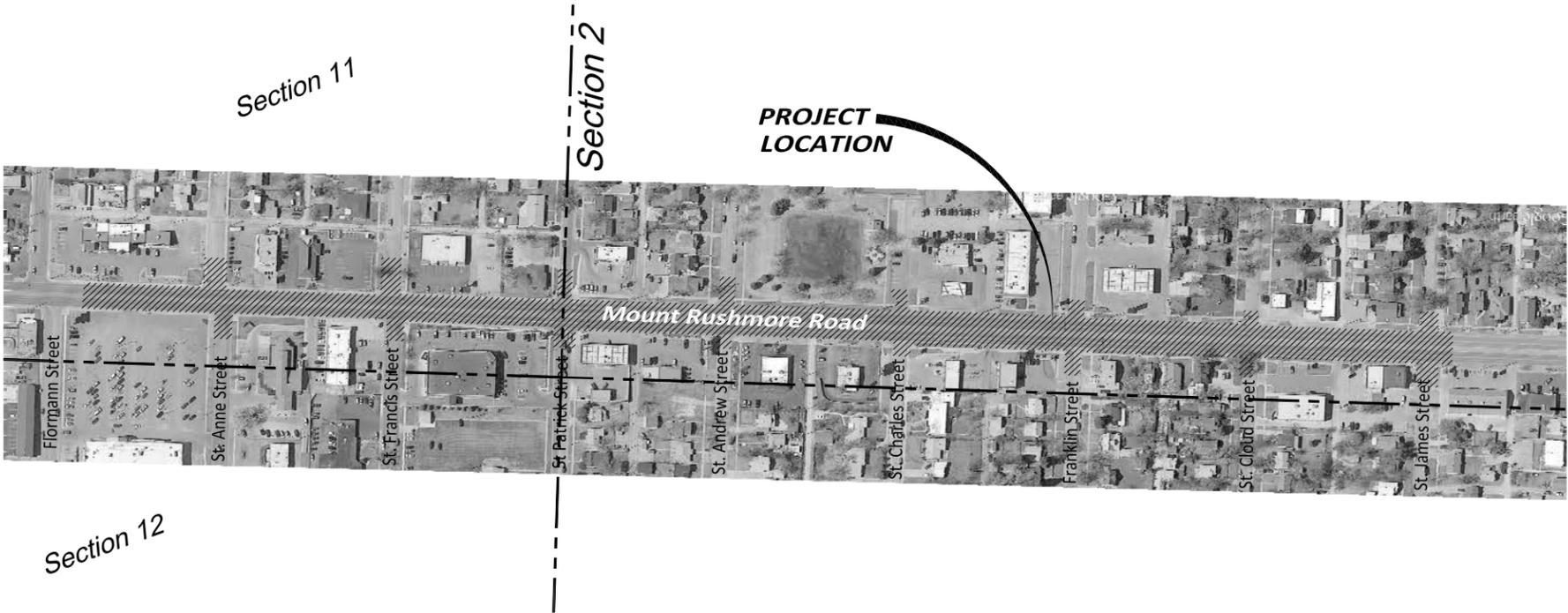


# SECTION H LANDSCAPING PLANS



PROJECT LOCATION MAP



**INDEX OF SHEETS**

SHEET NUMBER	DESCRIPTION
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H1.10	RAIN GARDEN DETAILS
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H2.2	IRRIGATION SPECIFICATIONS
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H2.10-H2.12	IRRIGATION DETAILS



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**811 Know what's below. Call before you dig.**  
 The locations of all existing utilities are shown in an approximate location. The Contractor is responsible for coordination and location of all existing utilities. Contractor is fully responsible for any and all damages resulting from the Contractor's failure to exactly locate and preserve any and all existing utilities.

Print Date: 8/19/2016  
 Plans Prepared For  
 Public Works Department  
  
 Engineering Services

**ESTIMATE OF QUANTITIES:**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
120E0010	Unclassified Excavation	100	CuYd
230E0020	Contractor Furnished Topsoil	150	CuYd
260E1010	Base Course	120	Ton
380E2574	4" Barrier Type Colored & Patterned Median PCC Pavement	390	SqYd
451E4901	Type 1 Bedding Material	41	Ton
530E0300	Type C Concrete Retaining Wall	64	Sqft
651E0750	5" Reinforced Colored Concrete Sidewalk	304	SqFt
680E0240	4" Corrugated Polyethylene Drainage Tubing	528	Ft
680E0440	4" Slotted Corrugated Polyethylene Drainage Tubing	175	Ft
735E0110	1 Gallon Perennial Plant, Furnish and Plant	289	Each
735E1205	1 Gallon Deciduous Shrub, Furnish and Plant	24	Each
735E1510	1 Gallon Coniferous Shrub, Furnish and Plant	96	Each
735E3010	Salvage, Store, and Replant Tree	2	Each
735E5010	1 Gallon Ornamental Grass, Furnish and Plant	70	Each
900E2030	Miscellaneous Work	2	Site
900E5156	3" Depth Shredded Bark Mulch	280	SqYd
900E5160	Planter	13	Each
900E5430	Irrigation System	1	LS

**SPECIFICATIONS FOR PLANTING SHRUBS**

This work consists of furnishing & planting shrubs, or perennials of the species & size specified along with furnishing and placing planting soil.

- A. Planting seasons shall be from April 15 to June 15 & from September 1 to November 1, unless otherwise coordinated. exceptions shall be coordinated with the owner.
- B. Contractor shall locate and protect all existing & new utilities. Contractor to repair or replace any damaged utilities at no cost to owner. Landscape Contractor shall coordinate with General Contractor prior to digging to verify safe digging locations. Trees to maintain a minimum of 10 feet from root ball to any utility.
- C. Plants furnished shall have been grown in western South Dakota or states located within the boundaries of Hardiness Zones 2, 3, or 4, as established by the United States Department of Agriculture. Submit to Owner proof of source of all plant material.
- D. All shrub locations shall be staked by contractor and approved by owner.
- E. Contractor is responsible for maintaining health of all plant material through final acceptance of project and the establishment period. Contractor shall take care as to not damage or disturb areas outside of the work limits. Any damage to these areas will be repaired at the expense of the contractor.
- F. Remove all surplus soil and waste material, including excess subsoil, unsuitable soil, trash, debris and legally dispose of these items off of the owner's property.
- G. Contractor will need to hand water at time of planting through establishment period to assure that all plant material is provided sufficient water.

**MATERIALS**

- A. Plant Materials (Nursery Stock) - Limitations on Source of Material - Plants furnished shall have been grown in a certified nursery located within western South Dakota or state located within the boundaries of Hardiness Zones 2, 3, or 4, as established by the USDA.
  - 1. Notification of Source of Supply & Verification of Origin as soon as possible. Prior to any planting, the Contractor shall furnish written notification of the location of the proposed source for each item of plant materials. Contractor shall furnish written verification from the supplier and grower to establish the origin of plant materials, seed, or vegetative material. The source of supply & origin of plant materials will be subject to approval.
  - 2. Names of Plants  
Plant materials furnished shall be of the genus, species, and variety specified and shall follow standard names of plant materials as adopted by the American Joint Committee on Horticultural Nomenclature and as this standard nomenclature is referred to in the current edition of Standardized Plant Names. Substitutions will not be permitted without the written consent of the Engineer.
  - 3. Form, Shape, and Condition of Plants  
Shrubs shall have been at least twice transplanted or root pruned and is heavily caned. Shrubs and perennials shall be number one (1), heavy-grade, nursery-grown stock, strong, healthy, clean, well-grown, free from insects, disease, rodents, mechanical injuries, disfiguring knots, sunscald, frost cracks, broken bark, broken or dead branches, broken

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Prepared For:  
 Public Works Department  
  
 Engineering Services

Scales: AS NOTED

Designed By: PHW  
 Drawn By: CHW  
 Design Date: August 2016  
 Print Date: August 23, 2016

Internal Job No: 11104.4

Surveyed By: KP/JC/DH/JD  
 Survey Date: 2012-2013

Project Number: 13-2139, CIP 50867, PCN X03L

FOR BIDDING PURPOSES ONLY

**MOUNT RUSHMORE ROAD  
UTILITY RECONSTRUCTION**

Sheet Title: MOUNT RUSHMORE RD  ESTIMATE OF QUANTITIES & PLANTING SPECIFICATIONS	Sheet No: H1.1  of 24
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roots, stubs, or any other objectionable features and shall possess a healthy, normal root system of sufficient size to permit successful establishment and good growth and shall be typical of the species or variety specified. All shrubs and perennials shall meet or exceed ANSI Z60.1-2004. Contractor shall notify landscape architect of planting schedule prior to planting. Landscape Architect shall review plant material prior to planting to determine plant health, vigor, size and root mass. If plant does not meet ANSI Z60.1-2004, plant will be rejected. Planting of out of specification plant material is not allowed without written authorization from the owner.

4. Size of Plants  
Plants shall be of uniform height and diameter meeting ANSI Z60.1-2004. All container grown plants shall be healthy, vigorous, well rooted, and established in the container in which they are growing. A container grown plant shall have a well established root system reaching the sides of the container to maintain a firm root ball, but shall not have excessive root growth encircling the inside of the container. Nursery Stock Plant materials shall be nursery grown unless otherwise specified, shall have been subjected to proper transplanting during growth in the nursery, shall bear evidence of proper top & root pruning, & shall be thrifty, well-grown, and hardy northern stock, grown under the same climatic conditions as exist at the location to be planted. Plants shall meet the standards as set forth in South Dakota Nursery Laws & in the edition of the American Standard for Nursery Stock. In all cases where grades are indicated in these standards, No. 1 or top grade will be required.

5. Labeling  
Legible labels must be attached to all specimens and or containers indicating the genus, species, size, grade, or age of each species or variety & the quantity contained.

6. Inspection, Certificates, and Rejection of Plants  
Before removal from the nursery, plant materials, must be inspected by authorized Federal or State authorities. Plants must be declared and certified free of diseases and insects, and necessary inspection certificates to this effect must accompany each shipment, invoice, or order of plants. Plants not approved by the Plant Industry Representative or Nursery Inspector or otherwise not meeting these specifications will be rejected. Rejected plants shall immediately be removed and disposed of by the Contractor and replaced with approved nursery stock of like variety, size, and age at no additional cost.

8. Planting Soil Placement shall conform to the requirements of Section 17 of CORC Standard Specifications. Contractors have 2 (two) options in regards to planting soil media. Contractor shall provide one of the following for planting media for the quantity listed on the estimate of quantities for the item Placing Contractor Furnished Topsoil to a depth indicated on the plans and details. Contractor shall indicate topsoil option selected along with supporting documentation or tests within the required landscape submittals. Depending on soil selected by contractor, additional information may be requested from owner and or landscape architect for review of topsoil. Contractor shall prepare the subsoil and remove all deleterious material, inorganic material and debris and all gravel, rocks and roots larger than 2" and loosen up the top 6" of subsoil. Contractor shall notify Landscape Architect and or Owner's Representative to observe planting pit prior to placement of planting soil media. Contractor shall finish the subsoil preparation by raking the area smooth and compact the subsoil not to exceed 65 percent compaction.

"Placing Contractor Furnished Topsoil" Options:  
Option 1: "Topsoil Blend" planter mix (see plans and details for depth) as produced by Waupaca Northwoods in Spearfish, SD. Contact Jane Damrau 715-258-1319 or jdamrau@waupacanorthwoods.com  
Option 2: Contractor provided, screened organic topsoil mixed with masonry sand and hardwood mulch by volume. Blended media shall be uniformly blended at a mix of 50% screened topsoil (meeting specifications below), 20% hardwood mulch by volume and 30% washed masonry sand. Mechanically screen soil media at a location approved by owner and delivered to site. Screened soil is subject to soil testing for organic matter. Soil shall be tested prior to blending. Contractor to coordinate the soil sampling and testing with Landscape Architect. The pH shall be based on the specific plant requirements but must be within the range of 5.5-6.5. Soluble salts shall not exceed 4mmhos/cm, Calcium levels shall not exceed 2,000 parts per million. Organic Matter shall be greater than five percent. Screened organic soil shall be sandy loam topsoil free of roots, clods, and stones larger than 2" with 99% passing through a 1" screen. RC landfill compost or Wood Mulch is not permitted. Mechanically mix soil during topsoil screening process or via portable blender - do not mix in the planting pit. Washed masonry sand shall be 95% sand and meet the following sieve Very Coarse(1.0): 12.9, Coarse (0.5): 34.5, Medium (0.25): 31.8, Fine (0.15): 11.4, Very Fine (0.05): 4.7. Hard wood mulch shall be pine bark mulch nuggets that have aged (stockpiled) at least one year. Contractor shall submit 1 gal samples of screened soil, washed masonry sand and hardwood mulch. Landscape Architect to review samples.

**CONSTRUCTION REQUIREMENTS**

- 1. General  
The digging, transporting, storing, layout, planting, pruning, watering, mulching, wrapping, staking, maintenance, & replacement of plants shall be performed by a qualified nurseryman, landscape specialist or by experienced crews under the direct supervision of a qualified nurseryman or landscape specialist.
- 2. Staking and Layout of Planting  
Planting holes shall not be dug until all plant locations have been staked. Plan-shown locations, spacings, and quantities may be adjusted by the Engineer to suit field conditions.

- 3. Planting - General Requirements
  - 1. Notify the Engineer (1) week in advance of the beginning of the planting operation.
  - 2. The Contractor shall provide necessary safeguards to prevent accidents during the time the plant holes are open.
  - 3. Planting holes shall have vertical sides and flat bottoms. The holes shall be of sufficient diameter to provide for not less than 6 inches of topsoil backfill around the plant root ball. The hole shall be no deeper than the root ball is tall. Set the root ball on firm soil so that the top of the root ball will sit slightly higher than the final grade.
  - 4. Mixing Backfill Soil  
Planting Beds: Mixing, Preparation and installation of the topsoil shall be included in the "Placing Contractor Furnished Topsoil" bid item as this work is incidental to the "Placing Contractor Furnished Topsoil" bid item.

4. Care of Plants Prior to Planting  
When plants are taken from storage to the planting site, roots of plants shall be immersed in water immediately upon opening the bundle and kept in water until planted. The Contractor shall have sufficient tanks and pails to keep roots of plants from opened bundles in water until planted.

4. In transferring plants from the site of temporary storage to the planting site, only plants that can be planted in that day shall be transferred. Material not planted the day it is taken from storage shall be rewrapped in the approved manner or the roots kept immersed in water at the storage site until planted.

Bare roots shall not lie exposed to the sun or air.  
 5. Potted Plants  
Potted plant holes shall be dug as described in 74.3. All plants shall be removed from containers in a manner, which does not damage the root ball.

1. Holes shall be backfilled in not less than two (2) lifts, the first lift shall not exceed one half (1/2) total hole depth. Each lift shall be heel tamped.

6. Cultivation  
Shrub beds are to be cultivated as a unit two (2) feet on each side of rows before planting and the plants placed separately.

7. Watering  
All plants shall be thoroughly watered within four hours of planting & every seven days thereafter until a letter of acceptance for the project is received from the Engineer. Each plant shall receive the gal. equivalent on the size of the root ball planted, at each watering.

8. Mulching  
Mulch shall be placed between and around the plants within forty-eight (48) hours after planting and shall be applied uniformly to cover the cultivated areas inside dikes to a depth of three (3) inches. Mulch shall be pulled back a minimum of (1) foot from trunks and canes.

9. Cleanup  
When planting is complete, all debris shall be removed from the jobsite. All excess earth materials shall be graded or otherwise removed, damaged turf reseeded, & the area left in a neat, orderly condition.

10. Establishment Period  
An establishment period shall begin immediately after original planting is made and shall continue for one year. The plants shall be guaranteed during this period against defects, including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse, or damage by others, or unusual phenomena or incidents, which are beyond, landscape installer's control. Contractor shall be responsible for watering all plants until a letter of acceptance for the project is received from the Engineer.



11. Warranty  
The contractor shall provide a two (2) year warranty for all plant material including replacements within the warranty period. Warranty period commences at the substantial completion date. Warranty covers death, unsatisfactory growth (except for defects due to lack of adequate maintenance, neglect or abuse by owner, abnormal weather conditions, unusual for warranty period, or incidents such as damage due to vandalism, hail, fire, owner neglect or other circumstances that are out of the contractors control.) Warranted replacement plants shall be of same species and size.

12. Replacement of Plants  
The Contractor shall remove and replace perennials, shrubs, ornamental grasses or other plants found to be dead or in unhealthy condition during establishment period. The Contractor shall also plant missing shrubs, ornamental grasses or other plants and make replacements during growing season following end of establishment period, and furnish and plant replacements which comply with requirements shown and specified. The Contractor shall also replace plant material, which are in doubtful condition at end of the establishment period, unless, in the opinion of the Engineer, it is advisable to extend the establishment period for a full growing season. The Engineer will make another inspection at the end of the extended establishment period to determine acceptance or rejection. Only one (1) replacement will be required at the end of the establishment period, except for losses or replacements due to failure to comply with specified requirements.

**METHOD OF MEASUREMENT**

Quantities of each species or variety of plant material will be determined from count of each.

**BASIS OF PAYMENT**

Upon satisfactory completion of planting, payment will be made at the contract unit price per plant material. Payment will constitute full compensation for furnishing, transporting, handling, storing, planting, wrapping, pruning, watering, necessary excavation, disposal of surplus materials, and labor, equipment, tools, and necessary incidentals. **TREE PROTECTION ZONES AND PROCEDURES [Wilson Park Area]**

1. Tree protection fence shall be installed around the tree protection area prior to any site preparation or construction work and maintained throughout the entire project. All turf & landscape areas (outside of the defined work limits) in the Wilson Park area shall be undisturbed & protected. Contractor shall erect temporary fence at the canopy of existing trees in locations as identified on sheets H2.6 - H2.7. See Detail 5, sheet H1.9. These areas are to be undisturbed and protected. In areas where cuts are to be made for the installation of utilities, walls or irrigation repairs adjacent to the tree protection area, the affected trees shall be root pruned prior to excavation. Root pruning shall be done with a saw or similar tool that will minimize damage to remaining roots. Vehicular storage, equipment storage, material storage, washout activities, trenching, placement of fill material, removal of soil, or any other activities that may be detrimental to the health of the tree are strictly prohibited within the tree protection area. Pruning to provide clearance for structures, vehicular traffic, and construction equipment shall be performed under city forester supervision and shall conform to ANSI A300 of the American National Standards Institute (ANSI) tree pruning standards. Branching that is damaged by construction equipment shall be pruned within 24 hours of damage. Provide and install protective measures around trees (as detailed) that may be damaged by normal equipment movements on the site. The contractor shall include all materials and labor for furnishing, installing, maintaining and removing the Tree Protection Fencing in the Bid Item "Miscellaneous Work".

**MISCELLANEOUS WORK**

These areas are identified on the plans of the Section H plans where there is work within the canopy of an existing tree in Wilson Park Area.

1. Contractor shall fabricate a temporary rigid fence located at the perimeter of the existing tree canopy within the construction area. Fence shall be fabricated on site using 2x4 framing at the drip line of the existing trees. It is understood that there may need to be limited grading within the canopy of the trees. Contractor shall use care when working in these areas. All costs for furnishing, installing, maintaining, and removing the "Miscellaneous Work" shall be incidental to the contract unit price per site (Wilson Park Area) for "Miscellaneous Work".

**TABLE OF MISCELLANEOUS WORK**

Station	to	Station	Length
49+60.5 - 55' L	to	50+17.32 - 54' L	61 LF
50+37 - 58.5'L	to	51+58 - 87'L	150 LF
Total: 211 LF			

**SALVAGE, STORE, AND REPLANT TREES**

The trees shall be salvaged prior to the start of any unclassified excavation work. Trees to be salvaged, stored and replanted may be replanted the same day that removal occurs. If any damage occurs to the tree during salvaging, transporting or replanting, the Contractor shall replace the tree with the same type and diameter tree which was damaged.

**TABLE OF SALVAGE, STORE, AND REPLANT TREES**

Salvage Station	Replant Station	Quantity (Each)
48+56 - 88' L	Within Park (coord with Parks Dept)	1
48+57 - 122' L	Within Park (coord with Parks Dept)	1
Total: 2		

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Prepared For: Public Works Department  
Scale: AS NOTED  
Designed By: PHW  
Design Date: August 2016  
Internal Job No: 11104.4  
Surveyed By: KP/JC/DH/JD  
Project Number: 13-2139, CIP 50867, PCN X03L  
Drawn By: PHW  
Print Date: August 19, 2016  
Survey Date: 2012-2013

**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
UTILITY RECONSTRUCTION**

Sheet Title:	Sheet No:
MOUNT RUSHMORE RD	H1.2
PLANTING LEGEND	of
NOTES & SPECIFICATIONS	24

**PRECAST RAIN GARDEN SPECIFICATIONS**

Refer to South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions for further coordination.

**GENERAL NOTES**

The plan shows quantities of the Precast Rain Gardens. Costs for furnishing and installing Precast Rain Gardens shall be included in the bid item 900E5160 - Planter. If additions or reductions to the number of Precast Rain Gardens are ordered by the Engineer, compensation for the Precast Rain Gardens required to furnish & install or to delete Precast Rain Gardens will be made at the contract unit price per each Planter. Costs included in each 900E5160 - Planter shall include: Fabrication (including steel reinforcing) Furnishing, transporting, installing, doweling reinforcing bar for adjacent sidewalk & boulevard, installation of skate prohibitors, notching precast concrete, coring of precast for drainage piping & final clean up.

Each Rain Garden shall have 12" depth Type 1 Bedding Material placed at the bottom of the planter. Refer to the Precast Rain Garden Details & Sections for further information. If additions or reductions to the number of Precast Rain Gardens are ordered by the Engineer, Type 1 Bedding Material required for the Precast Rain Gardens will be made at the contract unit prices per ton for Type 1 Bedding Material. The contract unit price per ton includes furnishing and installation of Type 1 Bedding Material.

Each Rain Garden shall have 4" Slotted Corrugated Polyethylene Drainage Tubing placed within the Type 1 Bedding Material (drainage layer). To compensate for high flow events, the planter shall be installed with a 4" Corrugated Polyethylene Drainage Tubing to carry water to the adjacent storm sewer inlets. If additions or reductions to the number of Precast Rain Gardens are ordered by the Engineer, compensation for the 4" Slotted Corrugated Polyethylene Drainage Tubing and 4" Corrugated Polyethylene Drainage Tubing for the Precast Rain Gardens will be made at the contract unit price per foot for the corresponding corrugated polyethylene drainage tubing and shall include furnishing and installation of 4" Slotted Corrugated Polyethylene Drainage Tubing and 4" Corrugated Polyethylene Drainage Tubing. Care shall be taken to ensure positive drainage to the storm sewer inlets.

Each Rain Garden shall have 3" depth Shredded Bark Mulch placed on the finish soil of the planter. Refer to the Precast Rain Garden Details and Sections for further information. If additions or reductions to the number of Precast Rain Gardens are ordered by the Engineer, compensation for the 3" depth Shredded Bark Mulch required for the Precast Rain Gardens will be made at the contract unit price per square yard for 3" Depth Shredded Bark Mulch which includes furnishing and installation of 3" depth Shredded Bark Mulch.

If contractor chooses to install the planters as cast-in-place, the grades on top of the planter shall follow the profile of the adjacent sidewalk and be 6" above the sidewalk grade.



<b>PLANT SCHEDULE</b>			
SHRUBS	CODE	QTY	BOTANICAL NAME / COMMON NAME
	DEL RED	72	Delosperma dyeri 'Red Mountain' / Red Mountain Iceplant
	ECH BA9	18	Echinacea purpurea Balscanery / Purple Coneflower
	HEM PAR	69	Hemerocallis x 'Pardon Me' / Pardon Me Daylily
	JUN ICE	96	Juniperus horizontalis 'Icee Blue' TM / Icee Blue Juniper
	PAR RED	13	Parthenocissus quinquefolia 'Red Wall' TM / Virginia Creeper
	ROS F43	24	Rosa x 'Noare' / Flower Carpet Red Groundcover Rose
	RUD SUL	24	Rudbeckia fulgida sullivantii 'Little Goldstar' / Coneflower
	RUD SUM	48	Rudbeckia hirta 'Indian Summer' / Gloriosa Daisy
	SCH PRA	70	Schizachyrium scoparium 'Prairie Blues' / Little Bluestem Grass
	SED DA6	45	Sedum x 'Dazzelberry' / Dazzelberry Stonecrop

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

Scale: AS NOTED

Designed By: PHW  
 Design Date: August 2016  
 Internal Job No: 11104.4  
 Surveyed By: KP/JC/DH/JD  
 Project Number: 13-2139, CIP 50867, PCN X03L

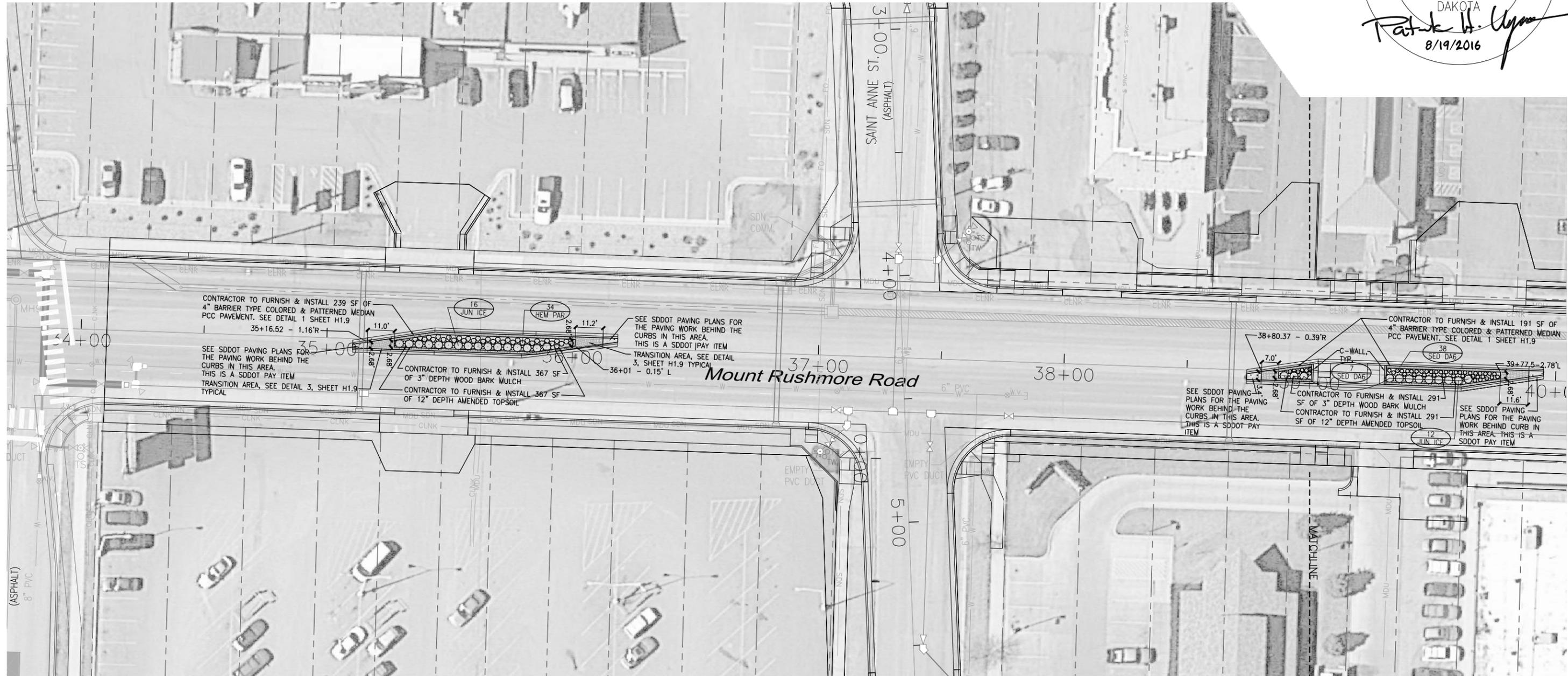
Drawn By: PHW  
 Print Date: August 19, 2016  
 Survey Date: 2012-2013

**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title:  
 MOUNT RUSHMORE RD  
 LANDSCAPE PLAN  
 STA 34+00 to 39+00

Sheet No:  
 H1.3  
 of  
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Install C-Wall at the following locations  
 39+00.71 - 3.34'L to 39+00.71 - 3.83' R (7.29' LONG)  
 39+30.38 - 3.83' L to 39+30.38 - 3.83' R (7.67' LONG)  
 C-Wall to be installed between the raised barrier median pavement. Coordinate with SDDOT plans.  
 SEE DETAIL 7 SHEET H1.9 FOR FURTHER COORDINATION

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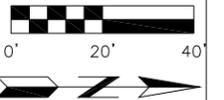
Prepared For:  
 Public Works Department  
  
 Engineering Services

Scale: AS NOTED  
 Designed By: PHW  
 Design Date: August 2016  
 Internal Job No: 11104.4  
 Surveyed By: KP/JC/DH/JD  
 Project Number: 13-2139, CIP 50867, PCN X03L  
 Drawn By: PHW  
 Print Date: August 19, 2016  
 Survey Date: 2012-2013

**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title:  
 MOUNT RUSHMORE RD  
 LANDSCAPE PLAN  
 STA 39+00 to 45+00  
 Sheet No:  
 H1.4  
 of  
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CONTRACTOR TO FURNISH & INSTALL 191 SF OF 4" BARRIER TYPE COLORED & PATTERNED MEDIAN PCC PAVEMENT. SEE DETAIL 1 SHEET H1.9

CONTRACTOR TO FURNISH & INSTALL 291 SF OF 3" DEPTH WOOD BARK MULCH

CONTRACTOR TO FURNISH & INSTALL 291 SF OF 12" DEPTH AMENDED TOPSOIL

SEE SDDOT PAVING PLANS FOR THE PAVING WORK BEHIND THE CURBS IN THIS AREA. THIS IS A SDDOT PAY ITEM

SEE SDDOT PAVING PLANS FOR THE PAVING WORK BEHIND CURB IN THIS AREA. THIS IS A SDDOT PAY ITEM

REGISTERED LANDSCAPE ARCHITECT

REG. NO.  
 4938  
 PATRICK H.  
 WYSS  
 SOUTH  
 DAKOTA

*Patrick H. Wyss*  
 8/19/2016

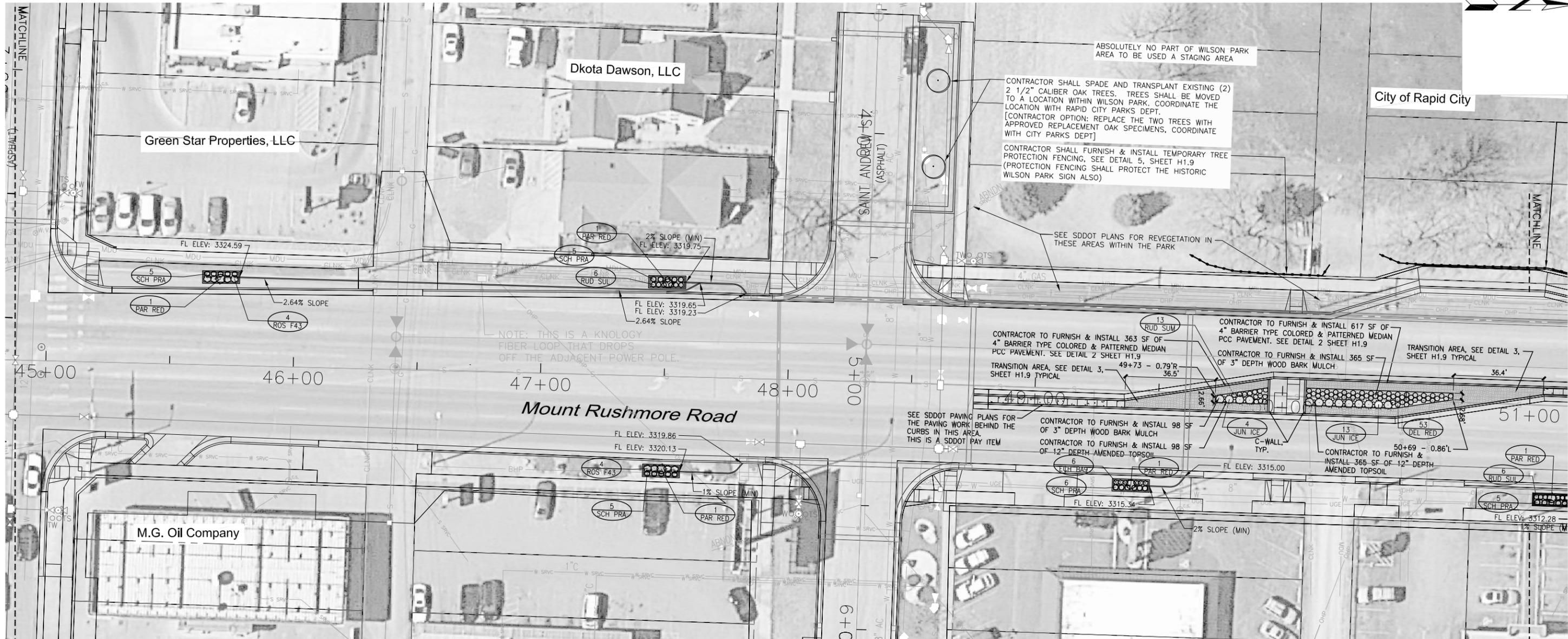
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Prepared For: **Public Works Department**  
 Scale: **AS NOTED**  
 Designed By: **PHW**  
 Design Date: **August 2016**  
 Internal Job No: **11104.4**  
 Surveyed By: **KP/JC/DH/JD**  
 Project Number: **13-2139, CIP 50867, PCN X03L**

**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title: **MOUNT RUSHMORE RD  
 LANDSCAPE PLAN  
 STA 45+00 to 51+00**  
 Sheet No: **H1.5  
 of  
 24**



Install Miscellaneous Work [Temporary Tree Protection] at the Following Locations:  
 49+60.5 - 55'L to 50+17.5 - 54'L 61 LF  
 SEE DETAIL 5, SHEET H1.9 FOR FURTHER COORDINATION

Install Planter at the Following Locations:  
 45+70 - 32.98' L  
 47+50 - 35.62' R  
 47+50 - 35.58' L  
 49+40 - 35.67' R  
 SEE SHEET H1.10 FOR FURTHER COORDINATION

Install C-Wall at the following locations  
 49+94.79 - 6.56' L to 49+94.79 - 6.83' R (13.39' LONG)  
 50+08.81 - 6.83' L to 50+08.81 - 6.83' R (13.67' LONG)  
 C-Wall to be installed between the raised barrier median pavement. Coordinate with SDDOT plans.  
 SEE DETAIL 7 SHEET H1.9 FOR FURTHER COORDINATION



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

Scale: AS NOTED

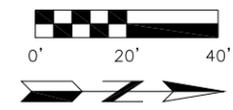
Designed By: PHW  
 Design Date: August 2016  
 Internal Job No: 11104.4  
 Surveyed By: KP/JC/DH/JD  
 Project Number: 13-2139, CIP 50867, PCN X03L

Drawn By: PHW  
 Print Date: August 19, 2016  
 Survey Date: 2012-2013

**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

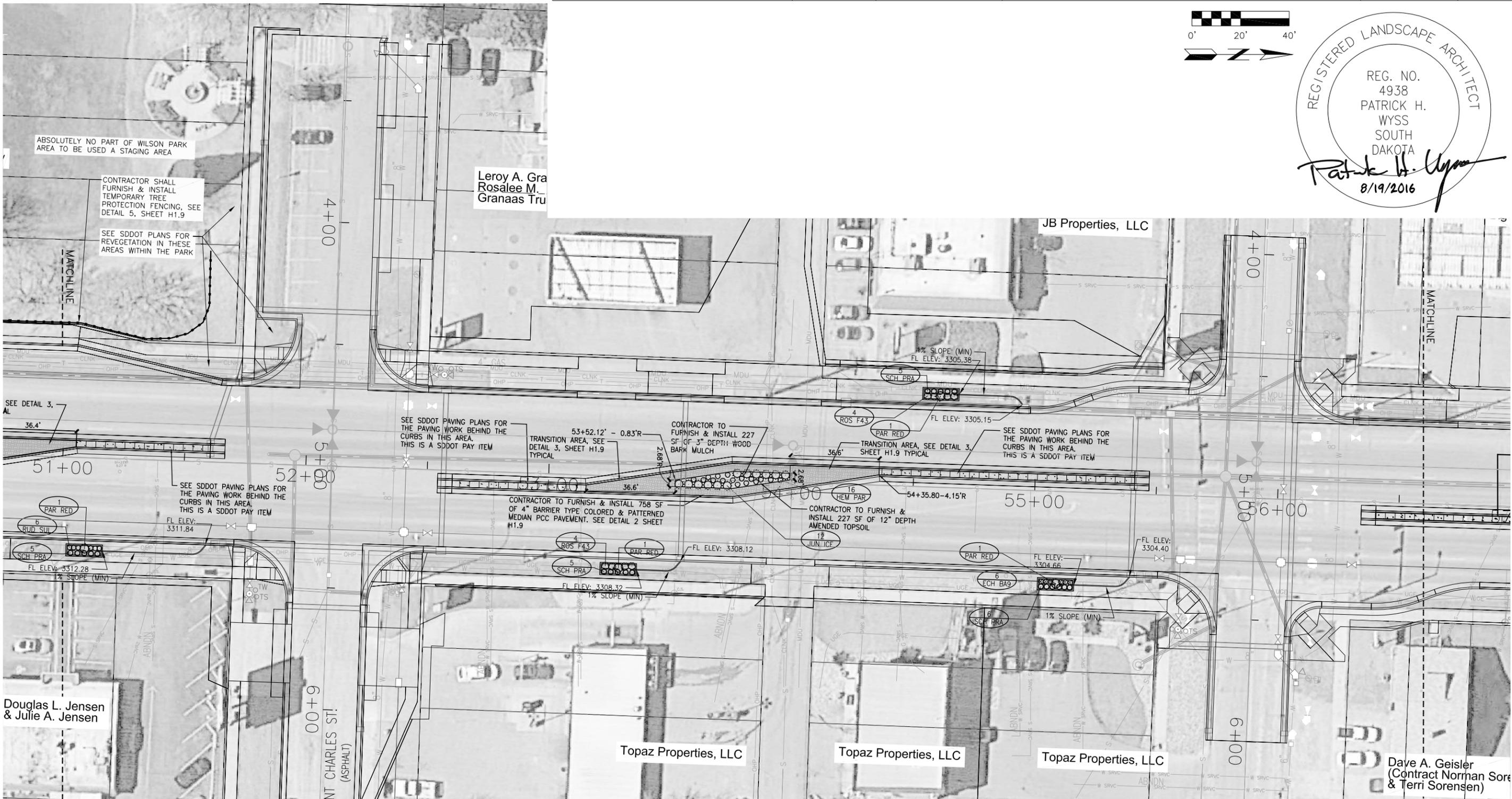
Sheet Title:	Sheet No:
MOUNT RUSHMORE RD	H1.6
LANDSCAPE PLAN	of
STA 51+00 to 56+60	24



REGISTERED LANDSCAPE ARCHITECT

REG. NO.  
4938  
PATRICK H. WYSS  
SOUTH DAKOTA

*Patrick H. Wyss*  
8/19/2016



Install Miscellaneous Work [Temporary Tree Protection] at the Following Locations:  
 50+37 - 58.5'L to 51+58 - 87'L 150 LF  
 SEE DETAIL 5, SHEET H1.9 FOR FURTHER COORDINATION

Install Planter at the Following Locations:  
 51+10 - 35.67' R  
 53+30 - 35.67' R  
 54+60 - 35.67' L  
 55+10 - 35.67' R  
 SEE SHEET H1.10 FOR FURTHER COORDINATION



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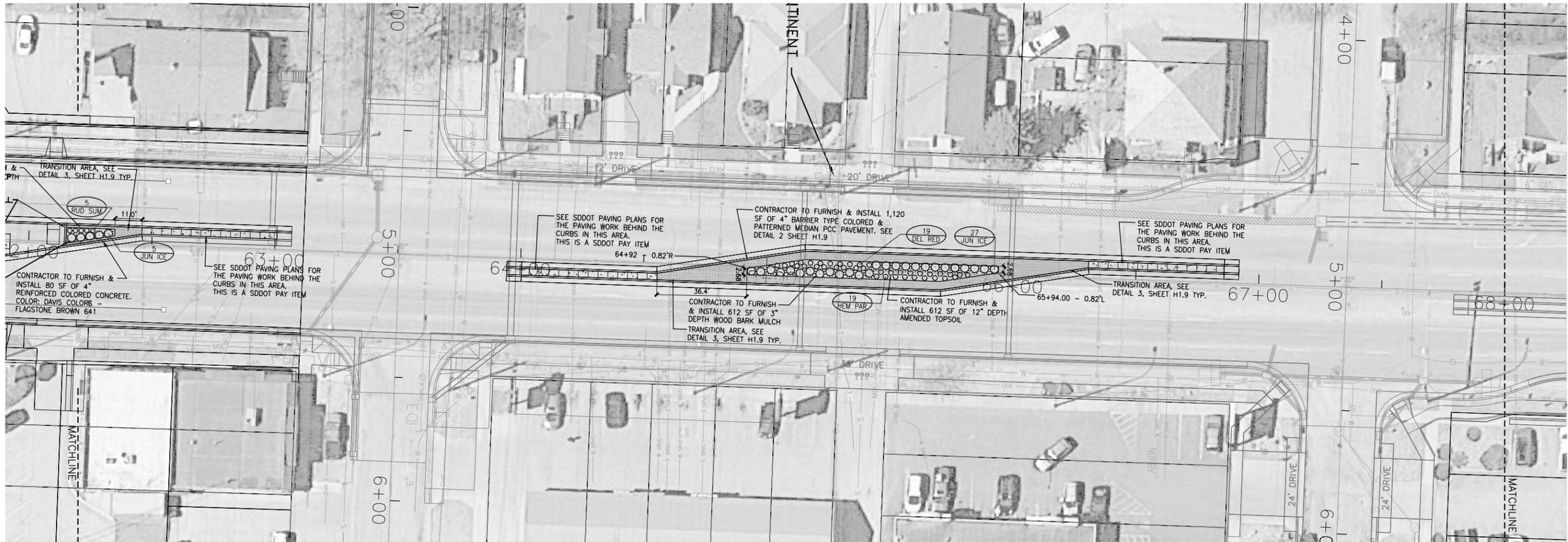
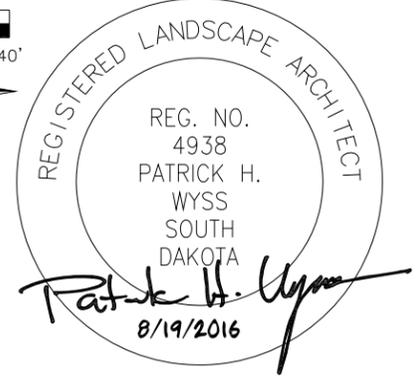
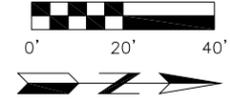
Prepared For:  
 Public Works Department  
  
 Engineering Services

Scale: AS NOTED  
 Designed By: PHW  
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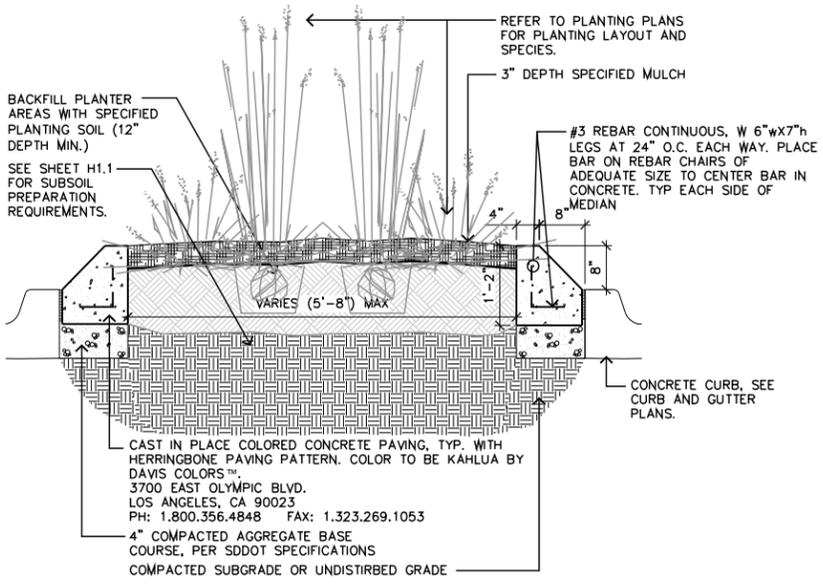
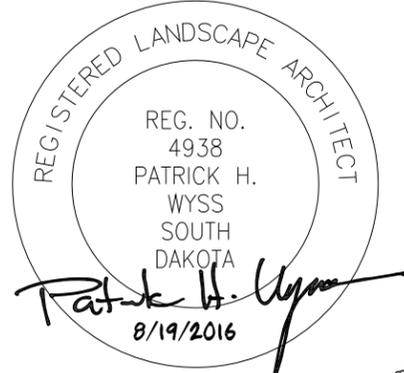
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**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

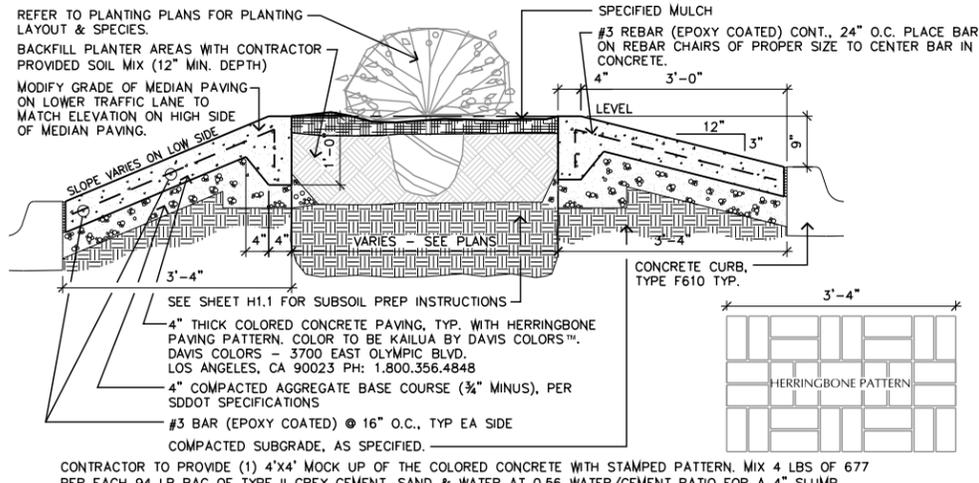
Sheet Title:  
 MOUNT RUSHMORE RD  
 LANDSCAPE PLAN  
 STA 62+20 to 68+00  
 Sheet No:  
 H1.8  
 of  
 24



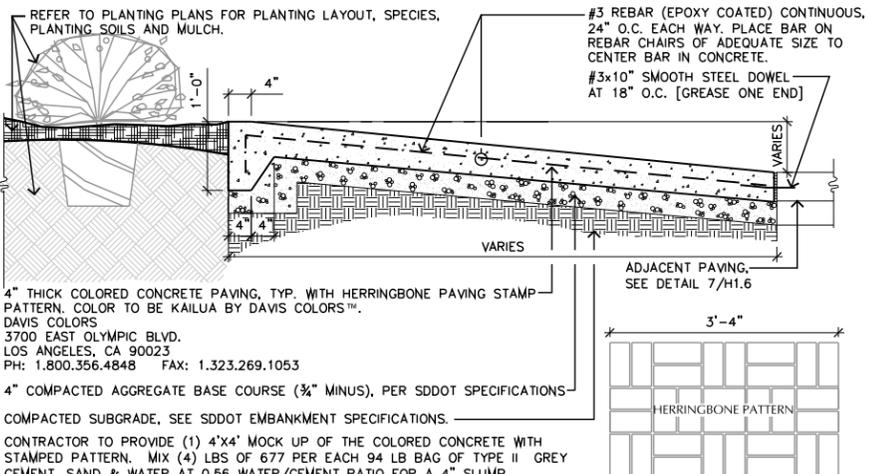
**FOR BIDDING PURPOSES ONLY**  
**MOUNT RUSHMORE ROAD**  
**UTILITY RECONSTRUCTION**



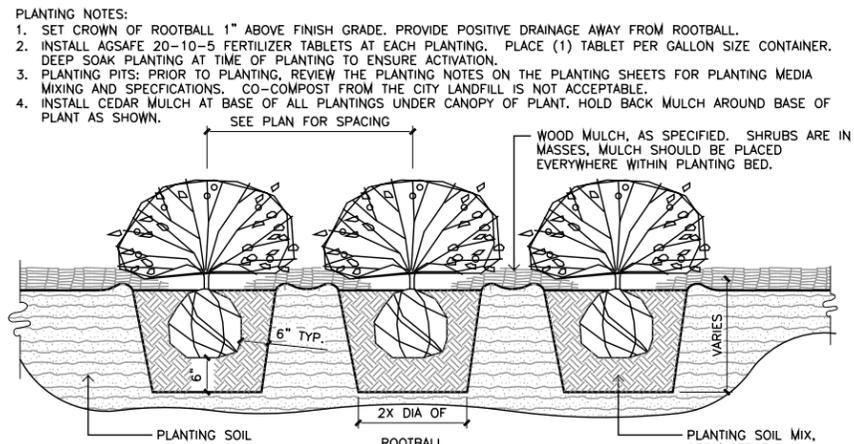
**1** DETAIL: CONCRETE PAVING & PLANTER AT NARROW MEDIAN  
 H1.9 SCALE: 3/4" = 1'-0"



**2** DETAIL: DECORATIVE CONCRETE PAVING PLANTER AT MEDIAN  
 H1.9 SCALE: 3/4" = 1'-0"

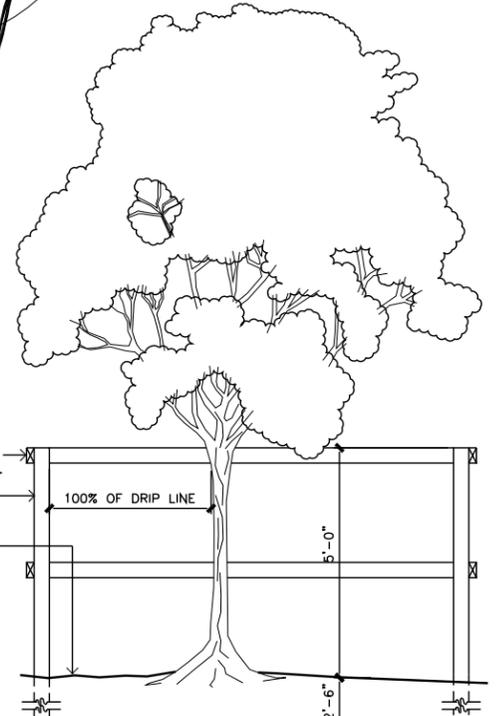


**3** DECORATIVE CONCRETE PAVING AND PLANTER AT MEDIAN  
 H1.9 SCALE: 3/4" = 1'-0"

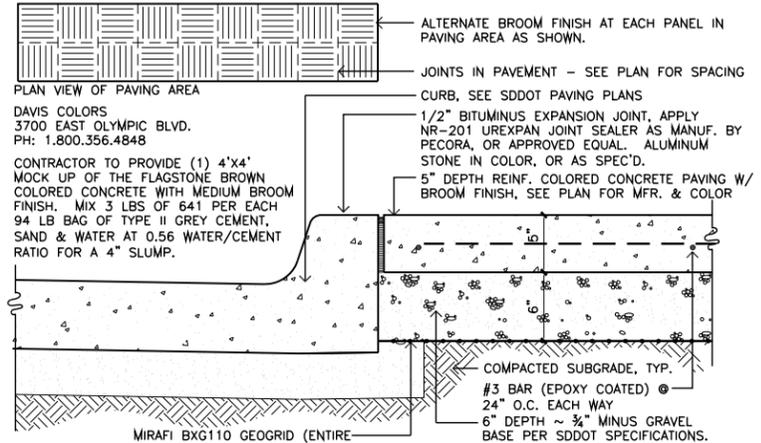


**4** SECTION: TYPICAL SHRUB PLANTING BED  
 H1.9 NO SCALE

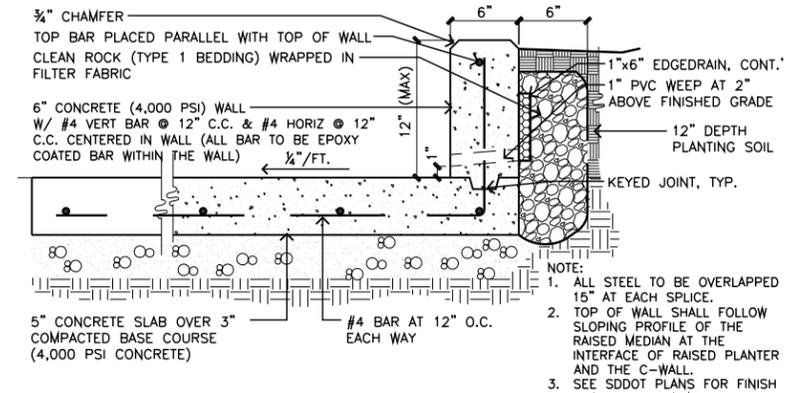
- NOTES:  
 1. TEMPORARY TREE PROTECTION BARRIER SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION OPERATIONS AROUND IDENTIFIED TREES AND UNDERSTORY TO REMAIN WITHIN THE LIMITS OF CONSTRUCTION AND SHALL REMAIN INTACT UNTIL COMPLETION OF CONSTRUCTION ACTIVITIES.  
 2. MINIMUM (4) POSTS PER TREE, ADDITIONAL POSTS MAY BE REQUIRED DEPENDING ON TREE CANOPY.  
 3. SECURE WOOD COMPONENTS WITH NAILS OR SCREWS FOR A SECURE CONNECTION  
 4. ALL COSTS ASSOCIATED TO THE TREE PROTECTION TO BE INCLUDED IN THE BID ITEM "MISCELLANEOUS WORK"  
 5. SEE TABLE ON SHEET H1.2 FOR LOCATIONS.



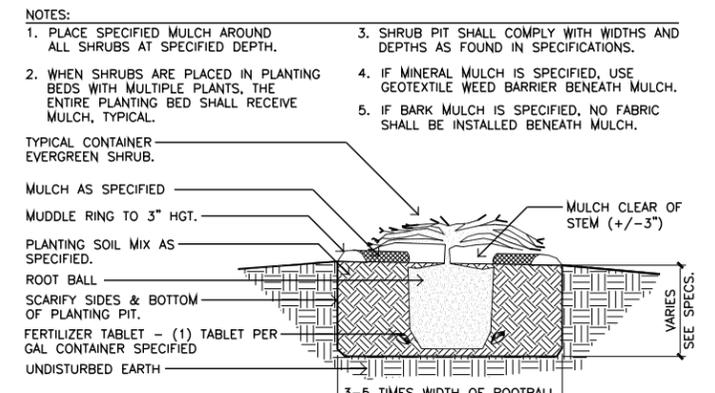
**5** DETAIL: TREE PROTECTION WITHIN CONSTRUCTION AREA  
 H1.9 SCALE: 1/2" = 1'-0"



**6** SECTION: MEDIAN PAVING AT R.O.W. CURB  
 H1.9 SCALE: 1 1/2" = 1'-0"



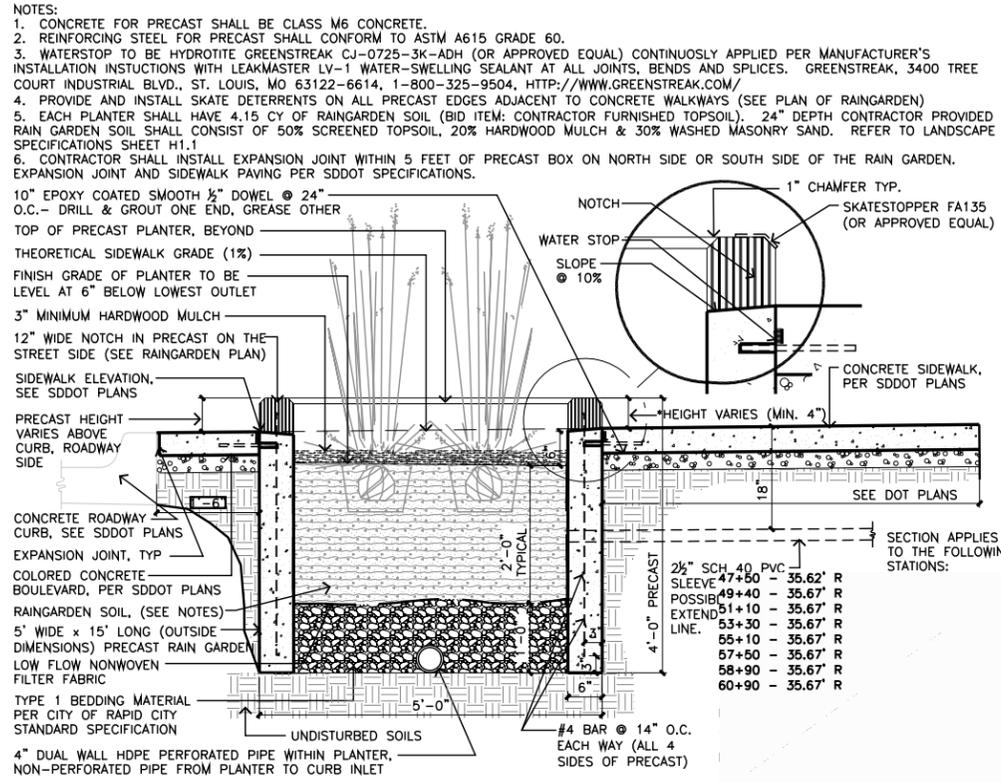
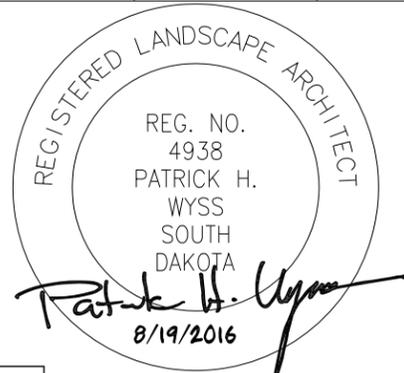
**7** SECTION: C-WALL CONSTRUCTION AT MEDIAN  
 H1.9 SCALE: 1 1/2" = 1'-0"



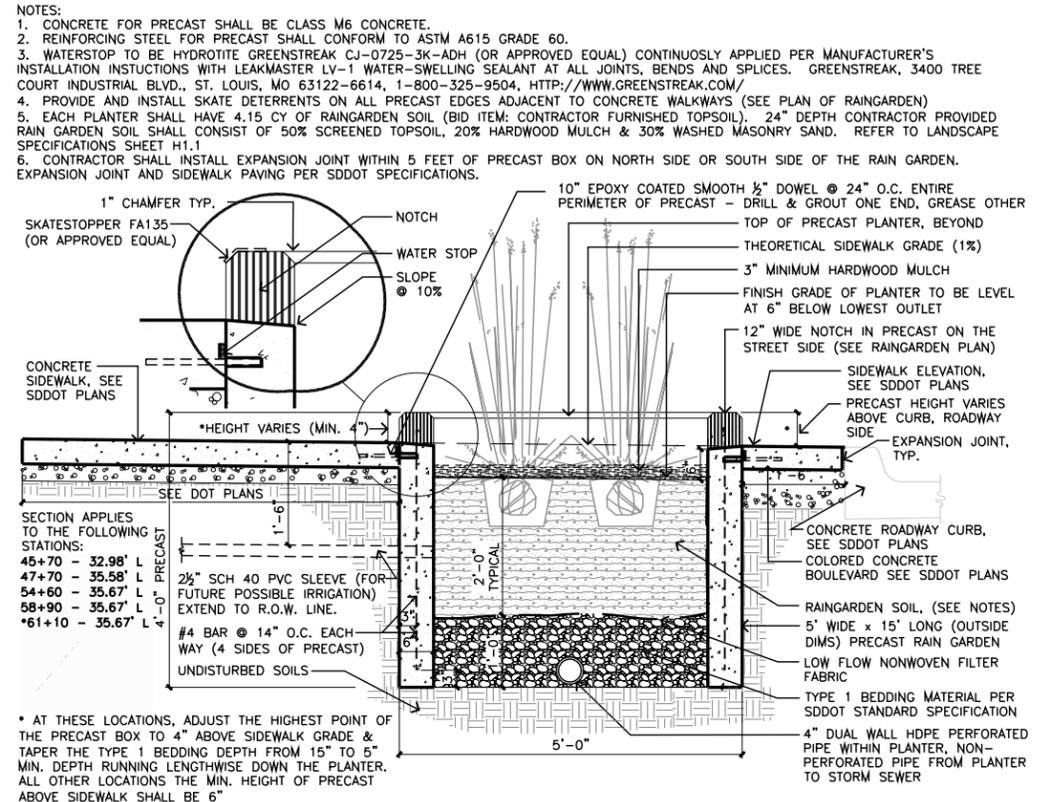
**8** SECTION: CONTAINER CONIFEROUS SHRUB  
 H1.9 NO SCALE

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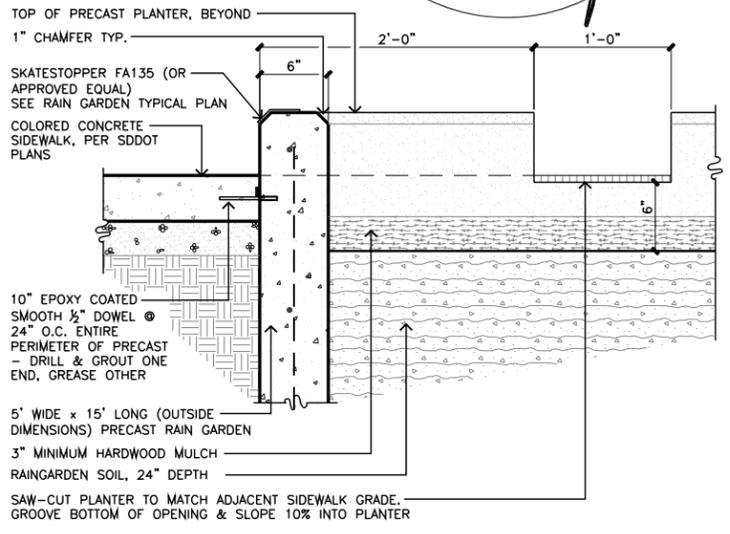
**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**



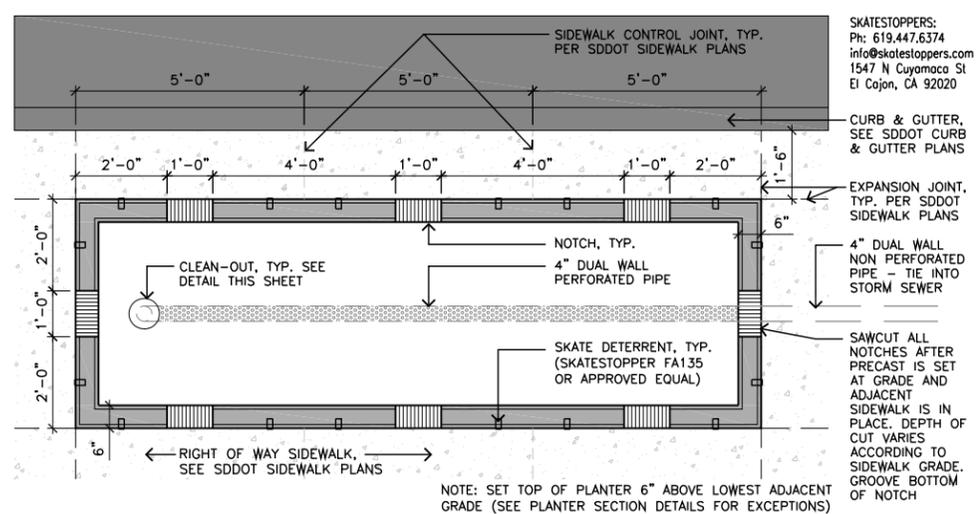
**1 SECTION: TYPICAL RAIN GARDEN PLANTER - RIGHT SIDE OF MT RUSHMORE ROAD**  
 H1.10 SCALE: 3/4" = 1'-0"



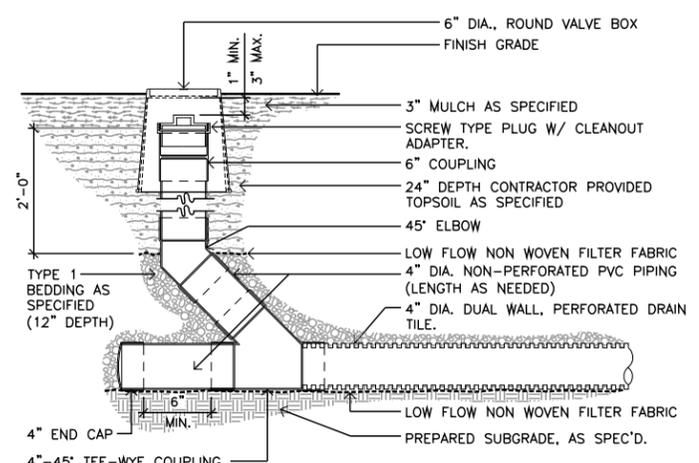
**2 SECTION: TYPICAL RAIN GARDEN PLANTER - LEFT SIDE OF MT RUSHMORE ROAD**  
 H1.10 SCALE: 3/4" = 1'-0"



**3 SECTION: CORNER OF RAINGARDEN**  
 H1.10 SCALE: 1 1/2" = 1'-0"

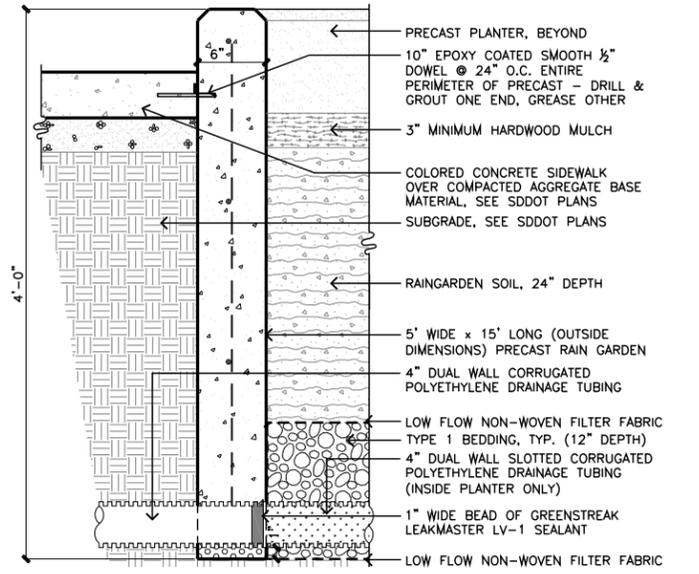


**4 PLAN: RAIN GARDEN PLANTER**  
 H1.10 SCALE: 1/2" = 1'-0"



**NOTES:**  
 1. ALL PIPE AND FITTINGS TO MEET ASTM F2648. PIPE SHALL HAVE A BUILT-IN BELL AND SPIGOT JOINT. ALL JOINTS SHALL BE SEALED BY HIGH-QUALITY, FACTORY-INSTALLED RUBBER GASKETS THAT MEET ALL THE REQUIREMENTS OF ASTM F477.  
 2. ELBOWS, COUPLINGS, CAPS, PLUGS AND VALVE BOX - INCLUDE THESE ITEMS IN THE BID ITEM "680E0440 - 4" Slotted Corrugated Polyethylene Drainage Tubing.

**5 SECTION: CLEAN-OUT FOR PERFORATED DRAINLINE**  
 H1.10 SCALE: 1 1/2" = 1'-0"



**6 SECTION: PIPE PENETRATION AT RAIN GARDEN**  
 H1.10 SCALE: 1 1/2" = 1'-0"

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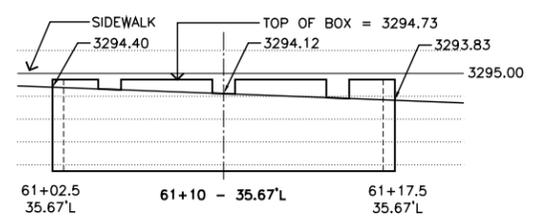
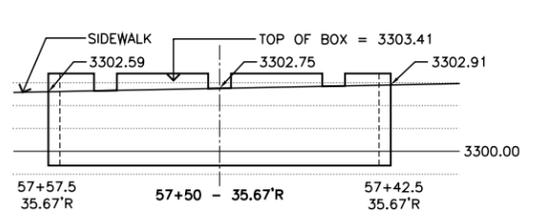
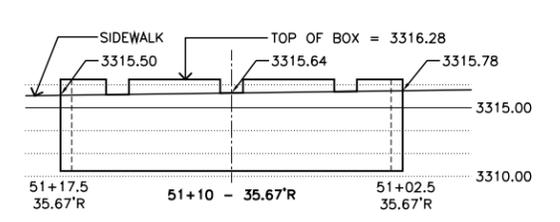
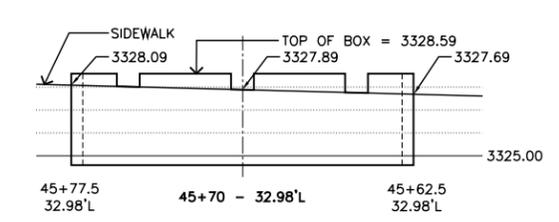
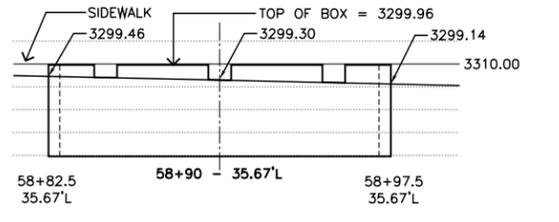
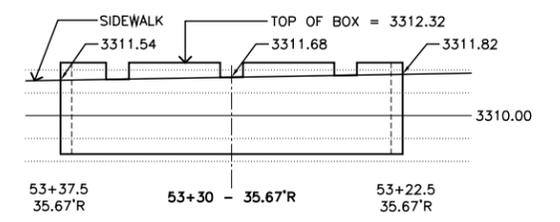
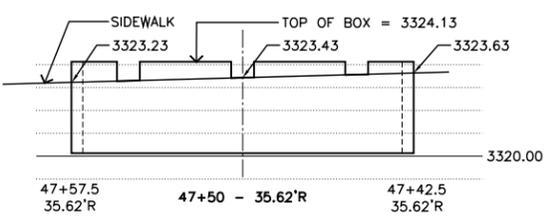
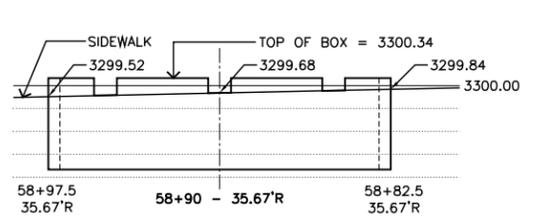
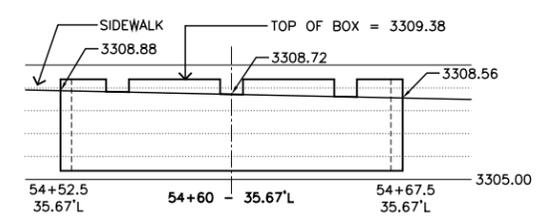
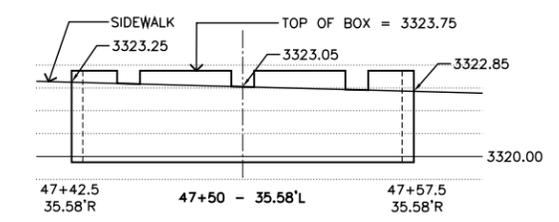
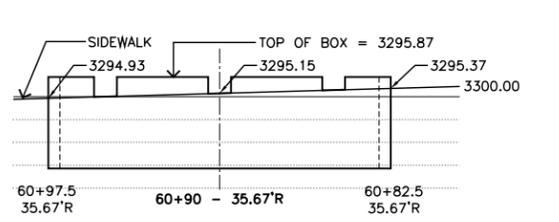
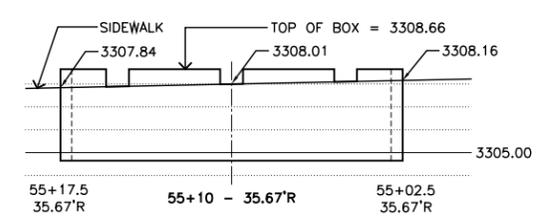
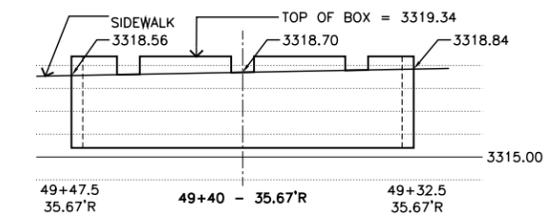
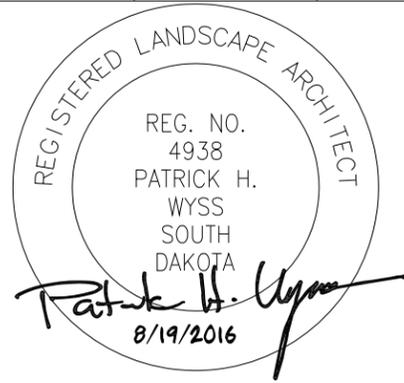
Prepared For:  
 Public Works Department  
  
 Engineering Services

Scale: AS NOTED  
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**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title:  
 MOUNT RUSHMORE RD  
 RAIN GARDEN  
 SECTIONS  
 Sheet No:  
 H1.11  
 of  
 24



GENERAL NOTES:  
 1. GRADES SHOWN ARE FOR GRADE AT BOULEVARD & PRECAST INTERFACE ON THE CURB AND GUTTER SIDE OF THE PRECAST RAIN GARDEN.  
 2. IF CONTRACTOR CHOOSES TO INSTALL THE PLANTERS AS CAST-IN-PLACE, THE GRADES ON TOP OF THE PLANTER SHALL FOLLOW THE PROFILE OF THE ADJACENT SIDEWALK AND BE 6" ABOVE THE SIDEWALK GRADE.

 SECTION: RAIN GARDEN LONGITUDINAL SECTIONS  
 SCALE: 1" = 4'

**IRRIGATION SPECIFICATIONS**

**PART 1: GENERAL**

This is a decoder based irrigation control system that has the ability to communicate with the City of RC Central Control System in the future.

1.00 This system is designed based on a minimum static operating pressure of 60 psi at the point of connection to the water main. Contractor shall verify pressure prior to construction & coordinate with owner if there is a discrepancy in the pressure.

1.01 SCOPE: Furnish all labor, materials, supplies, equipment, tools, transportation, & perform all operation in connection with & reasonably incidental to the complete installation of the irrigation system, & guarantee/ warranty as shown on the drawings, the installation details, & as specified herein. Items of work specifically included are:

I. Procurement of all applicable licenses, permits, and fees.

II. Coordination of Utility Locates – One Call of South Dakota (1.800.781.7474).

III. Preparation of Record Drawings.

IV. Winterization and Spring Start-up.

V. Maintenance period.

**1.02 SUBMITTALS**

I. Deliver four (4) copies of all submittals to the Project Manager within 10 working days from the date of Notice to Proceed. Provide information in a 3-ring binder with table of contents and index sheet. Provide sections that are indexed for different components and labeled with the specification section numbered and the name of the component.

Submittals must be made for all the components on the material list. Indicate which items are being supplied on the catalog cut sheets when multiple items are shown on one sheet. Submittal package must be complete prior to being reviewed by the Project Manager. Incomplete submittals will be returned without review.

II. Materials List: Include sleeving, pipe, fittings, mainline components, sprinkler heads, valves, shop drawings and all other components shown on the drawings and installation details or described herein. Components such as pipe sealant, wire, wire connectors, ID tags, etc. must be included. Quantities of materials need not be included.

III. Manufactures' Data: Submit manufactures' catalog cuts, specifications, and operating instructions for equipment shown on the materials list.

IV. Shop Drawings: If Required, Submit shop drawings called for in the installation details. Show products required for proper installation, their relative locations, and critical dimensions. Note modifications to the installation detail.

**1.03 RULES AND REGULATIONS**

I. Work and materials shall be in accordance with the latest edition of the National Electric Code, the Uniform Plumbing Code as published by the Western Plumbing Officials Association, City of Rapid City and Construction Specifications, and applicable laws and regulation of the governing authorities.

II. When the contract documents call for materials or construction of a better quality or larger size than required by the above-mentioned rules and regulations, provide the quality and size required by the contract documents.

III. If quantities are provided either in these specifications or on the drawings, these quantities are provided for information only, it is the Contractor's responsibility to determine the actual quantities of all material, equipment, and supplies required by the project and to complete an independent estimate of quantities and wastage.

IV. Notify Project Manager in writing prior to construction about discrepancies between contract documents and existing site conditions or manufacturer's specific recommendations for use or their product.

V. Contractor is responsible for damage to site amenities during construction. Replace damaged items with identical materials of equal value to match existing conditions. Make replacements at no additional cost to contract price. Penalty for specific damage: as valued by an independent auditor or as mutually agreed to by Owner and Contractor.

**1.04 QUALITY ASSURANCE**

I. Engage an experienced Installer who has completed irrigation work similar in materials, design, and extent to that indicated for this project and with a record of successful irrigation installations.

II. Installer's Field Supervision: Installer shall have their onsite supervisor, a person with minimum of three years' experience doing projects of similar scope and size. This person shall be on the project site full time when irrigation installation is in progress.

**1.05 TESTING**

I. Notify the Project Manager three days in advance of testing.

II. Pipelines jointed with rubber gaskets or threaded connection may be subjected to a pressure test at any time after partial completion of backfill. Pipelines jointed with solvent-welded PVC joints shall be allowed to cure at least 24 hours before testing.

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Prepared For:  Public Works Department  
 Scale: N/A  
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**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
UTILITY RECONSTRUCTION**

Sheet Title:	Sheet No:
MOUNT RUSHMORE RD	H2.1
IRRIGATION	of
SPECIFICATIONS	24

III. Subsections of mainline pipe may be tested independently, subject to the review of the Project Manager.

IV. Furnish clean, clear water, pumps, labor, fittings, and equipment necessary to conduct test or retests.

V. All costs, including travel expenses for site visits by the Project Manager or Consultant, for any re-inspection that may be required due to non-compliance with the Construction Documents shall be the sole responsibility of the Contractor.

VI. Hydrostatic Pressure Test (Solvent Weld Mainline Pipe)

1. Backfill to prevent pipe from moving under pressure. Expose couplings and fittings.
2. Expose all remote control valves their riser pipe and service tee fittings.
3. Purge air from mainline pipe before test. Attach pressure gauge to mainline pipe in test section.
4. Subject mainline pipe to a hydrostatic pressure equal to 140 PSI for two hours. Test with mainline components installed.
5. Observe pressure loss on pressure gauge. If pressure loss is greater than 5 PSI, identify reason for pressure loss. Visually inspect irrigation pipe for leakage and replace defective pipe, fitting, joint, valve, or appurtenance. Repeat test until pressure loss is equal to or less than 5 PSI.
6. Cement or caulking to seal leaks is prohibited.

VII. Volumetric Leakage Test (Mainline Pipe with Rubber Gaskets)

1. Backfill to prevent pipe from moving under pressure. Expose ALL fittings.
2. Purge air from pipeline before tests.
3. Provide all necessary pumps, bypass piping, storage tanks, meters, 3-inch test gauge, supply piping and fittings in order to properly perform testing.
4. Subject mainline pipe to 140 PSI for two hours. Maintain constant pressure.
5. Testing pump must provide a continuous 140 PSI to the mainline. Allowable deviation in test pressure is 5 PSI during test period. Restore test pressure to 140 PSI at end of test.
6. Water added to mainline pipe must be measured to the nearest 0.10 gallons.
7. Use the following table to determine maximum allowable volume lost during test:

Pipe Size (INCHES)	Leakage Allowable (Gallons per 100 joints/Hour)									
	60	70	80	90	100	110	120	130	140	
2" & 3"	0.48	0.51	0.55	0.58	0.62	0.65	0.68	0.70	0.73	

VIII. Operational Test

1. Activate each remote control valve in sequence from controller. The Project Manager will visually observe operation, water application patterns, and leakage.
2. Replace defective remote control valves, solenoids, wiring, or appurtenance to correct operational deficiencies.
3. Replace, adjust, or move water emission devices to correct operational or coverage deficiencies.
4. Replace defective pipe, fittings, joint, valves, sprinkler, or appurtenance to correct leakage problems. Cement or caulking to seal leaks is prohibited.
5. Repeat test(s) until each lateral passes all tests. Repeat tests, replace components, and correct deficiencies at no additional cost to the Owner.

IX. Control System Acceptance Test

1. Upon completion of construction, a System Acceptance Test must be performed with Owner's representative present.
2. Following construction completion and a Review by the Project Manager, the Maintenance Period period will begin. After 30 days of continuous service without major system problems, the system will be accepted and the guarantee/warranty period will begin. If at any time during the 30 day evaluation period, a major system problem occurs, the source of the problem will be determined and corrected and the 30 day Maintenance period will start again. Equipment will not be accepted until such time as the System Acceptance Test is passed.
3. If successful completion of the System Acceptance Test is not attained within 90 days following commencement of the evaluation period, the Project Manager has the option to request replacement of equipment, terminate the order, or portions thereof, or continue

with the System Acceptance Test. These options will remain in effect until such time as a successful completion of the System Acceptance Test.

4. Final payment will be made after successful completion of the System Test.

X. Sensor Cable

1. Test for leaks to ground per manufacturer's recommendations. Test results must meet or exceed manufacturer's guidelines for acceptance.
2. Test cable for continuity if cable is being installed for future expansion of the irrigation system.
3. Replace defective wire, underground splices, or appurtenances. Repeat test until manufacturer's guidelines are met.

XI. Control System Grounding

1. Test for proper grounding of control system per manufacturer's requirements. Test results must meet manufacturer's guidelines for acceptance.
2. Replace defective wire, grounding rod, or appurtenances. Repeat the test until the manufacturer's guidelines are met.

XII. Mainline Pipe Tracing Wire

1. Test mainline pipe tracing wire for continuity.
2. Testing shall be conducted in the presence of the OWNER REP. Repair or replace defective tracing wire.
3. Testing shall be documented by the contractor & approved by the OWNERS REPRESENTATIVE.

XIII. Testing Review

1. Failure of initial testing review will require additional review.

**1.06 CONSTRUCTION REVIEW:**

I. The purpose of on-site reviews by the Project manager is to periodically observe the work in progress, the Contractor's interpretation of the construction documents, and to address question with regard to the installation.

II. Scheduled reviews such as those for irrigation system layout or testing must be scheduled with the Project Manager as required by these specifications.

III. Impromptu reviews may occur at any time during the project.

IV. A review will occur at the completion of the irrigation system installation and Project Record Drawing submittal.

**1.07 COORDINATION AND SCHEDULING**

I. The irrigation construction schedule is to be provided at the Pre-Construction meeting listing the dates the various stages of the project will start & when they will be completed.

**1.08 GUARANTEE/WARRANTY AND REPLACEMENT:**

- I. The purpose of this guarantee/warranty is to insure that the Owner receives irrigation materials of prime quality, installed and maintained in a thorough and careful manner.
- II. For a period of two years from the commencement of the formal maintenance period, guarantee/warranty irrigation materials, equipment, and workmanship against defects. Fill and repair depressions. Restore landscape or structural features damaged by the settlement of irrigation trenches or excavations. Repair damage to the premises caused by defective item. Make repairs within seven days of notification from the Project Manager.
- III. Contract documents govern replacements identically as with new work. Make replacements at no additional cost to the contract price.
- IV. Guarantee/warranty applies to originally installed materials and equipment and replacements made during the guarantee/warranty period.

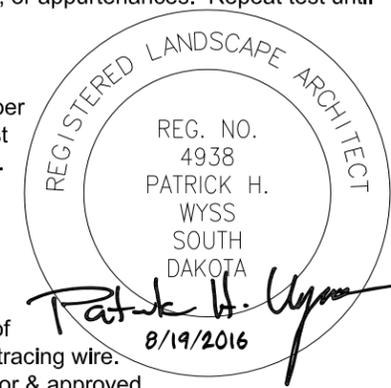
**PART 2: MATERIALS**

2.01 QUALITY: Use materials that are new and without flaws or defects of any type and which are the best of their class and kind.

**2.02 SUBSTITUTIONS**

I. Alternative product must be submitted and approved by the Owner prior to bidding. The Contractor is responsible for making changes to the design to accommodate approved alternate product(s).

II. Pipe sizes referenced in the construction documents are minimum sizes, and may be increased at the option of the Contractor and approval with the Owner.



2.03 PIPE AND FITTINGS

I. Mainline Pipe and Fittings

1. PVC compounds used in the extrusion of this pipe shall meet or exceed the requirements of ASTM D1784 cell class 12454. Gaskets shall conform to ASTM F477. Joint design shall meet the requirements of ASTM D3139.
2. Use Class 200, SDR-21, rated 200 PSI, conforming to the dimensions and tolerances established by ASTM Standard D2241. Use PVC pipe rated at higher pressures than Class 200 in the case of small nominal diameters that are not manufactured in Class 200.
3. Use rubber-gasketed pipe equipped with factory installed reinforced gaskets for mainline pipe with nominal diameter greater than or equal to 2-inches. Use Gasketed pipe joints conforming to "Laboratory Qualifying Tests" section of ASTM D3139. Use gasket material conforming to ASTM F477.
4. All main lines 2" and larger shall be PVC Class 200, SDR-21 gasket pipe with ductile iron fittings with joint restraint harnesses for IPS-size PVC pipe. Use Harco gasketed Ductile Iron Fittings or approved equal.
5. Mainline pipe within sleeves: Use heat fused HDPE PE4710 DR 9 (250 psi) High Density Polyethylene Irrigation Pipe with D.I. knuckle restraints at end of mainline at sleeve ends. See details. Provide restrained casing spacers within sleeve.
6. All decoder wire shall be installed within 3/4" (min.) schedule 80 conduit.

II. Lateral Pipe and Fittings

1. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting the requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with and integral belled end suitable for solvent welding.
2. Use Class 200, SDR-21, rated at 200 PSI, conforming to the dimensions and tolerances established by ASTM Standard D2241. Specialized Pipe and Fittings
3. Assemblies calling for flanged connections shall utilize stainless steel studs and nuts and rubber gaskets.
4. Assemblies calling for threaded pipe connections shall utilize PVC Schedule 80 and 40 threaded fittings pre-manufactured swing-joint assemblies. Use PVC Schedule 80 nipples.
5. Joint sealant, use non-hardening, nontoxic pipe thread sealant formulated for use on threaded connections and approved by the pipe fitting and valve manufacturer. Where directed by valve manufacturers, use threaded tape for threaded connections at valves and instead of thread paste.
6. Water Service to Backflow Prevention Device: no backflow is to be installed on this contract. Contractor shall utilize existing backflow and irrigation service main located as shown in Wilson Park.

III. Thrust Blocks

1. No thrust blocks needed with DI fittings

2.04 MAINLINE COMPONENTS

I. Isolation Gate Valve Assembly

1. As presented in the installation details or approved equal.

II. Quick Coupling Valve Assembly

1. As presented in the installation details or approved equal.

2.05 SPRINKLER IRRIGATION COMPONENTS

I. Remote control valves (RCV) Assembly for Sprinkler Laterals

1. As presented in the installation details.
2. Use wire connectors & waterproofing sealant to join control wires & latching solenoid valves.
3. Use standard Christy I.D. tags with black letters on a yellow background.
4. Install a separate valve box over a 3-inch depth of 3/4"-inch gravel for each assembly.
5. Provide PRS-D Pressure Regulating Modules at all spray and rotor sprinkler remote control valves.

II. Sprinkler Assembly

1. As presented in the installation details.
2. Sprinkler Pressure Test Kit
3. Provide one assembly per project. Assembly shall include one Rain Bird PHG and one Rain Bird Pitot Tube (part no. 41017), for use in pressure adjustment for spray and rotor sprinklers.

III. Two Wire Decoder Wire and Decoder

1. Control Wire: Communication between satellite controller(s) and the decoders & valves shall be accomplished by a twisted pair of #14 AWG decoder cables for direct

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 Public Works Department  
  
 Engineering Services

Scales: N/A

Designed By:  
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FOR BIDDING PURPOSES ONLY

MOUNT RUSHMORE ROAD  
UTILITY RECONSTRUCTION

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burial within a red HDPE outer jacket. The communication cable shall be manufactured by Paige Electric model #P7350D, or equal. Decoders (preferably just 1-station configuration with ability to operate one or two solenoids) shall have 'Integrated Surge Protection'. Each decoder is pre-addressed with an address, and can be reassigned. The decoders send DC signals to DC-latching solenoids up to 300 feet through #14 wire DTS cables. All splices shall be made in accordance with National Electrical Code® Articles 300.5 (Underground Installations) and 110.14 (Electrical Connections) using 3M DBY-6 or DBR-6 connectors, which are UL listed under "UL 486D-Direct Burial", for wet or damp locations, 600 volts. The decoders shall have 'Integrated Surge Protection' rated to 40 V, 1.5 kW transil.

2. Conduit: All decoder cable shall be located within 3/4" schedule 40 conduit.
3. Splices: Use 3M DBY-6 or 3M DBR-6.
4. Warning tape: Insert plastic film highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. Three inches wide, colored yellow, and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW"
5. Include tracing wire as shown in the Irrigation Trench Detail. Wire shall conform to City of Rapid City Utility Construction Specifications.

PART 3: EXECUTION

3.01 WATER SUPPLY

1. Supply to expanded irrigation system shall be from existing irrigation main in Wilson Park as shown on the irrigation plans. Contractor is responsible for making the connections to the existing 2 1/2" PVC Class 200 mainline piping - including a Harco 2 1/2" X 2" full service ductile iron tee with knuckle restraints with gate valve, and extending the irrigation main to supply the new irrigation network piping.
2. Lay out work as closely as possible to the drawings. The drawings, though carefully drawn, are generally diagrammatic to the extent that all offsets and fittings are not necessarily shown as they will exist on site.
3. The Contractor shall be responsible for full and complete coverage of irrigated areas as to spacing and precipitation rates being matched and shall make any necessary adjustments to the system at no additional charge to the Owner. Head spacing as shown on the drawings is predicated on the water pressure being 30 psi at the spray head. Head spacing shall not exceed 55 percent of manufacturer's stated diameter. Contractor shall verify existing working pressure before commencing work. Revisions to the irrigation system must be submitted to the engineer in written form for approval.

3.02 INSPECTIONS AND REVIEWS

I. Site Inspections

1. Verify construction site conditions and note irregularities affecting work of this section. Report irregularities to the Project Manager prior to beginning work.
2. Beginning work of this section implies acceptance of existing conditions.

II. Utility Locates - One Call of South Dakota(1.800.781.7474)

1. Arrange for & coordinate with local authorities the location of all existing underground utilities.
2. Repair any underground utilities damaged during irrigation work. Make repairs at no additional cost to the contract price.

3.03 LAYOUT OF WORK

I. Stake out the irrigation system. Items to be staked include:

1. Control valves; sleeving; mainline and lateral pipe; decoders; quick coupling valves; isolation valves; controller assembly; and sprinklers.
2. Irrigation System Layout Review: Irrigation system layout review will occur after the staking has been completed. Notify the Project Manager one week in advance of review. Modifications will be identified by the Project Manager at this review.
3. Install all mainline pipe and mainline components inside of project property lines.

3.04 EXCAVATION, TRENCHING, AND BACKFILLING

I. Excavate to permit the pipes to be laid at the intended elevations and to permit work space for installing connections and fittings.

1. Minimum cover (distance from top of pipe to roadway subgrade)

2. 24-inches over mainline pipe and over electrical conduit.
3. 28-inches over control wire and sensor cable.
4. 18-inches over lateral pipe to sprinklers.
5. Maintain at least 10-feet clearance from the centerline of any tree.
6. Backfill only after lines have been reviewed and tested.
7. Excavated material is generally satisfactory for backfill. Backfill shall be free from rubbish, vegetative matter and stones larger than 2-inches in maximum dimension. Frozen material will not be allowed. Remove material not suitable for backfill. Backfill placed next to pipe shall be free of sharp objects that may damage the pipe.
8. Backfill un-sleeved pipe in either of the following manners:
  - a. Backfill and puddle the lower half of the trench. Allow to dry 24 hours. Backfill the remainder of the trench in 6-inch layers. Compact to density of surrounding soil.
  - b. Backfill the trench by depositing the backfill material equally on both sides of the pipe in 6-inch layers and compacting to the density of surrounding soil.
9. Enclose pipe & wiring beneath roadways, walks, & curbs in sleeves. Minimum compaction of backfill for sleeves shall be 95% Standard Proctor Density, ASTM D698-78. Use of water for compaction around sleeves, will not be permitted.
10. Dress backfilled areas to original grade. Incorporate excess backfill into existing site grades.
11. Where utilities conflict with irrigation trenching and pipe work, contact the Project Manager for trench depth adjustments.

3.05 ASSEMBLING PIPE AND FITTINGS

I. General

1. Keep pipe free from dirt and pipe scale. Cut pipe ends square and debur. Clean pipe ends.
2. Keep ends of assembled pipe capped. Remove caps only when necessary to continue assembly.
3. Trenches may be curved to change direction or avoid obstructions within the limits of the curvature of the pipe. Minimum radius of curvature and offset per 20-foot length of pipe by pipe size are shown in the following table. All curvatures results from the bending of the pipe lengths. No deflection will be allowed at a pipe joint.

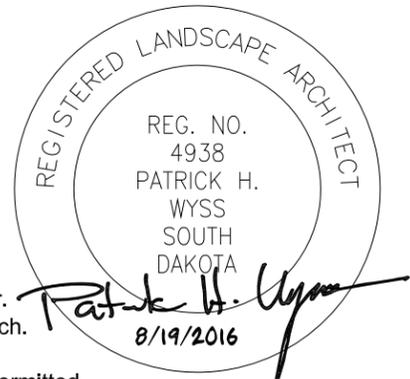
SIZE	RADIUS	OFFSET PER 20' LENGTH
1 1/2"	25'	7'-8"
2"	25'	7'-8"
2 1/2"	100'	1'-11"

II. Mainline Pipe and Fittings

1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC Rubber-Gasketed Pipe
  - a. Use pipe lubricant. Join pipe in the manner recommended by manufacturer.
3. Snake pipe from side to side within the trench.
4. Fittings
  - a. The use of cross type fittings is not permitted.
  - b. Only Ductile Iron fittings are allowed on mainline pipe.

III. Lateral Pipe and Fittings

1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC Solvent Weld Pipe
  - a. Use primer and solvent cement. Join pipe in the manner recommended by the manufacturer and in accordance with accepted industry practices.
  - b. Cure for 30 minutes before handling and 24 hours before allowing water in the pipe.
3. Snake pipe from side to side within the trench.
4. Fittings: The use of cross type fittings is not permitted.



IV. Specialized Pipe and Fittings

1. Flanged connections: Install stainless steel studs and nuts and rubber gaskets per manufacture's recommendations.
2. PVC Threaded Connections
  - a. Use only factory-formed threads. Field-cut threads are not permitted.
  - b. Use only non-hardening, nontoxic thread sealant. Apply thread sealant in a manner recommended by component, pipe and sealant manufacturers and in accordance with accepted industry practices.
3. When connection is plastic-to-metal, the plastic component shall have male threads and the metal component shall have female threads.
4. Make metal-to-metal, threaded connection with non-hardening, nontoxic pipe sealant applied to the male threads only.

V. Copper Pipe

1. Use flux and solder. Join pipe in manner recommended by manufacturer & in accordance with local codes and accepted industry practices.
2. Solder so that continuous bead show around the joint circumference.

3.06 INSTALLATION OF MAINLINE COMPONENTS

I. Isolation Gate Valve Assembly

1. Provide per installation details where indicated on the drawings. Install as indicated on the irrigation details.
2. Brand "GV" on valve box lid in 2-inch high letters.

II. Quick Coupling Valve Assembly

1. Provide per installation details where indicated on drawings.
2. Brand "QC" on valve box lid in 2-inch high letters.

III. Master Valve and Flow Meter

1. Provide & Install per installation details where indicated on drawings.
2. Brand "MV" on valve box lid with 2" high letters.

3.07 INSTALLATION OF SPRINKLER IRRIGATION COMPONENTS

I. Remote Control Valve (RCV) Assembly for Sprinkler Laterals

1. Flush mainline before installation of RCV Assembly.
2. Provide per installation details as shown on drawings. Use wire connector and waterproof to connect control wires to remote control valve wires. Use 3M DBY-6 or DBR-6 connectors & sealant per manufacturer's Recommendations.
3. Provide only one RCV to a valve box. Locate valve box at least 12-inches from and align with nearby walls or edges of paved areas. Group RCV assemblies together where practical. Arrange grouped valve boxes in rectangular patterns. Allow at least 12-inches between valve boxes.
4. Adjust RCV assembly to regulate downstream operating pressure.
5. Attach ID tag with controller station number on control wiring.
6. Brand controller ID & station number on valve box lid in 2" high numbers.

III. Sprinkler Assembly

1. Flush lateral pipe before installing sprinkler assembly.
2. Provide per installation details at location shown on drawings.
3. Locate spray sprinklers 3" from adjacent walls or edges of paved areas.
4. Install sprinklers perpendicular to finish grade.
5. Supply appropriate nozzle and/or adjust arc of coverage and/or radius of throw of each sprinkler for best performance and uniform coverage.

III. Sprinkler Pressure Test Kit

1. Use a pitot tube and pressure gauge at the worst-case rotor sprinkler assembly, from the respective remote control valve. Adjust PRS-Dial at each rotor remote control valve, to provide the design operating pressure at the worst-case rotor sprinkler head. Typically the worst-case sprinkler is the sprinkler furthest from the remote control valve. Complete pressure adjustments for every rotor remote control valve.
2. Using pressure gauge & necessary fittings, place gauge on worst case sprinkler from the respective remote control valve. Adjust PRS dial at each spray sprinkler head. Typically the worst-case sprinkler is the sprinkler furthest from the remote control valve. Complete pressure adjustment for each spray valve. Provide pressure gauge to the owner representative at completion of construction.

3.08 INSTALLATION OF CONTROL SYSTEM COMPONENTS

I. Satellite Control Assemblies

1. Coordinate the Electrical Service with the GC. See SDDOT Electrical Plans.
2. All control wire to be installed in schedule 40 PVC conduit.
3. Attach wire markers to the ends of control wires inside the controller unit housing. Label wires with the ID number (see drawings) of the remote control valve to which the control wire is connected.

4. Connect control wires to the corresponding controller terminal.
5. Connect power to the pedestal. See Site Electrical Plans (WPE Electrical Plans)

II. Sentinel Controller

1. Sentinel Controller shall be configured during assembly to be programmed to communicate with the RC Parks central control irrigation system's radio frequency. Sentinel Controller specified shall have the ability to communicate in the future to the City's Central Control System.
2. Contractor is responsible for configuring the Sentinel Controller to function as a stand alone irrigation controller to communicate only with the irrigation valves within this project. At the completion of the maintenance period & acceptance by the RC Parks Dept, the owner may chose to establish communications to the City Central Control Irrigation System. During maintenance period, contractor shall only water the landscape plantings via the Sentinel Controller using a contractor determined watering program. Contractor shall not manually water the landscape plant material by manual operation of the remote control valves.

III. Decoder Cable

1. Provide a 18-inch length of wire in an 8-inch diameter loop at each conduit transition, at valve boxes, and at all splices
2. If a decoder wire must be spliced, make splice with wire connectors & waterproof sealant, installed per the manufacturer's instructions. Locate splice in a valve box that contains an irrigation valve assembly, or in a separate 12-inch standard valve box. Use same procedure for connection to valves as for in-line splices.
3. The decoders and two-wire path must be properly surge protected and grounded. All decoder sand modules must have a maximum grounding resistance of 10 ohms, or less. Provide grounding per Toro recommendations.
4. Unless noted on plans, install wire parallel with and below PVC mainline pipe.

3.09 PROJECT RECORD DRAWINGS and OPERATIONS MANUAL

1. The Contractor is responsible for documenting changes to the design. Maintain on-site & separate from documents used for construction, one complete set of contract documents as Project Documents. Keep documents current. Do not permanently cover work until as-built information is recorded. Turn over the "Record Drawings" to the Owner. Completion of the Record Drawings will be a prerequisite for the Review at the completion of irrigation system installation. Provide 2 full size prints of the as-builts

3.10 OPERATIONS AND MAINTENANCE

1. Provide 2 O&M Manuals in separate binders with tabbed items of all components of the irrigation system. Included in the binder shall be an 11x17 set of plans (including as-built modifications). Set shall be folded in the binder.
2. Each binder shall include instructions covering full operation, care & maintenance of system & controls. Also provide manufacturers' parts catalogs.

3.11 WINTERIZATION AND SPRING START-UP

1. Contractor shall Winterize the irrigation system in the fall after the installation, & start-up the irrigation system the following spring. Repair any damage resulting from improper winterization at no additional cost to the Owner. Coordinate winterization & start-up with Parks Dept.

3.12 MAINTENANCE

1. Upon completion of construction & review by the Owner, maintain irrigation system during the "Maintenance Period".
2. At the completion of the Contractor's maintenance period, the Owner will be responsible for maintaining system in working order during the remainder of the guarantee/warranty period, for performing necessary minor maintenance, for trimming around sprinklers, for protecting against vandalism, & preventing damage after the landscape maintenance operation.
3. Maintenance period: Maintenance Period commences at final acceptance of the project and extends for 30 days after final acceptance. Final Acceptance of the project will be determined by the Engineer. Maintenance includes, maintaining and operating the irrigation system as designed for a duration of 30 calendar days. Contractor shall make periodic visits to the job to monitor irrigation system & make necessary adjustments to achieve the most desirable application of irrigated water.
4. In addition to initial start-up, contractor shall be onsite and perform the winterization & spring startup the following year after final acceptance of the project.

3.13 TRAINING

1. Contractor shall be responsible for the training of personnel determined by Owner. Schedule training with RC Parks Dept.

3.13 CLEANUP

1. Upon completion of work, remove from the site all excess materials & rubbish.

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Prepared For: Public Works Department  
 Scales: N/A  
 Design Date: August 2016  
 Internal Job No: 11104.4  
 Surveyed By: KP/JC/DH/JD  
 Project Number: 13-2139, CIP 50867, PCN X03L

FOR BIDDING PURPOSES ONLY

MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION

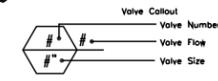
Sheet Title: MOUNT RUSHMORE RD IRRIGATION SCHEDULE & NOTES  
 Sheet No: H2.3 of 24

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI		DETAIL
	Rain Bird 1806-PRS 8 Series MPR Turf Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. Pressure Regulating.	17	30		7 H2.11
	Rain Bird 1806-PRS 50 Series Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	14	30		7 H2.11
	Rain Bird 1806-PRS 8 Series MPR Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	3	30		7 H2.11
	Rain Bird 1806-PRS 10 Series MPR Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	2	30		7 H2.11
	Rain Bird 1806-PRS 12 Series MPR Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	3	30		7 H2.11
	Rain Bird 1806-PRS 15 Series MPR Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	4	30		7 H2.11
	Rain Bird 1806-PRS ADJ Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	41	30		7 H2.11
	Rain Bird 1806-PRS ADJ Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	4	30		7 H2.11
	Rain Bird 1806-PRS 8 FLT Series MPR Shrub Spray 6.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet. With Pressure Regulating Device.	18	30		7 H2.11

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI	GPM	RADIUS	DETAIL
	Rain Bird 5006-PL-PC, FC-SAM Turf Rotor, 6.0" Pop-Up, Plastic Riser. Adjustable and Full Circle. Standard Angle Nozzle and Flow Shut-Off Device. With Seal-A-Matic Check Valve.	14	55	2.76	37'	6 H2.11
	Rain Bird 5006-PL-PC, FC-SAM Turf Rotor, 6.0" Pop-Up, Plastic Riser. Adjustable and Full Circle. Standard Angle Nozzle and Flow Shut-Off Device. With Seal-A-Matic Check Valve.	2	55	6.66	45'	6 H2.11

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY			DETAIL
	Rain Bird PEB-PRS-D 1", 1-1/2", 2" Plastic Industrial Valves. Low Flow Operating Capability, Globe Configuration. With Pressure Regulator Module.	12			2,3&5 7 H2.11 H2.10
	Rain Bird 5-RC 1" Brass Quick-Coupling Valve, with Corrosion-Resistant Stainless Steel Spring, Thermoplastic Rubber Cover, and 1-Piece Body.	8			4 2&4 H2.10 H2.11
	Watts WGV-X 2" & 2 1/2" Brass Cross Handle Gate Valve. Brass body construction with NPT female threaded connections, brass non-rising stem and gland, PTFE locking, brass threaded bonnet, solid wedge disc, and cast iron, cross handle handwheel. Max pressure 200 psi	8			2&7 2 H2.10 H2.11
	Febc 860 Master Series 2-1/2" Reduced Pressure Backflow Preventer	1			1 H2.12
	Toro TS-12-PS1 12-Station Modular Sentinel Field Satellite Controller. Remote and Flow Sensor Ready, with ET-based run times. Enclosure: Stainless Steel Pedestal Mount.	1			9 H2.11
	Netafim Press. Red. Photo Diode 3-8 4" Master Valve/Flow Sensor with Water Meter and Hydraulic Valve in a Single Unit. Cast Iron with Baked Powder-Coated Finish, Minimum Working Pressure 14 psi. Flange Connection, Pressure Reducing, Photo Diode Register, High Frequency.	1			3&7 2 H2.10 H2.11
	Guardshock Enclosure [OS-10] Powdercoated Backflow Enclosure, Large Clamshell Series. Color: 1019 Woodlands Tan. Include lock shield brackets.	1			1 H2.12
	Irrigation Lateral Line: PVC Class 200 SDR 21 PVC Class 200 irrigation pipe. Only lateral transition pipe sizes 1 1/4" and above are indicated on the plan, with all others being 1" in size.	1,445 l.f.			1 H2.10
	Irrigation Mainline: PVC Class 200 SDR 21 PVC Class 200 irrigation pipe. Include control wire as shown in the trench detail	1,174 l.f.			1&5 H2.10
	Irrigation Mainline: HDPE PE4710 DR 11 (200psi) High-Density Polyethylene Irrigation Pipe, heat fusion installation as per manufacturer's recommendation. Include control wire as shown in the trench detail	1,661 l.f.			1 H2.10
	Pipe Sleeve: HDPE PE4710 DR 11 (200psi) Direct Bore fused smooth wall conduit sized 2 times the carrying mainline piping	2,063 l.f.			1 H2.10

REGISTERED LANDSCAPE ARCHITECT  
 REG. NO. 4938  
 PATRICK H. WYSS  
 SOUTH DAKOTA  
 8/19/2016



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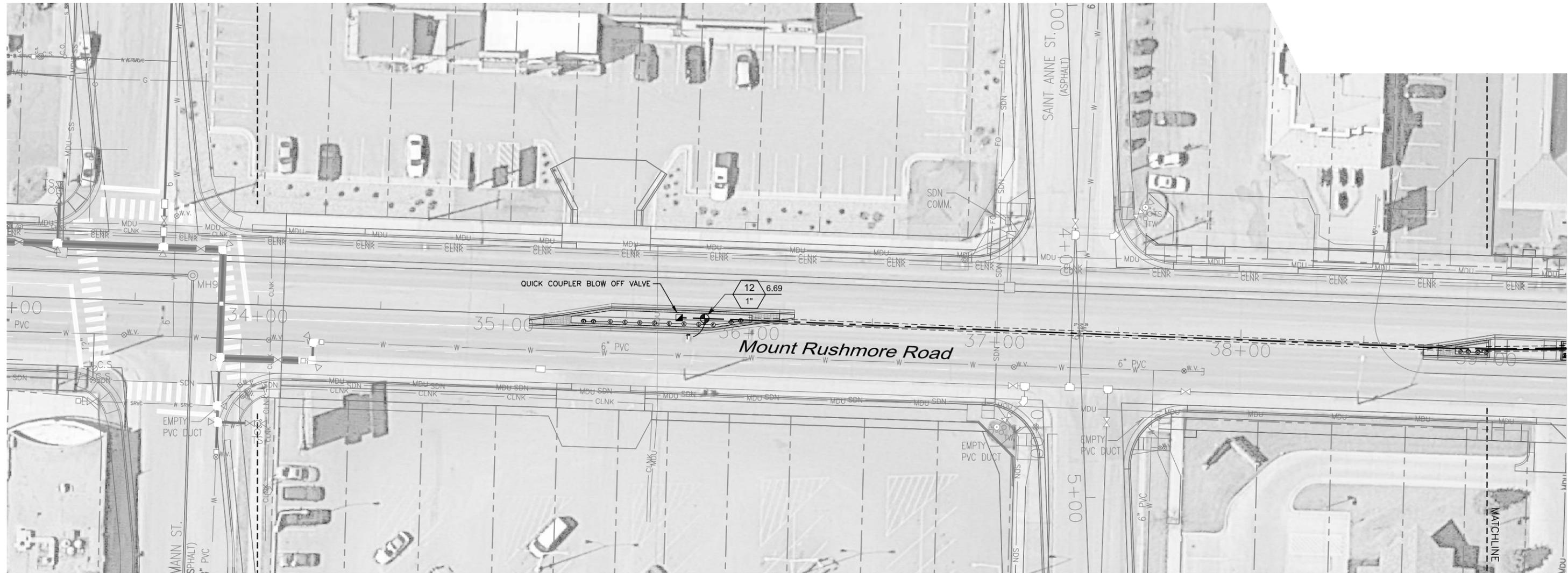
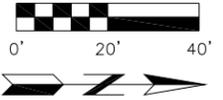
Prepared For:  
 Public Works Department  
  
 Engineering Services

Scale: AS NOTED  
 Designed By: PHW  
 Design Date: August 2016  
 Internal Job No: 11104.4  
 Surveyed By: KP/JC/DH/JD  
 Project Number: 13-2139, CIP 50867, PCN X03L  
 Drawn By: PHW  
 Print Date: August 19, 2016  
 Survey Date: 2012-2013

**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title:  
 MOUNT RUSHMORE RD  
 IRRIGATION PLAN  
 STA 34+00 to 39+00  
 Sheet No:  
 H2.4  
 of  
 24



REGISTERED LANDSCAPE ARCHITECT  
 REG. NO.  
 4938  
 PATRICK H.  
 WYSS  
 SOUTH  
 DAKOTA  
  
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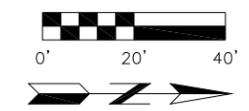
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**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title: MOUNT RUSHMORE RD  
 IRRIGATION PLAN  
 STA 39+00 to 45+00  
 Sheet No: H2.5  
 of 24



REGISTERED LANDSCAPE ARCHITECT  
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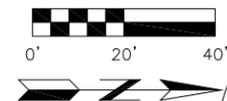
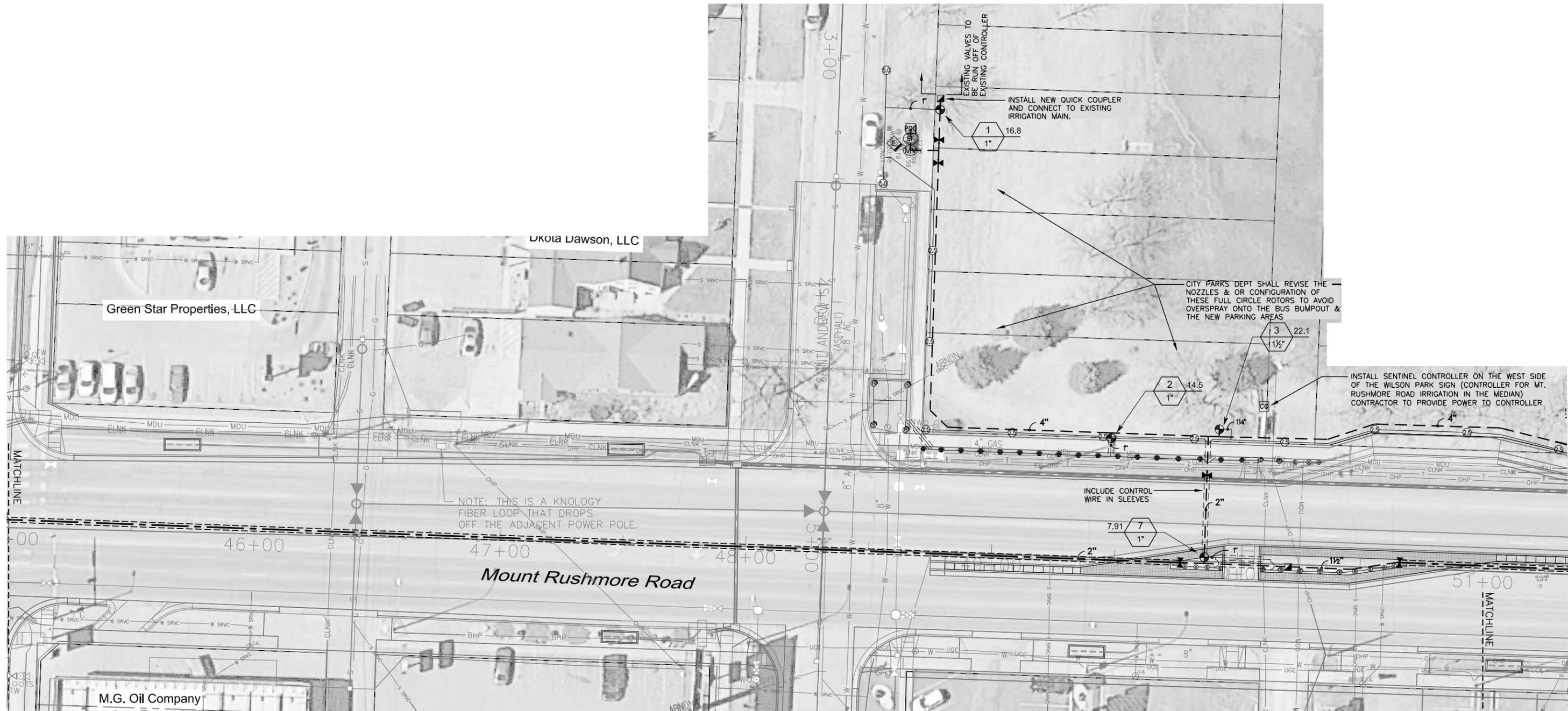
Drawn By: PHW  
 Print Date: August 19, 2016  
 Survey Date: 2012-2013

**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title: MOUNT RUSHMORE RD  
 IRRIGATION PLAN  
 STA 45+00 to 51+00

Sheet No: H2.6  
 of 24



REGISTERED LANDSCAPE ARCHITECT

REG. NO.  
 4938  
 PATRICK H.  
 WYSS  
 SOUTH  
 DAKOTA

*Patrick H. Wyss*  
 8/19/2016

Prepared By:  
 **Wyss Associates, Inc.**  
 Landscape Architecture · Corridor & Streetscape  
 Parks & Recreation Design · Land Planning  
 728 Sixth Street Rapid City, South Dakota 57701-3670  
 phone: 605.348.2268 Fax 605.348.6506  
 email: admin@wyssassociates.com web: www.wyssassociates.com

Prepared For:  
 Public Works Department  
  
 Engineering Services

Scale: AS NOTED  
 Designed By: PHW  
 Design Date: August 2016  
 Internal Job No: 11104.4  
 Surveyed By: KP/JC/DH/JD  
 Project Number: 13-2139, CIP 50867, PCN X03L  
 Drawn By: PHW  
 Print Date: August 19, 2016  
 Survey Date: 2012-2013

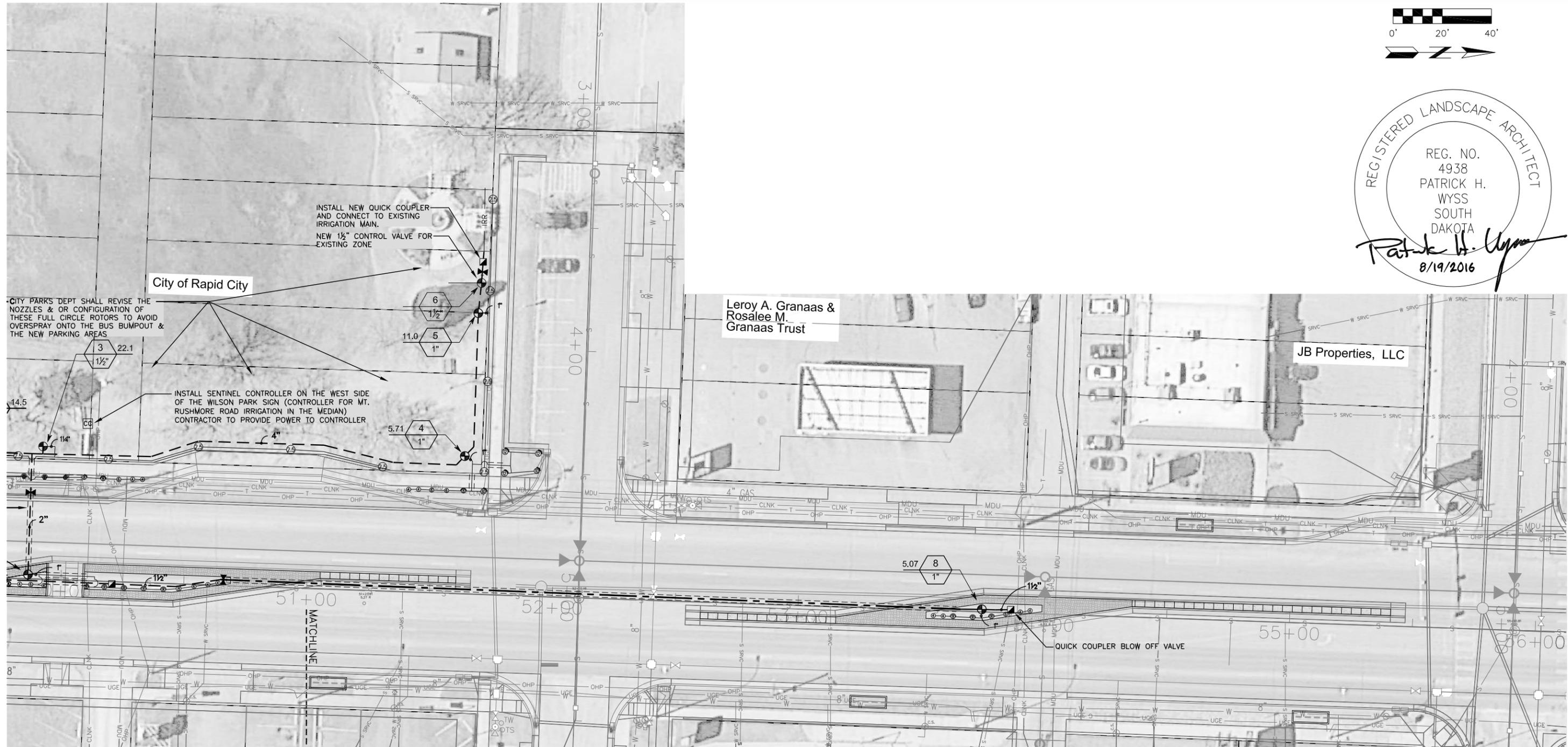
**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

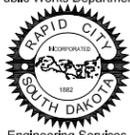
Sheet Title: MOUNT RUSHMORE RD  
 IRRIGATION PLAN  
 STA 51+00 to 56+60  
 Sheet No: H2.7  
 of 24



REGISTERED LANDSCAPE ARCHITECT  
 REG. NO. 4938  
 PATRICK H. WYSS  
 SOUTH DAKOTA  
*Patrick H. Wyss*  
 8/19/2016



Prepared By:  
 **Wyss Associates, Inc.**  
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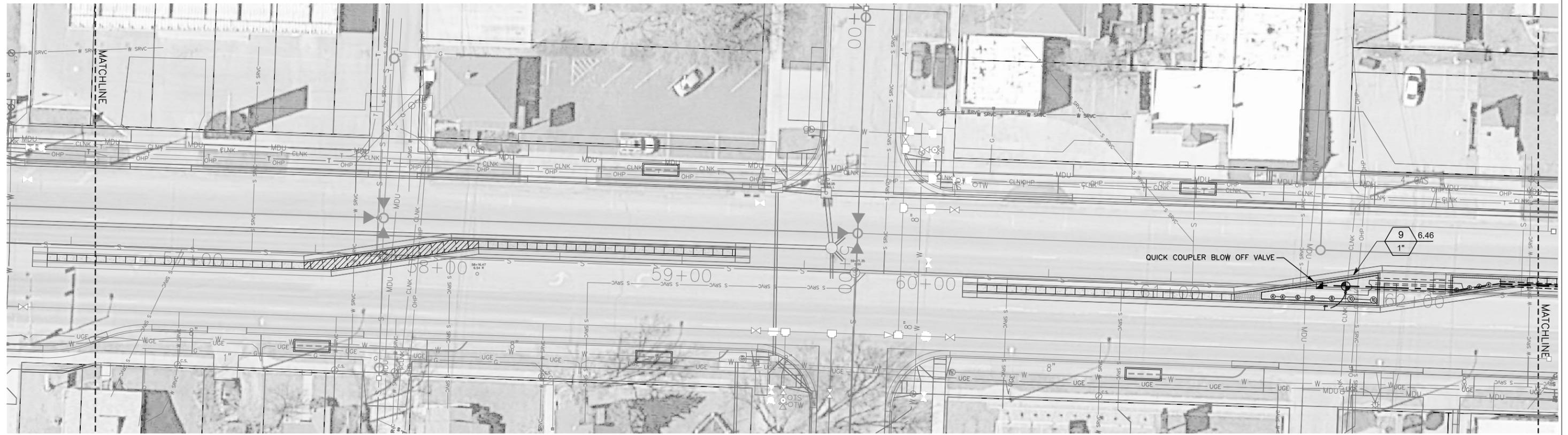
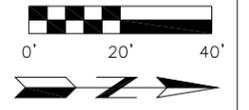
Prepared For:  
 Public Works Department  
  
 Engineering Services

Scale: AS NOTED  
 Designed By: PHW  
 Design Date: August 2016  
 Internal Job No: 11104.4  
 Surveyed By: KP/JC/DH/JD  
 Project Number: 13-2139, CIP 50867, PCN X03L  
 Drawn By: PHW  
 Print Date: August 19, 2016  
 Survey Date: 2012-2013

**FOR BIDDING PURPOSES ONLY**

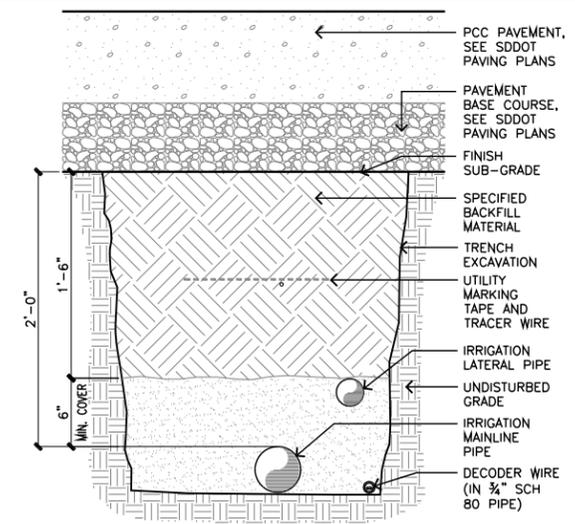
**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**

Sheet Title:  
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 IRRIGATION PLAN  
 STA 56+60 to 62+20  
 Sheet No:  
 H2.8  
 of  
 24

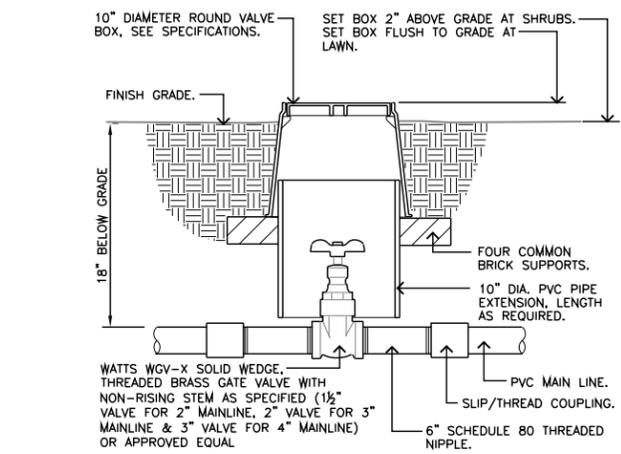


REGISTERED LANDSCAPE ARCHITECT  
 REG. NO.  
 4938  
 PATRICK H.  
 WYSS  
 SOUTH  
 DAKOTA  
  
 8/19/2016

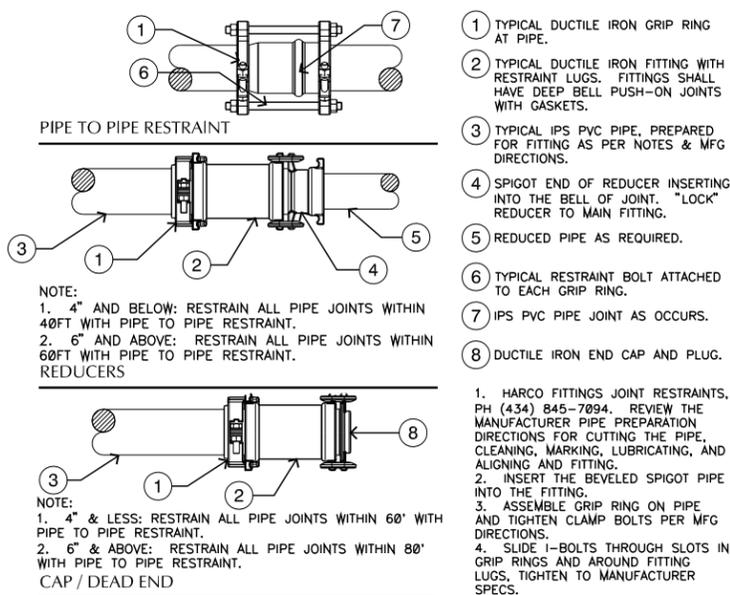




**1** **DETAIL: IRRIGATION TRENCHING**  
SCALE: 1 1/2" = 1'-0"



**2** **DETAIL: MANUAL BRONZE GATE VALVE**  
SCALE: 1 1/2" = 1'-0"



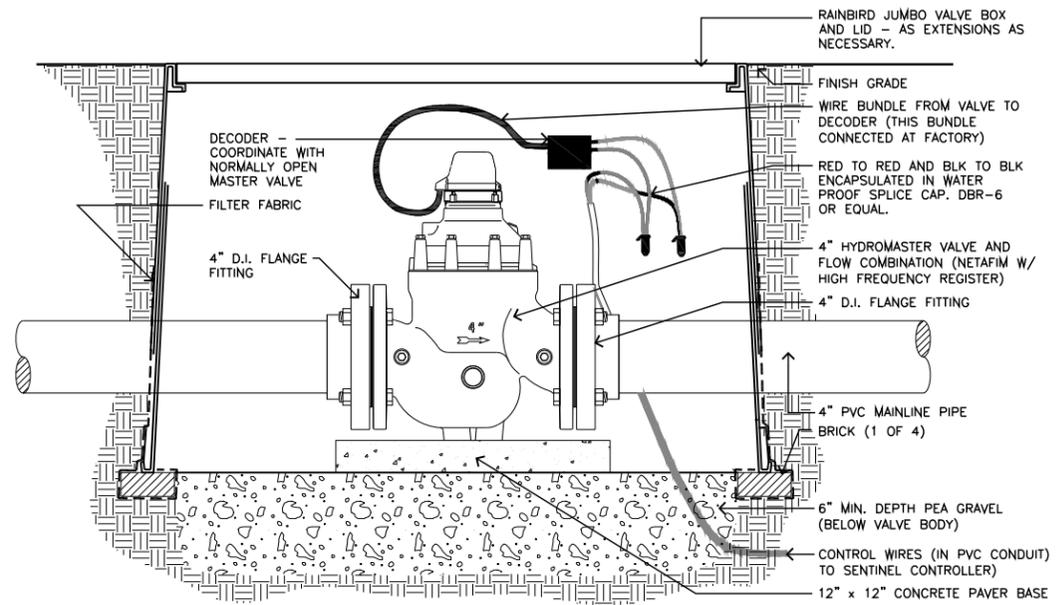
**5** **DETAIL: HARCO PIPE TO PIPE JT. RESTRAINT SYSTEM**  
SCALE: 1 1/2" = 1'-0"

Prepared By: **Wyss Associates, Inc.**  
Landscape Architecture - Corridor & Streetscape  
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728 Sixth Street Rapid City, South Dakota 57701-3670  
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Prepared For: **Rapid City Public Works Department**  
Scales: AS NOTED  
Designed By: PHW  
Design Date: August 2016  
Internal Job No: 11104.4  
Surveyed By: KP/JC/DH/JD  
Project Number: 13-2139, CIP 50867, PCN X03L

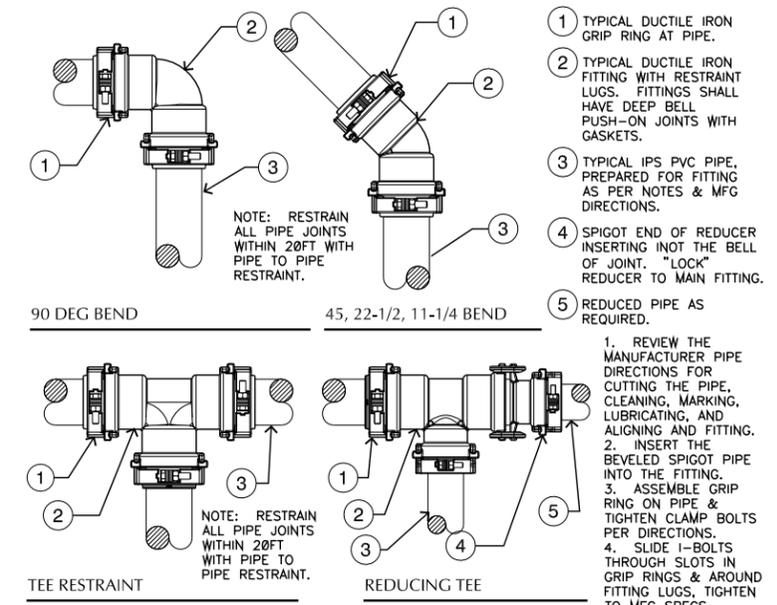
**FOR BIDDING PURPOSES ONLY**  
**MOUNT RUSHMORE ROAD**  
**UTILITY RECONSTRUCTION**

Sheet Title: **MOUNT RUSHMORE RD**  
**IRRIGATION DETAILS**  
Sheet No: **H2.10**  
of **24**

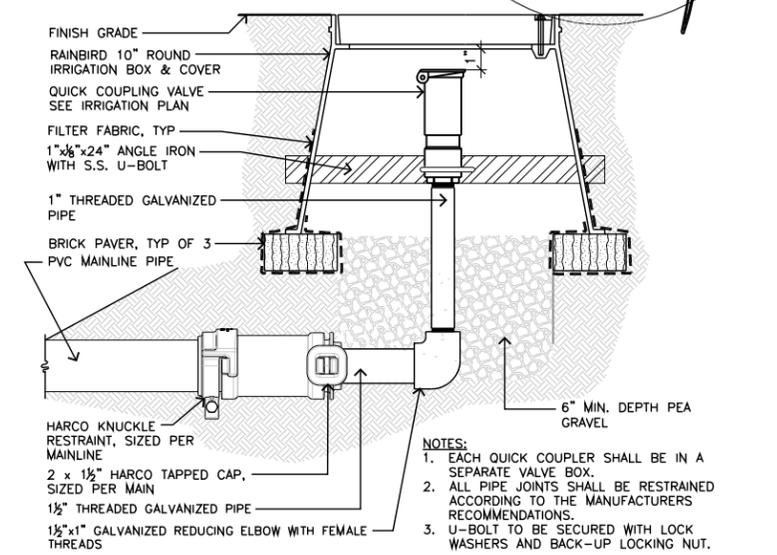


- NOTES:  
1. MAINTAIN 2" MIN. - 4" MAX. DISTANCE BETWEEN TOP OF CONTROL VALVE AND BOTTOM OF BOX LID  
2. INSTALL FILTER FABRIC AROUND EXTERIOR OF VALVE BOX. USE DUCT TAPE TO SECURE FABRIC TO PIPE & VALVE BOX.  
3. NO STRAIGHT PIPE UPSTREAM OR DOWNSTREAM OF THE HYDROMETER IS REQUIRED.  
4. INSTALL ISOLATION VALVE UPSTREAM OF HYDROMETER (SEE PLAN)  
5. WIRES FROM THE DECODER TO THE VALVE REGISTER ARE CONNECTED AT THE FACTORY AND ARE SHIPPED WITH THE VALVE.

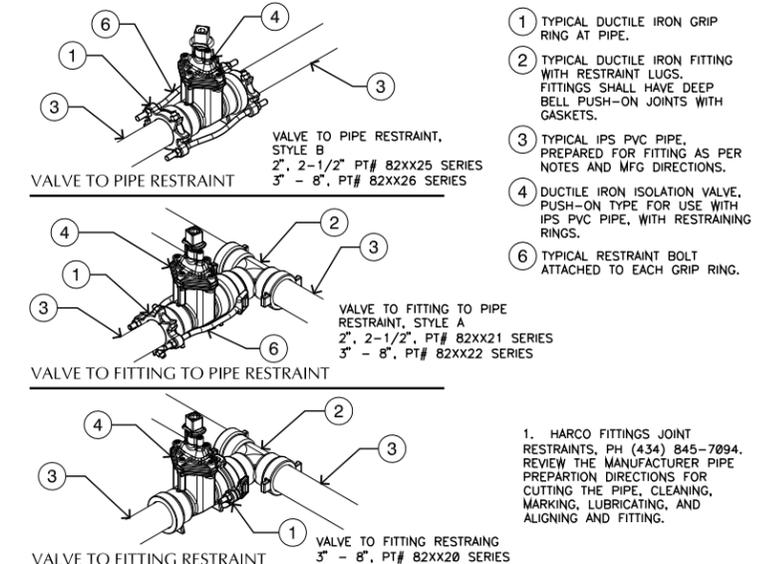
**3** **DETAIL: IRRIGATION MASTER VALVE & FLOW METER INSTALLATION**  
SCALE: 3" = 1'-0"



**6** **DETAIL: HARCO FITTING TO PIPE JOINT RESTRAINTS**  
SCALE: 1 1/2" = 1'-0"



**4** **DETAIL: IRRIGATION MAINLINE BLOWOUT ASSEMBLY**  
SCALE: 3" = 1'-0"

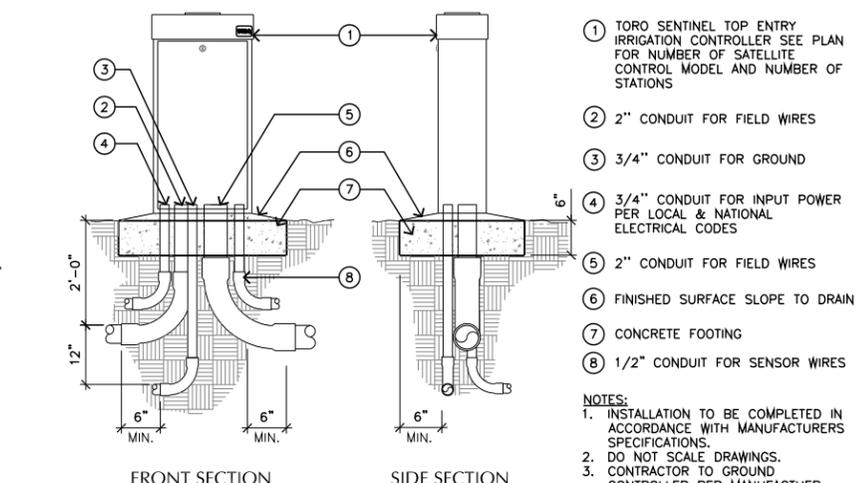
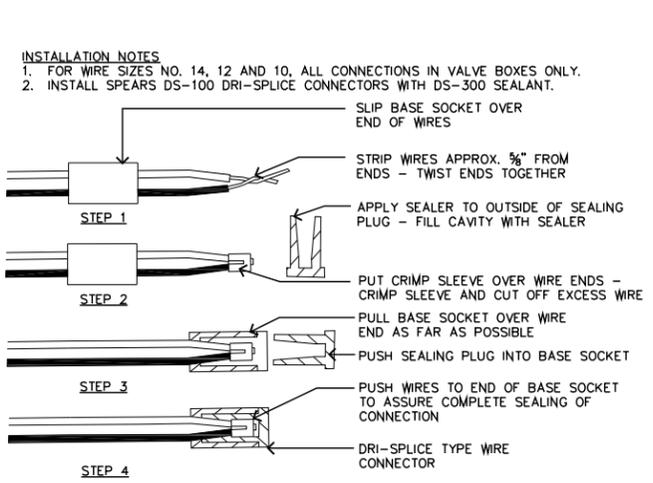
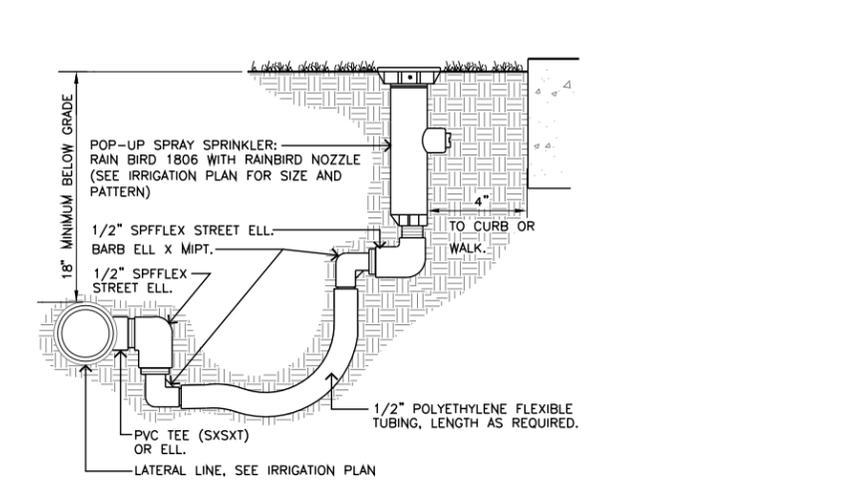
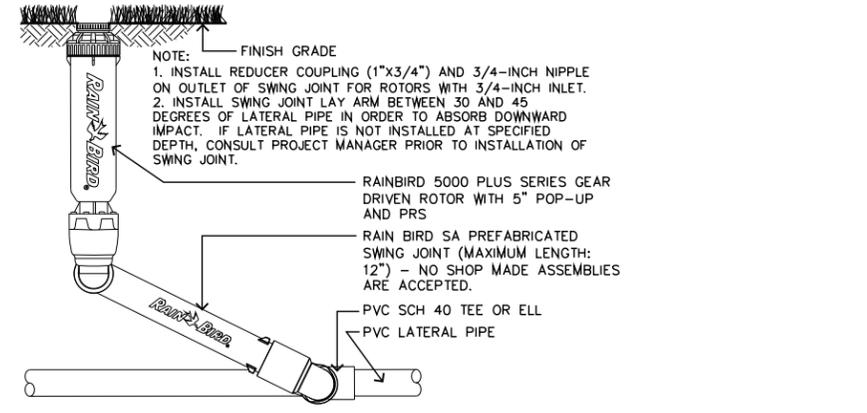
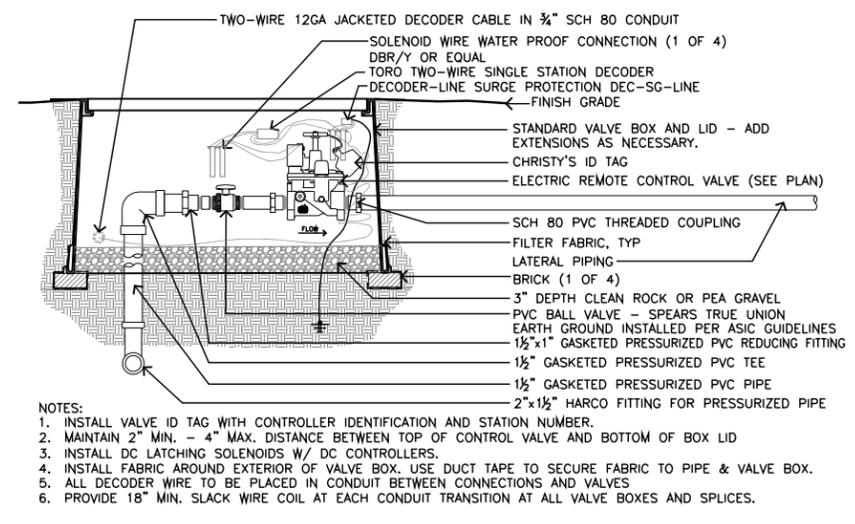
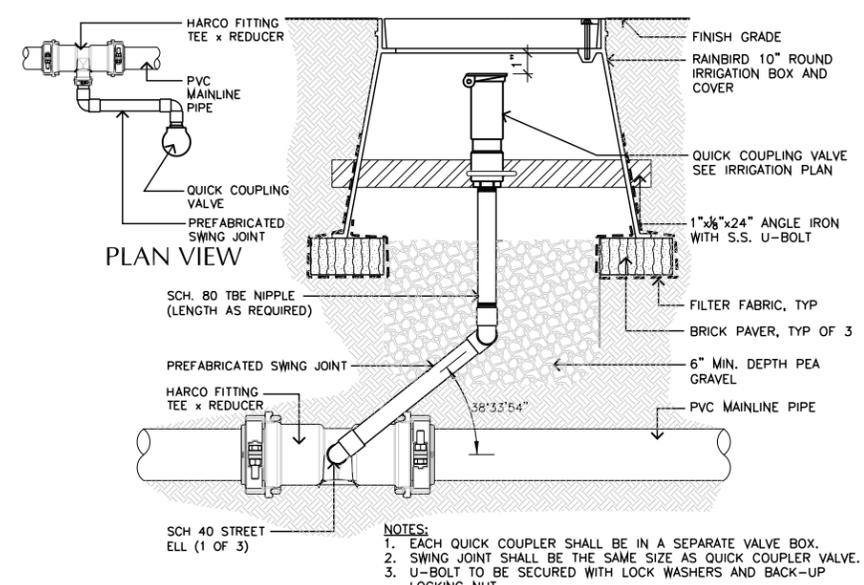
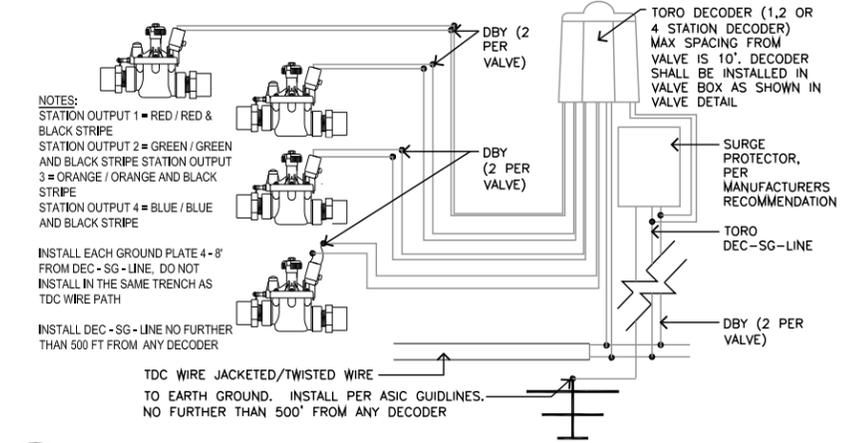
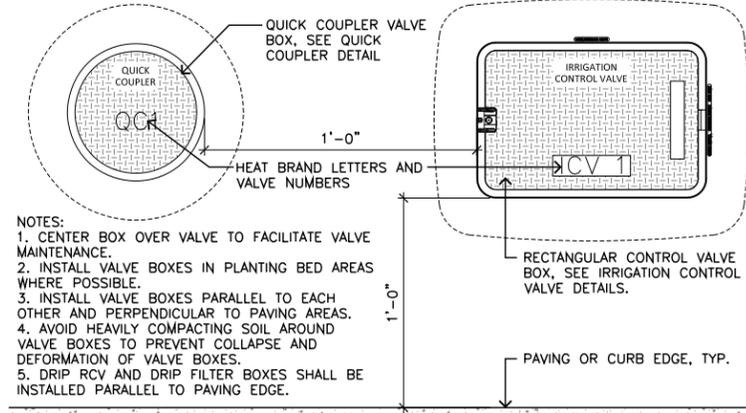
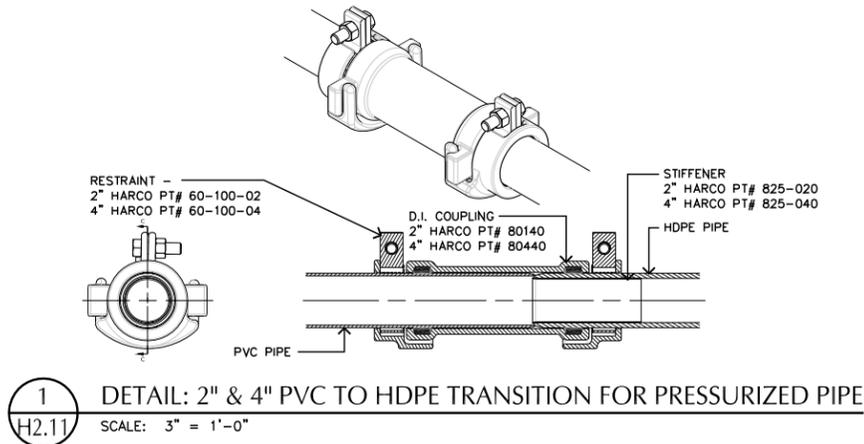


**7** **DETAIL: HARCO VALVE TO FITTING RESTRAINT SYSTEM**  
SCALE: 1 1/2" = 1'-0"



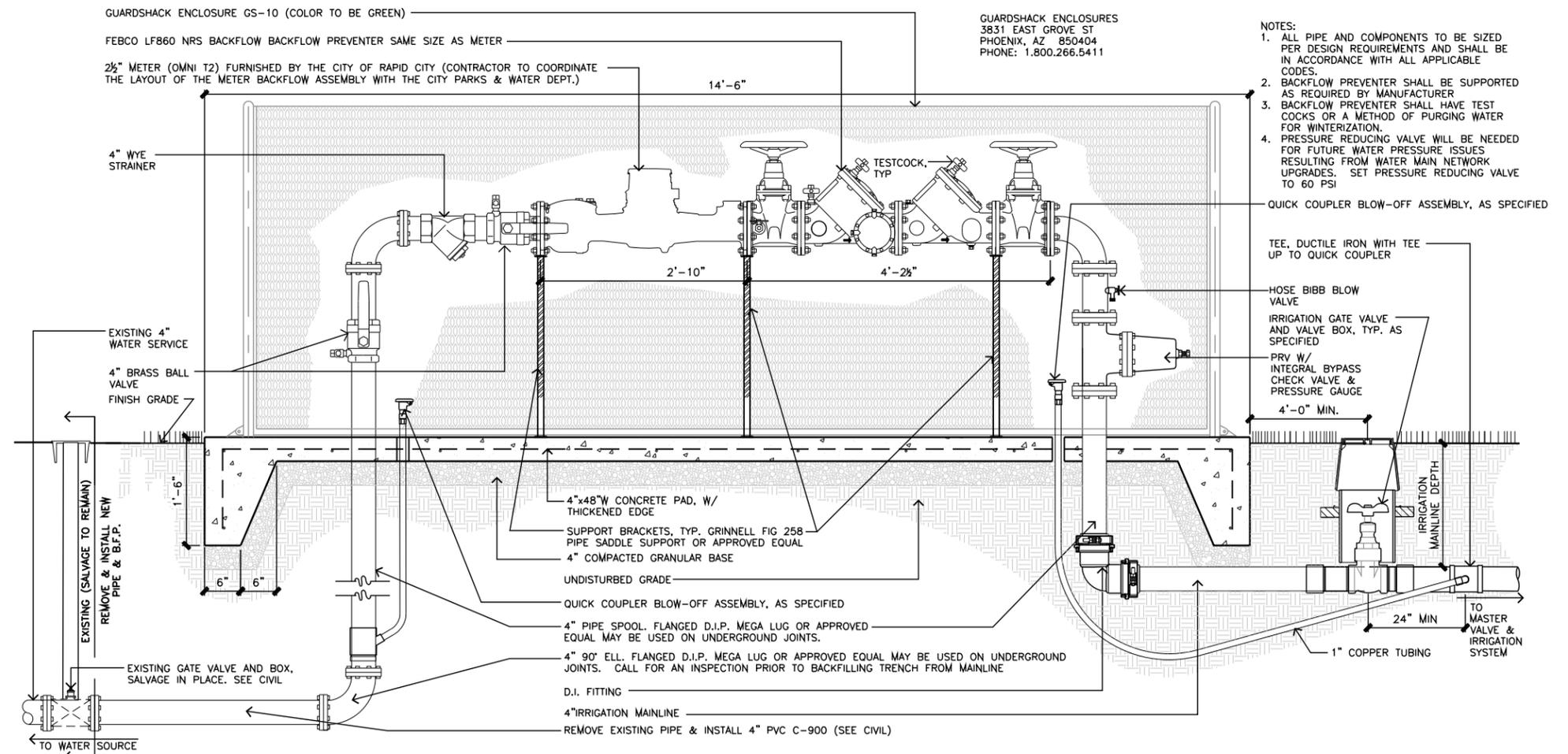
**FOR BIDDING PURPOSES ONLY**

**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**



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**MOUNT RUSHMORE ROAD  
 UTILITY RECONSTRUCTION**



**1** DETAIL: 4" IRRIGATION BACKFLOW AND METER ENCLOSURE  
 H2.12 SCALE: 1" = 1'-0"