				BID DIVISION #1		BID DIVISION #2		
				ACCESS ROAD AND SITE		SITE ELECTRICAL		
				SCHEDULE A	SCHEDULE B	SCHEDULE A	SCHEDULE B	
				ROAD & SITE	PARKING LOT	ROAD & SITE	PARKING LOT	TOTAL
BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY
1	P-100	MOBILIZATION	LS	0.5	0.5	0.75	0.25	2
2	P-102	SAFETY AND SECURITY	LS	0.5	0.5	0.75	0.25	2
3	P-104	PROJECT SURVEY AND STAKEOUT	LS	0.5	0.5	0.75	0.25	2
4	P-105	TEMPORARY CONSTRUCTION ITEMS	LS	0.5	0.5	0.75	0.25	2
5	P-156.501	EROSION CONTROL	LS	0.5	0.5	0.75	0.25	2
6	F-162.501	6' CHAIN LINK FENCE W/ 3 STRANDS BARBED WIRE	LF	421				421
7	F-162.502	6' TEMPORARY CHAIN LINK FENCE	LF	475				475
8	F-162.503	20' VERTICAL PIVOT GATE	LS	1				1
9	F-162.504	10' WIDE x 6' SINGLE LEAF SWING GATE (W/ PRIVACY SLATS)	LS		1			1
10	F-162.505	CHAIN LINK FENCE DESIGN SPECIAL (6' W/ PRIVACY SLATS)	LF		93			93
11	2100.601/00001	RELOCATE BUILDING - TOLL BOOTHS	LS		2			2
12	2101.501/00010	CLEARING	ACRE	0.45				0.45
13	2101.502/00010	CLEARING	TREE	9				9
14	2101.506/00010	GRUBBING	ACRE	0.45				0.45
15	2101.507/00010	GRUBBING	TREE	9				9
16	2103.501/00010	BUILDING REMOVAL (GARAGE)	LS	1				1
17	2104.501/00016	REMOVE SEWER PIPE (STORM)	LF	605	1122			1727
18	2104.501/00035	REMOVE FENCE	LF	715				715
19	2104.501/00062	REMOVE CONCRETE CURB AND GUTTER	LF	4000				4000
20	2104.505/00110	REMOVE CONCRETE PAVEMENT	SY	275				275
21	2104.505/00120	REMOVE BITUMINOUS PAVEMENT	SY	18500				18500
22	2104.509/00100	REMOVE MANHOLES OR CATCH BASINS	EACH	8	11			19
23	2104.511/00011	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	60				60
24	2104.513/00011	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	1150				1150
25	2105.503/00010	ROCK EXCAVATION	CY	1000	1000			2000
26	2105.505/00010	MUCK EXCAVATION	CY	1000	1000			2000
27	2105.515/00010	UNCLASSIFIED EXCAVATION	CY	56200	37406			93606
28	2105.521/00032	GRANULAR BORROW MOD 7% (CV)	CY	14500	17000			31500
29	2105.525/00030	TOPSOIL BORROW (CV) OBTAINED OFFSITE	CY	2200	1450			3650
30	2211.503/00050	AGGREGATE BASE (CV) CLASS 5	CY	7750	11400			19150
31	2221.503/00010	AGGREGATE SHOULDERING (CV) CLASS 1	CY	90				90
32	2357.502/00010	BITUMINOUS MATERIAL FOR TACK COAT	GAL	1825	3000			4825
33	2358.501/00010	BITUMINOUS MATERIAL FOR PRIME COAT	GAL	4550	7475			12025
34	2360.501/23600	TYPE (SP12.5) WEARING COURSE MIXTURE (3,F)	TON	2400	3945			6345
35	2360.502/23600	TYPE (SP12.5) NON WEARING COURSE MIXTURE (3,F)	TON	4800	3945			8745
36	2401.515	SIDEWALK CONCRETE (MIX #3A32) W/ 6" x 6" WWF	SF	3600	2650			6250
37	2401.521/00030	STRUCTURE EXCAVATION CLASS R	CY	200	200			400
38	2411.507	CONCRETE RETAINING WALL	EACH	1				1
39	2501.511	24" CORRUGATED HDPE PIPE CULVERT	LF	112				112
40	2501.515	24" CORRUGATED HDPE PIPE APRON	EACH	2				2
41	2502.541	4" PERFORATED (PVC) PIPE UNDERDRAIN SDR 35	LF	7057	3957			11014
42	2503.511	12" CORRUGATED HDPE PIPE SEWER	LF	1049	605			1654
43	2503.511	18" CORRUGATED HDPE PIPE SEWER	LF	1440	24			1464
44	2503.511	24" CORRUGATED HDPE PIPE SEWER	LF	506				506
45	2503.511	30" CORRUGATED HDPE PIPE SEWER	LF	341				341
46	2503.511	36" CORRUGATED HDPE PIPE SEWER	LF	130				130
47	2503.511/13060	6" PVC PIPE SEWER (SANITARY)	LF	45				45
48	2503.511/13080	8" PVC PIPE SEWER (SANITARY)	LF	274				274
49	2503.573	INSTALL 12" HDPE APRON SECTION	EACH	4				4
50	2503.573	INSTALL 18" HDPE APRON SECTION	EACH	1				1
51	2503.573	INSTALL 24" HDPE APRON SECTION	EACH	1				1
52	2503.573	INSTALL 30" HDPE APRON SECTION	EACH	2				2
53	2503.573	INSTALL 36" HDPE APRON SECTION	EACH	1				1
54	2503.602/00061	6" CLEANOUT ASSEMBLY (SANITARY)	EACH	1				1
55	2503.602	CONNECT TO EXISTING STORM MANHOLE	EACH	4				4
56	2503.602/00040	CONNECT TO EXISTING SANITARY SEWER	EACH	1				1
57	2504.602/00024	INSTALL HYDRANT & VALVE	EACH	4				4
58	2504.603	4" PVC IRRIGATION CONDUIT -SDR 35	LF	246	1297			1543
59	2504.603/01063	6" WATERMAIN DUCTILE IRON CL 53	LF	351				351
60	2504.603/01083	8" WATERMAIN DUCTILE IRON CL 53	LF	589				589
61	2505.603/02020	2" HP POLYETHYLENE GAS MAIN	LF	796				796
62	2506.502	CONSTRUCT DRAINAGE STRUCTURE TYPE G	EACH	15	10			25
63	2506.502	CONSTRUCT DRAINAGE STRUCTURE TYPE F	EACH	4				4
64	2506.502	CONSTRUCT DRAINAGE STRUCTURE TYPE 48 - 4020	EACH	18	2			20
65	2506.502	CONSTRUCT DRAINAGE STRUCTURE TYPE 60 - 4020	EACH	8				8
66	2506.502	CONSTRUCT DRAINAGE STRUCTURE TYPE 72 - 4020	EACH	3				3
67	2506.502	CONSTRUCT DRAINAGE STRUCTURE TYPE 84 - 4020	EACH	3				3
68	2506.503	RECONSTRUCT DRAINAGE STRUCTURE	LF	3.6				3.6
69	2506.521	INSTALL CASTING	EACH	2				2
70	2506.521	SANITARY CASTING	EACH	2				2
71	2506.522/00011	ADJUST FRAME & RING CASTING	EACH	2	1			3
72	2506.602/00011	MANHOLE (SANITARY)	EACH	2				2
73	2511.501	RANDOM RIPRAP CLASS III	CYD	100				100
74	2511.501	RANDOM RIPRAP CLASS IV	CYD	175				175
75	2521.618/00050	BRICK WALK	SF	400				400
76	2531.501/02120	CONCRETE CURB & GUTTER DESIGN D424	LF		300			300
77	2531.501/02320	CONCRETE CURB & GUTTER DESIGN B624	LF	9500	5700			15200
78	2531.503/00013	CONCRETE MEDIAN (NOSE)	SY	8				
79	2531.618	CONSTRUCT PEDESTRIAN RAMP (w/ TRUNCATED DOMES)	EACH	6	19			25
80	2545.523/00027	1" NON-METALLIC CONDUIT (PVC)	LF			6560	4210	10770
81	2545.523/00053	2" NON-METALLIC CONDUIT (PVC)	LF			5120		5120
82	2545.523/00103	4" NON-METALLIC CONDUIT (PVC)	LF			395		395
83	2550.512/00010	QUAZITE CAT. NO. PG2436BB36 ELECTRICAL HANDHOLE w/PG2436HA00 LID OR APPROVED EQUAL	EACH			4		4
84	2550.531/11219	TELEPHONE CABLE 10 PR NO 19	LF			1325		1325

				BID DIVISION #1		BID DIVISION #2		
				ACCESS ROAD AND SITE		SITE ELECTRICAL		
				SCHEDULE A	SCHEDULE B	SCHEDULE A	SCHEDULE B	
				ROAD & SITE	PARKING LOT	ROAD & SITE	PARKING LOT	TOTAL
BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY
85	2550.531/112519	TELEPHONE CABLE 25 PR NO 19	LF			960		960
86	2550.532/11040	POWER CABLE 1 CONDUCTOR NO 4 (EQUIPMENT GROUND)	LF			7995	4490	12485
87	2550.532/11060	POWER CABLE 1 CONDUCTOR NO 6	LF			8190	3845	12035
88	2550.532/11080	POWER CABLE 1 CONDUCTOR NO 8	LF			9675	5140	
89	2564.537/00010	INSTALL SIGN TYPE A, STOP SIGN, R1-1 (COMPLETE W/ POST)	EACH	4				
90	2564.537/00010	INSTALL SIGN TYPE A, SPEED LIMIT 20 SIGN, R2-1 (COMPLETE W/ POST)	EACH	1				
91	2564.537/00010	INSTALL SIGN TYPE A, ONE WAY SIGN, R6-2R (COMPLETE W/ POST)	EACH	3				
92	2564.537/00010	INSTALL SIGN TYPE A, HANDICAP SIGN, R7-8m (COMPLETE W/ POST)	EACH		18			
93	2564.537/00010	INSTALL SIGN TYPE A, TWO WAY TRAFFIC SIGN, W6-3 (COMPLETE W/ POST)	EACH	1				
94	2564.537/00010	INSTALL SIGN TYPE A, DOUBLE ARROW SIGN, W12-1 (COMPLETE W/ POST)	EACH	4				
95	2564.537/00010	INSTALL SIGN TYPE A, BEGIN ONE WAY SIGN, R6-X1 (COMPLETE W/ POST)	EACH	1				
96	2564.537/00010	INSTALL SIGN TYPE A, END ONE WAY SIGN, R6-X1 (COMPLETE W/ POST)	EACH	1				
97	2573.502	SILT FENCE TYPE MACHINE SLICED	LF	4410				4410
98	2573.502	SILT FENCE TYPE HEAVY DUTY	LF	656				656
99	2573.502	SILT FENCE TYPE SUPER DUTY	LF	343				343
100	2573.530	STORM DRAIN INLET PROTECTION	EACH	48	12			60
101	2573.540	FILTER LOG TYPE STRAW BIOROLL	LF	800				800
102	2573.550	EROSION CONTROL SUPERVISOR	LS	0.7	0.3			1
103	2573.601	STORM CHAMBER DETENTION SYSTEM WEST 13,500 CF	LS	1				1
104	2573.601	STORM CHAMBER DETENTION SYSTEM EAST 16,700 CF	LS		1			1
105	2573.602	WATER QUALITY UNIT	EACH	1	1			2
106	2573.604	ROCK CONSTRUTION ENTRANCE	SY	1200				1200
107	2575.501/00010	SEEDING	ACRE	1.9	0.2			2.1
108	2575.502	SEED MIXTURE 250	LBS	237	25			262
109	2575.505/00030	SODDING TYPE LAWN	SY	4709	1915			6624
110	2575.523	EROSION CONTROL BLANKET CATEGORY 2	SY	7995				7995
111	2575.532	FERTILIZER TYPE 1 10-10-10	LBS	760	80			840
112	2575.560	HYDRAULIC SOIL STABILIZER, TYPE 6	LBS	3360	420			3780
113	2575.572	RAPID STABILIZATION METHOD 4	SY	8294	1080			9374
114	2575.604/00003	GEOTEXTILE FABRIC	SY	25647				25647
115	2582.501/01001	PAVEMENT MESSAGE (LEFT ARROW) PAINT	EACH	6				6
116	2582.501/01002	PAVEMENT MESSAGE (RIGHT ARROW) PAINT	EACH	3				3
117	2582.501/01007	PAVEMENT MESSAGE (RIGHT-THRU ARROW) PAINT	EACH	2				2
118	2582.501/01010	PAVEMENT MESSAGE (HANDICAPPED SYMBOL) PAINT	EACH		18			18
119	2582.502/11104	4" SOLID LINE WHITE-PAINT	LF	3000	18600			21600
120	2582.502/11304	4" DOTTED LINE WHITE-PAINT	LF	1125				1125
121	2582.502/11524	24" STOP LINE WHITE-PAINT	LF	105				105
122	2582.502/12104	4" SOLID LINE YELLOW-PAINT	LF	2200				2200
123	2582.503/00110	CROSSWALK MARKING-PAINT	SF	75	940			1015
124	SP 38.3	ALLOWANCE FOR MN POWER UTILITITY RELOCATION	AL	1				1
125	SP 39.3	ALLOWANCE FOR QWEST UTILITITY RELOCATION	AL	1				1
126	SP 40.3	CONCRETE TRAFFIC BARRIER (MARKSTAAR MODEL B-96) OR APPROVED EQUAL	EACH	15	41			56
127	SP 41.3	TRAFFIC CONTROL ALLOWANCE	AL	1				1
128	SP 42.3	PRIVATE UTILTITY LOCATING SERVICE	LS	1				1
129	SP 43.3	ENTRANCE AND EXIT GATES W/ DETECTOR LOOPS W/ FOUNDATION	EACH		7			7
130	SP 44.3	RELOCATE EXIT GATES W/ DETECTOR LOOPS W/ NEW FOUNDATION	EACH					0
131	SP 45.3	PROVIDE AND INSTALL AUTOMATIC PAY STATION W/ FOUNDATION	EACH		1			1
132	SP 46.3	PROVIDE AND INSTALL TICKET DISPENSORS W/ FOUNDATION	EACH		6			6
133	SP 47.3	RELOCATE TICKET DISPENSORS W/ NEW FOUNDATION	EACH					0
134	SP 48.3	RELOCATE AUTOMATIC PAY STATION W/ NEW FOUNDATION	EACH		1			1
135	SP 49.3	LIGHTING UNIT, TYPE A W/ FOUNDATION	EACH			9	20	29
136	SP 50.3	LIGHTING UNIT, TYPE B W/ FOUNDATION	EACH			26	4	30
137	SP 52.3	LIGHTING REMOVAL	EACH		12			12
138	SP 53.3	ALLOWANCE FOR WAY FINDING SIGNS	AL		1			1
139	SP 54.3	LANDSCAPING ALLOWANCE	AL		1			1

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SUMMARY OF QUANTITIES

SHEET NUMBER
C002

BID DOCUMENTS

T:\P\2141882.093 DLH Terminal Design Civil\CAD\C\DLH-C002.dwg, 5/8/2009 11:22:40 AM

SAFETY REQUIREMENTS

1. ALL CONTRACTOR VEHICLES SHALL DISPLAY IN FULL VIEW A FLASHING AMBER (YELLOW) DOME–TYPE LIGHT AND/OR ABOVE THE VEHICLE A 3' X 3' OR LARGER, ORANGE AND WHITE CHECKERBOARD FLAG, EACH CHECKERBOARD COLOR BEING 1–FOOT SQUARE, (SEE CONSTRUCTION SAFETY FLAG DETAIL, THIS SHEET).

2. DEBRIS, WASTE AND LOOSE MATERIAL CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS OR BEING INGESTED IN JET ENGINES SHALL NOT BE ALLOWED ON AIRSIDE PAVEMENTS. IF THESE MATERIALS ARE OBSERVED TO BE ON AIRSIDE PAVEMENTS, THEY WILL BE REMOVED IMMEDIATELY AND/OR CONTINUOUSLY BY THE CONTRACTOR DURING CONSTRUCTION.

3. THE CONTRACTOR IS DIRECTED TO COMPLY WITH AND ACQUAINT HIS/HER EMPLOYEES WITH THE FOLLOWING SAFETY GUIDELINES, RELATED MATERIALS AND FAA ADVISORY CIRCULARS:

   150/5200–18C "AIRPORT SAFETY–SELF INSPECTION"
   150/5210–5C "PAINTING, MARKING & LIGHTING OF VEHICLES USED ON AIRPORTS"
   150/5370–2E "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION"

   COPIES OF THESE DOCUMENTS ARE PROVIDED IN THE CONTRACT SPECIFICATIONS.

4. CONSTRUCTION DURING THE PROJECT MAY BE HALTED AT ANY TIME BY RPR, ENGINEER, AND/OR AIRPORT OPERATIONS IF IT IS DETERMINED TO BE IN THE BEST INTEREST OF AIRPORT OPERATIONS OR SAFETY. THE CONTRACTOR MAY BE DIRECTED TO REMOVE EQUIPMENT AND/OR EVACUATE THE SITE IN ORDER TO ENABLE AIRCRAFT OPERATIONS; COMMERCIAL, MILITARY OR GENERAL AVIATION NECESSARY EXTENSIONS IN CONTRACT TIME WILL BE GRANTED OR A STOP WORK ORDER WILL BE ISSUED DUE TO THESE DELAYS, HOWEVER, THERE WILL BE NO ADJUSTMENTS IN CONTRACT PRICE DUE TO THESE DELAYS.

   IN ADDITION TO THE ABOVE, THE FOLLOWING SPECIAL REQUIREMENTS WILL APPLY FOR NIGHT CONSTRUCTION:

   a. A DAILY SAFETY AND PROGRESS MEETING SHALL BE HELD BETWEEN THE ENGINEER AND THE CONTRACTOR'S SUPERINTENDENT TO DISCUSS REQUIREMENTS FOR THE NEXT NIGHTTIME WORK PERIOD.

   b. THE CONTRACTOR SHALL PREPARE A SAFETY PLAN SPECIFIC TO NIGHTTIME CONSTRUCTION OPERATIONS, AS WELL AS A CONTINGENCY PLAN TO ADDRESS CASES OF ABNORMAL FAILURES OR UNEXPECTED DISASTERS USING APPENDIX 3 OF AC 150/5370–2E AS A GUIDE.

5. THE CONTRACTOR SHALL INSTALL ALL REQUIRED BARRICADES AT DESIGNATED PLAN LOCATIONS, HAVE ALL ACCESS GATES GUARDED AND LOCKABLE, HAVE ALL EQUIPMENT EITHER FLAGGED OR FITTED WITH FLASHING YELLOW DOME–TYPE LIGHTS ON TOP OF THE VEHICLES. ALL THESE ITEMS SHALL CONSIST OF THE SAFETY AND SECURITY SYSTEM. THE CONTRACTOR SHALL INSTALL THE COMPONENTS OF THE SYSTEM AT THE APPROPRIATE TIMES AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INSPECT EVERY ASPECT OF THE SAFETY AND SECURITY SYSTEM ON AT LEAST A DAILY BASIS AND ENSURE ALL COMPONENTS ARE FUNCTIONING PROPERLY. THE RESIDENT PROJECT REPRESENTATIVE (RPR) SHALL ALSO DAILY INSPECT THE SYSTEM AND IF ANY DEFICIENCIES ARE NOTED, THE CONTRACTOR SHALL HAVE THAT DAY'S PRORATED SAFETY AND SECURITY COST DEDUCTED FROM THE CONTRACTOR'S EARNINGS. THE SYSTEM ELEMENTS TO BE INSPECTED AND DEFICIENCIES NOTED ARE AS FOLLOWS:

   *BARRICADES SET PROPERLY AND ALL FLASHING WARNING LIGHTS OPERATING PROPERLY.
   *ALL CONTRACTOR PERSONNEL AND EQUIPMENT ACCESS GATES MANNED AND SECURITY PROCEDURES IN PLACE.
   *ALL EQUIPMENT FLAGGED OR OUTFITTED WITH FLASHING YELLOW DOME–TYPE LIGHTS.
   *CONTRACTOR USE OF UNAUTHORIZED AIRPORT ACCESS GATES CHECKED.

   ANY OF THE ABOVE SAFETY AND SECURITY ITEMS FOUND TO BE DEFICIENT AT THE BEGINNING OF THE DAY BY THE RPR AND/OR AIRPORT OPERATIONS STAFF WILL RESULT IN THAT DAY'S PRORATED SAFETY AND SECURITY BID ITEM LOST AND BEING DEDUCTED PERMANENTLY FROM THE CONTRACTOR'S EARNINGS. THE CONTRACTOR SHALL MAKE A CONCERTED EFFORT TO ENSURE ALL SAFETY AND SECURITY ITEMS ARE IN PROPER WORKING ORDER EACH DAY DUE TO THE HEIGHTENED SECURITY STATUS OF THE AIRPORT AND THE CONSIDERABLE LIABILITY ASSOCIATED WITH THE SAFETY AND SECURITY WORK.

6. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO ENSURE THE SAFETY OF THE TRAVELING PUBLIC AS WELL AS HIS OWN EQUIPMENT AND PERSONNEL. SPECIAL CONSIDERATIONS SHOULD BE GIVEN TO FLIGHT SCHEDULES. THE CONTRACTOR SHALL OBEY ALL INSTRUCTIONS AS TO ROUTES TO BE TAKEN BY EQUIPMENT TRAVELING WITHIN THE AIRPORT AREA AND KEEP SUCH VEHICLES AND EQUIPMENT MARKED WITH THE SPECIFIED AIRPORT SAFETY FLAGS. THE CONTRACTOR SHALL MAKE HIS OWN ESTIMATE OF ALL DIFFICULTIES TO BE ENCOUNTERED. EQUIPMENT NOT ACTUALLY IN OPERATION SHALL BE KEPT CLEAR OF LANDING AREAS. PERSONNEL SHALL NOT ENTER AREAS OF THE AIRPORT WHERE AIRCRAFT ARE OPERATING WITHOUT SPECIFIC PERMISSION.

7. THE CONTRACTOR SHALL TAKE ALL STEPS TO PROTECT THE EXISTING UNDERGROUND CABLES AND COMMERCIAL, AIRPORT AUTHORITY AND MILITARY UTILITIES DURING CONSTRUCTION TO ASSURE CONTINUOUS OPERATION OF LIGHTS AND NAVIGATIONAL AIDS WHEN NEEDED.

8. MATERIALS STORED OR STOCKPILED ON THE AIRPORT SHALL BE SO PLACED AND THE WORK SHALL, AT ALL TIMES, BE SO CONDUCTED AS TO CAUSE NO GREATER OBSTRUCTION TO THE TRAVELING PUBLIC THAN IS CONSIDERED NECESSARY BY THE ENGINEER.

9. THE CONTRACTOR SHALL ERECT AND MAINTAIN ALL NECESSARY BARRICADES, SIGNS, DANGER SIGNALS AND LIGHTS FOR THE PROTECTION OF THE WORK AND THE SAFETY OF THE TRAVELING PUBLIC IN ACCORDANCE WITH THE SPECIFICATIONS (AC 150/5370–2E).

10. THE CONTRACTOR SHALL HAVE PERSONNEL ON CALL 24 HOURS PER DAY FOR EMERGENCY MAINTENANCE OF HAZARD LIGHTING AND BARRICADES.

11. THE AIRPORT DIRECTOR, WORKING THROUGH THE ENGINEER, SHALL, AT ALL TIMES, HAVE COMPLETE JURISDICTION OVER THE SAFETY OF ALL OPERATIONS DURING THE WORK. WHERE EVER THE SAFETY OF THE TRAVELING PUBLIC IS CONCERNED, THE DECISIONS OF THE AIRPORT DIRECTOR OR HIS DESIGNATED REPRESENTATIVE, SHALL BE FINAL AS TO METHODS, PROCEDURES AND MEASURES USED.

12. THE CONTRACTOR SHALL CONTACT THE MINNESOTA AIRWAY FACILITIES SECTOR POINT OF CONTACT (POC) (ANDY GOMEZ AT 218–722–2826) TO PROVIDE FIELD LOCATIONS OF EXISTING FACILITY CABLES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAND DIGGING TO LOCATE FACILITY CABLING, AND PROTECTION OF THOSE CABLES THROUGHOUT THE PROJECT.

13. THE CONTRACTOR SHALL CONFINE HIS PERSONNEL, EQUIPMENT, OPERATIONS AND TRAVEL TO THE AREA WITHIN THE DEFINED WORK LIMITS SHOWN ON THE PLANS.

14. THE CONTRACTOR SHALL INFORM ALL CONSTRUCTION PERSONNEL AS TO THE PROPER ROUTES, SPEEDS AND PROCEDURES FOR TRANSPORTING EQUIPMENT AND MATERIALS TO THE CONSTRUCTION SITE. ON A DAILY BASIS AND MORE OFTEN IF NECESSARY ALL PERSONNEL SHALL BE ADVISED OF ANY CHANGES IN AIRPORT OPERATIONS THAT MAY FURTHER RESTRICT HIS MOVEMENT.

15. ACCESS OR HAUL ROUTES SHALL BE EXISTING ROADWAYS TO THE EXTENT THAT THEY ARE AVAILABLE. THE CONTRACTOR SHALL CORRECT ANY DAMAGE TO THE ROADS USED AND SHALL RESTORE THOSE ROADS TO THE SAME OR BETTER CONDITION AS THEY EXISTED PRIOR TO THE START OF WORK. THE CONTRACTOR MAY ESTABLISH ADDITIONAL HAUL OR ACCESS ROUTES AT HIS OWN EXPENSE AND RESPONSIBILITY IF APPROVED BY THE SPONSOR. UPON COMPLETION OF THE WORK, ANY ADDITIONAL ROADS SHALL EITHER BE LEFT OR GRADED AS DIRECTED SO THAT THEY DO NOT IMPEDE THE EXISTING DRAINAGE OR ACCESS ROUTES.

16. MEASURES SHALL BE ADOPTED TO PREVENT POTENTIAL POLLUTANTS FROM ENTERING ANY DRAINAGE SYSTEM OR WATERWAY. MATERIALS AND DEBRIS SHALL NOT BE STORED IN THE WORK AREA IN A MANNER THAT WOULD ALLOW THEM TO ENTER THE DRAINAGE SYSTEM AS A RESULT OF SPILLAGE, NATURAL RUNOFF OR FLOODING. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IMMEDIATELY NOTIFY THE SPONSOR SHOULD THERE BY A SPILLAGE OF MATERIAL WHICH MIGHT CONTAMINATE THE DRAINAGE SYSTEM. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND CLEAR UP SUCH SPILLAGE IN A MANNER ACCEPTABLE TO THE SPONSOR. MATERIAL SHALL BE SECURED SO THAT IT WILL NOT BE BLOWN BY THE WIND ONTO THE AIRFIELD SURFACES.

17. SPECIAL ATTENTION TO DUST CONTROL WILL BE REQUIRED WHEN EARTHWORK OR HAULING OPERATIONS ARE IN PROGRESS OR WHEN WIND AND WEATHER CONDITIONS CAUSE EXCESSIVE BLOWING OF DUST. IN THIS REGARD, THE CONTRACTOR SHALL APPLY WATER OR CALCIUM CHLORIDE SOLUTION TO THE AFFECTED SITES AS DIRECTED.

18. VEHICLES WITHIN THE SECURITY FENCE SHALL BE VISIBLY IDENTIFIABLE AS CONTRACTOR VEHICLES WHICH HAVE BEEN PROPERLY CLEARED FOR ENTRY (LOGO AND FLAGS ON AUTHORIZED EQUIPMENT AND VEHICLES WOULD BE ACCEPTABLE.)

19. CONSTRUCTION EQUIPMENT SHALL HAVE A MAXIMUM HEIGHT OF TWENTY–FIVE (25) FEET.

20. THE CONTRACTOR SHALL SUBMIT A SAFETY AND SECURITY PLAN TO THE ENGINEER FOR REVIEW AND APPROVAL BY THE AIRPORT AUTHORITY PRIOR TO CONSTRUCTION COMMENCING.

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING UTILITY LINES AND HAND DIGGING TO LOCATE FAA CABLING AND SHALL PROVIDE ADEQUATE PROVISIONS TO PROTECT ALL FAA CABLES EXPOSED DURING THE PROPOSED WORK. THE SPONSOR/CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE AIRWAY FACILITY SMO AT THE PROJECT PRECONSTRUCTION MEETING SHOULD CABLE RELOCATION BE NECESSARY.

22. ANY DAMAGE TO FAA CABLES, ACCESS ROADS, OR TO FAA FACILITIES DURING THE CONSTRUCTION WILL REQUIRE THE CONTRACTOR TO REPLACE THE DAMAGED CABLES, ACCESS ROAD, OR FAA FACILITIES TO THE AF SMO'S REQUIREMENTS, AND AT THE CONTRACTORS' EXPENSE.

23. IF ANY FAA POWER, CONTROL, OR SIGNAL CABLES ARE DAMAGED, THE SPONSOR/CONTRACTOR SHALL REPLACE THE CABLE IN ITS ENTIRETY. THE SPLICING OF CABLES IS NOT AN ACCEPTABLE FORM OF REPAIR.

NOTE: SAFETY FLAG SHALL BE PROMINENTLY DISPLAYED ON ALL CONSTRUCTION EQUIPMENT. (SEE NOTE 1 UNDER SAFETY)

CONSTRUCTION SAFETY FLAG
N.T.S.

SECURITY REQUIREMENTS

1. GENERAL INTENT: IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE AIRPORT SECURITY PLAN AND WITH THE SECURITY REQUIREMENTS SPECIFIED HEREIN BY AIRPORT OPERATIONS. THE CONTRACTOR SHALL DESIGNATE TO THE ENGINEER AND AIRPORT OPERATIONS, IN WRITING, THE NAME OF HIS "CONTRACTOR SECURITY AND SAFETY OFFICER (CSSO)." THE CSSO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS FOR THE CONTRACT.

2. CONTRACTOR PERSONNEL SECURITY ORIENTATION: THE CSSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON SECURITY REQUIREMENTS. ALL NEW CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON SECURITY REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA. THE AIRPORT SHALL BRIEF AND/OR TRAIN CONSTRUCTION RELATED VEHICLE EQUIPMENT DRIVERS ON OPERATIONS WITHIN AN AIRPORT/AIRCRAFT ENVIRONMENT. AIRPORT MANAGEMENT SHOULD PROVIDE PRINTED MATERIAL TO EACH VEHICLE OPERATOR THAT DEPICTS HAUL ROUTES, PROHIBITED MOVEMENT AREAS, AND DESCRIBES THE CONSEQUENCES FOR NON–COMPLIANCE WITH ESTABLISHED PROCEDURES. THE AIRPORT HAS IMPLEMENTED A ZERO TOLERANCE APPROACH TO DRIVING VIOLATIONS.

3. ACCESS TO THE SITE: CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY AIRPORT OPERATIONS. ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE EXPERIENCED IN THE ROUTE OR GUIDED BY CONTRACTOR PERSONNEL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE, AND FOR THE OPERATION AND SECURITY OF THE ACCESS GATE TO THE SITE. A CONTRACTOR'S FLAGMAN OR TRAFFIC CONTROL PERSON SHALL MONITOR AND COORDINATE ALL CONTRACTOR TRAFFIC AT THE ACCESS GATE WITH SECURITY. THE CONTRACTOR SHALL NOT PERMIT ANY UNAUTHORIZED CONSTRUCTION PERSONNEL OR TRAFFIC ON THE SITE. ACCESS GATES TO THE SITE SHALL BE LOCKED AND SECURED AT ALL TIMES WHEN NOT ATTENDED BY THE CONTRACTOR. IF THE CONTRACTOR CHOOSES TO LEAVE ANY ACCESS GATE OPEN, IT SHALL BE ATTENDED BY CONTRACTOR PERSONNEL WHO ARE FAMILIAR WITH THE REQUIREMENTS OF THE AIRPORT OPERATIONS SECURITY PROGRAM. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS ROUTE AS A RESULT OF HIS CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNING FROM THE ACCESS GATE ALONG THE DELIVERY ROUTE TO THE STORAGE AREA, PLANT SITE OR WORK SITE SHALL BE AS DIRECTED BY AIRPORT OPERATIONS.

4. MATERIALS DELIVERY TO THE SITE: ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE WORK SITE WILL USE AS A DELIVERY ADDRESS, THE STREET NAME ASSIGNED TO THE ACCESS POINT AT THE CONTRACTOR'S STAGING SITE AT THE AIRPORT. THE NAME "DULUTH INTERNATIONAL AIRPORT" SHALL NOT BE USED IN THE DELIVERY ADDRESS AT ANY TIME. THIS WILL PRECLUDE DELIVERY TRUCKS FROM ENTERING INTO THE TERMINAL COMPLEX, OR TAKING SHORT CUTS THROUGH THE PERIMETER GATES AND ENTERING INTO AIRCRAFT OPERATIONS AREAS INAPPROPRIATELY.

5. CONSTRUCTION AREA LIMITS: THE LIMITS OF CONSTRUCTION, MATERIAL STORAGE AREAS, PLANT SITE, EQUIPMENT STORAGE AREA, PARKING AREA AND OTHER AREAS DEFINED AS REQUIRED FOR THE CONTRACTOR'S EXCLUSIVE USE DURING CONSTRUCTION SHALL BE MARKED BY THE CONTRACTOR. THE CONTRACTOR SHALL ERECT AND MAINTAIN AROUND THE PERIMETER OF THESE AREAS SUITABLE FENCING, MARKING AND/OR WARNING DEVICES VISIBLE FOR DAY/NIGHT USE. TEMPORARY BARRICADES, FLAGGING AND FLASHING WARNING LIGHTS WILL BE REQUIRED AT CRITICAL ACCESS POINTS. TYPE OF MARKING AND WARNING DEVICES SHALL BE APPROVED BY AIRPORT OPERATIONS.

6. IDENTIFICATION––PERSONNEL: ALL EMPLOYEES, AGENTS, VENDORS, INVITEES, ETC. OF THE CONTRACTOR OR SUBCONTRACTORS REQUIRING ACCESS TO THE AIRCRAFT OPERATIONS AREA (AOA) SHALL, IN ACCORDANCE WITH THE AIRPORT OPERATIONS SECURITY PROGRAM, BE REQUIRED TO DISPLAY AIRPORT ISSUED IDENTIFICATION OR BE UNDER ESCORT BY PROPERLY BADGED PERSONNEL. THESE BADGES WILL BE IDENTIFIED NUMERICALLY AND ISSUED TO INDIVIDUAL EMPLOYEES WITH A PERMANENT RECORD MAINTAINED ON EACH INDIVIDUAL TO WHOM A BADGE IS ISSUED. AT THE COMPLETION OF THE CONTRACT ALL BADGES WILL BE RETURNED TO THE AIRPORT AND A CHARGE OF $50 PER BADGE WILL BE ASSESSED FOR ALL BADGES NOT RETURNED. IN ADDITION, A $20 NON–REFUNDABLE PROCESSING FEE WILL BE REQUIRED FOR EACH BADGE. THIS FEE WILL BE PAID BEFORE BADGE IS ISSUED. NO BADGE WILL BE ISSUED TO ANY PERSON UNTIL A REVIEW OF REQUIRED PAPERWORK BY AIRPORT SECURITY AND ALL REQUIREMENTS ARE MET. PAPERWORK SHALL BE SUBMITTED A MINIMUM OF 24 HOURS BEFORE ISSUANCE OF BADGE. IDENTIFIABLE HARD HATS OR OTHER IDENTIFICATION SHALL ALSO BE WORN AT ALL TIMES IF REQUIRED BY AIRPORT OPERATIONS. THE CONTRACTOR AND ITS STAFF IS RESPONSIBLE FOR ATTENDING TRAINING AND COMPLETING SECURITY BADGE APPLICATIONS, WHICH WILL INCLUDE AIR/GROUND RADIO, TAXIWAY AND AIRPORT FAMILIARIZATION. ESTIMATED TIME FOR COMPLETION IS 2 HOURS.

7. IDENTIFICATION––VEHICLES: THE CONTRACTOR, THROUGH THE CSSO, SHALL ESTABLISH AND MAINTAIN A LIST OF CONTRACTOR AND SUBCONTRACTOR VEHICLES AUTHORIZED TO OPERATE ON THE SITE AND SHALL ISSUE A PERMIT TO EACH VEHICLE TO BE MADE AVAILABLE UPON DEMAND BY AIRPORT OPERATIONS THE RPR OR ANY AIRPORT REPRESENTATIVES. A BLOCK OF VEHICLE PERMITS SHALL BE ISSUED BY AIRPORT OPERATIONS TO THE CONTRACTOR AND AT THE COMPLETION OF THE CONTRACT ALL PERMITS WILL BE RETURNED TO THE AIRPORT AND A CHARGE OF $25 PER PERMIT WILL BE ASSESSED FOR ALL PERMITS NOT RETURNED. CONTRACTOR EMPLOYEE VEHICLES SHALL BE RESTRICTED TO THE CONTRACTOR'S EMPLOYEE PARKING AREA AND ARE NOT ALLOWED ON THE AOA AT ANY TIME.

8. FINES: PAYMENT OF ALL FINES ASSESSED TO DULUTH INTERNATIONAL AIRPORT DUE TO VIOLATIONS BY THE CONTRACTOR OF FAA/TSA SECURITY OR SAFETY REQUIREMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DEDUCTED FROM MONIES DUE THE CONTRACTOR.

   A. IF THE RESTRICTED AREA GATE IS FOUND TO BE OPEN OR UNLOCKED AND UNATTENDED, AIRPORT SECURITY POLICE AND/OR TSA MAY ISSUE THE CONTRACTOR A CITATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COURT COSTS IMPOSED FINES. IN ADDITION, A CHARGE OF UP TO $10,000.00 MAY BE LEVIED BY THE DULUTH AIRPORT AUTHORITY AND/OR TSA FOR EACH VIOLATION SO DOCUMENTED AND UPON THE REQUEST FOR FINAL PAYMENT THE TOTAL OF ANY SUCH CHARGES WILL BE DEDUCTED FROM MONIES DUE THE CONTRACTOR.

   B. IN THE EVENT THE CONTRACTOR DEVIATES FROM THE IDENTIFIED CONSTRUCTION LIMITS AND/OR DESIGNATED HAUL ROUTES ONTO AN ACTIVE RUNWAY OR TAXIWAY THE CONTRACTOR WILL BE FINED $1,000 PER OCCURRENCE WHICH WILL BE DEDUCTED FROM THE FINAL CONTRACT AMOUNT DUE THE CONTRACTOR.

9. A MINIMUM OF 48 HOURS IN ADVANCE OF ANY EXCAVATION OR BORINGS, THE CONTRACTOR SHALL CONTACT THE FOLLOWING LOCAL CABLE OWNERS TO VERIFY ALL UNDERGROUND CABLE LOCATIONS IN THE VICINITY OF THE PROPOSED WORK:

CABLE OWNER	CONTACT PERSON	PHONE NUMBER
FEDERAL AVIATION ADMINISTRATION	ANDY GOMEZ	218–722–2826
Mn AIR NATIONAL GUARD	WORK CONTROL	218–723–7292
DULUTH AIRPORT AUTHORITY	TOM WERNER	218–727–6522
OTHERS	GOPHER STATE ONE–CALL	800–252–1166

10. RESPONSIBILITY FOR TEMPORARY LIGHTING AND MARKING

    THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING AND MAINTAINING THE NECESSARY BARRICADES AND HAZARD LIGHTING AS REQUIRED BY THE SPECIFICATIONS TO MARK CONSTRUCTION AREAS, HAZARDS, ETC. REFLECTORIZED ORANGE PLASTIC BARRELS WITH ATTACHED FLASHING RED LIGHTS FOR NIGHT USE ARE THE PREFERRED TYPE OF BARRICADE FOR USE ON THE AIRPORT.

11. CONSTRUCTION ACTIVITY IN THE VICINITY OF NAVIGATIONAL AIDS

    48 HOURS PRIOR TO THE PRE CONSTRUCTION CONFERENCE AND/OR CONSTRUCTION START, THE CONTRACTOR SHALL CONTACT THE LOCAL AIRWAY FACILITIES MANAGER AT (218) 727–2826. HE OR HIS REPRESENTATIVE WILL MEET WITH THE CONTRACTOR TO IDENTIFY FAA FACILITIES AND FAA CABLES.

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SAFETY AND SECURITY NOTES AND DETAILS

SHEET NUMBER
C003

BID DOCUMENTS

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GENERAL NOTES

1. SAFETY AND SECURITY – SAFETY AND SECURITY IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE COORDINATED WITH DULUTH INTERNATIONAL AIRPORT AND THE ENGINEER (SEE SPECIAL PROVISION SPECIFICATIONS).
2. EXISTING UTILITY INFORMATION SHOWN ON THE PLANS CONCERNING THE TYPE, SIZE AND LOCATION WERE COMPILED BASED ON THE BEST AVAILABLE UTILITY RECORDS TO THE ENGINEER. THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATION PRIOR TO CONSTRUCTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOWER AND/OR PROTECT ALL EXISTING UTILITIES IN PLACE UNLESS NOTED OR SPECIFIED OTHERWISE INCIDENTAL TO THIS PROJECT. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL FIELD VERIFY AND SOFT DIG TO IDENTIFY ACTUAL LOCATION AND DEPTH PRIOR TO REMOVAL AND EXCAVATION FOR ALL UTILITIES BOTH WET AND DRY.
3. CONTRACTOR UTILITIES – THE CONTRACTOR'S STAGING AREA IS SHOWN ON SHEET C006. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL UTILITIES AND HOOKUPS (SEE SPECIAL PROVISIONS). THE CONTRACTOR WILL BE REQUIRED TO COORDINATE WITH THE CITY ENGINEERING DEPARTMENT AND DULUTH INTERNATIONAL AIRPORT ON THE PRECISE LOCATION AND LIMITS OF THE STAGING AREA, AS WELL AS ANY SPECIAL REQUIREMENTS FOR FENCING, SECURITY BADGING AND ACCESSES.
4. HAUL ROUTES – THE LOCATION OF HAUL ROUTES ON THE AIRPORT SHALL BE AS SHOWN ON THE PLANS AND APPROVED BY THE CITY OF DULUTH AND THE DULUTH INTERNATIONAL AIRPORT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF–SITE HAUL ROUTES WITH THE PARTY HAVING JURISDICTION OVER THE AFFECTED ROUTE. ON–SITE HAUL ROUTES WILL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF USE AS A HAUL ROUTE. FENCING, DRAINAGE, GRADING, AND ANY OTHER WORK NECESSARY TO CONSTRUCT HAUL ROUTES ON THE AIRPORT IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE APPROVED BY THE ENGINEER PRIOR TO WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION OF ALL DULUTH INTERNATIONAL AIRPORT PROPERTY AND SHALL PROTECT CAREFULLY FROM DAMAGE OR DISTURBANCE ALL LAND MONUMENTS AND PROPERTY MARKERS. IF DAMAGE OR INJURY TO PROPERTY DOES OCCUR DURING THE WORK, THE CONTRACTOR SHALL RESTORE AT HIS/HER OWN EXPENSE SUCH PROPERTY TO A CONDITION EQUAL TO THAT EXISTING BEFORE SUCH DAMAGE OR INJURY WAS DONE.
6. EXCESS SOIL PLACEMENT SHALL BE OFF–SITE IN A CITY APPROVED LOCATION AND SHALL ADHERE TO ALL LOCAL LAWS AND REGULATIONS. COSTS ASSOCIATED WITH THE PLACEMENT AT THIS LOCATION SHALL BE INCLUDED IN THE COST OF REMOVAL. THE CONTRACTOR SHALL PROVIDE THE RESIDENT ENGINEER AND DULUTH INTERNATIONAL AIRPORT WITH DOCUMENTATION OF THE QUANTITY OF PLACEMENT, LOCATION AND CITY/LOCAL GOVERNMENT ACCEPTANCE.
7. ANY REMOVAL OF EQUIPMENT (TICKET DISPENSERS, PARKING LOT GATES, AND TOLL BOOTHS) ARE TO REMAIN THE PROPERTY OF DULUTH INTERNATIONAL AIRPORT UNLESS INDICATED OTHERWISE.
8. THE CONTRACTOR SHALL NOT ENTER INTO ANY PAVED OR UNPAVED AREA OUTSIDE OF THE LIMITS OF CONSTRUCTION WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
9. DURING TIMES OF CONSTRUCTION OPERATIONS IN THE AOA, A BADGED GATE GUARD PROVIDED BY THE CONTRACTOR SHALL BE PLACED AT GATE 11V. THE GUARD SHALL CHECK FOR ENTRY UNDER THE SPECIAL PROVISIONS AND THE LATEST FAA SAFETY REGULATIONS. PROPER TRAINING AND COORDINATION WITH AIRPORT OPERATIONS WILL BE REQUIRED.
10. THE CONTRACTOR SHALL REPAIR DAMAGE TO HAUL ROUTES ON AND OFF AIRPORT PROPERTY UPON COMPLETION OF THIS PROJECT. (INCIDENTAL TO THIS PROJECT).
11. CONTRACTOR SHALL SUBMIT A PLAN (PRIOR TO CONSTRUCTION) FOR CONSTRUCTION OF EACH PHASE. THIS PLAN SHALL SHOW SUFFICIENT REMOVAL OF AC TO PLACE REQUIRED CONCRETE/ASPHALT FOR EACH PHASE. IT SHALL ALSO SHOW WHAT STEPS WILL BE TAKEN WHEN VEHICLES/EQUIPMENT ARE REQUIRED TO BE TURNED AROUND AND HAVE PASSED THE AREA OF PAVING. IT WILL ALSO SHOW WHERE EQUIPMENT IS TO BE STORED IN EACH PHASE.
12. SHOULD ANY ITEM IN THESE PLANS CONFLICT WITH THE TECHNICAL SPECIFICATIONS, THE SPECIFICATIONS SHALL GOVERN.
13. THE CONTRACTOR SHALL BE GIVEN A SPECIFIC NUMBER OF CALENDAR DAYS TO PERFORM THE WORK AND IF THE CONTRACTOR DOES NOT COMPLETE THE CONSTRUCTION WITHIN THAT TIME FRAME, LIQUIDATED DAMAGES WILL BE ASSESSED UNLESS THE CONTRACTOR CAN SHOW JUST CAUSE FOR ANY DELAYS. IF THE ENGINEER, OR AIRPORT MANAGEMENT FEELS THAT CONSTRUCTION IS PROCEEDING AT TOO SLOW A PACE, THE ENGINEER SHALL NOTIFY THE CONTRACTOR IN WRITING AND THE CONTRACTOR SHALL BE REQUIRED TO RESPOND IN WRITING JUSTIFYING THE IDENTIFIED DELAYS AND/OR LACK OF ADEQUATE EQUIPMENT. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE JUSTIFICATION FOR WAIVING OF ANY LIQUIDATED DAMAGES CHARGED TO THE CONTRACTOR.
14. THE CONTRACTOR SHALL, AT ALL TIMES, COORDINATE HIS EFFORTS WITH THE ENGINEER. IF ANY PROBLEMS ARISE DURING THE CONSTRUCTION SEQUENCING, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER TO HELP RESOLVE SAID PROBLEMS PRIOR TO CONTINUING THE WORK.
15. THE CONTRACTOR SHALL PERFORM ALL FINAL CLEANUP WORK PRIOR TO A FINAL INSPECTION. THE CONTRACTOR SHALL ALSO CONTINUOUSLY CLEAN UP DURING EACH PHASE OF THE PROJECT.
16. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT HIS RECOMMENDED FIELD OPERATIONS AREAS FOR STORAGE OF EQUIPMENT, SUPPLIES AND FIELD OFFICES TO THE ENGINEER AND AIRPORT MANAGER AT THE PRECONSTRUCTION CONFERENCE FOR REVIEW, COMMENTS AND/OR APPROVAL. ANY AREAS RECOMMENDED FOR STORAGE OF EQUIPMENT OVERNIGHT, FOR STORAGE OF FUELING FACILITIES, MATERIALS AND OFFICES SHALL BE APPROVED BY THE AIRPORT MANAGEMENT AND ENGINEER PRIOR TO MOBILIZATION OF ANY EQUIPMENT OR FIELD OFFICES AND CERTIFIED BY THE CONTRACTOR THAT THE FACILITIES MEET ALL APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
17. ANY AREAS UTILIZED AS FIELD OPERATIONS AREAS SHALL BE MAINTAINED AT ALL TIMES IN A CLEAN AND ENVIRONMENTALLY SAFE CONDITION. IF THE CONTRACTOR MUST UTILIZE AGGREGATE BASE MATERIALS TO PROVIDE A STABLE SURFACE FOR EQUIPMENT STORAGE, THEN ANY MATERIALS UTILIZED WILL BE REMOVED AT THE END OF THE PROJECT AND DISPOSED OF AT A LOCATION ACCEPTABLE TO THE OWNER. A STABLE BASE EXTENDING FROM EXISTING PAVEMENT, NOT SCHEDULED FOR RECONSTRUCTION, TO THE FIELD OFFICES SHALL BE PROVIDED FOR CLEAN ACCESS.
18. APPROPRIATE EROSION CONTROL MEASURES SHALL BE ACCOMPLISHED PRIOR TO BEGINNING THE RESPECTIVE PHASE. REMOVAL OF TEMPORARY EROSION CONTROL SHALL BE ACCOMPLISHED BY THE CONTRACTOR EITHER AT THE COMPLETION OF THE ASSOCIATED PHASE OR THEREAFTER AS DIRECTED BY THE RPR.
19. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE MULTIPLE CREWS AND WORK EXTENDED HOURS TO ACCOMPLISH AND COMPLETE THE WORK WITHIN THE ALLOTTED TIME.
20. PERMITS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN AND PAY FOR ALL APPLICABLE PERMITS FOR CONSTRUCTION AND EQUIPMENT.
21. COORDINATION OF CONSTRUCTION ACTIVITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONSTANT COORDINATION BETWEEN THE SUBCONTRACTORS AND THE ENGINEER. ALL CONSTRUCTION ACTIVITIES PLANNED BY THE CONTRACTOR SHALL BE REVIEWED AND APPROVED BY THE ENGINEER AND AIRPORT OPERATIONS REPRESENTATIVES.
22. STAGING AREAS: ALL STAGING AND VEHICLE PARKING AREAS SHALL BE FINALIZED BY AIRPORT MANAGEMENT, AT THE PRE–CONSTRUCTION MEETING.

LEGEND

2/C #6 THHN 600V, 1/C #4 GRD. IN CONDUIT
4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
2/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
UED — PROPOSED CONDUIT DUCTS
OHE — PROPOSED OVERHEAD ELECT.
OE — EXISTING OVERHEAD ELECT.
EXISTING POWER POLE
PROPOSED POWER POLE
PROPOSED ELECT. MANHOLE
PROPOSED LIGHT POLES
PROPOSED PHONE PEDISTAL
PROPOSED COMM MANHOLE
UE — EXISTING UNDERGROUND ELECT.
E — EXISTING –PRIVATE– ELECT.
EXISTING LIGHT & POLE
UT — PROPOSED PHONE CABLES
UT — EXISTING PHONE CABLES
UTV — EXISTING CATV CABLES
FO — EXISTING FIBER OPTIC CABLE
EXISTING PARKING GATE
EMH — EXISTING ELECT. MANHOLE
W — PROPOSED WATERMAIN
W — EXISTING WATERMAIN
S — EXISTING SANITARY
SAN — PROPOSED SANITARY
SAN — EXISTING SANITARY MANHOLE
PROPOSED SANITARY MANHOLE
UG — EXISTING GAS LINE
GAS — PROPOSED GAS LINE
EXISTING HYDRANT
PROPOSED HYDRANT
PROPOSED WATER VALVE
WV — EXISTING WATER VALVE
PROPOSED STORM PIPE
PROPOSED EDGE DRAINS
EXISTING STORM PIPE

DEMOLITION

CLEAR ISOLATED TREE
CLEARING AND GRUBBING
EXISTING TREES TO REMAIN
EXISTING BITUMINOUS PAVEMENT REMOVAL
EXISTING CONCRETE PAVEMENT REMOVAL
EXISTING CURB REMOVAL
DEMOLISH EXISTING BUILDING OR SALVAGE
SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)

GRADING AND EROSION CONTROL LEGEND

1270 — PROPOSED MAJOR CONTOUR (5')
1267 — PROPOSED MINOR CONTOUR (1')
1270 — EXISTING MAJOR CONTOUR (5')
1268 — EXISTING MINOR CONTOUR (1')
PROPOSED GRADING LIMITS
SF — SILT FENCE TYPE: MACHINE SLICED
SF — SILT FENCE TYPE: HEAVY DUTY
SF — SILT FENCE TYPE: SUPER DUTY
BIOROLL
CRITICAL ZONE
CLASS III RIP RAP W/ TYPE V FABRIC
CATEGORY 2 EROSION BLANKET
RAPID STABILIZATION METHOD #4 (SPEC 2575.3)
TYPE 6 HYDRO MULCH (SPEC 5884)
SOD
CLASS IV RIP RAP W/TYPE IV FABRIC AT SLOPES

ABBREVIATIONS

AB	AGGREGATE BASE COURSE
AC	ADVISORY CIRCULAR OR ASPHALTIC CONCRETE
APPROX	APPROXIMATE
ARFF	AIRCRAFT RESCUE FIRE FIGHTING
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATCT	AIR TRAFFIC CONTROL TOWER
BC	BEGIN CURVE
BVC	BEGIN VERTICAL CURVE
CFS	CUBIC FEET PER SECOND
CTB	CEMENT TREATED BASE
CY	CUBIC YARDS
DAA	DULUTH AIRPORT AUTHORITY
DIA	DIAMETER
E	EASTING, ELECTRICAL OR EAST
EA	EACH
EC	END CURVE
EL	ELEVATION
EVC	END VERTICAL CURVE
EXIST	EXISTING
FAA	FEDERAL AVIATION ADMINISTRATION
FH	FIRE HYDRANT
FL	FLOWLINE
G	GAS
GA	GAUGE
GAL	GALLON
HP	HIGH POINT
HORZ	HORIZONTAL
ILS	INSTRUMENT LANDING SYSTEM
KV	KILOVOLT
LF	LINEAR FEET
LS	LUMP SUM
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
N	NORTHING OR NORTH
NAVD	NORTH AMERICAN VERTICAL DATUM
NO	NUMBER
NOTAM	NOTICE TO AIRMEN
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PAPI	PRECISION APPROACH PATH INDICATOR
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PROP	PROPOSED
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
RGRCP	RUBBER GASKET REINFORCED CONCRETE PIPE
R	RADIUS
RT	RIGHT
R/W	RUNWAY
ROW	RIGHT–OF–WAY
RWY	RUNWAY
S	SLOPE OR SOUTH
SF	SEMI–FLUSH OR SQUARE FEET
STA	STATION
STD	STANDARD
SY	SQUARE YARDS
TWY	TAXIWAY
T/W	TAXIWAY
TYP	TYPICAL
VASI	VISUAL APPROACH SLOPE INDICATOR
VERT	VERTICAL
W	WEST OR WATER

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
GENERAL CONSTRUCTION NOTES, LEGEND, AND ABBREVIATIONS

SHEET NUMBER
C004

BID DOCUMENTS

T:\P\2141882.093 DLH Terminal Design Civil\CAD\C\DLH-C004.dwg, 5/7/2009 10:53:12 AM

RUNWAY 9–27

RUNWAY 3/21

TAXIWAY "A–5"

TAXIWAY "D"

EXISTING AIRPORT SECURITY FENCE

EXISTING SOUTH PERIMETER ROAD

EXISTING RENTAL PARKING

EXISTING TERMINAL

EXISTING GRINDEN DRIVE

FUTURE TERMINAL

FUTURE RENTAL PARKING

PROPOSED AIRFIELD ACCESS

EXISTING RETENTION PONDS

EXISTING AIRPORT SECURITY FENCE

FIELD ACCESS ROAD

EXISTING EMPLOYEE LOT

EMPLOYEE RD (CARGO RD.)

PROPOSED TEMPORARY EMPLOYEE LOT ROAD

FUTURE EMPLOYEE LOT

HAINES ROAD

PROPOSED CELL PHONE LOT

FUTURE (N.I.C.) GRINDEN DRIVE

PROPOSED GRINDEN DRIVE

PROPOSED LOWER ACCESS ROAD

PROPOSED PARKING ROAD

PROPOSED SHORT TERM PARKING

PROPOSED LONG TERM PARKING

EXISTING BUILDING

PROPOSED RENTAL CAR MAINTENANCE

PROPOSED LONG TERM PARKING

MILLER CREEK

EXISTING WETLAND

PROPOSED GRINDEN DRIVE

AIRPORT ROAD

EXISTING WETLAND

MILLER CREEK

HAINES ROAD

EXISTING AIRPORT SECURITY FENCE

NORTH

0 100' 200'

ULTIMATE DEVELOPMENT SITE PLAN NOTES:

1. THIS DRAWING DEPICTS EXISTING CONDITIONS, WORK PROPOSED TO BE ACCOMPLISHED UNDER THIS CONTRACT, AND FUTURE DEVELOPMENT THAT IS NOT INCLUDED IN THIS CONTRACT. THIS DRAWING IS PRESENTED FOR CONTRACTOR'S INFORMATION ONLY, TO REPRESENT HOW THE CONTRACT WORK RELATES TO EXISTING CONDITIONS AND THE ULTIMATE DEVELOPMENT.

2. WHERE THE WORD "FUTURE" IS USED IN THESE DOCUMENTS, IT REPRESENTS ELEMENTS OF THE PROJECT NOT INCLUDED IN THIS CONTRACT, BUT IS PROVIDED FOR INFORMATION PURPOSES ONLY.

3. WHERE THE WORD "PROPOSED" IS USED IN THESE DOCUMENTS, IT REPRESENTS ELEMENTS OF THE PROJECT INCLUDED IN THIS CONTRACT FOR INSTALLATION, CONSTRUCTION, OR MODIFICATION AS SHOWN IN THE PLANS AND SPECIFICATIONS.

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

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NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

ULTIMATE DEVELOPMENT SITE PLAN

SHEET NUMBER

C005

BID DOCUMENTS

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CONTRACT LAYOUT PLAN NOTES

1.) PROJECT DESCRIPTION: THIS CONTRACT PROVIDES THE FIRST PHASE OF CONSTRUCTION FOR THE NEW REPLACEMENT TERMINAL DEVELOPMENT AT DULUTH INTERNATIONAL AIRPORT. SEVERAL OTHER PHASES OF CONSTRUCTION ARE BEING BID SEPARATELY, SOME OF WHICH WILL OVERLAP THE WORK AREAS AND THE CONSTRUCTION LIMITS OF THIS CONTRACT. FOR CLARITY, PORTIONS OF THE FUTURE WORK NOT INCLUDED IN THIS CONTRACT ARE ILLUSTRATED FOR INFORMATIONAL PURPOSES ONLY.

2.) SCOPE OF WORK: THE SCOPE OF WORK FOR THIS CONSTRUCTION SPECIFICALLY INCLUDES, BUT IS NOT LIMITED TO, TEMPORARY & PERMANENT FENCE & GATE INSTALLATION AND REMOVAL; BUILDING DEMOLITION & BUILDING SALVAGE; SITE CLEARING AND GRUBBING; EXCAVATION AND EMBANKMENT WITHIN LIMITS OF GRADING SHOWN ON PLANS; INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROL DEVICES; CONSTRUCTION OF SITE DRAINAGE COMPONENTS INCLUDING, INLETS, MANHOLES AND CULVERTS, CONSTRUCTION OF ASPHALT ROADWAYS AND PARKING LOTS; SITE ELECTRICAL AND ROADWAY AND PARKING LIGHTING; INSTALLATION OF POWER AND CONTROL CABLES FOR PARKING CONTROL DEVICES; TOLL BOOTH RELOCATION; SITE UTILITIES THAT SHALL INCLUDE SANITARY PIPE & SANITARY MANHOLES, WATERLINES, VALVES AND HYDRANTS, AND GAS LINES.

3.) HAUL ROUTES; LOCATION OF HAUL ROUTES SHALL BE SPECIFIED ON THE PLANS OR AS APPROVED BY ENGINEER. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS, OR CITY STREETS) WITH APPROPRIATE AGENCY.

4.) HAUL ROUTES SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF CONSTRUCTION.

5.) CONTRACTOR MUST AT ALL TIMES BE AWARE THAT THIS SITE IS AN ACTIVE AIRPORT TERMINAL, CONTRACTOR SHALL NOT BLOCK TRAFFIC TO TERMINAL OR EXISTING PARKING AREAS DURING CONSTRUCTION. SEE PHASING PLAN FOR OFF-PEAK CONSTRUCTION TIMES AND PHASING OF CONSTRUCTION.

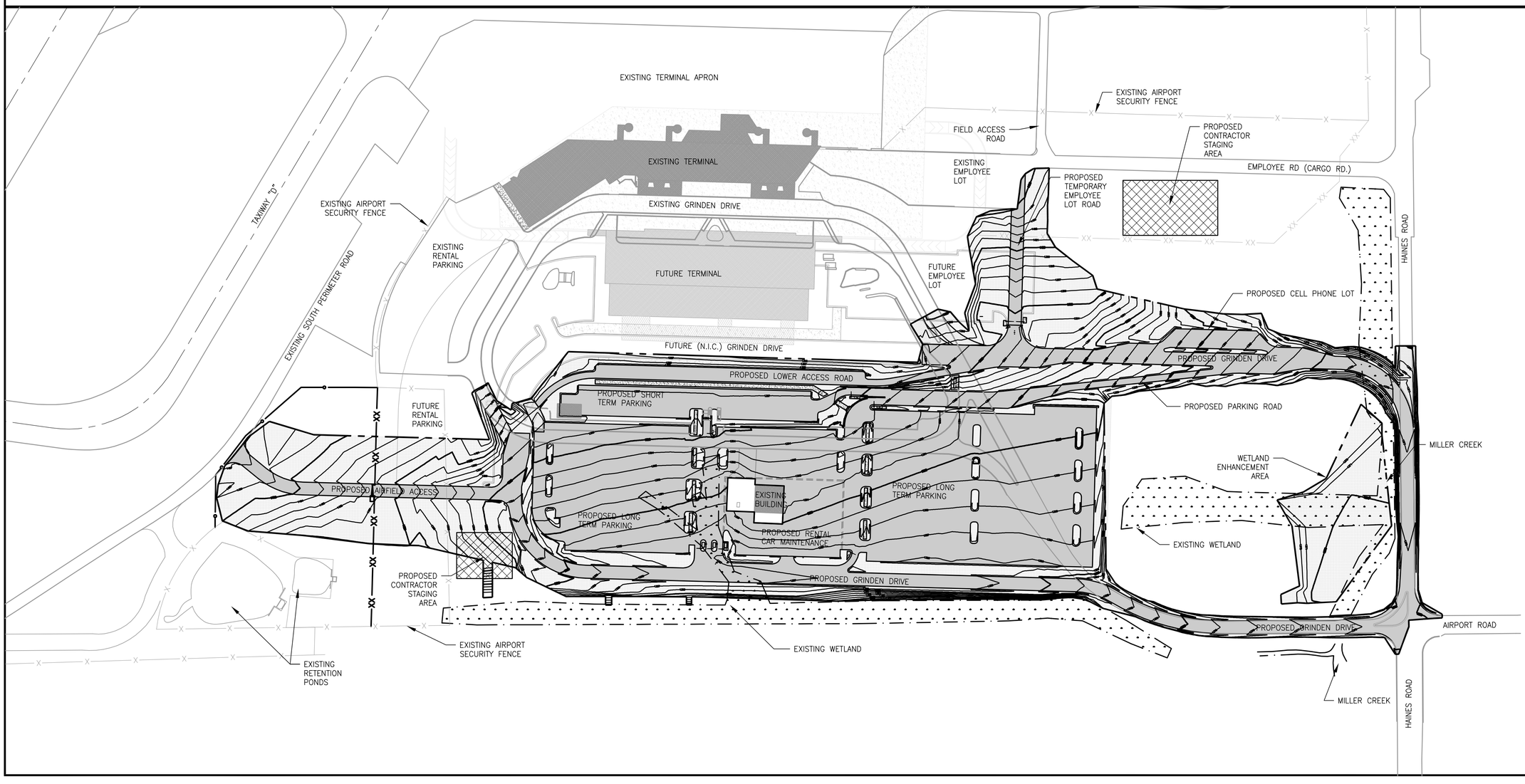
6.) CONTRACTOR SHALL KEEP PUBLIC SAFE BY BARRICADING OR FENCING OF EXCAVATIONS AND CONSTRUCTION ACTIVITIES FROM TERMINAL TRAFFIC AND PEDESTRIAN TRAFFIC.

LEGEND

- PROPOSED MAJOR CONTOUR (5')
- PROPOSED MINOR CONTOUR (1')
- PROPOSED GRADING LIMITS
- PROPOSED CONTRACTOR STAGING AREA
- PROPOSED BITUMINOUS ROAD OR PARKING
- PROPOSED GRADING AREA
- FUTURE TERMINAL (N.I.C.)
- EXISTING TERMINAL & BUILDINGS
- FUTURE APRON (N.I.C.)
- EXISTING WETLANDS

NORTH

0 100' 200'



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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
CONTRACT LAYOUT PLAN & CONTRACT NOTES

SHEET NUMBER
C006

BID DOCUMENTS

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HORIZONTAL AND VERTICAL CONTROL POINTS

NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP-DLHA	N:452663.9980	E:2854470.1940	1404.7870	DLHA IS A STEEL ROD SET 0.5' BELOW GROUND IN A 6" PVC CASING 12' EAST OF AIRPORT SECURITY FENCE CORNER OF RENTAL CAR LOT.
CP-51	N:452503.3840	E:2854771.0310	1403.5720	CP-51 IS A 24" #5 REBAR SET FLUSH WITH GROUND, IS 30' SOUTH OF GRINDEN DRIVE ON TOP OF HILL ACROSS FROM LONG TERM PARKING AND 20' WEST OF TOLL BOOTH BUILDING LINE.
CP-53	N:452925.0290	E:2854589.0160	1408.9110	CP-53 IS A 24" #5 REBAR SET FLUSH WITH GROUND, 2' SOUTH AND 5' WEST OF CURB RETURN AT THE NE CORNER OF RENTAL CAR PARKING LOT.
CP-54	N:453158.7960	E:2855600.7680	1409.9660	CP-54 IS A 24" #5 REBAR SET FLUSH WITH GROUND, IS 12' SOUTH OF SECURITY FENCE AND 10' EAST OF FIELD ACCESS RD. OFF OF THE NORTH SIDE OF THE EMPLOYEE PARKING ACCESS RD AT JOG IN FENCE.
CP-55	N:452196.8330	E:2856288.0920	1375.4790	CP-55 IS A 24" #5 REBAR SET FLUSH WITH GROUND, 2" SOUTH OF CURB RETURN AT THE SE QUADRANT OF HAINES RD. AND AIRPORT RD. INTERSECTION.
CP-68	N:453139.0790	E:2856206.3810	1381.9770	CP-68 IS A 24" #5 REBAR SET 0.1' BELOW GROUND, 6' EAST OF GUARDRAIL AT THE NW QUADRANT OF HAINES RD. AND THE CARGO RD. NOW THE EMPLOYEE PARKING RD. INTERSECTION.
CP-69	N:452523.4520	E:2855954.1440	1377.7660	CP-69 IS A 24" #5 REBAR SET FLUSH WITH GROUND ON THE SOUTH SIDE OF THE F-4 AIRCRAFT DISPLAY, IT IS 15' SOUTH OF THE TIP OF THE SOUTHERLY WING.

NOTES:
1. ULTIMATE DEVELOPMENT SHOWN FOR INFORMATION.
2. CONTROL POINT INFORMATION PROVIDED BY RLK-INCORPORATED DATE: 03-09-2009

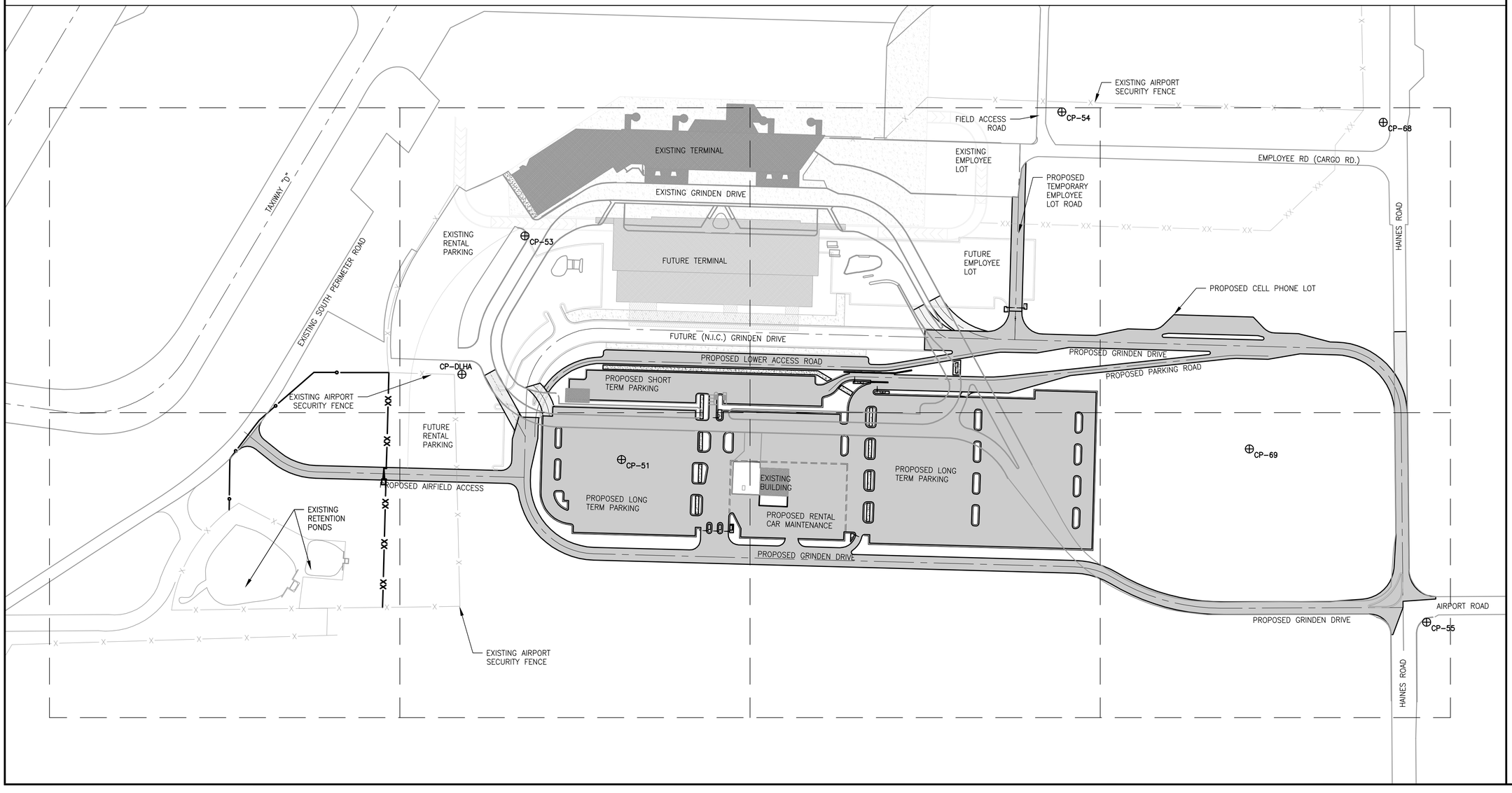
LEGEND

⊕ CP-01 CONTROL POINT LOCATION

NOTE:
ALL NORTHINGS, EASTINGS AND ELEVATIONS LABELED ON THESE PLANS ARE IN:
MINNESOTA STATE PLANE NORTH (1996)
VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

NORTH

0 100' 200'



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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

HORIZONTAL AND VERTICAL CONTROL PLAN & NOTES

SHEET NUMBER

C007

BID DOCUMENTS

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LEGEND

8 — 30 SCALE LAYOUT

2 — 60 SCALE LAYOUT

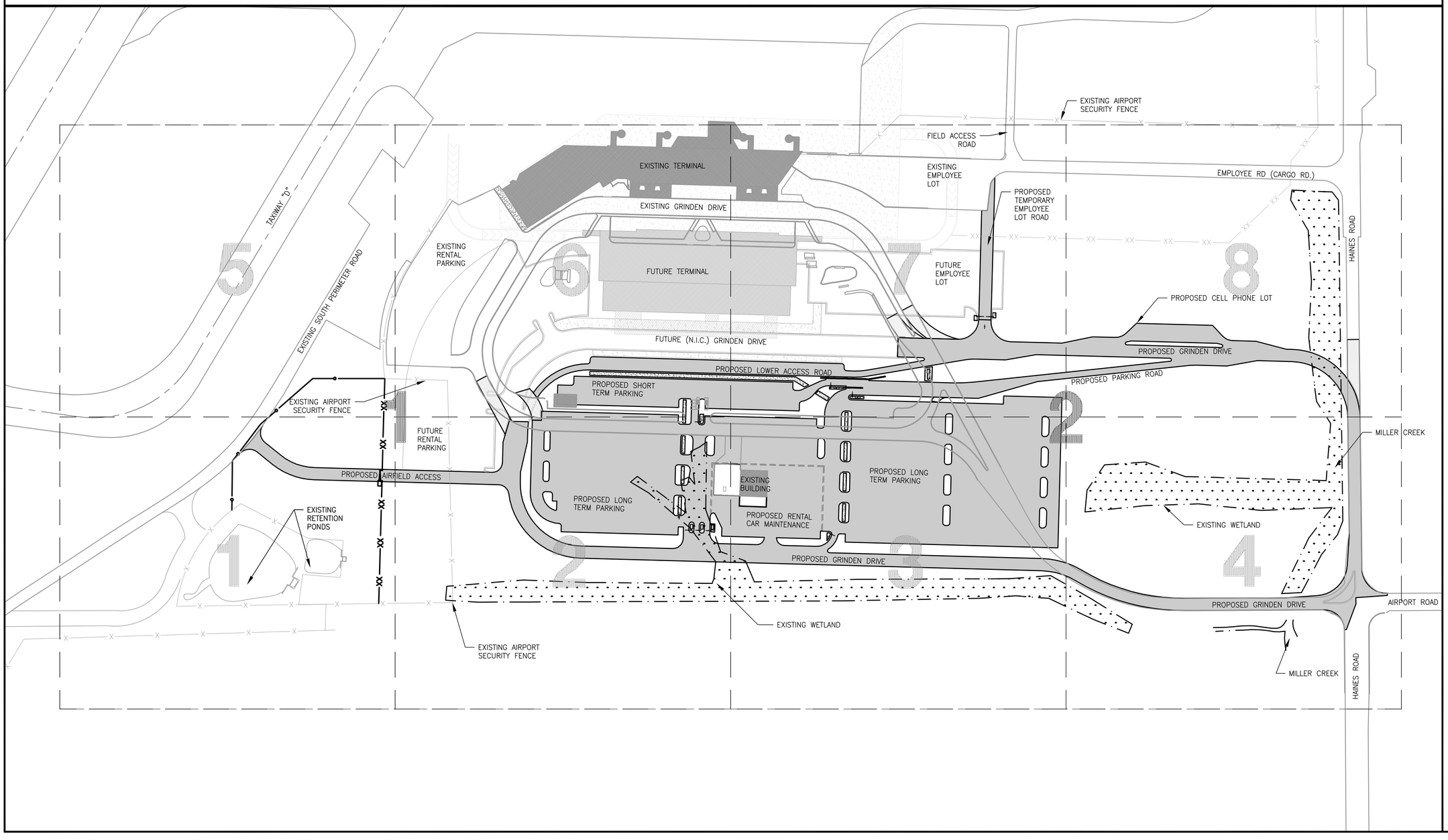
EXISTING ELEMENT

PROPOSED ELEMENT

NORTH

0 100' 200'

SHEETS ARE NUMBER THIS PLAN SET:
(X)00 IS THE OVERVIEW
(X)01–(X)08 ARE THE 30 SCALE SHEETS



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SHEET TITLE

SHEET LAYOUT PLAN

SHEET NUMBER

C008

BID DOCUMENTS

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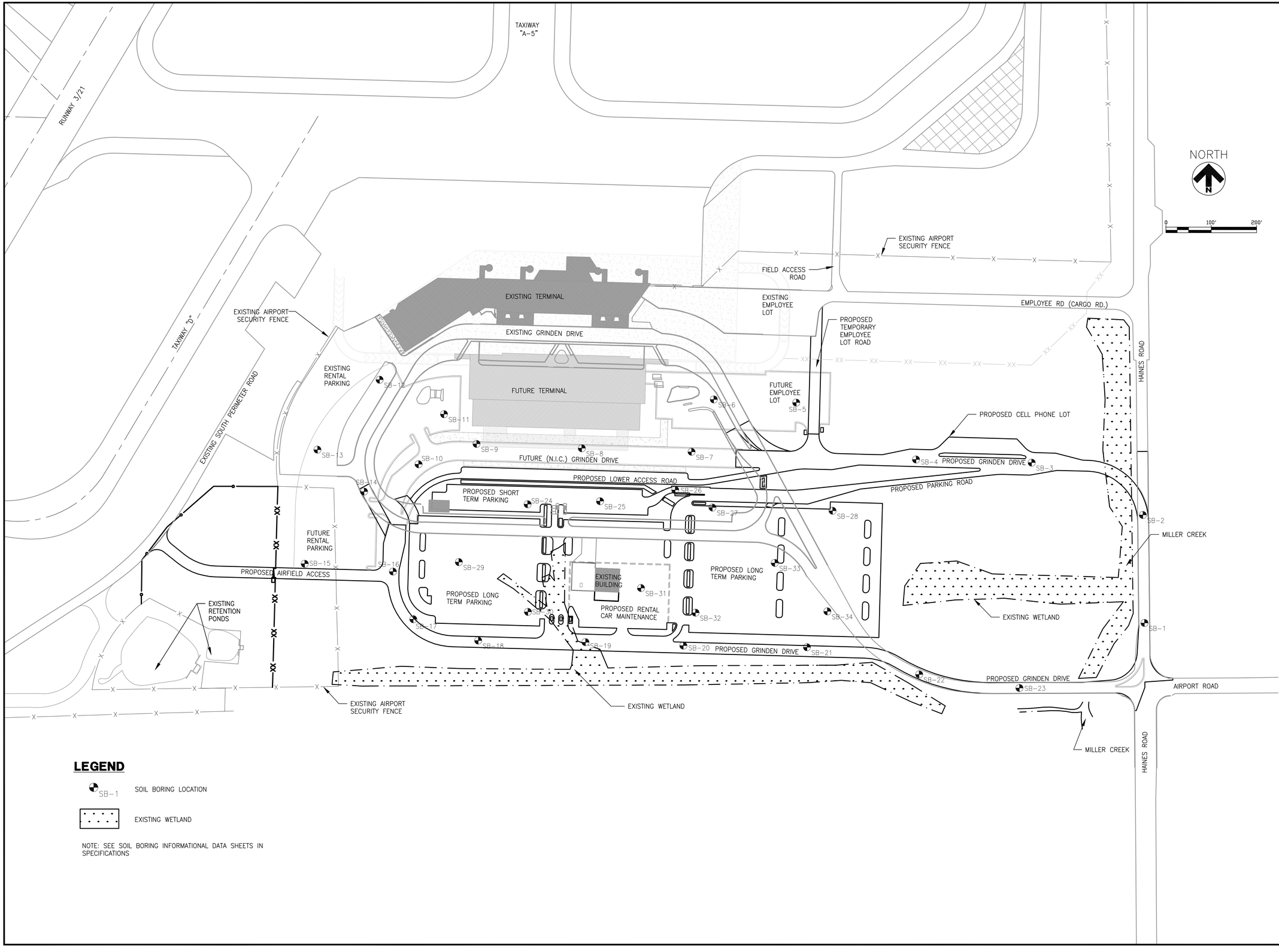

LEGEND

SB-1 SOIL BORING LOCATION

EXISTING WETLAND

NOTE: SEE SOIL BORING INFORMATIONAL DATA SHEETS IN SPECIFICATIONS

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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
GEOTECHNICAL BORING LAYOUT AND INFORMATION

SHEET NUMBER
C009

BID DOCUMENTS

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PHASING NOTES

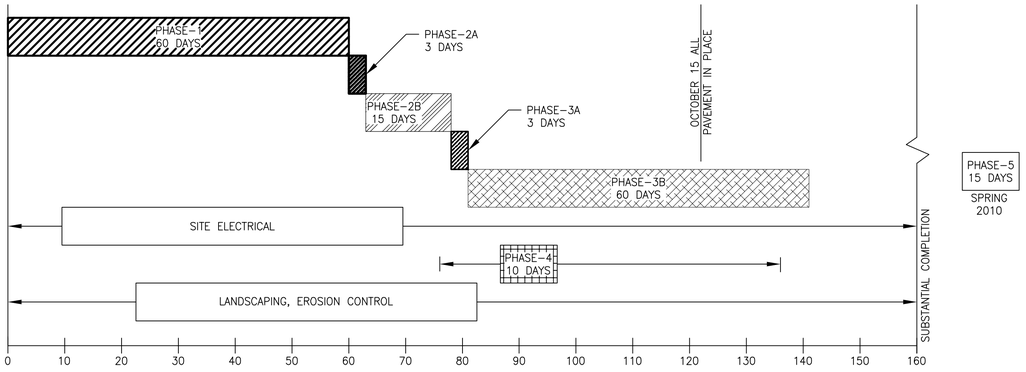
1. THE CONTRACTOR SHALL SUBMIT A TEMPORARY TRAFFIC CONTROL PLAN PRIOR TO CONSTRUCTION. THE TRAFFIC CONTROL PLAN SHALL COMPLY WITH PART 6 OF THE MINNESOTA MANUAL OF UTCD. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY TRAFFIC CONTROL SIGNAGE, WHICH SHALL BE REMOVED AFTER CONSTRUCTION. VEHICLE ACCESS TO TERMINAL, EMPLOYEE PARKING LOT, AND RENTAL PARKING LOT SHALL BE MAINTAINED AT ALL TIMES.

2. THE CONTRACTOR SHALL COMPLETE ALL PAVING OPERATIONS PRIOR TO OCTOBER 15, 2009.

3. PRIOR TO STARTING ANY WORK THAT WILL IMPACT UTILITIES OR ACCESS TO THE TERMINAL AND PARKING LOT AREAS, THE CONTRACTOR WILL COORDINATE THE WORK SCHEDULE WITH THE ENGINEER. ANY OUTAGES OF UTILITIES SHALL BE SCHEDULED 48 HOUR IN ADVANCE IN WRITING TO ENGINEER AND OWNER/TENATS.

4. AFTER COMPLETION OF PHASE 4, THE WORK AND CONTRACT TIME WILL BE SUSPENDED BY THE OWNER. ALL EQUIPMENT, MATERIALS, AND SUPPLIES SHALL BE MOBILIZED TO CONTRACTORS STAGING AREA.

5. DEMOBILIZATION AND SITE RESTORATION SHALL BE TO THE SATISFACTION OF THE OWNER PRIOR TO FINAL RELEASE OF PAYMENT.



SCHEMATIC PHASING SCHEDULE

TRAFFIC CONTROL NOTES

1) THE CONTRACTOR IS REQUIRED TO SUBMIT A DETAILED TRAFFIC CONTROL PLAN FOR EACH PHASE OF CONSTRUCTION PRIOR TO STARTING CONSTRUCTION FOR THAT PHASE.

2) TRAFFIC FLOW TO EXISTING TERMINAL AND PARKING SHALL BE MAINTAINED AT ALL TIMES. OFF PEAK HOURS AT AIRPORT ARE MIDNIGHT TO 5:00 AM.

3) THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN THE DEVICES IN THEIR SUBMITTED AND APPROVED TRAFFIC CONTROL PLAN UNLESS OTHERWISE NOTED.

4) ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS"--MAY 2005 W/(2007-2009 UPDATES).

5) FIELD CONDITIONS MAY REQUIRE MODIFICATIONS OF THIS LAYOUT AS DEEMED NECESSARY BY THE ENGINEER.

6) THE NUMBER AND PLACEMENT OF TRAFFIC CONTROL DEVICES WILL DEPEND UPON THE SEQUENCE OF THE CONTRACTORS OPERATION.

7) THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH MMUTCD.

8) IF THE CONTRACTOR DECIDES TO PERFORM THE CONSTRUCTION WORK IN A SEQUENCE OTHER THAN SHOWN IN THIS PHASING PLAN, THE CONTRACTOR SHALL PROVIDE COMPLETE REVISED TRAFFIC CONTROL PLANS TO BE APPROVED BY THE ENGINEER.

9) ALL TRAFFIC CONTROL DEVICES, INCLUDING SIGNS ON ROADS OPEN TO TRAFFIC THAT ARE NOT CONSISTENT WITH TRAFFIC OPERATION, SHALL BE COVERED, REMOVED OR REVISED AS DIRECTED BY THE ENGINEER.

10) "ROAD WORK AHEAD" SIGNS SHALL BE MOUNTED APPROX. 300 FT (1 BLOCK) IN ADVANCE OF THE CONSTRUCTION AND SHALL HAVE A TYPE "A" LOW INTENSITY FLASHING AMBER WARNING LIGHT MOUNTED ON THEM.

11) "ROAD CLOSED AHEAD" SIGNS SHALL BE ERECTED APPROX. 300 FT (1 BLOCK) IN ADVANCE OF THE CLOSURE.

12) "ROAD CLOSED TO THRU TRAFFIC" SIGNS SHALL BE INSTALLED ON TYPE III BARRICADES AND SHALL BE LOCATED AT A POINT IN THE STREET AS TO PERMIT LOCAL TRAFFIC USE BUT EFFECTIVELY DISCOURAGE THRU TRAFFIC USE.

13) WHEN A "ROAD CLOSED TO THRU TRAFFIC" SIGN IS USED, THE "STOP" OR "YIELD" SIGN AT THAT INTERSECTION SHALL BE LEFT IN PLACE OR MOVED TO A SUITABLE LOCATION WHERE THE DRIVER CAN STILL SEE THE SIGN.

14) "ROAD CLOSED" SIGNS MAY BE USED WHERE THE ROADWAY IS CLOSED TO ALL TRAFFIC EXCEPT CONTRACTOR'S EQUIPMENT OR OFFICIALLY AUTHORIZED VEHICLES.

15) TYPE "A" LOW INTENSITY AMBER WARNING LIGHTS SHALL BE MOUNTED ON ALL ADVANCE WARNING SIGNS AND ON ALL TYPE I AND TYPE III BARRICADES WHEN USED AT NIGHT OR TO IDENTIFY HAZARDS.

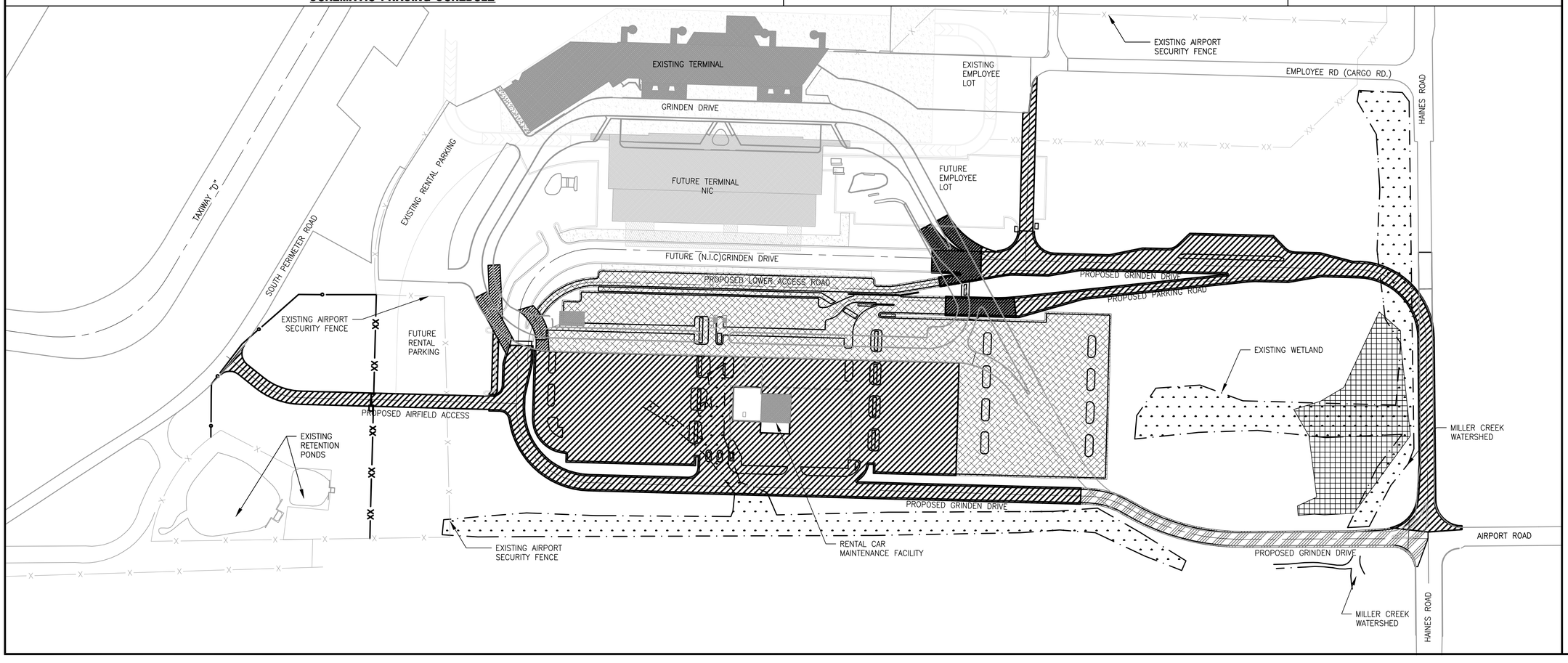
16) ADDITIONAL SIGNING MAY BE REQUIRED FOR SEPARATE LANE CLOSURES.

NORTH

0 100' 200'

LEGEND

- PHASE 1 CONSTRUCTION LIMITS
- PHASE 2A (OFF PEAK) CONSTRUCTION LIMITS
- PHASE 2B CONSTRUCTION LIMITS
- PHASE 3A CONSTRUCTION LIMITS
- PHASE 3B CONSTRUCTION LIMITS
- PHASE 4 CONSTRUCTION LIMITS



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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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214-1882-093 & 095

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SHEET TITLE

OVERALL PHASING PLAN

SHEET NUMBER

C010

BID DOCUMENTS

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PHASING 1 (60 CONSECUTIVE CALENDAR DAYS)

PHASE 1 SHALL CONSIST OF CONSTRUCTION OF THE PROPOSED GRINDEN DRIVE OVER THE EXISTING HAINES ROAD FROM STA: 0+93 TO STA: 13+25, PROPOSED EMPLOYEE LOT ROAD, PROPOSED CELL PHONE LOT, PROPOSED PARKING ROAD STA: 0+00 TO STA: 5+00, PROPOSED AIRFIELD ACCESS. TEMPORARY FENCE, AND SOUTHWEST HALF PROPOSED PARKING. TRAFFIC TO TERMINAL AND PARKING SHALL USE EXISTING GRINDEN DRIVE AND SHALL NOT BE RESTRICTED AT ANY TIME DURING THIS PHASE. THE ACCESS TO THE RENTAL CAR REPAIR FACILITY AND FUELING SHALL BE MAINTAINED.

THE WORK PERFORMED IN THIS PHASE SHALL INCLUDE BUT NOT LIMITED TO;

1. TEMPORARY FENCE INSTALLATION
2. EXCAVATION AND GRADING
3. UTILITY REMOVAL AND INSTALLATION
4. STORM SEWER INSTALLATION
5. CONCRETE CURB AND GUTTER INSTALLATION
6. ASPHALT PAVING
7. TOLL BOOTH SALVAGE/INSTALLATION
8. CREDIT CARD PAY STATION INSTALLATION
9. FENCE REMOVAL
10. TICKET DISPENSER INSTALLATION
11. PARKING LOT/ACCESS ROAD LIGHTING INSTALLATION
12. PERMANENT FENCE AND GATE
13. PERMANENT PAVEMENT MARKINGS

DURING PHASE 1 OF CONSTRUCTION ONE LANE OF HAINES ROAD ACCESS TO THE EMPLOYEE PARKING LOT SHALL BE MAINTAINED AT ALL TIMES.

ONE OF THE EXISTING TOLL BOOTHS & EQUIPMENT IS TO BE RELOCATED DURING THIS PHASE TO ALLOW PARKING OPERATIONS FOR FUTURE PHASES.

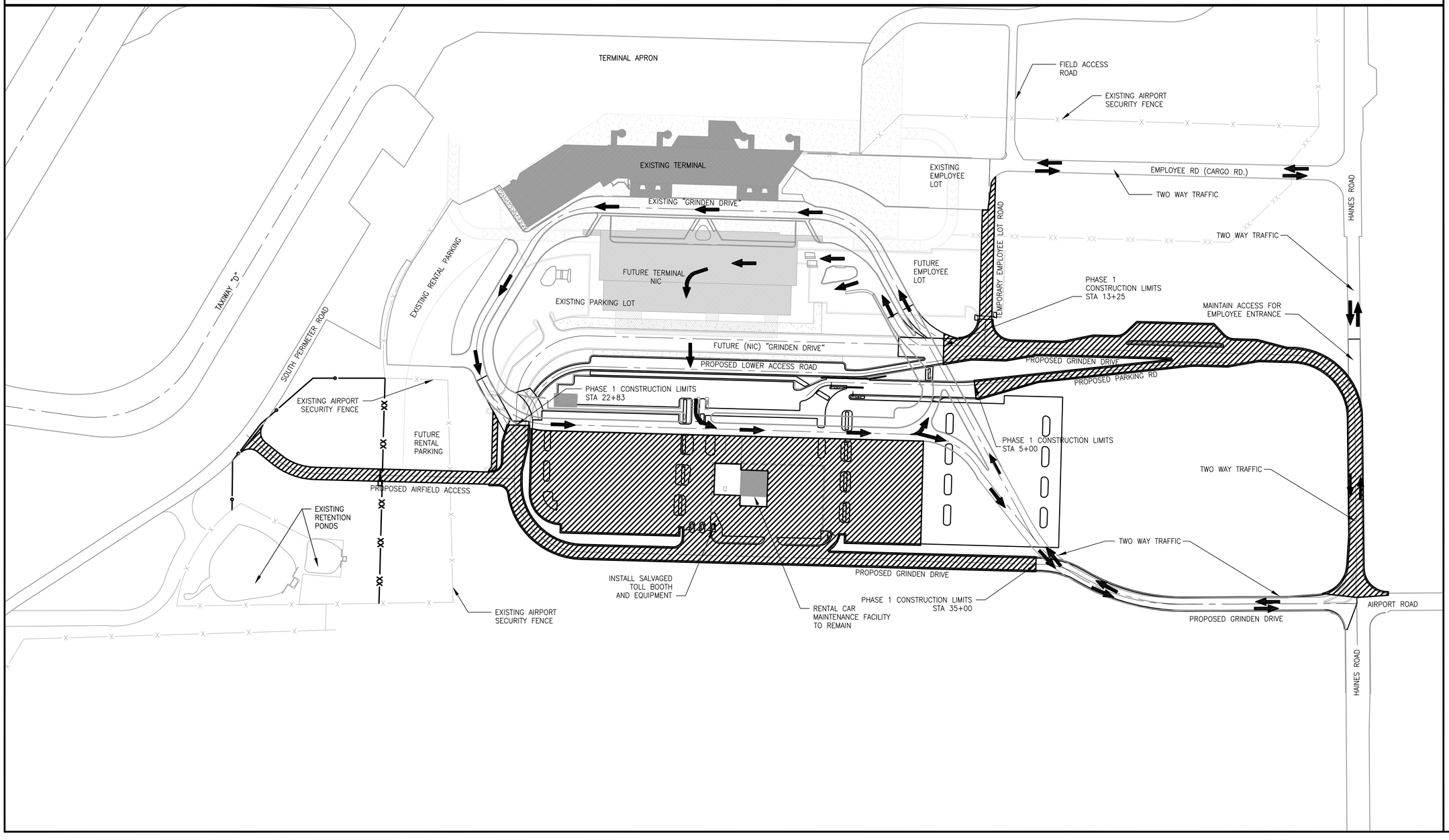
LEGEND

PHASE 1 CONSTRUCTION LIMITS

DIRECTION OF TRAFFIC FLOW

NORTH

0 100' 200'



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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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214-1882-093 & 095

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SHEET TITLE

PHASING AND TRAFFIC FLOW PLAN (SHEET 1 OF 3)

SHEET NUMBER

C011

BID DOCUMENTS

PHASING 2A (3 CONSECUTIVE CALENDAR DAYS)

FOLLOWING THE COMPLETION OF PHASE 1, PHASE 2A CAN COMMENCE. PHASE 2A SHALL CONSIST OF CONSTRUCTING THE CROSSOVERS NECESSARY TO CONNECT THE NORTHEAST PORTION OF THE PHASE 1 CONSTRUCTION WITH THE EXISTING GRINDEN DRIVE AND LOWER GRINDEN LOOP. PHASE 2A SHALL TAKE PLACE AT NIGHT (MIDNIGHT TO 5:00 AM) TRAFFIC TO TERMINAL & PARKING SHALL BE RESTORED EACH MORNING UNTIL ALL CONNECTIONS ARE COMPLETE. AT FULL COMPLETION OF THIS PHASE TRAFFIC SHALL BE REDIRECTED AND TRAFFIC CONTROL MEASURES SHALL BE IN PLACE. PHASE 2B SHALL NOT COMMENCE BEFORE THE COMPLETION OF PHASE 2A. ACCESS TO TERMINAL AND PARKING LOT SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION OF PHASE 2A & 2B.

THE WORK PERFORMED IN THIS PHASE SHALL INCLUDE BUT NOT BE LIMITED TO;

1. PAVEMENT REMOVAL
2. ASPHALT PAVING
3. CONCRETE CURB AND GUTTER INSTALLATION
4. EXCAVATION AND GRADING
5. UTILITY REMOVAL AND INSTALLATION
6. STORM SEWER INSTALLATION
7. PARKING LOT/ACCESS ROAD LIGHTING INSTALLATION
8. PERMANENT PAVEMENT MARKINGS

PHASING 2B (15 CONSECUTIVE CALENDAR DAYS)

FOLLOWING THE COMPLETION OF PHASE 2A. PHASE 2B CAN COMMENCE. PHASE 2B SHALL CONSIST OF CONSTRUCTING THE PROPOSED GRINDEN DRIVE NECESSARY TO CONNECT THE SOUTHEAST PORTION OF THE PHASE 1 CONNECTION WITH HAINES ROAD. ACCESS TO TERMINAL & PARKING LOT SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION OF PHASE 2A & 2B.

THE WORK PERFORMED IN THIS PHASE SHALL INCLUDE BUT NOT BE LIMITED TO;

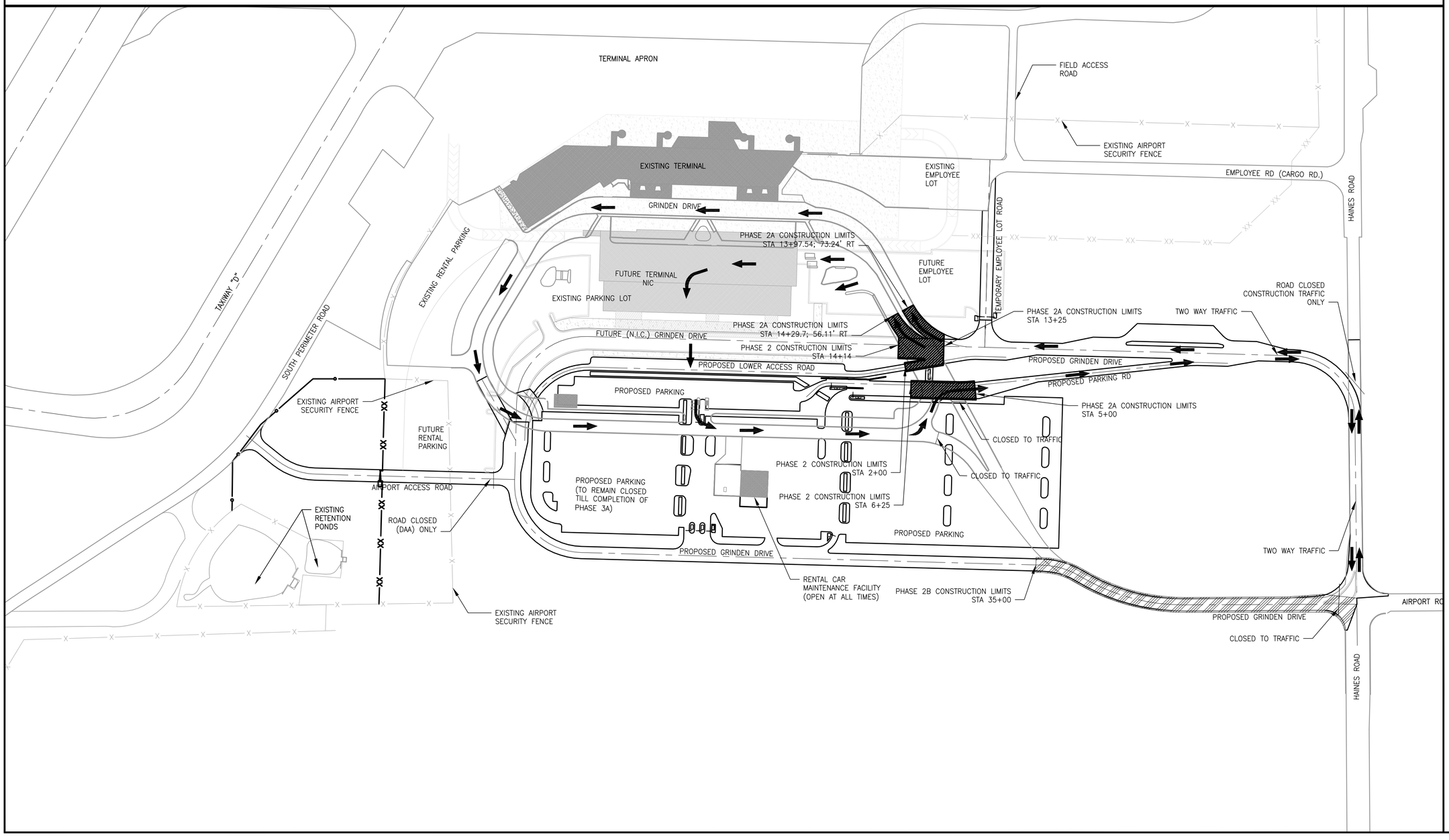
1. PAVEMENT REMOVAL
2. ASPHALT PAVING
3. CONCRETE CURB AND GUTTER INSTALLATION
4. EXCAVATION AND GRADING
5. UTILITY REMOVAL AND INSTALLATION
6. STORM SEWER INSTALLATION
7. PARKING LOT/ACCESS ROAD LIGHTING INSTALLATION
8. PERMANENT PAVEMENT MARKINGS

LEGEND

- PHASE 2A (OFF PEAK) CONSTRUCTION LIMITS
- DIRECTION OF TRAFFIC FLOW
- PHASE 2B CONSTRUCTION LIMITS

NORTH

0 100' 200'



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SHEET TITLE

PHASING AND TRAFFIC FLOW PLAN (SHEET 2 OF 3)

SHEET NUMBER

C012

BID DOCUMENTS

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PHASING 3A (3 CONSECUTIVE CALENDAR DAYS)

FOLLOWING THE COMPLETION OF PHASE 2A AND 2B, PHASE 3A CAN COMMENCE. PHASE 3A SHALL CONSIST OF CONSTRUCTING THE CROSSOVERS NECESSARY TO CONNECT THE NORTHWEST PORTION OF THE PHASE 1 CONSTRUCTION WITH THE EXISTING GRINDEN DRIVE AND PROPOSED GRINDEN DRIVE. PHASE 3A SHALL TAKE PLACE AT NIGHT (MIDNIGHT TO 5:00 AM) TRAFFIC TO TERMINAL & PARKING SHALL BE RESTORED EACH MORNING UNTIL ALL CONNECTIONS ARE COMPLETE. AT FULL COMPLETION OF THIS PHASE TRAFFIC SHALL BE REDIRECTED AND TRAFFIC CONTROL MEASURES SHALL BE IN PLACE. PHASE 3B SHALL NOT COMMENCE BEFORE THE COMPLETION OF PHASE 3A. ACCESS TO TERMINAL AND PARKING LOT SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION OF PHASE 3A & 3B. BEFORE TRAFFIC IS DIRECTED AS SHOWN ON THIS SHEET, THE TOLL BOOTH SHALL BE OPERATIONAL, AND ALL OTHER AREAS PROPERLY CLOSED.

THE WORK PERFORMED IN THIS PHASE SHALL INCLUDE BUT NOT BE LIMITED TO;
1. PAVEMENT REMOVAL
2. ASPHALT PAVING
3. EXCAVATION AND GRADING
4. UTILITY REMOVAL AND INSTALLATION
5. STORM SEWER INSTALLATION
6. PERMANENT PAVEMENT MARKING

PHASING 3B (45 CONSECUTIVE CALENDAR DAYS)

FOLLOWING THE COMPLETION OF PHASE 3A, PHASE 3B CAN COMMENCE. PHASE 3B SHALL CONSIST OF CONSTRUCTING PROPOSED LOWER ACCESS ROAD, PROPOSED PARKING ROAD AND PARKING LOT CONNECTING TO NORTHERN EDGE OF PHASE 1 CONSTRUCTION. ACCESS TO TERMINAL AND PARKING LOT SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION OF PHASE 3A & 3B.

THE WORK PERFORMED IN THIS PHASE SHALL INCLUDE BUT NOT BE LIMITED TO;
1. PAVEMENT REMOVAL
2. ASPHALT PAVING
3. EXCAVATION AND GRADING
4. UTILITY REMOVAL AND INSTALLATION
5. STORM SEWER INSTALLATION
6. CONCRETE CURB AND GUTTER INSTALLATION
7. RETAINING WALL
8. TICKET DISPENSER INSTALLATION
9. PARKING LOT/ ROAD LIGHTING INSTALLATION
10. TOLL BOOTH INSTALLATION
11. LANDSCAPING/ SODDING
12. PERMANENT PAVEMENT MARKINGS

PHASING 4 (7 CONSECUTIVE CALENDAR DAYS)

FOLLOWING THE COMPLETION OF PHASE 3A, PHASE 4 CAN COMMENCE. PHASE 4 SHALL CONSIST OF CONSTRUCTING WETLANDS ADJACENT TO EXISTING WETLANDS IN THE SOUTHEAST CORNER OF THE PROJECT AREA AND SODDING AND LANDSCAPING SITE.

THE WORK PERFORMED IN THIS PHASE SHALL INCLUDE BUT NOT BE LIMITED TO;
1. EXCAVATION AND GRADING
2. WETLAND PLANTING AND TURF ESTABLISHMENT
3. SODDING AND SEED/ MULCH
4. LANDSCAPING

PHASING 5 (15 CONSECUTIVE CALENDAR DAYS) (NOT SHOWN)

AFTER WINTER SUSPENSION HOLD OF CONTRACT PHASE 5 CAN COMMENCE IN SPRING.

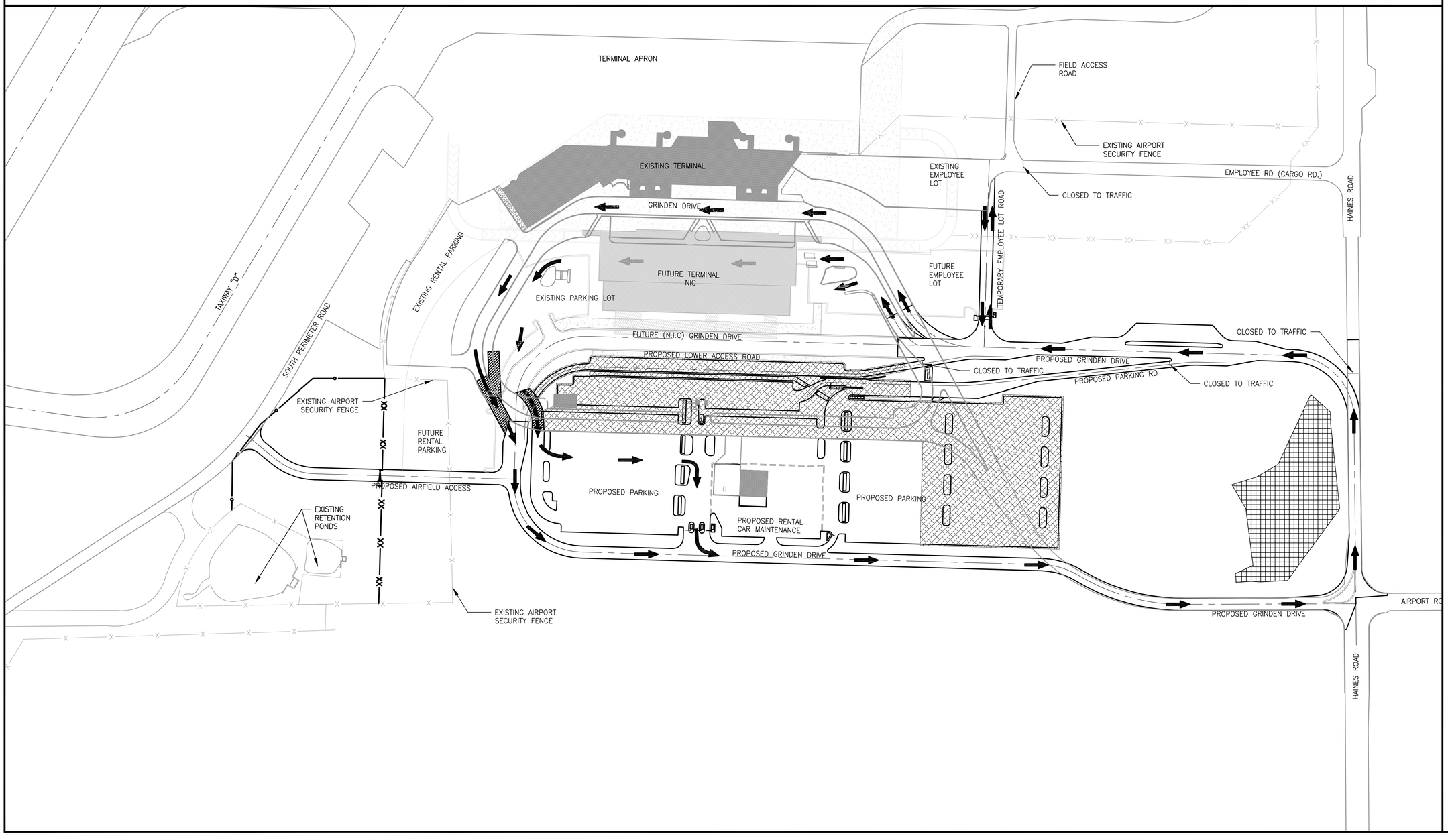
THE WORK PERFORMED IN THIS PHASE SHALL INCLUDE BUT NOT BE LIMITED TO;
2. WETLAND PLANTING AND TURF ESTABLISHMENT
3. SODDING AND SEED/ MULCH
4. LANDSCAPING

LEGEND

- PHASE 3A CONSTRUCTION LIMITS
- PHASE 3B CONSTRUCTION LIMITS
- PHASE 4 CONSTRUCTION LIMITS
- DIRECTION OF TRAFFIC FLOW

NORTH

0 100' 200'



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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

PHASING AND TRAFFIC FLOW PLAN (SHEET 3 OF 3)

SHEET NUMBER

C013

BID DOCUMENTS

T:\P-2141882.093 Duluth Terminal Design CivilCAD\C-Civil\C013.dwg, 5/7/2009 11:05:00 AM

DEMOLITION NOTES

1. SEE SHEETS E100 TO E108 FOR ELECTRICAL DEMOLITION,

2. THE DEMOLITION OF STRUCTURES SHALL INCLUDE THE COMPLETE REMOVAL AND DISPOSAL OF THEIR CONTENTS, FOUNDATIONS. ANY UNFILLED EXCAVATION OR OTHER HAZARD LEFT UNATTENDED DURING PERIODS OF INACTIVITY SHALL BE PROPERLY FENCED OR PROTECTED BY THE CONTRACTOR. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE STRUCTURE DEMOLITION. ALL UTILITIES, ELECTRICAL DUCTS/CABLES SHALL BE REMOVED AND/OR CAPPED TO THE SATISFACTION OF THE ENGINEER AND IN ACCORDANCE WITH ALL STATE PROVISIONS AND LOCAL REGULATIONS. THE REMOVAL OF ANY ITEM(S) OR OBJECT(S) LOCATED WITHIN THE LIMITS SHOWN FOR WHICH A SPECIFIC PAY ITEM IS NOT CONTAINED IN THE BID PROPOSAL SHALL BE INCIDENTAL TO THE ASSOCIATED BUILDING DEMOLITION.

3. ALL REFUSE SHALL BE CLEARED FROM THE PROJECT SITE TO THE SATISFACTION OF THE ENGINEER. THE LOCAL CONTRACTOR SHALL DISPOSE OF REFUSE OFFSITE IN ACCORDANCE WITH ALL STATE AND LOCAL REQUIREMENTS.

4. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN THE NECESSARY LOCAL PERMITS THAT ARE REQUIRED.

5. THE AIRPORT RESERVES THE RIGHT TO REMOVE AND SAVE ANY SALVAGEABLE MATERIALS PRIOR TO THE BUILDING DEMOLITION. THE CONTRACTOR SHALL GIVE A TWO WEEK NOTICE PRIOR TO BEGINNING BUILDING DEMOLITION.

6. PAVEMENT TO BE REMOVED THAT IS ADJACENT TO PAVEMENT TO REMAIN SHALL BE SAWCUT TO STRAIGHT, NEAT, PLUMB LINES PRIOR TO REMOVAL.

7. MATCHLINES ARE THE LIMIT OF WORK FOR CONTRACT QUANTITIES SHOWN ON EACH SHEET.

8. THERE ARE EXISTING UNDERGROUND ELECTRICAL AND COMMUNICATIONS CABLES IN THE PROJECT WORK AREAS. THE ENGINEER HAS MADE EVERY EFFORT TO SHOW THEIR APPROXIMATE LOCATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY CABLE LOCATED, FLAGGED AND IDENTIFIED PRIOR TO CONSTRUCTION. ANY DAMAGE DONE TO FLAGGED OR OTHERWISE LOCATED CABLES SHALL BE REPLACED AT THE CONTRACTORS EXPENSE. LOCATION OF EXISTING UTILITIES MAY BE DONE BY CALLING GOPHER STATE ONE CALL 1-800-252-1166 TO NOTIFY LOCAL UTILITIES. THIS IS REQUIRED BY LAW.

9. ALL EXISTING AIRPORT SIGNAGE ON ANY FENCING DEMOLITION WILL BE SALVAGED AND TURNED OVER TO THE OWNER.

10. ALL DEMOLITION IS TO BE PHASED TO MAINTAIN TRAFFIC FLOW TO AND FROM THE EXISTING TERMINAL BUILDING. SEE SHEETS C011-C013.

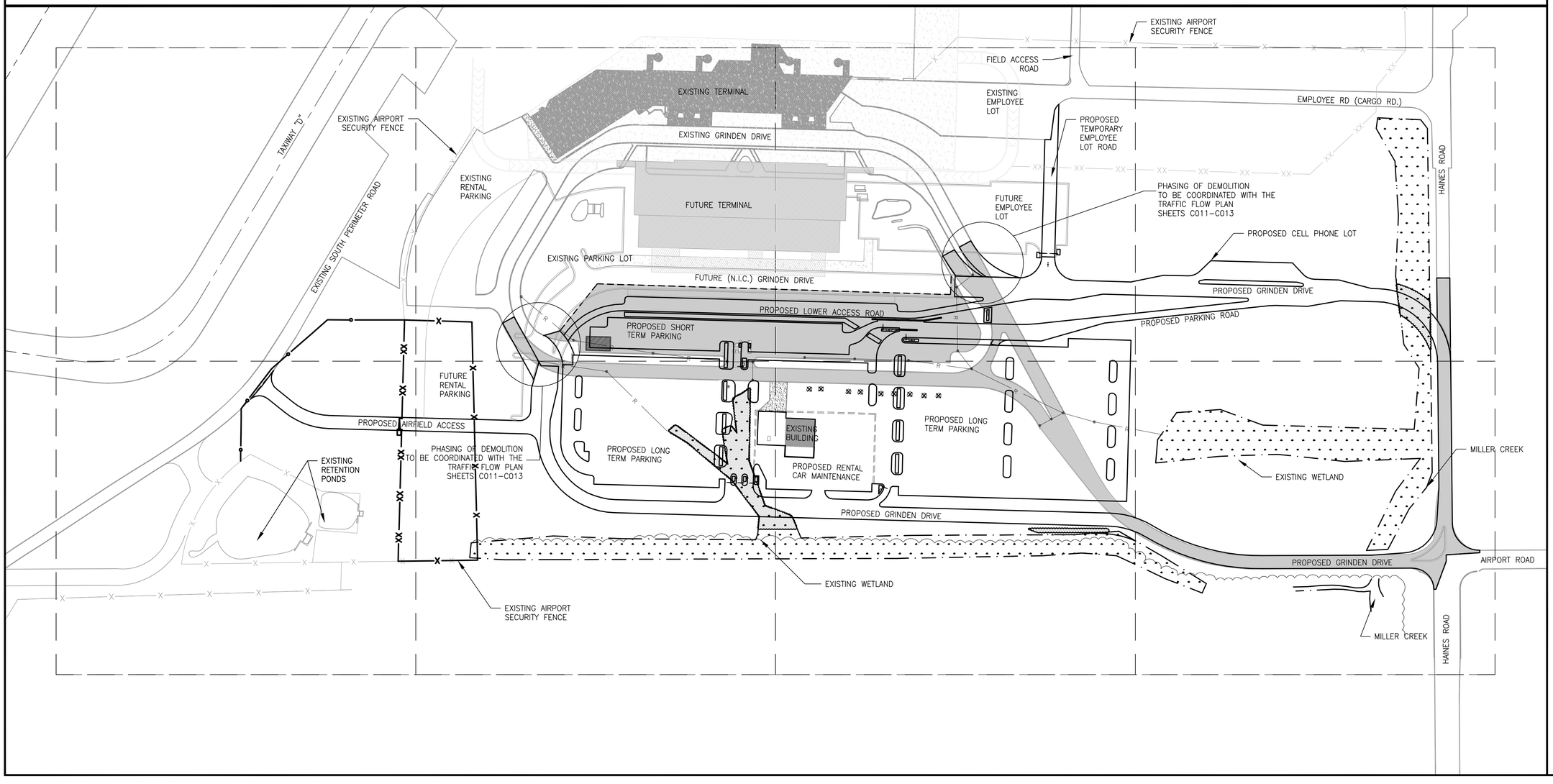
DEMOLITION LEGEND

- EXISTING FENCE TO REMAIN
- REMOVE EXISTING AIRFIELD SECURITY FENCE
- TEMPORARY SECURITY FENCE
- REMOVE EXISTING STORM SEWER
- SHEET MATCHLINE
- CLEAR ISOLATED TREE
- CLEARING AND GRUBBING
- EXISTING TREES TO REMAIN
- EXISTING BITUMINOUS PAVEMENT REMOVAL
- EXISTING CONCRETE PAVEMENT REMOVAL
- EXISTING CURB REMOVAL
- DEMOLISH EXISTING BUILDING OR SALVAGE
- SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)

NOTE:
PROPOSED FEATURES SHOWN FOR REFERENCE ONLY.

NORTH

0 100' 200'



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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING OVERALL PLAN AND NOTES

SHEET NUMBER
C100

BID DOCUMENTS

T:\P-214-1882-093\Dgn\Terminal Design (LAD)\C-C2A1x1728.dwg, 5/7/2009 11:56:05 AM

MATCH LINE SHEET C105

TAXIWAY "D"

107'

180'

TSA

TDFA

PROPOSED TEMPORARY SECURITY FENCE CORNER
N: 452577.88
E: 2854088.55

END OF SAWCUT
N: 452574.73
E: 2854092.43

SAW CUT 68 LF BITUMINOUS FULL DEPTH FOR CONNECTION TO EXISTING

5'

PROPOSED TEMPORARY SECURITY FENCE CORNER
N: 452504.86
E: 2854032.93

TRAFFIC CONTROL DEVICES PER THE CONTRACTOR'S TRAFFIC CONTROL PLAN (TYPICAL)

END OF SAWCUT
N: 452522.22
E: 2854049.84

PROPOSED GATE POSTS

PROPOSED AIRFIELD ACCESS

PROPOSED TEMPORARY SECURITY FENCE CORNER
N: 452408.20
E: 2854032.42

EXISTING FENCE TO REMAIN

PROPOSED FENCE

SOUTH PERIMETER ROAD

GRAVEL ACCESS ROAD

POND

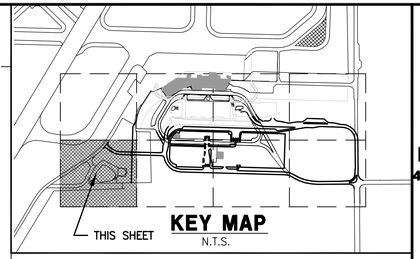
POND

MATCH LINE SHEET C102

REMOVE FENCE 33 LF

PROPOSED FENCE CORNER
N:452224.53
E:2854320.88

EXISTING FENCE TO REMAIN



KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION LEGEND

- EXISTING FENCE TO REMAIN
- REMOVE EXISTING AIRFIELD SECURITY FENCE
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MINNESOTA STATE PLANE NORTH (1996)
VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

SEE SHEET C007 FOR A LIST OF HORIZONTAL AND VERTICAL CONTROL POINTS

AIRFIELD NOTE:

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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 1 OF 8)

SHEET NUMBER

C101

BID DOCUMENTS

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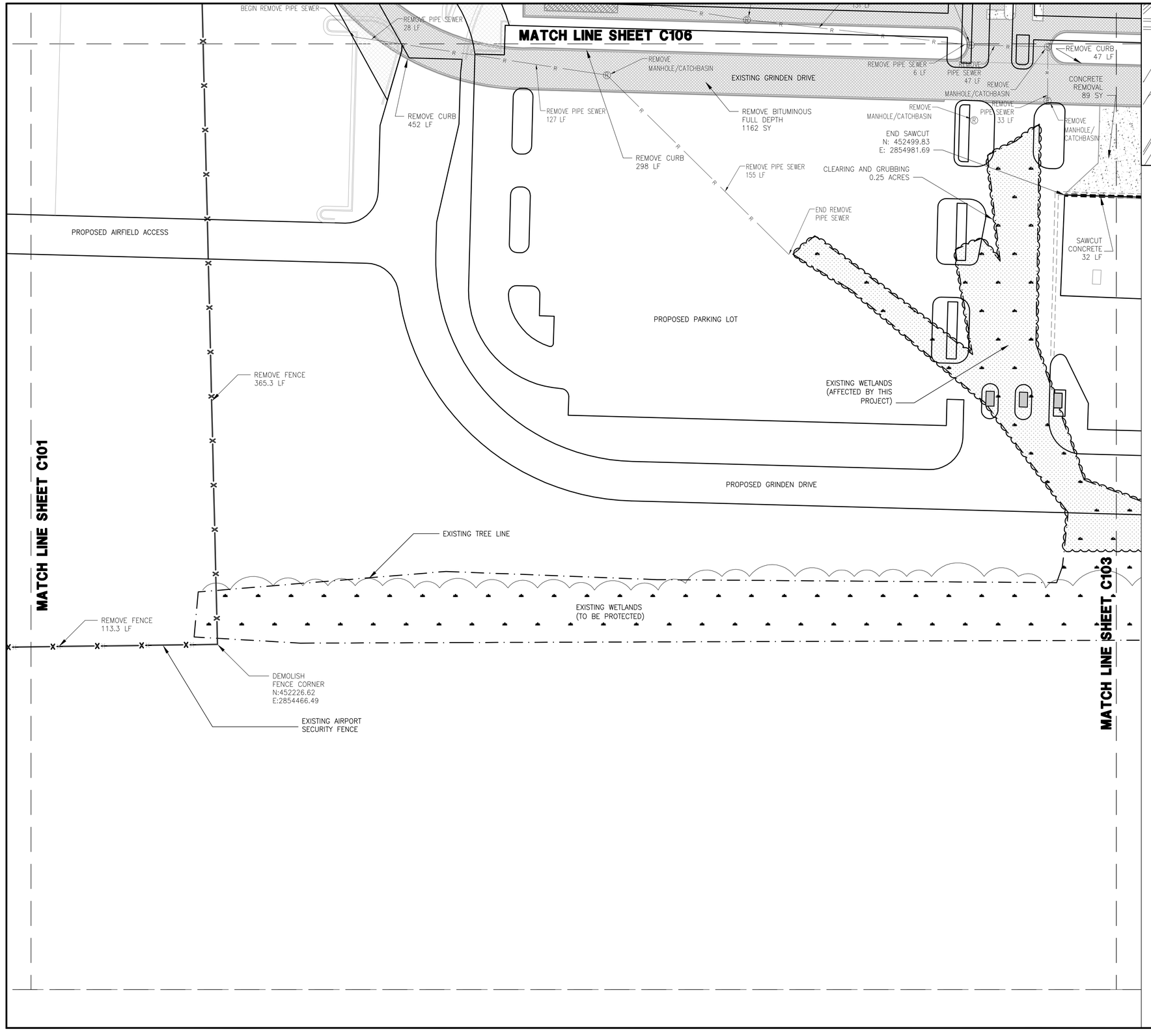

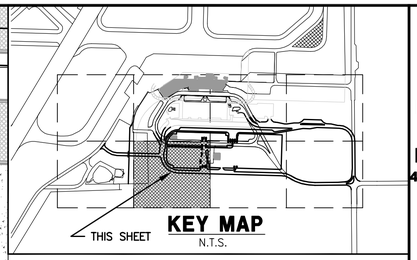

KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION LEGEND

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- SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 2 OF 8)

SHEET NUMBER
C102

BID DOCUMENTS

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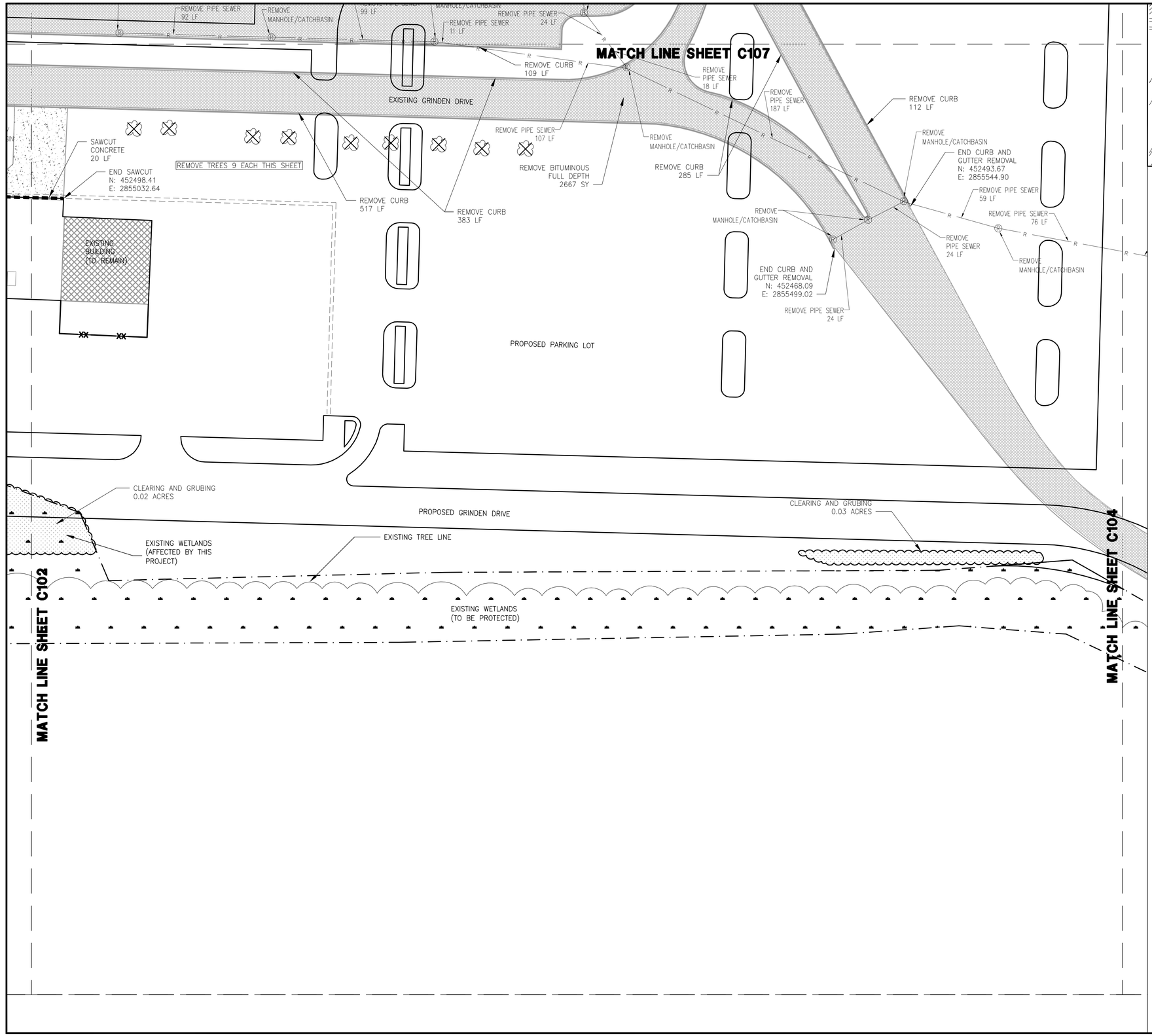

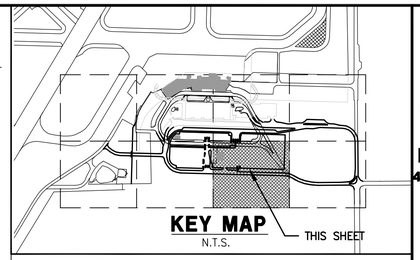

NORTH

0 30' 60'

DEMOLITION LEGEND

- EXISTING FENCE TO REMAIN
- REMOVE EXISTING AIRFIELD SECURITY FENCE
- TEMPORARY SECURITY FENCE
- REMOVE EXISTING STORM SEWER
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- SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 3 OF 8)

SHEET NUMBER
C103

BID DOCUMENTS

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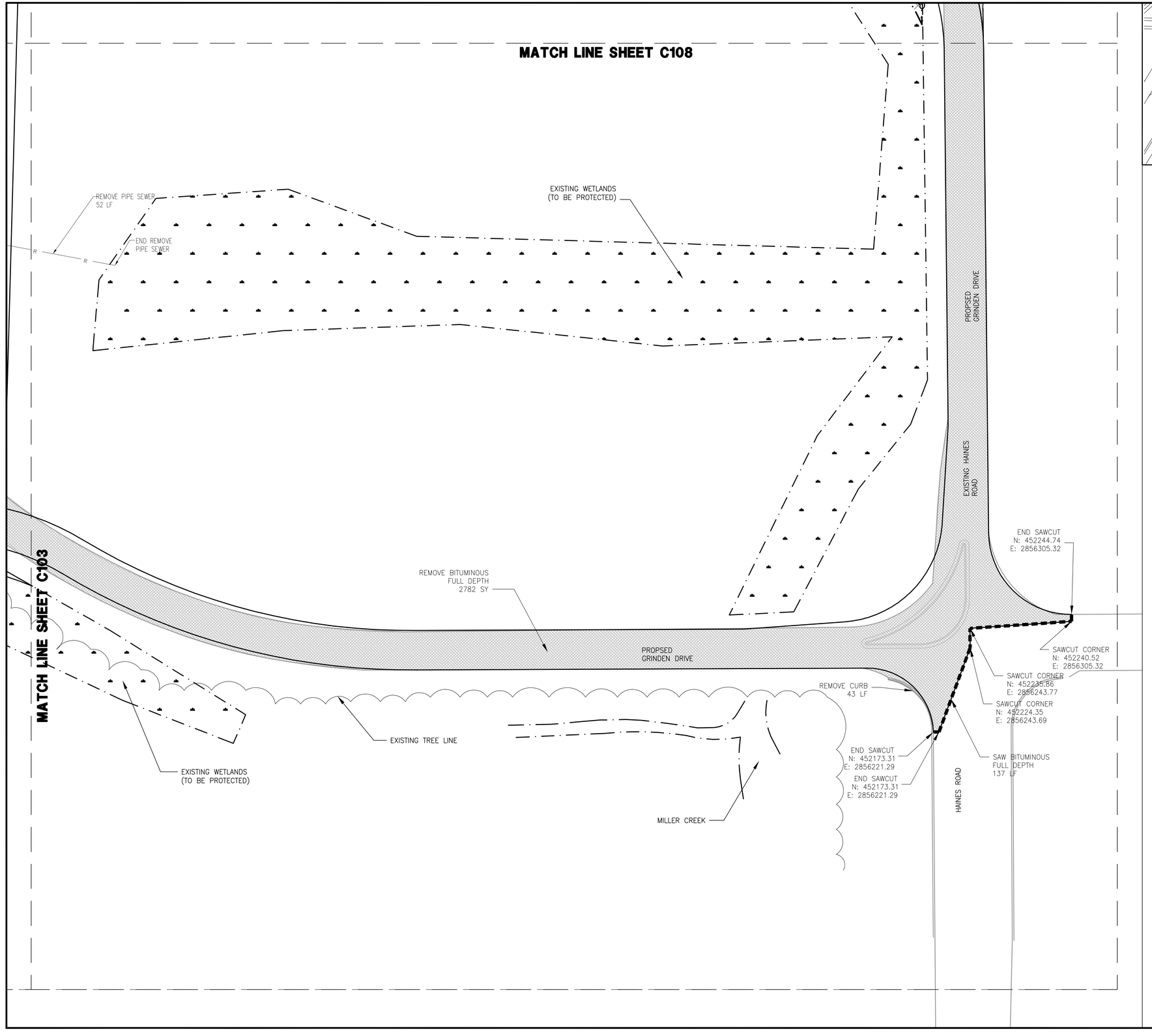

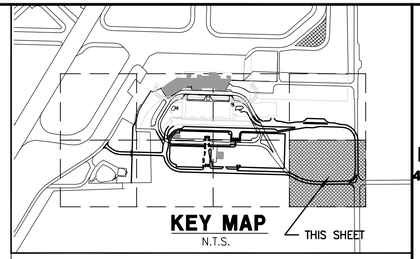

NORTH

0 30' 60'

DEMOLITION LEGEND

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- REMOVE EXISTING AIRFIELD SECURITY FENCE
- TEMPORARY SECURITY FENCE
- REMOVE EXISTING STORM SEWER
- SHEET MATCHLINE
- CLEAR ISOLATED TREE
- CLEARING AND GRUBBING
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- EXISTING CURB REMOVAL
- DEMOLISH EXISTING BUILDING OR SALVAGE
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SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 4 OF 8)

SHEET NUMBER
C104

BID DOCUMENTS

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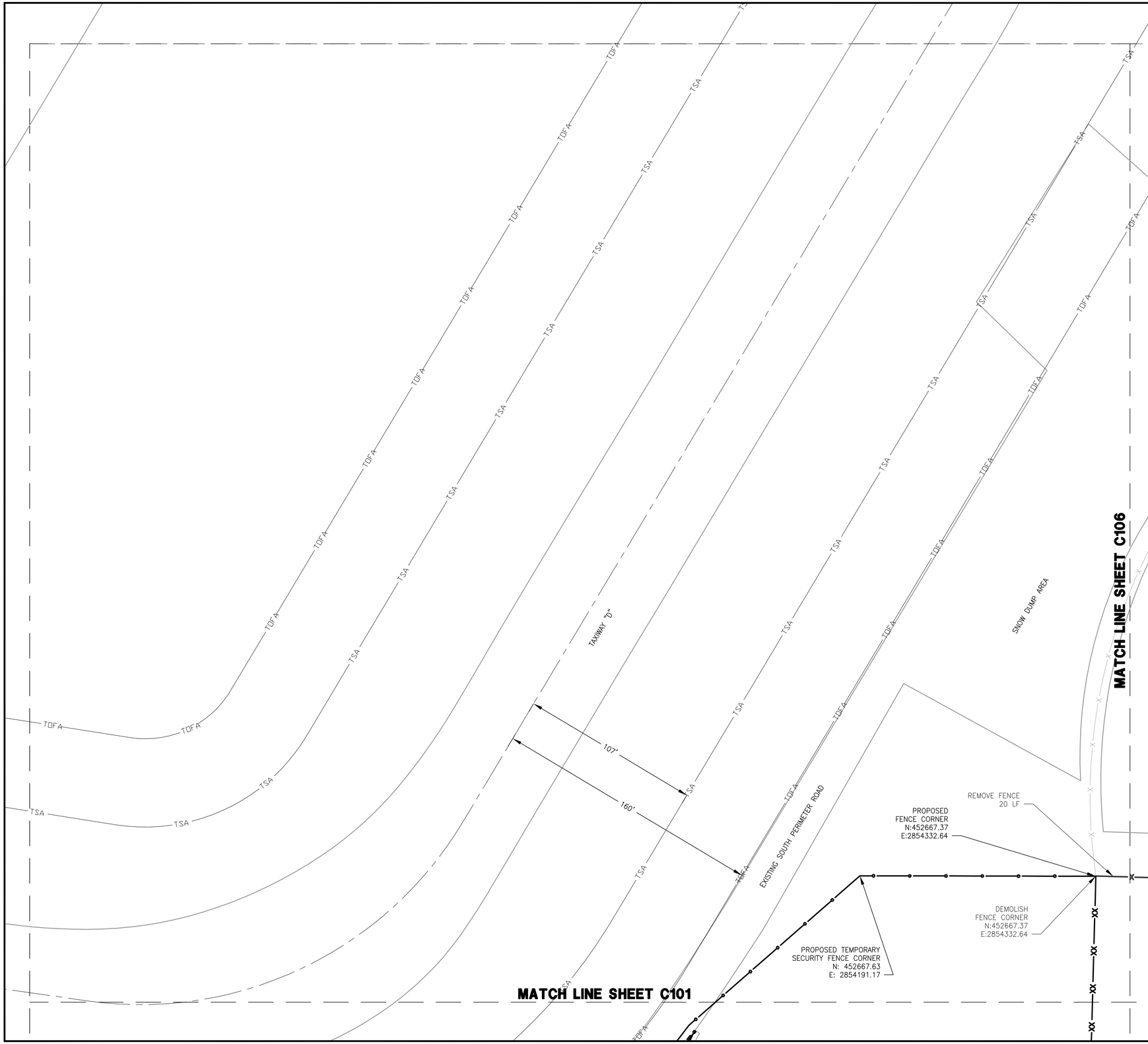

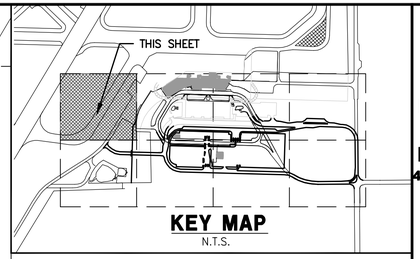

KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION LEGEND

- EXISTING FENCE TO REMAIN
- REMOVE EXISTING AIRFIELD SECURITY FENCE
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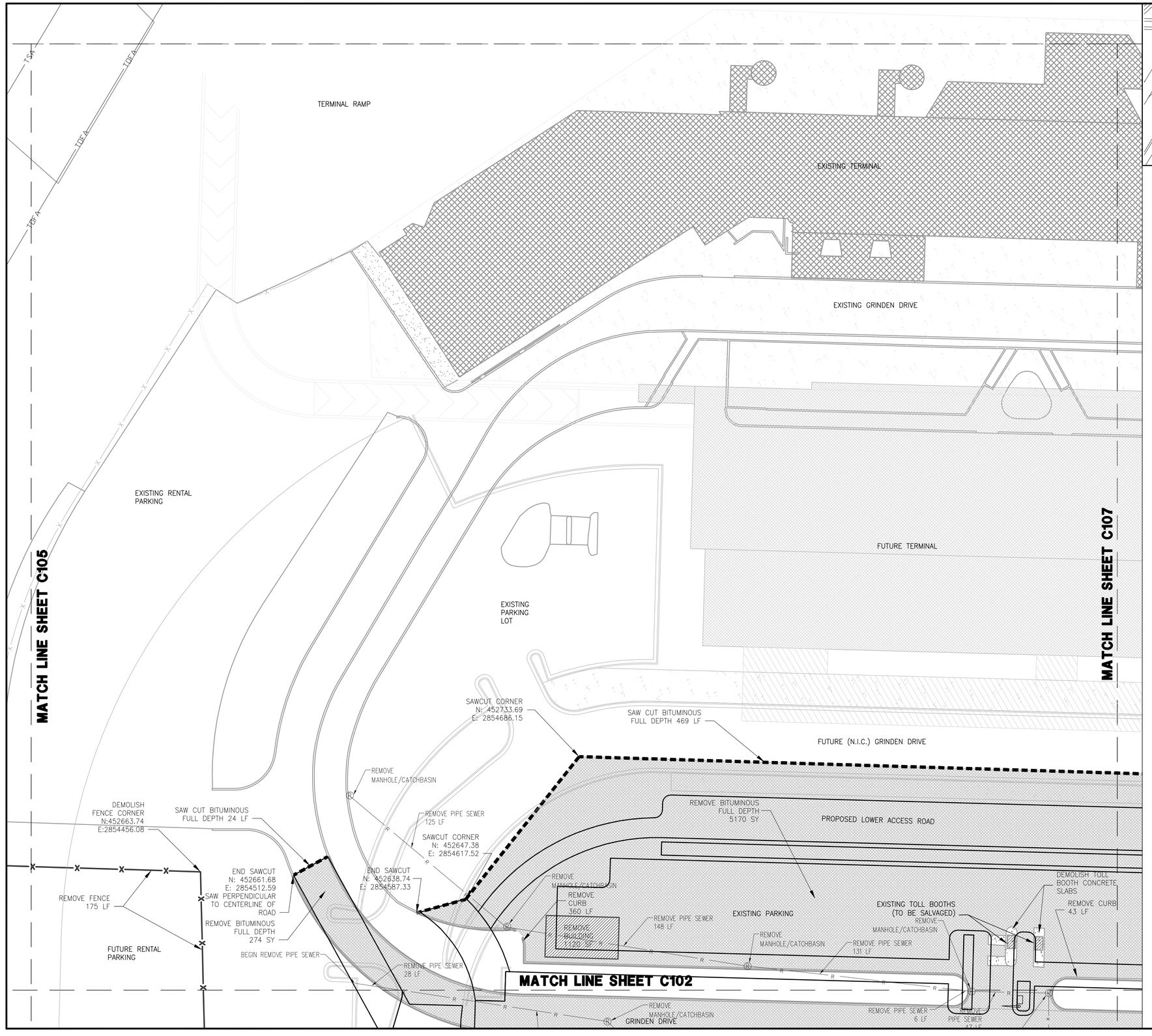
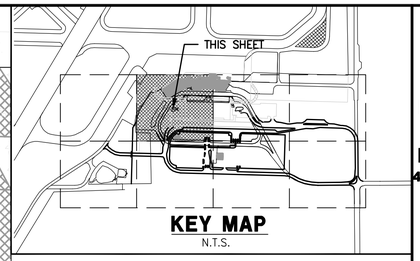
SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 5 OF 8)

SHEET NUMBER
C105

BID DOCUMENTS





KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION LEGEND

- EXISTING FENCE TO REMAIN
- REMOVE EXISTING AIRFIELD SECURITY FENCE
- TEMPORARY SECURITY FENCE
- REMOVE EXISTING STORM SEWER
- SHEET MATCHLINE
- CLEAR ISOLATED TREE
- CLEARING AND GRUBBING
- EXISTING TREES TO REMAIN
- EXISTING BITUMINOUS PAVEMENT REMOVAL
- EXISTING CONCRETE PAVEMENT REMOVAL
- EXISTING CURB REMOVAL
- DEMOLISH EXISTING BUILDING OR SALVAGE
- SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)

NOTE:
1. PROPOSED FEATURES SHOWN FOR REFERENCE ONLY.
2. QUANTITIES SHOWN WITHIN THE MATCH LINES ON THIS SHEET ARE ONLY FOR THIS SHEET.

NOTE:
ALL NORTHINGS, EASTINGS AND ELEVATIONS LABELED ON THESE PLANS ARE IN:
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VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

SEE SHEET C007 FOR A LIST OF HORIZONTAL AND VERTICAL CONTROL POINTS

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 6 OF 8)

SHEET NUMBER
C106

BID DOCUMENTS

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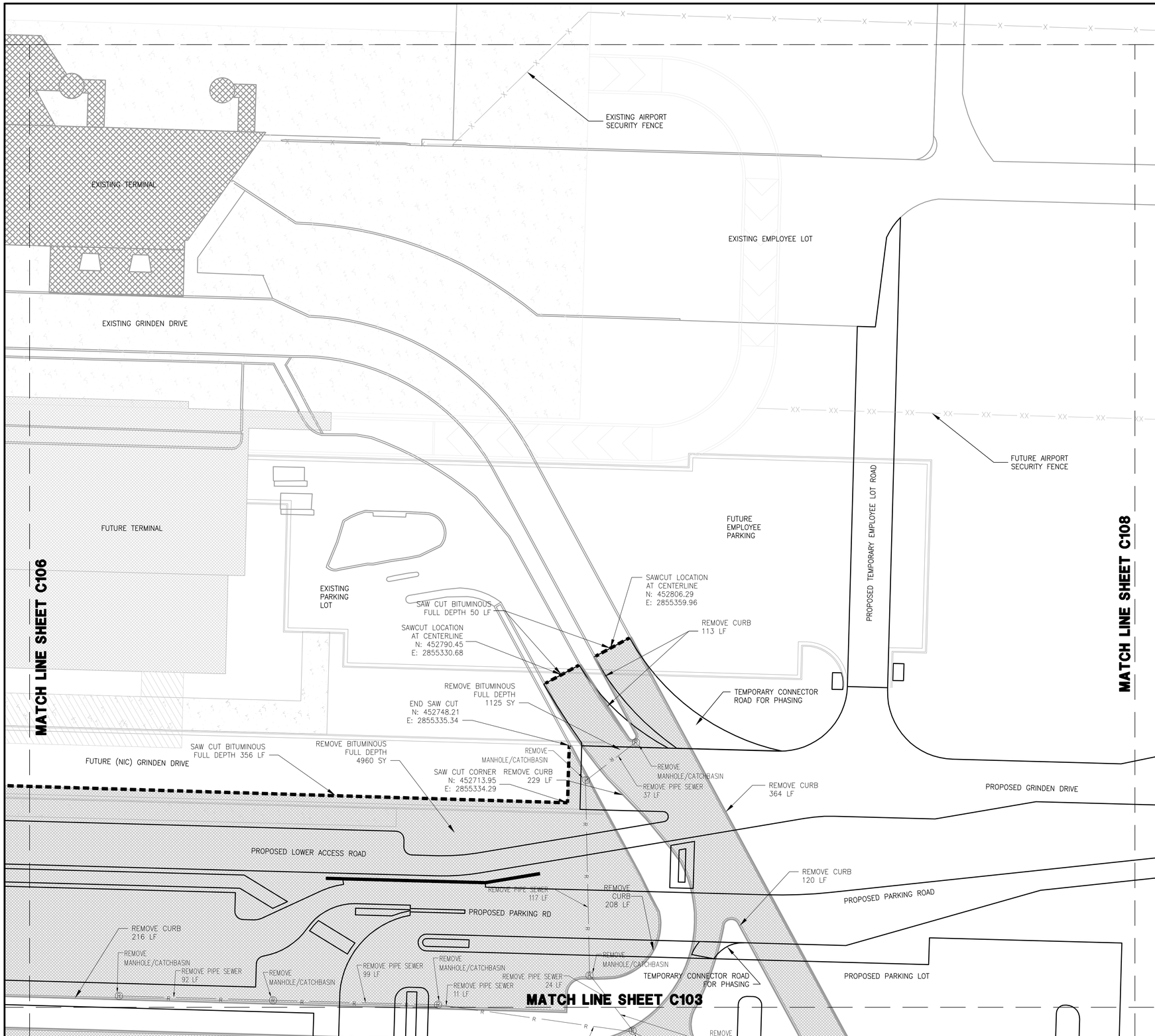

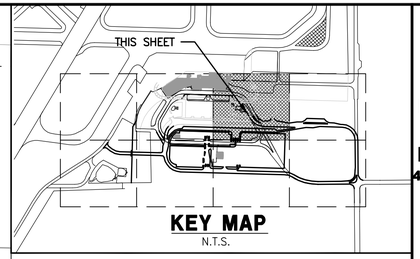

KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION LEGEND

- EXISTING FENCE TO REMAIN
- REMOVE EXISTING AIRFIELD SECURITY FENCE
- TEMPORARY SECURITY FENCE
- REMOVE EXISTING STORM SEWER
- SHEET MATCHLINE
- CLEAR ISOLATED TREE
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- EXISTING BITUMINOUS PAVEMENT REMOVAL
- EXISTING CONCRETE PAVEMENT REMOVAL
- EXISTING CURB REMOVAL
- DEMOLISH EXISTING BUILDING OR SALVAGE
- SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)

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NO.	DESCRIPTION	DATE

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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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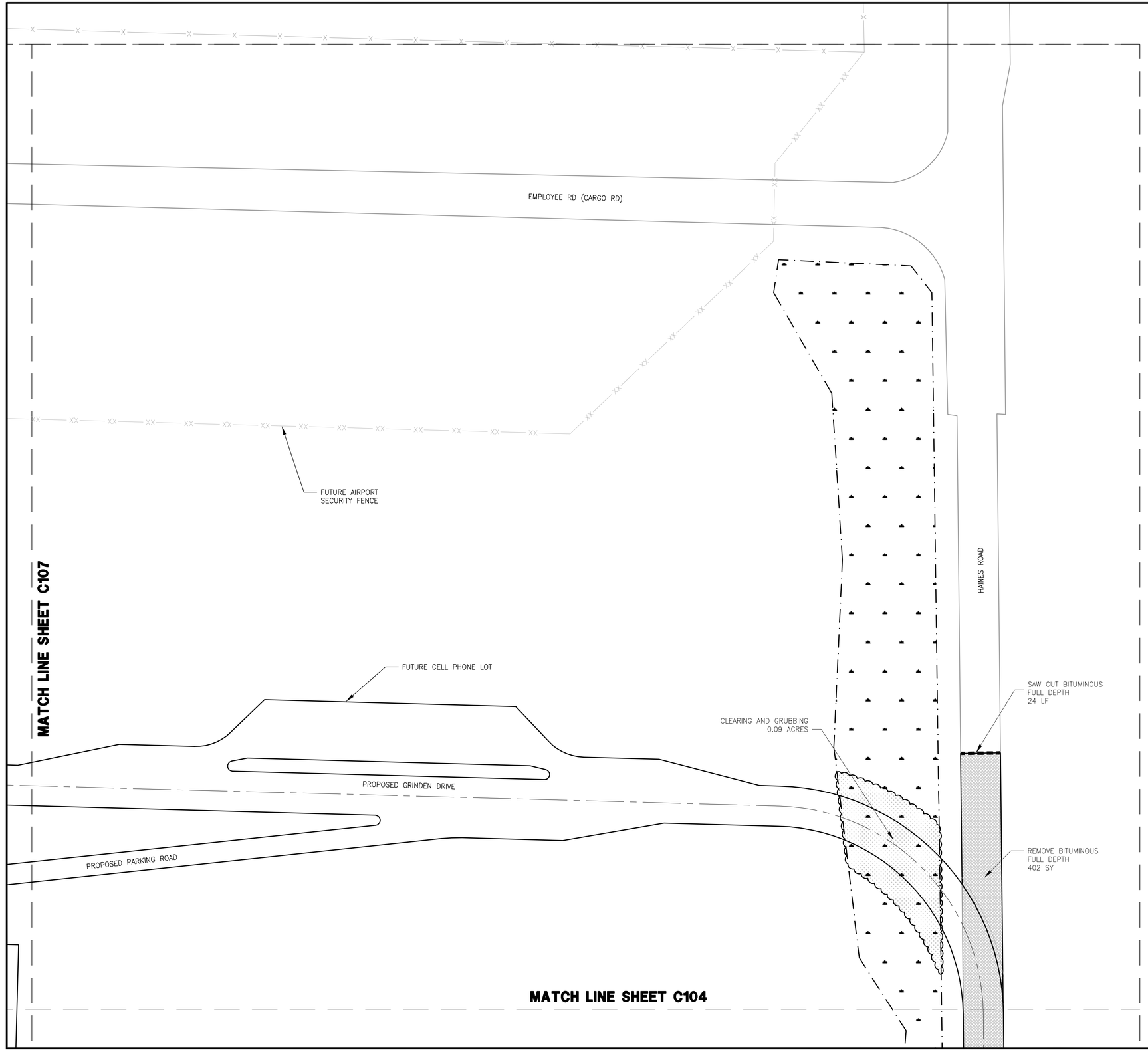
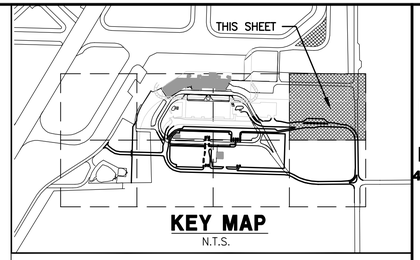
SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 7 OF 8)

SHEET NUMBER
C107

BID DOCUMENTS





KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION LEGEND

- EXISTING FENCE TO REMAIN
- REMOVE EXISTING AIRFIELD SECURITY FENCE
- TEMPORARY SECURITY FENCE
- REMOVE EXISTING STORM SEWER
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- CLEAR ISOLATED TREE
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NO.	DESCRIPTION	DATE

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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
DEMOLITION, CLEARING AND GRUBBING PLAN (SHEET 8 OF 8)

SHEET NUMBER
C108

BID DOCUMENTS

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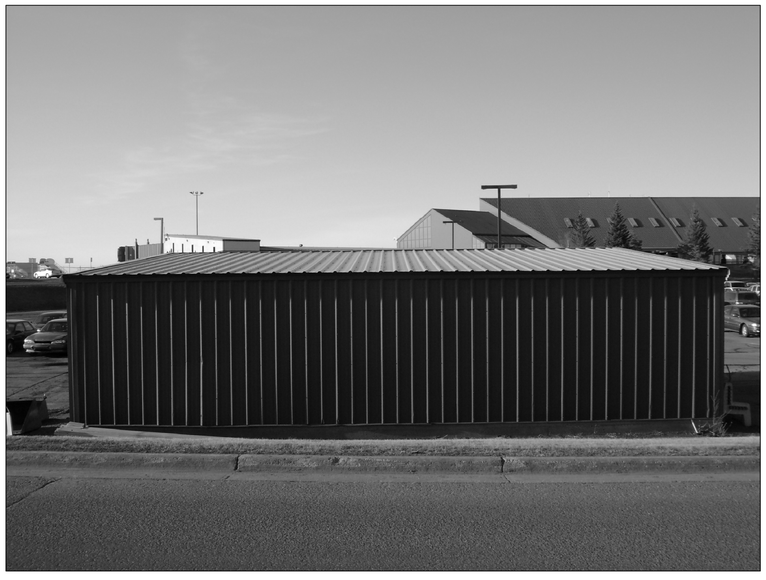
GARAGE BUILDING TO BE DEMOLISHED (NORTH)

GARAGE BUILDING TO BE DEMOLISHED (WEST SIDE)



GARAGE BUILDING TO BE DEMOLISHED (SOUTH)

TOLL BOOTHS TO BE SALVAGED/RELOCATED & ACCESS, GATE EQUIPMENT

NOTE: ALL DEMOLITION AND RELOCATING SHALL BE DONE IN COORDINATION WITH THE PHASING OF TRAFFIC TO ACCOMMODATE TRAFFIC TO AND FROM THE EXISTING TERMINAL BUILDING.

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Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
DEMOLITION DETAILS AND PHOTOS

SHEET NUMBER
C109

BID DOCUMENTS

HORIZONTAL CURVE DATA TABLE

CURVE NUMBER	CENTER	PC	PT	RADIUS	DELTA	LENGTH	ALIGNMENT NAME
1	N:452587.8783 E:2856114.8979	N:452589.1811 E:2856239.8908	N:452712.8318 E:2856118.3070	125.0'	87° 50' 24"	191.64'	GRINDEN DRIVE
2	N:452600.0092 E:2855926.9442	N:45266.9720 E:2855929.6717	N:452699.4515 E:2855916.3980	100.0'	7° 37' 00"	13.29'	PARKING ACCESS ROAD
3	N:452611.8981 E:2855491.2142	N:452711.8609 E:2855493.9416	N:45271035131 E:2855474.6284	100.0'	11° 06' 36"	19.39'	LOWER ACCESS ROAD
4	N:452952.8466 E:2855461.0891	N:452654.5196 E:2855492.7278	N:452652.9582 E:2855452.90061	300.0'	7° 37' 00"	39.88'	PARKING ACCESS ROAD
5	N:452952.8466 E:2855461.0891	N:452677.9917 E:2855281.2642	N:452676.3069 E:2855257.1230	125.0'	11° 06' 35"	24.24'	LOWER ACCESS ROAD
6	N:452619.6561 E:2855206.8806	N:452659.6413 E:2855207.9716	N:452649.1680 E:2855179.8797	40.0'	44° 01' 08"	30.73'	PARKING ACCESS ROAD
7	N:452565.5641 E:2854733.0263	N:452690.5133 E:2854736.4564	N:452566.9034 E:2854608.0372	125.0'	90° 57' 31"	198.43'	LOWER ACCESS ROAD
8	N:452615.7601 E:2854726.3861	N:452750.7099 E:2854730.0682	N:452619.3704 E:2854591.4344	135.0'	90° 01' 50"	212.13'	GRINDEN DRIVE
9	N:452605.0701 E:2854198.1442	N:452480.1149 E:2854194.7968	N:452507.6858 E:2854119.7778	125.0'	37° 17' 22"	81.35'	AIRPORT ACCESS ROAD
10	N:452460.8155 E:2854722.2410	N:452464.4258 E:2854587.2893	N:452325.8658 E:2854718.5589	135.0'	89° 58' 10"	211.99'	GRINDEN DRIVE
11*	N:452151.1829 E:2855621.1442	N:452301.1271 E:2855625.2354	N:452279.6581 E:2855698.5659	150.0'	29° 30' 40"	77.26'	GRINDEN DRIVE
12 **	N:452617.9781 E:2855902.4444	N:452279.6581 E:2855698.5659	N:452222.9820 E:2855900.2168	395.0'	30° 45' 03"	212.00'	GRINDEN DRIVE

NOTES:
1. *PT THIS CURVE IS PRC CURVE #11
2. ** PC THIS CURVE IS PRC CURVE #12

TEMPORARY ROAD CONNECTIONS HORIZONTAL CURVE DATA TABLE

CURVE NUMBER	CENTER	PC	PT	RADIUS	DELTA	LENGTH	ALIGNMENT NAME
13	N:452879.4958 E:2855491.9817	N:452730.3601 E:2855475.8919	N:452804.6463 E:2855361.9893	150.0'	53° 54' 58"	141.15'	TEMPORARY ROAD CONNECTION
14	N:452832.3931 E:2855439.4738	N:452732.9287 E:2855381.7514	N:452782.4180 E:2855335.9000	115.0'	34° 06' 52"	68.47'	TEMPORARY ROAD CONNECTION
15	N:452576.2839 E:2854548.6294	N:452643.3980 E:2854603.9918	N:452585.2296 E:2854635.1700	87.0'	44° 34' 45"	67.69'	TEMPORARY PARKING CONNECTION

NOTES:
1. THE TEMPORARY ROAD CONNECTIONS SHALL BE PLACED FOR EXISTING TERMINAL TRAFFIC AND SHALL BE PHASED. SEE SHEETS C012–C015 FOR TRAFFIC CONTROL AND PHASING.

NOTE:
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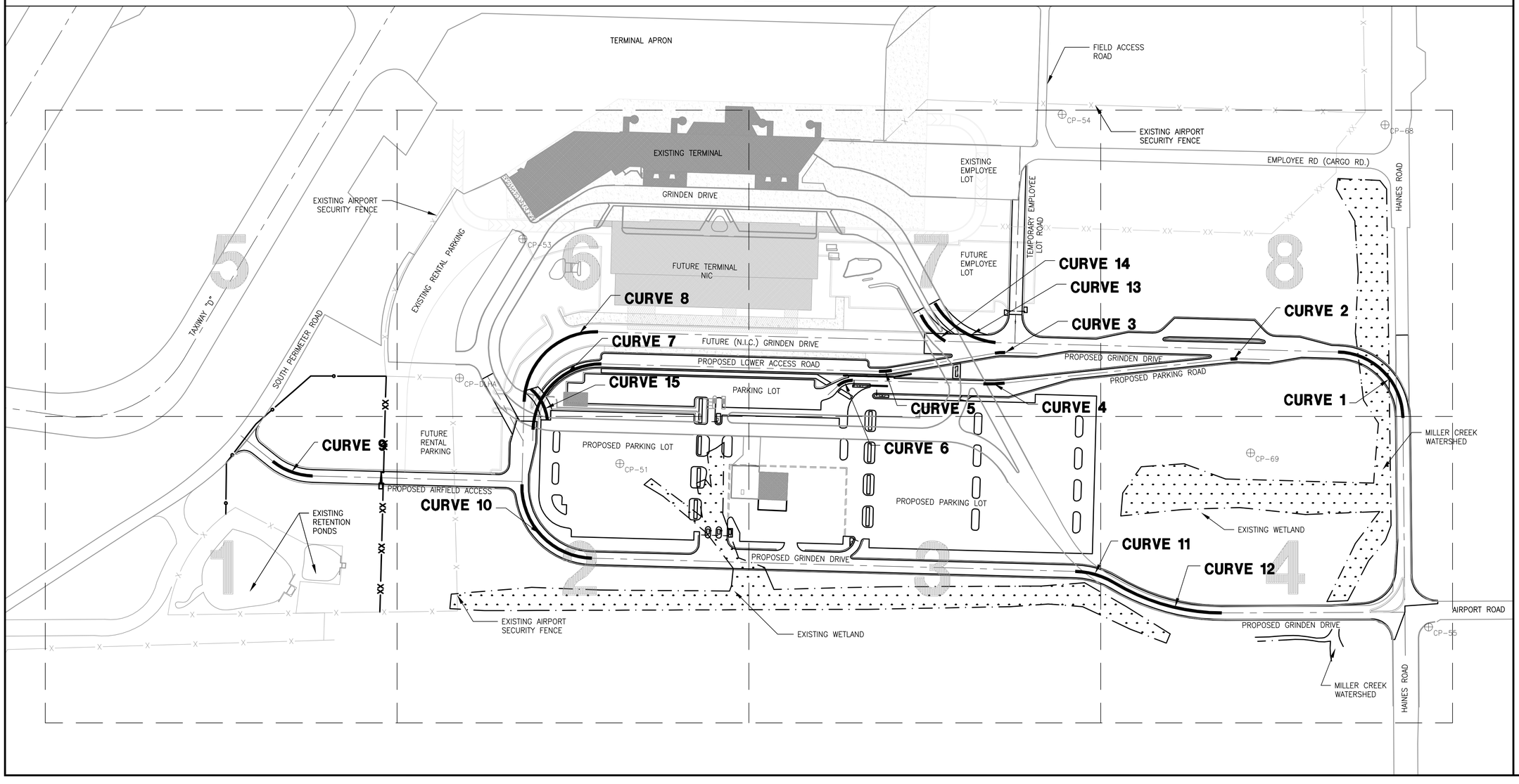
MINNESOTA STATE PLANE NORTH (1996)
VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

* SEE SHEET C007 FOR CONTROL POINT INFORMATION

NORTH

0 100' 200'



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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

HORIZONTAL GEOMETRY DATA

SHEET NUMBER

C200

BID DOCUMENTS

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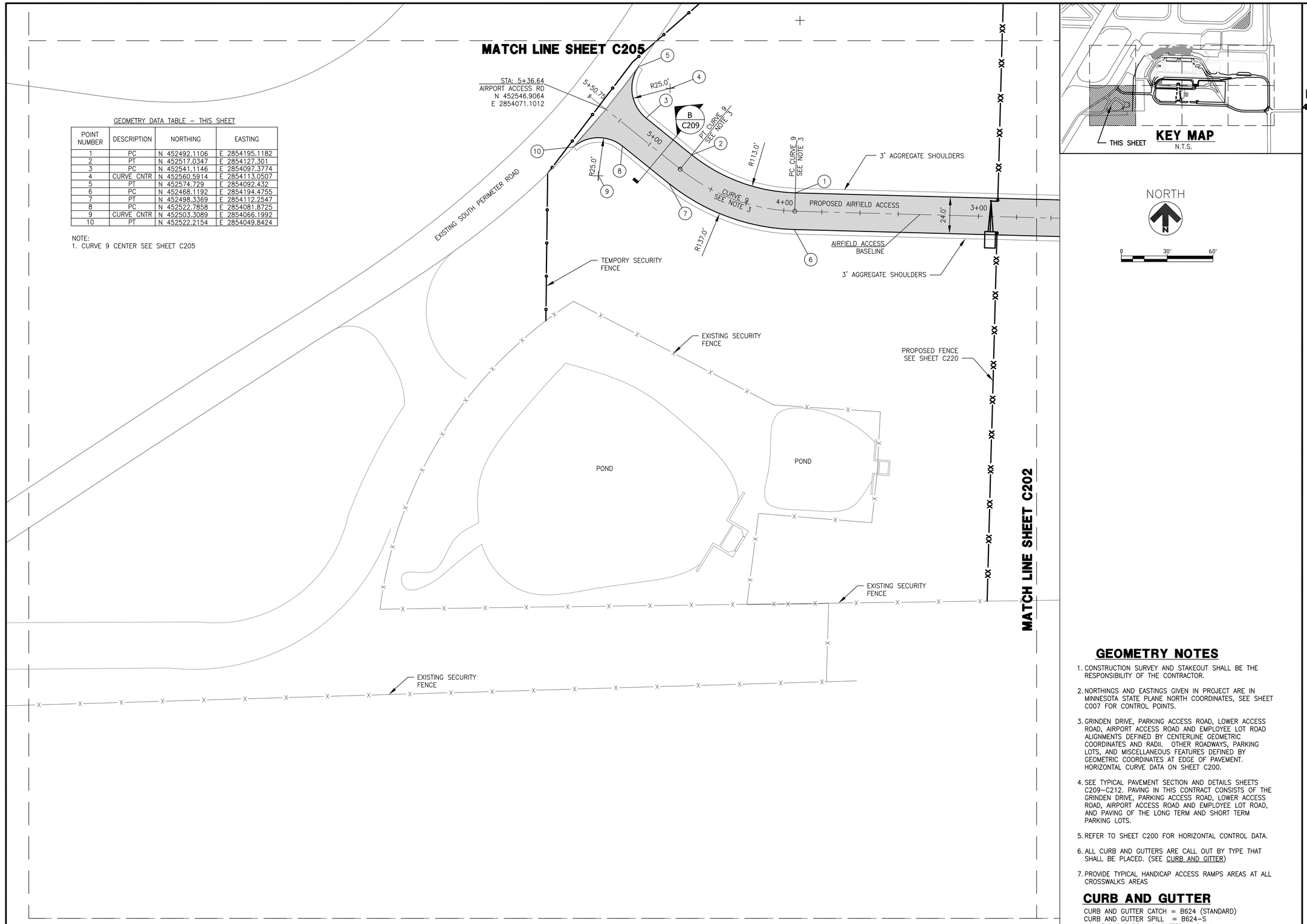

GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
1	PC	N 452492.1106	E 2854195.1182
2	PT	N 452517.0347	E 2854127.301
3	PC	N 452541.1146	E 2854097.3774
4	CURVE CNTR	N 452560.5914	E 2854113.0507
5	PT	N 452574.729	E 2854092.432
6	PC	N 452468.1192	E 2854194.4755
7	PT	N 452498.3369	E 2854112.2547
8	PC	N 452522.7858	E 2854081.8725
9	CURVE CNTR	N 452503.3089	E 2854066.1992
10	PT	N 452522.2154	E 2854049.8424

NOTE:
1. CURVE 9 CENTER SEE SHEET C205

GEOMETRY NOTES

1. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. NORTHINGS AND EASTINGS GIVEN IN PROJECT ARE IN MINNESOTA STATE PLANE NORTH COORDINATES, SEE SHEET C007 FOR CONTROL POINTS.
3. GRINDEN DRIVE, PARKING ACCESS ROAD, LOWER ACCESS ROAD, AIRPORT ACCESS ROAD AND EMPLOYEE LOT ROAD ALIGNMENTS DEFINED BY CENTERLINE GEOMETRIC COORDINATES AND RADII. OTHER ROADWAYS, PARKING LOTS, AND MISCELLANEOUS FEATURES DEFINED BY GEOMETRIC COORDINATES AT EDGE OF PAVEMENT. HORIZONTAL CURVE DATA ON SHEET C200.
4. SEE TYPICAL PAVEMENT SECTION AND DETAILS SHEETS C209–C212. PAVING IN THIS CONTRACT CONSISTS OF THE GRINDEN DRIVE, PARKING ACCESS ROAD, LOWER ACCESS ROAD, AIRPORT ACCESS ROAD AND EMPLOYEE LOT ROAD, AND PAVING OF THE LONG TERM AND SHORT TERM PARKING LOTS.
5. REFER TO SHEET C200 FOR HORIZONTAL CONTROL DATA.
6. ALL CURB AND GUTTERS ARE CALL OUT BY TYPE THAT SHALL BE PLACED. (SEE CURB AND GITTER)
7. PROVIDE TYPICAL HANDICAP ACCESS RAMPS AREAS AT ALL CROSSWALKS AREAS

CURB AND GUTTER

CURB AND GUTTER CATCH = B624 (STANDARD)
CURB AND GUTTER SPILL = B624–S
MOUNTABLE CURB AND GUTTER = D424
HANDICAP ACCESS RAMP AREA = HARA

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SHEET TITLE

GEOMETRY PLAN (SHEET 1 OF 8)

SHEET NUMBER

C201

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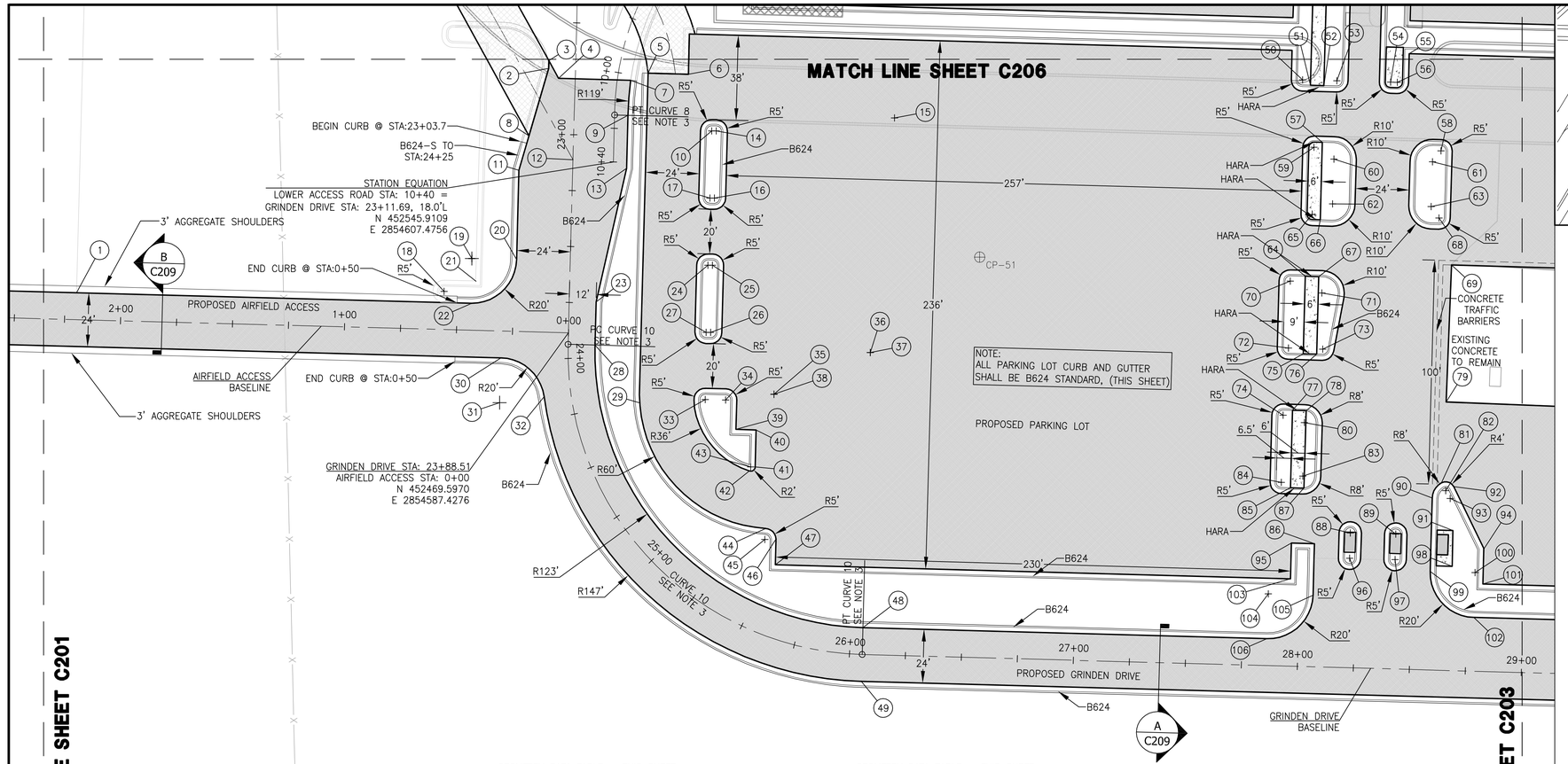

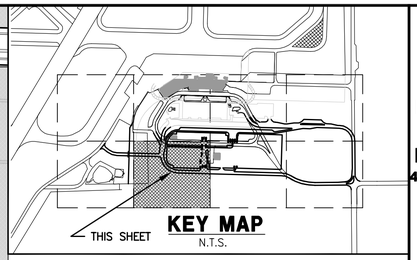

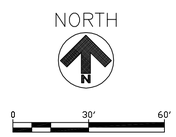

GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
1	CORNER	N 452487.483	E 2854367.8619
2	CORNER	N 452587.7026	E 2854578.5829
3	CORNER	N 452591.1389	E 2854578.6748
4	TANGENT	N 452583.2568	E 2854583.0423
5	CORNER	N 452585.5599	E 2854623.0586
6	CORNER	N 452585.0716	E 2854640.9632
7	PC	N 452582.4047	E 2854615.2285
8	CORNER	N 452557.5875	E 2854569.8299
9	PT	N 452566.743	E 2854614.0362
10	CURVE CNTR	N 452559.781	E 2854651.3841
11	CORNER	N 452542.2145	E 2854565.3617
12	CORNER	N 452546.8536	E 2854589.4944
13	CORNER	N 452543.0234	E 2854613.4005
14	CURVE CNTR	N 452559.7264	E 2854653.3833
15	CURVE CNTR	N 452565.5542	E 2854732.9917
16	CURVE CNTR	N 452529.7376	E 2854652.5651
17	CURVE CNTR	N 452529.7921	E 2854650.5658
18	CURVE CNTR	N 452488.0967	E 2854531.9026
19	CURVE CNTR	N 452502.758	E 2854544.2976
20	PC	N 452502.2232	E 2854564.292
21	CORNER	N 452492.7205	E 2854546.0312
22	PT	N 452482.7565	E 2854544.2991
23	CORNER	N 452483.3659	E 2854599.7977
24	CURVE CNTR	N 452499.8033	E 2854649.7476
25	CURVE CNTR	N 452499.7488	E 2854651.7468
26	CURVE CNTR	N 452469.7599	E 2854650.9286
27	CURVE CNTR	N 452469.8145	E 2854648.9293
28	PC	N 452464.1049	E 2854599.285

POINTS IN DATA TABLE NOT IN THIS CONTRACT

GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
29	PC	N 452438.3032	E 2854619.277
30	PC	N 452458.3999	E 2854557.2868
31	CURVE CNTR	N 452438.4071	E 2854556.7512
32	PT	N 452441.0908	E 2854576.5703
33	CURVE CNTR	N 452439.8151	E 2854648.4956
34	CURVE CNTR	N 452439.5665	E 2854657.6088
35	CURVE CNTR	N 452442.1573	E 2854679.2302
36	CURVE CNTR	N 452460.8155	E 2854722.241
37	CURVE CNTR	N 452460.8155	E 2854722.241
38	CURVE CNTR	N 452442.1573	E 2854679.2302
39	CORNER	N 452426.4349	E 2854662.2523
40	CORNER	N 452426.1895	E 2854671.249
41	PC	N 452409.7143	E 2854670.7987
42	PRC	N 452407.8174	E 2854668.1645
43	CURVE CNTR	N 452409.7087	E 2854668.7986
44	PC	N 452382.2075	E 2854675.465
45	CURVE CNTR	N 452377.2216	E 2854675.1339
46	PT	N 452377.4727	E 2854680.1245
47	COENER	N 452365.9335	E 2854679.8101
48	PT	N 452337.8613	E 2854718.8862
49	PT	N 452313.8702	E 2854718.2316
50	CURVE CNTR	N 452582.596	E 2854915.1239
51	CORNER	N 452580.1644	E 2854918.7054
52	CORNER	N 452580.0008	E 2854924.7031
53	CURVE CNTR	N 452582.1778	E 2854930.4525
54	CURVE CNTR	N 452581.5232	E 2854954.4435
55	CORNER	N 452594.3001	E 2854962.7949
56	CURVE CNTR	N 452581.4413	E 2854957.4424
57	CORNER	N 452554.679	E 2854924.0122
58	CURVE CNTR	N 452550.8985	E 2854976.927
59	CURVE CNTR	N 452552.4476	E 2854920.2841
60	CURVE CNTR	N 452547.2023	E 2854929.1443
61	CURVE CNTR	N 452546.0003	E 2854973.1279
62	CURVE CNTR	N 452527.2079	E 2854928.5988
63	CURVE CNTR	N 452526.0078	E 2854972.5824
64	CORNER	N 452494.8622	E 2854916.3779
65	CURVE CNTR	N 452522.4552	E 2854919.4657
66	CORNER	N 452520.0994	E 2854923.0687
67	CORNER	N 452494.6985	E 2854922.3757
68	CURVE CNTR	N 452520.9097	E 2854976.1087
69	CORNER	N 452499.8322	E 2854981.6994
70	CURVE CNTR	N 452492.7118	E 2854909.6509
71	CURVE CNTR	N 452487.3236	E 2854923.8098
72	CURVE CNTR	N 452462.723	E 2854908.8326
73	CURVE CNTR	N 452462.305	E 2854924.1516

GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
74	CURVE CNTR	N 452432.775	E 2854906.5161
75	CORNER	N 452460.209	E 2854915.4324
76	CORNER	N 452460.0454	E 2854921.4301
77	CORNER	N 452434.9948	E 2854910.6978
78	CORNER	N 452434.7823	E 2854916.7778
79	CORNER	N 452438.6711	E 2854979.2743
80	CURVE CNTR	N 452429.517	E 2854915.9308
81	PRC	N 452402.5194	E 2854977.1315
82	CURVE CNTR	N 452399.026	E 2854979.0799
83	CURVE CNTR	N 452405.526	E 2854915.2762
84	CURVE CNTR	N 452402.7862	E 2854905.6979
85	CORNER	N 452400.3417	E 2854909.7512
86	CORNER	N 452375.3656	E 2854920.4555
87	CORNER	N 452400.2173	E 2854915.785
88	CURVE CNTR	N 452380.1973	E 2854936.4297
89	CURVE CNTR	N 452379.6429	E 2854956.7495
90	PT	N 452395.7508	E 2854973.0313
91	CORNER	N 452381.2799	E 2854982.3069
92	PC	N 452400.8714	E 2854982.6288
93	CURVE CNTR	N 452395.5326	E 2854981.0283
94	CORNER	N 452372.9998	E 2854996.082
95	CORNER	N 452375.6544	E 2854910.1603
96	CURVE CNTR	N 452368.8616	E 2854936.1204
97	CURVE CNTR	N 452368.3071	E 2854956.4402
98	CORNER	N 452365.2771	E 2854981.9534
99	PC	N 452362.9633	E 2854972.1367
100	CURVE CNTR	N 452362.4178	E 2854992.1293
101	CORNER	N 452357.3157	E 2854995.654
102	PT	N 452342.4252	E 2854991.5838
103	CORNER	N 452359.6603	E 2854909.7239
104	CURVE CNTR	N 452352.9312	E 2854899.8492
105	PT	N 452352.4014	E 2854919.8422
106	PC	N 452332.9386	E 2854899.3037

GEOMETRY NOTES

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GEOMETRY PLAN (SHEET 2 OF 8)

SHEET NUMBER
C202

BID DOCUMENTS

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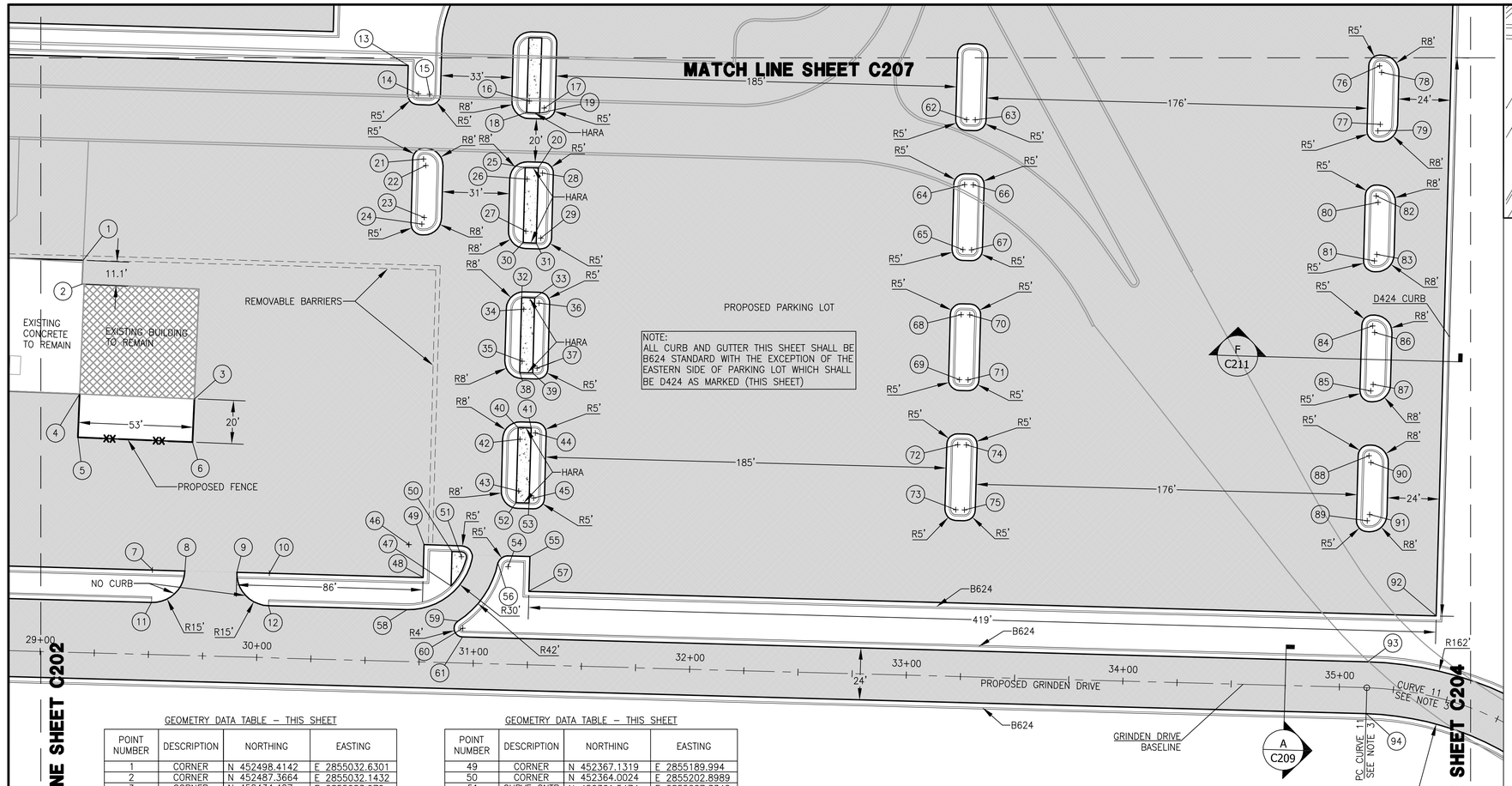
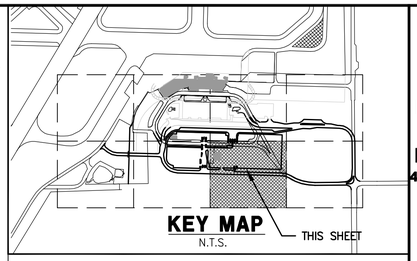


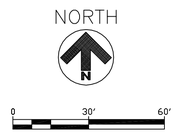
GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
1	CORNER	N 452498.4142	E 2855032.6301
2	CORNER	N 452487.3664	E 2855032.1432
3	CORNER	N 452434.427	E 2855083.979
4	CORNER	N 452436.6389	E 2855031.0252
5	CORNER	N 452416.6563	E 2855030.1905
6	CORNER	N 452414.4444	E 2855083.1443
7	CURVE CNTR	N 452355.4319	E 2855064.6982
8	PT	N 452355.0246	E 2855079.6228
9	PC	N 452354.374	E 2855103.6139
10	CURVE CNTR	N 452353.9649	E 2855118.6084
11	PC	N 452340.4433	E 2855064.2193
12	PT	N 452338.9705	E 2855118.1992
13	CORNER	N 452588.2723	E 2855182.7332
14	CURVE CNTR	N 452575.17	E 2855187.3777
15	CURVE CNTR	N 452575.0236	E 2855192.6537
16	CURVE CNTR	N 452571.7649	E 2855238.5935
17	CURVE CNTR	N 452568.5751	E 2855245.509
18	CORNER	N 452566.5558	E 2855237.4509
19	CORNER	N 452566.2975	E 2855243.4462
20	CORNER	N 452540.973	E 2855242.7552
21	CURVE CNTR	N 452545.089	E 2855189.8478
22	CURVE CNTR	N 452542.0628	E 2855190.7656
23	CURVE CNTR	N 452518.0717	E 2855190.111
24	CURVE CNTR	N 452515.1001	E 2855189.0295
25	CORNER	N 452541.0419	E 2855236.7542
26	CURVE CNTR	N 452535.7783	E 2855237.6116
27	CURVE CNTR	N 452511.7872	E 2855236.957
28	CURVE CNTR	N 452538.5863	E 2855244.6908
29	CURVE CNTR	N 452508.5974	E 2855243.8725
30	CORNER	N 452506.5784	E 2855235.8131
31	CORNER	N 452506.3199	E 2855241.8097
32	CORNER	N 452481.0641	E 2855235.1164
33	CORNER	N 452480.9953	E 2855241.1187
34	CURVE CNTR	N 452475.8006	E 2855235.9751
35	CURVE CNTR	N 452451.8096	E 2855235.3205
36	CURVE CNTR	N 452478.6086	E 2855243.0543
37	CURVE CNTR	N 452448.6198	E 2855242.2361
38	CORNER	N 452446.601	E 2855234.1753
39	CORNER	N 452446.3422	E 2855240.1732
40	CORNER	N 452421.0862	E 2855233.4786
41	CORNER	N 452421.0176	E 2855239.4822
42	CURVE CNTR	N 452415.823	E 2855234.3386
43	CURVE CNTR	N 452391.8319	E 2855233.684
44	CURVE CNTR	N 452418.6309	E 2855241.4178
45	CURVE CNTR	N 452388.6421	E 2855240.5996
46	CURVE CNTR	N 452367.2047	E 2855182.9849
47	CORNER	N 452348.0807	E 2855202.4645
48	CORNER	N 452352.0284	E 2855189.5819

GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
49	CORNER	N 452367.1319	E 2855189.994
50	CORNER	N 452364.0024	E 2855202.8989
51	CURVE CNTR	N 452361.5474	E 2855207.3342
52	CORNER	N 452386.6236	E 2855232.5375
53	CORNER	N 452386.3645	E 2855238.5367
54	CURVE CNTR	N 452356.9752	E 2855228.808
55	CORNER	N 452361.6712	E 2855238.8633
56	PRC	N 452358.6868	E 2855224.1102
57	CORNER	N 452345.5763	E 2855238.4241
58	PC	N 452337.2251	E 2855182.1667
59	PRC	N 452331.8986	E 2855205.7187
60	CURVE CNTR	N 452328.5352	E 2855207.8838
61	PT	N 452324.5367	E 2855207.7745
62	CURVE CNTR	N 452563.2565	E 2855440.4365
63	CURVE CNTR	N 452563.1474	E 2855444.435
64	CURVE CNTR	N 452533.2677	E 2855439.6183
65	CURVE CNTR	N 452503.2788	E 2855438.8
66	CURVE CNTR	N 452533.1586	E 2855443.6168
67	CURVE CNTR	N 452503.1697	E 2855442.7985
68	CURVE CNTR	N 452473.29	E 2855437.9818
69	CURVE CNTR	N 452443.3012	E 2855437.1635
70	CURVE CNTR	N 452473.1809	E 2855441.9803
71	CURVE CNTR	N 452443.1921	E 2855441.162
72	CURVE CNTR	N 452413.3123	E 2855436.3453
73	CURVE CNTR	N 452383.3235	E 2855435.527
74	CURVE CNTR	N 452413.2032	E 2855440.3438
75	CURVE CNTR	N 452383.2144	E 2855439.5255
76	CURVE CNTR	N 452588.0631	E 2855631.1841
77	CURVE CNTR	N 452561.0459	E 2855631.4473
78	CURVE CNTR	N 452585.037	E 2855632.1019
79	CURVE CNTR	N 452558.0743	E 2855630.3658
80	CURVE CNTR	N 452525.0593	E 2855630.4654
81	CURVE CNTR	N 452498.0966	E 2855628.7293
82	CURVE CNTR	N 452528.0854	E 2855629.5476
83	CURVE CNTR	N 452501.0682	E 2855629.8108
84	CURVE CNTR	N 452468.1078	E 2855627.9111
85	CURVE CNTR	N 452438.1189	E 2855627.0928
86	CURVE CNTR	N 452465.0816	E 2855628.8289
87	CURVE CNTR	N 452441.0905	E 2855628.1743
88	CURVE CNTR	N 452408.1301	E 2855626.2746
89	CURVE CNTR	N 452378.1412	E 2855625.4563
90	CURVE CNTR	N 452405.1039	E 2855627.1924
91	CURVE CNTR	N 452381.1129	E 2855626.5378
92	CORNER	N 452334.2591	E 2855657.2713
93	PC	N 452313.1226	E 2855625.5627
94	PC	N 452289.1315	E 2855624.9081
95	CURVE CNTR	N 452151.1829	E 2855621.1442





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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GEOMETRY PLAN (SHEET 1 OF 8)

SHEET NUMBER

C203

BID DOCUMENTS

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MATCH LINE SHEET C208

MATCH LINE SHEET C203

CP-69

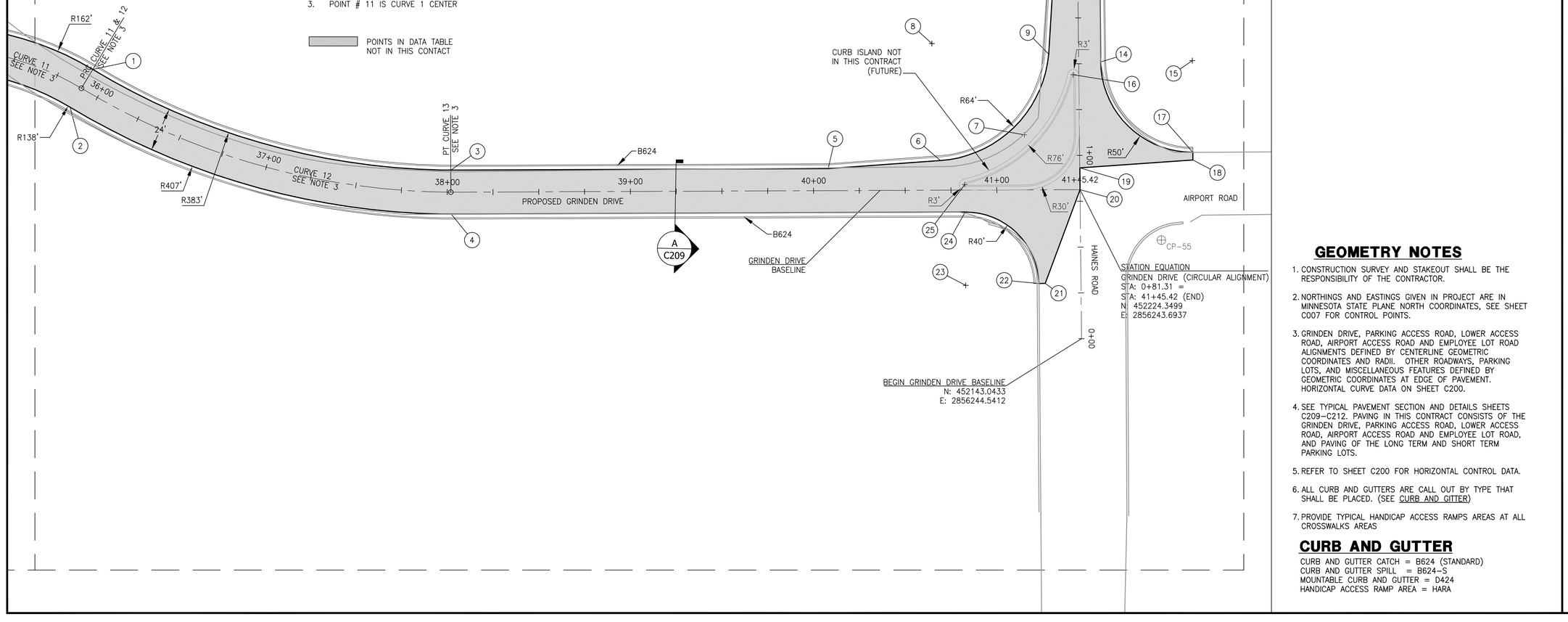
GEOMETRY DATA TABLE – THIS SHEET

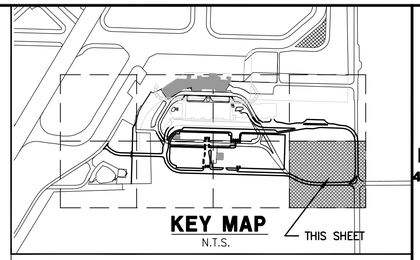
POINT NUMBER	DESCRIPTION	NORTHING	EASTING
1	PRC	N 452289.9361	E 2855704.7597
2	PRC	N 452269.38	E 2855692.3722
3	PT	N 452234.9856	E 2855900.169
4	PT	N 452210.9833	E 2855900.5754
5	CORNER	N 452235.8024	E 2856106.1979
6	PC	N 452240.1924	E 2856167.4351
7	CURVE CNTR	N 452254.2292	E 2856213.2848
8	CURVE CNTR	N 452304.0007	E 2856162.8743
9	PT	N 452298.2106	E 2856226.5938
10	CORNER	N 452359.194	E 2856230.2875
11	CURVE CNTR	N 452587.8783	E 2856114.8976
12	PC	N 452589.0593	E 2856227.8946
13	PC	N 452589.3062	E 2856251.8902
14	PT	N 452294.042	E 2856254.968
15	CURVE CNTR	N 452294.7377	E 2856304.964
16	CURVE CNTR	N 452287.0289	E 2856240.0046
17	PC	N 452244.738	E 2856305.3221
18	CORNER	N 452240.524	E 2856305.3194
19	CORNER	N 452236.2391	E 2856243.5697
20	CORNER	N 452224.3499	E 2856243.6937
21	CORNER	N 452173.2701	E 2856224.7638
22	PT	N 452173.1264	E 2856221.2766
23	CURVE CNTR	N 452172.0963	E 2856181.3007
24	PC	N 452212.1001	E 2856181.0047
25	CURVE CNTR	N 452227.0994	E 2856180.7991

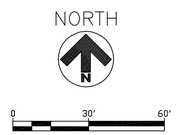
NOTE:
1. CURVE 11 CENTER SEE SHEET C203
2. CURVE 12 CENTER SEE SHEET C208
3. POINT # 11 IS CURVE 1 CENTER

POINTS IN DATA TABLE NOT IN THIS CONTACT

NOTE:
ALL CURB AND GUTTER SHALL BE B624 ON THIS SHEET







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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

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NO.	DESCRIPTION	DATE

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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GEOMETRY PLAN (SHEET 4 OF 8)

SHEET NUMBER

C204

BID DOCUMENTS

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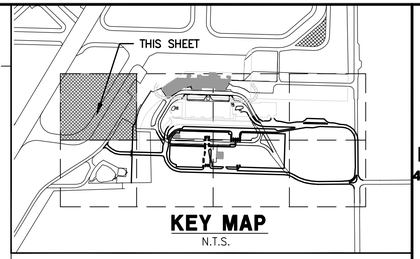

KEY MAP
N.T.S.

NORTH

0 30' 60'

TAXIWAY "D"

SOUTH PERIMETER ROAD

BITUMINOUS APRON

EXISTING RENTAL CAR PARKING LOT

MATCH LINE SHEET C206

EXISTING SECURITY FENCE

PROPOSED TEMORARY FENCE (SEE SHEET C220)

PROPOSED SECURITY FENCE SEE SHEET C220

CENTER OF CURVE #9
N:452605.0701
E:2854198.1442
CURVE ON SHEET C201

MATCH LINE SHEET C201

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Signature John E. Hippchen

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GEOMETRY PLAN (SHEET 5 OF 8)

SHEET NUMBER

C205

BID DOCUMENTS

T:\214882.093 ELH Terminal Design CMB\CAD\C214\C206.dwg, 5/7/2009 11:34:48 AM

GEOMETRY DATA TABLE – THIS SHEET

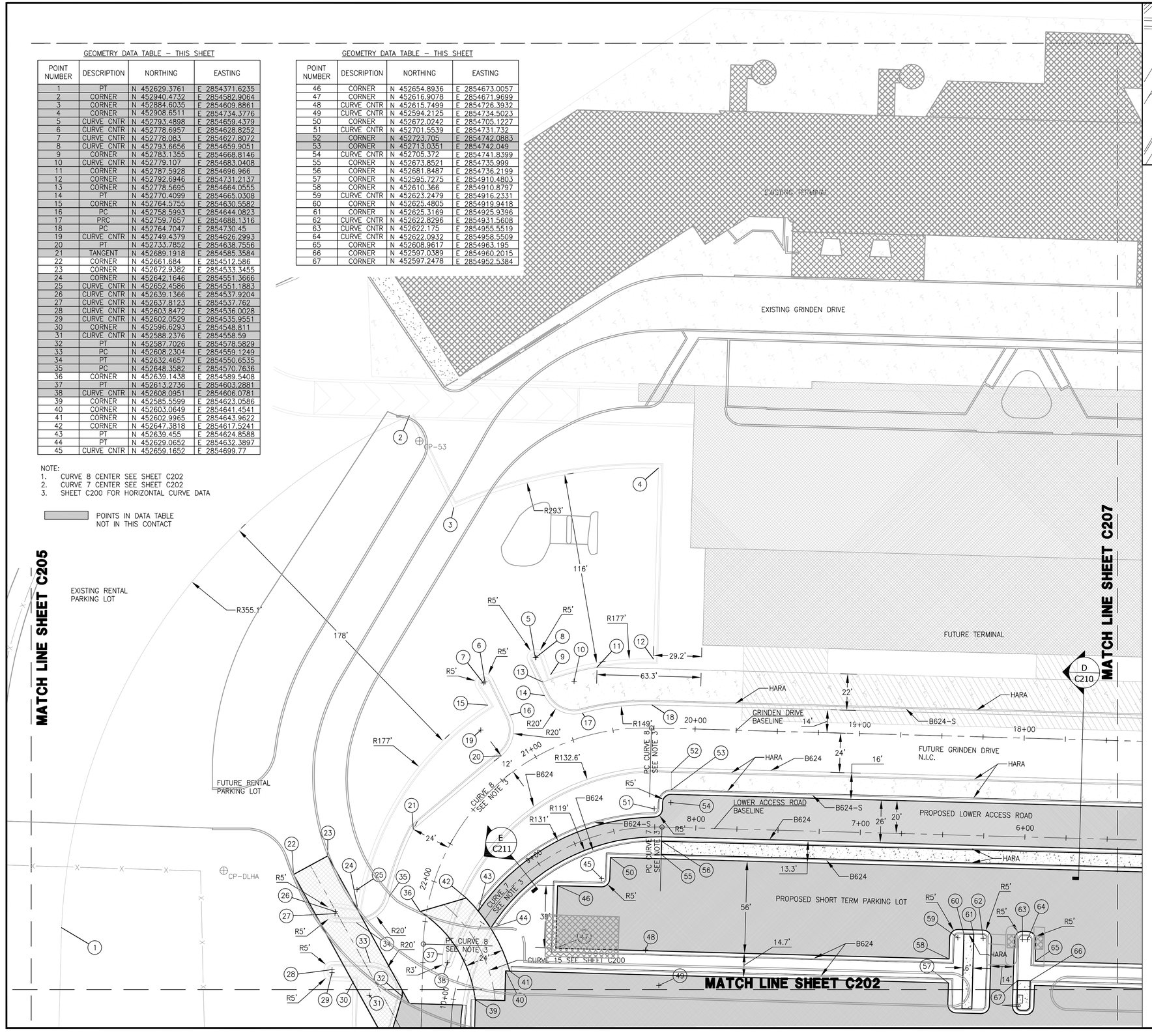
POINT NUMBER	DESCRIPTION	NORTHING	EASTING
1	PT	N 452629.3761	E 2854371.6235
2	CORNER	N 452940.4732	E 2854582.9064
3	CORNER	N 452884.6035	E 2854609.8861
4	CORNER	N 452908.6511	E 2854734.3776
5	CURVE CNTR	N 452793.4898	E 2854659.4379
6	CURVE CNTR	N 452778.6957	E 2854628.8252
7	CURVE CNTR	N 452778.083	E 2854627.8072
8	CURVE CNTR	N 452793.6656	E 2854659.9051
9	CORNER	N 452783.1355	E 2854668.8146
10	CURVE CNTR	N 452779.107	E 2854683.0408
11	CORNER	N 452787.5928	E 2854696.966
12	CORNER	N 452792.6946	E 2854731.2137
13	CORNER	N 452778.5695	E 2854664.0555
14	PT	N 452770.4099	E 2854665.0308
15	CORNER	N 452764.5755	E 2854630.5582
16	PC	N 452758.5993	E 2854644.0823
17	PRC	N 452759.7657	E 2854688.1316
18	PC	N 452764.7047	E 2854730.45
19	CURVE CNTR	N 452749.4379	E 2854626.2993
20	PT	N 452733.7852	E 2854638.7556
21	TANGENT	N 452689.1918	E 2854585.3584
22	CORNER	N 452661.684	E 2854512.586
23	CORNER	N 452672.9382	E 2854533.3455
24	CORNER	N 452642.1646	E 2854551.3666
25	CURVE CNTR	N 452652.4586	E 2854551.1883
26	CURVE CNTR	N 452639.1366	E 2854537.9204
27	CURVE CNTR	N 452637.8123	E 2854537.762
28	CURVE CNTR	N 452603.8472	E 2854536.0028
29	CURVE CNTR	N 452602.0529	E 2854535.9551
30	CORNER	N 452596.6293	E 2854548.811
31	CURVE CNTR	N 452588.2376	E 2854558.59
32	PT	N 452587.7026	E 2854578.5829
33	PC	N 452608.2304	E 2854559.1249
34	PT	N 452632.4657	E 2854550.6535
35	PC	N 452648.3582	E 2854570.7636
36	CORNER	N 452639.1438	E 2854589.5408
37	PT	N 452613.2736	E 2854603.2881
38	CURVE CNTR	N 452608.0951	E 2854606.0781
39	CORNER	N 452585.5599	E 2854623.0586
40	CORNER	N 452603.0649	E 2854641.4541
41	CORNER	N 452602.9965	E 2854643.9622
42	CORNER	N 452647.3818	E 2854617.5241
43	PT	N 452639.455	E 2854624.8588
44	PT	N 452629.0652	E 2854632.3897
45	CURVE CNTR	N 452659.1652	E 2854699.77

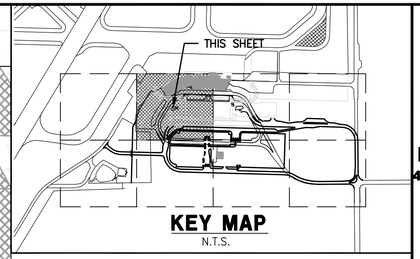
GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
46	CORNER	N 452654.8936	E 2854673.0057
47	CORNER	N 452616.9078	E 2854671.9699
48	CURVE CNTR	N 452615.7499	E 2854726.3932
49	CURVE CNTR	N 452594.2125	E 2854734.5023
50	CORNER	N 452672.0242	E 2854705.1227
51	CURVE CNTR	N 452701.5539	E 2854731.732
52	CORNER	N 452723.705	E 2854742.0883
53	CORNER	N 452713.0351	E 2854742.049
54	CURVE CNTR	N 452705.372	E 2854741.8399
55	CORNER	N 452673.8521	E 2854735.999
56	CORNER	N 452681.8487	E 2854736.2199
57	CORNER	N 452595.7275	E 2854910.4803
58	CORNER	N 452610.366	E 2854910.8797
59	CURVE CNTR	N 452623.2479	E 2854916.2331
60	CORNER	N 452625.4805	E 2854919.9418
61	CORNER	N 452625.3169	E 2854925.9396
62	CURVE CNTR	N 452622.8296	E 2854931.5608
63	CURVE CNTR	N 452622.175	E 2854955.5519
64	CURVE CNTR	N 452622.0932	E 2854958.5509
65	CORNER	N 452608.9617	E 2854963.195
66	CORNER	N 452597.0389	E 2854960.2015
67	CORNER	N 452597.2478	E 2854952.5384

NOTE:
1. CURVE 8 CENTER SEE SHEET C202
2. CURVE 7 CENTER SEE SHEET C202
3. SHEET C200 FOR HORIZONTAL CURVE DATA

POINTS IN DATA TABLE NOT IN THIS CONTACT





KEY MAP
N.T.S.

NORTH

0 30' 60'

GEOMETRY NOTES

1. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. NORTHINGS AND EASTINGS GIVEN IN PROJECT ARE IN MINNESOTA STATE PLANE NORTH COORDINATES, SEE SHEET C007 FOR CONTROL POINTS.
3. GRINDEN DRIVE, PARKING ACCESS ROAD, LOWER ACCESS ROAD, AIRPORT ACCESS ROAD AND EMPLOYEE LOT ROAD ALIGNMENTS DEFINED BY CENTERLINE GEOMETRIC COORDINATES AND RADII. OTHER ROADWAYS, PARKING LOTS, AND MISCELLANEOUS FEATURES DEFINED BY GEOMETRIC COORDINATES AT EDGE OF PAVEMENT. HORIZONTAL CURVE DATA ON SHEET C200.
4. SEE TYPICAL PAVEMENT SECTION AND DETAILS SHEETS C209–C212. PAVING IN THIS CONTRACT CONSISTS OF THE GRINDEN DRIVE, PARKING ACCESS ROAD, LOWER ACCESS ROAD, AIRPORT ACCESS ROAD AND EMPLOYEE LOT ROAD, AND PAVING OF THE LONG TERM AND SHORT TERM PARKING LOTS.
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6. ALL CURB AND GUTTERS ARE CALL OUT BY TYPE THAT SHALL BE PLACED. (SEE CURB AND GITTER)
7. PROVIDE TYPICAL HANDICAP ACCESS RAMPS AREAS AT ALL CROSSWALKS AREAS

CURB AND GUTTER

CURB AND GUTTER CATCH = B624 (STANDARD)
CURB AND GUTTER SPILL = B624–S
MOUNTABLE CURB AND GUTTER = D424
HANDICAP ACCESS RAMP AREA = HARA

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GEOMETRY PLAN (SHEET 6 OF 8)

SHEET NUMBER
C206

BID DOCUMENTS

T:\P-2141882.093 \Dgn\Terminal Design CSM\CAD\C206PCSM.dwg, 5/7/2009 11:36:11 AM

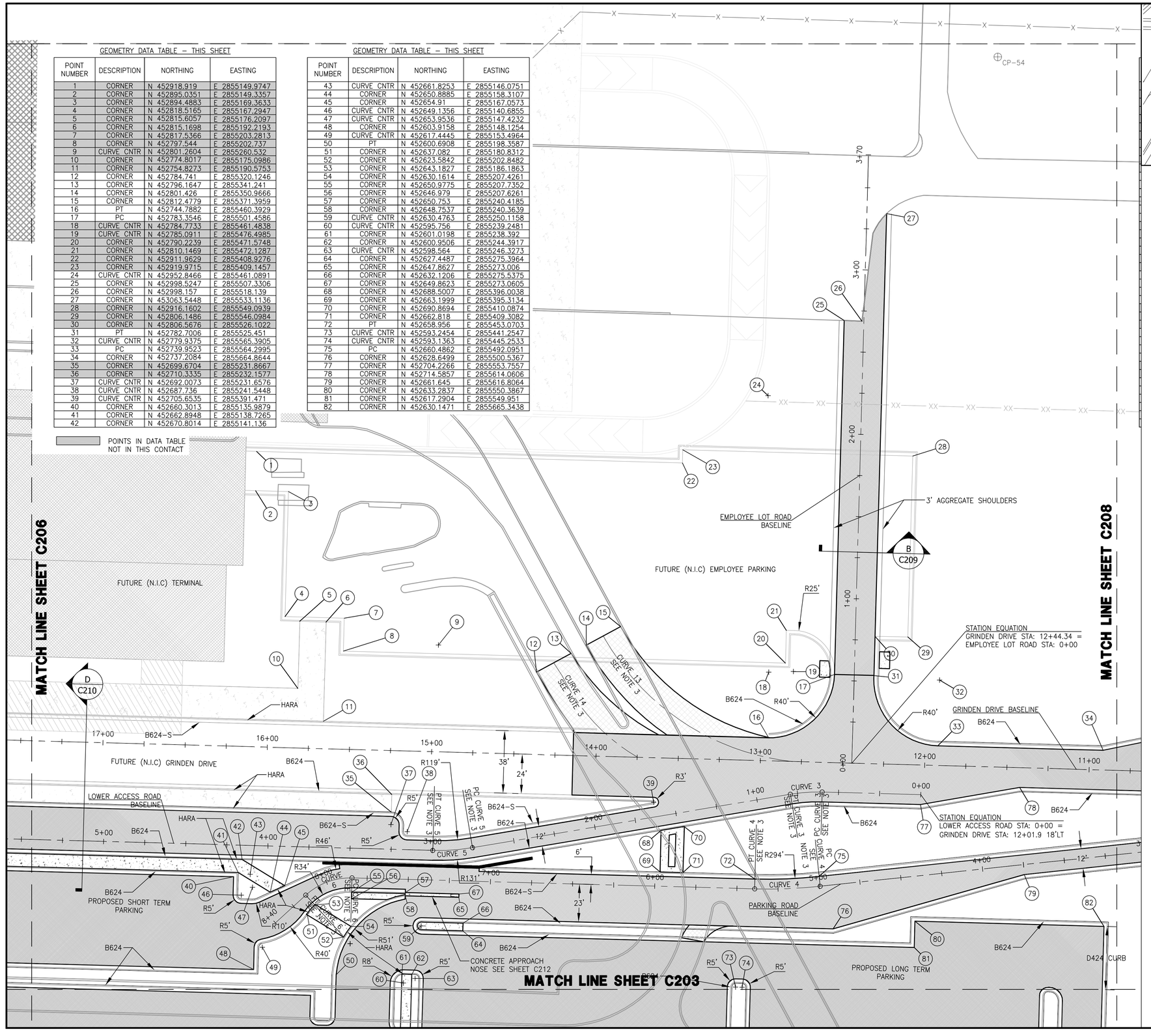
GEOMETRY DATA TABLE – THIS SHEET

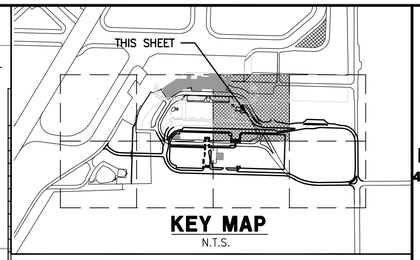
POINT NUMBER	DESCRIPTION	NORTHING	EASTING
1	CORNER	N 452918.919	E 2855149.9747
2	CORNER	N 452895.0351	E 2855149.3357
3	CORNER	N 452894.4883	E 2855169.3633
4	CORNER	N 452818.5165	E 2855167.2947
5	CORNER	N 452815.6057	E 2855176.2097
6	CORNER	N 452815.1698	E 2855192.2193
7	CORNER	N 452817.5366	E 2855203.2813
8	CORNER	N 452797.544	E 2855202.737
9	CURVE CNTR	N 452801.2604	E 2855260.532
10	CORNER	N 452774.8017	E 2855175.0986
11	CORNER	N 452754.8273	E 2855190.5753
12	CORNER	N 452784.741	E 2855320.1246
13	CORNER	N 452796.1647	E 2855341.241
14	CORNER	N 452801.426	E 2855350.9666
15	CORNER	N 452812.4779	E 2855371.3959
16	PT	N 452744.7882	E 2855460.3929
17	PC	N 452783.3546	E 2855501.4586
18	CURVE CNTR	N 452784.7733	E 2855461.4838
19	CURVE CNTR	N 452785.0911	E 2855476.4985
20	CORNER	N 452790.2239	E 2855471.5748
21	CORNER	N 452810.1469	E 2855472.1287
22	CORNER	N 452911.9629	E 2855408.9276
23	CORNER	N 452919.9715	E 2855409.1457
24	CURVE CNTR	N 452952.8466	E 2855461.0891
25	CORNER	N 452998.5247	E 2855507.3306
26	CORNER	N 452998.157	E 2855518.139
27	CORNER	N 453063.5448	E 2855533.1136
28	CORNER	N 452916.1602	E 2855549.0939
29	CORNER	N 452806.1486	E 2855546.0984
30	CORNER	N 452806.5676	E 2855526.1022
31	PT	N 452782.7006	E 2855525.451
32	CURVE CNTR	N 452779.9375	E 2855565.3905
33	PC	N 452739.9523	E 2855564.2995
34	CORNER	N 452737.2084	E 2855664.8644
35	CORNER	N 452699.6704	E 2855231.8667
36	CORNER	N 452710.3335	E 2855232.1577
37	CURVE CNTR	N 452692.0073	E 2855231.6576
38	CURVE CNTR	N 452687.736	E 2855241.5448
39	CURVE CNTR	N 452705.6535	E 2855391.471
40	CORNER	N 452660.3013	E 2855135.9879
41	CORNER	N 452662.8948	E 2855138.7265
42	CORNER	N 452670.8014	E 2855141.136

POINTS IN DATA TABLE NOT IN THIS CONTACT

GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
43	CURVE CNTR	N 452661.8253	E 2855146.0751
44	CORNER	N 452650.8885	E 2855158.3107
45	CORNER	N 452654.91	E 2855167.0573
46	CURVE CNTR	N 452649.1356	E 2855140.6855
47	CURVE CNTR	N 452653.9536	E 2855147.4232
48	CORNER	N 452603.9158	E 2855148.1254
49	CURVE CNTR	N 452617.4445	E 2855153.4964
50	PT	N 452600.6908	E 2855198.3587
51	CORNER	N 452637.082	E 2855180.8312
52	CORNER	N 452623.5842	E 2855202.8482
53	CORNER	N 452643.1827	E 2855186.1863
54	CORNER	N 452630.1614	E 2855207.4261
55	CORNER	N 452650.9775	E 2855207.7352
56	CORNER	N 452646.979	E 2855207.6261
57	CORNER	N 452650.753	E 2855240.4185
58	CORNER	N 452648.7537	E 2855240.3639
59	CURVE CNTR	N 452630.4763	E 2855250.1158
60	CURVE CNTR	N 452595.756	E 2855239.2481
61	CORNER	N 452601.0198	E 2855238.392
62	CORNER	N 452600.9506	E 2855244.3917
63	CURVE CNTR	N 452598.564	E 2855246.3273
64	CORNER	N 452627.4487	E 2855275.3964
65	CORNER	N 452647.8627	E 2855273.006
66	CORNER	N 452632.1206	E 2855275.5375
67	CORNER	N 452649.8623	E 2855273.0605
68	CORNER	N 452688.5007	E 2855396.0038
69	CORNER	N 452663.1999	E 2855395.3134
70	CORNER	N 452690.8694	E 2855410.0874
71	CORNER	N 452662.818	E 2855409.3082
72	PT	N 452658.956	E 2855453.0703
73	CURVE CNTR	N 452593.2454	E 2855441.2547
74	CURVE CNTR	N 452593.1363	E 2855445.2533
75	PC	N 452660.4862	E 2855492.0951
76	CORNER	N 452628.6499	E 2855500.5367
77	CORNER	N 452704.2266	E 2855553.7557
78	CORNER	N 452714.5857	E 2855614.0606
79	CORNER	N 452661.645	E 2855616.8064
80	CORNER	N 452633.2837	E 2855550.3867
81	CORNER	N 452617.2904	E 2855549.951
82	CORNER	N 452630.1471	E 2855665.3438





KEY MAP
N.T.S.

NORTH

0 30' 60'

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GEOMETRY PLAN (SHEET 7 OF 8)

SHEET NUMBER

C207

BID DOCUMENTS

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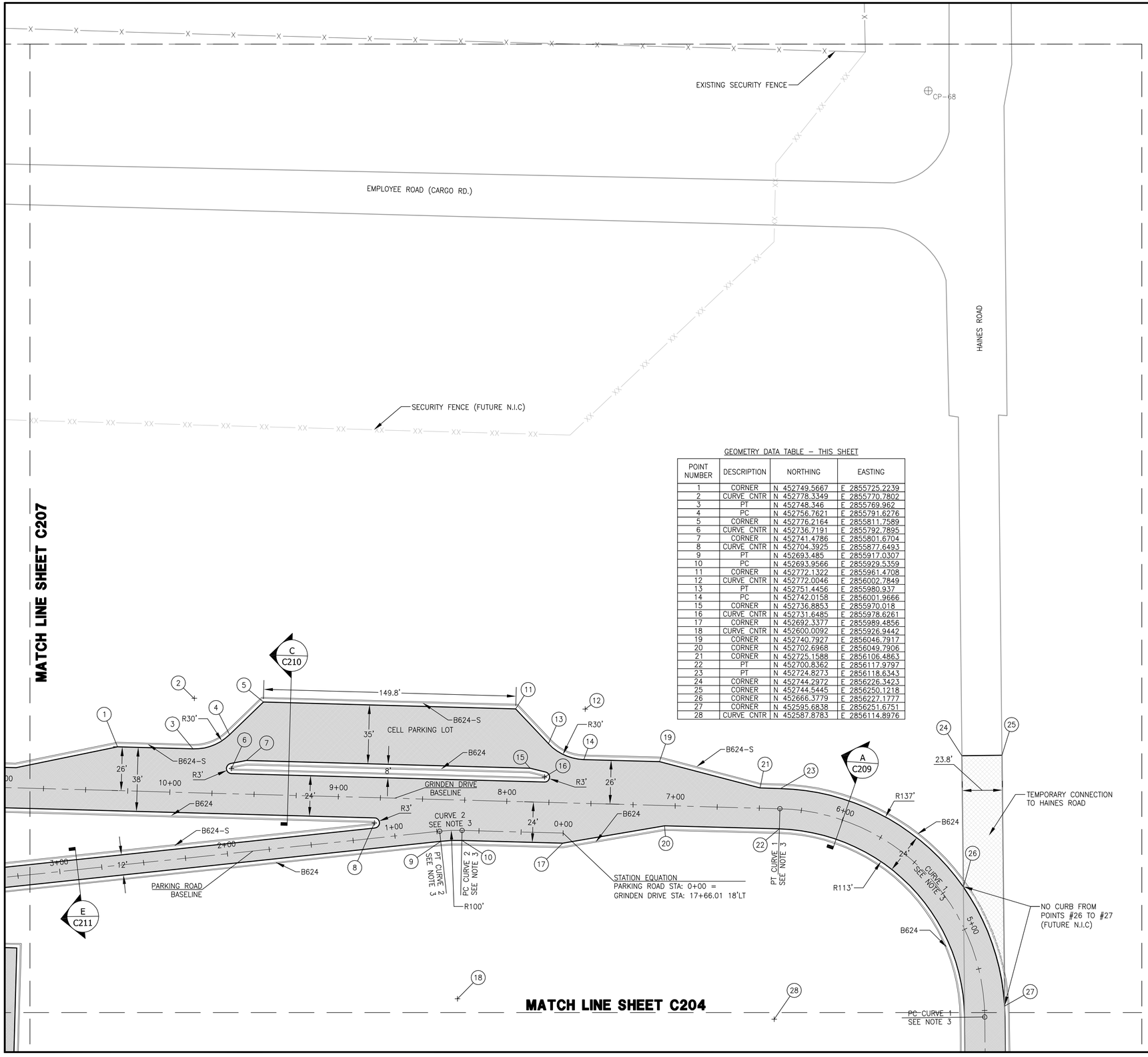

GEOMETRY DATA TABLE – THIS SHEET

POINT NUMBER	DESCRIPTION	NORTHING	EASTING
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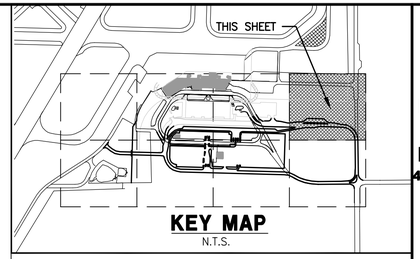
3	PT	N 452748.346	E 2855769.962
4	PC	N 452756.7621	E 2855791.6276
5	CORNER	N 452776.2164	E 2855811.7589
6	CURVE CNTR	N 452736.7191	E 2855792.7895
7	CORNER	N 452741.4786	E 2855801.6704
8	CURVE CNTR	N 452704.3925	E 2855877.6493
9	PT	N 452693.485	E 2855917.0307
10	PC	N 452693.9566	E 2855929.5359
11	CORNER	N 452772.1322	E 2855961.4708
12	CURVE CNTR	N 452772.0046	E 2856002.7849
13	PT	N 452751.4456	E 2855980.937
14	PC	N 452742.0158	E 2856001.9666
15	CORNER	N 452736.8853	E 2855970.018
16	CURVE CNTR	N 452731.6485	E 2855978.6261
17	CORNER	N 452692.3377	E 2855989.4856
18	CURVE CNTR	N 452600.0092	E 2855926.9442
19	CORNER	N 452740.7927	E 2856046.7917
20	CORNER	N 452702.6968	E 2856049.7906
21	CORNER	N 452725.1588	E 2856106.4863
22	PT	N 452700.8362	E 2856117.9797
23	PT	N 452724.8273	E 2856118.6343
24	CORNER	N 452744.2972	E 2856226.3423
25	CORNER	N 452744.5445	E 2856250.1218
26	CORNER	N 452666.3779	E 2856227.1777
27	CORNER	N 452595.6838	E 2856251.6751
28	CURVE CNTR	N 452587.8783	E 2856114.8976



KEY MAP
N.T.S.

NORTH

0 30' 60'

GEOMETRY NOTES

1. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GEOMETRY PLAN (SHEET 8 OF 8)

SHEET NUMBER
C208

BID DOCUMENTS

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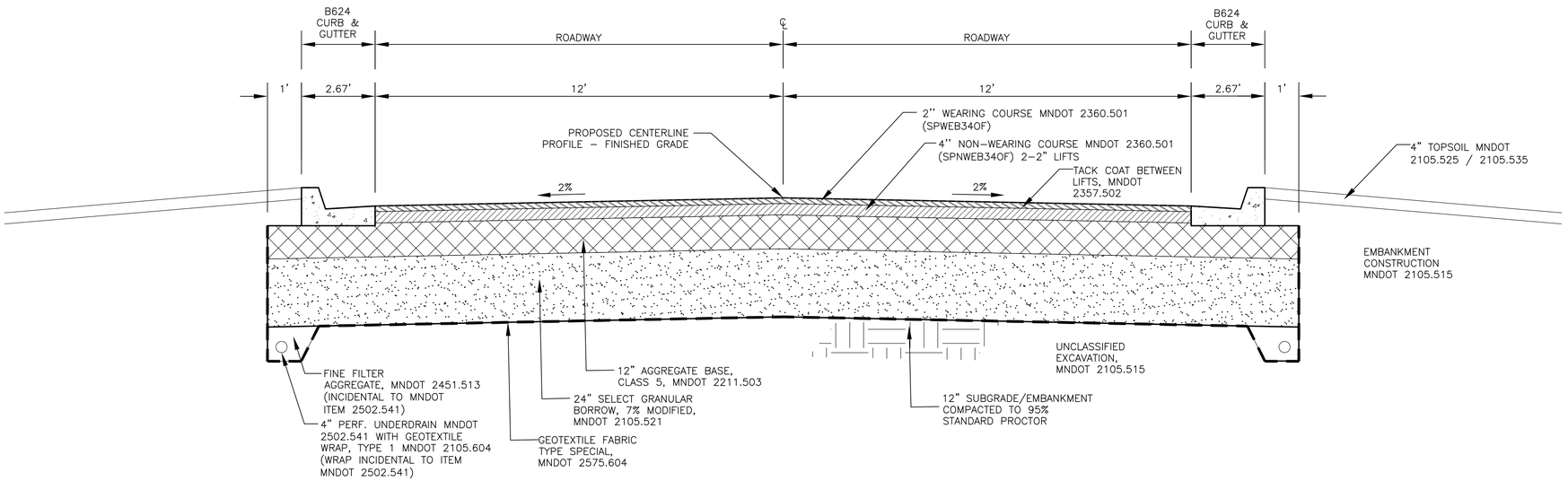
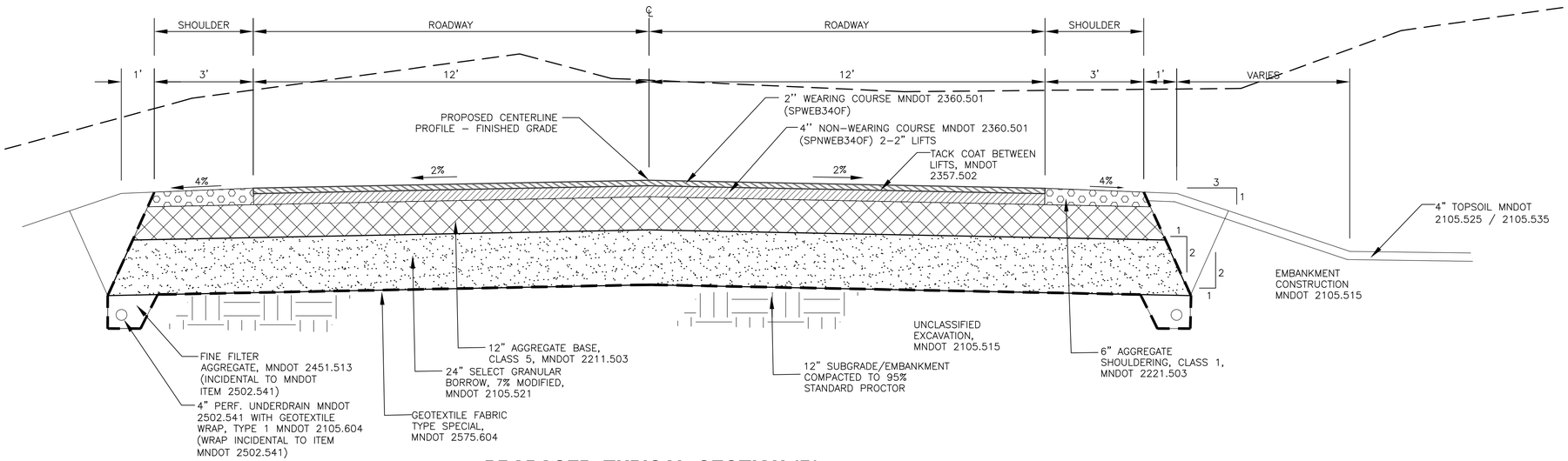


PROPOSED TYPICAL SECTION 'A'
PROPOSED GRINDEN DRIVE

N.T.S.



PROPOSED TYPICAL SECTION 'B'
TEMPORARY RD TO EMPLOYEE PARKING & AIRPORT ACCESS RD

N.T.S.

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
TYPICAL PAVEMENT SECTIONS (SHEET 1 OF 3)

SHEET NUMBER
C209

BID DOCUMENTS

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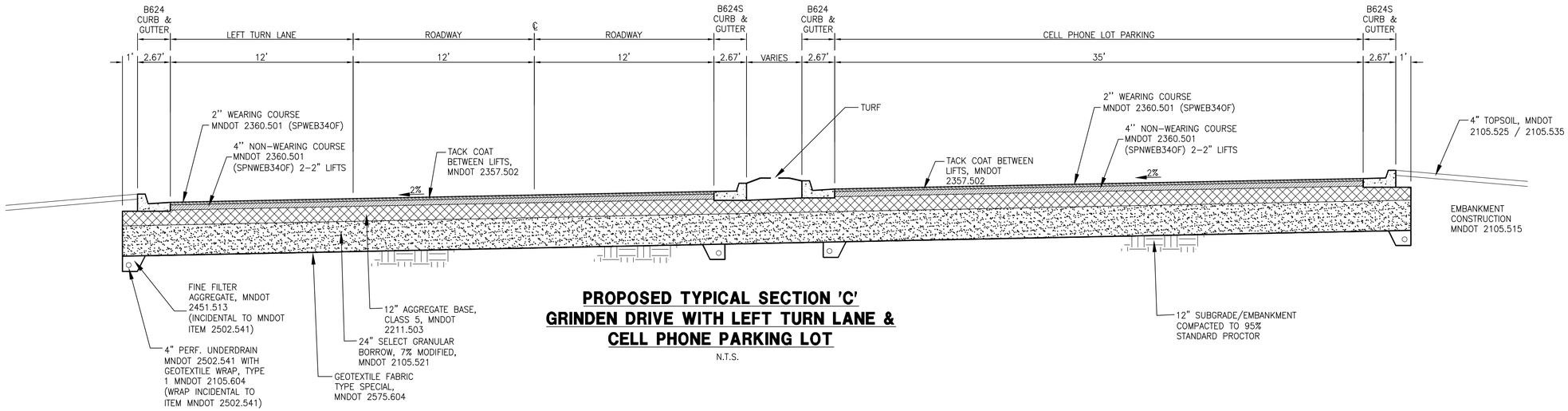
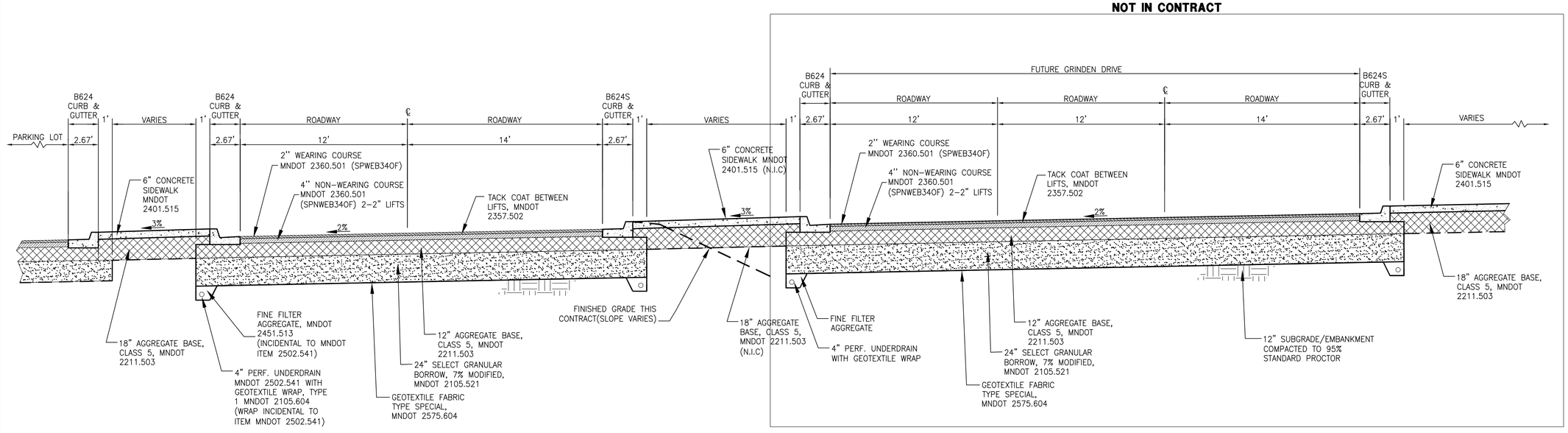


PROPOSED TYPICAL SECTION 'C'
GRINDEN DRIVE WITH LEFT TURN LANE & CELL PHONE PARKING LOT

N.T.S.

NOT IN CONTRACT



PROPOSED TYPICAL SECTION 'D'
LOWER ACCESS ROAD & FUTURE GRINDEN DRIVE

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
TYPICAL PAVEMENT SECTIONS (SHEET 2 OF 3)

SHEET NUMBER
C210

BID DOCUMENTS

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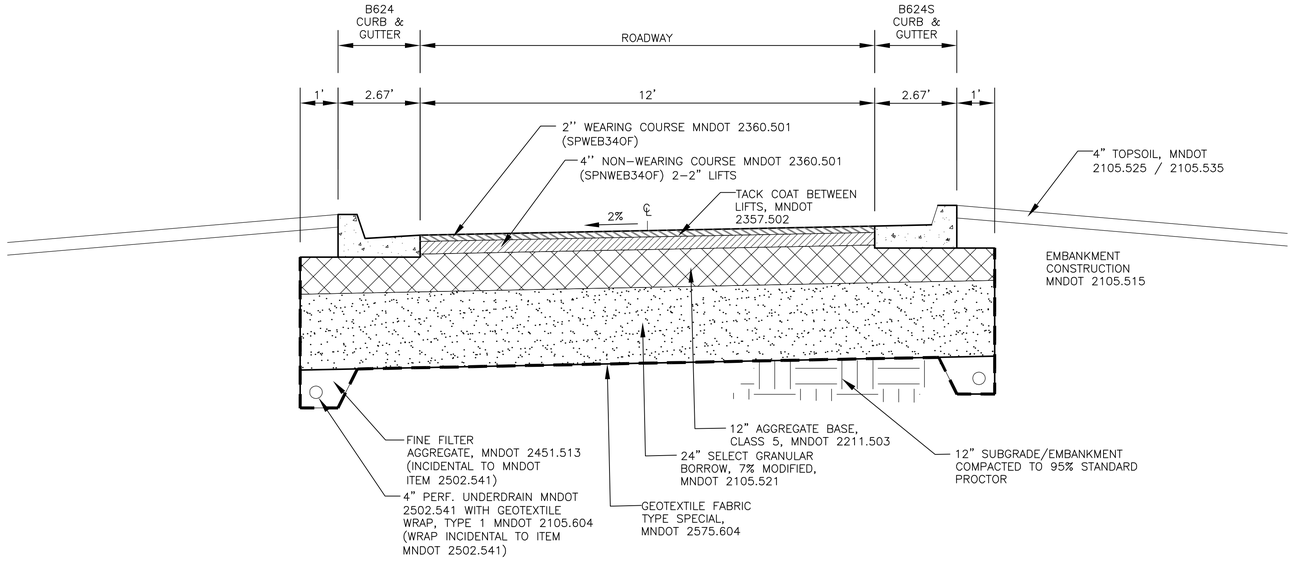
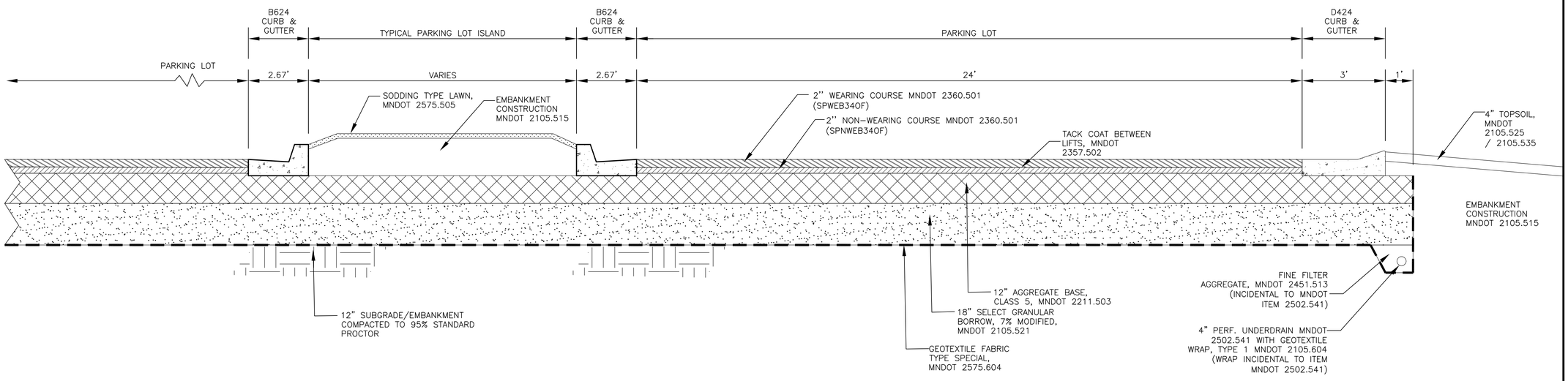


PROPOSED TYPICAL SECTION 'E'
PARKING ROAD
N.T.S.



PROPOSED TYPICAL SECTION 'F'
PARKING LOT
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SHEET TITLE
TYPICAL PAVEMENT SECTIONS (SHEET 3 OF 3)

SHEET NUMBER
C211

BID DOCUMENTS

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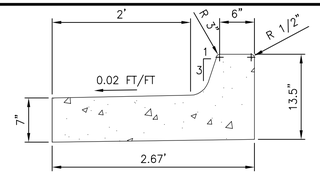
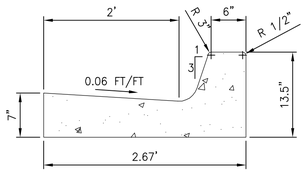


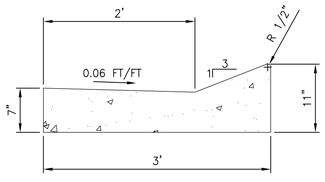
DESIGN B624 - SPILL: CURB AND GUTTER DETAIL

N.T.S.



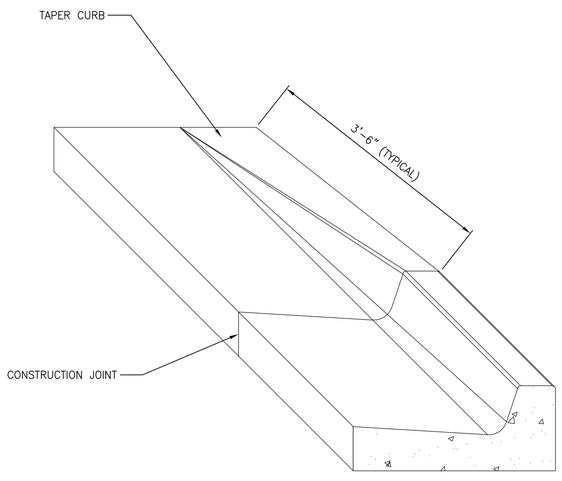
DESIGN B624 - NORMAL: CURB AND GUTTER DETAIL

N.T.S.



DESIGN D424 - NORMAL: CURB AND GUTTER DETAIL

N.T.S.

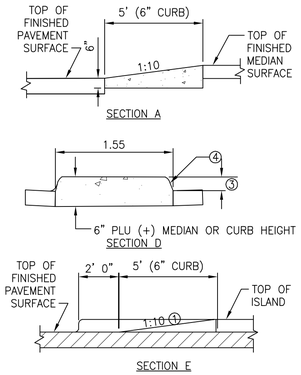


DETAIL OF CURB AND GUTTER TERMINATION

N.T.S.

NOTES:

1. SEE PLAN SHEETS FOR LOCATIONS OF EACH TYPE OF CURB AND GUTTER.
2. FORMS MAY BE TILTED TO ACHIEVE THE SPECIFIED SLOPE.

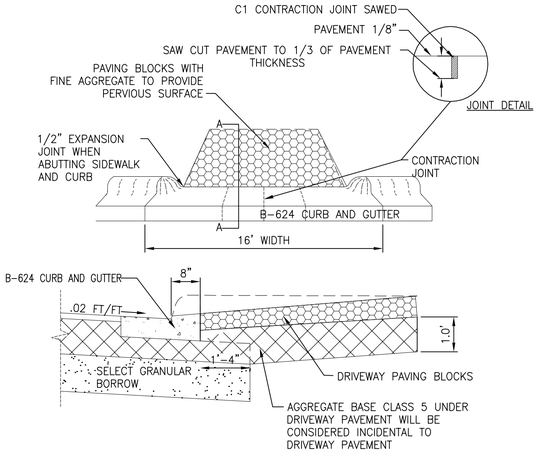


NOTES:

1. TYPICAL SLOPE ALONG GUTTER LINE EACH DIRECTION.
2. BITUMINOUS PAVEMENT ALONG APPROACH NOSE.
3. VARIABLE MEDIAN OR CURB HEIGHT.
4. SHAPE SAME AS MEDIAN OR CURB.
5. PROVIDE ONE 6" x 6" OPENING IN MEDIAN FOR SIGNING IF REQUIRED.
6. PAID FOR AS CONCRETE WALK, INCLUDES GUTTER, IF REQUIRED.

CONCRETE APPROACH NOSE DETAIL

N.T.S.

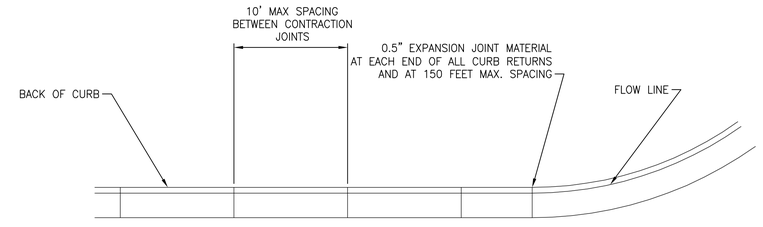


SECTION A–A

NOTE: THE CREST OF THE DRIVEWAY MUST BE AT LEAST 6" ABOVE GUTTER TO CONTAIN RUNOFF. NOTE: STATE OF MIN. STANDARD PLATE 7035L NOTE 5 SHALL NOT APPLY.

DRIVEWAY ENTRANCE

N.T.S.



CURB AND GUTTER LAYOUT DETAIL

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Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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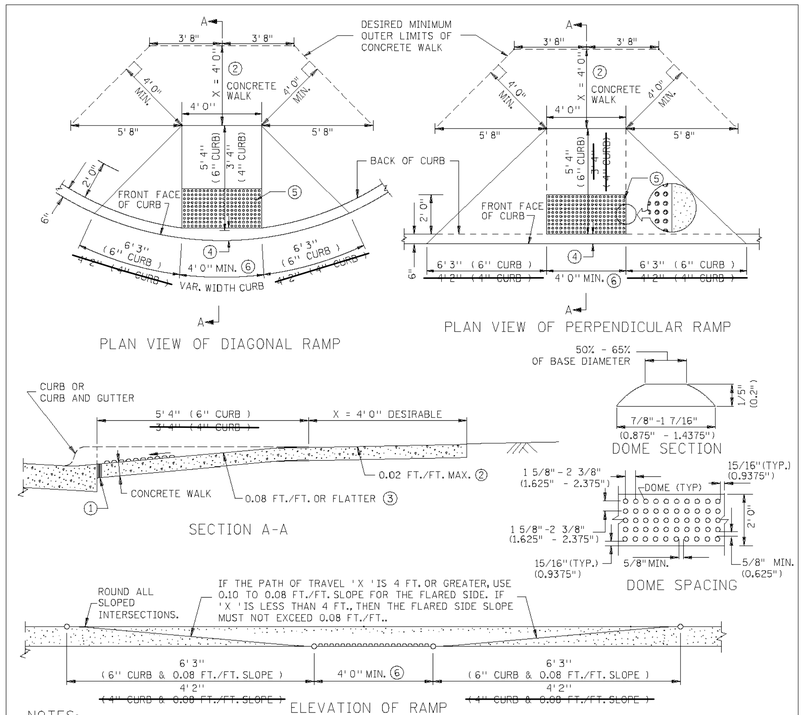
SHEET TITLE
TYPICAL CURB AND GUTTER DETAILS (SHEET 1 OF 2)

SHEET NUMBER
C212

BID DOCUMENTS

T:\214\1882.093\Dsn Terminal Dwg\c-DetC\AC212\AC212.dwg, 5/7/2009 12:45:14 PM



NOTES:

TO COMPLY WITH THE AMERICANS WITH DISABILITIES ACT (ADA), ALL STATE AND LOCAL AGENCIES ARE REQUIRED TO COMPLY WITH THIS STANDARD PLATE.

THE CURB AND CURB TRANSITION ON THE RAMP WILL BE PAID FOR AS LINEAR FEET OF CONCRETE CURB OR CONCRETE CURB AND GUTTER. THE RAMP AREA WILL BE PAID FOR AS CONCRETE WALK EXCLUDING THE TRUNCATED DOME AREA WHICH WILL BE PAID FOR AS TRUNCATED DOMES BY THE SQUARE FOOT. BIKE TRAILS SHALL HAVE TRUNCATED DOMES ACROSS THE ENTIRE WIDTH OF TRAIL WHEN THE TRAIL CROSSES A ROAD. DOMES ARE NOT TO BE USED ON SIDEWALKS OR TRAILS WHEN CROSSING ALLEYS OR DRIVEWAYS.

(1) 1/2 INCH PREFORMED JOINT FILLER MATERIAL, AASHTO M 213.

(2) WHEN POSSIBLE, PROVIDE A CLEAR PATH OF TRAVEL 4'0" WIDE BEHIND THE PEDESTRIAN RAMP. A RELATIVELY FLAT 4' X 4' LANDING WILL ALLOW WHEELCHAIRS TO NAVIGATE AROUND THE PEDESTRIAN RAMP. NO SIGNALS, SIGNS, CABINETS, OR OTHER OBSTRUCTIONS ARE ALLOWED IN THE RAMP OR PATH OF TRAVEL.

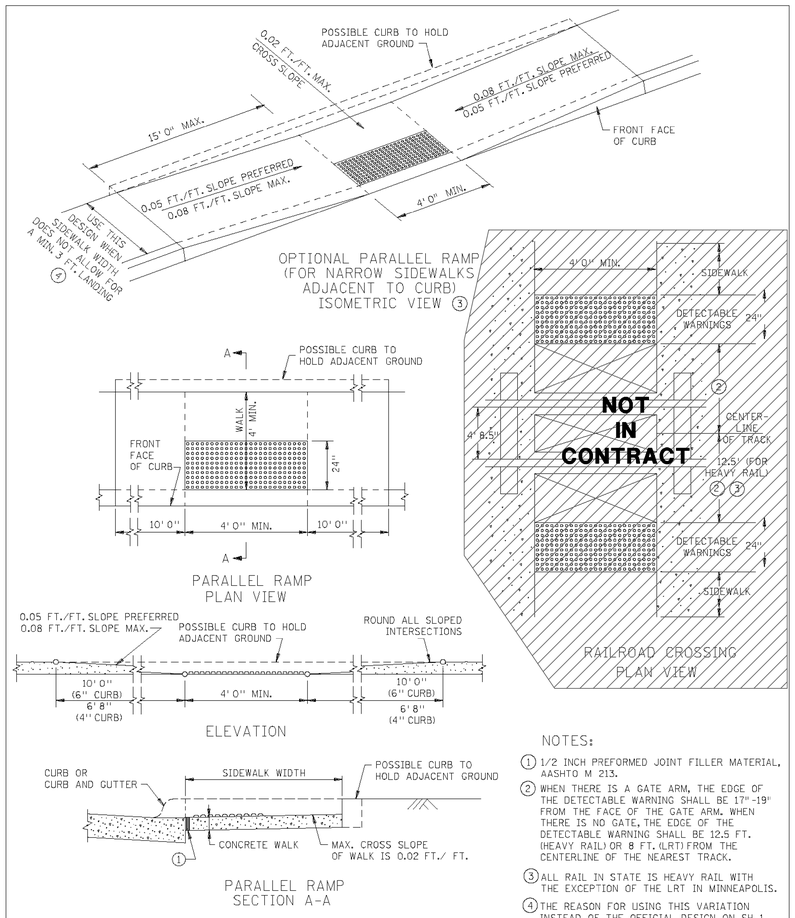
(3) WHEN A MEDIAN IS NOT WIDE ENOUGH FOR TWO PEDESTRIAN RAMPS AND A 48" LANDING BETWEEN THEM, THE PEDESTRIAN CROSSING SHALL BE CUT THROUGH THE MEDIAN AT STREET LEVEL.

(4) PLACE THE DETECTABLE WARNINGS (TRUNCATED DOMES) AT THE BACK OF CURB. WHEN THE DETECTABLE WARNING SYSTEM IS A PRECAST MATERIAL, THE CURB SHALL BE HAND FORMED TO FILL THE GAP.

(5) ADA REQUIRED TRUNCATED DOME AREA SHALL BE 2'0" MIN. IN DIRECTION OF TRAVEL AND SHALL EXTEND THE FULL WIDTH (3'0" OR 4'0" TYP.) OF THE CURB RAMP. THIS 2'0" BY 3'0" OR 4'0" WIDTH (TYP.) TRUNCATED DOME AREA SHALL CONTRAST VISUALLY WITH THE ADJACENT WALKING SURFACE. THE ENTIRE TRUNCATED DOME AREA SHALL BE A LIGHT (GRAY OR BUFF TYPICALLY) COLOR WHEN THE ADJACENT SIDEWALK IS A DARK COLOR. THE ENTIRE TRUNCATED DOME AREA SHALL BE A DARK COLOR (RED OR DARK GRAY TYPICALLY) WHEN THE ADJACENT SIDEWALK IS A LIGHT GRAY CEMENT COLOR.

(6) 4'0" MIN. FOR NEW CONSTRUCTION. 3'0" ALLOWED TO STAY IN PLACE FOR RETROFIT PROJECTS. IN SITUATIONS WHERE THE CURB CUT WIDTH EXCEEDS 4'0", THE DETECTABLE WARNINGS SHALL EXTEND THE FULL WIDTH.

APPROVED FEB. 20, 2004 — STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION — PEDESTRIAN CURB RAMP FOR THE HANDICAPPED	SPECIFICATION REFERENCE 2521 2531 — REVISION DATE 4-14-2004	STANDARD PLATE NO. 7036F 1 OF 2



THESE ARE OPTIONAL PEDESTRIAN SIDEWALK ACCESS DETAILS THAT ARE NOT REQUIRED BY CURRENT ADA REGULATIONS

NOTES:

(1) 1/2 INCH PREFORMED JOINT FILLER MATERIAL, AASHTO M 213.

(2) WHEN THERE IS A GATE ARM, THE EDGE OF THE DETECTABLE WARNING SHALL BE 17"-19" FROM THE FACE OF THE GATE ARM. WHEN THERE IS NO GATE, THE EDGE OF THE DETECTABLE WARNING SHALL BE 12.5 FT. (HEAVY RAIL) OR 8 FT. (LRT) FROM THE CENTERLINE OF THE NEAREST TRACK.

(3) ALL RAIL IN STATE IS HEAVY RAIL WITH THE EXCEPTION OF THE LRT IN MINNEAPOLIS.

(4) THE REASON FOR USING THIS VARIATION INSTEAD OF THE OFFICIAL DESIGN ON SH. 1 SHALL BE DOCUMENTED. IF A LARGE AMOUNT OF WATER IS EXPECTED FROM THE ADJACENT PROPERTY, THE DESIGNER SHOULD PLAN ACCORDINGLY.

APPROVED FEB. 20, 2004 — STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION — PEDESTRIAN CURB RAMP OPTIONS FOR THE HANDICAPPED	SPECIFICATION REFERENCE 2521 2531	STANDARD PLATE NO. 7036F 2 OF 2

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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
TYPICAL CURB AND GUTTER DETAILS (SHEET 2 OF 2)

SHEET NUMBER
C213

BID DOCUMENTS

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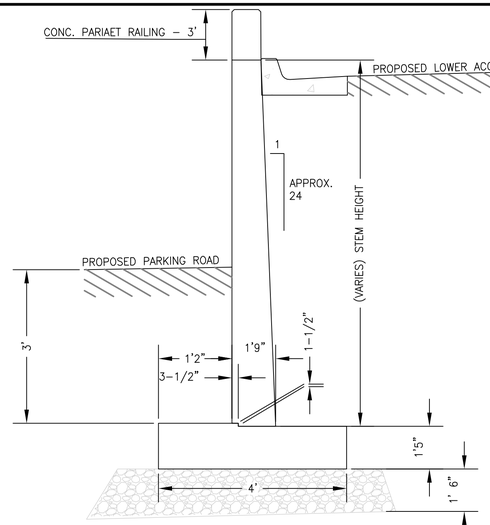


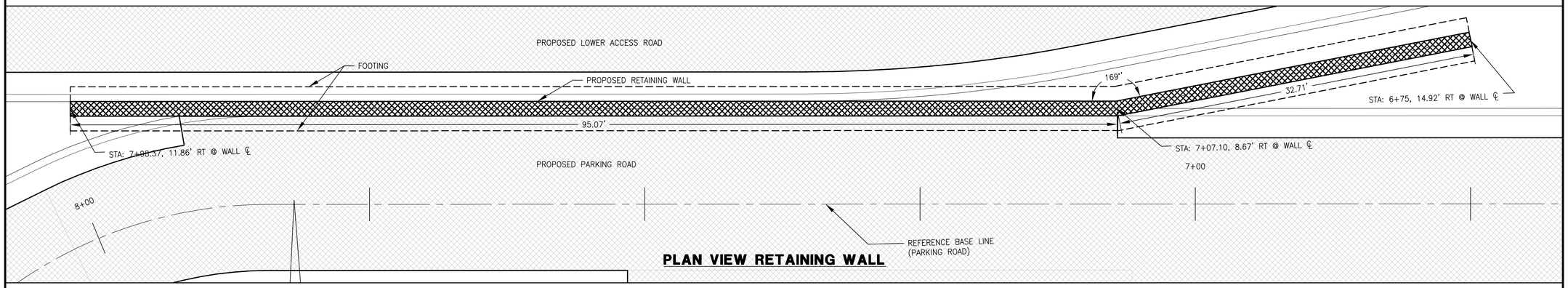
TYPICAL RETAINING WALL SECTION

N.T.S.

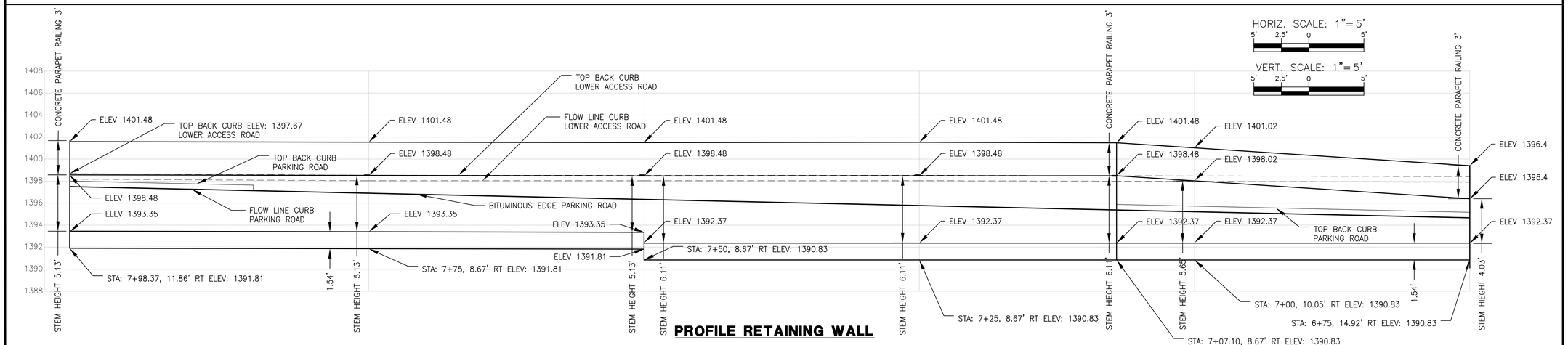
CONTRACTOR WILL FIND THE SPECIFICS PLANS FOR RETAINING WALL
MNDOT STANDARD RETAINING WALL PLANS
@http://www.dot.state.mn.us/design/standard-plans/complete/PlanApproved_85x11a.pdf

PLANS:
5-297.624 (1-3)
5-297.628 (1-4)
5-297.621
5-297.629

THESE PLAN SHEETS WILL DETAIL REINFORCEMENT BARS, LAYOUT AND SPACING & TYPE OF CONCRETE.



PLAN VIEW RETAINING WALL



PROFILE RETAINING WALL

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SHEET TITLE
RETAINING WALL PLAN & PROFILE, DETAILS AND NOTES

SHEET NUMBER
C214

BID DOCUMENTS

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FENCING NOTES

1. THE DEMOLITION OF FENCE SHALL INCLUDE THE COMPLETE REMOVAL AND DISPOSAL OF THERE CONTENTS, FOUNDATIONS. ANY UNFILLED EXCAVATION OR OTHER HAZARD LEFT UNATTENDED DURING PERIODS OF INACTIVITY SHALL BE PROPERLY FENCED OR PROTECTED BY THE CONTRACTOR. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE FENCE DEMOLITION.

2. THERE ARE EXISTING UNDERGROUND ELECTRICAL AND COMMUNICATIONS CABLES IN THE PROJECT WORK AREAS. THE ENGINEER HAS MADE EVERY EFFORT TO SHOW THEIR APPROXIMATE LOCATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY CABLE LOCATED, FLAGGED AND IDENTIFIED PRIOR TO CONSTRUCTION. ANY DAMAGE DONE TO FLAGGED OR OTHERWISE LOCATED CABLES SHALL BE REPLACED AT THE CONTRACTORS EXPENSE. LOCATION OF EXISTING UTILITIES MAY BE DONE BY CALLING GOPHER STATE ONE CALL 1-800-252-1166 TO NOTIFY LOCAL UTILITIES. THIS IS REQUIRED BY LAW.

3. ALL EXISTING AIRPORT SIGNAGE ON ANY FENCING DEMOLITION WILL BE SALVAGED AND TURNED OVER TO THE OWNER.

4. A SECURE PERIMETER MUST BE MAINTAINED AT ALL TIMES. ALL EMPLOYEES, AGENTS, VENDORS, INVITEES, ETC. OF THE CONTRACTOR OR SUBCONTRACTORS WORKING IN THE AIRCRAFT OPERATIONS AREA (AOA) SHALL, IN ACCORDANCE WITH THE AIRPORT OPERATIONS SECURITY PROGRAM, BE REQUIRED TO DISPLAY AIRPORT ISSUED IDENTIFICATION OR BE UNDER ESCORT BY PROPERLY BADGED PERSONNEL. THESE BADGES WILL BE IDENTIFIED NUMERICALLY AND ISSUED TO INDIVIDUAL EMPLOYEES WITH A PERMANENT RECORD MAINTAINED ON EACH INDIVIDUAL TO WHOM A BADGE IS ISSUED. SEE SECURITY NOTES, SHEET C003.

GENERAL NOTES

1. DIMENSIONS:
   ALL DIMENSIONS, SIZES, GAUGES, WEIGHTS, OR THICKNESSES SHOWN ARE THE MINIMUM ACCEPTABLE, UNLESS OTHERWISE INDICATED

2. SPECIFICATIONS:
   THE FEDERAL SPECIFICATIONS SHOWN SHALL BE INTERPRETED TO MEAN THE LATEST ISSUE OR AMENDMENT OF SUCH SPECIFICATION, IN EFFECT ON THE DATE OF PLAN APPROVAL FAA SPECIFICATIONS SHOWN ARE FROM THE FEDERAL AVIATION ADMINISTRATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS" MATERIALS AND CONSTRUCTION METHODS NOT DETAILED HEREON, SHALL BE IN ACCORDANCE WITH THE FAA SPECIFICATION LISTED FOR EACH CLASS OF FENCE, UNLESS OTHERWISE NOTED ON THE CONTRACT PLANS. GATES ARE MEASURED IN UNITS FOR EACH TYPE AND SIZE INSTALLED

3. FABRIC INSTALLATION:
   WIRE OR FABRIC ON BOUNDARY AND SECURITY FENCES SHALL BE ON THE SIDE OF POSTS AWAY FROM AIRPORT PROPERTY

   FENCES BETWEEN TERMINAL BUILDINGS AND APRONS, OR ADJACENT TO SIDEWALKS, SHALL HAVE FABRIC ON THE BUILDING OR SIDEWALK SIDE OF POSTS. ALL OTHER BUILDING AREA FENCES SHALL HAVE FABRIC ON SIDE OF POSTS AWAY FROM BUILDINGS OR INSTALLATION BEING FENCED, UNLESS OTHERWISE NOTED.

4. BARBED WIRE:
   BARBED WIRE SHALL BE ZINC COATED, MEETING REQUIREMENTS OF ASTM A 121, CLASS 3, WIRE SHALL BE TWO STRAND TWISTED No. 12-1/2 ASW GAUGE STEEL, WITH FOUR POINT BARBS, No.14 ASW GAUGE MINIMUM 1/2 " MINIMUM LENGTH, SPACED ON APPROXIMATELY 5" CENTERS. THE BARB WIRE SHALL BE ATTACHED TO 45 DEGREE ARMS. TENSION SHALL BE TO SATISFACTION OF THE ENGINEER. NO CRIMPING OR SPLICING SHALL BE USED TO OBTAIN PROPER TENSION. EACH POST SHALL HAVE PLACEMENT ARM AND 3-STRANDS OF BARBED WIRE SHALL BE CONTINUOUS. TYPE I, EXTENSION ARMS ARE REQUIRED.

5. CONCRETE:
   CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI. FOOTING TOPS SHALL BE 1" MINIMUM ABOVE GROUND AT THE POST, AND TROWEL FINISHED TO SLOPE AWAY FROM POST.

6. OPENINGS UNDER FENCE:
   ANY OPENING UNDER FENCES, WHEREIN THE BOTTOM FENCE WIRE IS MORE THAN 4" ABOVE GROUND AND THE TOTAL AREA OF OPENING IS 96 SQ. INCHES OR MORE, SHALL BE CLOSED.

   OPENINGS LESS THAN 18" HIGH SHALL BE CLOSED BY INSTALLING ONE OR MORE ADDITIONAL LINE POSTS NEAR THE OPENING CENTER AND STRETCHING STRANDS OF BARBED WIRE BETWEEN THE EXTRA POSTS AND ADJACENT LINE POSTS AT 6" MAXIMUM VERTICAL SPACING, VERTICAL STRANDS OF BARBED WIRE SHALL BE INSTALLED AT 12" MAXIMUM HORIZONTAL SPACING AND TIED TO ALL HORIZONTAL STRANDS AND THE FABRIC BOTTOM WIRE. THIS WORK SHALL BE INCIDENTAL TO FENCE INSTALLATION COSTS.

   OPENINGS 18" OR MORE IN HEIGHT, OPENINGS IN HIGH SECURITY RISK AND HAZARD AREAS, DITCHES, DRAINAGE COURSES, ETC., SHALL BE CLOSED BY METHODS DETAILED ON THE CONTRACT PLANS. PAYMENT FOR CLOSURES DETAILED ON THE PLANS SHALL BE AS NOTED ON THE CONTRACT PLANS.

7. GROUND RODS:
   GROUND RODS SHALL BE INSTALLED AT 400' MAXIMUM INTERVALS, INCIDENTAL TO FENCE COST. EACH SECTION OF FENCE SEPARATED BY NON-METALLIC CONNECTORS, BUILDINGS OR OTHER OPENINGS SHALL HAVE A MINIMUM OF ONE GROUND ROD. EACH GATE LEAF FRAME SHALL BE CONNECTED TO THE GATE POST BY A BRAIDED FLEXIBLE COPPER STRAP. EACH GATE POST SHALL BE GROUNDED AS DETAILED. GROUND RODS SHALL BE 5/8" x 8' MIN. SIZE, COPPER CLAD. ALL GROUND RODS TO BE TESTED WITH MAXIMUM RESISTANCE TO GROUND OF 10 OHMS. GROUND CABLE SHALL BE NO. 4 AWG. MIN., BARE STRANDED COPPER WIRE. FOR FENCES GROUNDING SHALL BE AS DETAILED. IF GROUNDING IS REQ'D THROUGH EXISTING RUNWAY/TAXIWAY/APRON PAVEMENT, CONTRACTOR SHALL CORE A 4-INCH HOLE THROUGH THE PAVEMENT AND PLACE REQUIRED GROUND ROD. CONNECTIONS TO FENCE AND RODS SHALL BE MADE WITH SUITABLE NON-CORROSIVE METAL CLAMPS, LUG OR CONNECTORS.

8. FENCE LINE AND ALIGNMENT:
   FENCE LINES SHALL BE CLEARED OF ALL OBSTRUCTIONS AND SMOOTH GRADED TO THE GENERAL CONTOUR OF THE ADJACENT GROUND FOR A 10' MIN. WIDTH EACH SIDE OF LINE. STUMPS AND ROOTS NOT INTERFERING WITH FENCE CONSTRUCTION, MAY BE CHIPPED TO GROUND LEVEL

   THE FENCE SHALL BE CONSTRUCTED VERTICAL, STRAIGHT AND TRUE TO LINE. THE LONGITUDINAL GRADIENT SHALL PARALLEL THE GENERAL SLOPE OF THE GROUND.

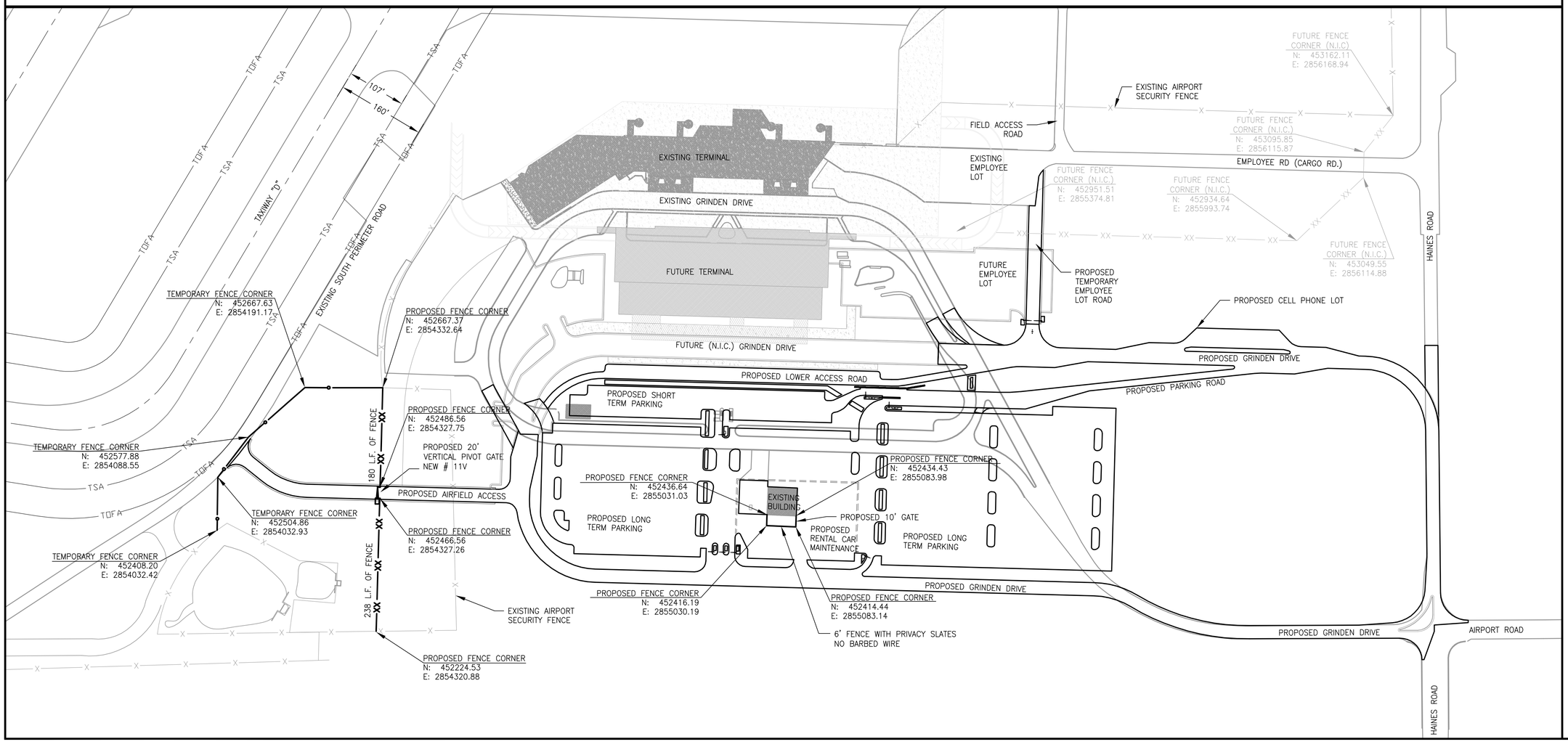
9. FENCE SIGNAGE:
   ANY NEW SIGNS TO BE PLACED ON NEW OR EXISTING FENCING MATERIALS SHALL BE DETAILED ON THE PLANS. ALL FURNISHING AND INSTALLING OF SIGNAGE IS INCIDENTAL TO ITEM F-162.

NORTH

0 100' 200'

FENCING LEGEND

- EXISTING FENCE TO REMAIN
- PROPOSED PERMANENT SECURITY FENCE
- PROPOSED TEMPORARY SECURITY FENCE



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REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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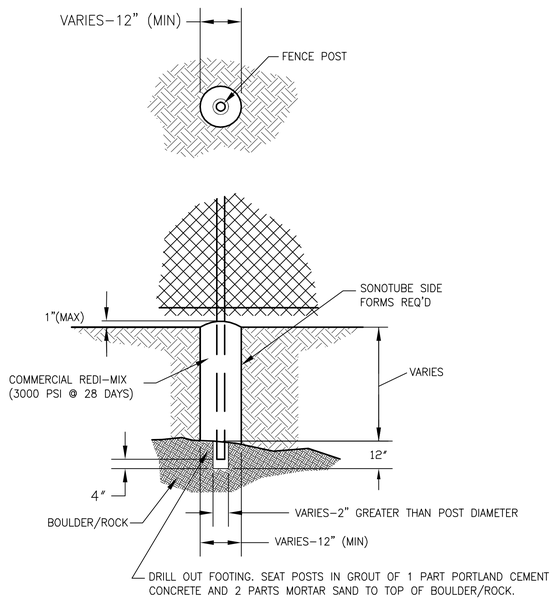
SHEET TITLE
FENCING LAYOUT SITE PLAN & NOTES

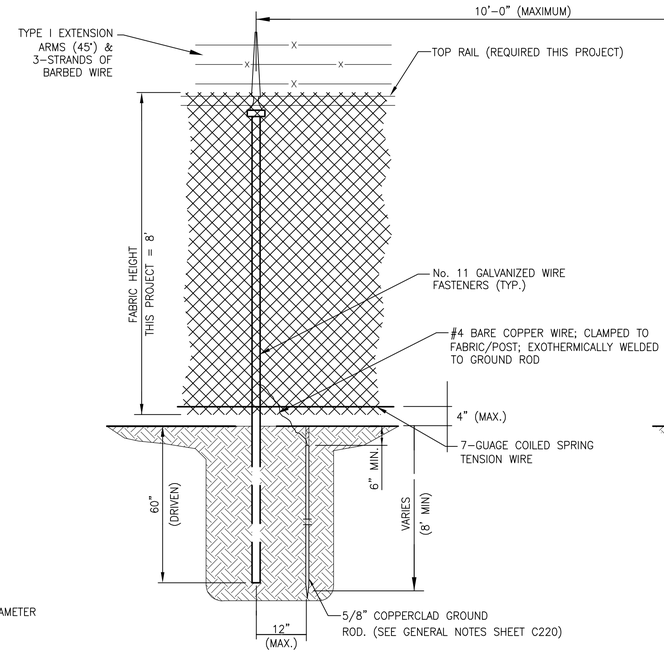
SHEET NUMBER
C220

BID DOCUMENTS

T:\P-2141882.093 DLH Terminal Design CMB\ADD\CDs\C220.dwg, 5/7/2009 13:05:11 PM



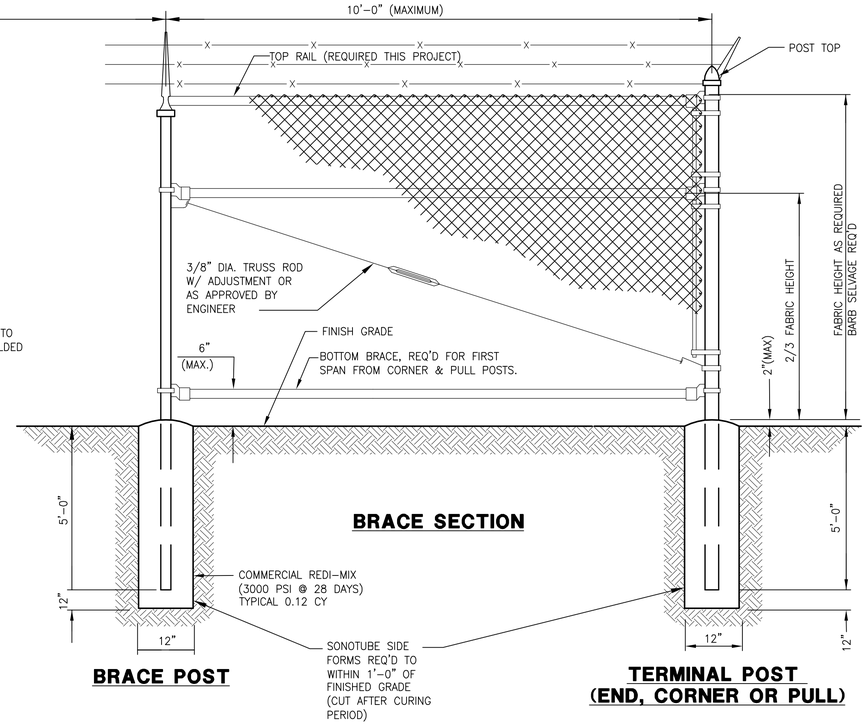
BOULDER/ROCK FOOTING DETAIL



TURF LINE POST (INTERMEDIATE)

POST NOTES:

1. SEE TABLE THIS SHEET FOR POST DIMENSIONS AND UNIT WEIGHT PER FOOT REQUIREMENT.



BRACE POST

TERMINAL POST (END, CORNER OR PULL)

CHAIN LINK FENCE, CLASS E, FAA SPEC. F-162

NTS

TYPICAL CHAIN LINK FENCE MEMBERS, DIMENSIONS & WEIGHTS

DESCRIPTION	SECTION	STEEL FRAME	
		OUTSIDE DIMENSION (INCHES)	WEIGHT (LBS/FT.)
CORNER, BRACE, END AND PULL POSTS	○	2.375	3.65
FABRIC HEIGHTS 6 ft AND LESS	□	2.00	3.60
FABRIC HEIGHTS OVER 6 ft	○	2.875	5.79
	□	2.5	5.70
ALL HEIGHTS	ROLL FORM	3.5x3.5	5.10
GATE POSTS	○	3 OR 4	5.79
GATE LEAF WIDTH 6 ft AND LESS	□	2.5	5.70
	ROLL FORM	3.5x3.5	5.10
GATE WIDTH OVER 6 ft THRU 13 ft	○	4.0	9.11
GATE LEAF WIDTH OVER 13 ft THRU 18 ft	○	6.625	18.97
GATE LEAF WIDTH OVER 18 ft THRU 23 ft	○	8.625	24.70
LINE POSTS			
FABRIC HEIGHTS 6 ft AND LESS	○	1.90	2.72
FABRIC HEIGHTS OVER 6 ft	○	2.375	3.65
RAILS & BRACES	○	1.660	1.806
	ROLL FORM	1.625x1.250	1.35

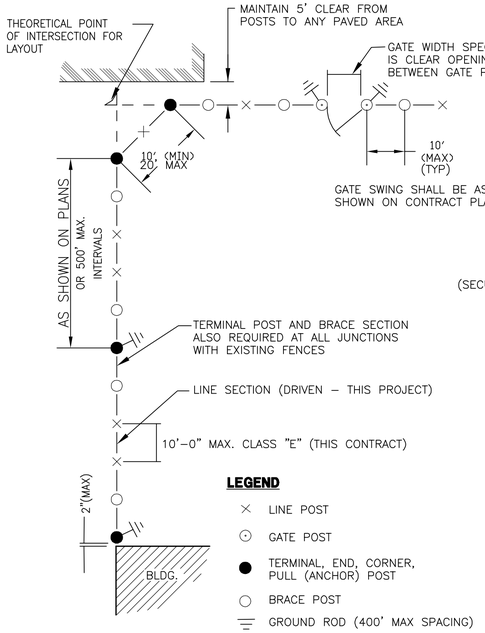
NOTES:

GALVANIZED STEEL PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F 1083.

POLYMER–COATED STEEL PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 569. POLYMER COATING SHALL BE IN ACCORDANCE WITH ASTM F 1234, TYPE B.

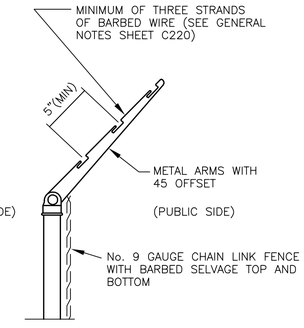
THE STEEL USED IN ALL STRUCTURAL SHAPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 572, GRADE 45, AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM F 1234, TYPE A.

ROLL–FORMED SECTIONS SHALL BE FABRICATED FROM MATERIAL MEETING THE REQUIREMENTS OF ASTM A 570, GRADE 45, AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A 123, OR COATED WITH ZINC–5% ALUMINUM MISCHMETAL ALLOY IN ACCORDANCE WITH ASTM F 1234, TYPE C.



TYPICAL FENCE LAYOUT

ALL CLASSES

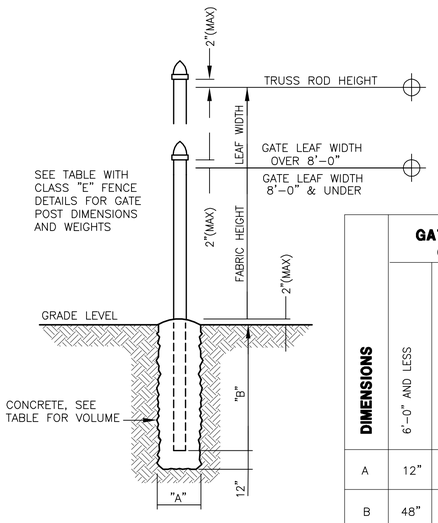


TYPE No.1

(REQUIRED THIS CONTRACT)

TYPE No. 1 ARMS SHALL BE INSTALLED ON SIDE AWAY FROM AIRPORT PROPERTY OR AIRCRAFT OPERATIONS AREA.

BARBED WIRE EXTENSION ARMS



DETAIL (TYP)

DIMENSIONS	GATE WIDTH (ONE LEAF) 6'–0" AND LESS	OVER 6'–0" TO 10'–0"	OVER 10'–0" TO 15'–0"	OVER 15'–0" TO 18'–0"
A	12"	16"	20"	24"
B	48"	66"	66"	66"
C.Y. CONC. *	0.15	0.42	0.53	0.76

* COST OF FURNISHING & PLACING CONCRETE INCIDENTAL TO COST OF EACH GATE

SCHEDULE

GATE POST & CONCRETE BASE

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Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE/LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
FENCING AND GATE DETAILS (SHEET 1 OF 4)

SHEET NUMBER
C221

BID DOCUMENTS

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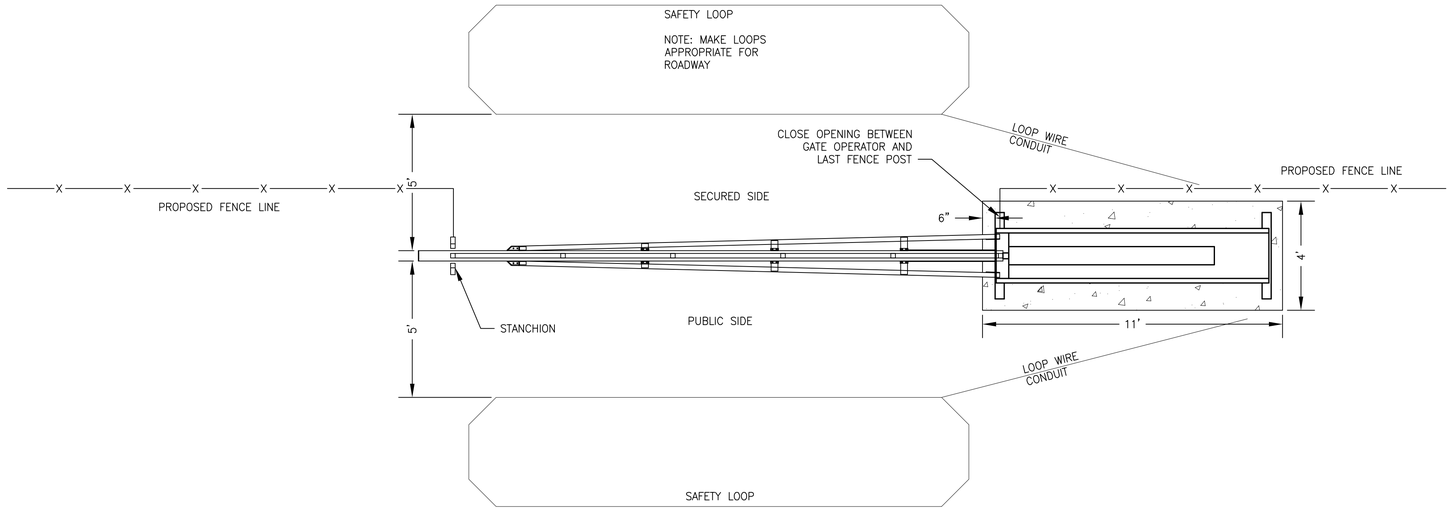
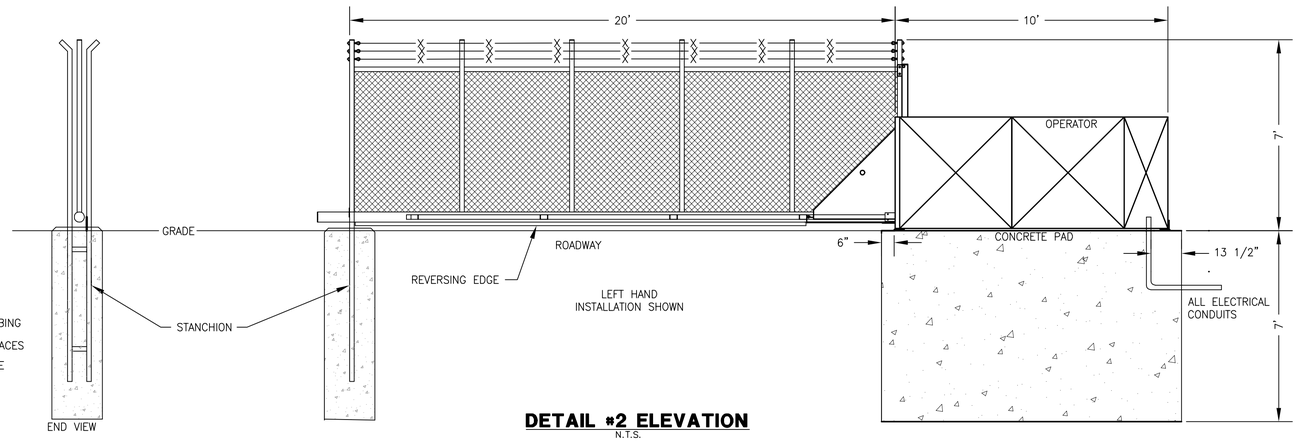


DETAIL #1 PLAN VIEW

N.T.S.

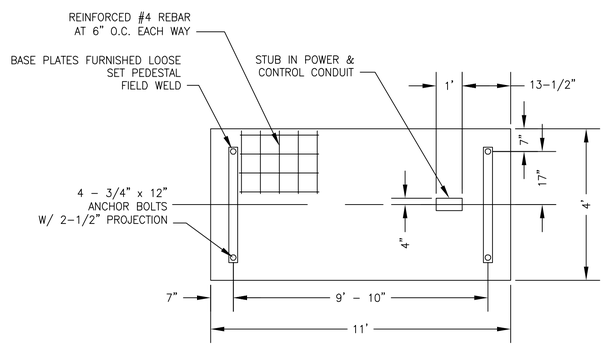


LIST OF MATERIALS

X .188 SQUARE TUBING
SCHEDULE 40 PIPE
SQ. TUBE SWAY BRACES
#" ALUMINUM CAPS
ANIZED BARBED WIRE

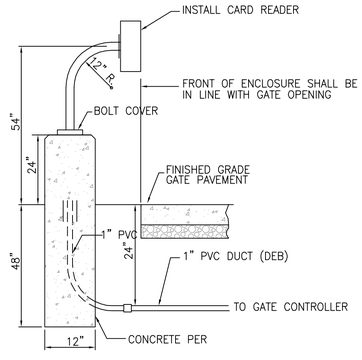
DETAIL #2 ELEVATION

N.T.S.



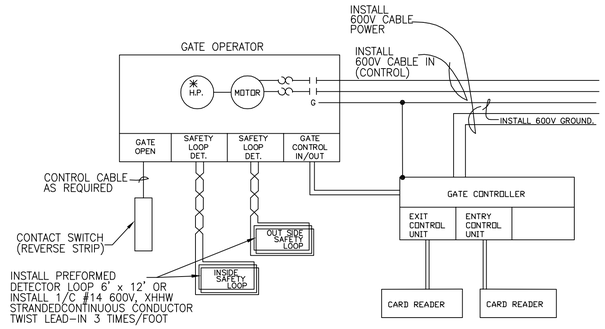
DETAIL #3 FOUNDATION DETAIL

N.T.S.



CARD READER PEDESTAL DETAIL

N.T.S.



ACCESS GATE WIRING DIAGRAM

N.T.S

H.P. = HYDRAULIC PUMP

GATE NOTES:

1. GATES SHALL HAVE A DEVICE WITH PROVISIONS FOR LOCKING. (SEE DETAIL #6 THIS SHEET)
2. WELDS ON STEEL FRAMES SHALL BE GROUND SMOOTH, THOROUGHLY CLEANED AND COVERED WITH ALUMINUM OR ZINC BASE PAINT.
3. GATES AND FITTINGS SHALL BE GALVANIZED STEEL PIPE PER REQUIREMENTS FOR POSTS, RAILS & BRACES
4. INSTALLATION SHALL MEET FAA SPEC. F-162, LATEST EDITION.
5. AS BARBED WIRE EXTENSION ARMS ARE SPECIFIED FOR FENCE, THE GATE POSTS SHALL BE EXTENDED 12" MINIMUM ABOVE THE TOP OF THE FENCE FABRIC, FOR TERMINATING THE BARBED WIRE.
6. GATE SHALL BE 20' X 6'+1' AMPLIMESH.
7. GATE SHALL BE INSTALLED WITH 150 MPH BRACING.
8. GATE SHALL OPERATE AT TEMPERATURES TO -40 F.
9. ALTERNATE POWER SOURCE WHEN COMMERCIAL POWER IS UNAVAILABLE.
10. ELECTRIC HEAT TAPE SHALL BE INSTALL IN CONCRETE BASE (INCEDENTAL TO GATE)

F-162 FENCE NOTES:

1. FABRIC: 2"X2" No. 9 GAUGE GALVANIZED STEEL WIRE MESH.
2. SELVAGE RAILS & TENSION WIRES: FENCES SHALL HAVE BARBED SELVAGE AND 7 GAUGE COILED SPRING TENSION WIRES PROVIDED, BOTTOM; KNUCKLED BARBED SELVAGE AND TOP RAIL, TOP.
3. POSTS: SEE SHEET C221.
4. FABRIC FASTENERS: MINIMUM 3/16" x 3/4" STRETCHER BAR, BANDED TO TERMINAL POSTS; OR INTEGRAL FABRIC FITTINGS ON TERMINAL POSTS. USE NO. 6 WIRE CLIPS FOR LINE POSTS AND NO. 9 WIRE CLIPS FOR BRACES, RAILS, AND TENSION WIRES. ALL FASTENERS SPACED 14" MAX. VERTICALLY, 24" MAX. HORIZONTALLY. ALL FABRIC FASTENERS SHALL BE SAME MATERIAL AS FENCE FABRIC BASE MATERIAL.
5. COATINGS: ZINC COATING ON POSTS, RAILS, GATE FRAMES AND STEEL FITTINGS SHALL AVERAGE 2.0 OZ./S.F. NO INDIVIDUAL SPECIMEN SHALL HAVE LESS THAN 1.8 OZ./S.F.
6. FENCE HEIGHT: THE FABRIC HEIGHT SHALL BE TEN (10') FEET.
7. BARBED WIRE: 3-STRANDS OF BARBED WIRE SHALL BE PLACED THIS CONTRACT.
8. POSTS IN PAVEMENT: POSTS SET IN EXISTING PAVEMENTS SHALL HAVE PAVEMENT CORED FULL DEPTH TO A DIAMETER THAT WILL PROVIDE 2" CLEAR TO POST ON ALL SIDES.
9. TIES: WIRE TIES SHALL BE OF THE SAME MATERIAL & COATING WEIGHT AS THE FABRIC TYPE WILL ALLOW ALUMINUM WIRE FASTENER TIES.

NOTE:

1. ELECTRICAL SITE CONTRACTOR SHALL PLACE/ PROVIDE CONDUIT AND CABLES FOR GATE POWER/ SERVICE, AND SHALL CORDINATE WITH FENCE/ GATE CONTRACTOR.
2. FENCE CONTRACTOR SHALL BE REPSONSIBLE FOR ALL LOOPS READERS AND ALL OTHER ELECTRICAL WIRE AND CONDUIT FOR THIS GATE
3. SEE ELECTRICAL SHEET E100-E109 FOR GATE POWER AND CONTROL
2. FENCING NOT SHOWN AROUND GATE OPERATOR FOR SAKE OF CLARITY.

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
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DESIGNED BY: JEH

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SHEET TITLE
FENCING AND GATE DETAILS (SHEET 2 OF 4)

SHEET NUMBER
C222

BID DOCUMENTS

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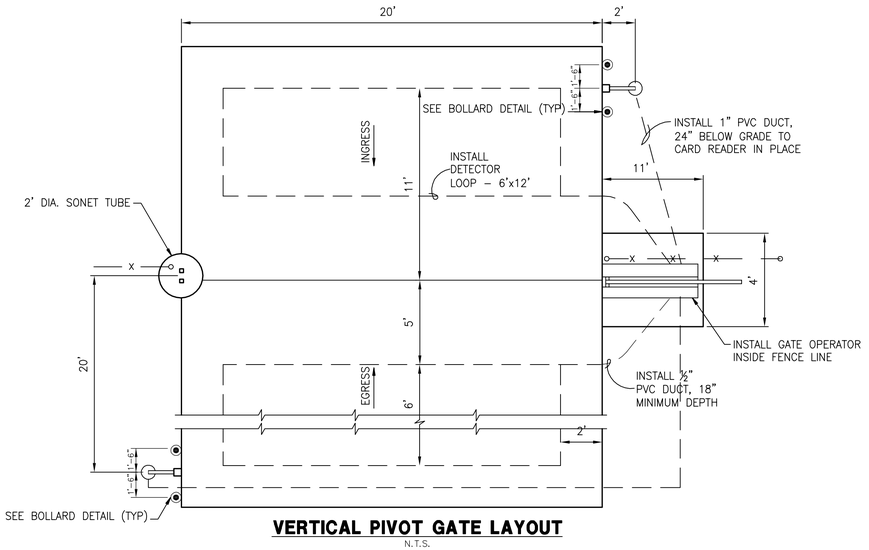
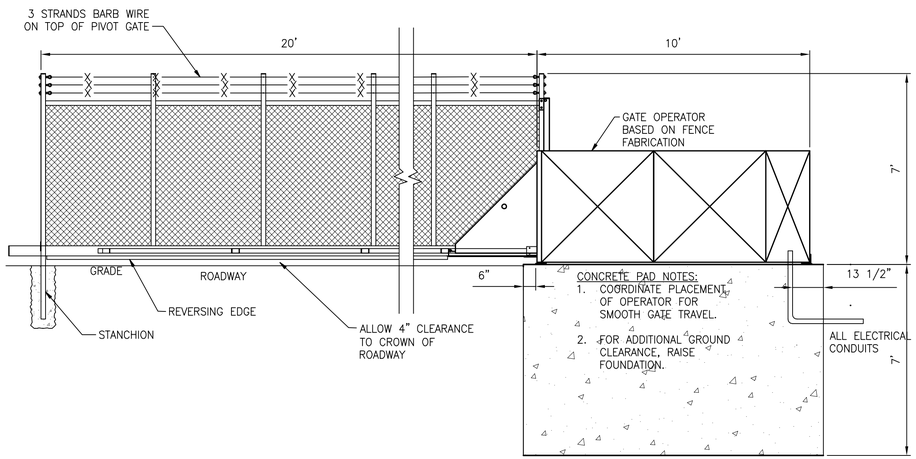


VERTICAL PIVOT GATE LAYOUT

N.T.S.



PIVOT GATE OPERATOR DETAIL

GATE OPERATOR MUST BE LOCATED ON AIRPORT OPERATION AREA SIDE OF FENCING
NTS

VERTICAL PIVOT GATE NOTES:

1. PROPOSED HYDRAULIC GATE OPERATORS SHALL BE IDEAL HYJD–25, OR APPROVED EQUAL. VOLTAGES AND HORSEPOWERS SHALL BE AS DETAILED. OPERATORS SHALL HAVE FULL SYSTEM CAPABILITIES AND MUST BE INTEGRATED EXISTING CHECKPOINT ACCESS AND CONTROL SYSTEM. THE OPERATOR SHALL BE MOUNTED ON A FOUNDATION PER DETAIL #3 SHEET C222.

2. PROXIMITY CARD READERS SHALL BE PROVIDED AS DETAILED AND MATCH EXISTING INSTALLATIONS. CONTROL SHALL BE VIA FIBER OPTIC CABLE AND SHALL BE INSTALLED IN PVC CONDUIT FROM CARD READERS TO GATE OPERATOR. PROVIDE TWO (2) CONCRETE BOLLARDS AROUND EACH CARD READER FOR PROTECTION.

3. PROVIDE PHOTO EYES AT EACH GATE FOR OBSTRUCTION SENSING. THE INFERRED PHOTO EYES SHALL BE EMX INDUSTRIES, INC. MODEL IRB–325 OR APPROVED EQUAL. AN INLINE CONTROL SWITCH MUST ALSO BE PROVIDED AT EACH PHOTO EYE FOR MANUAL OPERATION CONTROL WIRING SHALL BE INSTALLED IN PVC CONDUIT FROM EACH PHOTO EYE TO GATE OPERATOR.

4. THE CONTRACTOR SHALL PROVIDE A TRANSMITTER WITH AUDIBLE ALARM ON EACH GATE. THE TRANSMITTER SHALL BE MILLER EDGE MODEL MWTO2 OR APPROVED EQUAL. EACH GATE SHALL BE EQUIPPED WITH A CONTACT SAFETY DEVISE ON THE BOTTOM EDGE OF THE GATE. THE CONTACT SAFETY EDGE SHALL BE MILLER EDGE ME123 SENSING EDGE OR APPROVED EQUAL

5. EXACT LAYOUT FOR EACH GATE OPERATOR SYSTEM IS DIFFERENT. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO COORDINATE EXACT LAYOUT WITH THE AIRPORT AND ENGINEER PRIOR TO AND DURING CONSTRUCTION.

6. PROPOSED GATE OPERATORS SHALL BE OPERATED MANUALLY, BY PROXIMITY KEY CARD ACCESS, AND BY REMOTE TRANSMITTERS CONTRACTOR SHALL PROVIDE 100 KEY CARDS AND 10 TRANSMITTERS TO THE AIRPORT AT THE COMPLETION OF CONSTRUCTION FOR AIRPORT USE. ALL PROXIMITY CARDS AND TRANSMITTERS SHALL BE COMPATIBLE WITH THE EXISTING CHECKPOINT ACCESS AND CONTROL SYSTEM. ALL ENCLOSURES SHALL BE CONFIGURED IN SUCH A WAY THAT ALL ELECTRONIC COMPONENTS ARE PROTECTED FROM INCLEMENT WEATHER WHEN THE ENCLOSURE IS OPEN.

7. PROVIDE 1/2" PVC CONDUIT FOR LOOP WIRING FROM LOOP TO GATE OPERATOR.

8. ALL ITEMS ASSOCIATED WITH INSTALLATION OF PROPOSED HYDRAULIC GATES (CONDUITS, WIRING, DISCONNECTS, CARD READERS, BOLLARDS, SENSOR LOOPS, CONTROL STATIONS, KEY CARDS, WP/GFCI RECEPTACLES, POWER PANELS ETC.) SHALL BE CONSIDERED INCIDENTAL TO EACH GATE OPERATOR AT EACH LOCATION. EACH GATE OPERATOR SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE, WHICH PRICE SHALL INCLUDE THE ASSOCIATED ITEMS SHOWN ON THE PLANS AND AS REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.

9. (INFORMATION ONLY) THE EXISTING CHECKPOINT ACCESS AND CONTROL SYSTEMS AT DULUTH INTERNATIONAL AIRPORT ARE SERVICED BY PRO–TEC DESIGN

SAFETY LOOP NOTES

THE FOLLOWING CHART MUST BE UTILIZED WHEN INSTALLING A LOOP USED FOR VEHICLE DETECTION. THIS CHART LISTS THE PREDETERMINED NUMBER OF TURNS THAT MUST BE MADE BY THE ACTUAL LOOP WIRES IN ORDER TO CREATE AN ACCEPTABLE INDUCTANCE RANGE.

LOOP DIMENSION	NUMBER OF TURNS	LOOP AREA
A) 2' X 6'	6	A) 6 – 12
B) 2'–6" X 6'	5	B) 12 – 20
C) 4' X 8'	4	C) 20 – 60
D) 6' X 9'	3	D) 60 – 240
E) 12' X 20'	2	E) 240 & UP

DUE TO THE LOSS OF INDUCTANCE CAUSED BY A DISTANCE GREATER THAN 490 FEET FROM THE LOOP TO THE GATE DEVICE, AN ADDITIONAL TURN OF LOOP WIRE IS RECOMMENDED DURING INSTALLATION.

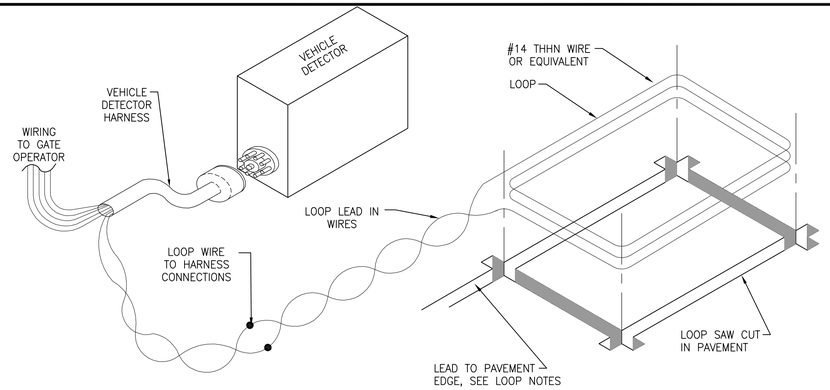
A CLEAN, SMOOTH SAW SLOT MUST BE CUT INTO THE PAVEMENT WHERE THE LOOP IS TO BE INSTALLED. THE INDUSTRY STANDARD REQUIRES THIS SLOT TO BE A MINIMUM OF 1–1/2" AND A MAXIMUM OF 3–1/2" DEEP AS A GENERAL RULE. WHEN A SOFTER PAVEMENT MATERIAL IS PRESENT, THE GREATER SAW CUT DEPTH IS PREFERRED. THIS PROTECTS THE LOOP WIRES FOR A LONGER PERIOD OF TIME.

AFTER THE LOOP SAW SLOTS HAVE BEEN CLEARED OUT, PROCEED TO TUCK THE WIRE IN THE SLOTS WITH AN OBJECT THAT WILL NOT INJURE THE WIRE INSULATION. WIND THE ACTUAL LOOP WITH #14 THHN STRANDED WIRE OR EQUIVALENT. THE WIRE MUST BE RATED FOR DIRECT BURIAL AND IMPERVIOUS TO MOISTURE. THIS WILL AVOID CHANGES IN THE DIELECTRIC CONSTANT OF THE WIRE INSULATION WHICH MAY CAUSE EXCESSIVE INDUCTANCE DRIFT. IT IS EXTREMELY IMPORTANT THAT THE LOOP BE WOUND WITH ONE CONTINUOUS LENGTH OF WIRE. THERE ARE ABSOLUTELY NO SPLICES PERMITTED!

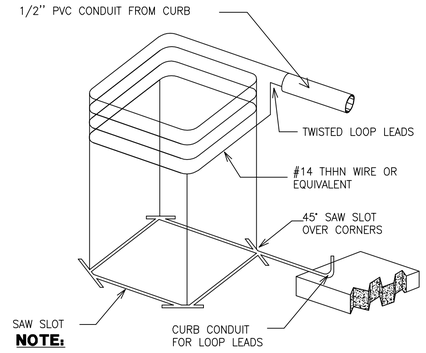
THE TWO WIRES THAT LEAVE THE LOOP AT THE CURB OR PAVEMENT AFTER THE LOOP HAS BEEN PROPERLY WOUND, MUST BE TWISTED AT A MINIMUM OF 5 TURNS PER FOOT AND TAPED TOGETHER WITH (UL) APPROVED ELECTRICAL TAPE TO PREVENT THE WIRES FROM MOVING. FAILURE TO TWIST AND SECURE THESE WIRES MAY PRODUCE A FALSE SIGNAL FROM THE LOOP.

WHEN THE LOOP INSTALLATION HAS BEEN COMPLETED, CHOOSE A SEALANT THAT CLOSELY MATCHES THE TYPE OF PAVEMENT MATERIAL PRESENT. INDUSTRY RECOMMENDS (3M) LOOP DETECTOR SEALANT. HARD SETTING EPOXIES SHOULD NOT BE USED WITH ASPHALT. AVOID HIGH TEMPERATURE SEALANTS.

VEHICLE DETECTION LOOPS SHALL BE TWO PER GATE AND BE CONFIGURED FOR SAFETY ONLY.
ALL LOOPS SHALL BE INSTALLED TO MANUFACTURERS SPECIFICATIONS AND FIELD LOCATED BY CONTRACTOR AND ENGINEER. LOOPS SHALL BE SAWCUT INTO SOUND PAVEMENT. WHERE PAVEMENT IS CRACKED, BROKEN OR OTHERWISE UNSOUND, LOOPS SHALL BE INSTALLED IN SCHEDULE 80 PVC AND LOCATED IN THE GRANULAR BASE PRIOR TO NEW PAVING BY OTHERS.

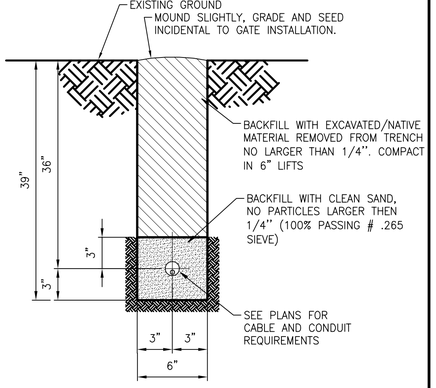


PROPOSED SAFETY LOOP DETECTOR INSTALLATION DETAIL



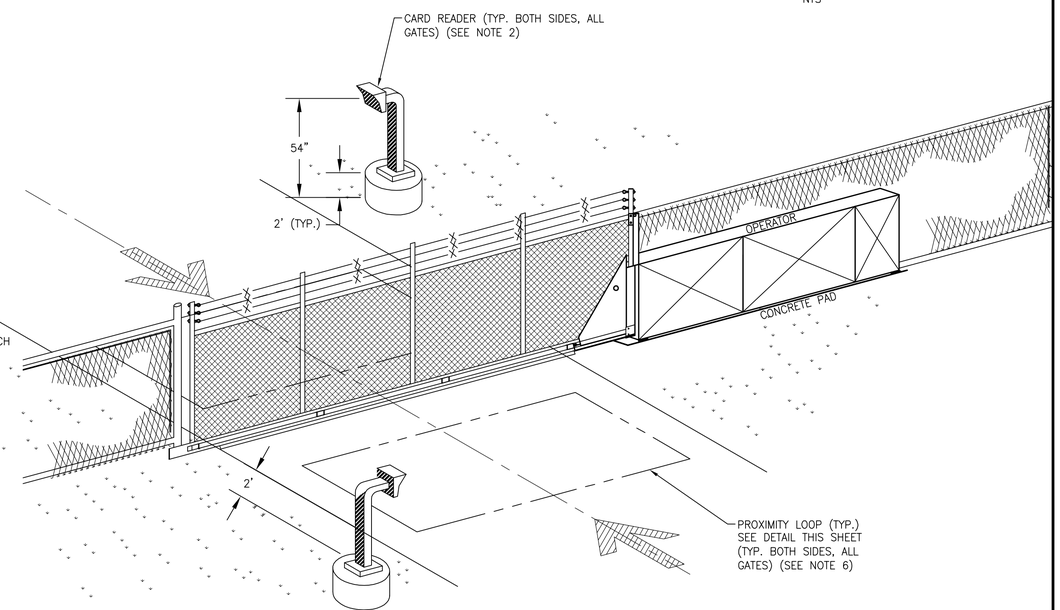
WARNING DO NOT INSTALL LOOP WITHIN 12 INCHES OF ANY CABLES OR CONDUITS.
DO NOT INSTALL LOOP WITHIN 2 INCHES OF ANY STEEL REINFORCEMENTS NOR ANY PAVEMENT JOINTS

SAFETY LOOP INSTALLATION DETAIL



CONDUIT TRENCH DETAIL

(IN TURF)
NTS



TYPICAL ELECTRIC GATE LAYOUT DETAIL

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

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SHEET TITLE
FENCING AND GATE DETAILS (SHEET 3 OF 4)

SHEET NUMBER
C223

BID DOCUMENTS

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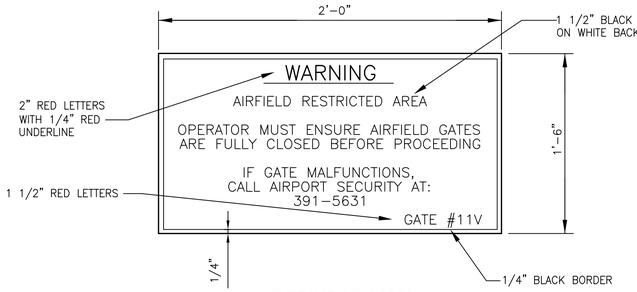
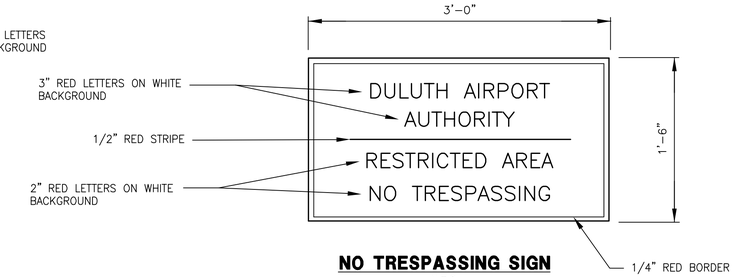
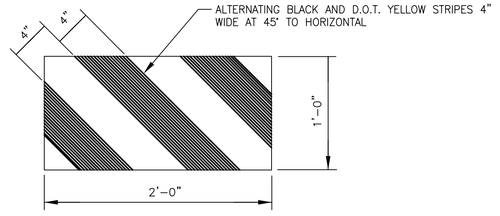


OPERATOR SIGN
N.T.S
(PLACED ON FRONT AND BACK OF EACH GATE)

VERTICAL PIVOT GATE SHALL BE GATE # 11V



NO TRESPASSING SIGN
N.T.S.
REQUIRED EVERY 200' ALONG NEW FENCE AND AT EACH SIDE OF A CORNER COST INCIDENTAL TO PROPOSED FENCE
(FACING NON-AOA SIDE)



BARRICADE SIGN
N.T.S.
ONE EACH FOR EACH LEAF OF GATE
(BOTH SIDES)

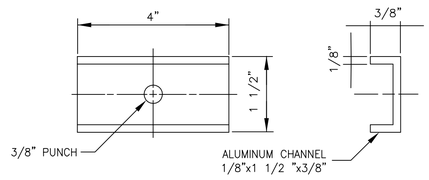
SIGN DETAILS

SIGNS TO BE ALUMINUM OR GALVANIZED STEEL WITH A MINIMUM THICKNESS OF 0.08".

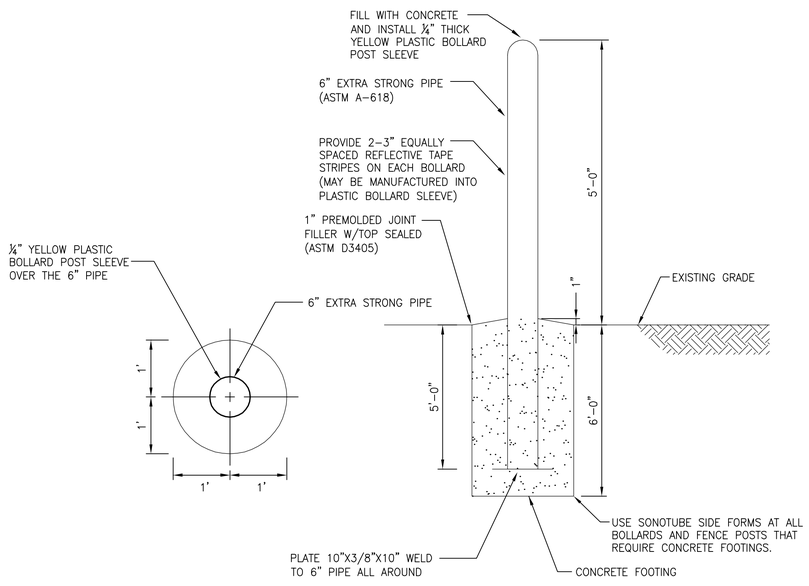
REFLECTORIZED MEDIA TO BE USED.

COST OF SIGNS SHALL BE CONSIDERED INCIDENTAL TO ASSOCIATED ITEMS REQUIRING SIGNS.

ALL SIGNS TO BE MOUNTED USING A MINIMUM OF 2 BRACKETS.



MOUNTING BRACKET
2 REQ'D EACH SIGN



CONCRETE BOLLARD POST DETAIL
NTS

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE /LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
FENCING AND GATE DETAILS (SHEET 4 OF 4)

SHEET NUMBER
C224

BID DOCUMENTS

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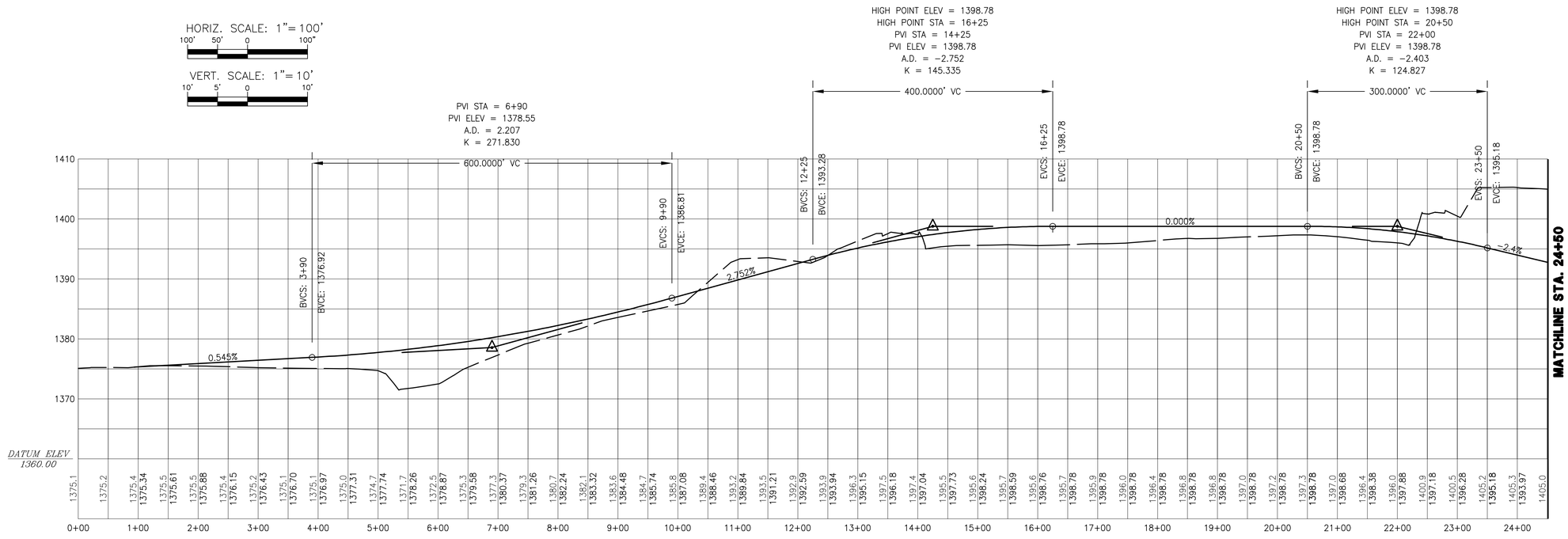
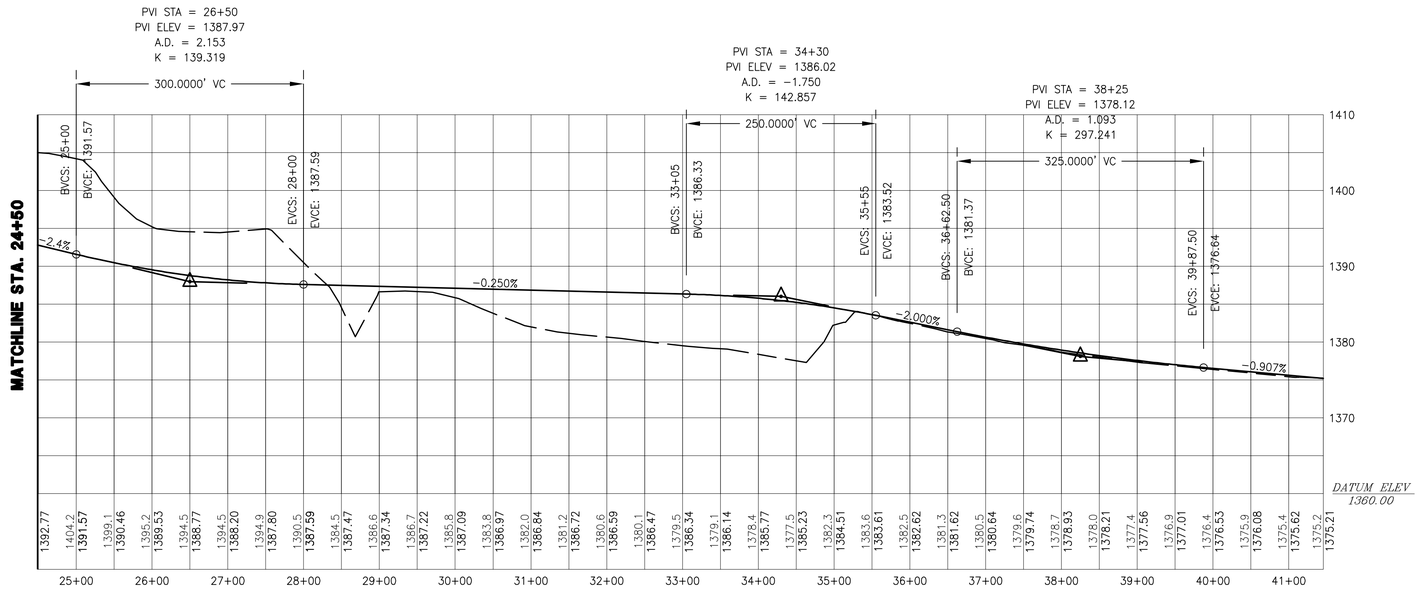


GRINDEN DRIVE PROFILE STA. 0+00 TO STA. 24+50



GRINDEN DRIVE PROFILE STA. 24+50 TO STA. 41+44.42

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DATE ISSUED: 05-11-2009
REVIEWED BY: PEB
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
CENTERLINE PROFILE GRINDEN DRIVE STA: 0+00 TO STA: 41+44.42

SHEET NUMBER
C300

BID DOCUMENTS

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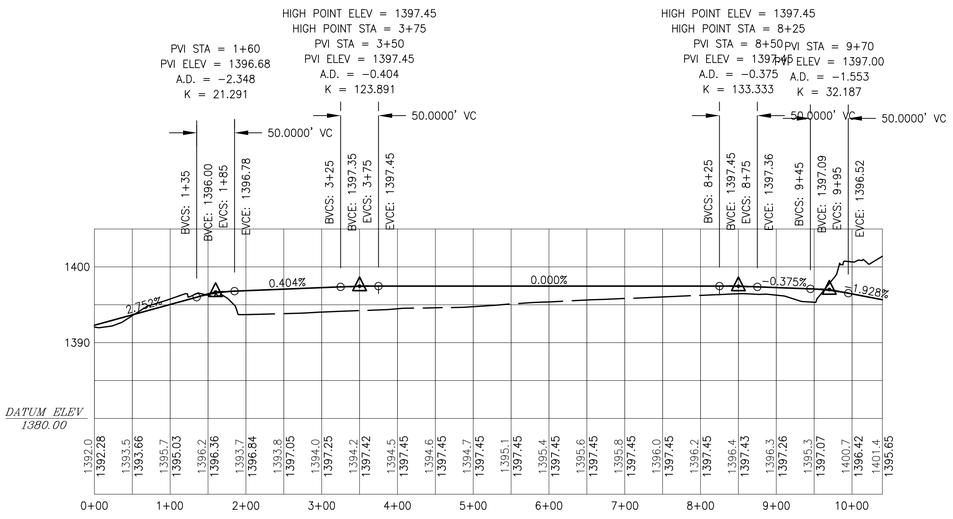
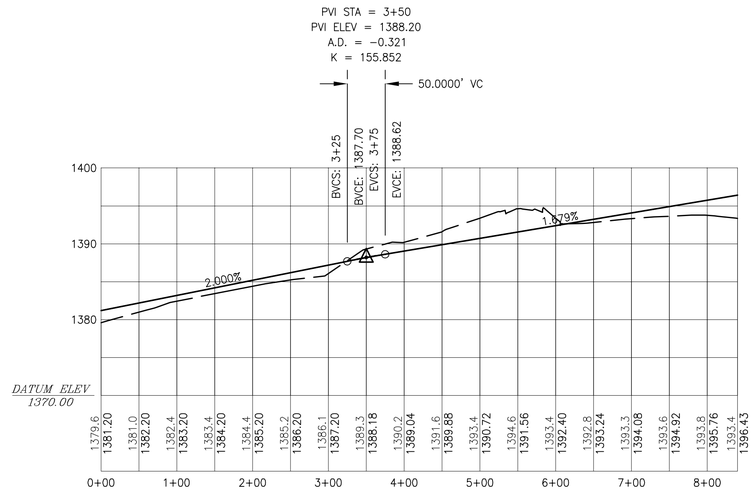


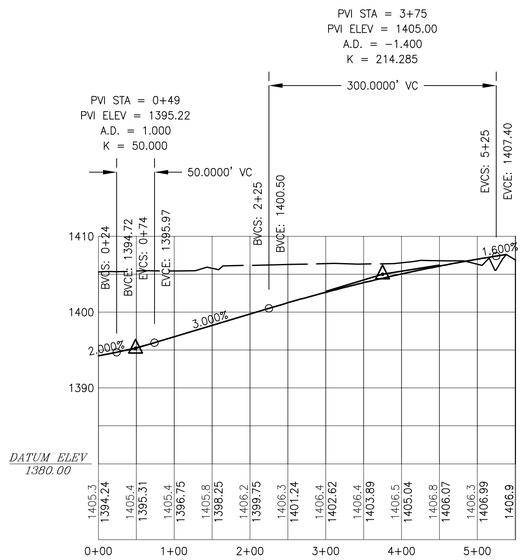
LOWER ACCESS ROAD PROFILE
STA: 0+00 TO STA: 10+40



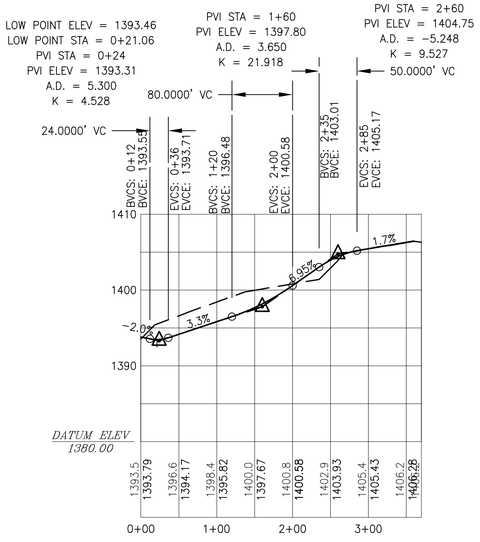
PARKING ENTRANCE ROAD PROFILE
STA: 0+00 TO STA: 8+40

HORIZ. SCALE: 1"=100'
100' 50' 0 100"

VERT. SCALE: 1"=10'
10' 5' 0 10'



AIRPORT ACCESS ROAD PROFILE
STA: 0+00 TO STA: 5+50.75



TEMPORARY EMPLOYEE LOT ROAD PROFILE
STA: 0+00 TO STA: 3+70

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
CENTERLINE PROFILES ALL SECONDARY & TEMPORARY ROADS

SHEET NUMBER
C301

BID DOCUMENTS

T:\P-214\882-093 Eor Terminal Design CAE\CAD\C2AHC00.dwg, 5/7/2009 1:05:03 PM

GRADING NOTES

1. THE CONTOURS IN THESE PLANS REPRESENT THE ULTIMATE FINISHED GRADE ELEVATIONS AND SLOPES FOR PAVING AND TURF AREAS WITHIN THIS CONTRACT PLAN.

2. ALL FUTURE AREAS SHOWN WITHIN THIS GRADING PLAN ARE NOT WITHIN THE CURRENT CONTRACT AND ARE FOR INFORMATIONAL PURPOSE ONLY.

3. NO WETLANDS ARE TO BE DISTURBED EXCEPT THOSE AREAS CALL FOR SPECIFICALLY IN THIS PLAN SET. ENGINEER SHALL BE CALLED BEFORE WETLANDS ANY OTHER WETLANDS ARE DISTURBED FOR ANY REASON.

EROSION NOTES

1. ONCE GRADING OPERATIONS ARE COMPLETE AREAS THAT ARE SPECIFIED TO HAVE SOD INSTALLED THAT ARE WITHIN THE 200' BUFFER OF WETANDS SHALL BE INTITIALLY STABILIZED USING THE RAPID STABILIZATION METHOD #4 (SPEC 2575.3).

2. FOLLOWING THE INSTALLATION THE RAPID STABILIZATION, TOPSOIL SHALL BE SPREAD, AND THE SOD PLACED DIRECTLY FOLLWING THE TOPSOIL APPLICATION.

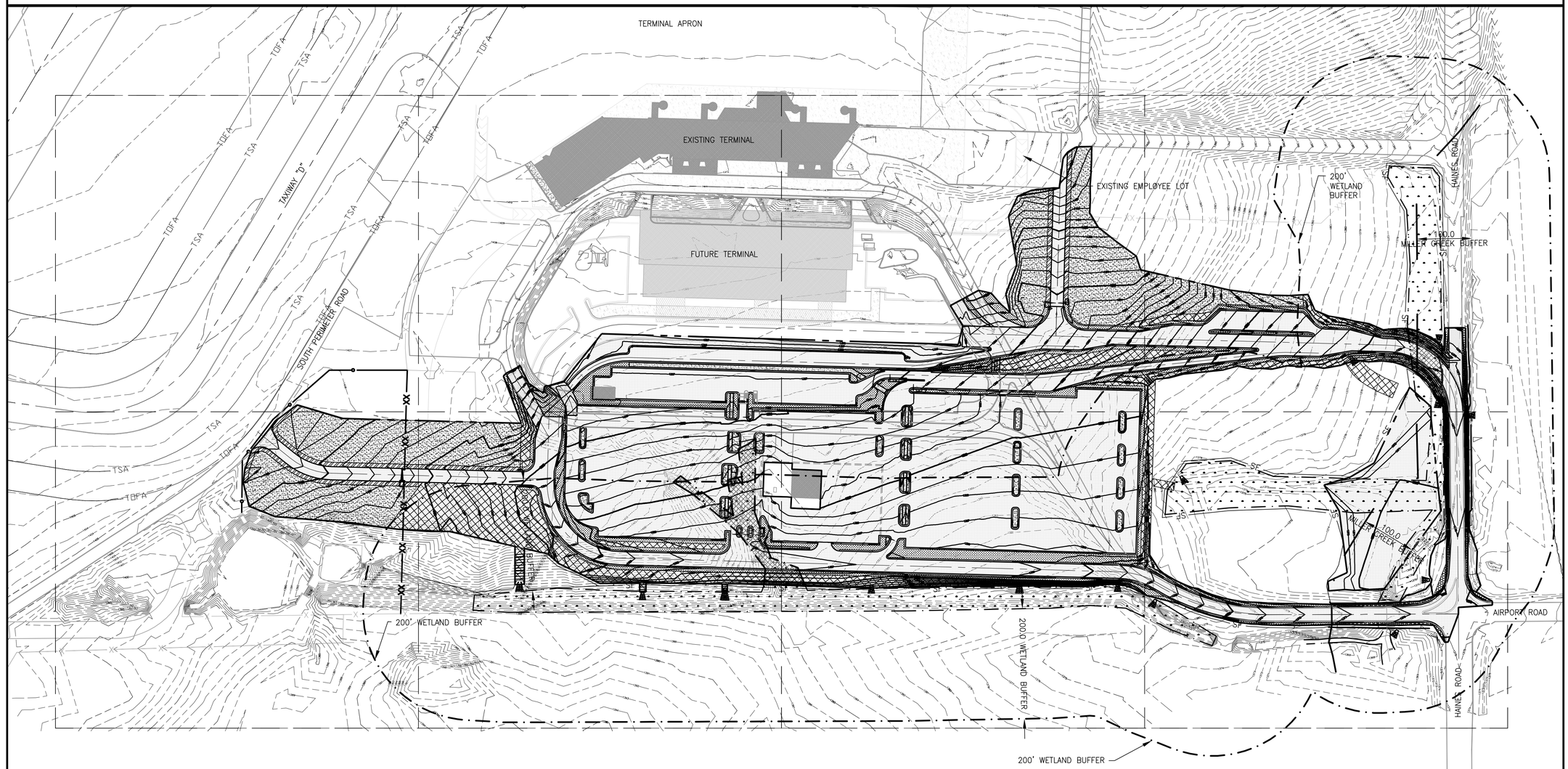
3. IF SOD CAN BE INSTALLED WITHIN THE TIME PERIOD REQUIRED BY THE MPCA, RAPID STABILZATION UNDER THE SOD WILL NOT BE NEEDED.

LEGEND

- PROPOSED MAJOR CONTOUR (5')
- PROPOSED MINOR CONTOUR (1')
- PROPOSED GRADING LIMITS
- EXISTING MAJOR CONTOUR (5')
- EXISTING MINOR CONTOUR (1')
- PROPOSED BITUMINOUS ROAD OR PARKING
- PROPOSED GRADING AREA
- FUTURE TERMINAL (N.I.C.)
- EXISTING TERMINAL & BUILDINGS
- FUTURE APRON (N.I.C.)
- EXISTING WETLANDS
- SF SILT FENCE TYPE: MACHINE SLICED
- SF SILT FENCE TYPE: HEAVY DUTY
- SF SILT FENCE TYPE: SUPER DUTY
- BIOROLL
- CRITICAL ZONE
- CLASS III RIP RAP W/ TYPE V FABRIC
- CATEGORY 2 EROSION BLANKET
- RAPID STABILIZATION METHOD #4 (SPEC 2575.3)
- TYPE 6 HYDRO MULCH (SPEC 5884)
- SOD
- CLASS IV RIP RAP W/TYPE IV FABRIC AT SLOPES

NORTH

0 100' 200'



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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GRADING AND EROSION CONTROL OVERALL PLAN AND NOTES

SHEET NUMBER

C400

BID DOCUMENTS

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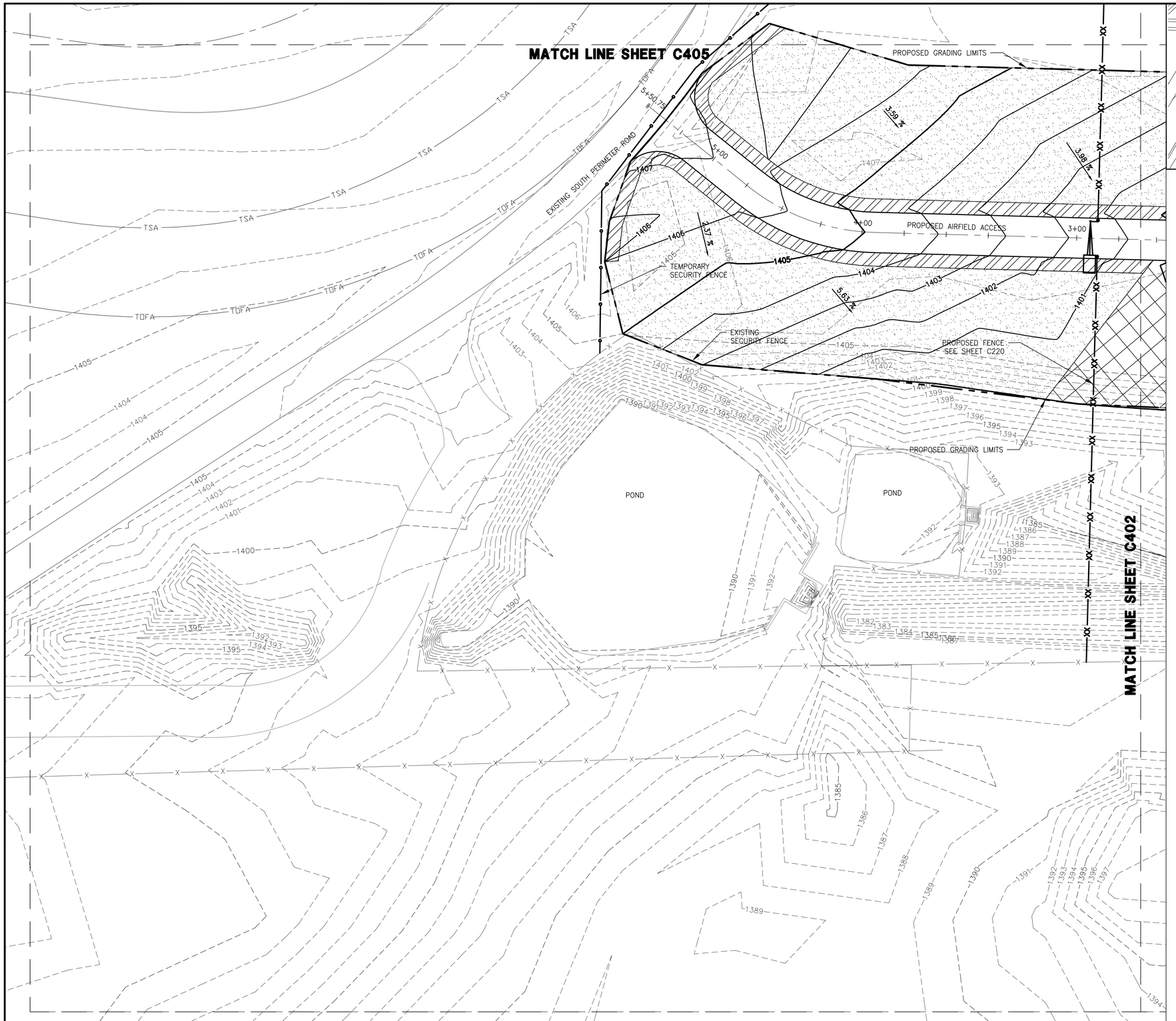

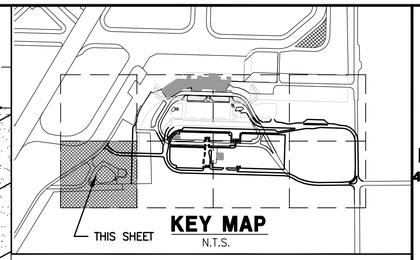

KEY MAP
N.T.S.

NORTH

0 30' 60'

GRADING AND EROSION CONTROL LEGEND

- 1270 — PROPOSED MAJOR CONTOUR (5')
- 1267 — PROPOSED MINOR CONTOUR (1')
- 1270 — EXISTING MAJOR CONTOUR (5')
- 1268 — EXISTING MINOR CONTOUR (1')
- PROPOSED GRADING LIMITS
- SF — SILT FENCE TYPE: MACHINE SLICED
- SF — SILT FENCE TYPE: HEAVY DUTY
- SF — SILT FENCE TYPE: SUPER DUTY
- BIOROLL
- CRITICAL ZONE
- CLASS III RIP RAP W/ TYPE V FABRIC
- CATEGORY 2 EROSION BLANKET
- RAPID STABILIZATION METHOD #4 (SPEC 2575.3)
- TYPE 6 HYDRO MULCH (SPEC 5884)
- SOD
- CLASS IV RIP RAP W/TYPE IV FABRIC AT SLOPES

GRADING AND EROSION CONTROL NOTES

1. THE CONTOURS IN THESE PLANS REPRESENT THE ULTIMATE FINISH GRADE ELEVATION FOR PAVING AND TURF AREAS.

2. CLEARING AND GRUBBING AREAS SHALL BE GRADED TO MATCH THE SURROUNDING EXISTING GRADE AND PROVIDE POSITIVE DRAINAGE.

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
GRADING AND EROSION CONTROL PLAN (SHEET 1 OF 8)

SHEET NUMBER
C401

BID DOCUMENTS

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MATCH LINE SHEET C406

MATCH LINE SHEET C401

MATCH LINE SHEET C403

PROPOSED AIRFIELD ACCESS

PROPOSED LONG TERM PARKING

PROPOSED GRIPPEN DRIVE

PROPOSED GRADING LIMITS

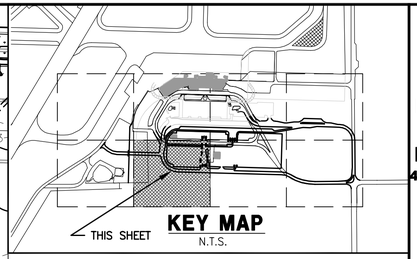
EXISTING WETLAND

CLASS III RIP RAP

SILT FENCE
MACHINE SLICE

SF

JS



KEY MAP
N.T.S.

NORTH

0 30' 60'

GRADING AND EROSION CONTROL LEGEND

- PROPOSED MAJOR CONTOUR (5')
- PROPOSED MINOR CONTOUR (1')
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GRADING AND EROSION CONTROL NOTES

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GRADING AND EROSION CONTROL PLAN (SHEET 2 OF 8)

SHEET NUMBER

C402

BID DOCUMENTS

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MATCH LINE SHEET C407

MATCH LINE SHEET C403

MATCH LINE SHEET C404

EXISTING GRINDEN DRIVE

EXISTING BUILDING TO REMAIN

PROPOSED LONG TERM PARKING

PROPOSED RENTAL CAR MAINTENCE

PROPOSED GRINDEN DRIVE

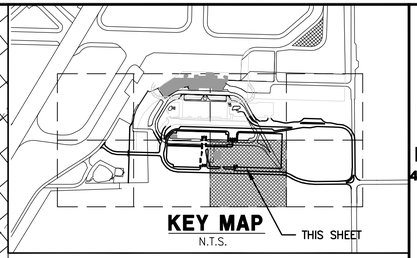
EXISTING WETLAND

CLASS III RIP RAP

CLASS IV RIP RAP AT SLOPE

4.11 %
3.87 %
3.61 %
2.78 %
1.59 %
2.90 %
3.70 %
2.13 %
2.30 %
6.32 %
6.14 %
2.19 %

29+00
30+00
31+00
32+00
33+00
34+00
35+00



NORTH

0 30' 60'

GRADING AND EROSION CONTROL LEGEND

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- CRITICAL ZONE
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GRADING AND EROSION CONTROL NOTES

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REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GRADING AND EROSION CONTROL PLAN (SHEET 3 OF 8)

SHEET NUMBER

C403

BID DOCUMENTS

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MATCH LINE SHEET C408

MATCH LINE SHEET C403

SILT FENCE MACHINE SLICE

EXISTING WETLANDS (TO BE PROTECTED)

CLASS III RIP RAP

MILLER CREEK

SILT FENCE SUPER DUTY

EXISTING HAINES ROAD

PROPOSED GRINDEN DRIVE

SILT FENCE HEAVY DUTY

HAINES ROAD

5.79 %

4.34 %

36+00

37+00

38+00

39+00

40+00

41+00

41+5.42

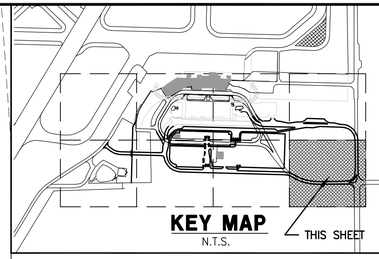
1+00

2+00

3+00

4+00

0+00



NORTH

0 30' 60'

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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GRADING AND EROSION CONTROL PLAN (SHEET 4 OF 8)

SHEET NUMBER

C404

BID DOCUMENTS

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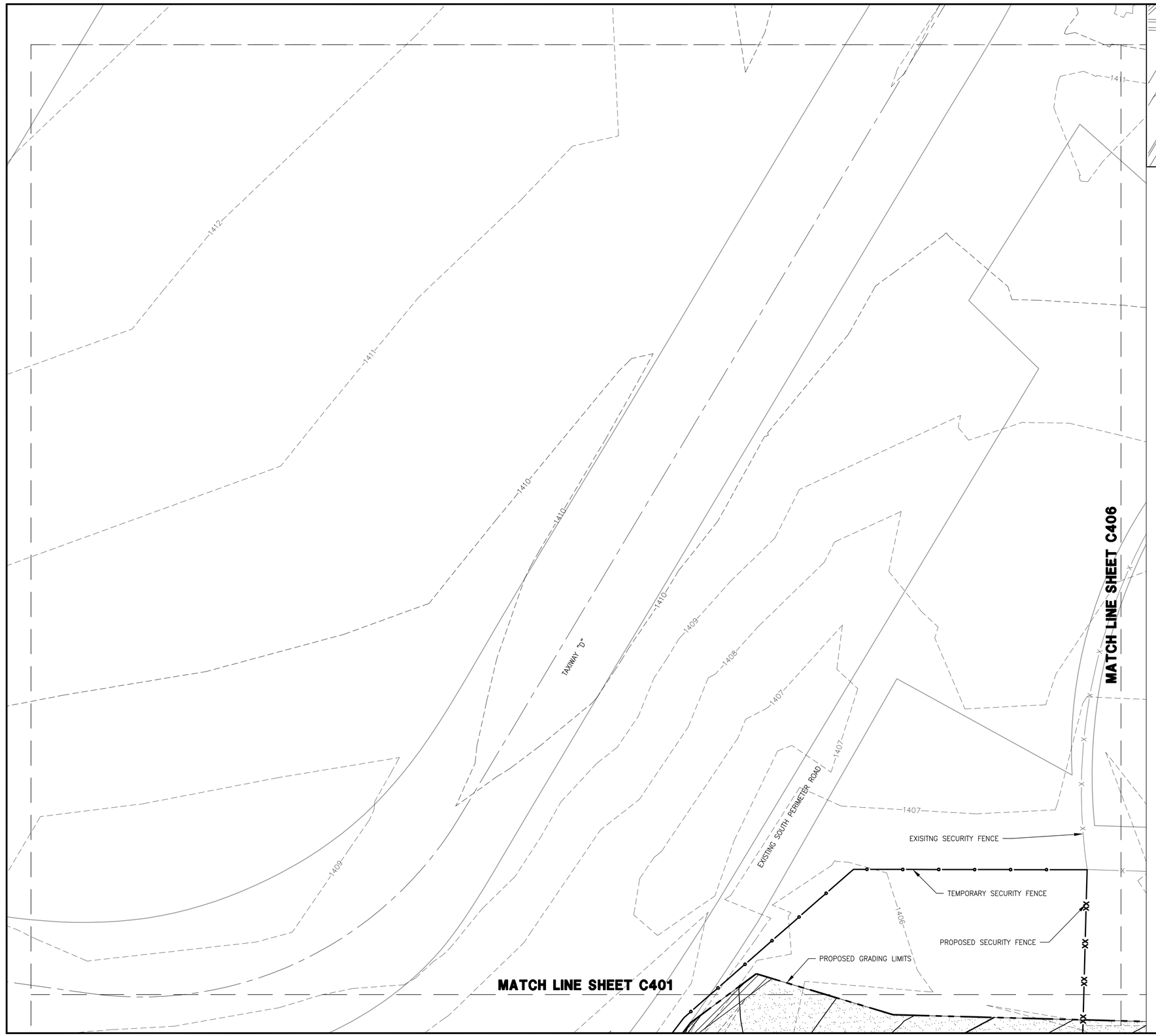

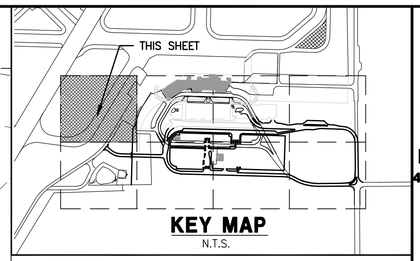

KEY MAP
N.T.S.

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Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
GRADING AND EROSION CONTROL PLAN (SHEET 5 OF 8)

SHEET NUMBER
C405

BID DOCUMENTS

T:\FY14\1882.093 DLH Terminal Design (CME)\CAD\C2\AVCMS6.dwg, 5/7/2009 1:08:18 PM

EXISTING TERMINAL

EXISITNG GRINDEN DRIVE

EXISTING RENTAL PARKING

FUTURE (N.I.C) RENTAL PARKING

FUTURE (N.I.C) TERMINAL

FUTURE (N.I.C) GRINDEN DRIVE

PROPOSED LOWER ACCESS ROAD

PROPOSED SHORT TERM PARKING

TOP A

1.55 %

2.00 %

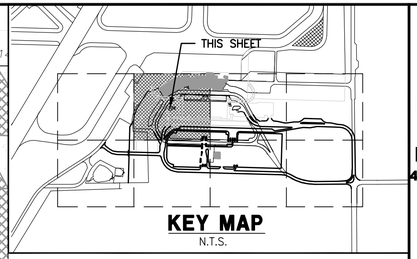
1.38 %

5.65 %

MATCH LINE SHEET C405

MATCH LINE SHEET C407

MATCH LINE SHEET C402



KEY MAP
N.T.S.

NORTH

0 30' 60'

GRADING AND EROSION CONTROL LEGEND

- 1270 — PROPOSED MAJOR CONTOUR (5')
- 1267 — PROPOSED MINOR CONTOUR (1')
- 1270 — EXISTING MAJOR CONTOUR (5')
- 1268 — EXISTING MINOR CONTOUR (1')
- PROPOSED GRADING LIMITS
- SF — SILT FENCE TYPE: MACHINE SLICED
- SF — SILT FENCE TYPE: HEAVY DUTY
- SF — SILT FENCE TYPE: SUPER DUTY
- BIOROLL
- CRITICAL ZONE
- CLASS III RIP RAP W/ TYPE V FABRIC
- CATEGORY 2 EROSION BLANKET
- RAPID STABILIZATION METHOD #4 (SPEC 2575.3)
- TYPE 6 HYDRO MULCH (SPEC 5884)
- SOD
- CLASS IV RIP RAP W/TYPE IV FABRIC AT SLOPES

GRADING AND EROSION CONTROL NOTES

1. THE CONTOURS IN THESE PLANS REPRESENT THE ULTIMATE FINISH GRADE ELEVATION FOR PAVING AND TURF AREAS.

2. CLEARING AND GRUBBING AREAS SHALL BE GRADED TO MATCH THE SURROUNDING EXISTING GRADE AND PROVIDE POSITIVE DRAINAGE.

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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GRADING AND EROSION CONTROL PLAN (SHEET 6 OF 8)

SHEET NUMBER

C406

BID DOCUMENTS

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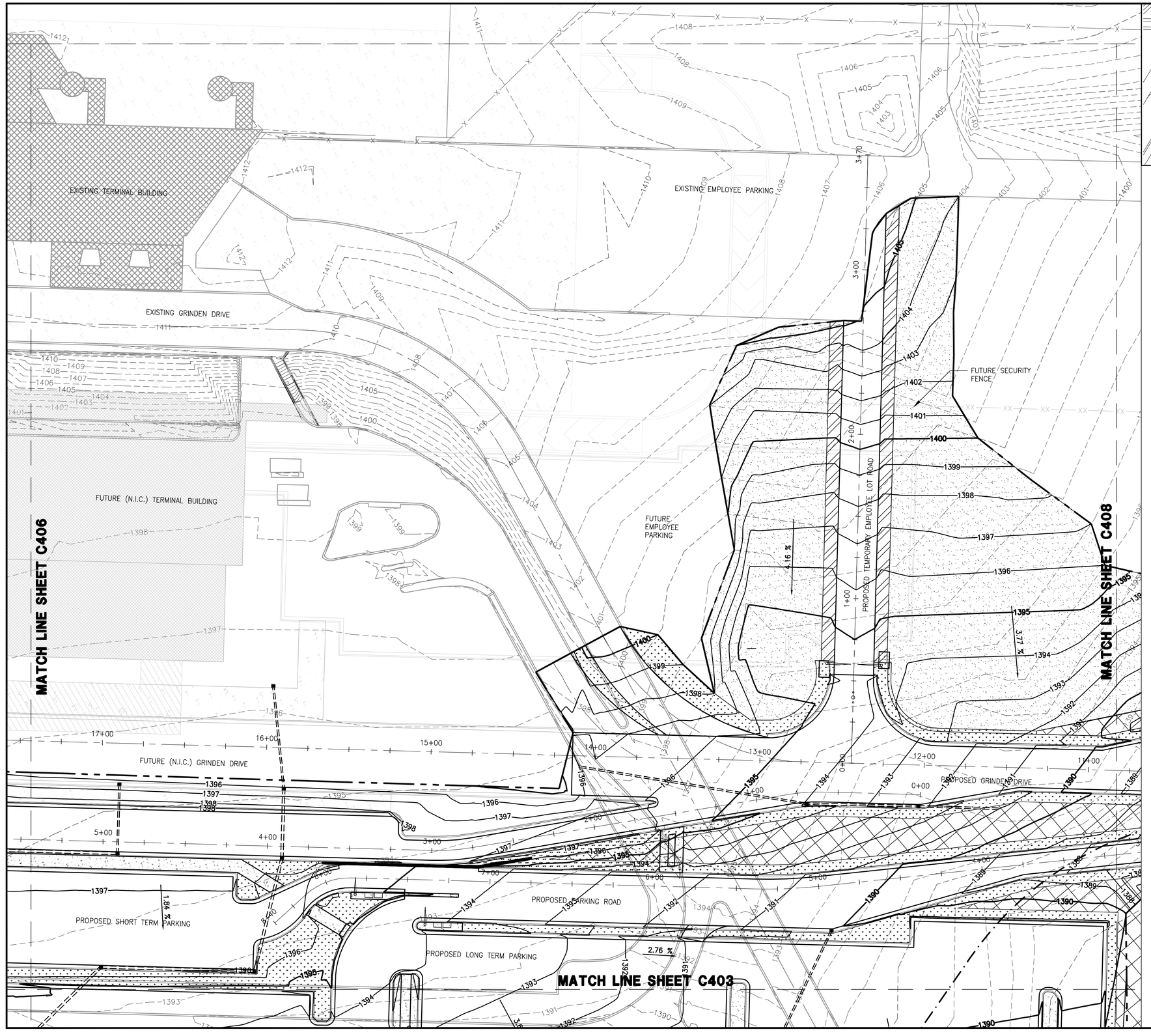

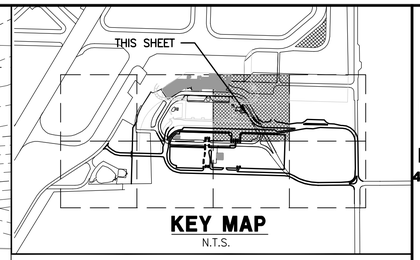

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- CRITICAL ZONE
- CLASS III RIP RAP W/ TYPE V FABRIC
- CATEGORY 2 EROSION BLANKET
- RAPID STABILIZATION METHOD #4 (SPEC 2575.3)
- TYPE 6 HYDRO MULCH (SPEC 5884)
- SOD
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GRADING AND EROSION CONTROL NOTES

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NO.	DESCRIPTION	DATE

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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
GRADING AND EROSION CONTROL PLAN (SHEET 7 OF 8)

SHEET NUMBER
C407

BID DOCUMENTS

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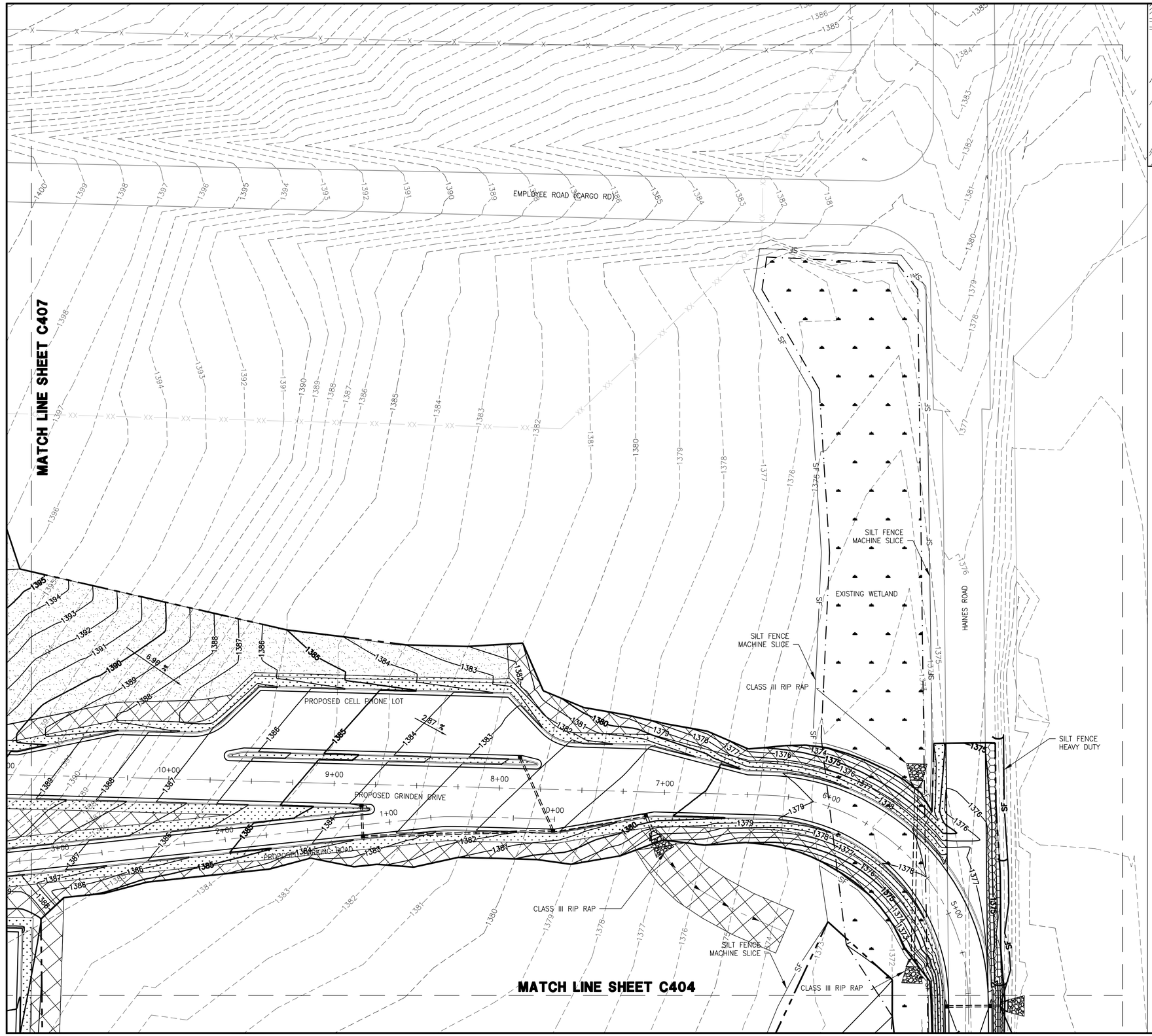

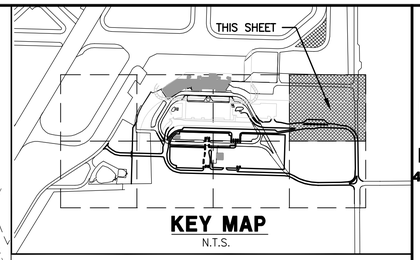

KEY MAP
N.T.S.

NORTH

0 30' 60'

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GRADING AND EROSION CONTROL NOTES

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

GRADING AND EROSION CONTROL PLAN (SHEET 8 OF 8)

SHEET NUMBER

C408

BID DOCUMENTS

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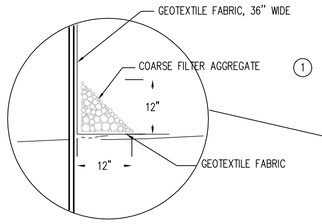
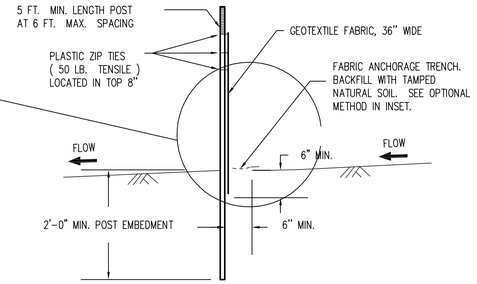


OPTIONAL METHOD FOR SILT FENCE, HEAVY DUTY

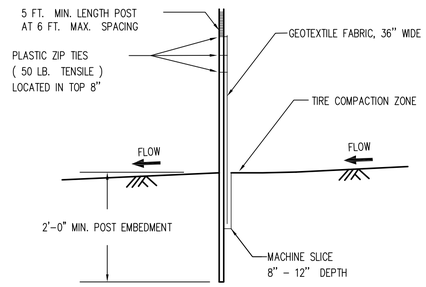


SILT FENCE, HEAVY DUTY

(HAND INSTALLED)

DESIGN GUIDELINES:

TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



SILT FENCE, MACHINE SLICED

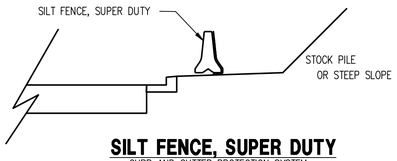
DESIGN GUIDELINES:

TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.

NOTES:

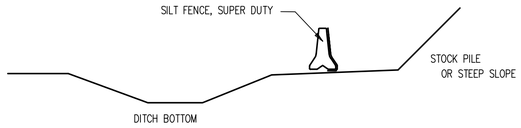
SEE SPECS. 2573, 3149 & 3886.

(1) COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.



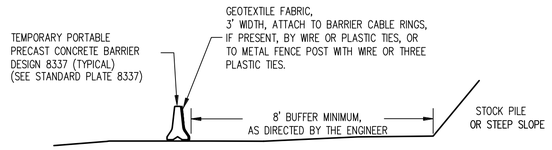
SILT FENCE, SUPER DUTY

CURB AND GUTTER PROTECTION SYSTEM

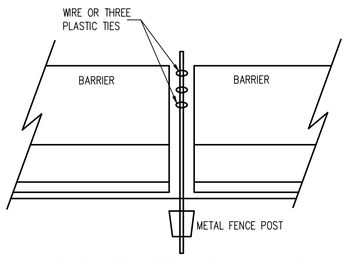


SILT FENCE, SUPER DUTY

DITCH PROTECTION SYSTEM

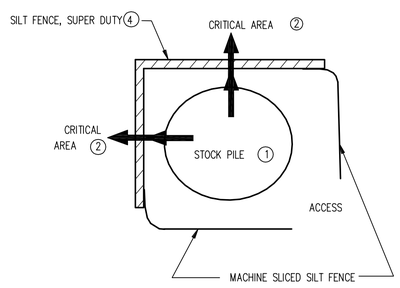


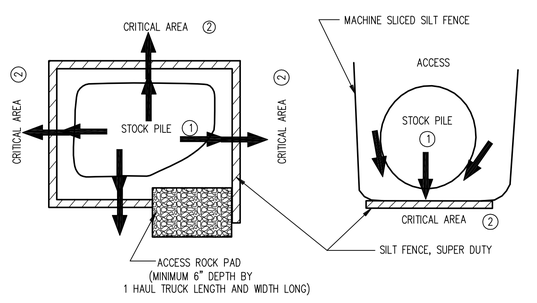
SILT FENCE, SUPER DUTY STOCKPILE SEDIMENT CONTROL



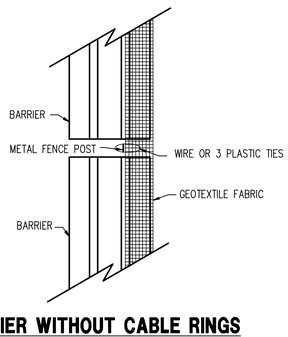
BARRIER WITHOUT CABLE RINGS

SIDE VIEW



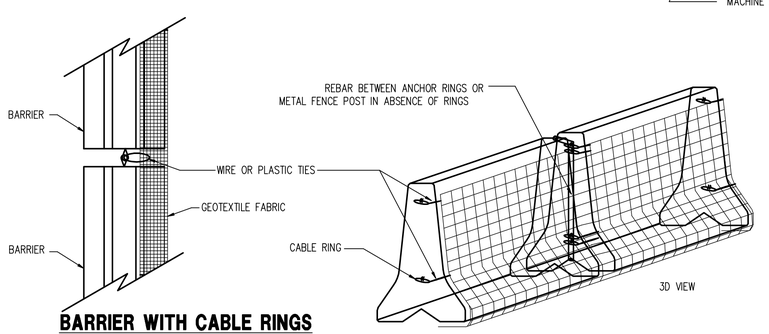


SILT FENCE, SUPER DUTY STOCK PILE CONTAINMENT



BARRIER WITHOUT CABLE RINGS

TOP VIEW



BARRIER WITH CABLE RINGS

TOP VIEW

NOTES:

(1) PLACING STOCK PILES NEXT TO AN ENVIRONMENTALLY SENTITIVE AREA IS NOT RECOMMENDED. WHEN THERE ARE NO FEASIBLE ALTERNATIVES, THE SUPER DUTY SILT FENCE IS TO BE USED AS SHOWN OR AS DIRECTED BY THE ENGINEER.

(2) CRITCAL AREAS INCLUDE WETLANDS, JUDICIAL DITCHES, STREAMS, WATER BODIES, AND OTHER AREAS REQUIRING PROTECTION.

(3) FOR CERTAIN APPLICATIONS PLASTIC WATER FILLED BARRIERS MAY BE USES IN PLACE OF CONCRETE BARRIER OR LINEAR RUNS OF SHEET PILE.

(4) INSTALL TO FIT LAND FORM AND ITEM TO PROTECT.

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: SCA
DESIGNED BY: DJL

AEP PROJECT NUMBER

214-1882-093

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SHEET TITLE

EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS 1 OF 7

SHEET NUMBER

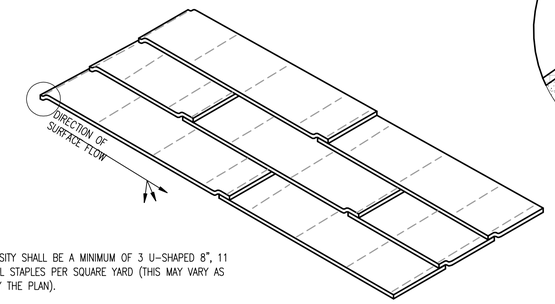
C409

BID DOCUMENTS

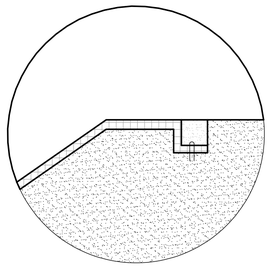
May 07, 2009 - 5:44pm
Y:\2009 Projects\09\1946.001A Terminal Expansion\Drawings\C409.dwg

ANCHOR TRENCH (SEE DETAIL AND NOTES TO THE RIGHT)

OVERLAP END JOINTS MINIMUM OF 6" AND STAPLE OVERLAP AT 1.5' INTERVALS.



STAPLE DENSITY SHALL BE A MINIMUM OF 3 U-SHAPED 8", 11 GAUGE METAL STAPLES PER SQUARE YARD (THIS MAY VARY AS DIRECTED BY THE PLAN).

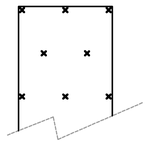


ANCHOR TRENCH
1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS
4. BACKFILL WITH NATURAL SOIL AND COMPACT
5. BLANKET LENGTH SHALL NOT EXCEED 100' WITHOUT AN ANCHOR TRENCH

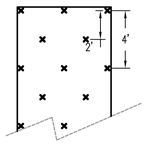
OVERLAP LONGITUDINAL JOINTS MINIMUM OF 6"

EROSION BLANKET INSTALLATION

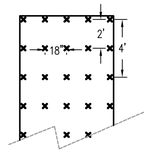
SLOPES FLATTER THAN 1:2 (1.2 STAPLES PER SQ. YD.)



SLOPES 1:2 TO 1:1 (1.7 STAPLES PER SQ. YD.)

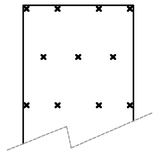


CHANNEL AND DITCH APPLICATIONS (3.5 STAPLES PER SQ. YD.)

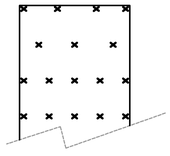


STANDARD 6' BLANKET

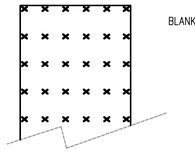
SLOPES FLATTER THAN 1:2 (1.2 STAPLES PER SQ. YD.)



SLOPES 1:2 TO 1:1 (1.7 STAPLES PER SQ. YD.)

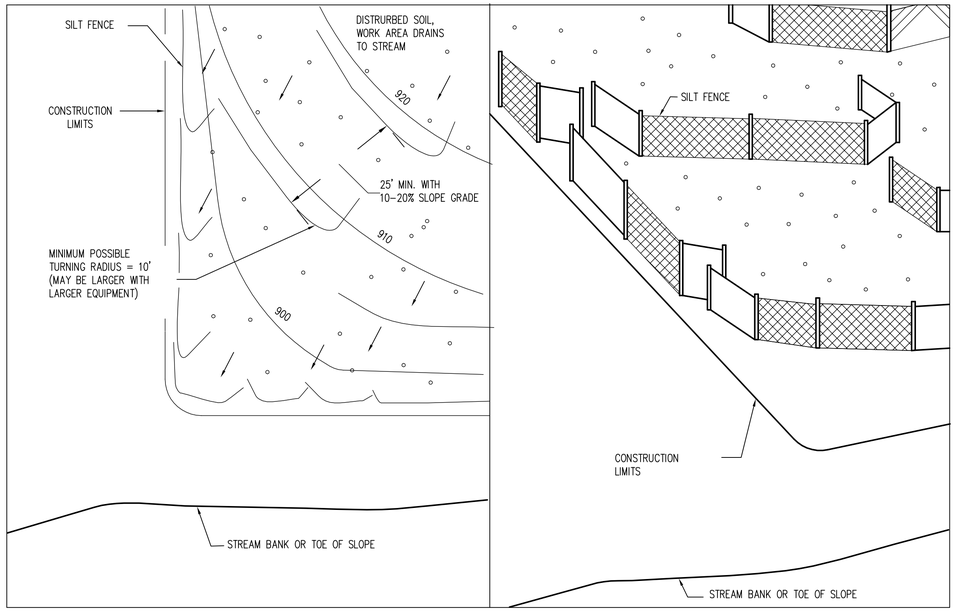


CHANNEL AND DITCH APPLICATIONS (3.5 STAPLES PER SQ. YD.)



BLANKET STAPLING PATTERN

STANDARD 8' BLANKET



May 07, 2009 - 5:46pm
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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Date 05/07/2009 Reg. No. 45009

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DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS 2 OF 7

SHEET NUMBER
C410

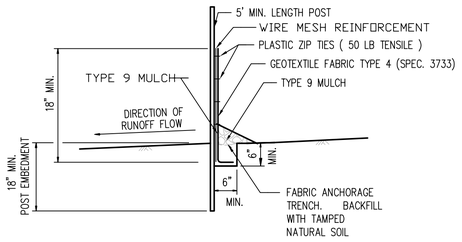
BID DOCUMENTS

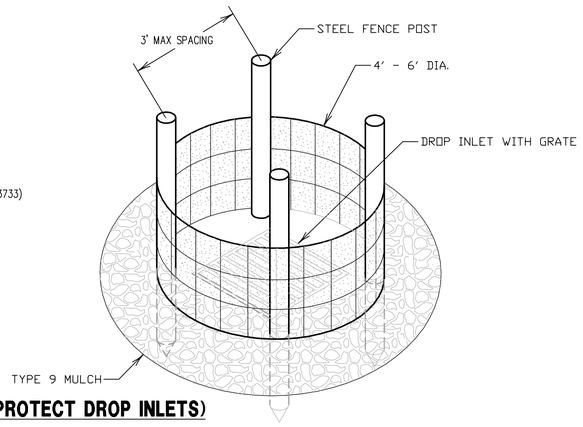
NOTES:

THE SEDIMENT CONTROL BARRIER SHALL BE A METAL OR PLASTIC/POLYETHELENE RISER SIZED TO FIT INSIDE THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING, FLANGES AND A LID/COVER.

(1) USE INLET PROTECTION TYPE A OR TYPE 9 MULCH, AS DIRECTED BY THE ENGINEER.

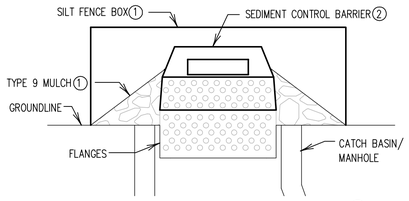
(2) PAID FOR AS SEDIMENT CONTROL BARRIER.





INLET PROTECTION TYPE A (SILT FENCE TO PROTECT DROP INLETS)

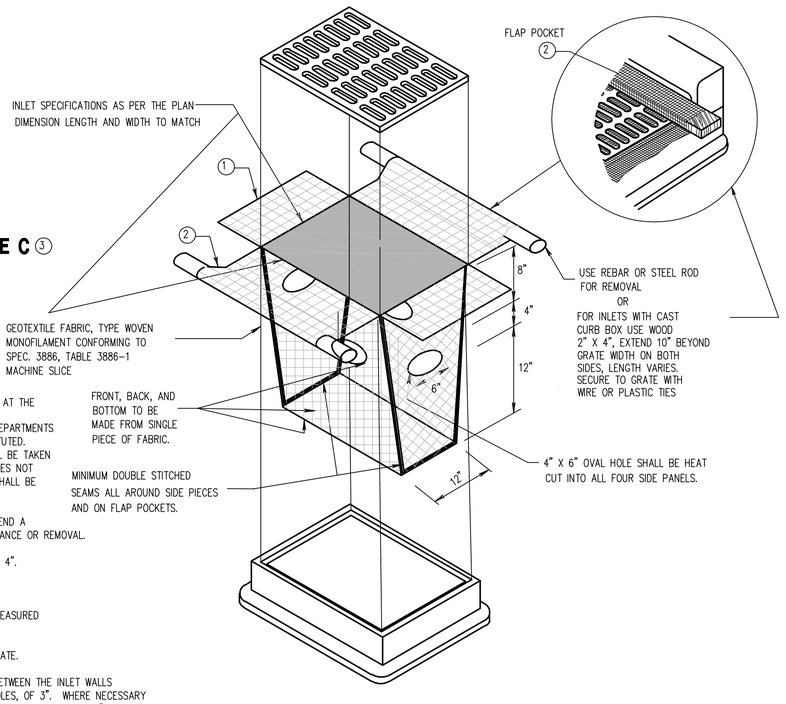
USE WHERE INLET DRAINS AN AREA WITH SLOPES AT 1:3 or LESS (TYPE A SPEC. 3891)



SEDIMENT CONTROL BARRIER (2)

NOTES:

- INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.
- MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENTS EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.
- WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.



INLET PROTECTION, TYPE C (3)

DETAIL

(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX)

NOTES:

- INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.
- MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENTS EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.
- WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

(1) FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

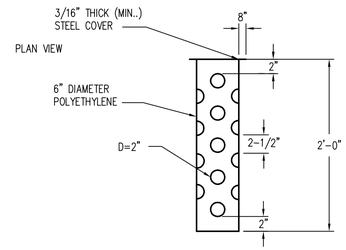
(2) FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2" X 4".

(3) INSTALLATION NOTES:

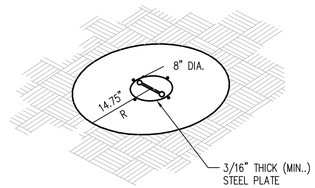
DO NOT INSTALL PROTECTION IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

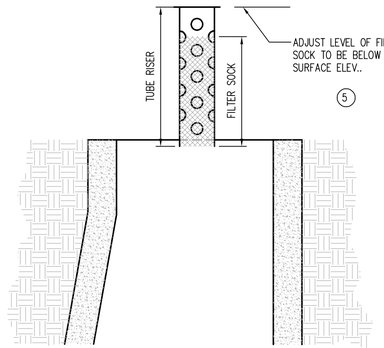
THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.



TUBE RISER

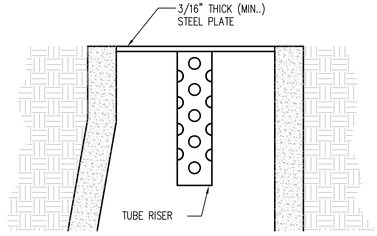


PERSPECTIVE VIEW



SECTION

(UP POSITION)



SECTION

(DOWN POSITION)

WIMCO EROSION BARRIER POP-UP HEAD

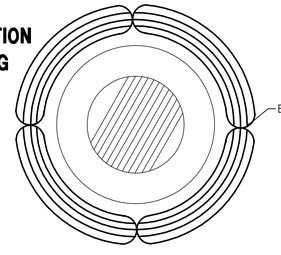
PAYMENT SHALL INCLUDE ALL MATERIALS, FILLING OF LOG,PLACEMENT, MAINTENANCE, & REMOVAL. 80% OF BID PRICE SHALL BE PAID UPON PROPER PLACEMENT WITH THE FINAL 20% PAID UPON REMOVAL.

FILL ROCK LOG WITH 45 LBS. OF OPEN GRADED AGGREGATE CONSISTING OF SOUND, DURABLE PARTICLES OF CRUSHED QUARRY ROCK OR GRAVEL CONFORMING TO THE FOLLOWING GRADATION.

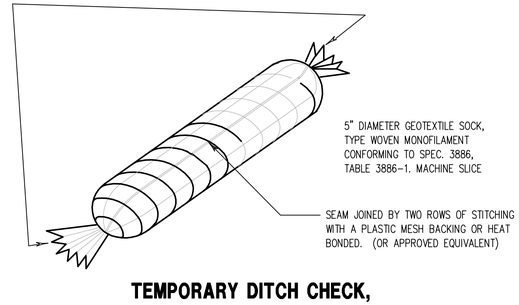
GRADATION	
SIEVE SIZE	PERCENT PASSING
11/2 INCH	100
1 INCH	95-100
3/4 INCH	65-95
3/8 INCH	30-65
NO. 4	10-35
NO.10	3-20
NO. 40	0-8
NO. 200	0-3

NOTE: CRUSHED CONCRETE OR BITUMINOUS SHALL NOT BE USED FOR OPEN GRADED AGGREGATE.

INLET PROTECTION WITH ROCK LOG



ENDS SECURELY CLOSED TO PREVENT LOSS OF OPEN GRADED AGGREGATE FILL. SECURED WITH 50 PSI. ZIP TIE.



TEMPORARY DITCH CHECK, TYPE ROCK LOG DETAIL

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: SCA
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS 3 OF 7

SHEET NUMBER
C411

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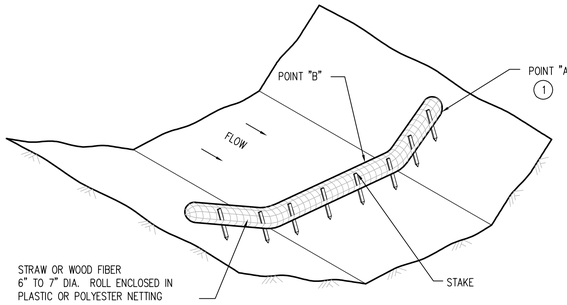
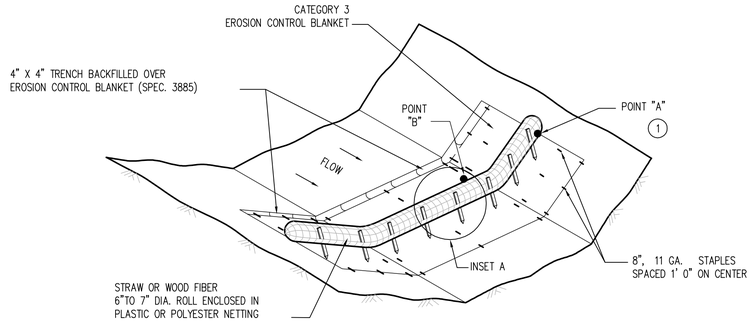


TYPE 2: BIOROLL DITCH CHECK

USE ON ROUGH GRADED AREAS



TYPE 3: BIOROLL BLANKET SYSTEM DITCH CHECK

NOTES:

SEE SPECS. 2573, 3885, 3886 & 3889.

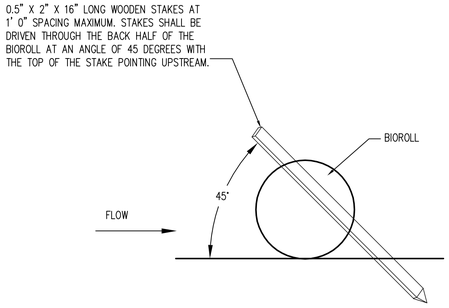
SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM SPACING FORMULA:

$$\text{SPACING OF DITCH CHECKS (FT.)} = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\text{\% CHANNEL SLOPE}} \times 100$$

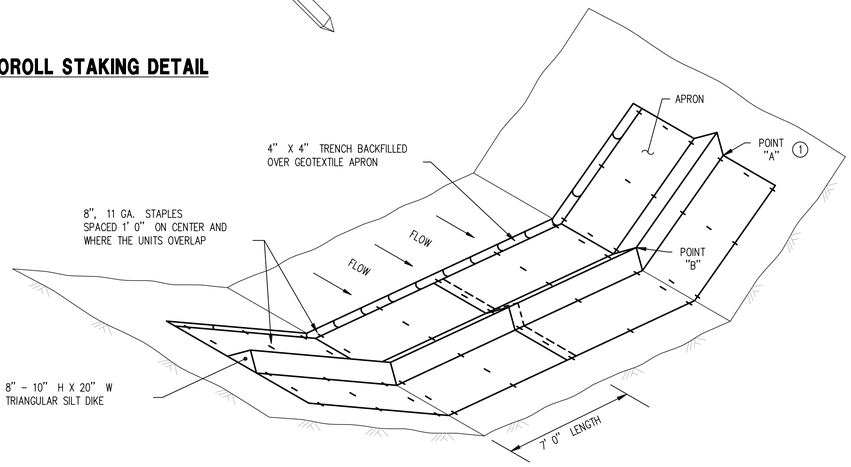
(1) POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

(2) CLASS I – IV RIPRAP (SPEC. 3601) WITH GEOTEXTILE FABRIC LINER, TYPE IV (SPEC. 3733).

(3) THE ROCK WEEPER FILTERS SEDIMENT OUT OF THE WATER BETTER THAN THE OTHER DITCH CHECKS. THE ROCK WEEPER COULD BE USED AS A PERMANENT WATER FILTERING FEATURE.

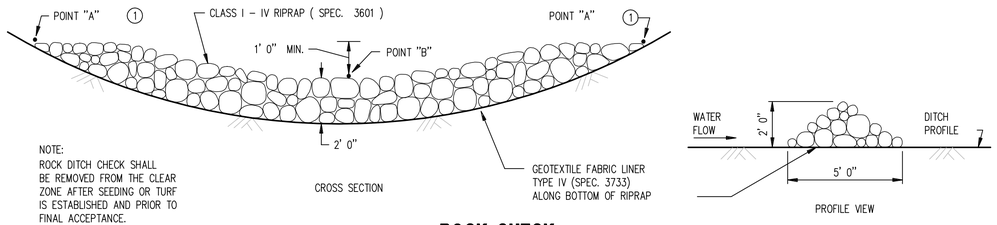


BIOROLL STAKING DETAIL



GEOTEXTILE TRIANGULAR DIKE

(TYPE 6 SPEC. 3889)



NOTE:
ROCK DITCH CHECK SHALL BE REMOVED FROM THE CLEAR ZONE AFTER SEEDING OR TURF IS ESTABLISHED AND PRIOR TO FINAL ACCEPTANCE.

ROCK CHECK

(TYPE 7 SPEC. 3889)

NOTES:

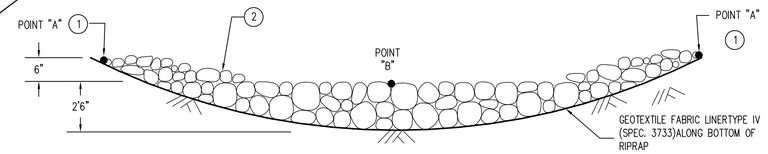
SEE MNDOT SPEC. 3889.

SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM SPACING FORMULA:

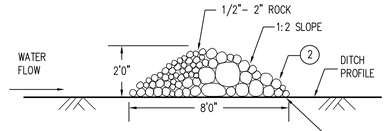
$$\text{SPACING OF DITCH CHECKS (FT)} = \left(\frac{\text{HEIGHT OF DITCH CHECK (FT) X 100}}{\text{DITCH GRADE IN PERCENT}}\right)$$

(1) POINT A MUST BE 1' 0" MIN. HIGHER THAN POINT B TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

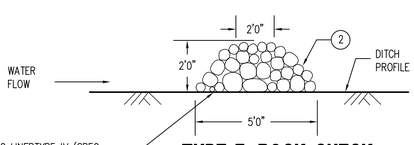
(2) TWO 2 IN. X 2 IN. WOOD STAKES OR REINFORCING BARS IN EACH BALE AND EMBEDDED IN THE GROUND 10 IN. MINIMUM.



CROSS SECTION (ROCK WEEPER AND ROCK CHECK)



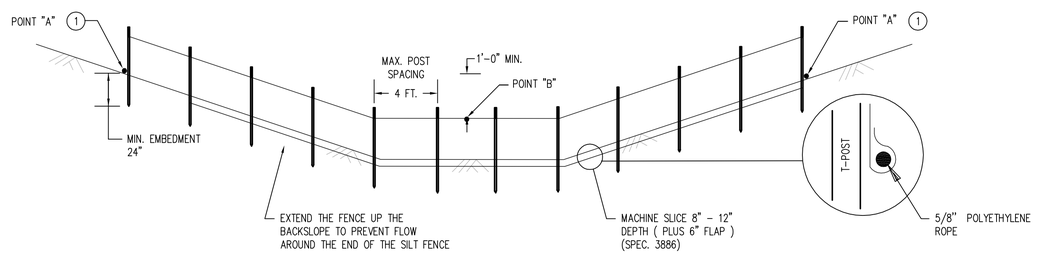
TYPE 5: ROCK WEEPER PROFILE VIEW (3)



TYPE 7: ROCK CHECK PROFILE VIEW

ROCK WEEPER AND ROCK CHECK DITCH CHECKS

USE ON ROUGH GRADED AREAS



NOTE: WHEN SEDIMENT BUILD UP REACHES 8 INCHES OR 1/3 OF SILT FENCE HEIGHT, THE SILT FENCE MUST BE CLEANED OUT OR REPLACED.

MACHINE SLICED SILT FENCE

(TYPE 1 SPEC. 3889)

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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DESIGNED BY: DJL

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SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS 4 OF 7

SHEET NUMBER
C412

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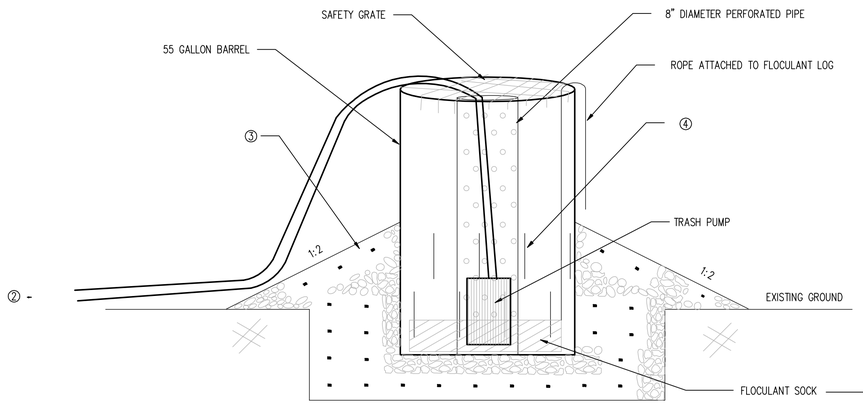
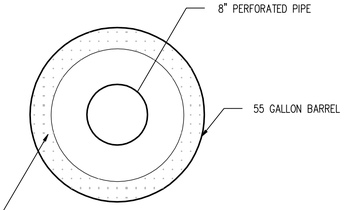
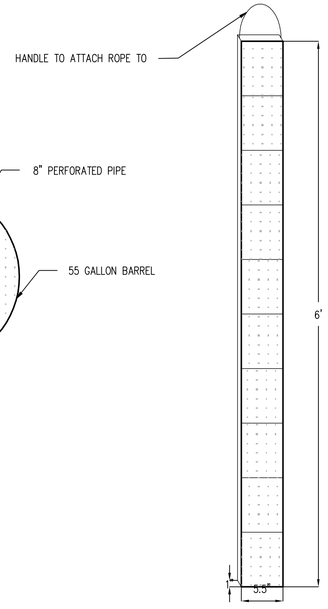


SUMP DEWATERING FOR POND

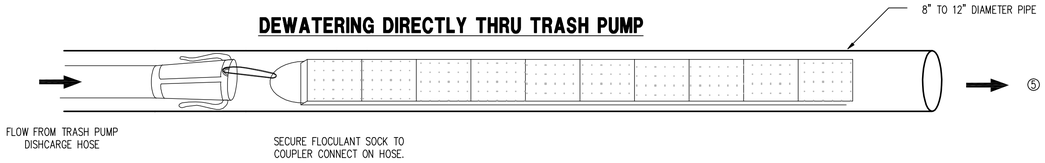


TOP VIEW



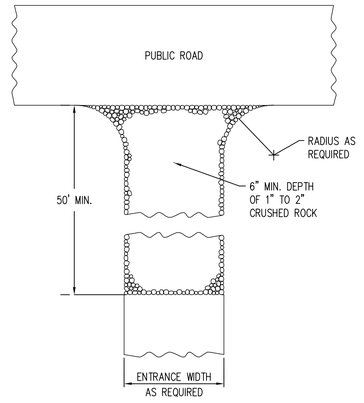
TYPICAL FLOCULANT SOCK

DEWATERING DIRECTLY THRU TRASH PUMP



NOTES

1. DEWATERING DEVICE SHOULD BE PLACED AT THE LOW POINT OF THE AREA TO DRAIN
2. MUST DISCHARGE WATER TO AN APPROPRIATE LOCATION SUCH AS A SMALL SETTING BASIN. DO NOT DISCHARGE TO AN EXISTING SURFACE WATER. MUST USE APPROPRIATE ENERGY DISSIPATION TO PREVENT SOIL SCOUR AND TRANSPORT.
3. 1"–2" DIAMETER CLEAN ROCK. ROCK IS TO BE PLACED 2 INCHES ABOVE HIGHEST SLIT IN BARREL.
4. 12" SLITS CUT INTO LOWER HALF OF BARREL.
5. MUST DISCHARGE WATER TO A SEDIMENT BASIN OR SEDIMENT TRAP. DO NOT DISCHARGE DIRECTLY TO A WATER BODY.



①

ROCK CONSTRUCTION ENTRANCE

NOTES:

SEE SPECS. 2573, 3892, & 3894.

① ROCKS AT ENTRANCE CLEAN WORKSITE MUD OFF OF TRUCK TIRES BEFORE TRUCKS ENTER MAIN ROAD. KEEPING MUD OFF THE ROAD WILL PREVENT AUTO DAMAGE AND KEEP CONSTRUCTION SEDIMENT OUT OF DRAINAGE SYSTEMS AND WETLANDS. GEOTEXTILE MAY BE PLACED UNDER THE ROCK TO KEEP ROCKS SEPARATE FROM SOIL.

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

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DATE ISSUED: 05-11-2009
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DESIGNED BY: DJL

AEP PROJECT NUMBER
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SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS 5 OF 7

SHEET NUMBER
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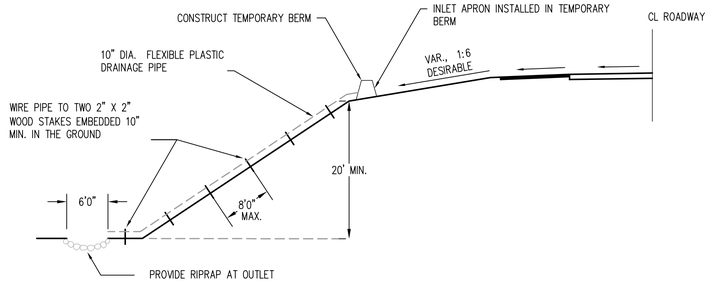
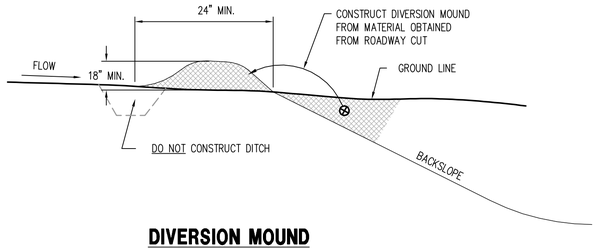


TEMPORARY DOWN DRAIN ON FILL SLOPE

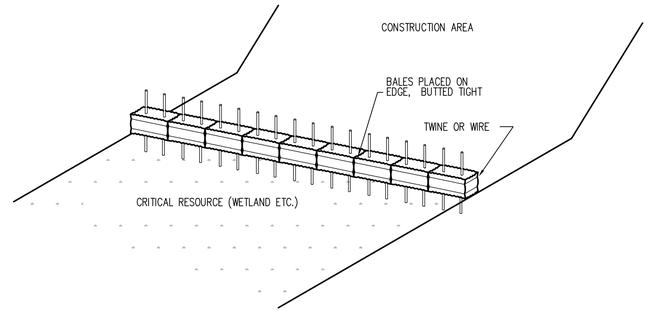
(SPEC 3892)

DESIGN GUIDELINES:
STORM FREQUENCY: 2 YEAR – 24 HOUR
MAXIMUM DRAINAGE AREA: 3 ACRES



DIVERSION MOUND

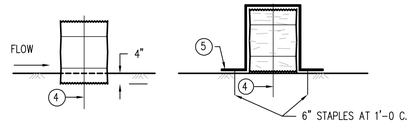
DESIGN GUIDELINES:
STORM FREQUENCY: 10 YEAR – 24 HOUR
MAXIMUM DRAINAGE AREA: 5 ACRES MAXIMUM
DIVERSION: GRADE 5%



BALE BARRIERS

TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS

(SPEC. 2573)



BALE BARRIER DETAIL

APPROX. BALE SIZE: 14" X 18" X 36" LONG

NOTES:

SEE SPECS. 2573, 3892, & 3894.

(1) ROCKS AT ENTRANCE CLEAN WORKSITE MUD OFF OF TRUCK TIRES BEFORE TRUCKS ENTER MAIN ROAD. KEEPING MUD OFF THE ROAD WILL PREVENT AUTO DAMAGE AND KEEP CONSTRUCTION SEDIMENT OUT OF DRAINAGE SYSTEMS AND WETLANDS.

(2) W = 10 FT. MIN., 20 FT. MAX.

(3) D = 2 FT.

(4) TWO 2 IN. X 2 IN. WOOD STAKES OR REINFORCING BARS IN EACH BALE EMBEDDED 10 INCHES MINIMUM IN THE GROUND.

(5) PLACE A CATEGORY 3 EROSION CONTROL BLANKET, 6 FT. WIDE MINIMUM, OVER THE BALE INSTEAD OF TRENCHING.

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS
6 OF 7

SHEET NUMBER
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GENERAL NOTES

1. THESE PLANS ARE PART OF THE GENERAL STORM WATER PERMIT FOR CONSTRUCTION ACTIVITY ISSUED BY THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA). FAILURE TO COMPLY WITH THE CONDITIONS SET FORTH IN THESE PLANS IS A VIOLATION OF THE PERMIT.

2. SEDIMENT AND EROSION CONTROL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE CONSTRUCTED AND IMPLEMENTED IN ACCORDANCE WITH THE MPCA REFERENCE MANUAL. PROTECTING WATER QUALITY IN URBAN AREAS BEST MANAGEMENT PRACTICES FOR MINNESOTA (*MPCA MANUAL*) AVAILABLE AT: HTTP://WWW.PCA.STATE.MN.US/WATER/PUBS/SW-BMPMANUAL.HTML

SUBSEQUENT NOTES ON SPECIFIC BMP'S REFERENCE SECTION NUMBERS OF THE MPCA MANUAL.

3. SITE DISTURBANCE INCLUDES THE FOLLOWING ACREAGE:

TYPE OF AREA	EXISTING AREA	COMPLETED AREA	CHANGED AREA
IMPERVIOUS	17.88 AC	20.7 AC	2.9 AC
PERVIOUS	27.12 AC	24.2 AC	−2.9 AC
TOTAL	45.0 AC	45.0 AC	

PERMIT EXCERPTS

THE FOLLOWING SECTIONS ARE INCLUDED IN THE GENERAL REQUIREMENTS OF THE STORM WATER PERMIT FOR CONSTRUCTION ACTIVITY

PART III. STORMWATER DISCHARGE DESIGN REQUIREMENTS
D. RECORD RETENTION

THE SWPPP (ORIGINAL OR COPIES) INCLUDING, ALL CHANGES TO IT, AND INSPECTIONS AND MAINTENANCE RECORDS MUST BE KEPT AT THE SITE DURING CONSTRUCTION BY THE PERMITTEE WHO HAS OPERATIONAL CONTROL OF THAT PORTION OF THE SITE. THE SWPPP CAN BE KEPT IN EITHER THE FIELD OFFICE OR IN AN ON SITE VEHICLE DURING NORMAL WORKING HOURS.

ALL OWNER(S) MUST KEEP THE SWPPP, ALONG WITH THE FOLLOWING ADDITIONAL RECORDS, ON FILE FOR THREE (3) YEARS AFTER SUBMITTAL OF THE NOT AS OUTLINED IN PART II.C. THIS DOES NOT INCLUDE ANY RECORDS AFTER SUBMITTAL OF THE NOT.

1. ANY OTHER PERMITS REQUIRED FOR THE PROJECT;
2. RECORDS OF ALL INSPECTION AND MAINTENANCE CONDUCTED DURING CONSTRUCTION (SEE PART IV.E. INSPECTIONS AND MAINTENANCE);
3. ALL PERMANENT OPERATION AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING ALL RIGHT OF WAY, CONTRACTS, COVENANTS AND OTHER BINDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE; AND
4. ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORMWATER MANAGEMENT SYSTEMS.

PART IV. CONSTRUCTION ACTIVITY REQUIREMENTS
B. EROSION PREVENTION PRACTICES

1. THE PERMITTEE(S) MUST PLAN FOR AND IMPLEMENT APPROPRIATE CONSTRUCTION PHASING, VEGETATIVE BUFFER STRIPS, HORIZONTAL SLOPE GRADING, AND OTHER CONSTRUCTION PRACTICES THAT MINIMIZE EROSION, SO THAT THE INSPECTION AND MAINTENANCE REQUIREMENTS OF PART IV.E. ARE COMPLIED WITH. THE LOCATION OF AREAS NOT TO BE DISTURBED MUST BE DELINEATED (E.G. WITH FLAGS, STAKES, SIGNS, SILT FENCE ETC.) ON THE DEVELOPMENT SITE BEFORE WORK BEGINS.
2. ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION BUT IN NO CASE LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY STOCKPILES WITHOUT SIGNIFICANT SILT, CLAY OR ORGANIC COMPONENTS (E.G., CLEAN AGGREGATE STOCKPILES, DEMOLITION CONCRETE STOCKPILES, SAND STOCKPILES) AND THE CONSTRUCTED BASE COMPONENTS OF ROADS, PARKING LOTS AND SIMILAR SURFACES ARE EXEMPT FROM THIS REQUIREMENT BUT MUST COMPLY WITH PART IV.C.5.
3. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH OR SWALE THAT DRAINS WATER FROM ANY PORTION OF THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE INTO ANY SURFACE WATER. STABILIZATION OF THE LAST 200 LINEAL FEET MUST BE COMPLETED WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER.

   STABILIZATION OF THE REMAINING PORTIONS OF ANY TEMPORARY OR PERMANENT DITCHES OR SWALES MUST BE COMPLETE WITHIN 14 DAYS AFTER CONNECTING TO A SURFACE WATER AND CONSTRUCTION IN THAT PORTION OF THE DITCH HAS TEMPORARILY OR PERMANENTLY CEASED.

   TEMPORARY OR PERMANENT DITCHES OR SWALES THAT ARE BEING USED AS A SEDIMENT CONTAINMENT SYSTEM (WITH PROPERLY DESIGNED ROCK DITCH CHECKS, BIO ROLLS, SILT DIKES ETC.) DO NOT NEED TO BE STABILIZED. THESE AREAS MUST BE STABILIZED WITHIN 24 HOURS AFTER NO LONGER BEING USED AS A SEDIMENT CONTAINMENT SYSTEM.
4. PIPE OUTLETS MUST BE PROVIDED WITH TEMPORARY OR PERMANENT ENERGY DISSIPATION WITHIN 24 HOURS AFTER CONNECTION TO A SURFACE WATER.

C. SEDIMENT CONTROL PRACTICES

1. SEDIMENT CONTROL PRACTICES MUST MINIMIZE SEDIMENT FROM ENTERING SURFACE WATERS, INCLUDING CURB AND GUTTER SYSTEMS AND STORM SEWER INLETS.
   a. TEMPORARY OR PERMANENT DRAINAGE DITCHES AND SEDIMENT BASINS THAT ARE DESIGNED AS PART OF A SEDIMENT CONTAINMENT SYSTEM (E.G., DITCHES WITH ROCK CHECK DAMS) REQUIRE SEDIMENT CONTROL PRACTICES ONLY AS APPROPRIATE FOR SITE CONDITIONS.
   b. IF THE DOWN GRADIENT TREATMENT SYSTEM IS OVERLOADED, ADDITIONAL UPGRADIENT SEDIMENT CONTROL PRACTICES OR REDUNDANT BMPS MUST BE INSTALLED TO ELIMINATE THE OVERLOADING, AND THE SWPPP MUST BE AMENDED TO IDENTIFY THESE ADDITIONAL PRACTICES AS REQUIRED IN PART III.A.4, A. THROUGH C.
   c. IN ORDER TO MAINTAIN SHEET FLOW AND MINIMIZE RILLS AND/OR GULLIES, THERE SHALL BE NO UNBROKEN SLOPE LENGTH OF GREATER THAN 75 FEET FOR SLOPES WITH A GRADE OF 3:1 OR STEEPER.
2. SEDIMENT CONTROL PRACTICES MUST BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UPGRADIENT LAND DISTURBING ACTIVITIES BEGIN. THESE PRACTICES SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS BEEN ESTABLISHED IN ACCORDANCE WITH PART IV.G.
3. THE TIMING OF THE INSTALLATION OF SEDIMENT CONTROL PRACTICES MAY BE ADJUSTED TO ACCOMMODATE SHORT-TERM ACTIVITIES SUCH AS CLEARING OR GRUBBING, OR PASSAGE OF VEHICLES. ANY SHORT-TERM ACTIVITY MUST BE COMPLETED AS QUICKLY AS POSSIBLE AND THE SEDIMENT CONTROL PRACTICES MUST BE INSTALLED IMMEDIATELY AFTER THE ACTIVITY IS COMPLETED. HOWEVER, SEDIMENT CONTROL PRACTICES MUST BE INSTALLED BEFORE THE NEXT PRECIPITATION EVENT EVEN IF THE ACTIVITY IS NOT COMPLETE.
4. ALL STORM DRAIN INLETS MUST BE PROTECTED BY APPROPRIATE BMPS DURING CONSTRUCTION UNTIL ALL SOURCES WITH POTENTIAL FOR DISCHARGING TO THE INLET HAVE BEEN STABILIZED. INLET PROTECTION MAY BE REMOVED FOR A PARTICULAR INLET IF A SPECIFIC SAFETY CONCERN (STREET FLOODING/FREEZING) HAS BEEN IDENTIFIED AND THE PERMITTEE(S) HAVE RECEIVED WRITTEN CORRESPONDENCE FROM THE JURISDICTIONAL AUTHORITY (E.G. CITY/COUNTY/TOWNSHIP/MNDOT ENGINEER) VERIFYING THE NEED FOR REMOVAL. THE WRITTEN CORRESPONDENCE MUST BE DOCUMENTED IN THE SWPPP OR AVAILABLE WITHIN 72 HOURS UPON REQUEST. WHEN WRITTEN CORRESPONDENCE CAN NOT BE OBTAINED IN A TIMELY MANNER, THE SPECIFIC INLET PROTECTION CAN BE REMOVED TO ALLEVIATE THE IMMEDIATE SAFETY CONCERN. HOWEVER, EFFORTS TO OBTAIN WRITTEN CORRESPONDENCE MUST BE DOCUMENTED IN THE SWPPP AND AVAILABLE WITHIN 72 HOURS UPON REQUEST. PERMISSION TO REMOVE INLET PROTECTION BASED ON A SPECIFIC SAFETY CONCERN MUST STILL BE OBTAINED FROM THE JURISDICTIONAL AUTHORITY WITHIN 30 DAYS OF REMOVAL.
5. TEMPORARY SOIL STOCKPILES MUST HAVE SILT FENCE OR OTHER EFFECTIVE SEDIMENT CONTROLS, AND CANNOT BE PLACED IN SURFACE WATERS, INCLUDING STORMWATER CONVEYANCES SUCH AS CURB AND GUTTER SYSTEMS, OR CONDUITS AND DITCHES UNLESS THERE IS A BYPASS IN PLACE FOR THE STORMWATER.
6. VEHICLE TRACKING OF SEDIMENT FROM THE CONSTRUCTION SITE (OR ONTO STREETS WITHIN THE SITE) MUST BE MINIMIZED BY BMPS SUCH AS STONE PADS, CONCRETE OR STEEL WASH RACKS, OR EQUIVALENT SYSTEMS. STREET SWEEPING MUST BE USED IF SUCH BMPS ARE NOT ADEQUATE TO PREVENT SEDIMENT FROM BEING TRACKED ONTO THE STREET (SEE PART IV.E.4.D.).
7. THE PERMITTEE MUST INSTALL TEMPORARY SEDIMENTATION BASINS AS REQUIRED IN PART III.B. OF THIS PERMIT.

E. INSPECTIONS AND MAINTENANCE

1. THE PERMITTEE(S) (EITHER THE OWNER OR OPERATOR, WHOEVER IS IDENTIFIED IN THE SWPPP) MUST ROUTINELY INSPECT THE ENTIRE CONSTRUCTION SITE AT LEAST ONCE EVERY SEVEN (7) DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. FOLLOWING AN INSPECTION WHICH OCCURS WITHIN 24 HOURS AFTER A RAINFALL EVENT, THE NEXT INSPECTION MUST BE CONDUCTED WITHIN SEVEN (7) DAYS AFTER THAT.
2. ALL INSPECTIONS AND MAINTENANCE CONDUCTED DURING CONSTRUCTION MUST BE RECORDED IN WRITING AND THESE RECORDS MUST BE RETAINED WITH THE SWPPP IN ACCORDANCE WITH PART III.D. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY SHALL INCLUDE:
   a. DATE AND TIME OF INSPECTIONS;
   b. NAME OF PERSON(S) CONDUCTING INSPECTIONS;
   c. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
   d. CORRECTIVE ACTIONS TAKEN (INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES);
   e. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 1/2 INCH (0.5 INCHES) IN 24 HOURS;
   f. DOCUMENTATION OF CHANGES MADE TO THE SWPPP AS REQUIRED IN PART III.A.4; AND
3. WHERE PARTS OF THE CONSTRUCTION SITE HAVE PERMANENT COVER, BUT WORK REMAINS ON OTHER PARTS OF THE SITE, INSPECTIONS OF THE AREAS WITH PERMANENT COVER MAY BE REDUCED TO ONCE PER MONTH. WHERE CONSTRUCTION SITES HAVE PERMANENT COVER ON ALL EXPOSED SOIL AREAS AND NO CONSTRUCTION ACTIVITY IS OCCURRING ANYWHERE ON THE SITE, THE SITE MUST BE INSPECTED FOR A PERIOD OF TWELVE (12) MONTHS (THE INSPECTIONS MAY BE CEASED DURING FROZEN GROUND CONDITIONS). FOLLOWING THE TWELFTH MONTH OF PERMANENT COVER AND NO CONSTRUCTION ACTIVITY, INSPECTIONS MAY BE TERMINATED UNTIL CONSTRUCTION ACTIVITY IS ONCE AGAIN INITIATED OR SOONER IF NOTIFIED IN WRITING BY THE MPCA. WHERE WORK HAS BEEN SUSPENDED DUE TO FROZEN GROUND CONDITIONS, THE REQUIRED INSPECTIONS AND MAINTENANCE SCHEDULE MUST BEGIN WITHIN 24 HOURS AFTER RUNOFF OCCURS AT THE SITE OR PRIOR TO RESUMING CONSTRUCTION, WHICHEVER COMES FIRST.
4. ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS MUST BE INSPECTED TO ENSURE INTEGRITY AND EFFECTIVENESS. ALL NONFUNCTIONAL BMPS MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WITH FUNCTIONAL BMPS WITHIN 24 HOURS AFTER DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS UNLESS ANOTHER TIME FRAME IS SPECIFIED BELOW. THE PERMITTEE(S) MUST INVESTIGATE AND COMPLY WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS:
   a. ALL SILT FENCES MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WHEN THEY BECOME NONFUNCTIONAL OR THE SEDIMENT REACHES 1/3 OF THE HEIGHT OF THE FENCE. THESE REPAIRS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.
   b. TEMPORARY AND PERMANENT SEDIMENTATION BASINS MUST BE DRAINED AND THE SEDIMENT REMOVED WHEN THE DEPTH OF SEDIMENT COLLECTED IN THE BASIN REACHES 1/2 THE STORAGE VOLUME. DRAINAGE AND REMOVAL MUST BE COMPLETED WITHIN 72 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS (SEE PART IV.D.).
   c. SURFACE WATERS, INCLUDING DRAINAGE DITCHES AND CONVEYANCE SYSTEMS, MUST BE INSPECTED FOR EVIDENCE OF EROSION AND SEDIMENT DEPOSITION. THE PERMITTEE(S) MUST REMOVE ALL DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATERS, INCLUDING DRAINAGE WAYS, CATCH BASINS, AND OTHER DRAINAGE SYSTEMS, AND RESTABILIZE THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL. THE REMOVAL AND STABILIZATION MUST TAKE PLACE WITHIN SEVEN (7) DAYS OF DISCOVERY UNLESS PRECLUDED BY LEGAL, REGULATORY, OR PHYSICAL ACCESS CONSTRAINTS. THE PERMITTEE SHALL USE ALL REASONABLE EFFORTS TO OBTAIN ACCESS. IF PRECLUDED, REMOVAL AND STABILIZATION MUST TAKE PLACE WITHIN SEVEN (7) CALENDAR DAYS OF OBTAINING ACCESS. THE PERMITTEE IS RESPONSIBLE FOR CONTACTING ALL LOCAL, REGIONAL, STATE AND FEDERAL AUTHORITIES AND RECEIVING ANY APPLICABLE PERMITS, PRIOR TO CONDUCTING ANY WORK.
   d. CONSTRUCTION SITE VEHICLE EXIT LOCATIONS MUST BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING ONTO PAVED SURFACES. TRACKED SEDIMENT MUST BE REMOVED FROM ALL PAVED SURFACES, WITHIN 24 HOURS OF DISCOVERY, OR IF APPLICABLE, WITHIN A SHORTER TIME TO COMPLY WITH PART IV.C.6.
   e. THE PERMITTEE(S) ARE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF TEMPORARY AND PERMANENT WATER QUALITY MANAGEMENT BMPS, AS WELL AS ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS, FOR THE DURATION OF THE CONSTRUCTION WORK AT THE SITE. THE PERMITTEE(S) ARE RESPONSIBLE UNTIL ANOTHER PERMITTEE HAS ASSUMED CONTROL ACCORDING TO PART II.B.5 OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED OR THE SITE HAS UNDERGONE FINAL STABILIZATION, AND A NOT HAS BEEN SUBMITTED TO THE MPCA.
   f. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED IN A MANNER AND AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G., FUGITIVE SEDIMENT IN STREETS COULD BE WASHED INTO STORM SEWERS BY THE NEXT RAIN AND/OR POSE A SAFETY HAZARD TO USERS OF PUBLIC STREETS).
5. ALL INFILTRATION AREAS MUST BE INSPECTED TO ENSURE THAT NO SEDIMENT FROM ONGOING CONSTRUCTION ACTIVITY IS REACHING THE INFILTRATION AREA AND THESE AREAS ARE PROTECTED FROM COMPACTION DUE TO CONSTRUCTION EQUIPMENT DRIVING ACROSS THE INFILTRATION AREA.

TEMPORARY EROSION & SEDIMENT CONTROL NOTES

1. INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES SHALL OBSERVE THE FOLLOWING SEQUENCE WITHIN ANY OF THE DRAINAGE BASINS SHOWN ON THE "TEMPORARY EROSION AND SEDIMENT CONTROL PLAN".

   A. STAKE LOCATION OF SEDIMENT TRAP(S) AND CONSTRUCTION LIMITS DELINEATING THE EDGE OF LAND DISTURBANCE.

   B. INSTALL SILT FENCE AROUND THE ENTIRE SITE PERIMETER AS SHOWN ON THE PLANS.

   C. CONSTRUCT SEDIMENT TRAP.

   D. CONSTRUCT ALL DIVERSION DITCHES AND PERMANENT DIVERSIONS.

   E. EXCAVATE WITHIN TRIBUTARY AREA.

   F. AS EMBANKMENT ALTERS THE EXISTING SITE TOPOGRAPHY, PERIODICALLY RELOCATE THE DIVERSION DITCHES TO FACILITATE DRAINAGE TO THE SEDIMENT TRAP.

2. CHANGES TO THE ABOVE DESCRIBED SEQUENCE OR TO THE CONSTRUCTION SEQUENCE FURNISHED BY THE CONTRACTOR ARE ALLOWED PROVIDED THAT PERMIT SECTIONS 1.D AND 1.E AND APPENDIX C.F.4 ARE COMPLIED WITH.

3. SILT FENCE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 6.3 OF THE MPCA MANUAL.

4. CONSTRUCTION OF DIVERSION DITCHES AND PERMANENT DIVERSIONS SHALL COMPLY WITH SECTION 5.9 OF THE MPCA REFERENCE MANUAL. DITCHES ARE CONSTRUCTED TO DIVERT RUNOFF TO SEDIMENT TRAPS.

PERMANENT DIVERSIONS ARE DIVESION DITCHES CONSTRUCTED PER THE ABOVE DETAIL AND ARE INTENDED TO REMAIN IN PLACE THROUGH THE LIFE OF THE CONSTRUCTION PROJECT. THE CONTRACTOR SHALL PROVIDE PERIODIC MAINTENANCE TO ASSURE THAT THE PERMANENT DIVERSION IS FUNCTIONAL.

DIVERSION DITCHES ARE TEMPORARY DITCHES CONSTRUCTED PER THE ABOVE DETAIL AND ARE INTENDED TO REMAIN IN PLACE ONLY AS LONG AS CUT/FILL OPERATIONS PERMIT. IT IS EXPECTED THAT THE CONTRACTOR WILL HAVE TO REGULARLY RELOCATE DIVERSION DITCHES AS CONSTRUCTION PROGRESSES.

THE LOCATION OF THE PERMANENT DIVERSIONS AND DIVERSION DITCHES SHOWN ON THE PLANS IS APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING THE DIVERSION DITCHES TO INTERCEPT AND CONVEY RUNOFF FROM THE SITE TO THE SEDIMENT TRAPS.

5. TEMPORARY SEEDING SHALL COMPLY WITH MPCA REFERENCE MANUAL SECTION 6.20 AND INCLUDE THE FOLLOWING:

   – SEED MIXTURE OF OATS (APPLIED AT 3 BUSHELS PER ACRE) AND CEREAL RYE (APPLIED AT 1.5 BUSHELS PER ACRE)
   – FERTILIZER (10–20–20) APPLIED AT 450 LBS PER ACRE
   – 1/2" TO 1–1/2" DEPTH OF PLANTING

PERMANENT EROSION & SEDIMENT CONTROL NOTES

1. PERMANENT SEEDING AND MULCHING SHALL COMPLY WITH MPCA REFERENCE MANUAL SECTION 6.21 AND 6.22 RESPECTIVELY, AND SHALL INCLUDE THE FOLLOWING:

   – SEED MIXTURE 250 APPLIED AT 125 LBS PER ACRE
   – FERTILIZER – MNDOT TYPE 1 (10–10–10)
   – TYPE 6 MULCH APPLIED AT 2100 LBS PER ACRE, OR CATEGORY 2 EROSION MAT, OR CATEGORY 3 EROSION MAT. (SEEP PLANS FOR LOCATIONS)

2. SODDING SHALL COMPLY WITH SECTION 6.22 OF THE MPCA REFERENCE MANUAL.

3. ALL AREAS WITHIN THE BOUNDARIES OF LAND DISTURBING ACTIVITIES SHALL BE STABILIZED IN ACCORDANCE WITH THE LEGEND ON SHEETS C400–C408.

CITY OF DULUTH, MN. EROSION CONTROL NOTES REV JANUARY 2009

1. MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION (2005 EDITION) SHALL APPLY. ALONG WITH THE DULUTH AIRPORT AUTHORITY, THE CONTRACTOR WILL BE CO–PERMITEE FOR THE MPCA NPDES STORM WATER CONSTRUCTION PERMIT FOR THIS PROJECT – CONTRACTORS SIGNATURE ON PERMIT IS REQUIRED.
   1.1. SUBMIT INITIAL EROSION CONTROL (EC) SCHEDULE AT OR BEFORE THE PRECONSTRUCTION CONFERENCE.
   1.2. SUBMIT EC SCHEDULE ALTERATIONS/ADJUSTMENTS WEEKLY THEREAFTER FOR ENGINEER'S APPROVAL.
2. THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL QUALITY CONTROL (WC) ON THIS PROJECT. CONTRACTOR SHALL PHASE/SEQUENCE THE PROJECT TO MINIMIZE EXPOSURE TO EROSION. CONTRACTOR SHALL PLACE OR OTHERWISE CONSTRUCT EROSION CONTROL AND SEDIMENT CONTAINMENT DEVICES TO MINIMIZE THE RUNOFF, TRACKING, AND SEDIMENT LOSS FROM DISTURBED AREAS OF THE PROJECT SITE.
3. DISTURBED SLOPES NOT ACTIVELY WORKED SHALL BE PROTECTED FROM SOIL EROSION WITH TEMPORARY OR PERMANENT COVER WITHIN 3 DAYS OF BEING WORKED. EROSION CONTROL BLANKET AND SOIL STAPLES SHALL BE USED.
4. AT MINIMUM, THE FOLLOWING CONTROLS WILL BE IMPLEMENTED AT THE CONSTRUCTION SITE:
   4.1. EROSION CONTROL BLANKETS SHALL BE USED ON ALL SLOPES 1:3 OR STEEPER
   4.2. SILT FENCES SHALL BE USED IN CONJUNCTION WITH OTHER EROSION BMPS
   4.3. ROCK DITCH CHECKS OR APPROVED EQUAL ARE TO BE USED TO REDUCE DITCH VELOCITIES AND REDUCE EROSION
   4.4. STORM INLET AND OUTLET AREAS SHALL BE CONTINUOUSLY PROTECTED WITH MNDOT APPROVED DEVICES/METHODS
   4.5. STABILIZED CONSTRUCTION ENTRANCE, OR REUSABLE MUD MAT SHALL BE USED TO REDUCE SEDIMENT TRACKING
   4.6. PERMANENT VEGETATION WILL BE ESTABLISHED RIGHT AFTER TOPSOIL IS SPREAD
   4.7. CONTROL ALL SITE SOLID WASTE, DEBRIS, MATERIAL STORAGE AND CONCRETE WASHOUT ON SITE. NO MIGRATION OFFSITE OR INTO DITCHES/STORM SYSTEMS PERMITTED
5. ALL SLOPES AND DITCHES SHALL BE STABILIZED PRIOR TO OPENING NEW CULVERTS INTO EXISTING DRAINAGE WAYS.
6. IF ANY STOCKPILE IS TO REMAIN IN PLACE FOR MORE THAN 3 DAYS SEDIMENT AND EROSION CONTROL DEVICES SHALL BE USED.
7. WATER PUMPED OR OTHERWISE DISCHARGED FROM THE SITE DURING CONSTRUCTION DEWATERING SHALL BE DIRECTED THROUGH EFFECTIVE FILTERING DEVICE(S) IN ACCORDANCE WITH MNDOT SPECIFICATION 2573. USE OF APPROVED FLOCCULANT MAY BE NECESSARY.
8. THE CONTRACTOR SHALL TAKE ALL POSSIBLE PRECAUTIONS TO PREVENT APPRECIABLE SOIL TRACKING ONTO ROADWAYS. APPRECIABLE SOIL, MUD, OR DEBRIS WASHED, TRACKED, OR DEPOSITED ONTO PAVED SURFACES SHALL BE REMOVED PRIOR TO THE END OF EACH WORK DAY.
9. STABILIZED CONSTRUCTION ENTRANCE(S) SHALL BE REMOVED AND AREA RESTORED AFTER GRADING IS COMPLETE.
10. THE CONTRACTOR QC PROGRAM SHALL ENSURE THAT A COMPETENT INDIVIDUAL SHALL INSPECT EROSION AND SEDIMENT CONTROL DEVICES WEEKLY AND AFTER EACH RAIN EVENT. ALL NONFUNCTIONAL DEVICES SHALL BE REPAIRED/REPLACED/CLEANED. MAINTAIN WRITTEN LOG OF ALL WEEKLY AND RAIN EVENT INSPECTIONS – INCLUDE THE CORRECTIVE ACTIONS THAT WERE TAKEN.
11. THE CONTRACTOR SHALL MAINTAIN THE CAPABILITY TO IMPLEMENT RAPID STABILIZATION METHOD 4 (MNDOT 2573.4) AT ALL TIMES. INCLUDES CAT III EROSION CONTROL BLANKED (ECB) [N. AMERICAN GREEN S150 OR APPROVED EQUAL] ALONG WITH SEED MIXTURE, FERTILIZER, AND SOIL STAPLES PER 2573–3. THE UPGRADE END OF EACH BLANKET STRIP SHALL BE BURIED AT LEAST 6 INCHES IN A VERTICAL CHECK SLOT. STAPLES SHALL BE PLACED AT SEAMS AND THROUGHOUT THE BLANKET AT A MAXIMUM SPACING IN ALL DIRECTIONS OF 2 FEET. PAYMENT ALLOWED SHALL BE PER CONTRACT OR IN ABSENCE OF CONTRACT BID PRICE IN ACCORDANCE WITH MNDOT SPECIFICATION 2575.5

CONSTRUCTION PRACTICES TO MINIMIZE STORM WATER CONTAMINATION

TO PREVENT STORM WATER CONTAMINATION FROM OCCURRING, THE FOLLOWING BMPS WILL BE IMPLEMENTED:

1. ALL AREAS THAT ARE ROUGH GRADED MUST BE KEPT IN A SMOOTH CONDITION TO ALLOW SHEET FLOW OF STORM WATER WHEREVER PRACTICAL AND ALWAYS READY FOR SURFACE APPLICATION OF DEGRADABLE OR NON–DEGRADABLE BLANKETS, MULCH, OR OTHER PROTECTIVE COVERS.
2. A STABILIZED CONSTRUCTION ENTRANCE/EXIT WILL BE CONSTRUCTED TO REDUCE VEHICLE TRACKING OF SEDIMENTS OFF THE PROJECT RIGHT OF WAY.
3. ALL SOLID WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER OR OTHER APPROVED CONTAINMENT METHOD AT THE END OF EACH DAY. ANY ALTERNATIVE TO A METAL DUMPSTER MUST BE SUBMITTED IN WRITING FOR APPROVAL BY THE PROJECT ENGINEER. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY TO FUNCTION AS INTENDED FOR DEBRIS COLLECTION. NO CONSTRUCTION MATERIALS WILL BE BURIED ON–SITE. THE CONTRACTOR'S EROSION CONTROL SUPERVISOR WILL INSTRUCT ALL PERSONNEL REGARDING THE CORRECT PROCEDURE FOR DISPOSAL.
4. RECYCLABLE MATERIALS MUST BE SEPARATED ON–SITE AND SEGREGATED IN DESIGNATED CONTAINERS.
5. A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR WILL COLLECT ALL SANITARY WASTE FROM THE PORTABLE UNITS AT A RATE NECESSARY TO MAINTAIN DESIGNED FUNCTION.
6. ALL VEHICLES ON SITE WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE.
7. FERTILIZERS WILL BE STORED IN A COVERED SHED AND PARTIALLY USED BAGS WILL BE TRANSFERRED TO A SEALABLE BIN TO REDUCE THE CHANCE OF SPILLAGE.
8. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS, WHICH ARE CLEARLY LABELED.
9. SPILL KITS WILL BE INCLUDED WITH ALL FUELING SOURCES AND MAINTENANCE ACTIVITIES. SECONDARY CONTAINMENT MEASURES WILL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR.
10. ANY ASPHALT SUBSTANCES USED ON SITE WILL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
11. ALL PAINT CONTAINERS AND CURING COMPOUNDS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM WATER SYSTEM BUT WILL BE PROPERLY DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTION.
12. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEAN–UP SHALL BE READILY AVAILABLE AND BE KEPT IN AN ENCLOSED TRAILER OR SHED ON SITE. EQUIPMENT WILL INCLUDE, BUT NOT LIMITED TO, BROOMS, MOPS, DUST PANS, RAGS, GLOVES, GOGGLES, ABSORBENT (KITTY LITTER, OIL ABSORBENT BOOMS AND DIAPERS) AND BUCKETS.
13. ALL SPILLS WILL BE CONTAINED AND CLEANED UP IMMEDIATELY UPON DISCOVERY. SPILLS LARGE ENOUGH TO REACH THE STORM WATER CONVEYANCE SYSTEM WILL BE REPORTED TO THE MINNESOTA DUTY OFFICER AT 1–800–422–0798.
14. CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE UNLESS DONE IN AN ENGINEERED CONTAINMENT SYSTEM. THE ENGINEERED SYSTEM MUST INCLUDE SITE DRAWINGS FOR THE PROJECT FILE AND WRITTEN ASSURANCE THAT THE SYSTEM WILL WORK AS DESIGNED AND LEAVE NO DISCHARGE OF CONCRETE OR CONCRETE RESIDUE POTENTIAL TO ENTER WATERS OF THE STATE.
15. FORM RELEASE OIL USED FOR CONCRETE WORK MUST BE APPLIED OVER A PALLET CONTAINING ABSORBENT TO COLLECT EXCESS LIQUID. THE ABSORBENT MATERIAL WILL BE REPLACED AND PROPERLY DISPOSED OF WHEN SATURATED.
16. DISCHARGES FROM BASIN DEWATERING OPERATIONS THAT ARE TURBID OR SEDIMENT LADEN SHALL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS CONSTRUCTED ON THE SITE TO PROVIDE TREATMENT PRIOR TO DISCHARGE TO A WATER OF THE STATE.

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature [signature]

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: SCA
DESIGNED BY: DJL

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SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS 7 OF 7

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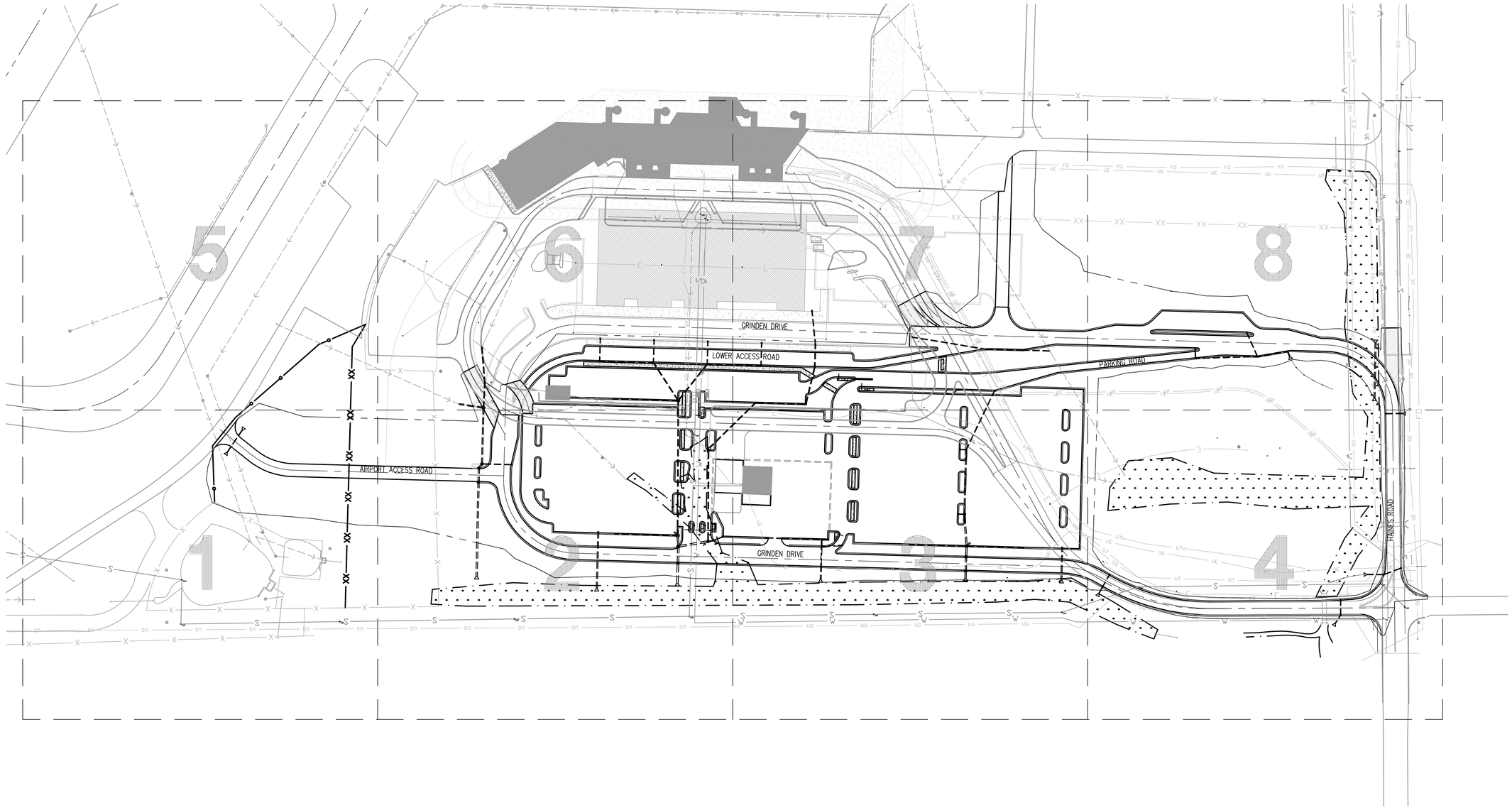

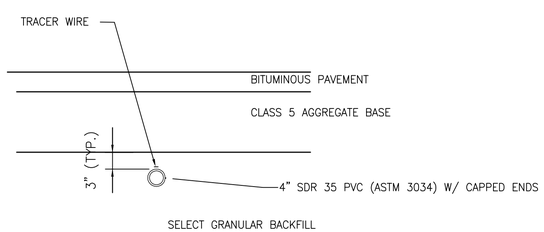

TYPICAL IRRIGATION CONDUIT PLACEMENT

NTS

CONDUIT PLACEMENT NOTES:

1) THE #6 AWG BSD COPPER COUNTERPOISE WIRE SHALL BE CENTERED THE DUCT.

2) EXTEND AND CAP A MIINIMUM OF 2 FEET BEHIND BACK OF CURB.

3) THE CONTRACTOR SHALL PROVIDE SURVEY TIES OF END LOCATIONS TO ENGINEER.

NORTH

100' 50' 0 100'

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DULUTH, MINNESOTA 55802
Ph: 218.727.3282 Fx: 218.727.1216
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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE

DRAINAGE OVERALL PLAN

SHEET NUMBER

C500

BID DOCUMENTS

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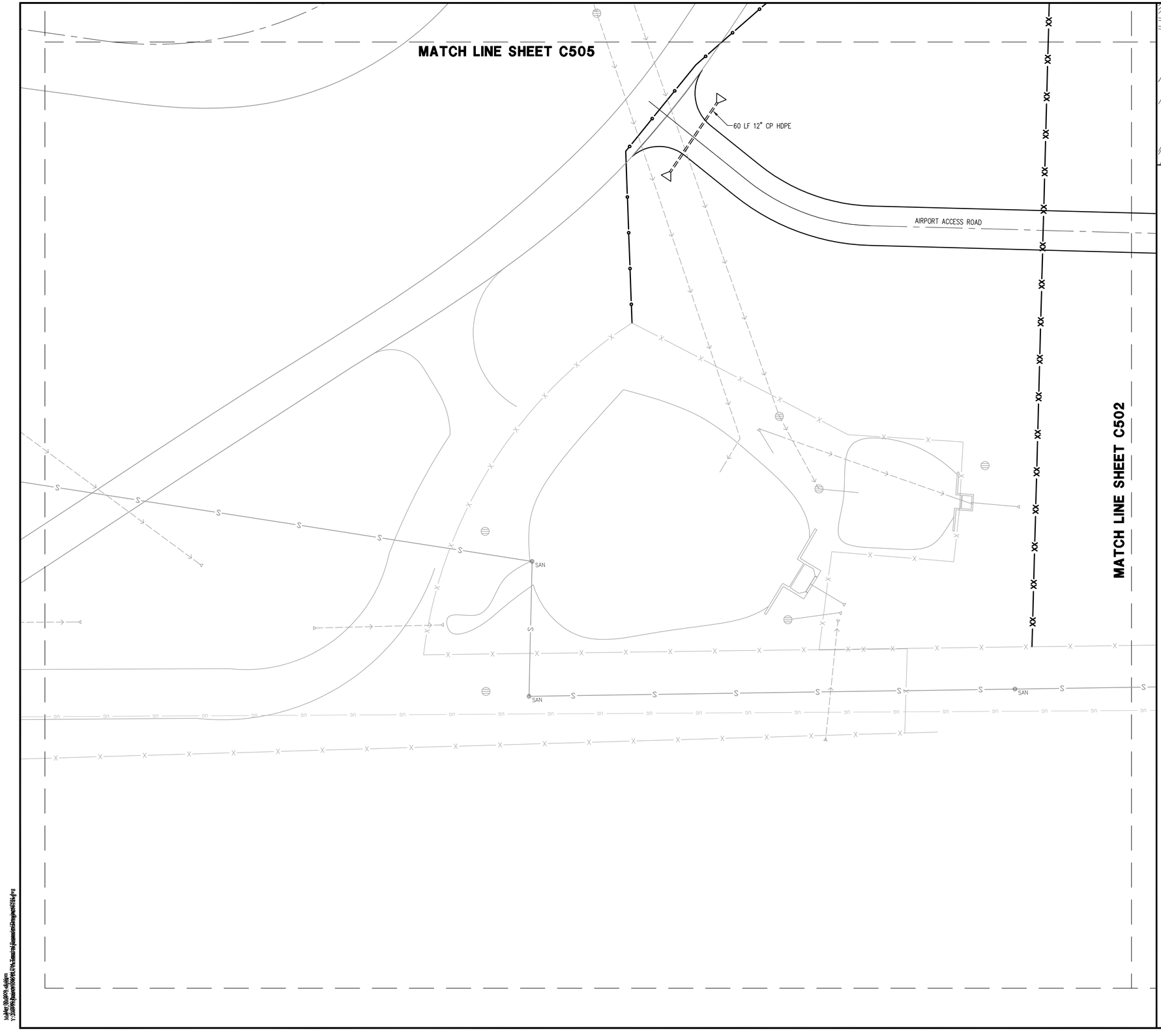

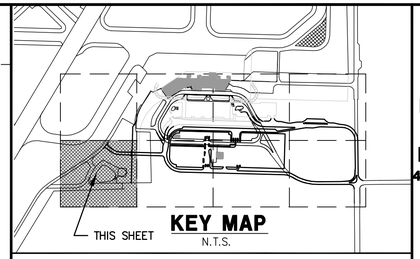

KEY MAP
N.T.S.

NORTH

30' 15' 0 30'

DRAINAGE LEGEND

- STORM STRUCTURE (48" DIA.)
- STORM STRUCTURE (>48" DIA.)
- CP HDPE PIPE
- FLARED END SECTION
- S-73 STRUCTURE NAME
- FES-09 FLARED END SECTION NAME
- 4" PERF. PVC PIPE UNDERDRAIN

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214-1882-093

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SHEET TITLE
DRAINAGE PLAN (AREA 1)

1 OF 8

SHEET NUMBER
C501

BID DOCUMENTS

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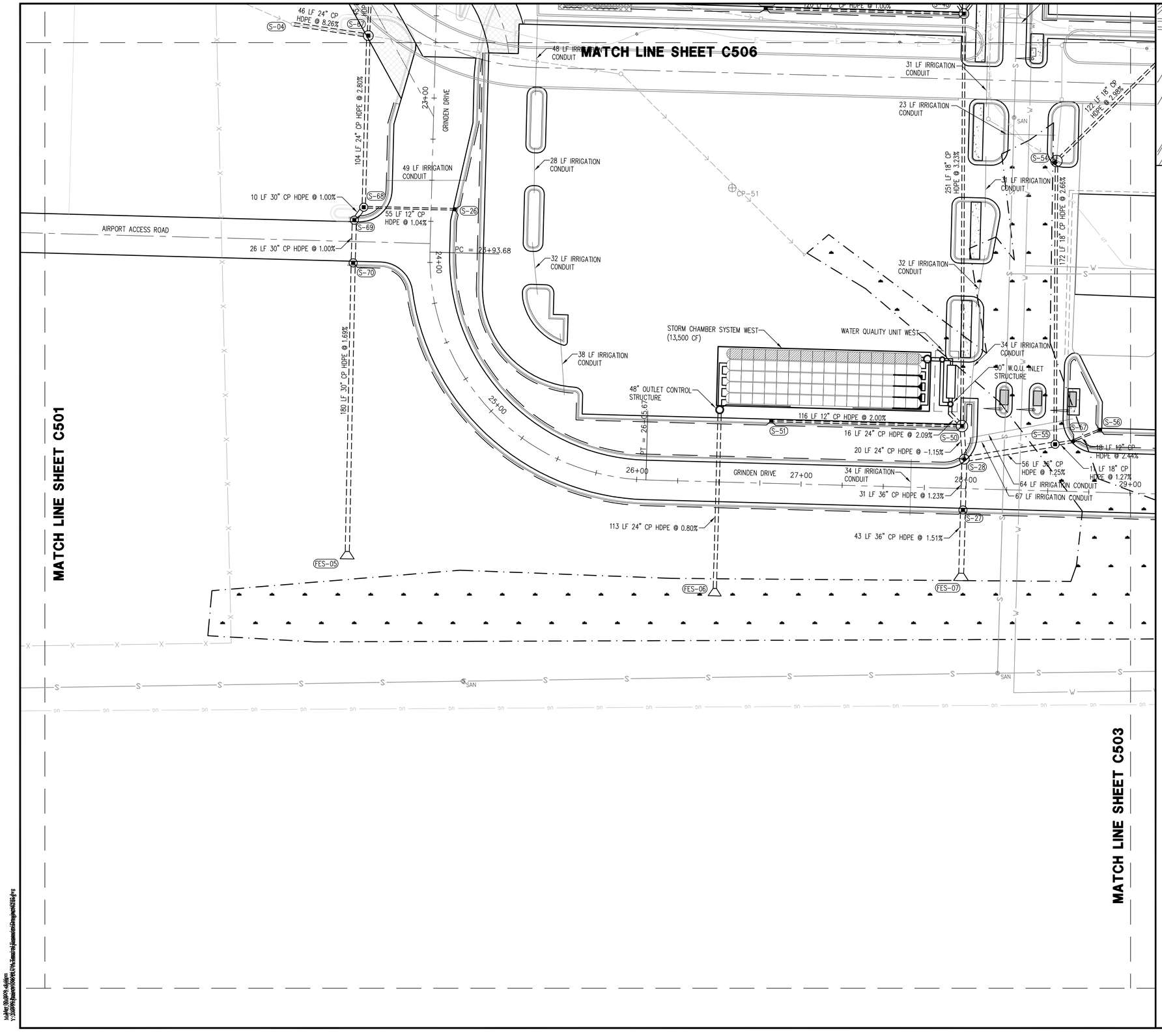

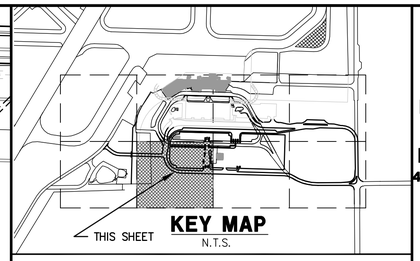

NORTH

30' 15' 0 30'

DRAINAGE LEGEND

- ■ STORM STRUCTURE (48" DIA.)
- ⊙ STORM STRUCTURE (>48" DIA.)
- === CP HDPE PIPE
- △ FLARED END SECTION
- (S-73) STRUCTURE NAME
- (FES-09) FLARED END SECTION NAME
- — — — 4" PERF. PVC PIPE UNDERDRAIN

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214-1882-093

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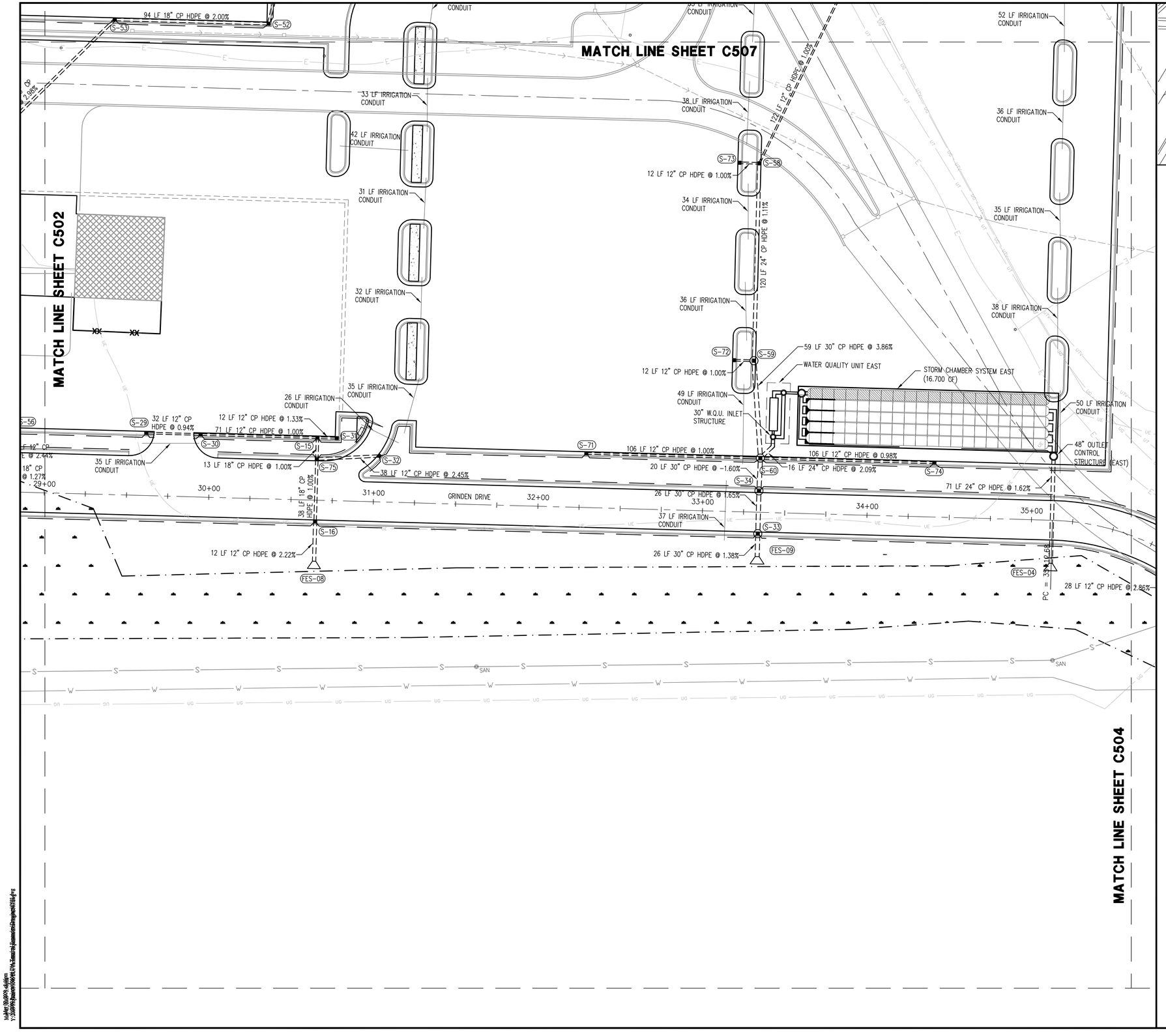
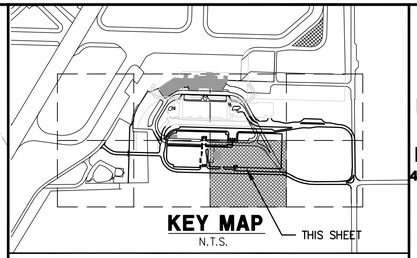
SHEET TITLE
DRAINAGE PLAN (AREA 2)

2 OF 8

SHEET NUMBER
C502

BID DOCUMENTS





NORTH

30' 15' 0 30'

DRAINAGE LEGEND

- STORM STRUCTURE (48" DIA.)
- STORM STRUCTURE (>48" DIA.)
- CP HDPE PIPE
- FLARED END SECTION
- (S-73) STRUCTURE NAME
- (FES-09) FLARED END SECTION NAME
- 4" PERF. PVC PIPE UNDERDRAIN

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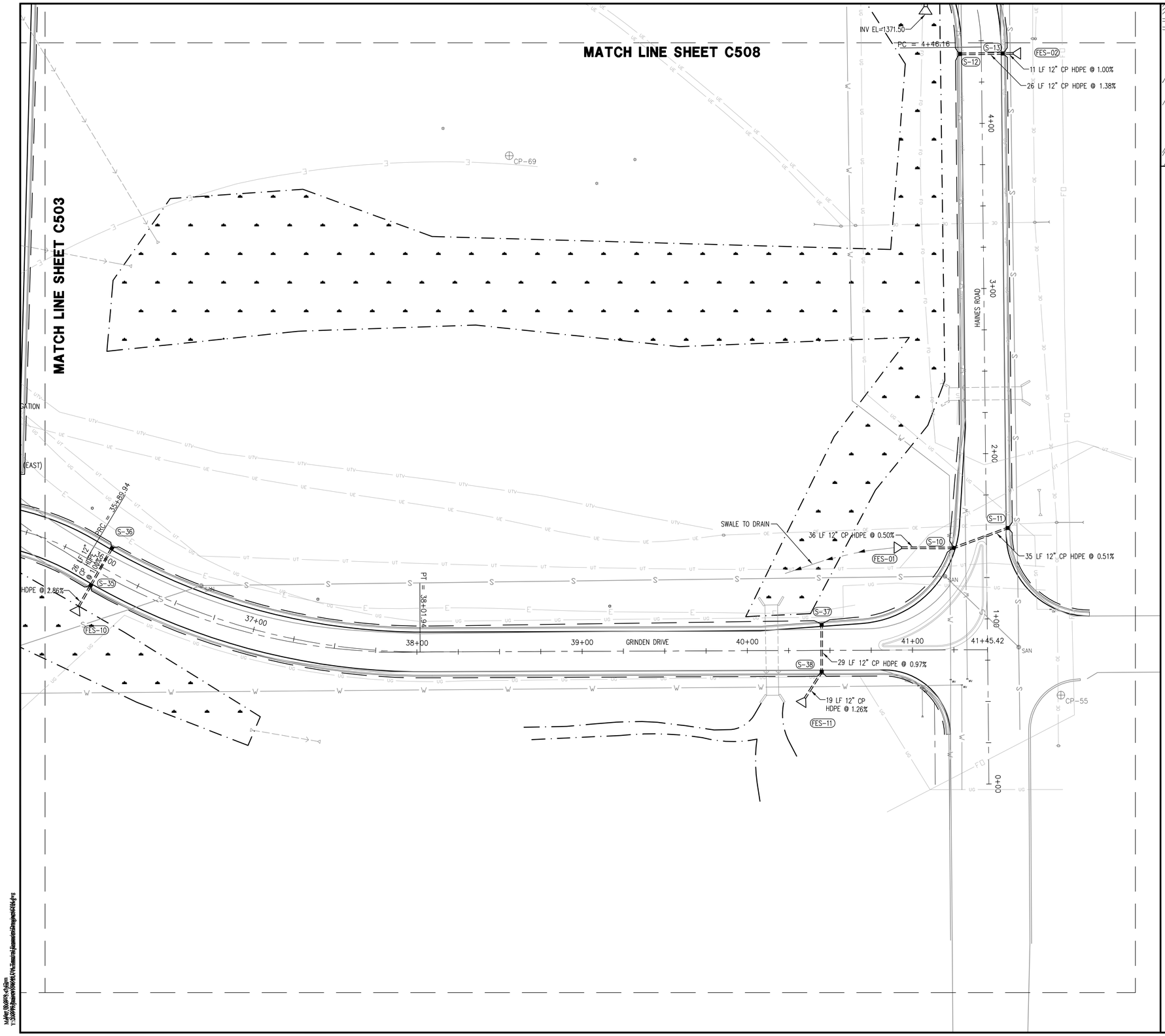
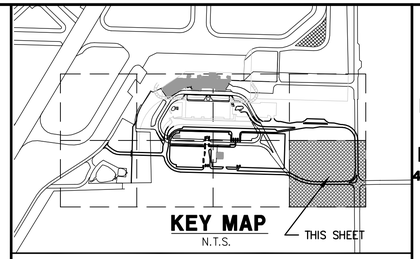
SHEET TITLE
DRAINAGE PLAN (AREA 3)

3 OF 8

SHEET NUMBER
C503

BID DOCUMENTS





NORTH

30' 15' 0 30'

DRAINAGE LEGEND

- ■ STORM STRUCTURE (48" DIA.)
- ◉ STORM STRUCTURE (>48" DIA.)
- === CP HDPE PIPE
- △ FLARED END SECTION
- (S-73) STRUCTURE NAME
- (FES-09) FLARED END SECTION NAME
- — — — 4" PERF. PVC PIPE UNDERDRAIN

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DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
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SHEET TITLE
DRAINAGE PLAN (AREA 4)

4 OF 8

SHEET NUMBER
C504

BID DOCUMENTS

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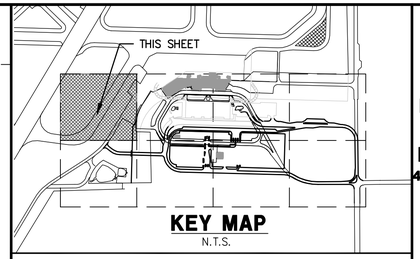
MATCH LINE SHEET C503

MATCH LINE SHEET C501



KEY MAP
N.T.S.

NORTH

30' 15' 0 30'

DRAINAGE LEGEND

- ■ STORM STRUCTURE (48" DIA.)
- ◉ STORM STRUCTURE (>48" DIA.)
- === CP HDPE PIPE
- △ FLARED END SECTION
- (S-73) STRUCTURE NAME
- (FES-09) FLARED END SECTION NAME
- — — — 4" PERF. PVC PIPE UNDERDRAIN

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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AEP PROJECT NUMBER
214-1882-093

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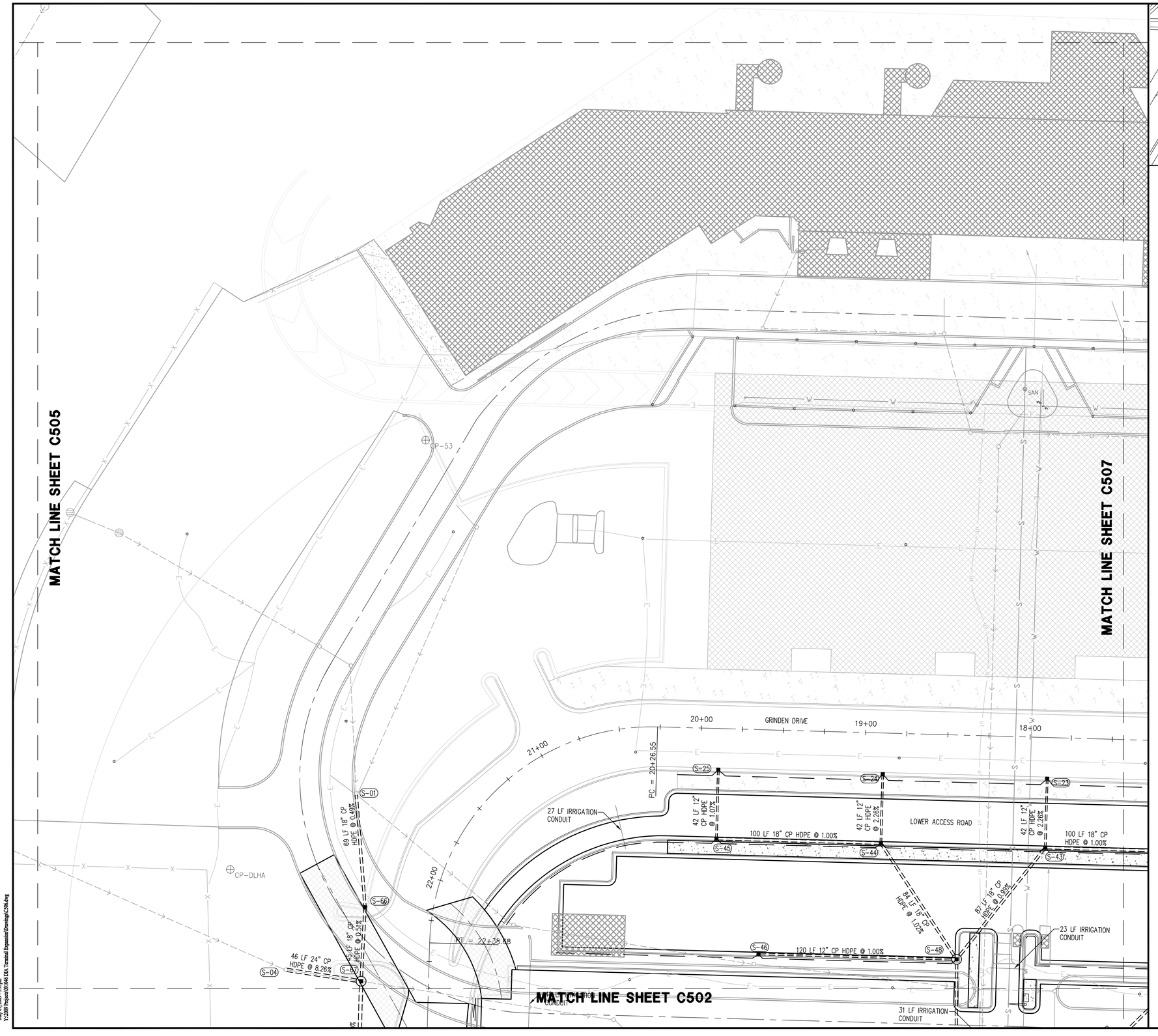
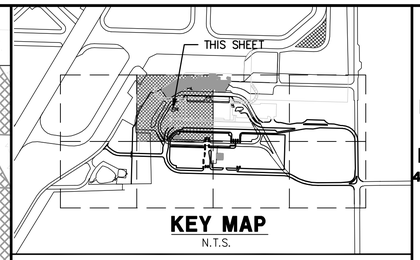
SHEET TITLE
DRAINAGE PLAN (AREA 5)

5 OF 8

SHEET NUMBER
C505

BID DOCUMENTS





KEY MAP
N.T.S.

NORTH

30' 15' 0 30'

DRAINAGE LEGEND

- STORM STRUCTURE (48" DIA.)
- STORM STRUCTURE (>48" DIA.)
- CP HDPE PIPE
- FLARED END SECTION
- (S-73) STRUCTURE NAME
- (FES-09) FLARED END SECTION NAME
- 4" PERF. PVC PIPE UNDERDRAIN

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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REVISIONS

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REVIEWED BY: PJM
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AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PLAN (AREA 6)

6 OF 8

SHEET NUMBER
C506

BID DOCUMENTS

May 07, 2009 - 5:47pm
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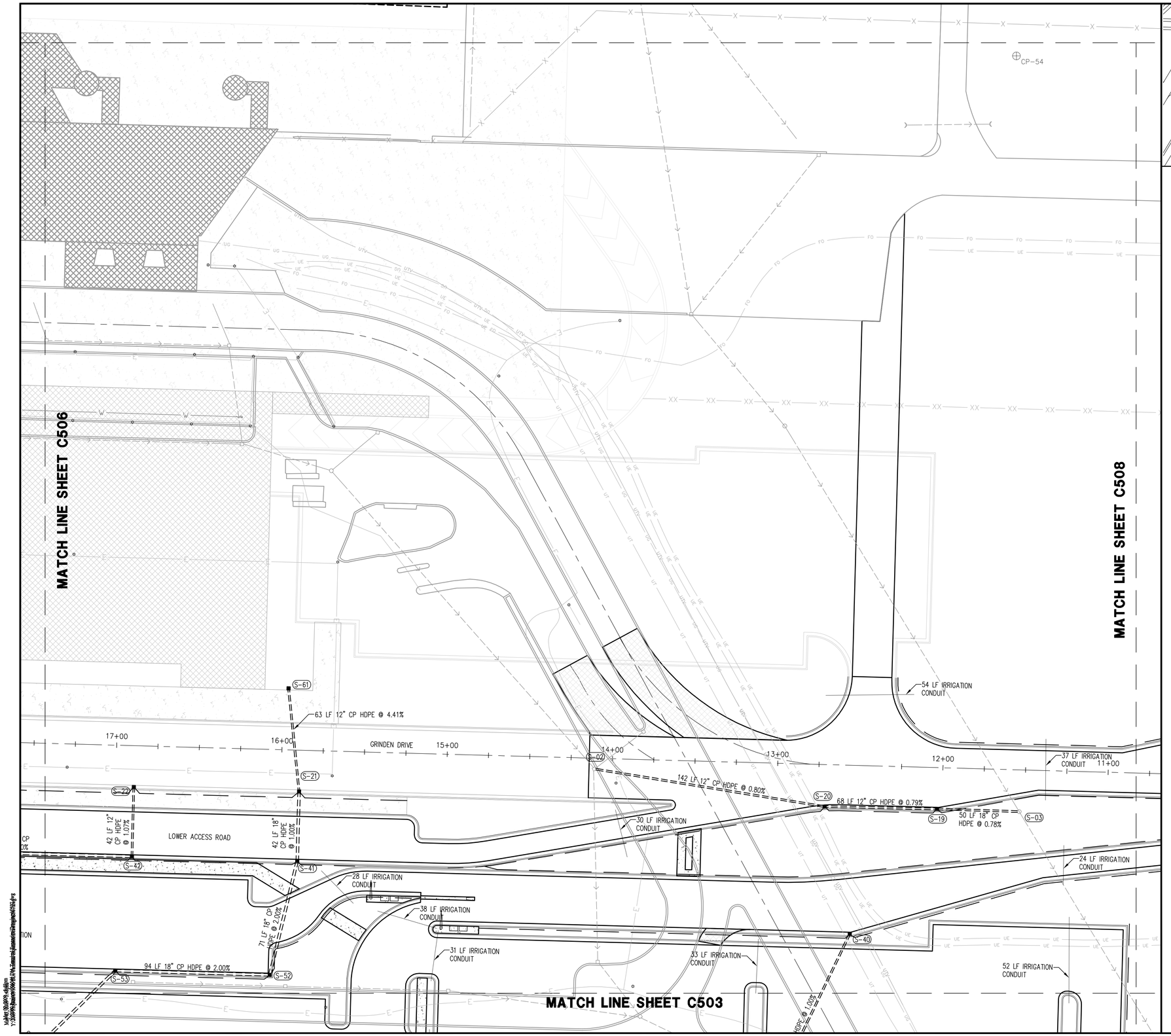

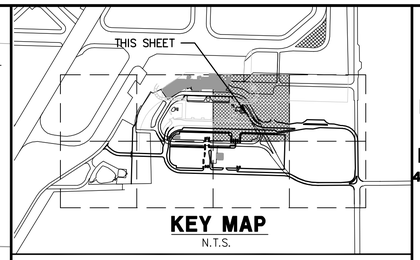

KEY MAP
N.T.S.

NORTH

30' 15' 0 30'

DRAINAGE LEGEND

■	STORM STRUCTURE (48" DIA.)
◉	STORM STRUCTURE (>48" DIA.)
===>	CP HDPE PIPE
△	FLARED END SECTION
(S-73)	STRUCTURE NAME
(FES-09)	FLARED END SECTION NAME
— — —	4" PERF. PVC PIPE UNDERDRAIN

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DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PLAN (AREA 7)

7 OF 8

SHEET NUMBER
C507

BID DOCUMENTS

MATCH LINE SHEET C507

MATCH LINE SHEET C504

CP-68

GRINDEN DRIVE

PARKING ROAD

10+00 9+00 8+00 7+00 6+00 5+00

S-17 49 LF 12" CP HDPE @ 4.45%

S-18 19 LF 12" CP HDPE @ 2.79%

S-39 115 LF 12" CP HDPE @ 2.81%

S-47 67 LF 18" CP HDPE @ 1.00%

S-14 22 LF 18" CP HDPE @ 0.75%

FES-03

38 LF IRRIGATION CONDUIT

PT = 6+37.80

SWALE TO DRAIN

INV EL=1372.00

112 LF 24" CP HDPE @ 0.45%

INV EL=1371.50

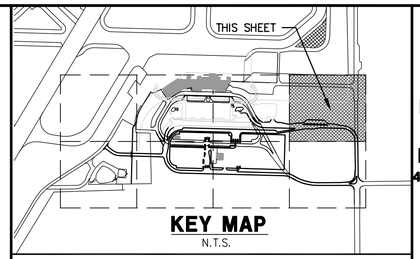
PC = 4+46.16

S-13

S-12

FES-02

11 LF 12" CP HDPE @ 1.00%



KEY MAP
N.T.S.

NORTH

30' 15' 0 30'

DRAINAGE LEGEND

- STORM STRUCTURE (48" DIA.)
- STORM STRUCTURE (>48" DIA.)
- CP HDPE PIPE
- FLARED END SECTION
- (S-73) STRUCTURE NAME
- (FES-09) FLARED END SECTION NAME
- 4" PERF. PVC PIPE UNDERDRAIN

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DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PLAN (AREA 8)

8 OF 8

SHEET NUMBER
C508

BID DOCUMENTS

DRAINAGE STRUCTURE TABLE - C502

STRM MH (S-26)	
Drainage Structure Design G	
Casting STRM-3	
STA. 23+67, 14.44 LT	Centerline Structure
RIM ELEV	1394.37
INV W	1389.27
STRM MH (S-27)	
Drainage Structure Design 60-4020	
Casting STRM-3	
STA. 27+99, 13.00 RT	Centerline Structure
STA. 27+99, 13.00 RT	Centerline Casting
RIM ELEV	1387.22
INV N	1379.75
INV S	1379.65
STRM MH (S-28)	
Drainage Structure Design 72-4020	
Casting STRM-3	
STA. 27+99, 17.88 LT	Centerline Structure
STA. 27+99, 17.88 LT	Centerline Casting
RIM ELEV	1387.14
INV N	1383.00
INV NE	1380.23
INV S	1380.13
STRM MH (S-48)	
Drainage Structure Design 72-4020	
Casting STRM-3	
STA. 18+41, 136.34 LT	Centerline Structure
STA. 18+41, 136.34 LT	Centerline Casting
RIM ELEV	1395.84
INV W	1390.90
INV NW	1390.17
INV NE	1390.17
INV S	1390.07
STRM MH (S-50)	
Drainage Structure Design 84-4020	
Casting STRM-3	
STA. 27+96.84, 38.00 LT	Centerline Structure
STA. 27+96.84, 38.00 LT	Centerline Casting
RIM ELEV	1386.80
INV N	1382.40
INV W	1382.30
INV S	1382.30
INV NW	1381.95
STRM MH (S-51)	
Drainage Structure Design G	
Casting STRM-3	
STA. 26+80.84, 38 LT	Centerline Structure
RIM ELEV	1387.38
INV E	1383.28
STRM MH (S-53)	
Drainage Structure Design F	
Casting STRM-3	
STA. 16+97.15, 136.35 LT	Centerline Structure
RIM ELEV	1396.04
INV E	1388.60
INV SW	1388.50
STRM MH (S-54)	
Drainage Structure Design 84-4020	
Casting STRM-3	
STA. 28+49.87, 200.69 LT	Centerline Structure
STA. 28+49.06, 199.57 LT	Centerline Casting
RIM ELEV	1391.51
INV NW	1386.14
INV NNE	1386.14
INV NE	1385.81
INV S	1385.71

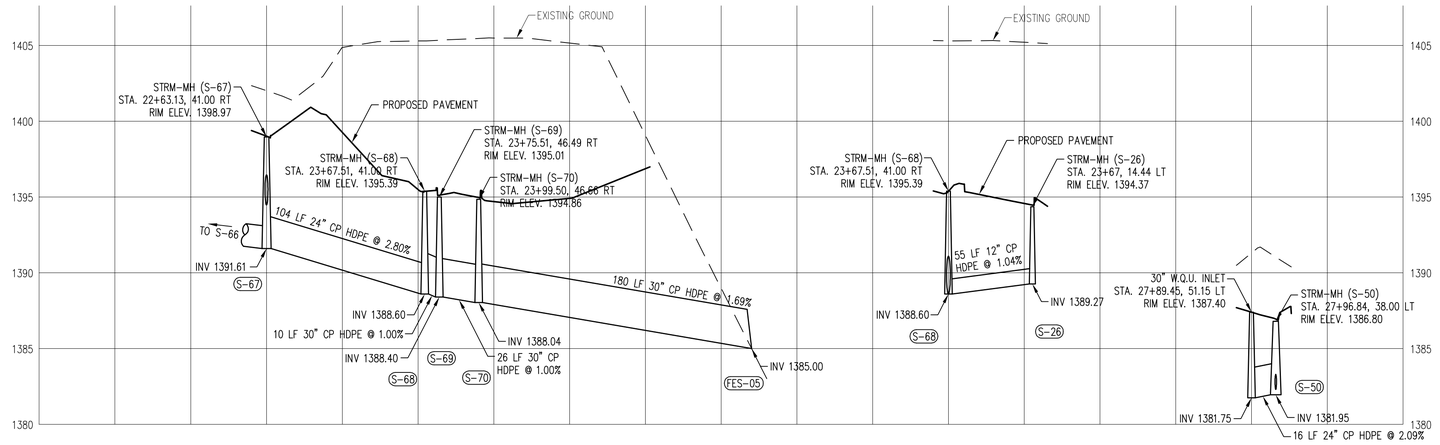
STRM MH (S-55)	
Drainage Structure Design 60-4020	
Casting STRM-1	
STA. 28+53.73, 28.45 LT	Centerline Structure
STA. 28+53.73, 28.45 LT	Centerline Casting
RIM ELEV	1386.94
INV N	1381.13
INV NE	1381.03
INV SW	1380.93
STRM MH (S-56)	
Drainage Structure Design G	
Casting STRM-3	
STA. 28+80.80, 38.00 LT	Centerline Structure
RIM ELEV	1385.81
INV SW	1381.71
STRM MH (S-57)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 28+64.71, 30.56 LT	Centerline Structure
STA. 28+64.71, 30.56 LT	Centerline Casting
RIM ELEV	1386.67
INV NE	1381.27
INV SW	1381.17
STRM MH (S-67)	
Drainage Structure Design 72-4020	
Casting STRM-3	
STA. 22+63.13, 41.00 RT	Centerline Structure
STA. 22+63.13, 41.00 RT	Centerline Casting
RIM ELEV	1398.97
INV N	1391.71
INV W	1394.47
INV E	1394.37
INV S	1391.61
STRM MH (S-68)	
Drainage Structure Design 60-4020	
Casting STRM-3	
STA. 23+67.51, 41.00 RT	Centerline Structure
STA. 23+67.51, 41.00 RT	Centerline Casting
RIM ELEV	1395.39
INV N	1388.70
INV E	1388.70
INV SW	1388.60
STRM MH (S-69)	
Drainage Structure Design 60-4020	
Casting STRM-3	
STA. 23+75.51, 46.49 RT	Centerline Structure
STA. 23+75.51, 46.49 RT	Centerline Casting
RIM ELEV	1395.01
INV NE	1388.50
INV S	1388.40
STRM MH (S-70)	
Drainage Structure Design 60-4020	
Casting STRM-3	
STA. 23+99.50, 46.66 RT	Centerline Structure
STA. 23+99.50, 46.66 RT	Centerline Casting
RIM ELEV	1394.86
INV N	1388.14
INV S	1388.04

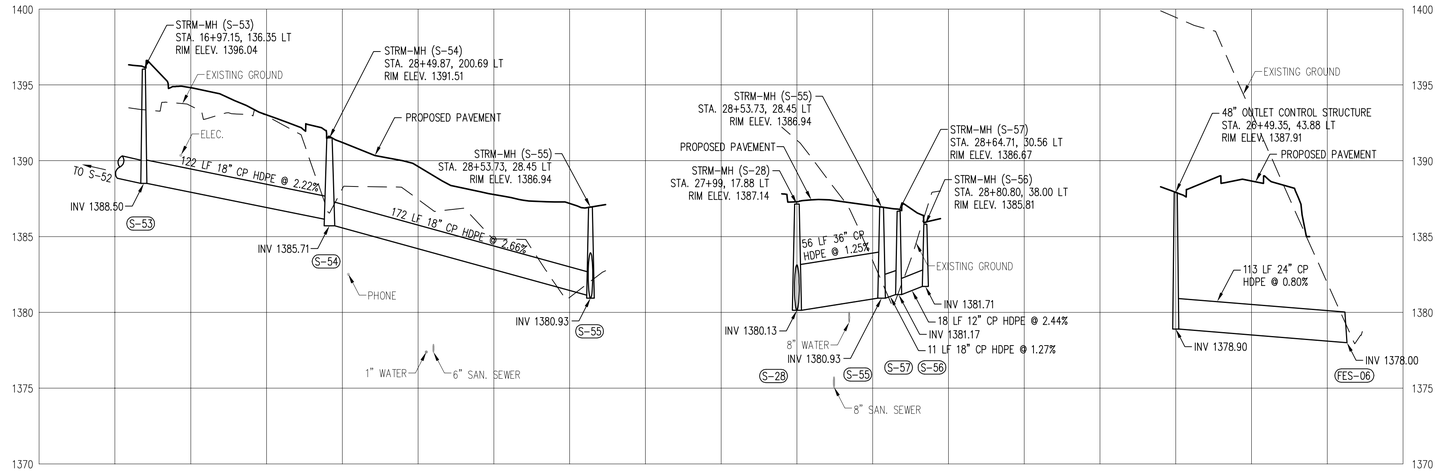
HORIZONTAL SCALE

50' 25' 0 50'

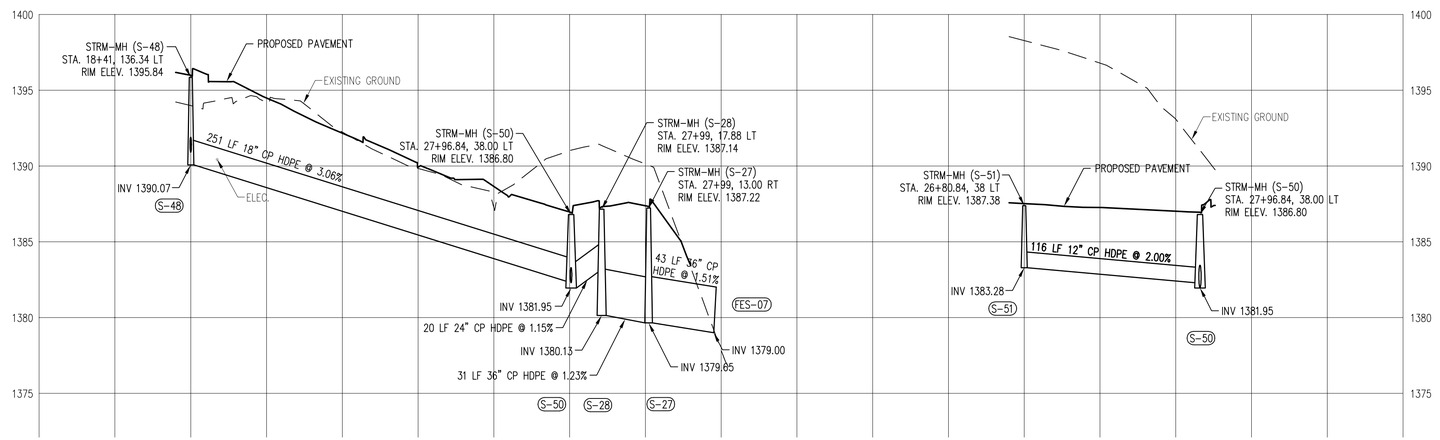
VERTICAL SCALE

5' 2.5' 0 5'





NOTE: INVERT SHOWN ON PROFILES REFLECTS STRUCTURE OUTLET INVERT.



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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PROFILES (AREA 2)

1 OF 6

SHEET NUMBER
C509

BID DOCUMENTS

May 07, 2009 - 5:48pm
Y:\2009 Projects\091946.00A Terminal Expansion\Drawings\C509.dwg

DRAINAGE STRUCTURE TABLE - C503

STRM MH (S-15)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 30+65, 38.00 LT	Centerline Structure
STA. 30+65, 38.00 LT	Centerline Casting
RIM ELEV	1385.88
INV W	1380.61
INV E	1380.61
INV S	1380.51

STRM MH (S-16)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 30+65, 13.00 RT	Centerline Structure
STA. 30+65, 13.00 RT	Centerline Casting
RIM ELEV	1386.54
INV N	1379.90
INV S	1379.80

STRM MH (S-29)	
Drainage Structure Design G	
Casting STRM-3	
STA. 29+61, 38.00 LT	Centerline Structure
RIM ELEV	1385.82
INV E	1381.72

STRM MH (S-30)	
Drainage Structure Design G	
Casting STRM-3	
STA. 29+94, 38.00 LT	Centerline Structure
RIM ELEV	1385.92
INV W	1381.42
INV E	1381.32

STRM MH (S-31)	
Drainage Structure Design G	
Casting STRM-3	
STA. 30+76.80, 38.00 LT	Centerline Structure
RIM ELEV	1385.81
INV W	1380.77

STRM MH (S-32)	
Drainage Structure Design G	
Casting STRM-3	
STA. 31+03, 27.93 LT	Centerline Structure
RIM ELEV	1386.41
INV W	1381.31

STRM MH (S-33)	
Drainage Structure Design 60-4020	
Casting STRM-3	
STA. 33+34, 13.00 RT	Centerline Structure
STA. 33+34, 13.00 RT	Centerline Casting
RIM ELEV	1385.88
INV N	1379.46
INV S	1379.36

STRM MH (S-34)	
Drainage Structure Design 60-4020	
Casting STRM-3	
STA. 33+34, 13.01 LT	Centerline Structure
STA. 33+34, 13.01 LT	Centerline Casting
RIM ELEV	1385.88
INV N	1381.25
INV S	1379.89

STRM MH (S-40)	
Drainage Structure Design G	
Casting STRM-3	
STA. 12+53.61, 102.00 LT	Centerline Structure
RIM ELEV	1390.54
INV SW	1385.44

STRM MH (S-58)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 33+28.80, 211.98 LT	Centerline Structure
STA. 33+28.80, 211.98 LT	Centerline Casting
RIM ELEV	1389.26
INV W	1385.04
INV NE	1384.22
INV S	1384.12

STRM MH (S-59)	
Drainage Structure Design 60-4020	
Casting STRM-3	
STA. 33+28.80, 91.98 LT	Centerline Structure
STA. 33+28.80, 91.98 LT	Centerline Casting
RIM ELEV	1386.96
INV W	1382.79
INV N	1382.79
INV S	1382.69

STRM MH (S-60)	
Drainage Structure Design 84-4020	
Casting STRM-3	
STA. 33+34.30, 32.94 LT	Centerline Structure
STA. 33+34.30, 32.94 LT	Centerline Casting
RIM ELEV	1385.56
INV N	1380.30
INV W	1380.41
INV E	1380.41
INV S	1380.93
INV NE	1380.20

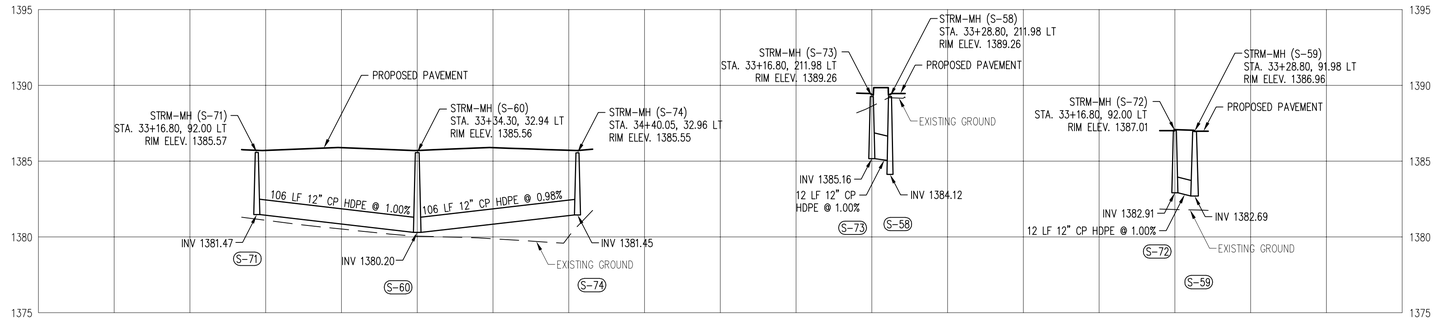
STRM MH (S-71)	
Drainage Structure Design G	
Casting STRM-3	
STA. 32+28.55, 32.91 LT	Centerline Structure
RIM ELEV	1385.57
INV E	1381.47

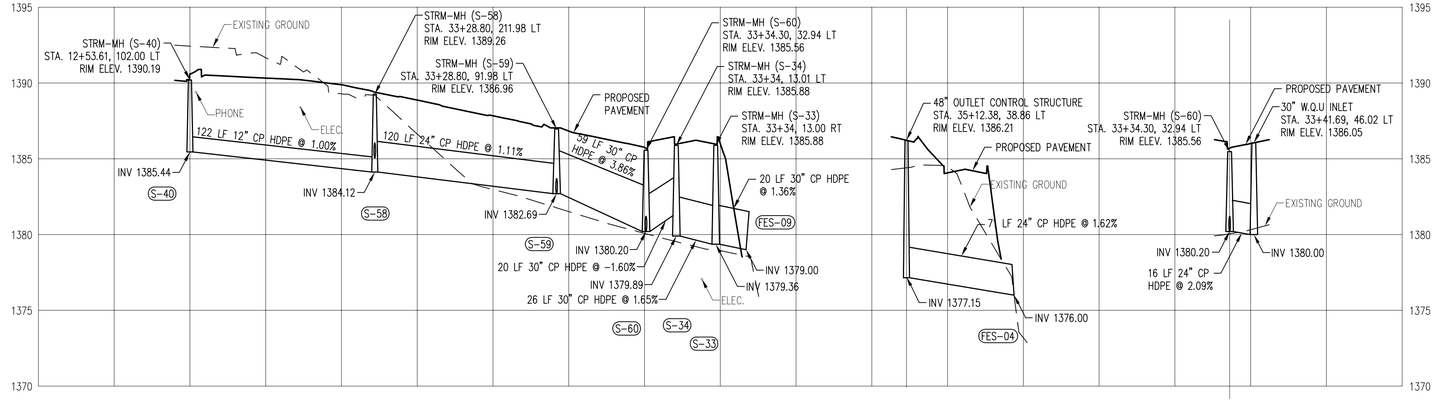
STRM MH (S-72)	
Drainage Structure Design G	
Casting STRM-3	
STA. 33+16.80, 92.00 LT	Centerline Structure
RIM ELEV	1387.01
INV E	1382.91

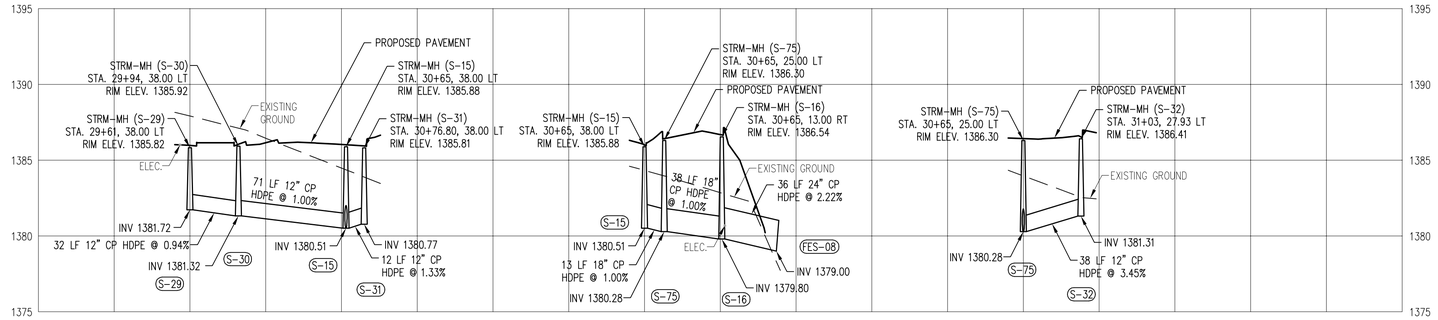
STRM MH (S-73)	
Drainage Structure Design G	
Casting STRM-3	
STA. 33+16.80, 211.98 LT	Centerline Structure
RIM ELEV	1389.26
INV E	1385.16

STRM MH (S-74)	
Drainage Structure Design G	
Casting STRM-3	
STA. 34+40.05, 32.96 LT	Centerline Structure
RIM ELEV	1385.55
INV W	1381.45

STRM MH (S-75)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 30+65, 25.00 LT	Centerline Structure
STA. 30+65, 25.00 LT	Centerline Casting
RIM ELEV	1386.30
INV N	1380.38
INV E	1380.38
INV S	1380.28







NOTE: INVERT SHOWN ON PROFILES REFLECTS STRUCTURE OUTLET INVERT.

HORIZONTAL SCALE

50' 25' 0 50'

VERTICAL SCALE

5' 2.5' 0 5'

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PROFILES (AREA 3)

2 OF 6

SHEET NUMBER
C510

BID DOCUMENTS

May 07, 2009 - 5:48pm
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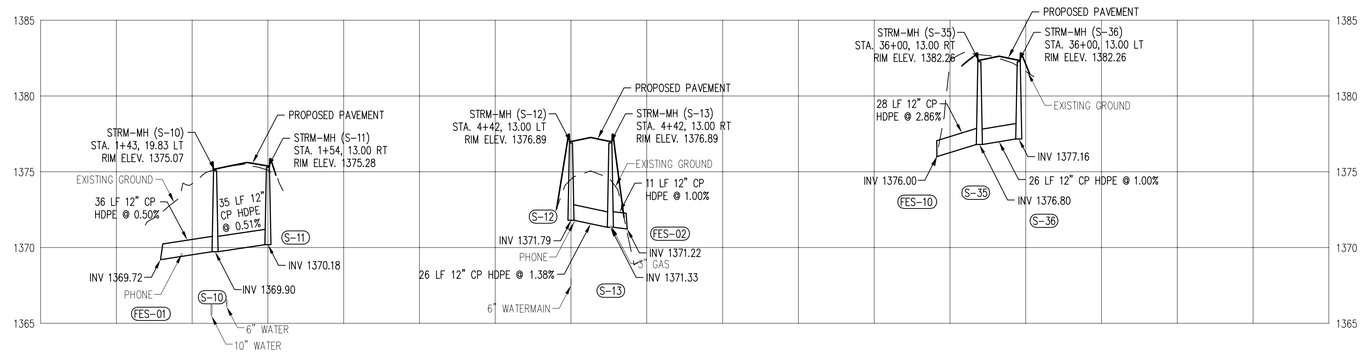
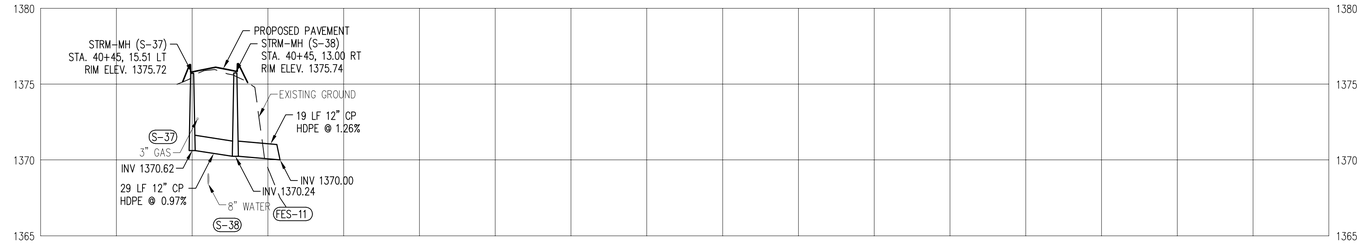
DRAINAGE STRUCTURE TABLE - C504

STRM MH (S-10)	
Drainage Structure Design G	
Casting STRM-3	
STA. 1+43, 19.83 LT	Centerline Structure
RIM ELEV	1375.07
INV NE	1370.00
INV W	1369.90
STRM MH (S-11)	
Drainage Structure Design G	
Casting STRM-3	
STA. 1+54, 13.00 RT	Centerline Structure
RIM ELEV	1375.28
INV SW	1370.18
STRM MH (S-12)	
Drainage Structure Design G	
Casting STRM-3	
STA. 4+42, 13.00 LT	Centerline Structure
RIM ELEV	1376.89
INV E	1371.79
STRM MH (S-13)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 4+42, 13.00 RT	Centerline Structure
STA. 4+42, 13.00 RT	Centerline Casting
RIM ELEV	1376.89
INV W	1371.43
INV E	1371.33
STRM MH (S-35)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 36+00, 13.00 RT	Centerline Structure
STA. 36+00, 13.00 RT	Centerline Casting
RIM ELEV	1382.26
INV NE	1376.90
INV SW	1376.80
STRM MH (S-36)	
Drainage Structure Design G	
Casting STRM-3	
STA. 36+00, 13.00 LT	Centerline Structure
RIM ELEV	1382.26
INV SW	1377.16
STRM MH (S-37)	
Drainage Structure Design G	
Casting STRM-3	
STA. 40+45, 15.51 LT	Centerline Structure
RIM ELEV	1375.72
INV S	1370.62
STRM MH (S-38)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 40+45, 13.00 RT	Centerline Structure
STA. 40+45, 13.00 RT	Centerline Casting
RIM ELEV	1375.74
INV N	1370.34
INV S	1370.24





NOTE: INVERT SHOWN ON PROFILES REFLECTS STRUCTURE OUTLET INVERT.

HORIZONTAL SCALE

50' 25' 0 50'

VERTICAL SCALE

5' 2.5' 0 5'

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Y:\2009 Projects\091004 DIA Terminal Expansion\Drawings\C511.dwg

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PROFILES (AREA 4)

3 OF 6

SHEET NUMBER
C511

BID DOCUMENTS

DRAINAGE STRUCTURE TABLE - C506

STRM MH (S-01) EXISTING	
STA. 21+76.94, 67.87 RT	Centerline Structure
RIM ELEV	1396.33
INV NW	1393.53
INV N	1392.48
INV NE	1392.58
INV SE	1392.38
INV S	1392.38
STRM MH (S-04) EXISTING	
STA. 22+57.37, 86.91 RT	Centerline Structure
RIM ELEV	1403.17
INV W	1398.37
INV E	1398.27
STRM MH (S-23)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 17+89, 25.00 LT	Centerline Structure
STA. 17+89, 25.00 LT	Centerline Casting
RIM ELEV	1398.18
INV S	1392.68
STRM MH (S-24)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 18+89, 25.00 LT	Centerline Structure
STA. 18+89, 25.00 LT	Centerline Casting
RIM ELEV	1398.18
INV S	1392.68
STRM MH (S-25)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 19+89, 25.00 LT	Centerline Structure
STA. 19+89, 25.00 LT	Centerline Casting
RIM ELEV	1398.18
INV S	1392.68
STRM MH (S-43)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 17+89, 67.00 LT	Centerline Structure
STA. 17+89, 67.00 LT	Centerline Casting
RIM ELEV	1397.23
INV N	1391.73
INV E	1391.13
INV SW	1391.03
STRM MH (S-44)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 18+89, 67.00 LT	Centerline Structure
STA. 18+89, 67.00 LT	Centerline Casting
RIM ELEV	1397.23
INV N	1391.73
INV W	1391.13
INV SE	1391.03
STRM MH (S-45)	
Drainage Structure Design G	
Casting STRM-3	
STA. 19+89, 67.00 LT	Centerline Structure
RIM ELEV	1397.23
INV N	1392.23
INV E	1392.13

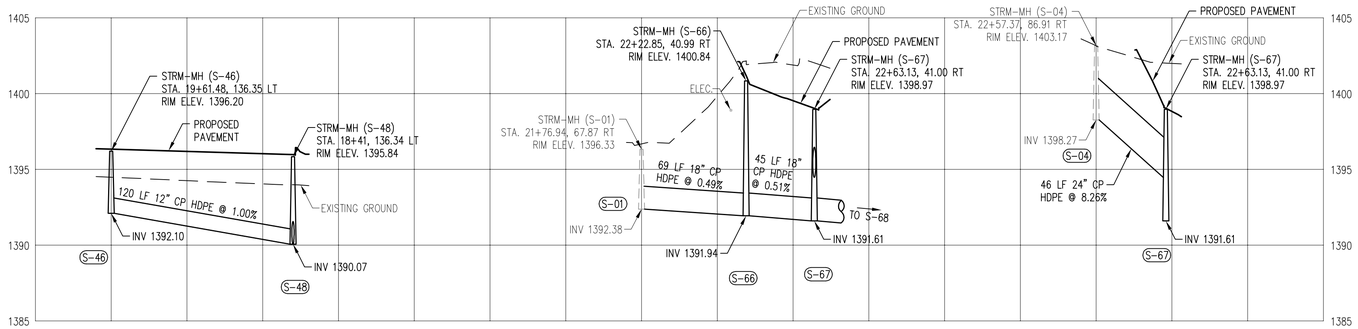
STRM MH (S-46)	
Drainage Structure Design G	
Casting STRM-3	
STA. 19+61.48, 136.35 LT	Centerline Structure
RIM ELEV	1396.20
INV S	1392.10
STRM MH (S-48)	
Drainage Structure Design 72-4020	
Casting STRM-3	
STA. 18+41, 136.34 LT	Centerline Structure
STA. 18+41, 136.34 LT	Centerline Casting
RIM ELEV	1395.84
INV W	1390.90
INV NW	1390.17
INV NE	1390.17
INV S	1390.07
STRM MH (S-66)	
Drainage Structure Design F	
Casting STRM-3	
STA. 22+22.85, 40.99 RT	Centerline Structure
RIM ELEV	1400.84
INV N	1392.04
INV S	1391.94
STRM MH (S-67)	
Drainage Structure Design 72-4020	
Casting STRM-3	
STA. 22+63.13, 41.00 RT	Centerline Structure
STA. 22+63.13, 41.00 RT	Centerline Casting
RIM ELEV	1398.97
INV N	1391.71
INV W	1394.47
INV E	1394.37
INV S	1391.61

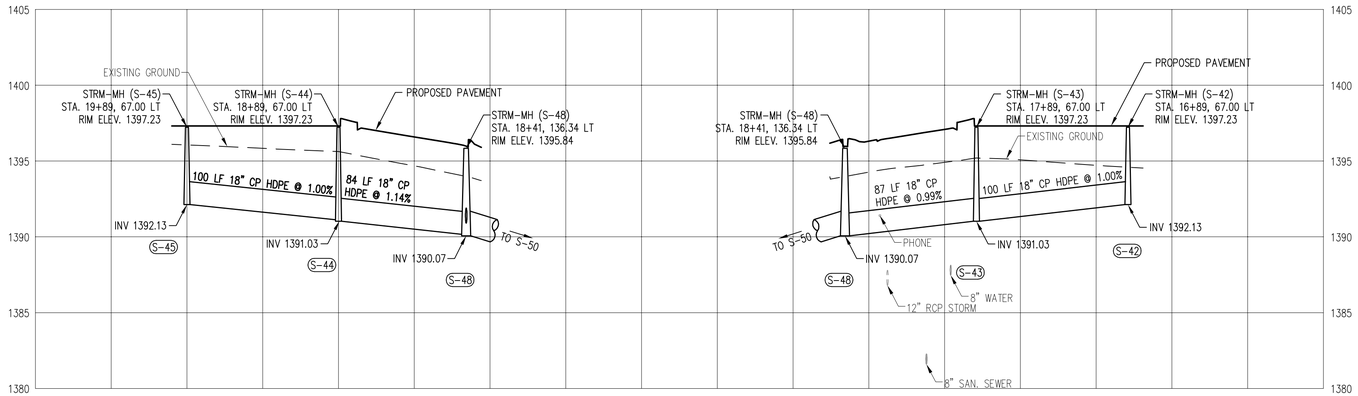
HORIZONTAL SCALE

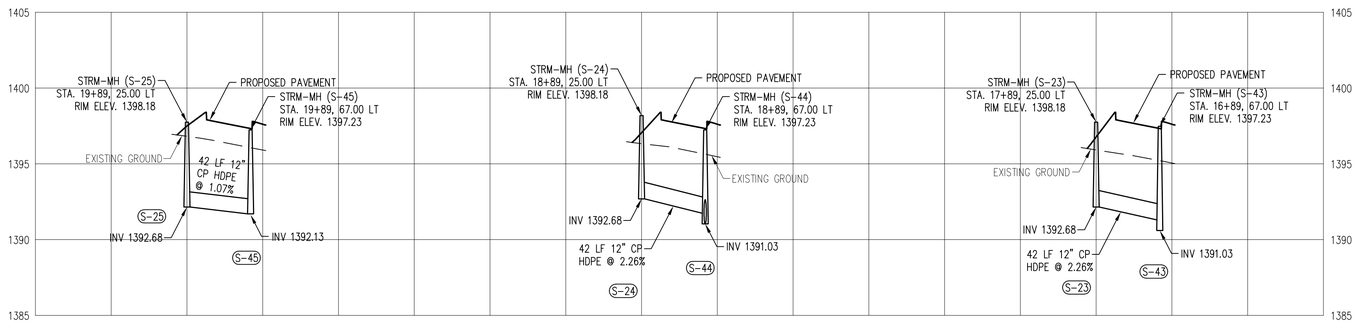
50' 25' 0 50'

VERTICAL SCALE

5' 2.5' 0 5'







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Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-04-2009
REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PROFILES (AREA 6)

4 OF 6

SHEET NUMBER
C512

BID DOCUMENTS

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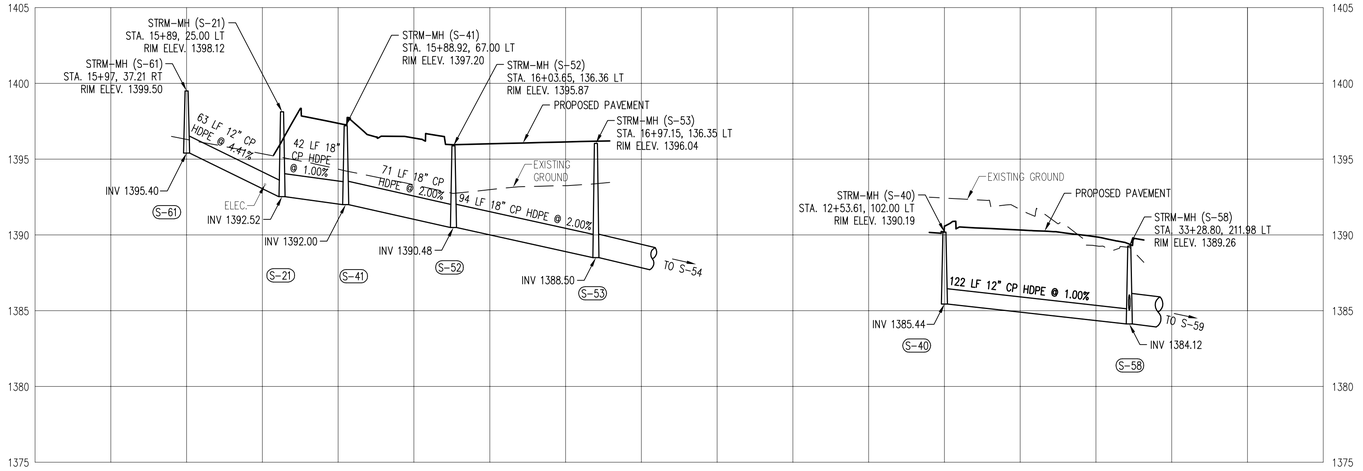
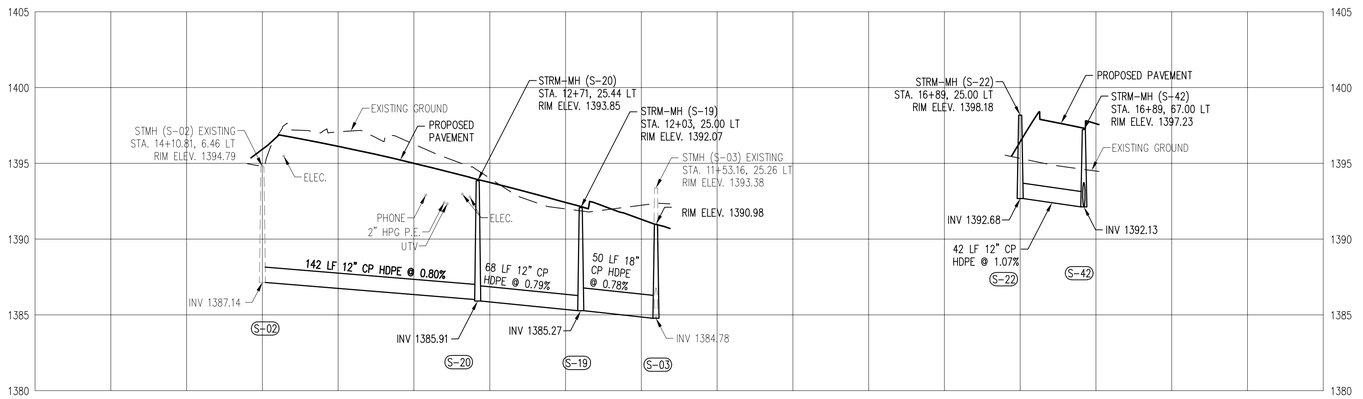
DRAINAGE STRUCTURE TABLE - C507

STRM MH (S-02) EXISTING	
STA. 14+10.81, 6.46 LT	Centerline Structure
RIM ELEV (EXISTING)	1394.79
RIM ELEV (PROPOSED)	1395.94
INV NW	1387.29
INV NE	1387.74
INV SE	1387.14
STRM MH (S-03) EXISTING	
STA. 11+53.16, 25.26 LT	Centerline Structure
RIM ELEV (EXISTING)	1393.38
RIM ELEV (PROPOSED)	1390.98
INV NW	1384.88
INV W	1384.88
INV SE	
STRM MH (S-19)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 12+03, 25.00 LT	Centerline Structure
STA. 12+03, 25.00 LT	Centerline Casting
RIM ELEV	1392.07
INV W	1385.37
INV E	1385.27
STRM MH (S-20)	
Drainage Structure Design F	
Casting STRM-3	
STA. 12+71, 25.44 LT	Centerline Structure
RIM ELEV	1393.85
INV WNW	1386.01
INV E	1385.91
STRM MH (S-21)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 15+89, 25.00 LT	Centerline Structure
STA. 15+89, 25.00 LT	Centerline Casting
RIM ELEV	1398.12
INV NW	1392.62
INV S	1392.52
STRM MH (S-22)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 16+89, 25.00 LT	Centerline Structure
STA. 16+89, 25.00 LT	Centerline Casting
RIM ELEV	1398.18
INV S	1392.68
STRM MH (S-40)	
Drainage Structure Design G	
Casting STRM-3	
STA. 12+53.61, 102.00 LT	Centerline Structure
RIM ELEV	1390.54
INV SW	1385.44
STRM MH (S-41)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 15+88.92, 67.00 LT	Centerline Structure
STA. 15+88.92, 67.00 LT	Centerline Casting
RIM ELEV	1397.20
INV N	1392.10
INV S	1392.00

STRM MH (S-42)	
Drainage Structure Design G	
Casting STRM-3	
STA. 16+89, 67.00 LT	Centerline Structure
RIM ELEV	1397.23
INV N	1392.23
INV W	1392.13
STRM MH (S-52)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 16+03.65, 136.36 LT	Centerline Structure
STA. 16+03.65, 136.36 LT	Centerline Casting
RIM ELEV	1395.87
INV NE	1390.58
INV W	1390.48
STRM MH (S-53)	
Drainage Structure Design F	
Casting STRM-3	
STA. 16+97.15, 136.35 LT	Centerline Structure
RIM ELEV	1396.04
INV E	1388.60
INV SW	1388.50
STRM MH (S-61)	
Drainage Structure Design G	
Casting STRM-3	
STA. 15+97, 37.21 RT	Centerline Structure
RIM ELEV	1399.50
INV SE	1395.40





NOTE: INVERT SHOWN ON PROFILES REFLECTS STRUCTURE OUTLET INVERT.

HORIZONTAL SCALE
50' 25' 0 50'

VERTICAL SCALE
5' 2.5' 0 5'

May 07, 2009 - 5:49pm
Y:\2009 Projects\09104A\10A Terminal Expansion\Drawings\C513.dwg

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE
DRAINAGE PROFILES (AREA 7)

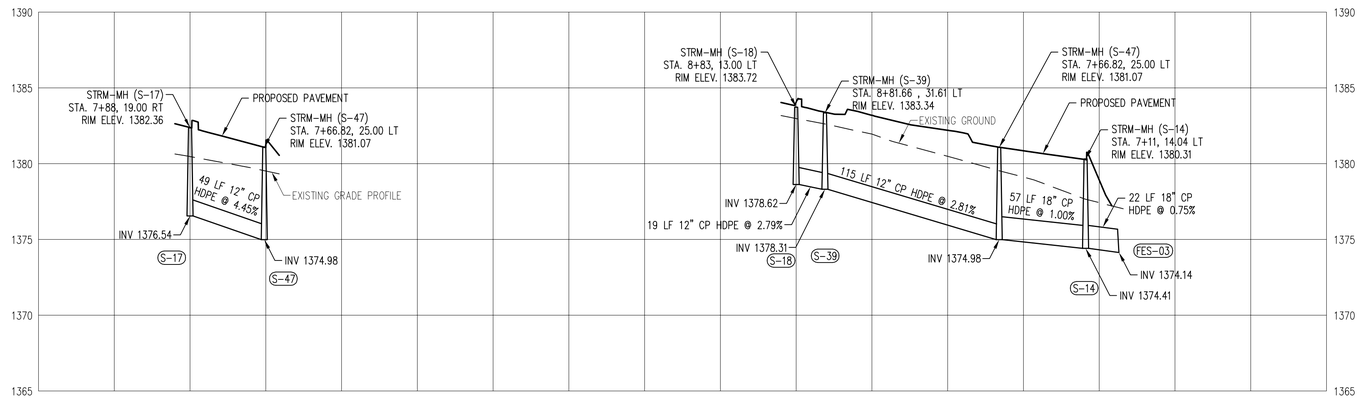
5 OF 6

SHEET NUMBER
C513

BID DOCUMENTS

DRAINAGE STRUCTURE TABLE - C508

STRM MH (S-14)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 7+11, 14.04 LT	Centerline Structure
STA. 7+11, 14.04 LT	Centerline Casting
RIM ELEV	1380.31
INV NW	1374.41
INV SW	1374.41
INV S	1374.31
STRM MH (S-17)	
Drainage Structure Design G	
Casting STRM-3	
STA. 7+88, 19.00 RT	Centerline Structure
RIM ELEV	1382.36
INV S	1377.26
STRM MH (S-18)	
Drainage Structure Design G	
Casting STRM-3	
STA. 8+83, 13.00 LT	Centerline Structure
RIM ELEV	1384.14
INV S	1379.04
STRM MH (S-39)	
Drainage Structure Design G	
Casting STRM-3	
STA. 8+81.66 , 31.61 LT	Centerline Structure
RIM ELEV	1383.34
INV N	1378.41
INV NE	1378.31
STRM MH (S-47)	
Drainage Structure Design 48-4020	
Casting STRM-3	
STA. 7+66.82, 25.00 LT	Centerline Structure
STA. 7+66.82, 25.00 LT	Centerline Casting
RIM ELEV	1381.07
INV NE	1375.08
INV W	1375.08
INV E	1374.98



NOTE: INVERT SHOWN ON PROFILES REFLECTS STRUCTURE OUTLET INVERT.

HORIZONTAL SCALE

50' 25' 0 50'

VERTICAL SCALE

5' 2.5' 0 5'

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AEP PROJECT NUMBER
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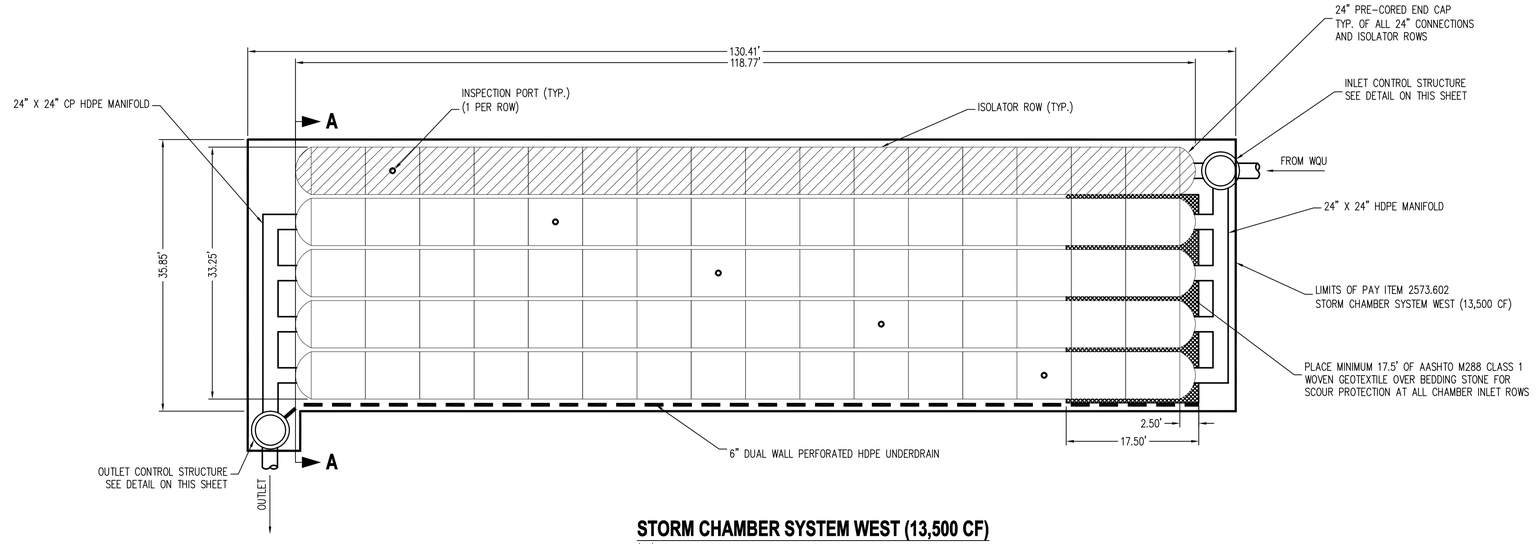
SHEET TITLE
DRAINAGE PROFILES (AREA 8)

6 OF 6

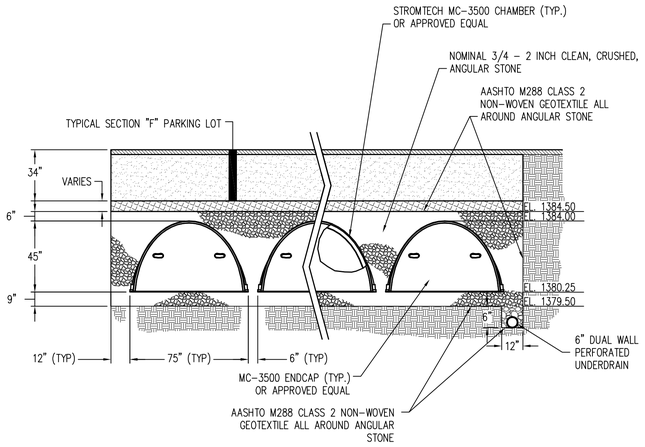
SHEET NUMBER
C514

BID DOCUMENTS

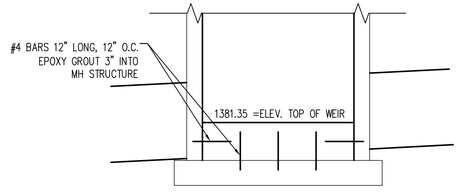


STORM CHAMBER SYSTEM WEST (13,500 CF)

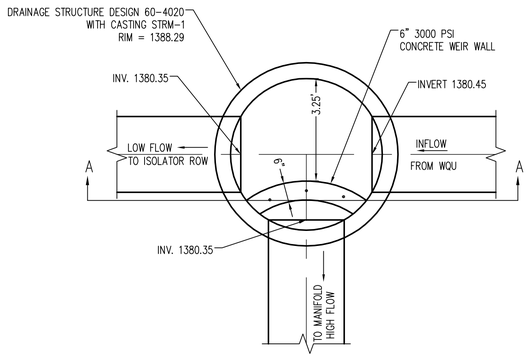
(80) CHAMBERS
(10) END CAPS
INSTALLED WITH 6" COVER STONE, 9" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 13,500 CF



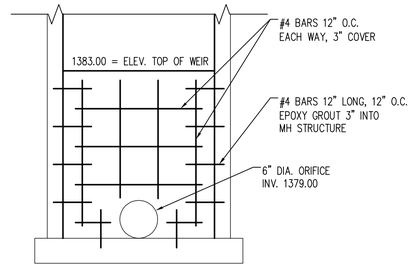
STORM CHAMBER SYSTEM WEST (13,500 CF)
TYPICAL SECTION (A-A)
N.T.S.



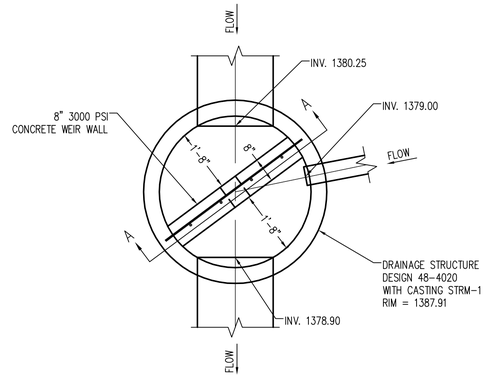
INLET CONTROL STRUCTURE A-A
N.T.S.



INLET CONTROL STRUCTURE
N.T.S.



OUTLET CONTROL STRUCTURE A-A
N.T.S.



OUTLET CONTROL STRUCTURE
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DRAWN BY: KLG
DESIGNED BY: STS

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE

STORM CHAMBER SYSTEM WEST (13,500 CF)

SHEET NUMBER

C515

BID DOCUMENTS

May 07, 2009 - 3:59pm
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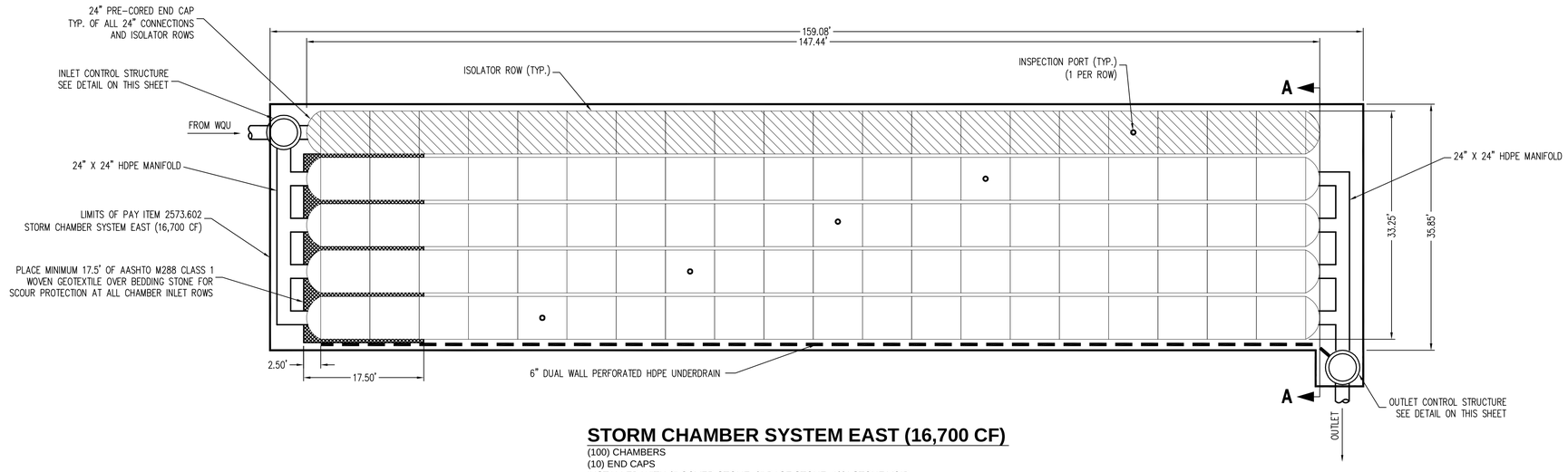
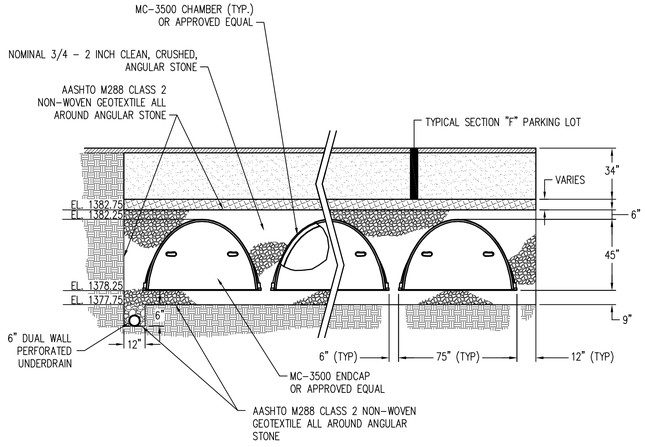
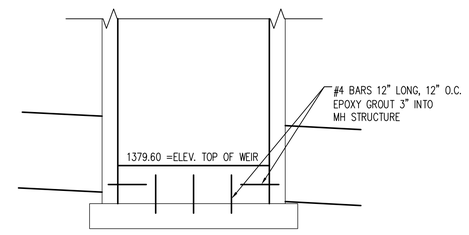


STORM CHAMBER SYSTEM EAST (16,700 CF)

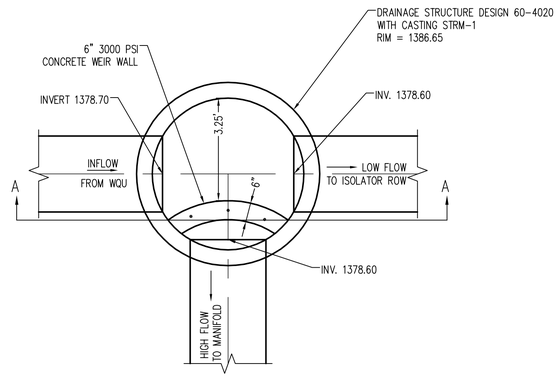
(100) CHAMBERS
(10) END CAPS
INSTALLED WITH 6" COVER STONE, 9" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 16700 CF



STORM CHAMBER SYSTEM EAST 16,700 CF
TYPICAL SECTION (A-A)
N.T.S.



INLET CONTROL STRUCTURE A-A
N.T.S.



INLET CONTROL STRUCTURE
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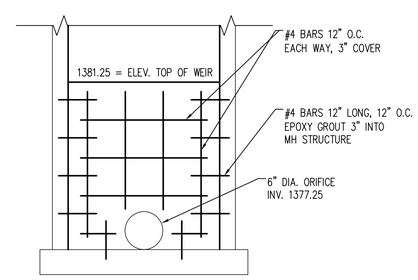
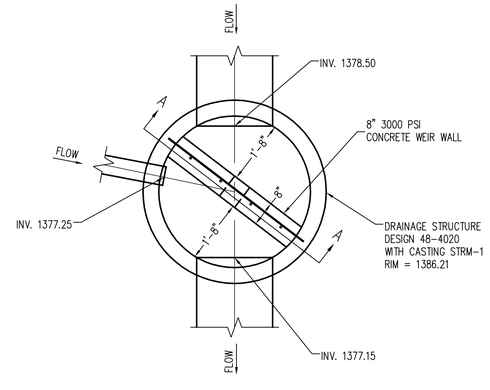


OUTLET CONTROL STRUCTURE A-A
N.T.S.



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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: STS

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE

STORM CHAMBER SYSTEM EAST (16,700 CF)

SHEET NUMBER

C516

BID DOCUMENTS

May 07, 2009 - 5:59pm
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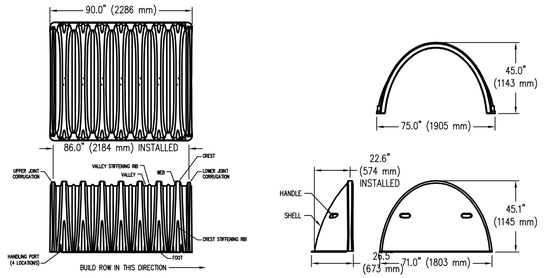
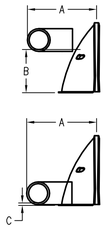


NOMINAL MC-3500 CHAMBER SPECIFICATIONS

SIZE (L x W x H)	90" x 75" x 45" (2286 mm x 1905 mm x 1143 mm)
CHAMBER STORAGE	110.0 ft³ (3.11 m³)
MINIMUM INSTALLED STORAGE	162.8 ft³ (4.61 m³)
WEIGHT	124 lbs. (56.2 kg)

NOMINAL MC-3500 END CAP SPECIFICATIONS

SIZE (L x W x H)	26.5" x 71" x 45" (673 mm x 1803 mm x 1143 mm
CHAMBER STORAGE	15.6 ft³ (0.44 m³)
MINIMUM INSTALLED STORAGE	41.6 ft³ (1.18 m³)
WEIGHT	43 lbs. (19.5 kg)



STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	B	C
MC3500TEPE12TN	12" (300 mm)	27.41" (696 mm)	N/A
MC3500TEPE12B	12" (300 mm)	N/A	1.35" (34 mm)
MC3500TEPE15TN	15" (375 mm)	24.59" (625 mm)	N/A
MC3500TEPE15B	15" (375 mm)	N/A	1.50" (38 mm)
MC3500TEPE18TN	18" (450 mm)	21.29" (541 mm)	N/A
MC3500TEPE18B	18" (450 mm)	N/A	1.77" (45 mm)
24" TOP STUB CORED ENDCAP NOT AVAILABLE			
MC3500TEPE24B	24" (600 mm)	N/A	2.06" (52 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

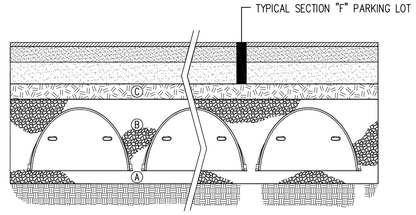
STORM CHAMBER TECHNICAL SPECIFICATIONS
N.T.S.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

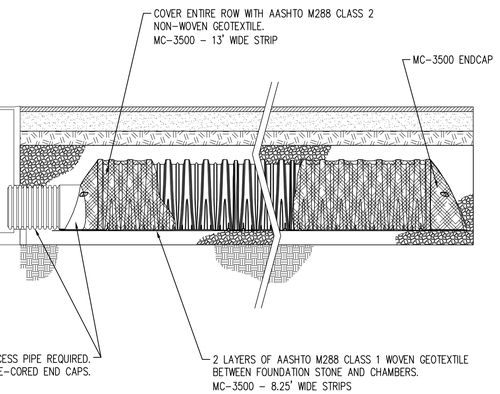
MATERIAL LOCATION	DESCRIPTION	MNDOT DESIGNATION(1)	COMPACTION/DENSITY REQUIREMENT
(C) FILL MATERIAL FOR LAYER C STARTS FROM THE TOP OF THE EMBEDMENT STONE (B LAYER) TO THE BOTTOM OF THE SUBBASE.	SELECT GRANULAR BORROW, 7% MODIFIED.	3149.2B2	BEGIN COMPACTION AFTER 12" OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT TO A MIN. 95% STANDARD PROCTOR DENSITY (2). ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs. DYNAMIC FORCE NOT TO EXCEED 20,000 lbs.
(B) EMBEDMENT STONE SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE (A LAYER) TO THE C LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 1 – 2 INCH	CA-1, CA-2, CA-3, CA-4	NO COMPACTION REQUIRED.
(A) FOUNDATION STONE BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 – 2 INCH	CA-1, CA-2, CA-3, CA-4	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY(2).

PLEASE NOTE:
1. THE LISTED MNDOT DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR.

2. AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS IN OPEN GRADED STONE, STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9"(229 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH AN APPROPRIATE COMPACTOR.

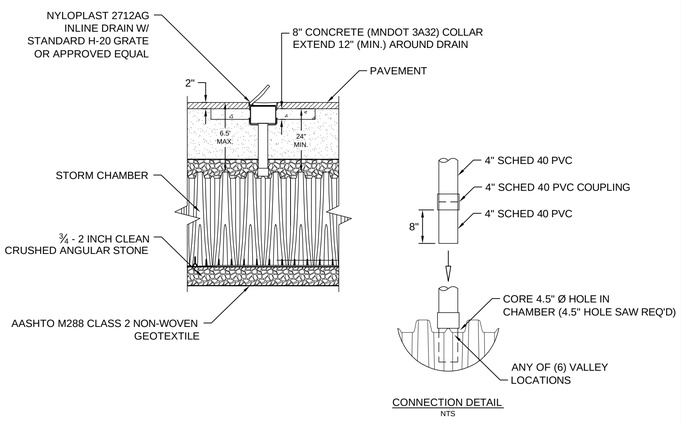


STORM CHAMBER SYSTEM ACCEPTABLE FILL
N.T.S.



ISOLATOR ROW PROFILE
N.T.S.

NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY OF (6) CHAMBER CORRUGATION VALLEYS



INSPECTION PORT DETAIL
N.T.S.

1.0 GENERAL NOTES:

1.1 INSTALLING CONTRACTOR SHALL USE AND UNDERSTAND MANUFACTURE'S LATEST INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLATION.

1.2 CONTRACTOR SHALL ARRANGE A PRE–INSTALLATION CONSULTATION WITH MANUFACTURE'S REPRESENTATIVES TO ANSWER QUESTIONS OR ADDRESS COMMENTS ON THE CHAMBER SYSTEM AND INFORM THE INSTALLING CONTRACTOR OF THE MINIMUM INSTALLATION REQUIREMENTS BEFORE BEGINNING THE SYSTEM'S CONSTRUCTION.

1.3 THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE DESIGN ENGINEER.

1.4 AASHTO M288 CLASS 2 NON–WOVEN GEOTEXTILE (FILTER FABRIC) MUST BE USED AS INDICATED IN THE PROJECT PLANS.

1.5 STONE PLACEMENT BETWEEN CHAMBERS ROWS AND AROUND PERIMETER MUST FOLLOW INSTRUCTIONS AS INDICATED IN THE MOST CURRENT VERSION OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

1.6 BACKFILLING OVER THE CHAMBERS MUST FOLLOW REQUIREMENTS AS INDICATED IN THE MOST CURRENT VERSION OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

1.7 THE CONTRACTOR IS RESPONSIBLE FOR PREVENTING VEHICLES THAT EXCEED THE MANUFACTURER'S REQUIREMENTS FROM TRAVELING ACROSS OR PARKING OVER THE STORMWATER SYSTEM. TEMPORARY FENCING, WARNING TAPE AND APPROPRIATELY LOCATED SIGNS SHALL BE USED TO PREVENT UNAUTHORIZED VEHICLES FROM ENTERING SENSITIVE CONSTRUCTION AREAS.

1.8 THE CONTRACTOR MUST APPLY EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF SITE CONSTRUCTION PER THE EROSION AND SEDIMENT CONTROL PLAN.

2.0 GENERAL SPECIFICATIONS:

2.1 CHAMBERS SHALL BE STORMTECH SC–3500 OR APPROVED EQUAL.

2.2 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418–05, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".

2.3 CHAMBERS SHALL BE MADE FROM VIRGIN–MODIFIED POLYPROPYLENE COPOLYMERS.

2.4 CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW.

2.5 THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12 ARE MET FOR: 1) LONG–DURATION DEAD LOADS AND 2) SHORT–DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCE.

2.6 IF CONTRACTOR PLANS TO USE A CHAMBER IN LIEU OF THAT SPECIFIED. THE CONTRACTOR SHALL SUBMIT (3 SETS) OF THE FOLLOWING TO THE ENGINEER FOR APPROVAL BEFORE ACCEPTANCE OF THE SUBSTITUTE:

a. A STRUCTURAL EVALUATION BY A REGISTERED STRUCTURAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12 ARE MET. THE 50–YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418–05 MUST BE USED AS A PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG–TERM PERFORMANCE.

b. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL CROSS SECTION IS BASED.

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Date 05/07/2009 Reg. No. 45009

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NO.	DESCRIPTION	DATE

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REVIEWED BY: PJM
DRAWN BY: KLG
DESIGNED BY: STS

AEP PROJECT NUMBER
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SHEET TITLE
STORM CHAMBER SYSTEM DETAILS

SHEET NUMBER
C517

BID DOCUMENTS

May 07, 2009 - 5:59pm
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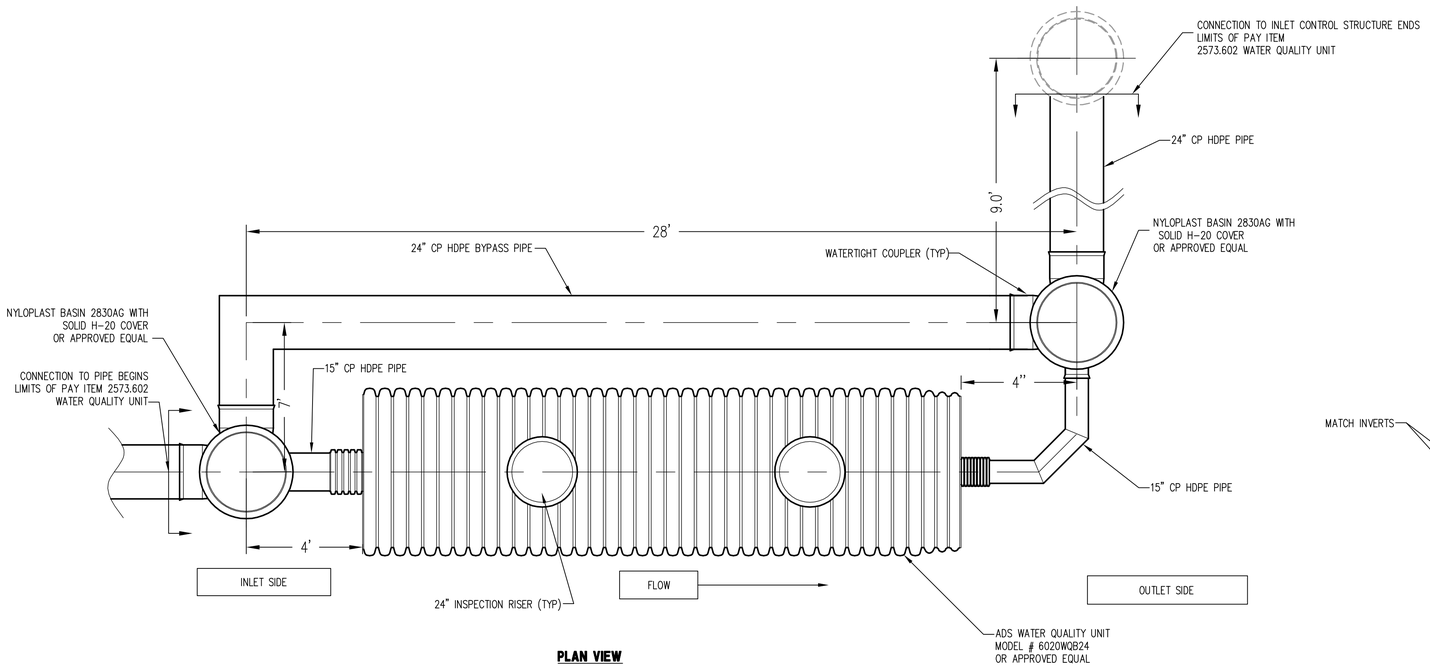
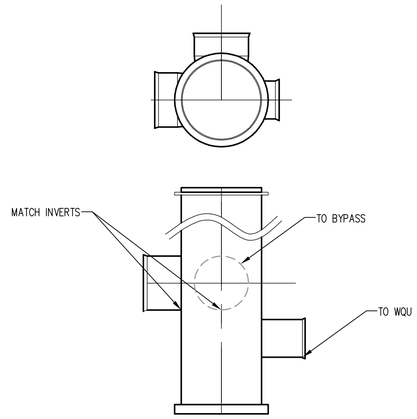
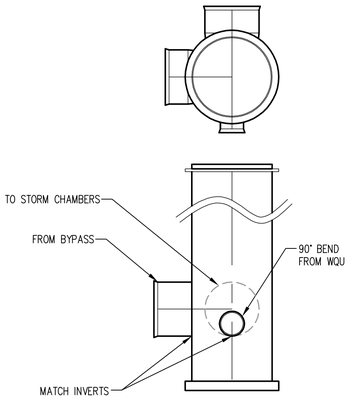


PLAN VIEW



INLET STRUCTURE NYLOPLAST BASIN



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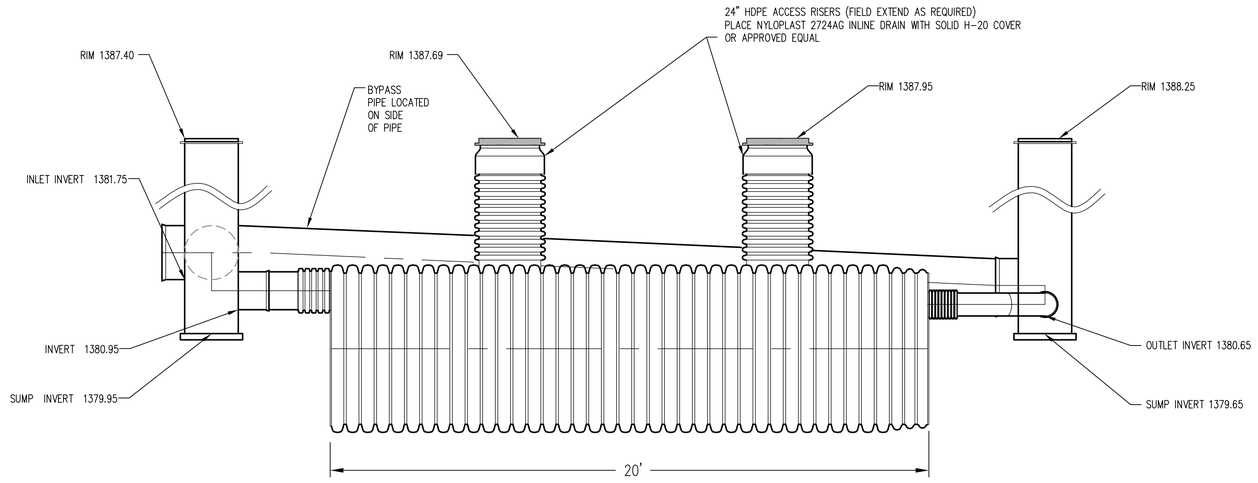

PROFILE VIEW

WATER QUALITY UNIT (WEST)
N.T.S.

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: SCA
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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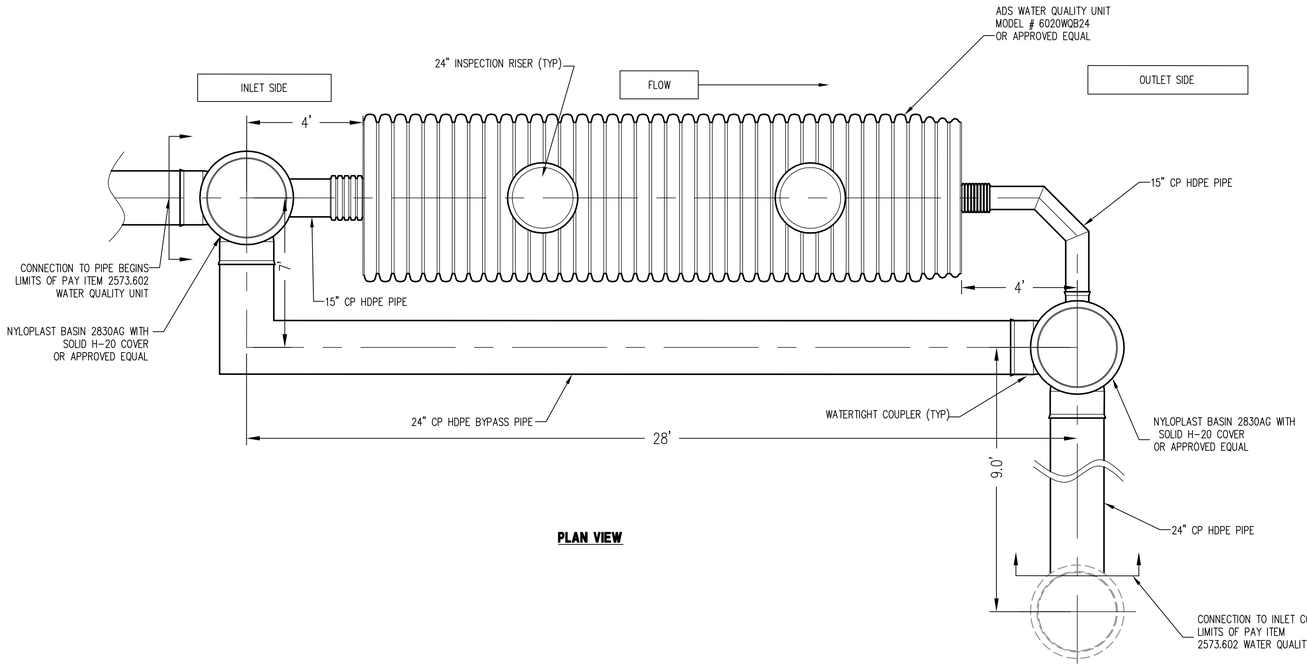
SHEET TITLE

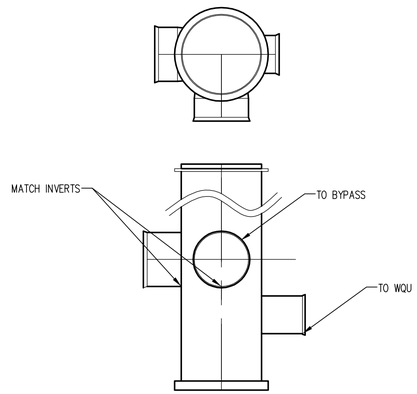
WATER QUALITY UNIT WEST

SHEET NUMBER
C518

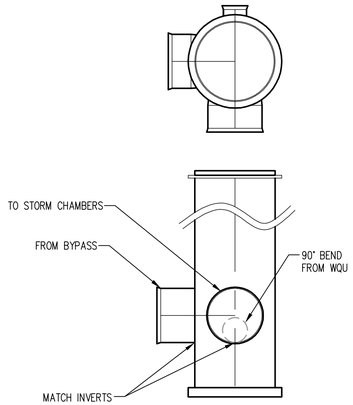
BID DOCUMENTS



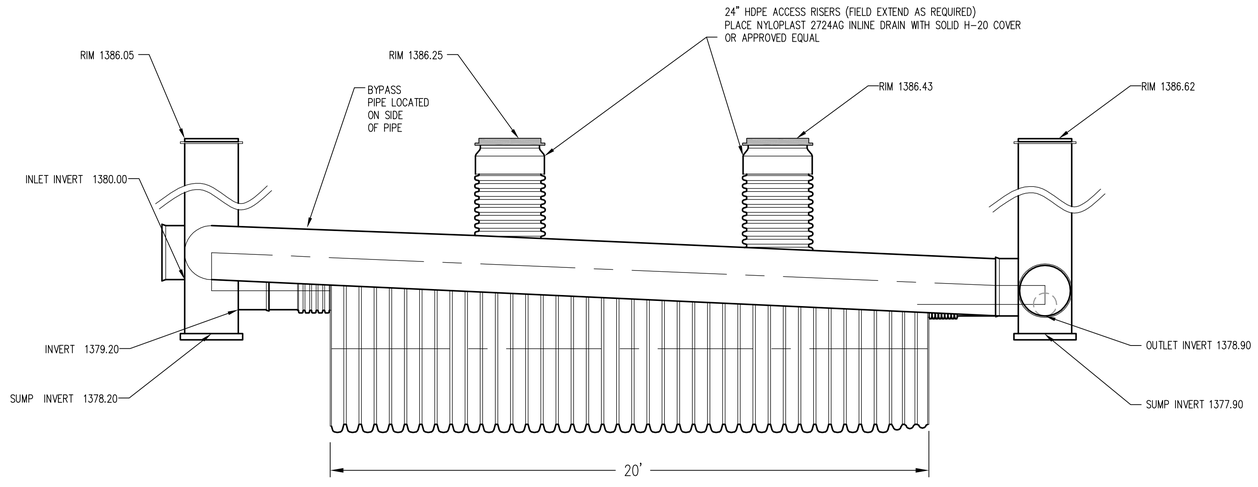
PLAN VIEW



INLET STRUCTURE NYLOPLAST BASIN
NTS



OUTLET STRUCTURE
NYLOPLAST BASIN
NTS



PROFILE VIEW

WATER QUALITY UNIT (EAST)
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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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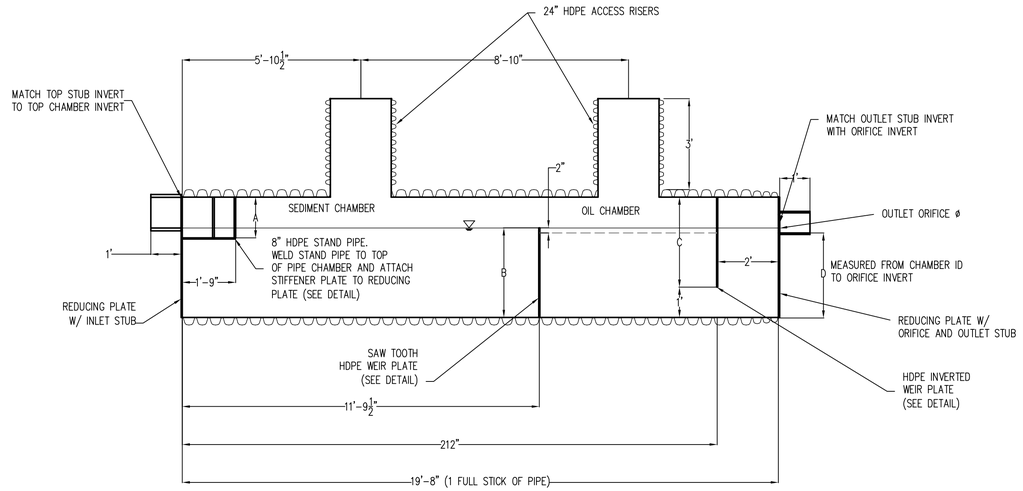
SHEET TITLE

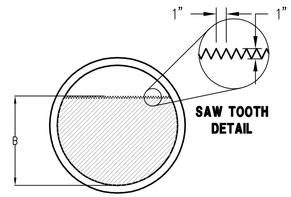
WATER QUALITY UNIT EAST

SHEET NUMBER

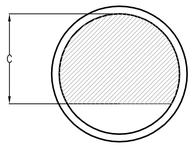
C519

BID DOCUMENTS





SAW TOOTH HDPE WEIR PLATE IN SEDIMENT CHAMBER



HDPE INVERTED WEIR PLATE FOR OIL CHAMBER

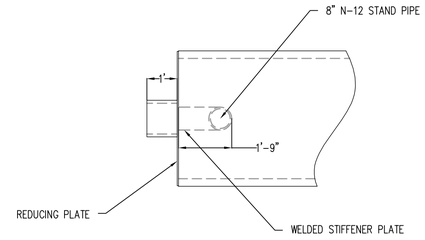
MODEL #	MAIN PIPE DIA.	TREAT. FLOW RATE	SIEVE SIZE	INLET STUB DIA.	OUTLET STUB DIA.	ORIFICE DIA.	A	B	C	D
3620WQAXX	36"	1.50 CFS	140	10"	10"	7.82"	13.9"	26"	24"	24"
3620WQBXX	36"	0.7 CFS	200	10"	10"	5.35"	13.9"	26"	24"	24"
4220WQAXX	42"	1.73 CFS	140	12"	12"	8.13"	16.1"	30"	30"	28"
4220WQBXX	42"	0.86 CFS	200	12"	12"	5.70"	16.1"	30"	30"	28"
4820WQAXX	48"	2.26 CFS	140	12"	12"	9.24"	16.1"	36"	36"	34"
4820WQBXX	48"	1.13 CFS	200	12"	12"	6.53"	16.1"	36"	36"	34"
6020WQAXX	60"	2.95 CFS	140	15"	15"	10.05"	18.9"	45"	48"	43"
→ 6020WQBXX	60"	1.47 CFS	200	15"	15"	7.1"	18.9"	45"	48"	43"

XX DENOTES A BY-PASS SIZE OF 15", 18", 24", 30", 36", 42", 48", OR 60"
XX=00 DENOTES UNITS W/OUT A BY-PASS.

NOTES:

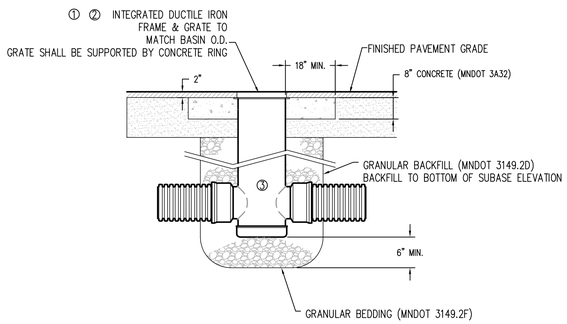
1. ALL DIMENSIONS ARE NOMINAL

2. ALL FITTING CONNECTIONS WILL BE MADE USING A STANDARD BELL/BELL OR SPLIT COUPLER



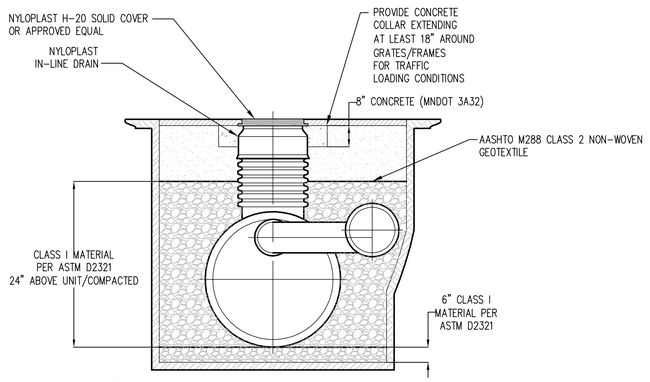
DISPERSION BAFFLE DETAIL (TOP VIEW)

WATER QUALITY UNIT DETAILS
N.T.S.



① – GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05 AND SHALL MEET H-20 LOAD RATING.
② – FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
③ – DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.

DRAIN BASIN INSTALLATION DETAIL
N.T.S.



NOTES:

1. CONTRACTOR SHALL REFER TO THE MANUFACTURE'S GUIDELINES FOR INSTALLATION.
2. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05 AND SHALL MEET H-20 LOAD RATING.
3. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
4. PLACE GEOTEXTILE AND BACKFILL WITH SELECT GRANULAR BORROW, MODIFIED 7%, FROM 24" ABOVE THE WATER QUALITY UNIT TO THE BOTTOM OF THE SUBBASE. PLACE IN 12" LIFTS AND COMPACT

WATER QUALITY UNIT INSTALLATION DETAIL
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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature

Typed Name PETER J. MARTHALER

Date 05/07/2009 Reg. No. 45009

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: PJM
DRAWN BY: SCA
DESIGNED BY: DJL

AEP PROJECT NUMBER
214-1882-093

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SHEET TITLE

WATER QUALITY UNIT DETAILS

SHEET NUMBER

C520

BID DOCUMENTS

10/4/2009 2:55:45 PM
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WATER NOTES

1. ALL WATER LINES, HYDRANTS, VALVES AND FITTINGS SHALL BE INSTALLED AS PER THE CITY OF DULUTH PUBLIC WORKS UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS, 2009 EDITION.

2. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES WITH THE ENGINEER PRIOR TO PURCHASE AND DELIVERY.

3. THE CONTRACTOR SHALL COORDINATE ALL WATER OUTAGES WITH THE ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE IN WRITING. (WET TAPS PERMISSIBLE FOR CONNECTIONS TO EXISTING 8" D.I. WATERMAIN.)

4. THE CONTRACTOR SHALL COORDINATE ALL VALVE OPERATIONS FOR TESTING WITH THE CITY OF ALL NEW WATER LINE AS SPECIFIED, AND INFORM THE ENGINEER OF TEST TIMES AND RESULTS.

SANITARY NOTES

1. ALL SANITARY LINES AND MANHOLES SHALL BE INSTALLED AS PER THE CITY OF DULUTH PUBLIC WORKS UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS, 2009 EDITION.

2. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES WITH THE ENGINEER PRIOR TO PURCHASE AND DELIVERY.

3. THE CONTRACTOR CAN PLACE TEMPOARY BYPASS IN EXISITNG SANITARY LINE OR OFF PEAK CONNECTION WHILE CONSTRUCTION OF SANITARY MANHOLE (SAN-1)

GAS NOTES

1. THE CONTRACTOR SHALL INSTALL ALL GAS MAINS AND SERVICES PER THE CITY OF DULUTH PUBLIC WORKS UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS, 2009 EDITION.

2. ALL CONNECTIONS TO THE EXISTING 2" GAS MAIN SHALL BE DONE BY THE CITY OF DULUTH OPERATIONS.

3. THE INSTALLER SHALL BE CERTIFIED BY THE CITY OF DULUTH.

4. THE CONTRACTOR SHALL COORDINATE ANY OUTAGES WITH THE ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE IN WRITING.

5. THE CONTRACTOR SHALL COORDINATE ALL TESTING WITH THE CITY OF ALL NEW GAS MAIN AS SPECIFIED, AND INFORM THE ENGINEER OF TEST TIMES AND RESULTS.

6. CITY ENGINEERING SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF WORK AND INSPECT ALL PIPE INSTALLATION AND CONNECTIONS.

7. PRIOR TO ANY EXCAVATION OF PROPOSED GRINDEN DRIVE, THE CONTRACTOR SHALL VERIFIY THE LOCATION AND DEPTH OF GAS MAINS WITHIN EXCAVATION LIMITS.

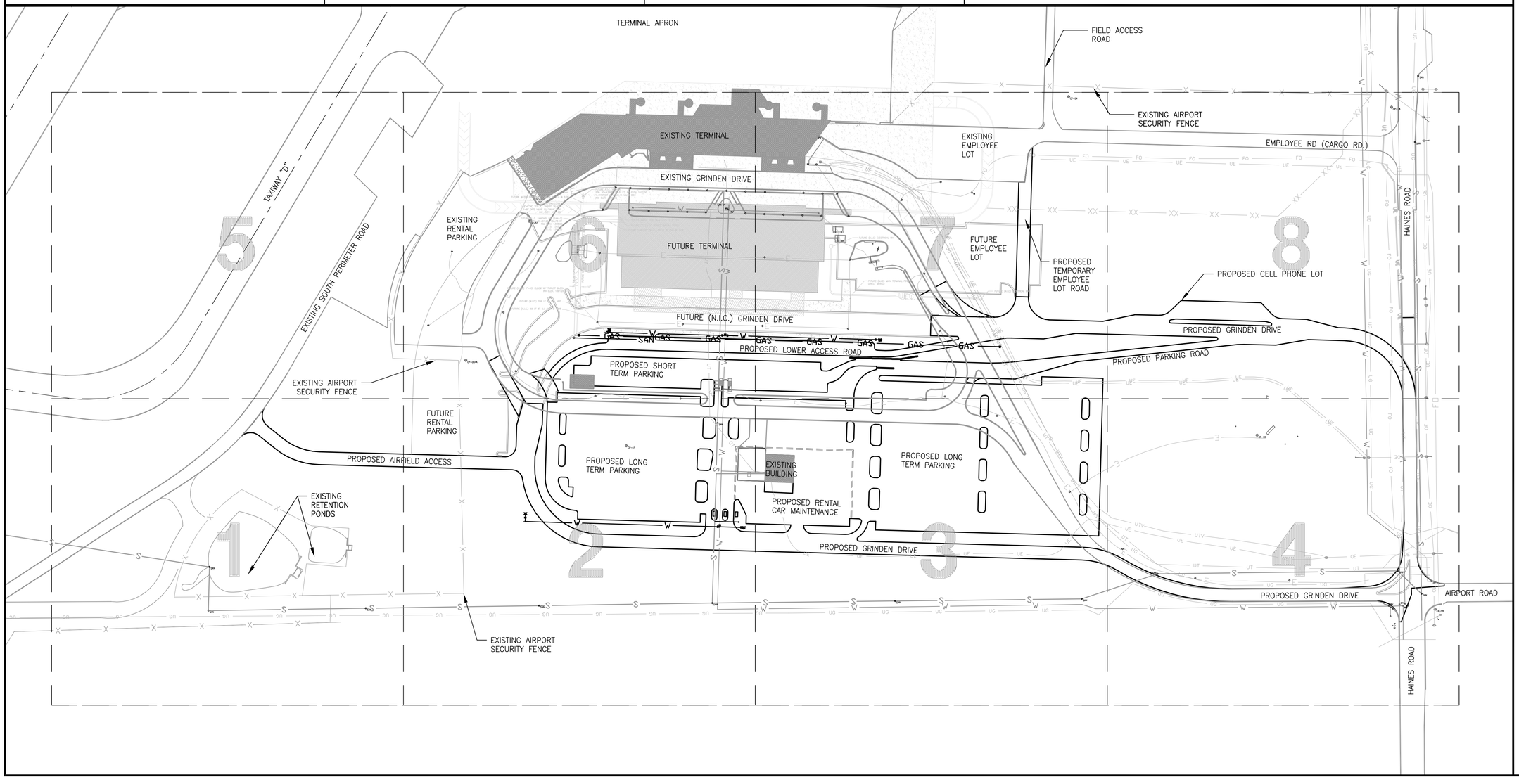
NORTH

0 100' 200'

NOTE:

1. PRIOR TO DIGGING THE CONTRACTOR SHALL VERIFIY LOCATION OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL. 1-800-252-1166

2. THE CONTRACTOR SHALL BE RESPONSIBLE TO MARK, MAINTAIN, AND REMARK IF NECERSARY, ALL PRIVATE (DAA) OWNED UTILITIES.



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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE UTILITY OVERALL PLAN AND NOTES

SHEET NUMBER

C600

BID DOCUMENTS

I:\P-214\1882-093 Dlut Terminal Design CAD\PLOT\C600.dwg, 5/7/2009 1:05:34 PM

MATCH LINE SHEET C605

MATCH LINE SHEET C602

EXISTING SOUTH PERIMETER ROAD

5+50.75

5+00

PT = 4+74.12

PC = 3+92.77

4+00

PROPOSED AIRFIELD ACCESS

3+00

TEMPORARY SECURITY FENCE

EXISTING SECURITY FENCE

PROPOSED FENCE SEE SHEET C220

STM RCP 24"

STM RCP 15"

STRM MH

POND

24" I.E.=1384.54

42" RCP INVERT EL=1394.32

30" RCP INVERT EL=1394.50

36" CMP INVERT EL=1391.32

EXISTING SAN MH RIM EL. 1398.93 INV EL. 1394.03 INV EL. 1387.33

CULVERT 42" INVERT EL=1388.82

SAN

8" PVC

3" P.E. HPG

EXISTING SAN MH RIM EL. 1396.38 INV EL. 1385.44

44" RCP I.E.=1381.75

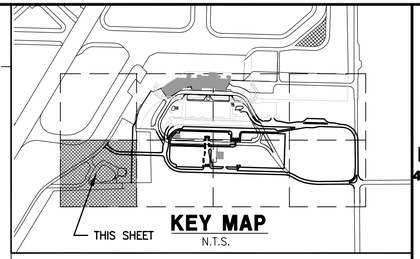
15" CMP

30" RCP I.E.=1386.81

30" RCP I.E.=1384.61

EXISTING SAN MH R.E.=1390.3 I.E.=1380.36

NOTE:
THE LOCATION OF EXISTING ELECTRICAL DUCTS, STORM SEWER PIPE AND OTHER UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE, THERE MAY BE OTHER UTILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. CONTRACTORS SHALL VERIFY THE ACTUAL LOCATION OF THE UTILITIES IN THE FIELD BEFORE EXCAVATION.



KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

- 2/C #6 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 2/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- UCD — PROPOSED CONDUIT DUCTS
- OHE — PROPOSED OVERHEAD ELECT.
- OE — EXISTING OVERHEAD ELECT.
- EXISTING POWER POLE
- PROPOSED POWER POLE
- PROPOSED ELECT. MANHOLE
- PROPOSED LIGHT POLES
- PROPOSED PHONE PEDISTAL
- PROPOSED COMM MANHOLE
- UE — EXISITNG UNDERGROUND ELECT.
- E — EXISTING –PRIVATE– ELECT.
- EXISTING LIGHT & POLE
- UT — PROPOSED PHONE CABLES
- UT — EXISTING PHONE CABLES
- UTV — EXISTING CATV CABLES
- FO — EXISTING FIBER OPTIC CABLE
- EXISTING PARKING GATE
- EXISTING ELECT. MANHOLE
- W — PROPOSED WATERMAIN
- W — EXISTING WATERMAIN
- S — EXISTING SANITARY
- SAN — PROPOSED SANITARY
- SAN — EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- UG — EXISTING GAS LINE
- GAS — PROPOSED GAS LINE
- EXISTING HYDRANT
- PROPOSED HYDRANT
- PROPOSED WATER VALVE
- WV — EXISTING WATER VALVE
- PROPOSED STORM PIPE
- PROPOSED EDGE DRAINS
- EXISTING STORM PIPE

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

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DATE ISSUED: 05-11-2009
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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE UTILITY PLAN (SHEET 1 OF 8)

SHEET NUMBER

C601

BID DOCUMENTS

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MATCH LINE SHEET C606

MATCH LINE SHEET C601

MATCH LINE SHEET C603

ADJUST RIM EXISTING SANITARY MH
STA: 18+08.75, 198.63 LT
PROPOSED RIM ELEV: 1393.50
EXISTING R.E.=1393.75
I.E. N=1384.90
I.E. N=1378.50
I.E. S=1378.35

PROPOSED AIRFIELD ACCESS

EXISTING SECURITY FENCE

PROPOSED LONG TERM PARKING

PROPOSED HYDRANT
1~HYDRANT W/VALVE & VALVE BOX
STA: 24+70.46, 28.78 RT
FG ELEV:1394.22
INV. 1385.25

15 LF 6" D.I. WATER PIPE @ 0.0%

PROPOSED TEE
1~8"x8"x6" TEE
1~8" CAP W/ THRUST BLOCK
STA: 24+80.01, 37.93 RT
INV. ELEV: 1385.25

PROPOSED 365 LF 8" D.I. WATERMAIN @ 3.0%

PROPOSED GRINDEN DRIVE

PROPOSED SANITARY C.O.
STA: 28+67.94, 41.68 LT
FG ELEV: 1387.15
INV. 1377.20

45 LF 6" PVC @ 2%

PROPOSED SEWER SERVICE CONNECTION
EXISTING 8" PVC INV. ±1375.18
STA: 28+22.94, 41.69 LT

CONNECT TO EXISTING 8" D.I. WATER PIPE
STA: 28+32.72, 31.69 LT, INV. ELEV. ±1374.30
1~8"x8"x8"x6" CROSS W/THRUST BLOCK
2~ 8" GATE VALVE W/ VALVE BOXES

PROPOSED WATER PIPE 45 LF 6" D.I. @ 1.0%

PROPOSED 6" 45 LF D.I. PIPE
HYDRANT & VALVE W/VALVE BOX
STA: 28+77.72, 31.67 LT
FG ELEV:1387.10
INV. ELEV:1378.80

EXISTING 8" PVC

EXISTING (PRIVATE) 8" D.I.

EXISTING 3" P.E. HPC

NOTE:
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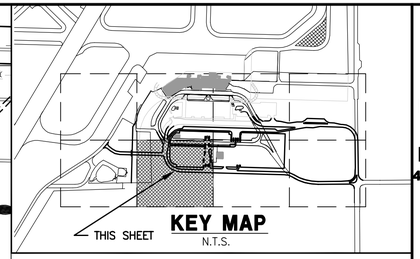

KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

- 2/C #6 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 2/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- PROPOSED CONDUIT DUCTS
- PROPOSED OVERHEAD ELECT.
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- PROPOSED PHONE PEDISTAL
- PROPOSED COMM MANHOLE
- EXISITNG UNDERGROUND ELECT.
- EXISTING –PRIVATE– ELECT.
- EXISTING LIGHT & POLE
- PROPOSED PHONE CABLES
- EXISTING PHONE CABLES
- EXISTING CATV CABLES
- EXISTING FIBER OPTIC CABLE
- EXISTING PARKING GATE
- EXISTING ELECT. MANHOLE
- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- EXISTING SANITARY
- PROPOSED SANITARY
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING GAS LINE
- PROPOSED GAS LINE
- EXISTING HYDRANT
- PROPOSED HYDRANT
- PROPOSED WATER VALVE
- EXISTING WATER VALVE
- PROPOSED STORM PIPE
- PROPOSED EDGE DRAINS
- EXISTING STORM PIPE

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

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DESIGNED BY: JEH

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SHEET TITLE

SITE UTILITY PLAN (SHEET 2 OF 8)

SHEET NUMBER

C602

BID DOCUMENTS

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MATCH LINE SHEET C607

EXISTING GRINDEN DRIVE

EXISTING BUILDING TO REMAIN

PROPOSED LONG TERM PARKING

PROPOSED RENTAL CAR MAINTENCE

PROPOSED GRINDEN DRIVE

MATCH LINE SHEET C602

MATCH LINE SHEET C604

12" RCP

24" RCP

24" CIP

1/C #6 + GRND

PHONE CABLE 300PR ?

CATV

STRM MH

2" P.E. HPG

1/0 AL HHS 229

EXISTING 8" PVC

EXISTING (PRIVATE) 8" D.I. WTR

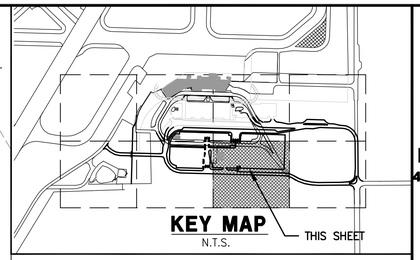
EXISTING 3" P.E. HPG

EXISTING SAN MH
R.E.=1380.4
I.E.=1370.35

EXISTING SAN MH
R.E.=1377.5
I.E.=1367.90

29+00 30+00 31+00 32+00 33+00 34+00 35+00

NOTE:
THE LOCATION OF EXISTING ELECTRICAL DUCTS, STORM SEWER PIPE AND OTHER UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE, THERE MAY BE OTHER UTILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. CONTRACTORS SHALL VERIFY THE ACTUAL LOCATION OF THE UTILITIES IN THE FIELD BEFORE EXCAVATION.



NORTH

0 30' 60'

LEGEND

- 2/C #6 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 2/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- PROPOSED CONDUIT DUCTS
- PROPOSED OVERHEAD ELECT.
- EXISTING OVERHEAD ELECT.
- EXISTING POWER POLE
- PROPOSED POWER POLE
- PROPOSED ELECT. MANHOLE
- PROPOSED LIGHT POLES
- PROPOSED PHONE PEDISTAL
- PROPOSED COMM MANHOLE
- EXISITNG UNDERGROUND ELECT.
- EXISTING –PRIVATE– ELECT.
- EXISTING LIGHT & POLE
- PROPOSED PHONE CABLES
- EXISTING PHONE CABLES
- EXISTING CATV CABLES
- EXISTING FIBER OPTIC CABLE
- EXISTING PARKING GATE
- EXISTING ELECT. MANHOLE
- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- EXISTING SANITARY
- PROPOSED SANITARY
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING GAS LINE
- PROPOSED GAS LINE
- EXISTING HYDRANT
- PROPOSED HYDRANT
- PROPOSED WATER VALVE
- EXISTING WATER VALVE
- PROPOSED STORM PIPE
- PROPOSED EDGE DRAINS
- EXISTING STORM PIPE

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE UTILITY PLAN (SHEET 3 OF 8)

SHEET NUMBER
C603

BID DOCUMENTS

T:\P-214188\0.093 Duluth Terminal Design Drawings\Civil\Cad\C603.dwg, 5/7/2009 1:38:11 PM

MATCH LINE SHEET C603

MATCH LINE SHEET C608

24" RCP

FLAG POLE

UNKNOWN CABLE LOCATION

CP-69

SIGN DAA

UNKNOWN CABLE LOCATION

UNKNOWN CABLE LOCATION

3Φ 120/208 1/0 AL

3Φ 120/208 1/0 AL

1/0 AL HMS 229

DAA RISER (F)

DAA RISER (D)

6" WATER

PROPOSED GRINDEN DRIVE

10" GAS

10" WATER

3" GAS

8" S

4+00

3+00

2+00

1+00

0+00

EXISTING SAN MH
R.E.=1380.22
I.E. E=1367.22
I.E. W=1367.12

EXISTING SAN MH
R.E.=1375.10
I.E. W=1364.65
I.E. SE=1364.60

EXISTING SAN MH
R.E.=1375.43
I.E. NW=1364.08
I.E. N=1363.83
I.E. S=1363.78

OHE

UT

UE

UG

UTV

FO

W

S

SAN

GV

EXISTING 8" PVC

EXISTING 2" P.E. HPG

EXISTING 3" P.E. HPG

EXISTING (PRIVATE) 8" D.I. WTR

36+00

37+00

38+00

39+00

40+00

41+00

41+5.42

AIRPORT ROAD

HAINES ROAD

CP-55

VLT

VENT PIPE

LIFT STATION

30"CMP

NOTE:
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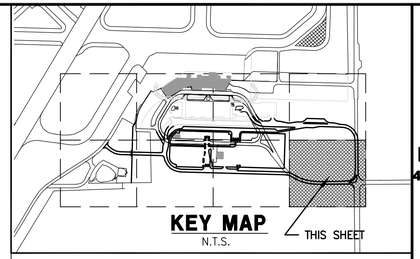

KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

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NO.	DESCRIPTION	DATE

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REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE UTILITY PLAN (SHEET 4 OF 8)

SHEET NUMBER
C604

BID DOCUMENTS

T:\P-214188_093 Dpt Tomhnd Design C&E\ACD\Dsh\D604.dwg, 5/7/2009 1:05:28 PM

NOTE:
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STRM MH

STRM MH

STRM MH

STRM MH

STRM MH

STRM MH

STRM MH

CB

TAXIWAY "D"

EXISTING SOUTH PERIMETER ROAD

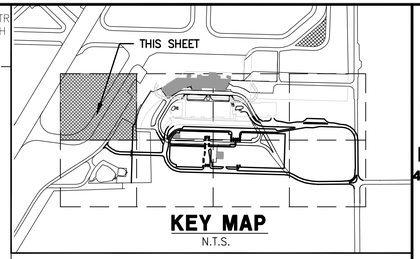
EXISITNG SECURITY FENCE

PROPOSED SECURITY FENCE

TEMPORARY SECURITY FENCE

MATCH LINE SHEET C601

MATCH LINE SHEET C606



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- OHE PROPOSED OVERHEAD ELECT.
- OE OE EXISTING OVERHEAD ELECT.
- EXISTING POWER POLE
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- SAN PROPOSED SANITARY
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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE UTILITY PLAN (SHEET 5 OF 8)

SHEET NUMBER
C605

BID DOCUMENTS

T:\P-214188_093 \Dgn\Terminal Design CAB\CAD\C606.dwg, 5/7/2009 1:45:37 PM

NOTE:
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MATCH LINE SHEET C605

MATCH LINE SHEET C607

MATCH LINE SHEET C602

EXISTING TERMINAL

EXISITNG GRINDEN DRIVE

EXISTING RENTAL PARKING

FUTURE (N.I.C) RENTAL PARKING

FUTURE (N.I.C) TERMINAL

PROPOSED SHORT TERM PARKING

PROPOSED LOWER ACCESS ROAD

CONNECTS TO J-BOX

CONNECTS TO J-BOX IN TUNNEL

GATE

STRM MH

CB

EXISTING HYDRANT

EXISTING SAN MH
R.E.=1399.63
I.E. N=1391.18
I.E. S=1391.03

6" D.I. WTR

EXISTING (PRIVATE) 8" D.I.

3-1/C #6 + GRND
ELECTRIC IN GUARD RAIL

"PHONE CABLE"

(PRIVATE) 8" PVC

CONNECT TO EXISTING 8" D.I. WATER PIPE
STA: 17+99.28, 34' LT. INV. ELEV: ±1387.30
2~ 8" GATE VALVES & VALVE BOXES
1~6" GATE VALVE & VALVE BOX
CROSS 8"x8" 8"x8" W/THRUST BLOCKING
REDUCER 8" TO 6" (EAST)

FUTURE (N.I.C) GRINDEN DRIVE

PROPOSED HYDRANT
STA: 20+16.55, 29' LT, FG ELEV: 1398.76
INV. ELEV: 1390.55
1~HYDRANT & VALVE W/VALVE BOX
1~ 8"x8"x6" TEE W/THRUST BLOCK

PROPOSED WATER PIPE END
STA: 20+22.10, 34' LT
1~8" GATE VALVE W VALVE BOX
1~ 8" CAP W/ THRUST BLOCK
INV ELEV: 1390.63

GAS LINE END STA: 20+93.54, 28.0 LT
1~2" POLY VALVE W/VALVE BOX
1~2" P.E. CAP

PROPOSED (PRIVATE) 222 LF 8" D.I. WATER PIPE @ 1.5%

PROPOSED (PRIVATE) 274 LF 8" PVC @ 1.0%

PROPOSED SANITARY MH (SAN-2)
STA: 21+02.22, 29.92 LT
RIM ELEV. 1398.64
INV. E: 1389.89

PROPOSED SANITARY MH (SAN-1)
STA: 18+08.82, 46' LT
RIM ELEV. 1397.74
(EXISTING) INV. N: 1387.10
(EXISTING) INV. S: 1387.07
(NEW) INV. W: 1387.15

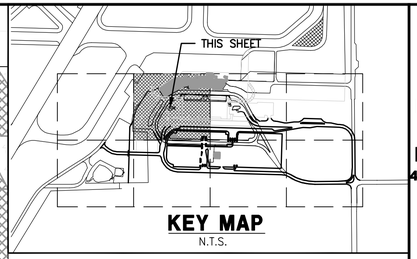
ADJUST RIM EXISTING SANITARY MH
STA: 18+08.75, 198.63 LT
PROPOSED RIM ELEV: 1393.50

(UNKNOWN FEED ?)
MAY BE ABANDONED CABLE

CP-DLHA

20+00 19+00 18+00 8+00 7+00 6+00 5+00 22+00 10+00

12' 7'



KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

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DESIGNED BY: JEH

AEP PROJECT NUMBER
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SHEET TITLE

SITE UTILITY PLAN (SHEET 6 OF 8)

SHEET NUMBER
C606

BID DOCUMENTS

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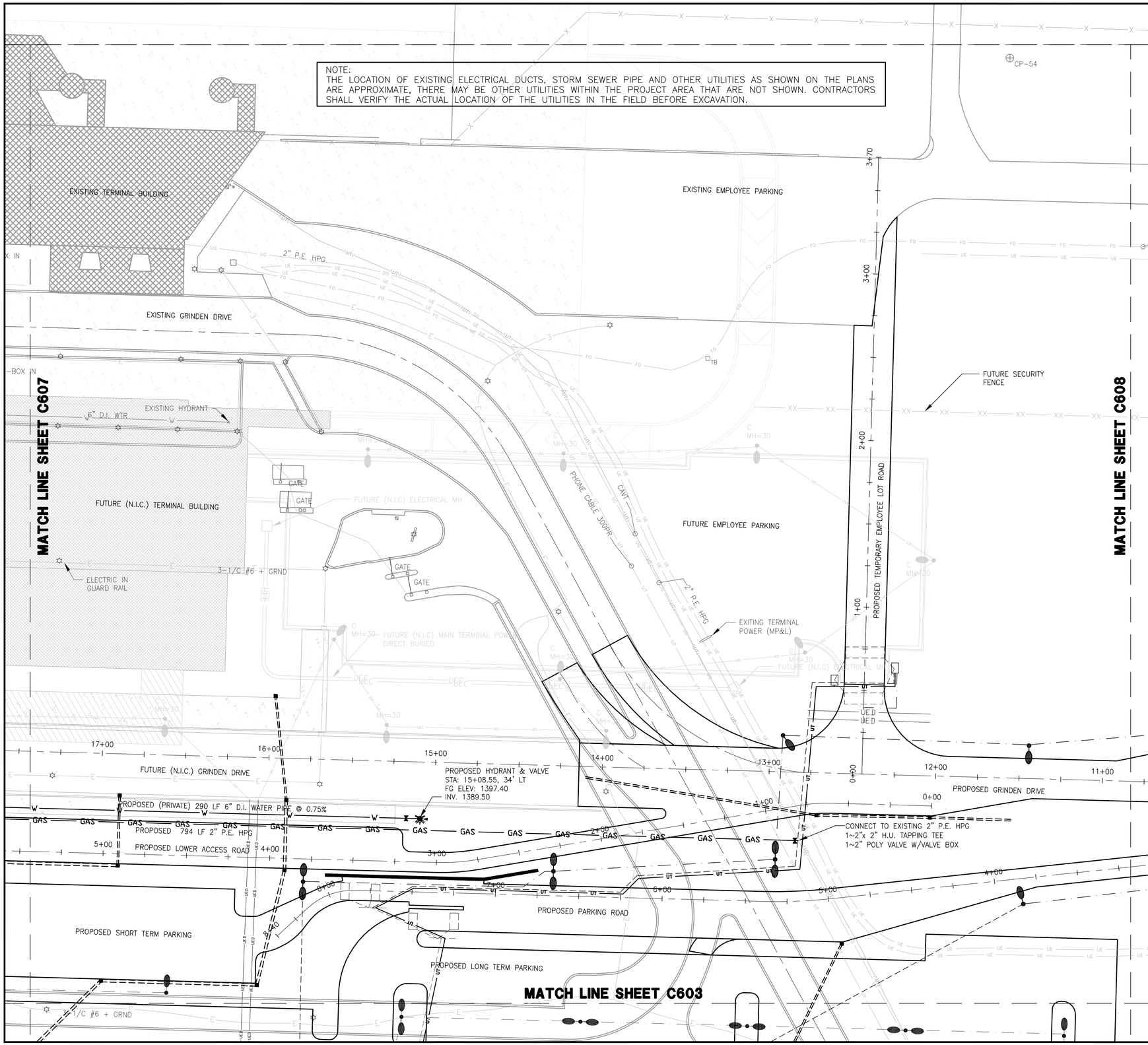

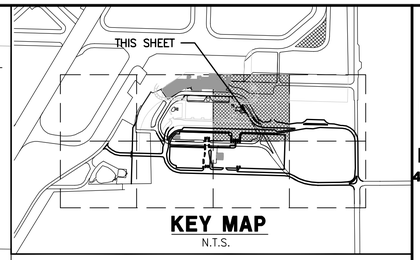

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NORTH

0 30' 60'

LEGEND

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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE UTILITY PLAN (SHEET 7 OF 8)

SHEET NUMBER
C607

BID DOCUMENTS

NOTE:
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MATCH LINE SHEET C607

EMPLOYEE ROAD (CARGO RD)

FIBER OPTIC

ABANDONED PRIMARY UG

I.E.=1377.23
12" CMP

CP-68

8" CMP

EXISTING SAN MH
R.E.=1379.40
I.E. N=1369.35
I.E. SE=1369.30

SAN

3" GAS

I.E.=1375.00

HAINES ROAD

PROPOSED CELL PHONE LOT

PROPOSED GRINDEN DRIVE

PROPOSED PARKING ROAD

10+00 9+00 8+00 7+00 6+00 5+00 4+00 3+00 2+00 1+00 0+00

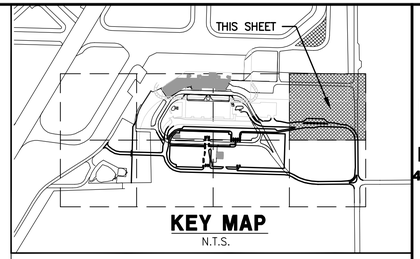
3" GAS

8" WATER

12" RCP

FLAG POLE

MATCH LINE SHEET C604



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SHEET TITLE

SITE UTILITY PLAN (SHEET 8 OF 8)

SHEET NUMBER

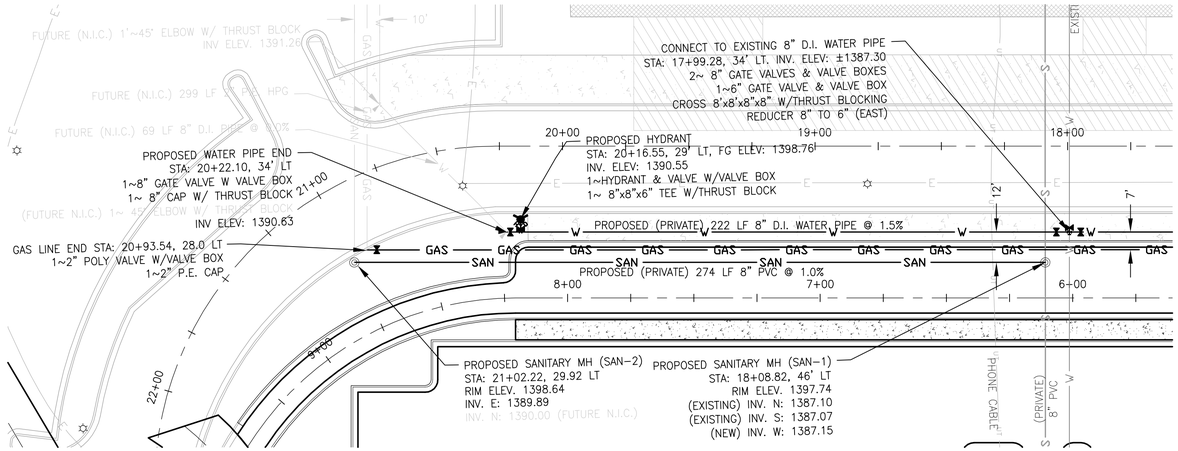
C608

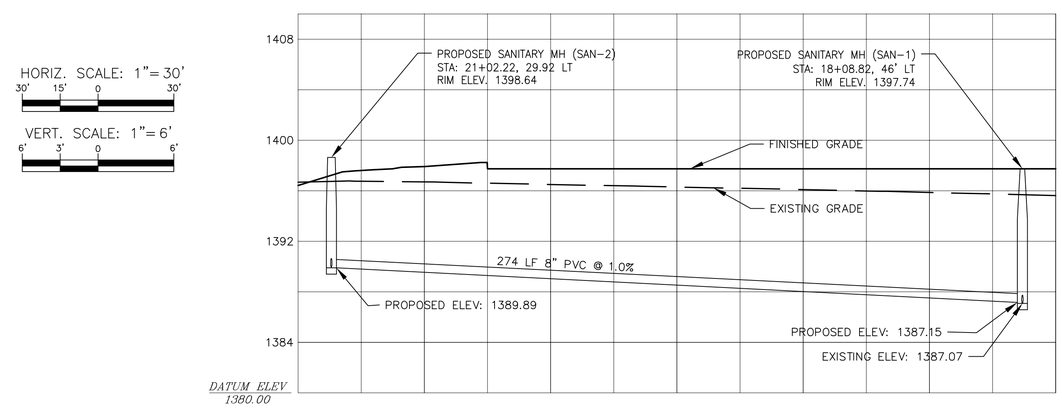
BID DOCUMENTS

EP:214-1882-093 Dgn Terminal Design CME-CIV\C3D\v2008\dwg, 7/7/2009 1:47:58 PM

NOTE:

PROVIDE TEMPORARY BYPASS AS NECESSARY FOR CONSTRUCTION OF SANITARY MANHOLE (SAN-1) THIS WORK SHALL BE CONSIDERED INCIDENTAL.





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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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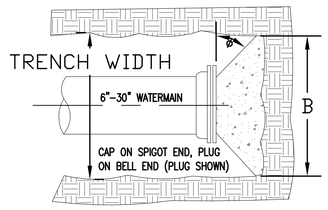
SHEET TITLE

SANITARY PLAN AND PROFILE

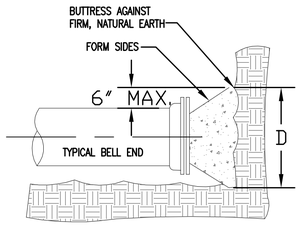
SHEET NUMBER

C609

BID DOCUMENTS



PLAN

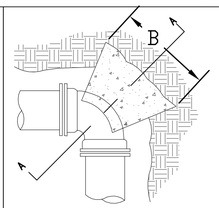


ELEVATION

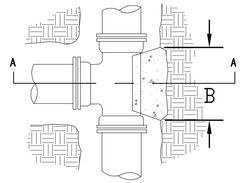
BLOCKING DIMENSIONS		
PLUG SIZE	B	D
6"	12"	15"
8"	24"	15"
10"	24"	20"
12"	30"	22"
16"	40"	28"
20"	50"	34"
24"	62"	40"
30"	80"	48"

NOTES:
1. BLOCKING DIMENSIONS BASED ON EARTH RESISTANCE OF 2 TONS PER SQ. FT. WHERE, IN THE OPINION OF THE ENGINEER, EARTH IS POOR, BLOCKING SHALL BE INCREASED IN SIZE AS DIRECTED OR STRAPPING MAY BE NECESSARY.
2. ANGLEø SHALL BE EQUAL TO OR LARGER THAN 45°.
3. BLOCKING SHALL BE CENTERED ON MAIN.
4. CONCRETE SHALL BE TYPE 3, GRADE B – MNDOT 2461.
5. POLYETHYLENE SHALL BE USED TO SEPARATE CONCRETE FROM FITTING.

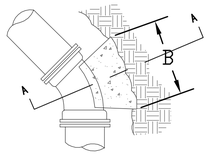
PLUG BLOCKING FOR WATERMAIN		W–2
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



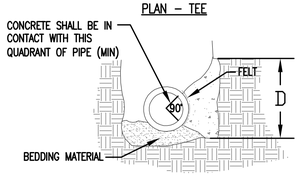
PLAN – 90° BEND



PLAN – TEE



PLAN – 45° BEND

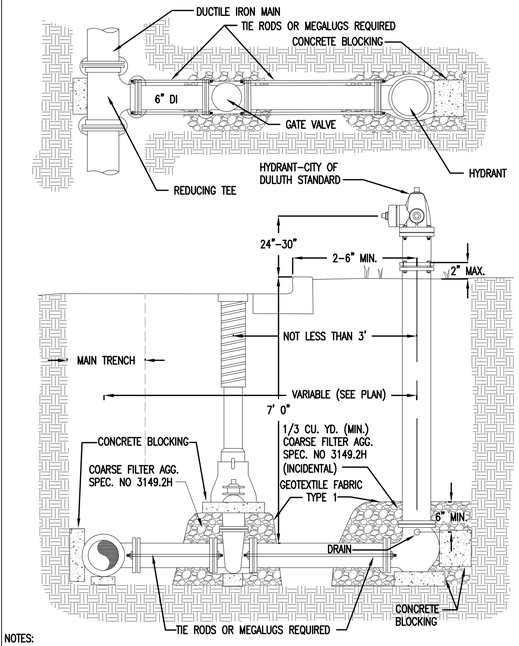


SECTION A–A

NOTES
1. DIMENSIONS IN TABLE ARE BASED ON A WATER PRESSURE OF 150 P.S.I. & AN EARTH RESISTANCE OF 2 TONS/S.F.
2. BLOCKING TO BE SET AGAINST UNDISTURBED SOIL
3. CONCRETE SHALL BE TYPE 3 GRADE B. (MNDOT SPEC. 2461) CONCRETE SHALL NOT INTERFERE WITH MECHANICAL JOINTS
4. POLYETHLYENE SHALL BE USED TO SEPARATE CONCRETE FROM FITTING.

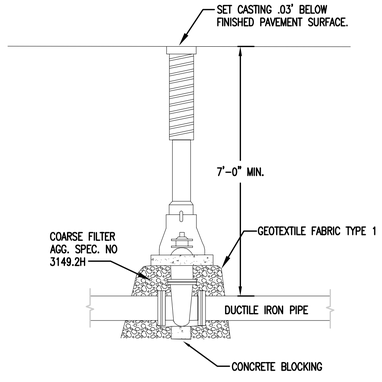
BLOCKING DIMENSIONS								
BEND OR BRANCH SIZE	22-1/2° BENDS		45° BENDS		90° BENDS		TEES	
	B	D	B	D	B	D	B	D
0'–6"	1'–0"	1'–0"	1'–0"	1'–0"	1'–4"	1'–2"	1'–3"	1'–0"
0'–8"	1'–0"	1'–0"	1'–4"	1'–2"	1'–10"	1'–6"	1'–6"	1'–4"
1'–0"	1'–4"	1'–4"	1'–10"	1'–10"	2'–8"	2'–3"	2'–3"	2'–0"
1'–4"	1'–10"	1'–8"	2'–6"	2'–4"	3'–10"	2'–10"	3'–2"	2'–4"
1'–8"	2'–4"	2'–0"	3'–3"	2'–10"	5'–0"	3'–4"	4'–0"	3'–0"
2'–0"	2'–10"	2'–4"	4'–0"	3'–3"	6'–4"	3'–10"	5'–3"	3'–4"
2'–6"	3'–6"	3'–0"	5'–4"	3'–10"	8'–0"	4'–8"	6'–3"	4'–3"

THRUST BLOCKING FOR WATERMAIN		W–3
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



NOTES:
1. VALVES SHALL BE CONNECTED DIRECTLY TO AN ANCHORING TEE. WHENEVER DIRECT CONNECTION IS NOT POSSIBLE, TIE RODS OR MEGALUGS SHALL BE USED. TIE RODS SHALL BE GALVANIZED.
2. USE EPOXY COATING ON VALVE AND HYDRANT BASE.
3. ALL BOLTS SHALL BE COR–TEN WITH ZINC ANODE CAPS CONFORMING TO ASTM B–418 FOR ALL MECHANICAL JOINT FITTINGS. ANODE SIZE – REGULAR.

FIRE HYDRANT SETTING DETAIL – DUCTILE IRON		W–4
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

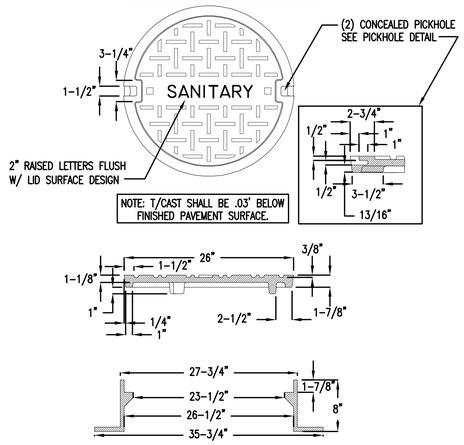


NOTES:
1. USE EPOXY COATING ON EXTERIOR OF VALVES
2. ALL BOLTS SHALL BE COR–TEN WITH ZINC ANODE CAPS CONFORMING TO ASTM B–418 FOR ALL MECHANICAL JOINT FITTINGS. ANODE SIZE – REGULAR.

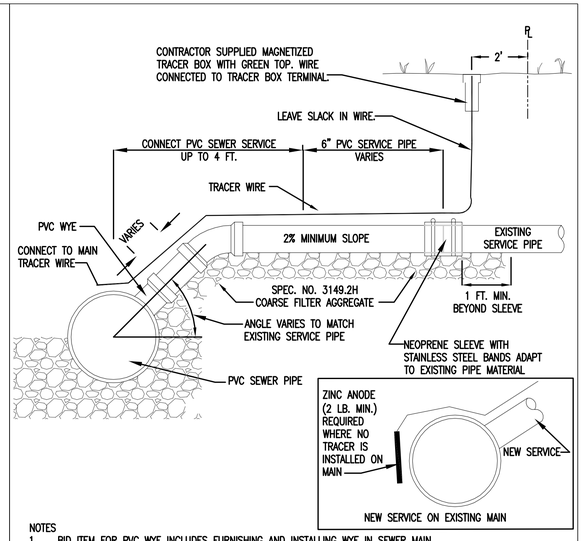
WATER VALVE BOX – DUCTILE IRON MAIN		W–17
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

WGT. 298 LBS		MATERIAL: GRAY IRON CLASS 35B
WGT. 122 LBS	TOTAL WEIGHT 420 LBS.	SPEC.: ASTM A–48–74

NOTE: SUITABLE FOR HS25 WHEEL LOADS



SANITARY CASTING DETAIL		SAN–1
REVIEWED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



NOTES
1. BID ITEM FOR PVC WYE INCLUDES FURNISHING AND INSTALLING WYE IN SEWER MAIN.
2. CONNECT SANITARY SERVICE INCLUDES UP TO 4.0' OF PVC HOUSE SERVICE PIPE AND ALL FITTINGS
3. 6" PVC SEWER SERVICE PIPE IS INTENDED FOR THE RECONSTRUCTION OF SEWER SERVICES (WHEN FOUND TO BE IN NEED BY THE ENGINEER) COMPLETE IN PLACE FROM 4.0' BEYOND THE C/L OF THE SEWER MAIN TO A POINT DESIGNATED BY THE ENGINEER
4. FOR NEW SERVICES, PIPE TO STOP AT RIGHT OF WAY
5. #12 GAUGE GREEN INSULATED COPPER TRACER WIRE SHALL BE INSTALLED WITH SANITARY SEWER MAINS AND SERVICES. TRACER WIRE TERMINAL BOXES SHALL BE INSTALLED DIRECTLY ABOVE THE SEWER SERVICE OR AS DETERMINED BY THE ENGINEER
6. FOR SERVICES, TRACER WIRE SHALL RUN FROM THE WYE AND TERMINATE IN A FLUSH MOUNTED TRACER BOX WITH A GREEN CAST IRON LOCKABLE TOP.
7. THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. SPLICES IN THE TRACER WIRE SHOULD BE MADE WITH SPLIT BOLT OR COMPRESSION TYPE CONNECTORS. WIRE NUTS SHALL NOT BE USED. A WATER–PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.

TYPICAL SEWER SERVICE CONNECTION		SAN–2
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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

UTILITY CITY OF DULUTH DETAILS (SHEET 1 OF 2)

SHEET NUMBER

C610

BID DOCUMENTS

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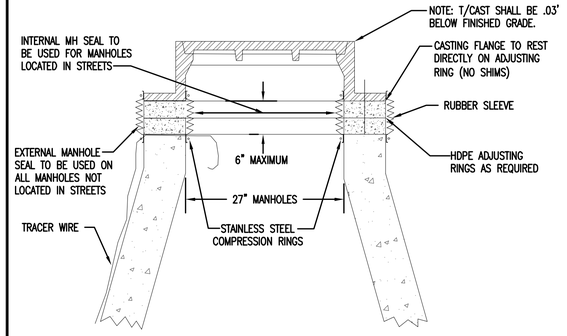
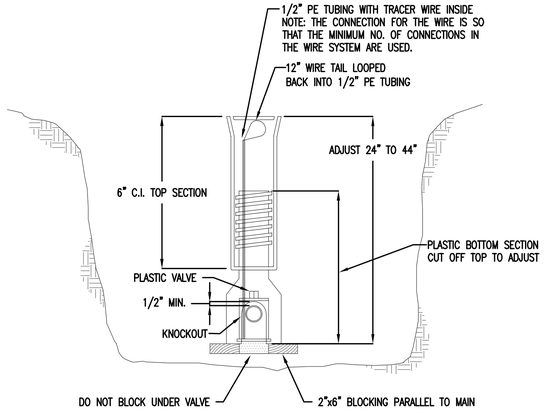
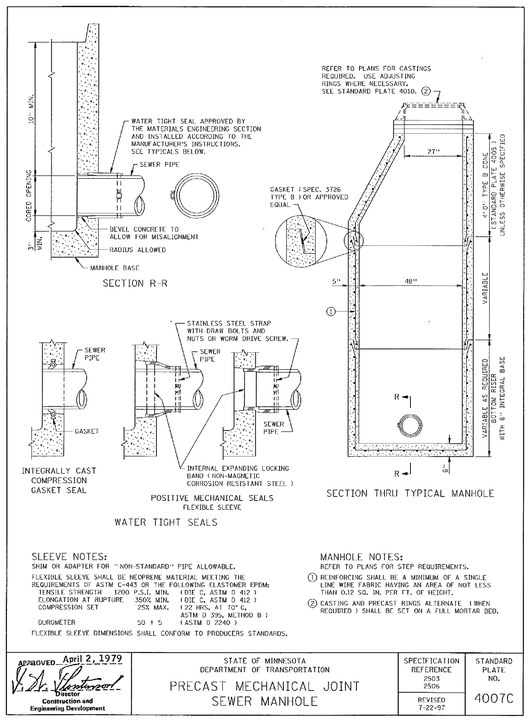


NOTE:
1. ALL SEALS SHALL EXTEND FROM THE CASTING TO THE CONE
2. TRACER WIRE REQUIRED ON ALL SANITARY SEWER MAINS

SANITARY MANHOLE SEAL		SAN-3
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



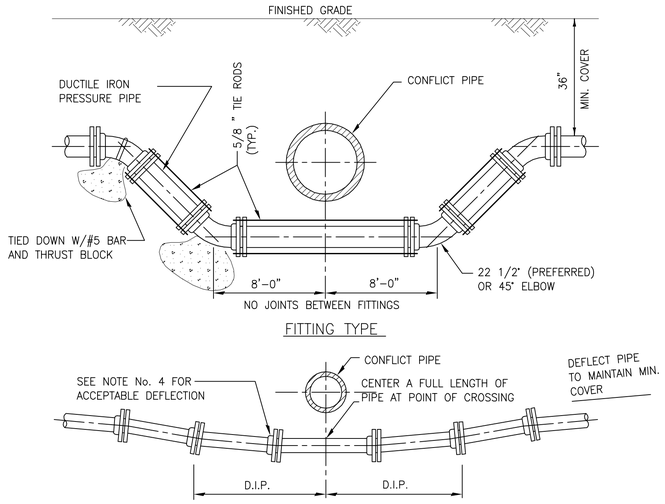
PE VALVE BOX SETTING		G-5
REVIEWED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



SLEEVE NOTES:
SHIM OR ADAPTER FOR "NON-STANDARD" PIPE ALLOWABLE.
FLEXIBLE SLEEVE SHALL BE NEOPRENE MATERIAL MEETING THE REQUIREMENTS OF ASTM C-443 OR THE FOLLOWING ELASTOMER EPDM:
TENSILE STRENGTH 1200 P.S.I. MIN. (DIE C, ASTM D 412)
ELONGATION AT RUPTURE 350% MIN. (DIE C, ASTM D 412)
COMPRESSION SET 25% MAX. (22 HRS. AT 70° C, ASTM D 395, METHOD B)
DUROMETER 50 ± 5 (ASTM D 2240)
FLEXIBLE SLEEVE DIMENSIONS SHALL CONFORM TO PRODUCERS STANDARDS.

MANHOLE NOTES:
REFER TO PLANS FOR STEP REQUIREMENTS.
① REINFORCING SHALL BE A MINIMUM OF A SINGLE LINE WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ. IN. PER FT. OF HEIGHT.
② CASTING AND PRECAST RINGS ALTERNATE (WHEN REQUIRED) SHALL BE SET ON A FULL MORTAR BED.

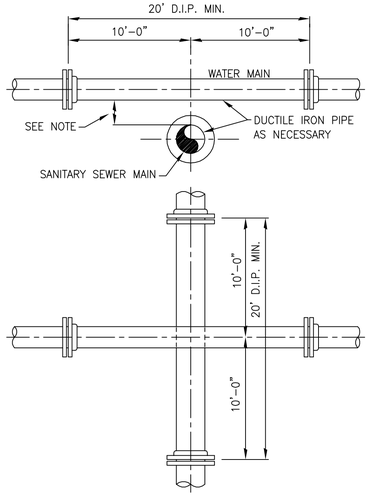
APPROVED April 2, 1979	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE 2503 2506	STANDARD PLATE NO.
Director Construction and Engineering Development	PRECAST MECHANICAL JOINT SEWER MANHOLE	REVISED 7-22-97	4007C



NOTES:
1. THERE SHALL BE IN ALL CASES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN WATER MAINS AND FORCE MAINS.
2. WHEREVER POSSIBLE WATER MAINS SHALL PASS OVER FORCE MAINS OR STORM SEWERS.
3. FITTINGS SHALL BE RESTRAINED WITH RETAINER GLANDS AND EITHER THRUST BLOCKS OR TIE RODS.
4. THE DEFLECTION TYPE CROSSING IS PREFERRED.
5. DO NOT EXCEED 75% OF MANUFACTURERS RECOMMENDED MAXIMUM JOINT DEFLECTION.
6. A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN WATER MAINS AND STORM SEWERS SHALL BE MAINTAINED, WHERE THIS IS NOT POSSIBLE WATER MAIN SHALL BE D.I.P. WITH NO LESS THAN 6" SEPARATION.

CONFLICT SEPARATION DETAIL

N.T.S.



NOTES

1. SEWER CROSSING UNDER WATER MAINS SHALL BE POSITIONED TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER PIPE JOINTS AND WATER MAIN JOINTS ARE EQUALLY SPACED FROM THE POINT OF CROSSING WITH NO LESS THAN 10 FEET BETWEEN ANY TWO JOINTS AND BOTH PIPES SHALL BE D.I.P. WHERE THERE IS NO ALTERNATIVE TO SEWER PIPES CROSSING OVER A WATER MAIN, THE CRITERIA FOR MINIMUM SEPARATION BETWEEN LINES AND JOINTS IN THE ABOVE SHALL BE REQUIRED AND BOTH PIPES BE D.I.P. IRRESPECTIVE OF SEPARATION.
2. MAINTAIN 10 FEET HORIZONTAL DISTANCE BETWEEN WATER AND SEWER MAINS AS A MINIMUM.
3. FORCE MAIN CROSSING WATER MAIN SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE FORCE MAIN AND THE OUTSIDE OF THE WATER MAIN WITH WATER MAIN CROSSING OVER FORCE MAIN.

WATER/SEWER SEPARATION DETAIL

N.T.S.

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
UTILITY CITY OF DULUTH DETAILS (SHEET 2 OF 2)

SHEET NUMBER
C611

BID DOCUMENTS

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PAVEMENT MARKING AND SIGNAGE NOTES

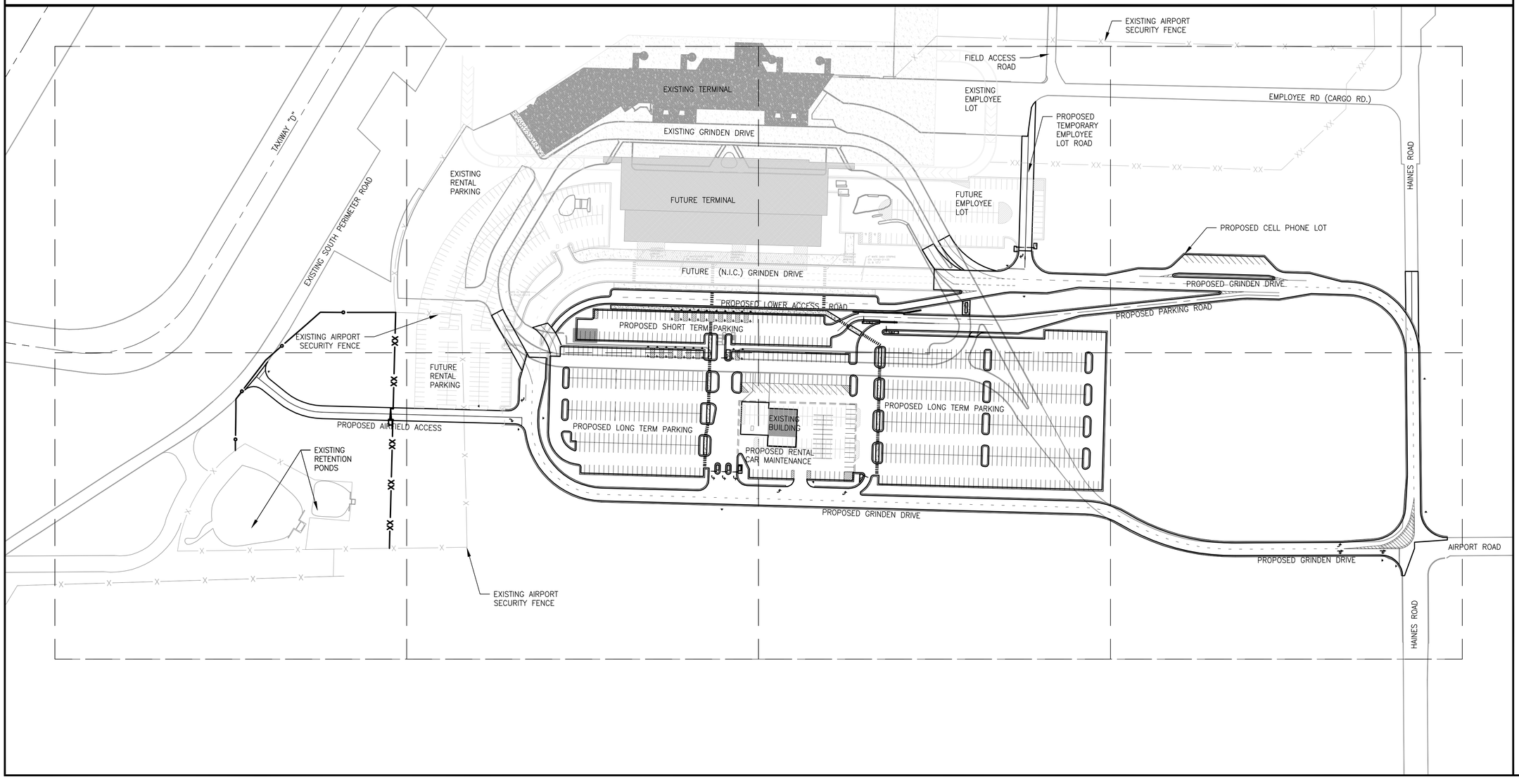
1. ALL SIGNS, PAVMENT MARKINGS, AND TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES – UPDATED MARCH 31, 2009.
2. THE BID ITEM FOR ALL SIGNS SHALL INCLUDE THE COST OF ALL MATERIALS AND LABOR USED TO INSTALL NEW SIGNS PER THE NEW SIGN INSTALLATION DETAIL, SHEET C709.
3. ALL PAINT SHALL BE LATEX WITH TYPE 2 REFLECTIVE GLASS BEADS CONFORMING TO MNDOT 2582. MANUFACTURERS CERTIFICATION TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE USE ON THE PROJECT.
4. TEMPORARY PAVEMENT MARKING PLACEMENT AND REMOVAL ASSOCIATED WITH PHASING SHALL BE PAID FOR UNDER THE BID ITEM MNDOT 2563.601 TRAFFIC CONTROL.
5. SIGNS LOCATIONED IN CONCRETE MEDIANS SHALL BE CORED AFTER THE CONCRETE IS PLACED. THE CORE SHALL BE 4" IN DIAMETER TO ALLOW ROOM FOR THE SIGN POST TO BE DRIVEN. AFTER DRIVING THE SIGN POST, THE CORE IS TO BE BACKFILLED WITH GRANULAR MATERIAL. CORING CONCRETE FOR SIGN POST IS INCEDENTAL TO INSTALLING SIGN.

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST
- FUTURE PAVEMENT MARKINGS (TYPICAL)

NORTH

0 100' 200'



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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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SHEET TITLE
PAVEMENT MARKING & SIGNAGE OVERALL SITE PLAN

SHEET NUMBER
C700

BID DOCUMENTS

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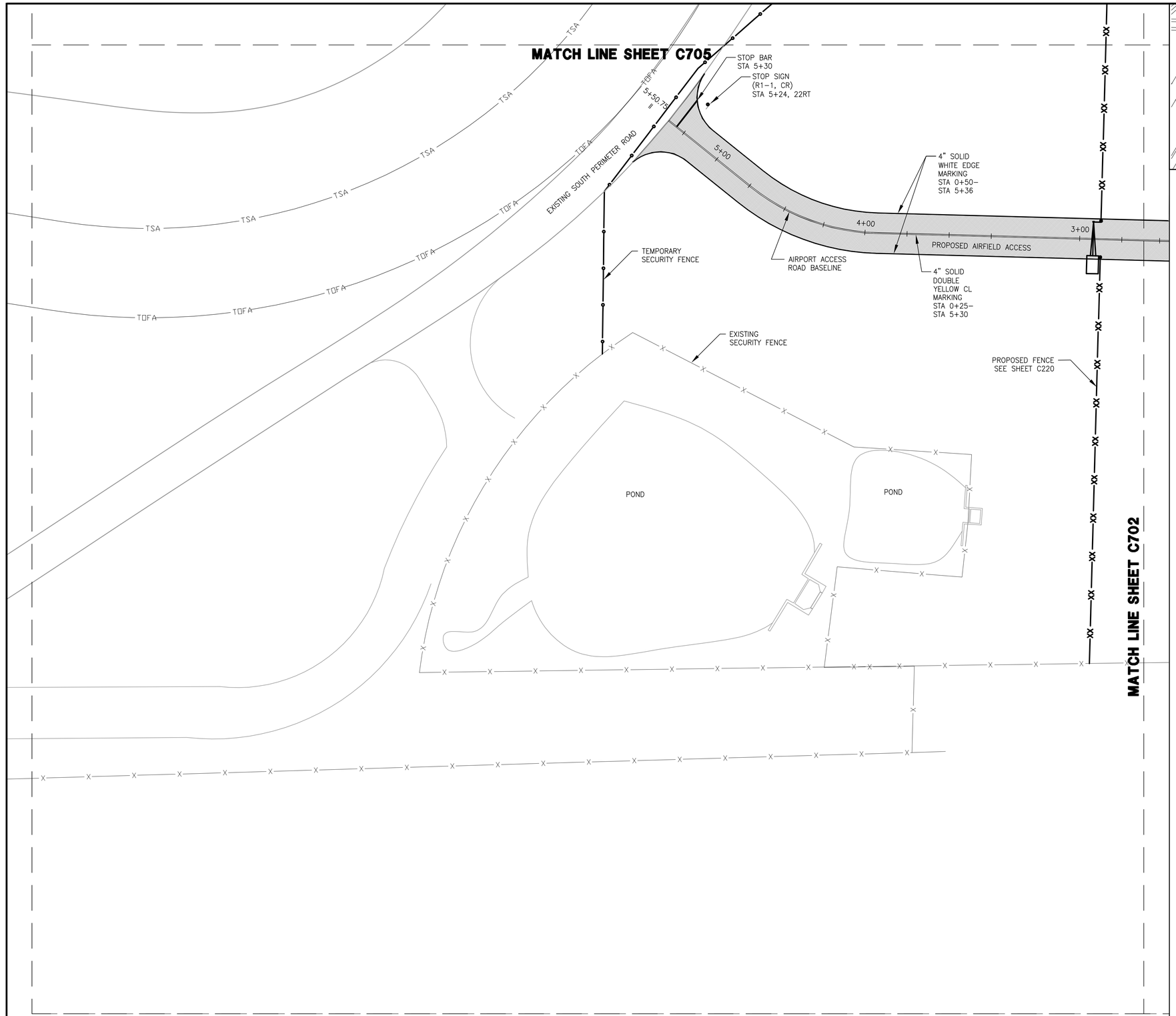

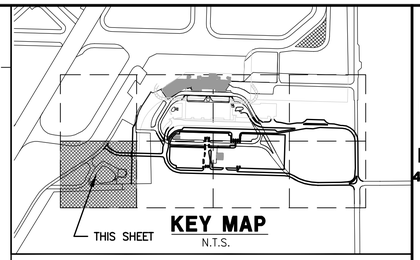

NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST – TYPE AS NOTED
- FUTURE PAVEMENT MARKINGS (TYPICAL)

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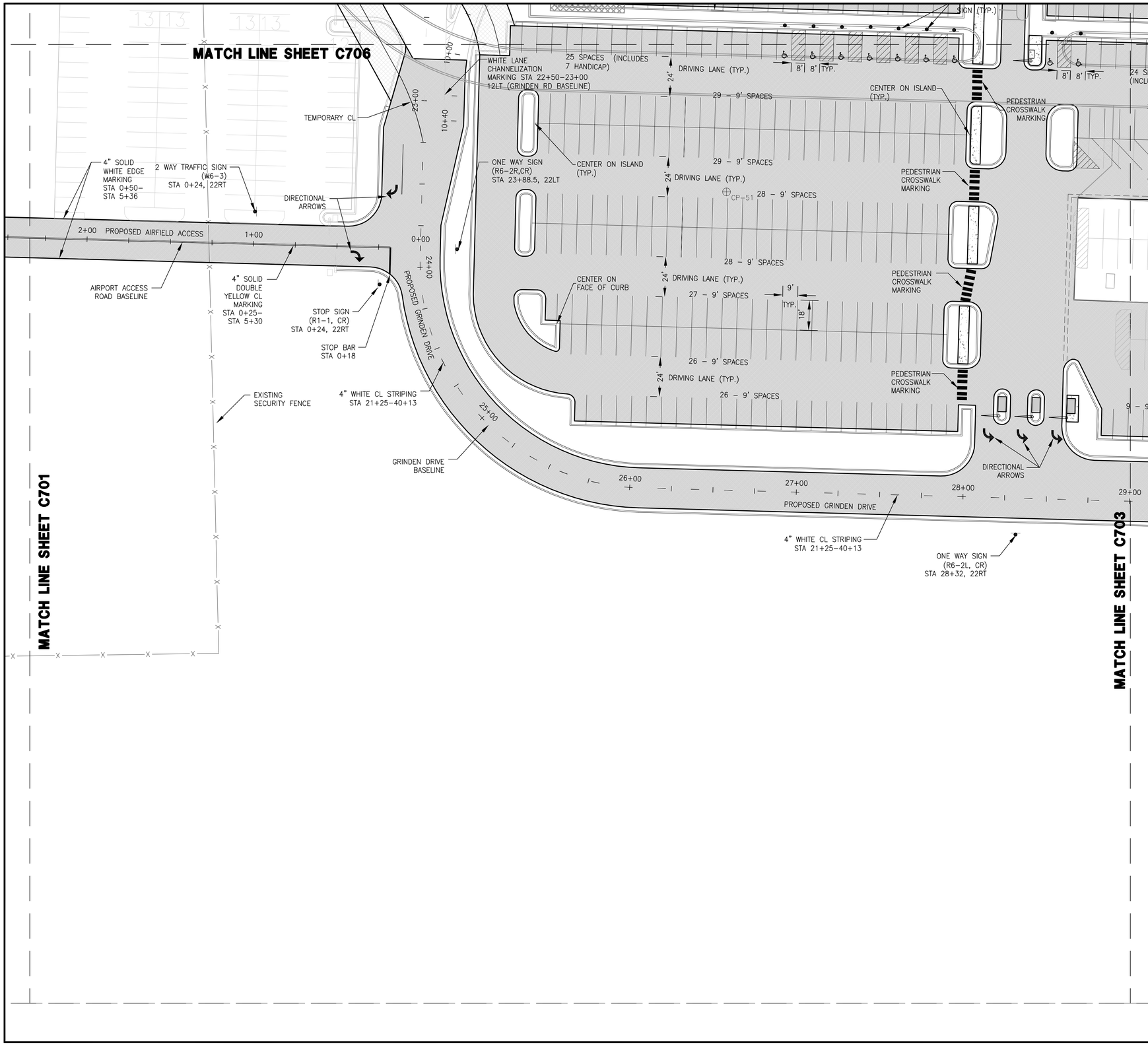
SHEET TITLE

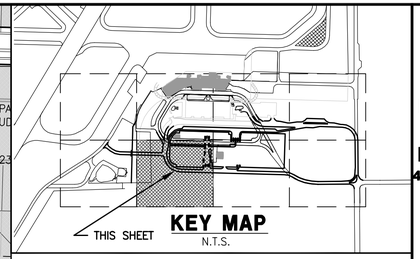
PAVEMENT MARKING & SIGNAGE PLAN (SHEET 1 OF 8)

SHEET NUMBER

C701

BID DOCUMENTS





NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST - TYPE AS NOTED
- FUTURE PAVEMENT MARKINGS (TYPICAL)

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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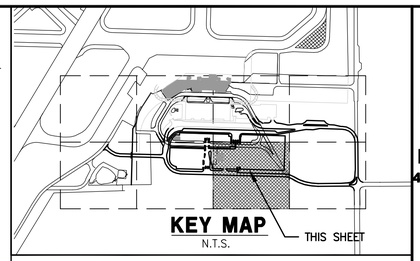
SHEET TITLE

PAVEMENT MARKING & SIGNAGE PLAN (SHEET 2 OF 8)

SHEET NUMBER

C702

BID DOCUMENTS



NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST - TYPE AS NOTED
- FUTURE PAVEMENT MARKINGS (TYPICAL)

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AEP PROJECT NUMBER
214-1882-093 & 095

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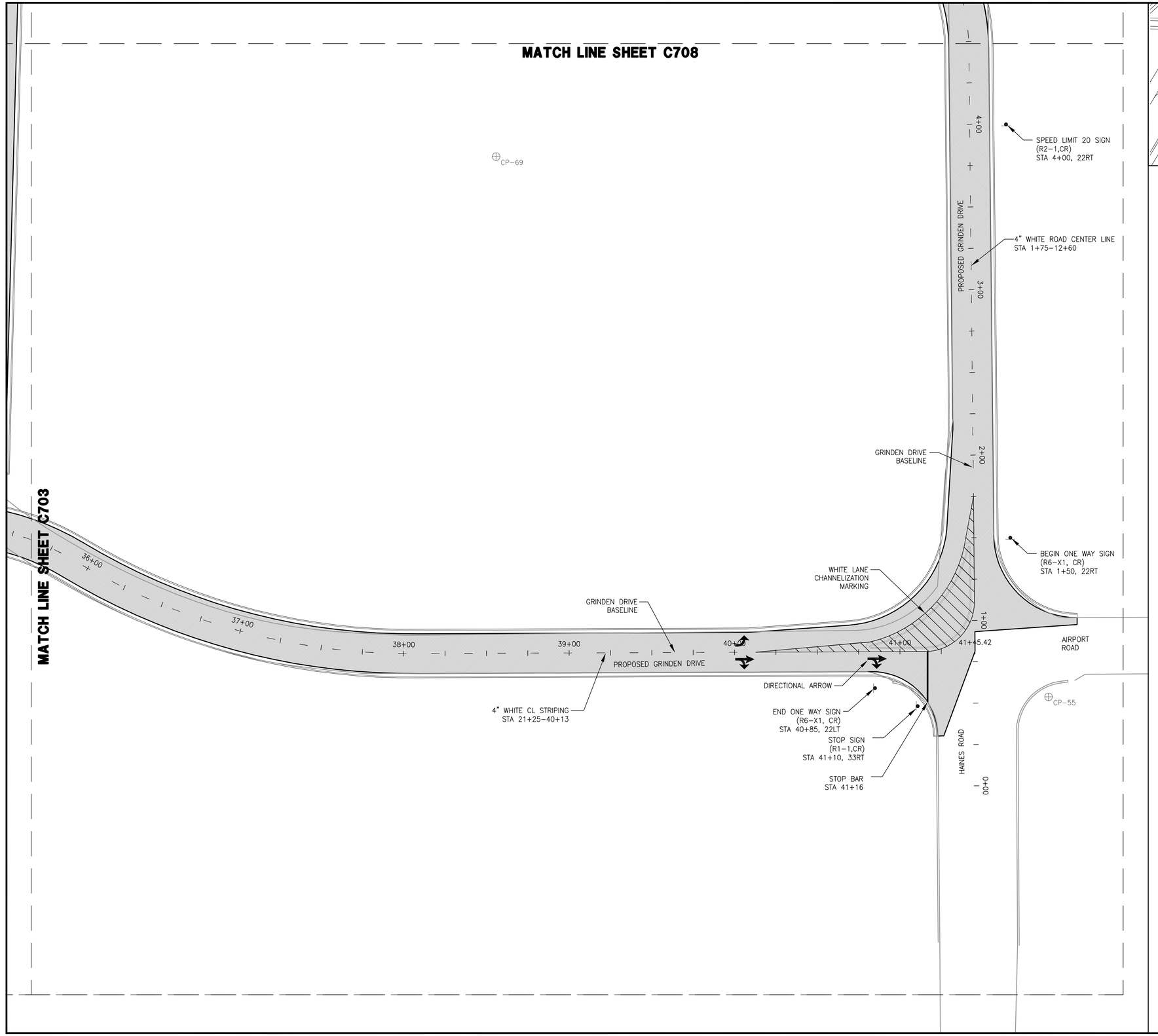
SHEET TITLE

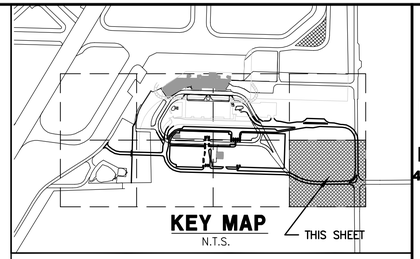
PAVEMENT MARKING & SIGNAGE PLAN (SHEET 3 OF 8)

SHEET NUMBER

C703

BID DOCUMENTS





NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST – TYPE AS NOTED
- FUTURE PAVEMENT MARKINGS (TYPICAL)

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214-1882-093 & 095

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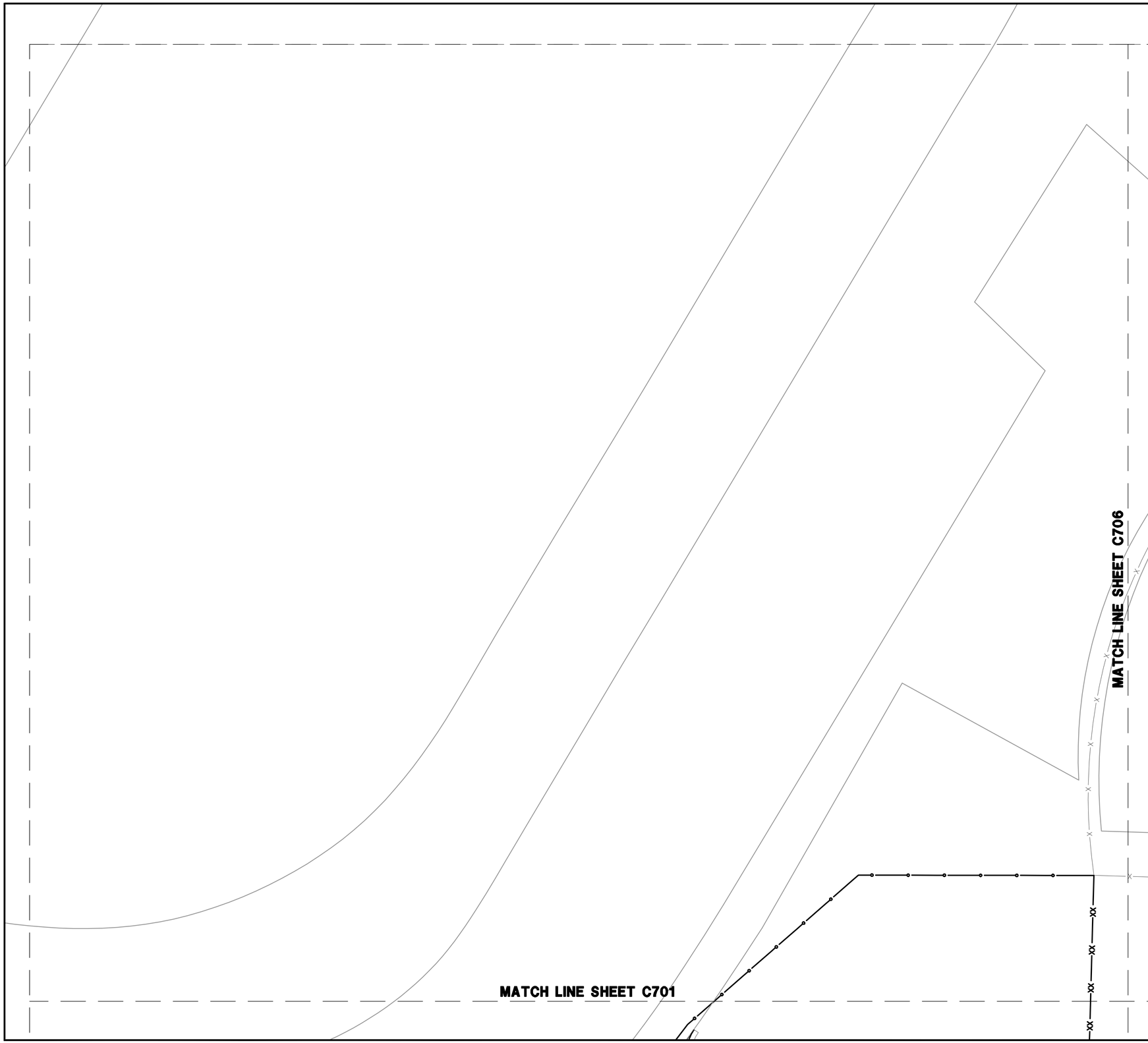
SHEET TITLE

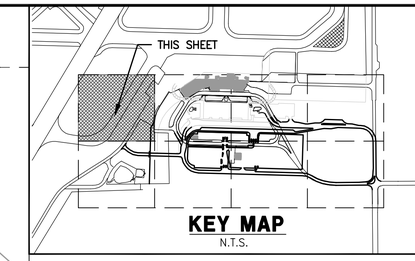
PAVEMENT MARKING & SIGNAGE PLAN (SHEET 4 OF 8)

SHEET NUMBER

C704

BID DOCUMENTS





KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
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AEP PROJECT NUMBER
214-1882-093 & 095

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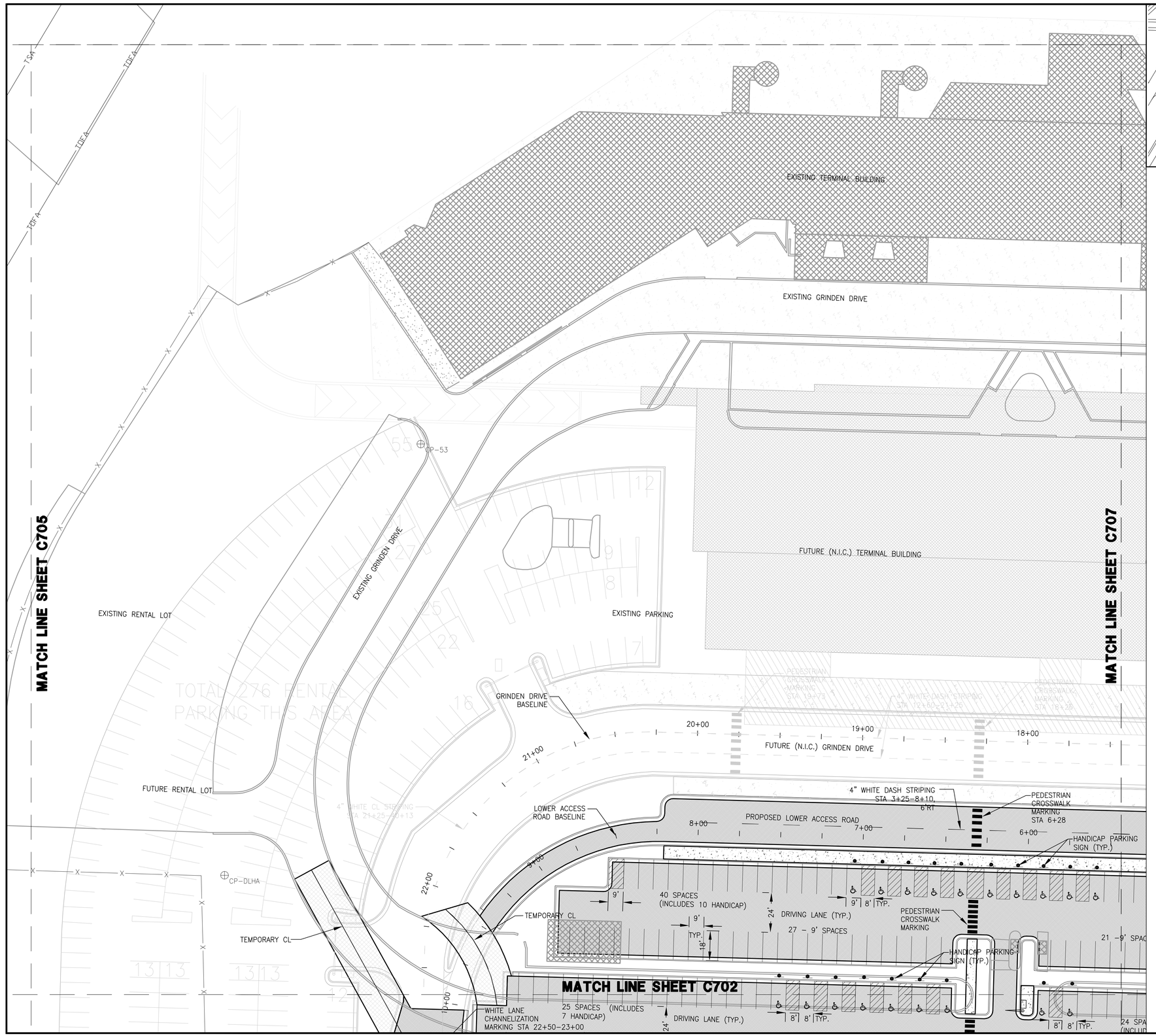
SHEET TITLE

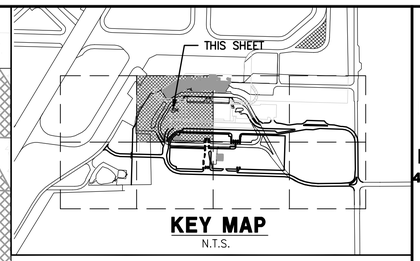
PAVEMENT MARKING & SIGNAGE PLAN (SHEET 5 OF 8)

SHEET NUMBER

C705

BID DOCUMENTS





KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST – TYPE AS NOTED
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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

PAVEMENT MARKING & SIGNAGE PLAN (SHEET 6 OF 8)

SHEET NUMBER

C706

BID DOCUMENTS

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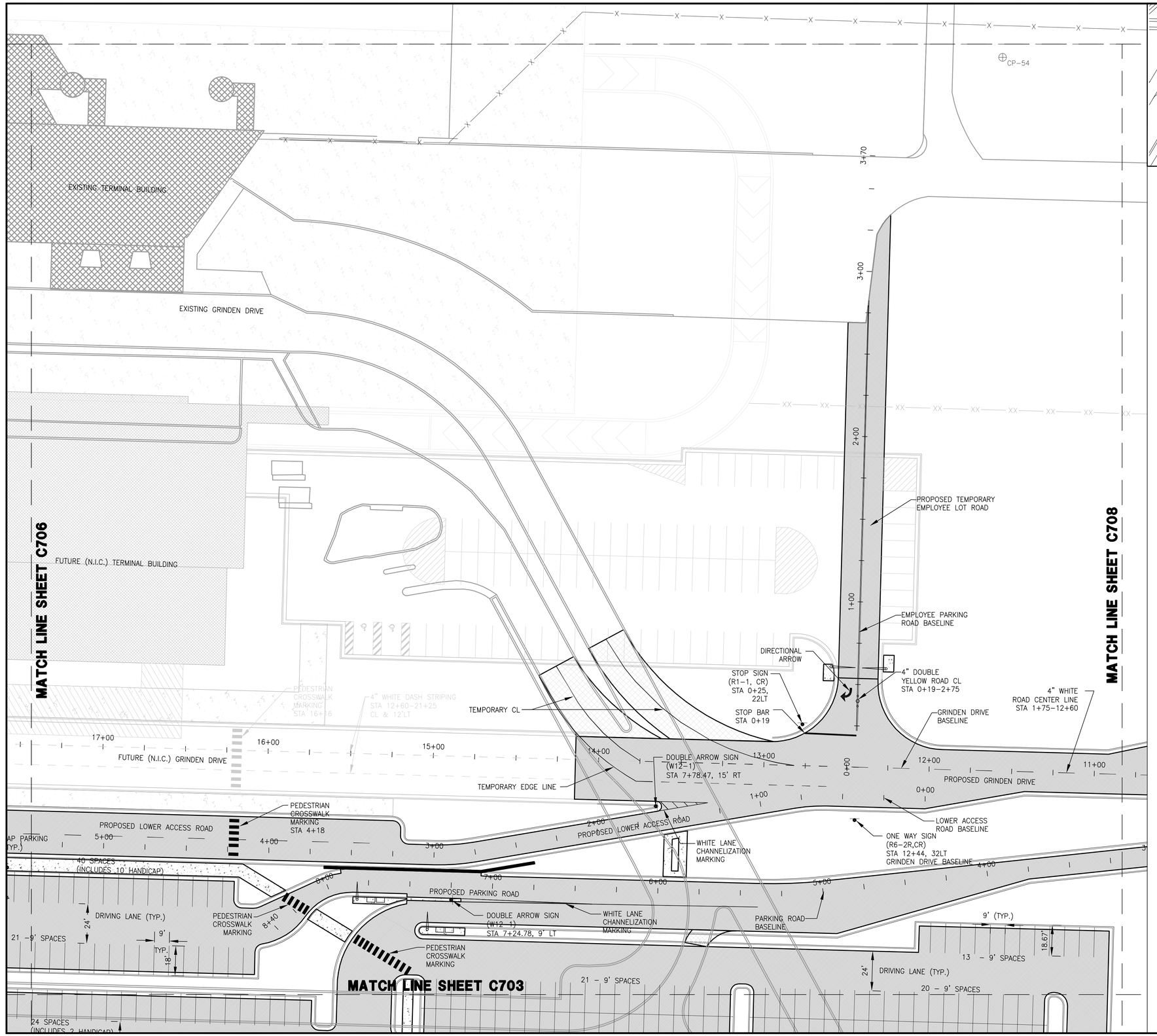

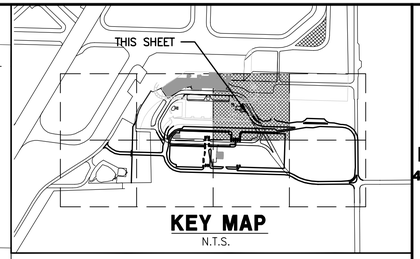

KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST – TYPE AS NOTED
- FUTURE PAVEMENT MARKINGS (TYPICAL)

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NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
PAVEMENT MARKING & SIGNAGE PLAN (SHEET 7 OF 8)

SHEET NUMBER
C707

BID DOCUMENTS

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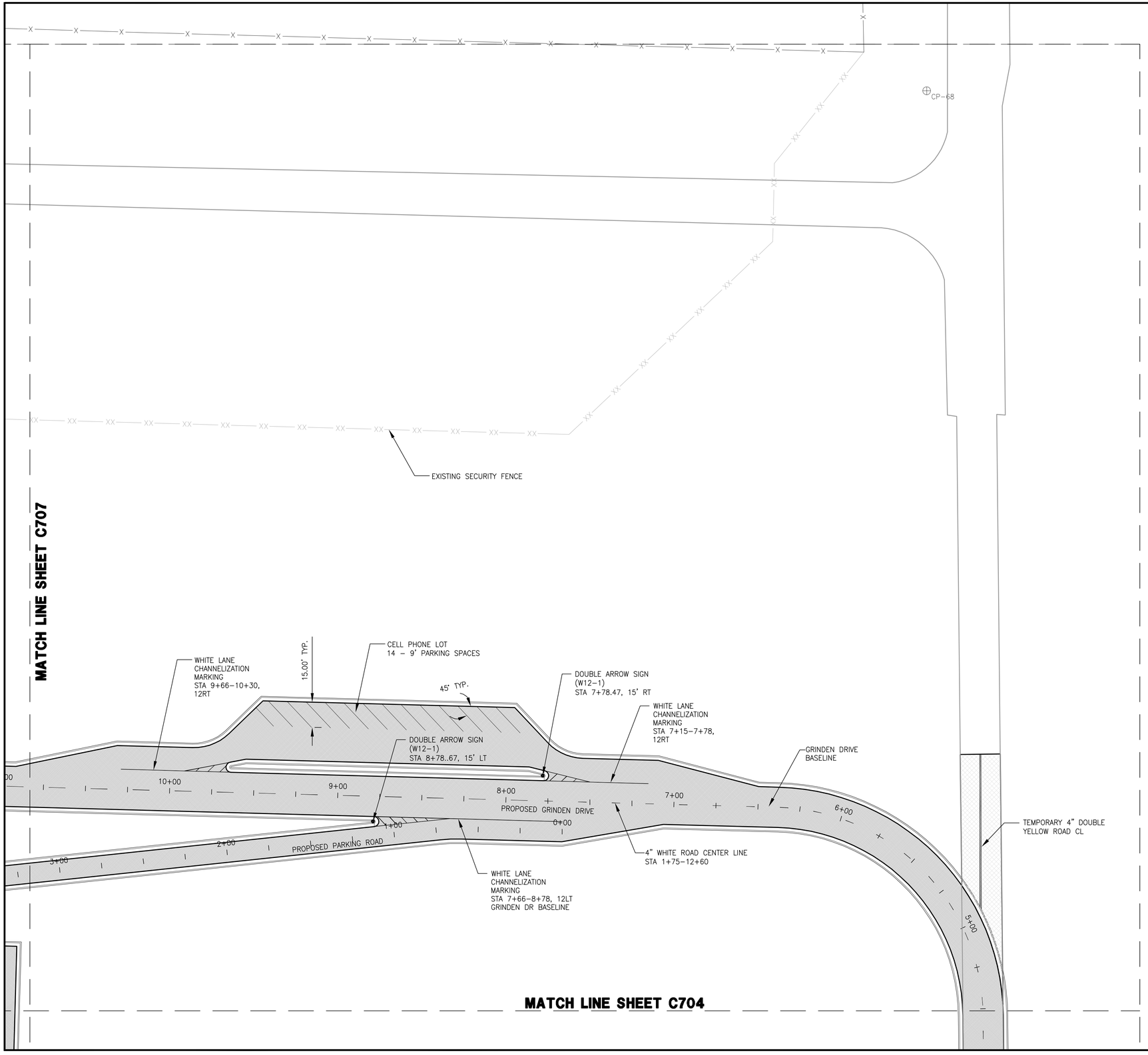

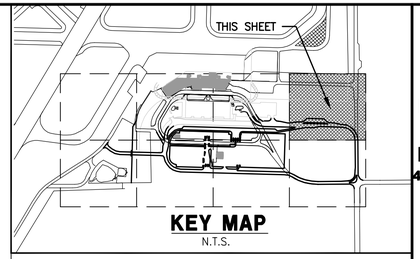

KEY MAP
N.T.S.

NORTH

0 30' 60'

LEGEND

- PEDESTRIAN CROSSWALK PAVEMENT MARKINGS
- 4" WIDE PAVEMENT MARKINGS
- DIRECTIONAL ARROW
- STOP BAR PAVEMENT MARKING
- SIGN COMPLETE W/ POST - TYPE AS NOTED
- FUTURE PAVEMENT MARKINGS (TYPICAL)

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DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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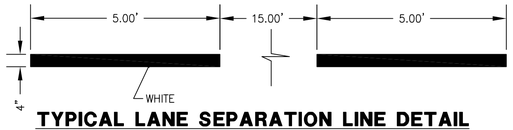
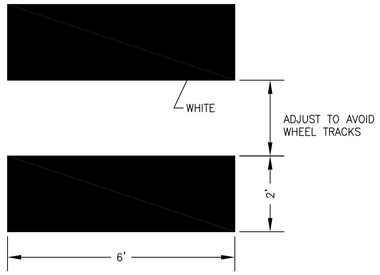
SHEET TITLE
PAVEMENT MARKING & SIGNAGE PLAN (SHEET 8 OF 8)

SHEET NUMBER
C708

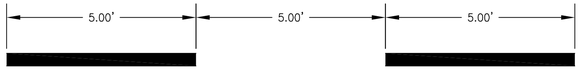
BID DOCUMENTS



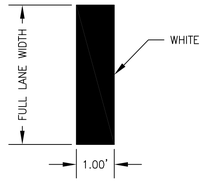
TYPICAL LANE SEPARATION LINE DETAIL
N.T.S.



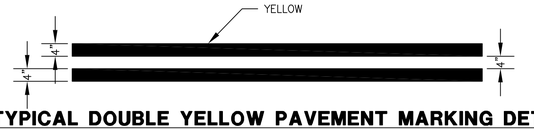
TYPICAL PEDESTRIAN CROSSWALK MARKING DETAIL
N.T.S.



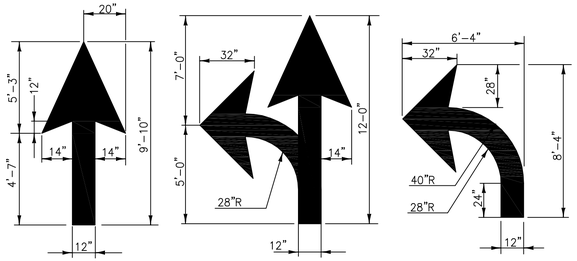
TYPICAL LANE SEPARATION MARKING DETAIL (STA 12+61.54 TO STA 25+00 - PROPOSED GRINDEN DRIVE) N.I.C.
N.T.S.



TYPICAL STOP LINE PAVEMENT MARKING DETAIL
N.T.S.

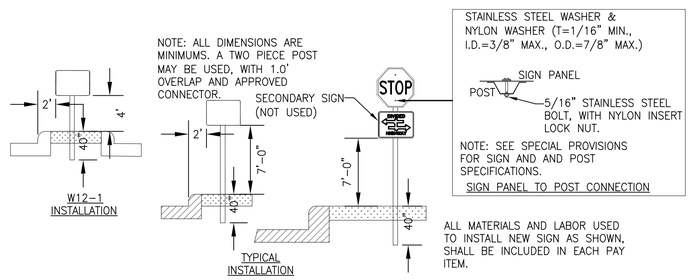


TYPICAL DOUBLE YELLOW PAVEMENT MARKING DETAIL
N.T.S.

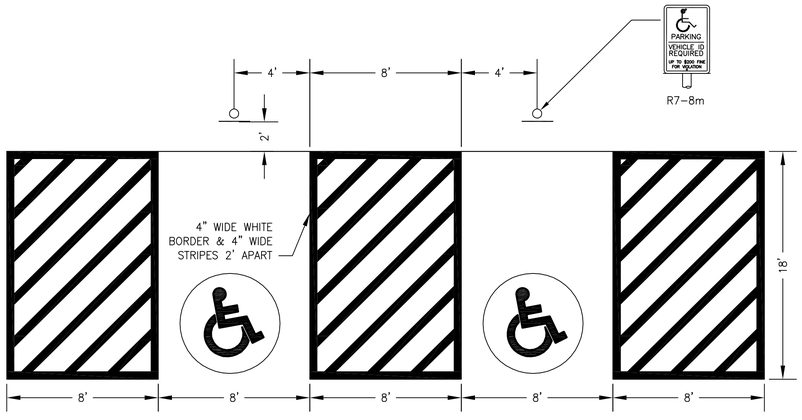


NOTE:
ALL PAVEMENT MARKINGS SHALL BE PAINTED TRAFFIC WHITE.

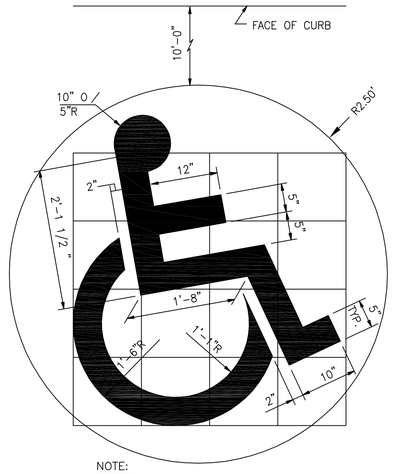
DIRECTIONAL ARROW PAVEMENT MARKING DETAILS
N.T.S.



SIGN INSTALLATION DETAIL
N.T.S.

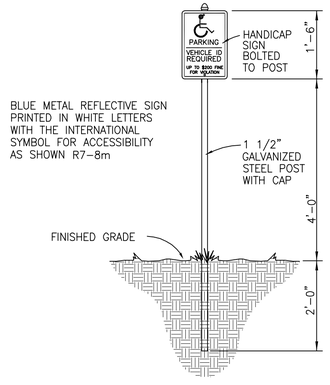


TYPICAL HANDICAP PARKING SPACE DETAIL
N.T.S.



NOTE:
SYMBOL TO BE PAINTED WITH WHITE.
CIRCLE TO BE PAINTED WITH BLUE.

TYPICAL PAVEMENT MARKING FOR HANDICAPPED SYMBOL
N.T.S.



TYPICAL HANDICAP PARKING SIGN
N.T.S.

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
PAVEMENT MARKING & SIGNAGE DETAILS

SHEET NUMBER
C709

BID DOCUMENTS

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SITE ELECTRICAL NOTES

ELECTRICAL NOTES:

GENERAL:
ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE (NFPA 70), THE LIFE SAFETY CODE (NFPA 101), OSHA, STATE AND LOCAL CODES.

ALL MATERIALS USED ON THIS PROJECT SHALL BE NEW, UL APPROVED, UNLESS NOTED OTHERWISE.

ALL CIRCUIT CONDUCTORS SHALL BE COPPER TYPE THHN #10 AWG MINIMUM. ADJUST WIRE SIZE FOR VOLTAGE DROP AS REQUIRED.

ALL BRANCH CIRCUIT WIRING SHALL BE INSTALLED IN SCHEDULE 80 PVC CONDUIT AS INDICATED ON THE DRAWINGS. MINIMUM CONDUIT SIZE SHALL BE 1" TRADE SIZE. CONCRETE EMBEDDED FEEDER CONDUIT SHALL BE CORROSION RESISTANT GALVANIZED IMC OR RIGID METAL CONDUIT WITH THREADED FITTINGS. SET SCREW FITTINGS ARE NOT PERMITTED. EMPTY CONDUIT SHALL BE PROVIDED WITH PULL STRING INSTALLED AND ENDS CAPPED.

PLAN:
COORDINATE INSTALLATION OF NEW 480 V. O.H. ELECTRIC SERVICE W/ MINNESOTA POWER TO MH LOCATION AS SHOWN. PROVIDE ENTRANCE & METER HARDWARE REQUIRED.

PROVIDE CONCRETE BASE FOR MOUNTING PANEL FP ON EMBEDDED GALVANIZED STEEL STRUT. PROVIDE TWO 3" GRS CONNECTIONS TO MANHOLE.

PANEL FP SHALL BE SERVICE ENTRANCE RATED NEMA 4X SS 480/277 V, 3 PHASE, 125A, 42 POLE, WITH COPPER BUS, & BOLT ON PROGRAMMABLE CIRCUIT BREAKERS. SQUARE D TYPE NF POWERLINK G3 OR APPROVED EQUAL (SEE SPECIFICATIONS). PROVIDE A TYPEWRITTEN CIRCUIT DIRECTORY IN STEEL FRAME ON INSIDE OF DOOR.

PROVIDE PHOTOCELL CONTROL MOUNTED AT NORTH SIDE OF NEAREST TICKET BOOTH ROOF. CONNECT TO PANEL FP CONTROLLER.

PROVIDE BRANCH CIRCUIT WIRING TO LIGHT POLES & TICKET DISPENSERS USING #6 WIRE TO FIRST POLE/DISPENSER AND #8 WIRE TO REMAINING POLES ON RUN.

PROVIDE 480 V TO 208 V TRANSFORMER AT PANELBOARD FOR GATE OPERATOR AND TEMPORARY CONNECTIONS FOR EXISTING OUTDOOR LIGHTING.

PROVIDE TWO 2" PVC CONDUIT CONNECTIONS BETWEEN ADJACENT ENTRY/EXIT ISLANDS AND BETWEEN ADJACENT TICKET BOOTHS STUBBED 6" AFG. CONNECT NEAREST TICKET BOOTH TO POWER MH AND TO COMM MH WITH A SINGLE 2" PVC CONDUIT.

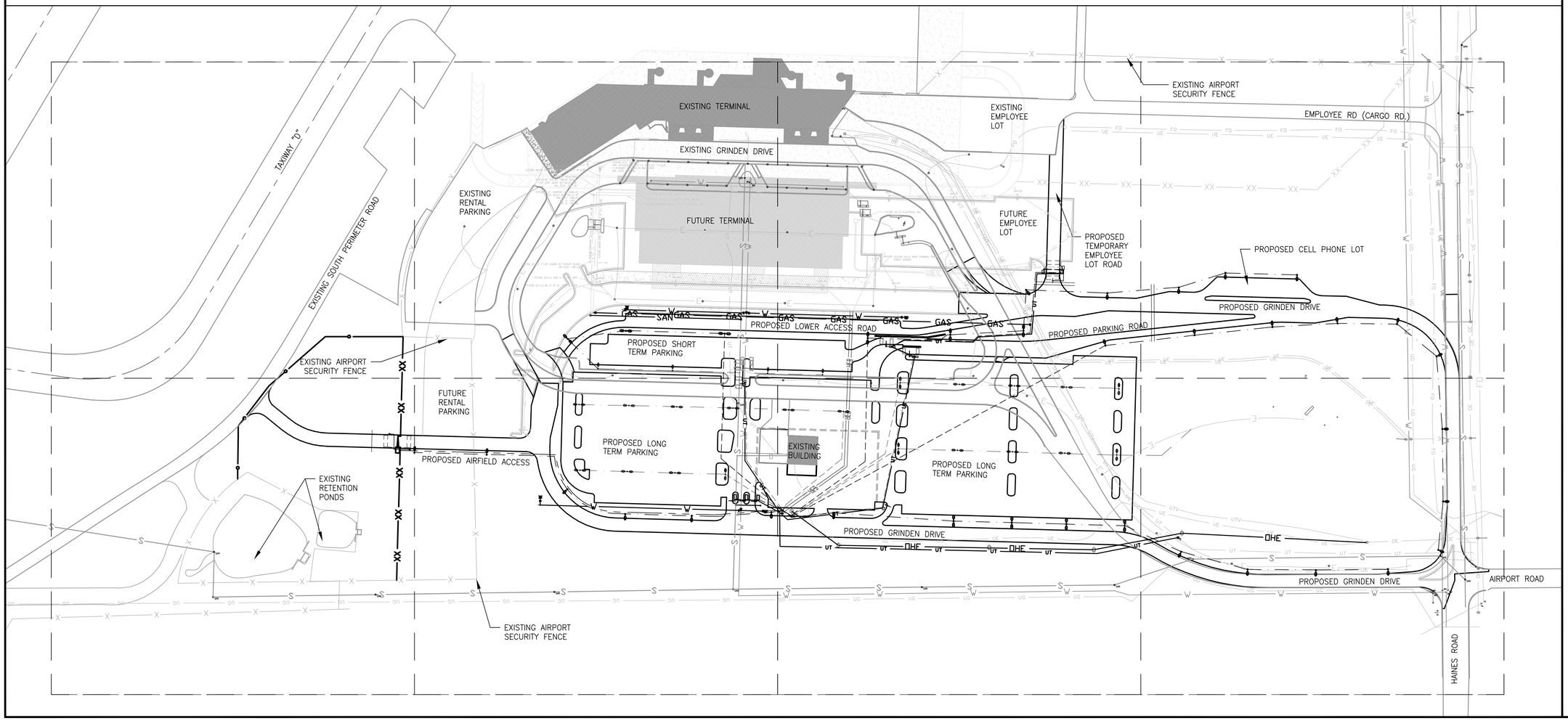
PROVIDE TWO 2" GRS CONDUIT, CONCRETE ENCASED TO NEW AIRFIELD ACCESS ROAD GATE OPERATOR, STUBBED 6" AFG. PROVIDE A 1" PVC CONDUIT CONNECTION BETWEEN THE GATE OPERATOR AND EACH CARD ACCESS STATION.

NORTH

0 100' 200'

NOTE:

1. PRIOR TO DIGGING THE CONTRACTOR SHALL VERIFIY LOCATION OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL. 1-800-252-1166
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO MARK, MAINTAIN, AND REMARK IF NECERSARY, ALL PRIVATE (DAA) OWNED UTILITIES.



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214-1882-093 & 095

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SHEET TITLE
SITE ELECTRICAL & COMM. OVERALL PLAN AND NOTES

SHEET NUMBER
E100

BID DOCUMENTS

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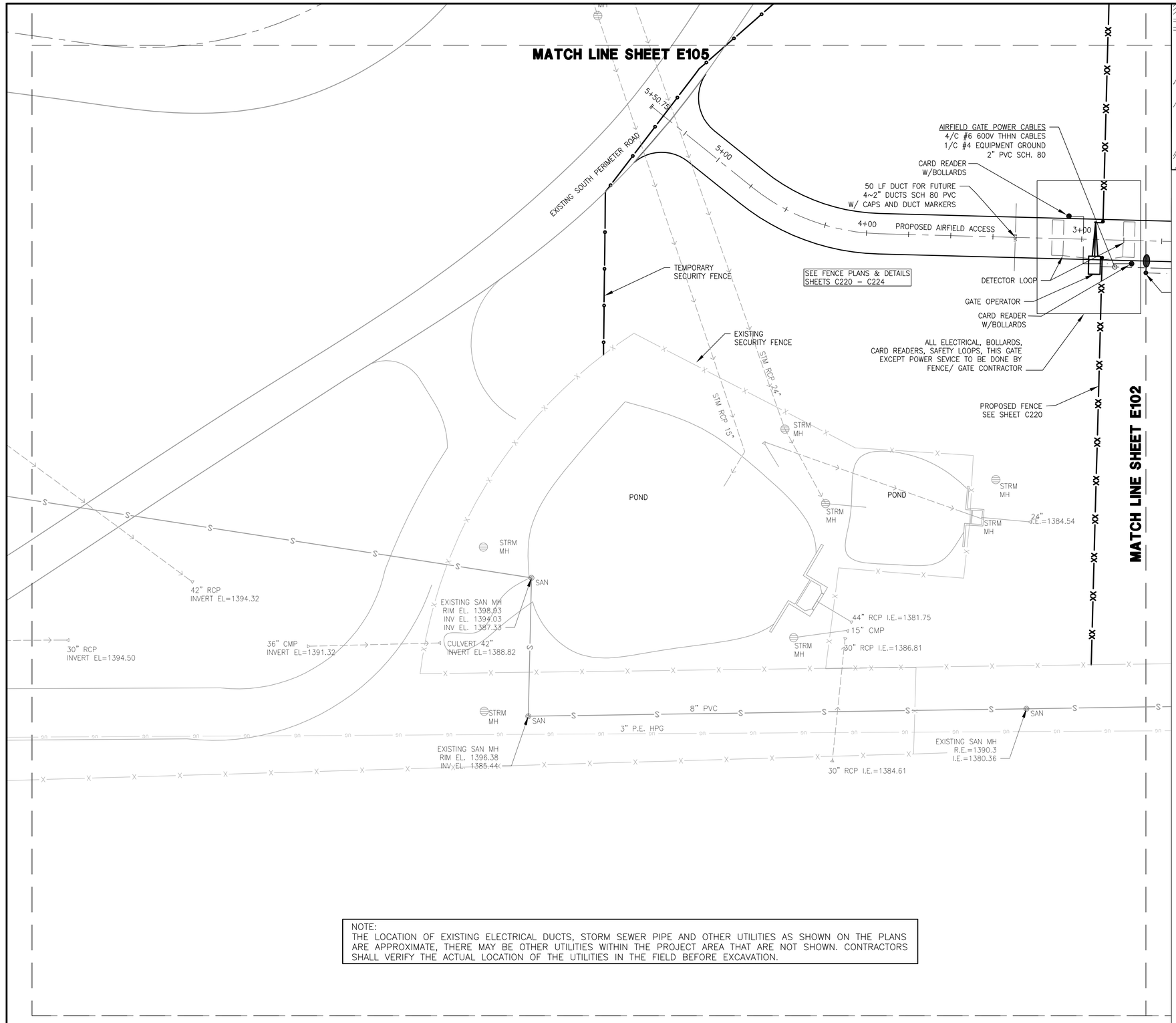
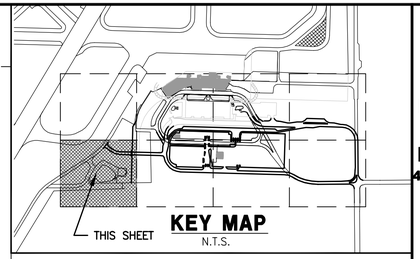


NOTE:
THE LOCATION OF EXISTING ELECTRICAL DUCTS, STORM SEWER PIPE AND OTHER UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE, THERE MAY BE OTHER UTILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. CONTRACTORS SHALL VERIFY THE ACTUAL LOCATION OF THE UTILITIES IN THE FIELD BEFORE EXCAVATION.



KEY MAP
N.T.S.

NORTH

0 30' 60'

NOTE:
ALL NORTHINGS, EASTINGS AND ELEVATIONS LABELED ON THESE PLANS ARE IN:
MINNESOTA STATE PLANE NORTH (1996)
VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

LEGEND

- 2/C #6 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 2/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- UCD — PROPOSED CONDUIT DUCTS
- OHE — PROPOSED OVERHEAD ELECT.
- OE — EXISTING OVERHEAD ELECT.
- EXISTING POWER POLE
- PROPOSED POWER POLE
- PROPOSED ELECT. MANHOLE
- PROPOSED LIGHT POLES
- T PROPOSED PHONE PEDISTAL
- PROPOSED COMM MANHOLE
- UE — EXISITNG UNDERGROUND ELECT.
- E — EXISTING –PRIVATE– ELECT.
- EXISTING LIGHT & POLE
- UT — PROPOSED PHONE CABLES
- UT — EXISTING PHONE CABLES
- UTV — EXISTING CATV CABLES
- FO — EXISTING FIBER OPTIC CABLE
- EXISTING PARKING GATE
- EXISTING ELECT. MANHOLE
- W — PROPOSED WATERMAIN
- W — EXISTING WATERMAIN
- S — EXISTING SANITARY
- SAN — PROPOSED SANITARY
- SAN EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- UG — EXISTING GAS LINE
- GAS — PROPOSED GAS LINE
- EXISTING HYDRANT
- PROPOSED HYDRANT

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: BOA

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

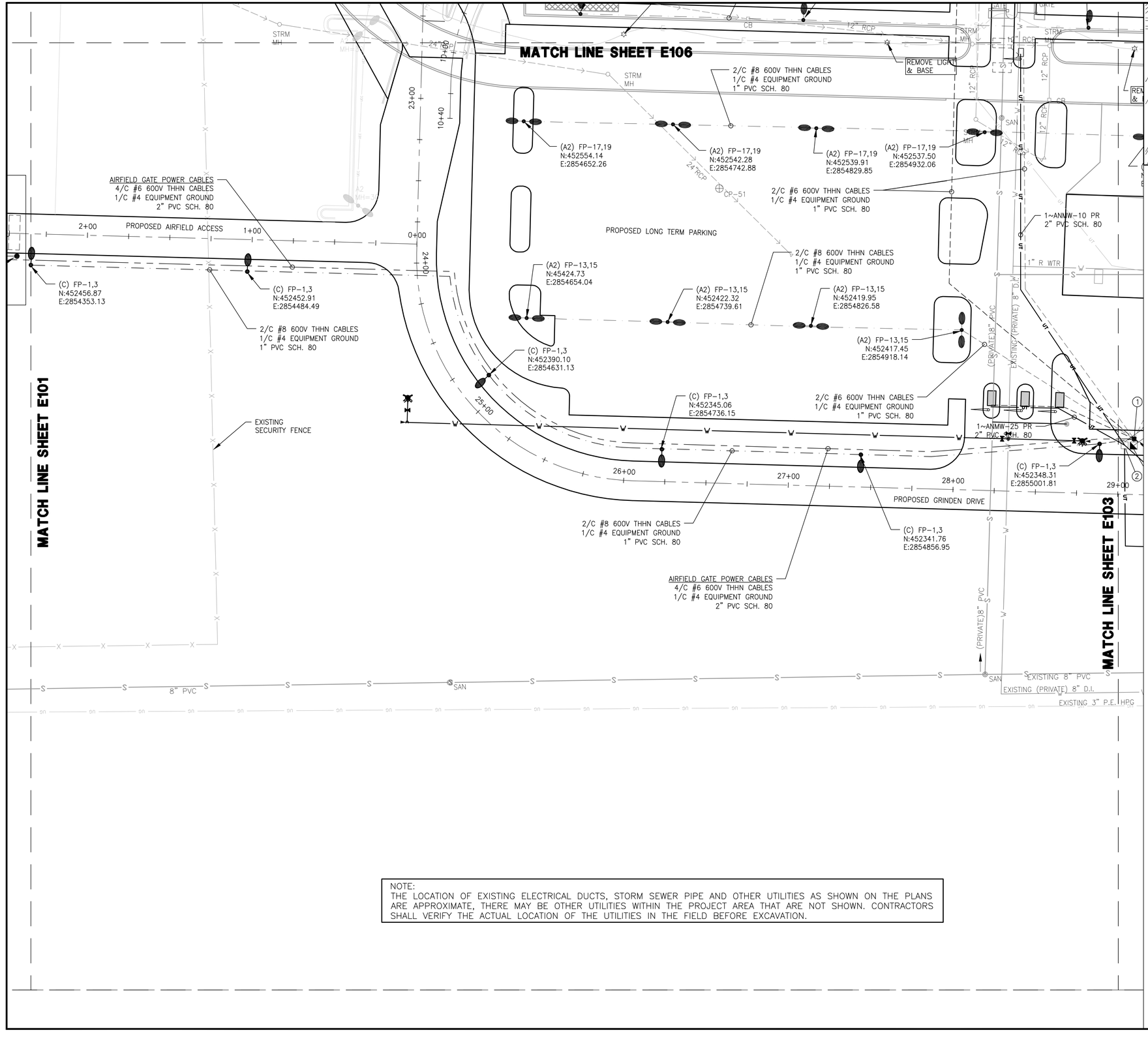
SITE ELECTRICAL PLAN (SHEET 1 OF 8)

SHEET NUMBER

E101

BID DOCUMENTS

I:\P\214882.093 Dal Thornhill Design\CAD\ACAD\ASHEET\E101.dwg, 5/7/2009 2:51:30 PM



NOTE:
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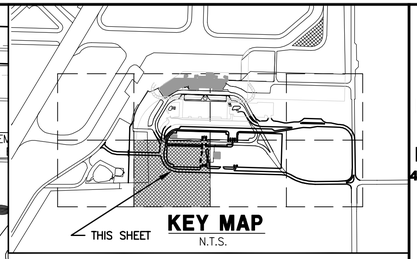

KEY MAP
N.T.S.

NORTH

0 30' 60'

NOTE:
ALL NORTHINGS, EASTINGS AND ELEVATIONS LABELED ON THESE PLANS ARE IN:
MINNESOTA STATE PLANE NORTH (1996)
VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

LEGEND

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REVISIONS

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DESIGNED BY: BOA

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

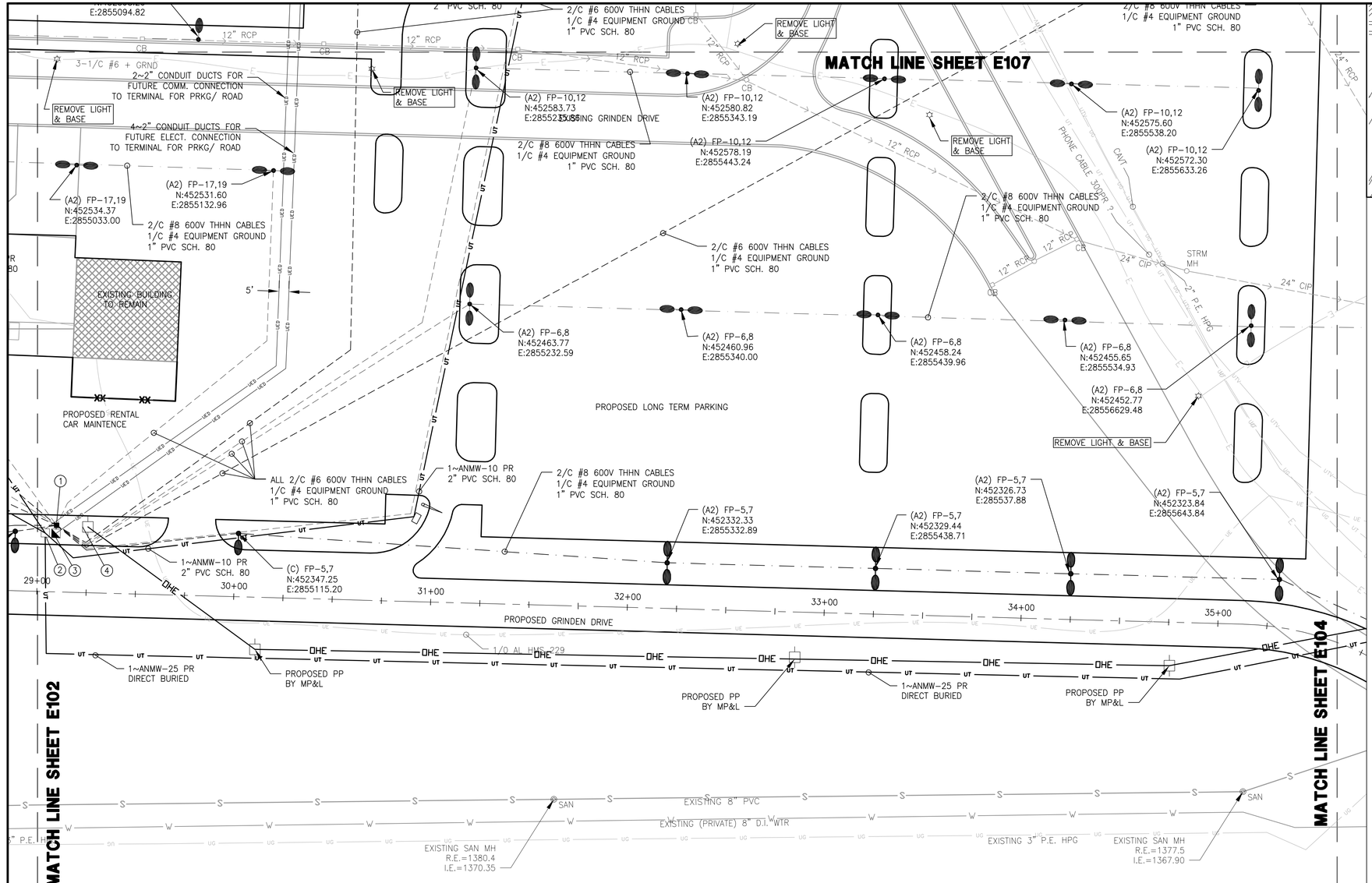
SITE ELECTRICAL PLAN (SHEET 2 OF 8)

SHEET NUMBER

E102

BID DOCUMENTS

T:\P-214188_093.SA1 Terminal Design CMP\CAD\E2\E2045E02.dwg, 5/7/2009 2:53:26 PM



NOTES SITE ELECTRICAL:

1. PANEL FP SHALL BE SERVICE ENTRANCE RATED NEMA 4X SS 480/277 V, 3 PHASE, 125A, 42 POLE, WITH COPPER BUS, & BOLT ON PROGRAMMABLE CIRCUIT BREAKERS. SQUARE D TYPE NF POWERLINK G3 OR APPROVED EQUAL (SEE SPECIFICATIONS). PROVIDE A TYPEWRITTEN CIRCUIT DIRECTORY IN STEEL FRAME ON INSIDE OF DOOR. (LOCATIION N: 452351.34, E: 2855022.80) PROVIDE TWO BOLLARDS (SEE SHEET C224) ON EACH SIDE OF ELECTRICAL SERVICE.
2. NEW HAND HOLES:QUAZITE PG2436HA00, 1 PIECE, 15,000 LBS/25,000LBS LOAD RATED COVER WITH LOGO "COMMUNICATION" AND QUAZITE PG2436BB36 BOX OR EQUAL. (LOCATION N:452347.48, E: 2855017.03)
3. NEW HAND HOLES:QUAZITE PG2436HA00, 1 PIECE, 15,000 LBS/25,000LBS LOAD RATED COVER WITH LOGO "ELECTRIC" AND QUAZITE PG2436BB36 BOX OR EQUAL. (LOCATION N: 452347.25, E: 2855022.50)
4. TEMPORARY 3ϕ SEVICE RISER TO IN ELECTRICAL SERVICE ENTRANCE (SEE NOTE 1).

NOTE:
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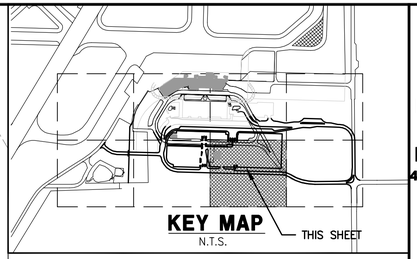

NORTH

0 30' 60'

NOTE:
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VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

LEGEND

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- 4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
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- PROPOSED HYDRANT

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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: BOA

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

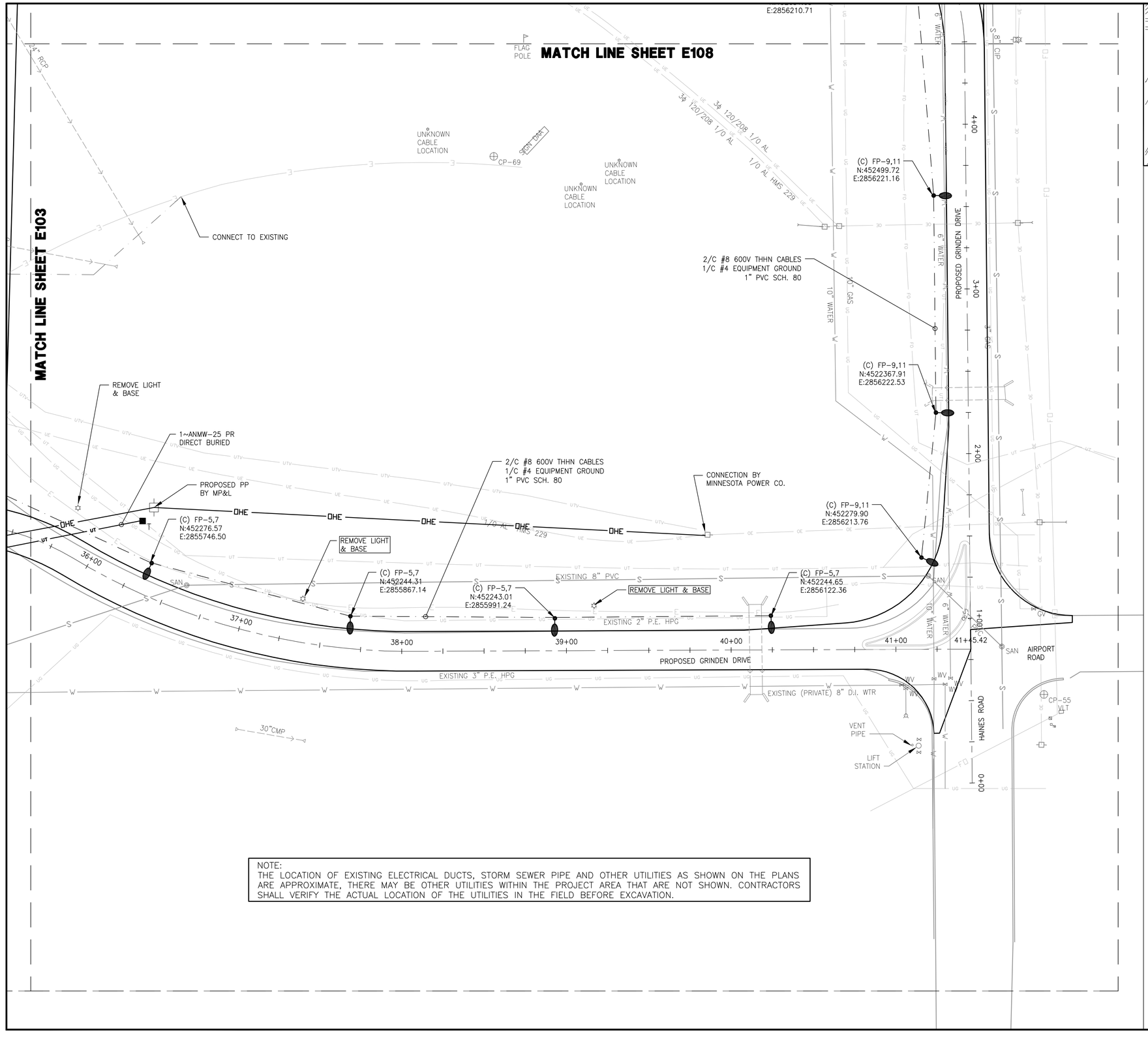
SITE ELECTRICAL PLAN (SHEET 3 OF 8)

SHEET NUMBER

E103

BID DOCUMENTS

T:\214-1882-093 Dal Terminal Design CAE-CAD\C3D\e103.dwg, 5/7/2009 2:58:27 PM



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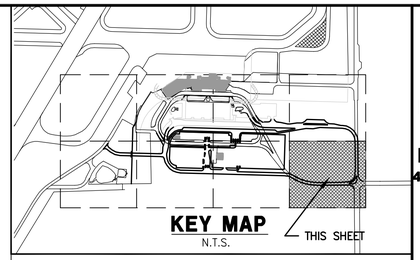

NORTH

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REVISIONS

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DATE ISSUED: 05-11-2009
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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE ELECTRICAL PLAN (SHEET 4 OF 8)

SHEET NUMBER
E104

BID DOCUMENTS

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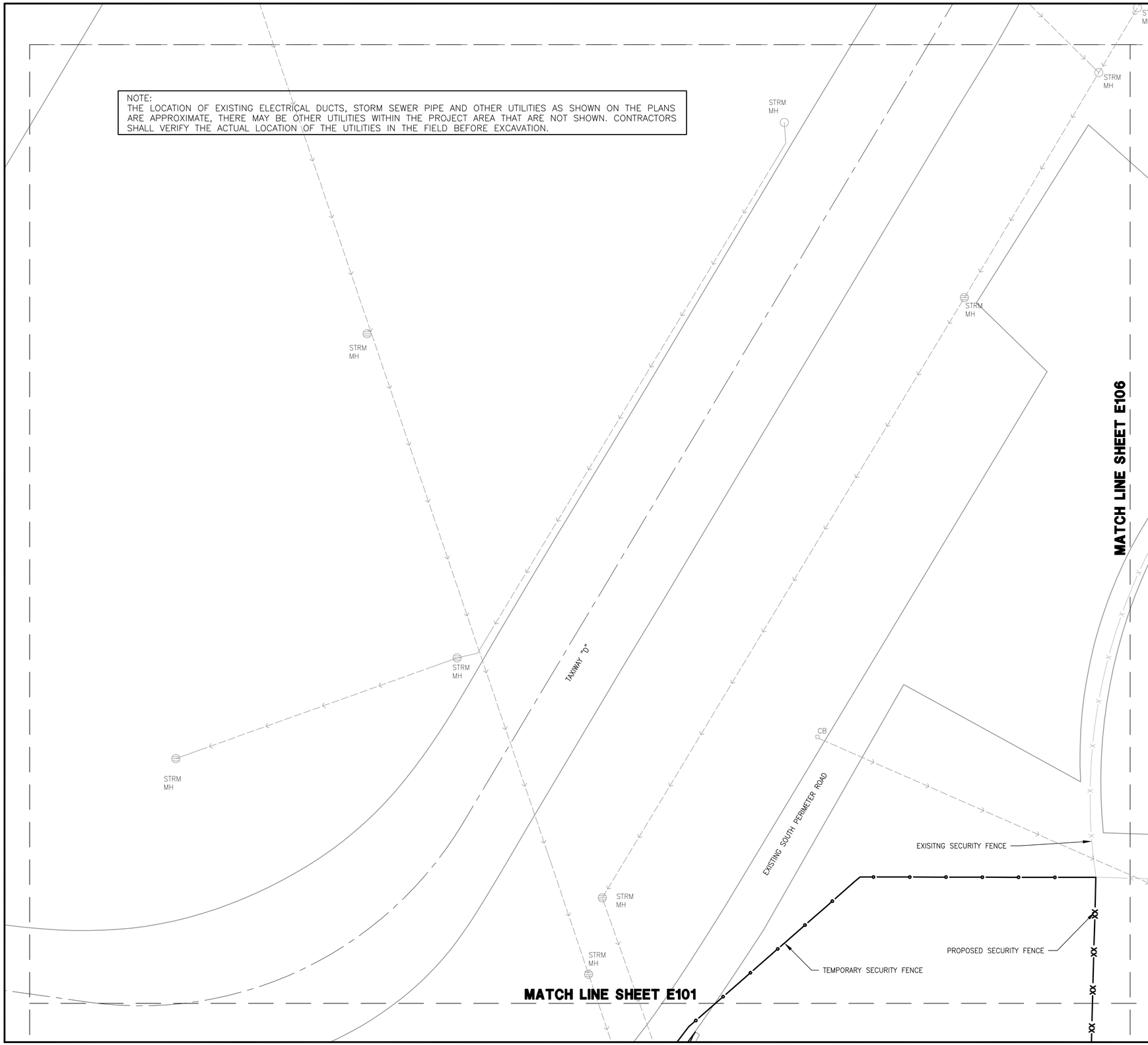
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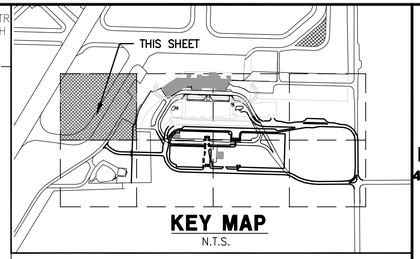

KEY MAP
N.T.S.

NORTH

0 30' 60'

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LEGEND

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- PROPOSED CONDUIT DUCTS
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214-1882-093 & 095

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SHEET TITLE

SITE ELECTRICAL PLAN (SHEET 5 OF 8)

SHEET NUMBER
E105

BID DOCUMENTS

NOTE:
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EXISTING TERMINAL

EXISITNG GRINDEN DRIVE

CONNECTS TO J-BOX IN TUNNEL

CONNECTS TO J-BOX IN TUNNEL

CONNECTS TO J-BOX

GATE

EXISTING RENTAL PARKING

FUTURE (N.I.C) RENTAL PARKING

FUTURE (N.I.C) TERMINAL

FUTURE (N.I.C) GRINDEN DRIVE

PROPOSED LOWER ACCESS ROAD

PROPOSED SHORT TERM PARKING

EXISTING HYDRANT

6" D.I. WTR

3-1/C #6 + GRND
ELECTRIC IN GUARD RAIL

EXISTING (PRIVATE) 8" D.I.

(PRIVATE) 8" PVC

PHONE CABLE

(A2) FP-2,4
N:452663.21
E:2854631.96

(A2) FP-2,4
N:452678.09
E:2854737.35

(B) FP-2,4
N:452609.34
E:2854686.73

2/C #8 600V THHN CABLES
1/C #4 EQUIPMENT GROUND
1" PVC SCH. 80

(B) FP-2,4
N:452673.05
E:2854816.76

(B) FP-2,4
N:452605.64
E:2854821.99

(B) FP-2,4
N:452600.95
E:2854995.05

REMOVE LIGHT & BASE

REMOVE LIGHT & BASE

2/C #8 600V THHN CABLES
1/C #4 EQUIPMENT GROUND

(UNKNOWN FEED ?)
MAY BE ABANDONED CABLE

CP-DLHA

P-53

STRM MH

SAN MH

MH-30

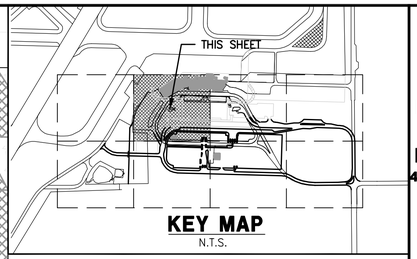
MH-31

MATCH LINE SHEET E105

MATCH LINE SHEET E107

MATCH LINE SHEET E102

20+00 19+00 18+00 21+00 8+00 7+00 6+00 9+00 22+00 10+00



KEY MAP
N.T.S.

NORTH
0 30' 60'

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Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
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AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE ELECTRICAL PLAN (SHEET 6 OF 8)

SHEET NUMBER

E106

BID DOCUMENTS

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NOTE:
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EXISTING TERMINAL BUILDING

EXISTING EMPLOYEE PARKING

EXISTING GRINDEN DRIVE

2" P.E. HPG

X IN

BOX IN

6" D.I. WTR

EXISTING HYDRANT

MATCH LINE SHEET E107

FUTURE (N.I.C.) TERMINAL BUILDING

GATE

GATE

GATE

FUTURE (N.I.C) ELECTRICAL MH

3-1/C #6 + GRND

ELECTRIC IN GUARD RAIL

FUTURE (N.I.C) MAIN TERMINAL POWER DIRECT BURIED

FUTURE EMPLOYEE PARKING

PHONE CABLE 300PR

CATV

2" P.E. HPG

EXITING TERMINAL POWER (MP&L)

FUTURE SECURITY FENCE

MATCH LINE SHEET E108

PROPOSED TEMPORARY EMPLOYEE LOT ROAD

DETECTOR LOOPS

GATE OPERATOR

CARD READER W/ BOLLARDS

DUCT 75 LF FOR COMM, FO 2~2" SCH 80 PVC W/ END CAPS & MARKERS

DUCT 75 LF FOR POWR 2~4" SCH 80 PVC W/ END CAPS & MARKERS

(C) FP-14,16
N:452752.55
E:2855464.71

(C) FP-14,16
N:452746.40
E:2855612.26

NOTES SITE ELECTRICAL:

1. NEW HAND HOLES:QUAZITE PG2436HA00, 1 PIECE, 15,000 LBS/25,000LBS LOAD RATED COVER WITH LOGO "COMMUNICATION" AND QUAZITE PG2436BB36 BOX OR EQUAL. (LOCATION N:452347.48, E: 2855017.03)
2. NEW HAND HOLES:QUAZITE PG2436HA00, 1 PIECE, 15,000 LBS/25,000LBS LOAD RATED COVER WITH LOGO "ELECTRIC" AND QUAZITE PG2436BB36 BOX OR EQUAL. (LOCATION N: 452347.25, E: 2855022.50)

FUTURE (N.I.C.) GRINDEN DRIVE

2~2" CONDUIT DUCTS FOR FUTURE COMM. CONNECTION TO TERMINAL FOR PRKG/ ROAD

4~2" CONDUIT DUCTS FOR FUTURE ELECT. CONNECTION TO TERMINAL FOR PRKG/ ROAD

2/C #8 600V THHN CABLES
1/C #4 EQUIPMENT GROUND
1" PVC SCH. 80

REMOVE LIGHT & BASE

1~ANMW-10 PR
2" PVC SCH. 80

PROPOSED GRINDEN DRIVE

(A2) FP-14,16
N:452659.95
E:2855459.95

2/C #6 600V THHN CABLES
1/C #4 EQUIPMENT GROUND
1" PVC SCH. 80

(C) FP-9,11
N:452651.40
E:2855608.78

(A2) FP-14,16
N:452664.81
E:2855176.86

PROPOSED LOWER ACCESS ROAD

DETECTOR LOOPS

(A2) FP-14,16
N:452671.03
E:2855326.98

1~ANMW-10 PR
2" PVC SCH. 80

2/C #6 600V THHN CABLES
1/C #4 EQUIPMENT GROUND
1" PVC SCH. 80

PROPOSED PARKING ROAD

PROPOSED SHORT TERM PARKING

(B) FP-2,4
N:452598.20
E:2855094.82

PROPOSED LONG TERM PARKING

REMOVE LIGHT & BASE

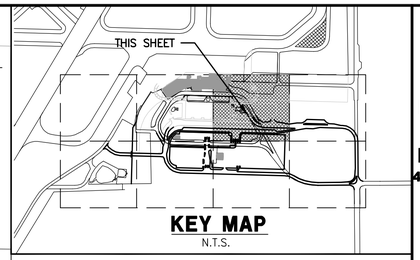
2/C #8 600V THHN CABLES
1/C #4 EQUIPMENT GROUND
1" PVC SCH. 80

MATCH LINE SHEET E103

3-1/C #6 + GRND

2~2" CONDUIT DUCTS FOR FUTURE COMM. CONNECTION TO TERMINAL FOR PRKG/ ROAD

REMOVE LIGHT



KEY MAP
N.T.S.

NORTH

0 30' 60'

NOTE:
ALL NORTHINGS, EASTINGS AND ELEVATIONS LABELED ON THESE PLANS ARE IN:
MINNESOTA STATE PLANE NORTH (1996)
VERTICAL DATUM IS NAVD 88
HORIZONTAL DATUM IS NAD83

LEGEND

- 2/C #6 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 2/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- PROPOSED CONDUIT DUCTS
- PROPOSED OVERHEAD ELECT.
- EXISTING OVERHEAD ELECT.
- EXISTING POWER POLE
- PROPOSED POWER POLE
- PROPOSED ELECT. MANHOLE
- PROPOSED LIGHT POLES
- PROPOSED PHONE PEDISTAL
- PROPOSED COMM MANHOLE
- EXISITNG UNDERGROUND ELECT.
- EXISTING –PRIVATE– ELECT.
- EXISTING LIGHT & POLE
- PROPOSED PHONE CABLES
- EXISTING PHONE CABLES
- EXISTING CATV CABLES
- EXISTING FIBER OPTIC CABLE
- EXISTING PARKING GATE
- EXISTING ELECT. MANHOLE
- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- EXISTING SANITARY
- PROPOSED SANITARY
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING GAS LINE
- PROPOSED GAS LINE
- EXISTING HYDRANT
- PROPOSED HYDRANT

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www.rsandh.com

DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: BOA

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

SITE ELECTRICAL PLAN (SHEET 7 OF 8)

SHEET NUMBER
E107

BID DOCUMENTS

T:\P-2141882.093 Dsn\Terminal Design CivilCAD\CADdata\E107.dwg, 5/7/2009 3:50:26 PM

NOTE:
THE LOCATION OF EXISTING ELECTRICAL DUCTS, STORM SEWER PIPE AND OTHER UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE, THERE MAY BE OTHER UTILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. CONTRACTORS SHALL VERIFY THE ACTUAL LOCATION OF THE UTILITIES IN THE FIELD BEFORE EXCAVATION.

MATCH LINE SHEET E107

EMPLOYEE ROAD (CARGO RD)

FIBER OPTIC

ABANDONED PRIMARY UG

12" CMP

CP-68

8" CIP

EXISTING SAN MH
R.E.=1379.40
I.E. N=1369.35
I.E. SE=1369.30

SAN

3" GAS

HAINES ROAD

DUCT 105 LF FOR COMM, FO
2~2" SCH 80 PVC
W/ END CAPS & MARKERS

DUCT 105 LF FOR POWR ,
2~4" SCH 80 PVC
W/ END CAPS & MARKERS

2/C #8 600V THHN CABLES
1/C #4 EQUIPMENT GROUND
1" PVC SCH. 80

(C) FP-14,16
N:452783.27
E:2855826.96

(C) FP-14,16
N:452779.72
E:2855957.09

(C) FP-14,16
N:452756.77
E:2855742.20

PROPOSED CELL PHONE LOT

PROPOSED GRINDEN DRIVE

PROPOSED PARKING ROAD

10+00 9+00 8+00 7+00 6+00 5+00 4+00 3+00 2+00 1+00 0+00

5'

(C) FP-9,11
N:452670.18
E:2855770.92

(C) FP-9,11
N:452685.06
E:2855912.24

(C) FP-9,11
N:452691.61
E:2856030.55

(C) FP-9,11
N:452690.46
E:2856138.81

2/C #8 600V THHN CABLES
1/C #4 EQUIPMENT GROUND
1" PVC SCH. 80

(C) FP-9,11
N:452631.65
E:2856210.71

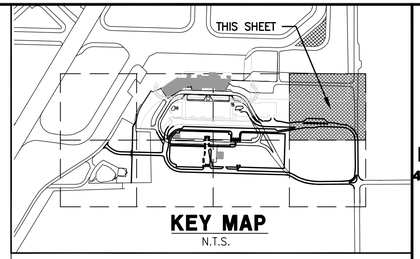
6" WATER

8" CIP

24" RCP

FLAG POLE

MATCH LINE SHEET E104



KEY MAP
N.T.S.

NORTH

0 30' 60'

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- 4/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- 2/C #8 THHN 600V, 1/C #4 GRD. IN CONDUIT
- UCD — PROPOSED CONDUIT DUCTS
- OHE — PROPOSED OVERHEAD ELECT.
- OE — EXISTING OVERHEAD ELECT.
- EXISTING POWER POLE
- PROPOSED POWER POLE
- PROPOSED ELECT. MANHOLE
- PROPOSED LIGHT POLES
- PROPOSED PHONE PEDISTAL
- PROPOSED COMM MANHOLE
- UE — EXISITNG UNDERGROUND ELECT.
- E — EXISTING –PRIVATE– ELECT.
- EXISTING LIGHT & POLE
- UT — PROPOSED PHONE CABLES
- UT — EXISTING PHONE CABLES
- UTV — EXISTING CATV CABLES
- FO — EXISTING FIBER OPTIC CABLE
- EXISTING PARKING GATE
- EXISTING ELECT. MANHOLE
- W — PROPOSED WATERMAIN
- W — EXISTING WATERMAIN
- S — EXISTING SANITARY
- SAN — PROPOSED SANITARY
- SAN — EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- UG — EXISTING GAS LINE
- GAS — PROPOSED GAS LINE
- EXISTING HYDRANT
- PROPOSED HYDRANT

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Signature John E. Hippchen
Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: BOA

AEP PROJECT NUMBER
214-1882-093 & 095

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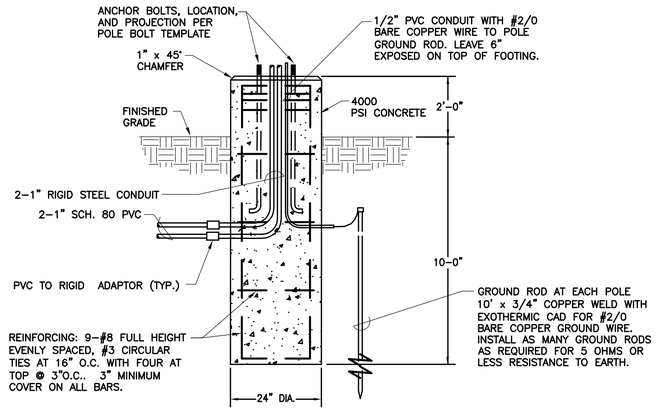
SHEET TITLE

SITE ELECTRICAL PLAN (SHEET 8 OF 8)

SHEET NUMBER
E108

BID DOCUMENTS

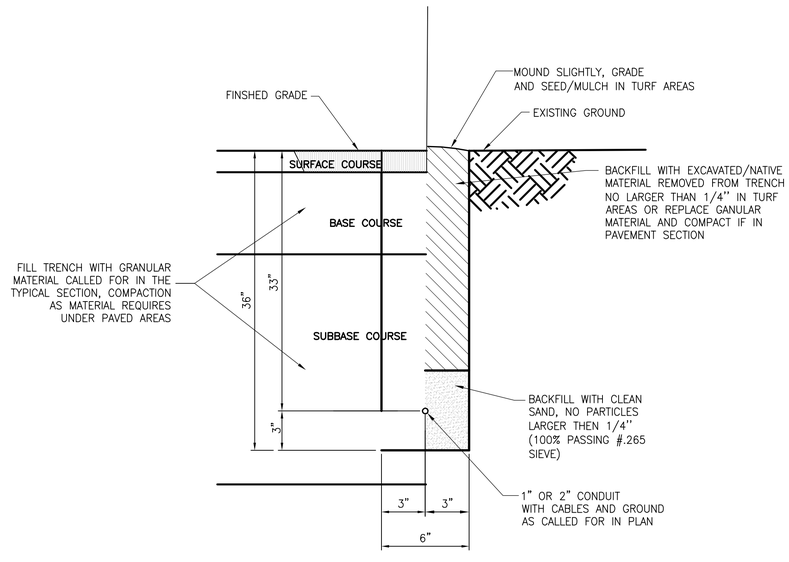
EP:214-1882-093 SUA Terminal Design CAE/CAD/CAM/E108.dwg, 5/7/2009 3:04:08 PM



1 30' LIGHT POLE FOUNDATION DETAIL
N.T.S.

LIGHTING FIXTURE SCHEDULE NOTES:

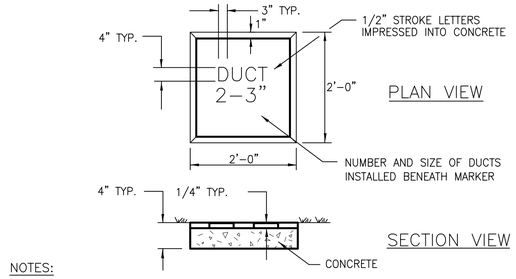
1. THE LIGHTING FIXTURE SCHEDULE AND CATALOG NUMBERS INDICATE MAJOR REQUIREMENTS FOR THE LIGHTING FIXTURES. WHETHER SPECIFIED BY THE CATALOG NUMBERS OR NOT THE CONTRACTOR SHALL PROVIDE ALL COMPONENTS, HARDWARE AND RELATED ITEMS TO PROVIDE A COMPLETE LIGHTING FIXTURE TO MEET THE REQUIREMENTS AS SPECIFIED IN THE DRAWINGS AND SPECIFICATIONS.
2. WHERE APPROVED EQUAL OR SINGLE MANUFACTURER FIXTURE IS INDICATED, THE CONTRACTOR MAY SUBMIT A FIXTURE WHICH IS EQUAL OR BETTER TO THE A/E FOR SHOP DRAWING APPROVAL. THE A/E'S DETERMINATION FOR APPROVED EQUAL SHALL GOVERN. PROVIDE A COMPLETE DETAIL OF THE EQUAL FIXTURE WITH A COMPARISON TO THE SPECIFIED FIXTURE. PHOTOMETRIC (POINT-TO-POINT) LAYOUT OF LIGHTED AREA SHALL ALSO BE PROVIDED BY THE CONTRACTOR FROM THE MANUFACTURER.
3. PROVIDE COLD WEATHER BALLASTS FOR FIXTURES LOCATED OUTSIDE.
4. PROVIDE ANCHOR BOLTS. DIAMETER AND LENGTH AS REQUIRED TO MEET EPA (90 MPH) WIND REQUIREMENTS.



2 CABLE / CONDUIT TRENCH DETAIL
N.T.S.

NTS

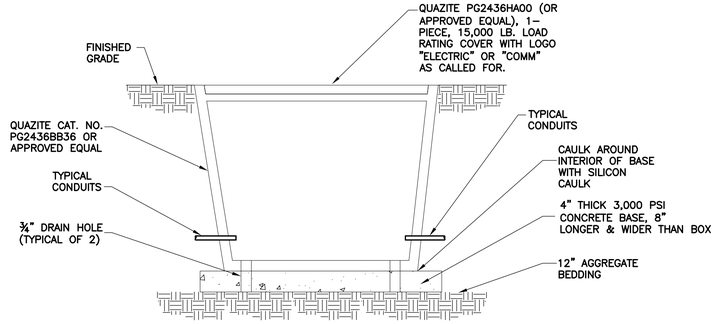
NOTE:
FOR MULTIPLE CABLE CONDUIT TRENCHES, CONDUITS SHALL BE SEPERATED 2" MIN WIDEN TRENCH ACCORDINGLY.



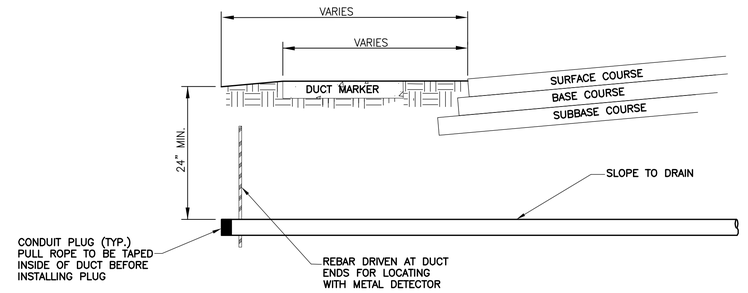
NOTES:

1. CONTRACTOR SHALL INSTALL NEW DUCT MARKERS WITH APPROPRIATE INFORMATION 5' OFF EDGE AND ON BOTH SIDES OF PAVEMENT WHEN EXISTING DUCT IS DISCOVERED OR NEW DUCT IS INSTALLED UNDER PAVEMENT.
2. EDGE EXPOSED CONCRETE WITH A "1/4" RADIUS TOOL.

3 DUCT MARKER DETAIL IN TURF
N.T.S.



4 ELECTRICAL HANDHOLE (IN TURF) DETAIL
N.T.S.



5 ELECTRICAL DUCT DETAIL
N.T.S.

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: BOA

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
ELECTRICAL NOTES AND DETAILS

SHEET NUMBER
E400

BID DOCUMENTS

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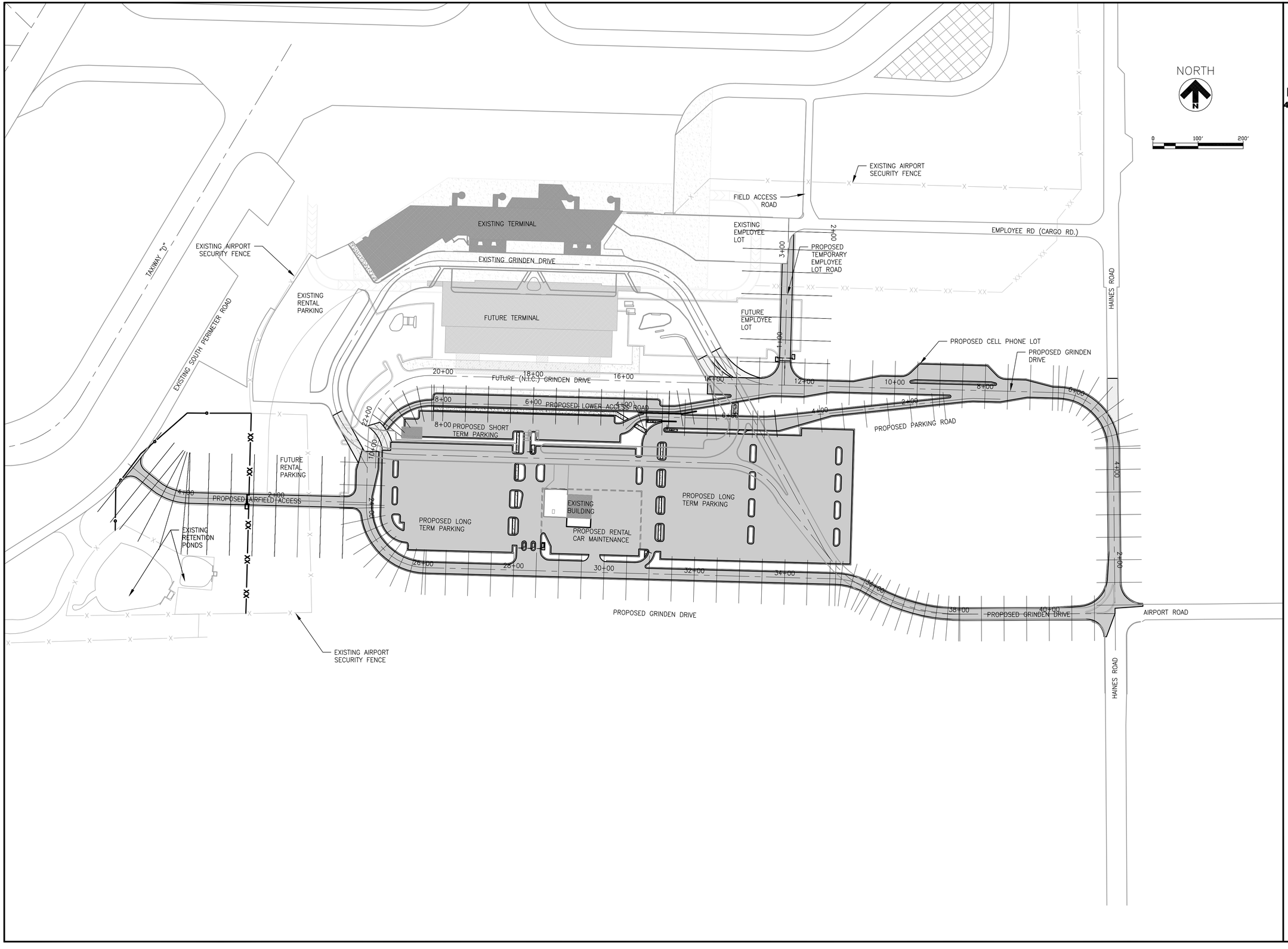

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214-1882-093 & 095

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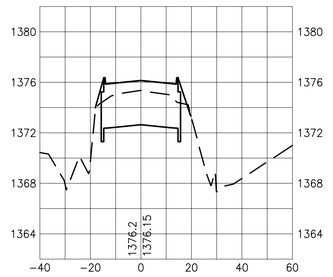
SHEET TITLE

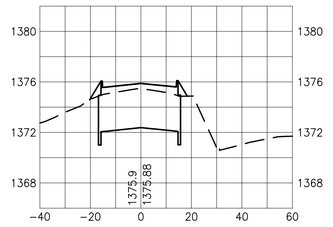
CROSS SECTION KEY

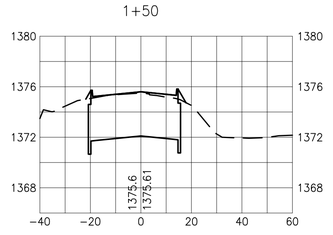
SHEET NUMBER

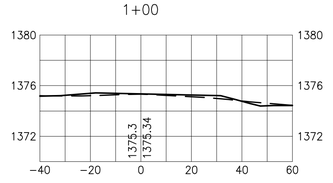
CX01

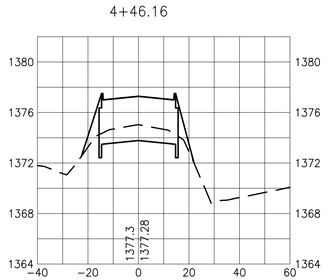
BID DOCUMENTS

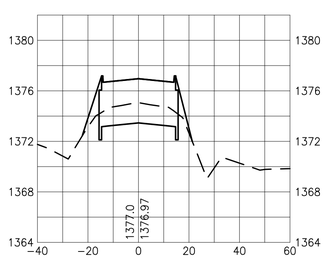


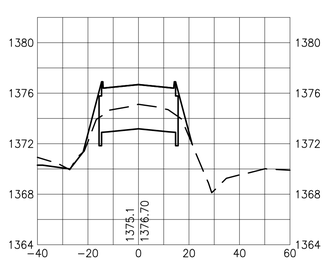


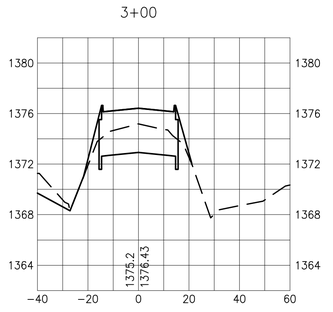


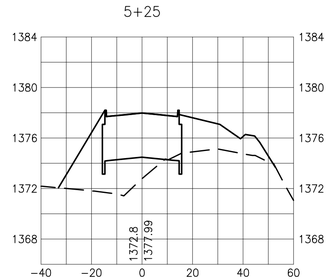


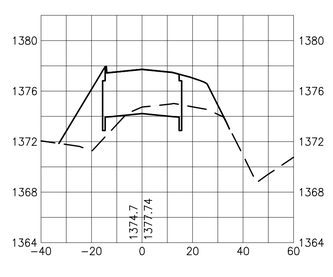


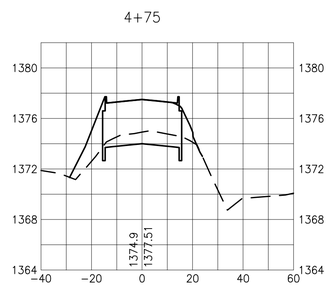


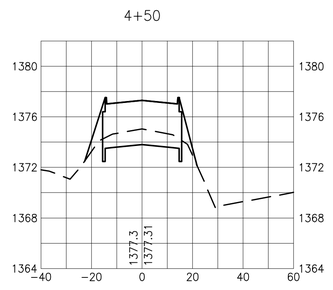


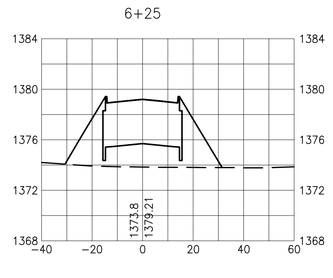


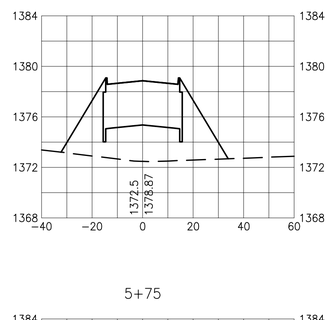


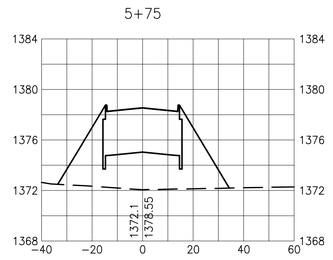


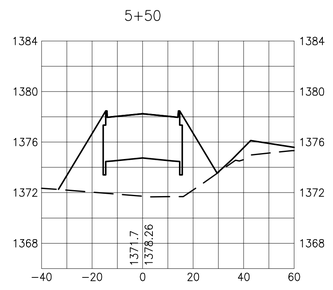


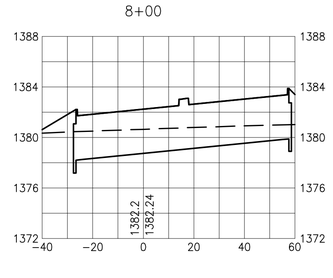


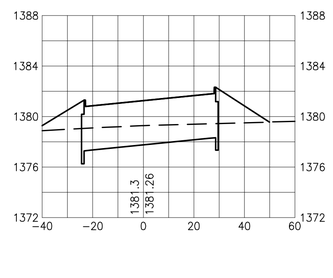


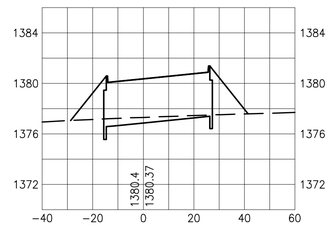


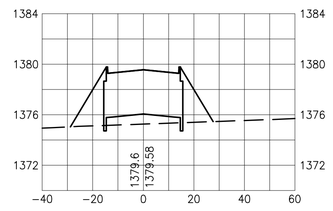


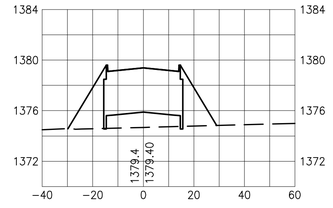












HORIZ. SCALE: 1"= 30'

30' 15' 0 30'

VERT. SCALE: 1"= 6'

6' 3' 0 6'

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214-1882-093 & 095

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SHEET TITLE
CROSS SECTIONS GRINDEN DRIVE STA: 1+00 TO STA: 8+00

SHEET NUMBER
CX02

BID DOCUMENTS

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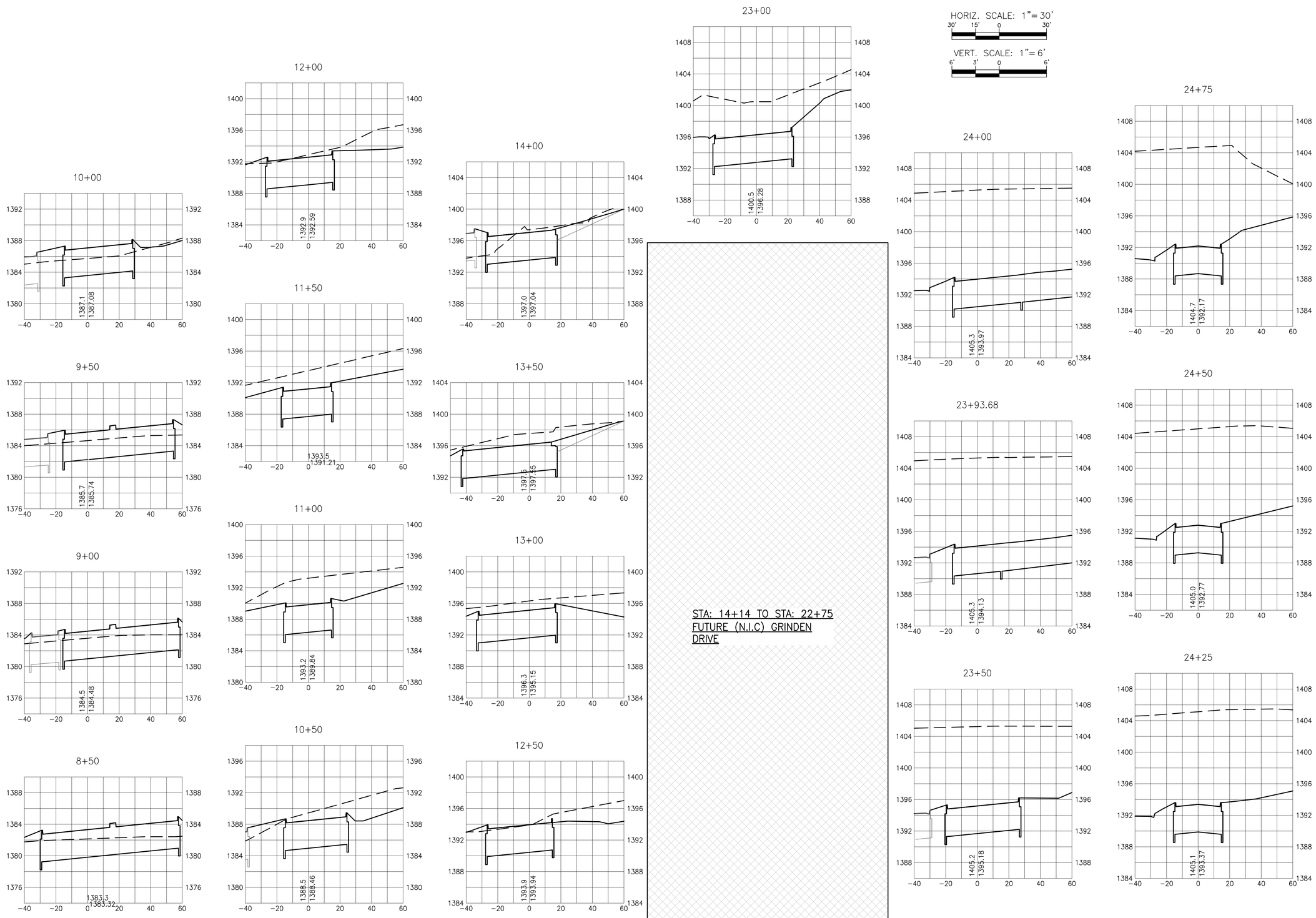

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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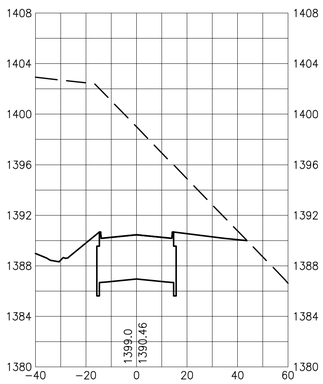
SHEET TITLE

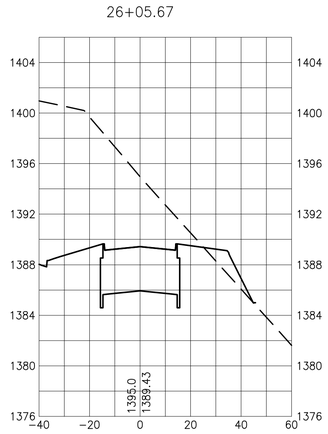
CROSS SECTIONS GRINDEN DRIVE STA: 8+50 TO STA: 24+75

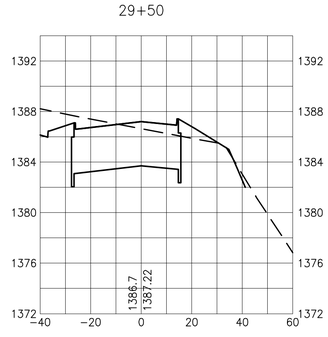
SHEET NUMBER

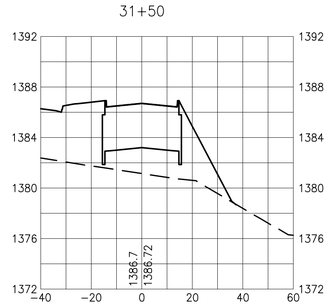
CX03

BID DOCUMENTS









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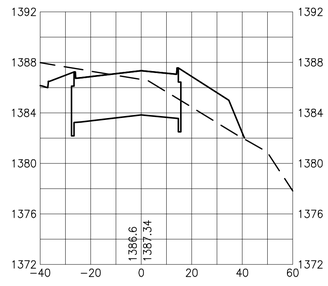
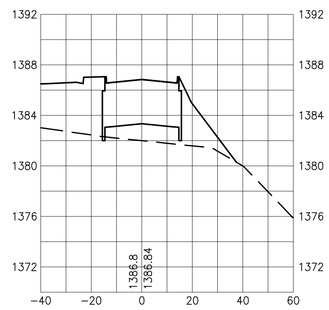
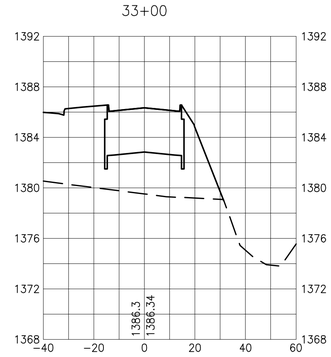
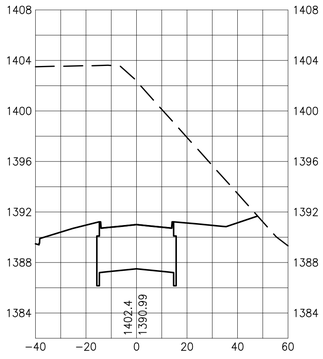
VERT. SCALE: 1"= 6'

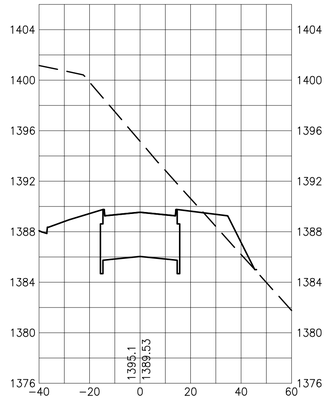
6' 3' 0 6'

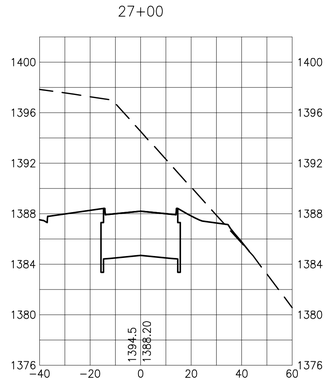


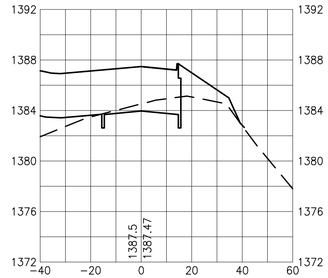


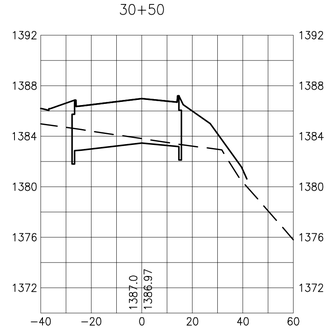


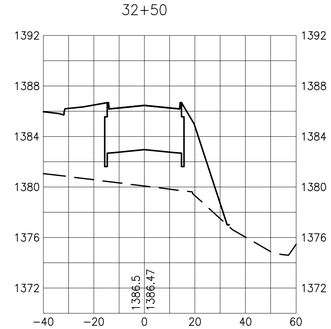


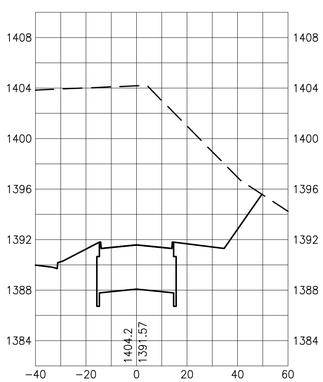


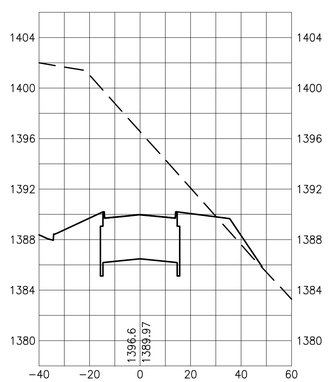


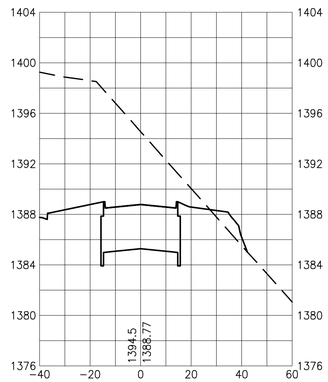


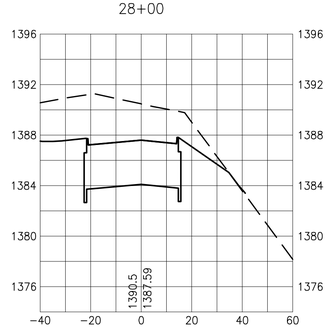


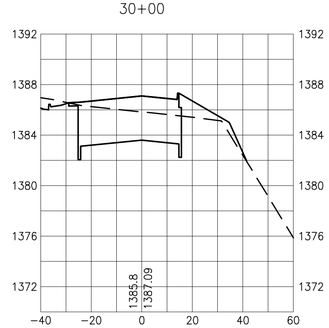


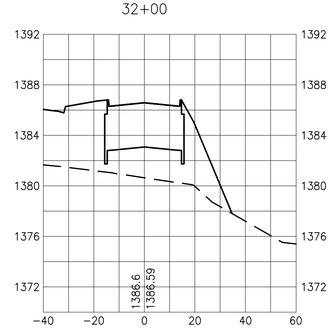












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Signature

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

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DATE ISSUED: 05-11-2009
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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER

214-1882-093 & 095

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SHEET TITLE

CROSS SECTIONS GRINDEN DRIVE STA: 24+75 TO STA: 33+00

SHEET NUMBER

CX04

BID DOCUMENTS

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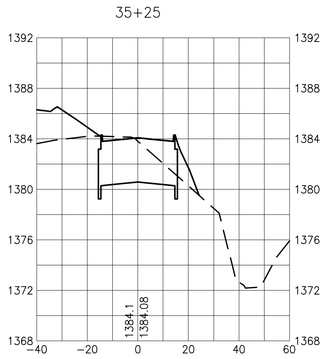
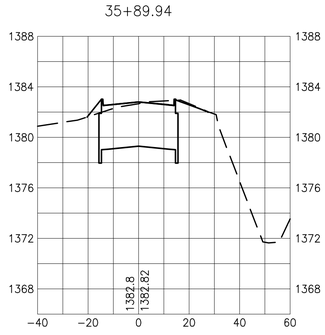
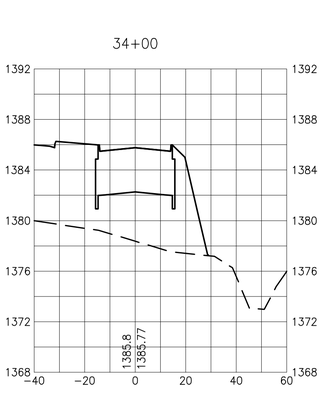
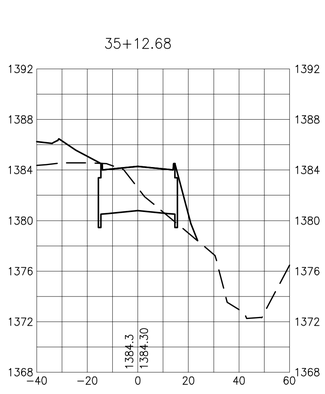
VERT. SCALE: 1"= 6'

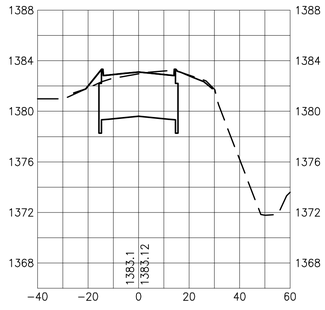
6' 3' 0 6'

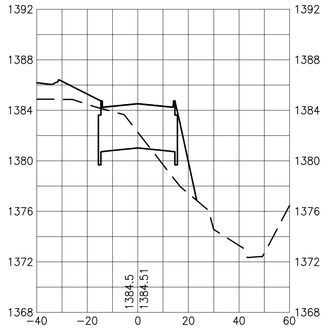


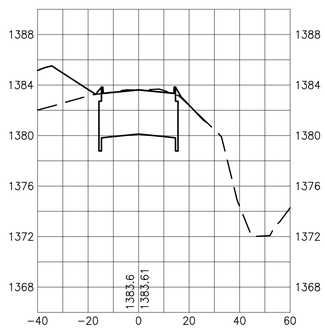


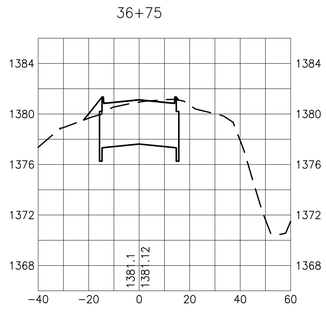


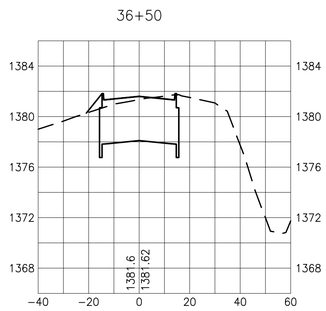


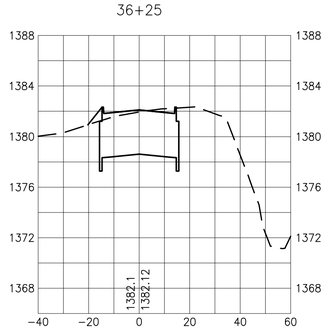


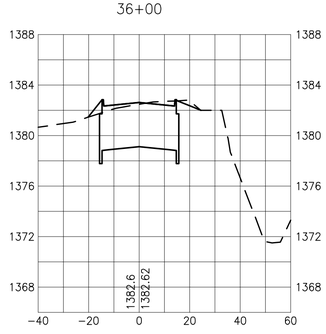


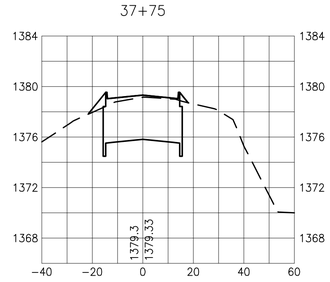


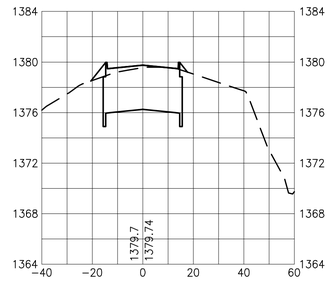


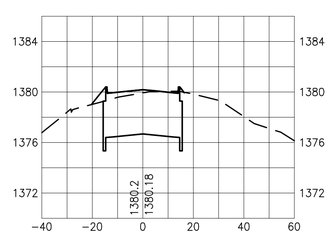


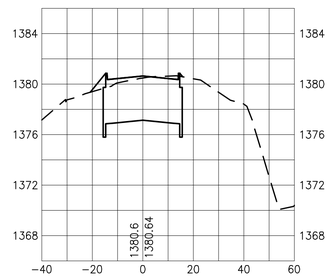


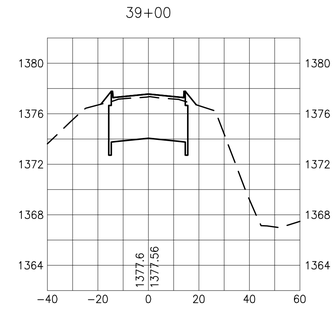


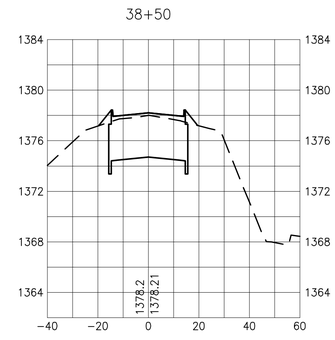


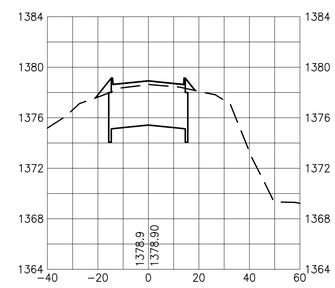


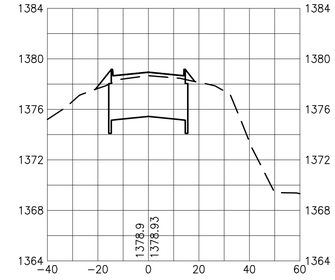












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REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

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Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

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DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER

214-1882-093 & 095

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SHEET TITLE

CROSS SECTIONS GRINDEN DRIVE STA: 33+50 TO STA: 39+00

SHEET NUMBER

CX05

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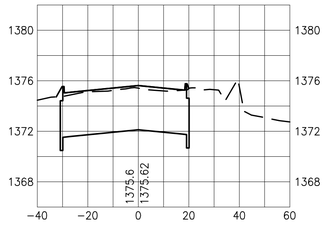

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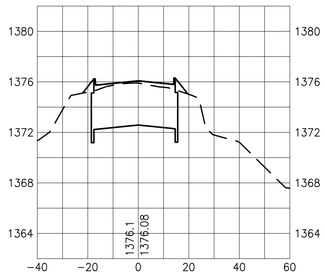

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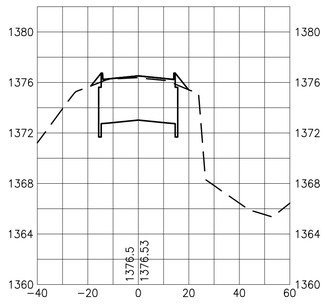

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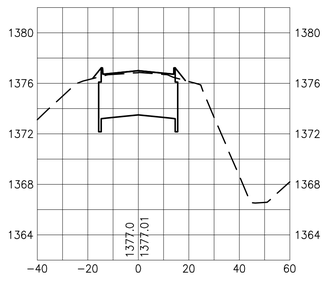

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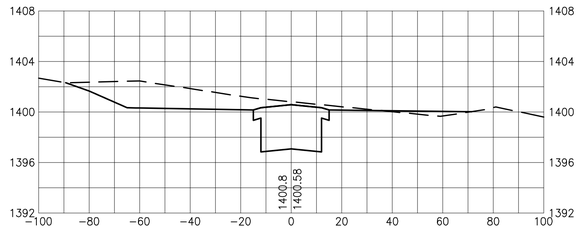

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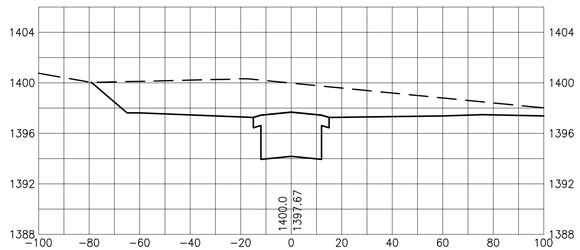

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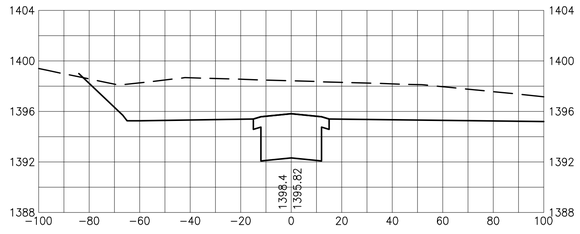

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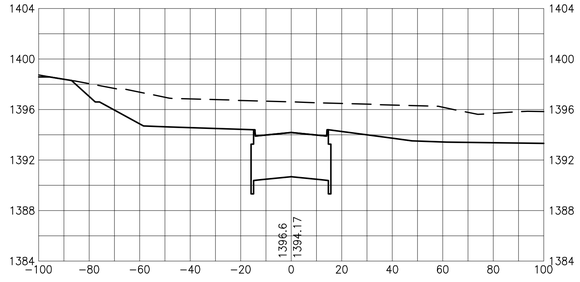

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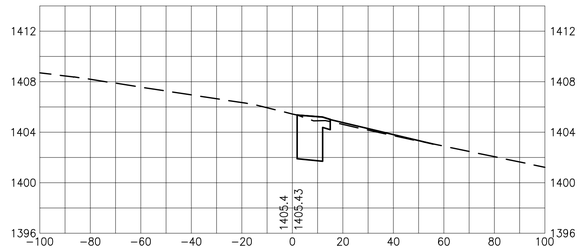

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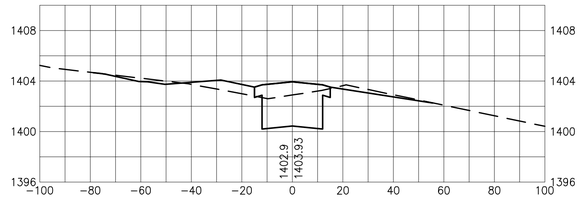

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Typed Name JOHN E. HIPPCHEN
Date 05/07/2009 Reg. No. 22088

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NO.	DESCRIPTION	DATE

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REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE
CROSS SECTIONS GRINDEN DRIVE STA: 39+00 - 41+00 EMPLOYEE ROAD STA: 0+50 - 3+00

SHEET NUMBER
CX06

BID DOCUMENTS

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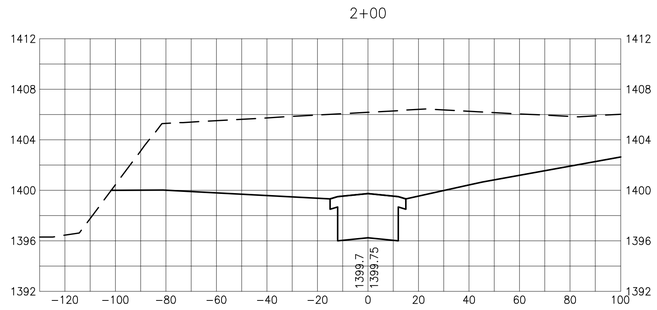

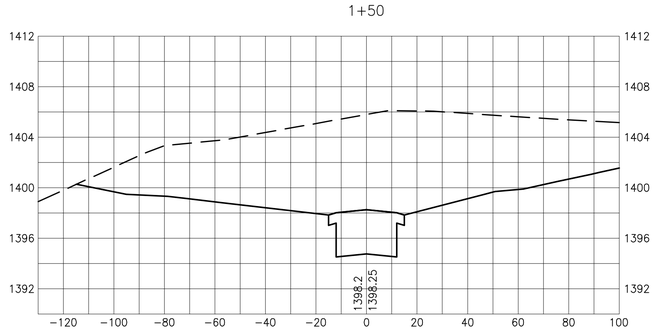

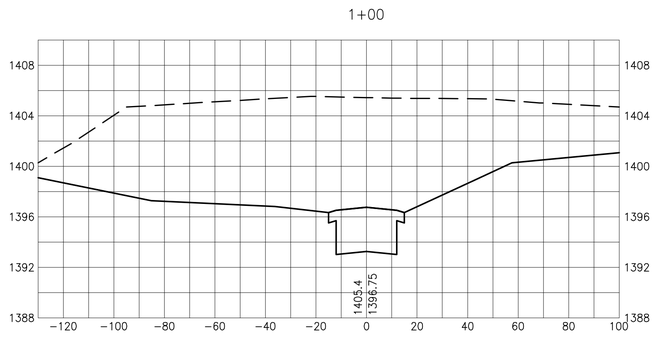

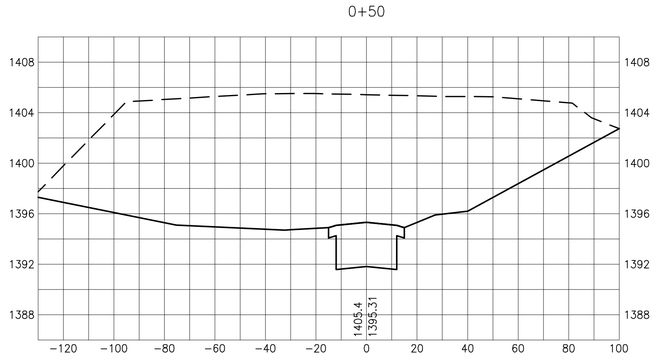

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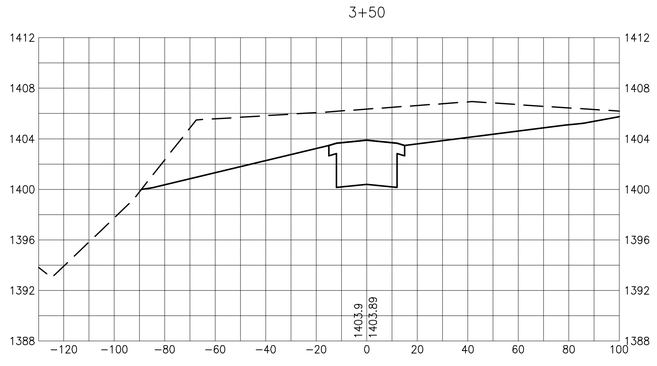
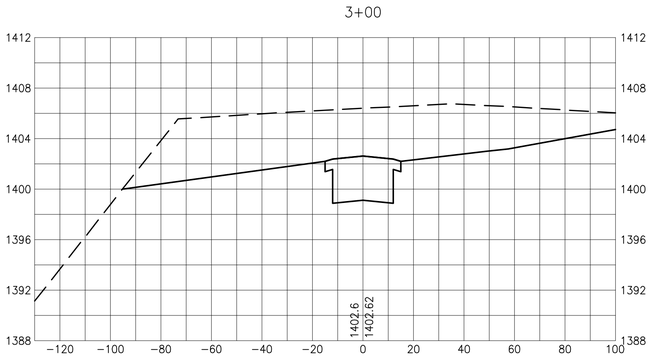
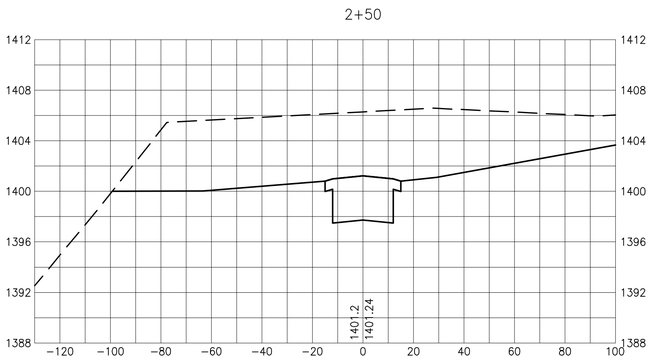
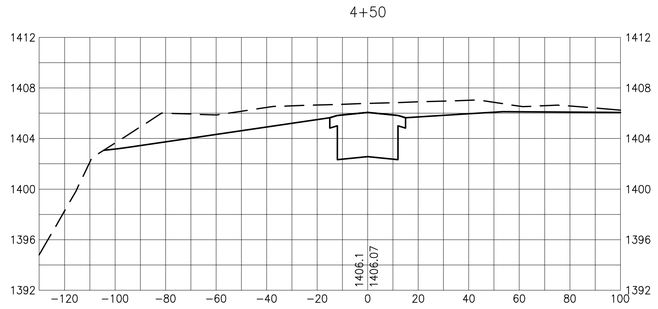
VERT. SCALE: 1"= 6'

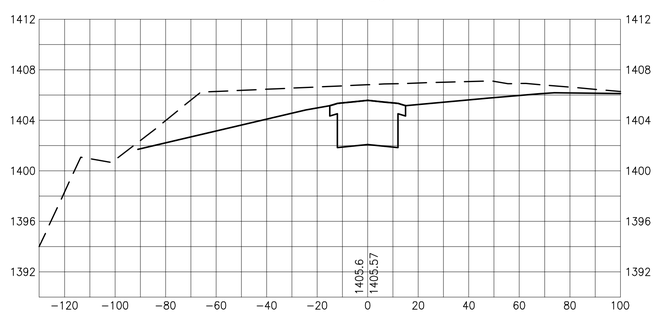
6' 3' 0 6'

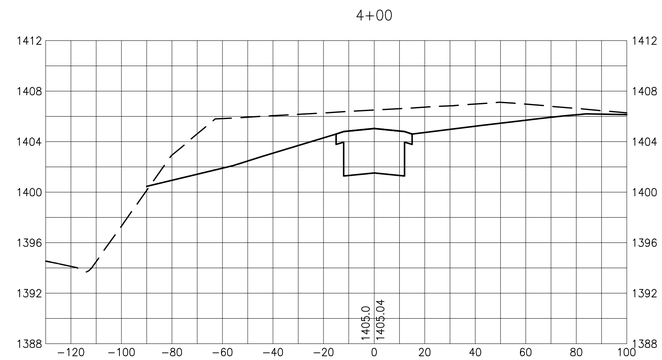


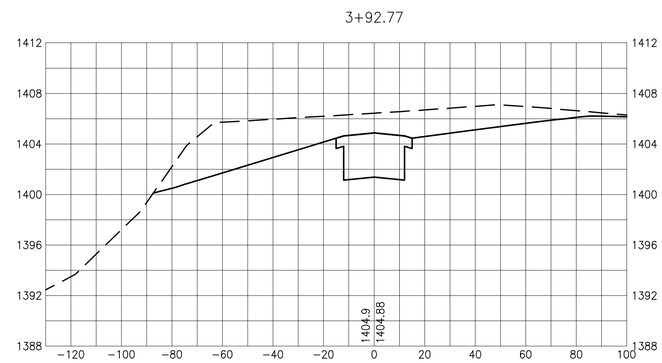












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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED:	**05-11-2009**
REVIEWED BY:	**BCT**
DRAWN BY:	**LAD**
DESIGNED BY:	**JEH**

AEP PROJECT NUMBER

214-1882-093 & 095

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SHEET TITLE

CROSS SECTIONS AIRFIELD ACCESS STA: 0+50 TO STA: 4+50

SHEET NUMBER

CX07

BID DOCUMENTS

I:\P-2\1882\L093 Dlut Terminal Design CAD\LAD\CX\CX07.dwg, 5/7/2009 2:53:27 PM

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VERT. SCALE: 1"= 6'

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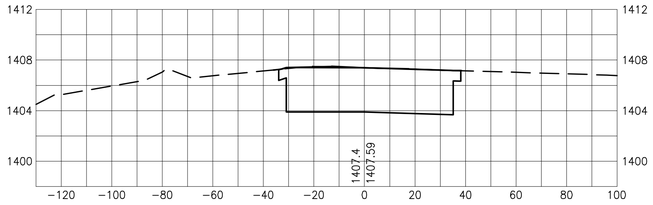

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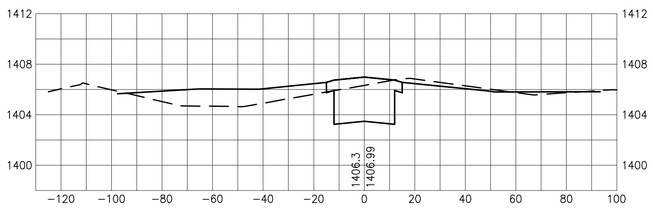

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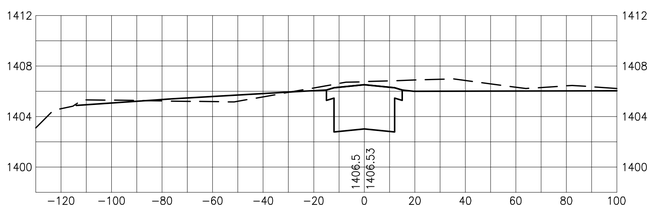

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Signature

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER
214-1882-093 & 095

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SHEET TITLE

CROSS SECTIONS AIRFIELD ACCESS STA: 4+74.12 TO STA: 5+36.60

SHEET NUMBER

CX08

BID DOCUMENTS

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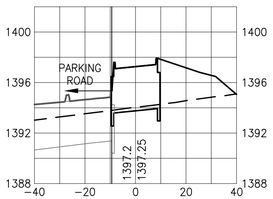

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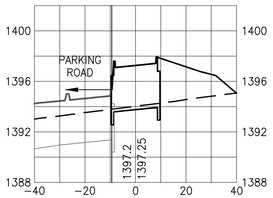

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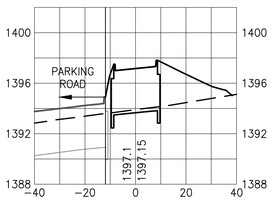

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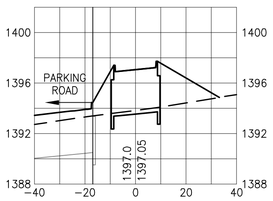

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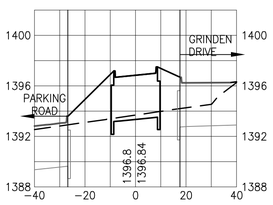

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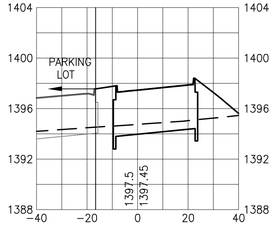

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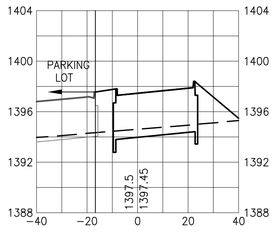

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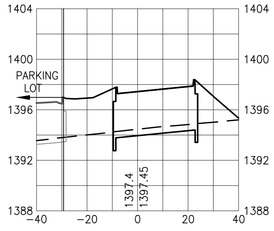

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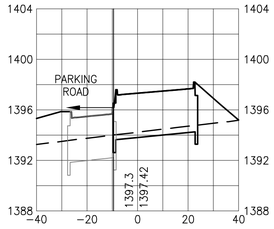

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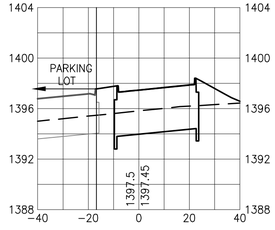

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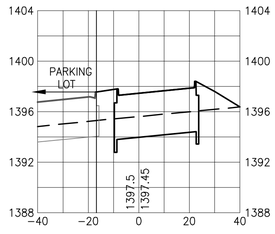

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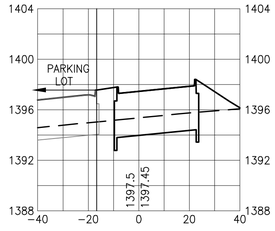

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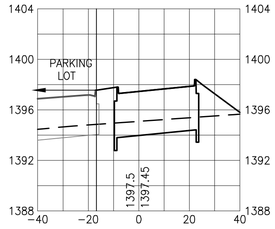

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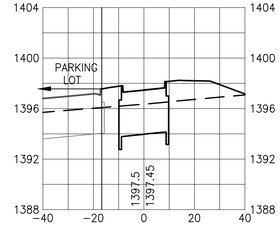

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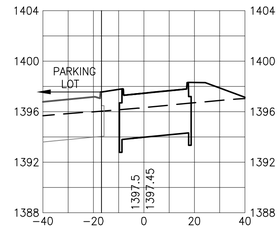

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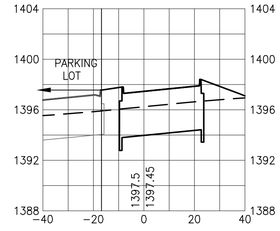

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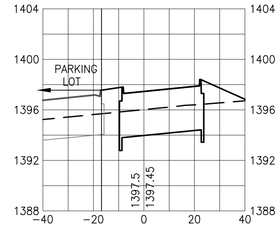

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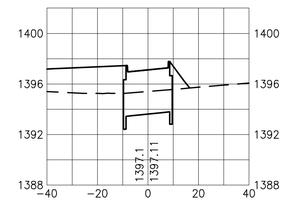

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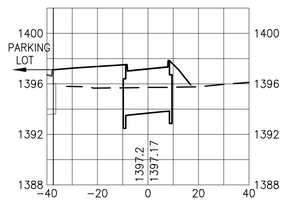

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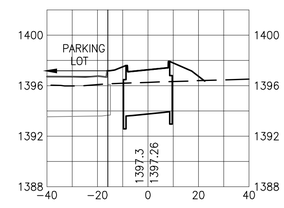

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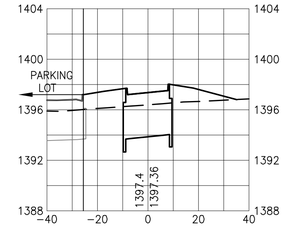

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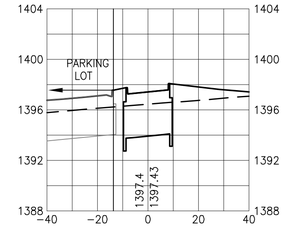

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature John E. Hippchen

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER

214-1882-093 & 095

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SHEET TITLE

CROSS SECTIONS LOWER ACCESS ROAD STA: 2+00 TO STA: 9+40

SHEET NUMBER

CX09

BID DOCUMENTS

T:\2\214882.093 Dul Terminal Dev\Bpc CMEs\ACCEs\CX09.dwg, 5/7/2009 2:25:13 PM

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VERT. SCALE: 1"= 6'

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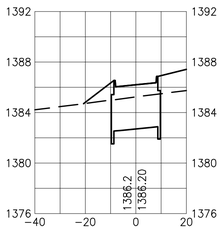
2+50



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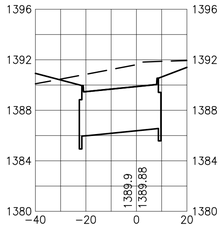

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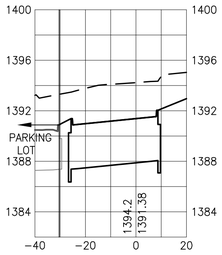

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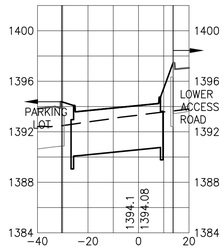

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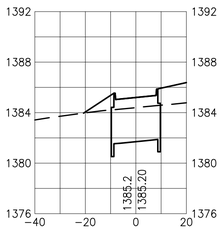

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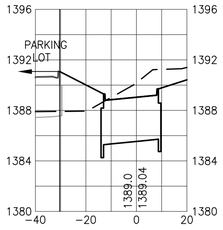

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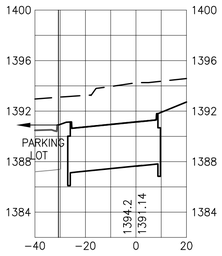

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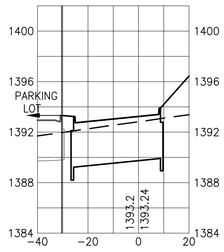

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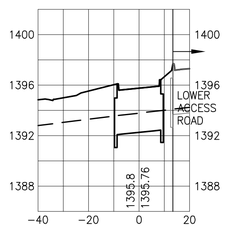

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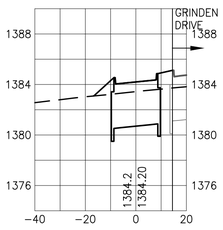

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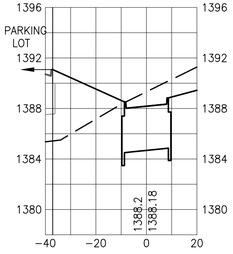

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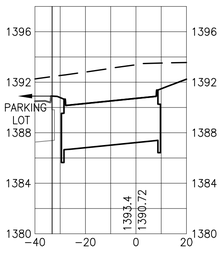

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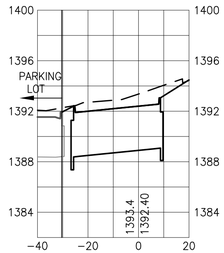

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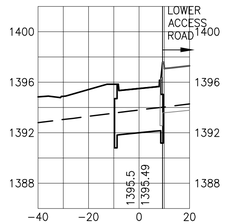

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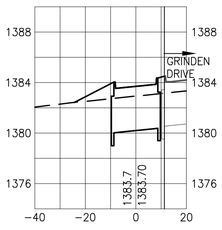

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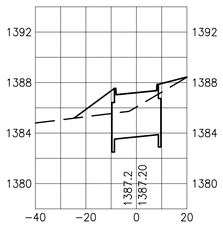

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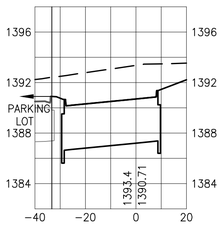

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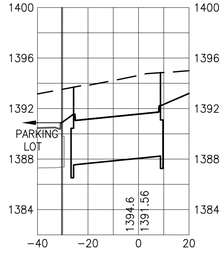

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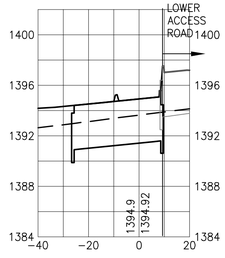

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DULUTH INTERNATIONAL AIRPORT

REPLACEMENT TERMINAL AREA DEVELOPMENT, LANDSIDE SITE PHASE I

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature

Typed Name JOHN E. HIPPCHEN

Date 05/07/2009 Reg. No. 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 05-11-2009
REVIEWED BY: BCT
DRAWN BY: LAD
DESIGNED BY: JEH

AEP PROJECT NUMBER

214-1882-093 & 095

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SHEET TITLE

CROSS SECTIONS PARKING ACCESS ROAD STA: 1+25 TO STA: 8+00

SHEET NUMBER

CX10

BID DOCUMENTS

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