DULUTH INTERNATIONAL AIRPORT

Director of Airports: Brian Ryks
4701 GRINDEN DRIVE - DULUTH INTERNATIONAL AIRPORT
DULUTH, MINNESOTA 55811

FAA AIP No. - 3-27-0024-48-10
RS&H PROJ. No. - 213.1882.091
CITY OF DULUTH BID No. - 11-4403

NEW PASSENGER TERMINAL
BID PACKAGE 2C - ISSUE FOR BID
VOLUME 1 OF 3
CIVIL, LANDSCAPING, STRUCTURAL

FEBRUARY 10, 2012

KRAUS-ANDERSON® CONSTRUCTION COMPANY

Construction Managers:
KRAUS-ANDERSON.
3716 Oneota Street
Duluth MN 55807
TEL: (218) 722-3775 / FAX: (218) 722-3778

RS&H IMPROVING YOUR WORLD

Architects and Civil Engineers:
REYNOLDS, SMITH & HILLS, INC.
4525 Airport Approach Road,
Duluth MN 55811
TEL: (218) 722-1227 / FAX: (218) 722-1052

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340,
Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300,
Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor,
Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103,
Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Public Address Consultants:
SHEN, MILSOM & WILKE, LLC
2 N. Riverside Plaza #1460
Chicago IL 60606
TEL: (312) 559-4585 / FAX (312) 559-5393

DRAWING LIST – VOLUME 1

G101 DRAWING LIST

CIVIL

C001 SUMMARY OF QUANTITIES
C002 SAFETY AND SECURITY NOTES & DETAILS
C003 GENERAL CONSTRUCTION NOTES, LEGEND AND ABBREVIATIONS
C004 ULTIMATE DEVELOPMENT SITE PLAN
C005 CONTRACT LAYOUT PLAN AND CONTRACT NOTES
C006 SAFETY PHASING PLAN PHASE 1
C007 SAFETY PHASING PLAN PHASE 2
C008 SAFETY PHASING PLAN PHASE 3
C009 HORIZONTAL AND VERTICAL CONTROL PLANS AND NOTES

C020 GEOTECHNICAL BORING LAYOUT AND INFORMATION
C021 GEOTECHNICAL BORING LOGS
C022 GEOTECHNICAL BORING LOGS

C100 OVERALL DEMOLITION PLANS AND NOTES
C101 DEMOLITION PLAN
C102 DEMOLITION PLAN
C103 DEMOLITION PLAN
C104 DEMOLITION PLAN
C104A DEMOLITION PLAN
C120 DEMOLITION DETAILS
C121 DEMOLITION DETAILS

C200 OVERALL GEOMETRY PLAN
C201 GEOMETRY PLAN
C202 GEOMETRY PLAN
C203 GEOMETRY PLAN
C204 GEOMETRY PLAN
C204A GEOMETRY PLAN
C205 TYPICAL PAVEMENT SECTIONS
C206 TYPICAL PAVEMENT JOINT DETAILS
C207 TYPICAL PAVEMENT JOINT DETAILS
C208 CURB, GUTTER AND STRUCTURE JOINT DETAILS
C209 FENCING LAYOUT SITE PLAN AND NOTES
C210 FENCING AND GATE DETAILS
C211 FENCING AND GATE DETAILS

C400 OVERALL GRADING AND EROSION CONTROL PLAN & NOTES
C401 GRADING AND EROSION CONTROL PLAN
C402 GRADING AND EROSION CONTROL PLAN
C403 GRADING AND EROSION CONTROL PLAN
C404 GRADING AND EROSION CONTROL PLAN
C404A GRADING AND EROSION CONTROL PLAN
C407 EROSION & SEDIMENTATION CONTROL NOTES & DETAILS
C408 EROSION & SEDIMENTATION CONTROL NOTES & DETAILS
C409 EROSION & SEDIMENTATION CONTROL NOTES & DETAILS
C410 EROSION & SEDIMENTATION CONTROL NOTES & DETAILS

C500 OVERALL SITE UTILITY PLAN AND NOTES
C501 SITE UTILITY PLAN
C502 SITE UTILITY PLAN
C503 SITE UTILITY PLAN
C504 SITE UTILITY PLAN
C504A SITE UTILITY PLAN
C510 SITE UTILITY TABLE
C511 SITE UNDERDRAIN TABLE
C512 STORM CHAMBER SYSTEM
C513 WATER QUALITY UNIT
C514 WATER QUALITY UNIT DETAILS
C520 SITE UTILITY PROFILES
C521 SITE UTILITY PROFILES
C530 CITY OF DULUTH UTILITY DETAILS
C531 CITY OF DULUTH UTILITY DETAILS
C532 DRAINAGE DETAILS
C533 DRAINAGE DETAILS
C534 DRAINAGE DETAILS
C535 DRAINAGE DETAILS
C536 DRAINAGE DETAILS

C601 CONCRETE JOINT LAYOUT PLAN
C602 CONCRETE JOINT LAYOUT PLAN
C610 CONCRETE JOINT SPOT ELEVATION PLAN
C611 CONCRETE JOINT SPOT ELEVATION PLAN
C612 CONCRETE JOINT SPOT ELEVATION PLAN
C613 CONCRETE JOINT SPOT ELEVATION PLAN

C700 PAVEMENT MARKING REMOVAL PLAN
C701 PAVEMENT MARKING PLAN
C702 LANDSIDE PAVEMENT MARKING PLAN AND DETAILS
C710 PAVEMENT MARKING DETAILS

CIVIL – ELECTRICAL

E000 ELECTRICAL NOTES
E101 PROPOSED LIGHTING AND SIGNAGE PLAN
E102 PROPOSED LIGHTING AND SIGNAGE PLAN
E103 PROPOSED LIGHTING AND SIGNAGE PLAN
E104 PROPOSED LIGHTING AND SIGNAGE PLAN
E104A PROPOSED LIGHTING AND SIGNAGE PLAN
E300 AIRFIELD SIGNAGE PLAN
E400 TAXIWAY GUIDANCE SIGN DETAILS
E401 ELECTRICAL DETAILS
E402 ELECTRICAL DETAILS

CIVIL – CROSS SECTIONS

X100 CROSS SECTION SUMMARY PLAN
X110 CROSS SECTIONS STA. 0+00 TO STA. 0+50
X111 CROSS SECTIONS STA. 1+00 TO STA. 1+50
X112 CROSS SECTIONS STA. 2+00 TO STA. 2+50
X113 CROSS SECTIONS STA. 3+00 TO STA. 3+50
X114 CROSS SECTIONS STA. 4+00 TO STA. 4+50
X115 CROSS SECTIONS STA. 5+00 TO STA. 5+50
X116 CROSS SECTIONS STA. 6+00 TO STA. 6+50
X117 CROSS SECTIONS STA. 7+00 TO STA. 7+50
X118 CROSS SECTIONS STA. 8+00 TO STA. 8+50
X119 CROSS SECTIONS STA. 9+00 TO STA. 9+50
X120 CROSS SECTIONS STA. 10+00 TO STA. 10+50
X121 CROSS SECTIONS STA. 11+00 TO STA. 11+50
X122 CROSS SECTIONS STA. 12+00 TO STA. 12+50
X123 CROSS SECTIONS STA. 13+00 TO STA. 13+50
X124 CROSS SECTIONS STA. 14+00 TO STA. 14+50
X125 CROSS SECTIONS STA. 15+00 TO STA. 15+50
X126 CROSS SECTIONS STA. 16+00 TO STA. 16+50
X127 CROSS SECTIONS STA. 17+00 TO STA. 17+50
X128 CROSS SECTIONS STA. 18+00
X129 CROSS SECTIONS STA. 18+50
X130 CROSS SECTIONS STA. 19+00
X131 CROSS SECTIONS STA. 19+50
X132 CROSS SECTIONS STA. 20+00
X133 CROSS SECTIONS STA. 20+50
X134 CROSS SECTIONS STA. 21+00
X135 CROSS SECTIONS STA. 21+40

LANDSCAPING

L100 LANDSCAPE OVERALL AREAS PHASE 2
L102 LANDSCAPE PLAN PHASE 2
L103 LANDSCAPE PLAN PHASE 2
L104 LANDSCAPE PLAN PHASE 2
L106 LANDSCAPE PLAN PHASE 2
L107 LANDSCAPE PLAN PHASE 2
L108 LANDSCAPE PLAN PHASE 2
L109 LANDSCAPE NOTES AND DETAILS

STRUCTURAL

S001 TITLE SHEET
S002 GENERAL STRUCTURAL NOTES
S003 GENERAL STRUCTURAL NOTES

S101 OVERALL FIRST LEVEL FLOOR PLAN
S102 OVERALL SECOND LEVEL FLOOR PLAN
S103 OVERALL THIRD LEVEL FLOOR PLAN
S104 OVERALL ROOF LEVEL FLOOR PLAN
S106 CANOPY FOUNDATION PLAN – AREA A
S107 CANOPY FOUNDATION PLAN – AREA B
S108 CANOPY ROOF FRAMING PLAN – AREA A
S109 CANOPY ROOF FRAMING PLAN – AREA B

S110 FOUNDATION PLAN – AREA A
S111 FOUNDATION PLAN – AREA B
S112 SECOND LEVEL FRAMING PLAN – AREA A
S113 SECOND LEVEL FRAMING PLAN – AREA B
S114 THIRD LEVEL FRAMING PLAN – AREA A
S115 THIRD LEVEL FRAMING PLAN – AREA B
S116 ROOF LEVEL FRAMING PLAN – AREA A
S117 ROOF LEVEL FRAMING PLAN – AREA B
S118 TUG ROAD FOUNDATION PLAN
S119 TUG ROAD ROOF FRAMING PLAN
S120 REVENUE CONTROL BOOTHS PLANS & DETAILS

S301 BRACING ELEVATIONS AND DETAILS
S302 BRACING ELEVATIONS AND DETAILS

S401 COLUMN SCHEDULE AND DETAILS

S501 STRUCTURAL DETAILS
S502 STRUCTURAL DETAILS
S503 STRUCTURAL DETAILS
S504 STRUCTURAL DETAILS
S505 STRUCTURAL DETAILS
S506 STRUCTURAL DETAILS

S701 STRUCTURAL DETAILS
S702 STRUCTURAL DETAILS
S703 STRUCTURAL DETAILS
S704 STRUCTURAL DETAILS
S705 STRUCTURAL DETAILS
S706 STRUCTURAL DETAILS

DRAWING LIST – VOLUME 2

G101 DRAWING LIST

ARCHITECTURAL

AS100 OVERALL SITE PLAN
AS101 ARCHITECTURAL SITE PLAN
AS102 PASSENGER BOARDING BRIDGES
AS103 PASSENGER BOARDING BRIDGES

A001 ABBREVIATIONS AND GENERAL NOTES
A002 SYMBOLS AND ADA
A003 PARTITION TYPES
A101 OVERALL FIRST FLOOR PLAN
A102 OVERALL SECOND FLOOR PLAN
A103 OVERALL THIRD FLOOR PLAN
A104 OVERALL ROOF PLAN
A110 FIRST FLOOR AREA A
A111 FIRST FLOOR AREA B
A112 SECOND FLOOR AREA A
A113 SECOND FLOOR AREA B
A114 THIRD FLOOR AREA A
A115 THIRD FLOOR AREA B

A201 OVERALL FIRST FLOOR RCP
A202 OVERALL SECOND FLOOR RCP
A203 OVERALL THIRD FLOOR RCP
A210 ENLARGED FIRST FLOOR RCP AREA A
A211 ENLARGED FIRST FLOOR RCP AREA B
A212 ENLARGED SECOND FLOOR RCP AREA A
A213 ENLARGED SECOND FLOOR RCP AREA B
A214 ENLARGED THIRD FLOOR RCP AREA A
A215 ENLARGED THIRD FLOOR RCP AREA B

A301 EXTERIOR ELEVATIONS
A302 EXTERIOR ELEVATIONS
A310 BUILDING SECTIONS
A311 BUILDING SECTIONS

A401 WALL SECTIONS
A402 WALL SECTIONS
A403 WALL SECTIONS
A404 WALL SECTIONS
A405 WALL SECTIONS

A510 PLAN DETAILS
A511 PLAN DETAILS
A512 PLAN DETAILS
A513 PLAN DETAILS
A514 PLAN DETAILS – EXIT CORRIDOR
A520 SECTION DETAILS
A521 SECTION DETAILS
A522 SECTION DETAILS
A530 EXTERIOR SYSTEMS – VERTICAL CIRCULATION
A530A EXTERIOR SYSTEMS – VERTICAL CIRCULATION
A530B EXTERIOR SYSTEMS – VERTICAL CIRCULATION
A531 INTERIOR SYSTEMS – VERTICAL CIRCULATION
A532 INTERIOR SYSTEMS – VERTICAL CIRCULATION
A533 INTERIOR SYSTEMS – VERTICAL CIRCULATION
A534 INTERIOR SYSTEM SHEET – MAIN ELEVATOR
A535 INTERIOR SYSTEM SHEET – MAIN STAIR AND ESCALATOR
A536 EXTERIOR SYSTEM SHEET – APRON RAMPS
A537 EXTERIOR SYSTEM SHEET – APRON RAMP CANOPY
A538 EXTERIOR SYSTEM SHEET – APRON RAMP CANOPY DETAILS
A560 MILLWORK ELEVATIONS
A561 MILLWORK ELEVATIONS
A562 MILLWORK ELEVATIONS AND DETAILS
A563 MILLWORK DETAILS
A564 MILLWORK ELEVATIONS AND DETAILS – TICKETING
A565 MILLWORK ELEVATIONS AND DETAILS – RENT–A–CAR
A566 MILLWORK ELEVATIONS AND DETAILS – CBP
A567 MISC. MILLWORK DETAILS

A601 INTERIOR ELEVATIONS
A602 INTERIOR ELEVATIONS
A603 INTERIOR ELEVATIONS
A604 INTERIOR ELEVATIONS
A605 INTERIOR ELEVATIONS
A606 INTERIOR ELEVATIONS
A607 INTERIOR ELEVATIONS
A608 INTERIOR ELEVATIONS
A610 INTERIOR SYSTEM SHEET – RESTROOMS
A611 INTERIOR SYSTEM SHEET – RESTROOMS
A612 INTERIOR SYSTEM SHEET – RESTROOMS
A620 INTERIOR SYSTEM SHEET – WOOD CEILING
A621 INTERIOR SYSTEM SHEET – METAL CEILING
A622 CEILING SECTION DETAILS
A623 CEILING PLAN DETAILS
A630 FEATURE WALL SYSTEM DETAILS
A631 FEATURE WALL SYSTEM DETAILS
A632 FEATURE WALL SYSTEM DETAILS

A701 DOOR SCHEDULES
A702 DOOR DETAILS
A703 DOOR DETAILS
A704 DOOR DETAILS
A710 EXTERIOR SYSTEM SHEET – LANDSIDE CURTAIN WALL
A711 EXTERIOR SYSTEM SHEET – LANDSIDE CURTAIN WALL
A712 EXTERIOR SYSTEM SHEET – AIRSIDE CURTAIN WALL
A713 EXTERIOR SYSTEM SHEET – AIRSIDE CURTAIN WALL
A714 EXTERIOR SYSTEM SHEET – ENTRY VESTIBULE
A715 EXTERIOR SYSTEM SHEET – CORE WALL
A720 EXTERIOR SYSTEM SHEET – TUG TUNNEL
A721 EXTERIOR SYSTEM SHEET – TUG TUNNEL
A722 EXTERIOR SYSTEM SHEET – TUG TUNNEL
A723 EXTERIOR SYSTEM SHEET – CANOPY
A724 EXTERIOR SYSTEM SHEET – REVENUE CONTROL BOOTH
A725 EXTERIOR SYSTEM SHEET – REVENUE CONTROL BOOTH

A801 INTERIOR FINISH SCHEDULES
A802 INTERIOR MATERIALS SCHEDULE
A811 FIRST FLOOR FURNITURE PLAN
A812 FIRST FLOOR FURNITURE PLAN – AREA A
A813 FIRST FLOOR FURNITURE PLAN – AREA B
A814 SECOND FLOOR FURNITURE PLAN
A815 SECOND FLOOR FURNITURE PLAN – AREA A
A816 SECOND FLOOR FURNITURE PLAN – AREA B
A817 THIRD FLOOR FURNITURE PLAN
A818 THIRD FLOOR FURNITURE PLAN – ADMIN.

A901 CONCESSIONS PLAN
A902 CONCESSIONS REFLECTED CEILING PLAN
A903 CONCESSIONS ELEVATIONS AND DETAILS

LS101 FIRST FLOOR LIFE SAFETY
LS102 SECOND FLOOR LIFE SAFETY
LS103 THIRD FLOOR LIFE SAFETY
LS110 EXISTING BASEMENT LIFE SAFETY
LS111 FIRST FLOOR INTERIM LIFE SAFETY
LS112 SECOND FLOOR INTERIM LIFE SAFETY

SIGNAGE

G001 TYPOGRAPHIC STANDARDS & SYMBOL SCHEDULE
G100 SITE SIGNAGE PLAN
G200 SIGNAGE TYPES AND DETAILS
G201 SIGNAGE TYPES AND DETAILS
G202 SIGNAGE TYPES AND DETAILS

GENERAL NOTE:
FOR ADA STANDARDS, PLUMBING FIXTURES' MOUNTING HEIGHTS AND CLEARANCES, SEE A002

DRAWING LIST – VOLUME 3

G101 DRAWING LIST

MECHANICAL

M001 MECHANICAL LEGEND
M002 MECHANICAL SYMBOLS

M112 PARTIAL SECOND FLOOR MECHANICAL PLAN – CONCESSIONS AREA
M114 PARTIAL THIRD FLOOR MECHANICAL PLAN – CONCESSIONS AREA
M116 PARTIAL ROOF LEVEL MECHANICAL PLAN – CONCESSIONS AREA
M401 MECHANICAL SCHEDULES & DETAILS

ELECTRICAL

E001 ELECTRICAL SYMBOLS
E002 ELECTRICAL SITE PLAN

E112 ENLARGED SECOND FLOOR ELECTRICAL PLAN – AREA A
E300 BUILDING POWER RISER DIAGRAM
E301 PANEL SCHEDULES

EL112 ENLARGED SECOND FLOOR LIGHTING PLAN – AREA A

ET001 TECHNOLOGY/ SECURITY SYSTEMS LEGEND AND NOTES
ET401 TECHNOLOGY FIRST FLOOR PLAN
ET402 TECHNOLOGY SECOND FLOOR PLAN
ET403 TECHNOLOGY THIRD FLOOR PLAN
ET410 TECHNOLOGY FIRST FLOOR PLAN AREA A
ET411 TECHNOLOGY FIRST FLOOR PLAN AREA B
ET412 TECHNOLOGY SECOND FLOOR PLAN AREA A
ET413 TECHNOLOGY SECOND FLOOR PLAN AREA B
ET414 TECHNOLOGY THIRD FLOOR PLAN AREA A
ET415 TECHNOLOGY THIRD FLOOR PLAN AREA B
ET501 COMMUNICATIONS EQUIPMENT RACK ELEVATION
ET502 ENLARGED ROOM PLANS
ET503 ACCESS CONTROL DETAILS
ET504 ACCESS CONTROL DETAILS
ET505 ACCESS CONTROL SIGNS
ET600 ACCESS POINT SCHEDULE
ET601 SECURITY RISER
ET602 MUFIDS RISER
ET603 VIDEO SURVEILLANCE RISER
ET604 NETWORK RISER
ET605 CATV & DISPLAY RISERS
ET606 COMMUNICATION RISER

PLUMBING

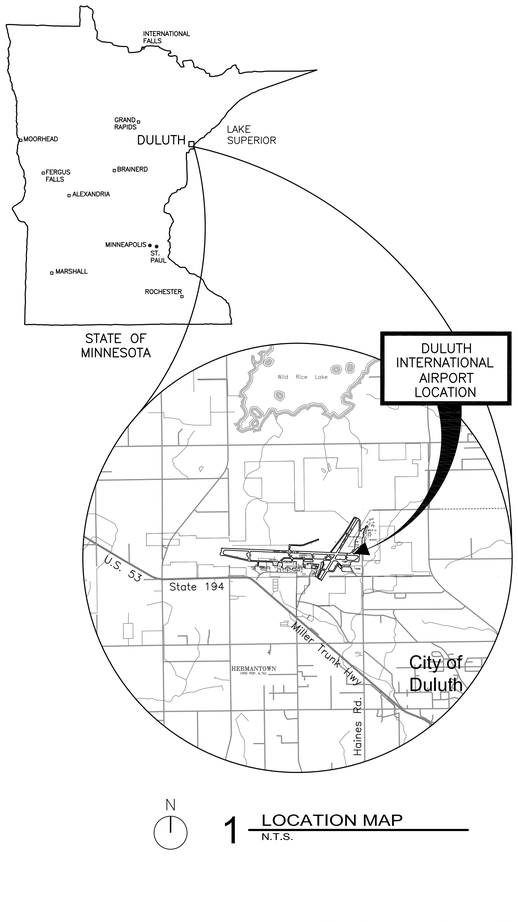
P001 PLUMBING SYMBOL LIST, ABBREVIATIONS AND DRAWING LIST

P112 ENLARGED SECOND FLOOR PLUMBING PLAN AREA A
P114 ENLARGED THIRD FLOOR PLUMBING PLAN AREA A
P210 FIRST FLOOR FOOD SERVICE PLUMBING PLAN
P212 SECOND FLOOR FOOD SERVICE PLUMBING PLAN

FIRE PROTECTION

F001 FIRE PROTECTION SYMBOL LIST, ABBREVIATIONS AND DRAWING INDEX

F112 ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A



1 LOCATION MAP
N.T.S.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

ARCHITECTURAL CERTIFICATION
I hereby certify that the architectural plans, specifications or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Architect under the laws of the State of Minnesota.

Print Name: Mark Ip

Signature:

Date: 06-03-10 Reg. No.: 46001

REVISIONS

NO.	DESCRIPTION	DATE
	BID ~~DESCRIPTION~~	~~DATE~~
	FOUNDATION PERMIT	6.11.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.16.10
4	BUILDING PERMIT REVISIONS	11.12.10
	BID PACKAGE 2A	1.24.11
	BP2A CONFORMANCE SET	5.2.11
	BID PACKAGE 2B REVIEW	7.6.11
	BP2B CONFORMANCE	10.21.11
	BID PACKAGE 2C	2.10.12

DATE ISSUED: 02-10-12
REVIEWED BY: TC
DRAWN BY: MKG/MI
DESIGNED BY: TC

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
DRAWING LIST

SHEET NUMBER
G101

BID PACKAGE 2C

BASE BID

BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY
1	P-100.3.1	MOBILIZATION	LS	1
2	P-102.10.1	SAFETY AND SECURITY	LS	1
3	P-104.5.1	PROJECT SURVEY AND STAKEOUT	LS	1
4	P-105.5.1	TEMPORARY CONSTRUCTION ITEMS	LS	1
5	P-106.5.1	PAVEMENT MARKING REMOVAL	SF	1990
6	P-107.4.1	REMOVE AND DISPOSE COMPOSITE PAVEMENT FULL DEPTH (INCLUDES CONCRETE AND ASPHALT AIRFIELD PVMT)	SY	12964
7	P-107.4.2	REMOVE AND DISPOSE CONCRETE SIDEWALK	SY	1810
8	P-107.4.3	REMOVE AND DISPOSE ASPHALT PAVEMENT FULL DEPTH	SY	18213
9	P-107.4.4	REMOVE CONCRETE CURB AND GUTTER	LF	2300
10	P-107.4.5	REMOVE STREET SIGN	EACH	75
11	P-109.5.1	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	1000
12	P-109.5.2	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	364
13	P-152.4.1	UNCLASSIFIED EXCAVATION	CY	59571
14	P-152.4.2	ROCK EXCAVATION	CY	1000
15	P-152.4.3	UNSUITABLE EXCAVATION AND SAND BACKFILL	CY	1000
16	P-152.4.5	EXCAVATION FROM HOLDING PONDS	CY	2013
17	P-152.4.6	CONTAMINATED SOIL DISPOSAL	CY	2013
18	P-154.6.1	SAND SUBBASE COURSE	CY	32135
19	P-156.5.1	EROSION CONTROL - INLET PROTECTION ON PAVEMENT	EACH	39
20	P-156.5.2	EROSION CONTROL - INLET PROTECTION OFF PAVEMENT	EACH	15
21	P-156.5.3	EROSION CONTROL - SILT FENCE	LF	2400
22	P-156.5.4	EROSION CONTROL - RIP RAP, CLASS III	SYD	50
23	P-209.5.1	CRUSHED AGGREGATE BASE COURSE	CY	6424
24	MNDOT 2104.501	REMOVE WATER MAIN AND VALVES	LF	70
25	MNDOT 2104.509/00111	REMOVE HYDRANT	EACH	1
26	MNDOT 2105.521/00032	GRANULAR BORROW MOD 7% (CV)	CY	2400
27	MNDOT 2105.604	GEOTEXTILE FABRIC TYPE V	SY	40911
28	MNDOT 2112.604/00010	SUBGRADE PREPARATION	SY	6755
29	MNDOT 2211.503	CRUSHED AGGREGATE BASE COURSE	CY	1741
30	2401.515	CONCRETE SIDEWALK (MIX#3A32) W/ 6" x 6" WWF, AS SPECIFIED	SY	730
31	P-401.8.1	BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE	TON	6751
32	P-401.8.2	BITUMINOUS SURFACE COURSE, 3/4" MAXIMUM AGGREGATE	TON	1120
33	P-501.8.1	12" THICK PORTLAND CEMENT CONCRETE PAVEMENT	SY	26225
34	P-501.8.2	9" THICK PORTLAND CEMENT CONCRETE PAVEMENT	SY	3400
35	P-501.8.3	BURIED TRANSITION-CONCRETE	SY	475
36	P-603.5.1	BITUMINOUS TACK COAT	GAL	4400
37	P-610.5.1	CONCRETE CURB AND GUTTER D424	LF	389
38	P-610.5.2	CONCRETE CURB AND GUTTER B624	LF	356
39	P-610.5.3	6 INCH CONCRETE SLAB W/ 6x6 WWF	SY	34
40	P-620.5.1	PAVEMENT MARKING (YELLOW) WITH REFLECTIVE BEADS INCLUDING SURFACE PREPARATION	SF	3400
41	P-620.5.2	PAVEMENT MARKING (BLACK) WITHOUT REFLECTIVE BEADS INCLUDING SURFACE PREPARATION	SF	4300
42	P-620.5.3	PAVEMENT MARKING (WHITE) WITH REFLECTIVE BEADS INCLUDING SURFACE PREPARATION	SF	7972
43	P-620.5.4	PAINTED PARKING POSITION SIGN WITH REFLECTIVE BEADS	EACH	4
44	P-620.5.5	HANDICAP SYMBOL PAVEMENT MARKING WITH REFLECTIVE BEADS	EACH	13
45	P-620.5.6	PAVMENT MARKING - TURN ARROW	EACH	2
46	D-701.5.1	STORM SEWER PIPE, 12" CL V, C76	LF	26
47	D-701.5.2	STORM SEWER PIPE, 18" CL V, C76	LF	80
48	D-701.5.3	STORM SEWER PIPE, 24" CL V, C76	LF	640
49	D-701.5.4	STORM SEWER PIPE, 30" CL V, C76	LF	255
50	D-701.5.5	STORM SEWER PIPE, 36" CL V, C76	LF	1355
51	D-701.5.6	STORM SEWER PIPE, 42" CL V, C77	LF	25
52	D-701.5.7	STORM SEWER PIPE, 4" SDR35	LF	1600
53	D-705.5.1	INSTALL 6" UNDERDRAIN WITH FABRIC PIPE WRAP AND POROUS BACKFILL	LF	9070
54	D-705.5.3	REMOVE SEWER PIPE (STORM), 12" - 18" DIA.	LF	980
55	D-705.5.4	REMOVE SEWER PIPE (STORM), 19" AND GREATER	LF	405
56	D-751.7.1	REMOVE MANHOLES OR CATCH BASINS	EACH	17
57	D-751.7.2	INSTALL NEW MANHOLE/CATCHBASIN, 4' DIA	EACH	5
58	D-751.7.3	INSTALL NEW MANHOLE/CATCHBASIN, 5' DIA	EACH	4
59	D-751.7.4	INSTALL NEW MANHOLE/CATCHBASIN, 6' DIA	EACH	9
60	D-751.7.5	INSTALL NEW MANHOLE/CATCHBASIN, 7' DIA	EACH	2
61	D-751.7.6	INSTALL NEW 42" DIA. END SECTION	EACH	1
62	D-751.7.7	RECONSTRUCT MANHOLES OR CATCH BASINS	EACH	10
63	D-751.7.8	STORM CHAMBER DETENTION SYSTEM	LSUM	1
64	D-751.7.9	STORM DRAINAGE FRAME AND COVER, AS SPECIFIED	EACH	26
65	D-751.7.10	WATER QUALITY UNIT	LSUM	1
66	D-751.7.11	ADJUST EXISTING STORM OR SANITARY MH CASTING	EACH	8
67	F-162.5.1	REMOVE FENCE	LF	1750
68	F-162.5.2	REMOVE GATES	EACH	3
69	F-162.5.3	6' CHAIN LINK FENCE W/ 3 STRANDS BARBED WIRE	LF	1610
70	F-162.5.4	TEMPORARY FENCE 6' CHAIN LINK FENCE, NO CONCRETE PULL POSTS, NO TOP RAIL, OR BARBED WIRE	LF	800
71	F-162.5.5	REINFORCED FENCE SECTION	EACH	1
72	T-901.5.1	HYDROSEEDING AND WOOD FIBER MULCH WITH FERTILZER	ACRE	6
73	T-905.5.1	TOPSOILING (FURNISHED FROM OFF THE SITE)	CY	3000

BASE BID

BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY
74	L-105.7.4	REMOVE LIGHT AND FOUNDATION (STREET)	EACH	9
75	L-105.7.5	REMOVE LIGHT AND FOUNDATION (SIDEWALK)	EACH	17
76	L-108-5.1	1/C NO. 8 AWG, 5KV, TYPE L-824 CABLE, SERIES LIGHTING CABLE INSTALLED IN DUCTBANK OR CONDUIT	LF	60
77	L-108-5.2	1/C NO. 6 AWG, BARE COPPER COUNTERPOISE WIRE INSTALLED IN TRENCH, INCLUDING GROUND RODS AND GROUNDING CONNECTORS	LF	20
78	L-108-5.3	4/C #8 600V THHN CABLE	LF	532
79	L-108-5.4	2/C #6 600V THHN CABLE	LF	2355
80	L-108-5.5	1/C #4 EQUIPMENT GROUND	LF	2889
81	L-110.5.1	1-WAY, 2" SCHEDULE 80 PVC, DIRECT BURIED	LF	656
82	L-125-5.1	MEDIUM INTENSITY TAXIWAY EDGE LIGHT, L861, 30" HEIGHT, 6.6A, BASE MOUNT, 360 BLUE LENS, LED LAMP	EACH	1
83	L-125-5.4	TEMPORARY TAXIWAY EDGE LIGHTING	LS	1
84	MNDOT 2401.521/00030	STRUCTURE EXCAVATION CLASS R	CY	300
85	MNDOT 2504.602/00024	INSTALL HYDRANT & VALVE	EACH	1
86	MNDOT 2504.603/10163	6" WATERMAIN DUCTILE IRON CL 53	LF	35
87	MNDOT 2564.537/00010	HANDICAP PARKING SIGN R7-8M	EACH	13
88	SP 5.3	TYPE 'C' LIGHT ON EXSTING FOUNDATION	EACH	3
89	SP 6.3	PROGRAMMABLE CIRCUIT BREAKER, SQUARE D TYPE NF POWERLINK OR APPROVED EQUAL	EACH	2
90	SP 7.3	ENTRANCE & EXIT GATES W/ DETECTOR LOOPS W/ FOUNDATION	EACH	4
91	SP 8.3	PROVIDE AND INSTALL PARKING STOPS	EACH	36
92	SP 9.3	BUILDING DEMOLITION	LS	1
93	SP 10.3	REMOVE VALVE AND CAP WATER LINE	EACH	1
94	SP 11.3	BUILDING UTILITY COORDINATION AND DEMOLITION (UTILITY ALLOWANCE	AL	1
95	SP 12.4	TRAFFIC CONTROL ALLOWANCE	AL	1
96	SP 14.3	COMMERCIAL VEHICLE GATE W/ DETECTOR LOOPS ,PROXIMITY ACCESS TAGS, AND FOUNDATION	EACH	1
97	SP 15.9	EXIT PAY STATION	EACH	1
98	SP 16.3	PRIVATE UTILITY LOCATING SERVICE	LS	1

BID ALTERNATE 1 - REVISED PAVEMENT GEOMETRY (EAST)

BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY
99	P-109.5.2	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	636
100	P-107.4.3	REMOVE AND DISPOSE ASPHALT PAVEMENT FULL DEPTH	SY	2151
101	P-152.4.1	UNCLASSIFIED EXCAVATION	CY	12579
102	MNDOT 2105.604	GEOTEXTILE FABRIC TYPE V	SY	7186
103	P-154.6.1	SAND SUBBASE COURSE	CY	9389
104	P-209.5.1	CRUSHED AGGREGATE BASE COURSE	CY	1597
105	P-401.8.1	BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE	TON	1413
106	P-401.8.2	BITUMINOUS SURFACE COURSE, 3/4" MAXIMUM AGGREGATE	TON	312
107	P-501.8.1	12" THICK PORTLAND CEMENT CONCRETE PAVEMENT	SY	3722
108	L-105.7.1	REMOVE GUIDANCE SIGN AND FOUNDATION	EACH	1
109	L-105.7.2	REMOVE ELECTRICAL HANDHOLE	EACH	13
110	L-105.7.3	REMOVE BASE MOUNTED AIRFIELD EDGE LIGHT	EACH	11
111	L-108-5.1	1/C NO. 8 AWG, 5KV, TYPE L-824 CABLE, SERIES LIGHTING CABLE INSTALLED IN DUCTBANK OR CONDUIT	LF	740
112	L-108-5.2	1/C NO. 6, BARE COPPER COUNTERPOISE WIRE INSTALLED IN TRENCH, INCLUDING GROUND RODS AND GROUNDING CONNECTORS	LF	580
113	L-110.5.1	1-WAY, 2" SCHEDULE 40 PVC, DIRECT BURIED	LF	65
114	L-110.5.2	1-WAY, 2" SCHEDULE 40 PVC, IN PAVED AREAS	LF	500
115	L-125-5.1	MEDIUM INTENSITY TAXIWAY EDGE LIGHT, L861, 30" HEIGHT, 6.6A, BASE MOUNT, 360 BLUE LENS, LED LAMP	EACH	9
116	L-125-5.2	L-858 GUIDANCE SIGN, SIZE 1, STYLE 3, MODE 2, 2 MODULE	EACH	1
117	L-125-5.3	JUNCTION BOX, L-867, CLASS 1, SIZE B, 24" DEEP, 12" WIDE	EACH	2

BID ALTERNATE 2 - PERIMETER ROAD EXTENSION AND SNOW MELT PAVEMENT

BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY
118	P-107.4.3	REMOVE AND DISPOSE ASPHALT PAVEMENT FULL DEPTH	SY	5456
119	P-152.4.1	UNCLASSIFIED EXCAVATION	CY	10912
120	MNDOT 2105.604	GEOTEXTILE FABRIC TYPE V	SY	5456
121	P-154.6.1	SAND SUBBASE COURSE	CY	6972
122	P-209.5.1	CRUSHED AGGREGATE BASE COURSE	CY	1212
123	P-401.8.1	BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE	TON	818
124	P-401.8.2	BITUMINOUS SURFACE COURSE, 3/4" MAXIMUM AGGREGATE	TON	491

BID ALTERNATE 3 - APRON DEICING CONTAINMENT SYSTEM

BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY
125	S-101.5.1	GEOSYNTHETIC CLAY LINER AND CUSHION LAYER	SY	40900
126	D-705.5.2	INSTALL 6" UNDERDRAIN WITH FABRIC PIPE WRAP AND POROUS BACKFILL (ALT BID)	LF	1320

BID ALTERNATE 4 - REVISED PAVEMENT GEOMETRY (WEST)

BID ITEM	SPEC. NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY
127	P-107.4.1	REMOVE AND DISPOSE COMPOSITE PAVEMENT FULL DEPTH (INCLUDES CONCRETE AND ASPHALT AIRFIELD PVMT)	SY	26
128	P-107.4.3	REMOVE AND DISPOSE ASPHALT PAVEMENT FULL DEPTH	SY	1080
129	P-152.4.1	UNCLASSIFIED EXCAVATION	CY	1938
130	MNDOT 2105.604	GEOTEXTILE FABRIC TYPE V	SY	1203
131	P-154.6.1	SAND SUBBASE COURSE	CY	1604
132	P-209.5.1	CRUSHED AGGREGATE BASE COURSE	CY	267
133	P-401.8.1	BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE	TON	288
134	P-501.8.1	12" THICK PORTLAND CEMENT CONCRETE PAVEMENT	SY	1203

GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.
(AVAILABLE AT: http://www.dot.state.mn.us/pre-letting/spec/index.html)

THE 2360 PLANT MIXED ASPHALT PAVEMENT COMBINED 2360/2350 (GYRANTORY/MARSHALL DESIGN) SPECIFICATIONS FOR 2008 CONSTRUCTION SHALL APPLY. AVAILABLE AT:
http://www.dot.state.mn.us/pre-letting/prov/order/2360-2350-combined.pdf

THE 2009 EDITION (as supplemented January 2010) OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATION SHALL APPLY

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

SUMMARY OF QUANTITIES

SHEET NUMBER

C001

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C001.dwg Plotted on: 2/10/2012 3:14 PM Plotted by: Erdmann, Ryan

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"
   150/5210–5D "PAINTING, MARKING & LIGHTING OF VEHICLES USED ON AIRPORTS"
   150/5370–2F "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 LOCATIONS DESIGNATED BY ENGINEER, HAVE ALL AOA 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 PER APPROVED CONTRACTOR SAFETY PLAN AND ALL FLASHING WARNING LIGHTS OPERATING PROPERLY.
   *ALL CONTRACTOR PERSONNEL AND EQUIPMENT ACCESS GATES MANNED OR LOCKED 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. WHEREVER 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. CONTRACTOR IS RESPONSIBLE FOR DOCUMENTING EXISTING DISTRESS WITH PHOTOS, LOCATION, AND/OR VIDEO.

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 AIRPORT 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 AIRPORT. 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 BY THE AIRPORT OR THE ENGINEER.

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.)

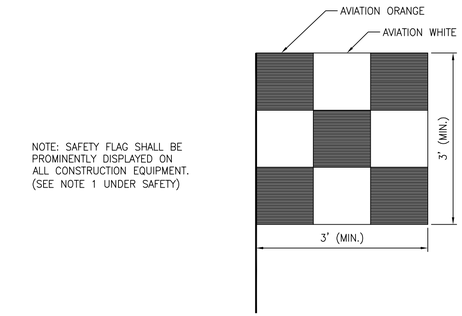
19. CONSTRUCTION EQUIPMENT SHALL HAVE A MAXIMUM HEIGHT OF TWENTY–FIVE (25) FEET.

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.

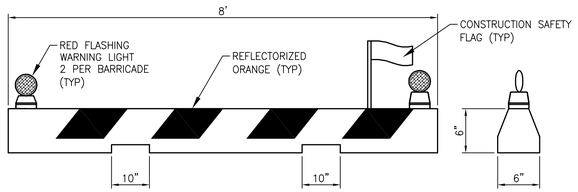
23. IF ANY FAA POWER, CONTROL, OR SIGNAL CABLES ARE DAMAGED, THE SPONSOR/CONTRACTOR SHALL REPLACE THE CABLE IN ITS ENTIRETY. THE SPLICING OF CABLES IS NOT AN ACCEPTABLE FORM OF REPAIR.



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

CONSTRUCTION SAFETY FLAG

N.T.S.



LOW PROFILE BARRICADE

(MUST MEET FAA ADVISORY CIRCULAR 150/5370-2E)

NTS

BARRICADE PLACEMENT NOTES

1. BARRICADES SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLAN THROUGH COORDINATION WITH AIRPORT AND ENGINEER STAFF. THE PHASE DURING WHICH EACH BARRICADE IS TO REMAIN IN PLACE IS INDICATED BY THE BARRICADE LABELS. BARRICADES SHALL BE INSTALLED AT THE BEGINNING OF EACH PHASE AND SHALL REMAIN IN PLACE THROUGHOUT THE PHASE. THE CONTRACTOR SHALL NOT MOVE ANY BARRICADES WITHOUT PRIOR COORDINATION WITH AIRPORT AND ENGINEER. AT NO TIME DURING CONSTRUCTION SHALL THE CONTRACTOR GO BEYOND THE BARRICADES OR PHASING LIMITS OF CONSTRUCTION.

2. BARRICADES SHALL BE NEUBERT AERO CORPORATION 8' LOW PROFILE BARRICADES OR APPROVED EQUAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND UPKEEP OF THE BARRICADES THROUGHOUT THE PROJECT. THE CONTRACTOR SHALL PURCHASE 50 ORANGE AND 50 WHITE BARRICADES FOR USE ON THE PROJECT. FOLLOWING COMPLETION OF THE WORK THE BARRICADES BECOME PROPERTY OF THE OWNER. THE BARRICADES SHALL BE SPACED AT TWELVE FOOT CENTERS WITH FLASHING RED LIGHTS AND FLAGS, AND SHALL BE WEIGHTED TO PREVENT MOVEMENT FROM HIGH WINDS AND JET OR PROP BLAST. ALL COSTS ARE INCIDENTAL TO THE PROJECT.

3. THE CONTRACTOR SHALL PROVIDE TWO WARNING SIGNS WHICH STATE "NO CONTRACTOR TRAFFIC BEYOND THIS POINT". SIGNS SHALL BE A MINIMUM OF 5'X5' PLYWOOD WITH TWO 4X4 POSTS. SIGNS SHALL BE ORANGE BACKGROUND WITH BLACK LETTERING WITH A HEIGHT OF 6 INCHES MINIMUM. ALL COSTS OF ARE INCIDENTAL TO THE PROJECT.

4. BARRICADES ARE TO BE ADEQUATELY SECURED AGAINST MOVEMENT DUE TO WIND AND AIRCRAFT ENGINE THRUST. BARRICADES MAY BE PINNED IF LOCATED ON PAVEMENT PLANNED FOR DEMOLITION IN LATTER PHASES.

5. ALL BARRICADES SHALL BE CHECKED VISUALLY ON A DAILY BASIS AND SHALL BE MAINTAINED AS NEEDED OR AS DIRECTED BY THE ENGINEER.

6. UPON COMPLETION OF PROJECT CONSTRUCTION, ALL LOW PROFILE BARRICADES SHALL REMAIN PROPERTY OF THE OWNER.

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 IN ADVANCE. 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 ITS 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 $65 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 AND 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 AS WELL AS A PRIVATE LOCATOR TO VERIFY ALL UNDERGROUND CABLE LOCATIONS IN THE VICINITY OF THE PROPOSED WORK:

CABLE OWNER	CONTACT PERSON	PHONE NUMBER
FEDERAL AVIATION ADMINISTRATION	ANDY GOMEZ	218–727–2826
Mn AIR NATIONAL GUARD	WORK CONTROL	218–788–7292
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

SAFETY AND SECURITY NOTES AND DETAILS

SHEET NUMBER
C002

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH–C002.dwg Plotted on: 2/7/2012 5:12 PM Plotted by: Erdmann, Ryan

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 (PART 6 – SAFETY AND SECURITY OF THE 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 C005. 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 ACCESS.

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 ITS 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 EQUIPMENT REMOVED IS 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 THE GATES SHOWN ON THE PHASING PLANS. 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 ITS 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 ITS 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.

23. EXISTING CONDITIONS: THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING ROADS, SOD, ETC PER THE GENERAL PROVISIONS OF THE SPECIFICATIONS.

DEMOLITION LEGEND

- EXISTING RETAINING WALL AND FOUNDATION TO BE REMOVED
- EXISTING BITUMINOUS PAVEMENT TO BE REMOVED
- EXISTING CONCRETE PAVEMENT TO BE REMOVED
- OBLITERATE EXISTING PAVEMENT MARKINGS
- REMOVE EXISTING CURB AND GUTTER
- PROPOSED TERMINAL BUILDING
- DEMOLISH EXISTING BUILDING
- SAWCUT PAVEMENT (FULL DEPTH)
- REMOVE EXISTING AIRFIELD SECURITY FENCE
- ABANDON EXISTING ELECTRICAL CABLE
- REMOVE EXISTING STORM PIPE
- REMOVE "R" EXISTING STORM DRAINAGE STRUCTURE. "RE" INDICATES RECONSTRUCT/ADJUST STRUCTURE
- REMOVE EXISTING ELECTRICAL HANDHOLE
- REMOVE STREET LIGHT FIXTURE, POLE, FOUNDATION, AND ASSOCIATED EQUIPMENT
- REMOVE SIDEWALK LIGHT FIXTURE, POLE, FOUNDATION, AND ASSOCIATED EQUIPMENT
- REMOVE EXISTING SINGLE FACE OR DOUBLE FACE INTERNALLY ILLUMINATED TAXI GUIDANCE SIGN. REMOVE EXISTING SIGN, FOUNDATION, AND ASSOCIATED EQUIPMENT AT LOCATION PER PLANS
- REMOVE EXISTING TAXIWAY EDGE LIGHT FIXTURE, ISOLATION TRANSFORMER, AND ALL ASSOCIATED EQUIPMENT INCLUDING L-867 BASE CAN
- REMOVE EXISTING STREET SIGN, POLE AND FOUNDATION

GEOMETRY LEGEND

- SHEET MATCH LINE
- PROPOSED CONCRETE PAVEMENT
- PROPOSED BITUMINOUS PAVEMENT
- EXISTING ENGINEERED AGGREGATE SECTION
- PROPOSED ENGINEERED AGGREGATE SECTION
- EXISTING SECURITY FENCE
- PROPOSED SECURITY FENCE
- LIMITS OF CONSTRUCTION

GRADING AND EROSION CONTROL LEGEND

- 1270 — PROPOSED MAJOR CONTOUR (1')
- 1267.25 — PROPOSED MINOR CONTOUR (0.25')
- 1270 — EXISTING MAJOR CONTOUR (5')
- 1268 — EXISTING MINOR CONTOUR (1')
- PROPOSED GRADING LIMITS
- PROPOSED SILT FENCE TYPE: MACHINE SLICED
- PROPOSED RIP RAP, CLASS III
- PROPOSED CATEGORY 3 EROSION BLANKET
- PROPOSED HYDROSEEDING
- PROPOSED INLET PROTECTION (OFF PAVEMENT)
- PROPOSED INLET PROTECTION (IN PAVEMENT)

SITE UTILITY LEGEND

- TB — EXISTING TELEPHONE BOX
- GM — EXISTING GAS METER
- UE — EXISTING UNDERGROUND ELECTRICAL DUCT BANK/CABLE
- UED — EXISTING UNDERGROUND ELECTRICAL DUCT
- E — EXISTING UNDERGROUND SITE LIGHTING POWER CABLE
- EXISTING AIRFIELD LIGHTING POWER CABLE
- EXISTING LIGHT & POLE
- UT — EXISTING UNDERGROUND TELEPHONE CABLE
- UTV — EXISTING CATV CABLES
- FO — EXISTING FIBER OPTIC CABLE
- EXISTING PARKING GATE
- W — PROPOSED WATERMAIN
- W — EXISTING WATERMAIN
- S — EXISTING SANITARY SEWER
- SAN — EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE/CATCHBASIN
- PROPOSED STORM MANHOLE/CATCHBASIN
- EXISTING STORM PIPE
- PROPOSED STORM PIPE
- PROPOSED UNDERDRAIN
- UG — EXISTING GAS LINE
- GAS — PROPOSED GAS LINE
- EXISTING HYDRANT
- PROPOSED HYDRANT
- PROPOSED WATER VALVE
- EXISTING WATER VALVE
- GV — EXISTING GAS VALVE

PAVEMENT LEGEND

- A — PROPOSED TYPE "A" ISOLATION JOINT, SEE SHEET C207 FOR DETAILS
- C — PROPOSED TYPE "C" DOWELED CONTRACTION JOINT, SEE SHEET C207 FOR DETAILS
- E — PROPOSED TYPE "E" DOWELED CONSTRUCTION JOINT, SEE SHEET C207 FOR DETAILS
- 10.25 — PROPOSED APRON SPOT ELEVATION (ADD 1400 TO EACH SPOT FOR ACTUAL ELEVATION)
- 10.25 — PROPOSED GSE SPOT ELEVATION (ADD 1400 TO EACH SPOT FOR ACTUAL ELEVATION)
- 1410.25 — PROPOSED ASPHALT SPOT ELEVATION

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

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

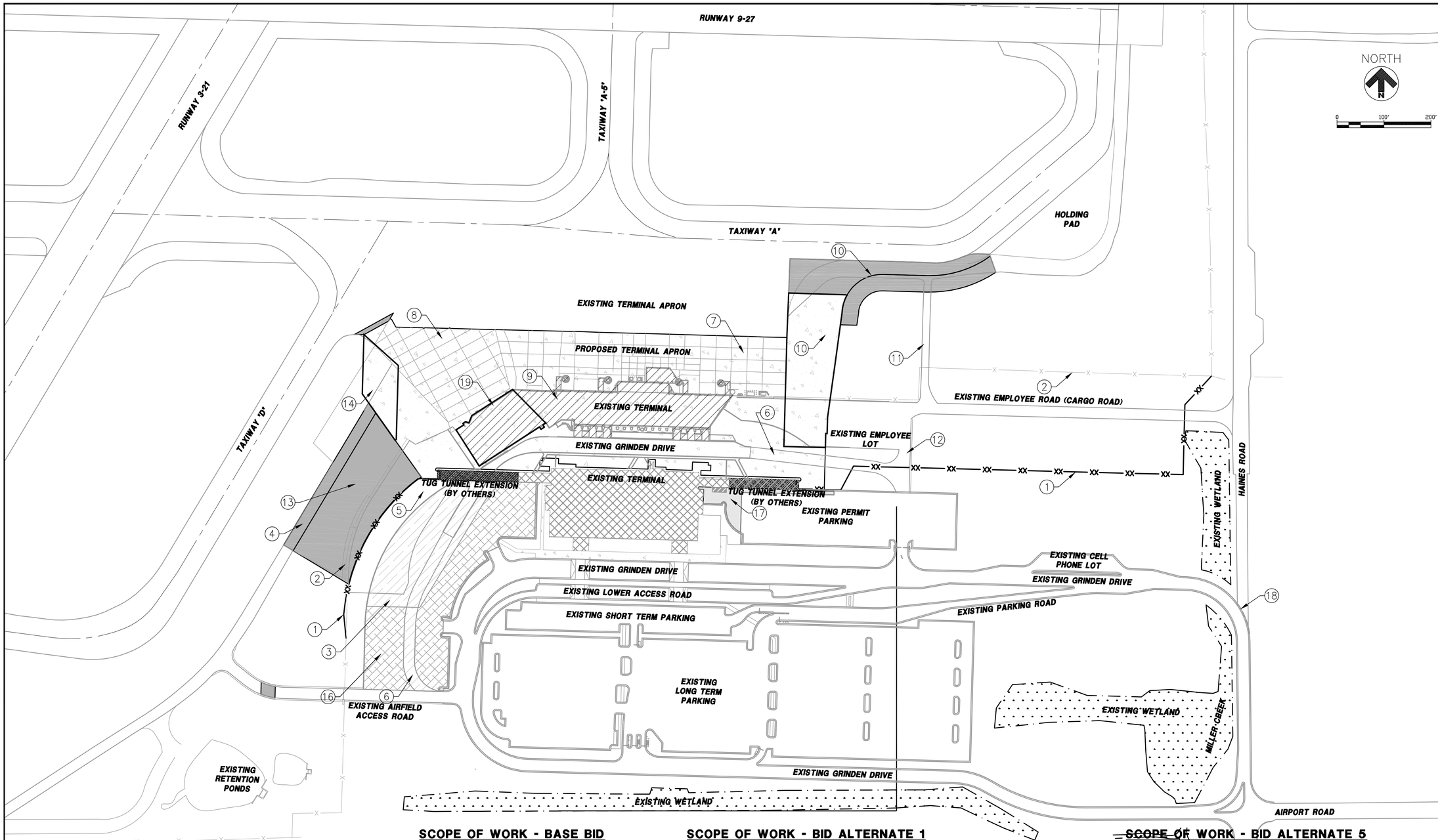
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
GENERAL CONSTRUCTION NOTES, LEGEND, AND ABBREVIATIONS

SHEET NUMBER
C003

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C003.dwg Plotted on: 2/6/2012 4:42 PM Plotted by: Erdmann, Ryan



SCOPE OF WORK - BASE BID

1. PROPOSED AIRPORT SECURITY FENCE
2. PROPOSED REMOVAL OF EXISTING AIRPORT SECURITY FENCE
3. PROPOSED PARKING LOT CONSTRUCTION
5. PROPOSED REMOVAL OF EXISTING PARKING AREA
6. PROPOSED REMOVAL OF EXISTING TEMPORARY ROAD
7. PROPOSED TERMINAL APRON
8. PROPOSED PARTIAL REMOVAL OF EXISTING APRON
9. PROPOSED REMOVAL OF EXISTING TERMINAL BUILDING INCLUDING REMOVAL OF UNDERGROUND PASSENGER TUNNELS
11. PROPOSED REMOVAL OF EXISTING FIELD ACCESS ROAD
12. PROPOSED REMOVAL OF EXISTING EMPLOYEE LOT ROAD
16. PROPOSED PARKING LOT PAVING OVER EXISTING ENGINEERED SECTION
17. PROPOSED PERMIT LOT WORK
18. PROPOSED SIGNAGE AND CURB AND GUTTER

SCOPE OF WORK - BID ALTERNATE 1 REVISED PAVEMENT GEOMETRY (EAST)

10. ELIMINATE PROPOSED TAXIWAY 'A' WORK AND ELIMINATE PROPOSED APRON PAVEMENT SECTION FROM BASE BID WORK ON THE EAST SIDE OF THE PROPOSED APRON

SCOPE OF WORK - BID ALTERNATE 2 PERIMETER ROAD EXTENSION AND SNOW MELT PAVEMENT

4. PROPOSED SOUTH PERIMETER ROAD AND SNOW MELT AREA

SCOPE OF WORK - BID ALTERNATE 3 APRON DEICING CONTAINMENT SYSTEM

13. PROPOSED APRON AND SNOW MELT AREA DEICING FLUID CONTAINMENT SYSTEM

SCOPE OF WORK - BID ALTERNATE 4 REVISED PAVEMENT GEOMETRY (WEST)

14. ELIMINATE PROPOSED PAVEMENT SECTION FROM BASE BID WORK ON THE WEST SIDE OF THE PROPOSED APRON

~~SCOPE OF~~ WORK - BID ALTERNATE 5 PHASED DEMOLITION OF EXISTING TERMINAL

19. DEMOLISH THE CUSTOMS AND BORDER PATROL AREA OF THE EXISTING TERMINAL IN PHASE 1, DEMOLISH REMAINING TERMINAL IN PHASE 2, INSTEAD OF DEMOLISHING THE ENTIRE BUILDING IN ONE PHASE. ALTERNATE ALSO INCLUDES THE PHASING OF THE APRON CONSTRUCTION AS SHOWN ON SHEET C006.

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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

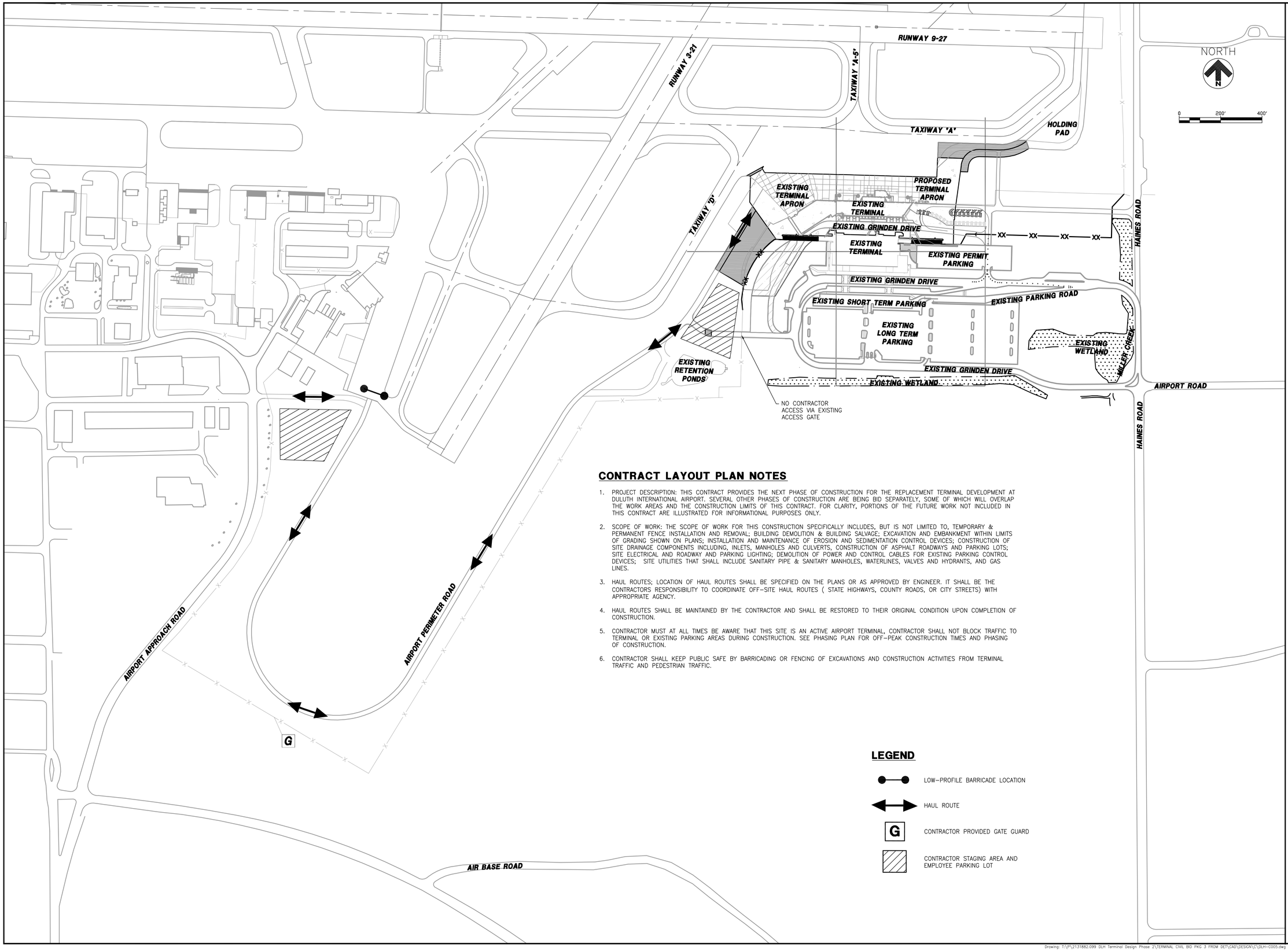
ULTIMATE DEVELOPMENT SITE PLAN

SHEET NUMBER

C004

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C004.dwg Plotted on: 2/7/2012 5:20 PM Plotted by: Erdmann, Ryan



CONTRACT LAYOUT PLAN NOTES

1. PROJECT DESCRIPTION: THIS CONTRACT PROVIDES THE NEXT PHASE OF CONSTRUCTION FOR THE 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 INSTALLATION AND REMOVAL; BUILDING DEMOLITION & BUILDING SALVAGE; 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; DEMOLITION OF POWER AND CONTROL CABLES FOR EXISTING PARKING CONTROL DEVICES; 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

- LOW-PROFILE BARRICADE LOCATION
- HAUL ROUTE
- G — CONTRACTOR PROVIDED GATE GUARD
- CONTRACTOR STAGING AREA AND EMPLOYEE PARKING LOT

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

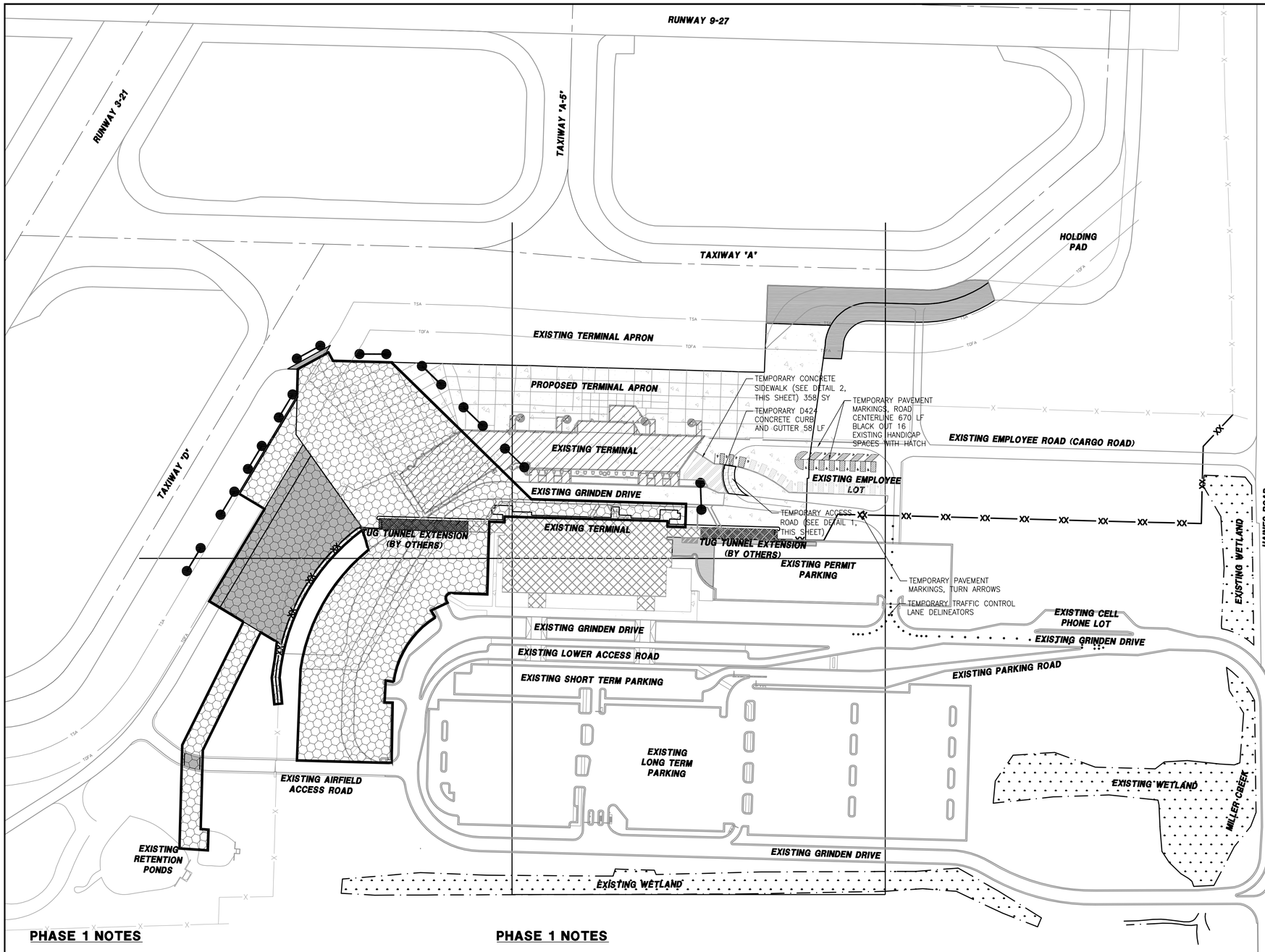
SHEET TITLE

CONTRACT LAYOUT PLAN AND CONTRACT NOTES

SHEET NUMBER
C005

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C005.dwg Plotted on: 2/6/2012 4:45 PM Plotted by: Erdmann, Ryan

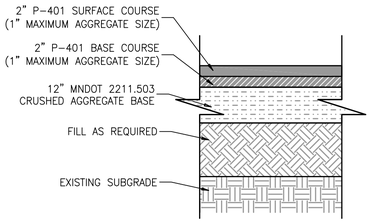


NORTH

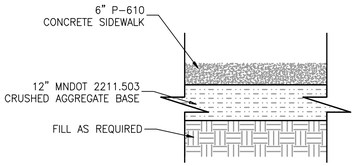
0 100' 200'

LEGEND

- PHASE ONE
- TEMPORARY PASSENGER TUNNEL
- TEMPORARY ACCESS ROAD
- TUG ACCESS ROAD
- TEMPORARY SECURITY FENCE 6' HEIGHT WITH BARB WIRE
- XX PROPOSED SECURITY FENCE
- LOW-PROFILE BARRICADE LOCATION
- LANE DELINEATOR



1 / C006 **TEMP. ACCESS ROAD**
SCALE: N.T.S.



2 / C006 **TEMP. SIDEWALK SECTION**
SCALE: N.T.S.

PHASE 1 NOTES

1. THE TEMPORARY SECURITY FENCE SHALL BE INSTALLED PRIOR TO REMOVAL OF THE EXISTING SECURITY FENCE. THE CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES.
2. ACCESS TO THE OLD TERMINAL IS TO BE MAINTAINED AT ALL TIMES DURING THIS PHASE OF CONSTRUCTION.
3. THE CONTRACTOR SHALL VACUUM/SWEEP ON A CONTINUOUS BASIS THROUGHOUT THE DURATION OF THE ENTIRE PROJECT, AND AS DIRECTED BY THE ENGINEER, THE ACTIVE AIRPORT AREAS NEAR CONSTRUCTION ACTIVITIES WHICH HAS HAD ANY FOREIGN OBJECT DEBRIS (FOD) DEPOSITED BY AUTOMOBILE OR CONSTRUCTION EQUIPMENT OR BY WIND BLOWING DEBRIS OR MATERIALS ONTO THOSE ACTIVE AREAS. IT IS IMPERATIVE THAT NO DAMAGE BE DONE TO ANY AIRCRAFT DUE TO FOD. ANY DAMAGE DONE TO AIRCRAFT WHICH IS ATTRIBUTABLE TO FOD FROM THE CONSTRUCTION AREAS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE WITH NO REIMBURSEMENT BY THE AIRPORT, ENGINEER OR THEIR AUTHORIZED REPRESENTATIVES.
4. THE CONTRACTOR SHALL PROVIDE FLAGMEN DESIGNATED TO OBSERVE ALL AIRCRAFT ACTIVITIES AROUND THE CONSTRUCTION AREAS FOR AIRCRAFT ARRIVING OR PREPARING TO DEPART FROM SAID AREAS NEAR THE CONSTRUCTION. THE FLAGMEN WILL STOP ANY CONSTRUCTION TRAFFIC WHERE THE AIRCRAFT CROSSES NEAR THE CONSTRUCTION, AND IF NECESSARY, REQUIRE THE CONSTRUCTION EQUIPMENT TO MOVE TO ALLOW SAFE PASSAGE OF THE AIRCRAFT. IF IT IS DETERMINED THAT A CONSIDERABLE AMOUNT OF AIRCRAFT ACTIVITY IS OCCURRING AND THE TRAFFIC WILL CAUSE CONSIDERABLE DELAYS FOR THE CONTRACTOR, THE CONTRACTOR SHALL REQUEST A MEETING WITH THE AIRPORT MANAGEMENT AND ENGINEER TO COORDINATE AND ALLEVIATE THE DELAYS.
5. ANY WORK WITHIN 250' OF THE RUNWAY CENTERLINE OR 160' OF TAXIWAY CENTERLINE REQUIRES CLOSURE OF THAT RUNWAY OR TAXIWAY.

PHASE 1 NOTES

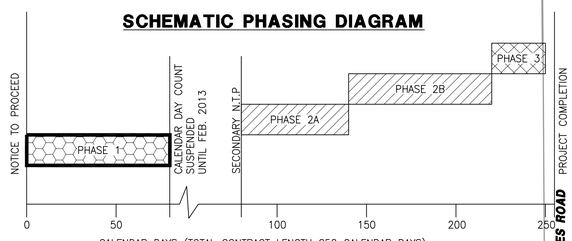
PHASE 1A – 15 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY)
CONSTRUCTION ITEMS:

- -TEMPORARY ACCESS ROAD CONSTRUCTION
- -TEMPORARY SIDEWALK CONSTRUCTION
- -TEMPORARY CONCRETE CURB AND GUTTER
- -TEMPORARY PAVEMENT MARKINGS
- -TAXIWAY 'D' CLOSURE

PHASE 1B – 65 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY)
CONSTRUCTION ITEMS:

- -CLOSE GRINDEN DRIVE
- -WEST TUG TUNNEL CONSTRUCTION (BY OTHERS)
- -CUSTOMS AND BORDER PATROL AREA DEMOLITION
- -ROAD, SNOW MELT, AND LOT DEMOLITION
- -SECURITY FENCE INSTALLATION
- -PARKING LOT, SNOW MELT AREA, AND APRON CONSTRUCTION
- -DRAINAGE CONSTRUCTION
- -STORM CHAMBER DETENTION SYSTEM CONSTRUCTION
- -ELECTRICAL CONSTRUCTION
- -RESTORATION

SCHEMATIC PHASING DIAGRAM



PHASE 1 – 80 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY
PHASE 2 – 140 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY
PHASE 3 – 30 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

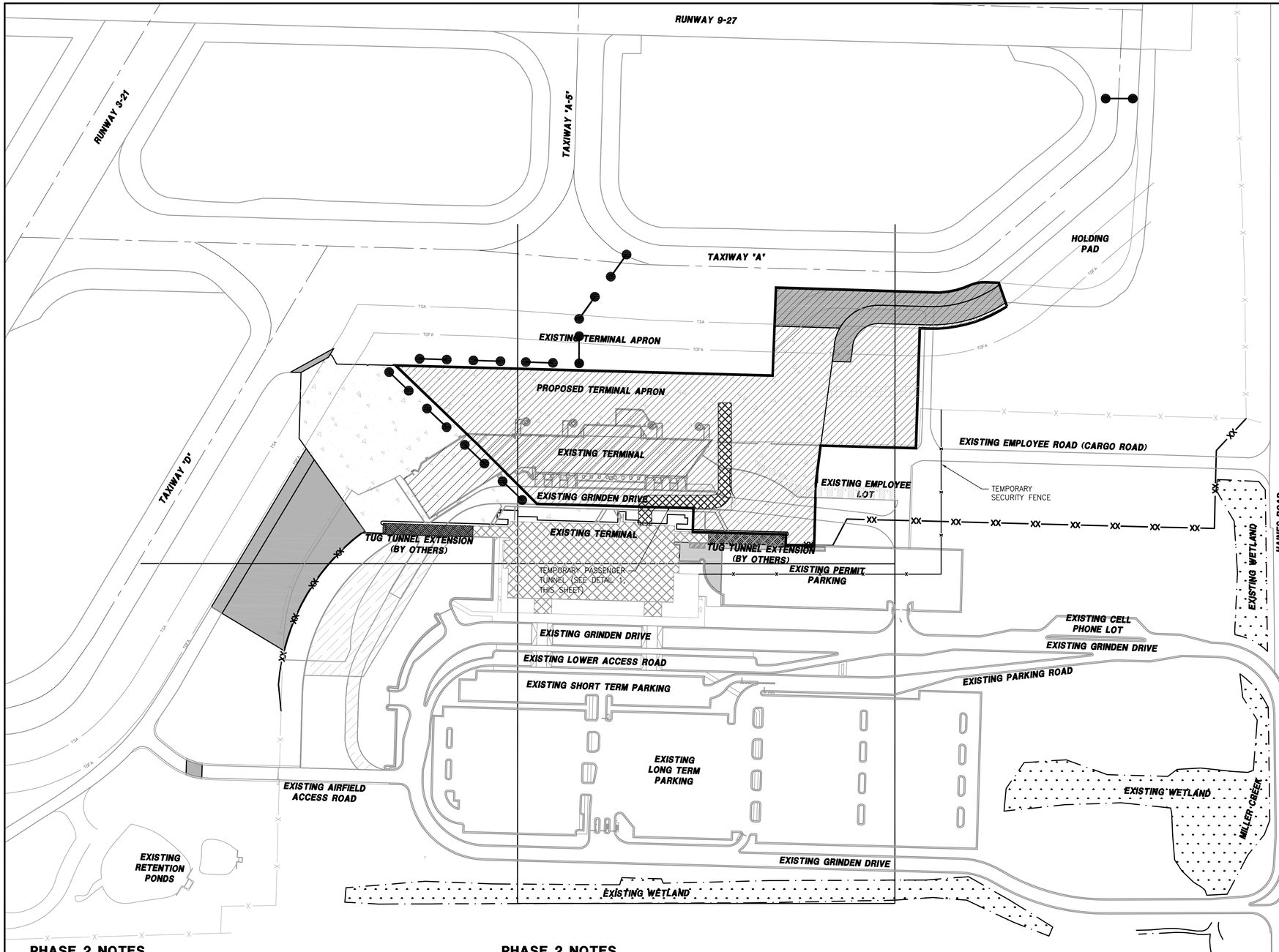
SHEET TITLE

SAFETY PHASING PLAN PHASE 1

SHEET NUMBER
C006

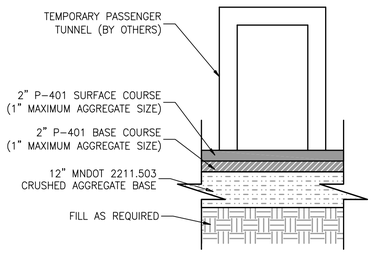
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C006.dwg Plotted on: 2/7/2012 5:16 PM Plotted by: Erdmann, Ryan



LEGEND

- PHASE TWO
- TEMPORARY PASSENGER TUNNEL
- TEMPORARY HAUL ROUTE
- TUG ACCESS ROAD
- TEMPORARY SECURITY FENCE 6' HEIGHT WITH BARB WIRE
- XX PROPOSED SECURITY FENCE
- LOW–PROFILE BARRICADE LOCATION



1 / C006 **TEMP. PASSENGER TUNNEL**
SCALE: N.T.S.

PHASE 2 NOTES

1. THE TEMPORARY SECURITY FENCE SHALL BE INSTALLED PRIOR TO REMOVAL OF THE EXISTING SECURITY FENCE. THE CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES.
2. ACCESS TO THE OLD TERMINAL IS TO BE MAINTAINED UNTIL OPERATIONS ARE FULLY TRANSFERRED TO THE NEW TERMINAL BUILDING.
3. THE CONTRACTOR SHALL VACUUM/SWEEP ON A CONTINUOUS BASIS THROUGHOUT THE DURATION OF THE ENTIRE PROJECT, AND AS DIRECTED BY THE ENGINEER, THE ACTIVE AIRPORT AREAS NEAR CONSTRUCTION ACTIVITIES WHICH HAS HAD ANY FOREIGN OBJECT DEBRIS (FOD) DEPOSITED BY AUTOMOBILE OR CONSTRUCTION EQUIPMENT OR BY WIND BLOWING DEBRIS OR MATERIALS ONTO THOSE ACTIVE AREAS. IT IS IMPERATIVE THAT NO DAMAGE BE DONE TO ANY AIRCRAFT DUE TO FOD. ANY DAMAGE DONE TO AIRCRAFT WHICH IS ATTRIBUTABLE TO FOD FROM THE CONSTRUCTION AREAS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE WITH NO REIMBURSEMENT BY THE AIRPORT, ENGINEER OR THEIR AUTHORIZED REPRESENTATIVES.
4. THE CONTRACTOR SHALL PROVIDE FLAGMEN DESIGNATED TO OBSERVE ALL AIRCRAFT ACTIVITIES AROUND THE CONSTRUCTION AREAS FOR AIRCRAFT ARRIVING OR PREPARING TO DEPART FROM SAID AREAS NEAR THE CONSTRUCTION. THE FLAGMEN WILL STOP ANY CONSTRUCTION TRAFFIC WHERE THE AIRCRAFT CROSSES NEAR THE CONSTRUCTION, AND IF NECESSARY, REQUIRE THE CONSTRUCTION EQUIPMENT TO MOVE TO ALLOW SAFE PASSAGE OF THE AIRCRAFT. IF IT IS DETERMINED THAT A CONSIDERABLE AMOUNT OF AIRCRAFT ACTIVITY IS OCCURRING AND THE TRAFFIC WILL CAUSE CONSIDERABLE DELAYS FOR THE CONTRACTOR, THE CONTRACTOR SHALL REQUEST A MEETING WITH THE AIRPORT MANAGEMENT AND ENGINEER TO COORDINATE AND ALLEVIATE THE DELAYS.
5. ANY WORK WITHIN 250' OF THE RUNWAY CENTERLINE OR 160' OF TAXIWAY CENTERLINE REQUIRES CLOSURE OF THAT RUNWAY OR TAXIWAY.

PHASE 2 NOTES

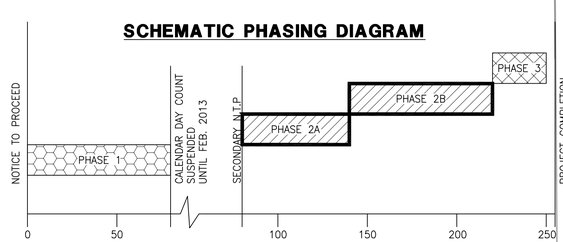
PHASE 2A – 60 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY)
CONSTRUCTION ITEMS:

- –TERMINAL BUILDING DEMOLITION
- –TEMPORARY PASSENGER TUNNEL SECTION
- –TEMPORARY FENCE
- –PERMIT LOT CONSTRUCTION (CURB & GUTTER, BITUMINOUS PAVING)
- –PARTIAL TAXIWAY 'A' CLOSURE

PHASE 2B – 80 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY)
CONSTRUCTION ITEMS:

- –EAST TUG TUNNEL CONSTRUCTION (BY OTHERS)
- –APRON DEMOLITION
- –APRON CONSTRUCTION
- –TAXIWAY AND SHOULDER CONSTRUCTION (ALTERNATE #1)
- –DRAINAGE CONSTRUCTION
- –ELECTRICAL CONSTRUCTION
- –RESTORATION

SCHEMATIC PHASING DIAGRAM



PHASE 1 – 80 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY
PHASE 2 – 140 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY
PHASE 3 – 30 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY

RS&H IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

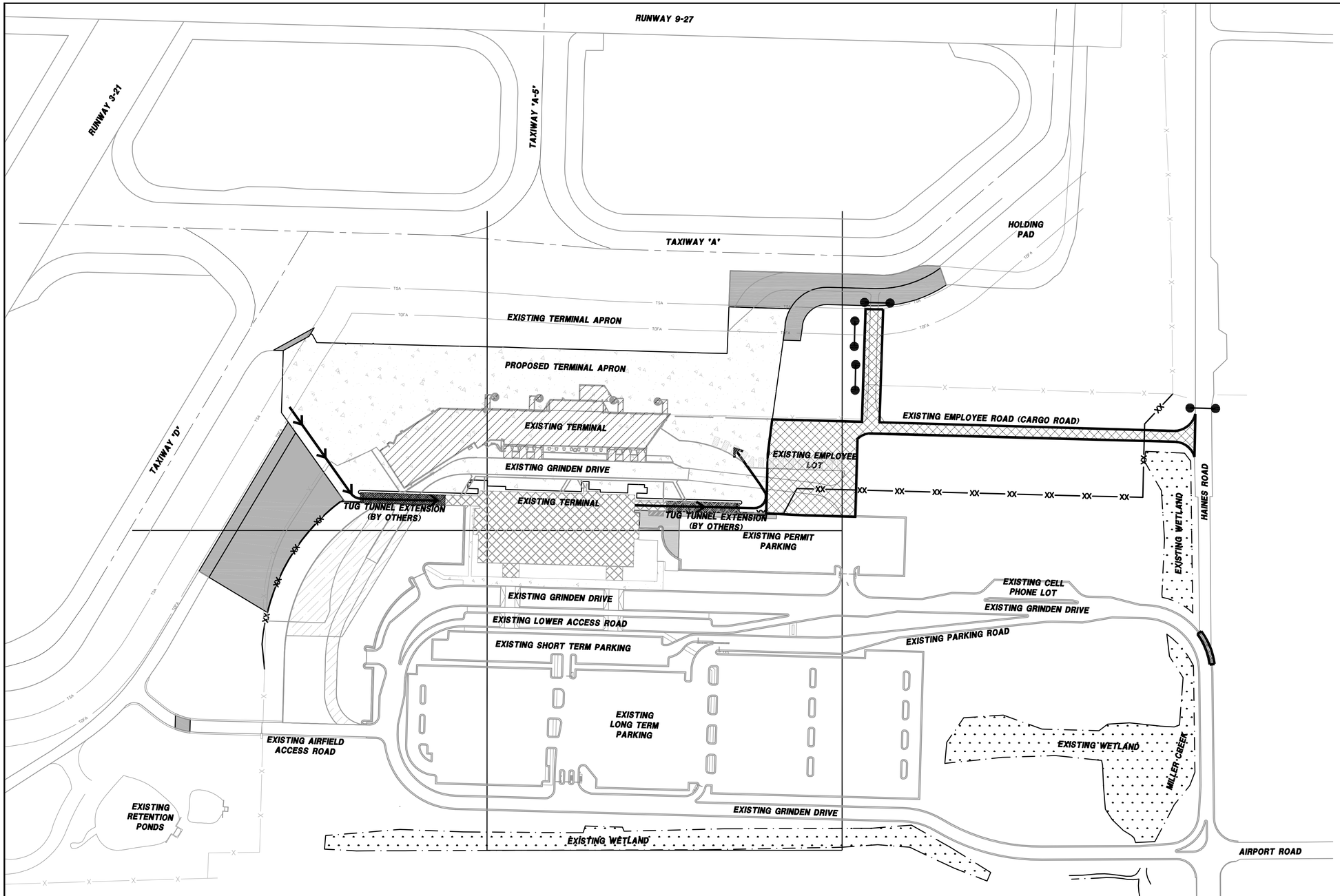
SAFETY PHASING PLAN PHASE 2

SHEET NUMBER

C007

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C007.dwg Plotted on: 2/7/2012 1:40 PM Plotted by: Erdmann, Ryan



LEGEND

- PHASE THREE
- TEMPORARY PASSENGER TUNNEL
- TEMPORARY HAUL ROUTE
- TUG ACCESS ROAD
- TEMPORARY SECURITY FENCE 6' HEIGHT WITH BARB WIRE
- PROPOSED SECURITY FENCE
- LOW–PROFILE BARRICADE LOCATION

PHASE 3 NOTES

1. THE TEMPORARY SECURITY FENCE SHALL BE INSTALLED PRIOR TO REMOVAL OF THE EXISTING SECURITY FENCE. THE CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES.
2. THE CONTRACTOR SHALL VACUUM/SWEEP ON A CONTINUOUS BASIS THROUGHOUT THE DURATION OF THE ENTIRE PROJECT, AND AS DIRECTED BY THE ENGINEER, THE ACTIVE AIRPORT AREAS NEAR CONSTRUCTION ACTIVITIES WHICH HAS HAD ANY FOREIGN OBJECT DEBRIS (FOD) DEPOSITED BY AUTOMOBILE OR CONSTRUCTION EQUIPMENT OR BY WIND BLOWING DEBRIS OR MATERIALS ONTO THOSE ACTIVE AREAS. IT IS IMPERATIVE THAT NO DAMAGE BE DONE TO ANY AIRCRAFT DUE TO FOD. ANY DAMAGE DONE TO AIRCRAFT WHICH IS ATTRIBUTABLE TO FOD FROM THE CONSTRUCTION AREAS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE WITH NO REIMBURSEMENT BY THE AIRPORT, ENGINEER OR THEIR AUTHORIZED REPRESENTATIVES.
3. THE CONTRACTOR SHALL PROVIDE FLAGMEN DESIGNATED TO OBSERVE ALL AIRCRAFT ACTIVITIES AROUND THE CONSTRUCTION AREAS FOR AIRCRAFT ARRIVING OR PREPARING TO DEPART FROM SAID AREAS NEAR THE CONSTRUCTION. THE FLAGMEN WILL STOP ANY CONSTRUCTION TRAFFIC WHERE THE AIRCRAFT CROSSES NEAR THE CONSTRUCTION, AND IF NECESSARY, REQUIRE THE CONSTRUCTION EQUIPMENT TO MOVE TO ALLOW SAFE PASSAGE OF THE AIRCRAFT. IF IT IS DETERMINED THAT A CONSIDERABLE AMOUNT OF AIRCRAFT ACTIVITY IS OCCURRING AND THE TRAFFIC WILL CAUSE CONSIDERABLE DELAYS FOR THE CONTRACTOR, THE CONTRACTOR SHALL REQUEST A MEETING WITH THE AIRPORT MANAGEMENT AND ENGINEER TO COORDINATE AND ALLEVIATE THE DELAYS.
4. ANY WORK WITHIN 250' OF THE RUNWAY CENTERLINE OR 160' OF TAXIWAY CENTERLINE REQUIRES CLOSURE OF THAT RUNWAY OR TAXIWAY.

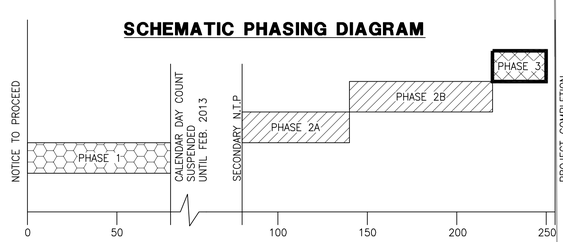
PHASE 3 NOTES

PHASE 3 – 30 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY)

BASE BID WORK WITHIN PHASE 3 LIMITS:

–PARTIAL TAXIWAY 'A' CLOSURE
–ROAD DEMOLITION
–SECURITY FENCE INSTALLATION
–CURB AND GUTTER
–SIGN INSTALLATION
–RESTORATION

SCHEMATIC PHASING DIAGRAM



PHASE 1 – 80 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY
PHASE 2 – 140 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY
PHASE 3 – 30 CALENDAR DAYS (LIQUIDATED DAMAGES = $3,000.00/DAY

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

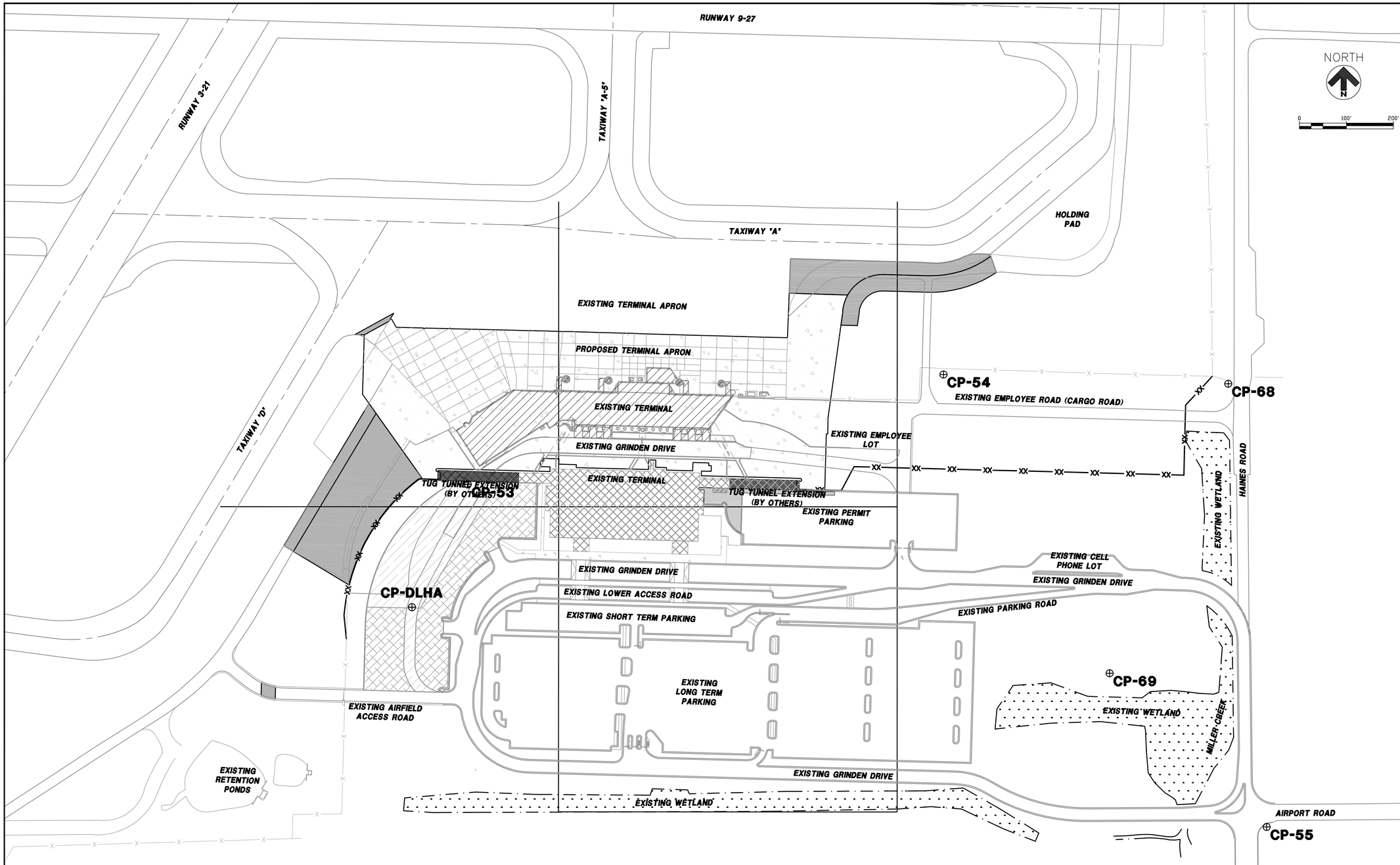
SHEET TITLE

SAFETY PHASING PLAN PHASE 3

SHEET NUMBER
C008

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C008.dwg Plotted on: 2/7/2012 5:06 PM Plotted by: Erdmann, Ryan



NOTES

1. ANY CONTROL POINT DISTURBED DURING CONSTRUCTION SHALL BE REESTABLISHED BY A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF MINNESOTE AT THE CONTRACTORS EXPENSE AND NO ADDITIONAL COST TO THE OWNER.
2. ULTIMATE DEVELOPMENT SHOWN FOR INFORMATION.
3. CONTROL POINT INFORMATION PROVIDED BY RLK-INCORPORATED DATE: 03-09-2009
4. ANY EXTRA CONTROL POINTS NEEDED SHALL BE SET BY CONTRACTOR & MAINTAINED

LEGEND

⊕ **CP-01** CONTROL POINT LOCATION

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-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.

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

RS&H IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

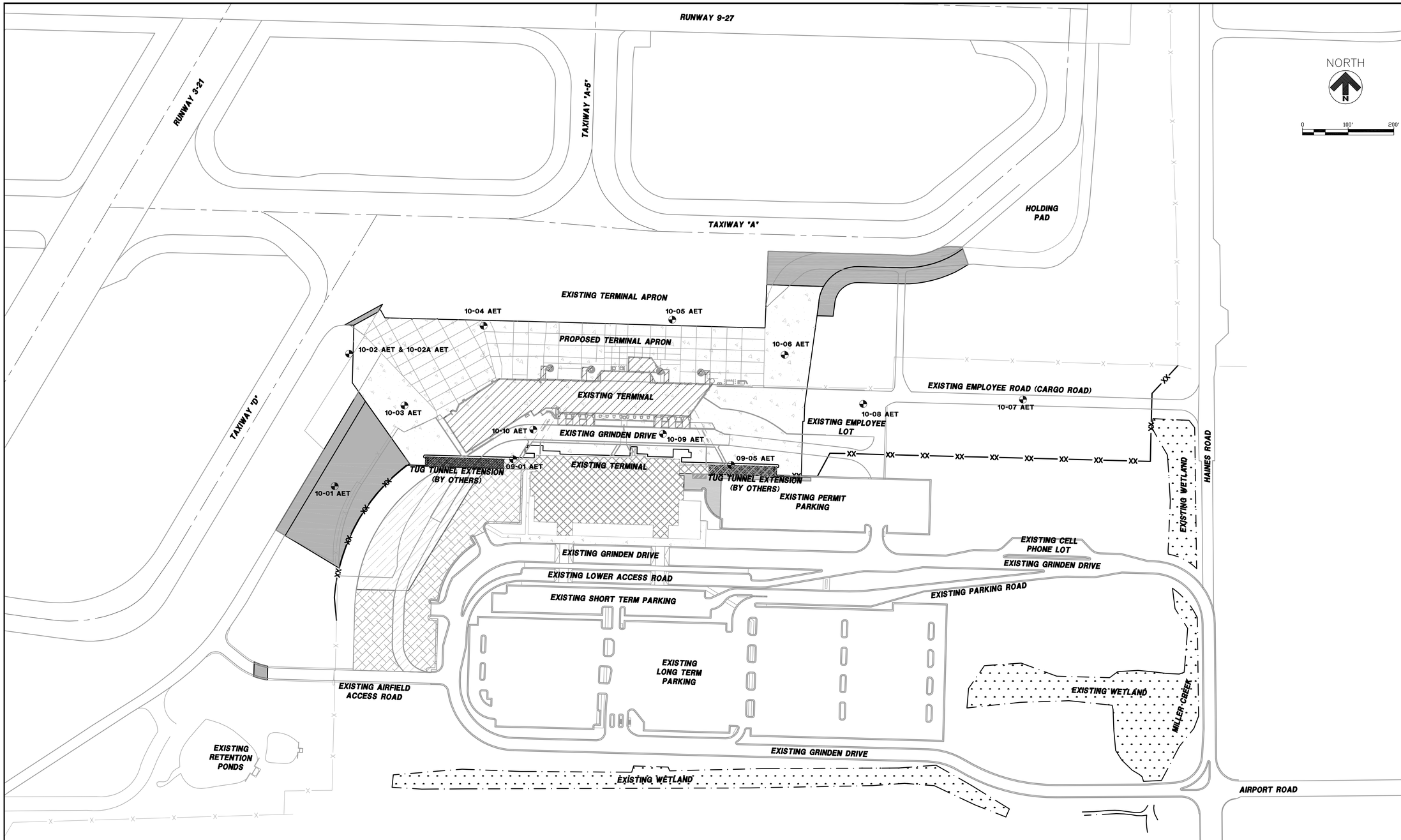
HORIZONTAL AND VERTICAL CONTROL PLAN AND NOTES

SHEET NUMBER

C009

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C009.dwg Plotted on: 2/6/2012 4:52 PM Plotted by: Erdmann, Ryan



LEGEND

SB-1 — SOIL BORING LOCATION

EXISTING WETLAND

NOTE: SEE SOIL BORING INFORMATIONAL DATA SHEETS IN SPECIFICATIONS AND ON FOLLOWING SHEETS

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
GEOTECHNICAL BORING LAYOUT AND INFORMATION

SHEET NUMBER
C020

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C020.dwg Plotted on: 2/6/2012 4:54 PM Plotted by: Erdmann, Ryan

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.2** LOG OF BORING NO. **09-01 (p. 1 of 1)**

PROJECT: **Duluth International Airport Terminal; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DD	LL	PL	% #200
1	FILL, organic sandy silt with roots, dark brown			M	SU						
2	FILL, coarse sand and gravel, dark brown (pea rock)	FILL									
3			4	M	SS	3					
4	SILTY SAND, dark brown, moist, medium dense (SM)										
5			21	M	SS	16	11				
6											
7	SILTY SAND, a little gravel, dark brown, moist to wet, medium dense (SM)										
8			18	M	SS	18					
9		TILL									
10			23	▼	SS	12					
11											
12	SILTY SAND, dark brown, moist with wet lenses, very dense to dense (SM)										
13			60		SS	0					
14											
15			46	W	SS	9					
16	**END OF BORING AT 16.0 FEET** Borehole backfilled with auger cuttings										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-14½' 3.25" HSA	**9/16/09**	**8:43**	**13.5**	**12.0**	**11.8**	**---**	**11.0**	SHEETS FOR AN
	9/16/09	**8:50**	**16.0**	**14.5**	**14.5**	**---**	**11.4**	EXPLANATION OF
BORING COMPLETED: **9/16/09**	**9/16/09**	**8:59**	**16.0**	**None**	**3.0**	**---**	**None**	TERMINOLOGY ON
DR. **LA** LG: **TDD** Rig: **51**								THIS LOG

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.4** LOG OF BORING NO. **10-01 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Bituminous Pavement - 2¾" thickness	PAVEMENT									
2	FILL, silty sand with gravel, dark brown	FILL	9	M	SS	11					
3	FILL, slightly organic silt with sand, a little gravel, trace roots, dark brown		15	M/W	SS	13					
4	SANDY SILT, a little gravel, brown, wet (ML)										
5	SILTY SAND, a little gravel, brown, moist, medium dense to dense (SM)		25	M	SS	9					
6											
7											
8			28	M	SS	18					
9		TILL									
10											
11			38	M	SS	15					
12	SILTY SAND WITH GRAVEL, dark brown, moist, dense (SM)										
13			39	M	SS	11					
14											
15	SILTY SAND, a little gravel, brown, moist, medium dense (SM)										
16			27	M	SS	12					
	END OF BORING AT 16.0 FEET Borehole backfilled with auger cuttings										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-14½' 3.25" HSA	**3/31/10**	**14:00**	**16.0**	**14.5**	**14.5**	**---**	**None**	SHEETS FOR AN
								EXPLANATION OF
BORING COMPLETED: **3/31/10**								TERMINOLOGY ON
DR. **LA** LG: **JK** Rig: **51**								THIS LOG

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.4** LOG OF BORING NO. **10-02 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	FILL, organic sandy silt with roots, dark brown	FILL	4	M	SS	15					
2	SILTY SAND, a little gravel, brown, moist, medium dense to dense (SM)	TILL	23	M	SS	18					
3											
4	**AUGER REFUSAL AT 4.0 FEET** Borehole backfilled with auger cuttings										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-4' 3.25" HSA								SHEETS FOR AN
								EXPLANATION OF
BORING COMPLETED: **3/31/10**								TERMINOLOGY ON
DR. **LA** LG: **JK** Rig: **51**								THIS LOG

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.4** LOG OF BORING NO. **10-02A (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	*No samples taken See boring 10-02*										
2											
3											
4											
5	SILTY SAND, a little gravel, brown, moist, medium dense to dense (SM)		33	M	SS	18					
6											
7	SILTY SAND WITH GRAVEL, dark brown, moist, very dense (SM)	TILL	72	M	SS	16					
8											
9											
10	SILTY SAND, a little gravel, dark brown, moist (SM)		109.5/ 10.3"	M	SS	8					
	AUGER REFUSAL AT 10.3 FEET Borehole backfilled with auger cuttings										
	Boring offset 3' west of boring 10-02										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-10.3' 3.25" HSA	**3/31/10**	**15:00**	**10.3**	**9.5**	**9.5**	**---**	**None**	SHEETS FOR AN
								EXPLANATION OF
BORING COMPLETED: **3/31/10**								TERMINOLOGY ON
DR. **LA** LG: **JK** Rig: **51**								THIS LOG

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.2** LOG OF BORING NO. **09-05 (p. 1 of 1)**

PROJECT: **Duluth International Airport Terminal; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DD	LL	PL	% #200
1	FILL, slightly organic silty sand with roots, dark brown			M	SU						
2	FILL, medium to coarse sand with gravel, brown	FILL	15	M	SS	15					
3	SILTY SAND WITH GRAVEL, dark brown, moist, medium dense, trace roots above about 2.5' (SM) (may be fill)	TILL OR FILL									
4			14	M	SS	11					
5											
6	SILTY SAND, a little gravel, dark brown, moist, medium dense (SM)										
7			22	M	SS	11					
8											
9											
10			30	M	SS	15					
11		TILL									
12	SILTY SAND WITH GRAVEL, dark brown, moist, dense (SM)										
13			37	M	SS	5					
14											
15	SILTY SAND, a little gravel, dark brown, moist, medium dense (SM)		29	M	SS	17					
16	**END OF BORING AT 16.0 FEET** Borehole backfilled with auger cuttings										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-14½' 3.25" HSA	**9/15/09**	**14:57**	**16.0**	**14.5**	**15.0**	**---**	**None**	SHEETS FOR AN
	9/15/09	**15:03**	**16.0**	**None**	**12.7**	**---**	**None**	EXPLANATION OF
BORING COMPLETED: **9/15/09**								TERMINOLOGY ON
DR. **LA** LG: **TDD** Rig: **51**								THIS LOG

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.4** LOG OF BORING NO. **10-03 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Bituminous Pavement - 14¾" thickness, deteriorated	PAVEMENT			CORE						
2	FILL, silty sand with gravel, brown	FILL	15	M	SS	12					
3	SILTY SAND, a little gravel, brown, moist, medium dense to dense (SM)		15	M	SS	12					
4											
5			40	M	SS	15					
6	SANDY SILT, a little gravel, brown, moist, dense (ML)										
7			35	M	SS	18					
8											
9	SILTY SAND, a little gravel, brown, moist with wet lenses, very dense (SM)	TILL									
10			73	M/W	SS	16					
11											
12	SILTY SAND WITH GRAVEL, brown, moist with wet lenses, very dense (SM)										
13			67	M/W	SS	16					
14											
15			57	M/W	SS	15					
16	**END OF BORING AT 16.0 FEET** Borehole backfilled with auger cuttings and bituminous patch										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-14½' 3.25" HSA	**3/31/10**	**12:00**	**16.0**	**14.5**	**15.0**	**---**	**None**	SHEETS FOR AN
								EXPLANATION OF
BORING COMPLETED: **3/31/10**								TERMINOLOGY ON
DR. **LA** LG: **JK** Rig: **51**								THIS LOG

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.4** LOG OF BORING NO. **10-04 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Concrete Pavement - 13½" thickness				CORE						
2	Bituminous Pavement - 6¾" thickness, deteriorated	PAVEMENT		M							
3	FILL, gravelly sand with silt, dark gray	FILL	22	M	SS	24					
4	FILL, sand with silt, a little gravel, brown										
5	SILTY CLAY, dark grayish brown (CL-ML)	FINE ALLUVIUM	33	M	SS	14					
6	SILT, dark grayish brown, moist (ML)										
7	SILTY SAND, a little gravel, dark grayish brown, moist, dense (SM)										
8	SANDY SILT, a little gravel, dark grayish brown, moist, medium dense (ML)		30	M	SS	15					
9		TILL									
10			19		SS	0					
11			60.5/ 5.0"	W	SS	5					
12	SILTY SAND, a little gravel, dark grayish brown, wet (SM)										
13	**AUGER REFUSAL AT 13.0 FEET** Borehole backfilled with auger cuttings, bituminous patch, and concrete patch										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-13' 3.25" HSA	**4/1/10**	**12:20**	**12.7**	**12.0**	**12.0**	**---**	**11.5**	SHEETS FOR AN
								EXPLANATION OF
BORING COMPLETED: **4/1/10**								TERMINOLOGY ON
DR. **LA** LG: **JK** Rig: **51**								THIS LOG

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

AET JOB NO: **07-04216.4** LOG OF BORING NO. **10-05 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Concrete Pavement - 13¾" thickness				CORE						
2	Bituminous Pavement - 6¾" thickness	PAVEMENT									
3	FILL, gravelly sand with silt, dark gray	FILL	25	M	SS	8					
4	FILL, sand with silt, a little gravel, brown										
5	SILTY SAND, a little gravel, brown, moist, medium dense (SM)										
6		TILL	20	M	SS	11					
7											
8			22	M	SS	13					
9	SILTY SAND, fine to medium grained, brown, moist (SM)	COARSE ALLUVIUM									
10	SILTY SAND, a little gravel, brown, moist, dense (SM)		42	M	SS	12					
11											
12		TILL									
13			31	M	SS	6					
14	**AUGER REFUSAL AT 14.0 FEET** Borehole backfilled with auger cuttings and bituminous patch										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	THE ATTACHED
0-14' 3.25" HSA	**4/1/10**	**9:45**	**13.5**	**14.0**	**14.0**	**---**	**None**	SHEETS FOR AN
								EXPLANATION OF
BORING COMPLETED: **4/1/10**								TERMINOLOGY ON
DR. **LA** LG: **JK** Rig: **51**								THIS LOG

06/06

BORING LOGS ARE FOR INFORMATION ONLY. THE COMPLETE REPORT IS LOCATED IN THE TECHNICAL SPECIFICATIONS, OR CAN BE VIEWIED UPON REQUEST. THE REPORT WAS PREPARED BY AMERICAN ENGINEERING TESTING, INC., OCTOBER 14, 2009 AND AUGUST 2, 2010.

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
GEOTECHNICAL BORING LOGS

SHEET NUMBER
C021

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C021.dwg Plotted on: 2/6/2012 4:57 PM Plotted by: Erdmann, Ryan

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

ART JOB NO: **07-04216.4** LOG OF BORING NO. **10-06 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	FILL, silty sand with gravel, brown	FILL	16	M	SS	18					
2											
3	SANDY SILT, a little gravel, brown, moist, medium dense (ML)		21	M	SS	16					
4											
5	SILTY SAND, a little gravel, brown, moist, medium dense to dense, lens of medium to coarse grained sand between about 7.7-7.9' (SM)		17	M	SS	16					
6											
7											
8			42	M	SS	15					
9		TILL									
10			36	M	SS	14					
11											
12											
13			36	M	SS	2					
14											
15			37	M	SS	18					
16	**END OF BORING AT 16.0 FEET** Borehole backfilled with auger cuttings										

DEPTH: DRILLING METHOD	DATE	TIME	WATER LEVEL MEASUREMENTS SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-14½' 3.25" HSA								
	3/31/10	**16:00**	**16.0**	**14.5**	**14.5**	**---**	**None**	
BORING COMPLETED: **3/31/10**								
DR: **LA** LG: **JK** Rig: **51**								

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

ART JOB NO: **07-04216.4** LOG OF BORING NO. **10-07 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Bituminous Pavement - 6¼" thickness	PAVEMENT			CORE						
	FILL, silty sand with gravel, brown	FILL									
2	SILTY SAND WITH GRAVEL, brown, moist, medium dense to dense (SM) (may be fill)		23	M	SS	15					
3		TILL OR FILL	36	M	SS	16					
4											
5											
6	SILTY SAND, a little gravel, brown, moist (SM)	TILL	21	M	SS	16					
	END OF BORING AT 6.0 FEET Borehole backfilled with auger cuttings and bituminous patch										

DEPTH: DRILLING METHOD	DATE	TIME	WATER LEVEL MEASUREMENTS SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-4½' 3.25" HSA								
	4/5/10	**11:45**	**6.0**	**4.5**	**4.5**	**---**	**None**	
BORING COMPLETED: **4/5/10**								
DR: **LA** LG: **JK** Rig: **51**								

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

ART JOB NO: **07-04216.4** LOG OF BORING NO. **10-08 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Bituminous Pavement - 3" thickness	PAVEMENT			CORE						
	FILL, silty sand with gravel, dark brown	FILL	23	M	SS	13					
2	SILTY SAND WITH GRAVEL, brown, moist, medium dense (SM) (may be fill)										
3		TILL OR FILL	16	M	SS	15					
4											
5	SILTY SAND, a little gravel, brown, moist, dense (SM)	TILL	32	M	SS	18					
6	**END OF BORING AT 6.0 FEET** Borehole backfilled with auger cuttings and bituminous patch										

DEPTH: DRILLING METHOD	DATE	TIME	WATER LEVEL MEASUREMENTS SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-4½' 3.25" HSA								
	4/5/10	**11:15**	**6.0**	**4.5**	**4.5**	**---**	**None**	
BORING COMPLETED: **4/5/10**								
DR: **LA** LG: **JK** Rig: **51**								

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

ART JOB NO: **07-04216.4** LOG OF BORING NO. **10-09 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Bituminous Pavement - 10" thickness	PAVEMENT			CORE						
	FILL, sand with silt and gravel, brown	FILL									
2	SILTY SAND WITH GRAVEL, brown, moist, medium dense (SM)		30	M	SS	18					
3											
4											
5	SANDY SILT, a little gravel, brown, moist, medium dense to very dense (ML)		16	M	SS	18					
6											
7			53	M	SS	1					
8											
9											
10			36	M	SS	18					
11											
12	SILTY SAND, a little gravel, brown, moist, dense (SM)	TILL	32	M	SS	16					
13											
14											
15	SILTY SAND WITH GRAVEL, brown to dark brown, moist, very dense (SM)		73	M	SS	12					
16											
17											
18											
19											
20			66	M	SS	12					
21											
22											
23											
24											
25			60	M	SS	18					
26	**END OF BORING AT 26.0 FEET** Borehole backfilled with auger cuttings and bituminous patch										

DEPTH: DRILLING METHOD	DATE	TIME	WATER LEVEL MEASUREMENTS SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-24½' 3.25" HSA								
	4/5/10	**9:15**	**26.0**	**24.5**	**24.5**	**---**	**None**	
BORING COMPLETED: **4/5/10**								
DR: **LA** LG: **JK** Rig: **51**								

06/06

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE TEST BORING LOG

ART JOB NO: **07-04216.4** LOG OF BORING NO. **10-10 (p. 1 of 1)**

PROJECT: **Duluth International Airport Apron; Duluth, MN**

DEPTH IN FEET	SURFACE ELEVATION _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	% #4	LL	PL	% #200
1	Bituminous Pavement - 9" thickness	PAVEMENT			CORE						
	FILL, gravelly sand with silt, brown	FILL									
2	SILTY SAND WITH GRAVEL, brown, moist, medium dense (SM)		15	M	SS	14					
3											
4											
5			24	M	SS	15					
6											
7	SILTY SAND, a little gravel, brown, moist, medium dense to dense (SM)		22	M	SS	16					
8											
9											
10			25	M	SS	18					
11											
12		TILL									
13			29	M	SS	18					
14											
15			32	M	SS	18					
16											
17											
18											
19											
20			49	M	SS	4					
21											
22											
23	SILT, dark grayish brown, moist, dense, laminations of brown clay (ML)										
24		FINE ALLUVIUM									
25			34	M	SS	15					
26	**END OF BORING AT 26.0 FEET** Borehole backfilled with auger cuttings and bituminous patch										

DEPTH: DRILLING METHOD	DATE	TIME	WATER LEVEL MEASUREMENTS SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-24½' 3.25" HSA								
	4/5/10	**10:30**	**26.0**	**24.5**	**24.5**	**---**	**None**	
BORING COMPLETED: **4/5/10**								
DR: **LA** LG: **JK** Rig: **51**								

06/06

BORING LOGS ARE FOR INFORMATION ONLY. THE COMPLETE REPORT IS LOCATED IN THE TECHNICAL SPECIFICATIONS, OR CAN BE VIEWED UPON REQUEST. THE REPORT WAS PREPARED BY AMERICAN ENGINEERING TESTING, INC., OCTOBER 14, 2009 AND AUGUST 2, 2010.

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
GEOTECHNICAL BORING LOGS

SHEET NUMBER
C022

BID PACKAGE 3 100% REVIEW

Drawing: I:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C022.dwg Plotted on: 2/6/2012 4:58 PM Plotted by: Erdmann, Ryan

DEMOLITION NOTES

1. THE AIRPORT RESERVES THE RIGHT TO SALVAGE ANY ELECTRICAL MATERIALS (GUIDANCE SIGNS, TAXIWAY EDGE LIGHTS, ACCESS CONTROL AND PARKING ACCESS CONTROL MATERIAL). THE CONTRACTOR SHALL COORDINATE THROUGH THE ENGINEER TO DETERMINE ITEMS WHICH THE AIRPORT WILL MAINTAIN OWNERSHIP. THESE ITEMS SHALL BE PROTECTED AND PROVIDED TO THE OWNER AT A LOCATION TO BE DETERMINED. ANY ITEMS NOT BEING SALVAGED TO THE OWNER SHALL BE THE PROPERTY OF THE CONTRACTOR AND THEY SHALL BE RESPONSIBLE FOR DISPOSAL OFFSITE PER ALL APPLICABLE LOCAL AND STATE REGULATIONS.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND/OR ABANDONMENT OF EXISTING UTILITIES AS NOTED HEREIN. THE CONTRACTOR SHALL COORDINATE WITH ALL LOCAL, STATE AND UTILITY PROVIDERS AS NECESSARY TO PROVIDE FOR THE WORK. THE CONTRACTOR SHALL FOLLOW ALL PHASING PLANS AND MAINTAIN FULL OPERATIONS TO ALL AIRPORT BUILDINGS, PARKING AND ROADWAYS UNLESS WRITTEN AUTHORIZATION HAS BEEN PROVIDED BY THE ENGINEER.

3. CONTRACTOR SHALL PROVIDE ALL REQUIRED WARNING SIGNAGE AND BARRICADES PER STATE AND LOCAL REGULATIONS ON PUBLIC ROADWAYS.

4. CONTRACTOR SHALL PROVIDE ANY AND ALL TEMPORARY ELECTRICAL WIRING AND CONNECTIONS TO PROVIDE FOR UNINTERRUPTED SERVICE FOR AIRFIELD LIGHTING, SIGNAGE, ROADWAY AND PARKING LOT LIGHTING AND ACCESS CONTROL SYSTEMS.

5. 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.

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

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

8. 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.

9. PAVEMENT TO BE REMOVED THAT IS ADJACENT TO PAVEMENT TO REMAIN SHALL BE SAWCUT TO STRAIGHT, NEAT, PLUMB LINES PRIOR TO REMOVAL. SEE SHEET C120 FOR DETAIL.

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

11. 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.

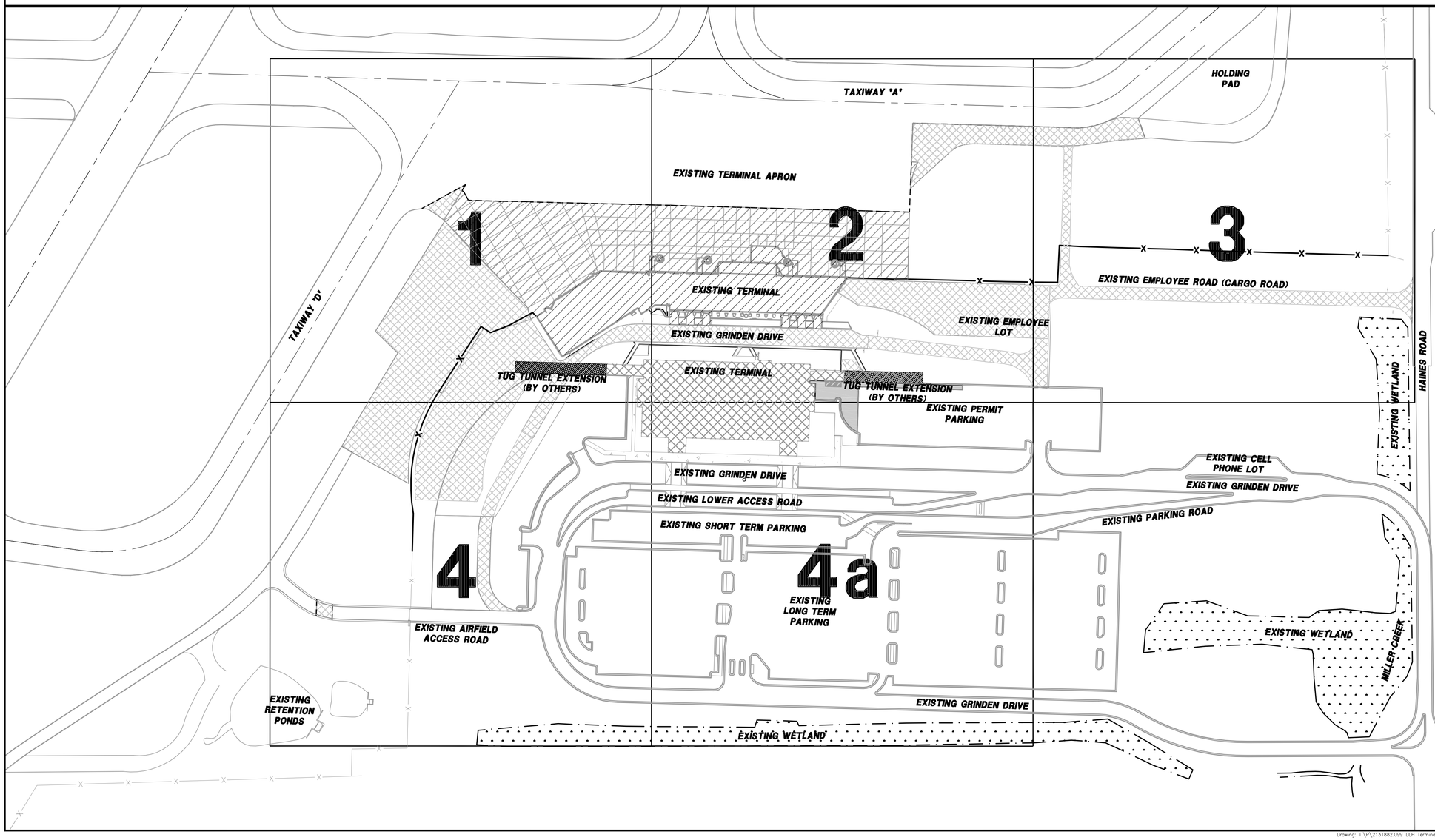
12. ALL EXISTING AIRPORT SIGNAGE ON ANY FENCING DEMOLITION WILL BE SALVAGED AND TURNED OVER TO THE OWNER.

13. ALL DEMOLITION IS TO BE PHASED TO MAINTAIN TRAFFIC FLOW TO AND FROM THE EXISTING TERMINAL BUILDING AND THE AIRFIELD OPERATIONS AREAS UNLESS NOTED.

14. DEMOLITION OF THE EXISTING BUILDING SHALL NOT BE COMMENCED UNTIL WRITTEN DIRECTION FROM THE ENGINEER IS PROVIDED.

NORTH

0 100' 200'



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

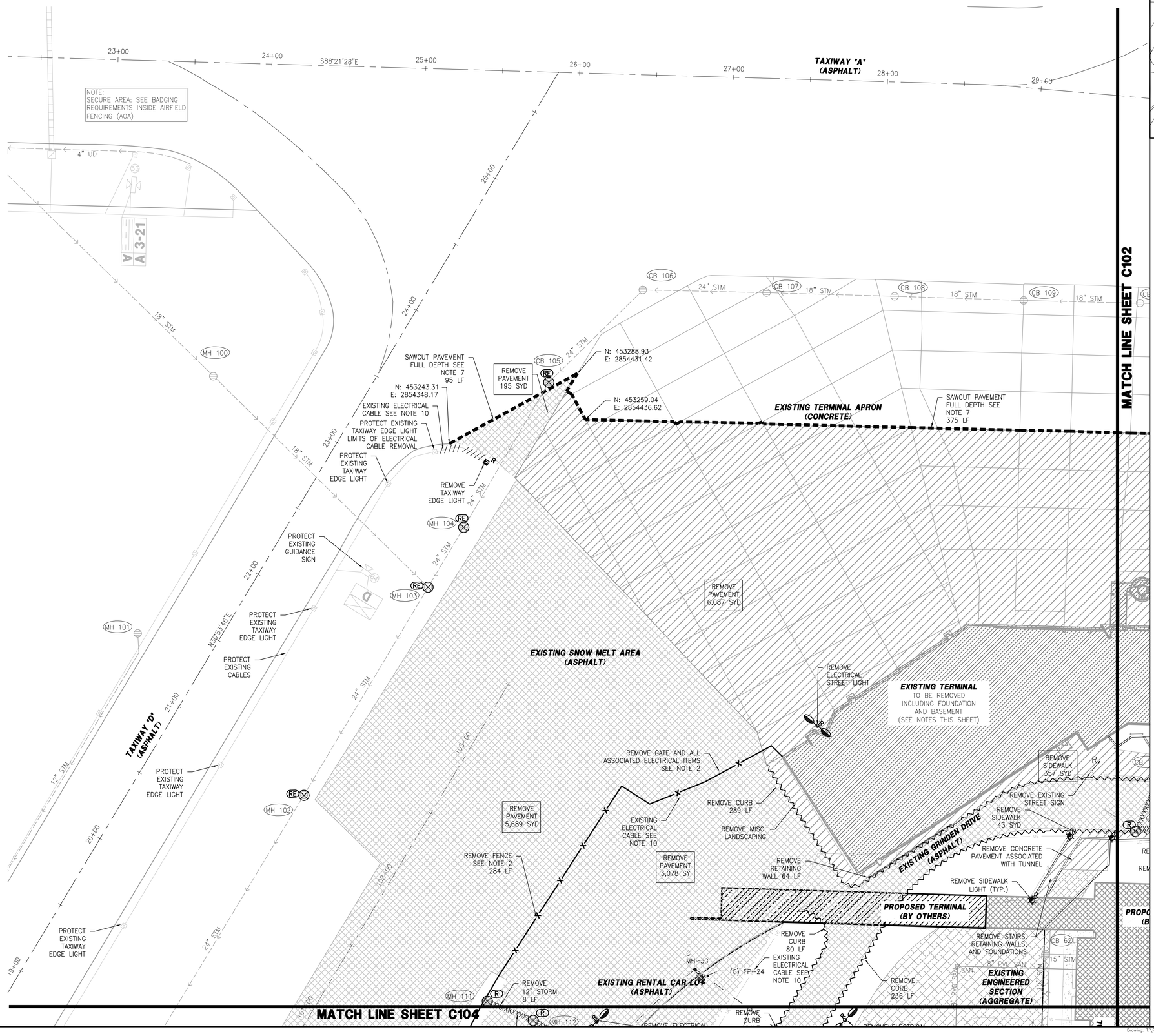
SHEET TITLE

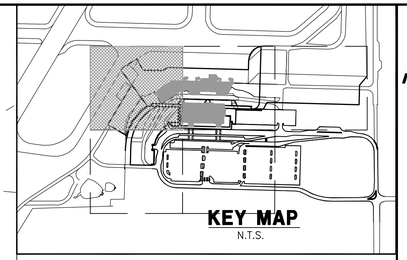
OVERALL DEMOLITION PLAN AND NOTES

SHEET NUMBER
C100

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C100.dwg Plotted on: 2/6/2012 4:59 PM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

DEMOLITION NOTES

1. SEE SHEET C003 FOR LEGEND. EXISTING TERMINAL OPERATIONS SHALL NOT BE AFFECTED EXCEPT AS SHOWN BY PHASING PLANS.
2. CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY NECESSARY TEMPORARY FENCING OR BADGED GATE GUARDS TO MEET AIRPORT SECURITY REQUIREMENTS. TEMPORARY FENCE SHALL MEET DETAILS AS PROVIDED HEREIN.
3. EXISTING TERMINAL SHALL BE COMPLETELY REMOVED PER PHASING PLAN. REMOVAL SHALL INCLUDE ENTIRE STRUCTURE INCLUDING ALL WALLS, FOUNDATIONS, FOOTINGS, SLABS, UTILITIES, AND ASSOCIATED ITEMS. EXCEPTIONS AS NOTED.
4. QUANTITIES SHOWN WITHIN THE MATCH LINES ON THIS SHEET ARE ONLY FOR THIS SHEET.
5. PIPE DEMOLITION QUANTITIES LISTED FROM MANHOLE TO MANHOLE (NODE TO NODE).
6. CONTRACTOR SHALL PROVIDE A FULL DEPTH SAWCUT TO A CLEAN EDGE. SEE DETAIL 1, SHEET C120.
7. ALL EXISTING PAVEMENT SECTIONS, WALLS, FOUNDATIONS AND OTHER MISCELLANEOUS BUILDING, ROADWAY AND OTHER STRUCTURES SHALL BE REMOVED TO CONSTRUCT PROPOSED ITEMS. ALL COSTS RELATED TO THESE REMOVALS SHALL BE INCLUDED IN THE COST OF THE PROPOSED ITEMS.
8. REMOVAL OF GUIDANCE SIGN SHALL INCLUDE THE DISMANTLE, REMOVAL, AND SALVAGE OF SIGN TO AIRPORT. REMOVAL SHALL INCLUDE THE DISPOSAL OF ALL FOUNDATIONS, CANS, CONDUITS, AND CABLES.
9. EXISTING UNDERDRAIN, ELECTRICAL CABLES, CONDUIT, AND/OR DUCTBANK AND MISCELLANEOUS UTILITY LINES TO BE ABANDONED IN PLACE UNLESS REMOVAL IS NECESSARY AND SHALL BE INCIDENTAL TO EXCAVATION ITEMS.
10. ITEMS SHOWN TO BE DEMOLISHED WITHOUT A CORRESPONDING BIT ITEM ARE TO BE INCIDENTAL TO THE BUILDING DEMOLITION BID ITEM.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

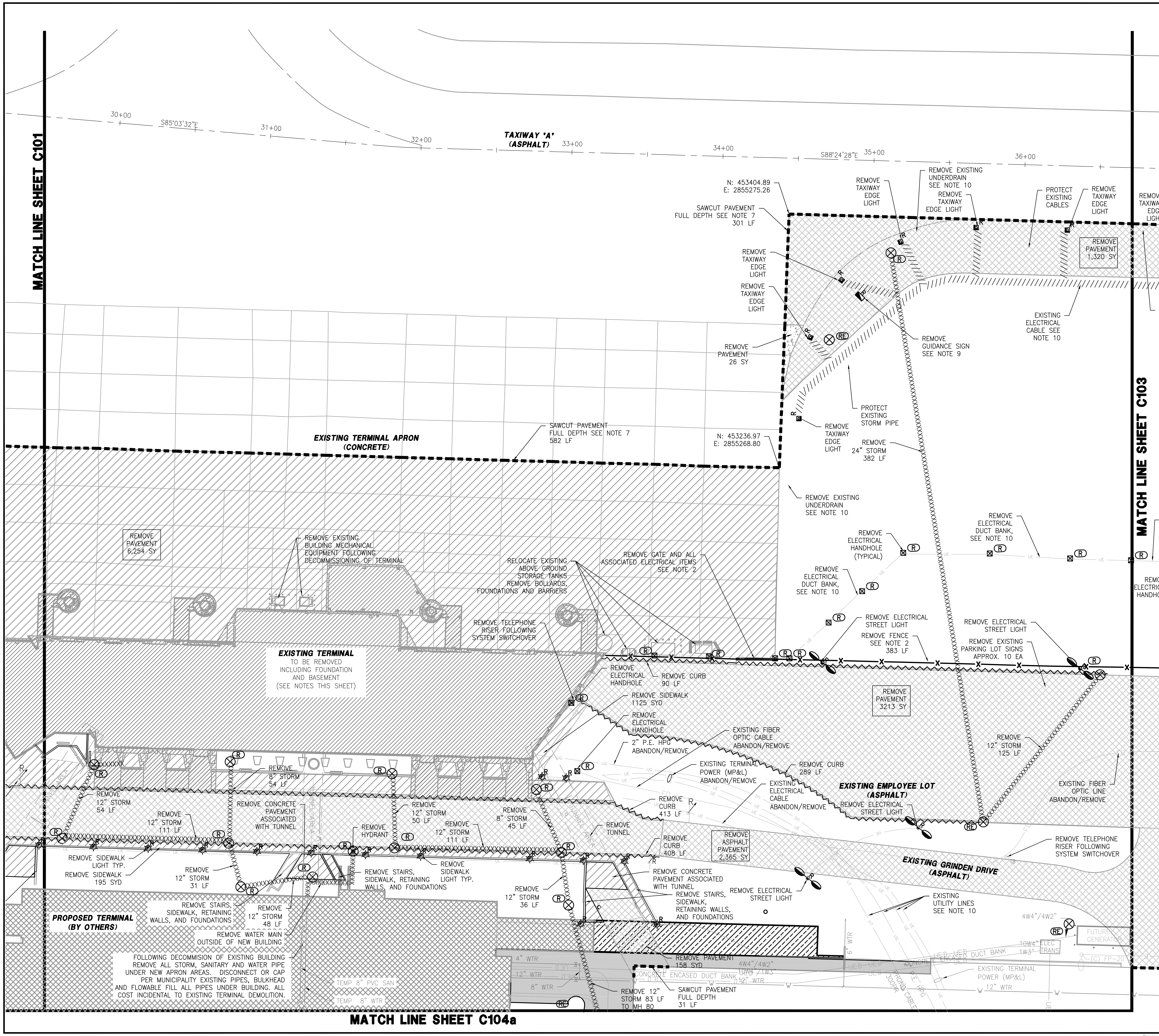
SHEET TITLE

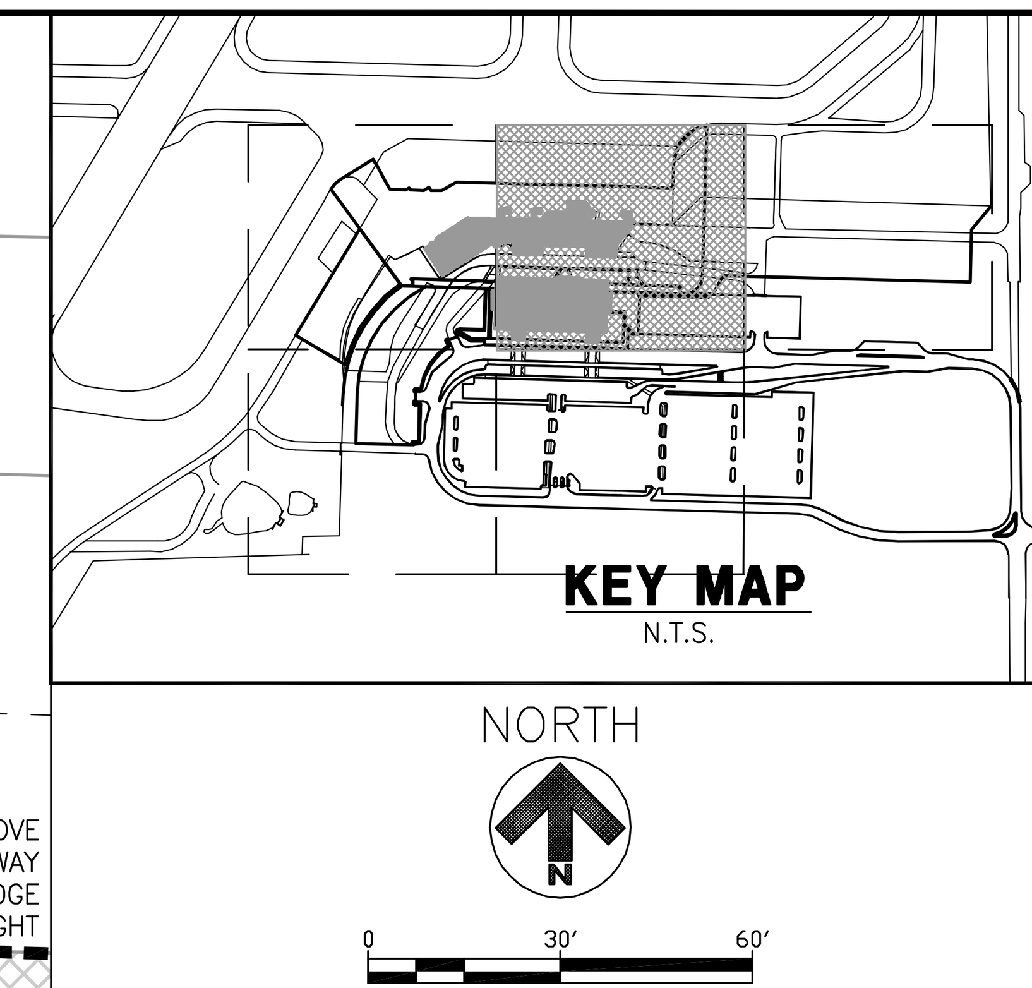
DEMOLITION PLAN (SHEET 1 OF 5)

SHEET NUMBER
C101

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C101.dwg Plotted on: 2/7/2012 4:38 PM Plotted by: Erdmann, Ryan





DEMOLITION NOTES

1. SEE SHEET C003 FOR LEGEND. EXISTING TERMINAL OPERATIONS SHALL NOT BE AFFECTED EXCEPT AS SHOWN BY PHASING PLANS.
2. CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY NECESSARY TEMPORARY FENCING OR BADGED GATE GUARDS TO MEET AIRPORT SECURITY REQUIREMENTS. TEMPORARY FENCE SHALL MEET DETAILS AS PROVIDED HEREIN.
3. EXISTING TERMINAL SHALL BE COMPLETELY REMOVED PER PHASING PLAN. REMOVAL SHALL INCLUDE ENTIRE STRUCTURE INCLUDING ALL WALLS, FOUNDATIONS, FOOTINGS, SLABS, UTILITIES, AND ASSOCIATED ITEMS. EXCEPTIONS AS NOTED.
4. QUANTITIES SHOWN WITHIN THE MATCH LINES ON THIS SHEET ARE ONLY FOR THIS SHEET.
5. PIPE DEMOLITION QUANTITIES LISTED FROM MANHOLE TO MANHOLE (NODE TO NODE).
6. CONTRACTOR SHALL PROVIDE A FULL DEPTH SAWCUT TO A CLEAN EDGE. SEE DETAIL 1, SHEET C120.
7. ALL EXISTING PAVEMENT SECTIONS, WALLS, FOUNDATIONS AND OTHER MISCELLANEOUS BUILDING, ROADWAY AND OTHER STRUCTURES SHALL BE REMOVED TO CONSTRUCT PROPOSED ITEMS. ALL COSTS RELATED TO THESE REMOVALS SHALL BE INCLUDED IN THE COST OF THE PROPOSED ITEMS.
8. REMOVAL OF GUIDANCE SIGN SHALL INCLUDE THE DISMANTLE, REMOVAL, AND SALVAGE OF SIGN TO AIRPORT. REMOVAL SHALL INCLUDE THE DISPOSAL OF ALL FOUNDATIONS, CANS, CONDUITS, AND CABLES.
9. EXISTING UNDERDRAIN, ELECTRICAL CABLES, CONDUIT, AND/OR DUCTBANK AND MISCELLANEOUS UTILITY LINES TO BE ABANDONED IN PLACE UNLESS REMOVAL IS NECESSARY AND SHALL BE INCIDENTAL TO EXCAVATION ITEMS.
10. ITEMS SHOWN TO BE DEMOLISHED WITHOUT A CORRESPONDING BIT ITEM ARE TO BE INCIDENTAL TO THE BUILDING DEMOLITION BID ITEM.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

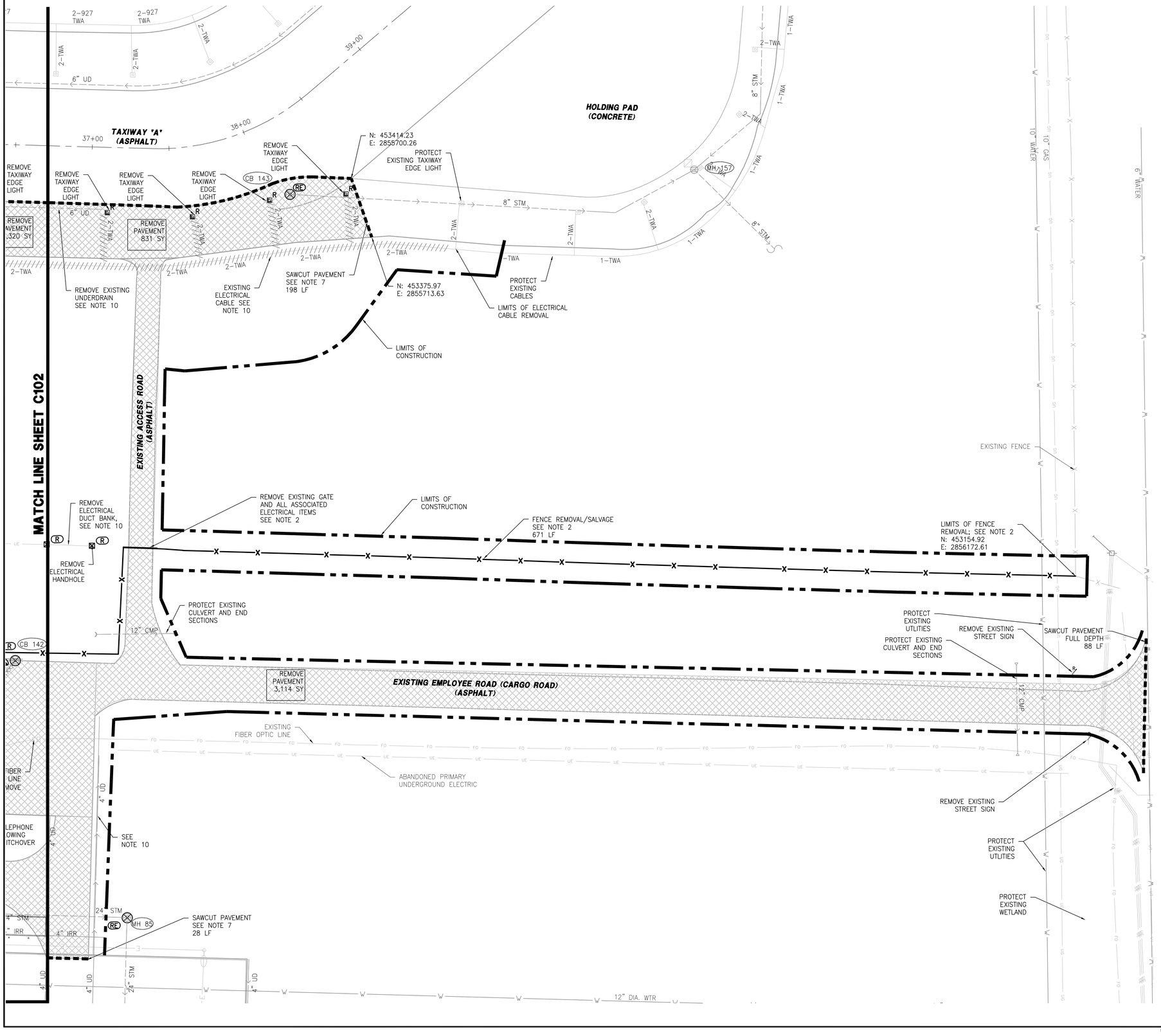
SHEET TITLE

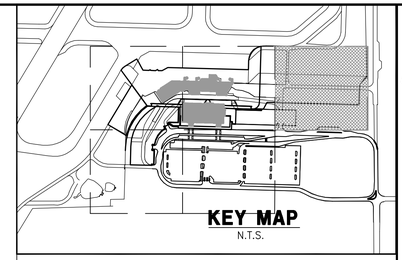
DEMOLITION PLAN (SHEET 2 OF 5)

SHEET NUMBER
C102

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C102.dwg Plotted on: 2/7/2012 4:40 PM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

DEMOLITION NOTES

1. SEE SHEET C003 FOR LEGEND. EXISTING TERMINAL OPERATIONS SHALL NOT BE AFFECTED EXCEPT AS SHOWN BY PHASING PLANS.
2. CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY NECESSARY TEMPORARY FENCING OR BADGED GATE GUARDS TO MEET AIRPORT SECURITY REQUIREMENTS. TEMPORARY FENCE SHALL MEET DETAILS AS PROVIDED HEREIN.
3. EXISTING TERMINAL SHALL BE COMPLETELY REMOVED PER PHASING PLAN. REMOVAL SHALL INCLUDE ENTIRE STRUCTURE INCLUDING ALL WALLS, FOUNDATIONS, FOOTINGS, SLABS, UTILITIES, AND ASSOCIATED ITEMS. EXCEPTIONS AS NOTED.
4. QUANTITIES SHOWN WITHIN THE MATCH LINES ON THIS SHEET ARE ONLY FOR THIS SHEET.
5. PIPE DEMOLITION QUANTITIES LISTED FROM MANHOLE TO MANHOLE (NODE TO NODE).
6. CONTRACTOR SHALL PROVIDE A FULL DEPTH SAWCUT TO A CLEAN EDGE. SEE DETAIL 1, SHEET C120.
7. ALL EXISTING PAVEMENT SECTIONS, WALLS, FOUNDATIONS AND OTHER MISCELLANEOUS BUILDING, ROADWAY AND OTHER STRUCTURES SHALL BE REMOVED TO CONSTRUCT PROPOSED ITEMS. ALL COSTS RELATED TO THESE REMOVALS SHALL BE INCLUDED IN THE COST OF THE PROPOSED ITEMS.
8. REMOVAL OF GUIDANCE SIGN SHALL INCLUDE THE DISMANTLE, REMOVAL, AND SALVAGE OF SIGN TO AIRPORT. REMOVAL SHALL INCLUDE THE DISPOSAL OF ALL FOUNDATIONS, CANS, CONDUITS, AND CABLES.
9. EXISTING UNDERDRAIN, ELECTRICAL CABLES, CONDUIT, AND/OR DUCTBANK AND MISCELLANEOUS UTILITY LINES TO BE ABANDONED IN PLACE UNLESS REMOVAL IS NECESSARY AND SHALL BE INCIDENTAL TO EXCAVATION ITEMS.
10. ITEMS SHOWN TO BE DEMOLISHED WITHOUT A CORRESPONDING BIT ITEM ARE TO BE INCIDENTAL TO THE BUILDING DEMOLITION BID ITEM.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

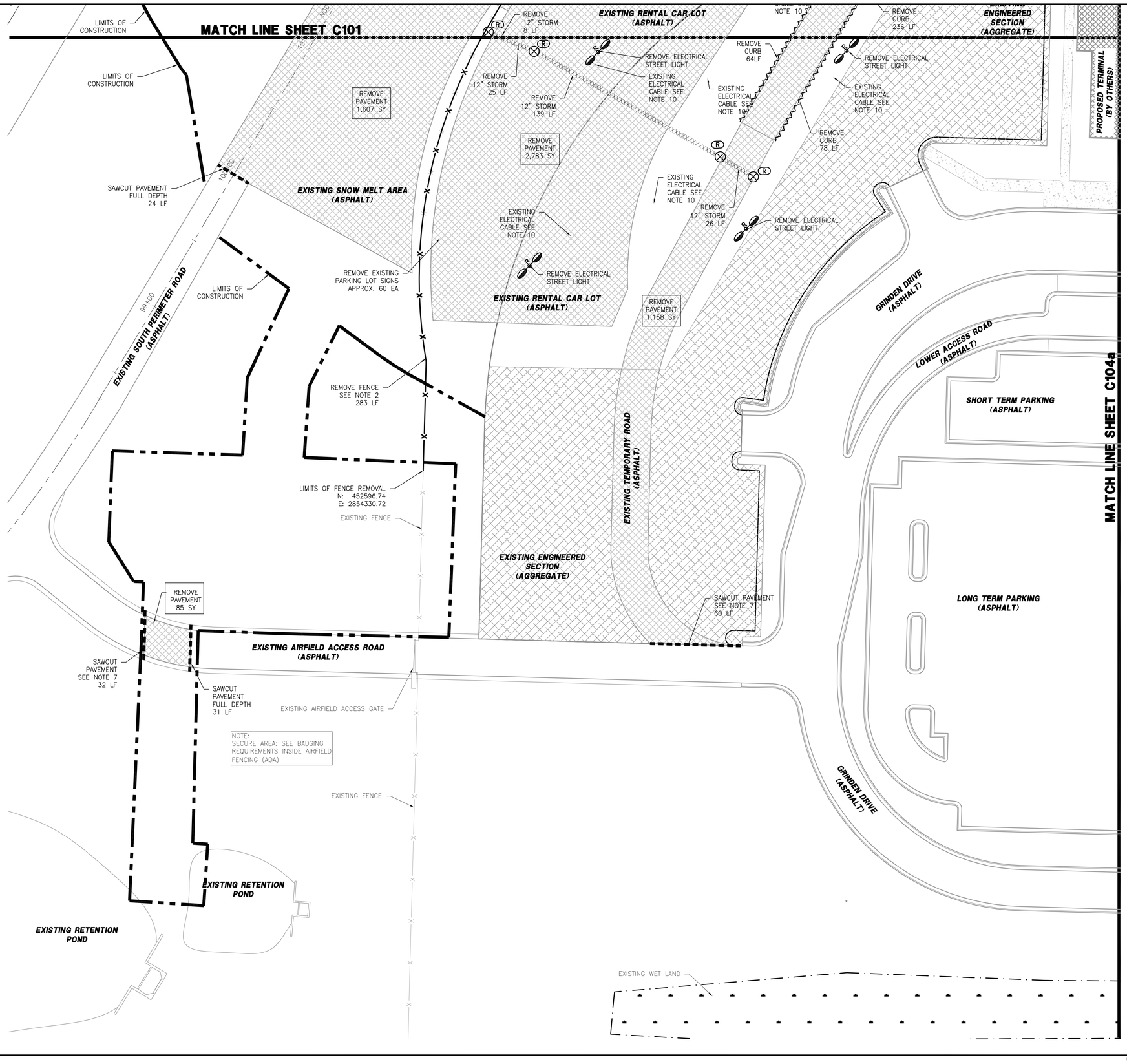
DEMOLITION PLAN (SHEET 3 OF 5)

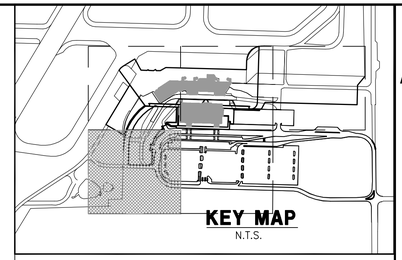
SHEET NUMBER

C103

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C103.dwg Plotted on: 2/7/2012 4:42 PM Plotted by: Erdmann, Ryan





KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION NOTES

1. SEE SHEET C003 FOR LEGEND. EXISTING TERMINAL OPERATIONS SHALL NOT BE AFFECTED EXCEPT AS SHOWN BY PHASING PLANS.
2. CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY NECESSARY TEMPORARY FENCING OR BADGED GATE GUARDS TO MEET AIRPORT SECURITY REQUIREMENTS. TEMPORARY FENCE SHALL MEET DETAILS AS PROVIDED HEREIN.
3. EXISTING TERMINAL SHALL BE COMPLETELY REMOVED PER PHASING PLAN. REMOVAL SHALL INCLUDE ENTIRE STRUCTURE INCLUDING ALL WALLS, FOUNDATIONS, FOOTINGS, SLABS, UTILITIES, AND ASSOCIATED ITEMS. EXCEPTIONS AS NOTED.
4. QUANTITIES SHOWN WITHIN THE MATCH LINES ON THIS SHEET ARE ONLY FOR THIS SHEET.
5. PIPE DEMOLITION QUANTITIES LISTED FROM MANHOLE TO MANHOLE (NODE TO NODE).
6. CONTRACTOR SHALL PROVIDE A FULL DEPTH SAWCUT TO A CLEAN EDGE. SEE DETAIL 1, SHEET C120.
7. ALL EXISTING PAVEMENT SECTIONS, WALLS, FOUNDATIONS AND OTHER MISCELLANEOUS BUILDING, ROADWAY AND OTHER STRUCTURES SHALL BE REMOVED TO CONSTRUCT PROPOSED ITEMS. ALL COSTS RELATED TO THESE REMOVALS SHALL BE INCLUDED IN THE COST OF THE PROPOSED ITEMS.
8. REMOVAL OF GUIDANCE SIGN SHALL INCLUDE THE DISMANTLE, REMOVAL, AND SALVAGE OF SIGN TO AIRPORT. REMOVAL SHALL INCLUDE THE DISPOSAL OF ALL FOUNDATIONS, CANS, CONDUITS, AND CABLES.
9. EXISTING UNDERDRAIN, ELECTRICAL CABLES, CONDUIT, AND/OR DUCTBANK AND MISCELLANEOUS UTILITY LINES TO BE ABANDONED IN PLACE UNLESS REMOVAL IS NECESSARY AND SHALL BE INCIDENTAL TO EXCAVATION ITEMS.
10. ITEMS SHOWN TO BE DEMOLISHED WITHOUT A CORRESPONDING BIT ITEM ARE TO BE INCIDENTAL TO THE BUILDING DEMOLITION BID ITEM.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

DEMOLITION PLAN (SHEET 4 OF 5)

SHEET NUMBER
C104

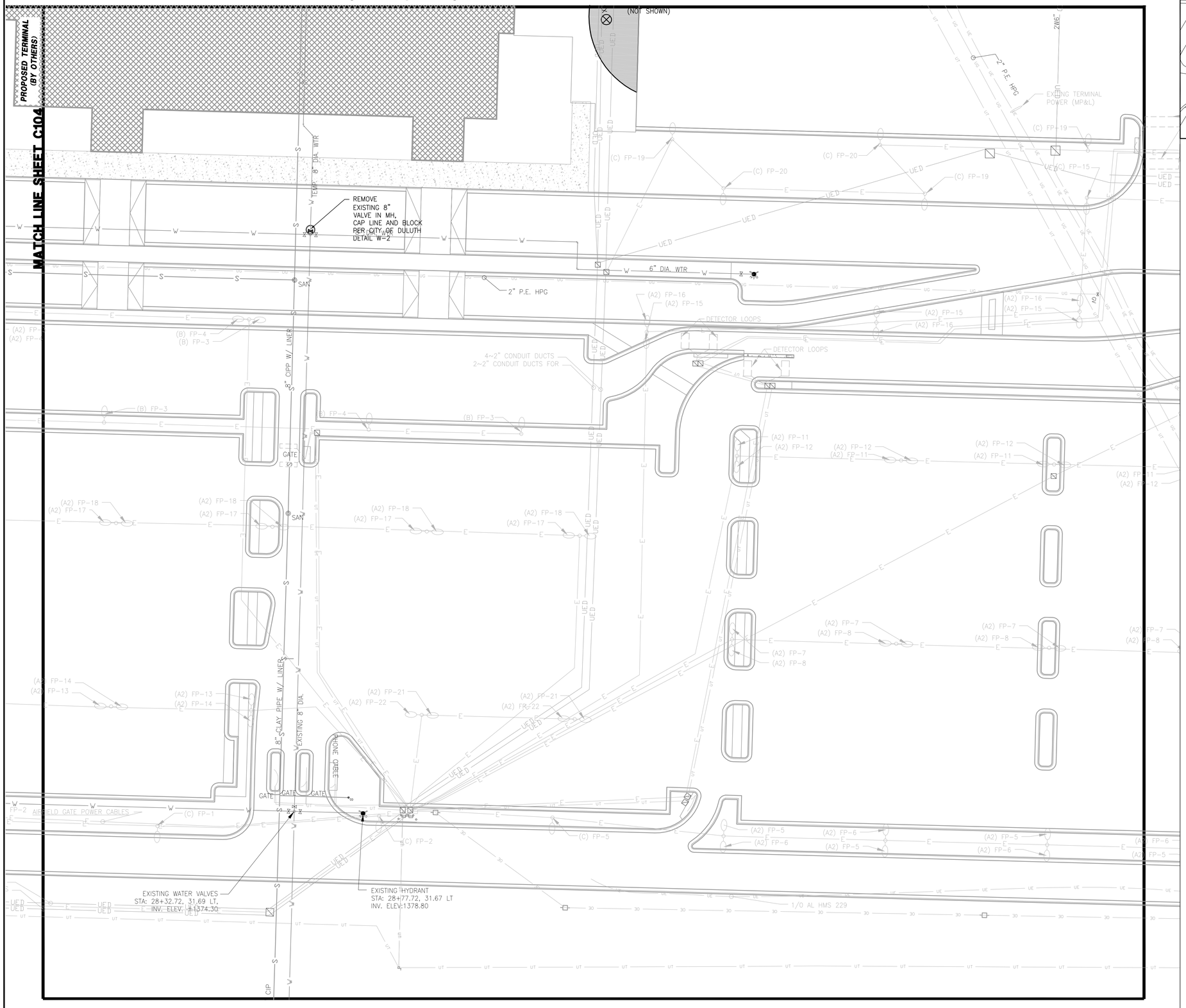
BID PACKAGE 2C
BID DOCUMENTS

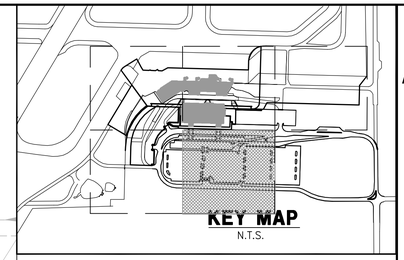
Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C104.dwg Plotted on: 2/7/2012 4:43 PM Plotted by: Erdmann, Ryan

MATCH LINE SHEET C102

MATCH LINE SHEET C104

PROPOSED TERMINAL (BY OTHERS)





KEY MAP
N.T.S.

NORTH

0 30' 60'

DEMOLITION NOTES

1. SEE SHEET C003 FOR LEGEND. EXISTING TERMINAL OPERATIONS SHALL NOT BE AFFECTED EXCEPT AS SHOWN BY PHASING PLANS.
2. CONTRACTOR SHALL MAINTAIN A SECURE PERIMETER AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY NECESSARY TEMPORARY FENCING OR BADGED GATE GUARDS TO MEET AIRPORT SECURITY REQUIREMENTS. TEMPORARY FENCE SHALL MEET DETAILS AS PROVIDED HEREIN.
3. EXISTING TERMINAL SHALL BE COMPLETELY REMOVED PER PHASING PLAN. REMOVAL SHALL INCLUDE ENTIRE STRUCTURE INCLUDING ALL WALLS, FOUNDATIONS, FOOTINGS, SLABS, UTILITIES, AND ASSOCIATED ITEMS. EXCEPTIONS AS NOTED.
4. QUANTITIES SHOWN WITHIN THE MATCH LINES ON THIS SHEET ARE ONLY FOR THIS SHEET.
5. PIPE DEMOLITION QUANTITIES LISTED FROM MANHOLE TO MANHOLE (NODE TO NODE).
6. CONTRACTOR SHALL PROVIDE A FULL DEPTH SAWCUT TO A CLEAN EDGE. SEE DETAIL 1, SHEET C120.
7. ALL EXISTING PAVEMENT SECTIONS, WALLS, FOUNDATIONS AND OTHER MISCELLANEOUS BUILDING, ROADWAY AND OTHER STRUCTURES SHALL BE REMOVED TO CONSTRUCT PROPOSED ITEMS. ALL COSTS RELATED TO THESE REMOVALS SHALL BE INCLUDED IN THE COST OF THE PROPOSED ITEMS.
8. REMOVAL OF GUIDANCE SIGN SHALL INCLUDE THE DISMANTLE, REMOVAL, AND SALVAGE OF SIGN TO AIRPORT. REMOVAL SHALL INCLUDE THE DISPOSAL OF ALL FOUNDATIONS, CANS, CONDUITS, AND CABLES.
9. EXISTING UNDERDRAIN, ELECTRICAL CABLES, CONDUIT, AND/OR DUCTBANK AND MISCELLANEOUS UTILITY LINES TO BE ABANDONED IN PLACE UNLESS REMOVAL IS NECESSARY AND SHALL BE INCIDENTAL TO EXCAVATION ITEMS.
10. ITEMS SHOWN TO BE DEMOLISHED WITHOUT A CORRESPONDING BIT ITEM ARE TO BE INCIDENTAL TO THE BUILDING DEMOLITION BID ITEM.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

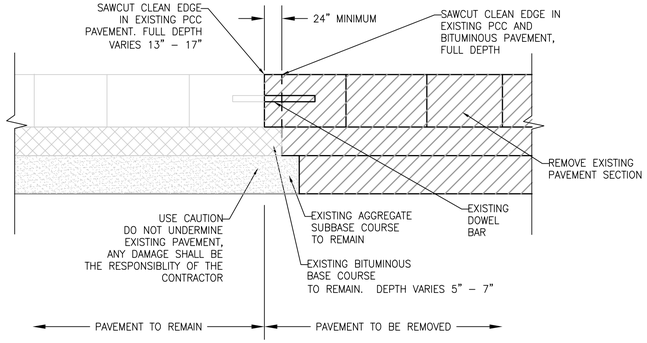
SHEET TITLE

DEMOLITION PLAN (SHEET 5 OF 5)

SHEET NUMBER
C104a

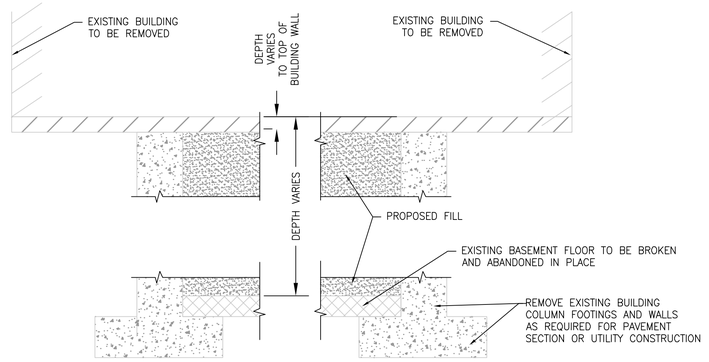
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C104a.dwg Plotted on: 2/7/2012 4:46 PM Plotted by: Erdmann, Ryan



1 / C120 **APRON PAVEMENT SECTION REMOVAL DETAIL**

SCALE: N.T.S.



SECTION VIEW

NOTE:

1. INFORMATION SHOWN ON THIS PLAN HAS BEEN OBTAINED FROM AVAILABLE RECORDS, NEITHER THE OWNER, NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY IN RESPECT TO THE ACCURACY OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE CONDITIONS INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE FIELD. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBLITY TO VISIT THE SITE AND ACQUAINT HIMSELF/HERSELF WITH THE EXISTING CONDITIONS.
2. CONTRACTOR SHALL REMOVE ALL PORTIONS OF THE EXISTING BUILDING AND/OR BASEMENT WALLS.
3. CONTRACTOR SHALL PLACE SUITABLE FILL MATERIALS TO MEET SPECIFICATIONS.
4. ALL EXISTING STRUCTURES ARE ASSUMED TO BE REINFORCED. THE ENGINEER HAS NOT VERIFIED ANY REINFORCEMENT.
5. BASEMENT WALLS TO BE COMPLETELY REMOVED AS REQUIRED TO INSTALL PAVEMENT SECTION AND/OR UTILITIES.

2 / C120 **EXISTING BUILDING SECTION REMOVAL DETAIL**

SCALE: N.T.S.

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

DEMOLITION DETAILS

SHEET NUMBER
C120

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C120.dwg Plotted on: 2/6/2012 3:10 PM Plotted by: Erdmann, Ryan

NOTES:

1. CONTRACTOR SHALL COORDINATE AND ASSIST THE AIRPORT WITH THE RELOCATION OF EXISTING ABOVE GROUND STORAGE TANKS (INCLUDING EXISTING DIESEL FUEL TANK, SEE DEMOLITION PLAN), TO LOCATIONS AS DETERMINED BY THE OWNER.

2. EXISTING FOUNDATIONS, BOLLARDS, CONCRETE BARRIERS AND ANY EXISTING ELECTRICAL CONDUIT, DUCT BANKS OR OTHER PIPING SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. THESE REMOVALS SHALL BE INCIDENTAL TO BUILDING REMOVAL.

1 / C121 **EXISTING ABOVE GROUND STORAGE TANKS**

SCALE: N.T.S.

NOTES:

1. REMOVAL OF EXISTING ROADWAY PAVEMENT, SIDEWALK, RETAINING WALL, PEDISTRIAN LIGHTING AND ALL ASSOCIATED UTILITIES SHALL BE PER THE PHASING PLANS. NO DEMOLITION SHALL OCCUR WITHOUT PRIOR WRITTEN DIRECTION FROM THE ENGINEER AND/OR THE AIRPORT. CONTRACTOR SHALL COORDINATE WITH ENGINEER TO DETERMINE IF ANY ITEMS ARE TO BE SALVAGED TO THE OWNER. THESE ITEMS SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION AS DETERMINED BY THE OWNER, ALL COSTS ARE INCLUDED IN THE REMOVAL ITEM. ANY MATERIALS NOT TO BE SALVAGED TO OWNER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE AND DISPOSE OF AT AN APPROPRIATE DISPOSAL FACILITY.

2 / C121 **EXISTING ROAD RETAINING WALL AND PEDESTRIAN LIGHTING**

SCALE: N.T.S.

NOTES:

1. REMOVAL OF GATES SHALL INCLUDE DEMOLITION OF ALL FENCE FABRIC, POSTS AND FOUNDATIONS, GATE MOTORS, ACCESS CONTROL DEVICES AND PROTECTIVE BOLLARDS. CONTRACTOR SHALL COORDINATE WITH ENGINEER TO DETERMINE IF ANY ITEMS ARE TO BE SALVAGED TO THE OWNER. THESE ITEMS SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION AS DETERMINED BY THE OWNER, ALL COSTS ARE INCLUDED IN THE REMOVAL ITEM. ANY MATERIALS NOT TO BE SALVAGED TO OWNER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE AND DISPOSE OF AT AN APPROPRIATE DISPOSAL FACILITY.

3 / C121 **TYPICAL EXISTING ACCESS GATE AND CONTROL SYSTEM**

SCALE: N.T.S.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

DEMOLITION DETAILS

SHEET NUMBER
C121

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C121.dwg Plotted on: 2/6/2012 5:12 PM Plotted by: Erdmann, Ryan

GEOMETRY NOTES

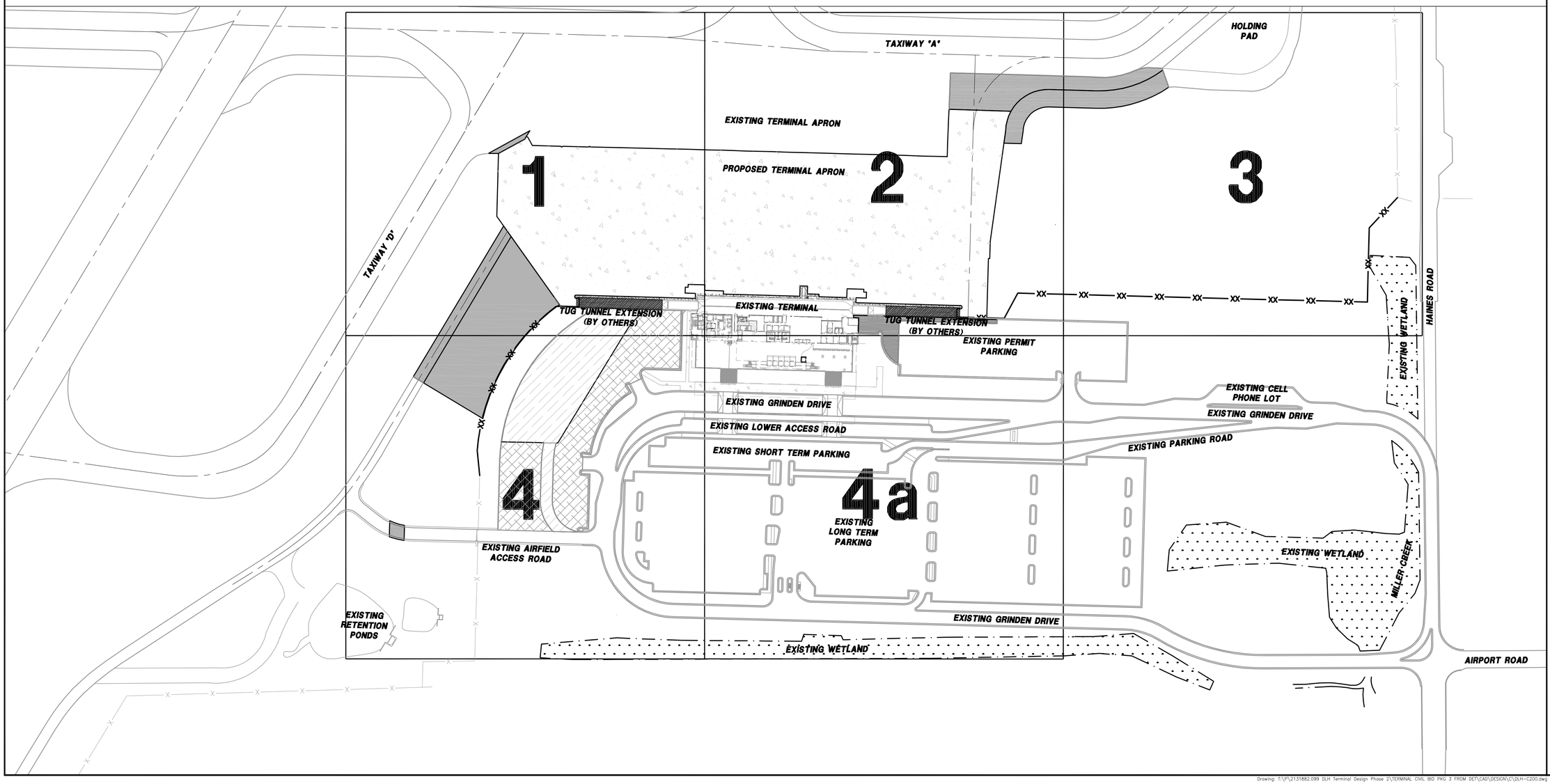
1. THE BELOW IS A DEPICTION OF THE SHEET LAYOUT FOR THE GEOMETRY PLANS. PLEASE SEE THE APPLICABLE SHEET FOR DETAILED LAYOUT INFORMATION.
2. ANY AND ALL TEMPORARY ROAD OR PARKING CONNECTIONS SHALL BE THE RESPONSIBLITY OF THE CONTRACTOR AS TO PROVIDE FOR UNINTERUPTED OPERATIONS OF THE EXISTING AND NEW TERMINAL. ALL BARRICADES AND SIGNAGE SHALL BE INCLUDED TO MEET AIRPORT, CITY, COUNTY OR STATE STANDARDS, SEE SHEETS C050 FOR TRAFFIC CONTROL AND PHASING.
3. CONSTRUCTION SHALL BE PHASED TO ALLOW FOR CONTINOUS OPERATIONS OF THE AIRPORT OPERATIONS UNLESS OTHERWISE NOTED.

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

* SEE SHEET C006 FOR CONTROL POINT INFORMATION

NORTH

0 100' 200'



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

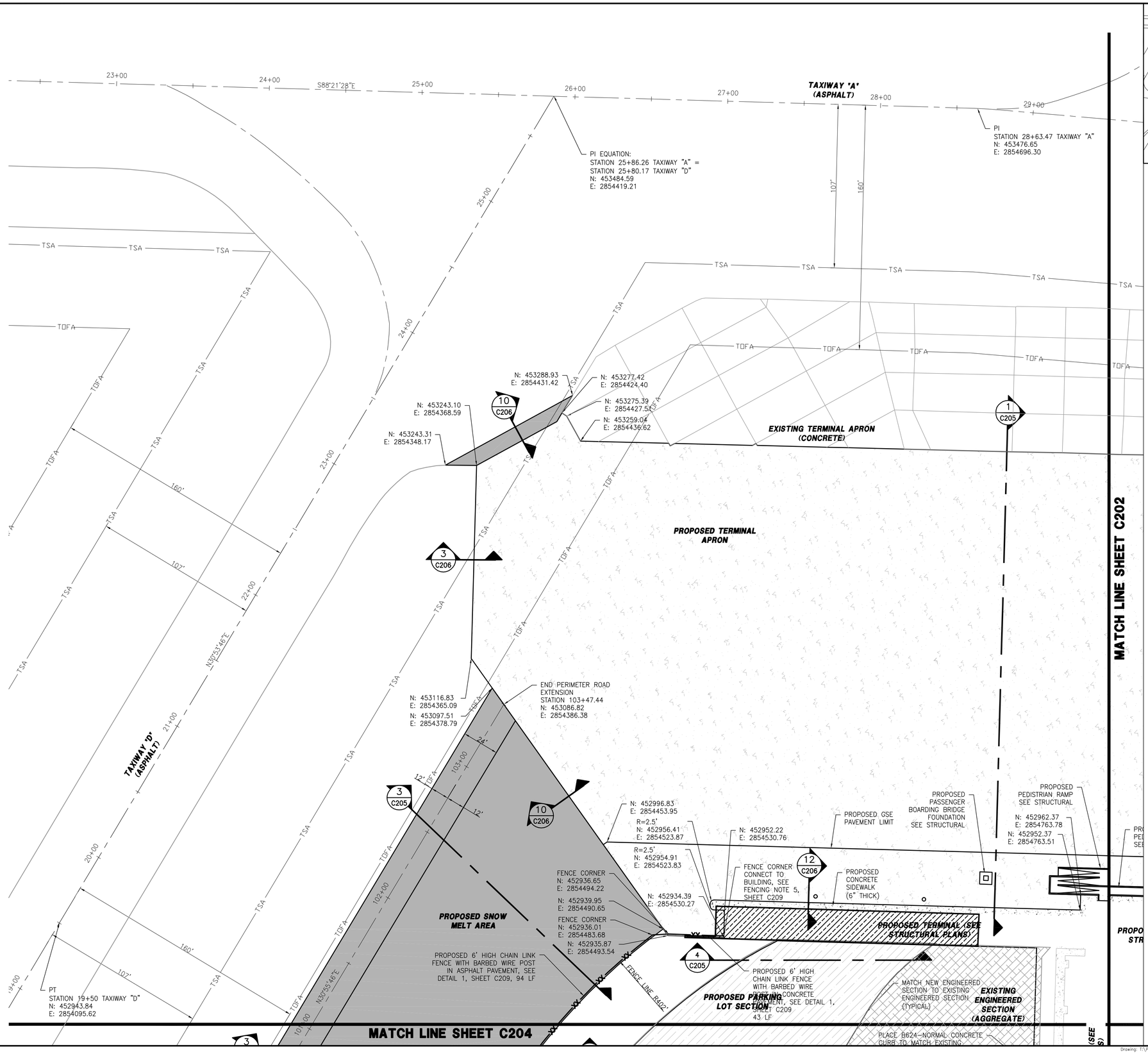
SHEET TITLE

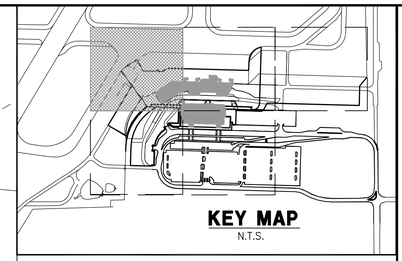
OVERALL GEOMETRY PLAN

SHEET NUMBER
C200

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C200.dwg Plotted on: 2/6/2012 5:14 PM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GEOMETRY NOTES

1. SEE SHEET C003 FOR LEGEND.
2. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. NORTHINGS AND EASTINGS GIVEN IN PROJECT ARE IN MINNESOTA STATE PLANE NORTH COORDINATES, SEE SHEET C006 FOR CONTROL POINTS.
4. SEE TYPICAL PAVEMENT SECTION AND DETAILS SHEETS C207–C210. PAVING IN THIS CONTRACT CONSISTS OF THE APRON, TAXIWAYS, SNOW MELT AREA, SOUTH PERIMETER ROAD, AND MISC. PARKING LOT AREAS.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

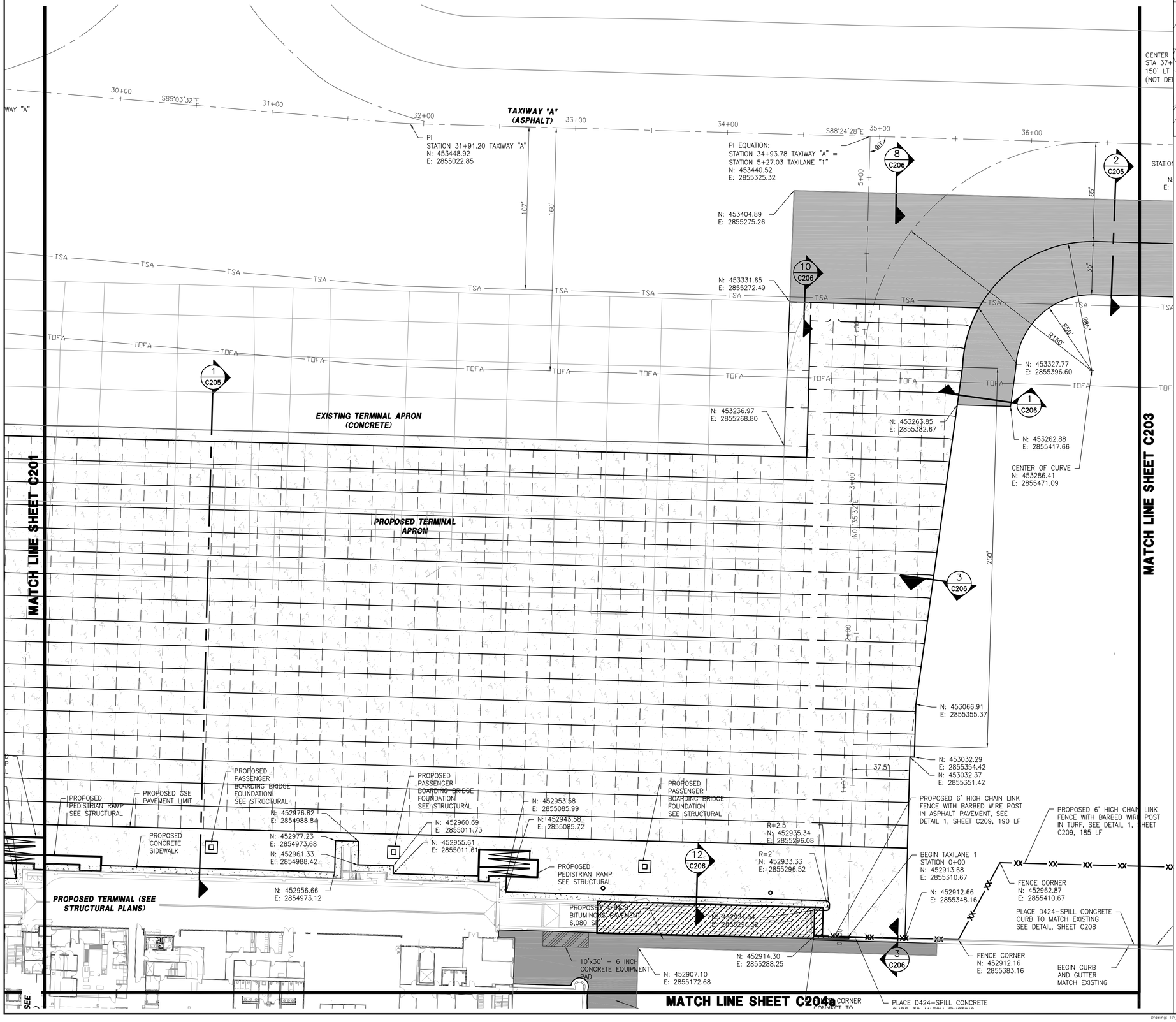
GEOMETRY PLAN (SHEET 1 OF 5)

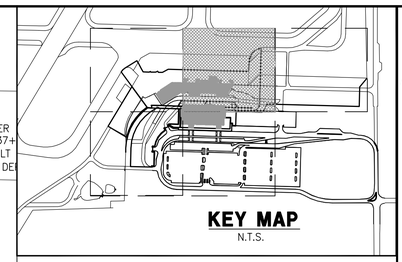
SHEET NUMBER

C201

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C201.dwg Plotted on: 2/6/2012 5:18 PM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GEOMETRY NOTES

1. SEE SHEET C003 FOR LEGEND.
2. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. NORTHINGS AND EASTINGS GIVEN IN PROJECT ARE IN MINNESOTA STATE PLANE NORTH COORDINATES, SEE SHEET C006 FOR CONTROL POINTS.
4. SEE TYPICAL PAVEMENT SECTION AND DETAILS SHEETS C207–C210. PAVING IN THIS CONTRACT CONSISTS OF THE APRON, TAXIWAYS, SNOW MELT AREA, SOUTH PERIMETER ROAD, AND MISC. PARKING LOT AREAS.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

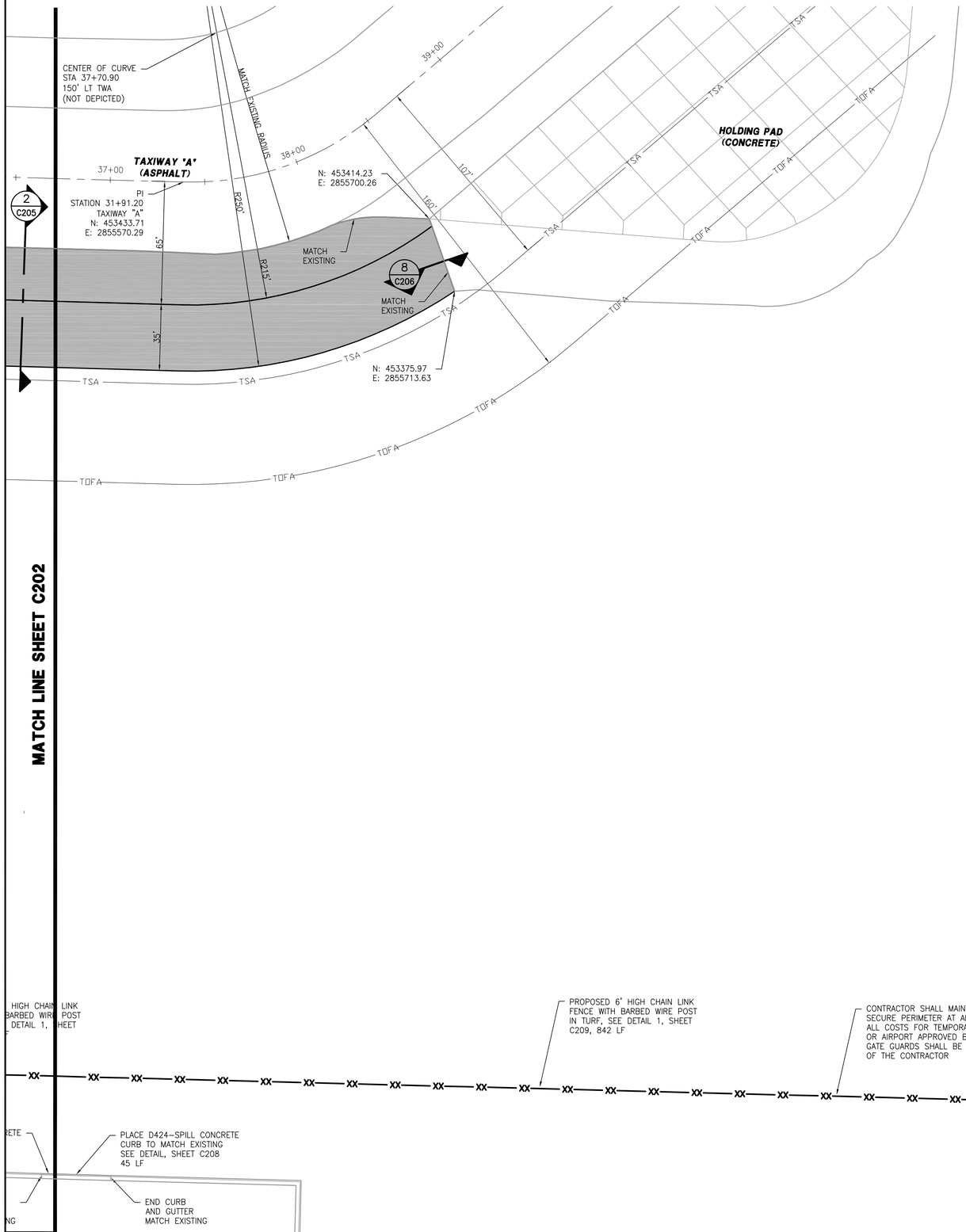
GEOMETRY PLAN (SHEET 2 OF 5)

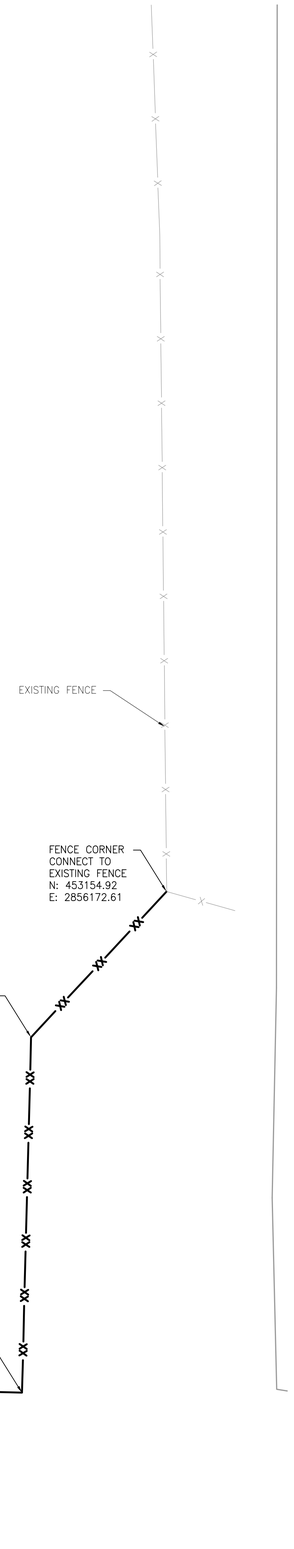
SHEET NUMBER

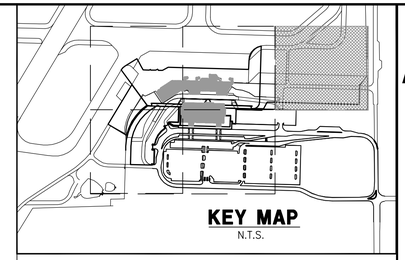
C202

BID PACKAGE 2C
BID DOCUMENTS

Drawing: I:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C202.dwg Plotted on: 2/6/2012 5:18 PM Plotted by: Erdmann, Ryan







NORTH

0 30' 60'

GEOMETRY NOTES

1. SEE SHEET C003 FOR LEGEND.
2. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. NORTHINGS AND EASTINGS GIVEN IN PROJECT ARE IN MINNESOTA STATE PLANE NORTH COORDINATES, SEE SHEET C006 FOR CONTROL POINTS.
4. SEE TYPICAL PAVEMENT SECTION AND DETAILS SHEETS C207–C210. PAVING IN THIS CONTRACT CONSISTS OF THE APRON, TAXIWAYS, SNOW MELT AREA, SOUTH PERIMETER ROAD, AND MISC. PARKING LOT AREAS.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

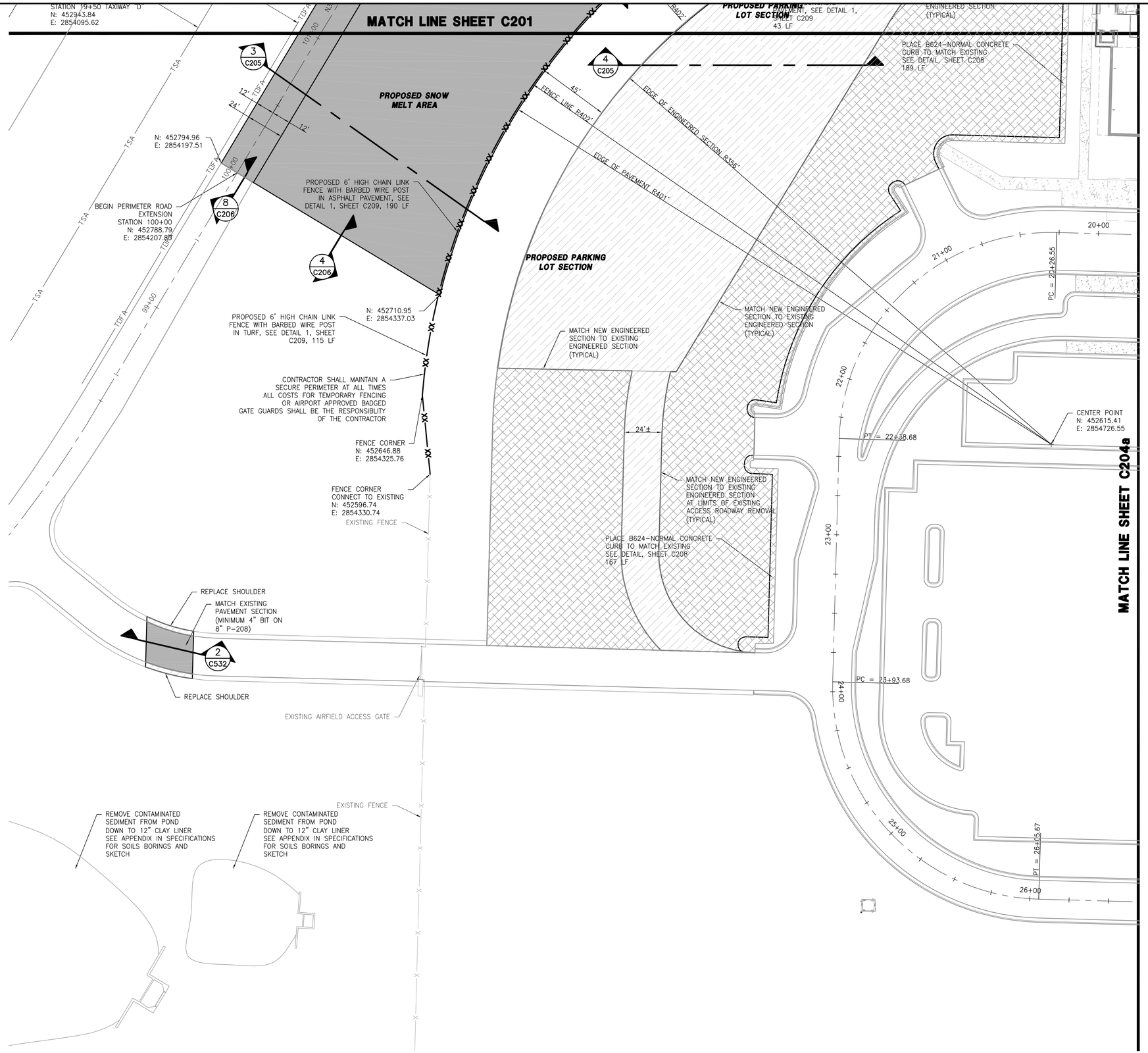
GEOMETRY PLAN (SHEET 3 OF 5)

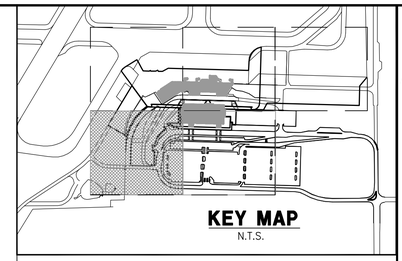
SHEET NUMBER

C203

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C203.dwg Plotted on: 2/6/2012 3:20 PM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GEOMETRY NOTES

1. SEE SHEET C003 FOR LEGEND.
2. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. NORTHINGS AND EASTINGS GIVEN IN PROJECT ARE IN MINNESOTA STATE PLANE NORTH COORDINATES, SEE SHEET C006 FOR CONTROL POINTS.
4. SEE TYPICAL PAVEMENT SECTION AND DETAILS SHEETS C207–C210. PAVING IN THIS CONTRACT CONSISTS OF THE APRON, TAXIWAYS, SNOW MELT AREA, SOUTH PERIMETER ROAD, AND MISC. PARKING LOT AREAS.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

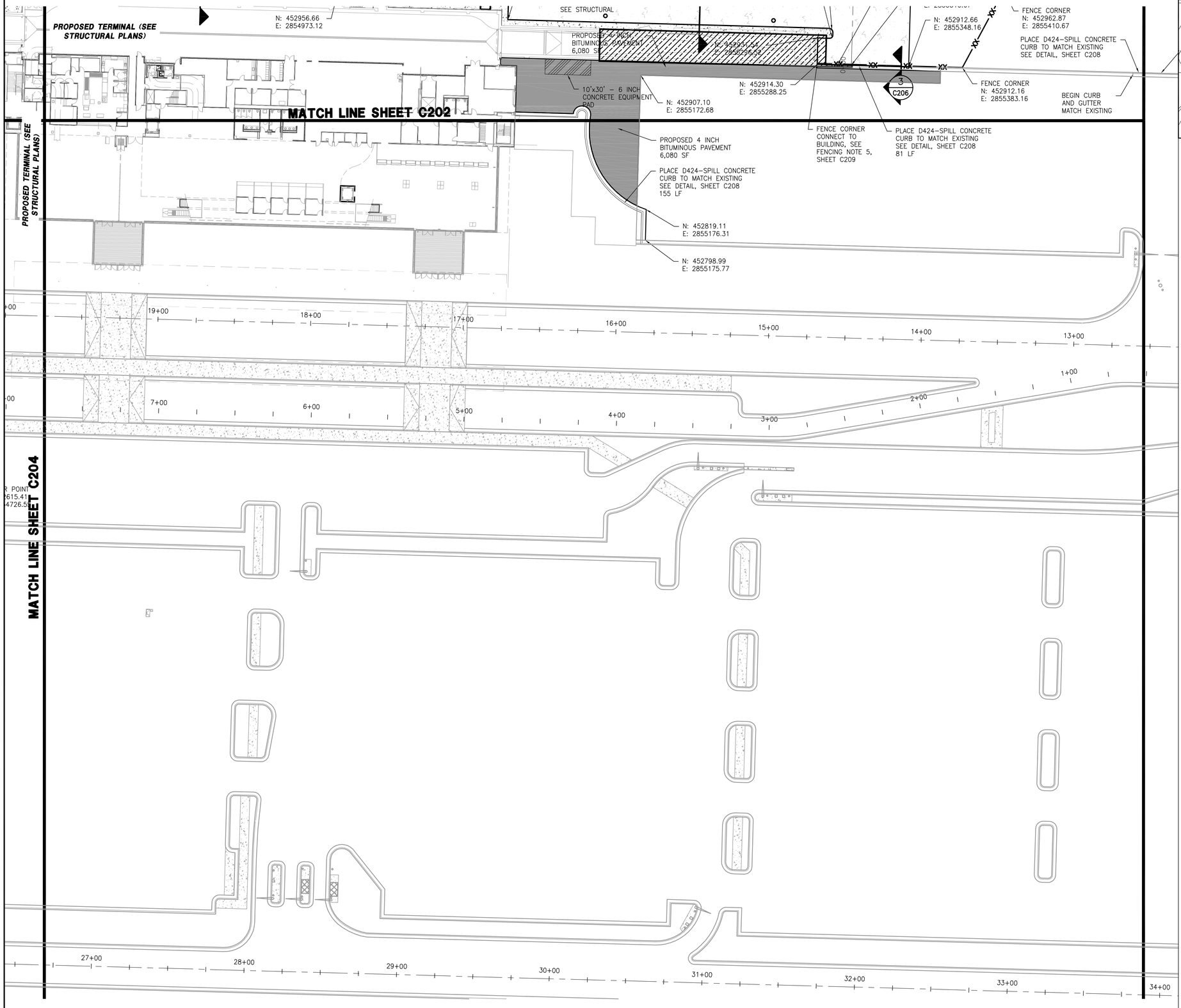
SHEET TITLE

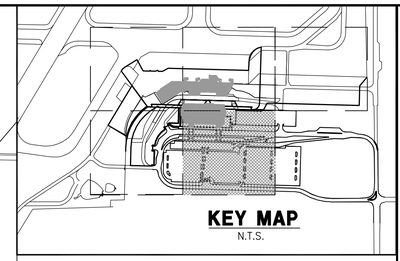
GEOMETRY PLAN (SHEET 4 OF 5)

SHEET NUMBER
C204

BID PACKAGE 2C
BID DOCUMENTS

Drawing: I:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C204.dwg Plotted on: 2/6/2012 5:22 PM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GEOMETRY NOTES

1. SEE SHEET C003 FOR LEGEND.
2. CONSTRUCTION SURVEY AND STAKEOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. NORTHINGS AND EASTINGS GIVEN IN PROJECT ARE IN MINNESOTA STATE PLANE NORTH COORDINATES, SEE SHEET C006 FOR CONTROL POINTS.
4. SEE TYPICAL PAVEMENT SECTION AND DETAILS SHEETS C207-C210. PAVING IN THIS CONTRACT CONSISTS OF THE APRON, TAXIWAYS, SNOW MELT AREA, SOUTH PERIMETER ROAD, AND MISC. PARKING LOT AREAS.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

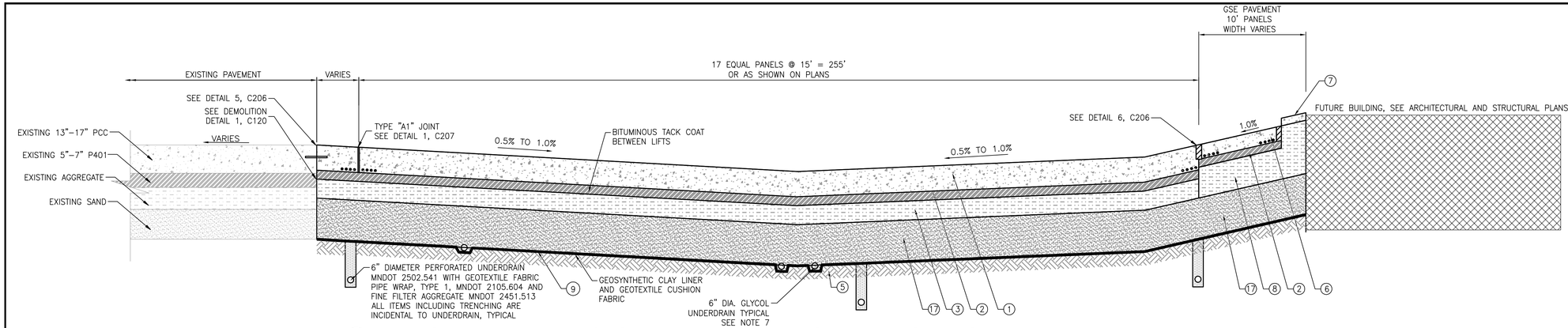
GEOMETRY PLAN (SHEET 5 OF 5)

SHEET NUMBER

C204a

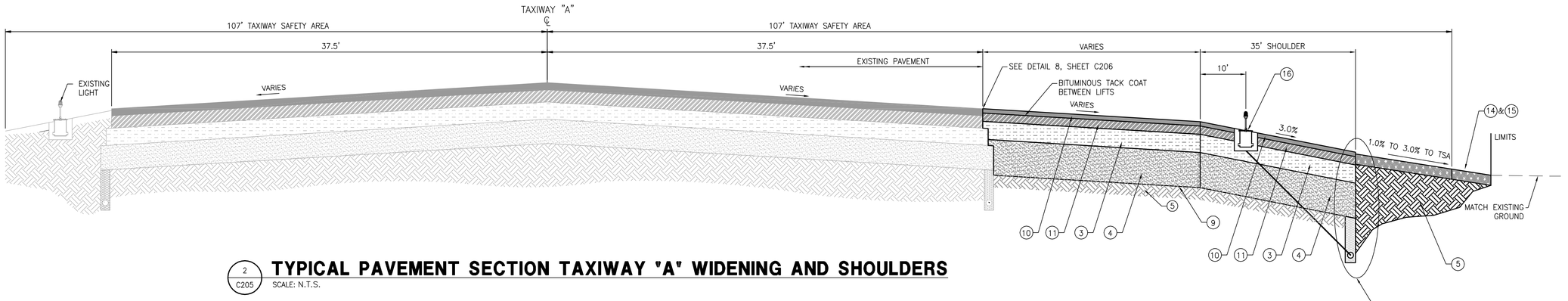
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C204a.dwg Plotted on: 2/6/2012 5:24 PM Plotted by: Erdmann, Ryan



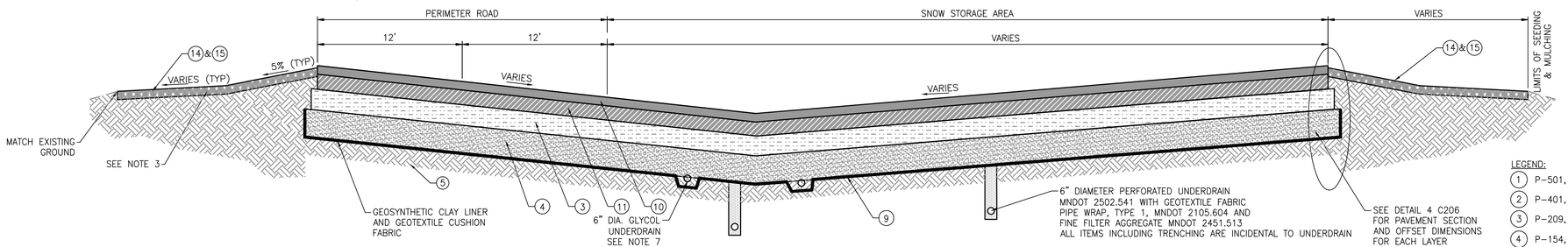
1 / C205 TYPICAL PAVEMENT SECTION APRON AND GENERAL SERVICE EQUIPMENT APRON

SCALE: N.T.S.



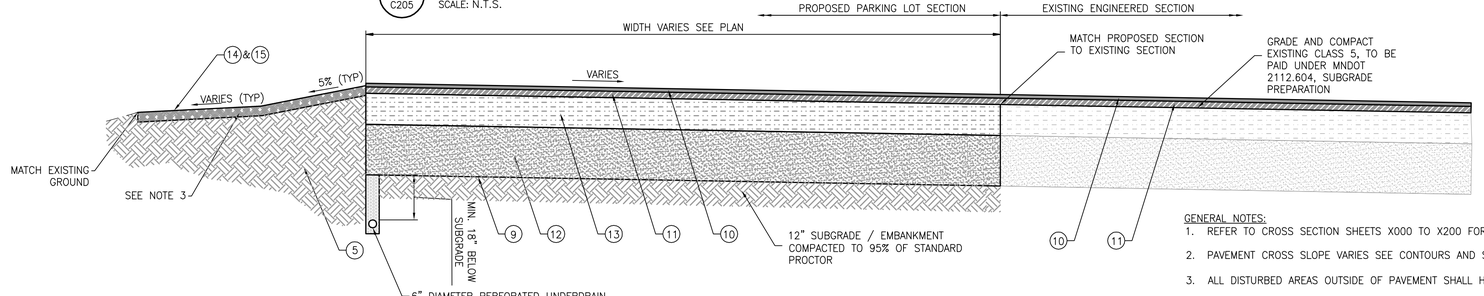
2 / C205 TYPICAL PAVEMENT SECTION TAXIWAY "A" WIDENING AND SHOULDERS

SCALE: N.T.S.



3 / C205 TYPICAL PAVEMENT SECTION PERIMETER ROAD AND SNOW STORAGE AREA

SCALE: N.T.S.



4 / C205 TYPICAL PARKING LOT SECTION

SCALE: N.T.S.

GENERAL NOTES:

1. REFER TO CROSS SECTION SHEETS X000 TO X200 FOR FURTHER INFORMATION.
2. PAVEMENT CROSS SLOPE VARIES SEE CONTOURS AND SPOT ELEVATION PLANS.
3. ALL DISTURBED AREAS OUTSIDE OF PAVEMENT SHALL HAVE A MINIMUM OF 4" OF TOPSOIL, UNLESS NOTED, AND BE HYDROSEED/MULCHED.
4. ALL BITUMINOUS PAVEMENT MILLINGS AND CONCRETE PAVEMENT DEBRIS SHALL BE TRANSPORTED AND DUMPED TO AN OFFSITE LOCATION.
5. ALL EXCESS MATERIALS SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR. ALL TEMPORARY STOCKPILES SHALL COMPLY WITH FAR PART 77 SURFACES AND SHALL HAVE NO MORE THAN 4:1 SIDE SLOPES TO ALLOW FOR MAINTAINANCE. ALL TEMPORARY STOCKPILES SHALL BE HYDROSEEDED/MULCHED AND HAVE PROPER EROSION CONTROL AND SEDIMENTATION MEASURES INSTALLED. ALL COSTS SHALL BE INCIDENTAL TO UNCLASSIFIED EXCAVATION.
6. GEOSYNTHTIC CLAY LINER AND GEOTEXTILE CUSHION FABRIC AND GLYCOL UNDERDRAINS, INCLUDING SAND BACKFILL AROUND UNDERDRAIN SHALL BE INCLUDED IN DEICING FLUID CONTAINMENT ITEM.
7. GLYCOL UNDERDRIAN SHALL BE CONSTRUCTED PER DETAIL 11, SHEET C206.

LEGEND:

1. P-501, 12" PORTLAND CEMENT CONCRETE
2. P-401, 4" BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE (TWO 2" LIFTS)
3. P-209, 8" CRUSHED AGGREGATE BASE COURSE
4. P-154, 46" SUBBASE COURSE
5. P-152, COMPACTED SUBGRADE/EMBANKMENT
6. P-501, 9" PORTLAND CEMENT CONCRETE
7. CONCRETE SIDEWALK, SEE DETAIL 10, SHEET C206
8. P-209, 13" CRUSHED AGGREGATE BASE COURSE
9. PROPOSED GEOTEXTILE FABRIC TYPE V, MNDOT 2105.604
10. P-401, 1.5" BITUMINOUS SURFACE COURSE, 3/4" MAXIMUM AGGREGATE
11. P-401, 2.5" BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE
12. P-154, 18" SELECT GRANULAR BORROW, 7% MODIFIED, MNDOT 2105.521
13. MNDOT 2211.503, 12" AGGREGATE BASE COURSE, CLASS 5
14. T-905, 4" TOPSOIL
15. T-901, HYDROSEED/MULCH/FERTILIZER TO CONSTRUCTION LIMITS
16. L-861 MEDIUM INTENSITY TAXIWAY EDGE LIGHT – (MITL)
17. P-154, 48" SUBBASE COURSE

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

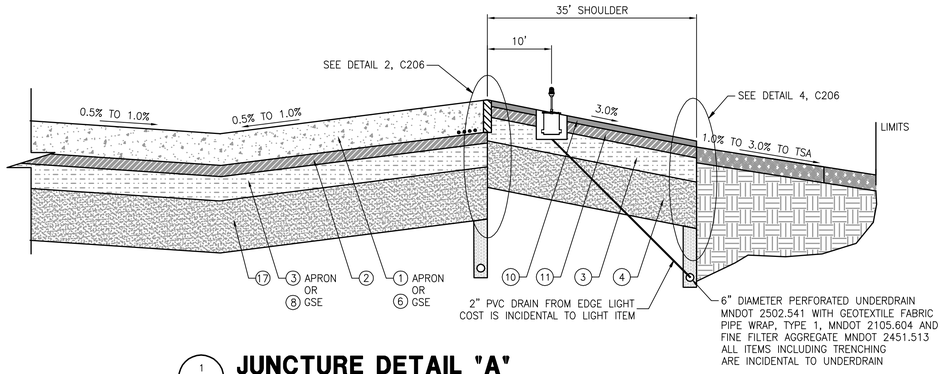
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
TYPICAL PAVEMENT SECTIONS

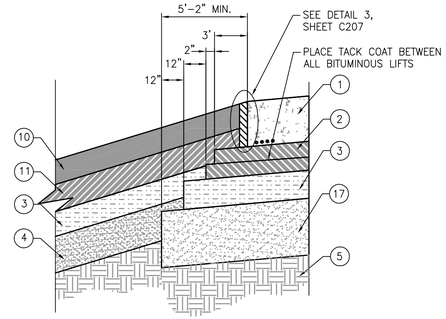
SHEET NUMBER
C205

BID PACKAGE 3
100% REVIEW

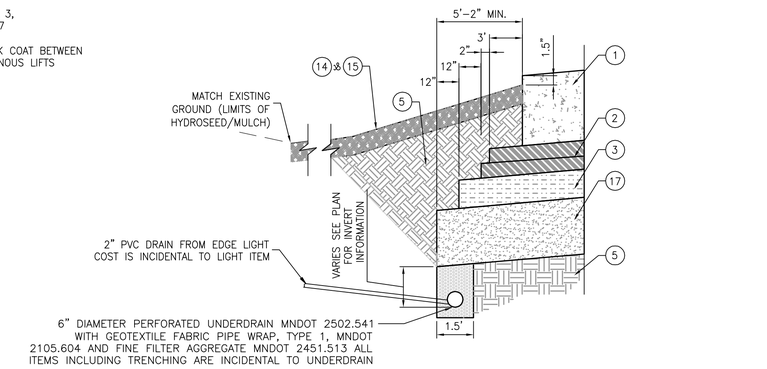
Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C205.dwg Plotted on: 2/6/2012 5:24 PM Plotted by: Erdmann, Ryan



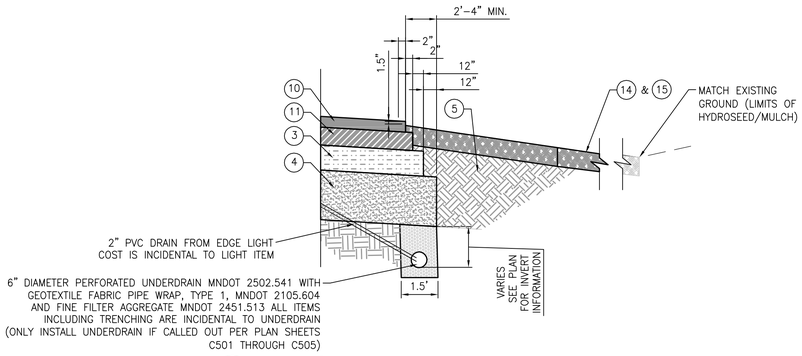
1 / C206 **JUNCTURE DETAIL "A"**
SCALE: N.T.S.



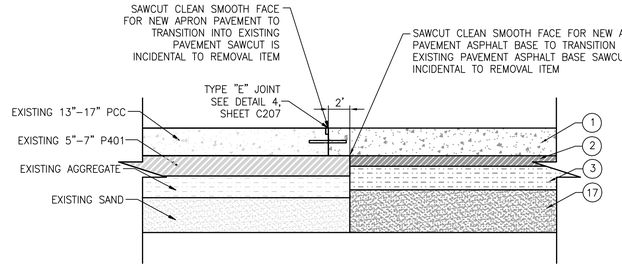
2 / C206 **JUNCTURE DETAIL "B"**
SCALE: N.T.S.



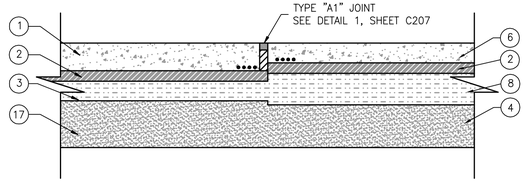
3 / C206 **JUNCTURE DETAIL "C"**
SCALE: N.T.S.



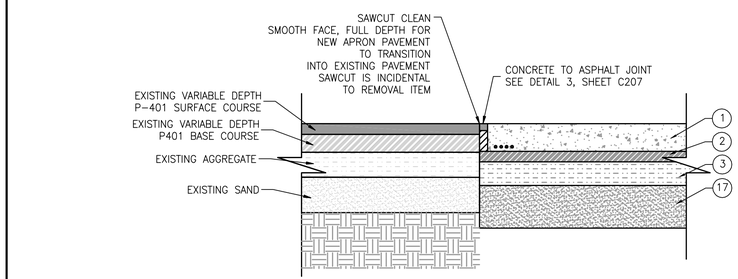
4 / C206 **JUNCTURE DETAIL "D"**
SCALE: N.T.S.



5 / C206 **JUNCTURE DETAIL "E"**
SCALE: N.T.S.

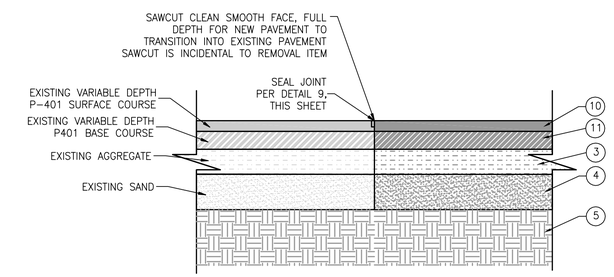


6 / C206 **JUNCTURE DETAIL "F"**
SCALE: N.T.S.

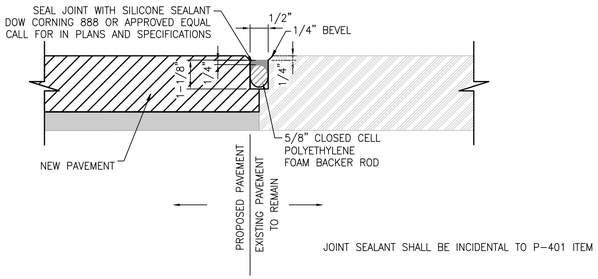


10 / C206 **JUNCTURE DETAIL "I"**
SCALE: N.T.S.

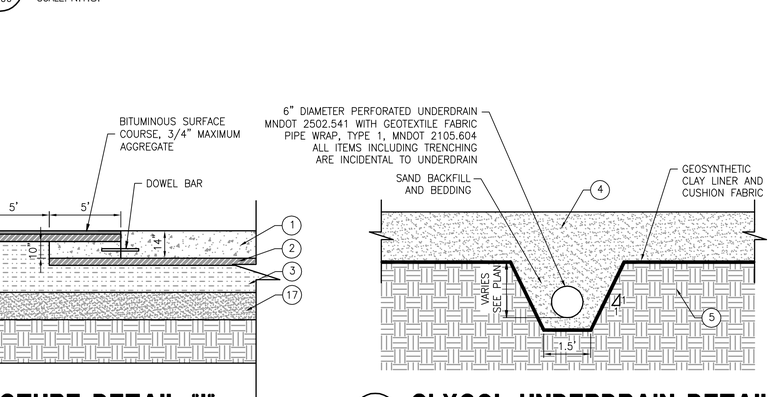
7 / C206 **JUNCTURE DETAIL "G"**
SCALE: N.T.S.



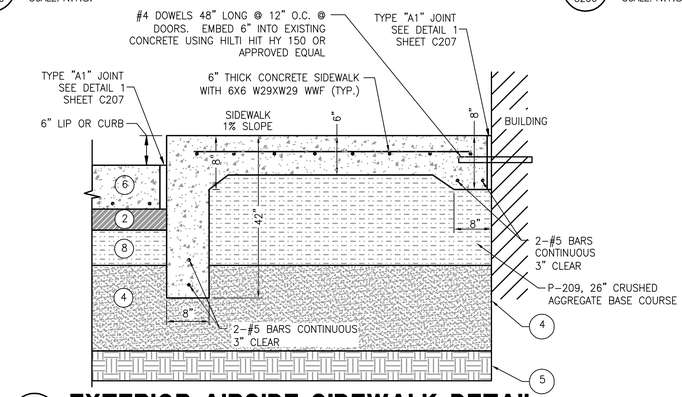
8 / C206 **JUNCTURE DETAIL "H"**
SCALE: N.T.S.



9 / C206 **JUNCTURE DETAIL "H" - JOINT SEAL**
SCALE: N.T.S.



11 / C206 **GLYCOL UNDERDRAIN DETAIL**
SCALE: N.T.S.



12 / C206 **EXTERIOR AIRSIDE SIDEWALK DETAIL**
SCALE: N.T.S.

LEGEND:

1. P-501, 12" PORTLAND CEMENT CONCRETE
2. P-401, 4" BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE (TWO 2" LIFTS)
3. P-209, 8" CRUSHED AGGREGATE BASE COURSE
4. P-154, 46" SUBBASE COURSE
5. P-152, COMPACTED SUBGRADE/EMBANKMENT
6. P-501, 9" PORTLAND CEMENT CONCRETE
7. CONCRETE SIDEWALK, SEE DETAIL 6, SHEET C206
8. P-209, 13" CRUSHED AGGREGATE BASE COURSE
9. PROPOSED GEOTEXTILE FABRIC TYPE V, MNDOT 2105.604
10. P-401, 1.5" BITUMINOUS SURFACE COURSE, 3/4" MAXIMUM AGGREGATE
11. P-401, 2.5" BITUMINOUS BASE COURSE, 1" MAXIMUM AGGREGATE
12. P-154, 18" SELECT GRANULAR BORROW, 7% MODIFIED, MNDOT 2105.521
13. P-209, 12" AGGREGATE BASE COURSE, CLASS 5, MNDOT 2211.503
14. T-905, 4" TOPSOIL
15. T-901, HYDROSEED/MULCH/FERTILIZER TO CONSTRUCTION LIMITS
16. L-861 MEDIUM INTENSITY TAXIWAY EDGE LIGHT – (MITL)
17. P-154, 48" SUBBASE COURSE

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

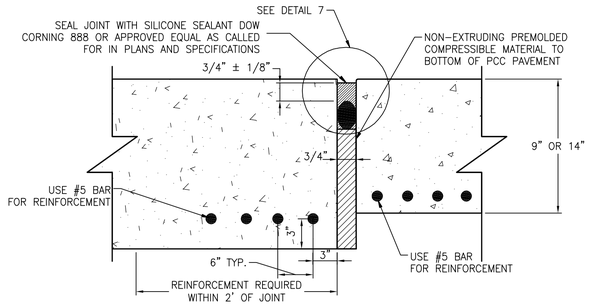
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
TYPICAL PAVEMENT JOINT DETAILS (SHEET 1 OF 2)

SHEET NUMBER
C206

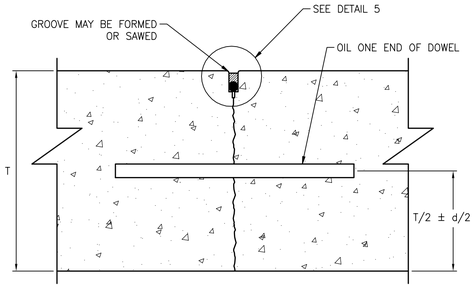
BID PACKAGE 3
100% REVIEW

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C206.dwg Plotted on: 2/6/2012 5:26 PM Plotted by: Erdmann, Ryan



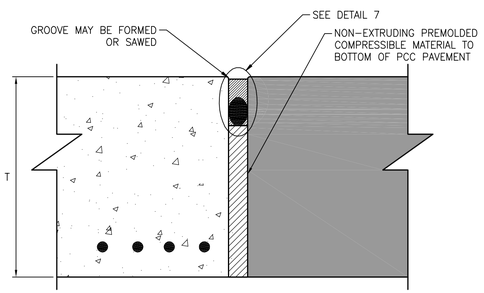
1 C207 **TYPE "A1" ISOLATION JOINT**

SCALE: N.T.S.



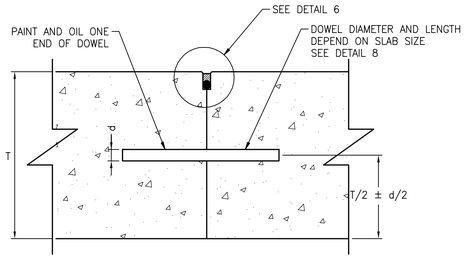
2 C207 **TYPE "C" DOWELED CONTRACTION JOINT**

SCALE: N.T.S.



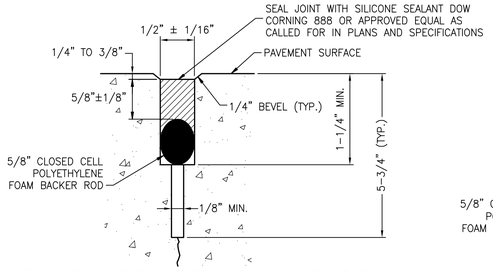
3 C207 **CONCRETE TO ASPHALT JOINT**

SCALE: N.T.S.



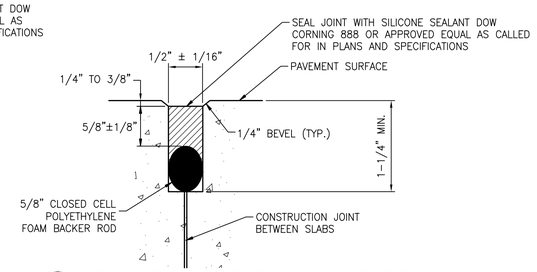
4 C207 **TYPE "E" DOWELED CONSTRUCTION JOINT**

SCALE: N.T.S.



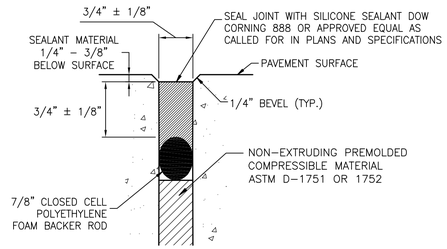
5 C207 **CONTRACTION JOINT SEAL**

SCALE: N.T.S.



6 C207 **CONSTRUCTION JOINT SEAL**

SCALE: N.T.S.



7 C207 **EXPANSION JOINT SEAL**

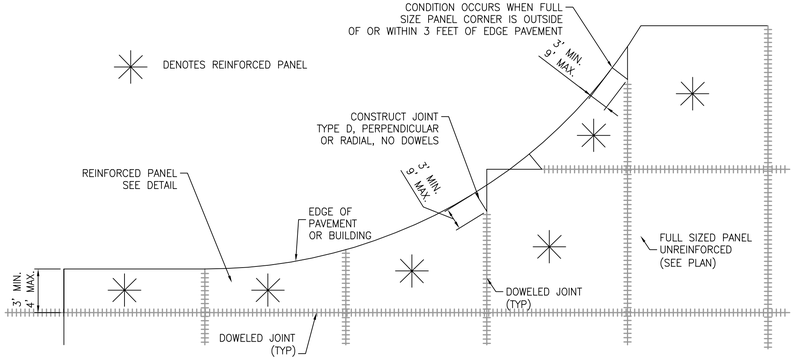
SCALE: N.T.S.

DIMENSIONING AND SPACING OF STEEL DOWELS TABLE

THICKNESS OF SLAB (T)	DIAMETER (d)	LENGTH	SPACING
12 IN.	1.25 IN.	20 IN.	15 IN.
9 IN.	1 IN.	19 IN.	12 IN.

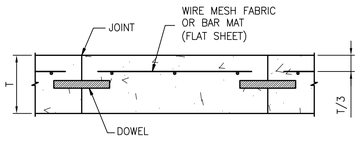
8 C207 **STEEL DOWEL DIMENSIONING AND SPACING TABLE**

SCALE: N.T.S.



10 C207 **TYPICAL IRREGULAR SLAB DETAIL**

SCALE: N.T.S.



PAVEMENT THICKNESS, T	TWO WAY WIRE FABRIC		BAR MAT SIZE AND SPACING
	SIZE	SPACING	SAME IN BOTH DIRECTIONS
12 INCH	W5 X W5	6 x 6	#3 @ 12" C-C
9 INCH	W5 X W5	6 x 6	#3 @ 12" C-C

9 C207 **REINFORCED CONCRETE PANEL**

SCALE: N.T.S.

REINFORCING NOTES:

1. TRANSVERSE LAP SHALL NOT BE LESS THAN 6 INCHES.
2. LONGITUDINAL LAP SHALL NOT BE LESS THAN 12 INCHES.
3. END AND SIDE CLEARANCES SHALL BE BETWEEN 2 INCHES AND 6 INCHES.
4. ALL REINFORCING STEEL SHALL BE EPOXY COATED, CONFORMING TO ASTM A615 AND AASHTO M254.

DOWEL BAR NOTES:

1. LUBRICATION BOND BREAKER SHALL BE USED ON DOWEL BARS EXCEPT WHERE APPROVED PULLOUT TEST INDICATE IT IS NOT NECESSARY.

2. DOWELS ARE TO BE EPOXY COATED STEEL BARS CONFORMING TO ASTM A615 AND AASHTO M254.

JOINTING NOTES:

1. DOWELS SHALL BE FULLY SHOP PAINTED WITH ONE COAT OF CORROSION INHIBITING PRIMER CONFORMING TO FEDERAL SPEC. TT-P-664D.
2. PRIOR TO INSTALLATION IN CONTRACTION JOINTS DOWELS SHALL BE LIGHTLY GREASED WITH A THIN COAT OF HIGH MELTING POINT GREASE OR APPROVED EQUAL AS INDICATED. IN CONSTRUCTION JOINT, ONLY THE FREE END SHALL BE GREASED, AND ONLY AFTER INSERTION AND GROUTING INTO PLACE.
3. ALL CONSTRUCTION JOINT DOWELS SHALL BE GANG-DRILLED AND EPOXY GROUTED. INSERTION EQUIPMENT WILL NOT BE ALLOWED.
4. DRILLING METHOD FOR DOWELS SHALL BE CAPABLE OF MAINTAINING DRILL HOLES PARALLEL TO THE CONCRETE SURFACE AND NORMAL TO THE JOINT LINES. DRILL HOLES SHALL BE ACCURATELY LAID OUT SO THAT THE MAXIMUM DEVIATION DOES NOT EXCEED 1". DRILL HOLE DIAMETER TO BE OF SUFFICIENT SIZE TO ACCEPT THE TYPE AND SIZE DOWEL REQUIRED.
5. AFTER DRILLING IS COMPLETE AND PRIOR TO THE INSTALLATION OF THE DOWELS, THE HOLES SHALL BE THOROUGHLY CLEANED TO REMOVE DRILLING DUST, CONCRETE CHIPS AND ANY OTHER MATERIAL DETRIMENTAL TO DEVELOPING BOND.
6. EPOXY GROUT SHALL BE INJECTED UNIFORMLY TO THE ENTIRE CIRCUMFERENCE OF THE DOWEL HOLE SURFACE (CONTRACTOR SHALL NOT DIP AND INSERT DOWEL) AND SUFFICIENT MATERIAL PLACED IN THE HOLE SO THAT A SLIGHT AMOUNT WILL BE FORCED OUT FROM AROUND THE ENTIRE CIRCUMFERENCE WHEN THE DOWEL IS INSERTED AND TAPPED TO THE CORRECT POSITION. SMALL WEDGES MAY BE USED TO SUPPORT THE DOWEL IN CORRECT ALIGNMENT UNTIL THE MATERIAL HARDENS. THE TOLERANCE FOR DOWEL ALIGNMENT IN EITHER THE HORIZONTAL OR VERTICAL DIRECTION IS ¼" PER FOOT OF DOWEL BAR.
7. ALL LONGITUDINAL AND TRANSVERSE CONTRACTION JOINT DOWELS SHALL BE INSTALLED USING AN ENGINEER-APPROVED WELDED BASKET ASSEMBLY ANCHORED TO THE POROUS BITUMINOUS COURSE WITH A MINIMUM OF 4 GALVANIZED STRAPS AND NAILS PER ASSEMBLY. POSITION ANCHOR STRAPS ON ALTERNATING SIDES OF THE BASKET ASSEMBLY.
8. A TRANSVERSE CONSTRUCTION JOINT SHALL BE INSTALLED AT A PLANNED JOINT WHEN PAVING OPERATIONS ARE INTERRUPTED FOR MORE THAN 30 MINUTES. IF THE INTERRUPTION OCCURS BETWEEN PLANNED JOINTS, THE FRESH CONCRETE SHALL BE REMOVED BACK TO THE PREVIOUSLY INSTALLED JOINT. UNLESS OTHERWISE APPROVED, NO JOINTS WILL BE ALLOWED BETWEEN THE JOINTS SHOWN ON THE JOINTING PLAN.
9. EDGES OF CONCRETE SLABS SHALL BE COVERED WITH AN APPROVED CURING MATERIAL AT THE SAME TIME AS SURFACE IS CURED. AT FORMED LOCATIONS, SLAB SIDES SHALL BE CURED WHEN FORMS ARE REMOVED.
10. CONCRETE IN REINFORCED PANELS SHALL BE PLACED IN ONE COURSE. ALL WWF SHALL BE INSTALLED USING ENGINEER-APPROVED HI-CHAIRS ANCHORED TO THE BITUMINOUS COURSE 3' ON CENTER MAXIMUM. THE WWF SHALL RETAIN ITS SPECIFIED POSITION DURING CONCRETE PLACEMENT. WWF VIBRATED DOWN FROM THE TOP AFTER CONCRETE IS PLACED WILL NOT BE ALLOWED.
11. SEALANT RESERVOIR SHAPE FACTOR, W/D, SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS.
12. ALL WORK AND MATERIALS REQUIRED FOR JOINTS IS INCIDENTAL TO PCC PAVEMENT PAY ITEMS.
13. COST OF MODIFYING UNDERLYING PAVEMENT COURSES TO ACCOMMODATE THE CONCRETE PAVEMENT THICKNESS CHANGES TO BE INCLUDED IN THE COST OF OTHER ITEMS. NO SEPARATE PAYMENT WILL BE MADE FOR SAID MODIFICATIONS. THE BITUMINOUS BASE SHALL BE CONSTRUCTED FULL THICKNESS UNDER THOSE AREAS.
14. ALL JOINT SEALANT RESERVOIRS SHOWN ON THIS SHEET SHALL BE VERIFIED BY THE SEALANT MANUFACTURER PRIOR TO CONSTRUCTION. REFER TO SECTION P-605 OF THE SPECIFICATIONS FOR FURTHER INFORMATION.
15. ALL JOINTS MUST BE ADEQUATELY CLEANED AFTER SAWCUTTING, IMMEDIATELY PRIOR TO THE INSTALLATION OF THE JOINT SEALANT.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

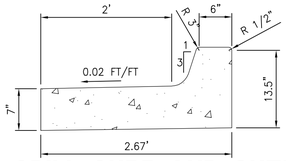
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
TYPICAL PAVEMENT JOINT DETAILS (SHEET 2 OF 2)

SHEET NUMBER
C207

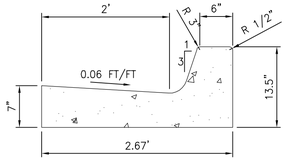
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C207.dwg Plotted on: 2/6/2012 5:26 PM Plotted by: Erdmann, Ryan



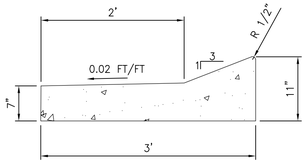
1 C208 DESIGN B624 - SPILL CURB AND GUTTER DETAIL

SCALE: N.T.S.



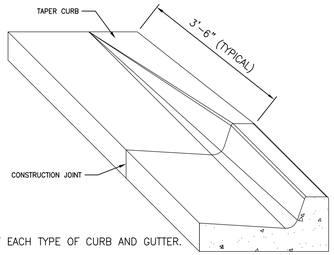
2 C208 DESIGN B624 - NORMAL CURB AND GUTTER DETAIL

SCALE: N.T.S.



3 C208 DESIGN D424 - SPILL CURB AND GUTTER DETAIL

SCALE: N.T.S.

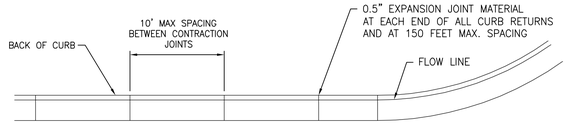


NOTES:

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

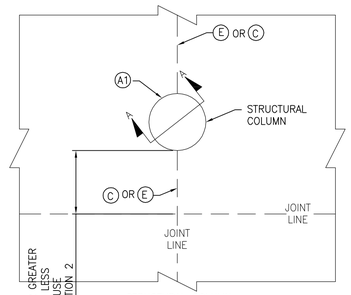
4 C208 DETAIL OF CURB AND GUTTER TERMINATION

SCALE: N.T.S.

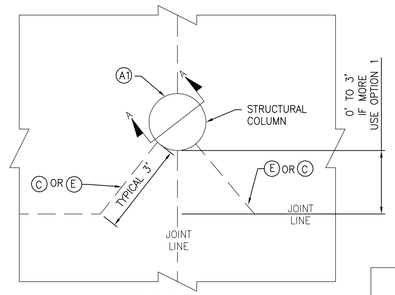


5 C208 CURB AND GUTTER LAYOUT DETAIL

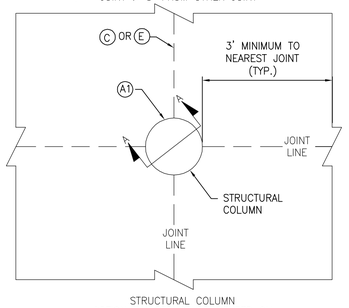
SCALE: N.T.S.



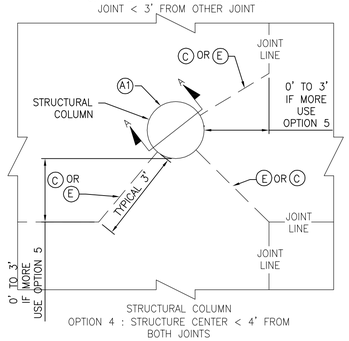
STRUCTURAL COLUMN
OPTION 1 : STRUCTURE CENTER ON JOINT > 3' FROM OTHER JOINT



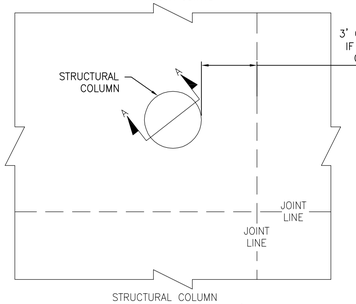
STRUCTURAL COLUMN
OPTION 2 : STRUCTURE CENTER ON JOINT < 3' FROM OTHER JOINT



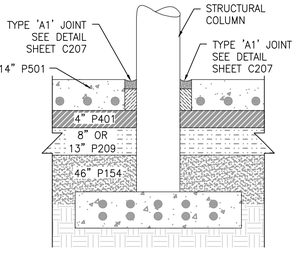
STRUCTURAL COLUMN
OPTION 3 : STRUCTURE CENTER ON BOTH JOINTS



STRUCTURAL COLUMN
OPTION 4 : STRUCTURE CENTER < 4' FROM BOTH JOINTS



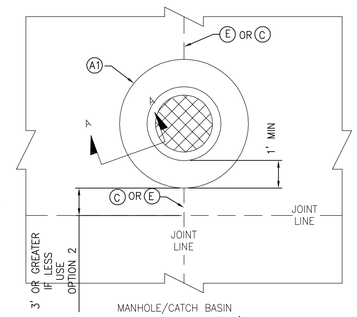
STRUCTURAL COLUMN
OPTION 5 : STRUCTURE CENTER > 4' FROM BOTH JOINTS



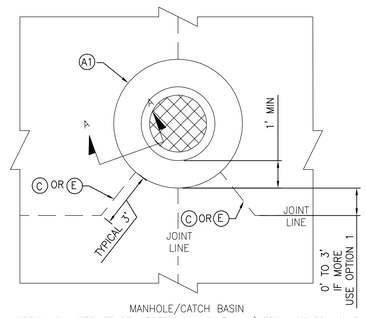
SECTION A-A

7 C208 STRUCTURAL COLUMN/LIGHT POLE IN CONCRETE DETAIL

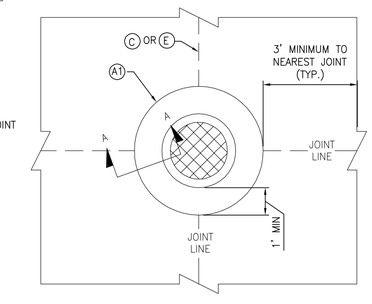
SCALE: N.T.S.



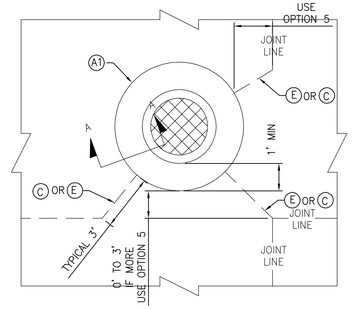
MANHOLE/CATCH BASIN
OPTION 1 : STRUCTURE CENTER ONJOINT > 4' FROM OTHER JOINT



MANHOLE/CATCH BASIN
OPTION 2 : STRUCTURE CENTER ON JOINT < 4' FROM OTHER JOINT



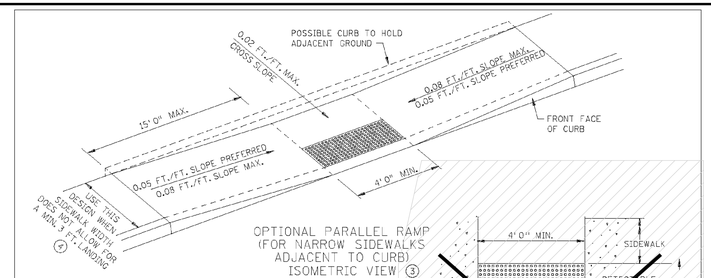
MANHOLE/CATCH BASIN
OPTION 3 : STRUCTURE CENTER ON BOTH JOINTS



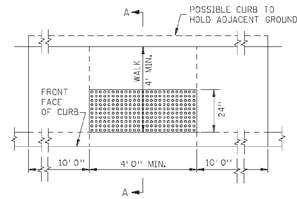
MANHOLE/CATCH BASIN
OPTION 4 : STRUCTURE CENTER < 4' FROM BOTH JOINTS

8 C208 MANHOLE/CATCH BASIN IN CONCRETE DETAIL

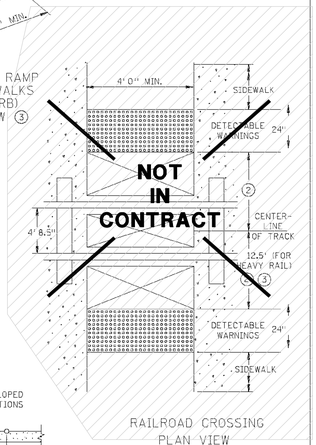
SCALE: N.T.S.



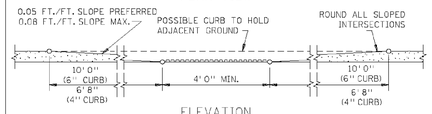
OPTIONAL PARALLEL RAMP
(FOR NARROW SIDEWALKS ADJACENT TO CURB)
ISOMETRIC VIEW (3)



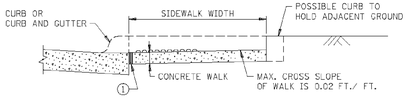
PARALLEL RAMP
PLAN VIEW



RAILROAD CROSSING
PLAN VIEW



ELEVATION



PARALLEL RAMP
SECTION A-A

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

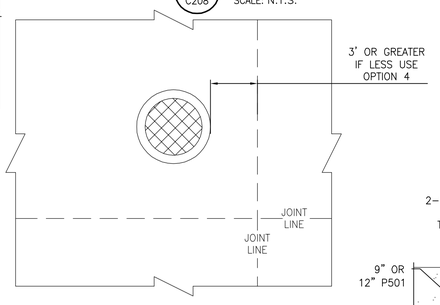
NOTES:

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.

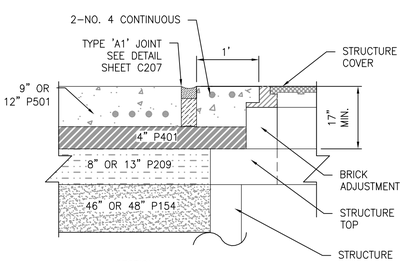
APPROVED FEB. 20, 2004 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	PEDESTRIAN CURB RAMP OPTIONS FOR THE HANDICAPPED	2521 2531	7036F 2 OF 2

7 C208 PEDESTRIAN SIDEWALK DETAIL

SCALE: N.T.S.



MANHOLE/CATCH BASIN
OPTION 5 : STRUCTURE CENTER > 4' FROM BOTH JOINTS



SECTION A-A

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CURB, GUTTER, AND STRUCTURE JOINT DETAILS

SHEET NUMBER
C208

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C208.dwg Plotted on: 2/6/2012 5:26 PM Plotted by: Erdmann, Ryan

FENCING NOTES

1. THE DEMOLITION OF FENCE 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 FENCE DEMOLITION. SEE DEMOLITION PLANS FOR FENCE REMOVAL LIMITS.

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.

5. FENCE TO BE INSTALLED AS CLOSE TO NEW TERMINAL BUILDING WALL AS POSSIBLE. A GAP BETWEEN FENCE END AND BUILDING/WALL FACE SHALL BE A MAXIMUM OF 2". PLACEMENT OF FENCE TO BE FIELD VERIFIED BY CONTRACTOR.

6. ANY AND ALL TEMPORARY FENCING REQUIRED BY THIS CONTRACT SHALL MEET THE STANDARDS AND DETAILS HEREIN AND WITHIN F-162. ALL FENCING MOUNTED TO EXISTING PAVEMENT, IF NECESSARY SHALL HAVE THE APPROVAL OF THE ENGINEER AND AIRPORT PRIOR TO PLACEMENT. IN ADDITION ALL TEMPORARY FENCING IN AREAS WHERE ACTIVE AIRCRAFT OPERATIONS ARE TAKING PLACE SHALL HAVE SOLAR POWER RED FLASHING LIGHT UNITS, LUMASTROBE MODEL SLX-2 OR APPROVED EQUAL. LIGHTS SHALL BE MOUNTED TO THE FENCING WITH GALVANIZED CHANNEL MOUNTING BRACKETS AND SECURED WITH STRAP TIES.

7. SEE GEOMETRY PLANS FOR FENCE LAYOUT.

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 APPROVED BY THE ENGINEER. PAYMENT FOR CLOSURES SHALL BE INCIDENTAL TO THE F-162 FENCING ITEM.

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.

TYPICAL CHAIN LINK FENCE MEMBERS, DIMENSIONS & WEIGHTS

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

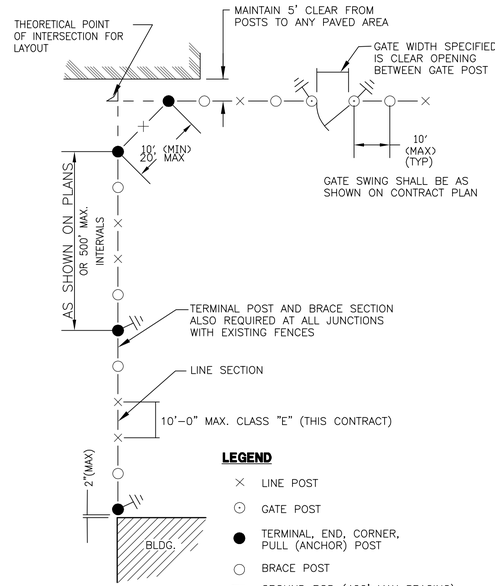
NOTES:

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.



1 / C209 **TYPICAL FENCE LAYOUT**
SCALE: N.T.S.

ALL CLASSES

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

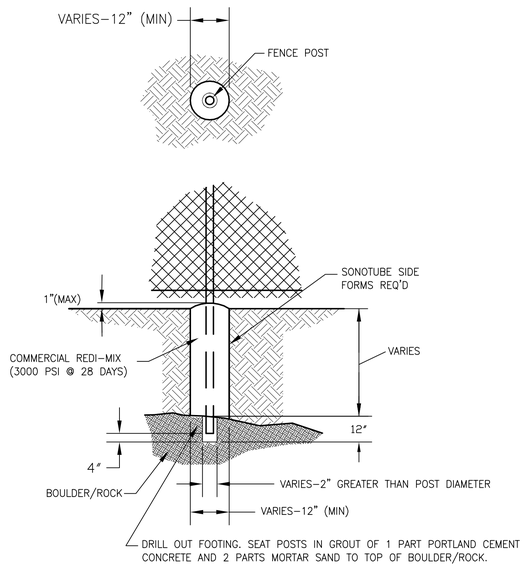
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
FENCING LAYOUT SITE PLAN AND NOTES

SHEET NUMBER
C209

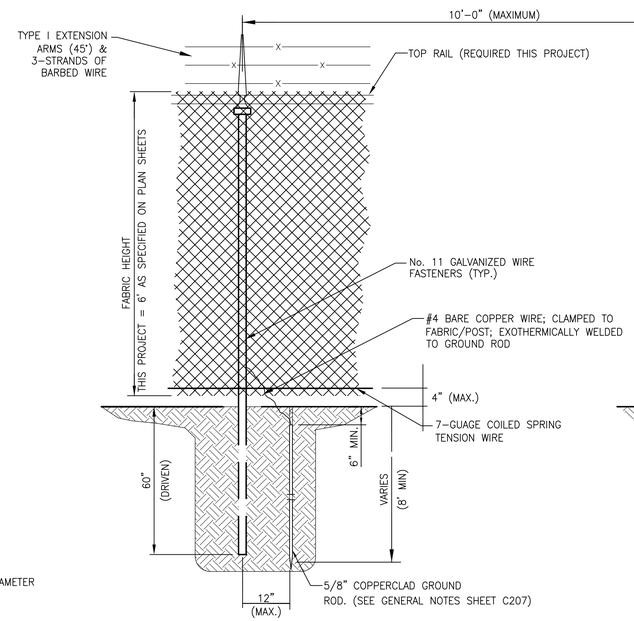
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\21\31882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C209.dwg Plotted on: 2/6/2012 5:27 PM Plotted by: Erdmann, Ryan



1 / C210 **BOULDER/ROCK FOOTING DETAIL**

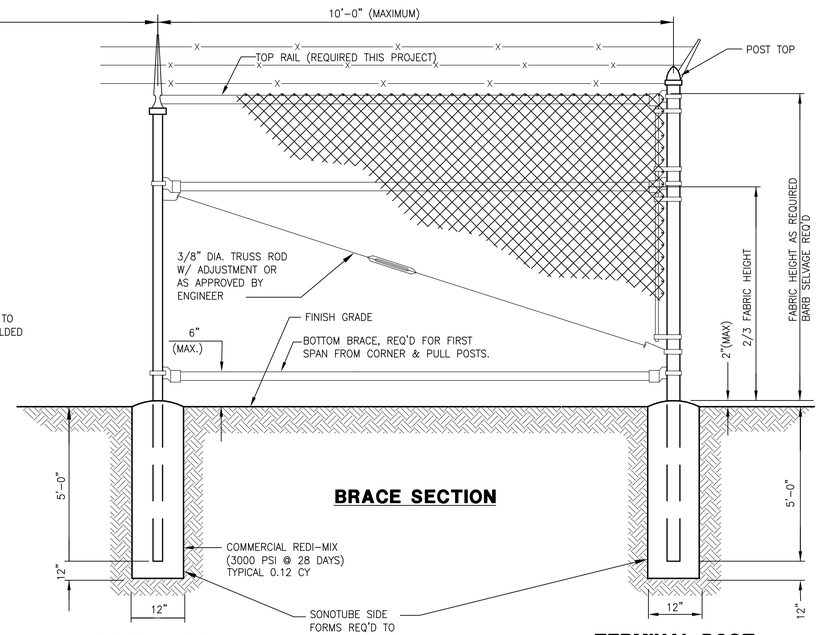
SCALE: N.T.S.



TURF LINE POST (INTERMEDIATE)

POST NOTES:

1. SEE TABLE SHEET C209 FOR POST DIMENSIONS AND UNIT WEIGHT PER FOOT REQUIREMENT.
2. ALL POSTS IN PAVED AREAS SHALL HAVE CONCRETE BASES PER DETAIL 4, THIS SHEET.



BRACE POST

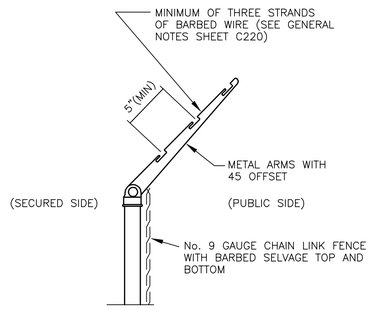
ALL POSTS IN PAVED AREAS SHALL HAVE CONCRETE BASES, AS SHOWN.

TERMINAL POST (END, CORNER OR PULL)

ALL POSTS IN PAVED AREAS SHALL HAVE CONCRETE BASES, AS SHOWN.

2 / C210 **CHAIN LINK FENCE, CLASS E, FAA SPEC. F-162**

SCALE: N.T.S.



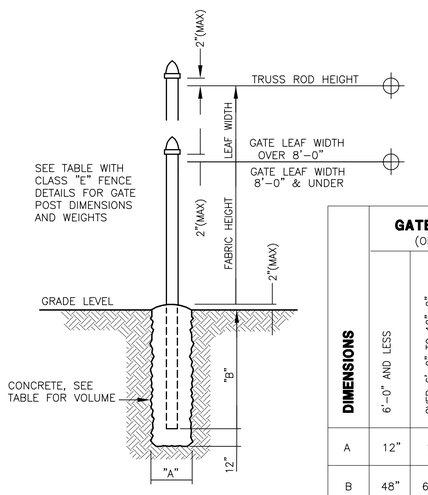
TYPE No.1

(REQUIRED THIS CONTRACT)

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

3 / C210 **BARBED WIRE EXTENSION ARMS**

SCALE: N.T.S.



DETAIL (TYP)

ALL POSTS IN PAVED AREAS SHALL HAVE CONCRETE BASES, AS SHOWN.

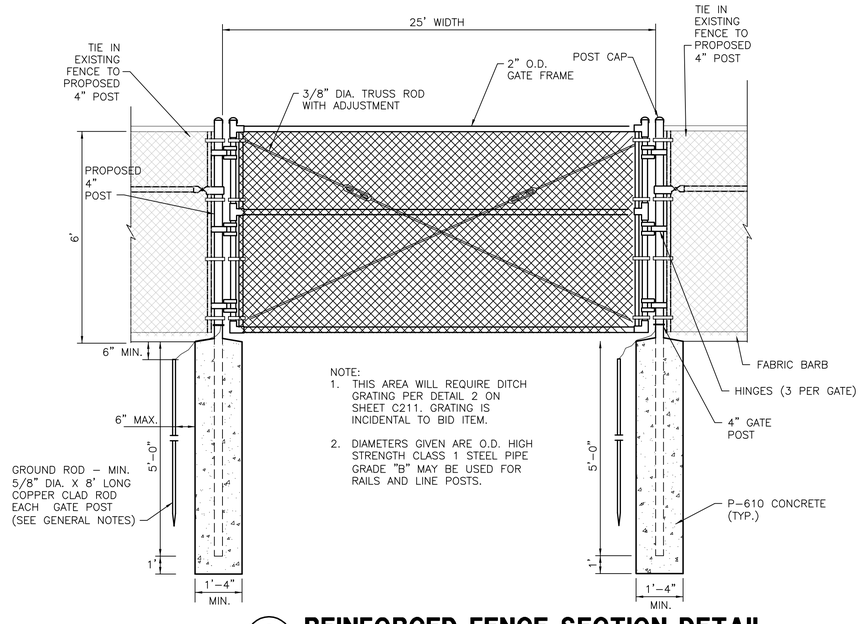
DIMENSIONS	GATE WIDTH (ONE LEAF) 6'–0" AND LESS	OVER 6'–0" TO 10'–0"	OVER 10'–0" TO 15'–0"	OVER 15'–0" TO 18'–0"
A	12"	16"	20"	24"
B	48"	66"	66"	66"
C.Y. CONC. *	0.15	0.42	0.53	0.76

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

SCHEDULE

4 / C210 **GATE POST & CONCRETE BASE**

SCALE: N.T.S.



5 / C210 **REINFORCED FENCE SECTION DETAIL**

SCALE: N.T.S.

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

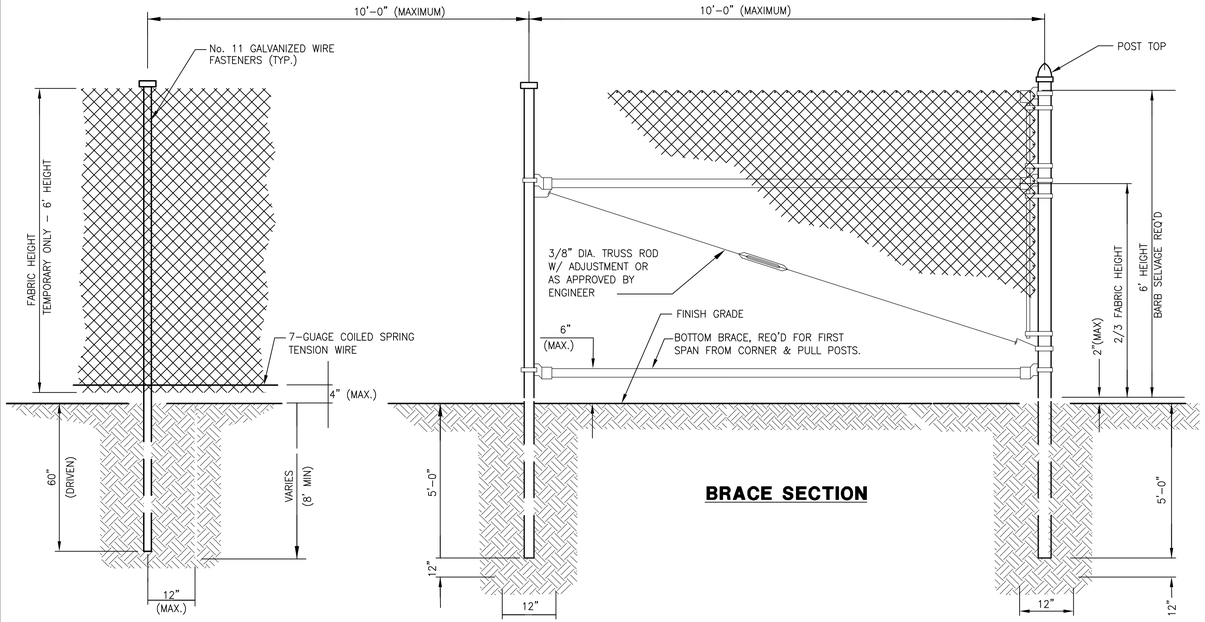
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
FENCING AND GATE DETAILS (SHEET 1 OF 2)

SHEET NUMBER
C210

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH–C210.dwg Plotted on: 2/10/2012 8:57 AM Plotted by: Erdmann, Ryan

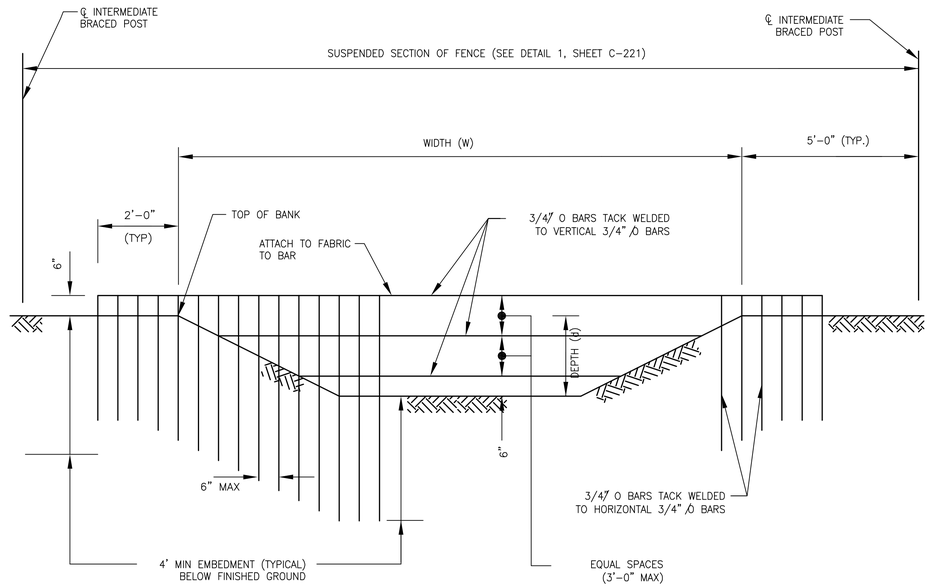


TEMPORARY FENCE POST | **BRACE POST** | **TERMINAL POST (END, CORNER OR PULL)**

BRACE SECTION

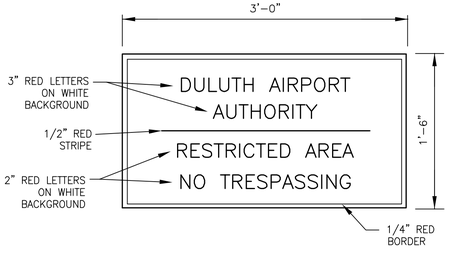
POST NOTES:

1. SEE TABLE ON SHEET C209 AND C210 FOR POST DIMENSIONS AND UNIT WEIGHT PER FOOT REQUIREMENT.



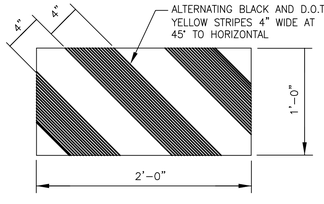
2 / C-211 **DITCH GRATING**
SCALE: NTS

1 / C-211 **TEMPORARY CHAIN LINK FENCE, CLASS E, FAA SPEC. F-162**
SCALE: NTS



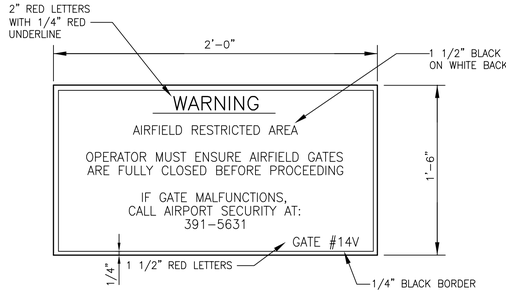
3 / C-211 **NO TRESPASSING SIGN**
SCALE: NTS

REQUIRED EVERY 200' ALONG NEW FENCE AND AT EACH SIDE OF A CORNER COST INCIDENTAL TO PROPOSED FENCE (FACING NON-AOA SIDE)



4 / C-211 **BARRICADE SIGN**
SCALE: NTS

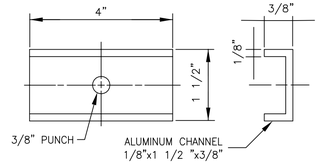
ONE EACH FOR EACH LEAF OF GATE (BOTH SIDES)



5 / C-211 **OPERATOR SIGN**
SCALE: NTS

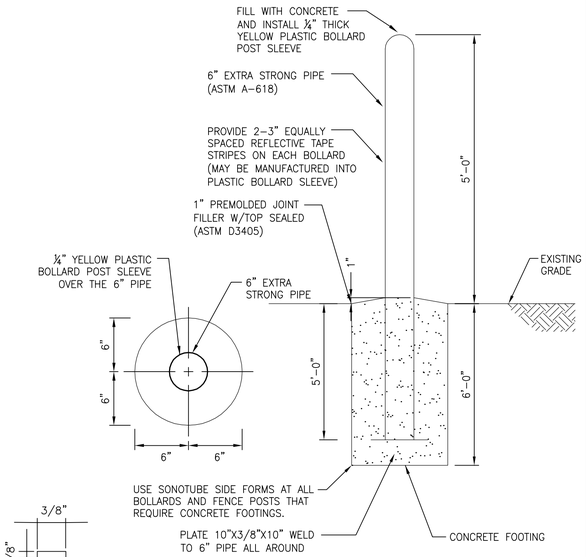
(PLACED ON FRONT AND BACK OF EACH GATE)

GATES SHALL BE GATE # 5V, 5P & 14V



6 / C-211 **MOUNTING BRACKET**
SCALE: NTS

2 REQ'D EACH SIGN



7 / C-211 **CONCRETE BOLLARD POST**
SCALE: NTS

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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

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

SHEET NUMBER
C211

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C211.dwg Plotted on: 2/6/2012 8:30 PM Plotted by: Erdmann, Ryan

GRADING NOTES

1. THE CONTOURS IN THESE PLANS REPRESENT THE ULTIMATE FINISHED GRADE ELEVATIONS AND SLOPES FOR PAVING AND TURF AREAS WITHIN THESE PLANS.
2. NO WETLANDS ARE TO BE DISTURBED. ENGINEER SHALL BE CALLED PRIOR TO DISTURBING ANY AND ALL WETLANDS.

EROSION CONTROL NOTES

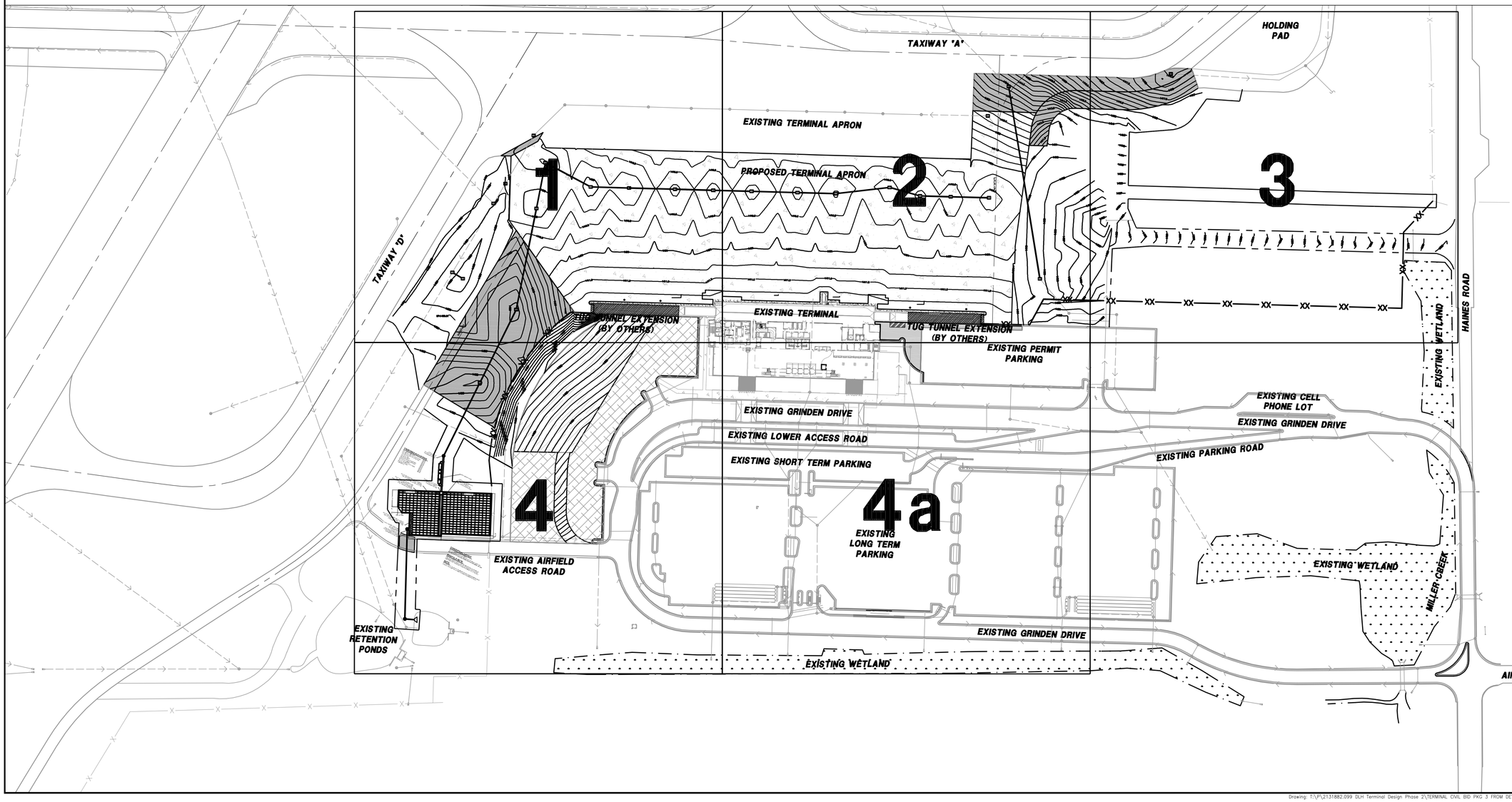
1. SEE SHEET C407 FOR EROSION CONTROL NOTES.

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 NADB3

* SEE SHEET C006 FOR CONTROL POINT INFORMATION

NORTH

0 100' 200'



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

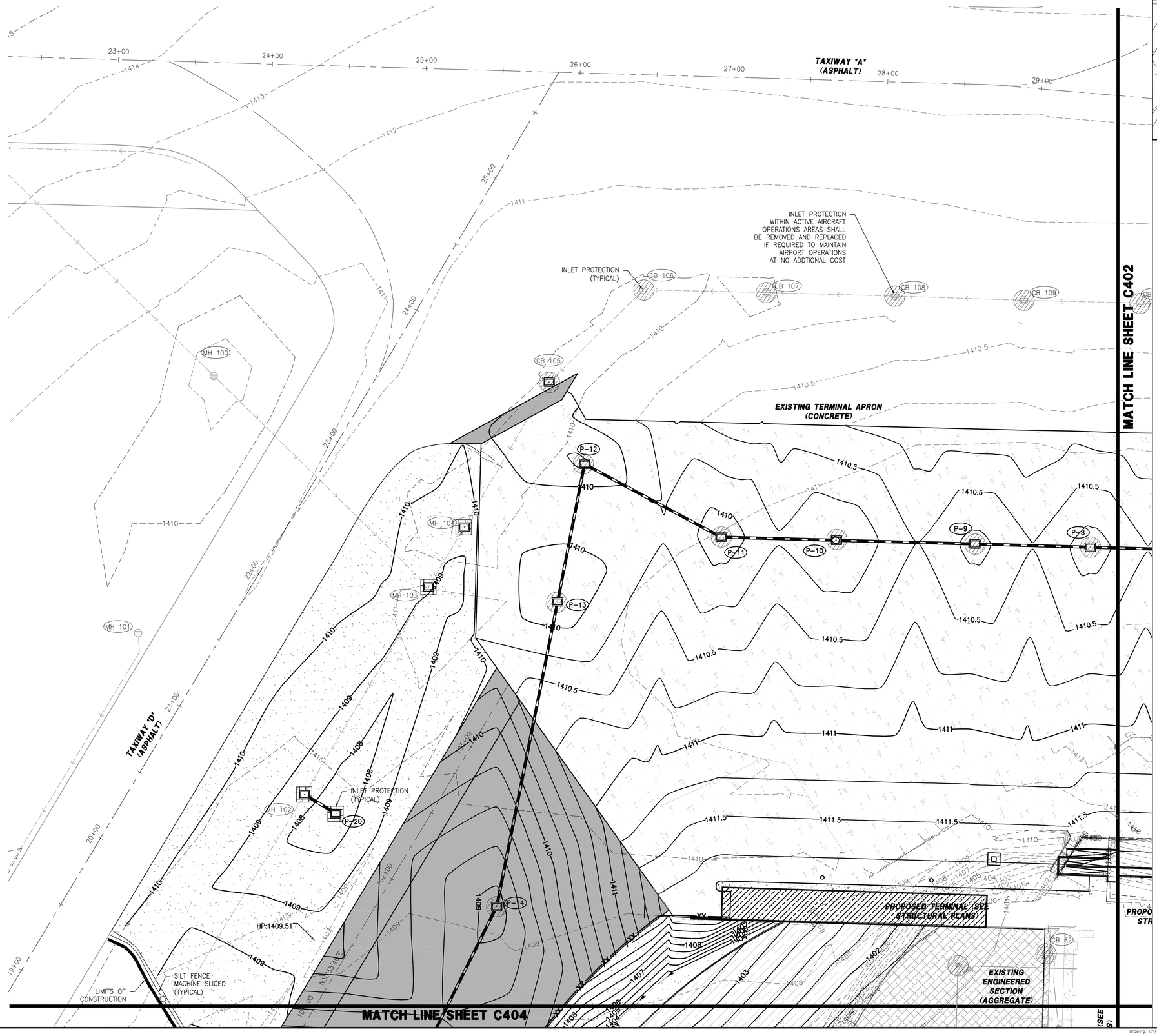
OVERALL GRADING AND EROSION CONTROL PLAN AND NOTES

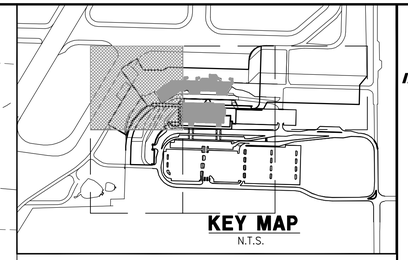
SHEET NUMBER

C400

BID PACKAGE 2C BID DOCUMENTS

Drawing: I:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C400.dwg Plotted on: 2/7/2012 8:05 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GRADING NOTES

1. SEE SITE UTILITY PLANS FOR UTILITY CONSTRUCTION NOTES.
2. SEE C510 FOR DRAINAGE STRUCTURE INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

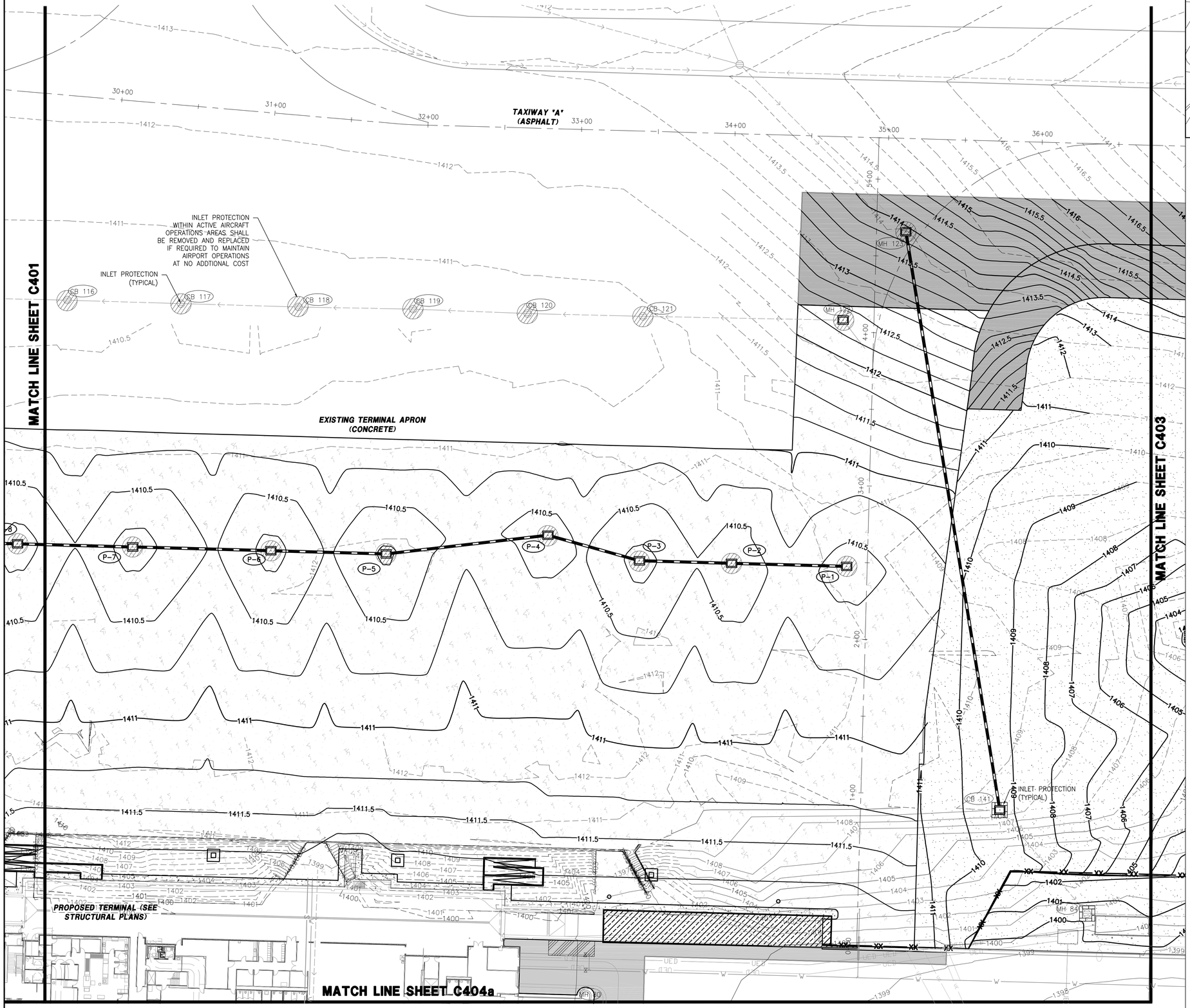
GRADING AND EROSION CONTROL PLAN (SHEET 1 OF 5)

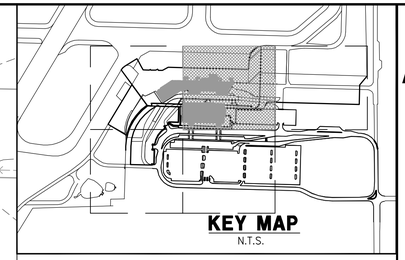
SHEET NUMBER

C401

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C401.dwg Plotted on: 2/7/2012 8:07 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GRADING NOTES

1. SEE SITE UTILITY PLANS FOR UTILITY CONSTRUCTION NOTES.
2. SEE C510 FOR DRAINAGE STRUCTURE INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

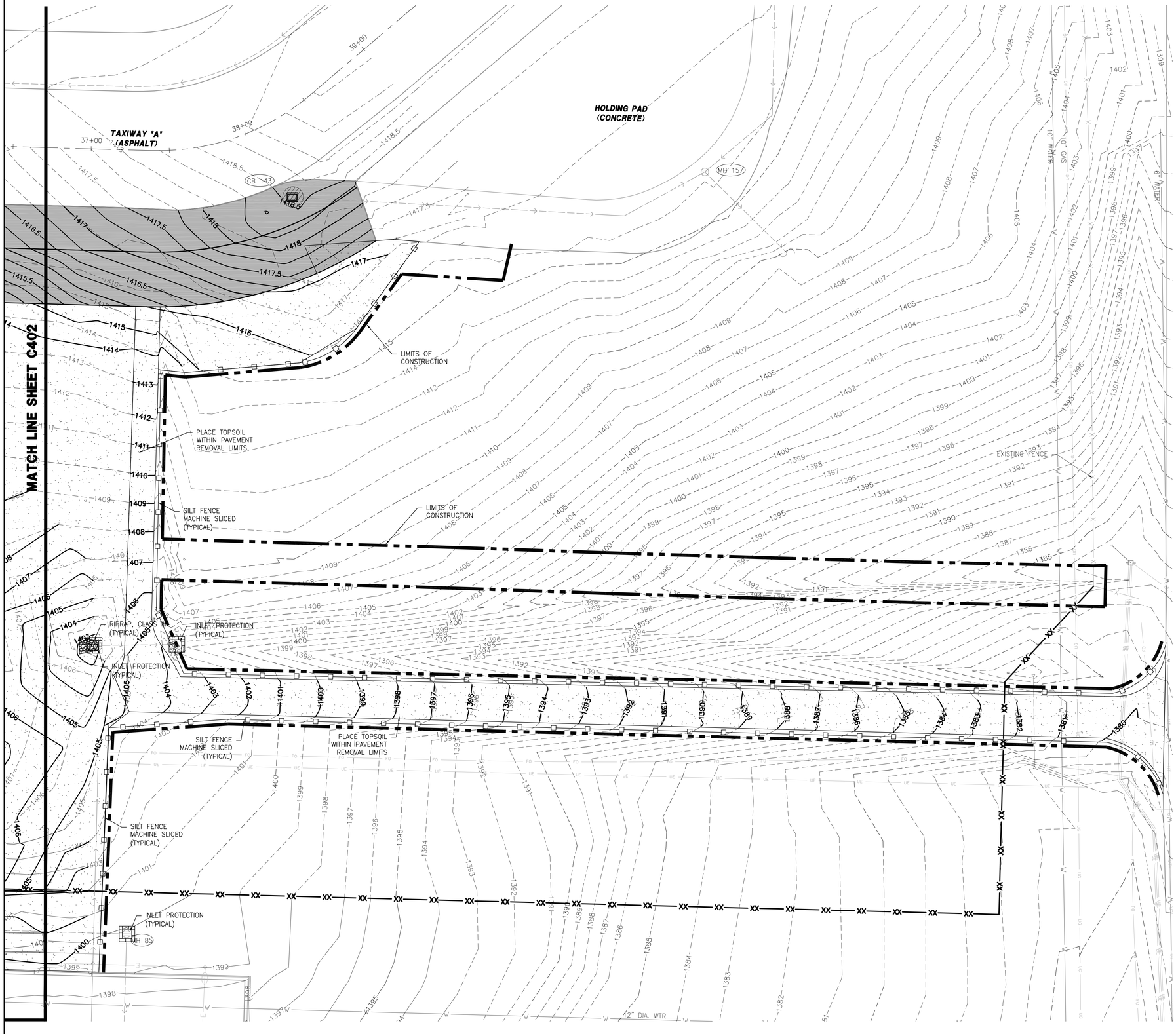
GRADING AND EROSION CONTROL PLAN (SHEET 2 OF 5)

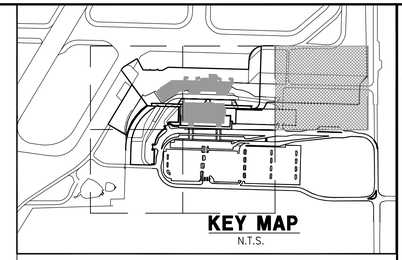
SHEET NUMBER

C402

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C402.dwg Plotted on: 2/7/2012 8:11 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GRADING NOTES

1. SEE SITE UTILITY PLANS FOR UTILITY CONSTRUCTION NOTES.
2. SEE C510 FOR DRAINAGE STRUCTURE INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

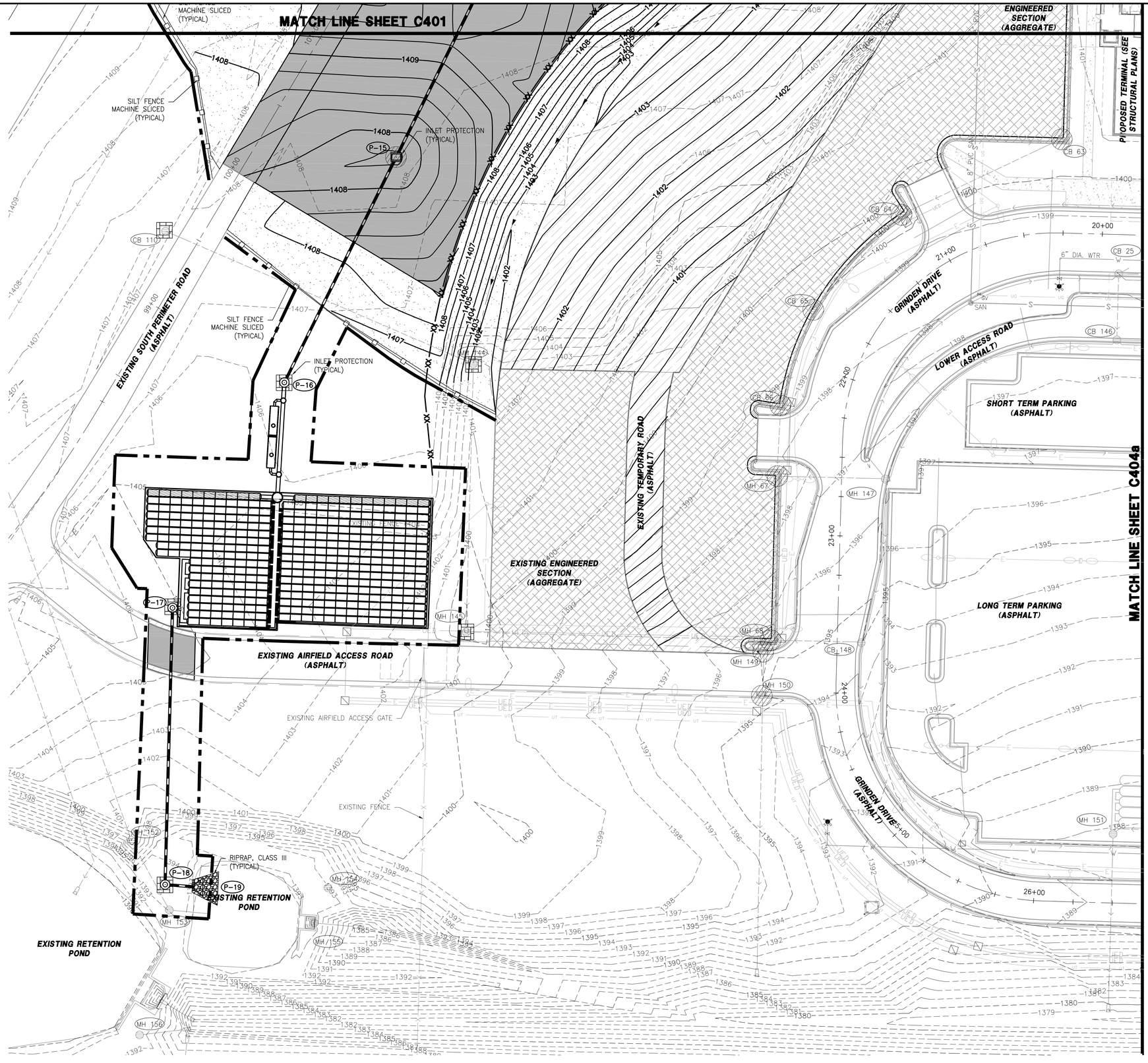
SHEET TITLE

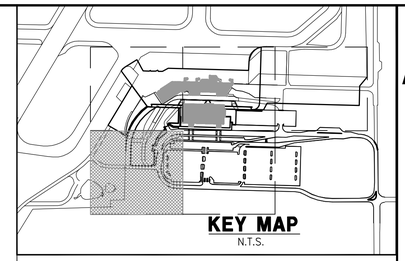
GRADING AND EROSION CONTROL PLAN (SHEET 3 OF 5)

SHEET NUMBER
C403

BID PACKAGE 2C
BID DOCUMENTS

Drawing: I:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C403.dwg Plotted on: 2/7/2012 8:15 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

GRADING NOTES

1. SEE SITE UTILITY PLANS FOR UTILITY CONSTRUCTION NOTES.
2. SEE C510 FOR DRAINAGE STRUCTURE INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

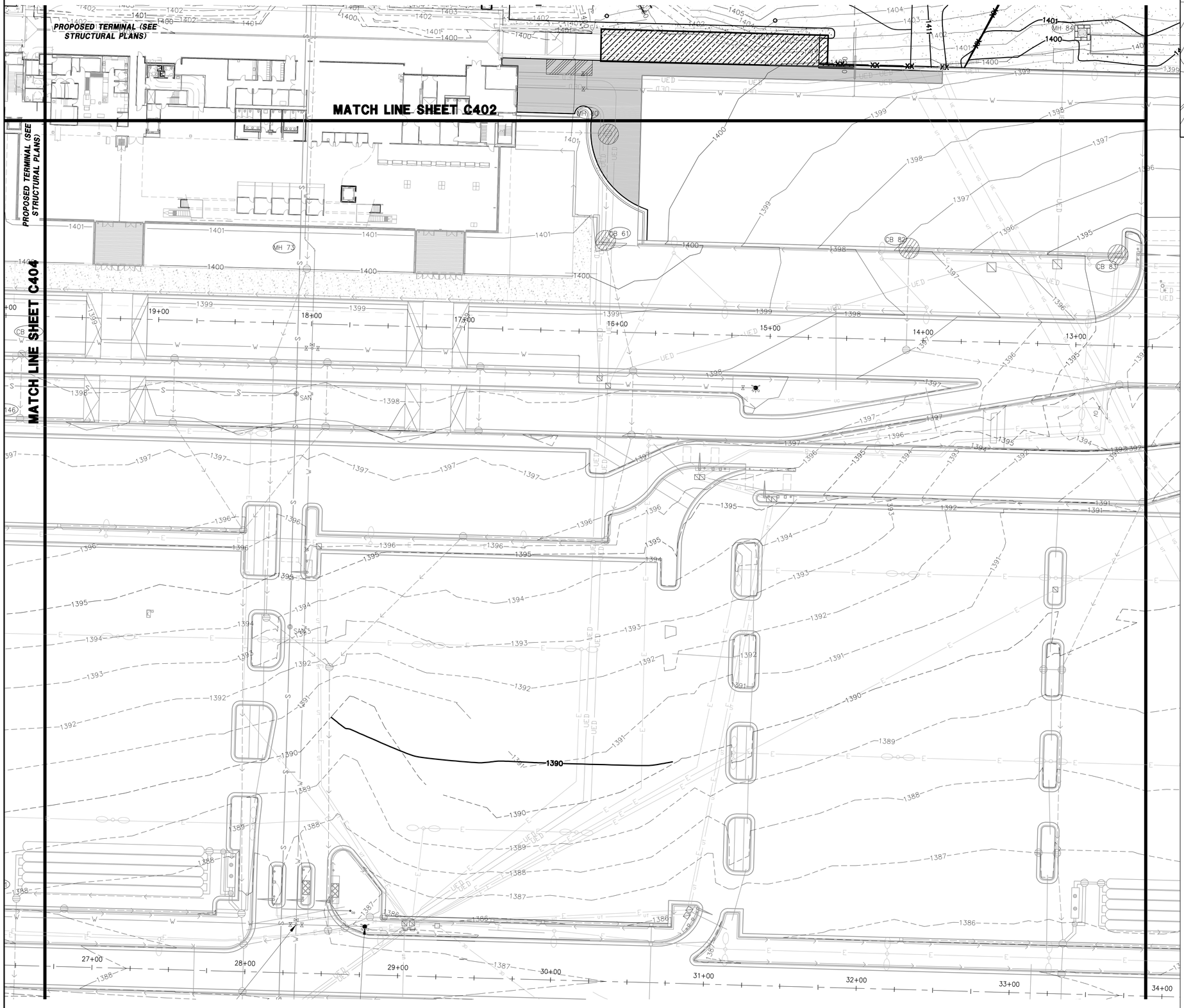
GRADING AND EROSION CONTROL PLAN (SHEET 4 OF 5)

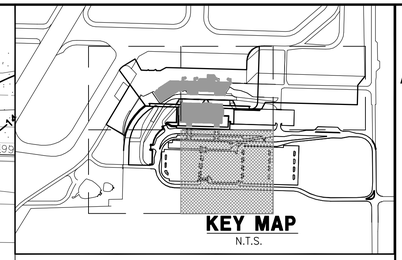
SHEET NUMBER

C404

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C404.dwg Plotted on: 2/14/2012 4:30 PM Plotted by: Erdmann, Ryan





KEY MAP
N.T.S.

NORTH

0 30' 60'

GRADING NOTES

1. SEE SITE UTILITY PLANS FOR UTILITY CONSTRUCTION NOTES.
2. SEE C510 FOR DRAINAGE STRUCTURE INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

GRADING AND EROSION CONTROL PLAN (SHEET 5 OF 5)

SHEET NUMBER

C404a

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C404a.dwg Plotted on: 2/8/2012 9:54 AM Plotted by: Eramann, Ryan

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	8.27 AC	10.00 AC	1.73 AC
PERVIOUS	4.46 AC	2.73 AC	1.73 AC
TOTAL	12.73 AC	12.73 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

A. 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.

D. 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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT
AUTHORITY

DULUTH
INTERNATIONAL
AIRPORT
DULUTH, MN

NEW TERMINAL
DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

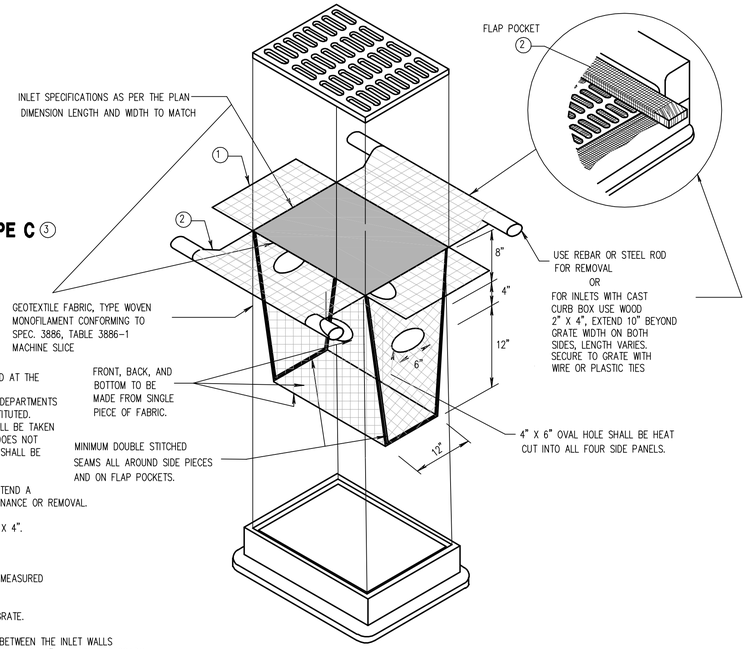
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS (SHEET 1 OF 4)

SHEET NUMBER
C407

BID PACKAGE 3
100% REVIEW

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".

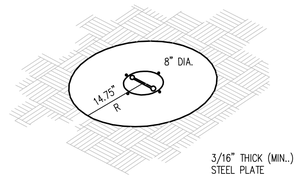
③ INSTALLATION NOTES:

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

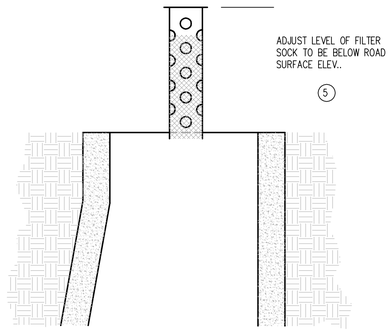
TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

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.

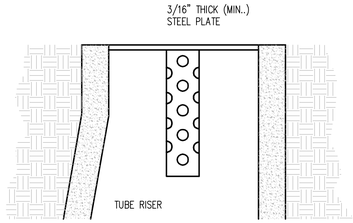
TUBE RISER



PERSPECTIVE VIEW



SECTION
(UP POSITION)



SECTION
(DOWN POSITION)

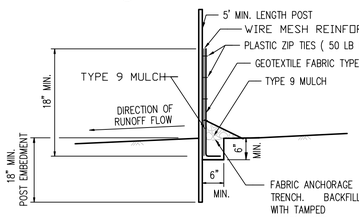
WIMCO EROSION BARRIER POP-UP HEAD

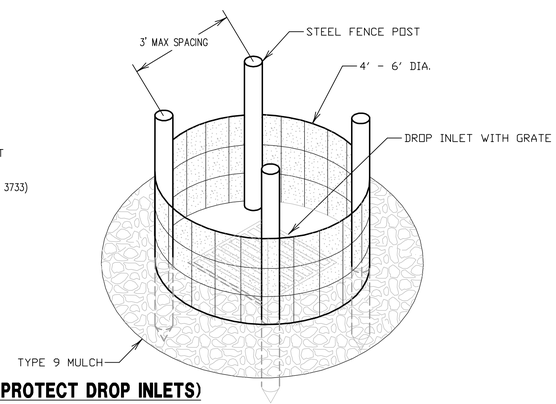
NOTES:

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.

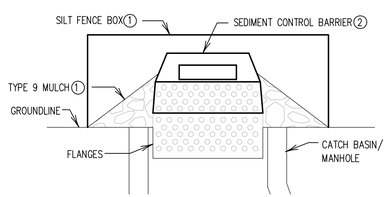
② PAID FOR AS SEDIMENT CONTROL BARRIER.





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)



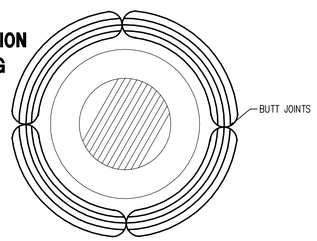
SEDIMENT CONTROL BARRIER ②

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.

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.

INLET PROTECTION WITH ROCK LOG

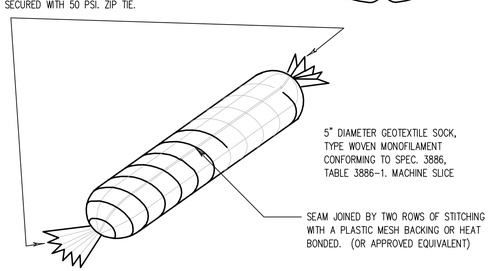


FILL ROCK LOG WITH 45 LBS. OF OPEN GRADED AGGREGATE CONSISTING OF SOUND, DURABLE PARTICLES OF CRUSHED QUARRY ROCK OR GRAVEL CONFORMING TO THE FOLLOWING GRADATION.

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.

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



TEMPORARY DITCH CHECK, TYPE ROCK LOG DETAIL

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

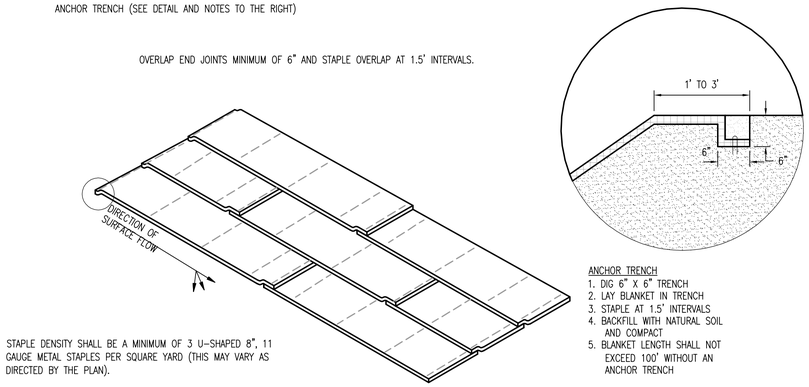
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS (SHEET 2 OF 4)

SHEET NUMBER
C408

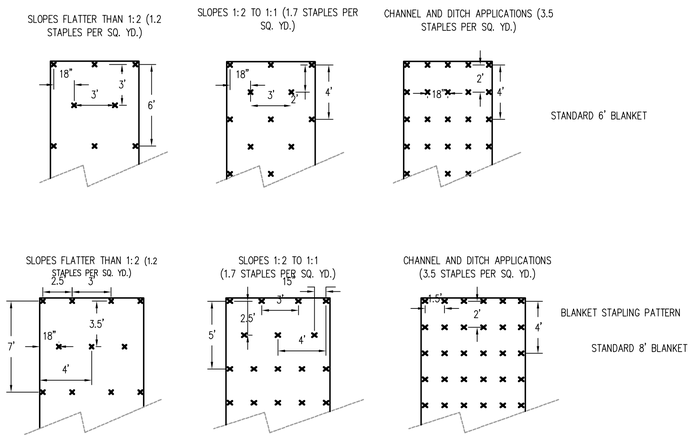
BID PACKAGE 3
100% REVIEW

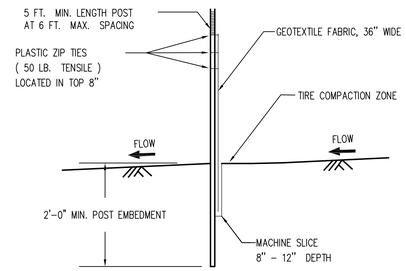
Drawing: T:\P\21\31882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C408.dwg Plotted on: 2/7/2012 8:24 AM Plotted by: Erdmann, Ryan



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

EROSION BLANKET INSTALLATION

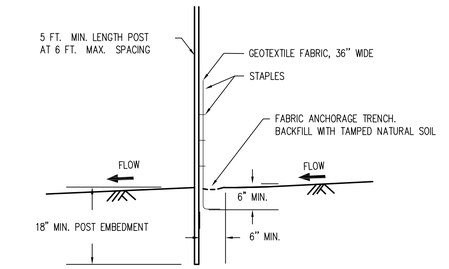




SILT FENCE, MACHINE SLICED

DESIGN GUIDELINES:

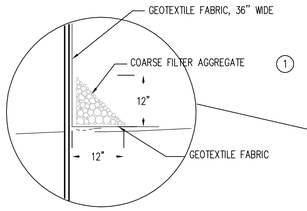
TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



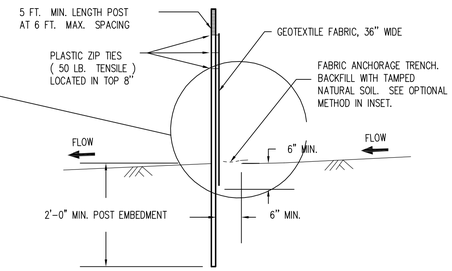
SILT FENCE, PREASSEMBLED

DESIGN GUIDELINES:

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



OPTIONAL METHOD FOR SILT FENCE, HEAVY DUTY



SILT FENCE, HEAVY DUTY

(HAND INSTALLED)

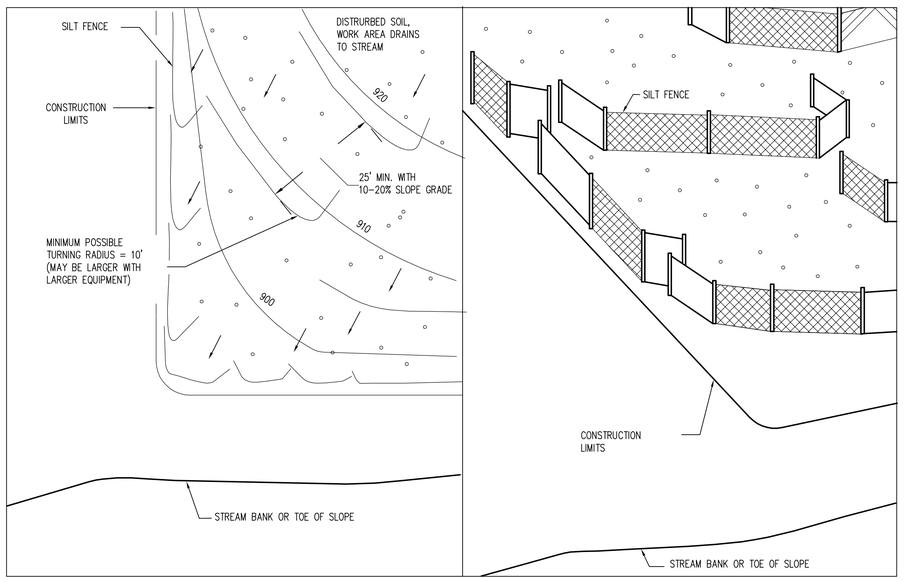
DESIGN GUIDELINES:

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

NOTES:

SEE SPECS. 2573, 3149 & 3886.

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



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

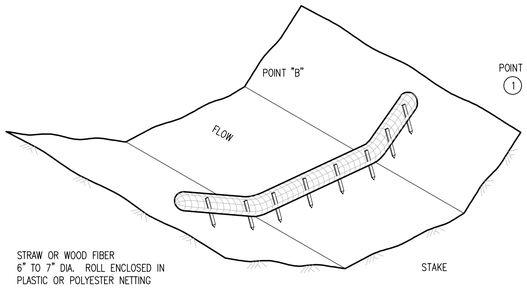
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS (SHEET 3 OF 4)

SHEET NUMBER
C409

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C409.dwg Plotted on: 2/7/2012 8:25 AM Plotted by: Erdmann, Ryan



TYPE 2: BIOROLL DITCH CHECK

USE ON ROUGH GRADED AREAS

NOTES:

SEE SPECS. 2573, 3885, 3886 & 3889.

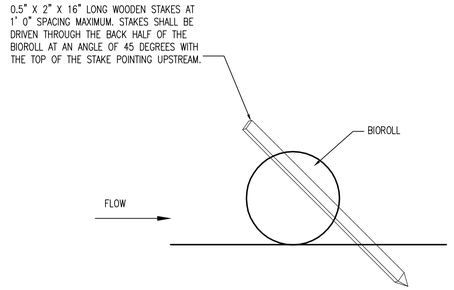
SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM SPACING FORMULA:

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

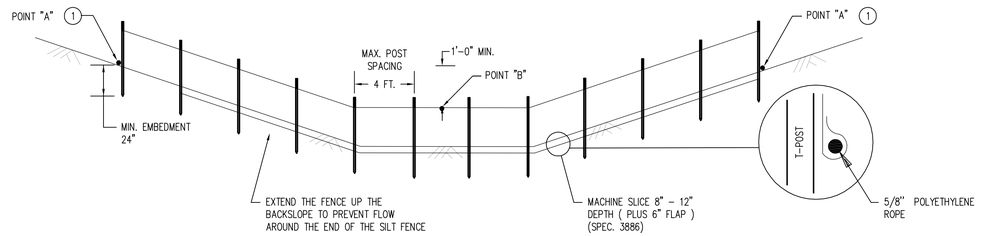
(1) POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

(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.



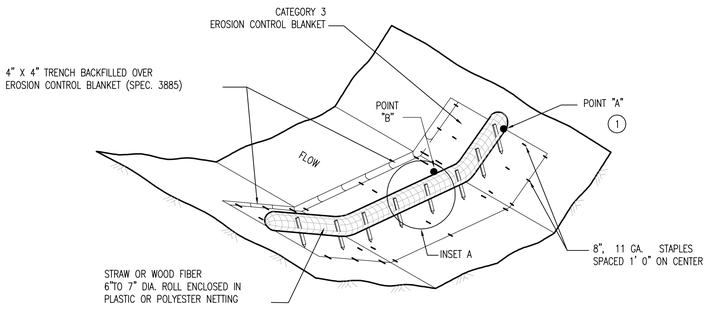
BIOROLL STAKING DETAIL



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)



TYPE 3: BIOROLL BLANKET SYSTEM DITCH CHECK

NOTES:

SEE SPECS. 2573, 3885, 3886 & 3889.

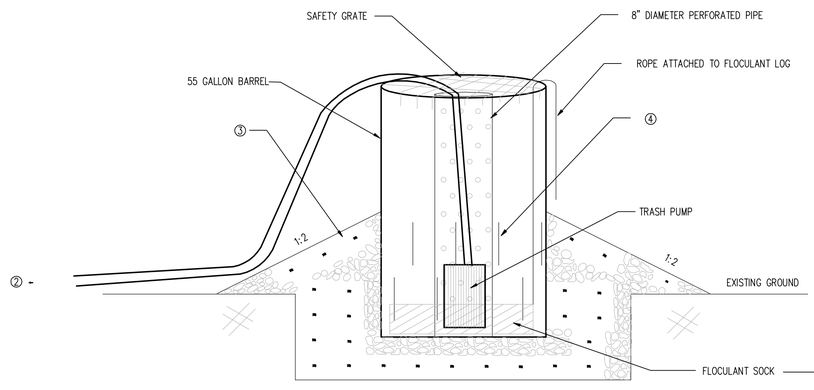
SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM SPACING FORMULA:

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

(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).

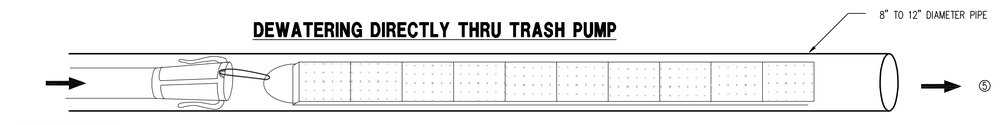
(3) THE ROCK WEEPER FILTERS SEDIMENT OUT OF THE WATER BETTER THAN THE OTHER DITCH CHECKS. THE ROCK WEEPER COULD BE USED AS A PERMANENT WATER FILTERING FEATURE.

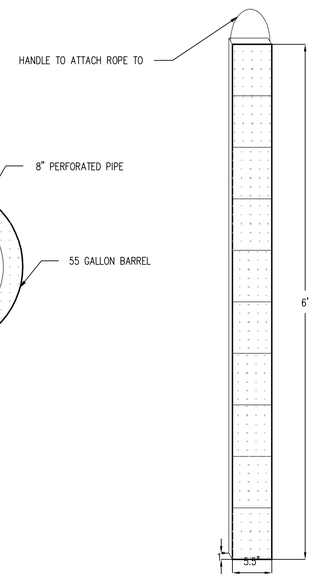


SUMP DEWATERING FOR POND

TOP VIEW

DEWATERING DIRECTLY THRU TRASH PUMP





TYPICAL FLOCULANT SOCK

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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
EROSION, AND SEDIMENTATION CONTROL NOTES AND DETAILS (SHEET 4 OF 4)

SHEET NUMBER
C410

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C410.dwg Plotted on: 2/7/2012 8:25 AM Plotted by: Erdmann, Ryan

UTILITY NOTES

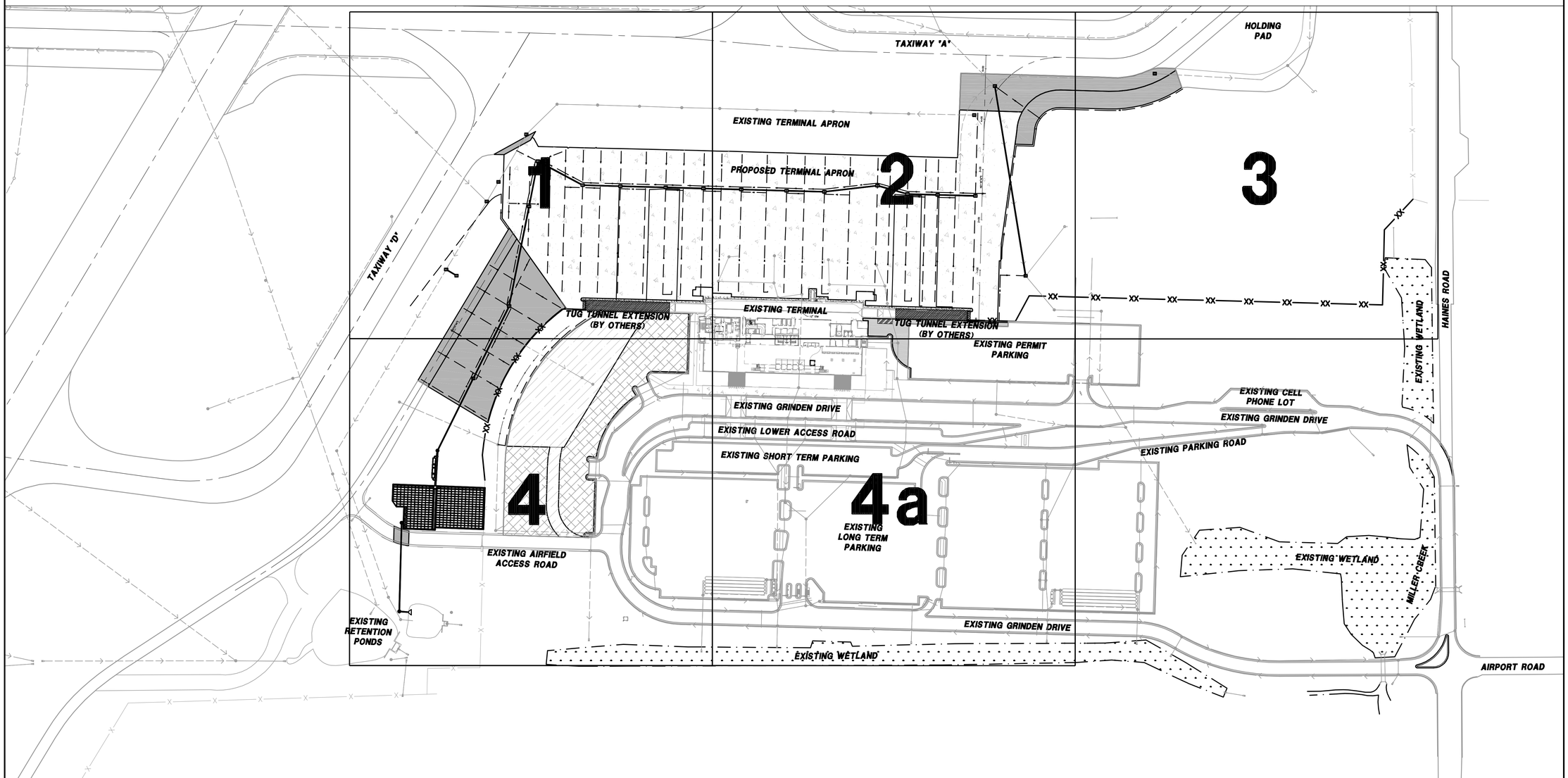
1. CONTRACTOR SHALL MAINTAIN EXISTING UTILTITIES PER PROJECT PHASING PLAN. EXISTING BUILDING SERVICES SHALL BE UNINTERUPTED UNTIL COMMISSIONING OF NEW BUILDING.

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

* SEE SHEET C006 FOR CONTROL POINT INFORMATION

NORTH

0 100' 200'



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

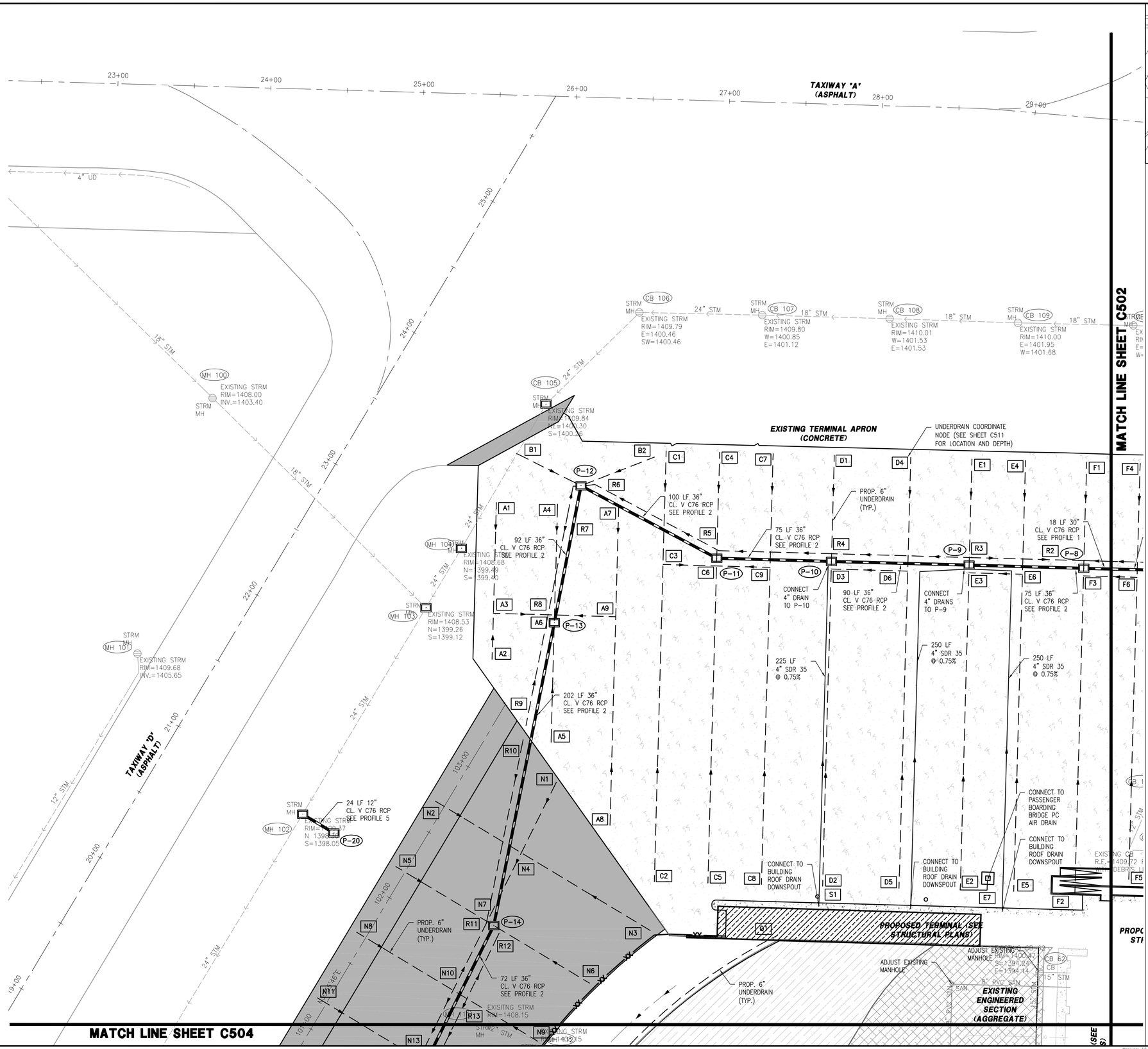
OVERALL SITE UTILITY PLAN AND NOTES

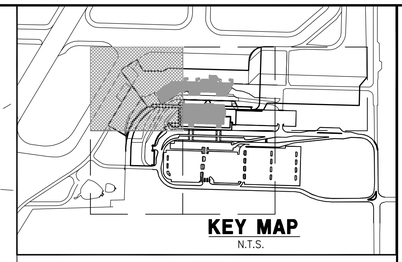
SHEET NUMBER

C500

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C500.dwg Plotted on: 2/7/2012 8:28 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

SITE UTILITY NOTES

1. SEE SHEET C510 FOR DRAINAGE STRUCTURE AND UNDERDRAIN INFORMATION.
2. SEE SHEET C003 FOR LEGEND.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

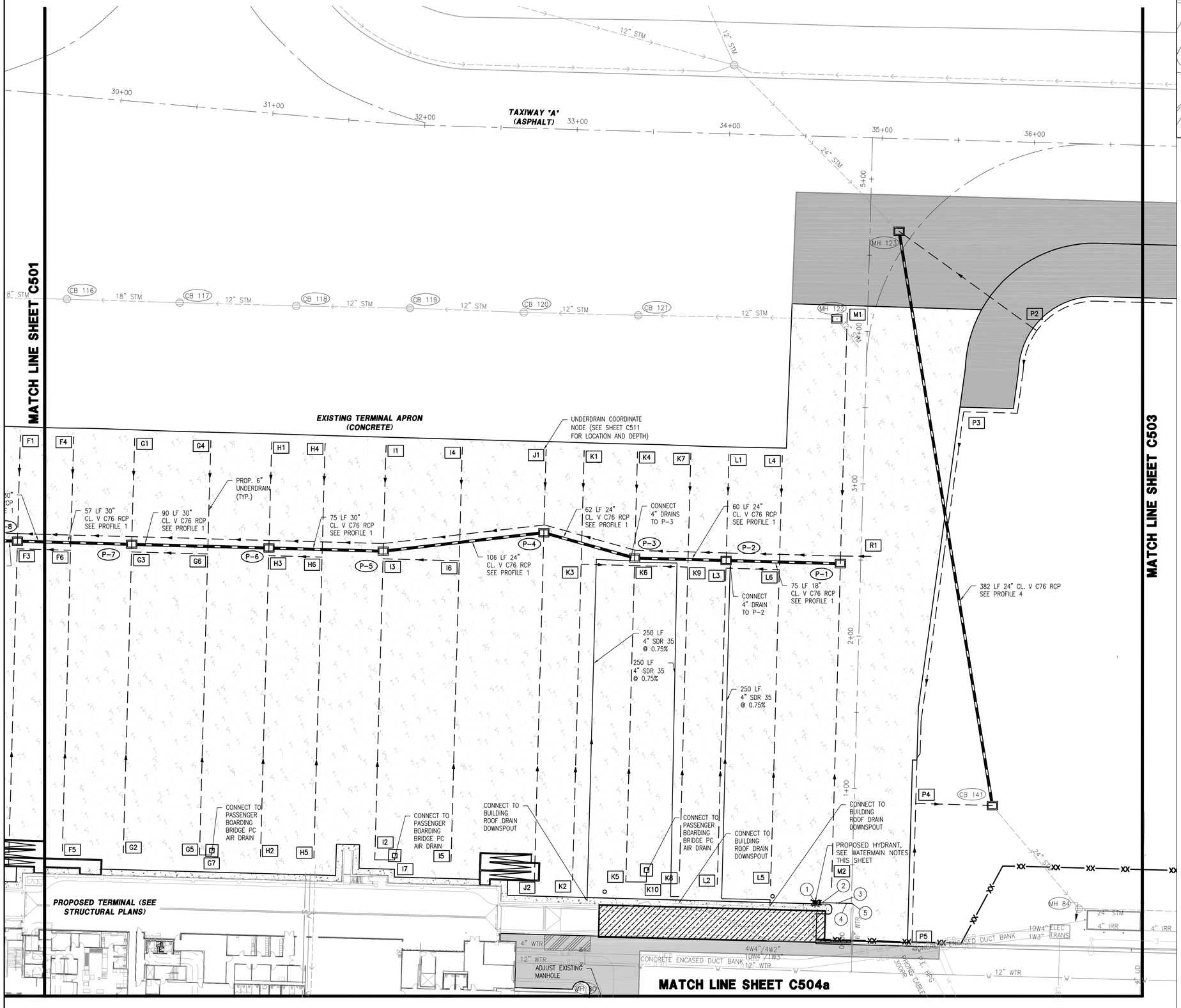
SHEET TITLE

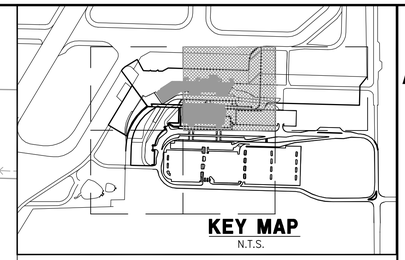
SITE UTILITY PLAN (SHEET 1 OF 5)

SHEET NUMBER
C501

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C501.dwg Plotted on: 2/7/2012 8:30 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

SITE UTILITY NOTES

1. SEE SHEET C510 FOR DRAINAGE STRUCTURE AND UNDERDRAIN INFORMATION.
2. SEE SHEET C003 FOR LEGEND.

WATERMAIN NOTES

1. (PUBLIC) HYDRANT STA: 14+75.36, 203.37 RT
   FG ELEV:1411.96, INV.=1404.46
   1~HYDRANT W/ 6" VALVE & VALVE BOX
2. (PUBLIC) WATER MAIN 15 LF 6" D.I. @ 0.00%
3. (PUBLIC) ELBOW STA: 14+60.36, 203.37 RT, INV.=1404.46
   1~6" 45° ELBOWS W/THRUST BLOCK & VERTICAL OFFSET STRAPING
4. (PUBLIC) WATER MAIN 16 LF 6" D.I W/STRAPING VERTICAL OFFSET
5. (EXISTING PUBLIC) ELBOW STA: 14+50.36, 203.37 RT, INV.=1391.50

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

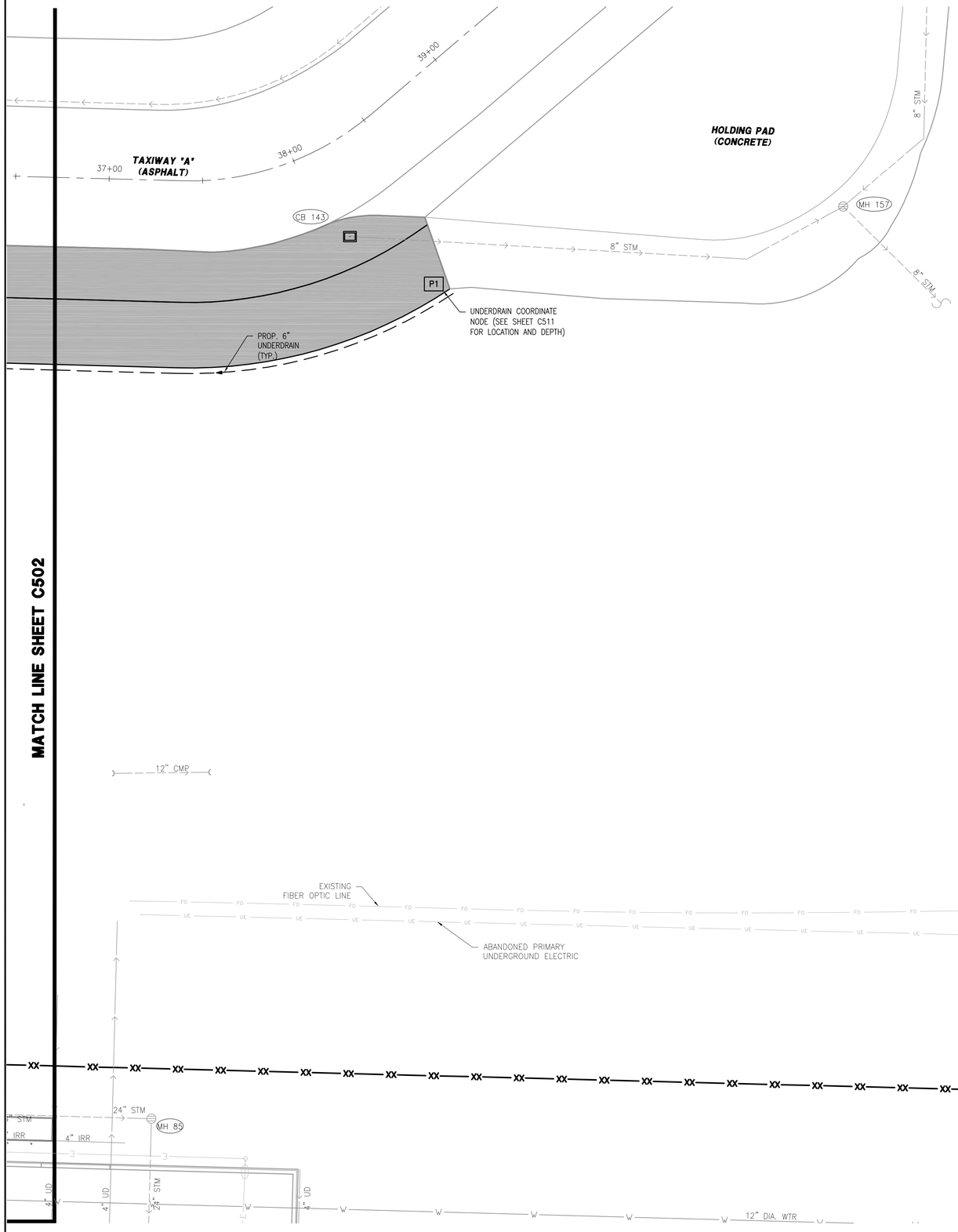
SITE UTILITY PLAN (SHEET 2 OF 5)

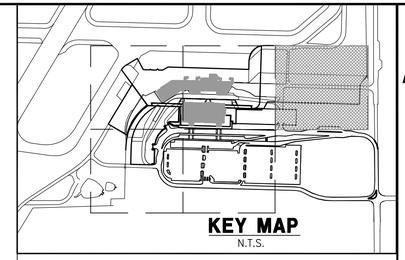
SHEET NUMBER

C502

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C502.dwg Plotted on: 2/7/2012 8:33 AM Plotted by: Erdmann, Ryan





KEY MAP
N.T.S.

NORTH

0 30' 60'

SITE UTILITY NOTES

1. SEE SHEET C510 FOR DRAINAGE STRUCTURE AND UNDERDRAIN INFORMATION.
2. SEE SHEET C003 FOR LEGEND.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

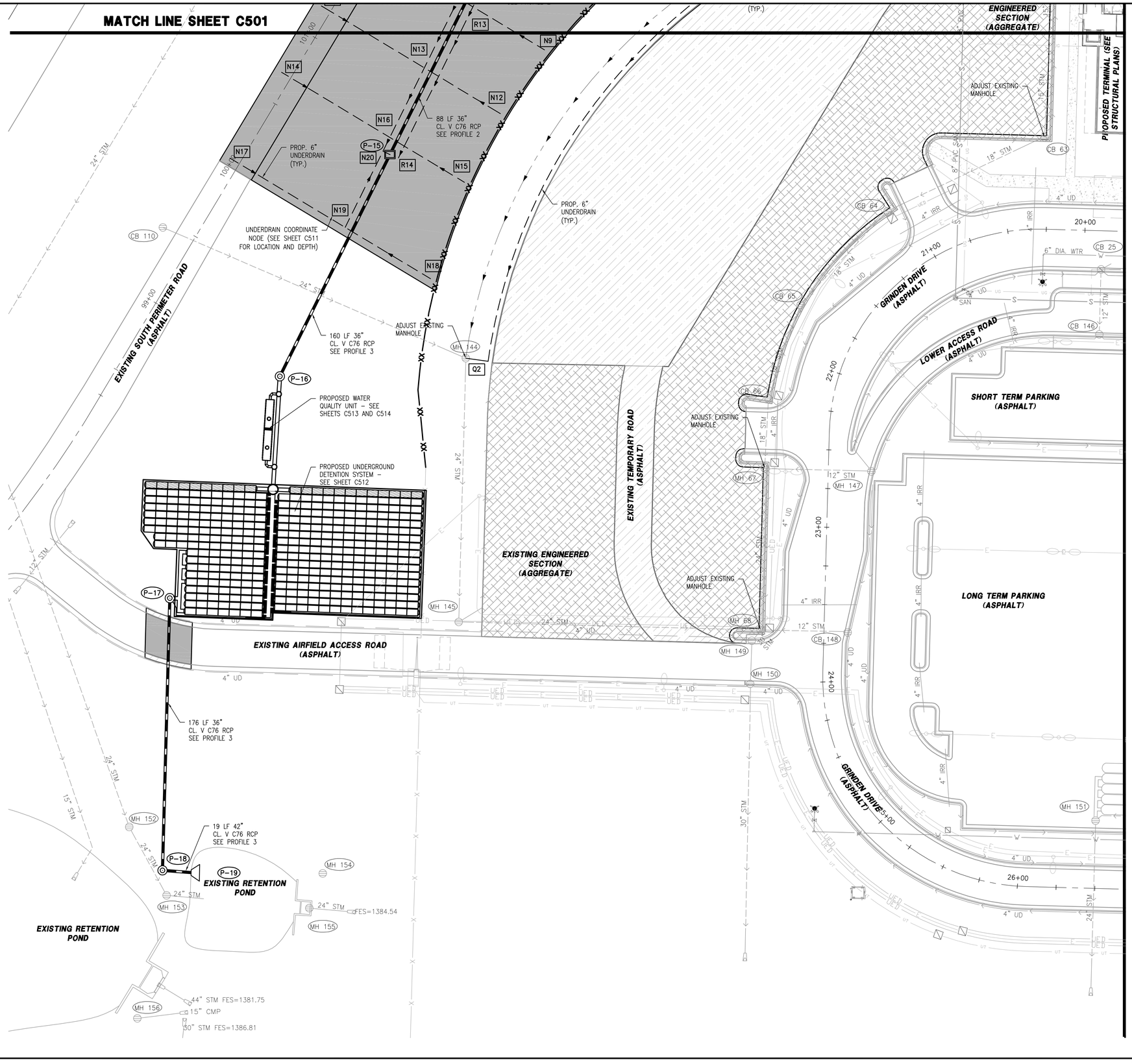
SHEET TITLE

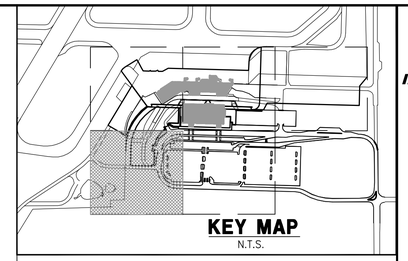
SITE UTILITY PLAN (SHEET 3 OF 5)

SHEET NUMBER
C503

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C503.dwg Plotted on: 2/7/2012 8:36 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

SITE UTILITY NOTES

1. SEE SHEET C510 FOR DRAINAGE STRUCTURE AND UNDERDRAIN INFORMATION.
2. SEE SHEET C003 FOR LEGEND.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

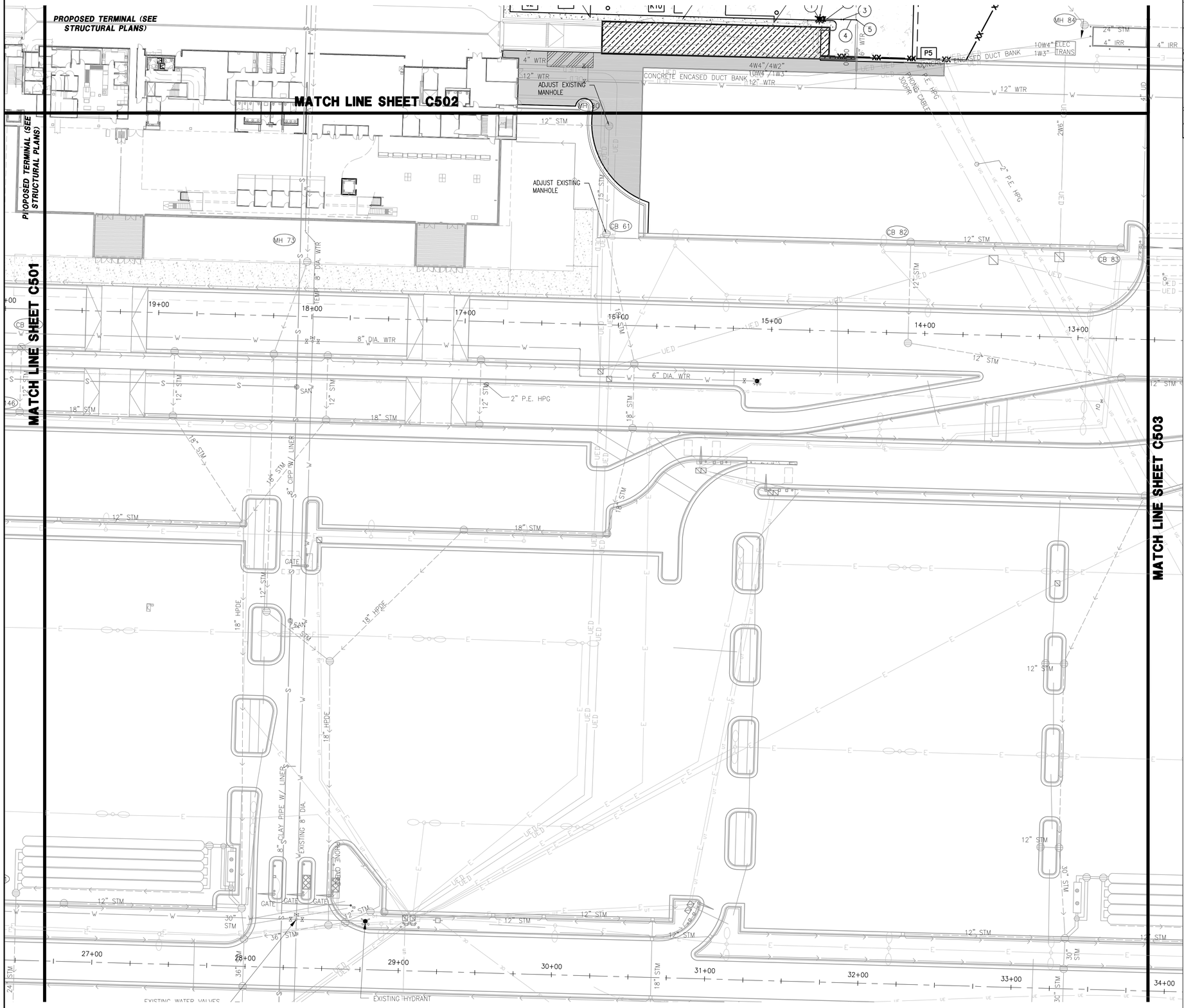
SITE UTILITY PLAN (SHEET 4 OF 5)

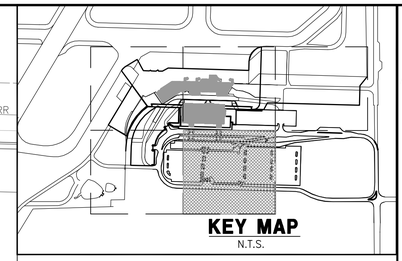
SHEET NUMBER

C504

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C504.dwg Plotted on: 2/7/2012 8:39 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

SITE UTILITY NOTES

1. SEE SHEET C510 FOR DRAINAGE STRUCTURE AND UNDERDRAIN INFORMATION.
2. SEE SHEET C003 FOR LEGEND.

WATERMAIN NOTES

1. (PUBLIC) HYDRANT STA: 14+75.36, 203.37 RT
   FG ELEV:1411.96, INV.=1404.46
   1~HYDRANT W/ 6" VALVE & VALVE BOX
2. (PUBLIC) WATER MAIN 15 LF 6" D.I. @ 0.00%
3. (PUBLIC) ELBOW STA: 14+60.36, 203.37 RT, INV.=1404.46
   1~6" 45° ELBOWS W/THRUST BLOCK & VERTICAL OFFSET STRAPING
4. (PUBLIC) WATER MAIN 16 LF 6" D.I W/STRAPING VERTICAL OFFSET
5. (EXISTING PUBLIC) ELBOW STA: 14+50.36, 203.37 RT, INV.=1391.50

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

SITE UTILITY PLAN (SHEET 5 OF 5)

SHEET NUMBER

C504a

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C504a.dwg Plotted on: 2/7/2012 8:42 AM Plotted by: Erdmann, Ryan

EXISTING DRAINAGE STRUCTURE TABLE

CB 25 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1398.18
12" INV. S. = 1392.68

CB 61 **EXISTING CATCH BASIN**
TO BE ADJUSTED
RIM ELEV. = 1400.79
PROP RIM ELEV = 1399.90
15" INV. N. = 1393.00
18" INV. S. = 1392.98

CB 62 **EXISTING CATCH BASIN**
TO BE ADJUSTED
RIM ELEV. = 1400.47
PROP RIM ELEV = 1400.47
15" INV. S. = 1394.14
15" INV. E. = 1394.24

CB 63 **EXISTING CATCH BASIN**
TO BE ADJUSTED
RIM ELEV. = 1400.08
PROP RIM ELEV = 1400.47
15" INV. N. = 1393.54
18" INV. SW. = 1393.54

CB 64 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1399.88
18" INV. NE. = 1392.98
18" INV. SW. = 1392.88

CB 65 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1399.41
18" INV. NE. = 1392.46
18" INV. SW. = 1392.36

CB 66 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1398.83
18" INV. NE. = 1392.04
18" INV. S. = 1391.94

MH 67 **EXISTING CATCH BASIN**
TO BE ADJUSTED
RIM ELEV. = 1398.18
PROP RIM ELEV = 1398.18
18" INV. N. = 1391.71
12" INV. E. = 1391.81
24" INV. S. = 1391.61

MH 68 **EXISTING CATCH BASIN**
TO BE ADJUSTED
RIM ELEV. = 1395.39
PROP RIM ELEV = 1395.48
24" INV. N. = 1388.70
12" INV. E. = 1388.70
24" INV. W. VERIFY
30" INV. SW. = 1388.60

CB 71 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1405.00
12" INV. NW. = 1399.78 **(R)**
12" INV. NE. = 1399.68 **(R)**

CB 72 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1399.00
12" INV. SW. = 1389.60 **(R)**
12" INV. S. = 1389.36 **(R)**

MH 80 **EXISTING MANHOLE**
TO BE RECONSTRUCTED
RIM ELEV. = 1400.85
PROP RIM ELEV = 1400.85
12" INV. N. = 1393.46 **(R)**
12" INV. W. = 1393.36
15" INV. S. = 1393.36

CB 81 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1402.71
12" INV. NW. = 1396.21 **(R)**
12" INV. SE. = 1394.27 **(R)**

MH 84 **EXISTING MANHOLE**
TO BE RECONSTRUCTED
RIM ELEV. = 1400.50
PROP RIM ELEV = 1404.90
24" INV. NW. = 1394.62
24" INV. E. = 1394.50
REUSE EXISTING FRAME AND COVER

MH 85 **EXISTING MANHOLE**
TO BE RECONSTRUCTED
RIM ELEV. = 1399.50
PROP RIM ELEV = 1404.90
24" INV. W. = 1392.10
24" INV. S. = 1392.00
REUSE EXISTING FRAME AND COVER

MH 100 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1408.00
18 INV. SE. = 1403.40
18 INV. NW. = 1403.40

MH 101 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1409.68
12" INV. S. = 1405.65

MH 102 **EXISTING MANHOLE**
TO BE RECONSTRUCTED
RIM ELEV. = 1409.37
PROP RIM ELEV = 1408.35
24" INV. NE. = 1398.30
24" INV. SW. = 1398.05
12" INV. SE = 1402.20 (P)
PROP FRAME AND COVER P

MH 103 **EXISTING MANHOLE**
TO BE RECONSTRUCTED
RIM ELEV. = 1408.53
PROP RIM ELEV = 1409.09
18" INV. NW. = 1399.26
24" INV. NE. = 1399.26
24" INV. SW. = 1399.12
PROP FRAME AND COVER P

MH 104 **EXISTING MANHOLE**
TO BE RECONSTRUCTED
RIM ELEV. = 1408.68
PROP RIM ELEV = 1410.05
24" INV. NE. = 1399.49
24" INV. SW. = 1399.40
PROP FRAME AND COVER P

CB 105 **EXISTING CATCH BASIN**
TO BE RECONSTRUCTED
RIM ELEV. = 1409.84
PROP RIM ELEV = 1409.84
24" INV. NE. = 1400.30
24" INV. SW. = 1400.26
FRAME AND CASTING TO BE
REINSTALLED AFTER
RECONSTRUCTION

CB 106 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1409.79
24" INV. E. = 1400.46
24" INV. SW. = 1400.46

CB 107 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1409.80
18" INV. E. = 1401.12
24" INV. W. = 1400.85

CB 108 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.01
18" INV. E. = 1401.53
18" INV. W. = 1401.53

CB 109 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.00
18" INV. E. = 1401.95
18" INV. W. = 1401.68

CB 110 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1406.33
24" INV. SE. = 1399.13

MH 111 **EXISTING MANHOLE**
TO BE REMOVED
RIM ELEV. = 1408.15
12" INV. SE. = 1398.80 **(R)**

MH 112 **EXISTING MANHOLE**
TO BE REMOVED
RIM ELEV. = 1407.65
12" INV. NW. = 1398.79 **(R)**
12" INV. SE. = 1398.55 **(R)**

CB 113 **EXISTING MANHOLE**
TO BE REMOVED
RIM ELEV. = 1405.71
12" INV. NW. = 1401.71 **(R)**
12" INV. SE. = 1401.71 **(R)**

CB 114 **EXISTING MANHOLE**
TO BE REMOVED
RIM ELEV. = 1404.91
12" INV. NW. = 1400.51 **(R)**

CB 116 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.16
18" INV. E. = 1402.57
18" INV. W. = 1402.32

CB 117 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.12
12" INV. E. = 1402.95
18" INV. W. = 1402.95

CB 118 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.15
12" INV. E. = 1403.32
12" INV. W. = 1403.26

CB 119 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.19
12" INV. E. = 1403.95
12" INV. W. = 1403.71

CB 120 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.48
12" INV. E. = 1404.33
12" INV. W. = 1404.21

CB 121 EXISTING CATCH BASIN
TO REMAIN
RIM ELEV. = 1410.77
12" INV. E. = 1404.70
12" INV. W. = 1404.70

MH 122 EXISTING MANHOLE
TO BE RECONSTRUCTED
RIM ELEV. = 1412.29
PROP RIM ELEV = 1412.63
12" INV. SE. = 1406.73
12" INV. W. = 1407.01
PROP FRAME AND COVER P

MH 123 EXISTING MANHOLE
TO BE REMOVED AND REPLACED
WITH 5' DIAMETER CATCH BASIN B
RIM ELEV. = 1414.19
PROP RIM ELEV = 1414.09
24" INV. NW. = 1401.31
24" INV. SE. = 1401.27 **(R)**
24" INV. SE. = 1401.27 **(P)**
PROP FRAME AND COVER M

CB 126 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1411.50
6" PVC INV. E. = 1407.90 **(R)**
12" INV. SW. = 1406.75 **(R)**

CB 128 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1409.72
12" INV. NE. = VERIFY **(R)**
12" INV. E. = VERIFY **(R)**

CB 129 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. VERIFY
8" INV. S. = 1405.30 **(R)**

CB 130 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. 1410.15
8" INV. N. 1405.25 **(R)**
12" INV. W. = 1405.15 **(R)**
12" INV. S. = 1405.00 **(R)**

CB 133 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = VERIFY
12" INV. S. = 1406.50 **(R)**

CB 134 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1410.31
12" INV. N. = 1406.45 **(R)**
12" INV. E. = 1406.11 **(R)**

CB 135 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1410.98
8" INV. S. = 1404.85 **(R)**

CB 139 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1410.25
8" INV. NW. = 1405.10 **(R)**
12" INV. S. = 1404.60 **(R)**

CB 141 **EXISTING CATCH BASIN**
TO BE RECONSTRUCTED
RIM ELEV. = 1408.28
PROP RIM ELEV = 1409.28
24" INV. NW. = 1397.98 **(R)**
12" INV. NE. = 1398.83 **(R)**
24" INV. SE. = 1397.98
24" INV. NW. = 1397.98 **(P)**
PROP FRAME AND COVER M

CB 142 **EXISTING CATCH BASIN**
TO BE REMOVED
RIM ELEV. = 1407.64
12" NV. SW. = 1402.34 **(R)**

CB 143 **EXISTING CATCH BASIN**
TO BE RECONSTRUCTED
RIM ELEV. = 1418.17
PROP RIM ELEV = 1418.57
VERIFY PIPE DEPTH AND LOCATION
PROP FRAME AND COVER P

MH 144 **EXISTING CATCH BASIN**
TO BE ADJUSTED
RIM ELEV. = 1401.43
PROP RIM ELEV = 1401.90
24" INV. NW. = 1398.75
24" INV. S. = 1396.08

MH 145 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1398.90
24" INV. N. = 1392.71
24" INV. E. = 1392.61

MH 146 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1397.23
12" INV. N. = 1392.23
18" INV. E. = 1392.13

MH 147 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1396.47
12" INV. W. = 1392.15

MH 148 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1394.37
12" INV. W. = 1389.27

MH 149 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1395.01
30" INV. NE. = 1388.50
30" INV. S. = 1388.40

MH 150 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1394.86
30" INV. N. = 1388.14
30" INV. S. = 1388.04

MH 151 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1387.91
INV. N. = 1380.25
24" INV. S. = 1378.90
6" INV. NE. = 1379.00

MH 152 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1401.06
24" INV. NW. = 1393.55
24" INV. SE. = 1393.55

MH 153 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1393.00
24" INV. NW. = 1388.21
24" INV. E. = 1388.21

MH 154 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = VERIFY

MH 155 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = VERIFY
24" INV. E. = VERIFY

MH 156 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1392.84
15" INV. E. = VERIFY

MH 157 EXISTING MANHOLE
TO REMAIN
RIM ELEV. = 1415.90
VERIFY PIPE DEPTH AND LOCATION

LEGEND

(E) = EXISTING TO REMAIN
(P) = PROPOSED
(R) = REMOVE

PROPOSED DRAINAGE STRUCTURE TABLE

P-1 PROPOSED 4' DIA. CATCHBASIN B
WITH 2' SUMP
FRAME AND COVER P
RIM ELEV. = 1410.37
18" INV. W. = 1401.75

P-2 PROPOSED 4' DIA. CATCHBASIN B
WITH 2' SUMP
FRAME AND COVER P
RIM ELEV. = 1410.26
18" INV. E. = 1401.37
24" INV. W. = 1401.27

P-3 PROPOSED 4' DIA. CATCHBASIN B
WITH 2' SUMP
FRAME AND COVER P
RIM ELEV. = 1410.15
24" INV. E. = 1400.97
24" INV. NW. = 1400.87

P-4 PROPOSED 4' DIA. CATCHBASIN B
WITH 2' SUMP
FRAME AND COVER P
RIM ELEV. = 1410.35
24" INV. SE. = 1400.56
24" INV. SW. = 1400.46

P-5 PROPOSED 5' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1410.20
24" INV. NE. = 1399.93
30" INV. W. = 1399.83

P-6 PROPOSED 5' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1410.15
30" INV. E. = 1399.45
30" INV. W. = 1399.35

P-7 PROPOSED 5' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1410.13
30" INV. E. = 1398.90
30" INV. W. = 1398.80

P-8 PROPOSED 6' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1410.12
30" INV. E. = 1398.42
36" INV. W. = 1398.32

P-9 PROPOSED 6' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1410.16
36" INV. E. = 1397.94
36" INV. W. = 1397.84

P-10 PROPOSED 6' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1409.98
36" INV. E. = 1397.39
36" INV. W. = 1397.29

P-11 PROPOSED 6' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1409.85
36" INV. E. = 1396.91
36" INV. NW. = 1396.81

P-12 PROPOSED 7' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1409.71
36" INV. SE. = 1396.31
36" INV. SW. = 1396.21

P-13 PROPOSED 6' DIA. CATCHBASIN B
FRAME AND COVER P
RIM ELEV. = 1409.81
36" INV. NE. = 1395.53
36" INV. SW. = 1395.43

P-14 PROPOSED 6' DIA. MANHOLE B
FRAME AND COVER T
RIM ELEV. = 1408.87
36" INV. NE. = 1393.92
36" INV. SW. = 1393.82

P-15 PROPOSED 6' DIA. MANHOLE B
FRAME AND COVER T
RIM ELEV. = 1407.67
36" INV. NE. = 1392.74
36" INV. SW. = 1392.66

P-16 PROPOSED 6' DIA. MANHOLE B
FRAME AND COVER A
36" INV. NE. = 1391.86
36" INV. SW. = 1391.96

P-17 PROPOSED 6' DIA. MANHOLE B
FRAME AND COVER A
36" INV. NE. = 1390.02
36" INV. S. = 1389.92

P-18 PROPOSED 7' DIA. MANHOLE D
FRAME AND COVER A
RIM ELEV. = 1193.44
36" INV. N. = 1388.60
42" INV. E. = 1388.50

P-19 PROPOSED 42" DIA. END SECTION
INV ELEV. = 1388.00

P-20 PROPOSED 4' DIA. MANHOLE B
WITH 2' SUMP
FRAME AND COVER T
RIM ELEV. = 1407.32
12" INV. NW. = 1402.32

EXISTING SANITARY STRUCTURE TABLE

SAN-3 EXISTING SANITARY MH
TO BE ADJUSTED
RIM ELEV. = 1401.00
PROP RIM ELEV = 1401.20
INV. S: 1393.09
INV. E: 1393.20

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

SITE UTILITY TABLE

SHEET NUMBER
C510

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\21\31882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C510.dwg Plotted on: 2/7/2012 8:42 AM Plotted by: Erdmann, Ryan

PROPOSED UNDERDRAIN COORDINATE TABLE

A1 INV. ELEV. = 1402.64
N: 453218.92
E: 2854380.46

A2 INV. ELEV. = 1402.72
N: 453116.39
E: 2854377.66

A3 INV. ELEV. = 1402.49
N: 453146.42
E: 2854378.48

A4 INV. ELEV. = 1402.58
N: 453217.83
E: 2854420.44

A5 INV. ELEV. = 1403.18
N: 453062.11
E: 2854416.19

A6 INV. ELEV. = 1402.30
N: 453145.33
E: 2854418.46
CONNECT TO P-13

A7 INV. ELEV. = 1402.53
N: 453216.74
E: 2854460.43

A8 INV. ELEV. = 1403.55
N: 453007.83
E: 2854454.73

A9 INV. ELEV. = 1402.38
N: 453144.24
E: 2854458.45

B1 INV. ELEV. = 1402.38
N: 453251.05
E: 2854393.51
CONNECT TO P-12

B2 INV. ELEV. = 1402.81
N: 453248.59
E: 2854483.74
CONNECT TO P-12

C1 INV. ELEV. = 1402.90
N: 453252.68
E: 2854491.42

C2 INV. ELEV. = 1404.04
N: 452971.01
E: 2854483.73

C3 INV. ELEV. = 1402.72
N: 453178.41
E: 2854489.39

C4 INV. ELEV. = 1403.06
N: 453251.75
E: 2854526.41
CONNECT TO P-11

C5 INV. ELEV. = 1404.29
N: 452970.06
E: 2854518.72

C6 INV. ELEV. = 1402.39
N: 453177.46
E: 2854524.38
CONNECT TO P-11

C7 INV. ELEV. = 1403.11
N: 453250.82
E: 2854561.39

C8 INV. ELEV. = 1404.31
N: 452969.10
E: 2854553.71

C9 INV. ELEV. = 1402.74
N: 453176.50
E: 2854559.37

D1 INV. ELEV. = 1403.19
N: 453249.75
E: 2854601.38
CONNECT TO P-10

D2 INV. ELEV. = 1404.31
N: 452968.01
E: 2854593.69

D3 INV. ELEV. = 1402.52
N: 453175.41
E: 2854599.35
CONNECT TO P-10

D4 INV. ELEV. = 1403.36
N: 453248.42
E: 2854651.36

D5 INV. ELEV. = 1404.31
N: 452966.65
E: 2854643.67

D6 INV. ELEV. = 1403.00
N: 453174.05
E: 2854649.33

E1 INV. ELEV. = 1403.36
N: 453247.35
E: 2854691.38
CONNECT TO P-9

E2 INV. ELEV. = 1404.31
N: 452965.55
E: 2854683.69

E3 INV. ELEV. = 1402.69
N: 453172.96
E: 2854689.35
CONNECT TO P-9

E4 INV. ELEV. = 1403.38
N: 453246.42
E: 2854726.36

E5 INV. ELEV. = 1404.31
N: 452964.60
E: 2854718.68

E6 INV. ELEV. = 1402.99
N: 453172.00
E: 2854724.33

E7 PASSENGER BRIDGE
PC AIR DRAIN
N: 452965.39
E: 2854701.25
SEE NOTE 1

F1 INV. ELEV. = 1403.31
N: 453245.36
E: 2854766.32

F2 INV. ELEV. = 1404.38
N: 452963.51
E: 2854758.63

F3 INV. ELEV. = 1402.66
N: 453170.91
E: 2854764.29
CONNECT TO P-8

F4 INV. ELEV. = 1403.39
N: 453244.42
E: 2854801.31

F5 INV. ELEV. = 1404.31
N: 452972.55
E: 2854793.89

F6 INV. ELEV. = 1403.00
N: 453169.96
E: 2854799.28

G1 INV. ELEV. = 1403.33
N: 453243.36
E: 2854841.29
CONNECT TO P-7

G2 INV. ELEV. = 1404.31
N: 452971.46
E: 2854833.88

G3 INV. ELEV. = 1402.67
N: 453168.86
E: 2854839.26
CONNECT TO P-7

G4 INV. ELEV. = 1403.35
N: 453242.03
E: 2854891.28

G5 INV. ELEV. = 1404.31
N: 452970.10
E: 2854883.86

G6 INV. ELEV. = 1403.05
N: 453167.50
E: 2854889.24

G7 PASSENGER BRIDGE
PC AIR DRAIN
N: 452970.02
E: 2854891.93
SEE NOTE 1

H1 INV. ELEV. = 1403.35
N: 453240.96
E: 2854931.26
CONNECT TO P-6

H2 INV. ELEV. = 1404.31
N: 452969.01
E: 2854923.84

H3 INV. ELEV. = 1402.69
N: 453166.41
E: 2854929.23
CONNECT TO P-6

H4 INV. ELEV. = 1403.43
N: 453240.03
E: 2854966.25

H5 INV. ELEV. = 1404.39
N: 452968.05
E: 2854958.83

H6 INV. ELEV. = 1403.03
N: 453165.46
E: 2854964.22

I1 INV. ELEV. = 1403.40
N: 453238.96
E: 2855006.24
CONNECT TO P-5

I2 INV. ELEV. = 1404.42
N: 452966.96
E: 2854998.81

I3 INV. ELEV. = 1402.74
N: 453164.36
E: 2855004.20
CONNECT TO P-5

I4 INV. ELEV. = 1403.42
N: 453237.63
E: 2855056.22

I5 INV. ELEV. = 1404.31
N: 452965.60
E: 2855048.80

I6 INV. ELEV. = 1403.23
N: 453163.00
E: 2855054.18

I7 PASSENGER BRIDGE
PC AIR DRAIN
N: 452966.84
E: 2855011.84
SEE NOTE 1

J1 INV. ELEV. = 1403.44
N: 453236.17
E: 2855111.20
CONNECT TO P-4

J2 INV. ELEV. = 1404.31
N: 452954.10
E: 2855103.50
CONNECT TO P-4

K1 INV. ELEV. = 1403.45
N: 453235.50
E: 2855136.19

K2 INV. ELEV. = 1404.31
N: 452953.42
E: 2855128.49

K3 INV. ELEV. = 1403.04
N: 453160.82
E: 2855134.15

K4 INV. ELEV. = 1403.34
N: 453234.57
E: 2855171.18
CONNECT TO P-3

K5 INV. ELEV. = 1404.31
N: 452952.46
E: 2855163.48

K6 INV. ELEV. = 1402.69
N: 453159.86
E: 2855169.14
CONNECT TO P-3

K7 INV. ELEV. = 1403.40
N: 453233.64
E: 2855206.17

K8 INV. ELEV. = 1404.31
N: 452951.51
E: 2855198.47

K9 INV. ELEV. = 1402.98
N: 453158.91
E: 2855204.13

K10 PASSENGER BRIDGE
PC AIR DRAIN
N: 452952.34
E: 2855176.95
SEE NOTE 1

L1 INV. ELEV. = 1403.45
N: 453232.97
E: 2855231.16
CONNECT TO P-2

L2 INV. ELEV. = 1404.31
N: 452950.83
E: 2855223.46

L3 INV. ELEV. = 1402.79
N: 453158.23
E: 2855229.12
CONNECT TO P-2

L4 INV. ELEV. = 1403.51
N: 453232.04
E: 2855266.14

L5 INV. ELEV. = 1404.31
N: 452949.87
E: 2855258.45

L6 INV. ELEV. = 1403.13
N: 453157.27
E: 2855264.10

M1 INV. ELEV. = 1404.97
N: 453325.51
E: 2855308.71
CONNECT TO P-1

M2 INV. ELEV. = 1404.31
N: 452948.78
E: 2855298.43
CONNECT TO P-1

N1 INV. ELEV. = 1404.44
N: 453035.91
E: 2854419.62

N2 INV. ELEV. = 1403.65
N: 453023.67
E: 2854340.51

N3 INV. ELEV. = 1405.29
N: 452939.05
E: 2854481.05

N4 INV. ELEV. = 1403.51
N: 452989.81
E: 2854396.74

N5 INV. ELEV. = 1403.29
N: 452980.84
E: 2854314.72

N6 INV. ELEV. = 1403.96
N: 452904.61
E: 2854441.32
CONNECT TO P-14

N7 INV. ELEV. = 1402.59
N: 452944.87
E: 2854374.45
CONNECT TO P-14

N8 INV. ELEV. = 1403.56
N: 452937.95
E: 2854289.02

N9 INV. ELEV. = 1403.42
N: 452866.66
E: 2854407.41

N10 INV. ELEV. = 1402.84
N: 452899.93
E: 2854352.15

N11 INV. ELEV. = 1403.35
N: 452895.06
E: 2854263.32

N12 INV. ELEV. = 1402.92
N: 452825.44
E: 2854378.93

N13 INV. ELEV. = 1402.58
N: 452854.99
E: 2854329.86

N14 INV. ELEV. = 1402.40
N: 452852.17
E: 2854237.62

N15 INV. ELEV. = 1402.40
N: 452781.04
E: 2854355.75

N16 INV. ELEV. = 1401.58
N: 452810.05
E: 2854307.56

N17 INV. ELEV. = 1401.85
N: 452796.67
E: 2854204.36

N18 INV. ELEV. = 1402.76
N: 452718.71
E: 2854333.84

N19 INV. ELEV. = 1401.67
N: 452751.90
E: 2854278.71

N20 INV. ELEV. = 1401.39
N: 452801.17
E: 2854303.16
CONNECT TO P-15

P1 INV. ELEV. = 1411.04
N: 453373.48
E: 2855715.30

P2 INV. ELEV. = 1406.22
N: 453313.94
E: 2855433.00
CONNECT TO MH-123

P3 INV. ELEV. = 1404.47
N: 453260.79
E: 2855385.09

P4 INV. ELEV. = 1403.68
N: 453003.87
E: 2855353.65
CONNECT TO CB-141

P5 INV. ELEV. = 1404.46
N: 452912.58
E: 2855351.16

Q1 INV. ELEV. = 1399.07
N: 452935.88
E: 2854564.21

Q2 INV. ELEV. = 1398.37
N: 452665.36
E: 2854371.00
CONNECT TO MH-144

R1 GLYCOL UNDERDRAIN
INV. ELEV. = 1404.03
N: 453165.99
E: 2855324.27

R2 GLYCOL UNDERDRAIN
INV. ELEV. = 1402.90
N: 453180.91
E: 2854764.56
CONNECT TO P-8

R3 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.71
N: 453182.95
E: 2854689.62

R4 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.52
N: 453185.41
E: 2854599.62
CONNECT TO P-10

R5 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.37
N: 453187.42
E: 2854525.83
CONNECT TO P-11

R6 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.18
N: 453230.70
E: 2854444.87
CONNECT TO P-12

R7 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.63
N: 453209.37
E: 2854426.68

R8 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.35
N: 453141.30
E: 2854413.42
CONNECT TO P-13

R9 GLYCOL UNDERDRAIN
INV. ELEV. = 1404.07
N: 453073.12
E: 2854399.80

R10 GLYCOL UNDERDRAIN
INV. ELEV. = 1405.23
N: 453063.82
E: 2854397.94

R11 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.60
N: 452943.91
E: 2854373.97
CONNECT TO P-14

R12 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.63
N: 452937.24
E: 2854382.27
CONNECT TO P-14

R13 GLYCOL UNDERDRAIN
INV. ELEV. = 1403.87
N: 452894.47
E: 2854361.23

R14 GLYCOL UNDERDRAIN
INV. ELEV. = 1402.46
N: 452796.80
E: 2854313.17
CONNECT TO P-15

NOTE:
1. 2" PVC SCHEDULE 40. CONNECT TO 6" UNDERDRAIN. CONTINUE TO PBB FOUNDATION AND STUB A MINIMUM OF 6" ABOVE FINISHED GRADE FOR CONNECTION TO PRE-CONDITIONED AIR DRAIN.
2. UNDERDRAIN NOTED AS GLYCOL UNDERDRAIN SHALL BE INSTALLED UNDER BID ALTERNATE. IF THIS ALTERNATE IS NOT ACCEPTED THIS WORK SHALL BE REMOVED FROM THE SCOPE.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: JJB

AEP PROJECT NUMBER
213-1882-091

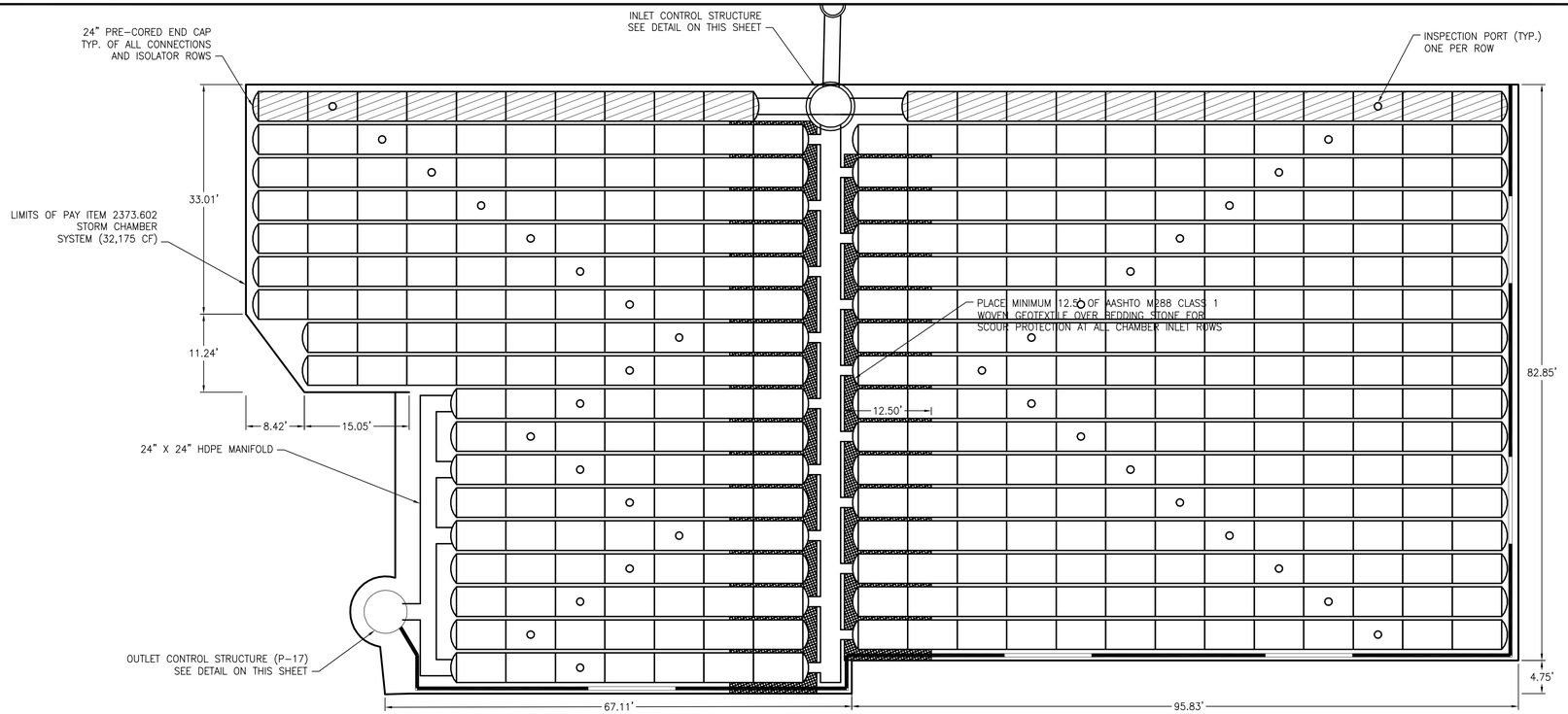
SHEET TITLE

SITE UNDERDRAIN TABLE

SHEET NUMBER
C511

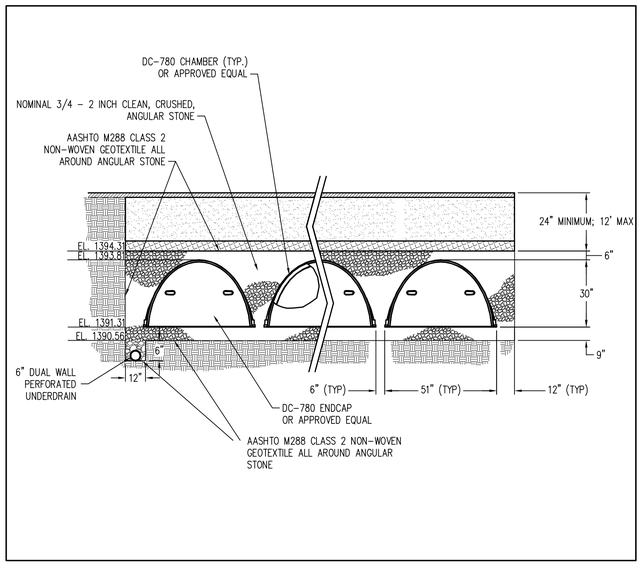
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C511.dwg Plotted on: 2/7/2012 8:43 AM Plotted by: Erdmann, Ryan

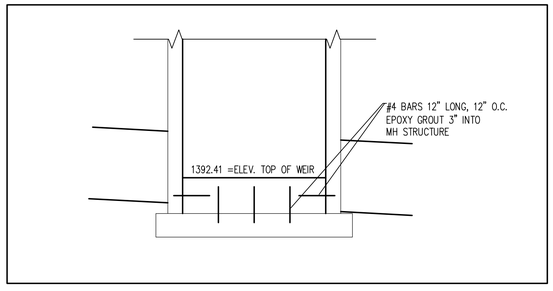


STORM CHAMBER SYSTEM WEST (32,125CF)

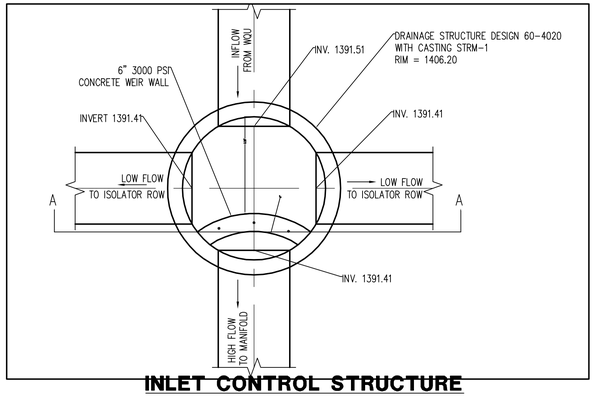
(379) CHAMBERS
(70) END CAPS
INSTALLED WITH 6" COVER STONE, 9" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 32,125 CF



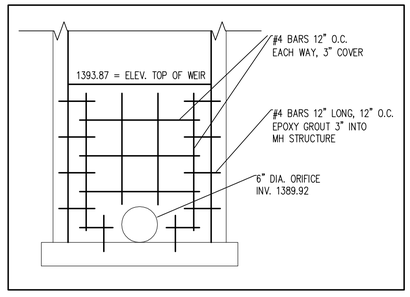
STORM CHAMBER SYSTEM WEST (32,175 CF)
TYPICAL SECTION (A-A)
N.T.S.



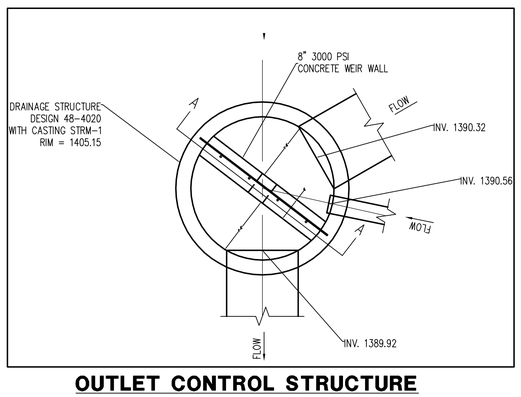
INLET CONTROL STRUCTURE A-A
N.T.S.



INLET CONTROL STRUCTURE
N.T.S.



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



OUTLET CONTROL STRUCTURE
N.T.S.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: DKC
DRAWN BY: RDRE
DESIGNED BY: JEH

AEP PROJECT NUMBER
213-1882-091

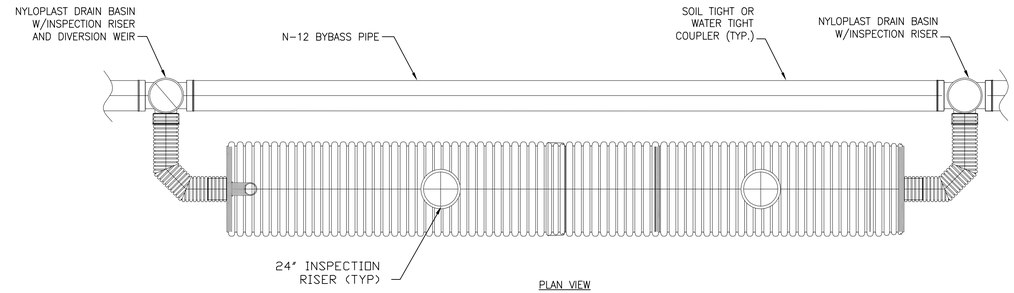
SHEET TITLE

STORM CHAMBER SYSTEM

SHEET NUMBER
C512

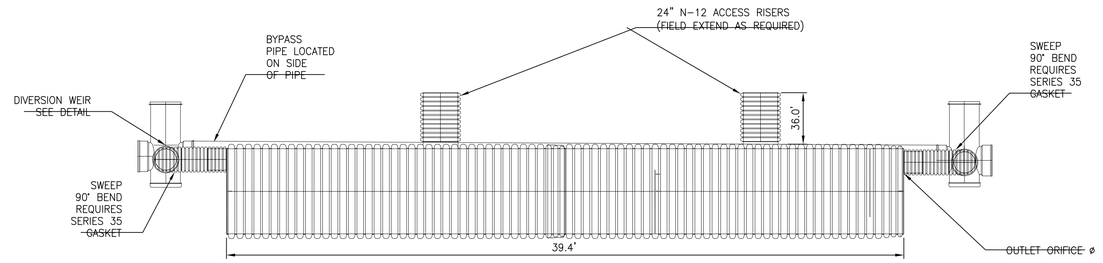
BID PACKAGE 2C
BID DOCUMENTS

ADS HDPE WATER QUALITY UNIT 6040WQA24 WITH WEIR



PLAN VIEW

INLET SIDE FLOW OUTLET SIDE



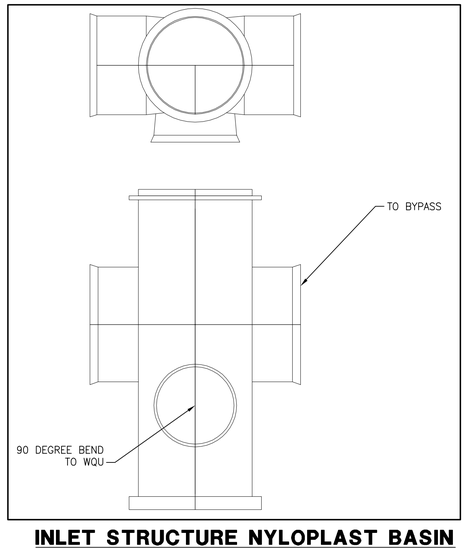
PROFILE VIEW

ADS MODEL #	MAIN PIPE DIA.	SIEVE SIZE	PARTICLE SIZE (CM)	TREATED FLOW RATE (CFS)	INLET ø	OUTLET ø	OUTLET ORIFICE ø	ELEVATION CHANGE*
6040WQAX24	60"	140	0.0106	6.23	15"	15"	14.61"	2"

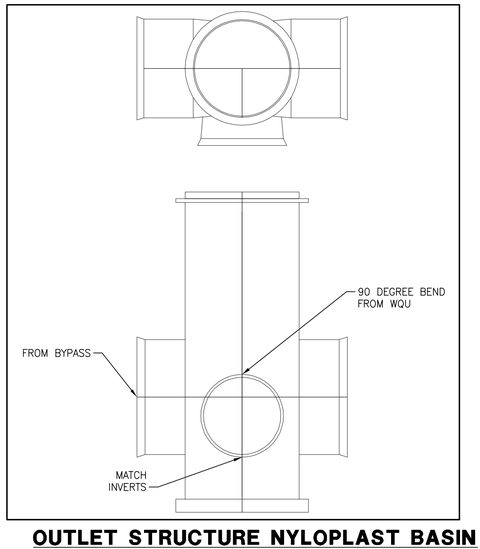
NOTE:

1. ELEVATION CHANGE DENOTES THE ELEVATION DROP FROM INVERT OF BY-PASS AT INLET TO INVERT OF BY-PASS AT OUTLET.

WATER QUALITY UNIT
N.T.S.



INLET STRUCTURE NYLOPLAST BASIN
N.T.S.



OUTLET STRUCTURE NYLOPLAST BASIN
N.T.S.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: JEH
DRAWN BY: RDRE
DESIGNED BY: DKC

AEP PROJECT NUMBER
213-1882-091

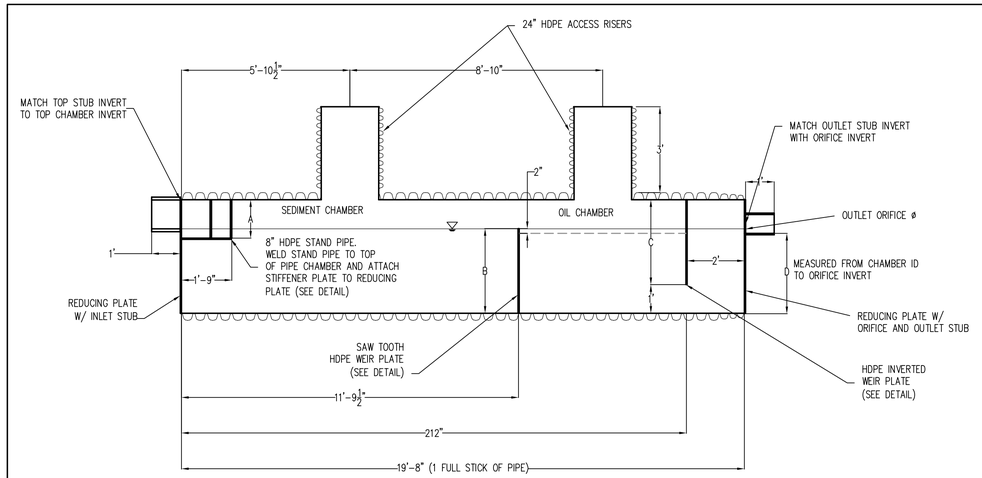
SHEET TITLE

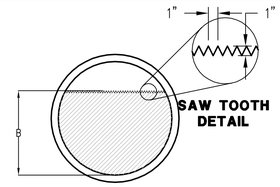
WATER QUALITY UNIT

SHEET NUMBER
C513

BID PACKAGE 2C BID DOCUMENTS

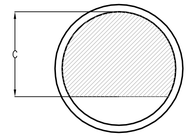
Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C513.dwg Plotted on: 2/7/2012 8:44 AM Plotted by: Erdmann, Ryan





SAW TOOTH DETAIL

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"

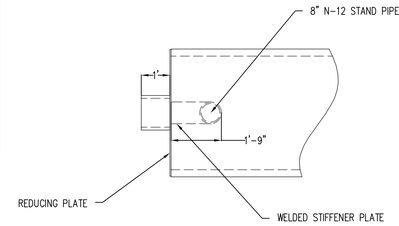
XX DENOTES A BY-PASS SIZE OF 15", 18", 24", 30", 36", 42", 48", OR 60"
XX=00 DENOTES UNITS W/OUT A BY-PASS.

NOTES:

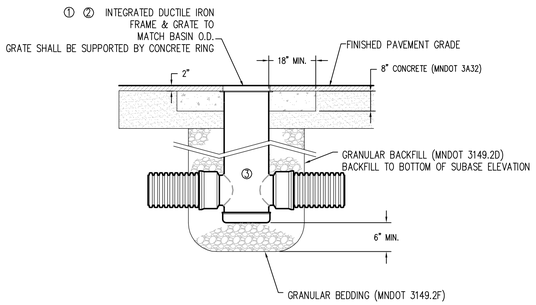
1. ALL DIMENSIONS ARE NOMINAL

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

WATER QUALITY UNIT DETAILS
N.T.S.

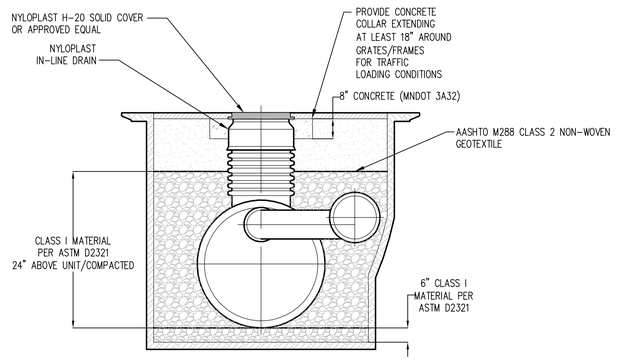


DISPERSION BAFFLE DETAIL (TOP VIEW)



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
N.T.S.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: JEH
DRAWN BY: RDRE
DESIGNED BY: DKC

AEP PROJECT NUMBER
213-1882-091

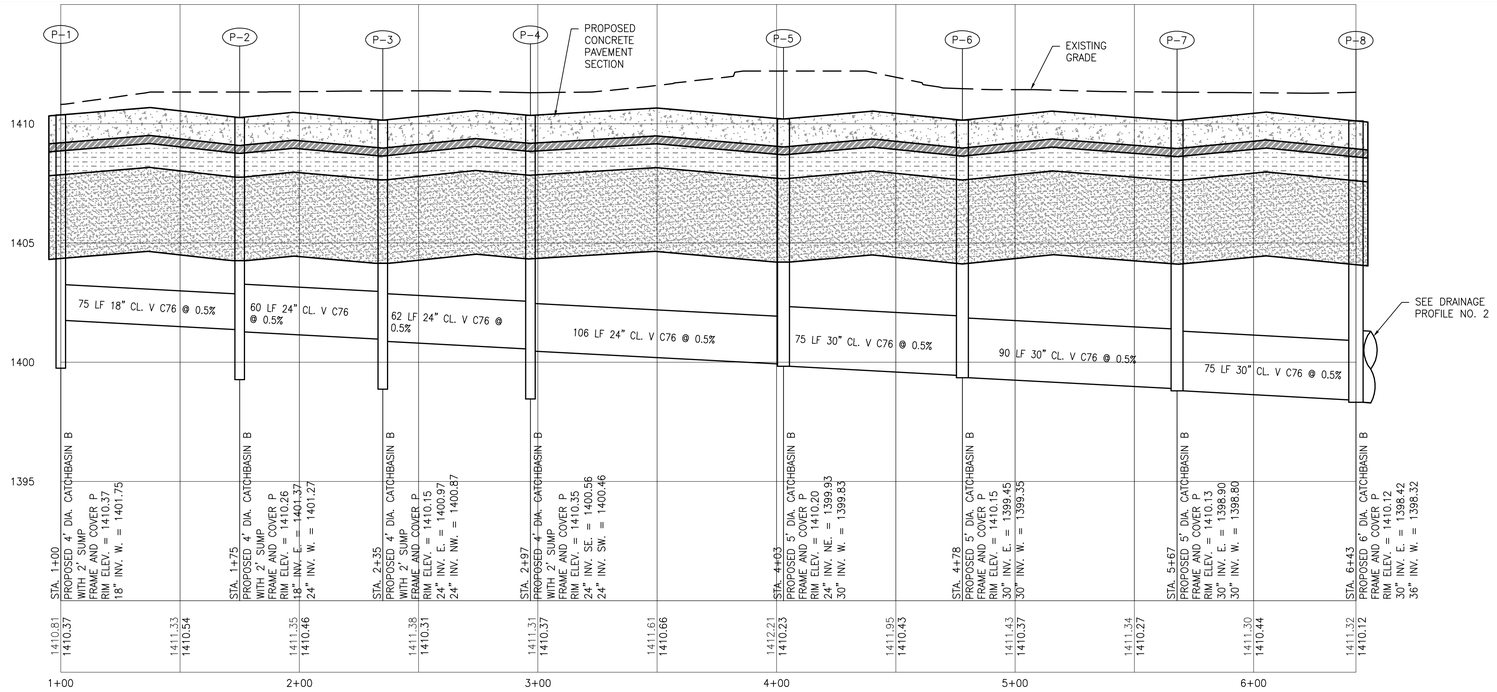
SHEET TITLE

WATER QUALITY UNIT DETAILS

SHEET NUMBER
C514

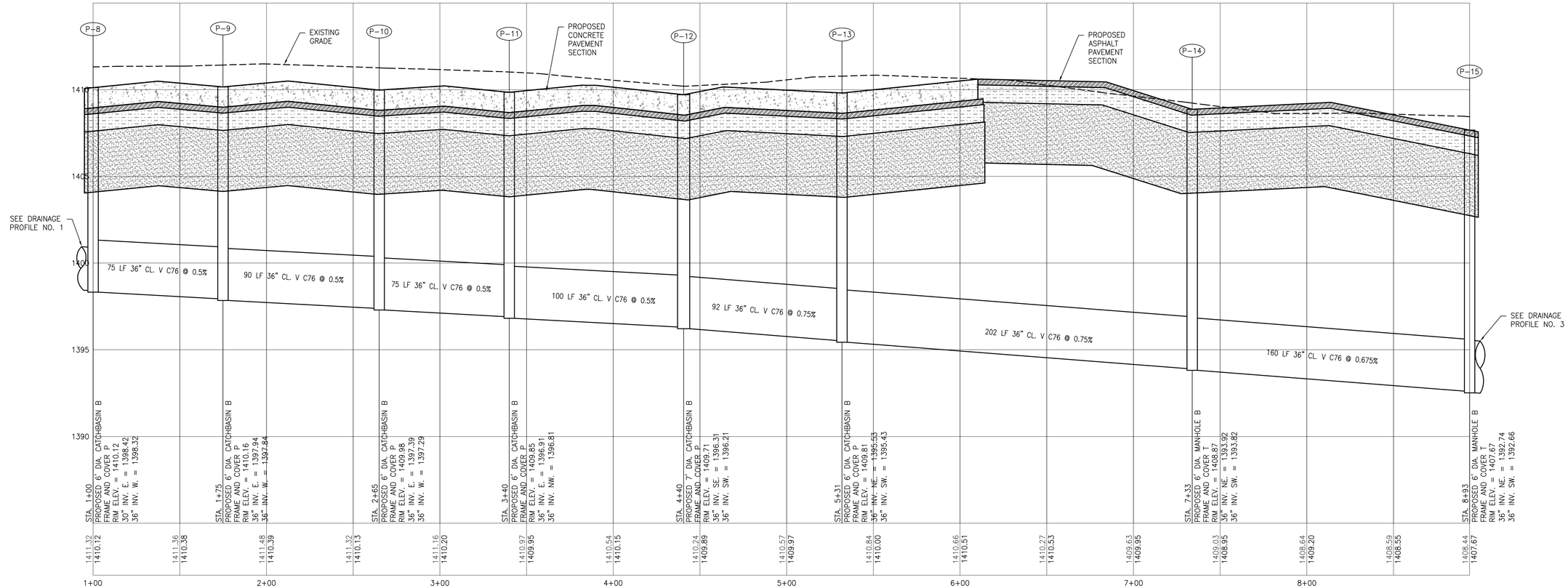
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C514.dwg Plotted on: 2/7/2012 8:45 AM Plotted by: Erdmann, Ryan



1 / C520 **DRAINAGE PROFILE NO. 1**

SCALE: HORZ. 1"=30' VERT. 1"=3'



2 / C520 **DRAINAGE PROFILE NO. 2**

SCALE: HORZ. 1"=30' VERT. 1"=3'

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

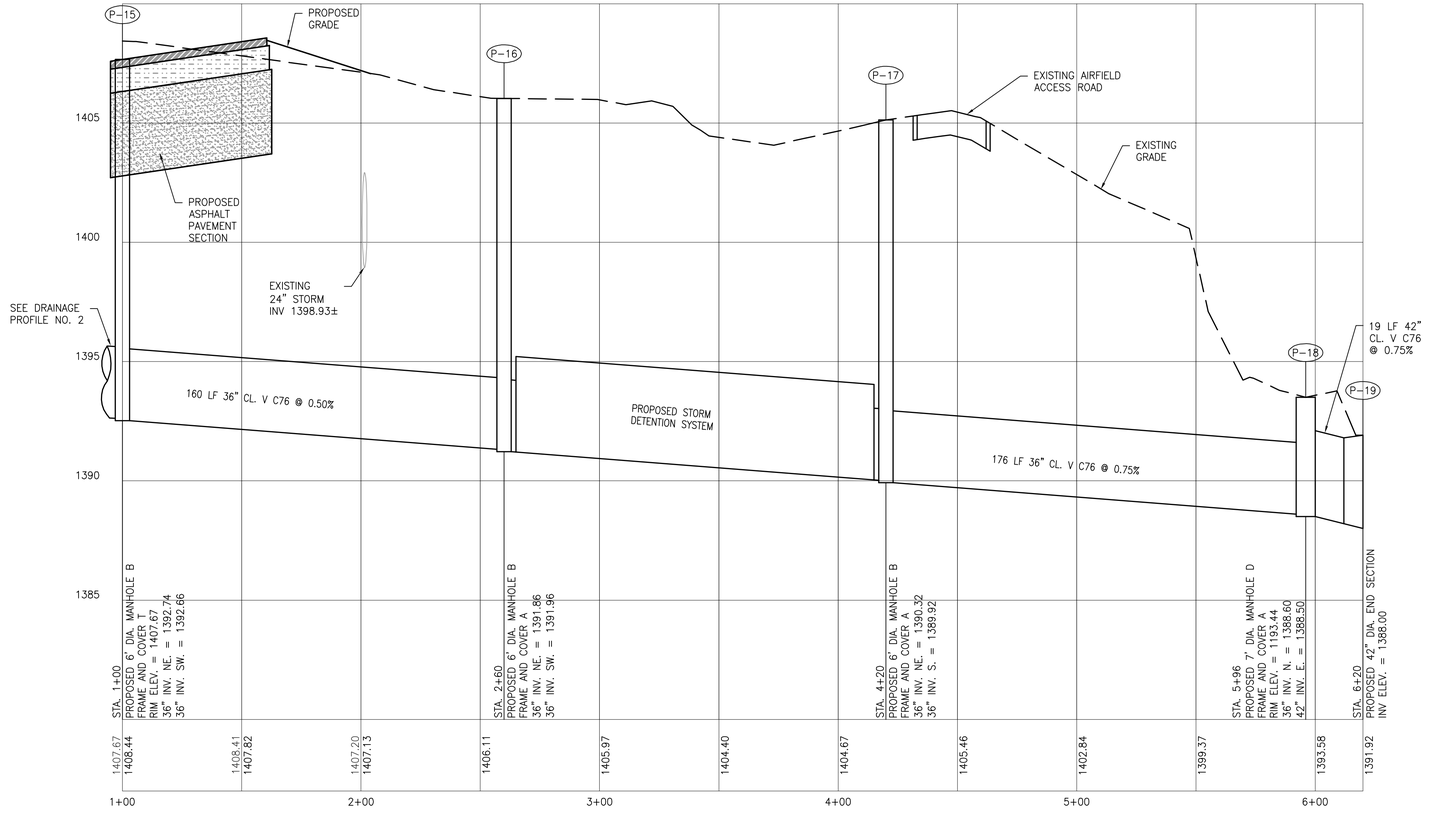
SITE UTILITY PROFILES (SHEET 1 OF 2)

SHEET NUMBER

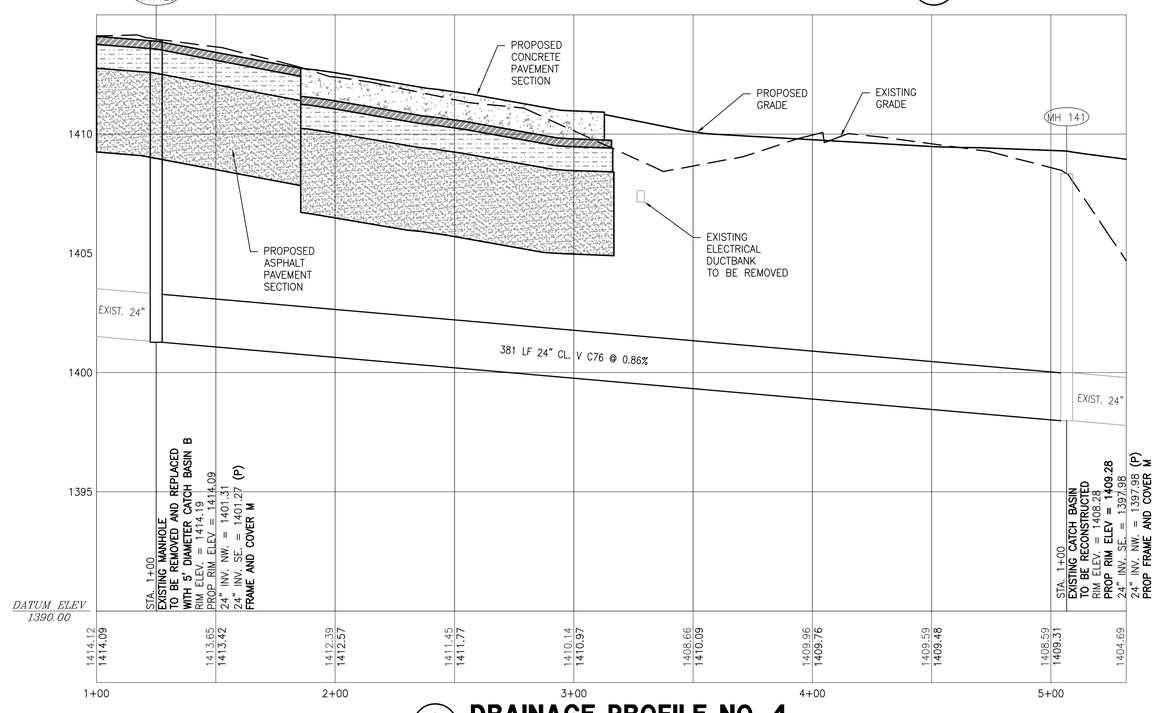
C520

BID PACKAGE 2C BID DOCUMENTS

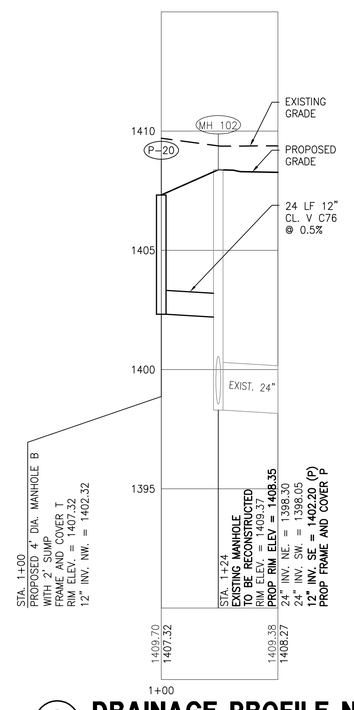
Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM GET\CAD\DESIGN\C\DLH-C520.dwg Plotted on: 2/7/2012 8:54 AM Plotted by: Erdmann, Ryan



1 C521 **DRAINAGE PROFILE NO. 3**
SCALE: HORZ. 1"=30' VERT. 1"=3'



2 C521 **DRAINAGE PROFILE NO. 4**
SCALE: HORZ. 1"=30' VERT. 1"=3'



3 C521 **DRAINAGE PROFILE NO. 5**
SCALE: HORZ. 1"=30' VERT. 1"=3'

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

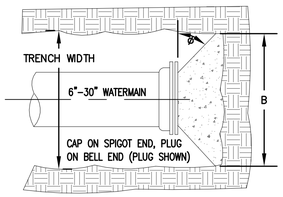
SHEET TITLE

SITE UTILITY PROFILES (SHEET 2 OF 2)

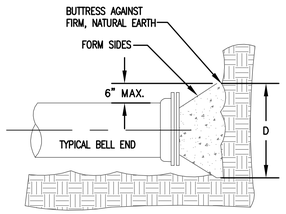
SHEET NUMBER
C521

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C521.dwg Plotted on: 2/7/2012 9:03 AM Plotted by: Erdmann, Ryan



PLAN

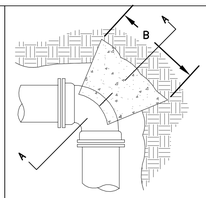


ELEVATION

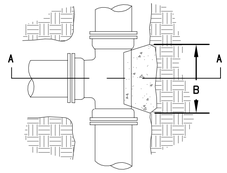
BLOCKING DIMENSIONS		
PLUG SIZE	B	D
6"	12"	15"
8"	24"	15"
10"	24"	20"
12"	30"	22"
16"	40"	28"
20"	50"	34"
24"	62"	40"
30"	80"	48"

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. ANGLE⊕ 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.

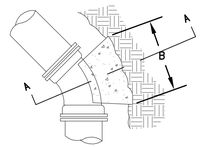
PLUG BLOCKING FOR WATERMAIN		W–2
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



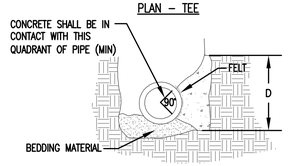
PLAN – 90° BEND



PLAN – TEE



PLAN – 45° BEND

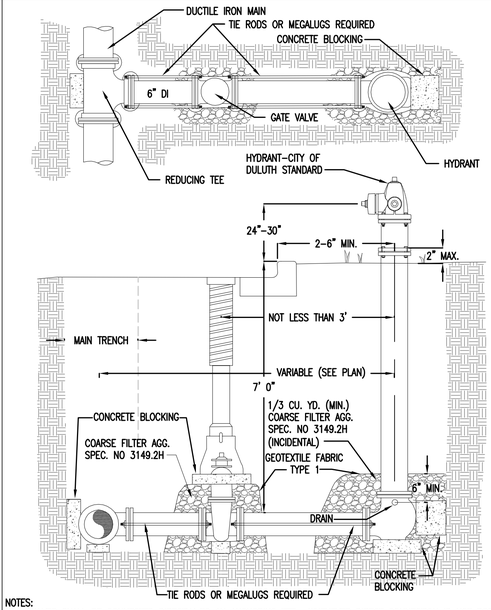


SECTION A–A

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. POLYETHYLENE SHALL BE USED TO SEPARATE CONCRETE FROM FITTING.

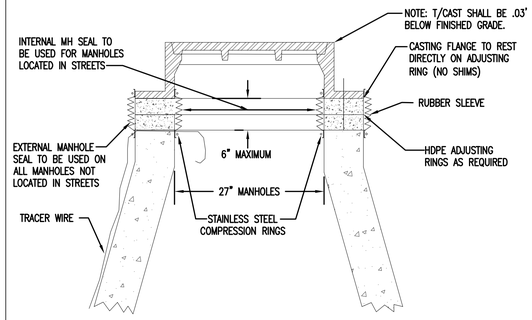
BLOCKING DIMENSIONS								
BEND OR BRANCH SIZE	22–1/2" BENDS		45° BENDS		90° BENDS		TEES	
	B	D	B	D	B	D	B	D
0'–6"	1'–0"	1'–0"	1'–0"	1'–0"	1'–4"	1'–2"	1'–3"	1'–0"
0'–8"	1'–0"	1'–0"	1'–4"	1'–2"	1'–10"	1'–6"	1'–6"	1'–4"
1'–0"	1'–4"	1'–4"	1'–10"	1'–10"	2'–8"	2'–3"	2'–3"	2'–0"
1'–4"	1'–10"	1'–8"	2'–6"	2'–4"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



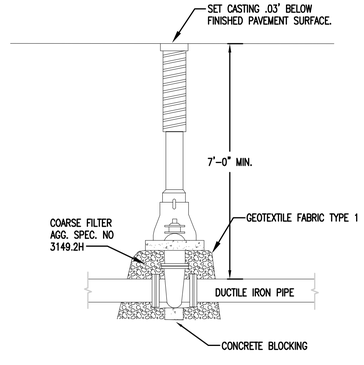
NOTES:
1. VALVES SHALL BE CONNECTED DIRECTLY TO AN ANCHORING TEE. WHENEVER DIRECT CONNECTION IS NOT POSSIBLE, TIE RODS OR MEGALUGS SHALL BE USED. TIE RODS SHALL BE GALVANIZED.
2. USE EPOXY COATING ON VALVE AND HYDRANT BASE.
3. ALL BOLTS SHALL BE COR–TEN WITH ZINC ANODE CAPS CONFORMING TO ASTM B–418 FOR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



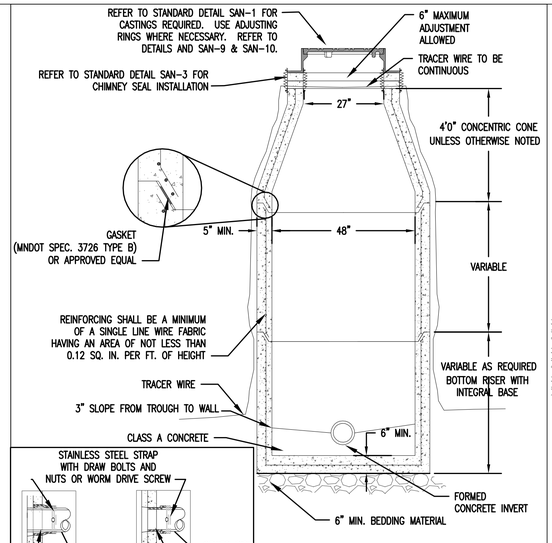
NOTE:
1. ALL SEALS SHALL EXTEND FROM THE CASTING TO THE CONE
2. TRACER WIRE REQUIRED ON ALL SANITARY SEWER MAINS

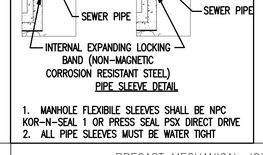
SANITARY MANHOLE SEAL		SAN–3
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



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



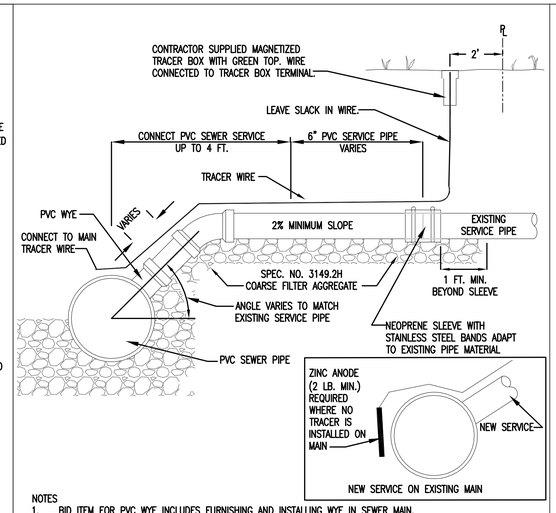


PIPE SLEEVE DETAIL

1. MANHOLE FLEXIBLE SLEEVES SHALL BE NPC KOR–N–SEAL 1 OR PRESS SEAL PSX DIRECT DRIVE
2. ALL PIPE SLEEVES MUST BE WATER TIGHT

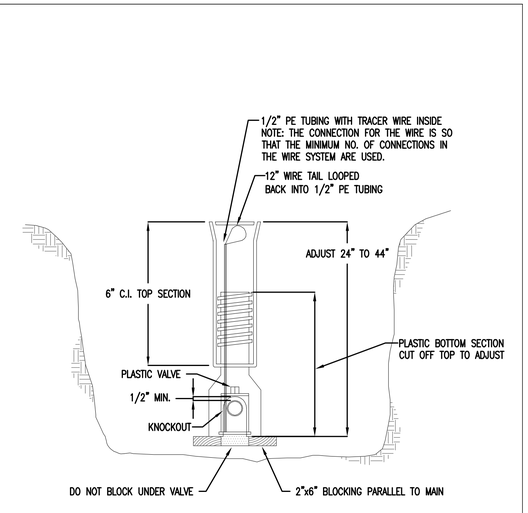
NOTES
1. SANITARY MANHOLES SHALL NOT HAVE STEPS.
2. ALL SANITARY MANHOLES SHALL BE VACUUM TESTED.
3. ALL SANITARY MANHOLES SHALL BE WATERTIGHT. ANY OBSERVABLE WATER SEEPAGE THROUGH THE END OF THE WARRANTY PERIOD SHALL BE CAUSE TO REJECT MANHOLES.

PRECAST MECHANICAL JOINT SEWER MANHOLE		SAN–11
REVIEWED/APPROVED 12/18/09	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
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

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

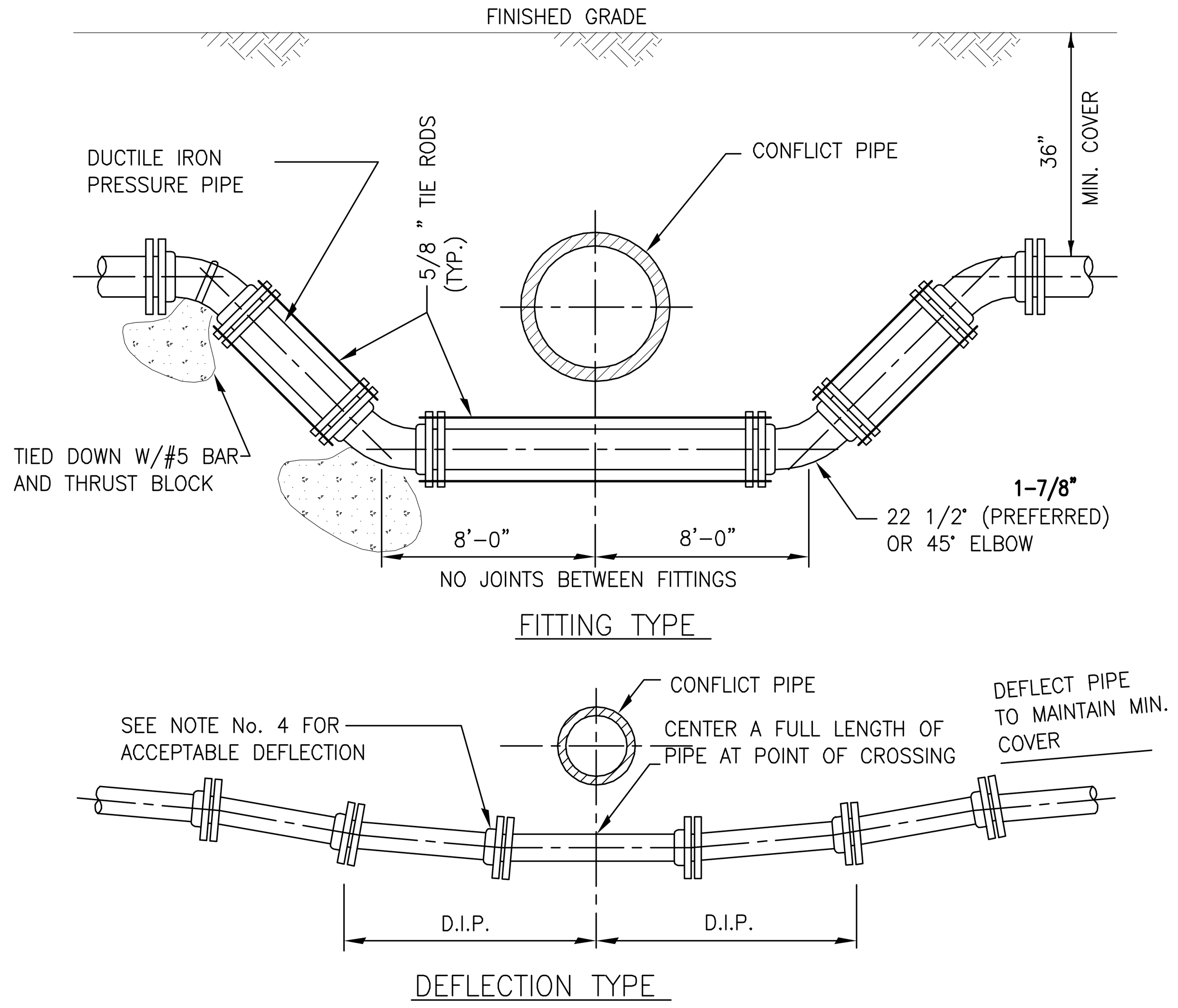
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
CITY OF DULUTH UTILITY DETAILS (SHEET 1 OF 2)

SHEET NUMBER
C530

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH–C530.dwg Plotted on: 2/7/2012 10:01 AM Plotted by: Erdmann, Ryan

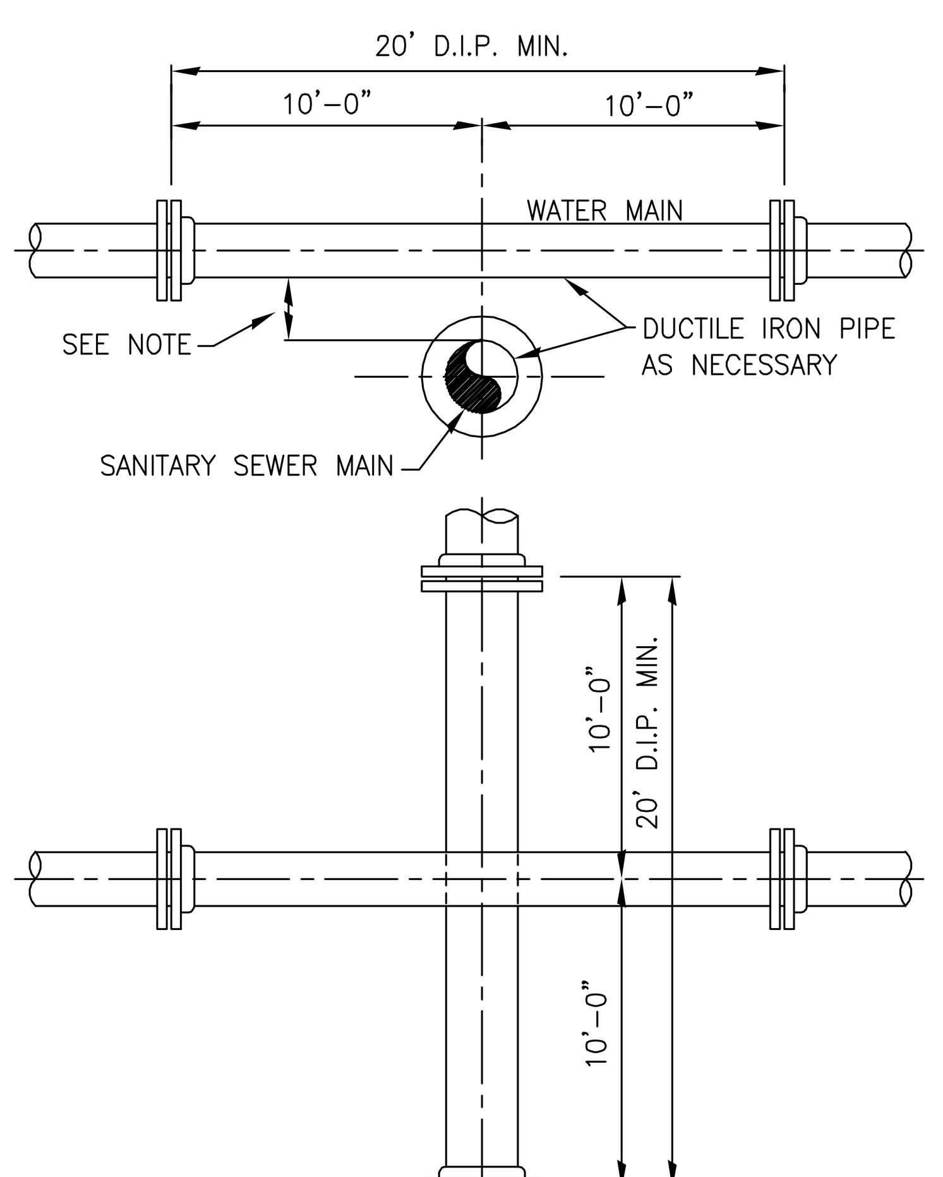


NOTES:

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.

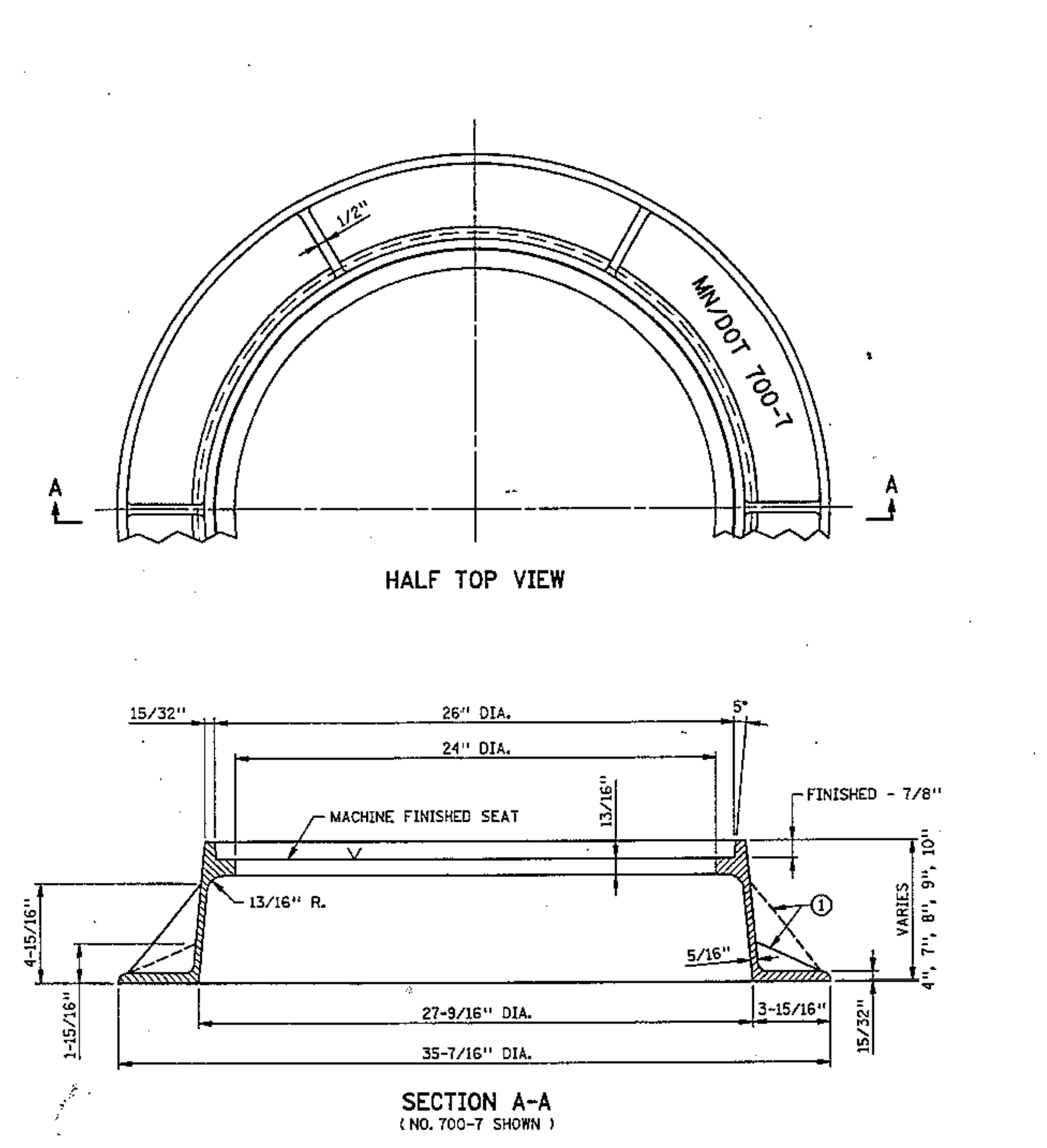


NOTES:

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 3. 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

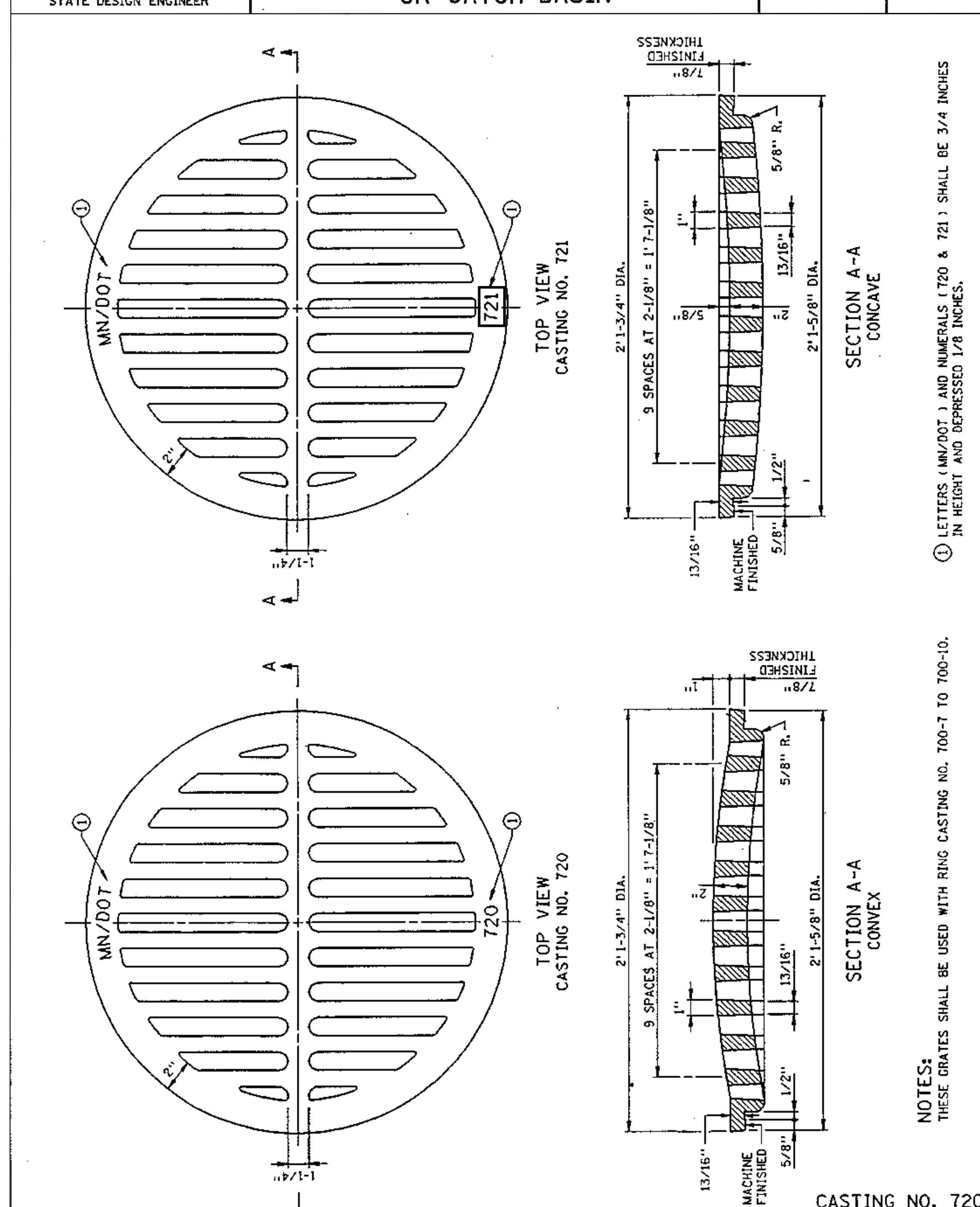
N.T.S.



NOTES:
THIS RING CASTING TO BE USED IN CONJUNCTION WITH ANY OF THE FOLLOWING CASTINGS:
MANHOLE COVER NO. 715 OR NO. 716
MANHOLE OR CATCH BASIN GRATES NO. 720 OR NO. 721.
① ALTERNATING GUSSETS (3 EACH).

4" CASTING NO. 700-4 (98 LBS.)
7" CASTING NO. 700-7 (118 LBS.)
8" CASTING NO. 700-8
9" CASTING NO. 700-9
10" CASTING NO. 700-10

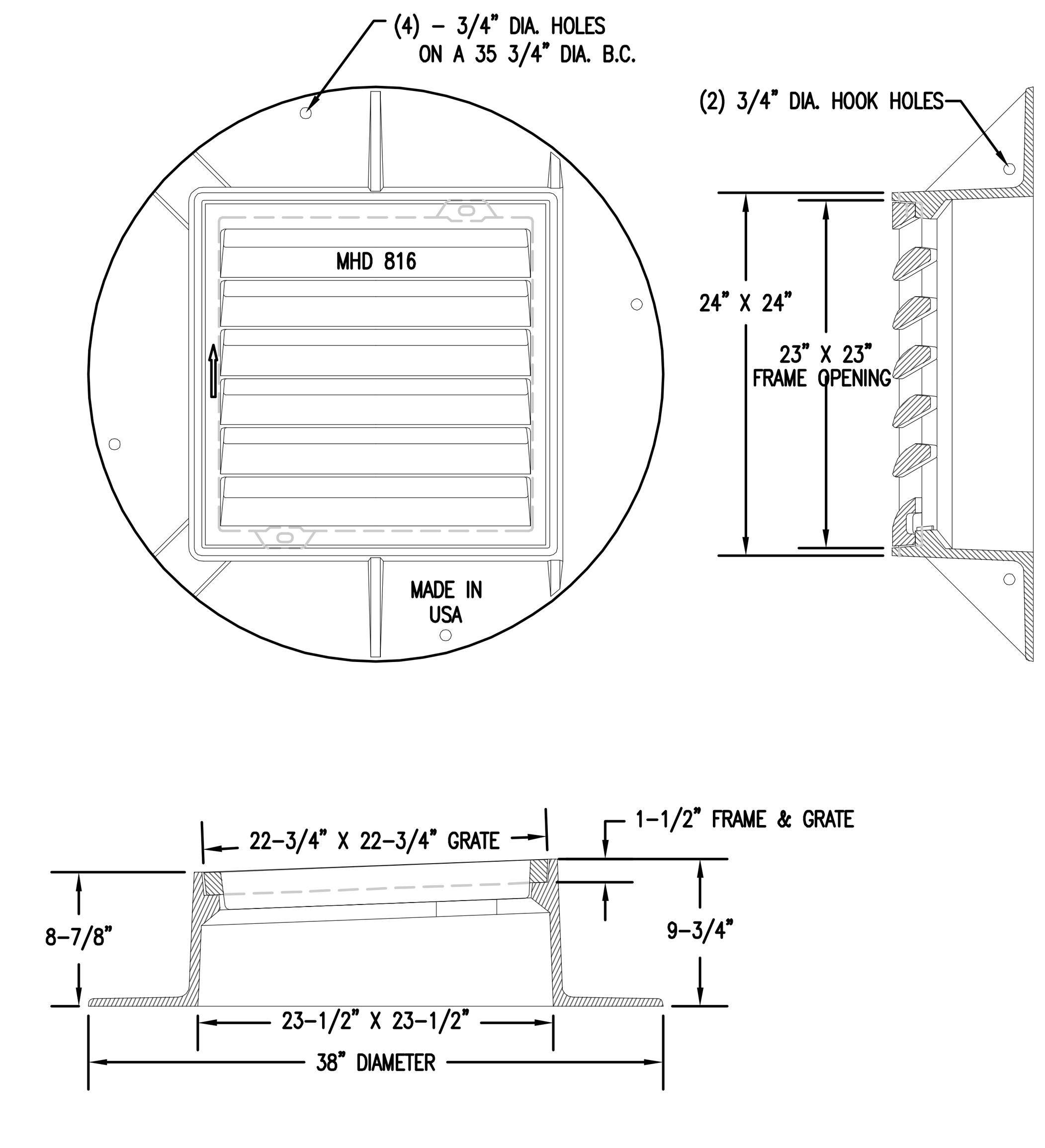
APPROVED OCTOBER 25, 1996 — STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION — RING CASTING FOR MANHOLE OR CATCH BASIN	SPECIFICATION REFERENCE 2506	STANDARD PLATE NO. 4101D



NOTES:
THESE GRATES SHALL BE USED WITH RING CASTING NO. 700-7 TO 700-10.
① LETTERS (MN/DOT) AND NUMERALS (720 & 721) SHALL BE 3/4 INCHES IN HEIGHT AND DEPRESSED 1/8 INCHES.

CASTING NO. 720
CASTING NO. 721

APPROVED Oct. 1, 1966 — ASSISTANT COMMISSIONER ENGINEERING STANDARDS	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION — SPECIAL GRATE CASTINGS FOR CATCH BASIN — CONVEX AND CONCAVE	SPECIFICATION REFERENCE 2506 — REVISED 5-5-99	STANDARD PLATE NO. 4140D

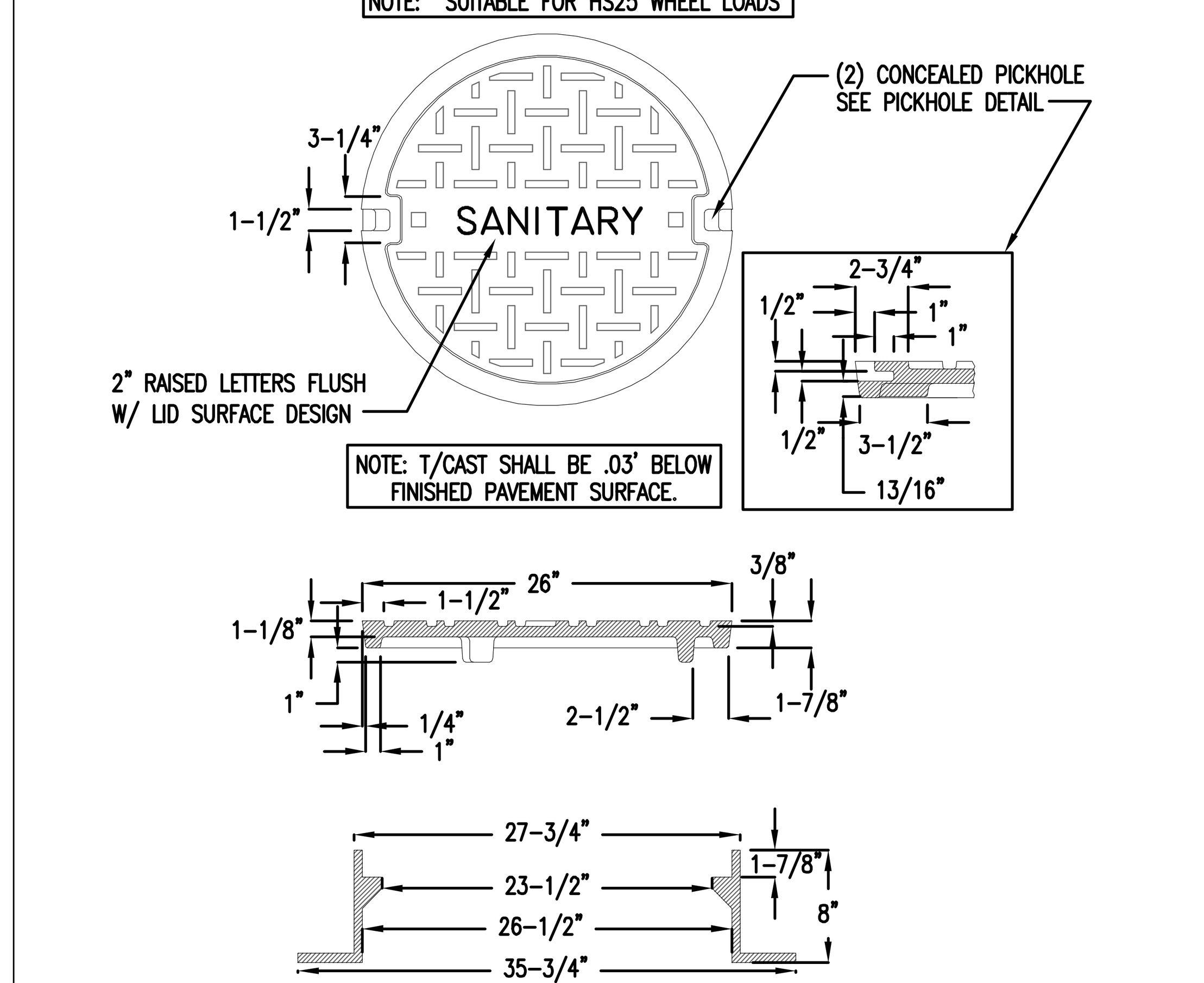


NOTES:
- COMPONENT NO'S: TOP FRAME 5005, GRATE 816 (STD PLATE 4154B).
- MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
- WEIGHT: FRAME 262#; GRATE 131#

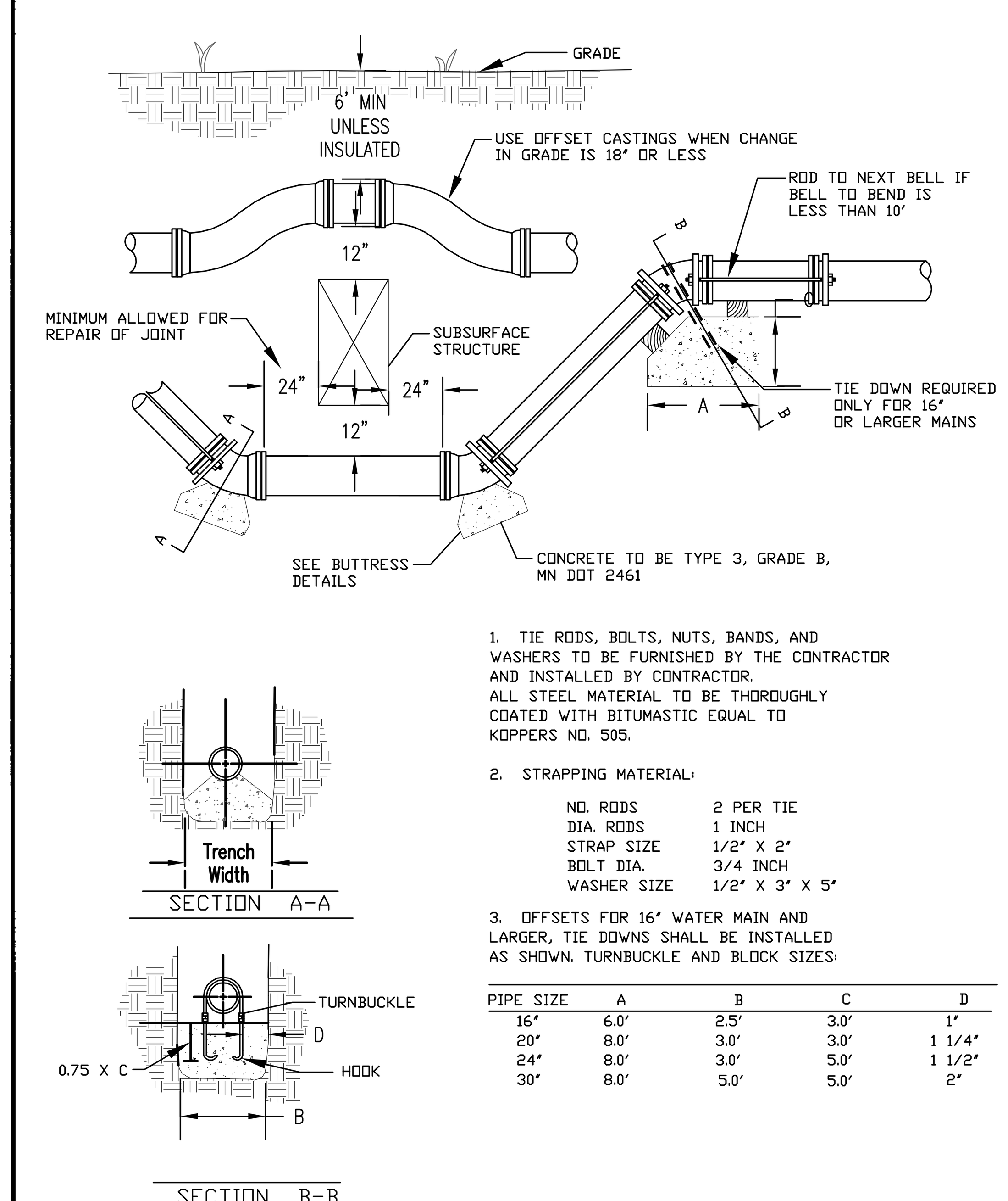
CATCH BASIN/CURB BOX CASTINGS		STRM-3
REVIEWED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

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



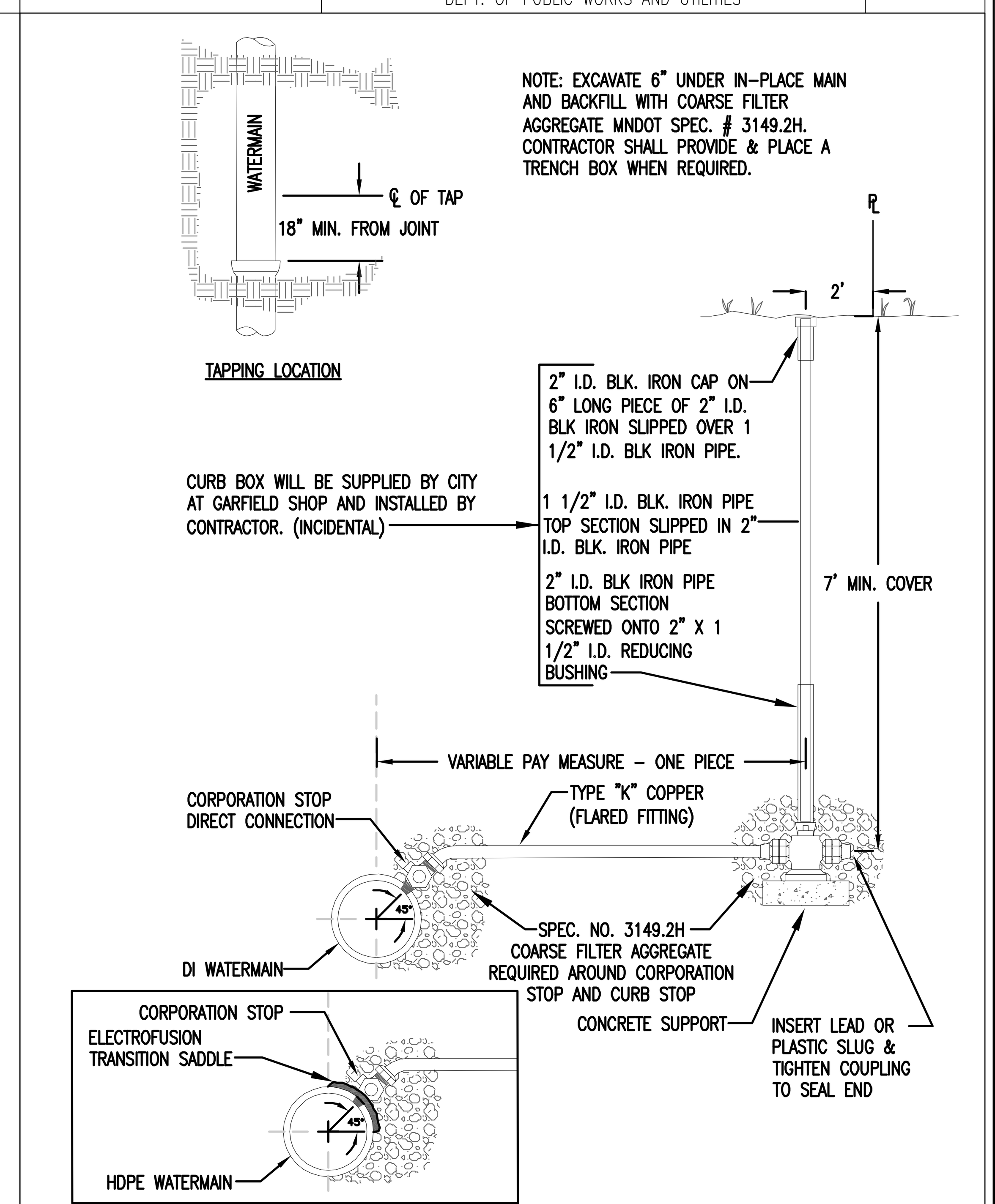
1. TIE RODS, BOLTS, NUTS, BANDS, AND WASHERS TO BE FURNISHED BY THE CONTRACTOR AND INSTALLED BY CONTRACTOR. ALL STEEL MATERIAL TO BE THOROUGHLY COATED WITH BITUMASTIC EQUAL TO KOPPERS NO. 505.
2. STRAPPING MATERIAL:

NO. RODS	2 PER TIE
DIA. RODS	1 INCH
STRAP SIZE	1/2" X 2"
BOLT DIA.	3/4 INCH
WASHER SIZE	1/2" X 3" X 5"

3. OFFSETS FOR 16" WATER MAIN AND LARGER, TIE DOWNS SHALL BE INSTALLED AS SHOWN. TURNBUCKLE AND BLOCK SIZES:

PIPE SIZE	A	B	C	D
16"	6.0'	2.5'	3.0'	1"
20"	8.0'	3.0'	3.0'	1 1/4"
24"	8.0'	3.0'	5.0'	1 1/2"
30"	8.0'	5.0'	5.0'	2"

STRAPPING WATER MAIN VERTICAL OFFSETS	W-6
REVIEWED / APPROVED 1/20/05	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES



TYPICAL COPPER WATER SERVICE		W-5
REVISED/APPROVED 3/11/09	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

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

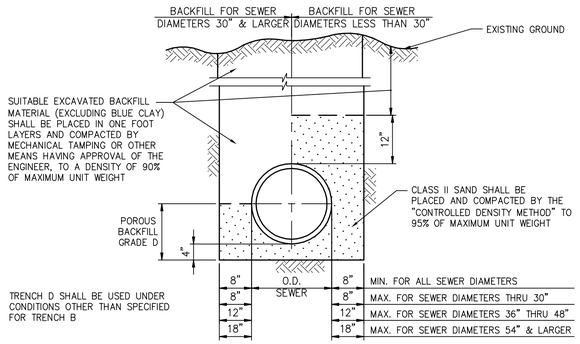
SHEET NUMBER
C531

BID PACKAGE 2C BID DOCUMENTS

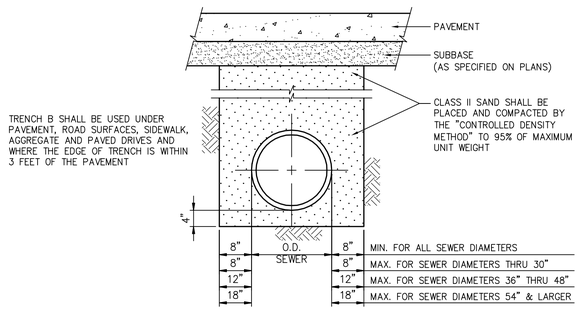
GENERAL NOTES:

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
2. THE CONTRACTOR MAY CONSTRUCT MANHOLES, CATCHBASINS AND INLETS, AS DETAILED, WITH PRECAST REINFORCED CONCRETE UNITS PROVIDED THE FOLLOWING CONDITIONS ARE SATISFIED:
   A. ALL PRECAST SECTIONS SHALL BE MADE IN ACCORDANCE WITH ASTM C-478 EXCEPT THAT:
      (1) THE MINIMUM WALL THICKNESS SHALL BE 5 INCHES.
      (2) BASE AND TOP SLABS SHALL BE AS DETAILED ON THE STANDARD PLANS, HOWEVER PRECAST HEAVY WALL SUMPS MEETING THE REINFORCING REQUIREMENTS FOR RISERS AND BASES MAY BE SUBSTITUTED FOR BASE SLABS.
      (3) ALL AIRCRAFT RATED PRECAST STRUCTURE RISERS AND CONE SECTIONS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-76 AND SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH REQUIREMENT OF 5000 PSI.
   B. NO OPENINGS SHALL BE MADE IN PRECAST UNITS WHICH WOULD REMOVE MORE THAN 70% OF THE CIRCUMFERENCE ALONG ANY HORIZONTAL PLANE. A MINIMUM OF 6" OF UNDISTURBED MANHOLE WALL IS REQUIRED BETWEEN ANY TWO OPENINGS. OPENINGS MAY BE CONSTRUCTED BY CASTING, REMOVAL OF GREEN CONCRETE, OR BY DRILLING THE OPENINGS IN CURED CONCRETE.
   C. OPENINGS FOR SEWER PIPE MAY BE CUT OR PRECAST WITH A DIAMETER 6" LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE. THE OPENING AROUND OUTSIDE OF PIPES SHALL BE CLOSED USING BRICK MASONRY.
   D. STRUCTURES NOT MEETING THE OPENING REQUIREMENTS SHALL BE BUILT OF BLOCK OR BRICK (12" BLOCK TO BE USED FOR AIRCRAFT RATED STRUCTURES) TO A MINIMUM OF 8" ABOVE THE TOP OF SEWER, WITH PRECAST UNITS BEING USED ABOVE THIS POINT. WHERE THE PRECAST UNITS REST ON THE BLOCK OR BRICK, THE GROOVE IN THE PRECAST UNIT WILL BE FILLED WITH MORTAR.
   E. SEWER PIPE SHALL NOT PENETRATE A PRECAST CONE UNLESS AUTHORIZED BY THE ENGINEER.
   F. CIRCUMSTANCES ENCOUNTERED DURING CONSTRUCTION MAY PRECLUDE THE USE OF PRECAST UNIT STRUCTURES, AS DETERMINED BY THE ENGINEER. IF THE CONTRACTOR ELECTS TO USE PRECAST UNIT STRUCTURES AND FIELD CHANGES PROHIBIT THEIR USE, NO COMPENSATION WILL BE MADE TO THE CONTRACTOR FOR HAVING THESE UNITS MANUFACTURED, SUPPLIED TO THE PROJECT, AND NOT UTILIZED.
   G. SPECIAL PRECAST UNITS FOR USE ON LARGE DIAMETER SEWERS MUST HAVE THE APPROVAL OF THE ENGINEER.
   H. PRECAST FLAT TOP SLABS MAY BE SUBSTITUTED FOR PRECAST CONES.
3. ALL VERTICAL HOLES IN CONCRETE BLOCK STRUCTURE WALL SHALL BE COMPLETELY FILLED WITH MORTAR. ALL VERTICAL WALL JOINTS SHALL BE BATTERED.
4. THE FIRST PIPE LENGTH ENTERING OR LEAVING ANY STRUCTURE SHALL BE TEMPORARILY SUPPORTED BY SUITABLE MEANS UNTIL THE STRUCTURE IS COMPLETED AND BACKFILLED.
5. A POURED REINFORCED CONCRETE BASE MAY BE SUBSTITUTED FOR A PRECAST BASE AS APPROVED BY THE ENGINEER.
6. BRICK OR BLOCK MANHOLES, CATCHBASINS OR INLETS, SHALL BE SHROUDED WITH GEOTEXTILE FABRIC FROM THE TOP DOWN 4' MINIMUM. PRECAST STRUCTURES SHALL BE SHROUDED WITH GEOTEXTILE FABRIC TO A POINT 1' BELOW THE STACK. ENOUGH GEOTEXTILE MATERIAL WILL BE LEFT ON THE TOP TO ROLL OVER THE BRICK STACK AND UNDER THE CASTING.
7. THE PLACEMENT OF 6" UNDERDRAIN STUBS IN SEWER TRENCH WILL BE REQUIRED AT PROPOSED DRAINAGE STRUCTURES (SEE DETAILS). THE COST OF THESE LENGTHS OF UNDERDRAIN WITH END CAPS SHALL BE INCLUDED IN THE COST OF THE DRAINAGE STRUCTURE.
8. STEPS ARE REQUIRED FOR ALL STRUCTURES. STEPS SHALL BE OF AN APPROVED DESIGN, MADE OF CAST IRON, ALUMINUM, OR PLASTIC COATED STEEL. RUNGS SHALL BE A MINIMUM OF 10" CLEAR LENGTH, DESIGNED TO PREVENT THE FOOT FROM SLIPPING OFF THE END AND CAPABLE OF SUPPORTING 800 POUNDS.
9. DRAINAGE STRUCTURE UNITS SHALL NOT BE SHIPPED TO THE PROJECT SITE (APPROVED FOR SHIPPING) UNTIL THE 28-DAY COMPRESSIVE STRENGTH REQUIREMENT HAS BEEN ATTAINED.
10. CONRETE PIPE SHALL HAVE FABRIC WRAPPED JOINTS.

1 / C532 **GENERAL NOTES**
SCALE: NTS



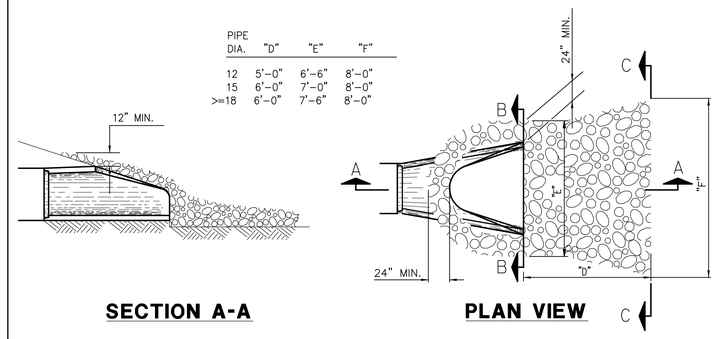
SEWER TRENCH A



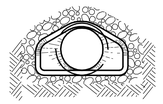
SEWER TRENCH B

NOTE: SEE GENERAL NOTES

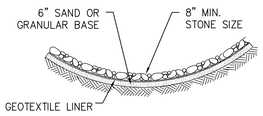
2 / C532 **SEWER TRENCH A, B**
SCALE: NTS



SECTION A-A **PLAN VIEW**



SECTION B-B



SECTION C-C

RIPRAP GENERAL NOTES:

1. RIPRAP SHALL BE LAID ON A NON-WOVEN GEOTEXTILE LINER INSTALLED OVER A SAND OR GRANULAR SUB-BASE.
2. EACH PIECE OF RIPRAP SHALL BE INDIVIDUALLY LAID BY HAND (NO DUMPING).
3. RIPRAP STONE SHALL BE NATURAL STONE OR FRACTURED ROCK HAVING A MINIMUM 8-INCH AND MAXIMUM 18-INCH MEAN DIAMETER WITH 75% OF THE MATERIAL 8-INCHES OR LARGER.
4. THE NON-WOVEN GEOTEXTILE LINER SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:

   GRAB TENSILE STRENGTH ASTM D4632: 200 LBS.
   TRAPEZOID TEAR STRENGTH ASTM D4533: 75 LBS.
   PUNCTURE STRENGTH ASTM D4833: 75 LBS.
   MULLEN BURST STRENGTH ASTM D3786: 200 LBS.
   PERMITTIVITY ASTM D4491: 0.5 PER SECOND
   APPARENT OPENING SIZE (MAX.) ASTM D4751: 0.21 MILLIMETERS

5. ALL RIP RAP SHALL BE INCIDENTAL TO THE END SECTION ITEM.

3 / C532 **END SECTION RIPRAP DETAIL**
SCALE: NTS

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

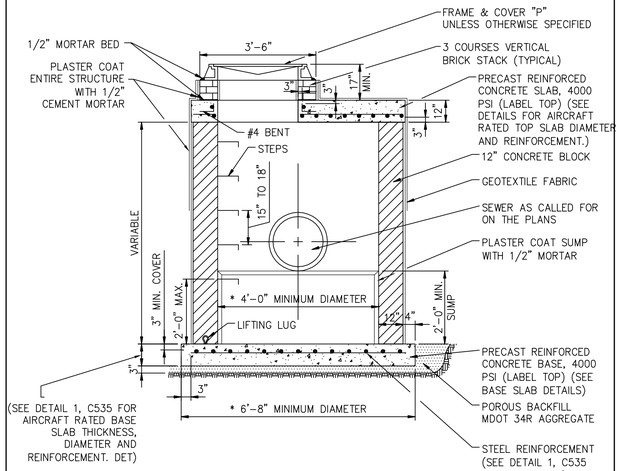
DRAINAGE DETAILS (SHEET 1 OF 5)

SHEET NUMBER
C532

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C532.dwg Plotted on: 2/7/2012 9:06 AM Plotted by: Erdmann, Ryan

AIRCRAFT RATED



TYPICAL SECTION

NOTES:

1. CATCH BASIN "B" SHALL BE USED FOR STRUCTURES WITHIN THE RUNWAY AND TAXIWAY SAFETY AREAS AND IN ALL APRON PAVEMENTS.

2. * DIAMETER OF CATCHBASIN SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE DIAMETERS AND ANGLES OF THE SEWERS.

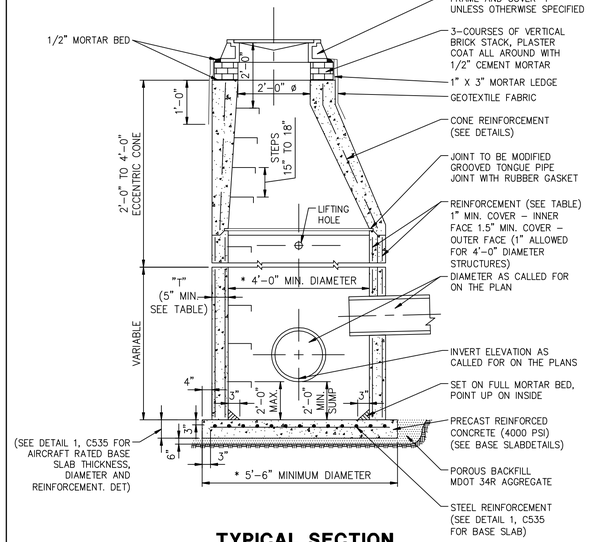
3. OMIT SUMP WHEN OUTLET SEWER IS 27" DIAMETER AND LARGER AND WHEN USED ON SANITARY SEWER, AND PLACE FORMED CONCRETE FILL GRADE A TO SPRING LINE OF SEWER.

NOTE: SEE GENERAL NOTES, DETAIL, C532

1 / C533 **CATCH BASIN B**

SCALE: NTS

AIRCRAFT RATED



TYPICAL SECTION

STRUCTURE INSIDE DIAMETER	RISER WALL THICKNESS "T"	REINFORCEMENT AREA	
		INNER CAGE SQ.IN./FT.	OUTER CAGE SQ.IN./FT.
* 4'	5"	0.24	0.18
5'	6"	0.34	0.26
6'	7"	0.49	0.37
7'	8"	0.64	0.48

CONES	
DIAMETER REDUCER	MIN. WALL THICKNESS
7' – 4'	6"
6' – 4'	6"
5' – 4'	6"
4' – 2'	5"

NOTES:

1. * DIAMETER OF CATCHBASIN SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE DIAMETERS AND ANGLES OF THE SEWERS.

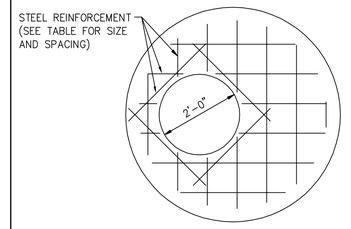
2. ALL PRECAST RISERS AND CONE SECTIONS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5000 PSI.

3. MANHOLE STEPS SHALL HAVE 3" EMBEDMENT MINIMUM (TYP.).

NOTE: SEE GENERAL NOTES, DETAIL, C532

2 / C533 **PRECAST CATCHBASIN B**

SCALE: NTS



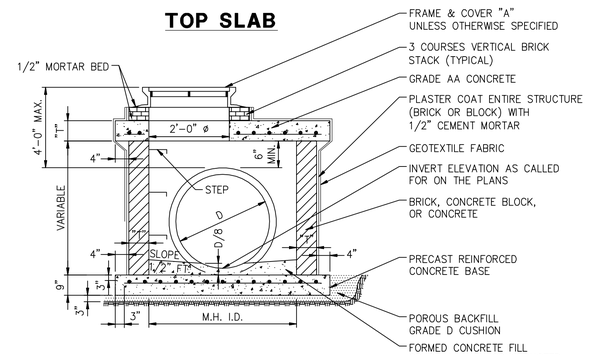
NOTE:

1. MANHOLE D SHALL BE USED WHERE THE DEPTH OF COVER FROM THE TOP OF CASTING TO THE TOP OF SEWER IS LESS THAN 4'-0".

2. MANHOLE D SHALL NOT BE USED WITHIN THE PAVEMENT AREA UNLESS OTHERWISE APPROVED BY THE ENGINEER.

3. * INSIDE DIAMETER OF M.H. SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE DIAMETERS AND ANGLES OF THE SEWER. WHERE THE DIAMETER OF OUTLET PIPE IS 24" OR LESS, THE M.H. SHALL BE CONSTRUCTED WITH A 2' SUMP.

TOP SLAB



TYPICAL SECTION

OUTLET "D"	M.H. I.D.	TOP SLAB "T"	WALLS "T"	TOP SLAB REINFORCING STEEL
24" OR LESS	4'–0"	9"	8"	#6 @ 9" EA. WAY
30"	*4'–0"	9"	8"	#6 @ 9" EA. WAY
36"	*4'–0"	9"	12"	#6 @ 9" EA. WAY
42"	*5'–0"	10"	12"	#6 @ 9" EA. WAY
48"	*6'–0"	11"	12"	#7 @ 9" EA. WAY
54"	*6'–0"	11"	12"	#7 @ 9" EA. WAY
---	*7'–0"	12"	12"	#7 @ 9" EA. WAY
---	*8'–0"	12"	12"	#8 @ 9" EA. WAY

NOTE: SEE GENERAL NOTES, DETAIL, C532

3 / C533 **MANHOLE D**

SCALE: NTS

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

DRAINAGE DETAILS (SHEET 2 OF 5)

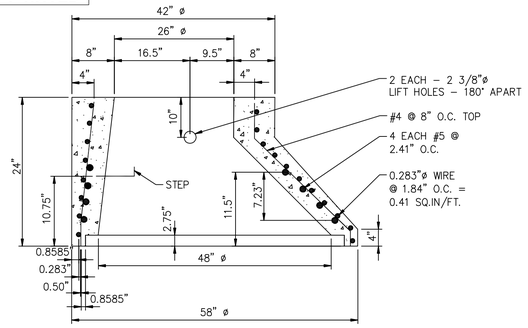
SHEET NUMBER

C533

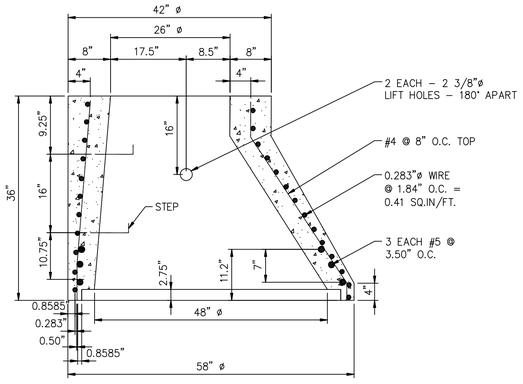
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C533.dwg Plotted on: 2/7/2012 9:07 AM Plotted by: Erdmann, Ryan

AIRCRAFT RATED



2' CONE



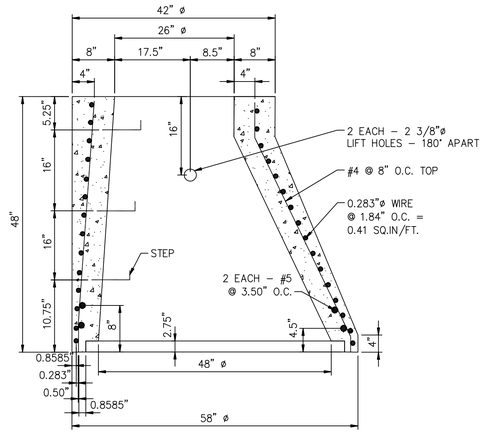
3' CONE

NOTE: SEE GENERAL NOTES, DETAIL, C532

1 / C534 **CATCH BASIN B**

SCALE: NTS

AIRCRAFT RATED



4' CONE

NOTES: (ALL CONES)

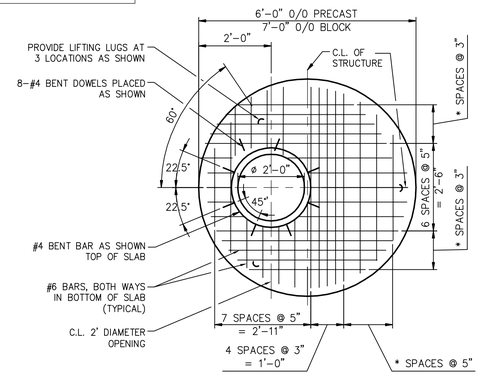
1. CONES SHALL CONFORM TO ASTM C-478-96, EXCEPT THAT LONGITUDINAL REINFORCEMENT AND DEFORMED BARS SHALL CONFORM TO ASTM A615 GRADE 60.
2. MINIMUM CONCRETE COMPRESSIVE STRENGTH IS 5000 P.S.I.
3. CIRCUMFERENTIAL REINFORCEMENT SHALL CONFORM TO ASTM A82.
4. #5 BARS TO HAVE A MINIMUM 18" LAB & BE TIED TO ALL #4 BARS.

NOTE: SEE GENERAL NOTES, DETAIL, C532

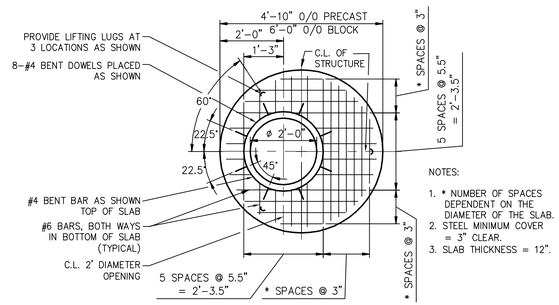
2 / C534 **CATCH BASIN B**

SCALE: NTS

AIRCRAFT RATED



TOP - 5' DIAMETER MANHOLE



NOTES:

1. * NUMBER OF SPACES DEPENDENT ON THE DIAMETER OF THE SLAB.
2. STEEL MINIMUM COVER = 3" CLEAR.
3. SLAB THICKNESS = 12".

TOP - 4' DIAMETER MANHOLE

NOTE: SEE GENERAL NOTES, DETAIL, C532

3 / C534 **CATCH BASIN B**

SCALE: NTS

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

DRAINAGE DETAILS (SHEET 3 OF 5)

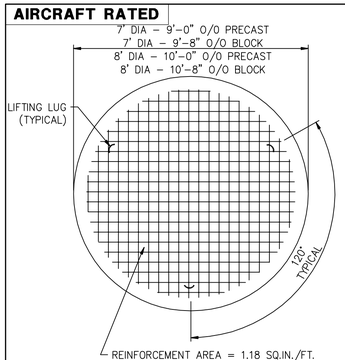
SHEET NUMBER

C534

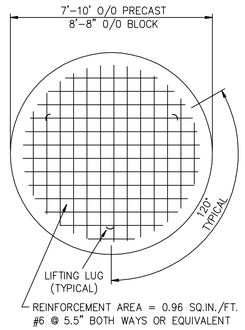
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C534.dwg Plotted on: 2/7/2012 9:09 AM Plotted by: Erdmann, Ryan

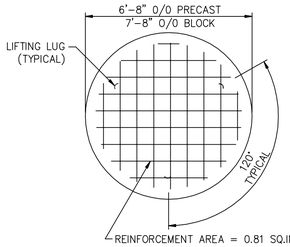
AIRCRAFT RATED



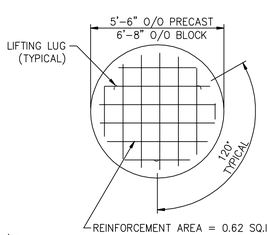
BASE, 7' AND 8' DIAMETER M.H.



BASE, 6' DIAMETER M.H.



BASE, 5' DIAMETER M.H.

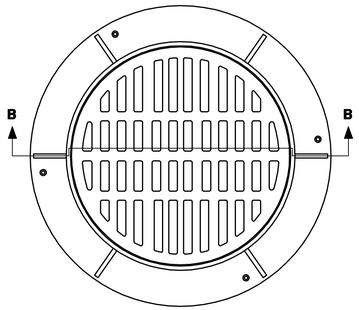


BASE, 4' DIAMETER M.H.

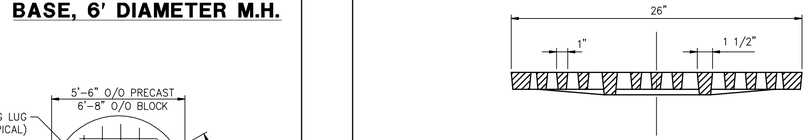
NOTES:
1. BASE SLAB DETAILS UP TO 16' DEEP
2. MAXIMUM BAR SIZE = #6
3. MINIMUM SPACING = 3"
4. SLAB THICKNESS = 12"
5. STEEL MINIMUM COVER = 3" CLEAR
6. LIFTING LUGS PLACED @ 120° INTERVALS, ALL BASES

NOTE: SEE GENERAL NOTES, DETAILS, C532

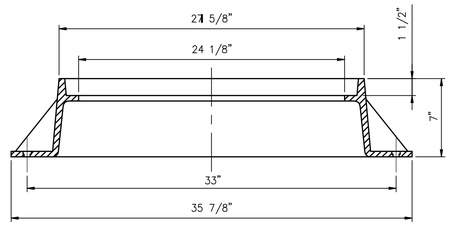
1 / C535 **BASE SLAB DETAILS**
SCALE: NTS



PLAN VIEW



COVER SECTION B-B



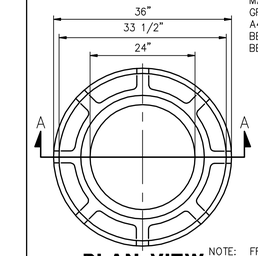
FRAME SECTION B-B

NOTE: USE NEENAH R-2501 OR APPROVED EQUAL.

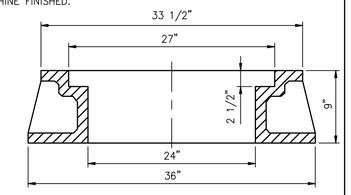
2 / C535 **CATCH BASIN FRAME AND COVER T**
SCALE: NTS

NOTE: SEE GENERAL NOTES, DETAILS, C532

AIRCRAFT RATED



MATERIAL:
GRAY IRON, A.S.T.M. STD. SPEC.
A48-83, CLASS 35B.
BEARING SURFACES SHALL
BE MACHINE FINISHED.



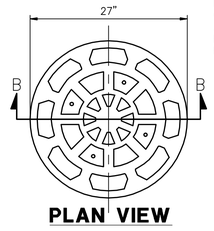
PLAN VIEW

NOTE: FRAME TO BE USED WITH COVER M AND COVER P. USE NEENAH R-3492, EJIW 1900 OR APPROVED EQUAL.

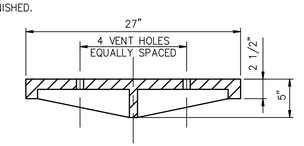
SECTION A-A

FRAME

AIRCRAFT RATED



MATERIAL:
GRAY IRON, A.S.T.M. STD. SPEC.
A48-83, CLASS 35B.
BEARING SURFACES SHALL
BE MACHINE FINISHED.



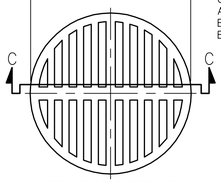
PLAN VIEW

SECTION B-B

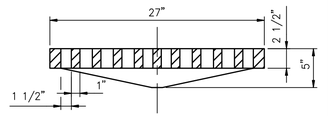
NOTE: USE NEENAH R-3492, EJIW 1900 OR APPROVED EQUAL

COVER M

AIRCRAFT RATED



MATERIAL:
GRAY IRON, A.S.T.M. STD. SPEC.
A48-83, CLASS 35B.
BEARING SURFACES SHALL
BE MACHINE FINISHED.



PLAN VIEW

SECTION C-C

NOTE: USE NEENAH R-2565-G, EJIW 2870 OR APPROVED EQUAL.

COVER P

3 / C535 **AIRCRAFT RATED FRAME, COVER M AND COVER P**
SCALE: NTS

NOTE: SEE GENERAL NOTES, DETAILS, C532

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

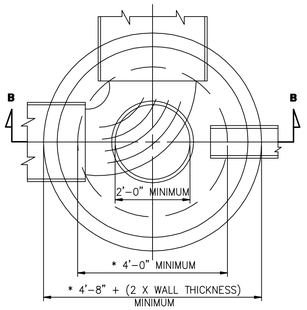
SHEET TITLE

DRAINAGE DETAILS (SHEET 4 OF 5)

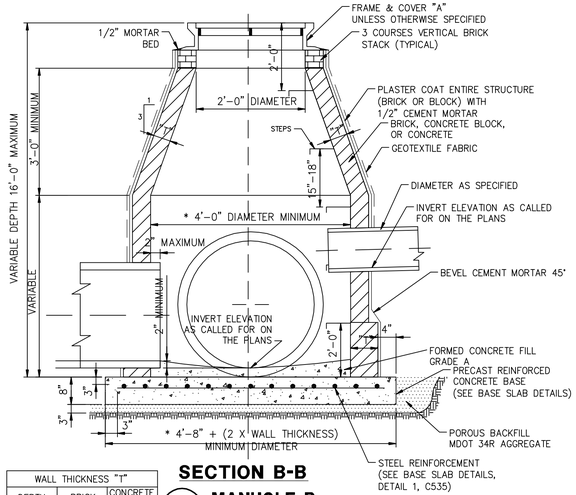
SHEET NUMBER
C535

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C535.dwg Plotted on: 2/7/2012 9:16 AM Plotted by: Erdmann, Ryan



MANHOLE "B" PLAN VIEW



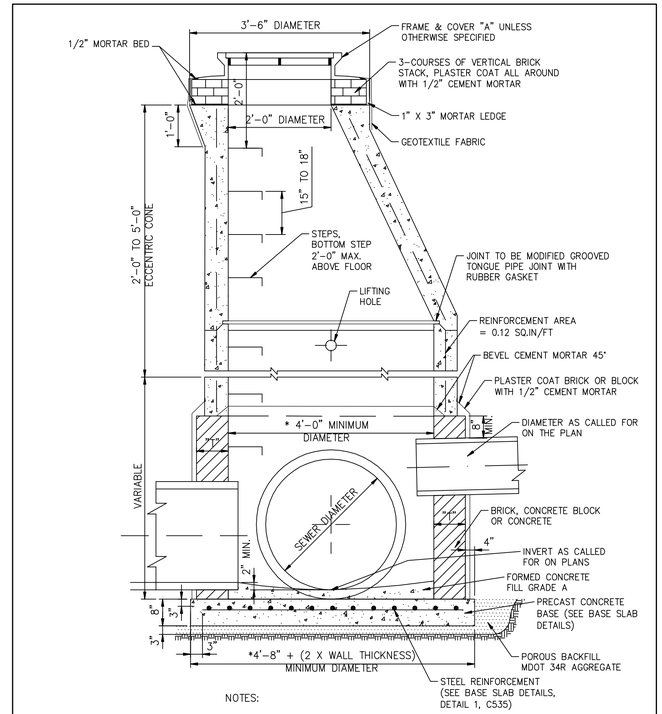
WALL THICKNESS "T"		
DEPTH	BRICK	CONCRETE OR BLOCK
0'–10'	8"	6"
10'–16'	12"	8"

SECTION B-B

MANHOLE B

1 / C536 SCALE: NTS

NOTE: SEE GENERAL NOTES, DETAILS, C532



NOTES:

1. * DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE DIAMETERS AND ANGLES OF THE SEWERS.

2. SUMP REQUIRED WHEN THE DIAMETER OF OUTLET PIPE IS 24" OR LESS. PLASTER COAT INTERIOR OF BRICK OR BLOCK SUMP WITH 1/2" CEMENT MORTAR.

3. PRECAST UNITS SHALL MEET THE REQUIREMENTS OF A.S.T.M. C478.

4. MANHOLE STEPS SHALL HAVE 3" EMBEDMENT MINIMUM (TYP.).

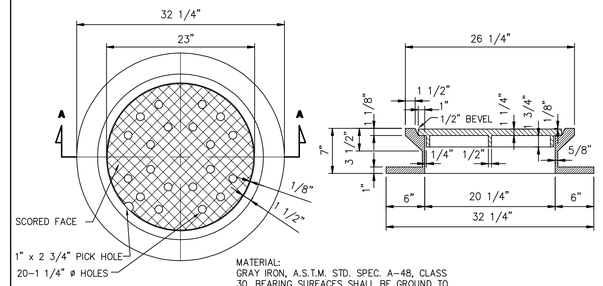
WALL THICKNESS "T"		
DEPTH	BRICK	CONCRETE OR BLOCK
0'–10'	8"	6"
10'–16'	12"	8"
> 16'	16"	12"

TYPICAL SECTION

PRECAST MANHOLE B

2 / C536 SCALE: NTS

NOTE: SEE GENERAL NOTES, DETAILS, C532



MATERIAL:
GRAY IRON, A.S.T.M. STD. SPEC. A-48, CLASS 30. BEARING SURFACES SHALL BE GROUND TO PREVENT ROCKING. TOTAL WEIGHT 410 LB.

PLAN VIEW **SECTION A-A**

NOTE: USE NEENAH R-1722, EJIW 1010 B OR APPROVED EQUAL

FRAME & COVER A

MANHOLE FRAME AND COVER A

3 / C535 SCALE: NTS

NOTE: SEE GENERAL NOTES, DETAILS, C532

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

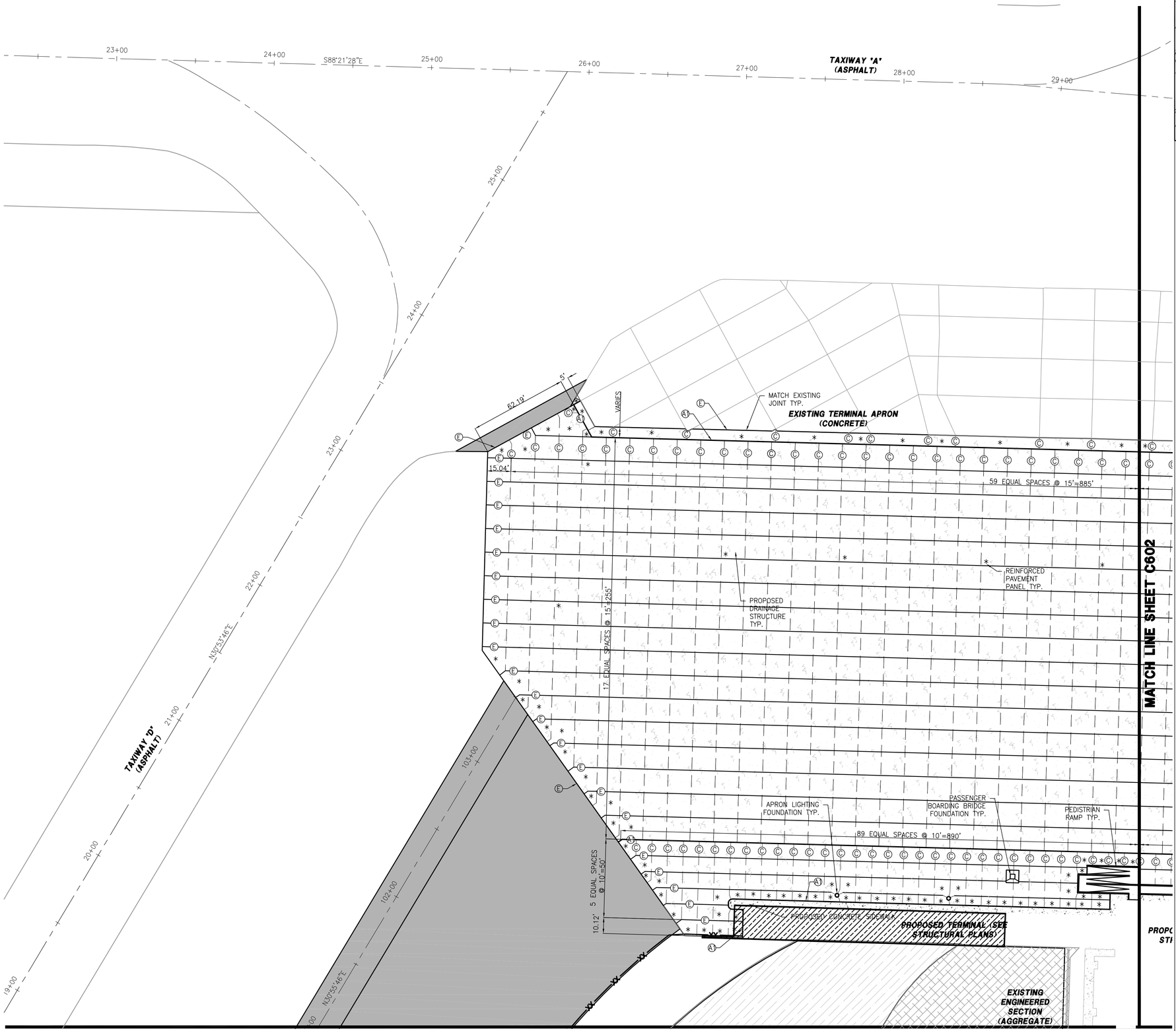
SHEET TITLE

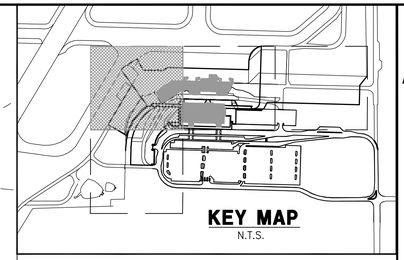
DRAINAGE DETAILS (SHEET 5 OF 5)

SHEET NUMBER
C536

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C536.dwg Plotted on: 2/7/2012 9:11 AM Plotted by: Erdmann, Ryan





KEY MAP
N.T.S.

NORTH

0 30' 60'

CONCRETE JOINT NOTES

1. SEE SHEET C003 FOR LEGEND.
2. SEE C610–C611 FOR CONCRETE PAVEMENT JOINT ELEVATION PLANS.
3. SEE SHEETS C206 AND C207 FOR JOINT DETAILS.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

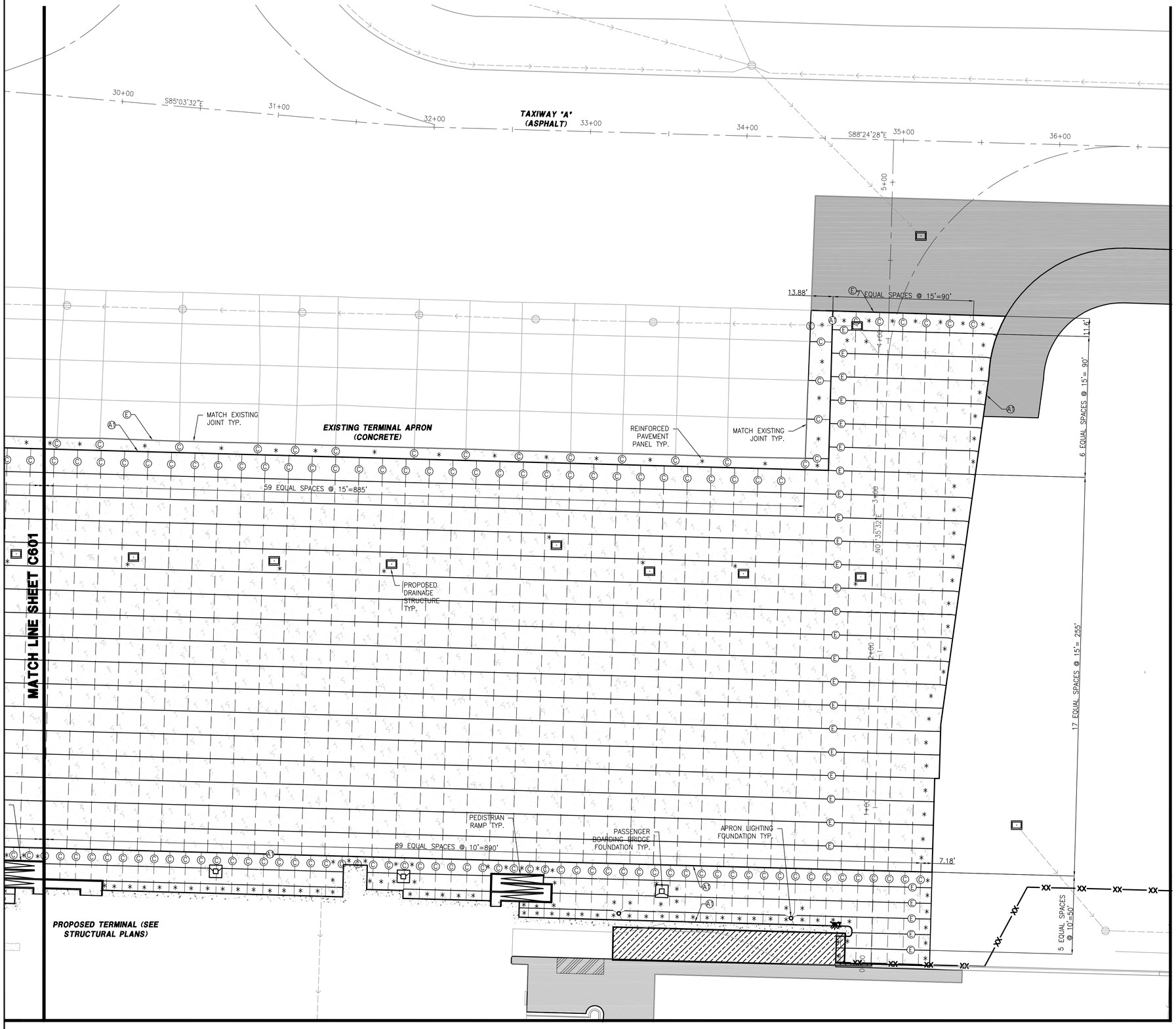
SHEET TITLE

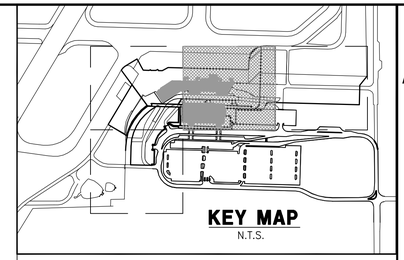
CONCRETE JOINT LAYOUT PLAN (SHEET 1 OF 2)

SHEET NUMBER
C601

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C601.dwg Plotted on: 2/8/2012 8:03 AM Plotted by: Erdmann, Ryan





KEY MAP
N.T.S.

NORTH

0 30' 60'

CONCRETE JOINT NOTES

1. SEE SHEET C003 FOR LEGEND.
2. SEE C610–C611 FOR CONCRETE PAVEMENT JOINT ELEVATION PLANS.
3. SEE SHEETS C206 AND C207 FOR JOINT DETAILS.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

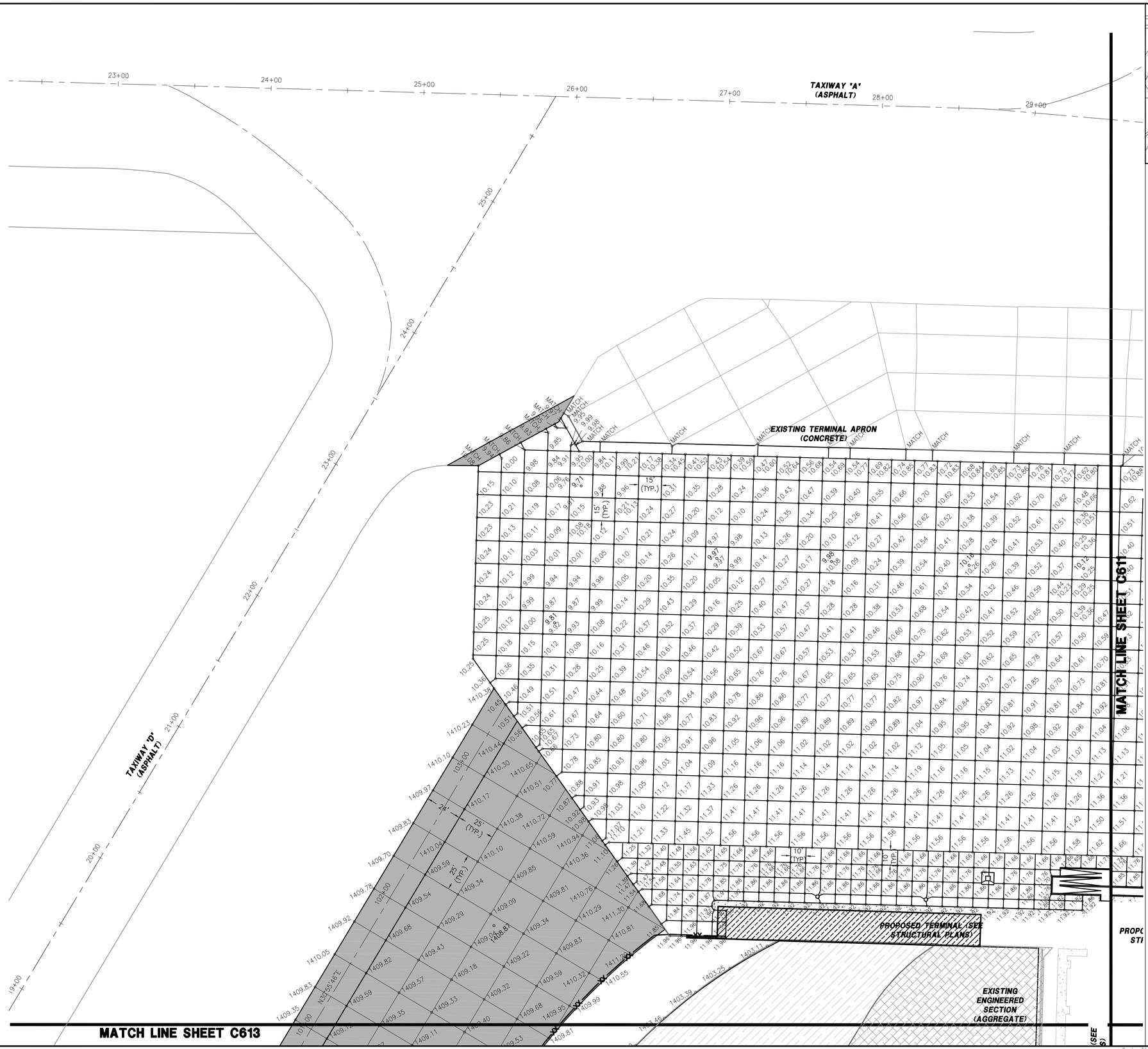
SHEET TITLE

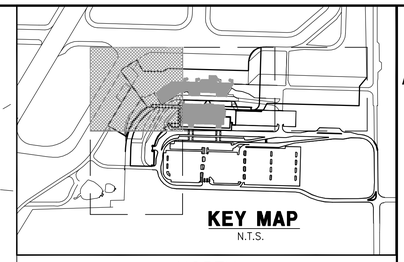
CONCRETE JOINT LAYOUT PLAN (SHEET 2 OF 2)

SHEET NUMBER
C602

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C602.dwg Plotted on: 2/8/2012 8:06 AM Plotted by: Erdmann, Ryan





KEY MAP
N.T.S.

NORTH

0 30' 60'

CONCRETE JOINT ELEVATION NOTES

1. SEE SHEET C003 FOR LEGEND.
2. SEE C601–C602 FOR CONCRETE PAVEMENT JOINT LAYOUT INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

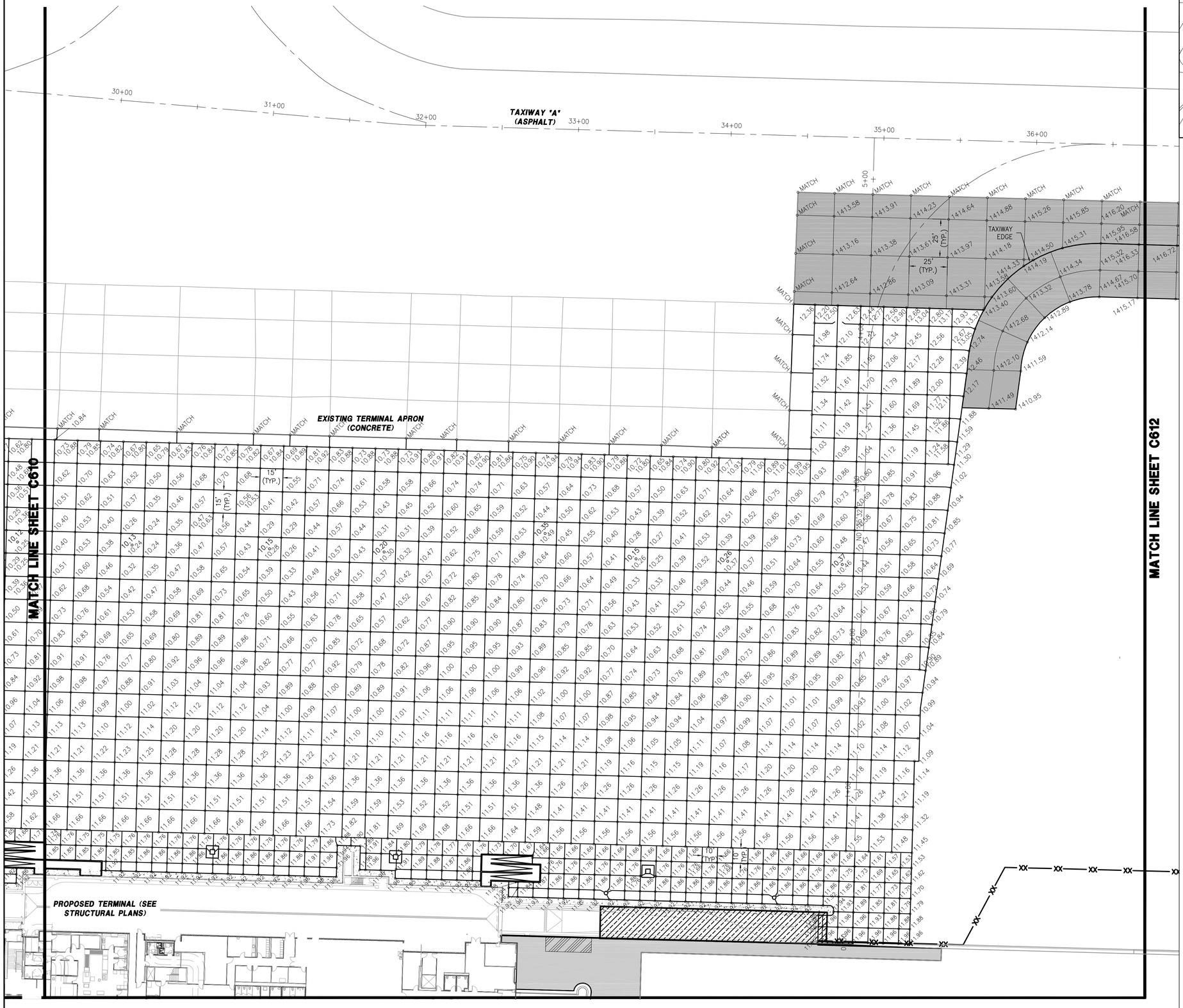
AEP PROJECT NUMBER
213-1882-091

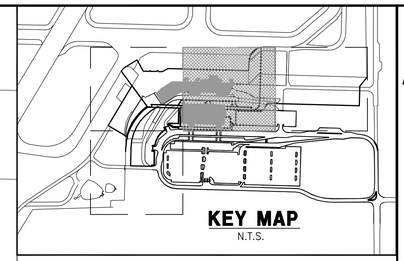
SHEET TITLE
CONCRETE JOINT AND SPOT ELEVATION PLAN (SHEET 1 OF 4)

SHEET NUMBER
C610

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C610.dwg Plotted on: 2/8/2012 7:52 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

CONCRETE JOINT ELEVATION NOTES

1. SEE SHEET C003 FOR LEGEND.
2. SEE C601–C602 FOR CONCRETE PAVEMENT JOINT LAYOUT INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

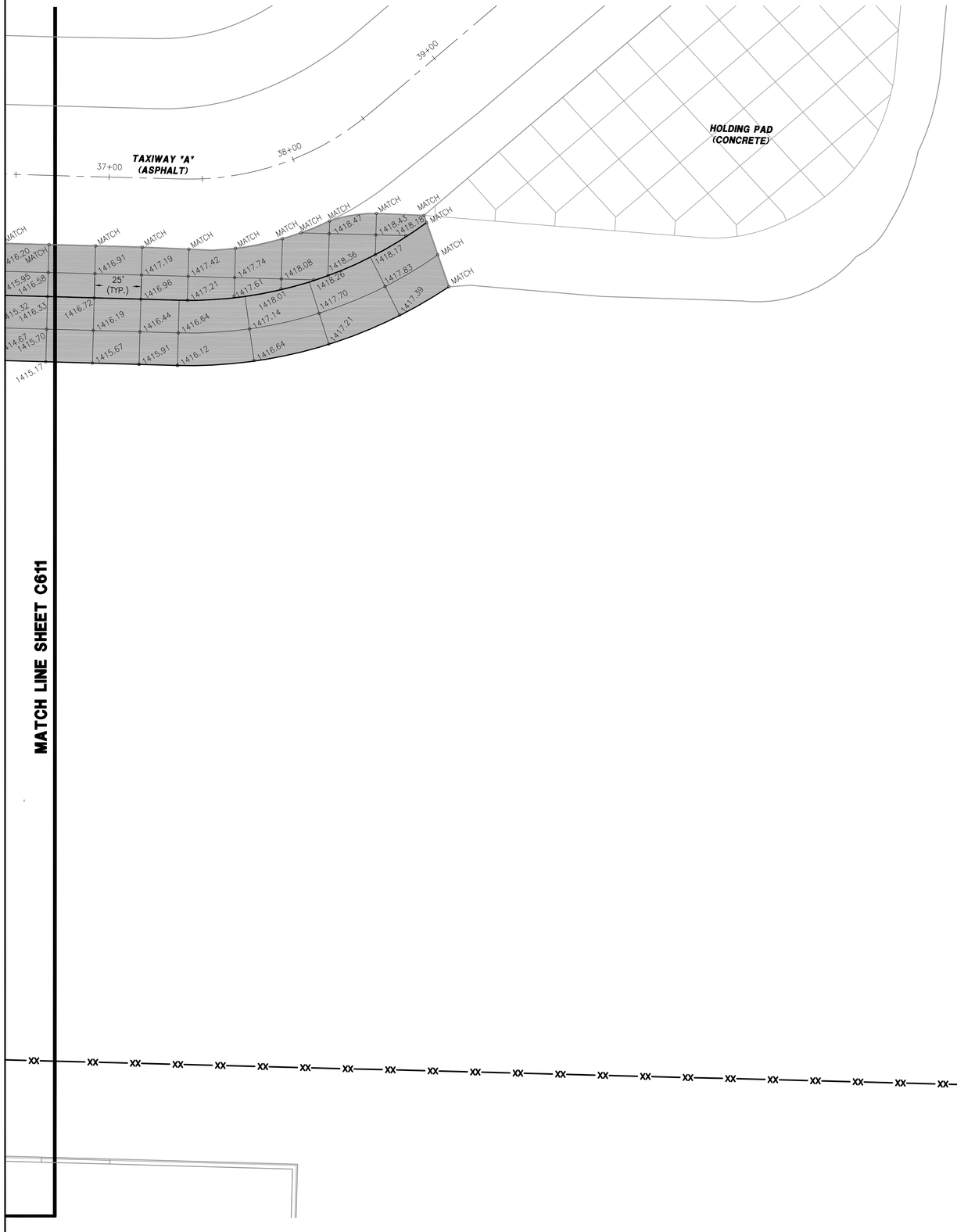
AEP PROJECT NUMBER
213-1882-091

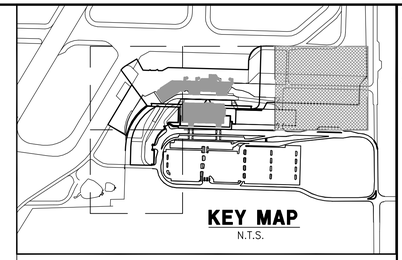
SHEET TITLE
CONCRETE JOINT AND SPOT ELEVATION PLAN (SHEET 2 OF 4)

SHEET NUMBER
C611

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C611.dwg Plotted on: 2/8/2012 7:56 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

CONCRETE JOINT ELEVATION NOTES

1. SEE SHEET C003 FOR LEGEND.
2. SEE C601–C602 FOR CONCRETE PAVEMENT JOINT LAYOUT INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

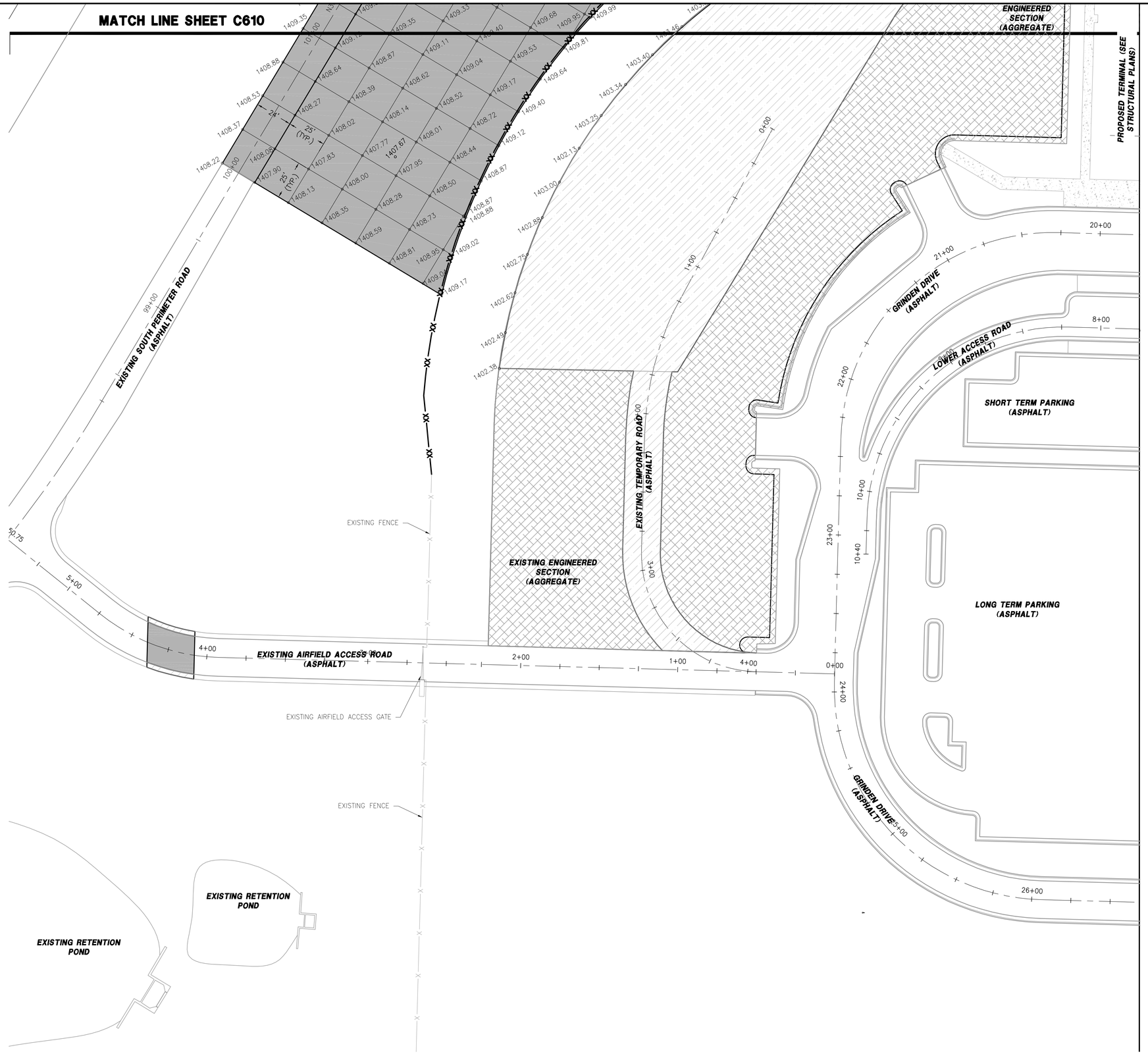
AEP PROJECT NUMBER
213-1882-091

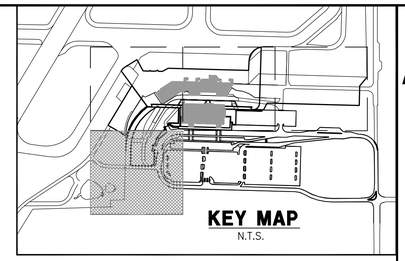
SHEET TITLE
CONCRETE JOINT AND SPOT ELEVATION PLAN (SHEET 3 OF 4)

SHEET NUMBER
C612

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C612.dwg Plotted on: 2/8/2012 8:01 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

CONCRETE JOINT ELEVATION NOTES

1. SEE SHEET C003 FOR LEGEND.
2. SEE C601-C602 FOR CONCRETE PAVEMENT JOINT LAYOUT INFORMATION.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

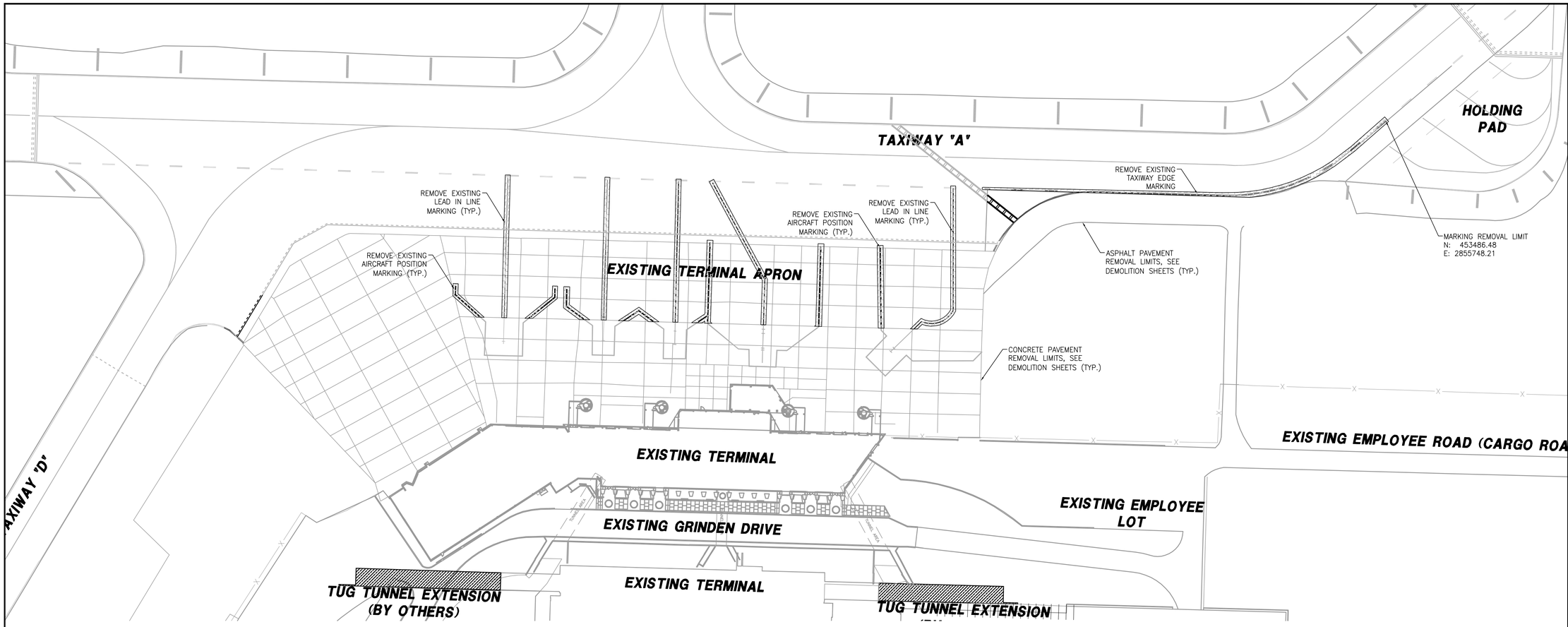
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
CONCRETE JOINT AND SPOT ELEVATION PLAN (SHEET 4 OF 4)

SHEET NUMBER
C613

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM SET\CAD\DESIGN\C\DLH-C613.dwg Plotted on: 2/7/2012 9:47 AM Plotted by: Erdmann, Ryan



PAVEMENT MARKING NOTES

1. SEE SHEET SERIES C100 FOR DEMOLITION PLANS.
2. SEE SHEET C701 FOR PROPOSED PAVEMENT MARKINGS.
3. REMOVAL OF EXISTING MARKINGS SHALL BE ACCORDING TO CONSTRUCTION SEQUENCE ESTABLISHED IN THE PHASING PLANS.
4. ALL MARKING REMOVAL SHALL BE IN COMPLIANCE WITH SPECIFICATION SECTION P-620.
5. THE CONTRACTOR SHALL PROTECT EXISTING MARKING TO REMAIN AT ALL TIMES. ALL DAMAGE RESULTING FROM CONTRACTOR RELATED ACTIVITIES SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
6. ALL FIELD CONDITONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO REMOVAL AND INSTALLATION OF PROPOSED MARKINGS.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

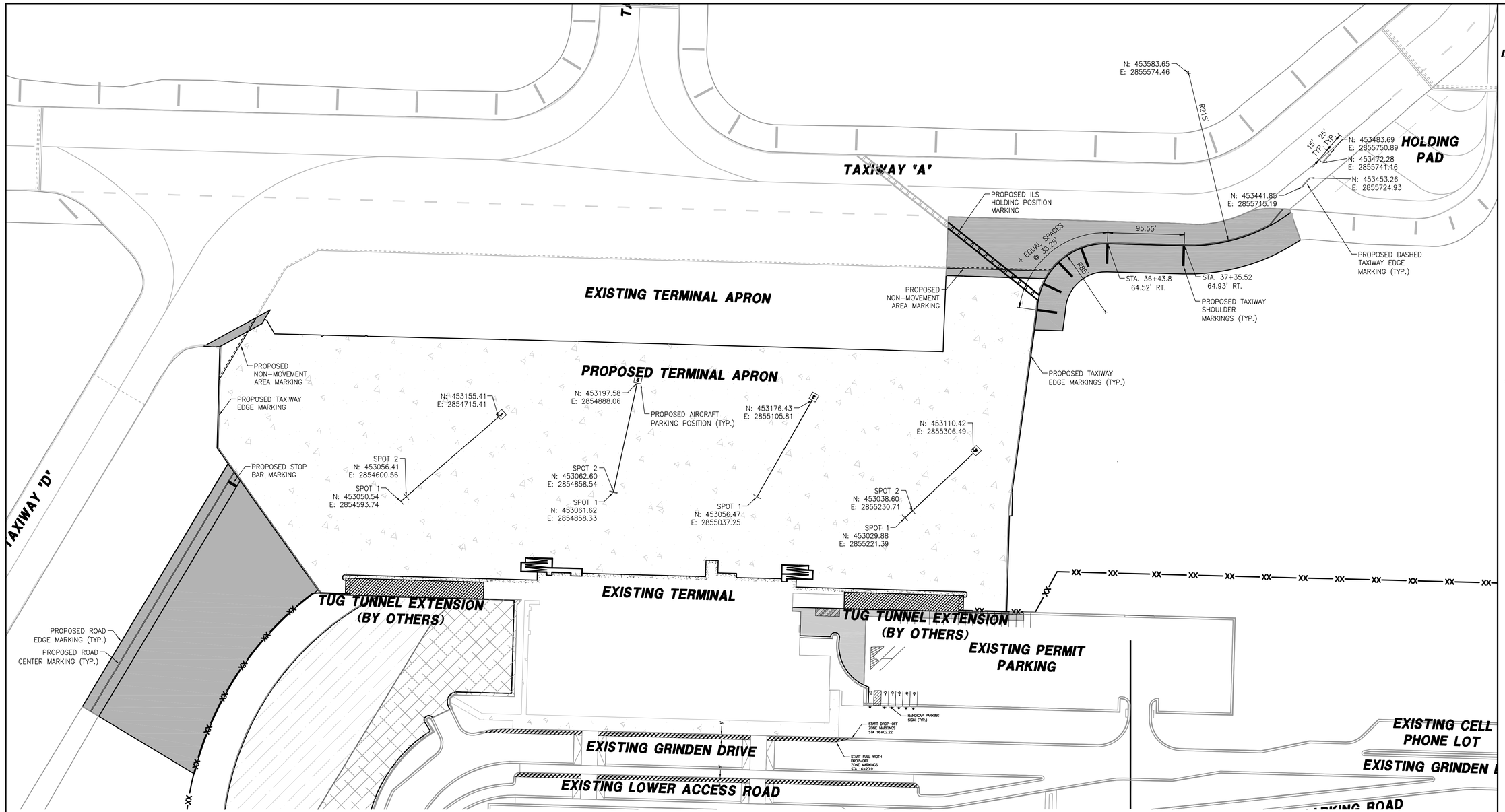
SHEET TITLE

PAVEMENT MARKING REMOVAL PLAN

SHEET NUMBER
C700

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C700.dwg Plotted on: 2/7/2012 10:08 AM Plotted by: Erdmann, Ryan



AIRCRAFT PARKING POSITION PAVEMENT MARKING TABLE

	SPOT 1	SPOT 2
PARKING POSITON 1	MD-80, 757-300	A319, B737-500, CRJ-200, A320-200, SAAB 2000
PARKING POSITON 2	SAAB 2000	A319, B737-500, CRJ-200, MD-80, A320-200
PARKING POSITON 3	A319, B737-500, CRJ-200, MD-80, A320-200, SAAB 2000	
PARKING POSITON 4	MD-80	A319, B737-500, CRJ-200, A320-200, SAAB 2000

PAVEMENT MARKING NOTES

1. SEE SHEET SERIES C200 FOR GEOMETRY PLANS.
2. SEE SHEET C700 FOR PAVEMENT MARKINGS REMOVAL.
3. SEE SHEET C710 FOR PAVEMENT MARKING DETAILS.
4. INSTALLATION OF PAVEMENT MARKINGS SHALL BE ACCORDING TO CONSTRUCTION SEQUENCE ESTABLISHED IN THE PHASING PLANS.
5. ALL MARKING SHALL BE IN COMPLIANCE WITH SPECIFICATION SECTION P-620.
6. THE CONTRACTOR SHALL PROTECT EXISTING MARKING TO REMAIN AT ALL TIMES. ALL DAMAGE RESULTING FROM CONTRACTOR RELATED ACTIVITIES SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
7. ALL FIELD CONDIITONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO REMOVAL AND INSTALLATION OF PROPOSED MARKINGS.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

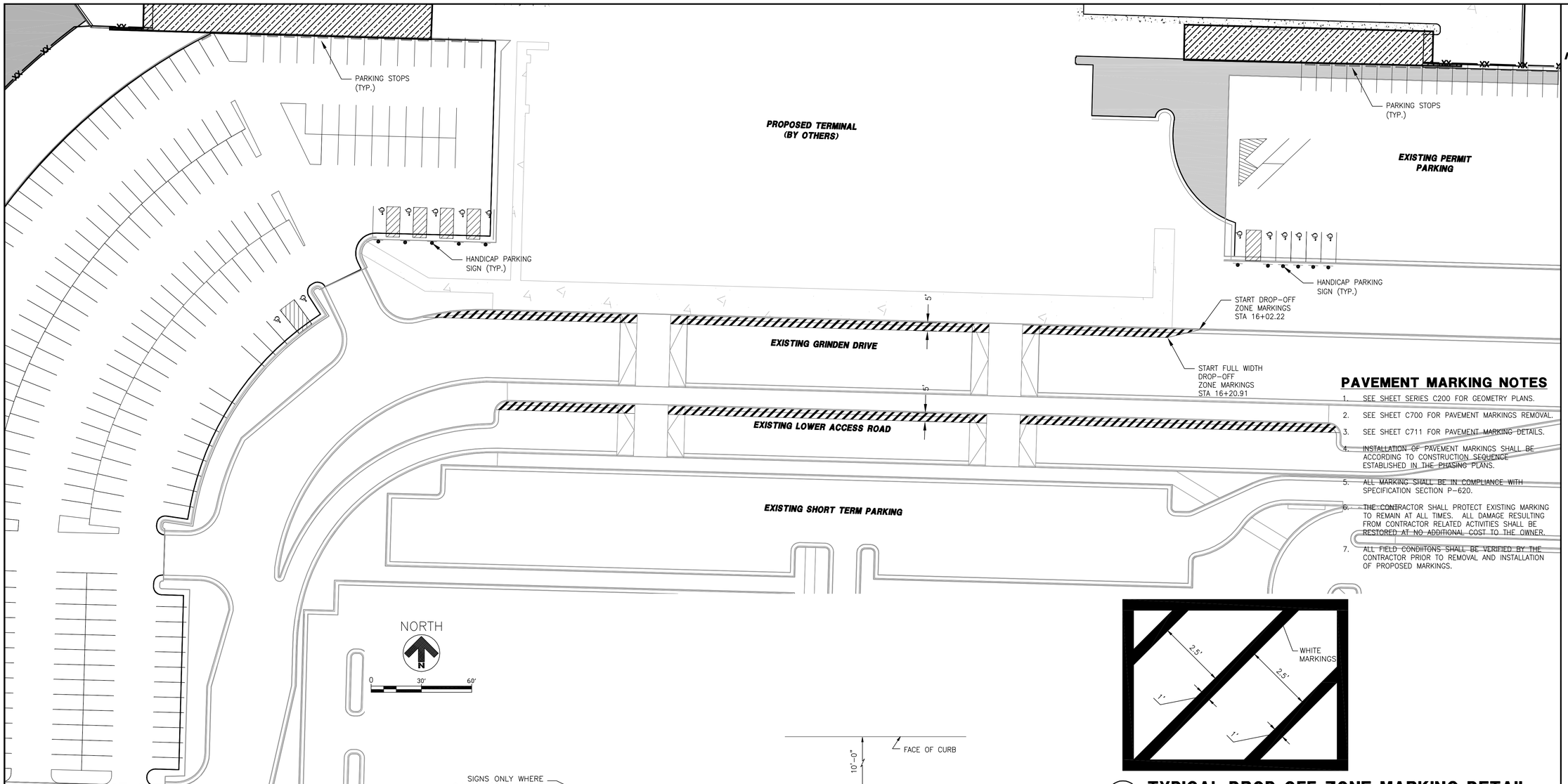
PAVEMENT MARKING PLAN

SHEET NUMBER

C701

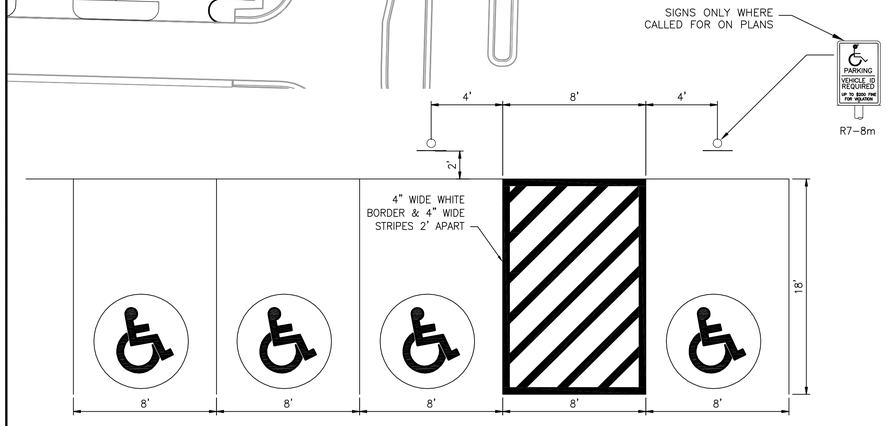
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM SET\CAD\DESIGN\C\DLH-C701.dwg Plotted on: 2/7/2012 10:10 AM Plotted by: Erdmann, Ryan

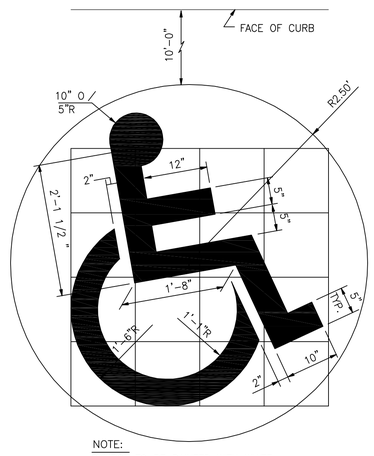


PAVEMENT MARKING NOTES

1. SEE SHEET SERIES C200 FOR GEOMETRY PLANS.
2. SEE SHEET C700 FOR PAVEMENT MARKINGS REMOVAL.
3. SEE SHEET C711 FOR PAVEMENT MARKING DETAILS.
4. INSTALLATION OF PAVEMENT MARKINGS SHALL BE ACCORDING TO CONSTRUCTION SEQUENCE ESTABLISHED IN THE PHASING PLANS.
5. ALL MARKING SHALL BE IN COMPLIANCE WITH SPECIFICATION SECTION P-620.
6. THE CONTRACTOR SHALL PROTECT EXISTING MARKING TO REMAIN AT ALL TIMES. ALL DAMAGE RESULTING FROM CONTRACTOR RELATED ACTIVITIES SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
7. ALL FIELD CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO REMOVAL AND INSTALLATION OF PROPOSED MARKINGS.



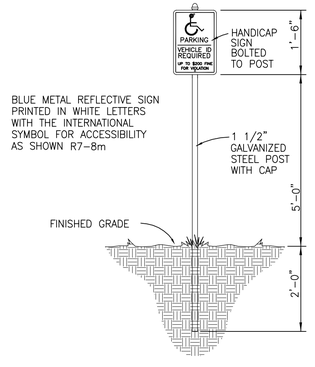
1 C702 **TYPICAL HANDICAP PARKING SPACE DETAIL**
SCALE: N.T.S.



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

2 C702 **TYPICAL PAVEMENT MARKING FOR HANDICAPPED SYMBOL**
SCALE: N.T.S.

3 C702 **TYPICAL DROP OFF ZONE MARKING DETAIL**
SCALE: N.T.S.



4 C702 **TYPICAL HANDICAP PARKING SIGN**
SCALE: N.T.S.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd. Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lakeave Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: MDH

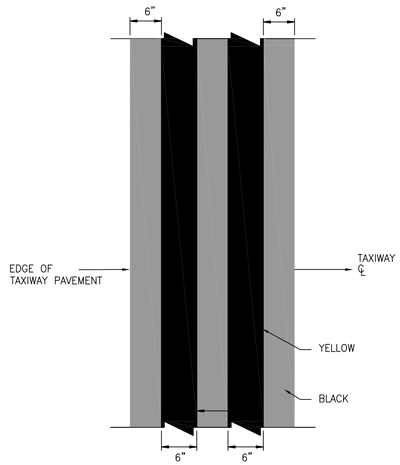
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
LANDSIDE PAVEMENT MARKING PLAN & DETAILS

SHEET NUMBER
C702

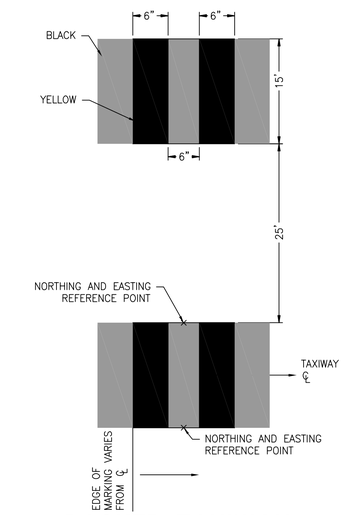
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C702.dwg Plotted on: 2/10/2012 3:06 PM Plotted by: Erdmann, Ryan



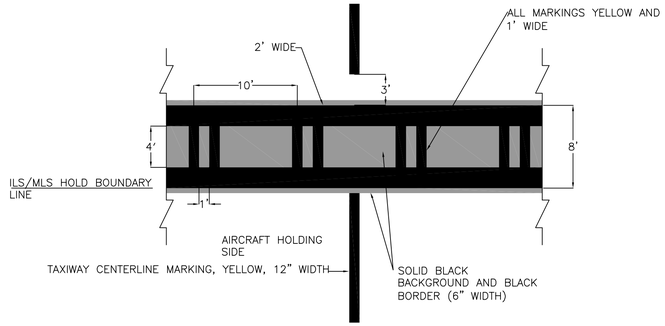
1 C710 TAXIWAY EDGE MARKING

SCALE: N.T.S.



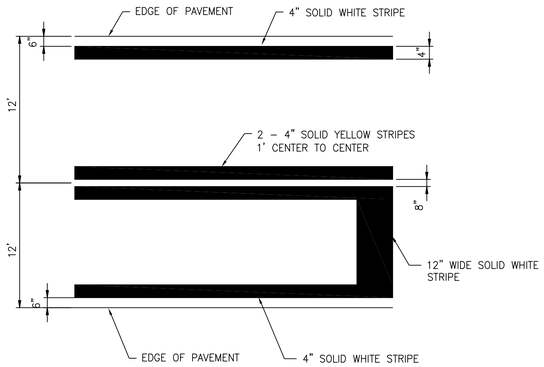
2 C710 DASHED TAXIWAY EDGE MARKING

SCALE: N.T.S.



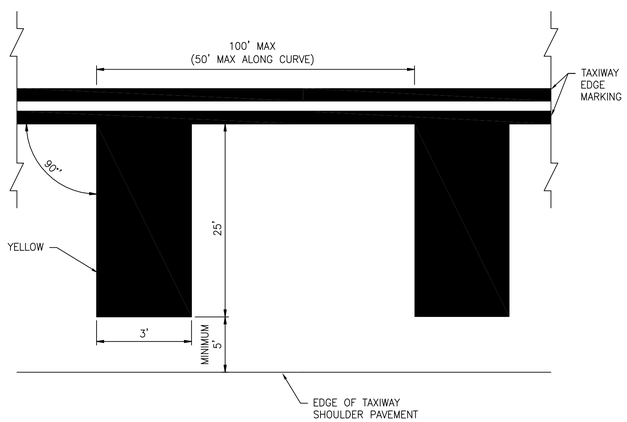
3 C710 ILS HOLDING POSITION MARKING

SCALE: N.T.S.



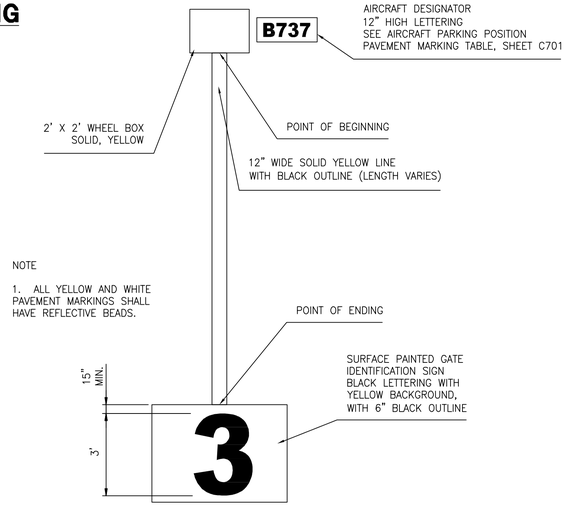
5 C710 PERIMETER ROAD MARKING

SCALE: N.T.S.



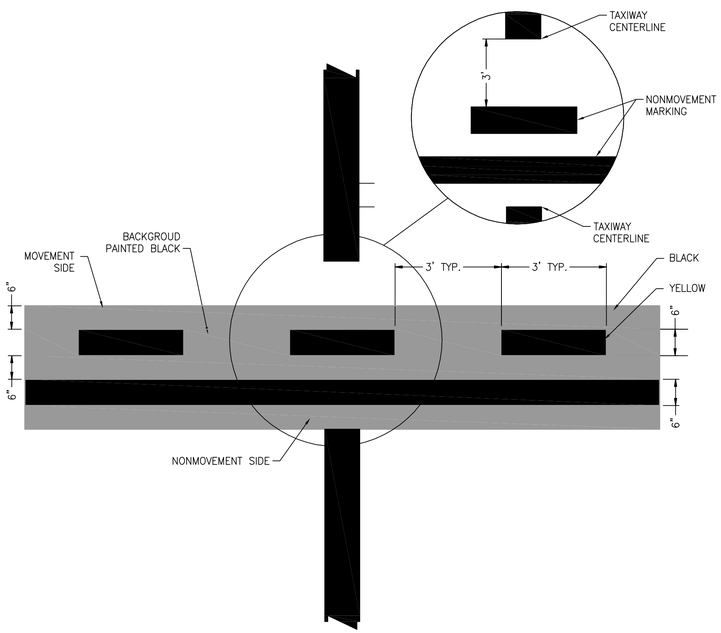
6 C710 TAXIWAY SHOULDER MARKING

SCALE: N.T.S.



4 C710 GATE PARKING POSITION MARKING

SCALE: N.T.S.



7 C710 TYPICAL NONMOVEMENT MARKING

SCALE: N.T.S.

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JKN
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

PAVEMENT MARKING DETAILS

SHEET NUMBER
C710

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-C710.dwg Plotted on: 2/7/2012 9:54 AM Plotted by: Erdmann, Ryan

ELECTRICAL GENERAL NOTES:

1. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR TO RELOCATE, MODIFY AND INSTALL THE AIRFIELD ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS. ITEMS NOT SHOWN BUT OBVIOUSLY NECESSARY FOR COMPLETION OF THE WORK SHALL BE INCLUDED.

2. ITEMS SHOWN IN SCREEN (HALFTONE OR LIGHT) ARE EXISTING OR CIVIL ITEMS. ITEMS SHOWN IN SOLID (BOLD) ARE NEW TO BE INSTALLED UNDER THIS CONTRACT, UNLESS OTHERWISE NOTED.

3. THE INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE, NATIONAL ELECTRICAL CODE, FEDERAL AVIATION ADMINISTRATION SPECIFICATIONS/ ADVISORY CIRCULARS AND APPLICABLE LOCAL BUILDING CODES.

4. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES, ETC., PRIOR TO COMMENCEMENT OF WORK. THE COST OF PERMITS, LICENSES, ETC., SHALL BE INCIDENTAL TO AND INCLUDED IN THE BID PRICE FOR THE RESPECTIVE PAY ITEMS.

5. ALL MATERIALS SCHEDULED FOR REMOVAL SUCH AS EXISTING LIGHTS, FIXTURES, SIGNS, ETC., WHICH ARE DEEMED SALVAGABLE BY THE AIRPORT SHALL BE DELIVERED TO THE LOCATION ON AIRPORT PROPERTY AS INDICATED BY THE AIRPORT. ALL NON-SALVAGABLE MATERIALS REMOVED SUCH AS MANHOLES, HANDHOLES, CONCRETE FOUNDATIONS, CONDUIT, CONDUCTORS, ETC. SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND LEGALLY DISPOSED OF OFF THE SITE BY THE CONTRACTOR.

6. EXISTING CONDUIT, DUCTBANK, CIRCUITING AND UTILITY INFORMATION IS BASED ON AIRPORT "AS BUILT" AND "RECORD" DRAWINGS AND SITE VISITS BY THE UTILITY COMPANIES AND THE ENGINEER. THE EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND SHALL NOT BE SCALED FOR EXACT LOCATIONS. NOT ALL UTILITIES MAY BE SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE APPROPRIATE UTILITY/AGENCY PRIOR TO STARTING WORK, FOR THE LOCATION OF EXISTING UTILITIES, ANY INTERPRETATION OF AN EXISTING SYSTEM OR UTILITY SERVICE SHALL BE C OORDINATED AND APPROVED BY THE AUTHORITY, AGENCY OR UTILITY HAVING JURISDICTION. PRIOR TO STARTING WORK, THE CONTRACTOR SHALL CONTACT ALL LOCAL UTILITIES TO ALLOW THEM TIME TO PROPERLY LOCATE ALL UTILITIES.

7. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE AIRPORT, FEDERAL AVIATION ADMINISTRATION, UTILITY COMPANIES, AND RESIDENT PROJECT REPRESENTATIVE (RPR) PRIOR TO AND DURING CONSTRUCTION TO ENSURE THAT ALL ELECTRICAL CIRCUITS AND FACILITIES HAVE BEEN LOCATED, FLAGGED AND ACCOUNTED FOR AND THAT ALL NECESSARY CIRCUITS HAVE BEEN DETERMINED PRIOR TO INITIATING CONSTRUCTION IN ANY LOCATION.

8. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO DETERMINE THAT ALL AIRFIELD LIGHTING CIRCUITS, EXCEPT THOSE THAT ARE SERVING CLOSED TAXIWAYS OR RUNWAYS, ARE COMPLETELY OPERATIONAL AT THE END OF EACH WORK SHIFT AND SHALL SO CERTIFY TO THE ENGINEER BEFORE THE END OF EACH SHIFT. THE CONTRACTOR SHALL NOT LEAVE THE WORK SITE UNTIL CIRCUIT OPERATION HAS BEEN CONFIRMED BY THE ENGINEER. TEMPORARY CABLE CONNECTIONS SHALL BE MADE IN AIRFIELD LIGHTING CIRCUITS WHEN PERMANENT WIRING CANNOT BE COMPLETED DURING THE WORK SHIFT. ALL AREAS NOT CLOSED FOR CONSTRUCTION (REFER TO PHASING PLAN) SHALL HAVE FULLY OPERABLE AIRFIELD LIGHTING DURING THE HOURS BETWEEN ONE HOUR BEFORE DUSK AND ONE HOUR AFTER DAWN. THE CONTRACTOR SHALL DISCUSS THE PROPOSED WIRING WITH THE RPR AND OBTAIN APPROVAL PRIOR TO COMMENCING WORK IN THAT AREA. ALL ELECTRICAL WIRING SHALL BE COMPLETED AND TESTED ONE (1) HOUR PRIOR TO THE ELECTRICAL MAINTENANCE DEPARTMENT'S END OF SHIFT.

9. ALL EXISTING SYSTEMS/UTILITIES TO REMAIN SHALL BE PROTECTED FROM DAMAGE. REPLACEMENT OF ANY DAMAGED EXISTING SYSTEMS/UTILITIES SHALL BE AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGED ELECTRICAL SYSTEMS AND SHALL MAKE REPAIRS IMMEDIATELY, AT THEIR OWN COST, IN ACCORDANCE WITH APPLICABLE SPECIFICATIONS. DAMAGED ELECTRICAL SYSTEMS SHALL BE IMMEDIATELY REPORTED TO THE RPR. THE CONTRACTOR IS URGED TO TAKE EVERY PRECAUTION NECESSARY TO PROTECT ANY AND ALL CABLES FROM DAMAGE OF ANY SORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KNOWING THE DEPTH OF ANY CABLE IN THE PROXIMITY OF THE CONSTRUCTION AS WELL AS THE HORIZONTAL LOCATION.

10. THE DUCT BANKS AND CONDUITS BETWEEN DEMOLISHED MANHOLES, HANDHOLES, BASE CANS, ETC. SHALL BE REMOVED EXCEPT WHERE LOCATED UNDER EXISTING PAVEMENT TO REMAIN OR WHERE THE DUCT OR CONDUIT IS TO BE EXTENDED IN THE NEW WORK.

11. ALL EXCAVATION WITHIN 10 FEET OF ANY UNDERGROUND UTILITY SHALL BE PERFORMED BY HAND EXCAVATION METHODS.

12. TAXIWAY EDGE LIGHTS SHALL BE INSTALLED 10 FEET FROM THE EDGE OF PAVEMENT OR AS OTHERWISE INDICATED. ALL STRAIGHT SECTIONS OF RUNWAY OR TAXIWAY EDGE LIGHTS SHALL BE ALIGNED TO DEVELOP A CONTINUOUS "IN-LINE" APPEARANCE OF THE LIGHTS WHEN VIEWED AT GROUND LEVEL FROM ONE END. ALL TAXIWAY EDGE LIGHTS ON STRAIGHT SECTIONS OF THE TAXIWAY SHALL BE LOCATED SUCH THAT A LINE BETWEEN LIGHTS ON OPPOSITE SIDES OF THE TAXIWAY IS PERPENDICULAR TO THE TAXIWAY CENTERLINE.

13. CHANGES TO THE LOCATION OF PROPOSED EQUIPMENT SHALL BE SUBMITTED BY THE CONTRACTOR TO THE RPR FOR APPROVAL. CONFLICTS THAT MAY OCCUR DUE TO CHANGES IN THE LOCATION OF THE LIGHTS SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.

14. ELECTRICAL DEMOLITION WORK SHALL BE LIMITED TO THE AREAS AND SCHEDULES INDENTIFIED IN THE DEMOLITION PLANS.

15. ALL GROUND RODS AND OTHER UNDERGROUND GROUNDING CONNECTIONS SHALL BE CADWELD OR APPROVED EQUIVALENT. CADWELD CONNECTIONS SHALL BE IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. THE PROPOSED COUNTERPOISE SYSTEM SHALL BE CONNECTED WITH THE EXISTING SYSTEM AT ALL CROSSING POINTS.

16. CIVIL DATA IS SHOWN ON ELECTRICAL DRAWINGS FOR REFERENCE ONLY. REFER TO CIVIL DRAWINGS FOR DRAINAGE AND GRADING DETAILS, DRAINAGE PLANS, ETC.

17. THE CONTRACTOR SHALL UTILIZE A LOCATE SERVICE AS WELL AS HAVE A CABLE TRACER AVAILABLE TO LOCATE THE EXISTING CABLES AND HAND DIGGING SHALL BE UNDERTAKEN WITHIN TEN (10) FEET OF ANY KNOWN OR SUSPECTED EXISTING UNDERGROUND CABLES AND UTILITIES WHICH ARE NOT TO BE DISTURBED.

18. SHOULD ANY RUNWAY OR TAXIWAY LIGHTING SYSTEM OR FAA SYSTEMS BE INOPERABLE DUE TO CONTRACTOR'S WORK, AND THE CONTRACTOR IS UNABLE TO RESTORE THE SYSTEM BY NIGHTFALL WITH PERMANENT REPAIRS, THE CONTRACTOR SHALL AT HIS OWN EXPENSE TAKE NECESSARY MEASURES TO ENSURE OPERATION OF THE SYSTEM DURING NIGHT HOURS. TEMPORARY WORK SHALL BE SUBJECT TO THE RPR'S APPROVAL. IF THE SYSTEM CANNOT BE RESTORED BY NIGHTFALL, THE CONTRACTOR SHALL INSTALL A TEMPORARY SYSTEM OF BATTERY OPERATED LIGHTS WITH THE APPROPRIATE COLORED LENSES FOR BOTH THRESHOLD AND RUNWAY EDGE LIGHTING TO ENSURE THE RUNWAY OPERATIONS CAN OCCUR. THE COST OF SUCH TEMPORARY LIGHTING SYSTEMS SHALL BE AT THE SOLE COST OF THE CONTRACTOR AND SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN OTHER ITEMS OF WORK.

19. DEWATERING FOR THE INSTALLATION OF STRUCTURES AND/OR DUCTBANKS IS INCIDENTAL TO THE RESPECTIVE PAY ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR AND OBTAIN ANY AND ALL PERMITS REQUIRED FOR DEWATERING.

20. THE AIRPORT "LOCK/TAG/TRY" PROCEDURE AND NFPA 70E SHALL BE COMPLIED WITH BY THIS CONTRACTOR

21. ALL DUCT LOCATED IN OR UNDER THE PAVEMENT AND WITHIN 5 FEET OF THE EDGE OF THE SHOULDER PAVEMENT SHALL BE CONCRETE ENCASED DUCT. ALL OTHER 2" DUCT SHALL BE DIRECT BURIED.

22. PROJECT PAY ITEMS: THE PROJECT PAY ITEMS ARE PROVIDED TO BE INCLUSIVE OF ALL WORK TO BE PERFORMED AS SHOWN IN THESE PLANS. ALL WORK TO BE IDENTIFED WITH A SPECIFIC PAY ITEM IS TO BE CONSIDERED REQUIRED WORK TO COMPLETE THE PROJECT AND IS TO BE SUBSIDIARY TO THE COST OF PROJECT PAY ITEMS PROVIDED.

23. THIS CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO STARTING WORK.

24. THE CONTRACTOR SHALL CONDUCT GROUND RESISTANCE TESTS (MEGGER) ON EACH CIRCUIT AFFECTED BY THIS WORK BEFORE COMMENCING WORK ON THAT CIRCUIT. CONTRACTOR SHALL PREPARE AND FORWARD TO THE ENGINEER A WRITTEN REPORT, BY CIRCUIT, OF THESE RESULTS. THE CONTRACTOR SHALL REPEAT THIS TEST ON EACH AFFECTED CIRCUIT AFTER COMPLETION OF THE WORK. RESULTS OF BOTH TESTS SHALL BE PROVIDED TO THE ENGINEER.

25. THE IDENTITY AND ROUTING OF ALL CABLES SHOWN ON THE PLANS SHALL BE VERIFIED IN THE FIELD. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE RPR AND RECORDED IN THE AS-BUILT DRAWINGS TO PROVIDE AN ACCURATE RECORD OF CONDITIONS. THE CONTRACTOR SHALL COORDINATE INFORMATION SHOWN ON THE PLAN SHEETS WITH EXISTING RECORD INFORMATION AVAILABLE THROUGH THE AIRPORT MAINTENANCE STAFF. THESE PLANS DO NOT PURPORT TO SHOW ALL EXISTING CABLES AND CONCEALED UTILTIES WHICH WIILL REQUIRE STAKE OUT PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY EXISTING CIRCUIT ROUTING PRIOR TO COMMENCING WORK.

26. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE SAFETY, SECURITY AND PHASING PLANS.

27. WHENEVER, IN THE CONTRACT DOCUMENTS, THE WORDS "PROVIDE", "FURNISH", "INSTALL", "FURNISH AND INSTALL", OR OTHER WORDS OF LIKE IMPORT ARE USED, IT SHALL BE UNDERSTOOD THAT THE INTENT OF THE CONTRACT DOCUMENTS IS TO PROVIDE FOR THE CONSTRUCTION AND COMPLETION IN EVERY DETAIL OF THE WORK DESCRIBED. IT IS FURTHER INTENDED THAT THE CONTRACTOR SHALL FURNISH ALL LABOR, SUPERVISION, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, SUPPLIES, TESTING AND INCIDENTALS REQUIRED TO COMPLETE THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

28. THE CONTRACTOR SHALL COMPLETELY SURVEY AND STAKE OUT EACH AREAS' LAYOUT PRIOR TO STARTING ANY INSTALLATION. SHOULD ANY IRREGULARITIES OCCUR IN THE LAYOUT, THE RPR SHALL BE NOTIFIED INMEDIATELY. THE BID ITEM PRICE SHALL INCLUDE THE NECESSARY LAYOUT FOR EACH ITEM AND THE COST FOR ANY ADDITIONAL ADJUSTMENT OF THE LOCATION OF THE ITEMS DUE TO THE EXISTING GEOMETRIC CONDITIONS.

29. THERE ARE A NUMBER OF AIRPORT, PUBLIC UTILITIES AND FAA LIGHTING, COMMUNICATIONS, UNDERGROUNDCABLES AND PIPES TRAVERSING THE AIRFIELD. THE ENGINEER HAS MADE EVERY ATTEMPT TO SHOW THE APPROXIMATE LOCATION OF ALL ITEMS. HOWEVER, THE ENGINEER IS NOT RESPONSIBLE FOR SHOWING OR LOCATING EVERY ITEM CURRENTLY IN PLACE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY ITEM LOCATED, FLAGGED AND IDENTIFIED PRIOR TO START OF CONSTRUCTION. ANY DAMAGE DONE TO ANY OF THE EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL REPAIR ANY ITEM DAMAGED, CAUSED BY HIS ACTIONS, WITH NO ADDITIONA COMPENSATION.

30. THE CONTRACTOR SHALL THOROUGHLY INSPECT ALL MATERIALS UPON ARRIVAL AT THE PROJECT SITE FOR ANY DAMAGE THAT OCCURRED DURING SHIPPING OR FOR MATERIAL DEFECTS.

31. ALL WORK SHOWN TO BE DEMOLISHED ON THE DRAWINGS IS BASED ON FIELD OBSERVATION OF THE ACTUAL EXISTING CONDITIONS AND ON EXISTING "AS-BUILT" DRAWINGS OF THE AREAS AFFECTED. THEY ARE THEREFORE CONSIDERED TO BE SCHEMATIC. IT IS THE INTENT OF THE DEMOLITION DRAWINGS THAT ALL EQUIPMENT, DEVICES, FIXTURES, WIRING MATERIALS, SYSTEMS AND APPURTENANCES, ETC. WHICH ARE NO LONGER REQUIRED AS A RESULTOF THE PROJECT BE REMOVED.

32. NEW MATERIALS SHALL BE U.L. LISTED.

33. THERE SHALL BE NO SEPARATE MEASUREMENT AND PAYMENT FOR LABOR OR MATERIALS REQUIRED FOR TEMPORARY CIRCUITS AND THEIR INSTALLATIONS. THESE COSTS SHALL BE INCIDENTAL TO ALL OTHER WORK.

ELECTRICAL ABBREVIATIONS

ATS – AUTOMATIC TRANSFER SWITCH
AIP – AIRPORT IMPROVEMENT PROGRAM
AOA – AIRCRAFT OPERATIONS AREA
ASOS – AUTOMATED SURFACE OBSERVING SYSTEM
AWG – AMERICAN WIRE GAUGE
℄ – BASELINE
℄ – CENTERLINE
C – CONDUIT
CO – CLEANOUT
CONC – CONCRETE
DIA – DIAMETER
DWG – DRAWING
EL/ELEV – ELEVATION
EOP – EDGE OF PAVEMENT
ERSA – EXTENDED RUNWAY SAFETY AREA
EX/EXST/EXIST – EXISTING
FAA – FEDERAL AVIATION ADMINISTRATION
FOD – FOREIGN OBJECT DEBRIS
I/C – NUMBER OF CONDUCTORS/CONDUCTOR
kV – KILOVOLT
LF – LINEAR FEET
LT – LEFT
MAX – MAXIMUM
MES – MITERED END SECTION
MIN – MINIMUM
NOTAM – NOTICE TO AIRMEN
NTS – NOT TO SCALE
OC – ON CENTER
OFA – OBJECT FREE AREA
PC – POINT OF CURVATURE
PT – POINT OF TANGENCY
PVC – POLYVINYL CHLORIDE PIPE
RPR – RESIDENT PROJECT REPRESENTATIVE
RPU – REMOTE PROCESSING UNIT
R/W – RUNWAY
RSA – RUNWAY SAFETY AREA
RT – RIGHT
SCH – SCHEDULE
SGN – SIGN
SS – STAINLESS STEEL
STA – STATION
STD – STANDARD
T/L – TAXILANE
T/W – TAXIWAY
TWA – TAXIWAY 'A' CIRCUIT
TWD – TAXIWAY 'D' CIRCUIT
TBR – TO BE REMOVED
TSA – TAXIWAY SAFETY AREA
TYP – TYPICAL
UD – UNDERDRAIN
UGE – UNDERGROUND ELECTRICAL DUCT
321– RUNWAY 3–21 CIRCUIT
927– RUNWAY 9–27 CIRCUIT

CABLE / TAGGING SCHEDULE

TAXIWAY D EDGE LIGHTING CABLE	TWD	1/C #8, 5KV, SERIES LIGHTING CABLE, TYPE L824, NUMBER OF CABLES AS NOTED
TAXIWAY A EDGE LIGHTING CABLE	TWA	1/C #8, 5KV, SERIES LIGHTING CABLE, TYPE L824, NUMBER OF CABLES AS NOTED

LEGEND

EXISTING TAXIWAY EDGE LIGHT FIXTURE, ISOLATION TRANSFORMER AND ASSOCIATED EQUIPMENT, ON EXISTING L-867 BASE CAN

2-TWA
4-WAY, 4" — EXISTING DUCTBANK, SIZE AND NUMBER AS INDICATED TO REMAIN. NUMERAL INDICATES THE NUMBER OF 1/C #8 5KV SERIES LIGHTING CABLES. 'W1' INDICATES CIRCUIT DESIGNATION. LIGHT TEXT INDICATES EXISTING CABLING. HEAVY TEXT INDICATES FURNISH AND INSTALL CABLING

EXISTING SINGLE OR DOUBLE FACED INTERNALLY ILLUMINATED TAXIWAY GUIDANCE SIGN. REMOVE EXISTING SIGN AND FOUNDATION AND ASSOCIATED EQUIPMENT AT LOCATIONS PER PLAN

64 — SIGN IDENTIFICATION NUMBER

EXISTING ELECTRICAL MANHOLE

TB — EXISTING TELEPHONE BOX

UE — EXISTING UNDERGROUND ELECTRICAL DUCT BANK/CABLE

UED — EXISTING UNDERGROUND ELECTRICAL DUCT

E — EXISTING UNDERGROUND SITE LIGHTING POWER CABLE

EXISTING AIRFIELD LIGHTING POWER CABLE

EXISTING LIGHT & POLE

UT — EXISTING UNDERGROUND TELEPHONE CABLE

UTV — EXISTING CATV CABLES

FO — EXISTING FIBER OPTIC CABLE

PROPOSED SINGLE FACE OR DOUBLE FACE INTERNALLY ILLUMINATED TAXI GUIDANCE SIGN.

PROPOSED L-861T LED TAXIWAY EDGE LIGHT AND L-867-B BASE CAN (LENS AND LAMP, 360 DEGREES – BLUE COLOR),

1-TWYD — PROPOSED 2" PVC CONDUIT, FURNISH AND INSTALL SERIES LIGHTING CABLE. NUMERAL INDICATES NUMBER OF 1/C #8, 5kV SERIES LIGHTING CABLES, TYPE L-824. 'TWYA' INDICATES CIRCUIT DESIGNATION,

J — PROPOSED JUNCTION BOX, L-867, CLASS I, SIZE B, 24" DEEP, 12" WIDE

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

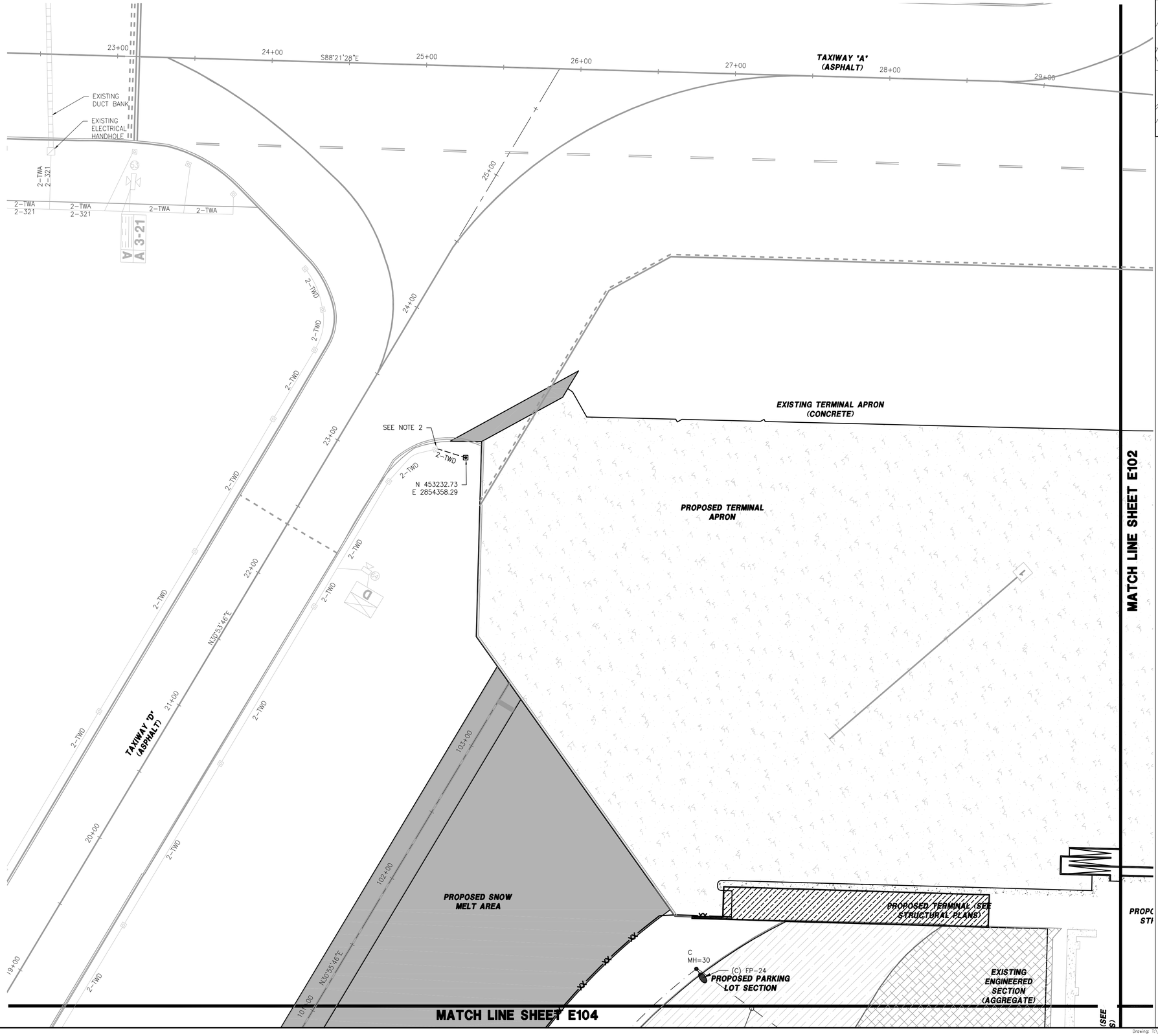
SHEET TITLE

ELECTRICAL NOTES

SHEET NUMBER

E000

BID PACKAGE 3
100% REVIEW



NORTH

0 30' 60'

LIGHTING AND SIGNAGE NOTES

1. FOR LEGEND, ABBREVIATIONS, AND GENERAL ELECTRICAL NOTES, SEE SHEET E000.
2. EXTEND PROPOSED CONDUIT AND CABLING TO EXISTING STAKE MOUNTED LIGHT. SPLICE NEW LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION.
3. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" AND RUNWAY 9-27 LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
4. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
5. SEE SHEET E300 FOR AIRFIELD SIGNAGE PLAN INFO.
6. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR FOR ANY AND ALL JUMPERS TO MAINTAIN EXISTING LIGHTING CIRCUITS AS REQUIRED.

WARNING
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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

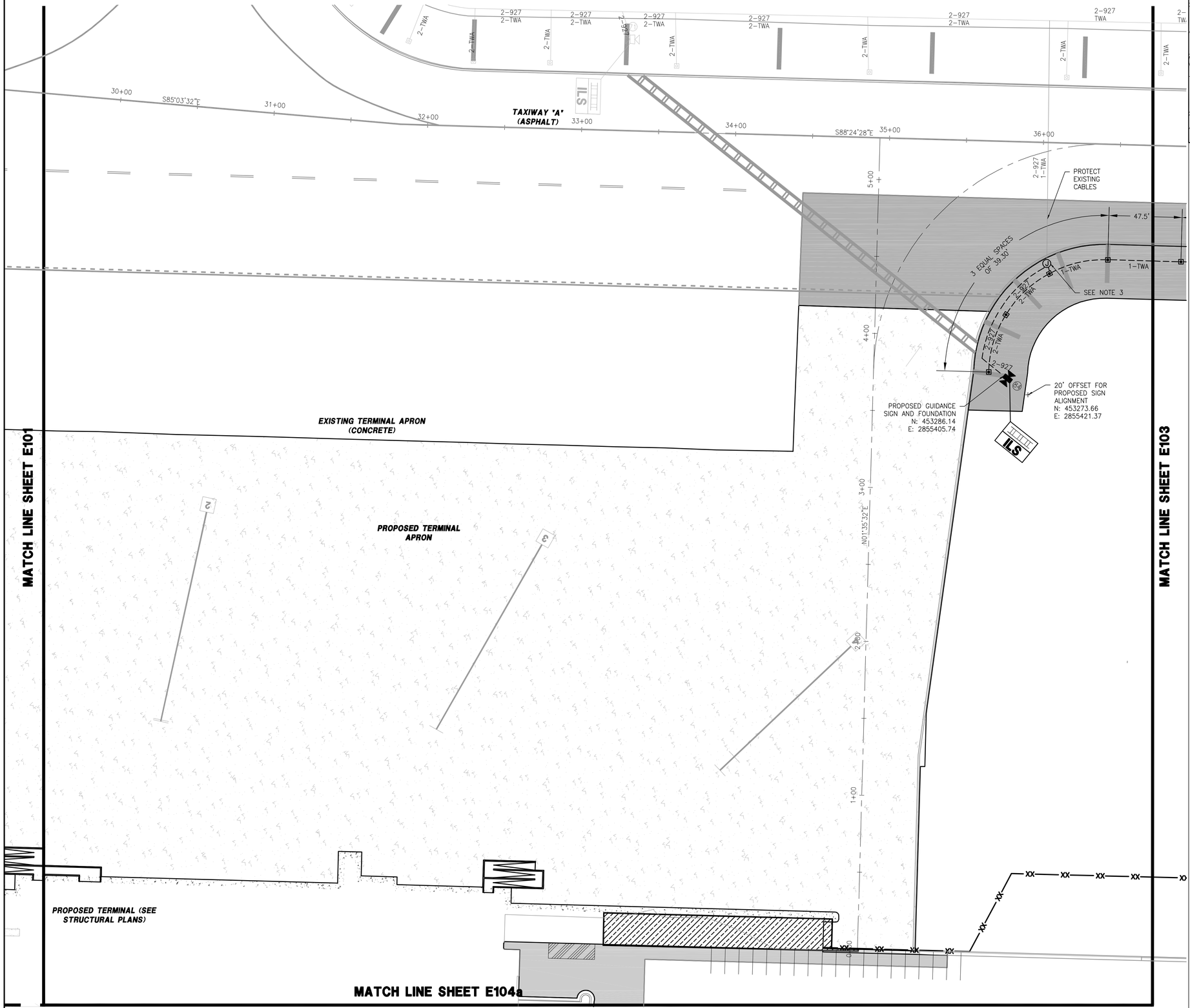
AEP PROJECT NUMBER
213-1882-091

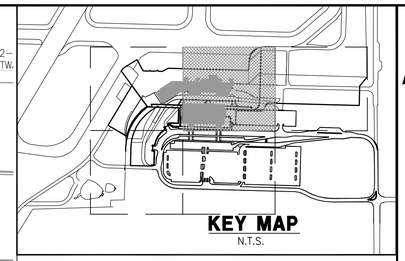
SHEET TITLE

PROPOSED LIGHTING AND SIGNAGE PLAN (SHEET 1 OF 5)

SHEET NUMBER
E101

BID PACKAGE 2C
BID DOCUMENTS





NORTH

0 30' 60'

LIGHTING AND SIGNAGE NOTES

1. FOR LEGEND, ABBREVIATIONS, AND GENERAL ELECTRICAL NOTES, SEE SHEET E000.
2. EXTEND PROPOSED CONDUIT AND CABLING TO EXISTING STAKE MOUNTED LIGHT. SPLICE NEW LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION.
3. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" AND RUNWAY 9-27 LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
4. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
5. SEE SHEET E300 FOR AIRFIELD SIGNAGE PLAN INFO.
6. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR FOR ANY AND ALL JUMPERS TO MAINTAIN EXISTING LIGHTING CIRCUITS AS REQUIRED.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

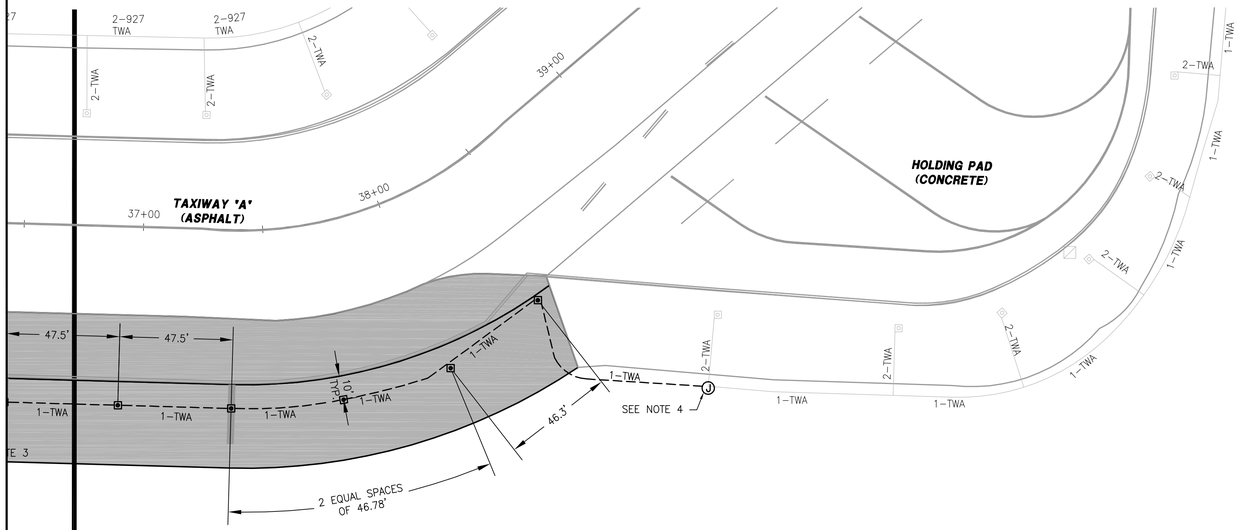
PROPOSED LIGHTING AND SIGNAGE PLAN (SHEET 2 OF 5)

SHEET NUMBER

E102

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-E102.dwg Plotted on: 2/7/2012 10:15 AM Plotted by: Erdmann, Ryan



KEY MAP
N.T.S.

LIGHTING AND SIGNAGE NOTES

1. FOR LEGEND, ABBREVIATIONS, AND GENERAL ELECTRICAL NOTES, SEE SHEET E000.
2. EXTEND PROPOSED CONDUIT AND CABLING TO EXISTING STAKE MOUNTED LIGHT. SPLICE NEW LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION.
3. INSTALL NEW L–867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" AND RUNWAY 9–27 LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
4. INSTALL NEW L–867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
5. SEE SHEET E300 FOR AIRFIELD SIGNAGE PLAN INFO.
6. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR FOR ANY AND ALL JUMPERS TO MAINTAIN EXISTING LIGHTING CIRCUITS AS REQUIRED.

WARNING

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.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT
AUTHORITY

**DULUTH
INTERNATIONAL
AIRPORT
DULUTH, MN**

**NEW TERMINAL
DESIGN**

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
**AMERICAN ENGINEERING
TESTING, INC.**
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

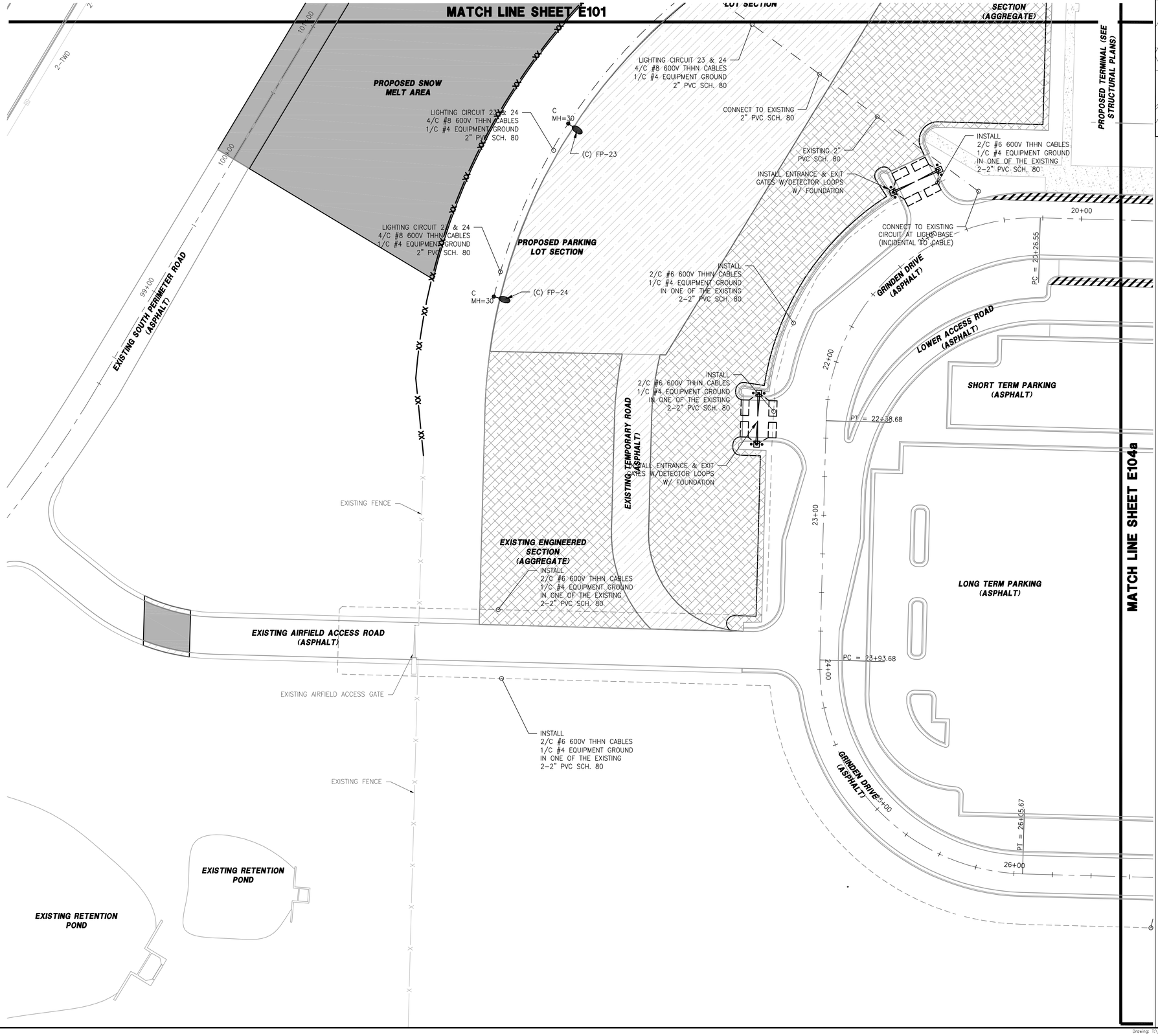
SHEET TITLE

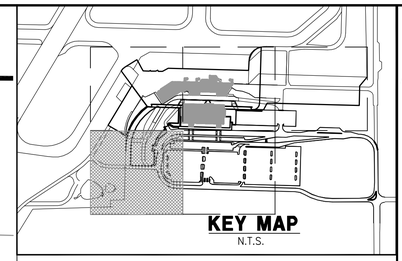
PROPOSED LIGHTING AND SIGNAGE PLAN (SHEET 3 OF 5)

SHEET NUMBER
E103

**BID PACKAGE 2C
BID DOCUMENTS**

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH–E103.dwg Plotted on: 2/7/2012 10:16 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

LIGHTING AND SIGNAGE NOTES

1. FOR LEGEND, ABBREVIATIONS, AND GENERAL ELECTRICAL NOTES, SEE SHEET E000.
2. EXTEND PROPOSED CONDUIT AND CABLING TO EXISTING STAKE MOUNTED LIGHT. SPLICE NEW LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION.
3. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" AND RUNWAY 9-27 LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
4. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
5. SEE SHEET E300 FOR AIRFIELD SIGNAGE PLAN INFO.
6. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR FOR ANY AND ALL JUMPERS TO MAINTAIN EXISTING LIGHTING CIRCUITS AS REQUIRED.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

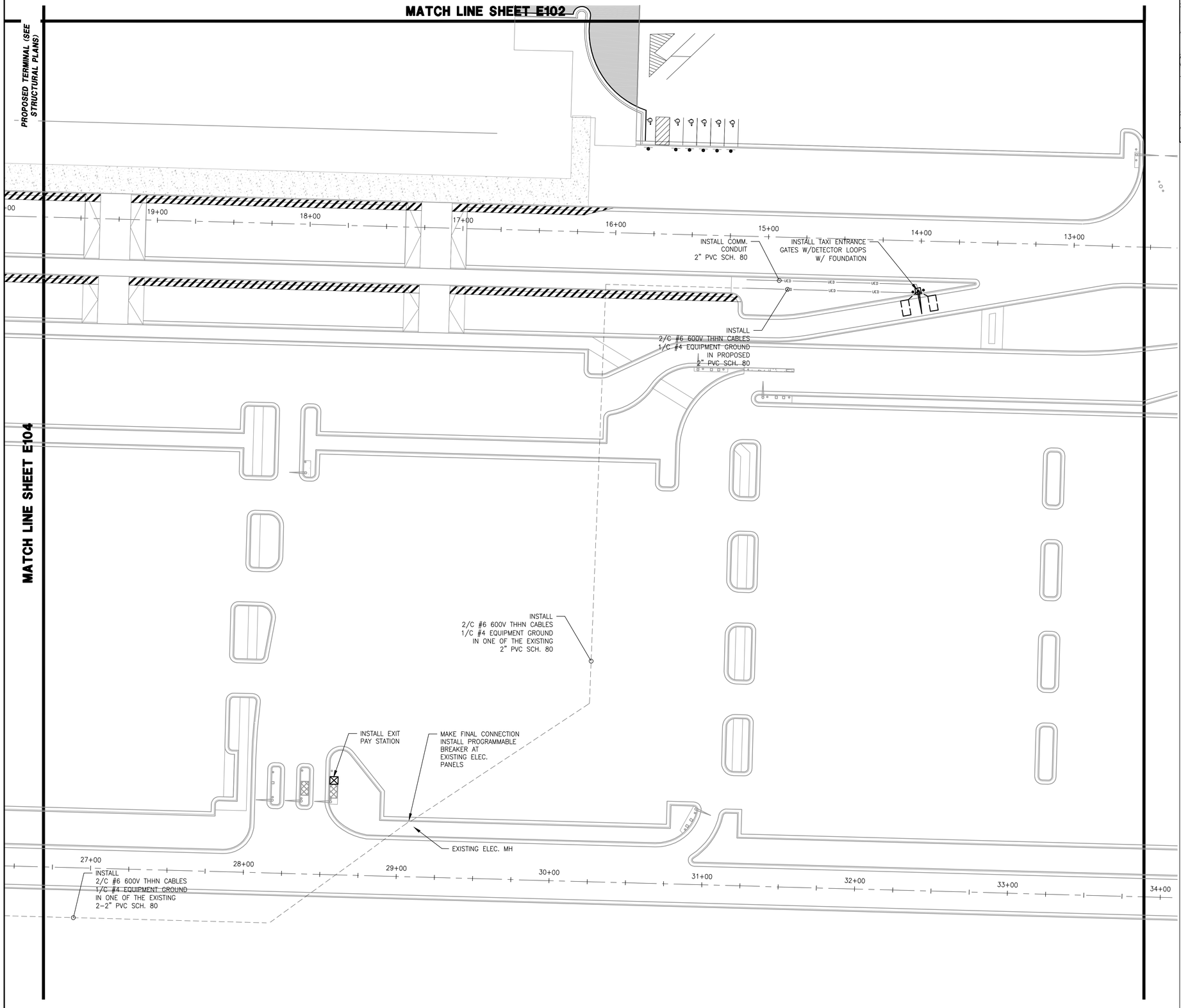
PROPOSED LIGHTING AND SIGNAGE PLAN (SHEET 4 OF 5)

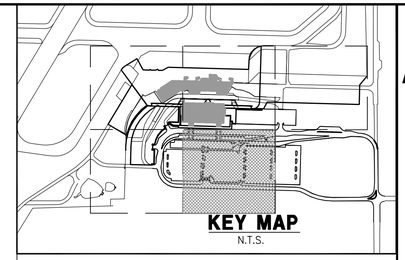
SHEET NUMBER

E104

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-E104.dwg Plotted on: 2/7/2012 10:18 AM Plotted by: Erdmann, Ryan





NORTH

0 30' 60'

LIGHTING AND SIGNAGE NOTES

1. FOR LEGEND, ABBREVIATIONS, AND GENERAL ELECTRICAL NOTES, SEE SHEET E000.
2. EXTEND PROPOSED CONDUIT AND CABLING TO EXISTING STAKE MOUNTED LIGHT. SPLICE NEW LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION.
3. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" AND RUNWAY 9-27 LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
4. INSTALL NEW L-867 BASE CAN AS SHOWN. SPLICE NEW TAXIWAY "A" LIGHTING CABLES WITH EXISTING LIGHTING CABLES TO ENSURE CONTINUITY WITH PROPOSED CIRCUIT. PROVIDE FITTINGS AND SEAL AS REQUIRED FOR PROPER INSTALLATION. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ROUTING OF EXISTING CIRCUITS PRIOR TO WORK TO PROTECT THE EXISTING CIRCUITS.
5. SEE SHEET E300 FOR AIRFIELD SIGNAGE PLAN INFO.
6. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR FOR ANY AND ALL JUMPERS TO MAINTAIN EXISTING LIGHTING CIRCUITS AS REQUIRED.

WARNING
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.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

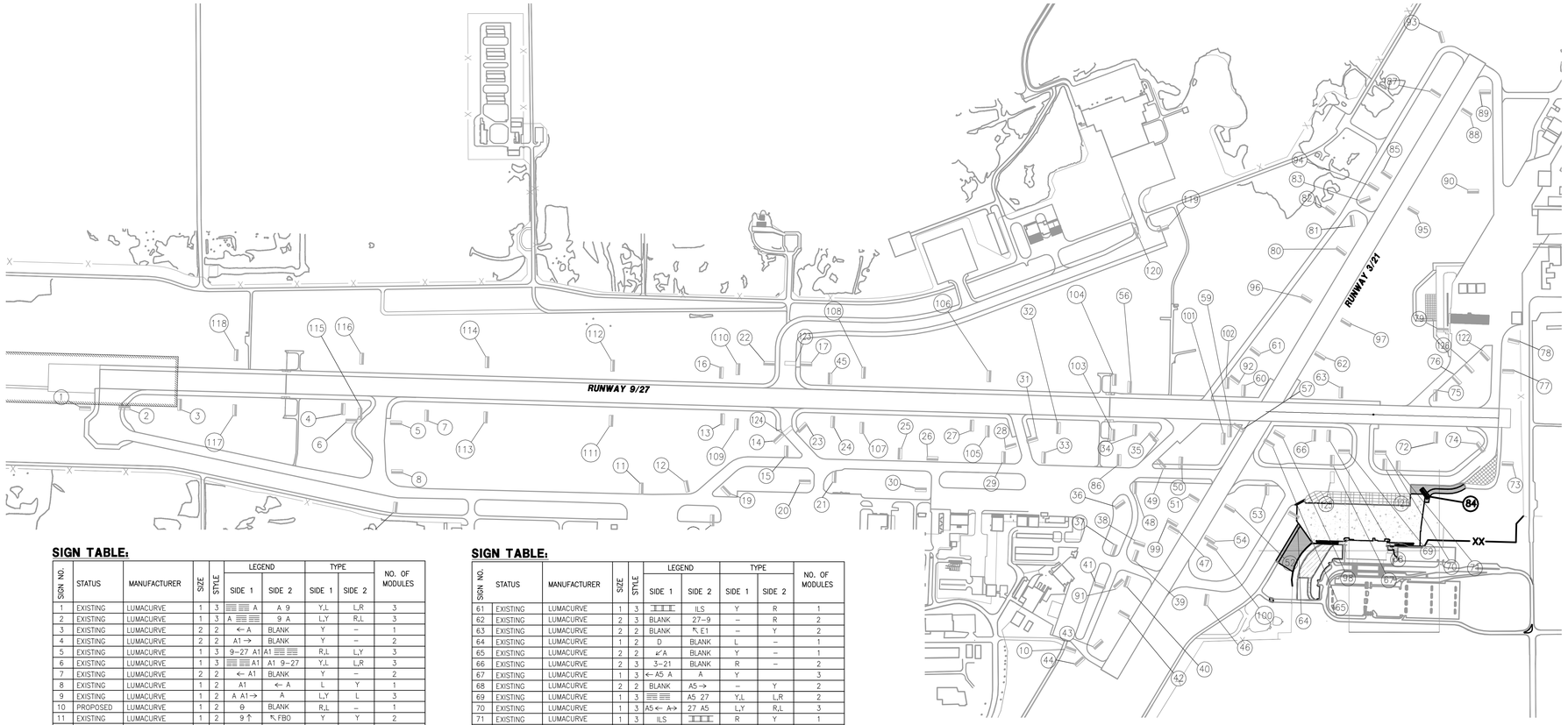
PROPOSED LIGHTING AND SIGNAGE PLAN (SHEET 5 OF 5)

SHEET NUMBER

E104a

BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\213188Z.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-E104a.dwg Plotted on: 2/7/2012 3:21 PM Plotted by: Erdmann, Ryan



NORTH

SCALE: 1"= 500'
500' 250' 0 500'

SIGN TABLE:

SIGN NO.	STATUS	MANUFACTURER	SIZE	STYLE	LEGEND SIDE 1	LEGEND SIDE 2	TYPE SIDE 1	TYPE SIDE 2	NO. OF MODULES
1	EXISTING	LUMACURVE	1	3	A	A 9	Y,L	L,R	3
2	EXISTING	LUMACURVE	1	3	A	9 A	L,Y	R,L	3
3	EXISTING	LUMACURVE	2	2	← A	BLANK	Y	–	1
4	EXISTING	LUMACURVE	2	2	A1→	BLANK	Y	–	2
5	EXISTING	LUMACURVE	1	3	9–27 A1	A1 9–27	R,L	L,Y	3
6	EXISTING	LUMACURVE	1	3	A1	A1 9–27	Y,L	L,R	3
7	EXISTING	LUMACURVE	2	2	← A1	BLANK	Y	–	2
8	EXISTING	LUMACURVE	1	2	A1	← A	L	Y	1
9	EXISTING	LUMACURVE	1	2	A A1→	A	L,Y	L	3
10	PROPOSED	LUMACURVE	1	2	θ	BLANK	R,L	–	1
11	EXISTING	LUMACURVE	1	2	9 ↑	↖ FBO	Y	Y	2
12	EXISTING	LUMACURVE	1	2	A	↖ A	L	Y	1
13	EXISTING	LUMACURVE	2	2	A2→	BLANK	Y	–	2
14	EXISTING	LUMACURVE	1	3	A2	A2 9–27	Y	L,R	3
15	EXISTING	LUMACURVE	1	2	BLANK	↙ A2 A	–	Y,L	3
16	EXISTING	LUMACURVE	2	2	←B	BLANK	Y	–	1
17	EXISTING	LUMACURVE	1	3	B	B 27–9	Y,L	L,R	3
18	EXISTING	LUMACURVE	1	2	A ↑	APRON ↑	Y	Y	3
19	REMOVE	LUMACURVE	1	2	A	A ↗	L	Y	1
20	EXISTING	LUMACURVE	1	2	APRON ↑	↖A ↖A2 A→	Y	Y	4
21	EXISTING	LUMACURVE	1	2	A A2 ↗	FBO ↑	L,Y	Y	3
22	EXISTING	LUMACURVE	1	3	B	27–9 B	L,Y	R,L	3
23	EXISTING	LUMACURVE	1	2	BLANK	↖A A2 A↘	–	Y,L,Y	3
24	EXISTING	LUMACURVE	2	2	← A2	BLANK	Y	–	2
25	EXISTING	LUMACURVE	1	2	FBO→	BLANK	Y	–	2
26	EXISTING	LUMACURVE	1	2	←9 27→	BLANK	Y	–	3
27	EXISTING	LUMACURVE	2	2	A3 ↗	BLANK	Y	–	2
28	EXISTING	LUMACURVE	1	3	A3	A3 9–27	Y,L	L,R	3
29	EXISTING	LUMACURVE	1	2	A	↙A3	L	Y	2
30	EXISTING	LUMACURVE	1	2	FBO↑	← A→	Y	Y	2
31	EXISTING	LUMACURVE	1	3	↖A A3 A↘	9–27 A3	Y,L,Y	R,L	3
32	EXISTING	LUMACURVE	2	2	BLANK	↙A3	–	Y	2
33	EXISTING	LUMACURVE	1	2	BLANK	A	–	L	2
34	EXISTING	LUMACURVE	2	2	BLANK	BLANK C↘	–	Y	3
35	EXISTING	LUMACURVE	1	3	C 9–27	C	L,R	Y,L	3
36	EXISTING	LUMACURVE	1	2	↖ A ↘	BLANK	Y	–	2
37	EXISTING	LUMACURVE	1	2	APRON ↑	D ← C →	Y	L,Y	3
38	EXISTING	LUMACURVE	1	2	C	C ← D →	L	L,Y	3
39	EXISTING	LUMACURVE	1	3	D	D 21–3	Y,L	L,R	3
40	EXISTING	LUMACURVE	1	3	21–3 D	D ← C →	R,L	L,Y	3
41	EXISTING	LUMACURVE	1	2	C ←D →	C	L,Y	L	3
42	EXISTING	LUMACURVE	2	2	C→	BLANK	Y	–	1
43	EXISTING	LUMACURVE	1	3	C 3	C 3	Y	L,R	2
44	EXISTING	LUMACURVE	1	2	BLANK	C↗	–	Y	1
45	EXISTING	LUMACURVE	2	2	BLANK	B→	–	Y	1
46	EXISTING	LUMACURVE	1	3	D	D 3–21	Y,L	L,R	3
47	EXISTING	LUMACURVE	2	2	D→	BLANK	Y	–	1
48	EXISTING	LUMACURVE	1	3	BLANK	3→	–	Y	1
49	EXISTING	LUMACURVE	1	2	↙A C A↗	BLANK	Y,L,Y	–	3
50	EXISTING	LUMACURVE	1	3	A	A 21–3	Y,L	L,R	3
51	EXISTING	LUMACURVE	2	2	BLANK	↙ A	–	Y	1
52	EXISTING	LUMACURVE	2	2	A ↗	BLANK	Y	–	1
53	EXISTING	LUMACURVE	1	3	A	A 3–21	Y,L	L,R	3
54	EXISTING	LUMACURVE	2	2	BLANK	↙ D	–	Y	1
56	EXISTING	LUMACURVE	2	2	BLANK	↖ C	–	Y	1
57	EXISTING	LUMACURVE	2	3	A ↗	9–27	Y	R	2
59	EXISTING	LUMACURVE	2	3	↖C	21–3	Y	R	2
60	EXISTING	LUMACURVE	2	3	BLANK	21–3	–	R	2

SIGN TABLE:

SIGN NO.	STATUS	MANUFACTURER	SIZE	STYLE	LEGEND SIDE 1	LEGEND SIDE 2	TYPE SIDE 1	TYPE SIDE 2	NO. OF MODULES
61	EXISTING	LUMACURVE	1	3		ILS	Y	R	1
62	EXISTING	LUMACURVE	2	3	BLANK	27–9	–	R	2
63	EXISTING	LUMACURVE	2	2	BLANK	↖ E1	–	Y	2
64	EXISTING	LUMACURVE	1	2	D	BLANK	L	–	1
65	EXISTING	LUMACURVE	2	2	↙A	BLANK	Y	–	1
66	EXISTING	LUMACURVE	2	3	3–21	BLANK	R	–	2
67	EXISTING	LUMACURVE	1	3	← A5 A	A	Y		3
68	EXISTING	LUMACURVE	2	2	BLANK	A5 →	–	Y	2
69	EXISTING	LUMACURVE	1	3		A5 27	Y,L	L,R	2
70	EXISTING	LUMACURVE	1	3	A5 ← A→	27 A5	L,Y	R,L	3
71	EXISTING	LUMACURVE	1	3	ILS		R	Y	1
72	EXISTING	LUMACURVE	2	2	BLANK	A→	–	Y	1
73	EXISTING	LUMACURVE	1	3	27–APCH	A	R	L,Y	3
74	EXISTING	LUMACURVE	1	3	27–APCH	A	R	Y,L	3
75	EXISTING	LUMACURVE	2	2	BLANK	← E2	–	Y	2
76	EXISTING	LUMACURVE	1	3	E1	27–APCH	Y,L	R	3
77	EXISTING	LUMACURVE	1	3	27–APCH		R	Y,L	3
78	EXISTING	LUMACURVE	1	3	ILS E2		R	Y	1
79	EXISTING	LUMACURVE	1	3	ILS		R	Y	1
80	EXISTING	LUMACURVE	2	2	← C1	BLANK	Y	–	1
81	EXISTING	LUMACURVE	1	3	21–3 C1	C C1 C↘	R,L	Y	2
82	EXISTING	LUMACURVE	1	2	C C1→	C	L,Y	L	2
83	EXISTING	LUMACURVE	1	3	C1	C1 21–3	Y,L	L,R	3
84	**SEE NOTE 2**	**LUMACURVE**	**1**	**3**	**ILS**		**R**	**Y**	**2**
85	EXISTING	LUMACURVE	2	2	BLANK	C1→	–	Y	1
86	EXISTING	LUMACURVE	1	2	↖ CAC →	A	Y,L,Y	L	3
87	EXISTING	LUMACURVE	2	2	BLANK	←C	–	Y	1
88	EXISTING	LUMACURVE	2	2	BLANK	F→	–	Y	1
89	EXISTING	LUMACURVE	1	3	F 3–21	F	L,R	Y,L	3
90	EXISTING	LUMACURVE	1	2	F	BLANK	L	–	1
91	EXISTING	LUMACURVE	3	2	DLH 012°-192° DME 2.2 NM VORTEC CHECK COURSE		Y		2
92	EXISTING	LUMACURVE	1	3	C 27–9	C	L,R	Y,L	3
93	EXISTING	LUMACURVE	1	3	C 21–3	C	R,L	Y,L	3
94	EXISTING	CROUSE HINDS	4	2	1	4	B	B	1
95	EXISTING	CROUSE HINDS	4	2	1	4	B	B	1
96	EXISTING	CROUSE HINDS	4	2	2	3	B	B	1
97	EXISTING	CROUSE HINDS	4	2	2	3	B	B	1
98	EXISTING	CROUSE HINDS	4	2	3	2	B	B	1
99	EXISTING	CROUSE HINDS	4	2	4	1	B	B	1
100	EXISTING	CROUSE HINDS	4	2	4	1	B	B	1
101	EXISTING	LUMACURVE	4	2	9	1	B	B	1
102	EXISTING	LUMACURVE	4	2	9	1	B	B	1
103	EXISTING	LUMACURVE	4	2	8	2	B	B	1
104	EXISTING	LUMACURVE	4	2	8	2	B	B	1
105	EXISTING	LUMACURVE	4	2	7	3	B	B	1
106	EXISTING	LUMACURVE	4	2	7	3	B	B	1
107	EXISTING	LUMACURVE	4	2	6	4	B	B	1
108	EXISTING	LUMACURVE	4	2	6	4	B	B	1
109	EXISTING	LUMACURVE	4	2	5	5	B	B	1
110	EXISTING	LUMACURVE	4	2	5	5	B	B	1
111	EXISTING	LUMACURVE	4	2	4	6	B	B	1
112	EXISTING	LUMACURVE	4	2	4	6	B	B	1
113	EXISTING	LUMACURVE	4	2	3	7	B	B	1
114	EXISTING	LUMACURVE	4	2	3	7	B	B	1
115	EXISTING	LUMACURVE	4	2	2	8	B	B	1
116	EXISTING	LUMACURVE	4	2	2	8	B	B	1
117	EXISTING	LUMACURVE	4	2	1	9	B	B	1
118	EXISTING	LUMACURVE	4	2	1	9	B	B	1
119	EXISTING	LUMACURVE	1	2	APRON ↑	B→	Y	Y	3
120	EXISTING	LUMACURVE	1	2	← APRON	BLANK	Y	–	3

SIGN TABLE:

SIGN NO.	STATUS	MANUFACTURER	SIZE	STYLE	LEGEND SIDE 1	LEGEND SIDE 2	TYPE SIDE 1	TYPE SIDE 2	NO. OF MODULES
121	EXISTING	LUMACURVE	1	2	A	A A5 →	Y	–	3
122	EXISTING	LUMACURVE	1	2	E1	BLANK	Y	–	1
123	EXISTING	SERVICE PAINTED SIGN			27–9	N/A	N/A	N/A	N/A
124	EXISTING	SERVICE PAINTED SIGN			9–27	N/A	N/A	N/A	N/A
125	EXISTING	SERVICE PAINTED SIGN			← A5	N/A	N/A	N/A	N/A
126	EXISTING	LUMACURVE	1	2	E1	BLANK	Y	–	1

SIGN TYPE LEGEND:

SIDE 1
SIDE 2

Y = L–858Y DIRECTION, DESTINATION AND BOUNDARY SIGNS
R = L–858R MANDATORY INSTRUCTION SIGNS
L = L–858L RUNWAY AND TAXIWAY LOCATION SIGNS
B = L–858B RUNWAY DISTANCE REMAINING SIGNS

THE DULUTH AIRPORT AUTHORITY (DAA) DESIGN STANDARD FOR AIRFIELD GUIDANCE SIGNS IS LUMACURVE, BY STANDARD SIGNS INC. THE CONTRACTOR MAY SUBMIT FAA APPROVED EQUAL ALTERNATIVES FOR CONSIDERATION, HOWEVER THE EVALUATION AND ACCEPTANCE OF ALTERNATIVE MANUFACTURERS MAY BE CONTINGENT UPON A DETERMINATION OF COMPATIBILITY WITH EXISTING SIGNS AND THE PROVISION OF IN HOUSE TRAINING SESSIONS BY THE MANUFACTURER FOR DAA SUPERVISORY AND MAINTENANCE PERSONNEL.

GENERAL NOTES:

1. REFER SHEETS E000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REMOVE EXISTING SIGN, CONDUITS, CABLES, BASE CANS AND FOUNDATION. SALVAGE EXISTING SIGN TO OWNER. CONTRACTOR SHALL DELIVER TO LOCATION AS DETERMINED BY OWNER. FURNISH AND INSTALL NEW SIGNS PER ELECTRICAL LAYOUT PLAN AND APPLICABLE DETAILS.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: AMA
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

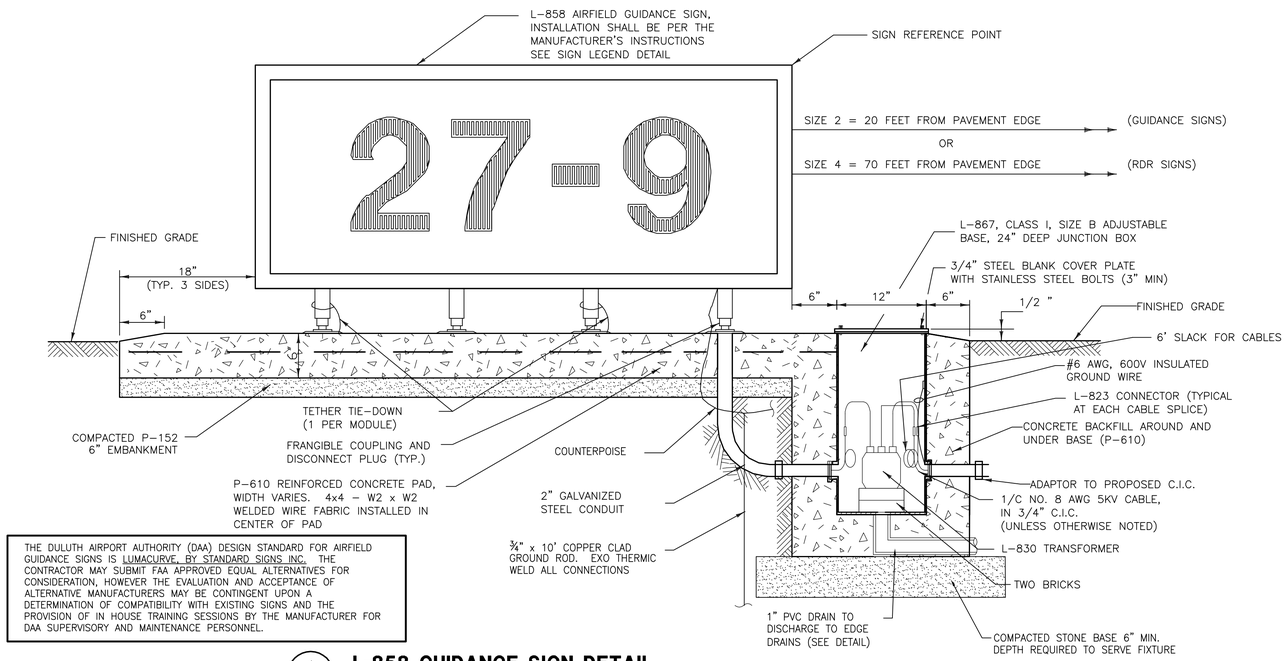
AIRFIELD SIGNAGE PLAN

SHEET NUMBER

E300

BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-E300.dwg Plotted on: 2/7/2012 10:50 AM Plotted by: Erdmann, Ryan



THE DULUTH AIRPORT AUTHORITY (DAA) DESIGN STANDARD FOR AIRFIELD GUIDANCE SIGNS IS LUMACURVE, BY STANDARD SIGNS INC. THE CONTRACTOR MAY SUBMIT FAA APPROVED EQUAL ALTERNATIVES FOR CONSIDERATION, HOWEVER THE EVALUATION AND ACCEPTANCE OF ALTERNATIVE MANUFACTURERS MAY BE CONTINGENT UPON A DETERMINATION OF COMPATIBILITY WITH EXISTING SIGNS AND THE PROVISION OF IN HOUSE TRAINING SESSIONS BY THE MANUFACTURER FOR DAA SUPERVISORY AND MAINTENANCE PERSONNEL.

1 / E-400 **L-858 GUIDANCE SIGN DETAIL**
SCALE: NTS

GENERAL SIGNAGE NOTES:

1. THE CONTRACTOR SHALL FIELD STAKE ALL SIGNS PRIOR TO INSTALLATION. ANY DISCREPANCIES IN ALIGNMENT OR LOCATIONS SHOULD BE RESOLVED PRIOR TO INSTALLATION.

2. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR TO INSTALL, RELOCATE OR MODIFY, AND INSTALL THE AIRFIELD GUIDANCE SIGNAGE AS INDICATED ON THE DRAWINGS. ITEMS NOT SHOWN BUT OBVIOUSLY NECESSARY FOR COMPLETION OF THE WORK SHALL BE INCLUDED.

3. THE ACTUAL SIGN DIMENSIONS WILL VARY PER MANUFACTURER. THE BASE SIZE AS SHOWN SHALL BE ADJUSTED TO MATCH THE SIGN SUBMITTED. THE SUBMITTAL SHALL INCLUDE NEW BASE DIMENSIONS, LAYOUT, ETC.

4. THE CONCRETE SHALL COMPLY WITH P-610 SPECIFICATION.

5. THE ORIENTATION, INSTALLATION, AND DEPTH OF THE 2" CONDUIT SHALL BE COORDINATED WITH THE PLANS. EXISTING SLEEVES MAY BE USED FOR ENTRY TO MANHOLES.

6. THE DETAILS SHOWN IN THE PLANS PROVIDE THE MINIMUM REQUIREMENTS FOR SIGN INSTALLATIONS. THE CONTRACTOR SHALL USE STANDARDS APPLICABLE FOR THE PARTICULAR SIGN MANUFACTURER. THE BOLT PATTERN, METHOD OF ANCHORING, ETC., SHALL BE PER SIGN MANUFACTURER'S RECOMMENDATIONS AND APPROVED BY THE ENGINEER.

7. ALL SIGNS SHALL BE FURNISHED WITH TETHERS ON EACH LEG. TETHERS SHALL BE 3/16" STAINLESS STEEL AIRCRAFT CABLE WITH A FORMED EYE ON BOTH ENDS. THE TETHER SHALL BE OF SUFFICIENT LENGTH TO HAVE A MINIMUM OF 2" OF SLACK WHEN ATTACHED BETWEEN THE SIGN AND THE FIXTURE PLATE. THE TETHERS AND BONDING CONDUCTORS SHALL BE OF SUFFICIENT LENGTH TO ALLOW THE FRANGIBLE COUPLINGS TO OPERATE WITHOUT RESTRICTIONS AND TO ALLOW POWER CABLE TO DISCONNECT IF THE SIGN FALLS OVER.

8. THE SIGN TETHER AND BONDING CONDUCTOR SHALL NOT BE ATTACHED AT THE SAME ANCHOR BOLT. AN APPROVED MECHANICAL OR COMPRESSION LUG SHALL BE USED TO CONNECT THE BONDING CONDUCTOR TO THE SIGN FLANGE AND SIGN.

9. ALL AREAS FOR THE LEG FLANGE SHALL BE IN THE SAME PLANE.

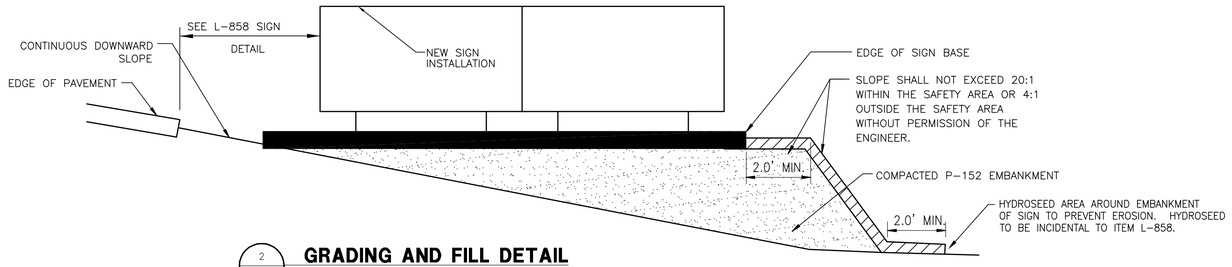
10. THE ANCHOR BOLTS SHALL BE A-36 STEEL. HOT DIPPED GALVANIZED STEEL WHEN CAST INTEGRALLY WITH THE CONCRETE PAD OR STAINLESS STEEL EXTENSION ANCHORS WHEN USED ON EXISTING OR DRILLED INTO NEW CONCRETE PADS. THE SIZE AND LENGTH SHALL BE SPECIFIED BY THE SIGN MANUFACTURER.

11. EACH NEW SIGN SHALL BE FURNISHED WITH AN ON-OFF TOGGLE SWITCH WITH WATERPROOF COVER. THE SWITCH SHALL BE USED BY MAINTENANCE PERSONNEL TO DE-ENERGIZE THE SIGN SO MAINTENANCE WORK CAN BE PERFORMED. THE SWITCH SHALL DISCONNECT POWER IMMEDIATELY ADJACENT TO THE SECONDARY CONNECTOR IN THE FRANGIBLE COUPLING. THE WEATHERPROOF COVER SHALL PROVIDE PROTECTION FROM DRIVING RAIN, SNOW AND ICE, AND SHALL HAVE A SPRING OPERATED CLOSING DEVICE. THE WEATHERPROOF COVER SHALL ALSO PROVIDE PHYSICAL PROTECTION FOR THE SWITCH HANDLE.

12. ALL SIGNS SHALL BE ORIENTED SUCH THAT THE LONGITUDINAL CENTERLINE OF THE SIGN IS PERPENDICULAR TO THE RESPECTIVE TAXIWAY/RUNWAY CENTERLINE.

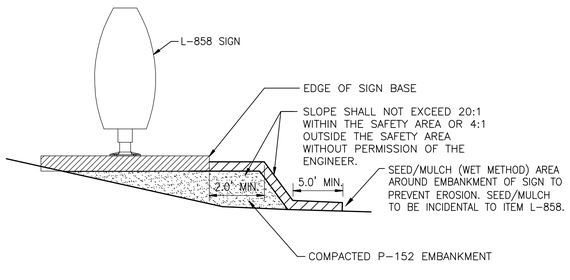
13. FOR SIGNS INSTALLED IN PAVED SHOULDER AREAS, ADJUSTABLE BASE CANS SHALL BE INSTALLED PRIOR TO PAVING. UPON COMPLETION OF PAVING THE BITUMINOUS SHALL BE NEATLY SAWCUT AND REMOVED TO ALLOW FOR ADJUSTMENT TO THE CAN TO FINISH GRADE AND PLACING THE REINFORCED CONCRETE SIGN PAD.

14. PROVIDE BRASS IDENTIFICATION LABEL FOR SIGN. LABEL SHALL BE STAMPED WITH TYPICAL MANUFACTURER DATA AND ATTACHED ON NEAR SIDE TO RUNWAY OR TAXIWAY.

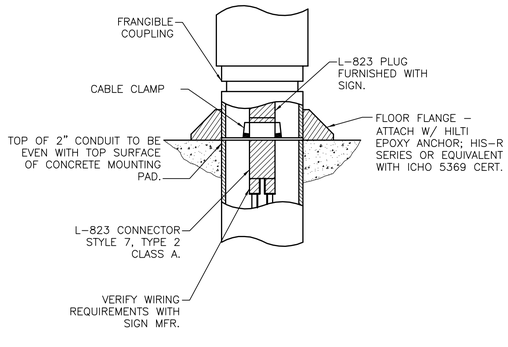


2 / E-400 **GRADING AND FILL DETAIL**
SCALE: NTS

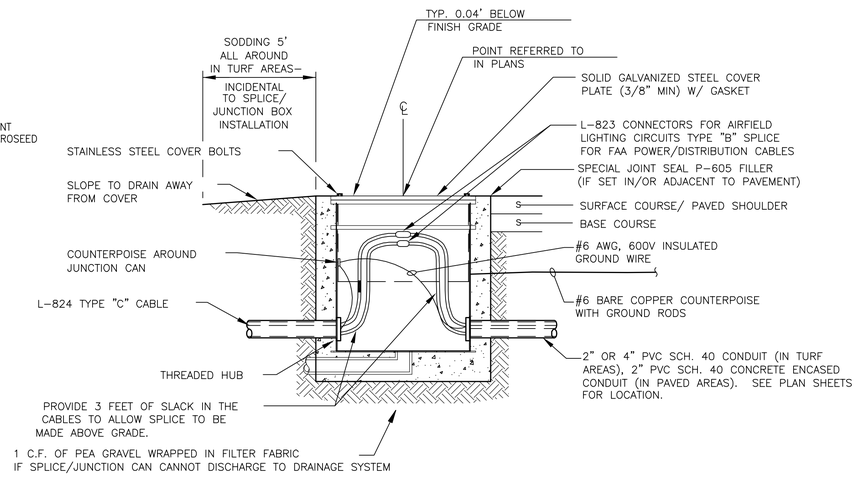
ALL GRADING AND SITE RESTORATION ARE CONSIDERED INCIDENTAL TO THE COST OF THE SIGN.



3 / E-400 **SECTION A-A**
SCALE: NTS



4 / E-400 **ELECTRICAL CONNECTION**
SCALE: NTS



L867-D, TYPE B

NOTE: CONTRACTOR TO DETERMINE THE NUMBER AND ORIENTATION OF OPENINGS FOR CONDUITS FOR EACH SPLICE/JUNCTION BOX AS SHOWN ON THE PLAN SHEETS.

5 / E-400 **CONCRETE-ENCASED JUNCTION BOX**
SCALE: NTS

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

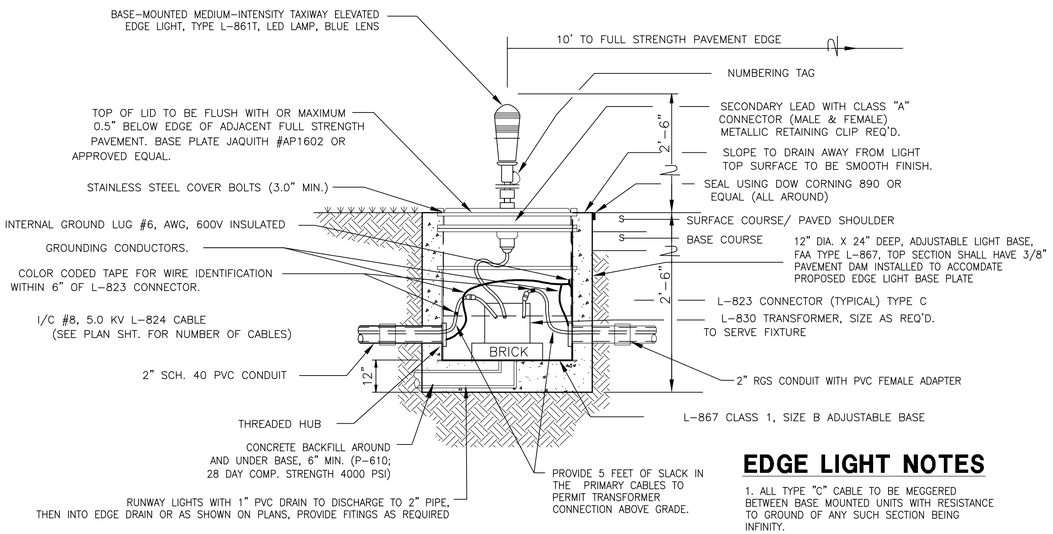
SHEET TITLE

TAXIWAY GUIDANCE SIGN DETAILS

SHEET NUMBER
E400

BID PACKAGE 3
100% REVIEW

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-E400.dwg Plotted on: 2/7/2012 10:51 AM Plotted by: Erdmann, Ryan



1 / E-401 **ELEVATED EDGE LIGHT AND BASE**

SCALE: NTS

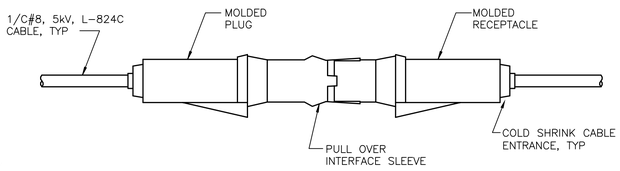
EDGE LIGHT NOTES

1. ALL TYPE "C" CABLE TO BE MEGGERED BETWEEN BASE MOUNTED UNITS WITH RESISTANCE TO GROUND OF ANY SUCH SECTION BEING INFINITY.

2. BREAKABLE COUPLING LOCATED 1 1/2" MAX. ABOVE COVER. MANUFACTURER SHALL PROVIDE AT LEAST A 1/4" DIA. OPENING OR EQUAL FOR DRAINAGE INTO L-867 BASE. WEEP HOLES IN THE COUPLING SHALL BE TO THE OUTSIDE.

3. ALL CONCRETE SHALL COMPLY WITH ITEM P-610 OF 28 DAY STRENGTH NOTED.

4. FOR LIGHTS INSTALLED IN PAVED SHOULDER AREAS, ADJUSTABLE BASE CANS SHALL BE INSTALLED PRIOR TO PAVING. UPON COMPLETION OF PAVING, THE BITUMINOUS PAVEMENT SHALL BE NEATLY CORED AND REMOVED TO ALLOW FOR ADJUSTMENT OF THE CAN TO FINISH GRADE AND PLACING TOP SECTION OF CONCRETE (MINIMUM TOP SECTION OF CONCRETE TIE BARS AND ONE #3 HOOP REQUIRED).



1. CONNECTORS SHALL BE PLUG AND RECEPTACLE TYPE, AMERACE 54 SUPER KIT IN ACCORDANCE WITH FAA SPECIFICATIONS, AND SHALL BE APPLIED IN ACCORDANCE WITH SERIES LIGHTING CABLE MANUFACTURERS INSTRUCTIONS. ACTUAL OUTSIDE DIAMETER (OVER JACKET) AS FOLLOWS:

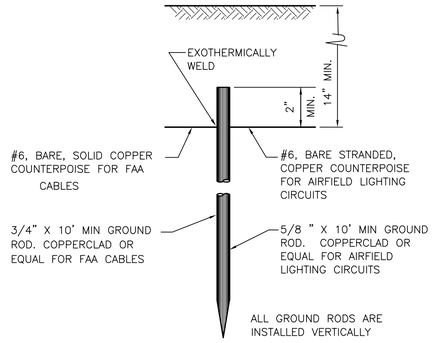
CABLE DIAMETER		AMERACE SIZE SYMBOL	AMERACE KIT NUMBER
MIN	MAX		
.250	.330	C	54 SUPER-C4-C4
.320	.430	D	54 SUPER-D4-D4
.420	.585	E	54 SUPER-E4-E4
.575	.785	F	54 SUPER-F4-F4

2. PROVIDE HEAT SHRINK TUBING OVER CABLE ENTRANCE AT EACH END OF SPLICE KIT.

3. PROVIDE TWO LAYERS OF TAPE OVER INTERFACE SLEEVE. FIRST LAYER SHALL BE RUBBER TAPE AND SHALL BE COVERED WITH LAYER OF VINYL TAPE.

2 / E-401 **TYPICAL L-823 CONNECTOR SPLICE DETAIL**

SCALE: NTS

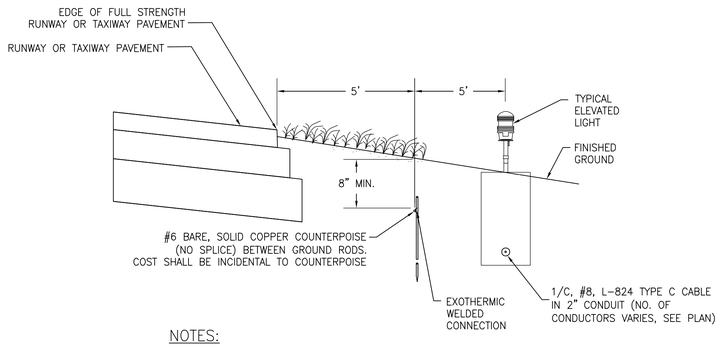


NOTES:

1. THE RESISTANCE TO GROUND OF ANY GROUNDING SYSTEM SHALL NOT EXCEED 10 OHMS. (VAULT GROUNDING – 10 OHMS)
2. COST OF GROUND RODS AND CONNECTIONS TO COUNTERPOISE IS INCIDENTAL TO ASSOCIATED ITEMS OF WORK REQUIRING GROUNDING AND NO SEPARATE PAYMENT WILL BE MADE.
3. MAXIMUM SPACING OF GROUND RODS FOR AUTHORITY LIGHTING SYSTEMS SHALL NOT EXCEED 400 FEET.
4. MAXIMUM SPACING OF GROUND RODS FOR FAA CABLE PROTECTION SHALL NOT EXCEED 200 FEET.
5. EACH ROD TO BE TESTED INDIVIDUALLY TO ENSURE RESISTANCE TO GROUND OF 5 OHMS OR LESS. ADD ADDITIONAL SECTIONS UNTIL THIS REQUIREMENT IS MET.

3 / E-401 **GROUND ROD DETAILS**

SCALE: NTS

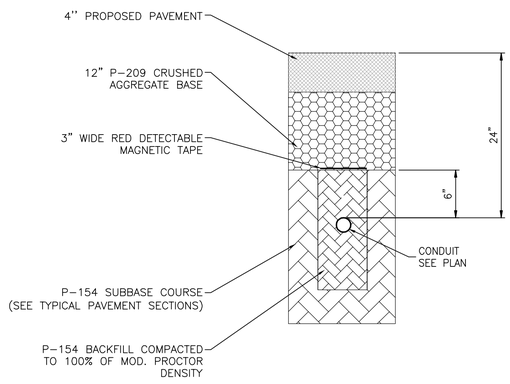


NOTES:

1. INSTALL 3/4" ø X 10' LONG COPPER CLAD GROUND RODS ALONG COUNTERPOISE SYSTEM AT 300' INTERVALS. CONNECTIONS OF GROUND RODS TO COUNTERPOISE CABLE SHALL BE EXOTHERMIC TYPE (COPPERWELD OR EQUAL)
2. THE RESISTANCE TO GROUND OF THE COUNTERPOISE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.
3. COST OF THE GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED.

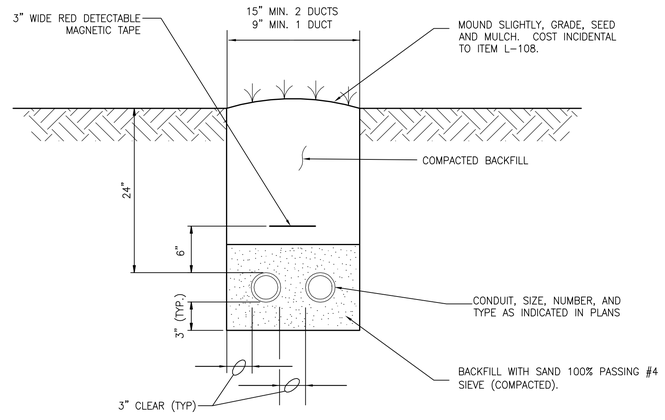
4 / E-401 **COUNTERPOISE (ALONG PAVEMENT) INSTALLATION DETAIL**

SCALE: NTS



5 / E-401 **CONDUIT AND TRENCH IN SHOULDER PAVEMENT AREAS**

SCALE: NTS



6 / E-401 **TRENCH AND CONDUIT PLACEMENT DETAIL**

SCALE: NTS

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

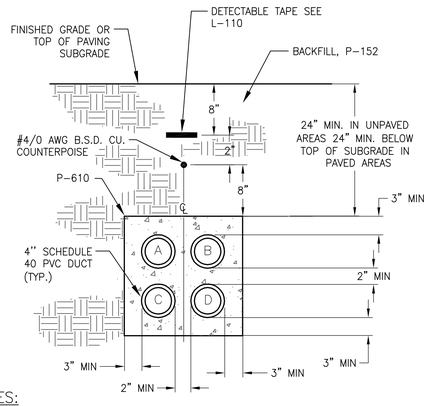
SHEET TITLE

ELECTRICAL DETAILS (SHEET 1 OF 2)

SHEET NUMBER
E401

BID PACKAGE 3 100% REVIEW

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-E401.dwg Plotted on: 2/7/2012 10:51 AM Plotted by: Erdmann, Ryan

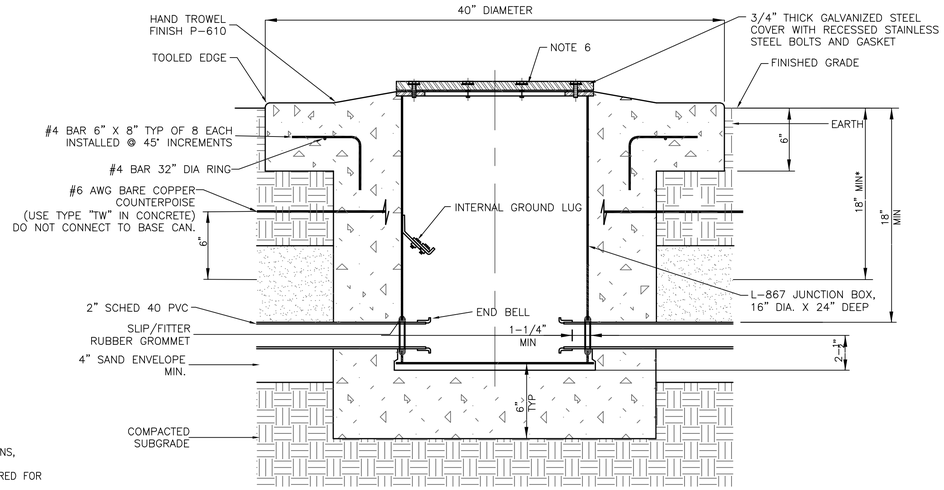


NOTES:

1. GRADING, SODDING, AREA RESTORATION, AND DEWATERING FOR THE INSTALLATION OF BASE CANS, MANHOLES, DUCT BANKS OR CONDUITS IS INCIDENTAL TO THE RESPECTIVE PAY ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR AND OBTAIN ANY AND ALL PERMITS REQUIRED FOR DEWATERING.
2. THE P-610 CONCRETE AROUND CONDUITS, DUCTS AND BASE CANS SHALL BE COMPLETELY CONSOLIDATED BY MECHANICAL MEANS AND SHALL BE FREE OF ANY VOIDS.
3. ALL DUCTS SHALL BE SECURELY FASTENED IN PLACE DURING CONSTRUCTION AND PROGRESS OF THE WORK AND SHALL BE PLUGGED TO PREVENT SEEPAGE OF GROUT, WATER OR DIRT. ANY DUCT SECTION HAVING A DEFECTIVE JOINT SHALL NOT BE INSTALLED. DUCTS SHALL BE SUPPORTED AND SPACED APART USING APPROVED SPACERS AT INTERVALS NOT TO EXCEED 5 FEET.
4. ALL CONSTRUCTION JOINTS IN CONCRETE-ENCASED DUCTS SHALL HAVE A MINIMUM OF 4 STEEL DOWELS, EVENLY SPACED AND INSTALLED AT THE JOINT. THE DOWELS SHALL BE #4 DEFORMED STEEL REINFORCING BARS, 24" LONG, WITH 1/2 OF THE LENGTH EMBEDDED IN THE PLASTIC CONCRETE THAT IS CONSTRUCTED INITIALLY.
5. ALL LOOSE MATERIAL SHALL BE REMOVED FROM ALL EXCAVATIONS FOR ELECTRICAL EQUIPMENT, RACEWAYS, MANHOLES, PADS, ETC. THE BOTTOM OF THE EXCAVATION SHALL BE COMPACTED TO 95% COMPACTION IN ACCORDANCE WITH ASTM D1557 PRIOR TO THE INSTALLATION OF THE ELECTRICAL ITEM AND BACKFILL.
6. ALL PROPOSED DUCT BANKS SHALL HAVE POSITIVE SLOPE TO A MANHOLE THAT IS CONNECTED TO THE AIRFIELD DRAINAGE SYSTEM. NO SAGS OR LOW POINTS WILL BE ALLOWED IN ANY DUCTBANKS.
7. THE 4/0 AWG BSD COPPER COUNTERPOISE WIRE SHALL BE CENTERED ON THE DUCTBANK.
8. THE MINIMUM DISTANCE BETWEEN TOP OF CONDUIT IN DUCT BANK AND COUNTERPOISE SHALL BE 3".
9. THE CONTRACTOR SHALL INSTALL A NYLON PULL WIRE IN EACH UNUSED DUCT OR CONDUIT INSTALLED AND PLUG OR CAP THE DUCT. THE WIRE SHALL BE SECURELY ATTACHED TO THE PLUG/CAP AT EACH END OF THE DUCT OR CONDUIT. NEW PULL WIRES SHALL BE INSTALLED IN EACH UNUSED DUCT OR CONDUIT IN DUCT BANK EXTENSIONS.
10. THE CONTRACTOR SHALL INSTALL A PLASTIC COATED, DETECTABLE MAGNETIC TWO (2) INCH WIDE TAPE EIGHT (8) INCHES BELOW TURF GRADE ABOVE ALL DUCTBANKS OR CONDUITS NOT INSTALLED UNDER AIRFIELD PAVEMENT.
11. ALL CONDUITS, DUCT AND DUCT BANKS SHOWN AS CONCRETE-ENCASED SHALL BE ENCASED IN 4000 PSI CONCRETE COMPRESSIVE STRENGTH, WITH NOT LESS THAN 3" OF COVER AT TOP AND SIDES.
12. DIRECTIONAL BORED DUCTS SHALL BE INSTALLED BELOW EXISTING PAVEMENT SUBGRADE AND EXISTING UTILITIES. CONFIRM CORRECT ELEVATION FOR CONNECTION TO NEW BASE CANS. DIRECTIONAL BORING IS REQUIRED FOR ALL DUCTS UNDER EXISTING PAVEMENT. THE ADDITIONAL COST FOR DIRECTIONAL BORING SHALL BE INCIDENTAL TO THE RESPECTIVE DUCT/CONDUIT PAY ITEM.
13. ALL CONDUITS AND DUCTS INSTALLED UNDER FULL STRENGTH (STRUCTURAL) PAVEMENT SHALL BE CONCRETE ENCASED. EXTEND CONCRETE ENCASEMENT 5' BEYOND EDGE OF STRUCTURAL PAVEMENT.
14. AFTER THE CONCRETE MARKER HAS SET A MINIMUM OF 24 HOURS, THE TOP SURFACE SHALL BE PAINTED BRIGHT ORANGE WITH PAINT MADE SPECIFICALLY FOR UNCURED EXTERIOR CONCRETE.

1 E-402 4-WAY, 4" CONCRETE-ENCASED DUCTBANK

SCALE: NTS



TYPICAL INSTALLATION DETAIL FOR JUNCTION BOX IN TURF

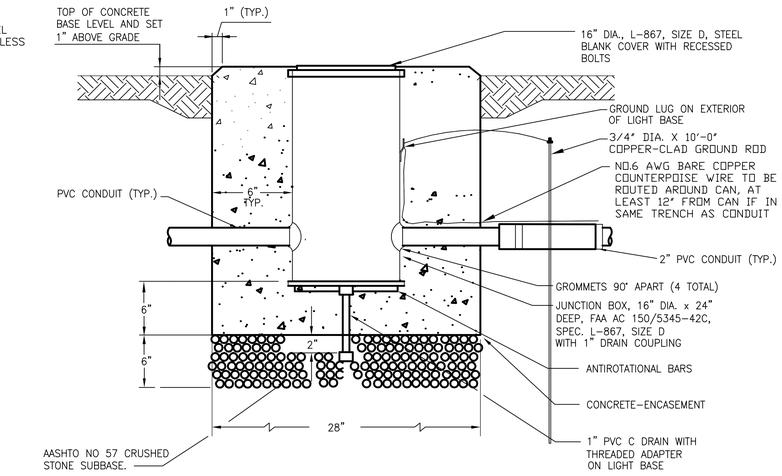
N.T.S.

NOTES:

1. ALL JUNCTION CAN INSTALLATION TECHNIQUES, METHODS, MATERIALS, ETC. SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE START OF WORK.
2. THE INSTALLATION DETAILS ARE A GUIDE FOR THE INSTALLATION OF THE L-867D JUNCTION BOX.
3. THE FINISHED SURFACE SHALL BE PROTECTED FROM FOREIGN SUBSTANCES WHICH COULD CAUSE STAINING, I.E. CONCRETE, OIL, ETC. THE CONTRACTOR SHALL IMMEDIATELY CLEAN ALL SPILLS AND CORRECT/CLEAN ANY STAINED SURFACES AT THE CONTRACTOR'S EXPENSE.
4. THE JUNCTION BOX COVER MOUNTING BOLTS SHALL EXTEND THRU THE BASE CAN MOUNTING FLANGE INTO THE BASE CAN A MIN. OF 0.5". THE BOLTS SHALL HAVE ENOUGH THREAD LENGTH SO THEY DO NOT SHOULDER OUT BEFORE THE COVER IS SECURELY TIGHTENED.
5. P-610 CONCRETE AROUND JUNCTION BOX AND DUCT/CONDUIT SHALL BE COMPLETELY CONSOLIDATED BY MECHANICAL MEANS AND SHALL BE FREE OF ANY VOIDS.
6. USE DOW CORNING COMPOUND III VALVE LUBRICANT, NON-CURING SEALANT, OR APPROVED EQUAL, AS A SEALANT BETWEEN ADAPTER/SPACER RING AND JUNCTION CAN, AND BETWEEN JUNCTION BOX SECTIONS.
7. GRADING, SODDING, AREA RESTORATION, AND DEWATERING FOR THE INSTALLATION OF BASE CANS, MANHOLES, DUCT BANKS OR CONDUITS IS INCIDENTAL TO THE RESPECTIVE PAY ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR AND OBTAIN ANY AND ALL PERMITS REQUIRED FOR DEWATERING.
8. ALL DUCTS SHALL BE SECURELY FASTENED IN PLACE DURING CONSTRUCTION AND PROGRESS OF THE WORK AND SHALL BE PLUGGED TO PREVENT SEEPAGE OF GROUT, WATER OR DIRT. ANY DUCT SECTION HAVING A DEFECTIVE JOINT SHALL NOT BE INSTALLED. DUCTS SHALL BE SUPPORTED AND SPACED APART USING APPROVED SPACERS AT INTERVALS NOT TO EXCEED 5 FEET.
9. ALL CONSTRUCTION JOINTS IN CONCRETE ENCASED DUCTS SHALL HAVE A MINIMUM OF 4 STEEL DOWELS, EVENLY SPACED AND INSTALLED AT THE JOINT. THE DOWELS SHALL BE #4 DEFORMED STEEL REINFORCING BARS, 24" LONG, WITH 1/2 OF THE LENGTH EMBEDDED IN THE PLASTIC CONCRETE THAT IS CONSTRUCTED INITIALLY.
10. ALL LOOSE MATERIAL SHALL BE REMOVED FROM ALL EXCAVATIONS FOR ELECTRICAL EQUIPMENT, RACEWAYS, MANHOLES, PADS, ETC. THE BOTTOM OF THE EXCAVATION SHALL BE COMPACTED TO 95% COMPACTION IN ACCORDANCE WITH ASTM D1557 PRIOR TO THE INSTALLATION OF THE ELECTRICAL ITEM AND BACKFILL.

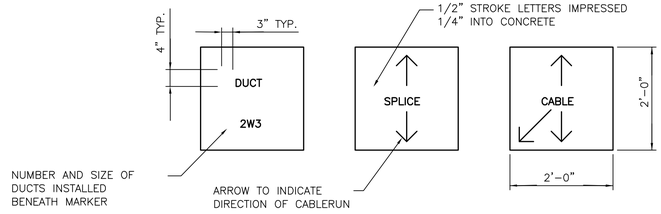
2 E-402 TYPICAL JUNCTION BOX DETAIL - TURF INSTALLATION

SCALE: NTS

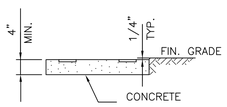


3 E-402 CONCRETE ENCASED L-867D JUNCTION BOX

SCALE: NTS



PLAN VIEW



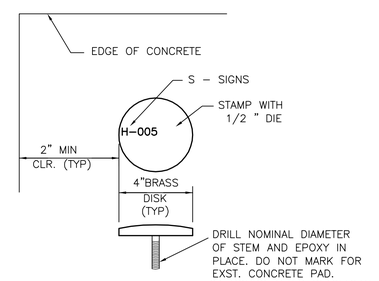
SECTION VIEW

NOTES:

1. MARKERS SHALL BE PLACED AT ALL DUCT CROSSINGS, END OF STUB OUTS, AND ANY CHANGE IN CABLE DIRECTION.
2. CONCRETE FOR PADS SHALL COMPLY WITH ITEM P-610, 3000 PSI.
3. EDGE EXPOSED CONCRETE WITH A 1/4" RADIUS TOOL.
4. LEGEND INSCRIBED BY HAND IN WET CONCRETE WILL NOT BE ACCEPTABLE.
5. CABLE AND DUCT MARKERS ARE INCIDENTAL TO OTHER ITEMS OF WORK NO SEPARATE PAYMENT WILL BE MADE.

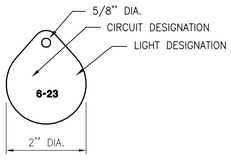
4 E-402 MANHOLE/HANDHOLE/SIGN NUMBERING DISK DETAIL

SCALE: NTS



NOTE:

PLACE NUMBERING DISK FOR ALL SIGNS AND HANDHOLES/ MANHOLES IN ACCORDANCE WITH NUMBERING SEQUENCE SHOWN ON THE PLAN SHEETS. ALL LABOR, MATERIALS AND EQUIPMENT TO NUMBER HANDHOLES/MANHOLES AND SIGNS SHALL BE INCIDENTAL TO ELECTRICAL WORK.

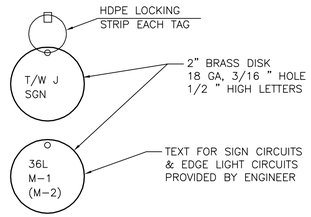


NOTES:

1. INSTALL A NONCORROSIVE DISC OF 2 INCH MINIMUM DIAMETER WITH NUMBER PERMANENTLY STAMPED, CUTOUT, OR ENGRAVED UNDER THE HEAD OF THE BASE PLATE BOLT OR ATTACHED TO LIGHT FLANGE WITH SET SCREW.
2. NUMBERS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY ALL EXISTING AND PROPOSED EDGE LIGHTS SHALL BE TAGGED AS DIRECTED BY THE ENGINEER. COST OF TAGGING LIGHTS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL.

5 E-402 LIGHT IDENTIFICATION TAG DETAIL

SCALE: NTS



6 E-402 CIRCUIT IDENTIFICATION TAG DETAIL

SCALE: NTS

7 E-402 MANHOLE/HANDHOLE/SIGN NUMBERING DISK DETAIL

SCALE: NTS

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: XX/XX/20XX Reg. No.:

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 12/17/2010
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

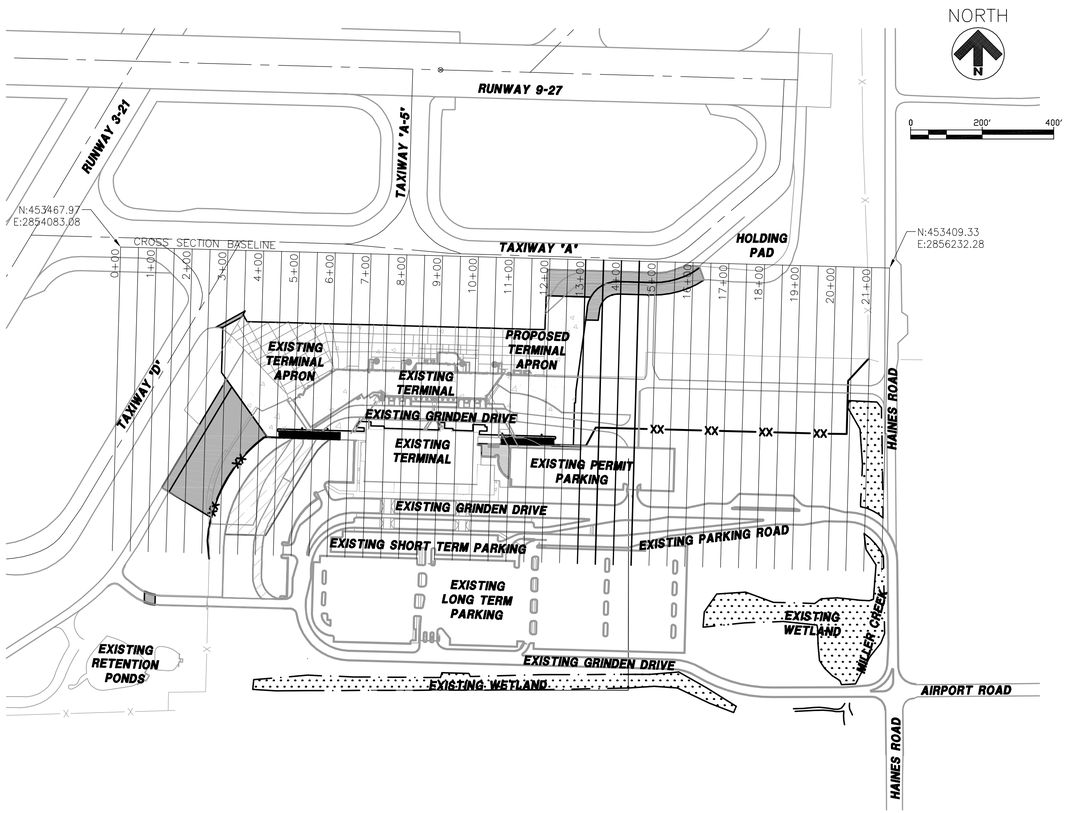
ELECTRICAL DETAILS (SHEET 2 OF 2)

SHEET NUMBER

E402

BID PACKAGE 3 100% REVIEW

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-E402.dwg Plotted on: 2/7/2012 10:52 AM Plotted by: Erdmann, Ryan



CROSS SECTION NOTES

1. IF UNSUITABLE MATERIALS ARE ENCOUNTERED, ADDITIONAL EXCAVATION AND BACKFILL WILL BE PAID AT THE CONTRACT UNIT PRICE FOR "UNSUITABLE EXCAVATION AND SAND BACKFILL". ALL WORK TO REMOVE UNSUITABLE MATERIAL SHALL BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING WORK. ALL SPOILS SHALL BE DISPOSED OF AT AN OFFSITE LOCATION. SAND BACKFILL SHALL MEET THE REQUIREMENTS OF ITEM P-154 "SAND SUBBASE COURSE".
2. THE ESTIMATED UNCLASSIFIED EXCAVATION FOR THE PROJECT INCLUDES 79,199 CYD OF CUT AND 1,954 CYD OF TOPSOIL STRIPPING FOR A TOTAL UNCLASSIFIED EXCAVTION QUANTITY OF 81,153 CYD. THE AVAERAGE DEPTH OF THE TOPSOIL ON SITE WAS ASSUMED TO BE 4 INCHES BASED ON INFORMATION INCLUDED IN THE BORING LOGS. ALL COSTS ASSOCIATED WITH THE STRIPPING AND STOCKPILING OF TOPSOIL SHALL BE INCLUDED IN THE P-152 "UNCLASSIFIED EXCAVATION" ITEM.
3. ALL CALCULATIONS ARE BASED ON AVERAGE END AREAS OF CROSS SECTIONS AT 50' INTERVALS, OR AS NOTED.
4. ALL QUANTITIES SHOWN ARE COMPACTED IN PLACE, NO SWELL OR SHRINKAGE FACTORS HAVE BEEN ASSUMED.
5. PAYMENT FOR WORK PERFORMED SHALL BE BASED ON COMPACTED IN PLACE QUANTITIES.

BASE BID QUANTITIES

Unclassified Excavation

STATION	CUT AREA (sqft)		CUT VOLUME (CY)	CUMULATIVE	FILL AREA (sqft)		FILL VOLUME (CY)	CUMULATIVE
	Cad	Converted			Cad	Converted		
0	0	0	0	0	0	0	0	0
50	0	0	18	18	0	0	0	0
100	196	20	258	276	0	0	33	33
150	2,588	259	1,092	1,368	357	36	66	100
200	9,206	921	2,075	3,443	361	36	98	198
250	13,201	1,320	3,066	6,508	702	70	91	289
300	19,909	1,991	4,318	10,826	280	28	39	328
350	26,725	2,673	5,067	15,893	143	14	39	367
400	27,999	2,800	5,132	21,026	273	27	41	408
450	27,429	2,743	4,880	25,906	168	17	16	423
500	25,275	2,528	4,140	30,046	0	0	0	423
550	19,439	1,944	3,248	33,294	0	0	0	423
600	15,643	1,564	2,775	36,069	0	0	59	482
650	14,325	1,433	2,713	38,782	637	64	308	790
700	14,976	1,498	2,797	41,579	2,693	269	251	1,041
750	15,233	1,523	2,763	44,342	13	1	9	1,050
800	14,610	1,461	2,761	47,104	84	8	25	1,075
850	15,210	1,521	2,850	49,953	184	18	157	1,232
900	15,568	1,557	2,887	52,841	1,515	151	151	1,383
950	15,615	1,562	2,810	55,651	118	12	13	1,397
1000	14,732	1,473	2,795	58,446	27	3	53	1,450
1050	15,456	1,546	2,881	61,327	549	55	209	1,659
1100	15,663	1,566	2,775	64,102	1,712	171	210	1,869
1150	14,307	1,431	3,404	67,506	552	55	93	1,962
1200	22,456	2,246	4,086	71,592	450	45	198	2,160
1250	21,668	2,167	2,846	74,438	1,691	169	820	2,980
1300	9,069	907	1,304	75,741	7,165	716	875	3,855
1350	5,009	501	882	76,623	2,285	228	350	4,205
1400	4,518	452	775	77,398	1,499	150	177	4,382
1450	3,851	385	577	77,976	409	41	80	4,462
1500	2,385	239	470	78,446	455	46	48	4,509
1550	2,694	269	501	78,947	58	6	11	4,520
1600	2,720	272	252	79,199	58	6	11	4,531
1650	0	0	0	79,199	58	6	9	4,540
1700	0	0	0	79,199	39	4	9	4,549
1750	0	0	0	79,199	59	6	11	4,560
1800	0	0	0	79,199	62	6	11	4,571
1850	0	0	0	79,199	59	6	12	4,583
1900	0	0	0	79,199	67	7	11	4,594
1950	0	0	0	79,199	52	5	10	4,604
2000	0	0	0	79,199	59	6	11	4,615
2050	0	0	0	79,199	56	6	10	4,625
2100	0	0	0	79,199	56	6	5	4,630
2140	0	0	0	79,199	9	1	1	4,631
2200	0	0			0	0		

BASE BID QUANTITIES

Topsoil Stripping

STATION	CUT AREA (sqft)		CUT VOLUME (CY)	CUMULATIVE
	Cad	Converted		
0	0	0	0	0
50	0	0	35	35
100	373	37	124	159
150	967	97	176	335
200	936	94	126	461
250	428	43	60	521
300	218	22	20	541
350	0	0	17	558
400	182	18	42	600
450	270	27	54	653
500	308	31	29	682
550	0	0	0	682
600	0	0	0	682
650	0	0	0	682
700	0	0	0	682
750	0	0	0	682
800	0	0	0	682
850	0	0	0	682
900	0	0	0	682
950	0	0	0	682
1000	0	0	17	699
1050	184	18	33	732
1100	174	17	45	777
1150	313	31	109	886
1200	867	87	170	1,056
1250	971	97	191	1,248
1300	1,093	109	198	1,445
1350	1,040	104	178	1,623
1400	885	88	144	1,767
1450	670	67	82	1,849
1500	213	21	42	1,890
1550	236	24	43	1,933
1600	227	23	21	1,954
1650	0	0	0	1,954
1700	0	0	0	1,954
1750	0	0	0	1,954
1800	0	0	0	1,954
1850	0	0	0	1,954
1900	0	0	0	1,954
1950	0	0	0	1,954
2000	0	0	0	1,954
2050	0	0	0	1,954
2100	0	0	0	1,954
2140	0	0	0	1,954
2200	0	0		

Topsoil Fill

STATION	CUT AREA (sqft)		CUT VOLUME (CY)	CUMULATIVE
	Cad	Converted		
0	0	0	0	0
50	0	0	35	35
100	373	37	124	159
150	967	97	184	343
200	1,023	102	184	527
250	967	97	132	659
300	456	46	67	726
350	269	27	45	771
400	221	22	31	802
450	110	11	10	812
500	0	0	0	812
550	0	0	0	812
600	0	0	0	812
650	0	0	0	812
700	0	0	0	812
750	0	0	0	812
800	0	0	0	812
850	0	0	0	812
900	0	0	0	812
950	0	0	0	812
1000	0	0	0	812
1050	0	0	0	812
1100	0	0	0	812
1150	0	0	0	812
1200	0	0	0	812
1250	0	0	96	908
1300	1,032	103	204	1,112
1350	1,170	117	234	1,346
1400	1,360	136	239	1,585
1450	1,219	122	139	1,723
1500	281	28	46	1,770
1550	218	22	27	1,797
1600	77	8	14	1,811
1650	77	8	14	1,825
1700	77	8	14	1,840
1750	77	8	14	1,854
1800	77	8	14	1,868
1850	77	8	14	1,883
1900	77	8	14	1,897
1950	77	8	14	1,911
2000	74	7	14	1,925
2050	75	7	14	1,938
2100	74	7	7	1,945
2140	21	2	2	1,948
2200	0	0		

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: MDH
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTION SUMMARY PLAN

SHEET NUMBER

X100

BID PACKAGE 2C BID DOCUMENTS

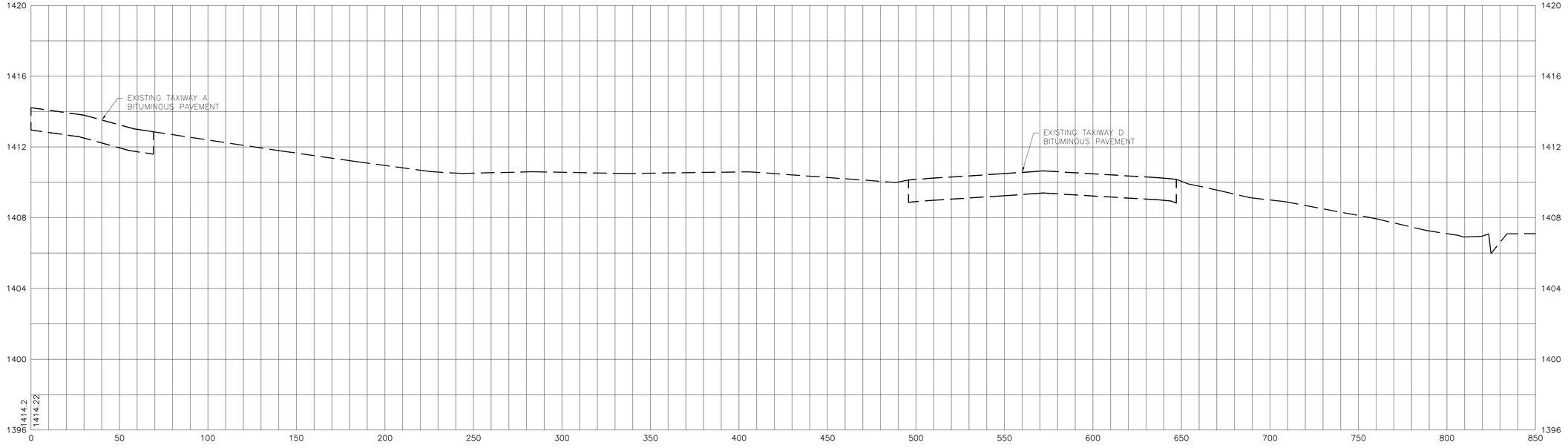
Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X100.dwg Plotted on: 2/8/2012 8:41 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

0+50

0+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 0+00 TO STA. 0+50

SHEET NUMBER

X110

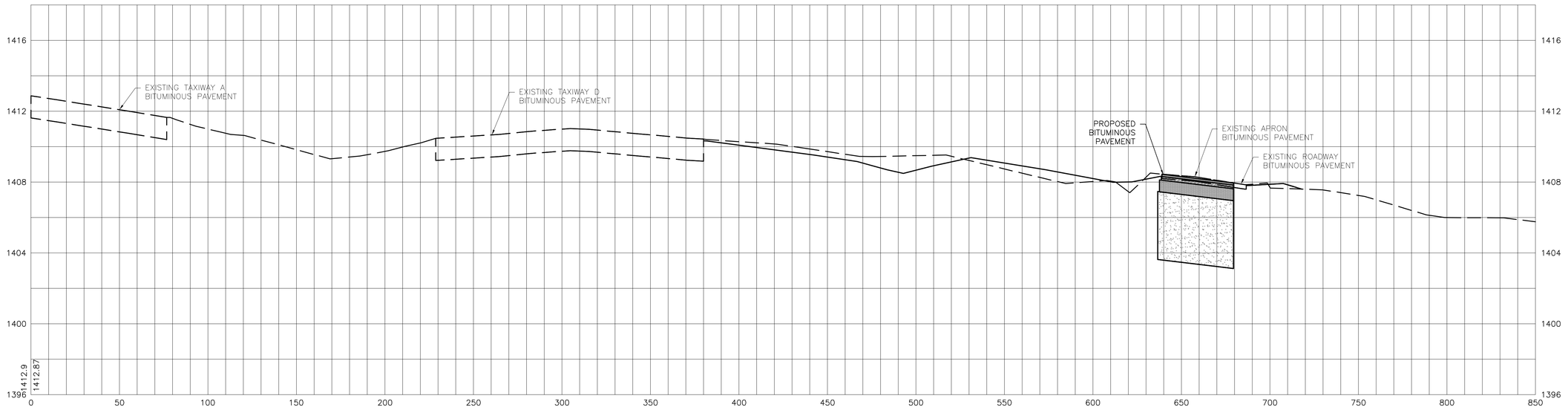
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X110.dwg Plotted on: 2/7/2012 12:02 PM Plotted by: Erdmann, Ryan

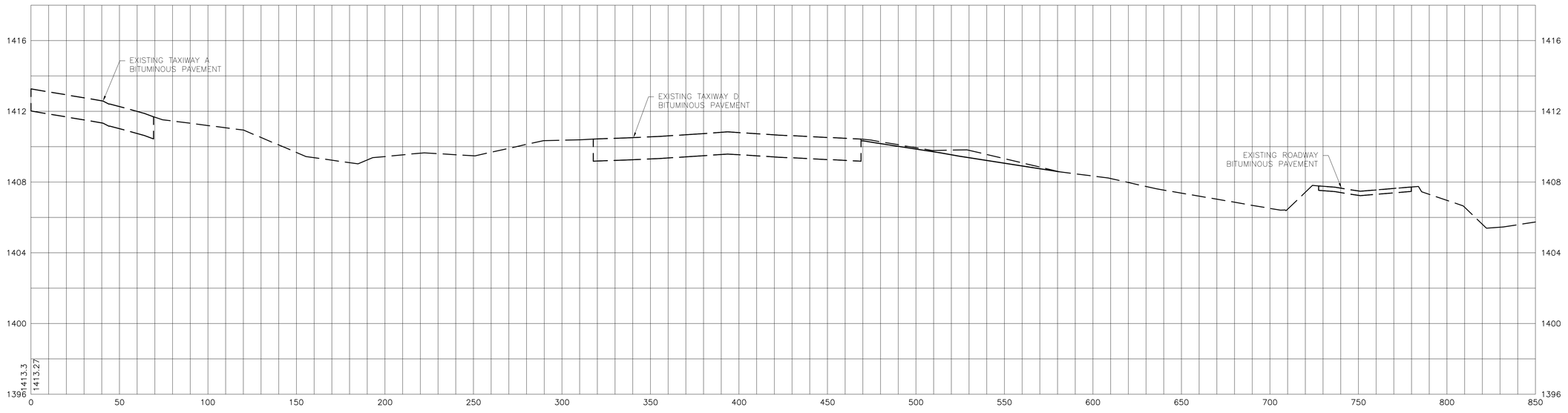
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

1+50



1+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 1+00 TO STA. 1+50

SHEET NUMBER

X111

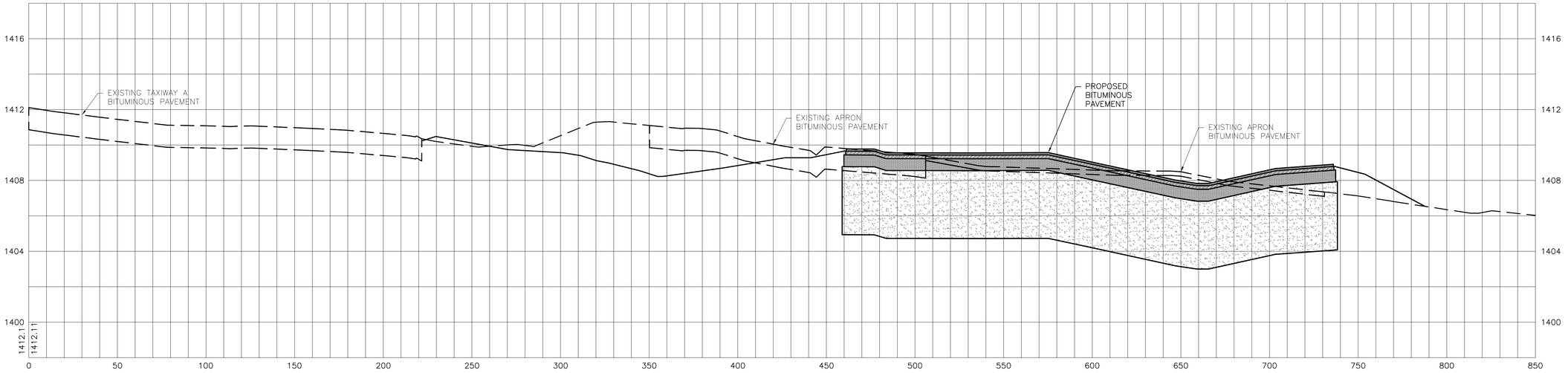
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X111.dwg Plotted on: 2/7/2012 10:57 AM Plotted by: Erdmann, Ryan

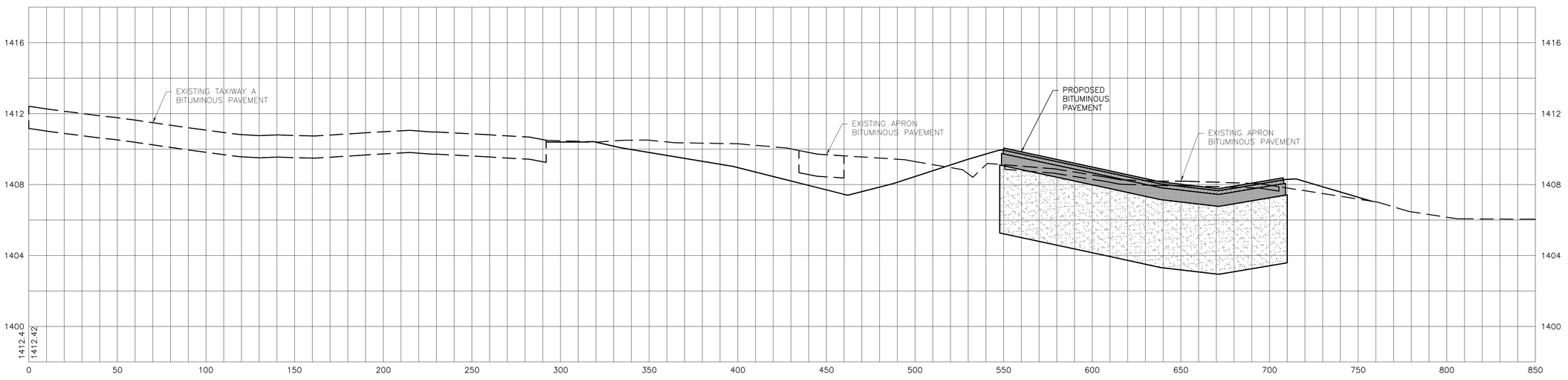
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

2+50



2+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 2+00 TO STA. 2+50

SHEET NUMBER

X112

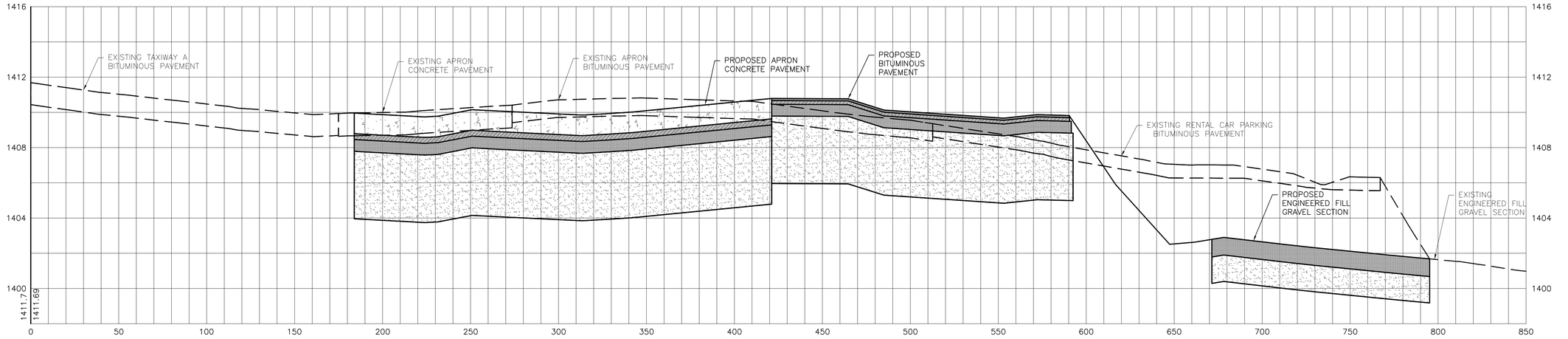
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X112.dwg Plotted on: 2/7/2012 10:58 AM Plotted by: Erdmann, Ryan

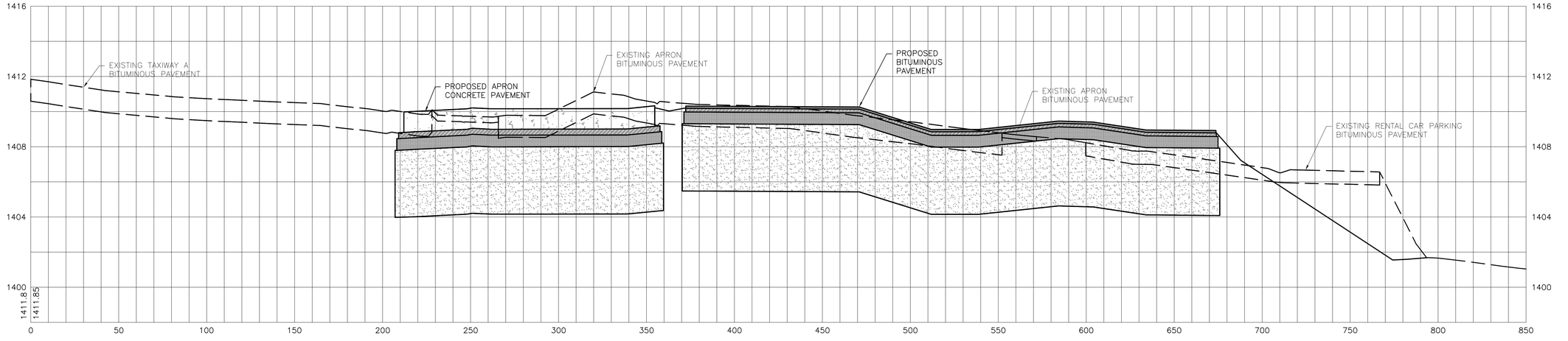
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

3+50



3+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 3+00 TO STA. 3+50

SHEET NUMBER

X113

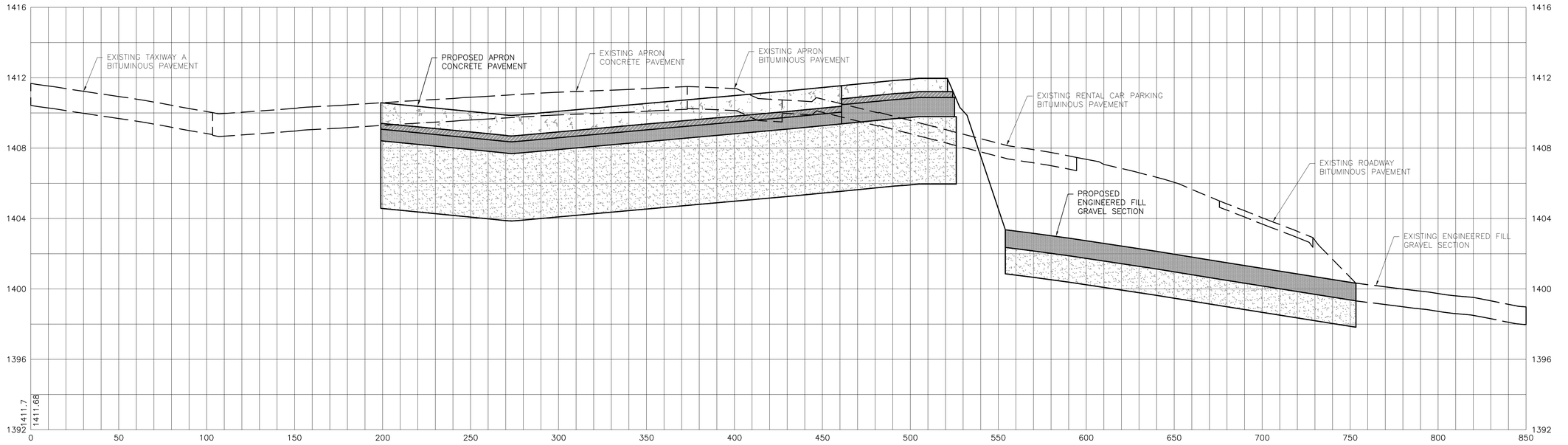
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X113.dwg Plotted on: 2/7/2012 11:00 AM Plotted by: Erdmann, Ryan

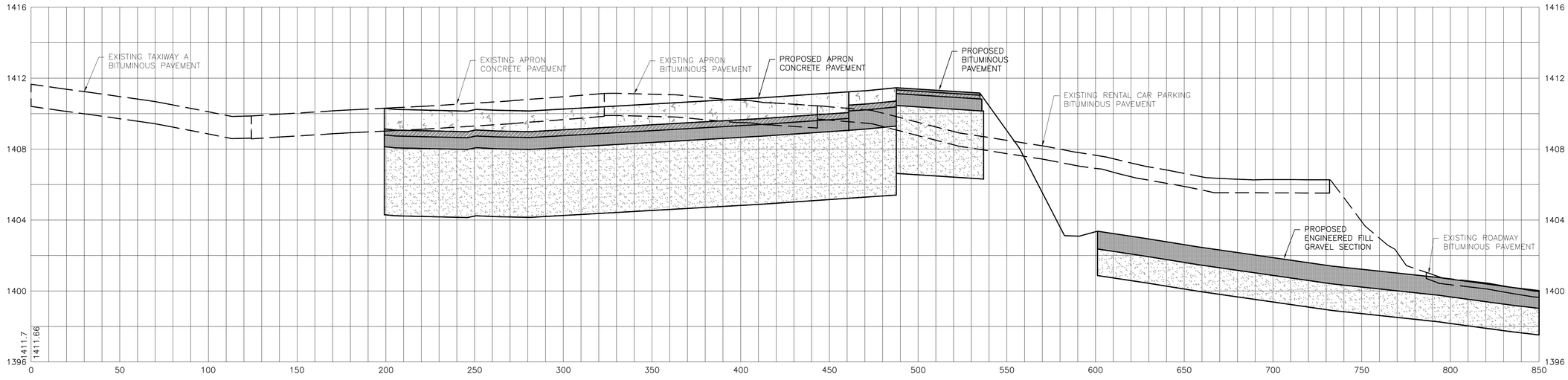
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

4+50



4+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 4+00 TO STA. 4+50

SHEET NUMBER

X114

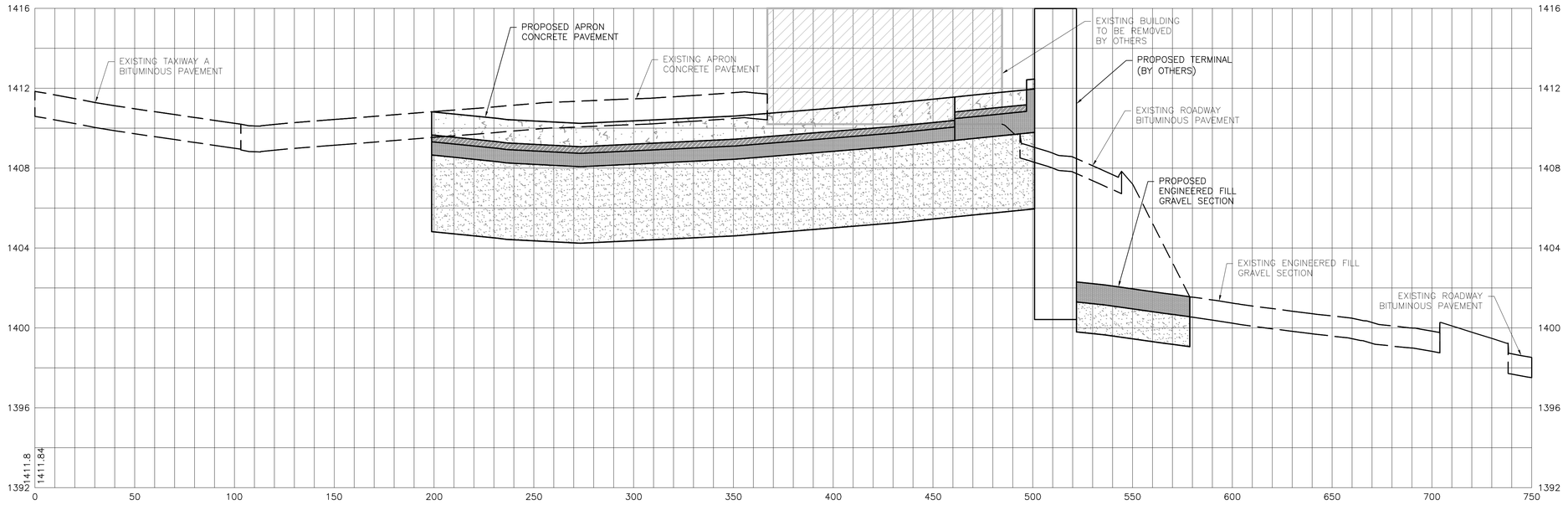
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X114.dwg Plotted on: 2/7/2012 11:01 AM Plotted by: Erdmann, Ryan

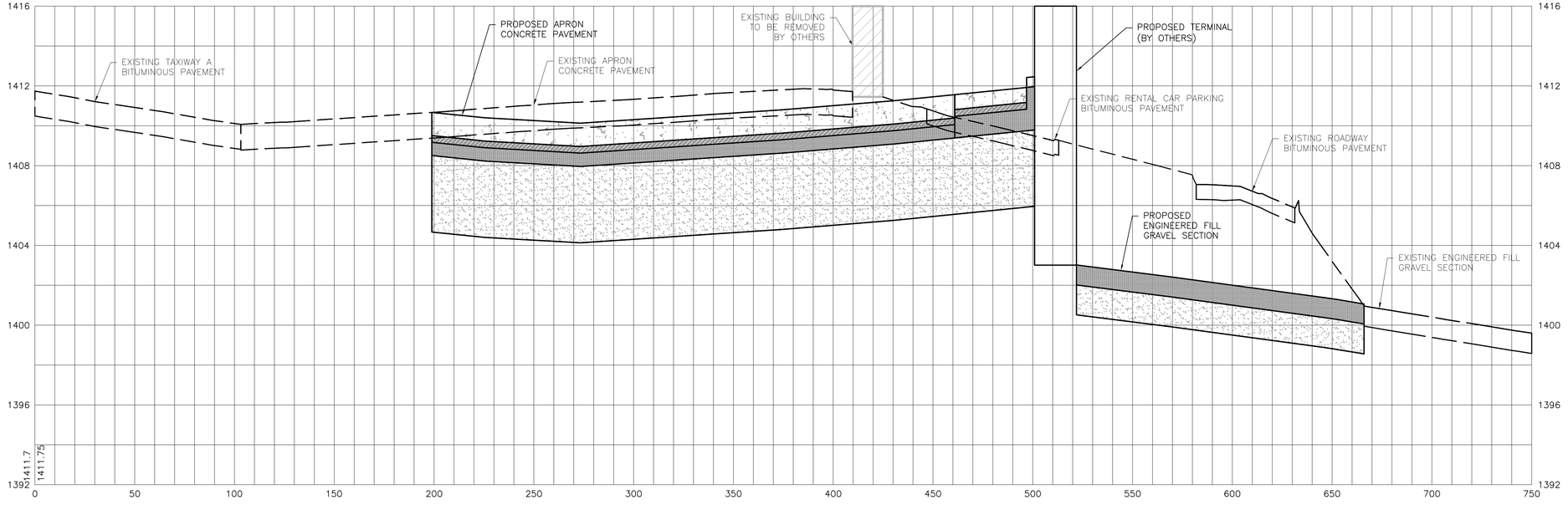
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

5+50



5+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 5+00 TO STA. 5+50

SHEET NUMBER

X115

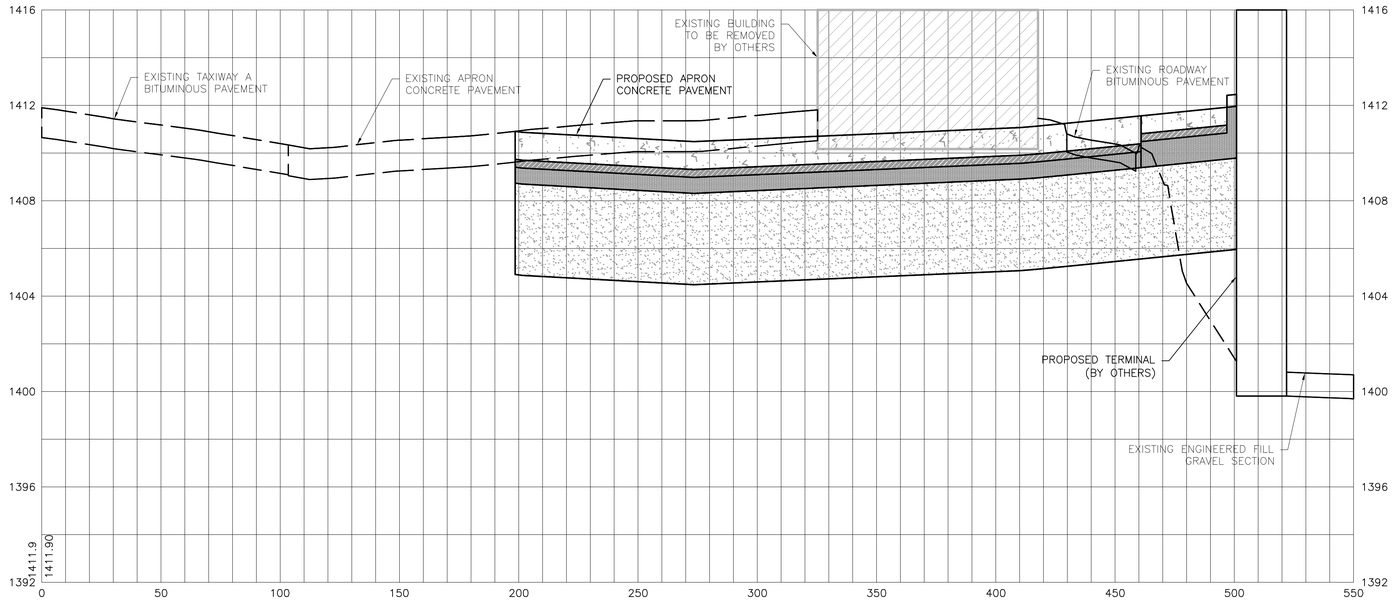
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X115.dwg Plotted on: 2/7/2012 11:02 AM Plotted by: Erdmann, Ryan

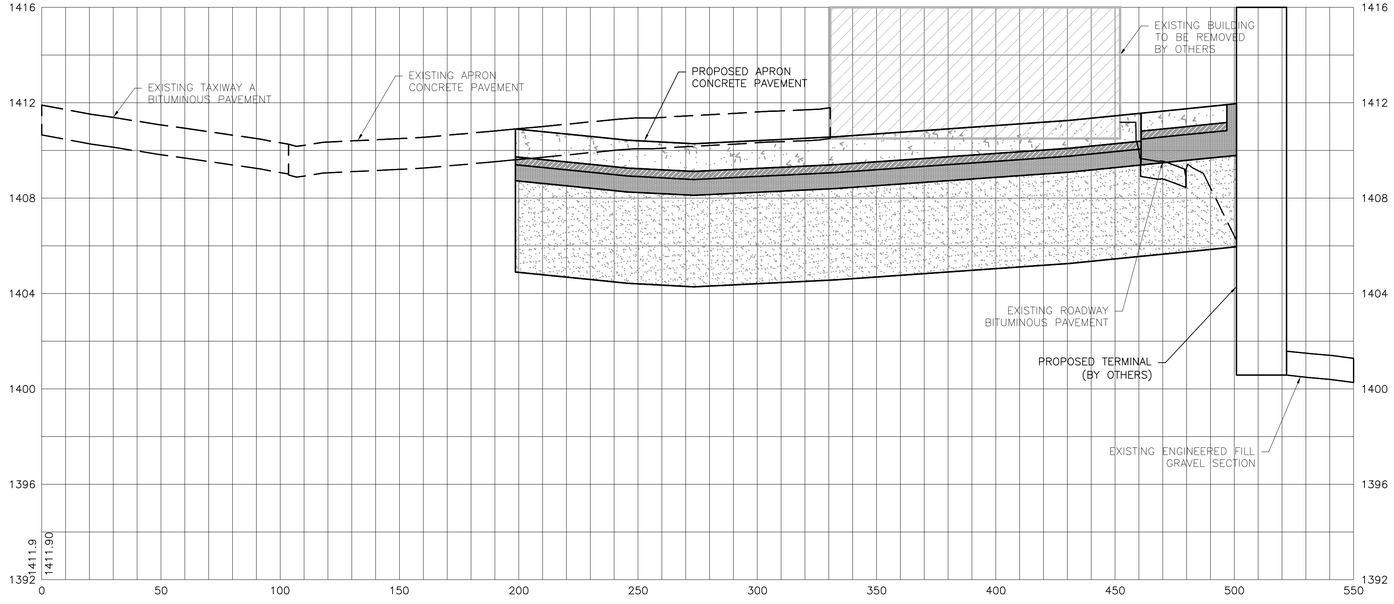
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

6+50



6+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 6+00 TO STA. 6+50

SHEET NUMBER

X116

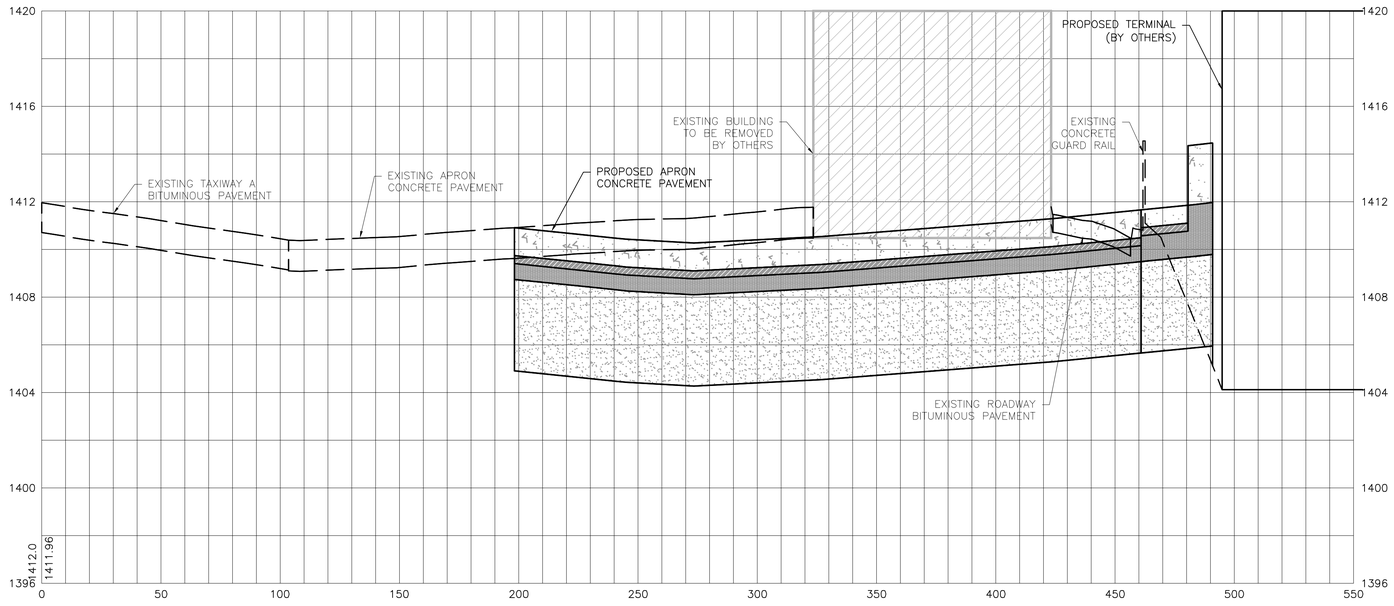
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X116.dwg Plotted on: 2/7/2012 11:03 AM Plotted by: Erdmann, Ryan

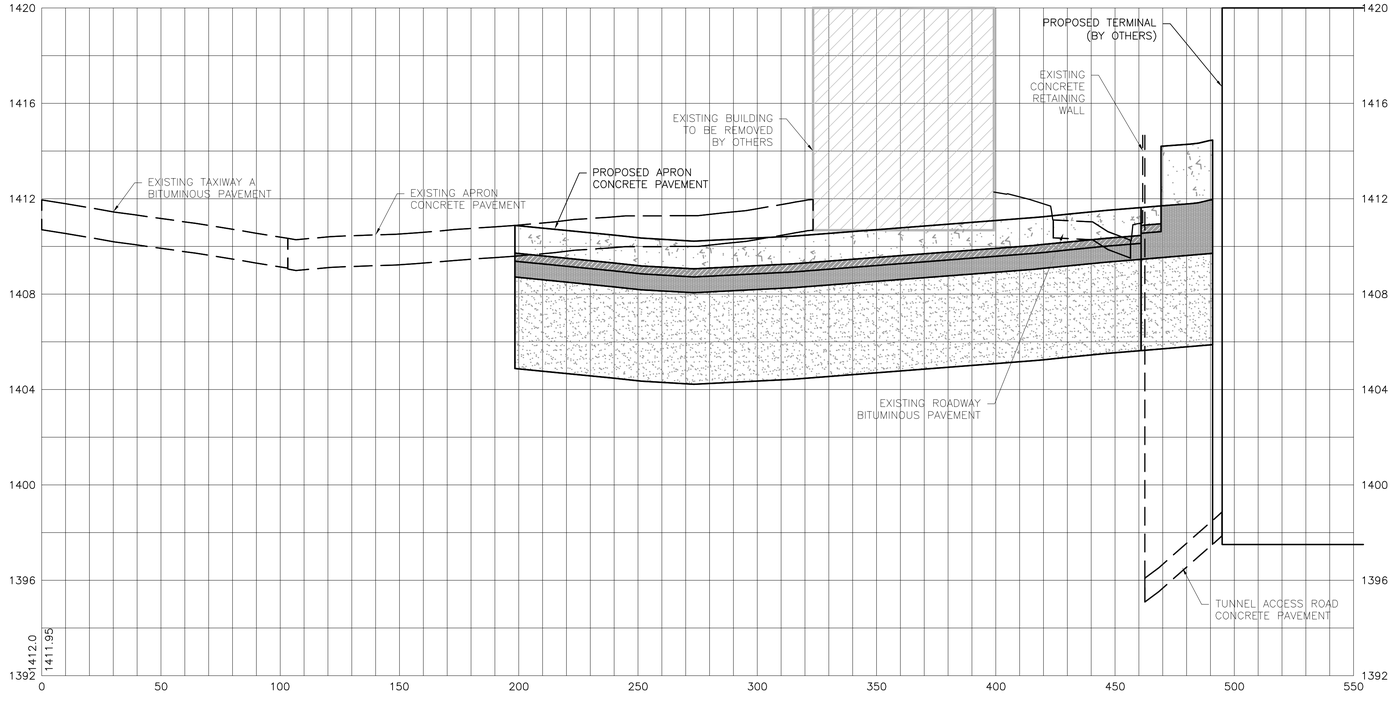
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

7+50



7+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 7+00 TO STA. 7+50

SHEET NUMBER

X117

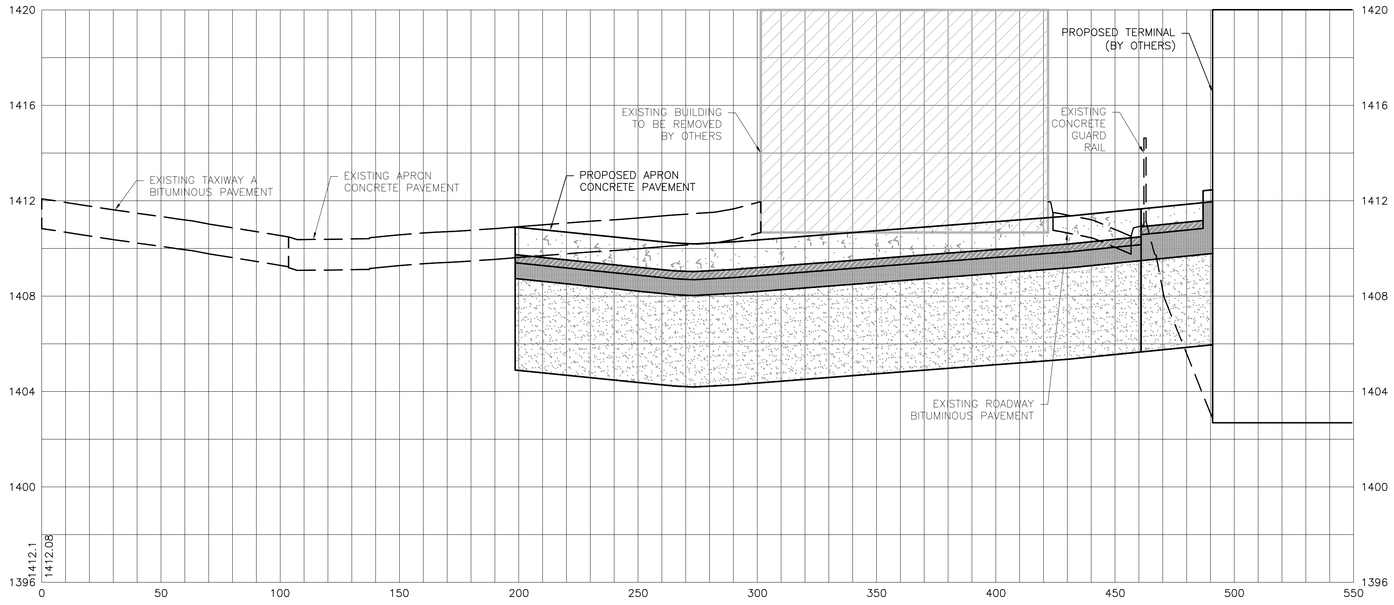
BID PACKAGE 2C
BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X117.dwg Plotted on: 2/7/2012 11:04 AM Plotted by: Erdmann, Ryan

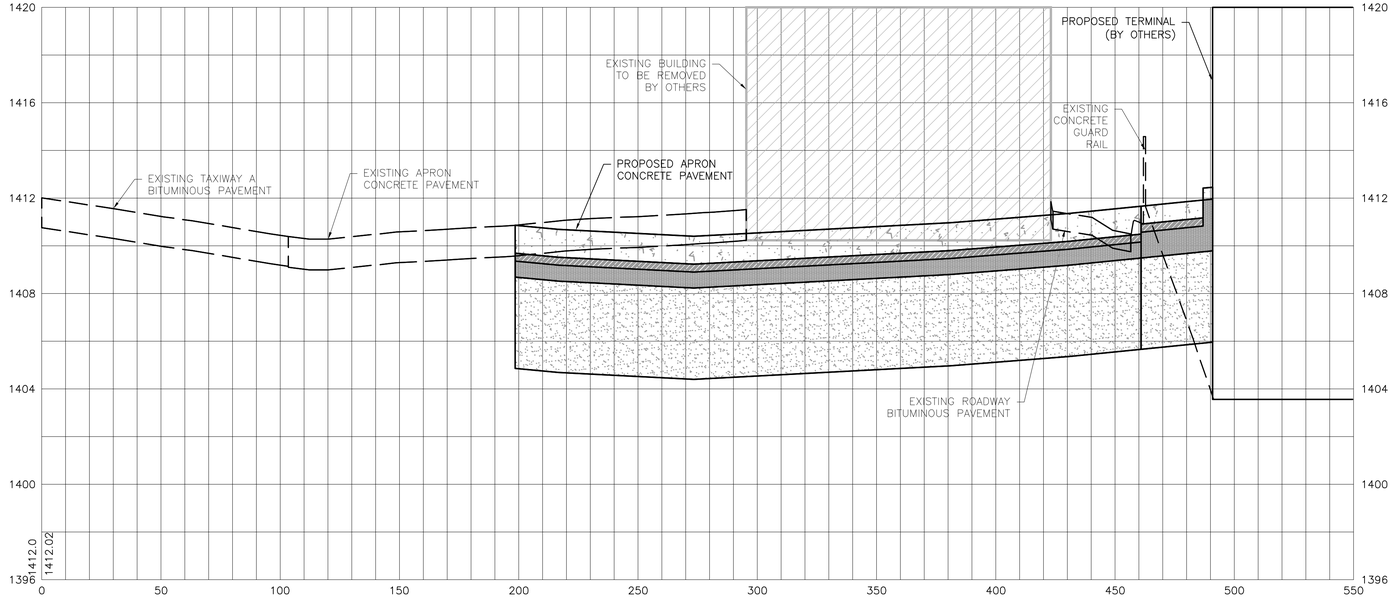
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

8+50



8+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 8+00 TO STA. 8+50

SHEET NUMBER
X118

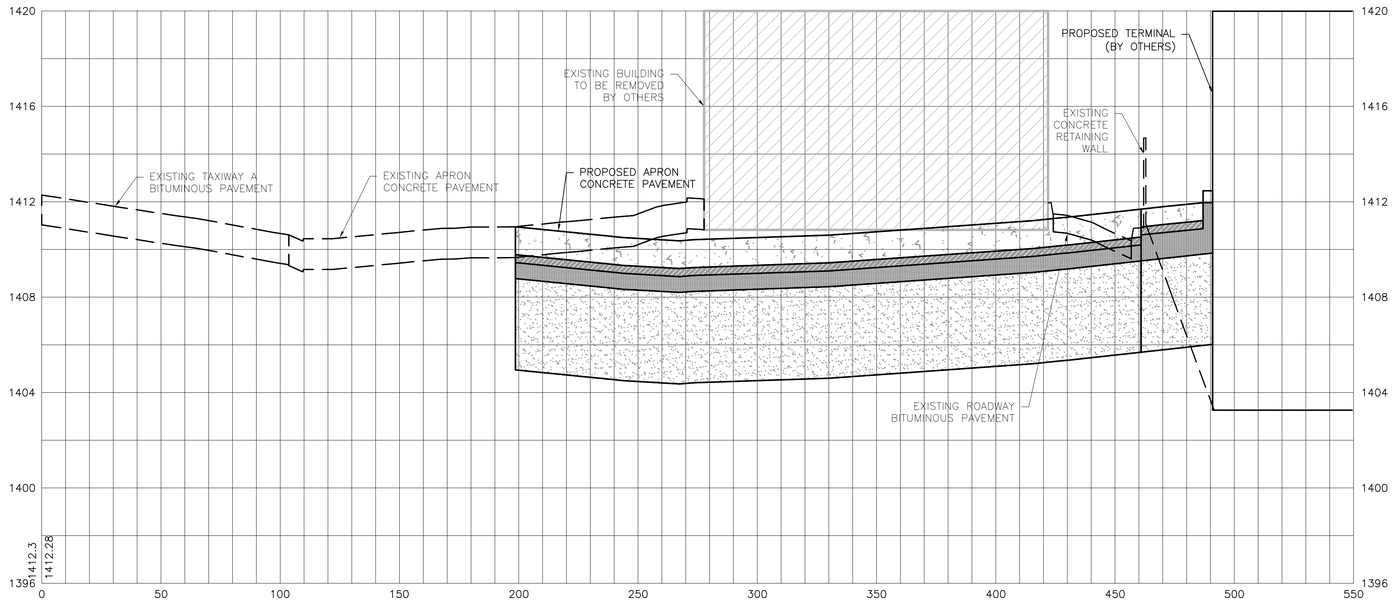
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X118.dwg Plotted on: 2/7/2012 11:05 AM Plotted by: Erdmann, Ryan

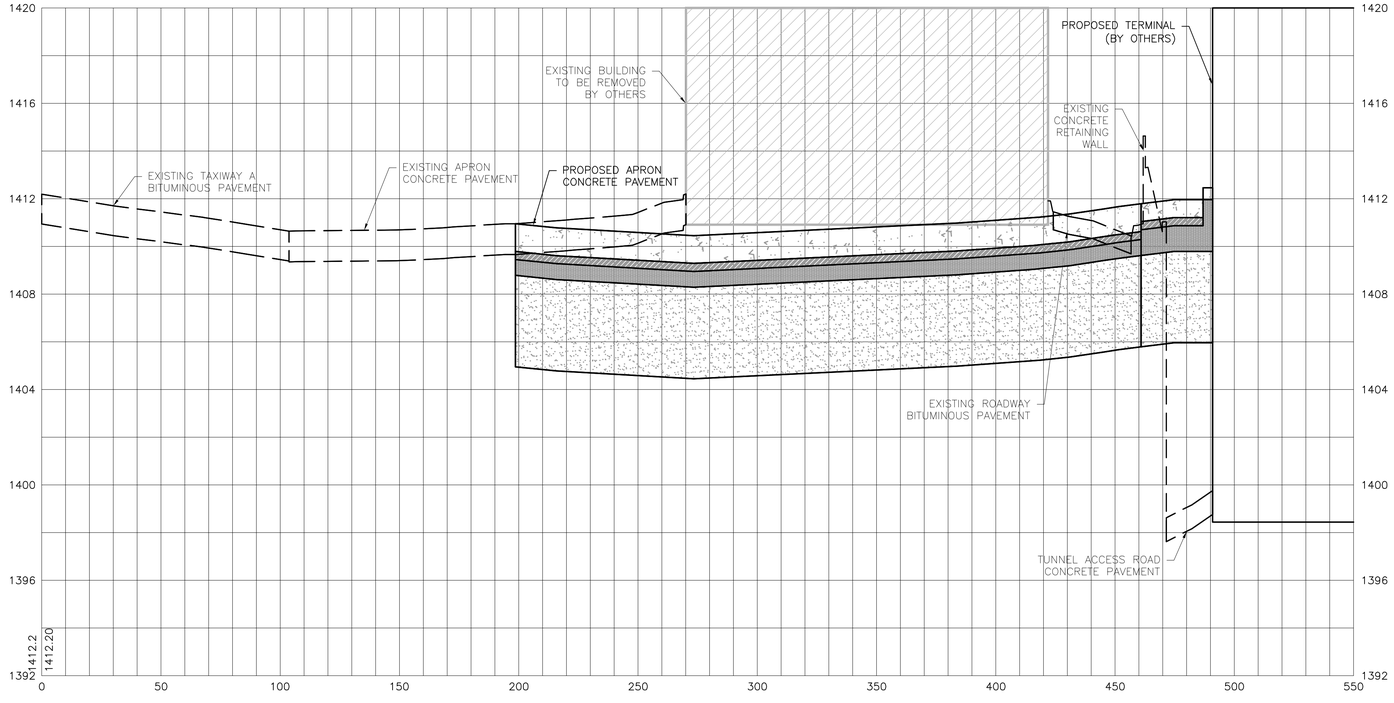
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

9+50



9+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 9+00 TO STA. 9+50

SHEET NUMBER

X119

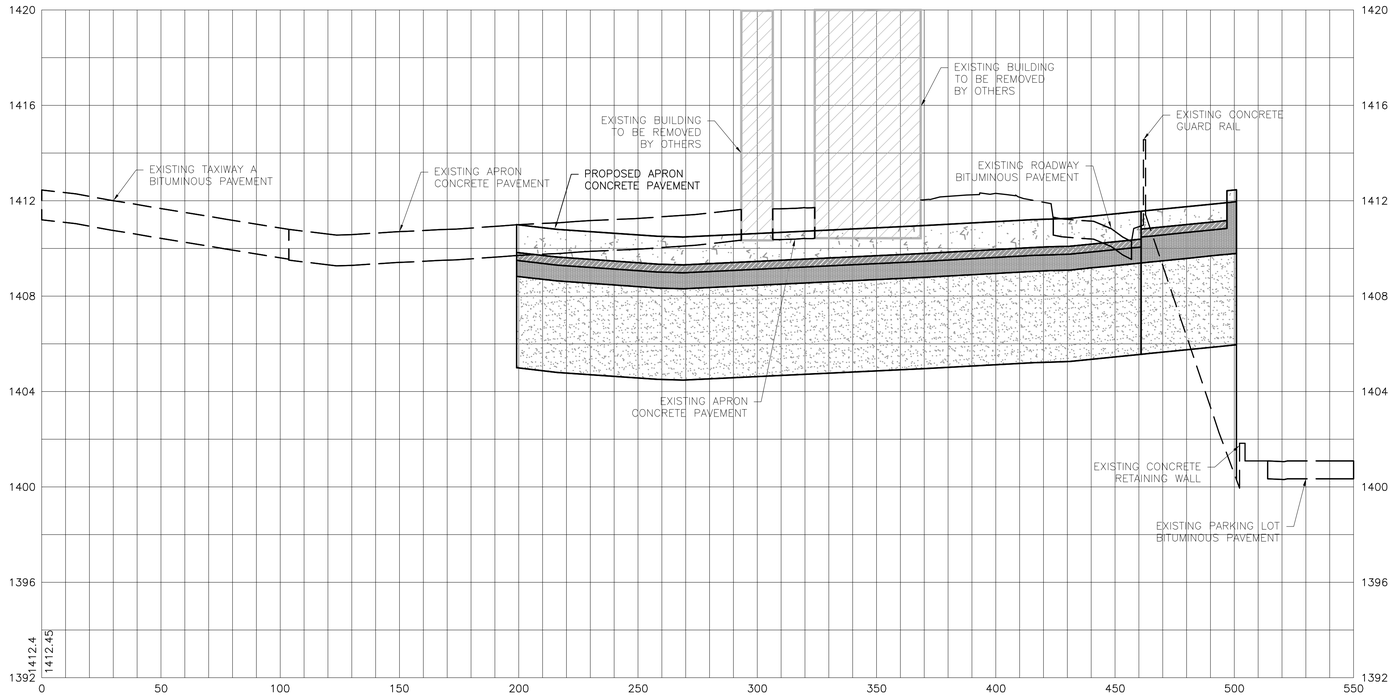
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X119.dwg Plotted on: 2/7/2012 11:06 AM Plotted by: Erdmann, Ryan

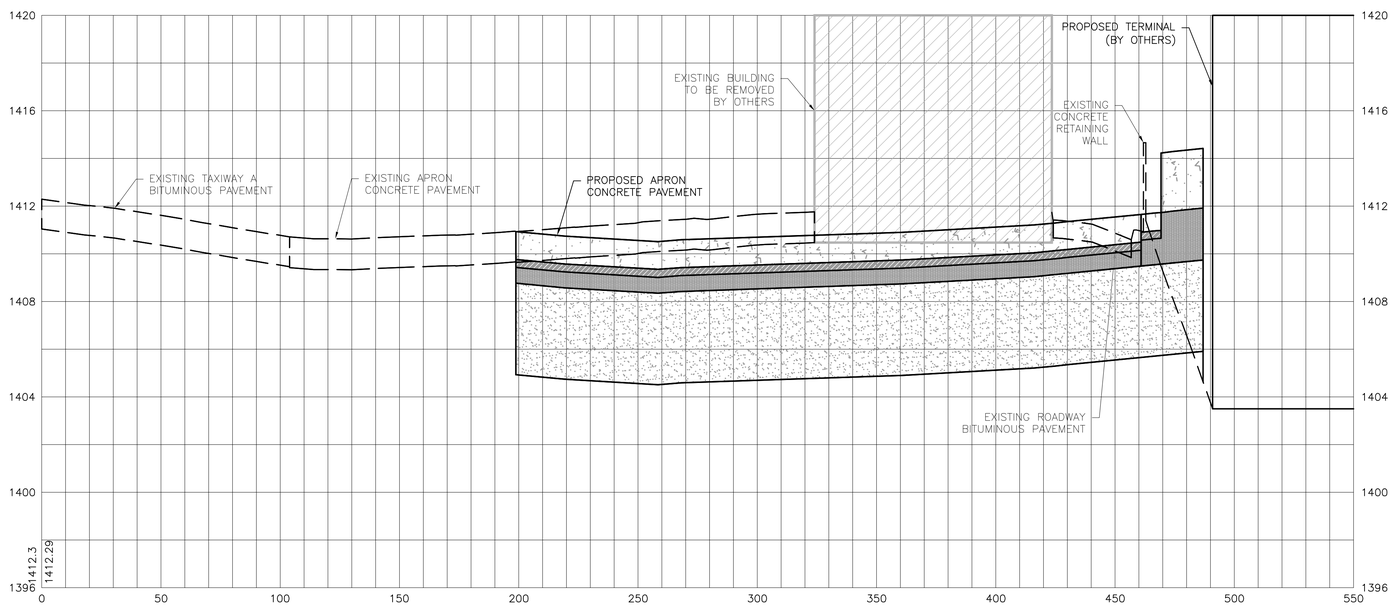
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

10+50



10+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 10+00 TO STA. 10+50

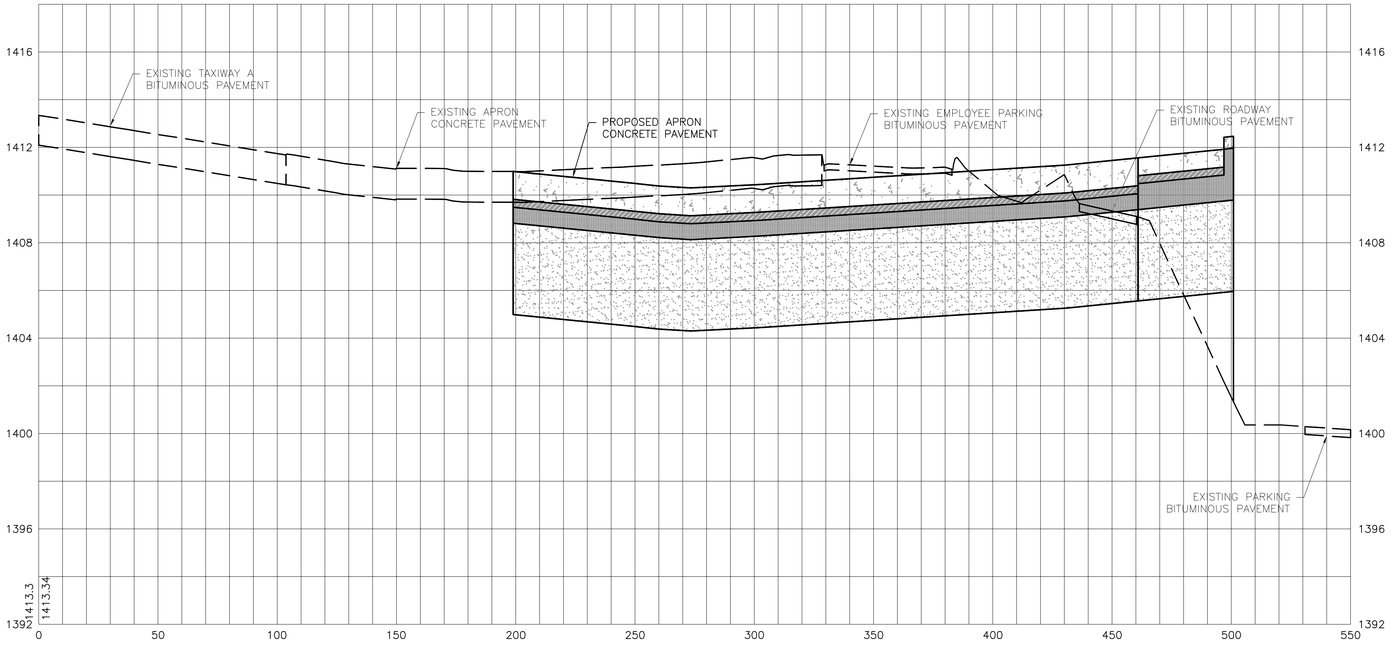
SHEET NUMBER

X120

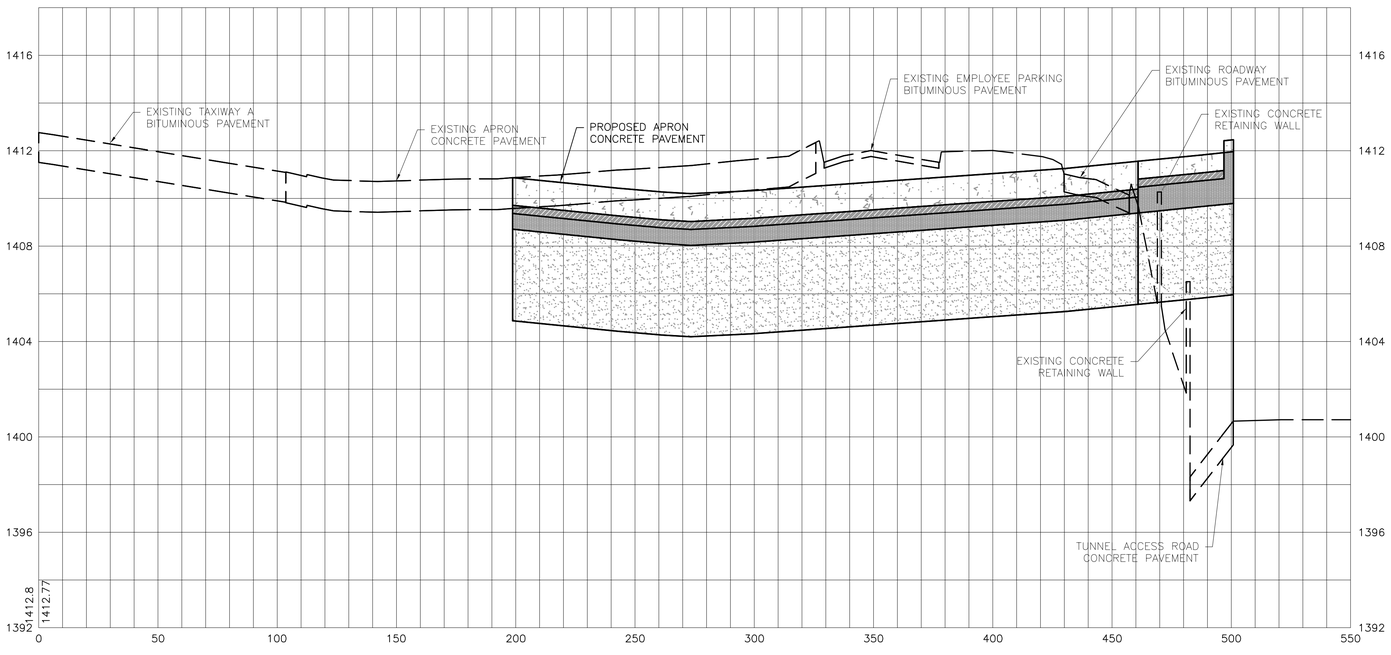
BID PACKAGE 2C BID DOCUMENTS

Drawing: I:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X120.dwg Plotted on: 2/7/2012 11:07 AM Plotted by: Erdmann, Ryan

11+50



11+00



HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 11+00 TO STA. 11+50

SHEET NUMBER

X121

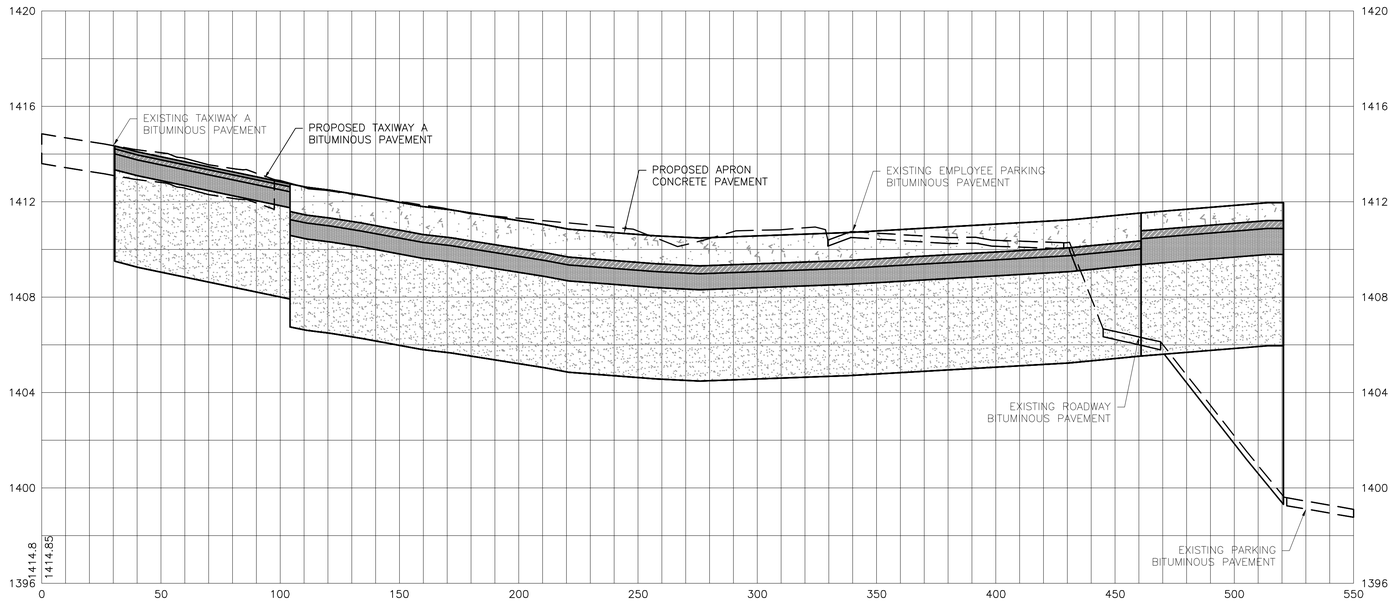
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X121.dwg Plotted on: 2/7/2012 11:08 AM Plotted by: Erdmann, Ryan

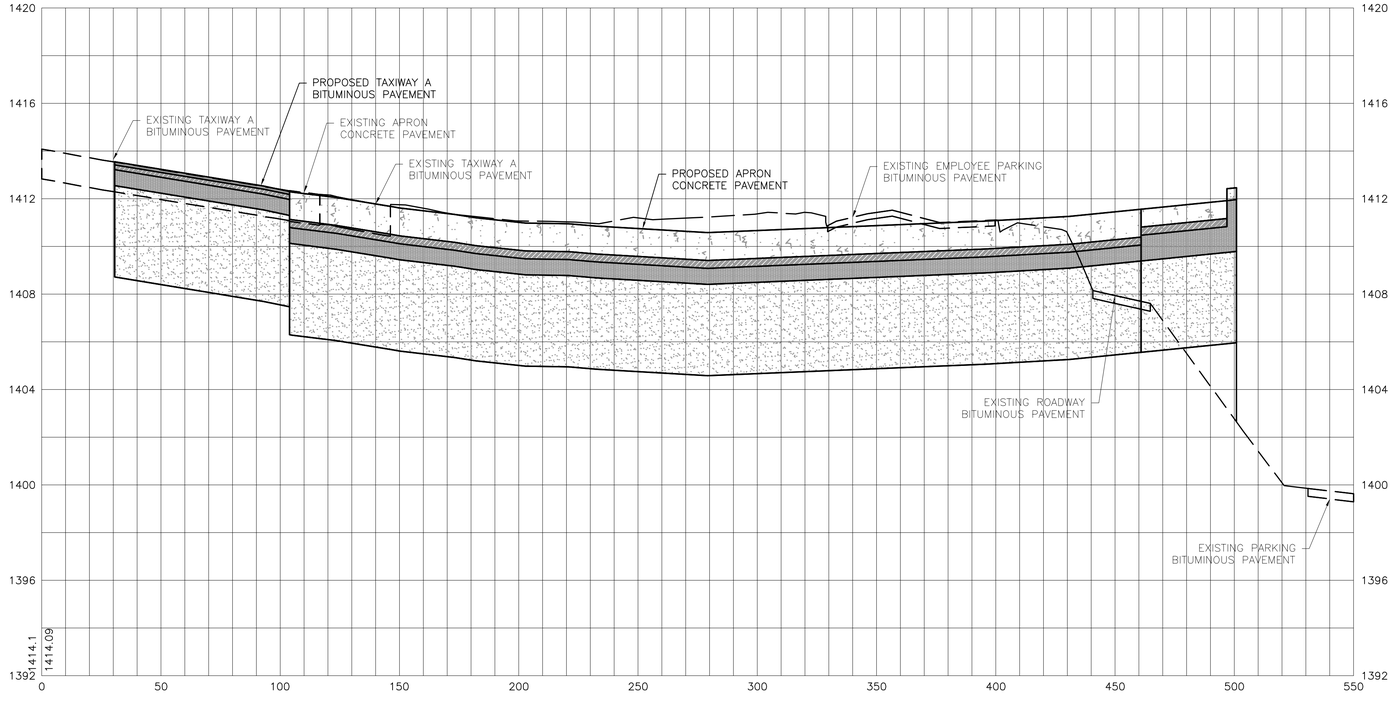
HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

12+50



12+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 12+00 TO STA. 12+50

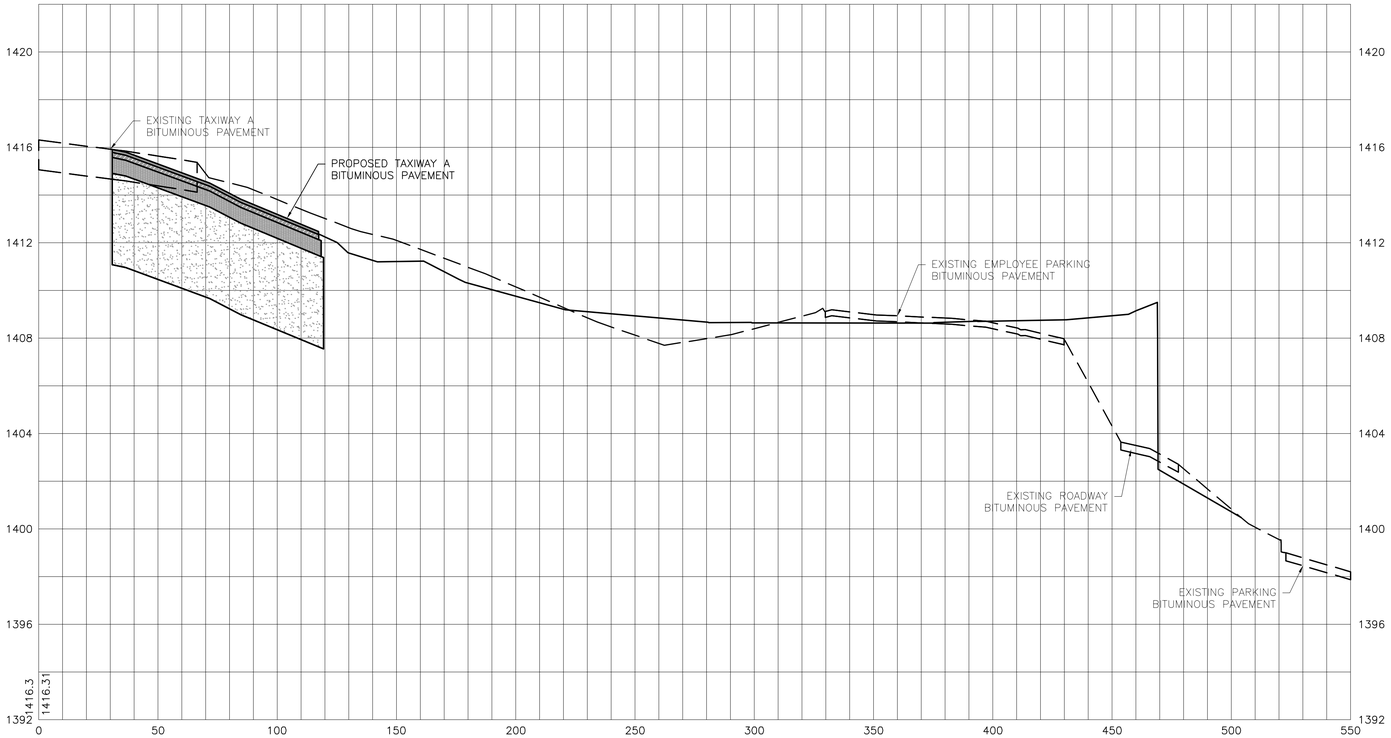
SHEET NUMBER

X122

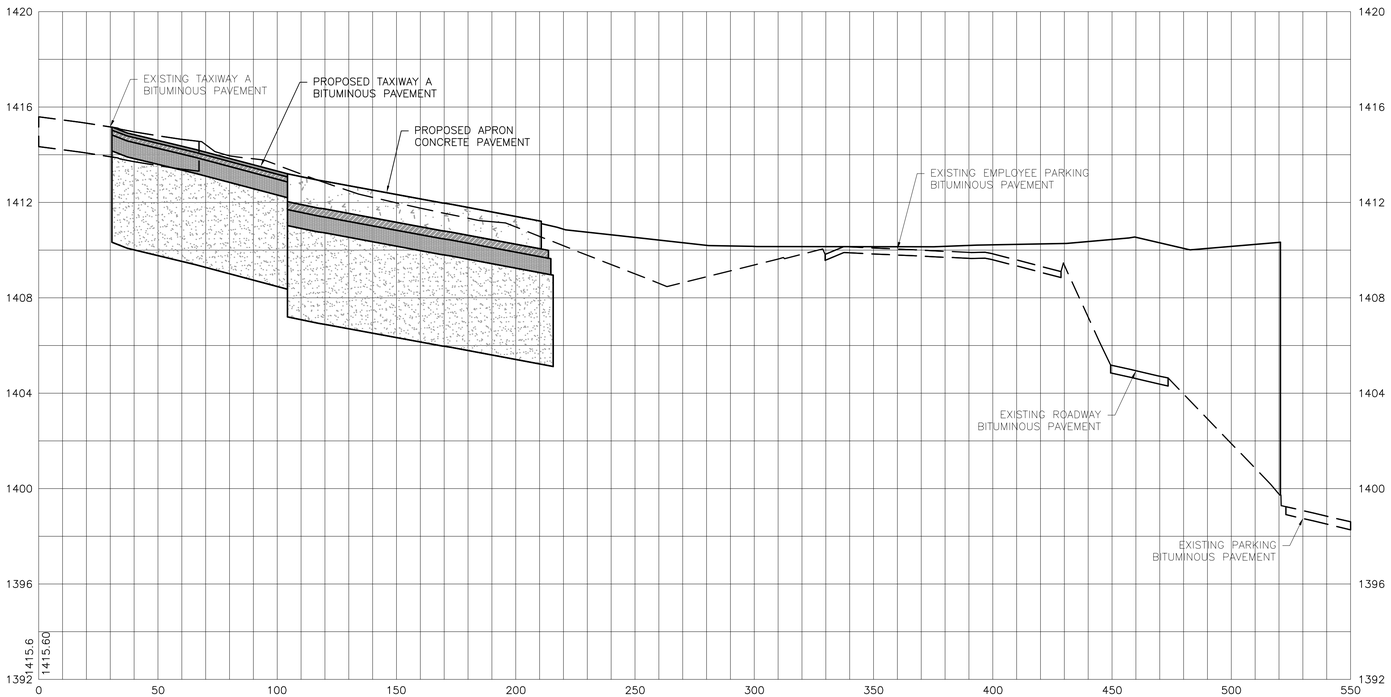
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X122.dwg Plotted on: 2/7/2012 11:09 AM Plotted by: Erdmann, Ryan

13+50



13+00



HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 13+00 TO STA. 13+50

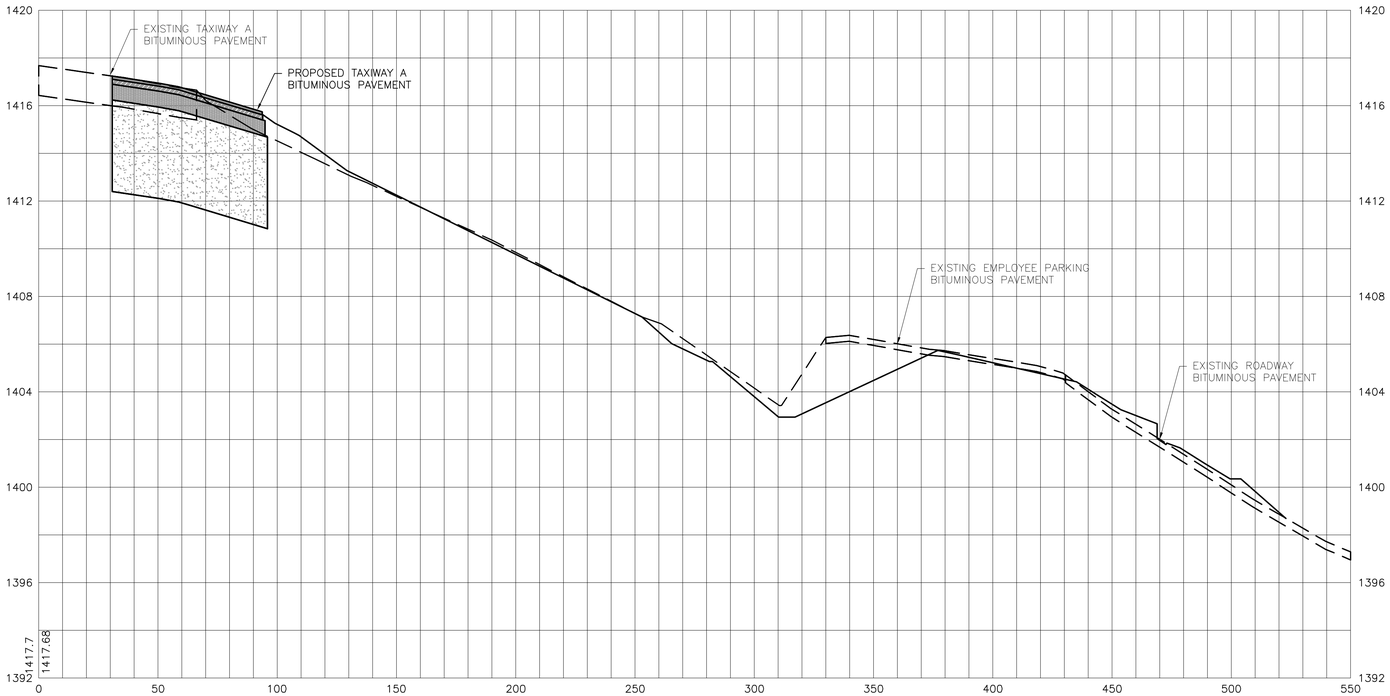
SHEET NUMBER

X123

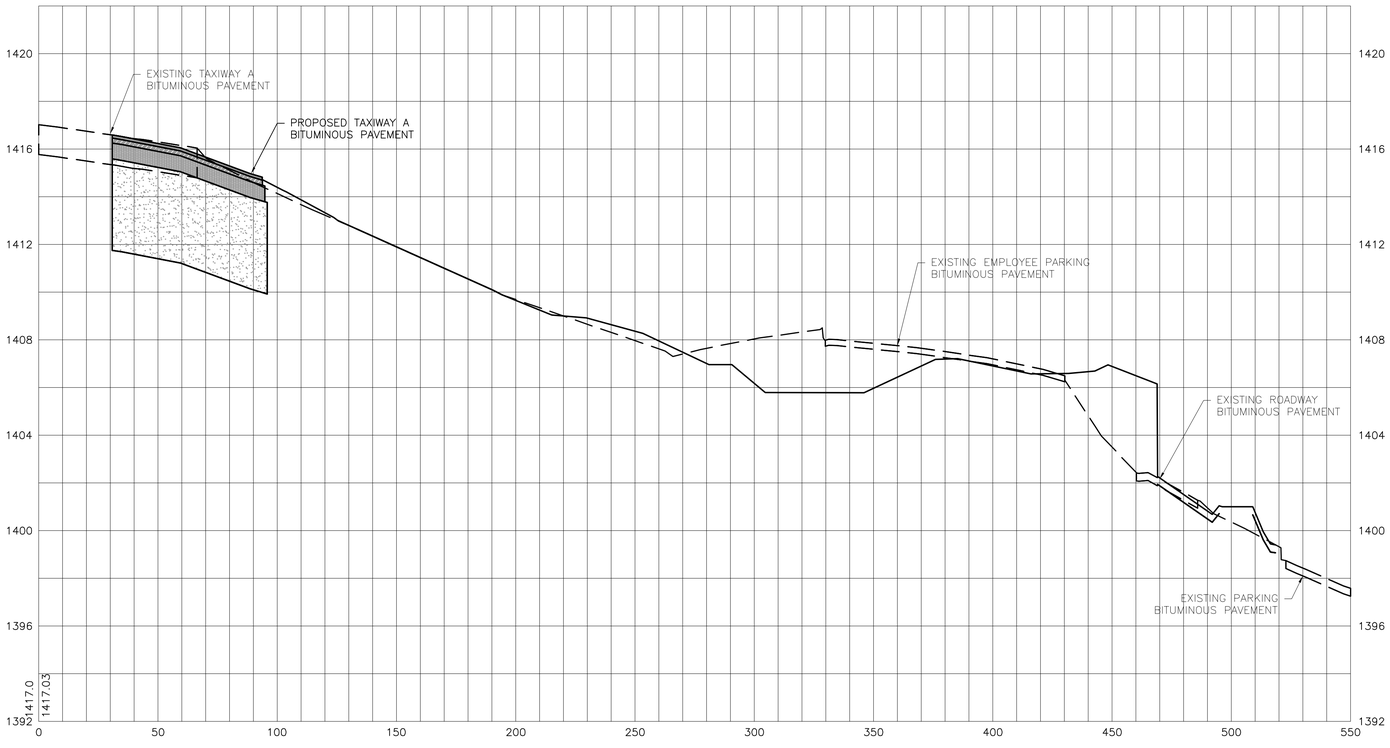
BID PACKAGE 2C
BID DOCUMENTS

Drawing: I:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X123.dwg Plotted on: 2/7/2012 11:10 AM Plotted by: Erdmann, Ryan

14+50



14+00



HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 14+00 TO STA. 14+50

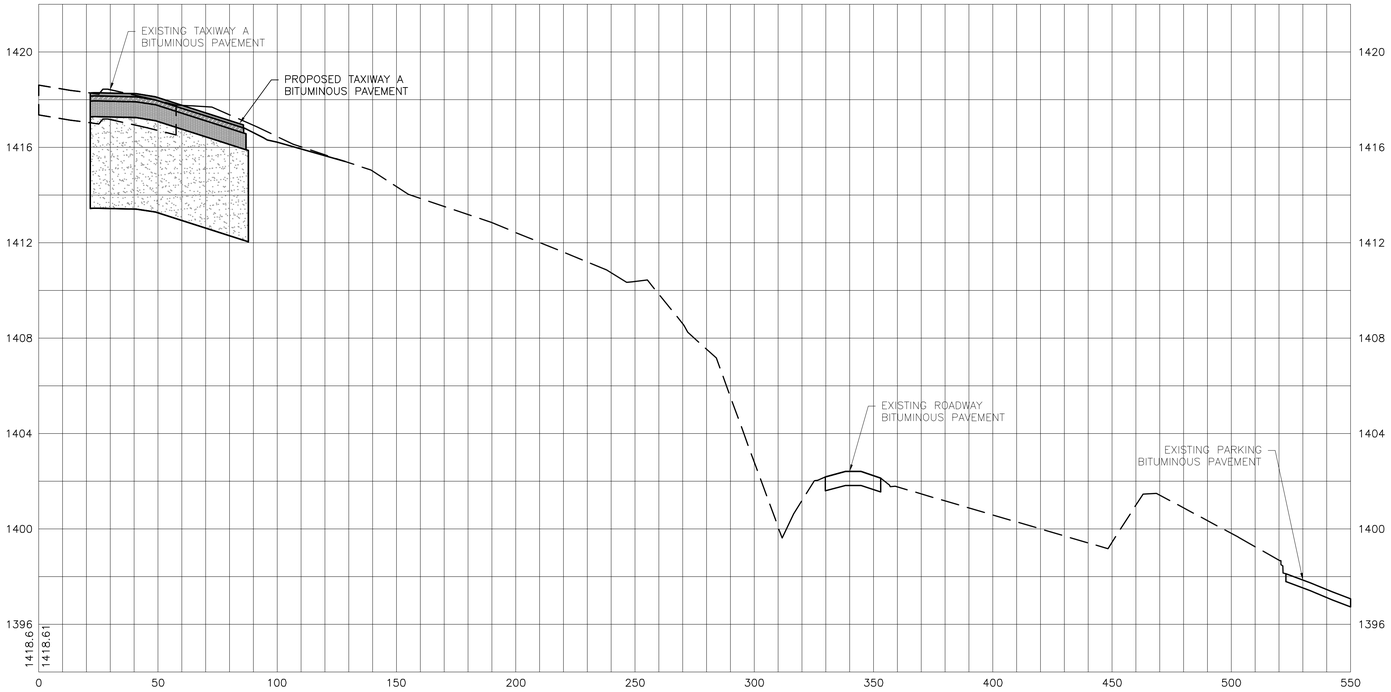
SHEET NUMBER

X124

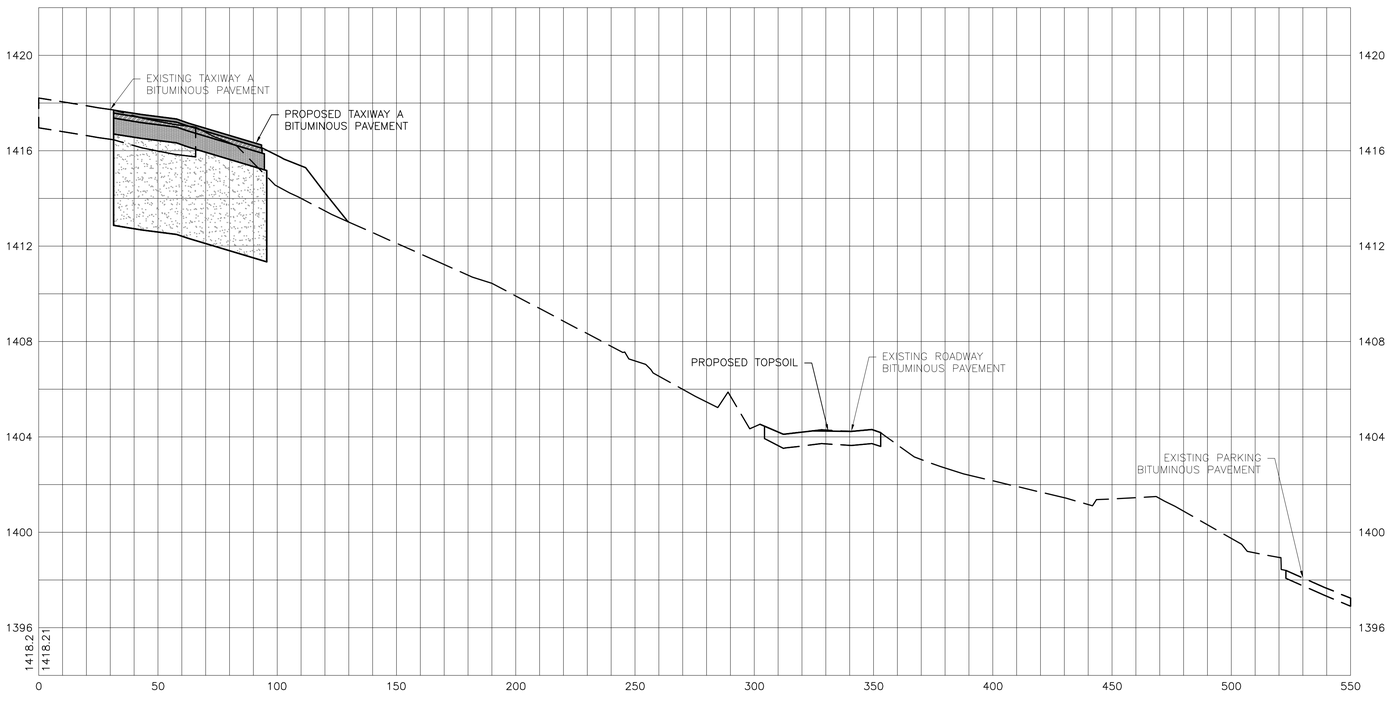
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X124.dwg Plotted on: 2/7/2012 11:11 AM Plotted by: Erdmann, Ryan

15+50



15+00



HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 15+00 TO STA. 15+50

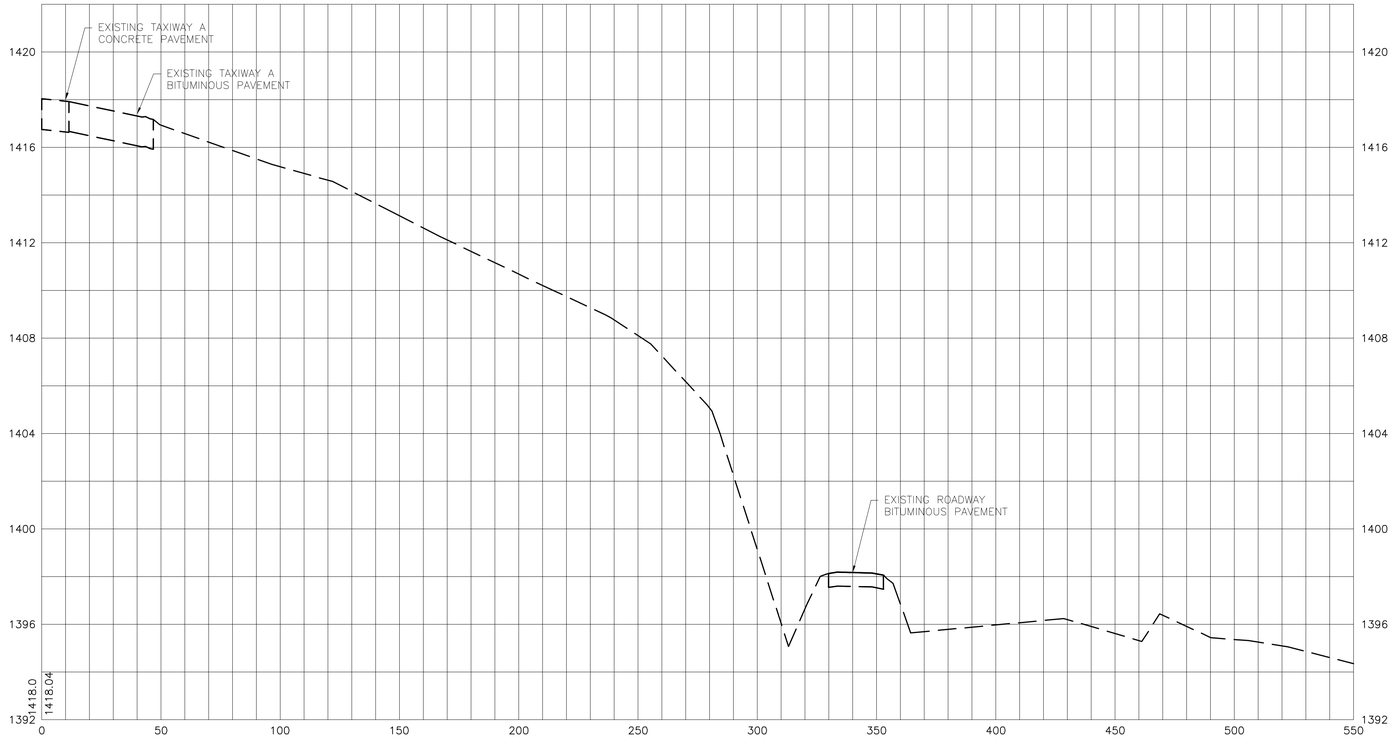
SHEET NUMBER

X125

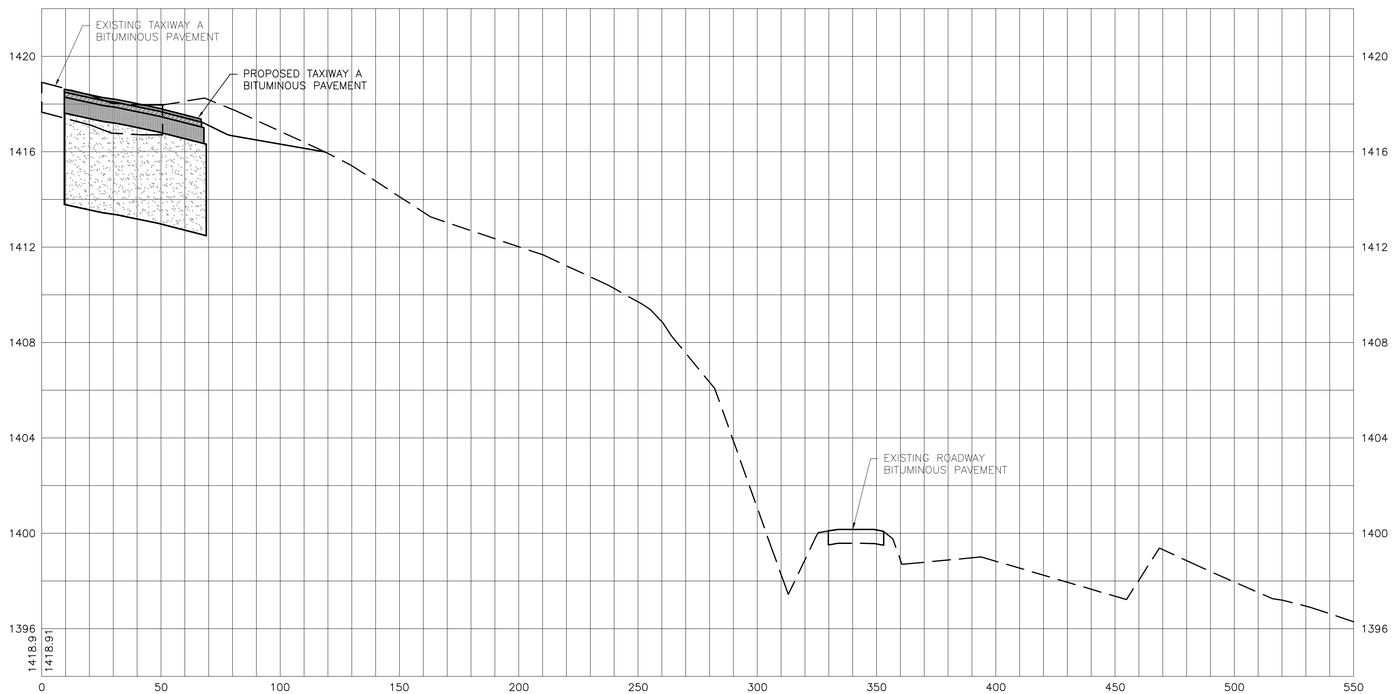
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X125.dwg Plotted on: 2/7/2012 11:12 AM Plotted by: Erdmann, Ryan

16+50



16+00



HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 16+00 TO STA. 16+50

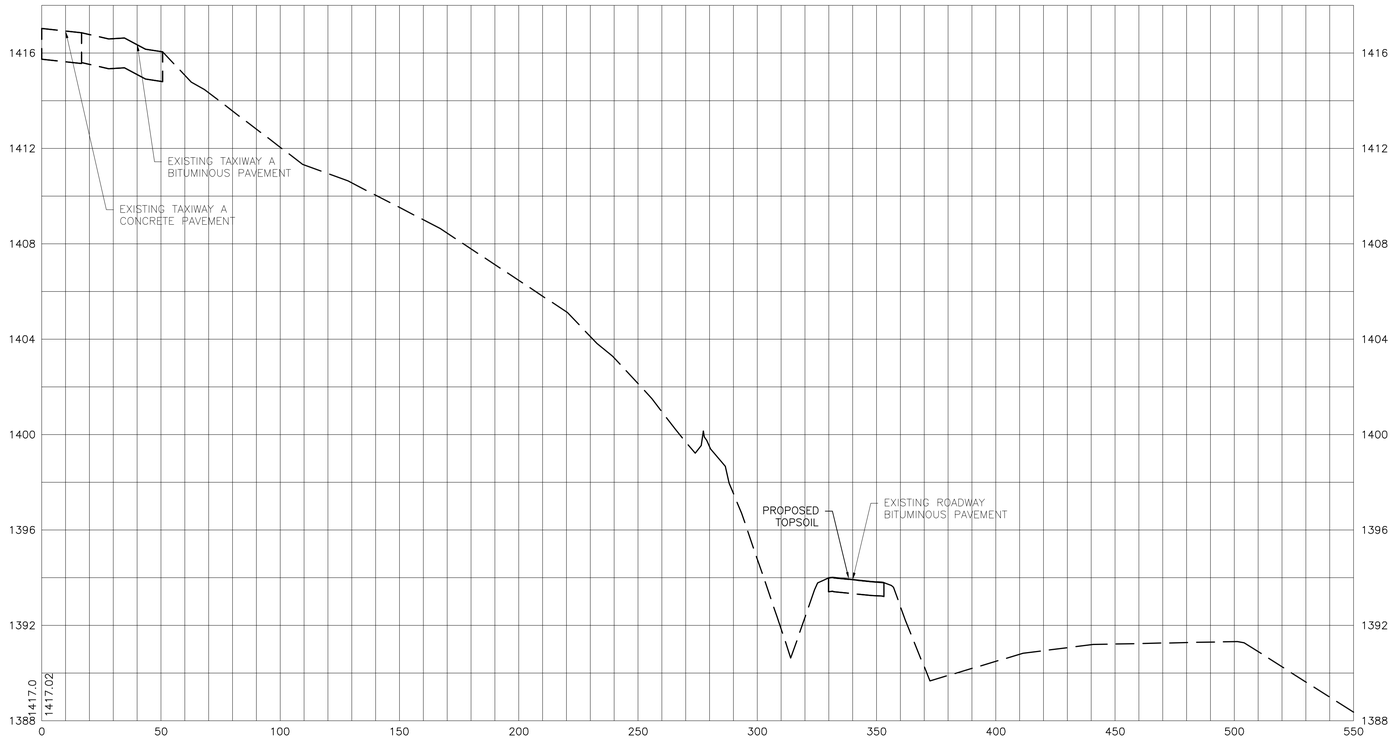
SHEET NUMBER

X126

BID PACKAGE 2C BID DOCUMENTS

Drawing: I:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X126.dwg Plotted on: 2/7/2012 11:13 AM Plotted by: Erdmann, Ryan

17+50



17+00

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 17+00 TO STA. 17+50

SHEET NUMBER

X127

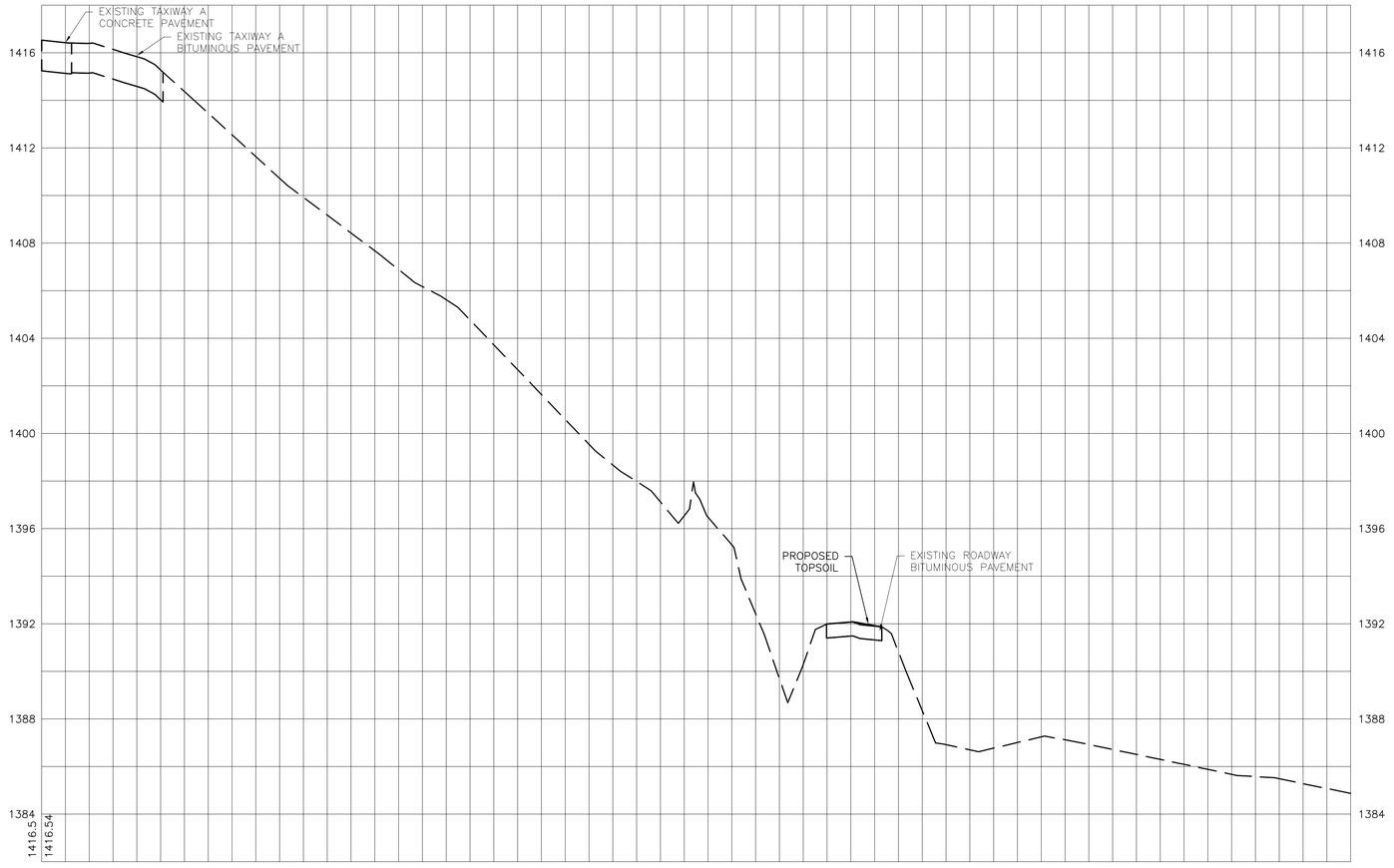
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X127.dwg Plotted on: 2/7/2012 11:14 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

18+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 18+00

SHEET NUMBER

X128

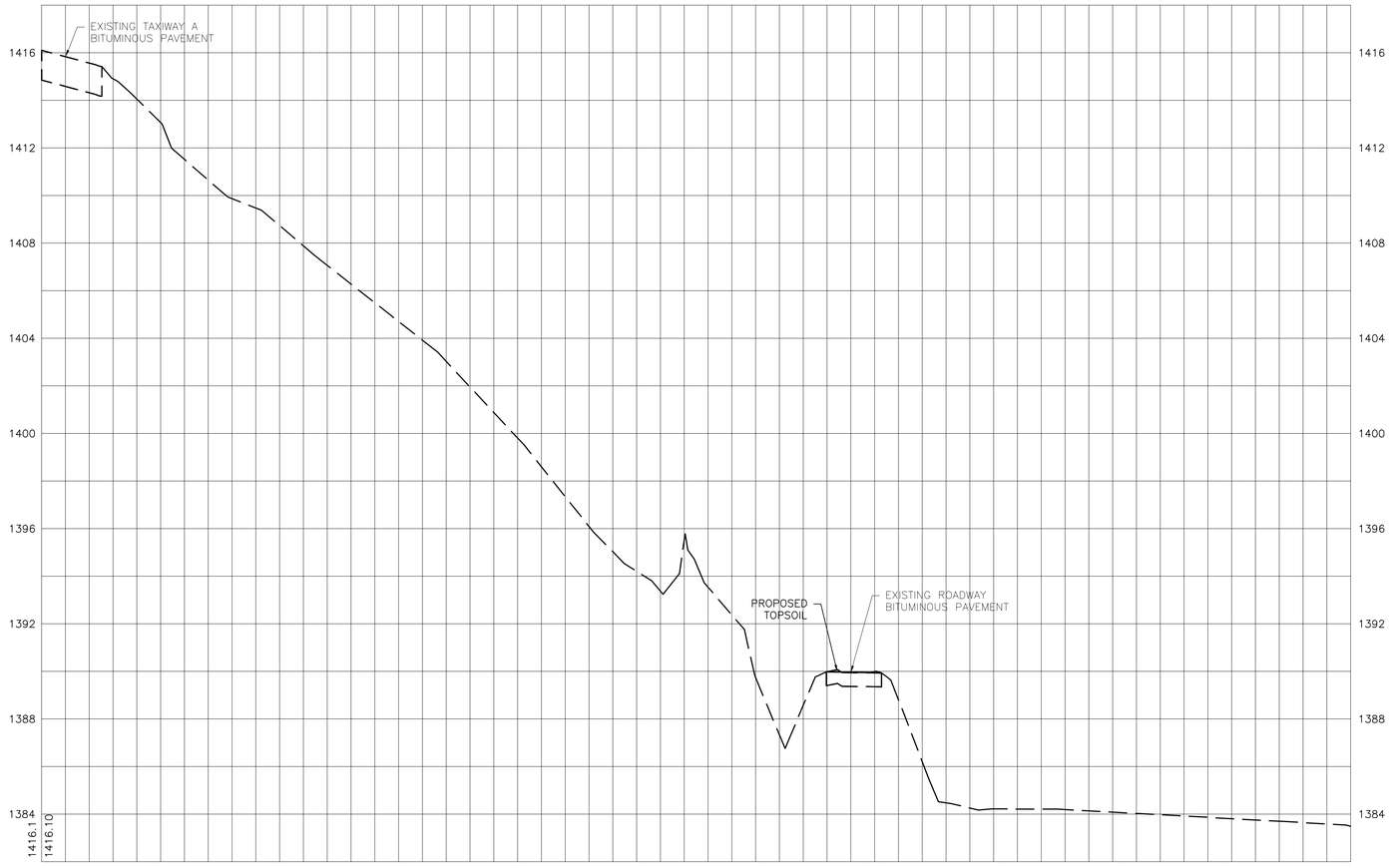
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X128.dwg Plotted on: 2/7/2012 11:14 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

18+50



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 18+50

SHEET NUMBER

X129

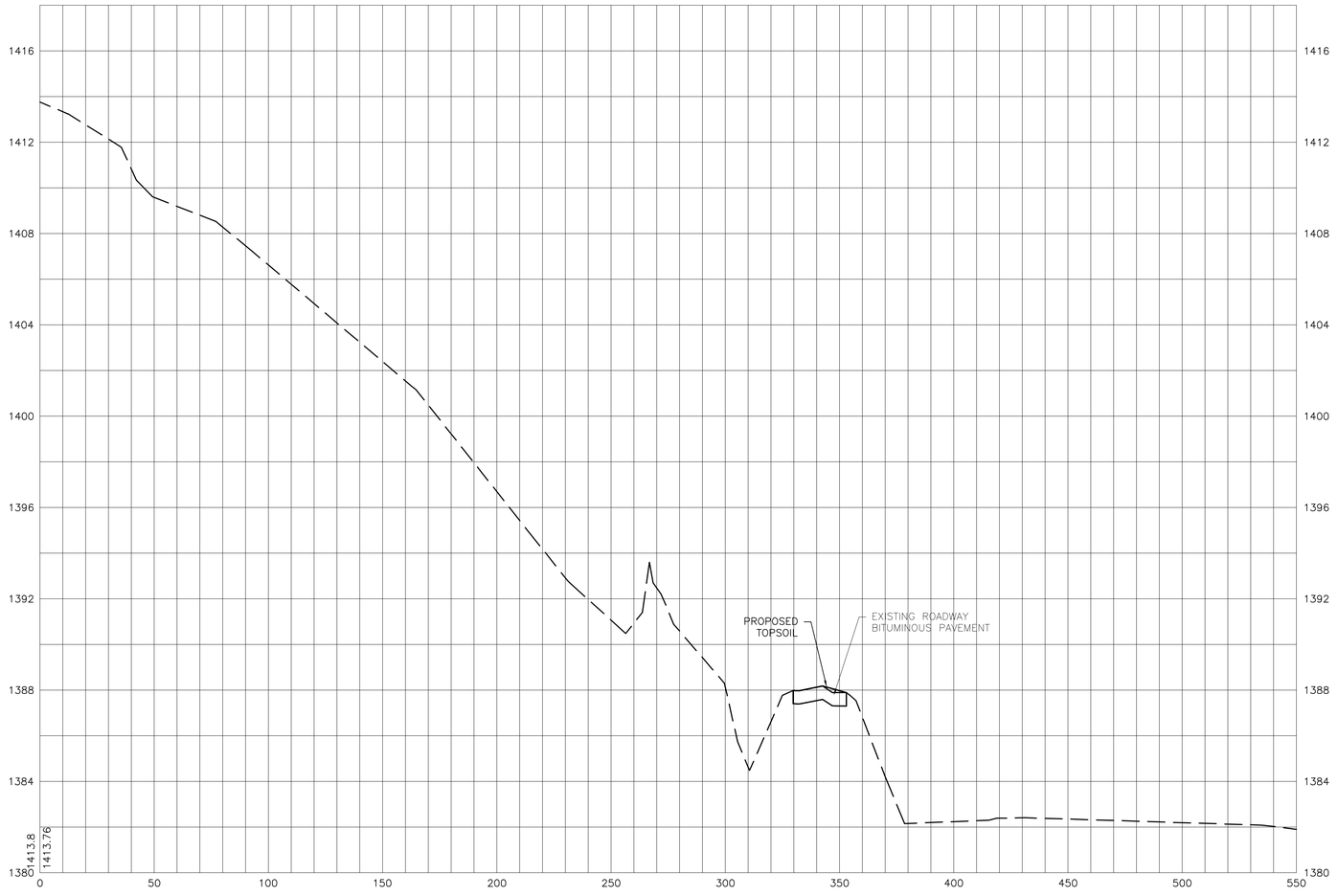
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X129.dwg Plotted on: 2/8/2012 9:17 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

19+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 19+00

SHEET NUMBER
X130

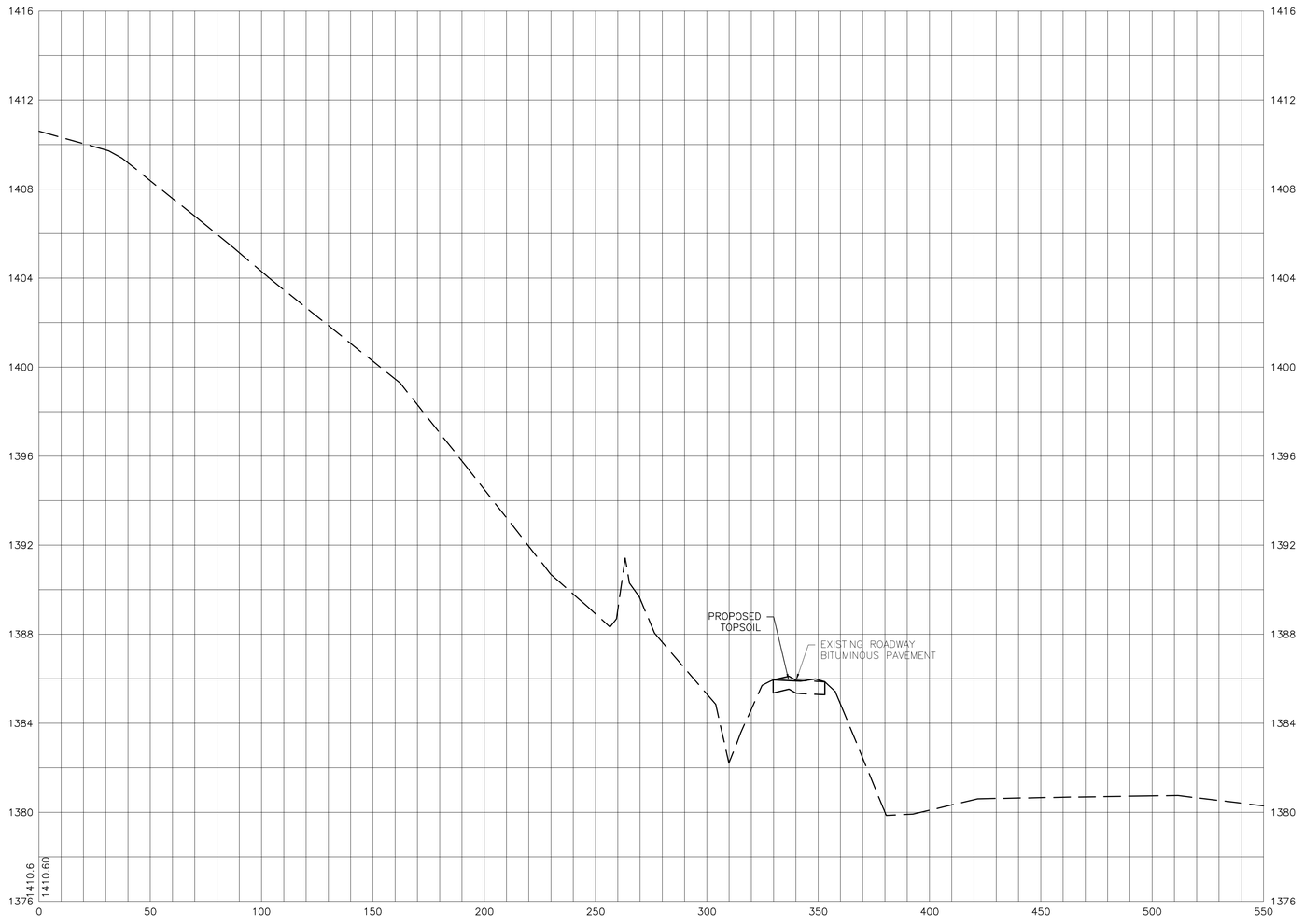
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X130.dwg Plotted on: 2/8/2012 9:18 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

19+50



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 19+50

SHEET NUMBER

X131

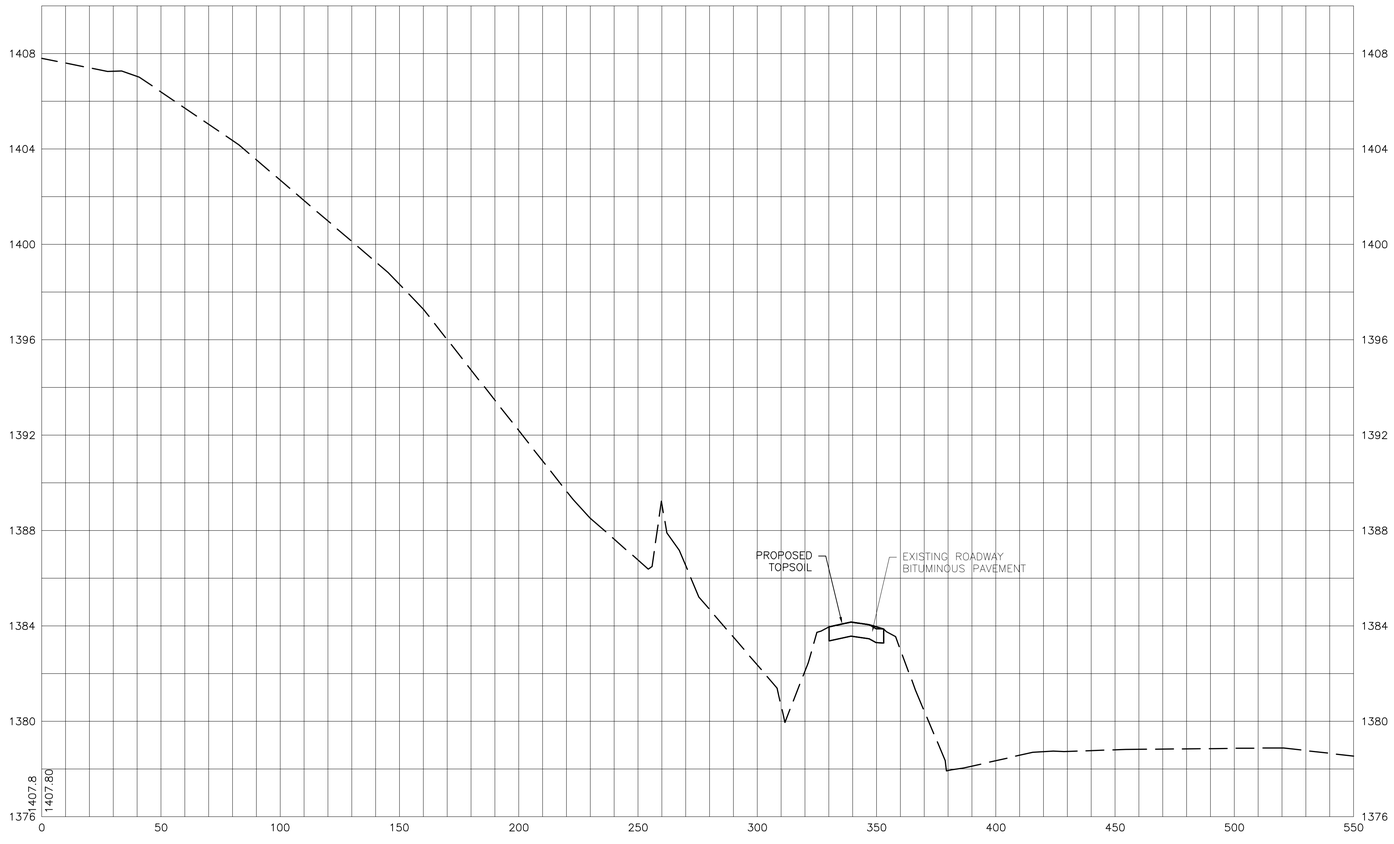
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X131.dwg Plotted on: 2/7/2012 11:19 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

20+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 20+00

SHEET NUMBER

X132

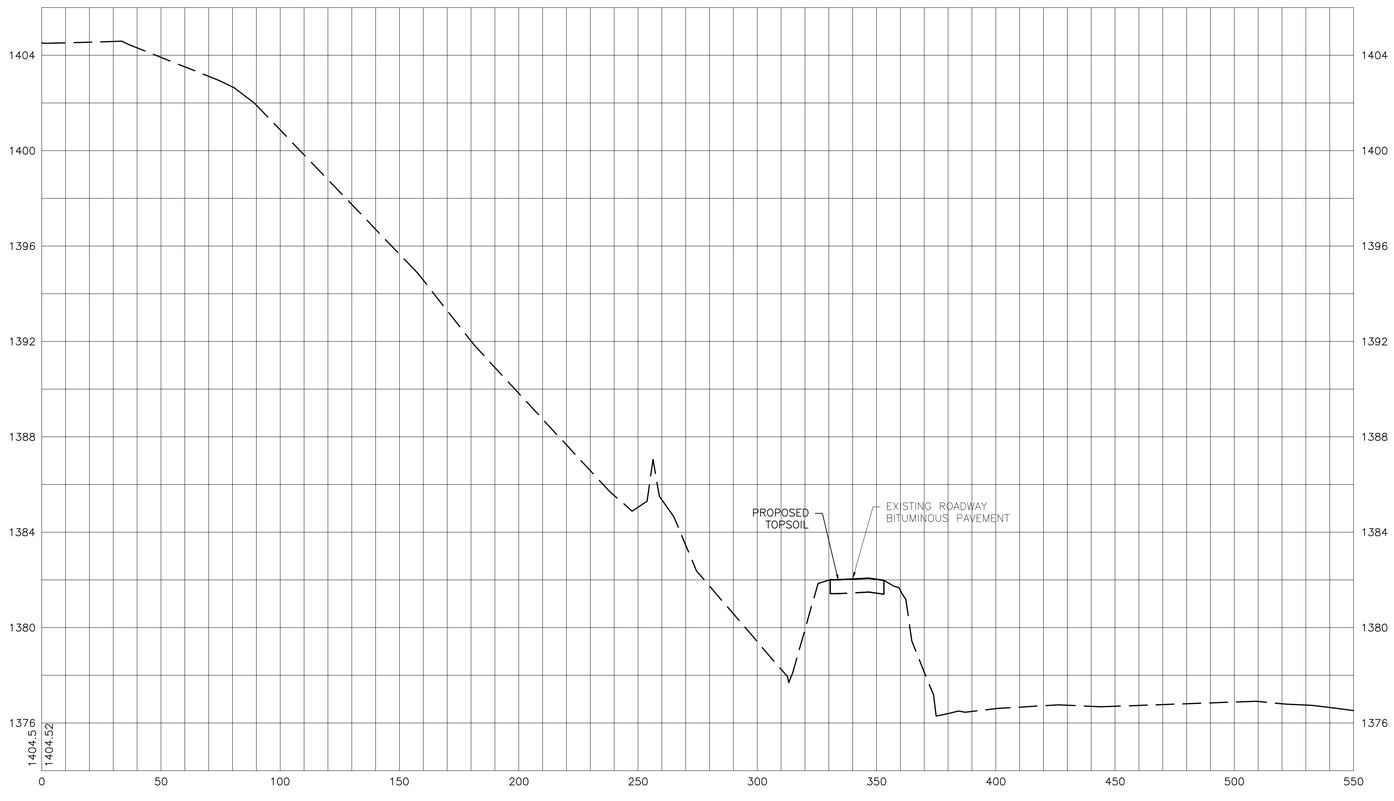
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X132.dwg Plotted on: 2/7/2012 11:20 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

20+50



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 20+50

SHEET NUMBER
X133

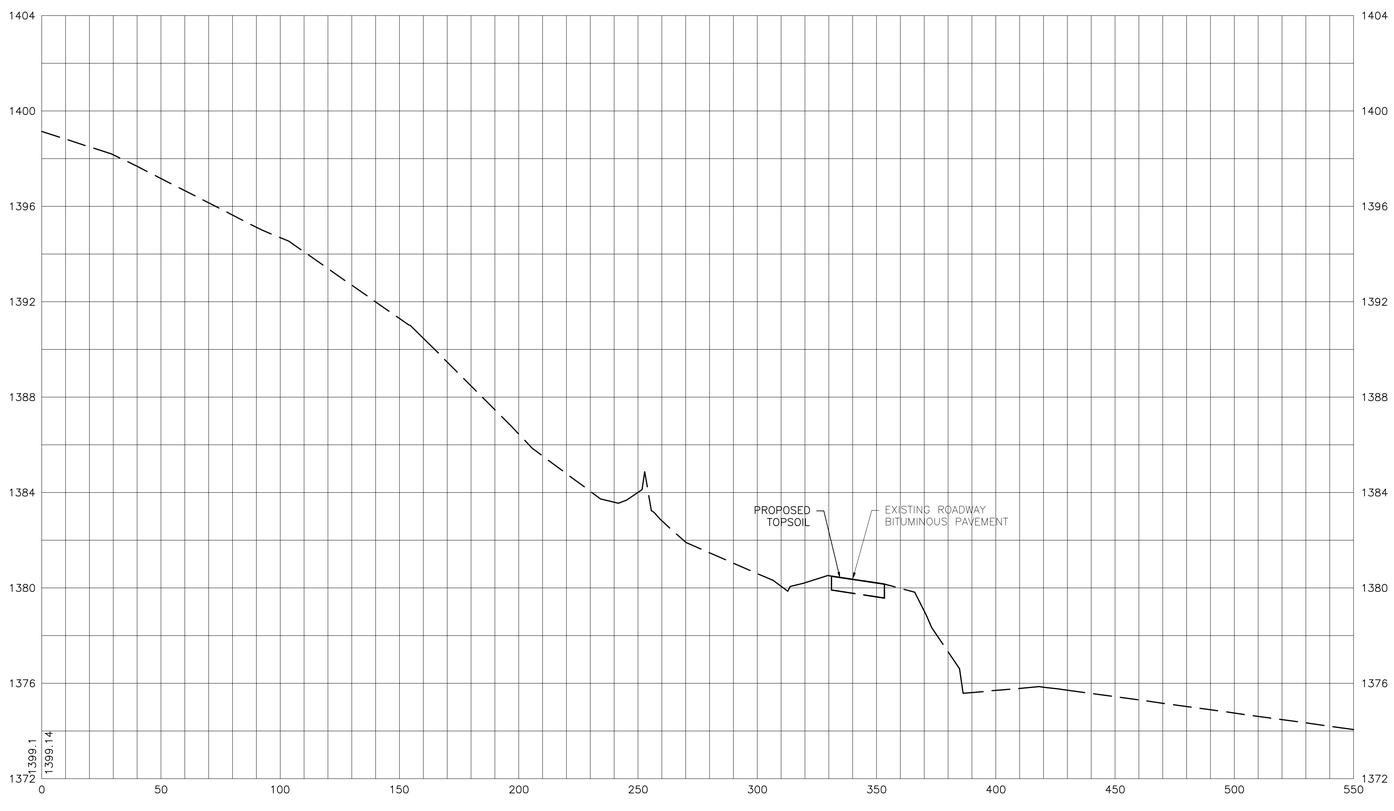
BID PACKAGE 2C BID DOCUMENTS

Drawing: I:\P\213882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X133.dwg Plotted on: 2/7/2012 11:21 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

21+00



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 21+00

SHEET NUMBER

X134

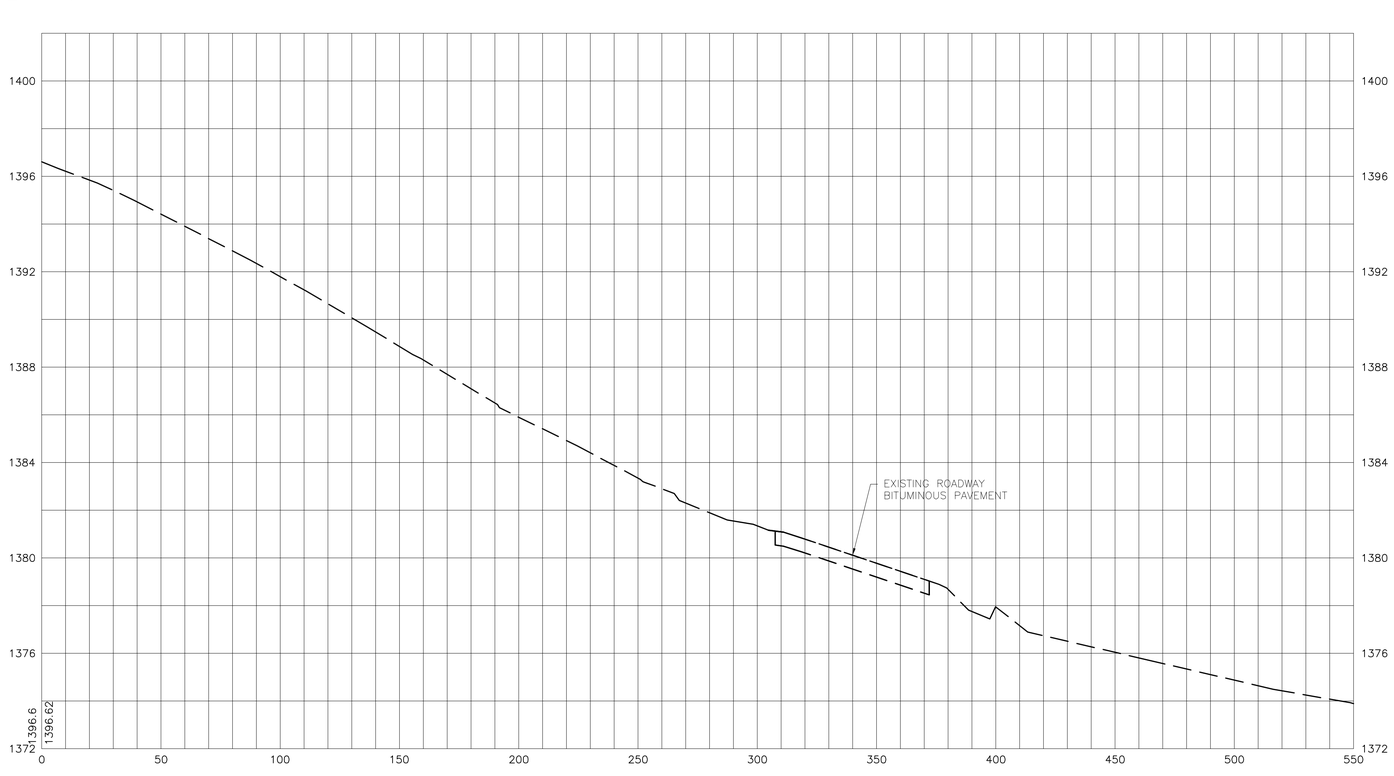
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X134.dwg Plotted on: 2/7/2012 11:23 AM Plotted by: Erdmann, Ryan

HORIZONTAL SCALE
0 30' 60'

VERTICAL SCALE
0 3' 6'

21+40



RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

Drainage Engineers:
KRECH OJARD & ASSOC., P.A.
227 West First Street, Suite 200, Duluth MN 55802
TEL: (218) 727-3282 / FAX: (218) 727-1216

Geotechnical Engineers:
AMERICAN ENGINEERING TESTING, INC.
4431 West Michigan Street, Suite 4, Duluth MN 55807
TEL: (218) 628-1518

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 or Architect under the laws of the State of Minnesota.

Print Name:

Signature:

Date: 02/10/2012 Reg. No.: 22088

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02/10/2012
REVIEWED BY: PTF
DRAWN BY: JJB
DESIGNED BY: AMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE

CROSS SECTIONS STA. 21+40

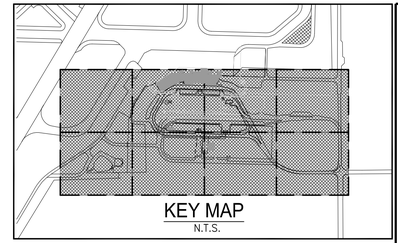
SHEET NUMBER
X135

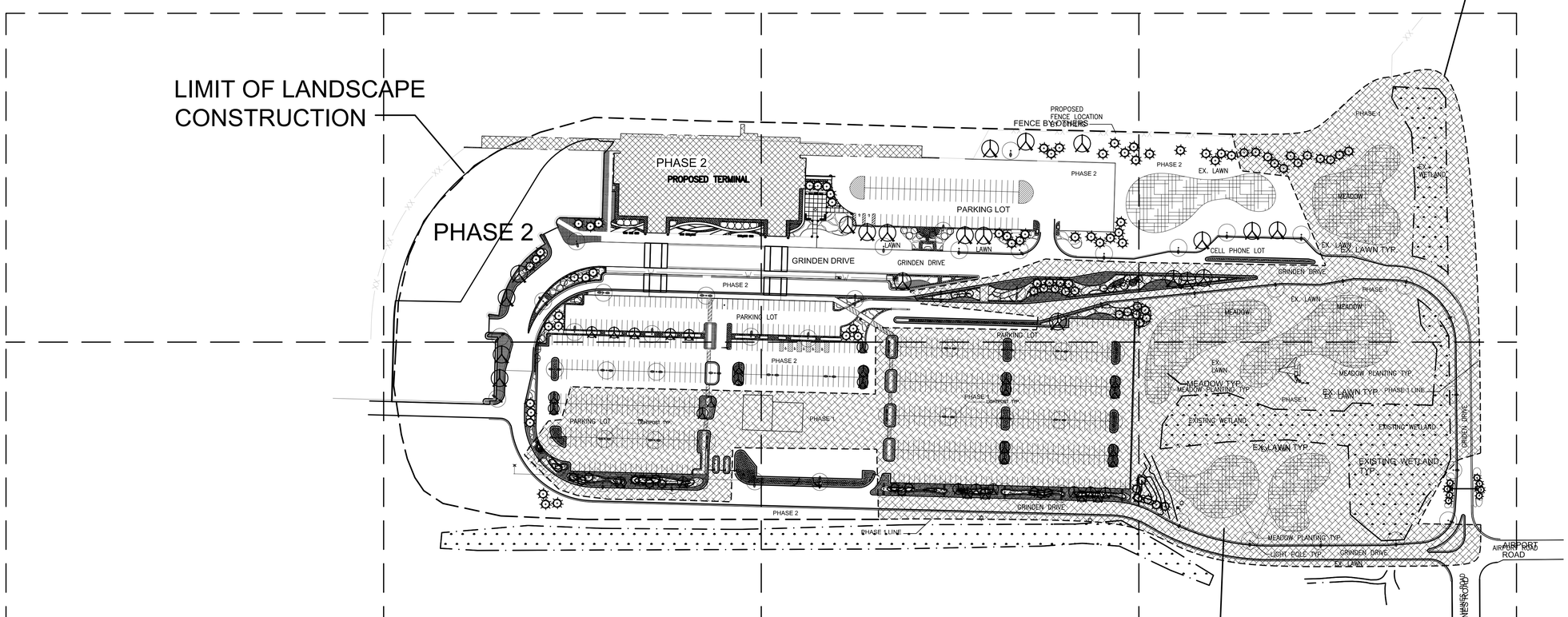
BID PACKAGE 2C BID DOCUMENTS

Drawing: T:\P\2131882.099 DLH Terminal Design Phase 2\TERMINAL CIVIL BID PKG 3 FROM DET\CAD\DESIGN\C\DLH-X135.dwg Plotted on: 2/7/2012 11:24 AM Plotted by: Erdmann, Ryan

LANDSCAPE NOTES:

1. LANDSCAPE PLANS SHALL NOT BE USED FOR LANDSCAPE INSTALLATION UNLESS EXCLUSIVELY DATED AND MARKED "FOR CONSTRUCTION". REVIEW ALL LANDSCAPE SPECIFICATIONS AND DETAILS PRIOR TO INSTALLATION.
2. NOTIFY THE LANDSCAPE ARCHITECT SEVEN (7) WORKING DAYS PRIOR TO SOIL AND LANDSCAPE INSTALLATION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE.
3. LAY OUT DESIGN AS PER THE LANDSCAPE PLAN.
4. ALL EXISTING HARDSCAPE AND LANDSCAPE THAT IS TO REMAIN SHOULD BE PROTECTED PRIOR TO AND DURING CONSTRUCTION.
5. THE LANDSCAPE CONTRACTOR SHALL VERIFY ALL QUANTITIES ON THE DRAWING PLANT LIST FOR GENERAL REFERENCE.
6. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UNDERGROUND UTILITIES PRIOR TO STARTING CONSTRUCTION.
7. LOCATIONS AND GRADES ARE APPROXIMATE. FIELD VERIFY ALL INFORMATION PRIOR TO STARTING WORK.
8. ESTABLISH GRADE AT WALKS, CURBS, PLANTERS, OTHER STRUCTURES, ETC. GRADING SHALL PROVIDE SLOPES THAT ARE SMOOTH AND CONTINUOUS. POSITIVE DRAINAGE SHALL BE PROVIDED IN ALL AREAS.
9. THE LANDSCAPE CONTRACTOR SHALL REPORT ANY DISCREPANCIES ON THE LANDSCAPE PLAN TO LANDSCAPE ARCHITECT AND GET WRITTEN APPROVAL BEFORE COMMENCING WITH CONSTRUCTION.
10. ALL SYMBOLS ON THE PLAN ARE NOT BE INTERPRETED AS SIZE AT INSTALLATION. THEY ARE ILLUSTRATED ON THE LANDSCAPE PLAN AS GRAPHIC REPRESENTATIONS.
11. CLEAN UP ALL AREAS, SWEEP WALKS AND DRIVES, AND HAUL AWAY DEBRIS.





SITE PLAN

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: SMW
DESIGNED BY: MMA

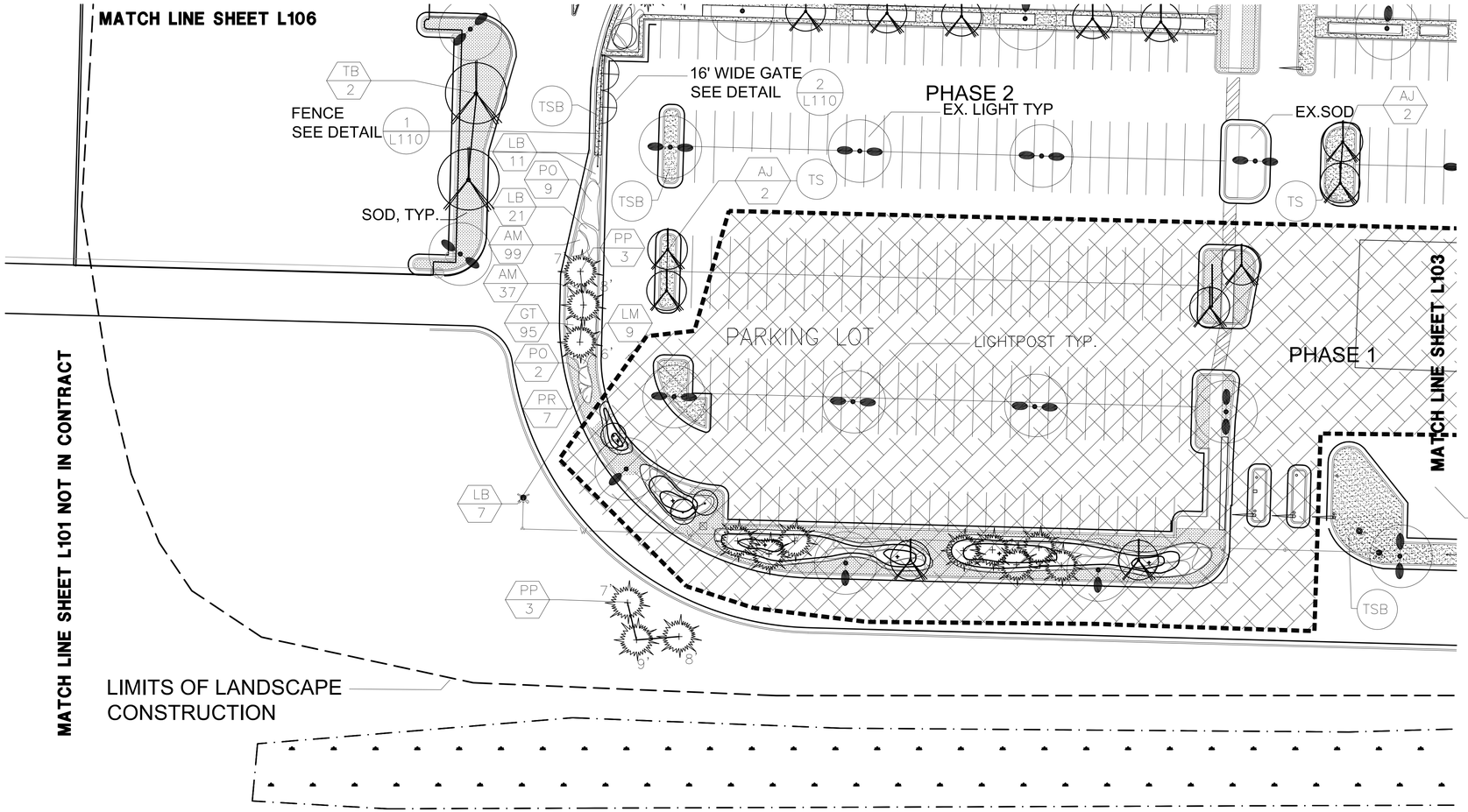
AEP PROJECT NUMBER
213-1882-091

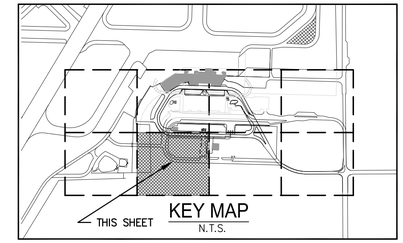
SHEET TITLE
LANDSCAPE OVERALL AREAS PHASE 2

SHEET NUMBER
L100
1 OF 8

BID PACKAGE 2C

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\L\DLH-L100.dwg Plotted on: 2/9/2012 2:13 PM Plotted by: Godzina, Marc





	PLANT	LIST	L102		
QUAN.	CODE	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
4	AJ	Acer freemani 'Autumn Blaze'	Autumn Blaze Maple	3" cal	
2	TB	Tilia americana 'Boulevard'	Boulevard Linden	3" cal.	
1	PP	Picea glauca densata	Black Hills Spruce	6' ht	
2	PP	Picea glauca densata	Black Hills Spruce	7' ht.	
2	PP	Picea glauca densata	Black Hills Spruce	8' ht	
1	PP	Picea glauca densata	Black Hills Spruce	9' ht	
95	GT	Geum triflorum	Prairie Smoke	4" pots	10" o.c.
136	AM	Anaphalis margaritacea	Pearly everlasting	4" pots	10" o.c.
11	PO	Physocarpus opulifolius	Ninebark	#5 cont	5' o.c
39	LB	Schizachyrium scoparium	Little Blue Stem	#1 cont	24" o.c
9	LM	Alchemilla mollis	Lady's Mantle	#1 cont	30" o.c.
7	PR	Eryngium yuccifolium	Rattlesnake master	4" pots	15" o.c.

NOTES:

TS - TACONITE SCREENING WITH EDGING, SEE DETAIL 4 L110

TSB - TACONITE SCREENING WITH WEED BARRIER, SEE DETAIL 3 L110

INSTALL ALUMINUM EDGING BETWEEN PLANTING BEDS AND SOD

EDGING TYPES (SEE SPECIFICATIONS)
TYPE A - STRAIGHT AREAS
TYPE B - CURVED AREAS
TYPE C - TERMINAL BUILDING

NORTH

30' 15' 0 30'

NOTE: L101 NOT IN CONTRACT

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1062
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

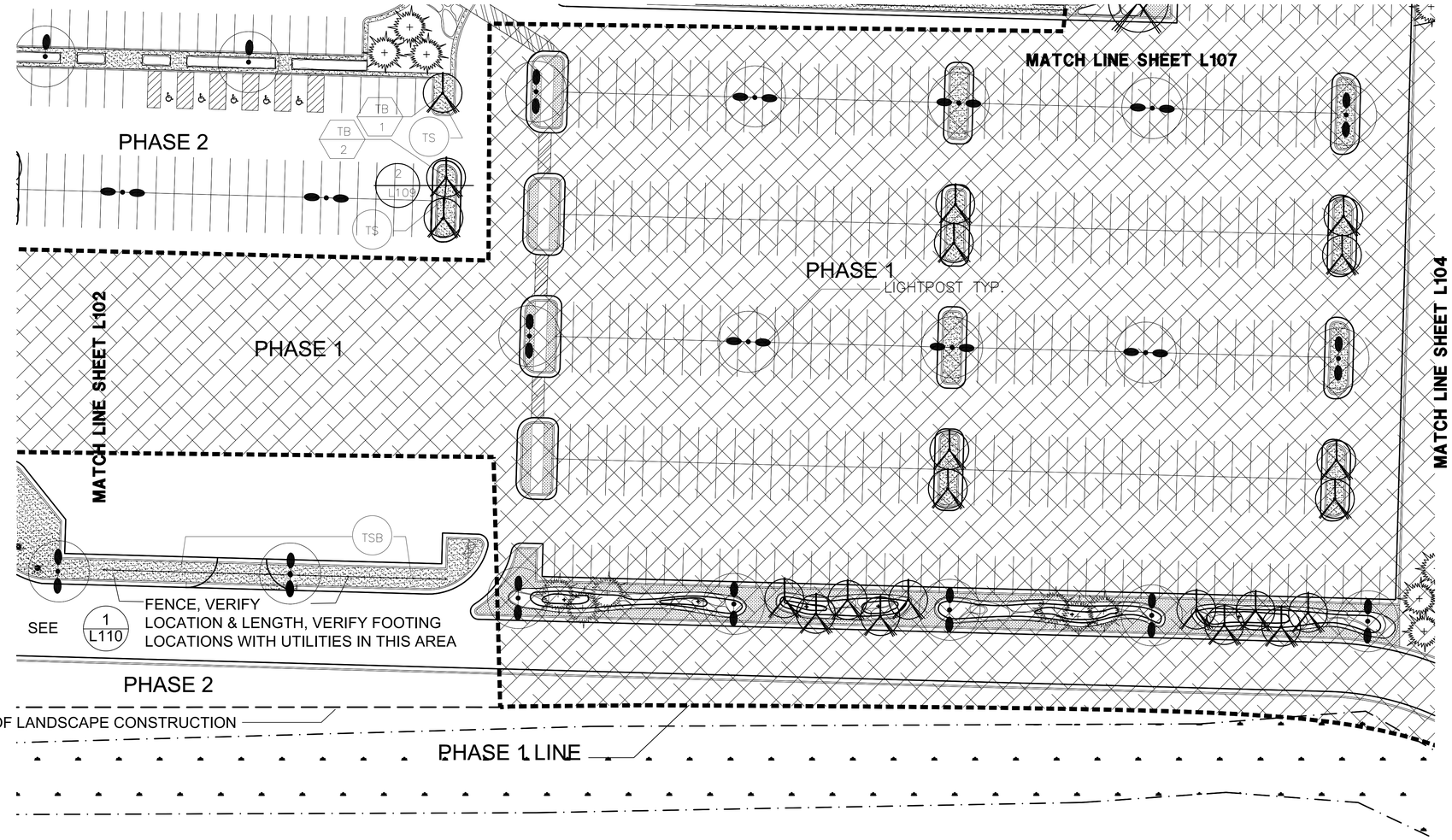
DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: SMW
DESIGNED BY: MMA
AEP PROJECT NUMBER
213-1882-091

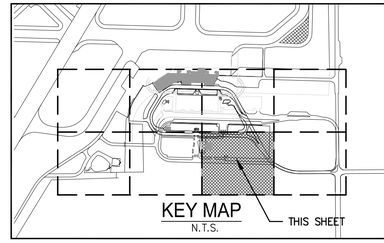
SHEET TITLE
LANDSCAPE PLAN PHASE 2

SHEET NUMBER
L102
2 OF 8

BID PACKAGE 2C

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\L\DLH-L102.dwg Plotted on: 2/9/2012 2:12 PM Plotted by: Godzina, Marc





	PLANT	LIST	L103		
QUAN.	CODE	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
3	TB	Tilia americana 'Boulevard'	Boulevard Linden	3" cal.	

NOTES:

TS - TACONITE SCREENING WITH EDGING, SEE DETAIL 4/L110

TSB - TACONITE SCREENING WITH WEED BARRIER, SEE DETAIL 3/L110

INSTALL ALUMINUM EDGING BETWEEN PLANTING BEDS AND SOD

EDGING TYPES (SEE SPECIFICATIONS)
TYPE A - STRAIGHT AREAS
TYPE B - CURVED AREAS
TYPE C - TERMINAL BUILDING

NORTH

30' 15' 0 30'

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

REVISIONS

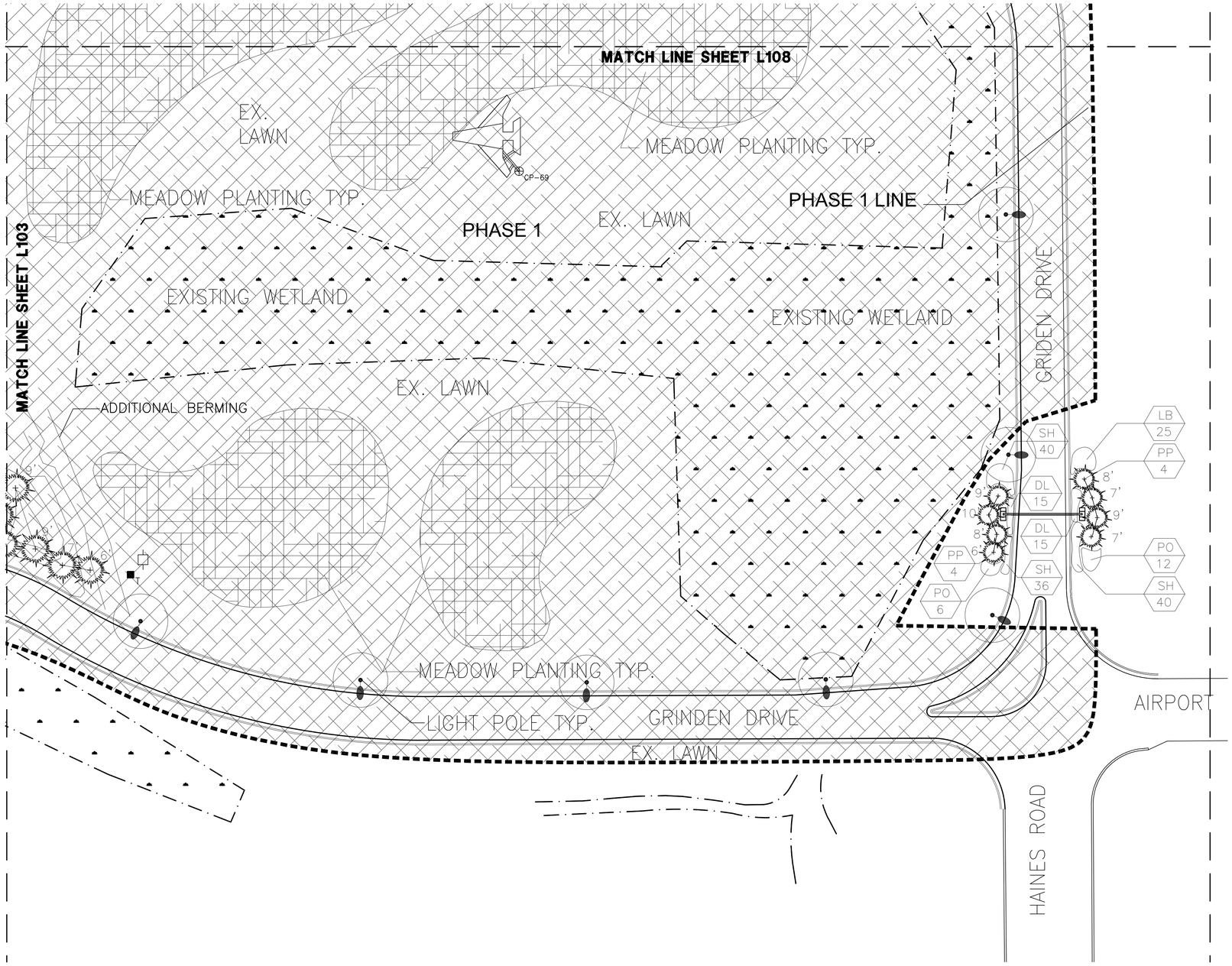
NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: SMW
DESIGNED BY: MMA
AEP PROJECT NUMBER
213-1882-091

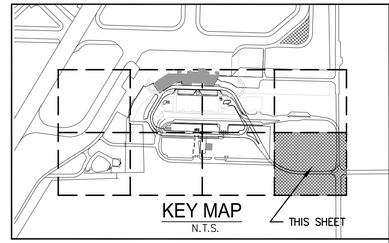
SHEET TITLE
LANDSCAPE PLAN PHASE 2

SHEET NUMBER
L103
3 OF 8

BID PACKAGE 2C



	PLANT	LIST	L104		
QUAN.	CODE	BOTANICAL NAME	COMMON NAME	SIZE	
1	PP	Picea glauca densata	Black Hills Spruce	6' ht.	
2	PP	Picea glauca densata	Black Hills Spruce	7' ht.	
2	PP	Picea glauca densata	Black Hills Spruce	8' ht.	
2	PP	Picea glauca densata	Black Hills Spruce	9' ht	
1	PP	Picea glauca densata	Black Hills Spruce	10' ht	
30	DL	Dievilla lonicera	Drawf Honeysuckle	#2 cont	3' o.c.
18	PO	Physocarpus opulifolius	Ninebark	#5 cont	4' o.c
116	SH	Sporobolus heterolepis	Prairie dropseed	#1 cont	18" o.c.
25	LB	Schizachyrium scoparium	Little Blue Stem	#1 cont	24" o.c



NORTH

30' 15' 0 30'

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1062
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: JJB,SMW
DESIGNED BY: MMA

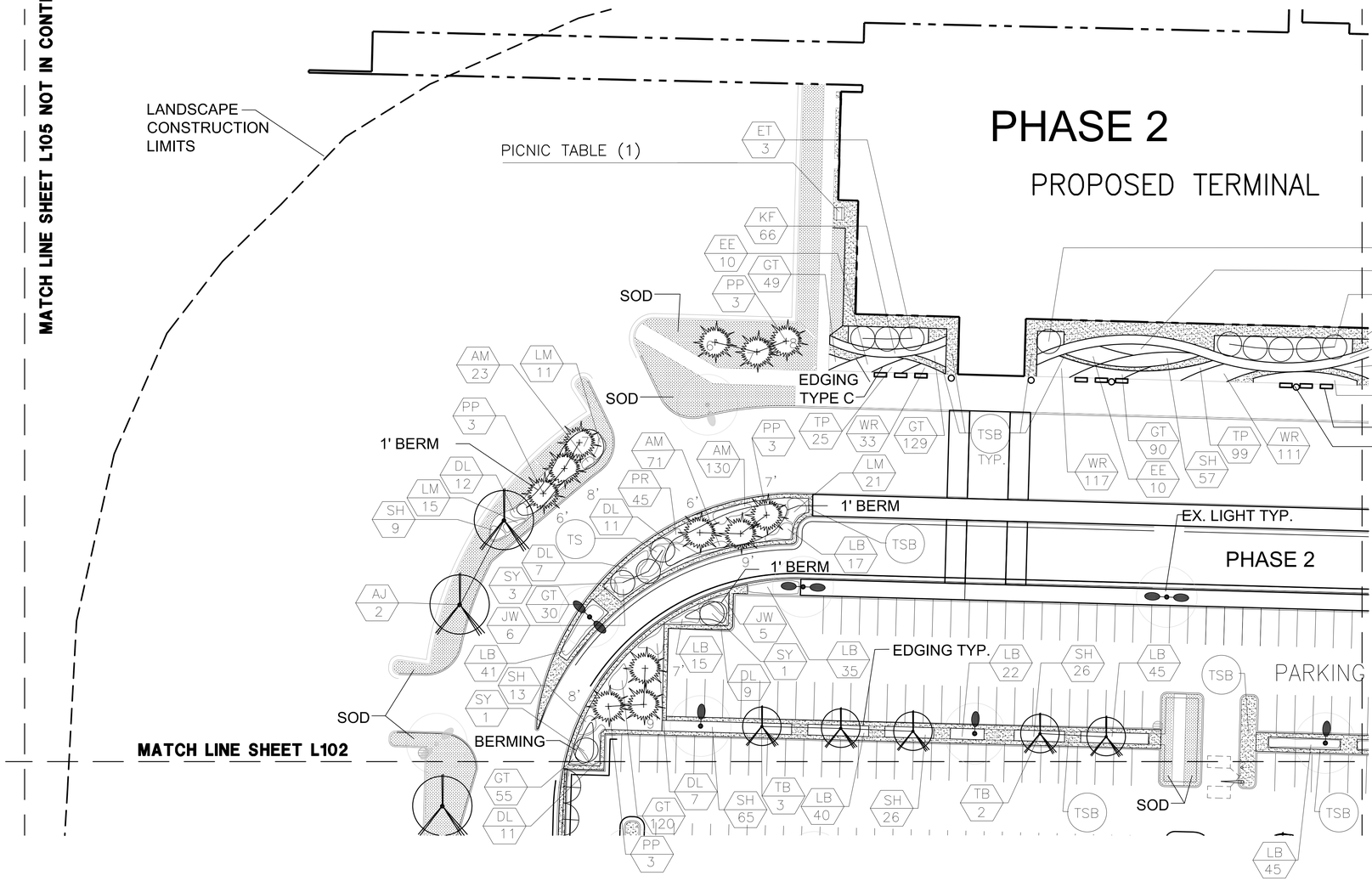
AEP PROJECT NUMBER
213-1882-091

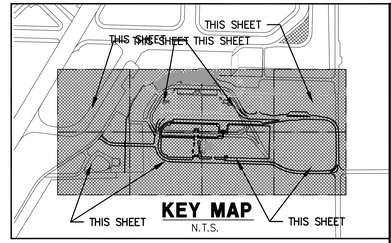
SHEET TITLE
LANDSCAPE PLAN PHASE 1

SHEET NUMBER
L104
4 OF 7

BID PACKAGE 2C

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\L\DLH-L104.dwg Plotted on: 2/9/2012 2:29 PM Plotted by: Godzina, Marc





	PLANT	LIST	L106		
QUAN.	CODE	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
2	AJ	Acer freemani 'Autumn Blaze'	Autumn Blaze Maple	3" cal	
5	TB	Tilia americana 'Boulevard'	Boulevard Linden	3" cal.	
3	PP	Picea glauca densata	Black Hills Spruce	6' ht	
4	PP	Picea glauca densata	Black Hills Spruce	7' ht.	
3	PP	Picea glauca densata	Black Hills Spruce	8' ht.	
2	PP	Picea glauca densata	Black Hills Spruce	9' ht.	
5	SY	Syringa reticulata 'Ivory Silk'	Japanese Tree Lilac- Clump	7' ht.	
9	ET	Thuja occidantalis 'Techny'	Techny White Cedar	7' ht.	
37	EE	Juniperus 'Icee Blue'	Icee Blue Juniper	#2 gal.	4' o.c.
11	JW	Juniperus 'Prince of Wales	Prince of Wales Juniper	#2 gal.	5' o.c.
262	KF	Calamagrostis x acutiflora "Karl Foerster	Karl Foerster Reed Grass	#1 gal.	24" o.c.
261	WR	Luzula multifora	Many Flowered Wood Rush	qt.	15" o.c.
124	TP	Thymus Pseudolanguinsus	Wooly Thyme	qt.	24" o.c.
155	PR	Eryngium yuccifolium	Rattlesnake master	#1 gal.	15" o.c.
602	GT	Geum triflorum	Prairie Smoke	4" pots	10" o.c.
224	AM	Anaphalis margaritacea	Pearly everlasting	4" pots	10" o.c.
57	DL	Dievilla lonicera	Drawf Honeysuckle	#2 cont	3' o.c.
196	SH	Sporobolus heterolepis	Prairie dropseed	#1 cont	30" o.c.
260	LB	Schizachyrium scoparium	Little Blue Stem	#1 cont	24" o.c
47	LM	Alchemilla mollis	Lady's Mantle	#1 cont	30" o.c.

NOTES:

TS - TACONITE SCREENING WITH EDGING, SEE DETAIL 4/L110

TSB - TACONITE SCREENING WITH WEED BARRIER, SEE DETAIL 3/L110

INSTALL ALUMINUM EDGING BETWEEN PLANTING BEDS AND SOD

EDGING TYPES (SEE SPECIFICATIONS)
TYPE A - STRAIGHT AREAS
TYPE B - CURVED AREAS
TYPE C - TERMINAL BUILDING

NOTE: L105 NOT IN CONTRACT

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1062
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

REVISIONS

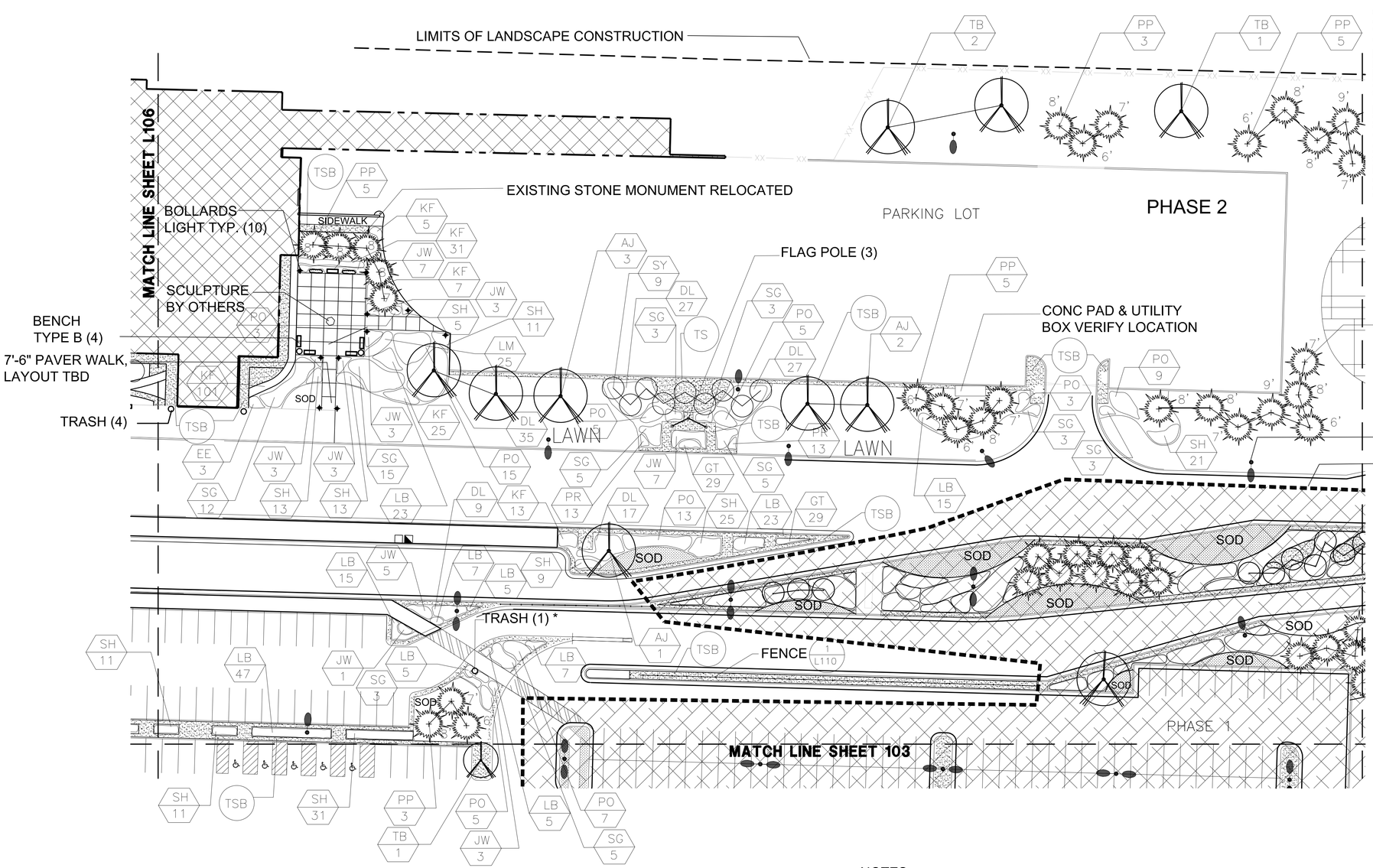
NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

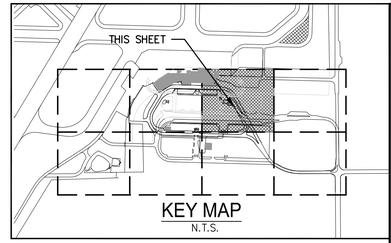
DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: SMW
DESIGNED BY: MMA
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
LANDSCAPE PLAN PHASE 2

SHEET NUMBER
L106
4 OF 8
BID PACKAGE 2C

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\L\DLH-L106.dwg Plotted on: 2/9/2012 2:28 PM Plotted by: Godzina, Marc





		PLANT LIST	L107		
QUAN.	CODE	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
6	AJ	Acer freemani 'Autumn Blaze'	Autumn Blaze Maple	3" cal	
4	TB	Tilia americana 'Boulevard'	Boulevard Linden	3" cal.	
6	PP	Picea glauca densata	Black Hills Spruce	6' ht.	
8	PP	Picea glauca densata	Black Hills Spruce	7' ht.	
12	PP	Picea glauca densata	Black Hills Spruce	8' ht.	
2	PP	Picea glauca densata	Black Hills Spruce	9' ht	
9	SY	Syringa reticulata 'Ivory Silk'	Japanese Tree Lilac- Clump	7' ht.	
3	EE	Juniperus 'Icee Blue'	Icee Blue Juniper	#2 gal.	4' o.c.
115	DL	Dievilla lonicera	Dwarf Honeysuckle	#2 cont	3' o.c.
65	PO	Physocarpus opulifolius	Ninebark	#5 cont	4' o.c
35	JW	Juniperus 'Prince of Wales	Prince of Wales Juniper	#2 cont.	5' o.c.
57	SG	Juniperus 'Sea Green'	Sea Green Juniper	#2 cont.	5' o.c.
58	GT	Geum triflorum	Prairie Smoke	4" pots	10" o.c.
182	KF	Calamagrostis x actiflora 'Karl Foerster'	Karl Foerster Reed Grass	#1cont	24" o.c.
150	SH	Sporobolus heterolepis	Prairie dropseed	#1 cont	30" o.c.
152	LB	Schizachyrium scoparium	Little Blue Stem	#1 cont	24" o.c
25	LM	Alchemilla mollis	Lady's Mantle	#1 cont	30 " o.c.
26	PR	Eryngium yuccifolium	Rattlesnake master	4" pots	15" o.c.

NOTES:

TS - TACONITE SCREENING WITH EDGING, SEE DETAIL (4 / L110)

TSB - TACONITE SCREENING WITH WEED BARRIER, SEE DETAIL (3 / L110)

INSTALL ALUMINUM EDGING BETWEEN PLANTING BEDS AND SOD

EDGING TYPES (SEE SPECIFICATIONS)
TYPE A - STRAIGHT AREAS
TYPE B - CURVED AREAS
TYPE C - TERMINAL BUILDING

*BENCH AND TRASH TO HAVE CONC PADS BELOW

NORTH

30' 15' 0 30'

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax. 218-722-1062
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: SMW
DESIGNED BY: MMA

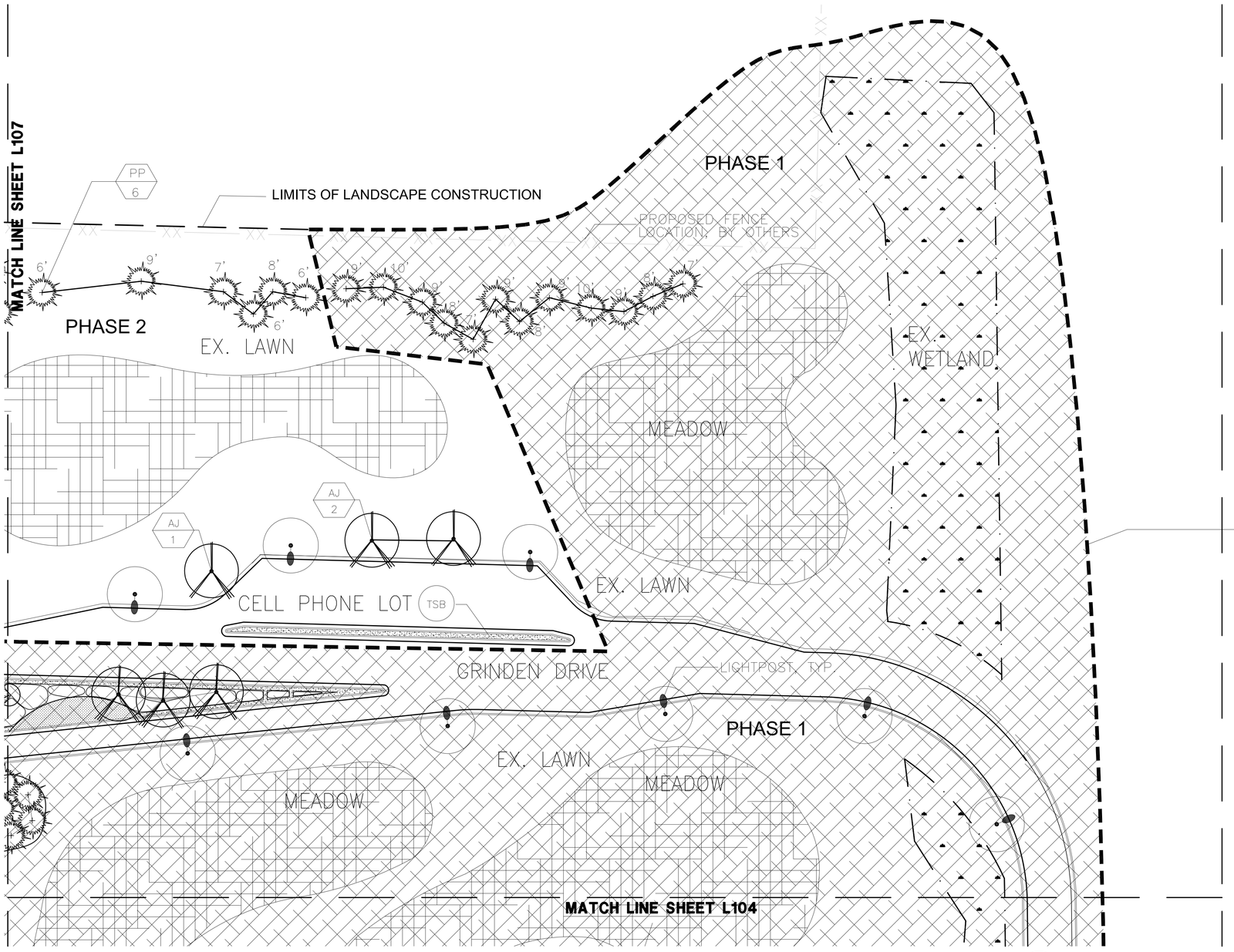
AEP PROJECT NUMBER
213-1882-091

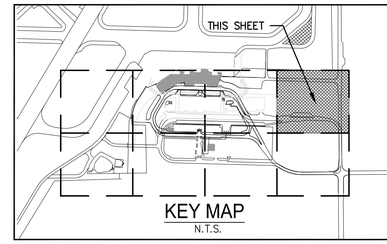
SHEET TITLE
LANDSCAPE PLAN PHASE 2

SHEET NUMBER
L107
5 OF 8

BID PACKAGE 2C

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\L\DLH-L107.dwg Plotted on: 2/9/2012 2:27 PM Plotted by: Godzina, Marc





	PLANT	LIST	L108		
QUAN.	CODE	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
3	PP	Picea glauca densata	Black Hills Spruce	6' ht.	
1	PP	Picea glauca densata	Black Hills Spruce	7' ht.	
1	PP	Picea glauca densata	Black Hills Spruce	8' ht.	
1	PP	Picea glauca densata	Black Hills Spruce	9' ht.	
3	AJ	Acer freemani 'Autumn Blaze'	Autumn Blaze Maple	3" cal	

TS - TACONITE SCREENING SEE DETAIL 4/L110

TSB - TACONITE SCREENING WITH WEED BARRIER SEE DETAIL 3/L110

NORTH

30' 15' 0 30'

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1062
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

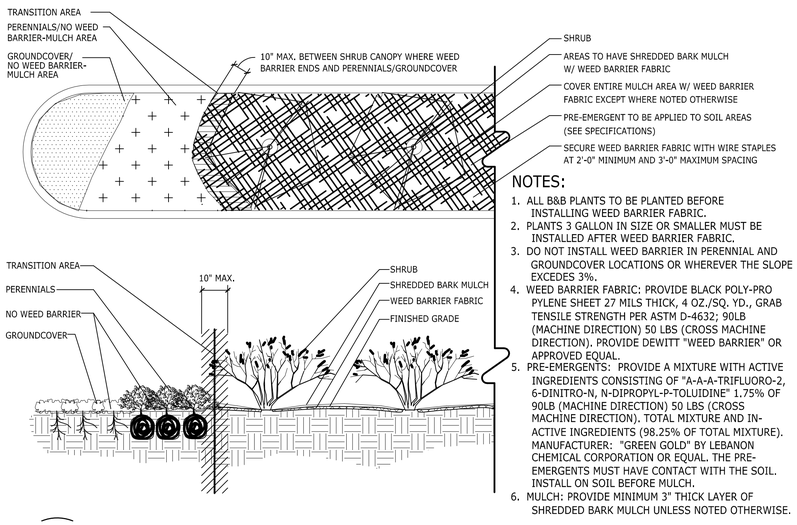
DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: SMW
DESIGNED BY: MMA

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
LANDSCAPE PLAN PHASE 2

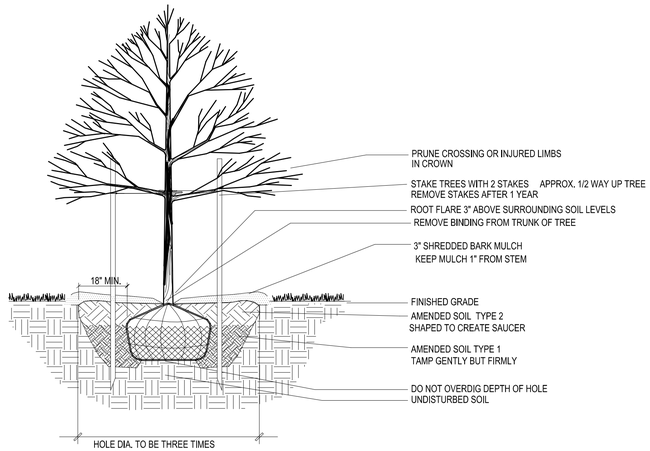
SHEET NUMBER
L108
6 OF 8

BID PACKAGE 2C

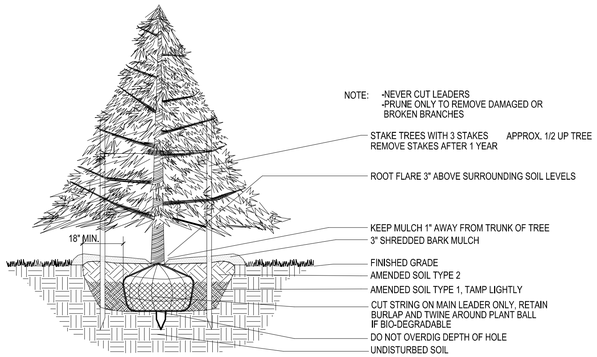


NOTES:

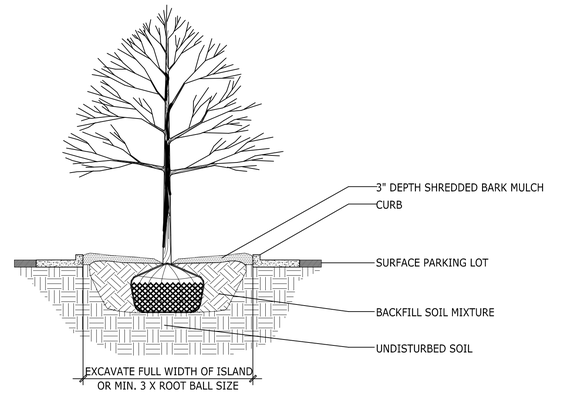
1. ALL B&B PLANTS TO BE PLANTED BEFORE INSTALLING WEED BARRIER FABRIC.
2. PLANTS 3 GALLON IN SIZE OR SMALLER MUST BE INSTALLED AFTER WEED BARRIER FABRIC.
3. DO NOT INSTALL WEED BARRIER IN PERENNIAL AND GROUNDCOVER LOCATIONS OR WHEREVER THE SLOPE EXCEDES 3%.
4. WEED BARRIER FABRIC: PROVIDE BLACK POLY-PRO PYLENE SHEET 27 MILS THICK, 4 OZ./SQ. YD., GRAB TENSILE STRENGTH PER ASTM D-4632; 90LB (MACHINE DIRECTION) 50 LBS (CROSS MACHINE DIRECTION), PROVIDE DEWITT "WEED BARRIER" OR APPROVED EQUAL.
5. PRE-EMERGENTS: PROVIDE A MIXTURE WITH ACTIVE INGREDIENTS CONSISTING OF "A-A-A-TRIFLUORO-2, 6-DINITRO-N, N-DIPROPYL-P-TOLUIDINE" 1.75% OF 90LB (MACHINE DIRECTION) 50 LBS (CROSS MACHINE DIRECTION), TOTAL MIXTURE AND IN-ACTIVE INGREDIENTS (98.25% OF TOTAL MIXTURE). MANUFACTURER: "GREEN GOLD" BY LEBANON CHEMICAL CORPORATION OR EQUAL. THE PRE-EMERGENTS MUST HAVE CONTACT WITH THE SOIL. INSTALL ON SOIL BEFORE MULCH.
6. MULCH: PROVIDE MINIMUM 3" THICK LAYER OF SHREDDED BARK MULCH UNLESS NOTED OTHERWISE.



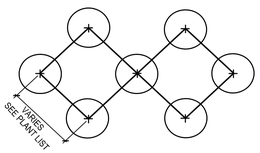
1 L109 SHADE TREE



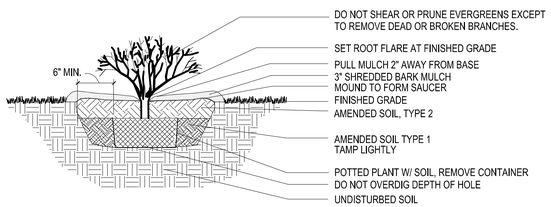
5 L109 STAKED EVERGREEN W/ STAKES N.T.S.



2 L109 SHADE TREE IN PARKING ISLAND N.T.S.

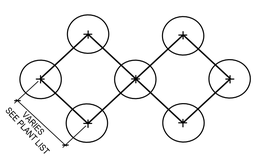


SPACING/LAYOUT PLAN

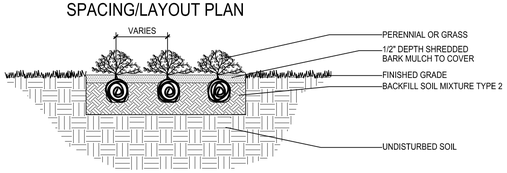


7 L109 SHRUB PLANTING

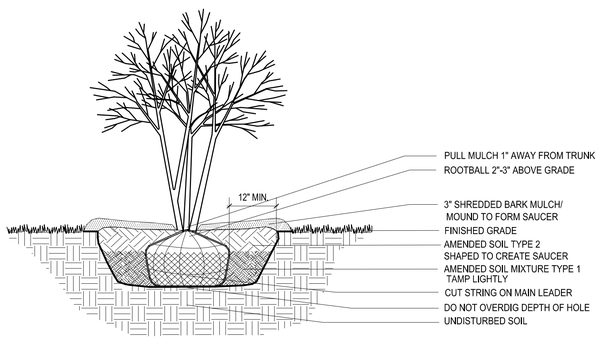
ALL PLANTING BEDS TO HAVE 3" SHREDDED HARDBARK MULCH



SPACING/LAYOUT PLAN



6 L109 PERENNIAL & GRASS PLANTING



3 L109 ORNAMENTAL TREE CLUMP/MULTI-STEM N.T.S.

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4625 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1062
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-0079

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	2.10.12

DATE ISSUED: 02-10-12
REVIEWED BY: MMA
DRAWN BY: JJB
DESIGNED BY: MMA

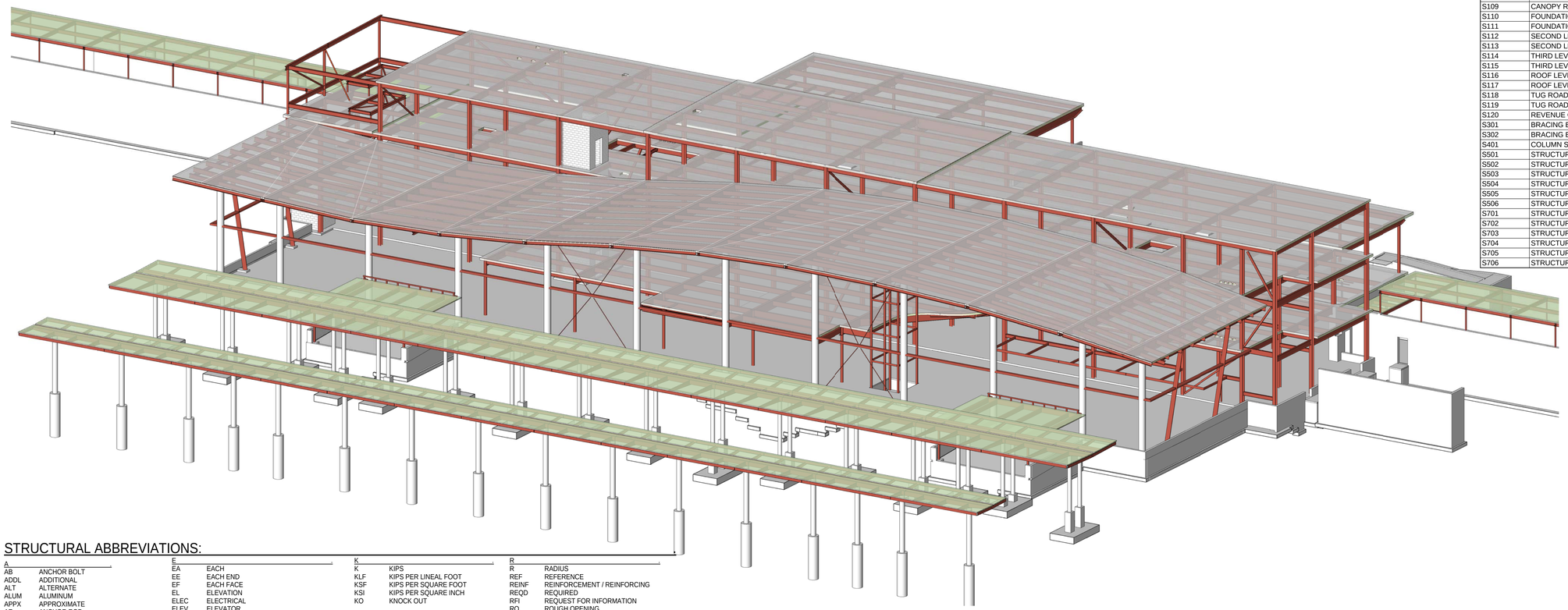
A&P PROJECT NUMBER
213-1882-091

SHEET TITLE
LANDSCAPE NOTES AND DETAILS

SHEET NUMBER
L109
7 OF 8

BID PACKAGE 2C

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\L\DLH-L109.dwg Plotted on: 2/9/2012 2:37 PM Plotted by: Godzina, Marc



SHEET NUMBER	SHEET NAME
S001	TITLE SHEET
S002	GENERAL STRUCTURAL NOTES
S003	GENERAL STRUCTURAL NOTES
S101	OVERALL FIRST LEVEL FLOOR PLAN
S102	OVERALL SECOND LEVEL FLOOR PLAN
S103	OVERALL THIRD LEVEL FLOOR PLAN
S104	OVERALL ROOF LEVEL PLAN
S106	CANOPY FOUNDATION PLAN - AREA A
S107	CANOPY FOUNDATION PLAN - AREA B
S108	CANOPY ROOF FRAMING PLAN - AREA A
S109	CANOPY ROOF FRAMING PLAN - AREA B
S110	FOUNDATION PLAN - AREA A
S111	FOUNDATION PLAN - AREA B
S112	SECOND LEVEL FRAMING PLAN - AREA A
S113	SECOND LEVEL FRAMING PLAN - AREA B
S114	THIRD LEVEL FRAMING PLAN - AREA A
S115	THIRD LEVEL FRAMING PLAN - AREA B
S116	ROOF LEVEL FRAMING PLAN - AREA A
S117	ROOF LEVEL FRAMING PLAN - AREA B
S118	TUG ROAD FOUNDATION PLAN
S119	TUG ROAD ROOF FRAMING PLAN
S120	REVENUE CONTROL BOOTH PLANS & DETAILS
S301	BRACING ELEVATIONS AND DETAILS
S302	BRACING ELEVATIONS AND DETAILS
S401	COLUMN SCHEDULE AND DETAILS
S501	STRUCTURAL DETAILS
S502	STRUCTURAL DETAILS
S503	STRUCTURAL DETAILS
S504	STRUCTURAL DETAILS
S505	STRUCTURAL DETAILS
S506	STRUCTURAL DETAILS
S701	STRUCTURAL DETAILS
S702	STRUCTURAL DETAILS
S703	STRUCTURAL DETAILS
S704	STRUCTURAL DETAILS
S705	STRUCTURAL DETAILS
S706	STRUCTURAL DETAILS

STRUCTURAL ABBREVIATIONS:

A	
AB	ANCHOR BOLT
ADDL	ADDITIONAL
ALT	ALTERNATE
ALUM	ALUMINUM
APPX	APPROXIMATE
AR	ANCHOR ROD
ARCH	ARCHITECT
B	
BDE	BOTTOM OF DECK ELEVATION
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BOD	BOTTOM OF DECK
BOT	BOTTOM
BP	BEARING PLATE
BR	BOTTOM REINFORCING
BRDG	BRIDGING
BRG	BEARING
BTWN	BETWEEN
C	
CANTL	CANTILEVER
C/C	CENTER TO CENTER
CIP	CAST IN PLACE
CGS	CENTER OF GRAVITY STRAND
CJ	CONTROL JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTER LINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN(S)	CONNECTION(S)
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CTR	CENTER
D	
d	NAIL DIAMETER
db	BAR DIAMETER
DBA	DEFORMED BAR ANCHOR
DBE	DECK BEARING ELEVATION
DBL	DOUBLE
DEG	DEGREE
DEMO	DEMOLITION
DET	DETAIL
DF	DOUGLAS FIR-LARCH
DIA	DIAMETER
DL	DEAD LOAD
E	
EA	EACH
EE	EACH END
EF	EACH FACE
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EJ	EXPANSION JOINT
EJBE	EXISTING JOIST BEARING ELEVATION
EMBED	EMBEDMENT
ENG	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
ETBE	EXISTING TOP OF BEAM ELEVATION
ETDE	EXISTING TOP OF DECK ELEVATION
ETFE	EXISTING TOP OF FOOTING ELEVATION
ETPCE	EXISTING TOP OF PILE CAP ELEVATION
ETPE	EXISTING TOP OF PIER ELEVATION
ETSE	EXISTING TOP OF SLAB ELEVATION
ETWE	EXISTING TOP OF WALL ELEVATION
EW	EACH WAY
E-W	EAST - WEST DIRECTION
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
F	
FDN	FOUNDATION
FFE	FINISHED FLOOR ELEVATION
FLR	FLOOR
FP	FULL PENETRATION
FRMG	FRAMING
FS	FOOTING STEP
FT	FEET
FTG	FOOTING
G	
GA	GAGE/GAUGE
GALV	GALVANIZED
GB	GRADE BEAM
GC	GENERAL CONTRACTOR
GEN	GENERAL
GL	GLUE LAMINATED TIMBER
GLB	GLUE LAMINATED BEAM
GR	GRADE
GSN	GENERAL STRUCTURAL NOTES
GYP BD	GYPSUM BOARD
H	
HDR	HEADER
HK	HOOK
HORIZ	HORIZONTAL
HP	HIGH POINT
HSA	HEADED STUD ANCHOR
HS	HEADED STUD
HSS	HOLLOW STRUCTURAL SHAPE
HT	HEIGHT
I	
ID	INSIDE DIAMETER
INT	INTERIOR
ISF	INSIDE FACE
J	
JT	JOINT
JBE	JOIST BEARING ELEVATION
JST	JOIST
K	
K	KIPS
KLF	KIPS PER LINEAL FOOT
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
KO	KNOCK OUT
L	
LB(S)	POUND(S)
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LP	LOW POINT
LSL	LAMINATED STRAND LUMBER
LTL	LINTEL
LG	LIGHT GUAGE
LW	LIGHT WEIGHT
LVL	LAMINATED VENEER LUMBER
M	
MAS	MASONRY
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL AND PLUMBING
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTL	METAL
N	
NA	NOT APPLICIABLE
NF	NEAR FACE
NIC	NOT IN CONTRACT
NS	NEAR SIDE
N-S	NORTH - SOUTH DIRECTION
NTS	NOT TO SCALE
NW	NORMAL WEIGHT
O	
OC	ON CENTER
OD	OUTSIDE DIAMETER
OSF	OUTSIDE FACE
OPG	OPENING
OPP	OPPOSITE
P	
PAF	POWER ACTUATED FASTENER
PC	PRECAST CONCRETE
PEN	PENETRATION
PERP	PERPENDICULAR
PL	PLATE
PLF	POUNDS PER LINEAL FOOT
PROJ	PROJECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSL	PARALLEL STRAND LUMBER
PT	POST TENSIONED
Q	
QTY	QUANTITY
R	
R	RADIUS
REF	REFERENCE
REINF	REINFORCEMENT / REINFORCING
REQD	REQUIRED
RFI	REQUEST FOR INFORMATION
RO	ROUGH OPENING
RTU	ROOF TOP UNIT
S	
SB	SOIL BORING
SC	SLIP CRITICAL
SCHED	SCHEDULE
SER	STRUCTURAL ENGINEER OF RECORD
SIM	SIMILAR
SK	SKETCH
SOG	SLAB ON GRADE
SPA	SPACES
SPEC	SPECIFICATION
SF	SQUARE FOOT
SPF	SPRUCE PINE FIR
SSK	STRUCTURAL SKETCH
STD	STANDARD
STIFF	STIFFENER
STEEL	STEEL
STRUCT	STRUCTURE / STRUCTURAL
SYM	SYMMETRICAL
SYP	SOUTHERN YELLOW PINE
T	
T/B	TOP AND BOTTOM
T/G	TOUNGE AND GROOVED
TBE	TOP OF BEAM ELEVATION
TDE	TOP OF DECK ELEVATION
TEMP	TEMPORARY
TFE	TOP OF FOOTING ELEVATION
TGBE	TOP OF GRADE BEAM ELEVATION
TJ	TRUSS JOIST
TPCE	TOP OF PILE CAP ELEVATION
TPE	TOP OF PIER ELEVATION
TR	TOP REINFORCING
TRANS	TRANSVERSE
TSE	TOP OF SLAB ELEVATION
TWE	TOP OF WALL ELEVATION
TYP	TYPICAL
U	
UNEX	UNEXCAVATED
UNO	UNLESS NOTED OTHERWISE
V	
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	
W/	WITH
W/O	WITHOUT
WD	WOOD
WF	WIDE FLANGE
WL	WIND LOAD
WP	WORK POINT
WS	WATERSTOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC

LEGENDS:

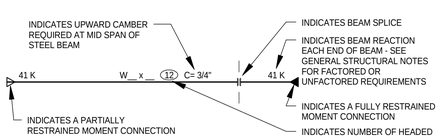
GENERAL:

BF1	INDICATES BRACE FRAME MARK NUMBER
FD	INDICATES APPROXIMATE LOCATION OF FLOOR DRAIN
L1	INDICATES LINTEL MARK NUMBER
RD	INDICATES APPROXIMATE LOCATION OF ROOF DRAIN
1	INDICATES KEY NOTE MARK NUMBER
	INDICATES SLAB STEP LOCATION
	INDICATES MATCH LINE
0	INDICATES NEW BUILDING GRID LINE
"LEVEL" / "ELEVATION"	ELEVATION MARKER
	SHADED AREA INDICATES EXISTING CONSTRUCTION
	INDICATES SPAN DIRECTION OF ELEMENT

FOUNDATION PLANS:

F1	INDICATES SPREAD FOOTING MARK NUMBER
P1	INDICATES PIER MARK NUMBER
WF1	INDICATES WALL FOOTING MARK NUMBER
	INDICATES APPROXIMATE LOCATION OF UNDERGROUND UTILITY
	INDICATES APPROXIMATE LOCATION OF DRAIN TILE
FS	INDICATES FOOTING STEP LOCATION
SB1	INDICATES APPROXIMATE LOCATION OF SOIL BORING

STEEL FRAMING SYSTEM:



STEEL BEAM

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
TITLE SHEET

SHEET NUMBER
S001

BID PACKAGE 2C

TYPICAL NOTES:
These notes specify the requirements for the design represented in these documents. The construction and materials shall comply with all the pertinent codes and references, plans, and details, including (but not limited to) those shown in architectural, civil, mechanical and electrical drawings.

The contractor shall verify all dimensions and existing conditions in the field that affect construction prior to commencing work on the affected element or shop drawing submittals. Resolve any discrepancies with the architect prior to construction.

The contract structural drawings and specifications represent the completed structure. The contractor is responsible for bracing and shoring (without overstressing) all structural elements as necessary at any stage of construction until completion of the project. The Structural Engineer is not responsible for the contractor's means, methods, sequences or procedures of construction. Contractor shall recognize and consider effects of thermal movements of structural elements during construction period.

The contractor is solely responsible for site safety including all temporary precautionary measures and safety programs. Site observation visits by the Structural Engineer do not include review of the contractor's safety precautions.

Refer to architectural, mechanical and electrical drawings for locations, elevations, dimensions, and details of sleeves, inserts, openings, recesses, curbs, housekeeping pads, etc. that are not shown on the structural drawings and do not damage structural members.

Information shown in the structural drawings regarding existing conditions represents the current and general field conditions related to the new work, to the best of our knowledge. Report all discrepancies to the Architect for resolution prior to performing related new work.

Requests for information shall be submitted in writing and shall reference the part of the construction documents that is in question.

SPECIAL INSPECTIONS:
Contractor shall read and understand their duties in the specification and under the building code for special inspections and coordinate as necessary the owner's responsibilities.

The special inspectors shall be provided and shall only use approved shop drawings.

Special inspection reports are to be submitted immediately to the SER, Architect, and Contractor daily when inspections are performed.

The general contractor shall provide timely notice to the special inspector and sufficient time for the inspector to perform their inspection.

SHOP DRAWINGS:
All engineering design provided by others and submitted for review shall bear the certification stamp and signature of a qualified professional engineer who is licensed in the state of Minnesota.

Submit shop drawing schedule with construction schedule that includes consideration for review period. See specification for additional information.

DEFERRED SUBMITTALS:
The following items shall be issued as deferred submittals per IBC:
Steel Connections

Light gage metal framing

All items issued as deferred submittals shall be issued a minimum of 30 days prior to installation and shall not be installed until their design and submittal documents have been reviewed for general conformance to the drawings by the general contractor, the engineer of record and the building official. A copy of the deferred submittal shall be forwarded to the city after the engineer of record has reviewed the documents and prior to erection of the deferred submittal items.

DESIGN CODES AND STANDARDS:
Minnesota State Building Code, MSBC 2007

2006 International Building Code, as amended and adopted by the MSBC 2007

ACI 318-05 Building Code Requirements for Reinforced Concrete

ACI 530-05 Building Code Requirements for Masonry Structures, Allowable Stress Design

ACI 530.1-05 Masonry Structures

AISC 360-05 Specification for Structural Steel Buildings

AISI NAS-01 North American Specification for the design of Cold-Formed Steel Structural Members including 2004 supplement.

ASCE 7-05 Minimum design loads for buildings and other structures including supplement NO. 1 and excluding Chapter 14 and Appendix 11A.

ASCE 3-01 Structural Design of Composite Slabs

MATERIAL PROPERTIES:
Reinforcing Steel (Fy):

Typical	60,000 psi	ATSM A615 Grade 60
Weldable	60,000 psi	ASTM A706 Grade 60

Cast-in-Place Concrete (f'c) at 28 days, UNO:

Controlled Low	1,200 psi (at 5 days)	Maximum
Strength Material (CLSM)	500 psi (at 5 days)	Minimum
Footings	4,000 psi	
Piers and Walls	4,000 psi	
Columns	4,000 psi	
Concrete placed over Metal Floor Deck	4,000 psi	
Slabs on Grade	4,000 psi	
Exterior Concrete	4,000 psi	
Masonry Corefill Concrete	3,000 psi	
All Concrete not otherwise noted	4,000 psi	

Concrete Masonry- Prism (f'm):

Typical Units:	2,000 psi	

Structural Steel (Fy):

Wide Flanges	50,000 psi	ASTM A992
Angles, Channels	36,000 psi	ASTM A36
Grade B Rectangular HSS	46,000 psi	ASTM A500
Grade B Round HSS	42,000 psi	ASTM A500
Grade B Steel Pipe	35,000 psi	ASTM A53
Plates, Bars	50,000 psi	ASTM A572 or A36 as indicated

Structural Fasteners:

Typical High-Strength Bolts	92,000 psi	ASTM A325
High-Strength Bolts as noted on plan	150,000 psi	ASTM A490
Grade 36 Anchor Rods, UNO	36,000 psi	ASTM F1554
Threaded Rods	36,000 psi	ASTM A36
Direct -Tension Indicator Washers as noted on plan		ASTM F959

Cold-formed Light Gauge Metal Framing (Fy):

Studs, Joists, Braces-16 ga. and heavier	50,000 psi	ASTM A653
Studs, Joists, Braces-18 ga. and lighter	33,000 psi	ASTM A653
Track, Channels and Accessories	33,000 psi	ASTM A653

DESIGN LOADS:
LATERAL LOADS:
Primary Frame Wind Data:

Basic Wind Speed:	90 mph
Wind Importance Factor:	1.15
Exposure:	C

Primary Seismic Data: No design required

Component Loads:
Exterior Component/Cladding: Supplier to develop based on MSBC 2007 and to indicate on shop drawings.

GRAVITY LOADS:
Roof Snow Load:

Ground Snow Load, Pg:	60 psf
Flat-Roof Snow Load, Pf:	46 psf
Snow Exposure Factor, Ce:	0.70
Snow Load Importance Factor, I:	1.1
Unbalanced/Drift Snow Load:	As required by ASCE 7

Floor Loads:

Live Load:	100 psf (not reducible)
Hanging loads at underside of 2nd floor:	40 psf superimposed

Stairs, Corridors and Lobbies: 100 psf (not reducible)
Stair Tread Concentrated Load: 300 lbs

Mechanical Rooms: 150 psf (not reducible)

2 Light Storage: 125 psf (not reducible)

Exterior Site Surcharge Loads:

Fire Trucks:	250 psf
Sidewalk:	250 psf
North terminal retaining wall and north tug tunnel retaining wall:	HS20-44 axle load as defined by IBC 2006 table 1607.6 at a distance of 5 feet from the north wall edge.

Provisions For Future Expansion:
Design for additional 30' bay (3 story) between grids "E" and "G", east of grid 12 and west of grid 1.

Design for one story expansion of 3rd floor office space north of grid "G".

FOUNDATIONS:
Refer to Geotechnical report number AET #07-04216.2 by American Engineering Testing, Inc., dated October 14, 2009 and the subsequent addendum (AET project #07-04216.3) dated January 29, 2010.

The contractor shall verify the location of all existing and new underground utilities and tanks prior to beginning excavation and contact Gopher State One Call.

The minimum dimension from exterior grade to bottom of footing and foundation shall be 72" in unheated areas.

For underground utilities adjacent to foundations and through foundations reference drawings for detail showing step footings below utilities as required to avoid undermining of structure by utilities.

See geotechnical report for water table elevations. Contractor to make adequate provisions for dewatering as required.

CONVENTIONAL FOOTINGS:
Unless noted otherwise on drawings, footings are designed for a maximum allowable soil bearing pressure of 8000 pounds per square foot on undisturbed native soil or lean mix concrete/controlled low strength material fill. Soil bearing pressure is to be verified in the field during construction by a qualified Geotechnical Engineer.

All topsoil, fill, organic swamp deposits, and/or other unsuitable bearing material shall be removed below the footings and/or within the building area to the depths indicated in the geotechnical engineering report and extent of removal shall be field verified by the Geotechnical Engineer.

All excavations shall be observed by a qualified geotechnical engineer to verify removal of unsuitable material and confirm the proper preparation of bearing conditions.

For footings that do not bear on natural undisturbed soil, extend engineered fill laterally beyond bottom edge of footing for a distance equal to the depth of engineered fill. Reference drawings for details.

Foundation and retaining walls shall be back filled with free draining fill approved by the Geotechnical Engineer. Provide drain tile required by the contract documents and verify with architect and civil engineer.

Backfill equally on both sides of foundation walls to prevent overturning or lateral wall movement, or temporarily brace as necessary until permanent bracing elements are complete and cured to design strength.

All temporary bracing, cribbing, shoring or underpinning not fully designed or detailed on these drawings shall be designed by a licensed specialty engineer engaged directly by the contractor.

For stepping of wall footings reference drawings for detail.

REINFORCED CONCRETE:
The detailing, fabrication and erection of all reinforcing shall be done in accordance with the latest edition of ACI-315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures and ACI-318, "Building Code Requirements for Structural Concrete."

All reinforcing bars are deformed and continuous, unless noted otherwise. Refer to drawings for reinforcing lap length schedule.

Provide suitable wire spacers, chairs, etc. for support of reinforcing steel in proper position while placing concrete. All bars shall be tied to prevent displacement while placing concrete. All chairs and slab bolsters shall be plastic or steel with plastic tips. When reinforcing steel is epoxy coated or p/t tendons are fully encapsulated, all chairs and slab bolsters shall be epoxy coated or plastic and all support bars shall be epoxy coated. Chairs are to be stable and resist tipping. Acceptable products are GTI or approved equal.

The fabricator shall submit a complete list of accessories and placing details with the shop drawings.

No horizontal construction joints shall be placed in beams, joists, or slabs, unless shown on drawings.

Locate vertical construction joints in beams and slabs at central one third of span. Refer to drawings for details. Submit proposed construction joint locations to the Structural Engineer of Record for review prior to placement of concrete. Where new concrete is placed against existing concrete, the existing concrete shall be roughened to a minimum 1/4" amplitude.

Refer to drawings and ACI 318 Chapter 6 for placement guidelines of embedded pipes, sleeves, and conduits. Conduits are not permitted in slabs 3 inches or less in thickness. The maximum size of conduits within any slab shall be 1 1/4" outside diameter and shall be spaced no closer (to each other or any reinforcing steel) than 4" unless prior approval is obtained from the structural engineer. Additional reinforcing steel and chairs may be required to support embedded conduit. All conduit shall be placed in the middle 1/3 of the slab thickness above the metal deck, typical. Conduit may not be tied to parallel reinforcing steel. Conduit may not be paced in deck flutes. Conduit may not cross within slabs 5" or less in thickness. Conduit placement drawings may be required in areas of high conduit concentricity.

Provide a 3/4 inch chamfer for all exposed concrete corners. See Architectural drawings for details and additional requirements.

The general contractor shall notify the Special Inspector a sufficient period in advance of placing concrete to allow required inspections and testing to occur in a timely fashion.

Formwork and all shoring for flatwork shall be left in place until the concrete reaches at least 75 percent of the 28-day compressive strength. Design of shoring and reshoring is the responsibility of the contractor and shall conform to ACI 347R-88.

Aluminum conduit, aluminum sleeves and aluminum embeds are not permitted in concrete.

Exterior concrete to have 6% +/- 1% entrained air.

Calcium chloride is not permitted as a concrete additive.

Concrete Cover on Reinforcing:

Topping Slab:	3/4" clear top. See drawings for cover at composite slabs
Slab on Grade:	3" bottom
Footings:	3" clear bottom and sides
	2" clear top
Walls:	#5 and smaller 1 1/2" clear earth or weather face
	#6 and greater 2" clear earth or weather face
	3/4" interior face
Columns and Beams:	1 1/2" clear to ties or stirrups

CONCRETE SLABS ON GRADE:
Slabs on grade shall be place in lane fashion.

The control or construction joints shall be placed as shown on the drawings. The joints shall align with the column grids and be spaced as noted below:

Exterior slabs	24 times slab thickness, maximum;
Interior slabs	36 times slab thickness, maximum;
Interior slabs	48 times slab thickness, maximum, with carpeting

The panels formed by control or construction joints shall not be "L" shaped and a rectangular panel's aspect ratio shall not exceed 1.5.

Refer to the drawings for the typical slab on grade construction and saw cut control joint detail. Control and construction joints must be continuous and not offset.

Refer to drawings for detail of isolation diamonds or circles at columns.

Refer to drawings for reinforcing at re-entrant corners. Bend bars as necessary at obstructions.

Refer to the specification for the existence, type, and thickness of interior ground vapor retarder. Locate a vapor retarder directly beneath the slab on grade on top of a 6 inch compactable granular base. Refer to the specification for requirements for the compactable granular base.

Mechanically vibrate concrete around trench drains, floor ducts, construction joint dowels, loading docks, architectural features and other embedded items.

Refer to the specification for slab on grade pre-placement meeting.

Refer to the specification for acceptable methods of curing the concrete.

Refer to flooring manufacturer's specification for levelness, flatness and curing of concrete slabs on grade to receive special architectural floor finishes.

REINFORCED MASONRY:
All masonry units are placed in running bond fashion. Corners shall have a standard bond by overlapping units.

Special shapes shall be provided for jambs, columns, pilasters, control joints, corners, and lintels.

All masonry walls shall have horizontal joint reinforcing spaced at 16" o.c. Horizontal joint reinforcing shall be truss style and fabricated with galvanized nine-gauge wire and shall include corner and intersecting wall pieces. Provide minimum 6" laps at all splices.

Vertical reinforcing shall be held in place by rebar positioners, crossties, chairs, or tying to every other layer of horizontal reinforcing steel. Refer to the detail in the drawings for vertical reinforcing bar location in a core.

Provide concrete cover of minimum 1/2" to face shell.

Refer to detail in the drawings for reinforcing bar lap lengths.

Extend vertical reinforcing from footings to 2" clear top of wall or to beam bearing. Extend vertical reinforcing into the next level of construction and lap in accordance with the lap schedule.

When typical vertical wall reinforcing is interrupted by long wall openings, provide typical vertical wall reinforcing above and below opening, and extend into horizontal bond beams. Refer to the schedule on the drawings, for masonry wall opening lintels. Refer to the detail in the drawings for masonry openings minimum jamb reinforcing.

Provide vertical reinforcing at the ends of walls and at wall intersections to match specified reinforcing. Run reinforcing full height of walls.

All masonry units shall be placed with full face shell mortar coverage on horizontal and vertical face shells. Webs shall also have full mortar coverage around all grouted cells.

Fill block core at vertical reinforcing (8" minimum length along wall) with concrete grout. Filling cores with mortar is not allowed. Vibrate in place. Rodding and puddling are not allowed.

Maximum lift height is four feet. For concrete core fill pour height up to maximum 8'-0", provide cleanouts if pour height exceeds 5'-0".

Masonry cement mortar is not allowed.

Calcium chloride or admixtures containing chloride shall not be used in mortar or grout.

For reinforced masonry bond beams, provide bent corner bars at corners and intersections that match reinforcing. Step bond beams as necessary to match roof slopes. Lap reinforcing bars per schedule.

For construction of masonry control joints refer to detail in drawings.

Unless noted otherwise on the drawings place control joints in masonry walls such that no straight run of wall exceeds 24'-0" and within 4'-0" of corners. Do not place control joints within 48 inches of a masonry opening jamb or a steel bearing plate.

Place bond beam reinforcing continuously through control joints. Do not splice bond beam reinforcing within 6'-0" of a control joint.

Provide bond beam with reinforcing at all floor lines, roof lines, and top of walls. Refer to details in the drawings.

Grout below steel bearing plate and refer to the drawings for additional information.

Refer to drawings for reinforcing schedule, top of wall bracing, thickened bearing slab and lintel schedule for non-bearing masonry walls. Refer to Architectural drawings for location and extent.

MASONRY BEAMS (HIGH-LOW BOND BEAMS):
For all masonry beams use lintel blocks.

1 Masonry beams are to bear 8" minimum at jambs. Extend vertical reinforcing through masonry beam bearing.

Extend horizontal reinforcing full length.

Grout masonry beams solid. Mechanically vibrate grout in place.

EXPANSION AND ADHESIVE ANCHORS:
Anchors in concrete or concrete masonry when not exposed to earth, weather, or corrosive environment shall be as noted below:

Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633.

Threaded anchor rod for adhesive anchors in concrete shall be ASTM A193, Grade B7, or ASTM A36, as noted in the drawings. The adhesive used for anchors shall be a structural grade, two part epoxy or acrylic material that meets the requirement of ASTM C-881 Types I, II, IV, and V, Grade 3, Classes B and C as noted on plans.

Holes shall be drilled with a bit and cleaned using a method that complies with the manufacturer's guidelines, and specifications. Do not cut or damage reinforcing steel or P-T tendons.

Upon the request of the structural engineer the anchors shall be proof tested by the manufacturer to verify capacity of anchors that do not meet the conditions in the construction documents.

Minimum embedment depths in concrete and concrete masonry for expansion and adhesive anchors shall be as noted below:

Concrete base material:
For 1/2", 5/8", and 3/4" diameter expansion anchors provide 4 3/4"embed, UNO on plan.

For 1/2"and 5/8" diameter adhesive anchors provide 5" embed. For 3/4" diameter adhesive anchors provide 7" embed, UNO on plan.

Grouted solid concrete masonry unit material:
For 1/2", 5/8", and 3/4" diameter expansion anchors provide 4 3/4"embed, UNO on plan.

For adhesive anchors refer to the product's ICBO Report.

Pre-approved manufacturer are as follows: HILTI, ITWR Ramset/Redhead, Powers Fasteners, and Simpson Strong-Tie. For review of alternate products, submit manufacture's product data and product's current ICBO report prior to construction.

Anchors in concrete or concrete masonry when exposed to earth, weather, or corrosive environment shall be manufactured from AISI 304/316 Stainless Steel.

STRUCTURAL STEEL:
Structural steel shall be detailed, fabricated and erected in compliance with AISC Specification for the design, fabrication, erection of structural steel for building, and Code of standard practice, and OSHA steel erection standards.

All beams and girders shall be cambered at mid-span as indicated on the structural drawings. The cambers indicated shall be present in the beam in its erected position after completion of the end connections and shall be verified prior to placing concrete. Cambering tolerances shall be (-0", +1/4"). No center point cambering allowed.

Splicing structural members where not detailed on the drawings is prohibited without prior approval of the structural engineer.

Modification of structural steel members in the field is not allowed without written approval by the structural engineer.

All composite beams using the concrete slab as a compression flange are designed for unshored construction unless noted otherwise.

Anchor rods shall be minimum 3/4" diameter or as detailed in drawings.

STRUCTURAL STEEL CONNECTIONS:
All steel connections shall be designed by the steel fabricator for the criteria indicated on the drawings unless noted or detailed otherwise. Connection design shall conform to the requirements of the AISC Specifications for the design, fabrication, erection of structural and OSHA regulations. Submit calculations certified by a Professional Engineer who is licensed in the state of Minnesota. All loads indicated on the drawings are unfactored, working loads.

Non-composite beams: Unless noted otherwise, design simple beam shear connections per the AISC Manual connection tables. The required end reaction shall be based on the reactions indicated on the plans. Design connections for the reactions indicated on plan or for the minimum connection requirements indicated in the Connection Schedule, whichever provides the greater capacity.

Composite beams: Design simple composite beam shear connections per the AISC Manual connection tables UNO. Design connections for the reactions indicated on the plans or the minimum connection requirements indicated in the Connection Schedule, whichever provides the greater capacity.

Unless detailed otherwise, beam shop connections may be welded or bolted and field connections are to be bolted. Bolts shall be a minimum 3/4" diameter for connections specified or detailed in the drawings. The fabricator may submit an alternate connection with the calculations that is certified by a professional engineer who is licensed in the state of Minnesota.

All beam web copes must be made to a 1 inch minimum radius.

Welded connections shall be made in accordance with ANSI/AWS D1.1 Structural Welding Code using E70XX electrodes unless noted otherwise. Weld sizes not shown or controlled by the required forces shall be AWS code minimum size. Welds shall be visually inspected for compliance with the AWS code visual inspection criteria. Welders shall be qualified in accordance with ANSI/AWS D1.1 and shall be experienced in weld in structural steel.

Full penetration welds shall be tested using NDT methods such as ultrasonic, magnetic particle or other methods referenced in the AWS code. Welds subject to NDT methods shall also have been found compliant with the AWS visual inspection criteria.

STRUCTURAL STEEL STAIRS:
Structural steel stair stringers, components, railings, posts, hangers, and connections to be designed by the fabricator's Qualified Professional Engineer for the loads indicated in the specifications. Configuration of stringers and railings shall be as indicated on the architectural drawings. Channel stringers to have a minimum 12" depth and a minimum 1 1/2" flange width.

STEEL ROOF DECK:
Manufacturer shall be a current member of the Steel Deck Institute (SDI).

Detail, manufacture and install steel roof deck and accessories in accordance with the SDI specifications and codes and OSHA requirements.

Steel roof deck shall be as noted on plan.

Welding shall be in accordance with AWS D1.3. Welders shall be qualified in accordance with AWS D1.3.

Where spray-on fireproofing of the deck is required, the contractor shall verify that the deck finish is compatible with the proposed fireproofing material to ensure proper bonding of the fireproofing. Coordinate fireproofing locations and requirements with the architect.

All steel deck shall span a minimum of three spans, unless otherwise approved by the engineer. Deck ends are to be lapped over supports.

Contractor shall verify the location and extent of acoustical steel deck with the architectural drawings.

Reference drawings for detail on steel roof deck fastening requirements unless noted otherwise. Powder actuated or pneumatically driven fasteners are not allowed.

Provide reinforcement or frames for deck openings as indicated on the drawings.

LIMITATIONS ON M/E SUPPORT FROM PRIMARY STRUCTURE:
All M/E systems shall be supported from the primary structural frame, unless noted otherwise. Do not connect to roof deck, floor slabs, or secondary members unless specifically allowed on the structural construction documents.

All M/E support systems, hangers, brackets and connections to the primary structural frame shall be designed, provided and installed by the M/E contractor, unless noted otherwise on the structural construction documents.

All M/E supports and connections for loads in excess of 300 lbs shall be designed by a structural engineer licensed in the state of Minnesota and engaged by the M/E contractor.

COMPOSITE STEEL FLOOR DECK:
Manufacturer shall be a current member of the Steel Deck Institute (SDI).
Composite steel floor deck shall be as noted on plan.

Detail, manufacture and install composite steel floor deck and accessories in accordance with the SDI specifications, codes and OSHA steel erection standards.

Refer to drawings for composite steel floor deck fastening requirements unless noted otherwise. Powder actuated or pneumatically driven fasteners are not allowed.

Provide and install pour stops, column closures, end closures, cover plates and girder fillers and other accessories as required by the SDI unless otherwise indicated or detailed.

Where spray-on fireproofing of the deck is required, the contractor shall verify that the deck finish is compatible with the proposed fireproofing material to ensure proper bonding of the fireproofing. Coordinate fireproofing locations and requirements with the architect.

Provide reinforcement or frames for deck openings as indicated on the drawings.

Do not cut control joints in structural slabs on metal deck.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
GENERAL STRUCTURAL NOTES

SHEET NUMBER
S002

BID PACKAGE 2C

NON-COMPOSITE STEEL FLOOR DECK:
Manufacturer shall be a current member of the Steel Deck Institute (SDI).

Non-composite steel floor deck shall be as noted on plan.

Detail, manufacture and install non-composite steel floor deck and accessories in accordance with the SDI specifications and codes and OSHA steel erection standards.

Refer to drawings for non-composite steel floor deck fastening requirements. Powder actuated or pneumatically driven fasteners are not allowed.

Where spray-on fireproofing of the deck is required, the contractor shall verify that the deck finish is compatible with the proposed fireproofing material to ensure proper bonding of the material. Coordinate locations and requirements with the architect.

Provide reinforcement or frames for deck openings as indicated on the drawings.

LIGHT GAUGE METAL FRAMING:
The design and connection detailing of all light gage material including, but not limited to exterior studs, bearing studs, headers, jambs, joists, rafters and anchorage shall be by the Light Gauge Supplier. The design for systems other than bearing framing shall meet the following criteria:

Stud in exterior walls shall be minimum 600S162-43 (6"-18 gauge) studs at 16" OC. See architectural for additional spacing requirements at exterior finishes.

Studs shall be cold rolled steel, galvanized, C shape, with minimum 1 5/8" flange and minimum 1/2" return. They are to be punched for utility access and galvanized to G60 coating per ASTM 525.

At all openings in exterior and bearing walls provide a minimum two studs full wall height each side of opening and a minimum one additional stud each side for lintel bearing.

Anchor bottom track to concrete or masonry with minimum 5/32" x 1 1/4" power driven fasteners at 16" OC.

Top and bottom tracks shall be cold rolled or break formed steel, galvanized U shaped and minimum 18 gauge and as noted on the drawings.

Light gauge metal framing fasteners shall be minimum #10 self-drilling sheet metal screws, 16 threads per inch, with low profile head. Provide a minimum of two screws per connection unless noted otherwise.

Fasten light gage framing to wood with minimum #10 x 1 7/8" bugle head wood screws. Pre-drill holes in metal studs. Provide a minimum of two screws per connection unless noted otherwise.

All framing components shall be squarely cut for attachment to perpendicular members. Stud ends must seat tightly into tracks for all bearing applications.

At all wall elements, provide 1 1/2"-16 gauge horizontal channel bridging to prevent stud rotation. For all axial loaded walls, space bridging at 4'-0" OC. For all non-load bearing exterior walls, space bridging at 5'-0" OC.

Wall stud deflection criteria:

For wall studs providing lateral support to masonry veneer and cementitious stucco, provide L/600.

For wall studs providing lateral support to other materials, provide L/360.

Joist and rafter deflection criteria:

Live Load Deflection is L/360.

Total Load Deflection is L/240.

An additional joist shall be provided under parallel non-load bearing partition walls.

The light gauge supplier shall submit certified shop drawings and design calculations prepared by a qualified Professional Engineer registered in the state of Minnesota. See project specification manual for additional submittal requirements.

All light gauge designations are in accordance with the Steel Stud Manufacturers Association (SSMA).

Refer to architectural drawings and specification for size, minimum gage, extent, and location of interior non-bearing light gage framing not shown on the structural drawings. Interior light gauge framing is to be designed for 5 psf lateral pressure by the light gauge supplier.

Temporary bracing shall be furnished by the light gauge supplier and framing installer and maintained until permanent systems providing lateral stability are in place.

Welding shall conform to the American Welding Society (AWS) "Structural Welding Code - Sheet Steel, D1.3 - Current Edition." Welders shall be qualified in accordance with AWS D1.3 and shall be experienced in light gage welding.

All light gage material to be welded must be nominal 16 gauge or thicker.

Touch up all light gage material at welds with zinc-rich paint.

Align load bearing wall studs with floor or roof joists.

Splices in studs, joists, and headers, are not permitted, unless approved in writing by the structural engineer.

Framing components may be pre-assembled into panels prior to erecting. Prefabricated panels shall be square, with components attached in a manner that prevents racking.

SPECIAL INSPECTION SCHEDULE:

SPECIAL INSPECTIONS REQUIRED OF STRUCTURAL ELEMENTS (PER IBC 2006, CHAPTER 17):

	Continuous	Periodic	Not Req'd	See Arch.	
1. Steel *					Table 1704.3
1.1 Welding	☐	■	☐	☐	
1.2 Details	☐	■	☐	☐	
1.3 High-strength Bolts	☐	■	☐	☐	
2. Concrete					Table 1704.4
2.1 Reinforcing steel including Prestressing tendons	☐	■	☐	☐	
2.2 Bolts installed in concrete	■	☐	☐	☐	
2.3 Required design mix	☐	■	☐	☐	
2.4 Sampling	■	☐	☐	☐	
2.5 Shotcrete	☐	☐	■	☐	
2.6 Curing techniques	☐	■	☐	☐	
2.7 Prestressed concrete forces and grouting	☐	☐	■	☐	
2.8 Erection of precast concrete members	☐	☐	■	☐	
2.9 Verification of IN-SITU concrete strength	☐	☐	■	☐	
3. Masonry					
3.1 Level 1 Special Inspection *	☐	■	☐	☐	1704.5.1, 1704.5.2, Table 1704.5.1
3.2 Level 2 Special Inspection	☐	☐	■	☐	1704.5.3, Table 1704.5.3
4. Wood	☐	☐	■	☐	1704.6
5. Soils	■	☐	☐	☐	1704.7
6. Pile Foundations	☐	☐	■	☐	1704.8
7. Pier Foundations	☐	☐	■	☐	1704.9
8. Wall Panel and Veneers	☐	☐	☐	■	1704.10
9. Sprayed Fire-Resistant Materials	☐	☐	☐	■	1704.11
10. Exterior Insulation and Finish Systems (EIFS)	☐	☐	☐	■	1704.12
11. Special Cases	☐	☐	☐	■	1704.13
12. Smoke Control Systems	☐	☐	☐	■	1704.14

* Please see referenced tables for exceptions.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

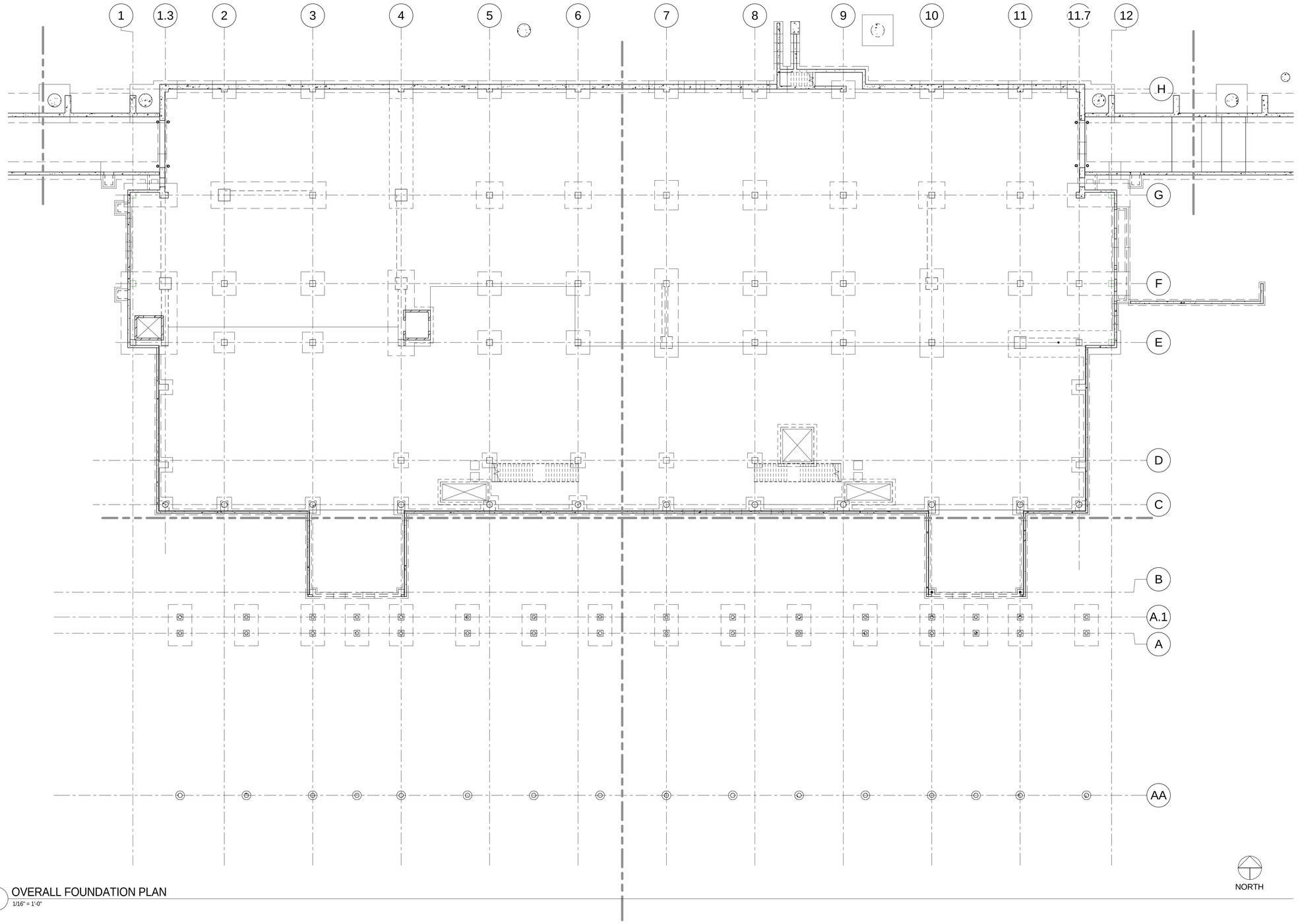
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
GENERAL STRUCTURAL NOTES

SHEET NUMBER
S003

BID PACKAGE 2C



1 OVERALL FOUNDATION PLAN
1/16" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

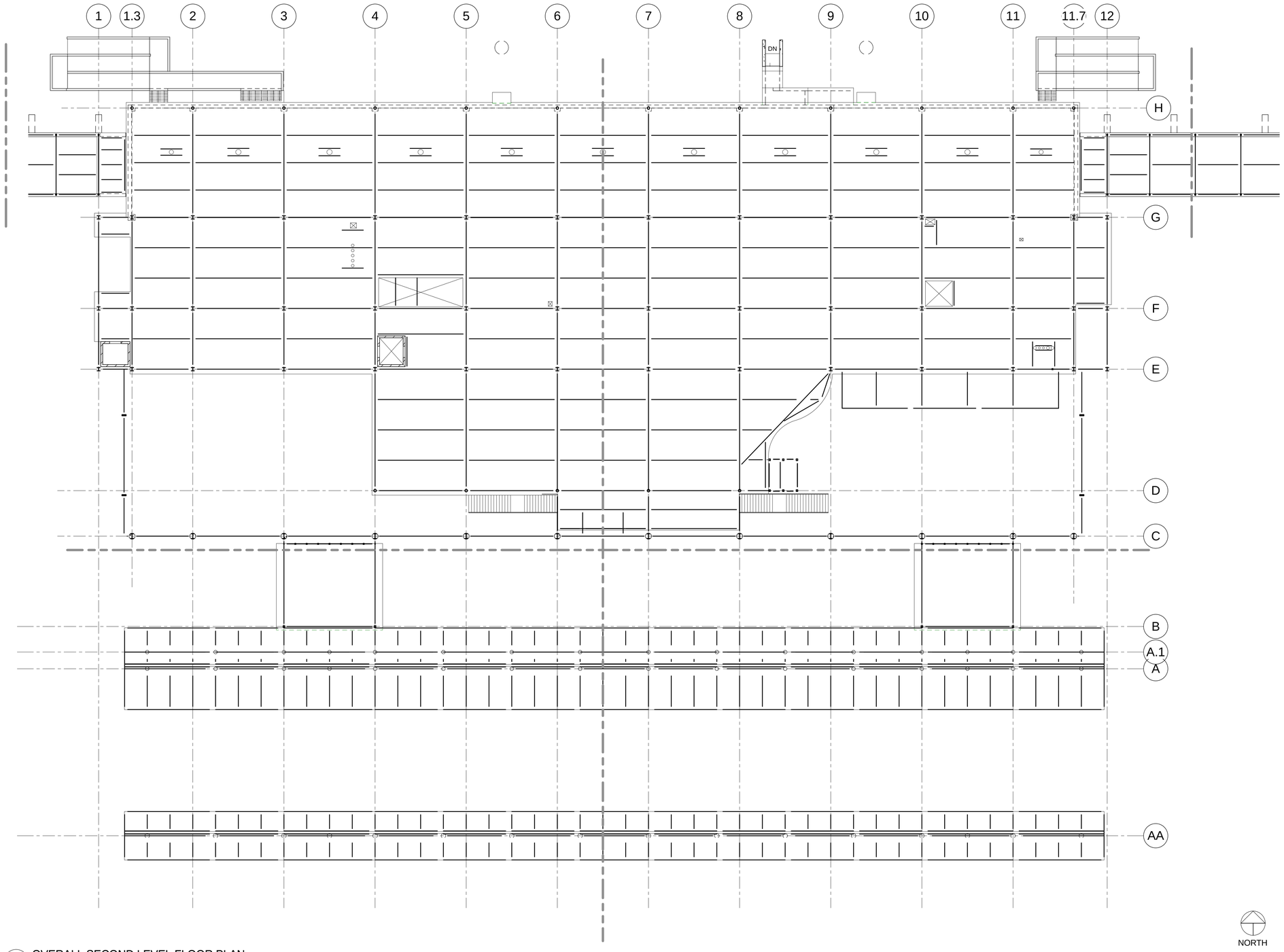
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
OVERALL FIRST LEVEL FLOOR PLAN

SHEET NUMBER
S101

BID PACKAGE 2C



1 OVERALL SECOND LEVEL FLOOR PLAN
1/16" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

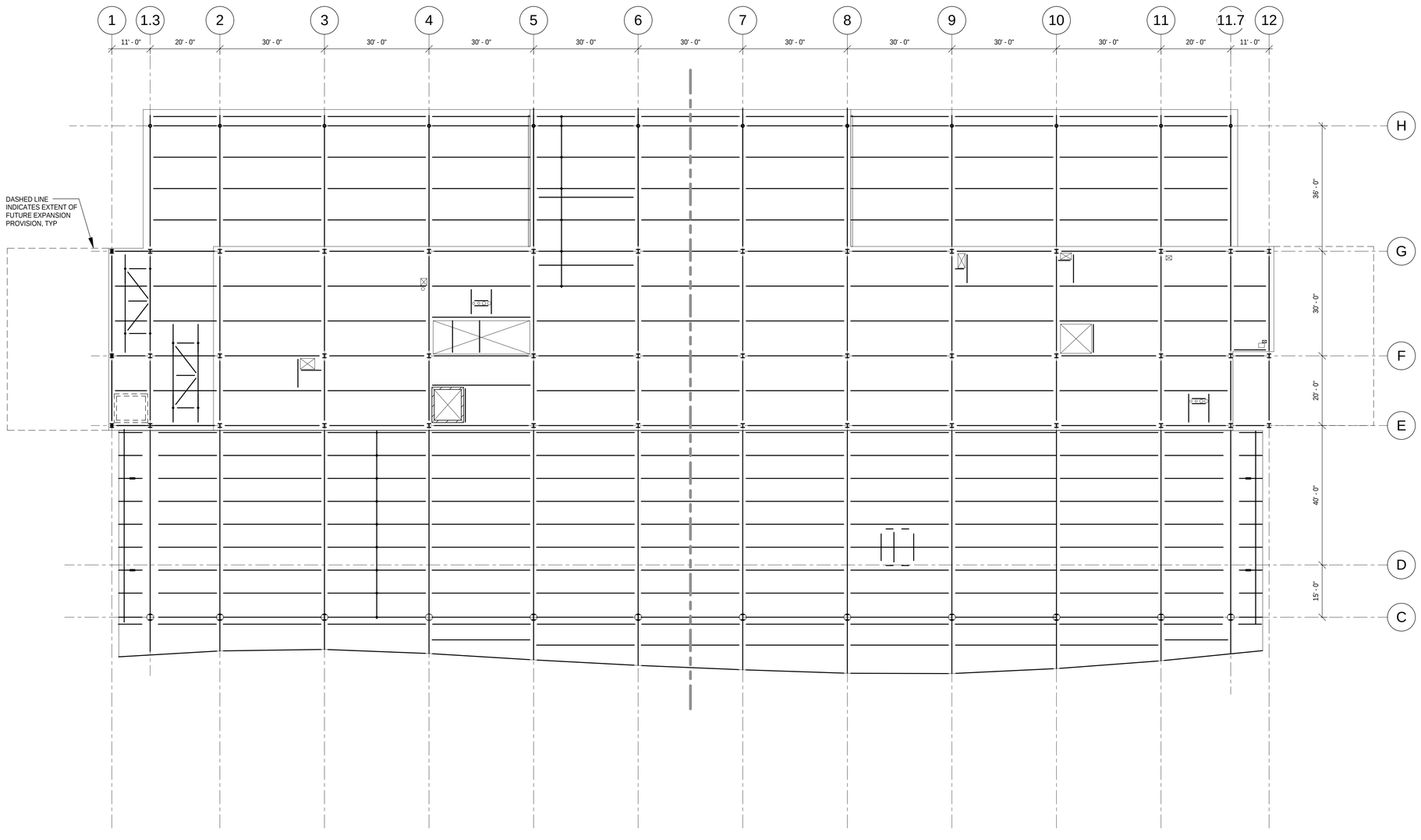
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
OVERALL SECOND LEVEL FLOOR PLAN

SHEET NUMBER
S102

BID PACKAGE 2C



1 OVERALL THIRD LEVEL FLOOR PLAN

1/16" = 1'-0"

NORTH

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER

213-1882-091

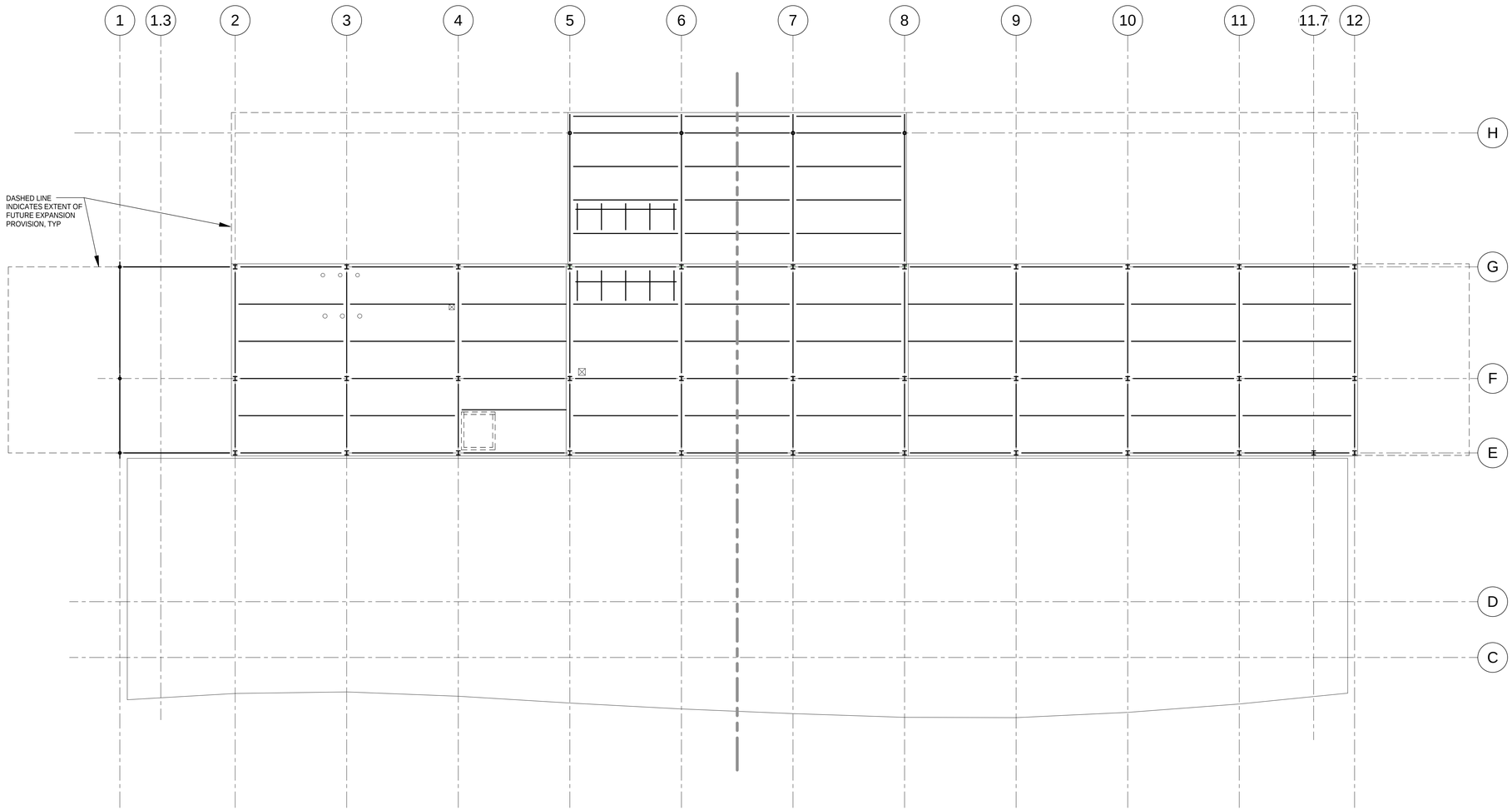
SHEET TITLE

OVERALL THIRD LEVEL FLOOR PLAN

SHEET NUMBER

S103

BID PACKAGE 2C



NORTH

1 OVERALL ROOF PLAN
1/16" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

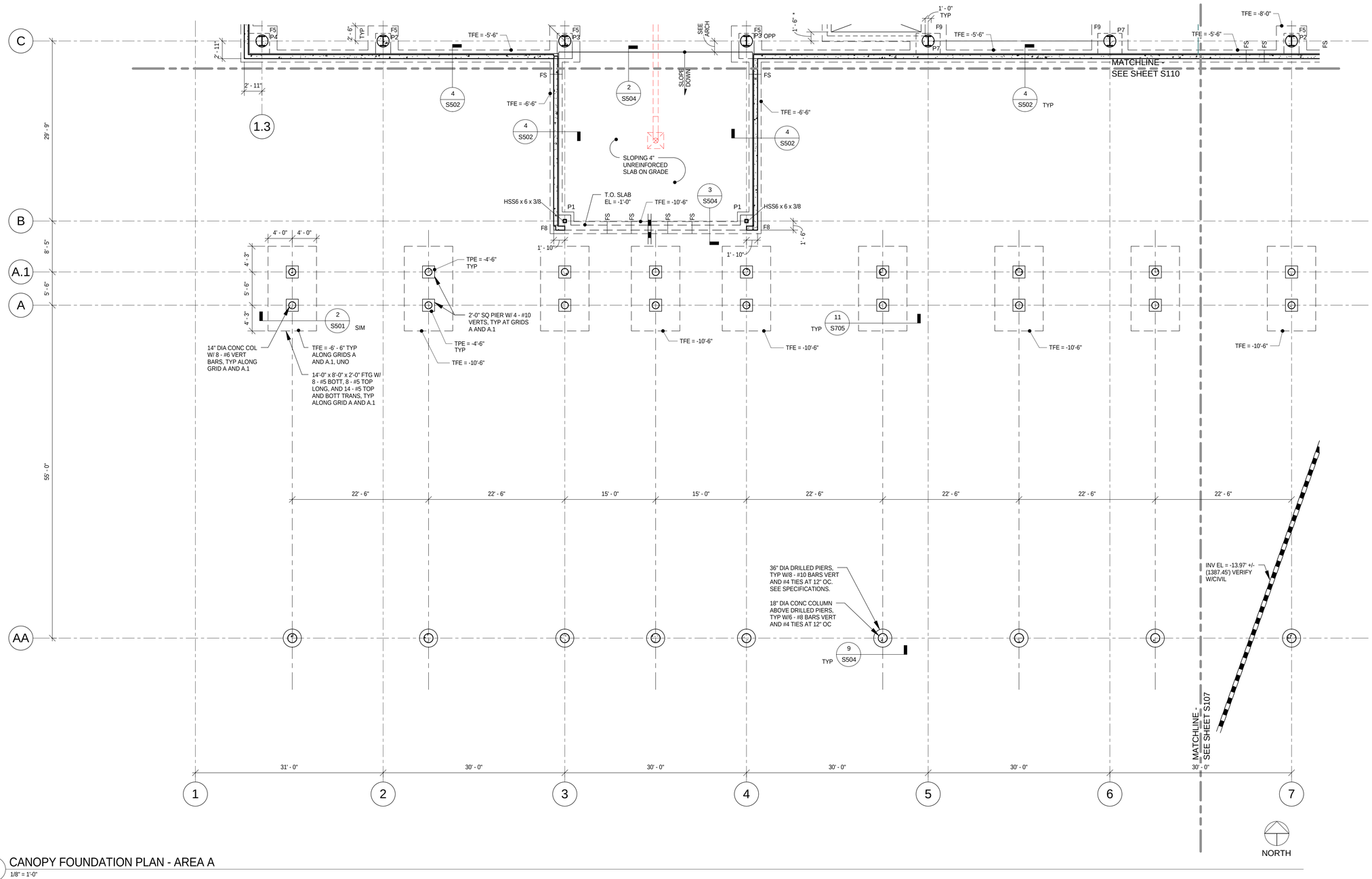
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
OVERALL ROOF LEVEL PLAN

SHEET NUMBER
S104

BID PACKAGE 2C



1 CANOPY FOUNDATION PLAN - AREA A

1/8" = 1'-0"

NOTES:
1. REFER TO S110 FOR TYPICAL PLAN NOTES.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

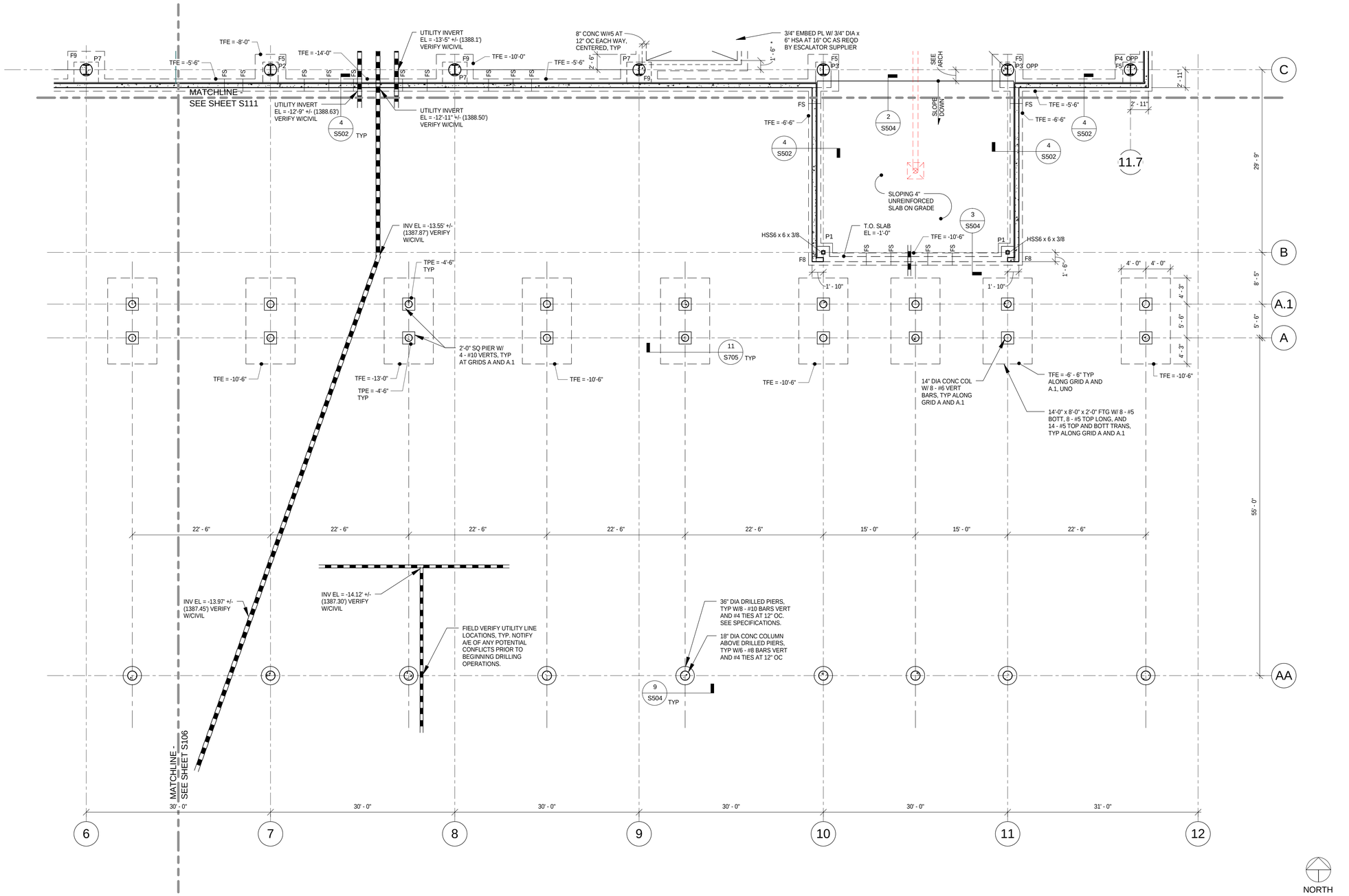
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
CANOPY FOUNDATION PLAN - AREA A

SHEET NUMBER
S106

BID PACKAGE 2C



1 CANOPY FOUNDATION PLAN - AREA B

1/8" = 1'-0"

NOTES:
1. REFER TO S110 FOR TYPICAL PLAN NOTES.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

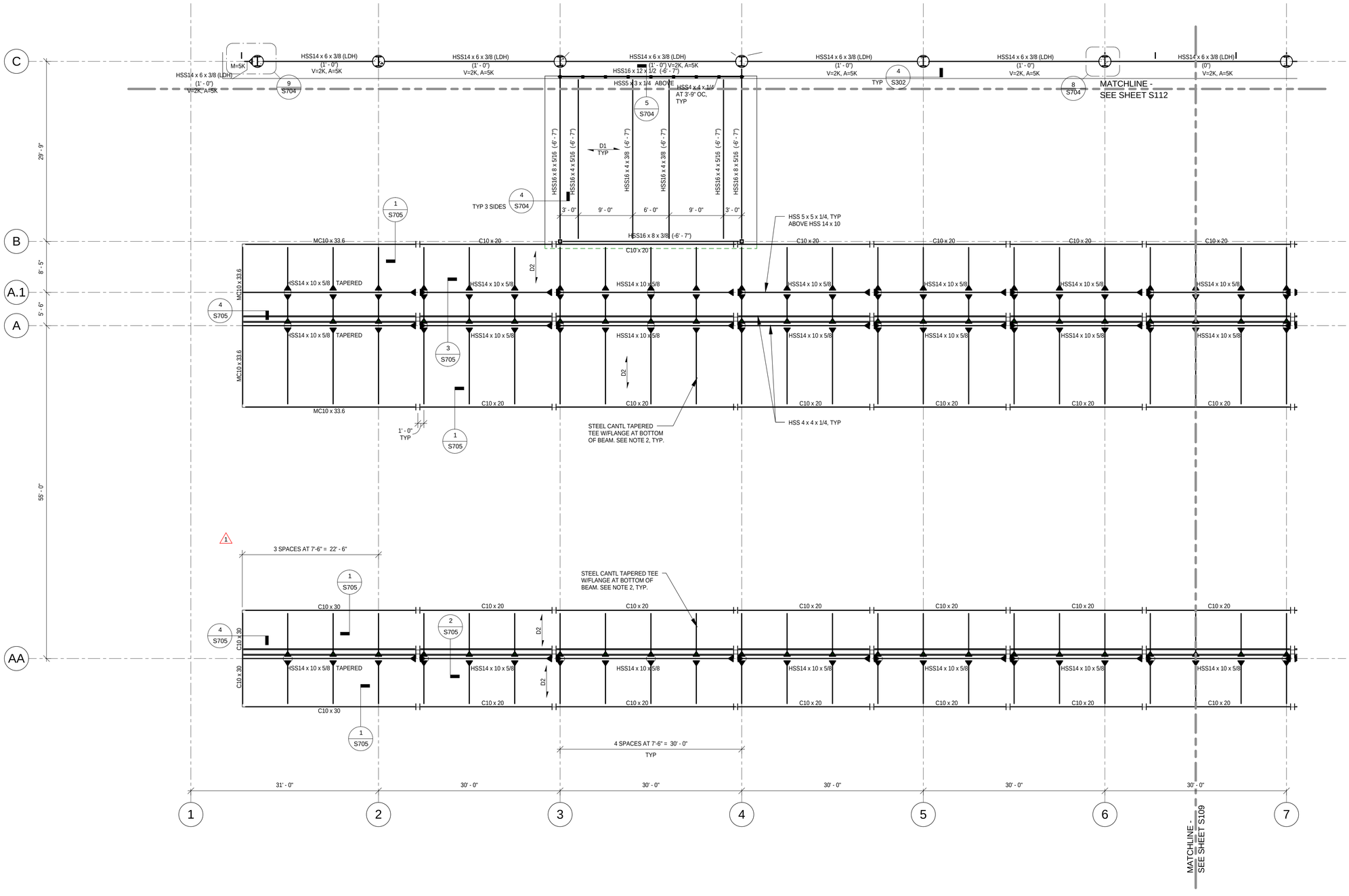
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
CANOPY FOUNDATION PLAN - AREA B

SHEET NUMBER
S107

BID PACKAGE 2C



1 CANOPY ROOF PLAN - AREA A

1/8" = 1'-0"

NOTES:
1. REFER TO S115 FOR TYPICAL PLAN NOTES.
2. FABRICATOR TO PROVIDE SECTION (BUILT UP PLATE SECTION OR CUT WT OR CUT WIDE FLANGE) WITH THE FOLLOWING DIMENSIONAL PROPERTIES:
   - d max = 14"
   - d min = 6"
   - bf = 12"
   - tf = 1 3/8"
   - tw = 3/4"
   - Fy = 50 ksi

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

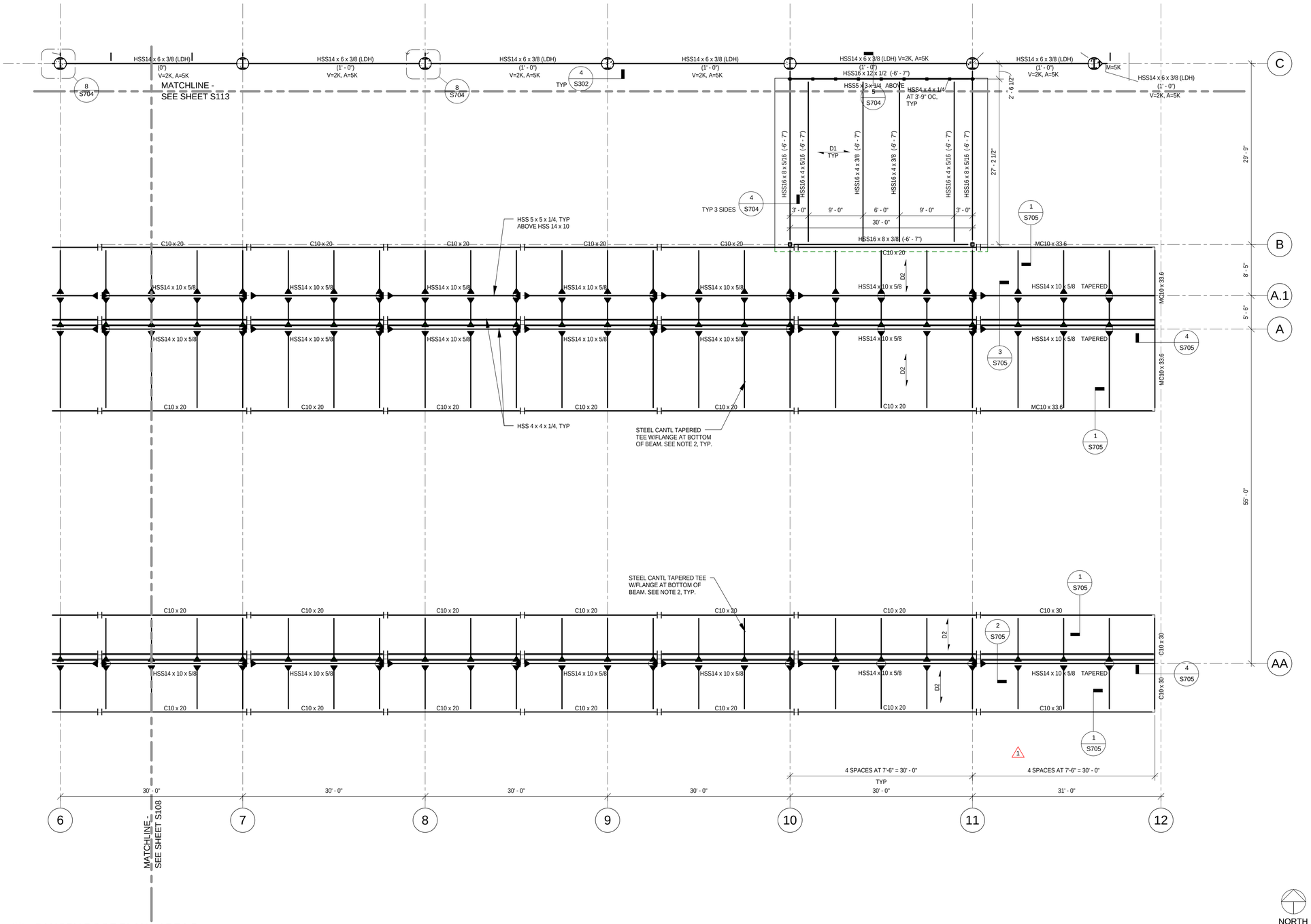
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
CANOPY ROOF FRAMING PLAN - AREA A

SHEET NUMBER
S108

BID PACKAGE 2C



1 CANOPY ROOF PLAN - AREA B

1/8" = 1'-0"

NOTES:
1. REFER TO S115 FOR TYPICAL PLAN NOTES.
2. FABRICATOR TO PROVIDE SECTION (BUILT UP PLATE SECTION OR CUT WT OR CUT WIDE FLANGE) WITH THE FOLLOWING DIMENSIONAL PROPERTIES:
   d max = 14"
   d min = 6"
   bf = 12"
   tf = 1 3/8"
   tw = 3/4"
   Fy = 50 ksi

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
CANOPY ROOF FRAMING PLAN - AREA B

SHEET NUMBER
S109

BID PACKAGE 2C

CONCRETE FOOTING SCHEDULE		
MARK	SIZE	REINFORCEMENT
F1	9'-0" x 9'-0" x 2'-6"	10 - #9 EACH WAY, BOTTOM
F2	8'-0" x 8'-0" x 2'-0"	8 - #9 EACH WAY, BOTTOM
F3	7'-0" x 7'-0" x 1'-6"	8 - #8 EACH WAY, BOTTOM
F4	5'-0" x 5'-0" x 1'-4"	5 - #6 EACH WAY, BOTTOM
F5	5'-0" x 5'-0" x 1'-0"	5 - #5 EACH WAY, BOTTOM
F6	8'-0" x 30'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F7	9'-0" x 39'-0" x 2'-6"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F8	3'-0" x 3'-0" x 1'-0"	3 - #5 EACH WAY, BOTTOM
F9	6'-0" x 6'-0" x 1'-0"	6 - #5 EACH WAY, BOTT
F10	8'-0" x 5'-0" x 2'-0"	#8 AT 12" OC EACH WAY, TOP AND BOTTOM
F11	8'-0" x 10'-0" x 2'-6"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F12	19'-0" x 28'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F13	8'-0" x 18'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F14	8'-0" x 21'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F15	10'-6" x 10'-6" x 2'-0"	11 - #8 EACH WAY, TOP AND BOTTOM

1 FOUNDATION PLAN - AREA A

1/8" = 1'-0"

NORTH

FOUNDATION PLAN NOTES (UNLESS NOTED OTHERWISE):

1. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND LEGENDS.
2. SEE SHEET S002 FOR GENERAL STRUCTURAL NOTES.
3. TOP OF SLAB ELEVATION (TSE) = 0' - 0" = DATUM ELEVATION 1401.42'. SEE PLAN FOR NON-TYPICAL ELEVATIONS.
4. TOP OF FOOTING ELEVATION (TFE) IS REFERENCED +/- FROM ELEVATION 0' - 0". TOP OF FOOTING ELEVATION = -4' - 0" TYPICAL, UNLESS NOTED OTHERWISE
5. FOOTINGS ARE CENTERED ON WALLS AND COLUMNS. SEE PLAN AND SCHEDULE FOR FOOTING SIZE AND REINFORCING.
6. SEE SHEET S501 FOR TYPICAL FOOTING STEP DETAIL.
7. CJ ON PLAN INDICATES SLAB ON GRADE CONTROL/CONSTRUCTION JOINT. SEE SHEET S501 FOR TYPICAL SLAB ON GRADE CONTROL/CONSTRUCTION JOINTS. SEE PLAN AND GENERAL STRUCTURAL NOTES FOR LAYOUT OF JOINTS.
8. VERIFY LOCATION AND INVERT ELEVATION FOR ALL UTILITIES, SUMPS AND DRAINS WITH CIVIL, MECHANICAL AND ARCHITECTURAL DRAWINGS.
9. **P1** ON PLAN INDICATES PIER MARK. REFER TO SHEET S502 FOR PIER SCHEDULE. UNLESS NOTED OTHERWISE ON PLAN, ALL PIERS TO BE TYPE "P1". TPE = -1' - 6" UNLESS NOTED OTHERWISE
10. GENERAL CONTRACTOR TO SEE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS NOT SHOWN.
11. **BF1** ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
12. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
13. 09-01 ON PLAN INDICATES APPROXIMATE LOCATION OF SOIL BORINGS. SEE GENERAL NOTES AND PROJECT GEOTECHNICAL REPORT.
14. ▬▬ ON PLAN INDICATES APPROXIMATE LOCATION OF UTILITY PENETRATIONS THROUGH FOUNDATION WALLS. NOT ALL PENETRATIONS ARE INDICATED. SEE CIVIL, MECHANICAL, ELECTRICAL AND ARCHITECTURAL DRAWINGS FOR TYPE AND LOCATION OF REMAINING PENETRATIONS AND INVERT ELEVATIONS. STEP FOOTING UNDER UTILITY PER DETAIL ON SHEET S501, EVEN IF FOOTING STEP IS NOT REPRESENTED ON PLAN.
15. SEE CIVIL DRAWINGS FOR ALL EXISTING UNDERGROUND UTILITIES TO BE REMOVED.
16. SEE COLUMN SCHEDULE SHEET S401 FOR COLUMN AND BASE PLATE INFORMATION.
17. W1 ON PLAN INDICATES CMU WALL REINFORCING. SEE SCHEDULE SHEET S503, TYP.
18. SEE ARCHITECTURAL DRAWINGS FOR ALL PARTITION WALL LOCATIONS. SEE SHEET S503 FOR ALL CMU NON-LOAD BEARING WALL REINFORCING AND CONNECTION INFORMATION.

RS&H IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
6	BP2A ADDENDUM 2	02.25.11
7	RFP 90	04.06.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

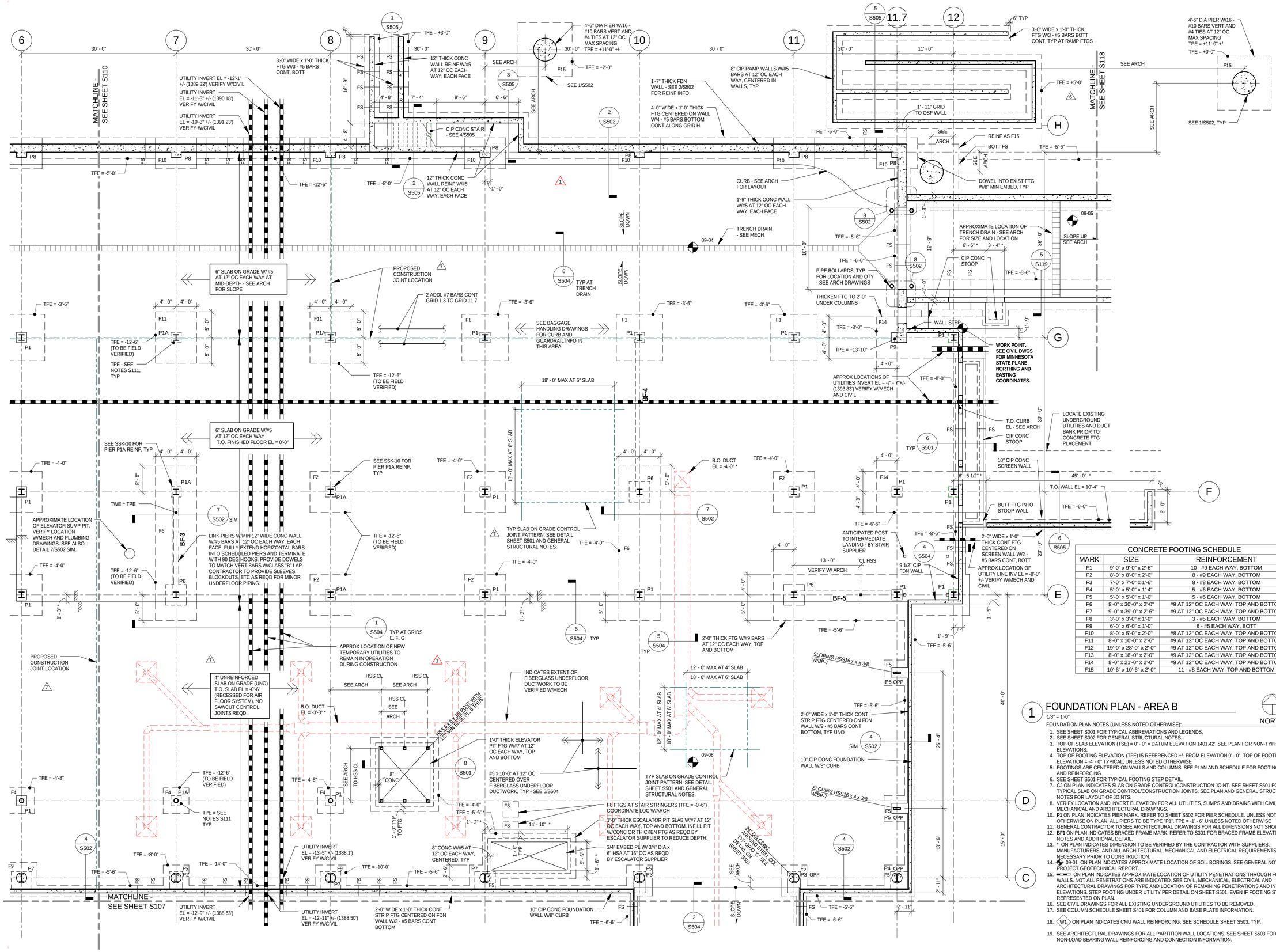
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
FOUNDATION PLAN - AREA A

SHEET NUMBER
S110

BID PACKAGE 2C



1 FOUNDATION PLAN - AREA B

1/8" = 1'-0"

NORTH

FOUNDATION PLAN NOTES (UNLESS NOTED OTHERWISE):

1. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND LEGENDS.
2. SEE SHEET S002 FOR GENERAL STRUCTURAL NOTES.
3. TOP OF SLAB ELEVATION (TSE) = 0' - 0" = DATUM ELEVATION 1401.42'. SEE PLAN FOR NON-TYPICAL ELEVATIONS.
4. TOP OF FOOTING ELEVATION (TFE) IS REFERENCED +/- FROM ELEVATION 0' - 0". TOP OF FOOTING ELEVATION = -4' - 0" TYPICAL, UNLESS NOTED OTHERWISE
5. FOOTINGS ARE CENTERED ON WALLS AND COLUMNS. SEE PLAN AND SCHEDULE FOR FOOTING SIZE AND REINFORCING.
6. SEE SHEET S501 FOR TYPICAL FOOTING STEP DETAIL.
7. CJ ON PLAN INDICATES SLAB ON GRADE CONTROL/CONSTRUCTION JOINT. SEE SHEET S501 FOR TYPICAL SLAB ON GRADE CONTROL/CONSTRUCTION JOINTS. SEE PLAN AND GENERAL STRUCTURAL NOTES FOR LAYOUT OF JOINTS.
8. VERIFY LOCATION AND INVERT ELEVATION FOR ALL UTILITIES, SUMPS AND DRAINS WITH CIVIL, MECHANICAL AND ARCHITECTURAL DRAWINGS.
10. **P1** ON PLAN INDICATES PIER MARK. REFER TO SHEET S502 FOR PIER SCHEDULE. UNLESS NOTED OTHERWISE ON PLAN, ALL PIERS TO BE TYPE "P1". TPE = -1' - 6" UNLESS NOTED OTHERWISE.
11. GENERAL CONTRACTOR TO SEE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS NOT SHOWN.
12. **BF1** ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
13. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
14. 09-01 ON PLAN INDICATES APPROXIMATE LOCATION OF SOIL BORINGS. SEE GENERAL NOTES AND PROJECT GEOTECHNICAL REPORT.
15. ON PLAN INDICATES APPROXIMATE LOCATION OF UTILITY PENETRATIONS THROUGH FOUNDATION WALLS. NOT ALL PENETRATIONS ARE INDICATED. SEE CIVIL, MECHANICAL, ELECTRICAL AND ARCHITECTURAL DRAWINGS FOR TYPE AND LOCATION OF REMAINING PENETRATIONS AND INVERT ELEVATIONS. STEP FOOTING UNDER UTILITY PER DETAIL ON SHEET S501, EVEN IF FOOTING STEP IS NOT REPRESENTED ON PLAN.
16. SEE CIVIL DRAWINGS FOR ALL EXISTING UNDERGROUND UTILITIES TO BE REMOVED.
17. SEE COLUMN SCHEDULE SHEET S401 FOR COLUMN AND BASE PLATE INFORMATION.
18. W1 ON PLAN INDICATES CMU WALL REINFORCING. SEE SCHEDULE SHEET S503, TYP.
19. SEE ARCHITECTURAL DRAWINGS FOR ALL PARTITION WALL LOCATIONS. SEE SHEET S503 FOR ALL CMU NON-LOAD BEARING WALL REINFORCING AND CONNECTION INFORMATION.

CONCRETE FOOTING SCHEDULE

MARK	SIZE	REINFORCEMENT
F1	9'-0" x 9'-0" x 2'-6"	10 - #9 EACH WAY, BOTTOM
F2	8'-0" x 8'-0" x 2'-0"	8 - #9 EACH WAY, BOTTOM
F3	7'-0" x 7'-0" x 1'-6"	8 - #8 EACH WAY, BOTTOM
F4	5'-0" x 5'-0" x 1'-4"	5 - #6 EACH WAY, BOTTOM
F5	5'-0" x 5'-0" x 1'-0"	5 - #5 EACH WAY, BOTTOM
F6	8'-0" x 30'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F7	9'-0" x 39'-0" x 2'-6"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F8	3'-0" x 3'-0" x 1'-0"	3 - #5 EACH WAY, BOTTOM
F9	6'-0" x 6'-0" x 1'-0"	6 - #5 EACH WAY, BOTT
F10	8'-0" x 5'-0" x 2'-0"	#8 AT 12" OC EACH WAY, TOP AND BOTTOM
F11	8'-0" x 10'-0" x 2'-6"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F12	19'-0" x 28'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F13	8'-0" x 18'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F14	8'-0" x 21'-0" x 2'-0"	#9 AT 12" OC EACH WAY, TOP AND BOTTOM
F15	10'-6" x 10'-6" x 2'-0"	11 - #8 EACH WAY, TOP AND BOTTOM

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
6	BP2A ADDENDUM 2	02.25.11
7	RFP 90	04.06.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

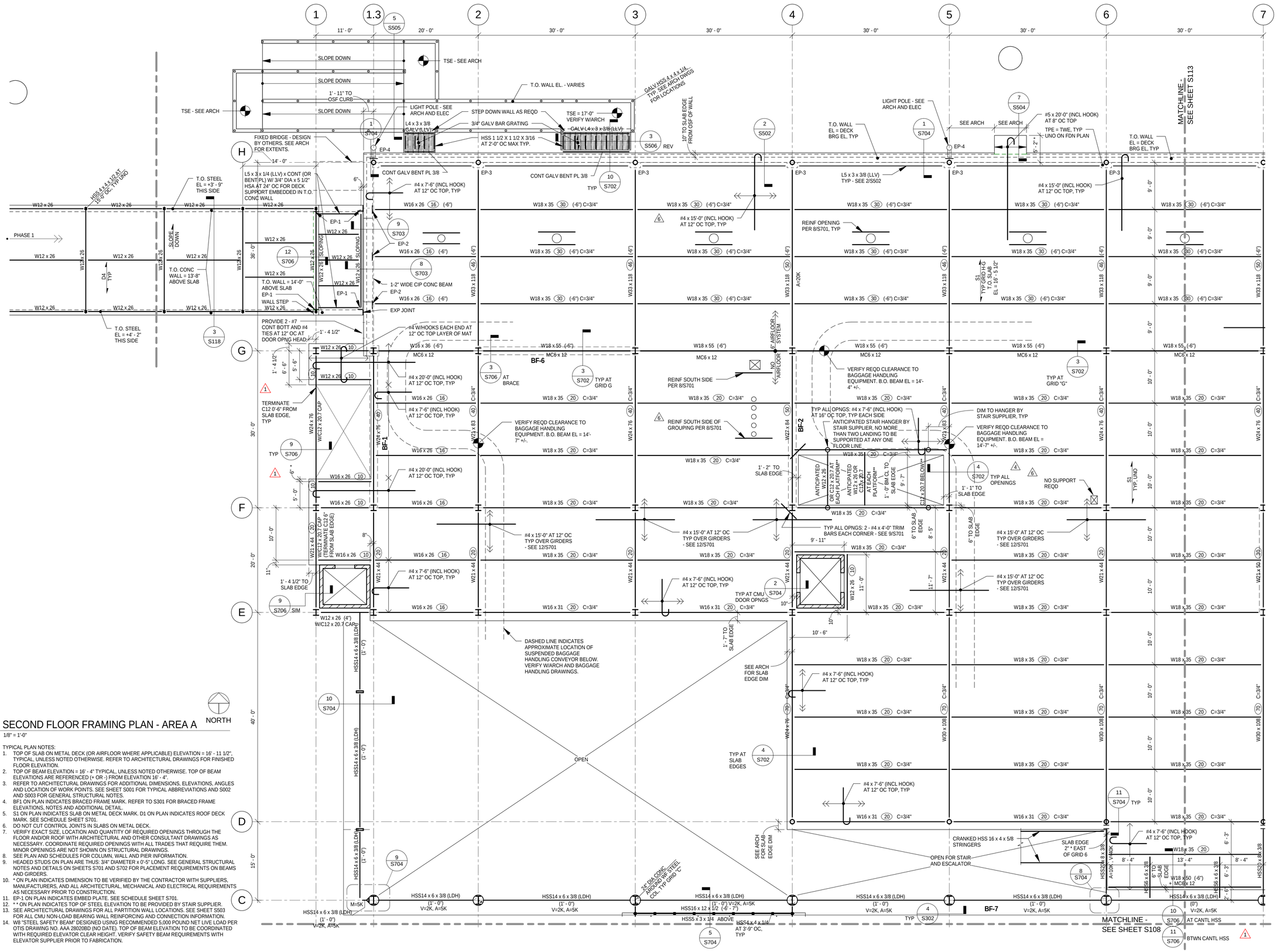
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
FOUNDATION PLAN - AREA B

SHEET NUMBER
S111

BID PACKAGE 2C



1 SECOND FLOOR FRAMING PLAN - AREA A

1/8" = 1'-0"

TYPICAL PLAN NOTES:

1. TOP OF SLAB ON METAL DECK (OR AIRFLOOR WHERE APPLICABLE) ELEVATION = 16' - 11 1/2", TYPICAL, UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHED FLOOR ELEVATION.
2. TOP OF BEAM ELEVATION = 16' - 4" TYPICAL, UNLESS NOTED OTHERWISE. TOP OF BEAM ELEVATIONS ARE REFERENCED (+ OR -) FROM ELEVATION 16' - 4".
3. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
4. BF1 ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
5. S1 ON PLAN INDICATES SLAB ON METAL DECK MARK. D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE SHEET S701.
6. DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
7. VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
8. SEE PLAN AND SCHEDULES FOR COLUMN, WALL AND PIER INFORMATION.
9. HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-5" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S702 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
10. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
11. EP-1 ON PLAN INDICATES EMBED PLATE. SEE SCHEDULE SHEET S701.
12. * * ON PLAN INDICATES TOP OF STEEL ELEVATION TO BE PROVIDED BY STAIR SUPPLIER.
13. SEE ARCHITECTURAL DRAWINGS FOR ALL PARTITION WALL LOCATIONS. SEE SHEET S503 FOR ALL CMU NON-LOAD BEARING WALL REINFORCING AND CONNECTION INFORMATION.
14. WR "STEEL SAFETY BEAM" DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. AAA 28020BD (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
6	RFP 223	02.09.12
	BID PACKAGE 2C	02.10.12

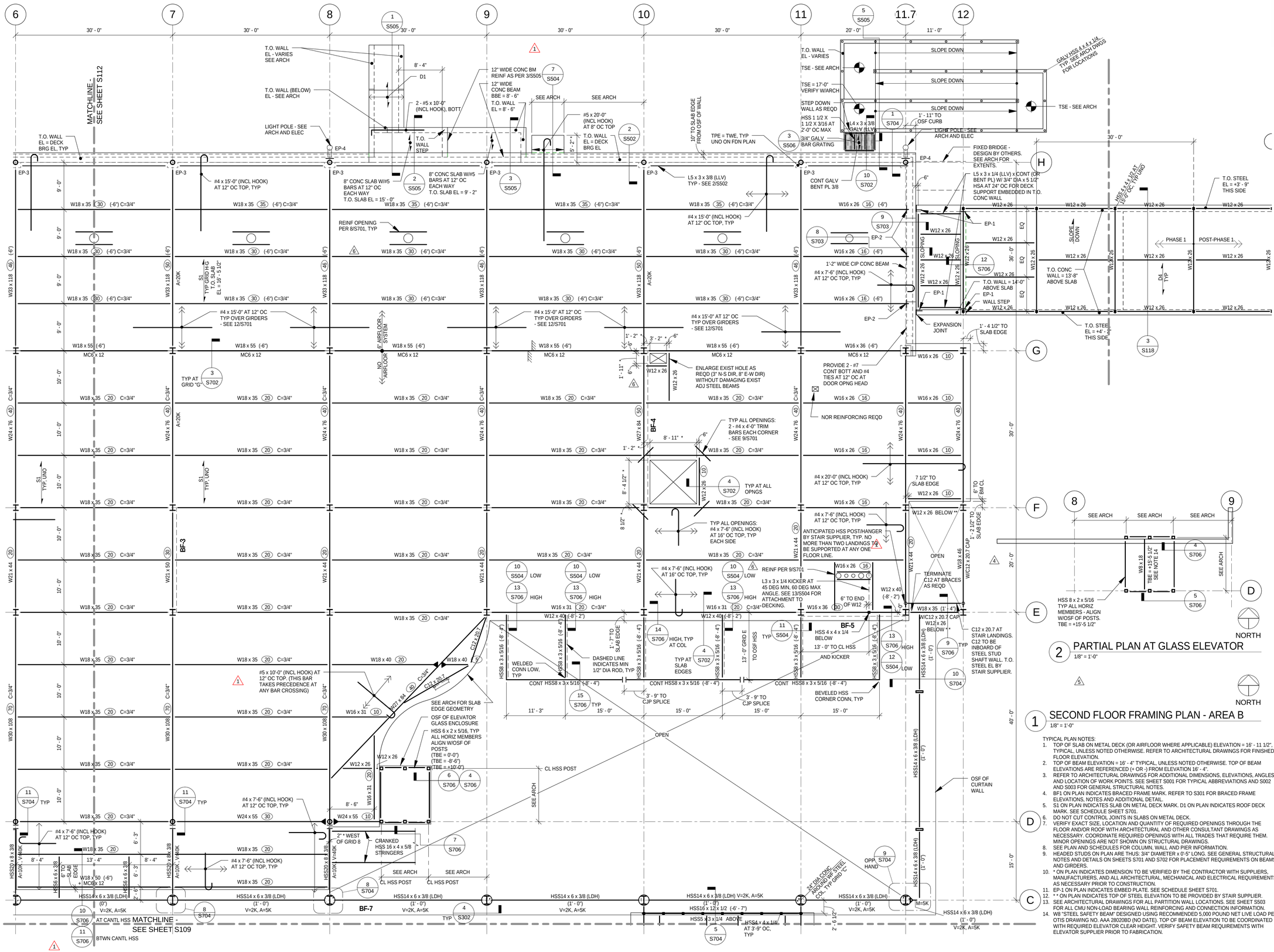
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
SECOND LEVEL FRAMING PLAN - AREA A

SHEET NUMBER
S112

BID PACKAGE 2C



2 PARTIAL PLAN AT GLASS ELEVATOR

1/8" = 1'-0"

1 SECOND FLOOR FRAMING PLAN - AREA B

1/8" = 1'-0"

TYPICAL PLAN NOTES:

1. TOP OF SLAB ON METAL DECK (OR AIRFLOOR WHERE APPLICABLE) ELEVATION = 16' - 11 1/2", TYPICAL, UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHED FLOOR ELEVATION.
2. TOP OF BEAM ELEVATION = 16' - 4" TYPICAL, UNLESS NOTED OTHERWISE. TOP OF BEAM ELEVATIONS ARE REFERENCED (+ OR -) FROM ELEVATION 16' - 4".
3. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
4. BF1 ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
5. S1 ON PLAN INDICATES SLAB ON METAL DECK MARK. D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE SHEET S701.
6. DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
7. VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
8. SEE PLAN AND SCHEDULES FOR COLUMN, WALL AND PIER INFORMATION.
9. HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-5" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S702 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
10. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
11. EP-1 ON PLAN INDICATES EMBED PLATE. SEE SCHEDULE SHEET S701.
12. * * ON PLAN INDICATES TOP OF STEEL ELEVATION TO BE PROVIDED BY STAIR SUPPLIER.
13. SEE ARCHITECTURAL DRAWINGS FOR ALL PARTITION WALL LOCATIONS. SEE SHEET S503 FOR ALL CMU NON-LOAD BEARING WALL REINFORCING AND CONNECTION INFORMATION.
14. W8 "STEEL SAFETY BEAM" DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. AAA 28020BD (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	RFP 120	07.22.11
6	RFP 223	02.09.12
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER

213-1882-091

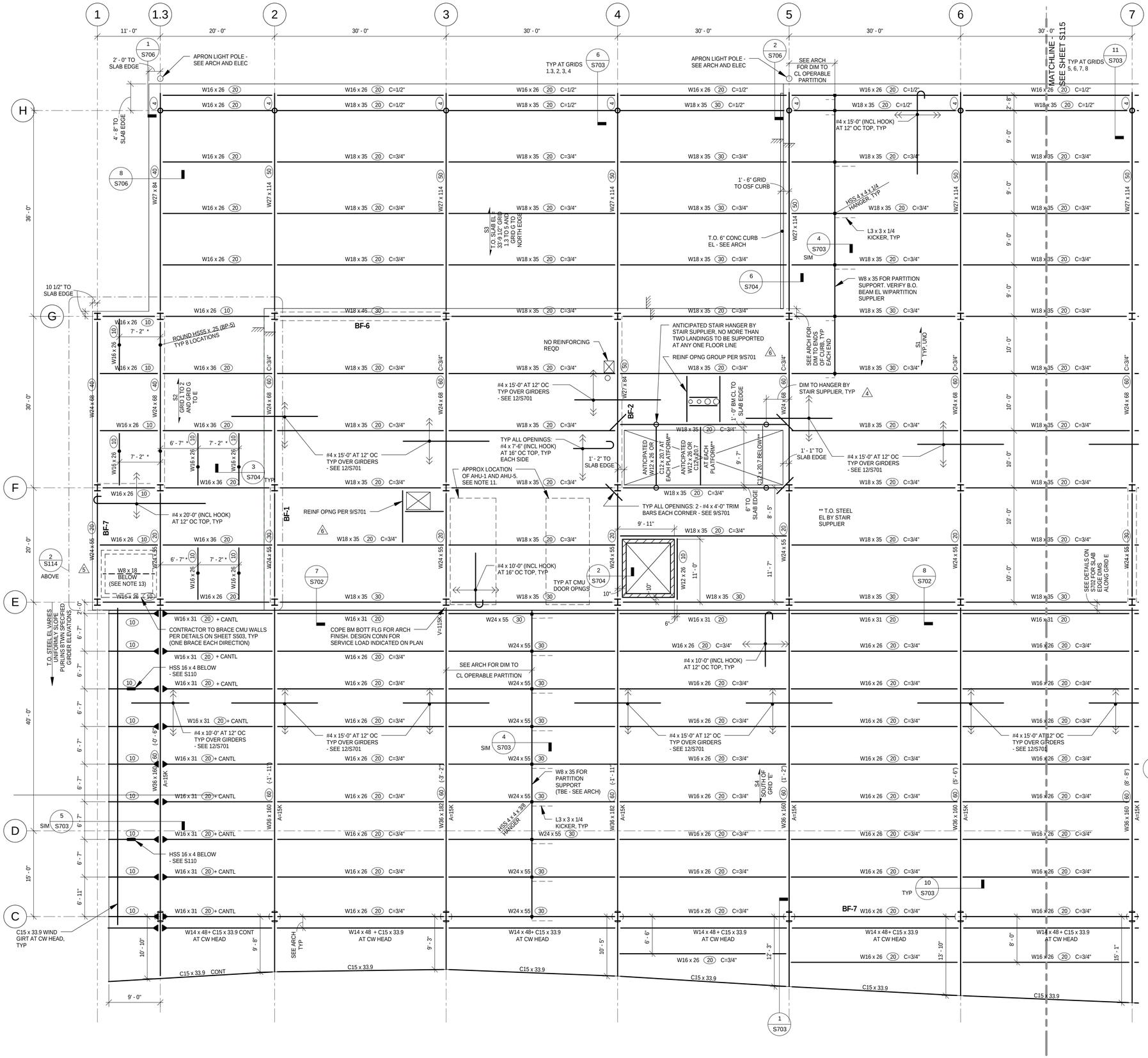
SHEET TITLE

SECOND LEVEL FRAMING PLAN - AREA B

SHEET NUMBER

S113

BID PACKAGE 2C



1 THIRD LEVEL FRAMING PLAN - AREA A

1/8" = 1'-0"

NORTH

TYPICAL PLAN NOTES:

1. TOP OF SLAB ELEVATION = 33' - 7 1/2", UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHED FLOOR ELEVATION.
2. TOP OF BEAM ELEVATION = 33' - 0" TYPICAL, UNLESS NOTED OTHERWISE. TOP OF BEAM ELEVATIONS ARE REFERENCED (+ OR -) FROM ELEVATION 33' - 0".
3. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
4. BF1 ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
5. S1 ON PLAN INDICATES SLAB ON METAL DECK MARK. D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE ON SHEET S701.
6. DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
7. VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
8. SEE PLAN AND SCHEDULES FOR COLUMN, WALL AND PIER INFORMATION.
9. HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-5" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S702 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
10. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
11. PROVIDE HOUSEKEEPING PADS FOR MECHANICAL EQUIPMENT AS INDICATED (MAXIMUM 6" THICKNESS) ON MECHANICAL DRAWINGS. REINFORCE PADS WITH #4 BARS AT 12" OC EACH WAY, CENTERED IN SLAB.
12. SEE ARCHITECTURAL DRAWINGS FOR ALL PARTITION WALL LOCATIONS. SEE SHEET S503 FOR ALL CMU NON-LOAD BEARING WALL REINFORCING AND CONNECTION INFORMATION.
13. 5 W8 "STEEL SAFETY BEAM" DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. AAA 28020BD (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. BEAR ON BEARING PLATE 1/2" x 8" x 0'-8" WITH 3/4" DIAMETER x 4" LONG HSA EACH END OVER FULLY GROUTED CELL. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

2 PARTIAL THIRD FLOOR FRAMING PLAN

1/8" = 1'-0"

NOTES:

1. TOP OF CHILLER SUPPORT BEAM EL = 37'-0" *, TYP. SEE NOTE 10 ON 1/S120.
2. ASSUMED APPROXIMATE CHILLER SELF-WEIGHT = 13,000 LBS. SEE MECHANICAL EQUIPMENT SCHEDULES.

1

APPROXIMATE AHU WEIGHTS (VERIFY W/MECH)	
MARK	WEIGHT (POUNDS)
AHU-1	5,000
AHU-2	12,000
AHU-3	6,200
AHU-4	6,200
AHU-5	5,000

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
6	RFP 223	02.09.12
	BID PACKAGE 2C	02.10.12

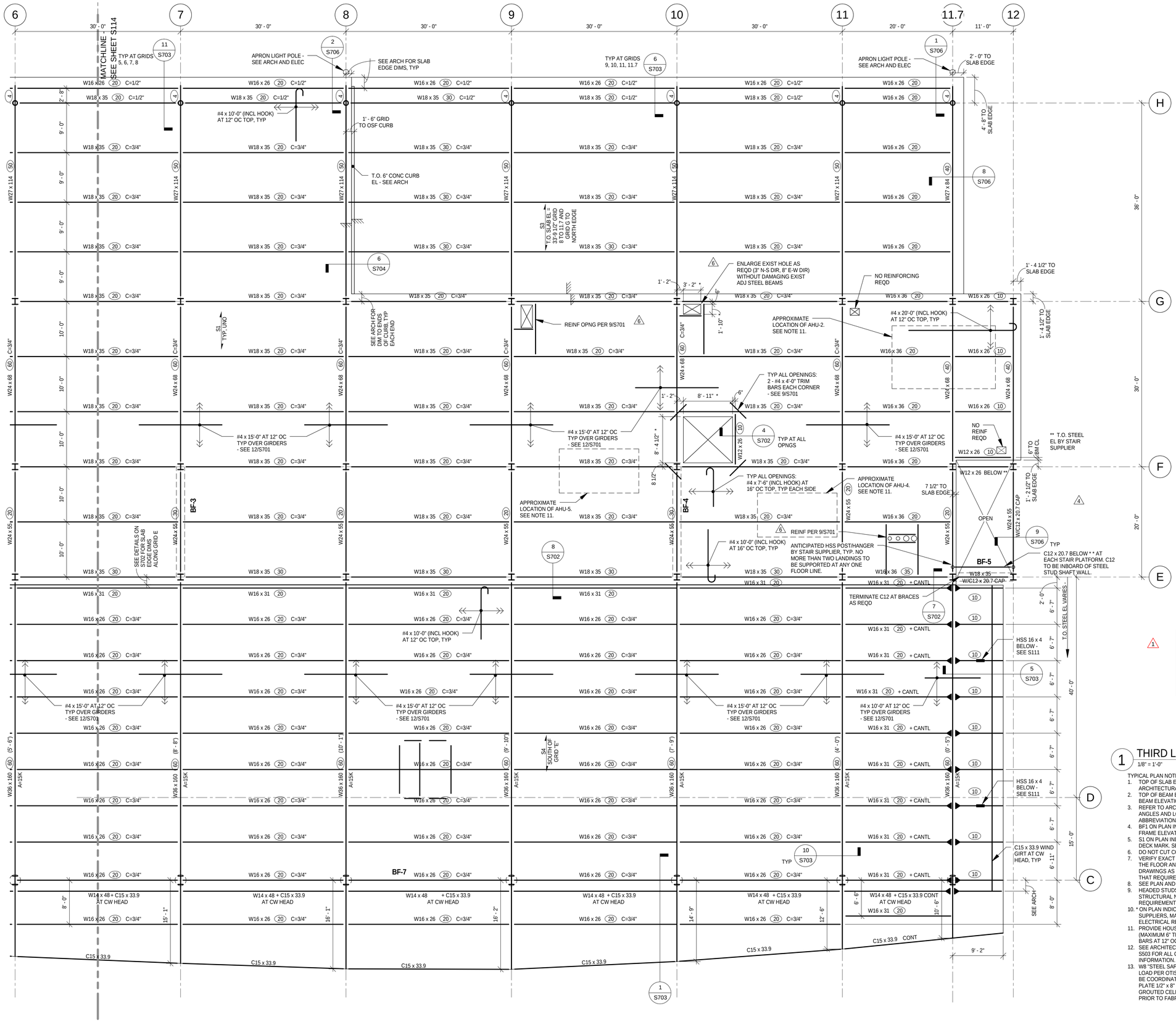
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
THIRD LEVEL FRAMING PLAN - AREA A

SHEET NUMBER
S114

BID PACKAGE 2C



APPROXIMATE AHU WEIGHTS (VERIFY W/MECH)	
MARK	WEIGHT (POUNDS)
AHU-1	5,000
AHU-2	12,000
AHU-3	6,200
AHU-4	6,200
AHU-5	5,000

1 THIRD LEVEL FRAMING PLAN - AREA B

1/8" = 1'-0"

TYPICAL PLAN NOTES:

1. TOP OF SLAB ELEVATION = 33' - 7 1/2", UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHED FLOOR ELEVATION.
2. TOP OF BEAM ELEVATION = 33' - 0" TYPICAL, UNLESS NOTED OTHERWISE. TOP OF BEAM ELEVATIONS ARE REFERENCED (+ OR -) FROM ELEVATION 33' - 0".
3. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
4. BF1 ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
5. S1 ON PLAN INDICATES SLAB ON METAL DECK MARK. D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE ON SHEET S701.
6. DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
7. VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
8. SEE PLAN AND SCHEDULES FOR COLUMN, WALL AND PIER INFORMATION.
9. HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-5" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S702 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
10. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
11. PROVIDE HOUSEKEEPING PADS FOR MECHANICAL EQUIPMENT AS INDICATED (MAXIMUM 6" THICKNESS) ON MECHANICAL DRAWINGS. REINFORCE PADS WITH #4 BARS AT 12" OC EACH WAY, CENTERED IN SLAB.
12. SEE ARCHITECTURAL DRAWINGS FOR ALL PARTITION WALL LOCATIONS. SEE SHEET S503 FOR ALL CMU NON-LOAD BEARING WALL REINFORCING AND CONNECTION INFORMATION.
13. W8 "STEEL SAFETY BEAM" DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. AAA 28020BD (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. BEAR ON BEARING PLATE 1/2" x 8" x 0'-8" WITH 3/4" DIAMETER x 4" LONG HSA EACH END OVER FULLY GROUTED CELL. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
6	RFP 223	02.09.12
	BID PACKAGE 2C	02.10.12

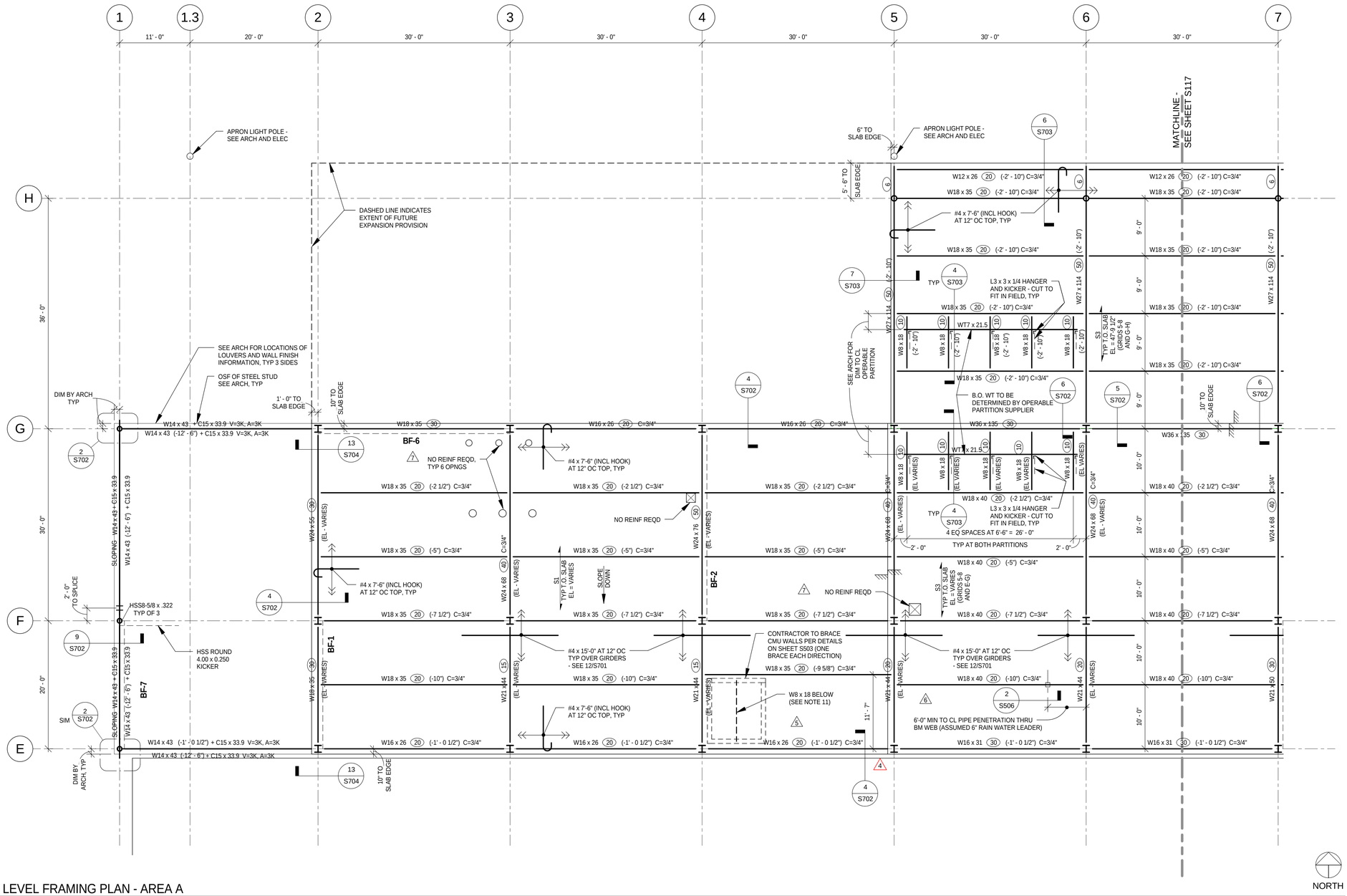
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
THIRD LEVEL FRAMING PLAN - AREA B

SHEET NUMBER
S115

BID PACKAGE 2C



1 ROOF LEVEL FRAMING PLAN - AREA A

1/8" = 1'-0"

TYPICAL PLAN NOTES:

1. TOP OF STEEL BEAM ELEVATION IS REFERENCED (+ OR -) FROM ELEVATION 49' - 6", TOP OF STEEL BEAM = 49' - 6", UNLESS NOTED OTHERWISE.
2. TOP OF SLAB ELEVATION VARIES. SEE PLAN
3. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
4. BF1 ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
5. S1 ON PLAN INDICATES SLAB ON METAL DECK MARK. D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE ON SHEET S701.
6. DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
7. VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
8. SEE PLAN AND SCHEDULES FOR COLUMN, WALL AND PIER INFORMATION.
9. HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-5" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S702 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
10. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
11. W8 "STEEL SAFETY BEAM" DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. AAA 28020BD (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. BEAR ON BEARING PLATE 1/2" x 8" x 0'-8" WITH 3/4" DIAMETER x 4" LONG HSA EACH END OVER FULLY GROUTED CELL. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	10.15.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
6	RFP	05.25.11
7	RFP 223	02.09.12
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER

213-1882-091

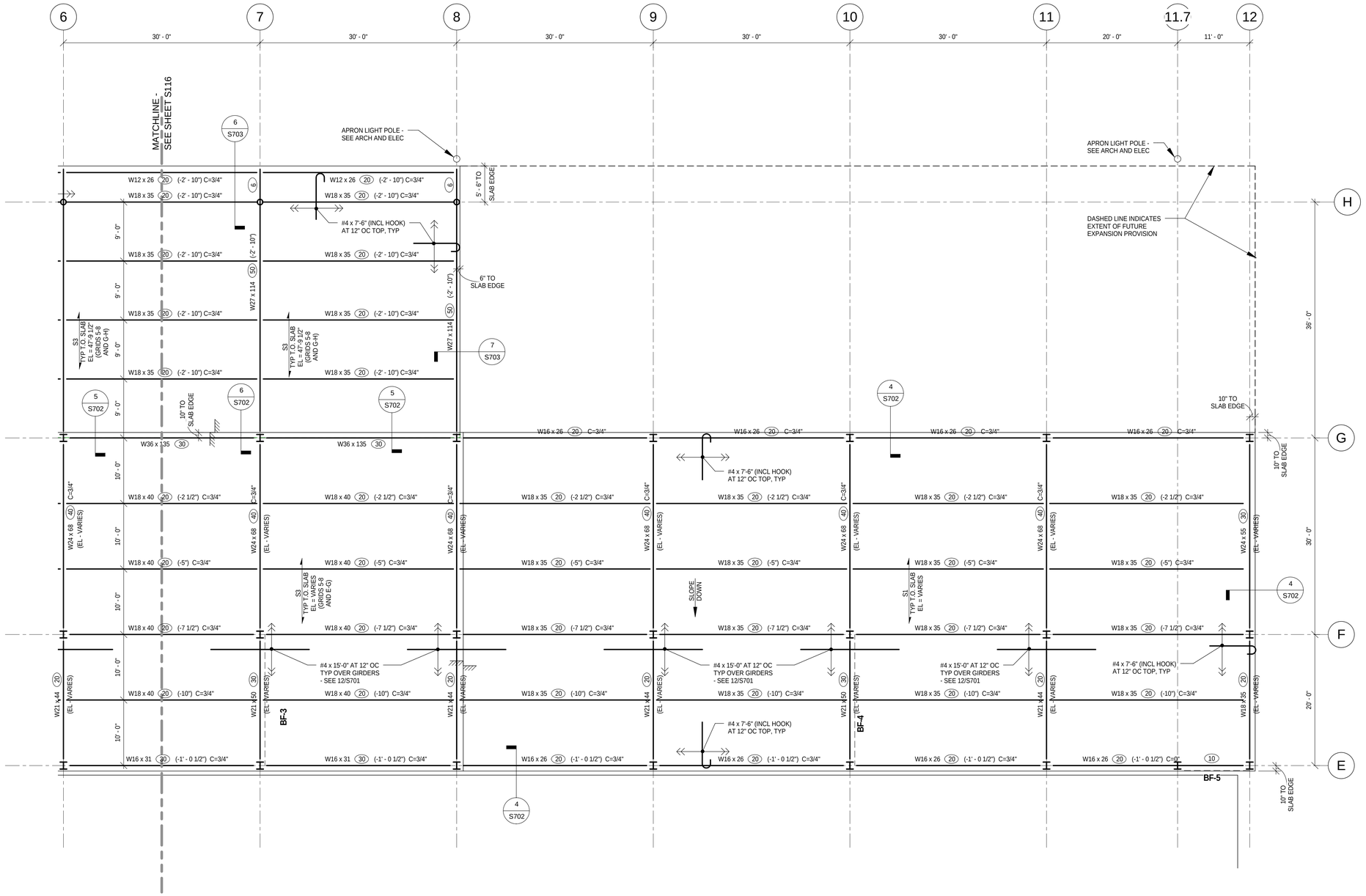
SHEET TITLE

ROOF LEVEL FRAMING PLAN - AREA A

SHEET NUMBER

S116

BID PACKAGE 2C



NORTH

1 ROOF LEVEL FRAMING PLAN - AREA B

1/8" = 1'-0"

TYPICAL PLAN NOTES:

1. TOP OF STEEL BEAM ELEVATION IS REFERENCED (+ OR -) FROM ELEVATION 49' - 6". TOP OF STEEL BEAM = 49' - 6", UNLESS NOTED OTHERWISE.
2. TOP OF SLAB ELEVATION VARIES. SEE PLAN
3. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
4. BF1 ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
5. S1 ON PLAN INDICATES SLAB ON METAL DECK MARK. D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE ON SHEET S701.
6. DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
7. VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
8. SEE PLAN AND SCHEDULES FOR COLUMN, WALL AND PIER INFORMATION.
9. HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-5" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S702 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
10. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
11. W8 "STEEL SAFETY BEAM" DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. AAA 28020BD (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. BEAR ON BEARING PLATE 1/2" x 8" x 0'-8" WITH 3/4" DIAMETER x 4" LONG HSA EACH END OVER FULLY GROUTED CELL. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

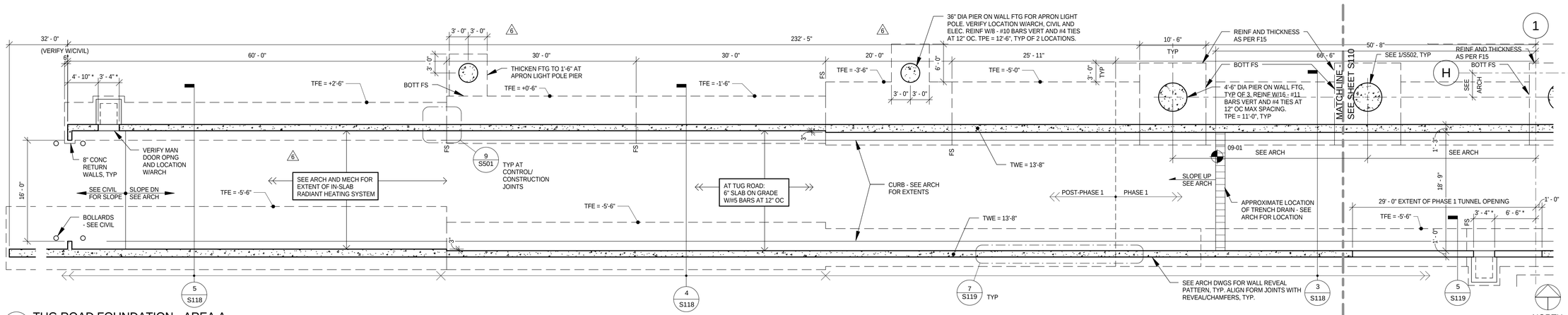
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
ROOF LEVEL FRAMING PLAN - AREA B

SHEET NUMBER
S117

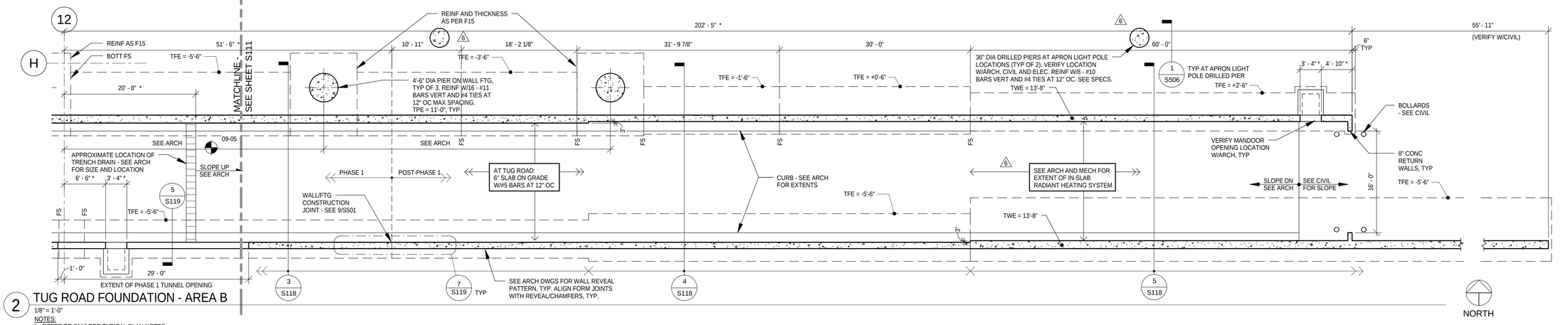
BID PACKAGE 2C



1 TUG ROAD FOUNDATION - AREA A

1/8" = 1'-0"

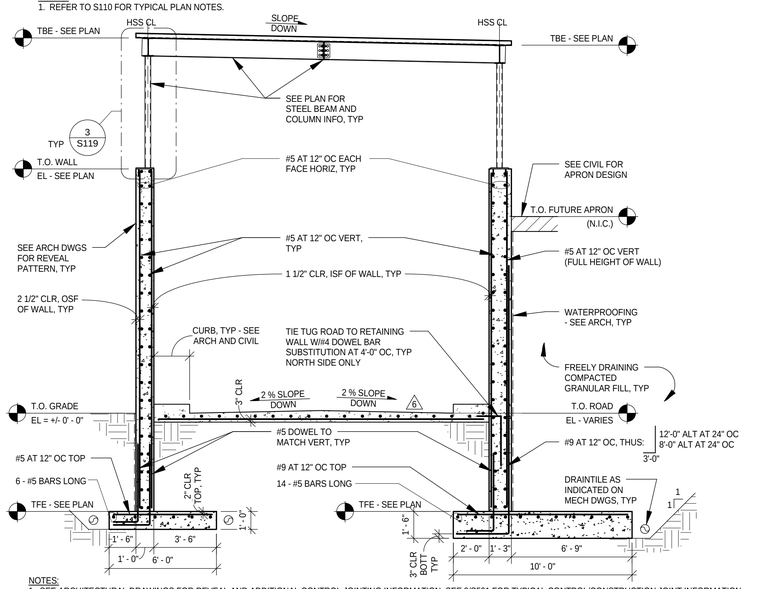
NOTES:
1. REFER TO S110 FOR TYPICAL PLAN NOTES.



2 TUG ROAD FOUNDATION - AREA B

1/8" = 1'-0"

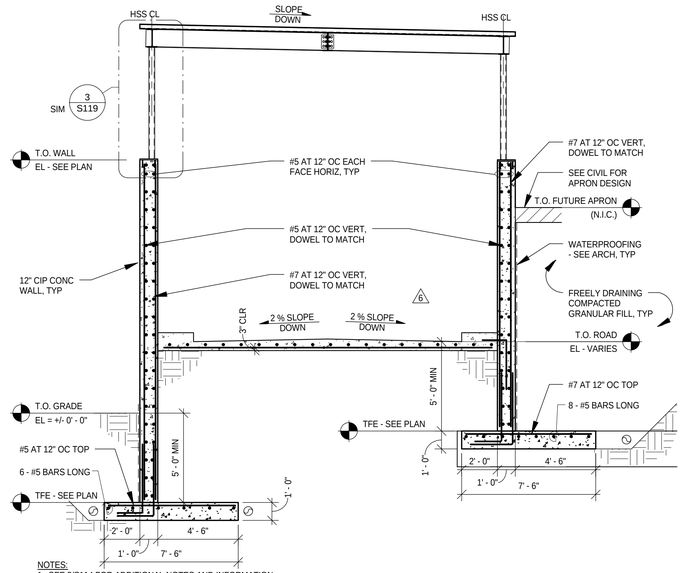
NOTES:
1. REFER TO S110 FOR TYPICAL PLAN NOTES.



NOTES:
1. SEE ARCHITECTURAL DRAWINGS FOR REVEAL AND ADDITIONAL CONTROL JOINTING INFORMATION. SEE 9/S501 FOR TYPICAL CONTROL/CONSTRUCTION JOINT INFORMATION.
2. SEE SPECIFICATION FOR CONCRETE WALL FINISH INFORMATION.
3. CONTRACTOR TO ADEQUATELY SEQUENCE BACKFILLING OPERATIONS OR BRACE WALL UNTIL CONCRETE REACHES ITS 28-DAY COMPRESSIVE STRENGTH.
4. FREE-DRAINING COMPACTED GRANULAR BACKFILL TO BE AS DEFINED IN THE PROJECT GEOTECHNICAL REPORT.
5. FOR DRAIN TILE DESIGN AND LAYOUT - SEE MECHANICAL DRAWINGS.
6. FOOTINGS MAY BEAR ON MATERIAL PROVIDING A BEARING CAPACITY OF 5000 PSF (ENGINEERED FILL). REFER TO THE PROJECT GEOTECHNICAL REPORT FOR MORE INFORMATION.

3 SECTION NEAR TERMINAL (LOOKING WEST)

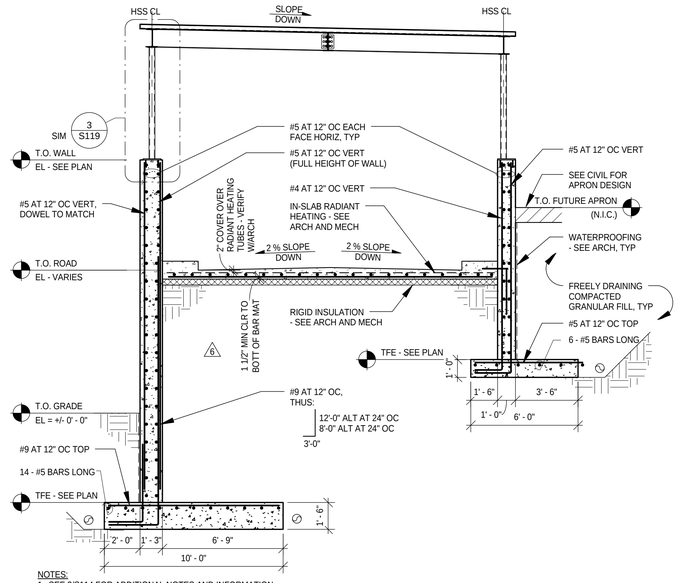
1/4" = 1'-0"



NOTES:
1. SEE 3/S114 FOR ADDITIONAL NOTES AND INFORMATION.

4 SECTION HALFWAY DOWN TUG ROAD (LOOKING WEST)

1/4" = 1'-0"



NOTES:
1. SEE 3/S114 FOR ADDITIONAL NOTES AND INFORMATION.

5 SECTION (LOOKING WEST)

1/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
6	BP2A ADDENDUM 2	02.25.11
	BP 2A CONFORMANCE	05.02.11
	RFP 120	07.22.11
	BID PACKAGE 2C	02.10.12

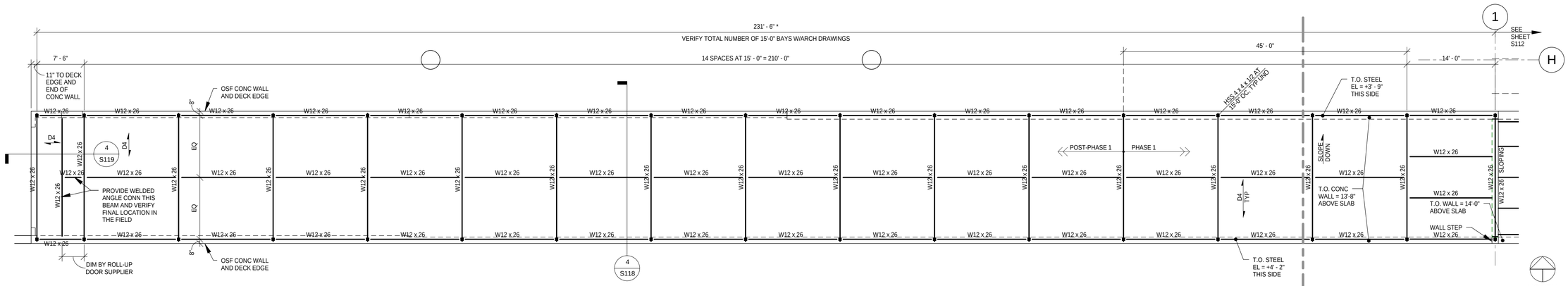
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
TUG ROAD FOUNDATION PLAN

SHEET NUMBER
S118

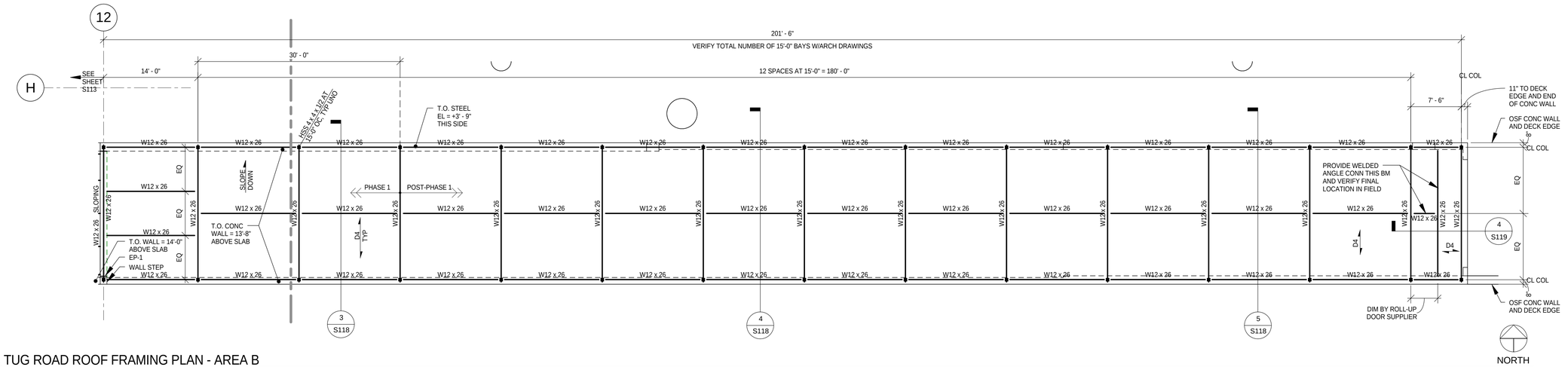
BID PACKAGE 2C



1 TUG ROAD ROOF FRAMING PLAN - AREA A

1/8" = 1'-0"

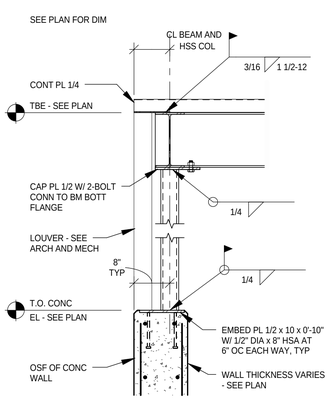
NOTES:
1. REFER TO S113 FOR TYPICAL PLAN NOTES.



2 TUG ROAD ROOF FRAMING PLAN - AREA B

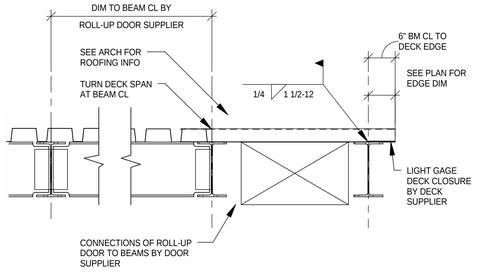
1/8" = 1'-0"

NOTES:
1. REFER TO S113 FOR TYPICAL PLAN NOTES.



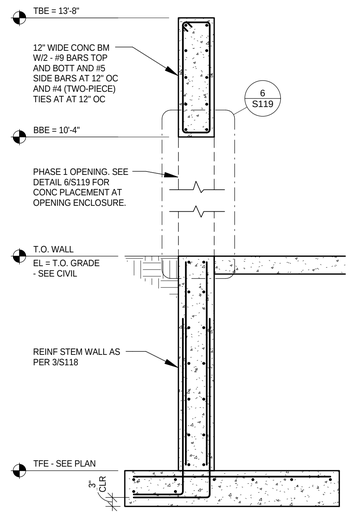
3 SECTION

3/4" = 1'-0"



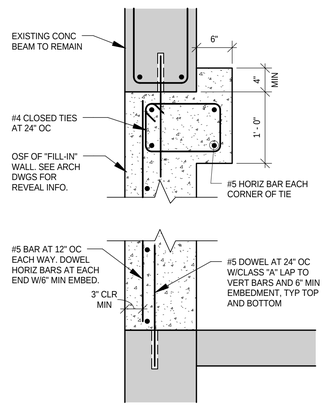
4 SECTION

3/4" = 1'-0"



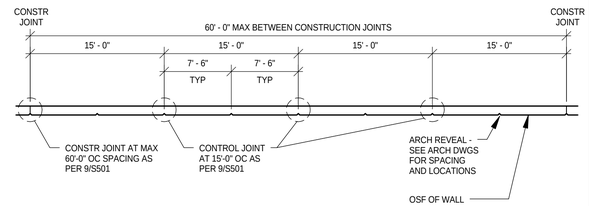
5 SECTION AT PHASE 1 TUNNEL OPENING

1/2" = 1'-0"



6 SECTION AT PHASE 1 OPENING CLOSURE

1" = 1'-0"



NOTE:
1. VERIFY ACTUAL REVEAL SPACING WITH ARCHITECTURAL DRAWINGS.

7 PLAN DETAIL

1/8" = 1'-0"

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	RFP 120	07.22.11
	BID PACKAGE 2C	02.10.12

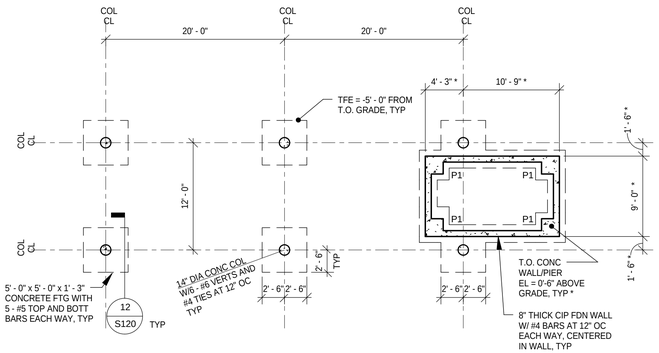
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
TUG ROAD ROOF FRAMING PLAN

SHEET NUMBER
S119

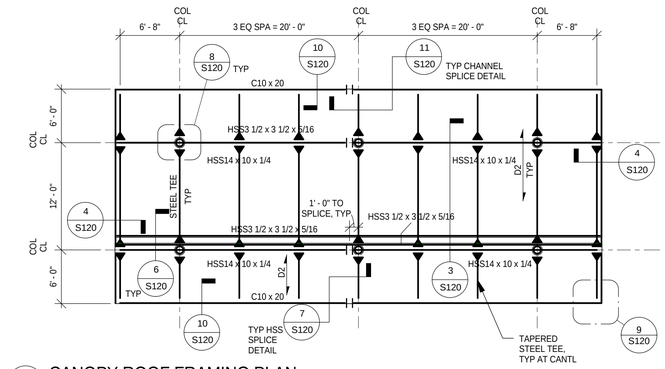
BID PACKAGE 2C



1 FOUNDATION PLAN

1/8" = 1'-0"

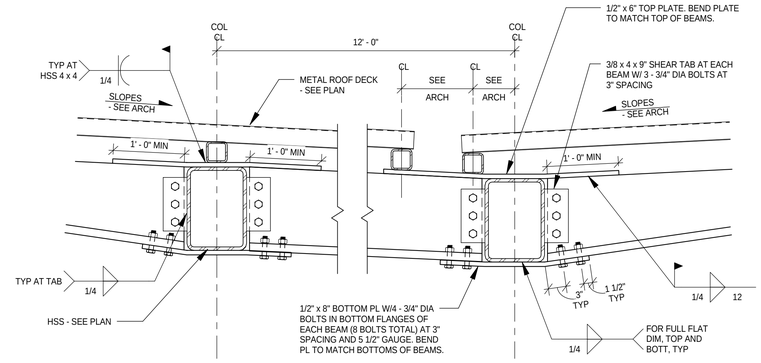
NOTES:
1. SEE SHEET S110 FOR TYPICAL FOUNDATION PLAN NOTES.
2. REFER TO ARCHITECTURAL AND CIVIL DRAWINGS FOR LOCATION OF REVENUE CONTROL BOOTHS AND CANOPY.
3. * ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
4. DESIGN OF REVENUE CONTROL BOOTH CONNECTION TO CONCRETE WALLS/PIERS BY BOOTH SUPPLIER. VERIFY PIER SIZE AND LOCATION WITH BOOTH SUPPLIER PRIOR TO FABRICATION AND INSTALLATION.
5. "P1" ON PLAN INDICATES CONCRETE PIER. SEE "CONCRETE PIER SCHEDULE AND PLAN DETAILS" SHEET S502.



2 CANOPY ROOF FRAMING PLAN

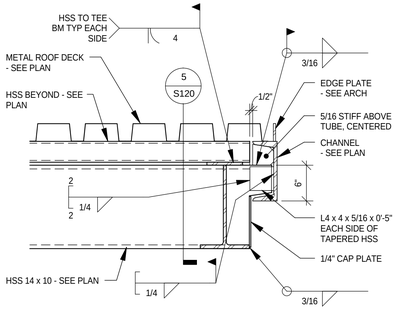
1/8" = 1'-0"

NOTES:
1. SEE DRAWING S115 FOR TYPICAL FRAMING PLAN NOTES.
2. FABRICATOR TO PROVIDE SECTION (BUILT-UP PLATE SECTION OR CUT WT OR CUT WIDE FLANGE) WITH THE FOLLOWING MINIMUM DIMENSIONAL PROPERTIES:
   - d MAX = 14"
   - d MIN = 6"
   - bf = 8.22"
   - tf = 0.522"
   - tw = 0.375"
   - Fy = 50 KSI
3. REFER TO ARCHITECTURAL DRAWINGS FOR TOP OF STEEL RELATIONSHIPS.
4. "DZ" ON PLAN INDICATES STEEL ROOF DECKING. SEE "FLOOR AND ROOF DECK SCHEDULE" SHEET S701.



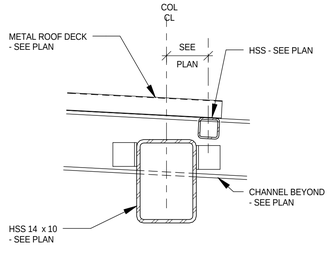
3 SECTION

1" = 1'-0"



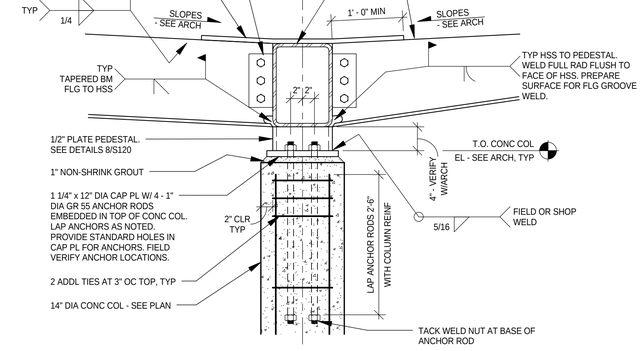
4 SECTION AT END HSS

1" = 1'-0"



5 SECTION

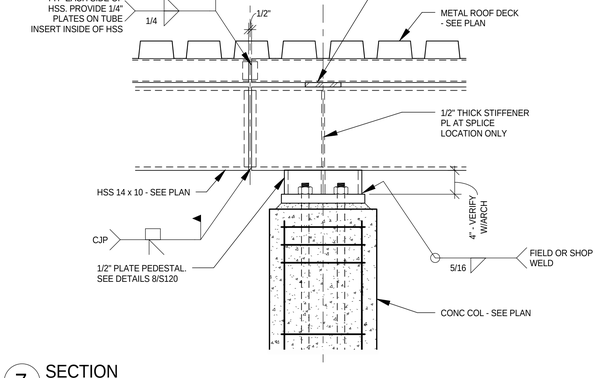
1" = 1'-0"



6 SECTION

1" = 1'-0"

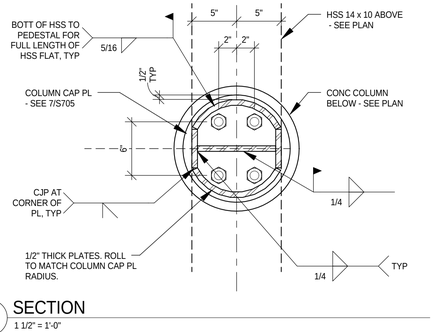
NOTES:
1. DECK AND HSS MEMBERS NOT SHOWN FOR CLARITY. SEE PLAN AND 3/S120 FOR INFORMATION NOT SHOWN.
2. AS ALTERNATE, 4" THICK PLATE MAY BE PROVIDED TO MATCH PROFILE OF 1/2" PLATE PEDESTAL.



7 SECTION

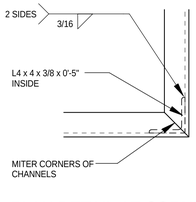
1" = 1'-0"

NOTES:
1. SEE DETAILS 6/S120 FOR INFORMATION NOT SHOWN.



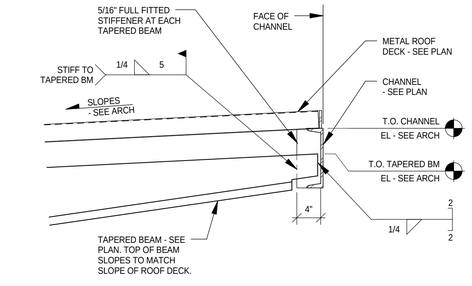
8 SECTION

1 1/2" = 1'-0"



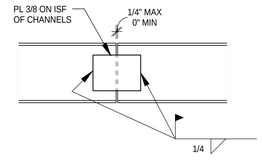
9 PLAN DETAIL AT CORNER

1 1/2" = 1'-0"



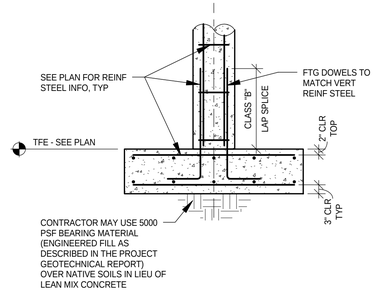
10 SECTION

1" = 1'-0"



11 DETAIL

1" = 1'-0"



12 SECTION

1/2" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2C	02.10.12

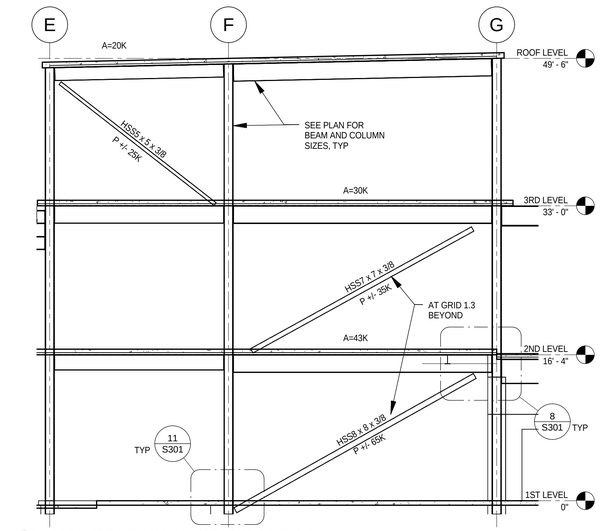
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

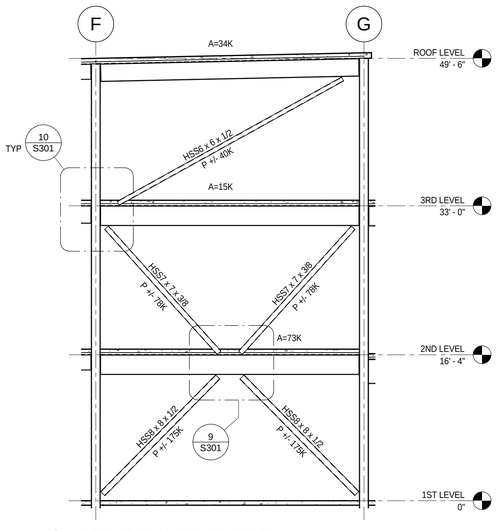
SHEET TITLE
REVENUE CONTROL BOOTH PLANS & DETAILS

SHEET NUMBER
S120

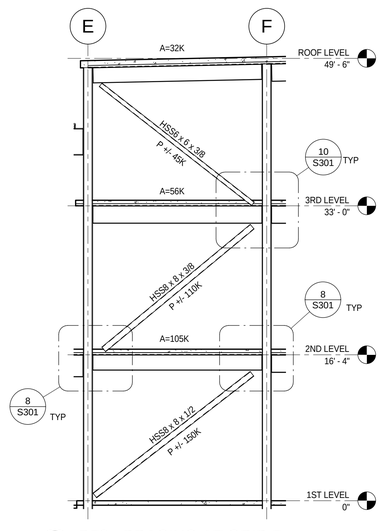
BID PACKAGE 2C



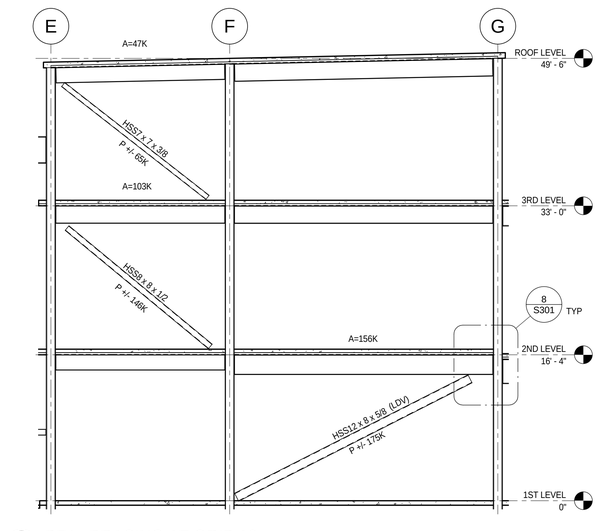
1 BF1 - BRACING AT GRID 2 AND 1.3
1/8" = 1'-0"



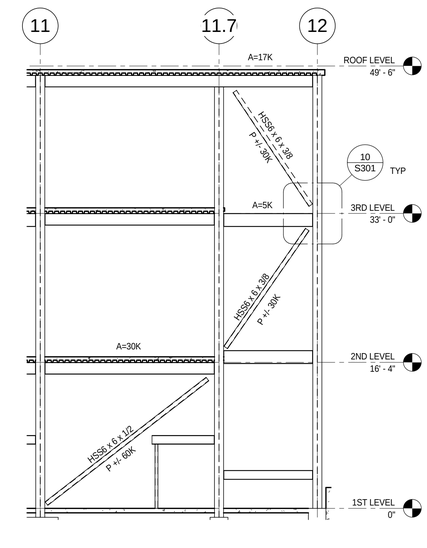
2 BF2 - BRACING AT GRID 4
1/8" = 1'-0"



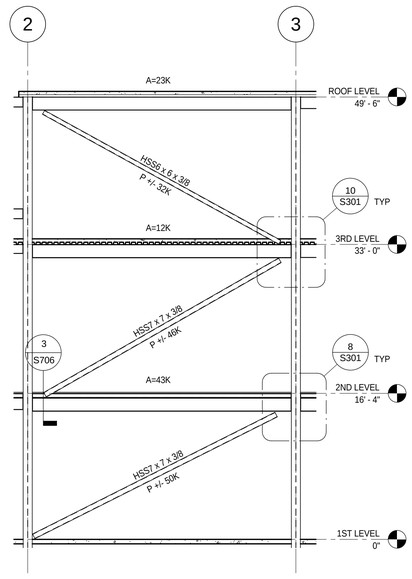
3 BF3 - BRACING AT GRID 7
1/8" = 1'-0"



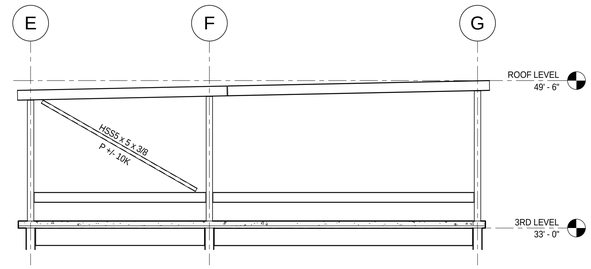
4 BF4 - BRACING AT GRID 10
1/8" = 1'-0"



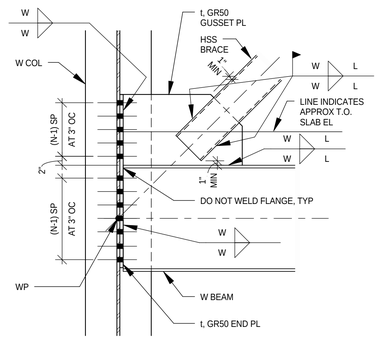
5 BF5 - BRACING AT GRID E
1/8" = 1'-0"



6 BF6 - BRACING AT GRID G
1/8" = 1'-0"

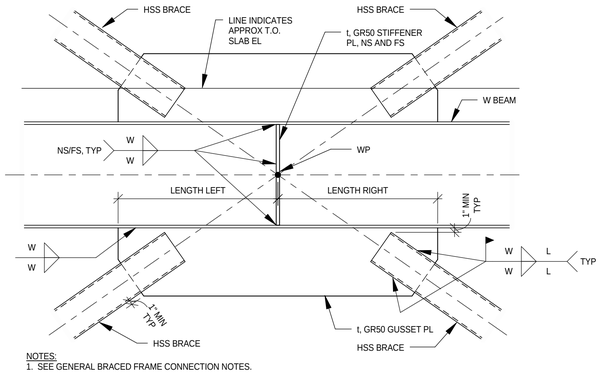


7 BF7 - BRACING AT GRID 1
1/8" = 1'-0"



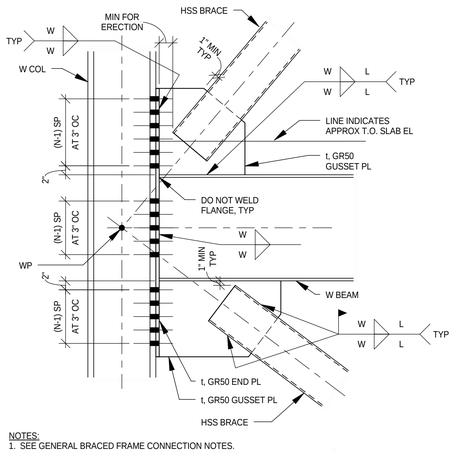
NOTES:
1. SEE GENERAL BRACED FRAME CONNECTION NOTES.

8 DETAIL
NO SCALE



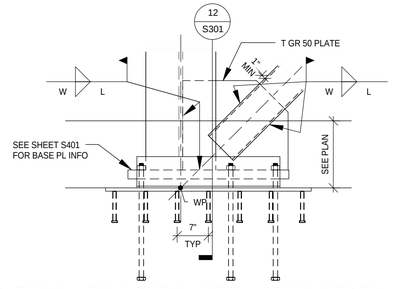
NOTES:
1. SEE GENERAL BRACED FRAME CONNECTION NOTES.

9 DETAIL
NO SCALE

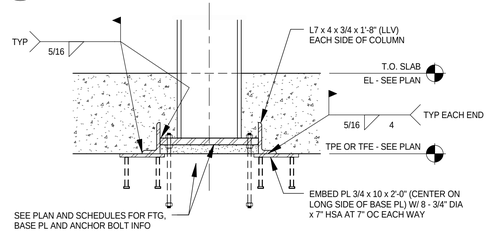


NOTES:
1. SEE GENERAL BRACED FRAME CONNECTION NOTES.

10 DETAIL
NO SCALE



11 TYPICAL FOUNDATION DETAIL AT BRACED FRAMES
NO SCALE



12 SECTION
NO SCALE

GENERAL BRACED FRAME CONNECTION NOTES:

1. ALL PLATE MATERIAL USED IN CONNECTIONS: ASTM A572-50.
2. ALL ANGLE MATERIAL USED IN CONNECTIONS: ASTM A-36.
3. ALL BOLTS 3/4" DIAMETER A325N OR 1" A490N BOLTS, UNLESS NOTED OTHERWISE. ALL BOLTS IN BRACED FRAMES CONNECTIONS SHALL BE FULLY TENSIONED.
4. ALL BOLTS ARE IN STANDARD HOLES, UNLESS NOTED OTHERWISE. FABRICATOR MAY OPT TO PROVIDE SHORT SLOTTED HOLES NORMAL TO LOAD DIRECTION IN GIRDER/BRACE END PLATES.
5. 1 1/2" MINIMUM EDGE DISTANCE.
6. 6" MAXIMUM EDGE DISTANCE.
7. 2" MINIMUM PITCH.
8. E70XX WELDING ELECTRODES.
9. CONNECTIONS SHOWN ARE CONCEPTUAL DETAILS ONLY. WELD LENGTHS, NUMBER OF BOLTS AND PLATE SIZES WILL VARY AS REQUIRED FOR DESIGN FORCES INDICATED.
10. PROVIDE A SLOTTED ERECTION AID FOR BRACE MEMBERS.
11. DO NOT WELD BRACE TO UPPER GUSSET UNTIL AFTER COMPOSITE CONCRETE FLOORS HAVE BEEN POURED.
12. "P" INDICATES MEMBER AXIAL FORCE. "A" INDICATES AXIAL FORCE TO BE TRANSFERRED THROUGH THE CONNECTION.
13. "t" INDICATES PLATE THICKNESS TO BE DETERMINED BY FABRICATOR BASED ON THE DESIGN FORCES INDICATED.

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

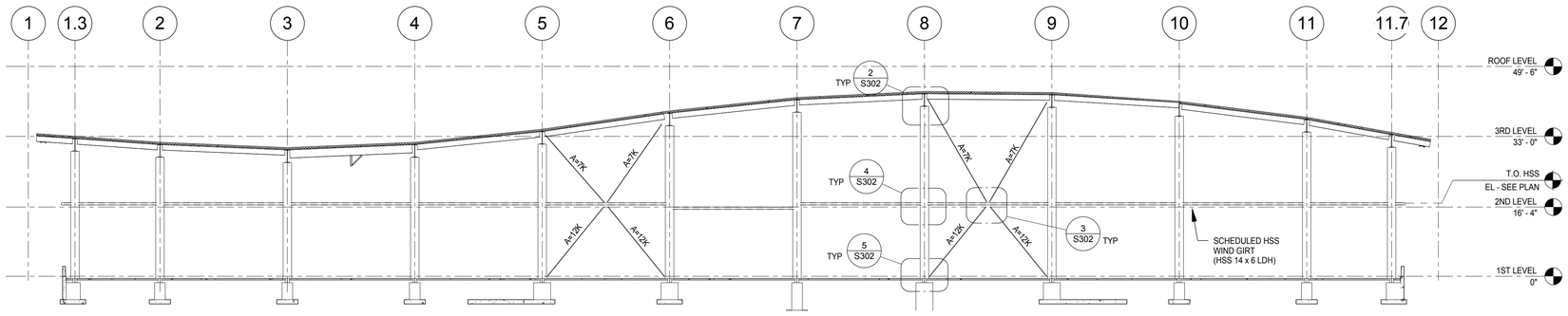
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
BRACING ELEVATIONS AND DETAILS

SHEET NUMBER
S301

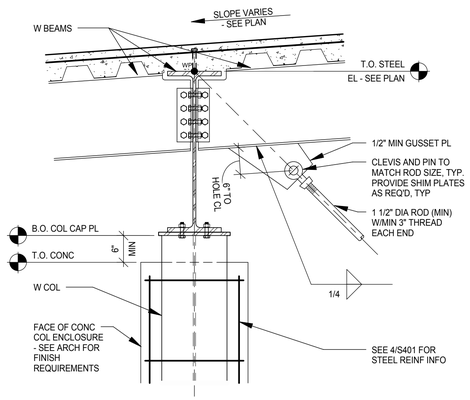
BID PACKAGE 2C



1 ELEVATION AT GRID "C"

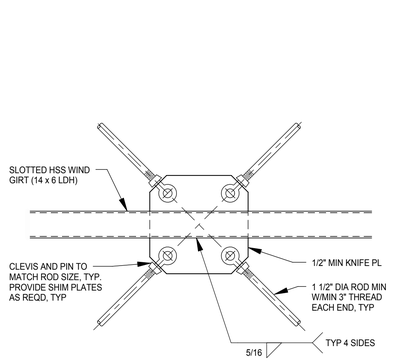
1/16" = 1'-0"

NOTES:
1. SEE GENERAL BRACED FRAME CONNECTION NOTES ON SHEET S301, TYPICAL THIS SHEET.



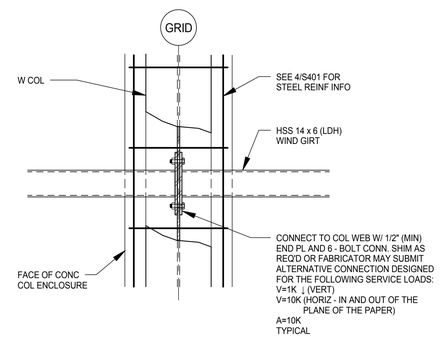
2 SECTION AT COLUMN HEAD

3/4" = 1'-0"



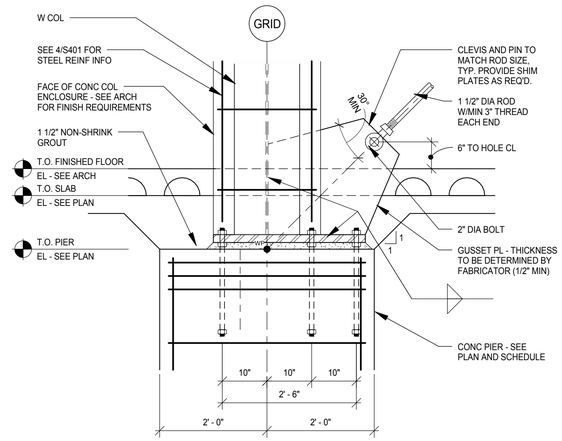
3 SECTION AT BRACING INTERSECTION

3/4" = 1'-0"



4 SECTION AT COLUMN TO GIRT CONNECTION

3/4" = 1'-0"



5 SECTION AT COLUMN BASE

3/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

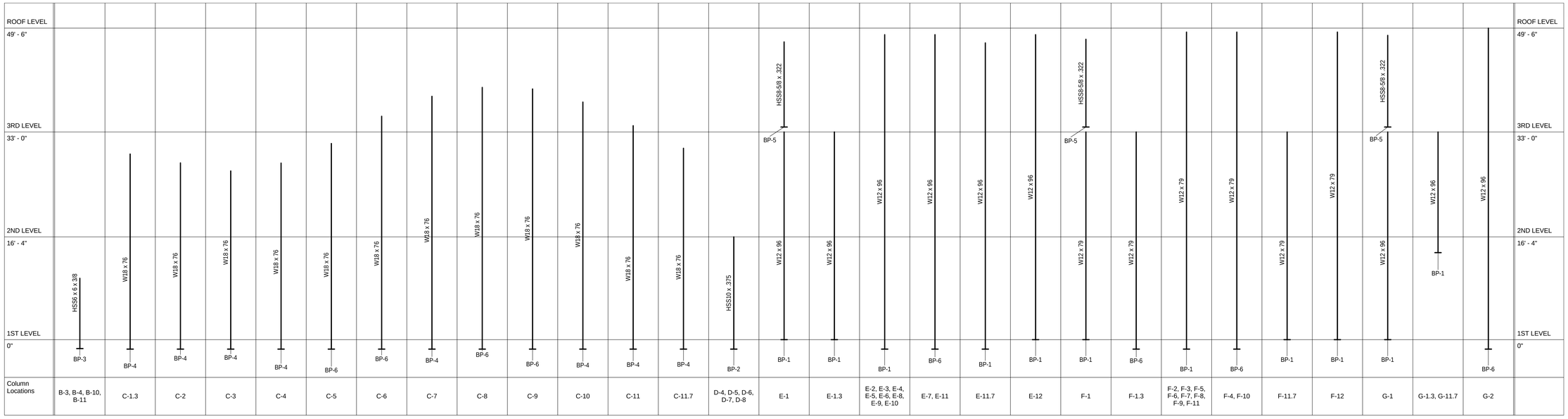
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

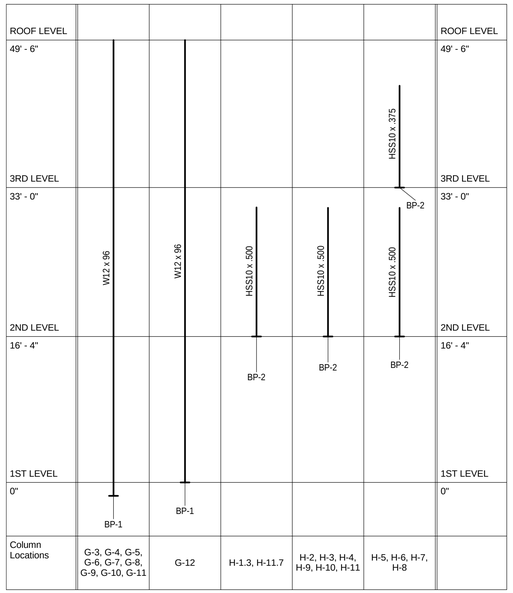
AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
BRACING ELEVATIONS AND DETAILS

SHEET NUMBER
S302

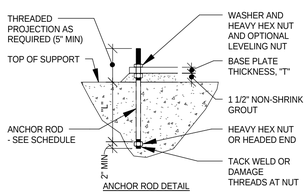
BID PACKAGE 2C



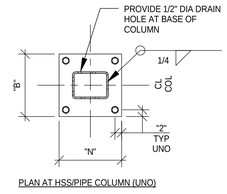


NOTES:
1. FOR BASE PLATE AND ANCHOR BOLT INFORMATION, SEE COLUMN BASE PLATE SCHEDULE THIS SHEET.
2. AT HSS ROUND COLUMNS, FABRICATOR MAY OPT TO SUBMIT EQUIVALENT PIPE SECTION TO A/E FOR REVIEW IN LIEU OF HSS ROUND COLUMN SHOWN.

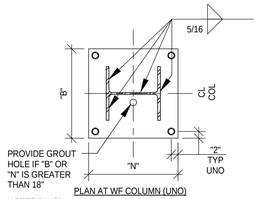
1 STEEL COLUMN SCHEDULE
NO SCALE



ANCHOR ROD DETAIL



PLAN AT HSS/PIPE COLUMN (UNO)

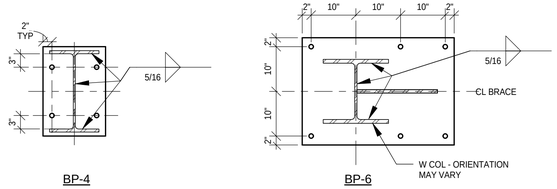


PLAN AT WF COLUMN (UNO)

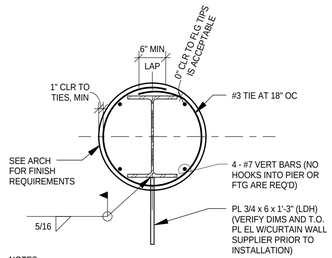
COLUMN BASE PLATE AND ANCHOR ROD SCHEDULE							
	BASE PLATE SIZE (IN)			ANCHOR RODS			
MARK	"N"	"B"	"T"	NO.	DIA (IN)	EMBED "L"	COMMENTS:
BP-1	20	20	1 3/4"	4	3/4"	0'-11"	AT GRID E-10, ANCHOR ROD EMBED LENGTH "L" = 2'-0"
BP-2	16	16	1"	4	3/4"	0'-11"	
BP-3	12	12	3/4"	4	3/4"	0'-11"	
BP-4	20	14	1 1/2"	4	3/4"	0'-11"	SEE 3/S401
BP-5	12	12	3/4"	4	1/2"	0'-3 1/2"	EXP ANCHORS
BP-6	24	34	1 3/4"	6	1"	1'-6"	SEE 3/S401
BP-7	12	18	1 1/2"	4	3/4"	0'-11"	

NOTES (UNO):
1. SEE SCHEDULE FOR BASE PLATE AND ANCHOR ROD DIMENSIONS.
2. DIMENSION "N" IS PARALLEL TO WF WEB OR LONGER HSS DIMENSION.
3. ANCHOR RODS SHALL BE ASTM F1554, GRADE 36.
4. BASE PLATES SHALL BE ASTM A36, MINIMUM.
5. MILL COLUMN BASE AND/OR BASE PLATE AS NECESSARY FOR FULL CONTACT.
6. ANCHOR RODS SHALL SET BY TEMPLATE AND NOT BE SET INTO CONCRETE AFTER CONCRETE IS CAST.
7. SEE SHEETS S301 AND S302 FOR ADDITIONAL INFORMATION AT BRACED FRAME BASE PLATES.
8. FOR ALL UNDESIGNATED BASE PLATES, MINIMUM "N" = MEMBER SIZE + 4". MINIMUM "B" = MEMBER WIDTH + 1". MINIMUM "T" = 1/2". MINIMUM 4 - 3/4" DIAMETER ANCHOR RODS.

2 COLUMN BASE PLATE AND ANCHOR ROD SCHEDULE
NO SCALE



3 BASE PLATE DETAILS
NO SCALE



NOTES:
1. SEE PLAN FOR LOCATIONS.

4 CONCRETE ENCASED WIDE FLANGE COLUMN
NO SCALE

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

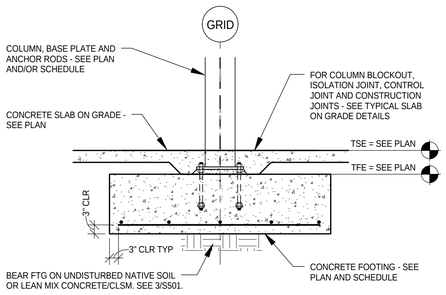
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

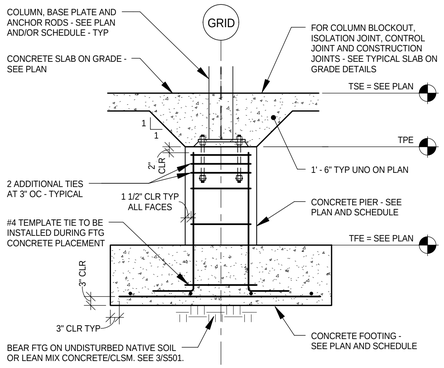
SHEET TITLE
COLUMN SCHEDULE AND DETAILS

SHEET NUMBER
S401

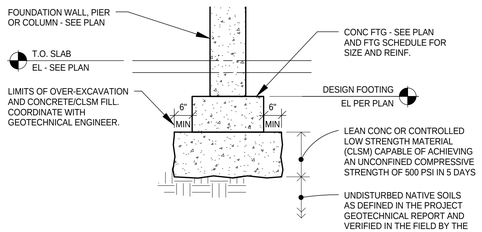
BID PACKAGE 2C



1 TYPICAL INTERIOR WF COLUMN FOOTING DETAIL
NO SCALE

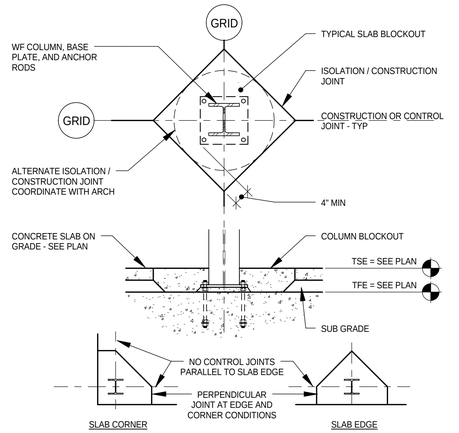


2 TYPICAL WF COLUMN, CONCRETE PIER AND FOOTING DETAIL
NO SCALE



NOTES:
1. THIS DETAIL APPLIES ONLY AT LOCATIONS WHERE THE GEOTECHNICAL ENGINEER HAS DETERMINED THAT SOILS AT THE DESIGN FOOTING ELEVATIONS ARE NOT ADEQUATE FOR FOOTING SUPPORT ACCORDING TO THE ALLOWABLE SOIL BEARING CAPACITY LISTED UNDER "DESIGN UNIT STRESS" ON SHEET S002.
2. IN LIEU OF OVER-EXCAVATING AND PLACING LEAN CONCRETE OR CLSM AS OUTLINED IN THIS DETAIL, CONTRACTOR MAY LOWER THE DESIGN FOOTING ELEVATION SUCH THAT THE FOOTING RESTS DIRECTLY ON UNDISTURBED NATIVE SOILS AS APPROVED BY THE GEOTECHNICAL ENGINEER IN THE FIELD.
3. SEE GEOTECHNICAL REPORT FOR WATER TABLE ELEVATIONS. CONTRACTOR TO MAKE ADEQUATE PROVISIONS FOR DEWATERING AS REQUIRED.

3 OVER-EXCAVATION WITH LEAN CONCRETE/CLSM FILL DETAIL
NO SCALE



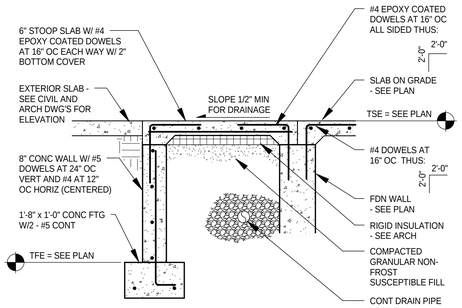
NOTE:
1. CONTRACTOR MAY PROPOSE ALTERNATE ISOLATION JOINT DETAIL TO A/E PRIOR TO CONSTRUCTION.

4 TYPICAL COLUMN ISOLATION JOINT
NO SCALE

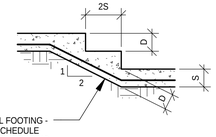
TENSION LAP SPLICE / CONCRETE / GR 60 UNCOATED REINFORCING				
STRUCTURAL ELEMENTS	FOOTINGS / SLAB-ON-GRADE / CONCRETE FILL ON METAL DECK			
CONCRETE	F'c = 4,000 PSI (NORMAL WEIGHT)			
BAR SIZE	CLASS "A" LAP		CLASS "B" LAP	
	BASIC	TOP BAR	BASIC	TOP BAR
#3	12"	14"	14"	18"
#4	15"	19"	19"	25"
#5	18"	23"	23"	30"
#6	22"	28"	28"	36"
#7	32"	42"	42"	55"
#8	42"	55"	55"	71"
#9	53"	69"	69"	90"
#10	68"	88"	88"	114"
#11	83"	108"	108"	140"

NOTES:
1. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE PLACED BELOW THEM.
2. USE CLASS "B" LAP LENGTHS - TYPICAL UNLESS NOTED OTHERWISE ON DRAWINGS.

5 BAR LAP SCHEDULE
NO SCALE

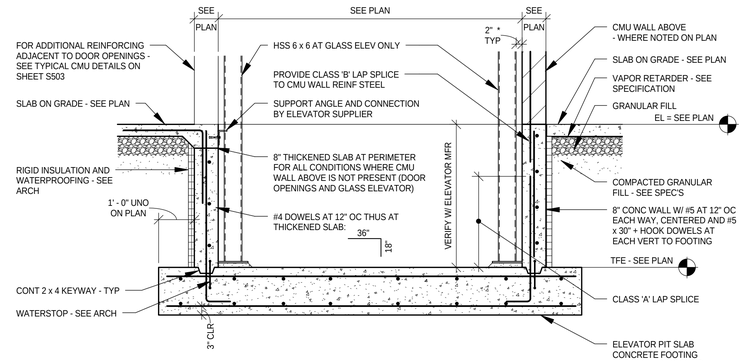


6 TYPICAL STOOP DETAIL
NO SCALE

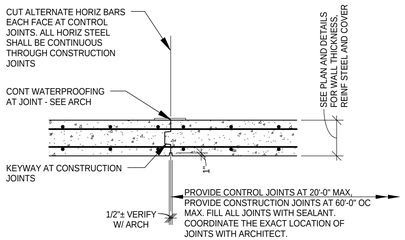


NOTE:
MAX FOOTING STEP EQUALS 24"

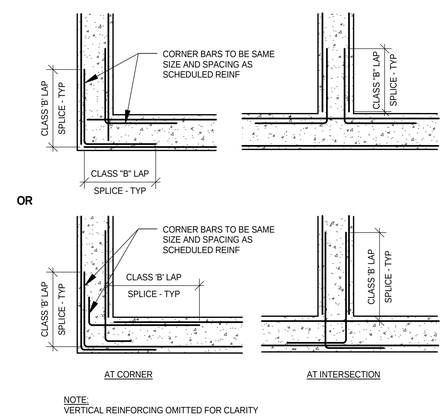
7 TYPICAL FOOTING STEP
NO SCALE



8 SECTION THRU ELEVATOR PIT
NO SCALE

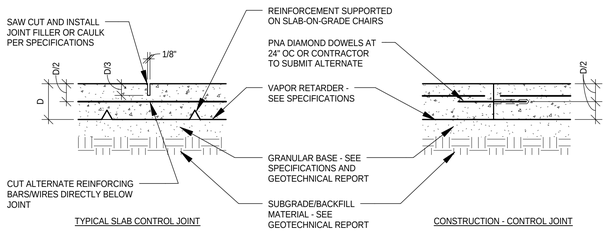


9 TYPICAL CONSTRUCTION/CONTROL JOINTS FOR CONCRETE WALLS
1/2" = 1'-0"



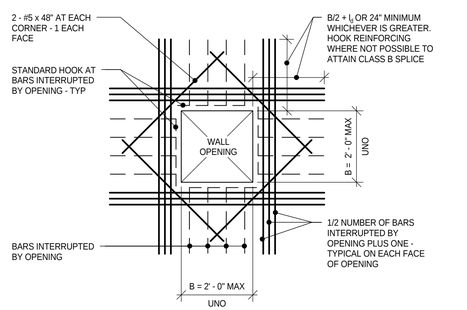
NOTE:
VERTICAL REINFORCING OMITTED FOR CLARITY

10 TYPICAL CONCRETE CORNER BAR PLACING DETAIL
NO SCALE



NOTES:
1. A CONSTRUCTION JOINT WHICH IS NOT INTENDED TO ALSO SERVE AS A CONTROL JOINT IS TO HAVE ALL REINFORCING EXTEND THROUGH IT AND TO HAVE NO GROOVE/SAW-CUT, UNLESS NOTED OTHERWISE.
2. IGNORE REINFORCING NOTES AT UNREINFORCED OR FIBER REINFORCED SLABS-ON-GRADE.
3. FOR EXTERIOR SLAB ON GRADE EXPOSED TO FREEZE-THAW CYCLES, CONSTRUCT A SLAB EXPANSION-CONTRACTION JOINT THE SAME EXCEPT ADD 3/8" COMPRESSIBLE MATERIAL THROUGH JOINT.

11 TYPICAL SLAB ON GRADE CONSTRUCTION DETAIL
1/2" = 1'-0"



NOTES:
1. FOR WALL OPENINGS LARGER THAN 2'-0" (FOR WALLS NOT SUBJECT TO LATERAL EARTHPRESSURE) ADD 2 - #5 EACH FACE ALL 4 SIDES OF OPENING. EXTEND BAR 24" PAST OPENING UNLESS NOTED OTHERWISE.

12 TYPICAL ADDITIONAL BAR PLACING DETAIL FOR WALL OPENING
1/2" = 1'-0"

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

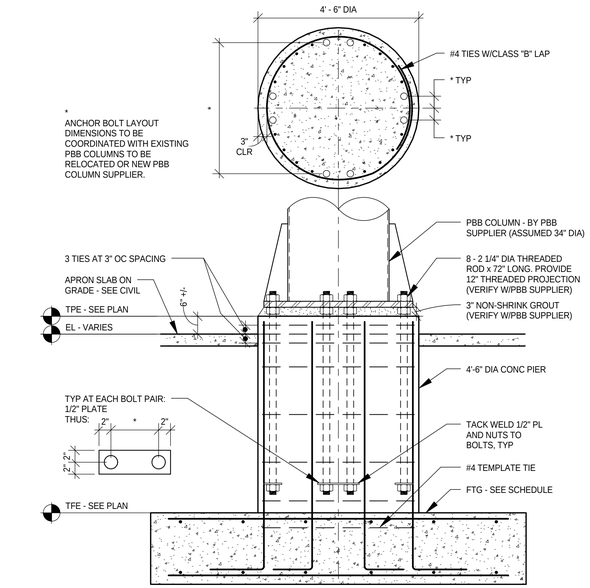
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

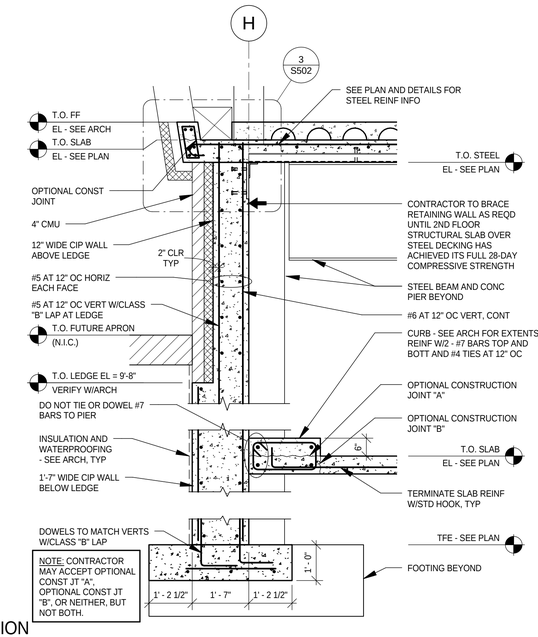
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S501

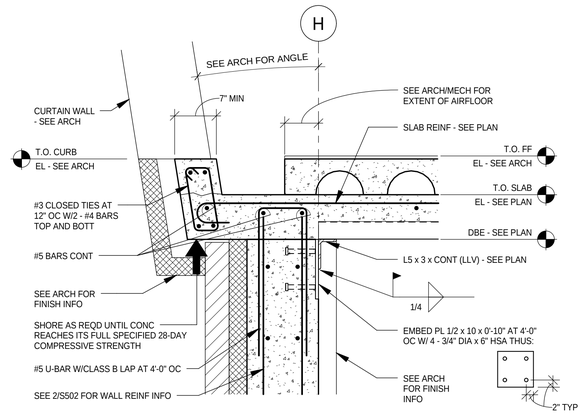
BID PACKAGE 2C



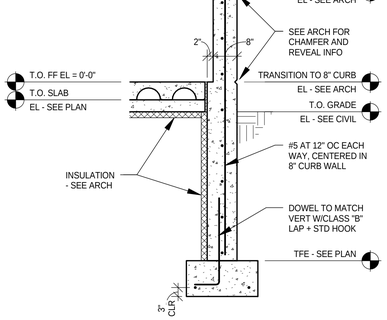
1 SECTION AT PASSENGER BOARDING BRIDGE - SPREAD FOOTING
1/2" = 1'-0"



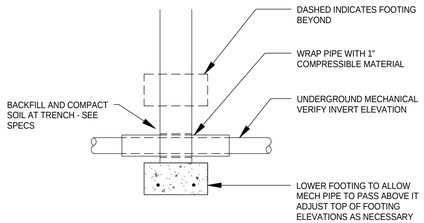
2 SECTION
1/2" = 1'-0"



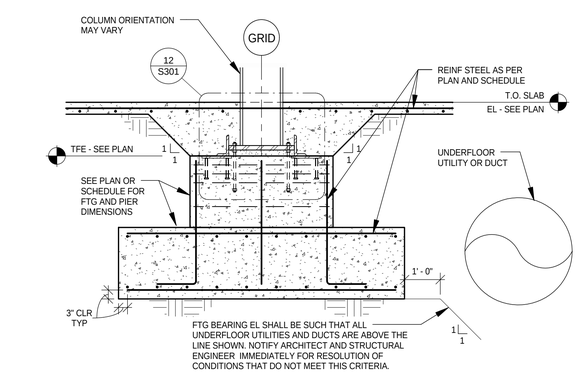
3 SECTION BETWEEN COLUMNS
1" = 1'-0"



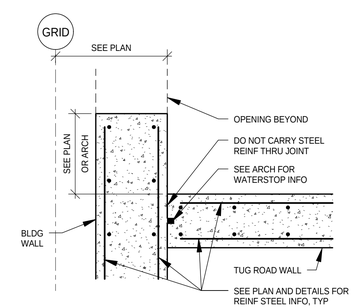
4 SECTION
1/2" = 1'-0"



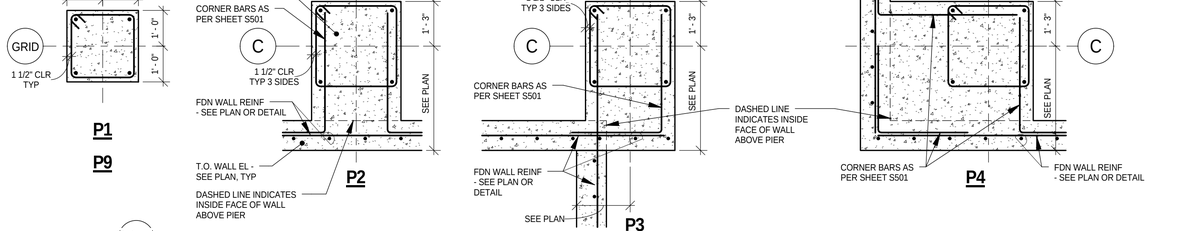
5 TYPICAL FOUNDATION WALL PIPE SLEEVE DETAIL
NO SCALE



7 SECTION AT FOOTING
1/2" = 1'-0"



8 WALL DETAIL - TUG ROAD ONLY
3/4" = 1'-0"



CONCRETE PIER SCHEDULE			
MARK	SIZE	VERTICAL REINFORCEMENT	TIES (SEE PLAN DETAILS)
P1	24" x 24"	4 - #8 BARS	#4 AT 12" OC
P1A	24" x 24"	4 - #8 BARS	#4 AT 12" OC
P2	30" x 30"	4 - #10 BARS	#4 AT 12" OC
P3	30" x 30"	4 - #10 BARS	#4 AT 12" OC
P4	30" x 30"	4 - #10 BARS	#4 AT 12" OC
P5	24" x 24"	4 - #8 BARS	#4 AT 12" OC
P6	48" x 48"	8 - #11 BARS	#4 AT 12" OC
P7	48" x 30"	6 - #11 BARS	#4 AT 12" OC
P8	24" x 24"	6 - #11 BARS	#4 AT 12" OC
P9	24" x 24"	4 - #11 BARS	#4 AT 12" OC

NOTES:
1. PROVIDE 3 - #4 TIES AT 3" ON CENTER TOP, TYPICAL.
2. RUN HORIZONTAL AND VERTICAL WALL STEEL CONTINUOUS THROUGH PIERS AT INTERSECTIONS.

6 CONCRETE PIER SCHEDULE AND PLAN DETAILS
NO SCALE

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S502

BID PACKAGE 2C

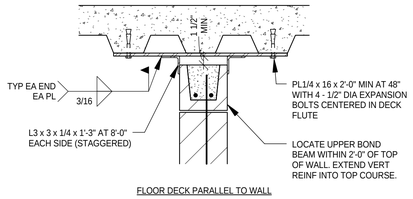
CMU WALL REINFORCING SCHEDULE					
		CENTERED IN WALL			
MARK	WALL TYPE	FOOTING DOWELS	HORIZONTAL	VERTICAL	COMMENTS
W1	8" CMU	#5 AT 24" OC	AS NOTED ON DETAILS	#5 AT 24" OC	CMU BOND BEAM LINTELS OVER ELEVATOR DOOR OPENINGS TO EXTEND AROUND ALL 4 SIDES OF ELEVATOR CORES TO PROVIDE ATTACHMENT POINT FOR ELEVATOR GUIDE RAIL SUPPORTS

UNLESS NOTED OTHERWISE:
1. PROVIDE CLASS "A" SPLICE TO DOWELS TYPICAL.
2. FOR ALL CMU WALLS NOT INDICATED ON STRUCTURAL PLANS, SEE "NON-LOAD BEARING MASONRY PARTITION WALL REINFORCING SCHEDULE".
3. SEE LINTEL SCHEDULE THIS SHEET FOR LINTELS OVER MASONRY WALL OPENINGS.

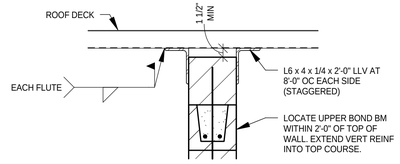
1 WALL REINFORCING SCHEDULE
NO SCALE

NON-LOAD BEARING MASONRY PARTITION WALL REINFORCING SCHEDULE		
WALL TYPE	VERTICAL REINFORCING	HORIZONTAL REINFORCING
6" CMU UP TO 13'-0"	#4 AT 4'-0" OC, CENTERED	BOND BM AT 5'-4" OC W/1 - #5 CONT, CENTERED
8" CMU UP TO 13'-0"	#5 AT 5'-4" OC, CENTERED	BOND BM AT TOP OF WALL AND ABOVE ALL OPNGS, EACH W/2 - #5 CONT
8" CMU CANTL TO 5'-4" MAX	#5 AT 2'-8" OC, CENTERED	BOND BM AT TOP OF WALL W/2 - #5 CONT

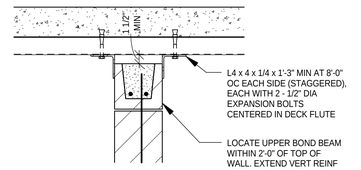
NOTES:
1. REFER TO TYPICAL DETAILS FOR DOWELS AT BOTTOM OF CMU WALLS AND BRACING AT TOP OF CMU WALLS. TOP OF WALL BRACING TO BE PLACED AT 10'-0" OC MAX SPACING WHERE DISTANCE BETWEEN WALL CORNERS EXCEEDS 12'-0". CONTRACTOR MAY USE ONE OF THE BRACING OPTIONS PROVIDED OR COORDINATE ALTERNATE BRACING WITH A/E.
2. GROUT CMU SOLID AT HANDRAIL, GUARDRAIL AND OTHER SUPPORTS. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION AND ADDITIONAL GROUTING REQUIREMENTS.
3. PROVIDE (1) ADDITIONAL VERTICAL BAR MATCHING SCHEDULED REINFORCING IN FULLY GROUTED CELL AT CORNERS AND WITHIN 8" OF ALL OPENINGS.
4. REFER TO 3/S503 FOR MASONRY LINTEL SCHEDULE.



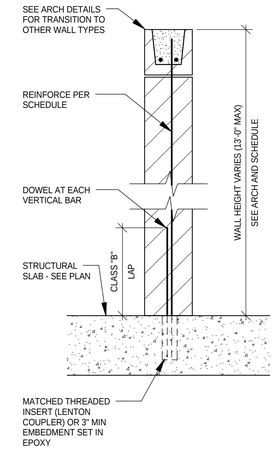
FLOOR DECK PARALLEL TO WALL



ROOF DECK PERPENDICULAR TO WALL



FLOOR DECK PERPENDICULAR TO WALL



CMU LINTEL SCHEDULE			
WALL TYPE	ROUGH OPENING	REQUIRED LINTEL	BEARING LENGTH EACH END
6" CMU	UP TO 3'-4"	8" DEEP BOND BM W/1 - #5 CONT BOTT	8"
6" CMU	3'-4" TO 8'-0"	16" DEEP BOND BM W/1 - #5 CONT TOP AND BOTT	16"
8" CMU	UP TO 5'-4"	8" DEEP BOND BM W/2 - #5 CONT BOTT	8"
8" CMU	5'-4" TO 10'-0"	16" DEEP BOND BM W/2 - #5 CONT TOP AND BOTT AND #4 SINGLE LEG HOOKED STIRRUP AT 8" OC	16"

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR ALL ROUGH OPENING SIZES AND ELEVATIONS.
2. USE LINTEL BLOCKS FOR ALL CMU LINTELS.
3. PROVIDE 8" DEEP BOND BM W/2 - #5 CONT BOTTOM AT ALL SILLS.
4. ALL LINTEL REINFORCING TO EXTEND 1'-4" MINIMUM BEYOND EDGES OF ROUGH OPENING.

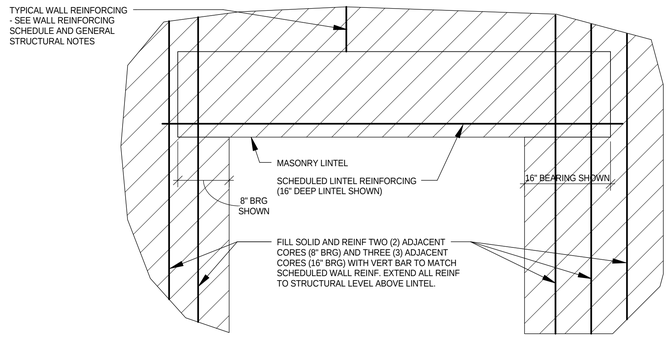
MASONRY LAP SPLICE SCHEDULE	
BAR SIZE	8" CMU (1 BAR IN CENTER)
	f'c = 2,000 PSI
#4	24"
#5	30"
#6	36"

NOTES:
1. ALL BARS TO BE IN FULLY GROUTED CELLS OR BOND BEAMS
2. Fy = 60 KSI (Fs = 24 KSI MAX)
3. BAR LAP LENGTHS PER IBC 2006 SECTION 2107.5 AND ACI 530 EQ 2-9
4. SEE SHEET S501 FOR CONCRETE REINFORCING LAP SCHEDULE.

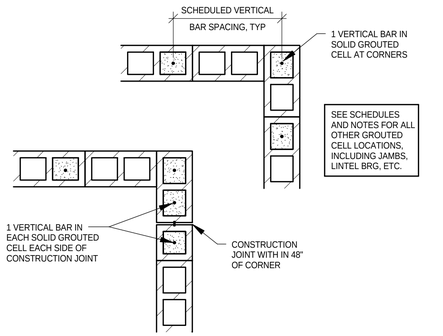
3 LINTEL SCHEDULE
NO SCALE

4 SCHEDULE
NO SCALE

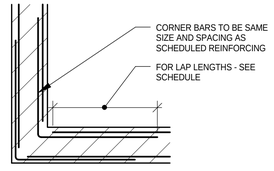
2 NON-LOAD BEARING WALL REINFORCING SCHEDULE AND TYPICAL DETAILS
NO SCALE



8 TYPICAL CMU LINTEL BEARING DETAIL
NO SCALE



5 TYPICAL VERTICAL REINFORCING AT MASONRY CORNER DETAIL
NO SCALE

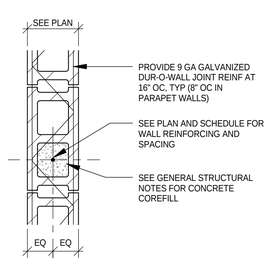


AT CORNER

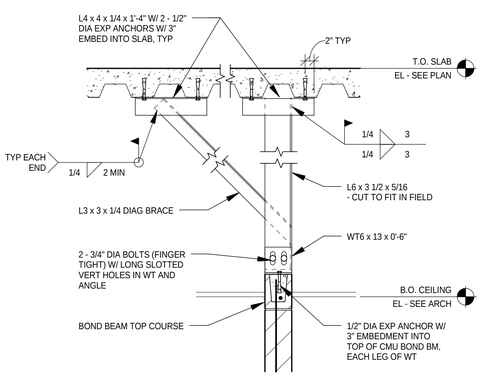
AT INTERSECTION

NOTE:
VERTICAL REINFORCING OMITTED FOR CLARITY

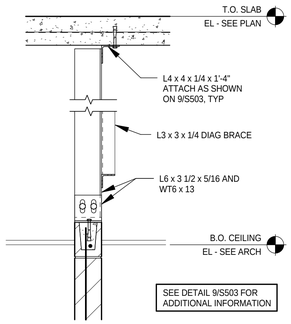
6 TYPICAL HORIZONTAL REINFORCING AT MASONRY CORNER
NO SCALE



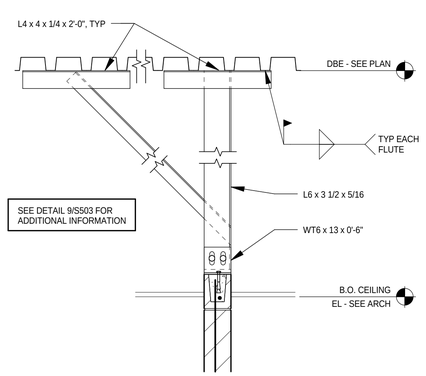
7 TYPICAL CMU WALL DETAIL
NO SCALE



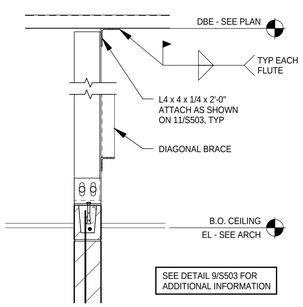
9 FLOOR DECK PARALLEL TO WALL
NO SCALE



10 FLOOR DECK PERPENDICULAR TO WALL
3/4" = 1'-0"



11 ROOF DECK PARALLEL TO WALL
3/4" = 1'-0"



12 ROOF DECK PERPENDICULAR TO WALL
3/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

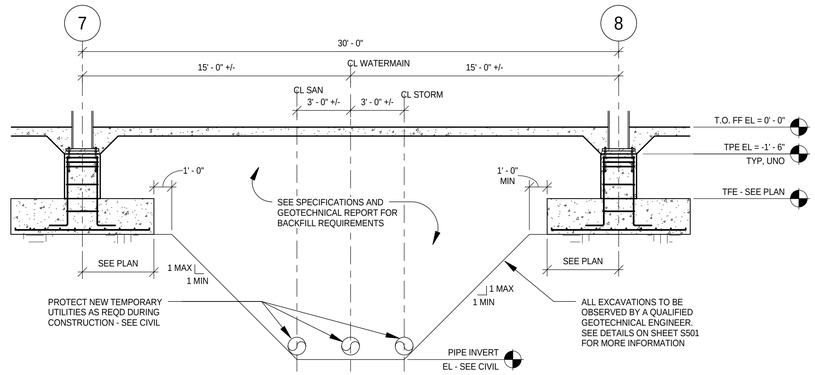
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
STRUCTURAL DETAILS

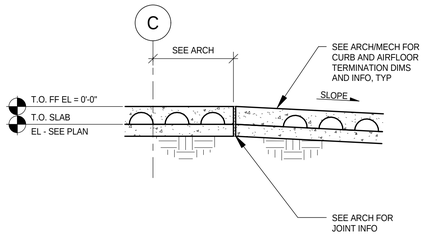
SHEET NUMBER
S503

BID PACKAGE 2C

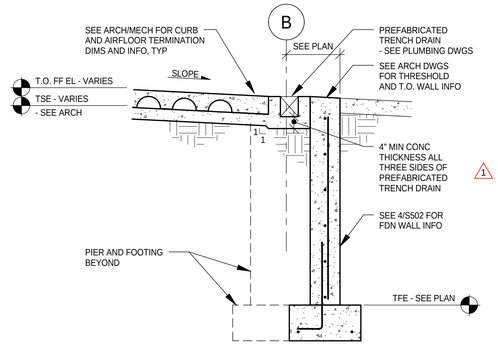


NOTES:
1. SEE GEOTECHNICAL REPORT FOR WATER TABLE ELEVATIONS. CONTRACTOR TO MAKE ADEQUATE PROVISIONS FOR DEWATERING AS REQUIRED.
2. PIPE INVERT LOCATION SHOWN SCHEMATICALLY REPRESENT LOCATIONS AT GRID E.
3. CONTRACTOR TO NOTIFY A/E IMMEDIATELY IF ACTUAL FIELD CONDITIONS VARY FROM LOCATIONS/SLOPES INDICATED.

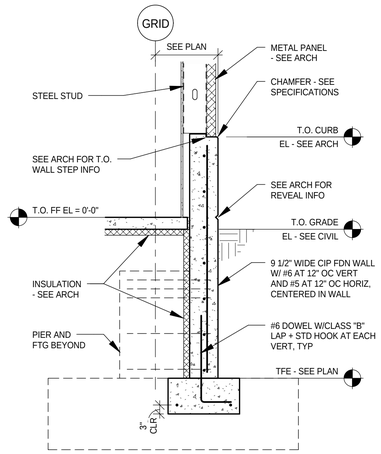
1 SECTION
1/4" = 1'-0"



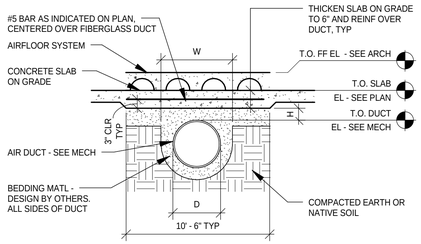
2 SECTION
1/2" = 1'-0"



3 SECTION AT VESTIBULE DOOR
1/2" = 1'-0"



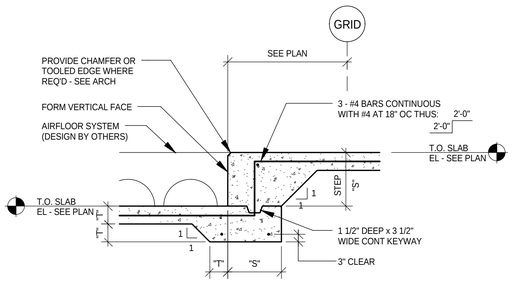
4 SECTION
1/2" = 1'-0"



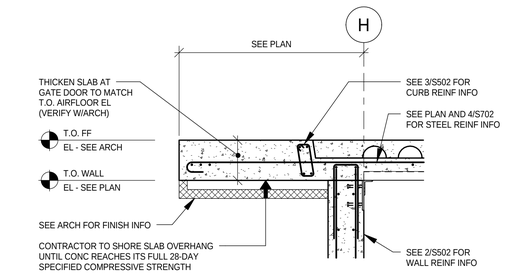
NOTE:
1. "H" AND "W" DIMENSIONS AND SPECIFICATIONS FOR BEDDING MATERIAL TO BE VERIFIED WITH UNDERGROUND DUCT SUPPLIER PRIOR TO CONSTRUCTION.

1

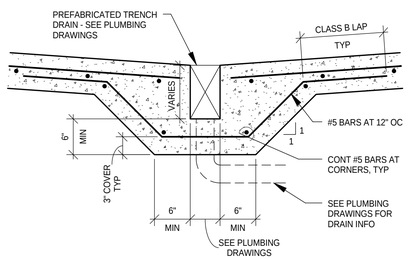
5 UNDERGROUND DUCTWORK DETAIL
1/2" = 1'-0"



6 SLAB STEP DETAIL
3/4" = 1'-0"

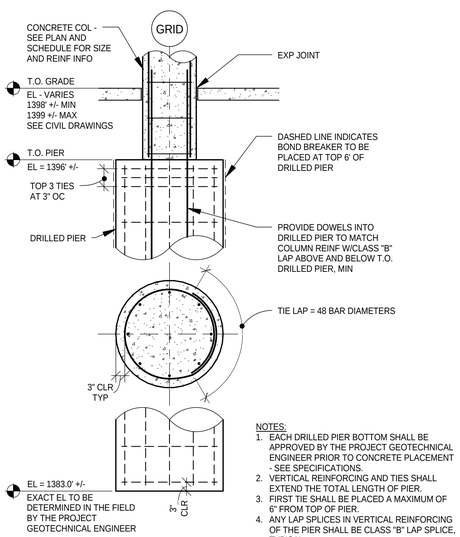


7 SECTION AT GATE DOOR SLAB
1/2" = 1'-0"



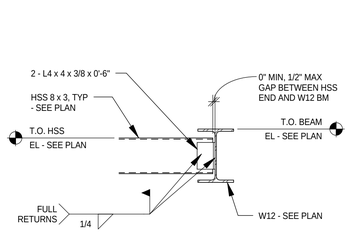
8 SECTION AT TRENCH DRAIN
1" = 1'-0"

1

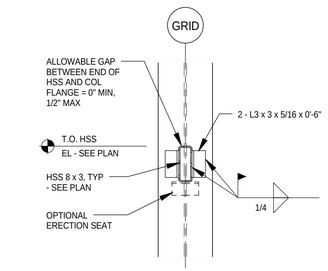


NOTES:
1. EACH DRILLED PIER BOTTOM SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO CONCRETE PLACEMENT - SEE SPECIFICATIONS.
2. VERTICAL REINFORCING AND TIES SHALL EXTEND THE TOTAL LENGTH OF PIER.
3. FIRST TIE SHALL BE PLACED A MAXIMUM OF 6" FROM TOP OF PIER.
4. ANY LAP SPLICES IN VERTICAL REINFORCING OF THE PIER SHALL BE CLASS "B" LAP SPLICE, TYPICAL.

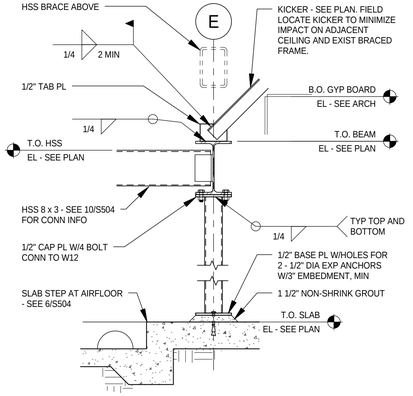
9 DRILLED PIER DETAIL
NO SCALE



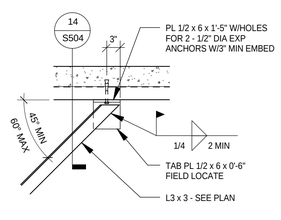
10 SECTION
3/4" = 1'-0"



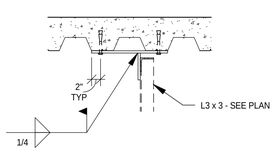
11 SECTION
3/4" = 1'-0"



12 SECTION
3/4" = 1'-0"



13 SECTION
3/4" = 1'-0"



14 SECTION
3/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

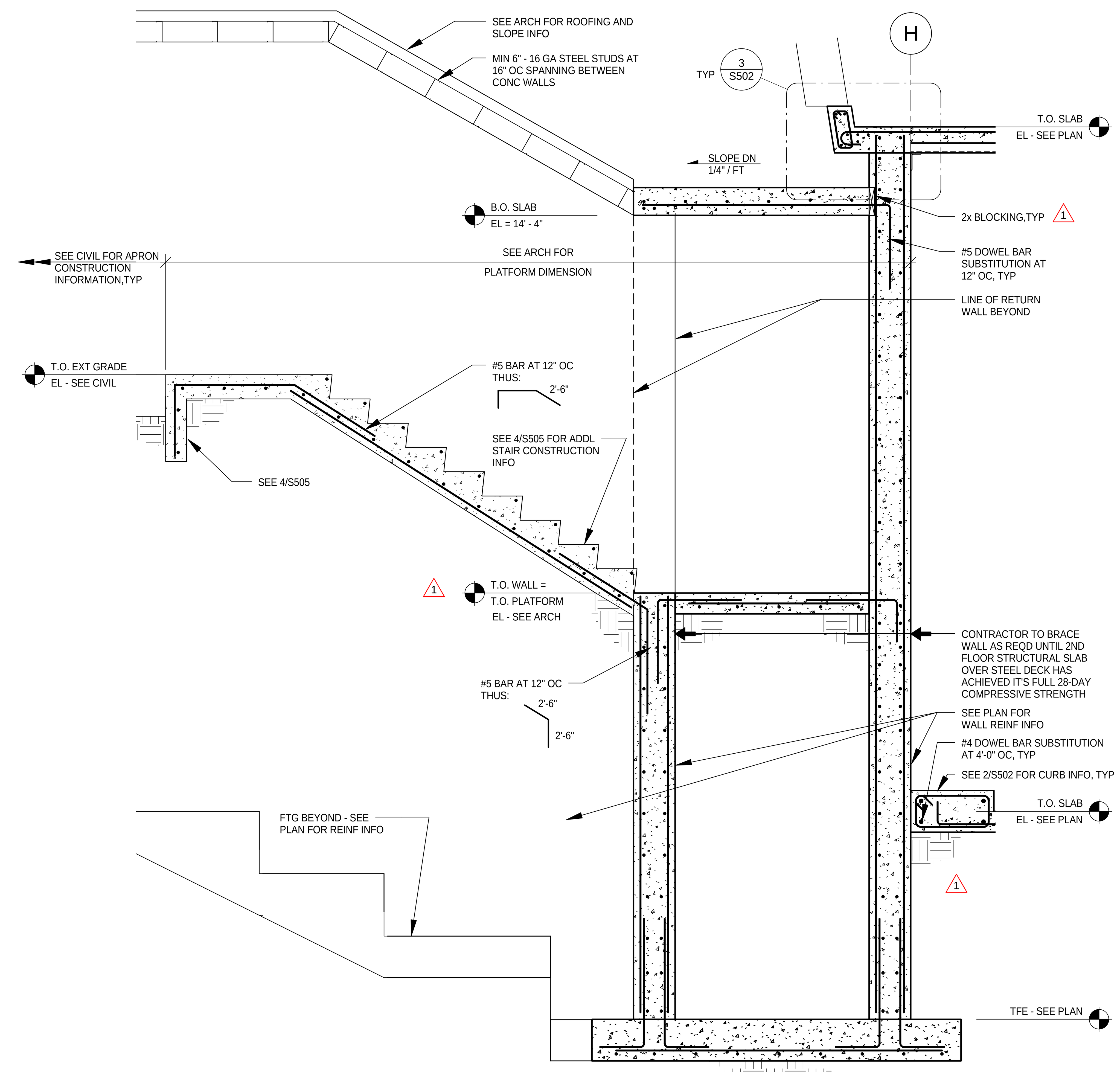
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

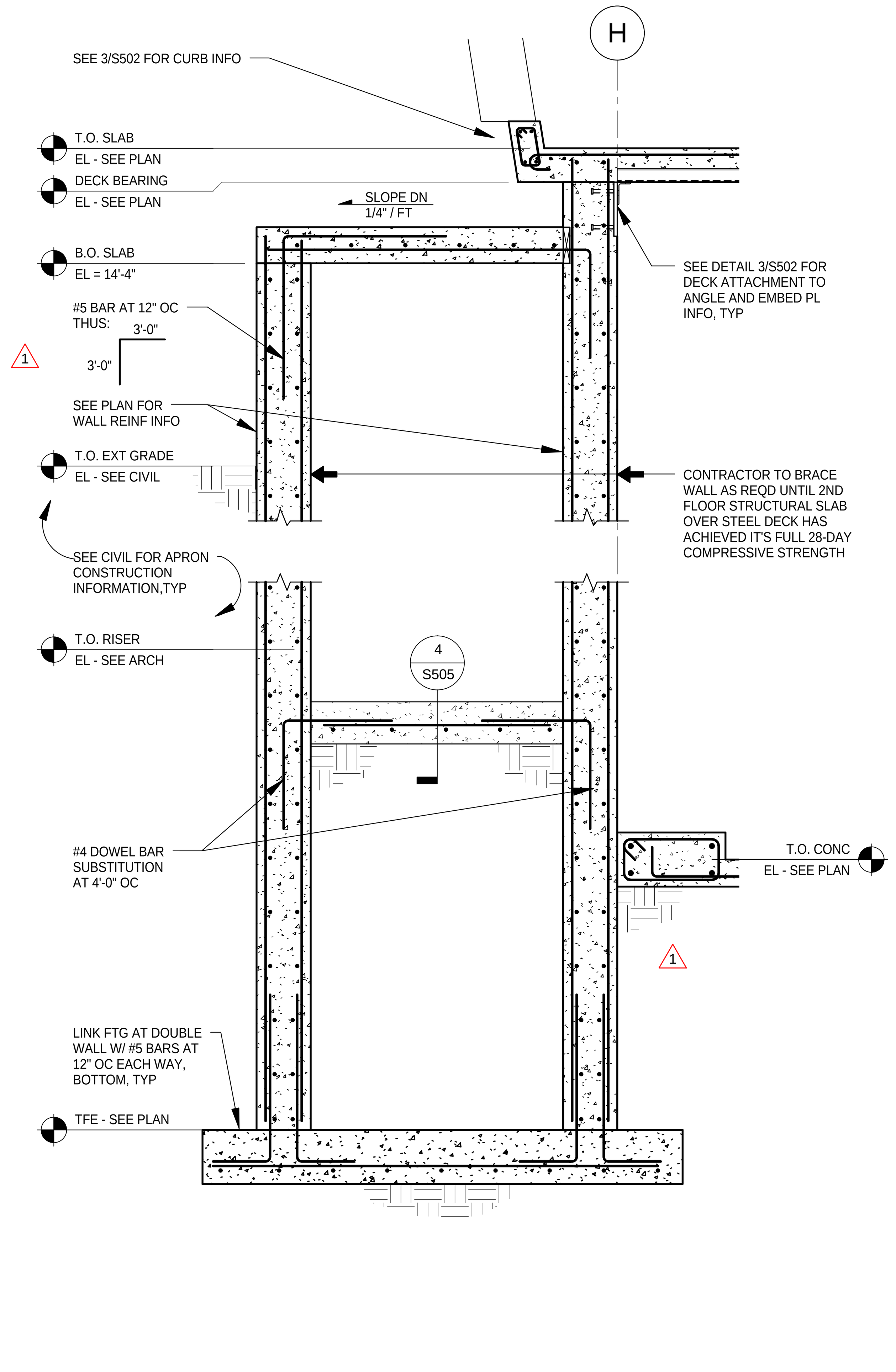
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S504

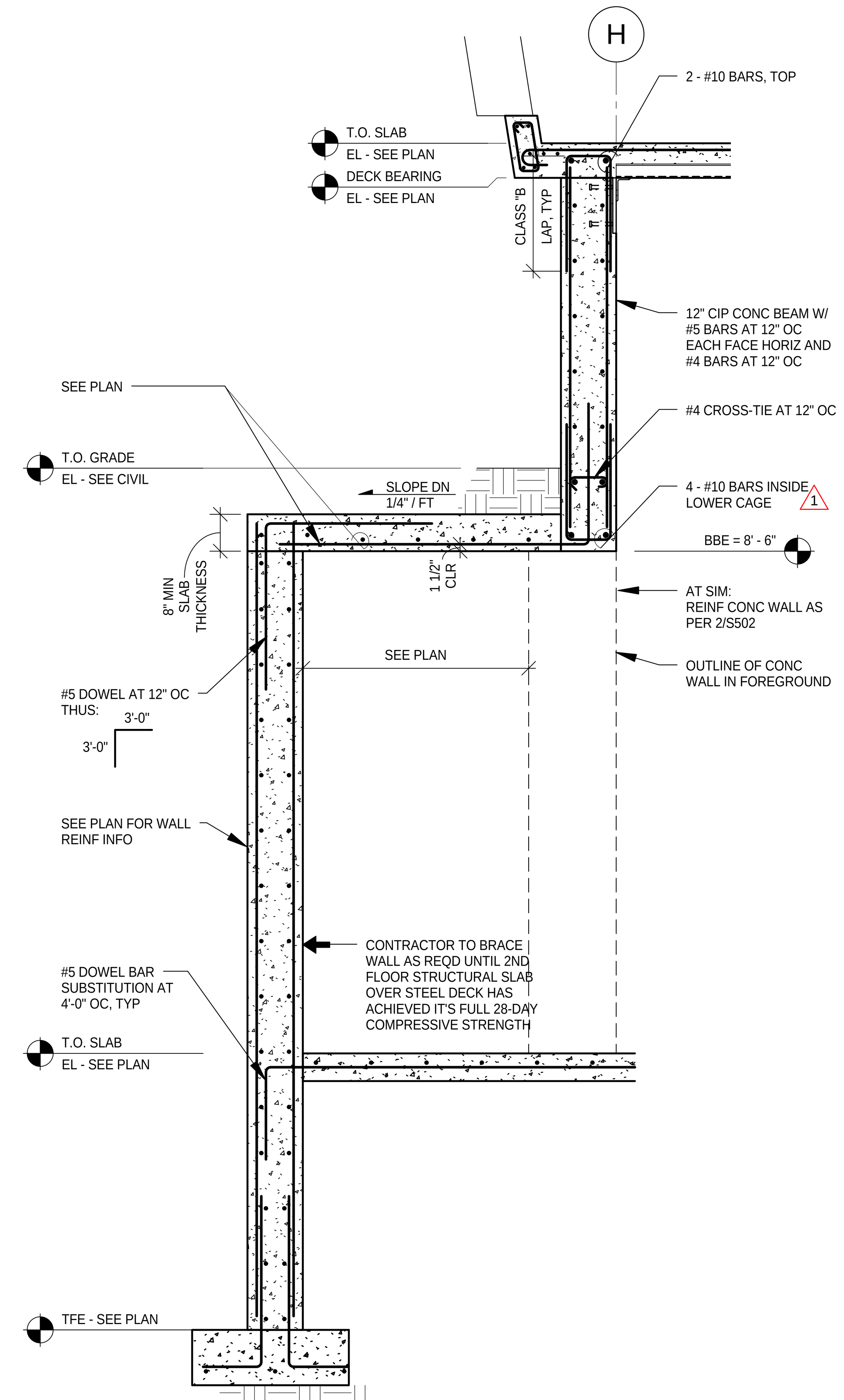
BID PACKAGE 2C



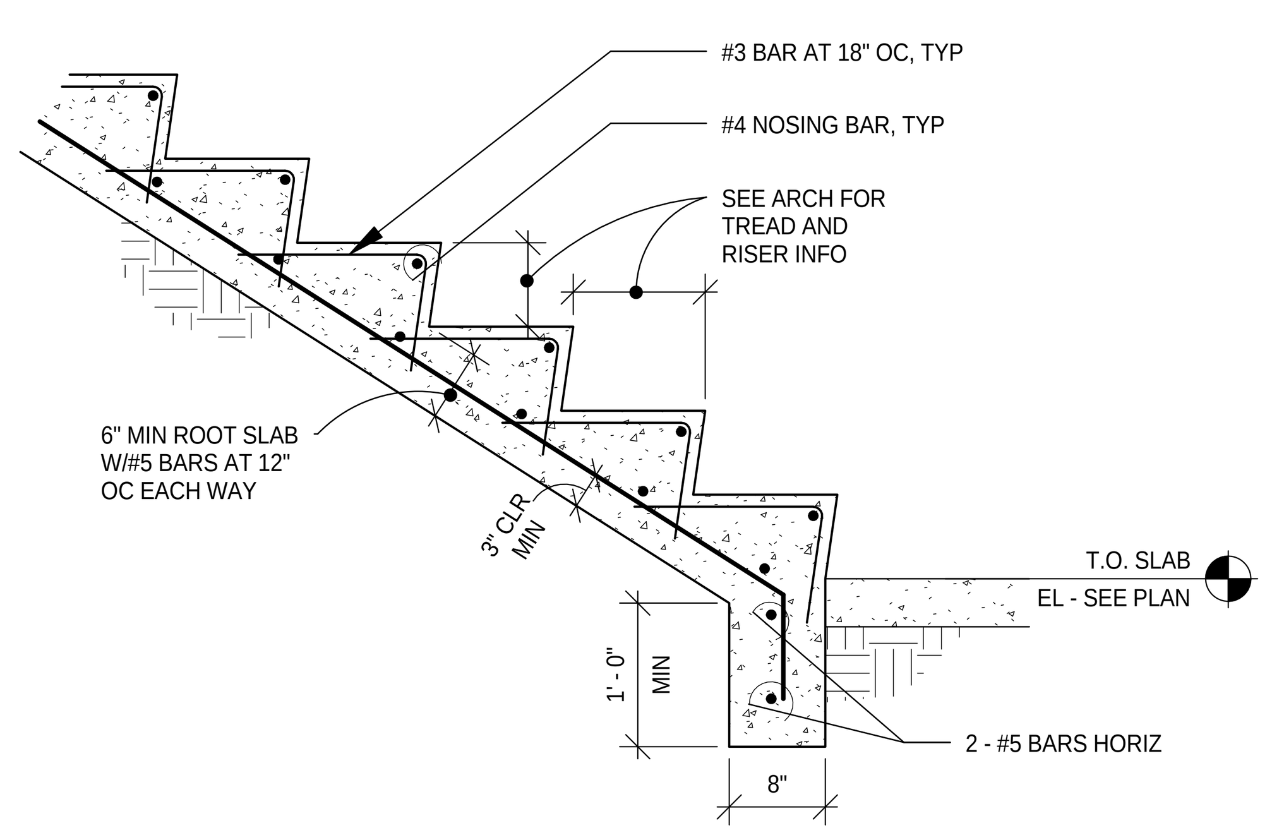
1 SECTION
1/2" = 1'-0"



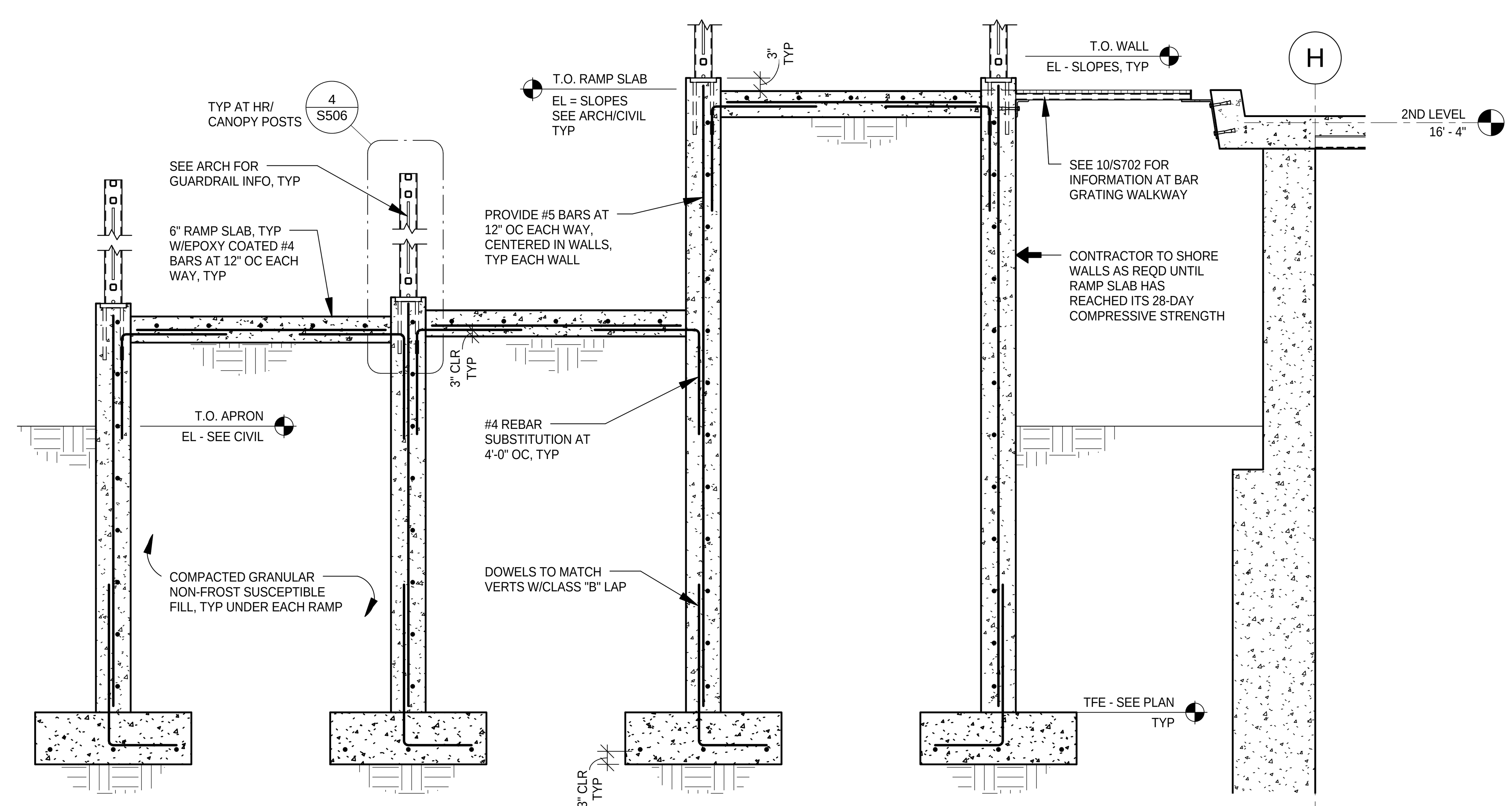
2 SECTION
1/2" = 1'-0"



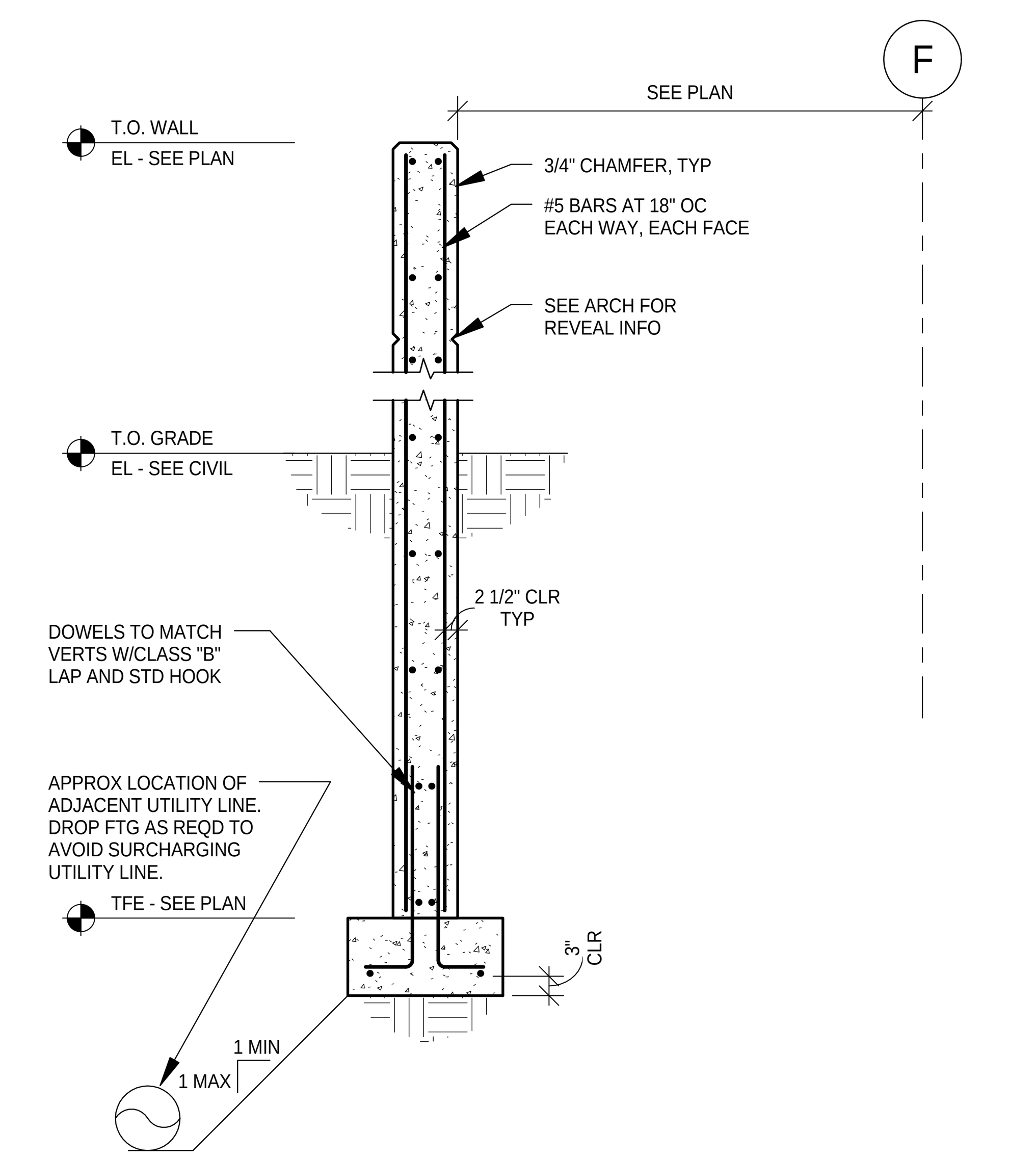
3 SECTION
1/2" = 1'-0"



4 STAIR SECTION
3/4" = 1'-0"



5 SECTION
1/2" = 1'-0"



6 SCREEN WALL SECTION
1/2" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

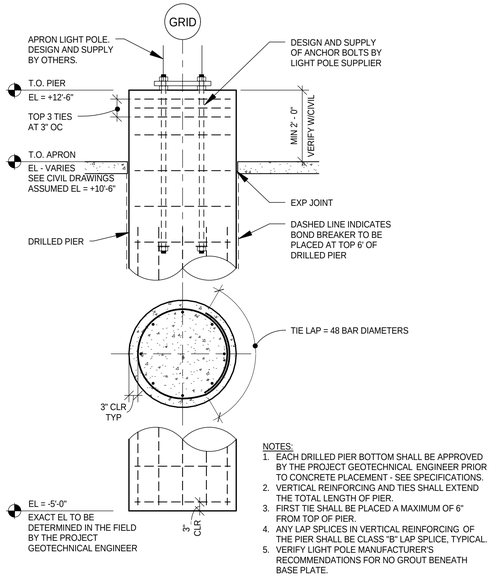
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S505

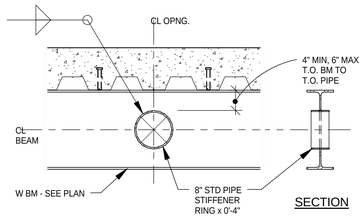
BID PACKAGE 2C



NOTES:
1. EACH DRILLED PIER BOTTOM SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO CONCRETE PLACEMENT - SEE SPECIFICATIONS.
2. VERTICAL REINFORCING AND TIES SHALL EXTEND THE TOTAL LENGTH OF PIER.
3. FIRST TIE SHALL BE PLACED A MAXIMUM OF 6" FROM TOP OF PIER.
4. ANY LAP SPLICES IN VERTICAL REINFORCING OF THE PIER SHALL BE CLASS "B" LAP SPLICE, TYPICAL.
5. VERIFY LIGHT POLE MANUFACTURER'S RECOMMENDATIONS FOR NO GROUT BENEATH BASE PLATE.

1

1 DRILLED PIER DETAIL
1/2" = 1'-0"

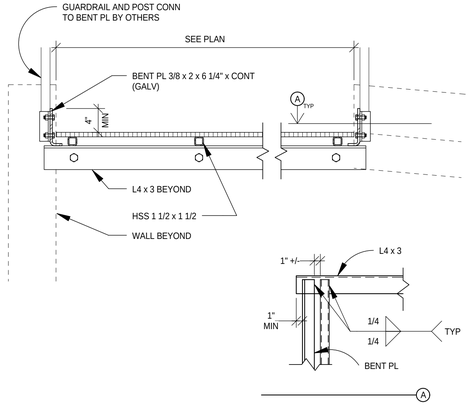


SECTION

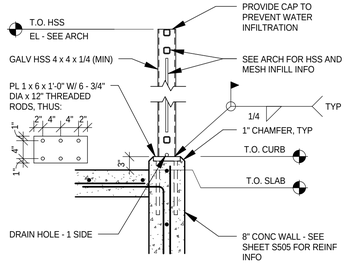
NOTES:
1. SEE PLAN FOR BEAM WEB OPENING LOCATION.
2. WELDING TO BE AS PER AWS D1.1. CARE IS TO BE TAKEN NOT TO DAMAGE PORTIONS OF BEAM TO REMAIN DURING CUTTING OF BEAM WEB.

2

2 STEEL BEAM WEB OPENING REINFORCING DETAIL
NO SCALE



3 SECTION
1" = 1'-0"



4 SECTION
3/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
1	BP2A ADDENDUM 2	02.25.11
	BP 2A CONFORMANCE	05.02.11
2	RFP	05.25.11
	BID PACKAGE 2C	02.10.12

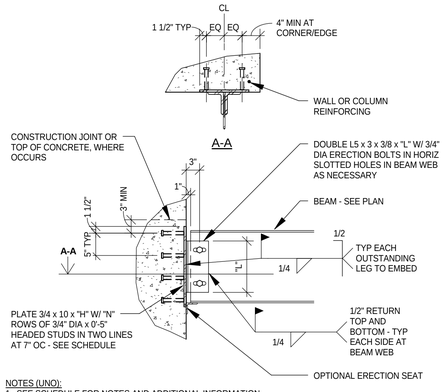
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S506

BID PACKAGE 2C



NOTES (UNO):
1. SEE SCHEDULE FOR NOTES AND ADDITIONAL INFORMATION.
2. PROVIDE ERECTION SEAT AS NECESSARY.

1 TYPICAL EMBED PLATE - DOUBLE ANGLE CONNECTION
3/4" = 1'-0"

TYPICAL EMBED PLATE SCHEDULE				
MARK	STEEL BEAM SIZE	STUD ROWS "N"	PLATE LENGTH "H"	MIN ANGLE LENGTH "L"
EP-1	W12, W14	3	13"	8 1/2"
EP-2	W16	4	18"	11 1/2"
EP-3	W33	8	38"	24"
EP-4	HSS 5 x 5	3	13"	NA

NOTES (UNO):
1. PROVIDE EMBED PLATES CORRESPONDING TO BEAM SIZES IN SCHEDULE, UNLESS NOTED OTHERWISE ON PLANS OR DETAILS.
2. PROVIDE HOLES AS NECESSARY FOR PLATE ATTACHMENT TO FORMWORK (5/16" DIA MAX).
3. COORDINATE CONCRETE REINFORCING BAR PLACEMENT WITH HEADED STUDS.
4. FIELD VERIFY EMBED PLATE PLACEMENT PRIOR TO BEAM ERECTION.
5. AT EP-4, PROVIDE 3" DIAMETER HOLE CENTERED ON HSS FOR CONDUIT ACCESS.

2 TYPICAL EMBED PLATE SCHEDULE
1 : 1

BEAM SHEAR CONNECTION SCHEDULE				
STEEL BEAM SIZE	SINGLE SHEAR CONNECTION FOR BEAMS SUPPORTING DECK ONLY		DOUBLE SHEAR CONNECTION FOR BEAMS SUPPORTING OTHER BEAMS	
	MIN ROWS OF BOLTS	MIN DESIGN SERVICE CAPACITY (KIPS)	MIN ROWS OF BOLTS	MIN DESIGN SERVICE CAPACITY (KIPS)
W8, W10	2	12	2	24
W12	3	23	3	46
W14	3	23	3	46
W16	4	35	4	70
W18	5	45	4	70
W21	6	55	5	90
W24	7	65	6	110
W27	7	65	6	110
W30	8	75	7	130
W33	8	75	7	130
W36	9	85	8	150

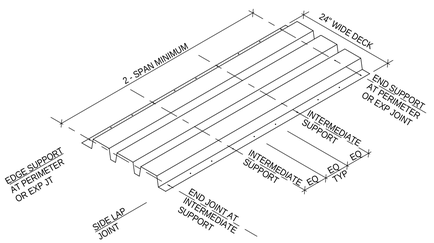
NOTES:
1. CONTRACTOR/FABRICATOR SHALL DESIGN TYPICAL SHEAR CONNECTIONS FOR THIS PROJECT. CONNECTION TYPES SHALL CONFORM TO AISC STANDARD SHEAR CONNECTIONS. SUBMIT PROPOSED CONNECTION TYPES FOR APPROVAL BEFORE STARTING SHOP DRAWINGS.
2. PROVIDE BEAM CONNECTIONS FOR END REACTIONS INDICATED ABOVE OR AS SHOWN ON PLAN OR DETAIL, WHICHEVER IS GREATER. BEAM TO BEAM CONNECTIONS MAY BE SINGLE OR DOUBLE SHEAR, AS REQUIRED TO PROVIDE THE SPECIFIED CONNECTION CAPACITY WITHIN THE AVAILABLE CONNECTION GEOMETRY. ALL BEAM TO COLUMN CONNECTIONS SHALL BE DOUBLE SHEAR.
3. ALL BOLTS SHALL BE 3/4" DIAMETER A325-N OR 1" DIAMETER A490-N, UNLESS NOTED OTHERWISE.
4. SHOP CONNECTIONS MAY BE WELDED (WITH CAPACITY AS NOTED HEREIN) OR BOLTED.
5. VALUES SHOWN ASSUME 1/4" BEAM WEB THICKNESS, MINIMUM.
6. USE TWO ANGLE CONNECTION TO ALL BEAMS FRAMING INTO CONCRETE EMBED PLATES.

3 BEAM SHEAR CONNECTION SCHEDULE
1" = 1'-0"

FLOOR AND ROOF DECK SCHEDULE				
MARK	DECK TYPE	CONCRETE TOPPING THICKNESS	CONCRETE TOPPING REINFORCING	COMMENTS
S1	3" - 19 GA COMPOSITE DECK	4 1/2" NORMAL WT	STRUX 90/40 SYNTHETIC FIBER	5.0 LBS/CU YD
S2	3" - 19 GA COMPOSITE DECK	6 1/2" NORMAL WT	#5 AT 12" OC EACH WAY	1 1/2" TOP COVER
S3	3" - 19 GA COMPOSITE DECK	6 1/2" NORMAL WT	STRUX 90/40 SYNTHETIC FIBER	5.0 LBS/CU YD
S4	3" - 20 GA COMPOSITE DECK	3" NORMAL WT	STRUX 90/40 SYNTHETIC FIBER	5.0 LBS/CU YD
D1	3" - 20 GA TYPE N ROOF DECK	NA	NA	NA
D2	3 1/2" - 16 GA ROOF DECK OR 4 1/2" - 18 GA ROOF DECK	NA	NA	NA
D3	1 1/2" - 20 GA TYPE N ROOF DECK	NA	NA	NA
D4	3" - 20 GA TYPE N ROOF DECK	NA	NA	"GALVALUM" FINISH REFER TO ARCH

NOTES (UNO):
1. SEE TYPICAL DETAILS FOR DECK ATTACHMENT DETAILS.
2. SEE GENERAL STRUCTURAL NOTES FOR CONCRETE STRENGTH.
3. CONCRETE TOPPING THICKNESS IS FROM TOP OF DECK TO TOP OF CONCRETE
4. SEE PLANS AND DETAILS FOR ADDITIONAL REINFORCING AND REINFORCING PLACEMENT AT CONCRETE SLABS ON METAL DECK.
5. SEE SPECIFICATIONS FOR SYNTHETIC FIBERS.
6. ALL COMPOSITE DECK IS GALVANIZED. REFER TO SPECIFICATIONS FOR ROOF DECK FINISH.

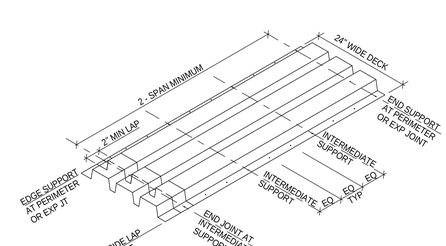
4 FLOOR AND ROOF DECK SCHEDULE
NO SCALE



DECK SUPPORT CONDITION	DECK ATTACHMENT
END SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
EDGE SUPPORT	PUDDLE WELDS AT 12" OC
INTERMEDIATE SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
END JOINT AT INT SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE, EACH SIDE
SIDE LAP JOINT	#10 TEK SCREWS OR 1 1/2" SEAM WELD AT 36" OC MAX

NOTES (UNO):
1. ALL PUDDLE (ARC-SPOT) WELDS SHALL BE 5/8" DIAMETER.
2. PROVIDE DECK ATTACHMENTS AT SPACING SHOWN UNLESS NOTED OTHERWISE ON DRAWINGS.
3. DECK SHEETS SHALL BE BUTTED AT END JOINTS. PROVIDE 2 1/2" MINIMUM BEARING. GAPS UP TO 1" ARE ACCEPTABLE AT BUTT JOINTS.
4. HEADED STUD INSTALLED THROUGH THE DECK MAY BE SUBSTITUTED FOR PUDDLE WELD.

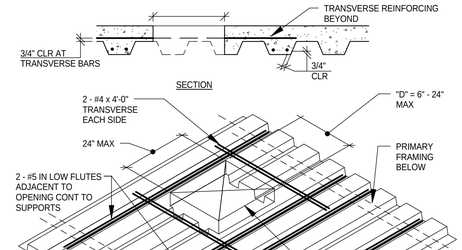
5 TYPICAL 3" COMPOSITE STEEL DECK ATTACHMENT DETAIL
NO SCALE



DECK SUPPORT CONDITION	DECK ATTACHMENT
END SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
EDGE SUPPORT	PUDDLE WELDS AT 12" OC
INTERMEDIATE SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
END LAP JOINT	PUDDLE WELDS AT EACH LOW FLUTE
SIDE LAP JOINT	#10 TEK SCREWS PER SPAN

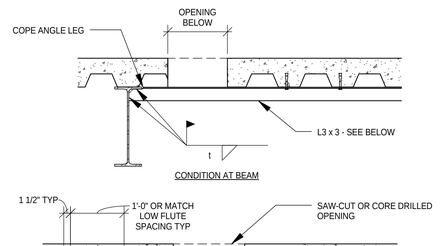
NOTES (UNO):
1. ALL PUDDLE (ARC-SPOT) WELDS SHALL BE 5/8" DIAMETER.
2. PROVIDE DECK ATTACHMENTS AT SPACING SHOWN UNLESS NOTED OTHERWISE ON DRAWINGS.
3. AT END LAP CONDITIONS, PUDDLE WELDS SHALL PROVIDE FUSION THROUGH ALL DECK LAYERS.

6 TYPICAL 3" STEEL ROOF DECK ATTACHMENT DETAIL
NO SCALE



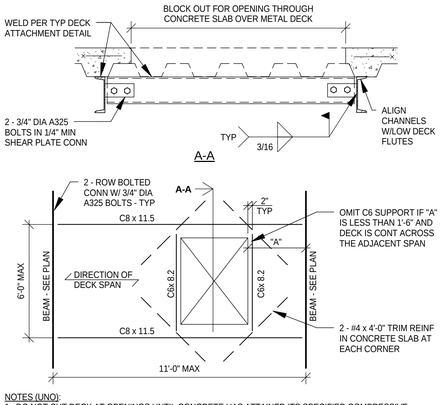
NOTES (UNO):
1. DO NOT CUT DECK AT OPENINGS UNTIL CONCRETE HAS ATTAINED ITS SPECIFIED COMPRESSIVE STRENGTH.
2. PROVIDE 2 TIMES "D" CLEAR DISTANCE BETWEEN OPENING EDGES. "D" IS LARGEST OF ADJACENT OPENING DIMENSIONS.

7 TYPICAL FRAMING AT FLOOR OPENINGS (6"-24" MAX)
NO SCALE



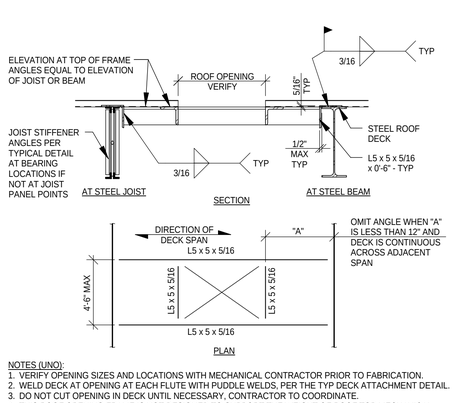
NOTES (UNO):
1. DO NOT OVER CUT CORNERS OF SQUARE OR RECTANGULAR OPENINGS.
2. CLUSTER OF OPENINGS CONSIDERED TO BE ONE OPENING. PROVIDE SUPPORT ANGLES IF OPENINGS LOCATED WITH LESS THAN TWO TIMES "D" CLEAR BETWEEN OPENING EDGES. "D" IS LARGEST OF ADJACENT OPENING DIMENSIONS.

8 TYPICAL OPENING (6"-24" MAX) THROUGH SLAB OVER METAL DECK
NO SCALE



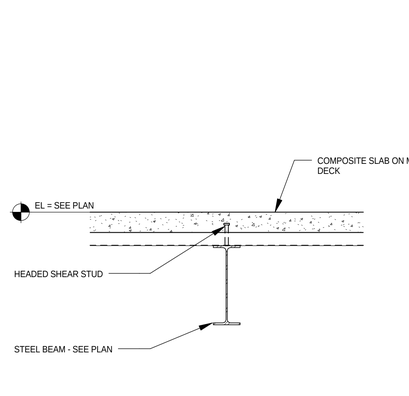
NOTES (UNO):
1. DO NOT CUT DECK AT OPENINGS UNTIL CONCRETE HAS ATTAINED ITS SPECIFIED COMPRESSIVE STRENGTH.
2. VERIFY OPENING DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND MECHANICAL TRADES.

9 TYPICAL FLOOR OPENING FRAME (OVER 24")
NO SCALE



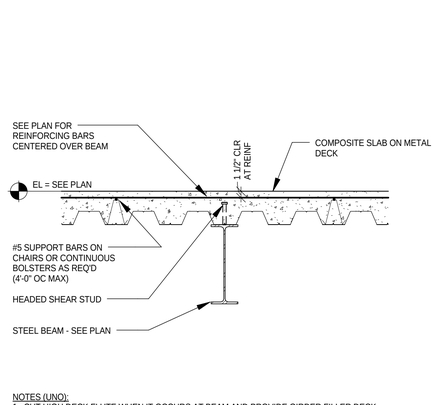
NOTES (UNO):
1. VERIFY OPENING SIZES AND LOCATIONS WITH MECHANICAL CONTRACTOR PRIOR TO FABRICATION.
2. WELD DECK AT OPENING AT EACH FLUTE WITH PUDDLE WELDS, PER THE TYP DECK ATTACHMENT DETAIL.
3. DO NOT CUT OPENING IN DECK UNTIL NECESSARY, CONTRACTOR TO COORDINATE.
4. THIS ROOF OPENING FRAME IS NOT DESIGNED TO SUPPORT THE WEIGHT OF ROOF TOP MECHANICAL EQUIPMENT WEIGHING OVER 400 LBS. EQUIPMENT SHALL BE SUPPORTED ON A STRUCTURAL CURB DESIGNED BY THE SUPPLIER TO SPAN TO THE PRIMARY STRUCTURAL FRAMING.

10 TYPICAL ROOF OPENING FRAME FOR 3" DECK
NO SCALE



NOTES (UNO):
1. SEE TYPICAL DETAILS FOR DECK ATTACHMENT AND HEADED STUD INFORMATION.

11 TYPICAL SECTION AT COMPOSITE DECK PERPENDICULAR TO BEAM
NO SCALE



NOTES (UNO):
1. CUT HIGH DECK FLUTE WHEN IT OCCURS AT BEAM AND PROVIDE GIRDER FILLER DECK PIECE AS NECESSARY.
2. SEE TYPICAL DETAILS FOR DECK ATTACHMENT AND HEADED STUD INFORMATION.

12 TYPICAL SECTION AT COMPOSITE DECK PARALLEL TO BEAM
NO SCALE

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	RFP 120	07.22.11
	BID PACKAGE 2C	02.10.12

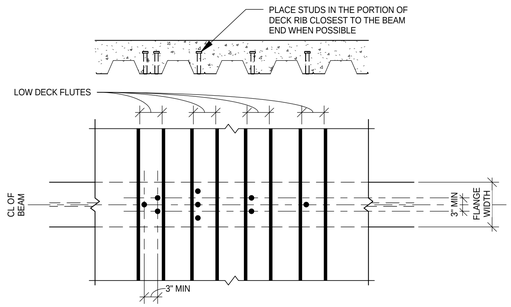
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

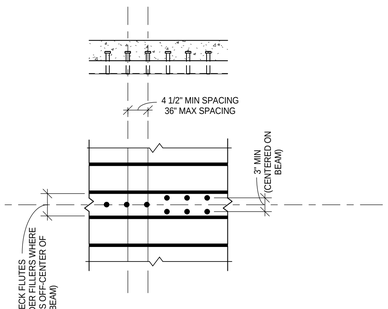
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S701

BID PACKAGE 2C



DECK PERPENDICULAR TO BEAM

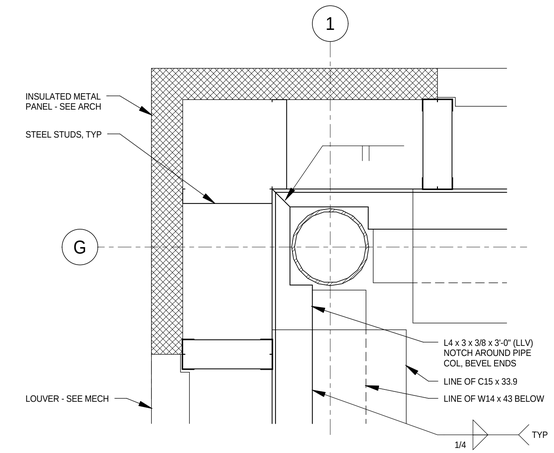


DECK PARALLEL TO BEAM

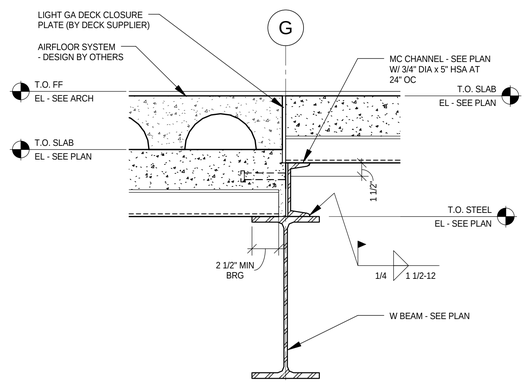
NOTES (UNO):
1. USE ONLY ONE STUD PER RIB UNTIL NUMBERS OF STUDS EXCEEDS DECK RIBS AVAILABLE. LOCATE SINGLE STUDS OVER WEB.
2. START LAYOUT OF HEADED STUDS AT EACH END OF THE BEAM AND PROCEED TOWARDS THE CENTER OF THE BEAM.
3. PROVIDE STUDS IN DOUBLE OR TRIPLE CONFIGURATION SHOWN TO MEET TOTAL NUMBER OF STUDS REQUIRED. START LAYOUT OF DOUBLE/TRIPLE STUDS AT EACH END OF BEAM. DOUBLE/TRIPLE STUD LAYOUTS SHALL ONLY BE USED FOR BEAMS WITH MINIMUM FLANGE WIDTHS SHOWN.
4. PROVIDE ADDITIONAL STUDS BEYOND NUMBER NOTED ON PLANS OR SCHEDULES TO MEET MAXIMUM STUD SPACING SHOWN.
5. HEADED STUDS SHALL BE 3/4" DIA x 5" LONG (AFTER WELDING) TYPICAL, UNLESS NOTED OTHERWISE. REMOVE ALL FERRULS PRIOR TO CONCRETE PLACEMENT.

NOTES:
1. TRIPLE STUDS NOT PERMITTED.

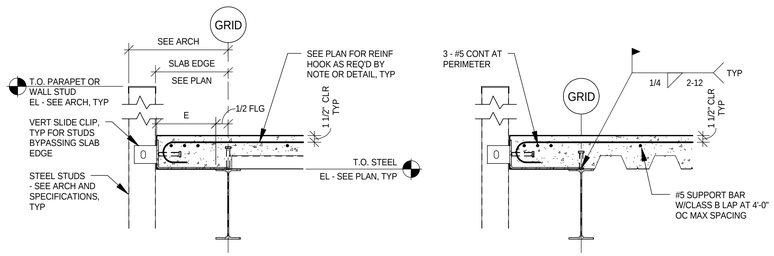
1 TYPICAL HEADED STUD PLACEMENT DETAIL
NO SCALE



2 PLAN DETAIL AT CHILLER ENCLOSURE
1 1/2" = 1'-0"



3 SECTION
1 1/2" = 1'-0"

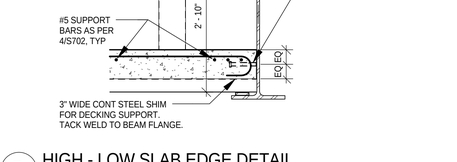


METAL DECK PERPENDICULAR TO BEAM

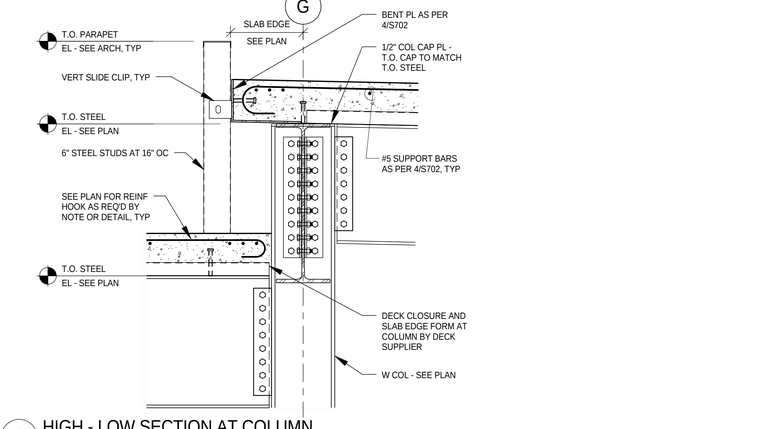
METAL DECK PARALLEL TO BEAM

NOTES:
1. FOR "E" GREATER THAN 5" AND LESS THAN 12", PROVIDE 1/4" BENT PLATE EDGE FORM WITH 3/4" DIA x 6" LONG HEADED STUDS AT 24" OC.
2. FOR "E" GREATER THAN 12" BUT LESS THAN 24", PROVIDE 3/8" BENT PLATE EDGE FORM WITH 3/4" DIA x 6" HEADED STUDS AT 24" OC AND SHORE SLAB OVERHANG (DESIGN BY CONTRACTOR) UNTIL CONCRETE REACHES ITS 28 DAY SPECIFIED COMPRESSIVE STRENGTH.
3. FOR "E" UP TO 5", PROVIDE OPTIONAL LIGHT GAGE BENT PLATE POUR STOP AND ANY REQUIRED ACCESSORIES BY DECK FABRICATOR OR USE 1/4" BENT PLATE PER NOTE 1.

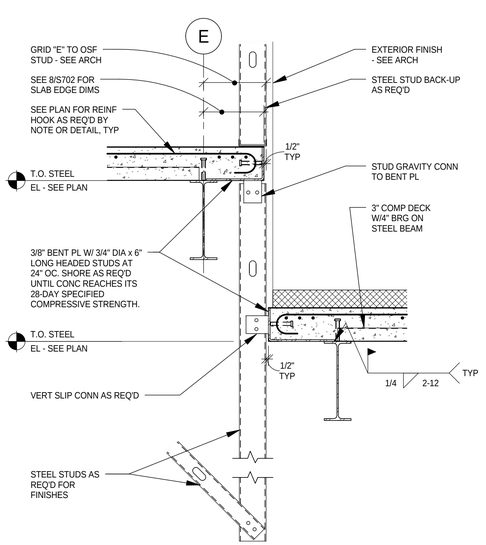
4 TYPICAL SLAB EDGE DETAIL
NO SCALE



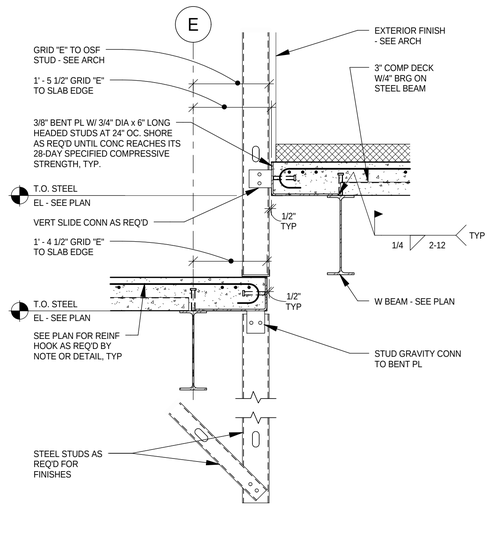
5 HIGH - LOW SLAB EDGE DETAIL
3/4" = 1'-0"



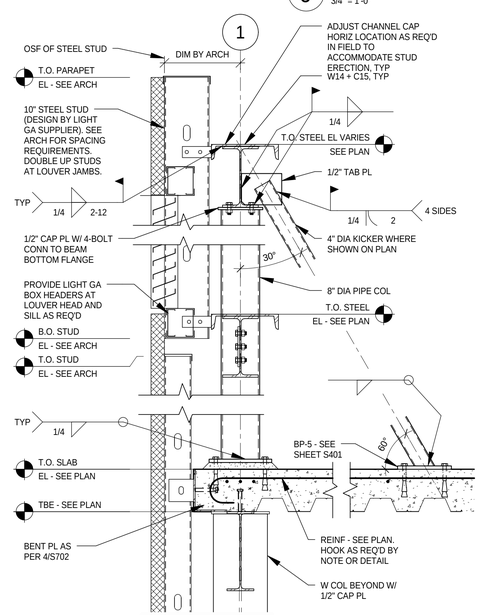
6 HIGH - LOW SECTION AT COLUMN
3/4" = 1'-0"



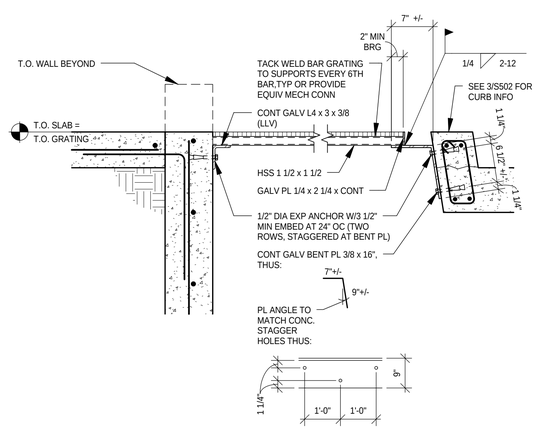
7 SECTION (CURVED ROOF BELOW 3RD FLOOR)
3/4" = 1'-0"



8 SECTION (CURVED ROOF ABOVE 3RD FLOOR)
3/4" = 1'-0"



9 SECTION
3/4" = 1'-0"



10 SECTION
1" = 1'-0"

RS&H
IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

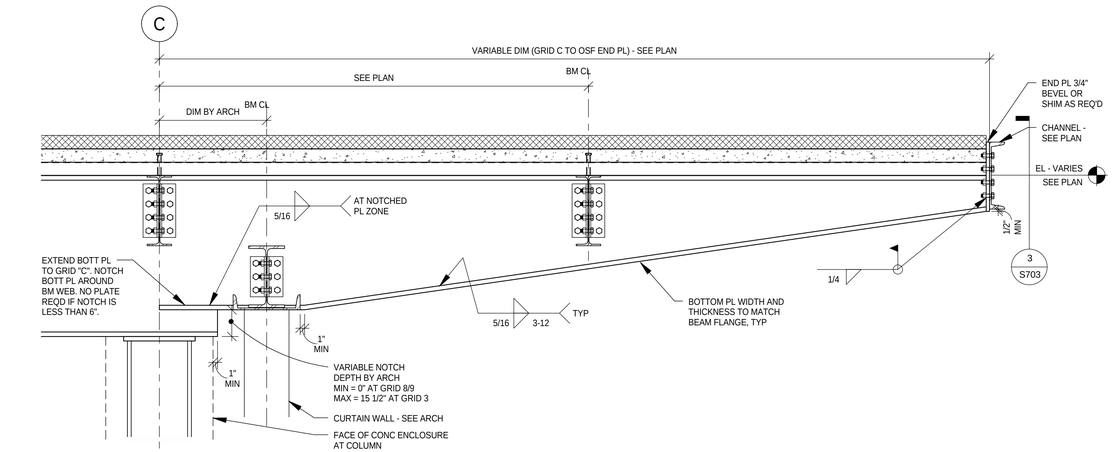
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

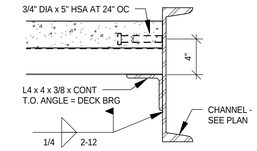
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S702

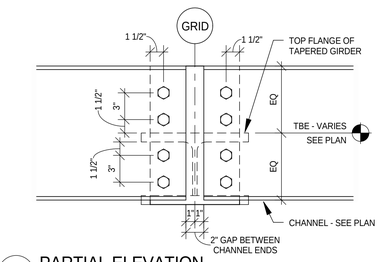
BID PACKAGE 2C



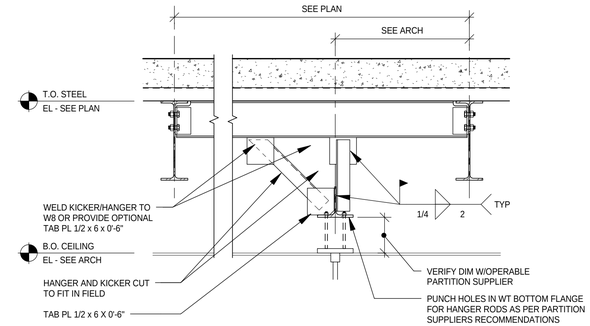
1 SECTION AT GIRDER
3/4" = 1'-0"



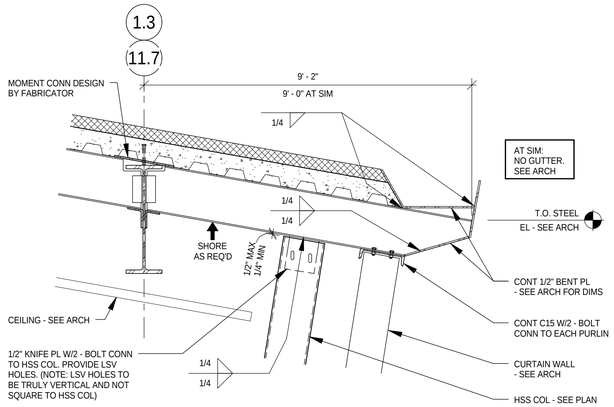
2 SECTION BETWEEN GIRDERS
1 1/2" = 1'-0"



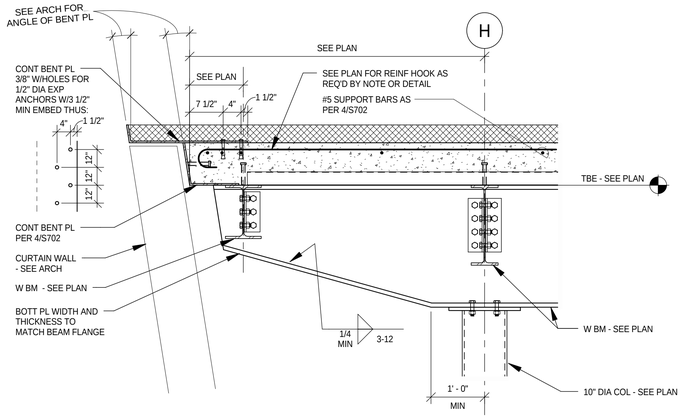
3 PARTIAL ELEVATION
1 1/2" = 1'-0"



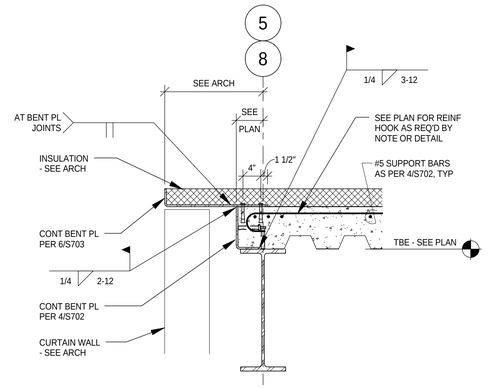
4 SECTION
3/4" = 1'-0"



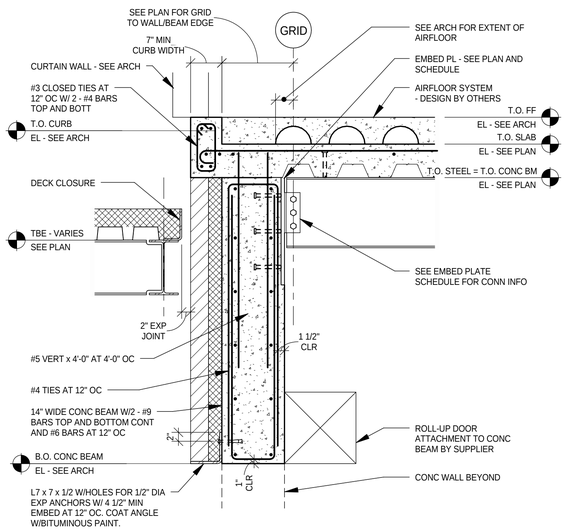
5 SECTION
1/2" = 1'-0"



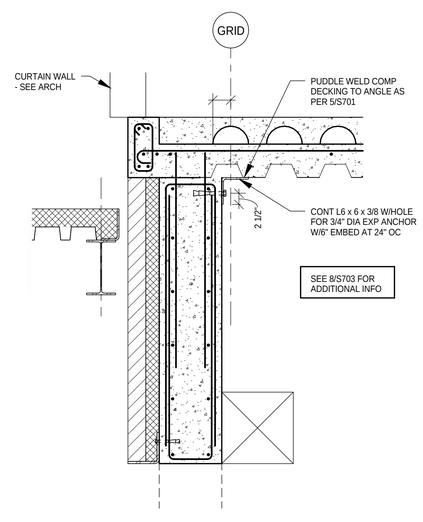
6 SECTION AT NORTH EDGE
3/4" = 1'-0"



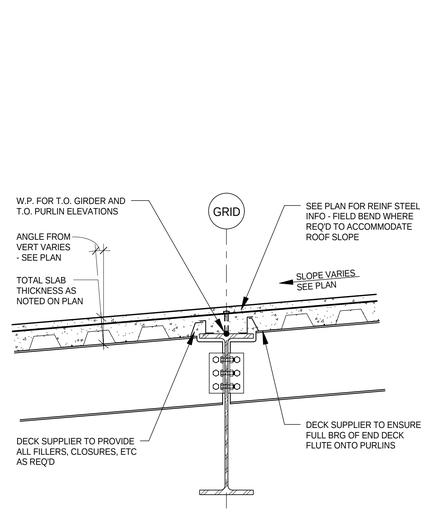
7 SECTION
3/4" = 1'-0"



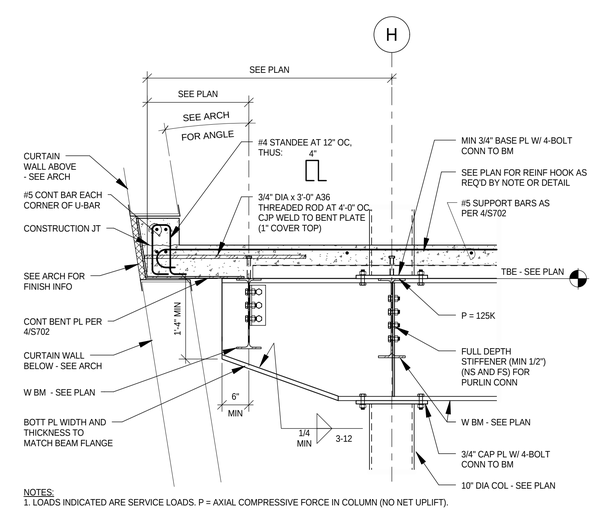
8 SECTION AT PURLIN
3/4" = 1'-0"



9 SECTION BETWEEN PURLINS
3/4" = 1'-0"



10 SECTION
3/4" = 1'-0"



11 SECTION AT NORTH EDGE
3/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

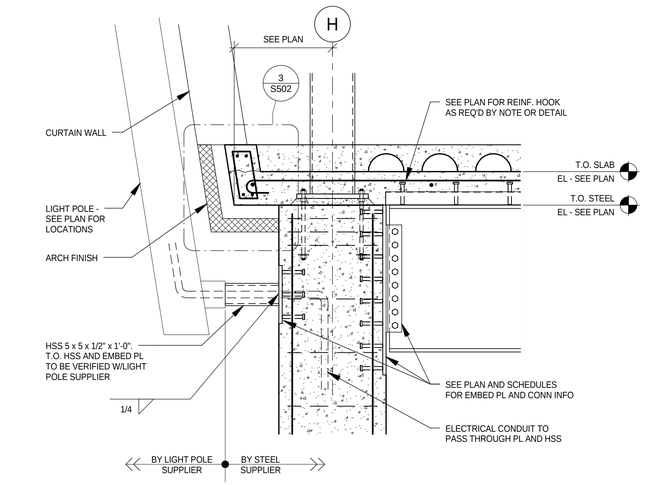
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

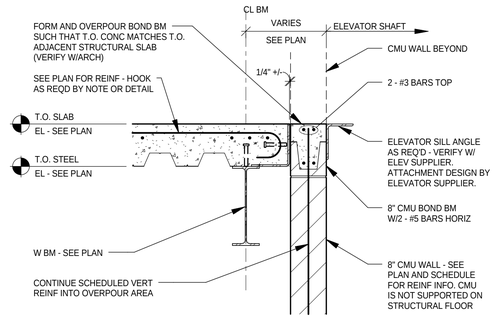
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S703

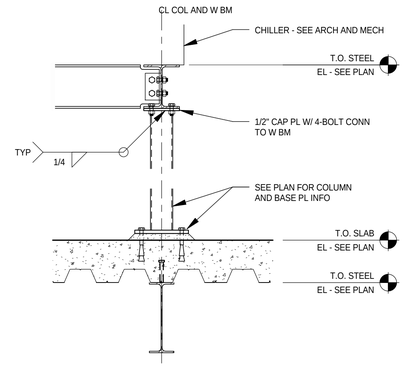
BID PACKAGE 2C



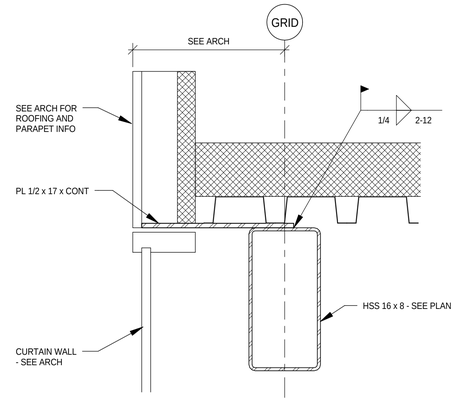
1 SECTION AT COLUMN AND LIGHT POLE
3/4" = 1'-0"



2 SECTION AT ELEVATOR DOOR OPENING
3/4" = 1'-0"



3 SECTION
3/4" = 1'-0"

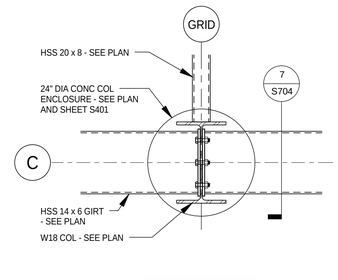


4 SECTION
1 1/2" = 1'-0"

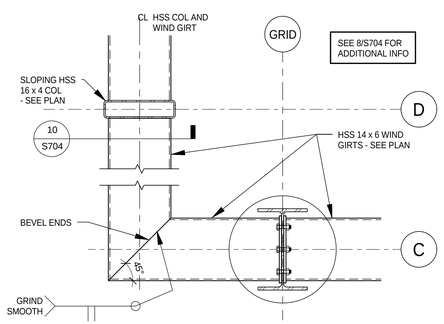
5 SECTION
1 1/2" = 1'-0"

6 SECTION
3/4" = 1'-0"

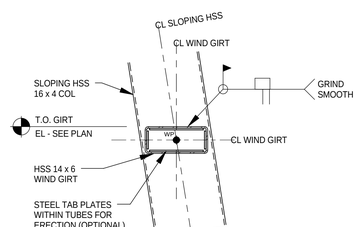
7 SECTION
3/4" = 1'-0"



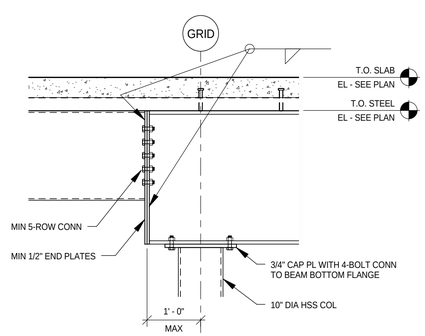
8 PARTIAL PLAN DETAIL
3/4" = 1'-0"



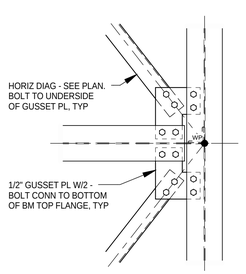
9 CORNER PLAN DETAIL
3/4" = 1'-0"



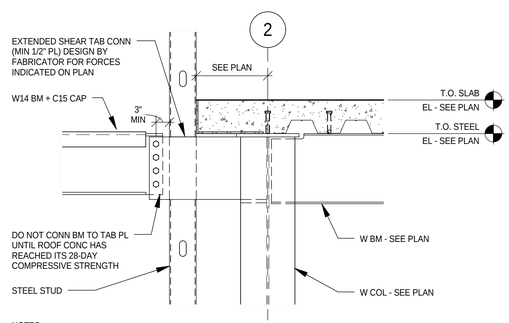
10 SECTION
3/4" = 1'-0"



11 SECTION
3/4" = 1'-0"



12 PLAN DETAIL
3/4" = 1'-0"



NOTES:
1. SEE ARCH FOR WATERPROOFING AND INSULATION INFORMATION AT CONNECTION.

13 SECTION
3/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

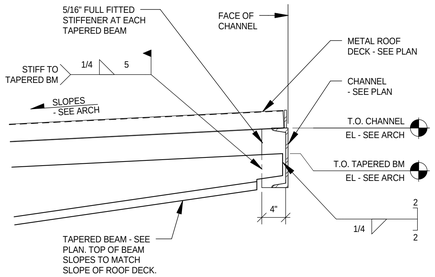
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

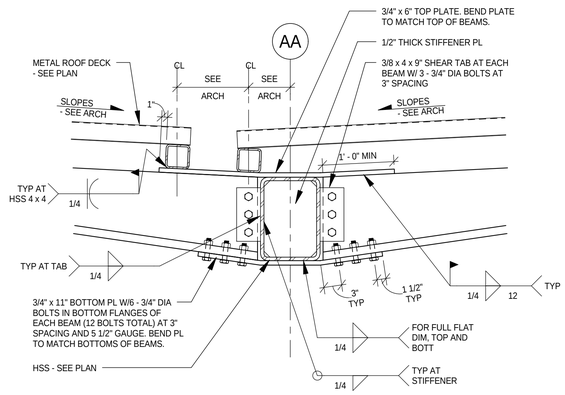
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S704

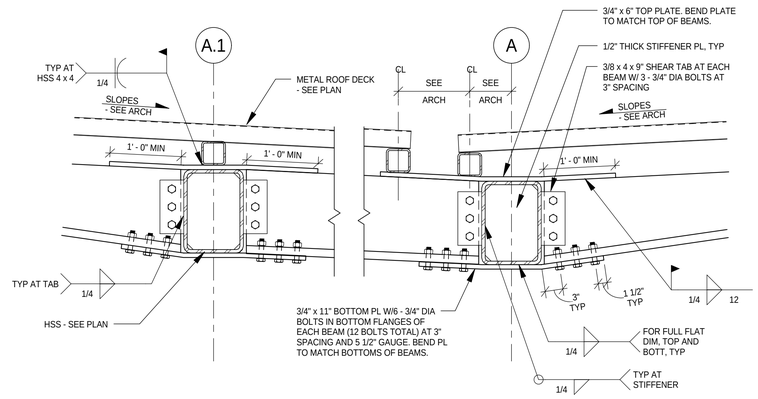
BID PACKAGE 2C



1 SECTION
1" = 1'-0"



2 SECTION
1" = 1'-0"



3 SECTION
1" = 1'-0"

4 SECTION AT END HSS
1" = 1'-0"

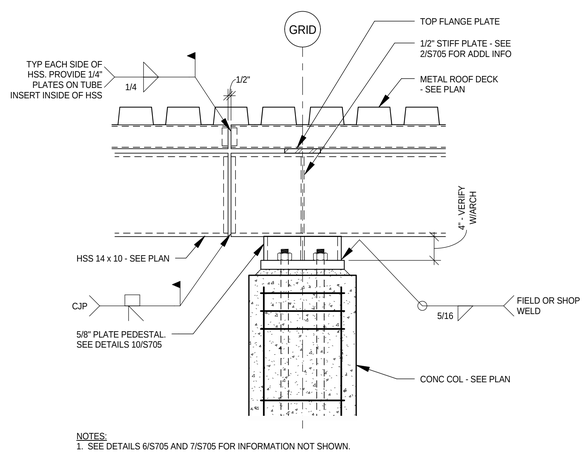
5 SECTION
1" = 1'-0"

NOTES:
1. DECK AND HSS 4 x 4'S NOT SHOWN FOR CLARITY. SEE 2/S705 FOR INFORMATION NOT SHOWN.
2. AS ALTERNATE, 4 THICK PLATE MAY BE PROVIDED TO MATCH PROFILE OF 5/8" PLATE PEDESTAL.

6 SECTION
1" = 1'-0"

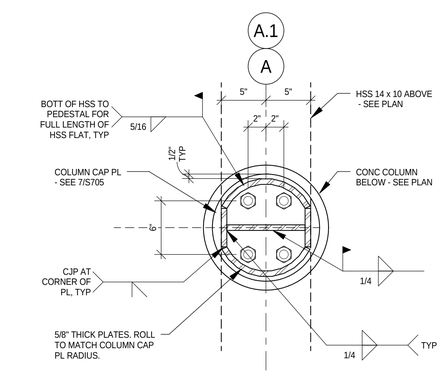
NOTES:
1. DECK AND HSS 4 x 4'S NOT SHOWN FOR CLARITY. SEE 3/S705 FOR INFORMATION NOT SHOWN.
2. AS ALTERNATE, 4" THICK PLATE MAY BE PROVIDED TO MATCH PROFILE OF 5/8" PLATE PEDESTAL.

7 SECTION
1" = 1'-0"

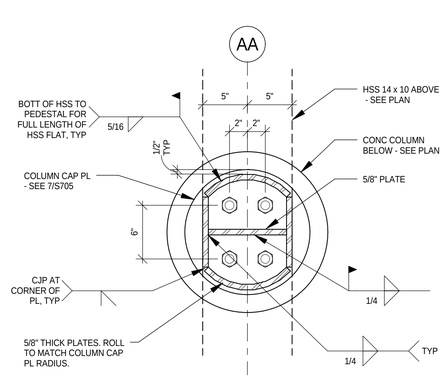


NOTES:
1. SEE DETAILS 6/S705 AND 7/S705 FOR INFORMATION NOT SHOWN.

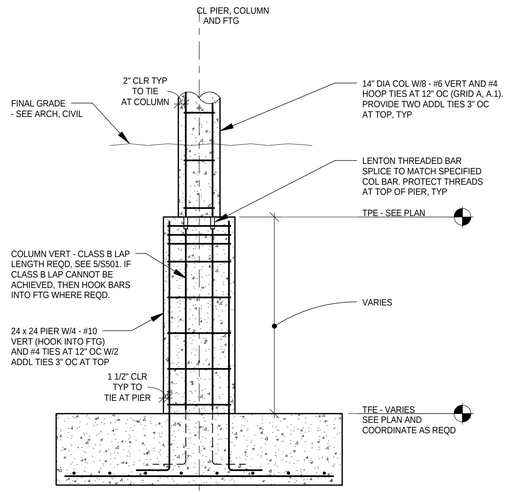
8 SECTION
1" = 1'-0"



9 SECTION
1 1/2" = 1'-0"



10 SECTION
1 1/2" = 1'-0"



11 SECTION AT CANOPY COLUMN
1/2" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

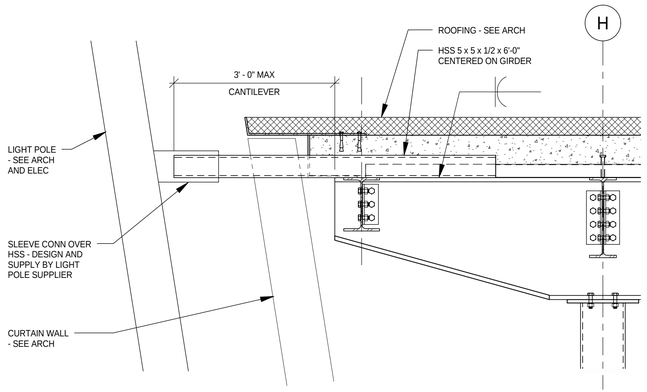
DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

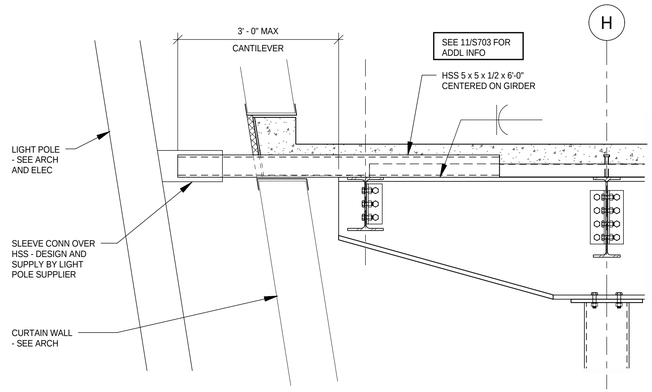
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S705

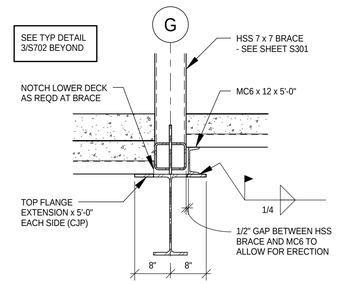
BID PACKAGE 2C



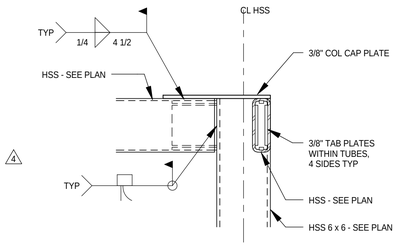
1 SECTION
3/4" = 1'-0"



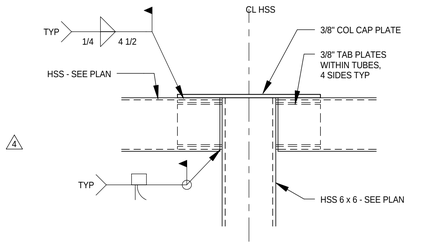
2 SECTION
3/4" = 1'-0"



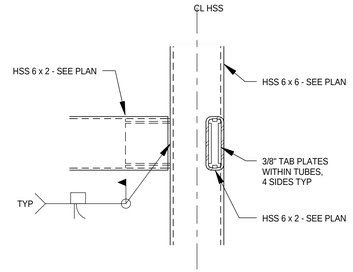
3 SECTION AT BF-6 AT LEVEL 2
3/4" = 1'-0"



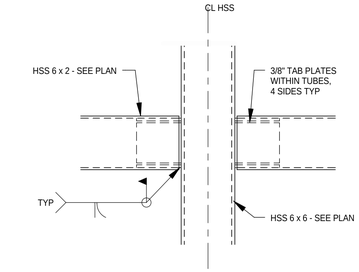
4 SECTION
1 1/2" = 1'-0"



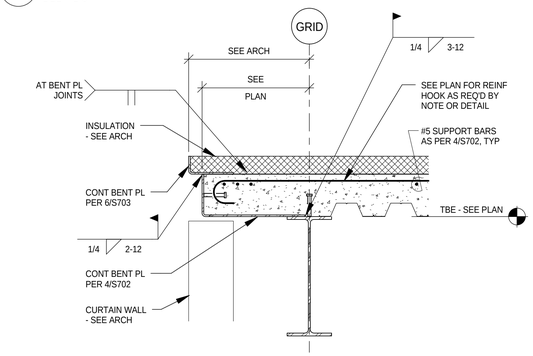
5 SECTION
1 1/2" = 1'-0"



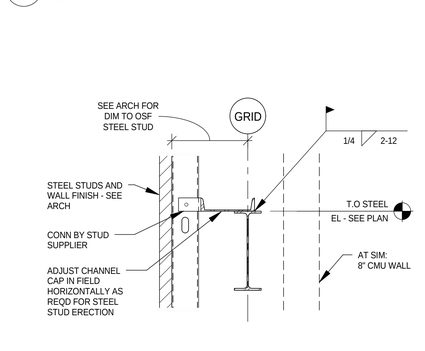
6 SECTION
1 1/2" = 1'-0"



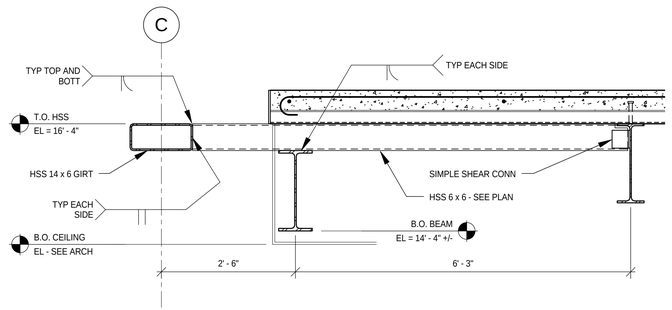
7 SECTION
1 1/2" = 1'-0"



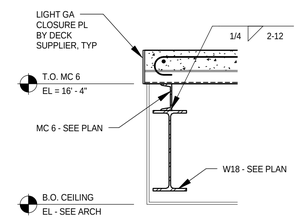
8 SECTION
3/4" = 1'-0"



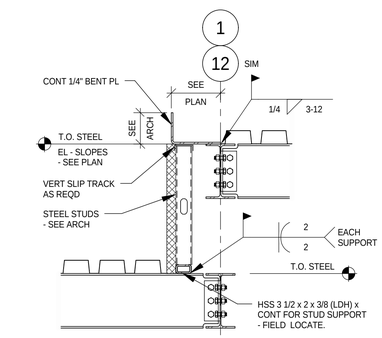
9 SECTION
3/4" = 1'-0"



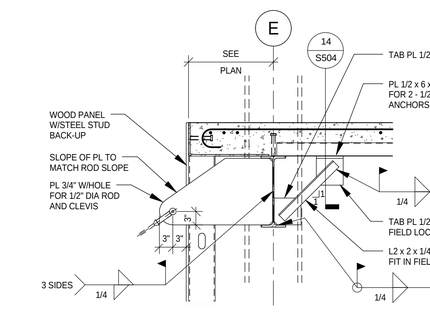
10 SECTION AT HSS CANTILEVER
3/4" = 1'-0"



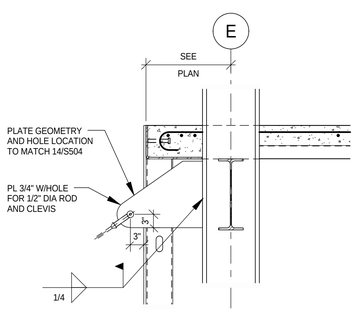
11 SECTION BETWEEN HSS CANTILEVER
3/4" = 1'-0"



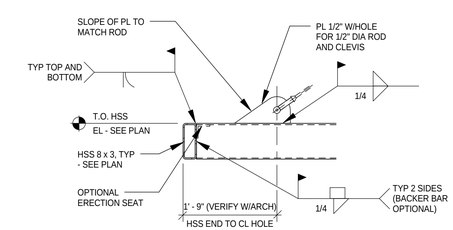
12 SECTION
3/4" = 1'-0"



13 SECTION BETWEEN COLUMNS
3/4" = 1'-0"



14 SECTION AT COLUMNS
3/4" = 1'-0"



15 SECTION
3/4" = 1'-0"

RS&H
IMPROVING YOUR WORLD

Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 FAX 218-722-1052
www.rsandh.com

DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Suite 340 Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI
1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscape Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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.

Print Name: Paul A. Johnson

Signature:

Date: June 3, 2010 Reg. No.: 20379

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
	BP 2A CONFORMANCE	05.02.11
	BID PACKAGE 2C	02.10.12

DATE ISSUED: 10-21-11
REVIEWED BY: PAJ / CWB
DRAWN BY: SJL
DESIGNED BY: CWB

AEP PROJECT NUMBER
213-1882-091

SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S706

BID PACKAGE 2C