

STORM WATER PERMIT

No Storm Water Permit Required

#### DESIGN DESIGNATION

ADT (2012) 2615 ADT (2032) 4375 DHV 608 D 50% T DHV 7.5% T ADT 16.4% V 65 mph

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	090 E-451	1	29
Plotting Date:	03/16/2015		

# INDEX OF SHEETS

Sheet No.	1:	Title and Index
Sheets No.	2 - 5:	Estimate, Notes, & Tables
Sheets No.	6 - 8:	Typical Sections
Sheets No.	9 - 10:	Plan Sheets
Sheets No.	11 - 12:	Profile Sheets
Sheets No.	13 - 24:	Cross Sections
Sheets No.	25 - 29:	Standard Plates

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#### **ESTIMATE OF QUANTITIES**

Bid Item Number	ltem	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
120E0010	Unclassified Excavation	292	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
634E0010	Flagging	40	Hour
634E0100	Traffic Control	276	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
730E0210	Type F Permanent Seed Mixture	11	Lb
731E0100	Fertilizing	645	Lb
732E0200	Fiber Mulching	0.4	Ton
734E0104	Type 4 Erosion Control Blanket	1,230	SqYd
734E0133	Type 3 Turf Reinforcement Mat	196.0	SqYd
734E0154	12" Diameter Erosion Control Wattle	50	Ft
734E0510	Shaping for Erosion Control Blanket	694	Ft

# **SPECIFICATIONS**

Standard Specifications for Roads & Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

# UTILITIES

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the contractor shall contact the project engineer to determine modifications that will be necessary to avoid utility impacts.

Any damage to a utility will be the Contractor's responsibility to repair.

Utilities, if identified within the limits of the proposed construction, shall be adjusted by the owner as addressed in SDCL 31-26-23 unless otherwise indicated in these plans.

# **SEQUENCE OF OPERATIONS**

Variations from this sequence shall be submitted to the Engineer for approval.

- 1. Set up traffic control
- 2. Remove topsoil.
- 3. Excavate ditch and build berm.
- 4. Replace topsoil.
- 5. Install permanent erosion control measures.
- 6. Remove traffic control.

# **ENVIRONMENTAL COMMITMENTS**

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

# COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

# Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

# COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

## Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

# COMMITMENT H: WASTE DISPOSAL SITE

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

# Action Taken/Required:

State ROW.

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

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

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

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

1.31.

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

STATE OF	PROJECT	SHEET	TOTAL
SOUTH DAKOTA	090 E-451	2	29

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

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

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

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

### **COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES**

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

#### Action Taken/Required:

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

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

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

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

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

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

#### COMMITMENT R: FIRE PREVENTION IN THE BLACK HILLS AREA

This project is located within the confines of the Black Hills Forest Fire Protection Boundary.

#### **Action Taken/Required:**

The Contractor shall adhere to the "Special Provision for Fire Plan".

#### SHRINKAGE FACTOR:

A Shrinkage factor of +20% was used in calculating embankment fill quantities.

### **GRADING OPERATIONS**

Water for Embankment is estimated at the rate of 20 gallons of water per cubic yard of Embankment minus Waste. No separate payment will be made for the Water for Embankment and all costs associated shall be incidental to the contract unit price per cubic yard of Unclassified Excavation.

Special ditch grades and other sections of the roadway different than the typical section(s) shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

Any extra excavated soil may be placed on the embankment as approved and directed by the Engineer.

### UNCLASSIFIED EXCAVATION

Unclassified Excavation is provided on the project for excavating material from ditches and building berms in accordance with the plans. Any excess material shall be handled as waste. The estimate of quantities provides 292 cubic yards of Unclassified Excavation for performing this work.

Payment for Unclassified Excavation shall be based only on plans quantity and measurement of these excavation guantities during construction shall not be performed.

If changes are made in the field during construction, measurements shall be taken and the quantity shall be adjusted accordingly.

### TABLE OF UNCLASSIFIED EXCAVATION

Station to Station	Water for Embankment (For Informational Purposes Only) Mgal	Quantity CuYd	Embankment (For Informational Purposes Only) CuYd
0+80 to 6+94 Berm Alignment	4.6	261	231
0+00 to 1+00 Ditch Alignment	0.4	32	19
Total	5.0	292	250

#### HORIZONTAL ALIGNMENT DATA

	Berm Alignment							
Туре	Station			Northing	Easting			
POB	0+00.00			275390.033	952808.888			
		TL= 693.50	S 86°03'31" E					
POE	6+93.50			275342.366	953500.749			

	Ditch Alignment							
Туре	Station			Northing	Easting			
POB	0+00.00			275353.701	953498.82			
		TL= 175.97	S 60°20'56" E					
POE	1+75.97			275266.648	953651.74			

# **REMOVE AND REPLACE TOPSOIL**

Prior to beginning grading operations, a 4" depth of topsoil shall be bladed to the construction limits of the project. Following completion of grading operations, topsoil shall be bladed back over the disturbed areas.

All costs associated with removing and replacing the topsoil shall be incidental to the lump sum price for Remove and Replace Topsoil.

#### **TRAFFIC CONTROL**

- implementation.
- Interstate mainline.

STATE OF	PROJECT	SHEET	TOTAL SHEETS
SOUTH DAKOTA	090 E-451	3	29

1. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential

2. All work shall be accessed from either the Exit 8 EB Off Ramp or the crossroad. Lane. Closures will not be permitted on the

3. Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined as 1/2 hour after sunset until 1/2 hour before sunrise.

4. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

5. Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.

6. The quantity of Signs paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.

7. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

8. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

9. The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

#### **TRAFFIC CONTROL (CONTINUED)**

- 10. The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.
- 11. The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for "Traffic Control. Miscellaneous".
- 12. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the Contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at  $75 \pm 15$  flashes per minute. Vehicle flasher/hazard lights are not acceptable. All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.
- 13. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD - whichever is more stringent shall be used, as determined by the Engineer.

#### **INVENTORY OF TRAFFIC CONTROL DEVICES**

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS	
G20-2	36" x 18"	END ROAD WORK	1	17	17	
W3-4	48" x 48"	BE PREPARED TO STOP	1	34	34	
W5-4	48" x 48"	RAMP NARROWS	1	34	34	
W13-1P	30" x 30"	ADVISORY SPEED PLATE	1	21	21	
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68	
W20-1a	48" x 48"	RAMP WORK AHEAD	1	34	34	
W20-7	48" x 48"	FLAGGER	1	34	34	
W21-5	48" x 48"	SHOULDER WORK	1	34	34	
	TOTAL UNITS 276					

#### **MYCORRHIZAL INOCULUM**

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

Glomus intraradices	25%
Glomus aggregatu	25%
Glomus mosseae	25%
Glomus etunicatum	25%

All seed shall be inoculated with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

The mycorrhizal inoculum shall be from the list below or an approved equal:

Product **MycoApply** 

FERTILIZING

#### Manufacturer

Mycorrhizal Applications, Inc. Grants Pass. OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Flintlock, Rodan, Rosana	7
Green Needlegrass	Lodorm	4
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	3
Blue Grama	Bad River, Willis	2
Oats or Spring Wheat: April through May;		10
Winter Wheat: August through November		
	Total:	26

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer shall be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer shall have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer shall also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The all-natural slow release fertilizer shall be applied according to the manufacturer's application recommendations.

The application rate is 1,500 pounds per acre.

The all-natural slow release fertilizer shall be from the list below or an approved equal:

> Product Sustane

Manufacturer Sustane Corporate Headquarters Cannon Falls. Minnesota Phone: 1-800-352-9245 http://www.sustane.com/

### DRILLS

In addition to the drills specified in Section 730 of the Standard Specifications, other types of drills including no-till drills will be allowed as long as they have baffles, partitions, agitators, or augers which keep the seed distributed throughout the seed box and the seed is planted at a depth of ¼" to ½".

#### PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits

All permanent seed shall be planted in the topsoil at a depth of  $\frac{1}{4}$ " to  $\frac{1}{2}$ ".

All seed broadcast must be raked or dragged in (incorporated) within the top 1/4" to 1/2" of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

STATE OF	STATE OF	PROJECT	SHEET	TOTAL SHEETS
	SOUTH DAKOTA	090 E-451	4	29

The varieties listed for seed mixtures are preferred varieties.

Native harvest seed will be allowed.

Type F Permanent Seed Mixture shall consist of the following:

#### **FIBER MULCHING**

Fiber mulch shall be applied in a separate operation following permanent seeding.

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the list below. If the product selected has guar gum tackifier included, then the additional 2% of tackifier shall be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier shall be synthetic.

Fiber mulch shall be applied at the rate of 2000 pounds per acre.

The Contractor shall allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract unit price per ton for Fiber Mulching.

The fiber mulch used on this project shall be one from the list below:

Product	Manufacturer
Mat-Fiber Plus	Mat, Inc. Floodwood, MN Phone: 1-888-477-3028 www.matinc.biz
Conwed Hydro Mulch 2000	Profile Products LLC Buffalo Grove, IL Phone: 1-800-366-1180 <u>www.conwedfibers.com</u>
EcoFibre Plus Tackifier	Profile Products LLC Buffalo Grove, IL Phone: 1-800-366-1180 <u>www.profile-eco.com</u>
Terra-Mulch Wood with Tacking Agent 3	Profile Products LLC Buffalo Grove, IL Phone: 1-800-726-6371 <u>www.terra-mulch.com</u>
Excel Fiber Mulch II with Tackifier	American Excelsior Co. Arlington, TX Phone: 1-800-777-7645 <u>www.curlex.com</u>

# TABLE OF MULCH, FERTLIZER, AND SEEDING

 Area Acres	Type F Permanent Seed Mixture Ibs	Fertilizing Ibs	Fiber Mulch tons
 0.43	11	645	0.4
Total	11	645	0.4

# **EROSION CONTROL BLANKET**

Erosion control blanket shall be installed 16 feet wide at the locations noted in the table and at locations determined by the Engineer during construction.

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

## http://sddot.com/business/certification/products/Default.aspx

The Contractor shall install erosion control blanket according to the manufacturer's installation instructions.

# TABLE OF EROSION CONTROL BLANKET

Station to	Station		Location	Туре	Quantity SqYd
0+80	6+94	Berm Alignment	Ditch Bottom & Backslope	4	1230
			Tota	l Type 4	1230

Erosion Control Blanket:

# SHAPING FOR EROSION CONTROL BLANKET

The ditches shall be shaped for the erosion control blanket as specified on Standard Plate 734.01.

All costs for shaping the ditches for erosion control blanket including labor and equipment shall be incidental to the contract unit price per foot for Shaping for Erosion Control Blanket.

# TURF REINFORCEMENT MAT

Turf Reinforcement Mat shall be installed at locations shown in the table at the widths specified, and at locations determined by the Engineer during construction. The Contractor shall use a turf reinforcement mat from the approved products list. The approved product list for turf reinforcement mat may be viewed at the following internet site:

# http://sddot.com/business/certification/products/Default.aspx

Installation of the Turf Reinforcement Mat shall be according to the manufacturer's installation instructions.

# TABLE OF TURF REINFORCEMENT MAT

Station to	Station	Location	L/R	Width (Ft)	Туре	Quantity (SqYd)
6+80	6+94	Berm Alignment	Ditch Bottom and Sides	16	3	21
0+00	1+00	Ditch Alignment	Ditch Bottom and Sides	16	3	175

196 Total Type 3 Turf Reinforcement Mat:

# **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 to decompose.

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:

Station

0+90 to 1+10 Ditc

STATE OF	PROJECT	SHEET	TOTAL
SOUTH DAKOTA	090 E-451	5	29

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

## TABLE OF EROSION CONTROL WATTLE

	Diameter		Quantity
	(Inch)	Location	(Ft)
h Alignment	12	At end of Ditch	50
		Total:	50







STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	090 E-451	8	29
Plotting Date:	03/16/2015		

Type 3 Turf Reinforcement Mat

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STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	090 E-451	12	29
Plotting Date:	03/16/2015		

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PROJECT STATE OF SHEE' NO. TOTAL SHEETS SOUTH DAKOTA 25 29 090 E-451 Posted Spacing of Spacing of Channelizing Advance Warning Taper Speed Signs Devices Prior to Length Work (Feet) (Feet) (Feet) (M.P.H.) (A) (L) (G) 0 - 30 200 180 25 320 600 660 35 - 40 350 500 750

780

50

50

50

■ Channelizing Device

1000

45 - 50

55

60 - 65

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The channelizing devices shall be drums or 42" cones if traffic control must remain overnight.

For short duration operations (I hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

-WORK SPACE

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**GUIDES FOR TRAFFIC CONTROL DEVICES** WORK ON SHOULDERS

September 22,2014

PLATE NUMBER 634.03

Sheet I of I

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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
DAKOTA	090 E-451	28	29

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<ul> <li>Ine stakes shall be 1"x2" or 2"x2" wood rebar may be used only if approved 6" from the ends of the wattles and shall be 3' to 4'.</li> <li>Where installing running lengths of w wattle tightly against the first and The Contractor and Engineer shall ins week and within 24 hours after every Contractor shall remove, dispose, or renecessary as determined by the Engine Sediment removal, disposal, or necessar All costs for removing accumulated se shaping shall be incidental to the con Sediment".</li> <li>All costs for furnishing and installing equipment, and materials shall be incidental for the corresponding erosion contractor</li> </ul>
<ul> <li>wattle tightly against the first and</li> <li>The Contractor and Engineer shall ins</li> <li>week and within 24 hours after every</li> <li>Contractor shall remove, dispose, or r</li> <li>necessary as determined by the Engine</li> <li>Sediment removal, disposal, or necessa</li> <li>All costs for removing accumulated sets shaping shall be incidental to the consediment".</li> <li>All costs for furnishing and installing equipment, and materials shall be incidental for the corresponding erosion contractor</li> </ul>
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All costs for furnishing and installing equipment, and materials shall be incid for the corresponding erosion contro
equipment, and materials shall be incid "Remove Erosion Control Wattle".

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shaping shall b nent,disposal o ct unit price	pe as dir of sedime per cubi	rected by the ent, and necess ic yard for "R	Engineer. sary emove		
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