

SECTION 01016 – WATER MAINS NEAR SEWERS

PART 1 - GENERAL

1.01 SUMMARY

This section covers the required separation, horizontal and vertical, of water mains from any existing or proposed sanitary sewer, sewer force main or storm sewer. The horizontal separation shall be ten feet (10') and the vertical separation shall be eighteen inches (18"). If this specification conflicts with other specifications, this specification shall govern. If this specification conflicts with Missouri's Code of State Regulations, the Code of State Regulations govern.

1.02 SPECIFICATION MODIFICATIONS

- A. It is understood that throughout this section these Specifications may be modified by appropriate items in Section 01015 – Specific Project Requirements, or as otherwise indicated on the Contract Drawings.

1.03 RELATED SECTIONS

- A. Section 01015 – Specific Project Requirements.
- B. Section 02618 – Ductile Iron Pipe for Water Mains.
- C. Section 02620 – Ductile Iron Pipe for Sewers.
- D. Section 02624 – PVC Gravity Sewer Pipe.

1.04 CODES AND STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. Missouri Code of State Regulations.
- C. American Society for Testing and Materials (ASTM):
 - D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
 - D2412 Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
 - D3034 Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - D3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
 - F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 - F679 Standard Specification for Type PSM Poly Vinyl Chloride (PVC).

1.05 DEFINITIONS

- A. Non-Potable Fluid Line: An existing or proposed pipeline that carries non-potable fluids such as, but not limited to drains, storm sewers, sanitary sewers, combined

sewers, sewer service connections, sanitary sewer force mains, process waste or product lines.

- B. Non-Potable Fluid Structure: An existing or proposed structure associated with a Non-Potable Fluid Line. Non-Potable Fluid Structures include, but are not limited to, sanitary sewer manholes, sanitary sewer pump stations, storm sewer inlets and storm sewer junction boxes.

1.06 INFORMATION PROVIDED BY THE CITY

- A. As provided in the contract documents.

1.07 SUBMITTALS

- A. Submit as specified in Section 01300 – Submittals.

1.08 QUALITY ASSURANCE

- A. The Contractor is responsible for the quality assurance and quality control of the Work.

1.09 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Follow the provisions for the delivery, storage and handling of products to and at the site as provided in Section 01000 – General Project Requirements.

PART 2 - PRODUCTS

2.01 PVC PIPE

- A. Sewers reconstructed using PVC pipe shall conform to Section 02624 – PVC for Gravity Sewers.

2.02 DUCTILE IRON PIPE

- A. Sewers reconstructed using ductile iron pipe shall conform to Section 02620 - Ductile Iron Pipe for Sewers. Joints shall be restrained push-on joints.

PART 3 - EXECUTION

3.01 SEPARATION REQUIREMENTS

- A. The Missouri Department of Natural Resources (MDNR) has established the minimum separation requirements between water distribution systems and potential sources of contamination such as Non-Potable Fluid Lines, Non-Potable Fluid Structures and Disposal Facilities.
- B. When ten foot (10') horizontal separation cannot be achieved, the strategy for protecting the water distribution system is to be shown on the Drawings. Eighteen inches (18") of vertical separation is required at all times.
- C. If the Contractor encounters conditions during construction for which the minimum requirements for separation cannot be met, then the work shall be stopped and the City's representative shall be notified. The strategy to protect the water distribution system shall be provided to the Contractor by the City.

3.02 PARALLEL INSTALLATION

A. Minimum Requirements:

1. Water mains shall be laid at least 10 feet horizontally, from any non-potable fluid line. The distance shall be measured from edge to edge.
2. An elevation difference shall be maintained such that the bottom of the water main is at least 18 inches above the top of the non-potable line while also meeting minimum cover requirements for the water main.

B. Conforming to Standards:

1. In cases where it is not possible to maintain a 10-foot horizontal separation, the City may allow alternative designs on a case-by-case basis consistent with the Code of State Regulations. The following minimum criteria shall be met:
 - (a) The water main shall be laid in a separate trench located as far away from the non-potable line as feasible. The water main shall be installed on an undisturbed earth shelf located on one side of the non-potable line so the bottom of the water main is at least eighteen inches (18") above the top of the sanitary sewer.
2. Alternatively, one or more of the following options may be required:
 - (a) The sewer main shall be reconstructed in accordance with paragraph 3.06 SANITARY SEWER RECONSTRUCTION.
 - (b) Casing pipe shall be installed so either the water line or the non-potable fluid line is cased in all areas until the horizontal separation requirement is achieved.
 - (i) The casing shall be installed so it is a continuous casing.
 - (ii) The casing pipe material shall be PVC C900 or ductile iron pipe as specified in PART 2 - PRODUCTS.
 - (c) The required length of sewer to be reconstructed or continuously cased shall be the length necessary to achieve the minimum 10 foot horizontal separation.

3.03 CROSSINGS

- A. Water mains that cross non-potable fluid lines shall be laid to provide a minimum vertical clear distance of 18 inches between the outside of the water main and the outside of the non-potable fluid line. This shall be the case where the water main is either above or below the non-potable fluid line.
- B. At crossings, one full length of water pipe shall be located or centered so both joints will be located as far as possible from the non-potable line.
- C. Additional requirements:
 1. When crossing under a non-potable fluid line, the following criteria shall also be met:
 - (a) The non-potable fluid line shall be reconstructed in accordance with paragraph 3.06 SANITARY SEWER RECONSTRUCTION.
 2. When crossing under a non-potable fluid line, one or more of the following criteria may also be required by the City/Design Professional:
 - (a) The water line shall be constructed using restrained joints. Installed in a casing pipe with casing spacers and end seals (see paragraph 3.07).
 - (b) Install casing pipe for non-potable fluid line (see paragraph 3.07):
 - (i) The casing shall be continuous.
 - (ii) The casing pipe material shall be AWWA C900 pressure pipe or ductile iron pipe as specified in PART 2 - PRODUCTS.

- (iii) The full length of casing pipe is to be located so each end of the casing is as far from the point of crossing as possible.

3.04 NON-POTABLE FLUID STRUCTURES

- A. No waterline shall be installed closer than 10 feet to any part of a sanitary or combined sewer manhole. For all other Non-potable Fluid Structures, the minimum separation shall be 18 inches.
- B. Conforming to Standards:
 - 1. Where the horizontal separation cannot be obtained, the waterline shall be constructed of mechanical or manufactured restrained joint pipe or cased in a continuous casing. Casing pipe must be a material that is approved for use as water main.
 - 2. The full length of water pipe shall be located so both joints will be as far from the manhole as possible, but in no case less than 10 feet or centered on a nominal 20-foot pipe.
- C. No water pipe shall pass through or come into contact with any part of a Non-Potable Structure.

3.05 DISPOSAL FACILITIES

- A. No water main shall be located closer than 25 feet to any wastewater disposal facility, agricultural waste disposal facility, or landfill.
- B. Water mains shall be separated by a minimum of 25 feet from septic tanks and wastewater disposal areas such as cesspools, subsurface disposal fields, pit privies, land application fields, and seepage beds.
- C. All such disposal facilities shall be noted on the Drawings.

3.06 SANITARY SEWER RECONSTRUCTION

- A. The paragraph applies to the installation of potable water lines crossing under non-potable fluid lines with the eighteen inches (18") of vertical clearance.
- B. As indicated on the Drawings, specified in Section 01015 – Specific Project Requirements, or as otherwise directed by the City, the Contractor shall reconstruct the non-potable fluid line using mechanical or manufactured restrained joint pipe, or fusion welded pipe meeting the following criteria:
 - 1. Pipe material shall be PVC or ductile iron pipe as specified in PART 2 – Products.
 - 2. Install as specified herein and in accordance with drawing No. 01016-1, Sewer Crossing Detail.

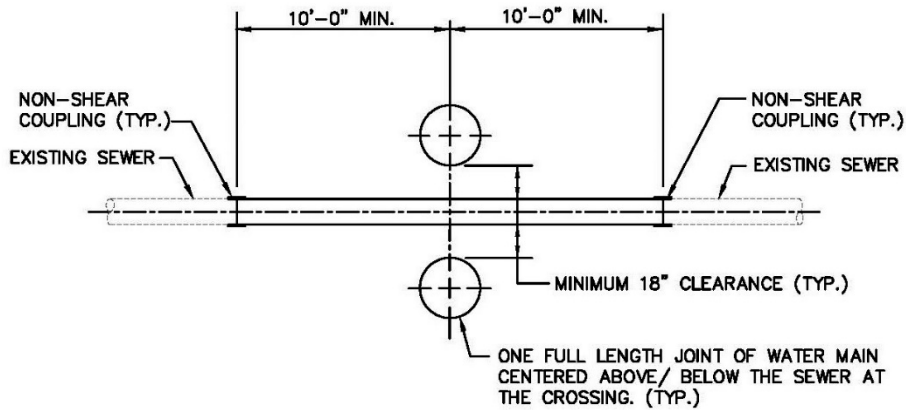
3.07 CASINGS FOR PIPE CROSSINGS

- A. The casing pipe material shall be C900/C905 PVC.
- B. The full length of casing pipe shall be located so both joints will be as far from the non-potable pipeline as possible, but in no case less than 10 feet or centered on a nominal 20-foot pipe.
- C. See section 02320 – Utility Casings for casing spacer and casing end seal requirements.

3.08 CONCRETE ENCASEMENT

- A. Conventional poured concrete encasement is not allowed.

Drawings 01016-1 through 01016-5 are on the following five pages.



ELEVATION
NOT TO SCALE

NOTES:

1. IF THE WATER MAIN CROSSES BELOW THE SEWER, THE SEWER SHALL BE REPLACED WITH PVC OR DIP.
2. PVC PIPE SHALL CONFORM TO 02624 PVC GRAVITY SEWER PIPE, DIP SHALL CONFORM TO 02620 DIP FOR SEWERS.

SEWER CROSSING DETAIL

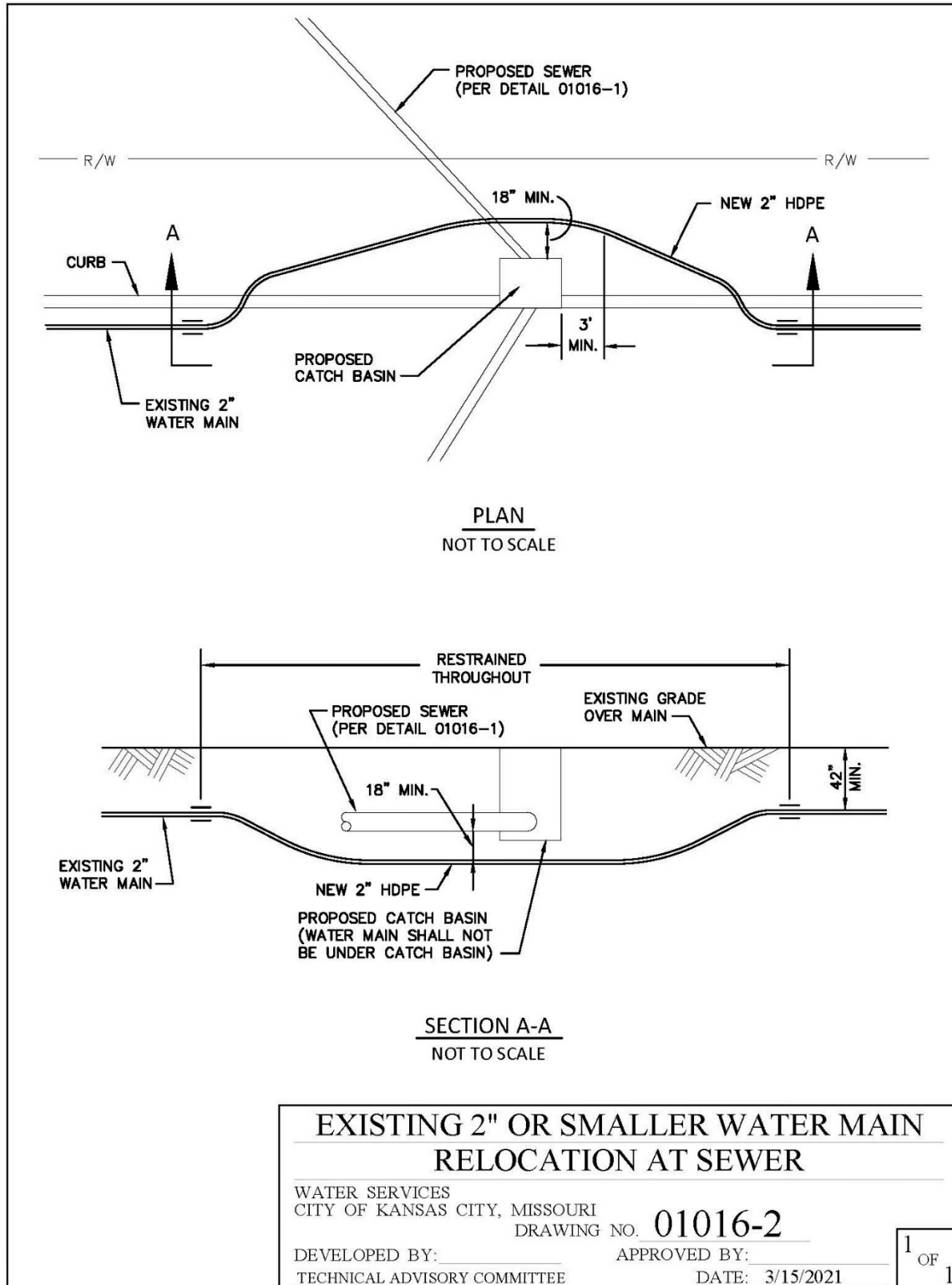
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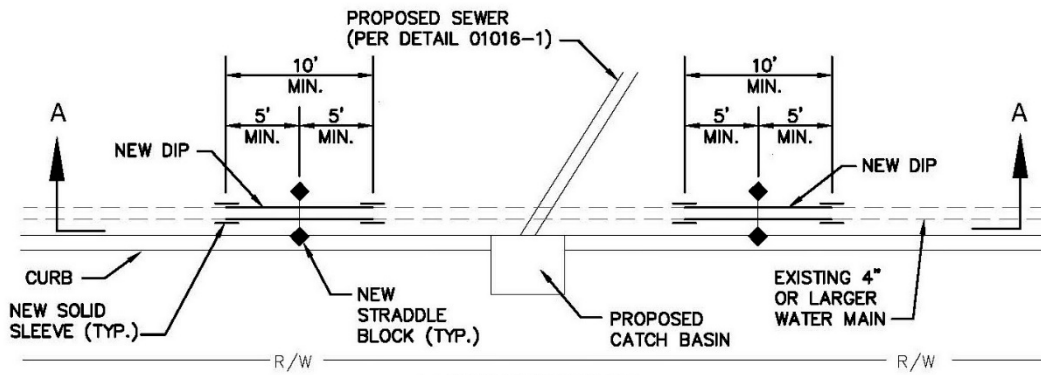
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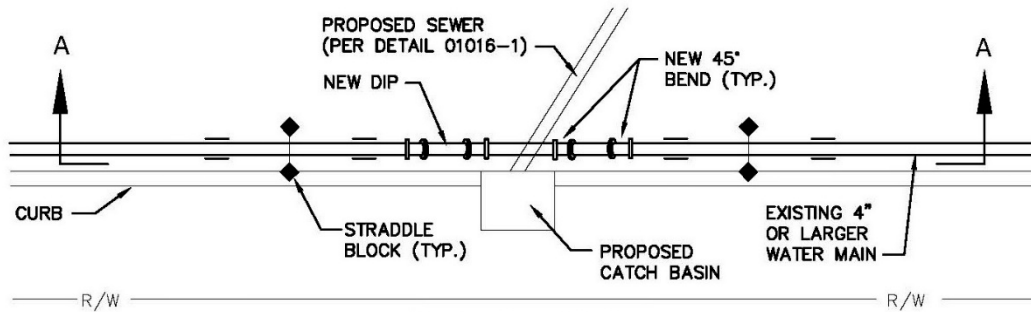
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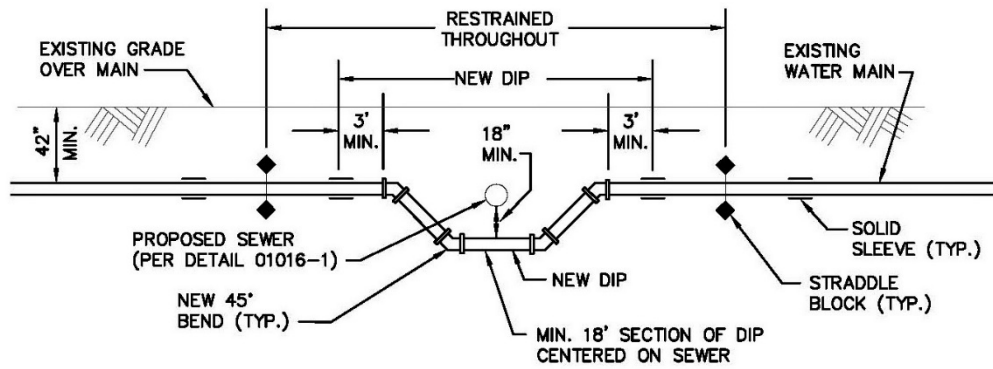


TEMPORARY PLAN



PERMANENT PLAN

NOT TO SCALE
RESTRAIN ALL JOINTS



SECTION A-A

NOT TO SCALE

EXISTING 4" OR LARGER WATER MAIN VERTICAL RELOCATION AT SEWER

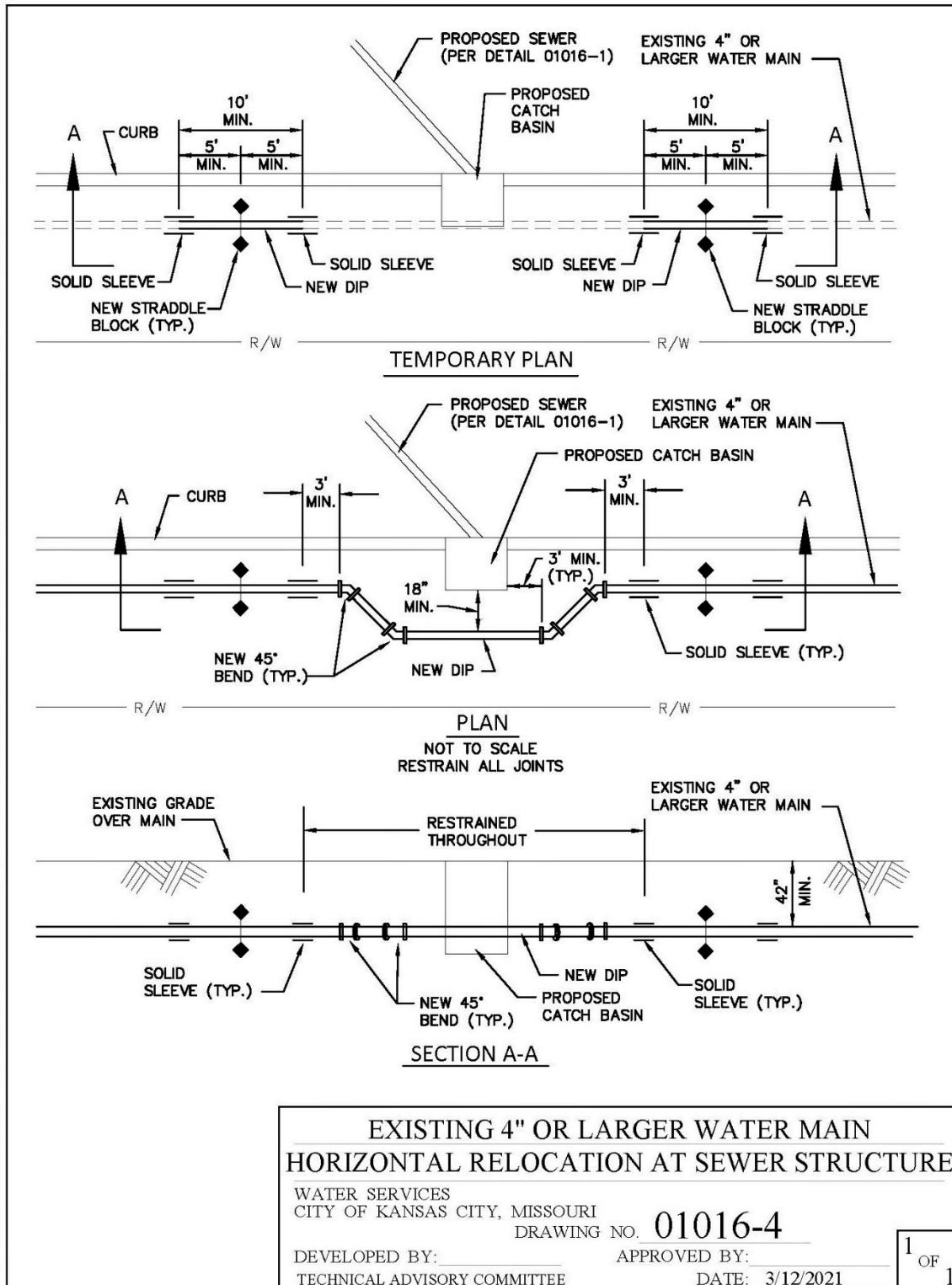
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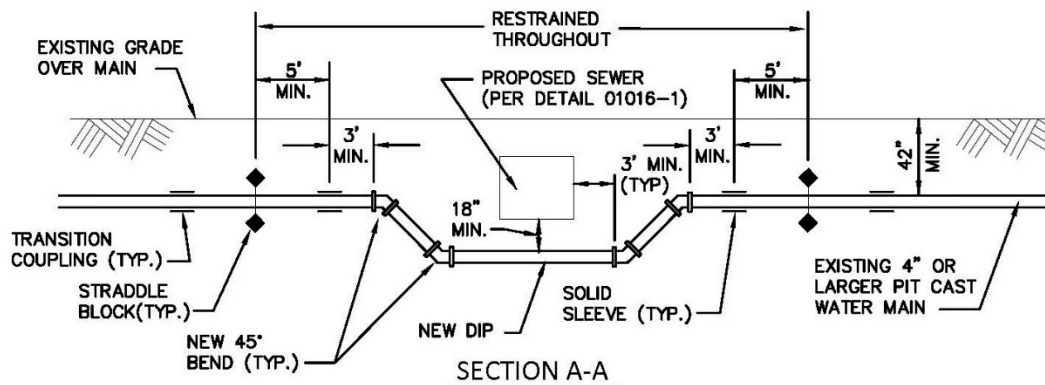
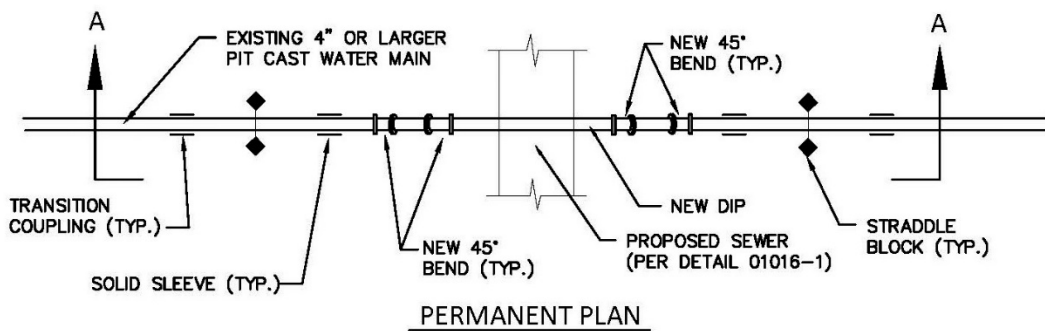
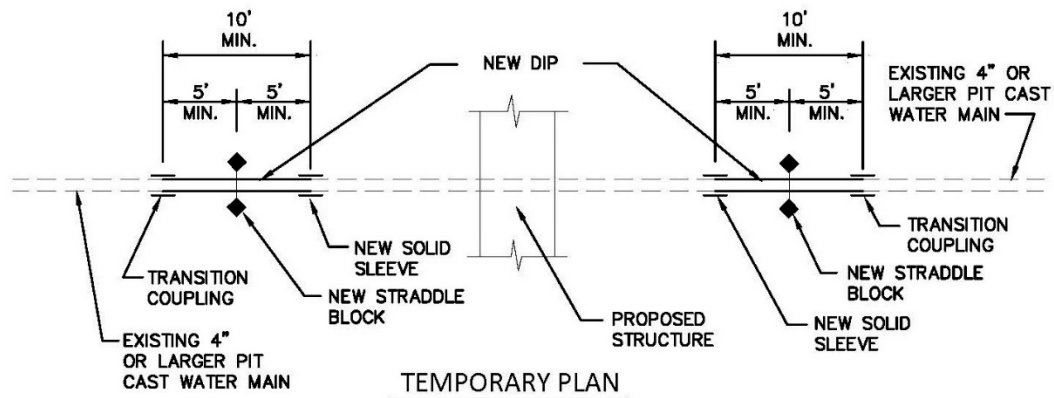
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EXISTING 4" OR LARGER PIT CAST PIPE WATER MAIN RELOCATION AT SEWER STRUCTURE

WATER SERVICES

CITY OF KANSAS CITY, MISSOURI

DRAWING NO.

01016-5

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APPROVED BY:

TECHNICAL ADVISORY COMMITTEE

DATE: 3/12/2021

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END OF SECTION