONTROL AS DIRECTED BY THE CITY'S REPRESENTATIVE).
- THE TEMPORARY CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SHOWN IN THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A TEMPORARY CONSTRUCTION ENTRANCE AT LOCATIONS WHERE CONSTRUCTION VEHICLES WILL BE ENTERING AND EXITING THE LIMITS OF DISTURBANCE. CONSTRUCTION ENTRANCE SHALL BE REMOVED AT THE END OF CONSTRUCTION.
- THE LIMITS OF DISTURBANCE SHOWN ARE APPROXIMATE. THE CONTRACTOR SHOULD TAKE CARE TO MINIMIZE DISTURBANCE AS MUCH AS POSSIBLE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE PROJECT SWPPP THROUGHOUT THE PROJECT.
- THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED AREAS AS CONSTRUCTION PHASES ARE COMPLETED AND IN ACCORDANCE WITH THE PROJECT SWPPP.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSPECTION & MAINTENANCE OF ALL EROSION CONTROL MEASURES IN ACCORDANCE WITH THE SWPPP THROUGHOUT THE DURATION OF THE PROJECT.



UTILITIES LEGEND	
EXISTING UNDERGROUND POWER LINES	--- -- E ---
EXISTING OVERHEAD UTILITIES	--- -- OHU ---
EXISTING UNDERGROUND TELEPHONE LINES	--- -- T ---
EXISTING WATER LINE	--- -- W ---
EXISTING SANITARY SEWER	--- -- SAN ---
EXISTING GAS LINE	--- -- G ---
EXISTING STORM SEWER	--- -- ST ---
EXISTING FIBER OPTIC	--- -- FO ---
EXISTING TREE LINE	~~~~~
EXISTING CHAINLINK FENCE	—○—○—○—
EXISTING WIRE/ BARBED WIRE FENCE	—x—x—x—
EXISTING WOOD FENCE	—□—□—□—
PROPOSED SANITARY SEWER	— SAN —
PROPOSED WATER	— W —
RIGHT OF WAY	— R/W —
PROPERTY LINE	— P/L —
EXISTING EASEMENT	— P/E ---
PERMANENT EASEMENT	— P/E ---
TEMPORARY CONSTRUCTION EASMENT	— T/E ---
SECTION LINE	—
PROPOSED MANHOLE	○
PROPOSED COMBINATION AIR VALVE	⊙
ROAD LIMITS	█

LEGEND	
ENCASEMENT PIPE	▬▬▬▬▬▬
SIGN	⊙
TYPE 3 BARRICADE	E
POWER POLE	⊠
LIGHT POLE	⊠
PROPERTY LINE	P/L
ELECTRIC TRANSFORMER	⊠
TELEPHONE POLE	⊠
TELEPHONE PEDESTAL	⊠
CABLE TV PEDESTAL	⊠
GUY ANCHOR	⊠
GAS METER	⊠
GAS VALVE	⊠
MAIL BOX	⊠
SIGN (SURVEY)	⊠
EXISTING TREE (DIA)	⊙ 12"
EXISTING PINE TREE (DIA)	⊙ 12"
EXISTING BUSH	⊙ 5"
TREE REMOVAL	⊙
EXISTING MANHOLE	⊙
BORING REFUSAL	⊙
BENCHMARK	⊙
CONTROL POINT	⊙
GATE VALVE	⊙
FLUSHING ASSEMBLY	⊙
PLUG	⊙
HYDRANT ASSEMBLY	⊙
BACKING BLOCK	⊙
STRADDLE BLOCK	⊙

ABBREVIATIONS:	
AI	AREA INLET
BMP	BEST MANAGEMENT PRACTICE
CI	CURB INLET
CMP	CORRUGATED METAL PIPE
CY	CUBIC YARD
CTR	CENTER
DIA	DIAMETER
DND	DO NOT DISTURB
DWG	DRAWING
EGL	ENERGY GRADE LINE
EL	ELEVATION
EOP	EDGE OF PAVEMENT
EXIST	EXISTING
FES	FLARED END SECTION
FH	FIRE HYDRANT
FL	FLOWLINE
HDPE	HIGH DENSITY POLYETHYLENE
HGL	HYDRAULIC GRADE LINE
INV	INVERT
JB	JUNCTION BOX
LF	LINEAR FEET
MH	MANHOLE
PVC	POLYVINYL CHLORIDE PIPE
PVMT	PAVEMENT
PG	PROFILE GRADE
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT-OF-WAY
SE	SANITARY EASEMENT
SF	SQUARE FEET
SY	SQUARE YARD
TCE	TEMPORARY CONSTRUCTION EASEMENT
UIP	USE IN PLACE
VCP	VITRIFIED CLAY PIPE
VPC	VERTICAL POINT OF CURVATURE
VPT	VERTICAL POINT OF TANGENCY
YD	YARD

**WATER MAIN NOTES:**

- ALL CONSTRUCTION OF WATER MAINS ON THIS PROJECT SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND MISSOURI DEPARTMENT OF NATURAL RESOURCES (DNR).
- THE SCHEDULING OF WATER LINE CONNECTION TO EXISTING MAINS & ANY OPERATION OF WATER SYSTEM APPURTENANCES SHALL BE AT THE DISCRETION OF CONFEDERATE PARK. THE CONTRACTOR SHALL COORDINATE THESE ACTIVITIES BY CONTACTING THE PARK (XXX-XXX-XXXX). ALL WATER CONNECTIONS SHALL BE MADE WITHIN A 4 HOUR TIME PERIOD DURING NORMAL WORKING HOURS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING 72 HOUR ADVANCE NOTICE PRIOR TO ANY SHUT DOWNS. HOT CONNECTION WILL NOT BE ALLOWED.
- THE PRECISE LOCATION, ELEVATION AND ARRANGEMENT OF THE CONNECTIONS ARE TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS AND COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE FITTINGS, ADAPTERS, SOLID SLEEVES, CLOSURE AND HARNESSSED MECANICAL COUPLINGS AND ROTATE FITTINGS, DEFLECT JOINTS, AND MODIFY EXISTING PIPELINE AS APPLICABLE AND REQUIRED TO MAKE CONNECTION TO EXISTING WATER LINE. ADJUSTMENTS FOR ANY OFFSETS IN CENTERLINE ELEVATION BETWEEN PROPOSED AND EXISTING WATER LINES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL FITTINGS REQUIRED TO PROVIDE PROPER HORIZONTAL AND VERTICAL ALIGNMENT FOR NEW WATER MAINS, CONNECTIONS TO EXISTING WATER MAINS AND INSTALLATION OF FIRE HYDRANTS AT THE PROPER LOCATION AND ELEVATION. ALL PIPE FITTINGS SHALL BE CONSIDERED INCIDENTAL TO PIPE INSTALLATION AND SHALL NOT RECEIVE SEPARATE PAYMENT.
- ALL 2" WATER LINES SHALL BE PVC PIPE AND COMPLY WITH C-901 SDR 9, FOR 250 PSI SERVICE. ALL FITTINGS SHALL BE MADE OF DUCTILE IRON AND MANUFACTURED ACCORDING TO AWWA C111/AWSI A21.11. ALL JOINTS SHALL BE RESTRAINED AS SHOWN.
- ALL BENDS IN WATER LINES SHALL HAVE FIELD LOC GASKETS AND THRUST BLOCKING AS REQUIRED PER PLANS AND SHALL BE CONSIDERED INCIDENTAL TO PIPE INSTALLATION.
- COPPER TRACER WIRE SHALL BE INSTALLED WITH ALL PVC PIPE AND SHALL BE CONSIDERED INCIDENTAL TO PIPE INSTALLATION.
- ALL WATER MAINS SHALL HAVE A MINIMUM OF 42 INCHES DEPTH OF COVER FROM THE FINISHED GRADE. BEDDING SHALL COMPLY WITH PROJECT SPECIFICATIONS AND ASTM C33.
- FIRE HYDRANTS SHALL BE AVK MODEL NO 2780 OR MUELLER A423 WITH NONRISING STEM, OR APPROVED EQUAL. HYDRANT SHALL HAVE A 5 1/4" VALVE WITH A 4 1/4" PUMPER NOZZLE, AND 2, 2 1/2" HOSE NOZZLES, LEFT HAND OPENING.
- ALL FIRE HYDRANT BRANCHES SHALL BE RESTRAINED USING APPROVED RESTRAINING DEVICES. HYDRANTS SHALL BE INSTALLED SO THAT THE CENTERLINE OF THE OUTLET NOZZLE IS BETWEEN EIGHTEEN AND TWENTY-ONE INCHES (18"-21") ABOVE FINISHED GRADE, OR CURB WERE APPLICABLE. THESE ITEMS SHALL BE CONSIDERED INCIDENTAL TO FIRE HYDRANT ASSEMBLY.
- GATE VALVES SHALL BE RESILIENT TYPE CONFORMING TO AWWA C-509 WITH MECHANICAL JOINT END CONNECTIONS. ALL BOLTS SHALL BE STAINLESS STEEL.
- ALL VALVES PLACED BEHIND BACK OF CURB SHALL HAVE MIN. 1' CLEARANCE.
- VALVE BOXES SHALL BE APPROVED BY THE PARKS . ALL BOXES SHALL BE INSTALL OUT OF THE ROADWAY WHENEVER POSSIBLE.
- WATER MAINS SHALL BE HYDROSTATICALLY TESTED FOR BACKING AND LEAKAGE AT 150 PSI PER AWWA C-605. DISINFECTION (CHLORINATION) SHALL BE DONE IN ACCORDANCE WITH AWWA C-651. CITY SHALL WITNESS THE ABOVE AND SHALL RECEIVEACCEPTABLE RESULTS OF BACTERIOLOGIC TESTS BEFORE THE LINE IS PLACED IN SERVICE. HYDROSTATIC TESTING REQUIRES 150 PSI FOR 2 HOURS. ALL TESTING SHALL BE CONSIDERED INCIDENTAL AND THE RESPONSIBILITY OF THE CONTRACTOR.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TEMPORARY BLOW-OFF ASSEMBLIES, FITTINGS, THRUST BLOCKING, AND RESTRAINING DEVICES REQUIRED FOR TEMPORARY CONNECTIONS FOR FLUSHING, PRESSURE TESTING, CHLORINATION, AND DE-CHLORINATION OF THE NEW WATER MAINS. PRIOR TO PLACING NEW MAINS IN SERVICE THE CONTRACTOR SHALL REMOVE ANY CORPORATION COCKS USED FOR TESTING OR CHLORINATION AND REPLACE THEM WITH TAPERED BRASS PLUGS.
- COVERS, LIDS AND STANDPIPES ON ALL ABANDONED VALVES SHALL BE REMOVED TO AT LEAST TWO FEET (2') BELOW GRADE AND THE AREA SHALL BE PROPERLY BACKFILLED. IN PAVED AREAS REMOVAL OF VALVE LID AND FILLING OF VALVE BOX WITH CONCRETE MAY BE ALLOWED AT PARK'S DISCRETION. THIS WORK SHALL BE CONSIDERED INCIDENTAL AND NO SEPARATE PAYMENT WILL BE MADE TO THE CONTRACTOR.
- ABANDONED WATER MAINS SHALL BE CUT & PLUGGED, AT THE LOCATIONS SHOWN IN THE PLANS, AND CONCRETE PLUGGED AT ENDS TO ELIMINATE VOIDS.
- EXISTING FIRE HYDRANTS THAT ARE REMOVED SHALL BE RETURNED TO THE PARKS. THIS WORK SHALL BE CONSIDERED INCIDENTAL AND NO SEPARATE PAYMENT WILL BE MADE TO THE CONTRACTOR.
- WATER SERVICE LINES CONNECTED TO MAINS BEING ABANDONED SHALL BE RECONNECTED TO NEW MAINS IN ACCORDANCE WITH THE CONTRACT COCUMENTS. EXISTING WATER SERVICE LINES WILL BE UPGRADED TO ONE CONTINUOUS PIECE OF PIPE BETWEEN MAIN TO METER AND MEET CURRENT REGULATIONS.
- THE CONTRACTOR SHALL INSTALL NEW METER PITS AND METERS WHEN REPLACING WATER SERVICES. THE METERS SHALL BE PAID FOR PER EACH AND THE COST SHALL INCLUDE METER PITS AND ALL MATERIALS, LABOR AND APPURTENANCES REQUIRED TO COMPLETE THE WORK.
- ALL EXCAVATION SHALL BE UNCLASSIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEWATERING.
- IN THE EVENT UNSUITABLE SOIL IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD STAKING.
- THE CONTRACTOR SHALL COMPACT BACKFILL & GRAVEL TO 95% OPTIMUM MOISTURE CONTENT.

**SANITARY SEWER NOTES:**

- TOP OF MANHOLE ELEVATION SHOWN ON PLANS IS TOP OF RING AND COVER CASTING.
- ACTUAL PROPOSED PIPE LENGTHS MAY VARY SLIGHTLY FROM THOSE INDICATED ON PLANS DUE TO THE ANGLE OF ENTRANCE INTO THE STRUCTURE WALL. PAYMENTS WILL BE BASED UPON ACTUAL HORIZONTAL AS-BUILT MEASUREMENTS.
- GRAVITY SANITARY SEWER PIPE MATERIAL SHALL BE PVC/SDR26 AND GREEN IN COLOR UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF THE DEPTH OVER THE LINE EXCEEDS 22 FEET. MATERIALS AND LOCATIONS OF SERVICE LINES SHALL BE SUPPLIED TO THE ENGINEER FOR AS-BUILT DRAWINGS.
- TYPICALLY, GRAVITY SANITARY SEWER LATERALS SHALL BE 4 INCHES IN DIAMETER AND PVC/SDR26; HOWEVER, THE CONTRACTOR SHALL MATCH THE SIZE OF THE EXISTING SERVICE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE DEPTH, LOCATION, AND SIZE OF ANY LATERAL BEING REPLACED, PRIOR TO CONSTRUCTION. SANITARY SEWER LATERALS SHALL BE PAID FOR PER EACH, AND SHALL INCLUDE COST FOR CONNECTION TO THE MAIN, ALL EXCAVATION AND BACKFILL, PIPE FROM THE NEW MAIN TO THE RIGHT-OF-WAY LINE OR OTHERWISE SHOWN, INSTALLATION OF CLEAN-OUT THE SAME SIZE AS LATERAL, CLEAN-OUT COVER AND ALL LABOR, FURNISHINGS, AND MATERIAL ASSOCIATED WITH THIS WORK. SEE DETAILS. IF THE CONTRACTOR FINDS A LATERAL WITHIN LIMITS OF PROPOSED PIPE FROM MH REPLACEMENT, THEN THE LATERAL SHALL BE REPLACED NEW.
- THE EXISTING SEWER IS AN ACTIVE LINE, THEREFORE THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A BYPASS PUMPING PLAN PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN EXISTING DRY & WET WEATHER SEWER FLOWS DURING CONSTRUCTION. THE BYPASS PUMPING PLAN SHALL BE APPROVED BY THE CITY PRIOR TO CONSTRUCTION. BYPASS PUMPING SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NO SEPARATE PAYMENT WILL BE MADE TO THE CONTRACTOR.
- THE CONTRACTOR SHALL MAINTAIN MINIMUM 18" VERTICAL AND 10' HORIZONTAL CLEARANCE BETWEEN WATER AND SEWER LINES.
- PRIOR TO SHOP DRAWING REVIEW AND ORDERING OF MANHOLES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE DEPTH AND ELEVATIONS OF EXISTING MANHOLES. IF DEPTHS DIFFER FROM THE ELEVATIONS SHOWN, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COST AND COORDINATION OF TESTING ASSOCIATED WITH SEWER IN ACCORDANCE WITH SECTION 2500 OF THE KANSAS CITY METROPOLITAN CHAPTER OF AMERICAN PUBLIC WORKS ASSOCIATION. TESTING SHALL INCLUDE: SOILS DENSITY TESTING AND MANHOLE VACUUM TESTING. THE CONTRACTOR SHALL UTILIZE A THIRD PARTY INDEPENDENT TESTING LABORATORY FOR SOILS DENSITY TESTING. ALL COST ASSOCIATED WITH TESTING SHALL BE CONSIDERED INCIDENTAL TO THE BASE BID.
- ALL EXCAVATION SHALL BE UNCLASSIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEWATERING.
- IN THE EVENT UNSUITABLE SOIL IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD STAKING.
- THE CONTRACTOR SHALL COMPACT BACKFILL & GRAVEL TO 95% OPTIMUM MOISTURE CONTENT.
- UNDERGROUND TRACER WIRE SHALL BE INSTALLED ALONG THE FORCEMAIN. TRACER WIRE SHALL HAVE HDPE INSULATION, BE NO SMALLER THAN 12 GAUGE AND GREEN IN COLOR. SPLICES IN WIRING SHALL BE MADE WITH EPOXY/SILICON CONNECTOR. TRACER WIRE SHALL BE ACCESSIBLE AT AIR RELEASE VALVE ASSEMBLIES. TRACER WIRE SHALL BE GROUNDED TO A MINIMUM ONE POUND MAGNESIUM ANODE AT THE SEWER LINE.



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STATE HISTORIC SITE  
211 WEST FIRST STREET  
HIGGINSVILLE, MISSOURI

PROJECT # X230504  
SITE # 5106  
ASSET # 7815106026

REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

CAD DWG FILE:  
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DRAWN BY: MBT  
CHECKED BY: MS  
DESIGNED BY: TML

SHEET TITLE:  
GENERAL NOTES  
AND LEGEND

SHEET NUMBER:

C-001

3 OF 28 SHEETS  
8/29/2024





COORDINATES SHOWN HEREON ARE BASED ON THE MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD 83 (2011), VERTICAL DATUM IS NAVD 88 AND ALL IS SHOWN IN U.S. SURVEY 'GROUND' FEET USING A COMBINED AVERAGE FACTOR OF 0.99996247. A TRIMBLE R12I RTK RECEIVER WAS UTILIZED AND THE GPS BASE STATION FOR THE PROJECT WAS MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION GLOBAL NAVIGATION SATELLITE REAL TIME NETWORK. PROJECT INITIAL START DATE IS MARCH, 2024.

**HORIZONTAL AND VERTICAL CONTROL**

CP 2 - SET 5/8" IRON BAR AT THE NW CORNER OF ASPHALT PARKING LOT ON THE SOUTH SIDE OF WEST 1st STREET.  
 RM 1 - EAST 82.77' TO MAG NAIL IN WEST FACE OF POWER POLE  
 RM 2 - SW 15.86' TO EAST FACE OF PARK BOUNDARY SIGN  
 RM 3 - NORTH 3.26' TO EDGE OF SIDEWALK  
 NORTHING: 1068679.683 / EASTING: 3007999.233 / ELEVATION: 810.87

CP 3 - SET 1/2" IRON BAR AT THE NE CORNER OF ASPHALT PARKING LOT ON THE NORTH SIDE OF WEST 1st STREET, EAST OF HIGHWAY 213.  
 RM 1 - SE 3.40' TO NE CORNER OF PARKING LOT  
 RM 2 - WEST 64.80' TO EAST FACE OF 36" TREE  
 RM 3 - SE 35.00' TO NW CORNER OF CONCRETE PAD  
 NORTHING: 1069452.457 / EASTING: 3009116.355 / ELEVATION: 820.82

CP 4 - SET 1/2" IRON BAR ON NORTH SIDE OF SIDEWALK AT P.I.  
 RM 1 - SW 33.30' TO NE CORNER OF TRASH CAN ENCLOSURE  
 RM 2 - NORTH 30.50' TO SOUTH FACE OF GRILL POST  
 RM 3 - NE 27.90' TO SOUTH FACE OF HANDICAP SIGN POST  
 NORTHING: 1068381.306 / EASTING: 3009207.941 / ELEVATION: 807.98

CP 5 - SET 1/2" IRON BAR ON THE NORTH SIDE OF PARK ACCESS ROAD.  
 RM 1 - NW 59.30' TO SOUTH FACE OF 36" TREE  
 RM 2 - WEST 49.00' TO WEST FACE OF 48" TREE  
 RM 3 - SW 51.70' TO NORTH FACE OF TWIN 18" TREE  
 NORTHING: 1068122.747 / EASTING: 3008190.841 / ELEVATION: 781.12

CP 6 - SET 1/2" IRON BAR ON THE SOUTH SIDE OF PARK ACCESS ROAD, NORTH OF HIGHWAY 13.  
 RM 1 - SE 58.60' TO NE CORNER OF CONCRETE HEADWALL AT POND SPILLWAY  
 RM 2 - EAST 92.00' TO EAST FACE OF 36" TREE  
 RM 3 - NE 53.80' TO SOUTH FACE OF 18" TREE  
 NORTHING: 1067493.395 / EASTING: 3007457.547 / ELEVATION: 761.53

CP 7 - SET 1/2" IRON BAR ON THE SOUTHEAST SIDE OF WEST 1st STREET.  
 RM 1 - NE 74.00' TO SOUTHEAST FACE OF 20" TREE  
 RM 2 - WEST 17.40' TO SOUTH EDGE OF PAVEMENT  
 RM 3 - SW 20.0' TO NORTH FACE OF 24" TREE  
 NORTHING: 1068260.997 / EASTING: 3007489.876 / ELEVATION: 800.63

BM 2 - SET CHISELED BOX ON WEST SIDE OF OLD FLAG POLE BASE.  
 ELEVATION: 814.28

BM 3 - SET CHISELED BOX ON NW CORNER OF CONCRETE BASE OF NW LEG OF OLD WATER TOWER.  
 ELEVATION: 823.94

BM 4 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND PICNIC TABLE.  
 ELEVATION: 809.35

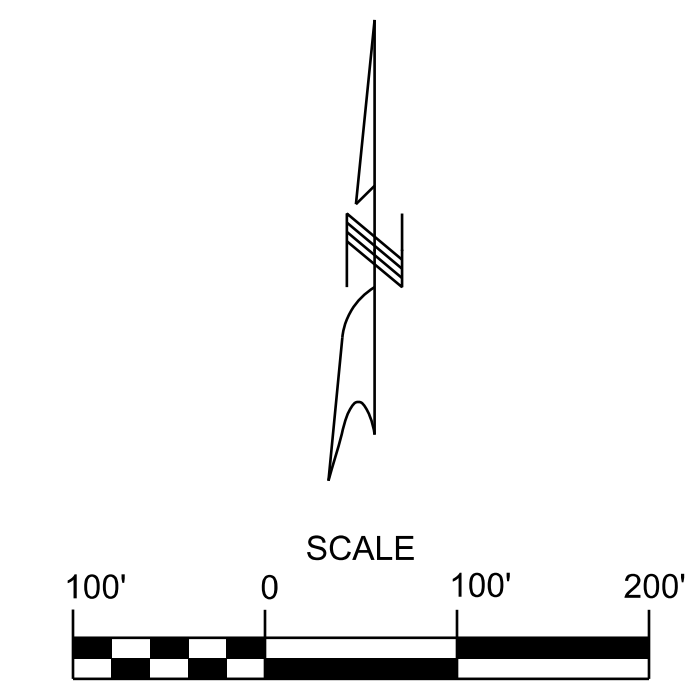
BM 5 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND 'HOLE #5' SIGN.  
 ELEVATION: 774.99

BM 6 - SET CHISELED BOX ON NE CORNER OF CONCRETE HEADWALL AROUND POND SPILLWAY.  
 ELEVATION: 760.02

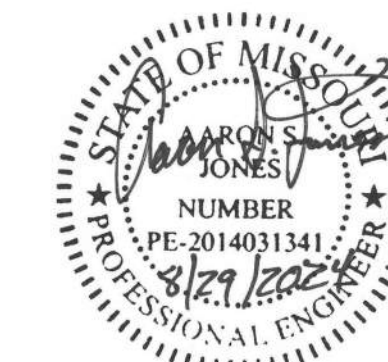
BM 7 - SET CHISELED BOX ON NE CORNER OF CONCRETE PAD AT ENTRANCE TO CHURCH.  
 ELEVATION: 805.83

**SURVEYORS NOTES:**

- THIS EXHIBIT DOES NOT REPRESENT A BOUNDARY SURVEY.
- UTILITIES SHOWN HEREON AS MARKED BY MISSOURI ONE-CALL, EXHIBITS/MAPS AND VISUAL OBSERVATION UNLESS OTHERWISE NOTED, THIS SURVEYOR MAKES NO GUARANTEE AS TO ACCURACY OR COMPLETENESS OF SAID LOCATES. CONTRACTOR TO FIELD VERIFY BEFORE ANY EXCAVATION.



STATE OF MISSOURI  
 MICHAEL L. PARSON,  
 GOVERNOR



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PROJECT # X230504  
 SITE # 5106  
 ASSET # 7815106026

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ISSUE DATE: 8/29/2024

CAD DWG FILE:  
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 DRAWN BY: MBT  
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 DESIGNED BY: TML

SHEET TITLE:  
 WATER LAYOUT &  
 SURVEY CONTROL

SHEET NUMBER:

C-002

4 OF 28 SHEETS  
 8/29/2024





COORDINATES SHOWN HEREON ARE BASED ON THE MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD 83 (2011), VERTICAL DATUM IS NAVD 88 AND ALL IS SHOWN IN U.S. SURVEY 'GROUND' FEET USING A COMBINED AVERAGE FACTOR OF 0.99996247. A TRIMBLE R12i RTK RECEIVER WAS UTILIZED AND THE GPS BASE STATION FOR THE PROJECT WAS MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION GLOBAL NAVIGATION SATELLITE REAL TIME NETWORK. PROJECT INITIAL START DATE IS MARCH, 2024.

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 ELEVATION: 774.99

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CP #7 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND 'HOLE #5' SIGN.  
 ELEVATION: 774.99

CP #8 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND PICNIC TABLE.  
 ELEVATION: 809.35

CP #9 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND 'HOLE #5' SIGN.  
 ELEVATION: 774.99

CP #10 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND PICNIC TABLE.  
 ELEVATION: 809.35

CP #11 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND 'HOLE #5' SIGN.  
 ELEVATION: 774.99

CP #12 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND PICNIC TABLE.  
 ELEVATION: 809.35

CP #13 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND 'HOLE #5' SIGN.  
 ELEVATION: 774.99

CP #14 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND PICNIC TABLE.  
 ELEVATION: 809.35

CP #15 - SET CHISELED BOX ON NW CORNER OF CONCRETE PAD AROUND 'HOLE #5' SIGN.  
 ELEVATION: 774.99



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 211 WEST FIRST STREET  
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PROJECT # X230504  
 SITE # 5106  
 ASSET # 7815106026

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ISSUE DATE: 8/29/2024

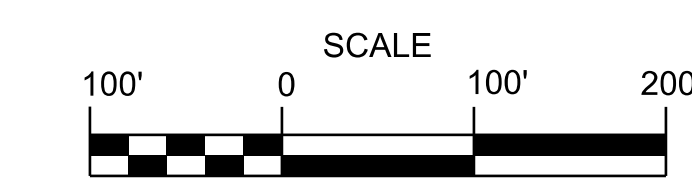
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SHEET TITLE:  
**SEWER LAYOUT &  
 SURVEY CONTROL**

SHEET NUMBER:

**C-003**

5 OF 28 SHEETS  
 8/29/2024







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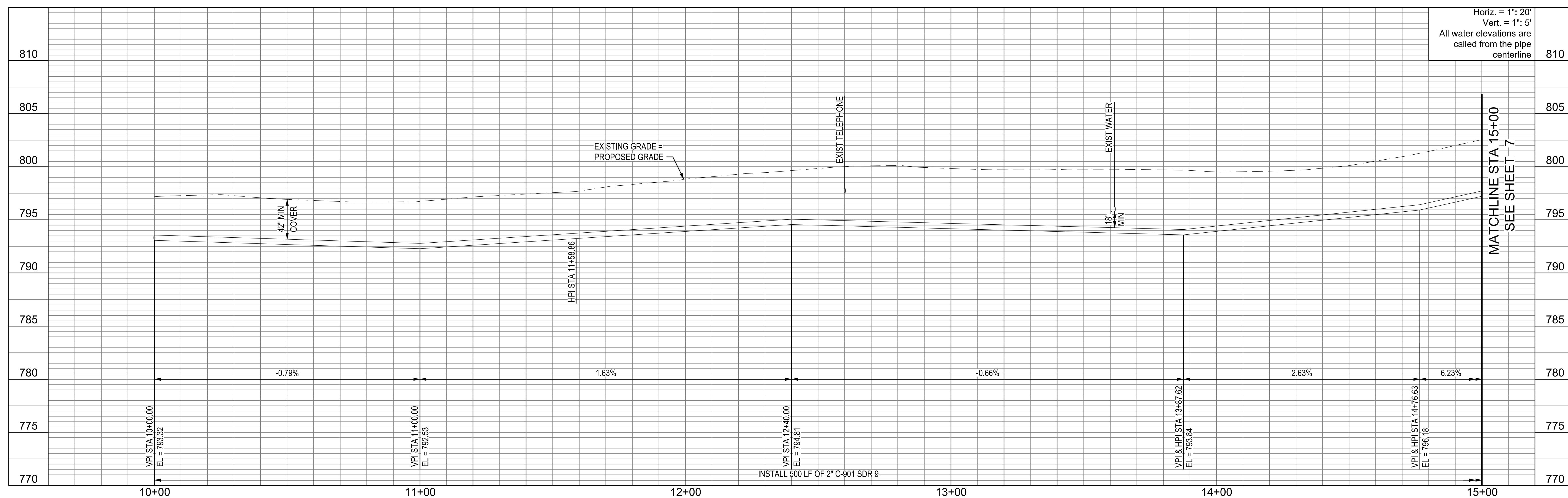
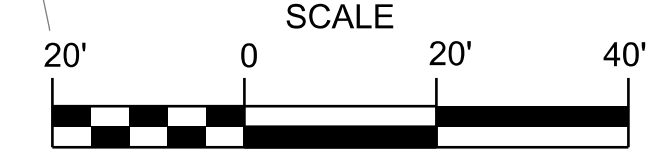
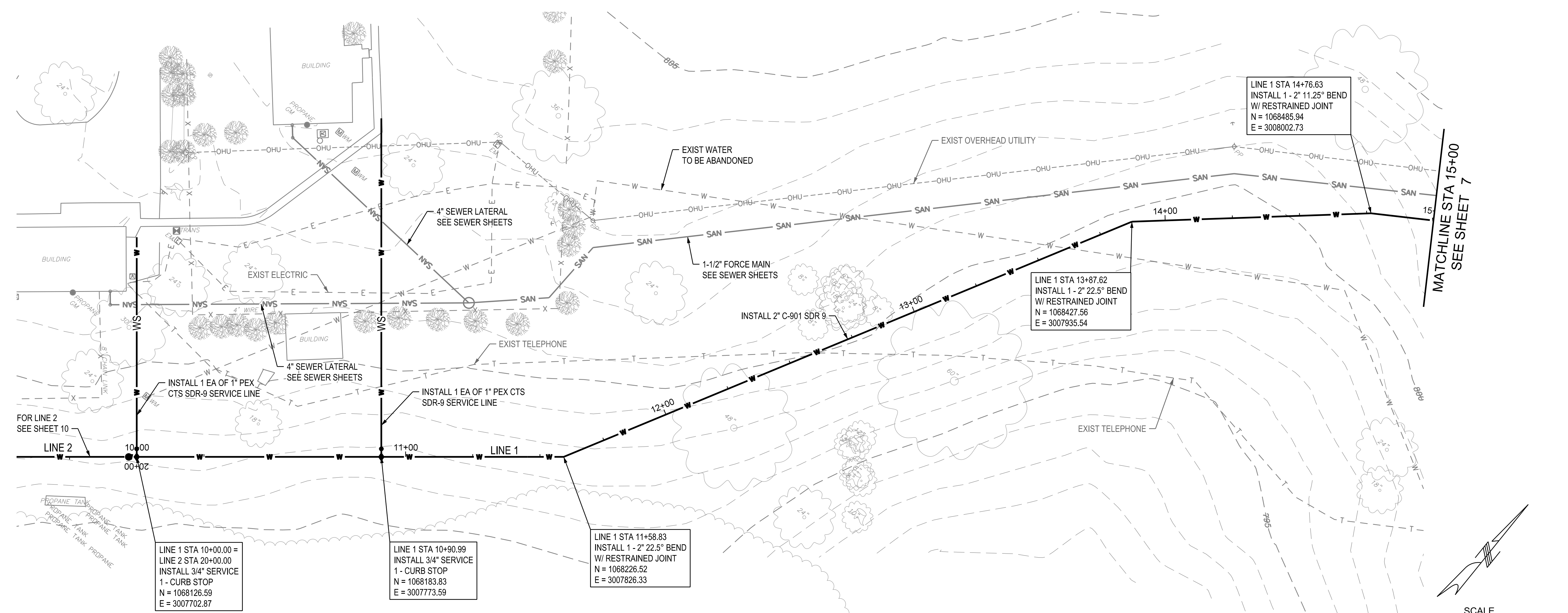
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SHEET TITLE:  
**WATER LINE 1  
PLAN & PROFILE**

SHEET NUMBER:

**C-100**

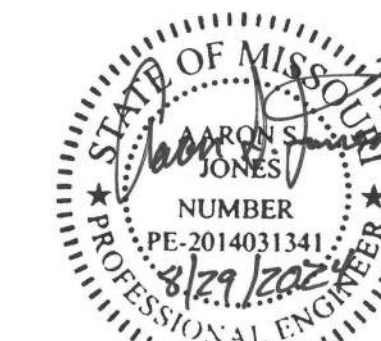
6 OF 28 SHEETS  
8/29/2024



Horiz. = 1" = 20'  
Vert. = 1" = 5'  
All water elevations are called from the pipe centerline

MATCHLINE STA 15+00  
SEE SHEET 7





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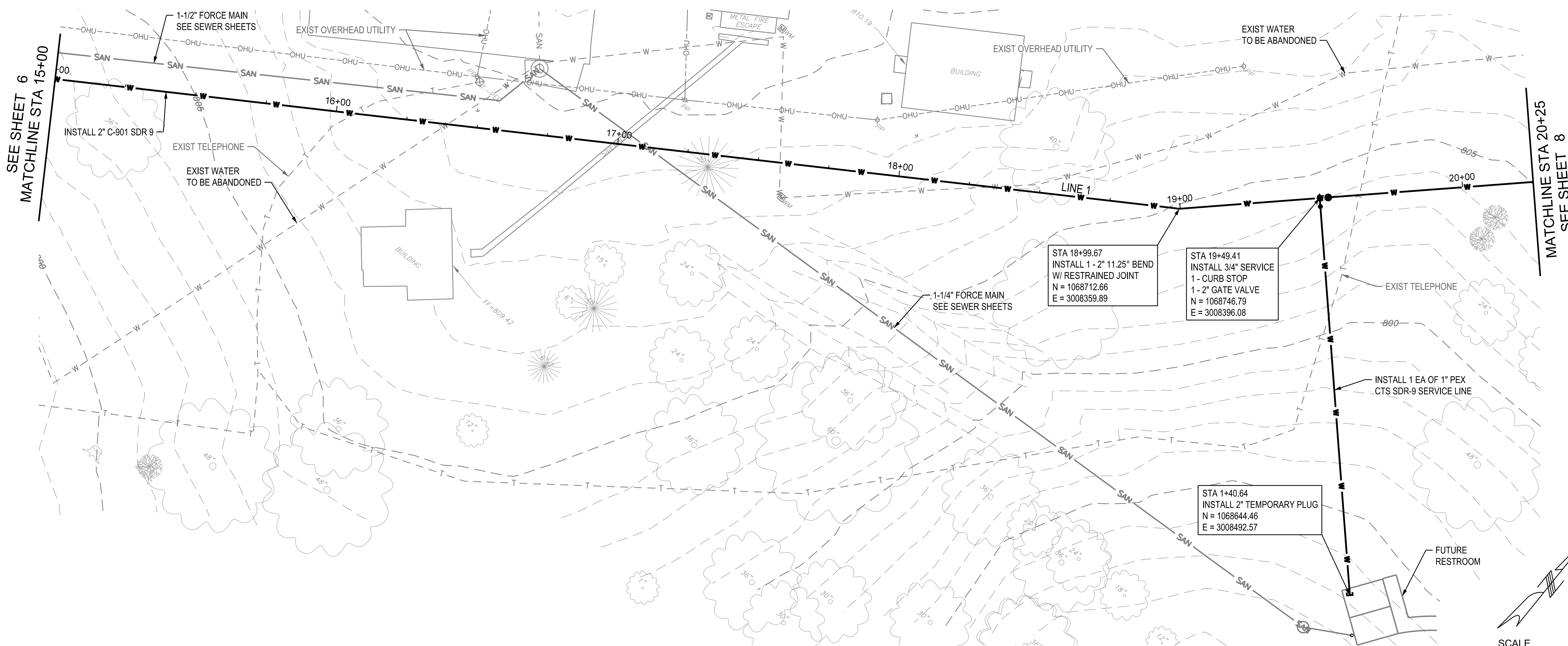
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**WATER LINE 1  
PLAN & PROFILE**

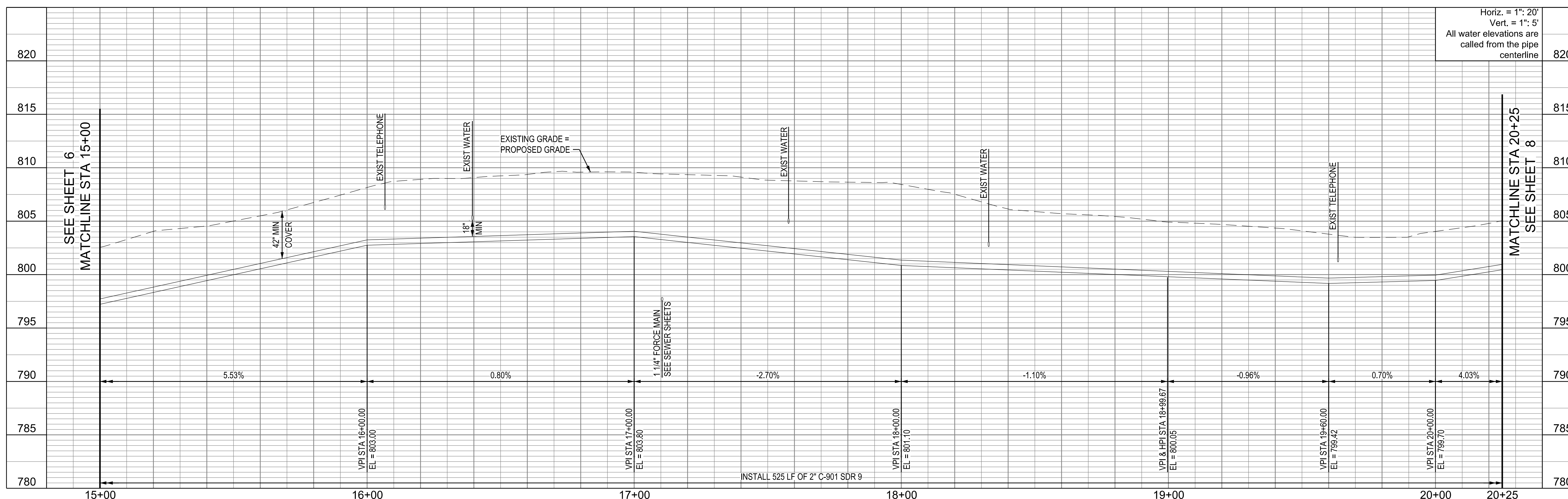
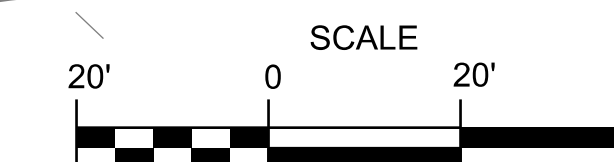
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**C-101**

7 OF 28 SHEETS  
8/29/2024

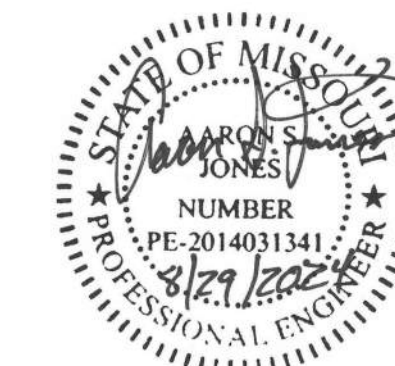


**LINE 1 WATER LINE PLAN**



Horiz. = 1" = 20'  
Vert. = 1" = 5'  
All water elevations are  
called from the pipe  
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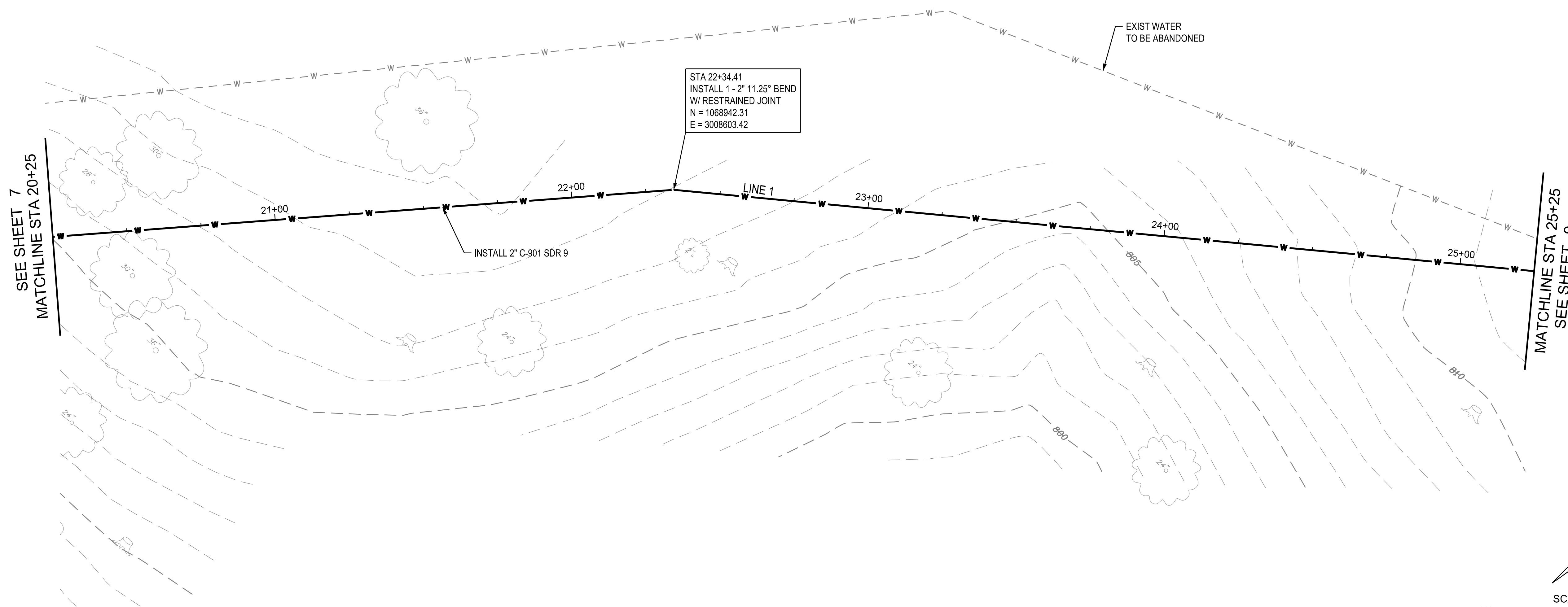
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DESIGNED BY: TML

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**WATER LINE 1  
PLAN & PROFILE**

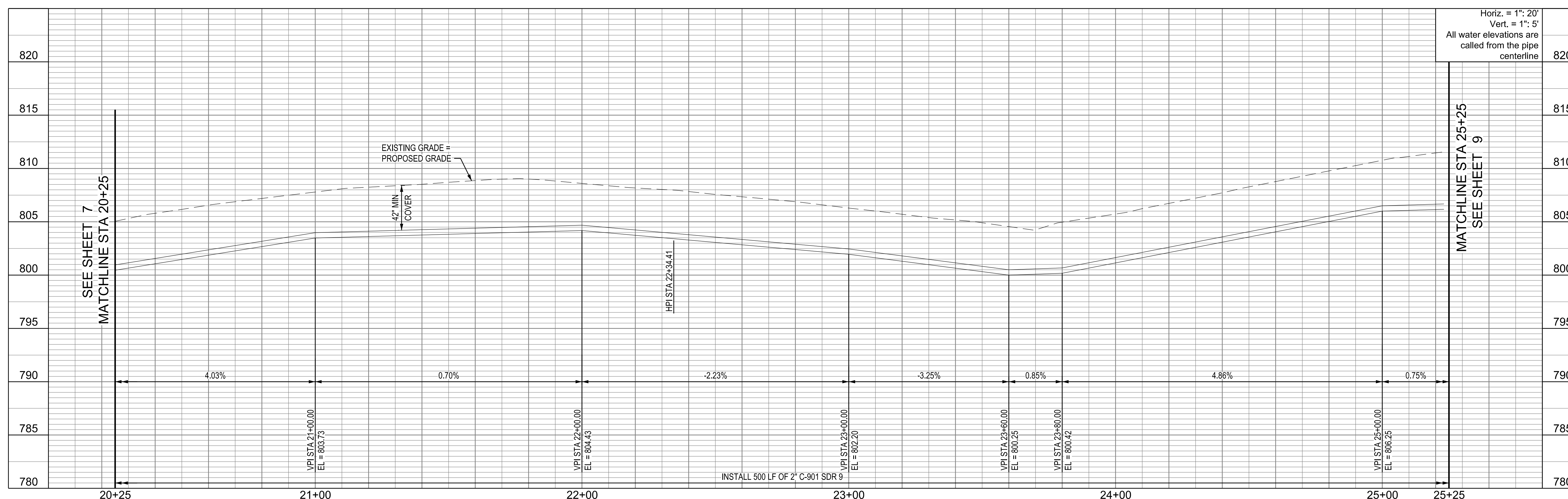
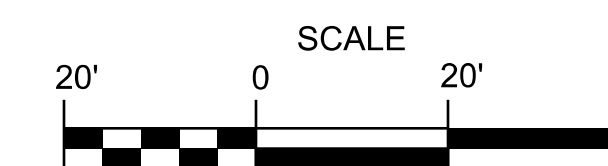
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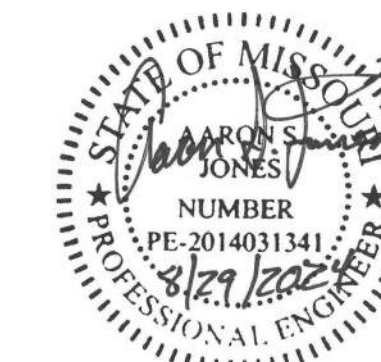
**C-102**

8 OF 28 SHEETS  
8/29/2024



**LINE 1 WATER LINE PLAN**





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ISSUE DATE: 8/29/2024

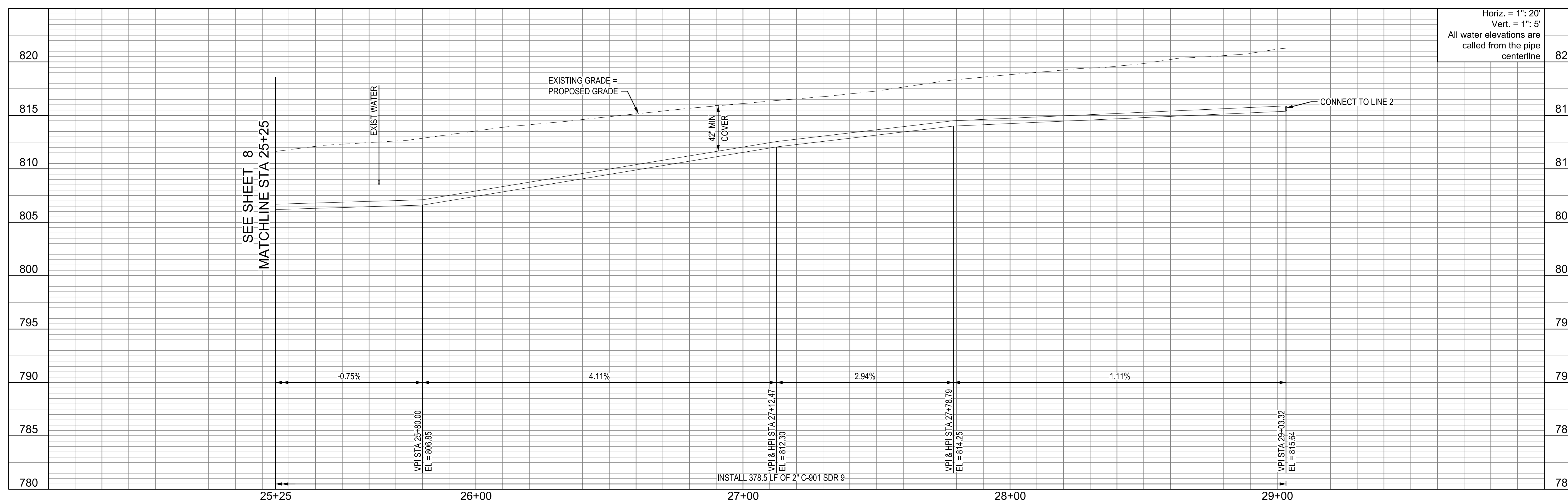
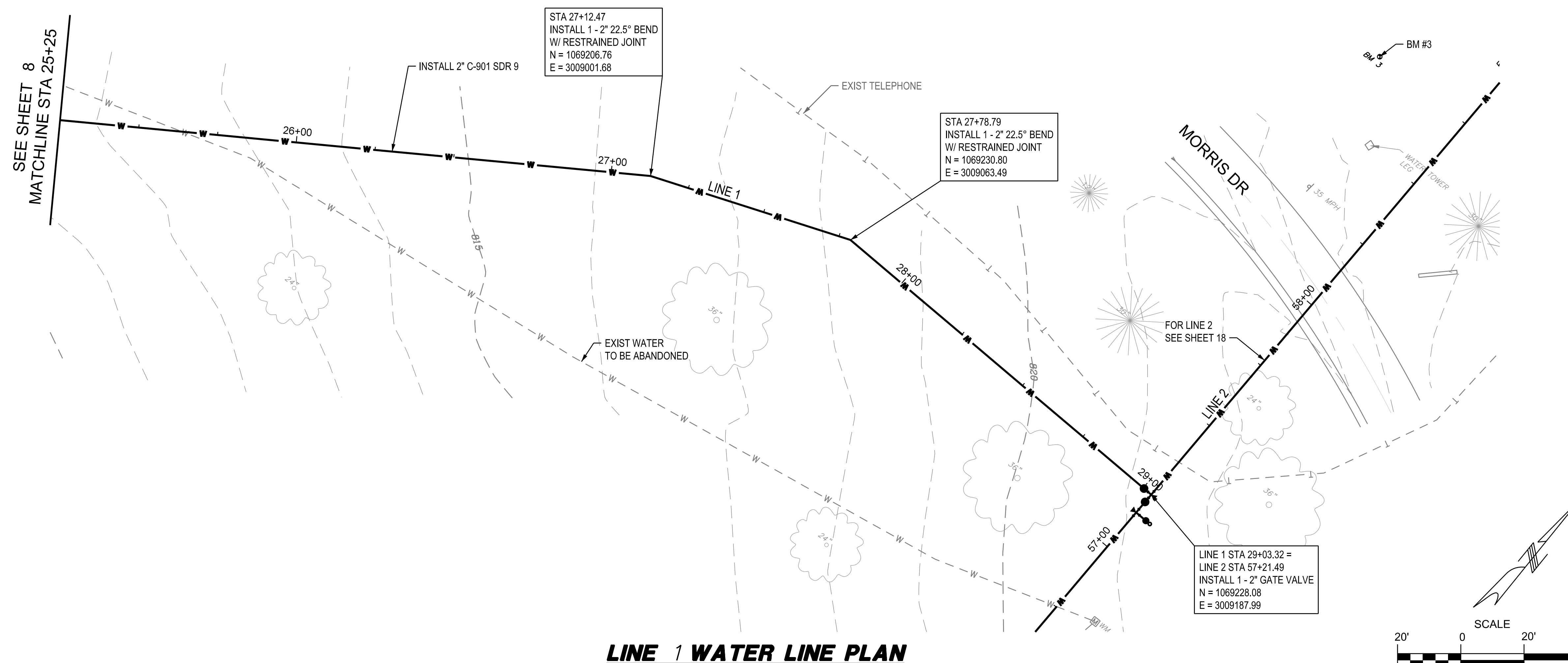
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PLAN & PROFILE**

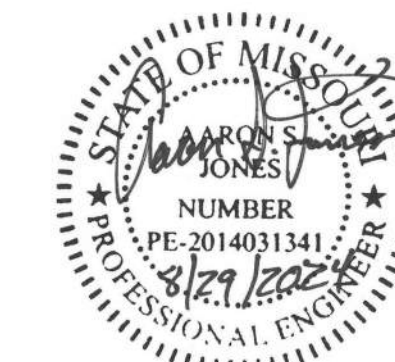
SHEET NUMBER:

**C-103**

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8/29/2024







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CONFEDERATE MEMORIAL  
STATE HISTORIC SITE  
211 WEST FIRST STREET  
HIGGINSVILLE, MISSOURI

PROJECT # X230504  
SITE # 5106  
ASSET # 7815106026

REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

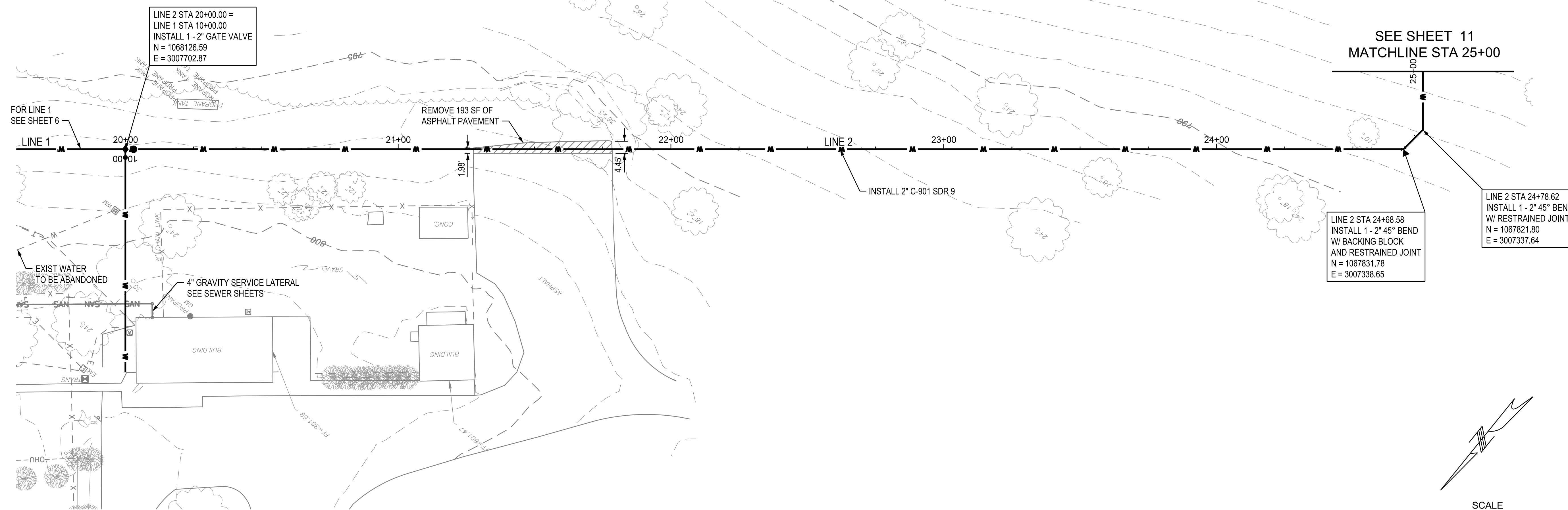
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PLAN & PROFILE**

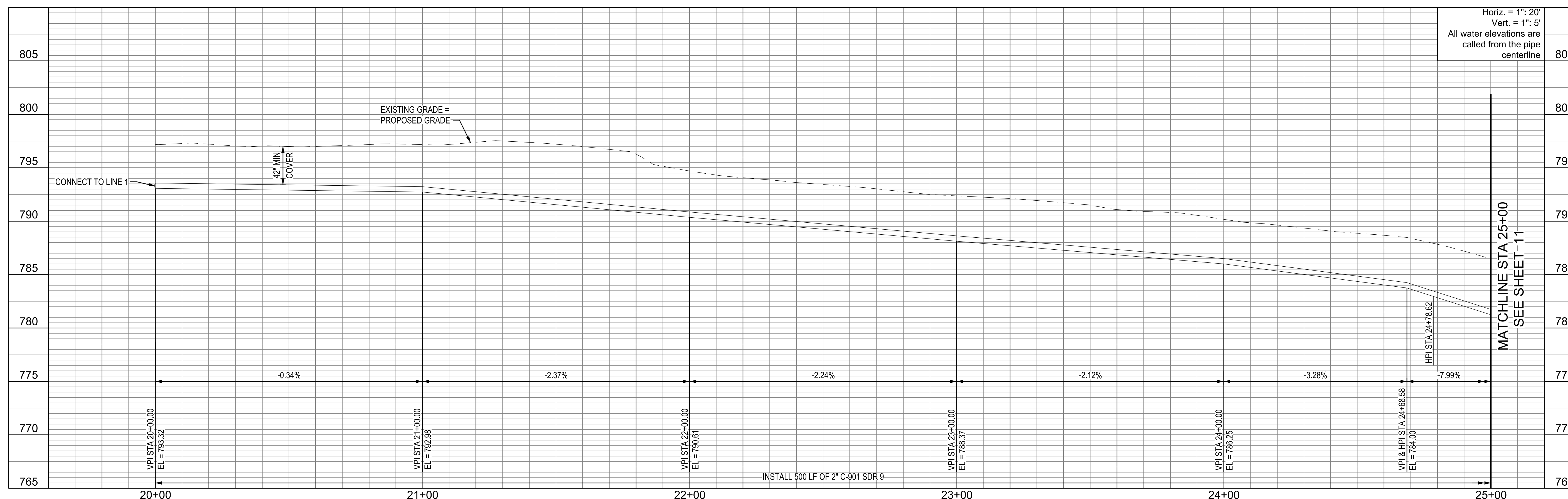
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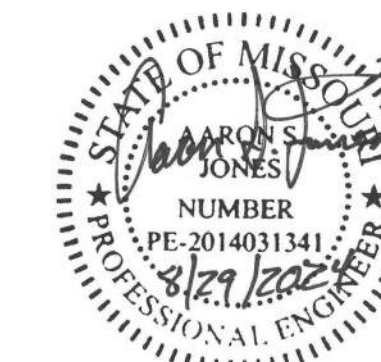
**C-104**

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8/29/2024



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SITE # 5106  
ASSET # 7815106026

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REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

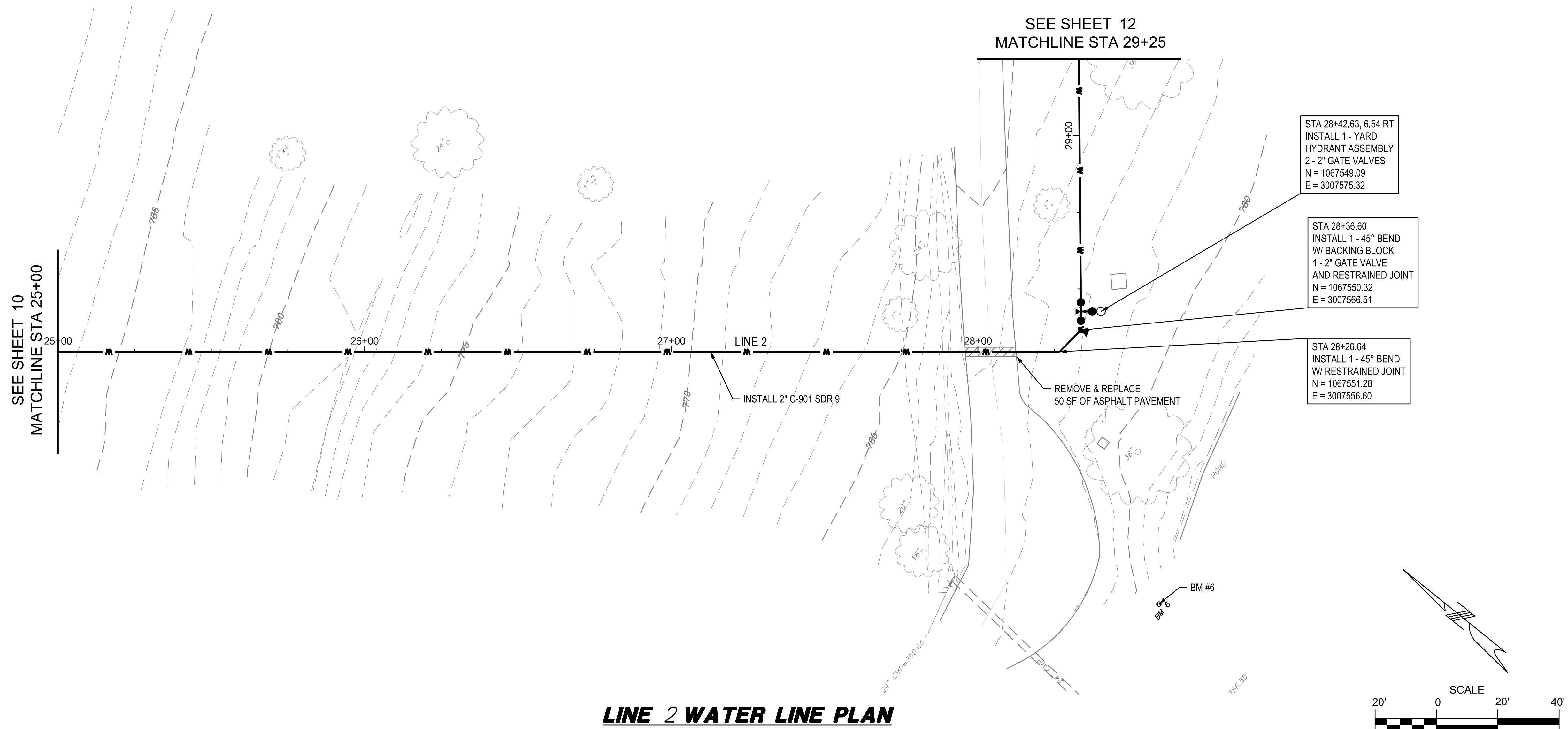
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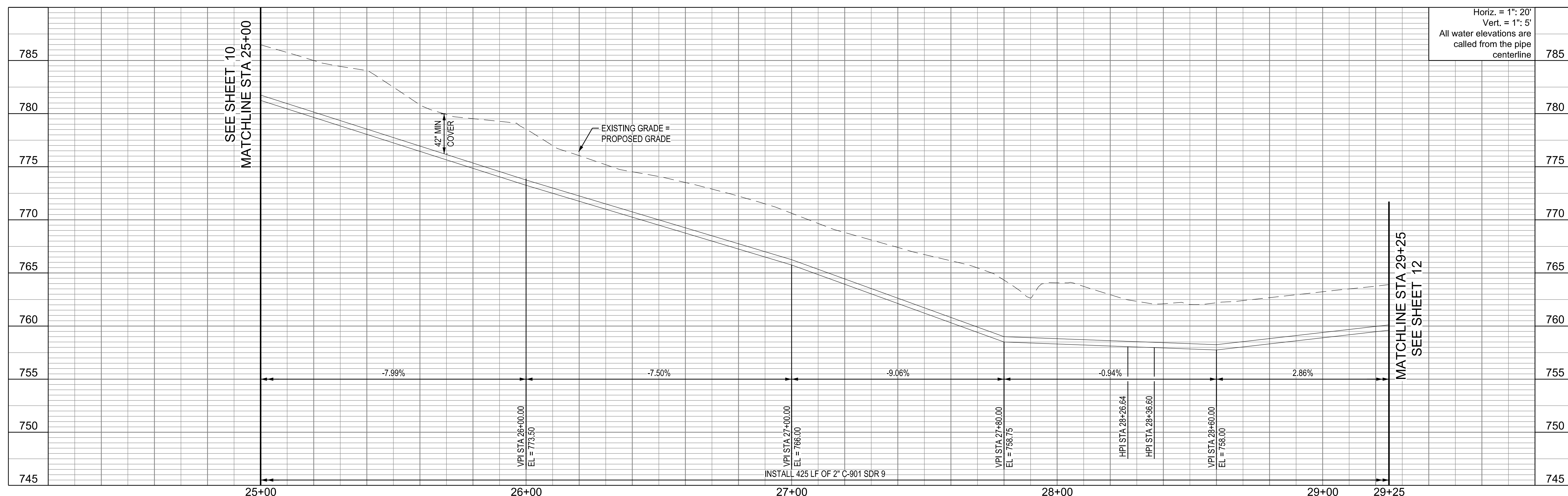
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C-105

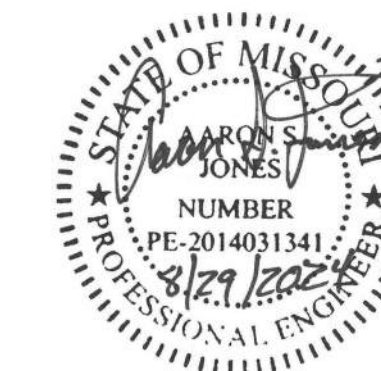
11 OF 28 SHEETS  
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PROJECT # X230504  
SITE # 5106  
ASSET # 7815106026

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REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

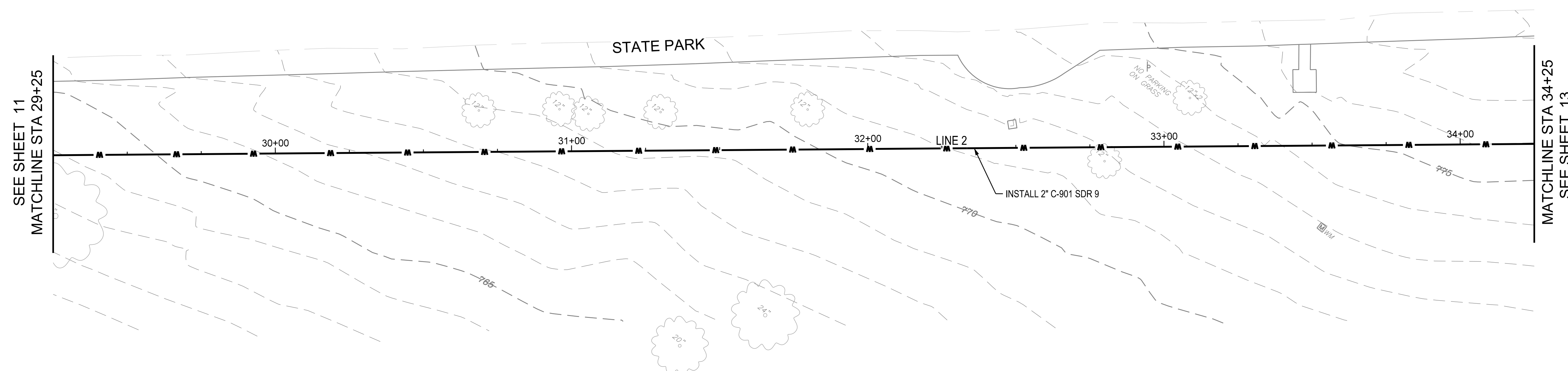
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PLAN & PROFILE**

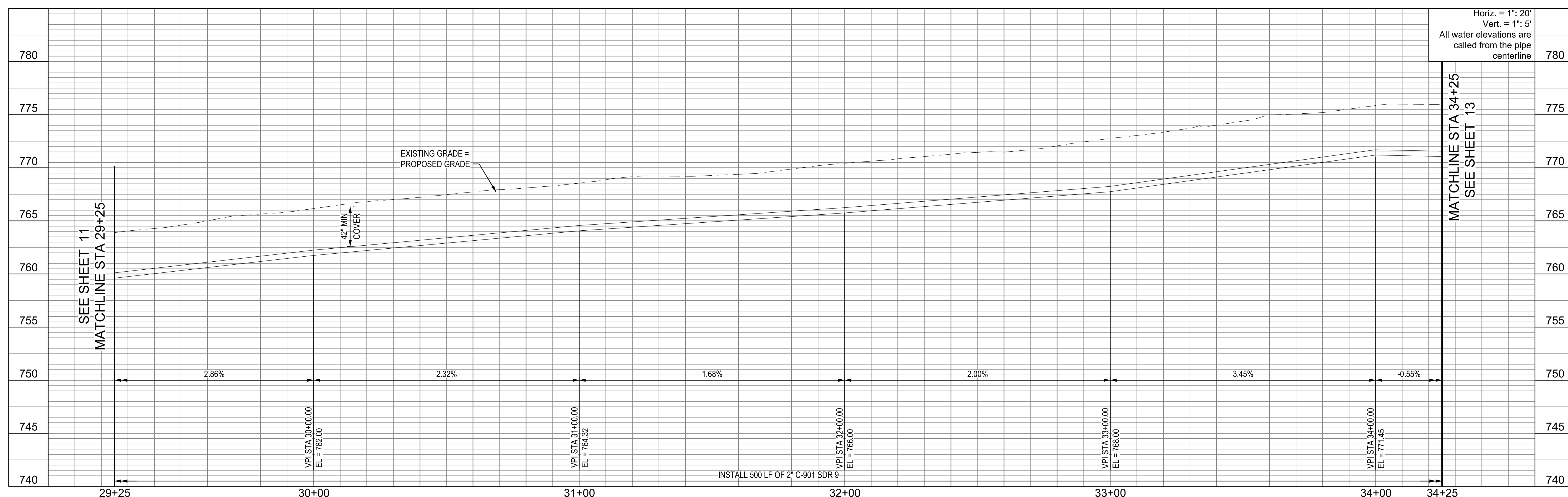
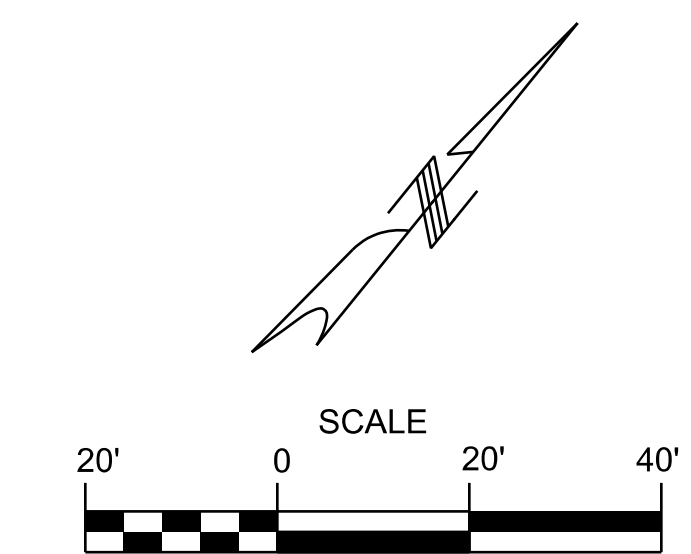
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**C-106**

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8/29/2024



**LINE 2 WATER LINE PLAN**



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REVISION: \_\_\_\_\_  
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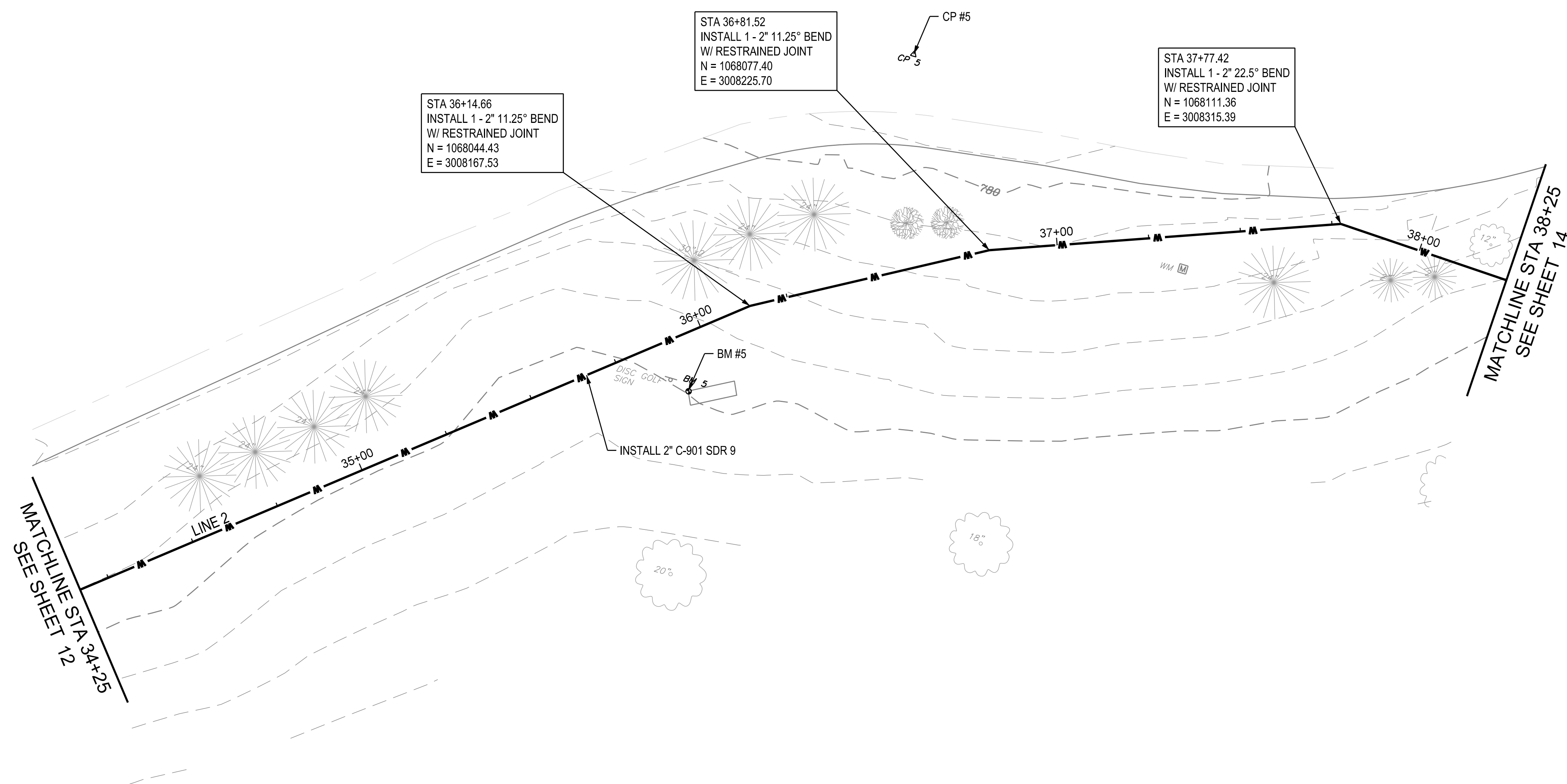
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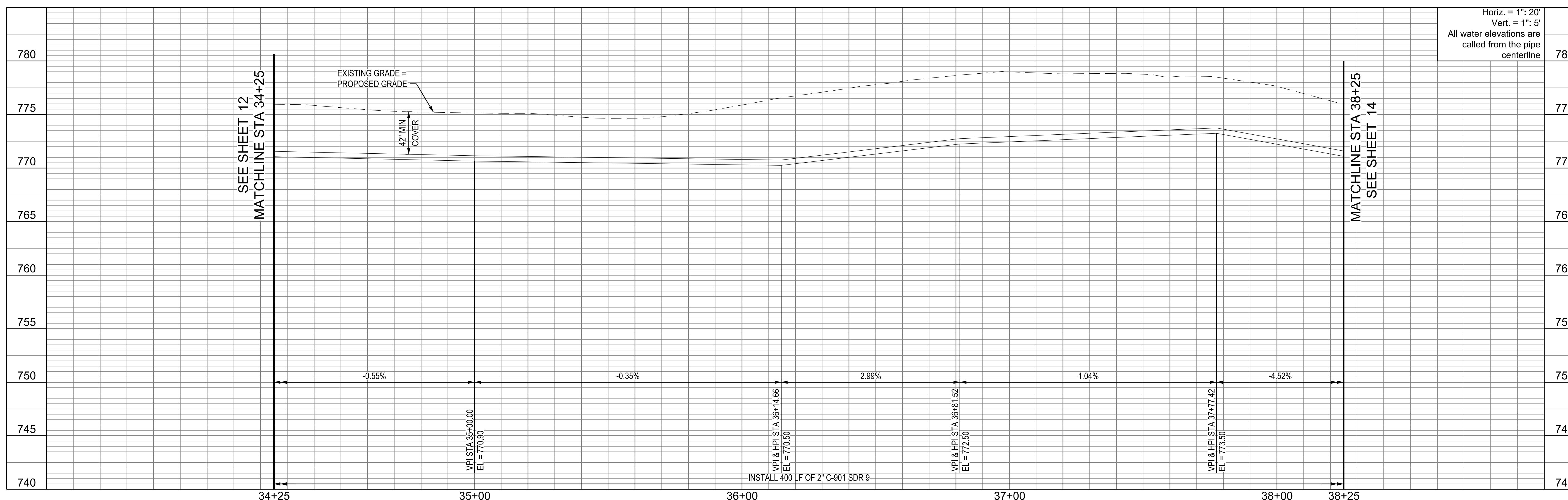
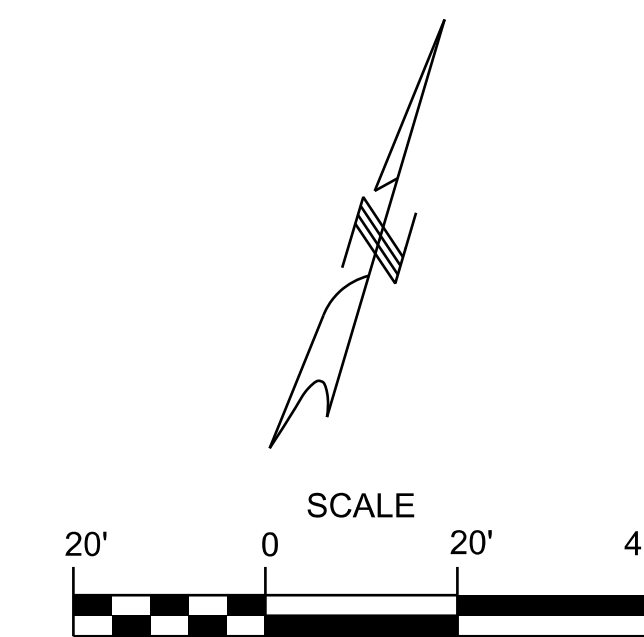
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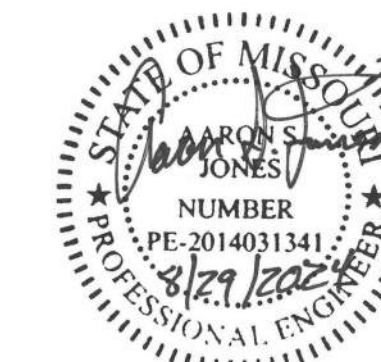
13 OF 28 SHEETS  
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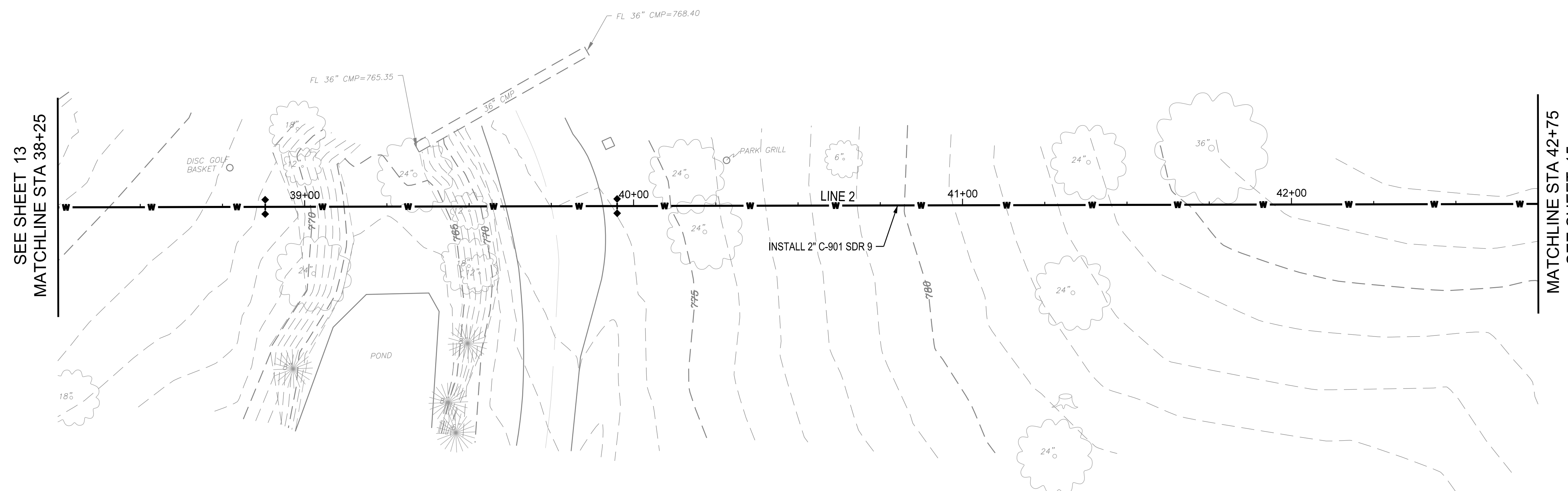
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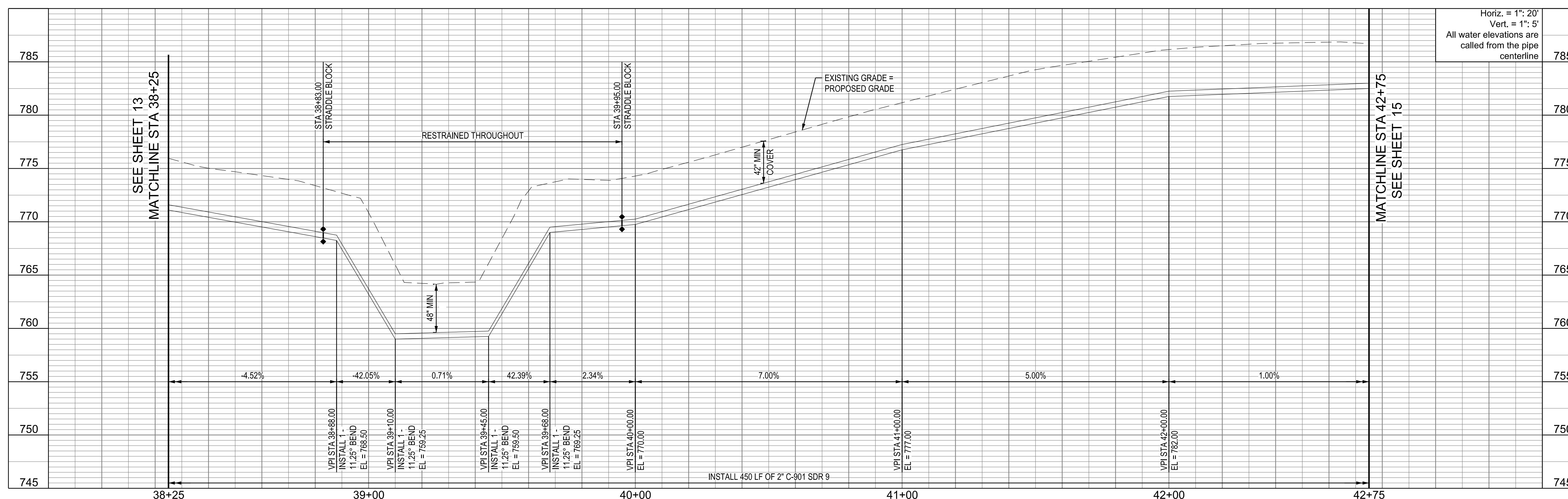
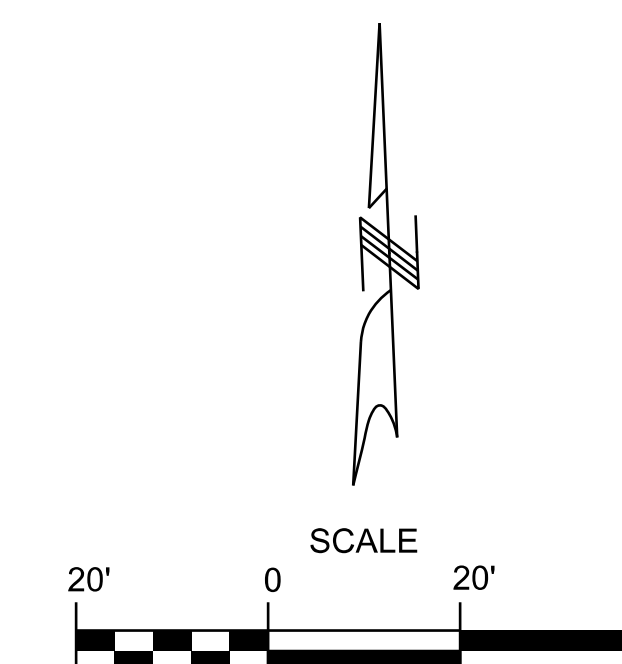
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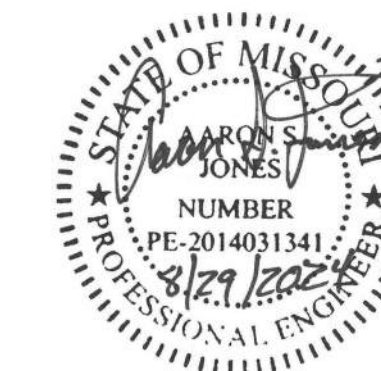
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DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

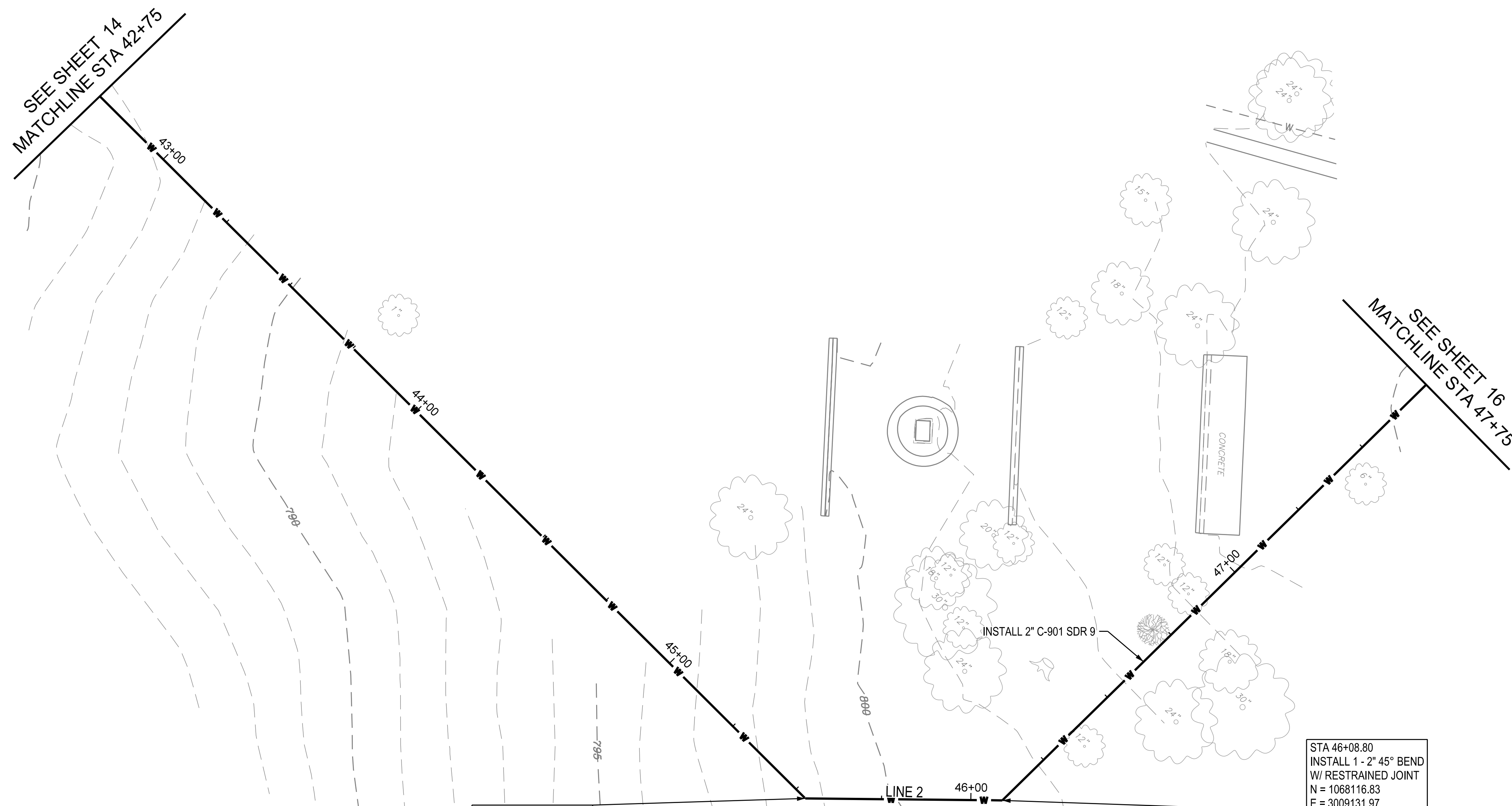
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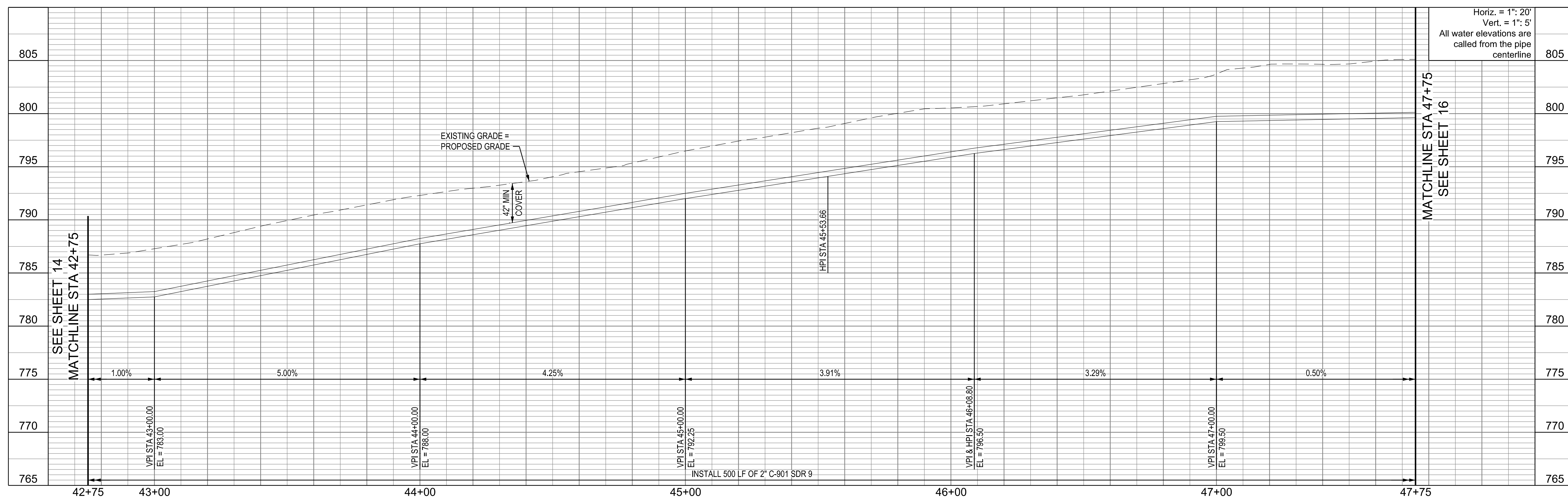
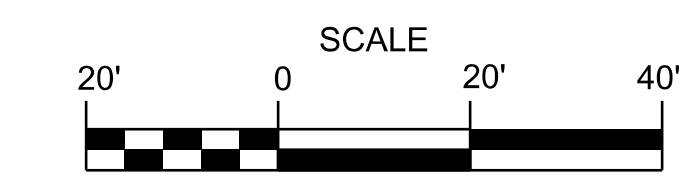
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8/29/2024

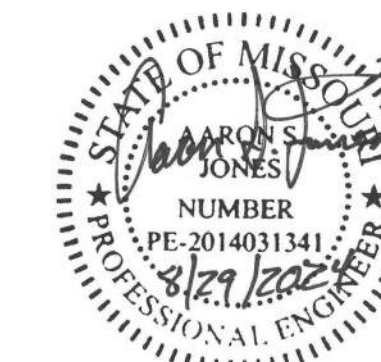


**LINE 2 WATER LINE PLAN**



SEE SHEET 14  
MATCHLINE STA 42+75

MATCHLINE STA 47+75  
SEE SHEET 16



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PROJECT # X230504  
SITE # 5106  
ASSET # 7815106026

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DATE: \_\_\_\_\_  
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DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

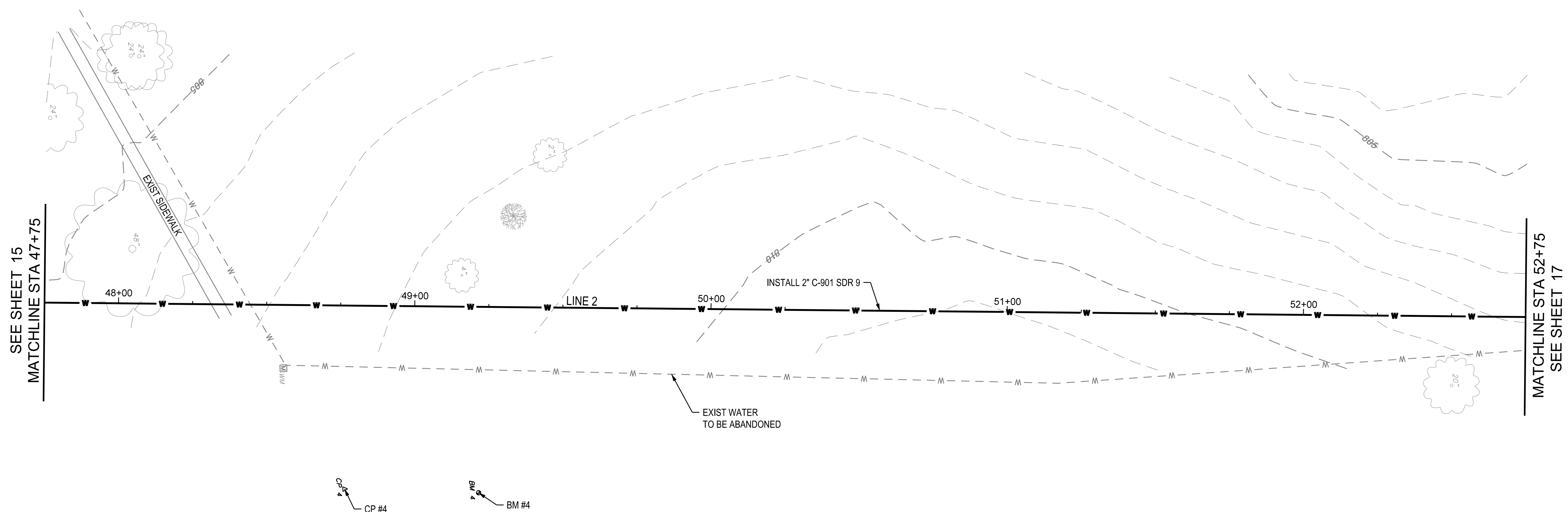
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PLAN & PROFILE**

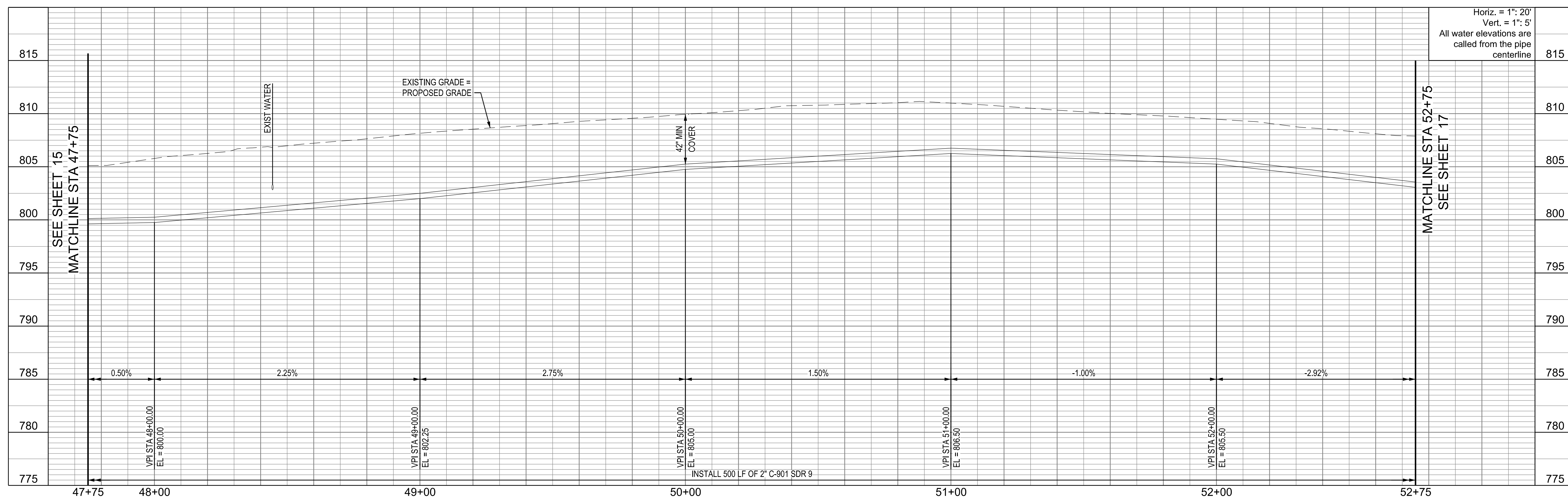
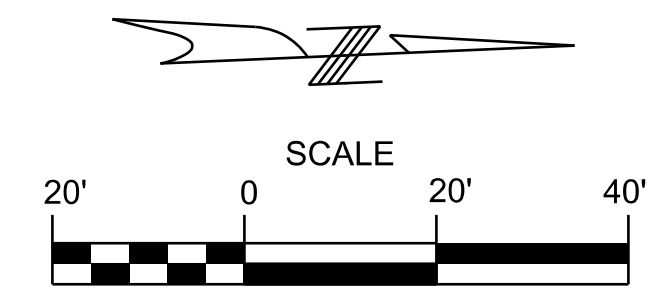
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8/29/2024

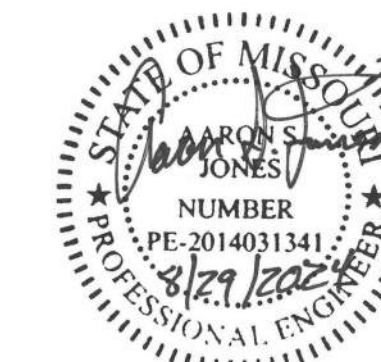


**LINE 2 WATER LINE PLAN**



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ASSET # 7815106026

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ISSUE DATE: 8/29/2024

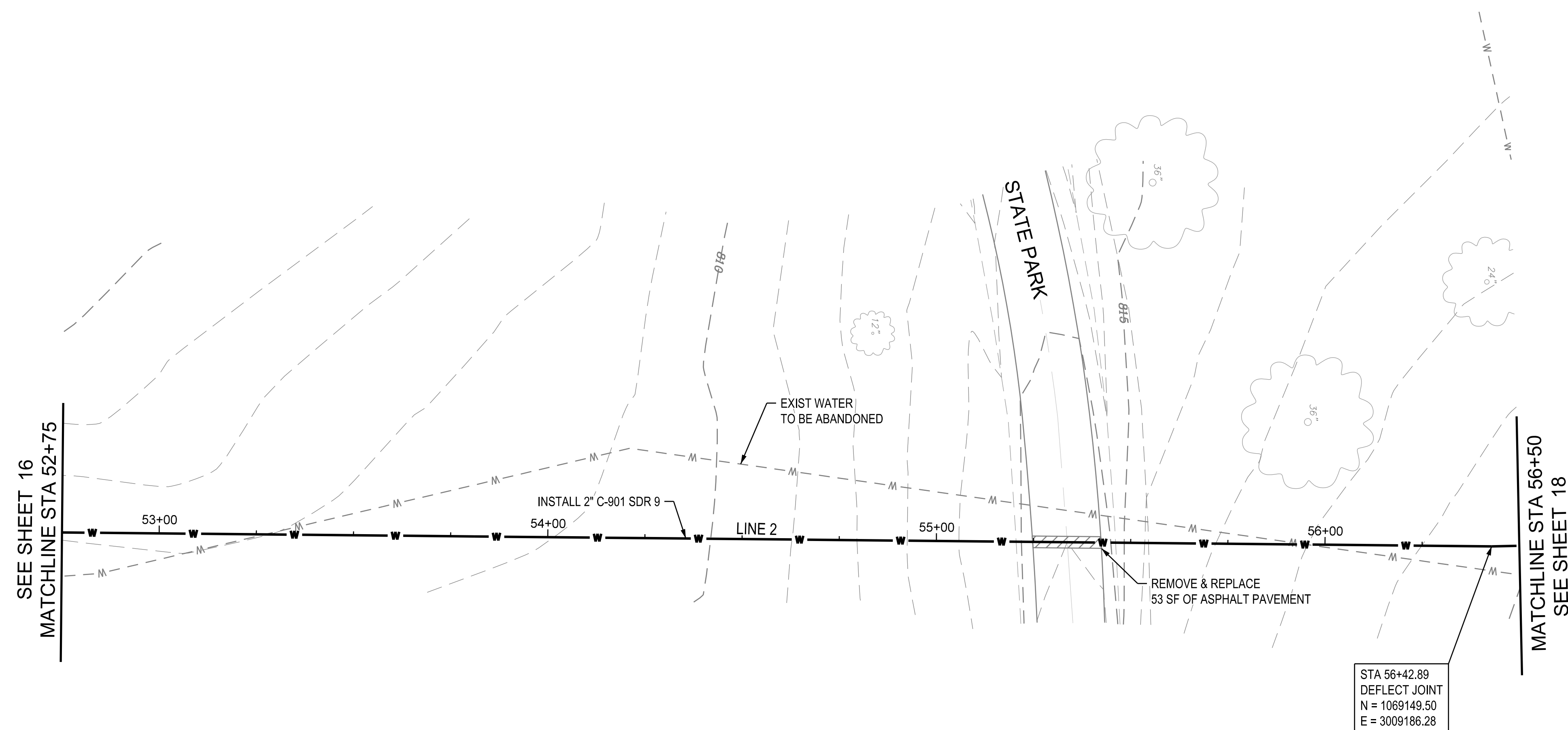
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SHEET TITLE:  
**WATER LINE 2  
PLAN & PROFILE**

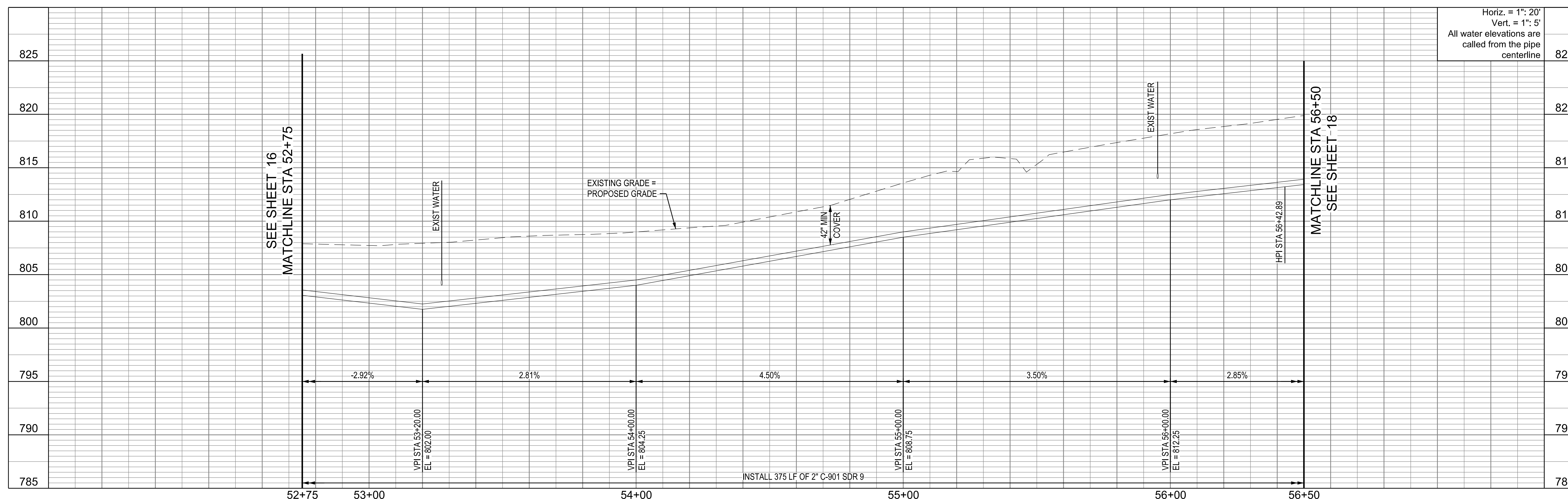
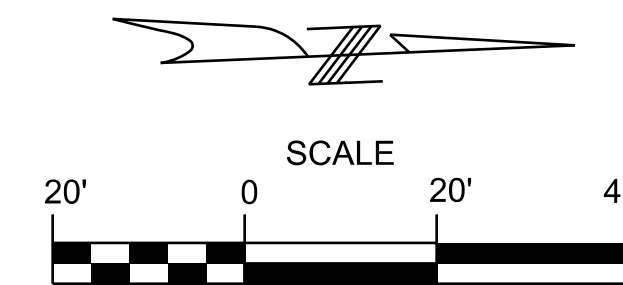
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**C-111**

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8/29/2024



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ISSUE DATE: 8/29/2024

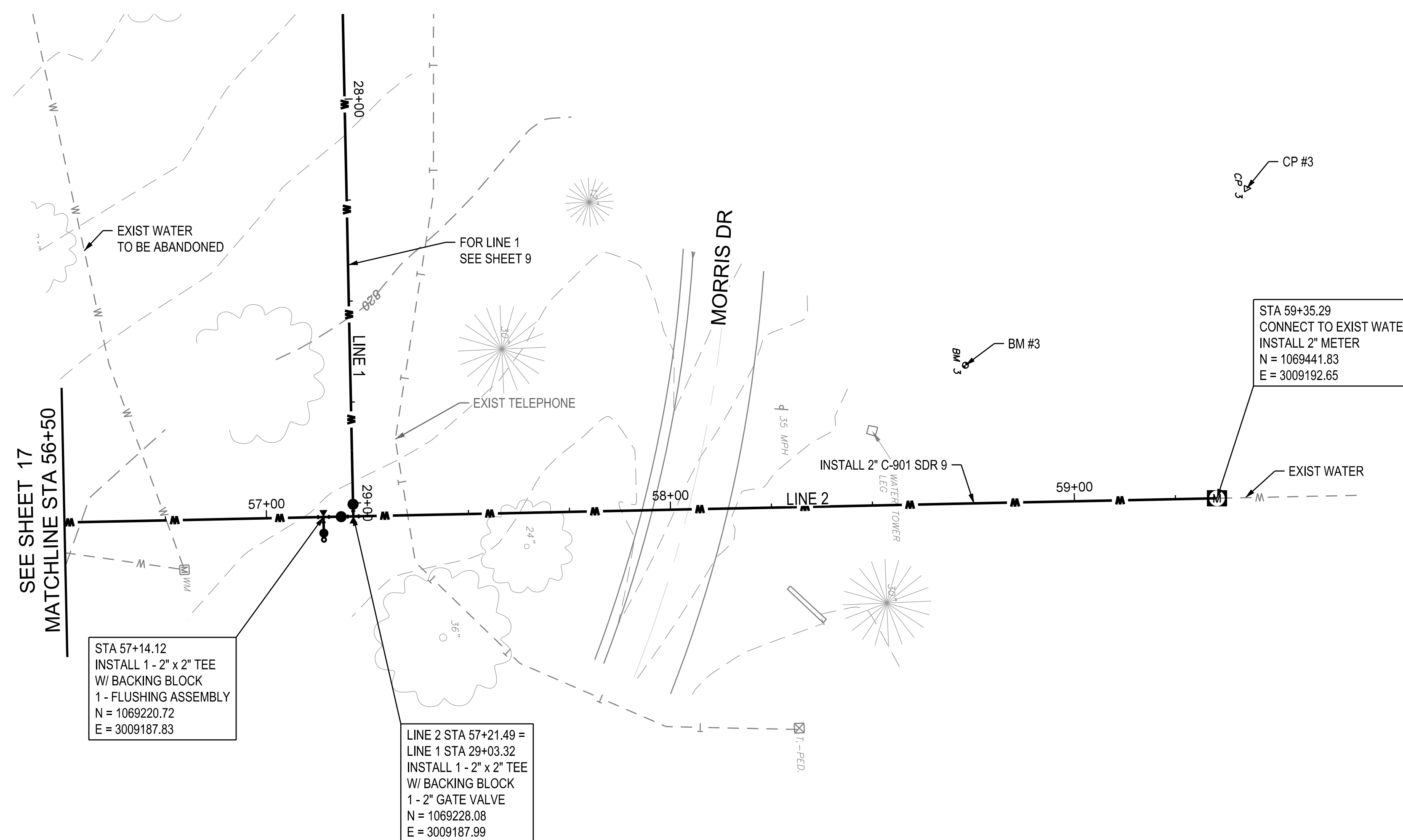
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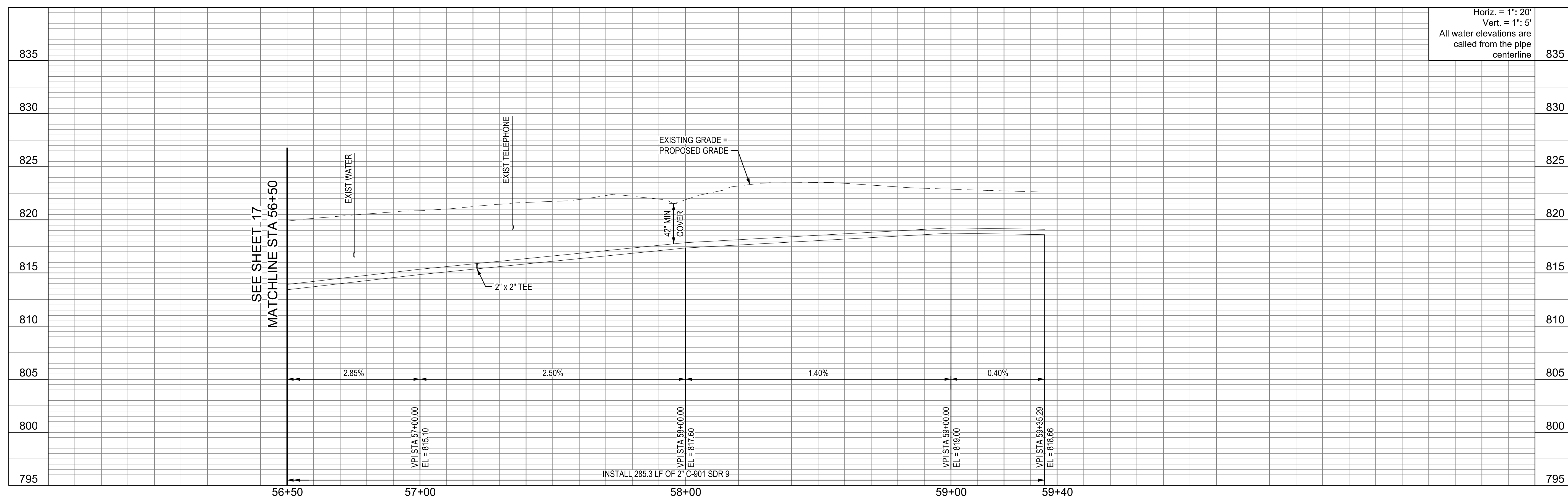
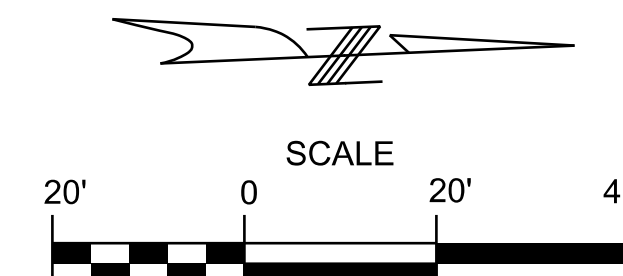
SHEET NUMBER:

**C-112**

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DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

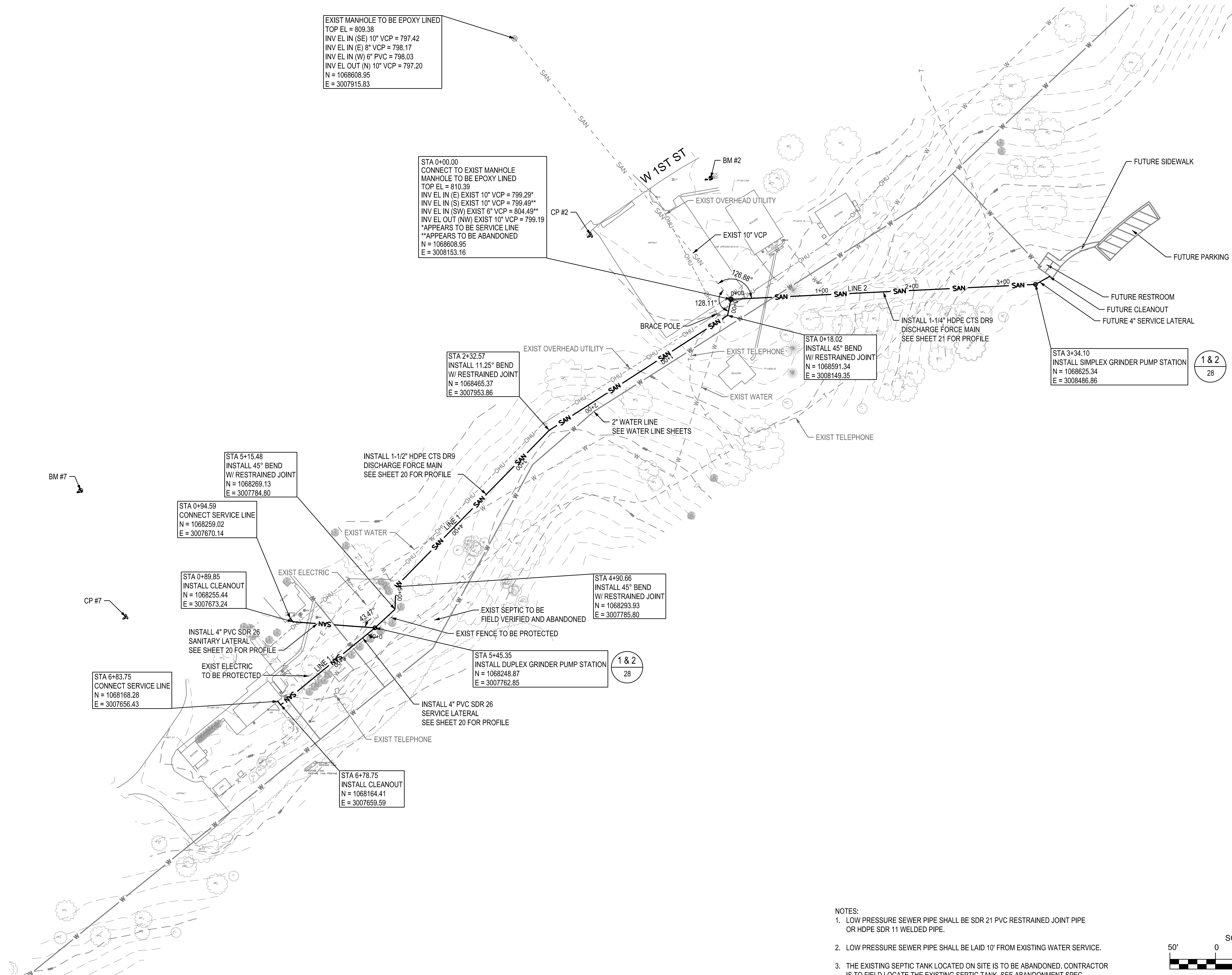
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SHEET TITLE:  
**SEWER  
SITE PLAN**

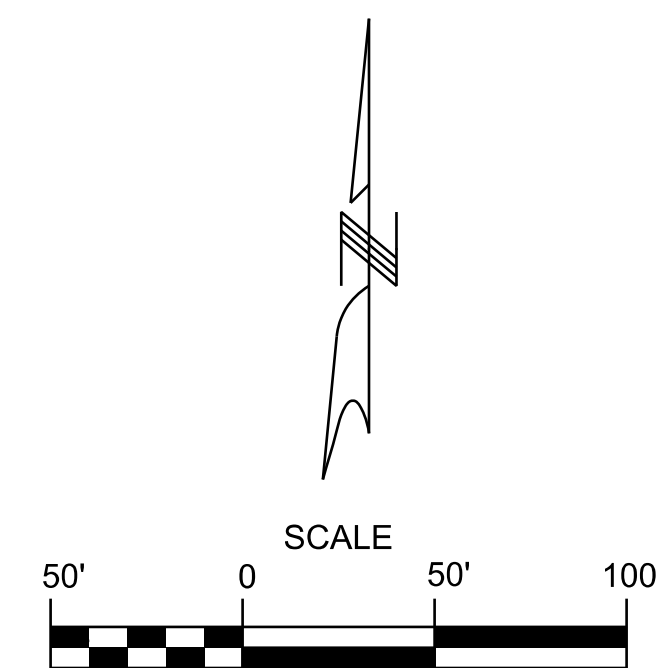
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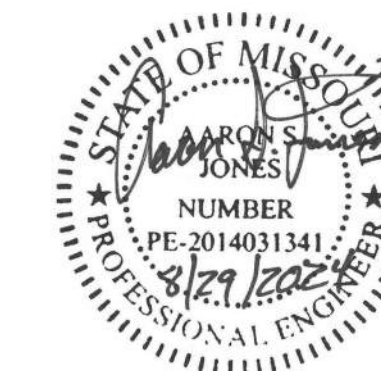
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- NOTES:
1. LOW PRESSURE SEWER PIPE SHALL BE SDR 21 PVC RESTRAINED JOINT PIPE OR HDPE SDR 11 WELDED PIPE.
  2. LOW PRESSURE SEWER PIPE SHALL BE LAID 10' FROM EXISTING WATER SERVICE.
  3. THE EXISTING SEPTIC TANK LOCATED ON SITE IS TO BE ABANDONED. CONTRACTOR IS TO FIELD LOCATE THE EXISTING SEPTIC TANK. SEE ABANDONMENT SPEC.





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WATER AND WASTEWATER  
SYSTEM IMPROVEMENT  
PROJECT  
American Rescue Plan Act (ARPA)

CONFEDERATE MEMORIAL  
STATE HISTORIC SITE  
211 WEST FIRST STREET  
HIGGINSVILLE, MISSOURI

PROJECT # X230504  
SITE # 5106  
ASSET # 7815106026

REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
REVISION: \_\_\_\_\_  
DATE: \_\_\_\_\_

ISSUE DATE: 8/29/2024

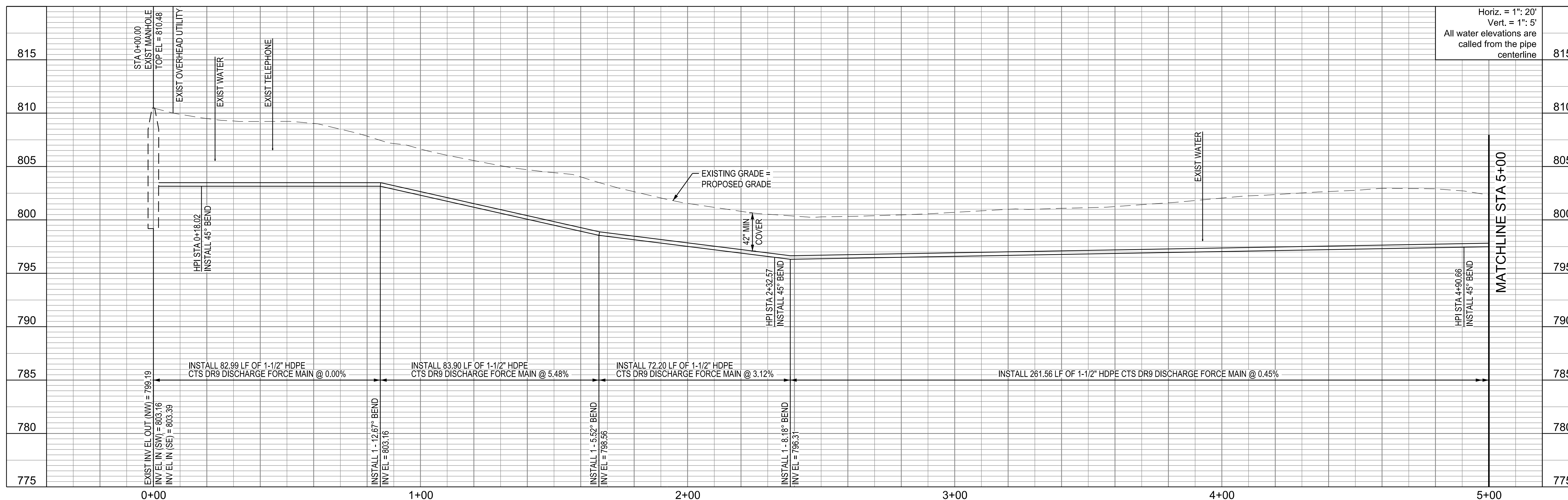
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DRAWN BY: MBT  
CHECKED BY: MS  
DESIGNED BY: TML

SHEET TITLE:  
**SEWER PROFILE  
LINE 1**

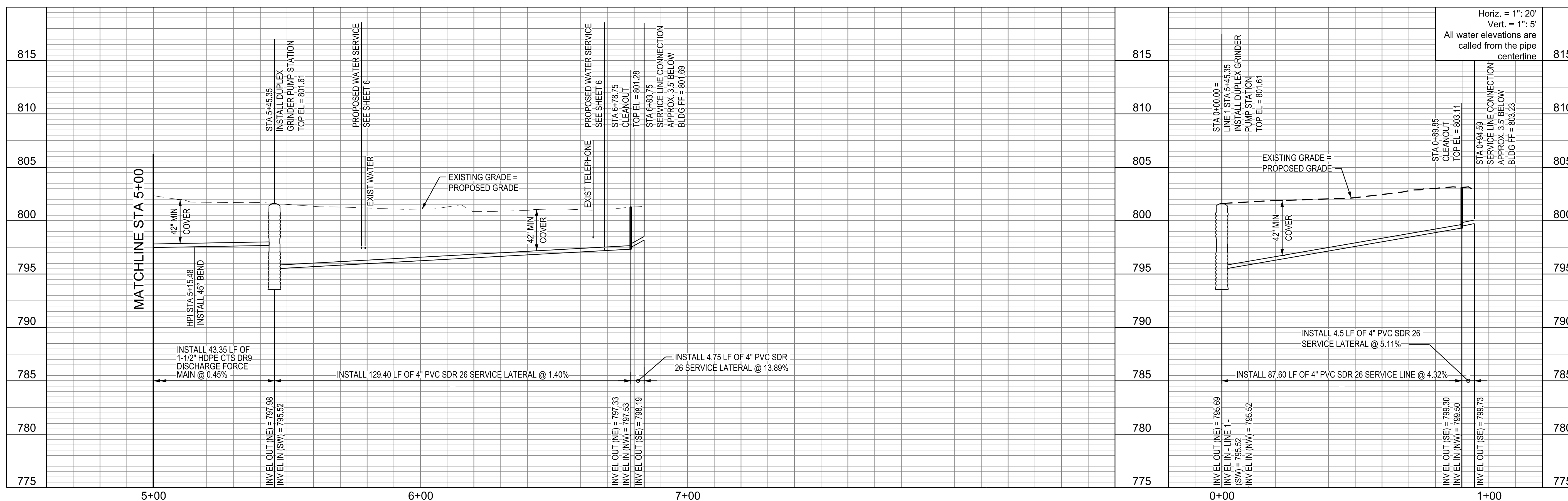
SHEET NUMBER:

**C-114**

20 OF 28 SHEETS  
8/29/2024



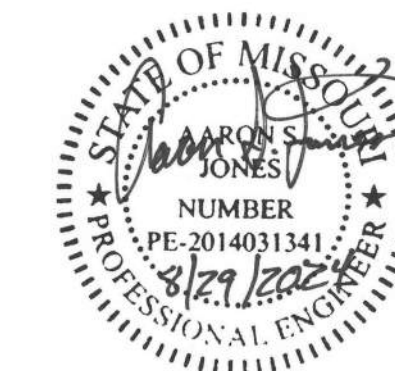
LINE 1 SEWER LINE PROFILE



SEWER LATERAL PROFILE

LINE 1 SEWER LINE PROFILE





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OFFICE OF ADMINISTRATION  
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ISSUE DATE: 8/29/2024

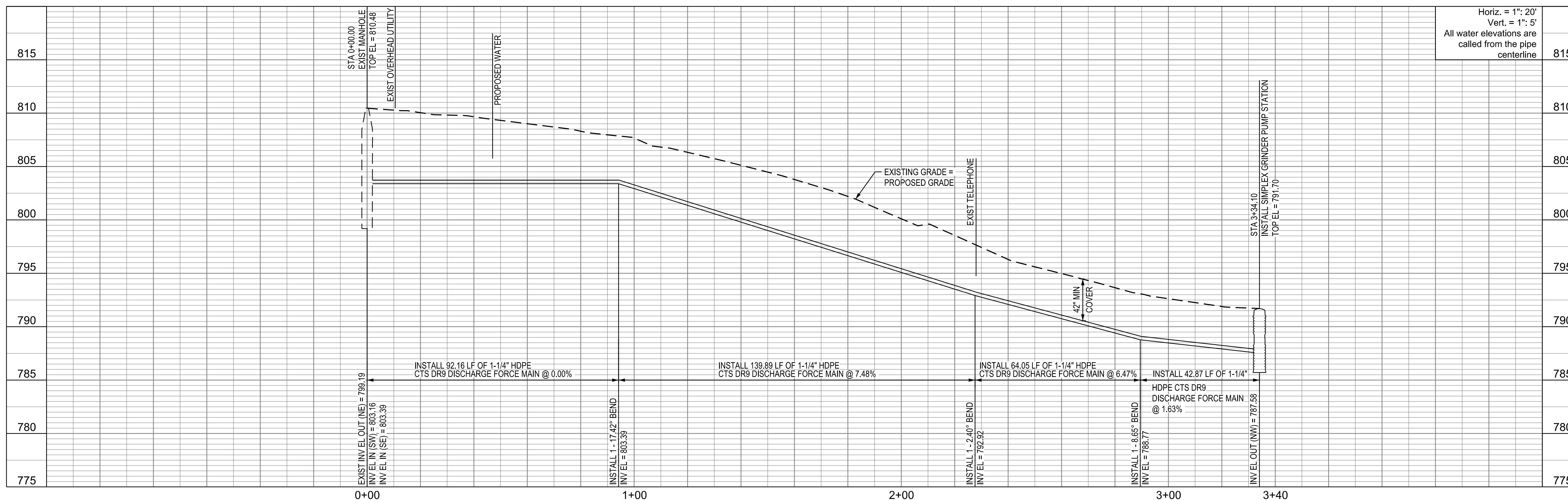
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CHECKED BY: MS  
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SHEET TITLE:  
SEWER PROFILE  
LINE 2

SHEET NUMBER:

C-115

21 OF 28 SHEETS  
8/29/2024

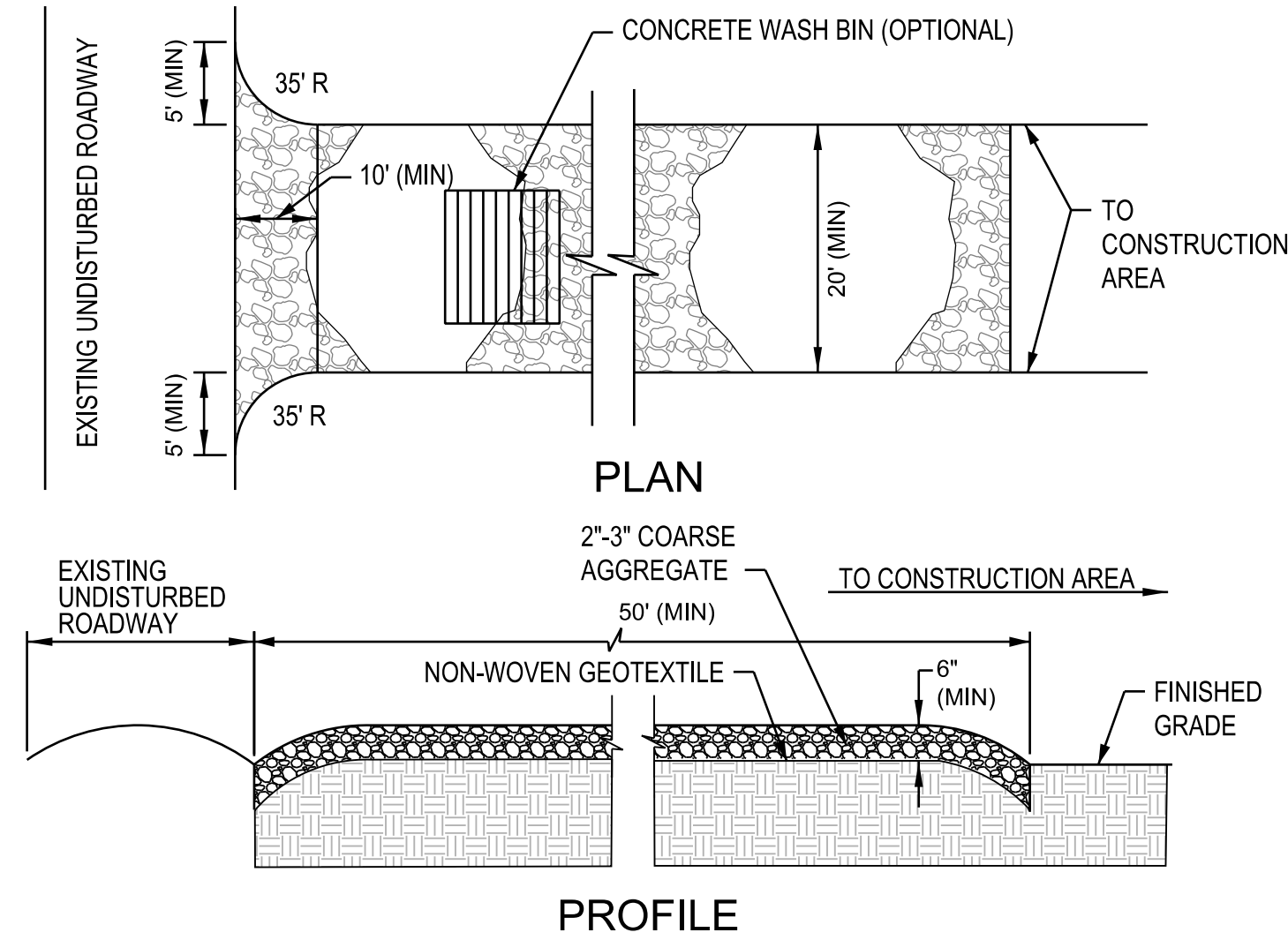


LINE 2 SEWER LINE PROFILE



NOTES:

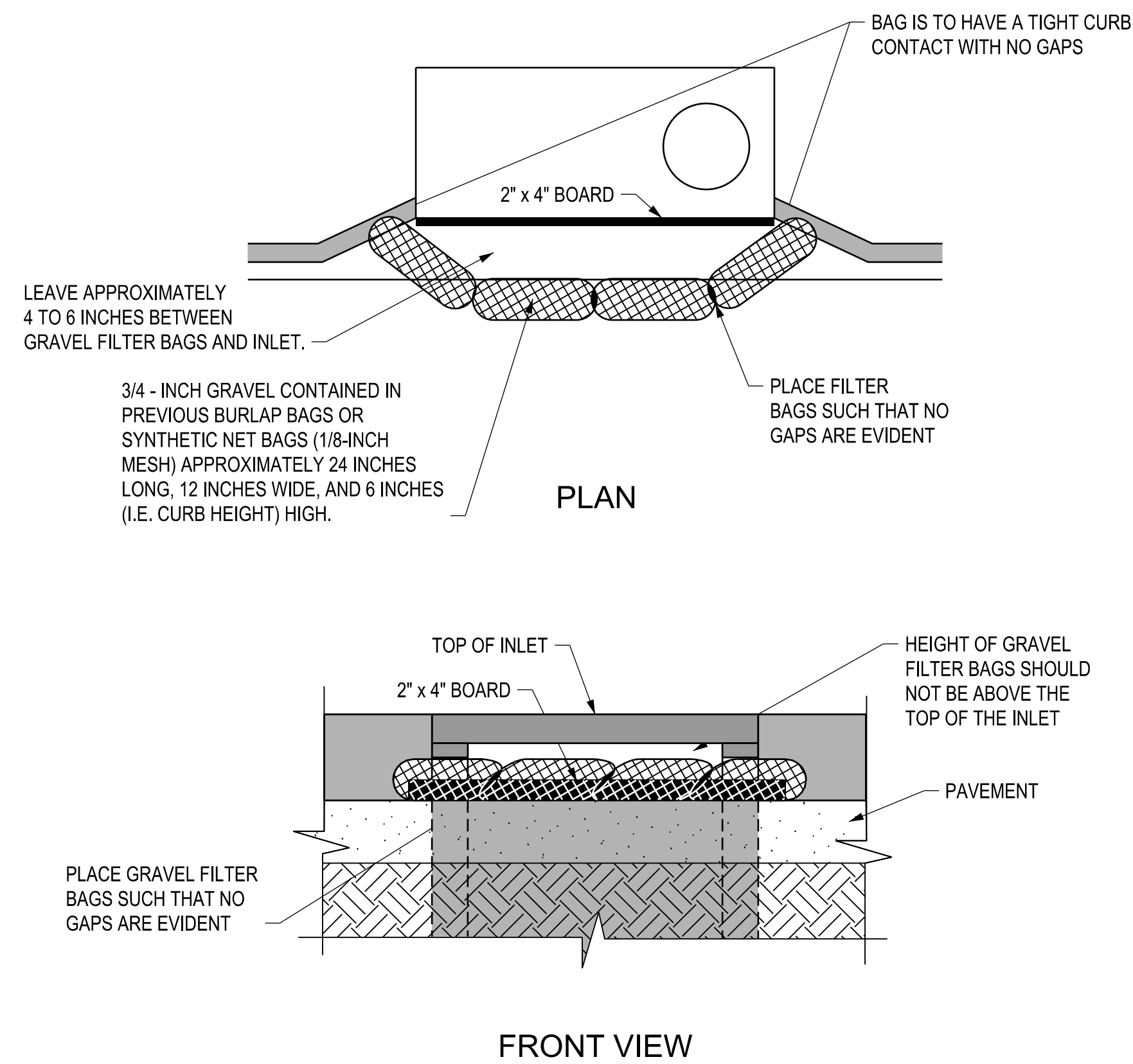
1. PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND UNDISTURBED ROADWAY.
2. LIMITS OF STABILIZED CONSTRUCTION ENTRANCE SHALL BE AS DIRECTED BY THE ENGINEER.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO UNDISTURBED ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDING STONE TO THE LENGTH OF THE ENTRANCE.
4. REPAIR AND CLEAN OUT MEASURES USED TO TRAP SEDIMENT.
5. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO UNDISTURBED ROADWAY SHALL BE REMOVED AS DIRECTED BY THE ENGINEER.



**TEMPORARY CONSTRUCTION ENTRANCE**

NOT TO SCALE

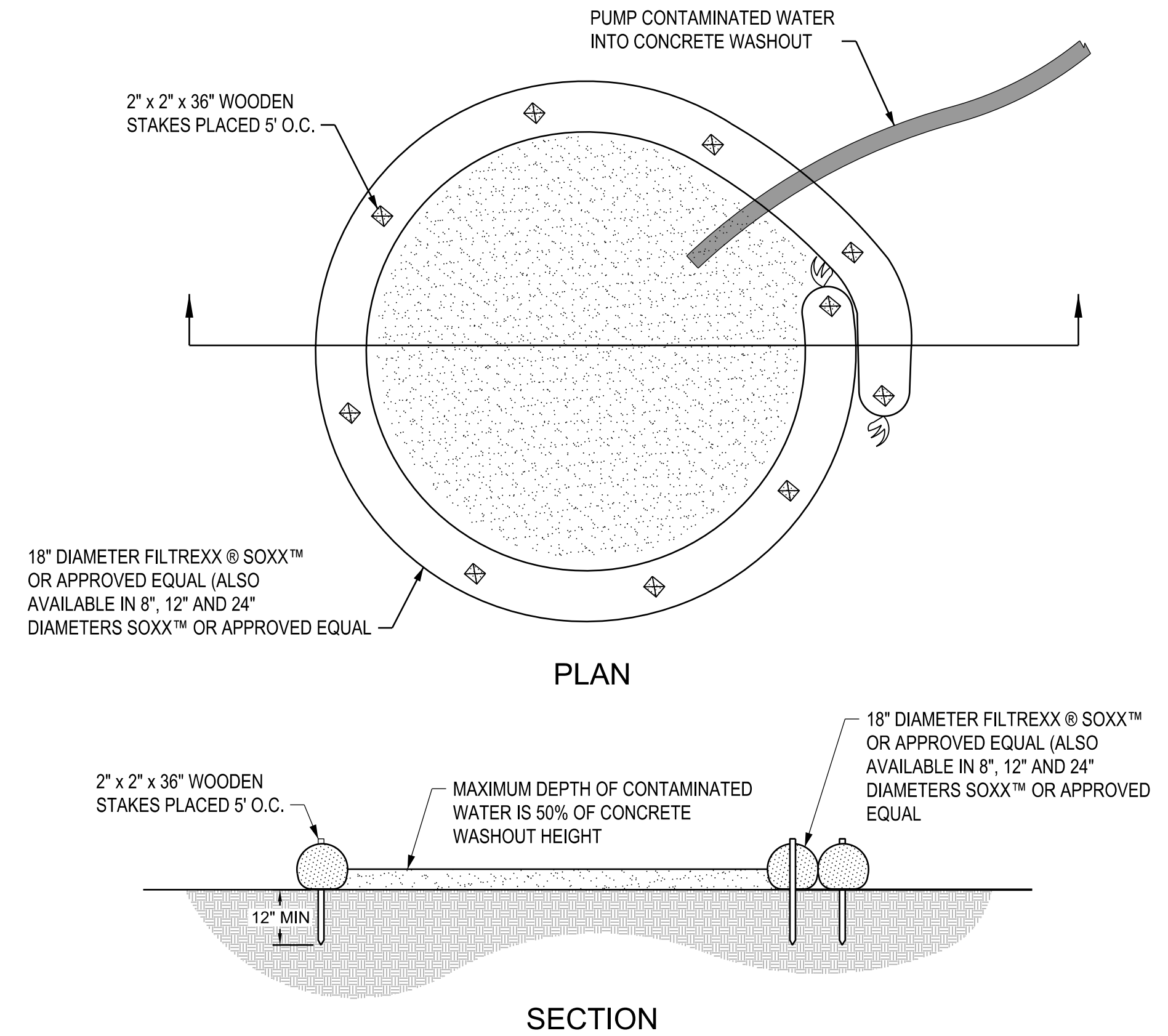
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X-XX



**INLET PROTECTION**

NOT TO SCALE

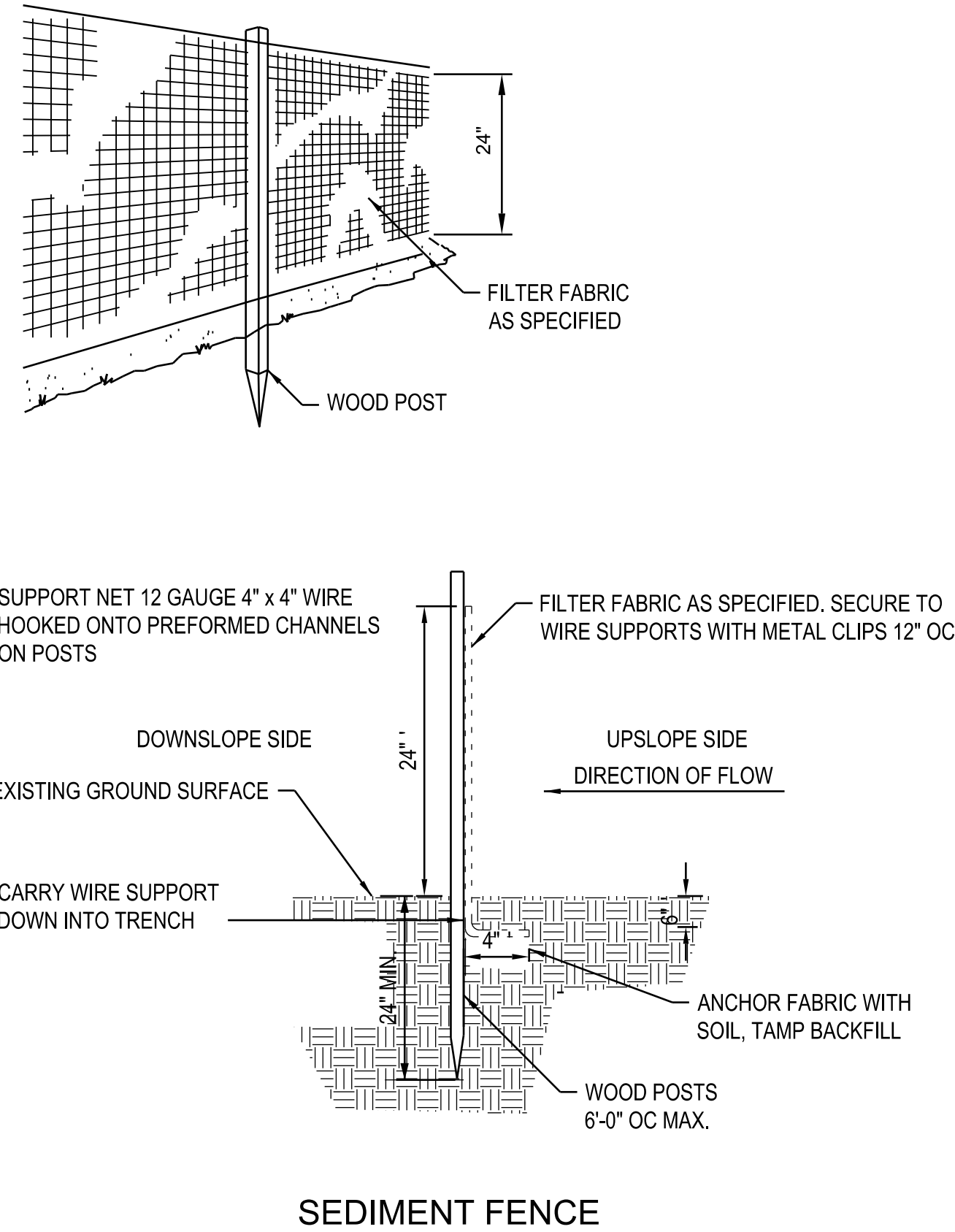
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**CONCRETE WASHOUT**

NOT TO SCALE

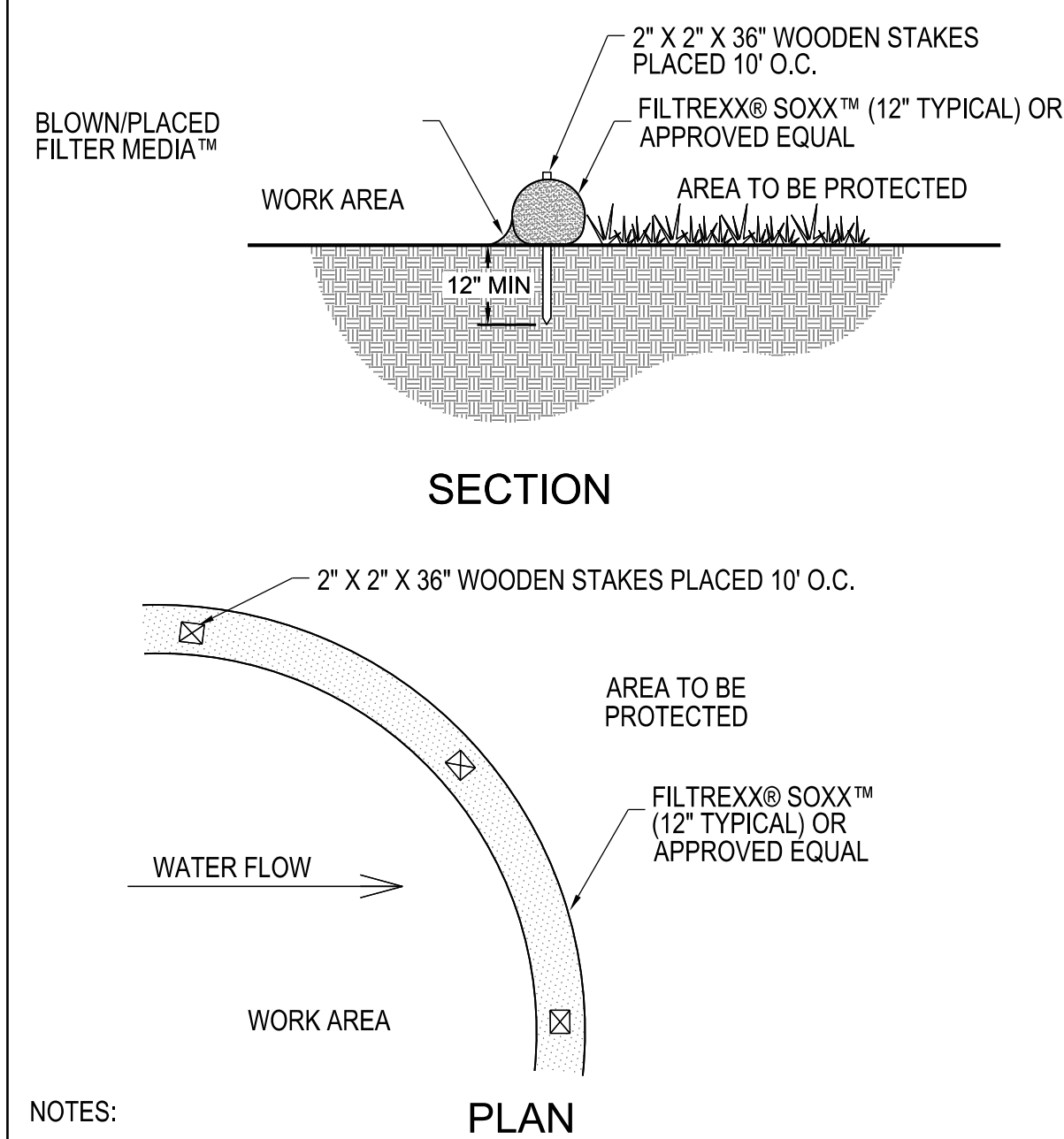
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**PERIMETER CONTROLS**

NOT TO SCALE

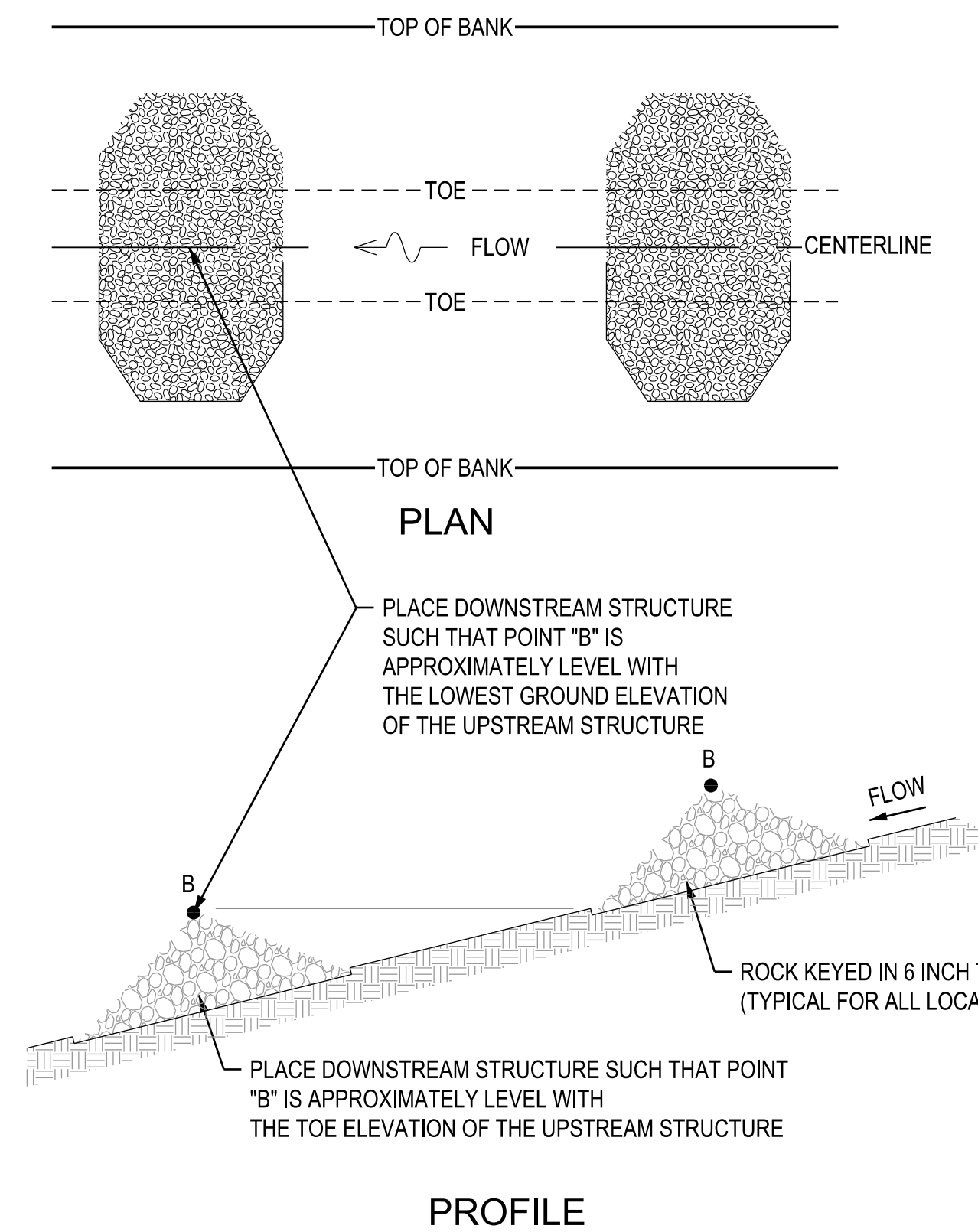
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**PERIMETER WATTLE**

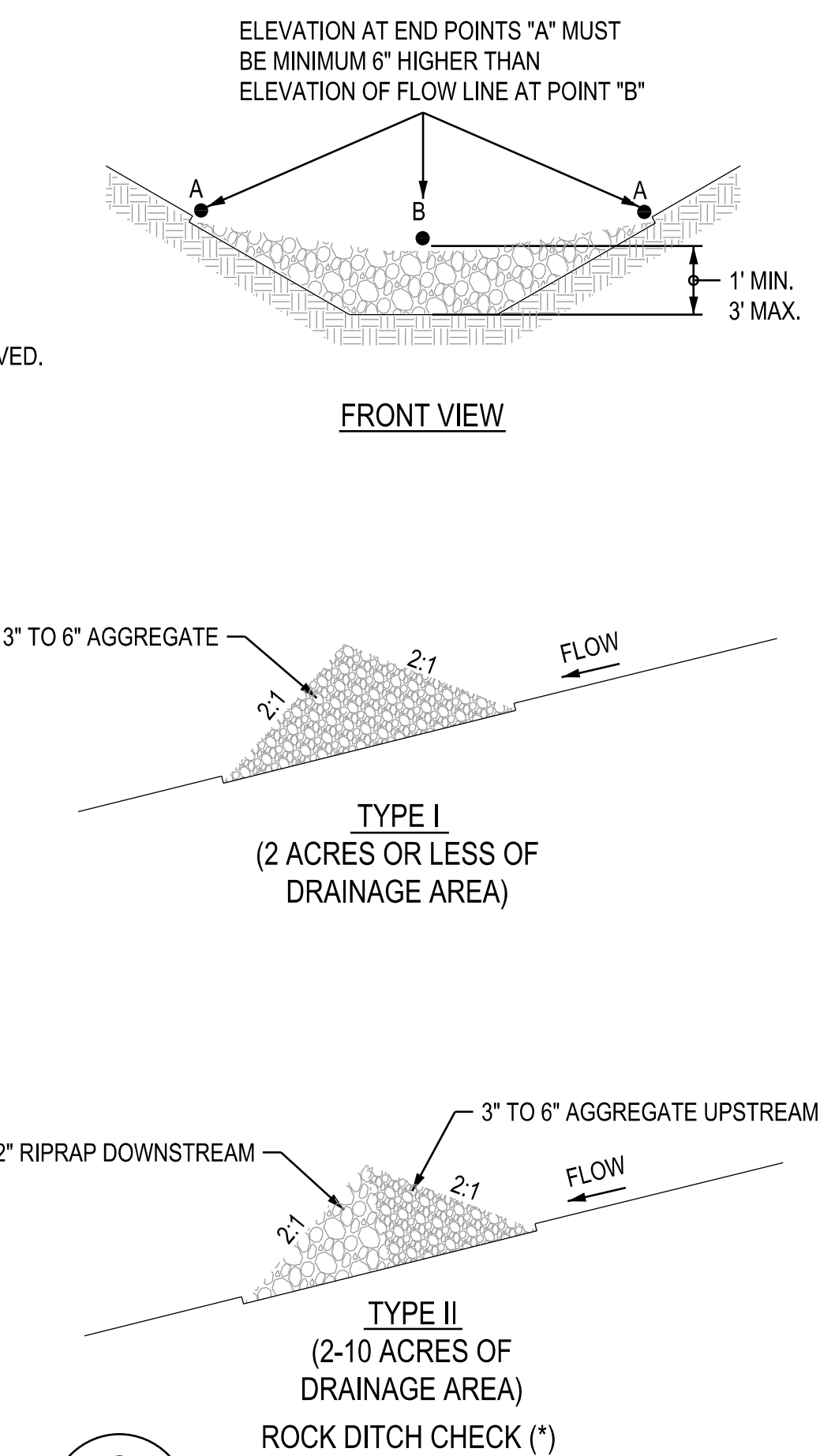
NOT TO SCALE

5  
X-XX



**TEMPORARY ROCK CHECK DAM**

NOT TO SCALE



NOTES:

1. ROCK CHECK DAMS SHALL BE USED ONLY FOR DRAINAGE AREAS LESS THAN 10 ACRES UNLESS OTHERWISE APPROVED.

MAINTENANCE:

REMOVE SILT WHEN IT ACCUMULATES 1/2 THE HEIGHT OF THE DITCH CHECK. IF UNITS ARE DAMAGED OR DISLODGED DURING THE SEDIMENT REMOVAL PROCESS, REPAIR AND RE-ESTABLISH CONTINUITY.

(\*) ALTERNATIVE TYPES OF DITCH CHECK:

1. FOAM DIKE
2. GEORIDGE
3. WATTLES (INSTALL PER MANUFACTURER'S INSTRUCTIONS).



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CAD DWG FILE:  
X2305-04\_5106-XX\_C500\_22.dgn  
DRAWN BY: MBT  
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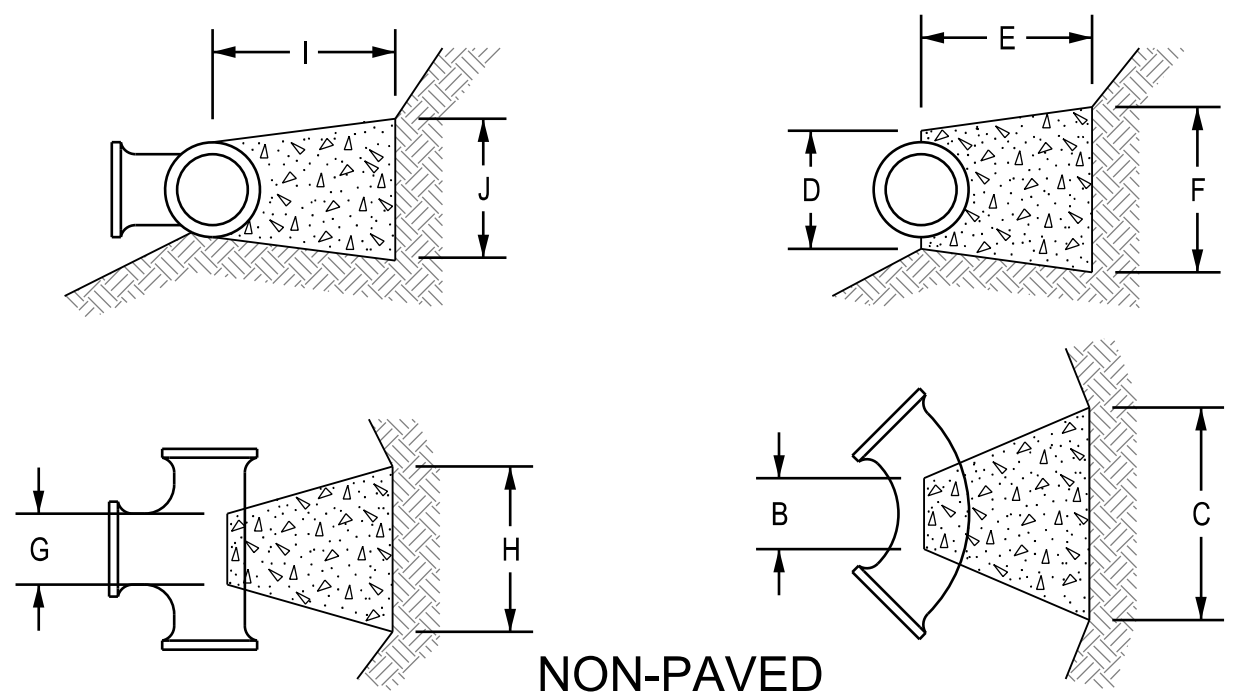


BENDS LESS THAN 45°						BENDS 45° THRU 90°					
B	C	D	E	F		B	C	D	E	F	
6"	8"	18"	12"	24"	12"	6"	8"	30"	12"	24"	30"
8"	8"	24"	12"	24"	18"	8"	8"	36"	12"	24"	36"
10"	8"	24"	12"	24"	18"	10"	8"	42"	12"	24"	42"
12"	8"	36"	18"	24"	24"	12"	12"	54"	18"	30"	48"
16"	12"	36"	18"	24"	30"	16"	18"	60"	18"	30"	48"
24"	18"	42"	30"	30"	36"	24"	24"	72"	30"	36"	54"

TEES					TEES				
G	H	I	J		G	H	I	J	
6" x 6" x 6"	12"	24"	24"	18"	16" x 16" x 6"	12"	24"	24"	18"
8" x 8" x 6"	12"	24"	24"	18"	16" x 16" x 8"	12"	24"	24"	24"
8" x 8" x 8"	12"	24"	24"	24"	16" x 16" x 12"	12"	36"	24"	36"
10" x 10" x 6"	12"	24"	24"	18"	16" x 16" x 16"	18"	48"	30"	48"
10" x 10" x 8"	12"	24"	24"	24"	24" x 24" x 8"	12"	24"	24"	24"
10" x 10" x 10"	12"	24"	24"	30"	24" x 24" x 10"	12"	30"	24"	30"
12" x 12" x 6"	12"	24"	24"	18"	24" x 24" x 12"	18"	36"	24"	36"
12" x 12" x 8"	12"	24"	24"	24"	24" x 24" x 16"	18"	48"	30"	48"
12" x 12" x 12"	12"	36"	24"	36"	24" x 24" x 24"	24"	60"	36"	60"

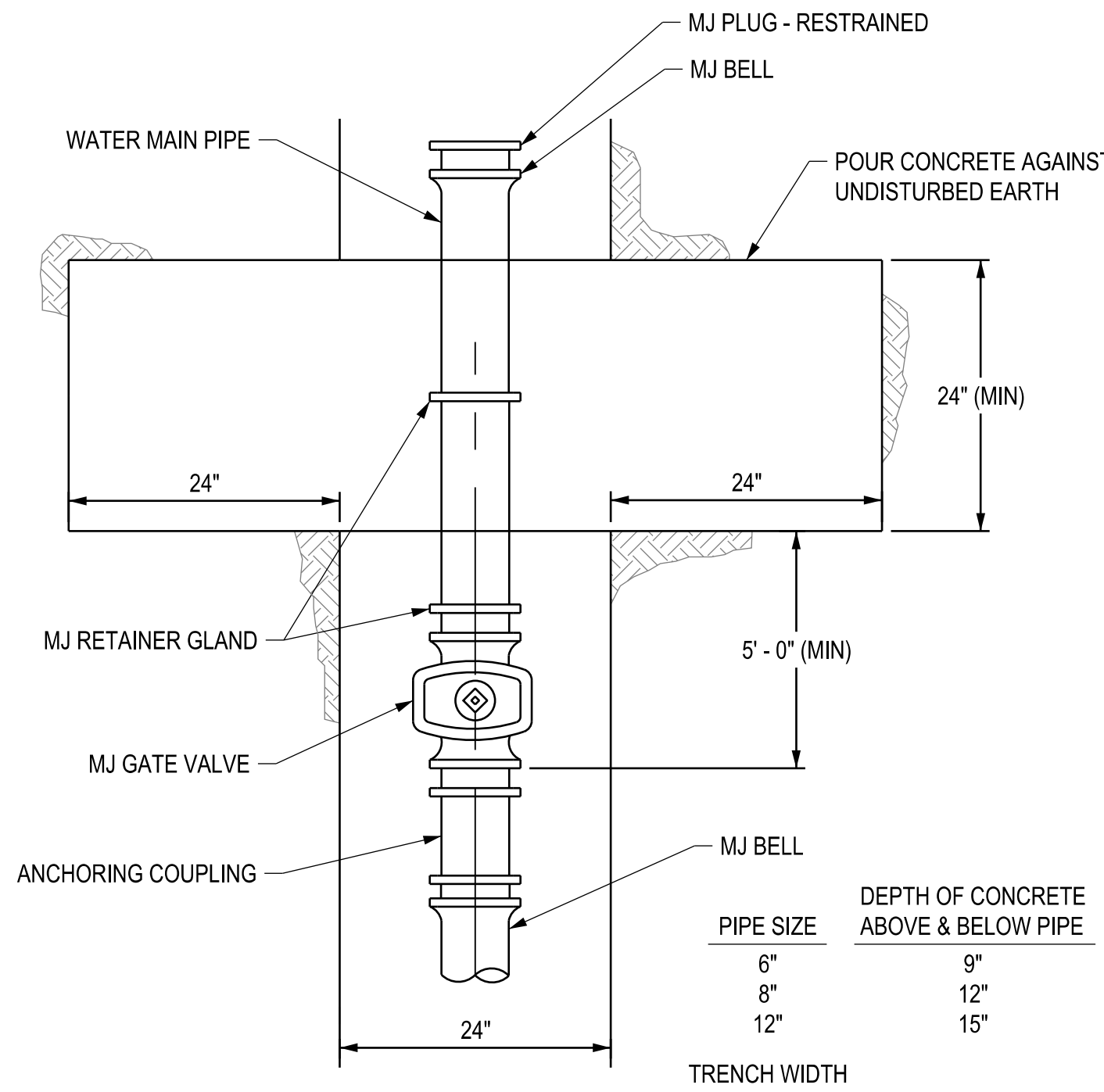
NOTE: ALL MECHANICAL FITTINGS SHALL BE ANCHORED TO PIPE.



### THRUST BLOCK DETAIL

NOT TO SCALE

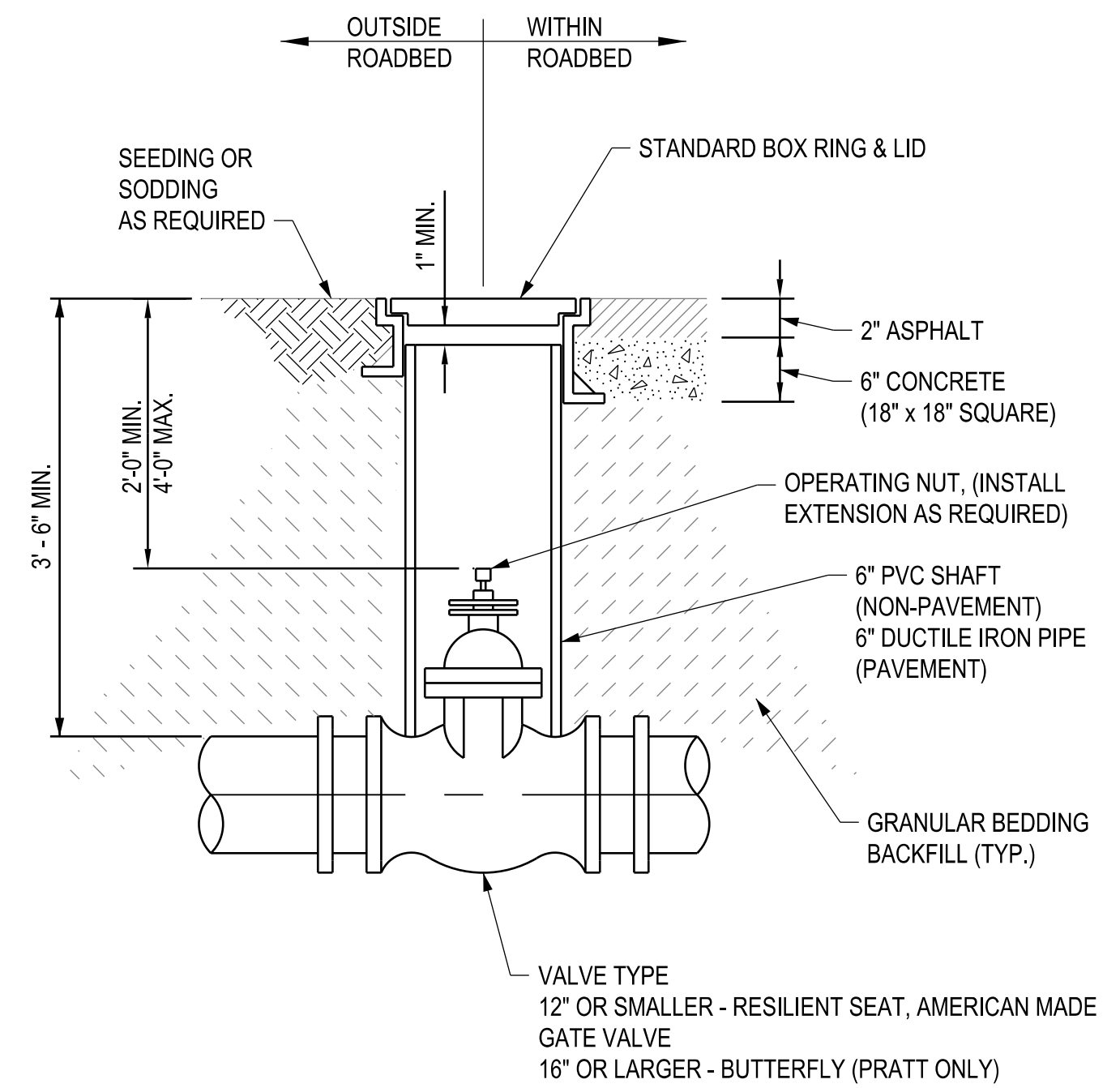
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### STRADDLE BLOCK DETAIL

NOT TO SCALE

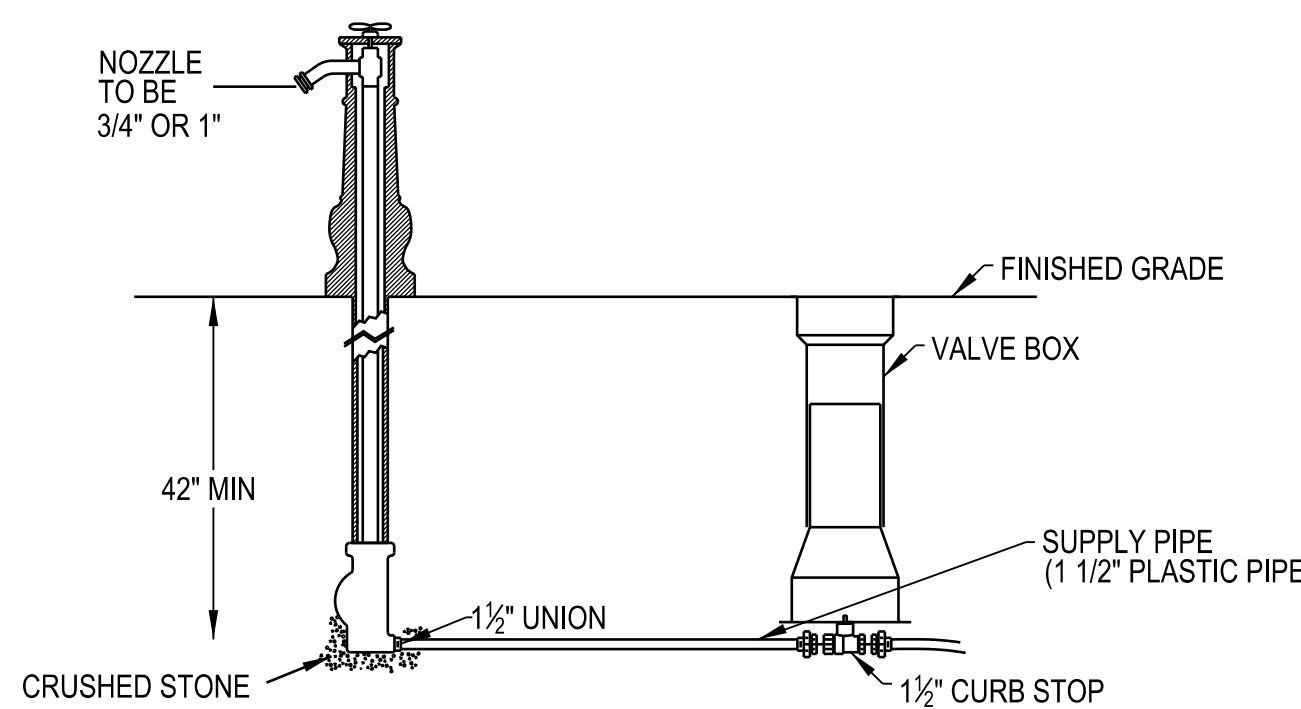
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X-XX



### VALVE BOX DETAIL

NOT TO SCALE

3  
X-XX



YARD HYDRANTS SHALL BE TOTAL ECLIPSE #1 YARD HYDRANTS AS MANUFACTURED BY JOHN C. KUPFERLE FOUNDRY CO., ST. LOUIS, MO, OR APPROVED EQUAL.

YARD HYDRANTS SHALL BE SELF-DRAINING, NON-FREEZING, COMPRESSION TYPE. INLET CONNECTION SHALL BE 1/2\"/>

YARD HYDRANTS SHALL HAVE A STEEL PIPE RISER WITH A CAST IRON CASING GUARD. PRINCIPAL INTERIOR OPERATING PARTS SHALL BE BRASS AND REMOVABLE FROM YARD HYDRANT FOR SERVICING WITHOUT EXCAVATION.

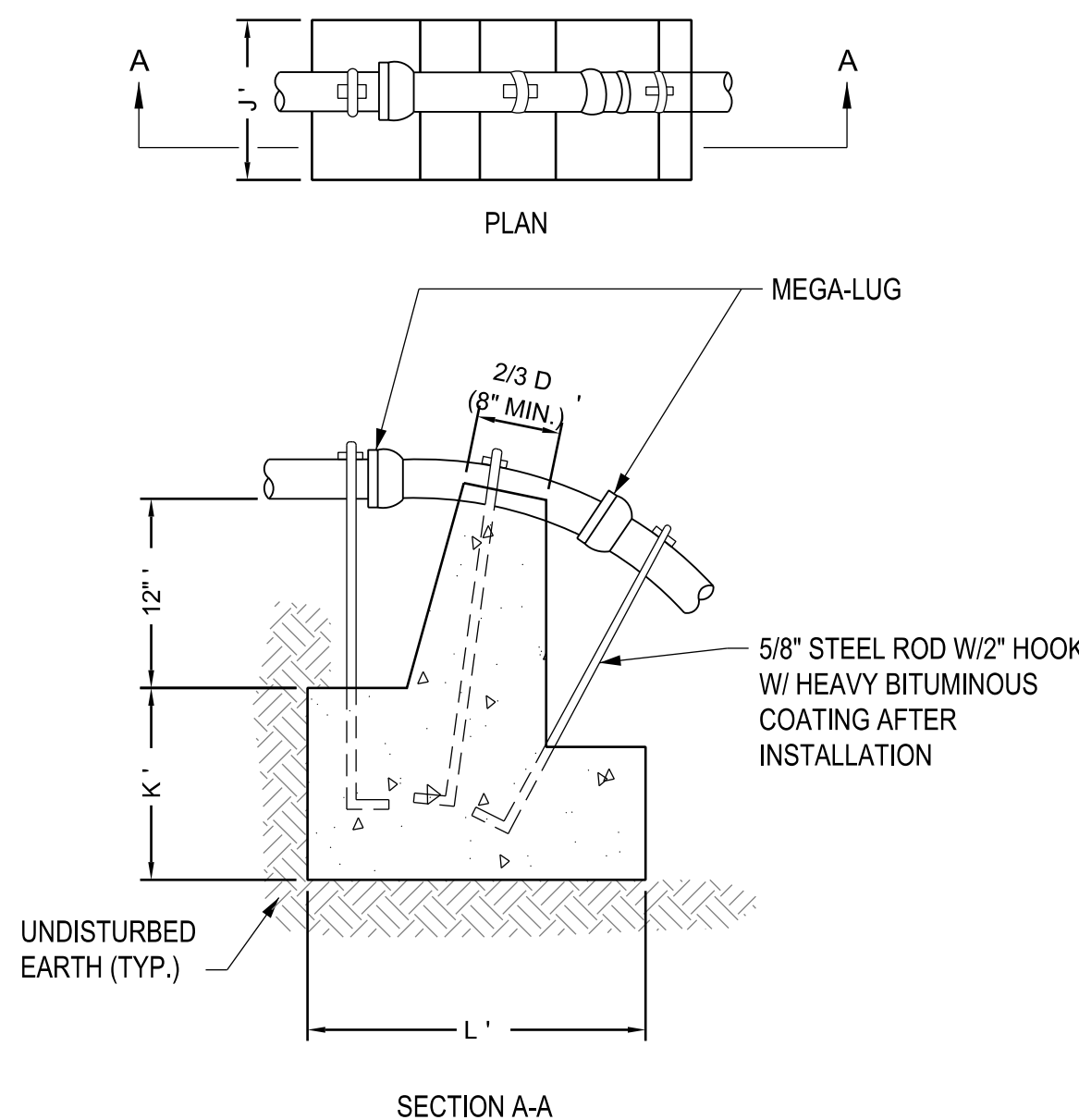
YARD HYDRANTS SHALL BE SET IN 4 CUBIC FEET OF CRUSHED STONE TO ALLOW FOR PROPER DRAINAGE. RECOMMENDATIONS OF THE AWWA SHOULD BE FOLLOWED WHEN INSTALLING THE YARD HYDRANT.

PROVIDE WARNING SIGN NON-POTABLE WATER USE.

### NO. 1 TOTAL YARD HYDRANT (OR APPROVED EQUAL)

NOT TO SCALE

4  
X-XX

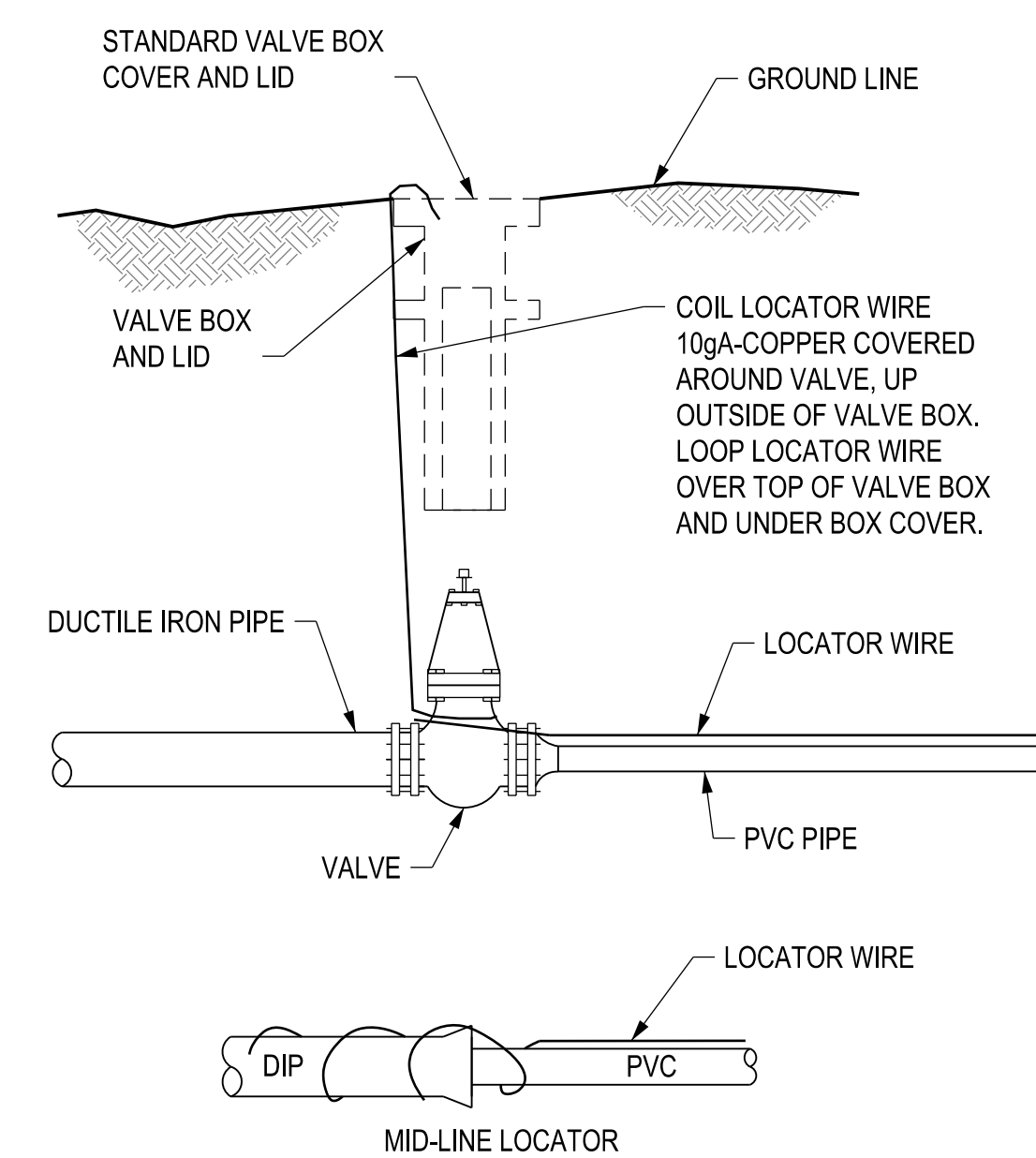


PIPE SIZE	J	K	L
6\"/>			
8\"/>			

### VERTICAL BEND TRUST BLOCK DETAILS

NOT TO SCALE

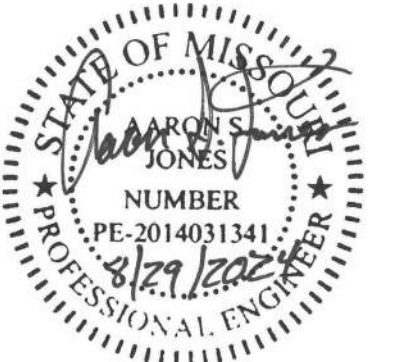
5  
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### TRACER OR LOCATOR WIRE

NOT TO SCALE

6  
X-XX



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REVISION: \_\_\_\_\_  
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ISSUE DATE: 8/29/2024

CAD DWG FILE:  
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DRAWN BY: MBT  
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DESIGNED BY: TML

SHEET TITLE:

WATER DETAILS

SHEET NUMBER:

C-501

23 OF 28 SHEETS  
8/29/2024

ALLOWABLE LEAKAGE PER 1,000 FEET OF PIPELINE\* - gph

NOMINAL PIPE DIAMETER (INCHES)

AVERAGE TEST PRESSURE (psi)	4	6	8	10	12	14	16	18	20	24
300	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12
275	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99
250	0.47	0.71	.995	1.19	1.42	1.66	1.90	2.14	2.37	2.85
225	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70
200	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55
175	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38
150	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21
125	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01
100	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80

\* FOR PIPE WITH 18-FOOT NOMINAL LENGTHS, TO OBTAIN THE RECOMMENDED ALLOWABLE LEAKAGE FOR PIPE WITH 20-FOOT LENGTHS, MULTIPLY THE LEAKAGE CALCULATED FROM THE TABLE BY 0.9, IF THE PIPELINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE ALLOWABLE LEAKAGE WILL BE THE SUM OF THE COMPUTED LEAKAGE FOR EACH SIZE.

NON-PAVED

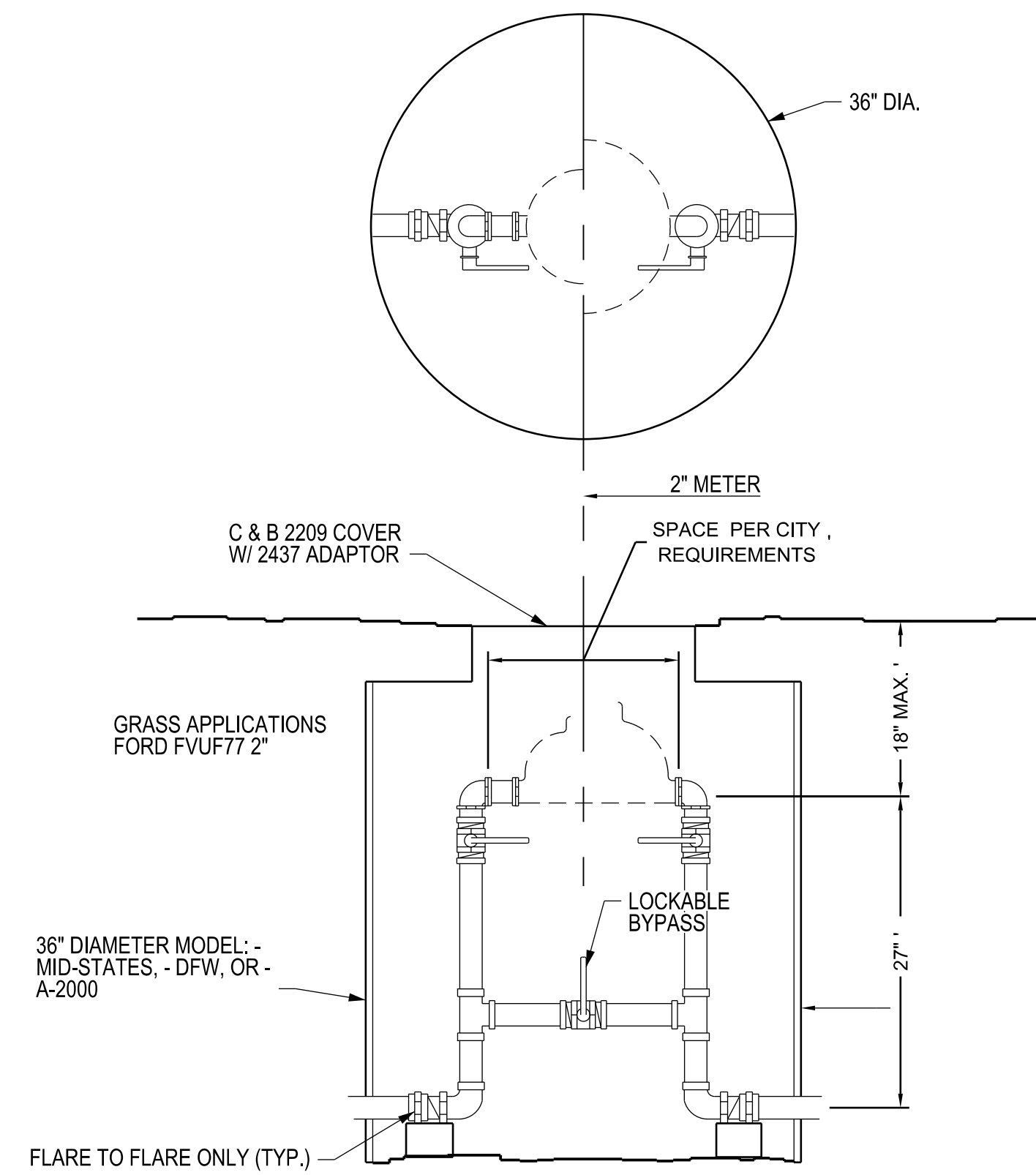
### ALLOWABLE LEAKAGE FOR WATERLINES

NOT TO SCALE

1

X-XX

NOTE: ALL FITTINGS SHALL BE FLANGED.



### 2" SERVICE METERS

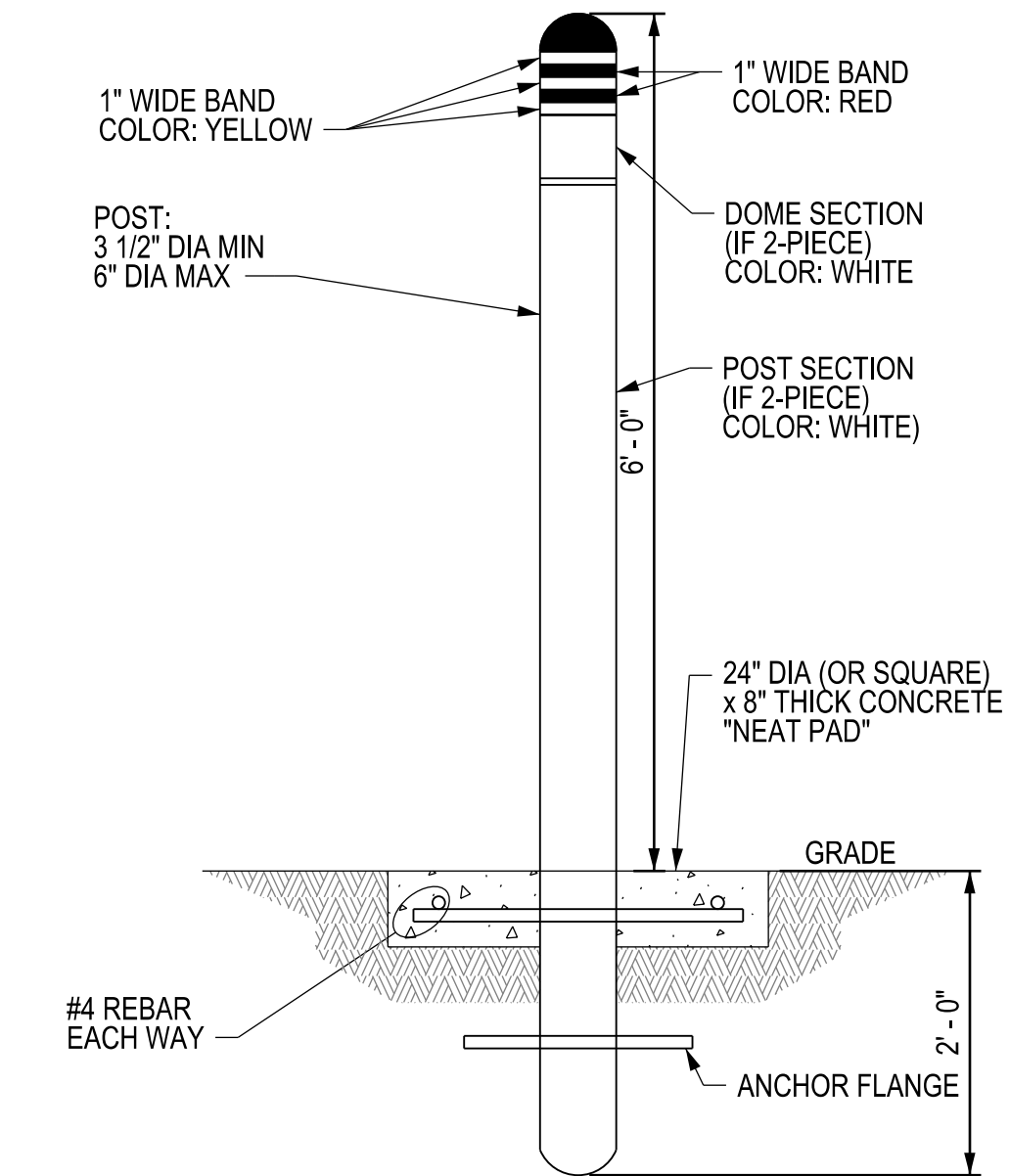
NOT TO SCALE

2

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NOTES:

1. MARKER POST SHALL BE A MINIMUM OF 3 1/2" O.D. AND MAXIMUM OF 6" O.D.
2. MARKER POSTS MAY BE ONE OR TWO PIECE CONSTRUCTION. TWO PIECE POSTS SHALL HAVE THE UPPER DOME SECTION PERMANENTLY SOLVENT WELDED TO THE LOWER POST SECTION.
3. MARKER POST MATERIAL SHALL BE POLYETHYLENE OR FIBERGLASS WITH UV INHIBITORS TO PREVENT DETERIORATION FROM WEATHER EXPOSURE.
4. MARKING BAND DECALS SHALL BE PERMANENTLY APPLIED, AND SHALL BE MANUFACTURED FROM UV RESISTANT MATERIALS AND INKS TO REDUCE FADING.
5. MARKING AND BAND COLORS SHALL BE "HIGH VISIBILITY" COLORS.

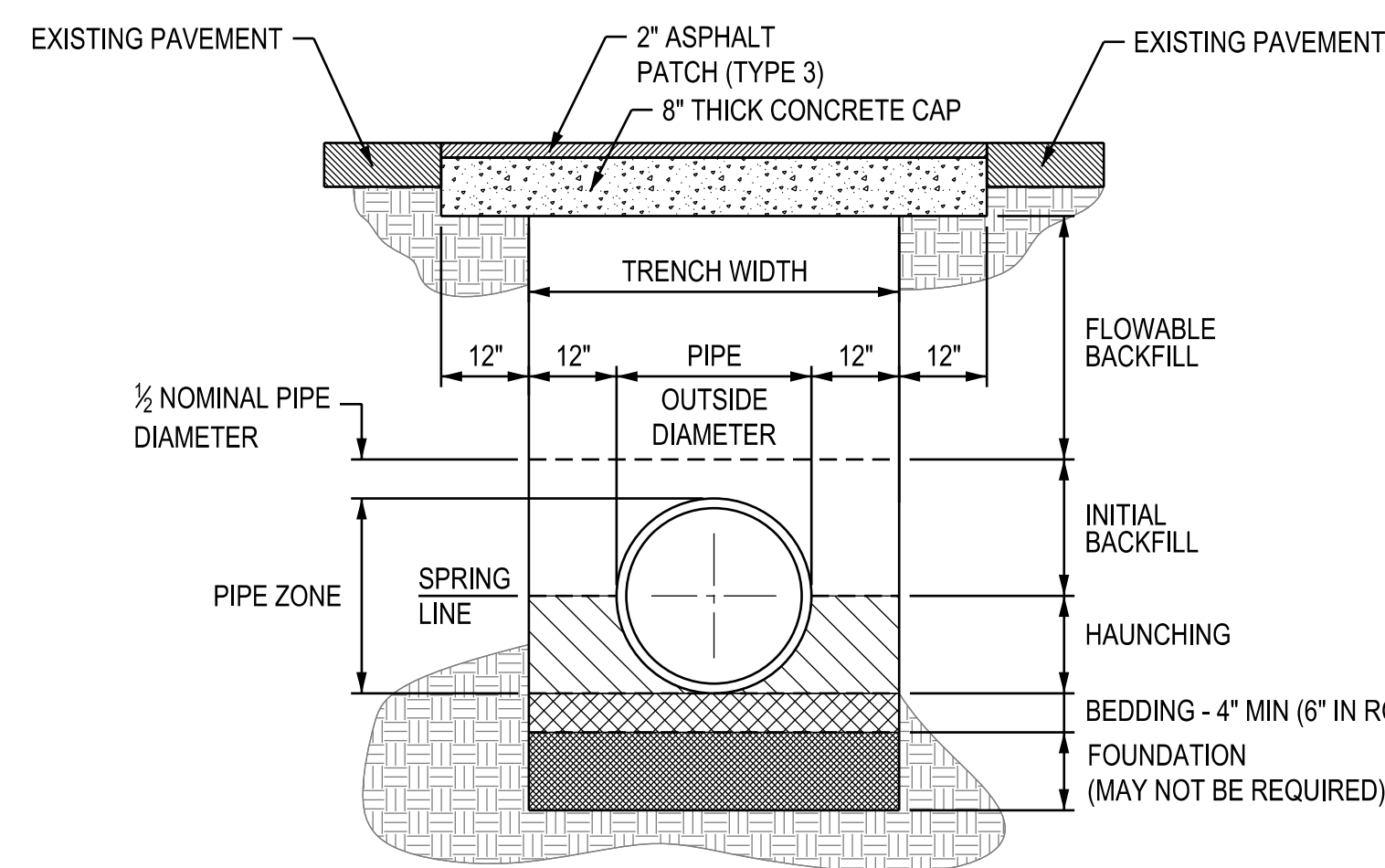


### TYPICAL MARKER POST INSTALLATION

NOT TO SCALE

3

X-XX



(UNDER PAVEMENT)

### PIPE EMBEDMENT AND INSTALLATION DETAILS

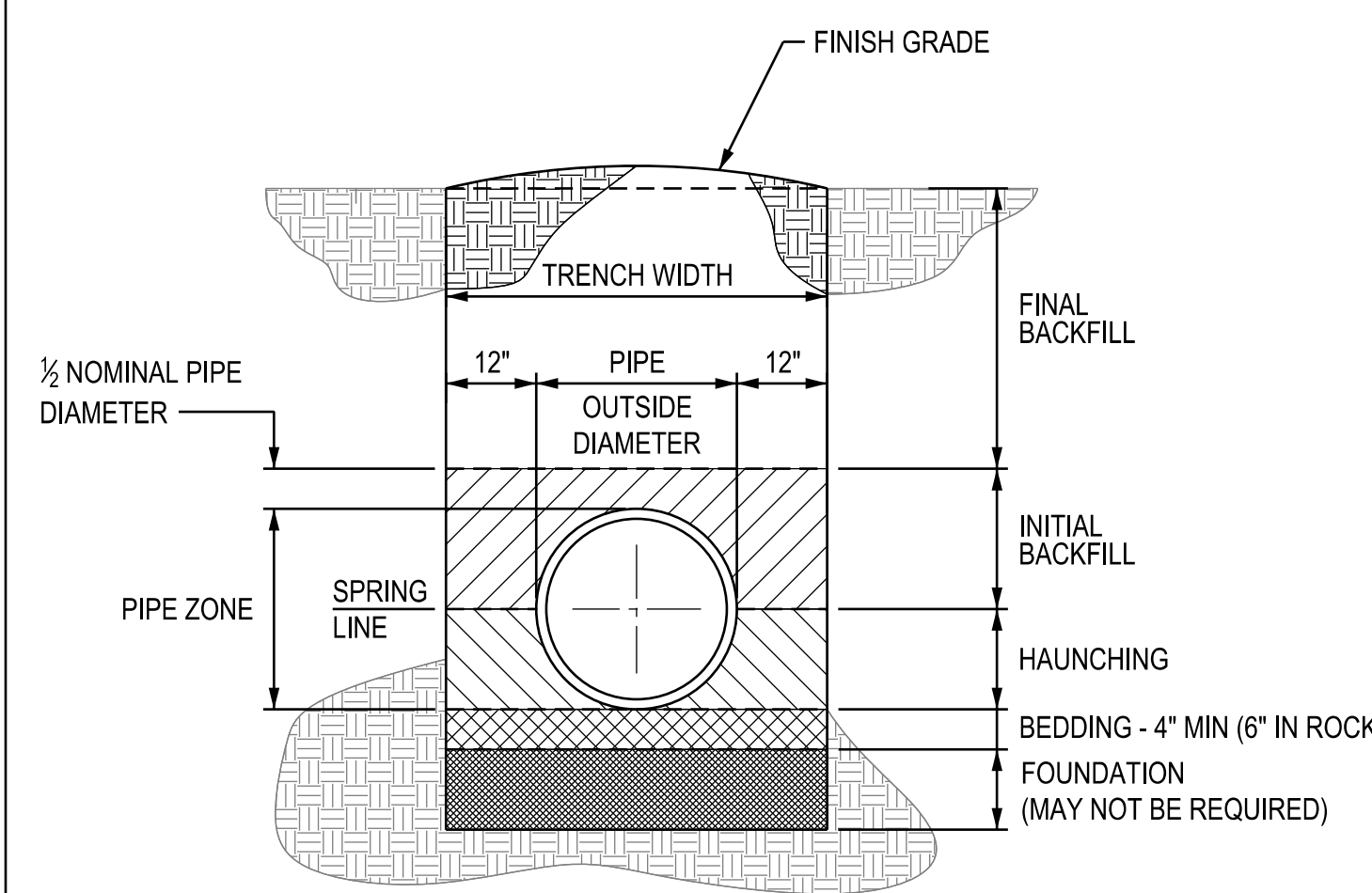
NOT TO SCALE

4

X-XX

NOTES:

1. PAVEMENT SHALL BE SAW-CUT AND REMOVED TWELVE INCHES (12") BEYOND THE TRENCH LINE, OR TWELVE INCHES (12") BEYOND SURFACE DAMAGE CAUSED BY THE CONSTRUCTION WORK, WHICHEVER IS GREATER. IF THE SAW-CUT LINE IS WITHIN THREE FEET (3') OF AN EXISTING JOINT, CUT, OR EDGE OF PAVEMENT, THE SURFACE RESTORATION SHALL BE EXTENDED TO THAT JOINT, CUT, OR EDGE. A TACK COAT SHALL BE APPLIED PRIOR TO ASPHALT PLACEMENT. JOINTS SHALL BE SEALED AFTER THE ASPHALT HAS BEEN PLACED AND COMPACTED.
2. ASPHALT PAVING AND MATERIALS SHALL MEET THE REQUIREMENTS OF KANSAS CITY, MISSOURI PUBLIC WORKS CRITERIA (KCMO APWA SECTION 2200).
3. CONCRETE TRENCH CAP SHALL BE PORTLAND CEMENT CONCRETE, MCIB MIX WA 738-3/4-4.
4. FLOWABLE BACKFILL: SHALL MEET THE REQUIREMENTS OF KANSAS CITY, MISSOURI PUBLIC WORKS CRITERIA (KCMO APWA SECTION 2602).
5. INITIAL BACKFILL: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
6. HAUNCHING: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
7. BEDDING: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
8. TRENCH BOTTOM: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
9. FOUNDATION: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
10. TRENCH CHECKS: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)



(NON-PAVED)

### PIPE EMBEDMENT AND INSTALLATION DETAILS

NOT TO SCALE

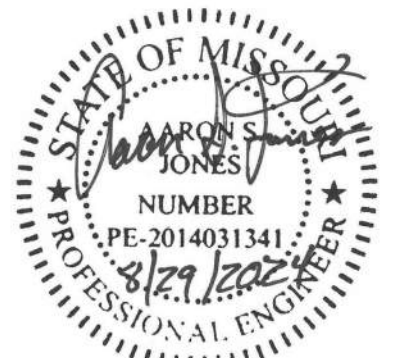
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NOTES:

1. FINISHED GRADE: PROVIDE 3" MOUND FOR SETTLEMENT.
2. FINAL BACKFILL: SHALL BE JOB-SITE EXCAVATED MATERIAL, FREE OF LARGE STONES (6" OR GREATER), FROZEN MATERIAL, OR DEBRIS. BACKFILL SHALL BE PLACED IN LIFTS NOT TO EXCEED 8" (LOOSE MEASURE) AND COMPACTED TO 95% OF MAXIMUM DENSITY UNDER THE ROAD AND 90% OF MAXIMUM DENSITY IN RIGHT-OF-WAY.
3. INITIAL BACKFILL: SHALL BE 3/4" GRANULAR AGGREGATE COMPACTED TO PROVIDE FIRM SIDE AND TOP SUPPORT. DEPTH OF COVER ABOVE THE TOP OF PIPE SHALL BE ONE HALF THE NOMINAL PIPE DIAMETER (4" MINIMUM).
4. HAUNCHING: SHALL BE 3/4" GRANULAR AGGREGATE WORKED UNDER THE SIDES OF THE PIPE, AND COMPACTED TO PROVIDE FIRM SIDE SUPPORT.
5. BEDDING: SHALL BE 3/4" GRANULAR AGGREGATE COMPACTED TO PROVIDE FIRM BOTTOM SUPPORT. DEPTH OF BEDDING SHALL BE A MINIMUM OF 4" (6" WHEN TRENCH IS EXCAVATED IN ROCK).
6. TRENCH BOTTOM: SHALL BE FIRM AND STABLE, PROVIDING UNIFORM SUPPORT FOR THE FULL LENGTH OF THE PIPE. BELL HOLES SHALL BE PROVIDED AT EACH JOINT.
7. FOUNDATION: WHEN AN UNSTABLE TRENCH BOTTOM IS ENCOUNTERED, THE SUB-GRADE MATERIAL SHALL BE REMOVED AND REPLACED WITH COMPACTED 3/4" GRANULAR AGGREGATE. IF THE DEPTH OF UNSTABLE MATERIAL EXCEEDS TWELVE INCHES (12"), NOTIFY THE ENGINEER FOR EVALUATION PRIOR TO PROCEEDING.
8. 3/4" GRANULAR AGGREGATE SHALL BE CRUSHED ROCK OR PEA GRAVEL WITH NOT LESS THAN 95% PASSING 3/4" (95% PASSING 1" FOR PIPE 30" DIAMETER AND LARGER) AND NOT LESS THAN 95% RETAINED ON A 3/8" SIEVE.

STATE OF MISSOURI  
MICHAEL L. PARSON,  
GOVERNOR



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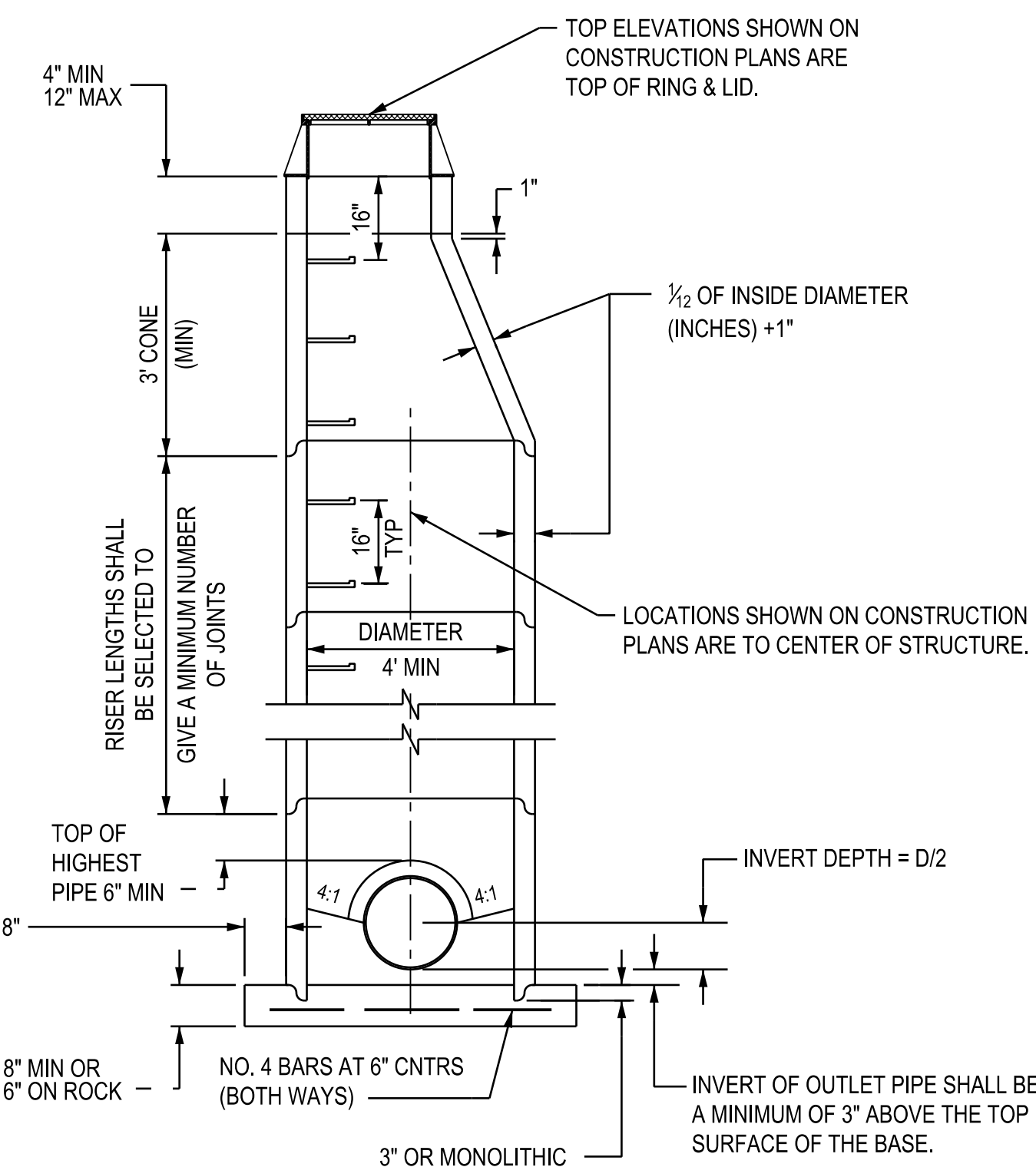
SHEET TITLE:  
WATER DETAILS

SHEET NUMBER:

C-502

24 OF 28 SHEETS  
8/29/2024





PRECAST-ECCENTRIC CONE

MANHOLE

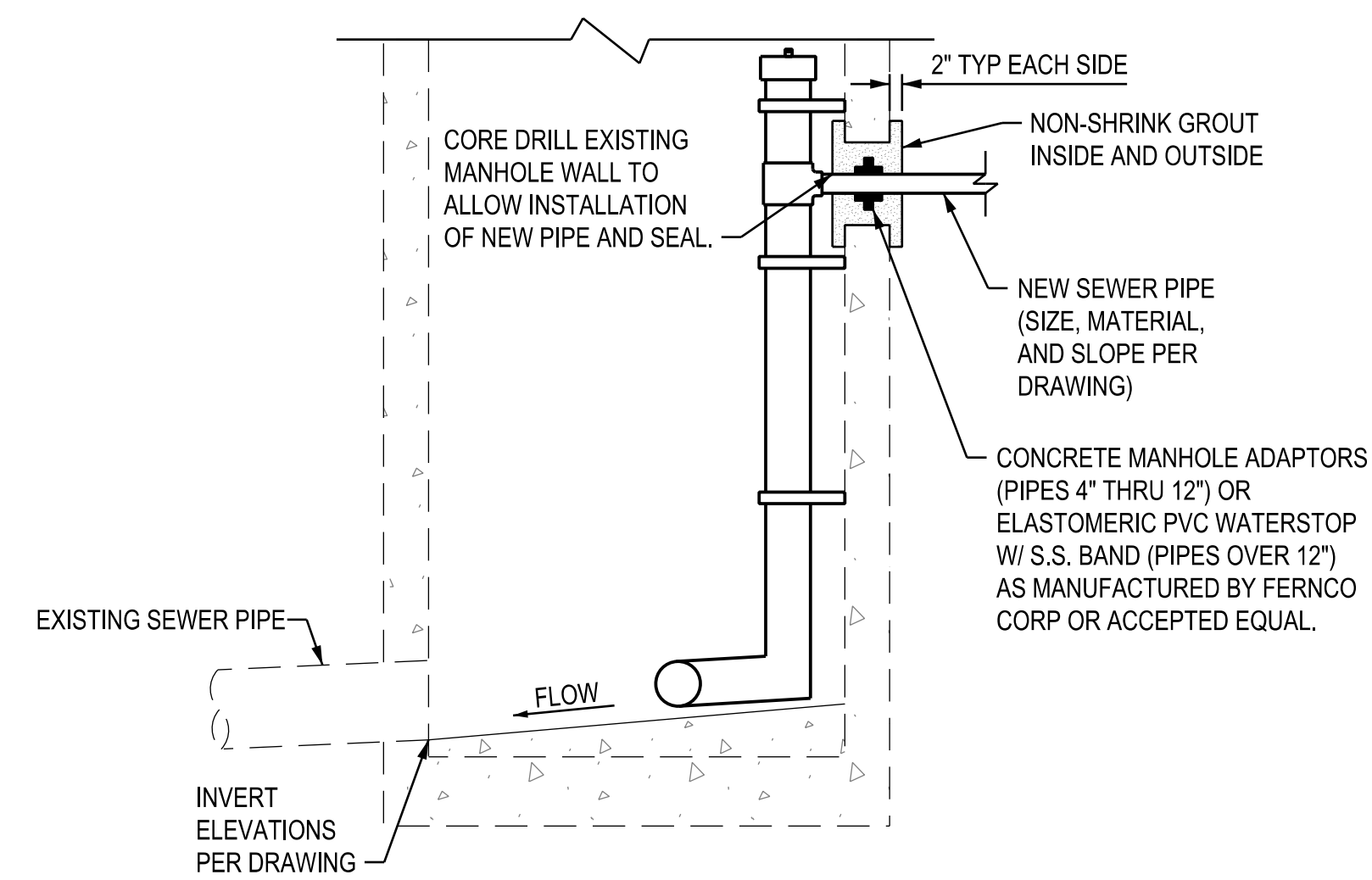
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NOT TO SCALE

PRECAST MANHOLE NOTES:

1. ALL MANHOLES ARE TO BE PRECAST CONCRETE AND OF ECCENTRIC CONE TYPE UNLESS OTHERWISE SPECIFIED.
2. USE KCMMB3K FOR ALL INVERTS.
3. MANHOLE TOP ADJUSTMENTS SHALL BE ACCOMPLISHED BY THE USE OF CONCRETE ADJUSTMENT RINGS.
4. TOP OF MANHOLE CASTING SHALL BE SET FLUSH AND ON SAME SLOPE AS FINISHED SURFACE OR AS DIRECTED BY THE ENGINEER.
5. REINFORCEMENT IN ALL SECTIONS ALL EQUAL OR EXCEED A.S.T.M. C-478 SPECIFICATIONS.
6. THE ENGINEER SHALL DESIGNATE MODIFICATIONS FOR MANHOLES WITH SPECIAL DESIGNS.
7. THE INSIDE DIAMETER OF THE MANHOLE SHALL BE 4'-0" FOR PIPE DIAMETERS FROM 12" THROUGH 24", 5'-0" FOR PIPE DIAMETERS FROM 27" THROUGH 36", AND 6'-0" FOR PIPE DIAMETERS 42" THROUGH 48".
8. CLEARANCE TOLERANCE OF PIPE OPENINGS: THE MAXIMUM ALLOWABLE PIPE OPENING ON A HORIZONTAL AXIS SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 12" THE MAXIMUM ALLOWABLE PIPE OPENING ON VERTICAL AXIS SHALL BE THE OUTSIDE DIAMETER PLUS 8". THE MINIMUM CLEARANCE BETWEEN THE OUTSIDE SURFACE OF AN INSTALLED PIPE AND THE CONCRETE OF THE MANHOLE SHALL BE 2".
9. INSTALLATION OF PIPE OPENINGS: ALL REQUIRED PIPE OPENINGS SHALL BE PLANT CAST IN MANHOLE UNITS. FIELD ALTERATIONS OF OPENINGS WILL BE PERMITTED PROVIDED WALLS ARE SCORED WITH A MASONRY SAW TO A DEPTH SUFFICIENT TO SEVER REINFORCING STEEL. A CHIPPING HAMMER MAY THEN BE USED TO REMOVE THE CONCRETE. MINIMUM DISTANCE BETWEEN ANY ADJACENT PIPES SHALL BE 4".
10. NO DIRECT PAYMENT FOR SHAPING FLOOR OR CONNECTION PIPES AS SHOWN ON PLANS.
11. RING & COVER TO BE NEENAH R-1736, CLAY & BAILEY #2008, DEETER #1215, OR APPROVED EQUAL.
12. STEPS REQUIRED AT 16" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 4' STEPS SHALL BE CLAY & BAILEY NO. 2102 OR APPROVED EQUAL.
13. CONCRETE ADMIXTURE: THE CONCRETE FOR ALL MANHOLES, INCLUDING PRE-CAST CONCRETE SECTIONS AND ADJUSTING RINGS; SHALL CONTAIN A LIQUID CONCRETE ADMIXTURE SALT THAT PERMEATES THE ENTIRE CONCRETE CROSS SECTION, AND SHALL BE "CONSHIELD."
  - a. THE CONSHIELD SHALL BE ADDED TO THE CONCRETE WALL SECTIONS OR DEVELOPED BASE SECTIONS.
  - b. THE CONSHIELD SHALL BE ADDED TO THE ADJUSTING RINGS.
  - c. THE CONSHIELD SHALL BE ADDED TO THE READI-MIX THAT IS USED TO POUR THE MANHOLE INVERTS. THE DELIVERY TICKET SHALL REFLECT THE ADDITION OF THE ADMIXTURE.
  - d. ALL CONSHIELD PRE-CAST SECTIONS SHALL BE PAINTED A GREY-GREEN COLOR TO DENOTE THE ADDITION OF ADMIXTURE, ALONG WITH STENCILED PAINTED LETTERS.

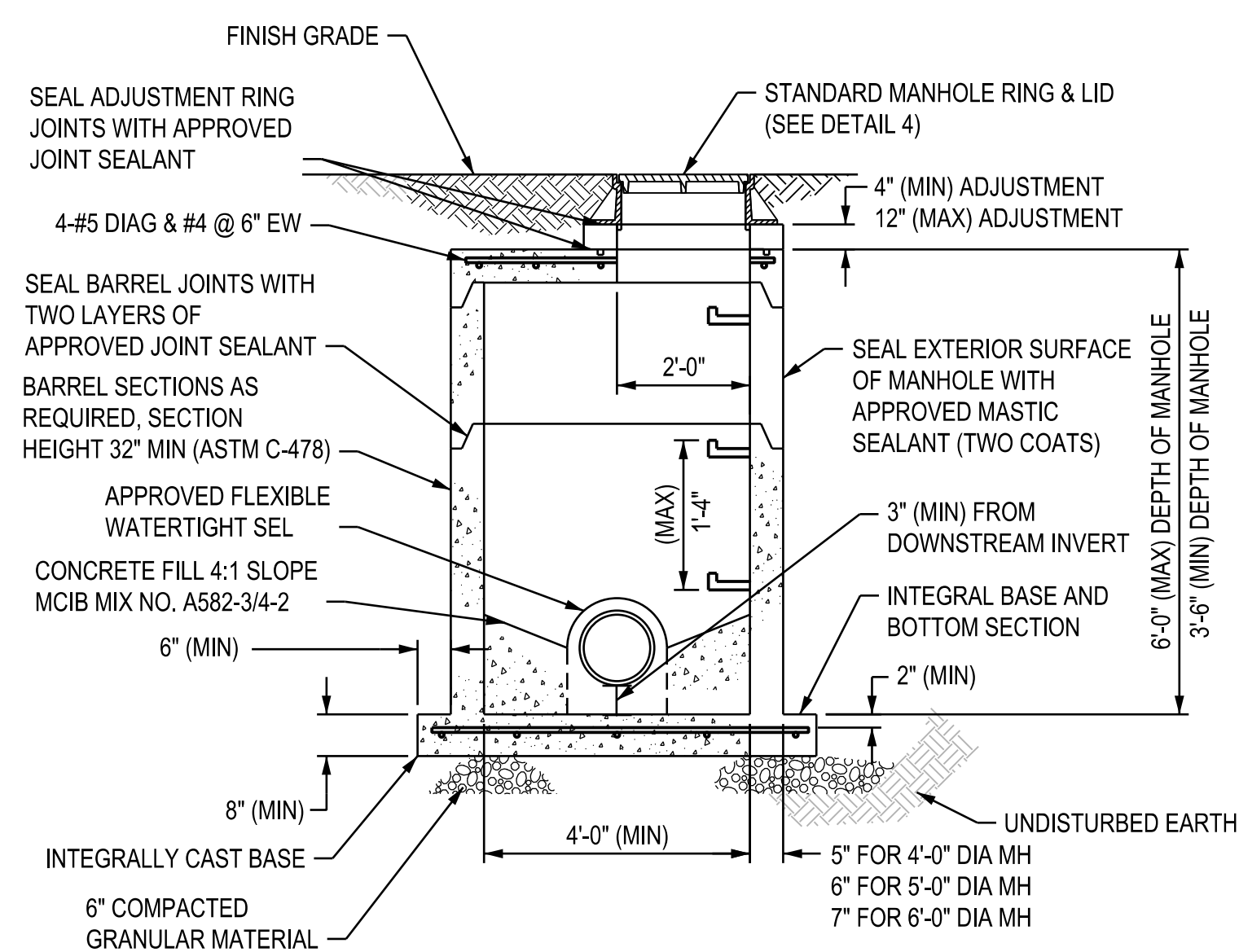
- NOTE:
1. DRILL AND BOOT ACCEPTED OPTION.
  2. MANHOLE MUST BE VACUUM TESTED.



CONNECTION TO EXISTING MANHOLE

2  
X - XX

NOT TO SCALE

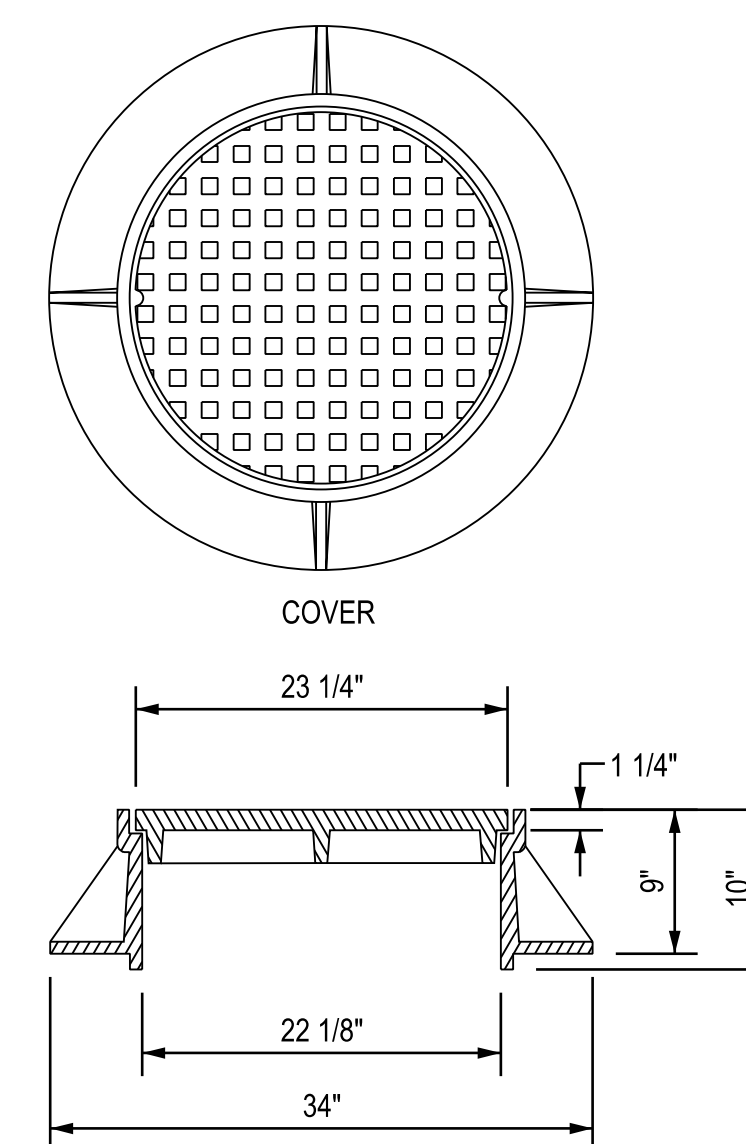


FLAT TOP

MANHOLE

3  
X - XX

NOT TO SCALE

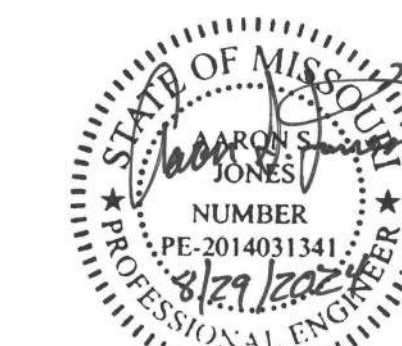


NOTE: MINIMUM LID WEIGHT = 135 LBS

MANHOLE RING AND LID

4  
X - XX

NOT TO SCALE



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SITE # 5106  
ASSET # 7815106026

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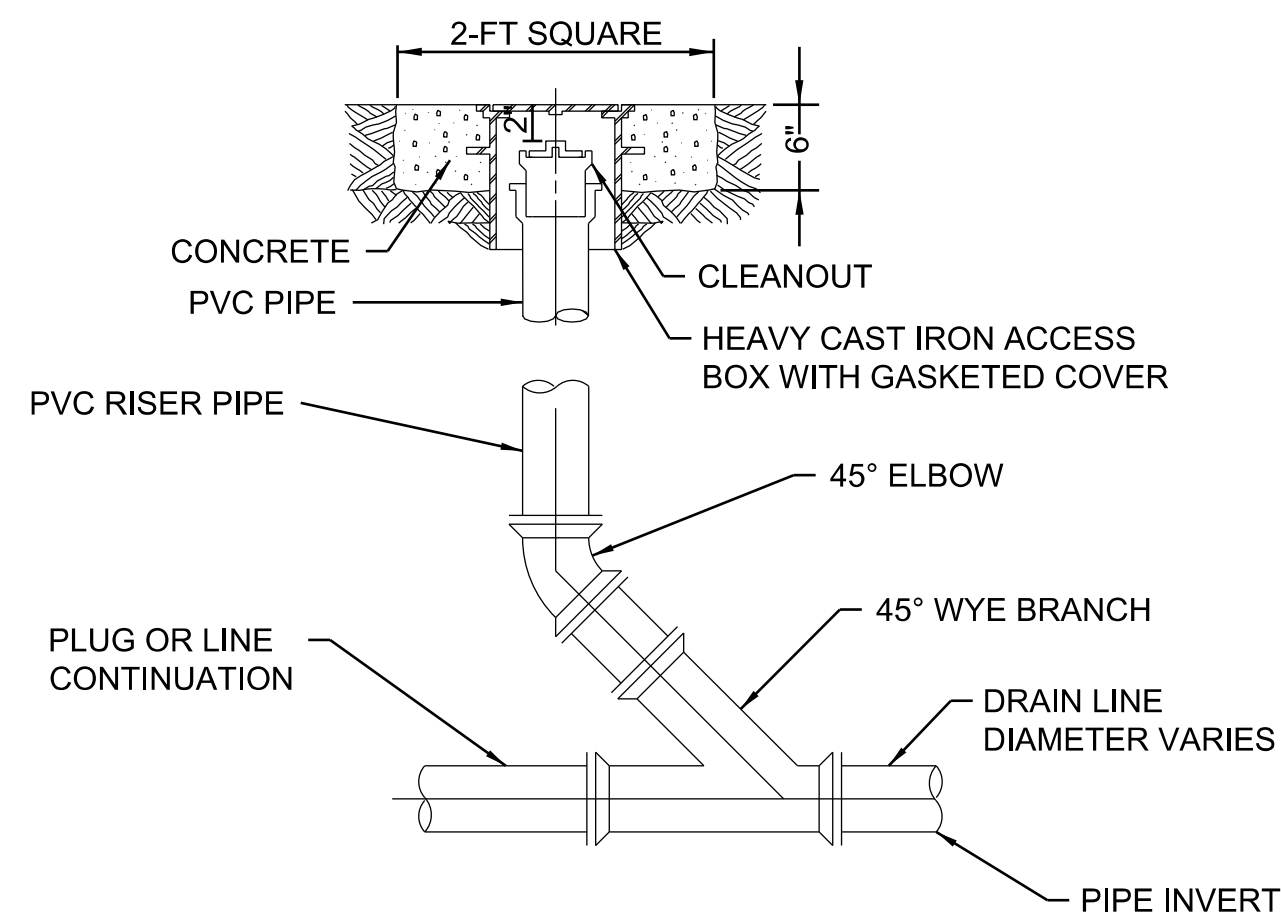
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C-503

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8/29/2024

**NOTES:**

1. PRIOR TO PLACEMENT OF BASE COURSE MATERIAL THE PREVIOUSLY PREPARED SUBGRADE SURFACE SHALL BE CLEARED OF ALL FOREIGN SUBSTANCES AND RESTORED IN SHAPE, TOLERANCE AND DENSITY AS SPECIFIED IN KCMO APWA SECTION 02201 ENTITLED "SUBGRADE PREPARATION." THE TOP 6" OF SUBGRADE SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY FOR THE MATERIAL USED AS DETERMINED BY ASTM D698 AND WITHIN A TOLERANCE OF PLUS 2% AND MINUS 3% OF OPTIMUM MOISTURE CONTENT.
2. THE 6" LAYER OF COMPACTED AGGREGATE SHALL COMPLY WITH MODOT TYPE 5 AGGREGATE.
3. ALL PORTLAND CEMENT CONCRETE PAVEMENT, REINFORCEMENT, JOINTS, CURING, AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 03300 ENTITLED "PORTLAND CEMENT CONCRETE PAVEMENT."

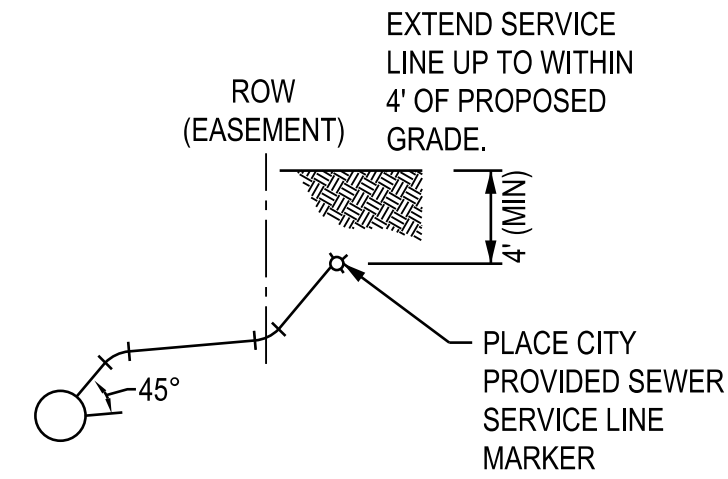


**PIPE CLEANOUT DETAIL**

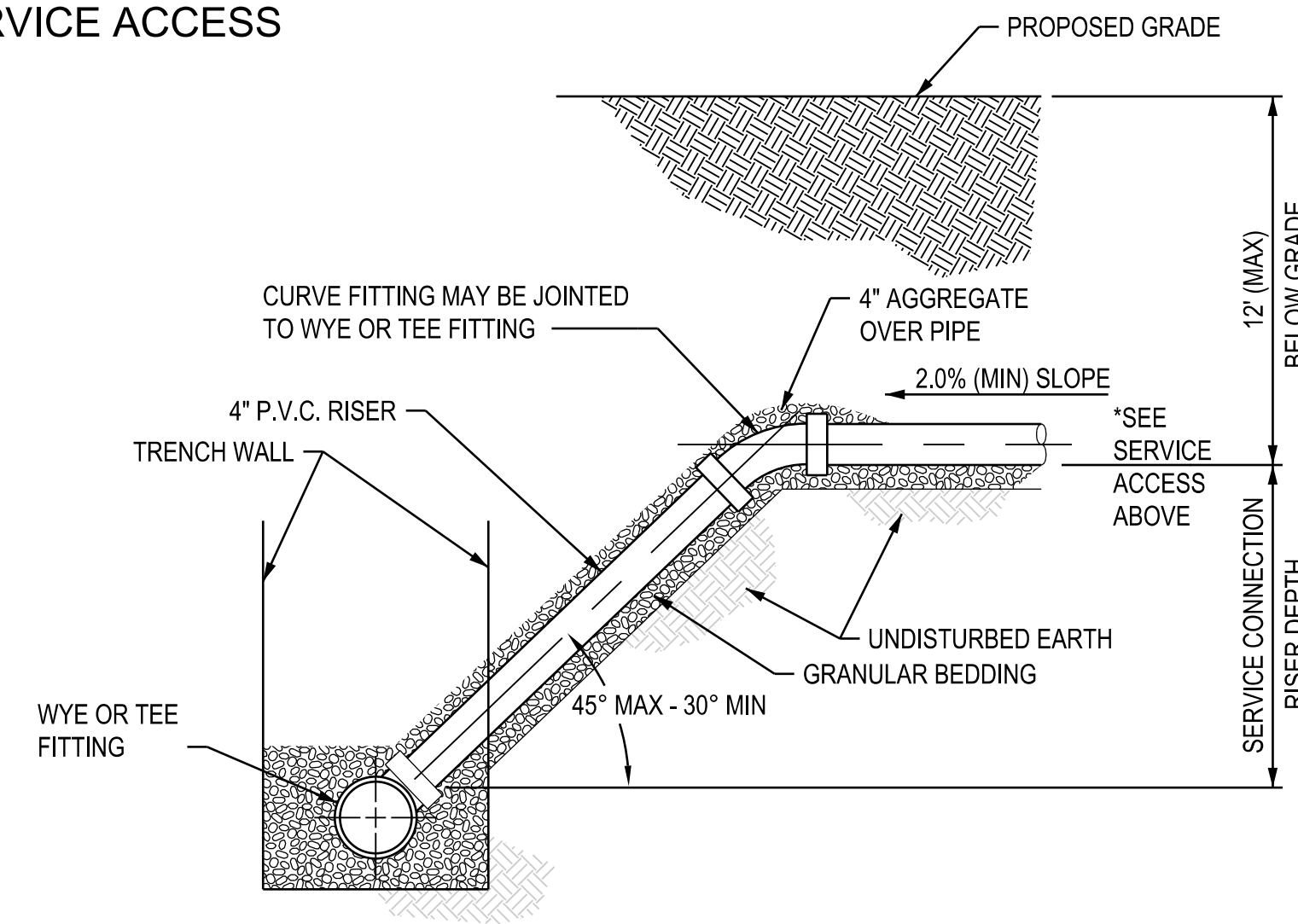
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**1**

X-XX



**SERVICE ACCESS**



**SANITARY SERVICE CONNECTION**

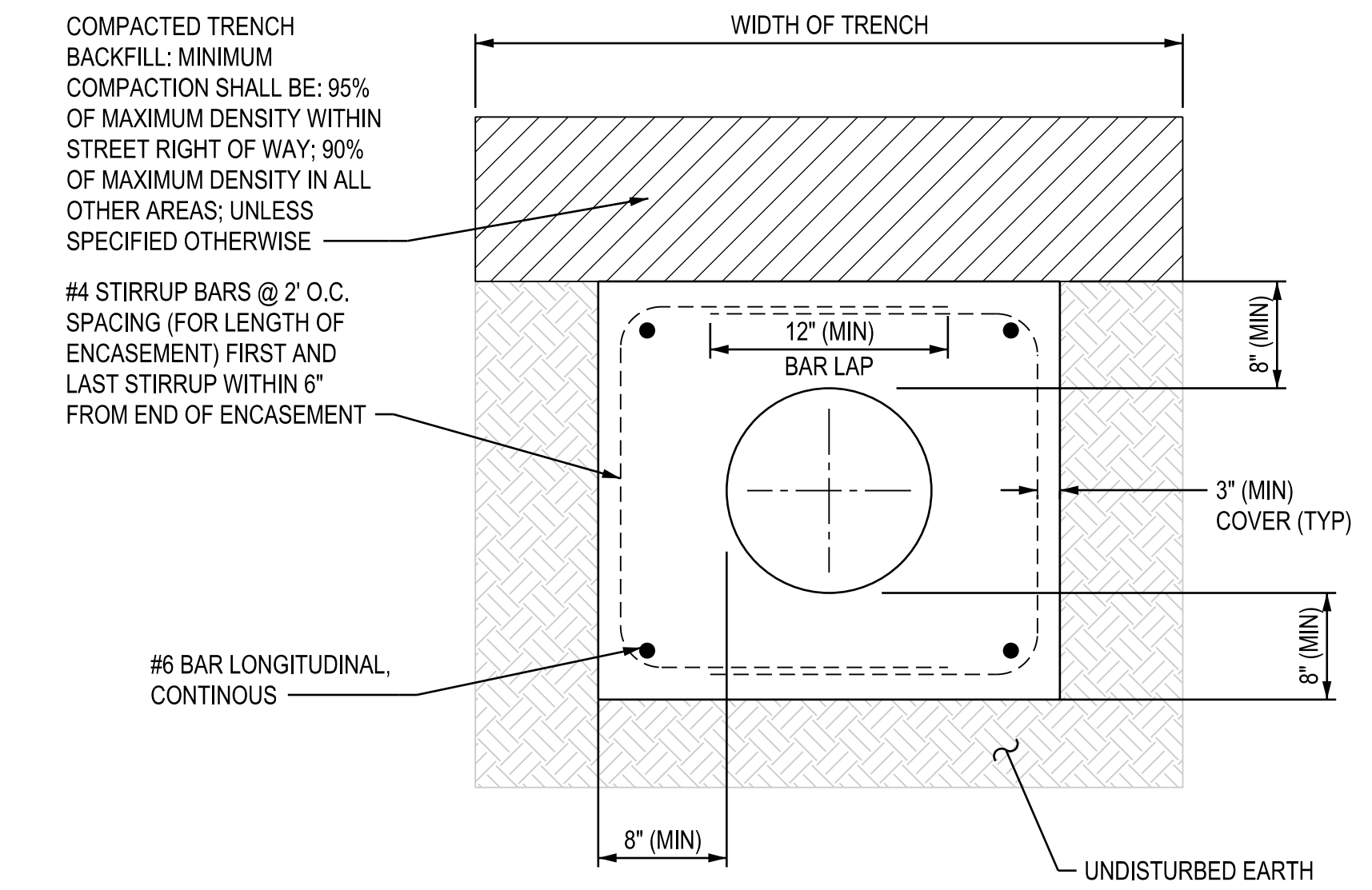
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**5**

X-XX

**NOTE:**

1. A PIPE JOINT SHALL BE LOCATED OUTSIDE OF, AND WITHIN 12" OF EACH END OF THE ENCASEMENT.
2. CONCRETE SHALL BE POURED AGAINST UNDISTURBED EARTH OR ROCK (BOTH SIDES AND BOTTOM).
3. REINFORCING STEEL SHALL HAVE A MINIMUM OF 3" COVER
4. CONTRACTOR SHALL BLOCK UP PIPE WITH 8"x8"x16" SOLID CONCRETE BLOCKS TO GIVE A MINIMUM PIPE CLEARANCE INDICATED.
5. CONTRACTOR SHALL PROVIDE PIPE TIE DOWNS AS NECESSARY TO PREVENT FLOATING.
6. ALLOW CONCRETE TO SET 4 HOURS MINIMUM PRIOR TO TRENCH BACKFILL.

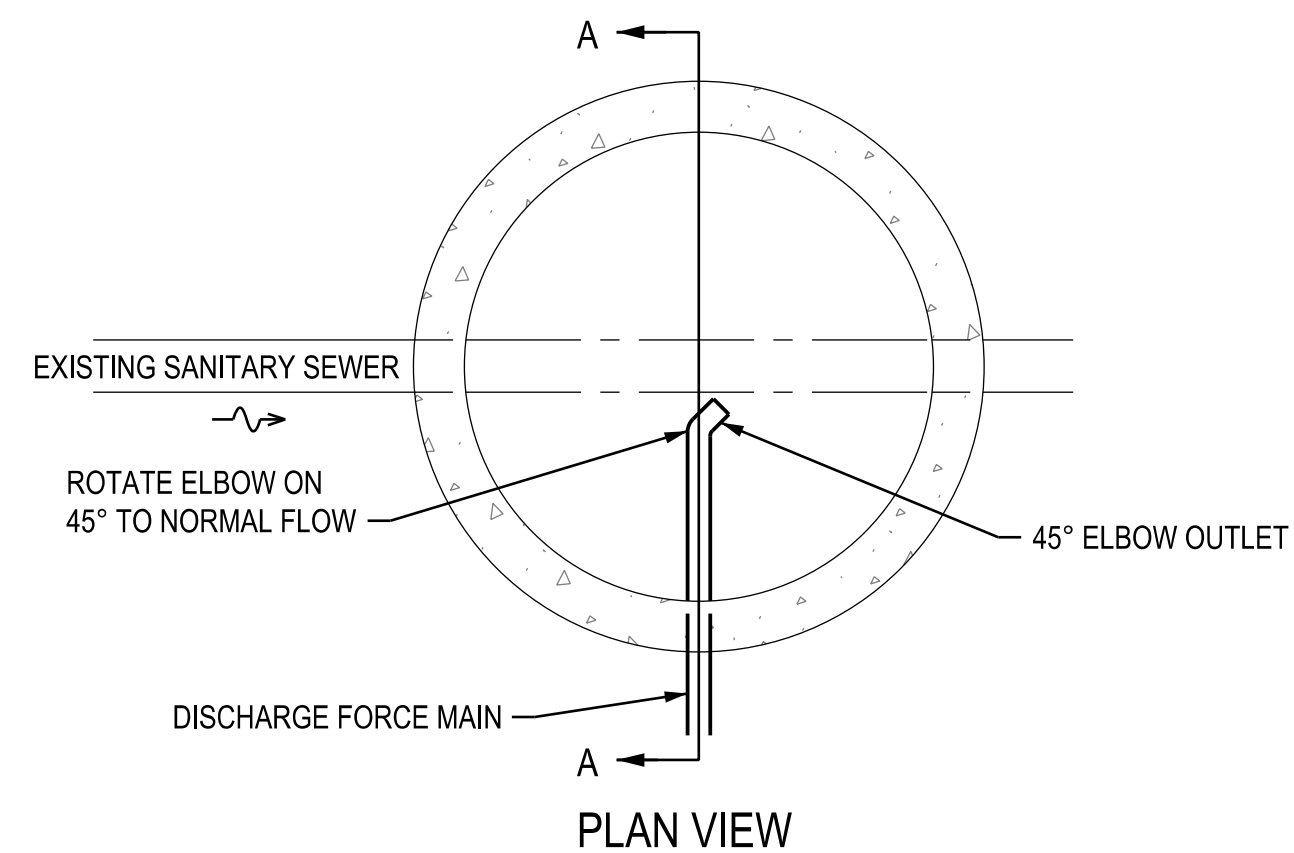


**CONCRETE ENCASEMENT**

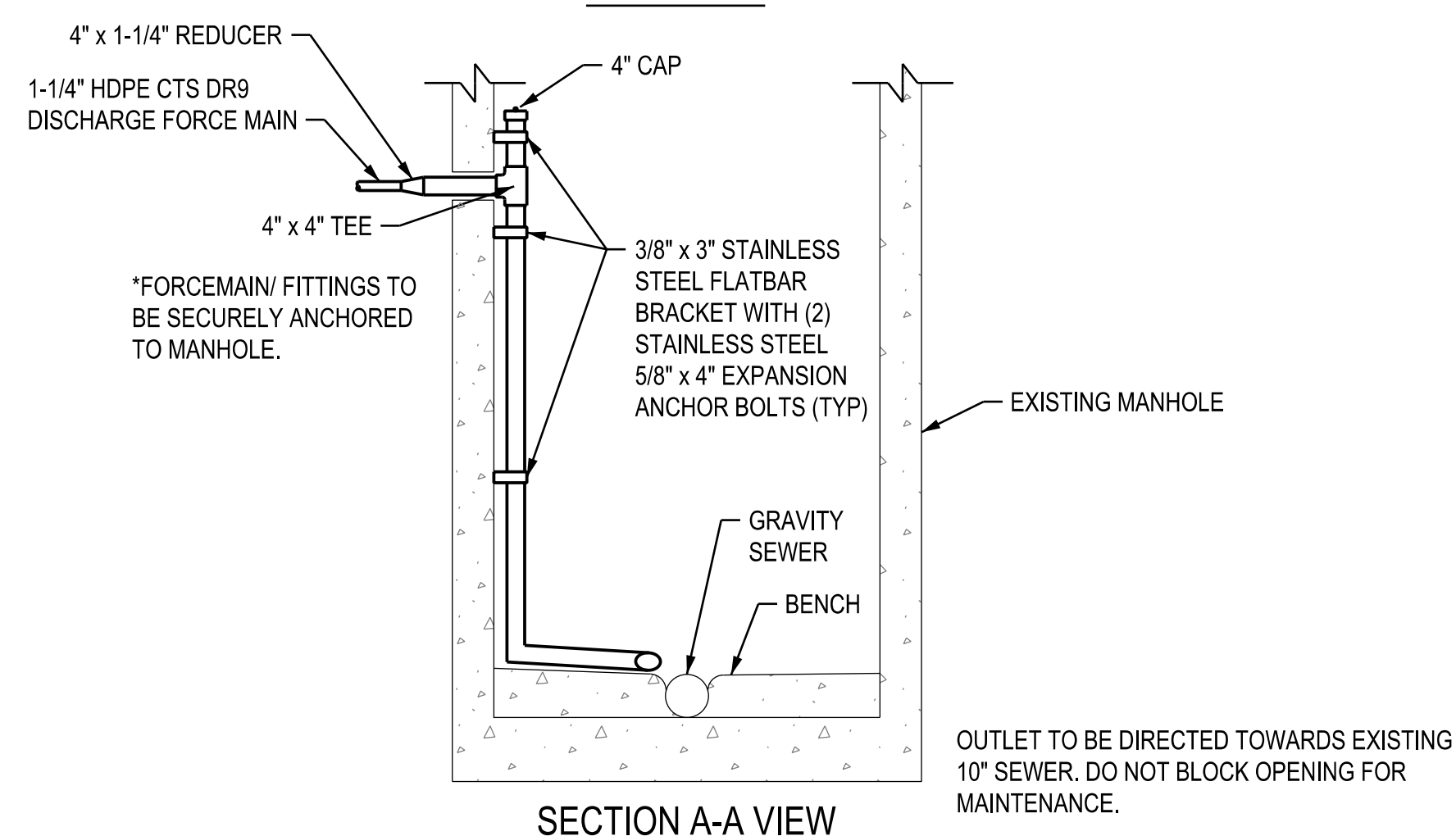
NOT TO SCALE

**3**

X-XX



**PLAN VIEW**



**SECTION A-A VIEW**

**DROP CONNECTION INTO EXISTING MANHOLE**

NOT TO SCALE

**4**

X-XX

**NOT USED**

NOT TO SCALE

**5**

X-XX

**NOT USED**

NOT TO SCALE

**6**

X-XX



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SITE # 5106  
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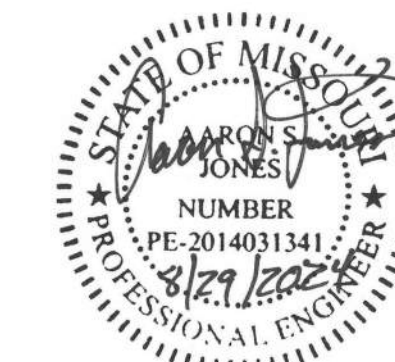
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8/29/2024





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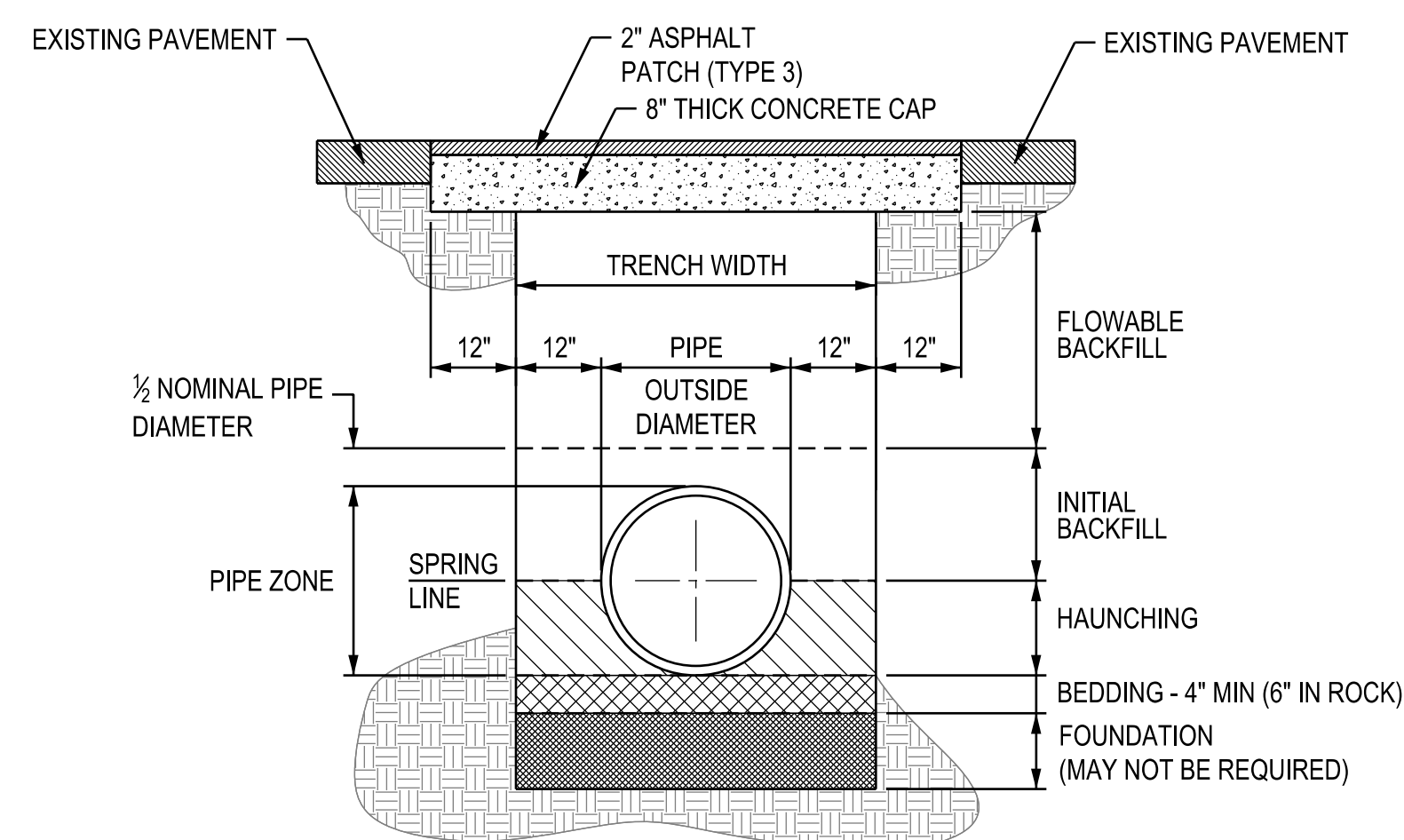
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**C-505**

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8/29/2024



(UNDER PAVEMENT)

**PIPE EMBEDMENT AND INSTALLATION DETAILS**

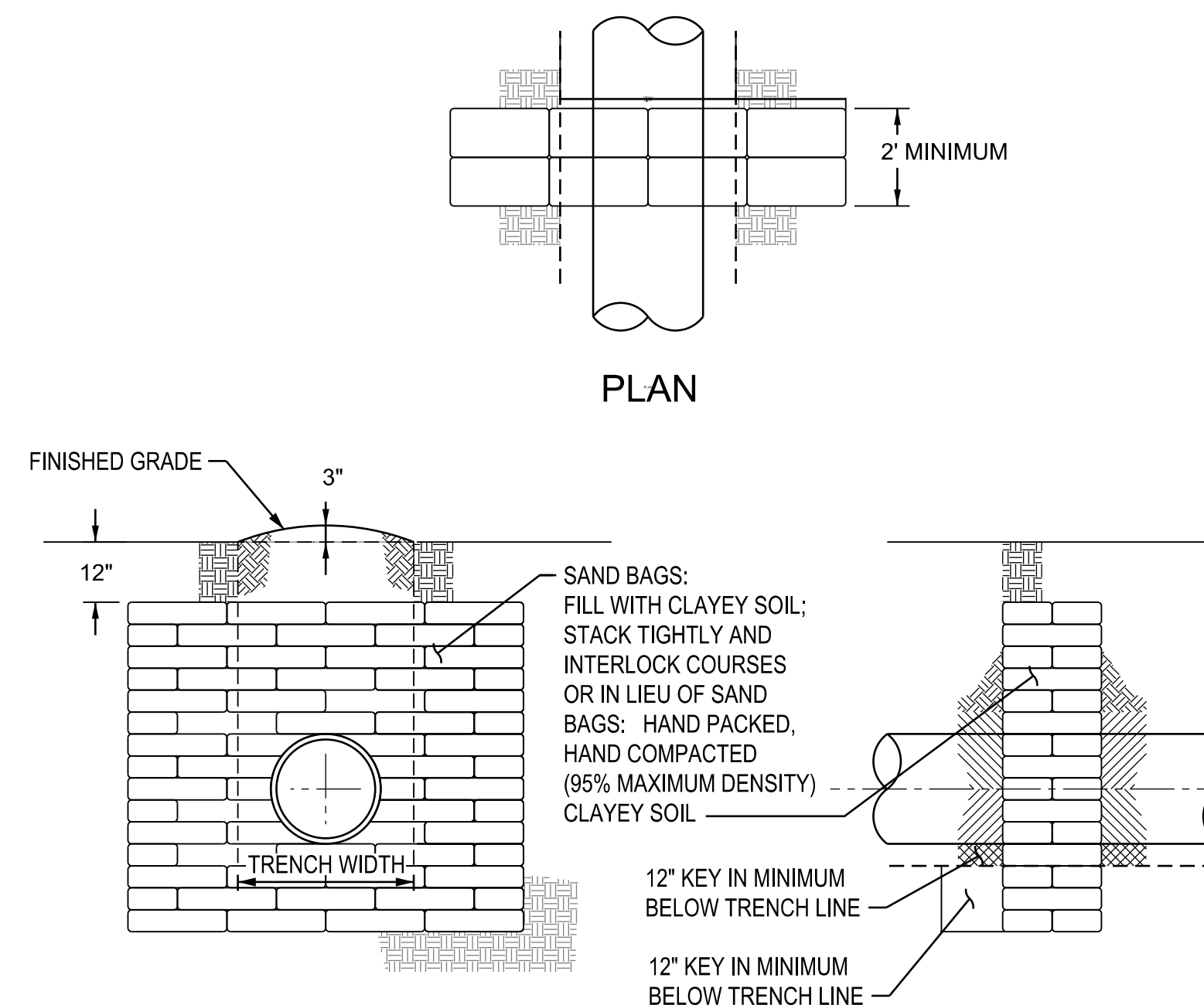
NOT TO SCALE

1

X-XX

NOTES:

- PAVEMENT SHALL BE SAW-CUT AND REMOVED TWELVE INCHES (12") BEYOND THE TRENCH LINE, OR TWELVE INCHES (12") BEYOND SURFACE DAMAGE CAUSED BY THE CONSTRUCTION WORK, WHICHEVER IS GREATER. IF THE SAW-CUT LINE IS WITHIN THREE FEET (3') OF AN EXISTING JOINT, CUT, OR EDGE OF PAVEMENT, THE SURFACE RESTORATION SHALL BE EXTENDED TO THAT JOINT, CUT, OR EDGE. A TACK COAT SHALL BE APPLIED PRIOR TO ASPHALT PLACEMENT. JOINTS SHALL BE SEALED AFTER THE ASPHALT HAS BEEN PLACED AND COMPACTED.
- ASPHALT PAVING AND MATERIALS SHALL MEET THE REQUIREMENTS OF MISSOURI STATE PARKS.
- CONCRETE TRENCH CAP SHALL BE PORTLAND CEMENT CONCRETE, MCIB MIX WA 738-3/4-4.
- FLOWABLE BACKFILL: SHALL MEET THE REQUIREMENTS OF MISSOURI STATE PARKS.
- INITIAL BACKFILL: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
- HAUNCHING: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
- BEDDING: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
- TRENCH BOTTOM: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
- FOUNDATION: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)
- TRENCH CHECKS: (PER PIPE EMBEDMENT AND INSTALLATION REQUIREMENTS)

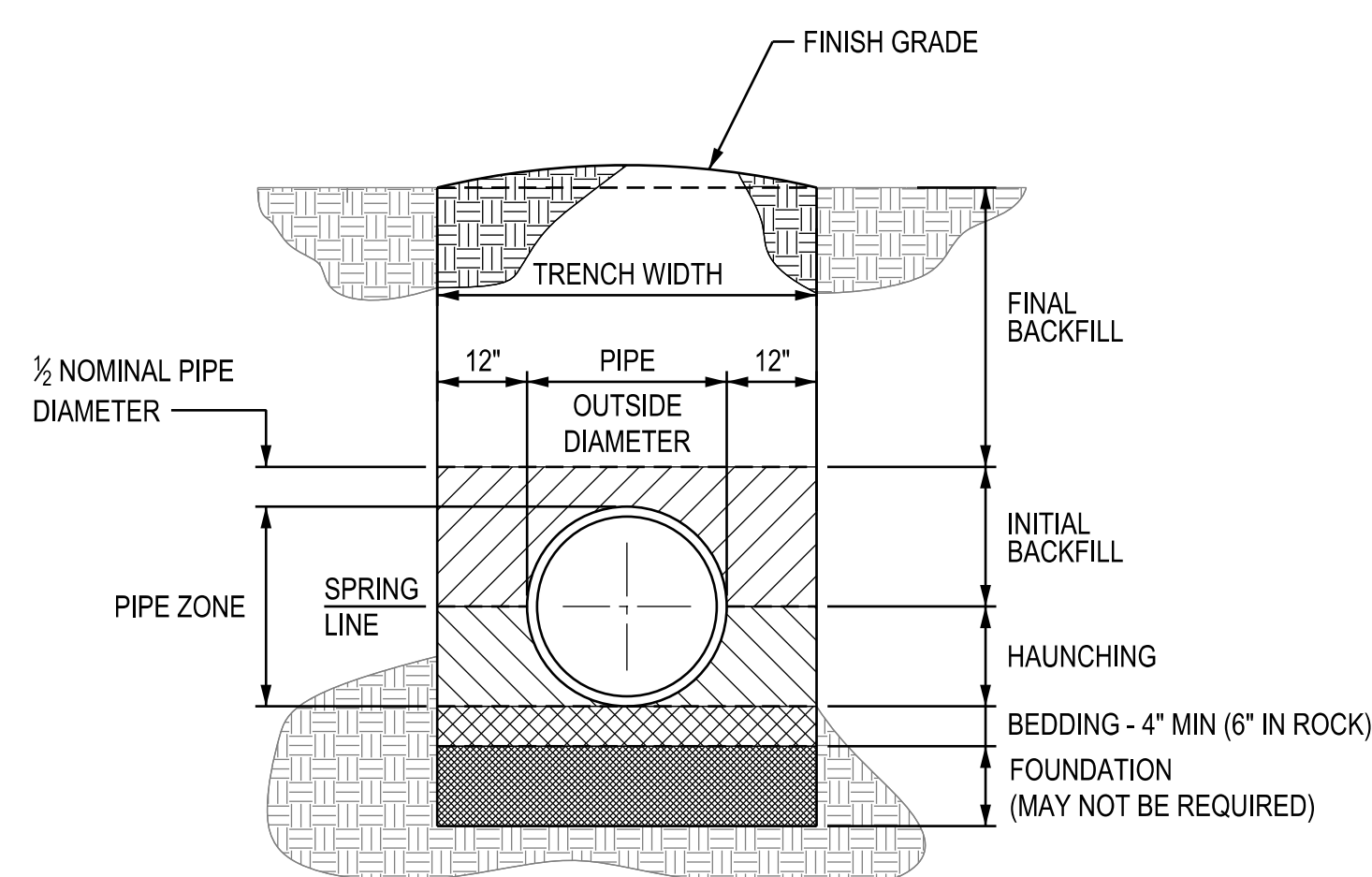


**TRENCH PLUG DETAIL**

NOT TO SCALE

2

X-XX



(NON-PAVED)

**PIPE EMBEDMENT AND INSTALLATION DETAILS**

NOT TO SCALE

3

X-XX

NOTES:

- FINISHED GRADE: PROVIDE 3" MOUND FOR SETTLEMENT.
- FINAL BACKFILL: SHALL BE JOB-SITE EXCAVATED MATERIAL, FREE OF LARGE STONES (6" OR GREATER), FROZEN MATERIAL, OR DEBRIS. BACKFILL SHALL BE PLACED IN LIFTS NOT TO EXCEED 8" (LOOSE MEASURE) AND COMPACTED TO 95% OF MAXIMUM DENSITY UNDER THE ROAD AND 90% OF MAXIMUM DENSITY IN RIGHT-OF-WAY.
- INITIAL BACKFILL: SHALL BE 3/4" GRANULAR AGGREGATE COMPACTED TO PROVIDE FIRM SIDE AND TOP SUPPORT. DEPTH OF COVER ABOVE THE TOP OF PIPE SHALL BE ONE HALF THE NOMINAL PIPE DIAMETER (4" MINIMUM).
- HAUNCHING: SHALL BE 3/4" GRANULAR AGGREGATE WORKED UNDER THE SIDES OF THE PIPE, AND COMPACTED TO PROVIDE FIRM SIDE SUPPORT.
- BEDDING: SHALL BE 3/4" GRANULAR AGGREGATE COMPACTED TO PROVIDE FIRM BOTTOM SUPPORT. DEPTH OF BEDDING SHALL BE A MINIMUM OF 4" (6" WHEN TRENCH IS EXCAVATED IN ROCK).
- TRENCH BOTTOM: SHALL BE FIRM AND STABLE, PROVIDING UNIFORM SUPPORT FOR THE FULL LENGTH OF THE PIPE. BELL HOLES SHALL BE PROVIDED AT EACH JOINT.
- FOUNDATION: WHEN AN UNSTABLE TRENCH BOTTOM IS ENCOUNTERED, THE SUB-GRADE MATERIAL SHALL BE REMOVED AND REPLACED WITH COMPACTED 3/4" GRANULAR AGGREGATE. IF THE DEPTH OF UNSTABLE MATERIAL EXCEEDS TWELVE INCHES (12"), NOTIFY THE ENGINEER FOR EVALUATION PRIOR TO PROCEEDING.
- 3/4" GRANULAR AGGREGATE SHALL BE CRUSHED ROCK OR PEA GRAVEL WITH NOT LESS THAN 95% PASSING 3/4" (95% PASSING 1" FOR PIPE 30" DIAMETER AND LARGER) AND NOT LESS THAN 95% RETAINED ON A 3/8" SIEVE.
- TRENCH CHECKS (TRENCH PLUGS) SHALL BE INSTALLED AT APPROXIMATELY 200-FOOT SPACING ALONG THE TRENCH. TRENCH CHECKS SHALL BE 5-FEET IN LENGTH, AND SHALL SPAN THE FULL WIDTH OF THE TRENCH. TRENCH CHECKS SHALL BE CONSTRUCTED OF IMPERVIOUS (CLAYEY) SOIL MATERIAL. THE TRENCH CHECK SHALL BE CONSTRUCTED BY PLACING THE IMPERVIOUS MATERIAL IN LIEU OF THE BEDDING, HAUNCHING, AND INITIAL BACKFILL AGGREGATE MATERIAL. THE IMPERVIOUS MATERIAL SHALL BE HAND-COMPACTED, AND CARE SHALL BE TAKEN TO MAINTAIN THE PIPE ALIGNMENT AND GRADE, AND TO PROTECT THE PIPE FROM BEING DEFLECTED OR DEFORMED.



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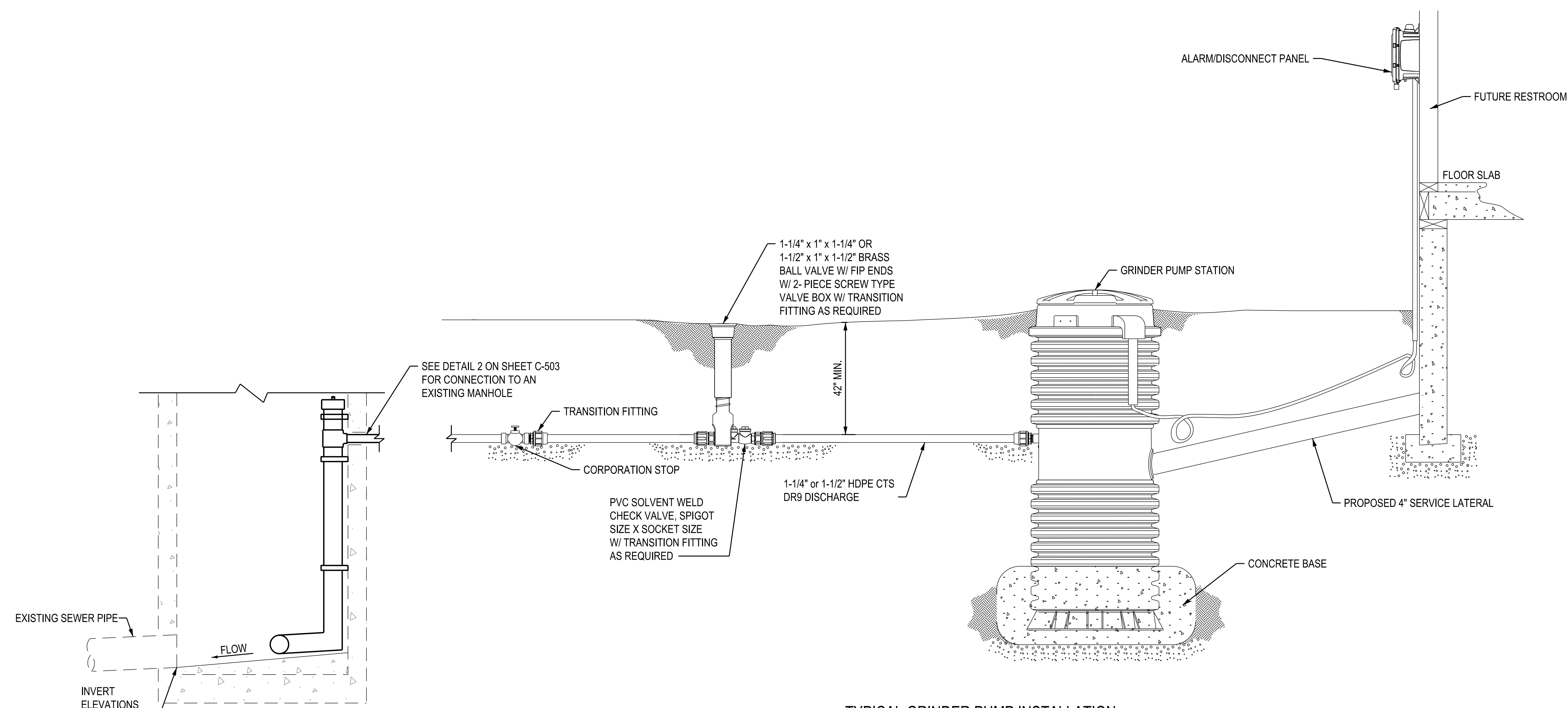
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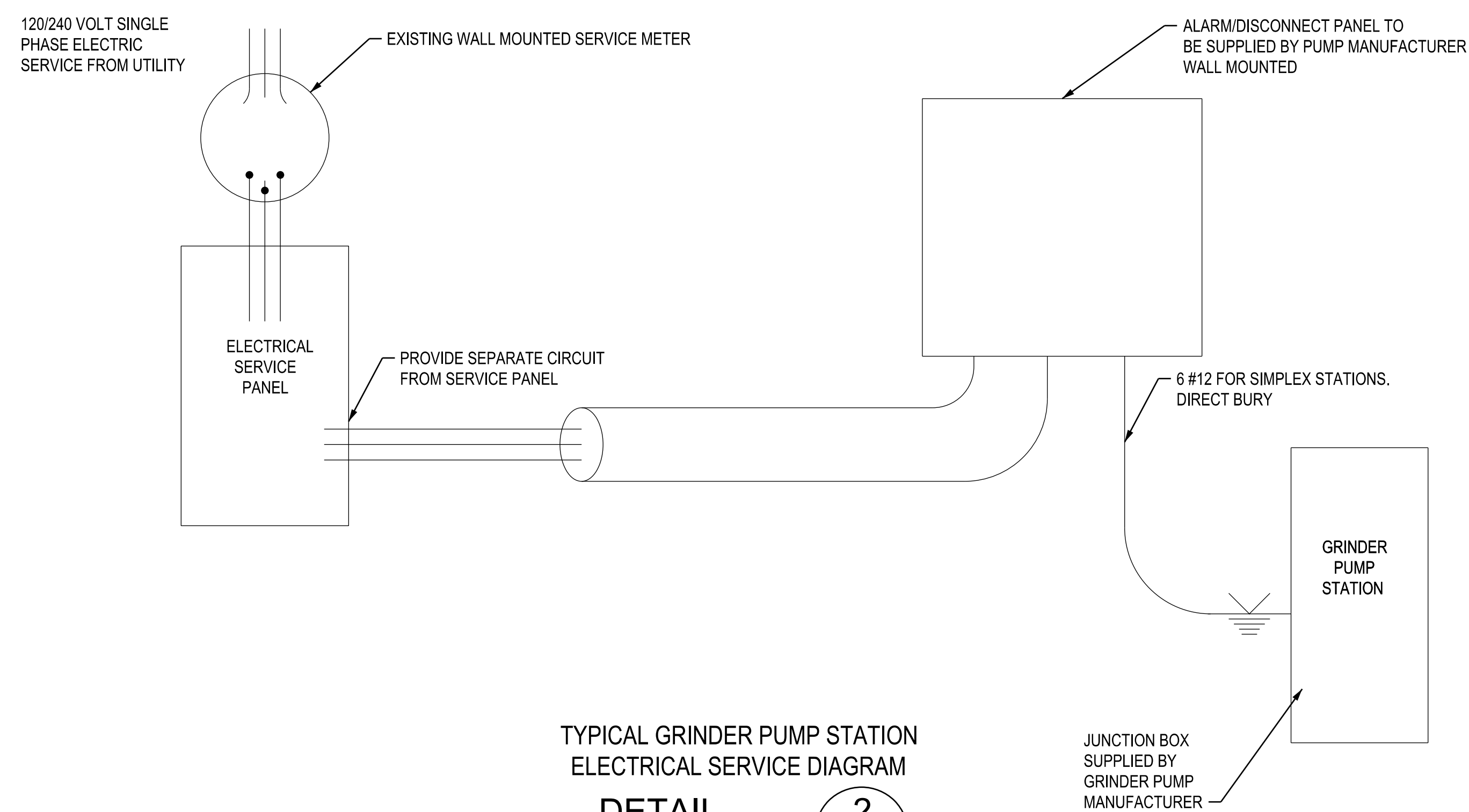
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8/29/2024



TYPICAL GRINDER PUMP INSTALLATION

DETAIL 1  
NOT TO SCALE x-xx



TYPICAL GRINDER PUMP STATION  
ELECTRICAL SERVICE DIAGRAM

DETAIL 2  
NOT TO SCALE x-xx