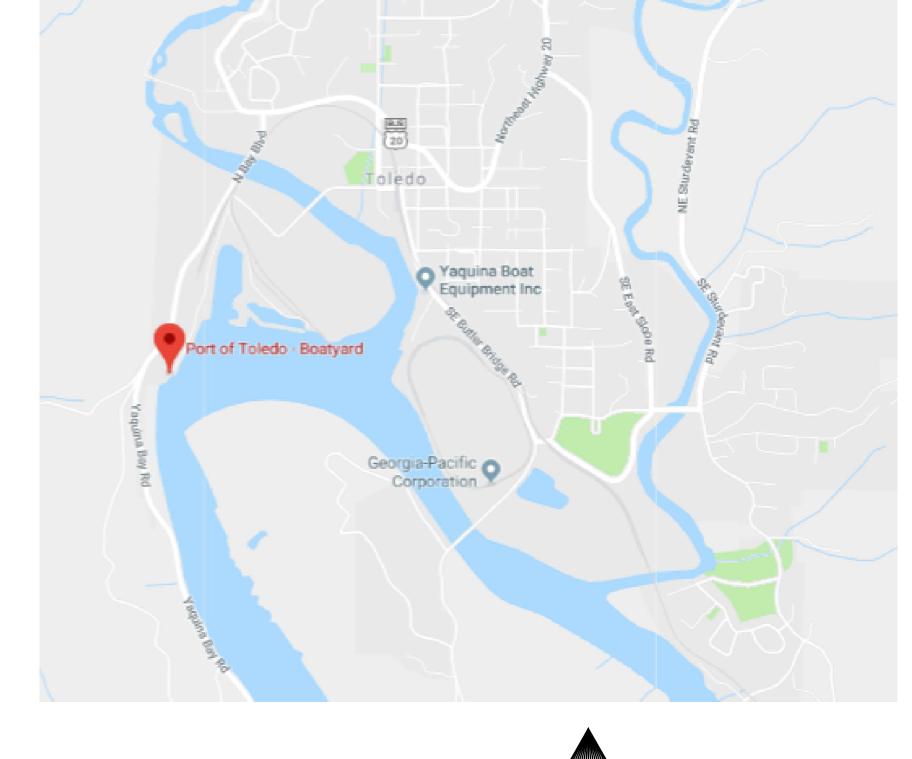
PORT OF TOLEDO BOATYARD

SCHEDULE 1: CORE SANITARY SEWER SYSTEM AND PUMP STATIONS

SCHEDULE 2: BOAT WASHDOWN WASTEWATER TREATMENT

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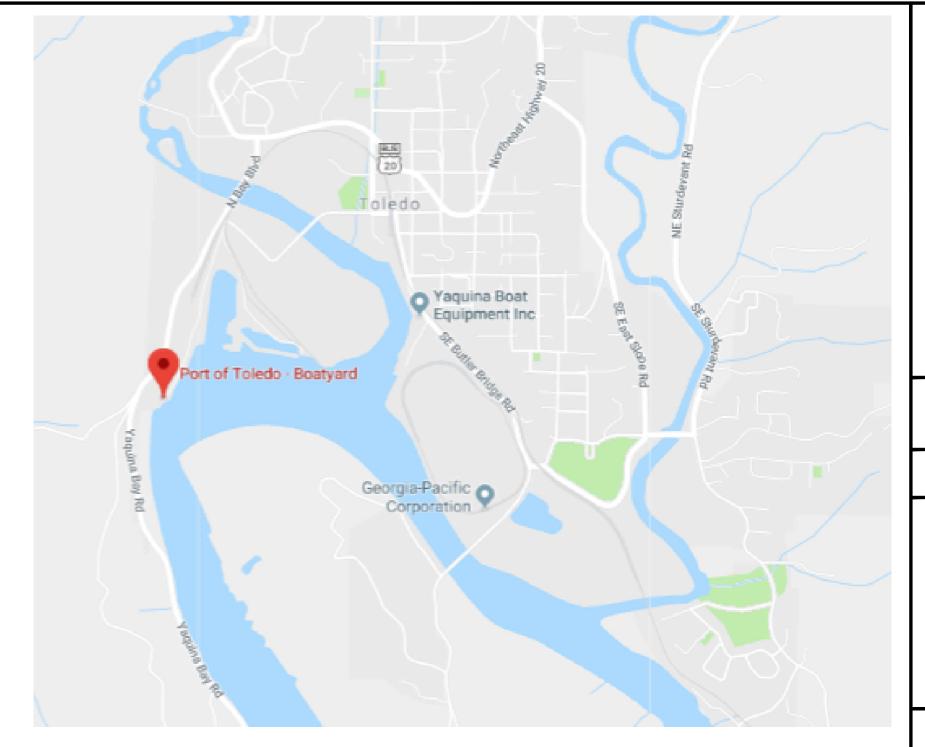
SCHEDULE 1: CORE SANITARY SEWER AND PUMP STATIONS

SEWER SYSTEM STANDARD GENERAL NOTES:

- 1. ALL SEWER LINES AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT EDITIONS OF THE CITY OF TOLEDO DESIGN AND CONSTRUCTION STANDARDS, ASCE STANDARDS, OREGON ADMINISTRATIVE RULES (OAR), AND THE OREGON PLUMBING SPECIALTY CODE (OPSC).
- 2. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE BASED ON AVAILABLE INFORMATION AND ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY DEPTH AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION; POTHOLE ALL EXISTING UTILITIES AS REQUIRED TO AVOID CONFLICTS WITH THE PROPOSED SEWER LINE; AND INFORM THE ENGINEER OF ANY DISCREPANCIES IN THE PLANS.
- 3. THE CONTRACTOR SHALL CALL THE OREGON UTILITY NOTIFICATION CENTER (811) AT LEAST 48 HOURS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE BEGINNING EXCAVATION. OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. COPIES OF THE RULES ARE AVAILABLE THROUGH THE NOTIFICATION CENTER. IF ADDITIONAL INFORMATION IS DESIRED, YOU MAY CONTACT THE WATER DEPARTMENT AT 541-336-2247.
- 4. THE CONTRACTOR SHALL NOTIFY THE PORT OF TOLEDO AT 541-336-5207 A MINIMUM 48 HOURS (TWO BUSINESS DAYS) PRIOR TO CONSTRUCTION. WEEKENDS AND HOLIDAYS ARE NOT TO BE COUNTED AS PART OF NOTIFICATION TIME.
- 5. ALL SEWER SERVICE LINES SHALL HAVE A MINIMUM COVER OVER THE TOP OF THE PIPE OF 30 INCHES ON IMPROVED ROADS AND 42 INCHES ON UNIMPROVED AREAS, UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIFICATIONS.
- 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE PROPER HORIZONTAL AND VERTICAL SEPARATION BETWEEN SANITARY SEWER LINES AND WATERLINES AS REQUIRED BY THE OREGON HEALTH AUTHORITY, PUBLIC HEALTH DIVISION, OAR 333-061-0050.
- 7. PRIOR TO BEING PLACED IN SERVICE, ALL SEWER LINES AND SERVICES SHALL BE LEAK TESTED. A REPRESENTATIVE MUST BE PRESENT DURING PRESSURE TESTING, FLUSHING AND DISINFECTION.
- 8. THE CONTRACTOR SHALL PROTECT ALL SEWER APPURTENANCES DURING CONSTRUCTION. ANY TESTED AND APPROVED SEWER SERVICE THAT IS DISTURBED PRIOR TO THE CITY'S FINAL ACCEPTANCE OF ALL PUBLIC IMPROVEMENTS SHALL BE REMOVED AND REPLACED AT THE DEVELOPER'S EXPENSE.

- 9. IN THE EVENT OF A CONFLICT OR CHANGE IN CONDITIONS, THE PORT OF TOLEDO RESERVES THE RIGHT TO MAKE FIELD ADJUSTMENTS TO THE LOCATION OF A SEWER LINE OR APPURTENANCE AS REQUIRED FOR CONSTRUCTION.
- 10. THE CONTRACTOR SHALL INSTALL AND MAINTAIN ALL REQUIRED EROSION CONTROL MEASURES IN ACCORDANCE WITH THE CURRENT EDITION OF DEQ "EROSION PREVENTION AND SEDIMENT CONTROL STANDARDS" AND CITY OF TOLEDO GRADING AND EROSION CONTROL PERMITS. COORDINATE EROSION CONTROL MEASURES WITH THE CITY OF TOLEDO INSPECTOR.
- 11. TRAFFIC CONTROL IN THE RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ODOT "MANUAL ON TRAFFIC PRACTICES HANDBOOK FOR LOCAL ROADS AND STREETS IN OREGON." DURING THE WORK DAY, ONE LANE OF TRAFFIC SHALL BE MAINTAINED AT ALL TIMES.
- 12. THE CONTRACTOR SHALL CONFINE PUBLIC IMPROVEMENT WORK TO THE DEDICATED RIGHT-OF-WAY AND UTILITY EASEMENT AREAS.
- 13. DURING CONSTRUCTION, THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL HAVE A MINIMUM OF ONE (1) SET OF ENGINEER APPROVED STAMPED PLANS AND SPECIFICATIONS ON THE JOB SITE AT ALL TIMES.

		PUMP DATA	A	
	PS-01	PS-02	PS-03	PS-04
Flow(GPM)	25	25	50	75
TDH in feet at Flow	40	20	40	20
Wet Well	BCPBPACKR8	BCPBPACKR8	RC-509	BCPBPACKR
	Xylem	Xylem	Old Castle	Xylem
Gould Pump	1GD51G4BA	1GD51G4DA	3SDX12H4HF	1GD51G4DA
FLYGT			NP 3069 SG 3 ADAPTIVE 276	
	Simplex	Simplex	Duplex	Simplex
Pump On (elevation)	7'	12'	8.67'	10'
Pump Off (elevation)	5'	10'	8.17'	8'
Alarm (elevation)	8'	13'	9.67'	11'



VICINITY MAP

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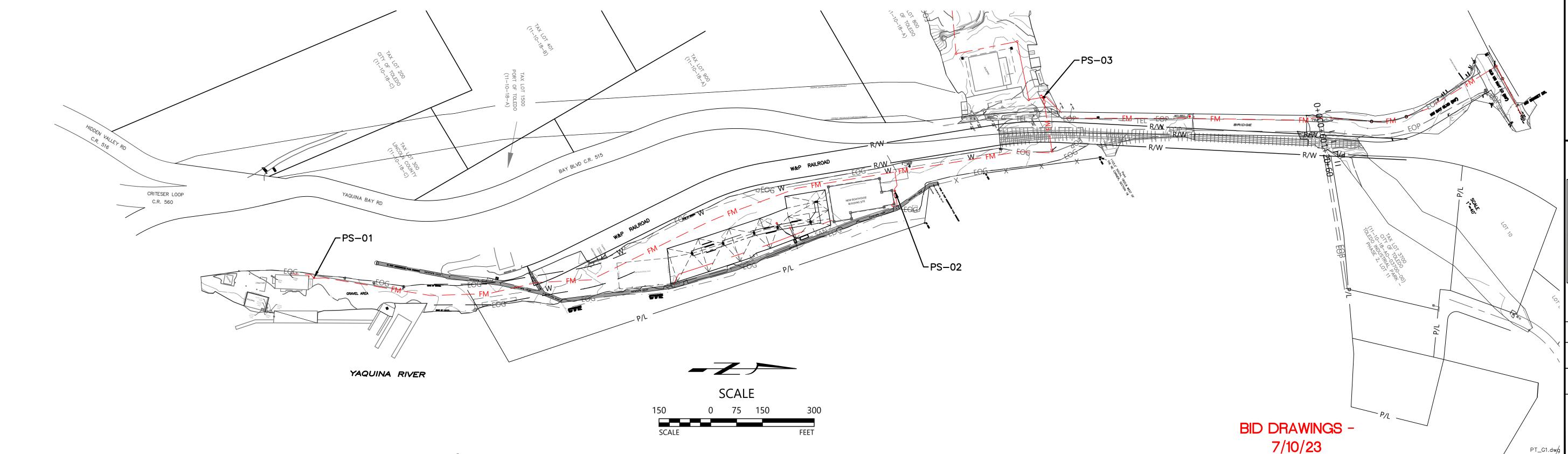
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GUIDELINES FOR DEVELOPMENT SANITARY SEWER DESIGN STANDARDS MANUAL

SECTION 4 – CONSTRUCTION PROVISIONS

4.1 ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE CONDUCTED BY A LICENSED AND BONDED CONTRACTOR. THIS REQUIREMENT SHALL BE STATED ON THE CONSTRUCTION DRAWINGS AND IN THE PROJECT SPECIFICATIONS.

4.2 CITY SHALL BE NOTIFIED AT LEAST 3 WORKING DAYS IN ADVANCE PRIOR TO COMMENCING CONSTRUCTION WORK EXCEPTION SHALL BE MADE FOR EMERGENCY REPAIRS.

4.3 TRAFFIC CONTROL SHALL BE SIGNED, FLAGGED AND CONDUCTED IN A MANNER CONFORMING TO ODOT STANDARDS (MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, MUTCD) AND APPROVED BY CITY. IF ROAD CLOSURES OR DETOURS ARE ANTICIPATED, PRIOR APPROVAL FROM CITY AND/OR ODOT, MUST BE OBTAINED, AS APPROPRIATE.

4.4 SAFETY REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR OBSERVING THE SAFETY OF THE WORK AND ALL PERSONS AND PROPERTY COMING INTO CONTACT WITH THE WORK. THE CONTRACTOR SHALL CONDUCT HIS WORK IN A MANNER COMPLYING WITH THE REQUIREMENTS PRESCRIBED BY OSHA.

4.5 PROGRESS. CONSTRUCTION SHALL PROCEED IN A SYSTEMATIC MANNER TO MINIMIZE PUBLIC INCONVENIENCE AND DISRUPTION OF SERVICES. ALL EXCAVATIONS, EMBANKMENTS, STOCKPILES, WASTE AREAS, ETC. SHALL BE KEPT PROTECTED. ALL ROADS, DITCHES, ETC. SHALL BE KEPT FREE FROM DEBRIS AND SHALL BE CONTINUALLY CLEANED DURING THE WORK. DUST CONTROL MEASURES SHALL BE EMPLOYED AS REQUIRED AND DIRECTED BY THE CITY.

4.6 PROTECTION OF EXISTING IMPROVEMENTS. CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER AT LEAST 48 HOURS IN ADVANCE OF DIGGING OPERATIONS TO GET APPROXIMATE LOCATIONS FOR BURIED UTILITIES. EXACT LOCATIONS OF BURIED FACILITIES MAY NOT BE KNOWN OR SHOWN AND CONTRACTOR IS RESPONSIBLE TO POT-HOLE CAREFULLY IN ADVANCE OF THE WORK TO AVOID SUCH FACILITIES. CONTRACTOR SHALL COORDINATE WITH ALL UTILITIES AND NOTIFY THEM IMMEDIATELY IN THE EVENT OF ANY DAMAGE. CONTRACTOR SHALL PROTECT, REPAIR, AND REPLACE ANY DAMAGED UTILITIES
AS DIRECTED BY THE PERSONS RESPONSIBLE FOR SUCH UTILITY. ALL LANDSCAPE, GRASS, SHRUBS, SIGNS, PAVEMENTS, MAIL BOXES, DRIVEWAYS, CULVERTS, GRAVEL SURFACING, FENCING, ETC. SHALL BE PROTECTED FROM DAMAGE AND RETURNED TO CONDITIONS AS GOOD, OR BETTER THAN EXISTED PRIOR TO CONSTRUCTION. ALL COSTS FOR PROTECTION, REPAIR, AND REPLACEMENT OF ALL EXISTING ITEMS SHALL BE BORNE ENTIRELY BY THE CONTRACTOR. CONTRACTOR SHALL OBTAIN A RELEASE FROM ANY PROPERTY OWNERS FOR ANY CLAIMS OF INJURY OR PROPERTY DAMAGE PRIOR TO FINAL ACCEPTANCE OF THE WORK

4.7 ALL EXISTING SURVEY MONUMENTS AND CONTROL SHALL BE PROTECTED, INCLUDING INDIVIDUAL PROPERTY CORNER STAKES. ANY SUCH MONUMENTS DESTROYED OR ALTERED DURING CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR OR DEVELOPER IN ACCORDANCE WITH ORS.

4.8 ANY TEMPORARY DISRUPTION TO WATER OR SEWER SERVICE MUST BE COORDINATED WITH, AND APPROVED BY THE CITY AND KEPT TO THE MINIMUM LENGTH OF TIME NECESSARY. CITY SHALL BE NOTIFIED AT LEAST 2 WORKING DAYS IN ADVANCE OF WHEN AN APPROVED SHUT-DOWN IS DESIRED AS NECESSARY TO MAKE TIE-INS.

4.9 TRENCH FOUNDATION GRADES SHALL BE CONSTRUCTED TO WITHIN 0.1 FEET OF THE GRADE SHOWN IN THE SURFACE TOLERANCES SHALL BE WITHIN 0.02 FEET OF PLAN ELEVATION AT ANY ONE POINT.

4.10 FOR PIPELINES, VERTICAL DEVIATION FROM TRUE GRADE SHALL NOT EXCEED 0.02 FEET (0.24 INCH). HORIZONTAL TOLERANCE FOR DEVIATION FROM LINE SHALL BE 0.03125 FEET (3/8 INCH). DEPRESSIONS OR BELLIES WHICH CREATE THE POTENTIAL FOR SOLIDS DEPOSITION ARE NOT ALLOWED.

4.11 COMPACTION TESTING EQUIPMENT (NUCLEAR GAUGE) SHALL BE FURNISHED AND OPERATED BY THE CONTRACTOR OR AN INDEPENDENT TESTING FIRM SHALL BE RETAINED BY THE CONTRACTOR OR DEVELOPER TO PERFORM COMPACTION TESTING. TESTING SHALL CONFORM TO THE ODOT MANUAL OF FIELD TESTING PROCEDURES (MFTP). COMPACTION TESTING SHALL BE CONDUCTED IN THE PRESENCE OF THE CITY'S INSPECTOR. SUFFICIENT TESTS WILL BE TAKEN TO ENSURE THAT THE MATERIALS AND COMPACTION EFFORTS BEING USED ARE ADEQUATE TO OBTAIN THE REQUIRED DENSITY. SEVERAL TESTS SHALL BE TAKEN ON EACH LIFT PLACED DURING THE FIRST DAY OF BACKFILL OPERATIONS. ADDITIONAL TESTS WILL BE TAKEN PERIODICALLY DURING THE WORK. AT MINIMUM, 2 COMPACTION TESTS SHALL BE TAKEN FOR EACH TRENCHLINE (MANHOLE TO MANHOLE). ALTERNATE MATERIALS OR METHODS WILL BE REQUIRED IF ADEQUATE COMPACTION IS NOT BEING OBTAINED. IN NO CASE SHALL PIPE LAYING CONTINUE IF INADEQUATE COMPACTION RESULTS UNTIL A RESOLUTION IS PROVIDED.

4.12 CONSTRUCTION STAKING WILL BE PROVIDED BY THE DEVELOPER'S ENGINEER FOR ESTABLISHING THE LOCATION OF THE SYSTEM. OFFSET STAKES SHALL BE PLACED AT NO MORE THAN 100 FOOT INTERVALS ALONG THE MAINLINE AT EACH MANHOLE. EACH LATERAL LOCATION SHALL BE STAKED.

4.13 OPEN TRENCH LENGTH AT ANY TIME SHALL NOT EXCEED 100 FEET UNLESS OTHERWISE APPROVED. RELATED RESURFACING SHALL BE COMPLETED WITHIN 800 FEET OF THE OPEN TRENCH LIMIT.

SECTION 5 – SANITARY SEWER SYSTEM MATERIALS

5.1 ALL MATERIALS SHALL BE MANUFACTURED IN THE USA AND BE NEWLY MANUFACTURED. NO REBUILT, RECONDITIONED OR USED MATERIAL WILL BE ALLOWED.

5.2 OREGON STANDARD SPECIFICATIONS (OSS) – MEANS THE 2002 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION PRODUCED BY ODOT AND APWA, INCLUDING LATEST REVISIONS.

5.3 CONCRETE SHALL CONFORM TO OSS SECTION 00440, COMMERCIAL GRADE CONCRETE. COMPRESSIVE FIELD STRENGTH SHALL NOT BE LESS THAN 3,000 PSI AT 28 DAYS. MAXIMUM AGGREGATE SIZE SHALL BE 1½-INCHES. SLUMP SHALL BE BETWEEN 2 AND 4 INCHES.

5.4 NON-SHRINK GROUT. GROUT SHALL BE SIKA 212, EUCO N-S, FIVE STAR, OR APPROVED EQUAL NONMETALLIC CEMENTITIOUS COMMERCIAL GROUT EXHIBITING ZERO SHRINKAGE PER ASTM C827. GROUT SHALL NOT BE AMENDED WITH CEMENT OR SAND AND SHALL NOT BE RECONDITIONED WITH WATER AFTER INITIAL MIXING. NONSHRINK GROUT SHALL BE PLACED AND PACKED ONLY WITH THE USE OF AN APPROVED COMMERCIAL BONDING AGENT. UNUSED GROUT SHALL BE DISCARDED AFTER 20 MINUTES.

5.5 MANHOLES SHALL CONFORM TO ASTM C478-03 WITH YARD PERMEABILITY TESTS PASSING ASTM C497-03 PRIOR TO DELIVERY. MANHOLE STEPS SHALL BE PLASTIC WITH ½" GRADE 60 STEEL REINFORCING BAR ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES. PREFORMED GASKETS SHALL BE RAM-NEK, KENT-SEAL NO. 2, OR APPROVED EQUAL.

5.6 TRENCH BACKFILL MATERIALS

5.6.1 FOUNDATION STABILIZATION: 3"-0 TO 6"-0 AGGREGATE BASE ROCK MEETING OSS SECTIONS 00641 AND 02630. REQUIRED WHEN NATIVE TRENCH FOUNDATION MATERIAL CONTAINS GROUNDWATER, OR IS UNSUITABLE TO PROVIDE A FIRM FOUNDATION IN THE OPINION OF THE PUBLIC WORKS DIRECTOR OR CITY REPRESENTATIVE.

5.6.2 PIPE BEDDING AND ZONE: 3/4"-0 DENSE-GRADED AGGREGATE, UNIFORMLY GRADED FROM COARSE TO FINE AND MEETING OSS SECTION 02630.10.

5.6.3 CLASS A BACKFILL: NATIVE OR COMMON EXCAVATED MATERIAL, FREE FROM ORGANIC OR OTHER DELETERIOUS MATERIAL, FREE FROM ROCK LARGER THAN 3-INCHES, AND WHICH MEETS THE CHARACTERISTICS REQUIRED FOR THE SPECIFIC SURFACE LOADING OR OTHER CRITERIA OF THE BACKFILL ZONE IN THE OPINION OF THE PUBLIC WORKS DIRECTOR OR CITY REPRESENTATIVE. IF STOCKPILED MATERIAL BECOMES SATURATED OR UNSUITABLE, CLASS B, C OR D BACKFILL SHALL BE SUBSTITUTED.

5.6.4 CLASS B BACKFILL: 3/4"-0 DENSE GRADED AGGREGATE, UNIFORMLY GRADED FROM COARSE TO FINE AND MEETING OSS SECTION 02630.10.

5.6.5 CLASS C BACKFILL: CLEAN SAND WITH NO PARTICLES LARGER THAN 1/4-INCH.

5.6.6 CLASS D BACKFILL: PIT RUN OR BAR RUN MATERIAL, WELL GRADED FROM COARSE TO FINE, WITH MAXIMUM AGGREGATE SIZE OF 3 INCHES.

5.6.7 CLASS E BACKFILL (CLSM): CONTROLLED LOW-STRENGTH MATERIAL (CEMENT SLURRY) CONFORMING TO OSS SECTION 00442.

5.6.8 COMPACTION: MATERIAL (EXCEPT CLASS E BACKFILL) SHALL BE COMPACTED IN MULTIPLE LIFTS (6-INCH MAXIMUM LIFT) TO OBTAIN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T-99.

5.6.9 ALL BACKFILL WITHIN PUBLIC RIGHT-OF-WAYS OR WITHIN 5 FEET OF A TRAVELED SURFACE SHALL BE CLASS B BACKFILL, EXCEPT WHERE CLASS E BACKFILL IS REQUIRED UNDER PAVEMENTS BY CITY OR STATE REQUIREMENTS.

5.7 SEWER PIPE MATERIALS

5.7.1 PVC GRAVITY PIPE, 4- THROUGH 15-INCH NOMINAL DIAMETER SHALL BE RUBBER GASKETED, SDR35 MINIMUM, CONFORMING TO ALL REQUIREMENTS OF ASTM D3034 IN ACCORDANCE WITH ASTM D1784. PIPE SHALL INCORPORATE INTEGRAL WALL-THICKENED BELLS WITH BONDED-IN ELASTOMERIC GASKETS MEETING ASTM F477.

5.7.2 PVC GRAVITY PIPE, 18- THROUGH 27-INCH NOMINAL DIAMETER SHALL BE RUBBER GASKETED, SDR35 MINIMUM, CONFORMING TO ALL REQUIREMENTS OF ASTM F679 IN ACCORDANCE WITH ASTM D1784. PIPE SHALL INCORPORATE INTEGRAL WALL-THICKENED BELLS WITH BONDED-IN ELASTOMERIC GASKETS MEETING ASTM F477. LARGER DIAMETER

PIPES TO BE APPROVED BY THE PUBLIC WORKS DIRECTOR OR CITY REPRESENTATIVE ON A CASE BY CASE BASIS

5.7.3 FORCE MAINS. PVC PIPE, 4- THROUGH 12-INCH NOMINAL DIAMETER SHALL BE RIGID PVC MADE FROM CLASS 12454-A OR B COMPOUNDS AS DEFINED IN ASTM D1784. PIPE SHALL BE CLASS 150 MEETING DR18, MINIMUM, CONFORMING TO ALL REQUIREMENTS OF AWWA C900. PIPE SHALL INCORPORATE INTEGRAL WALL-THICKENED BELLS WITH BONDED-IN ELASTOMERIC GASKETS MEETING ASTM F477.

5.7.4 DUCTILE IRON PIPE SHALL BE CLASS 50 MINIMUM THICKNESS (CLASS 51 FOR 14-INCH AND MANUFACTURED IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 UNDER METHOD OF DESIGN OUTLINED IN ANSI/AWWA C150/A21.50. PIPE INTERIOR SHALL HAVE A LINING SUITABLE FOR SEPTIC SEWER SERVICE SUCH AS PROTECTO 401 OR SIMILAR APPROVED LINING. EXTERNAL PIPE COATING SHALL BE AN ASPHALTIC COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51. USE ONLY WHERE APPROVED BY CITY.

5.7.5 SMALL DIAMETER PIPE FOR INDIVIDUAL GRINDER PUMPS SHALL BE CLASS 200 / SDR 21 PVC PIPE MEETING ASTM D2241, OR PE3408 HDPE / SIDR 7, IPS SIZE AS REQUIRED. PROPER PACK JOINTS AND STIFFENERS REQUIRED WITH HDPE PIPE.

5.8 FITTINGS

5.8.1 PVC FITTINGS FOR GRAVITY PIPE SHALL BE RUBBER GASKETED SEWER FITTINGS MEETING ASTM D3034, SDR 35, ASTM F477, AND ASTM D3212.

5.8.2 JOINTS FOR DUCTILE IRON PIPE AND C900 PIPE SHALL BE DUCTILE IRON MECHANICAL JOINT (FORCE MAINS) OR PUSH-ON TYPE (GRAVITY). FITTINGS SHALL CONFORM TO ANSI/AWWA C110/A21.10 STANDARD (FULL BODY) OR ANSI/AWWA C153/A21.53 (COMPACT), WITH 250 PSI MINIMUM WORKING PRESSURE RATING. ALL GRAY AND DUCTILE IRON FITTINGS SHALL BE LINED WITH A COATING SUITABLE FOR SEPTIC SEWER SERVICE SUCH AS PROTECTO 401 OR AS APPROVED. EXTERIOR OF FITTINGS SHALL HAVE AN ASPHALTIC COATING IN ACCORDANCE WITH ANSI/AWWA C110/A21.10. JOINTS AND GASKETS FOR FITTINGS SHALL CONFORM TO ANSI/AWWA C111/A21.11 STANDARD.

5.8.3 JOINT RESTRAINERS FOR MJ FITTINGS SHALL BE MEGALUG BY EBAA IRON, OR APPROVED EQUAL, SPECIFICALLY DESIGNED FOR THE TYPE OF PIPE MATERIAL USED.

5.8.4 SERVICE LATERALS SHALL BE MADE BY THE USE OF NEW PVC IN-LINE TEES WITH MANUFACTURED BENDS (WYES) TO THE MAIN.

5.8.4.1 CONNECTIONS TO THE PIPE SHALL BE MADE WITH GPK IN-LINE FITTINGS, GPK SADDLE WYES OR "INSERTA-TEE" AS MANUFACTURED BY FOWLER MANUFACTURING OR APPROVED EQUAL. INSTALLATION SHALL BE AS MANUFACTURES RECOMMENDATIONS. PVC TEE SADDLE MANUFACTURED IN ACCORDANCE WITH ASTM D3034 WITH NEOPRENE RUBBER GASKET SEAL AND ASTM F477 LATERAL PIPE SEAL GASKET. STAINLESS STEEL BANDS, SERIES 300, 9/16-INCH WIDE MINIMUM.

5.8.4.2 CAST DUCTILE IRON SADDLE WITH VIRGIN SBR RUBBER GASKET AND ADJUSTABLE 3½-INCH WIDE STAINLESS STEEL STRAP. ROMAC STYLE "CB" OR APPROVED NOT ALLOWED WITH PLASTIC SEWER PIPE EXCEPT C900.

5.8.4.3 WHERE EXISTING PIPE IS DAMAGED, INTERFERING JOINTS EXIST, OR OTHER CONDITIONS NECESSITATE, OR WHEN DIRECTED BY THE CITY, CUT IN A REGULAR PIPE WYE WITH PIPE SPOOLS AND FERNCO TYPE COUPLINGS.

5.8.4.4 ALL TAPS OR CONNECTIONS TO THE EXISTING MAIN SHALL BE MADE IN THE PRESENCE OF THE PUBLIC WORKS DIRECTOR OR CITY REPRESENTATIVE.

5.8.5 COUPLINGS FOR GRAVITY SEWER PIPING SHALL BE FLEXIBLE RUBBER TYPE WITH STAINLESS STEEL BANDS. FERNCO OR APPROVED EQUAL. USE ONLY WHERE APPROVED. ROTATE SO THAT 'SIZE' AND 'TYPE' INFORMATION IS TURNED UPWARD TO ALLOW FOR INSPECTION.

5.8.6 MANHOLE CONNECTIONS

5.8.6.1 CONNECTIONS TO PRECAST MANHOLE SECTIONS SHALL BE ACCURATELY CORE-DRILLED AND SHALL UTILIZE A PROPERLY SIZED FLEXIBLE RUBBER BOOT PROVIDING A WATERTIGHT SEAL. ADAPTER SHALL BE FACTORY TESTED FOR WATERTIGHTNESS UP TO 10.8 PSI. KOR-N-SEAL AS MANUFACTURED BY NPC, INC. OR APPROVED EQUAL.

5.8.6.2 CONNECTIONS TO CAST-IN-PLACE CONCRETE SHALL BE MADE WITH A RUBBER WATERSTOP GROUTING RING. RING SHALL CLAMP TO PIPE WITH STAINLESS STEEL CLAMP AND HAVE WATERSTOP RIBS. WATERSTOP GROUTING RING BY PRESS-SEAL GASKET CORP., OR APPROVED EQUAL.

5.9 MANHOLE FRAMES AND COVERS. CASTING SHALL BE TOUGH, CLOSE-GRAINED GRAY IRON, SMOOTH AND CLEAN, FREE FROM BLISTERS, BLOWHOLES AND ALL DEFECTS AND CONFORMING TO ASTM A48, CLASS 30. ALL BEARING SURFACES SHALL BE PLANED, GROUND OR MACHINED TO ENSURE FLAT, TRUE SURFACES. WATERTIGHT FRAMES AND COVERS SHALL BE INSTALLED AT ALL LOCATIONS SUBJECT TO FLOODING OR PONDING. TAMPERPROOF FRAMES AND COVERS REQUIRED IN OFF-STREET AREAS AND EASEMENTS. CAP SCREWS FOR BOLT-DOWN COVERS SHALL BE STAINLESS STEEL WITH 60,000 PSI MINIMUM TENSILE STRENGTH CONFORMING TO ASTM A453.

5.10 CLEANOUTS. CLEANOUTS SHALL BE CONSTRUCTED OF THE SAME PVC MATERIAL AS USED TO CONSTRUCT THE MAINLINE COLLECTION SYSTEM PIPING. CLEANOUT SIZE, FITTINGS, AND CLEANOUT COVERS SHALL BE AS SHOWN IN THE CITY'S STANDARD DETAIL DRAWINGS. CLEANOUTS SHALL NOT BE INSTALLED IN MAINLINE OR SUBSTITUTED FOR MANHOLES.

SECTION 6 – SANITARY SEWER PIPE INSTALLATION

6.1 PREPARE TRENCH IN ACCORDANCE WITH THE STANDARD DETAIL IN A SAFE MANNER. PLACE AND COMPACT FOUNDATION STABILIZATION MATERIALS AS REQUIRED. NOTIFY CITY TO ALLOW FOR INSPECTION OF THE TRENCH BOTTOM.

6.2 PLACE AND COMPACT PIPE BEDDING MATERIAL BEFORE PLACING PIPE IN THE TRENCH. DIG DEPRESSION FOR PIPE BELLS TO PROVIDE UNIFORM BEARING ALONG THE ENTIRE PIPE LENGTH. THOROUGHLY COMPACT BEDDING MATERIAL TO PREVENT FUTURE BELLIES.

6.3 PRIOR TO LOWERING PIPE INTO THE TRENCH, THE ENGINEER AND CITY REPRESENTATIVE WILL CHECK FOR DAMAGE TO THE PIPE. THE CONTRACTOR SHALL REPAIR OR REPLACE, AS DIRECTED, ALL DAMAGED OR FLAWED PIPE PRIOR TO INSTALLATION.

6.4 THOROUGHLY CLEAN INSIDE THE PIPE BEFORE LAYING. PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE

WHILE IT IS BEING PLACED IN THE TRENCH. REMOVE ALL FOREIGN MATERIAL FROM THE INSIDE OF THE PIPE AND JOINT BEFORE THE NEXT PIPE IS PLACED. KEEP DEBRIS, TOOLS, RAGS OR OTHER MATERIALS OUT OF THE PIPE AT ALL TIMES. WHEN PIPE LAYING IS NOT IN PROGRESS, COVER THE EXPOSED END OF THE PIPE USING A WATERTIGHT EXPANDING PLUG, OR BY OTHER APPROVED MEANS TO PREVENT ENTRY OF TRENCH WATER OR OTHER FOREIGN MATERIALS INTO THE PIPE.

6.5 LAY PIPE WITH BELL ENDS FACING THE DIRECTION OF LAYING. FOR LINES ON AN APPRECIABLE SLOPE, FACE BELLS UP-GRADE UNLESS OTHERWISE DIRECTED BY THE CITY. THOROUGHLY CLEAN THE ENDS OF THE PIPE TO REMOVE ALL FOREIGN MATTER FROM THE PIPE JOINT. LUBRICATE THE BELL AND SPIGOT ENDS WITH APPROVED PIPE LUBRICANT, AS RECOMMENDED BY THE MANUFACTURER.

6.6 PVC PIPE SHALL BE INSTALLED AND HANDLED IN ACCORDANCE WITH THE UNI-BELL PLASTIC PIPE ASSOCIATION STANDARDS UNI-B-3, THESE SPECIFICATIONS AND THE MANUFACTURER'S INSTALLATION THE CONTRACTOR SHALL HAVE ON SITE ALL PROPER TOOLS AND EQUIPMENT TO PROPERLY AND SAFELY INSTALL THE PIPE.

6.7 PLACE MATERIALS IN THE PIPE ZONE IN LAYERS NOT GREATER THAN 6 INCHES THICK AND IN A MANNER THAT EQUALIZES THE PRESSURE ON THE PIPE AND MINIMIZES STRESS. AS REQUIRED UNDER THE HAUNCHES OF PIPE AND AREAS NOT ACCESSIBLE TO MECHANICAL TAMPERS OR TO TESTING, COMPACT WITH HAND METHODS TO ENSURE THOROUGH CONTACT BETWEEN THE MATERIAL AND THE PIPE. BEFORE PLACING THE PIPE ZONE MATERIAL, CONDITION, AERATE, OR WET THE MATERIAL SO THAT THE MOISTURE CONTENT OF EACH LAYER IS WITHIN MINUS 4% TO PLUS 2% OF OPTIMUM MOISTURE CONTENT.

6.8 PROVIDE PROPER BACKFILL CLASS MATERIAL AS REQUIRED. BACKFILL THE TRENCH ABOVE THE PIPE ZONE IN SUCCESSIVE LIFTS. DO NOT ALLOW THE BACKFILL TO FREE-FALL INTO THE TRENCH UNTIL AT LEAST 3 FEET OF COVER IS PROVIDED OVER THE TOP OF THE PIPE. MODIFY THE COMPACTION AS NECESSARY TO PROTECT THE PIPE COMPACT EACH LIFT TO NOT LESS THAN 95% OF THE MAXIMUM DENSITY.

6.9 IF THE SPECIFIED COMPACTION IS NOT OBTAINED, CONTRACTOR SHALL REMOVE MATERIAL, MODIFY COMPACTION PROCEDURES, AND/OR REDUCE THE THICKNESS OF LIFTS AS REQUIRED. DO NOT PROCEED WITH ADDITIONAL EXCAVATION OR PIPE LAYING UNTIL THE BACKFILL CAN BE COMPACTED TO THE SATISFACTION OF THE CITY.

6.10 CLSM. WHEN CLSM BACKFILL IS REQUIRED, BACKFILL ABOVE PIPE ZONE WITH CLSM MATERIAL. IF THE CLSM IS TO BE USED AS A TEMPORARY SURFACING, BACKFILL TO TOP OF THE TRENCH AND STRIKE OFF TO PROVIDE A SMOOTH SURFACE. IF CLSM IS NOT TO BE USED AS A TEMPORARY SURFACE, BACKFILL TO BOTTOM OF THE PROPOSED RESURFACING. USE STEEL PLATES TO PROTECT THE CLSM FROM TRAFFIC A MINIMUM OF 24 HOURS.

6.11 PROVIDE CONCRETE THRUST BLOCKING AT ALL BENDS, VALVES, TEES AND OTHER FITTINGS IN ACCORDANCE WITH THE STANDARD DETAILS, AS REQUIRED TO PREVENT MOVEMENT DUE TO THRUST. MECHANICAL JOINT RESTRAINTS SHALL ALSO BE INSTALLED.

6.12 WHERE NEW WATER PIPE IS INSTALLED NEAR EXISTING OR NEW SANITARY SEWER LINES, ALL PROVISIONS OF CURRENT OAR 333-61-050 (CROSSINGS – SANITARY SEWERS AND WATERLINES), REGARDING PLACEMENT OF PIPE NEAR, UNDER, OR OVER SANITARY SEWER LINES SHALL BE FOLLOWED.

6.13 RESTORE ALL SURFACES AFTER BACKFILL IS COMPLETE. BASE ROCK, ASPHALT PAVING AND CONCRETE PAVING METHODS AND MATERIALS SHALL CONFORM TO OREGON STANDARD SPECIFICATIONS AS APPROVED BY THE CITY AND/OR ODOT, AS APPROPRIATE.

6.14 PRESSURE PIPE SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH CITY OF TOLEDO STANDARDS CONTAINED IN THIS MANUAL.

6.15 TOLERANCE. FOR GRAVITY PIPELINES, VERTICAL DEVIATION FROM TRUE GRADE SHALL NOT EXCEED 0.02 FEET (0.24 INCH). HORIZONTAL TOLERANCE FOR DEVIATION FROM LINE SHALL BE 0.03125 FEET (3/8 INCH). DEPRESSIONS OR BELLIES WHICH CREATE THE POTENTIAL FOR SOLIDS DEPOSITION ARE NOT ALLOWED. IF IDENTIFIED DURING THE APPROVAL PROCESS, BELLIES WILL BE CORRECTED BY THE APPLICANT OR THE APPLICANT'S CONTRACTOR.

6.16 TESTING. AFTER INSTALLATION, SEWER SYSTEM SHALL BE TESTED FOR EXFILTRATION ALLOWANCES AND DEFECTS ACCORDING TO THE FOLLOWING SECTIONS. ALL LINES SHALL ALSO BE VIDEO INSPECTED IN THE PRESENCE OF CITY REPRESENTATIVE AT OWNER/DEVELOPERS EXPENSE, FOR BELLIES AND DEFECTS. PRIOR TO ACCEPTANCE ALL PIPE SECTIONS INCLUDING LATERALS AND ALL MANHOLES SHALL PASS THE ACCEPTANCE CRITERIA. ALL ITEMS NOT PASSING TESTS SHALL BE REPAIRED OR REPLACED AS REQUIRED.

NO. DATE REVISIONS

BOATYARD - SANITA SEWER PROJECT

TOLEDO

CT SITE:

WE HWY 20, UNIT 1,

PROJECT SITES 496 NE HWY





DATE
7/25/2022

SCALE: PROJ. NO.:

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GUIDELINES FOR DEVELOPMENT SANITARY SEWER DESIGN STANDARDS MANUAL

SECTION 7 – LOW-PRESSURE AIR TESTING OF GRAVITY SEWERS (PER UNI-B-6-98 / ASTM F1417)

7.1 THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT, MATERIALS AND PERSONNEL REQUIRED FOR PROPERLY CONDUCTING ALL REQUIRED LOW-PRESSURE AIR TESTING UNDER OBSERVATION OF THE ENGINEER. PRESSURE GAUGE SHALL HAVE 0.10 PSI INCREMENTS AND AN ACCURACY OF 0.0625-PSI. TESTING EQUIPMENT MUST INCLUDE A PRESSURE RELIEF DEVICE DESIGNED TO RELIEVE PRESSURE AT A MAXIMUM OF 9 PSI AND MUST ALLOW CONTINUOUS MONITORING OF THE TEST PRESSURE TO AVOID EXCESSIVE PRESSURE. ALL AIR USED SHALL PASS THROUGH A SINGLE CONTROL VALVE. ONLY QUALIFIED PERSONNEL SHALL BE PERMITTED TO CONDUCT THE TEST. THE TIME PRESSURE DROP METHOD SHALL BE USED.

7.2 TESTING SHALL BE DONE IN THE PRESENCE OF A CITY REPRESENTATIVE. TESTING SHALL BE CONDUCTED AFTER BACKFILLING AND COMPACTION HAS BEEN COMPLETED TO FINISH GRADE. NOTIFY CITY AT LEAST 2 WORKING DAYS IN ADVANCE.

7.3 INITIAL TEST – A TEST SHALL BE CONDUCTED ON THE FIRST SECTION OF PIPE LAID BY EACH CREW TO ESTABLISH THAT THE PIPELINE INSTALLATION IS CAPABLE OF PREVENTING EXCESSIVE INFILTRATION. THE SECTION OF PIPELINE TESTED SHALL BE AT LEAST 300 FEET IN LENGTH. IF THE TEST INDICATES EXFILTRATION EXCEEDING THE AMOUNT HEREINAFTER SPECIFIED, ALL DEFECTIVE MATERIALS AND/OR WORKMANSHIP SHALL BE CORRECTED AND THE TEST RERUN UNTIL LEAKAGE IS WITHIN THE SPECIFIED LIMITS.

7.4 IF, IN THE OPINION OF THE CITY, THE WATERTIGHTNESS OF THE PIPE IS IN QUESTION DURING INSTALLATION, THE CITY MAY REQUIRE THE CONTRACTOR TO TEST THE PIPE SECTIONS IN QUESTION. SUCH TESTING SHALL NOT BE CONSIDERED ADEQUATE FOR FINAL PIPE TESTING, PERFORMED AFTER THE PIPE IS INSTALLED, BACKFILLED, COMPACTED AND CLEANED. THEREAFTER ALL SEWER PIPE SHALL BE TESTED AS PROVIDED HEREIN.

7.5 THE CONTRACTOR MAY DESIRE TO MAKE AIR TESTS PRIOR TO COMPLETE BACKFILLING, FOR HIS OWN PURPOSES; HOWEVER, ACCEPTANCE AIR TEST SHALL BE MADE ONLY AFTER INSTALLATION OF ALL LATERALS AND BACKFILLING HAS BEEN COMPLETED AND COMPACTED. IT IS RECOMMENDED THAT TESTING BE COMPLETED AND ACCEPTED PRIOR TO PAVING IN THE EVENT THAT SOME PIPING MAY REQUIRE EXCAVATION FOR REPAIR OF DEFICIENCIES.

7.6 IT IS EXTREMELY IMPORTANT THAT ALL PLUGS, INCLUDING END OF SERVICE LATERALS, BE INSTALLED AND BRACED SUCH THAT BLOWOUTS ARE PREVENTED (EX. 250 LBS FORCE IS EXERTED ON AN 8" PLUG AT 5 PSIG). EXERCISE CARE TO PREVENT EXCESSIVE PRESSURES. KEEP WORKERS OUT OF MANHOLES UNTIL PRESSURE IS RELEASED.

7.7 TESTING PROCEDURE

7.7.1 IMMEDIATELY FOLLOWING PIPE CLEANING, THE PIPE INSTALLATION SHALL BE TESTED WITH LOW PRESSURE AIR. EACH PIPE SECTION BETWEEN MANHOLES SHALL BE TESTED. SERVICE LATERALS FROM THE MAIN TO THE PROPERTY LINE SHALL BE INCLUDED IN THE TEST.

7.7.2 CHECK THE AVERAGE HEIGHT OF GROUND WATER OVER THE PIPE INVERT. THE TEST PRESSURE REQUIRED BELOW SHALL BE INCREASED 0.433 PSI FOR EACH FOOT OF AVERAGE WATER DEPTH OVER THE PIPE (EX. IF GROUNDWATER IS 2.8 FEET ABOVE PIPE INVERT, ADD 1.2 PSIG TO TEST PRESSURES). METHOD USED TO DETERMINE GROUNDWATER DEPTH SHALL BE ACCEPTABLE TO THE CITY (PIEZOMETER, EXCAVATION, OR OTHERS).

SECTION 7 – LOW-PRESSURE AIR TESTING OF GRAVITY SEWERS (PER UNI-B-6-98 / ASTM F1417)

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7.4 IF, IN THE OPINION OF THE CITY, THE WATERTIGHTNESS OF THE PIPE IS IN QUESTION DURING INSTALLATION, THE CITY MAY REQUIRE THE CONTRACTOR TO TEST THE PIPE SECTIONS IN QUESTION. SUCH TESTING SHALL NOT BE CONSIDERED ADEQUATE FOR FINAL PIPE TESTING, PERFORMED AFTER THE PIPE IS INSTALLED, BACKFILLED, COMPACTED AND CLEANED. THEREAFTER ALL SEWER PIPE SHALL BE TESTED AS PROVIDED HEREIN.

7.5 THE CONTRACTOR MAY DESIRE TO MAKE AIR TESTS PRIOR TO COMPLETE BACKFILLING, FOR HIS OWN PURPOSES; HOWEVER, ACCEPTANCE AIR TEST SHALL BE MADE ONLY AFTER INSTALLATION OF ALL LATERALS AND BACKFILLING HAS BEEN COMPLETED AND COMPACTED. IT IS RECOMMENDED THAT TESTING BE COMPLETED AND ACCEPTED PRIOR TO PAVING IN THE EVENT THAT SOME PIPING MAY REQUIRE EXCAVATION FOR REPAIR OF DEFICIENCIES.

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7.7.3 AIR SHALL BE SLOWLY SUPPLIED TO THE PLUGGED PIPE UNTIL INTERNAL AIR PRESSURE REACHES 4.0 PSI GREATER THAN THE AVERAGE BACK PRESSURE OF ANY GROUND WATER THAT MAY SUBMERGE THE PIPE. DO NOT EXCEED A TOTAL PRESSURE OF 9.0 PSIG.

7.7.4 AFTER THE INTERNAL TEST PRESSURE IS REACHED, AT LEAST TWO MINUTES SHALL BE ALLOWED FOR THE AIR TEMPERATURE TO STABILIZE. AFTER THE STABILIZATION PERIOD, DISCONNECT THE AIR SUPPLY.

7.7.5 THE CONTINUOUS MONITORING PRESSURE GAUGE SHALL THEN BE OBSERVED WHILE THE PRESSURE IS DECREASED TO NO LESS THAN 3.5 PSIG (GREATER THAN AVERAGE BACKPRESSURE OF ANY GROUNDWATER OVER THE PIPE). AT A READING OF 3.5 PSIG, OR ANY CONVENIENT PRESSURE BETWEEN 3.5 PSIG AND 4.0 PSIG (ABOVE GROUNDWATER PRESSURE), TIMING SHALL COMMENCE WITH AN ACCURATE STOPWATCH.

7.7.6 ACCEPTANCE - THE TESTED SECTION SHALL BE CONSIDERED ACCEPTABLE IF THE REQUIRED TESTING TIME HAS ELAPSED BEFORE A 1.0 PSIG PRESSURE DROP HAS OCCURRED. IF THE PRESSURE DROPS 1.0 PSIG BEFORE THE MINIMUM LENGTH OF TIME HAS ELAPSED, THE AIR LOSS RATE IS CONSIDERED EXCESSIVE AND THE SECTION OF PIPE HAS FAILED THE TEST.

7.7.7 ACCEPTANCE CRITERIA IS BASED ON AN ALLOWABLE AIR LOSS OF Q=0.0015 CFM PER FT 2 OF INTERNAL PIPE SURFACE AREA LESS THAN 625 FT^2 THIS RESULTS IN A TOTAL ALLOWABLE LOSS OF 625Q = 0.94 CFM. THE

SHORTEST TIME (T), IN SECONDS, ALLOWED FOR THE AIR PRESSURE TO DROP 1.0 PSIG IS CALCULATED WITH THE FOLLOWING FORMULA:

T = 0.085 (DK/0.0015)

K = 0.000419DL BUT NOT LESS THAN 1.0, D = PIPE I.D. IN INCHES, AND L = LENGTH OF

PIPE TESTED IN FEET.

7.7.8 CONTRACTOR SHALL RECORD AND DOCUMENT THE TESTING PROCEDURE AND RESULTS DURING THE TESTING PROCESS. THE UNI-BELL "AIR TEST DATA SHEET" OR SIMILAR APPROVED EQUAL SHALL BE USED AND SUBMITTED TO THE ENGINEER. RECORD THE DIAMETER (IN), LENGTH START AND END MANHOLE NUMBERS, TIME, DATE, PRESSURE DROP, AND GROUNDWATER LEVEL ON INSPECTION FORM. SUBMIT TO CITY.

Minimum Specified Time Required for 1.0 PSIG Pressure Drop

Pipe	T _{min}	L for	T for	Specification Time for Length (L) Shown (min:sec)							
ø (in)	(min:sec)	T _{min} (ft)	longer L (sec)	100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	.380L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:3
27	25:30	88	17.306L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:4
30	28:20	80	21.366L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:1

7.7.9 SERVICE LATERALS SHALL BE INCLUDED IN TEST. HOWEVER THE LENGTH OF SERVICE LATERALS MAY BE IGNORED AND THE LENGTH OF MAIN LINE ONLY USED IN THE ABOVE TABLE. IF DESIRED, LENGTH OF SERVICE LATERALS INCLUDED IN TEST SECTION MAY BE INCLUDED IN THE CALCULATION BY FOLLOWING THE METHOD OUTLINED IN UNI-B-6-98 SECTION 9.4.

SECTION 8 – HYDROSTATIC TESTING OF PIPE

8.1 CONTRACTOR SHALL PROVIDE ALL HOSE, TEMPORARY PIPING, APPROVED PIPE PLUGS, TANK TRUCKS, AND OTHER EQUIPMENT, LABOR AND MATERIAL REQUIRED TO MAKE THE HYDROSTATIC TESTS, AND SHALL PAY FOR THE WATER USED, UNLESS OTHERWISE APPROVED BY THE CITY. TESTING OF THE PIPE SHALL BE CONDUCTED IN THE PRESENCE OF A CITY REPRESENTATIVE. TESTING SHALL BE CONDUCTED AFTER BACKFILLING AND COMPACTION HAS BEEN COMPLETED TO FINISH GRADE. NOTIFY CITY AT LEAST 2 WORKING DAYS IN ADVANCE.

8.2 PRIOR TO MAKING EXFILTRATION LEAKAGE TESTS, CONTRACTOR MAY FILL THE PIPE WITH CLEAR WATER TO PERMIT NORMAL ABSORPTION INTO THE PIPE WALLS; PROVIDED HOWEVER, THAT AFTER FILLING THE PIPE, LEAKAGE TESTING SHALL BE COMPLETED WITHIN TWENTY-FOUR (24) HOURS AFTER FILLING. WHEN UNDER TEST, ALLOWABLE LEAKAGE SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS: LEAKAGE SHALL NOT EXCEED 0.04 GALLONS PER HOUR PER INCH DIAMETER PER ONE HUNDRED (L00) FEET OF SANITARY SEWER PIPE, WITH A MINIMUM TEST PRESSURE OF SIX (6) FEET OF WATER COLUMN ABOVE THE HIGHEST SECTION OF PIPE (INCLUDING SERVICE LATERALS), OR ABOVE THE ACTIVE GROUND WATER TABLE, WHICHEVER IS HIGHER AS DETERMINED BY THE CITY. THE LENGTH OF PIPE TESTED

SHALL BE LIMITED SO THAT THE PRESSURE ON THE INVERT OF THE LOWER END OF THE SECTION TESTED SHALL NOT EXCEED 28 FEET OF WATER COLUMN, AND IN NO CASE SHALL BE GREATER THAN 500 FEET. ALL SERVICE CONNECTION FOOTAGE SHALL BE TAKEN INTO ACCOUNT IN COMPUTING ALLOWABLE LEAKAGE. TEST DURATION SHALL BE AT LEAST 2 HOURS. METHODS OF IMPOSING THE WATER COLUMN AND MEASURING THE WATER LOSS SHALL BE ACCEPTABLE TO THE CITY.

SECTION 9 – VACUUM TESTING OF MANHOLES (PER ASTM C1244)

9.1 PRECAST CONCRETE MANHOLES SHALL BE TESTED IN ACCORDANCE WITH THE FOLLOWING PROCEDURE. MANHOLE INSTALLATIONS WHICH FAIL THE TESTING SHALL BE REPAIRED OR REPLACED UNTIL PASSING RESULTS ARE OBTAINED. IF FLEXIBLE JOINT SEALANT IS PULLED OUT DURING TESTING, IT SHALL BE REPAIRED.

9.2 TESTING SHALL BE DONE IN THE PRESENCE OF A CITY REPRESENTATIVE. NOTIFY CITY AT LEAST 2 WORKING DAYS IN ADVANCE. USE REPORT FORM APPROVED BY CITY.

9.3 ALL MANHOLES SHALL BE TESTED FOR ACCEPTANCE AFTER THE TRENCH HAS BEEN BACKFILLED, COMPACTION REQUIREMENTS HAVE BEEN MET, ROAD BASE ROCK HAS BEEN INSTALLED, PAVING IS COMPLETE, AND CONCRETE MANHOLE COLLARS HAVE BEEN INSTALLED. IF MANHOLE HAS PASSED TEST AND THE CASTINGS HAVE LATER BEEN DISTURBED, MANHOLE SHALL BE RE-TESTED.

9.4 THOROUGHLY CLEAN ALL MANHOLES PRIOR TO TESTING. REMOVE ALL DEBRIS AND DO NOT ALLOW FOREIGN MATERIAL TO ENTER DOWNSTREAM PIPING.

9.5 CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT AND PERSONNEL TO CONDUCT THE TESTING, INCLUDING VACUUM EQUIPMENT AND INDICATING DEVICES.

9.6 PROCEDURE

9.6.1 PLUG ALL PIPES ENTERING MANHOLE. SECURE ALL PLUGS TO PREVENT MOVEMENT WHILE VACUUM IS BEING DRAWN.

9.6.2 TESTING SHALL INCLUDE THE JOINT BETWEEN THE MANHOLE CONE OR RISER RING(S) AND THE MANHOLE COVER FRAME.

9.6.3 INSTALLATION AND OPERATION OF VACUUM EQUIPMENT AND INDICATING DEVICES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.

9.6.4 WITHDRAW AIR FROM THE MANHOLE UNTIL A MEASURED VACUUM OF 10-INCHES OF MERCURY (10" HG = 4.9 PSI) IS ESTABLISHED IN THE MANHOLE INTERIOR.

9.6.5 RECORD THE TIME IT TAKES FOR THE VACUUM TO DROP TO 9-INCHES OF MERCURY (9" HG = 4.4 PSI). ACCEPTANCE STANDARDS ARE BASED ON THIS 1-INCH OF MERCURY CHANGE IN NEGATIVE PRESSURE. TIME MEASURED FOR THE 1" HG (1" HG = 0.5 PSI) PRESSURE CHANGE SHALL BE EQUAL TO OR GREATER THAN THE VALUES IN THE FOLLOWING TABLE:

VACUUM TESTING REQUIREMENTS (MINIMUM TEST TIMES, SECONDS)

Manhole	Manhole Diameter (in)						
Depth (ft)	42"	48"	54"	60*	72"		
8' or less	17	20	23	26	33		
10	21	25	29	33	41		
12	25	30	35	39	49		
14	30	35	41	46	57		
16	34	40	46	52	67		
18	38	45	52	59	73		
20	42	50	53	65	81		
22	46	55	64	72	89		

9.6.6 HYDROSTATIC TESTING OF MANHOLES MAY BE ALLOWED. TEST SHALL BE IN ACCORDANCE WITH ASTM C497 AS MODIFIED HERE. TEST WILL CONSIST OF PLUGGING ALL INLETS AND OUTLETS AND FILLING THE MANHOLE WITH WATER TO THE RIM. LEAKAGE IN EACH MANHOLE SHALL NOT EXCEED 0.2 GALLONS PER HOUR PER FOOT OF HEAD ABOVE THE INVERT. LEAKAGE WILL BE DETERMINED BY REFILLING TO THE RIM USING A CALIBRATED OR KNOWN VOLUME CONTAINER. TESTING DURATION SHALL BE AT LEAST 2 HOURS. TESTING RESULTS SHALL BE RECORDED ON A FORM APPROVED BY THE CITY.

SECTION 10 – DEFLECTION TESTING FOR FLEXIBLE PIPE

10.1 IN ADDITION TO AIR OR HYDROSTATIC TESTING, THE CONTRACTOR SHALL CONDUCT DEFLECTION TESTS OF SANITARY SEWERS CONSTRUCTED OF FLEXIBLE PIPE. TESTING WILL CONSIST OF PULLING AN APPROVED MANDREL THROUGH THE COMPLETED PIPELINE AFTER BACKFILL AND COMPACTION TO FINISH GRADE IS BE CONDUCTED IN THE PRESENCE OF A CITY REPRESENTATIVE.

10.2 DIAMETER OF THE MANDREL SHALL BE AT LEAST 95% OF THE PIPE INTERNAL DIAMETER. MANDREL SHALL HAVE AT LEAST 6 VANES.

10.3 TESTING SHALL BE DONE FROM MANHOLE TO MANHOLE. PIPE SHALL BE THOROUGHLY CLEANED AND FLUSHED PRIOR TO PULLING THE MANDREL. MANDREL SHALL PASS SMOOTHLY THROUGH THE PIPE WITHOUT EXCESSIVE EFFORT.

10.4 TESTING SHALL BE CONDUCTED ONLY AFTER AT LEAST 30 DAYS HAVE ELAPSED AFTER BACKFILL AND COMPACTION WAS COMPLETED. MAY BE CONDUCTED CONCURRENTLY WITH VIDEO INSPECTION

SECTION 11 – VIDEO INSPECTION OF GRAVITY SYSTEMS

11.1 ALL GRAVITY SEWER LINES CONSTRUCTED AS PART OF THE PROJECT SHALL BE TELEVISED AND TAPED AT THE END OF CONSTRUCTION PRIOR TO ACCEPTANCE. TAPING SHALL BE CONDUCTED AFTER ALL BACKFILL AND COMPACTION, BUT PRIOR TO FINAL SURFACE RESTORATION. ALL PIPES SHALL BE THOROUGHLY FLUSHED BY THE CONTRACTOR IMMEDIATELY PRIOR TO THE VIDEO INSPECTION. THE VIDEO SHALL BE RECORDED IN COLOR ON VHS OR DVD FORMAT (PREFERABLE). SUFFICIENT LIGHT SHALL BE PROVIDED TO SHOW DETAIL. CAMERA SPEED SHALL NOT EXCEED 3 FEET PER SECOND. CAMERA SHALL HAVE A SWIVEL (PAN AND TILT) HEAD CAPABLE OF LOOKING UP EACH SERVICE CONNECTION. A COPY OF THE VIDEO TAPE AND A WRITTEN TV INSPECTION REPORT SHALL BE FURNISHED TO THE CITY. ANY SECTIONS OF SEWER PIPE NOT MEETING SPECIFICATIONS OR EXHIBITING DEFECTS SHALL, AT THE

CONTRACTOR'S EXPENSE, BE CORRECTED TO MEET SPECIFICATION. REPAIRED SECTIONS SHALL BE RE-TELEVISED ALL REPAIRS MUST BE COMPLETED BEFORE ACCEPTANCE OF THE PROJECT.

11.2 THE SANITARY SEWER LINES CONSTRUCTED AS PART OF THE PROJECT WILL ALSO BE VIDEO INSPECTED NEAR THE END (11TH MONTH) OF THE ONE-YEAR OR TWO-YEAR WARRANTY PERIOD AS APPROPRIATE TO DETERMINE IF ANY DEFECTS EXIST IN THE SYSTEM. THE WARRANTY VIDEO INSPECTION WILL BE CONDUCTED DURING A SEASON OF HIGH GROUNDWATER AS CLOSE TO THE END OF THE WARRANTY PERIOD AS POSSIBLE. THE WARRANTY PERIOD WILL CONTINUE TO BE IN EFFECT, REGARDLESS OF DURATION, UNTIL ALL VIDEO RECORDINGS ARE RECEIVED AND APPROVED. ALL DEFECTS IN THE SYSTEM WILL BE CORRECTED AT THE DEVELOPER'S OR CONTRACTOR'S EXPENSE.

11.3 VIDEO INSPECTION AND TAPING COSTS WILL BE BORNE BY THE CONTRACTOR OR APPLICANT UNLESS OTHERWISE APPROVED.

11.4 ALL VIDEO INSPECTION AND TAPPING SHALL BE CONDUCTED IN THE PRESENCE OF A CITY REPRESENTATIVE

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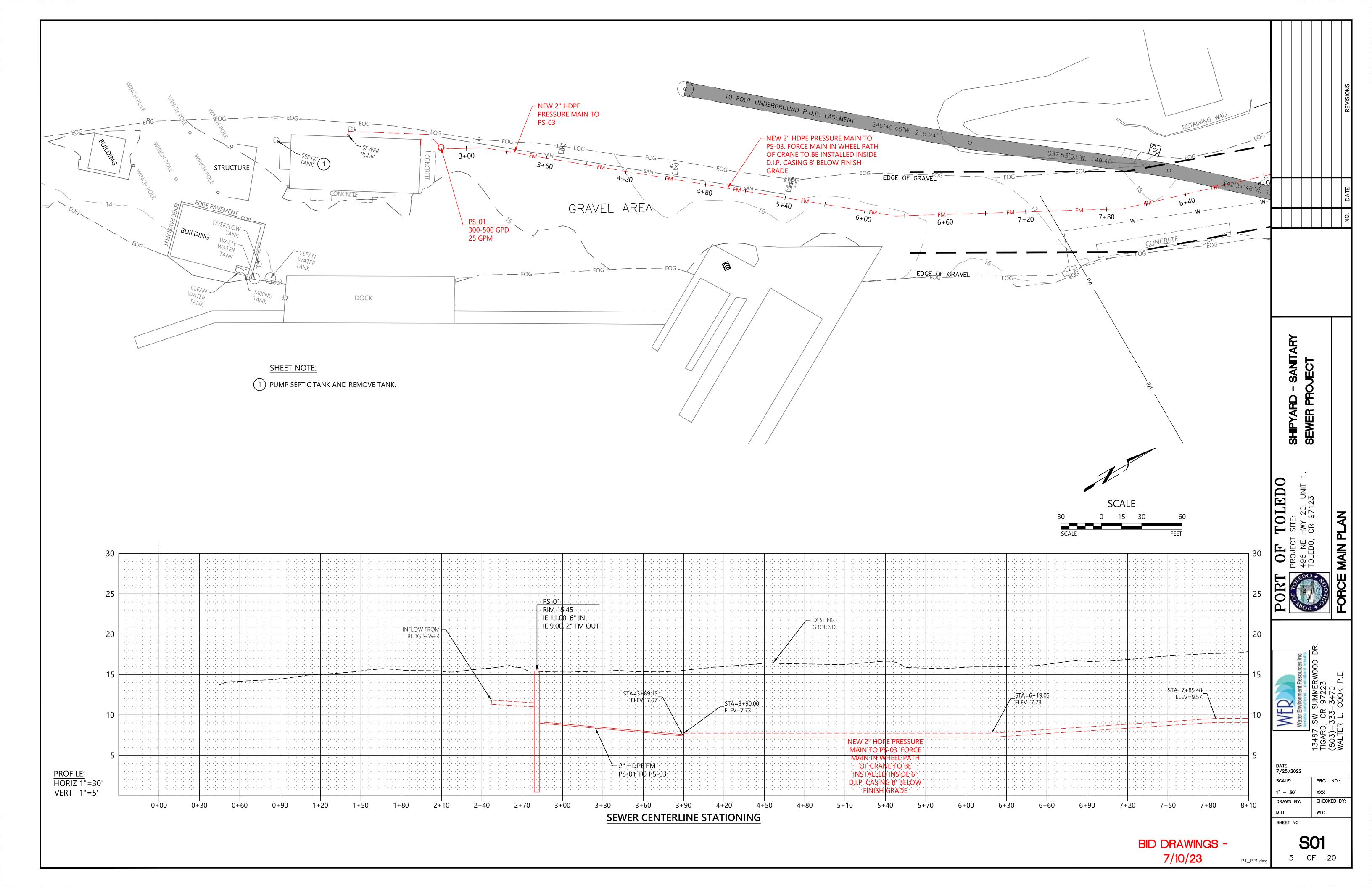


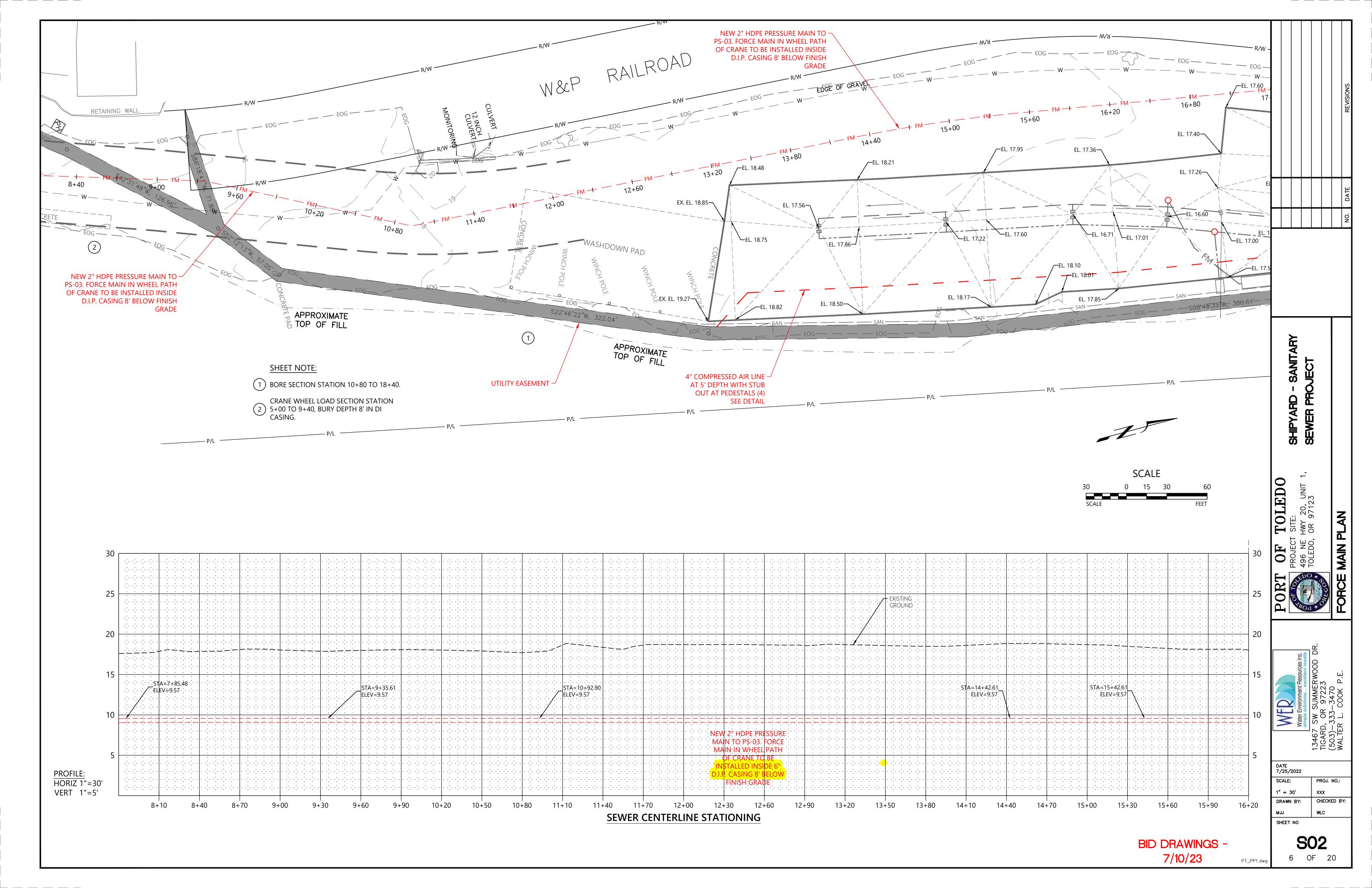


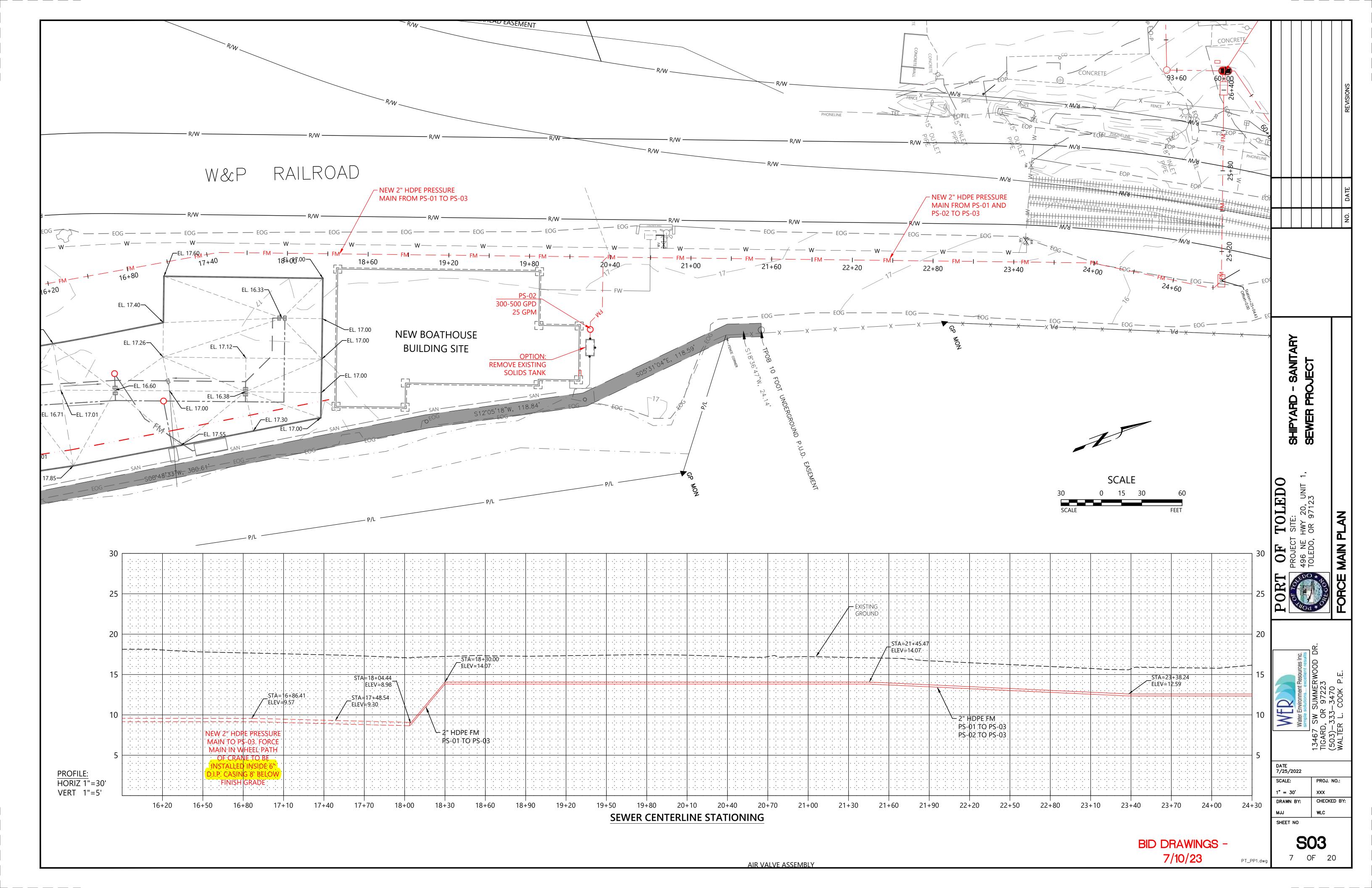
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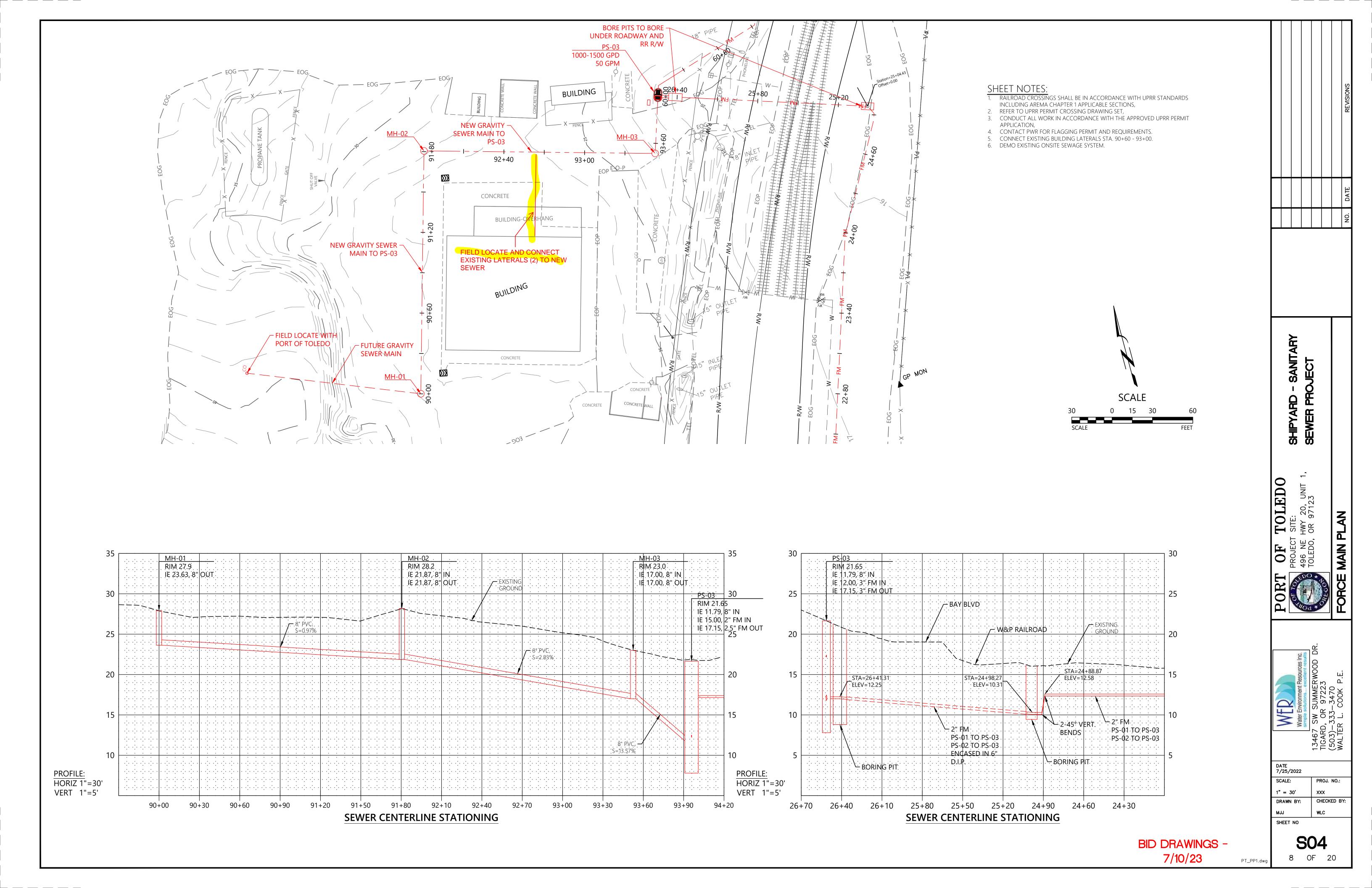
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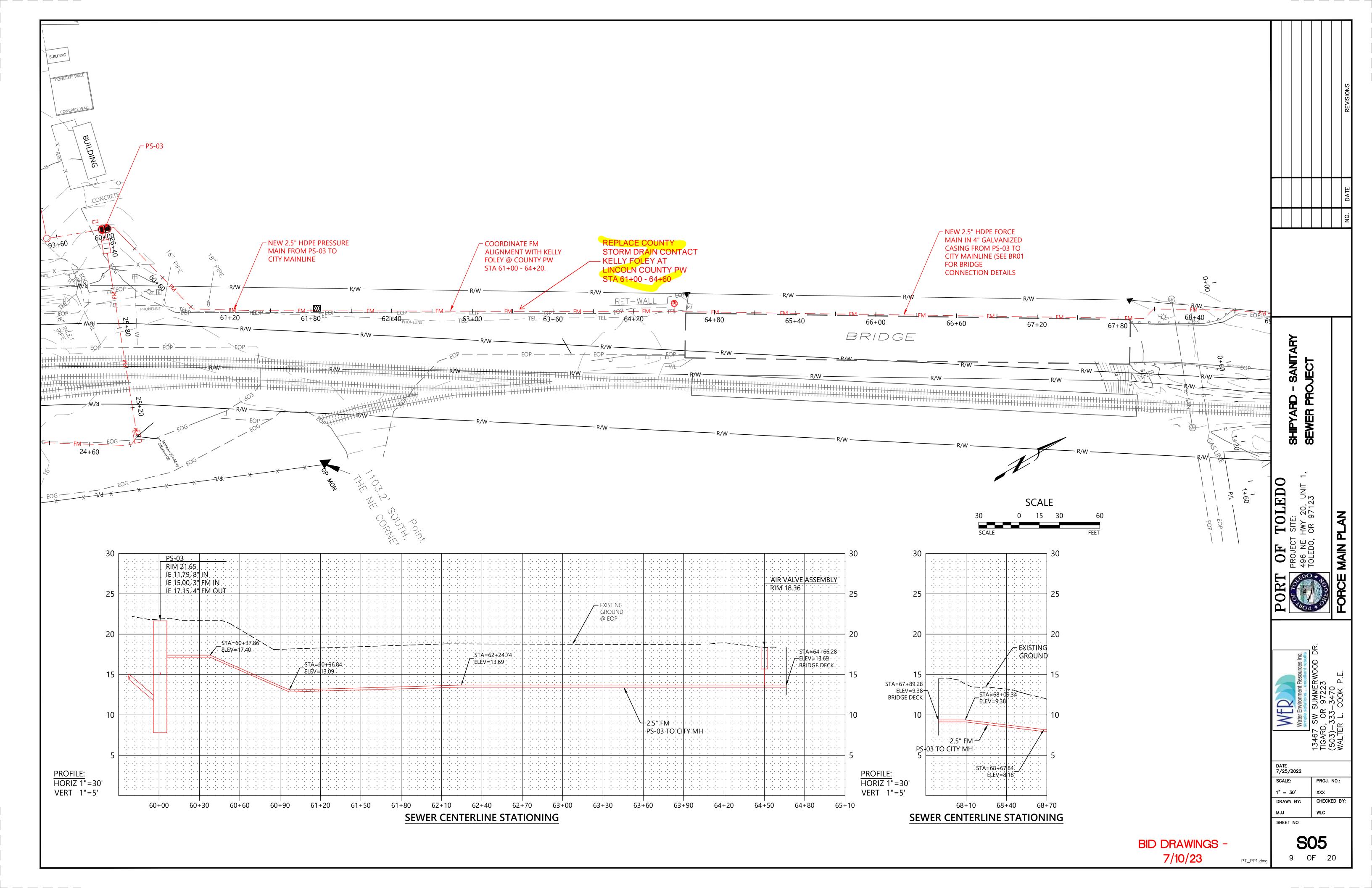
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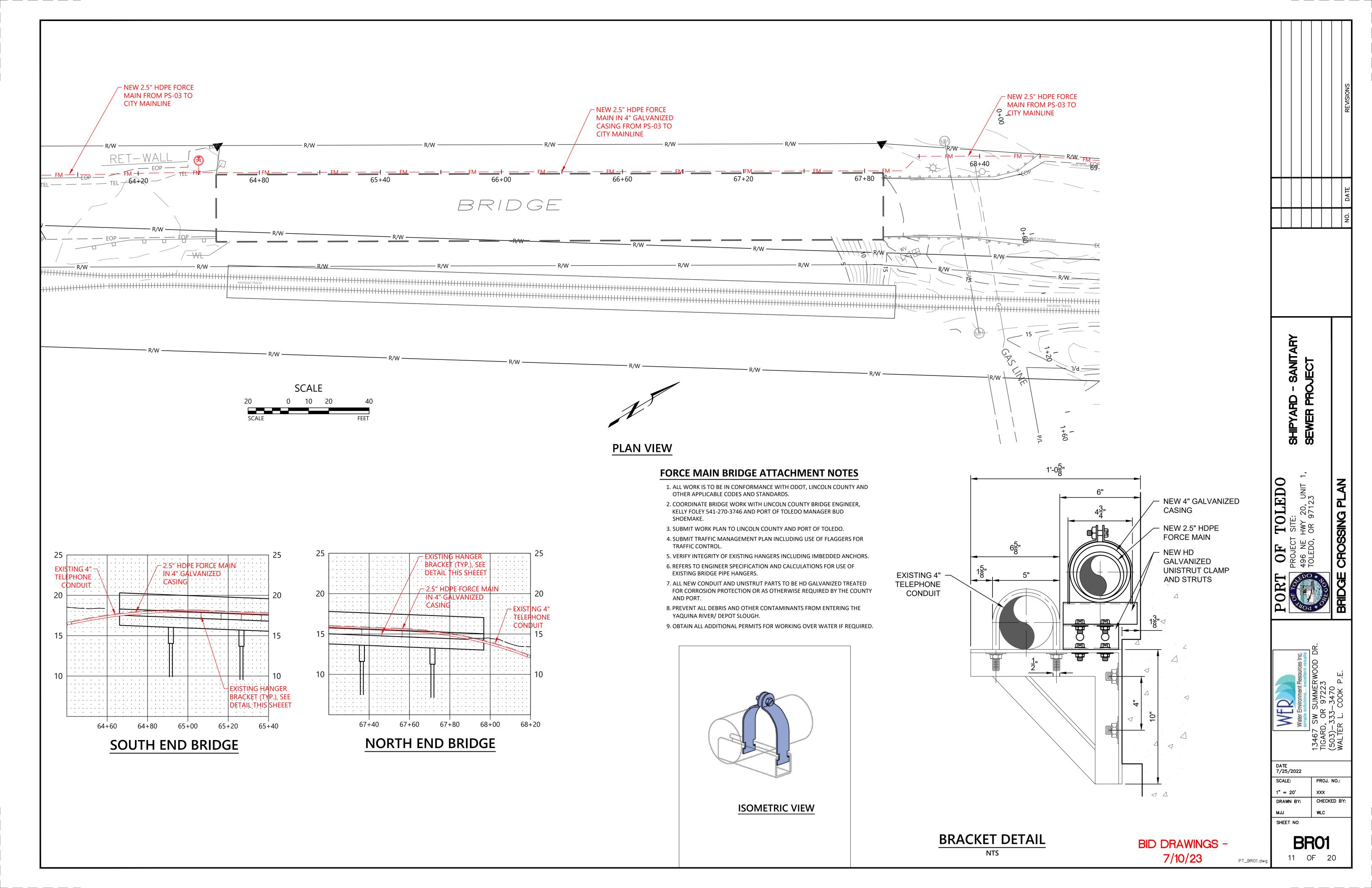


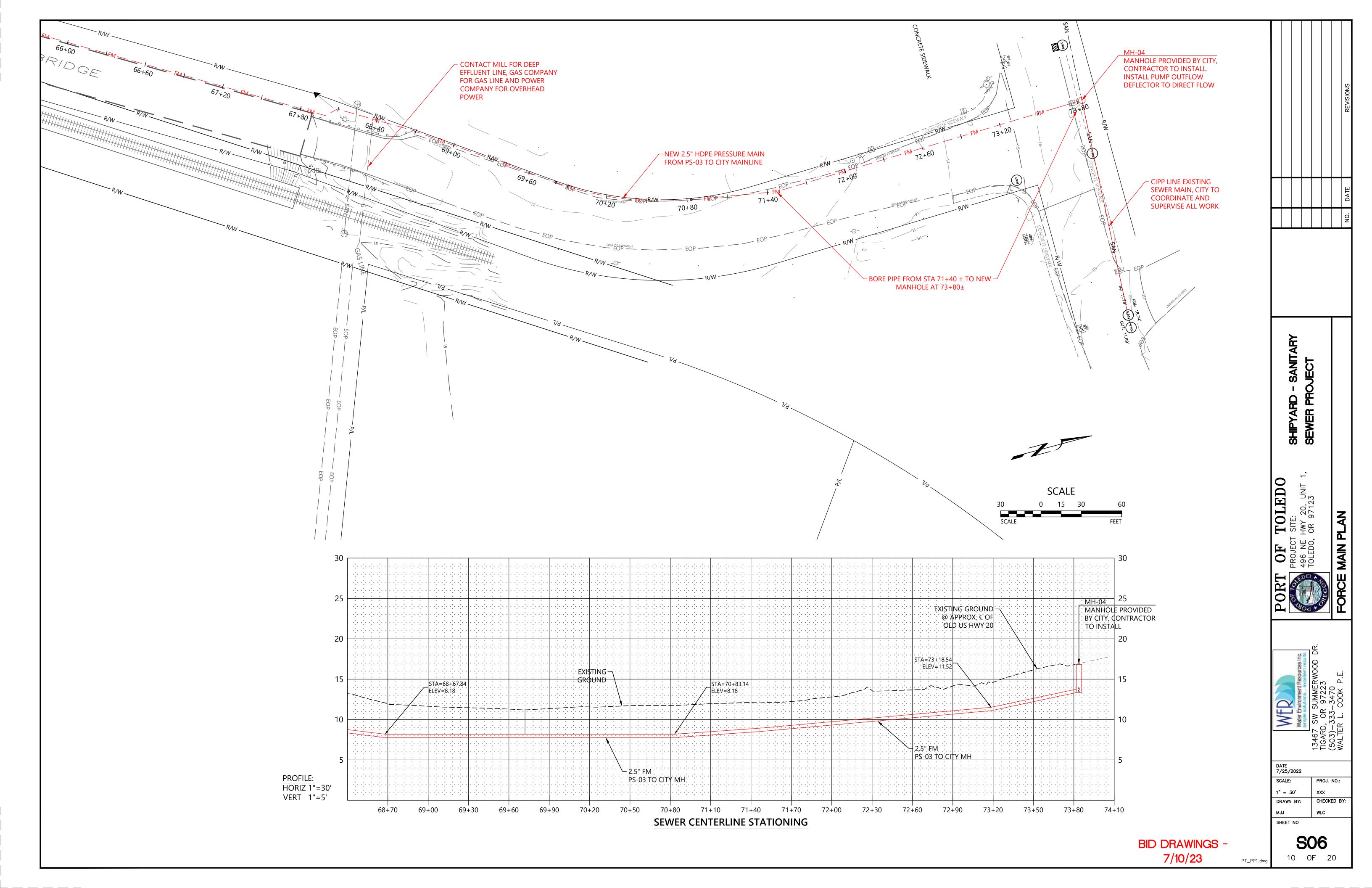


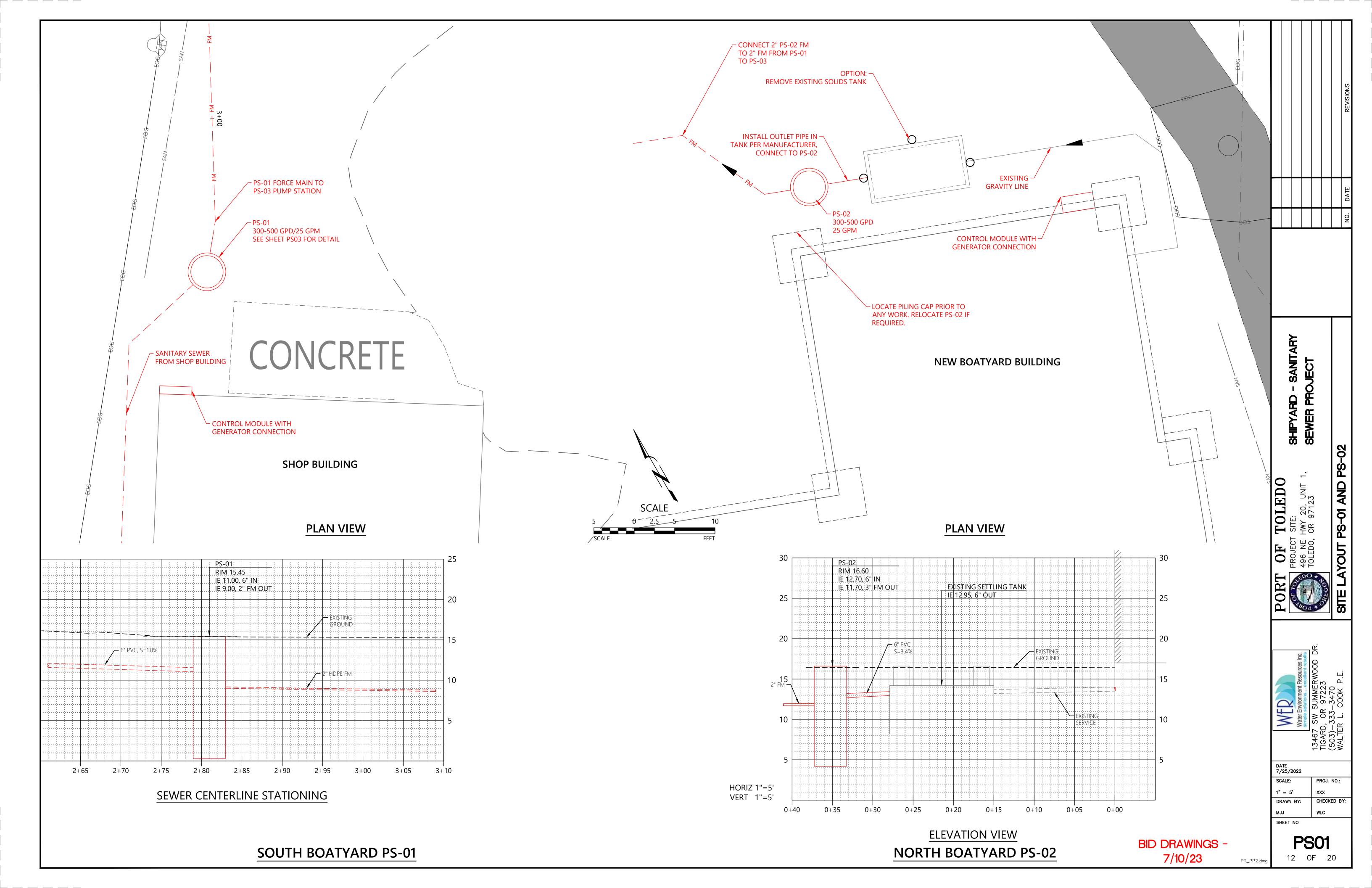


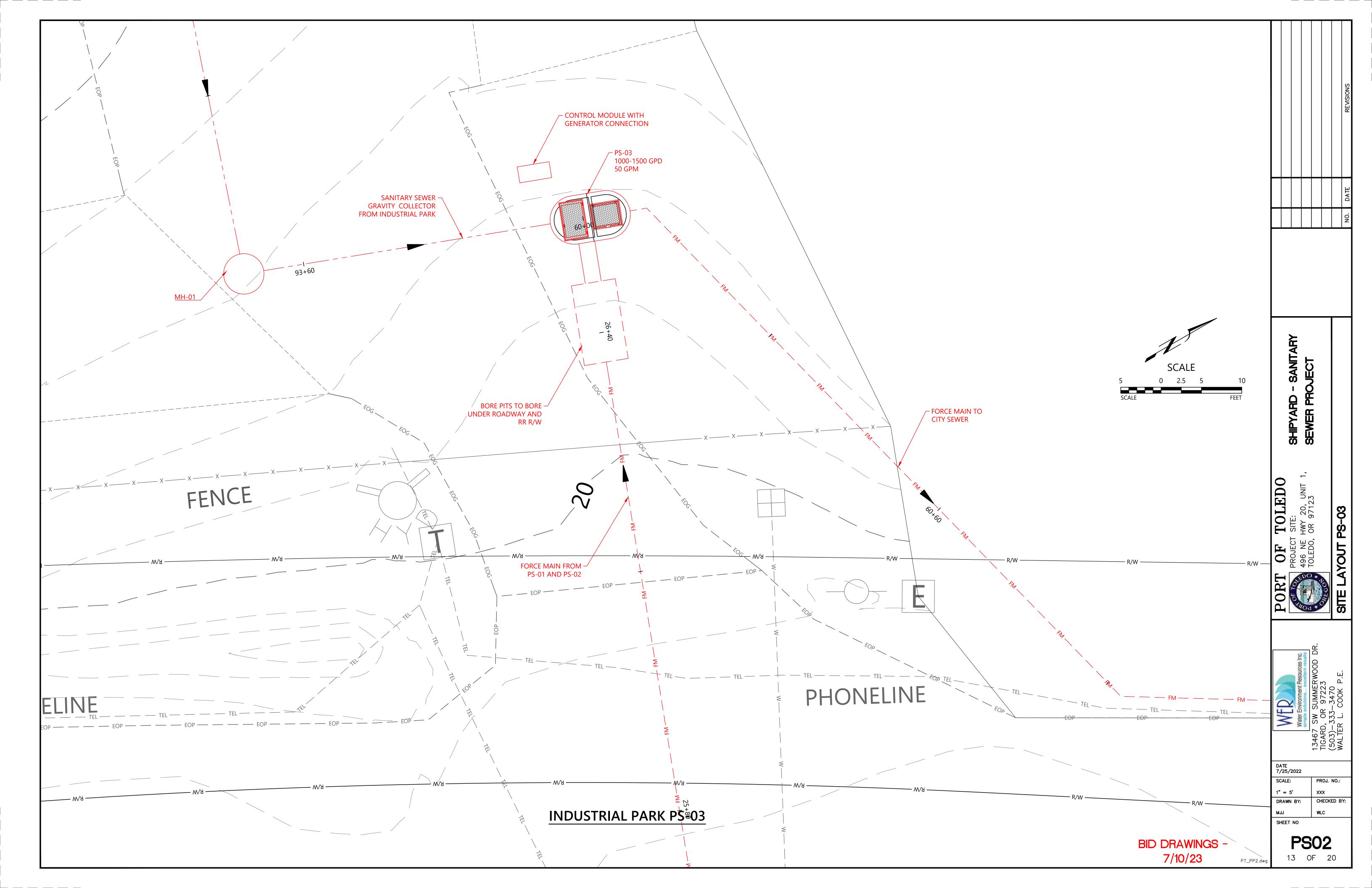


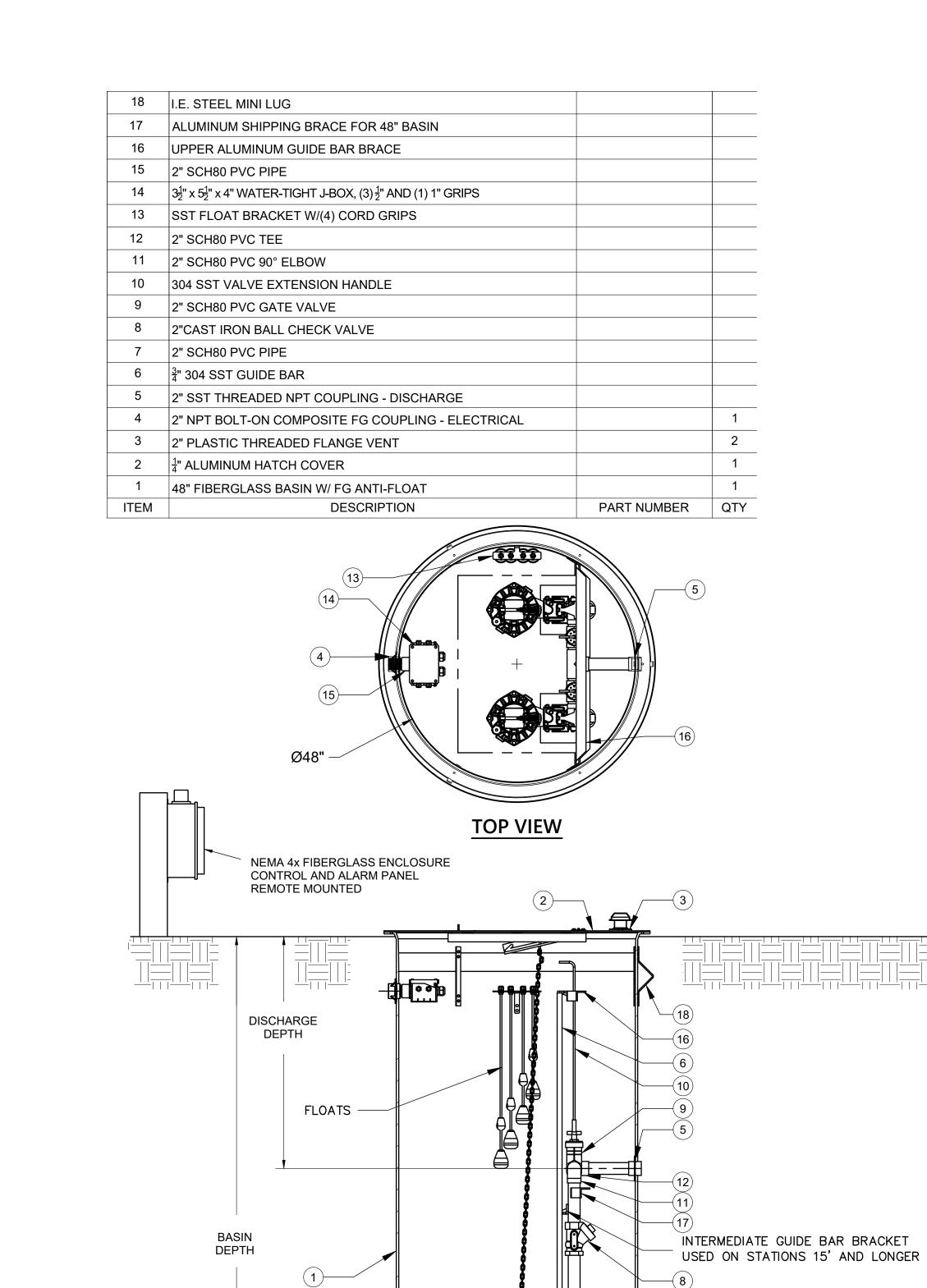












TYPICAL PUMP STATION PS-01 AND PS-02 DETAIL

ELEVATION VIEW

LIFTING CHAIN

MP GRINDER PUMP (MP-3085 SHOWN)

2" XYLEM BASE ELBOW

BID DRAWINGS -7/10/23

TOLI

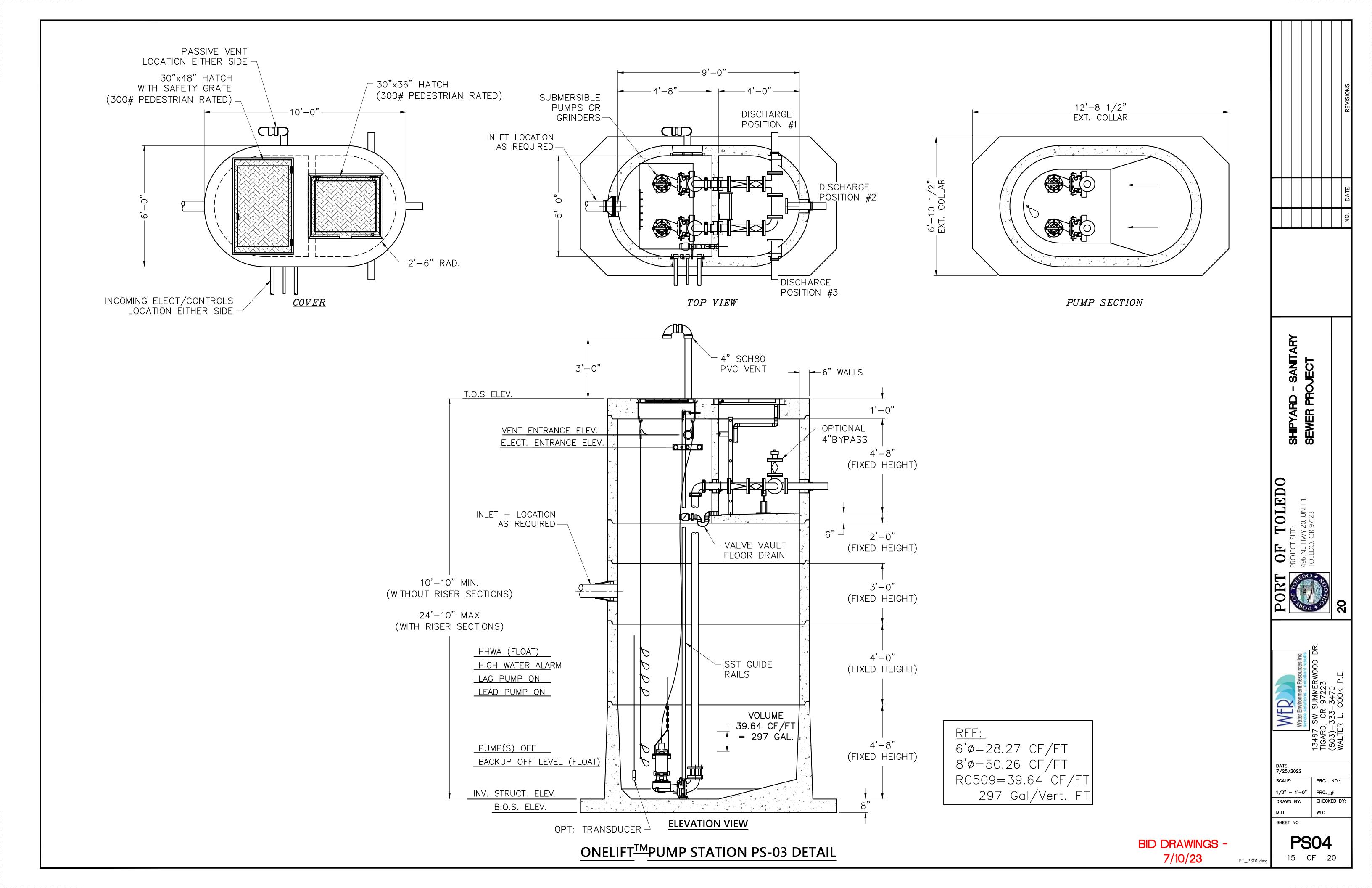
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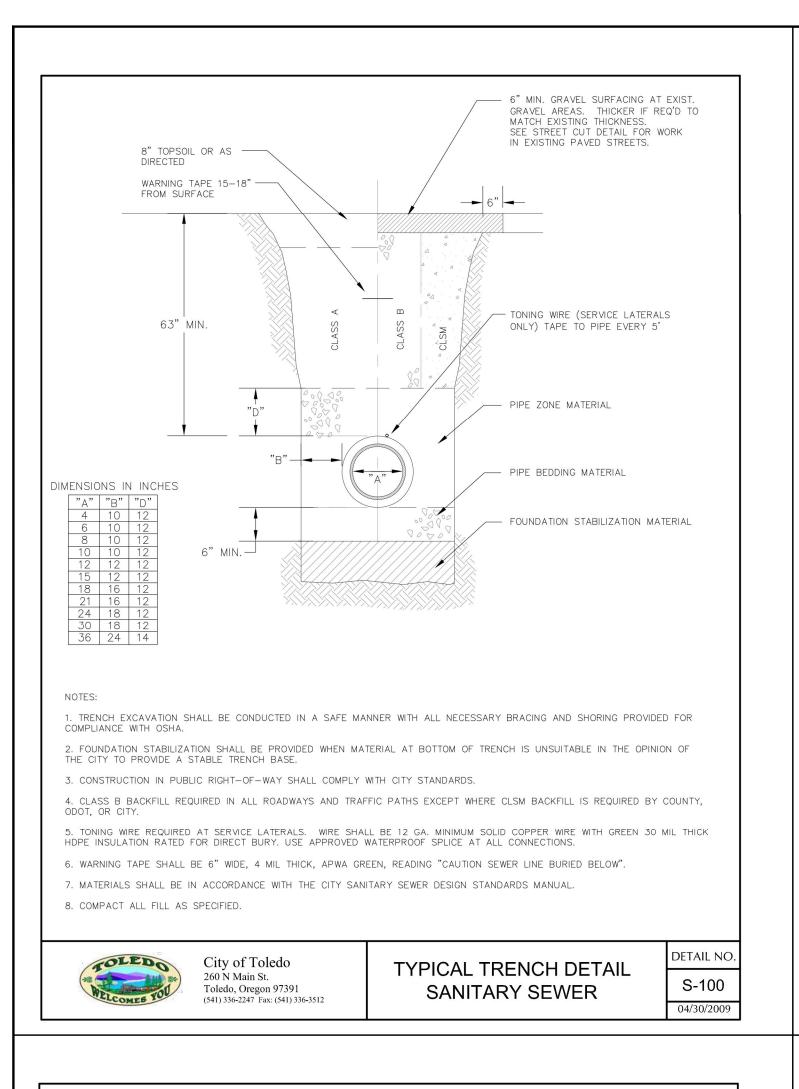
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PS03 14 OF 20





SET FRAME IN NON-SHRINK GROUT.
SEE MANHOLE COVER AND FRAME

FINISH GRADE

26" MAX.

STEEL REINFORCED BY MH MFGR. ALIGN VERTICALLY.

→ 15"-18" TYP.

DETAIL NO

S-205

04/30/2009

DETAIL (S-250)

12" MAX.

SEE MANHOLE BASE STANDARD DETAIL (S-210)

FLAT-TOP MANHOLE

PIPES LESS THAN 24" DIAM.

RECAST REINFORCED RADE RINGS, 3 LAYERS MAX.

2" MAX., O" MIN. SET IN NON-SHRINK GROUT.

EYED JOINTS WITH PRE- -FORMED SEAL (RAM-NEK) OR RUBBER RING GASKET

1) ALL PRECAST MANHOLE SECTIONS SHALL MEET ASTM C-478.

TOLEDO

2) STANDARD MANHOLE REQUIRED WHEN DEPTH FROM FINISH GRADE TO INVERT IS 6 FEET OR

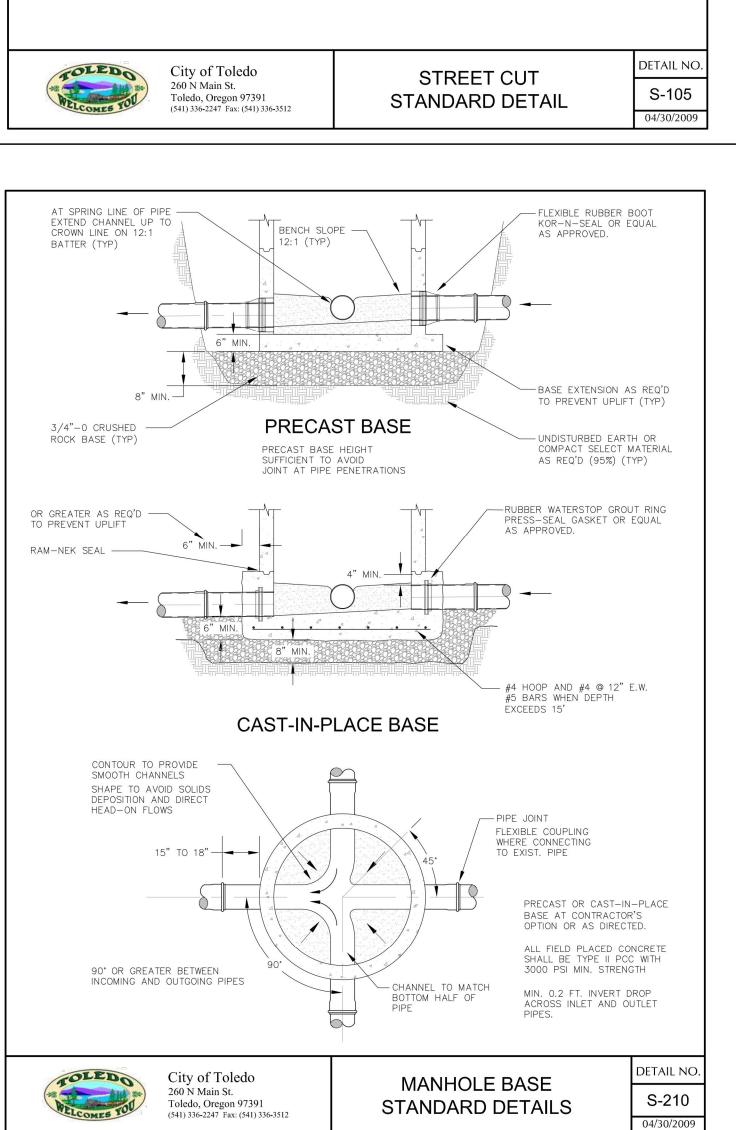
City of Toledo

Toledo, Oregon 97391

(541) 336-2247 Fax: (541) 336-3512

260 N Main St.

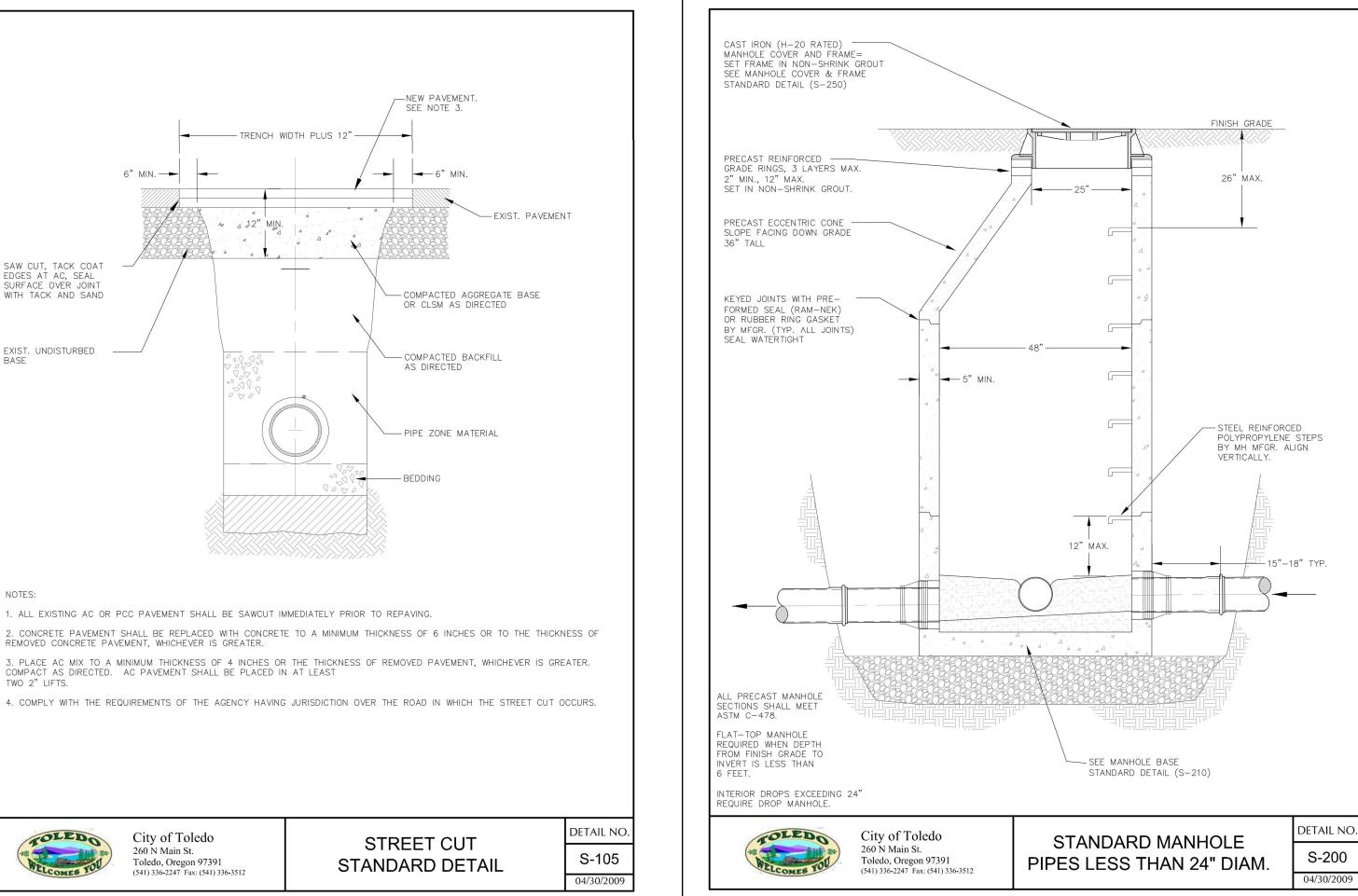
BY MFGR. (TYP. ALL JOINTS)
SEAL WATERTIGHT

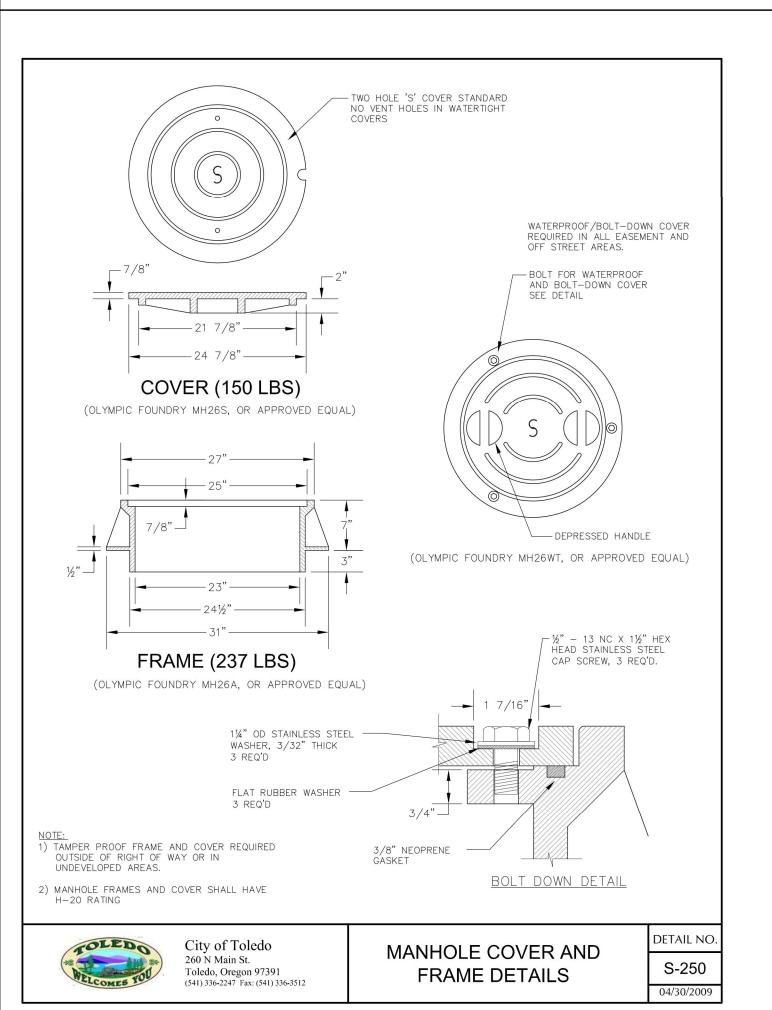


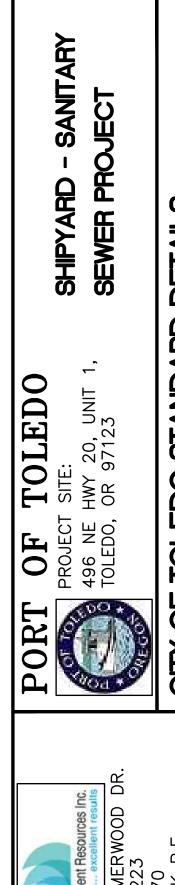
SAW CUT, TACK COAT EDGES AT AC, SEAL SURFACE OVER JOINT WITH TACK AND SAND

EXIST. UNDISTURBED

NOTES:







BID DRAWINGS -

7/10/23

16 OF 20 PT_CD01.dwg

WER

7/25/2022

DRAWN BY:

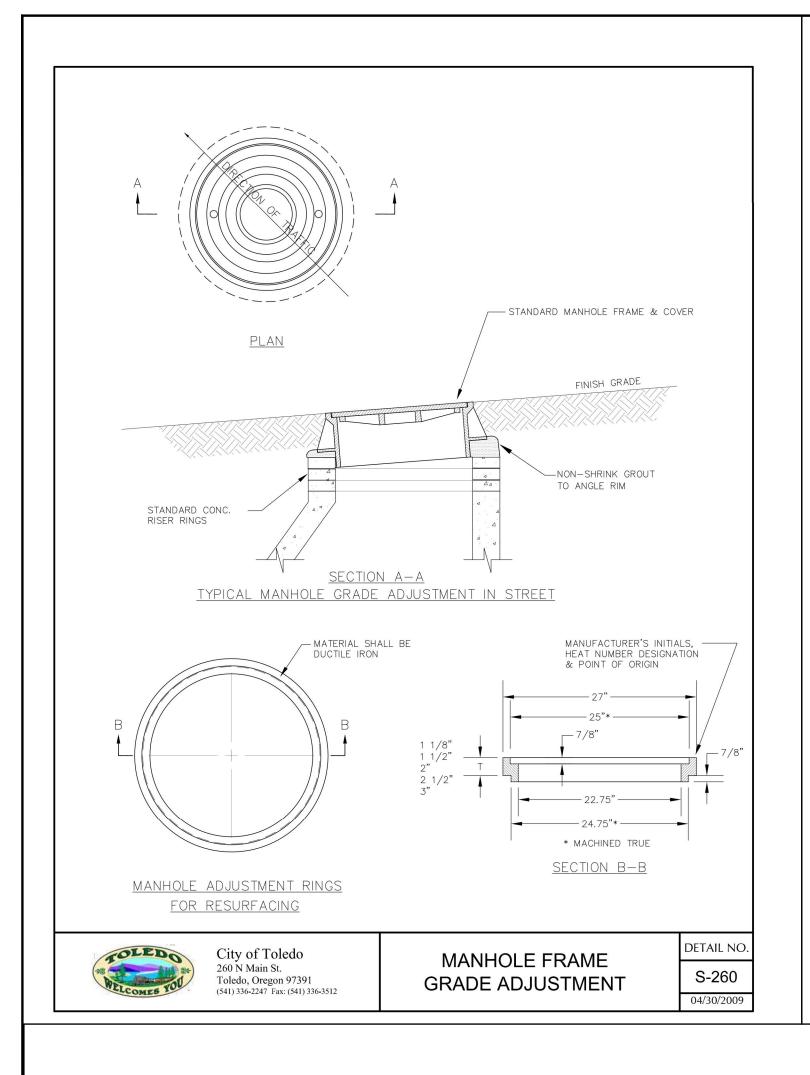
SCALE:

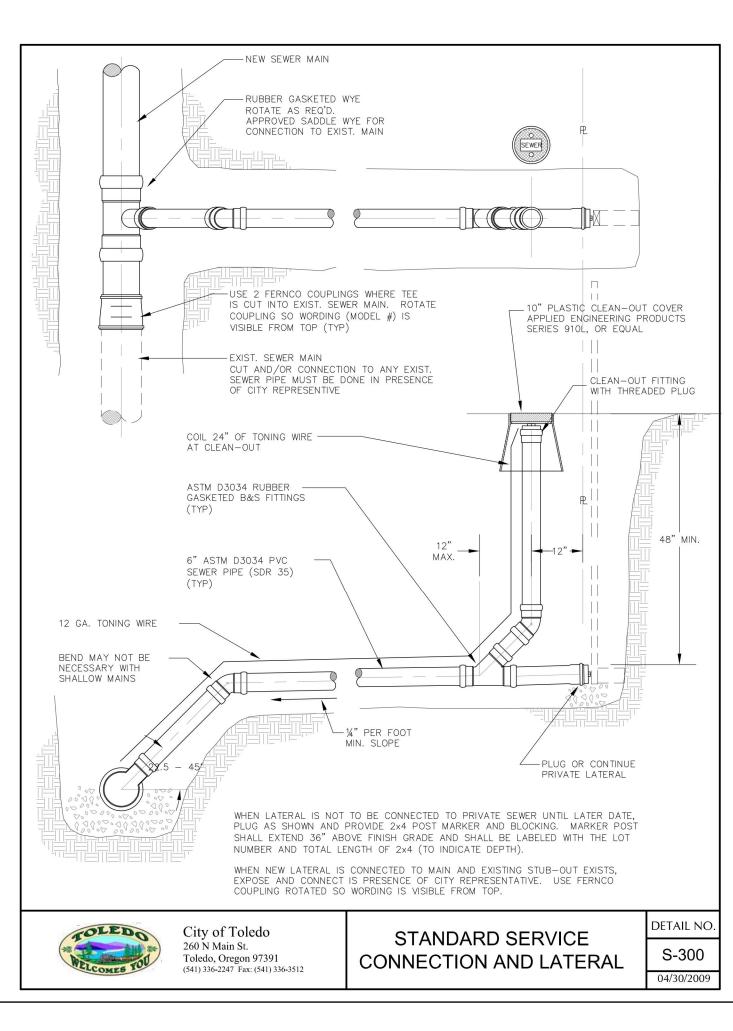
SHEET NO CD01

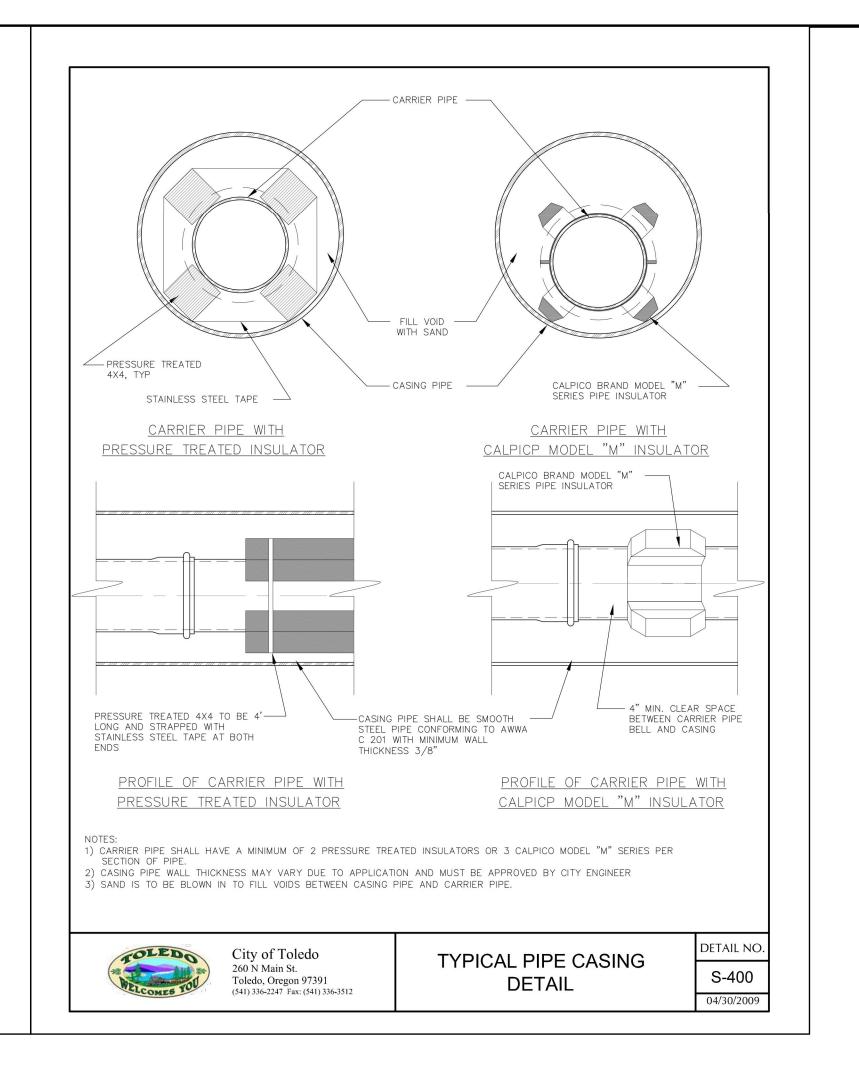
PROJ. NO.:

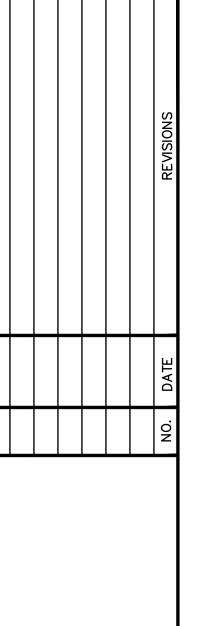
CHECKED BY:

XXX









SANIT,

DETAIL

ED0 OF TOLEDO

PROJECT SITE:
496 NE HWY 20, UNIT TOLEDO, OR 97123

DATE 7/25/2022 SCALE: PROJ. NO.: CHECKED BY:

SHEET NO

CD02 17 OF 20

