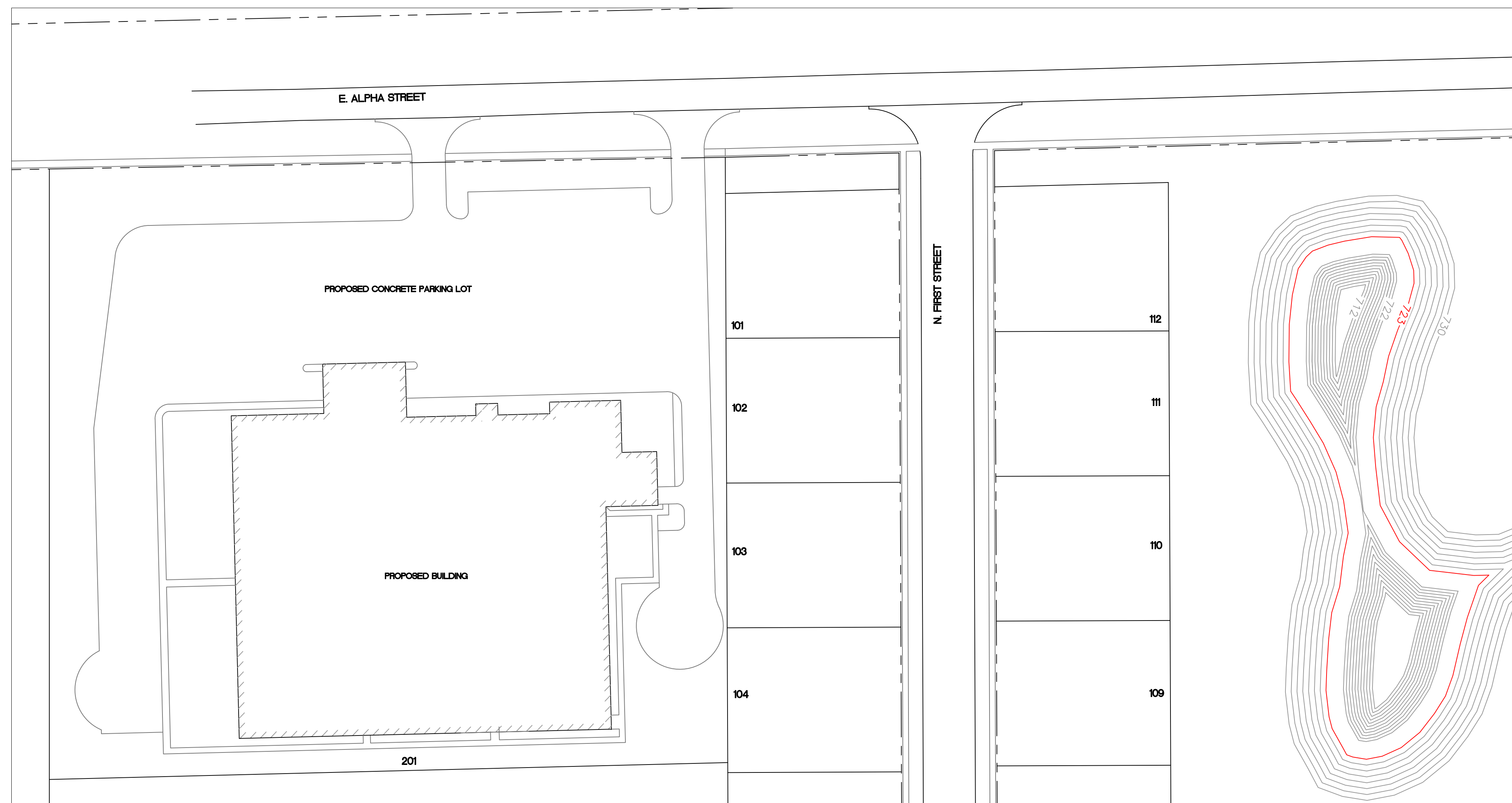



**ILLINOIS
AMERICAN WATER**

**E. ALPHA STREET
STORM & SANITARY SEWER EXTENSION
XXX, ILLINOIS
XXXX DISTRICT
WBS #R25-XXB1.2X-P-00XX
W 1/2, NW 1/4 SEC. xx, T.xN. R.xE.,
THIRD P.M., XXXXX COUNTY, ILLINOIS**

INDEX OF DRAWINGS

SHEET	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES AND LEGEND
3	EXISTING CONDITIONS SHEET
4-5	E. ALPHA ST. SANITARY SEWER PLAN/PROFILE
6	E. ALPHA ST. STORM SEWER PLAN/PROFILE
7-8	STANDARD DETAIL SHEETS



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PROJECT
**E. ALPHA STREET
STO. AND SAN. SEWER EXTENSION**

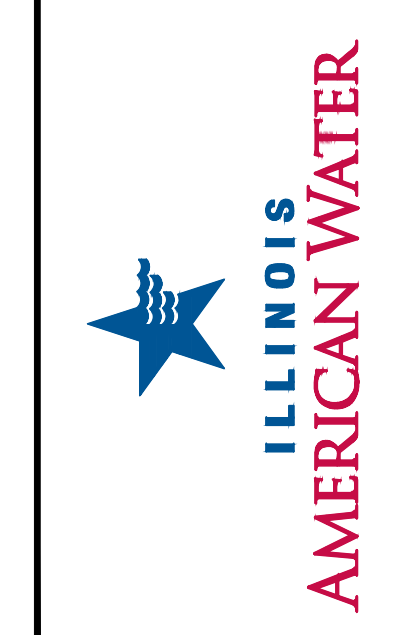
DISTRICT
**CITY
XXXXX DISTRICT**

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ENGINEERING DEPARTMENT
201 DEVONSHIRE DRIVE
CHAMPAIGN, IL 61820



FILE	xx	OF	8
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XREF	xxx		
SHEET	1	OF	8

GENERAL NOTES

- 1.
- 2.

SANITARY SEWER GRADE PLUS WATER / SEWER SEPARATION:

1. WATER MAINS AND WATER SERVICE LATERALS SHALL BE PROTECTED FROM SEWERS, SEWER LATERALS, DRAINS AND SEPTIC FIELDS IN ACCORDANCE WITH ILLINOIS ADMINISTRATIVE CODE, TITLE 35, SUBTITLE F, CHAPTER II, PART 652.203, AND WITH THE LATEST EDITION OF TITLE 35: ENVIRONMENTAL PROTECTION, SUBTITLE F: PUBLIC WATER SUPPLIES, CHAPTER II: ENVIRONMENTAL PROTECTION AGENCY, SECTION 653.119: PROTECTION OF WATER MAIN AND WATER SERVICE LINES. THE WATER AND SEWER MAIN AS SHOWN ON THE PLANS SHALL BE CONSTRUCTED WITH A MINIMUM 10' HORIZONTAL SEPERATION OR 1.5' VERTICAL SEPERATION
2. ALL STORM SEWERS MUST BE CONSTRUCTED OF WATER MAIN GRADE MATERIALS IF PROPOSED TO BE WITHIN 10.0' HORIZONTALLY OR 1.5' VERTICALLY OF A WATER MAIN.

SANITARY SEWER

- 1.

EROSION AND SEDIMENTATION CONTROL

- 1.

EARTHWORK

- 1.

NOTE TO DESIGNERS:
1. THE MINIMUM SANITARY BURY DEPTH IS THE SAME AS THE MINIMUM WATER BURY DEPTH. SEE MINIMUM BURY DEPTHS IN ILAW STANDARDS BY DISTRICT.

LEGEND

EXISTING GUY POLE -	PROPOSED GUY POLE -
EXISTING LIGHT POLE -	PROPOSED LIGHT POLE -
EXISTING POWER POLE -	PROPOSED POWER POLE -
EXISTING TELEPHONE POLE -	PROPOSED TELEPHONE POLE -
EXISTING GUY WIRE -	PROPOSED GUY WIRE -
EXISTING TRANSMISSION TOWER -	PROPOSED TRANSMISSION TOWER -
EXISTING ELECTRIC SPLICE BOX -	PROPOSED ELECTRIC SPLICE BOX -
EXISTING TELEPHONE SPLICE BOX -	PROPOSED TELEPHONE SPLICE BOX -
EXISTING CABLE SPLICE BOX -	PROPOSED CABLE SPLICE BOX -
EXISTING WATER HYDRANT -	PROPOSED WATER HYDRANT -
EXISTING GAS METER -	PROPOSED GAS METER -
EXISTING WATER METER -	PROPOSED WATER METER -
EXISTING WATER VALVE -	PROPOSED WATER VALVE -
EXISTING GAS VALVE -	PROPOSED GAS VALVE -
EXISTING FIRE HYDRANT -	PROPOSED FIRE HYDRANT -
EXISTING SANITARY MANHOLE TOP -	PROPOSED SANITARY MANHOLE TOP -
EXISTING STORM MANHOLE TOP -	PROPOSED STORM MANHOLE TOP -
EXISTING STORM INLET TOP -	PROPOSED TELEPHONE MANHOLE TOP -
EXISTING TELEPHONE MANHOLE TOP -	PROPOSED SANITARY CLEAN OUT -
EXISTING SANITARY CLEAN OUT -	PROPOSED MAILBOX -
CONTROL POINT -	PROPOSED GUARD POST -
BENCHMARK -	PROPOSED ADVERTISING SIGN -
TEST PIT / NUMBER -	PROPOSED TRAFFIC SIGN -
BORING / NUMBER -	PROPOSED RAILROAD MILE POST -
RIGHT-OF-WAY MARKER -	PROPOSED RAILROAD SIGNAL CONTROLLER -
AXLE FOUND -	PROPOSED RAILROAD CROSSING GATE -
BOLT FOUND -	PROPOSED TRAFFIC SIGNAL -
CHISELED "X" FOUND -	PROPOSED TRAFFIC SIGNAL CONTROLLER -
PIN FOUND -	PROPOSED HANDHOLE -
PINCH PIPE FOUND -	PROPOSED DOUBLE HANDHOLE -
PK NAIL FOUND -	PROPOSED MAST ARM BASE -
RAILROAD SPIKE FOUND -	PROPOSED DECIDUOUS TREE / SIZE -
STONE FOUND -	PROPOSED EVERGREEN TREE / SIZE -
BRASS MONUMENT FOUND -	PROPOSED BUSH -
IRON PIPE FOUND -	PROPOSED PLANT -
MONUMENT FOUND -	PROPOSED EDGE OF PAVEMENT ELEVATION - +512.00 EP
REBAR FOUND -	PROPOSED PAVEMENT ELEVATION - +505.50 P
EXISTING MAILBOX -	PROPOSED CURB ELEVATION - +550.25 C
EXISTING FENCE POST -	PROPOSED SIDEWALK ELEVATION - +515.15 SW
EXISTING GATE POST -	PROPOSED FLOWLINE ELEVATION - +501.58 FL
EXISTING GATE POST -	PROPOSED SANITARY & STORM SEWER W/CALLOUT
EXISTING FLAG POLE -	PROPOSED ILAW EASEMENT -
EXISTING GUARD POST -	EXISTING STORM SEWER - 24" STO
EXISTING ADVERTISING SIGN -	EXISTING WATER MAIN WITH SIZE - 8" W
EXISTING TRAFFIC SIGN -	EXISTING UNDERGROUND ELECTRIC - UE UE
EXISTING PARKING METER -	EXISTING OVERHEAD ELECTRIC - OH OH
EXISTING RAILROAD MILE POST -	EXISTING ROW LINE -
EXISTING RAILROAD SIGNAL CONTROLLER -	EXISTING UTILITY EASEMENT -
EXISTING RAILROAD CROSSING GATE -	EXISTING SUMP DRAIN - SD SD
EXISTING TRAFFIC SIGNAL -	EXISTING CONTOUR LINE - 730
EXISTING TRAFFIC SIGNAL CONTROLLER -	PROPOSED CONTOUR LINE - 730
EXISTING HANDHOLE -	EXISTING EVERGREEN TREE / SIZE -
EXISTING DOUBLE HANDHOLE -	EXISTING STUMP / SIZE -
EXISTING MAST ARM BASE -	EXISTING BUSH -
EXISTING DECIDUOUS TREE / SIZE -	EXISTING SHRUB -
EXISTING EVERGREEN TREE / SIZE -	EXISTING TREE TO BE REMOVED -
EXISTING STUMP / SIZE -	
EXISTING BUSH -	
EXISTING SHRUB -	
EXISTING TREE TO BE REMOVED -	

NOTE TO DESIGNERS:
CUSTOMIZE THE LEGEND TO MEET YOUR NEEDS & WHAT IS USED.

PROJECT
**E. ALPHA STREET
 STO. AND SAN. SEWER EXTENSION**
 DISTRICT
 CITY
XXXXX DISTRICT

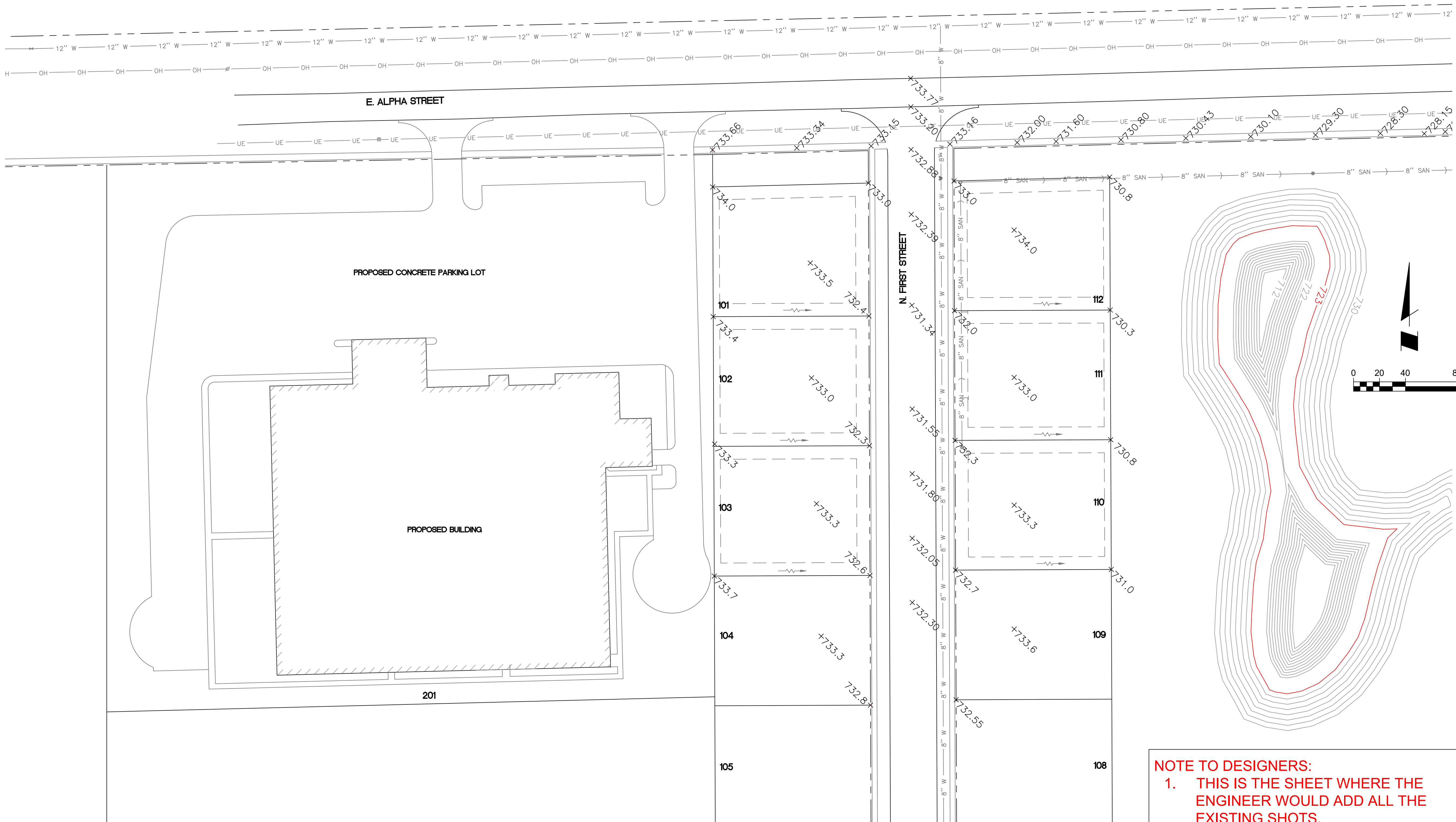
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SHEET	2 OF 8



EXISTING CONDITIONS

NOTE TO DESIGNERS:

1. THIS IS THE SHEET WHERE THE ENGINEER WOULD ADD ALL THE EXISTING SHOTS.
2. IF YOU HAVE GEOTECH INFO, PLEASE INSERT ANOTHER SHEET WITH THE BORING DEPTH, LOCATION AND ANY OTHER INFORMATION.
3. SHOW EXISTING TOPO LINES ON THIS SHEET.


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PROJECT
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 DISTRICT
 CITY
XXXXX DISTRICT

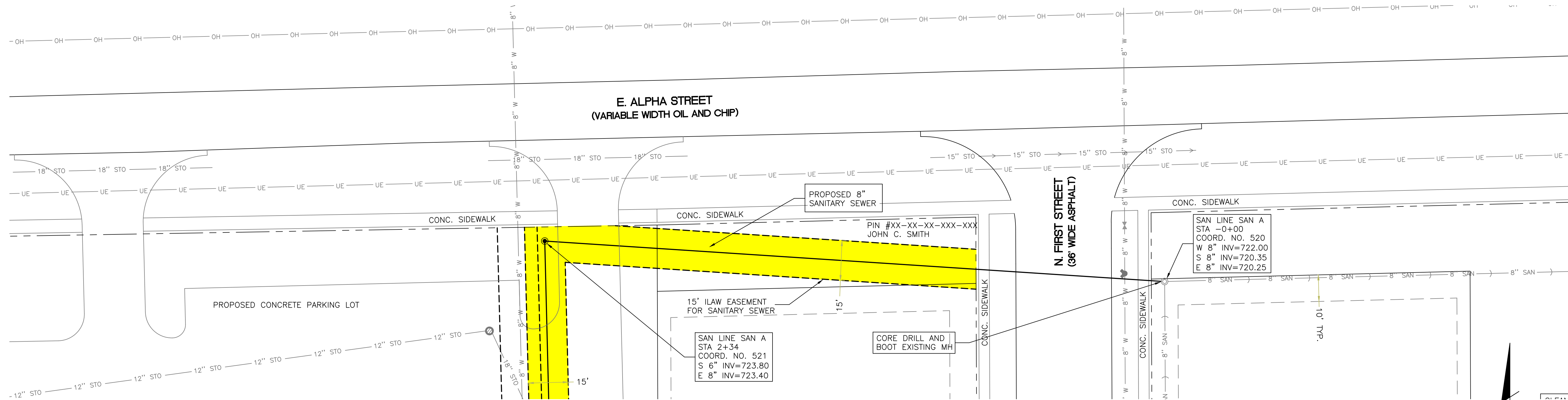
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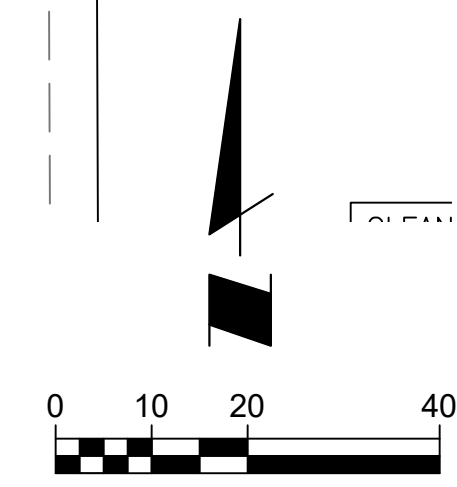


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PLAN VIEW

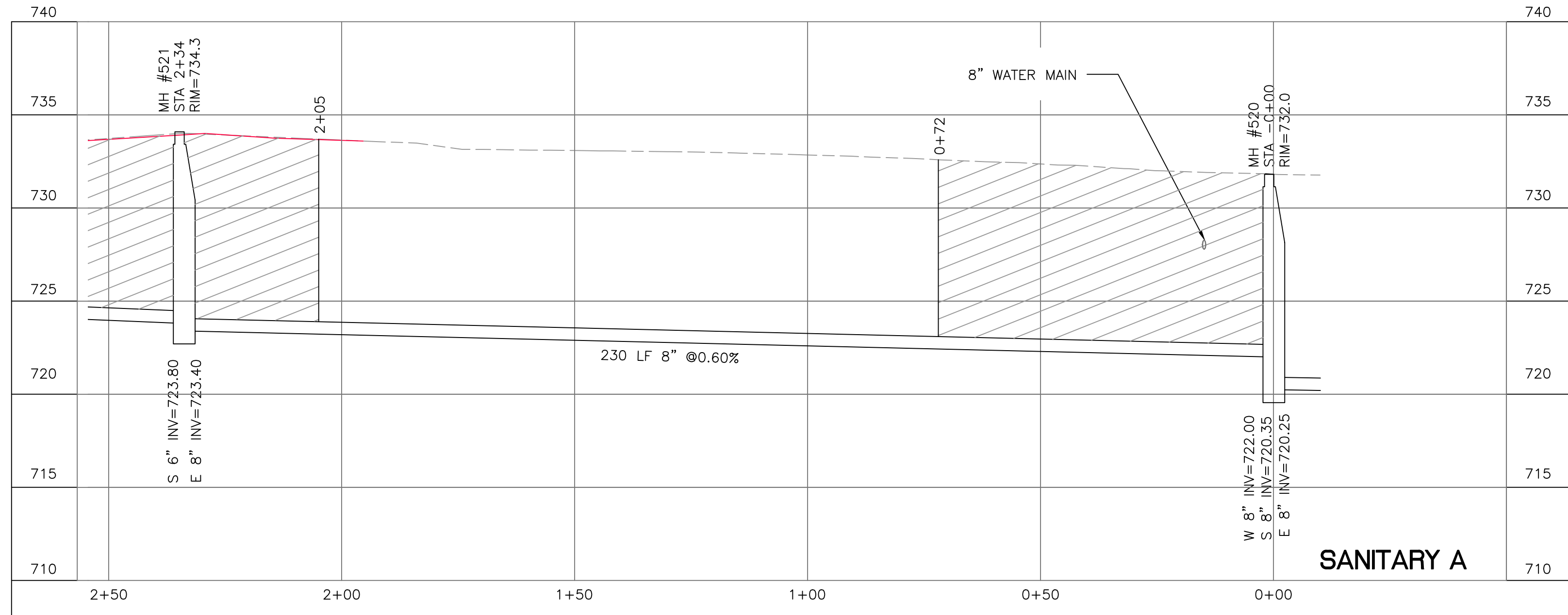
NOTE TO DESIGNERS FOR PLAN/PROFILE SHEETS:
PER ITEM #10 TO THE LEFT, ADD PIN NUMBER, NAMES AND ADD BACKGROUND COLOR ON ANY LOTS THAT REQUIRE AN EASEMENT. SEE LOT ABOVE FOR REFERENCE.



- BASIC NOTES TO DESIGNERS FOR THIS SHEET:**
1. TURN OFF EXISTING GRADE SHOTS, PAVEMENT SHOTS & ELEVATION LINES.
 2. SHOW SURVEY CONTROL POINTS.
 3. INCLUDE A TABLE OF SURVEY CONTROL POINTS.
 4. MAKE THE PROPOSED SANITARY SEWER STAND OUT BY MAKING IT BOLDER THAN ANY OTHER LINE ON THE DRAWING.
 5. MAKE SURE THE EXISTING SANITARY SEWER MAIN DARKER THAN THE REST OF THE UTILITY LINES.
 6. FOR PIPE SIZES OVER 21", USE A DOUBLE PARALLEL LINE, PIPES UNDER 18" USE A SINGLE LINE.
 7. SURVEY & SHOW ALL EXISTING CLEANOUTS ON PLANS.
 8. SHOW ALL BUILDING FOOTPRINTS WHERE AVAILABLE.
 9. SHOW INDIVIDUAL TREES WHERE WE CAN AND TREE LINES WHERE IT MAKES MORE SENSE.
 10. ADD PIN #, PROPERTY OWNERS NAMES & ADD COLOR BACKGROUND TO LOTS/AREAS THAT REQUIRE AN EASEMENT.

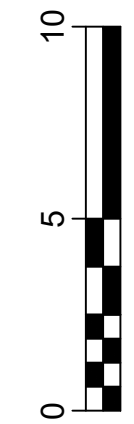
SANITARY SEWER STRUCTURE SCHEDULE

LINE	PLAN STATION	MH NO.	STRUCTURE	CASTING	NORTH COORDINATE	EAST COORDINATE
SAN A	-0+00	520	EXISTING 48" MH	XXXX	XXXX.XXXX	XXXX.XXXX
SAN A	2+34	521	48" MH	XXXX	XXXX.XXXX	XXXX.XXXX
SAN A	4+45	522	CLEANOUT	XXXX	XXXX.XXXX	XXXX.XXXX



SEE LOCAL REQUIREMENTS FOR BACKFILL UNDER PAVEMENT.

PROFILE VIEW



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DISTRICT
CITY
XXXXX DISTRICT

REVISIONS

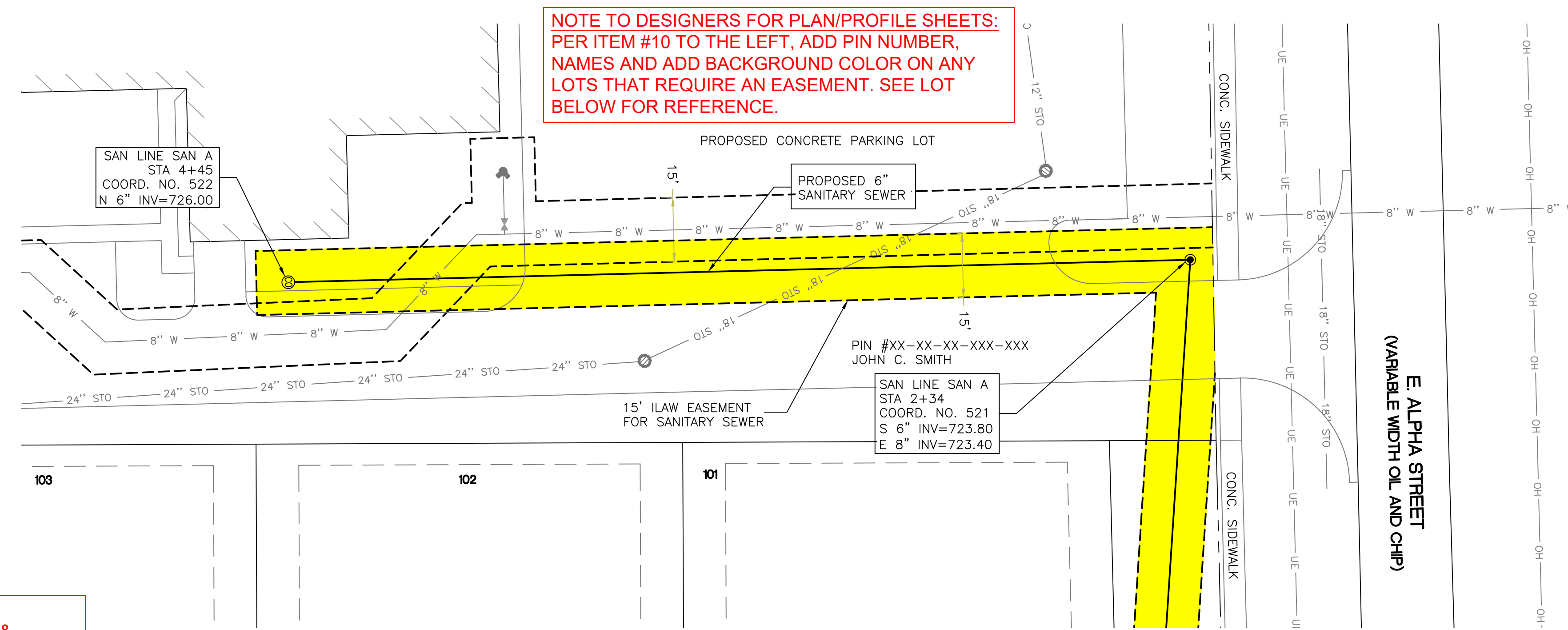
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SHEET	4 OF 8

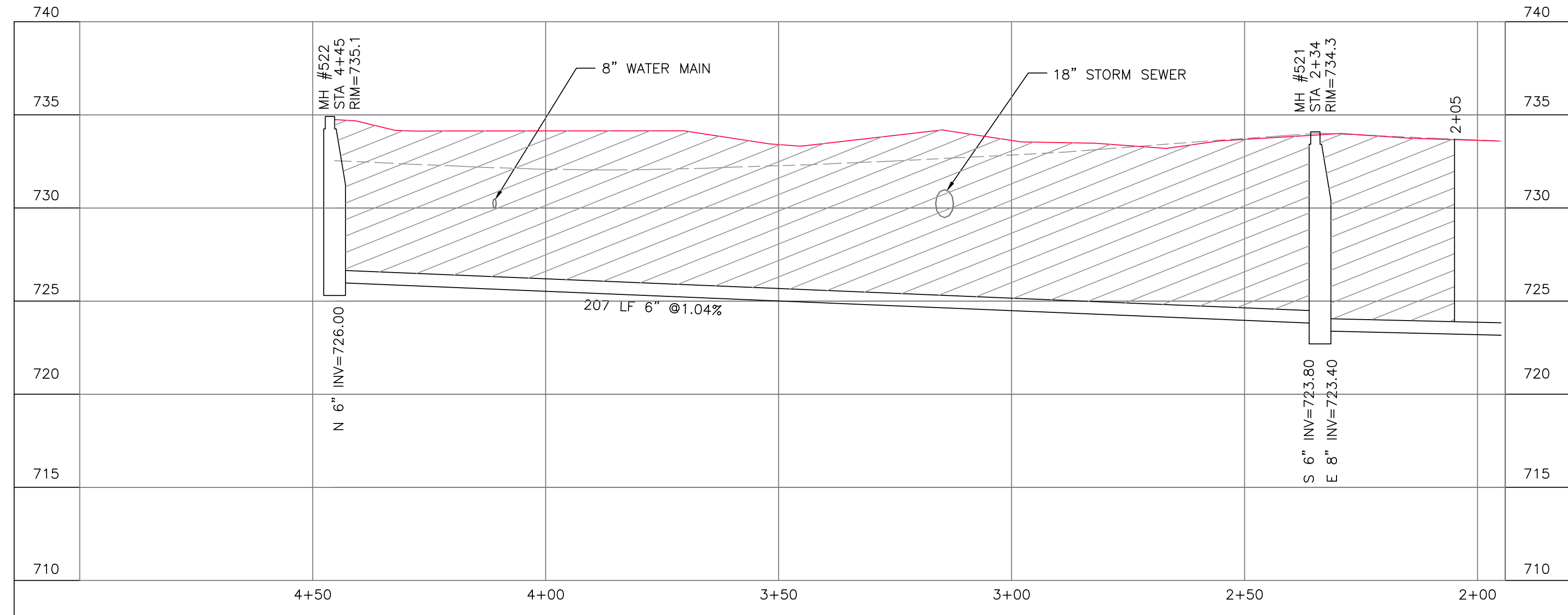


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PLAN VIEW

- BASIC NOTES TO DESIGNERS FOR THIS SHEET:**
1. TURN OFF EXISTING GRADE SHOTS, PAVEMENT SHOTS & ELEVATION LINES.
 2. SHOW SURVEY CONTROL POINTS.
 3. INCLUDE A TABLE OF SURVEY CONTROL POINTS.
 4. MAKE THE PROPOSED SANITARY SEWER STAND OUT BY MAKING IT BOLDER THAN ANY OTHER LINE ON THE DRAWING.
 5. MAKE SURE THE EXISTING SANITARY SEWER MAIN DARKER THAN THE REST OF THE UTILITY LINES.
 6. FOR PIPE SIZES OVER 21", USE A DOUBLE PARALLEL LINE, PIPES UNDER 18" USE A SINGLE LINE.
 7. SURVEY & SHOW ALL EXISTING CLEANOUTS ON PLANS.
 8. SHOW ALL BUILDING FOOTPRINTS WHERE AVAILABLE.
 9. SHOW INDIVIDUAL TREES WHERE WE CAN AND TREE LINES WHERE IT MAKES MORE SENSE.
 10. ADD PIN #, PROPERTY OWNERS NAMES & ADD COLOR BACKGROUND TO LOTS/AREAS THAT REQUIRE AN EASEMENT.

SANITARY SEWER STRUCTURE SCHEDULE						
LINE	PLAN STATION	MH NO.	STRUCTURE	CASTING	NORTH COORDINATE	EAST COORDINATE
SAN A	-0+00	520	EXISTING 48" MH	XXXX	XXXX.XXXX	XXXX.XXXX
SAN A	2+34	521	48" MH	XXXX	XXXX.XXXX	XXXX.XXXX
SAN A	4+45	522	CLEANOUT	XXXX	XXXX.XXXX	XXXX.XXXX



SEE LOCAL REQUIREMENTS FOR BACKFILL UNDER PAVEMENT.

PROFILE VIEW

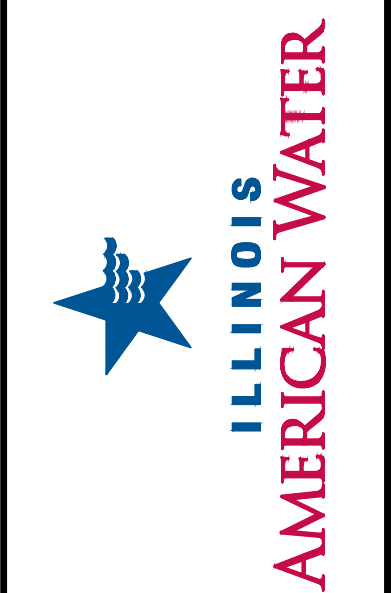
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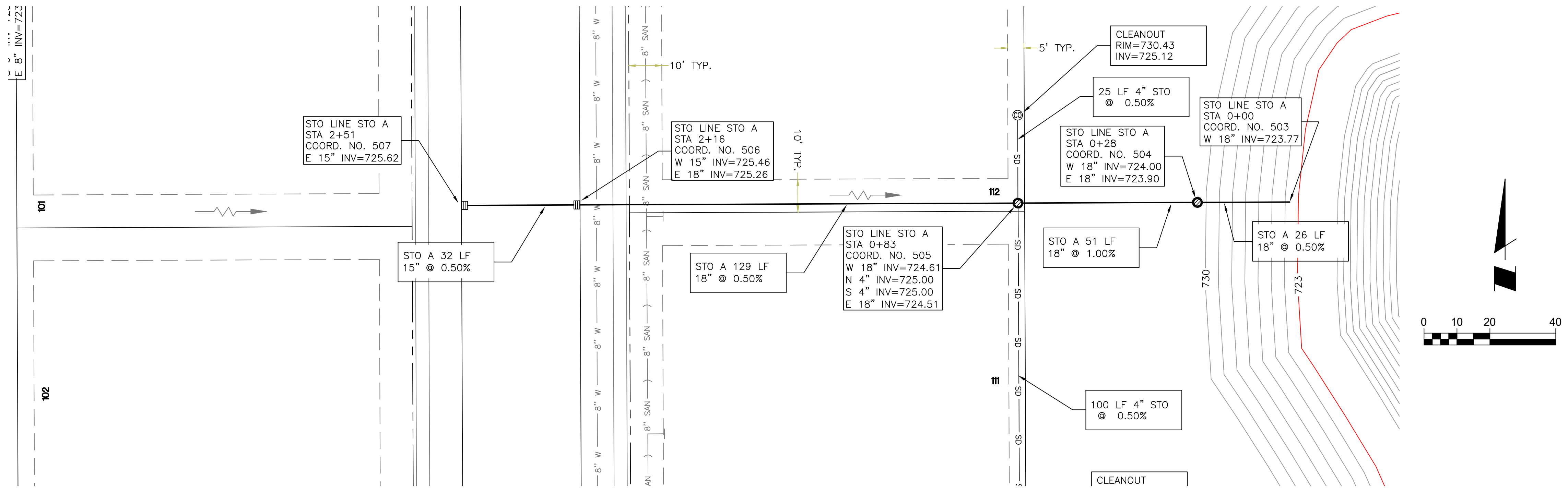
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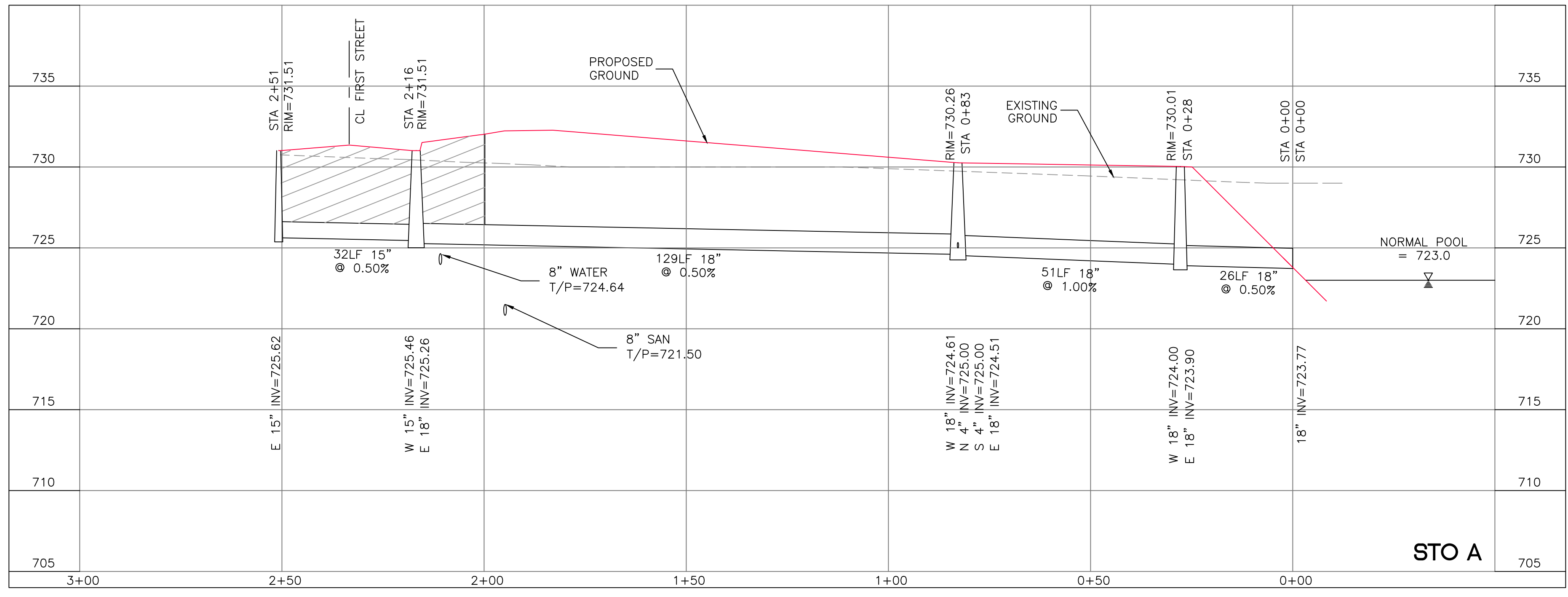
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JOB NO.	xxx
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SHEET	5 OF 8



PLAN VIEW

- BASIC NOTES TO DESIGNERS FOR THIS SHEET:**
1. TURN OFF EXISTING GRADE SHOTS, PAVEMENT SHOTS & ELEVATION LINES.
 2. SHOW SURVEY CONTROL POINTS.
 3. INCLUDE A TABLE OF SURVEY CONTROL POINTS.
 4. MAKE THE PROPOSED STORM SEWER STAND OUT BY MAKING IT BOLDER THAN ANY OTHER LINE ON THE DRAWING.
 5. MAKE SURE THE EXISTING STORM SEWER MAINS ARE DARKER THAN THE REST OF THE UTILITY LINES.
 6. FOR PIPE SIZES OVER 21", USE A DOUBLE PARALLEL LINE, PIPES UNDER 18" USE A SINGLE LINE.
 7. SURVEY & SHOW ALL EXISTING CLEANOUTS ON PLANS.
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STORM SEWER STRUCTURE SCHEDULE						
LINE	PLAN STATION	PROPOSED STRUCTURE	CASTING NUMBER	POINT NO.	NORTH COORDINATE	EAST COORDINATE
STO A	0+00	FES	---	503	1228128.6903	1007498.8459
STO A	0+28	48" MH	XX	504	1228128.8764	1007470.8461
STO A	0+83	48" MH	XX	505	1228128.3547	1007416.3503
STO A	2+16	48" MH	XX	506	1228127.8137	1007283.3514
STO A	2+51	24" MH	XX	506	1228127.6673	1007247.3517



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PROJECT
E. ALPHA STREET
STO. AND SAN. SEWER EXTENSION
 DISTRICT
 CITY
XXXXX DISTRICT

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SHEET	6 OF 8

MATERIALS SPECIFICATIONS FOR SEWAGE COLLECTION

- Pipe Material for Sewers (shall be as specified on the plans)
 - Polyvinyl Chloride (PVC) sewer pipe shall conform to ASTM-D-3034, SDR26 and shall be manufactured and supplied in accordance with UNI-B-81 (Uni-Bell Plastic Pipe Association). Unless otherwise called for all pipe through 15" shall meet this specification. Joints shall be rubber gasketed in accordance with ASTM D-3212.
 - Class 52 ductile iron pipe (AWWA C151), with AWWA C-111 joints shall be used where the minimum separation cannot be maintained between water and sewer lines, within casing pipe installations, or for other special conditions as directed by Illinois-American.

- Manhole Materials

Sanitary sewer manholes shall be of precast concrete unit construction (ASTM- C478) with an offset cone and joints sealed with butyl based material. Concrete adjustment rings shall be used where adjustment is necessary. Adjustment sections shall not exceed 12" vertically overall. All joints shall be sealed with Rubber-Nec, or approved equal Butyl based material. Cement grouting of the seams and joints should not be completed.

Butyl material shall total a minimum width of 2" wide as applied, in two pieces. Manholes shall be 48" inside diameter on sewers 24" and smaller, and shall be 60" inside diameter for sewers 27" through 48".

- Drop Manholes

Sanitary sewer manholes shall have poured-in-place or precast inverts. The inverts shall conform to the sewer grades with smooth, well rounded junctions and transitions. A flexible union between the pipe and manhole wall, meeting ASTM C-223, cast integrally into the manhole wall, shall be provided for each pipe connection to the manhole. Unions shall be the Interpace Lock Joint Flexible Manhole Sleeve, the A-Lok Manhole Pipe Connector, or approved equal. Such unions shall be selected and installed in accordance with the manufacturer's specifications for the specific type of pipe used. Sanitary manhole castings shall be Neenah R-1772-B or approved equal and shall have concealed pick holes. Lids shall be Neenah Foundry Type B "Self Sealing" with the word "SANITARY" imprinted. Manhole steps shall be M-A Industries plastic coated.

Manholes located in areas subject to flooding, or located in open fields, shall be furnished with waterproof frames and lids, Neenah Foundry F-1916-C complete with stainless steel anchor bolts or approved equal.

- Drop Manholes

An exterior drop pipe shall be provided for a sewer entering a manhole at an elevation of 24" or more above the manhole invert. The entire drop assembly shall be cast in concrete monolithically with the manhole barrel section. The diameter of the drop pipe shall be smaller than the diameter of the entering sewer by two diameters, provided that the minimum diameter of the drop pipe shall not be less than 8" diameter.

- Service Lead Material

Service leads shall be a minimum of 6" diameter. Pipe shall be PVC SDR35, Resin #12454B, or ductile iron. Where ductile iron pipe is called for on the plans, the lead shall be Class 52 ductile iron with push-on joints (AWWA C-111).

All pipes for leads shall include end stoppers for all stubs capable of withstanding a standard low pressure air test on the main sewer without leaking. Stoppers may be of an integrally cast breakout design.

Joining of dissimilar pipes will be with use of a "Band Seal", using a flexible rubber sleeve sealed tightly to each pipe with a stainless steel clamp.

INSTALLATION SPECIFICATIONS FOR SEWAGE COLLECTION

- Protection of Water Main Lines from Sanitary Sewers and Storm Sewers

Water mains shall be protected for horizontal and vertical separation in accordance with the requirements of the "Technical Policy Statements", or the requirements of MWRDGC, whichever applies.
- Depth of Pipe Cover

NOTE: THE MINIMUM SANITARY BURY DEPTH IS THE SAME AS THE MINIMUM WATER BURY DEPTH. SEE MINIMUM BURY DEPTHS IN ILLAW STANDARDS BY DISTRICT.

A minimum depth of 5'-0" shall be maintained for all sanitary sewer pipes. The 5'-0" depth shall be from proposed ground elevation to the crown of the pipe.
- Pipe Installation

PVC plastic pipe shall be installed in accordance with the requirements of ASTM Standard D-2321. Only Class I embedment materials shall be allowed.
- Unsuitable Soil

If unsuitable soil conditions are encountered under sanitary sewer mains which require removal of unsuitable material below the depth of the standard bedding, the material removed shall be replaced with granular material of the gradation approved by Illinois-American.
- Service Lines

All sanitary sewer service lines must be inspected by Illinois-American Water Company prior to back filling. Illinois-American must be provided with a minimum of 48 hours advanced notice (830739-8839) to arrange for inspection. Notice is not considered valid until acknowledged by the Illinois-American representative. Sanitary sewer service connections shall be a minimum of 6" diameter unless otherwise noted on the plans.

Tee or wye fittings shall be provided on the sanitary sewer main for all sanitary sewer service connections, except those which are made directly to a manhole. Wyes shall be laid so that material discharge is compatible with the direction of flow in the main.

- Service connections into manholes shall be made with uniform circular flow channels at the crown elevation of the sewer main, using a flexible sleeve (ASTM C-923), or approved equal. The service connection shall enter the manhole no more than two feet above the manhole invert for mains 24 inch and smaller. The invert shall match the crown of the main sewer when the main is larger than 24 inch.

- Risers shall be provided on service lines where the sewer main is greater than 12 feet below the proposed ground elevation and shall extend from the sewer main up to a point 9 feet below the proposed ground elevation.

- All sanitary sewer service lines must have a clean-out installed at the property line in Right-of-Way. To be installed per Clean-out detail.

- Connecting to an Existing Main

When it is necessary to connect a new sewer service to an existing sewer main by means other than an existing wye, tee or an existing manhole, one of the following methods shall be used:

 - Saw cut the sewer main by means of a Sewer Tap or similar device, and properly install a hub wye saddle or hub tee saddle, using a two-part epoxy glue compound.
 - With a pipe cutter, neatly and accurately cut out desired length of pipe for insertion of proper wye fitting using "Band Seal" or similar couplings to hold it firmly in place.
 - When a manhole is required to be installed on an existing main, a section of the main is to be removed and the new manhole is to be "spliced" into the line using mission couplings. The manhole is to be supplied with flexible manhole sleeves for connection to the main. A "doghouse" style manhole is not allowed.

- Connection to an Existing Manhole

A direct connection to an existing manhole is to be made by core drilling the manhole and connecting the new main to the manhole by use of a flexible manhole sleeve ("boot") or a concrete manhole adapter (Fermco concrete manhole adapter, or approved equal).

- Cleaning

In preparation for final inspection, all sanitary sewers shall be jet rod cleaned. Jet cleaning may also be required prior to testing.

- Unauthorized Connections

Connections to the sanitary sewer system with the following items shall not be permitted: down-spouts or roof drains; sump pumps; footing drains or drainage tiles; window wells or area drains; driveway drains, etc. No storm water or groundwater shall be allowed to enter the sanitary sewer system.
- TESTING
 - Testing of Sanitary Sewers

Testing for sanitary sewers for leakage will be witnessed by an Illinois-American representative or approved site inspector after all service connections have been stubbed to the property line. Infiltration, exfiltration or air pressure tests will be required at Illinois-American's discretion. Note that the sewer must be clean to the satisfaction of Illinois-American at the time of testing. If additional cleaning is required, the cost for this will not be borne by Illinois-American Water Company, and shall be paid by the contractor.

All sanitary sewers, including manholes, will be tested for leakage and shall satisfactorily meet the tests and requirements prior to acceptance of the work. Illinois-American or approved site inspector may order leakage tests made on sections of sewer as they are completed. Right is reserved to order the tests performed before back fill is placed over the pipe joints.

The Developer / Contractor shall furnish all labor, testing materials, and equipment (such as plugs and standpipes) and shall perform the tests described herein under the supervision and to the satisfaction of Illinois-American. There are five tests which will be employed for gravity sewers:

 - Infiltration test, exfiltration test or air pressure test
 - Deflection testing for thermoplastic pipe
 - Sonar Televising
 - Manhole vacuum test
 - Air Pressure Tests

The section of sewer to be tested shall have been trench back filled and cleared. The sewer pipe shall be pressurized to 5 PSIG above the average back pressure of groundwater over the sewer pipe and the air pressure allowed to stabilize for at least two minutes.

After the stabilization period, the line shall be pressurized to 3.5 PSIG and the time, in minutes, measured for a pressure drop to 2.5 PSIG. If ground-water is present, the air pressure within shall be increased to 3.5 PSIG above the level of the groundwater at the highest elevation of the sewer and the drop of one pound of air pressure measured in minutes (2.31 ft. of water = 1 PSIG).

Air leakage test results shall not be less than the time per inch of pipe diameter per length of sewer pipe as specified in the table entitled "Air Test Table" as shown in Standard Specifications for Water and Sewer Main Construction in Illinois, and as shown within the standard details.

The Developer / Contractor shall furnish all labor, testing materials, and equipment (such as plugs and standpipes) and shall perform the tests described herein under the supervision and to the satisfaction of Illinois-American. There are five tests which will be employed for gravity sewers:

- Infiltration test, exfiltration test or air pressure test
- Deflection testing for thermoplastic pipe
- Sonar Televising
- Manhole vacuum test

- Air Pressure Tests

The section of sewer to be tested shall have been trench back filled and cleared. The sewer pipe shall be pressurized to 5 PSIG above the average back pressure of groundwater over the sewer pipe and the air pressure allowed to stabilize for at least two minutes.

After the stabilization period, the line shall be pressurized to 3.5 PSIG and the time, in minutes, measured for a pressure drop to 2.5 PSIG. If ground-water is present, the air pressure within shall be increased to 3.5 PSIG above the level of the groundwater at the highest elevation of the sewer and the drop of one pound of air pressure measured in minutes (2.31 ft. of water = 1 PSIG).
- Infiltration Test

This test may be used only when groundwater levels are at least 2.0 feet above the crown of the pipe for the entire length of the section to be tested during the entire period of the test. Groundwater levels may be measured in an open trench, in standpipes previously placed in back filled trenches during the back filling operations, or with piezometers installed in the manhole wall. Infiltration through joints shall be measured by using a watertight weir or any other approved device for volumetric measurement installed at the lower end of the section under the test.

The maximum allowable rate of infiltration shall not exceed 100 gallons per twenty-four (24) hours per mile per inch diameter of the sewer pipe, for any section of the system.

Manholes will be tested by saturating the soil around the manhole. Test will be satisfactory if there are no visible leaks.
- Deflection Testing for Flexible Thermo-Plastic Pipe

The entire length of the main shall be tested for excessive deflection by pulling a "Go-No-Go" mandrel through the main from manhole to manhole.

Whenever possible and practical, the testing shall initiate at the downstream line and proceed toward the upstream lines.

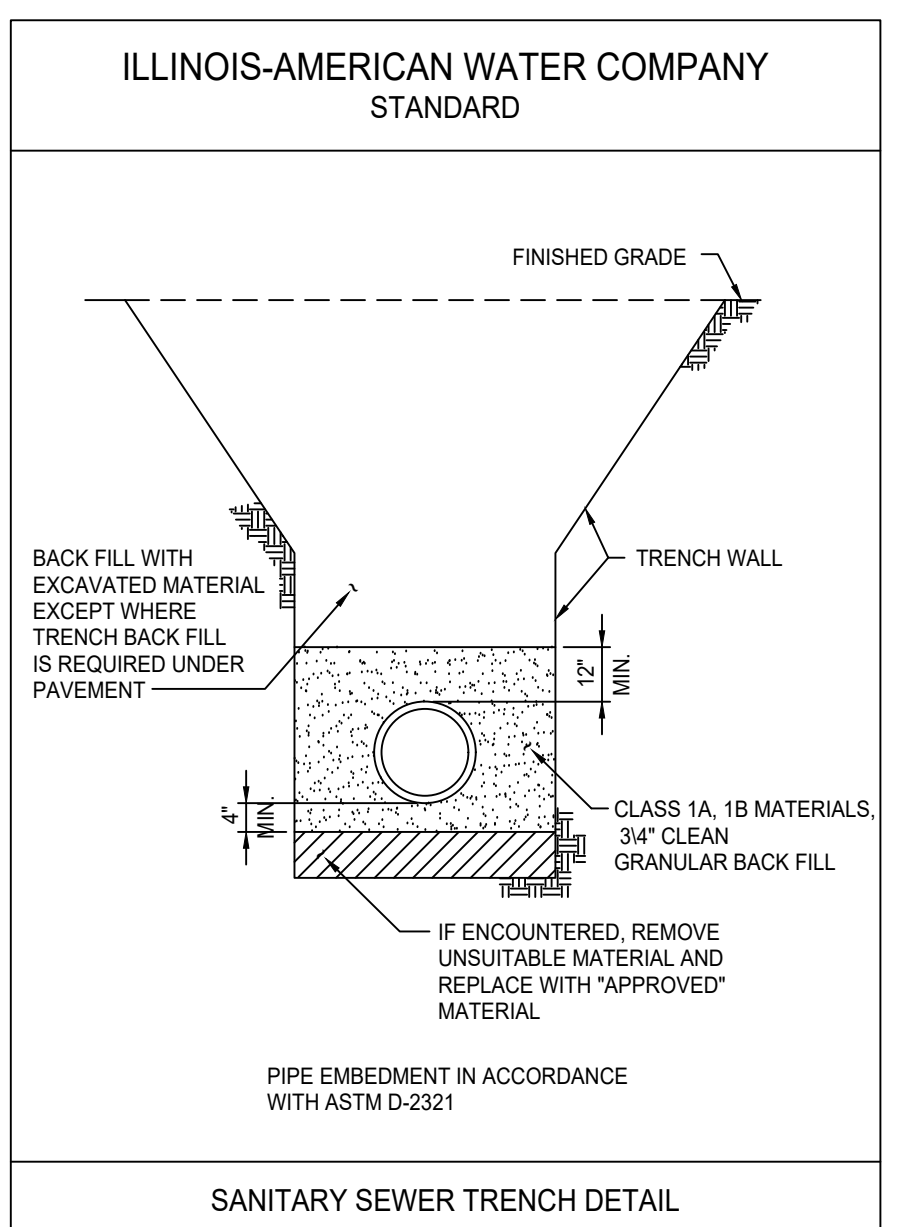
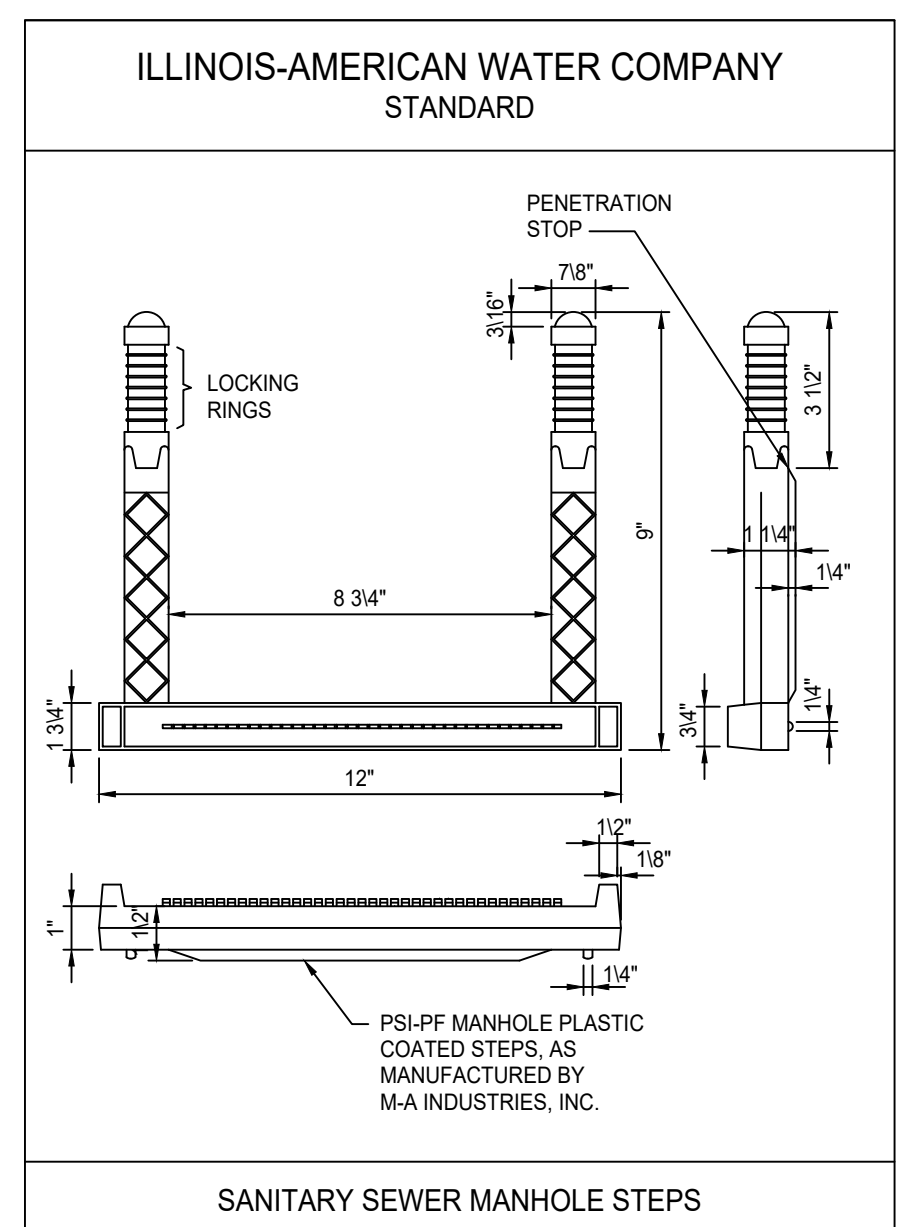
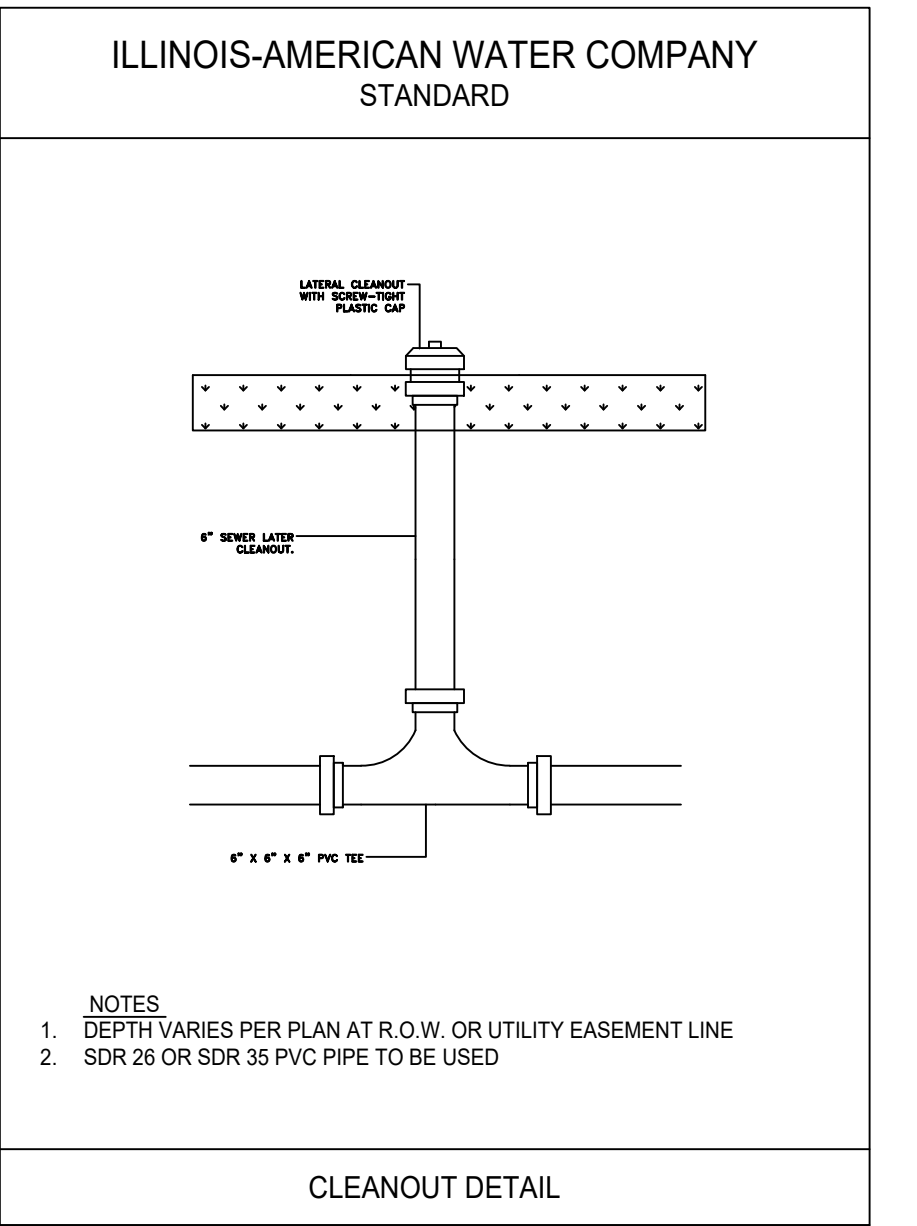
Where deflection is found to be in excess of the allowable testing limits, the developer shall excavate the point of excess deflection and carefully compact around the point where the deflection was found. The line shall then be retested for deflection. However, after the initial testing, should the deflected pipe fail to return to the original size (inside diameter) the line shall be replaced.

The deflection limits for flexible pipes shall not exceed 5% of the "Base I.D." of the pipe. A period of time will be required for the trench and pipe to come to equilibrium before the deflection test is performed. In all sewer systems the deflection test shall be performed no sooner than 30 days after the trench is back filled over the pipe.

- Televising

The Contractor shall produce a record video using a pan-and-tilt, radial viewing, pipe inspection camera that pans 275 degrees and rotates 360 degrees. The television camera used for the inspection shall be specifically designed and constructed for such inspection. The camera shall be operative in 100% humidity conditions. The Contractor shall use a camera with an accurate footage counter which displays on the monitor the exact distance of the camera from the centerline of the starting manhole. The Contractor shall use a camera with camera height adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe being televised. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. A reflector in front of the camera may be required to enhance lighting in dark or large diameter pipe. The video camera shall be capable of showing on the tape the City name, Project name, Contractor name, date, line size and material, line identification (plan manhole numbers at both ends) and ongoing footage counter. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Owner; and if unsatisfactory, equipment shall be removed and replaced with adequate equipment. DVD video shall be supplied for all television surveys. All videos shall be submitted to the Owner and will become the property of the Owner. Videotapes shall be labeled with the above referenced information. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 15 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. During the internal inspection, the television camera shall be temporarily stopped at each defect along the line. The nature and location of the defect shall be recorded by the Contractor. The camera shall also be stopped at all service connections and identified by address or lot number. The camera operator shall slowly pan and tilt at beginning and ending manhole connections, each service connection, joints, visible defects and at pipe material transitions. TV inspection shall be continuous for pipe segments between manholes. Do not leave gaps in the video of a segment between manholes and do not show a single segment on more than one video, unless specifically approved by the Owner. The purpose of recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. Video recordings shall include an audio track recorded by the inspection technician during the actual inspection work describing the parameters of the line being inspected (i.e. location, depth, diameter, pipe material), as well as describing connections, defects and unusual conditions observed during the inspection.
- Manhole Testing

Vacuum testing of each manhole shall be carried out immediately after assembly, after all connections are made, and prior to backfilling. All lift holes shall be plugged with an approved non-shrink grout. No grout will be placed in the horizontal joints before testing. All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole. The test head shall be placed at the inside of the top of the frame and the seal inflated in accordance with the manufacturer's recommendation. If using a "plate" style manhole tester, position the plate on the frame. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, that time shall be measured for the vacuum to drop to 9 inches. The manhole shall pass if the time is greater than 60 seconds for a 48" diameter manhole, 75 seconds for a 60" manhole and 90 seconds for a 72" manhole. If the manhole fails the test, complete necessary repairs and repeat test procedures until a satisfactory test is obtained.



ILLINOIS-AMERICAN WATER COMPANY STANDARD

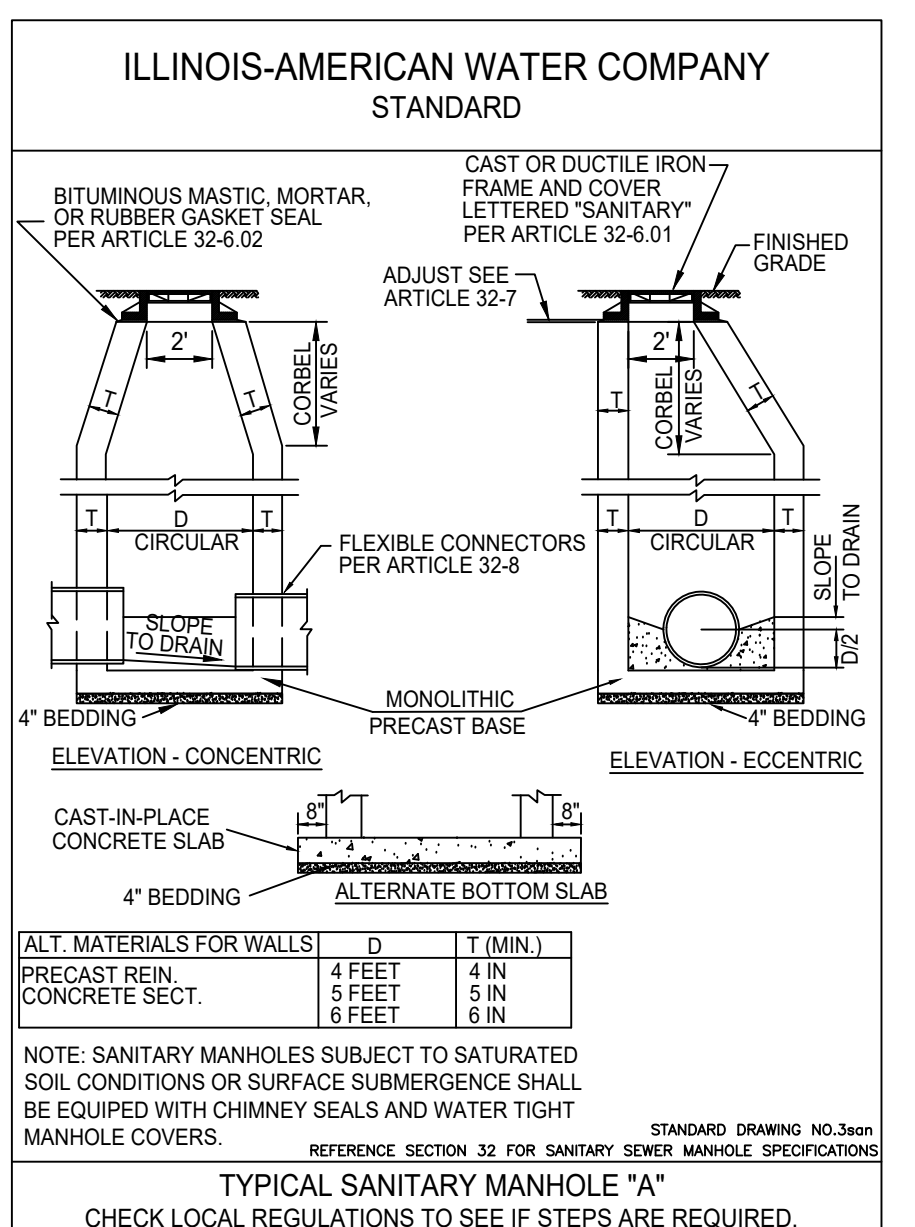
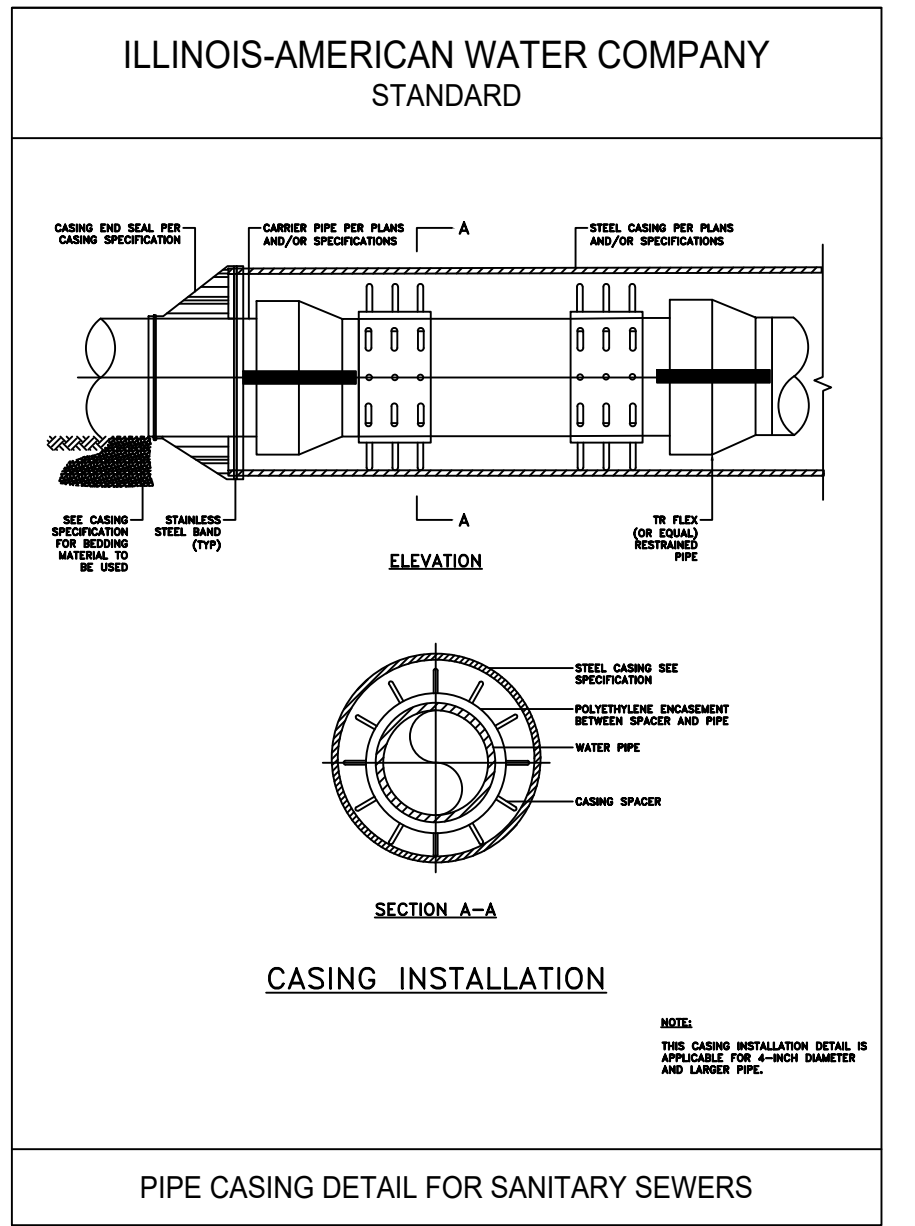
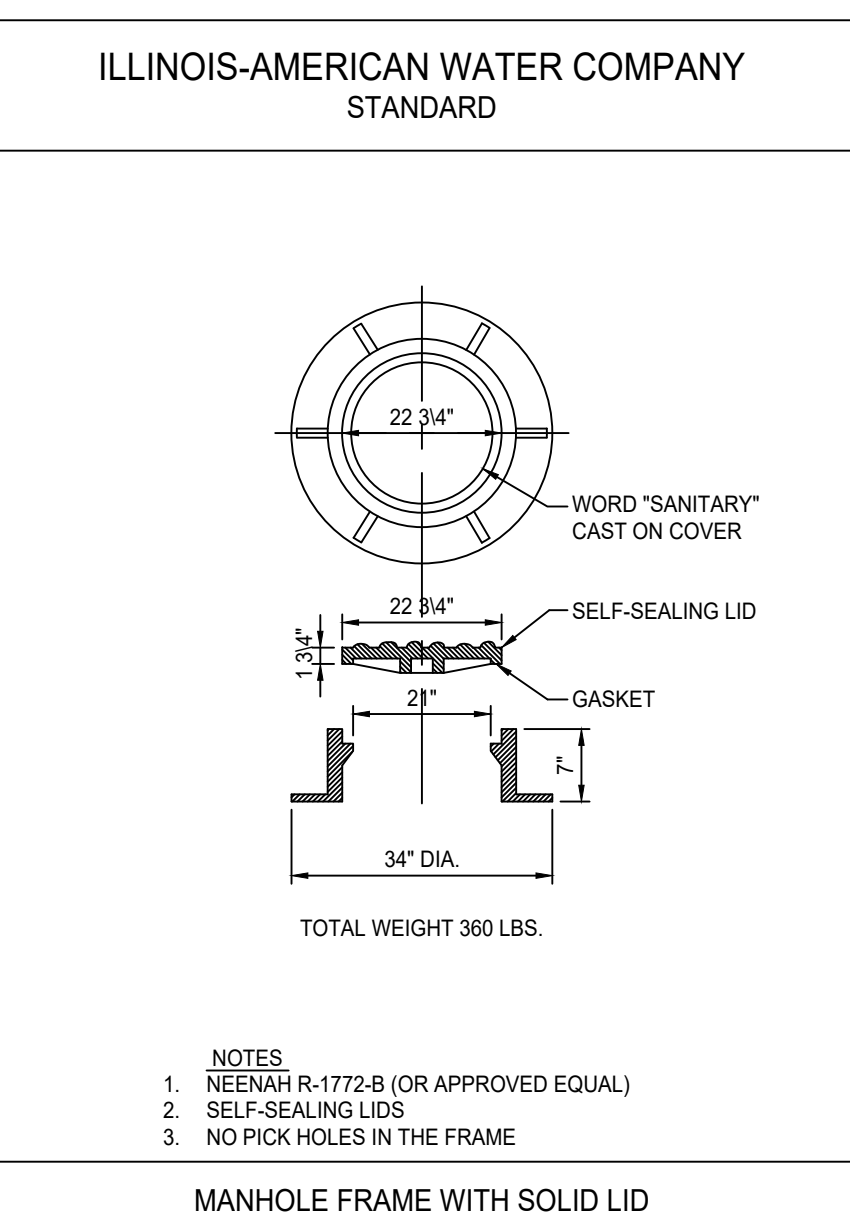
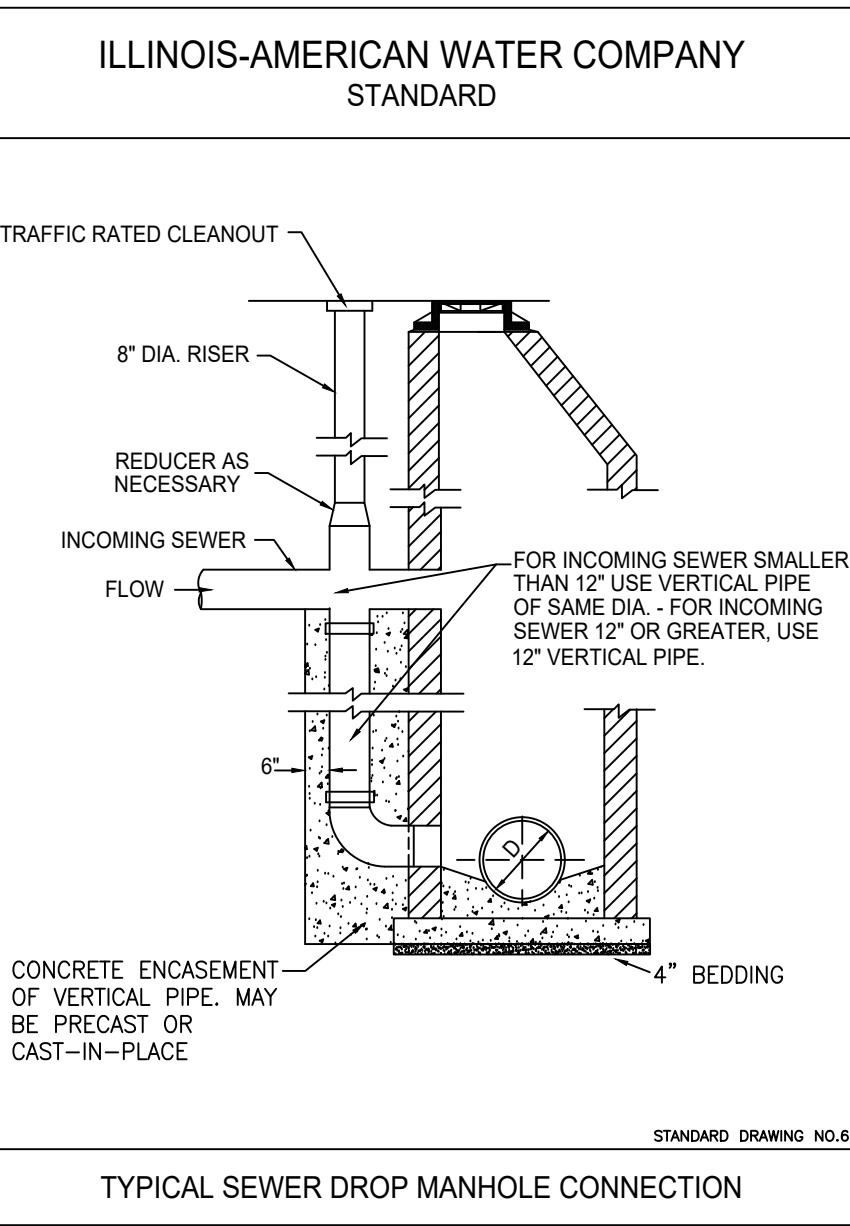
BASED ON EQUATIONS FROM ASTM C828 SPECIFICATION TIME (MIN. SEC) REQUIRED FOR PRESSURE DROP FROM 3 1/2 TO 2 1/2 PSIG WHEN TESTING ONE PIPE DIAMETER ONLY

PIPE DIAMETER, INCHES	PIPE DIAMETER, INCHES											
	4"	6"	8"	10"	12"	15"	18"	21"	24"			
25	0.04	0.10	0.18	0.28	0.40	1.02	1.29	2.01	2.38			
50	0.09	0.20	0.35	0.55	1.19	2.04	2.96	4.03	5.17			
75	0.13	0.30	0.53	1.23	1.59	3.06	4.27	6.04	7.55			
100	0.18	0.40	1.10	1.50	2.38	4.08	5.56	8.05	10.34			
125	0.22	0.50	1.28	2.18	3.18	5.09	7.26	9.55	11.20			
150	0.26	0.59	1.46	2.45	3.59	6.11	8.30					
175	0.31	1.09	2.03	3.13	4.37	7.05						
200	0.35	1.19	2.21	3.40	5.17					12.06		
225	0.40	1.29	2.38	4.08	5.40					10.25	13.36	
250	0.44	1.39	2.56	4.35			8.31	11.35	15.07			
275	0.48	1.49	3.14	4.43			9.21	12.44	16.38			
300	0.53	1.59	3.31				10.12	13.53	18.09			
350	1.02	2.19	3.47			8.16	11.54	16.12	21.10			
400	1.10	2.38			6.03	9.27	12.36	18.31	24.12			
450	1.19	2.50			6.48	10.38	15.19	20.50	27.13			
500	1.28				5.14	7.34	11.49	17.01	23.09	30.14		

DEFLECTION CRITERIA

DIAMETER	BASE I.D. PER UNIBELL	5% MANDREL O.D.
6 IN.	5.79 IN.	5.50 IN.
8 IN.	7.76 IN.	7.37 IN.
10 IN.	9.71 IN.	9.23 IN.
12 IN.	11.56 IN.	10.98 IN.
15 IN.	14.14 IN.	13.43 IN.

SANITARY SEWER MAIN AIR TEST TABLE



PROJECT
**E. ALPHA STREET
 STO. AND SAN. SEWER EXTENSION**

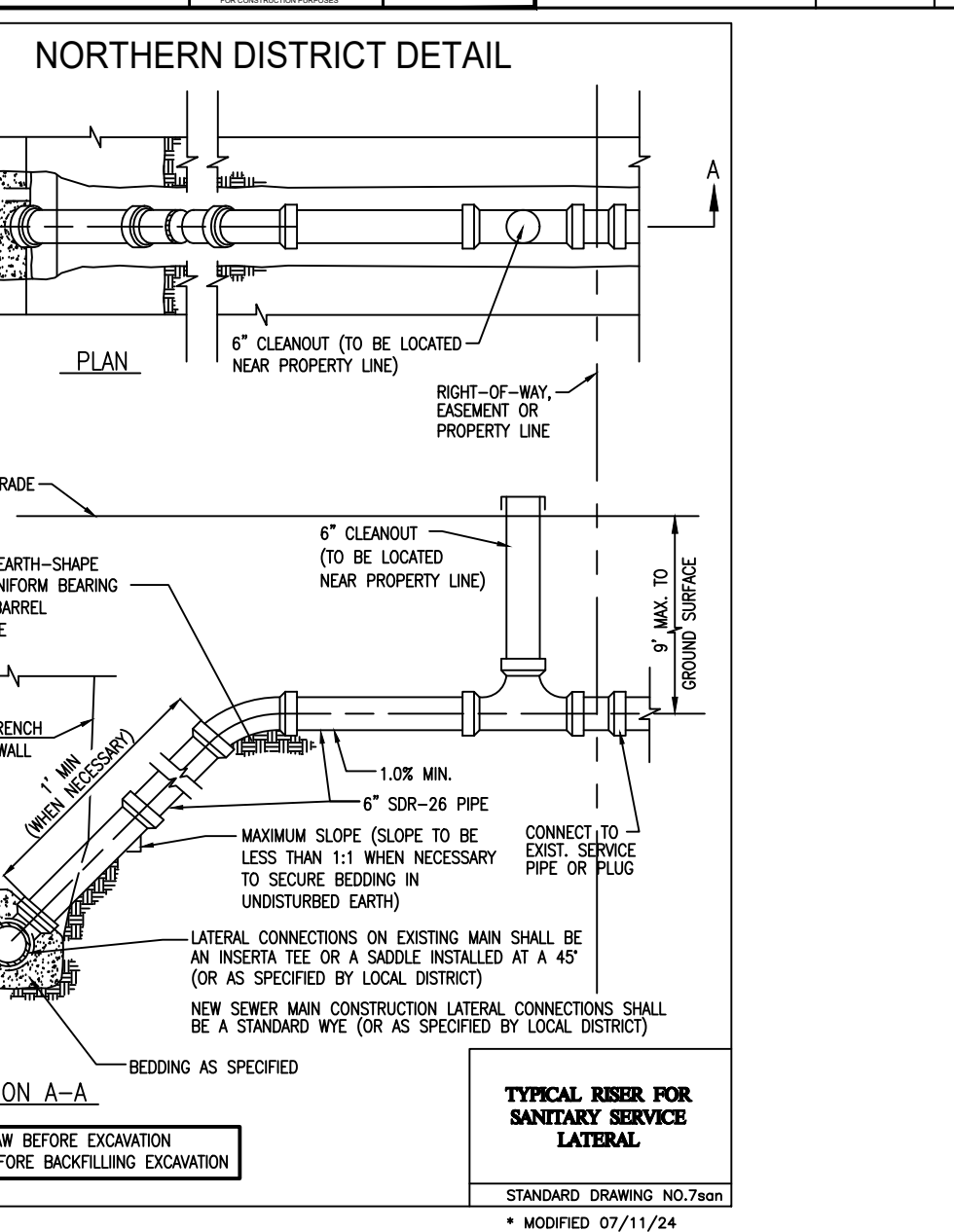
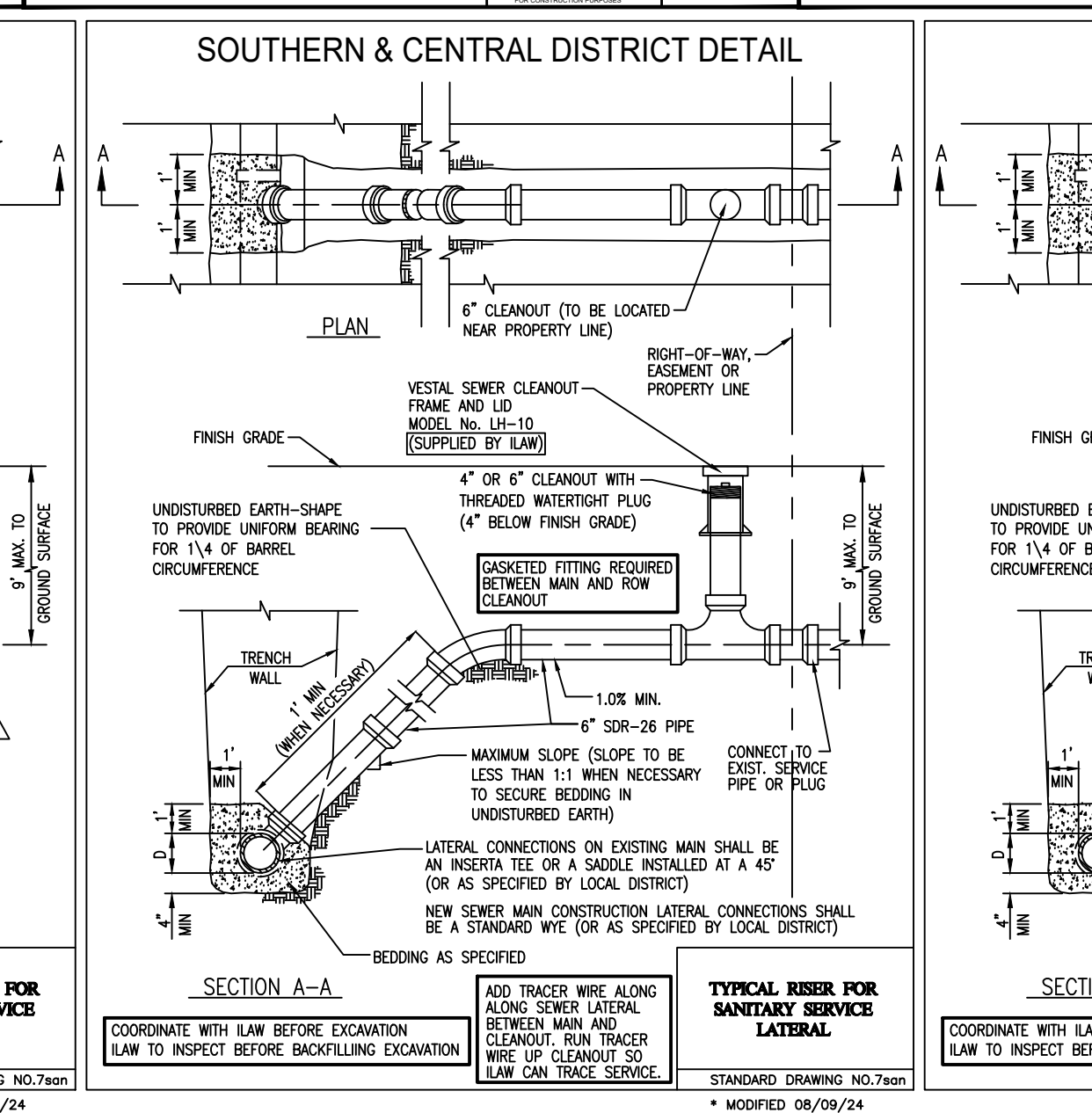
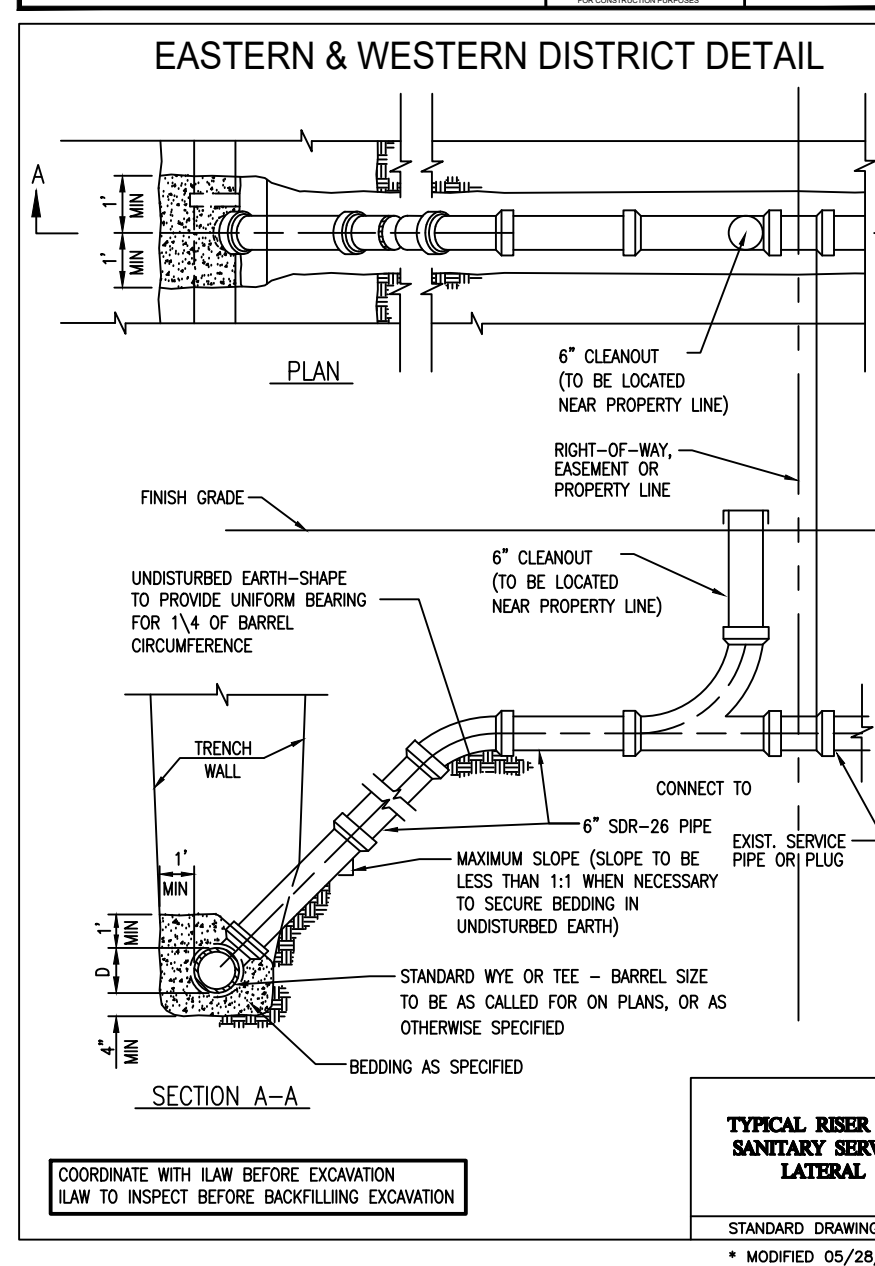
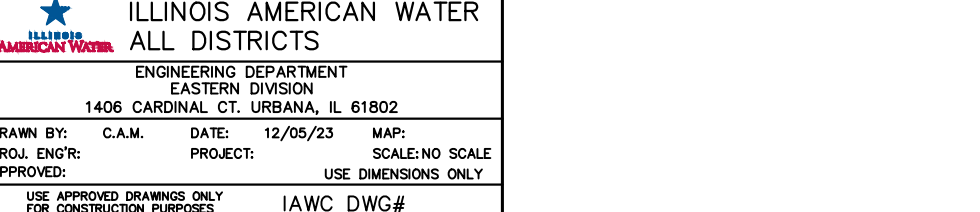
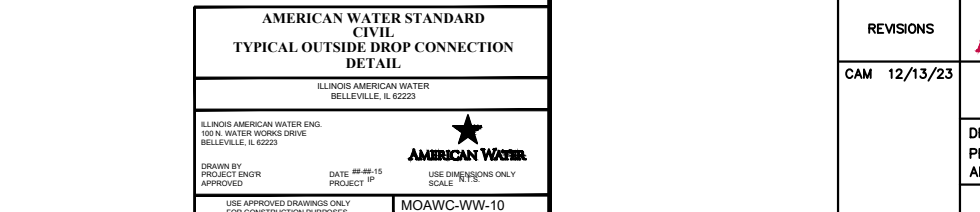
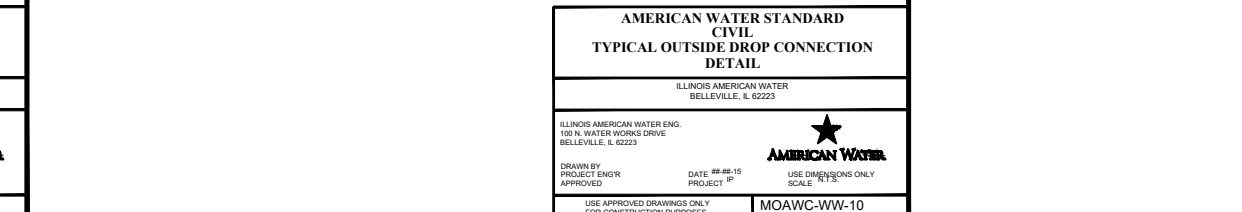
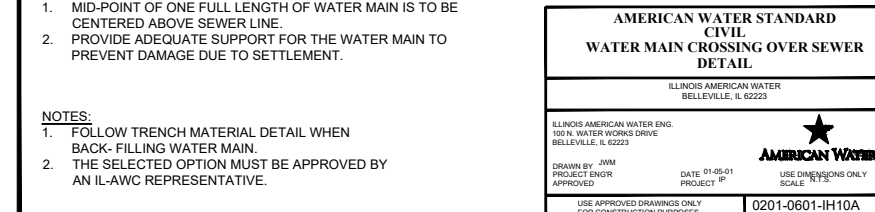
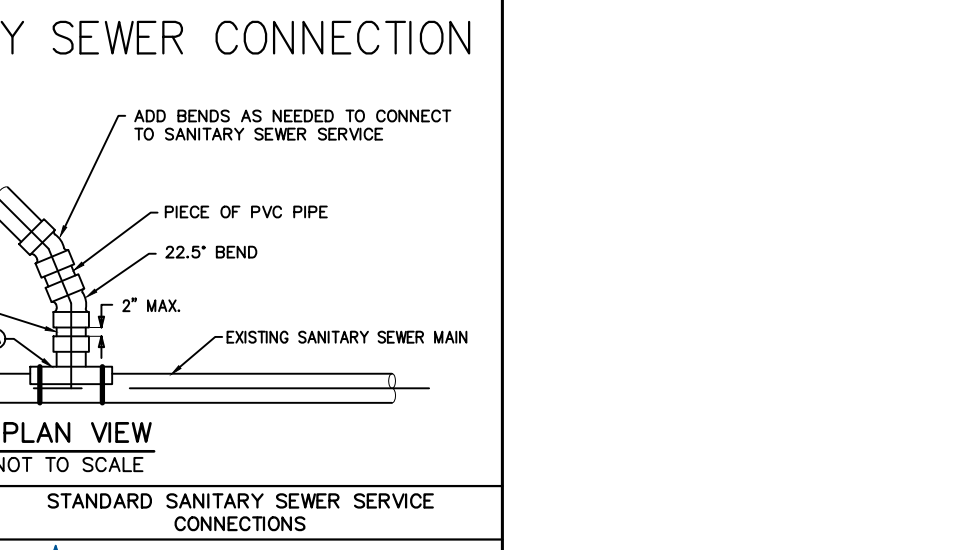
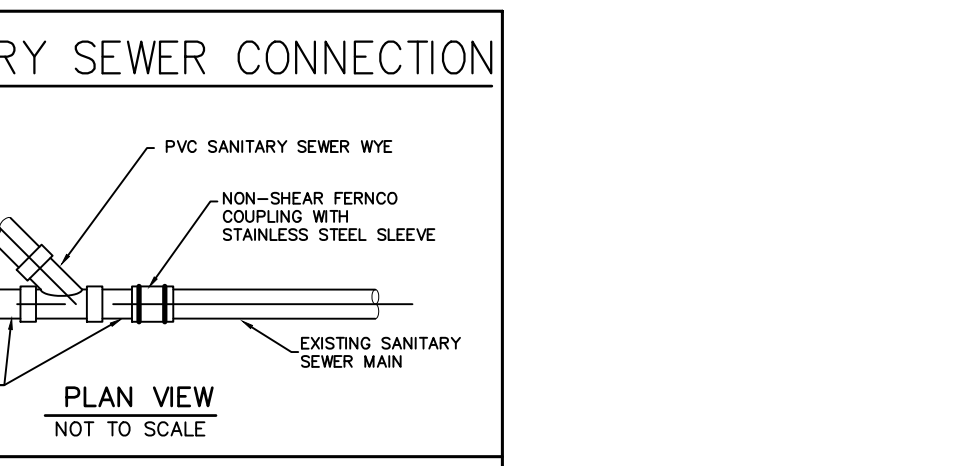
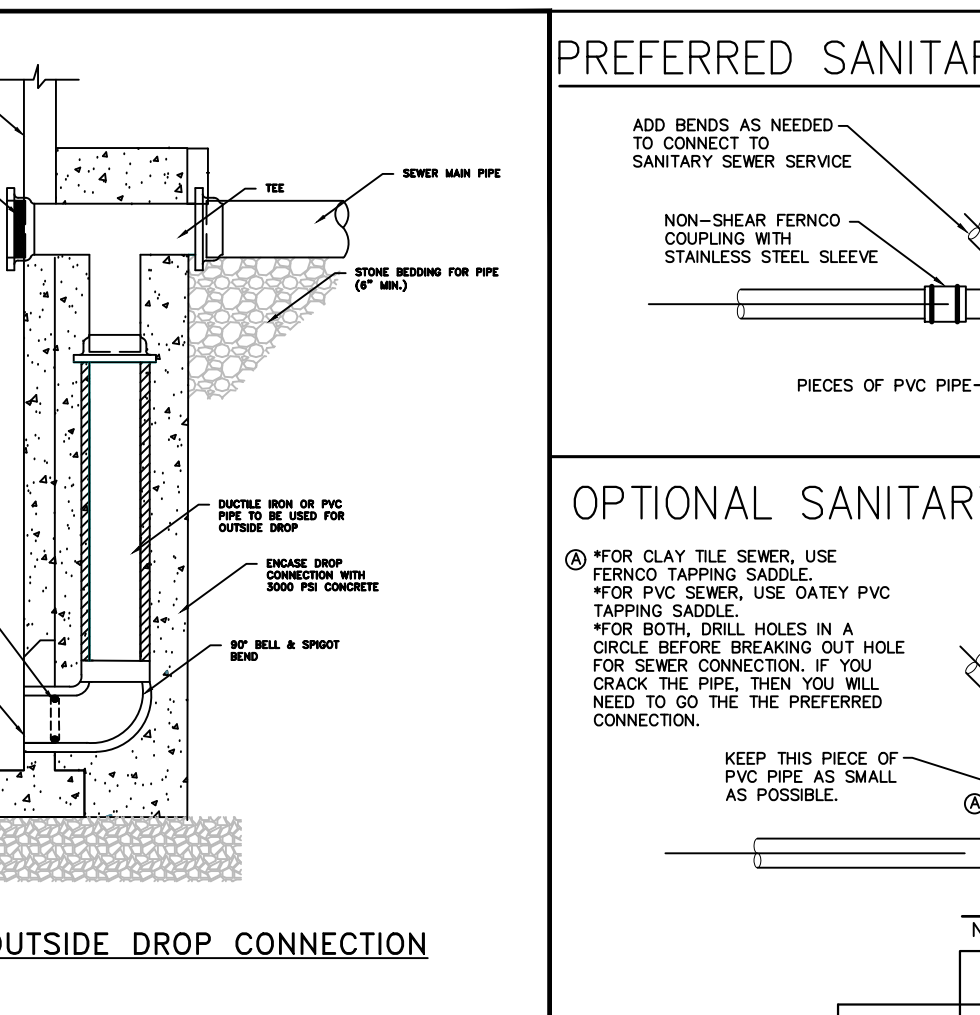
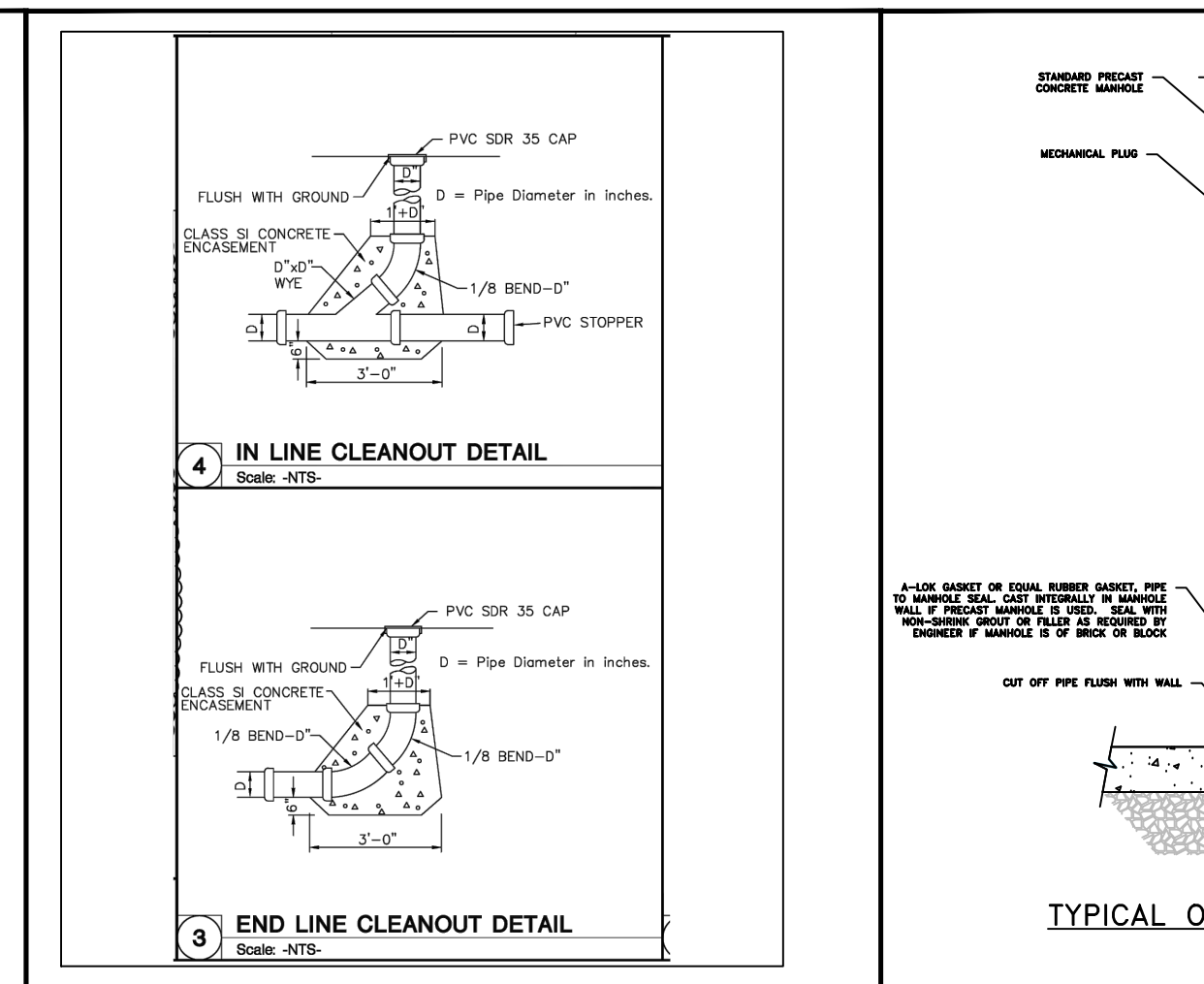
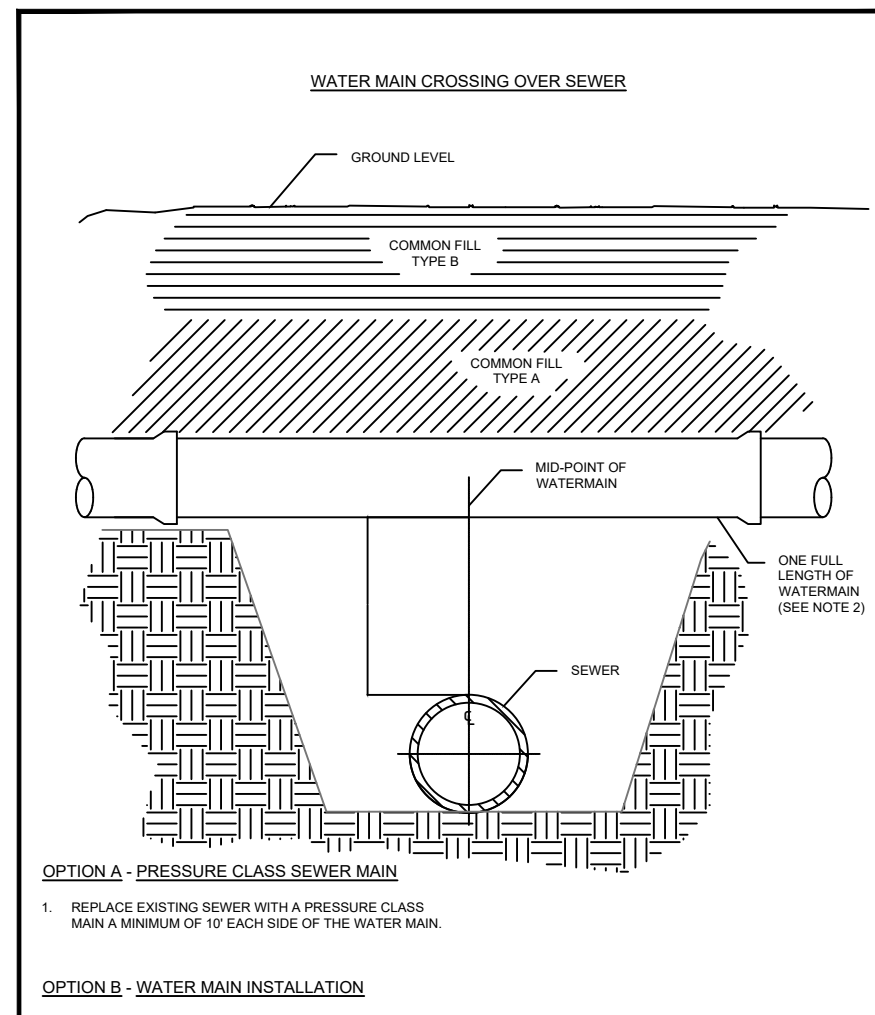
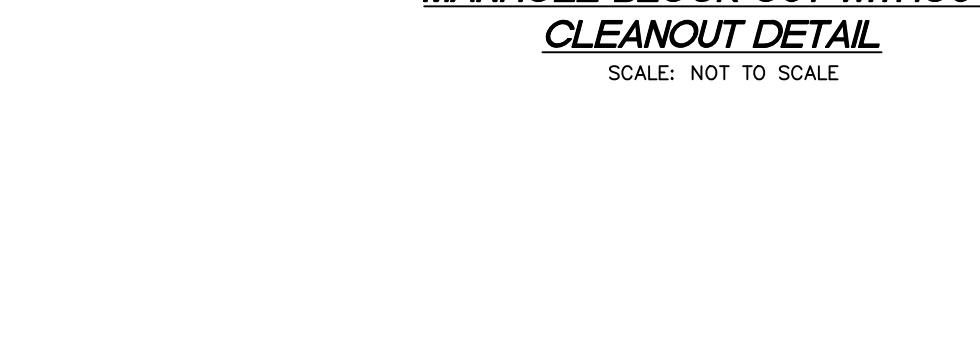
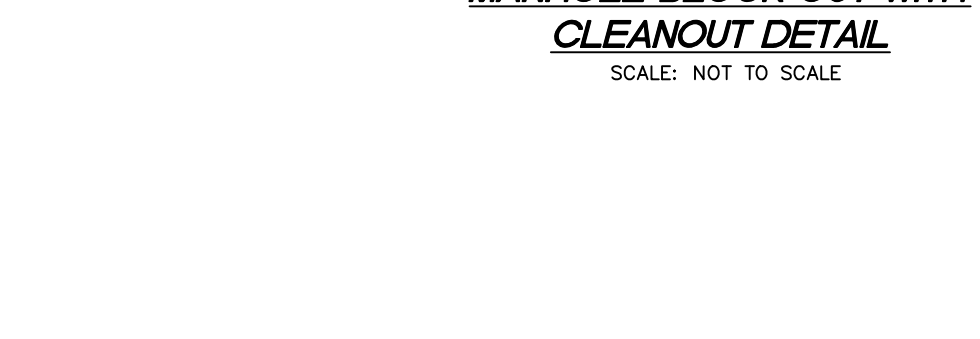
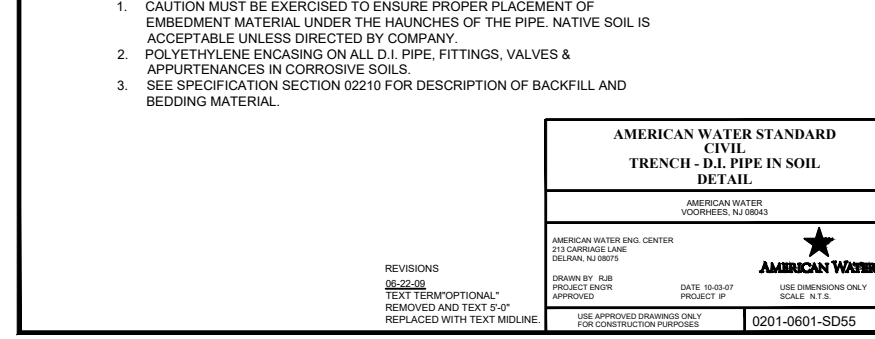
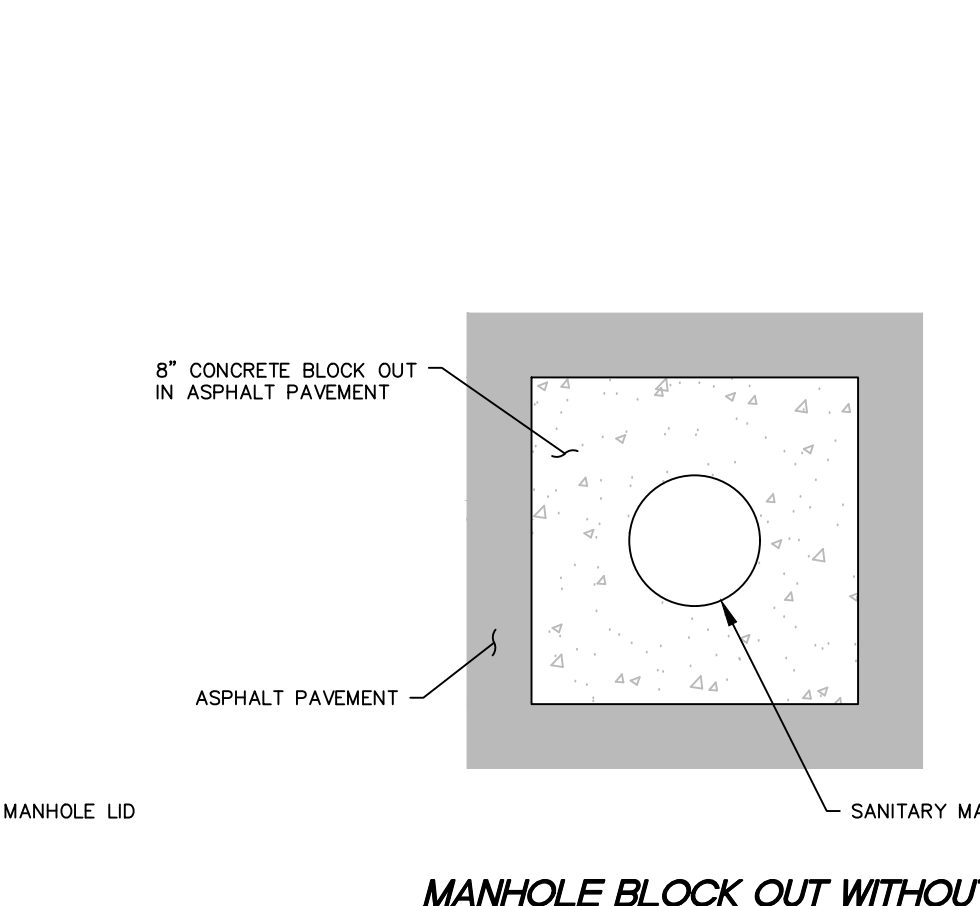
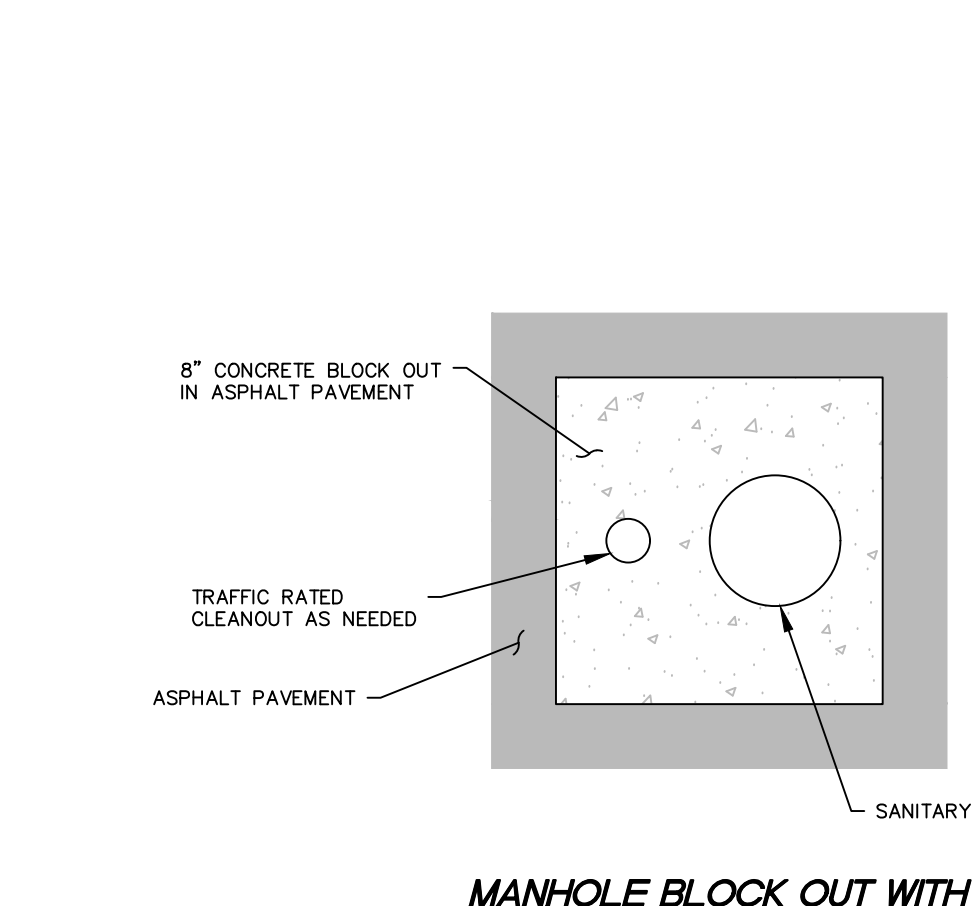
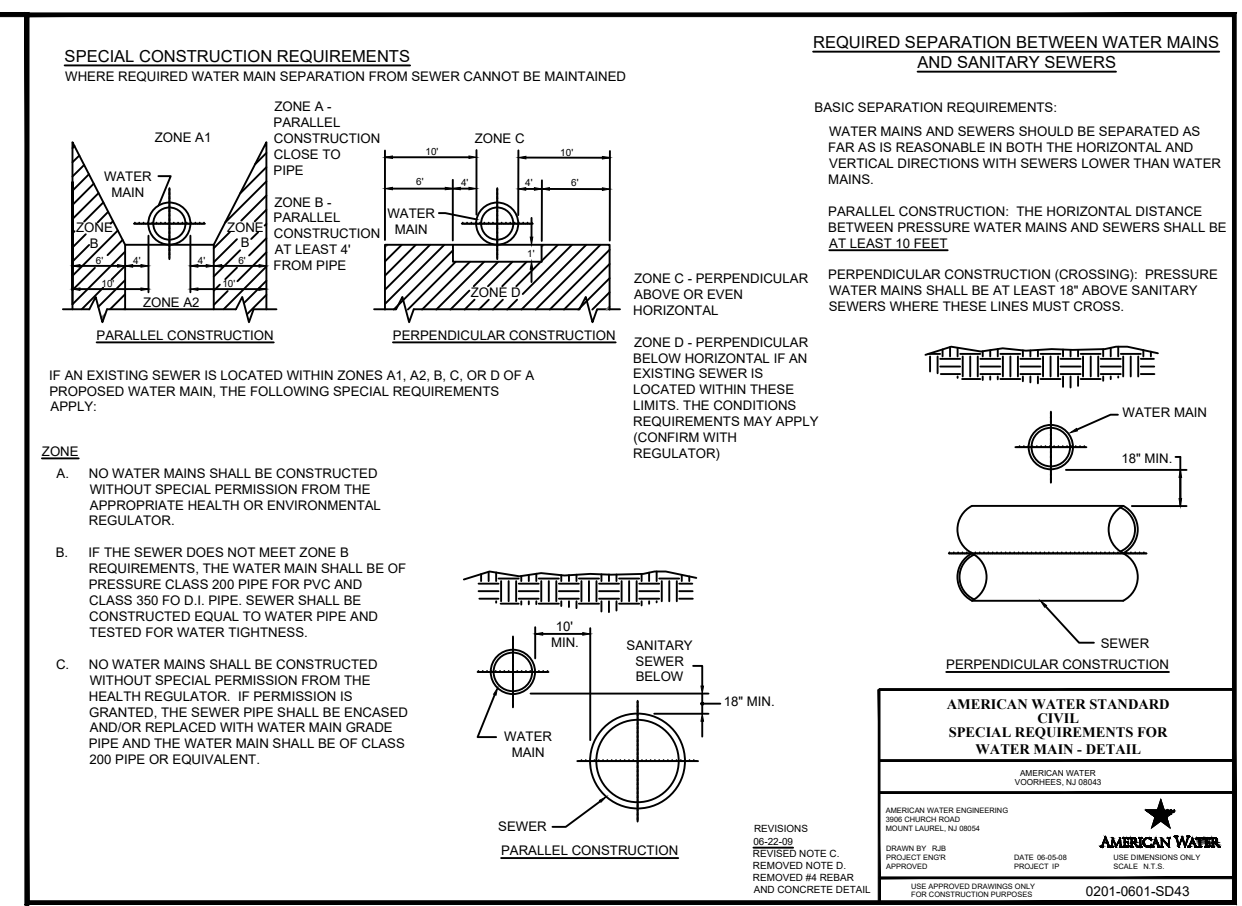
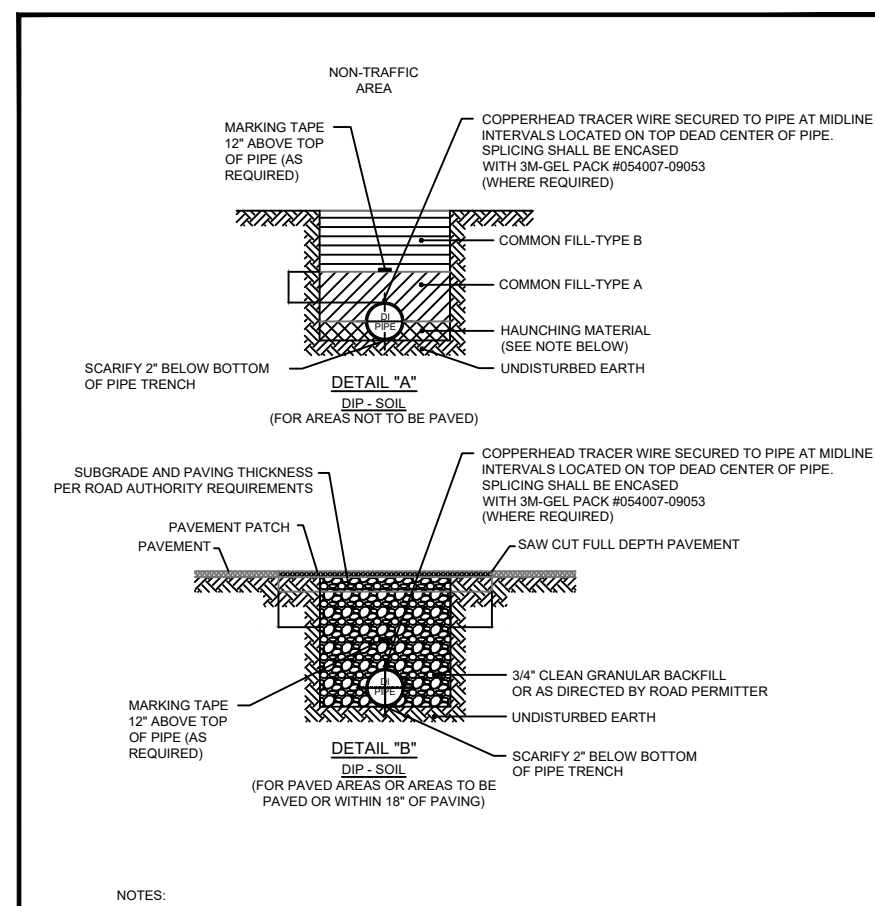
CITY
XXXXX DISTRICT

NO.	DATE	INIT.	REVISIONS
	12/18/23	CAM	ADDED SAN. SEWER SERVICE DETAIL
	08/09/24	CAM	ADDED SAN. SEWER LATERAL DETAILS

ENGINEERING DEPARTMENT
 201 DEVONSHIRE DRIVE
 CHAMPAIGN, IL 61820

ILLINOIS AMERICAN WATER

FILE NO. xx
 JOB NO. xxx
 DATE 06/22/22
 DRAWN BY CAM
 APP. BY
 SCALE AS SHOWN
 XREF xxx
 SHEET 7 OF 8



PROJECT
**E. ALPHA STREET
 STO. AND SAN. SEWER EXTENSION**
 CITY
XXXXX DISTRICT
 DISTRICT

NO.	DATE	INIT.	REVISIONS
	12/18/23	CAM	ADDED SAN. SEWER SERVICE DETAIL
	08/09/24	CAM	ADDED SAN. SEWER LATERAL DETAILS

NO.	DATE	INIT.	REVISIONS

ENGINEERING DEPARTMENT
 201 DEVONSHIRE DRIVE
 CHAMPAIGN, IL 61820



FILE NO.	xx xxx
JOB NO.	xxx
DATE	06/22/22
DRAWN BY	CAM
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SCALE	AS SHOWN
XREF	xxx
SHEET	8 OF 8