Meade County
Project 14.2030.C02
PCN X03P

A Pre-Bid meeting will be held in Sturgis at the Sturgis Fire Hall (1901 Ballpark Road) from 10:00am to 12:00pm MT on Thursday, February 18, 2016. All interested parties are strongly encouraged to attend.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	1	26

Plotting Date: 10/15/2015

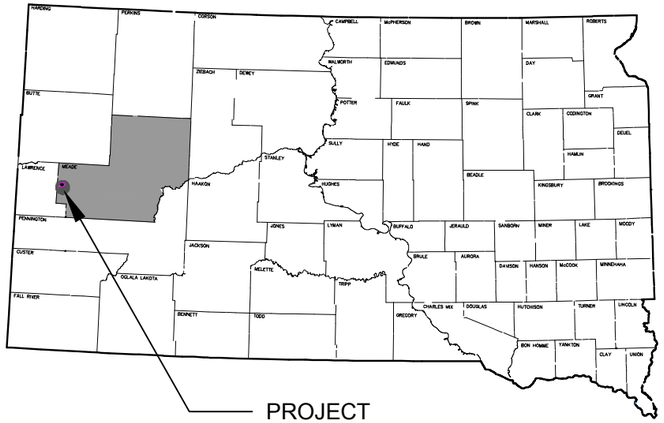
UTILITY PLANS

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS
PLANS FOR PROPOSED

PROJECT 14.2030.C02
MAIN STREET
STURGIS, MEADE COUNTY

WATER MAIN REPLACEMENT
PCN X03P



INDEX OF SHEETS

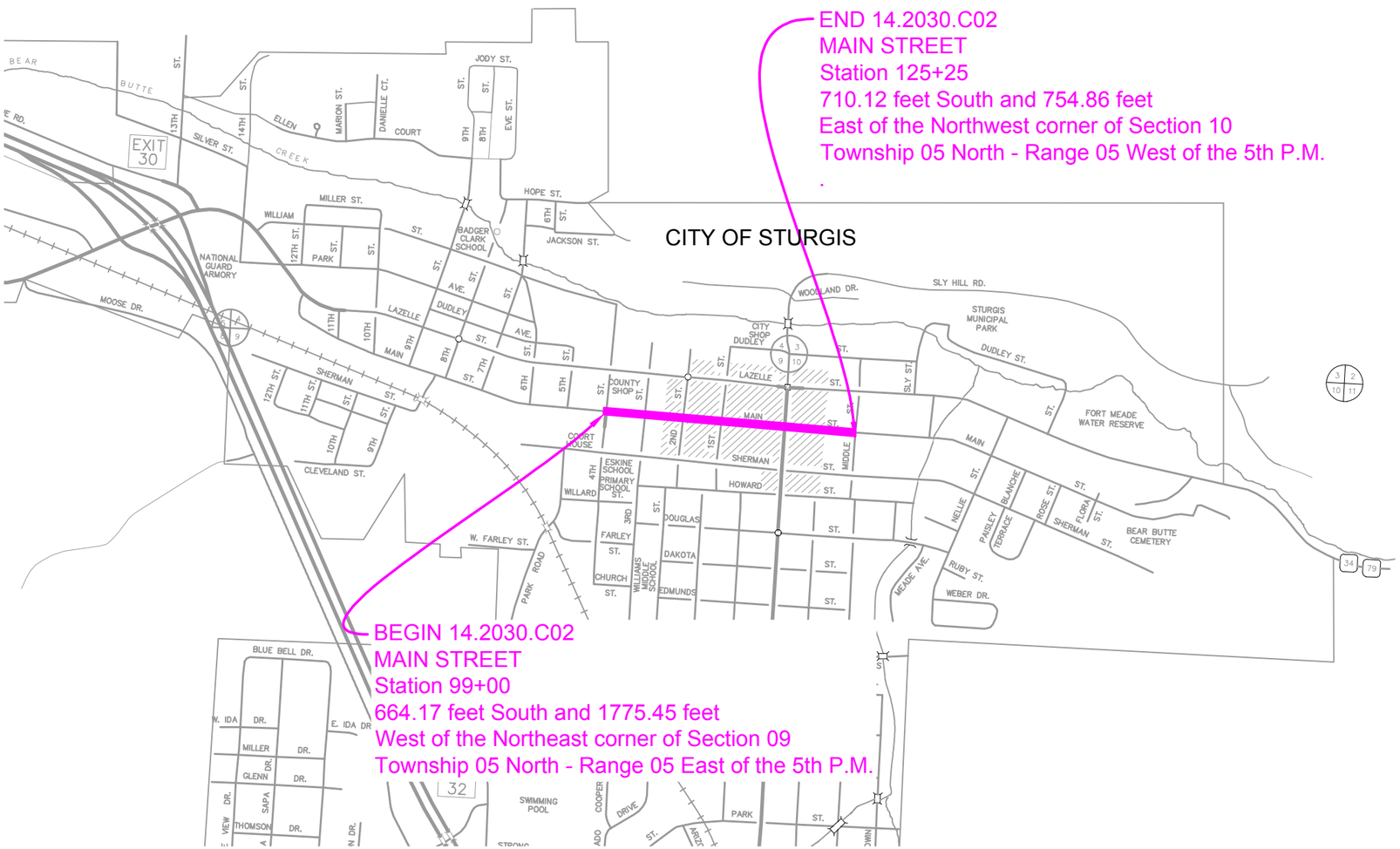
Sheet 1:	Cover Sheet
Sheet 2-8:	Estimate of Quantities and Environmental Commitments
Sheets 9-12:	Utility Removal Plans
Sheets 13-21:	Utility Plans
Sheets 22-26:	Details

DESIGN DESIGNATION

ADT (2013)	2840
ADT (2033)	3510
DHV	397
D	50%
T DHV	1.6%
T ADT	3.7%
V	25 mph

STORM WATER PERMIT

Major Receiving
Body of Water: Bear Butte Creek
Area Distrubed: .81 Acres
Total Project Area: 4.3 Acres
Approx. Begin Lat/Long: 44.4146/-103.5163



GROSS LENGTH	2525.00 FEET	0.478 MILES
LENGTH OF EXCEPTIONS	0.00 FEET	0.000 MILES
NET LENGTH	2525.00 FEET	0.478 MILES

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REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA

L:\14-2030 Sturgis Main St Reconst\Drawings\Eng\Sheet Files\Section G\14-2030 COVERSHEET NON-PARTICIPATING.dwg 10/15/2015 3:50:02 PM

REVISED 12-10-15

Utility Plans

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3200	Construction Staking	Lump Sum	LS
110E0370	Remove Curb Stop	73	Each
110E1950	Remove Contaminated Water	10	Mgal
110E1960	Remove Valve Box	18	Each
110E1965	Remove Gate Valve	18	Each
110E1970	Remove Water Main	299	Ft
110E5740	Salvage Fire Hydrant	5	Each
250E0010	Incidental Work	Lump Sum	LS
260E6010	Granular Material	5	Ton
451E0301	Pipe Encasement	15	Each
451E0604	4" PVC Water Main	205	Ft
451E0606	6" PVC Water Main	60	Ft
451E0608	8" PVC Water Main	1968	Ft
451E0802	1" Copper Pipe	2209	Ft
451E2212	8"x4" Pipe Tee	5	Each
451E2213	8"x6" Pipe Tee	5	Each
451E2214	8"x8" Pipe Tee	5	Each
451E2412	8"x4" Pipe Reducer	2	Each
451E2413	8"x6" Pipe Reducer	4	Each
451E2802	1" Corporation Stop with Tapping Saddle	76	Each
451E2902	1" Curb Stop with Box	76	Each
451E3008	8" Pipe Bend	17	Each
451E3204	4" Pipe Coupling	7	Each
451E3206	6" Pipe Coupling	4	Each
451E3208	8" Pipe Coupling	1	Each
451E4204	4" Gate Vavle with Box	5	Each
451E4208	8" Gate Valve with Box	16	Each
451E4400	Pipe Insulation	208	SqFt
451E4585	Fire Hydrant with Auxiliary Valve & Box	6	Each
451E4610	Thrust Block	46	Each
451E4750	Meter Pit	6	Each
451E4904	Type 3 Foundation Material	15	Ton
451E4918	Imported Trench Backfill	90	CuYd
451E6100	Reconnect Water Service	76	Each
451E6101	Abandon Water Main	1	Each
451E6105	Connect to Existing Water Main	7	Each
451E7500	Locate Utilities	10	Each
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
900E2090	AASHTO T-180 Soil Test	5	Each

SPECIFICATIONS

Standard Specifications for utilities shall be, **Development and Construction Standards for the City of Sturgis**, except as modified herein via plans, plan notes, and special provisions included in the contract/bid documents.

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

Encasement and Pipe Insulation Specifications and details shall be City of Rapid City Standard Specifications for Public Works Construction, 2007 Edition.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office. A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT:
http://sddot.com/transportation/highways/environmental/stormwater/Default.aspx

DENR: http://www.denr.sd.gov/des/sw/stormwater.aspx

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Contractor Certification Form:

The "Department of Environmental and Natural Resources – Contractor Certification Form" (SD EForm – 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at:
http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the State ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Highway, Road, and Railway Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

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SOUTH DAKOTA

REVISED 12-10-15

COMMITMENT H: WASTE DISPOSAL SITE (CONTINUED)

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

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PROJECT SEQUENCE

The Contractor shall coordinate all work to follow the proposed schedule, traffic control, and completion dates of the associated roadway project. A sequence of work is suggested in these plans as well as the proposed major project phasing. The Contractor shall develop a construction schedule and sequence to meet the general intent. Any changes from the proposed sequence shall be closely coordinated with the Engineer and the South Dakota Department of Transportation and shall be discussed at least two weeks prior to implementing the change.

TABLE OF CURB STOP REMOVAL

Station	L/R	Quantity (Each)
100+48.12	L	1
100+17.50	L	1
101+05.18	L	1
101+60.29	R	1
102+07.75	L	1
102+83.38	L	1
102+91.46	L	1
103+26.25	R	1
103+31.24	R	1
103+55.50	L	1
103+91.70	L	1
104+32.92	R	1
105+02.93	L	1
105+21.67	L	1
105+29.50	R	1
105+30.27	R	1
105+93.08	R	1
105+96.50	L	1
105+96.55	L	1
105+97.23	L	2
106+47.90	L	1
107+02.39	R	1
107+48.08	L	1
108+84.27	L	1
109+20.59	L	1
109+37.16	L	1
109+41.17	R	1
109+53.35	L	1
109+66.30	R	1
110+02.61	L	1
110+10.74	R	1
110+32.11	L	1
110+60.76	L	1
110+61.10	L	1
110+80.52	L	1
110+83.13	R	1
110+83.98	R	1
111+13.69	L	1
111+19.47	R	1
111+19.86	R	1
111+11.85	L	1
111+15.12	L	1
112+03.99	L	1
112+30.89	L	1
112+82.20	R	1
112+82.91	R	1
112+99.50	L	1
113+15.86	R	1
113+22.90	L	1
113+40.58	R	1
113+55.62	L	1
113+76.17	L	1
113+86.08	R	1
113+86.54	R	1
114+10.25	L	1
114+36.06	L	1
115+10.26	L	1
115+15.49	L	1
115+18.26	R	1
115+49.48	L	1
115+58.49	R	1
115+75.91	R	1
115+97.12	R	1
116+36.99	R	1
116+38.96	R	1
116+66.60	R	1
116+70.48	L	1
116+77.79	L	1
117+11.56	R	1
117+37.96	R	1
117+52.19	L	1
124+27.50	L	1
	Total:	73

TABLE OF SALVAGE FIRE HYDRANT

Station	L/R	Quantity (Each)
100+64.11	L	1
104+30.01	L	1
107+97.63	L	1
111+72.16	L	1
124+27.65	L	1
	Total:	5

TABLE OF GATE VALVE AND BOX REMOVAL

Station	L/R	Quantity (Each)
100+86.32	L	1
100+87.95	L	1
101+30.30	L	1
102+61.78	L	1
103+46.43	L	1
104+47.85	L	1
104+49.52	L	1
104+54.96	L	1
108+14.77	R	1
110+01.87	L	1
110+58.43	L	1
111+91.63	R	1
113+85.11	L	1
114+80.85	R	1
116+77.69	L	1
117+49.81	L	1
117+57.18	L	1
124+27.62	L	1
	Total:	18

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INCIDENTAL WORK

Water Meter pits to be to be salvaged for future use and hauled to the City of Sturgis Maintenance Yard as directed by the Engineer. Care shall be taken not to damage the structural properties of the items during dismantling and transporting. All broken concrete and materials not salvaged shall be disposed of in accordance with the Specifications.

Station	L/R	Quantity (Each)	Description
102+83.59	L	1	Remove and salvage water meter pit
105+29.94	R	1	Remove and salvage water meter pit
105+92.98	R	1	Remove and salvage water meter pit
106+30.59	R	1	Remove and salvage water meter pit
107+02.39	R	1	Remove and salvage water meter pit
109+91.71	R	1	Remove and salvage water meter pit
110+10.75	R	1	Remove and salvage water meter pit
110+83.76	R	1	Remove and salvage water meter pit
111+44.73	L	1	Remove and salvage water meter pit
112+82.18	R	1	Remove and salvage water meter pit
113+55.85	L	1	Remove and salvage water meter pit
114+10.32	L	1	Remove and salvage water meter pit
115+15.36	L	1	Remove and salvage water meter pit
115+19.12	L	1	Remove and salvage water meter pit
117+52.56	L	1	Remove and salvage water meter pit

GRANULAR MATERIAL

Existing private utilities are buried on Main Street prior to this contract. It will be necessary to dig under and expose the private utilities in order to install water services under this contract. It is anticipated that as backfill operations proceed and the level of the trench backfill nears the exposed utilities, compaction by conventional methods using material from the trench may become impractical. Granular Material shall then be used to backfill the trench to the spring line of the utility at the highest elevation. Existing trench material shall then be used to continue backfill operations.

Granular material shall conform to the South Dakota Department of Transportation Standard Specifications, 2015 Edition with current updates and revisions as specified in the proposal. However, payment shall be incidental to the contract unit price per Ton of Granular Material. The Contractor shall be responsible to take all weight delivery tickets as materials arrive at the job site and provide copies to the Engineer at the end of each work day.

PROOFROLLING TRENCH

In addition to backfill compaction testing by the Engineer, the Contractor shall perform proof rolling on the trench subgrade at the bottom of the DOT proposed undercut depth. Proof rolling shall be performed with a loaded wheel loader or other approved equipment which can travel within the trench line without damage to adjacent work. Any areas of instability shall be stabilized with Type 2 or 3 foundation material as directed by the Engineer. Proof rolling of the trench will not be paid for directly but will be considered to be incidental to pipe installation

TRENCH EXCAVATION AND BACKFILL

Trench excavation, backfill, and granular materials shall conform to Article II of the City of Sturgis standard Specifications except as modified herein. Compaction of trench backfill under the roadways shall conform to the South Dakota Department of Transportation Standard Specifications, 2015 Edition with current updates and revisions as specified in the proposal.

It is anticipated that in some areas special foundations may be required to provide adequate support for the pipe. Such foundation will consist of sub-excavation to a depth as required by the Engineer and placement of Type 3 foundation material. The granular foundation material or trench stabilization material will be paid for at the contract unit price per ton if authorized by the Engineer.

For 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. Due to the compressed sequence of operations and short construction duration, it is assumed that the Contractor will be importing materials rather than drying. It is not recommended that the Contractor use imported backfill for the top section of the trench that will be removed by DOT during undercut operations. The undercut of Main Street is approximately 1 foot, verify with roadway plans.

Payment for the use of imported backfill will only be authorized by the Engineer; if in the Engineer's opinion, there is insufficient quantity of suitable backfill material, including material that can be dried. Imported backfill quantities will be determined by counting truck loads. The quantity of material each truck holds shall be agreed upon by the Engineer and the Contractor prior to any hauling operations. The Contractor shall not be paid for trench widths greater than four 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 Trench Backfill shall be furnished by the Contractor and shall be uniform in texture and free from organic material. The liquid limit shall not exceed 45 and the plastic index shall not exceed 25. The Contractor shall be responsible to provide AASHTO T-99 test results on the material to confirm its suitability for the project.

WATER FOR COMPACTION

The Contractor is responsible for providing water for compaction of embankments, granular materials and trench backfill as required. There will be no separate payment for compaction. The cost of loading, transporting, and applying water shall be considered incidental to the various items where water is required.

MUCK EXCAVATION

Muck Excavation within this project shall be considered incidental to the item being installed and no additional payment will be made.

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TRENCH DEWATERING

The Contractor has the option to treat sediment laden water trapped within the project limits with a dewatering and sediment collection system, or the Contractor may elect to transport sediment laden water off the project. The dewatering and sediment collection System shall be pre-approved by the Engineer prior to the start of trench dewatering. All costs for the dewatering and sediment collection system including but not limited to the system, labor, materials, and disposals shall be incidental to the utility being installed.

If the Contractor elects to transport sediment laden water off the project, no additional payment for loading, transporting, and labor costs will be made. Water transported off the project limits shall not be disposed of in an area where it can enter a waterway. The disposal site must be approved by the Engineer. All costs for loading, transporting, and disposal shall be incidental to the utility being installed.

Trench dewatering shall be necessary when the ground water level is higher than the bottom of the water trench and is needed to facilitate water main installation.

DISPOSAL OF CHLORINATED WATER

The contractor shall provide a plan to the Engineer on how he intends to neutralize chlorinated water from water main disinfection and flushing operations two weeks prior to flushing operations. The Contractor shall both neutralize the chlorinated water with specifically manufactured products and ascorbic acid or discharge the water into a truck and haul the water to an Engineer approved location for disposal. No separate payment will be made for neutralization of the super chlorinated water and it shall be considered incidental to the respective water main bid item.

PIPE ENCASEMENT

Pipe encasement shall be installed in accordance with Section M of the Recommended Design Criteria Manual, Wastewater Collection and Treatment Facilities, South Dakota Department of Environment and Natural Resources. Concrete encasement for water mains shall be controlled low strength material conforming to Section 200 of the City of Rapid City Standard Specifications and shall be paid for at the contract unit price per each.

TABLE OF WATER MAIN ENCASEMENTS

Station	to	Station	L/R	Description	Quantity Each
100+51.35		100+93.91	L/R	Main Street	1
100+97.48		101+19.98	R	Main Street	1
103+85.58		104+07.58	R	Main Street	1
104+58.68		104+84.68	R	Main Street	1
107+48.33		107+70.33	R	Main Street	1
108+08.79		108+47.52	R	Main Street	1
110+20.37		110+42.37	R	Main Street	1
111+27.16		111+49.17	R	Main Street	1
111+95.37		112+21.36	R	Main Street	1
114+26.06		114+48.13	R	Main Street	1
117+45.90		117+55.90	R	Main Street	1

TABLE OF WATER MAIN ENCASEMENTS (CONTINUED)

201+09.54	201+40.52	L	4th Street	1
401+90.52	402+12.15	L	3rd Street	1
500+53.28	501+13.05	L	2nd Street	1
600+78.16	600+86.06	L	1st Street	1
			Total:	15

TRENCH BOX

Due to anticipated limited construction work area widths, the Contractor shall utilize moveable trench box or shoring trenching. Benching or sloping trench sidewalls is prohibited. The maximum allowable trench width and pavement removal limits shall be as shown on the plan details and typical sections. Use of trench box or shoring for trenching operations shall be incidental to the project.

AS-BUILT PLANS

The Contractor shall measure and record any horizontal or vertical deviations for the contract drawings. The changes shall be recorded in as accurate neat fashion on the drawings and furnished to the Engineer upon completion of the project. Specifically, all service taps, connections, anodes and buried fittings shall be recorded for the work. The As-Built Drawings shall be on-site and available for review by the Engineer upon request.

TEMPORARY APPURTENANCES

The existing mains must remain in-service until the new water main is complete, disinfected, and pressure tested. Temporary plugs, valving, connections, hydrants, etc. may be needed to maintain service to existing services and shall be considered incidental work.

WATER PIPE

All water pipe mains, services, appurtenances, etc. shall conform to the City of Sturgis Standard Specifications.

PVC Water Mains and 4" PVC water services shall be AWWA Specification C900, DR18.

Water Services 1" through 2" shall be Type K soft copper tubing per the specifications.

WATER MAIN & FITTINGS

1. All high deflection pipe couplings shall be mechanical join sleeves or repaired couplings allowing 4 degree deflections.
2. Ductile iron fittings shall be epoxy coated per Article III of the Standard Specifications.
3. Fittings shall be mechanically restrained where restraint is required by the plans or the specifications. Cost of restraint shall be incidental to the associated fitting or pipe.
4. Bolts for mechanical joints shall be Series 300 Stainless Steel.
5. Testing and disinfection shall be per Standard Specifications. The Contactor is responsible for all testing, disinfection and water sampling.
6. Tracer wire is required on all water mains as per Standard Specifications.

AASHTO T-180 SOIL TEST

In order to match and correlate with the SDDOT specifications, the Contractor shall provide T-99 soil test results under the bid item AASHTO T-180 Soil Test. Payment will be made for only those Proctor tests required by the Engineer.

TABLE OF 1" CURB STOP WITH BOX

Station	L/R	Description	Quantity (Each)
100+49.39	L	Main Street	1
101+32.09	R	Main Street	1
101+85.09	R	Main Street	1
102+07.70	L	Main Street	1
102+83.34	L	Main Street	1
103+24.79	L	Main Street	1
103+31.20	R	Main Street	1
103+55.48	L	Main Street	1
103+91.66	L	Main Street	1
104+32.89	R	Main Street	1
104+95.97	R	Main Street	1
105+02.89	L	Main Street	1
105+21.62	L	Main Street	1
105+30.25	R	Main Street	1
105+92.93	R	Main Street	1
105+96.48	L	Main Street	1
106+30.53	R	Main Street	1
106+47.86	L	Main Street	1
106+60.24	R	Main Street	1
107+02.39	R	Main Street	1
107+44.07	L	Main Street	1
108+76.21	R	Main Street	1
108+83.97	L	Main Street	1
109+20.52	L	Main Street	1
109+37.12	L	Main Street	1
109+41.13	R	Main Street	1
109+53.30	L	Main Street	1
109+66.27	R	Main Street	1
109+91.56	R	Main Street	1
110+02.57	L	Main Street	1
110+09.90	R	Main Street	1
110+11.90	R	Main Street	1
110+32.10	L	Main Street	1
110+36.69	R	Main Street	1
110+68.25	L	Main Street	1
110+80.46	L	Main Street	1
110+83.92	R	Main Street	1
111+14.01	L	Main Street	1
111+19.82	R	Main Street	1
111+34.67	R	Main Street	1
111+44.81	L	Main Street	1
111+59.00	L	Main Street	1
112+30.85	L	Main Street	1
112+42.08	R	Main Street	1
112+62.48	R	Main Street	1
112+71.71	L	Main Street	1
112+82.19	R	Main Street	1
113+12.87	L	Main Street	1
113+15.83	R	Main Street	1
113+42.04	R	Main Street	1
113+55.63	L	Main Street	1
113+76.18	L	Main Street	1
113+86.04	R	Main Street	1
114+01.20	L	Main Street	1
114+04.20	L	Main Street	1
114+07.20	L	Main Street	1
114+36.05	L	Main Street	1
114+80.21	R	Main Street	1
114+84.36	L	Main Street	1
114+86.92	R	Main Street	1
115+10.22	L	Main Street	1
115+11.50	R	Main Street	1
115+15.51	L	Main Street	1
115+26.32	R	Main Street	1
115+49.42	L	Main Street	1
115+58.45	R	Main Street	1
115+75.50	R	Main Street	1
115+97.12	R	Main Street	1
116+37.46	R	Main Street	1
116+40.46	R	Main Street	1
116+66.58	R	Main Street	1
116+77.75	L	Main Street	1
117+10.09	R	Main Street	1
117+13.09	R	Main Street	1
117+52.38	L	Main Street	1
124+99.88	R	Main Street	1
		Total:	76

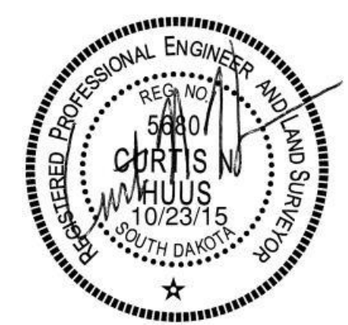


TABLE OF 8" X 6" REDUCER

Station	L/R	Description	Quantity (Each)
100+41.62	L	Main Street	1
104+54.85	L	Third Street	1
108+15.50	R	Second Street	1
111+91.86	R	First Street	1
		Total:	4

TABLE OF 8" X 4" REDUCER

Station	L/R	Description	Quantity (Each)
100+83.46	R	Fourth Street	1
104+49.72	L	Third Street	1
		Total:	2

TABLE OF 8"GATE VALVE WITH BOX

Station	L/R	Description	Quantity (Each)
100+39.93	L	Main Street	1
100+92.75	R	Main Street	1
100+96.85	R	Main Street	1
104+31.51	R	Main Street	1
104+49.94	L	Third Street	1
104+55.70	L	Third Street	1
104+99.21	R	Main Street	1
107+96.66	R	Main Street	1
108+15.53	R	Second Street	1
108+25.42	R	Main Street	1
108+79.44	R	Main Street	1
111+68.42	R	Main Street	1
111+91.87	R	First Street	1
112+48.77	R	Main Street	1
114+65.53	R	Main Street	1
117+53.97	R	Main Street	1
		Total:	16

TABLE OF 6"GATE VALVE WITH BOX (INCIDENTIAL TO FIRE HYRANT)

Station	L/R	Description	Quantity (Each)
100+56.07	L	Main Street	1
104+81.39	R	Main Street	1
108+58.15	R	Main Street	1
112+27.48	R	Main Street	1
114+95.24	R	Main Street	1
124+27.59	L	Main Street	1
		Total:	6

TABLE OF 4"GATE VALVE WITH BOX

Station	L/R	Description	Quantity (Each)
104+40.94	L	Third Street	1
110+61.10	R	Main Street	1
113+85.12	R	Main Street	1
116+75.80	R	Main Street	1
117+49.80	L	Main Street	1
		Total:	5

TABLE OF 8" X 4" TEE

Station	L/R	Description	Quantity (Each)
104+40.94	L	Third Street	1
110+61.10	R	Main Street	1
113+85.12	R	Main Street	1
116+75.80	R	Main Street	1
117+49.80	L	Main Street	1
		Total:	5

TABLE OF 8" X 6" TEE

Station	L/R	Description	Quantity (Each)
100+56.08	L	Main Street	1
104+81.39	R	Main Street	1
108+58.15	R	Main Street	1
112+27.48	R	Main Street	1
114+95.28	R	Main Street	1
		Total:	5

TABLE OF 8" X 8" TEE

Station	L/R	Description	Quantity (Each)
100+83.81	R	Main Street	1
104+54.85	R	Main Street	1
104+54.85	L	Third Street	1
108+15.52	R	Main Street	1
111+91.86	R	Main Street	1
		Total:	5

TABLE OF 8" BEND

Station	L/R	Description	Quantity (Each)
100+72.72	L	Main Street 90°)	1
100+72.65	R	Main Street (90°)	1
104+49.70	L	Third Street (90°)	1
117+37.02	R	Main Street (90°)	1
117+37.08	L	Main Street (90°)	1
104+54.18	R	Main Street (22.5°)	1
104+58.67	R	Main Street (22.5°)	1
108+06.12	R	Main Street (45°)	1
108+08.87	R	Main Street (45°)	1
108+29.58	R	Main Street (45°)	1
108+32.13	R	Main Street (45°)	1
111+82.07	R	Main Street (45°)	1
111+85.16	R	Main Street (45°)	1
112+21.46	R	Main Street (45°)	1
112+24.30	R	Main Street (45°)	1
201+26.32	L	Fourth Street (45°)	1
201+16.00	L	Fourth Street (45°)	1
		Total:	17

TABLE OF 6" PIPE COUPLINGS

Station	L/R	Description	Quantity (Each)
100+38.02	L	Main Street	1
104+54.87	L	Third Street	1
108+15.50	R	Second Street	1
111+91.86	R	First Street	1
		Total:	4

TABLE OF 4" PIPE COUPLING

Station	L/R	Description	Quantity (Each)
100+83.36	R	Fourth Street	1
104+49.77	L	Third Street	1
104+40.94	L	Third Street	1
110+61.10	R	Main Street	1
113+85.12	R	Main Street	1
116+75.80	R	Main Street	1
117+49.80	L	Main Street	1
		Total:	7

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA

TABLE OF 8" PIPE COUPLING

Station	L/R	Description	Quantity (Each)
117+55.94	L	Main Street	1
		Total:	1

TABLE OF FIRE HYDRANT

Station	L/R	Description	Quantity (Each)
100+56.08	L	Main Street	1
104+81.39	L	Main Street	1
108+58.15	L	Main Street	1
112+27.47	L	Main Street	1
114+95.28	L	Main Street	1
124+27.59	L	Main Street	1
		Total:	6

TABLE OF METER PIT

Station	L/R	Description	Quantity (Each)
106+60.24	R	Main Street	1
109+91.56	R	Main Street	1
110+10.90	R	Main Street	1
110+83.92	R	Main Street	1
112+82.19	R	Main Street	1
115+49.42	R	Main Street	1
		Total:	6

PIPE INSULATION

Pipe insulation is needed the water main at the location listed in the table below. All cost for insulation material, Type 1 Bedding, and sand cushion will be incidental to the contract unit price for Pipe Insulation.

TABLE OF PIPE INSULATION

Station	to	Station	Quantity SqFt
112+01.77		112+14.77	104.0
104+65.18		104+78.18	104.0
		Total:	208.0

PROPOSED LEGEND

- CURB STOP
- CONNECT TO EXISTING
- 90 DEG. BEND
- TEE
- GATE VALVE
- FIRE HYDRANT
- METER PIT
- VERTICAL BEND
- REDUCER
- ENCASEMENT
- WATER MAIN
- WATER SERVICE

UTILITY REMOVAL PLAN

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	9	26

Plotting Date: 10/15/2015

WATER MAIN REMOVALS:

REMOVE AND DISPOSE OF WATER VALVES AND BOXES AT THE FOLLOWING LOCATIONS:
STA 100+86.32 - 13.13' L (MAIN ST.)
STA 100+87.95 - 15.44' L (MAIN ST.)
STA 101+30.30 - 15.02' L (MAIN ST.)
STA 102+61.78 - 13.83' L (MAIN ST.)
STA 103+46.43 - 14.67' L (MAIN ST.)
STA 104+47.85 - 60.75' L (MAIN ST.)
STA 104+49.52 - 35.24' L (MAIN ST.)
STA 104+54.96 - 19.43' L (MAIN ST.)

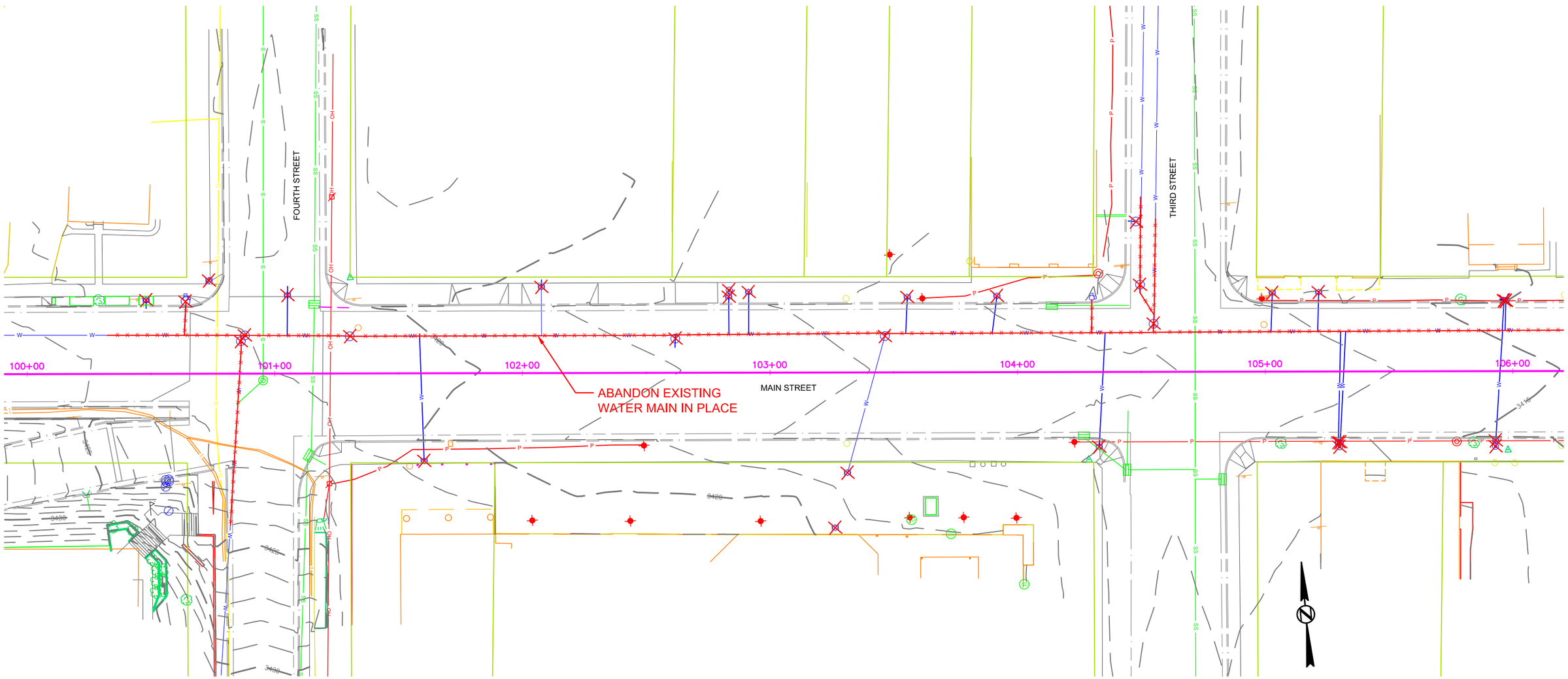
REMOVE AND SALVAGE FIRE HYDRANTS TO THE CITY OF STURGIS AT THE FOLLOWING LOCATIONS:
STA 100+64.11 - 30.47' L (MAIN ST.)
STA 104+30.01 - 29.98' L (MAIN ST.)

REMOVE AND SALVAGE METER PITS TO THE CITY OF STURGIS AT THE FOLLOWING LOCATIONS:
STA 102+83.59 - 33.35' L (MAIN ST.)
STA 105+29.94 - 30.38' R (MAIN ST.)
STA 105+92.98 - 30.32' R (MAIN ST.)

REMOVE AND DISPOSE OF CURB STOPS AT THE FOLLOWING LOCATIONS:
STA 100+48.12 - 29.77' L (MAIN ST.)
STA 100+73.50 - 37.63' L (MAIN ST.)
STA 101+05.18 - 31.67' L (MAIN ST.)
STA 101+60.29 - 35.36' R (MAIN ST.)
STA 102+07.75 - 34.80' L (MAIN ST.)
STA 102+83.38 - 30.90' L (MAIN ST.)
STA 102+91.46 - 32.66' L (MAIN ST.)
STA 103+26.25 - 62.67' R (MAIN ST.)
STA 103+31.24 - 40.50' R (MAIN ST.)
STA 103+55.50 - 30.42' L (MAIN ST.)
STA 103+91.70 - 30.81' L (MAIN ST.)
STA 104+32.92 - 30.16' R (MAIN ST.)
STA 105+02.93 - 31.82' L (MAIN ST.)
STA 105+21.67 - 32.07' L (MAIN ST.)
STA 105+29.50 - 28.59' R (MAIN ST.)
STA 105+30.27 - 28.59' R (MAIN ST.)

REMOVE AND DISPOSE OF CURB STOPS AT THE FOLLOWING LOCATIONS:
STA 105+93.08 - 27.96' R (MAIN ST.)
STA 105+96.50 - 28.67' L (MAIN ST.)
STA 105+96.55 - 28.57' L (MAIN ST.)
STA 105+97.23 - 28.37' L (MAIN ST.)
STA 105+97.23 - 28.49' L (MAIN ST.)

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5880
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA



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UTILITY REMOVAL PLAN

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	10	26

Plotting Date: 10/15/2015

WATER MAIN REMOVALS:

REMOVE AND DISPOSE OF WATER VALVES AND BOXES AT THE FOLLOWING LOCATIONS:
STA 108+15.77 - 36.04' R (MAIN ST.)
STA 110+01.87 - 19.87' L (MAIN ST.)
STA 110+58.43 - 19.85' L (MAIN ST.)
STA 111+91.63 - 37.72' R (MAIN ST.)

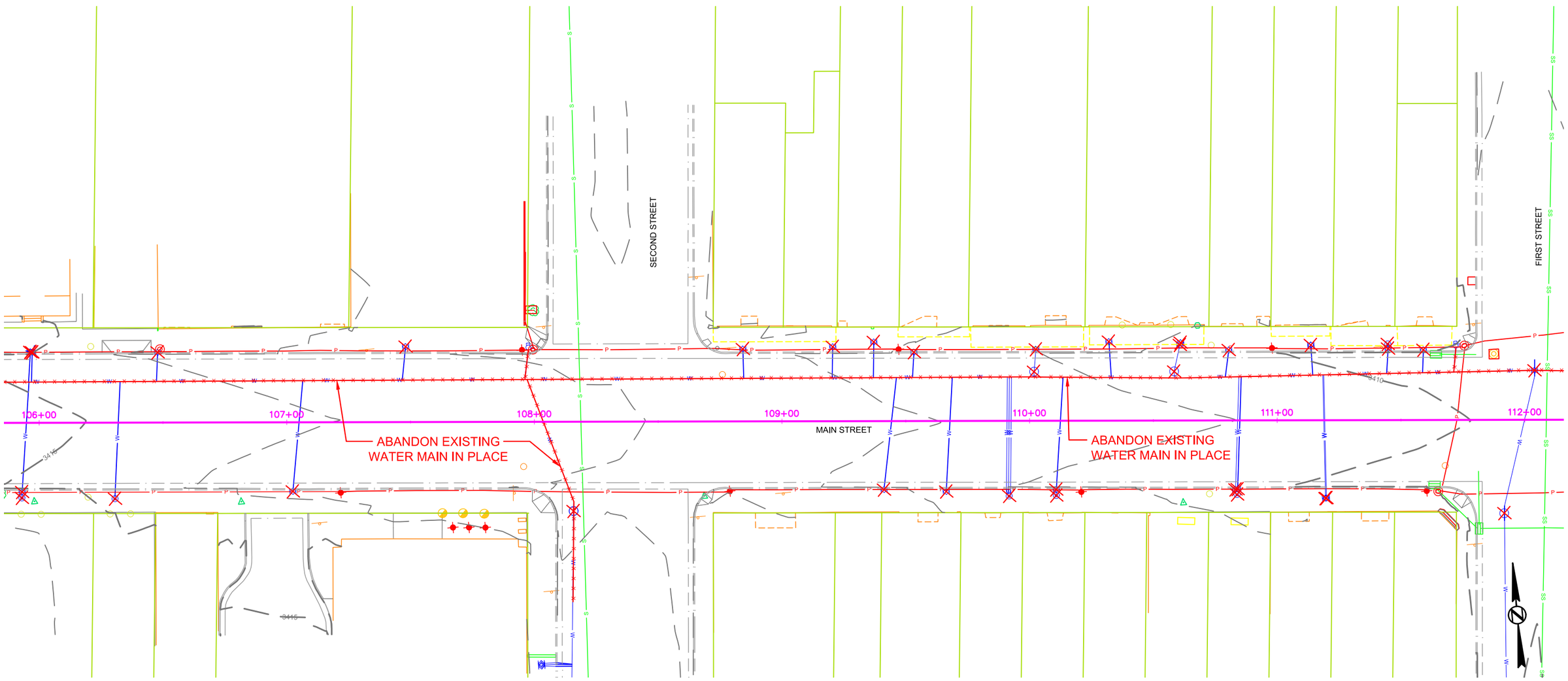
REMOVE AND SALVAGE FIRE HYDRANTS TO THE CITY OF STURGIS AT THE FOLLOWING LOCATIONS:
STA 107+97.63 - 30.00' L (MAIN ST.)
STA 111+72.16 - 30.00' L (MAIN ST.)

REMOVE AND SALVAGE METER PITS TO THE CITY OF STURGIS AT THE FOLLOWING LOCATIONS:
STA 106+30.59 - 30.71' R (MAIN ST.)
STA 107+02.39 - 27.92' R (MAIN ST.)
STA 109+91.71 - 30.31' R (MAIN ST.)
STA 110+10.75 - 30.17' R (MAIN ST.)
STA 110+83.76 - 29.91' R (MAIN ST.)
STA 111+44.73 - 30.76' L (MAIN ST.)

REMOVE AND DISPOSE OF CURB STOPS AT THE FOLLOWING LOCATIONS:
STA 106+47.90 - 28.34' L (MAIN ST.)
STA 107+02.39 - 27.92' R (MAIN ST.)
STA 107+48.08 - 30.47' L (MAIN ST.)
STA 108+84.27 - 29.20' L (MAIN ST.)
STA 109+20.59 - 30.06' L (MAIN ST.)
STA 109+37.16 - 31.98' L (MAIN ST.)
STA 109+41.17 - 27.67' R (MAIN ST.)
STA 109+53.35 - 27.81' L (MAIN ST.)
STA 109+66.30 - 28.49' R (MAIN ST.)
STA 110+02.61 - 28.86' L (MAIN ST.)
STA 110+10.74 - 27.79' R (MAIN ST.)
STA 110+32.11 - 31.92' L (MAIN ST.)
STA 110+60.76 - 30.51' L (MAIN ST.)
STA 110+61.10 - 31.44' L (MAIN ST.)
STA 110+80.52 - 28.43' L (MAIN ST.)

REMOVE AND DISPOSE OF CURB STOPS AT THE FOLLOWING LOCATIONS:
STA 110+83.13 - 27.87' R (MAIN ST.)
STA 110+83.98 - 27.72' R (MAIN ST.)
STA 111+13.69 - 30.37' L (MAIN ST.)
STA 111+19.47 - 31.49' R (MAIN ST.)
STA 111+19.86 - 31.42' R (MAIN ST.)
STA 111+44.85 - 28.90' L (MAIN ST.)
STA 111+59.12 - 28.36' L (MAIN ST.)

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA



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UTILITY REMOVAL PLAN

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	11	26

Plotting Date: 10/15/2015

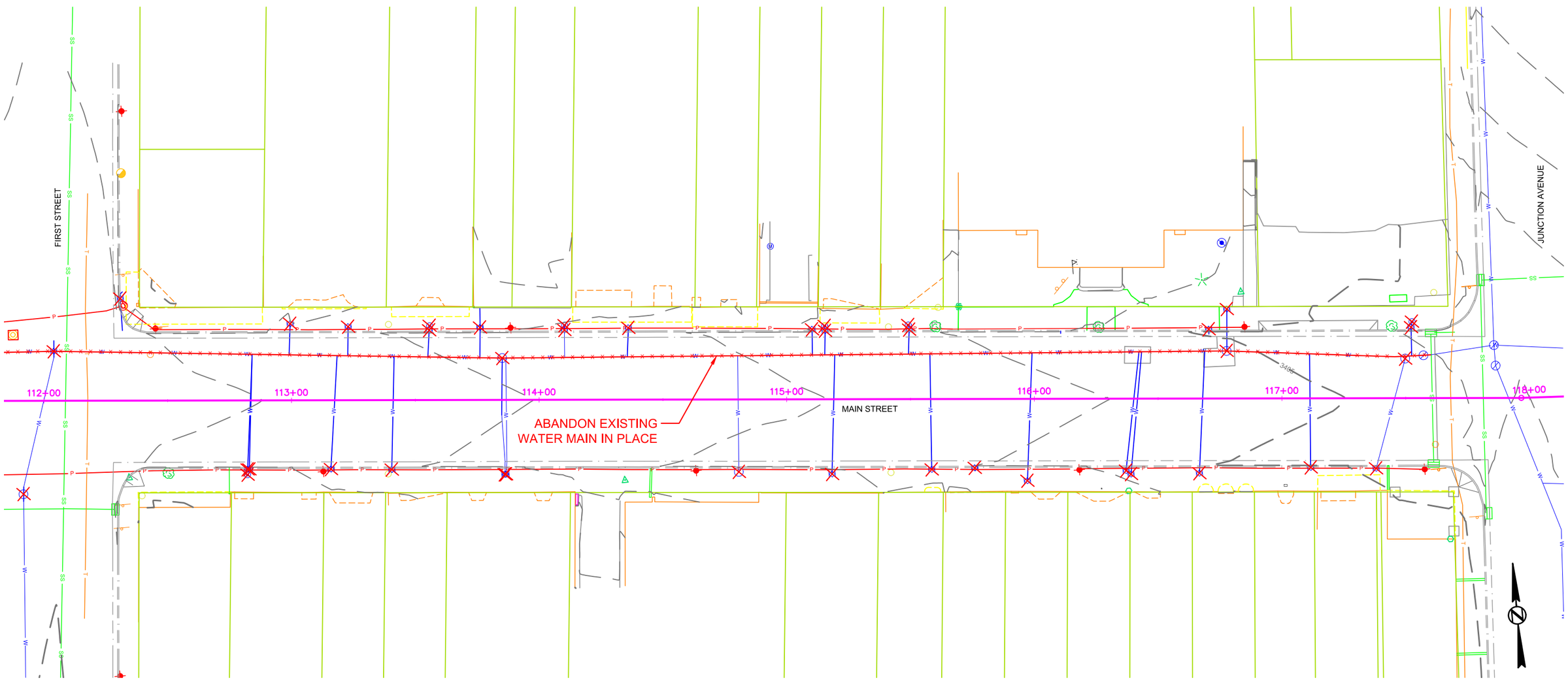
WATER MAIN REMOVALS:

REMOVE AND DISPOSE OF WATER VALVES AND BOXES AT THE FOLLOWING LOCATIONS:
STA 113+85.11 - 16.91' L (MAIN ST.)
STA 114+80.58 - 29.27' R (MAIN ST.)
STA 116+77.69 - 19.22' L (MAIN ST.)
STA 117+49.81 - 15.99' L (MAIN ST.)
STA 117+57.18 - 17.29' L (MAIN ST.)

REMOVE AND SALVAGE METER PITS TO THE CITY OF STURGIS AT THE FOLLOWING LOCATIONS:
STA 112+82.18 - 30.01' R (MAIN ST.)
STA 113+55.85 - 30.01' L (MAIN ST.)
STA 114+10.32 - 30.14' L (MAIN ST.)
STA 115+15.36 - 29.69' L (MAIN ST.)
STA 115+49.12 - 29.94' L (MAIN ST.)
STA 117+52.56 - 30.90' L (MAIN ST.)

REMOVE AND DISPOSE OF CURB STOPS AT THE FOLLOWING LOCATIONS:
STA 112+03.99 - 20.00' L (MAIN ST.)
STA 112+30.89 - 41.26' L (MAIN ST.)
STA 112+82.20 - 27.87' R (MAIN ST.)
STA 112+82.91 - 27.85' R (MAIN ST.)
STA 112+99.50 - 30.94' L (MAIN ST.)
STA 113+15.86 - 27.81' R (MAIN ST.)
STA 113+22.90 - 29.72' L (MAIN ST.)
STA 113+40.58 - 28.29' R (MAIN ST.)
STA 113+55.62 - 28.21' L (MAIN ST.)
STA 113+76.17 - 29.27' L (MAIN ST.)
STA 113+86.08 - 30.09' R (MAIN ST.)
STA 113+86.54 - 30.04' R (MAIN ST.)
STA 114+10.25 - 28.20' L (MAIN ST.)
STA 114+36.06 - 29.02' L (MAIN ST.)
STA 115+10.26 - 28.28' L (MAIN ST.)

REMOVE AND DISPOSE OF CURB STOPS AT THE FOLLOWING LOCATIONS:
STA 115+15.49 - 27.69' L (MAIN ST.)
STA 115+18.26 - 30.19' R (MAIN ST.)
STA 115+49.48 - 28.08' L (MAIN ST.)
STA 115+58.49 - 28.42' R (MAIN ST.)
STA 115+75.91 - 27.83' R (MAIN ST.)
STA 115+97.12 - 33.07' R (MAIN ST.)
STA 116+36.99 - 29.05' R (MAIN ST.)
STA 116+38.96 - 30.46' R (MAIN ST.)
STA 116+66.60 - 30.17' R (MAIN ST.)
STA 116+70.48 - 27.99' L (MAIN ST.)
STA 116+77.79 - 36.13' L (MAIN ST.)
STA 117+11.56 - 27.91' R (MAIN ST.)
STA 117+37.96 - 28.35' R (MAIN ST.)
STA 117+52.19 - 28.68' L (MAIN ST.)



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UTILITY REMOVAL PLAN

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	12	26

Plotting Date: 10/15/2015

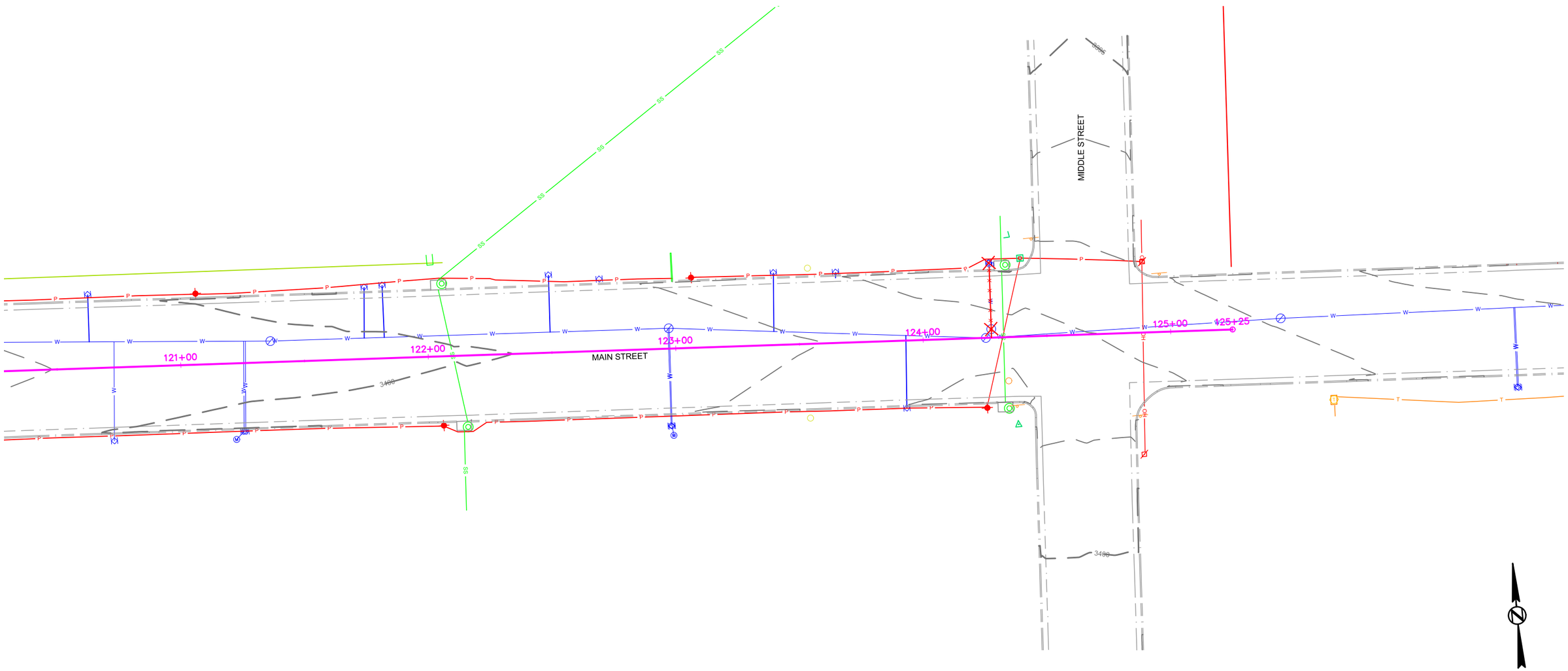
WATER MAIN REMOVALS:

REMOVE AND DISPOSE OF WATER VALVES AND BOXES AT THE FOLLOWING LOCATIONS:
STA 124+27.62 - 3.44' L (MAIN ST.)

REMOVE AND SALVAGE FIRE HYDRANTS TO THE CITY OF STURGIS AT THE FOLLOWING LOCATIONS:
STA 124+27.65 - 29.52' L (MAIN ST.)

REMOVE AND DISPOSE OF CURB STOPS AT THE FOLLOWING LOCATIONS:
STA 124+27.50 - 30.15' L (MAIN ST.)

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA



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WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	13	26

FOURFRONT DESIGN INC

Plotting Date: 10/27/2015

STA 100+32.99 - 15.6' L
CONNECT TO EXISTING 6"
WATER MAIN W/ 6" COUPLING

STA 100+35.91 - 15.6' L
F&I 8" x 6" REDUCER

STA 100+39.93 - 15.6' L
F&I 8" GATE VALVE

STA 100+45.06 - 15.6' L
F&I 8" X 6" TEE
AND THRUST BLOCK

STA 100+45.09 - 20.7' L
F&I 6" AUXILIARY
GATE VALVE AND BOX

STA 100+45.09 - 29.7' L
F&I FIRE HYDRANT AND
THRUST BLOCK

STA 100+51.42 - 15.6' L
to 100+93.87 -18.0' R
F&I WATER MAIN
ENCASEMENT, 76 LF

STA 100+72.76 - 15.6' L
F&I 8" 90 DEGREE BEND
AND THRUST BLOCK

STA 100+72.70 - 18.0' R
F&I 8" 90 DEGREE BEND
AND THRUST BLOCK

STA 100+92.76 - 18.0' R
F&I 8" X 8" TEE
AND THRUST BLOCK

STA 100+96.85 - 18.0' R
F&I 8" GATE VALVE AND BOX

STA 100+97.48 to 101+19.95 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 22LF

STA 103+85.58 to 104+07.54 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 22 LF

STA 104+31.51 - 18.0' R
F&I 8" GATE VALVE AND BOX

STA 104+49.74 - 18.0' R
F&I 8" X 8" TEE
AND THRUST BLOCK

STA 104+54.18 - 18.0' R
F&I VERTICAL 8"
22.5 DEGREE BEND

STA 104+58.67 - 18.0' R
F&I VERTICAL 8"
22.5 DEGREE BEND

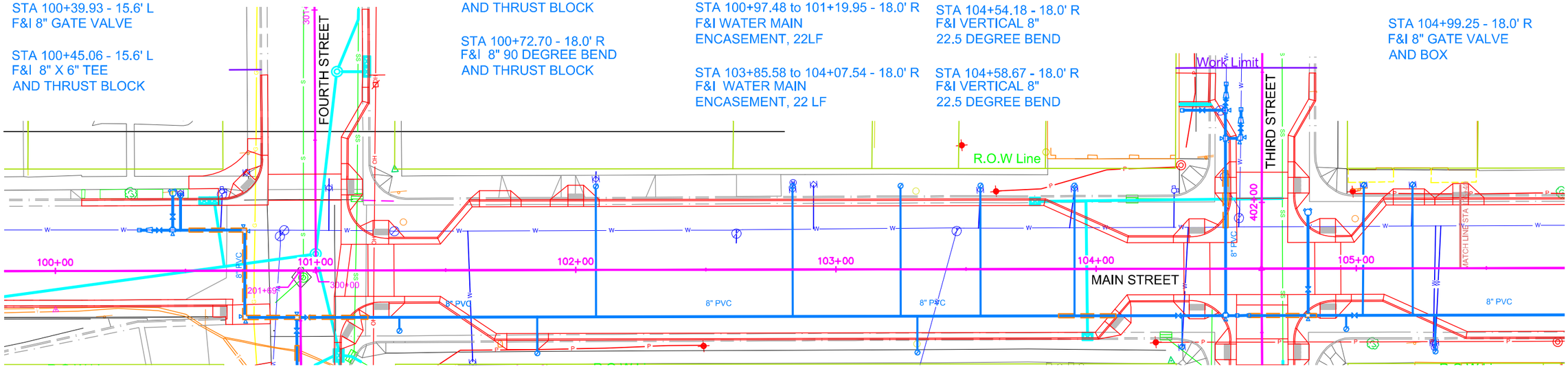
STA 104+58.67 to 104+84.63- 18.0' R
F&I WATER MAIN
ENCASEMENT, 26 LF

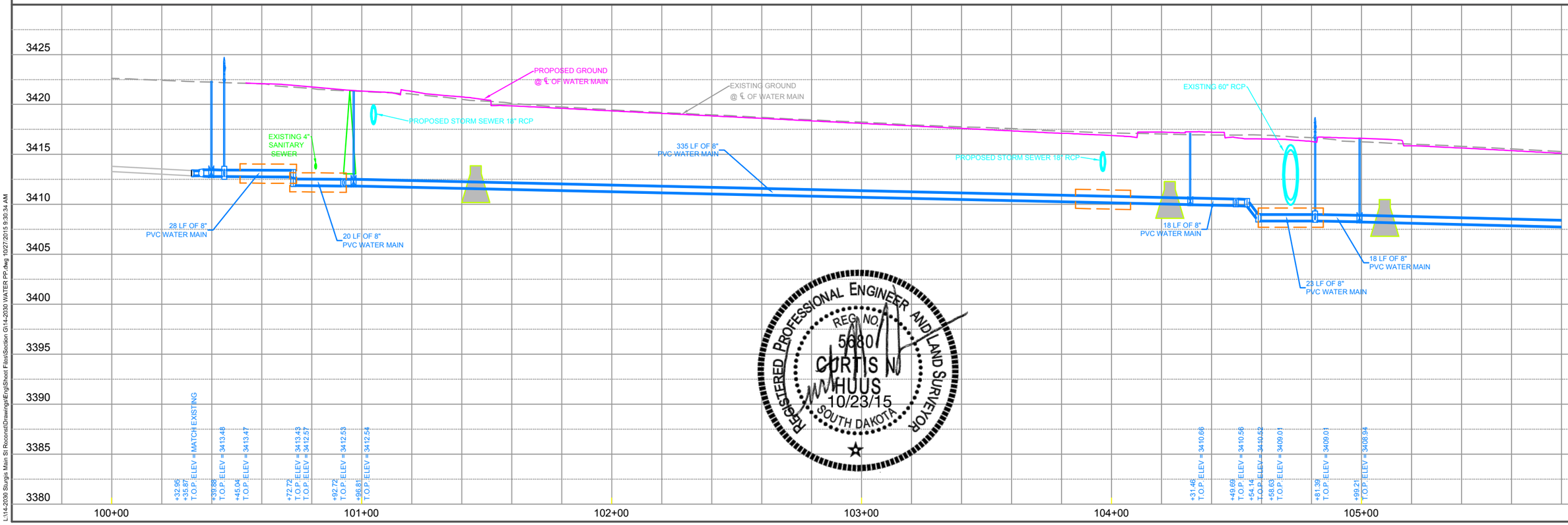
STA 104+81.43 - 18.0' R
F&I 8" X 6" TEE
AND THRUST BLOCK

STA 104+81.43 - 8.0' R
F&I 6" AUXILIARY
GATE VALVE AND BOX

STA 104+81.43 - 21.4' L
F&I FIRE HYDRANT
AND THRUST BLOCK

STA 104+99.25 - 18.0' R
F&I 8" GATE VALVE
AND BOX





REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA

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WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	14	26

FOURFRONT DESIGN INC

Plotting Date: 10/15/2015

STA 106+60.29 - 34.0' R
F&I WATER METER PIT

STA 107+48.33 to 107+70.28 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 22 L

STA 107+96.70 - 18.0' R
F&I 8" GATE VALVE AND BOX

STA 108+06.12 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 108+08.87 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 108+08.79 to 108+47.48 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 39 LF

STA 108+15.56 - 18.0' R
F&I 8" X 6" TEE
AND THRUST BLOCK

STA 108+25.42 - 18.0' R
F&I 8" GATE VALVE AND BOX

STA 108+29.58 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 108+32.13 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 108+58.19 - 18.0' R
F&I 8" X 6" TEE
AND THRUST BLOCK

STA 108+58.19 - 8.0' R
F&I 6" AUXILIARY
GATE VALVE AND BOX

STA 108+58.19 - 20.0' L
F&I FIRE HYDRANT
AND THRUST BLOCK

STA 108+79.48 - 18.0' R
F&I 8" GATE VALVE AND BOX

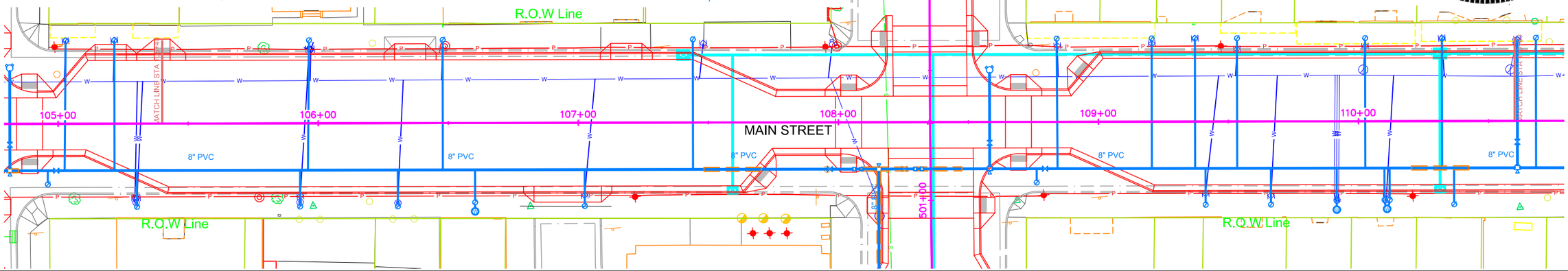
STA 109+13.92 to 109+35.88 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 22 LF

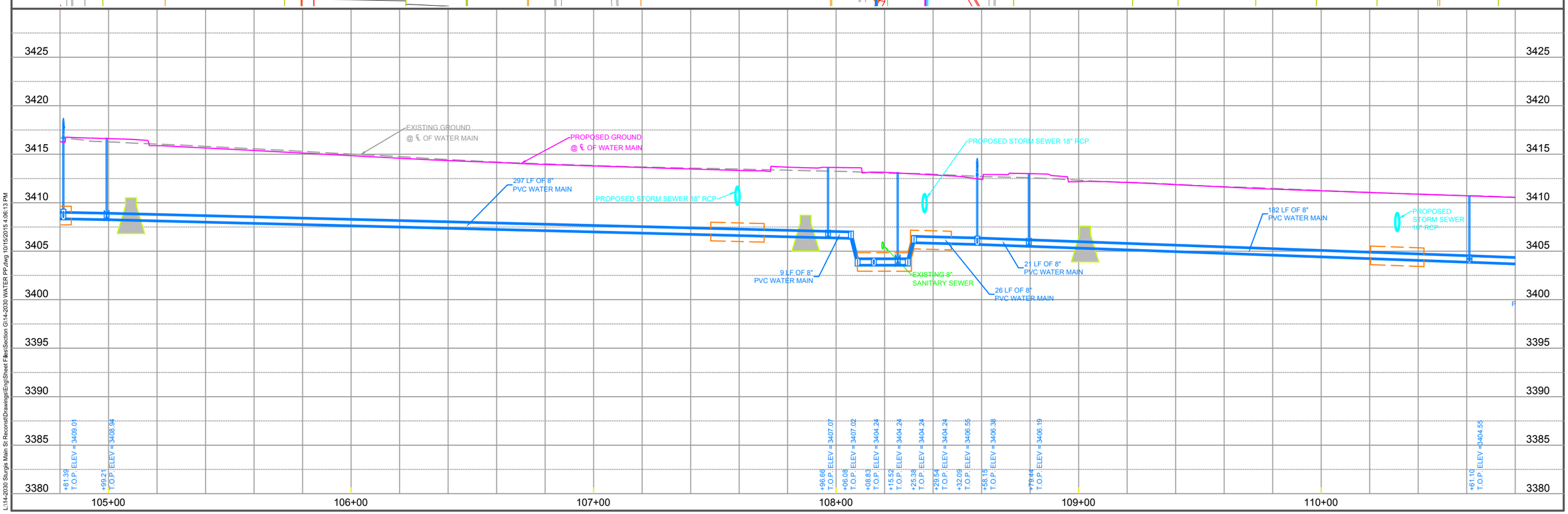
STA 109+91.60 - 34.0' R
F&I WATER METER PIT

STA 110+10.94 - 33.7' R
F&I WATER METER PIT

STA 110+20.37 to 114+42.33 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 22 LF

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA





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WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	15	26

FOURFRONT DESIGN INC.

Plotting Date: 10/15/2015

STA 110+61.10 - 18.0' R
F&I 8" X 8" X 4" TEE
AND THRUST BLOCK

STA 110+61.10 - 8.0' R
F&I 4" GATE VALVE AND BOX

STA 110+61.10 - 30.8' L
CONNECT TO EXISTING 4"
FIRE LINE

STA 110+83.96 - 38.9' R
F&I WATER METER PIT

STA 111+27.16 to 111+49.12 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 22 LF

STA 111+68.46 - 18.0' R
F&I 8" GATE VALVE AND BOX

STA 111+82.07 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 111+85.16 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 111+91.90 - 18.0' R
F&I 8" X 8" TEE
AND THRUST BLOCK

STA 111+95.37 to 112+21.33 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 26 LF

STA 112+21.46 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 112+24.30 - 18.0' R
F&I VERTICAL 8"
45 DEGREE BEND

STA 112+27.52 - 18.0' R
F&I 8" X 6" TEE
AND THRUST BLOCK

STA 112+27.52 - 8.0' R
F&I 6" AUXILIARY
GATE VALVE AND BOX

STA 112+27.51 - 21.5' L
F&I FIRE HYDRANT
AND THRUST BLOCK

STA 112+48.81 - 18.0' R
F&I 8" GATE VALVE AND BOX

STA 112+82.23 - 34.0' R
F&I WATER METER PIT

STA 113+85.12 - 18.0' R
F&I 8" X 8" X 4" TEE
AND THRUST BLOCK

STA 113+85.12 - 23.2' R
F&I 4" GATE VALVE AND BOX

STA 113+85.13 - 35.0' R
CONNECT TO EXISTING 4"
FIRE LINE

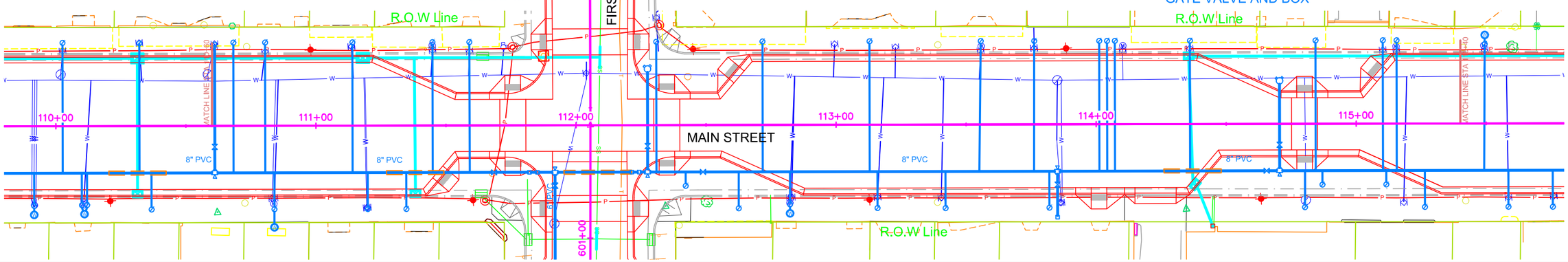
STA 114+26.06 to 111+48.02 - 18.0' R
F&I WATER MAIN
ENCASEMENT, 22 LF

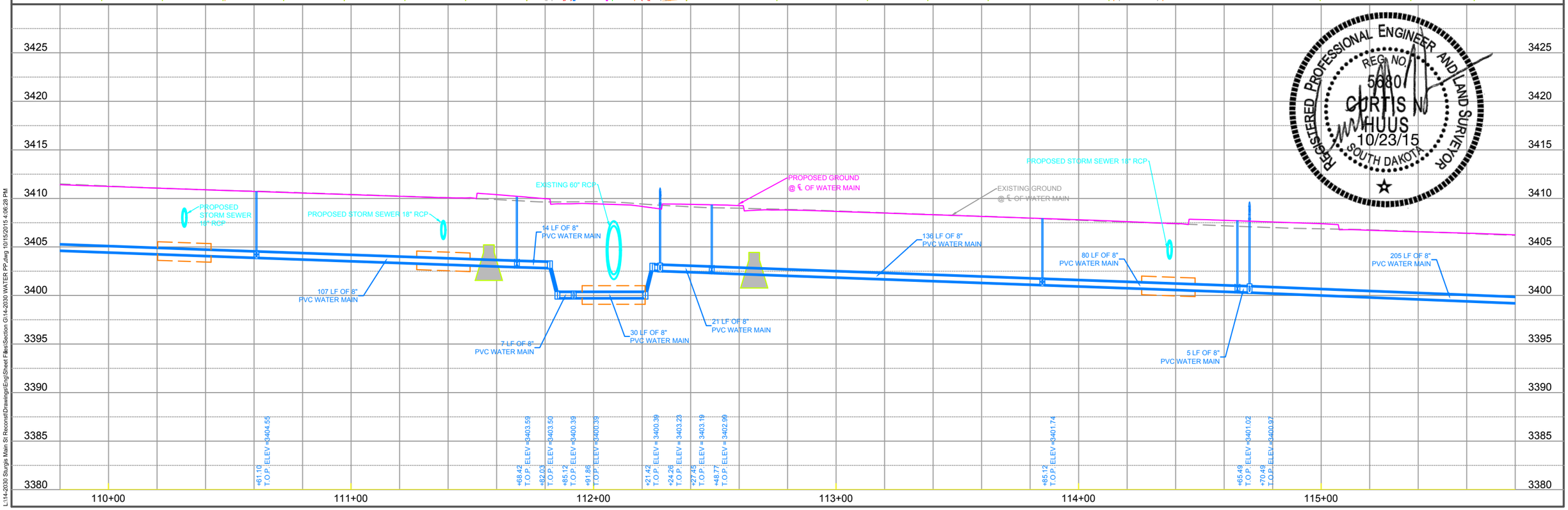
STA 114+65.53 - 18.0' R
F&I 8" GATE VALVE AND BOX

STA 114+70.50 - 18.0' R
F&I 8" X 6" TEE
AND THRUST BLOCK

STA 114+70.53 - 8.0' R
F&I 6" AUXILIARY
GATE VALVE AND BOX

STA 114+70.52 - 16.5' L
F&I FIRE HYDRANT
AND THRUST BLOCK





REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA

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WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	16	26

FOURFRONT DESIGN INC

Plotting Date: 10/15/2015

STA 115+49.46 - 34.0' L
F&I WATER METER PIT

STA 116+75.80 - 18.0' R
F&I 8" X 8" X 4" TEE
AND THRUST BLOCK

STA 116+75.80 - 8.0' R
F&I 4" GATE VALVE AND BOX

STA 116+75.82 - 35.8' L
CONNECT TO EXISTING 4"
FIRE LINE

STA 117+37.05 - 18.0' R
F&I 8" 90 DEGREE BEND
AND THRUST BLOCK

STA 117+37.12 - 17.0' L
F&I 8" 90 DEGREE BEND
AND THRUST BLOCK

STA 117+45.90 to 111+55.86- 17.2' L
F&I WATER MAIN
ENCASEMENT, 10 LF

STA 117+49.73 - 35.4' R
CONNECT TO EXISTING 4"
FIRE LINE

STA 117+49.73 - 12.0' L
F&I 4" GATE VALVE AND BOX

STA 117+49.73 - 17.1' L
F&I 8" X 8" X 4" TEE
AND THRUST BLOCK

STA 117+53.87 - 17.2' L
F&I 8" GATE VALVE AND BOX

STA 117+55.31 - 17.2' L
CONNECT TO EXISTING 8"
WATER MAIN W/ 8" COUPLING

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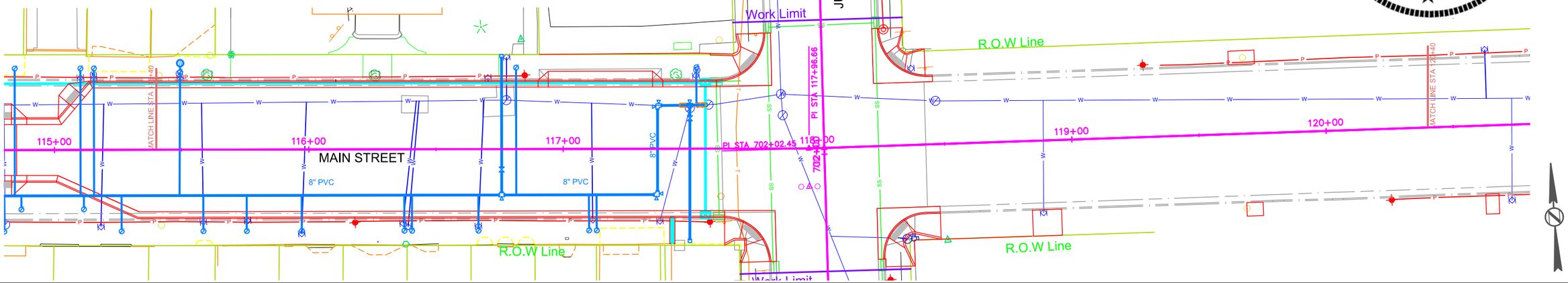
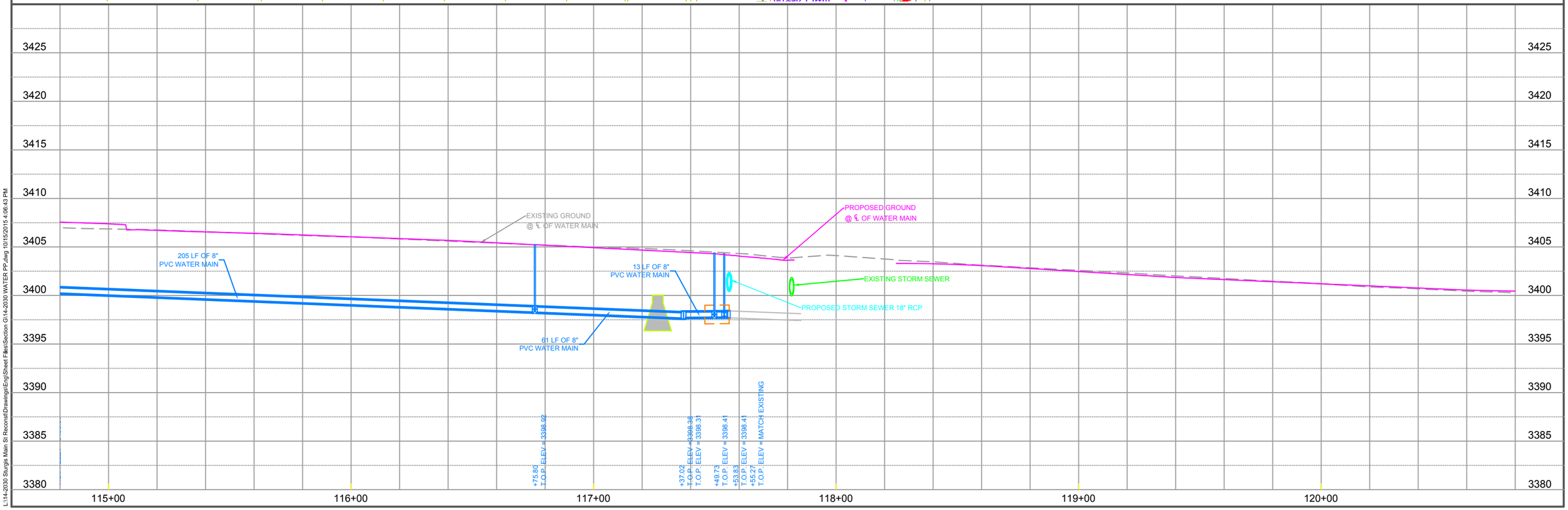
10/23/15
SOUTH DAKOTA





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WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	17	26

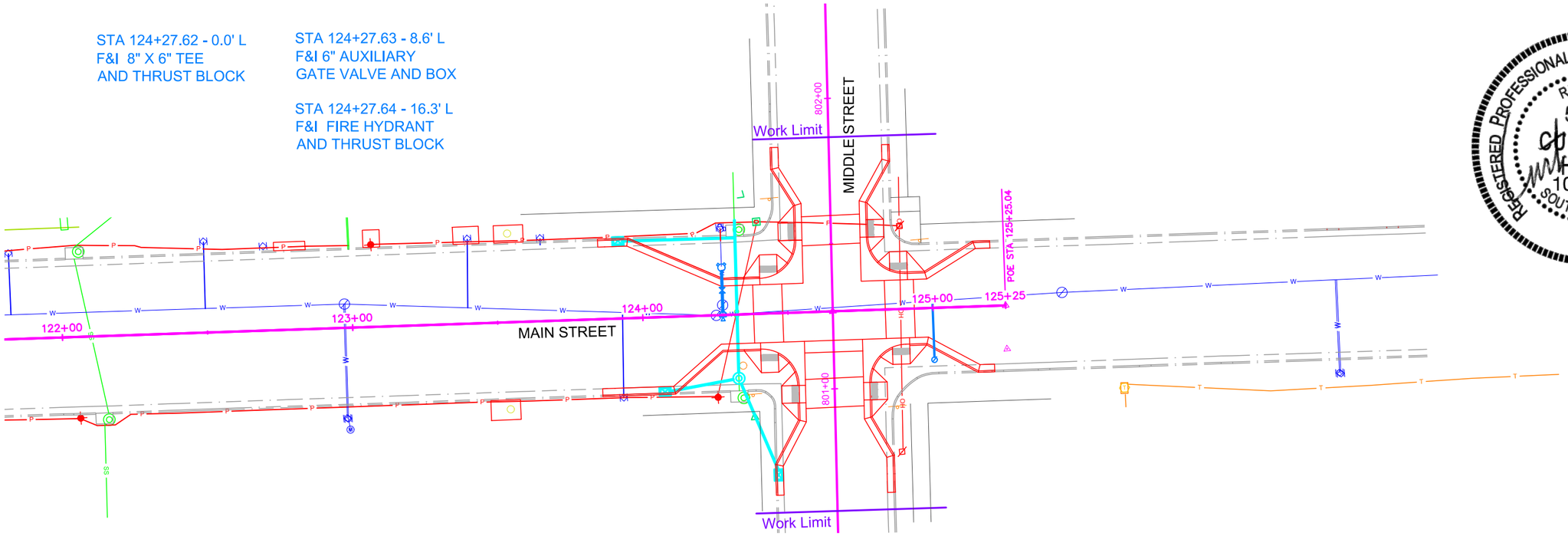
FOURFRONT DESIGN INC

Plotting Date: 10/15/2015

STA 124+27.62 - 0.0' L
F&I 8" X 6" TEE
AND THRUST BLOCK

STA 124+27.63 - 8.6' L
F&I 6" AUXILIARY
GATE VALVE AND BOX

STA 124+27.64 - 16.3' L
F&I FIRE HYDRANT
AND THRUST BLOCK



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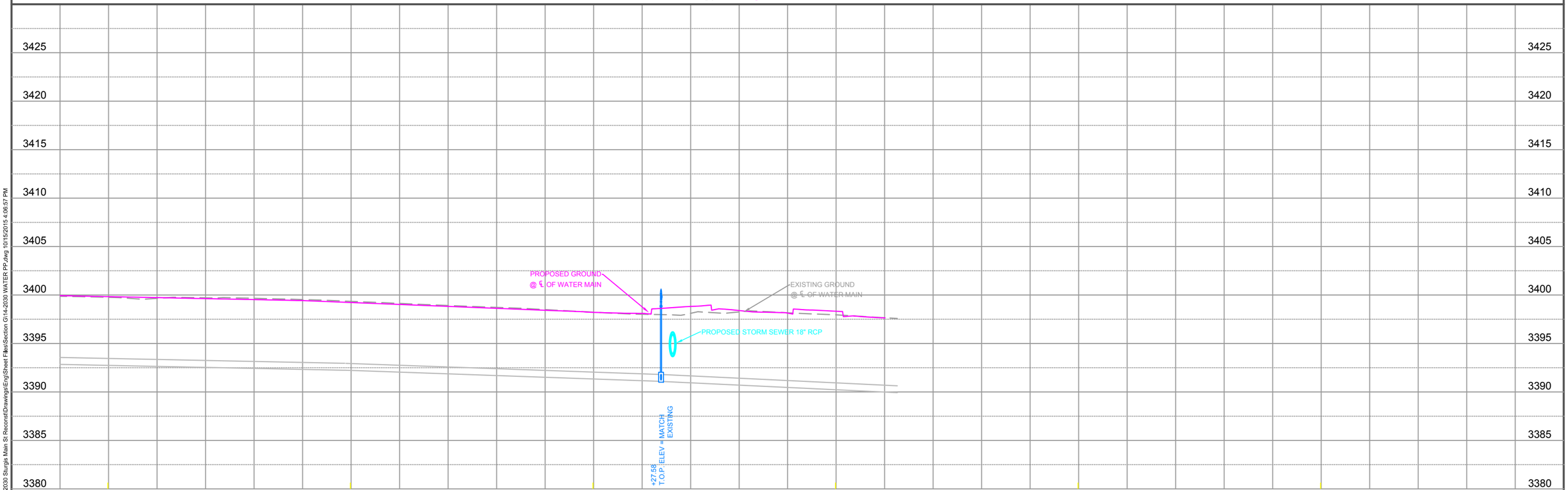
10/23/15
SOUTH DAKOTA



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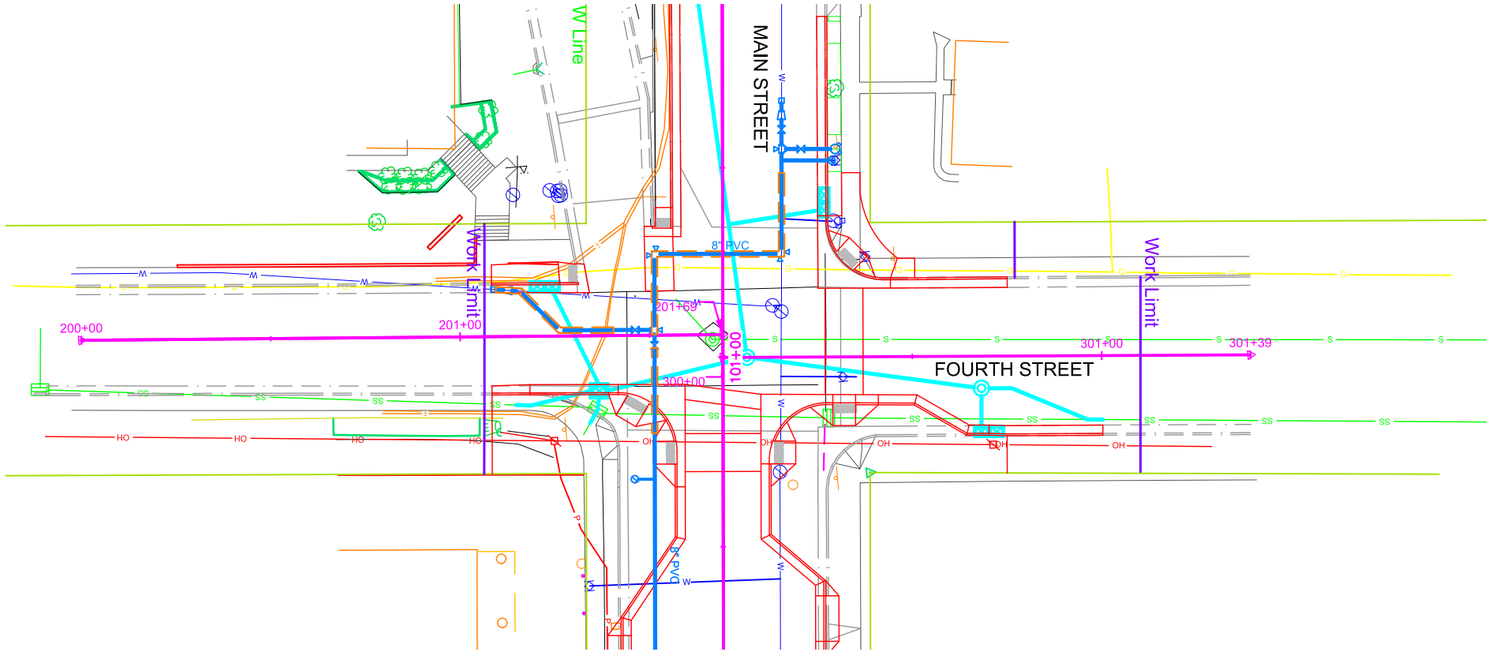
WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	18	26

FOURFRONT DESIGN INC

Plotting Date: 10/15/2015



STA 201+46.24 - 1.4' L
F&I 8" GATE VALVE AND BOX

STA 201+40.52 - 1.5' L
to 201+09.54 - 12.4' L
F&I WATER MAIN
ENCASEMENT - 35 LF

STA 201+26.32 - 1.5' L
F&I 8" 45 DEGREE BEND
AND THRUST BLOCK

STA 201+16.00 - 11.9' L
F&I 8" 45 DEGREE BEND
AND THRUST BLOCK

STA 201+12.68 - 12.2' L
F&I 8" X 4" REDUCER

STA 201+09.49 - 12.4' L
CONNECT TO EXISTING 4"
WATER MAIN WITH COUPLING

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
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10/23/15
SOUTH DAKOTA

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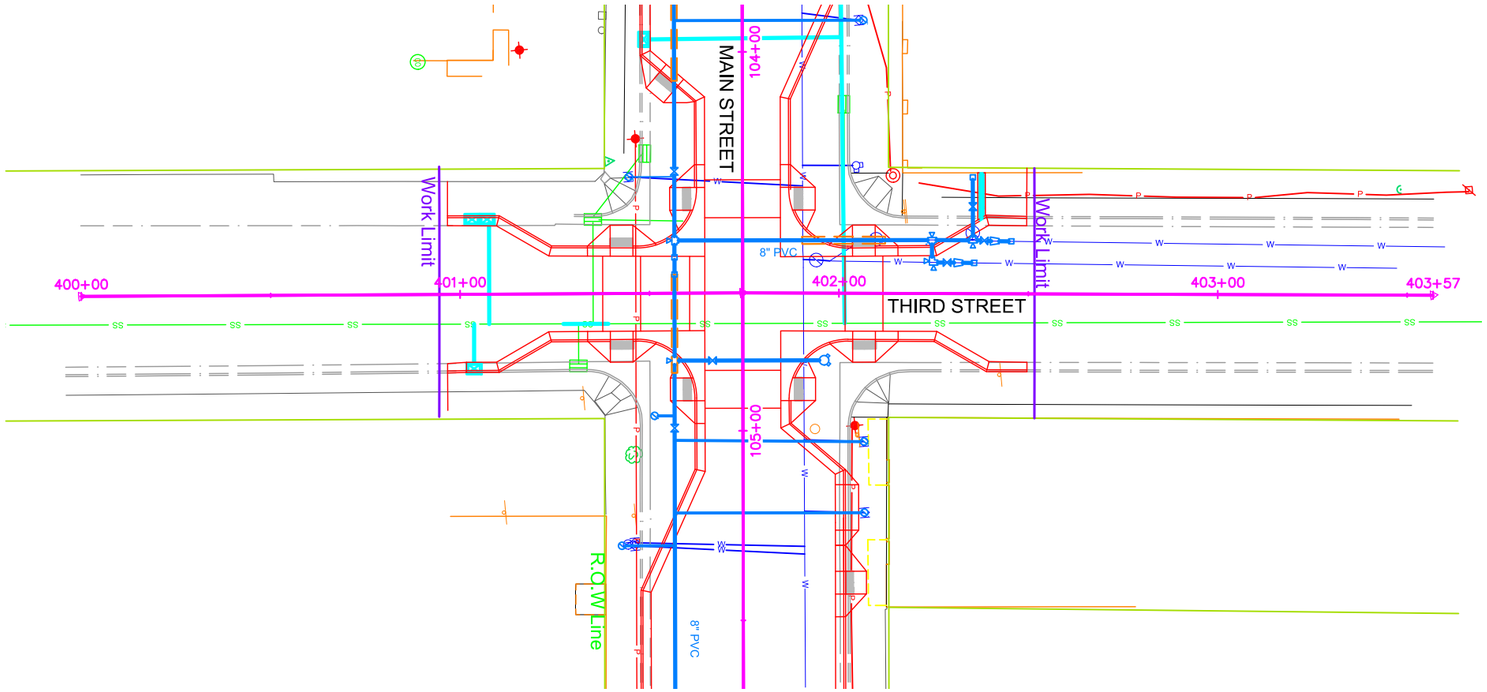
WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	19	26

FOURFRONT DESIGN INC

Plotting Date: 10/15/2015



STA 401+90.23 to 402+12.23 - 14.0' L
F&I WATER MAIN
ENCASEMENT, 22 LF

STA 402+24.49 - 14.1' L
F&I 8" x 8" TEE
AND THRUST BLOCK

STA 402+24.53 - 8.2' L
F&I 8" 90° BEND

STA 402+28.60 - 8.2' L
F&I 8" GATE VALVE AND BOX

STA 402+31.95 - 8.1' L
F&I 8" X 6" REDUCER

STA 402+35.00 - 8.1' L
CONNECT TO EXISTING 6"
WATER MAIN WITH COUPLING

STA 402+35.04 - 30.0' L
CONNECT TO EXISTING 4"
FIRE LINE

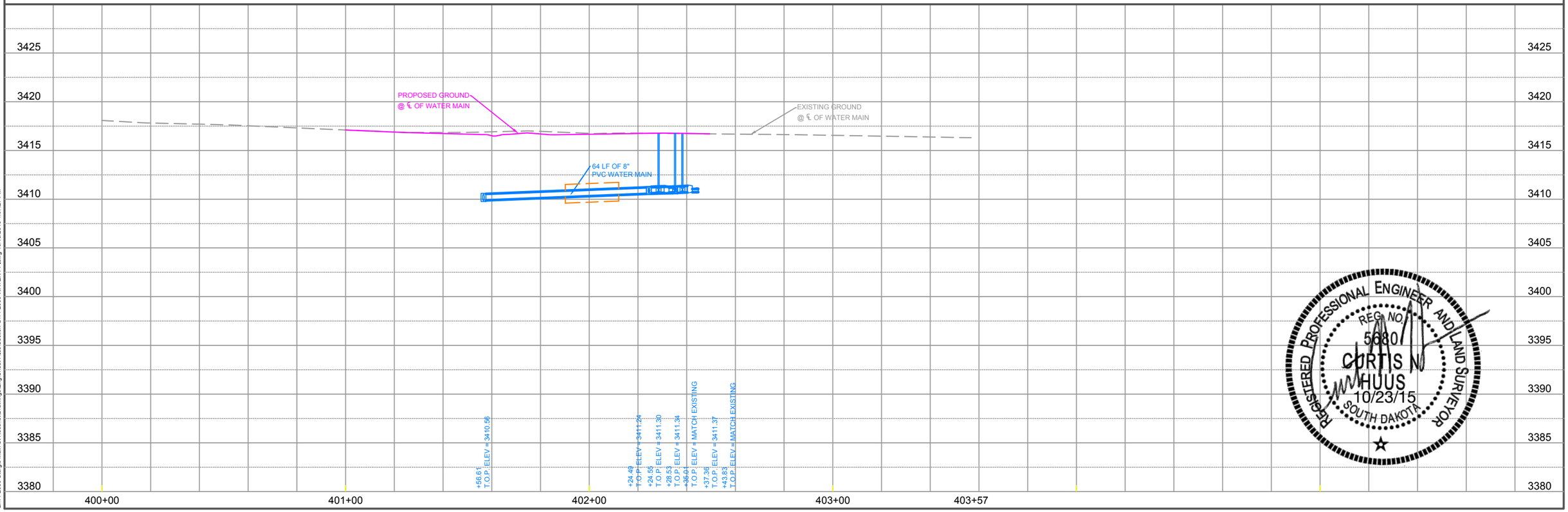
STA 402+35.28 - 23.0' L
F&I 4" GATE VALVE AND BOX

STA 402+35.32 - 14.1' L
F&I 8" X 8" X 4" TEE

STA 402+38.31 - 14.0' L
F&I 8" GATE VALVE AND BOX

STA 402+41.34 - 13.9' L
F&I 8" X 4" REDUCER

STA 402+44.78 - 13.8' L
CONNECT TO EXISTING 4"
WATER MAIN WITH COUPLING



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SOUTH DAKOTA

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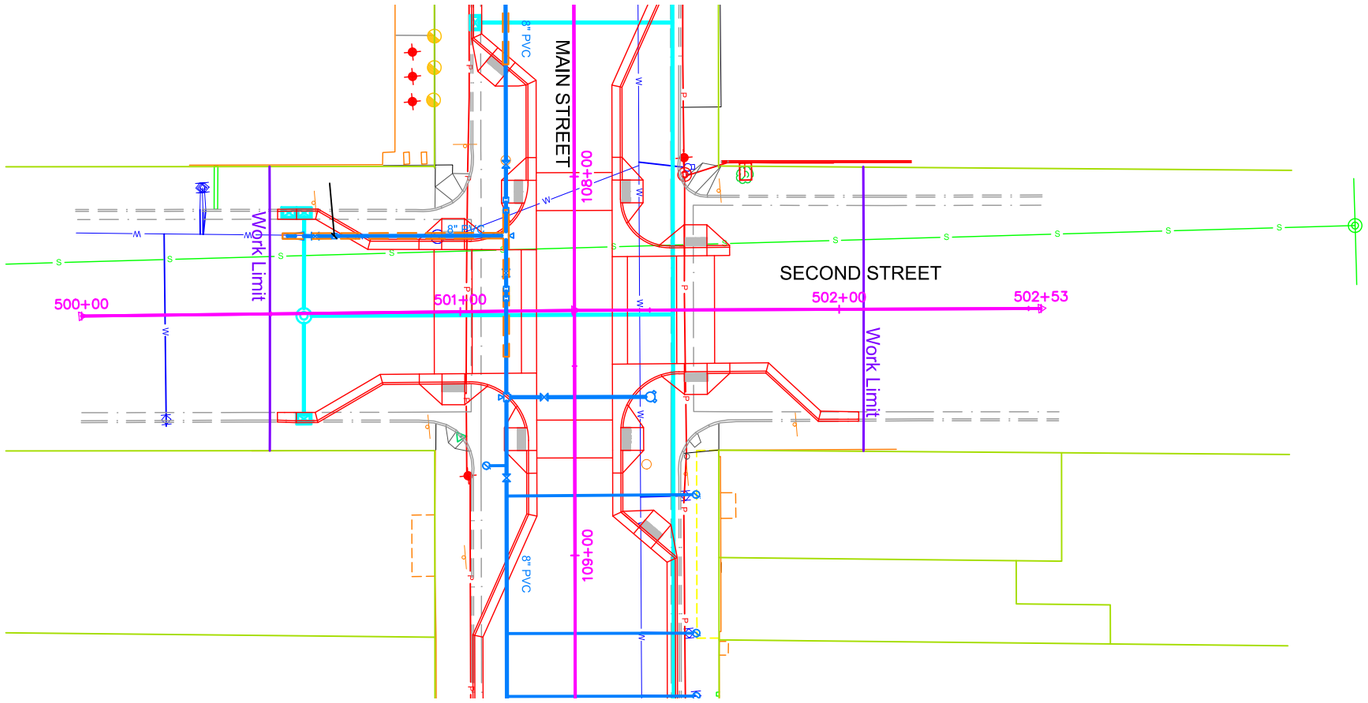
WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	20	26

Plotting Date: 10/15/2015



STA 500+54.63 - 20.5' L
CONNECT TO EXISTING 6"
WATER MAIN WITH COUPLING

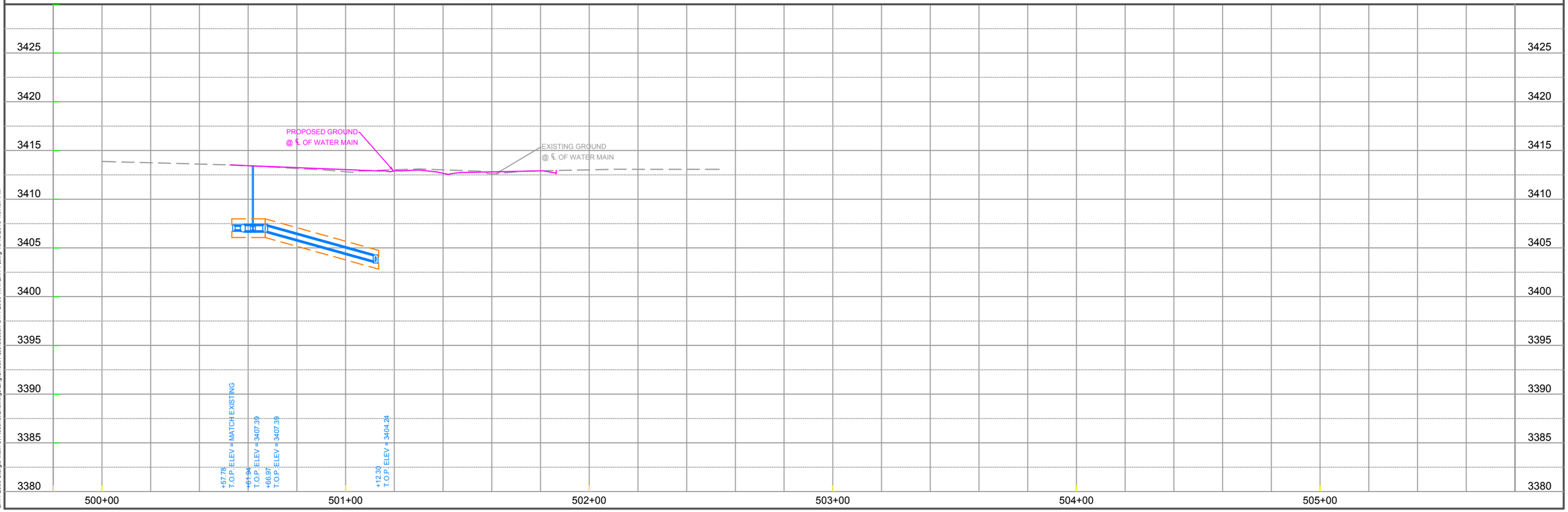
STA 500+57.78 - 20.4' L
F&I 8" X 6" REDUCER

STA 500+61.94 - 20.4' L
F&I 8" GATE VALVE AND BOX

STA 500+66.97 - 20.3' L
F&I 8" HIGH DEFLECTION COUPLING

STA 500+53.28 - 20.5' L
to 501+11.55 - 19.9' L
F&I WATER MAIN ENCASEMENT, 58 LF

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA



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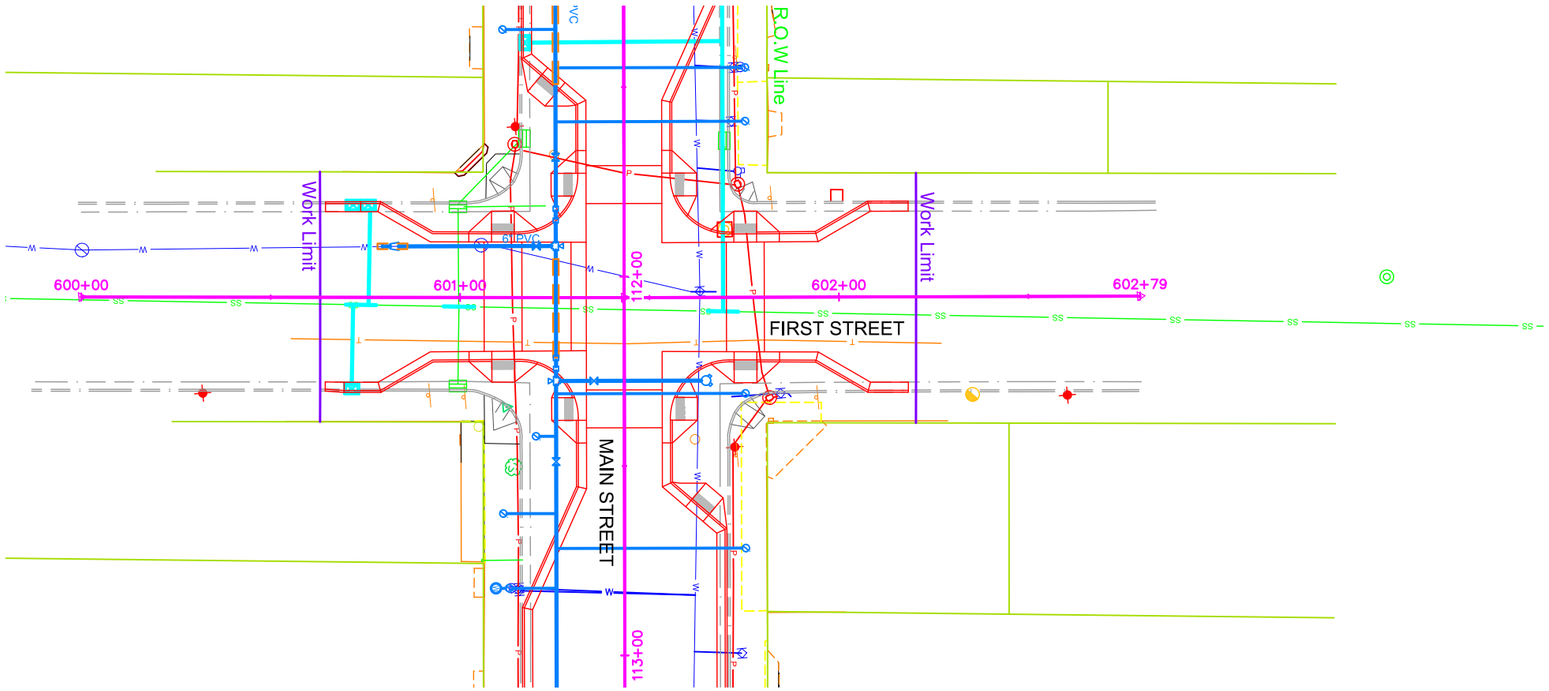
WATER MAIN PLAN AND PROFILE

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	21	26

FOURFRONT DESIGN INC

Plotting Date: 10/15/2015



STA 600+79.50 - 13.5' L
CONNECT TO EXISTING 6"
WATER MAIN WITH COUPLING

STA 600+82.40 - 13.5' L
F&I 8" X 6" REDUCER

STA 601+20.08 - 13.6' L
F&I 8" GATE VALVE AND BOX

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
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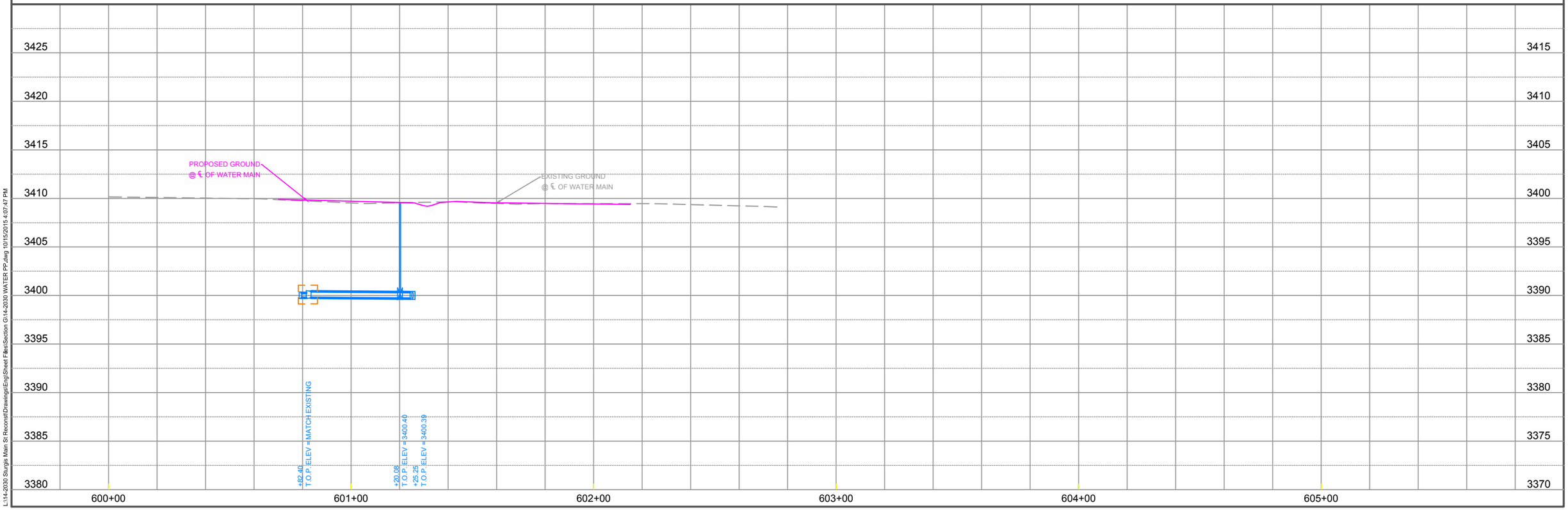
SOUTH DAKOTA



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STANDARD DETAILS

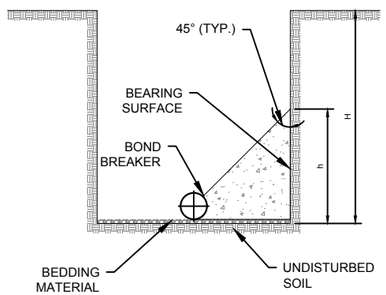
FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	22	26

Plotting Date: 10/15/2015

GENERAL:

1. FOR ALL BURIED PIPING EXCEPT FLANGED, SCREWED, SOCKET WELD OR STEEL PIPE SPECIFIED TO BE PRESSURE TESTED. ALL FITTINGS SHALL BE PROVIDED WITH CONCRETE THRUST BLOCKS AT ALL DIRECTION CHANGES UNLESS OTHERWISE NOTED.
2. IN ADDITION TO THRUST BLOCKS, ALL FITTINGS AND VALVES SHALL BE RESTRAINED PER THE RESTRAINT LENGTH TABLES.
3. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH OR STRUCTURAL BACKFILL.
4. KEEP CONCRETE CLEAR OF JOINT, BOLTS, NUTS, CLAMPS, AND OTHER ACCESSORIES.
5. THRUST BLOCKS SHALL NOT E LOCATED OR SIZED TO ENCASE ADJACENT PIPES OR FITTINGS.
6. A BOND BREAKER SHALL BE PLACED BETWEEN THE PIPE AND THRUST BLOCK.



- DEPTH REQUIREMENTS: BLOCK HEIGHT (h) SHALL BE EQUAL TO OR LESS THAN 1/2 THE TOTAL DEPTH TO THE BOTTOM OF THE BLOCK (H), BUT NOT LESS THAN THE PIPE DIAMETER
- BLOCK HEIGHT (h) SHALL BE 1/2 TO 1 TIMES ITS WIDTH

TYPICAL CROSS SECTION

TABLE 1 - BEARING AREA OF THRUST BLOCKS IN SQUARE FEET
(HORIZONTAL BENDS AND VERTICAL UPWARD BENDS)

	A1	A2			
FITTING SIZE (IN)	TEE, WYE PLUG OR CAP (SF)	90° BEND (SF)	45° BEND (SF)	22 1/2° BEND (SF)	11 1/4° BEND (SF)
4	1.4	2.0	1.1	1.0	1.0
6	3.2	4.5	2.4	1.2	1.0
8	5.7	8.0	4.3	2.2	1.1
10	8.8	12.5	6.8	3.4	1.7
12	12.7	18.0	9.7	5.0	2.5
14	17.3	24.5	13.3	6.8	3.4
16	22.6	32.0	17.3	8.8	4.4
18	28.6	40.5	21.9	11.2	5.6
20	35.3	50.0	27.1	13.8	6.9
24	50.8	72.0	35.0	19.9	10.0

HORIZONTAL BENDS AND VERTICAL UPWARD BENDS:

1. BEARING AREAS (TABLE 1) BASED ON TEST PRESSURE OF 150 psi. AN ALLOWABLE SOIL BEARING PRESSURE OF 2,000 psf AND A SAFETY FACTOR OF 1.5, TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING PRESSURES, USE THE FOLLOWING EQUATION:

BEARING AREA = (TEST PRESSURE / 150 psi) x (2,000 / SOIL BEARING PRESSURE psf) x (TABLE 1 VALUE)

2. UNLESS OTHERWISE NOTED ON THE GENERAL DRAWINGS IN THE GENERAL NOTES OR SPECIFICATIONS, USE SOIL BEARING PRESSURE = 2,000 psf FOR THIS PROJECT.
3. USE TEST PRESSURE OF 150 psi OR AS DETERMINED BY ENGINEER.
4. BEARING AREA OF THRUST BLOCK SHALL NOT BE LESS THAN 1.0 SQUARE FOOT.
5. IF THE DEPTH REQUIREMENT (SEE TYPICAL CROSS SECTION) CAN NOT BE ACHIEVED, THE ENGINEER SHALL BE NOTIFIED.

TABLE 2 - VOLUME OF THRUST BLOCK IN CUBIC YARDS
(VERTICAL DOWNWARD BENDS)

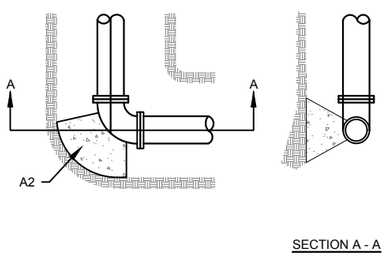
	V1				
FITTING SIZE (IN)	45° BEND (CY)	22 1/2° BEND (CY)	11 1/4° BEND (CY)	ROD SIZE	EMBEDMENT (FT)
4	0.5	0.3	0.1	#6	2.5
6	1.1	0.6	0.3	#6	2.5
8	2.0	1.1	0.5	#6	2.5
10	3.1	1.7	0.9	#6	2.5
12	4.4	2.4	1.2	#6	2.5
14	6.1	3.3	1.7	#8	3.0
16	7.9	4.3	2.2	#8	3.0
18	10.0	5.4	2.8	#8	3.0
20	12.3	6.7	3.4	#8	3.0
24	17.8	9.6	4.9	#8	3.0

VERTICAL DOWNWARD BENDS:

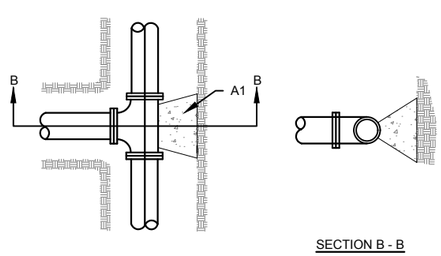
1. VERTICAL BENDS THAT REQUIRED A THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS. SEE DRAWINGS FOR VOLUMES SHOWN TO LEFT OF HEAVY BOLD LINE IN TABLE 2.
2. THRUST BLOCK VOLUMES (TABLE 2) FOR VERTICAL DOWNWARD BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED NO TEST PRESSURE OF 150 psi, THE WEIGHT OF CONCRETE = 4,050 LBS/CUBIC YARD, AND A SAFETY FACTOR OF 1.5. TO COMPUTE VOLUMES FOR DIFFERENT TEST PRESSURES AND CONCRETE WEIGHTS, USE THE FOLLOWING EQUATION:

VOLUME = (TEST PRESSURE / 150) x (4,050 / CONCRETE WEIGHT) x (TABLE 2 VALUE)

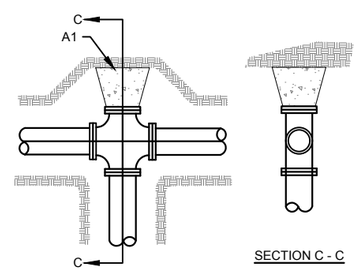
3. VOLUME OF THRUST BLOCK IN CUBIC YARDS FOR VALVES SHALL BE THE SAME VOLUME USED FOR 11 1/4 BENDS.



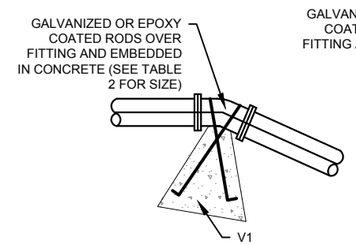
BEND



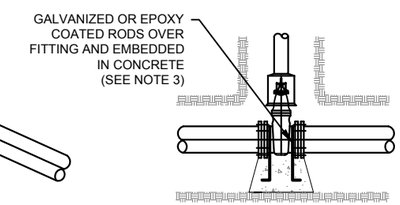
TEE



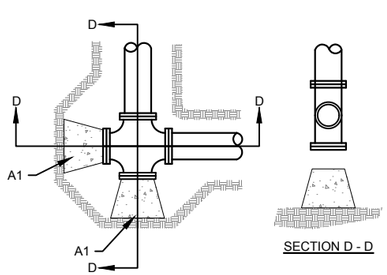
PLUGGED CROSS



VERTICAL DOWNWARD BEND



VALVE



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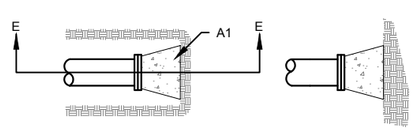
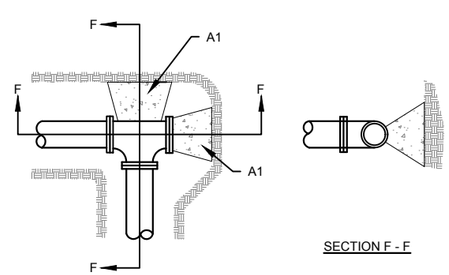
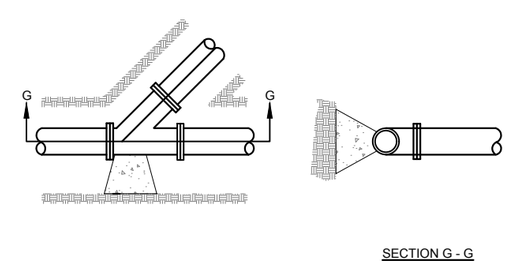


PLUG OR CAP



TEE PLUGGED ON RUN



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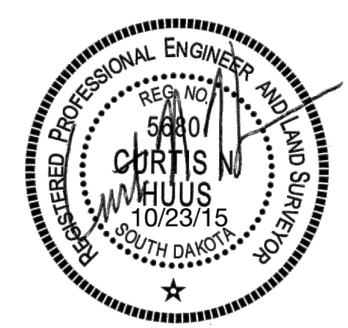

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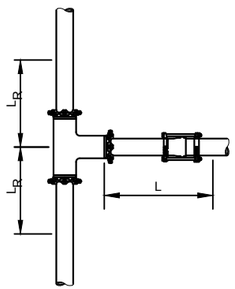
STANDARD DETAILS

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	23	26

Plotting Date: 10/15/2015

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
REG. NO. 5680
CURTIS N. HUUS
10/23/15
SOUTH DAKOTA



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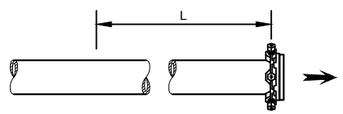
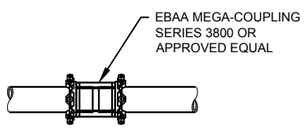
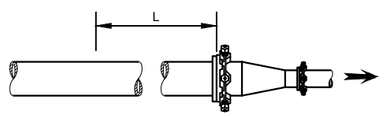


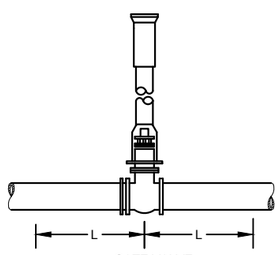
CAP/DEAD END/VALVE



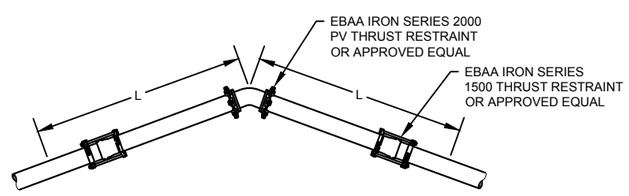
RESTRAINED COUPLING



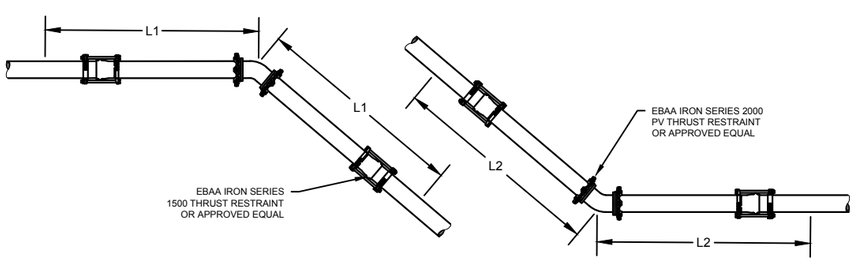
DECREASER



GATE VALVE

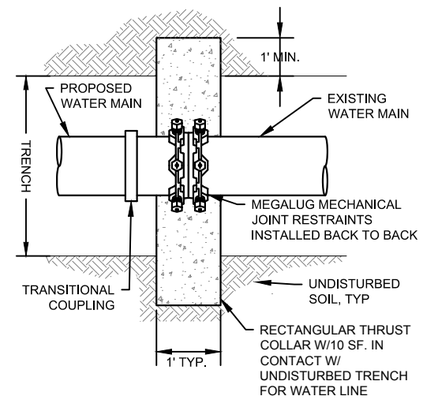


BEND

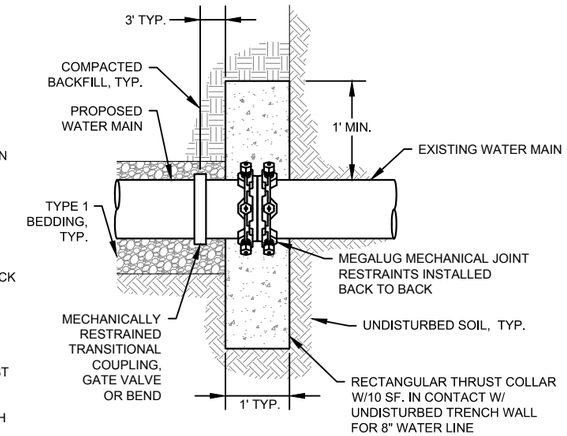


VERTICAL BEND RESTRAINT

THRUST RESTRAINT DETAILS
N.T.S



TOP VIEW



PROFILE VIEW

CONCRETE THRUST COLLAR DETAIL
N.T.S

JOINT RESTRAINT NOTES:

1. THE CONTRACTOR IS REQUIRED TO USE MECHANICAL JOINT THRUST RESTRAINT DEVICES INSTEAD OF CONCRETE THRUST BLOCKS FOR ALL BENDS, TEES, REDUCERS, CAPS, VALVES AND PIPE JOINTS AS REQUIRED. CONCRETE THRUST BLOCKS MAY BE REQUIRED IN SPECIAL CASES WHERE MAXIMUM RESTRAINED LENGTH CANNOT BE OBTAINED.

2. ALL FITTINGS, VALVES, AND PIPE JOINTS FROM THE TEE TO FIRE HYDRANT SHALL HAVE MECHANICAL JOINT THRUST RESTRAINTS.

3. MECHANICAL JOINT THRUST RESTRAINT FOR VERTICAL BENDS SHALL INCLUDE THE RESTRAINT OF ALL JOINTS WITHIN THE DESIGNATED LENGTH AS SHOWN ON THE PLAN AND PROFILE VIEW OF THE PLANS. MECHANICAL JOINT THRUST RESTRAINT SHALL BE INCIDENTAL TO THE PIPE AND/OR FITTINGS.

4. THE FOLLOWING TABLE GIVES THE REQUIRED LENGTH (L) FOR WATER MAINS TO BE RESTRAINED WITH MECHANICAL JOINT THRUST RESTRAINTS INCLUDING FITTINGS, VALVES, AND PIPE JOINTS.

RESTRAINT LENGTH TABLE

FITTING	L (FEET)	L_R (FEET)
8" - DEADEND	48	-
6" - DEADEND	37	-
8"X6" REDUCER	20	-
8"X4" REDUCER	35	-
8" - 45° BEND	7	-
8" - 90° BEND	16	-
8"X8" TEE	3	5
8"X6" TEE	5	5

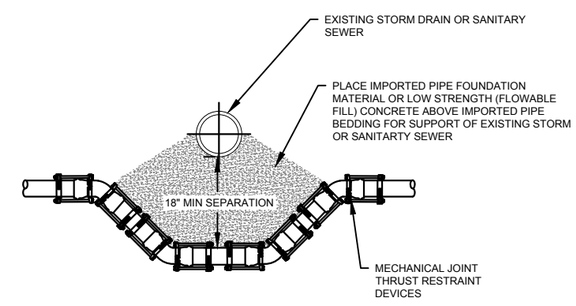
VERTICAL BEND RESTRAINT LENGTH

SIZE	L1 (FEET)	L2 (FEET)
8" 45° BEND	20	5
8" 22.5° BEND	10	3

DESIGN NOTE:

RESTRAINT CALCULATIONS ARE BASED UPON EBAA RESTRAINT DESIGN CALCULATION SOFTWARE VERSION 7.12 WITH THE FOLLOWING FACTORS:

SOIL TYPE	GP
SAFETY FACTOR	2.0
TRENCH TYPE	5
BURY DEPTH	6'
TEST PRESSURE	150 PSI



THRUST RESTRAINT FOR WATER MAIN FITTINGS
N.T.S

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STANDARD DETAILS

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CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	24	26

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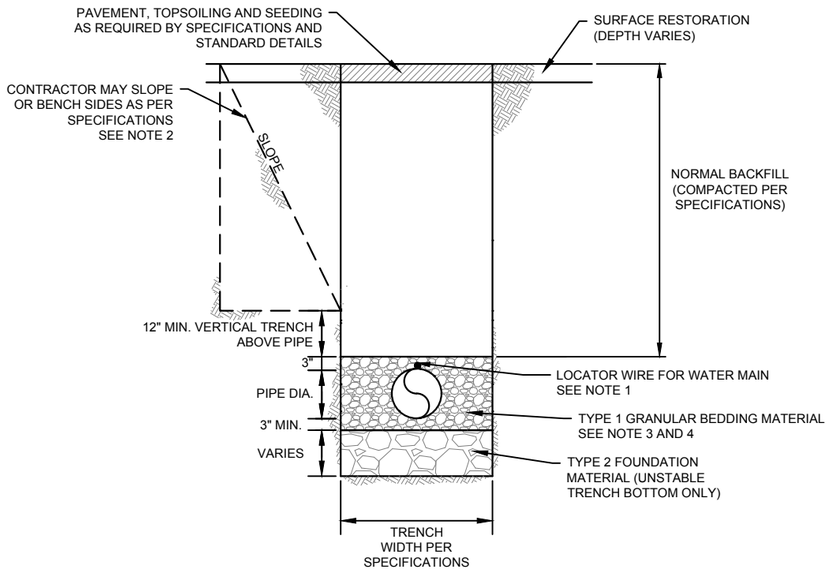
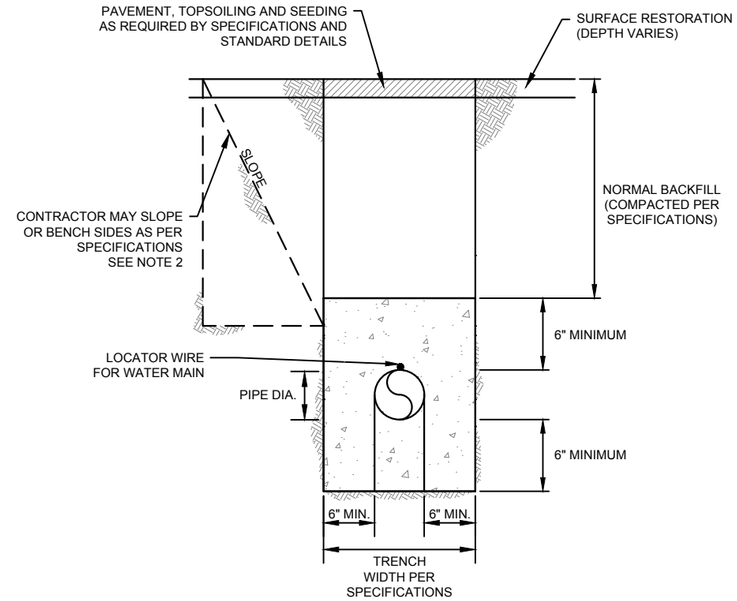
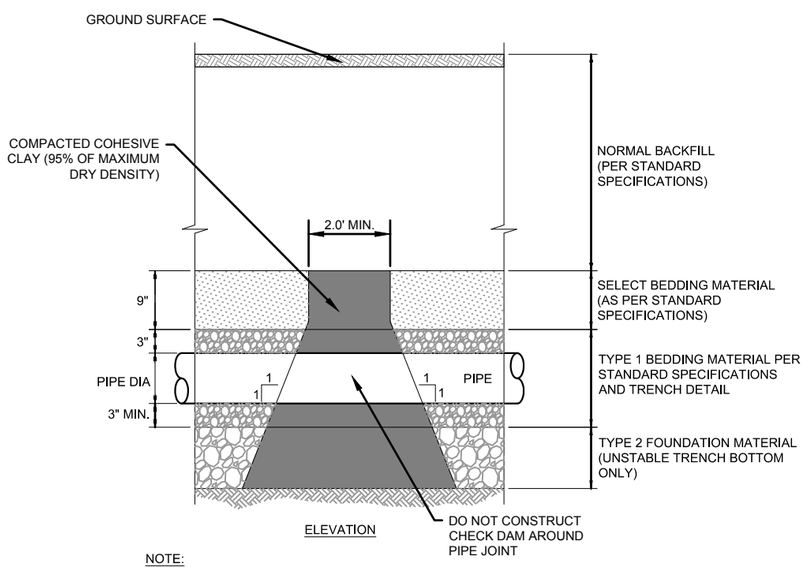


1. CONNECT LOCATOR WIRE TO EXISTING LOCATOR WIRE AT EXISTING CONNECTIONS.
2. THE CONTRACTOR SHALL UTILIZE A TRENCH BOX OR OTHER OSHA APPROVED SHORING METHODS TO MINIMIZE SURFACE RESTORATION REQUIREMENTS.
3. GRANULAR BEDDING 12" ABOVE ALL FITTINGS
4. GRANULAR BEDDING 3" ABOVE PIPE WITHIN STREET AREAS.

TRENCH DETAIL FOR WATER
N.T.S



PIPE ENCASEMENT
N.T.S

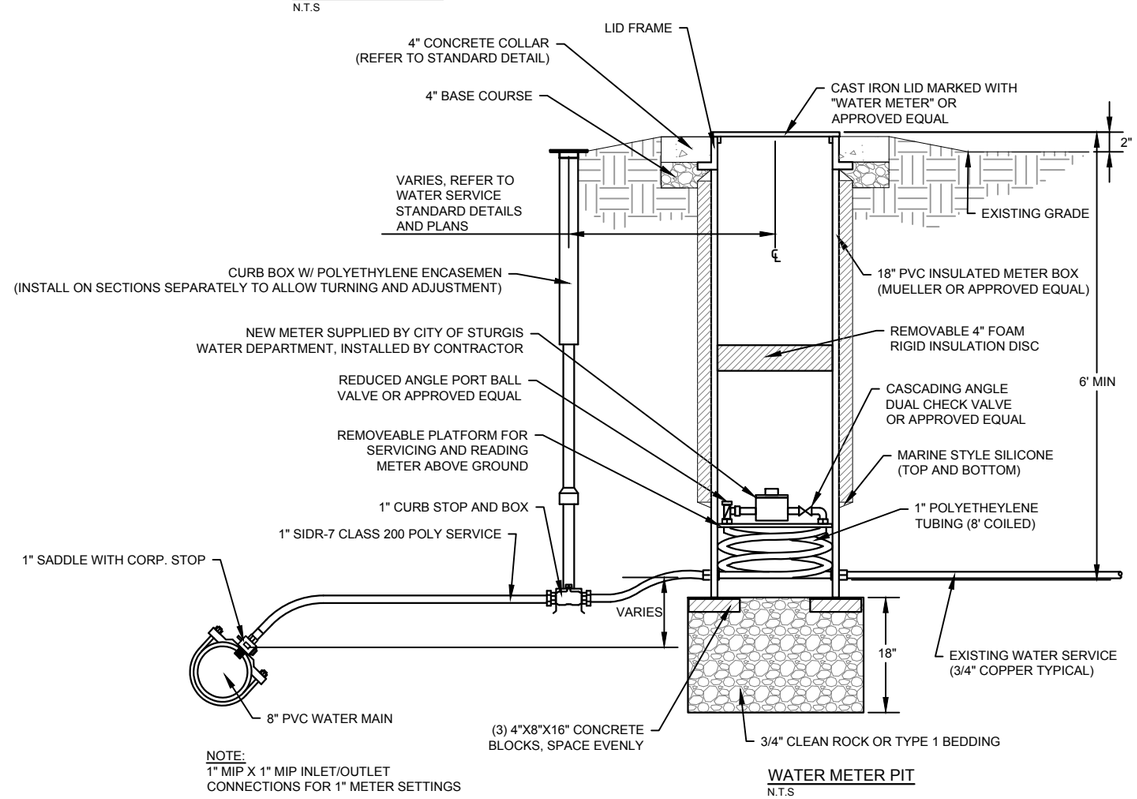


NOTE:

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.

TYPICAL TRENCH CHECK DAM DETAIL FOR WATER MAIN
N.T.S.



NOTES:

WATER METER PIT SHALL BE EQUIPPED TO PROVIDE LID MOUNTING OF REMOTE READ DEVICE. REMOTE METER READ POST SHALL NOT BE PROVIDED. CONTRACTOR TO PROVIDE WIRING AND INSTALLATION OF OWNER FURNISHED METER AND REMOTE READER. REMOTE READER TO BE INSTALLED ON UNDERSIDE OF LID BY CONTRACTOR PER METER PIT MANUFACTURER RECOMMENDATIONS. METER PIT AND LID SHALL BE PER THE SPECIFICATIONS.

NOTE:
1" MIP X 1" MIP INLET/OUTLET CONNECTIONS FOR 1" METER SETTINGS

WATER METER PIT
N.T.S

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STANDARD DETAILS

FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	25	26

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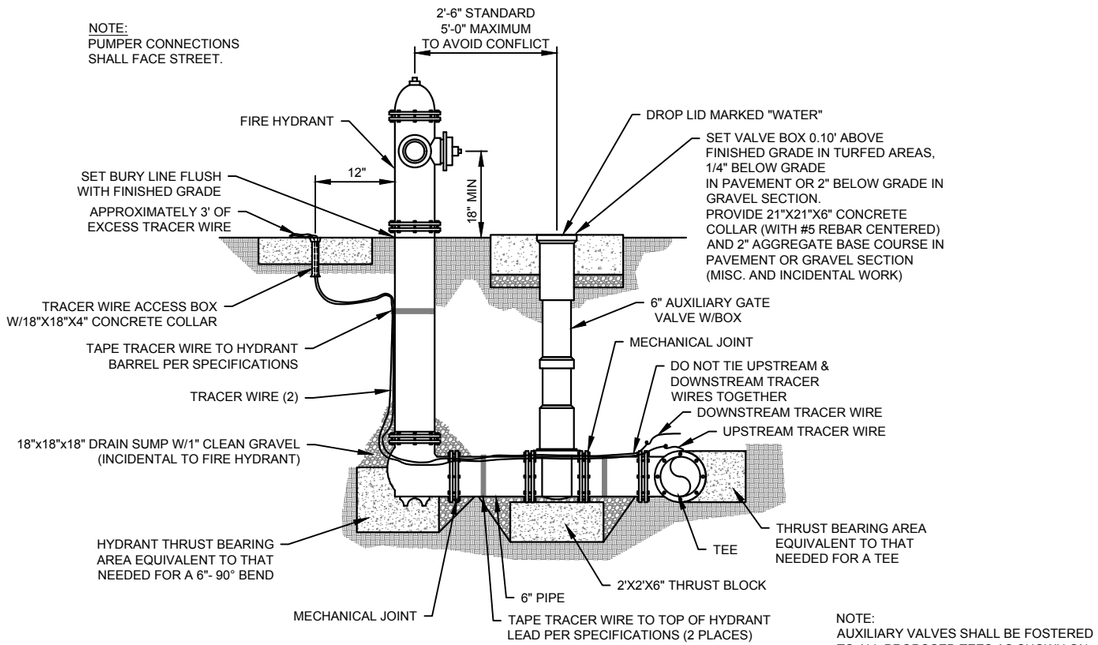
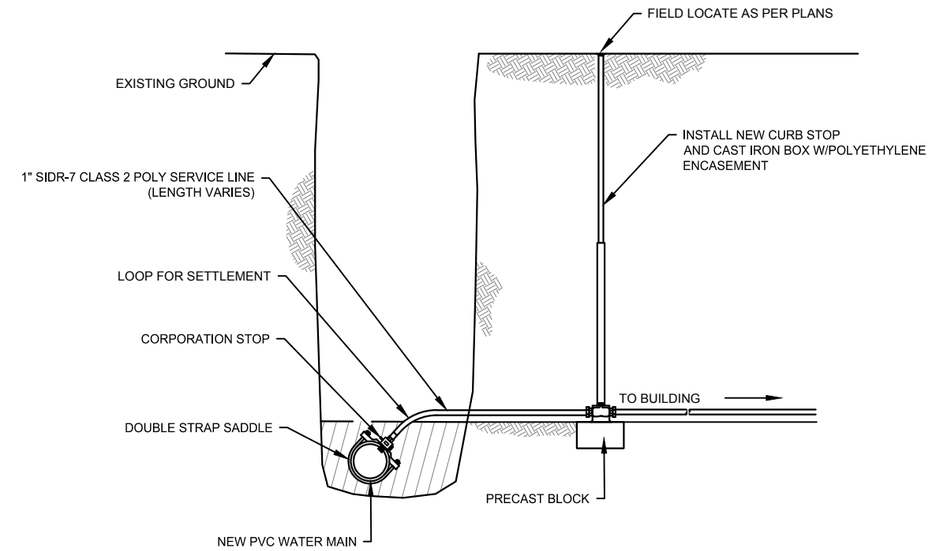
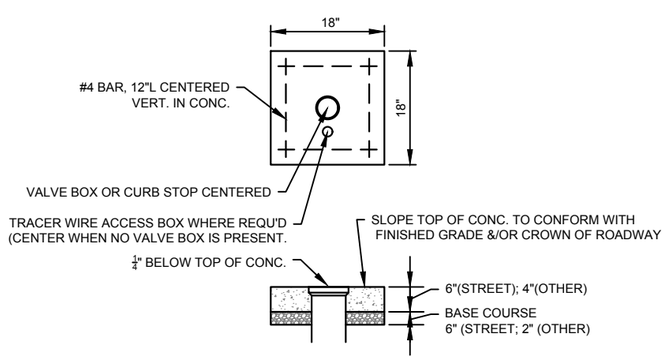


FIRE HYDRANT SETTING DETAIL W/THRUST BLOCKS
N.T.S

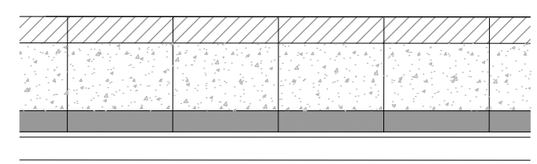
NOTE:
AUXILIARY VALVES SHALL BE FOSTERED TO ALL PROPOSED TEES AS SHOWN ON THE PLANS OR INSTALLED AS CLOSE TO THE MAIN ON THE HORIZONTAL PORTION OF THE LEAD AS POSSIBLE. ALL JOINTS SHALL BE RESTRAINED.

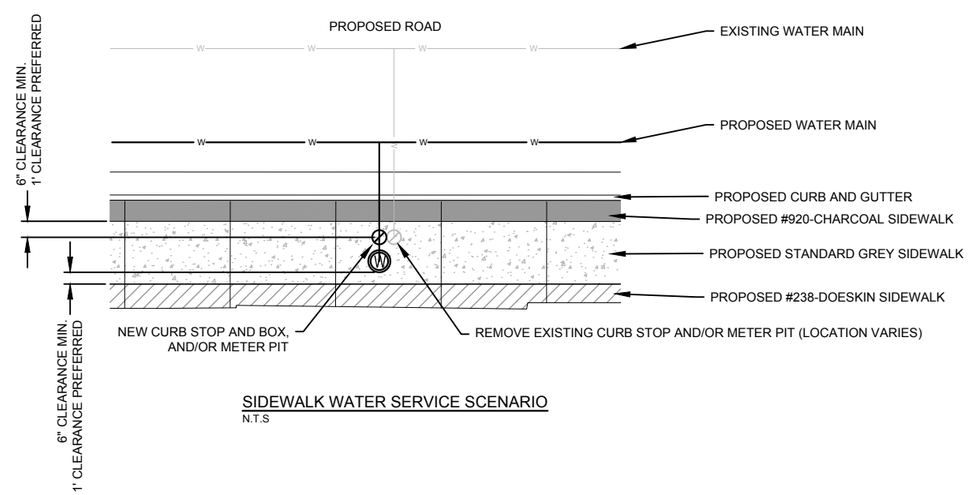


TYPICAL WATER SERVICE CONNECTION
N.T.S

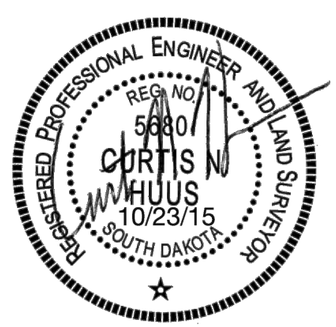


VALVE BOX COLLAR
N.T.S





SIDEWALK WATER SERVICE SCENARIO
N.T.S



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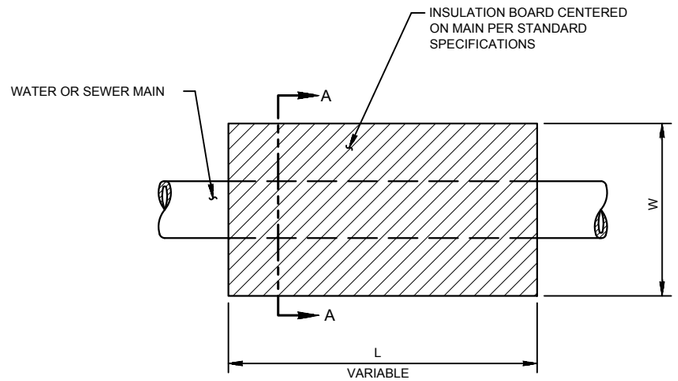
STANDARD DETAILS

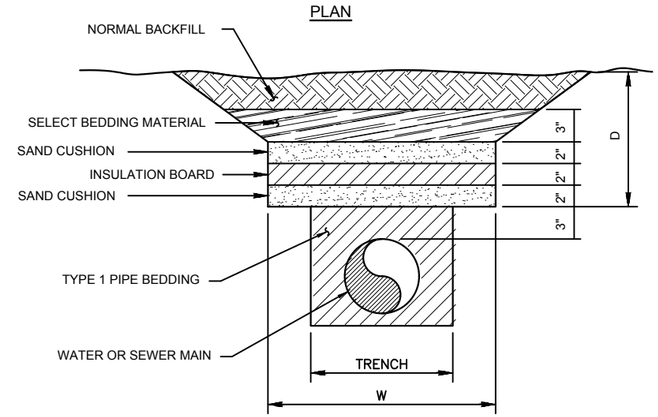
FOR BIDDING PURPOSES ONLY

CITY OF STURGIS	PROJECT	SHEET	TOTAL SHEETS
	14.2030.C02	26	26

Plotting Date: 10/15/2015



PLAN



SECTION A-A

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.

WATER INSULATION DETAIL

N.T.S

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