

FOR BIDDING PURPOSES ONLY



# SECTION D EROSION CONTROL PLANS



CITY of RAPID CITY  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

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**PROJECT  
LOCATIONS**

**PROJECT LOCATION MAP** NOT TO SCALE

Plan Set Number :

**JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK**  
CITY OF RAPID CITY PROJECT NO. SSW10-1837

**SECTION D ESTIMATE OF QUANTITIES**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1690	Remove Sediment	10.0	CuYd
110E1693	Remove Erosion Control Wattle	239	Ft
110E1700	Remove Silt Fence	1031	Ft
734E0044	Soil Stabilizer	2.0	Acre
734E0151	9" Diameter Erosion Control Wattle	239	Ft
734E0165	Remove and Reset Erosion Control Wattle	60	Ft
734E0170	Temporary Sediment Barrier	2035	Ft
734E0602	Low Flow Silt Fence	763	Ft
734E0604	High Flow Silt Fence	320	Ft
734E0620	Repair Silt Fence	260	Ft
734E0630	Floating Silt Curtain	80	Ft
734E0680	Flocculent Housing Unit	2	Each
734E0683	500K Gallon Treatment Flocculent Bag	2	Each
734E0845	Sediment Control at Inlet with Frame and Grate	4	Each
734E0847	Sediment Control at Type S Reinforced Concrete Drop Inlet	11	Ft
734E5005	Dewatering	Lump Sum	LS
734E5010	Sweeping	6.0	Hour
900E1320	Construction Entrance	1	Each

**GENERAL NOTES**

See Section A for GENERAL NOTES common to all sections.

**SENSITIVE SITE**

The areas denoted as "Sensitive Site" on the erosion and sediment control plan sheets are environmentally sensitive areas that require extra measures to ensure that water quality standards are met.

**COORDINATION WITH SECTION H**

Section H of these plans contains additional vegetation requirements that are not shown in these Section D plans.

**DEWATERING AND SEDIMENT CONTROL**

The Contractor has the option to treat sediment laden water trapped within the project limits with the DEWATERING AND SEDIMENT COLLECTION SYSTEM as detailed in these plans, or the Contractor may elect to transport sediment laden water off the project.

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.

**EROSION CONTROL**

The majority of the erosion control will be administered through the combination project P 0044(149)40, PCN 6925. The Contractor for this project is still required to obtain applicable erosion control permits and prepare and maintain erosion control plans and a SWPPP applicable to the work in this contract. Also, it may be necessary at times for adjustment to the erosion control devices placed by the combination project due to sewer and water main construction outside the phasing limits and the traveled way. The Contractor shall be responsible for coordinating all erosion control impacts with the combination project. Section D - Erosion Control shows minimum temporary and permanent erosion control measures. Section H shows final stabilization with regards to seeding and sodding. The Contractor may use Section D to prepare the required erosion & sediment control plan and SWPPP. The Contractor is responsible for all temporary erosion control and it's administration.

Payment for all temporary erosion control including, installation and maintenance of BMP's shall be paid under the respective bid items. Preparation of a SWPPP, weekly inspections, and all requirements of the applicable permits shall be considered incidental to all erosion control items.

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**REVEGETATION**

Plans and quantities for revegetation are located in Section H.

The Contractor shall coordinate the extent of disturbed areas with the combination project P 0044(149)40, PCN 6925.

For utility trench construction areas on City property or in DOT ROW that is not already included in the combination project shall be revegetated under this project.

Payment for revegetation of disturbed areas shall only be for areas within the defined project limits or temporary easement areas. Disturbed areas outside of the project limits or temporary easements areas shall be revegetated at the Contractor's expense.

**STREET SWEEPING**

Vehicle tracking of sediment from the construction site shall be minimized. Street sweeping shall be used if erosion and sediment control best management practices are not adequate to prevent sediment from being tracked onto the street.

The Contractor shall use a pickup broom having integral self-contained storage to clean the roadway. The pickup broom used shall be a minimum of 6 feet wide and have working gutter brooms.

At a minimum, sweeping will be required:

1. Prior to opening any segment or roadway to traffic.
2. Following pavement grooving operations and prior to the application of the pavement marking tape.
3. When sawing operations are underway in the inside driving lanes, the outside driving lanes and gutter may need to be swept to control dust.

All costs for cleaning the roadway with a pickup broom shall be incidental to the contract unit price per hour for "Sweeping".



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		Design Date: OCT 2013	Print Date: FEB 2014			
SDDOT Job No. P 0044(149)40				SSW10-1837 / CIP 50177 PCN X02U		

**TEMPORARY SEDIMENT BARRIER**

Temporary sediment barriers shall be installed at locations noted in the table and at locations determined by the Engineer during construction.

All costs for furnishing, installing, and maintaining the temporary sediment barrier including hauling, materials, equipment, labor, and incidentals necessary shall be paid for at the contract unit price per foot for "Temporary Sediment Barrier".

An additional quantity of Temporary Sediment Barrier has been added to the Estimate of Quantities for erosion and sediment control on areas that require an increased level of filtration and sediment control.

The temporary sediment barriers shall be from the list below or an approved equal:

Product	Manufacturer
ProWattle Perimeter Guard	ERTEC Environmental Systems LLC Alameda, CA Phone: 1-866-521-0724 <a href="http://www.ertecsystems.com">www.ertecsystems.com</a>
Compost Filter Sock 12"	Dioten Engineering, Inc. Rapid City, SD Phone: 1-605-430-7213 <a href="http://www.dioten.com/">www.dioten.com/</a>
SedimentSTOP Or SediMax-FR Filtration Rolls	North American Green Poseyville, IN Phone: 1-800-772-2040 <a href="http://www.tensarnagreen.com">www.tensarnagreen.com</a>
Typar Geocells	Fiberweb Inc. Old Hickory, TN Phone: 1-615-847-7500 <a href="http://www.typargeocells.com">www.typargeocells.com</a>
Silt Sock 12"	Aspen Ridge Lawn and Landscaping, LLC Rapid City, SD Phone: 1-605-415-0695 <a href="http://www.siltsocksd.com">www.siltsocksd.com</a>
Terra-Tubes	Profile Products LLC Buffalo Grove, IL Phone: 1-800-366-1180 <a href="http://www.profileproducts.com">www.profileproducts.com</a>

**TABLE OF TEMPORARY SEDIMENT BARRIER**

Station	to Station	L/R	Quantity (Ft)
4+28	7+03	R	335
7+50	9+89	R	240
47+51	50+89	R	420
51+24	52+14	R	180
1+42	0+67 (Park Dr.)	L	110
1+01	0+03 (Park Dr.)	L	110
-0+30	-1+61 (Park Dr.)	L	140
ADDITIONAL QUANTITY			500
Total:			2035

**LOW FLOW SILT FENCE**

The low flow silt fence fabric provided shall be from the approved product list. The approved product list for low flow silt fence may be viewed at the following internet site:

<http://sddot.com/business/certification/products/Default.aspx>

Low flow silt fence shall be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.04 for details.

An additional quantity of Low Flow Silt Fence has been added to the Estimate of Quantities for temporary sediment control.

**TABLE OF LOW FLOW SILT FENCE**

Station	L/R	Location	Quantity (Ft)
50+86 to 52+14	R	Top of Creek Bank	130
13+47 to 9+83 (Cottonwood)	L	Top of Creek Bank	480
Additional Quantity:			153
Total:			763

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**HIGH FLOW SILT FENCE**

The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

<http://sddot.com/business/certification/products/Default.aspx>

High flow silt fence shall be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

An additional quantity of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control.

**TABLE OF HIGH FLOW SILT FENCE**

Station	L/R	Location	Quantity (Ft)
<b>Jackson Blvd. Alignment</b>			
4+06	L	Inlet End of Pipe	15
4+28	L	Inlet End of Pipe	15
12+75	R	By Golf Course Building	30
48+06	R	Around Storm Sewer MH	40
50+60	R	Around Storm Sewer MH	50
<b>Cottonwood Alignment</b>			
7+15	L	Type B Inlet	15
8+45	R	Type B Inlet	15
8+65	R	Type B Inlet	40
Additional Quantity:			100
Total:			320



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**MUCKING SILT FENCE**

Mucking silt fence shall consist of removing muck trapped by the silt fence and spreading the material evenly over the adjacent area to conform to the existing grade. Payment will be under "Remove Sediment" contract item.

**REMOVE SILT FENCE**

Silt fence shall be removed when vegetation is established. Some or all of the silt fence may be left on the project until vegetation is established. The interim sediment control devices shall be immediately replaced by Sediment Control at Inlets with Frames and Grates, Sediment Control at Type S Reinforced Concrete Drop Inlets, and/or the appropriate lids.

**INTERIM SEDIMENT CONTROL AT INLETS, MANHOLES, AND JUNCTION BOXES AFTER SURFACING REMOVAL AND BEFORE PLACEMENT OF SURFACING**

Refer to Standard Plate 734.05 for details of installation of high flow silt fence at drop inlets, manholes, and junction boxes. The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

<http://apps.sd.gov/applications/HC60ApprovedProducts/main.aspx>

In addition, the Contractor shall do the following for this installation:

- A space of at least 1' shall be provided between the silt fence installation and the inlet. This space shall be filled completely with a 2" depth of aggregate, 2" minus or smaller.
- The top elevation of the silt fence shall be such that a 12" horizontal flap of silt fence will remain at the bottom.
- The base of the silt fence shall conform to the natural ground profile but does not need to be trenched in at the bottom.
- The extra 12" of the silt fence material may be cut so that the material will lay flat upon the subgrade.
- Sediment filter bags shall be placed on the 12" flap around the perimeter of the silt fence installation. The sediment filter bags shall overlap 6" at the ends and be placed tightly together.
- The sediment filter bags shall be filled with clean aggregate 2" minus or smaller.

**Sediment Filter Bag**

<u>Product</u>	<u>Manufacturer</u>
Snake Bag	Sacramento Bag Manufacturing Co. Sacramento, CA Phone: 1-800-287-2247 <a href="http://www.sacbag.com">www.sacbag.com</a>

The sediment filter bag shall be the Snake Bag from Sacramento Bag Manufacturing Company or an approved equal. All costs for furnishing and installing the sediment filter bags shall be incidental to the contract unit price per foot for "Sediment Filter Bag." All costs for removing the sediment filter bags shall be incidental to the contract unit price per foot for "Remove Sediment Filter Bag".

Payment for high flow silt fence shall be as stated in Section 734.5 of the Standard Specifications.

All costs for furnishing, installing, and removing the 2" depth of aggregate shall be incidental to other erosion and sediment control bid items.

All costs for removing and disposing of sediment collected by the sediment control device shall be incidental to the contract unit price per cubic yard for "Remove Sediment". The removed sediment shall be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or other storm sewer system. The Contractor and Engineer shall inspect and maintain the sediment control device once every week and within 24 hours after every rainfall event greater than 1/2".

**TABLE OF INTERIM SEDIMENT CONTROL AT INLETS, MANHOLES, AND JUNCTION BOXES AFTER SURFACING REMOVAL AND BEFORE PLACEMENT OF SURFACING, SEDIMENT CONTROL AT TYPE S REINFORCED CONCRETE DROP INLETS, AND SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES**

Station	L/R	High Flow Silt Fence Quantity (Ft)	Sediment Filter Bag Quantity (Ft)	Sediment Control at Type S Drop Inlets *	Sediment Control at Inlets w/ Frames and Grates
7+15 (Cottonwood)	L	15		0	1
8+45 (Cottonwood)	R	15		0	1
8+65 (Cottonwood)	L	38		11	0
Totals:		68	0	11	2

\* Quantity shown is the minimum length required and shall be the basis of payment.

**SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES**

This type of sediment control device should be used where there is pavement in the vicinity of the drop inlets and storm water or sediment could possibly enter the frame and grate. Sediment Control at Inlets with Frame and Grates shall be installed prior to working in the vicinity of the drop inlets.

The Contractor shall be responsible for maintaining and repairing the sediment control devices for the duration of the project for which sediment control measures are required. Maintenance shall be scheduled to prevent storm water from backing up into the driving lane.

"Sediment Control at Inlets with Frames and Grates" will be paid for one time at each location, regardless of the number of times the sediment control devices are installed, inspected, cleaned, removed, repaired, or replaced. All costs associated with furnishing, installing, inspecting, maintaining, cleaning, sediment removal, and repairing Sediment Control at Inlets with Frames and Grates shall be incidental to the contract unit price per each for "Sediment Control at Inlet with Frame and Gate".

**SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES**

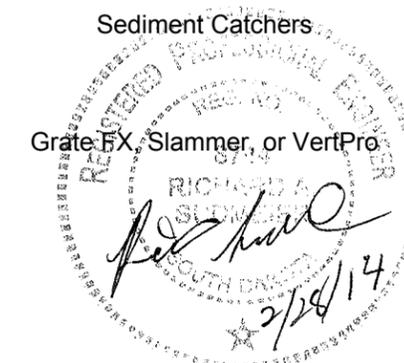
(continued)

Sediment collection devices shall be:

A commercial made sediment collection device from the "Sediment Control at Inlet with Frame and Grate" list or an approved equal. The device shall be installed in reinforced concrete drop inlets according to the manufacturer's recommendations.

Sediment Control at Inlet with Frame and Grate Approved List:

<u>Product</u>	<u>Manufacturer</u>
InfraSafe Debris Collection Device with filter sock	Royal Environmental Systems, Inc. Stacy, MN Phone: 1-800-817-3240 <a href="http://www.royalenterprises.net">www.royalenterprises.net</a>
Dandy Curb Sack	Dandy Products Inc. Dublin, OH Phone: 1-800-591-2284 <a href="http://www.dandyproducts.com">www.dandyproducts.com</a>
Silt Trapper	Storm Water Solutions Lakeville, MN Phone: 1-952-461-4376 <a href="http://www.silttrapper.com">www.silttrapper.com</a>
DIP Basket	Skyview Construction Co., LLC Waubay, SD Phone: 1-605-520-0555 <a href="http://www.skyviewconst.com">www.skyviewconst.com</a>
FLEXSTORM Inlet Filters	Inlet and Pipe Protection, Inc. Naperville, IL Phone: 1-866-287-8655 <a href="http://www.inletfilters.com">www.inletfilters.com</a>
GR-8 Guard or Combo Guard	ERTEC Environmental Systems LLC Alameda, CA Phone: 1-866-521-0724 <a href="http://www.ertecsystems.com">www.ertecsystems.com</a>
Sediment Catchers Grate FX, Slammer, or VertPro	Shaun Jensen Brookings, SD Phone: 1-605-690-4950
	Enviroscape ECM, Ltd. Oakwood, OH Phone: 1-419-594-3210 <a href="http://www.strawblanket.com">www.strawblanket.com</a>



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		Payment for high flow silt fence shall be as stated in Section 734.5 of the Standard Specifications.				

**SEDIMENT CONTROL AT TYPE S REINFORCED CONCRETE DROP INLETS**

The sediment control device provided shall be from the list shown below. Refer to Standard Plate 734.11 for details.

Product	Manufacturer
Dandy Curb	Dandy Products Inc. Dublin, OH Phone: 1-800-591-2284 <a href="http://www.dandyproducts.com">www.dandyproducts.com</a>
Gutterbuddy	ACF Environmental Richmond, VA Phone: 1-800-448-3636 <a href="http://www.acfenvironmental.com">www.acfenvironmental.com</a>
SS-300	Silt-Saver, Inc. Conyers, GA Phone: 1-888-382-7458 <a href="http://www.siltsaver.com">www.siltsaver.com</a>
Curb Inlet Guard	ECTEC Environmental Systems LLC Alameda, CA Phone: 1-866-521-0724 <a href="http://www.ertecsystems.com">www.ertecsystems.com</a>

**SOIL STABILIZER**

An estimated quantity of 2.0 acres of soil stabilizer has been included in the Estimate of Quantities. The soil stabilizer shall be applied on permanently seeded areas and areas deemed necessary by the Engineer.

The Contractor shall apply soil stabilizer according to the manufacturer's application instructions and at the rate specified in the list of approved soil stabilizers.

Wood fiber mulch that contains a green dye shall be mixed with the soil stabilizer to be used as a tracer when the soil stabilizer is applied hydraulically. Wood fiber mulch shall be added at a rate of 300 pounds per acre to all of the approved soil stabilizers listed in the table except for the Pam-12 Plus product. The wood fiber mulch shall be a 100% wood fiber product and does not need to contain a tackifier.

All costs for furnishing and applying the soil stabilizer including wood fiber mulch, hauling, materials, equipment, labor, and incidentals necessary shall be paid for at the contract unit price per Acre for "Soil Stabilizer".

The soil stabilizer shall be from the list below or an approved equal:

Product	Manufacturer
StarTak 600 Applied at a rate of 150 Lb/Acre	Chemstar Products Company Minneapolis, MN Phone: 1-800-328-5037 <a href="http://www.chemstar.com">www.chemstar.com</a>

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Pam-12 Plus  
Applied at a rate of:  
Slope  
None to 4:1 1000 Lb/Acre  
4:1 to 3:1 1000 to 2000 Lb/Acre  
3:1 to 2:1 2000 to 3000 Lb/Acre

M-Binder  
Applied at a rate of 150 Lb/Acre

FiberRX  
Applied at a rate of:  
Slope  
None to 4:1 50 Lb/Acre  
3:1 60 Lb/Acre  
2:1 70 Lb/Acre  
1:1 or steeper 80 Lb/Acre

Enviropam  
Applied at a rate of 9 Lb/Acre

HydraTack, Tack Plus,  
Tack-P, or Tack-P Plus  
Applied at a rate of 30 Lb/Acre

FI-1045 Hydrobond or  
FI-1046 Hydrobond  
Applied at a rate of 15 Lb/Acre

HF5000 Tack  
Applied at a rate of 60 Lb/Acre

R-Tack  
Applied at a rate of 150 Lb/Acre

SpecTac  
Applied at a rate of:  
Slope  
None 30 to 80 Lb/Acre  
4:1 50 to 100 Lb/Acre  
3:1 80 to 120 Lb/Acre  
2:1 100 to 170 Lb/Acre

ENCAP, LLC  
Green Bay, WI  
Phone: 1-877-405-5050  
<http://professional.encap.net/>

Ecology Controls  
Carpinteria, CA  
Phone: 1-805-684-0436  
[www.ssseeds.com](http://www.ssseeds.com)

Hydrostraw, LLC  
Manteno, IL  
Phone: 1-800-545-1755  
<http://hydrostraw.com/>

Innovative Turf Solutions, LLC  
Cincinnati, OH  
Phone: 1-513-317-8311  
[www.innovativeturfsolutions.com](http://www.innovativeturfsolutions.com)

Innovative Turf Solutions, LLC  
Cincinnati, OH  
Phone: 1-513-317-8311  
[www.innovativeturfsolutions.com](http://www.innovativeturfsolutions.com)

JRM Chemical, Inc.  
Cleveland, OH  
Phone: 1-216-475-8488  
[www.soilmoist.com](http://www.soilmoist.com)

Rantec Corporation  
Ranchester, WY  
Phone: 1-307-655-9565  
[www.ranteccorp.com](http://www.ranteccorp.com)

Rantec Corporation  
Ranchester, WY  
Phone: 1-307-655-9565  
[www.ranteccorp.com](http://www.ranteccorp.com)

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Super Tack  
Applied at a rate of 60 Lb/Acre

Rantec Corporation  
Ranchester, WY  
Phone: 1-307-655-9565  
[www.ranteccorp.com](http://www.ranteccorp.com)

EarthGuard SFM  
Applied at a rate of 60 LB/Acre  
(approx. 6 Gallons/Acre)

Terra Novo Inc.  
Bakersfield, CA  
Phone: 1-661-747-5956  
[www.terrano.com](http://www.terrano.com)

**EROSION CONTROL WATTLE**

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project until vegetation has been established.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

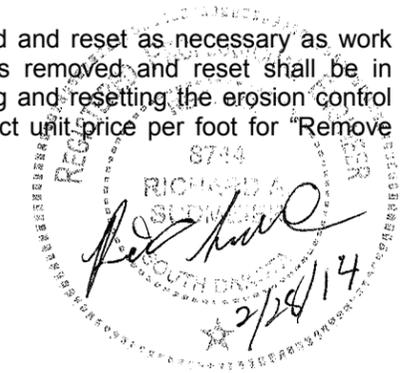
<http://sddot.com/business/certification/products/Default.aspx>

**TABLE OF EROSION CONTROL WATTLE**

Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
Cottonwood Alignment				
14+36 to 14+36	LtoR	9		103
14+96 to 14+79	LtoR	9		88
Additional Quantity:				48
Total:				239

**REMOVE AND RESET EROSION CONTROL WATTLE**

Erosion control wattles may be removed and reset as necessary as work progresses. The erosion control wattles removed and reset shall be in useable condition. All costs for removing and resetting the erosion control wattles shall be incidental to the contract unit price per foot for "Remove and Reset Erosion Control Wattle".



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JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK

Sheet Title: SECTION D  
ESTIMATED QUANTITIES AND GENERAL NOTES  
Sheet: D5 of D23

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**FLOATING SILT CURTAIN**

Floating silt curtains shall be installed at locations noted in the table and at locations determined by the Engineer during construction.

The Contractor shall determine the water depth and other waterway characteristics such as stream flow velocity and seek technical advice from the manufacturer before ordering the floating silt curtain so that the floating silt curtain installed is the correct type for the individual sites.

The Contractor shall install the floating silt curtain according to the manufacturer's installation instructions or as directed by the Engineer.

The Contractor shall maintain the floating silt curtains for the duration of the project to ensure continuous protection of the waterway.

A list of known manufacturers of floating silt curtain is shown below for informational purpose. Contractors may also use Engineer approved floating silt curtain from manufacturers that are not included in the list.

- |   |  |
|---|--|
| ABASCO, LLC<br>Houston, TX<br>Phone: 1-800-242-7745<br><a href="http://www.abasco.net">www.abasco.net</a>                                       | Aer-Flo, Inc.<br>Bradenton, FL<br>Phone: 1-800-823-7356<br><a href="http://www.aerflo.com">www.aerflo.com</a>                          |
| American Boom and Barrier Corp.<br>Cape Canaveral, FL<br>Phone: 1-800-843-2110<br><a href="http://www.abcoboom.com">www.abcoboom.com</a>        | ENVIRO-USA, LLC<br>Cocoa, FL<br>Phone: 1-321-222-9551<br><a href="http://www.enviro-usa.com">www.enviro-usa.com</a>                    |
| Elastec/American Marine, Inc.<br>Carmi, IL<br>Phone: 1-618-382-2525<br><a href="http://www.turbiditycurtains.com">www.turbiditycurtains.com</a> | Geo-Synthetics, LLC (GSI)<br>Waukesha, WI<br>Phone: 1-800-444-5523<br><a href="http://www.geosynthetics.com">www.geosynthetics.com</a> |
| Parker Systems, Inc.<br>Chesapeake, VA<br>Phone: 1-866-472-7537<br><a href="http://www.parkersystemsinc.com">www.parkersystemsinc.com</a>       |  |

**TABLE OF FLOATING SILT CURTAIN**

Station	to Station	L/R	Quantity (Ft)
Cottonwood Alignment			
14+88	15+10	R to L	80
Total:			80

**SDDOT CONSTRUCTION ENTRANCE**

If the SDDOT Construction Entrance is utilized, then the Contractor shall install the SDDOT Construction Entrance in accordance with these notes and the detail drawings.

Pit run material shall be obtained from a granular source and shall conform to the following gradation:

Sieve Size	Percent Passing
6"	100%
#4	0-60%
#200	0-20%

The pit run material shall be compacted to the satisfaction of the Engineer.

The aggregate for the granular material shall conform to the following gradation requirements:

Sieve Size	Percent Passing
3"	100%
2 1/2"	90-100%
1 1/2"	25-60%
3/4"	0-10%
1/2"	0-5%

The granular material shall be placed in 6" maximum lifts.

It is anticipated that the granular material will need to be periodically removed and replaced as it becomes inundated with mud and sediment.

The MSE geotextile shall conform to Section 831 of the Standard Specifications. The MSE geotextile shall be on the Approved Products List for this material or will be certified by the supplier to meet this specification prior to installation.

The MSE geotextile should be kept as taut as possible prior to placing.

Equipment shall not be allowed on the MSE geotextile until the first lift of granular material is in place.

All seams in the MSE geotextile shall be overlapped at least 2' and shingled.

SDDOT Construction Entrance will be paid for under the unit price per each for "Construction Entrance". All costs for furnishing materials, excavation, installation, and maintenance thereof will be included in the unit price. There may be times during the course of the project where additional pit run or granular material will be necessary for rejuvenation of the construction entrance. All costs for additional materials will be considered incidental to the contract unit price per each "Construction Entrance"



Revised By: RS 4/18/2014

Prepared By:  <b>FMG, Inc.</b> 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Prepared For: Public Works Department  Engineering Services	Scale: Design By: RAS/BF Design Date: OCT 2013 Internal Job No. 110155 Surveyed By: DOT / FMG SDDOT Job No. P 0044(149)40	Drawn By: RS/KS/JK Print Date: FEB 2014 Survey Date: 8-04 / 10-10	JACKSON BOULEVARD UTILITIES CHAPEL LANE TO RAPID CREEK SSW10-1837 / CIP 50177 PCN X02U	Sheet Title: SECTION D ESTIMATED QUANTITIES AND GENERAL NOTES	Sheet: D6 of D23

**FOR BIDDING PURPOSES ONLY**

**STORMWATER POLLUTION PREVENTION NARRATIVE**

**PROJECT AND SITE DESCRIPTION**

1. Project Description:  
This project consists of installation of City of Rapid City sanitary sewer and water main utilities within and in the vicinity of Jackson Blvd between Chapel Lane and the Rapid Creek Bridge. City of Rapid City storm sewer upgrades are also part of this project within Cottonwood Street from 1<sup>st</sup> Ave. to Rapid Creek and within the Meadowbrook Golf Course and Canyon Lake Park.
2. Existing Site Condition:  
The site lies in State of SD ROW for Highway 44 and a Rapid City greenway tract that was cleared due to the 1972 flood. The site is predominately grass surface with large trees and various roadway, parking, and sidewalk surfacing.
3. Adjacent Areas:  
The area to the south of the site is generally the Meadowbrook Golf Course and Canyon Lake Park. The area to the north of the site is generally residential and the Blessed Sacrament Church. There are no wetlands located within or adjacent to the project.
4. Soils:  
4+30 to 30+50 – The soil profile generally consists of finely grained clays, silts and sands.  
30+50 to 70+87.85 – The soil profile generally consists of finely grained clays, silts and sands underlain by a well-graded gravel with clay which become saturated with depth.
5. Disturbed Area:  
Area disturbed is 17.76 acres.
6. Construction Schedule:  
May 2014 through August 2015

**EROSION AND SEDIMENT CONTROL CONSTRUCTION SITE PLAN**

The attached erosion and sediment control construction site plan is provided to establish a number of erosion control devices for bidding purposes and to provide information to the Contractor to aid in the process of obtaining all associated construction permits. The Contractor is responsible for the methods and means required for implementing any and all construction activities to be in compliance with all permits.

**EROSION AND SEDIMENT CONTROL PERMIT**

The Prime Contractor is the responsible party for obtaining a City of Rapid City erosion and sediment control permit from the City of Rapid City.

**STORMWATER POLLUTION PREVENTION PLAN AND PERMITS**

The Prime Contractor is the responsible party for preparing a Notice of Intent (NOI) for filing for coverage under the South Dakota Department of Environment and Natural Resources (SDDENR) to obtain coverage under the general permit for storm water discharges associated with construction activities.

The City of Rapid City is the Project Owner. The NOI and the contractor certification shall be submitted to the Project Owner. The Project Owner will return to the Contractor once signatures have been obtained. The Contractor shall submit NOI to SDDENR.

The Prime Contractor is the responsible party for preparing the Notice of Termination (NOT) for the SDDENR once "final stabilization" has been obtained on the project. The NOT shall be submitted to the Project Owner. The City will submit the NOT to the SDDENR. Please refer to the SDDENR general permit for definitions of final stabilization.

Per City permit requirements, the Contractor shall at all times have a copy of the SDDENR NOI permit letter, Stormwater Pollution Prevention Plan (SWPPP) with associated Erosion and Sediment Control Plan (ESCP) drawings, and inspection

reports located within or adjacent to the project limits available for review. The Contractor shall ensure that this information is located within a weather tight, secure enclosure and clearly labeled.

**MODIFICATIONS TO THE ESCP**

The Engineer may order changes to the ESCP and/or the Contractor is responsible to request changes to the ESCP if unforeseen changes occur, or the ESCP does not perform as intended, or to improve the effectiveness of the ESCP, or to comply with the SDDENR permit. The Engineer will evaluate and determine if any Contractor requested changes to the ESCP should be made. The Contractor is responsible to implement these changes as soon as practical.

The Contractor shall have available, on-site, the original ESCP with any modifications implemented identified on the ESCP.

**INSPECTIONS**

The Contractor shall ensure that qualified personnel perform inspections on the project at the following minimum frequency until the site has reached final stabilization and a Notice of Termination is submitted to the SDDENR:

1. Prior to removal of any surfacing or topsoil.
2. Once every seven calendar days (minimum). When runoff is unlikely due to winter conditions the inspections may be reduced to once a month.
3. Within 24 hours of every rainfall 1/2 inch or greater.
4. After a snow melt that causes erosion.
5. Within 24 hours of a complaint being made to the Contractor or Project Owner.

The Engineer reserves the right to perform inspections more frequently than identified and additional inspections will be made of obvious items if non-compliance exists. If the Contractor fails to attend any inspections, it does not relieve them of their responsibility to comply with any correction of maintenance actions required.

Items noted as being non-compliant or needing maintenance as a result of the inspections must be corrected as soon as practical. The site shall continue to be considered in non-compliance until the issue has been corrected to the satisfaction of the Engineer.

**NOTICE OF TERMINATION**

The Contractor is responsible for complying with the ESCP until a Notice of Termination (NOT) of coverage under the general permit has been issued. The notice will be prepared by the Contractor for submittal to the City and to the SDDENR when all storm water discharges covered by the permit are eliminated and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Final stabilization means either or a combination of:

1. All soil disturbing activities at the site have been completed and uniform perennial vegetative cover with a density of 70% of the native cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geo-textiles) have been employed; or
2. For construction projects on land used for agricultural purposes, final stabilization may be accomplished by returning the disturbed area to its pre-construction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to "waters of the state" and areas which are not being returned to their pre-construction agricultural use must meet the final stabilization criteria in (1) above.

**GOOD HOUSEKEEPING**

Non-structural bmp's used as good housekeeping measures can, to some degree, prevent the deposition of pollutants on the urban landscape or remove pollutants at their source. The source of pollutants for assimilation into storm water is the land surface itself, especially the impervious surfaces in the urban area. Thus, it is expected that when non-structural measures are effectively implemented, they will reduce the amount of pollutants being deposited on the land surfaces for eventual contact with storm water and transported to the receiving water system. Therefore, the Contractor should evaluate and determine which appropriate good housekeeping measures listed below should be used.

Operations and maintenance: to assure that equipment and work related processes are working well; the following practices can be implemented:

1. Maintain dry and clean floors and ground surfaces by using brooms, shovels, vacuum cleaners, or cleaning machines rather than wet cleanup methods.
2. Regularly pick up and dispose garbage and waste material.
3. Make sure all equipment and related processes are working properly and preventative maintenance is kept up with on both.
4. Routinely inspect equipment and processes for leaks or conditions that could lead to discharges of chemicals or contact of storm water with raw materials, intermediate materials, waste materials, or products used on-site.
5. Assure all spill cleanup procedures are understood by employees. Training of employees on proper cleanup procedures shall be implemented.
6. Designate separate areas of the site for auto parking vehicle refueling, concrete truck wash-out, and routine maintenance.
7. Clean up leaks, drips, and other spills immediately.
8. Cover and maintain dumpster's and waste receptacles.

Material storage practices: improperly storing material on-site can lead to the release of materials and chemicals that can cause storm water runoff pollution. Proper storage techniques include the following:

1. Provide adequate aisle space to facilitate material transfer and ease of access for inspection.
2. Store containers, drums, and bags away from direct traffic routes to prevent accidental spills.
3. Stack containers according to manufacturer's instructions to avoid damaging the containers from improper weight distribution.
4. Store containers on pallets or similar devices to prevent corrosion of containers that results from containers coming in contact with moisture on the ground.
5. Store toxic or hazardous liquids within curbed area or secondary containers.
6. Assign responsibility of hazardous material inventory to a limited number of people who are trained to handle such materials.



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**FOR BIDDING PURPOSES ONLY**

**GOOD HOUSEKEEPING (CONTINUED)**

Material inventory practices: an up-to-date inventory kept on all materials (both hazardous and non-hazardous) present on-site will help track how materials are stored and handled onsite, and identify which materials and activities pose the most risk to the environment. The following description provides the basic steps in completing a material inventory:

1. Identify all chemical substances present at the work site. Perform a walk-through of the site, review purchase orders, list chemical substances used, and obtain material safety data sheets (msds) for all chemicals.
2. Label all containers. Labels shall provide name and type of substance, stock number, expiration date, health hazards, handling suggestions, and first aid information. This material can also be found on the msds.
3. Clearly mark on the hazardous materials inventory which chemicals require special handling, storage, use, and disposal considerations. Decisions on the amounts of hazardous materials that are stored on-site shall include an evaluation of any emergency control systems that are in place. All storage areas shall be designed to contain any spills.

Training and participation: frequent and proper training in good housekeeping techniques reduces the possibility of chemicals or equipment that will be mishandled. Reducing waste generation is another important pollution prevention technique. The following are ways to get people involved in good housekeeping practices.

1. Provide information sessions on good housekeeping practices in training programs.
2. Discuss good housekeeping at meetings.
3. Publicize pollution prevention through posters or signs.

**SPILL PREVENTION AND RESPONSE**

A Spill Prevention Control and Countermeasure Plan (SPCC) identifies area where spills can occur on-site, specifies materials handling procedures, storage requirements, and identifies spill cleanup procedures. The plan is intended to establish standard operating procedures and necessary employee training to minimize the likelihood of accidental releases of pollutants that can contaminate storm water.

Storm water contamination assessment, flow diversion, record keeping, internal reporting, employee training, and preventative maintenance are associated bmp's that can be incorporated into a comprehensive spill prevention plan.

Emergency spill cleanup plans shall include the following information:

1. A description of the facility including the nature of the facility activity and general types and quantities of chemicals stored at the facility.
2. A site plan showing the location of storage areas of chemicals, the location of storm drains, site drainage patterns, firefighting equipment and water source locations, and the location and description of any devices used to contain spills such as positive control valves.
3. Notification procedures to be implemented in the event of a spill such as phone numbers of key personnel and appropriate regulatory agencies.
4. Instructions regarding cleanup procedures.
5. Designated personnel with overall spill response cleanup responsibility.
6. Quick notification of Rapid City fire and rescue for spills that cannot be handled by local site staff.

**METHODS OF ENSURING SURFACE WATER QUALITY**

The only non-storm water discharge allowed by the general permit for storm water discharge associated with construction activities is uncontaminated ground water or waters, used as a best management practice, to wash vehicles and control dust. It is the responsibility of the Contractor to obtain a general permit to discharge under the South Dakota surface water discharge system for temporary discharge activities in South Dakota (dewatering permit) for all other non-storm water discharges. All monitoring, testing, and other requirements of the dewatering permit are the responsibility of the Contractor.

Pumping (mechanically discharging) sediment laden water including ponded storm water or contaminated trench dewatering into the storm sewer or off the project site is not covered under the general permit. It is the responsibility of the contractor to obtain and comply with a dewatering permit for these activities. The Engineer may notify the SDDENR if the Contractor is observed pumping sediment laden water into the storm sewer or off site. Pumping sediment laden storm water through inlet protection is not allowed as a bmp.

In lieu of pumping sediment laden water the following are some methods the Contractor may use to control sediment laden water:

1. The best method is for the contractor to maintain positive drainage during all phases of the project to prevent water from ponding on the project.
2. Treat the sediment laden water on-site through the use of filter bags, deflocculating chemicals, sediment basins, or a portable containment system.
3. Pump or discharge the water to other portions of the site. This is allowed if waters do not leave the project limits.

No separate payment will be made to the Contractor to comply with the dewatering permit.

**MODIFICATIONS OF EROSION AND SEDIMENT CONTROL DEVICES TO PREVENT PROPERTY DAMAGE**

The Contractor is responsible to maintain drainage. In the event that an erosion or sediment control device is obstructing drainage and damage to property is possible the Contractor may temporarily modify or remove the device to facilitate drainage. The Contractor shall immediately notify the Engineer to discuss and implement alternatives to comply with the ESCP and general permit.

During the course of construction heavy rainfall events may occur. The Contractor shall make sure that the stormwater runoff will go into the inlets, which may require removing the inlet protection temporarily. In no case shall the inlets be so plugged as to allow stormwater to get onto homeowners property or into basements. i.e. The Contractor needs to have personnel on-site during rain events to pull inlet protection if flooding of private property begins. Do not pull prior to storm events or if the event is small.

**SOIL SURFACE STABILIZATION PRACTICES**

After construction begins, soil surface stabilization shall be applied within 14 days to all disturbed areas that may not be at final grade but will remain dormant (undisturbed) for periods longer than 21 calendar days. Within 14 days after final grade is reached on any portion of the site, permanent or temporary soil surface stabilization shall be applied to disturbed areas and soil stockpiles. The following table lists the amount of time various erosion control measures are applicable:

Maximum time limits of land exposures for selection of erosion controls.

Erosion Control Method	Maximum Allowable Period of Exposure (Months)
Surface Roughening	1
Mulching	12
Temporary Re-Vegetation	12-24
Permanent Re-Vegetation	24 or More
Soil Stockpile Re-Vegetation	2
Early Application of Road Base	1

**MAINTENANCE**

The Contractor is responsible for maintaining and repairing all temporary and permanent erosion and sediment control devices until a notice of termination is filed.

**REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES**

The Contractor is responsible to remove all temporary erosion control and sediment control devices when the site reaches final stabilization. The Engineer may order specific temporary erosion control and sediment control devices to remain in-place past final stabilization. The Contractor will not be responsible to remove these items.

**PERMANENT STABILIZATION MEASURES**

Permanent seeding and/or sod along with replacement all preconstruction hard surfaces will be used for permanent stabilization of all areas located throughout the project. Erosion Control Fabric will also be used to stabilize slopes as determined by the Engineer.



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**EROSION AND SEDIMENT CONTROL SEQUENCE AND TIME SCHEDULE**

The following sequence and time schedule are intended to provide a guideline to the Contractor for the installation and implementation of the ESCP during construction. The sequence and time schedule are for reference only and may change depending on the Contractor's sequence of operations and must be approved by the Engineer prior to making changes.

**SEQUENCING:**

Prior To Start of Construction – All Phases:

Install applicable preliminary erosion control measures such as silt fence, wattles, vehicle tracking pads, inlet protection, and sediment traps prior to beginning grading activities in each phase.

Coordinate Construction Activities with the combination project.

Erosion Control Removals - All Phases:

Vehicle tracking stations shall be removed when all roadway gravel base has been placed in particular phase. Silt traps, silt ditch, and temporary silt fence shall be removed after all hard surfacing is complete and final stabilization has been achieved within each drainage basin.

**EROSION AND SEDIMENT CONTROL PLAN PROJECT OWNER CERTIFICATION:**

"This erosion and sediment control report and attached site construction plan appear to fulfill the technical criteria and the criteria for erosion and sediment control requirements of the City of Rapid City. I understand that additional erosion control measures may be needed if unforeseen erosion or sediment control problems occur or if the submitted plan does not function as intended."

\_\_\_\_\_  
Terry Wolterstorff Date  
Public Works Director  
City Of Rapid City

**PROJECT OWNER /ENGINEER:**

City of Rapid City  
300 Sixth Street  
Rapid City, SD 57701  
Owner Representative: Klare Schroeder, P.E.  
Email Address: [klare.schroeder@rcgov.org](mailto:klare.schroeder@rcgov.org)  
Phone Number: (605) 394-4154

**PRIME CONTRACTOR:**

Company Name:  
Address:  
City, State, Zip:  
Project Manager:  
Email Address:  
Phone Number:

**EROSION AND SEDIMENT CONTROL PLAN PREPARED BY:**

Richard Sudmeier, P.E.  
3700 Sturgis Road  
Rapid City, SD 57702  
Email Address: [rsudmeier@fmgeengineering.com](mailto:rsudmeier@fmgeengineering.com)  
Phone Number (605) 342-4105

Engineer's Certification: I hereby certify that these plans were prepared under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of South Dakota.



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**FOR BIDDING PURPOSES ONLY**

- SYMBOLGY FOR BEST MANAGEMENT PRACTICES
-  STORM WATER DISCHARGE POINT
  -  LOW FLOW SILT FENCE
  -  HIGH FLOW SILT FENCE
  -  SILT TRAP
  -  SEDIMENT CONTROL AT INLET WHEN SURFACING IS IN PLACE
  -  TEMPORARY SEDIMENT BARRIER
  -  TEMPORARY WATER BARRIER
  -  FLOATING SILT CURTAIN
  -  SEDIMENT FILTER BAGS
  -  TRIANGULAR SILT BARRIERS
  -  EROSION CONTROL WATTLES
  -  EROSION BALES
  -  SURFACE ROUGHENING
  -  SOIL STABILIZER / TEMPORARY MULCH / DUST CONTROL
  -  CUT INTERCEPTOR DITCH
  -  TEMPORARY SLOPE DRAIN
  -  SEDIMENT CONTROL AT INLET BEFORE PLACEMENT OF SURFACING
  -  HYDRAULIC STRAW MULCH / FIBER MULCHING / BONDED FIBER MATRIX / FIBER REINFORCED MATRIX
  -  ROCK CHECK DAM
  -  SODDING
  -  TYPE 1 EROSION CONTROL BLANKET
  -  TYPE 2 EROSION CONTROL BLANKET
  -  TYPE 3 EROSION CONTROL BLANKET
  -  TYPE 4 EROSION CONTROL BLANKET
  -  TYPE 1 TURF REINFORCEMENT MAT
  -  TYPE 2 TURF REINFORCEMENT MAT
  -  TYPE 3 TURF REINFORCEMENT MAT
  -  SYNTHETIC CHANNEL PROTECTION
  -  TOPSOIL STOCKPILES
  -  BORROW AREAS
  -  STABILIZED CONSTRUCTION ENTRANCES
  -  CONCRETE WASHOUTS
  -  VEGETATED BUFFER STRIPS
  -  ASPHALT PLANT SITE
  -  CONCRETE PLANT SITE
  -  ON-SITE CONSTRUCTION MATERIAL STORAGE AREAS
  -  SPILL KIT
  -  WORK PLATFORM
  -  PORTABLE TOILET
  -  VEHICLE AND EQUIPMENT PARKING, FUELING, AND MAINTENANCE AREAS
  -  DUMPSTER OR OTHER TRASH AND DEBRIS CONTAINERS

BEST MANAGEMENT PRACTICES

BEST MANAGEMENT PRACTICES (BMP'S) SHOULD BE USED THROUGHOUT CONSTRUCTION. TO REMIND CONTRACTORS AND FIELD PERSONNEL THAT BMP'S FOR WATER QUALITY SHOULD BE UTILIZED THROUGHOUT THE CONSTRUCTION PROCESS. THE SYMBOLGY IS COLORED AS FOLLOWS:

RED BMPS ARE TO BE INSTALLED BEFORE EARTH MOVING ACTIVITIES COMMENCE. RED BMPS ARE USED FOR PERIMETER CONTROL. THEY PREVENT SEDIMENT FROM LEAVING THE SITE OR ENTERING FROM ANOTHER SITE. THEY MAY ALSO DETER WATER AWAY FROM OR AROUND THE SITE. THEY MAY BE LEFT IN PLACE AND MAINTAINED FOR THE REMAINDER OF CONSTRUCTION OR UNTIL VEGETATION HAS REACHED 70% OF THE BACKGROUND LEVEL.

BLUE BMPS ARE TO BE INSTALLED DURING CONSTRUCTION. BLUE BMPS ARE USED FOR TEMPORARY STABILIZATION. THEY PREVENT EROSION DURING CONSTRUCTION. THEY MAY ALSO BE SEDIMENT CONTROLS UTILIZED AFTER DRAIN PIPES AND STORM SEWERS ARE IN PLACE. THEY MAY BE LEFT IN PLACE AND MAINTAINED FOR THE REMAINDER OF CONSTRUCTION OR UNTIL VEGETATION HAS REACHED 70% OF THE BACKGROUND LEVEL. SOME YELLOW BMPS WILL BE REMOVED OR REPLACED DURING CONSTRUCTION.

GREEN BMPS ARE TO BE INSTALLED WHEN GRADING IS COMPLETE. GREEN BMPS ARE USED FOR FINAL STABILIZATION. THEY ARE PERMANENT EROSION CONTROL MEASURES THAT ARE NOT REMOVED.

IF THE CONTRACTOR OR ENGINEER DECIDE TO USE ADDITIONAL BEST MANAGEMENT PRACTICES OR LABEL THE LOCATIONS OF THEM THEY SHOULD USE THE SYMBOLGY SHOWN. OTHER BEST MANAGEMENT PRACTICES FOR WHICH THERE IS NO SYMBOLGY INCLUDE:

PERMANENT SEEDING IS DONE BEFORE THE APPLICATION OF ALL TYPES OF MULCHING AND HYDRAULICALLY APPLIED SOIL MULCHES AND MATRIXS. PERMANENT GRASS HAY/ STRAW MULCH IS NOT SHOWN ON PLAN SHEETS, BUT IT CAN BE ASSUMED THAT ALL AREAS THAT ARE NOT ROADWAYS ON RURAL PROJECTS WILL BE SEEDED THEN MULCHED. AREAS WHERE AN ALTERNATE TO GRASS HAY /STRAW MULCH IS USED WILL BE SHOWN WITH THE APPROPRIATE SYMBOLGY.

SEDIMENT BASINS UTILIZED DURING CONSTRUCTION WILL BE SHOWN ON PLAN SHEETS AND IN SECTION X.

GEOTEXTILE FABRIC USUALLY SUPPLEMENTS OTHER BMPS, BUT IT MAY BE USED TO TEMPORARILY COVER AREAS FOR EROSION PROTECTION UNTIL IT IS PERMANENTLY INSTALLED.

STREET SWEEPING SHOULD BE DONE AS NEEDED TO KEEP SEDIMENT ON ROADWAYS FROM LEAVING THE SITE.

DEWATERING AND SEDIMENT COLLECTING IS SHOWN ON A DETAIL SHEET WHEN IT IS NEEDED. DEWATERING WITHOUT SEDIMENT COLLECTING DOES NOT HAVE A DETAIL, JUST A DETAILED NOTE. SEDIMENT LADEN WATER SHOULD NEVER BE PUMPED OFF THE SITE.

GABIONS AND RIP RAP AT PIPE AND CULVERT OUTLETS ARE DETAILED IN SECTION B.

PROJECT PHASING

PROJECT PHASING MAY BE ONE OF THE MOST IMPORTANT BMPS. DURING PHASING REMEMBER THE FOLLOWING:

ALWAYS INSTALL PERIMETER CONTROLS BEFORE BEGINING EARTH MOVING ACTIVITIES.

DO NOT DISTURB MORE AREA THAN WHAT IS NEEDED TO COMPLETE EACH PHASE OF CONSTRUCTION.

IF POSSIBLE CONSTRUCT SEDIMENT BASINS AND STABILIZE THEM BEFORE BEGINNING ROADWAY GRADING.

TEMPORARILY STABILIZE AREAS THAT WILL NOT BE TOUCHED WITHIN 14 DAYS.

PERMANENTLY STABILIZE AREAS WHEN GRADING IN THAT AREA IS COMPLETE. PERMANENT STABILIZATION CAN BE COMPLETED IN PHASES AND DOES NOT HAVE TO WAIT UNTIL THE WHOLE ROADWAY HAS BEEN CONSTRUCTED.

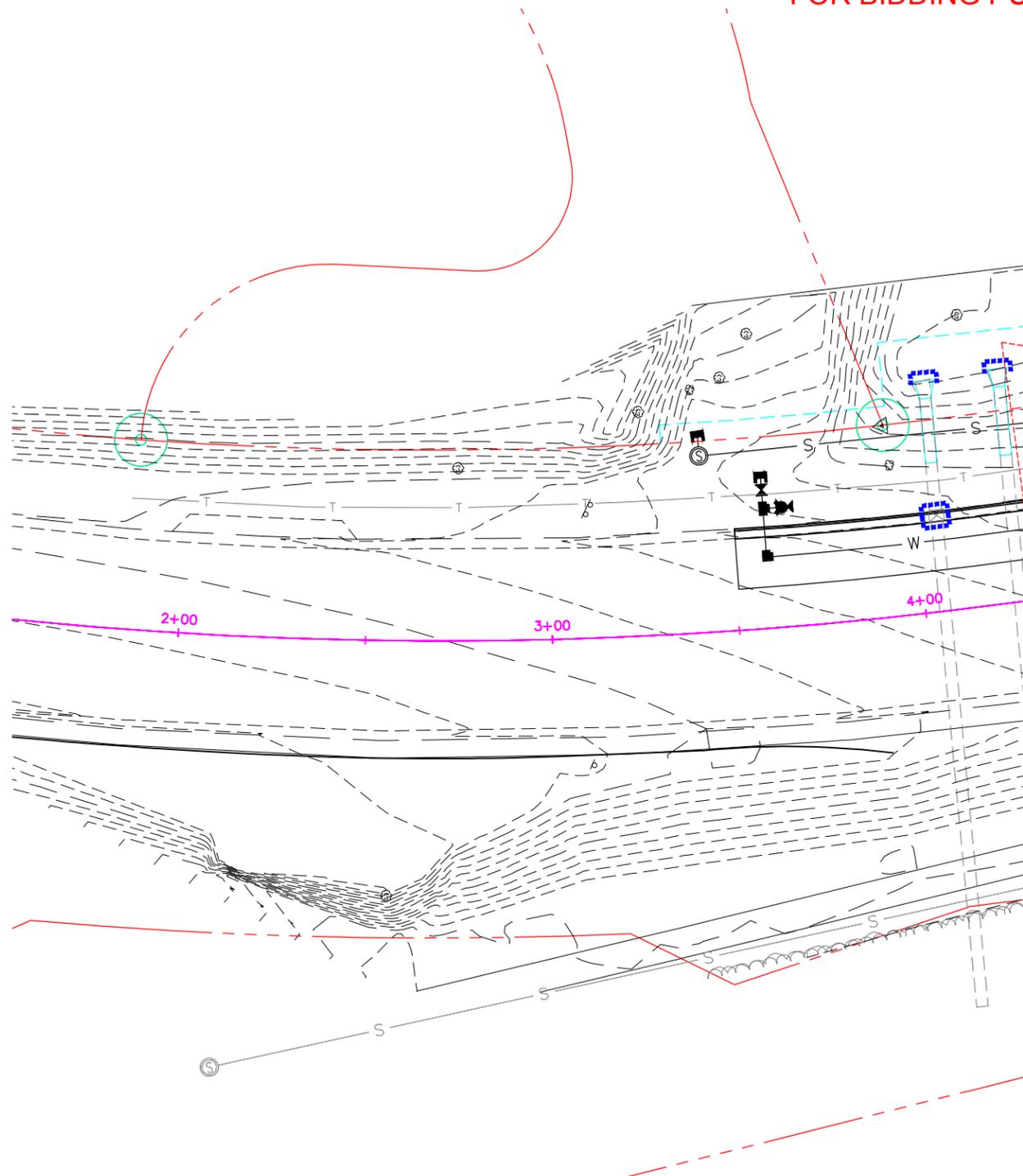
CONTINUALLY MAINTAIN ALL SEDIMENT CONTROLS AND MONITOR AREAS WHERE EROSION CONTROL HAS BEEN INSTALLED.



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 <p><b>FMG, Inc.</b> 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com</p>	 <p>Public Works Department Engineering Services</p>	Scale: 1" = 40' Designed By: JAP/JF/RS Design Date: SEPT 2013 Internal Job No: 110155 Surveyed By: DOT / FMG SDDOT Project No. P 0044(149)40	Drawn By: JRK Print Date: FEB 2014 Survey Date: 8/04-7/13	<p><b>JACKSON BOULEVARD UTILITIES CHAPEL LANE TO RAPID CREEK</b></p>	Sheet Title: EROSION AND SEDIMENT CONTROL LEGEND	Sheet: <b>D10</b> of <b>D23</b>
		SSW10-1837 / CIP 50177 / PCN X02U				

FOR BIDDING PURPOSES ONLY



TEMPORARY STABILIZATION

INSTALL HIGH FLOW SILT FENCE AT THE FOLLOWING LOCATIONS:

- 4+07-64'L 15 FT
- 4+28-64'L 15 FT

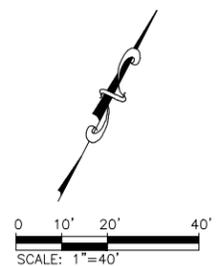
PERIMETER PROTECTION

INSTALL SEDIMENT CONTROL AT INLET AT THE FOLLOWING LOCATIONS:

- 4+06-25.00'L TYPE B

FINAL STABILIZATION

SEE SECTION H



Prepared By:



**FMG, Inc.**  
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Prepared For:  
Public Works Department



Engineering Services

Scale: 1" = 40'

Designed By: JAP/JF/RS	Drawn By: JRK
Design Date: SEPT 2013	Print Date: FEB 2014
Internal Job No: 110155	
Surveyed By: DOT / FMG	Survey Date: 8/04-7/13
SDDOT Project No. P 0044(149)40	

**JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK**

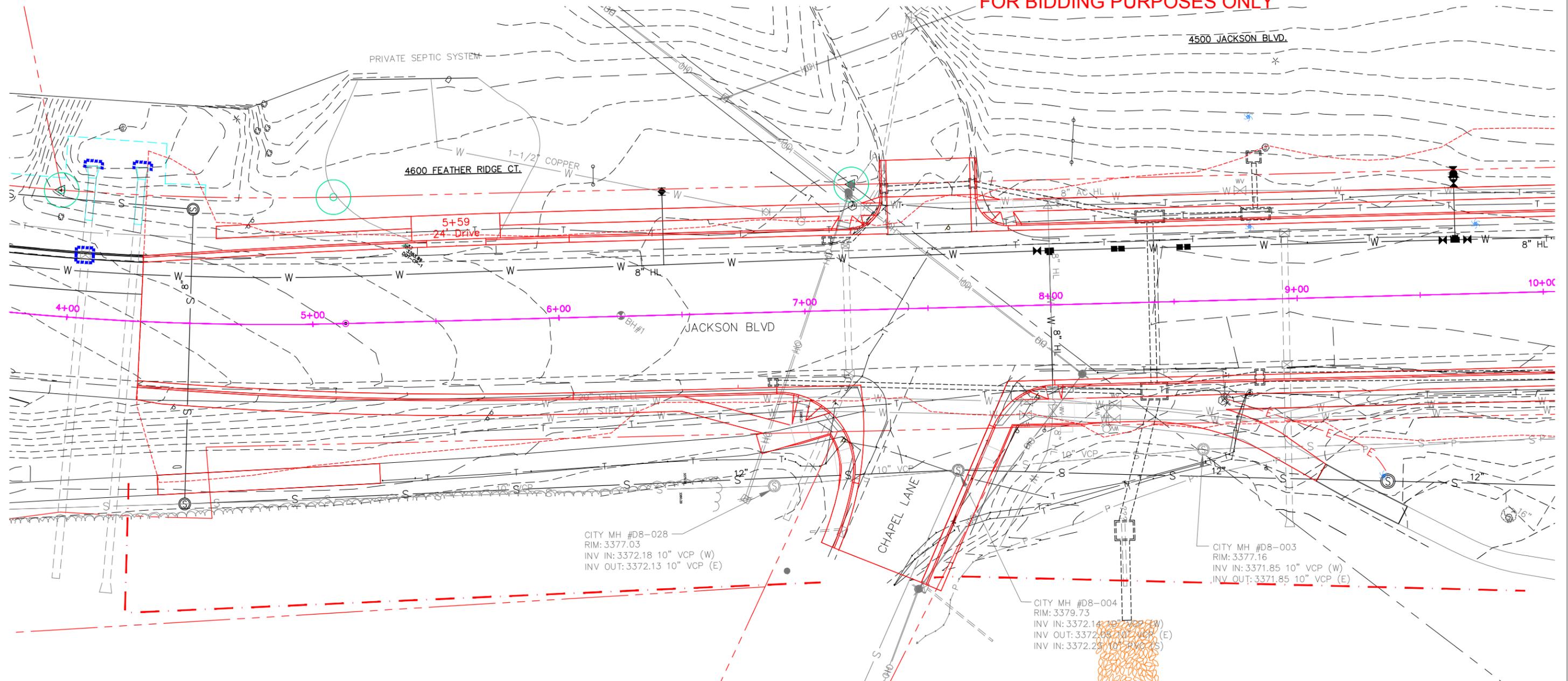
SSW10-1837 / CIP 50177 / PCN X02U

Sheet Title:  
JACKSON BLVD  
EROSION  
& SEDIMENT  
CONTROL

Sheet:  
**D11**  
of  
**D23**

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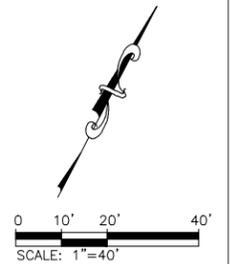
**PERIMETER PROTECTION**

INSTALL TEMPORARY SEDIMENT BARRIER AT THE FOLLOWING LOCATIONS:

- 4+28 L TO 7+03 R      335 FT
- 7+50 L TO 9+89 R      240 FT

**FINAL STABILIZATION**

SEE SECTION H



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 Rapid City, SD 57702-0317  
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Public Works Department

Scale: 1" = 40'

Designed By: JAP/JF/RS	Drawn By: JRK
Design Date: SEPT 2013	Print Date: FEB 2014
Internal Job No: 110155	
Surveyed By: DOT / FMG	Survey Date: 8/04-7/13
SDDOT Project No. P 0044(149)40	

**JACKSON BOULEVARD UTILITIES  
 CHAPEL LANE TO RAPID CREEK**

SSW10-1837 / CIP 50177 / PCN X02U

Sheet Title:

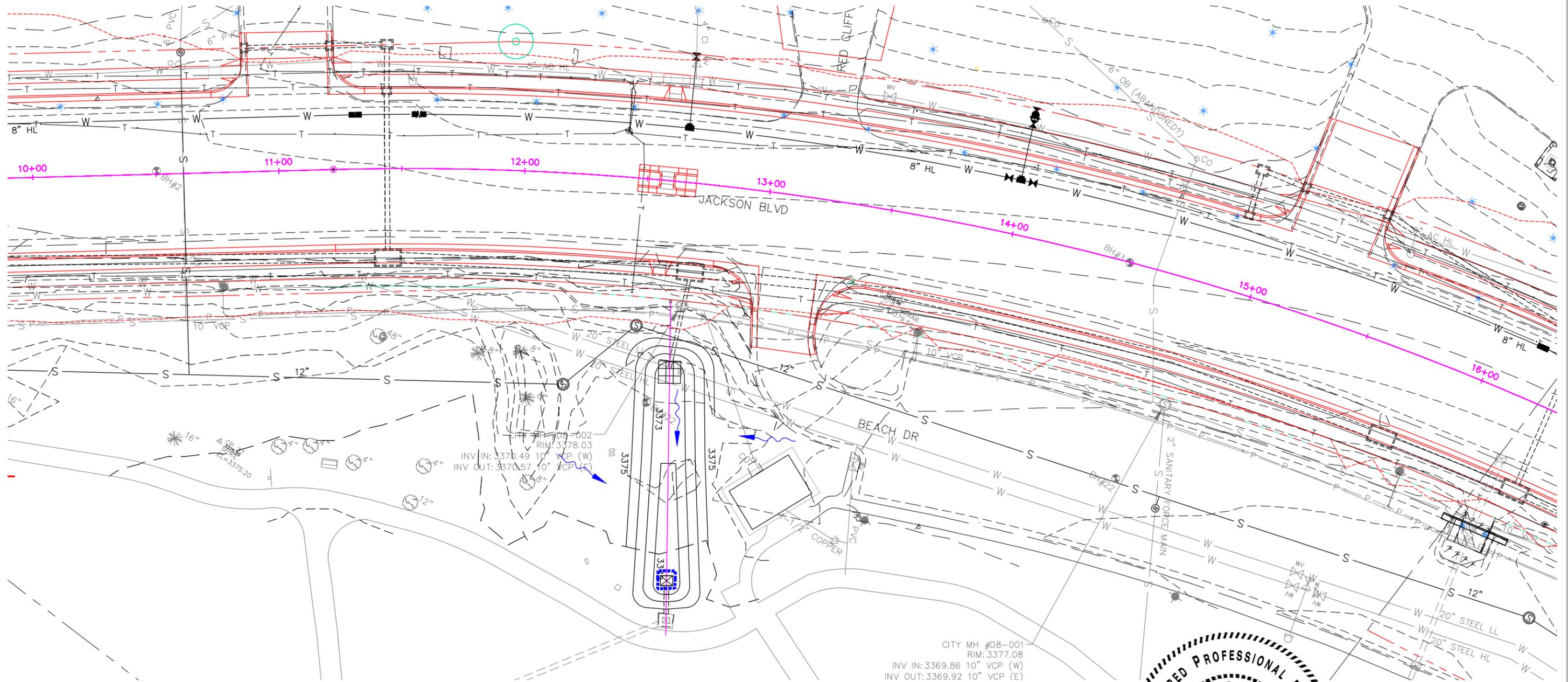
JACKSON BLVD & CHAPEL LN EROSION & SEDIMENT CONTROL

Sheet:

**D12**  
 of  
**D23**

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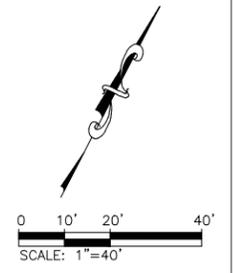
TEMPORARY STABILIZATION

INSTALL HIGH FLOW SILT FENCE AT THE FOLLOWING LOCATIONS:  
12+75-165'R      30 FT

FINAL STABILIZATION

SEE SECTION H

CITY MH #D8-001  
RIM: 3377.08  
INV IN: 3369.86 10" VCP (W)  
INV OUT: 3369.92 10" VCP (E)



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Engineering Services

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Design Date: SEPT 2013	Print Date: FEB 2014
Internal Job No: 110155	Surveyed By: DOT / FMG
Survey Date: 8/04-7/13	SDDOT Project No. P 0044(149)40

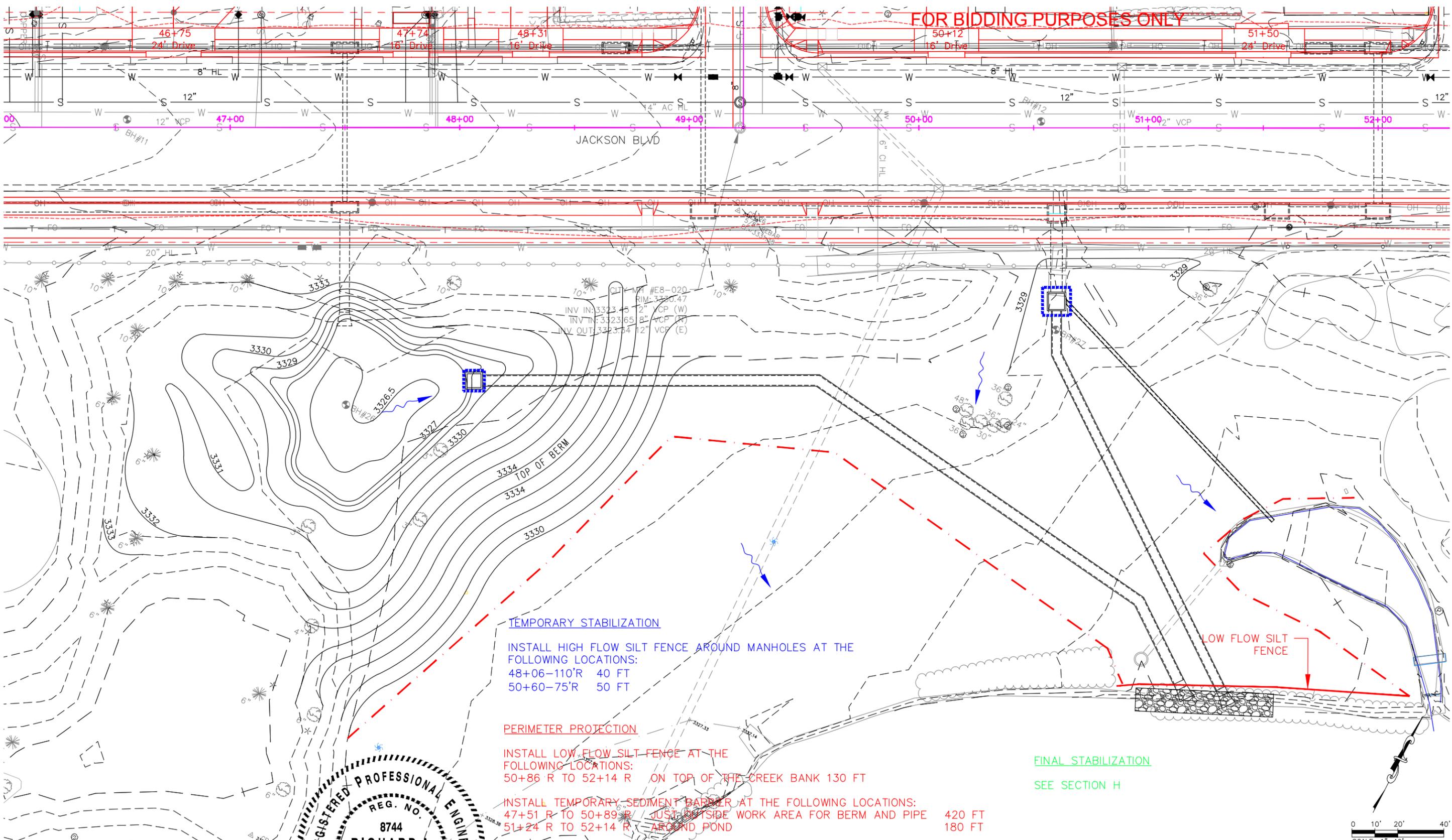
**JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK**

SSW10-1837 / CIP 50177 / PCN X02U

Sheet Title:  
CANYON LAKE PARK  
EROSION AND  
SEDIMENT CONTROL  
PLAN

Sheet:  
**D13**  
of  
**D23**

FOR BIDDING PURPOSES ONLY



**TEMPORARY STABILIZATION**

INSTALL HIGH FLOW SILT FENCE AROUND MANHOLES AT THE FOLLOWING LOCATIONS:  
48+06-110'R 40 FT  
50+60-75'R 50 FT

**PERIMETER PROTECTION**

INSTALL LOW FLOW SILT FENCE AT THE FOLLOWING LOCATIONS:  
50+86 R TO 52+14 R ON TOP OF THE CREEK BANK 130 FT

INSTALL TEMPORARY SEDIMENT BARRIER AT THE FOLLOWING LOCATIONS:  
47+51 R TO 50+89 R JUST OUTSIDE WORK AREA FOR BERM AND PIPE 420 FT  
51+24 R TO 52+14 R AROUND POND 180 FT

**FINAL STABILIZATION**

SEE SECTION H



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Engineering Services

Scale: 1" = 40'

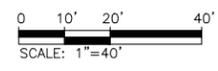
Designed By: JAP/JF/RS	Drawn By: JRK
Design Date: SEPT 2013	Print Date: FEB 2014
Internal Job No: 110155	
Surveyed By: DOT / FMG	Survey Date: 8/04-7/13
SDDOT Project No: P 0044(149)40	

**JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK**

SSW10-1837 / CIP 50177 / PCN X02U

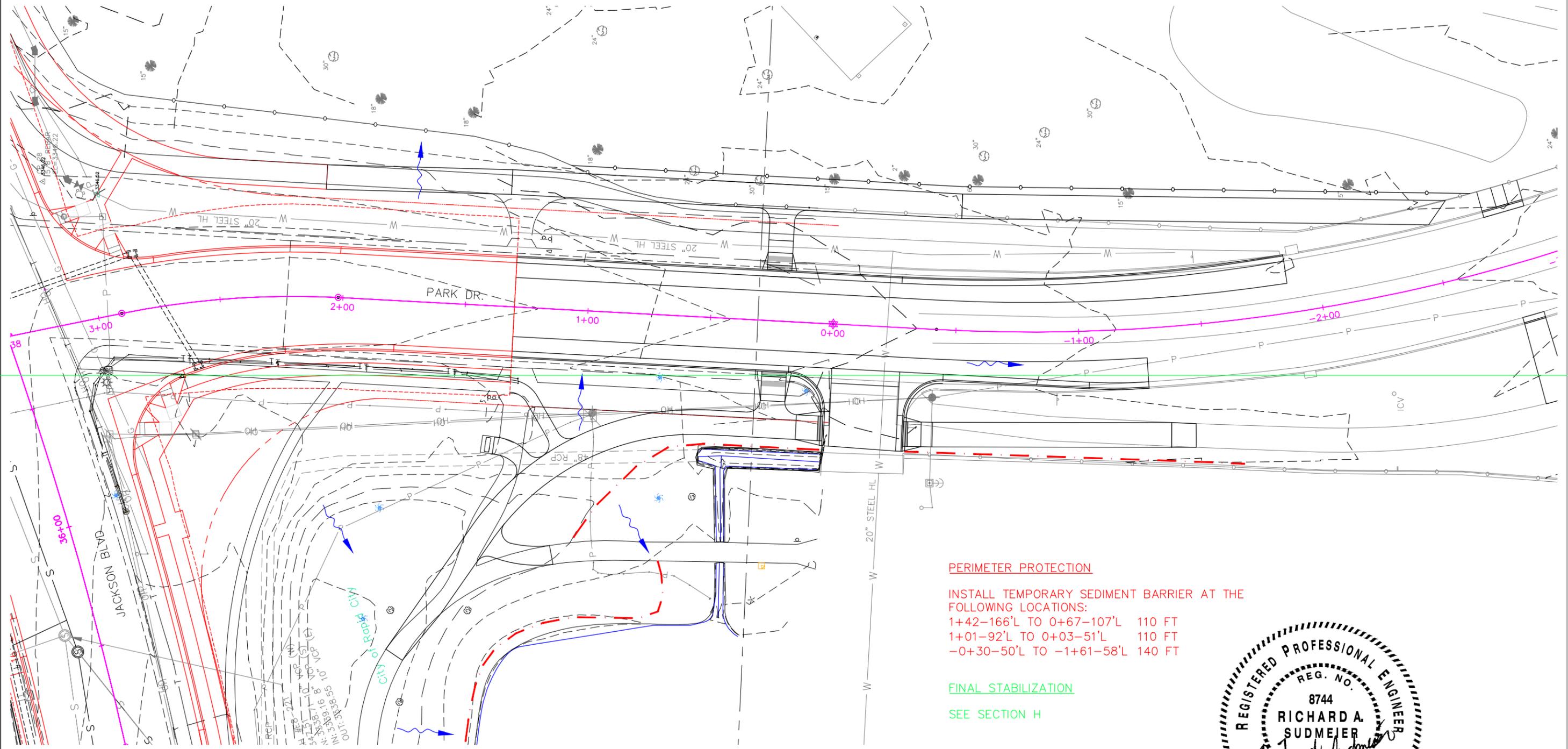
Sheet Title: GOLF COURSE EROSION AND SEDIMENT CONTROL PLAN

Sheet: **D14** of **D23**



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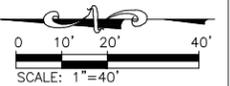
**PERIMETER PROTECTION**

INSTALL TEMPORARY SEDIMENT BARRIER AT THE FOLLOWING LOCATIONS:

- 1+42-166'L TO 0+67-107'L 110 FT
- 1+01-92'L TO 0+03-51'L 110 FT
- 0+30-50'L TO -1+61-58'L 140 FT

**FINAL STABILIZATION**

SEE SECTION H



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Public Works Department



Scale: 1" = 40'

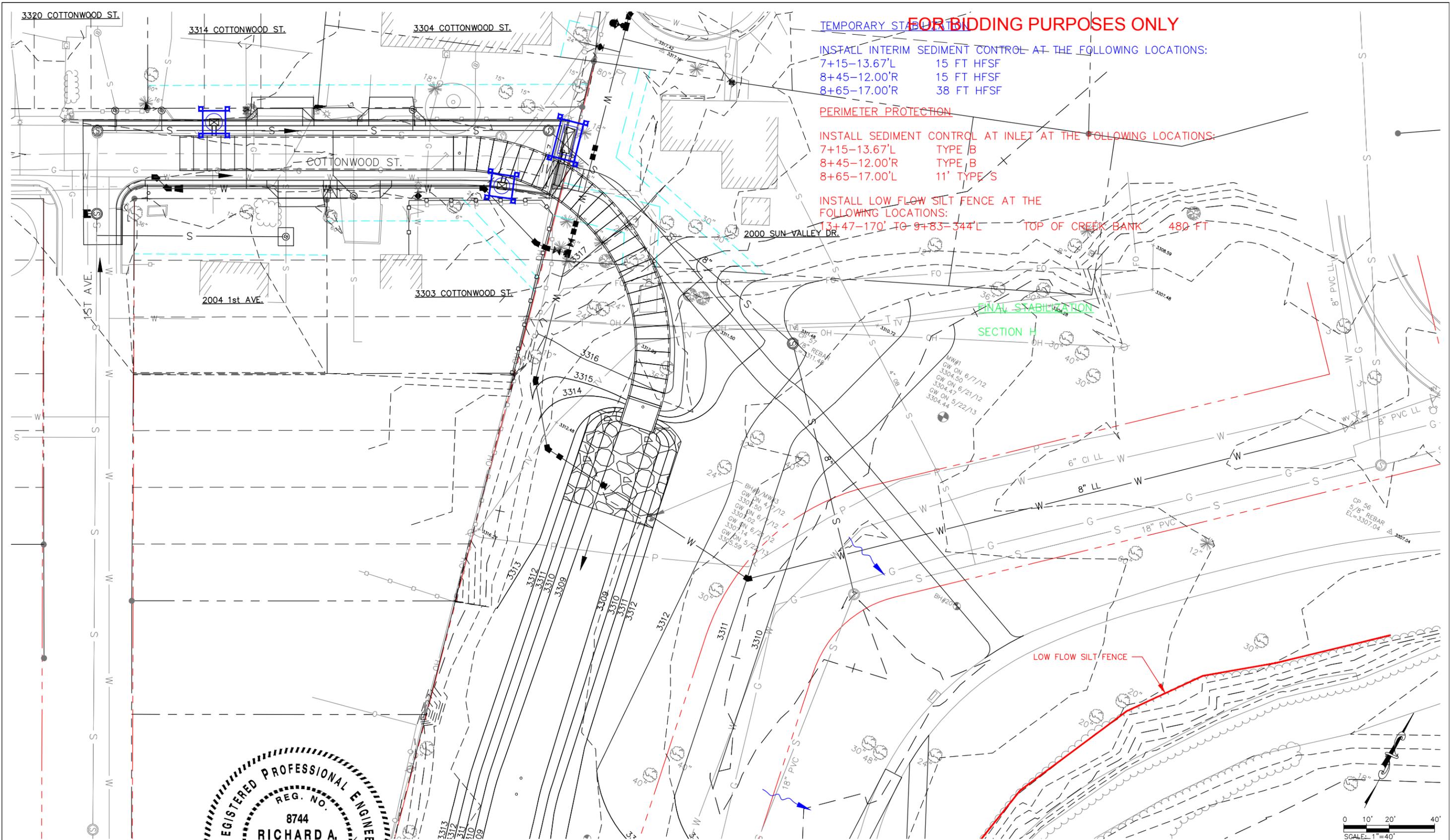
Designed By: JAP/JF/RS	Drawn By: JRK
Design Date: SEPT 2013	Print Date: FEB 2014
Internal Job No: 110155	Surveyed By: DOT / FMG
Surveyed By: DOT / FMG	Survey Date: 8/04-7/13
SDDOT Project No. P 0044(149)40	

**JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK**

SSW10-1837 / CIP 50177 / PCN X02U

Sheet Title:  
PARK DRIVE  
EROSION AND  
SEDIMENT CONTROL  
PLAN

Sheet:  
**D15**  
of  
**D23**



**TEMPORARY STABILIZATION FOR BIDDING PURPOSES ONLY**

INSTALL INTERIM SEDIMENT CONTROL AT THE FOLLOWING LOCATIONS:

- 7+15-13.67'L 15 FT HFSF
- 8+45-12.00'R 15 FT HFSF
- 8+65-17.00'R 38 FT HFSF

**PERIMETER PROTECTION**

INSTALL SEDIMENT CONTROL AT INLET AT THE FOLLOWING LOCATIONS:

- 7+15-13.67'L TYPE B
- 8+45-12.00'R TYPE B
- 8+65-17.00'L 11' TYPE S

INSTALL LOW FLOW SILT FENCE AT THE FOLLOWING LOCATIONS:

- 13+47-170' TO 9+83-344'L TOP OF CREEK BANK 480 FT

FINAL STABILIZATION

SECTION H

LOW FLOW SILT FENCE

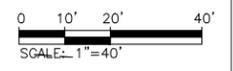


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Prepared For: Public Works Department  
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 Drawn By: JRK  
 Print Date: FEB 2014  
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 Survey Date: 8/04-7/13  
 SDDOT Project No. P 0044(149)40

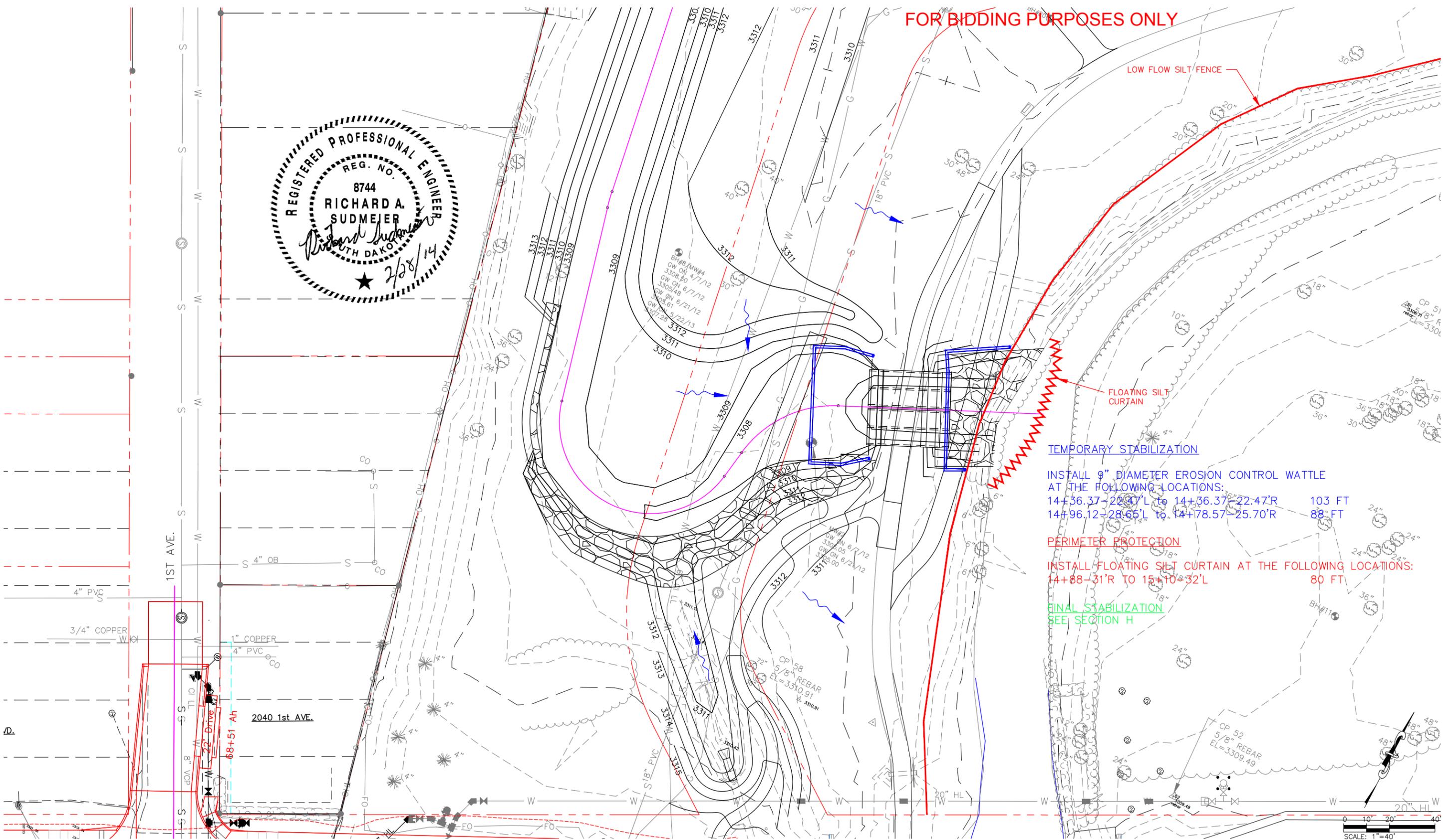
**JACKSON BOULEVARD UTILITIES  
 CHAPEL LANE TO RAPID CREEK**

Sheet Title: COTTONWOOD EROSION AND SEDIMENT CONTROL PLAN  
 Sheet: **D16** of **D23**



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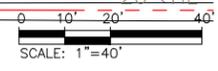
**TEMPORARY STABILIZATION**

INSTALL 9" DIAMETER EROSION CONTROL WATTLE AT THE FOLLOWING LOCATIONS:  
14+36.37-22+47'L to 14+36.37-22+47'R 103 FT  
14+96.12-28+65'L to 14+78.57-25.70'R 88 FT

**PERIMETER PROTECTION**

INSTALL FLOATING SILT CURTAIN AT THE FOLLOWING LOCATIONS:  
14+88-31'R TO 15+10-32'L 80 FT

**FINAL STABILIZATION**  
SEE SECTION H



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Designed By: JAP/JF/RS  
Design Date: SEPT 2013  
Internal Job No: 110155  
Surveyed By: DOT / FMG  
Survey Date: 8/04-7/13  
SDDOT Project No. P 0044(149)40

Drawn By: JRK  
Print Date: FEB 2014

**JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK**

SSW10-1837 / CIP 50177 / PCN X02U

Sheet Title:

COTTONWOOD EROSION AND  
SEDIMENT CONTROL  
PLAN

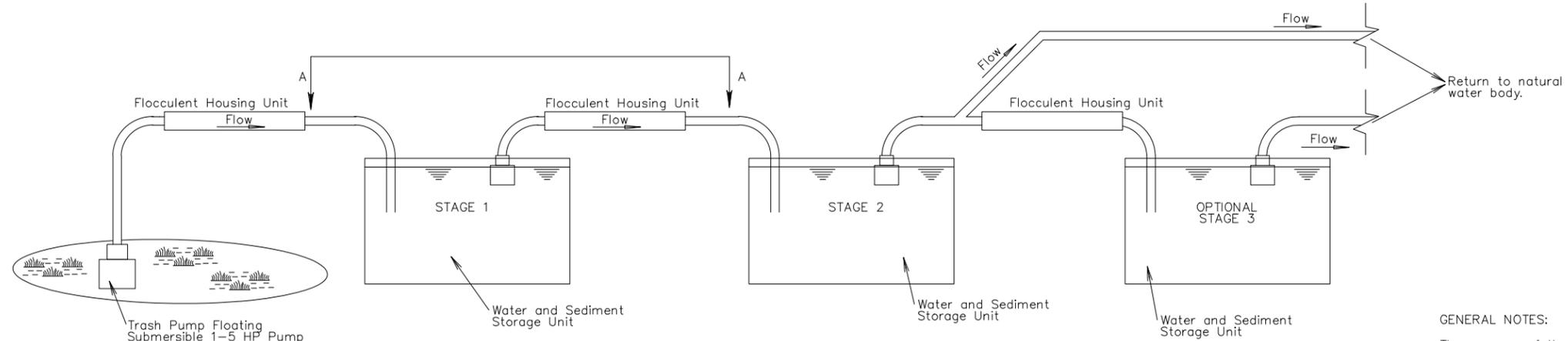
Sheet:

**D17**  
of  
**D23**

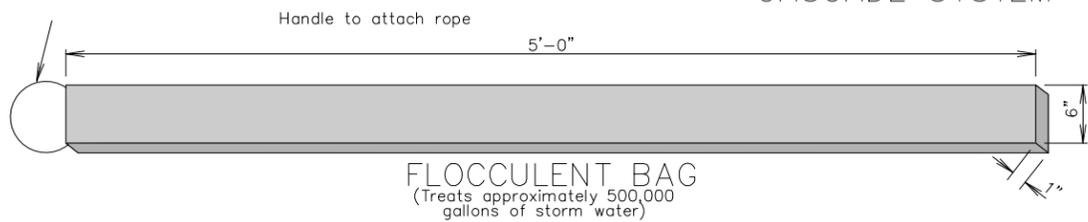
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# DEWATERING AND SEDIMENT COLLECTION SYSTEM

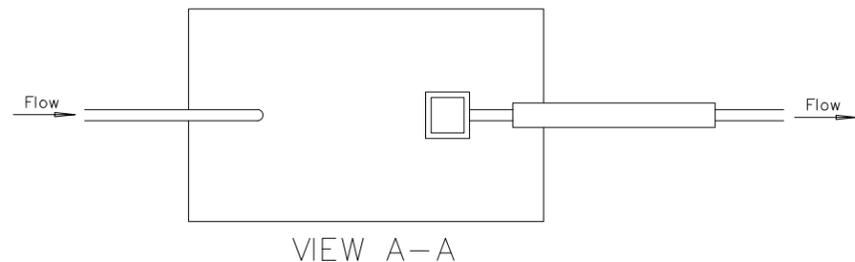
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ELEVATION VIEW  
CASCADE SYSTEM



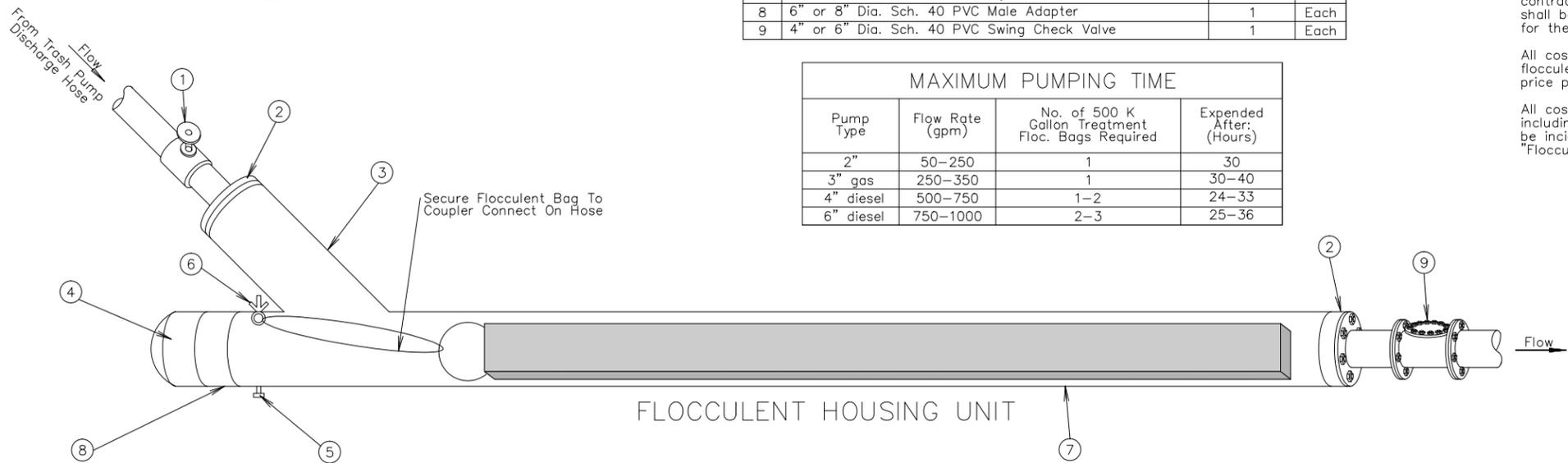
FLOCCULENT BAG  
(Treats approximately 500,000 gallons of storm water)



VIEW A-A

FLOCCULENT HOUSING UNIT (Estimated Quantities) (For Information Only)			
NO.	DESCRIPTION	QUANTITY	UNIT
1	4" or 6" Dia. Sch. 40 Gate Valve	1	Each
2	4" X 6" or 6" X 8" Sch. 40 PVC Bushing	2	Each
3	6" or 8" Dia. Sch. 40 PVC "Y"	1	Each
4	6" or 8" Dia. Sch. 40 PVC Female Threaded Cap	1	Each
5	1" Dia. Sch. 80 PVC Drain Valve	1	Each
6	1/2" Eye Bolt With Wing Nut and Rubber Gromets	1	Each
7	6" or 8" Dia. Sch. 40 PVC Pipe	10	Ft.
8	6" or 8" Dia. Sch. 40 PVC Male Adapter	1	Each
9	4" or 6" Dia. Sch. 40 PVC Swing Check Valve	1	Each

MAXIMUM PUMPING TIME			
Pump Type	Flow Rate (gpm)	No. of 500 K Gallon Treatment Floc. Bags Required	Expended After: (Hours)
2"	50-250	1	30
3" gas	250-350	1	30-40
4" diesel	500-750	1-2	24-33
6" diesel	750-1000	2-3	25-36



FLOCCULENT HOUSING UNIT

GENERAL NOTES:

The purpose of the dewatering and sediment collection system is to collect turbid storm water on the project and treat it with a flocculent. The sediment would then settle in the storage units and the clear water would then be discharged into the storm sewer, lake, stream, vegetated ditch, or other Engineer approved site. Clear water for this project is defined as having a maximum of 30 mg/L of suspended solids. The clear water discharged shall have a ph between 6.1 and 8.5, with a ph of 7.0 preferred.

The drawing of the cascade system is for conceptual purposes only; however, the cascade system shall at a minimum incorporate the use of 2 flocculent housing units and 2 water and sediment storage units.

Design and construction of the water and sediment storage units are project site specific and shall be the Contractor's responsibility. A water and sediment storage unit may consist of a storage bin lined with plastic, the bed of a dump truck lined with plastic, a sediment basin, or other Engineer approved unit.

The 500,000 gallon treatment flocculent bag shall be a BIOSTAR™ CH product or approved equal. Information concerning the product may be found on the Internet at the following location: <http://www.biostar-ch.com>

All costs for the dewatering and sediment collection system including disposing of sediment collected in the water and sediment storage units, pumping, furnishing and using the water and sediment collection units, labor, materials, and incidentals necessary for the dewatering and sediment collection system shall be incidental to the contract unit price per hour for "Dewatering". Measurement shall be based on the number of hours pumping occurs for the dewatering and sediment collection system.

All costs for furnishing the 500,000 gallon treatment flocculent bag shall be incidental to the contract unit price per each for "500 K Gallon Treatment Flocculent Bag".

All costs for furnishing the flocculent housing unit including all labor, materials, and incidentals shall be incidental to the contract unit price per each for "Flocculent Housing Unit".

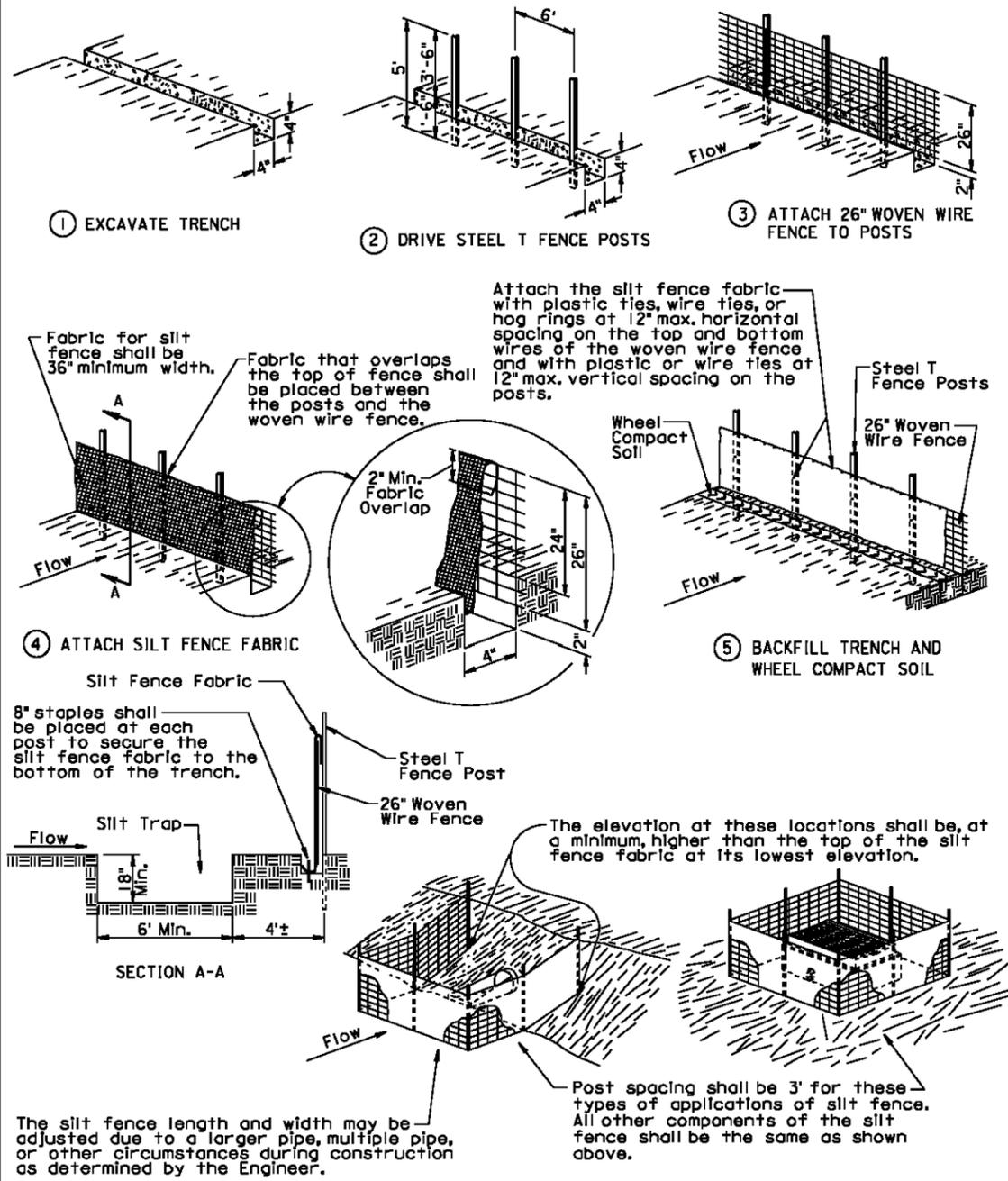


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				<p>SSW10-1837 / CIP 50177 / PCN X02U</p>	

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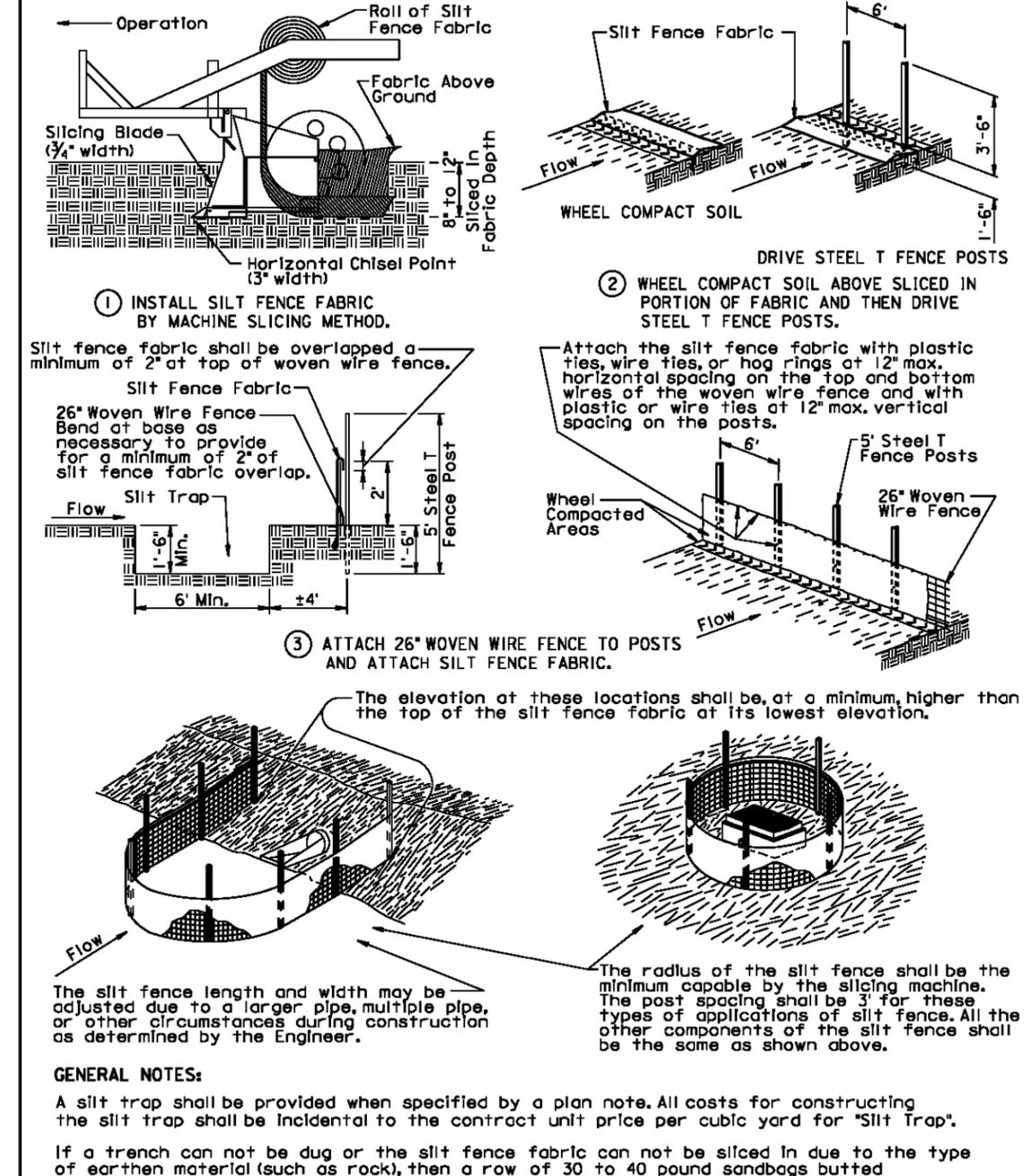
MANUAL LOW FLOW SILT FENCE INSTALLATION



December 23, 2003

<b>S D D O T</b>	<b>LOW FLOW SILT FENCE AND SILT TRAP</b>	PLATE NUMBER <b>734.04</b>
	Published Date: 4th Qtr. 2013	Sheet 1 of 2

MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION



December 23, 2003

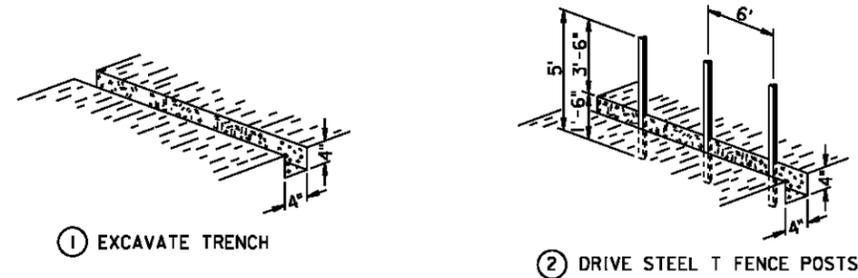
<b>S D D O T</b>	<b>LOW FLOW SILT FENCE AND SILT TRAP</b>	PLATE NUMBER <b>734.04</b>
	Published Date: 4th Qtr. 2013	Sheet 2 of 2

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**FOR BIDDING PURPOSES ONLY**

**MANUAL HIGH FLOW SILT FENCE INSTALLATION**

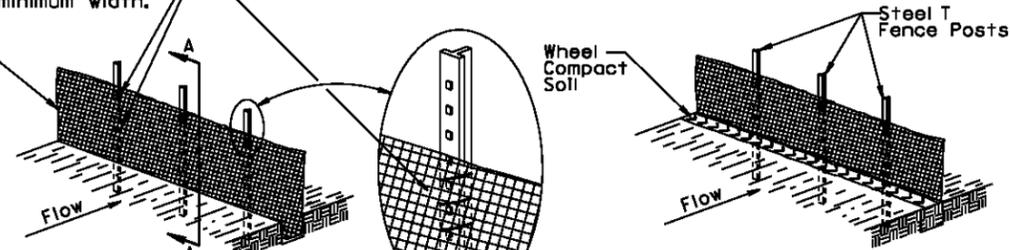


① EXCAVATE TRENCH

② DRIVE STEEL T FENCE POSTS

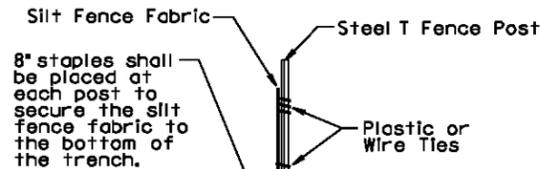
Attach the silt fence fabric with a total of 4 plastic or wire ties per post. Three ties shall be used at the top and 1 tie shall be approximately at mid-point of the post.

Fabric for silt fence shall be 36" minimum width.



③ ATTACH SILT FENCE FABRIC

④ BACKFILL TRENCH AND WHEEL COMPACT SOIL

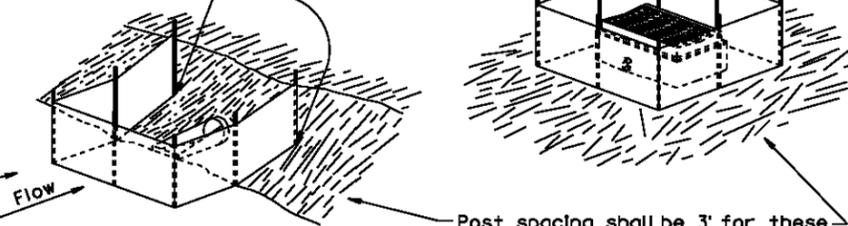


8" staples shall be placed at each post to secure the silt fence fabric to the bottom of the trench.

Plastic or Wire Ties

The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.

SECTION A-A



The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

Post spacing shall be 3' for these types of applications of silt fence. All other components of the silt fence shall be the same as shown above.

December 23, 2003

Published Date: 1st Qtr. 2014

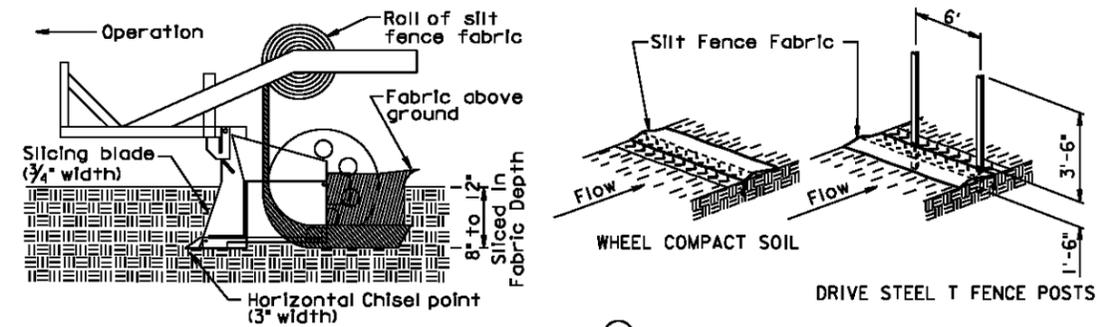
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**HIGH FLOW SILT FENCE**

PLATE NUMBER  
**734.05**

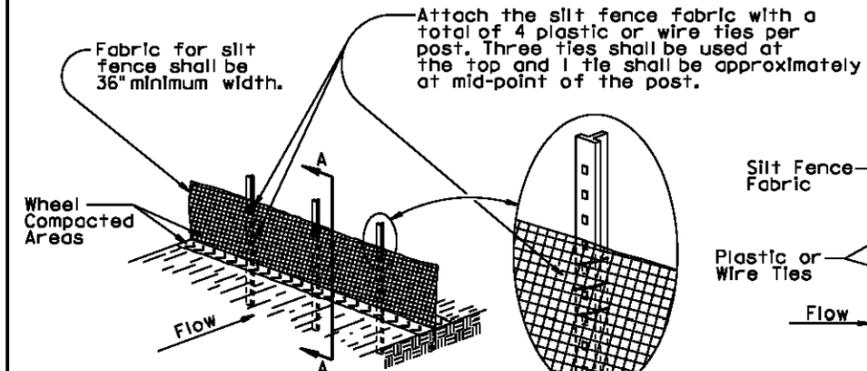
Sheet 1 of 2

**MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION**



① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

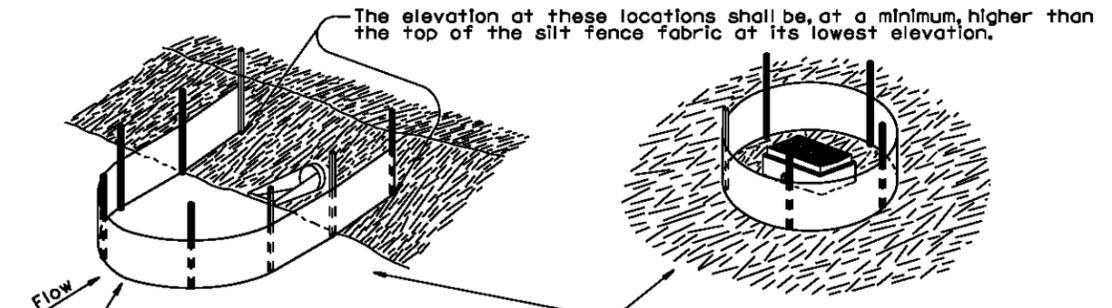
② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



③ ATTACH SILT FENCE FABRIC

SECTION A-A

The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.



The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

The radius of the silt fence shall be the minimum capable by the slicing machine. The post spacing shall be 3' for these types of applications of silt fence. All the other components of the silt fence shall be the same as shown above.

**GENERAL NOTE:**

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23, 2003

Published Date: 1st Qtr. 2014

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**HIGH FLOW SILT FENCE**

PLATE NUMBER  
**734.05**

Sheet 2 of 2

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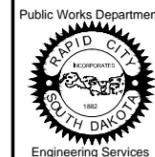
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Prepared For:



Scale: NOT TO SCALE

Designed By: JAP/JF/RS  
Design Date: SEPT 2013  
Internal Job No: 110155  
Surveyed By: DOT / FMG  
Survey Date: 8/04-7/13  
SDDOT Project No: P 0044(149)40

Drawn By: JRK  
Print Date: FEB 2014

**JACKSON BOULEVARD UTILITIES  
CHapel Lane To Rapid Creek**

SSW10-1837 / CIP 50177 / PCN X02U

Sheet Title:

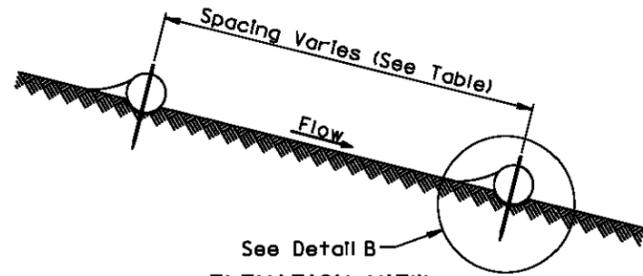
DETAILS

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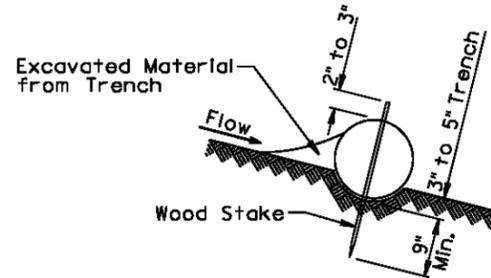
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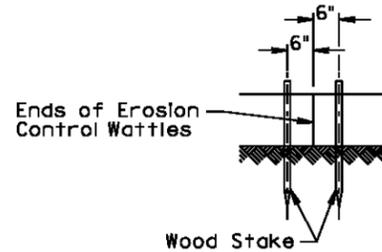


ELEVATION VIEW  
CUT OR FILL SLOPE INSTALLATION

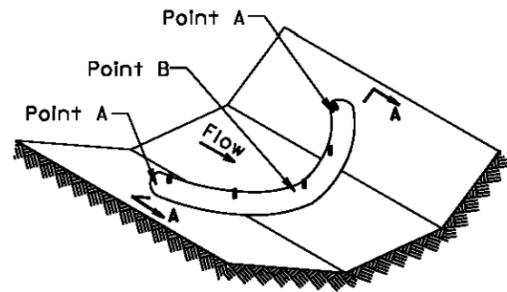
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



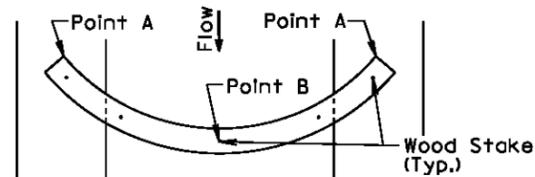
DETAIL B  
(TYPICAL OF ALL INSTALLATIONS)



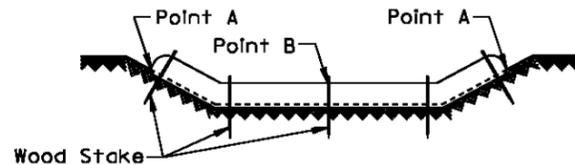
DETAIL C



ISOMETRIC VIEW  
DITCH INSTALLATION



PLAN VIEW  
DITCH INSTALLATION



SECTION A-A

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50

December 23, 2004

<b>S D D O T</b>	<b>EROSION CONTROL WATTLE</b>	PLATE NUMBER <b>734.06</b>
		Sheet 1 of 2
		Published Date: 1st Qtr. 2014

**GENERAL NOTES:**

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than 1/2". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004

<b>S D D O T</b>	<b>EROSION CONTROL WATTLE</b>	PLATE NUMBER <b>734.06</b>
		Sheet 2 of 2
		Published Date: 1st Qtr. 2014

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Prepared For: Public Works Department  
Scale: NOT TO SCALE  
Designed By: JAP/JF/RS  
Design Date: SEPT 2013  
Internal Job No: 110155  
Surveyed By: DOT / FMG  
Survey Date: 8/04-7/13  
SDDOT Project No: P 0044(149)40

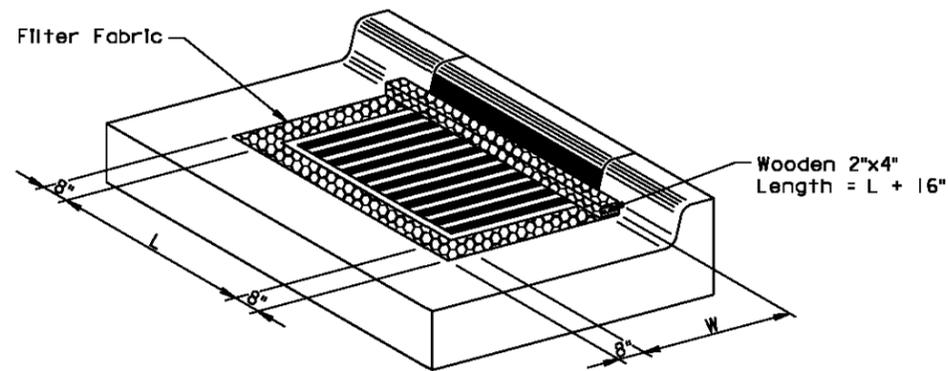
JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK

SSW10-1837 / CIP 50177 / PCN X02U

Sheet Title: DETAILS  
Sheet: **D21** of **D23**

FOR BIDDING PURPOSES ONLY

L = Length of Grate  
W = Width of Grate



ISOMETRIC VIEW

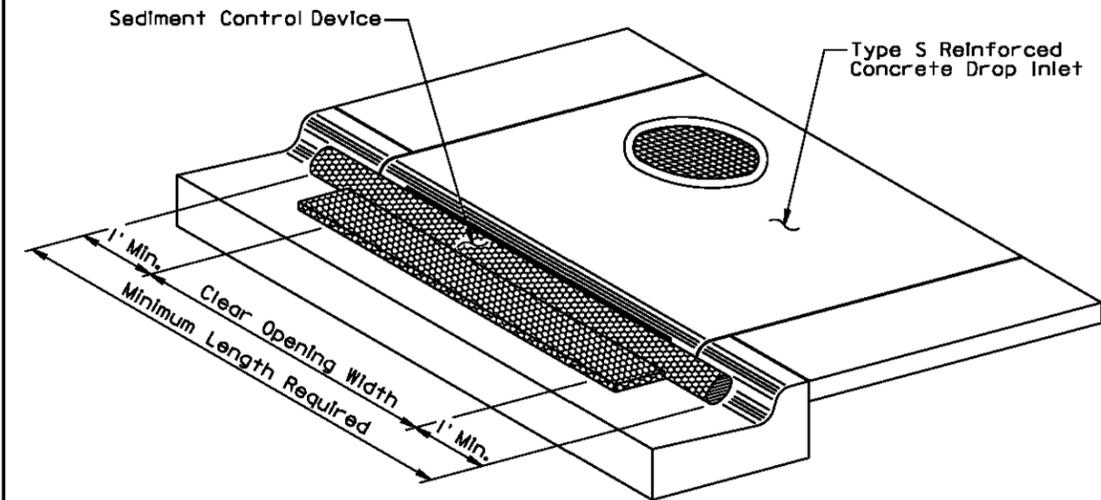
**GENERAL NOTES:**

- The grate and curb and gutter shown are for illustrative purposes only.
- The sediment control at inlet with frame and grate shall be placed at locations stated in the plans or at locations determined by the Engineer.
- The filter fabric shall be the type specified in the plans.
- The filter fabric shall be placed in the inlet opening prior to placing the grate. Approximately 18 inches of excess filter fabric shall be wrapped around the 2"x4" and stapled securely to the 2"x4" after the grate has been placed.
- The Contractor shall inspect and maintain the sediment control device once every week and within 24 hours after every rainfall event. The Contractor shall maintain the sediment control device by removing accumulated sediment and replacing torn filter fabric with new filter fabric.
- The removed sediment shall be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or other storm sewer system.
- All costs for furnishing, installing, inspecting, maintaining, removing, and replacing the sediment control device at the inlet including labor, equipment, and materials shall be incidental to the contract unit price per each for "Sediment Control at Inlet with Frame and Grate".

September 14, 2005

<b>S D D O T</b>	<b>SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES</b>	PLATE NUMBER <b>734.10</b>
		Sheet 1 of 1

Published Date: 1st Qtr. 2014



ISOMETRIC VIEW

**GENERAL NOTES:**

- The type of sediment control device shown is for illustrative purposes only.
- The type of sediment control device used shall be one of the types as specified in the plans.
- The sediment control device shall be placed at the drop inlets according to the manufacturers' installation instructions.
- The sediment control at inlet for type S reinforced concrete drop inlet shall be placed at locations stated in the plans or at locations determined by the Engineer.
- The Contractor shall inspect and maintain the sediment control device once every week and within 24 hours after every rainfall event. The Contractor shall maintain the sediment control device by removing the device, removing accumulated sediment, and resetting the device.
- The removed sediment shall be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or other storm sewer system.
- Payment for the "Sediment Control at Type S Drop Inlet" shall be based on the minimum length required at the drop inlets. Some of the sediment control devices specified in the plans will have to be longer due to available length.
- All costs for furnishing, installing, inspecting, maintaining, removing, and resetting the sediment control device at the drop inlet including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Sediment Control at Type S Reinforced Concrete Drop Inlet".

September 14, 2005

<b>S D D O T</b>	<b>SEDIMENT CONTROL AT INLETS FOR TYPE S REINFORCED CONCRETE DROP INLETS</b>	PLATE NUMBER <b>734.11</b>
		Sheet 1 of 1

Published Date: 1st Qtr. 2014

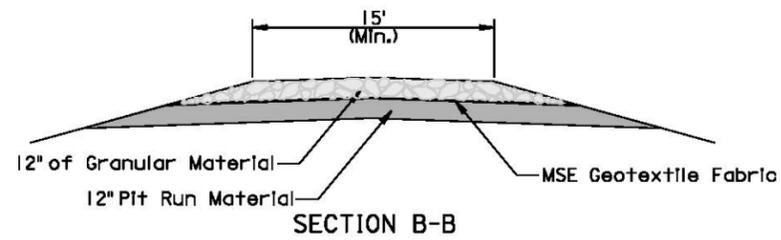
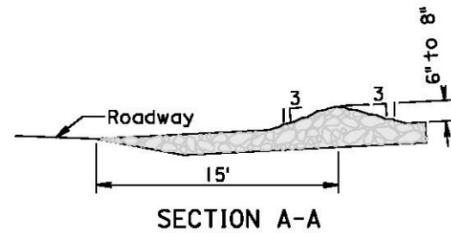
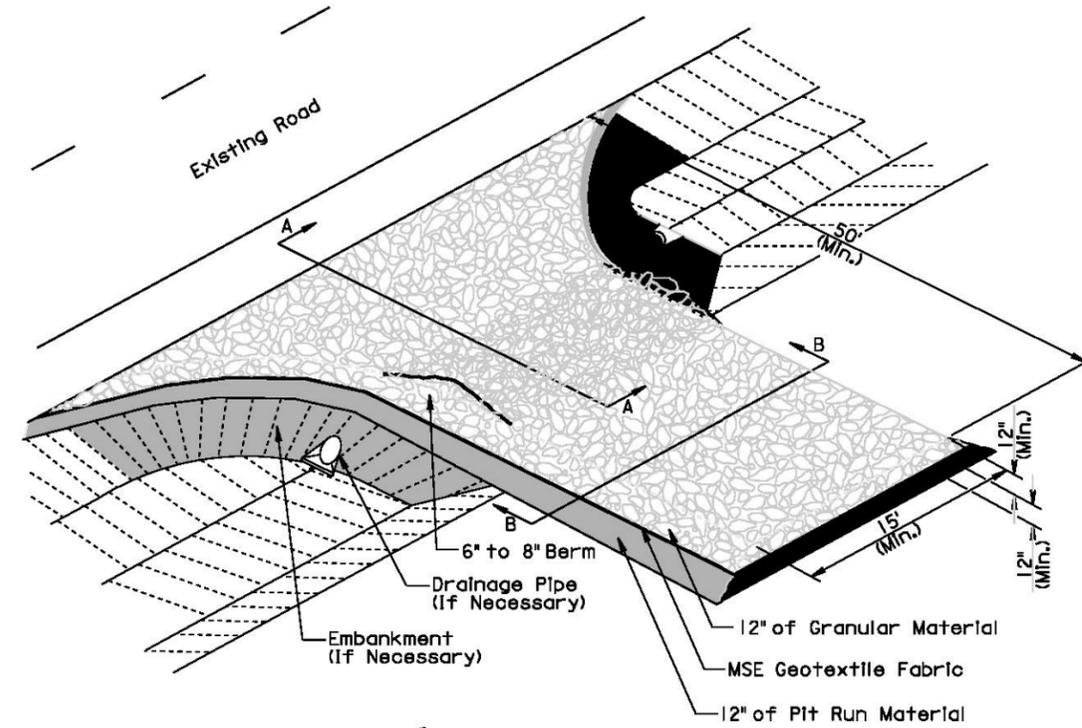
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Prepared By:  <b>FMG, Inc.</b> 3700 Sturgis Road Rapid City, SD 57702-0317 (605) 342-4105 FAX (605) 342-4222 www.fmgengineering.com	Prepared For: Public Works Department  Engineering Services	Scale: NOT TO SCALE Designed By: JAP/JF/RS Design Date: SEPT 2013 Internal Job No: 110155 Drawn By: JRK Print Date: FEB 2014 Surveyed By: DOT / FMG Survey Date: 8/04-7/13 SDDOT Project No. P 0044(149)40	<b>JACKSON BOULEVARD UTILITIES CHAPEL LANE TO RAPID CREEK</b>	Sheet Title: DETAILS	Sheet: <b>D22</b> of <b>D23</b>
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SSW10-1837 / CIP 50177 / PCN X02U

# CONSTRUCTION ENTRANCE

FOR BIDDING PURPOSES ONLY



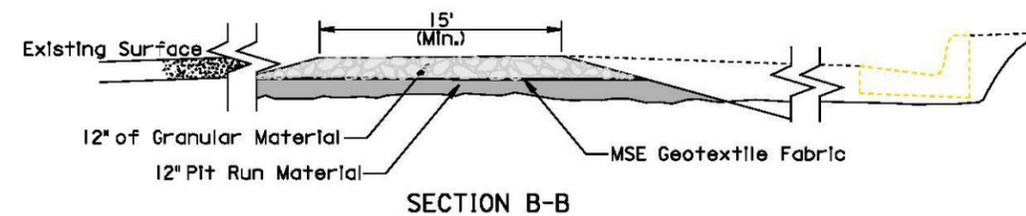
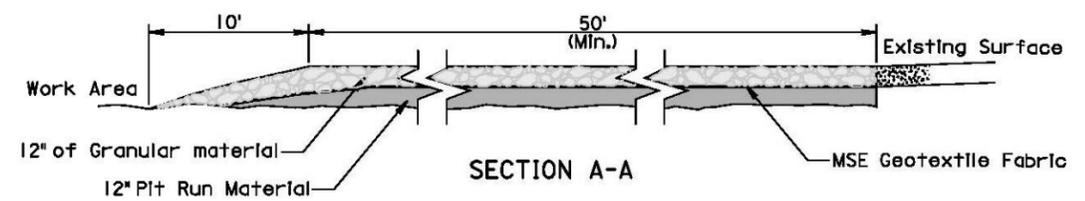
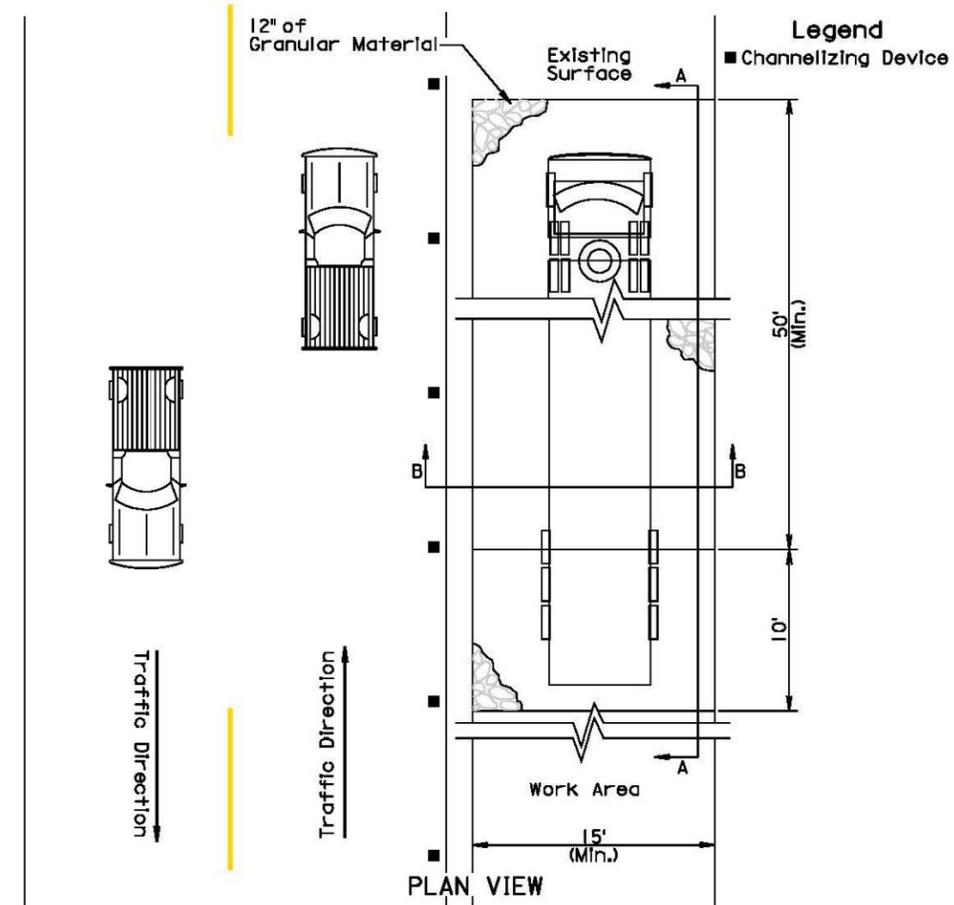
**GENERAL NOTES:**

If the grade of the entrance slopes down to the roadway, a berm of extra rock shall be used to prevent sediment or mud from being deposited on the roadway. See SECTION A-A.

If a drainage pipe is necessary the size and type shall be determined by the Contractor to meet field conditions. All cost shall be incidental to the various bid items.

If embankment is necessary it shall be pit run material.

## TRANSVERSE TO ROADWAY



## PARALLEL TO ROADWAY

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Public Works Department



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JACKSON BOULEVARD UTILITIES  
CHAPEL LANE TO RAPID CREEK

SSW10-1837 / CIP 50177 / PCN X02U

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DETAILS

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