FOR BIDDING PURPOSES ONLY

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SECTION G
UTILITY PLANS

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6/18/15

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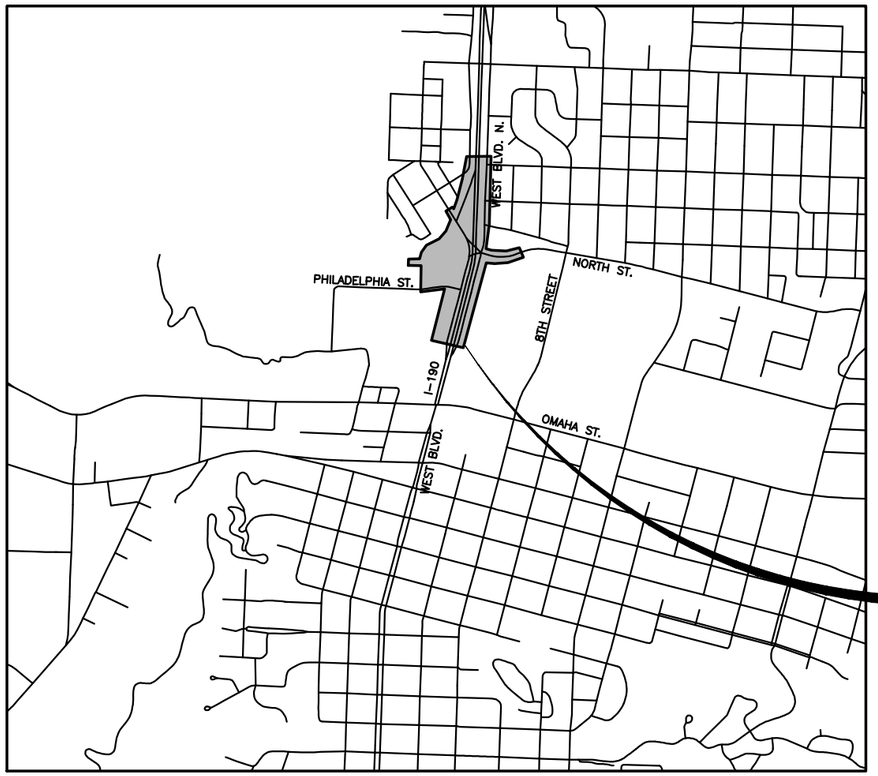

PROJECT LOCATION

PROJECT LOCATION MAP
NOT TO SCALE

CITY of RAPID CITY
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

Plan Set Number :

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT
CITY OF RAPID CITY PROJECT NO. 12-2053

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SECTION G ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3200	Construction Staking	Lump Sum	LS
009E3220	Reestablish Property Corner	1	Each
250E0010	Incidental Work	Lump Sum	LS
451E0130	30” Steel Encasement Pipe	190	Ft
451E0301	Pipe Encasement	15	Each
451E0606	6” PVC Water Main	163	Ft
451E0608	8” PVC Water Main	3752	Ft
451E0612	12” PVC Water Main	1041	Ft
451E0802	1” Copper Pipe	234	Ft
451E1008	8” PVC Sewer Pipe	2175	Ft
451E1010	10” PVC Sewer Pipe	1184	Ft
451E1012	12” PVC Sewer Pipe	915	Ft
451E1204	4” Sewer Service	62	Ft
451E1504	4” Sanitary Sewer Cleanout	2	Each
451E2213	8”x6” Pipe Tee	8	Each
451E2214	8”x8” Pipe Tee	6	Each
451E2231	12”x6” Pipe Tee	3	Each
451E2232	12”x8” Pipe Tee	1	Each
451E2234	12”x12” Pipe Tee	1	Each
451E2413	8”x6” Pipe Reducer	2	Each
451E2500	Tapping Saddle	9	Each
451E2728	12”x6” Tapping Tee	1	Each
451E2902	1” Curb Stop with Box	9	Each
451E3006	6” Pipe Bend	9	Each
451E3008	8” Pipe Bend	31	Each
451E3012	12” Pipe Bend	13	Each
451E3108	8” Pipe Cap	1	Each
451E3208	8” Coupling	2	Each
451E3412	6” Pipe Plug	2	Each
451E3452	12” Pipe Plug	1	Each
451E4206	6” Gate Valve with Box	1	Each
451E4208	8” Gate Valve with Box	17	Each
451E4212	12” Gate Valve with Box	4	Each
451E4585	Fire Hydrant with Auxiliary Valve & Box	11	Each
451E4901	Type 1 Bedding Material	100.0	Ton
451E4904	Type 3 Foundation Material	750.0	Ton
451E4918	Imported Trench Backfill	500	CuYd
451E5050	Trench 0’ to 6’ Deep	83	Ft
451E5051	Trench 6’ to 8’ Deep	435	Ft
451E5052	Trench 8’ to 10’ Deep	1374	Ft
451E5053	Trench 10’ to 12’ Deep	1348	Ft
451E5054	Trench 12’ to 14’ Deep	506	Ft
451E5055	Trench 14’ to 16’ Deep	138	Ft
451E5056	Trench 16’ to 18’ Deep	126	Ft
451E5057	Trench 18’ to 20’ Deep	73	Ft
451E5130	Bore and Jack 30” Pipe	190	Ft
451E6100	Reconnect Water Service	5	Each
451E6105	Connect to Existing Water Main	16	Each
451E7010	Reconnect Sewer Service	2	Each
451E7016	Connect to Existing Sewer Main	3	Each
451E7020	Sewer Bypass Pumping	Lump Sum	LS
451E7108	8” Temporary Sewer Pipe	800	Ft
451E7402	Test Station	6	Each
671E1048	48” Manhole	17	Each
671E1348	48” Drop Manhole	2	Each
671E5510	Extra Depth for 48” Manhole	86.2	Ft

INCIDENTAL WORK

Incidental work shall include all miscellaneous items not included in the regular items covered by unit prices listed in the proposal and shown on the drawings, but which must be performed in order to properly complete the work. The items and work listed below are to be included in the incidental work item, but the list does not limit the scope to only those items. The Contractor shall include those items that may be specific to his construction procedures.

Obtain Permits as Needed;
Remove and Reset, Mailboxes, or other Moveable Surface Obstructions;
Abandonment\Removal of Existing Water and Sewer Mains;
Abandonment\Removal of Existing Water Appurtenances and Sewer Manholes;
Abandonment\Removal of Existing Water and Sewer Services, including curb stops and cleanouts;
Adjust Water Valve Boxes;
Dewatering;
Temporary Water and Sewer Connections(Unless included in other items);
Water for Compaction;
Strip, Stockpile, & Replace Topsoil (For Water & Sewer Utility Construction in this Section Only);
Tree Trimming;
Salvage & Reinstall Landscape Materials and/or Irrigation Systems;
Protect Other Utilities from Movement During Excavation.

The Contractor shall be responsible for obtaining and complying with the right to work permit for the project allowing the contractor to work in the right-of-way. The Contractor shall not be charged for the permit, and can obtain it from the City Engineering department.

PRIVATE IRRIGATION SYSTEMS

The Contractor shall take care to protect existing landscaping and lawn irrigation systems in the ROW, on property outside of the ROW, or within any temporary or permanent easement. All landscaping and lawn irrigation shall be replaced/reset in kind at no additional cost to the City.

DEWATERING

Dewatering activities shall be conducted in compliance with the “General Permit to Discharge Under the Surface Water Discharge System for Temporary Dewatering Activities in South Dakota”, SDDENR Permit no. SDG 070000. A copy of the permit is available through SDDENR. The Contractor is required to furnish the “Request for Authorization” to DENR required under the permit and furnish a copy to the City at the preconstruction meeting.

The Contractor is responsible for performing self-monitoring activities including sampling, testing and reporting as may be determined to be required under the authorization to discharge. Payment for all compliance activities and obligations by the Contractor shall be included in the contract lump sum price for “Incidental Work”.

TRENCH EXCAVATION AND BACKFILL

The Contractor shall be responsible for maintaining a safe excavation complying with applicable State and Federal regulations. It is possible that in some areas special foundations may be required to provide adequate support for the pipe. Such foundations will consist of sub-excavation to a depth as required by the Engineer and placement of Type 3 Foundation Material and additional Type 1 Bedding.

Trench compaction shall be in accordance with DOT specifications rather than City of Rapid City specifications.

For the trench backfill above the Type 1 Bedding, the Contractor shall be responsible for either drying the wet but otherwise suitable material, or hauling in drier material at no additional cost to the City.

Payment for the use of imported backfill will only be authorized by the Engineer, if in the Engineer’s opinion, there is an insufficient quantity of suitable backfill material, including material that can be dried.

Imported backfill material (trench) quantities will be determined by counting truck loads. The quantity of material each truck holds shall be agreed upon by the Engineer and Contractor prior to any hauling operations. The Contractor shall not be paid for trench widths greater than four (4) feet (or the maximum trench width, whichever is greater). Imported backfill will not be paid for when the Contractor fails to perform proper dewatering techniques per the Engineer's request.

Imported backfill shall not be classified as CH, MH, or OH soil types as defined by the Unified Soils Classification System. The Contractor shall provide a submittal detailing the source, soil type, sieve analysis, and Atterberg limits for the proposed imported backfill material. The Contractor shall not begin hauling material until approved by the Engineer. Once approved, The Contractor shall submit an AASHTO T-99 4-point proctor for the material provided. The Engineer may require additional submittals or reject individual loads of imported material if the material changes significantly from the original submittal. Changes in the imported material may also require additional proctors to be provided by the Contractor. All costs for preparation of the submittal and subsequent submittal of proctors for Contractor furnished materials are incidental to the material supplied and no separate payment will be made.

Typical installation of Type 1 bedding per Standard Specifications Section 11 is incidental to all pipeline installation. Type 1 bedding is required from 3 inches below the pipe invert to 3 inches above the crown of the pipe. Any additional bedding requested by the Engineer would be measured and paid by the contract bid item per ton of “Type 1 Bedding Material.”

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ROCK EXCAVATION

Rock excavation is not anticipated for this project. However, large areas of shale are anticipated. In accordance with Section 11 of the Standard Specifications, “Shale, regardless of the nature of deposit, or loose boulders or large fieldstone will not be considered rock excavation.”

ADVANCE EXPOSURE OF UTILITIES

The Contractor shall expose existing underground obstructions and utilities far enough in advance of pipe laying that the water, sewer, storm, and private utilities can be adjusted if possible. Contractor shall not deviate from the design lines and grades without the approval of the Engineer.

TRENCH CHECK DAM

Contractor shall place within the trench a compacted cohesive clay check dam. During construction, check dam locations may be moved due to field conditions. The check dam shall extend from the bottom of the excavation through the bedding material to the backfill and shall extend completely to each trench sidewall. The check dam is used as a means to prevent the conveyance of water through the trench bedding.

Compacted cohesive clay shall consist of material that contains a minimum of 25% minus No. 200 sieve material with 70% passing a 3/4" sieve and a PI of 10%. The material shall consist of clay, silty sand or silty clay. If the normal excavated matter is not suitable for construction of the check dam, then the Contractor shall obtain material from outside sources. Check dam installation and material shall be considered as incidental to the pipe installation.

TYPE 3 FOUNDATION MATERIAL

Type 3 foundation material may be used when utility trench bottom material is deemed unstable and Type 1 bedding material is deemed unsuitable by the Engineer. Prior approval from the Engineer is required before placing Type 3 foundation material.

Payment for Type 3 foundation material will be at the contract unit price per ton of Type 3 foundation material placed and shall include excavation and disposal of unsuitable material, placing of Type 3 foundation material, and any incidental work necessary.

WATER FOR COMPACTION

Water for use by the Contractor for trench backfill compaction must be furnished by the Contractor. The Contractor is responsible for loading, purchasing, hauling, and application of the water. The City of Rapid City will make water available for purchase at a fire hydrant near the project. If water is purchased from the City, the Contractor will be required to pay for meter installation and water. All costs for water for compaction shall be included in the contract lump sum price for “Incidental Work”.

TOPSOIL

All topsoil in the excavated areas for water and sanitary sewer utility construction shall be stripped and stockpiled by the Contractor. Upon completion of the backfill the topsoil shall be spread evenly at a depth no less than six inches (6”) over the excavated area. Topsoil is not considered a waste material and shall not be removed from the site. The Contractor shall spread all topsoil to at least the minimum thickness required. All additional topsoil shall be spread evenly across all applicable disturbed areas. Stripping, stockpiling, and replacing the topsoil for utility construction shall be included in the contract lump sum price for “Incidental Work”.

TREE TRIMMING

If any trees are overhanging the work area and require trimming, the Contractor shall hire the services of an experienced arborist who specializes in this work. All costs for tree trimming shall be included in the contract lump sum price for “Incidental Work”.

REVEGETATION

Revegetation types and areas for the utility construction are detailed in Section D – Erosion Control. The Contractor shall coordinate the extent of disturbed areas with the combination project IM 1902(61)0, PCN 1162. The Contractor shall not be paid for revegetation of areas that are included in the combination project.

WATER AND SEWER PIPE

Water main piping materials, installation, flushing, and testing shall conform to Section 8a & 8b the Standard Specifications.

4”-12” water mains shall be PVC pressure pipe conforming to the requirements of AWWA Specification C-900, DR-18.

Measurement and payment for water main and services will be at the contract unit price per foot for the appropriate size of pipe and shall be in accordance with the revised Section 8a & 8b included in the contract documents, except for special items noted.

All sanitary sewer pipe shall be PVC pipe conforming to the requirements of Section 9 of the Standard Specifications.

Measurement and payment for sewer main will be at the contract unit price per foot for the appropriate size. Trenching for permanent sewer main will be at the contract unit price per bury depth regardless of pipe size. Trenching for sewer services is incidental to the sewer service pipe and no separate payment will be made.

PIPE ENCASEMENT

Pipe encasement locations are shown on the drawings. During construction the Engineer may direct fewer or greater encasement locations due to the proximity of non-potable pipelines or other conditions. Pipe encasement shall extend through the limits defined on the drawings or established by the Engineer and shall encase the pipeline in six inches (6”) of controlled low strength material in accordance with Standard Specification Section 200. Payment for encasement will be made at the contract unit price per each for “Pipe Encasement”.

PIPE DEFLECTION

Pipe deflection in restrained joint PVC pipe 12” and smaller shall not exceed the minimum allowable radius of curvature as recommended by the pipe manufacturer.

Deflections of pipe joints for PVC pipe larger than 12” is prohibited. Restrained joint fittings or other restrained flexible couplings shall be used for all deflections in 14” or larger PVC pipe. Long barrel, solid sleeve, restrained, mechanical joint, fittings shall be used for deflections up to 1.5 degrees of the C905 PVC pipe.

Pipe deflection at fittings shall be within the tolerances recommended by the pipe and/or fitting manufacturer. Allowable deflection parameters shall be included in the pipe and fitting submittal and shall be clearly marked as such.

Water main top of pipe (TOP) elevations have been called out within these plans. The Contractor shall be responsible for installing the pipe according to these elevation call outs with all high points occurring at fire hydrants.

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CORROSION PROTECTION

This project requires corrosion protection and pipeline coatings and linings for all buried, submerged or immersed ferrous metals associated with the water main piping, fittings and appurtenances. Specifications, details and requirements are included in the Specifications for the project. All work shall follow the requirements set forth in the above-referenced details and specifications, whether or not they are described in the plans, details and specifications for the project.

The Contractor or subcontractor shall have a minimum of two (2) years of practical experience in the type of work called for in the specifications, and shall have knowledge about soil conditions in the local area. The Contractor may be required to show proof and furnish a list of references substantiating this requirement to the satisfaction of the Engineer.

The Contractor shall provide at all times a thoroughly experienced and competent field foreman, who will be present to supervise this portion of construction at the site. This person shall be responsible for the field test reports and have the authority to represent the Contractor and shall be the point of contact with the Engineer for this work.

The corrosion protection system and monitoring system shall be operational upon completion of pipe installation. The system shall be tested as soon as practical after backfilling.

The Contractor shall have available adequate parts and materials to complete the work per the specifications and be prepared to immediately order and provide additional materials for changed conditions found upon construction.

Corrosion control items and linings, including but not limited to coating and lining, insulators, anodes, cathodic protection, joint bonds on new piping and fittings, etc.) along with testing instruments, mobilization, training, quality assurance and other work related to general corrosion protection shall be incidental to the various items being protected an no separate payment will be made.

Cathodic protection test stations with associated reference electrodes, anodes, and other components will be measured and paid for under the contract unit price per each, regardless of type, for "Test Station". Test stations shall be located at select fire hydrants at the following locations;

TABLE OF CORROSION PROTECTION TEST STATION

Station	L/R	Quantity (EA)
211+26 (North St)	R	1
215+72 (North St)	L	1
22+71 (W. Blvd.)	L	1
0+30 (W.Blvd.N.Water)	L	1
51+25 (W. Blvd. N.	R	1
0+64 (Van Buren St)	R	1
	Total:	6

CORROSION PROTECTION TESTING

Upon completion of the cathodic protection system installation work, the contractor shall perform testing to ensure proper operation of the system.

All cathodic protection system tests shall be conducted by the Contractor's corrosion specialist, cathodic protection specialist or corrosion engineer. All testing shall be conducted in the presence of a representative of the Owner and a minimum of 5 days advance notice must be given to the owner prior to the start of any testing.

The integrity and function of all test station and anode wires shall be verified by field testing after installation by obtaining pipe-to-soil (p/s) and anode-to-soil (a/s) potential measurements. P/s and a/s measurements shall be obtained for each wire prior to and after the connection of any wires to the test station terminal block. The Contractor shall submit a written procedure for such testing for approval by the Owner's Representative prior to the start of construction. The procedure must describe in detail the method and equipment to be used for the testing. Such procedure may be rejected and returned to the Contractor for revision. The procedure shall satisfactorily demonstrate the integrity and proper functioning of the test station and anode wires.

Prior to connection of each anode wire to its test station terminal block, all anode-to-soil “native” potential measurements shall be as follows:

Magnesium anode: -1.55 volts dc or more negative when referenced to a copper sulfate electrode (cse)-anodes not satisfying this “native potential level” shall be replaced by the contractor at no additional cost to the Owner. All tests results shall be documented in the tabular format on 8 ½” x 11” paper and submitted in a written test report. The report shall include a description of any test procedures, all test results, and recommendations to correct any identified problems or deficiencies. The report shall include results at each cathodic protection test station location.

EPOXY COATINGS

The City of Rapid City Public Works Director issued a waiver to the 2007 Edition Standard Specifications requiring the internal epoxy coating for fire hydrants. Any fire hydrant that doesn’t have the internal epoxy coating per the specifications shall double the cathodic protection (anodes) required for the fire hydrant. The cost of the extra cathodic protection shall be absorbed into the unit price of the fire hydrant. Fire hydrants with the internal epoxy coating of sufficient thickness do not need to have double the cathodic protection.

Fire hydrants and any other buried ferrous or metallic objects that require epoxy coatings shall have coating thickness as detailed in Section 8b of the Standard Specifications. Items that do not meet the external epoxy coating mil thickness requirements shall have double the cathodic protection (anodes) required. A 30 lb anode will be considered equal to (2) 18 lb anodes.

BOLTS FOR FITTING AND JOINT RESTRAINING DEVICES

Bolts and nuts for all buried water main valves, fittings, restraining devices, and other applicable ferrous or metallic appurtenances shall be series 300 stainless steel. Fluoropolymer coated bolts are not acceptable. Bolts and wedges integral to the restraining devices may be coated with the same epoxy coating system as the restraint ring (such as MEGA-BOND used on EBBA Iron Products). All loose bolts for restraining devices shall be series 300 stainless steel.

RESTRAINT OF WATER MAIN FITTINGS

All water main fittings for this project shall be restrained using the EBAA, or equal restraint system. Certain valves, reducers, and vertical bends require joint restraint devices within the “L” length of the fitting. These restrained joint lengths have been called out on the plans.

THRUST BLOCKS

Thrust blocks shall be provided at water main fittings as shown on the plans. All Low Level (LL) water main fittings shall use the 150 psi thrust block table and all of the High Level (HL) water main fittings shall use the 200 psi thrust block table. Refer to the thrust block details for sizing information. Thrust blocks shall cure for at least 4 hours before being covered and at least 48 hours prior to activating the water main. Thrust blocks are considered incidental to the fitting and no separate payment will be made.

DEEP VALVE BOXES

Any valve boxes over 8’ in depth shall include a valve key riser in the valve box to allow a standard key to operate the valve.

WATER MAIN DISINFECTION AND TESTING

Disinfection of water mains 16” and smaller may be accomplished utilizing the tablet methods as detailed in Section 8a of the Standard Specifications.

Pipe segments used in tie-ins that need to be activated immediately after installation shall be disinfected by swabbing with a 1% hypochlorite solution.

All pipelines shall be tested at 1.5 times the static pressure, but not greater than the working pressure of the pipe.

Pipe segments used in tie-ins that need to be activated immediately after installation shall be left exposed for 4 hours to observe any leaks.

All costs for disinfection and testing are incidental to the installation of the water main and no additional payments will be made.

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NEUTRALIZATION OF HIGHLY CHLORINATED WATER

The Contractor shall use de-chlorination equipment to de-chlorinate the water when flushing the water mains so that highly chlorinated water is not discharged to a surface water course.

Neutralization of water shall be accomplished by introducing No-chlor™ ascorbic acid (granular form) de-chlorination grade using equipment specifically manufactured for the neutralization process. The City Utility Maintenance department will make de-chlorination equipment available to the Contractor when possible. The Contractor shall supply the ascorbic acid and hoses, etc.

As an option to the dechlorination, the Contractor may discharge the highly chlorinated water to a truck and haul the water to an approved location for land application. Neutralization or disposal of the high chlorinated water shall be considered incidental to the respective water main installation bid item.

MANHOLE RIMS AND CASTINGS

Manholes and castings shall be supplied and installed in accordance with Section 9 of the Standard Specifications. The contractor shall verify the rim elevations shown on these utility plans with the final grade or surfacing elevations identified on the DOT combination project IM 1902(61)0, PCN 1162 plans before ordering manholes. The Contractor shall supply castings that have a depth that matches the surfacing thickness at the location where the casting will be installed and indicate the proper depth in the submittals. Castings are to be included in the unit price for the various manhole bid items.

Manhole rims located in grass areas shall be shall have a bolt down frame with watertight cover. Frames and covers shall be Neenah R1916F, Deeter 1247, or equal as listed in the Standard Specifications.

COATING FOR SANITARY SEWER MANHOLES

A corrosion resistant liner shall be provided in each manhole. The liner shall be Kretekote 200, Sauereisen Sewerguard No. 210, Induron Cermasafe 90, or approved equal. The coating color shall be grey. The corrosion coating is incidental to the applicable manhole bid item and no separate payment shall be made.

SEQUENCE OF OPERATIONS

The overall sequence of operations will be dictated by the DOT combination project IM 1902(61)0, PCN 1162. Some utility construction will be required to be completed by interim completion dates (See Notes On Sequencing in Section A and Special Provisions for Contract Time). The Contractor shall be responsible for coordinating utility construction and reconnections with the overall sequence of operations. The Contractor shall also be responsible for coordinating any shutdowns, tie-ins, or bypass operations with the Engineer and City staff at least 7 days prior to initiating such activities. A step by step sequence of operations for utility construction has not been provided due to the flexibility allowed in the overall sequencing.

See Section A - General Notes and the Special Provision for Contract Time for more information.

WATER MAIN RECONNECTS & SEQUENCING

The Contractor shall anticipate having to initiate & complete multiple water main tie-ins. Most of the tie-ins are anticipated to occur during the work week between the hours of 8:00 am and 4:00 pm, but some may need to occur on the weekend or possibly at night.

The Contractor shall be responsible for the installation, protection of, and removal of any temporary water lines needed during the course of construction, unless otherwise noted. All costs associated with the installation, protection of, and removal of any temporary water lines shall be considered incidental and be paid under the lump sum contract price for “Incidental Work”, unless otherwise noted.

The Contractor shall coordinate all planned water shut downs (outages) with Engineer and City Utility Maintenance department and submit a tie-in and abandonment sequencing plan at least seven (7) days prior to the planned shutdown. Preparation of the plan is considered incidental to the work and no separate payment will be made.

The Contractor shall notify all impacted properties of scheduled shut down (outage) 3 days prior to the shutdown. Notification shall consist of door hangers for each property. The Contractor shall furnish all door hangers for the project. The proposed door hangers shall be submitted as a shop drawing for engineer approval.

TEMPORARY SANITARY SEWER MAIN

Due to sequencing, work on the bridge abutments/foundations for the companion project may impact the existing sanitary sewer between MH# G6-001 and MH# G6-054. If necessary, a temporary sanitary sewer main may be installed as shown in the plans.

The temporary sewer main shall consist of an 8-inch diameter pipe of any material suitable for use in conveying the sewage. The temporary main shall be air tested in accordance with Section 9 of the Standard Specifications. Pipe bedding, trench dams, and tracer wire shall not be required. Density testing of the trench backfill will be completed.

The Contractor shall be responsible for flow maintenance through the temporary sewer main. All costs including, connections to the existing mains, cleanouts, bends, trenching, backfill, testing, and maintenance shall be included in the contract pay item for “8” Temporary Sewer Main.” The temporary main may be abandoned in place with the cleanouts removed and end connections plugged when no longer needed.

SANITARY SEWER BYPASS PUMPING

Sanitary sewer service must be maintained at all times. Bypass pumping shall be in accordance with Section 9 of the Standard Specifications. Bypass pumping plans shall be coordinated with the Sequence of Operations noted in the combination DOT Project IM 1902(61)0, PCN 1162. It is anticipated that multiple bypass operations will be required depending on the sequencing and or/ means and methods chosen by the Contractor. All costs for preparation of the required plans, installation and maintenance of the bypass pumping equipment, installation and removal of temporary sewer connections, and coordination with the combination project shall be included in the contract lump sum price for “Incidental Work”.

FOR BIDDING PURPOSES ONLY

STEEL CASING PIPE-BORED AND JACKED

Furnish and install steel casing pipe for the sanitary sewer in areas noted on the drawings.

A. GENERAL:

Qualifications: The Contractor or Subcontractor performing the boring/jacking shall be experienced in this type of construction. Contractor or Subcontractor shall, upon request, document at least five (5) successful bored crossings of equivalent scope and complexity required for this project.

B. MATERIALS:

Steel Casing Pipe: The steel casing pipe for use in borings shall be of the size shown on the drawings. The casing pipe shall be carbon steel, ASTM A53, Grade B, seamless or welded construction. Pipe wall thickness shall 0.469" minimum for the 30" casing pipe. Joints shall be continuous butt weld type.

Casing Chocks: Prefabricated restraining type casing spacers/chocks shall be placed on the carrier pipe to provide a minimum of 1.0 inch clearance between the carrier pipes greatest outside bell diameter and the casing pipe. The casing spacers/chocks shall also be sized to restrict the pipe's vertical or horizontal movement within the steel casing pipe to 1.5 inches. Spacing of the casing chocks shall be per manufacturer's recommendations or as shown on the drawings or specified herein. Casing Chocks shall also be placed within 1' of the end of the casing pipe. The casing spacers/chocks shall securely clamp to the carrier pipe to preclude slippage during installation. The spacers/chocks shall be capable of supporting the weight of the carrier pipe running full. The in-place casing shall be laser profiled to verify line and grade. Custom chocks shall be required to maintain a consistent grade for the PVC sewer pipe if the in-place profile of the casing is incorrect or inconsistent.

Sand: Silica Sand shall be blown into the annular space after the carrier pipe is installed. The sand shall be 2.2 mm grade manufactured by Unimen or approved equal.

Casing Seals: Casing seals shall be installed at both ends of the casing pipe. The casing seals shall be rubber pull-on type with stainless steel clamps at the sleeve and carrier pipe to provide a water tight seal. The casing end seals shall be installed in accordance with the Manufacturer's recommendations.

C. EXECUTION:

Steel casing pipes of the size shown shall be installed at the locations shown on the drawings. The steel casing pipe shall be installed by boring or jacking methods. The length of each steel casing pipe crossing shown on the drawings.

Jacking or Boring Pit: The jacking or boring pit shall be excavated on one side of the crossing under which the pipe casing is to be installed.

The pit shall be of sufficient length to provide room for the boring machine, jacking head, jacking frame, reaction blocks, jacks and one pipe length. The pit shall be of sufficient width to permit ample working space and shall meet OSHA regulations. The end of the pit nearest the roadway shall present a near vertical face into which the sleeve is to be installed. Shielding of the working face with steel plates may be necessary to prevent voids or caving.

Pits shall be maintained in a dewatered condition throughout the construction period.

Installation: The steel casing pipe shall be installed by auger boring method by which the pipe is simultaneously jacked through the earth while removing the soil inside with an auger. The bore may not exceed the diameter of the casing pipe.

Joints for the steel casing pipe shall be of the continuous butt weld type.

Line and Grade: The steel casing pipe shall be true to plan line and grade with a vertical tolerance of 0.75 feet ± unless the Engineer approves deviation of a greater amount. Horizontal tolerance of the installed steel casing pipe shall be 0.3 feet ± per 10 feet of casing length from plan location.

If the Contractor is unable to achieve this tolerance, he shall fully bear the full responsibility for corrective work and/or redesign and relocation.

Installation of Carrier Pipe: Following installation of the casing pipe, the sanitary sewer shall be installed in the casing. Carrier pipe shall be as noted on the drawings.

The carrier pipe shall be supported continuously and uniformly with casing spacers attached to the pipe. The location of the spacers shall be such that the distance between shall not exceed the Manufacturer's recommendations. A spacer shall be installed at both ends of the casing pipe.

The carrier pipe shall be installed in such a manner that it is not damaged by the installation procedure. Pipe joints of the carrier pipe inside the casing pipe shall be restrained to prevent separation or over-belling during the installation. Contractor's method of installation shall be approved by the Engineer.

After carrier pipe installation, sand shall be blown into the casing completely filling the annular space, and the ends of the casing pipe shall be sealed with a flexible casing seal as specified herein.

D. MEASUREMENT AND PAYMENT:

The steel casing pipe installed by boring and jacking will be measured by plans quantity. Payment will be at the contract unit price per foot for "30" Steel Encasement Pipe" and "30" Bore and Jack Pipe" complete in place which payment shall be considered full compensation for all labor, materials, equipment and incidentals to complete the installation of the casing pipe, including the placement of the sand fill. Casing seals will be considered incidental to the steel casing pipe. Casing spacers/chocks will be considered incidental to the cost of the carrier pipe in the casing. The cost of the carrier pipe will be paid for separately under the appropriate contract item.

Payment for the carrier pipe installed in the casing pipe will be at the contract unit price per foot for "12" PVC Sewer Pipe."

TABLE OF STEEL CASING PIPE-BORED AND JACKED

West Side Sewer Alignment				Quantity
Station	to	Station	Size	(Ft)
0+18		2+08	30"	190

FOR BIDDING PURPOSES ONLY

WATER MAIN ABANDONMENTS

The Contractor shall seal all open ends of water mains to be abandoned with a concrete plug having a length equal to the diameter of the pipe being plugged. Approximate plug locations are shown on the plans. All costs associated with water main abandonments shall be included in the contract lump sum price for “Incidental Work.”

ABANDON WATER VALVE AND BOX

The Contractor shall close the valve then remove and dispose of the valve box. The resulting holes shall be backfilled and compacted per the Standard Specifications and, if applicable, resurfaced with the appropriate material; i.e. seed, sod, asphalt, concrete, etc. All costs associated with valve box removals shall be included in the contract lump sum price for “Incidental Work.”

TABLE OF ABANDON EXISTING WATER VALVE AND BOX

Station	L/R	Quantity (EA)
102+58 (I-190)	R	1
102+59 (I-190)	L	1
102+61 (I-190)	L	1
102+62 (I-190)	R	1
102+63 (I-190)	R	1
108+90 (I-190)	L	1
109+02 (I-190)	L	1
109+11 (I-190)	L	1
109+12 (I-190)	L	1
109+42 (I-190)	L	1
109+51 (I-190)	L	1
109+58 (I-190)	L	1
113+79 (I-190)	R	1
113+99 (I-190)	R	1
114+02 (I-190)	R	1
114+37 (I-190)	R	1
114+55 (I-190)	R	1
114+56 (I-190)	R	1
114+57 (I-190)	R	1
114+68 (I-190)	R	1
114+73 (I-190)	R	1
116+47 (I-190)	R	1
120+92 (I-190)	R	1
121+45 (I-190)	R	1
121+74 (I-190)	R	1
125+68 (I-190)	R	1
125+92 (I-190)	R	1
	Total:	27

REMOVE FIRE HYDRANT

The Contractor shall remove and salvage fire hydrant and auxiliary valve and deliver them to the City utility maintenance office on Steele Avenue. The water main at the end of the removed auxiliary valve shall be plugged. The resulting holes shall be backfilled and compacted per the Standard Specifications and, if applicable, resurfaced with the appropriate material; i.e. seed, sod, asphalt, concrete, etc. All costs associated with fire hydrant removals shall be included in the contract lump sum price for “Incidental Work.”

TABLE OF REMOVE EXISTING FIRE HYDRANT AND AUXILIARY VALVE

Station	L/R	Quantity (EA)
108+46 (I-190)	R	1
109+47 (I-190)	L	1
111+46 (I-190)	R	1
113+85 (I-190)	R	1
121+50 (I-190)	R	1
123+28 (I-190)	L	1
125+85 (I-190)	R	1
	Total:	7

ABANDON CURB STOP

The found curb stop boxes to be abandoned are listed below. The Contractor shall close the curb stop then remove and dispose of the valve box. The resulting holes shall be backfilled and compacted per the Standard Specifications and, if applicable, resurfaced with the appropriate material; i.e. seed, sod, asphalt, concrete, etc. If the existing curb stop and service line will interfere with the installation of the new service line and curb stop, they shall be removed and the cut end of the service line shall be capped or crimped. If exposed by other work, the Contractor shall abandon water services by closing the corp stop on the main. All costs associated with curb stop abandonment shall be included in the contract lump sum price for “Incidental Work.”

TABLE OF ABANDON EXISTING CURB STOP

Station	L/R	Quantity (Each)
118+48 (I-190)	L	1
121+99 (I-190)	R	1
122+51 (I-190)	R	1
122+99 (I-190)	R	1
123+24 (I-190)	R	1
123+36 (I-190)	R	1
	Total	6

ADJUST VALVE BOX

Any existing valve boxes that will not be removed or abandoned shall be protected from damage and adjusted to match the new surface elevation. If the valve box is damaged, the Contractor shall be responsible for replacing both the upper and lower portion of the valve box and provide a centering adapter as required by the standard specifications. All work related to adjustment of valve boxes shall be included in the contract lump sum price for “Incidental Work”.

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FOR BIDDING PURPOSES ONLY

SEWER MAIN ABANDONMENTS

Existing sewer mains to be abandoned between manholes shall be plugged at all open ends with concrete extending into the abandoned pipe one foot or one pipe diameter, whichever is greater. Existing sewers to be abandoned at a manhole shall be cut flush with the inside of the manhole and plugged as specified above. The pipe shall be grouted flush with the inside of the manhole and the manhole invert shall be reconstructed. Approximate plug locations are shown on the plans. All costs associated with sewer main abandonments shall be included in the contract lump sum price for "Incidental Work."

SEWER SERVICE ABANDONMENTS

Existing sewer services shall be abandoned by cutting and plugging the line at the sewer main or any other exposed and cut location. The service line shall be plugged in the same manner as specified for plugging sewer mains. All costs associated with sewer service abandonments shall be included in the contract lump sum price for "Incidental Work."

REMOVE MANHOLE

The Contractor shall remove the entire manhole including the base section. The incoming and outgoing sewer mains shall be plugged with concrete extending into the pipe one foot or one pipe diameter and the resulting hole shall be backfilled and compacted per the Standard Specifications and, if applicable, resurfaced with the appropriate material; i.e. seed, sod, asphalt, concrete, etc. All costs associated with manhole removals shall be included in the contract lump sum price for "Incidental Work."

TABLE OF REMOVE EXISTING SEWER MANHOLE

Station	L/R	Quantity (Each)
102+49 (I-190)	R	1
112+36 (I-190)	R	1
113+93 (I-190)	R	1
114+83 (I-190)	R	1
114+88 (I-190)	R	1
116+21 (I-190)	R	1
118+08 (I-190)	L	1
118+42 (I-190)	L	1
120+70 (I-190)	L	1
	Total	9

ABANDON MANHOLE

Existing manholes to be abandoned shall have all pipes plugged with concrete extending into the abandoned pipe one foot or one pipe diameter, whichever is greater. The upper 4 ft. of the manhole shall be broken or removed and the manhole filled with compacted Select Granular Backfill material. The Contractor shall not backfill manholes to be abandoned until the Engineer/Inspector has inspected each plug. Unless shown otherwise on the Drawings or specified in the Detailed Specifications, the Contractor shall salvage manhole frames and covers and deliver to and unload them at the City Utility Maintenance Shop on Steele Avenue. All costs associated with manhole abandonments shall be included in the contract lump sum price for "Incidental Work."

TABLE OF ABANDON EXISTING SEWER MANHOLE

Station	L/R	Quantity (Each)
102+50 (I-190)	R	1
102+52 (I-190)	L	1
106+16 (I-190)	R	1
106+29 (I-190)	L	1
109+21 (I-190)	L	1
109+45 (I-190)	R	1
	Total	6

TABLE OF 6" X 11.25^{O} BENDS

Station	L/R	Quantity (EA)
221+38 (North St)	L	1
223+54 (North St)	L	1
	Total:	2

TABLE OF 6" X 45° BENDS

Station	L/R	Quantity (EA)
0+63 (Adams St)	L	1
0+77 (Adams St)	L	1
0+79 (Van Buren St)	L	1
0+91 (Van Buren St)	L	1
For Fire Hydrant Bury Change	-	2
	Total:	6

TABLE OF 6" X 90° BENDS

Station	L/R	Quantity (EA)
2+70 (Philadelphia St)	L	1
	Total:	1

TABLE OF 8" X 11.25^{O} BENDS

Station	L/R	Quantity (EA)
212+99 (North St)	L	1
221+36 (North St)	L	1
13+88 (W. Side Sewer)	L	1
16+53 (W. Side Sewer)	L	1
1+41 (W.Blvd.N.Water) - Vert	L	1
1+64 (W.Blvd.N.Water) - Vert	L	1
2+14 (W.Blvd.N.Water)	L	1
50+44 (W. Blvd. N.)	L	1
	Total:	8

TABLE OF 8" X 22.5^{O} BENDS

Station	L/R	Quantity (EA)
211+60 (North St)	L	1
218+81 (North St)	L	1
223+28 (North St)	L	1
15+13 (W. Blvd.)	L	1
15+97 (W. Blvd.)	L	1
4+37 (W.Blvd.N.Water) - Vert	L	1
4+49 (W.Blvd.N.Water) - Vert	L	1
	Total:	5

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SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: SECTION G ESTIMATE OF QUANTITIES AND GENERAL NOTES

FOR BIDDING PURPOSES ONLY

TABLE OF 8" X 45° BENDS

Station	L/R	Quantity (EA)
211+36 (North St)	L	1
215+01 (North St) - Vertical	L	1
215+10 (North St) - Vertical	L	1
215+40 (North St) - Vertical	L	1
215+48 (North St) - Vertical	L	1
224+38 (North St)	L	1
224+44 (North St)	L	1
0+57 (Silver St.)	R	1
0+78 (Silver St.) - Vertical	R	1
0+84 (Silver St.) - Vertical	L	1
20+29 (W. Blvd.) - Vertical	L	1
20+35 (W. Blvd.) - Vertical	L	1
22+64 (W. Blvd.)	L	1
54+24 (W. Blvd. N.)	R	1
54+33 (W. Blvd. N.)	R	1
58+68 (W. Blvd. N.)	R	1
58+81 (W. Blvd. N.)	R	1
	Total:	17

TABLE OF 8" X 90° BENDS

Station	L/R	Quantity (EA)
1+18 (W.Blvd.N.Water)	L	1
	Total:	1

TABLE OF 8" HIGH DEFLECTION COUPLING

Station	L/R	Quantity (EA)
20+76 (W. Blvd.)	L	1
52+23 (W. Blvd. N.)	L	1
	Total:	2

High Deflection Couplings are paid at the contract unit price per each for "8" Coupling."

TABLE OF 12" X 11.25° BENDS

Station	L/R	Quantity (EA)
212+57 (North St)	R	1
	Total:	1

TABLE OF 12" X 22.5° BENDS

Station	L/R	Quantity (EA)
219+23 (North St)	R	1
219+56 (North St)	R	1
219+89 (North St)	R	1
221+33 (North St)	R	1
221+89 (North St)	R	1
0+20 (W.Blvd.N.Water)	L	1
	Total:	6

TABLE OF 12" X 45° BENDS

Station	L/R	Quantity (EA)
214+89 (North St) - Vertical	R	1
214+99 (North St) - Vertical	R	1
215+29 (North St) - Vertical	R	1
215+39 (North St) - Vertical	R	1
0+23 (E. Side Sewer)	L	1
0+21 (E. Side Sewer)	L	1
	Total:	6

TABLE OF 6" PLUG

Station	L/R	Quantity (EA)
6+50 (E. Side Sewer)	L	1
9+51 (E. Side Sewer)	L	1
	Total:	2

TABLE OF 8" WATER CAP

Station	L/R	Quantity (EA)
50+25 (W. Blvd. N.)	L	1
	Total:	1

Paid for at the contract unit price per each for "8" Pipe Cap".

TABLE OF 12" PLUG

Station	L/R	Quantity (EA)
11th St/Philadelphia	-	1
	Total:	1

TABLE OF 8" X 6" REDUCER

Station	L/R	Quantity (EA)
0+58 (Adams St)	L	1
0+74 (Van Buren St)	R	1
	Total:	2

TABLE OF 8" X 8" X 6" TEE

Station	L/R	Quantity (EA)
215+73 (North St)	L	1
221+40 (North St)	L	1
223+55 (North St)	L	1
22+75 (W. Blvd.)	L	1
1+59 (W.Blvd.N.Water)	L	1
51+25 (W. Blvd. N.)	L	1
0+41 (Adams St)	L	1
0+64 (Van Buren St)	R	1
	Total:	8

TABLE OF 8" X 8" X 8" TEE

Station	L/R	Quantity (EA)
214+82 (North St)	L	1
17+98 (W. Blvd.)	L	1
1+36 (W.Blvd.N.Water)	L	1
4+59 (W.Blvd.N.Water)	L	1
54+19 (W. Blvd. N.)	R	1
58+48 (W. Blvd. N.)	R	1
	Total:	6

TABLE OF 12" X 12" X 6" TEE

Station	L/R	Quantity (EA)
211+27 (North St)	R	1
215+49 (North St)	R	1
0+30 (W.Blvd.N.Water)	L	1
	Total:	3

TABLE OF 12" X 12" X 8" TEE

Station	L/R	Quantity (EA)
211+32 (North St)	R	1
	Total:	1

TABLE OF 12" X 12" X 12" TEE

Station	L/R	Quantity (EA)
219+66 (North St)	R	1
	Total:	1

TABLE OF 12" X 12" X 6" TAPPING TEE

Station	L/R	Quantity (EA)
6+14 (E. Side Sewer)	L	1
	Total:	1

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SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

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Sheet Title: SECTION G ESTIMATE OF QUANTITIES AND GENERAL NOTES

FOR BIDDING PURPOSES ONLY

TABLE OF FIRE HYDRANT WITH AUXILIARY VALVE AND BOX

Station	L/R	Hyd. Bury (FT)	Quantity (EA)
211+26 (North St)	R	6.5	1
215+72 (North St)	L	7.5	1
215+49 (North St)	R	7.0	1
22+71 (W. Blvd.)	L	6.0	1
0+30 (W.Blvd.N.Water)	L	8.5	1
1+56 (W.Blvd.N.Water)	R	9.0*	1
6+14 (E. Side Sewer)	L	9.4*	1
51+25 (W. Blvd. N.)	R	11.5*	1
0+41 (Adams St)	L	7.0	1
0+64 (Van Buren St)	R	8.0	1
2+71 (Philadelphia St)	L	7.5	1
	Total:		11

The proposed bury depths are approximate and are dependent upon several factors, such as: existing water main depth, other utilities, field changes & etc.

*Hydrant bury greater than 8.5' requires rotated tee and (1) 6" x 45 deg bend in hydrant lead to reduce bury. Contractor to select appropriate barrel length.

TABLE OF 6" GATE VALVE AND BOX

Station	L/R	Quantity (EA)
221+39 (North St)	L	1
	Total:	1

TABLE OF 8" GATE VALVE AND BOX

Station	L/R	Quantity (EA)
211+33 (North St)	R	1
215+68 (North St)	L	1
219+07 (North St)	L	1
13+83 (W. Side Sewer)	L	1
17+54 (W. Blvd.)	L	1
18+26 (W. Blvd.)	L	1
22+72 (W. Blvd.)	L	1
1+32 (W.Blvd.N.Water)	L	1
1+69 (W.Blvd.N.Water)	L	1
4+54 (W.Blvd.N.Water)	L	1
50+70 (W. Blvd. N.)	L	1
51+30 (W. Blvd. N.)	L	1
53+54 (W. Blvd. N.)	L	1
54+38 (W. Blvd. N.)	R	1
0+53 (Adams St)	L	1
58+33 (W. Blvd. N.)	R	1
0+69 (Van Buren St)	R	1
	Total:	17

TABLE OF 12" GATE VALVE AND BOX

Station	L/R	Quantity (EA)
211+22 (North St)	R	1
215+44 (North St)	R	1
219+60 (North St)	R	1
0+25 (W.Blvd.N.Water)	L	1
	Total:	4

TABLE OF NEW CURB STOP, 1" SERVICE LINE, AND RECONNECT TO EXISTING SERVICE

Station	L/R	New Curb Stop Quantity (Each)	1" Service Line Quantity (FT)	1" Tapping Saddle Quantity (Each)	Reconnect to Existing Quantity (Each)
17+19 W.Blvd	L	1	40	1	1
22+17 W.Blvd	L	1	8	1	1
51+59 W.Blvd.N	R	1	32	1	
52+09 W.Blvd.N	R	1	32	1	
52+98 W.Blvd.N	R	1	31	1	
53+08 W.Blvd.N	R	1	30	1	
54+62 W.Blvd.N	R	1	21	1	1
55+15 W.Blvd.N	R	1	20	1	1
55+63 W.Blvd.N	R	1	20	1	1
	Total	9	234	9	5

1" corp. stops provided by City at the time of tapping. Contractor to provide all other sizes of corp. stops.

TABLE OF CONNECT TO EXISTING WATER MAIN

Station	L/R	Quantity (EA)
211+17 (12" Pipe) (North St)	R	1
211+36 (12" Valve) (North St)	R	1
212+11 (12" Valve) (North St)	R	1
221+39 (6" Pipe) (North St)	L	1
221+89 (12" Pipe) (North St)	R	1
223+54 (6" Valve) (North St)	L	1
224+49 (8" Tee) (North St)	L	1
0+90 (8" Valve) (Silver St.)	R	1
22+79 (8" Pipe) (W. Blvd.)	L	1
0+14 (12" Pipe) (E. Side Sewer)	R	1
0+23 (12" Valve) (E. Side Sewer)	L	1
0+20 (12" Pipe) (W.Blvd.N.Water)	L	1
0+77 (6" Pipe) (Adams St)	L	1
59+05 (8" Pipe) (W.Blvd.N.)	R	1
0+91 (6" Pipe) (Van Buren St)	R	1
2+70 (6" Pipe) (Philadelphia St)	L	1
	Total:	16

TABLE OF PIPE ENCASEMENT

Station	to	Station	L/R	Quantity (EA)
211+35 (North St)		211+74	L	1
215+10 (North St)		215+40	L	1
214+99 (North St)		215+29	R	1
217+50 (North St)		217+80	R	1
218+02 (North St)		218+20	R	1
218+67 (North St)		219+50	R	1
223+30 (North St)		223+53	L	1
15+35 (W. Blvd)		15+59	L	1
16+56 (W. Blvd.)		16+88	L	1
17+58 (W. Blvd.)		17+81	L	1
0+37 (Silver St.)		0+83	R	1
19+95 (W. Blvd.)		20+29	L	1
20+53 (W. Blvd.)		20+71	L	1
0+16 (E. Side Sewer)		0+21	R to L	1
4+04 (W.Blvd.N.Water)		4+32	L	1
			Total:	15

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SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

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Sheet Title: SECTION G ESTIMATE OF QUANTITIES AND GENERAL NOTES

Sheet: G10 of G77

FOR BIDDING PURPOSES ONLY

TABLE OF NEW 48" DROP MANHOLE

Station	L/R	Description	Quantity (EA)
9+25 (W. Side Sewer)	CL	MH 5	1
13+48 (E. Side Sewer)	CL	MH 18	1
	Total:		2

TABLE OF NEW 48" TERMINATION MANHOLE

Station	L/R	Description	Quantity (EA)
14+62 (E. Side Sewer)	CL	MH 19	1
	Total:		1

Termination manholes are paid at the contract unit price per each for "48" Manhole."

TABLE OF NEW 48" MANHOLE

Station	L/R	Description	Quantity (EA)
0+10 (W. Side Sewer)	CL	MH 1	1
2+17 (W. Side Sewer)	CL	MH 2	1
4+28 (W. Side Sewer)	CL	MH 3	1
7+14 (W. Side Sewer)	CL	MH 4	1
9+99 (W. Side Sewer)	CL	MH 6	1
13+91 (W. Side Sewer)	CL	MH 7	1
16+34 (W. Side Sewer)	CL	MH 8	1
17+21 (W. Blvd.)	CL	MH 9	1
19+77 (W. Blvd.)	CL	MH 10	1
23+12 (W. Blvd.)	CL	MH 11	1
26+80 (W. Blvd.)	CL	MH 12	1
0+38 (E. Side Sewer)	CL	MH 13	1
4+38 (E. Side Sewer)	CL	MH 14	1
8+38 (E. Side Sewer)	CL	MH 15	1
11+25 (E. Side Sewer)	CL	MH 16	1
11+67 (E. Side Sewer)	CL	MH 17	1
	Total:		16

TABLE OF EXTRA DEPTH FOR 48" MANHOLE

Station	L/R	Description	Quantity (LF)
0+10 (W. Side Sewer)	CL	MH 1	6.7
2+17 (W. Side Sewer)	CL	MH 2	2.1
4+28 (W. Side Sewer)	CL	MH 3	1.4
7+14 (W. Side Sewer)	CL	MH 4	6.8
9+25 (W. Side Sewer) - Drop	CL	MH 5	7.9
9+99 (W. Side Sewer)	CL	MH 6	5.6
13+91 (W. Side Sewer)	CL	MH 7	6.5
16+34 (W. Side Sewer)	CL	MH 8	10.6
17+21 (W. Blvd)	CL	MH 9	2.4
19+77 (W. Blvd)	CL	MH 10	4.7
23+12 (W. Blvd.)	CL	MH 11	4.3
26+80 (W. Blvd.)	CL	MH 12	3.0
0+38 (E. Side Sewer)	CL	MH 13	2.6
4+38 (E. Side Sewer)	CL	MH 14	2.6
8+38 (E. Side Sewer)	CL	MH 15	4.7
11+25 (E. Side Sewer)	CL	MH 16	1.5
11+67 (E. Side Sewer)	CL	MH 17	5.3
13+48 (E. Side Sewer) - Drop	CL	MH 18	7.5
14+62 (E. Side Sewer) - Term	CL	MH 19	0.0
	Total:		86.2

TABLE OF NEW 4" PVC SEWER SERVICE AND RECONNECTION

Station	L/R	4" PVC Service Line Quantity (FT)	4" Cleanout	Reconnect to Existing Service Quantity (Each)
13+32 (E. Side Sewer)	R	33	1	1
14+57 (E. Side Sewer)	R	29	1	1
	Total	62	2	2

TABLE OF 8" SEWER CAP

Station	L/R	Quantity (EA)
26+87 (W. Blvd.)	CL	1
	Total:	1

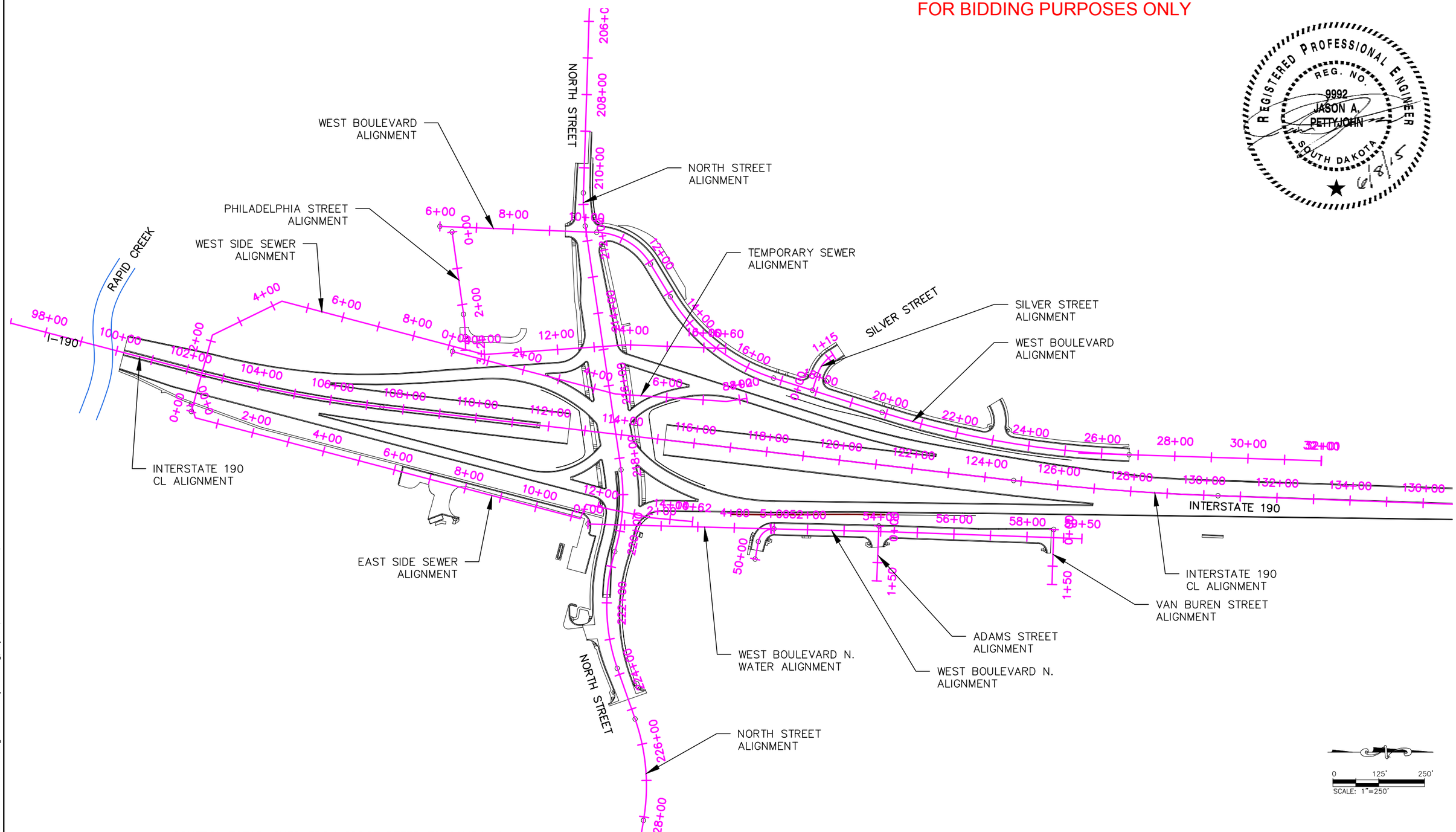
Paid for at the contract unit price per each for "8" Pipe Cap".

TABLE OF CONNECT TO EXISTING SEWER MAIN

Station	L/R	Quantity (EA)
0+10 (12") (W. Side Sewer)	L	1
17+26 (8") (W. Blvd.)	L	1
19+84 (8") (W. Blvd.)	L	1
	Total:	3

FOR BIDDING PURPOSES ONLY

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15



CONTROL ESTABLISHED FROM SDDOT REFER TO COMPANION PROJECT IM 1902(61)0, PCN 1162.

SURVEY DATA SHOWN IS BASED ON SDDOT SURVEY ON THE SOUTH DAKOTA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (NAD 83/96, NAVD 88) SF = 0.99978357.

Prepared By: F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Prepared For: Public Works Department Rapid City Incorporated 1882 South Dakota Engineering Services	Scale: 1" = 40' Designed By: JAP / Drawn By: JRK Design Date: JUNE 2015 / Print Date: JUNE 2015 Internal Job No: 130234 Surveyed By: DOT / FMG / Survey Date: SURVEY BY DOT SDDOT Project No. 1M 1902(61)0	SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT 12-2053 / CIP 50940 / PCN X03T	Sheet Title: HORIZONTAL ALIGNMENT KEYPLAN	Sheet: G12 of G77

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FOR BIDDING PURPOSES ONLY

I-190 CENTERLINE ALIGNMENT

Description: Alignment Created from the DOT's Drawings

Tangent Data

Description	PT Station	Northing	Easting
Start:	95+00.000	651618.776	1206534.115
End:	102+46.254	652340.906	1206722.327
Length: 746.254	Course: N 14° 36' 29.9541" E		

Curve Point Data

Description	Station	Northing	Easting
PC:	102+46.254	652340.906	1206722.327
RP:		653238.774	1203277.413
PT:	107+41.588	652827.359	1206813.56

Circular Curve Data

Delta:	07° 58' 19.4256"	Type:	LEFT
Radius: 3560			
Length: 495.334		Tangent:	248.067
Mid-Ord: 8.612		External:	8.632
Chord: 494.934		Course:	N 10° 37' 20.2413" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	107+41.588	652827.359	1206813.56
End:	124+79.184	654553.313	1207014.367
Length: 1737.595	Course: N 06° 38' 10.5286" E		

Curve Point Data

Description	Station	Northing	Easting
PC:	124+79.184	654553.313	1207014.367
RP:		655335.693	1200289.727
PT:	130+39.220	655111.638	1207056.018

Circular Curve Data

Delta:	04° 44' 22.8835"	Type:	LEFT
Radius: 6770			
Length: 560.036		Tangent:	280.178
Mid-Ord: 5.79		External:	5.795
Chord: 559.876		Course:	N 04° 15' 59.0868" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	130+39.220	655111.638	1207056.018
End:	155+99.995	657670.771	1207147.711
Length: 2560.776	Course: N 02° 03' 07.2423" E		

NORTH STREET ALIGNMENT

Description: Alignment Created from the DOT's Drawings

Tangent Data

Description	PT Station	Northing	Easting
Start:	200+00.000	653412.219	1205161.207
End:	210+68.608	653377.847	1206229.263
Length: 1068.608	Course: S 88° 09' 24.3570" E		

Curve Point Data

Description	Station	Northing	Easting
PC:	210+68.608	653377.847	1206229.263
RP:		653887.583	1206245.667
PT:	211+59.462	653383.007	1206319.85

Circular Curve Data

Delta:	10° 12' 25.1145"	Type:	LEFT
Radius: 510			
Length: 90.854		Tangent:	45.548
Mid-Ord: 2.022		External:	2.03
Chord: 90.734		Course:	N 86° 44' 23.0858" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	211+59.462	653383.007	1206319.85
End:	218+31.916	653480.82	1206985.151
Length: 672.453	Course: N 81° 38' 10.5286" E		

Curve Point Data

Description	Station	Northing	Easting
PC:	218+31.916	653480.82	1206985.151
RP:		652976.244	1207059.334
PCC:	220+57.963	653463.877	1207208.712

Circular Curve Data

Delta:	25° 23' 42.8594"	Type:	RIGHT
Radius: 510			
Length: 226.048		Tangent:	114.911
Mid-Ord: 12.473		External:	12.785
Chord: 224.202		Course:	S 85° 39' 58.0418" E

Curve Point Data

Description	Station	Northing	Easting
PCC:	220+57.963	653463.877	1207208.712
RP:		653951.511	1207358.09
PT:	223+82.142	653470.433	1207527.393

Circular Curve Data

Delta:	36° 25' 11.0415"	Type:	LEFT
Radius: 510			
Length: 324.179		Tangent:	167.777
Mid-Ord: 25.542		External:	26.888
Chord: 318.748		Course:	N 88° 49' 17.8672" E

NORTH STREET ALIGNMENT (CONTINUED)

Tangent Data

Description	PT Station	Northing	Easting
Start:	223+82.142	653470.433	1207527.393
End:	225+28.819	653519.125	1207665.753
Length: 146.678	Course: "N 70° 36' 42.3465"" E"		

Curve Point Data

Description	Station	Northing	Easting
PC:	225+28.819	653519.125	1207665.753
RP:		653000.315	1207848.335
PT:	228+09.582	653542.191	1207942.517

Circular Curve Data

Delta:	"29° 14' 53.3673""	Type:	RIGHT
Radius: 550			
Length: 280.762		Tangent:	143.511
Mid-Ord:	17.818	External:	18.415
Chord: 277.724		Course:	"N 85° 14' 09.0301"" E"

Tangent Data

Description	PT Station	Northing	Easting
Start:	228+09.582	653542.191	1207942.517
End:	231+46.604	653484.479	1208274.561
Length: 337.022	Course: "S 80° 08' 24.2863"" E"		

PHILADELPHIA STREET ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	653019.32	1206336.165
End:	2+26.659	653050.568	1206560.66
Length: 226.659	Course: N 82° 04' 32.3943" E		

Curve Point Data

Description	Station	Northing	Easting
PC:	2+26.659	653050.568	1206560.66
RP:		652555.343	1206629.593
PT:	2+87.867	653055.28	1206621.648

Circular Curve Data

Delta:	07° 00' 49.8661"	Type:	RIGHT
Radius: 500			
Length: 61.207		Tangent:	30.642
Mid-Ord: 0.936		External:	0.938
Chord: 61.169		Course:	N 85° 34' 57.3273" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+87.867	653055.28	1206621.648
End:	3+25.000	653055.87	1206658.776
Length: 37.133	Course: N 89° 05' 22.2604" E		

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Prepared For:
Public Works Department
Engineering Services

Scale:	
Design By: JAP/RS	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No. 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: HORIZONTAL ALIGNMENT DATA

FOR BIDDING PURPOSES ONLY

WEST BOULEVARD ALIGNMENT

Description: Alignment Created from the DOT's Drawings

Tangent Data

Description	PT Station	Northing	Easting
Start:	6+00.000	652985.681	1206320.719
End:	10+28.838	653414.205	1206337.147
Length: 428.838		Course: N 02° 11' 43.7953" E	

Curve Point Data

Description	Station	Northing	Easting
PC:	10+28.838	653414.205	1206337.147
RP:		653407.309	1206517.015
PT:	12+06.578	653561.229	1206423.695

Circular Curve Data

Delta:	56° 34' 34.7965"	Type:	RIGHT
Radius: 180			
Length: 177.74		Tangent:	96.872
Mid-Ord: 21.496		External:	24.412
Chord: 170.606		Course:	N 30° 29' 01.1935" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	12+06.578	653561.229	1206423.695
End:	13+10.945	653615.338	1206512.94
Length: 104.367		Course: N 58° 46' 18.5918" E	

Curve Point Data

Description	Station	Northing	Easting
PC:	13+10.945	653615.338	1206512.94
RP:		654051.444	1206248.532
PT:	16+77.663	653897.464	1206734.731

Circular Curve Data

Delta:	41° 11' 55.7033"	Type:	LEFT
Radius: 510			
Length: 366.718	`	Tangent:	191.69
Mid-Ord: 32.608		External:	34.835
Chord: 358.869		Course:	N 38° 10' 20.7401" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	16+77.663	653897.464	1206734.731
End:	19+88.630	654193.919	1206828.619
Length: 310.967		Course: N 17° 34' 22.8885" E	

Curve Point Data

Description	Station	Northing	Easting
PC:	19+88.630	654193.919	1206828.619
RP:		654948.721	1204445.287
PT:	26+75.392	654868.729	1206944.007

Circular Curve Data

Delta:	15° 44' 21.9452"	Type:	LEFT
Radius: 2500			
Length: 686.762		Tangent:	345.557
Mid-Ord: 23.545		External:	23.769
Chord: 684.605		Course:	N 09° 42' 11.9159" E

WEST BOULEVARD ALIGNMENT (CONTINUED)

Tangent Data

Description	PT Station	Northing	Easting
Start:	26+75.392	654868.729	1206944.007
End:	32+00.996	655394.064	1206960.824
Length: 525.604		Course: N 01° 50' 00.9433" E	

WEST BOULEVARD NORTH ALIGNMENT

Description: Alignment Created from the DOT's Drawings

Tangent Data

Description	PT Station	Northing	Easting
Start:	50+00.000	653846.856	1207229.052
End:	50+48.910	653855.956	1207180.997
Length: 48.91		Course: N 79° 16' 38.8888" W	

Curve Point Data

Description	Station	Northing	Easting
PC:	50+48.910	653855.956	1207180.997
RP:		653897.714	1207188.904
PT:	51+08.814	653898.813	1207146.418

Circular Curve Data

Delta:	80° 45' 32.8495"	Type:	RIGHT
Radius: 42.5			
Length: 59.904		Tangent:	36.144
Mid-Ord: 10.125		External:	13.291
Chord: 55.067		Course:	N 38° 53' 52.4640" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	51+08.814	653898.813	1207146.418
End:	54+48.316	654238.201	1207155.197
Length: 339.502		Course: N 01° 28' 53.9608" E	

Tangent Data

Description	PT Station	Northing	Easting
Start:	54+48.316	654238.201	1207155.197
End:	59+50.004	654739.56	1207173.394
Length: 501.689		Course: N 02° 04' 43.2281" E	

WEST BOULEVARD NORTH WATER ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	653390.173	1207133.262
End:	5+08.810	653898.813	1207146.418
Length: 508.81		Course: N 01° 28' 53.9608" E	

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
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6/8/15

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: HORIZONTAL ALIGNMENT DATA

Sheet: G14 of G77

FOR BIDDING PURPOSES ONLY

WEST SIDE SEWER ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	652306.825	1206826.261
End:	2+16.845	652364.29	1206617.169

Length: 216.845 Course: N 74° 37' 57.9312" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+16.845	652364.29	1206617.169
End:	4+27.972	652554.256	1206525.041

Length: 211.127 Course: N 25° 52' 19.2973" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	4+27.972	652554.256	1206525.041
End:	9+25.051	653035.007	1206651.395

Length: 497.078 Course: N 14° 43' 33.0142" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	9+25.051	653035.007	1206651.395
End:	9+98.997	653106.525	1206670.192

Length: 73.946 Course: N 14° 43' 33.0142" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	9+98.997	653106.525	1206670.192
End:	13+91.340	653497.995	1206644.031

Length: 392.343 Course: N 03° 49' 23.7956" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	13+91.340	653497.995	1206644.031
End:	16+59.721	653766.194	1206653.902

Length: 268.381 Course: N 02° 06' 28.5355" E

EAST SIDE SEWER ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	652306.642	1206807.028
End:	0+37.636	652317.305	1206843.122

Length: 37.636 Course: N 73° 32' 31.5782" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+37.636	652317.305	1206843.122
End:	11+25.044	653369.279	1207118.454

Length: 1087.408 Course: N 14° 40' 01.0660" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	11+25.044	653369.279	1207118.454
End:	11+67.008	653385.283	1207079.662

Length: 41.964 Course: N 67° 34' 49.2029" W

Tangent Data

Description	PT Station	Northing	Easting
Start:	11+67.008	653385.283	1207079.662
End:	13+48.038	653562.644	1207115.926

Length: 181.03 Course: N 11° 33' 21.0408" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	13+48.038	653562.644	1207115.926
End:	14+61.845	653675.942	1207126.675

Length: 113.807 Course: N 05° 25' 09.9542" E

TEMPORARY SEWER MAIN ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	653020.303	1206662.382
End:	0+22.517	653042.094	1206668.052

Length: 22.517 Course: N 14° 35' 04.9745" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+22.517	653042.094	1206668.052
End:	4+59.968	653465.449	1206778.207

Length: 437.451 Course: N 14° 35' 04.9745" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	4+59.968	653465.449	1206778.207
End:	7+62.998	653767.778	1206798.805

Length: 303.03 Course: N 03° 53' 51.7541" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	7+62.998	653767.778	1206798.805
End:	8+19.995	653824.108	1206790.111

Length: 56.998 Course: N 08° 46' 26.8821" W

SILVER STREET ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	654003.508	1206768.316
End:	0+43.886	654016.759	1206726.479

Length: 43.886 Course: N 72° 25' 31.6413" W

Curve Point Data

Description	Station	Northing	Easting
PC:	0+43.886	654016.759	1206726.479
RP:		654111.942	1206757.14
PT:	1+15.110	654059.937	1206671.727

Circular Curve Data

Delta: 40° 48' 31.8027" Type: RIGHT
Radius: 100
Length: 71.225 Tangent: 37.198
Mid-Ord: 6.274 External: 6.695
Chord: 69.729 Course: N 51° 44' 24.2744" W

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: HORIZONTAL ALIGNMENT DATA

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FOR BIDDING PURPOSES ONLY

ADAMS STREET ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	654184.894	1207138.813
End:	1+50.000	654179.086	1207288.7
Length: 150	Course:	S 87° 46' 51.9694" E	

VAN BUREN STREET ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	654663.047	1207148.215
End:	1+50.000	654657.705	1207298.12
Length: 150	Course:	S 87° 57' 33.6873" E	

36" STORM SEWER ALIGNMENT

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	654608.794	1206737.724
End:	0+31.627	654608.965	1206769.351
Length: 31.627	Course:	N 89° 41' 28.6523" E	

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+31.627	654608.965	1206769.351
End:	1+89.998	654547.391	1206915.262
Length: 158.371	Course:	S 67° 07' 14.0314" E	

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: HORIZONTAL ALIGNMENT DATA

Sheet: G16 of G77

FOR BIDDING PURPOSES ONLY

PROPERTY OWNERSHIP AND EASEMENT TABLE

Additional Easements have been obtained by SDDOT as shown in the companion Project IM 1902(61)0 PCN 1162

Parcel	Station to Station	Side	Type	Purpose	Area	Address/Owner	Description
100	Omitted						
101						Philadelphia St. Doris Waba Trustee	Lots 23-31 of Block 2 of North Boulevard Addition to the City of Rapid City
102						1101 Setters Creek Pl. Robert & Mary Giacometto	Lot 1R of Block 2 of Sellers Creek Townhomes Addition to the City of Rapid City
103						1036 Philadelphia St. David C. Kepner	Lots 17-18 of Block 2 of North Boulevard Addition to the City of Rapid City
104						1030 Philadelphia St. Charles A. White	Lots 15-16 of Block 2 of North Boulevard Addition to the City of Rapid City
105						1028 Philadelphia St. Jean M. Jackson	Lots 13-14 of Block 2 of North Boulevard Addition to the City of Rapid City
106						1024 Philadelphia St. Doris Waba Trustee	Lots 11-12 of Block 2 of North Boulevard Addition to the City of Rapid City
107						1022 Philadelphia St. Harold E. Messner	Lots 9-10 of Block 2 of North Boulevard Addition to the City of Rapid City
108	City Plat		Perm	Sewer Main	0.41 Ac. 17811 Sq. Ft.	433 North Mount Rushmore Rd. RC Independent School District #1	Lot PE1 - Lot RU-302A and Lot RU-302B located in the Original Townsite of the City of Rapid City
109	City Plat		Perm	Water/Sewer Main	0.13 Ac. 5740 Sq. Ft.	433 North Mount Rushmore Rd. RC Independent School District #1	Lot PE1 Lot RU-302B located in the Original Townsite of the City of Rapid City
110						925 Filmore St. George Q. & Gloria Rankin	Lots 13-16 of Block 1 of Original Town of Rapid
111						928 Fillmore St. Ohana Properties LLC	Lot 12 of Block 15 of North Rapid Addition to the City of Rapid City
112						706 West Blvd. North Theresa J. Schaefer	Lots 13-14 of Block 15 of North Rapid Addition to the City of Rapid City
113						708 West Blvd. North Kevin R. Gilmore	Lots 15-16 of Block 15 of North Rapid Addition to the City of Rapid City
114						710 West Blvd. North Michael N. & George Powers	Lots 17-18 of Block 15 of North Rapid Addition to the City of Rapid City
115						712 West Blvd. North Joseph C. & Penny Pilgrim	Lots 19-20 of Block 15 of North Rapid Addition to the City of Rapid City

FOR BIDDING PURPOSES ONLY

PROPERTY OWNERSHIP AND EASEMENT TABLE

Additional Easements have been obtained by SDDOT as shown in the companion Project IM 1902(61)0 PCN 1162

Parcel	Station to Station	Side	Type	Purpose	Area	Address/Owner	Description
116						940 Adams St. Frank G. & Deborah Rasmussen	Lots 17-18 of Block 14 of North Rapid Addition to the City of Rapid City
117						806 West Blvd. North Kenneth A. Bella	Lot B of Block 14 of North Rapid Addition to the City of Rapid City
118						810 West Blvd. North Rebecca L. & Joel Anderson	Lot A of Block 14 of North Rapid Addition to the City of Rapid City
119						No Address City of Rapid City	Lots 23-32 of Block 14 of North Rapid Addition to the City of Rapid City
120						930 Van Buren St.	Lot 22 of Block 7 of North Rapid Addition to the City of Rapid City
A	Purchased by SDDOT by Description		Right of Way			503 West Blvd. North South Dakota Department of Transportation (formerly Harrington)	Lot H1 - Lot 16 of Block 12 of Mallow's Addition to the City of Rapid City
B	Purchased by SDDOT by Description		Right of Way			417 West Blvd. North South Dakota Department of Transportation (formerly Ehlers)	Lot H1 - Lots 36, 37 and 38 in Block 2 North Boulevard Addition to the City of Rapid City
C	Purchased by SDDOT by Description		Right of Way			413 West Blvd. North South Dakota Department of Transportation (formerly Collins)	Lot H1 - Lot 1 Block A Lot 1 of 35-T2N-R7E; Lot 33A of Lots 33,34 and 35 Block 2 – North Boulevard Addition
D	Purchased by SDDOT by Description		Right of Way			623 Silver St. South Dakota Department of Transportation (formerly Strong)	Lot H1 - Lot 11 of Block 12 of Mallow's Addition to the City of Rapid City
E	Purchased by SDDOT by Description		Right of Way			629 Silver St. South Dakota Department of Transportation (formerly Lahr)	Lot A - Lot 7 and 8 of Block 12 of Mallow's Addition to the City of Rapid City
F	Purchased by SDDOT by Description		Right of Way			501 West Blvd. North South Dakota Department of Transportation (formerly Van Zee)	Lot H1 - Lot 17 of Block 12 of Mallow's Addition to the City of Rapid City
G	Purchased by SDDOT by Description		Right of Way			619 Silver St. South Dakota Department of Transportation (formerly Scholl)	Lot H1 - Lots 12 and 13 of Block 12 of Mallow's Addition to the City of Rapid City
H	Purchased by SDDOT by Description		Right of Way			625 Silver St. South Dakota Department of Transportation (formerly Danley)	Lot H1 - Lots 9 and 10 of Block 12 of Mallow's Addition to the City of Rapid City
I	Purchased by SDDOT by Description		Right of Way			403 West Blvd. North South Dakota Department of Transportation (formerly Dimond)	Lot H1 - Lots 5 and 6 in Block 2 North Boulevard Addition to the City of Rapid City
J	Purchased by SDDOT by Description		Right of Way			409 West. Blvd. North South Dakota Department of Transportation (formerly G/GSA Inc.)	Lot H1 - Lots 1 and 2 in Block 2 North Boulevard Addition to the City of Rapid City
K	Purchased by SDDOT by Description		Right of Way			633 Silver St. South Dakota Department of Transportation (formerly Stroppel)	Lot A - Lots 5 and 6 of Block 12 of Mallow's Addition to the City of Rapid City

FOR BIDDING PURPOSES ONLY

PROPERTY OWNERSHIP AND EASEMENT TABLE

Additional Easements have been obtained by SDDOT as shown in the companion Project IM 1902(61)0 PCN 1162

Parcel	Station to Station	Side	Type	Purpose	Area	Address/Owner	Description
L	Purchased by SDDOT by Description		Right of Way			635 Silver St. South Dakota Department of Transportation (formerly Camping)	Lot A - Lots 3 and 4 of Block 12 of Mallow's Addition to the City of Rapid City
M	Purchased by SDDOT by Description		Right of Way			639 Silver St. South Dakota Department of Transportation (formerly Lahoe)	Lot H1 - Lots 1 and 2 of Block 12 of Mallow's Addition to the City of Rapid City
N	Purchased by SDDOT by Description		Right of Way			West Blvd. South Dakota Department of Transportation (formerly City of Rapid City)	Lot A - Lot RU 301-B of Block 1, North Boulevard Addition to the City of Rapid City
CA1						No Address City of Rapid City	Rapid City Greenway Tracts
CA2						Philadelphia St. Doris Waba Trustee c/o Joel W Waba	Lots 28-29 in Block 2 of North Boulevard Subdivision to the City of Rapid City
CA3						No Address City of Rapid City	Lot 1 of Tract C of NE1/4SE1/4 of Section 35 T2N-R7E
A3						1102, 1108, 1114, 1120 Settlers Creek Pl. Rushmore Properties LLC	Lot 1-4 in Block 1 of Settler's Creek Townhomes Addition to the City of Rapid City
A4						No Address Maxine L. Smith	Lots 26-28 of Block 12 of Mallow's Addition to the City of Rapid City
A5						731 Gold St. Gold Street LLC.	Lots 2 and 3 of Block 9 of Mallow's Addition to the City of Rapid City
A6						No Address City of Rapid City	Lot F Less ROW of Block 19 of Scotts Additions to the City of Rapid City
A7						Mallow St. Century Motels Inc	Lot 1-9; Vac 9th St; Vac Fillmore St; Vac Alley of Block 1 of Original Town of Rapid City to the City of Rapid City
A8						950 North St. South Dakota Department of Transportation (formerly Kenzy)	Lot 23 of Block 7 of Mallow's Addition to the City of Rapid City
2	Omitted						
3	SDDOT Plat					1018 Philadelphia St. Gary E. Messner	Lot H1 - Lot 7 in Block 2 of North Boulevard Addition to the City of Rapid City
4	Purchased by SDDOT by Description		Right of Way			405 West Blvd. North South Dakota Department of Transportation (formerly Pederson)	Lot H1 - Lots 3 and 4 in Block 2 of North Boulevard Addition to the City of Rapid City
5	SDDOT Plat					1018 Philadelphia St. Gary E. Messner	Lot H2 - Lot 7 and Lot 8 in Block 2 of North Boulevard Addition to the City of Rapid City

FOR BIDDING PURPOSES ONLY

PROPERTY OWNERSHIP AND EASEMENT TABLE

Additional Easements have been obtained by SDDOT as shown in the companion Project IM 1902(61)0 PCN 1162

Parcel	Station to Station	Side	Type	Purpose	Area	Address/Owner	Description
6	SDDOT Plat					Philadelphia St. Doris Waba Trustee c/o Joel W Waba	Lot H1 - Lots 30, 31 and 32 in Block 2 of North Boulevard Addition to the City of Rapid City
7	SDDOT Plat					Philadelphia St. Doris Waba Trustee c/o Joel W Waba	Lot H1 - Lots 23, 24, 25, 26 and 27 in Block 2 of North Boulevard Addition to the City of Rapid City
8	Purchased by SDDOT by Description					415 West Blvd. North South Dakota Department of Transportation (formerly Brightman)	Lot H1 - Lot 33B of Lot 33 of Block 2 North Boulevard Addition to the City of Rapid City and Block A Less Lot 1 of Block A of Government Lot 3 of Section 35 Township 2 North – Range 7 East of the Black Hills Meridian
9	SDDOT Plat					1032 Philadelphia St. City of Rapid City	Lot H1 - Lot 1 of Lot B in Block 2 of North Boulevard Addition to the City of Rapid City
10	SDDOT Plat					215 Mount Rushmore Rd. City of Rapid City	Lot H2 - Track 19 less Lot H-1 of Rapid City Greenway Tracts to the City of Rapid City
11	Purchased by SDDOT by Description		Right of Way			509 West Blvd. North South Dakota Department of Transportation (formerly Chamberlain)	Lot H1 - Lots 14 and 15 of Block 12 of Mallow's Addition to the City of Rapid City
12	SDDOT Plat					433 North Mount Rushmore Rd. RC Independent School District #1	Lot H1 - Lot RU-302A and Lot RU-302B located in the Original Townsite of the City of Rapid City
12A	SDDOT Plat					433 North Mount Rushmore Rd. RC Independent School District #1	Lot H2 Lot RU-302B located in the Original Townsite of the City of Rapid City
13	Purchased by SDDOT by Description		Right of Way			Mallow St. Lisa A. Doyle & David Doyle	Lot H1 - Lot A, B and C of Block 12 of Mallow's Addition to the City of Rapid City
14	SDDOT Plat					No Address Maxine L. Smith	Lot H1 - Lots 18, 19, 20, 21 and 22 of Block 12 of Mallow's Addition to the City of Rapid City
15	SDDOT Plat					Mallow St. David L Brown & Valarie Brown	Lot H1 - Lots 24 and 25 of Block 12 of Mallow's Addition to the City of Rapid City
16	Purchased by SDDOT by Description					Mallow St. Thomas P Baumgartner	Lot H1 - Lot 4 of Block 13 of Mallow's Addition to the City of Rapid City
17	SDDOT Plat					Mallow St. Lisa A. Doyle & David Doyle	Lot H1 - Lots 1, 2 and 3 of Block 13 of Mallow's Addition to the City of Rapid City
18	Purchased by SDDOT by Description		Right of Way and Slope Protection			615 Mallow St. Larry Brown / Kebach c/o Carol Hendrickson	Lot H1 - Lot 17 of Block 7 of Mallow's Addition to the City of Rapid City
19	Purchased by SDDOT by Description		Right of Way			Mallow St. Lisa Chandler	Lot H1 - Lot 18 of Block 7 of Mallow's Addition to the City of Rapid City
20	SDDOT Plat					Mallow St. Capital Development Inc	Lot H1 - Lots 1-8 of Block 14 of Mallow's Addition to the City of Rapid City

FOR BIDDING PURPOSES ONLY

PROPERTY OWNERSHIP AND EASEMENT TABLE

Additional Easements have been obtained by SDDOT as shown in the companion Project IM 1902(61)0 PCN 1162

Parcel	Station to Station	Side	Type	Purpose	Area	Address/Owner	Description
21	SDDOT Plat					712 Silver St. Jay I Swanson	Lot H2 - Lots 21, 22 and 23 less Lot H-1 of Block 9 of Mallow's Addition to the City of Rapid City
22	SDDOT Plat					727 Gold St. Delores M O'daniel & Robert O'daniel	Lot H2 - Lots 4, 5, 6, 7, 8, 9 and 10 Less Lot H-1 of Block 9 of Mallow's Addition to the City of Rapid City
23	SDDOT Plat					718 Silver St. John L Fortune	Lot H1 - Lot 24 of Block 9 of Mallow's Addition to the City of Rapid City
26	SDDOT Plat					950 North St. Century Motels Inc	Lot H1 - Lot RU-20 in Block 1 of the original Townsite of Rapid City
27	SDDOT Plat					No Address Maxine L. Smith	Lot H2 - Lots 21 and 22 of Block 12 of Mallow's Addition to the City of Rapid City
28	SDDOT Plat					Mallow St. Lisa A. Doyle & David Doyle	Lot H2 - Lots 1 and 2 of Block 13 of Mallow's Addition to the City of Rapid City
44	SDDOT Plat					301 West Blvd. North Jeanette Mcgough	Lot H1 - Lot 1 and Lot 2 of Lot RU 301A of Block 1, North Boulevard Addition to the City of Rapid City
45	SDDOT Plat		Right of Way and Slope Protection			605 Mallow St. South Dakota Department of Transportation (formerly Pesek)	Lot H1 - Lots 19-22 of Block 7 of Mallow's Addition to the City of Rapid City
45A	SDDOT Plat		Right of Way and Slope Protection			605 Mallow St. South Dakota Department of Transportation (formerly Pesek)	Lot PE1 - Lots 19-22 of Block 7 of Mallow's Addition to the City of Rapid City

FOR BIDDING PURPOSES ONLY

MALLOW ST.
HIGH ST.
NORTH STREET
11TH STREET
PHILADELPHIA STREET
WEST BLVD. ALIGNMENT
NORTH STREET ALIGNMENT
WEST SIDE SEWER ALIGNMENT
PHILADELPHIA STREET ALIGNMENT
EAST SIDE SEWER ALIGNMENT
212+84.01
61.50R
219+59.99
45.69R
221+33.84
67.81R
222+13.67
48.85R
219+83.48
61.89R

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 25' 50' 100'
SCALE: 1"=100'

SHEET KEY

CITY OF RAPID CITY PERMANENT EASEMENT

APPROXIMATE SDDOT EASEMENT LIMITS*

APPROXIMATE SDDOT ROW*

*SEE COMBINATION PROJECT IM 1902(61)0 PCN 1162 FOR SDDOT ROW & EASEMENTS

Prepared By:

F M G, Inc.
3700 Sturgis Road
Rapid City, SD 57702-0317
(605) 342-4105 FAX (605) 342-4222
www.fmgengineering.com

Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: PROPERTY & EASEMENT PLAN

Sheet: G22 of G77

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FOR BIDDING PURPOSES ONLY

PHILADELPHIA STREET ALIGNMENT

WEST SIDE SEWER ALIGNMENT

NORTH STREET ALIGNMENT

EAST SIDE SEWER ALIGNMENT

NORTH STREET

11+16.35
15.00L

12+46.40
15.00L

12+45.05
3.83R

11+14.72
7.78R

12+24.34
17.27R

11+31.18
10.00R

11+67.27
51.67R

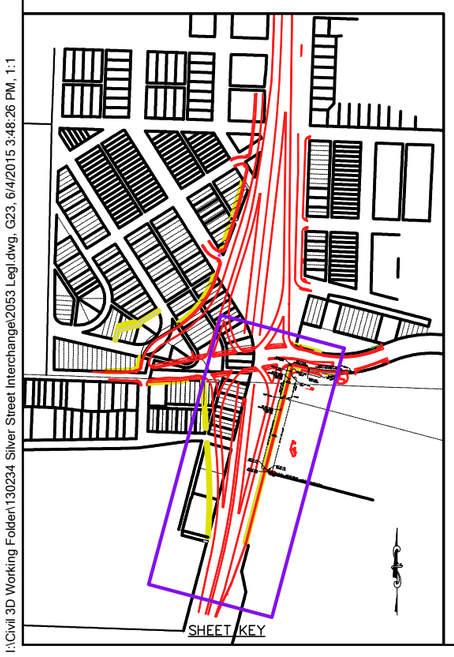
12+09.72
39.42R

6+08.96
7.19R

6+18.96
7.21R

6+18.96
27.79L

6+08.96
10.00R



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9992
JASON A.
PETTYJOHN
SOUTH DAKOTA
6/8/15

0 25' 50' 100'
SCALE: 1"=100'

CITY OF RAPID CITY PERMANENT EASEMENT

APPROXIMATE SDDOT EASEMENT LIMITS*

APPROXIMATE SDDOT ROW*

*SEE COMBINATION PROJECT IM 1902(61)0 PCN 1162 FOR SDDOT ROW & EASEMENTS

Prepared By:

F M G, Inc.
3700 Sturgis Road
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www.fmgengineering.com

Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: PROPERTY & EASEMENT PLAN

Sheet: G23 of G77

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FOR BIDDING PURPOSES ONLY

WEST SIDE SEWER ALIGNMENT

SILVER STREET

BOEGEL STREET

WEST BOULEVARD

WEST BLVD. ALIGNMENT

NORTH STREET ALIGNMENT

EAST SIDE SEWER ALIGNMENT

WEST BLVD. NORTH ALIGNMENT

WEST BOULEVARD NORTH

ADAMS STREET

VAN BUREN ST.

SHEET KEY

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

CITY OF RAPID CITY PERMANENT EASEMENT

APPROXIMATE SDDOT EASEMENT LIMITS*

APPROXIMATE SDDOT ROW*

*SEE COMBINATION PROJECT IM 1902(61)0 PCN 1162 FOR SDDOT ROW & EASEMENTS

0 25' 50' 100'
SCALE: 1"=100'

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Prepared For:
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Design Date: JUNE 2015	Print Date: JUNE 2015
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SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: PROPERTY & EASEMENT PLAN

Sheet: G24 of G77

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FOR BIDDING PURPOSES ONLY

CITY MH #G6-066
RIM: 3261.35
INV OUT: 3254.47 8" PVC

CITY MH #G6-067
RIM: 3247.97
INV IN: 3238.11 8" PVC
INV OUT: 3238.27 8" PVC

CITY MH #G6-001
RIM: 3249.20
INV IN: 3241.28 8" PVC
INV OUT: 3241.19 8" PVC

CITY MH #3
RIM: 3258.39
INV IN: 3244.18 8" PVC
INV IN: 3244.18 8" PVC
INV OUT: 3244.14 8" PVC

CITY MH #G6-056
RIM: 3246.29
INV IN: 3236.58 8" PVC
INV OUT: 3235.84 8" PVC

CITY MH #G6-101
RIM: 3243.88
INV IN: 3236.45 8" PVC
INV OUT: 3236.29 8" PVC

VALVES TO REMAIN

VALVE TO REMAIN

NORTH STREET

950 NORTH STREET

925 FILLMORE STREET

1032 PHILADELPHIA ST.

PHILADELPHIA ST.

1114 SETTLERS CREEK PL.

1108 SETTLERS CREEK PL.

1102 SETTLERS CREEK PL.

11TH STREET

INTERSTATE 190 (SOUTH)

INTERSTATE 190 (NORTH)

117+00

116+00

115+00

114+00

113+00

112+00

111+00

110+00

109+00

WATER MAIN REMOVALS

ABANDON WATER VALVE
AND BOX
108+90 – 529'L

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9992
JASON A.
PETTYJOHN
SOUTH DAKOTA
6/8/15

0 25' 50' 100'
SCALE: 1"=100'

SHEET KEY

I:\Civil 3D Working Folder\130234 Silver Street Interchange\2053 Demo.dwg, G25, 6/4/2015 3:43:10 PM, 1:1

Prepared By:

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Prepared For:
Public Works Department
Rapid City, South Dakota, Incorporated 1852
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: DEMOLITION PLAN

Sheet: G25 of G77

FOR BIDDING PURPOSES ONLY

CITY MH #G6-052
RIM: 3232.31
INV IN: 3222.37 10" PVC
INV OUT: 3222.37 10" PVC

CITY MH #G6-053
RIM: 3237.52
INV IN: 3223.70 8" PVC
INV OUT: 3223.69 10" PVC

CITY MH #G6-054
RIM: 3240.83
INV IN: 3230.27 8" PVC
INV IN: 3225.48 8" PVC
INV OUT: 3225.48 8" PVC

CITY MH #G6-056
RIM: 3246.29
INV IN: 3236.58 8" PVC
INV OUT: 3235.84 8" PVC

CITY MH #G6-001
RIM: 3249.20
INV IN: 3241.28 8" PVC
INV OUT: 3241.19 8" PVC

NORTH STREET

101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00

INTERSTATE 190 (SOUTH)

INTERSTATE 190 (NORTH)

VALVES TO REMAIN

MAIN LINE VALVES TO REMAIN

CITY MH #G6-063
RIM: 3233.30
INV IN: 3220.69 10" PVC
INV OUT: 3220.50 12" PVC

CITY MH #G6-049
RIM: 3233.65
INV IN: 3221.06 8" PVC
INV IN: 3220.95 10" PVC
INV OUT: 3221.00 10" PVC

CITY MH #G6-050
RIM: 3237.16
INV IN: 3224.86 8" PVC
INV IN: 3224.77 6"
INV OUT: 3224.90 8" PVC

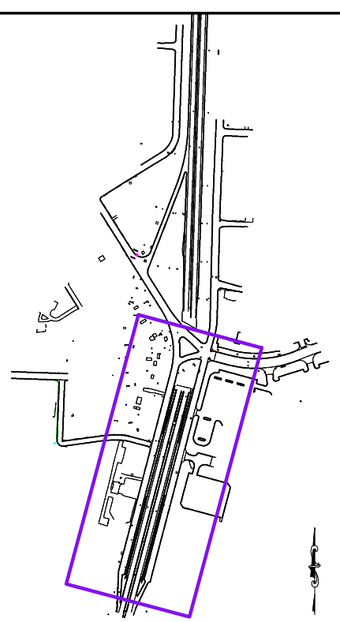
CITY MH #G6-051
RIM: 3241.64
INV IN: 3231.54 8" PVC
INV OUT: 3231.56 8" PVC

MAIN LINE VALVE TO REMAIN

CITY MH #G6-101
RIM: 3243.88
INV IN: 3236.45 8" PVC
INV OUT: 3236.29 8" PVC

950 NORTH STREET

NORTH STREET



SHEET KEY

WATER MAIN REMOVALS

ABANDON AIR RELEASE MANHOLE
102+58 – 56'R

REMOVE FIRE HYDRANT AND AUXILIARY VALVE
108+46 – 167'R
109+47 – 38'L
111+46 – 194'R
113+85 – 242'R

ABANDON CURB STOP AND BOX
106+84 – 68'L

ABANDON WATER VALVE AND BOX
102+58 – 99'R
102+59 – 68'L
102+61 – 73'L
102+62 – 119'R
102+63 – 59'R
109+02 – 30'L
109+11 – 239'L
109+12 – 235'L
109+42 – 34'L
109+51 – 23'L
109+58 – 188'L
113+79 – 235'R
113+99 – 244'R
114+02 – 227'R
114+37 – 187'R
114+68 – 243'R
114+55 – 397'R
114+57 – 400'R

SANITARY SEWER REMOVALS

ABANDON 48" MANHOLE
102+50 – 70'R
102+52 – 59'L
106+16 – 88'R
106+29 – 40'L
109+21 – 2'L
109+45 – 134'R

REMOVE 48" MANHOLE
102+49 – 99'R
112+36 – 42'R
113+93 – 199'R

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 25' 50' 100'
SCALE: 1"=100'

Prepared By:

F M G, Inc.
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(605) 342-4105 FAX (605) 342-4222
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Prepared For:
Public Works Department
Engineering Services

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Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: DEMOLITION PLAN

Sheet: G26 of G77

I:\Civil 3D Working Folder\130234 Silver Street Interchange\2053 Demo.dwg, G26, 6/4/2015 3:41:42 PM, 1:1

FOR BIDDING PURPOSES ONLY

NORTH STREET

SILVER ST.

VALVES TO REMAIN

CITY MH #G6-020
RIM: 3264.42
INV IN: 3252.70 8" PVC
INV OUT: 3252.64 8" PVC

CITY MH #G6-001
RIM: 3249.20
INV IN: 3241.28 8" PVC
INV OUT: 3241.19 8" PVC

CITY MH #G6-011
RIM: 3257.88
INV IN: 3248.26 8" PVC
INV IN: 3247.49 8" PVC
INV OUT: 3247.29 8" PVC

CITY MH #--- (NEW)
RIM: 3257.90
INV IN: 3248.70 8" PVC
INV IN: 3248.70 8" PVC
INV OUT: 3248.70 8" PVC

VALVE TO REMAIN

WEST BOULEVARD

113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00 124+00 125+00 126+00 127+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00

CITY MH #G6-066
RIM: 3261.35
INV OUT: 3254.47 8" PVC

CITY MH #G6-067
RIM: 3247.97
INV IN: 3238.11 8" PVC
INV OUT: 3238.27 8" PVC

WEST BOULEVARD NORTH

VALVES TO REMAIN

925 FILLMORE STREET

928 FILLMORE ST.

706 WEST BLVD. N.

708 WEST BLVD. N.

710 WEST BLVD. NJ

712 WEST BLVD. N.

940 ADAMS ST.

806 WEST BLVD. N.

810 WEST BLVD. N.

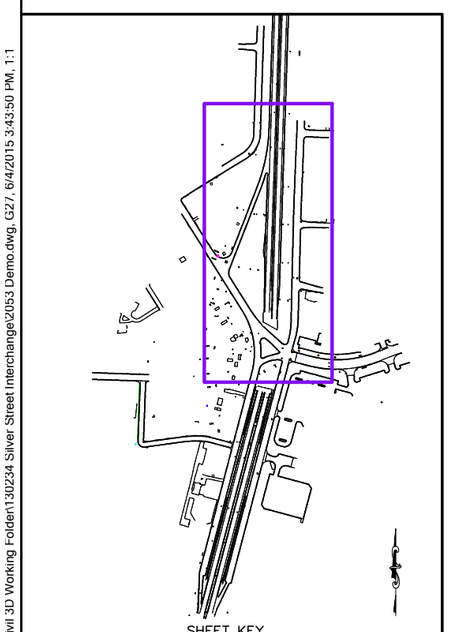
706 WEST BLVD. N.

CITY #H6-230
RIM: 3287.43
INV OUT: 3283.91 8" PVC

CITY #H6-229
RIM: 3297.70
INV IN: 3282.70 8" PVC
INV IN: 3282.66 8" PVC
INV OUT: 3282.59 8" PVC

CITY # UNKNOWN
RIM: 3303.07
INV OUT: 3290.86 8" PVC

CITY #H6-226
RIM: 3303.10
INV OUT: 3297.23 6"



SHEET KEY

WATER MAIN REMOVALS

REMOVE FIRE HYDRANT AND AUXILIARY VALVE
121+50 – 221'R
123+28 – 95'L
125+85 – 185'R

ABANDON CURB STOP AND BOX
118+48 – 260'L
121+99 – 206'R
122+51 – 201'R
122+99 – 198'R
123+24 – 131'L
123+36 – 140'L

ABANDON WATER VALVE AND BOX
114+56 – 24'R
114+73 – 20'R
116+47 – 178'R
120+92 – 191'R
121+45 – 218'R
121+74 – 206'R
125+68 – 176'R
125+92 – 188'R

SANITARY SEWER REMOVALS

REMOVE 48" MANHOLE
114+88 – 206'R
114+83 – 55'R
116+21 – 216'R
118+08 – 208'L
118+42 – 197'L
120+70 – 130'L

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 25' 50' 100'
SCALE: 1"=100'

Prepared By:

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Prepared For:
Public Works Department
Rapid City, South Dakota
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: DEMOLITION PLAN

Sheet: G27 of G77

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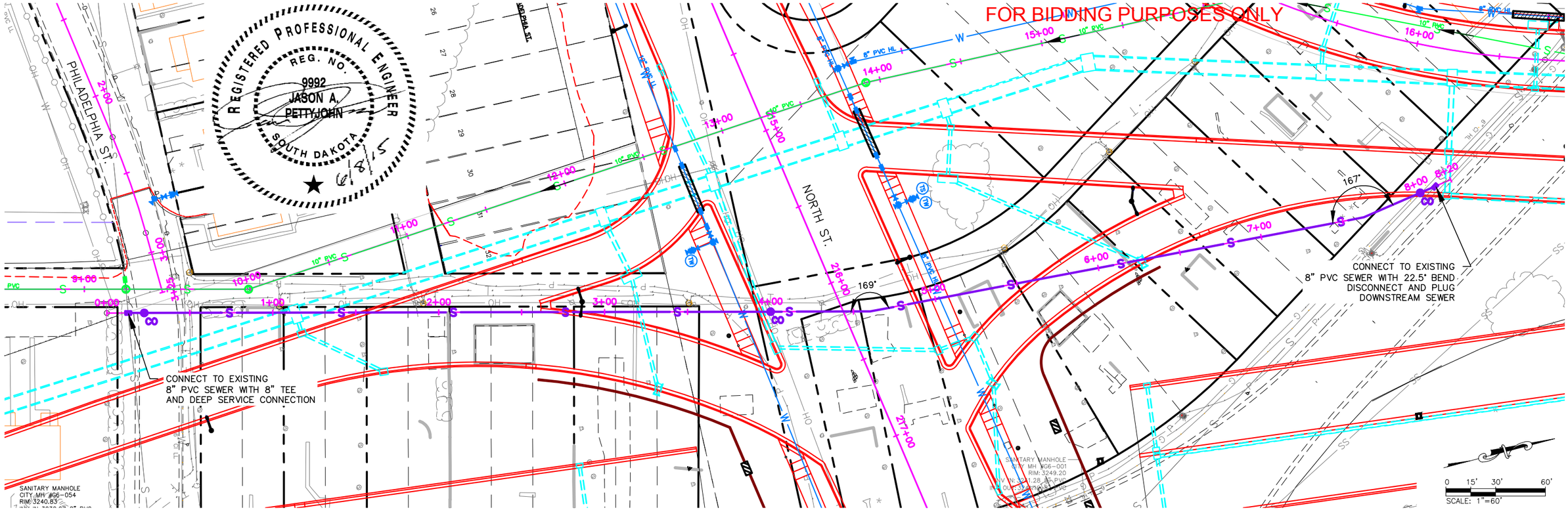
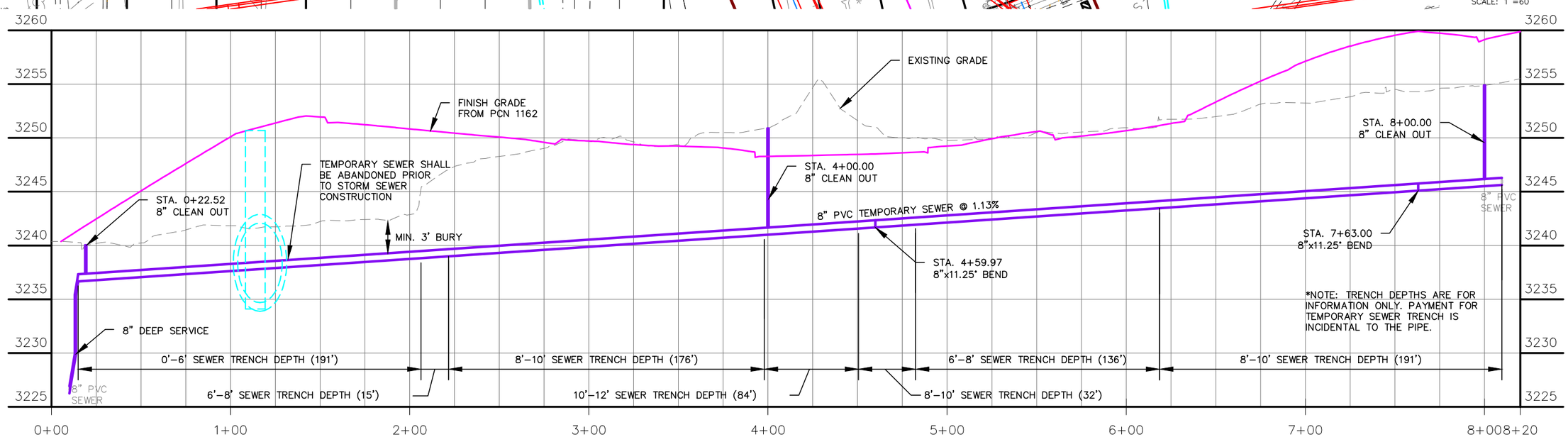
FOR BIDDING PURPOSES ONLY

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15





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Prepared For:
Public Works Department
Rapid City, South Dakota, Incorporated 1882
Engineering Services

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Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: TEMPORARY SEWER PLAN & PROFILE

Sheet: G28 of G77

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SANITARY MANHOLE
CITY MH #1
RIM: 3260.24
INV IN: 3253.30 8" PVC
INV IN: 3253.46 8" PVC
INV OUT: 3253.30 8" PVC

SANITARY MANHOLE
CITY MH #2
RIM: 3253.89
INV IN: 3246.37 8" PVC
INV OUT: 3246.32 8" PVC

207+09
208+00
209+00
210+00
211+00
212+00
10+00
11+00
9+00

PHILADELPHIA STREET

MANHOLE ADJUSTMENT BY PVC 1162

ADJUST VALVE BOXES (INCIDENTAL WORK)

SANITARY MANHOLE
CITY MH #3
RIM: 3258.39
INV IN: 3244.18 8" PVC
INV IN: 3244.18 8" PVC
INV OUT: 3244.14 8" PVC

PRESSURE ZONE ISOLATION VALVES, OPEN OR CLOSE TO CONVERT 12" TO H.L. OR L.L.

1032 PHILADELPH

FIRE HYDRANT EXTENSION WILL BE MADE BY CITY MAINTENANCE

11TH STREET

SIDEWALK

LANDSCAPE ROCK

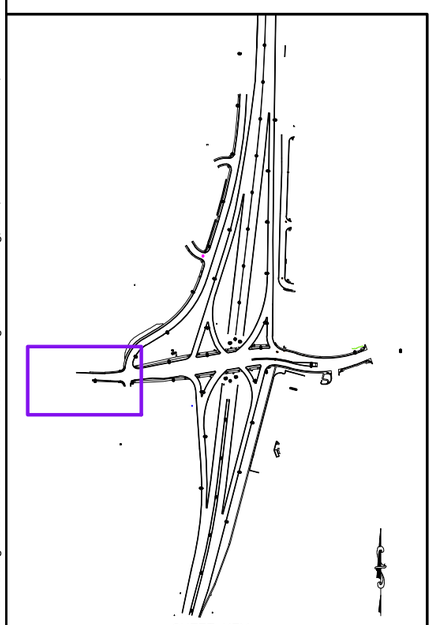
1120 SETTLERS CREEK PL.

1114 SETTLERS CREEK PL.

1108 SETTLERS CREEK PL.

1102 SETTLERS CREEK PL.

LOT 1R, BLOCK 1
SETTLERS CREEK TOWNHOMES



SHEET KEY

WATER MAIN NOTES

211+31.58 – 30.41'R to 212+00.00 – 30.90'L
F&I 106' – 8" PVC WATER MAIN

211+32.81 – 20.49'R
F&I 8" GATE VALVE AND VALVE BOX

211+36.32 – 5.97'L
F&I 8" x 45° BEND AND THRUST BLOCK

211+59.58 – 22.29'L
F&I 8" x 22.5° BEND AND THRUST BLOCK

211+17.46 – 29.02'R to 211+36.25 – 31.08'R
F&I 20' – 12" PVC WATER MAIN

211+17.46 – 29.02'R
CONNECT TO EXISTING 12" MAIN

211+22.17 – 29.47'R
F&I 12" GATE VALVE AND VALVE BOX

211+26.87 – 29.96'R
F&I 12" x 12" x 6" TEE AND THRUST BLOCK

211+26.87 – 29.96'R to 211+26.29 – 35.93'R
F&I 6' – 6" PVC HYDRANT LEAD

211+26.29 – 35.93'R
F&I FIRE HYDRANT WITH THRUST BLOCK, AUXILIARY VALVE, AND VALVE BOX

211+31.57 – 30.50'R
12" x 12" x 8" TEE AND THRUST BLOCK

211+36.25 – 31.08'R
CONNECT TO EXISTING 12" GATE VALVE

F&I CONCRETE WATER MAIN ENCASEMENT
211+35.72 – 1.60'L to 211+73.64 – 25.29'L (1EA)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

211+26 – 36'R
F&I CP TEST STATION

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
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SOUTH DAKOTA
6/8/15

0 10' 20' 40'
SCALE: 1"=40'

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Prepared For:
Public Works Department
Rapid City, South Dakota
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: NORTH STREET UTILITY PLAN

Sheet: G29 of G77

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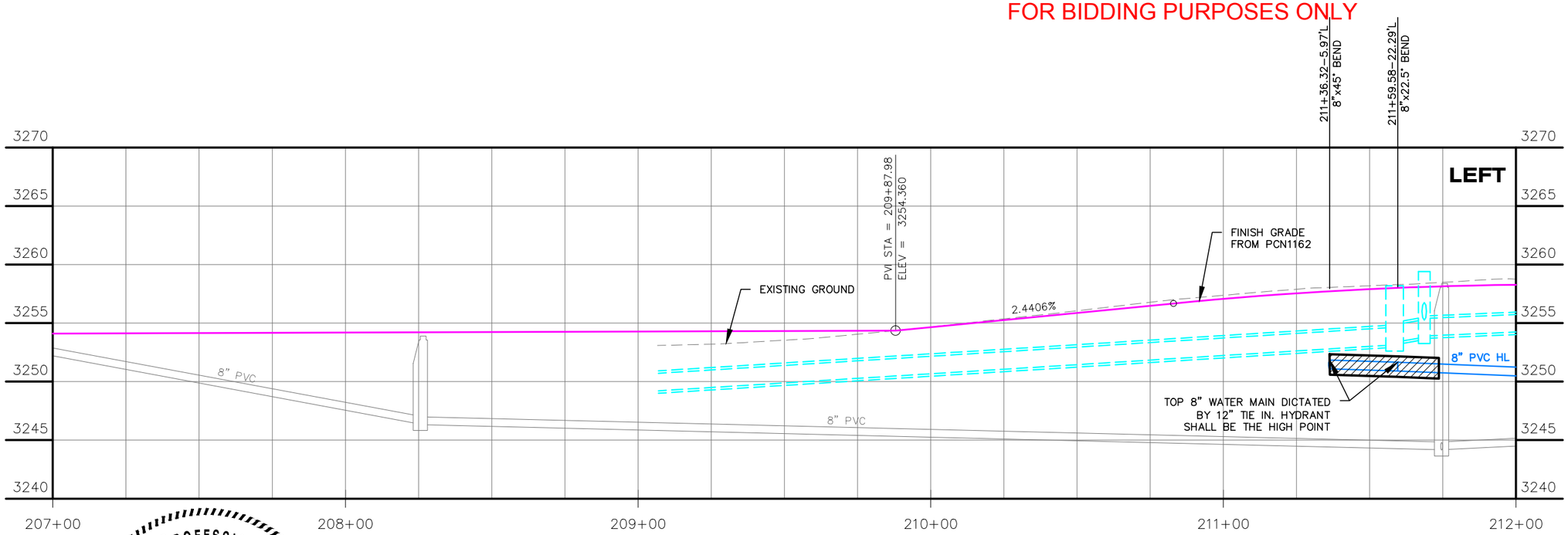
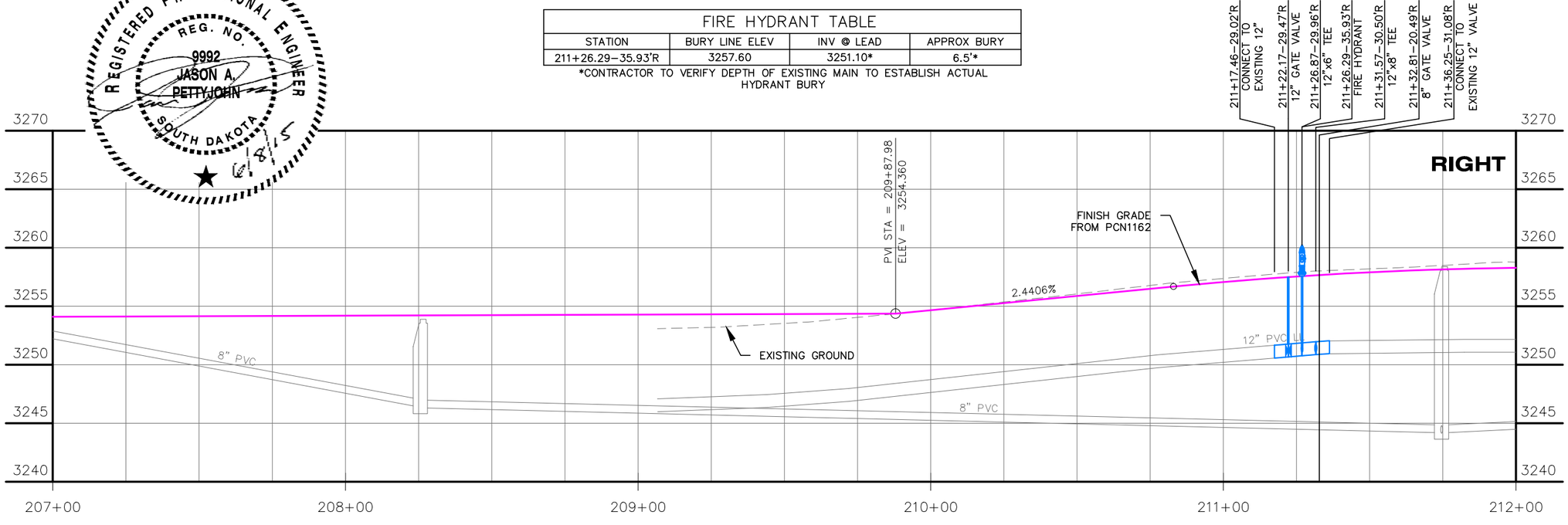


FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
211+26.29–35.93'R	3257.60	3251.10*	6.5'*

*CONTRACTOR TO VERIFY DEPTH OF EXISTING MAIN TO ESTABLISH ACTUAL HYDRANT BURY

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15



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Design Date: JUNE 2015	Print Date: JUNE 2015
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Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: NORTH STREET UTILITY PROFILE

Sheet: G30 of G77

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REGISTERED PROFESSIONAL ENGINEER
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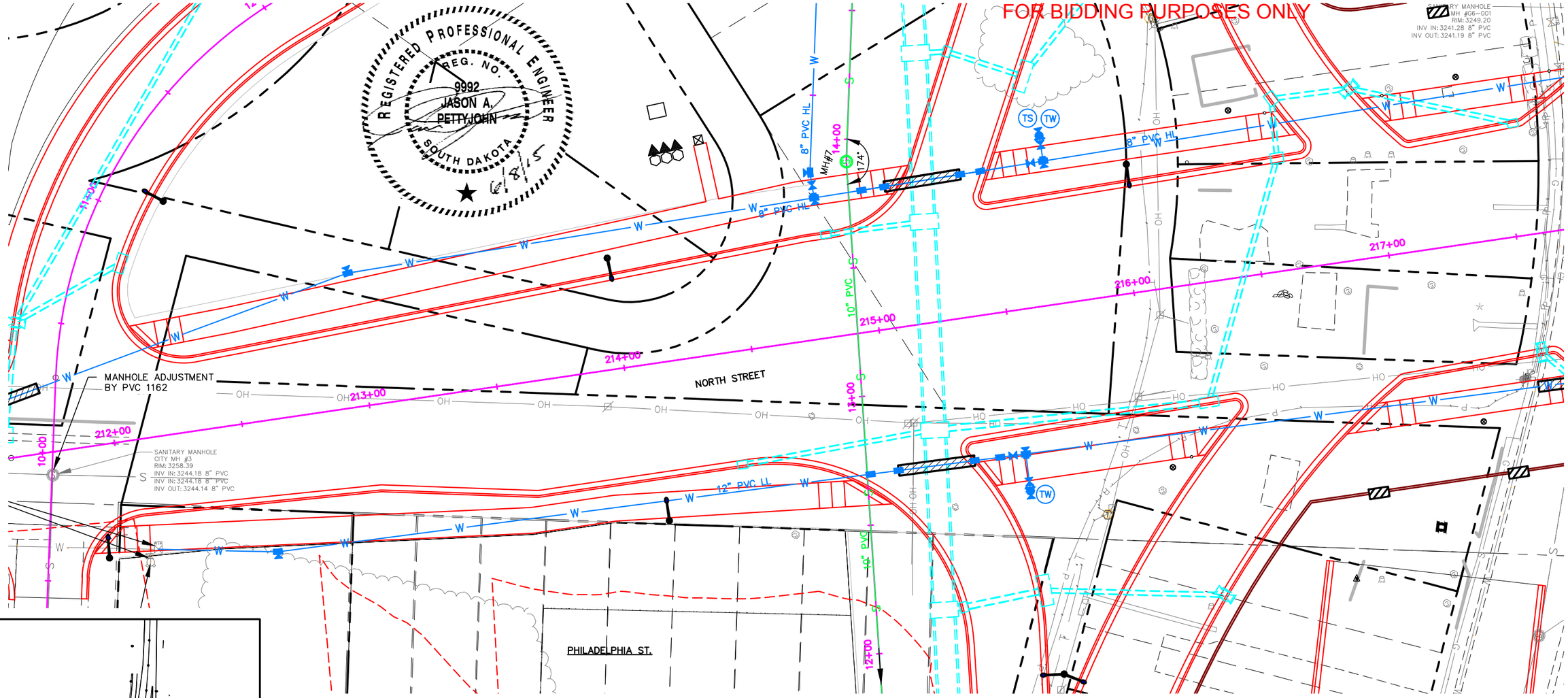
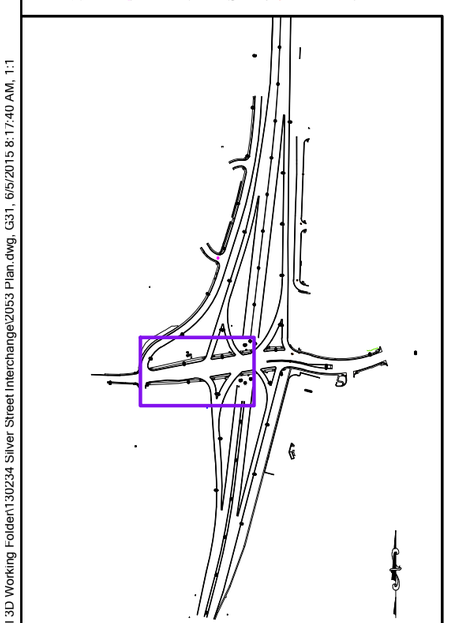
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15





SHEET KEY

WATER MAIN NOTES

212+00.00 – 30.90'L to 217+00.00 – 57.44'L
F&I 502' – 8" PVC WATER MAIN

212+99.14 – 52.02'L
F&I 8" x 11.25° BEND AND THRUST BLOCK

214+82.48 – 54.50'L
F&I 8" x 8" x 8" TEE AND THRUST BLOCK

215+01.05 – 54.75'L
F&I 8" x 45° VERT BEND

215+10.05 – 54.87'L
F&I 8" x 45° VERT BEND

215+39.84 – 55.27'L
F&I 8" x 45° VERT BEND

215+47.84 – 55.38'L
F&I 8" x 45° VERT BEND

215+67.52 – 55.65'L
F&I 8" GATE VALVE AND VALVE BOX

215+72.52 – 55.71'L
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

215+72.52 – 55.71'L to 215+72.41 – 65.67'L
F&I 10' – 6" PVC HYDRANT LEAD

215+72.41 – 65.67'L
F&I FIRE HYDRANT WITH THRUST BLOCK,
AUXILIARY VALVE, AND VALVE BOX

212+10.81 – 43.33'R to 217+00.00 – 58.08'R
F&I 490' – 12" PVC WATER MAIN

212+10.81 – 43.33'R
CONNECT TO EXISTING 12" GATE VALVE

212+56.63 – 51.06'R
F&I 12" x 11.25° BEND AND THRUST BLOCK

214+88.58 – 54.73'R
F&I 12" x 45° VERT BEND

214+99.58 – 54.91'R
F&I 12" x 45° VERT BEND

215+29.34 – 55.38'R
F&I 12" x 45° VERT BEND

215+39.34 – 55.53'R
F&I 12" x 45° VERT BEND

215+44.39 – 55.61'R
F&I 12" GATE VALVE AND VALVE BOX

215+49.40 – 55.69'R
F&I 12" x 12" x 6" TEE AND THRUST BLOCK

215+49.40 – 55.69'R to 215+49.05 – 70.17'R
F&I 15' – 6" PVC HYDRANT LEAD

215+49.05 – 70.17'R
F&I FIRE HYDRANT WITH THRUST BLOCK,
AUXILIARY VALVE, AND VALVE BOX

F&I CONCRETE WATER MAIN ENCASEMENT
215+10.05 – 54.87'L to 215+39.84 – 55.27'L (1EA)
214+99.58 – 54.91'R to 215+29.34 – 55.38'R (1EA)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED
METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

215+72 – 66'L
F&I CP TEST STATION

0 10' 20' 40'
SCALE: 1"=40'

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Prepared For:
Public Works Department
Rapid City, South Dakota
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: NORTH STREET UTILITY PLAN

Sheet: G31 of G77

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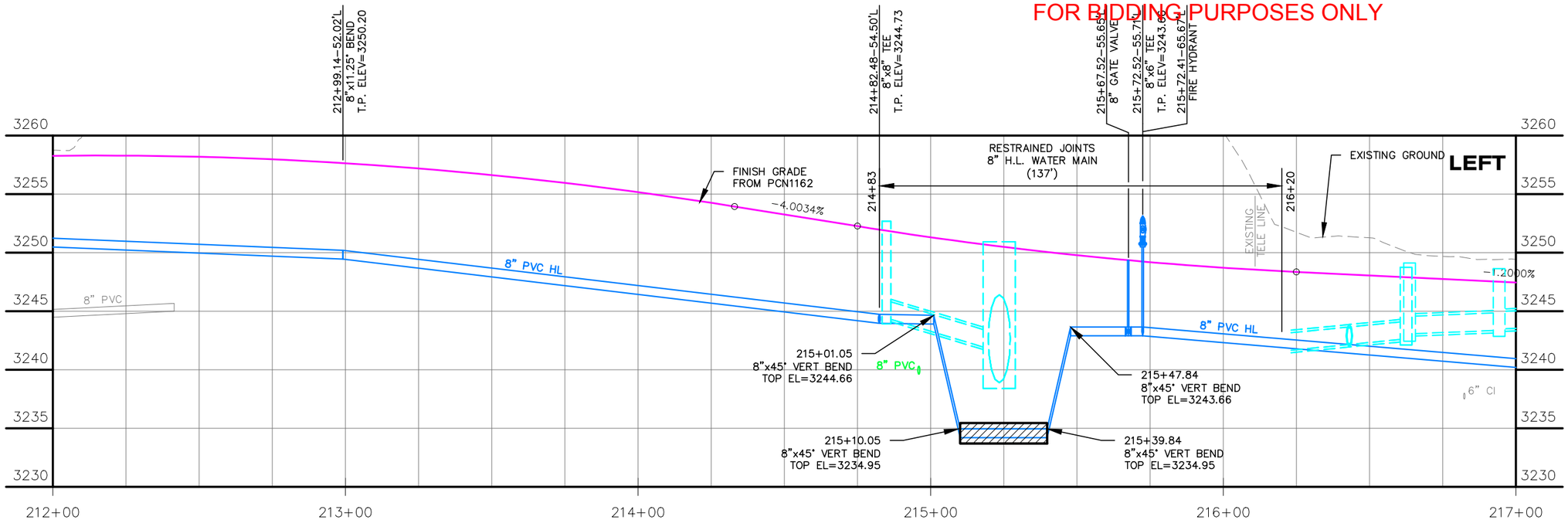
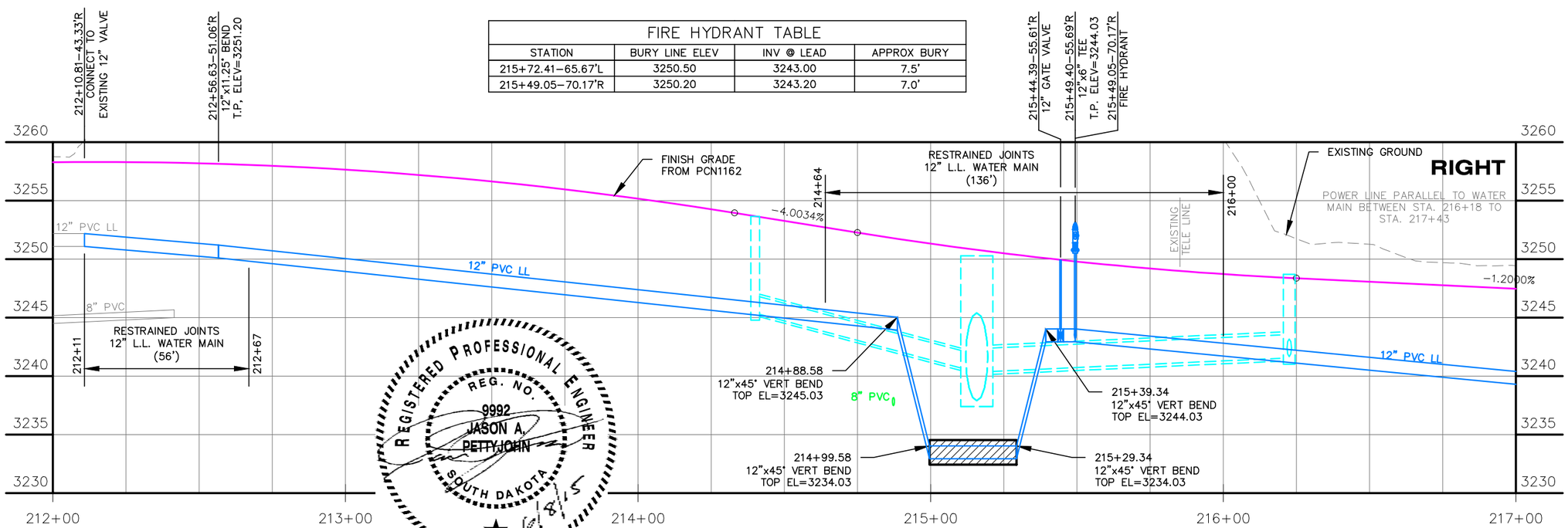


FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
215+72.41–65.67'L	3250.50	3243.00	7.5'
215+49.05–70.17'R	3250.20	3243.20	7.0'



REGISTERED PROFESSIONAL ENGINEER
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SOUTH DAKOTA
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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: NORTH STREET UTILITY PROFILE

Sheet: G32 of G77

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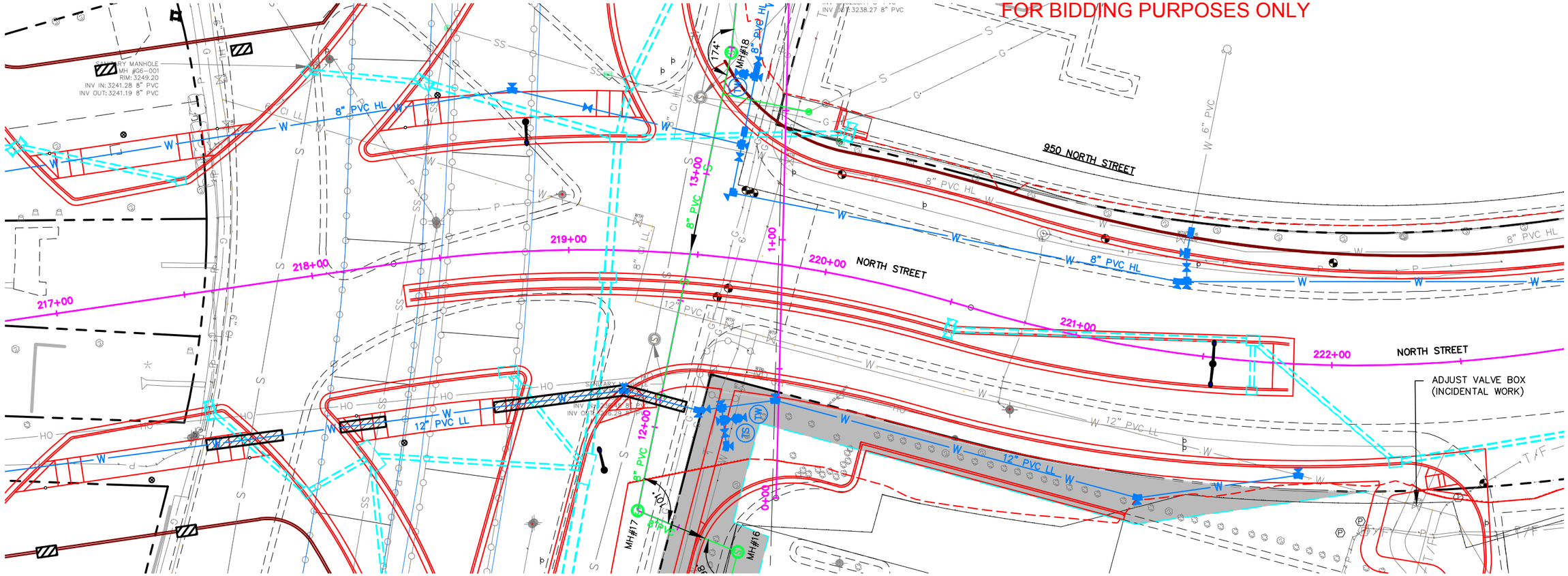
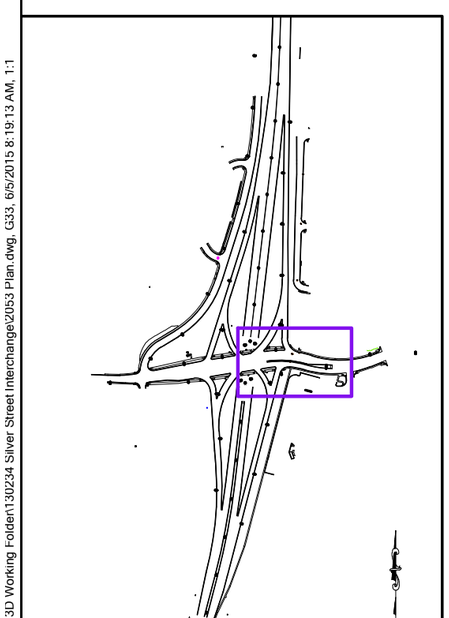




SHEET KEY

WATER MAIN NOTES

217+00.00 – 57.44'L to 219+62.36 – 44.13'L
F&I 279' – 8" PVC WATER MAIN

218+81.15 – 62.63'L
F&I 8" x 22.5° BEND AND THRUST BLOCK

219+07.20 – 54.99'L
F&I 8" GATE VALVE AND VALVE BOX

219+60.78 – 25.04'L to 222+00.00 – 32.31'L
F&I 236' – 8" PVC WATER MAIN

221+36.24 – 27.41'L
F&I 8" x 11.25° BEND AND THRUST BLOCK

221+39.76 – 27.88'L
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

221+38.96 – 33.33'L
F&I 6" GATE VALVE AND VALVE BOX

221+38.14 – 38.78'L
F&I 6" x 11.25° BEND AND THRUST BLOCK

221+38.65 – 47.05'L
CONNECT TO EXISTING 6" PVC HYDRANT LEAD

217+00.00 – 58.08'R to 221+88.77 – 42.98'R
F&I 481' – 12" PVC WATER MAIN

219+23.16 – 54.17'R
F&I 12" x 22.5° BEND AND THRUST BLOCK

219+56.19 – 60.04'R
F&I 12" x 22.5° BEND AND THRUST BLOCK

219+59.50 – 59.36'R
F&I 12" GATE VALVE AND VALVE BOX

219+66.08 – 57.93'R
F&I 12" x 12" x 12" TEE AND THRUST BLOCK

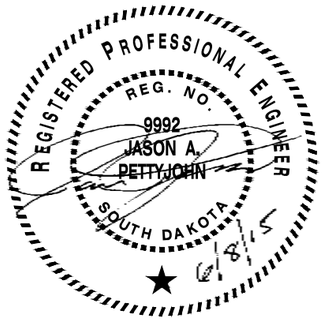
219+88.79 – 52.34'R
F&I 12" x 22.5° BEND AND THRUST BLOCK

221+33.04 – 57.64'R
F&I 12" x 22.5° BEND AND THRUST BLOCK

221+88.77 – 42.98'R
F&I 12" x 22.5° BEND
CONNECT TO EXISTING 12" PVC MAIN

F&I CONCRETE WATER MAIN ENCASEMENT
217+50.09 – 58.87'R to 217+79.69 – 59.34'R (1EA)
218+02.28 – 59.69'R to 218+19.97 – 59.97'R (1EA)
218+66.50 – 59.61'R to 219+50.24 – 59.14'R (1EA)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS



0 10' 20' 40'
SCALE: 1"=40'

Prepared By:	Prepared For:	Scale: 1" = 40'		Sheet Title:	Sheet:
F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Public Works Department Engineering Services	Designed By: JAP Design Date: JUNE 2015 Internal Job No: 130234 Surveyed By: DOT / FMG SDDOT Project No. 1M 1902(61)0	Drawn By: JRK Print Date: JUNE 2015 Survey Date: SURVEY BY DOT	SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT 12-2053 / CIP 50940 / PCN X03T	NORTH STREET UTILITY PLAN	G33 of G77

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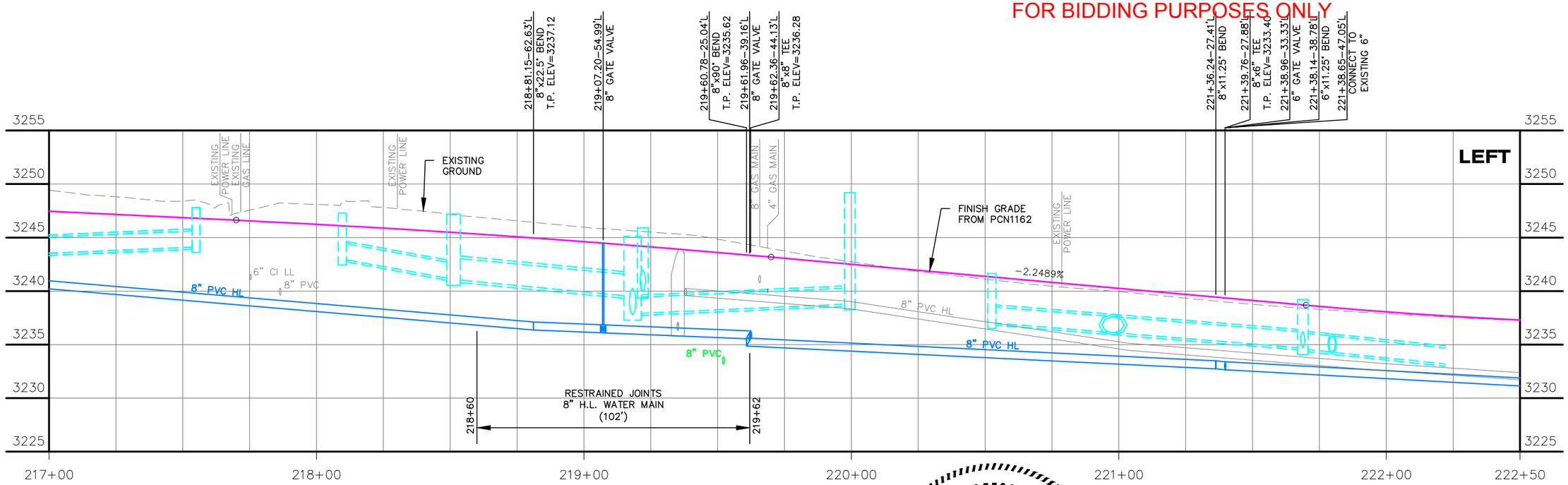

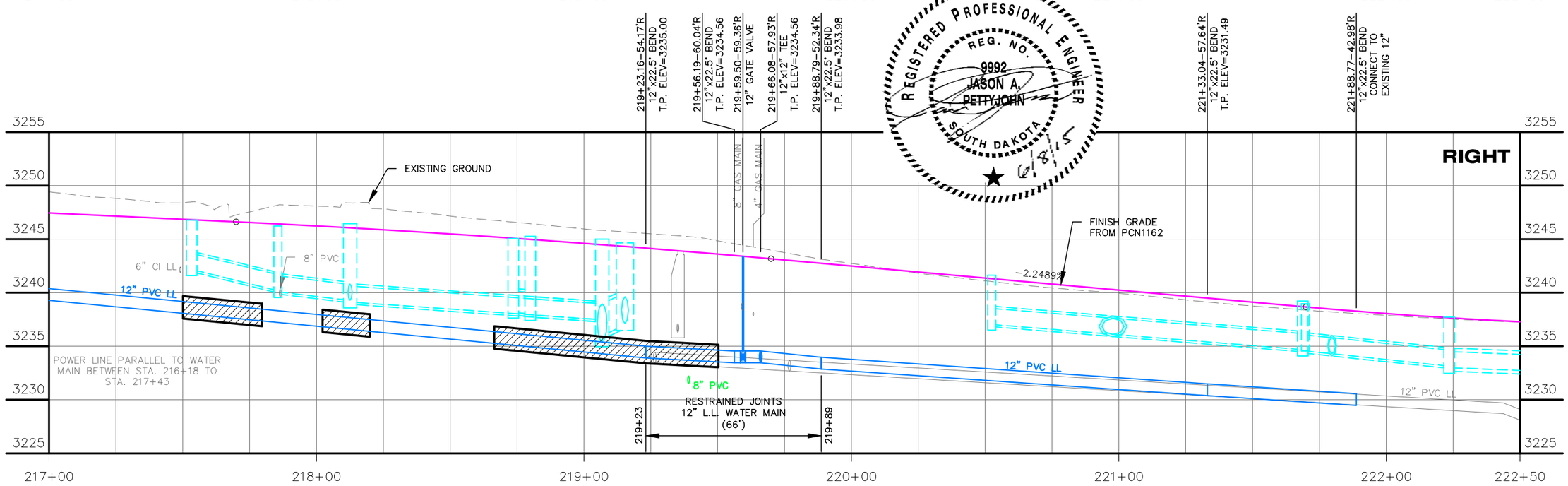

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

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Prepared For:
Public Works Department
RAPID CITY INCORPORATED 1882 SOUTH DAKOTA
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
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Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title:
NORTH STREET
UTILITY PROFILE

Sheet:
G34
of
G77

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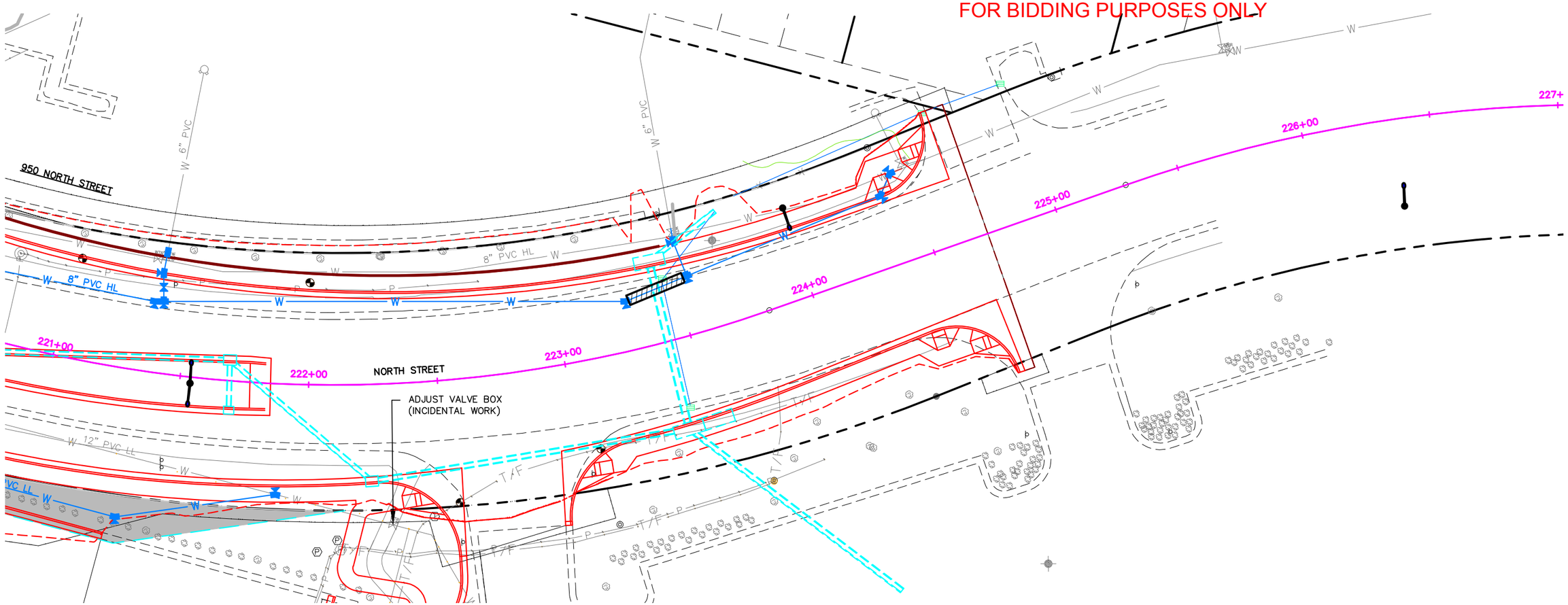

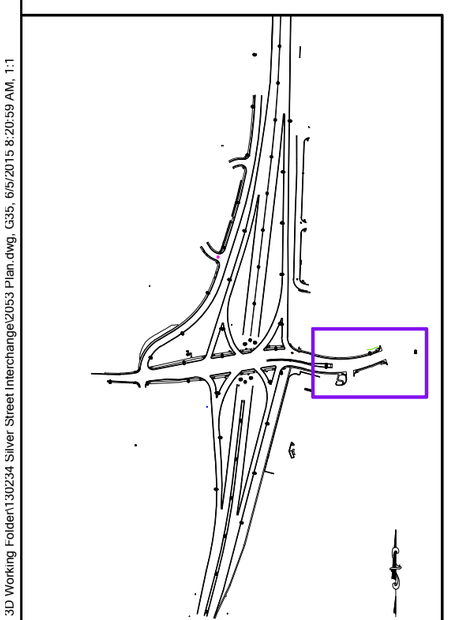

WATER MAIN NOTES

222+00.00 – 32.31'L to 224+48.92 – 34.87'L
F&I 244' – 8" PVC WATER MAIN

223+28.46 – 19.11'L
F&I 8" x 22.5° BEND AND THRUST BLOCK

223+55.07 – 22.54'L
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

223+53.68 – 36.97'L
F&I 6" x 11.25° BEND AND THRUST BLOCK

223+53.85 – 40.47'L
CONNECT TO EXISTING
6" GATE VALVE

224+37.50 – 27.64'L
F&I 8" x 45° BEND AND THRUST BLOCK

224+43.92 – 34.65'L
F&I 8" x 45° BEND AND THRUST BLOCK

224+48.92 – 34.87'L
CONNECT TO EXISTING 8" TEE

F&I CONCRETE WATER MAIN ENCASEMENT
223+29.71 – 19.30'L to 223+53.40–22.36'L (1EA)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 10' 20' 40'
SCALE: 1"=40'

Prepared By:	Prepared For:	Scale: 1" = 40'		SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT	Sheet Title:	Sheet:
F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Public Works Department Engineering Services	Designed By: JAP	Drawn By: JRK		NORTH STREET UTILITY PLAN	G35 of G77
		Design Date: JUNE 2015	Print Date: JUNE 2015			
		Internal Job No: 130234				
		Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT			
		SDDOT Project No. 1M 1902(61)0		12-2053 / CIP 50940 / PCN X03T		

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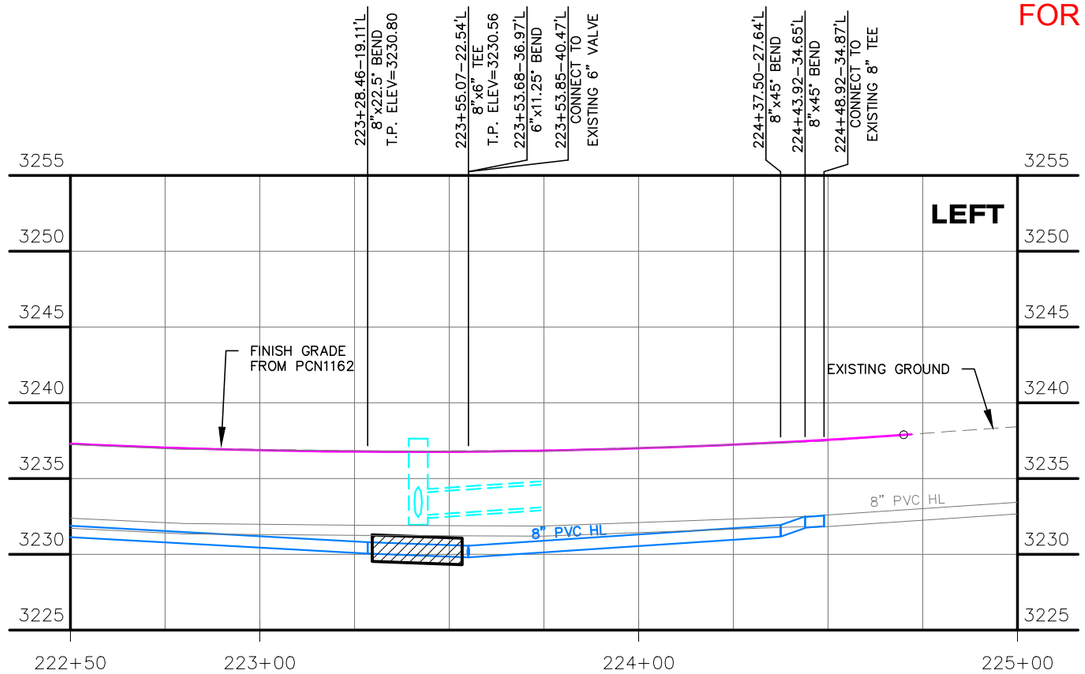

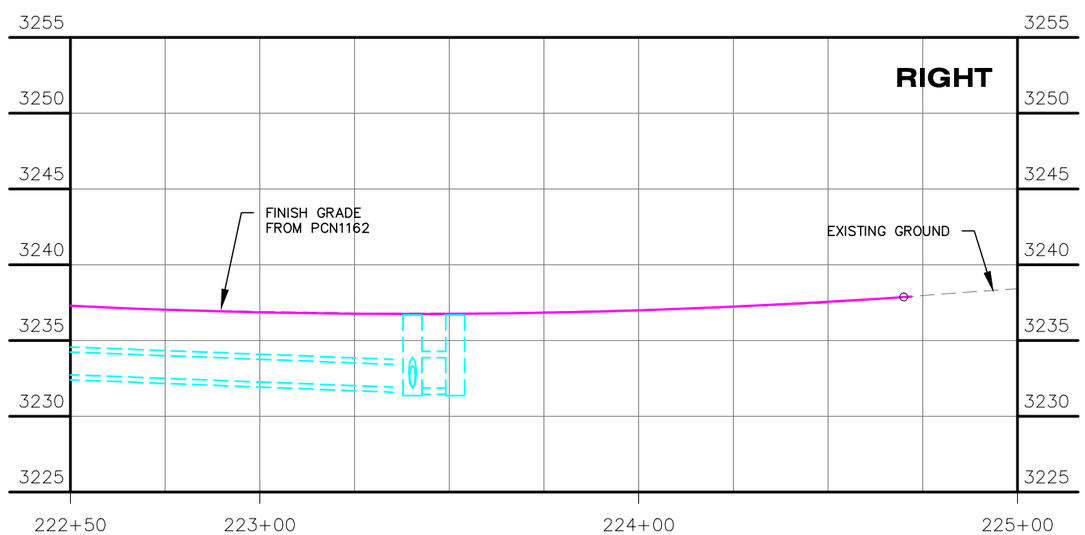

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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: NORTH STREET UTILITY PROFILE

Sheet: G36 of G77

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REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA

POND GRADING BY PCN 1162

12" PVC 5+00

MH#3

139°

4+00

40' (TYP.)

12" PVC

3+00

WORK LIMITS

W 10" PVC

137°

MH#2

1+00

SANITARY MANHOLE
CITY MH #G6-052
RIM: 3232.31
INV IN: 3222.37 10" PVC
INV OUT: 3222.37 10" PVC

12" PVC

1+00

SANITARY MANHOLE
CITY MH #G6-049
RIM: 3233.65
INV IN: 3221.06 8" PVC
INV IN: 3220.95 10" PVC
INV OUT: 3221.00 10" PVC

3+00

12" PVC

2+00

40' (TYP.)

8" PVC

1+00

148°

MH#1

121°

6" PVC

MH#13

SANITARY MANHOLE
CITY MH #G6-063
RIM: 3233.30
INV IN: 3220.69 10" PVC
INV OUT: 3220.50 12" PVC

WORK LIMITS

TEMPORARY INVERT AND PIPE CONNECTION REQUIRED BETWEEN MH#1 & CITY MH#G6-063. ABANDON INVERT AFTER ALL SEWER MAIN IS COMPLETE

0 10' 20' 40'
SCALE: 1"=40'

SANITARY SEWER NOTES

0+10.00 (WEST SIDE SEWER)
F&I MANHOLE #1 (48")

2+16.85 (WEST SIDE SEWER)
F&I MANHOLE #2 (48")

4+27.97 (WEST SIDE SEWER)
F&I MANHOLE #3 (48")

0+18.49 to 2+08.49 (WEST SIDE SEWER)
BORE & JACK 30" STEEL CASING (190')

0+10.35 – 4.96'L (WEST SIDE SEWER)
CONNECT NEW 12" PVC SEWER
TO EXISTING 12" PVC SEWER

SHEET KEY

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Prepared For:
Public Works Department
Rapid City, South Dakota, Incorporated 1882
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
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Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST SIDE SEWER PLAN

Sheet: G37 of G77

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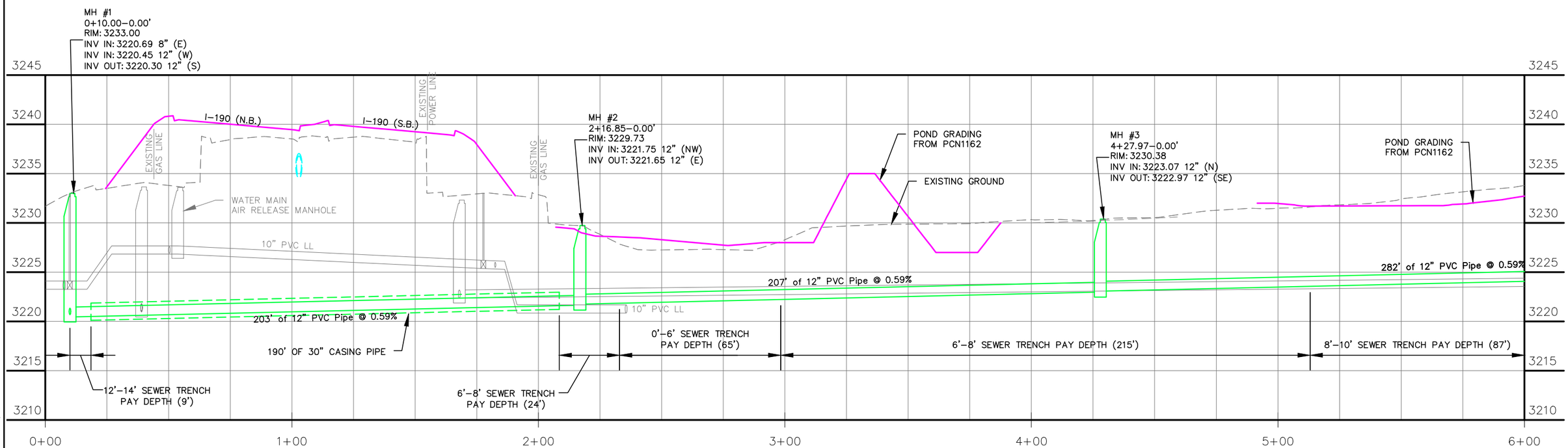

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
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SOUTH DAKOTA
6/8/15

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Public Works Department
Engineering Services

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SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST SIDE SEWER PROFILE

Sheet: G38 of G77

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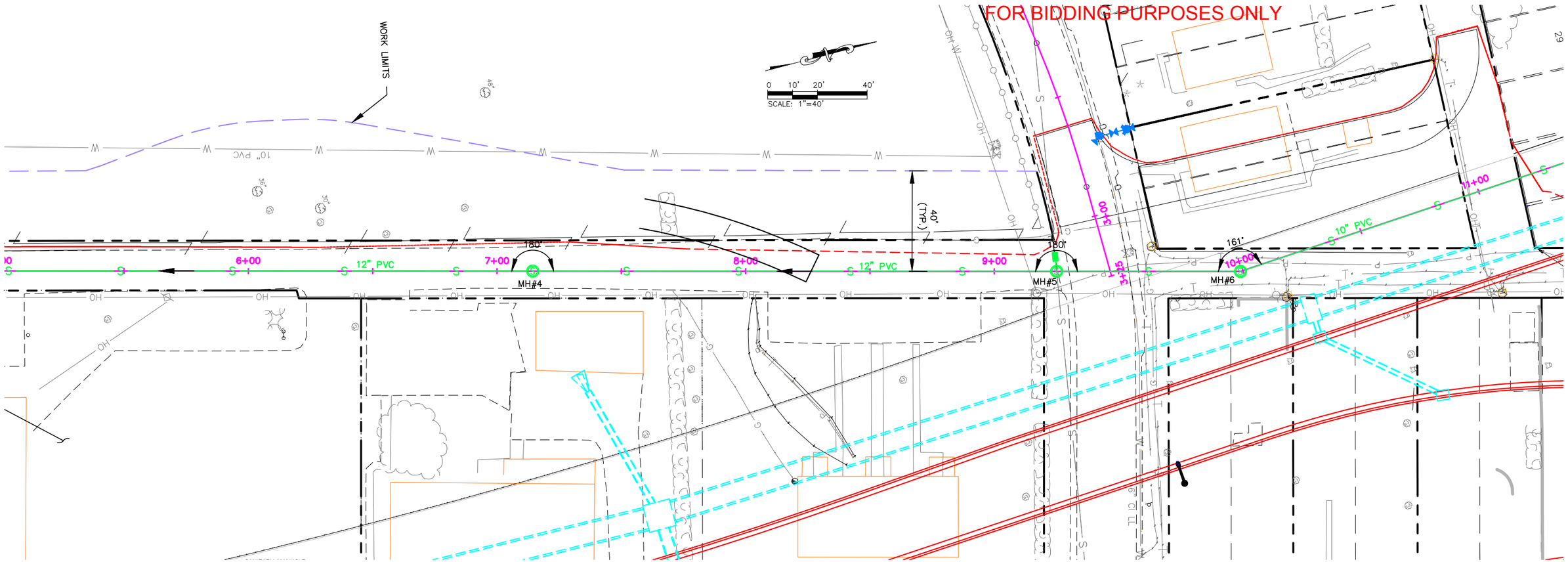

SHEET KEY

SANITARY SEWER NOTES

7+14.37 (WEST SIDE SEWER)
F&I MANHOLE #4 (48")

9+25.05 (WEST SIDE SEWER)
F&I MANHOLE #5 (48") (DROP)

9+99.00 (WEST SIDE SEWER)
F&I MANHOLE #6 (48")

9+24.50 – 5.83'L
CONNECT NEW 8" PVC SEWER
TO EXISTING 8" PVC SEWER

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Rapid City, South Dakota
Engineering Services

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST SIDE SEWER PLAN

Sheet: G39 of G77

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REGISTERED PROFESSIONAL ENGINEER
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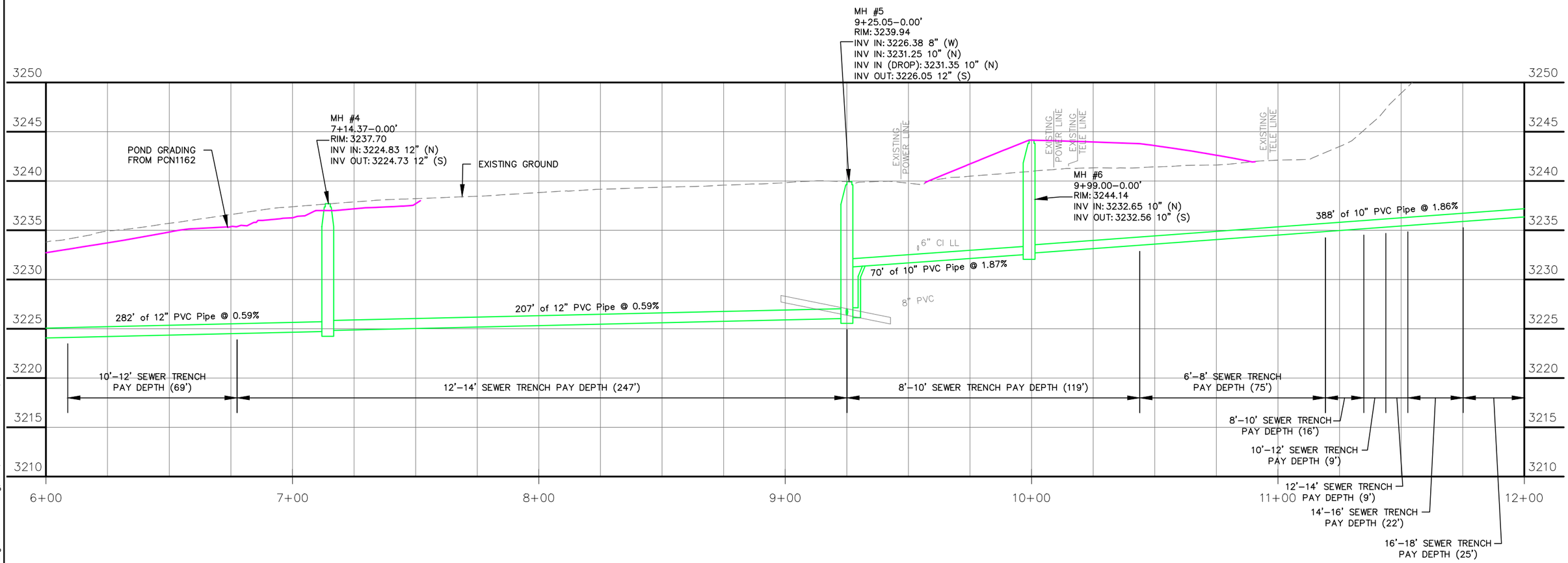
6/8/15



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F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Public Works Department Rapid City, South Dakota Engineering Services	Designed By: JAP	Drawn By: JRK	SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT	WEST SIDE SEWER PROFILE	G40 of G77
		Design Date: JUNE 2015	Print Date: JUNE 2015			
		Internal Job No: 130234				
		Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT			
		SDDOT Project No. 1M 1902(61)0		12-2053 / CIP 50940 / PCN X03T		

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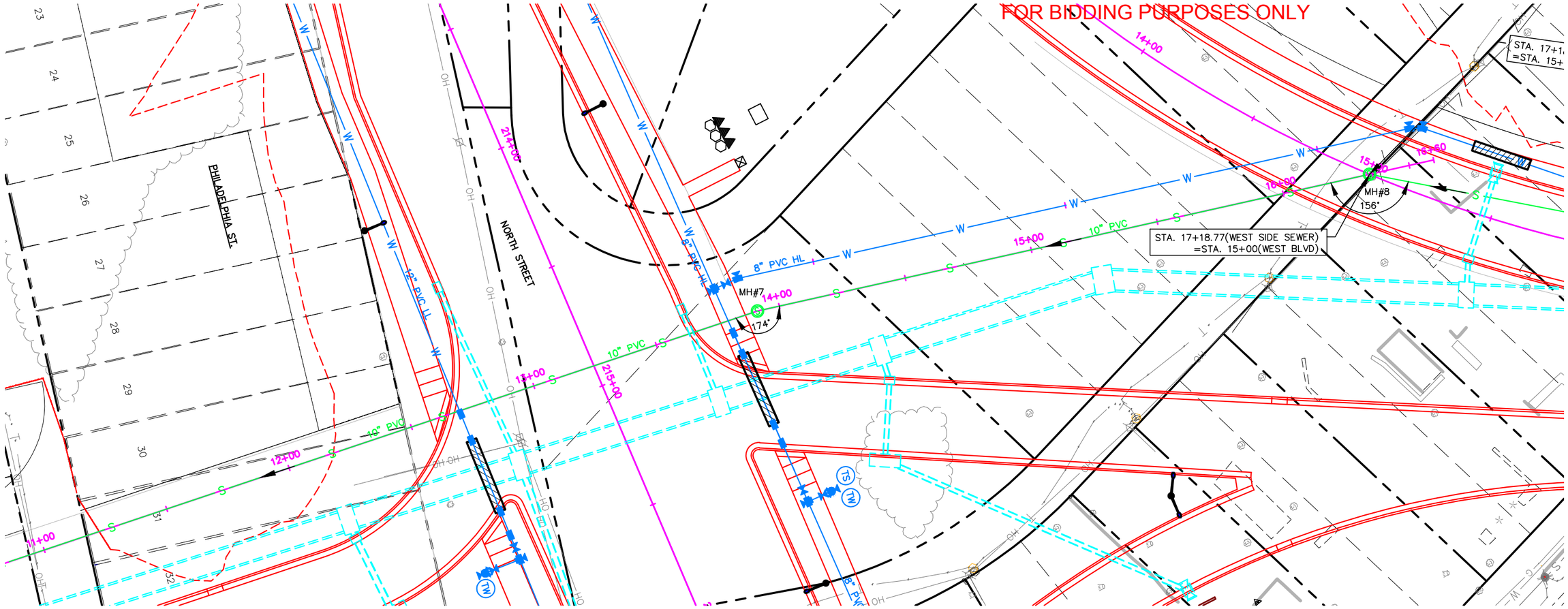

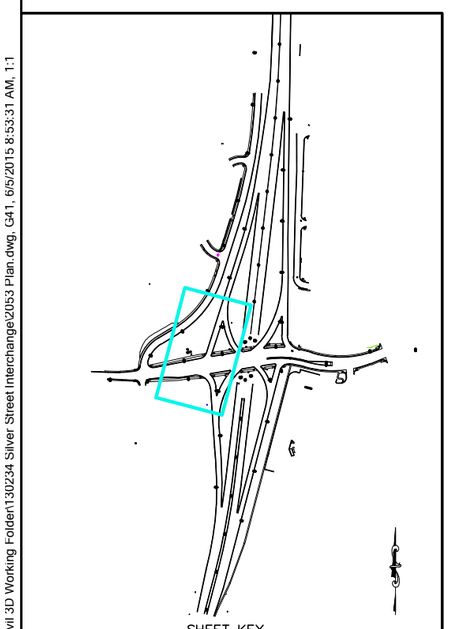

SHEET KEY

WATER MAIN NOTES

13+78.12 – 13.44'L to 16+53.21 – 13.95'L (WEST SIDE SEWER)
F&I 277' – 8" PVC WATER MAIN

13+83.10 – 13.90'L (WEST SIDE SEWER)
F&I 8" GATE VALVE AND VALVE BOX

13+88.08 – 14.36'L (WEST SIDE SEWER)
F&I 8" x 11.25° BEND AND THRUST BLOCK

16+53.21 – 13.95'L
F&I 8" x 11.25° BEND AND THRUST BLOCK

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

SANITARY SEWER NOTES

13+91.34 (WEST SIDE SEWER)
F&I MANHOLE #7 (48")

16+34.26 (WEST SIDE SEWER)
F&I MANHOLE #8 (48")

0 10' 20' 40'
SCALE: 1"=40'

REGISTERED PROFESSIONAL ENGINEER
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SOUTH DAKOTA
6/8/15

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST SIDE SEWER PLAN

Sheet: G41 of G77

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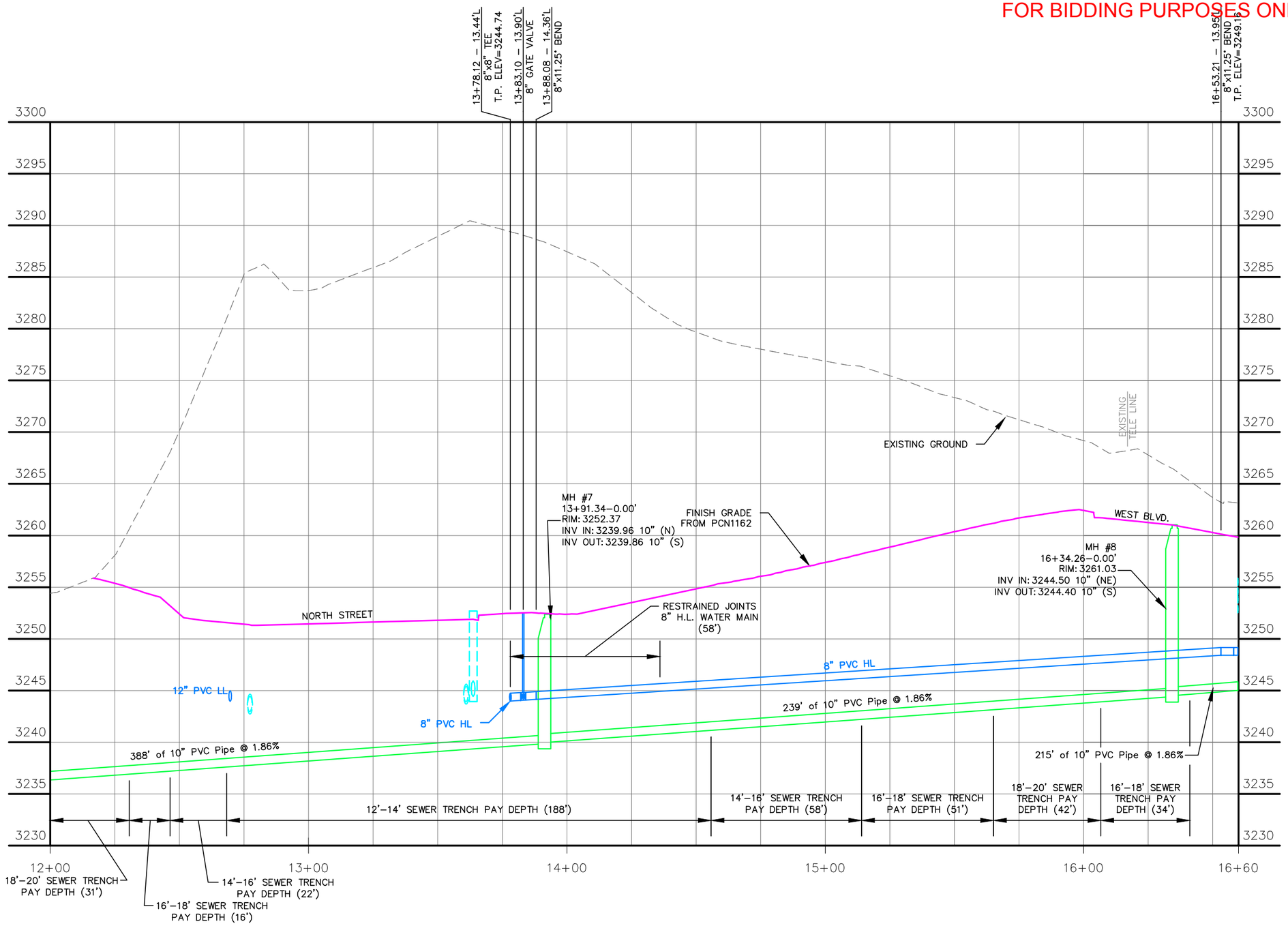

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SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST SIDE SEWER PROFILE

Sheet: G42 of G77

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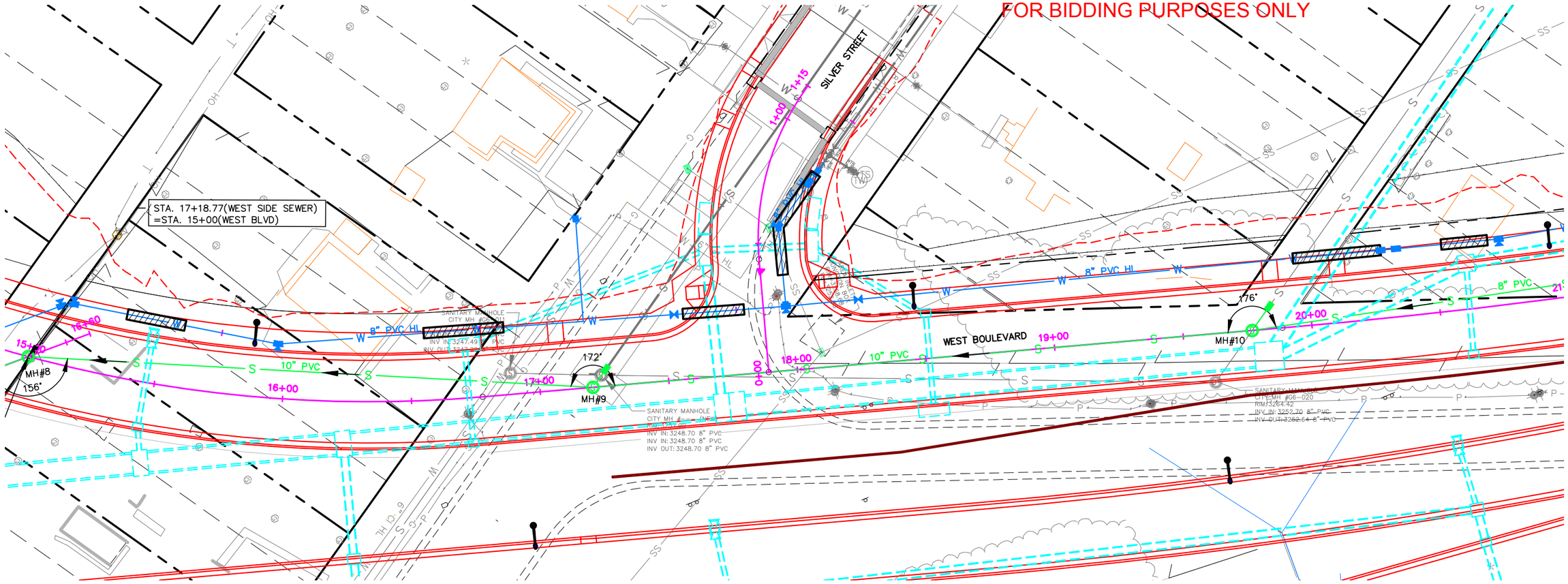

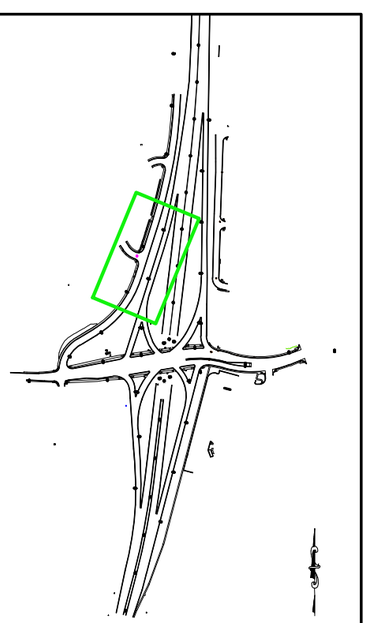

SHEET KEY

WATER MAIN NOTES

15+07.70 – 22.30'L to 20+00.00 – 26.46'L (WEST BLVD)
F&I 485' – 8" PVC WATER MAIN

15+12.52 – 24.26'L (WEST BLVD)
F&I 8" x 22.5° BEND AND THRUST BLOCK

15+96.86 – 21.08'L (WEST BLVD)
F&I 8" x 22.5° BEND AND THRUST BLOCK

17+54.23 – 25.39'L (WEST BLVD)
F&I 8" GATE VALVE AND VALVE BOX

17+97.64 – 24.88'L (WEST BLVD)
F&I 8" x 8" x 8" TEE AND THRUST BLOCK

18+25.80 – 25.10'L (WEST BLVD)
F&I 8" GATE VALVE AND VALVE BOX

0+24.88 – 8.74'R to 0+83.89 – 18.55'R (SILVER ST)
F&I 57' – 8" PVC WATER MAIN

0+57.00 – 7.64'R (SILVER ST)
F&I 8" x 45° BEND AND THRUST BLOCK

0+78.14 – 16.93'R (SILVER ST)
F&I 8" x 45° VERT BEND

0+83.89 – 18.55'R (SILVER ST)
F&I 8" x 45° VERT BEND

0+89.69 – 19.85'R (SILVER ST)
CONNECT TO EXISTING 8" GATE VALVE

F&I NEW CURB STOP, NEW 1" WATER SERVICE LINE AND RECONNECT TO EXISTING SERVICE LINE
17+19.40 – 65.60'L (40') (WEST BLVD)

F&I 1" TAPPING SADDLE
17+18.93 – 25.81'L (WEST BLVD)

F&I CONCRETE WATER MAIN ENCASEMENT
15+34.61 – 24.71'L to 15+58.56 – 24.18'L (1EA) (WEST BLVD)
16+55.85 – 26.09'L to 16+87.92 – 26.17'L (1EA) (WEST BLVD)
17+57.63 – 25.35'L to 17+81.38 – 25.07'L (1EA) (WEST BLVD)
0+37.11 – 8.65'R to 0+83.13 – 18.35'R (1EA) (SILVER ST)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

SANITARY SEWER NOTES

17+20.52 (WEST BLVD)
F&I MANHOLE #9 (48")

19+76.80 (WEST BLVD)
F&I MANHOLE #10 (48")

17+26.08 – 6.56'L (WEST BLVD)
CONNECT NEW 8" PVC SEWER TO EXISTING 8" PVC SEWER

19+84.14 – 8.70'L (WEST BLVD)
CONNECT NEW 8" PVC SEWER TO EXISTING 8" PVC SEWER

REGISTERED PROFESSIONAL ENGINEER
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JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 10' 20' 40'
SCALE: 1"=40'

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BOULEVARD PLAN

Sheet: G43 of G77

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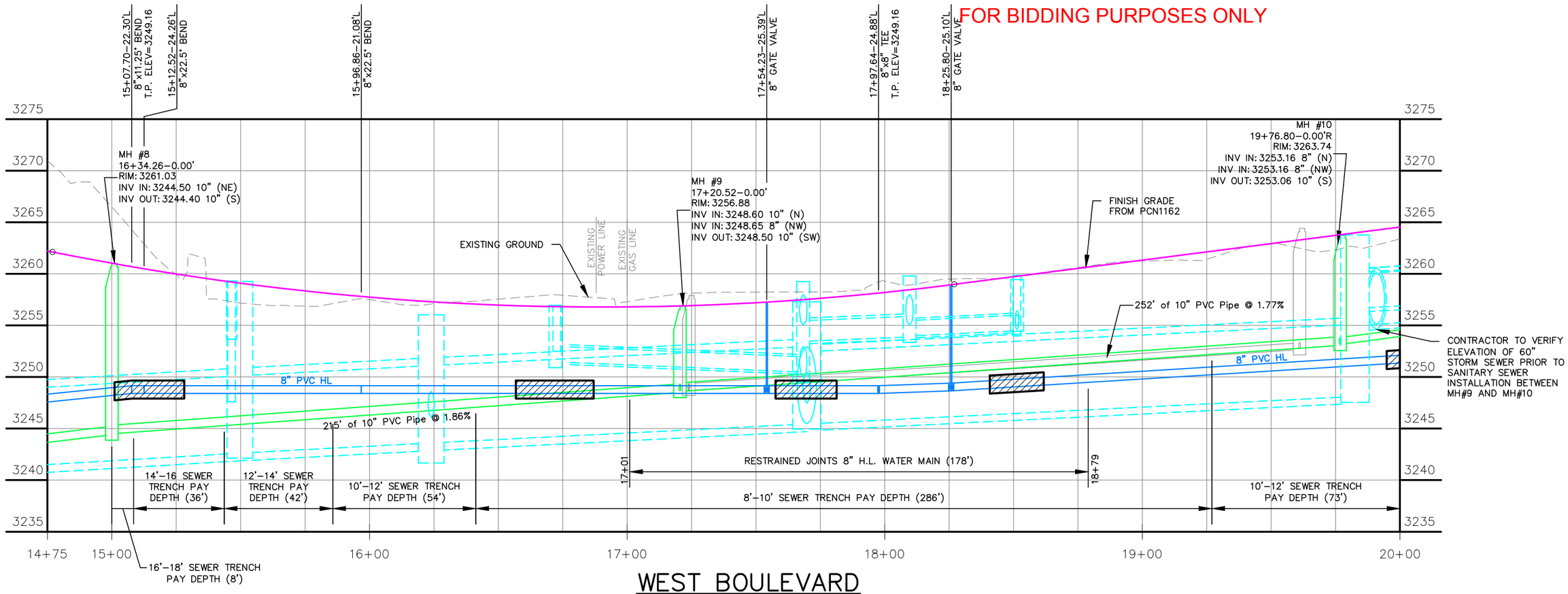
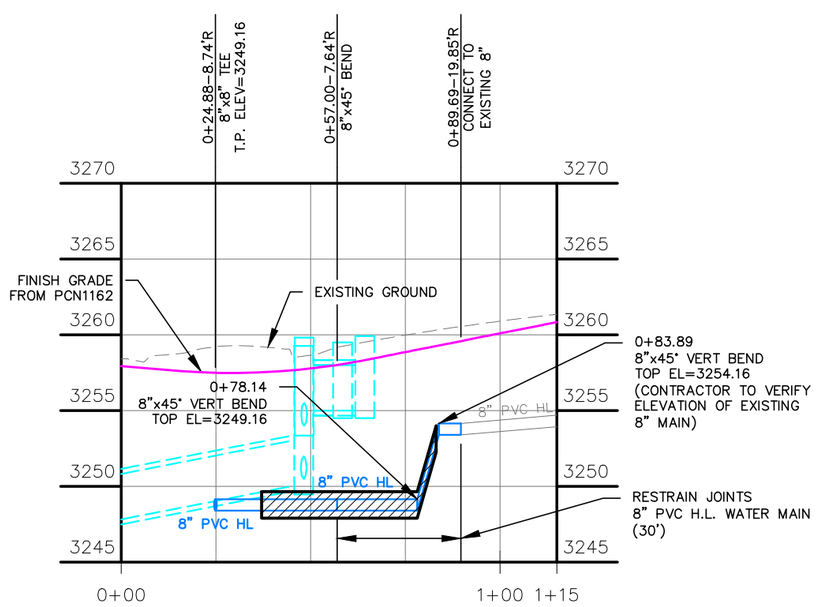


WEST BOULEVARD



SILVER STREET

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BOULEVARD PROFILE

Sheet: G44 of G77

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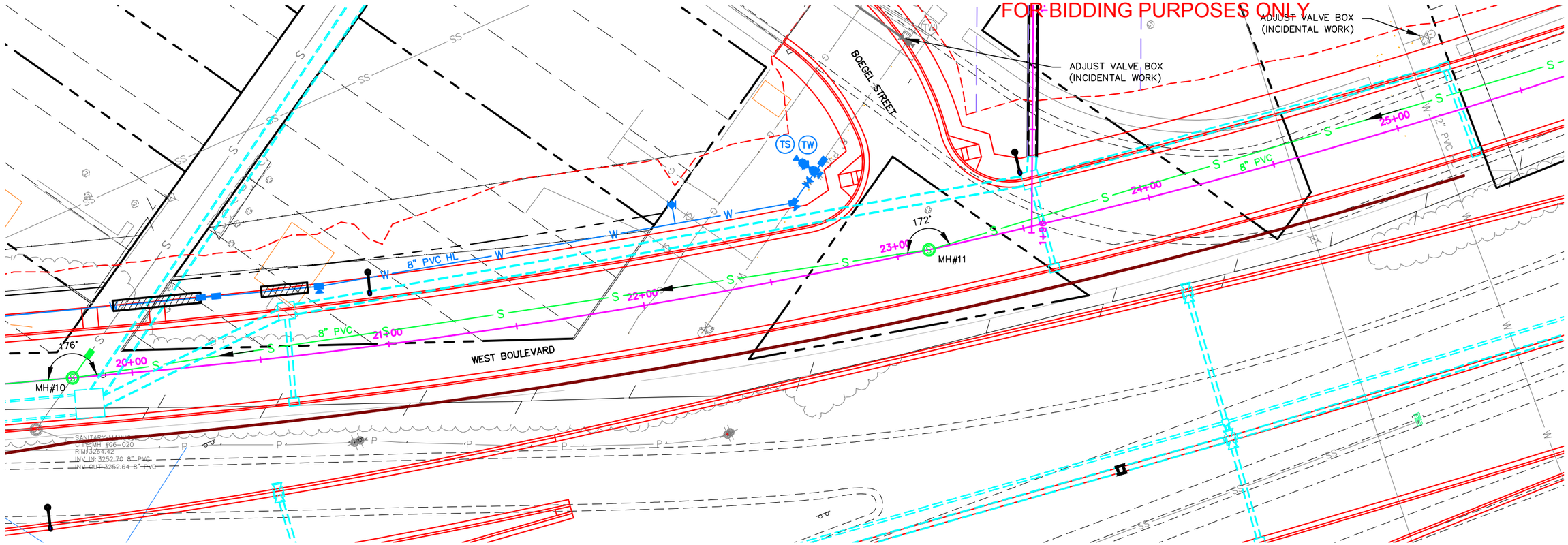

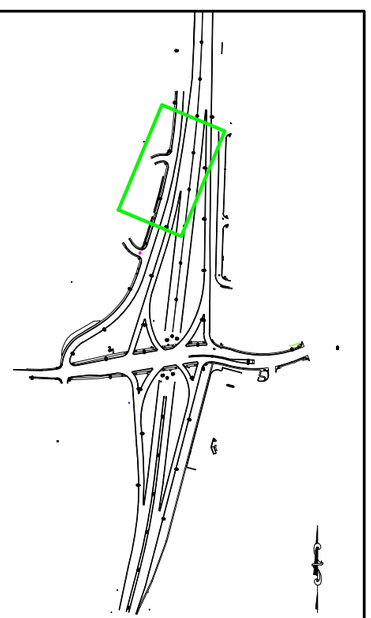

SHEET KEY

WATER MAIN NOTES

20+00.00 – 26.46'L to 22+78.98 – 42.05'L (WEST BLVD)
F&I 281' – 8" PVC WATER MAIN

20+29.41 – 26.38'L (WEST BLVD)
F&I 8" x 45° VERT BEND

20+35.47 – 26.32'L (WEST BLVD)
F&I 8" x 45° VERT BEND

20+75.83 – 25.57'L (WEST BLVD)
F&I 8" HIGH DEFLECTION COUPLING AND THRUST BLOCK

22+64.49 – 28.52'L (WEST BLVD)
F&I 8" x 45° BEND AND THRUST BLOCK

22+71.60 – 35.18'L (WEST BLVD)
F&I 8" GATE VALVE AND VALVE BOX

22+75.29 – 38.62'L (WEST BLVD)
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

22+75.29 – 38.62'L to 22+71.10 – 42.98'L (WEST BLVD)
F&I 6' – 6" PVC HYDRANT LEAD

22+71.10 – 42.98'L (WEST BLVD)
F&I FIRE HYDRANT WITH THRUST BLOCK,
AUXILIARY VALVE, AND VALVE BOX

22+78.98 – 42.05'L (WEST BLVD)
CONNECT TO EXISTING 8" PVC MAIN

F&I NEW CURB STOP, NEW 1" WATER SERVICE LINE
AND RECONNECT TO EXISTING SERVICE LINE
22+17.44 – 36.59'L (8') (WEST BLVD)

F&I 1" TAPPING SADDLE
22+17.42 – 29.11'L (WEST BLVD)

F&I CONCRETE WATER MAIN ENCASEMENT
19+94.94 – 26.44'L to 20+29.41 – 26.38'L (1EA) (WEST BLVD)
20+53.21 – 26.08'L to 20+71.36 – 25.69'L (1EA) (WEST BLVD)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS,
INCLUDING BELL RESTRAINTS

22+71 – 43'L (WEST BLVD)
F&I CP TEST STATION

SANITARY SEWER NOTES

23+12.44 (WEST BLVD)
F&I MANHOLE #11 (48")

0 10' 20' 40'
SCALE: 1"=40'

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BOULEVARD PLAN

Sheet: G45 of G77

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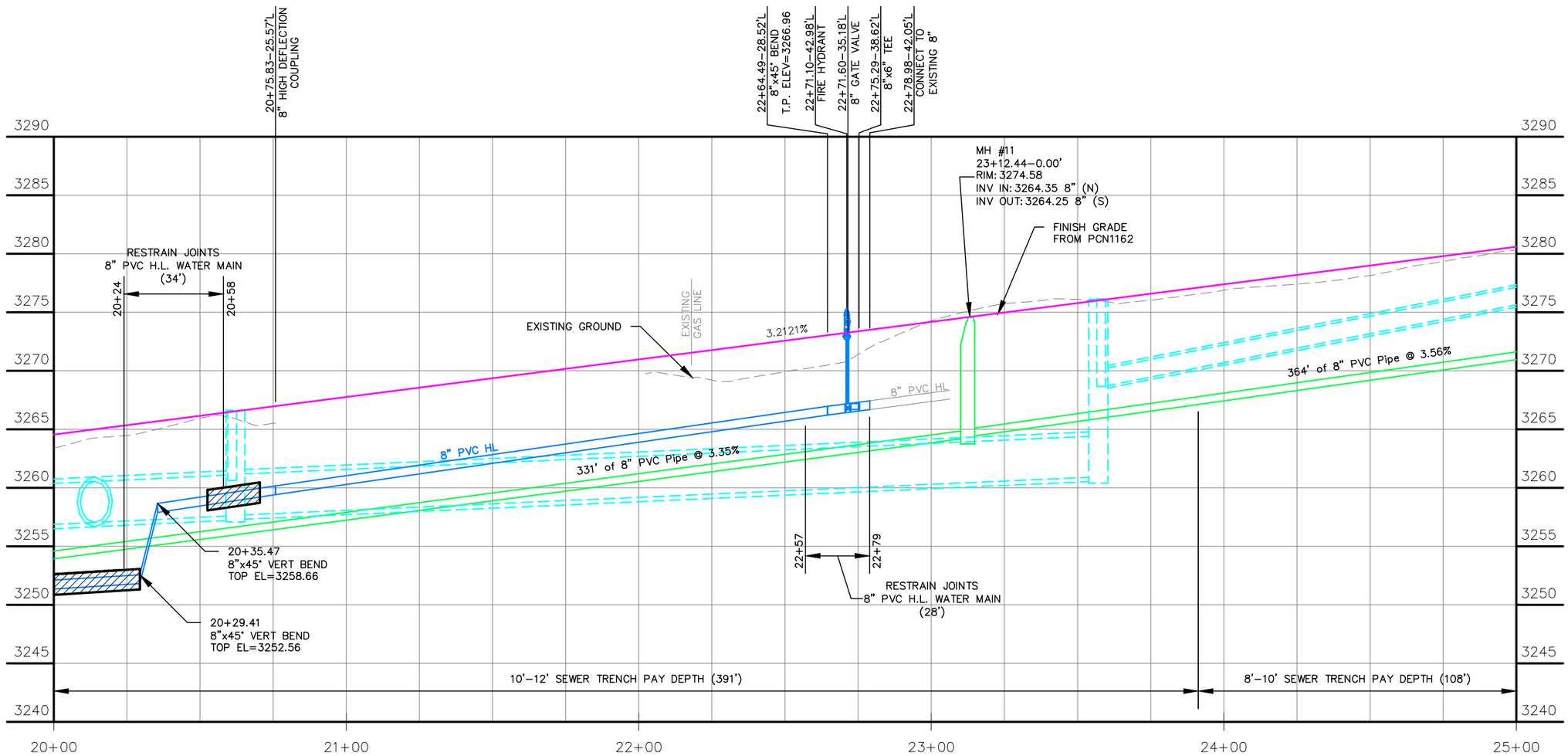

FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
51+24.97–26.47'R	3272.70	3266.70	6.0'*

*CONTRACTOR TO VERIFY DEPTH OF EXISTING MAIN TO ESTABLISH ACTUAL HYDRANT BURY

REGISTERED PROFESSIONAL ENGINEER
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6/8/15

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BOULEVARD PROFILE

Sheet: G46 of G77

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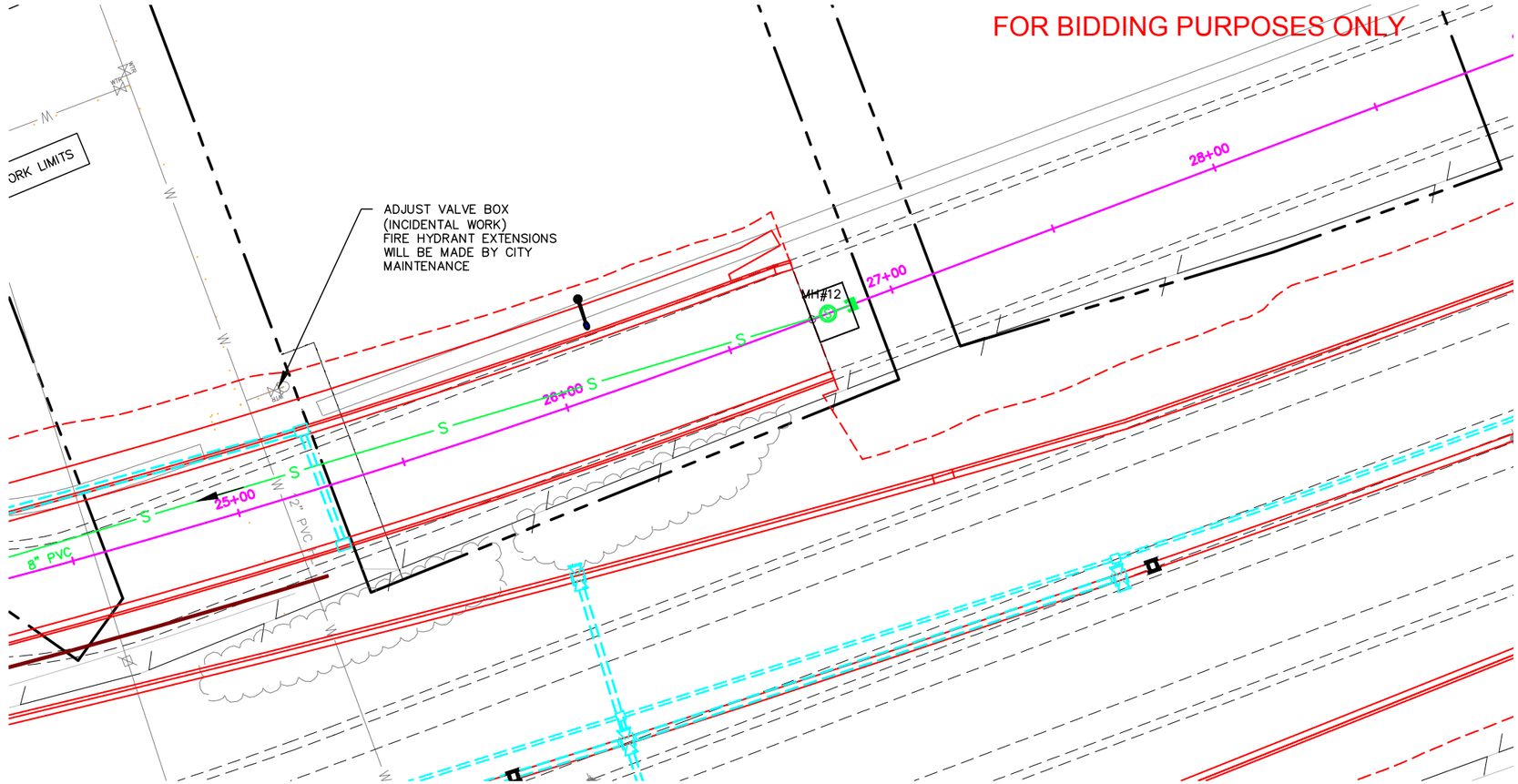

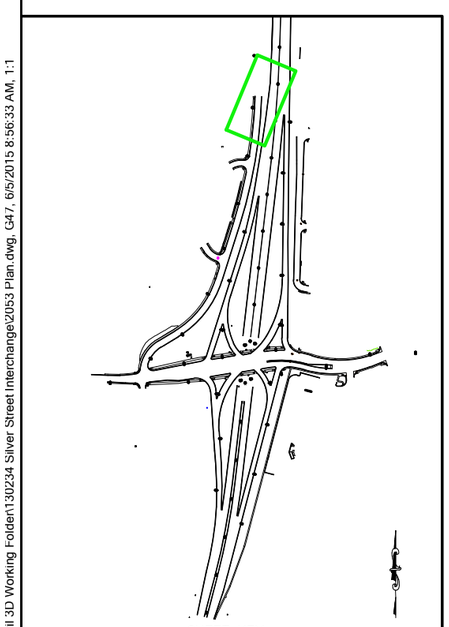

SANITARY SEWER NOTES

26+80.28 (WEST BLVD)
F&I MANHOLE #12 (48")

26+87.28 (WEST BLVD)
F&I 8" PVC SEWER CAP

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 10' 20' 40'
SCALE: 1"=40'

Prepared By:

F M G, Inc.
3700 Sturgis Road
Rapid City, SD 57702-0317
(605) 342-4105 FAX (605) 342-4222
www.fmgengineering.com

Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BOULEVARD PLAN

Sheet: G47 of G77

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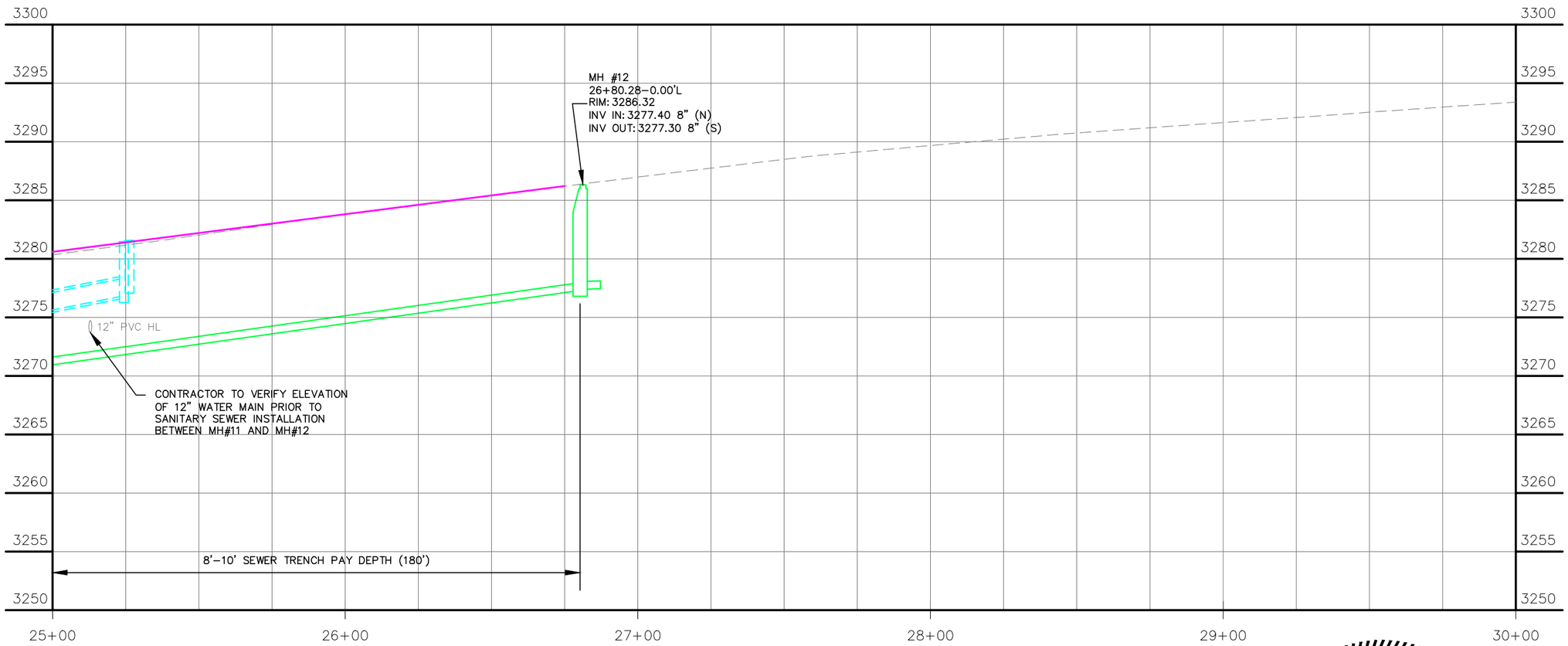

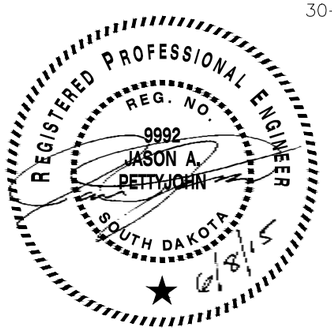

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Prepared For:
Public Works Department
Engineering Services

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Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BOULEVARD PROFILE

Sheet: G48 of G77

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FOR BIDDING PURPOSES ONLY

SANITARY MANHOLE
CITY MH #G6-049
RIM: 3233.63
INV IN: 3221.96 8" PVC
INV IN: 3221.96 8" PVC
INV OUT: 3221.00 10" PVC

SANITARY MANHOLE
CITY MH #G6-050
RIM: 3237.16
INV IN: 3224.86 8" PVC
INV IN: 3224.77 6"
INV OUT: 3224.90 8" PVC

SANITARY MANHOLE
CITY MH #G6-063
RIM: 3233.30
INV IN: 3220.69 10" PVC
INV OUT: 3220.50 12" PVC

MH#13 MH#14 MH#15

145° 121° 180°

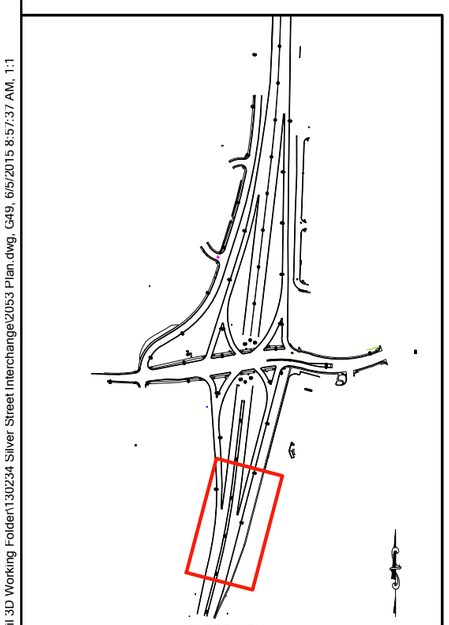
1+00 2+00 3+00 4+00 5+00 6+00

12" PVC 8" PVC 8" PVC 10" PVC

ABANDONED

40' (TYP.)

WORK LIMITS



WATER MAIN NOTES

0+13.89 – 14.40'R to 0+23.39 – 16.84'L (EAST SIDE SEWER)
F&I 35' – 12" PVC WATER MAIN

0+13.89 – 14.40'R (EAST SIDE SEWER)
CONNECT TO EXISTING 12" MAIN

0+23.09 – 0.88'L (EAST SIDE SEWER)
F&I 12" x 45° BEND AND THRUST BLOCK

0+20.66 – 12.39'L (EAST SIDE SEWER)
F&I 12" x 45° BEND AND THRUST BLOCK

0+23.39 – 16.84'L (EAST SIDE SEWER)
CONNECT TO EXISTING 12" VALVE

F&I CONCRETE WATER MAIN ENCASEMENT
0+16.48 – 10.10'R to 0+21.18–9.93'L (1EA) (EAST SIDE SEWER)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

SANITARY SEWER NOTES

0+37.64 (EAST SIDE SEWER)
F&I MANHOLE #13 (48")

4+37.64 (EAST SIDE SEWER)
F&I MANHOLE #14 (48")

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 10' 20' 40'
SCALE: 1"=40'

Prepared By:	Prepared For:		
F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Public Works Department Engineering Services	Scale: 1" = 40'	
		Designed By: JAP	Drawn By: JRK
		Design Date: JUNE 2015	Print Date: JUNE 2015
		Internal Job No: 130234	
		Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
		SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: EAST SIDE SEWER PLAN

Sheet: G49 of G77

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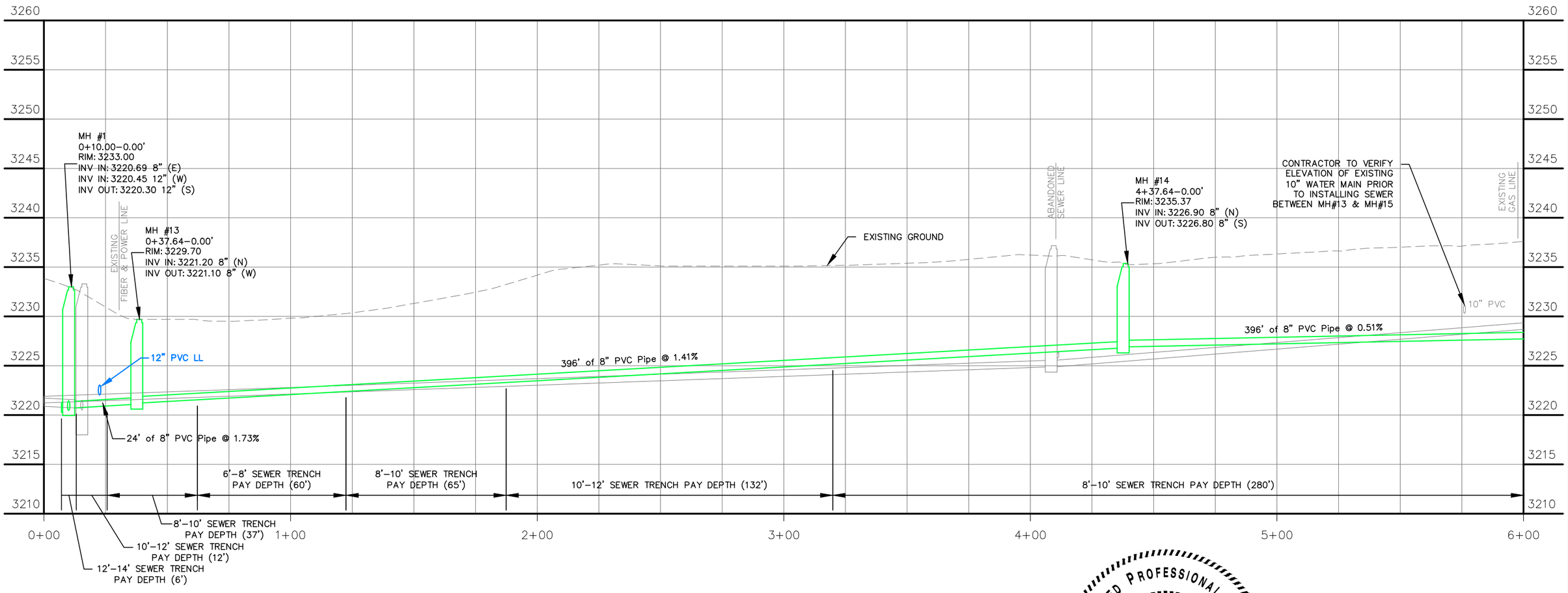

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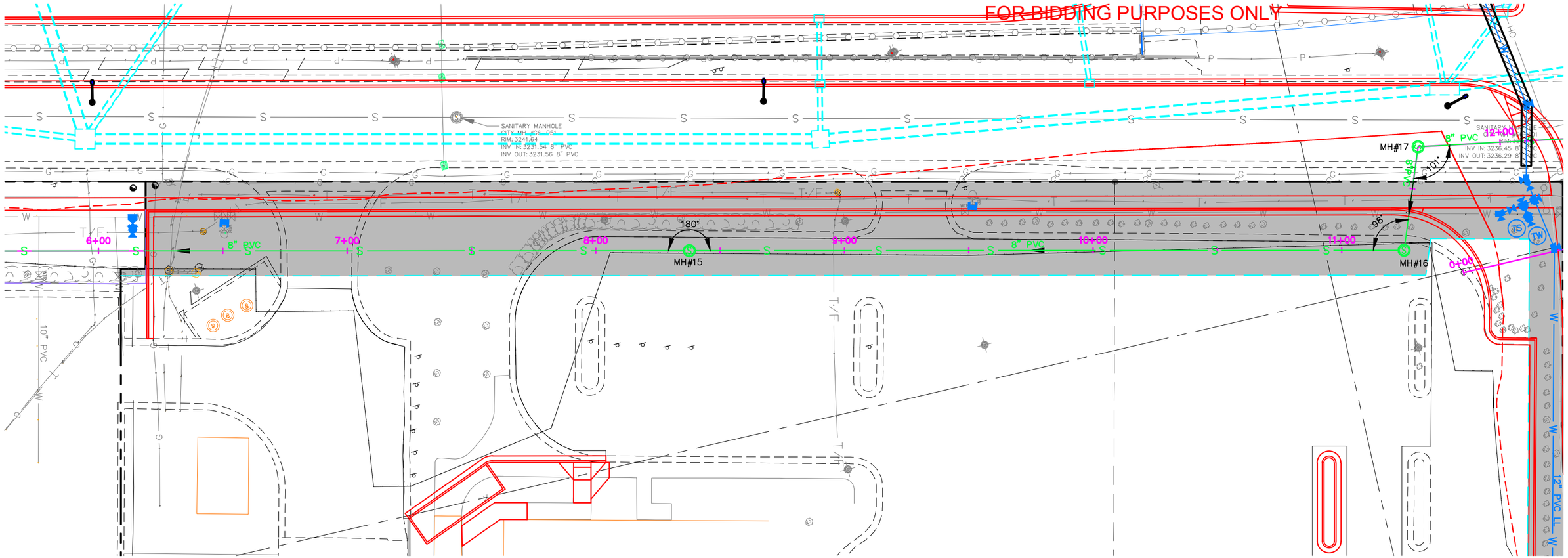
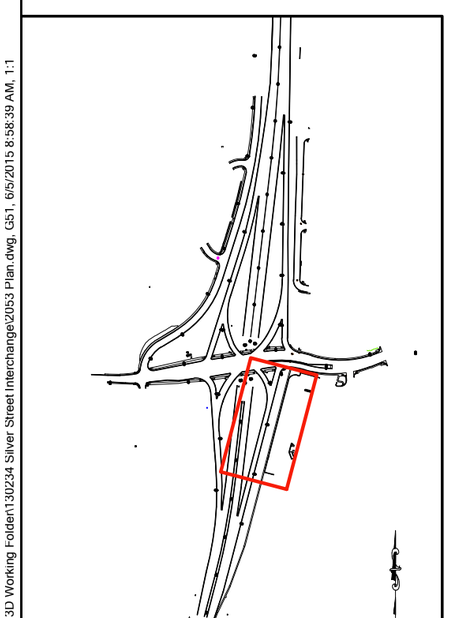
Prepared By: F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Prepared For: Public Works Department Engineering Services	Scale: 1" = 40'	SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT	Sheet Title: EAST SIDE SEWER PROFILE	Sheet: G50 of G77
		Designed By: JAP / Drawn By: JRK			
		Design Date: JUNE 2015 / Print Date: JUNE 2015			
		Internal Job No: 130234			
		Surveyed By: DOT / FMG / Survey Date: SURVEY BY DOT			
		SDDOT Project No. 1M 1902(61)0	12-2053 / CIP 50940 / PCN X03T		

FOR BIDDING PURPOSES ONLY





SHEET KEY

WATER MAIN NOTES

6+13.74 – 13.64'L (EAST SIDE SEWER)
F&I 12" x 12" x 6" TAPPING TEE AND VALVE WITH BOX

6+13.74 – 13.64'L to 6+13.73 – 8.65'L (EAST SIDE SEWER)
F&I 5' – 6" PVC HYDRANT LEAD

6+13.73 – 8.65'L (EAST SIDE SEWER)
F&I FIRE HYDRANT WITH THRUST BLOCK, AUXILIARY VALVE, AND VALVE BOX

6+50.53 – 10.87'L
F&I 6" PLUG

9+51.52 – 18.14'L
F&I 6" PLUG

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

SANITARY SEWER NOTES

8+37.64 (EAST SIDE SEWER)
F&I MANHOLE #15 (48")

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA

0 10' 20' 40'
SCALE: 1"=40'

Prepared By: F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Prepared For: Public Works Department Rapid City Incorporated 1883 South Dakota — Engineering Services	Scale: 1" = 40' Designed By: JAP Drawn By: JRK Design Date: JUNE 2015 Print Date: JUNE 2015 Internal Job No: 130234 Surveyed By: DOT / FMG Survey Date: SURVEY BY DOT SDDOT Project No. 1M 1902(61)0	SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT 12-2053 / CIP 50940 / PCN X03T	Sheet Title: EAST SIDE SEWER PLAN	Sheet: G51 of G77

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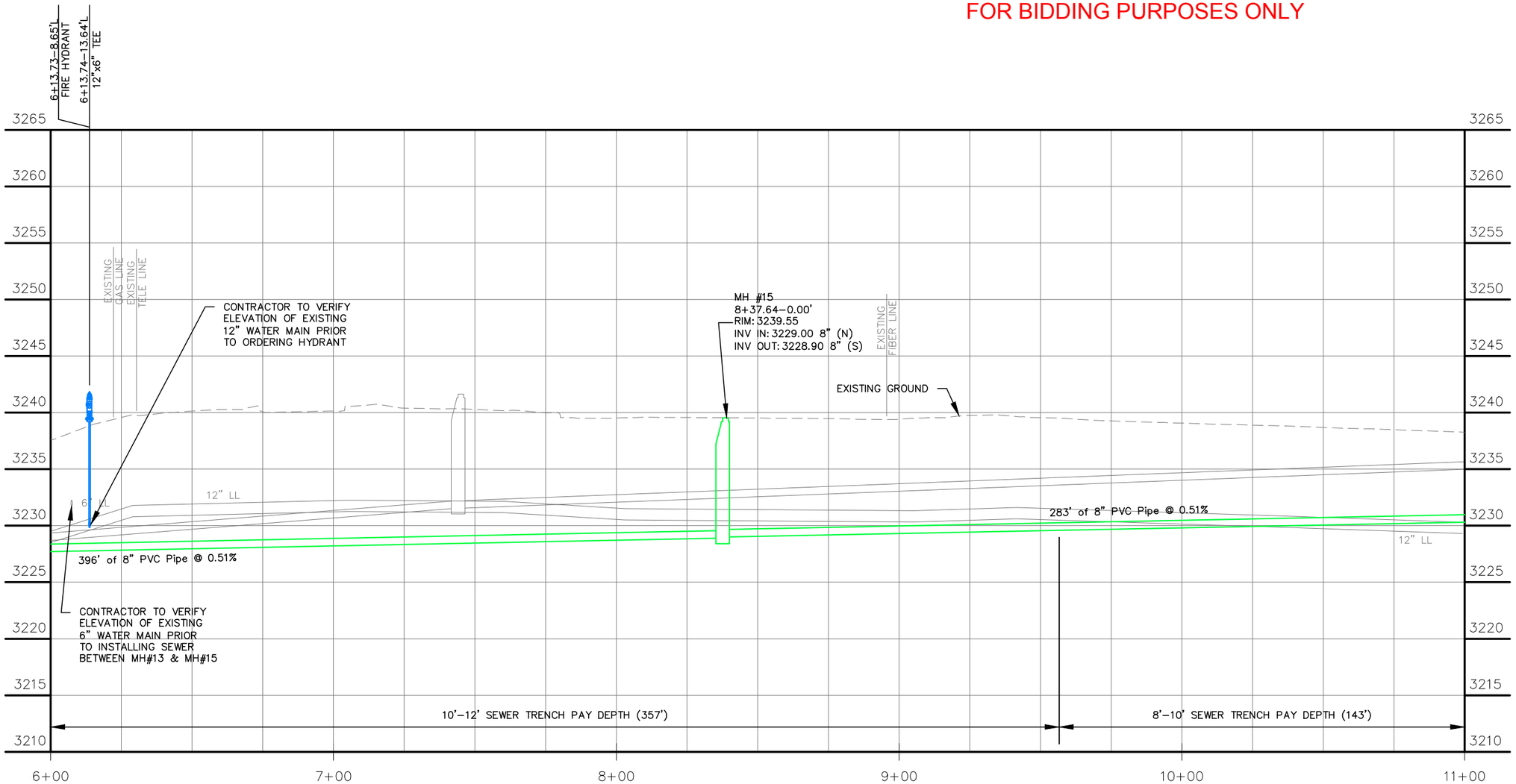

FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
6+13.73–8.65'L	3239.20	3229.80	9.4'*

*HYDRANT BURY GREATER THAN 8.5' REQUIRES ROTATED TEE AND (1) 6" X 45° BEND IN HYDRANT LEAD TO REDUCE BURY. CONTRACTOR TO SELECT APPROPRIATE BARREL LENGTH

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: EAST SIDE SEWER PROFILE

Sheet: G52 of G77

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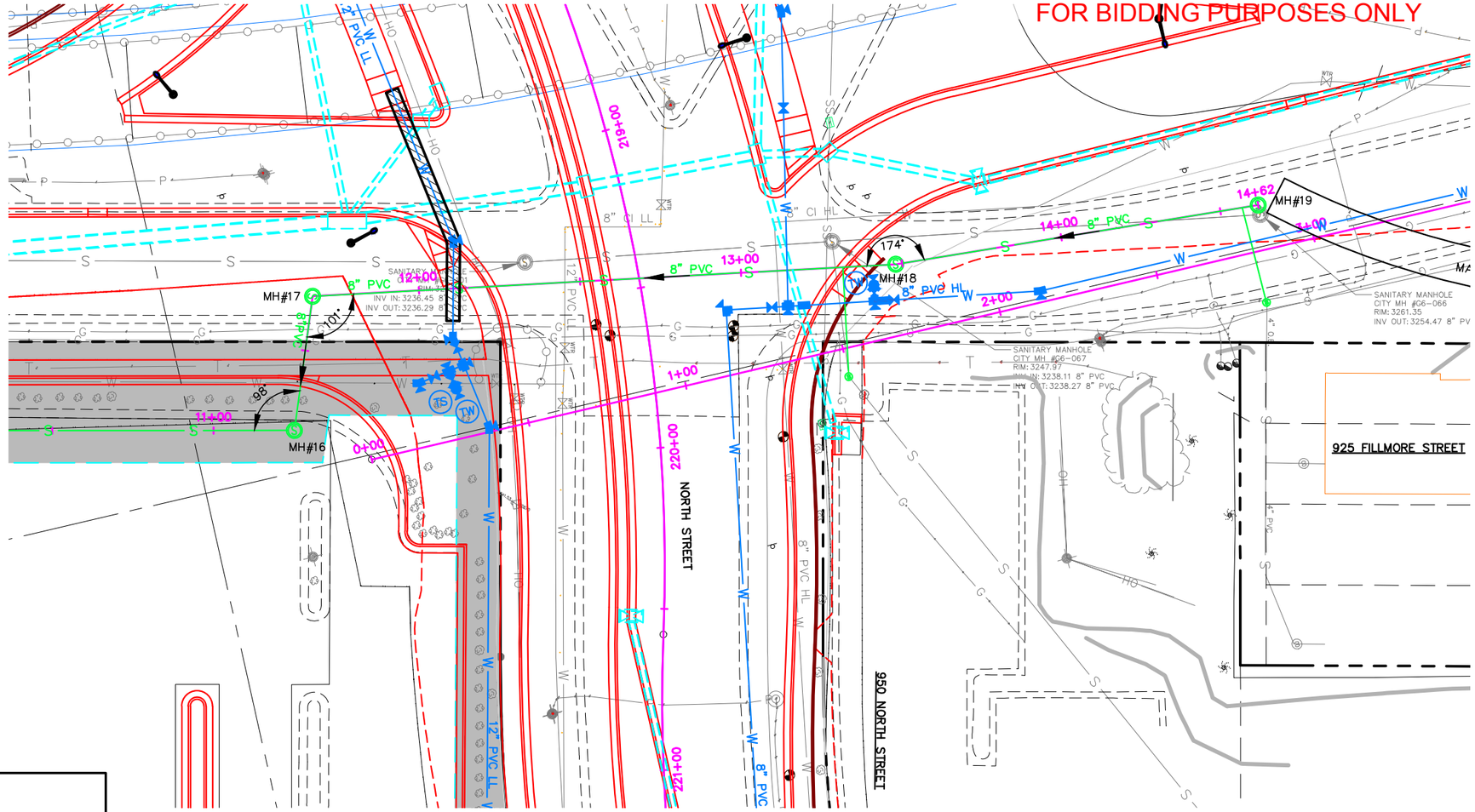

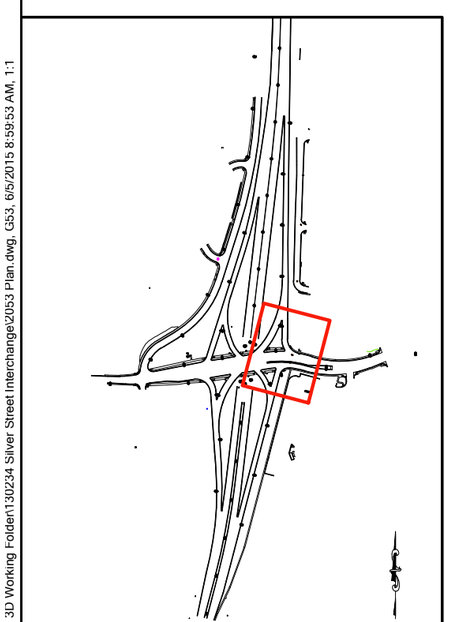

SHEET KEY

SANITARY SEWER NOTES

11+25.04 (EAST SIDE SEWER)
F&I MANHOLE #16 (48")

11+67.01 (EAST SIDE SEWER)
F&I MANHOLE #17 (48")

13+48.04 (EAST SIDE SEWER)
F&I MANHOLE #18 (48") (DROP)

14+61.84 (EAST SIDE SEWER)
F&I MANHOLE #19 (48") (TERMINATION)

F&I NEW 4" PVC SEWER SERVICE LINE, CLEANOUT, AND RECONNECT TO EXISTING SERVICE LINE
13+31.57 to 13+31.57 – 34.00'R (33') (EAST SIDE SEWER)
14+56.87 to 14+59.53 – 30.19'R (29') (EAST SIDE SEWER)

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA

0 10' 20' 40'
SCALE: 1"=40'

Prepared By:
F M G, Inc.
3700 Sturgis Road
Rapid City, SD 57702-0317
(605) 342-4105 FAX (605) 342-4222
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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: EAST SIDE SEWER PLAN

Sheet: G53 of G77

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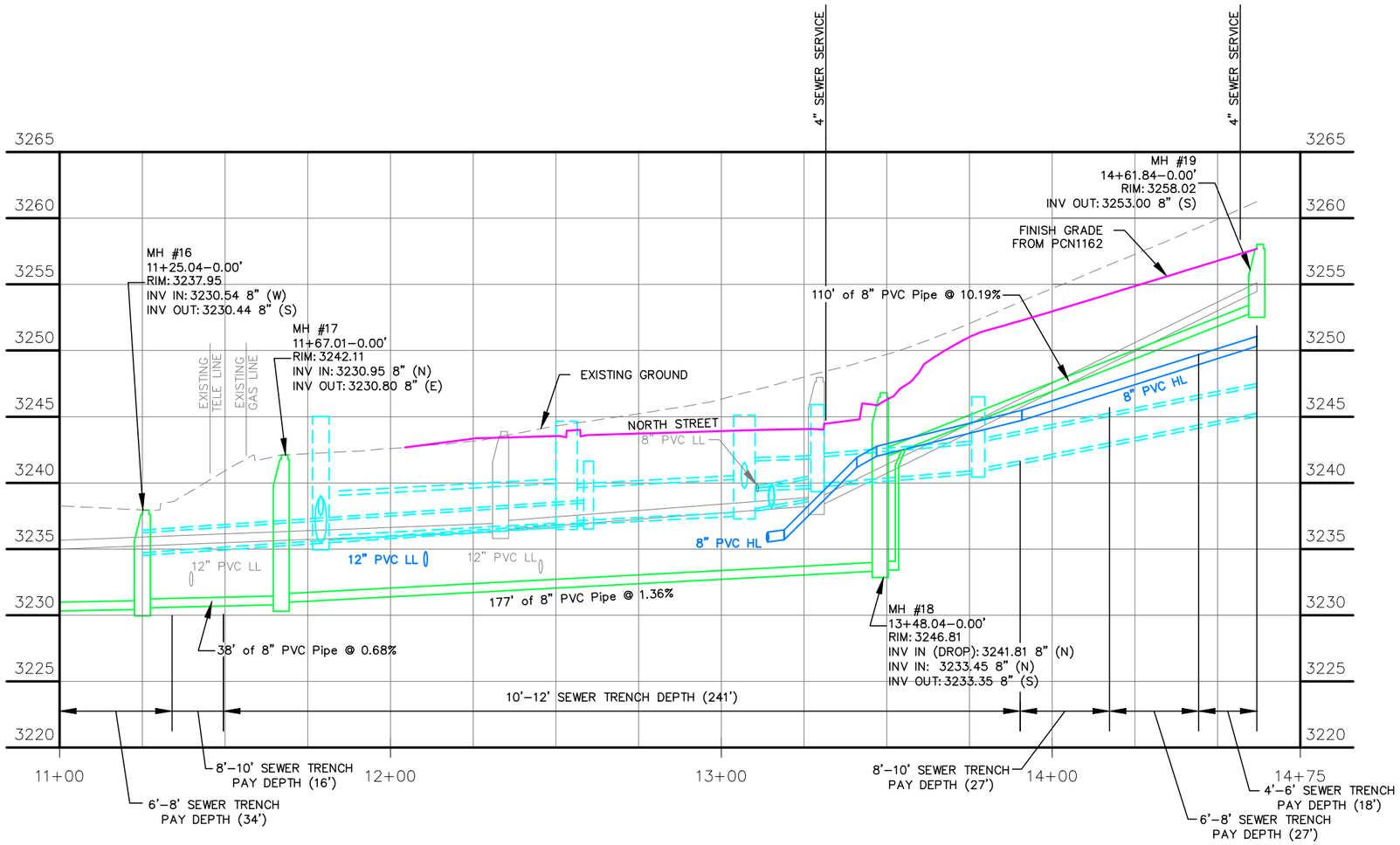

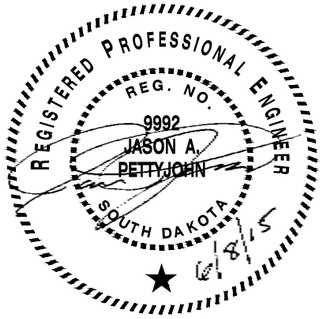

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Prepared For:
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Design Date: JUNE 2015	Print Date: JUNE 2015
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SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title:
EAST SIDE
SEWER PROFILE

Sheet:
G54
of
G77

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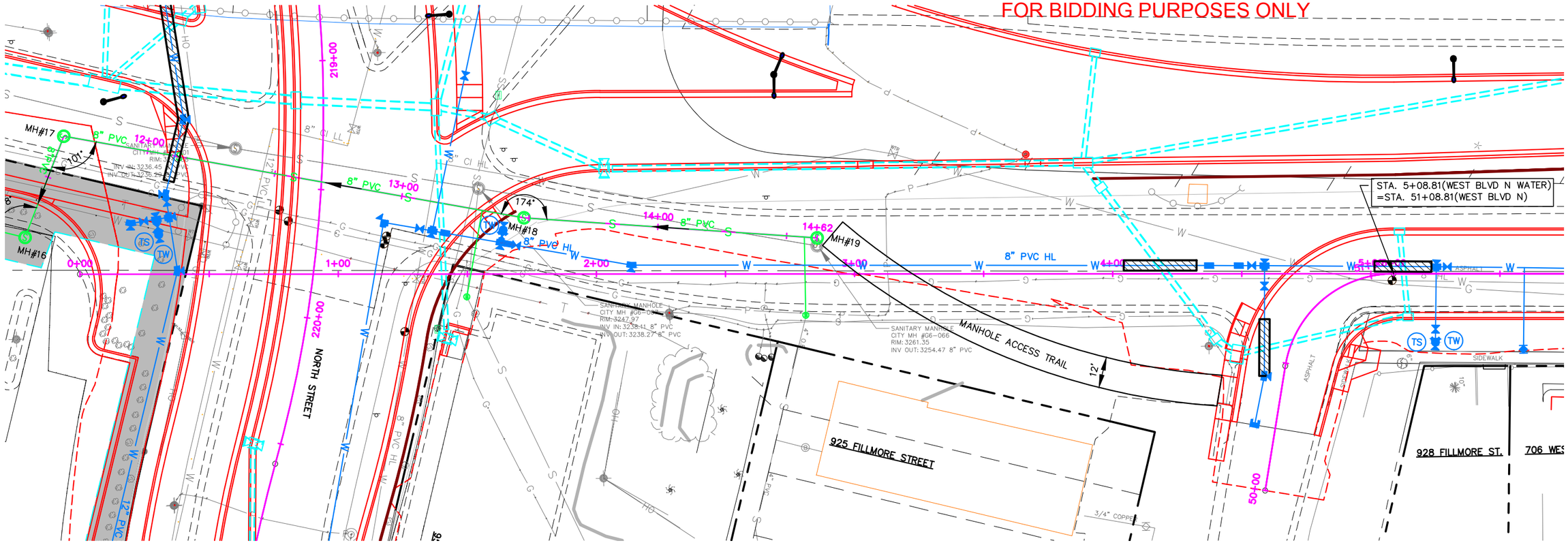

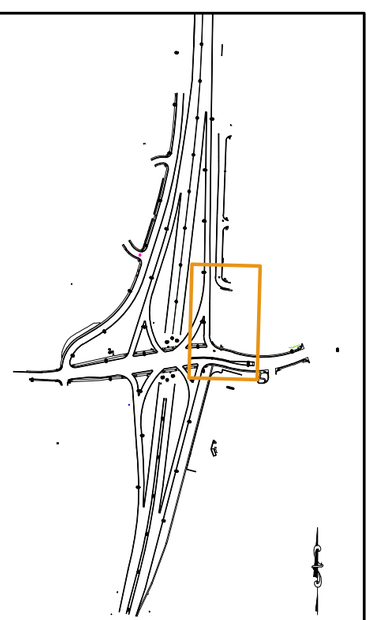

SHEET KEY

WATER MAIN NOTES

0+19.63 – 19.67'L to 0+34.99 – 22.00'L
(WEST BLVD N WATER)
F&I 15' – 12" PVC WATER MAIN

0+19.63 – 19.67'L (WEST BLVD N WATER)
F&I 12" x 22.5° BEND AND THRUST BLOCK
CONNECT TO EXISTING 12" MAIN

0+24.61 – 20.46'L (WEST BLVD N WATER)
F&I 12" GATE VALVE AND VALVE BOX

0+29.55 – 21.23'L (WEST BLVD N WATER)
F&I 12" x 12" x 6" TEE AND THRUST BLOCK

0+29.55 – 21.23'L to 0+30.49 – 15.31'L
(WEST BLVD N WATER)
F&I 6' – 6" PVC HYDRANT LEAD

0+30.49 – 15.31'L (WEST BLVD N WATER)
F&I FIRE HYDRANT WITH THRUST BLOCK,
AUXILIARY VALVE, AND VALVE BOX

1+17.59 – 19.99'L to 5+08.81 – 2.86'L
(WEST BLVD N WATER)
F&I 393' – 8" PVC WATER MAIN

1+17.59 – 19.99'L (WEST BLVD N WATER)
F&I 8" x 90° BEND AND THRUST BLOCK

1+31.56 – 17.58'L (WEST BLVD N WATER)
F&I 8" GATE VALVE AND VALVE BOX

1+36.47 – 16.74'L (WEST BLVD N WATER)
F&I 8" x 8" x 8" TEE AND THRUST BLOCK

1+41.40 – 15.89'L (WEST BLVD N WATER)
F&I 8" x 11.25° VERT BEND

1+63.02 – 12.17'L (WEST BLVD N WATER)
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

1+63.02 – 12.17'L to 1+63.86 – 17.10'L
(WEST BLVD N WATER)
F&I 5' – 6" PVC HYDRANT LEAD

1+63.86 – 17.10'L (WEST BLVD N WATER)
F&I FIRE HYDRANT WITH THRUST BLOCK,
AUXILIARY VALVE, AND VALVE BOX

1+65.97 – 11.66'L (WEST BLVD N WATER)
F&I 8" x 11.25° VERT BEND

1+68.93 – 11.15'L (WEST BLVD N WATER)
F&I 8" GATE VALVE AND VALVE BOX

2+13.62 – 3.46'L (WEST BLVD N WATER)
F&I 8" x 11.25° BEND AND THRUST BLOCK

4+37.32 – 3.21'L (WEST BLVD N WATER)
F&I 8" x 22.5° VERT BEND

4+48.83 – 3.20'L (WEST BLVD N WATER)
F&I 8" x 22.5° VERT BEND

4+53.83 – 3.19'L (WEST BLVD N WATER)
F&I 8" GATE VALVE AND VALVE BOX

4+58.77 – 3.18'L (WEST BLVD N WATER)
F&I 8" x 8" x 8" TEE AND THRUST BLOCK

F&I CONCRETE WATER MAIN ENCASEMENT
4+04.23 – 3.25'L to 4+32.44 – 3.22'L (1EA)
(WEST BLVD N WATER)

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED
METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

0+30 – 15'L (WEST BLVD. WATER)
F&I CP TEST STATION

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9992
JASON A.
PETTYJOHN
SOUTH DAKOTA

0 10' 20' 40'
SCALE: 1"=40'

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Prepared For:
Public Works Department
Rapid City, South Dakota
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BLVD NORTH WATER PLAN

Sheet: G55 of G77

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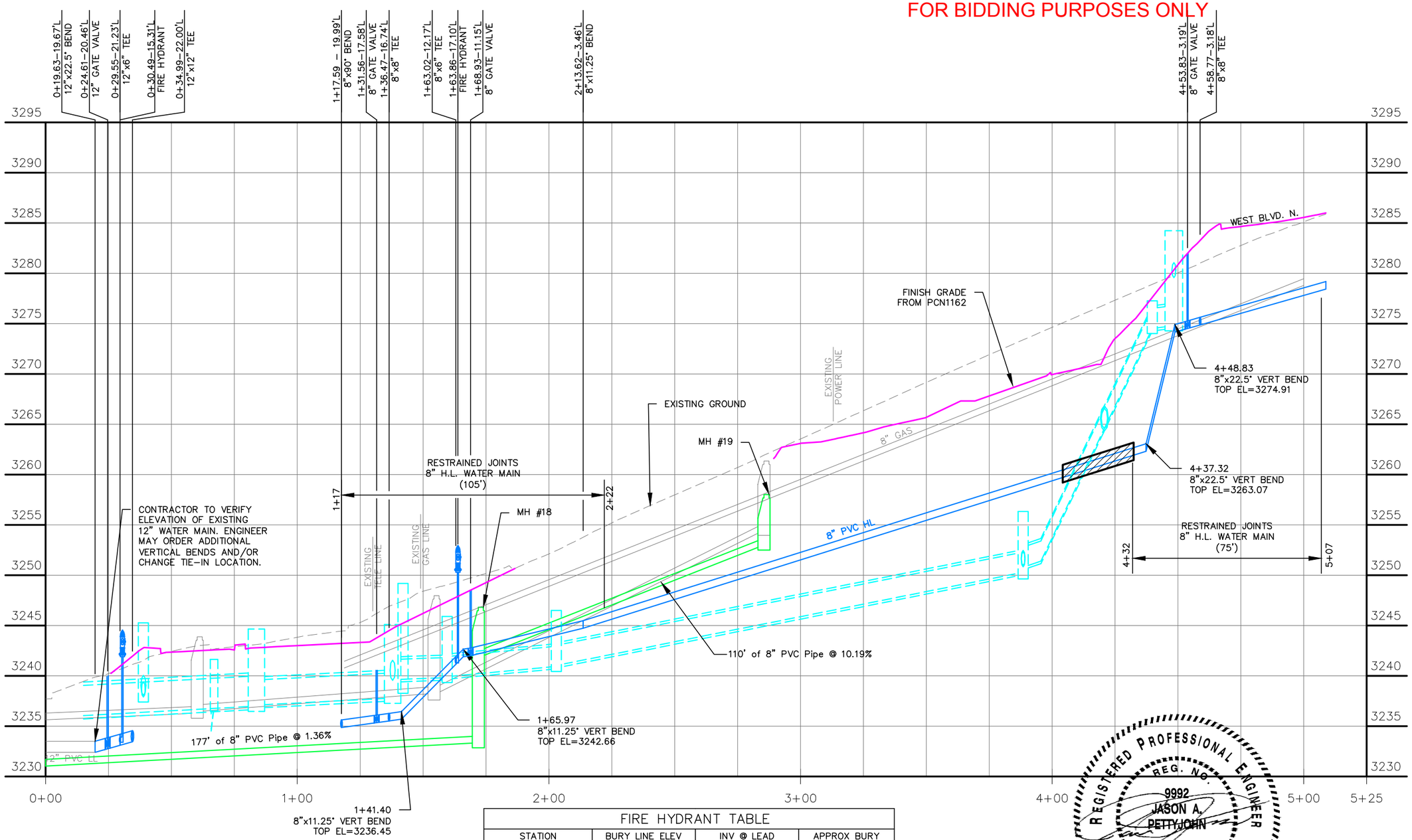

FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
0+30.49–15.31'L	3241.90	3233.40	8.5'
1+63.86–17.10'L	3250.30	3241.30	9.0'*

*HYDRANT BURY GREATER THAN 8.5' REQUIRES ROTATED TEE AND
(1) 6" X 45° BEND IN HYDRANT LEAD TO REDUCE BURY.
CONTRACTOR TO SELECT APPROPRIATE BARREL LENGTH

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

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Prepared For:
Public Works Department
Rapid City, Incorporated 1882, South Dakota
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
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SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BLVD NORTH WATER PROFILE

Sheet: G56 of G77

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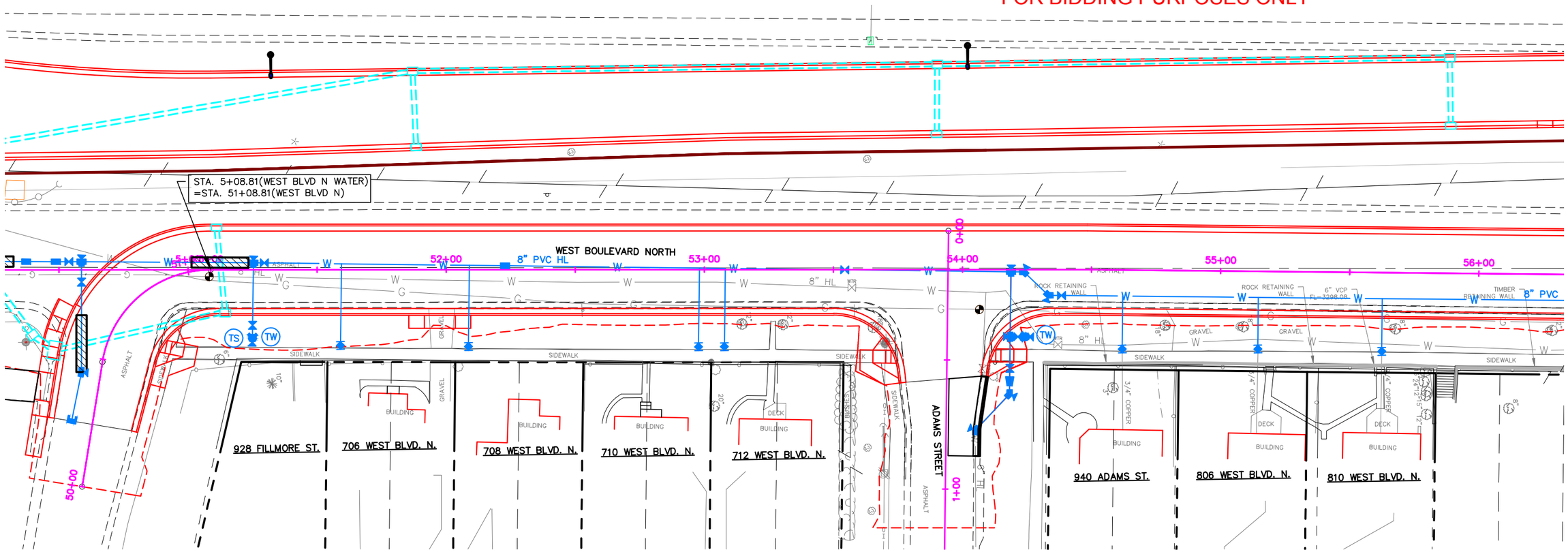

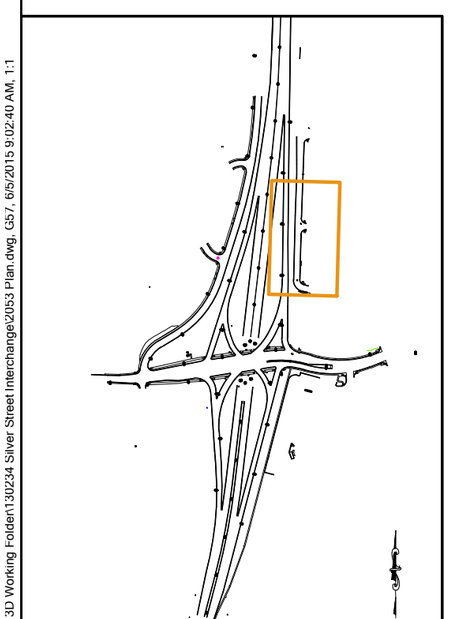

SHEET KEY

WATER MAIN NOTES

50+25.00 – 8.00'L to 50+73.52 – 25.21'L
F&I 61' – 8" PVC WATER MAIN

50+25.00 – 8.00'L
F&I 8" WATER CAP

50+43.76 – 7.41'L
F&I 8" x 11.25° BEND AND THRUST BLOCK

50+69.55 – 20.22'L
F&I 8" GATE VALVE AND VALVE BOX

51+08.81 – 2.86'L to 56+00.00 – 10.08'L
F&I 495' – 8" PVC WATER MAIN

51+25.33 – 2.76'L
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

51+25.33 – 2.76'L to 51+24.97 – 26.47'R
F&I 29' – 6" PVC HYDRANT LEAD

51+24.97 – 26.47'R
F&I FIRE HYDRANT WITH THRUST BLOCK, AUXILIARY VALVE, AND VALVE BOX

51+29.57 – 2.71'L
F&I 8" GATE VALVE AND VALVE BOX

52+22.82 – 1.56'L
F&I 8" HIGH DEFLECTION COUPLING

53+54.41 – 0.05'R
F&I 8" GATE VALVE AND VALVE BOX

54+18.78 – 0.84'R
F&I 8" x 8" x 8" TEE AND THRUST BLOCK

54+23.78 – 0.90'R
F&I 8" x 45° BEND AND THRUST BLOCK

54+33.34 – 9.98'R
F&I 8" x 45° BEND AND THRUST BLOCK

54+38.35 – 10.03'R
F&I 8" GATE VALVE AND VALVE BOX

0+15.50 – 24.38'L to 0+57.93 – 24.41'L (ADAMS ST)
F&I 42' – 8" PVC WATER MAIN

0+40.70 – 24.40'L (ADAMS ST)
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

0+40.70 – 24.40'L to 0+40.60 – 30.37'L (ADAMS ST)
F&I 6' – 6" PVC HYDRANT LEAD

0+40.60 – 30.37'L (ADAMS ST)
F&I FIRE HYDRANT WITH THRUST BLOCK, AUXILIARY VALVE, AND VALVE BOX

0+52.93 – 24.41'L
F&I 8" GATE VALVE AND VALVE BOX

0+57.93 – 24.41'L
F&I 8" x 6" REDUCER AND THRUST BLOCK

0+57.93 – 24.41'L to 0+77.07 – 11.33'L (ADAMS ST)
F&I 24' – 6" PVC WATER MAIN

0+62.93 – 24.41'L (ADAMS ST)
F&I 6" x 45° BEND AND THRUST BLOCK

0+77.07 – 11.33'L (ADAMS ST)
F&I 6" x 45° BEND AND THRUST BLOCK, CONNECT TO EXISTING 6" MAIN

F&I NEW CURB STOP, NEW 1" WATER SERVICE LINE AND RECONNECT TO EXISTING SERVICE LINE
51+59.07 – 29.29'R (32')
52+08.59 – 29.73'R (32')
52+97.74 – 29.84'R (31')
53+07.78 – 29.83'R (30')
54+62.15 – 30.64'R (21')
55+14.68 – 30.09'R (20')
55+62.66 – 10.09'R (20')

F&I 1" TAPPING SADDLE
51+59.46 – 2.34'L
52+09.01 – 1.73'L
52+98.12 – 0.64'L
53+08.12 – 0.52'L
54+62.14 – 10.13'R
55+14.67 – 10.11'R
55+62.66 – 10.09'R

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS, INCLUDING BELL RESTRAINTS

51+25 – 27'R
F&I CP TEST STATION

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

0 10' 20' 40'
SCALE: 1"=40'

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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BLVD. NORTH PLAN

Sheet: G57 of G77

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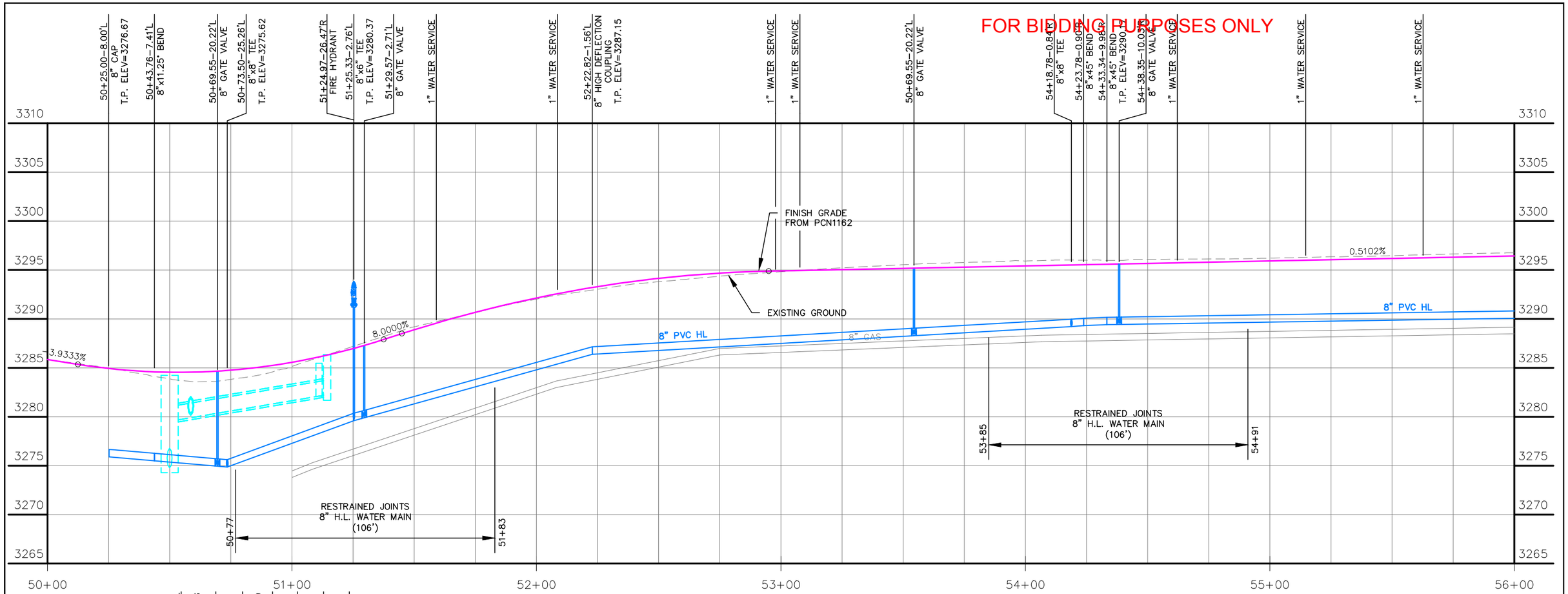
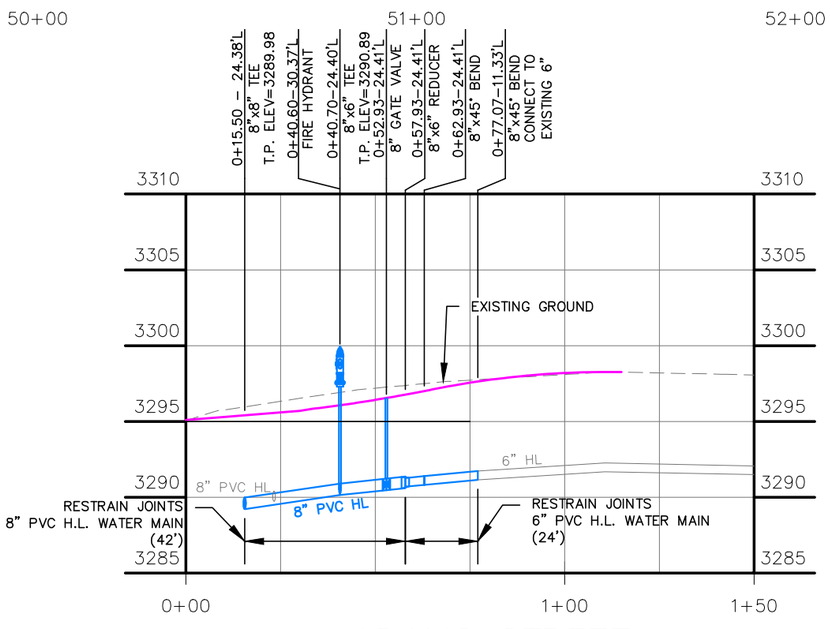


FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
51+24.97–26.47'R	3291.20	3279.70	11.5'*

*HYDRANT BURY GREATER THAN 8.5' REQUIRES ROTATED TEE AND
(1) 6" X 45° BEND IN HYDRANT LEAD TO REDUCE BURY.
CONTRACTOR TO SELECT APPROPRIATE BARREL LENGTH

WEST BOULEVARD NORTH



ADAMS STREET

FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
0+40.60–30.37'L	3297.30	3290.30	7.0'

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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BLVD. NORTH PROFILE

Sheet: G58 of G77

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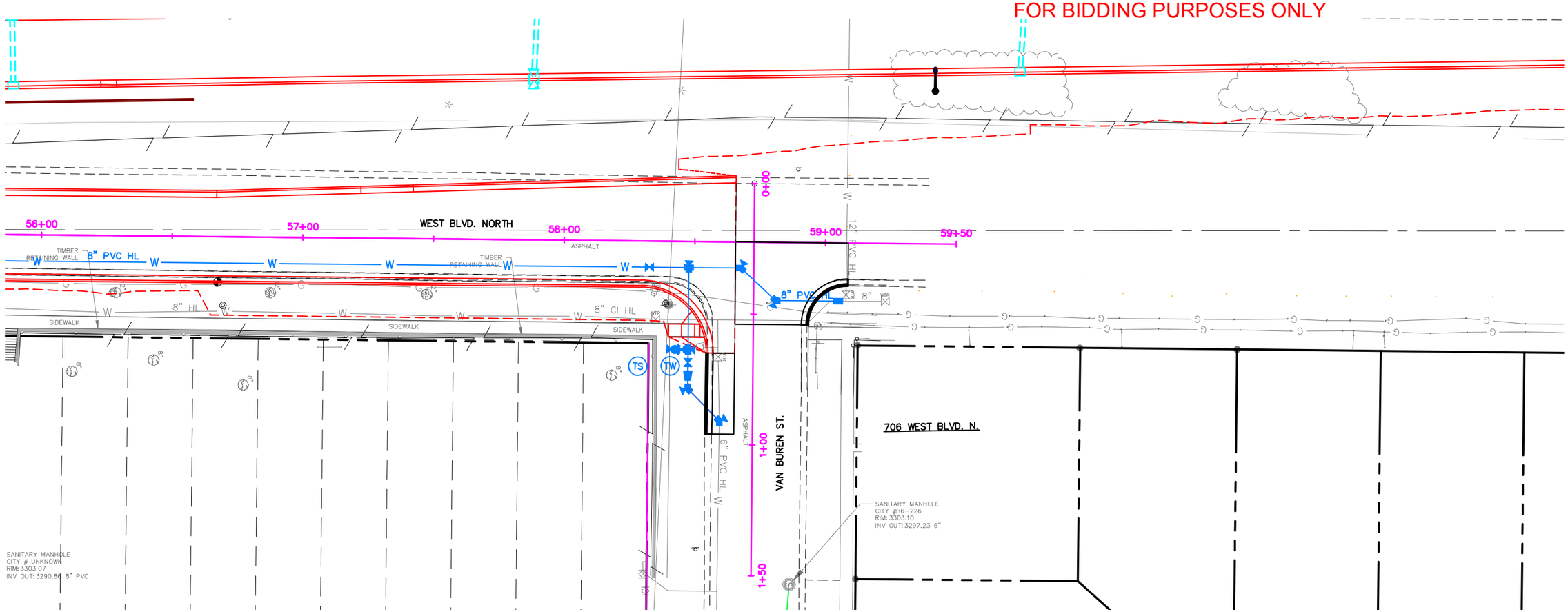

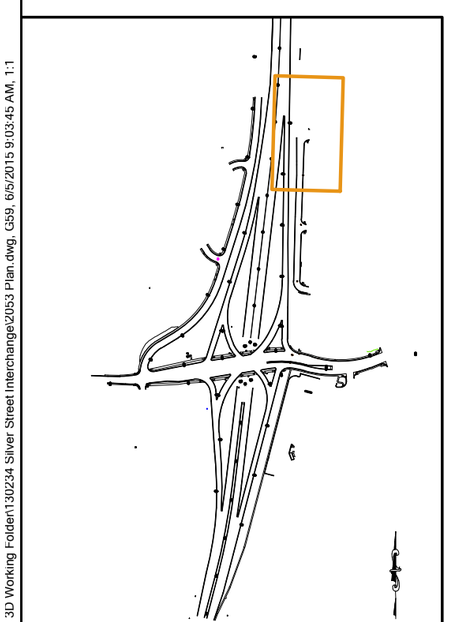

SHEET KEY

WATER MAIN NOTES

56+00.00 – 10.08'L to 59+05.00 – 22.28'R
F&I 310' – 8" PVC WATER MAIN

58+32.68 – 10.00'R
F&I 8" GATE VALVE AND VALVE BOX

58+47.77 – 10.00'R
F&I 8" x 8" x 8" TEE AND THRUST BLOCK

58+67.77 – 10.00'R
F&I 8" x 45° BEND AND THRUST BLOCK

58+81.04 – 22.32'R
F&I 8" x 45° BEND AND THRUST BLOCK

59+05.00 – 22.28'R
CONNECT TO EXISTING 8" MAIN

0+32.36 – 24.88'R to 0+73.72 – 24.89'R (VAN BUREN ST)
F&I 41' – 8" PVC WATER MAIN

0+63.72 – 24.89'R (VAN BUREN ST)
F&I 8" x 8" x 6" TEE AND THRUST BLOCK

0+63.72 – 24.89'R to 0+63.72–29.89'R (VAN BUREN ST)
F&I 5' – 6" PVC HYDRANT LEAD

0+63.72–29.89'R (VAN BUREN ST)
F&I FIRE HYDRANT WITH THRUST BLOCK,
AUXILIARY VALVE, AND VALVE BOX

0+68.72 – 24.89'R (VAN BUREN ST)
F&I 8" GATE VALVE AND VALVE BOX

0+73.72 – 24.89'R to 0+90.95 – 12.67'R (VAN BUREN ST)
F&I 22' – 6" PVC WATER MAIN

0+73.72 – 24.89'R (VAN BUREN ST)
F&I 8" x 6" REDUCER AND THRUST BLOCK

0+78.72 – 24.89'R (VAN BUREN ST)
F&I 6" x 45° BEND AND THRUST BLOCK

0+90.95 – 12.67'R (VAN BUREN ST)
F&I 6" x 45° BEND AND THRUST BLOCK,
CONNECT TO EXISTING 6" MAIN

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS,
INCLUDING BELL RESTRAINTS

0+64 – 30'R
F&I CP TEST STATION

0 10' 20' 40'
SCALE: 1"=40'

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Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BLVD. NORTH PLAN

Sheet: G59 of G77

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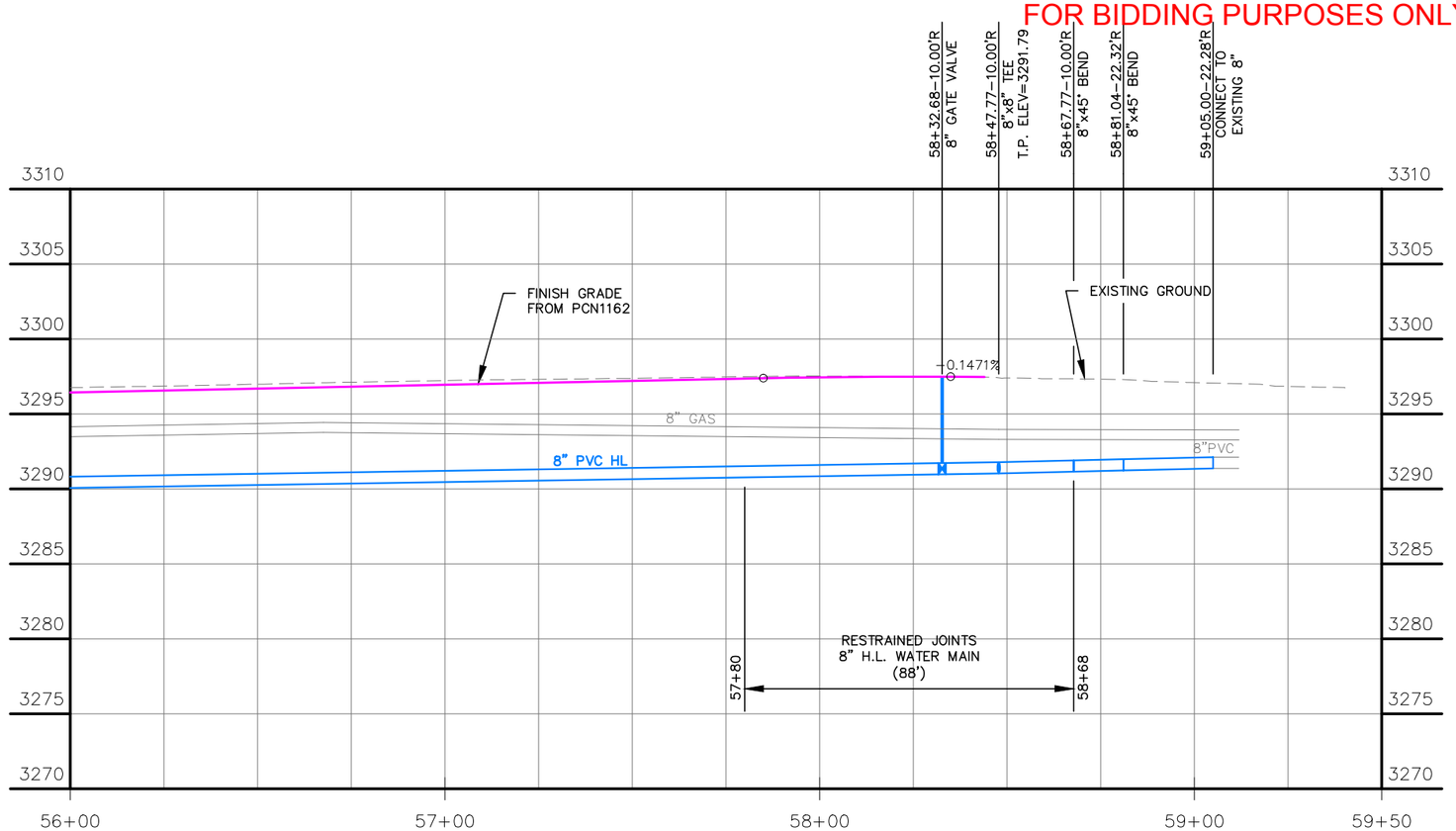
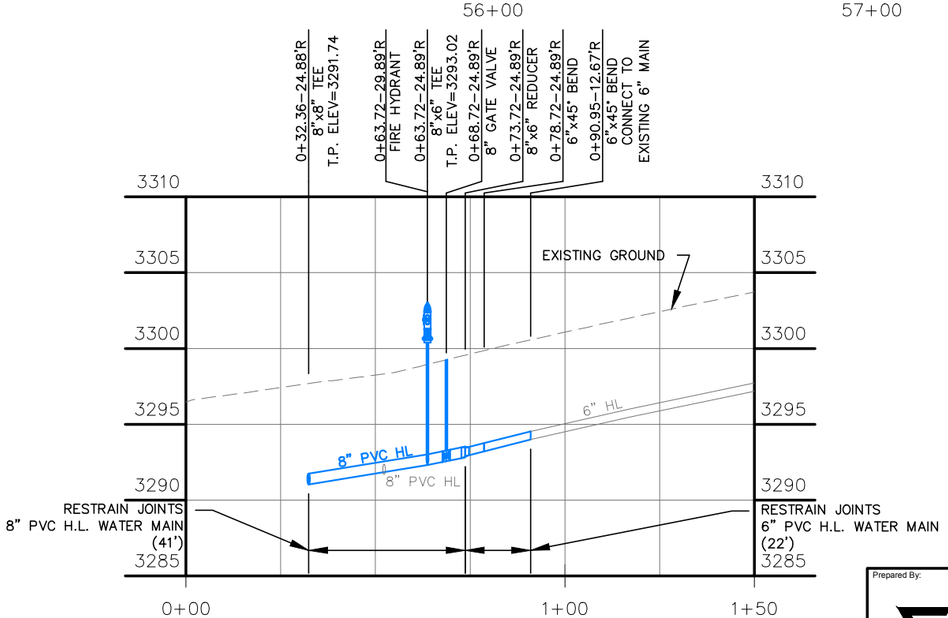


WEST BOULEVARD NORTH



VAN BUREN STREET

FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
0+63.72–29.89'R	3300.40	3292.40	8.0'

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Prepared For:
Public Works Department
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Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
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SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: WEST BLVD. NORTH AND VAN BUREN ST. PROFILE

Sheet: G60 of G77

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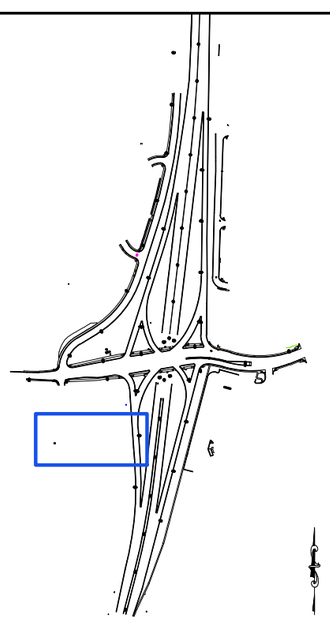
BLOCK BARRICADE
ASPHALT
RETAINING WALL
LOT 1R, BLOCK 2
SETTLERS CREEK TOWNHOMES
RETAINING WALL
SANITARY MANHOLE
CITY MH #5
RIM: 3234.42
INV IN: 3228.88 8" PVC
INV OUT: 3228.76 8" PVC
18" RCP
FL=3230.73
36" RC ARCH
PIPE FL=3230.54
FLARE FL=3230.66
36" RC ARCH
PIPE FL=3230.59
FLARE FL=3230.60
36" RC ARCH
PIPE FL=3230.59
FLARE FL=3230.60
36" RC ARCH
PIPE FL=3230.61
FLARE FL=3230.68
36" RC ARCH
PIPE FL=3230.68
FLARE FL=3230.82
36" RC ARCH
PIPE FL=3230.11
FLARE FL=3230.11
36" RC ARCH
PIPE FL=3230.24
FLARE FL=3230.20
SIDEWALK
2" PVC LL
SANITARY MANHOLE
CITY MH #6
RIM: 3234.72
INV IN: 3228.53 8" PVC
INV IN: 3227.54 8" PVC
NOT ACCEPTED
TYPE B INLET
TC=3234.09
FL=3230.99
TYPE B INLET
TC=3233.82
FL=3231.32
SANITARY MANHOLE
CITY MH #G6-055
RIM: 3234.53
INV IN: 3228.09 8" PVC
INV OUT: 3227.72 8" PVC
6" PVC LL
12" PVC LL
PHILADELPHIA STREET
0+00
1+00
2+00
3+00
3+25
6+00
7+00
8+00
9+00
10+00
F&I PLUG IN SOUTH
SIDE OF EXISTING 12"x6" TEE
36" RC ARCH
PIPE FL=3230.16
FLARE FL=3230.14
36" RC ARCH
PIPE FL=3230.24
FLARE FL=3230.24
36" RC ARCH
PIPE FL=3230.19
FLARE FL=3230.13
24"??? RCP
PIPE FL=???
FLARE FL=3230.31
161'
MH#6
80°
MH#5
40'
(TYP.)
10" PVC
12" PVC
SANITARY MANHOLE
CITY MH #G6-054
RIM: 3240.83
INV IN: 3230.27 8" PVC
INV IN: 3225.48 8" PVC (DROP)
INV IN: 3225.48 8" PVC
INV OUT: 3225.48 8" PVC



WATER MAIN NOTES

2+70.02 – 10.52'L (PHILADELPHIA ST)
F&I 6" x 90° BEND AND THRUST BLOCK,
CONNECT TO EXISTING 6" PVC MAIN

2+70.02 – 10.52'L to 2+70.59 – 22.05'L (PHILADELPHIA ST)
F&I 12' – 6" PVC HYDRANT LEAD

2+70.59 – 22.05'L (PHILADELPHIA ST)
F&I FIRE HYDRANT WITH THRUST BLOCK,
AUXILIARY VALVE, AND VALVE BOX

CORROSION PROTECTION NOTES
PLACE 18# MAGNESIUM ANODE ON ALL BURIED METALLIC FITTINGS,
INCLUDING BELL RESTRAINTS

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9992
JASON A.
PETTYJOHN
SOUTH DAKOTA
6/8/15

0 10' 20' 40'
SCALE: 1"=40'

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Prepared By:	Prepared For:	Scale: 1" = 40'		SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT	Sheet Title:	Sheet:
F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Public Works Department Engineering Services	Designed By: JAP	Drawn By: JRK		PHILADELPHIA ST. UTILITY PLAN	G61 of G77
		Design Date: JUNE 2015	Print Date: JUNE 2015			
		Internal Job No: 130234				
		Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT			
		SDDOT Project No. 1M 1902(61)0		12-2053 / CIP 50940 / PCN X03T		

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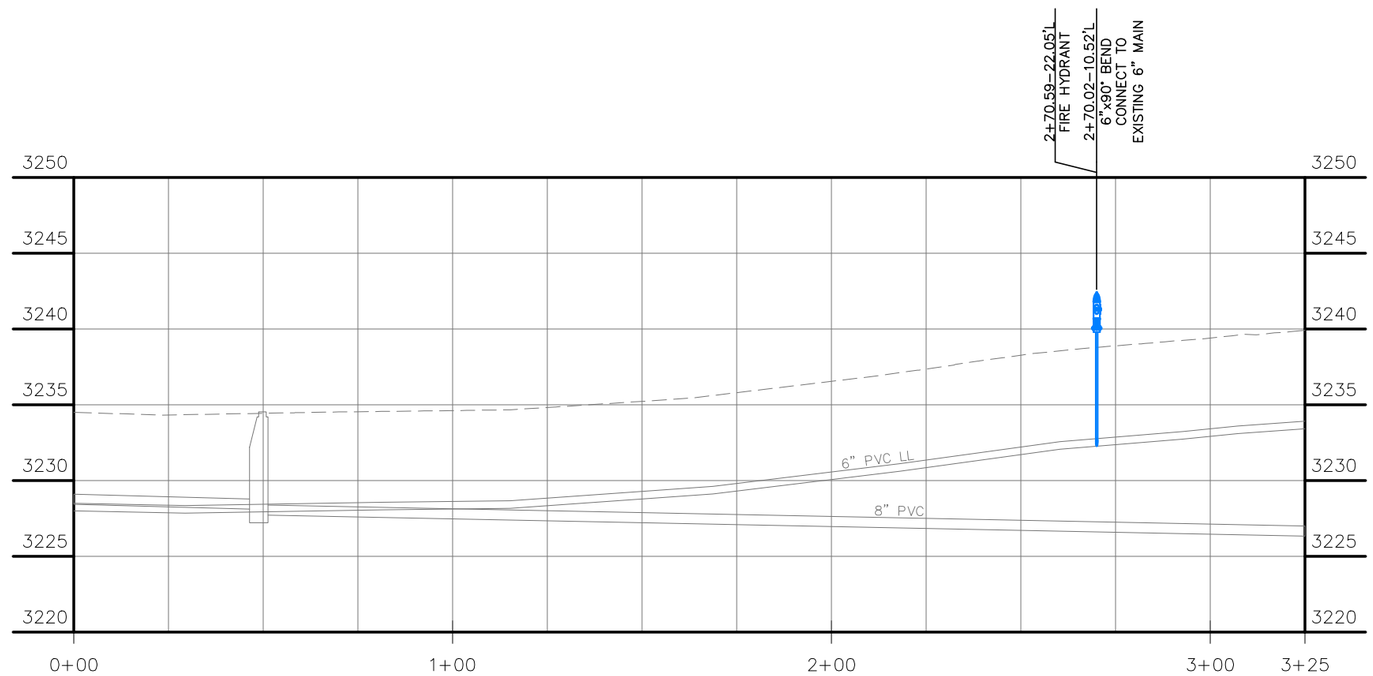

FIRE HYDRANT TABLE			
STATION	BURY LINE ELEV	INV @ LEAD	APPROX BURY
2+70.59–22.05'L	3239.80	3232.30	7.5'

*CONTRACTOR TO VERIFY DEPTH OF EXISTING MAIN TO ESTABLISH ACTUAL HYDRANT BURY

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9992
JASON A. PETTYJOHN
SOUTH DAKOTA
6/8/15

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Prepared For:
Public Works Department
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Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: PHILADELPHIA ST. UTILITY PLAN

Sheet: G62 of G77

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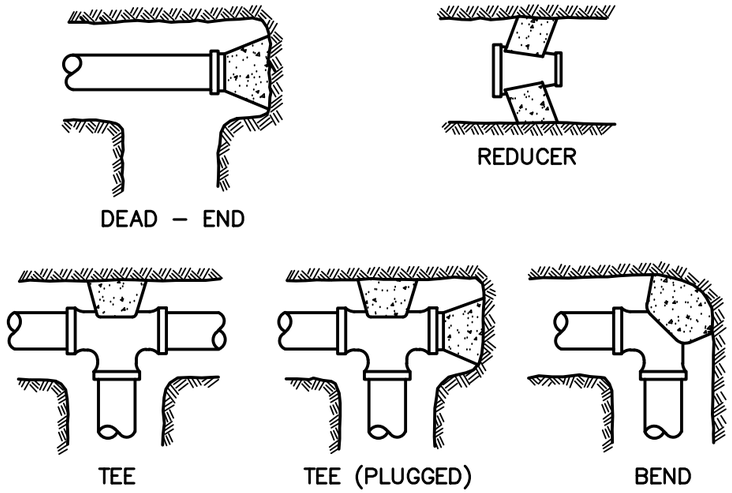

1. Place 8 mi. polyethylene between concrete and fitting.
2. All thrust blocking shall be cast–in–place concrete having a minimum 28–day compressive strength of 4000 psi.
3. Thrust blocking shall be cast against undisturbed earth. Thrust block orientation shall be such that the center of the fitting corresponds with the center of the thrust block.
4. The horizontal dimension of the bearing area shall be between 0.8 and 1.25 times the vertical dimension.

TABLE Pounds of Thrust per fitting at 150 psi Water Pressure

(Minimum bearing area in sq. ft. for concrete thrust block based on 150 psi and soil bearing capacity of 1000 pounds per square foot)

[Minimum Volume (CY) of Concrete per Thrust Block]

Pipe Size	Tee & Dead End	90° Bend	45° Bend	22 1/2° Bend	11 1/4° Bend
4"	2700(2.7)[1.0]	3950(4.0)[1.5]	2090(2.09)[0.8]	1050(1.1)[0.4]	530(0.5)[0.2]
6"	5610(5.6)[2.1]	7940(7.9)[2.9]	4290(5.7)[2.1]	2190(2.2)[0.8]	1100(1.1)[0.4]
8"	9650(9.7)[3.6]	13650(13.7)[5.1]	7380(9.8)[3.6]	3760(3.8)[1.4]	1890(1.9)[0.7]
10"	14520(14.5)[5.4]	20530(20.5)[7.6]	11100(14.8)[5.5]	5670(5.7)[2.1]	2850(2.9)[1.1]
12"	20530(20.5)[7.6]	29030(29.0)[10.7]	15710(21.0)[7.8]	8010(8.0)[3.0]	4030(4.0)[1.5]
14"	27580(27.6)[10.2]	39000(39.0)[14.4]	21100(28.1)[10.4]	10770(10.8)[4.0]	5400(5.4)[2.0]
16"	35670(35.7)[13.2]	50440(50.4)[18.7]	27300(36.4)[13.5]	13920(13.9)[5.2]	6990(7.0)[2.6]
20"	54970(55.0)[20.3]	77740(77.7)[28.8]	42080(56.1)[20.8]	21450(21.5)[7.9]	10780(10.8)[4.0]

THRUST BLOCK DETAILS (150psi)

NOT TO SCALE

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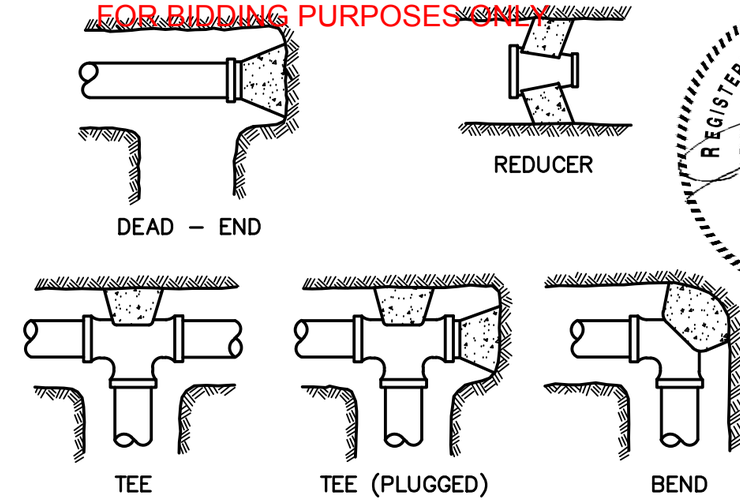

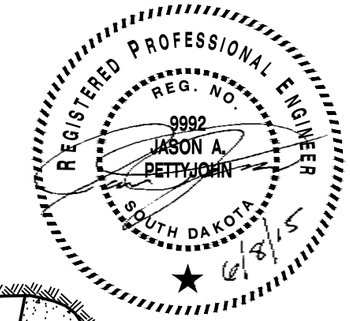

1. Place 8 mi. polyethylene between concrete and fitting.
2. All thrust blocking shall be cast–in–place concrete having a minimum 28–day compressive strength of 4000 psi.
3. Thrust blocking shall be cast against undisturbed earth. Thrust block orientation shall be such that the center of the fitting corresponds with the center of the thrust block.
4. The horizontal dimension of the bearing area shall be between 0.8 and 1.25 times the vertical dimension.

TABLE Pounds of Thrust per fitting at 200 psi Water Pressure

(Minimum bearing area in sq. ft. for concrete thrust block based on 150 psi and soil bearing capacity of 1000 pounds per square foot)

[Minimum Volume (CY) of Concrete per Thrust Block]

Pipe Size	Tee & Dead End	90° Bend	45° Bend	22 1/2° Bend	11 1/4° Bend
4"	3600(3.6)[1.3]	5260(5.3)[2.0]	2780(2.8)[1.0]	1400(1.4)[0.5]	700(0.7)[0.3]
6"	7480(7.5)[2.8]	10580(10.6)[3.9]	5720(5.7)[2.1]	2920(2.9)[1.1]	1460(1.5)[0.6]
8"	12860(12.9)[4.8]	18200(18.2)[6.7]	9840(9.8)[3.6]	5020(5.0)[1.9]	2520(2.5)[0.9]
10"	19360(19.4)[7.2]	27370(27.4)[10.1]	14800(14.8)[5.5]	7560(7.6)[2.8]	3800(3.8)[1.4]
12"	27370(27.4)[10.1]	387700(38.7)[14.3]	20950(21.0)[7.8]	10680(10.7)[4.0]	5370(5.7)[2.1]
14"	36770(36.8)[13.6]	52000(52.0)[19.2]	28140(28.1)[10.4]	14350(14.4)[5.3]	7200(72.0)[26.6]
16"	47560(47.6)[17.6]	67250(67.3)[24.9]	36400(36.4)[13.5]	18560(18.6)[6.9]	9320(9.3)[3.4]
20"	73290(73.3)[27.1]	103650(103.7)[38.4]	56100(56.1)[20.8]	28600(28.6)[10.6]	14370(14.4)[5.3]

THRUST BLOCK DETAILS (200psi)

NOT TO SCALE

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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: STANDARD DETAILS

Sheet: G63 of G77

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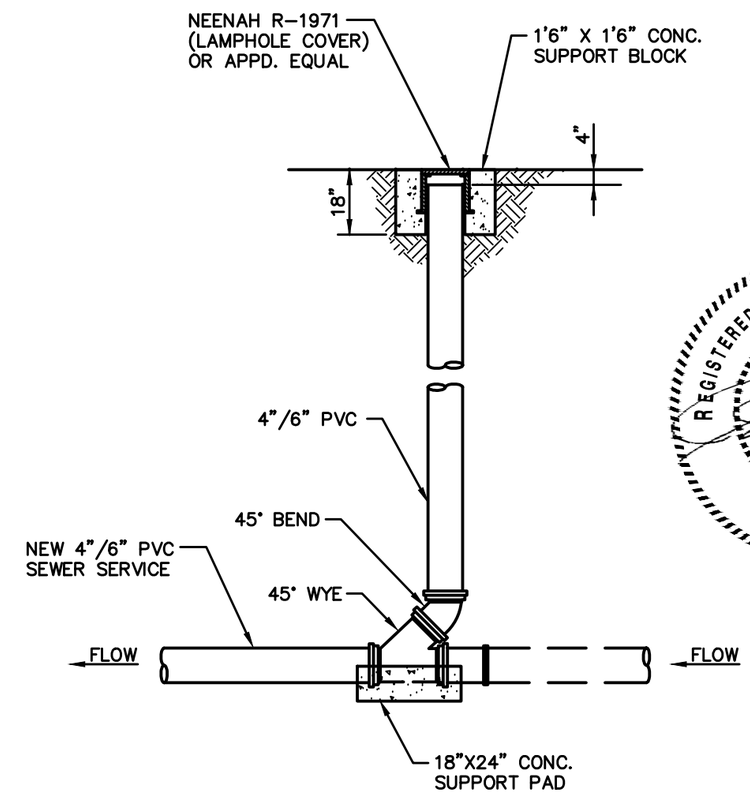
FOR BIDDING PURPOSES ONLY



SEWER CLEANOUT DETAIL
FOR PAVED AREAS

NOT TO SCALE

NOTE:
USE CITY STANDARD DETAIL
9-10 FOR NON PAVED AREAS

Prepared By:	Prepared For:	Scale: 1" = 40'			Sheet Title:	Sheet:
F M G, Inc. 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Public Works Department Engineering Services	Designed By: JAP	Drawn By: JRK	SILVER STREET INTERCHANGE UTILITY RECONSTRUCTION PROJECT	STANDARD DETAILS	G64 of G77
		Design Date: JUNE 2015	Print Date: JUNE 2015			
		Internal Job No: 130234				
		Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT			
		SDDOT Project No. 1M 1902(61)0		12-2053 / CIP 50940 / PCN X03T		

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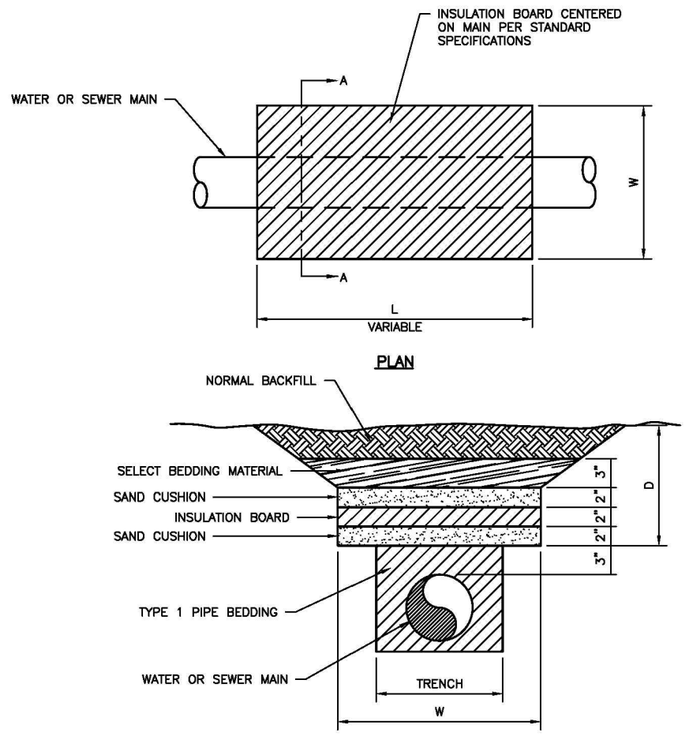


INSULATION WIDTH VS. PIPE DEPTH

WATER		SEWER	
D (FEET)	W (FEET)	D (FEET)	W (FEET)
3	8	2.5	8
4	6	3	6
5	4	3.5	4

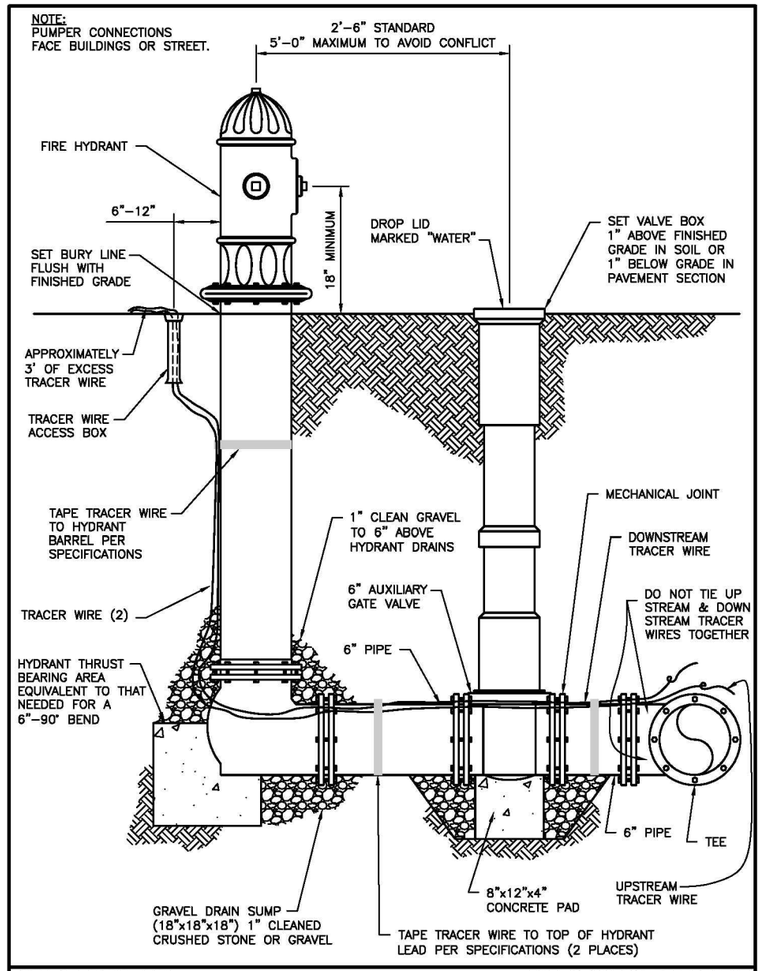
* THE USE OF INSULATION REQUIRES PRIOR APPROVAL BY THE ENGINEER.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

WATER & SEWER MAIN INSULATION DETIAL

DATE: 5–1–07

SEC. 11 — SHT. 1

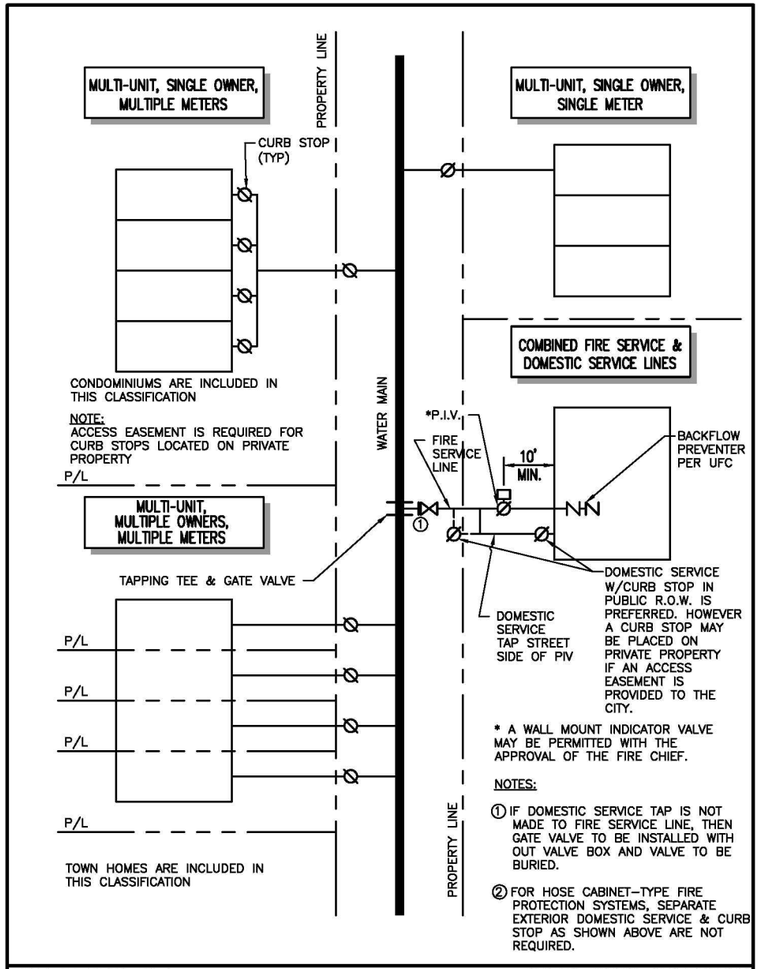


CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

HYDRANT SETTING DETAIL

DATE: 5–1–07

SEC. 8 — SHT. 1



* A WALL MOUNT INDICATOR VALVE MAY BE PERMITTED WITH THE APPROVAL OF THE FIRE CHIEF.

NOTES:

1. IF DOMESTIC SERVICE TAP IS NOT MADE TO FIRE SERVICE LINE, THEN GATE VALVE TO BE INSTALLED WITH OUT VALVE BOX AND VALVE TO BE BURIED.
2. FOR HOSE CABINET–TYPE FIRE PROTECTION SYSTEMS, SEPARATE EXTERIOR DOMESTIC SERVICE & CURB STOP AS SHOWN ABOVE ARE NOT REQUIRED.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TYPICAL WATER SERVICE LINE LAYOUT

DATE: 5–1–07

SEC. 8 — SHT. 5

Prepared By:

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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CITY STANDARD PLATES

Sheet: G65 of G77

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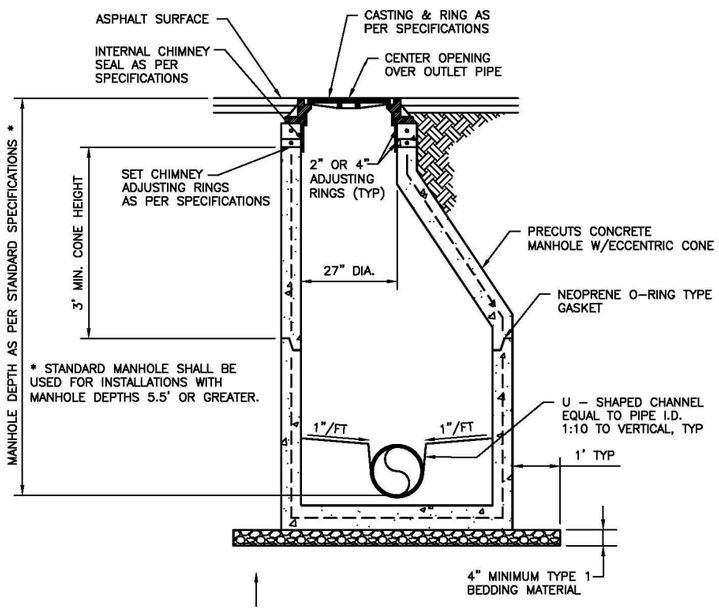
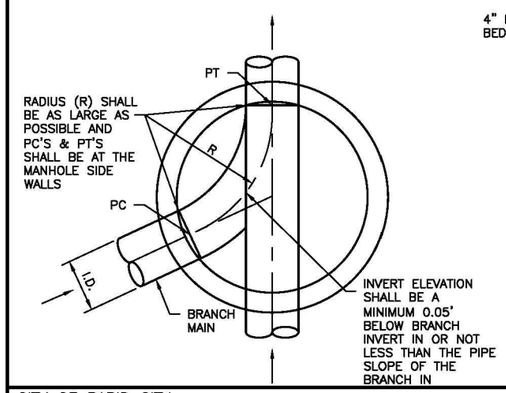




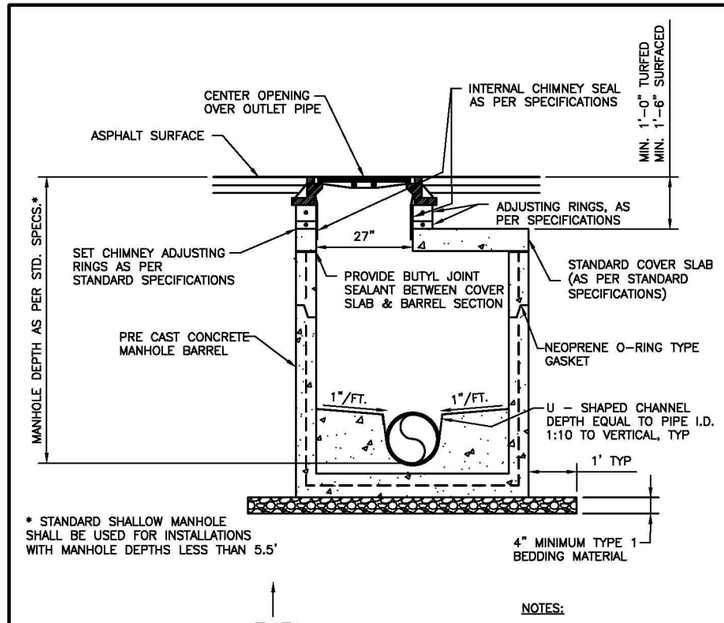
NOTES:

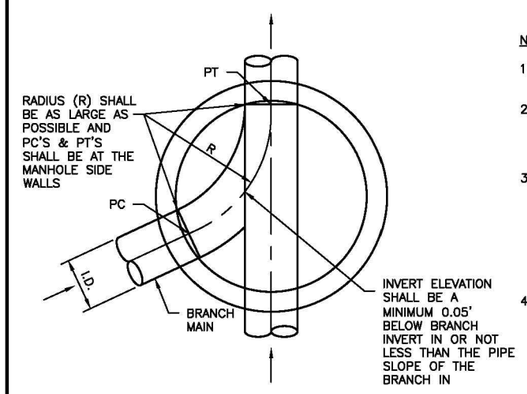
1. PC'S & PT'S ARE TO BE WITHIN THE MANHOLE.
2. ALL INVERTS TO BE U-SHAPED CHANNEL EQUAL TO PIPE I.D. AND SHALL BE CONSTRUCTED WITH SWEEPS.
3. A MINIMUM RADIUS (R) OF 2.5 TIMES THE I.D. OF THE BRANCH MAIN IS REQUIRED FOR ALL SWEEPS. IF THE 2.5 TIMES THE I.D. OF THE BRANCH CAN'T BE MET, A LARGER DIAMETER MANHOLE SHALL BE REQUIRED. SEE DETAIL SHEET 9-3.
4. MANHOLE PIPE CONNECTOR SHALL BE A RESILIENT WATER TIGHT SEAL.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

STANDARD MANHOLE DETAIL WITH MONOLITHIC BASE (48" & 60")

DATE: 5-1-07 — SEC. — SHT. 9-1





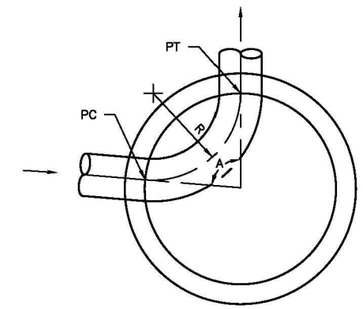
NOTES:

1. PC'S & PT'S ARE TO BE WITHIN THE MANHOLE.
2. ALL INVERTS TO BE U-SHAPED CHANNEL EQUAL TO PIPE I.D. AND SHALL BE CONSTRUCTED WITH SWEEPS.
3. A MINIMUM RADIUS (R) OF 2.5 TIMES THE I.D. OF THE BRANCH MAIN IS REQUIRED FOR ALL SWEEPS. IF THE 2.5 TIMES THE I.D. OF THE BRANCH CAN'T BE MET, A LARGER DIAMETER MANHOLE SHALL BE REQUIRED. SEE DETAIL SHEET 9-3.
4. MANHOLE PIPE CONNECTOR SHALL BE A RESILIENT WATER TIGHT SEAL.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

STANDARD SHALLOW MANHOLE DETAIL WITH MONOLITHIC BASE (48" 60" & 72")

DATE: 5-1-07 — SEC. — SHT. 9-2



OUTLET PIPE DIA.	INLET PIPE DIA.	MIN. ANGLE "A" IN DEGREES				
INCHES	INCHES	48" DIA.	60" DIA.	72" DIA.	84" DIA.	96" DIA.
8	8	80	75	75	75	75
10	8	81	75	75	75	75
10	10	94	80	75	75	75
12	8	81	75	75	75	75
12	10	94	81	75	75	75
12	12	104	91	80	75	75
15	8	83	75	75	75	75
15	10	95	81	75	75	75
15	12	106	92	81	75	75
15	15	117	104	94	84	77

ANGLES LESS THAN 90°

NOTE:

"A" ANGLES LESS THAN 90° REQUIRE THE DESIGN ENGINEER TO SUBMIT A WRITTEN REQUEST AND JUSTIFICATION FOR A DESIGN EXCEPTION, AND OBTAIN CITY APPROVAL. IN NO CASE SHALL THE "A" ANGLE BE LESS THAN 75°.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

MINIMUM INVERT ANGLES FOR SANITARY MANHOLES

DATE: 5-1-07 — SEC. — SHT. 9-3

Prepared By:
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Prepared For: Public Works Department — Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CITY STANDARD PLATES

Sheet: G66 of G77

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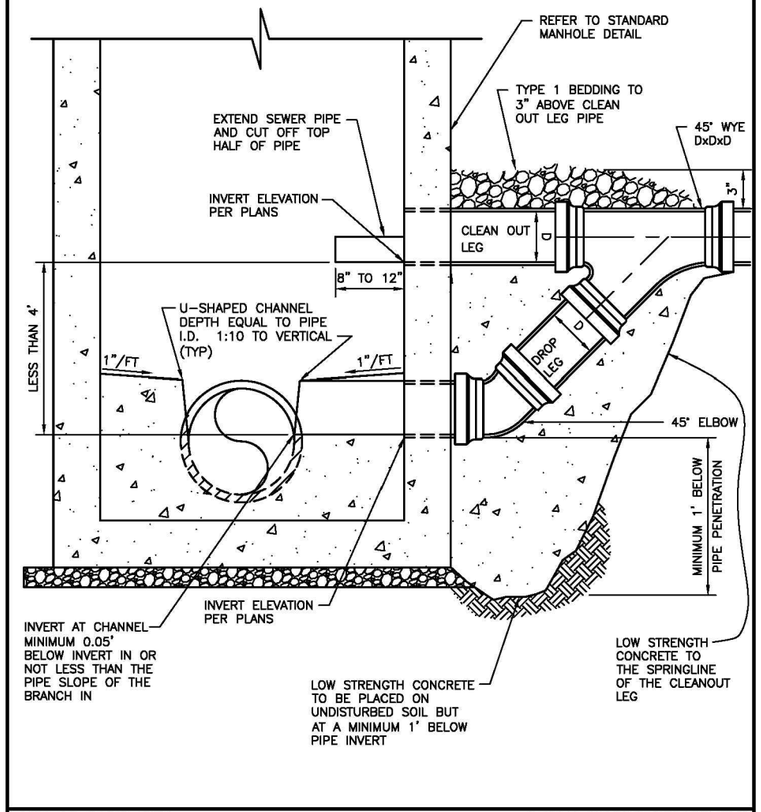
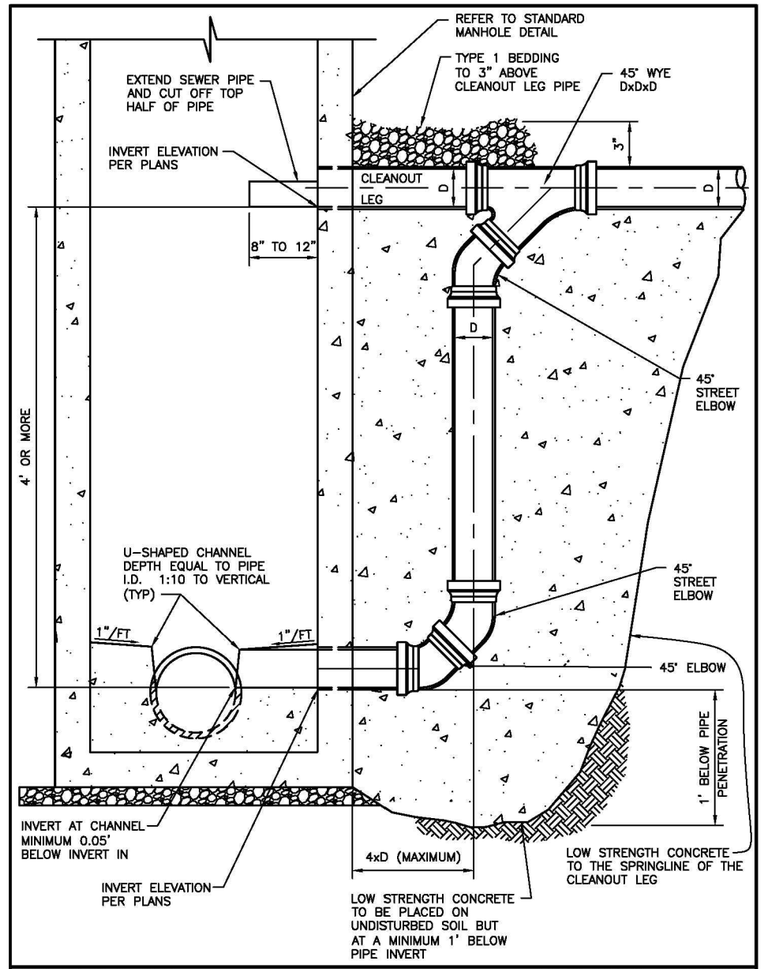


CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

STANDARD DROP MANHOLE DETAIL FOR INVERT CHANGES LESS THAN 4'

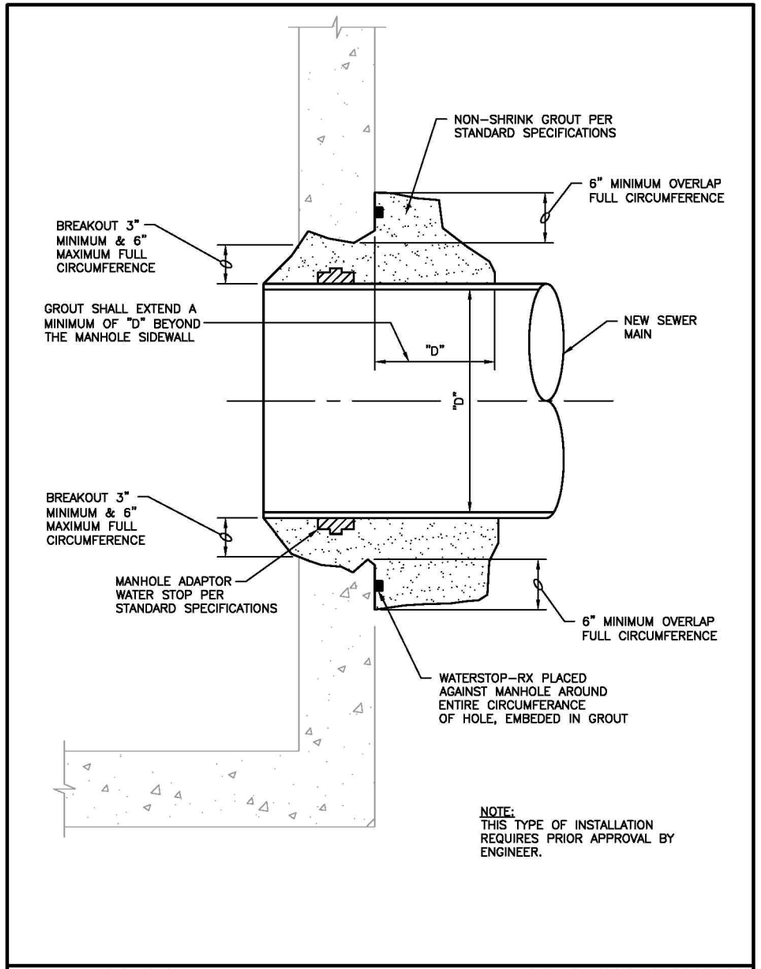
DATE: 5-1-07 — SEC. — SHT. 9-4



CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

STANDARD DROP MANHOLE DETAILS FOR INVERT CHANGES MORE THAN 4'

DATE: 5-1-07 — SEC. — SHT. 9-5



CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PIPE CONNECTION TO EXISTING MANHOLE (GROUTED CONNECTION)

DATE: 5-1-07 — SEC. — SHT. 9-6

Prepared By:

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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CITY STANDARD PLATES

Sheet: G67 of G77

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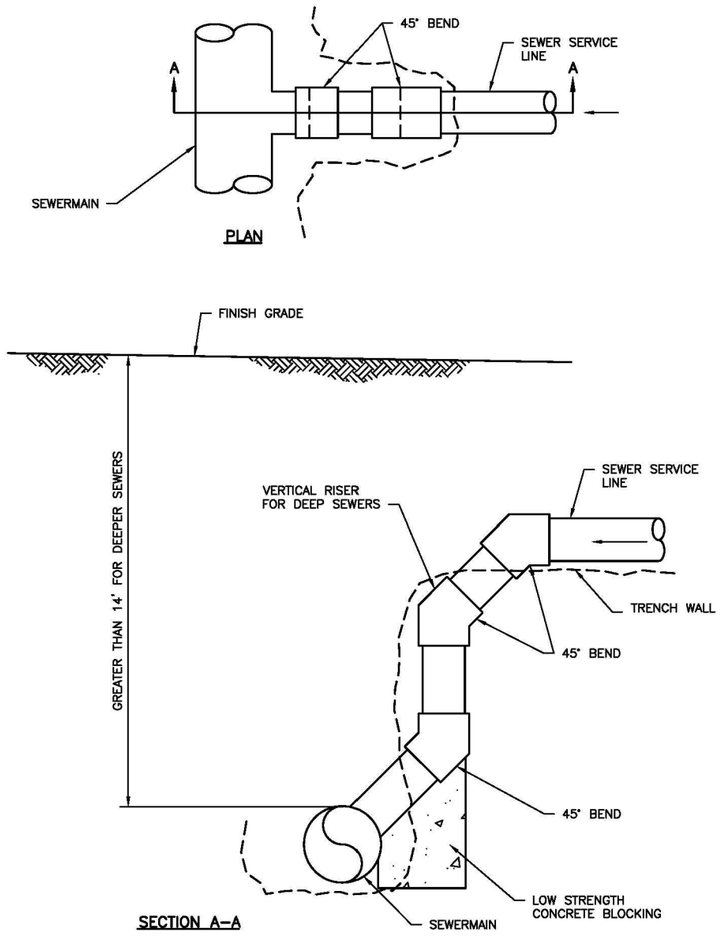
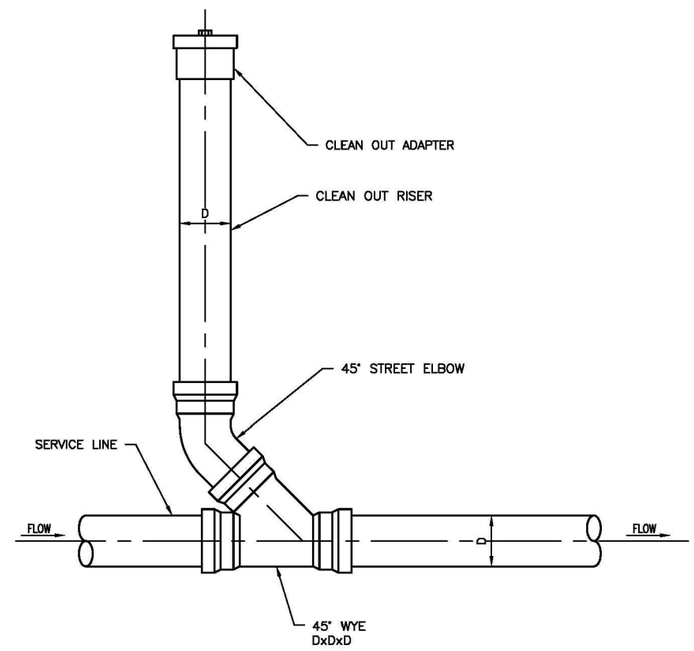


CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

DEEP SANITARY SERVICE CONNECTION

DATE: 5–1–07

SEC. 9 — SHT. 9



ELEVATION

NOTES:

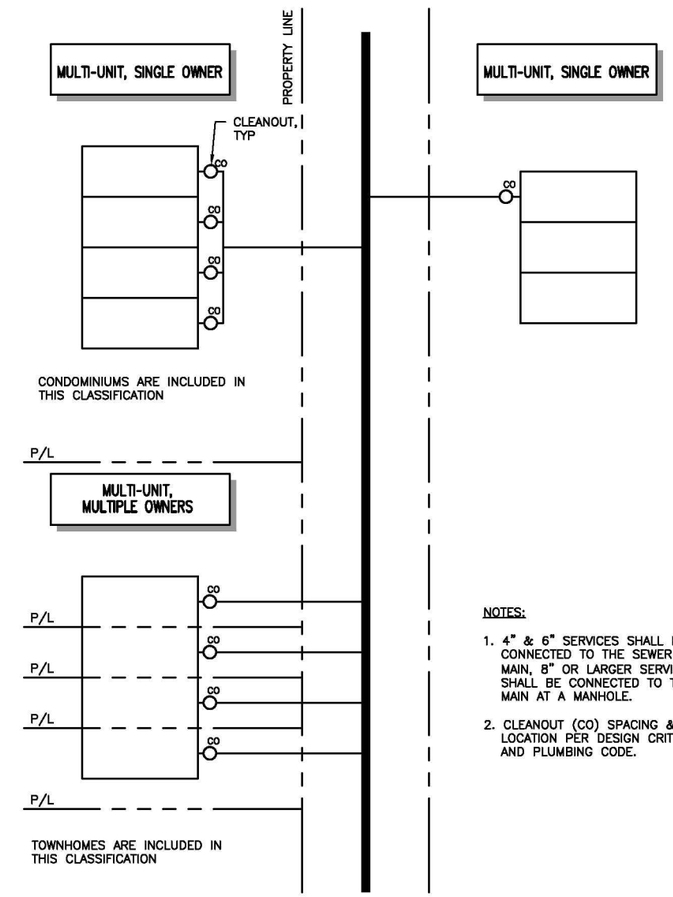
1. ALL FITTINGS SHALL BE GASKETED.
2. CLEAN OUTS TO BE SAME DIAMETER (D) AS SERVICE LINE.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

SANITARY SEWER SERVICE CLEAN OUT DETAIL

DATE: 5–1–07

SEC. 9 — SHT. 10



NOTES:

1. 4" & 6" SERVICES SHALL BE CONNECTED TO THE SEWER MAIN, 8" OR LARGER SERVICES SHALL BE CONNECTED TO THE MAIN AT A MANHOLE.
2. CLEANOUT (CO) SPACING & LOCATION PER DESIGN CRITERIA AND PLUMBING CODE.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TYPICAL SEWER SERVICE LINE LAYOUT

DATE: 5–7–07

SEC. 9 — SHT. 12

Prepared By:

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Prepared For:
Public Works Department
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CITY STANDARD PLATES

Sheet: G68 of G77

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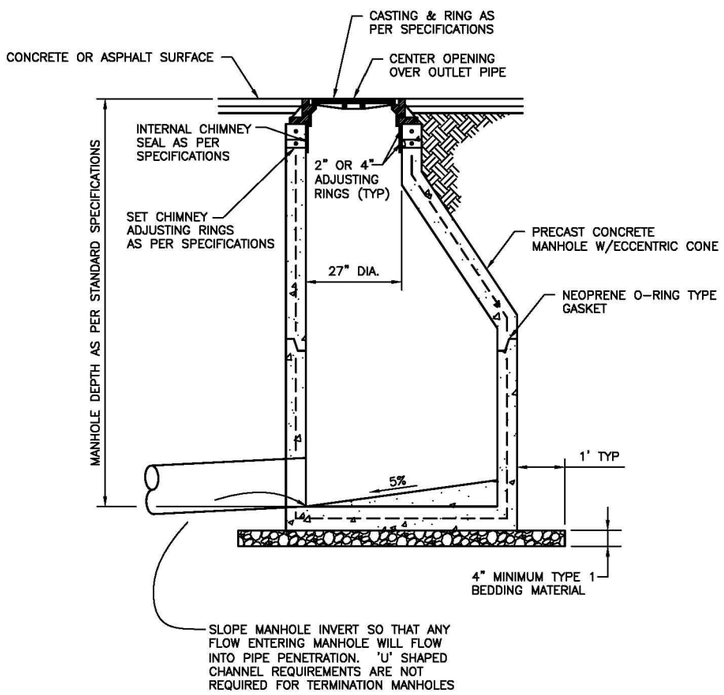


NOTE:

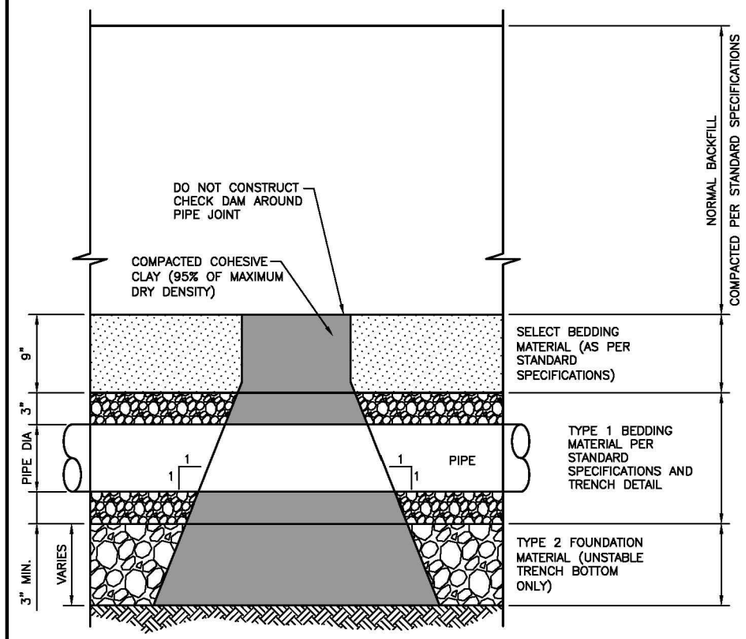
MANHOLE PIPE CONNECTOR SHALL BE A RESILIENT WATER TIGHT SEAL.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TERMINATION MANHOLE

DATE: 5-1-07

SEC. 9 — SHT. 13



ELEVATION

NOTE:

CHECK DAM INSTALLATION LOCATIONS SHALL BE AS INDICATED ON THE PLANS. HOWEVER DURING CONSTRUCTION, CHECK DAM INSTALLATION LOCATIONS MAY BE MOVED DUE TO FIELD CONDITIONS.

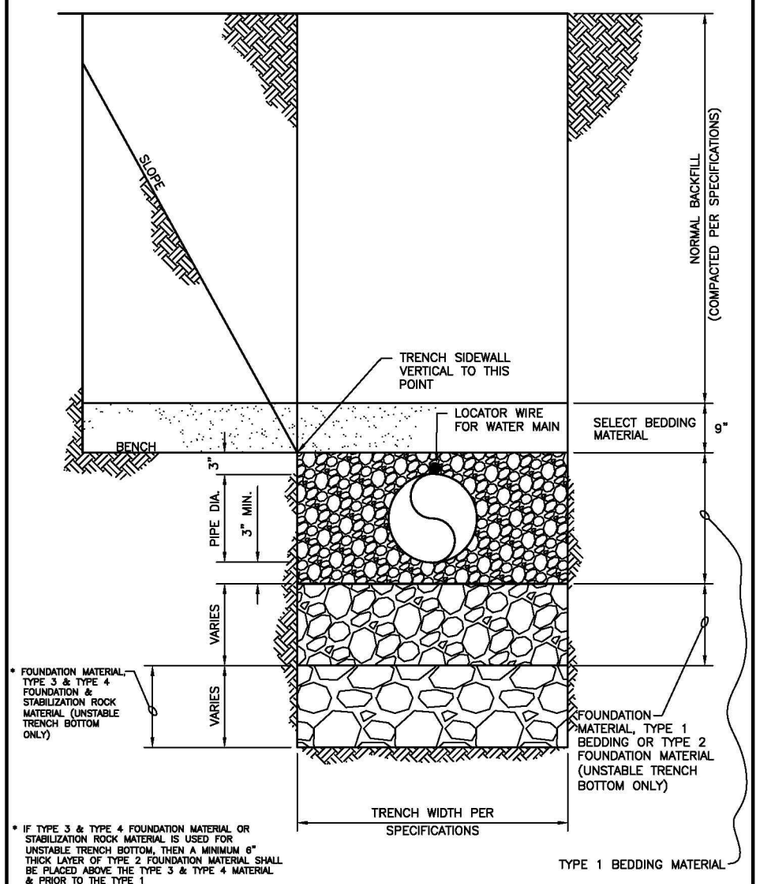
THE CHECK DAM SHALL EXTEND FROM THE BOTTOM OF THE EXCAVATION THROUGH THE BEDDING MATERIAL TO THE "NORMAL BACKFILL" AND SHALL EXTEND COMPLETELY TO EACH TRENCH SIDEWALL. CHECK DAM MATERIAL SHALL BE COMPACTED COHESIVE CLAY THAT CONTAINS A MINIMUM OF 25% MINUS NO. 200 SIEVE MATERIAL, WITH 70% PASSING A 3/4 INCH SIEVE. IF THE NORMAL EXCAVATED MATERIAL IS NOT SUITABLE FOR CONSTRUCTION OF THE CHECK DAM, THEN THE CONTRACTOR SHALL OBTAIN MATERIAL FROM OUTSIDE SOURCES. CHECK DAM INSTALLATION AND MATERIAL SHALL BE CONSIDERED AS INCIDENTAL TO THE PIPE INSTALLATION.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TYPICAL TRENCH CHECK DAM DETAIL FOR WATER & SEWER MAINS

DATE: 5-1-07

SEC. 11 — SHT. 2



* IF TYPE 3 & TYPE 4 FOUNDATION MATERIAL OR STABILIZATION ROCK MATERIAL IS USED FOR UNSTABLE TRENCH BOTTOM, THEN A MINIMUM 6" THICK LAYER OF TYPE 2 FOUNDATION MATERIAL SHALL BE PLACED ABOVE THE TYPE 3 & TYPE 4 MATERIAL & PRIOR TO THE TYPE 1 BEDDING MATERIAL.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TRENCH DETAIL FOR WATER & SEWER MAIN

DATE: 5-1-07

SEC. 11 — SHT. 3

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Prepared For:
Public Works Department
Rapid City, South Dakota, Incorporated 1882
Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CITY STANDARD PLATES

Sheet: G69 of G77

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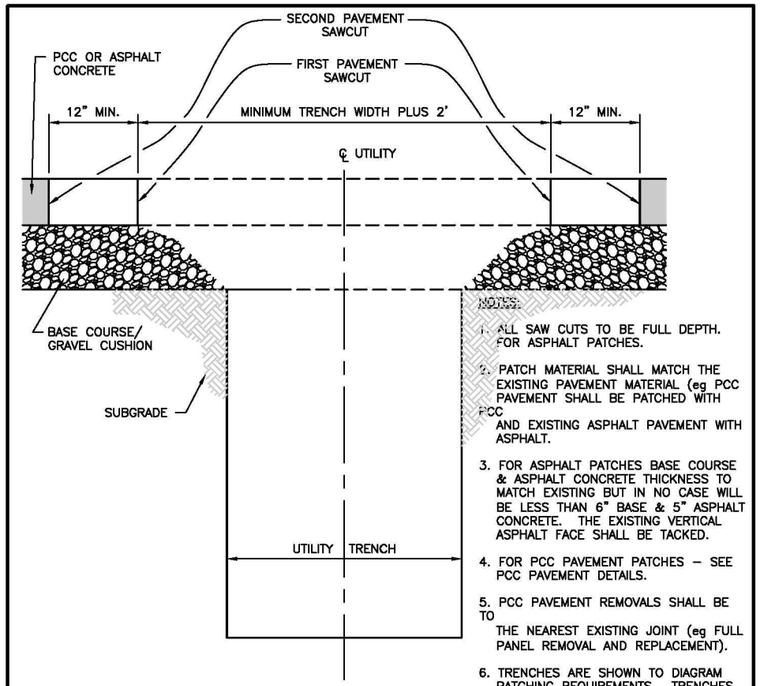


NOTES:

1. ALL SAW CUTS TO BE FULL DEPTH. FOR ASPHALT PATCHES.
2. PATCH MATERIAL SHALL MATCH THE EXISTING PAVEMENT MATERIAL (eg PCC PAVEMENT SHALL BE PATCHED WITH PCC AND EXISTING ASPHALT PAVEMENT WITH ASPHALT.
3. FOR ASPHALT PATCHES BASE COURSE & ASPHALT CONCRETE THICKNESS TO MATCH EXISTING BUT IN NO CASE WILL BE LESS THAN 6" BASE & 5" ASPHALT CONCRETE. THE EXISTING VERTICAL ASPHALT FACE SHALL BE TACKED.
4. FOR PCC PAVEMENT PATCHES – SEE PCC PAVEMENT DETAILS.
5. PCC PAVEMENT REMOVALS SHALL BE TO THE NEAREST EXISTING JOINT (eg FULL PANEL REMOVAL AND REPLACEMENT).
6. TRENCHES ARE SHOWN TO DIAGRAM PATCHING REQUIREMENTS. TRENCHES SHALL BE CONSTRUCTED TO MEET OSHA REQUIREMENTS.
7. PAVEMENT REMOVAL BETWEEN FIRST AND SECOND SAW CUT SHALL BE REMOVED AT TIME OF PATCHING.

TABLE 11–1 MINIMUM TRENCH WIDTH TABLE

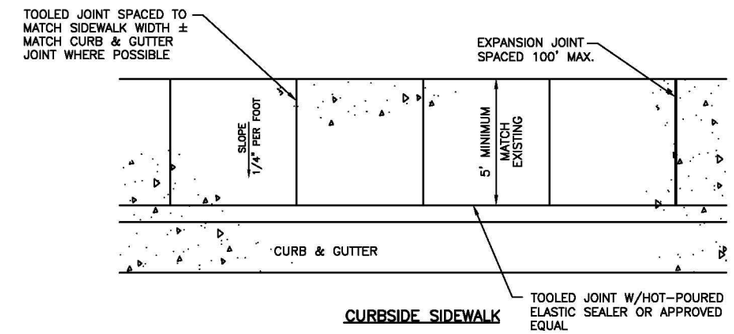
PIPE DIAMETER	MINIMUM WIDTH	MINIMUM BETWEEN FIRST SAWCUTS	MINIMUM BETWEEN SECOND SAWCUTS	PCC PAVEMENT
<8 in.	24"	4'	6'	SECOND SAWCUTS SHALL BE AT EXISTING JOINTS SEE NOTE #5
8in. – 12in.	30"	4'–6"	6'–6"	
14in. – 18in.	36"	5'	7'	
20in. – 21in.	42"	5'–6"	7'–6"	
24in. – 36in.	1.25 (PIPE OD) PLUS 12in.	MIN. WIDTH PLUS 2'	MIN. WIDTH PLUS 4'	
>36in.	PER PLANS	MIN. WIDTH PLUS 2'	MIN. WIDTH PLUS 4'	

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

UTILITY TRENCH PATCH DETAIL

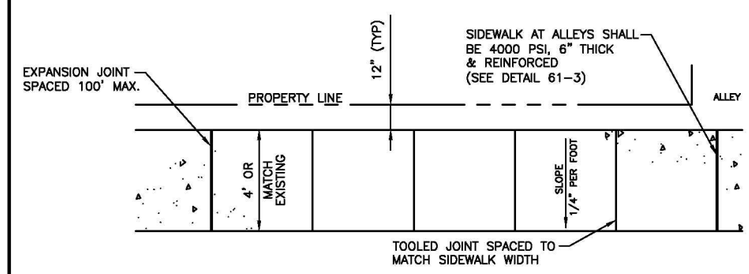
DATE: 5–1–07

SEC. 41 — SHT. 1



CURBSIDE SIDEWALK

ALL SIDEWALKS SHALL BE A MINIMUM OF 4" THICK 4000 PSI CONCRETE WITH A MINIMUM OF 2" OF COMPACTED CUSHION MATERIAL PLACED UNDER THE SIDEWALK



PROPERTY LINE SIDEWALK

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

SIDEWALKS

DATE: 5–1–07

SEC. 61 — SHT. 2

Prepared By:

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Prepared For:

Public Works Department

Engineering Services

Scale: 1" = 40'	
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Design Date: JUNE 2015	Print Date: JUNE 2015
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Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: SDDOT STANDARD PLATES

Sheet: G70 of G77

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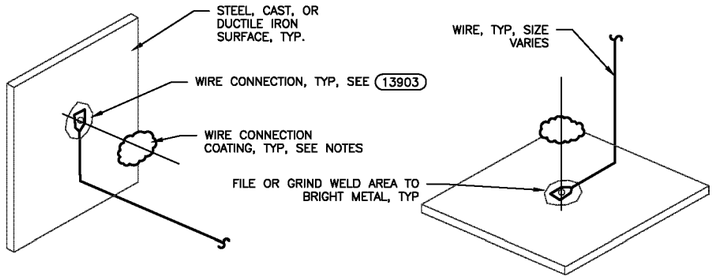


NOTES:

1. COPPER SLEEVE REQUIRED FOR THERMITE WELDING OF No. 10 AWG AND SMALLER WIRE AND No. 4 AND No. 2 AWG SIZE WIRES.

2. WELDER AND CARTRIDGE SIZE VARIES ACCORDING TO SURFACE SHAPE, MATERIAL, AND HORIZONTAL OR VERTICAL SURFACE. CONSULT WELDER MANUFACTURER FOR RECOMMENDED WELDER AND CARTRIDGE.

3. FOR MULTIPLE WIRE CONNECTIONS TO PIPE SEPARATE THERMITE WELD CONNECTIONS BY ONE PIPE DIAMETER MINIMUM, 2'–0" MAXIMUM.

4. WIRE CONNECTIONS TO FOREIGN PIPELINES SHALL BE MADE BY FOREIGN PIPELINE REPRESENTATIVE.

5. USE 15 GRAM MAXIMUM SIZE WELD CARTRIDGES FOR CONNECTIONS TO PETROLEUM AND NATURAL GAS PIPELINES OR STRUCTURES. THERMITE CONNECTIONS ONLY AS SPECIFIED & APPROVED BY OWNER. CROW'S FOOT LARGER WIRE CONNECTIONS IF SPECIFIED & APPROVED BY OWNER.

6. COAT COMPLETED THERMITE WELD CONNECTIONS WITH EPOXY REPAIR COATING, OR AS OWNER SPECIFIED.

7. UTILIZE INSULATED STRANDED COPPER WIRE ONLY, SIZE AS SPECIFIED. COLOR CODE WIRES ACCORDING TO WIRE COLOR CODE, SEE 13902PRC

8. CONNECT BOND AND TEST WIRES TO METALLIC FITTINGS PRIOR TO ASSEMBLY, AS REQUIRED TO ALLOW CONNECTIONS TO BE MADE TO LEVEL FLAT (HORIZONTAL TYPE) SURFACES ON TOP OF FITTINGS.

9. ATTACH THERMITE WELD TO STUD OR WELD BASE PLATE IF PROVIDED OR TO DRY SIDE OF JOINT IF APPROVED BY PIPE MANUFACTURER.

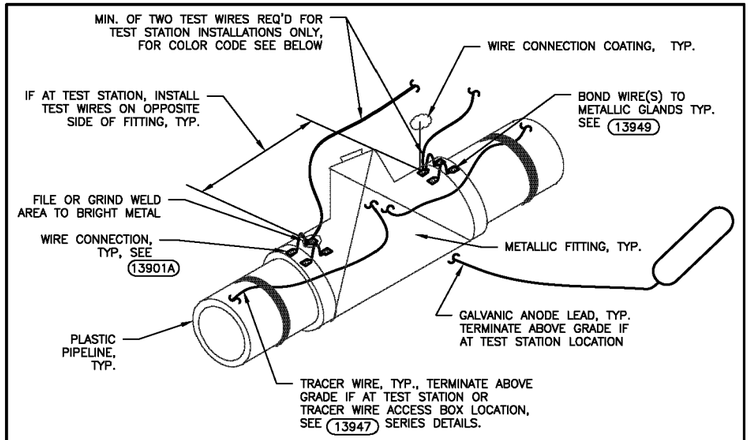
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

VERTICAL AND HORIZONTAL WIRE THERMITE WELD CONNECTIONS

DATE: 2–19–13

13901A



NOTES:

1. THERMITE OR PIN BRAZE WELD TO METALLIC PIPE, FITTINGS, & STRUCTURES ONLY.

2. STANDARD LOCATION FOR ANODE PLACEMENT IS ON EAST SIDE OF NORTH–SOUTH MAIN AND NORTH SIDE OF EAST–WEST MAIN. ACTUAL PLACEMENT LOCATION WILL VARY BASED UPON OTHER UTILITY CONFLICTS.

3. UTILIZE INSULATED STRANDED COPPER WIRE ONLY, SIZE AS SPECIFIED.

4. UTILIZE PURPLE TAPE TO IDENTIFY NORTH (1 STRIP) OR WEST (2 STRIPS) WIRE DIRECTION & GRAY TAPE TO IDENTIFY SOUTH (1 STRIP) OR EAST (2 STRIPS) WIRE DIRECTION, AS REQ'D.

WIRE COLOR CODE

1. PIPELINE TEST WIRES:

WATER – BLUE
HIGH LEVEL – DARK BLUE WITH 1 STRIP OF BLUE TAPE
LOW LEVEL – LIGHT BLUE WITH 1 STRIP OF WHITE TAPE

2. UNPROTECTED PIPELINE (NOT CATHODICALLY PROTECTED–e.g. PUMP STATION SIDE OF METALLIC PIPE) – BLACK

3. ANODE LEADS – BLACK

4. REFERENCE ELECTRODE WIRES – YELLOW

5. TRACER WIRES NON–METALLIC PIPE – GREEN W/ 2 STRIPS BLACK TAPE AND STRIPS OF PURPLE OR GRAY TAPE PER WIRE DIRECTION, SEE NOTE ABOVE

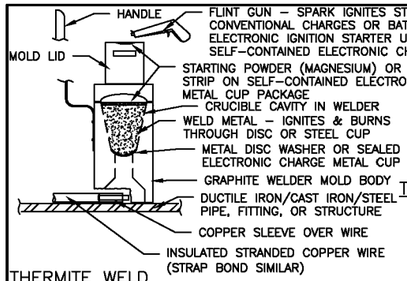
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PLASTIC PIPELINE METALLIC FITTING WIRE CONNECTION AND COLOR CODE

DATE: 2–19–13

13902PRC

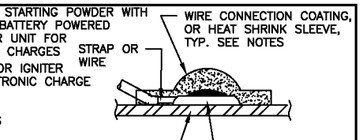


THERMITE WELD

USE CAST IRON CHARGES FOR DUCTILE IRON AND CAST IRON STRUCTURES. USE STEEL CHARGES FOR STEEL STRUCTURES.

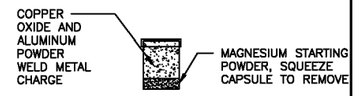
(SIMILAR SIZE AND TYPE OF CONVENTIONAL OR ELECTRONIC IGNITION TYPE CHARGES ACCEPTABLE)

COMPLETE WELDS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS



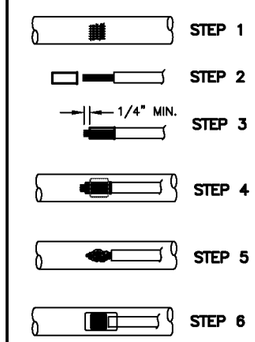
THERMITE WELD CONNECTION COATING

(WIRE BRAZED TO STRUCTURE, TYP.)



CONVENTIONAL WELD METAL CAPSULE

TYPE & SIZE VARIES (MAXIMUM 25 GRAM FOR STEEL, 32 GRAM FOR CAST & DUCTILE IRON, & 15 GRAM SIZE FOR OIL & GAS TYPE PIPELINES)



FILE STRUCTURE CONNECTION AREA (2"x2") TO BARE BRIGHT SHINY METAL & CLEAN. ALL WIRE WELDS SHALL BE A MINIMUM OF ONE PIPE DIAMETER APART UP TO A MAXIMUM OF 2 FEET SEPARATION DISTANCE.

STRIP INSULATION FROM WIRE. ATTACH COPPER SLEEVE (REQUIRED ON No. 10 AWG WIRE & SMALLER & No. 2 & No. 4 AWG JOINT BOND WIRES AS SPECIFIED)

ATTACH COPPER SLEEVE TO WIRE WITH CORRECT HAMMER DIE OR CRIMP TOOL. FACTORY SLEEVES SHALL BE ANGLED AND FIELD MADE BONDS SHALL HAVE WIRE EXTEND 1/4" PAST SLEEVE SO WIRE IS EXPOSED TO THERMITE WELD.

PLACE WASHER IN BOTTOM OF MOLD AND FILL CRUCIBLE W/POWDER OR INSERT PREPACKED ELECTRONIC CANISTER CHARGE, CLOSE LID, HOLD FIRMLY W/OPENING AWAY FROM OPERATOR, & IGNITE W/FLINT GUN OR ELECTRONIC IGNITION STARTER.

REMOVE SLAG FROM CONNECTION, VISUALLY INSPECT & TAP WELD TO TEST FOR SOUNDNESS & ADHESION W/ HAMMER. MEASURE JOINT BOND RESISTANCE AS SPECIFIED. REPLACE ALL POORLY FORMED, UNSIGHTLY, POROUS, HIGH RESISTANT, OR DEFECTIVE WELDS. INSTALL ADDITIONAL BOND WIRE OR STRAP IF REQUIRED.

CLEAN AND COAT CONNECTION AND EXPOSED STRUCTURE SURFACE WITH HEAT SHRINK SLEEVE, PRIMERLESS HANDYCAP, OR EPOXY REPAIR COATING MATERIALS PER BELOW, APPLY IN ACCORDANCE WITH COATING MANUFACTURER'S RECOMMENDATIONS.

6–A. IF THERMITE WELD CONNECTION LOCATED AT PIPE JOINT TO BE COATED WITH HEAT SHRINK SLEEVE, APPLY MASTIC FILLER & HEAT SHRINK SLEEVE OVER CONNECTION. NO WELD CAP REQUIRED. IF NOT HEAT SHRINKED, THEN EITHER:
6–B. UTILIZE REGULAR SIZE PRIMERLESS THERMITE WELD CAP FOR No. 8 AWG AND SMALLER WIRE.
6–C. UTILIZE PRIMERLESS HANDYCAP XL–IP (EXTRA LARGE) OR EQUAL FOR No. 6 AND LARGER WIRE AND PIN WELD TYPE CONNECTIONS.
6–D. OR UTILIZE 100 PERCENT MOISTURE TOLERANT EPOXY REPAIR COATING FOR HARD TO COAT CONNECTIONS AND SPOT EXTERNAL COATING REPAIRS.
6–E. REPAIR PIPE OR STRUCTURE COATING DAMAGE WITH SPECIFIED AND APPROVED COATING REPAIR MATERIALS FOR ORIGINAL COATING TYPE.

GENERAL EXOTHERMIC WELD AND COATING PROCEDURES

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

THERMITE WELD WIRE CONNECTIONS

DATE: 2–19–13

13903

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Prepared For: Public Works Department — Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CORROSION PROTECTION DETAILS

Sheet: G71 of G77

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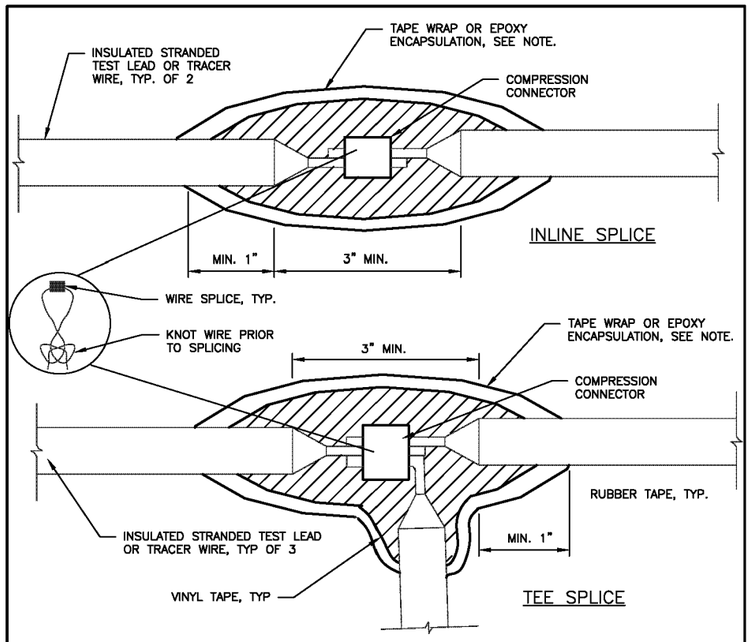
FOR BIDDING PURPOSES ONLY



NOTES:

1. KNOT WIRES PRIOR TO MAKING SPLICE TO MINIMIZE STRESS ON SPLICE.

2. MAKE WIRE SPLICE CONNECTION WITH COMPRESSION TYPE CONNECTOR IN ACCORDANCE WITH COMPRESSION CONNECTOR MANUFACTURER RECOMMENDATIONS OR SECURE WITH SPLIT BOLT AND SILVER SOLDER FOR TEST WIRES DO NOT USE BUTT SPLICES OR WIRE NUTS. COMPLETE ALL SPLICES ONLY IN THE PRESENCE OF THE ENGINEER.

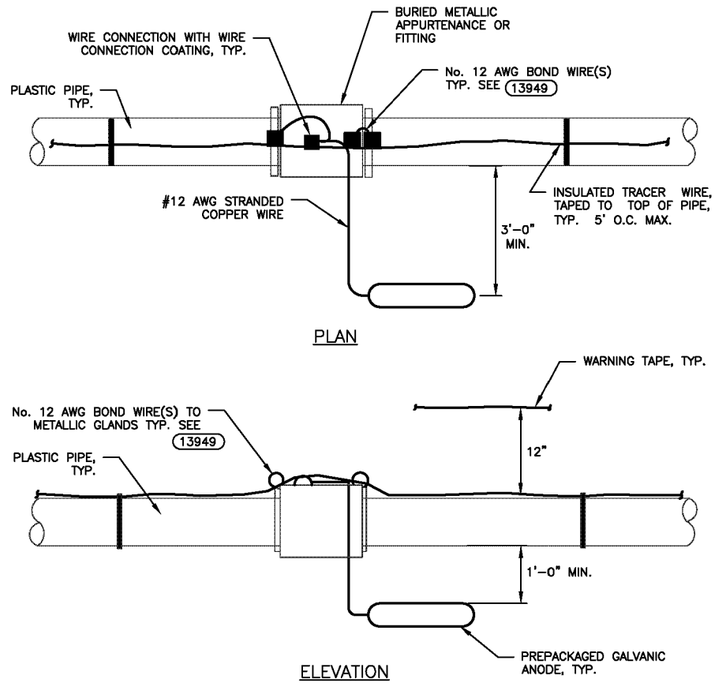
3. WRAP ENTIRE CONNECTION WITH TWO (2) LAYERS OF HIGH VOLTAGE RUBBER TAPE AND THEN WRAP WITH TWO (2) LAYERS OF VINYL ELECTRICAL TAPE AND COAT WITH SEALER OR ENCAPSULATE IN EPOXY SPLICE KIT. EXTEND A MINIMUM OF 1-INCH ONTO INTACT WIRE INSULATION.

4. TEST LEADS SHALL BE COMPLETED PER DETAIL.

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TEST LEAD SPLICES — DATE: 2-19-13 — 13929S



NOTES

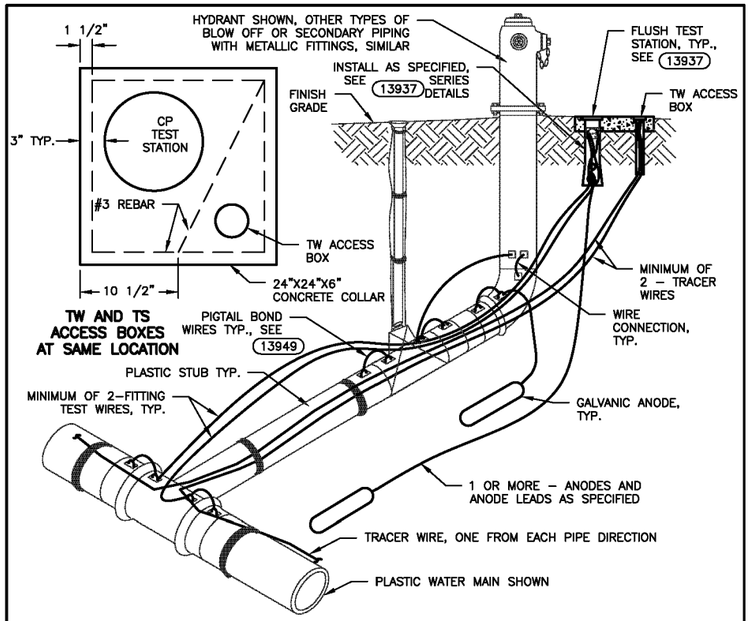
1. MINIMUM OF TWO No. 12 AWG BOND WIRES EACH FOR 12" AND LARGER PIPE, ONE BOND WIRE FOR SMALLER PIPE.

2. PROVIDE TYPE, NUMBER & SIZE OF ANODES AS SPECIFIED, MINIMUM SHALL BE ONE ANODE PER FITTING

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

GALVANIC ANODE INSTALLATION AT BURIED METALLIC FITTINGS — DATE: 2-19-13 — 13940



NOTES:

1. PLACE TEST STATION IN A PROTECTED LOCATION SO AS TO NOT INTERFERE WITH OPERATION OF VALVES OR FIRE HYDRANT. TERMINATE FITTING TEST WIRES, ANODE LEAD AND TRACER WIRES IN TEST STATION WITH MIN. 18" SLACK.

2. INSTALL GALVANIC ANODE MINIMUM 3'-0" FROM AND 1'-0" BELOW PIPELINE, FITTING, OR VALVE INVERT ELEVATION. INSTALL MINIMUM NUMBER, TYPE, & SIZE OF GALVANIC ANODES SPECIFIED,

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

FLUSH TYPE TEST STATIONS AT HYDRANT ASSEMBLIES W/ PLASTIC STUB — DATE: 2-19-13 — 13942FH

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Prepared For: Public Works Department — Rapid City, South Dakota — Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CORROSION PROTECTION DETAILS

Sheet: G72 of G77

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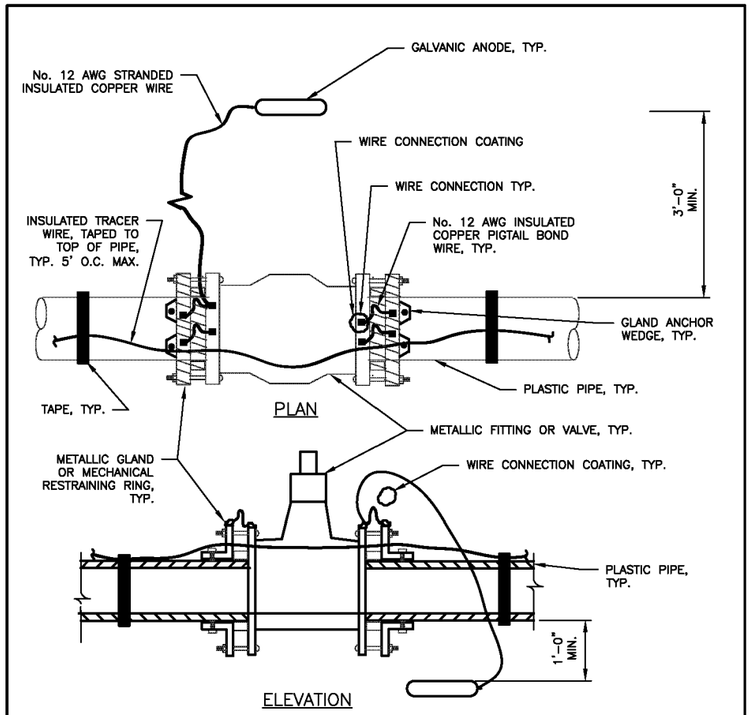


NOTES:

1. BOND PLASTIC PIPE METALLIC GLANDS OR MECHANICAL RESTRAINING RINGS TO METALLIC VALVE OR FITTING BODY, SEE 13940 AND 13949
2. PROVIDE TYPE, NUMBER & SIZE OF ANODES AS SPECIFIED, MINIMUM SHALL BE ONE ANODE PER FITTING

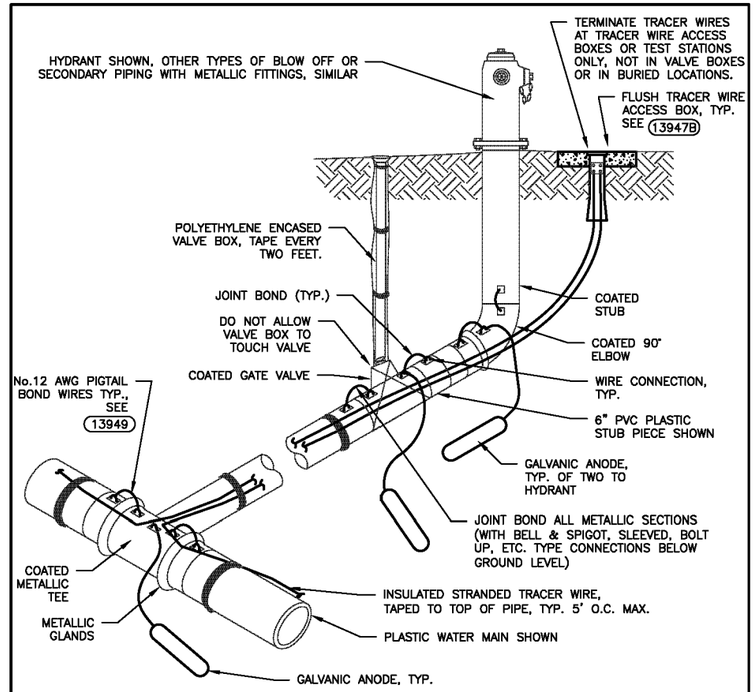
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

CORROSION PROTECTION FOR METALLIC VALVES OR FITTINGS ON PLASTIC PIPE

DATE: 2-19-13

13943DIP



NOTES:

1. INSTALL GALVANIC ANODE MINIMUM 3'-0" FROM AND 1'-0" BELOW PIPELINE, FITTING, OR VALVE INVERT ELEVATION.
2. INSTALL MINIMUM NUMBER, TYPE, & SIZE OF GALVANIC ANODES SPECIFIED, MINIMUM OF TWO ANODES TO FIRE HYDRANT ASSEMBLY AND ONE OR MORE ANODE(S) PER EACH METALLIC FITTING. NUMBER AND SIZE OF ANODES ON METALLIC TEE WILL DEPEND ON MAINLINE DIAMETER.

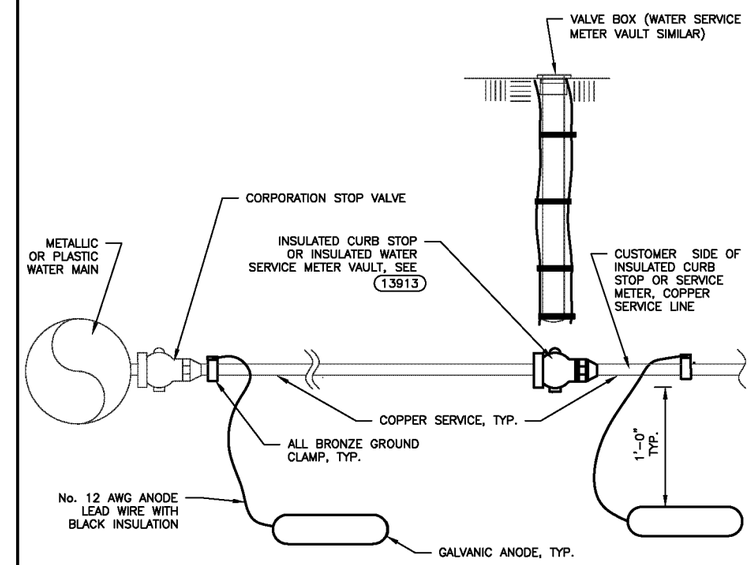
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

GALVANIC ANODE INSTALLATION AT HYDRANT ASSEMBLIES W/ PLASTIC STUB

DATE: 2-19-13

13944T



NOTES:

1. INSTALL ELECTRICAL INSULATORS AT CONNECTION TO METALLIC WATER MAIN AND AT CUSTOMER SERVICE CURB STOP OR WATER METER VAULT LOCATION, IF COPPER TYPE SERVICE ON CUSTOMER SIDE.
2. INSTALL GALVANIC ANODES TO COPPER SERVICE LINE ON BOTH SIDES OF INSULATED CORPORATION STOP OR SERVICE METER. MINIMUM ONE ANODE ON WATER MAIN SIDE AND ONE ANODE ON CUSTOMER SIDE COPPER SERVICE. MAINTAIN ELECTRICAL ISOLATION BETWEEN WATER MAIN AND CUSTOMER COPPER SERVICE LINES.

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PLASTIC MAIN WITH CUSTOMER COPPER SERVICE LINE INSULATORS AND ANODES

DATE: 2-19-13

13946P

Prepared By:

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Prepared For: Public Works Department — Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CORROSION PROTECTION DETAILS

Sheet: G73 of G77

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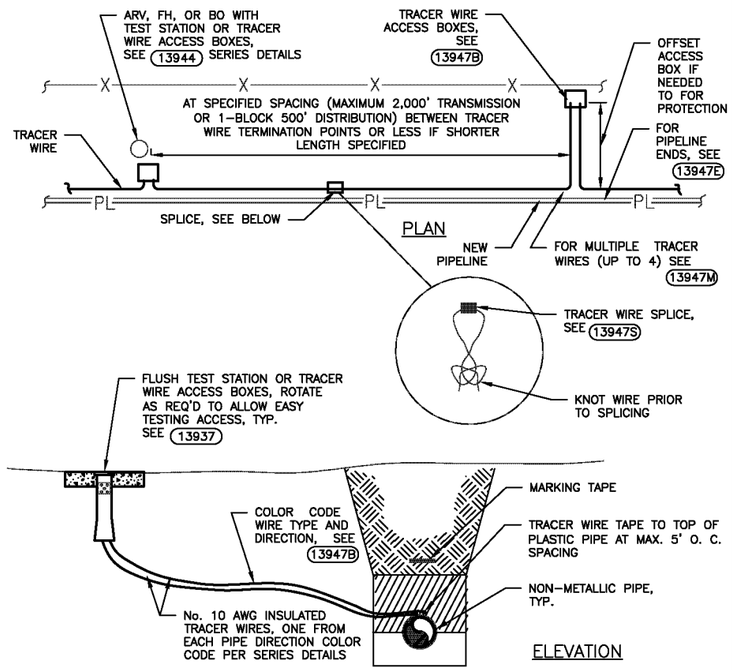


NOTES:

1. TERMINATE TRACER WIRE AT TEST STATIONS OR TRACER WIRE ACCESS BOXES LOCATED AT SPECIFIED DISTANCES, STRUCTURES AND END OF EACH PIPE RUN. TEST TRACER WIRE ELECTRICAL CONTINUITY AS SPECIFIED PRIOR TO PLACEMENT OF CURB AND GUTTER OR PAVING. DO NOT CONNECT TRACER WIRE DIRECTLY TO EXSITING OR NEW METALLIC PIPE OR FITTING. USE TRACER BOX OR TEST STATIONS.
2. LOCATE TRACER WIRE ACCESS BOXES OR TEST STATIONS IN PROTECTED LOCATIONS DIRECTLY OVER PIPE UNLESS OFFSET REQUIRED BY SPECS. OR FIELD CONDITIONS (IN ROAD, FIELD, ETC.). OFFSET TO BACK OF CURB AND GUTTER OR HYDRANT, IF NO PROTECTED LOCATION AVAILABLE OVER PIPELINE. COORDINATE LOCATIONS WITH ENGINEER.

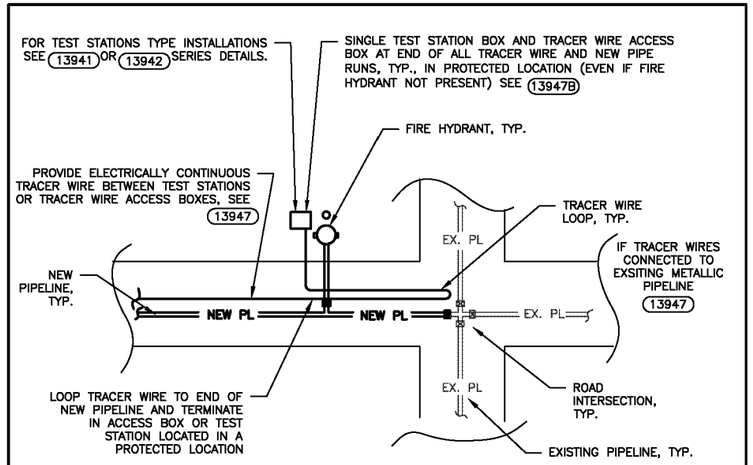
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TRACER WIRE DETAIL

DATE: 2-19-13

13947



TRACER WIRE LOOP AT END OF NEW PIPELINE CONNECTION IN INTERSECTION OR UNPROTECTED LOCATION

NOTES

1. TERMINATE TRACER WIRES ABOVEGRADE AT POST TYPE TEST STATIONS OR TRACER WIRE ACCESS BOXES LOCATED IN A PROTECTED LOCATION AT ABOVEGRADE STRUCTURES OR IN A FLUSH TYPE TEST STATION OR ACCESS BOX LOCATED TO SIDE OF ROAD. COORDINATE LOCATION AND TYPE WITH ENGINEER. DO NOT TERMINATE WIRE ENDS BELOW GRADE OR IN VALVE BOXES.
2. LOOP TRACER WIRE PAST TEST STATION OR ACCESS BOX TO END OF NEW PIPELINE RUN AND TERMINATE IN BOX.
3. SINGLE PIPE SHOWN, SIMILAR FOR MULTIPLE NEW PIPELINES.
4. DO NOT TERMINATE TRACER WIRE ENDS BELOW GRADE OR IN VALVE BOXES.
5. TEST TRACER WIRE ELECTRICAL CONTINUITY PRIOR TO PLACEMENT OF CURB AND GUTTER AND BEFORE PAVING.

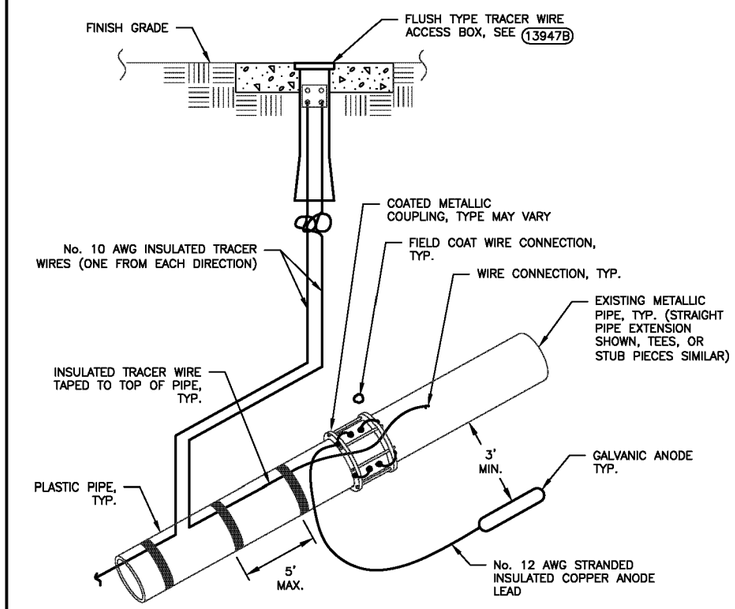
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TRACER WIRE AT NEW PIPELINE ENDS

DATE: 2-19-13

13947E



NOTES:

1. INSTALL GALVANIC ANODE TO METALLIC FITTING AT CONNECTION TO EXISTING METALLIC PIPELINE (IF METALLIC PIPE NOT ALREADY CATHODIC PROTECTED WITH AN IMPRESSED CURRENT TYPE CATHODIC PROTECTION SYSTEM).
2. IF TRACER WIRE CONNECTED TO EXISTING METALLIC PIPELINE, LOOP TRACER WIRES ABOVEGRADE AND TERMINATE IN TRACER WIRE OR TEST STATION BOX. SEE 13947 SERIES DETAILS.

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TRACER WIRE ACCESS BOXES AT CONNECTION TO EXISTING

DATE: 2-19-13

13947F

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Prepared For: Public Works Department — Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CORROSION PROTECTION DETAILS

Sheet: G74 of G77

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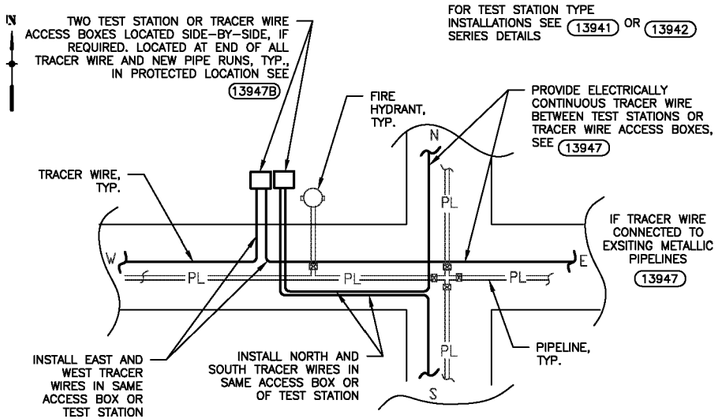


TRACER WIRE DIRECTION COLOR CODE:

NORTH WIRE – 1 STRIP OF PURPLE TAPE
SOUTH WIRE – 1 STRIP OF GRAY TAPE
WEST WIRE – 2 STRIPS OF PURPLE TAPE
EAST WIRE – 2 STRIPS OF GRAY TAPE

TRACER WIRE AT THREE OR FOUR-WAY INTERSECTION

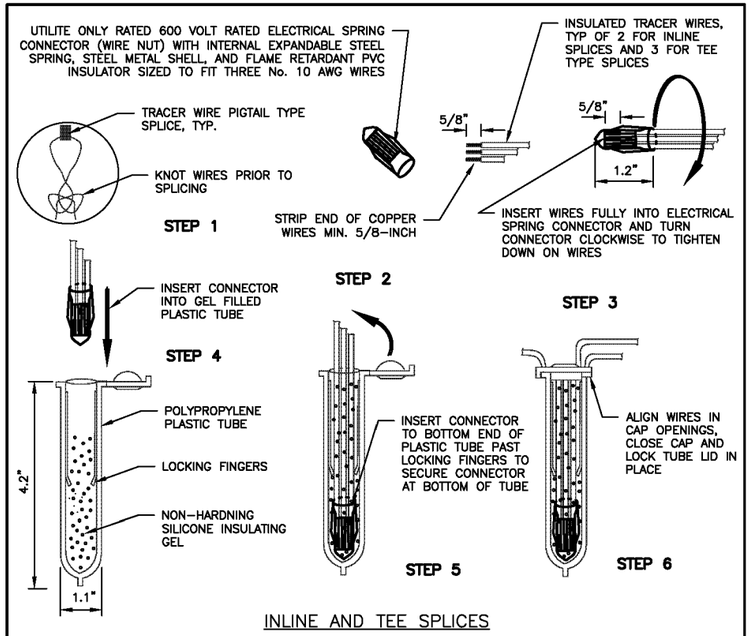
NOTES

1. TERMINATE TRACER WIRES ABOVEGRADE AT TEST STATIONS OR TRACER WIRE ACCESS BOXES LOCATED AT ABOVEGRADE STRUCTURES WITH TRACER WIRE FROM EACH PIPE DIRECTION (UP TO 4 TRACER WIRES POSSIBLE). DO NOT TERMINATE WIRE ENDS BELOW GRADE OR IN VALVE BOXES.
2. IF 3 OR 4 TRACER WIRES, TERMINATE TRACER WIRES IN IN TWO TEST STATION, OR TWO TRACER WIRE ACCESS BOXES LOCATED NEXT TO EACH OTHER. TERMINATE NORTH AND SOUTH TRACER WIRES IN SAME BOX AND EAST AND WEST TRACER WIRES IN SAME BOX.
3. TEST TRACER WIRE ELECTRICAL CONTINUITY PRIOR TO PLACEMENT OF CURB AND GUTTER AND BEFORE PAVING.

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

MULTIPLE TRACER WIRES — DATE: 2-19-13 — 13947M



INLINE AND TEE SPLICES

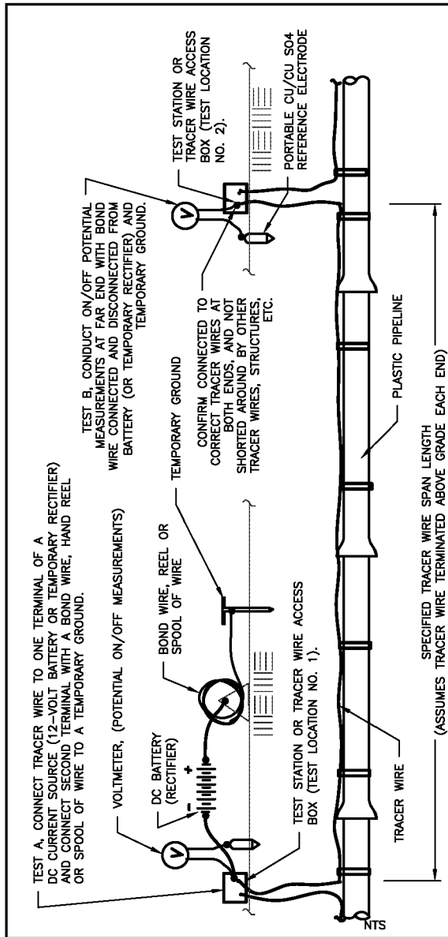
NOTES:

1. ALLOWED FOR TRACER WIRE TYPE SPLICES ONLY. TRACER WIRE ONLY REQUIRED FOR NON-METALLIC PIPE TYPE INSTALLATIONS. KNOT WIRES PRIOR TO MAKING SPLICE TO MINIMIZE STRESS ON SPLICE.
2. FOR COPPER WIRE SPLICES ONLY. STRIP WIRES AND MAKE WIRE SPLICE CONNECTION WITH ELECTRICAL SPRING (WIRE NUT) TYPE CONNECTORS. INSERT THE CONNECTOR INTO THE GEL FILLED TUBE TO THE END PAST THE LOCKING FINGERS TO HOLD THE CONNECTOR SECURELY IN PLACE, ALIGN WIRES AND THEN SHUT AND LOCK THE INSULATOR TUBE TOP LID COVER INTO PLACE. COMPLETE SPLICES AND INSULATE IN ACCORDANCE WITH CONNECTOR MANUFACTURER'S RECOMMENDATIONS.
3. COMPLETE ALL SPLICES ONLY IN THE PRESENCE OF THE ENGINEER.

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TRACER WIRE SPLICES — DATE: 2-19-13 — 13947S



TRACER WIRE CONTINUITY VERIFICATION WITH POTENTIAL SHIFT TEST PROCEDURE:

1. CONDUCT ON AND OFF POTENTIAL MEASUREMENTS AT TEST LOCATION NO. 1 WITH TEMPORARY GROUND AND CONNECTION TO A BATTERY OR TEMPORARY RECTIFIER AT SAME END. THEN CONDUCT AN ON AND OFF POTENTIAL TEST MEASUREMENT AT FAR END (TEST BOX LOCATION NO. 2). TEST IS SIMILAR TO TESTING WITH GALVANIC ANODE BUT PROVIDES A LARGER VOLTAGE DIFFERENCE.
2. THE MEASURED POTENTIALS SHOULD CHANGE NEAR TO THE SAME AS THE VOLTAGE OF THE BATTERY (APPROXIMATELY 12 TO 13 VOLTS) OR TEMPORARY RECTIFIER DC VOLTAGE OUTPUT AT BOTH TEST LOCATIONS 1 AND 2.
3. IF BOTH TEST POINT MEASURED VOLTAGES ARE THE SAME, THIS INDICATES THE TRACER WIRE FOR THE SPAN TESTED IS CONTINUOUS.
4. IF THERE IS NO POTENTIAL CHANGE (OFF TO ON) AT THE TEST LOCATION NO. 2, (TEST B) END, BUT THERE IS AT THE TEMPORARY GROUND END (TEST LOCATION 1, TEST A), THIS INDICATES THAT THE TRACER WIRE MAY EITHER NOT BE ELECTRICALLY CONTINUOUS WITH ONE OR MORE BREAKS OR ELECTRICALLY SHORTED TO ANOTHER STRUCTURE.
5. IF NO POTENTIAL CHANGE, VERIFY BY TESTING FROM OPPOSITE DIRECTION. UTILIZE OTHER TEST METHODS TO CONFIRM.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TRACER WIRE CONTINUITY TEST PROCEDURES BATTERY OR RECTIFIER POTENTIAL SHIFT METHOD — DATE: 2-19-13 — 13947T1

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Prepared For:
Public Works Department
Engineering Services

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Design Date: JUNE 2015	Print Date: JUNE 2015
Internal Job No: 130234	
Surveyed By: DOT / FMG	Survey Date: SURVEY BY DOT
SDDOT Project No. 1M 1902(61)0	

SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CORROSION PROTECTION DETAILS

Sheet: G75 of G77

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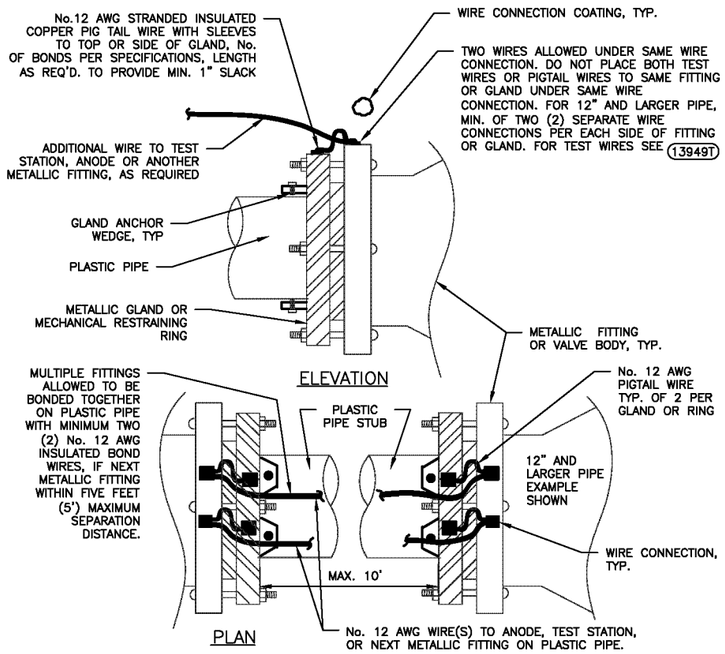
FOR BIDDING PURPOSES ONLY



NOTES:

1. BOND PLASTIC PIPE METALLIC GLANDS TO METALLIC FITTING BODY. COMPLETE PIGTAIL WIRE CONNECTIONS TO GLANDS BEFORE ASSEMBLY.
2. MINIMUM NO. 12 AWG PIGTAIL WIRES EACH SIDE OF FITTING, MIN. 2 PIGTAIL BONDS EACH FOR 12" & LARGER PIPE, MIN. 1 FOR SMALLER PIPE.
3. NUMBER, SIZE AND TYPE OF GALVANIC ANODES REQUIRED FOR SINGLE OR MULTIPLE FITTINGS PER SPECIFICATIONS.

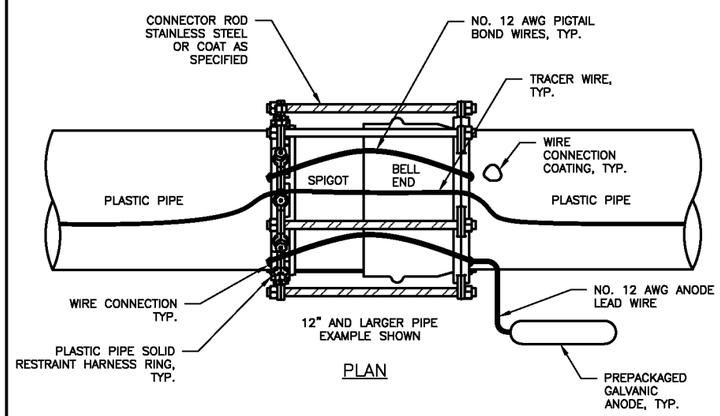
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PLASTIC PIPE METALLIC FITTING GLANDS AND MECHANICAL RESTRAINT RINGS BONDING

DATE: 2-19-13

13949P



NOTES:

1. SOLID RING TYPE RESTRAINTS SHOWN WITH MINIMUM OF 2 PIGTAIL BOND WIRES FOR 12 INCH AND LARGER PIPE. SINGLE PIGTAIL BOND WIRE ALLOWED FOR PIPE 10 INCH AND SMALLER. SPLIT RING RESTRAINTS MAY ONLY BE USED IF APPROVED BY ENGINEER AND WILL REQUIRE ADDITIONAL PIGTAIL BOND WIRES, SEE 13949S
2. NUMBER, SIZE AND TYPE OF GALVANIC ANODES REQUIRED FOR SINGLE FITTING PER SPECIFICATIONS. MINIMUM OF ONE 17 POUND GALVANIC ANODE PER FITTING.
3. PRIOR TO ASSEMBLY, LOCATE WIRE CONNECTION FOR NO. 12 AWG BOND WIRES TO FLAT AREA ON SIDE OF COUPLING BOLT PATTERN RESTRAINT HARNESS RING.

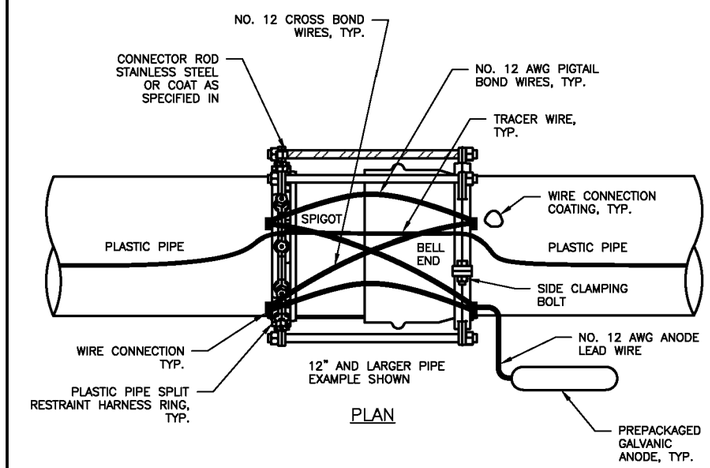
NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PLASTIC PIPE BELL SOLID RING RESTRAINT HARNESS JOINT BONDING

DATE: 2-19-13

13949R



NOTES:

1. SPLIT RING TYPE RESTRAINTS SHOWN WITH MINIMUM OF FOUR (TWO PIGTAIL AND TWO CROSS BOND WIRES FOR 12-INCH AND LARGER PIPE. TWO PIGTAIL CROSS BOND PIGTAIL WIRES ALLOWED FOR 10-INCH AND SMALLER PIPE). SPLIT RING RESTRAINTS MAY ONLY BE USED IF APPROVED BY ENGINEER. FOR SOLID RING PIGTAIL BOND WIRES, SEE 13949R
2. NUMBER, SIZE AND TYPE OF GALVANIC ANODES REQUIRED FOR SINGLE FITTING PER SPECIFICATIONS. MINIMUM OF ONE 17 POUND GALVANIC ANODE PER FITTING.
3. PRIOR TO ASSEMBLY, LOCATE THERMITE WELD OR PIN BRAZED TYPE WIRE CONNECTION FOR NO. 12 AWG BOND WIRES TO FLAT AREA ON SIDE OF COUPLING BOLT PATTERN RESTRAINT HARNESS RING.

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PLASTIC PIPE BELL SPLIT RING RESTRAINT HARNESS JOINT BONDING

DATE: 2-19-13

13949S

Prepared By:

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Prepared For: Public Works Department — Engineering Services

Scale: 1" = 40'	
Designed By: JAP	Drawn By: JRK
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SILVER STREET INTERCHANGE
UTILITY RECONSTRUCTION PROJECT

12-2053 / CIP 50940 / PCN X03T

Sheet Title: CORROSION PROTECTION DETAILS

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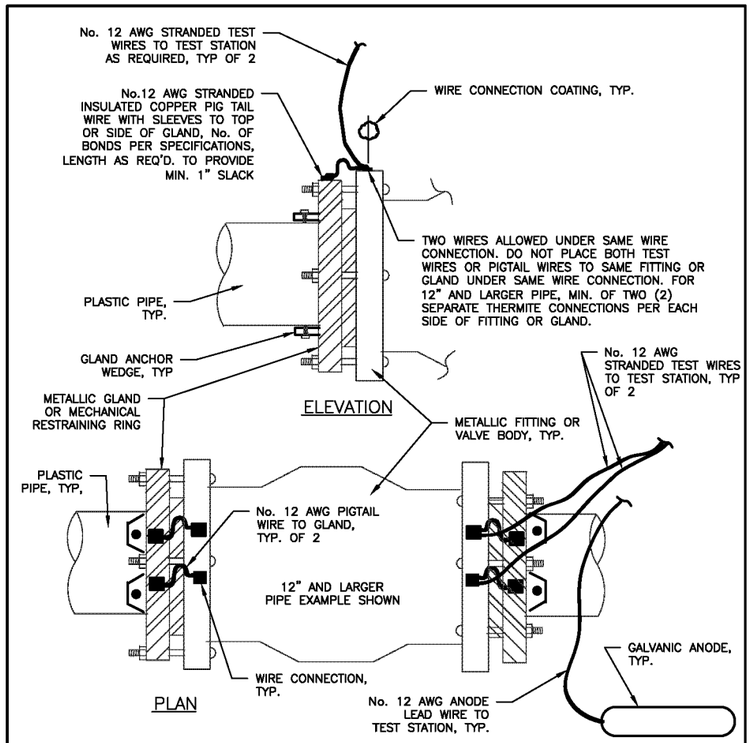

NOTES:

1. BOND METALLIC MECHANICAL RESTRAINT RINGS TO METALLIC FITTING BODY. COMPLETE PIGTAIL WIRE CONNECTIONS TO GLANDS BEFORE ASSEMBLY.

2. MINIMUM NO. 12 AWG SIZED PIGTAIL BOND WIRES EACH SIDE OF FITTING, MIN. 2 PIGTAIL BONDS EACH FOR 12" & LARGER PIPE, MIN. 1 EACH SIDE FOR SMALLER PIPE.

NTS

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PLASTIC PIPE METALLIC GLANDS/RESTRAINT RINGS BONDING, ANODE AND TEST LEADS

DATE: 2-19-13

13949T

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Prepared For:
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UTILITY RECONSTRUCTION PROJECT

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Sheet Title: CORROSION PROTECTION DETAILS

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