North Dakota Department of Transportation

Grant Levi, P.E.
Director

Jack Dalrymple
Governor

September 7, 2016

ADDENDUM 4 – JOB 2

TO: All prospective bidders on project SOIB-7-804(054)312, Job No. 2 scheduled for the September 9, 2016 bid opening.

The following plan and request for proposal revisions shall be made:

Plan Revisions:
See attached summary from Adam McGill, PE, Dowl, dated September 7, 2016 for an explanation.

Request for Proposal Revisions:
Remove and replace page 6 of 19 of the Proposal pages located at the beginning of the Request for Proposal, with the enclosed page revised 9/7/2016.

Page 6 of 19:

Item 203 0101 COMMON EXCAVATION-TYPE A; quantity decreased from 210,361 to 200,197 CY.

Item 203 0109 TOPSOIL; quantity decreased from 40,851 to 38,213 CY.

Item 216 0100 WATER; quantity decreased from 4,443 to 3,974 M GAL.

This addendum is to be incorporated into the bidder's proposal for this project. Expedite bid files should be updated by downloading the addendum file from the Bid Express on-line bidding exchange at http://www.bidx.com/ or the Department's web page (http://www.dot.nd.gov) and load it into the Expedite program.

CAL J. GENDREAU, P.E., CONSTRUCTION SERVICES ENGINEER

80/cjg/slk
Enclosure

DOWL

September 7, 2016

To: **All prospective bidders on Project SOIB-7-804(054)312, scheduled for the September 9, 2016 bid opening.**

The following plan revisions shall be made:

Remove and replace Section 6 sheets 5, Section 8 sheet 1, Section 11 sheet 4 to 11, and Section 55 sheets 17 with the enclosed sheets revised on 9/7/2016.

Section	Sheet	Description of Change
6	5	Added note 714-P04
8	1	Updated quantity for 203-0101 "Common Excavation – Type A", 203-0109 "Topsoil", and 216-0100 "Water".
11	4	Removed stations 16508+50 to 16522+44.37 and updated mass table.
11	5-9	Updated Mass Ordinate
11	10-11	Updated Mass Haul diagram per the new start station.
55	17	The stations in the quantities table were updated.

This addendum is to be incorporated into the bidder's proposal for this project.

Sincerely,

DOWL

Adam McGill

Adam McGill, P.E.
Transportation Engineer
amcgill@dowl.com

Attachment(s): SOIB-7-804(054)312 Addendum 4 Sheets

BID ITEMS

Project: SOIB-7-804(054)312 (PCN-20890)

Bidder must type or neatly print unit prices in numerals, make extensions for each item, and total. Do not carry unit prices further than three (3) decimal places.

Item No.	Spec No.	Code No.	Description	Unit	Approx. Quantity	Unit Price $$$$$	Unit Price 000	Amount $$$$$	Amount 00
017	202	0400	REMOVAL OF RIPRAP - LOOSE ROCK	CY	1,470.				
018	202	0812	DISPOSAL OF CONTAMINATED WATER	GAL	43,500.				
019	203	0101	COMMON EXCAVATION-TYPE A	CY	200,197.				
020	203	0109	TOPSOIL	CY	38,213.				
021	203	0113	COMMON EXCAVATION-WASTE	CY	22,629.				
022	203	0138	COMMON EXCAVATION-SUBCUT	CY	6,683.				
023	210	0050	BOX CULVERT EXCAVATION	EA	1.				
024	210	0212	FLOWABLE FILL	CY	75.				
025	210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1.				
026	216	0100	WATER	M GAL	3,974.				
027	230	0165	SUBGRADE PREPARATION-TYPE A-12IN	STA	199.				
028	251	0300	SEEDING CLASS III	ACRE	48.340				
029	251	2000	TEMPORARY COVER CROP	ACRE	46.730				
030	253	0101	STRAW MULCH	ACRE	78.950				
031	255	0101	ECB TYPE 1	SY	80,417.				
032	256	0100	RIPRAP GRADE I	CY	416.				

NOTES

704-P01 STATE ROUTE MARKERS: Provide State Route Marker signs for temporary traffic control. State Route Markers may be either the old design or the new state outlined design; however, all Route Marker signs provided must be of the same type.

Upon project completion, the State Route Marker sign panels will become property of the State. Stockpile sign panels within the project limits. The Engineer will arrange to have the stockpiled panels removed from the project limits.

Include the cost of furnishing, installing, maintaining, stockpiling, and other incidentals in the contract unit price for "Traffic Control Signs".

704-P02 TRAFFIC CONTROL: Implement traffic control to allow for 2 way traffic at all times unless otherwise approved by the Engineer.

704-P03 TEMPORARY EMBANKMENT: Include the cost for additional embankment needed beyond the typical section, to maintain two way traffic at all times, in the contract unit price for "Common Excavation-Type A". No measurement will be made of the temporary embankment.

704-P04 VERTICAL PANELS – BACK TO BACK: In locations where Vertical Panels – Back to Back are to be installed in pavement, coring the pavement is incidental to the contract unit price for "VERTICAL PANELS – BACK TO BACK".

714-P01 PIPE CONC XXIN-STORM DRAIN: Complete the following work on the storm sewer in the contaminated area as defined in SP 290(14).

Install rubber gaskets that meet the following criteria, on all reinforced concrete pipe (RCP):

- Meeting the requirements of ASTM C 443,
- Solid gaskets of circular cross section.

Grout all tie bar penetrations through the pipe walls.

Before the RCP is placed in the trench, coat the exterior surface with a masonry waterproofing paint that is designed for the following:

- A minimum water pressure of 12 PSI when tested according to ASTM D 7088;
- Designed for below grade exterior foundation walls; and
- Resistant to gasoline and diesel fuels.

Prepare the surface and apply the paint according to the paint manufacturer's recommendations.

Conduct the following tests on the RCP.

- ASTM C1214M - Standard Test Method for Concrete Pipe Sewer Lines by Negative Air Pressure (Vacuum) Test Method (Metric).
- ASTM Designation C 361 Standard Specification for Reinforced Concrete Low-Head Pressure Pipe.

If tests fail, repair the leaks and retest the pipe until the tests are passed.

Include the cost for gaskets, grout, surface coating, and testing in the contract unit price "PIPE CONC XXIN-STORM DRAIN".

714-P02 STORM SEWER: The storm sewer pipe to be installed will either be constructed with Reinforced Concrete Pipe (RCP) or Pipe Conduit in accordance with SP 314(14). The section 55 plan and Profile sheets were prepared with the pay items of Pipe Conduit. If the project is constructed with RCP, the corresponding RCP pay item will be used in place of the pay item of pipe conduit.

714-P03 PIPE CONDUIT - STORM DRAIN - VERTICAL ELBOWS: Install prefabricated vertical elbow sections in the storm drain conduits at the following locations as shown in the plans.

STATION	PIPE DIAMETER (Inches)	Vertical Deflection Angle
16658+23	18	11° 50' 00"
16665+58	18	8° 39' 00"
16668+05	18	11° 01' 00"
16669+12	18	13° 45' 00"
16670+54	18	14° 23' 00"
16674+00	18	15° 11' 00"
16678+00	18	16° 00' 00"
16687+25	18	13° 22' 00"

The prefabricated elbows will be measured for payment by the lineal foot of the length of pipe bend section installed.

Include all costs to furnish and install the prefabricated bend sections in the contract unit price for the corresponding size of "Pipe Conduit - Storm Drain."

714-P04 STORM DRAIN PIPE OPTION: The storm drain bid option indicated on sheet 8-3 applies to all pipe conduit west of station 16664+00

722-100 INLETS AND MANHOLES: Inlets and manholes were designed with a minimum 4 foot riser height Fill the bottom of each drainage structure with concrete, up to the lowest invert elevation.

722-P01 ABANDON STORM SEWER SYSTEM: Abandon portions of the storm sewer by covering the pipe penetrations in the storm sewer manholes with plywood and filling the bottom of the manhole with slurry to the crown of the pipe. Eight cubic yards of slurry is anticipated to abandon the storm sewer system. Use slurry that meets ASTM C 928 R1. Remove the manhole barrel to a minimum of 1 foot below the roadway base coarse and fill with embankment, compacted per subgrade specifications. Plug and abandon outlet pipes as called out in section 40. Remove end section of outlet pipe before plugging and bury plugged outlet to match adjacent grading. Include the cost for plywood, concrete slurry, plugging, removal of concrete barrel, and embankment in the contract unit price for "ABANDON STORM SEWER SYSTEM".

722-P02 MANHOLE CASTINGS: Use a floating manhole casting (D-722-5A) for all manhole castings within the concrete pavement. Use a standard manhole casting compliant with D-722-5 for all manholes outside of the concrete pavement.

748-P01 CURB & GUTTER – TYPE 1: Align all joints in the curb and gutter with the joint in the concrete pavement.

752-P01 FENCE BARBED WIRE 3 STRAND-STEEL POST: Install the 3 strand barbed wire fence in accordance with standard drawing D-752-1. Maintain the wire distance, shown in Standard Drawing D-752-1, from the top of the post to the top wire and from the ground to the bottom wire. Evenly space the third wire in between the top and bottom wires.

752-P02 TEMPORARY SAFETY FENCE: The bid item for the installation of TEMPORARY SAFETY FENCE includes removal of the fence.

762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.

This document was originally issued and sealed by Adam McGill, Registration Number PE-7565, on 9/7/2016 and the original document is stored at the North Dakota Department of Transportation.

Revised	8/25/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
Revised	8/29/2016				
Revised	9/2/2016	ND	SOIB-7-804(054)312	8	1
Revised	9/6/2016				
Revised	9/7/2016				

ESTIMATE OF QUANTITIES

Spec	Code	Description	Unit	Mainline	City Cost Share	100% Local	Total
103	0100	CONTRACT BOND	L SUM	1			1
103	0200	ESCROW OF BID DOCUMENTATION	L SUM	1			1
107	0100	RAILWAY PROTECTION INSURANCE	L SUM	1			1
201	0300	CLEARING & GRUBBING	ACRE	41			41
202	0105	REMOVAL OF STRUCTURE	L SUM	1			1
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	30			30
202	0130	REMOVAL OF CURB & GUTTER	LF	7323			7323
202	0135	REMOVAL OF BITUMINOUS SURFACING	TON	39995			39995
202	0152	REMOVAL OF BRIDGE RAIL	L SUM	1			1
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	1818			1818
202	0210	REMOVAL OF MANHOLES	EA	2			2
202	0230	REMOVAL OF INLETS	EA	14			14
202	0231	REMOVE & RESET INLETS	EA	1			1
202	0288	EXCAVATION & DISPOSAL OF CONTAMINATED SOIL	CY	1100			1100
202	0289	REMOVE APPROACH	EA	3			3
202	0312	REMOVE EXISTING FENCE	LF	16348			16348
202	0400	REMOVAL OF RIPRAP - LOOSE ROCK	CY	1470			1470
202	0812	DISPOSAL OF CONTAMINATED WATER	GAL	43500			43500
203	0101	COMMON EXCAVATION-TYPE A	CY	200197			200197
203	0109	TOPSOIL	CY	38213			38213
203	0113	COMMON EXCAVATION-WASTE	CY	22629			22629
203	0138	COMMON EXCAVATION-SUBCUT	CY	6683			6683
210	0050	BOX CULVERT EXCAVATION	EA	1			1
210	0212	FLOWABLE FILL	CY	75			75
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1			1
216	0100	WATER	M GAL	3974			3974
230	0165	SUBGRADE PREPARATION-TYPE A-12IN	STA	199			199
251	0300	SEEDING CLASS III	ACRE	48.34			48.34
251	2000	TEMPORARY COVER CROP	ACRE	46.73			46.73
253	0101	STRAW MULCH	ACRE	78.95			78.95
255	0101	ECB TYPE 1	SY	80417			80417
256	0100	RIPRAP GRADE I	CY	416			416
256	0200	RIPRAP GRADE II	CY	132			132
260	0200	SILT FENCE SUPPORTED	LF	10971			10971
260	0201	REMOVE SILT FENCE SUPPORTED	LF	10971			10971
261	0112	FIBER ROLLS 12IN	LF	26063			26063
261	0113	REMOVE FIBER ROLLS 12IN	LF	25007			25007
265	0100	STABILIZED CONSTRUCTION ACCESS	EA	1			1
265	0101	REMOVE STABILIZED CONSTRUCTION ACCESS	EA	1			1
302	0050	TRAFFIC SERVICE AGGREGATE	TON	13069			13069
302	0100	SALVAGED BASE COURSE	TON	92578			92578
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	4714			4714
550	0310	10IN NON REINF CONCRETE PVMT CL AE-DOWELED	SY	117871			117871

Spec	Code	Description	Unit	Mainline	City Cost Share	100% Local	Total
602	1208	CONCRETE BRIDGE BARRIER	LF	80			80
702	0100	MOBILIZATION	L SUM	1			1
704	0100	FLAGGING	MHR	2000			2000
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2968			2968
704	1035	ATTENUATION DEVICE-TYPE B-25	EA	6			6
704	1052	TYPE III BARRICADE	EA	20			20
704	1060	DELINEATOR DRUMS	EA	405			405
704	1067	TUBULAR MARKERS	EA	350			350
704	1080	STACKABLE VERTICAL PANELS	EA	350			350
704	1081	VERTICAL PANELS-BACK TO BACK	EA	122			122
704	1086	SEQUENCING ARROW PANEL-TYPE B	EA	1			1
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	1			1
704	3510	PRECAST CONCRETE MED BARRIER-STATE FURNISHED	EA	40			40
706	0500	AGGREGATE LABORATORY	EA	1			1
706	0600	CONTRACTOR'S LABORATORY	EA	1			1
708	1010	RIPRAP-GROUTED JOINT	SY	60			60
708	1540	INLET PROTECTION-SPECIAL	EA	88			88
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	89			89
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	18090			18090
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	18788			18788
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	1231			1231
709	0161	GEOSYNTHETIC MATERIAL TYPE S1	SY	15167			15167
709	0162	GEOSYNTHETIC MATERIAL TYPE S2	SY	1361			1361
714	0115	PIPE CONC REINF 12IN CL III-STORM DRAIN	LF	16			16
714	0210	PIPE CONC REINF 15IN CL III-STORM DRAIN	LF	900			900
714	0315	PIPE CONC REINF 18IN CL III-STORM DRAIN	LF	61			61
714	0500	PIPE CONC REINF 24IN CL II-45DEG BEND	EA	3			3
714	0620	PIPE CONC REINF 24IN CL III-STORM DRAIN	LF	37	184		221
714	4097	PIPE CONDUIT 15IN-STORM DRAIN	LF	318			318
714	4099	PIPE CONDUIT 18IN-APPROACH	LF	188			188
714	4101	PIPE CONDUIT 18IN-STORM DRAIN	LF	682			682
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	495			495
714	4107	PIPE CONDUIT 24IN-STORM DRAIN	LF	187			187
714	4112	PIPE CONDUIT 30IN-STORM DRAIN	LF	1786			1786
714	4115	PIPE CONDUIT 36IN	LF	88			88
714	4116	PIPE CONDUIT 36IN-APPROACH	LF	295			295
714	4117	PIPE CONDUIT 36IN-STORM DRAIN	LF	734			734
714	4120	PIPE CONDUIT 42IN	LF	170			170
714	4122	PIPE CONDUIT 42IN-APPROACH	LF	102			102
714	9200	CATTLE PASS CONC INTERMED SECTION	LF	150			150
714	9611	REMOVE & RELAY CONC CATTLE PASS END SECTION	EA	4			4
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	2			2
714	9680	PLUG PIPE-ALL TYPES & SIZES	EA	2			2

Revised	9/6/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
Revised	9/7/2016	ND	SOIB-7-804(054)312	11	4

ND 1804 Reconstruction							
Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16522+44.37	0	991.5	0	0	0	0	0
16522+72.91	0	1014.2	0	1272	72	65	-1272
16523+00.00	6.3	566.7	3	952	73	48	-2221
16523+18.88	6.2	334.4	4	378	48	18	-2594
16524+00.00	0	840	9	2117	191	119	-4702
16525+00.00	56.2	474.1	104	2920	249	230	-7518
16525+53.27	129.1	361.5	183	989	143	132	-8325
16526+00.00	195.5	208.3	281	592	123	114	-8635
16527+00.00	867.5	0	1969	463	254	234	-7130
16528+00.00	1954.9	0	5227	0	294	275	-1903
16528+25.65	2051.5	0.0	1903	0	86	81	0
16529+00.00	2331.5	0	6035	0	258	243	6035
16530+00.00	2888.3	0	9666	0	367	346	15701
16531+00.00	3542.7	0	11909	0	389	369	27610
16531+18.86	3710.3	0	2533	0	78	74	30143
16532+00.00	4220.9	0	11917	0	348	332	42061
16533+00.00	4480.1	0	16113	0	438	417	58174
16534+00.00	4550.8	0	16724	0	446	425	74898
16534+48.36	4555.7	0	8155	0	221	212	83053
16535+00.00	4403.9	0	8568	0	236	226	91621
16536+00.00	3713.1	0	15031	0	444	425	106653
16537+00.00	3062.1	0	12547	0	437	417	119199
16537+50.83	2922	0	5633	0	224	213	124832
16538+00.00	2425.8	0	4869	0	211	202	129702
16539+00.00	1287.2	0	6876	0	392	372	136577
16540+00.00	759.2	17	3790	38	336	314	140329
16541+00.00	49	386.6	1497	897	285	264	140929
16542+00.00	7.4	927.6	104	2920	263	243	138113
16542+58.55	0.8	1008.6	9	2519	155	143	135603
16543+00.00	0.2	835.4	1	1699	110	102	133905
16544+00.00	0	753.8	0	3532	274	254	130374
16545+00.00	0	725.6	0	3288	279	260	127086
16545+43.35	0	839.7	0	1508	122	114	125578
16546+00.00	0	1116.3	0	2462	169	157	123116
16547+00.00	0	1742.5	0	6353	328	308	116763
16547+35.33	0	1624.1	0	2643	121	114	114120
16548+00.00	1.3	521.2	2	3083	178	165	111038
16549+00.00	282.2	119.8	525	1424	230	209	110139
16549+23.35	386.6	54.6	289	90	65	41	110338
16549+62.57	434.4	77.9	596	115	117	77	110818
16550+00.00	401.8	90.6	580	140	105	98	111258
16550+29.77	320.3	35.6	398	83	89	59	111573
16550+33.45	322.5	36.2	44	6	12	5	111610
16550+74.61	216	123	410	146	114	73	111875
16551+00.00	149.4	187.9	172	175	60	56	111872
16551+19.44	121.7	243.5	98	186	47	43	111783
16551+31.82	100.8	257.7	51	138	30	27	111696
16551+50.00	76.7	272.5	60	214	42	39	111542
16551+60.01	69.7	272.8	27	121	23	21	111447
16552+00.00	58.5	287.9	95	498	90	81	111044
16552+50.00	51.1	286	101	638	110	100	110508
16553+00.00	0.7	313.1	48	666	97	87	109890
16553+50.00	10.6	399.4	10	792	94	84	109109
16554+00.00	0	528.2	10	1031	100	91	108088
16554+50.00	0	722.4	0	1390	110	100	106699
16555+00.00	0	555.2	0	1420	112	103	105279
16555+50.00	64.3	364.7	60	1022	104	95	104316
16556+00.00	169.5	278.2	216	714	107	97	103819
16556+50.00	188.5	232.7	331	568	113	103	103582
16557+00.00	142.7	237.5	307	522	113	103	103367
16557+50.00	81.8	280.6	208	576	110	100	102999
16558+00.00	23.8	318	98	665	106	96	102432
16558+50.00	13.8	316.4	35	705	103	92	101761
16559+00.00	12.3	295.7	24	680	98	88	101106
16559+50.00	13	294	23	655	95	85	100474
16560+00.00	14.1	314	25	676	96	87	99823
16560+50.00	23.4	304.3	35	687	99	89	99171

ND 1804 Reconstruction Earthwork and Topsoil Summary										
	Earthwork								Topsoil	
Spec and Code		203-0101					203-0113	203-0138	203-0109	
	Total Excavation	Common Excavation - Type A	Mainline Excavation	Coal Waste Site (4) Excess Excavation	Embankment (1)	Excess Excavation (3)	Common Excavation - Waste (Coal) (2)	Common Excavation - Subcut	Topsoil (Mainline)	Topsoil (Coal Waste)
	A = C + D + H	B = A - G - H	C	D	E	F = A - E - G - H	G	H		
	(CY)	(CY)		(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)
TOTALS	229,508	200,196	202,825	20,000	167,969	32,227	22,629	6,683	36,709	1,504

(1) Volumes shown have been adjusted to account for 20% shrinkage
(2) See Coal Waste table
(3) See Note 203-P02
(4) See Note 203-P01

COAL WASTE (2)	
Location	Quantity (CY)
16527+00 to 16531+00	9556
16531+00	931
16532+00	1889
16533+00	1919
16534+00	1917
16535+00	2111
16536+00	2222
16537+00	1667
16538+00	417
Total	22629

Note; Coal quantities are estimated and will vary in the field. Estimates are based on information presented in the "Phase I Linear Survey and Recomendations", dated January 2016

Differences in quantities will be paid for at the contract unit price for the respective bid item.

This document was originally issued and sealed by Adam McGill Registration Number PE- 7565, on 9/7/2016 and the original document is stored at the North Dakota Department of Transportation

Earthwork Mass Summary

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	11	5

ND 1804 Reconstruction

Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16561+00.00	73	269	89	637	98	88	98623
16561+50.00	124	253	182	580	99	89	98226
16562+00.00	126.3	258	232	568	101	90	97890
16562+50.00	121.2	257.4	229	573	99	89	97546
16563+00.00	129.2	252.2	232	566	104	95	97212
16563+50.00	110	276.2	221	587	106	96	96846
16564+00.00	49.9	333.5	148	677	104	94	96317
16564+50.00	25	359.7	69	770	105	95	95616
16565+00.00	50.6	345.4	70	783	105	96	94902
16565+50.00	66	317.8	108	737	108	98	94274
16566+00.00	53.7	313.1	111	701	107	97	93683
16566+50.00	46.3	297.1	93	678	104	94	93098
16567+00.00	56.2	282.1	95	644	100	90	92549
16567+50.00	83.9	265.9	130	609	99	89	92070
16568+00.00	99.9	281	170	608	103	93	91633
16568+50.00	77.3	323.1	164	671	107	98	91125
16569+00.00	7.1	387	78	789	105	96	90415
16569+50.00	4.2	388.3	10	861	97	88	89564
16570+00.00	6.7	312.9	10	779	87	77	88795
16570+50.00	95	243.2	94	618	96	86	88271
16571+00.00	192.9	220.1	267	515	115	106	88023
16571+50.00	66.6	14.7	240	261	112	55	88002
16571+59.65	85.7	5.2	27	4	21	0	88025
16572+00.00	231.4	190.8	237	176	96	46	88086
16572+50.00	178.5	242.2	380	481	122	113	87985
16572+79.11	145.6	258.3	175	324	69	63	87836
16573+00.00	133.7	262.2	108	242	48	44	87702
16573+07.29	130.5	262.1	36	85	16	15	87653
16573+19.67	126.1	260.6	59	144	28	26	87568
16573+64.51	135.9	238.5	218	497	102	93	87288
16574+00.00	137.4	221.5	180	363	81	74	87105
16574+09.34	138.2	216.2	48	91	22	19	87062
16575+00.00	90.4	206.2	384	851	203	185	86594
16576+00.00	85.3	219.7	325	946	209	189	85973
16577+00.00	178.1	198.1	488	928	207	186	85533
16578+00.00	119.1	189.5	550	861	218	198	85222
16579+00.00	56.8	245.3	326	966	209	190	84581
16580+00.00	24.1	310	150	1234	192	172	83497
16580+51.94	21.4	389.5	44	807	101	91	82734
16581+00.00	55.8	113.2	69	537	89	78	82265
16582+00.00	64.7	183.7	223	660	185	161	81829
16583+00.00	107	196.4	318	845	205	185	81302
16584+00.00	112.1	183	406	843	209	189	80865
16584+13.65	110.9	182	56	111	28	24	80810
16584+54.79	83.6	197.6	148	347	75	68	80611
16584+95.92	162.7	220.2	188	382	80	72	80417
16584+98.09	160.3	221.1	13	21	5	4	80409
16585+00.00	158.1	221.8	11	19	3	4	80401
16585+19.43	139.4	232.4	107	196	41	38	80312
16585+50.00	140.7	229	159	313	69	63	80157
16586+00.00	128.1	221.2	249	500	113	103	79906
16586+50.00	133.6	218.9	242	489	112	103	79659
16587+00.00	135	202.2	249	468	114	104	79440
16587+37.37	120	114.8	176	263	81	60	79353
16587+50.00	198.3	114.9	74	64	27	20	79363
16588+00.00	136.1	210.1	310	361	113	101	79312
16588+50.00	118.2	220.8	235	479	111	102	79069
16589+00.00	98.9	217	201	486	110	101	78783
16589+50.00	78.3	231.9	164	499	110	100	78448
16590+00.00	55.2	255.6	124	542	109	99	78030
16590+50.00	35.4	265.1	84	579	107	96	77536
16591+00.00	35.5	266.1	66	590	98	89	77011
16591+50.00	33.8	262.7	64	588	92	83	76488
16592+00.00	23	262.1	53	583	90	79	75957
16592+50.00	26.7	236.3	46	554	87	75	75449
16592+66.40	39.3	157.5	20	144	34	19	75326
16593+00.00	30.5	195.1	43	263	69	38	75106

ND 1804 Reconstruction

Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16593+50.00	37.5	232.9	63	476	86	73	74694
16594+00.00	41.2	246.1	73	532	88	73	74234
16594+50.00	49.2	253	84	555	87	73	73763
16595+00.00	64.1	245.3	105	554	90	74	73315
16595+50.00	70.6	245.6	125	545	94	76	72894
16596+00.00	91.6	241.1	150	541	95	78	72503
16596+50.00	113.5	210.9	190	502	95	77	72191
16597+00.00	138.7	205.5	234	463	100	79	71962
16597+50.00	169	194.9	285	445	107	84	71802
16597+91.56	187.7	183.5	275	349	93	71	71727
16598+00.00	191.7	183.8	59	69	20	15	71717
16598+50.00	215.5	203.4	377	430	115	86	71664
16598+71.57	214.6	213.3	172	200	51	37	71636
16599+00.00	230.5	215.4	234	271	68	46	71600
16599+50.00	225.9	224.1	423	488	122	74	71534
16600+00.00	178	254.9	374	532	122	78	71376
16600+31.62	152.6	273.6	194	371	76	51	71198
16600+50.00	131	274.4	97	224	43	28	71071
16601+00.00	20.8	224.8	141	555	104	65	70657
16601+17.07	48.8	152.7	22	143	33	21	70535
16601+50.00	20.1	184.9	42	247	63	39	70330
16602+00.00	35.8	276.2	52	512	93	56	69870
16602+20.72	31.9	304.7	26	267	40	26	69628
16602+25.00	32.5	305.1	5	58	8	6	69575
16602+50.00	30.9	317.5	29	346	49	33	69259
16602+75.00	23.4	351.4	25	372	51	35	68912
16603+00.00	16.9	415.8	19	426	50	34	68505
16603+25.00	14.6	458.8	15	486	48	33	68033
16603+50.00	12.5	478.9	13	521	49	33	67525
16603+75.00	9.2	493.2	10	540	49	34	66995
16604+00.00	7.8	494.8	8	549	52	36	66454
16604+20.72	9.4	482	7	450	45	32	66011
16604+25.00	10.6	477	2	91	9	7	65921
16604+50.00	19	425.2	14	501	54	39	65434
16604+75.00	24.6	377.2	20	446	54	39	65008
16605+00.00	28.9	341.6	25	399	52	39	64634
16605+25.00	29.7	313.5	27	364	50	38	64297
16605+50.00	23.7	285.6	25	333	48	37	63989
16605+64.72	22	271.1	12	182	27	21	63819
16605+75.00	21.6	269.8	8	124	19	15	63704
16606+00.00	18.7	270.5	19	300	45	35	63422
16606+25.00	20.2	254.5	18	292	43	33	63149
16606+50.00	17.9	244.8	18	277	43	33	62889
16606+75.00	18.8	254.6	17	277	42	32	62628
16607+00.00	18.7	255.7	17	284	42	32	62362
16607+25.00	20	247.5	18	280	42	32	62101
16607+50.00	23.6	237.4	20	269	41	31	61851
16607+75.00	25	231.5	23	261	43	33	61613
16608+00.00	28.7	223.4	25	253	44	34	61385
16608+25.00	35.7	215.2	30	244	43	33	61172
16608+50.00	41.3	212.2	36	237	42	32	60970
16608+75.00	48.1	209.9	41	235	43	32	60777
16609+00.00	52.3	204.2	46	230	42	32	60593
16609+25.00	56.9	205.6	51	228	42	33	60416
16609+50.00	62.5	209.6	55	231	46	36	60241
16609+75.00	70.7	187.5	62	221	48	39	60082
16610+00.00	88.9	116.2	74	169	50	40	59987
16610+25.00	119.8	24.6	97	78	56	31	60005
16610+33.83	59.8	17.6	29	8	21	4	60026
16610+50.00	132.7	28.1	58	16	39	7	60068
16610+75.00	62.1	141.1	90	94	56	31	60064
16611+00.00	78.9	213.1	65	197	51	41	59932
16611+25.00	105.3	235.3	85	249	54	43	59768
16611+50.00	100.5	236.7	95	262	52	42	59601
16611+75.00	86.6	239.7	87	265	49	39	59423
16612+00.00	65.3	246.5	70	270	49	38	59224
16612+25.00	47.9	250.3	52	276	47	37	59000

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Earthwork Mass Diagram

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	11	6

ND 1804 Reconstruction

Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16612+50.00	31.3	258.2	37	283	46	36	58754
16612+75.00	18	267.6	23	292	45	35	58485
16613+00.00	12.7	271.2	14	299	43	34	58200
16613+25.00	10.6	274.6	11	303	43	34	57907
16613+27.06	59.7	189.1	3	21	4	3	57889
16613+50.00	6	286	28	242	40	31	57675
16613+75.00	4	291.6	5	321	43	33	57358
16613+83.06	48.7	201.6	8	88	14	11	57278
16614+00.00	6.4	287.6	17	184	29	22	57111
16614+25.00	9.6	277.3	7	314	43	33	56805
16614+50.00	9.4	268.4	9	303	43	33	56510
16614+75.00	13.2	255.6	10	291	43	33	56230
16614+81.06	14.9	254.1	3	69	10	8	56164
16615+00.00	17.1	243.2	11	209	32	24	55966
16615+25.00	18.9	238.9	17	268	42	32	55715
16615+50.00	19.1	236.4	18	264	42	32	55468
16615+75.00	20.1	229.4	18	259	41	31	55228
16615+79.06	21.1	228	3	41	6	5	55190
16616+00.00	25.6	227.5	18	212	34	26	54996
16616+25.00	36	213.9	29	245	41	31	54779
16616+50.00	73.1	119.7	51	185	43	22	54644
16616+62.59	87.1	113.3	37	65	21	7	54616
16616+75.00	149.2	111.9	54	62	21	12	54609
16617+00.00	93.1	208.7	112	178	45	36	54543
16617+25.00	70.6	223.2	76	240	47	37	54378
16617+50.00	62.6	232.7	62	253	46	36	54187
16617+75.00	53.5	254.6	54	271	43	33	53970
16618+00.00	53.3	269	49	291	42	31	53728
16618+25.00	51.2	235	48	280	42	32	53497
16618+50.00	50.2	185.3	47	234	41	30	53310
16618+75.00	55.1	174.5	49	200	43	32	53159
16619+00.00	51.9	170.2	50	192	45	35	53017
16619+25.00	50.8	168.2	48	188	42	32	52877
16619+50.00	47	169.3	45	188	39	29	52734
16619+75.00	42.7	174.5	42	191	39	29	52585
16620+00.00	36.9	189.1	37	202	39	29	52420
16620+25.00	28.3	203.7	30	218	40	29	52232
16620+50.00	21.8	217.9	23	234	39	29	52021
16620+75.00	15.2	240.2	17	255	39	29	51783
16621+00.00	10.6	270.9	12	284	38	29	51511
16621+25.00	6.4	300.5	8	317	39	29	51202
16621+50.00	1.5	332.5	4	352	39	28	50854
16621+75.00	0	362.3	1	386	36	26	50468
16622+00.00	0	383.4	0	414	34	24	50054
16622+25.00	0	388.2	0	429	35	24	49626
16622+50.00	0	356.1	0	414	35	25	49212
16622+75.00	0	279.1	0	353	34	24	48859
16622+82.48	0	275.6	0	92	10	7	48767
16623+00.00	0	272.3	0	213	24	16	48554
16623+25.00	0	335.9	0	338	36	25	48216
16623+50.00	7	207.4	3	302	43	19	47917
16623+75.00	19.1	279	12	270	46	20	47659
16624+00.00	22.6	326	19	336	44	29	47342
16624+25.00	24.5	207.5	22	296	46	30	47068
16624+50.00	26.4	297.4	24	281	46	30	46811
16624+75.00	29.4	280.6	26	321	46	30	46515
16625+00.00	26.4	268.3	26	305	46	30	46236
16625+25.00	25.7	251	24	289	46	30	45972
16625+50.00	24.8	238.7	23	272	46	30	45723
16625+75.00	23.4	230.2	22	261	45	29	45485
16626+00.00	37.3	223	28	252	49	33	45261
16626+00.52	37.4	222.9	1	5	1	1	45257
16626+25.00	40.6	212.2	35	237	50	36	45056
16626+50.00	50	201.6	42	230	51	36	44868
16626+75.00	57.8	189	50	217	50	36	44701
16627+00.00	65.9	173.5	57	201	49	36	44556
16627+25.00	72.6	153.4	64	182	47	37	44439

ND 1804 Reconstruction

Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16627+44.52	75.6	144.8	54	129	38	29	44363
16627+50.00	77.5	143.3	16	35	10	8	44344
16627+75.00	88.5	133.2	77	154	49	39	44267
16628+00.00	93.6	134.8	84	149	50	40	44202
16628+25.00	101.1	132.5	90	149	51	41	44144
16628+50.00	110.8	131.8	98	147	52	41	44095
16628+75.00	120.2	131.1	107	146	52	41	44056
16629+00.00	130.4	131.2	116	146	52	42	44026
16629+25.00	135.3	133.4	123	147	52	42	44002
16629+50.00	145.3	131.6	130	147	52	42	43985
16629+75.00	150.6	123.8	137	142	52	42	43980
16630+00.00	159.6	121.6	144	136	52	42	43987
16630+25.00	157.3	121.6	147	135	52	42	43999
16630+50.00	159.5	120.4	147	134	54	43	44011
16630+75.00	171.1	122.2	153	135	55	45	44030
16631+00.00	162	125.2	154	137	57	47	44046
16631+25.00	153.2	128	146	141	56	47	44052
16631+50.00	162	123.8	146	140	57	46	44058
16631+75.00	304.1	72.7	216	109	57	46	44164
16632+00.00	184.8	109.6	226	101	57	46	44289
16632+25.00	174.8	120.8	166	128	57	47	44328
16632+50.00	169.8	121.7	160	135	57	47	44353
16632+75.00	97.2	149.9	124	151	51	41	44325
16633+00.00	97.1	138.6	90	160	44	34	44255
16633+25.00	102.7	133.7	93	151	43	32	44196
16633+50.00	109.4	126.6	98	145	43	32	44150
16633+75.00	164	5.6	127	73	39	28	44203
16633+84.36	185.7	2.8	61	2	13	8	44262
16633+86.39	189.4	2.4	14	0	3	2	44276
16634+00.00	159.3	45.3	88	14	21	15	44349
16634+25.00	130.3	100.4	134	81	43	33	44402
16634+50.00	135.7	106.9	123	115	43	33	44410
16634+75.00	133.6	107.7	125	119	43	33	44416
16635+00.00	129	109.6	122	121	43	33	44417
16635+25.00	134.4	104.9	122	119	43	33	44419
16635+50.00	138.9	96.6	127	112	43	33	44434
16635+75.00	147.3	87.6	133	102	43	33	44464
16636+00.00	150.1	71.6	138	88	43	33	44513
16636+25.00	167.8	34	147	59	41	29	44602
16636+50.00	467.4	1.7	294	20	49	37	44876
16636+75.00	154.4	8.5	288	6	56	26	45158
16637+00.00	143.5	82.8	138	51	47	16	45245
16637+25.00	327.6	80	218	90	52	37	45373
16637+50.00	312.2	86.1	296	92	61	45	45577
16637+75.00	300.9	87.8	284	97	60	44	45764
16638+00.00	293	94.7	275	101	60	44	45938
16638+25.00	282.5	99.4	266	108	60	44	46096
16638+50.00	274.1	100.2	258	111	59	44	46243
16638+75.00	295.2	79.4	264	100	59	44	46407
16639+00.00	284.8	62.3	269	79	58	34	46597
16639+03.34	281.7	62.9	35	9	7	3	46623
16639+25.00	279.2	61.7	225	60	49	30	46788
16639+50.00	189.3	102.6	217	91	55	41	46913
16639+75.00	180.9	116.6	171	122	50	37	46963
16640+00.00	168.6	150.3	162	148	50	38	46976
16640+25.00	152.6	132.9	149	157	53	41	46968
16640+47.34	129.5	132.8	117	132	46	37	46953
16640+50.00	128	134.1	13	16	5	4	46949
16640+75.00	115.5	173.7	113	171	50	41	46891
16641+00.00	95.8	204	98	210	51	43	46779
16641+25.00	94.9	218.6	88	235	53	46	46633
16641+50.00	111.3	186.4	95	225	54	47	46503
16641+58.36	117.7	169.7	35	66	17	15	46472
16641+75.00	124.5	146.6	75	117	33	28	46430
16642+00.00	126.3	128.4	116	153	47	41	46393
16642+25.00	121	114.4	114	135	44	40	46373
16642+50.00	100.1	109.5	102	124	44	38	46351

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Earthwork Mass Diagram

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	11	7

ND 1804 Reconstruction							
Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16642+70.00	74.1	105	65	95	33	29	46320
16642+75.00	70.9	104.9	13	23	8	7	46310
16643+00.00	51.9	104.3	57	116	36	32	46251
16643+25.00	56.8	103.9	50	116	34	30	46186
16643+50.00	71.7	109.3	59	118	36	32	46127
16643+75.00	66.6	107.1	64	120	37	32	46070
16644+00.00	96.1	51.5	75	88	37	32	46058
16644+13.19	62.2	27.1	39	23	17	11	46073
16644+25.00	46.6	43.2	24	18	11	7	46079
16644+50.00	30.3	157.8	36	112	27	22	46003
16644+75.00	32.1	141.6	29	166	28	23	45865
16645+00.00	73.7	122.9	49	147	35	19	45767
16645+08.11	86.2	121.4	24	44	14	5	45747
16645+25.00	101.8	114	59	88	29	10	45718
16645+50.00	24.7	122.8	59	132	35	19	45645
16645+75.00	23.5	143.7	22	148	26	22	45519
16646+00.00	18.1	167.7	19	173	27	22	45365
16646+25.00	15.8	175.8	16	191	28	23	45190
16646+50.00	14.3	173.9	14	194	29	24	45010
16646+75.00	10	182.2	11	198	28	23	44823
16647+00.00	8.6	192.4	9	208	27	22	44624
16647+25.00	7.7	199.6	8	218	28	23	44413
16647+50.00	5.3	198.3	6	221	26	22	44198
16647+75.00	6.2	197.4	5	220	26	21	43984
16648+00.00	4.6	193.1	5	217	25	21	43772
16648+25.00	5	193.5	4	215	25	21	43561
16648+50.00	4.8	198.9	5	218	25	21	43348
16648+75.00	7.1	197.8	6	220	26	22	43133
16649+00.00	9	185.2	7	213	26	22	42928
16649+25.00	10	182.3	9	204	27	22	42732
16649+50.00	11.1	174.5	10	198	28	23	42544
16649+75.00	12.7	164	11	188	28	23	42367
16650+00.00	11.7	114.3	11	155	25	20	42224
16650+25.00	13.3	143.9	12	143	25	20	42092
16650+50.00	46	151.5	27	164	32	28	41955
16650+75.00	17	173.3	29	180	33	29	41804
16651+00.00	12.5	188.6	14	201	31	26	41616
16651+25.00	28.4	216.1	19	225	35	30	41411
16651+50.00	34.7	218	29	241	40	36	41199
16651+75.00	32.8	154.4	31	207	43	37	41023
16652+00.00	43	152.7	35	171	41	37	40887
16652+16.44	28.8	201.8	22	130	27	24	40780
16652+25.00	43.6	216.9	11	80	14	13	40712
16652+50.00	67	173.9	51	217	44	39	40546
16652+75.00	35	181.1	47	197	45	39	40396
16653+00.00	14.8	184.2	23	203	40	34	40216
16653+25.00	5.2	193.9	9	210	37	30	40015
16653+50.00	8.9	183.6	7	210	35	28	39812
16653+75.00	13.6	177.2	10	200	36	29	39622
16654+00.00	27.5	149.7	19	182	39	31	39459
16654+25.00	28.3	142.6	26	162	42	34	39323
16654+50.00	32.8	116.4	28	144	39	30	39207
16654+75.00	39.8	103.8	34	122	36	28	39118
16654+86.44	40.7	104.9	17	53	17	13	39082
16655+00.00	16.6	98.4	14	61	17	16	39035
16655+25.00	26.1	77.2	20	98	27	31	38958
16655+50.00	37.8	66.3	30	80	27	31	38908
16655+75.00	46.9	57	39	69	28	30	38878
16656+00.00	53.5	57.7	46	64	27	30	38861
16656+25.00	49.6	59.6	48	65	28	30	38844
16656+30.44	45.7	60.2	10	14	6	7	38839
16656+50.00	38.7	67	31	55	21	24	38814
16656+75.00	24.6	88.1	29	86	28	30	38757
16657+00.00	15.2	86.1	18	97	25	28	38679
16657+25.00	12.9	90	13	98	25	28	38594
16657+50.00	13.9	92.5	12	101	27	30	38505
16657+75.00	13.9	90.9	13	102	26	29	38416

ND 1804 Reconstruction							
Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16658+00.00	9.4	92.7	11	102	25	28	38325
16658+25.00	4.1	94.1	6	104	24	27	38227
16658+50.00	1.5	73.1	3	93	22	25	38137
16658+63.80	12.8	89.9	4	50	17	10	38091
16658+75.00	0.3	79	3	42	14	8	38051
16659+00.00	2.3	91.2	1	95	21	24	37958
16659+25.00	1.5	123.3	2	119	24	27	37840
16659+50.00	4.5	124.1	3	137	28	31	37706
16659+75.00	4.9	125.4	4	139	28	31	37572
16660+00.00	3.6	133.1	4	144	28	31	37432
16660+25.00	2.2	136.7	3	150	28	30	37285
16660+50.00	3.7	131.1	3	149	27	30	37139
16660+75.00	4.8	129.6	4	145	27	30	36998
16661+00.00	6.4	137.6	5	148	28	30	36854
16661+25.00	6.9	144.1	6	157	28	31	36704
16661+50.00	5.8	149.9	6	163	29	31	36547
16661+75.00	4.4	139.8	5	161	29	31	36390
16662+00.00	2	135.7	3	153	28	30	36240
16662+25.00	5.3	115.9	3	140	28	28	36104
16662+50.00	39.2	26.1	21	79	28	27	36046
16662+75.00	56.2	19.7	44	25	39	19	36064
16662+80.65	66.6	18.1	13	5	12	3	36072
16663+00.00	72.2	20	50	16	39	9	36106
16663+25.00	15	53.5	40	41	39	18	36105
16663+50.00	0.3	173.3	7	126	30	27	35986
16663+75.00	1.5	294.8	1	260	35	33	35727
16664+00.00	1	602.3	1	498	19	32	35230
16664+25.00	1	573.6	1	653	0	27	34578
16664+50.00	1	550	1	624	0	27	33954
16664+75.00	106.8	124.3	50	375	21	33	33630
16665+00.00	115.1	110.9	103	131	42	40	33602
16665+25.00	100.3	112.3	100	124	42	40	33577
16665+50.00	89.2	115.8	88	127	41	38	33538
16665+75.00	80.2	112.8	78	127	39	37	33490
16666+00.00	86.4	102.1	77	119	39	36	33448
16666+25.00	91.8	86.2	83	105	37	34	33426
16666+50.00	95.4	75.7	87	90	36	33	33422
16666+75.00	130.2	36.6	104	62	37	34	33464
16667+00.00	297.3	13	198	28	40	37	33635
16667+25.00	145.7	13.8	205	15	37	25	33825
16667+33.57	128.7	14.7	44	5	12	4	33863
16667+50.00	112.3	15.2	73	11	22	7	33925
16667+75.00	81	26.7	89	23	39	10	33992
16668+00.00	115.1	42.1	91	38	43	23	34044
16668+25.00	80.1	97.1	90	77	39	36	34057
16668+50.00	65.8	116.3	68	119	37	34	34006
16668+75.00	59	135.6	58	140	34	31	33924
16669+00.00	68.7	151.2	59	159	33	29	33824
16669+25.00	81.9	151.6	70	168	35	32	33725
16669+50.00	122.6	154	95	170	39	36	33650
16669+75.00	167.2	163.8	134	177	42	40	33608
16669+83.64	140.7	170.6	49	64	19	11	33593
16670+00.00	161.6	181.7	92	128	38	22	33556
16670+03.93	150	182.4	23	32	6	7	33547
16670+25.00	93.4	170.2	95	165	34	33	33477
16670+50.00	89.6	167.3	85	188	41	40	33374
16670+75.00	101.6	129.7	89	165	41	40	33298
16671+00.00	104	97.2	95	126	36	37	33267
16671+25.00	106.6	75.1	98	96	43	44	33269
16671+47.93	115.5	24.7	94	51	34	35	33312
16671+50.00	116	25.4	9	2	1	2	33319
16671+75.00	124.4	27.9	111	30	27	30	33401
16672+00.00	127.2	28.3	116	31	32	34	33486
16672+25.00	124.4	13.1	116	23	22	25	33579
16672+50.00	123.9	90.8	115	58	37	40	33636
16672+75.00	114.6	111	110	112	62	65	33635
16673+00.00	114.1	72.5	106	102	53	55	33639

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Earthwork Mass Diagram

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	11	8

ND 1804 Reconstruction							
Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16673+25.00	121.5	70	109	79	42	45	33669
16673+50.00	119.9	54.7	112	69	44	46	33711
16674+00.00	134.7	8.6	236	70	63	68	33877
16674+25.00	142.6	4.6	128	7	18	21	33998
16674+50.00	150.7	6.5	136	6	17	19	34127
16674+75.00	151.9	9.1	140	9	16	19	34259
16675+00.00	152.5	30.8	141	22	26	29	34377
16675+25.00	181.4	26	155	32	35	37	34500
16675+50.00	175.2	37.5	165	35	36	38	34630
16675+75.00	160.1	44.9	155	46	37	40	34740
16676+00.00	141.8	55	140	56	37	41	34824
16676+20.98	134.5	68.5	107	58	33	35	34874
16676+25.00	132.9	69.2	20	12	6	7	34881
16676+50.00	124.4	64.8	119	74	41	43	34926
16676+75.00	103.9	69.9	106	75	41	44	34957
16677+00.00	87.5	86.4	89	87	42	45	34959
16677+25.00	73	107.4	74	108	43	46	34925
16677+50.00	50.8	120.1	57	126	44	47	34856
16677+64.98	48.8	123.4	28	81	26	29	34803
16677+75.00	54.3	120.4	19	54	19	20	34768
16678+00.00	61.1	111.2	53	129	47	50	34692
16678+25.00	57.2	99.8	55	117	47	51	34630
16678+50.00	56.9	88.4	53	105	46	51	34578
16678+75.00	67.1	78.5	57	93	47	52	34543
16679+00.00	72.2	61.7	64	78	47	53	34529
16679+25.00	77	56.8	69	66	44	51	34533
16679+50.00	78.1	112.8	72	94	45	51	34510
16679+75.00	71	205.5	69	177	50	54	34402
16680+00.00	63.2	287.9	62	274	53	54	34190
16680+25.00	47.5	264.6	51	307	53	54	33935
16680+34.98	42.4	252.9	17	115	20	21	33837
16680+50.00	35.3	233.4	22	162	32	32	33696
16680+75.00	19.5	196.2	25	239	52	54	33483
16681+00.00	5.5	300.4	12	276	72	74	33218
16681+25.00	1	315	3	342	92	94	32879
16681+50.00	0	297.8	0	340	90	93	32539
16681+75.00	0	491.5	0	439	88	92	32101
16682+00.00	0	0	0	273	0	0	31828
16682+25.00	0	0	0	0	0	0	31828
16682+50.00	0	0	0	0	0	0	31828
16682+75.00	0	0	0	0	0	0	31828
16683+00.00	0	0	0	0	0	0	31828
16683+25.00	0	0	0	0	0	0	31828
16683+50.00	0	0	0	0	0	0	31828
16683+75.00	0	0	0	0	0	0	31828
16684+00.00	0	0	0	0	0	0	31828
16684+25.00	0	0	0	0	0	0	31828
16684+50.00	0	0	0	0	0	0	31828
16684+75.00	20.9	760.6	10	423	89	88	31415
16685+00.00	34	402.8	25	646	90	85	30794
16685+25.00	51.8	126.3	40	294	69	63	30540
16685+50.00	68.7	44.2	56	95	41	32	30501
16685+75.00	112.5	35.9	84	45	31	26	30540
16685+81.31	118.3	35.2	27	10	8	7	30557
16686+00.00	132.9	34.4	87	29	24	19	30615
16686+25.00	155.3	33.4	133	38	31	23	30711
16686+50.00	165.9	23.5	149	32	30	21	30828
16686+75.00	180.6	5.3	160	16	29	19	30973
16687+00.00	179.3	63.1	167	38	30	22	31101
16687+25.00	182	99	167	90	33	26	31178
16687+25.31	182.3	99.4	2	1	0	0	31179
16687+50.00	193	104.9	172	112	34	25	31239
16687+75.00	190.8	117	178	123	34	25	31293
16688+00.00	180.1	116.4	172	130	33	23	31335
16688+25.00	174.7	113.4	164	128	32	22	31372
16688+50.00	164.2	98.8	157	118	30	20	31411
16688+75.00	157.7	138.6	149	132	37	26	31428

ND 1804 Reconstruction							
Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16689+00.00	149.6	74.2	142	118	41	31	31452
16689+25.00	147.3	22.2	137	54	31	20	31536
16689+50.00	221.9	0	171	12	30	20	31694
16689+75.00	310	0	246	0	40	30	31941
16689+93.54	331.9	0	220	0	32	25	32161
16690+00.00	333	0	80	0	12	9	32241
16690+25.00	255.6	0	273	0	44	35	32513
16690+50.00	138.8	25.2	183	14	39	30	32682
16690+75.00	131.3	24.7	125	28	33	25	32779
16691+00.00	127.1	12.8	120	21	30	24	32878
16691+25.00	95.4	7.1	103	11	21	16	32970
16691+50.00	84.9	27.3	83	19	22	8	33034
16691+75.00	82.4	6.2	77	19	22	8	33093
16692+00.00	77.9	4.3	74	6	12	7	33161
16692+25.00	68.8	2.1	68	4	10	6	33226
16692+50.00	58.4	0.1	59	1	8	3	33283
16692+75.00	58.6	0.1	54	0	7	2	33337
16693+00.00	57.8	0.7	54	0	7	3	33391
16693+25.00	65.5	0.5	57	1	7	3	33447
16693+50.00	71.5	0.1	63	0	7	3	33510
16693+75.00	62.1	1.3	62	1	8	3	33571
16694+00.00	54.2	4.7	54	3	9	4	33622
16694+25.00	44.1	5.5	46	6	10	5	33662
16694+50.00	37.1	7.7	38	7	11	6	33692
16694+75.00	33.6	8.6	33	9	12	7	33716
16695+00.00	29.2	8.9	29	10	12	7	33735
16695+25.00	21.4	10.1	23	11	12	7	33748
16695+50.00	23	12.7	21	13	11	7	33756
16695+75.00	16.3	9.5	18	12	11	7	33762
16696+00.00	13.6	12	14	12	11	6	33764
16696+25.00	12.5	11.3	12	13	10	6	33763
16696+50.00	12.2	11.4	11	13	10	5	33762
16696+75.00	10.4	13.4	10	14	9	5	33758
16697+00.00	8.6	16.7	9	17	9	5	33750
16697+25.00	7.1	27.5	7	25	10	5	33733
16697+50.00	6.4	37.6	6	36	10	5	33703
16697+75.00	5.5	38.4	6	42	10	5	33666
16698+00.00	4.3	42	5	45	10	5	33626
16698+25.00	3.1	41.3	3	46	10	5	33583
16698+50.00	3.5	42.8	3	47	10	6	33540
16698+75.00	4.8	40.1	4	46	11	6	33498
16699+00.00	6.8	28.1	5	38	10	6	33465
16699+25.00	10.3	15.3	8	24	10	6	33449
16699+50.00	13.2	12	11	15	9	5	33445
16699+75.00	16.5	7.7	14	11	9	5	33447
16700+00.00	18.8	4.9	16	7	9	5	33457
16700+25.00	24.9	4.1	20	5	9	4	33472
16700+75.00	45	2	65	7	17	7	33530
16700+89.19	49.9	1.8	25	1	4	1	33554
16701+00.00	54.2	1.6	21	1	3	1	33574
16701+25.00	62.4	0.8	54	1	8	2	33626
16701+50.00	64.6	1.5	59	1	8	2	33684
16701+75.00	61.1	1.6	58	2	10	3	33740
16702+00.00	73.8	0.5	62	1	12	3	33802
16702+25.00	78.7	0	71	0	12	3	33872
16702+33.19	81	0	24	0	4	1	33896
16702+50.00	89.3	0.3	53	0	9	3	33949
16702+75.00	95.9	0.2	86	0	14	4	34035
16703+00.00	86.4	1.4	84	1	15	4	34118
16703+25.00	88.7	0.7	81	1	14	4	34198
16703+50.00	91.5	1.1	83	1	16	5	34280
16703+75.00	89.4	1.3	84	1	15	5	34363
16704+00.00	85.6	2.2	81	2	16	5	34442
16704+25.00	86.2	1.3	80	2	16	6	34519
16704+50.00	60.2	2.8	68	2	16	6	34585
16704+75.00	76.8	1.9	63	3	15	4	34646
16705+00.00	73.3	1.2	69	2	14	4	34714

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Earthwork Mass Diagram

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	11	9

ND 1804 Reconstruction							
Station	Area (SF)		Volume (CY)				
	End Area Excavation	End Area Embankment	Excavation	Embankment	Topsoil Strip	Topsoil Fill	Mass Ordinate
16705+25.00	77.9	1.7	70	2	14	4	34782
16705+50.00	94	1.7	80	2	15	5	34860
16705+75.00	97.6	1.3	89	2	13	5	34947
16706+00.00	93.2	1	88	1	10	4	35034
16706+25.00	94.7	0.6	87	1	8	3	35120
16706+50.00	93.8	0	87	0	7	2	35207
16706+75.00	96.8	0	88	0	7	2	35295
16707+00.00	93.9	0	88	0	7	2	35383
16707+25.00	89.7	0	85	0	7	3	35468
16707+50.00	84.4	0	81	0	7	3	35549
16707+75.00	88.8	0	80	0	7	3	35629
16708+00.00	93.5	0	84	0	7	3	35713
16708+25.00	91	0.4	85	0	8	3	35799
16708+50.00	87.8	1.2	83	1	9	4	35881
16708+75.00	89.5	0.1	82	1	9	4	35962
16709+00.00	106.4	0.6	91	0	10	3	36052
16709+25.00	91.6	1.5	92	1	11	3	36143
16709+50.00	91.2	2.3	85	2	9	4	36225
16709+75.00	86.6	4.3	82	4	9	4	36304
16710+00.00	76.3	5.4	75	5	10	5	36374
16710+25.00	77.3	0	71	3	8	3	36442
16710+50.00	79.4	0	73	0	7	2	36515
16710+75.00	122.2	0	93	0	14	2	36608
16711+00.00	127.6	0	116	0	21	1	36724
16711+25.00	97	0	104	0	13	2	36827
16711+50.00	115.7	11.7	98	7	17	12	36919
16711+75.00	116.7	12.8	108	14	25	21	37013
16712+00.00	118.2	13	109	14	26	21	37108
16712+00.71	118.2	13.2	3	0	0	1	37111
16712+25.00	120.1	19.4	107	18	26	21	37200
16712+50.00	109.3	25.3	106	25	29	23	37282
16712+75.00	100.6	32.3	97	32	30	23	37347
16713+00.00	93.2	46	90	44	33	25	37393
16713+25.00	87.9	63.7	84	61	38	29	37416
16713+44.88	83.4	80.7	63	64	34	27	37415
16713+50.00	81.8	89.3	16	19	9	7	37411
16713+75.00	73.5	99	72	105	44	34	37379
16714+00.00	66	114.8	65	119	44	34	37325
16714+25.00	59.4	127.5	58	135	44	34	37248
16714+50.00	50.2	133.5	51	145	45	34	37154
16714+75.00	40.3	133.6	42	148	45	35	37047
16715+00.00	25.1	120.5	30	141	45	35	36936
16715+25.00	14	127.9	18	138	45	35	36816
16715+50.00	11.7	131.2	12	144	45	35	36684
16715+75.00	11.5	139.3	11	150	44	34	36545
16716+00.00	14.5	137.1	12	154	42	33	36403
16716+25.00	80.1	48.8	44	103	53	31	36344
16716+50.00	73.4	12.5	71	34	66	15	36381
16716+75.00	21.6	81.4	44	52	55	17	36373
16717+00.00	16.9	133.5	18	119	45	34	36271
16717+25.00	23.1	145.4	19	155	46	34	36135
16717+50.00	28.5	172.1	24	176	45	34	35982
16717+75.00	32.4	187.1	28	200	43	34	35811
16718+00.00	37.1	146.8	32	186	42	33	35657
16718+25.00	46.8	155.4	39	168	42	32	35528
16718+50.00	53	159.5	46	175	42	33	35400
16718+75.00	60.3	140.9	52	167	42	32	35285
16718+94.38	58.1	146	42	124	33	24	35204
16719+00.00	60.9	130.4	12	35	10	7	35182
16719+25.00	50.5	150.4	52	156	46	31	35078
16719+50.00	39.2	136.5	42	159	48	32	34960
16719+75.00	46.1	117.7	39	141	47	31	34858
16719+90.38	57.8	82.6	30	68	28	19	34819
16720+00.00	70.3	78.4	23	34	16	12	34808
16720+25.00	76.9	74.4	68	85	41	27	34791
16720+50.00	80.2	59.7	73	75	35	24	34789
16720+75.00	61.3	0.9	66	34	22	15	34821
16720+80.38	59	1.4	12	0	2	1	34833
16720+92.25	53.7	2.6	25	1	5	3	34856

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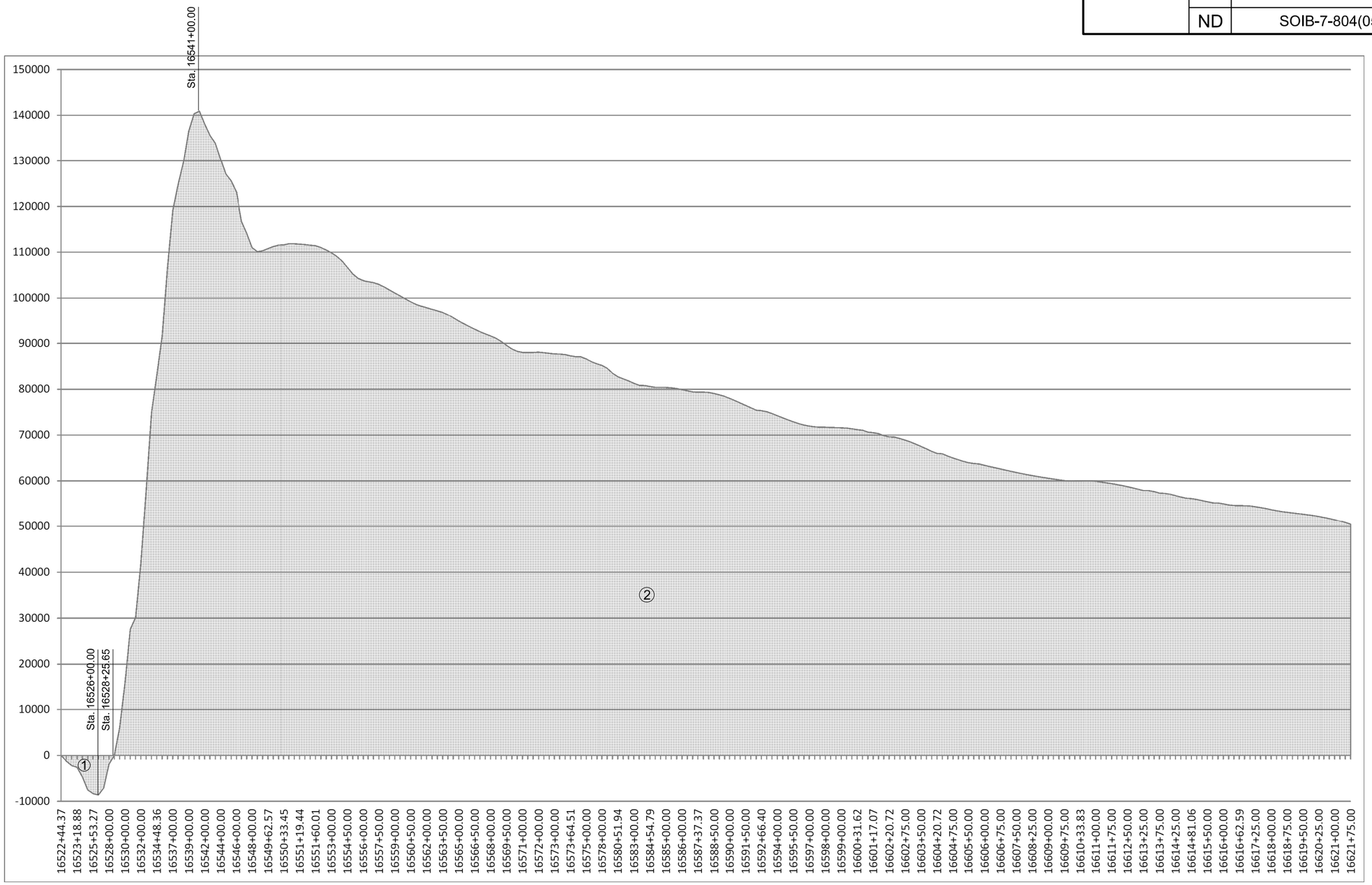
Earthwork Mass Diagram

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	11	10



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1 Sta. 16528+25.65			
Excavation	=	9,683	CY
Embankment	=	9,683	CY
Topsoil	=	1,533	CY
CY Stationing	=	31,004	CY
AVG Haul	=	8,635	CY
	=	3.59	STA

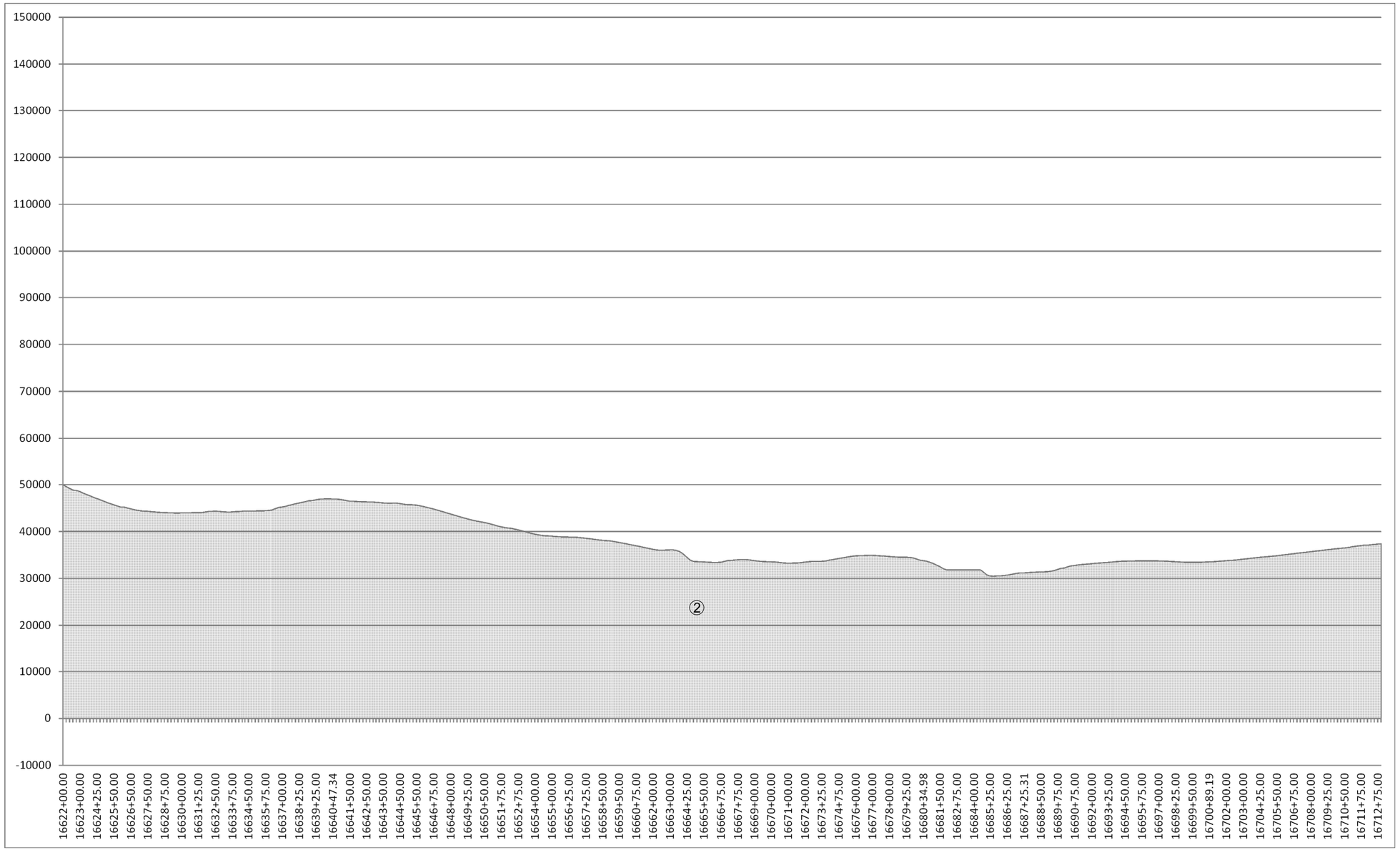
2 Sta. 16720+92.25			
Excavation	=	195,046	CY
Embankment	=	158,286	CY
Topsoil	=	35,262	CY
CY Stationing	=	11,621,558	CY
AVG Haul	=	140,929	CY
	=	82.46	STA

Earthwork Mass Diagram

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	11	11



PROJECT TOTAL			
Excavation	=	202,825	CY
Embankment	=	167,969	CY
Waste (Coal)	=	22,629	CY
Excess Exc	=	12,227	CY
Topsoil	=	36,709	CY
CY Stationing	=	11,652,562	CY
AVG Haul	=	149,564	CY
	=	77.91	STA

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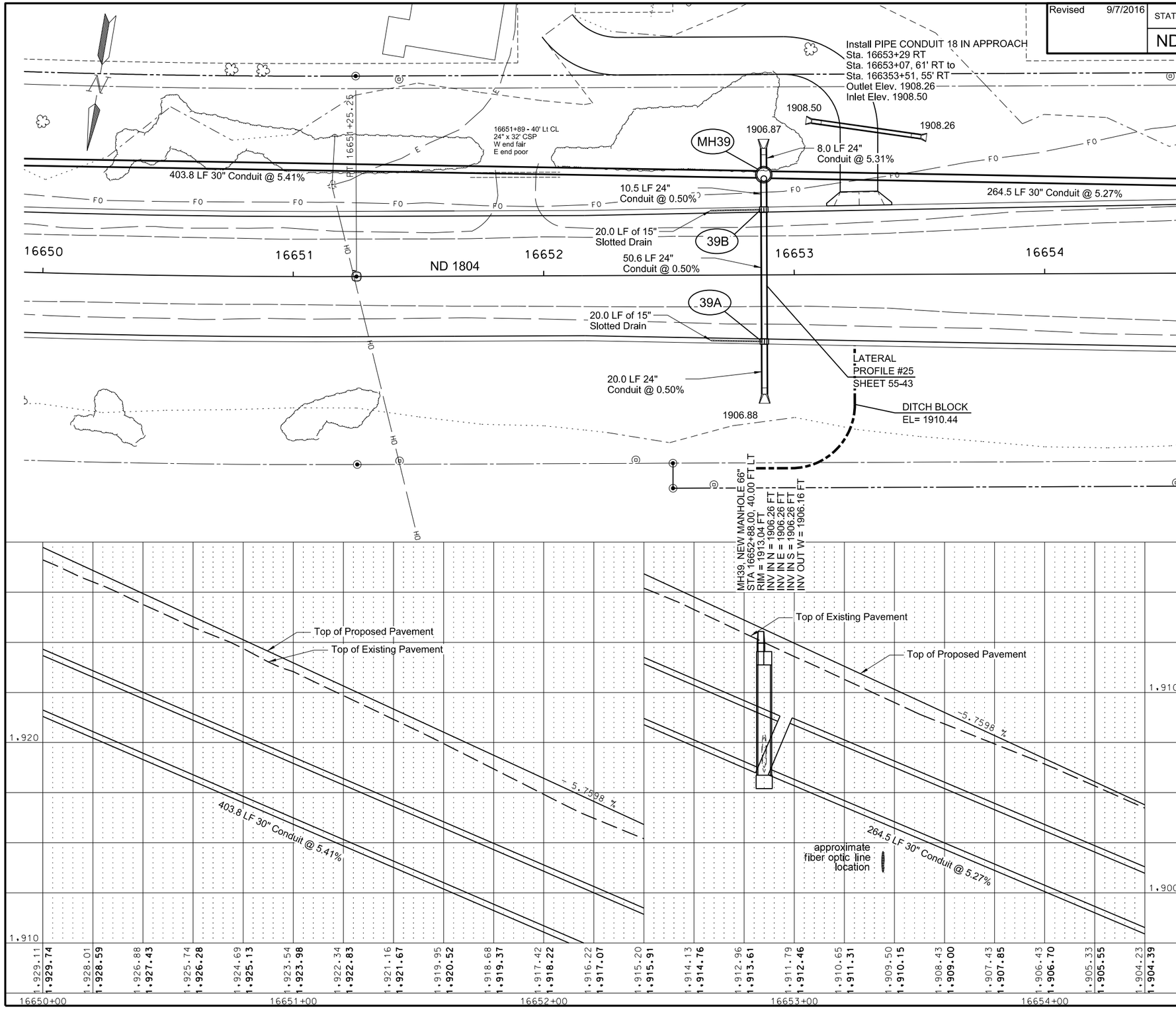
Earthwork Mass Diagram

ND 1804 Reconstruction

Williams County, ND

Revised 9/7/2016	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-804(054)312	55	17



Spec	Code	Bid Item	Unit	Quantity
709	0151	GEOSYNTHETIC MATERIAL TYPE R1		
		16652+88, CL	SY	278
714	4099	PIPE CONDUIT 18IN-APPROACH		
		16653+07.2, 61.3' LT to 16653+50.8, 54.9' LT (inc. 1 End Sec) (inc. 1 Traversable End Sec)	LF	45
714	4107	PIPE CONDUIT 24IN-STORM DRAIN		
		16652+88, 47.6' RT to 16652+88, 27.6' RT (inc. 1 Traversable End Sec)	LF	21
		16652+88, 50.5' LT to 16652+88, 42.5' LT (inc. 1 Traversable End Sec)	LF	9
		16652+88, 25.6' RT to 16652+88, 25' LT	LF	52
		16652+88, 37.5' LT to 16652+88, 27' LT	LF	12
714	4112	PIPE CONDUIT 30IN-STORM DRAIN		
		16648+79.5, 40.7' LT to 16652+85.5, 40.1' LT	LF	404
722	0115	MANHOLE 66IN		
		16652+88, 40' LT	EA	1
722	1115	MANHOLE RISER 66IN		
		16652+88, 40' LT	LF	6
722	3510	INLET-TYPE 2		
		16652+88, 26.59' RT	EA	1
		16652+88, 26.04' LT	EA	1
722	3910	INLET SLOTTED DRAIN 15IN		
		16652+88, 26.59' RT	LF	20
		16652+88, 26.04' LT	LF	20

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Drainage Plan and Profile

ND 1804 Reconstruction

Williams County, ND
Sta. 16650+00 to Sta. 16654+40