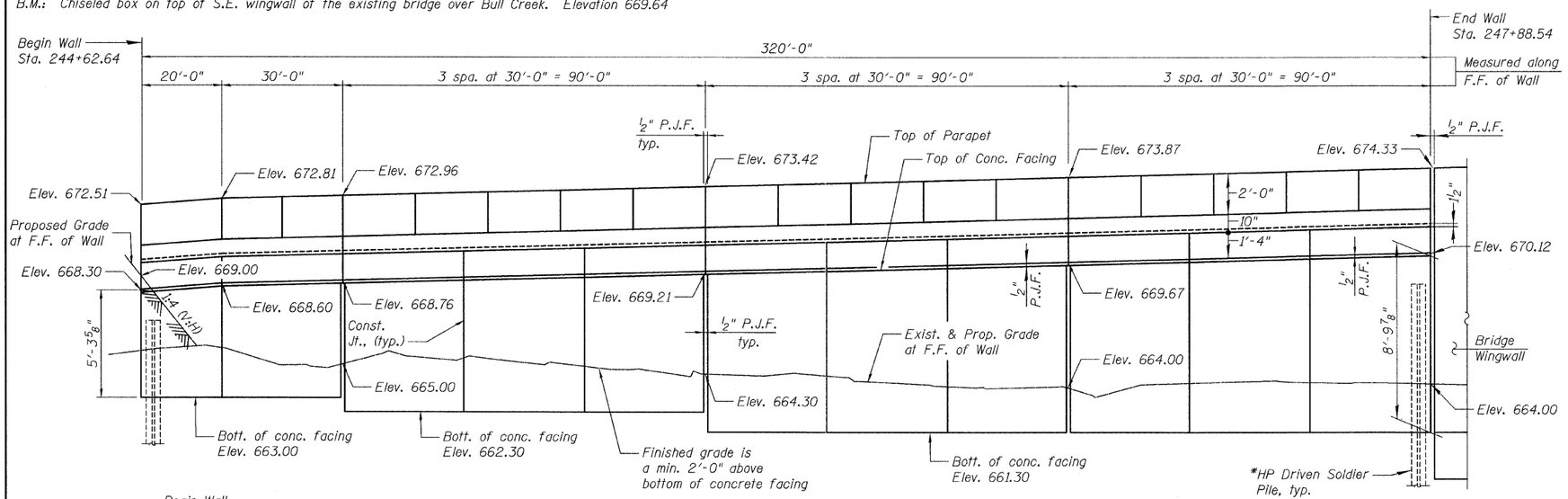
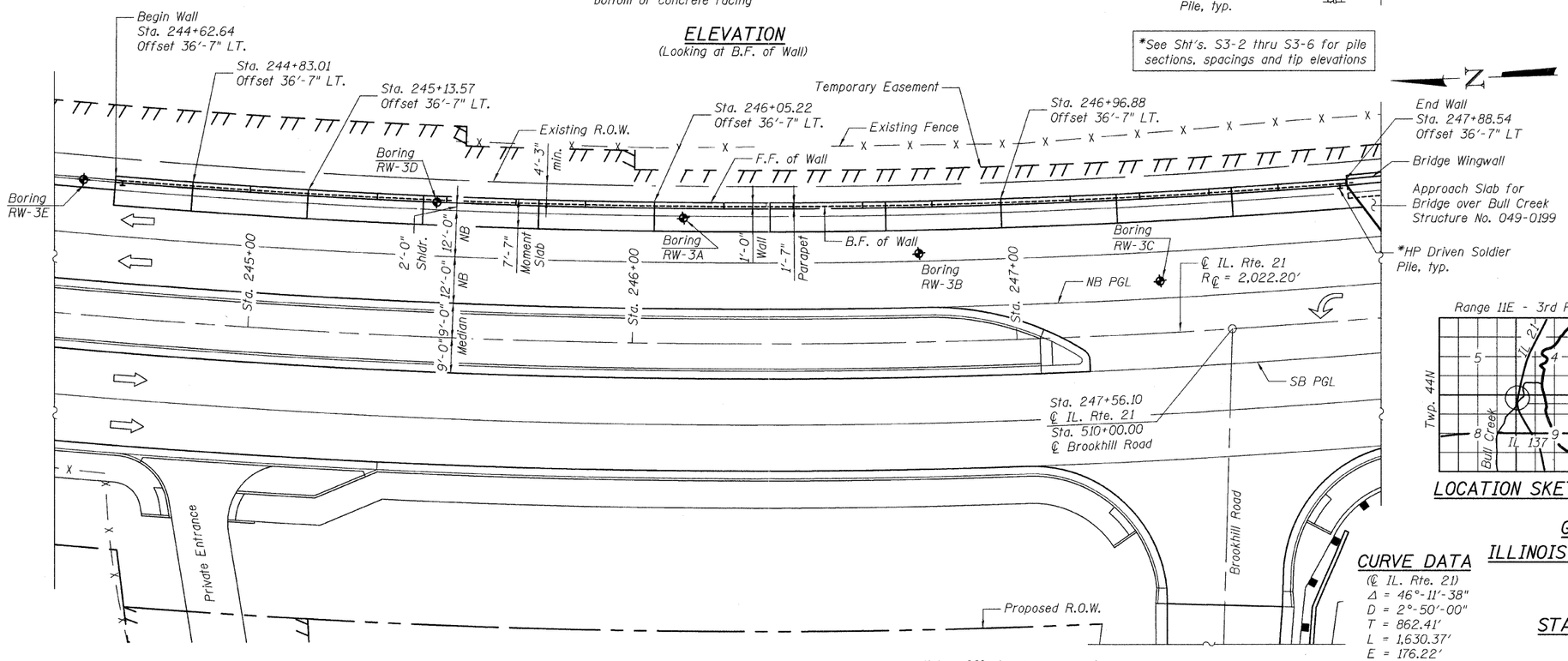
B.M.: Chiseled box on top of S.E. wingwall of the existing bridge over Bull Creek. Elevation 669.64



ELEVATION
(Looking at B.F. of Wall)

*See Sht's. S3-2 thru S3-6 for pile sections, spacings and tip elevations

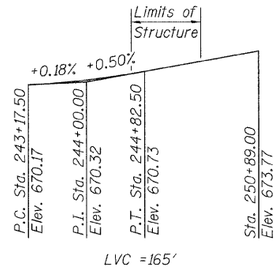


PLAN

Note: Offsets are measured from the ℄ of IL. Rte. 21

Indicates Boring Locations

INDEX OF SHEETS



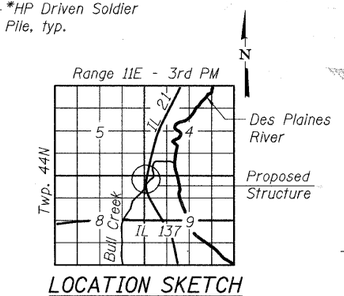
PROFILE GRADE
(along NB PGL)

DESIGN STRESSES
FIELD UNITS

f'_c = 3,500 psi
f_y = 60,000 psi (Reinforcement)
f_y = 36,000 psi (Structural Steel AASHTO M 270, Gr. 36 Soldier Piles)

DESIGN SPECIFICATIONS
AASHTO 2002 Standard Specifications for Highway Bridges

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
ENGINEER OF BRIDGES AND STRUCTURES



LOCATION SKETCH

CURVE DATA
(℄ IL. Rte. 21)
Δ = 46°-11'-38"
D = 2°-50'-00"
T = 862.41'
L = 1,630.37'
E = 176.22'
R = 2,022.20'
S.E. = 2.90%
P.C. Sta. = 243+66.70
P.T. Sta. = 259+97.07
P.I. Sta. = 252+29.11

BHADRESH N. SHAH AUG. 15, 2011
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21 - RETAINING WALL NO. 3
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 244+62.64 TO 247+88.54
STRUCTURE NO. 049-W019

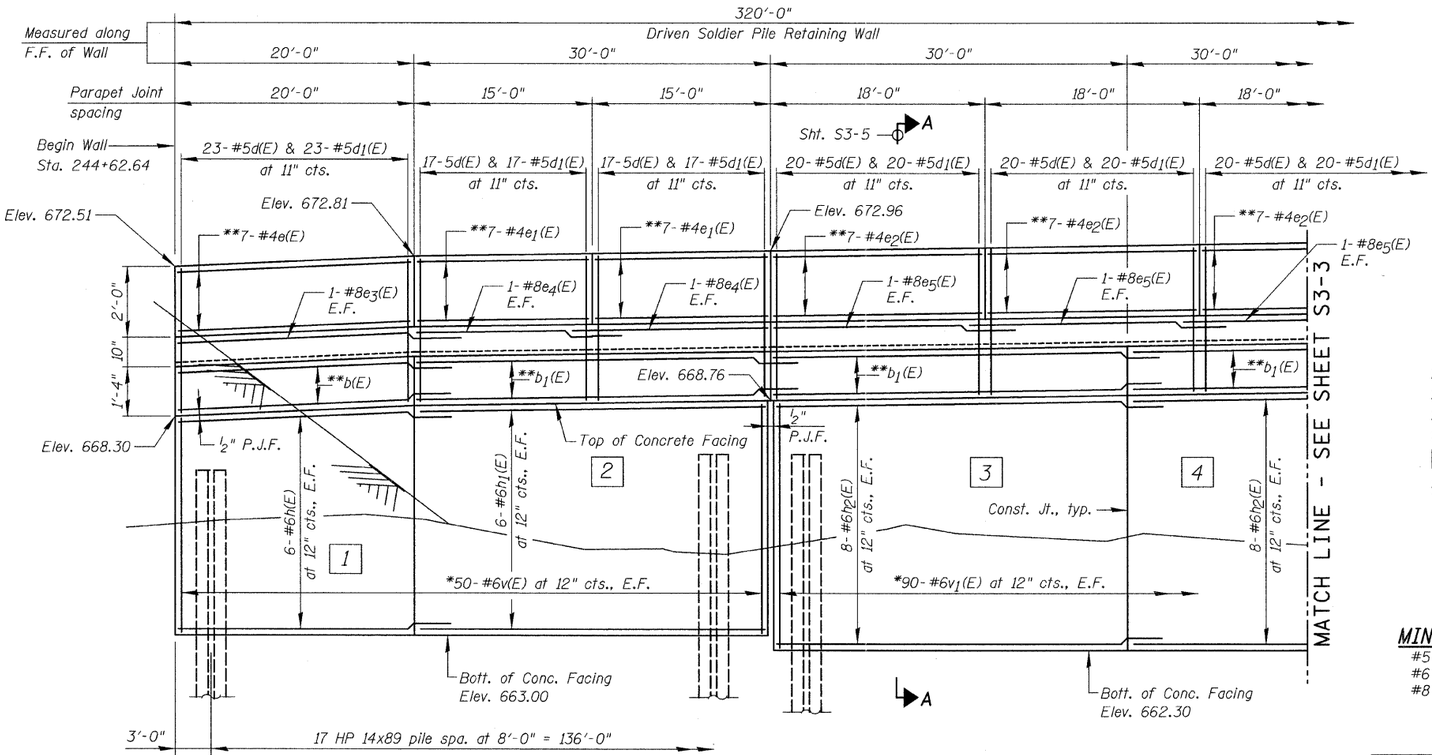
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D1681953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

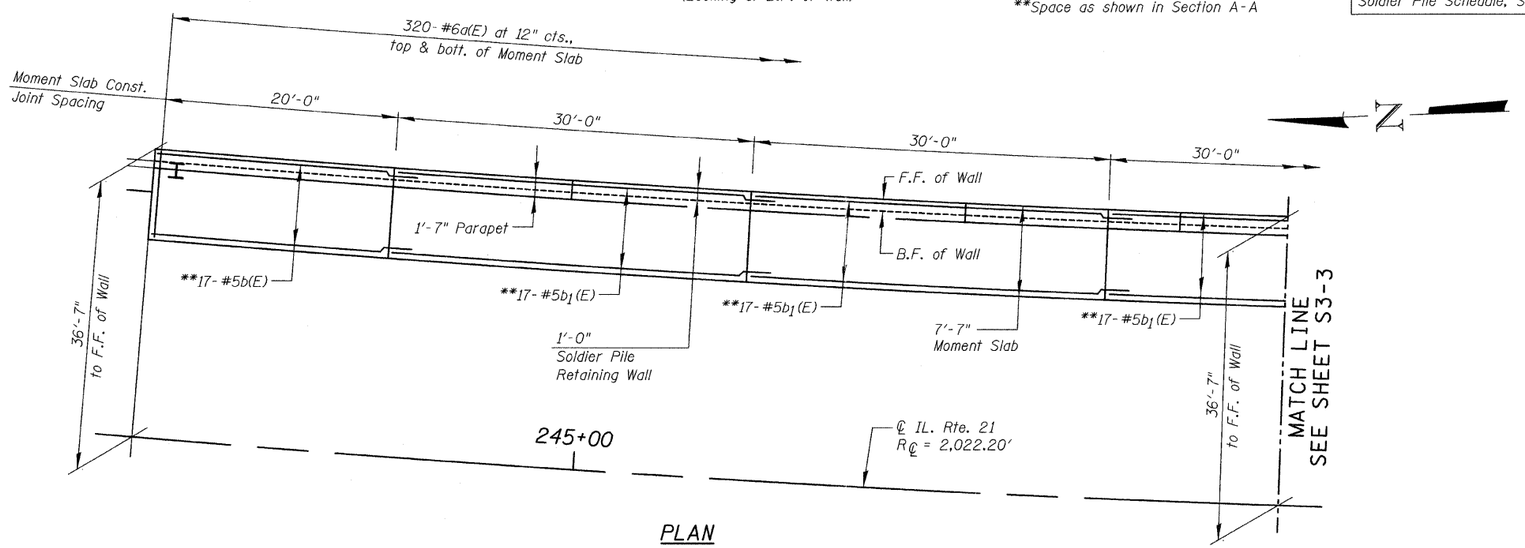
GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-W019
SHEET NO. S3-1 OF S3-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	301
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



ELEVATION
(Looking at B.F. of Wall)

*Cut in field to fit
**Space as shown in Section A-A



PLAN

NOTE:
For Pile Tip Elevations, see Soldier Pile Schedule, Sht. S3-6

GENERAL NOTES:

1. The Contractor is responsible for the design and performance of the lagging using no less than a 3 in. nominal rough-sawn thickness and timber with a minimum allowable bending stress of 1000 psi.
2. Pipe Underdrain Outlet Pipes shall drain into concrete headwalls. See Article 601.05 of the Standard Specifications and see Highway Standard 601101.
3. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
4. All Exposed Concrete edges shall be chamfered 3/4" unless otherwise noted.
5. Reinforcement Bars designated (E) shall be Epoxy Coated.

LEGEND:

E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
[1] = Panel Numbers
(1) = Pile Numbers

MIN. BAR LAP:

#5 bars = 2'-6"
#6 bars = 3'-0"
#8 bars = 5'-2"

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Structure Excavation	Cu. Yd.	135
Concrete Structures	Cu. Yd.	88.4
Concrete Superstructure	Cu. Yd.	150.2
Form Liner Textured Surface	Sq. Ft.	1,828
Stud Shear Connectors	Each	1,480
Reinforcement Bars, Epoxy Coated	Pound	36,620
Geocomposite Wall Drain	Sq. Yd.	133
Untreated Timber Lagging	Sq. Ft.	1,765
Furnishing Soldier Piles (HP Section)	Foot	1,067
Pipe Underdrains for Structures 4"	Foot	325
Driving Soldier Piles	Foot	1,067
Stain For Concrete Structures	Sq. Yd.	204

PLAN & ELEVATION-I
STRUCTURE NO. 049-W019

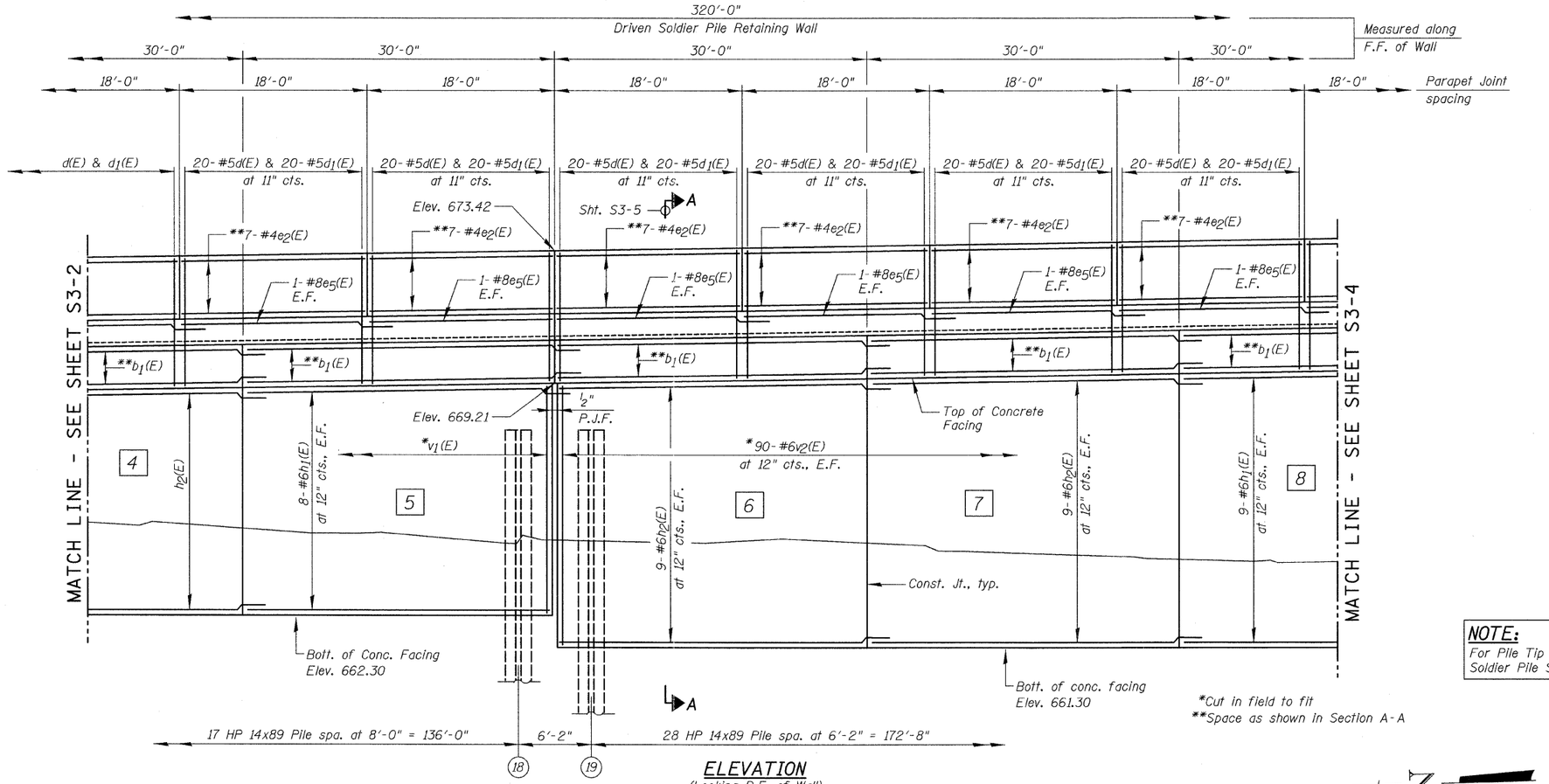
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-02-plan_elev-1.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN & ELEVATION-I
STRUCTURE NO. 049-W019
SHEET NO. S3-2 OF S3-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	302
		CONTRACT NO. 60953		
		ILLINOIS	FED. AID PROJECT	



LEGEND:

E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
[1] = Panel Numbers
(1) = Pile Numbers

MIN. BAR LAP:

#5 bars = 2'-6"
#6 bars = 3'-0"
#8 bars = 5'-2"

NOTE:

For Pile Tip Elevations, see Soldier Pile Schedule, Sht. S3-6

PLAN & ELEVATION-II
STRUCTURE NO. 049-W019

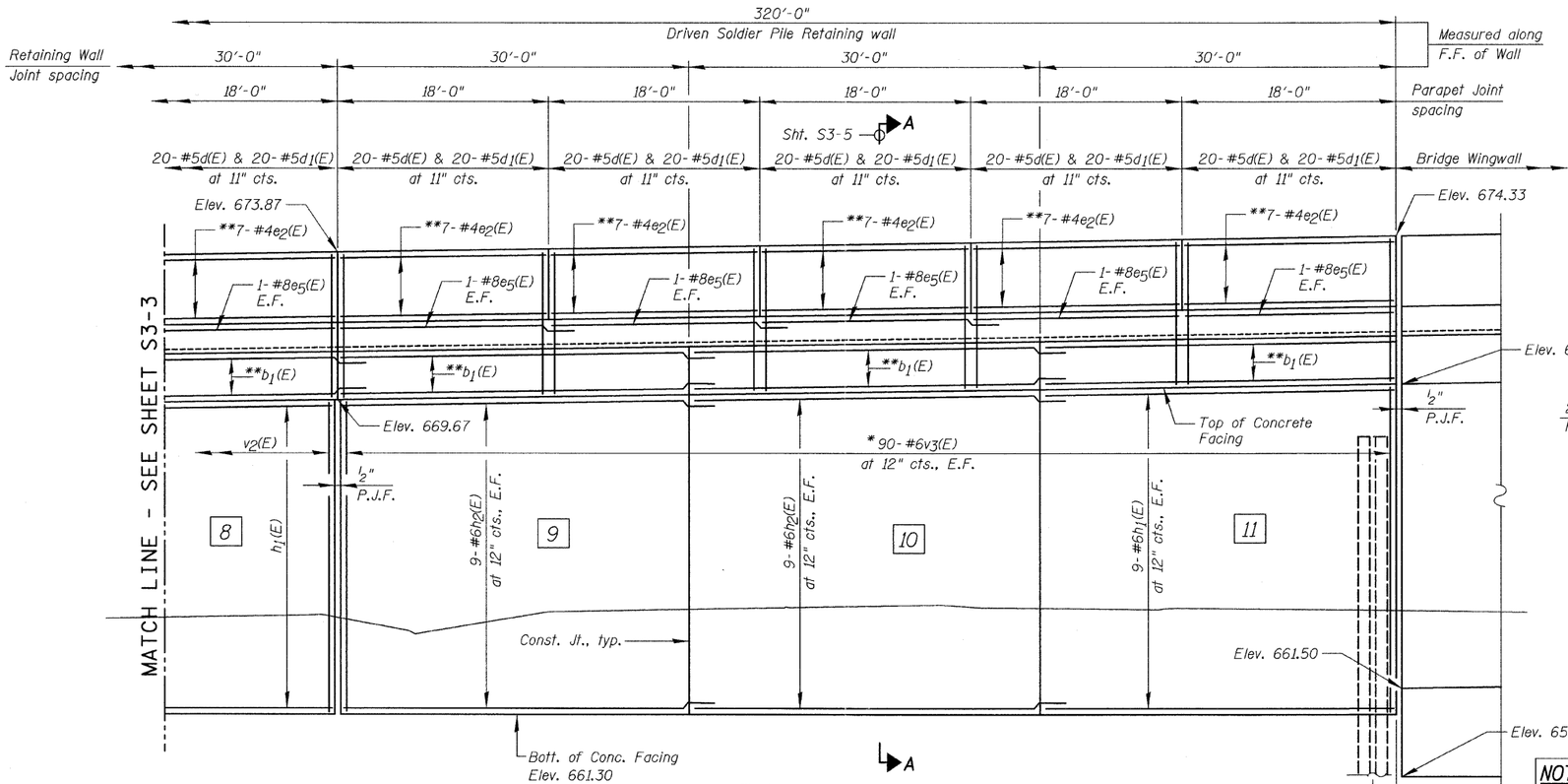
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-03-plan_elev-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

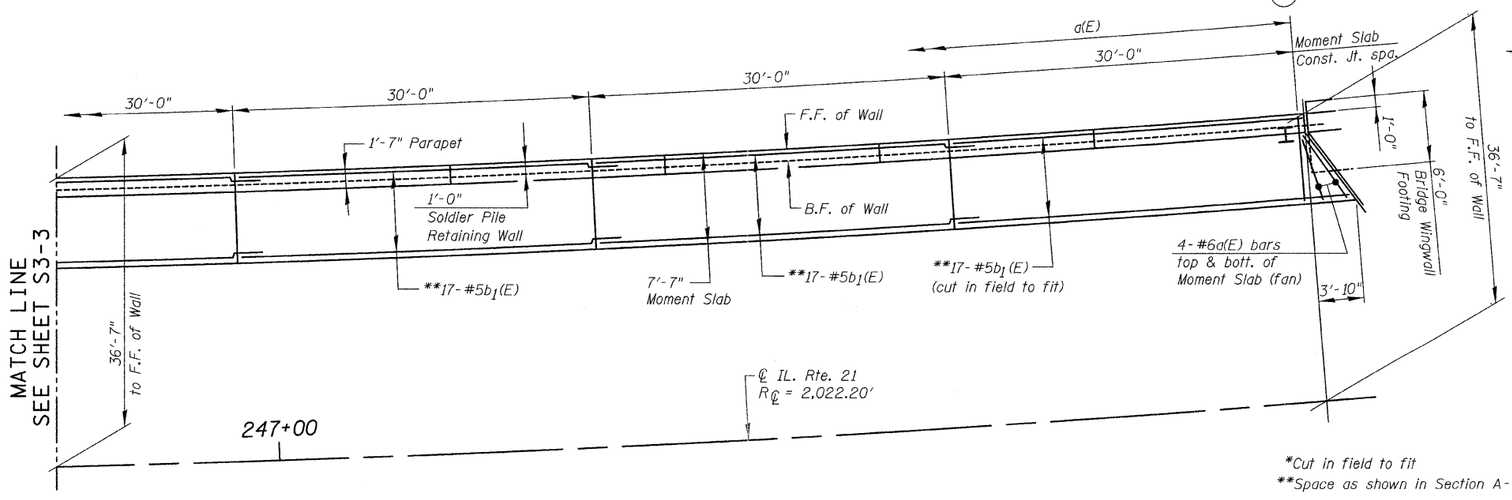
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN & ELEVATION-II
STRUCTURE NO. 049-W019
SHEET NO. S3-3 OF S3-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	303
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

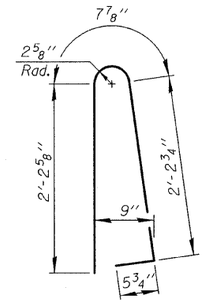


ELEVATION
(Looking at B.F. of Wall)

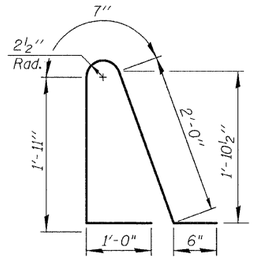


PLAN

*Cut in field to fit
**Space as shown in Section A-A



BAR d(E)



BAR d_1(E)

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
d(E)	648	#6	7'-3"	——
b(E)	17	#5	22'-6"	——
b_1(E)	170	#5	32'-6"	——
d(E)	357	#5	5'-7"	⌐
d_1(E)	357	#5	6'-0"	⌐
e(E)	7	#4	19'-9"	——
e1(E)	14	#4	14'-9"	——
e2(E)	105	#4	17'-9"	——
e3(E)	2	#8	25'-2"	——
e4(E)	4	#8	17'-6"	——
e5(E)	30	#8	22'-1"	——
h(E)	12	#6	23'-0"	——
h_1(E)	64	#6	29'-9"	——
h_2(E)	104	#6	33'-0"	——
v(E)	100	#6	5'-6"	——
v1(E)	180	#6	6'-7"	——
v2(E)	180	#6	8'-1"	——
v3(E)	180	#6	8'-6"	——
Reinforcement Bars, Epoxy Coated		Pound	36,620	
Concrete Structures		Cu. Yd.	88.4	
Concrete Superstructure		Cu. Yd.	150.2	

NOTE:
For Pile Tip Elevations, see Soldier Pile Schedule, Sht. S3-6

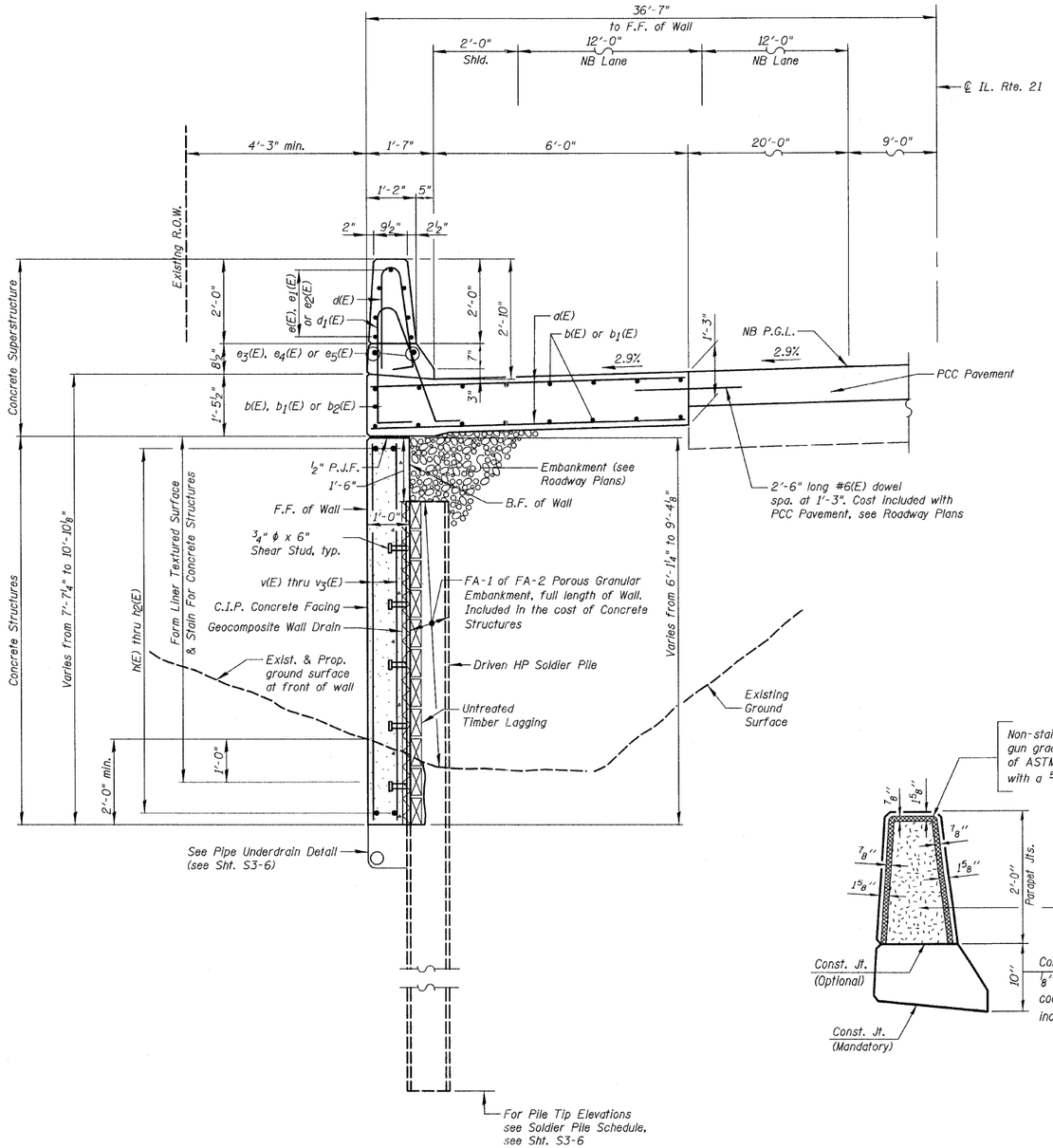
MIN. BAR LAP:
#5 bars = 2'-6"
#6 bars = 3'-0"
#8 bars = 5'-2"

LEGEND:
E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
[1] = Panel Numbers
(1) = Pile Numbers

PLAN & ELEVATION-III
STRUCTURE NO. 049-W019

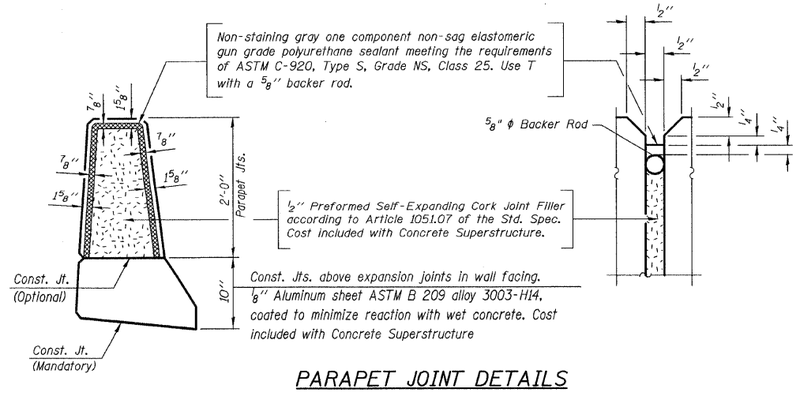
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = 0168953-04-plan_elev-III.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PLAN & ELEVATION-III STRUCTURE NO. 049-W019	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	304
	PLOT SCALE =	DRAWN - F.M.	REVISED -						CONTRACT NO. 60953	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. S3-4 OF S3-9 SHEETS			ILLINOIS	FED. AID PROJECT	



SECTION A-A

DRIVEN SOLDIER PILE

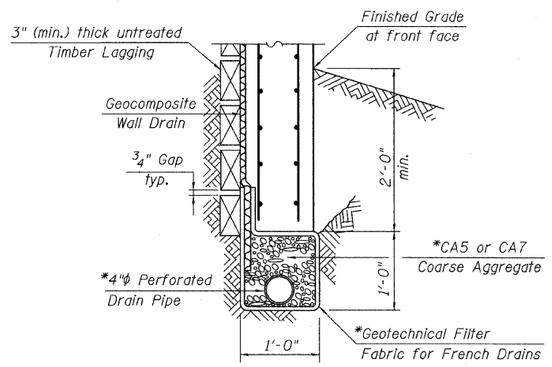


PARAPET JOINT DETAILS

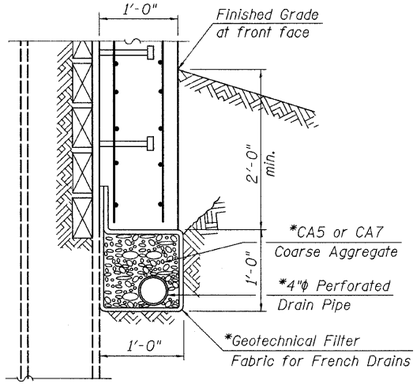
RETAINING WALL SECTION
STRUCTURE NO. 049-W019

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D168953-05-ret_wall_sect.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	RETAINING WALL SECTION STRUCTURE NO. 049-W019	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	305
	PLOT SCALE =	DRAWN - F.M.	REVISED -					CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. S3-5 OF S3-9 SHEETS		ILLINOIS FED. AID PROJECT			



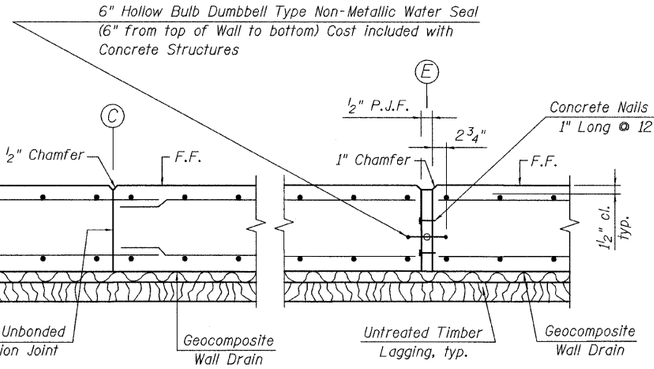
BETWEEN SOLDIER PILES



AT SOLDIER PILES

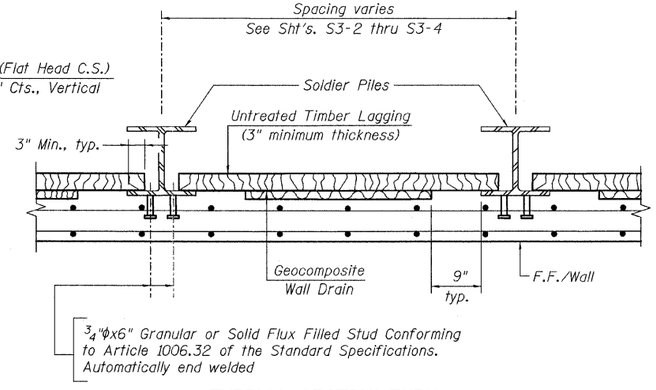
*Included in the cost of
Pipe Underdrains for Structures 4"

PIPE UNDERDRAIN DETAIL



CONSTRUCTION JOINT EXPANSION JOINT

END OF PANEL DETAILS



TYPICAL SECTION THRU
SOLDIER PILE WALL

SOLDIER PILE RETAINING WALL NO. 3 SOLDIER PILE SCHEDULE

PILE NO.	PILE SIZE	TOP/PILE ELEV.	TIP/PILE ELEV.	APPROX. PILE LENGTH (FT.)	NO. STUD PER PILE	STUD SPACING
1	HP 14x 89	666.85	650.25	16.59	2 x 10 = 20	9 SPA. @ 4.75 IN = 3'-6"
2	HP 14x 89	666.97	648.25	18.71	2 x 10 = 20	9 SPA. @ 4.75 IN = 3'-6"
3	HP 14x 89	667.09	646.25	20.83	2 x 11 = 22	10 SPA. @ 4.50 IN = 3'-9"
4	HP 14x 89	667.14	645.00	22.14	2 x 11 = 22	10 SPA. @ 4.75 IN = 3'-11"
5	HP 14x 89	667.18	645.00	22.18	2 x 11 = 22	10 SPA. @ 4.75 IN = 3'-11"
6	HP 14x 89	667.22	645.00	22.22	2 x 11 = 22	10 SPA. @ 4.75 IN = 3'-11"
7	HP 14x 89	667.26	643.50	23.76	2 x 13 = 26	12 SPA. @ 4.75 IN = 4'-9"
8	HP 14x 89	667.30	643.50	23.80	2 x 13 = 26	12 SPA. @ 4.75 IN = 4'-9"
9	HP 14x 89	667.34	643.50	23.84	2 x 13 = 26	12 SPA. @ 4.75 IN = 4'-9"
10	HP 14x 89	667.38	643.50	23.88	2 x 13 = 26	12 SPA. @ 4.75 IN = 4'-9"
11	HP 14x 89	667.42	643.50	23.92	2 x 13 = 26	12 SPA. @ 4.75 IN = 4'-9"
12	HP 14x 89	667.46	643.50	23.96	2 x 13 = 26	12 SPA. @ 4.75 IN = 4'-9"
13	HP 14x 89	667.50	643.50	24.00	2 x 14 = 28	13 SPA. @ 4.50 IN = 4'-10"
14	HP 14x 89	667.54	643.50	24.04	2 x 14 = 28	13 SPA. @ 4.50 IN = 4'-10"
15	HP 14x 89	667.58	642.50	25.08	2 x 14 = 28	13 SPA. @ 4.50 IN = 4'-10"
16	HP 14x 89	667.62	642.50	25.12	2 x 14 = 28	13 SPA. @ 4.75 IN = 5'-1"
17	HP 14x 89	667.66	642.50	25.16	2 x 14 = 28	13 SPA. @ 4.75 IN = 5'-1"
18	HP 14x 89	667.71	642.50	25.21	2 x 14 = 28	13 SPA. @ 4.75 IN = 5'-1"
19	HP 14x 89	667.74	642.00	25.74	2 x 17 = 34	16 SPA. @ 4.50 IN = 6'-0"
20	HP 14x 89	667.77	642.00	25.77	2 x 17 = 34	16 SPA. @ 4.50 IN = 6'-0"
21	HP 14x 89	667.80	642.00	25.80	2 x 17 = 34	16 SPA. @ 4.50 IN = 6'-0"
22	HP 14x 89	667.83	642.00	25.83	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
23	HP 14x 89	667.86	642.00	25.86	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
24	HP 14x 89	667.89	642.00	25.89	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
25	HP 14x 89	667.93	642.00	25.93	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
26	HP 14x 89	667.96	642.00	25.96	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
27	HP 14x 89	667.99	642.00	25.99	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
28	HP 14x 89	668.02	642.00	26.02	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
29	HP 14x 89	668.05	642.00	26.05	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
30	HP 14x 89	668.08	642.00	26.08	2 x 17 = 34	16 SPA. @ 4.75 IN = 6'-4"
31	HP 14x 89	668.11	642.00	26.11	2 x 18 = 36	17 SPA. @ 4.50 IN = 6'-4"
32	HP 14x 89	668.15	642.00	26.15	2 x 18 = 36	17 SPA. @ 4.50 IN = 6'-4"
33	HP 14x 89	668.18	642.00	26.18	2 x 18 = 36	17 SPA. @ 4.50 IN = 6'-4"
34	HP 14x 89	668.21	642.00	26.21	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
35	HP 14x 89	668.24	642.00	26.24	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
36	HP 14x 89	668.27	642.00	26.27	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
37	HP 14x 89	668.30	642.00	26.30	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
38	HP 14x 89	668.33	642.00	26.33	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
39	HP 14x 89	668.37	642.00	26.37	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
40	HP 14x 89	668.40	642.00	26.40	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
41	HP 14x 89	668.43	642.00	26.43	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
42	HP 14x 89	668.46	642.00	26.46	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
43	HP 14x 89	668.49	642.00	26.49	2 x 18 = 36	17 SPA. @ 4.75 IN = 6'-8"
44	HP 14x 89	668.52	642.00	26.52	2 x 19 = 38	18 SPA. @ 4.50 IN = 6'-9"
45	HP 14x 89	668.55	642.00	26.55	2 x 19 = 38	18 SPA. @ 4.50 IN = 6'-9"
46	HP 14x 89	668.58	642.00	26.58	2 x 19 = 38	18 SPA. @ 4.50 IN = 6'-9"
47	HP 14x 89	668.62	642.00	26.62	2 x 19 = 38	18 SPA. @ 4.75 IN = 7'-1"
			TOTAL	1,067	1,480	

SOLDIER PILE SCHEDULE & DETAILS
STRUCTURE NO. 049-W019

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D1601953-06-sched_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOLDIER PILE SCHEDULE & DETAILS
STRUCTURE NO. 049-W019
SHEET NO. S3-6 OF S3-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	306
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3A

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 663.82 ft
North: 2056808.72 ft
East: 1084324.59 ft
Station: 246+13
Offset: 32.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	663.8	Medium Stiff, dark brown SILTY CLAY LOAM --FILL--	0					
	662.3	Brown SILTY LOAM, some gravel, wet --FILL--			1	3 5 5	0.90 B	20
	660.8	Medium dense, light gray SILTY GRAVEL, wet	5		2	8 8 7	NP	10
					3	5 10 11	NP	8
			10		4	7 10 13	NP	9
	652.8	Stiff to hard, gray CLAY, trace gravel			5	4 5 8	5.17 B	17
			15		6	4 5 11	3.77 B	17
	646.8	Medium dense, gray SILTY LOAM, wet			7	2 8 16	1.23 B	32
			20		8	6 6 7	NP	13
	643.3	Very stiff SILTY CLAY LOAM, trace gravel			9	5 8 26/3"	3.54 B	13
	641.3	--AUGER REFUSAL-- Boring terminated at 22.50 ft	25					
			30					
			35					
			40					

GENERAL NOTES

Begin Drilling 05-03-2001 Complete Drilling 05-03-2001
Drilling Contractor Windy City Drilling Drill Rig CME 45
Driller Gabriel Logger T. Chen Checked by P. Wang
Drilling Method 3.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling ▽ 4.20 ft
At Completion of Drilling ▼ 1.50 ft
Time After Drilling 24 hours
Depth to Water ▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.INC 7222301.GPJ MANGENG.GDT 11/5/10

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3B

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 663.41 ft
North: 2056736.90 ft
East: 1084316.62 ft
Station: 246+75
Offset: 23.0 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	663.4	Stiff, brown SILTY CLAY LOAM --FILL--	0					
					1	3 3 3	1.00 P	16
	659.4	Medium stiff, black CLAY LOAM --FILL--	5		2	2 1 2	0.50 P	47
	657.9	Medium dense to dense, gray SILTY GRAVEL, wet			3	7 12 28	NP	22
			10		4	9 22 29	NP	7
					5	13 12 7	NP	8
	650.4	Very stiff to hard, gray CLAY, trace gravel	15		6	7 9 12	5.58 B	16
					7	3 4 8	1.97 B	32
	645.4	Medium dense, gray SILTY LOAM, wet	20		8	11 10 8	NP	13
	642.9	Hard, gray SILTY CLAY LOAM, trace gravel			9	5 6 8	4.26 B	14
	640.4	Medium dense to dense SANDY LOAM, wet	25		10	6 7 13	NP	16
					11	9 11 14	NP	22
			30		12	6 10 9	NP	19
	628.4	Boring terminated at 35.00 ft	35		13	6 14 28	NP	20
			40					

GENERAL NOTES

Begin Drilling 05-03-2001 Complete Drilling 05-03-2001
Drilling Contractor Windy City Drilling Drill Rig CME 45
Driller Gabriel Logger T. Chen Checked by P. Wang
Drilling Method 3.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling ▽ 6.00 ft
At Completion of Drilling ▼ 3.20 ft
Time After Drilling 24 hours
Depth to Water ▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.INC 7222301.GPJ MANGENG.GDT 11/5/10

SOIL BORING LOGS-I
STRUCTURE NO. 049-W019

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-07-boring_logs-1.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

SOIL BORING LOGS-I
STRUCTURE NO. 049-W019
SHEET NO. S3-7 OF S3-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	307
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3C

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 663.84 ft
North: 2056664.46 ft
East: 1084311.66 ft
Station: 247+38
Offset: 13.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	663.54	4-inch thick ASPHALT --PAVEMENT--						
		Medium stiff to stiff, brown to black CLAY LOAM --FILL--			1	4 4 8	1.00 P	12
			5		2	4 4 4	0.50 P	19
	657.5	Medium stiff, black CLAY LOAM, with organic matter --BURIED TOPSOIL--			3	3 2 3	0.50 P	46
	655.3	Medium dense, gray gravel (Relocate boring)	10		4	8 9 6	NP	14
	652.8	Medium dense, gray SANDY LOAM, little gravel			5	10 9 6	NP	10
	649.5	Very stiff to hard, gray CLAY LOAM	15		6	10 5 10	5.50 B	14
	647.1	Brown, fine SAND			7	5 8 14	3.00 B	20
	645.0	Stiff, gray SILTY CLAY LOAM	20		8	3 5 4	1.50 P	16
	643.3	Loose to medium dense, light brown, fine SAND			9	1 3 5	NP B	20
			25		10	5 7 18	NP	22
	638.3	Medium dense, brown SANDY LOAM			11	11 14 16	NP	16
		Must relocate boring to complete	30		12	16 18 14	NP	19
	626.8		35		13	1 1 1	NP	19
			40		14		NP	

GENERAL NOTES

Begin Drilling: 04-11-2001 Complete Drilling: 04-22-2001
Drilling Contractor: Rock and Soil Drilling Drill Rig: D-120
Driller: Dave Logger: T. Chen Checked by: P. Wang
Drilling Method: 2.75" ID HSA; backfilled w/ bentonite chip and AC blacktop.

WATER LEVEL DATA

While Drilling: ▽ 8.50 ft
At Completion of Drilling: ▼
Time After Drilling: 24 hours
Depth to Water: ▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG WANGENG.GDT 11/5/10
722301.GPJ

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3C

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 663.84 ft
North: 2056664.46 ft
East: 1084311.66 ft
Station: 247+38
Offset: 13.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		15		NP	
			50		16		NP	
		Boring terminated at 55.00 ft	55		17		NP	
			60					

GENERAL NOTES

Begin Drilling: 04-11-2001 Complete Drilling: 04-22-2001
Drilling Contractor: Rock and Soil Drilling Drill Rig: D-120
Driller: Dave Logger: T. Chen Checked by: P. Wang
Drilling Method: 2.75" ID HSA; backfilled w/ bentonite chip and AC blacktop.

WATER LEVEL DATA

While Drilling: ▽ 8.50 ft
At Completion of Drilling: ▼
Time After Drilling: 24 hours
Depth to Water: ▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG WANGENG.GDT 11/5/10
722301.GPJ

SOIL BORING LOGS-II
STRUCTURE NO. 049-W019

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-08-boring_logs-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	**SOIL BORING LOGS-II STRUCTURE NO. 049-W019**
	PLOT SCALE =	DRAWN - F.M.	REVISED -	SHEET NO. S3-8 OF S3-9 SHEETS
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	308
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3E

WEI Job No.: 950-12-01

Client: Christian-Roge & Associates, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 665.00 ft
North: 2056861.73 ft
East: 1084300.14 ft
Station: 244+54.90
Offset: 34.70 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	664.2	10-inch thick, black CLAY LOAM --TOPSOIL--						
		Medium dense, brown SANDY LOAM, little gravel			1	8 8 14	NP	16
	662.2	Medium dense, brown GRAVELLY SAND	5		2	6 11 14	NP	12
	659.8	Dense, gray SANDY GRAVEL			3	10 17 19	NP	13
	657.9	Medium dense, gray GRAVELLY SAND	10		4	7 9 13	NP	14
	652.0	Very stiff to hard, gray CLAY, trace gravel	15		5	15 15 6	NP	11
					6	3 7 10	3.85 B	22
					7	7 16 21	5.41 B	12
			20		8	6 11 19	5.66 B	13
	644.5	Medium dense, gray, fine, poorly-graded SAND			9	21 7 7	NP	29
			25		10	7 10 13	NP	26
					11	6 10 13	NP	20
	635.0	Boring terminated at 30.00 ft	30		12	7 11 15	NP	19
			35					
			40					

GENERAL NOTES		WATER LEVEL DATA	
Begin Drilling: 03-17-2011	Complete Drilling: 03-17-2011	While Drilling: ▽	3.50 ft
Drilling Contractor: WTS	Drill Rig: Mobile B-57 TMR	At Completion of Drilling: ▼	3.50 ft
Driller: K&R	Logger: F. Bozga Checked by: M. Snider	Time After Drilling:	NA
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion		Depth to Water: ▽	NA
		The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.	

WANGENG.GDT 4/5/11
WANGENG.INC 950120I.GPJ

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3D

WEI Job No.: 950-12-01

Client: Christian-Roge & Associates, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 665.00 ft
North: 2056772.85 ft
East: 1084284.06 ft
Station: 245+46.95
Offset: 34.90 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	664.2	10-inch thick, black CLAY LOAM --TOPSOIL--						
		Medium dense, brown SANDY LOAM, little gravel			1	4 5 10	NP	15
	662.0	Medium dense to dense, gray GRAVELLY SAND	5		2	6 8 11	NP	8
					3	11 12 12	NR	
			10		4	7 15 17	NP	10
	654.5	Very stiff to hard, gray CLAY, trace gravel	15		5	6 7 10	3.28 B	20
					6	4 6 10	2.54 B	24
					7	9 10 15	4.59 B	15
			20		8	5 10 11	3.50 P	15
	644.5	Medium dense, gray SILT to SILTY LOAM			9	9 11 15	NP	19
			25		10	7 11 15	NP	22
	640.0	Medium dense, gray, fine, poorly-graded SAND			11	7 10 12	NP	29
	635.0	Boring terminated at 30.00 ft	30		12	9 10 10	NP	21
			35					
			40					

GENERAL NOTES		WATER LEVEL DATA	
Begin Drilling: 03-17-2011	Complete Drilling: 03-17-2011	While Drilling: ▽	3.00 ft
Drilling Contractor: WTS	Drill Rig: Mobile B-57 TMR	At Completion of Drilling: ▼	1.00 ft
Driller: K&R	Logger: F. Bozga Checked by: M. Snider	Time After Drilling:	NA
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion		Depth to Water: ▽	NA
		The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.	

WANGENG.GDT 4/5/11
WANGENG.INC 950120I.GPJ

SOIL BORING LOGS-III
STRUCTURE NO. 049-W019

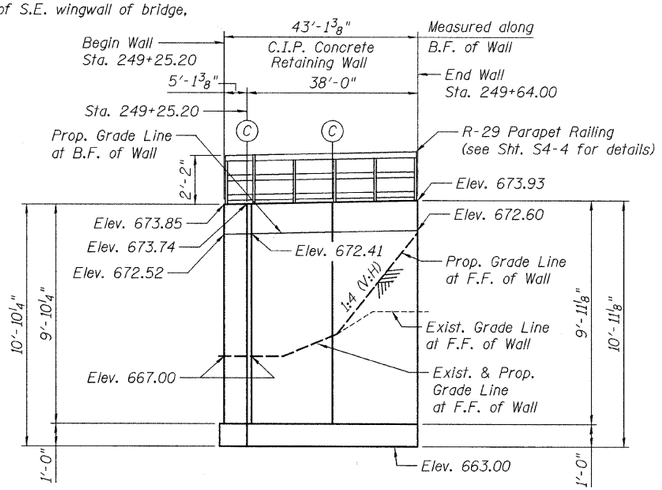
CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D1680953-09-boring_logs-III.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

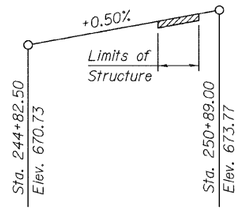
SOIL BORING LOGS–III
STRUCTURE NO. 049–W019
SHEET NO. S3-9 OF S3-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	309
		CONTRACT NO. 60953		
		ILLINOIS	FED. AID PROJECT	

Bench Mark:
Chiseled box on top of S.E. wingwall of bridge,
Elevation 669.64



ELEVATION
(Looking at B.F. of Wall)

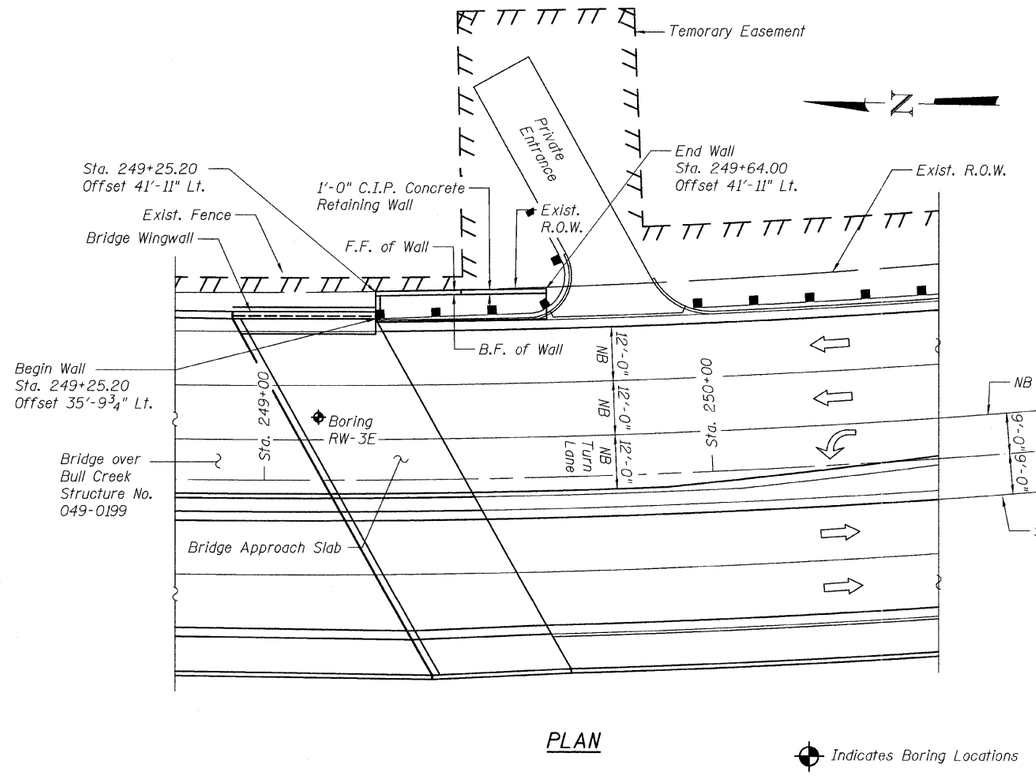


PROFILE GRADE
(along NB P.G.L.)

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Structure Excavation	Cu. Yd.	80
Concrete Structures	Cu. Yd.	25.2
Form Liner Textured Surface	Sq. Ft.	281
Reinforcement Bars, Epoxy Coated	Pound	3,950
Parapet Railing	Foot	43
Geocomposite Wall Drain	Sq. Yd.	15
Porous Granular Embankment, Special	Cu. Yd.	18
Stain For Concrete Structures	Sq. Yd.	33



PLAN

Indicates Boring Locations

CURVE DATA

℄ IL. Rte. 21)
Δ = 46°-11'-38"
D = 2°-50'-00"
T = 862.41'
L = 1,630.37'
E = 176.22'
R = 2,022.20'
S.E. = 2.90%
P.C. Sta. = 243+66.70
P.T. Sta. = 259+97.07
P.I. Sta. = 252+29.11

DESIGN SPECIFICATIONS

AASHTO 2002 Standard
Specifications for Highway Bridges

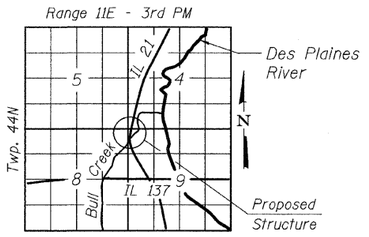
DESIGN STRESSES

FIELD UNITS

f'_c = 3,500 psi
f_y = 60,000 psi (Reinforcement)
f_y = 36,000 psi (Structural Steel)

LEGEND:

F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
Ⓒ = Construction Joint



LOCATION SKETCH

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
CHICAGO
LICENSED STRUCTURAL ENGINEER

BHADRESH N. SHAH AUG. 15, 2011
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21 - RETAINING WALL NO. 4
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 249+25.20 TO 249+64.00
STRUCTURE NO. 049-W020

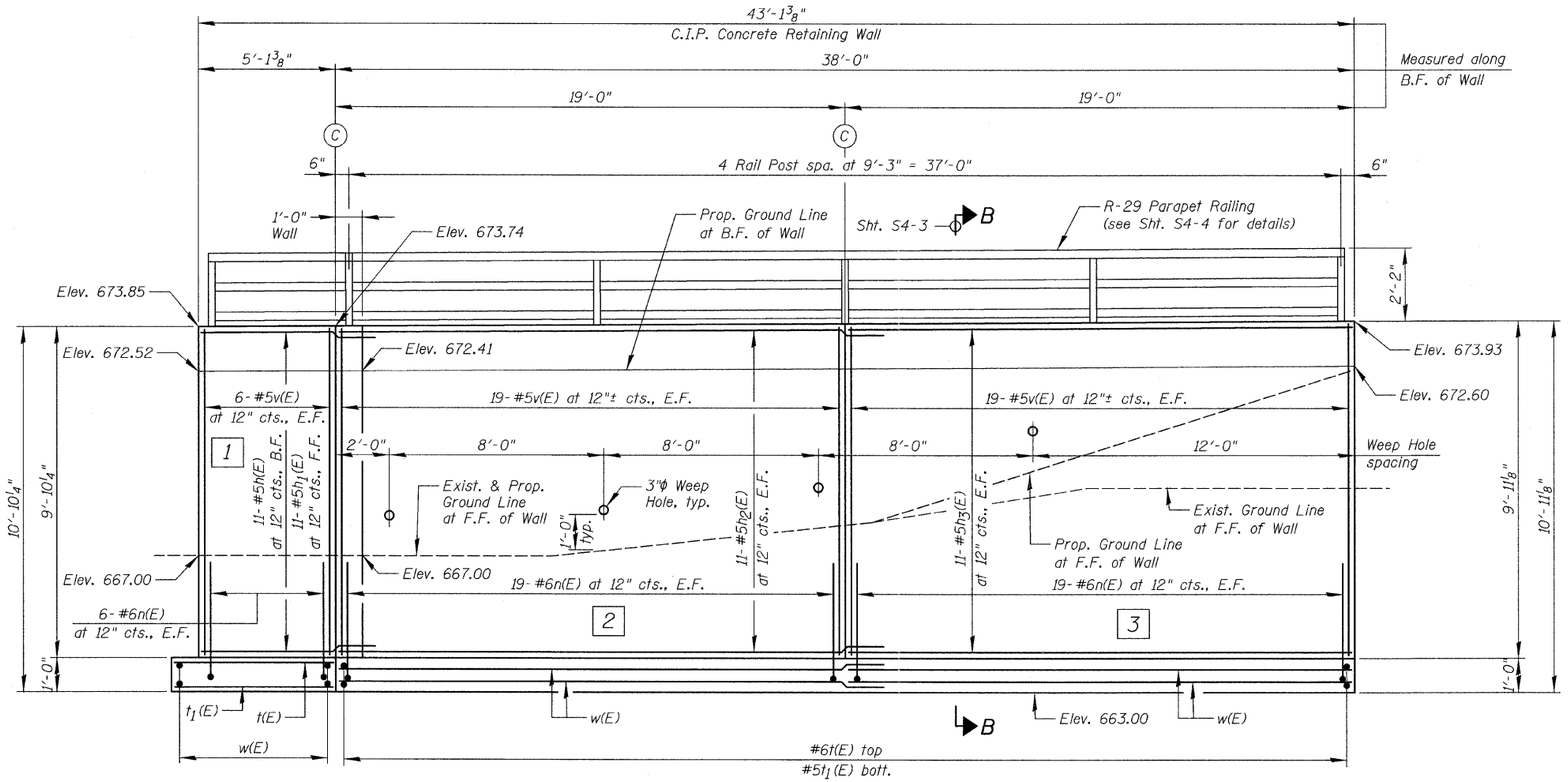
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D168953-01GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

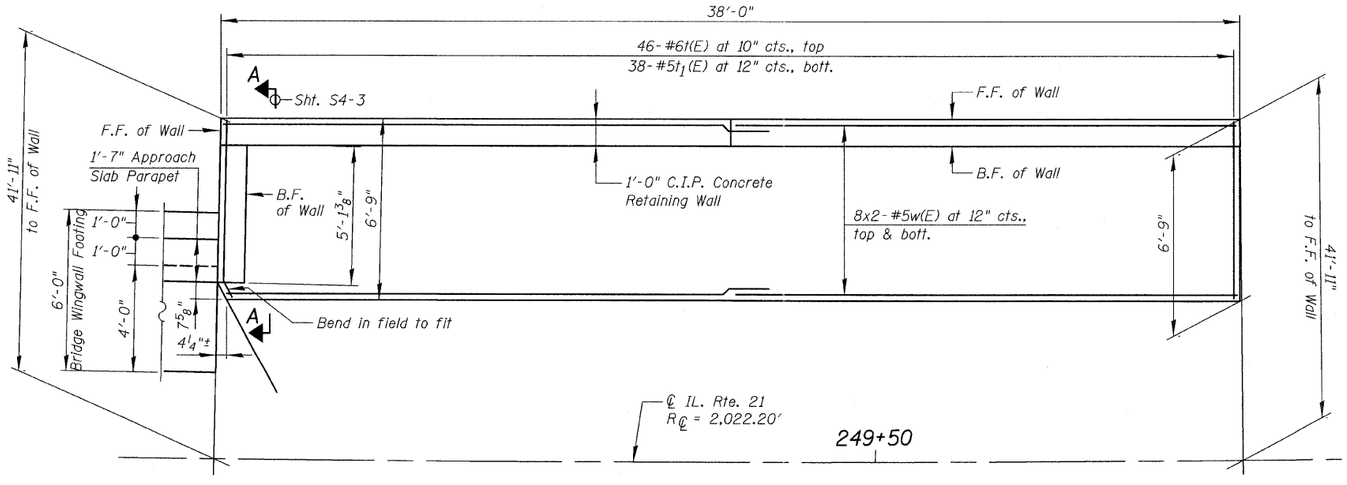
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-W020
SHEET NO. S4-1 OF S4-5 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	310
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



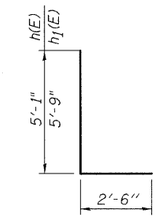
ELEVATION
(Looking at B.F. of Wall)



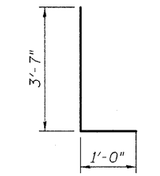
PLAN
(Showing Footing Reinforcement)

GENERAL NOTES:

1. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
2. All Exposed Concrete edges shall be chamfered 3/4" unless otherwise noted.
3. Reinforcement Bars designated (E) shall be Epoxy Coated.



BARS h(E) & h_1(E)



BAR nE)

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	11	#5	7'-7"	L
h_1(E)	11	#5	8'-3"	L
h_2(E)	22	#5	21'-6"	—
h_3(E)	22	#5	18'-8"	—
n(E)	88	#6	4'-7"	L
t(E)	46	#6	6'-5"	—
t_1(E)	38	#5	6'-5"	—
v(E)	88	#5	9'-6"	—
w(E)	32	#5	20'-1"	—
Reinforcement Bars, Epoxy Coated			Pound	3,950
Concrete Structures			Cu. Yd.	25.2

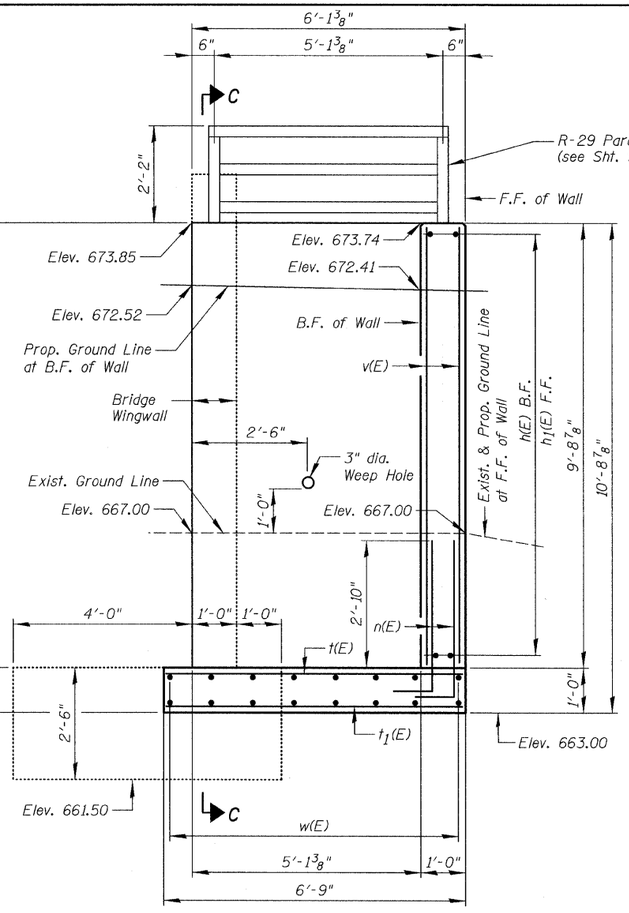
MIN. BAR LAP:
#5 bars = 2'-6"
#6 bars = 3'-0"

LEGEND:
E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
(C) = Construction Joint
[1] = Panel Numbers

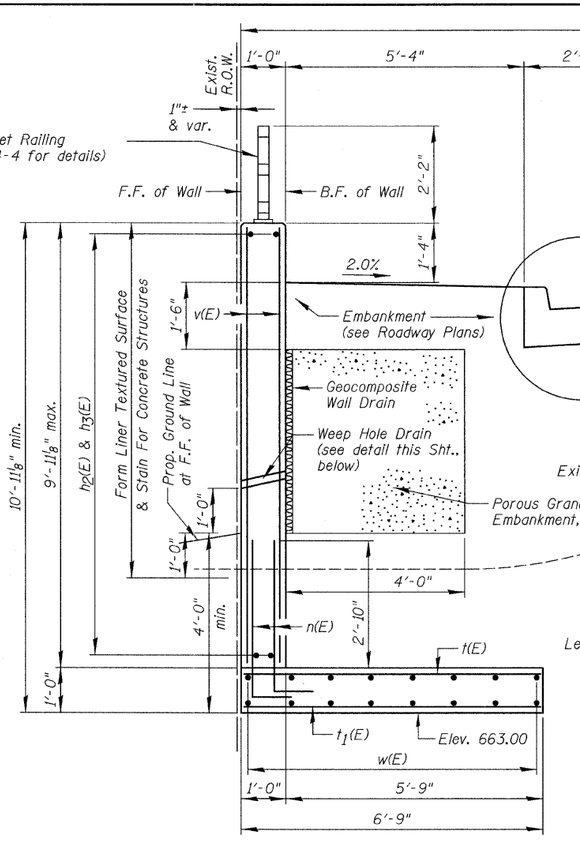
PLAN & ELEVATION
STRUCTURE NO. 049-W020

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-02-plan_elevation.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PLAN & ELEVATION STRUCTURE NO. 049-W020	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	311
	PLOT SCALE =	DRAWN - F.M.	REVISED -		SHEET NO. S4-2 OF S4-5 SHEETS			CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -				ILLINOIS FED. AID PROJECT			

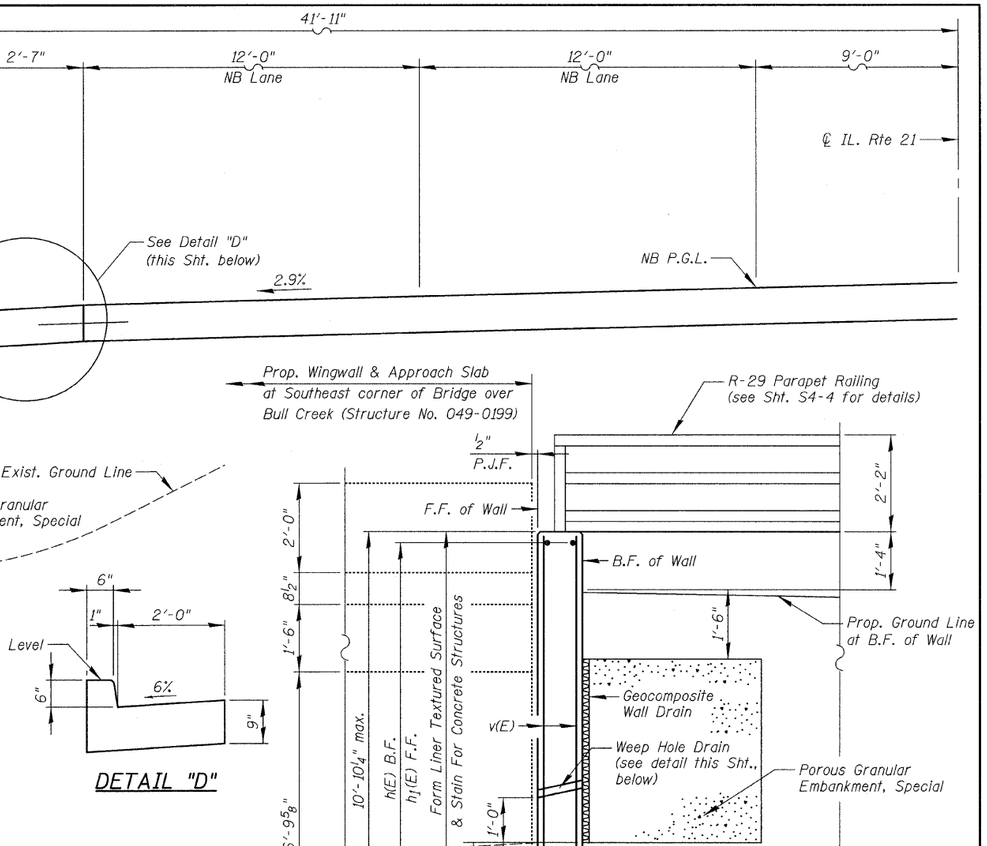


ELEVATION A-A

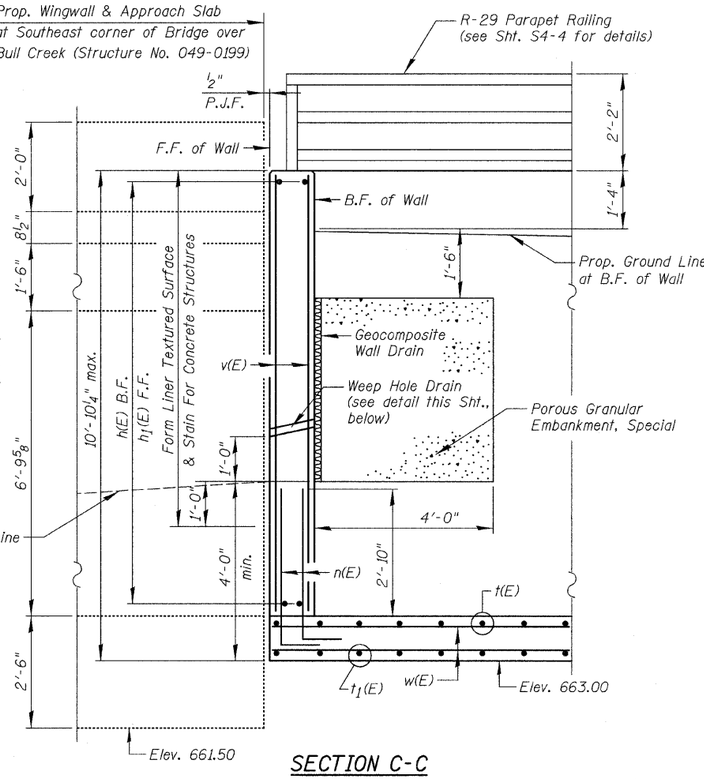


SECTION B-B

Maximum bearing pressure under footing = 2.9 ksf



DETAIL "D"

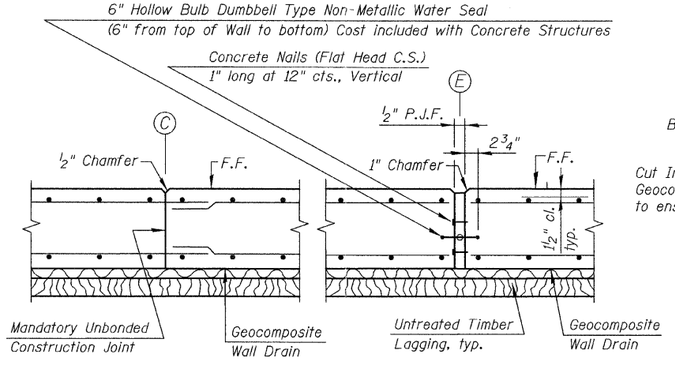


SECTION C-C

LEGEND:

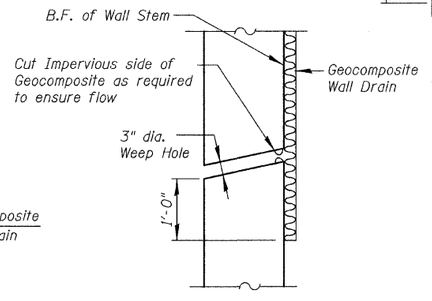
F.F. = Front Face

B.F. = Back Face



CONSTRUCTION JOINT EXPANSION JOINT

JOINT DETAILS FOR CAST-IN-PLACE T-TYPE WALLS



WEEP HOLE DRAIN DETAIL

RETAINING WALL SECTIONS
STRUCTURE NO. 049-W020

CHRISTIAN-ROGE & ASSOCIATES, INC.

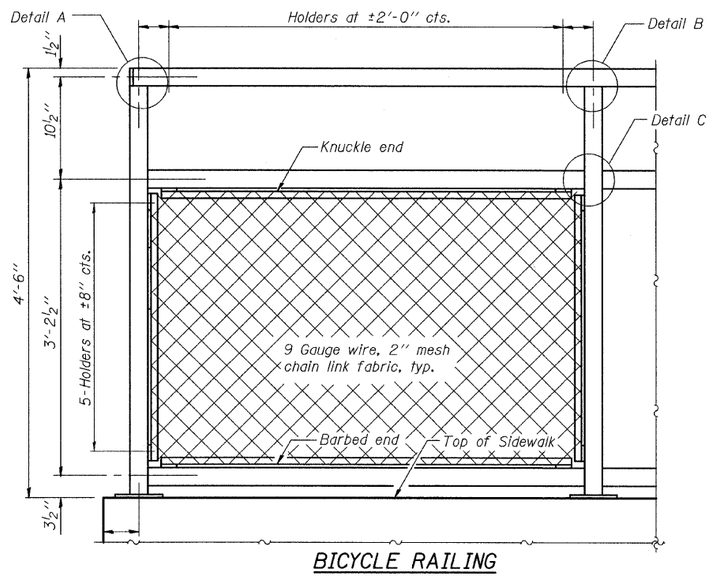
FILE NAME = D160953-03-ret_wall_sect.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

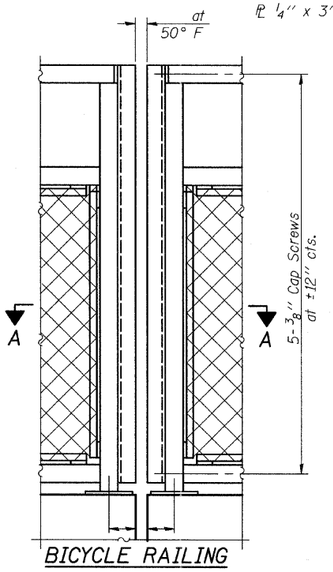
RETAINING WALL SECTIONS
STRUCTURE NO. 049-W020

SHEET NO. S4-3 OF S4-5 SHEETS

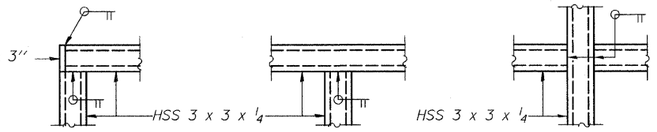
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	312
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



BICYCLE RAILING

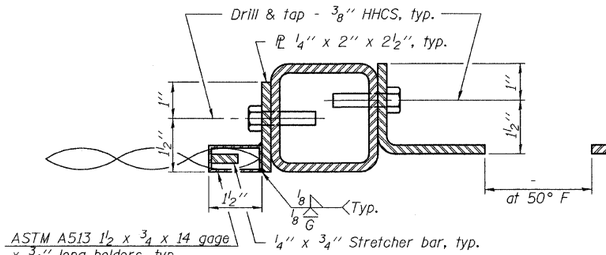


BICYCLE RAILING

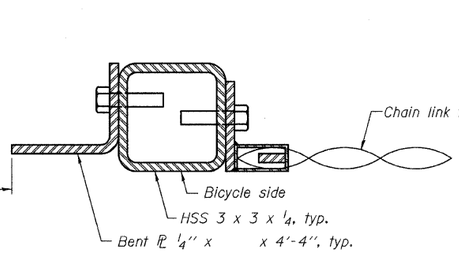


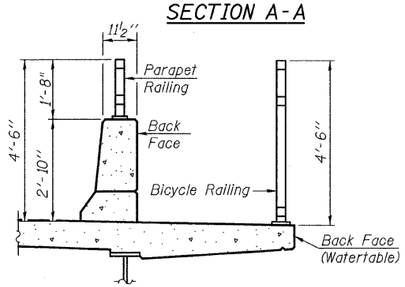
DETAIL A DETAIL B DETAIL C

All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

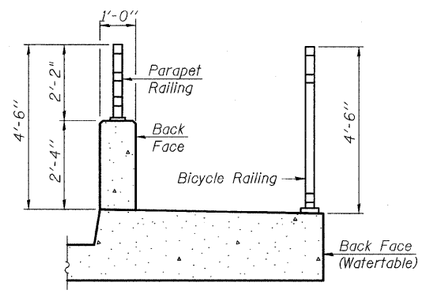


SECTION A-A

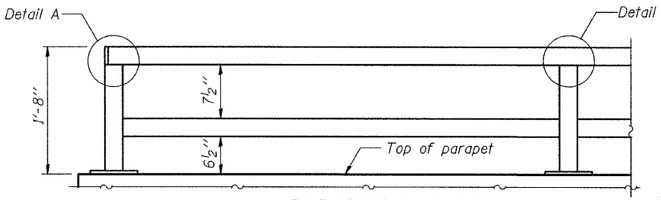




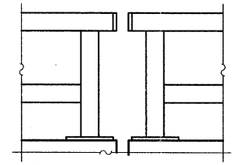
SECTION THRU DECK



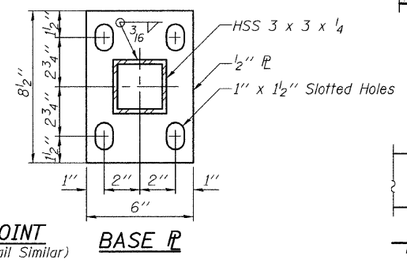
SECTION THRU SIDEWALK



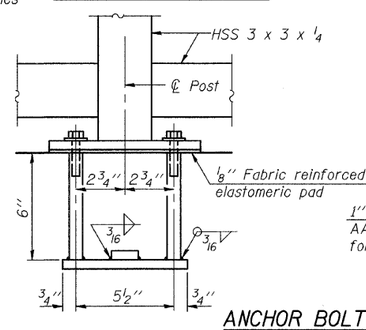
PARAPET RAILING ELEVATION
(Inside Face of Two Element Rail)

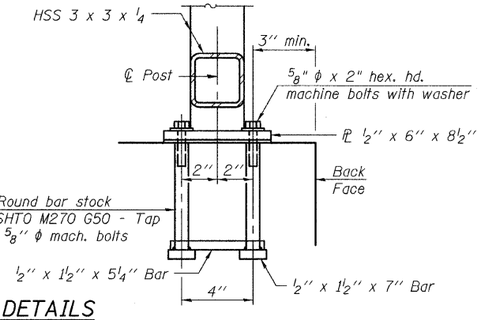


PARAPET RAILING ELEVATION AT EXPANSION JOINT
(Two Element Rail Shown - Three Element Rail Similar)



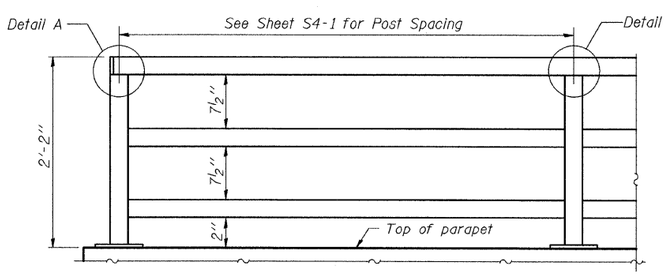
BASE ℄



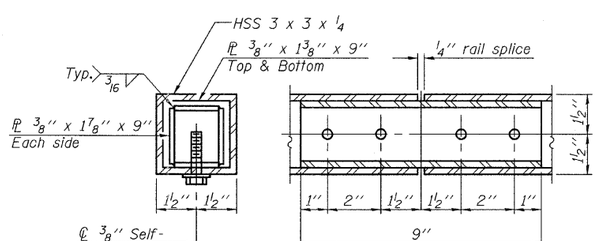


ANCHOR BOLT DETAILS

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting ⅝" ϕ anchor rods according to Article 509.06 of the Standard Specifications. Embedment shall be according to the manufacturer's specifications.



PARAPET RAILING ELEVATION
(Inside Face of Three Element Rail)



RAIL SPLICE

BILL OF MATERIAL

Item	Unit	Quantity
Parapet Railing	Foot	43

PARAPET RAILING
STRUCTURE NO. 049-W020

CHRISTIAN–ROGE & ASSOCIATES, INC.

R-29 7-1-10 (10'-0" Maximum Post Spacing)

FILE NAME = D160953-04-par_railing.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARAPET RAILING
STRUCTURE NO. 049-W020
SHEET NO. S4-4 OF S4-5 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	313
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3E

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 670.50 ft
North: 2056507.85 ft
East: 1084288.77 ft
Station: 249+12.11
Offset: 14.00' LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	670.24	4.5-inch thick ASPHALT --PAVEMENT--						
		Dense, gray SANDY GRAVEL --FILL--			1	13 19 21	NP	
	667.5	Medium dense to very dense, gray SANDY LOAM, trace gravel --FILL--	5		2	8 8 6	NP	15
					3	10 22 14	NP	12
					4	20 26/4"	NP	10
	659.0	Medium dense to dense, brown SANDY LOAM, little to some gravel	10		5	15 16 16	NP	13
			15		6	10 11 14	NP	13
	654.0	Very stiff to hard, gray CLAY LOAM			7	17 12 15	7.70 B	15
			20		8	16 16 23	4.50 B	16
	643.8	Dense to very dense, brown SANDY LOAM	25		9	5 8 19	3.40 B	
					10	10 14 12	6.15 B	15
					11	8 11 14	4.50 B	14
			30		12	7 20 33	NP	16
			35		13	9 15 23	NP	24
			40		14	8 16 24	NP	26

GENERAL NOTES

Begin Drilling 04-11-2001 Complete Drilling 04-11-2001
Drilling Contractor Rock and Soil Drilling Drill Rig D-120
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 4.25" ID HSA; backfilled w/ bentonite chip and AC blacktop; rotary wash after 20 ft.

WATER LEVEL DATA

While Drilling ▽ 11.00 ft
At Completion of Drilling ▽ 6.50 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG INC 7222301.GPJ WANGENG.GDT 11/5/10

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-3E

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 670.50 ft
North: 2056507.85 ft
East: 1084288.77 ft
Station: 249+12.11
Offset: 14.00' LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	628.5	Medium dense to dense, gray SILTY LOAM	45		15	12 12 10	NP	19
	620.5	Boring terminated at 50.00 ft	50		16	22 26 24	NP	21

GENERAL NOTES

Begin Drilling 04-11-2001 Complete Drilling 04-11-2001
Drilling Contractor Rock and Soil Drilling Drill Rig D-120
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 4.25" ID HSA; backfilled w/ bentonite chip and AC blacktop; rotary wash after 20 ft.

WATER LEVEL DATA

While Drilling ▽ 11.00 ft
At Completion of Drilling ▽ 6.50 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG INC 7222301.GPJ WANGENG.GDT 11/5/10

SOIL BORING LOGS
STRUCTURE NO. 049-W020

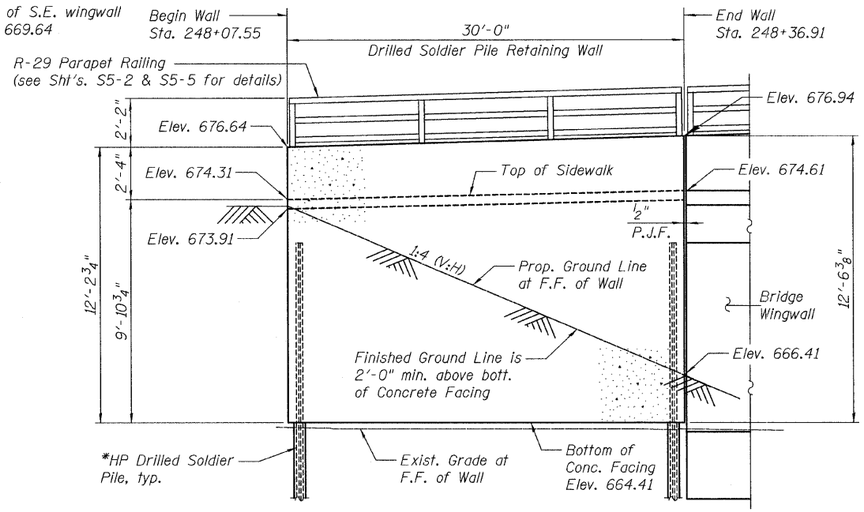
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-05-boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

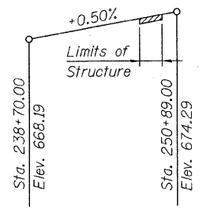
SOIL BORING LOGS
STRUCTURE NO. 049-W020
SHEET NO. S4-5 OF S4-5 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	314
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

Bench Mark:
Chiseled box on top of S.E. wingwall of bridge, Elevation 669.64



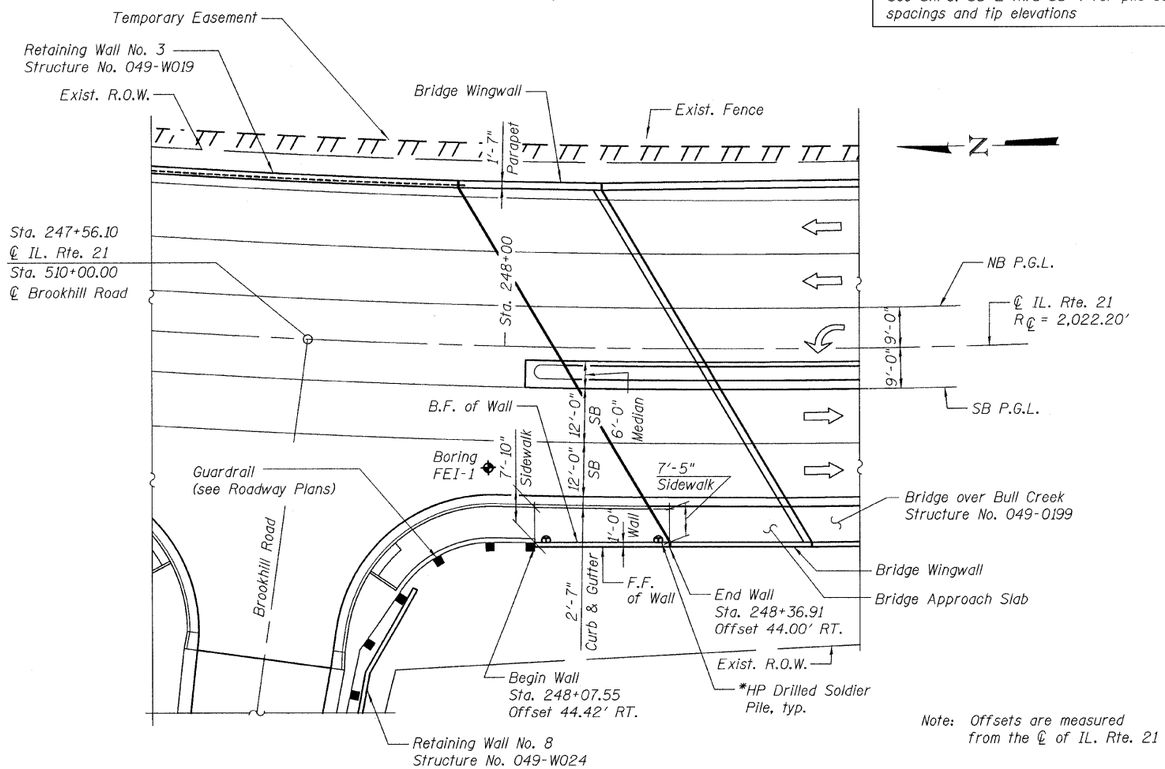
ELEVATION
(Looking at F.F. of Wall)



PROFILE GRADE
(along SB P.G.L.)

LEGEND:
F.F. = Front Face
B.F. = Back Face

*See Sht's. S5-2 thru S5-4 for pile sections, spacings and tip elevations



PLAN

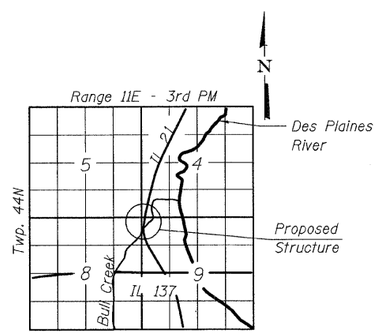
Indicates Boring Locations

Note: Offsets are measured from the ℄ of IL. Rte. 21

CURVE DATA
(℄ IL. Rte. 21)
Δ = 46°-11'-38"
D = 2°-50'-00"
T = 862.41'
L = 1,630.37'
E = 176.22'
R = 2,022.20'
S.E. = 2.90%
P.C. Sta. = 243+66.70
P.T. Sta. = 259+97.07
P.I. Sta. = 252+29.11

DESIGN SPECIFICATIONS
AASHTO 2002 Standard Specifications for Highway Bridges

DESIGN STRESSES
FIELD UNITS
f'_c = 3,500 psi
f_y = 60,000 psi (Reinforcement)
f_y = 36,000 psi (Structural Steel AASHTO M 270, Gr. 36 Soldier Piles)



LOCATION SKETCH

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Structure Excavation	Cu. Yd.	2
Concrete Structures	Cu. Yd.	13.8
Form Liner Textured Surface	Sq. Ft.	229
Stud Shear Connectors	Each	208
Reinforcement Bars, Epoxy Coated	Pound	2,260
Parapet Railing	Foot	30
Geocomposite Wall Drain	Sq. Yd.	16
Untreated Timber Lagging	Sq. Ft.	224
Furnishing Soldier Piles (HP Section)	Foot	97
Pipe Underdrains for Structures 4"	Foot	35
Drilling and Setting Soldier Piles (In Soil)	Cu. Ft.	274
Stain For Concrete Structures	Sq. Yd.	26

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
ENGINEER OF BRIDGES AND STRUCTURES

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
LICENSED
CHICAGO
STRUCTURAL
ENGINEER

BS Bhadresh N. Shah AUG. 15, 2011
BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21 - RETAINING WALL NO. 5
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 248+07.55 TO 248+36.91
STRUCTURE NO. 049-W021

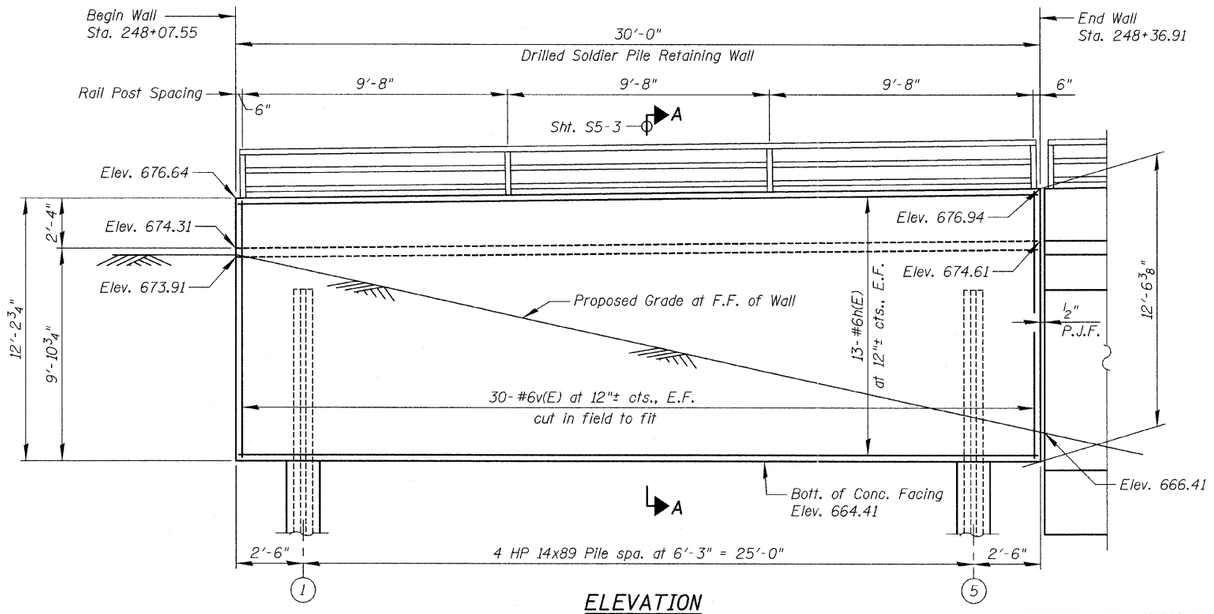
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D1S0953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

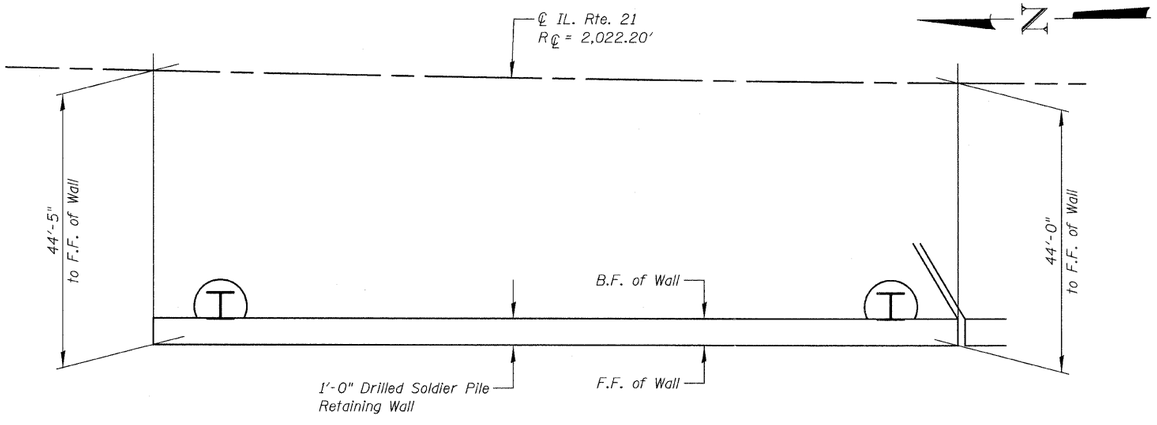
GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-W021
SHEET NO. S5-1 OF S5-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	315
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



ELEVATION
(Looking at F.F. of Wall)

*See Sht's. S5-2 thru S5-4 for pile sections, spacings and tip elevations



PLAN

GENERAL NOTES:

1. The Contractor is responsible for the design and performance of the lagging using no less than a 3 in. nominal rough-sawn thickness and timber with a minimum allowable bending stress of 1000 psi.
2. Pipe Underdrain Outlet Pipes shall drain into concrete headwalls. See Article 601.05 of the Standard Specifications and see Highway Standard 601101.
3. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
4. All Exposed Concrete edges shall be chamfered $\frac{3}{4}$" unless otherwise noted.
5. Reinforcement Bars designated (E) shall be Epoxy Coated.

LEGEND:

E.F. = Each Face
F.F. = Front Face
B.F. = Back Face

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	26	#6	29'-8"	——
v(E)	60	#6	12'-2"	——
Reinforcement Bars, Epoxy Coated			Pound	2,260
Concrete Structures			Cu. Yd.	13.8

CURVE DATA

(℄ IL. Rte. 21)
Δ = 46°-11'-38"
D = 2°-50'-00"
T = 862.41'
L = 1,630.37'
E = 176.22'
R = 2,022.20'
S.E. = 2.90%
P.C. Sta. = 243+66.70
P.T. Sta. = 259+97.07
P.I. Sta. = 252+29.11

PLAN & ELEVATION
STRUCTURE NO. 049-W021

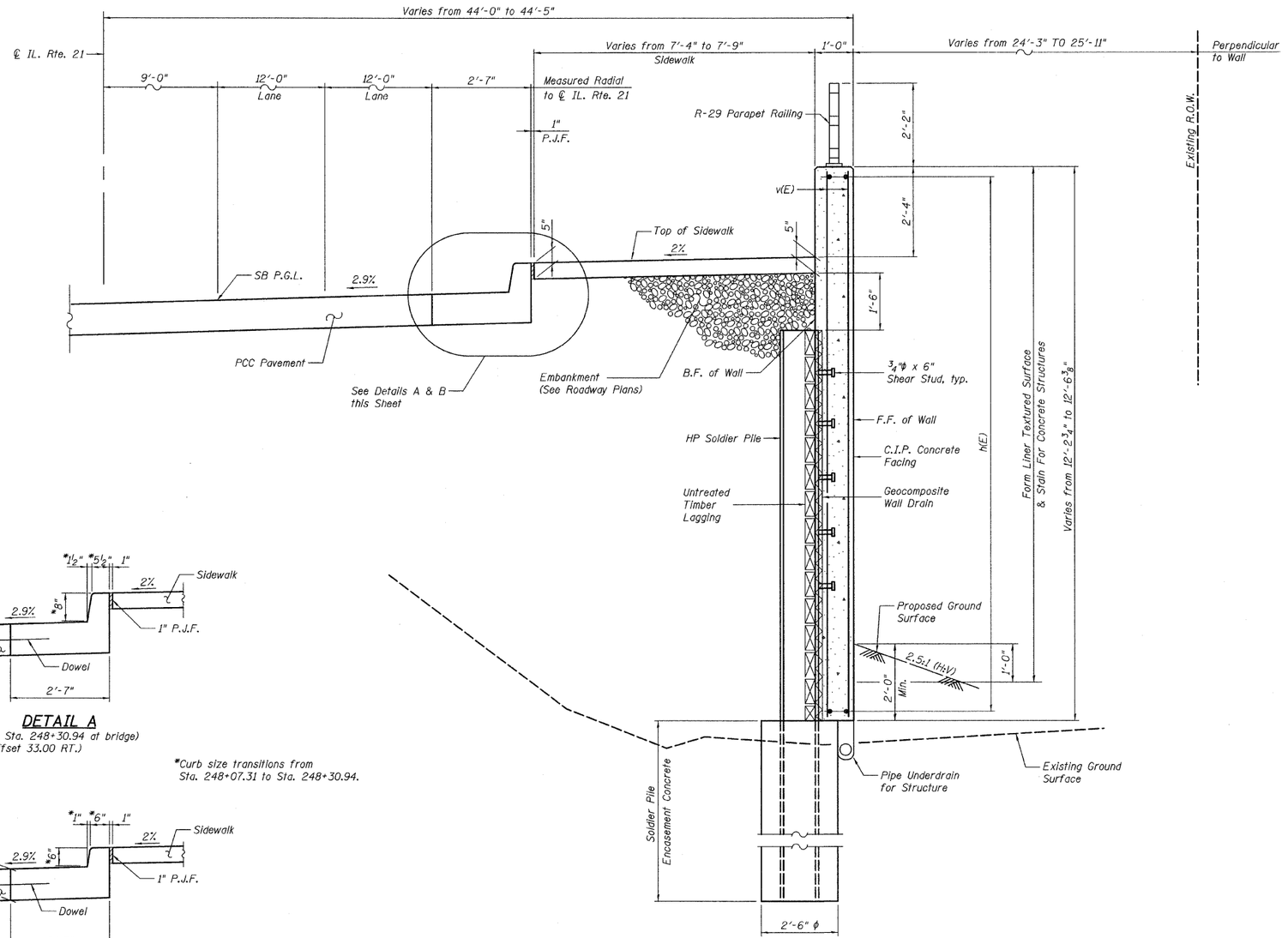
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-02-plan-elev.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

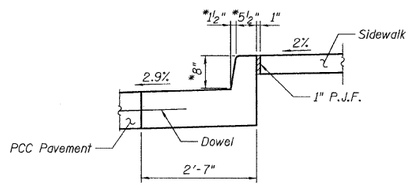
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN & ELEVATION
STRUCTURE NO. 049-W021
SHEET NO. S5-2 OF S5-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	316
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

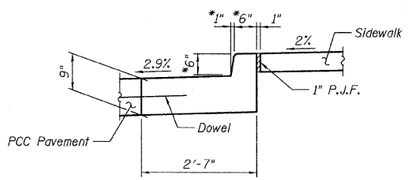


TYPICAL WALL SECTION
(Looking South)



DETAIL A
(at Sta. 248+30.94 at bridge)
(Offset 33.00 RT.)

*Curb size transitions from Sta. 248+07.31 to Sta. 248+30.94.

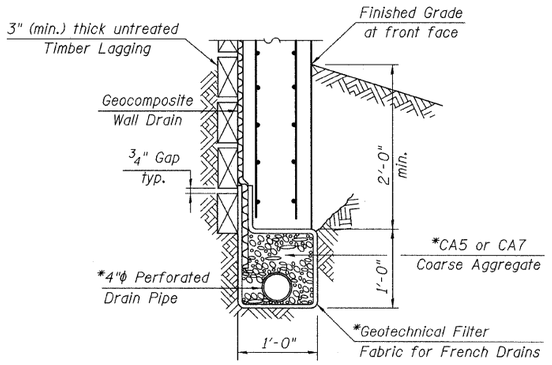


DETAIL B
(at Sta. 248+07.31)
(Offset 33.00 RT.)

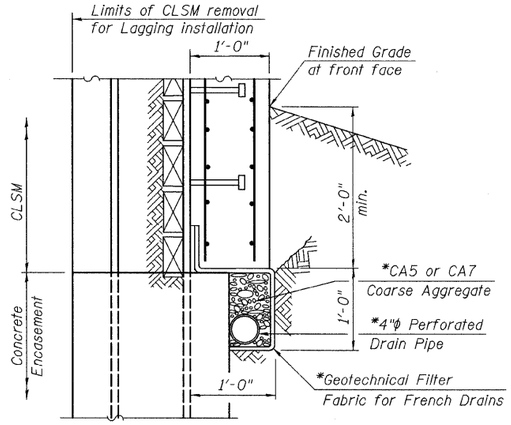
RETAINING WALL SECTION
STRUCTURE NO. 049-W021

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-03-ret-wall_sections.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	RETAINING WALL SECTION STRUCTURE NO. 049-W021	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	317
	PLOT SCALE =	DRAWN - F.M.	REVISED -						CONTRACT NO. 60953	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. S5-3 OF S5-6 SHEETS			ILLINOIS	FED. AID PROJECT	



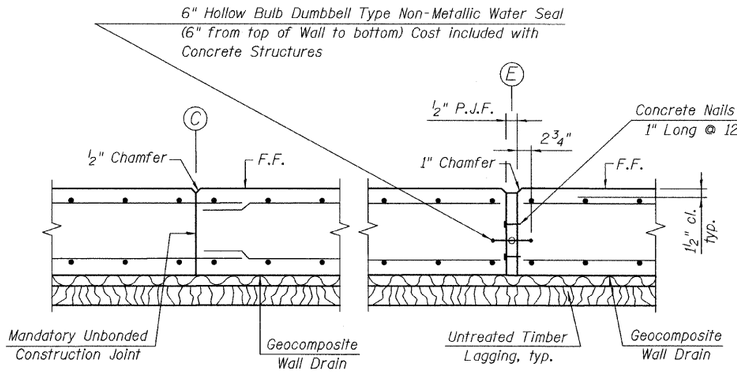
BETWEEN SOLDIER PILES



AT SOLDIER PILES

*Included in the cost of
Pipe Underdrains for Structures 4"

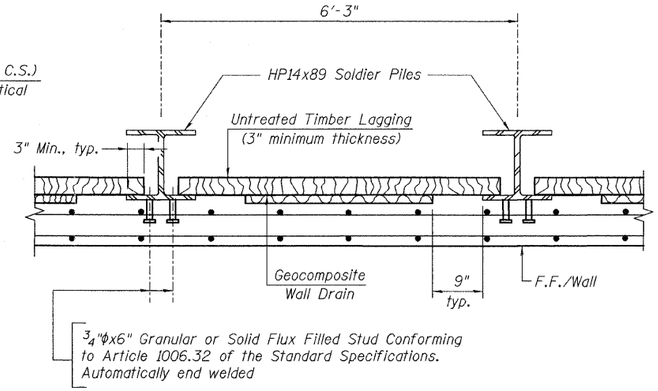
PIPE UNDERDRAIN DETAIL



CONSTRUCTION JOINT

EXPANSION JOINT

END OF PANEL DETAILS



TYPICAL SECTION THRU
SOLDIER PILE WALL

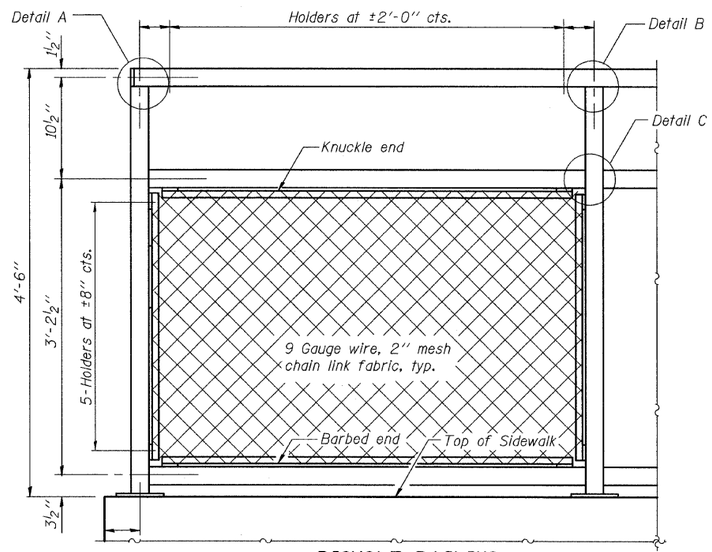
SOLDIER PILE RETAINING WALL NO. 5
SOLDIER PILE SCHEDULE

PILE NO.	PILE SIZE	TOP/PILE ELEV.	TIP/PILE ELEV.	APPROX. PILE LENGTH (FT.)	NO. STUD PER PILE	STUD SPACING
1	HP14x89	672.41	656.29	16.13	2 × 20 = 40	19 SPA. @ 4.75 IN = 7'- 6"
2	HP14x89	672.47	654.70	17.77	2 × 21 = 42	20 SPA. @ 4.63 IN = 7'- 8"
3	HP14x89	672.54	653.12	19.42	2 × 21 = 42	20 SPA. @ 4.75 IN = 7'- 11"
4	HP14x89	672.60	651.54	21.06	2 × 21 = 42	20 SPA. @ 4.75 IN = 7'- 11"
5	HP14x89	672.66	649.95	22.71	2 × 21 = 42	20 SPA. @ 4.75 IN = 7'- 11"
			TOTAL	97	208	

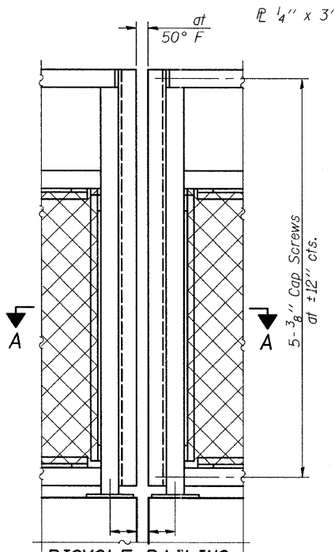
SOLDIER PILE SCHEDULE & DETAILS
STRUCTURE NO. 049-W021

CHRISTIAN–ROGE & ASSOCIATES, INC.

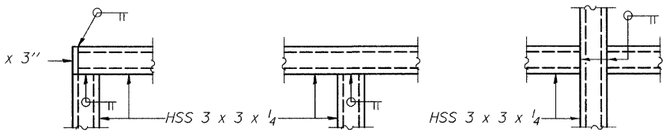
FILE NAME = D1601953-04-sched_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	SOLDIER PILE SCHEDULE & DETAILS STRUCTURE NO. 049-W021	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	318
	PLOT SCALE =	DRAWN - F.M.	REVISED -						CONTRACT NO. 60953	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. S5-4 OF S5-6 SHEETS			ILLINOIS	FED. AID PROJECT	



BICYCLE RAILING

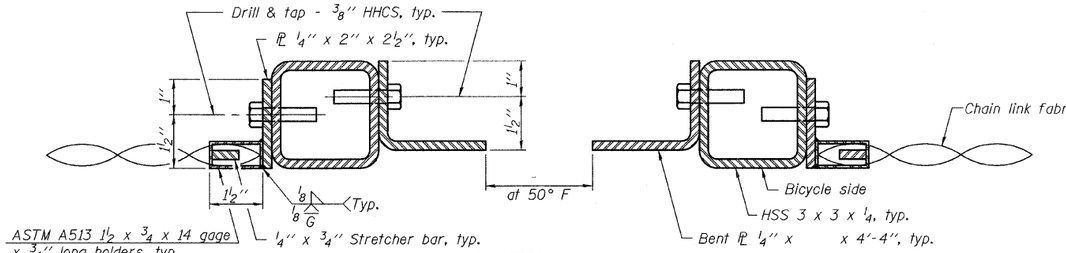


BICYCLE RAILING

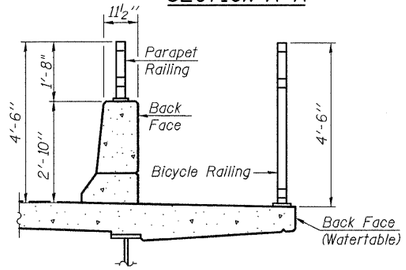


DETAIL A DETAIL B DETAIL C

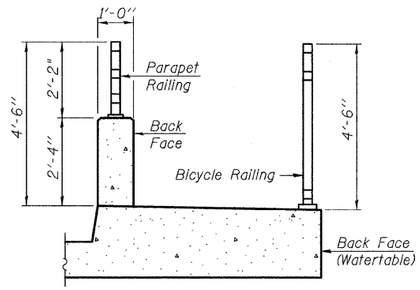
All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.



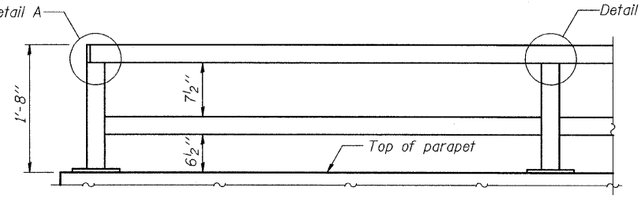
SECTION A-A



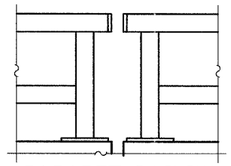
SECTION THRU DECK



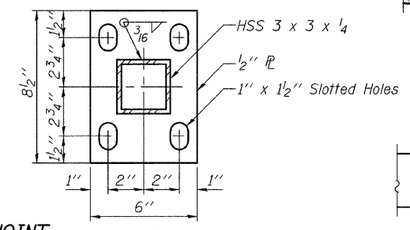
SECTION THRU SIDEWALK



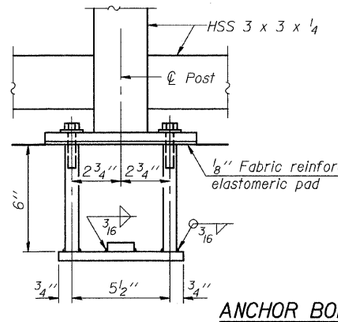
PARAPET RAILING ELEVATION
(Inside Face of Two Element Rail)

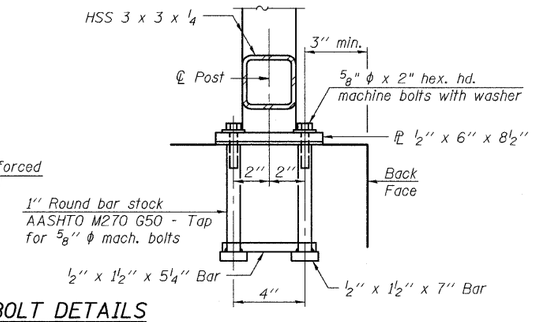


PARAPET RAILING ELEVATION AT EXPANSION JOINT
(Two Element Rail Shown - Three Element Rail Similar)



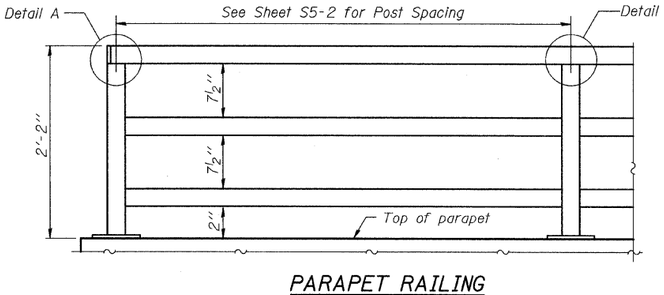
BASE ℄



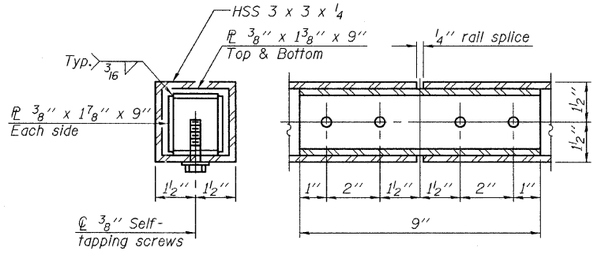


ANCHOR BOLT DETAILS

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting ⅝" ϕ anchor rods according to Article 509.06 of the Standard Specifications. Embedment shall be according to the manufacturer's specifications.



PARAPET RAILING ELEVATION
(Inside Face of Three Element Rail)



RAIL SPLICE

BILL OF MATERIAL

Item	Unit	Quantity
Parapet Railing	Foot	30

PARAPET RAILING
STRUCTURE NO. 049-W021

CHRISTIAN-ROGE & ASSOCIATES, INC.

R-29 7-1-10 (10'-0" Maximum Post Spacing)

FILE NAME = D160953-05-par_railing.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARAPET RAILING
STRUCTURE NO. 049-W021
SHEET NO. S5-5 OF S5-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	319
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG FEI-1

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 668.90 ft
North: 2056624.45 ft
East: 1084243.30 ft
Station: 247+97.000
Offset: 27.00 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Loose, brown, black, and gray CLAY, SAND & GRAVEL --FILL--			1	1 3 2	0.80 P	21
			5		2	2 1 2	0.80 P	22
					3	2 3 4	0.80 P	21
	660.9	Medium dense to dense, brown and gray SAND AND GRAVEL --% Gravel = 36%-- --% Sand = 62%-- --% Silt and Clay = 2%--			4	8 10 15	NP	13
			10		5	9 12 40	NP	9
	655.9	Hard, gray SILTY CLAY, trace sand --LL = 29%, PL = 15%-- --% Sand = 8%-- --% Silt = 55%-- --% Clay = 37%--			6	6 8 12	6.70 S	16
			15		7	8 9 17	5.50 B	15
			20		8	6 8 12	4.20 B	14
	647.4	Loose to very dense, gray, fine SAND			9	5 1 3	NP	21
			25		10	1 1 2	NP	19
					11	9 10 15	NP	19
			30		12	10 15 24	NP	21
					13	15 23 28	NP	20
			35		14	15 22 30	NP	21
					15	19 47 60	NP	19
			40		16	15 30 32	NP	19

GENERAL NOTES

Begin Drilling 03-14-1995 Complete Drilling 03-14-1995
Drilling Contractor Foundation Engineering, Inc. Drill Rig D-50
Driller BP Logger CHC Checked by
Drilling Method 2.75" ID HSA; backfilled w/ bentonite chip and AC blacktop.

WATER LEVEL DATA

While Drilling ▽ NA
At Completion of Drilling ▼ NA
Time After Drilling 24 hours
Depth to Water ▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG FEI-1

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 668.90 ft
North: 2056624.45 ft
East: 1084243.30 ft
Station: 247+97.000
Offset: 27.00 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		17	15 28 36	NP	20
					18	25 35 61	NP	22
					19	11 21 24	NP	20
	618.9	Boring terminated at 50.00 ft	50		20	19 20 22	NP	21
			55					
			60					

GENERAL NOTES

Begin Drilling 03-14-1995 Complete Drilling 03-14-1995
Drilling Contractor Foundation Engineering, Inc. Drill Rig D-50
Driller BP Logger CHC Checked by
Drilling Method 2.75" ID HSA; backfilled w/ bentonite chip and AC blacktop.

WATER LEVEL DATA

While Drilling ▽ NA
At Completion of Drilling ▼ NA
Time After Drilling 24 hours
Depth to Water ▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.INC 722301.GPJ MANGENG.GDT 11/5/10

SOIL BORING LOGS
STRUCTURE NO. 049-W021

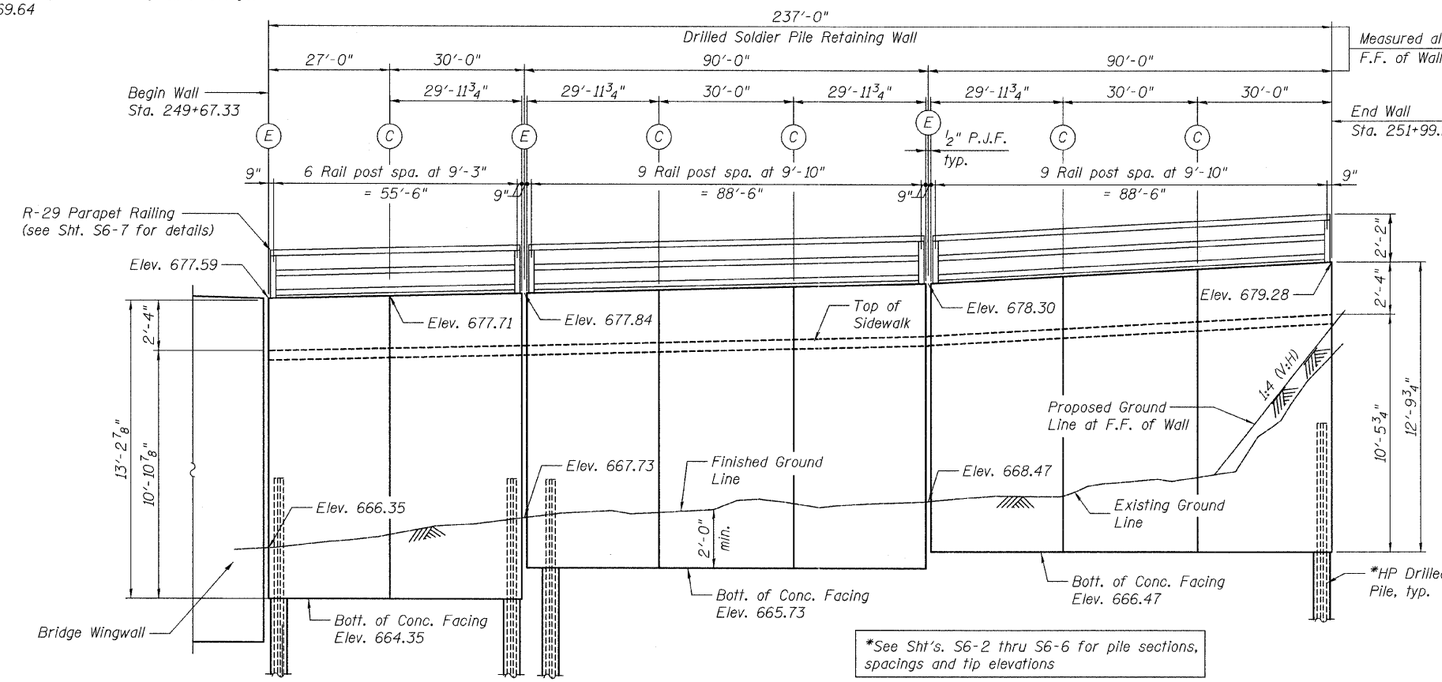
CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D160953-06-boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

SOIL BORING LOGS
STRUCTURE NO. 049–W021
SHEET NO. S5-6 OF S5-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	320
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

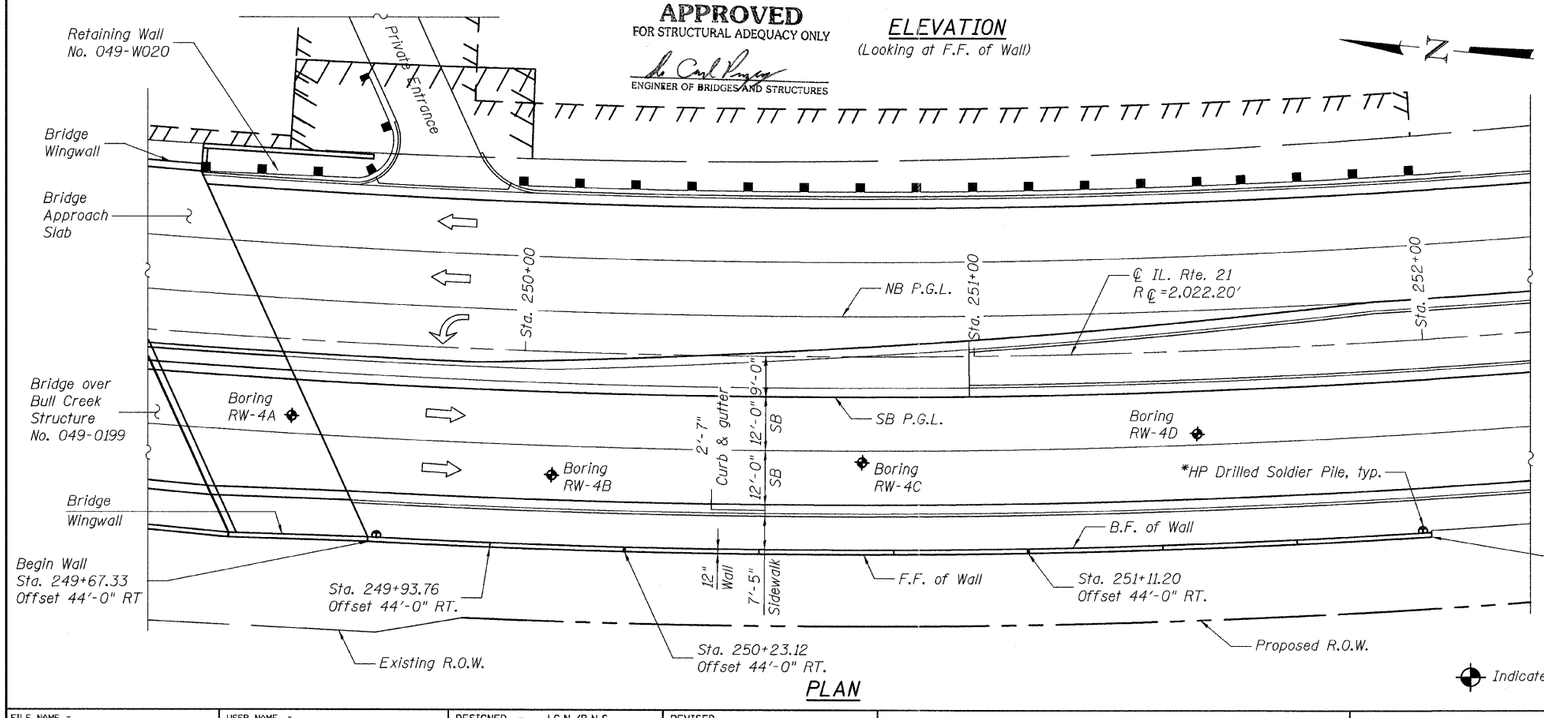
Bench Mark:
Chiseled box on top of S.E. wingwall of bridge.
Elevation 669.64



*See Sht's. S6-2 thru S6-6 for pile sections, spacings and tip elevations

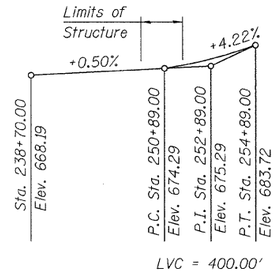
APPROVED
FOR STRUCTURAL ADEQUACY ONLY
ENGINEER OF BRIDGES AND STRUCTURES

ELEVATION
(Looking at F.F. of Wall)



PLAN

Indicates Boring Locations



PROFILE GRADE
(Along SB P.G.L.)

INDEX OF SHEETS

DESIGN SPECIFICATIONS

AASHTO 2002 Standard
Specifications for Highway Bridges

DESIGN STRESSES

FIELD UNITS

f'_c = 3,500 psi
f_y = 60,000 psi (Reinforcement)
f_y = 36,000 psi (Structural Steel AASHTO M 270, Gr. 36 Soldier Piles)

LEGEND:

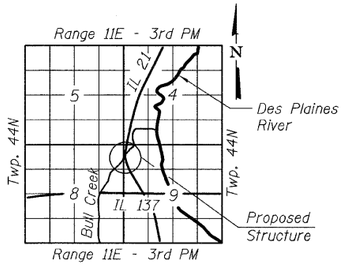
F.F. = Front Face
B.F. = Back Face
(C) = Construction Joint
(E) = Expansion Joint

CURVE DATA

(℄ IL. Rte. 21)
Δ = 46°-11'-38"
D = 2°-50'-00"
T = 862.41'
L = 1,630.37'
E = 176.22'
R = 2,022.20'
S.E. = 2.90%
P.C. Sta. = 243+66.70
P.T. Sta. = 259+97.07
P.I. Sta. = 252+29.11

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Structure Excavation	Cu. Yd.	119
Concrete Structures	Cu. Yd.	110.5
Form Liner Textured Surface	Sq. Ft.	2,513
Stud Shear Connectors	Each	1,216
Reinforcement Bars, Epoxy Coated	Pound	19,220
Parapet Railing	Foot	237
Geocomposite Wall Drain	Sq. Yd.	146
Untreated Timber Lagging	Sq. Ft.	1,841
Furnishing Soldier Piles (HP Section)	Foot	699
Pipe Underdrains for Structures 4"	Foot	242
Drilling and Setting Soldier Piles (in Soil)	Cu. Ft.	2,661
Stain For Concrete Structures	Sq. Yd.	280



LOCATION SKETCH

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
LICENSED STRUCTURAL ENGINEER
CHICAGO

BHADRESH N. SHAH 11.30.2011
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

Note: Offsets are measured from the ℄ of IL. Rte. 21

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21 - RETAINING WALL NO. 6
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 249+67.33 TO 251+99.28
STRUCTURE NO. 049-W022

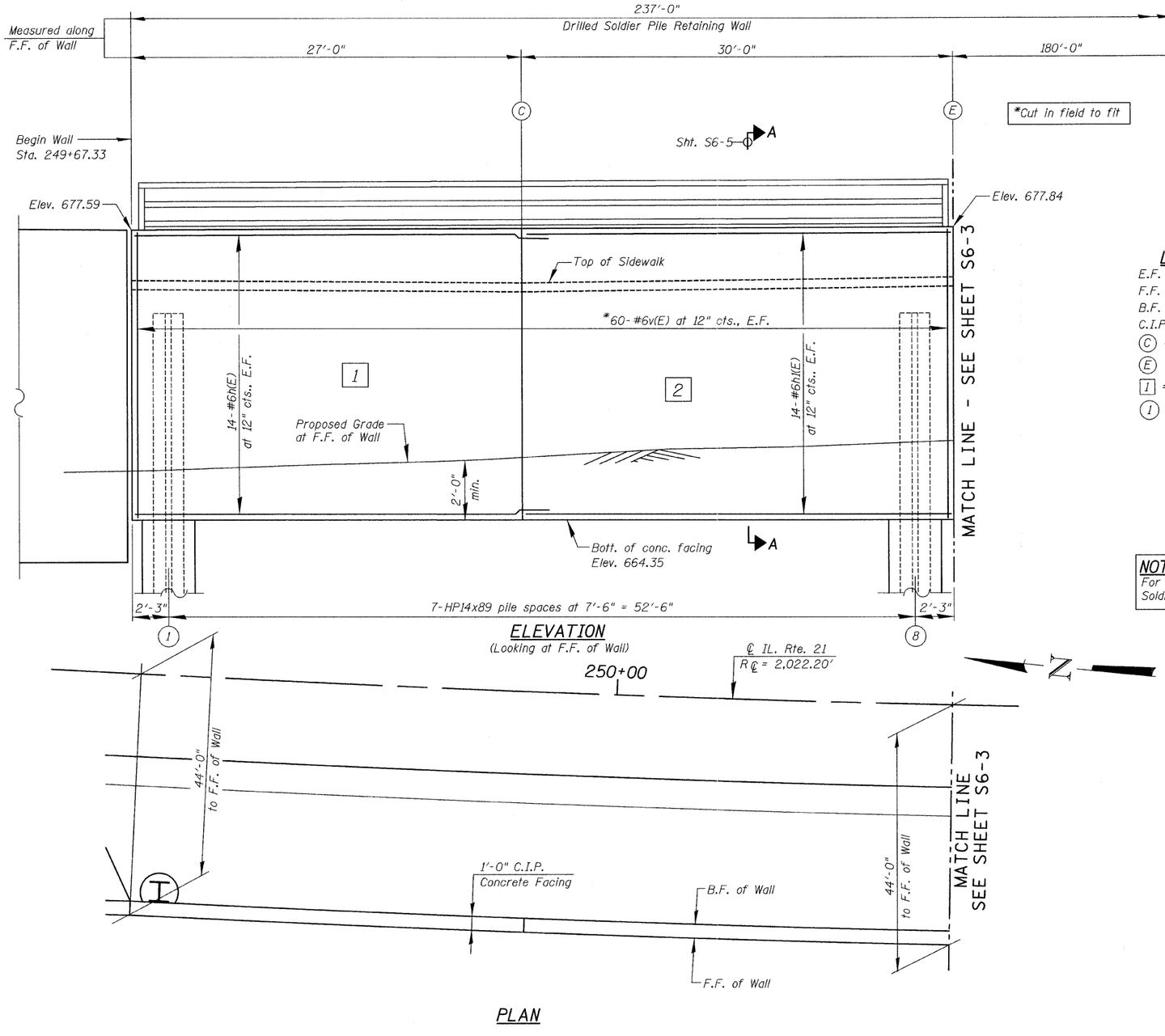
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-W022
SHEET NO. S6-1 OF S6-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	321
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



GENERAL NOTES:

1. The Contractor is responsible for the design and performance of the lagging using no less than a 3 in. nominal rough-sawn thickness and timber with a minimum allowable bending stress of 1000 psi.
2. Pipe Underdrain Outlet Pipes shall drain into concrete headwalls. See Article 601.05 of the Standard Specifications and see Highway Standard 601101.
3. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
4. All Exposed Concrete edges shall be chamfered $\frac{3}{4}$" unless otherwise noted.
5. Reinforcement Bars designated (E) shall be Epoxy Coated.

LEGEND:

E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
(C) = Construction Joint
(E) = Expansion Joint
[1] = Panel Numbers
(1) = Pile Numbers

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	28	#6	30'-0"	———
h1(E)	82	#6	29'-9"	———
h2(E)	106	#6	33'-0"	———
v(E)	120	#6	13'-2"	———
v1(E)	180	#6	12'-3"	———
v2(E)	180	#6	12'-5"	———
Reinforcement Bars, Epoxy Coated			Pound	19,220
Concrete Structures			Cu. Yd.	110.5

MIN. BAR LAP:

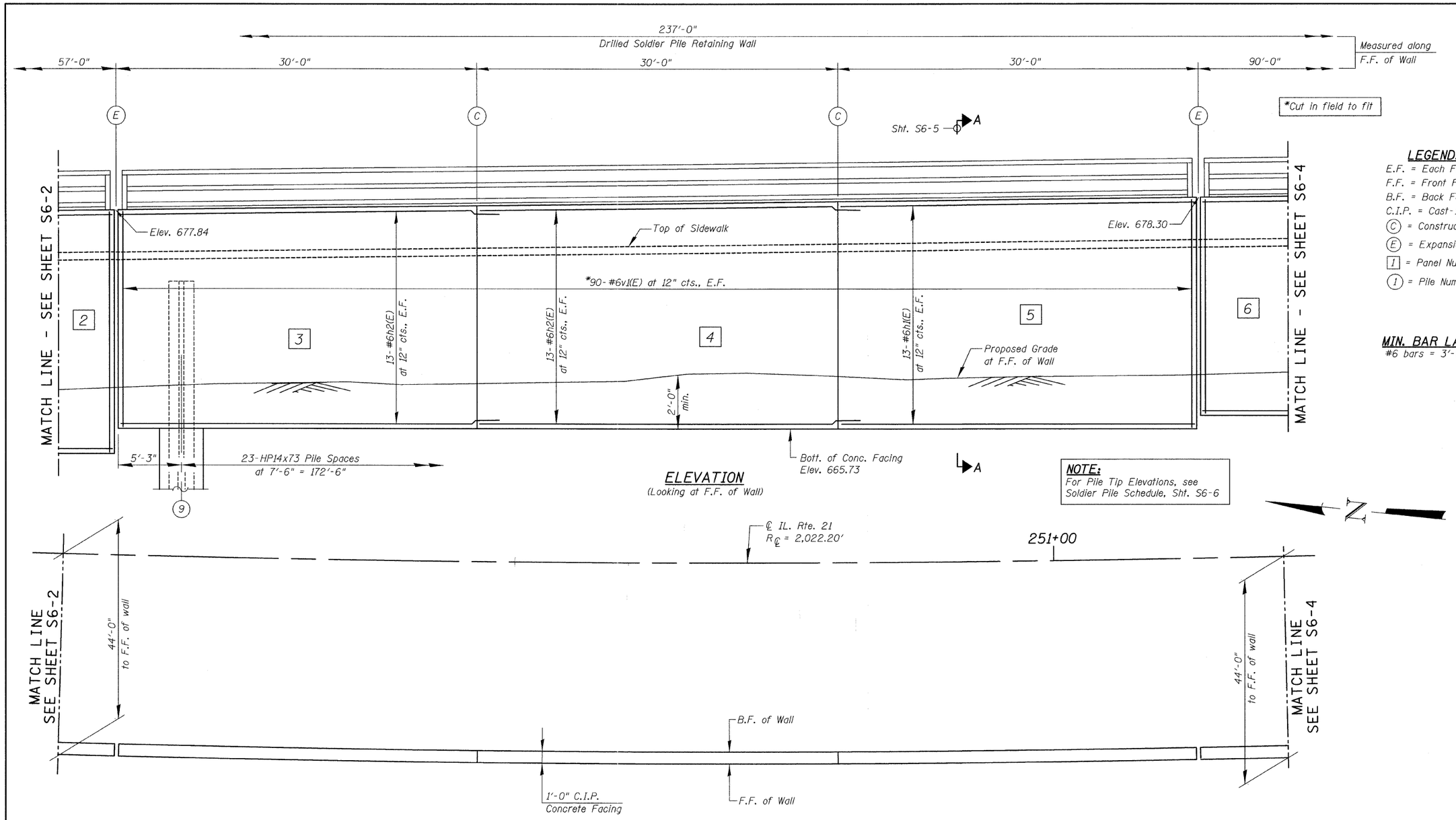
#6 bars = 3'-0"

NOTE:
For Pile Tip Elevations, see Soldier Pile Schedule, Sht. S6-6

PLAN & ELEVATION-I
STRUCTURE NO. 049-W022

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D1609953-02-plan_elev-1.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PLAN & ELEVATION-I STRUCTURE NO. 049-W022	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	322
	PLOT SCALE =	DRAWN - F.M.	REVISED -					CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. S6-2 OF S6-9 SHEETS			ILLINOIS FED. AID PROJECT		



PLAN & ELEVATION-II
STRUCTURE NO. 049-W022

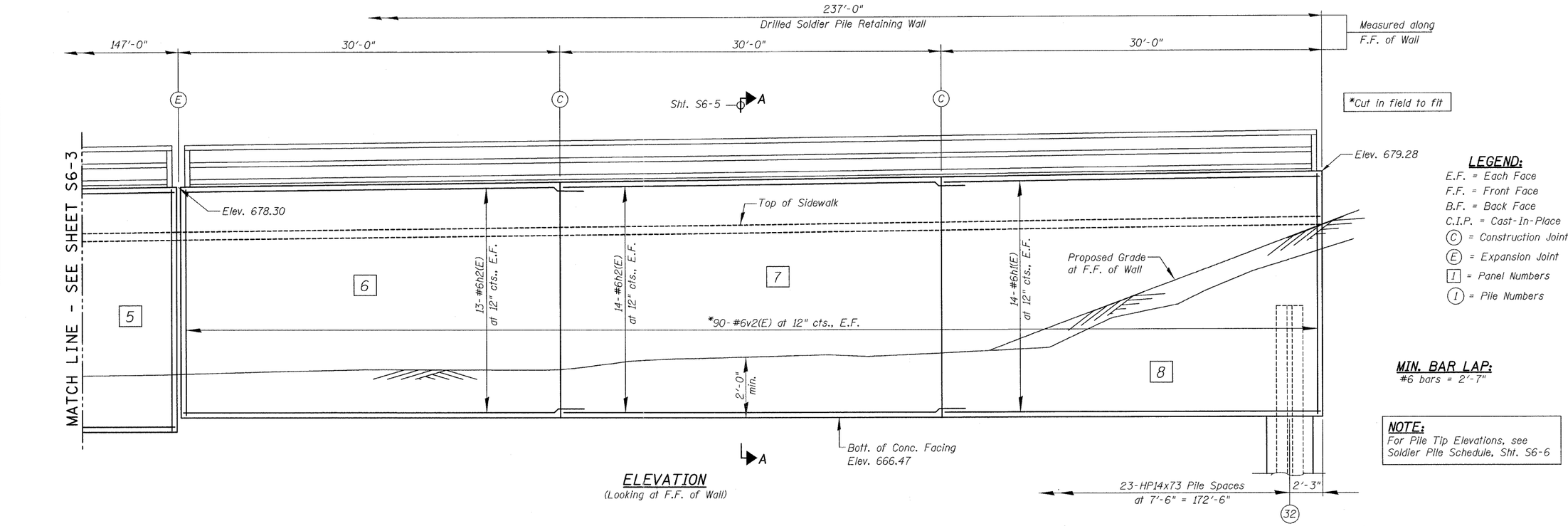
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D162953-03-plan_elev-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

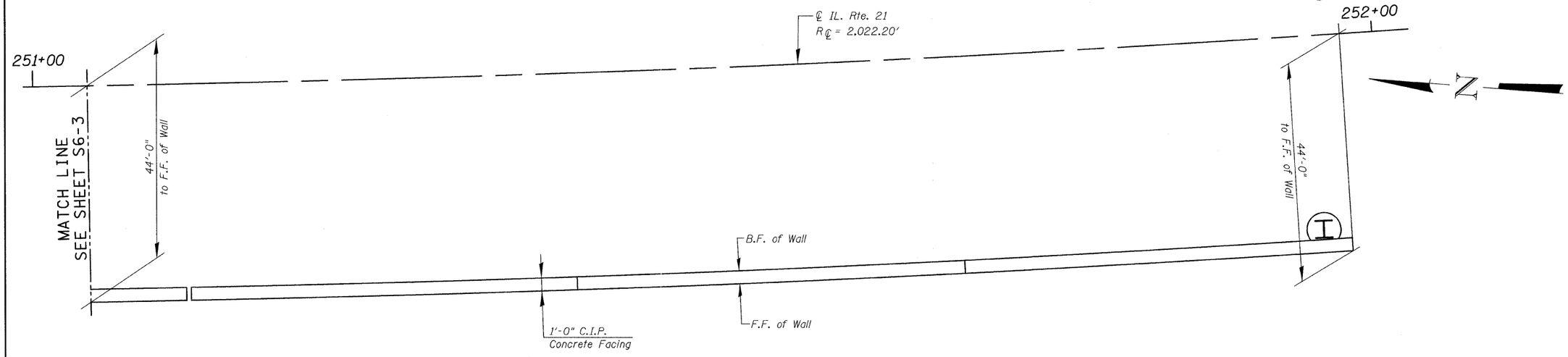
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN & ELEVATION-II
STRUCTURE NO. 049-W022
SHEET NO. S6-3 OF S6-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	323
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



ELEVATION
(Looking at F.F. of Wall)

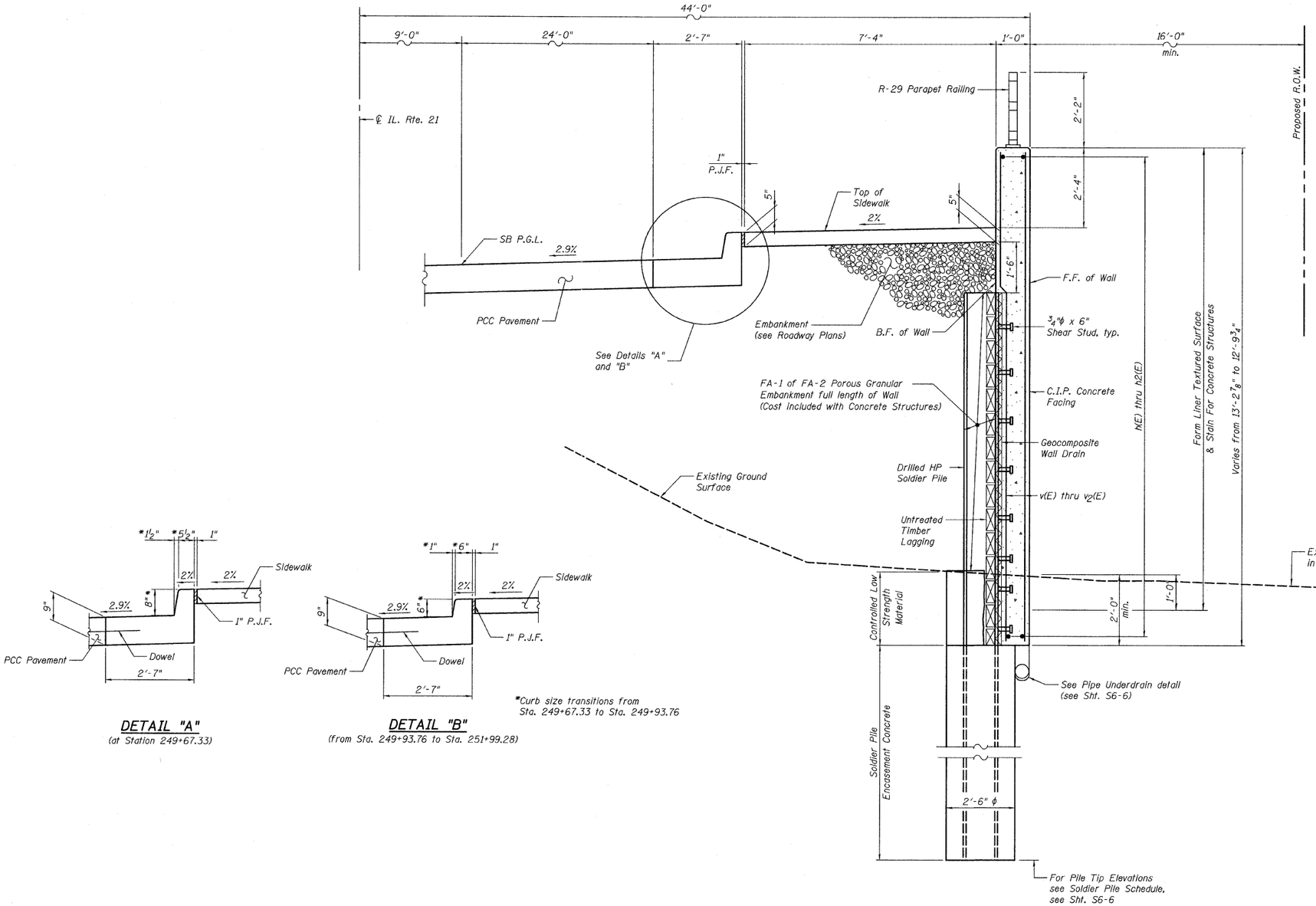


PLAN

PLAN & ELEVATION-III
STRUCTURE NO. 049-W022

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D162953-04-plan_elev-III.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PLAN & ELEVATION-III STRUCTURE NO. 049-W022	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	324
	PLOT SCALE =	DRAWN - F.M.	REVISED -					CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. S6-4 OF S6-9 SHEETS		ILLINOIS	FED. AID PROJECT		



DETAIL "A"
(at Station 249+67.33)

DETAIL "B"
(from Sta. 249+93.76 to Sta. 251+99.28)

DRILLED SOLDIER PILE

SECTION A-A

RETAINING WALL SECTION STRUCTURE NO. 049-W022

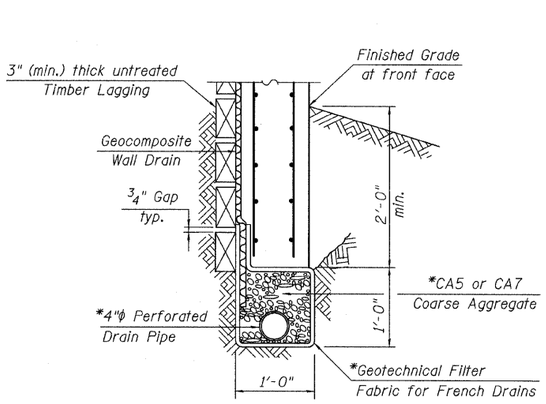
CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D160953-05-ret_wall_section.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

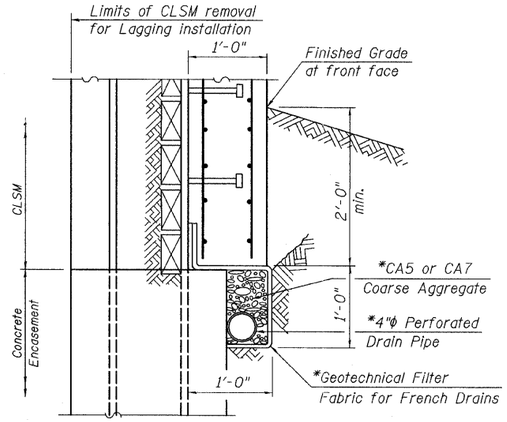
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RETAINING WALL SECTION
STRUCTURE NO. 049–W022
SHEET NO. S6-5 OF S6-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	325
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



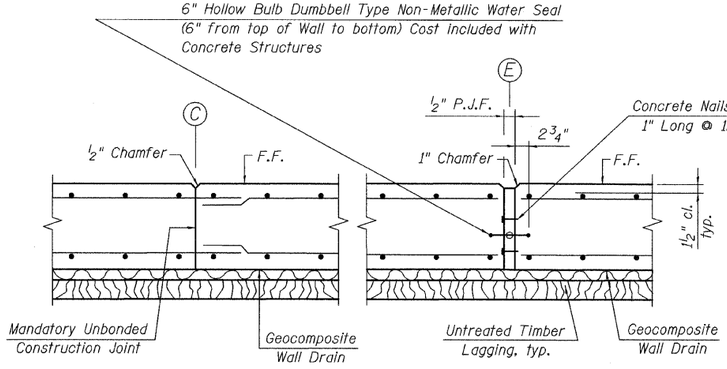
BETWEEN SOLDIER PILES



AT SOLDIER PILES

*Included in the cost of
Pipe Underdrains for Structures 4"

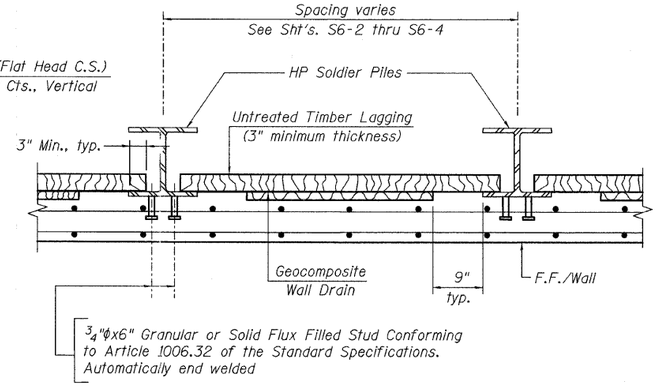
PIPE UNDERDRAIN DETAIL



CONSTRUCTION JOINT

EXPANSION JOINT

END OF PANEL DETAILS



TYPICAL SECTION THRU
SOLDIER PILE WALL

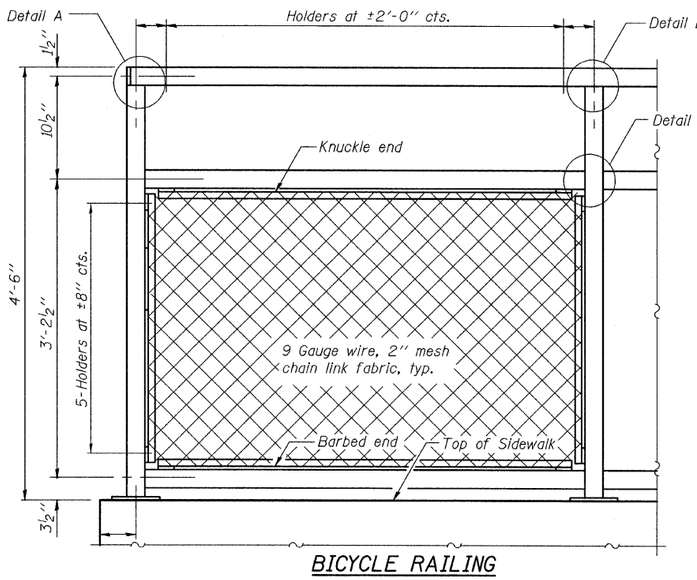
SOLDIER PILE RETAINING WALL NO. 6
SOLDIER PILE SCHEDULE

PILE NO.	PILE SIZE	TOP/PILE ELEV.	TIP/PILE ELEV.	APPROX. PILE LENGTH (FT.)	NO. STUD PER PILE	STUD SPACING
1	HP 14x 89	673.35	647.35	26.00	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
2	HP 14x 89	673.39	647.53	25.86	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
3	HP 14x 89	673.42	647.71	25.71	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
4	HP 14x 89	673.46	647.89	25.57	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
5	HP 14x 89	673.50	648.07	25.43	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
6	HP 14x 89	673.53	648.25	25.28	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
7	HP 14x 89	673.57	648.43	25.14	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
8	HP 14x 89	673.61	648.61	25.00	2 x 22 = 44	21 SPA. @ 5.00 IN = 8'- 9 "
9	HP 14x 73	673.64	651.54	22.10	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
10	HP 14x 73	673.68	651.60	22.08	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
11	HP 14x 73	673.72	651.66	22.06	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
12	HP 14x 73	673.75	651.72	22.03	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
13	HP 14x 73	673.79	651.79	22.01	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
14	HP 14x 73	673.83	651.85	21.98	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
15	HP 14x 73	673.86	651.91	21.96	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
16	HP 14x 73	673.90	651.97	21.93	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
17	HP 14x 73	673.94	652.03	21.91	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
18	HP 14x 73	673.97	652.09	21.88	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
19	HP 14x 73	674.01	652.16	21.86	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
20	HP 14x 73	674.05	652.22	21.83	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
21	HP 14x 73	674.13	652.28	21.85	2 x 18 = 36	17 SPA. @ 5.00 IN = 7'- 1 "
22	HP 14x 73	674.21	652.34	21.87	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
23	HP 14x 73	674.29	652.40	21.89	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
24	HP 14x 73	674.37	652.46	21.91	2 x 18 = 36	17 SPA. @ 5.25 IN = 7'- 5 "
25	HP 14x 73	674.45	652.52	21.93	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
26	HP 14x 73	674.53	652.59	21.95	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
27	HP 14x 73	674.62	652.65	21.97	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
28	HP 14x 73	674.70	652.71	21.99	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
29	HP 14x 73	674.78	661.02	13.75	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
30	HP 14x 73	674.86	661.10	13.75	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
31	HP 14x 73	674.94	661.18	13.75	2 x 18 = 36	17 SPA. @ 5.50 IN = 7'- 9 "
32	HP 14x 73	675.02	660.15	14.87	2 x 18 = 36	17 SPA. @ 5.75 IN = 8'- 1 "
			TOTAL	699	1,216	

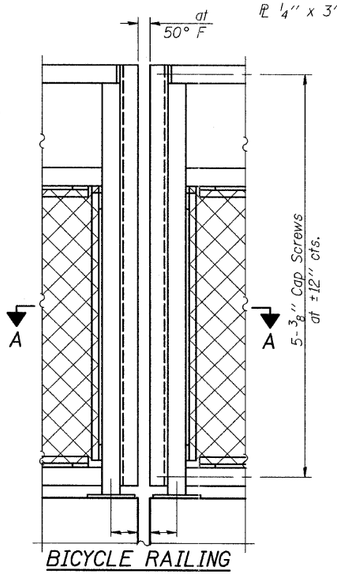
SOLDIER PILE SCHEDULE & DETAILS
STRUCTURE NO. 049-W022

CHRISTIAN–ROGE & ASSOCIATES, INC.

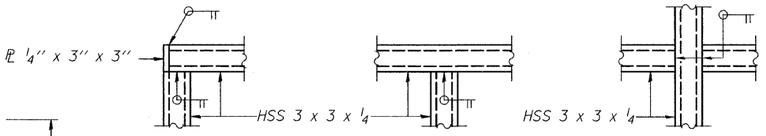
FILE NAME = D168953-06-sched_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	SOLDIER PILE SCHEDULE & DETAILS STRUCTURE NO. 049-W022	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	326
	PLOT SCALE =	DRAWN - F.M.	REVISED -					CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. S6-6 OF S6-9 SHEETS			ILLINOIS FED. AID PROJECT		



BICYCLE RAILING

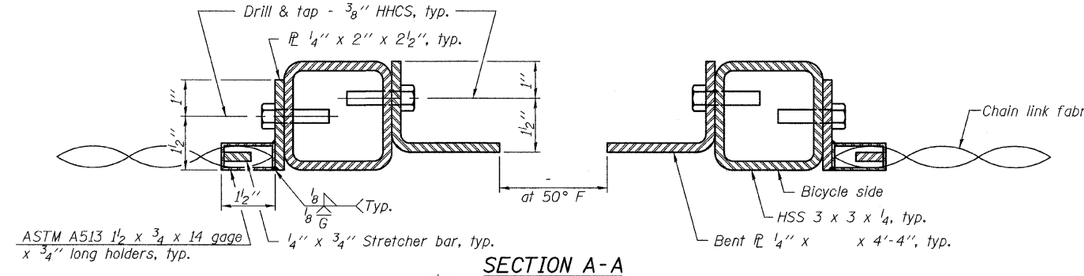


BICYCLE RAILING

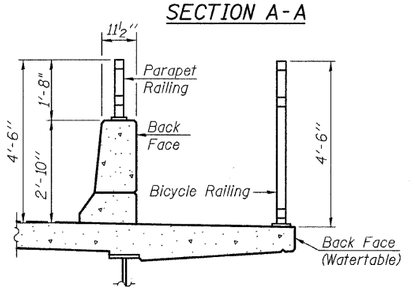


DETAIL A DETAIL B DETAIL C

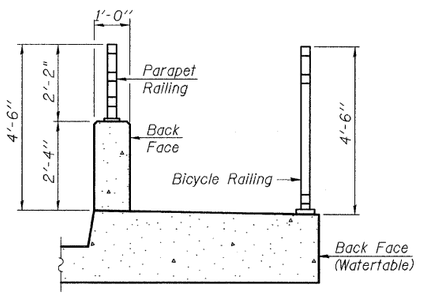
All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.



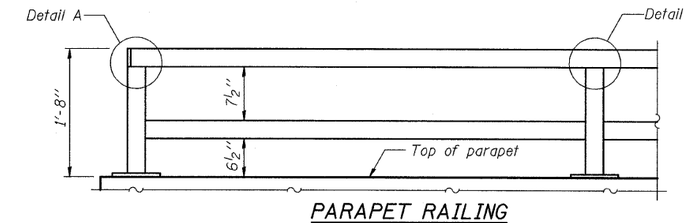
SECTION A-A



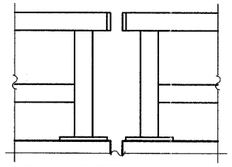
SECTION THRU DECK



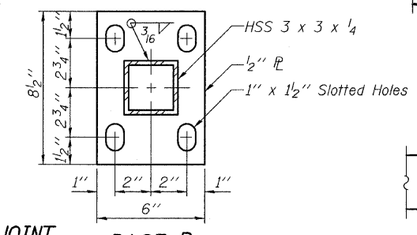
SECTION THRU SIDEWALK



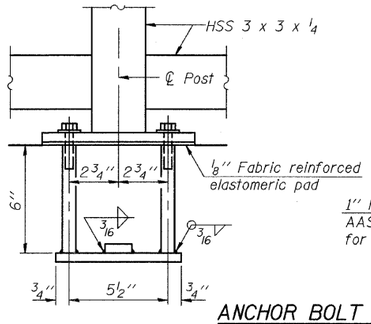
PARAPET RAILING ELEVATION
(Inside Face of Two Element Rail)

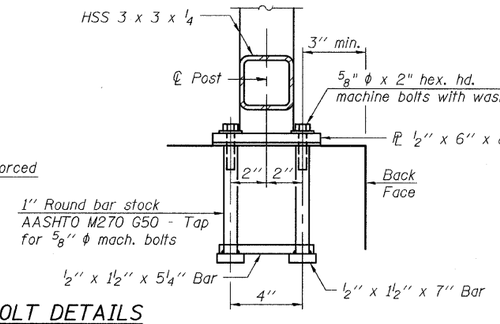


PARAPET RAILING ELEVATION AT EXPANSION JOINT
(Two Element Rail Shown - Three Element Rail Similar)



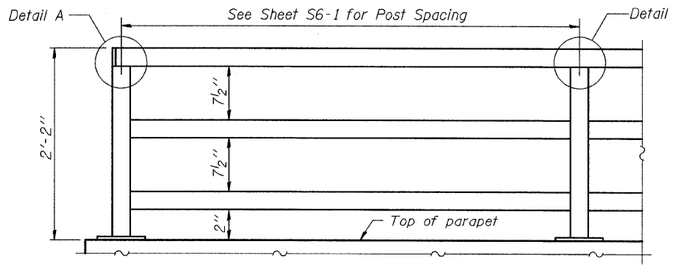
BASE PL



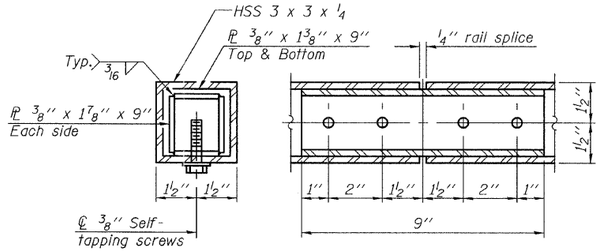


ANCHOR BOLT DETAILS

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting ⅝" ϕ anchor rods according to Article 509.06 of the Standard Specifications. Embedment shall be according to the manufacturer's specifications.



PARAPET RAILING ELEVATION
(Inside Face of Three Element Rail)



RAIL SPLICE

BILL OF MATERIAL

Item	Unit	Quantity
Parapet Railing	Foot	237

PARAPET RAILING
STRUCTURE NO. 049-W022

CHRISTIAN–ROGE & ASSOCIATES, INC.

R-29 7-1-10 (10'-0" Maximum Post Spacing)

FILE NAME = D162953-07-par_railing.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARAPET RAILING
STRUCTURE NO. 049-W022
SHEET NO. S6-7 OF S6-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	327
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-4A

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 672.40 ft
North: 2056470.57 ft
East: 1084258.77 ft
Station: 249+48.92
Offset: 17.00' RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	672.6	6-inch thick ASPHALT --PAVEMENT--						
		Stiff, brown SILTY CLAY LOAM, trace gravel --FILL--			1	7 7 11	1.03 B	9
			5		2	16 8 8	--	
					3	4 4 4	1.31 B	17
	663.4	Dense, brown SANDY GRAVEL --FILL--	10		4	15 16 19	NP	14
					5	11 22 25	NP	11
	659.4	Dense, gray SAND, little gravel	15		6	10 13 22	NP	21
					7	7 15 28	NP	23
	653.7	Stiff to hard, gray CLAY LOAM, trace gravel	20		8	5 10 14	4.40 B	15
		--LL = 33%, PL = 16%--	25		9	8 14 17	4.50 B	16
					10	PUSH	1.99 B	18
			30		11	10 25 34	2.90 B	16
	640.4	Medium dense to very dense, brown, medium SAND			12	5 7 14	1.00 B	12
			35		13	11 15 19	NP	22
			40		14	16 28 30	NP	20

GENERAL NOTES

Begin Drilling 04-10-2001 Complete Drilling 04-10-2001
Drilling Contractor Rock and Soil Drilling Drill Rig D-120
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 4.25" ID HSA; backfilled w/ bentonite chip and AC blacktop; rotary wash after 20 ft.

WATER LEVEL DATA

While Drilling ▽ 13.50 ft
At Completion of Drilling ▽ 9.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.INC 722301.GPJ MANGENG.GDT 11/5/10

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-4A

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 672.40 ft
North: 2056470.57 ft
East: 1084258.77 ft
Station: 249+48.92
Offset: 17.00' RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	630.9	Medium dense to dense, gray SILTY LOAM						
			45		15	17 14 14	NP	23
			50		16	13 21 27	NP	20
	617.4	Boring terminated at 55.00 ft	55		17	17 20 22	NP	21
			60					

GENERAL NOTES

Begin Drilling 04-10-2001 Complete Drilling 04-10-2001
Drilling Contractor Rock and Soil Drilling Drill Rig D-120
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 4.25" ID HSA; backfilled w/ bentonite chip and AC blacktop; rotary wash after 20 ft.

WATER LEVEL DATA

While Drilling ▽ 13.50 ft
At Completion of Drilling ▽ 9.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.INC 722301.GPJ MANGENG.GDT 11/5/10

SOIL BORING LOGS-I
STRUCTURE NO. 049-W022

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-00-boring_logs-I.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

SOIL BORING LOGS-I
STRUCTURE NO. 049-W022
SHEET NO. S6-8 OF S6-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	328
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-4B

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 669.27 ft
North: 2056411.26 ft
East: 1084251.55 ft
Station: 250+06.716
Offset: 27.39 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Very stiff, brown to black SANDY CLAY LOAM --FILL--				1	13 12 10	2.75 P	20
	665.3	Stiff, dark gray CLAY	5			2	4 6 11	1.90 B	22
	663.8	Medium dense to very dense, white SANDY GRAVEL				3	12 16 18	NP	10
			10			4	17 30 25	NP	
						5	103	NP	14
	655.5	Very stiff, gray CLAY	15			6	35 10 12	3.50 P	17
	653.3	Dense, gray SANDY LOAM and GRAVEL, wet				7	30 19 18	NP	16
	651.3	Very stiff, gray CLAY	20			8	19 9 9	2.48 B	22

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	648.8	Very dense, light brown SILTY LOAM, wet				9	50 32 27	1.50 B	19
	646.3	Hard, gray SILTY CLAY LOAM, trace gravel	25			10	38 19 21	5.58 B	14
	643.0	Dense to very dense, brown SANDY LOAM, wet				11	22 18 18	NP	17
			30			12	7 7 23	NP	18
	634.3	Boring terminated at 35.00 ft	35			13	26 33 36	NP	
			40						

GENERAL NOTES

Begin Drilling 04-18-2001 Complete Drilling 04-18-2001
Drilling Contractor Rock and Soil Drilling Drill Rig Acker 82
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 4.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling ▽ 16.00 ft
At Completion of Drilling ▽ 3.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA
The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-4C

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 670.37 ft
North: 2056338.56 ft
East: 1084263.21 ft
Station: 250+75
Offset: 23.5 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Stiff, dark brown SILTY CLAY, trace gravel --FILL--				1	5 4 3	1.80 S	14
	667.4	Dense, dark brown SANDY GRAVEL --FILL--	5			2	22 12 6	NP	6
	664.9	Very stiff, dark brown to black SILTY CLAY --FILL--				3	4 10 8	NP	10
		Medium dense to dense, brown SANDY GRAVEL, wet	10			4	6 8 16	NP	10
						5	10 18 38	NP	10
	657.4	Stiff to very stiff, gray CLAY, trace gravel	15			6	27 6 8	3.77 B	16
						7	43 13 9	2.05 B	17
			20			8	27 11 6	1.80 B	18

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	647.4	Stiff to hard, gray SILTY CLAY LOAM				9	21 8 5	1.56 B	21
			25			10	21 7 11	2.38 S	16
						11	6 8 9	1.72 B	16
	641.4	Medium dense, brown, fine SAND	30			12	5 1 5	4.92 B	22
	635.4	Boring terminated at 35.00 ft	35			13	1 2 9	NP	18
			40						

GENERAL NOTES

Begin Drilling 05-03-2001 Complete Drilling 05-03-2001
Drilling Contractor Windy City Drilling Drill Rig CME 45
Driller Gabriel Logger T. Chen Checked by P. Wang
Drilling Method 3.25" ID HSA; backfilled with benotine chip.

WATER LEVEL DATA

While Drilling ▽ 10.00 ft
At Completion of Drilling ▽ 8.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA
The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-4D

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 671.97 ft
North: 2056262.68 ft
East: 1084276.85 ft
Station: 251+49
Offset: 18.5 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Medium stiff to stiff, dark brown SANDY CLAY LOAM --FILL--				1	4 8 7	1.80 B	15
			5			2	12 10 12	1.60 S	11
	664.2	Medium dense, brown SANDY LOAM, some gravel --FILL--				3	4 9 33	0.40 S	33
			10			4	8 13 17	NP	10
	661.5	Very stiff gray SILTY CLAY, little gravel				5	5 7 9	3.28 B	12
	657.0	--AUGER REFUSAL--	15			6	5 10 26	3.03 B	15
		Boring terminated at 15.00 ft							
			20						

GENERAL NOTES

Begin Drilling 04-30-2001 Complete Drilling 04-30-2001
Drilling Contractor Windy City Drilling Drill Rig CME 45
Driller Gabriel Logger T. Chen Checked by P. Wang
Drilling Method 3.25" ID HSA; backfilled with benotine chip.

WATER LEVEL DATA

While Drilling ▽ 14.50 ft
At Completion of Drilling ▽
Time After Drilling 24 hours
Depth to Water ▽ NA
The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

SOIL BORING LOGS-II
STRUCTURE NO. 049-W022

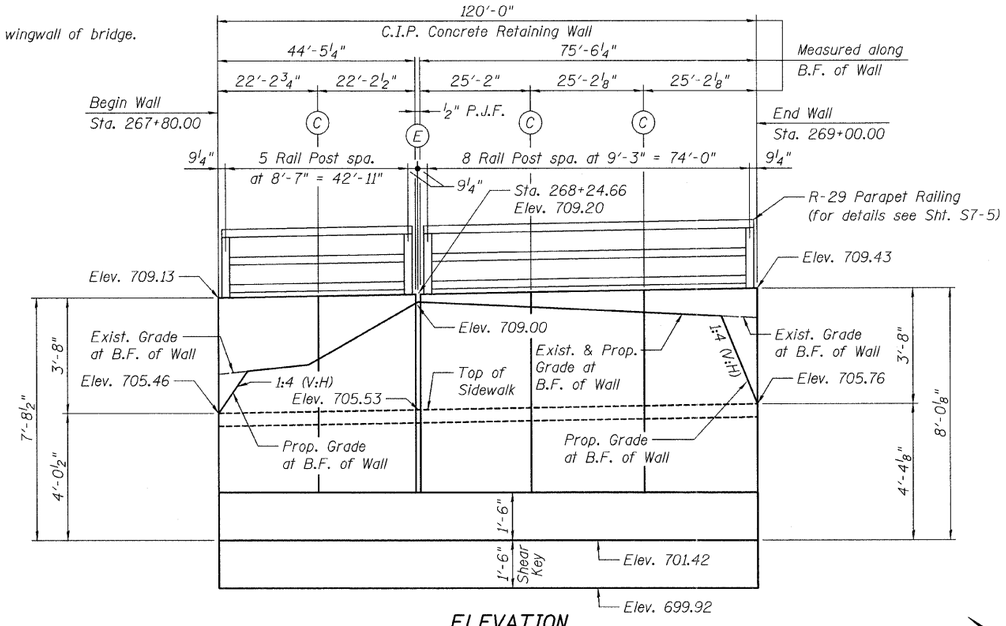
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D1680953-09-boring_logs-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

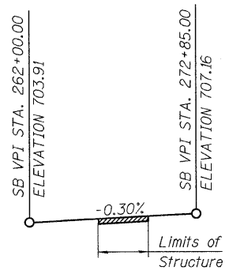
SOIL BORING LOGS-II
STRUCTURE NO. 049-W022
SHEET NO. S6-9 OF S6-9 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	329
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

Bench Mark:
Chiseled box on top of S.E. wingwall of bridge.
Elevation 669.64



ELEVATION
(Looking at B.F. of Wall)



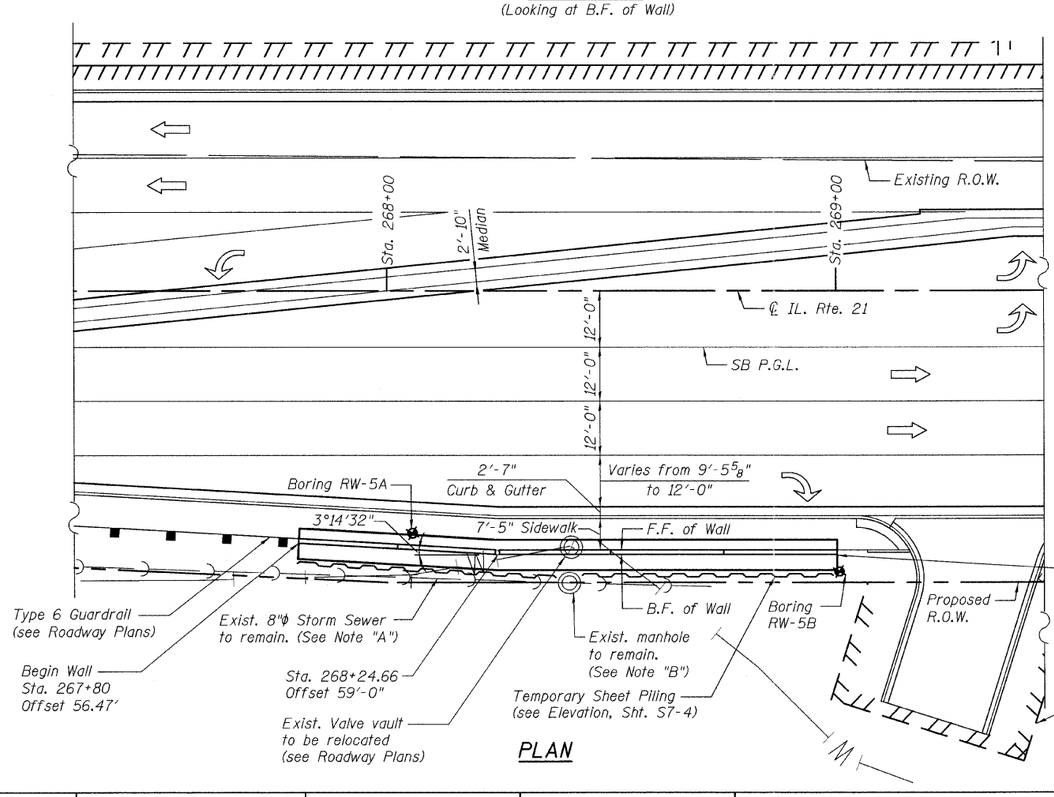
PROFILE GRADE

LEGEND:
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
(C) = Construction Joint
(E) = Expansion Joint

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

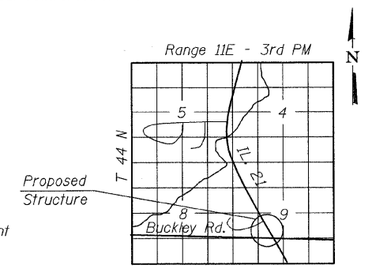
DESCRIPTION	UNIT	QUANTITY
Structure Excavation	Cu. Yd.	376
Concrete Structures	Cu. Yd.	80.0
Form Liner Textured Surface	Sq. Ft.	440
Reinforcement Bars, Epoxy Coated	Pound	8,870
Parapet Railing	Foot	120
Geocomposite Wall Drain	Sq. Yd.	63
Temporary Sheet Piling	Sq. Ft.	1,620
Pipe Underdrains for Structures 4"	Foot	130
Porous Granular Embankment, Special	Cu. Yd.	73
Stain For Concrete Structures	Sq. Yd.	49



PLAN

NOTE "A"
The Contractor must use extreme cautions as not to damage or disturb the exist. 8"ϕ storm sewer. The Contractor must locate the exist. 8"ϕ storm sewer prior to driving the temporary sheet piling.

NOTE "B"
The Contractor must use extreme caution as not to damage or disturb the exist. manhole. If necessary, the proposed footing must be notched to avoid the exist. manhole and cut reinforcement to fit within the notched area.



LOCATION SKETCH

DESIGN SPECIFICATIONS
AASHTO 2002 Standard
Specifications for Highway Bridges

DESIGN STRESSES
FIELD UNITS
f'_c = 3,500 psi
f_y = 60,000 psi (Reinforcement)
f_y = 36,000 psi (Structural Steel)

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
LICENSED STRUCTURAL ENGINEER
CHICAGO

Bhadresh N. Shah AUG. 15, 2011
BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21 - RETAINING WALL NO. 7
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 267+80.00 TO 269+00.00
STRUCTURE NO. 049-W023

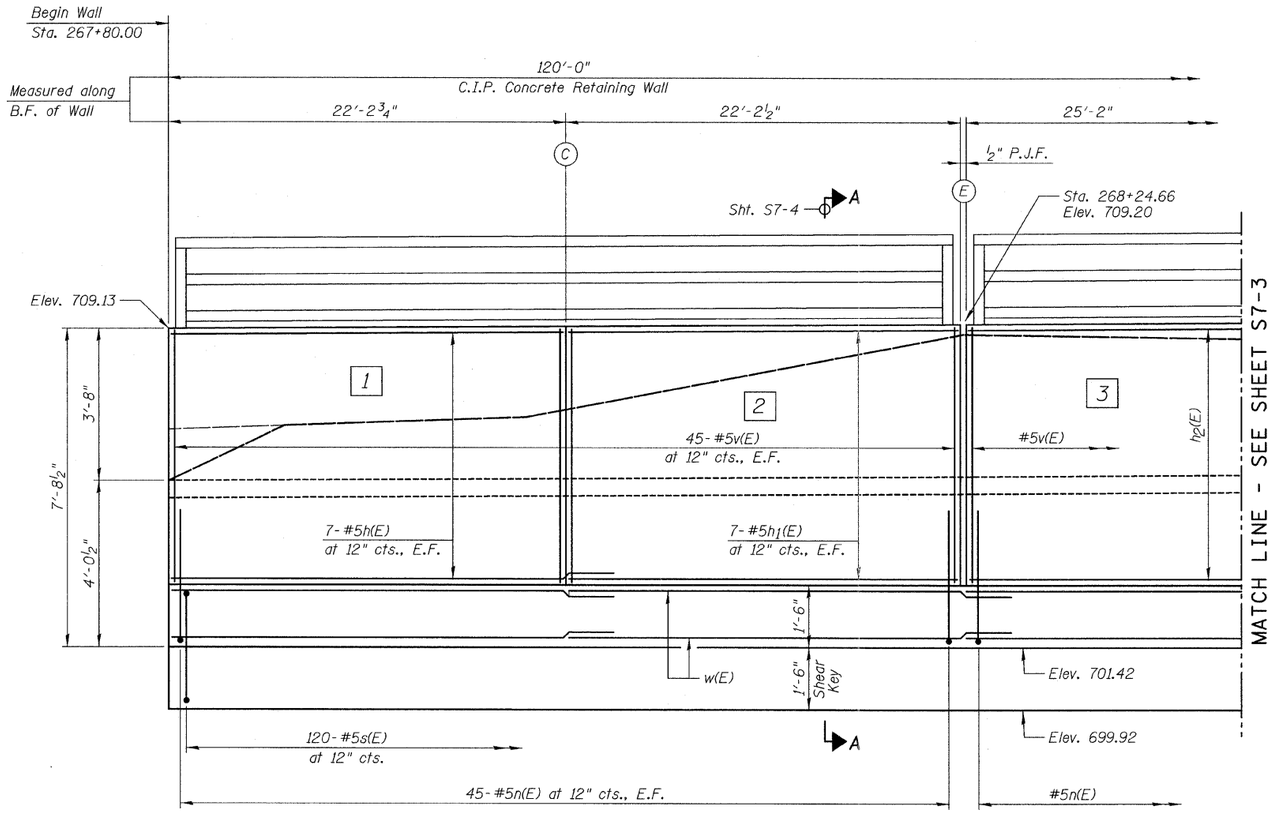
CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D1680953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

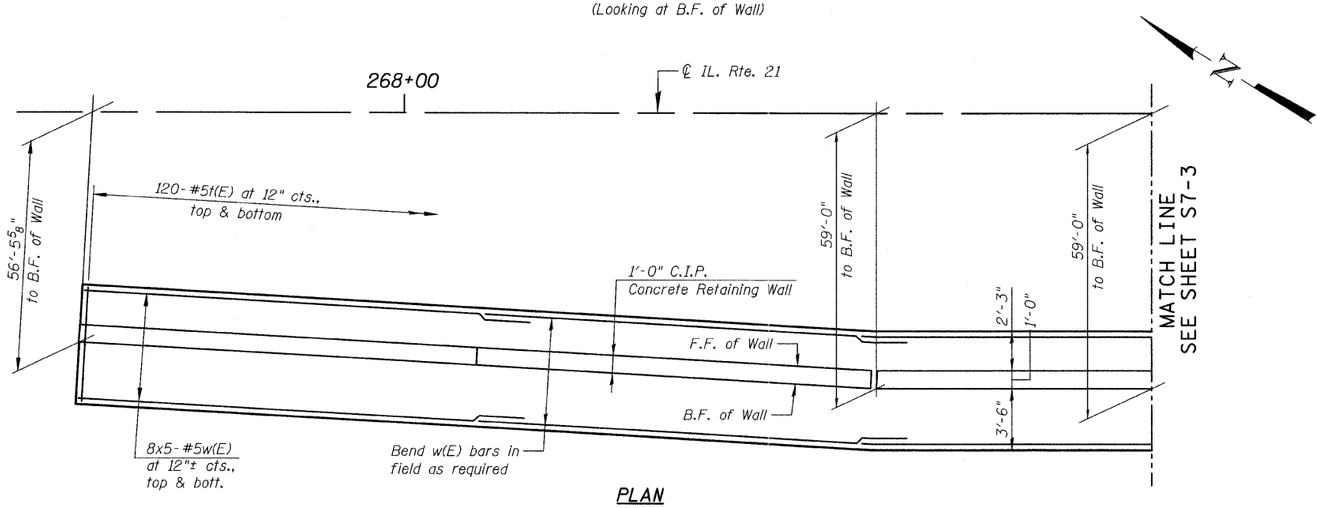
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-W023
SHEET NO. S7-1 OF S7-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	330
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



ELEVATION
(Looking at B.F. of Wall)



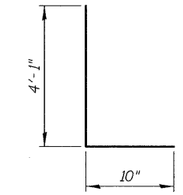
PLAN

GENERAL NOTES:

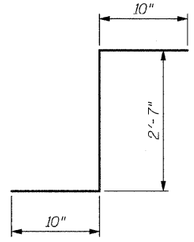
1. Pipe Underdrain Outlet Pipes shall drain into concrete headwalls. See Article 601.05 of the Standard Specifications and see Highway Standard 601101.
2. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
3. All Exposed Concrete edges shall be chamfered 3/4" unless otherwise noted.
4. Reinforcement Bars designated (E) shall be Epoxy Coated.

LEGEND:

E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
(C) = Construction Joint
(E) = Expansion Joint
[1] = Panel Numbers



BAR n(E)



BAR s(E)

MIN. BAR LAP:
#5 bars = 2'-6"

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	14	#5	24'-9"	——
h1(E)	14	#5	21'-11"	——
h2(E)	28	#5	27'-8"	——
h3(E)	14	#5	24'-11"	——
n(E)	240	#5	4'-11"	L
s(E)	120	#5	4'-3"	⌐
t(E)	240	#5	6'-5"	——
v(E)	240	#5	5'-11"	——
w(E)	80	#5	26'-0"	——
Reinforcement Bars, Epoxy Coated		Pound	8,870	
Concrete Structures		Cu. Yd.	80.0	

PLAN & ELEVATION-I
STRUCTURE NO. 049-W023

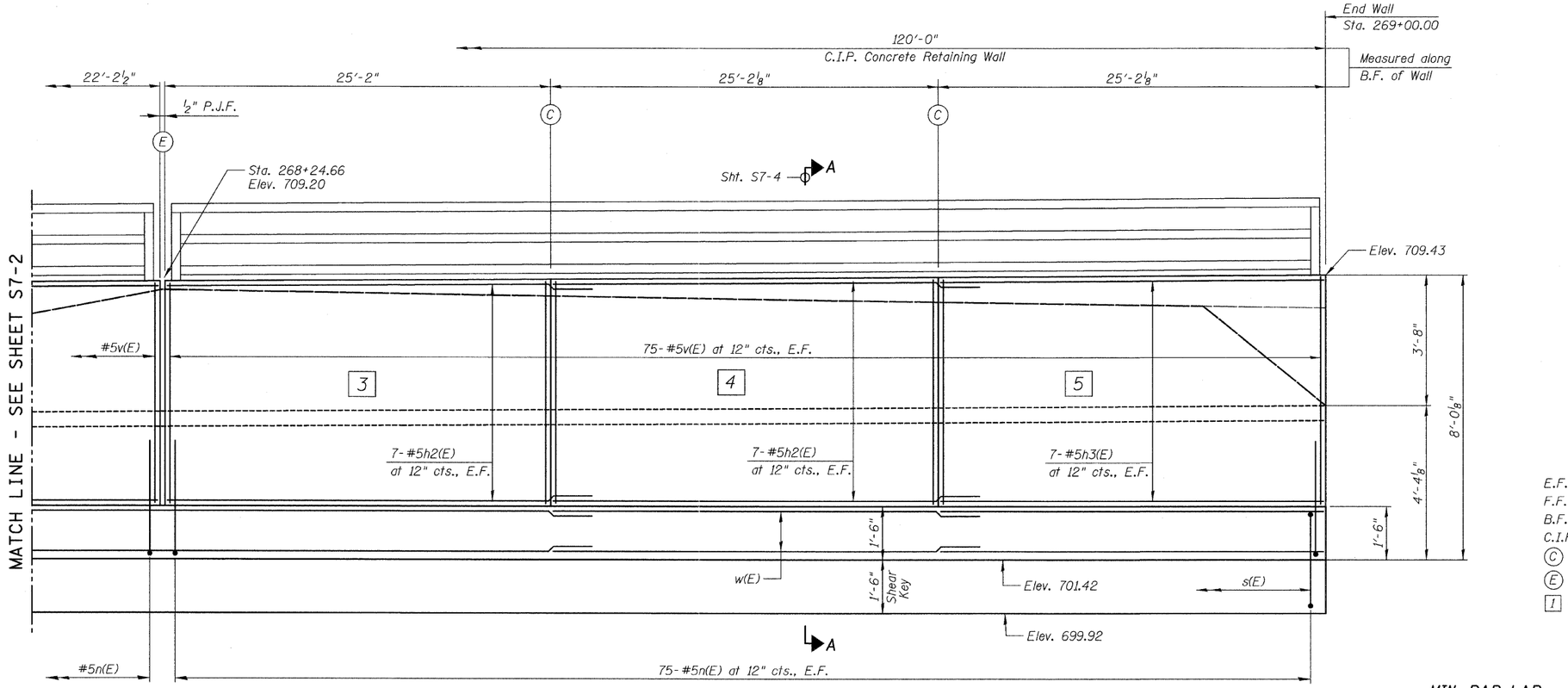
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D168953-02-plan_elev-1.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN & ELEVATION-I
STRUCTURE NO. 049-W023
SHEET NO. S7-2 OF S7-6 SHEETS

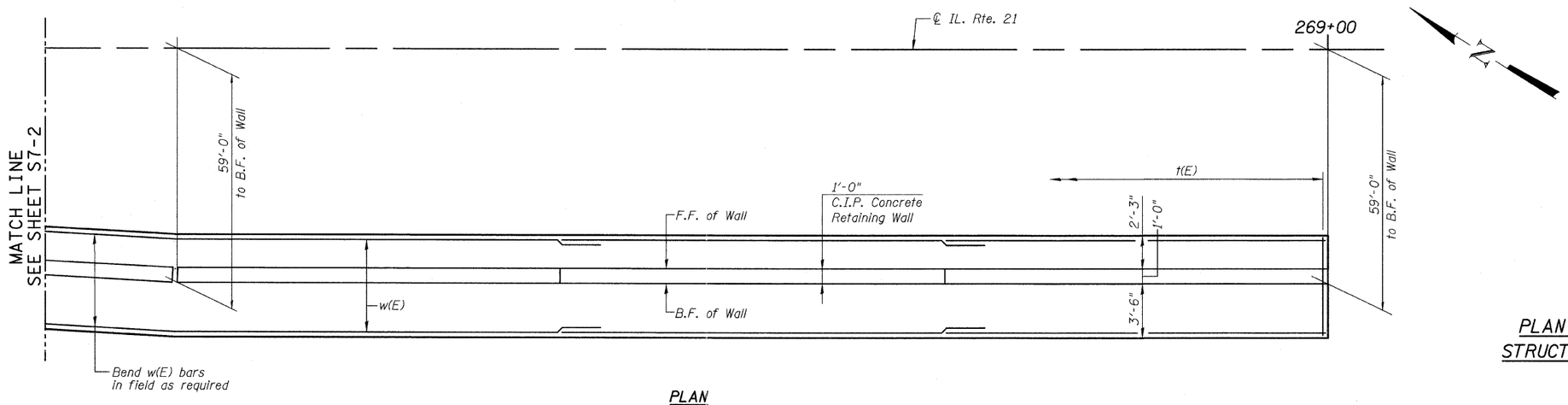
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	331
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



ELEVATION
(Looking at B.F. of Wall)

LEGEND:
E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
(C) = Construction Joint
(E) = Expansion Joint
[1] = Panel Numbers

MIN. BAR LAP:
#5 bars = 2'-6"



PLAN

PLAN & ELEVATION-II
STRUCTURE NO. 049-W023

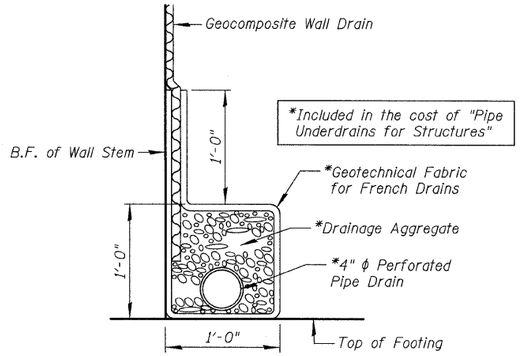
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D168953-03-plan_elev-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

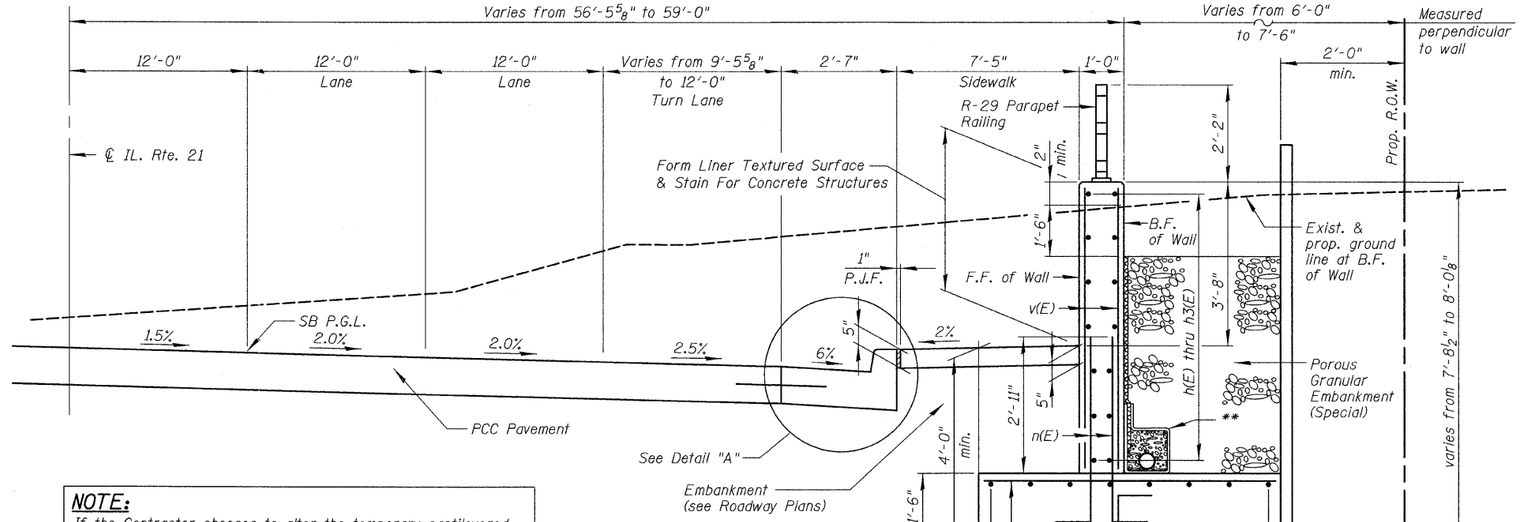
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN & ELEVATION-II
STRUCTURE NO. 049-W023
SHEET NO. S7-3 OF S7-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	332
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



PIPE UNDERDRAIN DETAIL



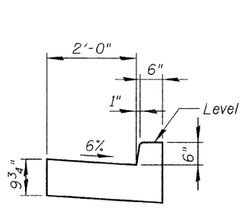
SECTION A-A

Maximum bearing pressure under footing = 1.5 ksf

**Pipe Underdrain (see Pipe Underdrain Detail, this Sheet)

NOTE:

If the Contractor chooses to alter the temporary cantilevered sheet piling design requirements shown on the plans, a design submittal including plan details and calculations will be required for review and acceptance by the Engineer.



DETAIL "A"

LEGEND:

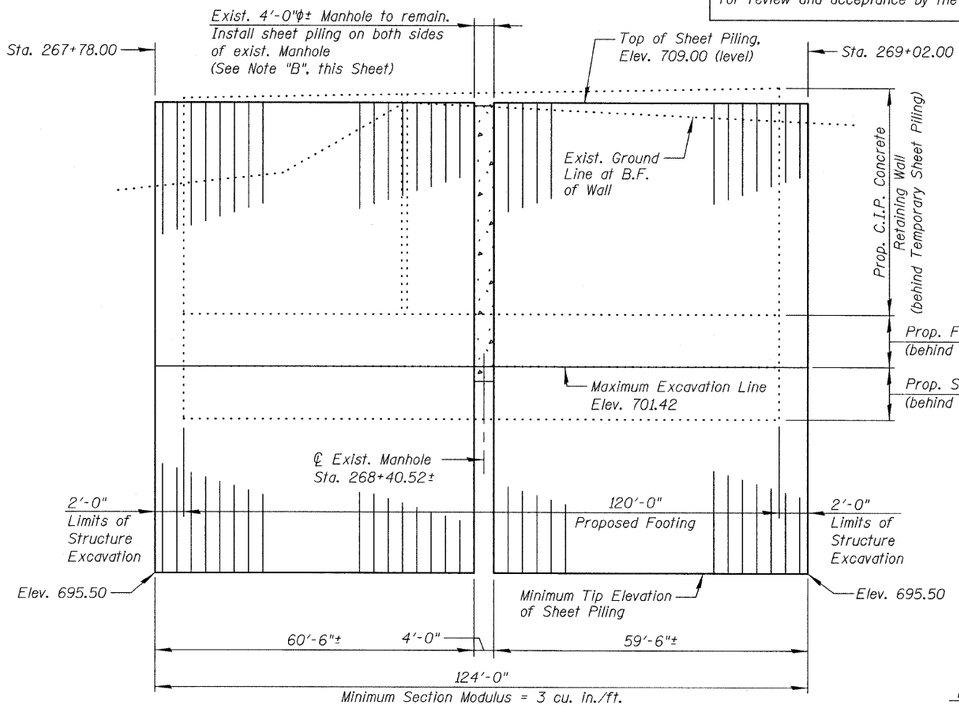
F.F. = Front Face
B.F. = Back Face
C.I.P. = cast-In-Place

NOTE "A"

The Contractor must use extreme cautions as not to damage or disturb the exist. 8"ϕ storm sewer. The Contractor must locate the exist. 8"ϕ storm sewer prior to driving the temporary sheet piling.

NOTE "B"

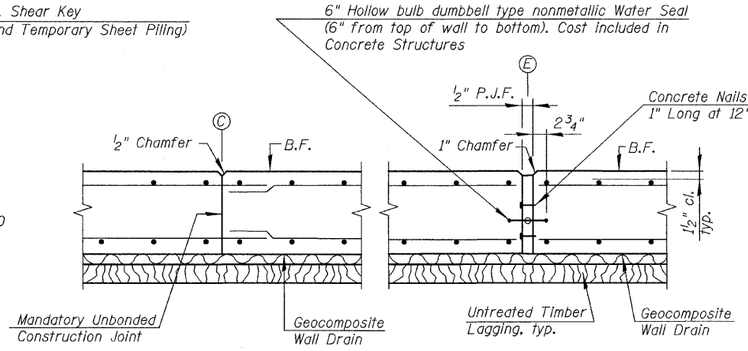
The Contractor must use extreme caution as not to damage or disturb the exist. manhole. If necessary, the proposed footing must be notched to avoid the exist. manhole and cut reinforcement to fit within the notched area.



ELEVATION

TEMPORARY SHEET PILING

(Looking at B.F. of Wall)



CONSTRUCTION JOINT

EXPANSION JOINT

END OF PANEL DETAILS

RETAINING WALL SECTION
STRUCTURE NO. 049-W023

CHRISTIAN-ROGE & ASSOCIATES, INC.

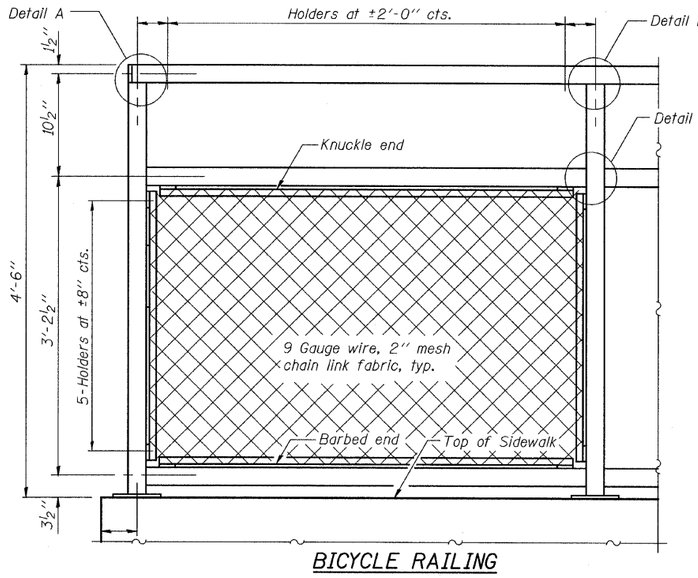
FILE NAME = D168953-04-ret_wall_sect.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

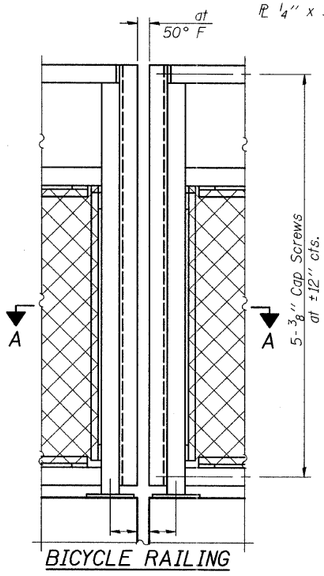
RETAINING WALL SECTION
STRUCTURE NO. 049-W023

SHEET NO. S7-4 OF S7-6 SHEETS

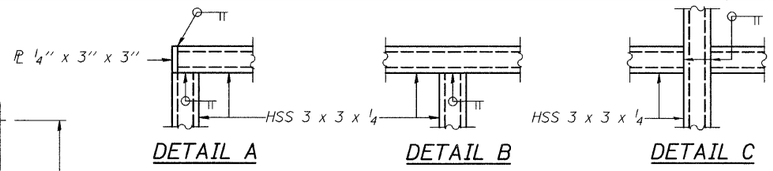
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	333
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



BICYCLE RAILING

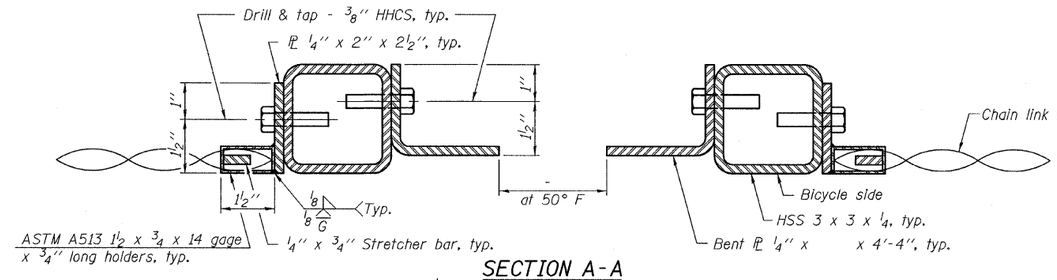


BICYCLE RAILING

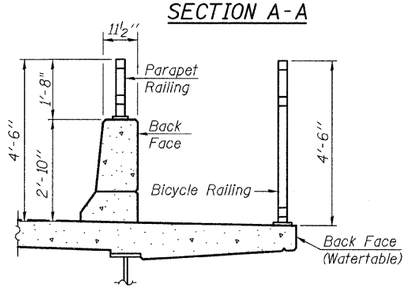


DETAIL A DETAIL B DETAIL C

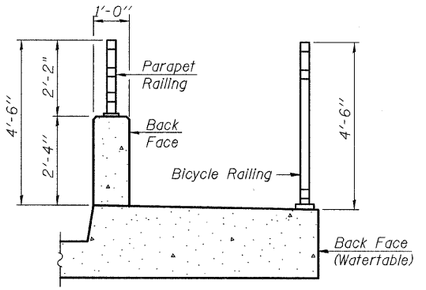
All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.



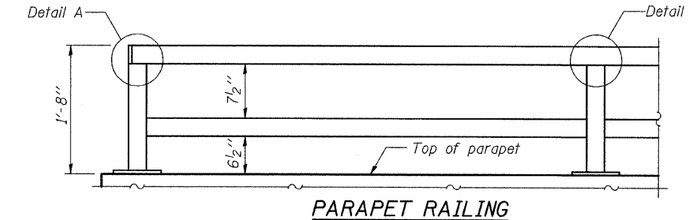
SECTION A-A



SECTION THRU DECK

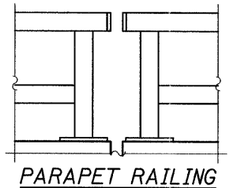


SECTION THRU SIDEWALK



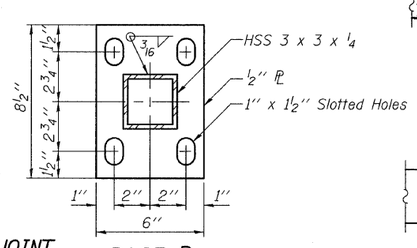
PARAPET RAILING ELEVATION

(Inside Face of Two Element Rail)

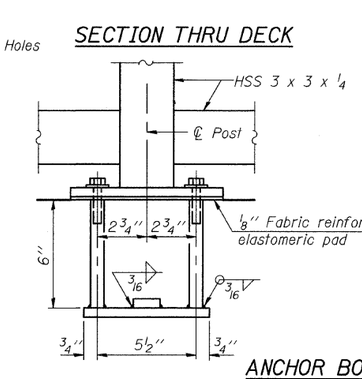


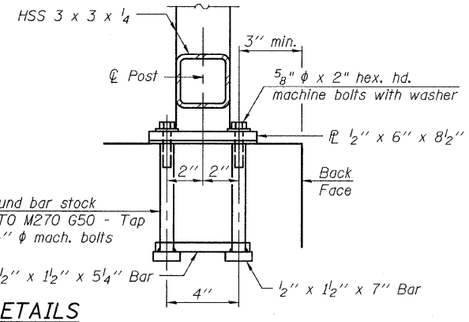
PARAPET RAILING ELEVATION AT EXPANSION JOINT

(Two Element Rail Shown - Three Element Rail Similar)



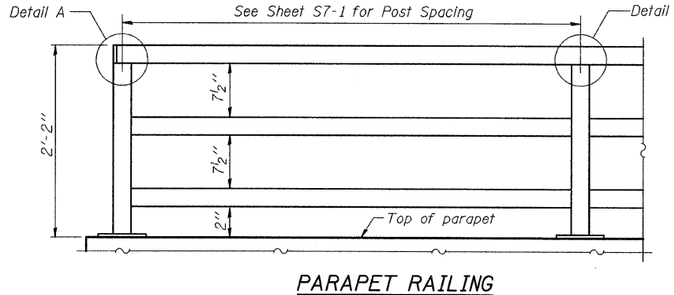
BASE ℄





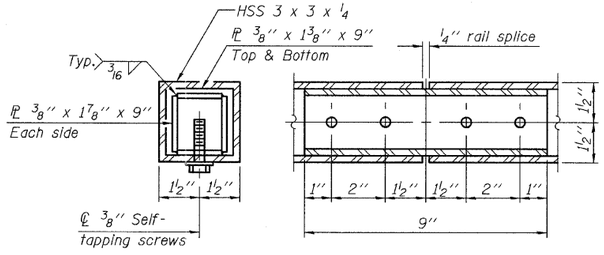
ANCHOR BOLT DETAILS

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting ⅝" ϕ anchor rods according to Article 509.06 of the Standard Specifications. Embedment shall be according to the manufacturer's specifications.



PARAPET RAILING ELEVATION

(Inside Face of Three Element Rail)



RAIL SPLICE

BILL OF MATERIAL

Item	Unit	Quantity
Parapet Railing	Foot	120

PARAPET RAILING
STRUCTURE NO. 049-W023

CHRISTIAN-ROGE & ASSOCIATES, INC.

R-29 7-1-10 (10'-0" Maximum Post Spacing)

FILE NAME = D1609953-05-par_railing.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARAPET RAILING
STRUCTURE NO. 049-W023
SHEET NO. S7-5 OF S7-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	334
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-5A

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 706.64 ft
North: 2054762.30 ft
East: 1084957.50 ft
Station: 268+05.521
Offset: 53.3 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Stiff to very stiff, brown CLAY LOAM			1	2 3 3	1.39 S	21
	698.6		5		2	3 4 5	2.54 B	15
					3	2 3 4	1.89 B	17
	696.6	Loose, brown SANDY LOAM	10		4	2 4 5	NP	19
		Boring terminated at 10.00 ft						
			15					
			20					

GENERAL NOTES	WATER LEVEL DATA
Begin Drilling 04-30-2001 Complete Drilling 04-30-2001	While Drilling ▽ 8.00 ft
Drilling Contractor Windy City Drilling Drill Rig CME 45	At Completion of Drilling ▼ 7.00 ft
Driller Gabriel Logger T. Chen Checked by P. Wang	Time After Drilling 24 hours
Drilling Method 3.25" ID HSA; backfilled with benotine chip.	Depth to Water ▽ NA
	The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.GDT 11/5/10
WANGENG INC 722301.GPJ

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-5B

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 708.22 ft
North: 2054681.22 ft
East: 1085007.20 ft
Station: 269+00.618
Offset: 61.89 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Stiff, brown CLAY LOAM --FILL--			1	5 3 3	1.89 B	22
	705.2		5		2	3 3 5	2.05 B	18
		Stiff to very stiff, brown CLAY LOAM			3	2 3 4	1.97 B	17
	698.2		10		4	3 4 6	1.72 B	16
		Boring terminated at 10.00 ft						
			15					
			20					

GENERAL NOTES	WATER LEVEL DATA
Begin Drilling 04-30-2001 Complete Drilling 04-30-2001	While Drilling ▽ DRY
Drilling Contractor Windy City Drilling Drill Rig CME 45	At Completion of Drilling ▼ DRY
Driller Gabriel Logger T. Chen Checked by P. Wang	Time After Drilling 24 hours
Drilling Method 3.25" ID HSA; backfilled with benotine chip and blacktop.	Depth to Water ▽ NA
	The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.GDT 11/5/10
WANGENG INC 722301.GPJ

SOIL BORING LOGS
STRUCTURE NO. 049-W023

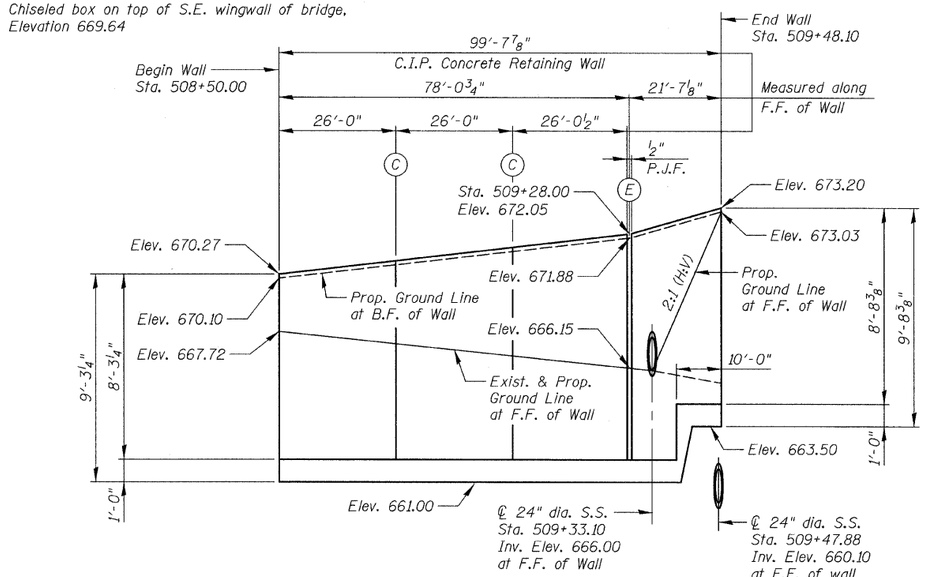
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-06-boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

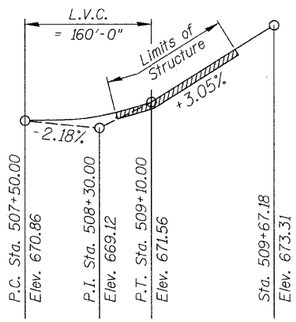
SOIL BORING LOGS
STRUCTURE NO. 049-W023
SHEET NO. S7-6 OF S7-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	335
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

Bench Mark:
Chiseled box on top of S.E. wingwall of bridge.
Elevation 669.64



ELEVATION
(Looking at F.F. of Wall)



PROFILE GRADE

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Structure Excavation	Cu. Yd.	349
Concrete Structures	Cu. Yd.	80.2
Form Liner Textured Surface	Sq. Ft.	487
Reinforcement Bars, Epoxy Coated	Pound	12,030
Geocomposite Wall Drain	Sq. Yd.	27
Concrete Gutter, Type B	Foot	100
Porous Granular Embankment, Special	Cu. Yd.	36
Stain For Concrete Structures	Sq. Yd.	55

LEGEND:

F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
(C) = Construction Joint
(E) = Expansion Joint

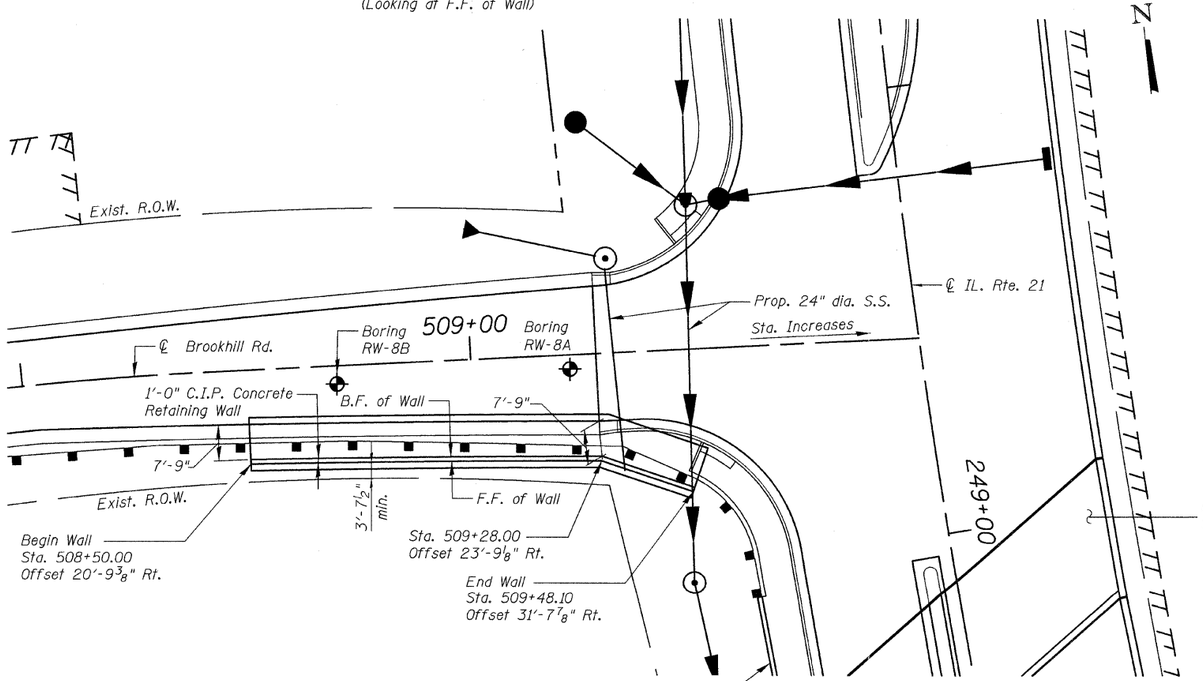
DESIGN SPECIFICATIONS

AASHTO 2002 Standard
Specifications for Highway Bridges

DESIGN STRESSES

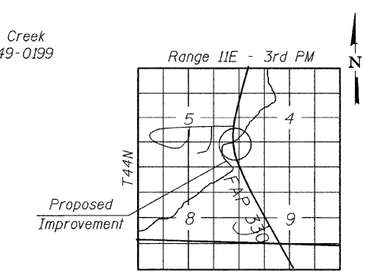
FIELD UNITS

f'_c = 3,500 psi
f_y = 60,000 psi (Reinforcement)



PLAN

Indicates Boring Locations



LOCATION SKETCH

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
CHICAGO
LICENSED STRUCTURAL ENGINEER

Bhadresh N. Shah AUG. 05, 2011
BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

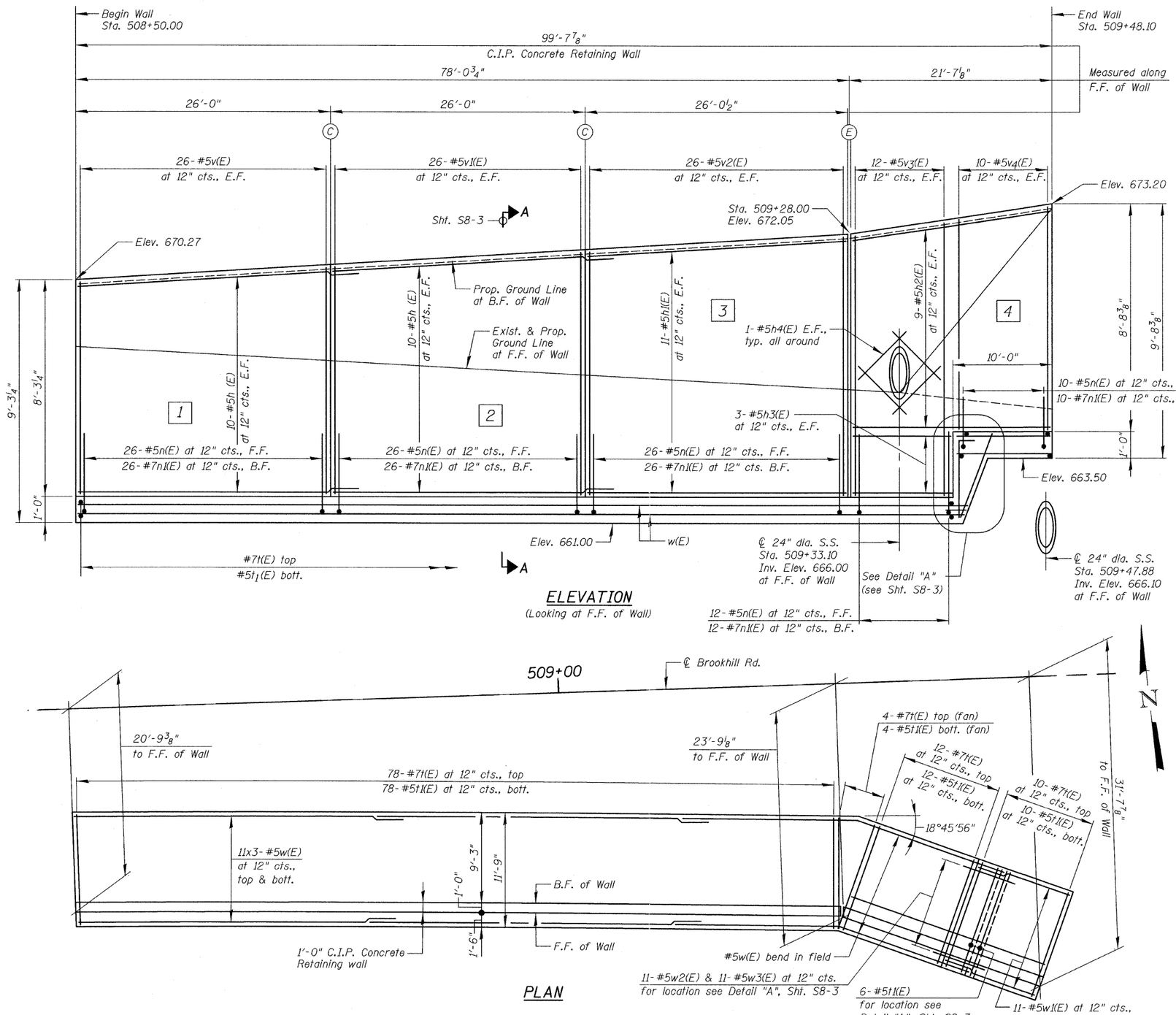
GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21 - RETAINING WALL NO. 8
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 508+50.00 TO 509+48.10
STRUCTURE NO. 049-W042

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-W042
SHEET NO. S8-1 OF S8-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	336
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



ELEVATION
(Looking at F.F. of Wall)

PLAN

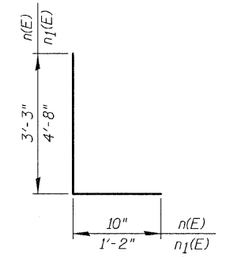
GENERAL NOTES:

1. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
2. All Exposed Concrete edges shall be chamfered 3/4" unless otherwise noted.
3. Reinforcement Bars designated (E) shall be Epoxy Coated.

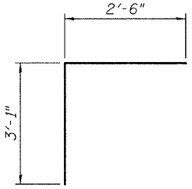
BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	40	#5	28'-6"	——
h1(E)	22	#5	25'-10"	——
h2(E)	18	#5	21'-3"	——
h3(E)	6	#5	11'-3"	——
h4(E)	8	#5	4'-0"	——
n(E)	100	#5	4'-1"	L
n1(E)	100	#7	5'-10"	L
t(E)	104	#7	11'-5"	——
t1(E)	110	#5	11'-5"	——
v(E)	52	#5	8'-0"	——
v1(E)	52	#5	8'-7"	——
v2(E)	52	#5	9'-2"	——
v3(E)	24	#5	9'-9"	——
v4(E)	20	#5	7'-11"	——
w(E)	66	#5	32'-3"	——
w1(E)	22	#5	9'-8"	——
w2(E)	11	#5	5'-7"	⌐
w3(E)	11	#5	7'-2"	⌐
Reinforcement Bars, Epoxy Coated			Pound	12,030
Concrete Structures			Cu Yd	80.2

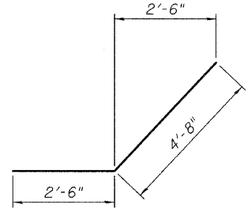
Reinforcement Bars designated thus 11x3-#5 etc., indicates 11 lines of bars with 3 lengths per line



BARS n(E) & n3(E)



BAR w2(E)



BAR w3(E)

MIN. BAR LAP:
#5 bars = 2'-6"
#7 bars = 3'-11"

LEGEND:
E.F. = Each Face
F.F. = Front Face
B.F. = Back Face
C.I.P. = Cast-In-Place
(C) = Construction Joint
(E) = Expansion Joint
[1] = Panel Numbers

PLAN & ELEVATION STRUCTURE NO. 049-W042

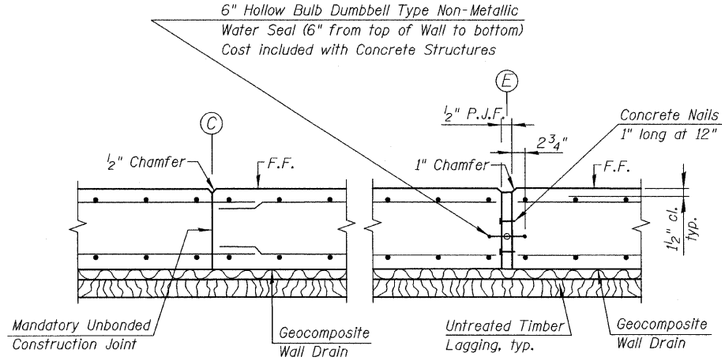
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-02-plan_elev.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

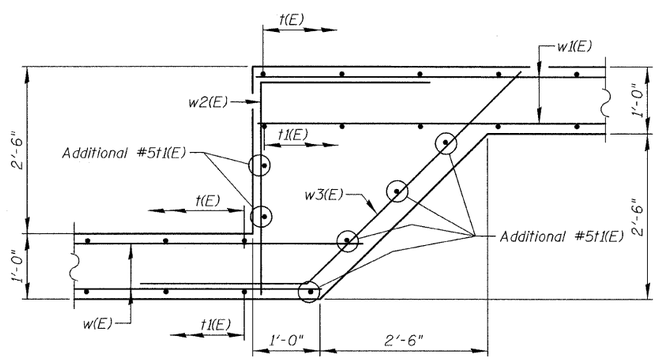
PLAN & ELEVATION
STRUCTURE NO. 049-W042
SHEET NO. S8-2 OF S8-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	337
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



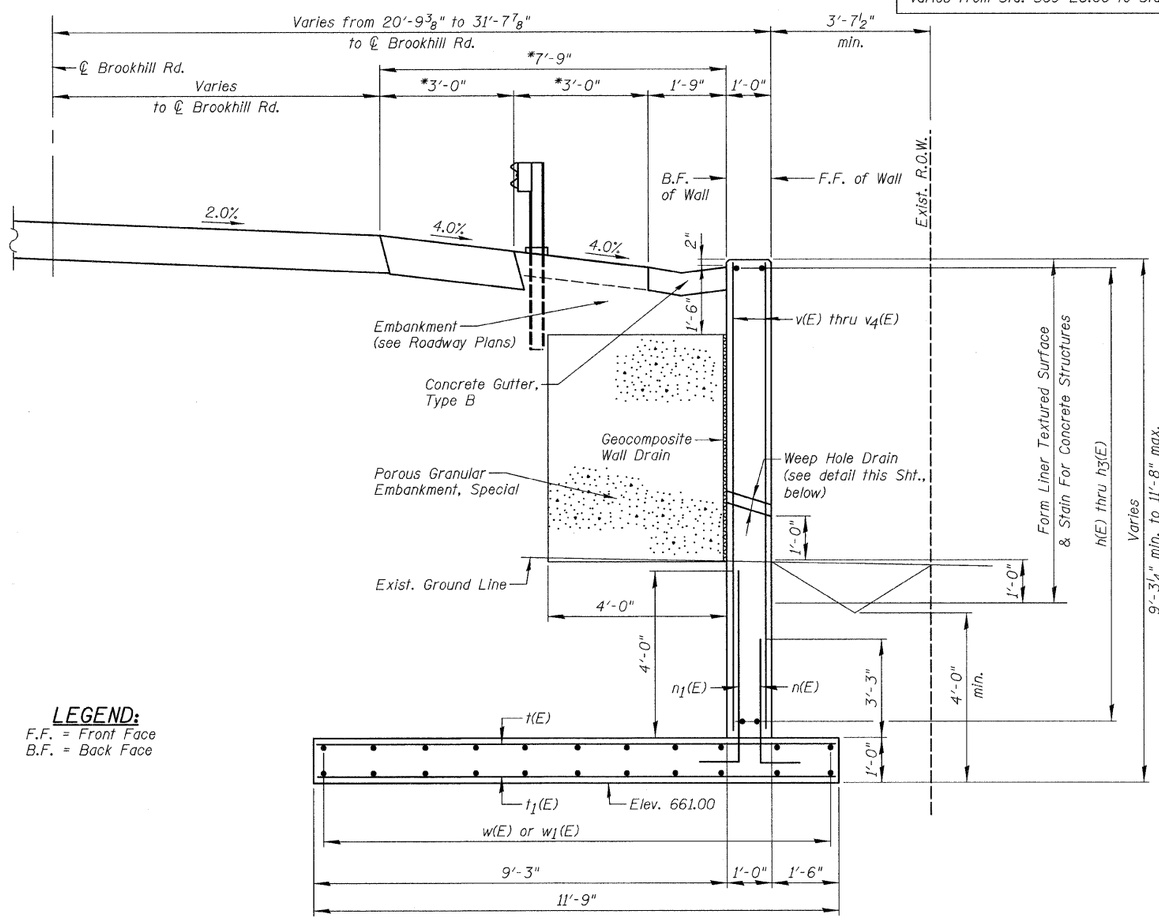
CONSTRUCTION JOINT EXPANSION JOINT

JOINT DETAILS FOR CAST-IN-PLACE T-TYPE WALLS



DETAIL "A"

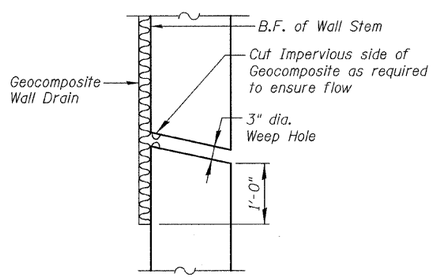
*For Sta. 508+50.00 to Sta. 509+28.00 & varies from Sta. 509+28.00 to Sta. 509+48.10



LEGEND:
F.F. = Front Face
B.F. = Back Face

SECTION A-A

Maximum bearing pressure under footing = 1.7ksf



WEEP HOLE DRAIN DETAIL

RETAINING WALL SECTION
STRUCTURE NO. 049-W042

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-03-ret-wall_sections.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RETAINING WALL SECTION
STRUCTURE NO. 049-W042
SHEET NO. S8-3 OF S8-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	338
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-8B

WEI Job No.: 950-12-01

Client: Christian-Roge & Associates, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 668.00 ft
North: 2056586.61 ft
East: 1084099.16 ft
Station: 508+70.46
Offset: 3.55 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	667.5	5-inch thick, ASPHALT --PAVEMENT--						
		Very soft, brown SANDY CLAY LOAM, trace gravel and wood --FILL--			1	2 3 4	* 0.25 P	17
	665.5	Loose to medium dense, brown SANDY LOAM, little gravel --MOIST--			2	1 3 4	NP	20
					3	5 10 9	NP	11
	660.0	Medium dense, gray, fine, poorly-graded SAND, trace gravel			4	9 13 11	NP	22
	658.4	--WET-- Stiff, gray CLAY, trace gravel			5	4 4 5	1.15 B	18
					6	4 5 6	1.72 B	23
	652.5	Medium dense, gray SILT			7	6 9 9	NP	17
	650.0							
	649.5	COBBLES, trace sand						
		Loose to dense, gray, fine, poorly-graded SAND			8	6 8 12	NP	
	638.0	Boring terminated at 30.00 ft			9	4 2 4	NP	24
					10	1 4 6	NP	16
					11	4 4 9	NP	19
					12	5 15 24	NP	18

GENERAL NOTES

Begin Drilling: 03-16-2011 Complete Drilling: 03-16-2011
Drilling Contractor: WTS Drill Rig: Mobile B-57 TMR
Driller: K&R Logger: F. Bozga Checked by: M. Snider
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 8.00 ft
At Completion of Drilling: 5.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-8A

WEI Job No.: 950-12-01

Client: Christian-Roge & Associates, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 668.00 ft
North: 2056579.55 ft
East: 1084150.05 ft
Station: 509+22.31
Offset: 3.11 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	667.74	4-inch thick ASPHALT --PAVEMENT--						
		Loose, brown GRAVELLY SAND --FILL--			1	2 4 4	NP	12
	666.0	Loose, brown SANDY LOAM, little gravel --MOIST--			2	4 4 5	NP	14
	663.0	Gray ROCK FRAGMENTS and COBBLES, trace sand --WET--			3	9 14 15	NP	13
	661.5	Stiff to hard, gray CLAY, trace gravel			4	5 5 4	2.25 P	18
					5	3 4 6	2.05 B	19
					6	2 3 4	1.07 B	22
					7	4 7 9	4.35 B	14
	650.0	Loose to medium dense, gray, fine, poorly-graded SAND			8	3 3 3	NP	17
	638.0	Boring terminated at 30.00 ft			9	5 5 4	NP	20
					10	3 8 11	NP	19
					11	5 6 10	NP	21
					12	9 12 15	NP	18

GENERAL NOTES

Begin Drilling: 03-16-2011 Complete Drilling: 03-16-2011
Drilling Contractor: WTS Drill Rig: Mobile B-57 TMR
Driller: K&R Logger: F. Bozga Checked by: M. Snider
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 5.50 ft
At Completion of Drilling: 5.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG,INC 950120I.GPJ WANGENG.GDT 4/5/11

WANGENG,INC 950120I.GPJ WANGENG.GDT 4/5/11

SOIL BORING LOGS
STRUCTURE NO. 049-W042

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-04-boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOIL BORING LOGS
STRUCTURE NO. 049-W042
SHEET NO. S8-4 OF S8-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	339
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Bench Mark: Chiseled box on top of S.E. wingwall of the existing bridge over Bull Creek, El. 669.64.

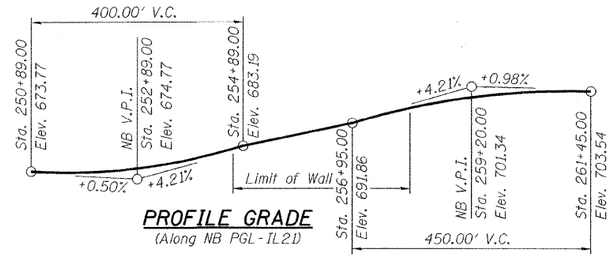
Existing Structure: None.

Legend:

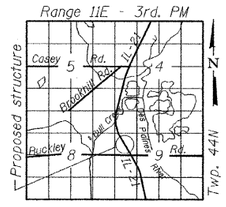
- F.F. Front Face
- B.F. Back Face
- (C) Construction Joint
- (E) Expansion Joint
- Boring Location
- Tree, to Remain
- —G— Underground Gas Line
- —E— Underground Electric Line

Notes:

1. Wall dimensions are measured along F.F. of wall.
2. Stations and offsets for the wall are given from the ℄ IL-21 to the F.F. of wall.
3. See sheet S9-2 for pile location, top and tip elevations.



PROFILE GRADE
(Along NB PGL - IL21)



LOCATION SKETCH

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges (17th Edition)

DESIGN STRESSES

FIELD UNITS

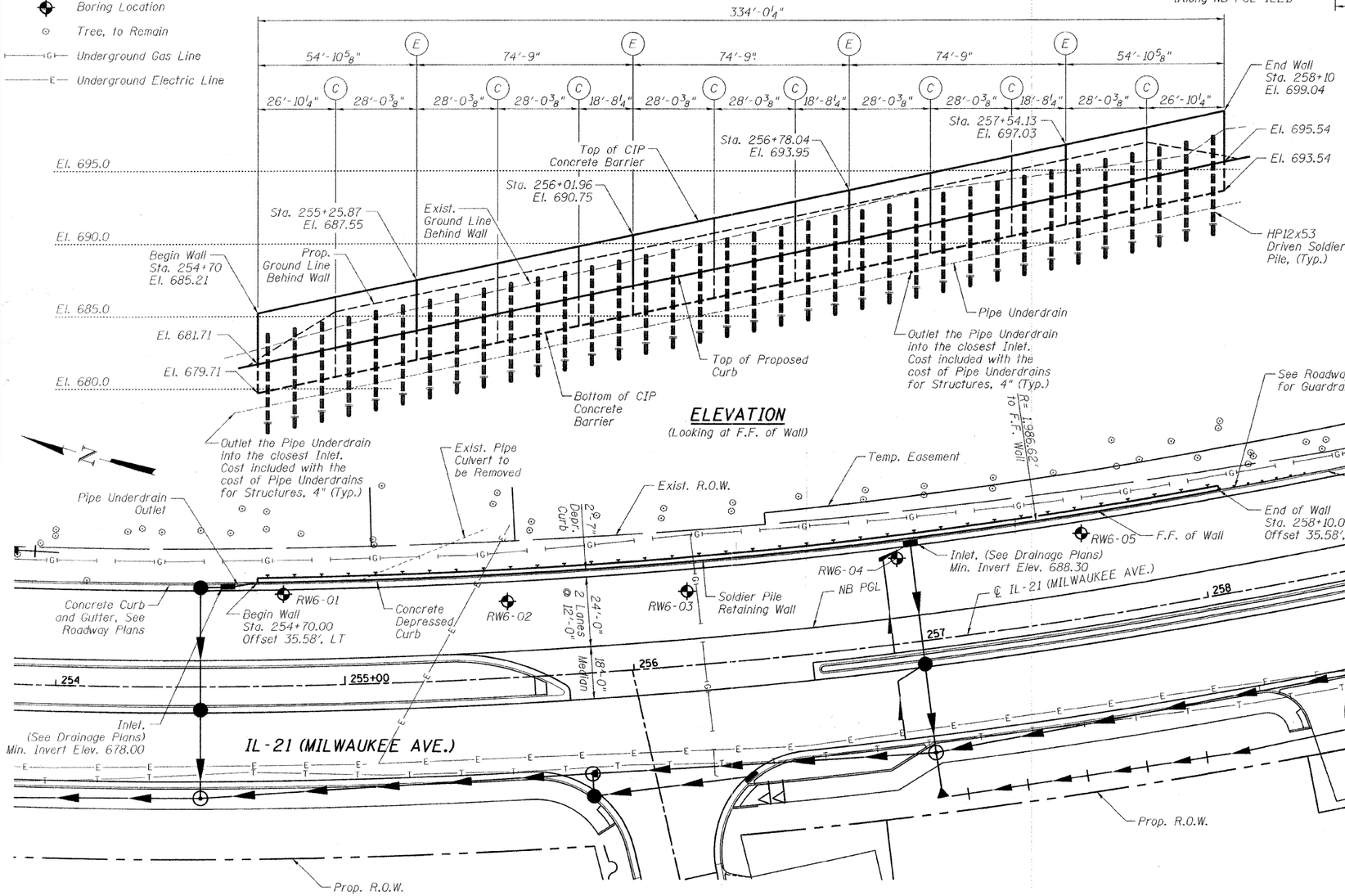
f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 36,000 psi (M270 Gr. 36)

CURVE DATA

℄ IL-21 (Milwaukee Ave.)
Δ = 46°-11'-38"
D = 2°-50'-00"
T = 862.41'
L = 1,630.37'
E = 176.22'
R = 2,022.20'
S.E. = 2.90%
P.C. Sta. = 243+66.70
P.T. Sta. = 259+97.07
P.I. Sta. = 252+29.11

HIGHWAY CLASSIFICATION

F.A.P. 330 - IL Rte. 21
Functional Class: Other Principal Arterial
ADT: 23,800 (2010); 51,000 (2030)
ADTT: 952 (2010); 2,040 (2030)
DHV: 2,445 (2030)
Design Speed: 45 m.p.h.
Posted Speed: 45 m.p.h.
Two Way Traffic
Directional Distribution: 50:50



ELEVATION
(Looking at F.F. of Wall)

PLAN

COLLINS ENGINEERS, INC.
JAMES M. HAMELKA
NO. 81-6116
EXPIRES 11-30-2012

GENERAL PLAN AND ELEVATION
IL-21 (MILWAUKEE AVENUE) - RETAINING WALL NO. 9
F.A.P. 330 - SEC. 128R-3
LAKE COUNTY
STATION 254+70.00 TO 258+10.00
STRUCTURE NO. 049-W041

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -
		CHECKED - JMH	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
	PLOT DATE =	CHECKED - JMH	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 049-W041
SHEET NO. S9-1 OF S9-9 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	340
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

INDEX OF SHEETS

GENERAL NOTES:

1. Reinforcement bars shall conform to the requirements of ASTM A706 Gr. 60.
2. Reinforcement bars designated (E) shall be epoxy coated.
3. The Contractor is responsible for the design and performance of the lagging using no less than a 3" nominal rough-sawn thickness and timber with a minimum allowable bending stress of 1000 psi.
4. Shear stud connectors shall be 3/4" diameter x 6" granular or solid flux filled headed studs automatically end welded to the front flange in the field.
5. Protective Coat shall be applied to all exposed surfaces of the concrete barrier and shall extend 1'-0" minimum below finished grade.
6. The cost of cutting off any piling in excess of that needed shall be included in the cost of "Driving Soldier Piles."
7. All exposed edges shall have a 3/4" chamfer, except as shown otherwise.
8. The Contractor shall locate all existing utilities prior to construction. Any damage to utilities to be repaired at the Contractor's expense. In case of conflict with soldier pile, the maximum spacing between adjacent soldier piles shall be 10'-0".
9. No construction equipment is allowed behind the location of the proposed wall.
10. The Contractor shall pay special attention during construction to not to damage any trees or tree roots.

TOTAL BILL OF MATERIAL

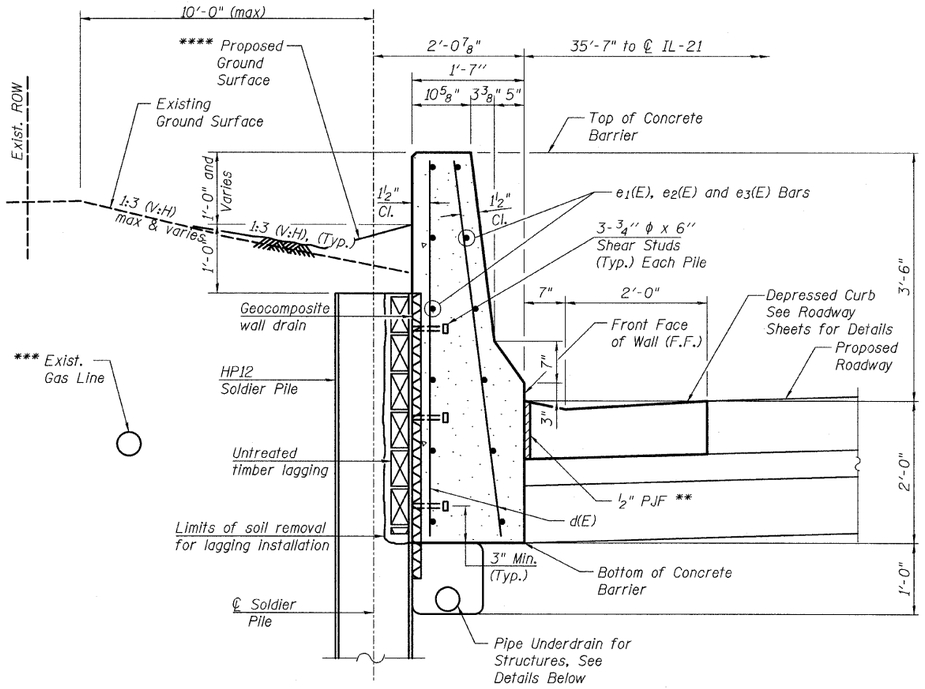
ITEM DESCRIPTION	UNIT	TOTAL
Structure Excavation	Cu. Yd.	168
Concrete Structures	Cu. Yd.	91.0
Protective Coat	Sq. Yd.	272
Shear Stud Connectors	Each	108
Reinforcement Bars, Epoxy Coated	Pound	8,160
Geocomposite Wall Drain	Sq. Yd.	150
Driving Soldier Piles	Foot	696
Untreated Timber Lagging	Sq. Ft.	1,170
Furnishing Soldier Piles (HP Section)	Foot	696
Pipe Underdrains For Structures, 4"	Foot	335

SOLDIER PILE WALL INFORMATION

Pile	Station *	Offset *	Top of Pile Elevation	Pile Tip Elevation	Pile Length (Ft)	No. Stud Shear Connectors
Pile # 1	254+73.56	37.66	681.47	663.85	17.62	3
Pile # 2	254+83.07	37.66	682.62	664.25	18.37	3
Pile # 3	254+92.58	37.66	683.77	664.64	19.13	3
Pile # 4	255+02.09	37.66	684.55	665.05	19.50	3
Pile # 5	255+11.60	37.66	684.95	665.45	19.50	3
Pile # 6	255+21.11	37.66	685.35	665.85	19.50	3
Pile # 7	255+30.62	37.66	685.75	666.25	19.50	3
Pile # 8	255+40.13	37.66	686.15	666.65	19.50	3
Pile # 9	255+49.64	37.66	686.55	667.05	19.50	3
Pile # 10	255+59.16	37.66	686.95	667.45	19.50	3
Pile # 11	255+68.67	37.66	687.35	667.85	19.50	3
Pile # 12	255+78.18	37.66	687.75	668.25	19.50	3
Pile # 13	255+87.69	37.66	688.15	668.65	19.50	3
Pile # 14	255+97.20	37.66	688.55	669.05	19.50	3
Pile # 15	256+06.71	37.66	688.95	669.45	19.50	3
Pile # 16	256+16.22	37.66	689.35	669.85	19.50	3
Pile # 17	256+25.73	37.66	689.75	670.25	19.50	3
Pile # 18	256+35.24	37.66	690.15	670.65	19.50	3
Pile # 19	256+44.76	37.66	690.55	671.05	19.50	3
Pile # 20	256+54.27	37.66	690.95	671.45	19.50	3
Pile # 21	256+63.78	37.66	691.35	671.85	19.50	3
Pile # 22	256+73.29	37.66	691.75	672.25	19.50	3
Pile # 23	256+82.80	37.66	692.16	672.66	19.50	3
Pile # 24	256+92.31	37.66	692.56	673.06	19.50	3
Pile # 25	257+01.82	37.66	692.95	673.45	19.50	3
Pile # 26	257+11.33	37.66	693.35	673.85	19.50	3
Pile # 27	257+20.84	37.66	693.73	674.23	19.50	3
Pile # 28	257+30.36	37.66	694.11	674.61	19.50	3
Pile # 29	257+39.87	37.66	694.49	674.99	19.50	3
Pile # 30	257+49.38	37.66	694.85	675.35	19.50	3
Pile # 31	257+58.89	37.66	695.21	675.71	19.50	3
Pile # 32	257+68.40	37.66	695.57	676.07	19.50	3
Pile # 33	257+77.91	37.66	695.91	676.41	19.50	3
Pile # 34	257+87.42	37.66	695.89	676.75	19.13	3
Pile # 35	257+96.93	37.66	695.49	677.09	18.40	3
Pile # 36	258+06.44	37.66	695.09	677.42	17.67	3
					Total =	108

* Stations and Offsets for the soldier piles are given to ℄ of piles.

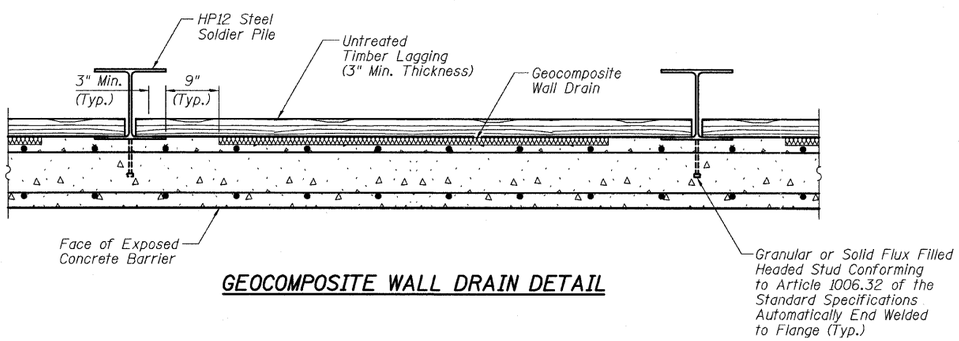
FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	GENERAL NOTES, BILL OF MATERIALS AND INDEX OF SHEETS STRUCTURE NO. 049-W041	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - JMH	REVISED -			330	128R-3	LAKE	518	341
	PLOT SCALE =	DRAWN - DR	REVISED -					CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - JMH	REVISED -		SHEET NO. S9-2 OF S9-9 SHEETS			ILLINOIS FED. AID PROJECT		



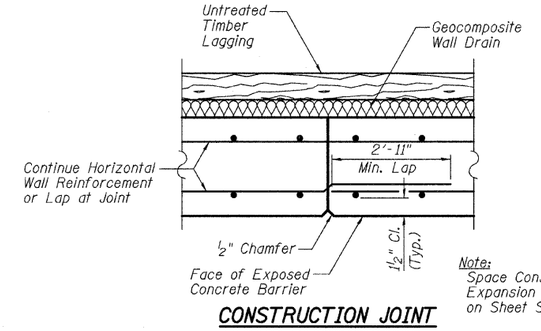
SECTION THRU SOLDIER PILE WALL

*** The Contractor shall locate the existing gas line and all other utilities prior to the construction. Any damage to utilities to be repaired at the Contractor's expense.

**** Final grading behind the wall to divert the surface run-off away form the wall. See Civil drawings for Landscaping Details and Pay Items.

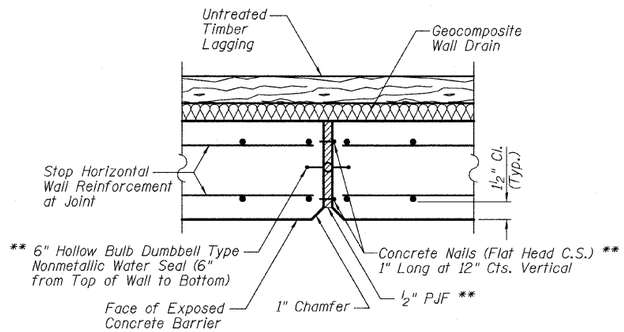


GEOCOMPOSITE WALL DRAIN DETAIL



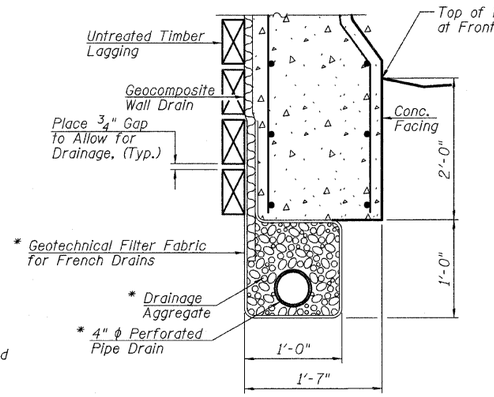
Note: Space Construction and Expansion Joints as shown on Sheet S1 Elevation.

CONSTRUCTION JOINT

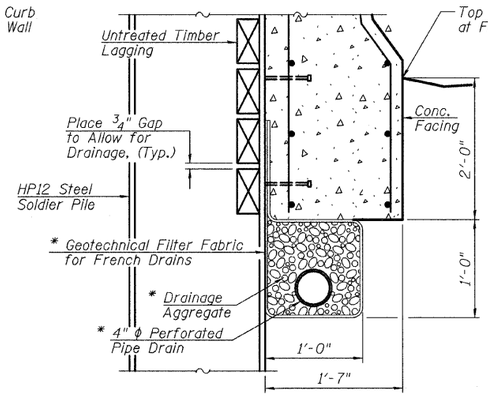


EXPANSION JOINT

** Cost Included in Pay Item for Concrete Structures.



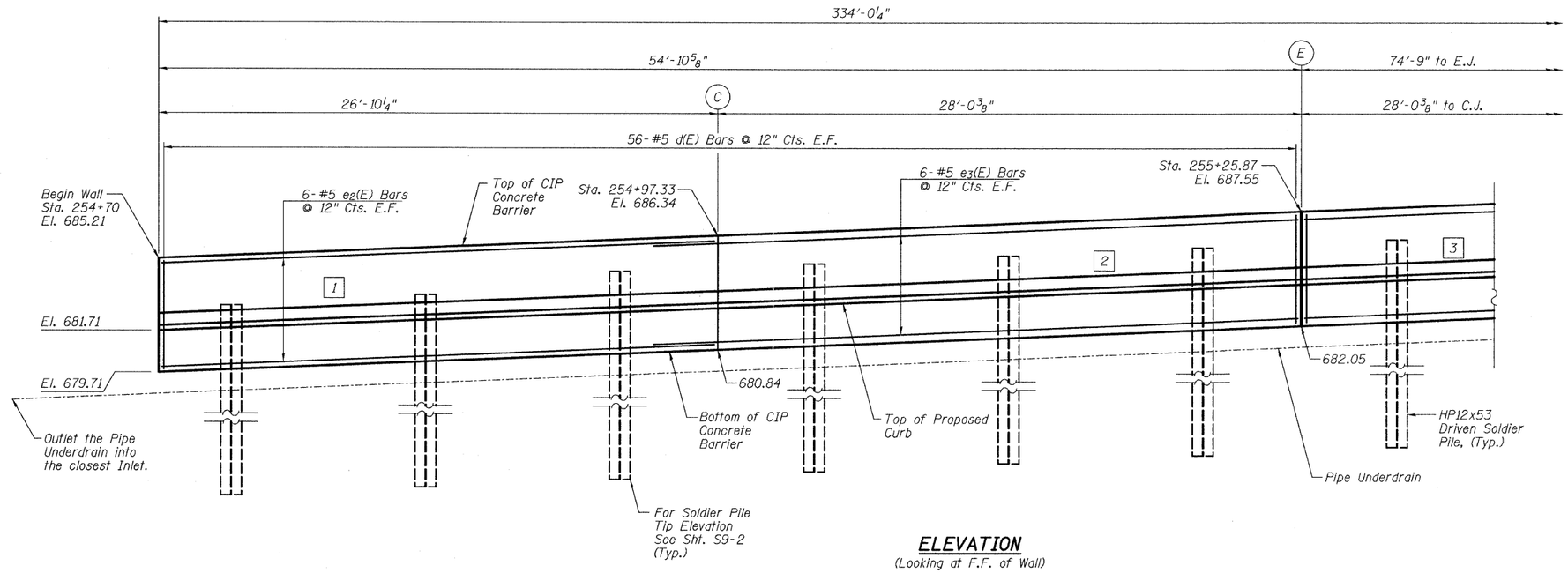
PIPE UNDERDRAIN DETAIL BETWEEN SOLDIER PILES



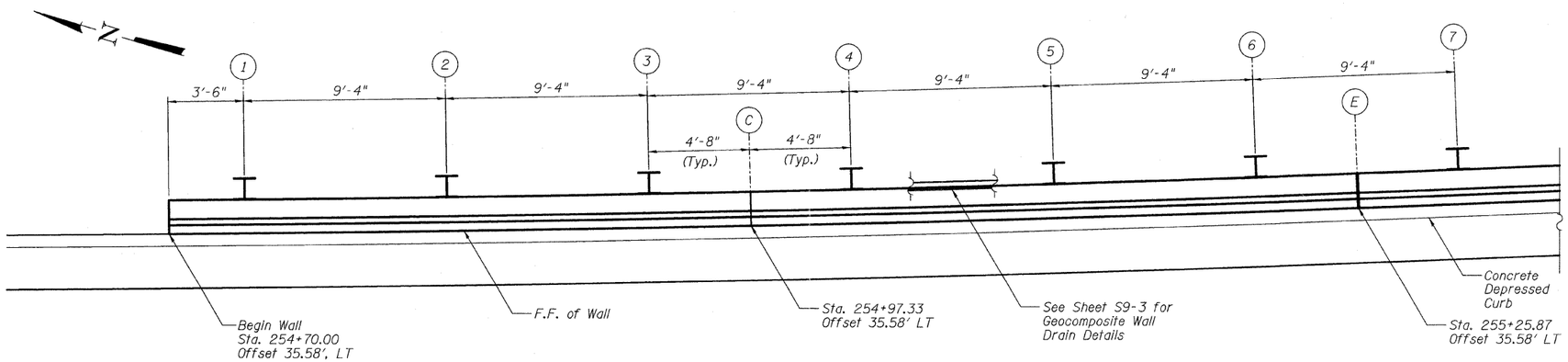
PIPE UNDERDRAIN DETAIL AT SOLDIER PILES

* Underdrain System Shall Extend to 1'-0" from the Ends of the Wall. Cost Included With "Pipe Underdrain for Structures, 4".

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL WALL SECTION AND DETAILS STRUCTURE NO. 049-W041	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - JMH	REVISED -			330	128R-3	LAKE	518	342
	PLOT SCALE =	DRAWN - DR	REVISED -		SHEET NO. S9-3 OF S9-9 SHEETS			CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - JMH	REVISED -					ILLINOIS FED. AID PROJECT		



ELEVATION
(Looking at F.F. of Wall)



PLAN

MINIMUM BAR LAPS:

No. 5 Bars - 2'-11"

Notes:

1. See sheet S9-2 for pile tip elevations.
2. Wall dimensions are measured along F.F. of the wall, stations are taken from ℄ I-21.

BILL OF MATERIAL
CAST-IN-PLACE CONCRETE

Bar	No.	Size	Length	Shape
d(E)	674	#5	5'-3"	——
e1(E)	36	#5	18'-5"	——
e2(E)	24	#5	26'-7"	——
e3(E)	96	#5	31'-0"	——
Concrete Structures			Cu. Yd.	91.0
Reinforcement Bars, Epoxy Coated			Pound	8,160

Legend:

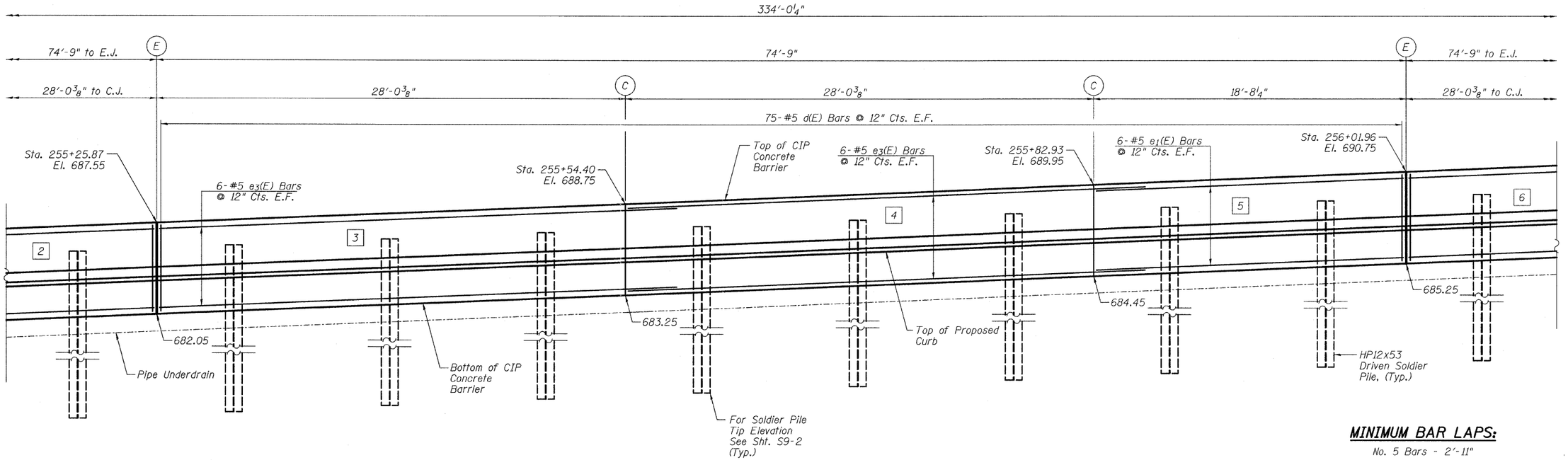
- F.F. Front Face
- B.F. Back Face
- E.F. Each Face
- (C) Construction Joint
- (E) Expansion Joint
- [1] Panel Number
- (1) Pile Number

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -
		CHECKED - JMH	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
	PLOT DATE =	CHECKED - JMH	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARTIAL PLAN AND ELEVATION I
STRUCTURE NO. 049-W041
SHEET NO. S9-4 OF S9-9 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	343
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



MINIMUM BAR LAPS:

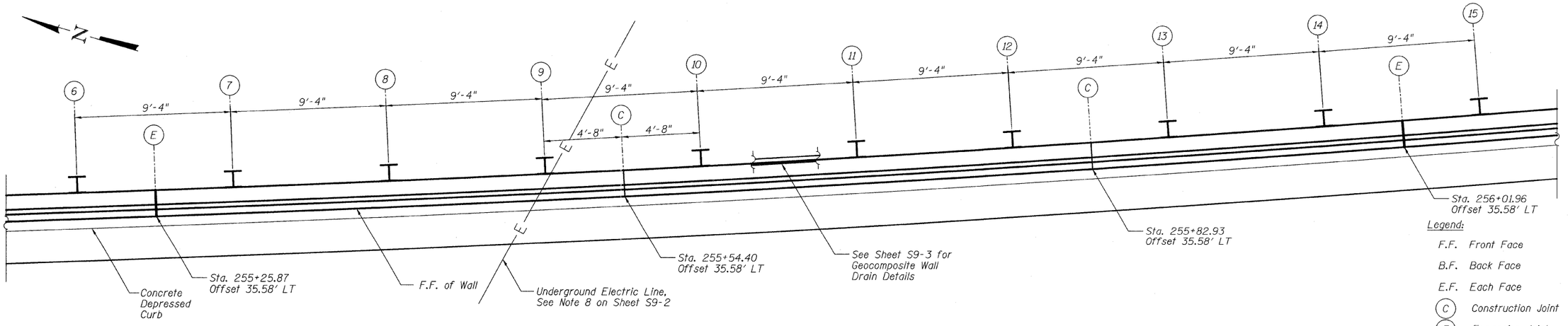
No. 5 Bars - 2'-11"

ELEVATION

(Looking at F.F. of Wall)

Notes:

1. See sheet S9-2 for pile tip elevations.
2. Wall dimensions are measured along F.F. of the wall, stations are taken from ℄ I-21.

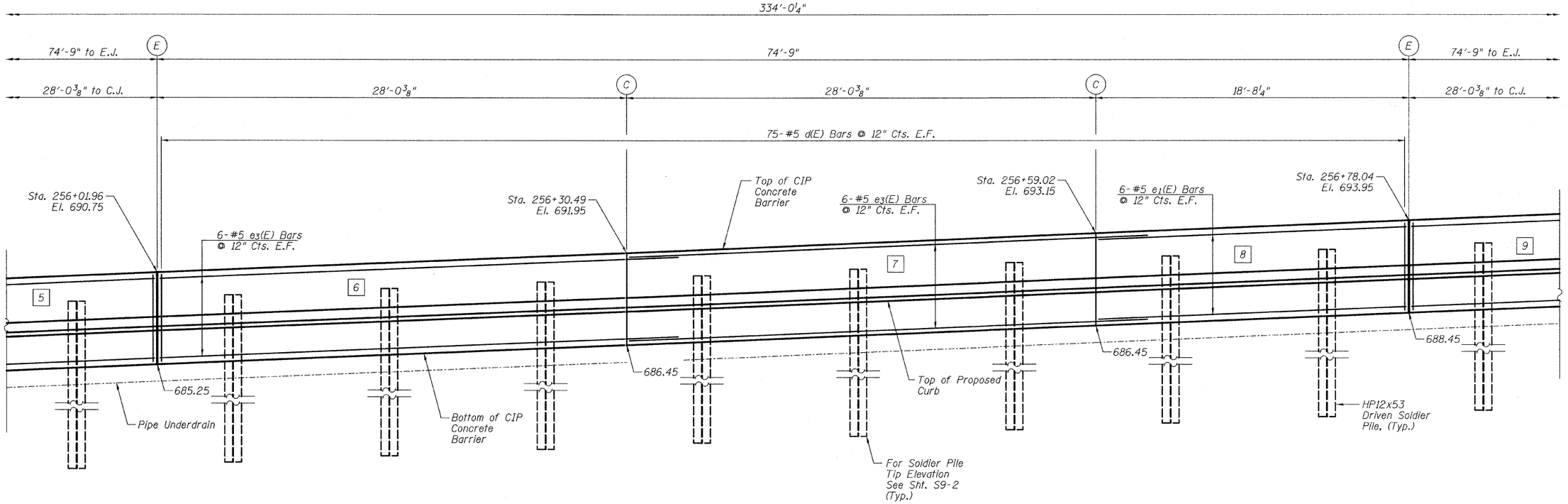


PLAN

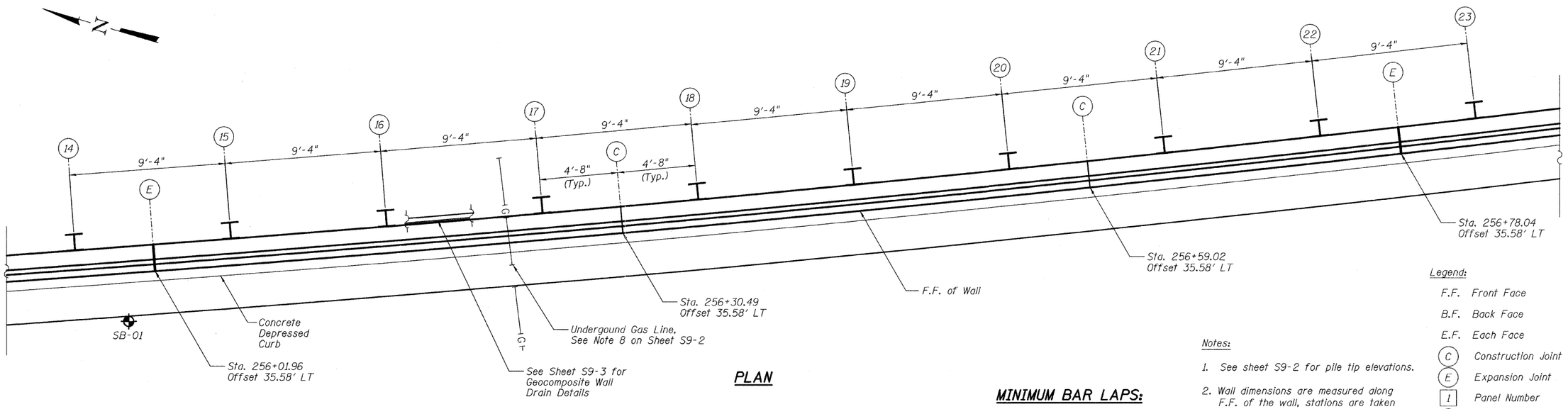
Legend:

- F.F. Front Face
- B.F. Back Face
- E.F. Each Face
- (C) Construction Joint
- (E) Expansion Joint
- [1] Panel Number
- (1) Pile Number

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PARTIAL PLAN AND ELEVATION II STRUCTURE NO. 049-W041 SHEET NO. S9-5 OF S9-9 SHEETS	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - JMH	REVISED -			330	128R-3	LAKE	518	344
	PLOT SCALE =	DRAWN - DR	REVISED -					CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - JMH	REVISED -					ILLINOIS FED. AID PROJECT		



ELEVATION
(Looking at F.F. of Wall)



PLAN

MINIMUM BAR LAPS:
No. 5 Bars - 2'-11"

Notes:

1. See sheet S9-2 for pile tip elevations.
2. Wall dimensions are measured along F.F. of the wall, stations are taken from ℄ I-21.

Legend:

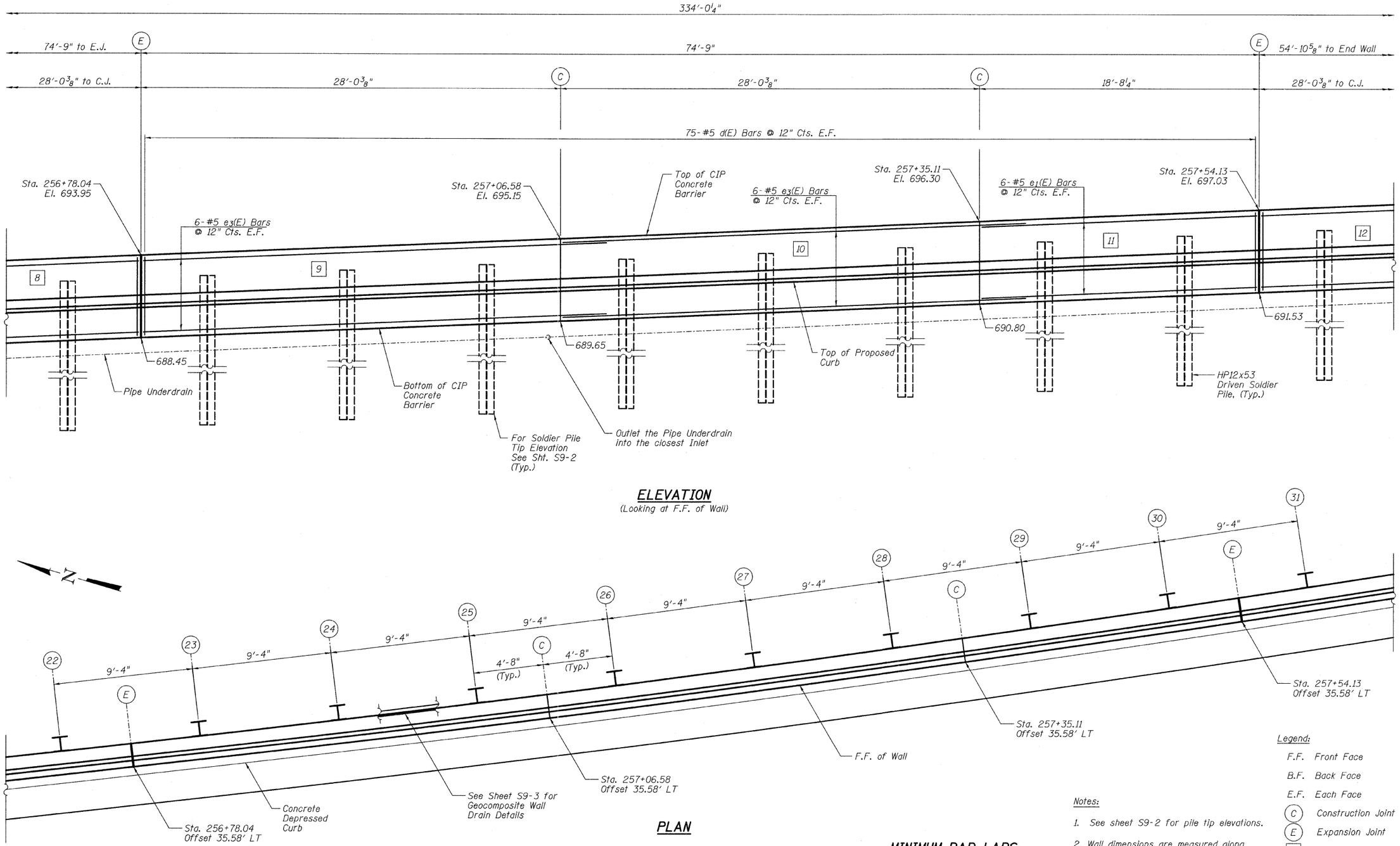
- F.F. Front Face
- B.F. Back Face
- E.F. Each Face
- (C) Construction Joint
- (E) Expansion Joint
- [1] Panel Number
- (1) Pile Number

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -
		CHECKED - JMH	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
	PLOT DATE =	CHECKED - JMH	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARTIAL PLAN AND ELEVATION III
STRUCTURE NO. 049-W041
SHEET NO. S9-6 OF S9-9 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	345
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



MINIMUM BAR LAPS:

No. 5 Bars - 2'-11"

Notes:

1. See sheet S9-2 for pile tip elevations.
2. Wall dimensions are measured along F.F. of the wall, stations are taken from ℄ I-21.

Legend:

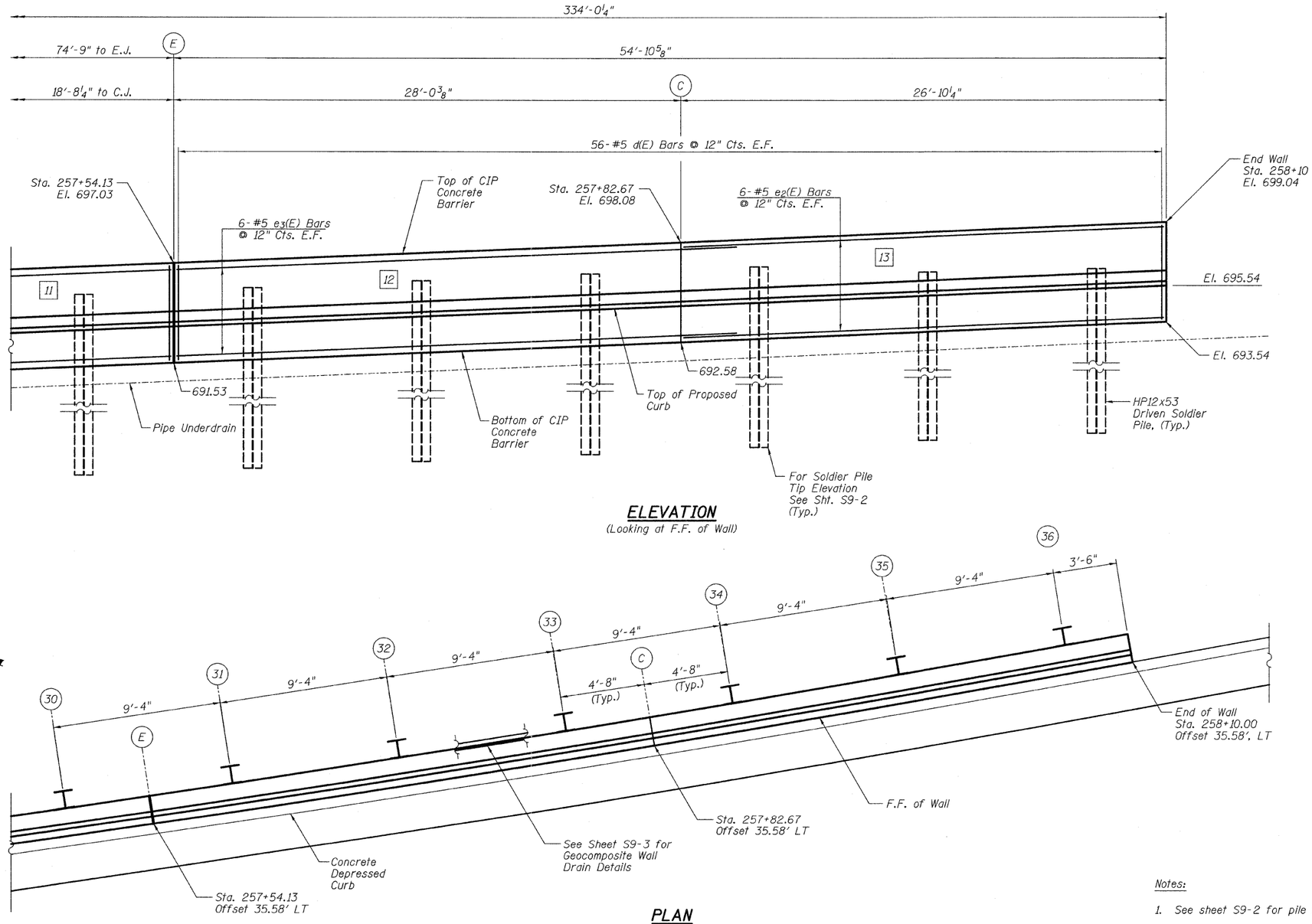
F.F.	Front Face
B.F.	Back Face
E.F.	Each Face
(C)	Construction Joint
(E)	Expansion Joint
[1]	Panel Number
(1)	Pile Number

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -
		CHECKED - JMH	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
	PLOT DATE =	CHECKED - JMH	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARTIAL PLAN AND ELEVATION IV
STRUCTURE NO. 049-W041
SHEET NO. S9-7 OF S9-9 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	346
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



ELEVATION

(Looking at F.F. of Wall)

PLAN

MINIMUM BAR LAPS:

No. 5 Bars - 2'-11"

Notes:

1. See sheet S9-2 for pile tip elevations.
2. Wall dimensions are measured along F.F. of the wall, stations are taken from ℄ I-21.

Legend:

- F.F. Front Face
- B.F. Back Face
- E.F. Each Face
- (C) Construction Joint
- (E) Expansion Joint
- [1] Panel Number
- (1) Pile Number

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -
		CHECKED - JMH	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
	PLOT DATE =	CHECKED - JMH	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PARTIAL PLAN AND ELEVATION V
STRUCTURE NO. 049-W041
SHEET NO. S9-8 OF S9-9 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	347
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax 630 953-9938

BORING LOG RW6-01

WEI Job No.: 486-07-03

Client ..... Collins Engineers Inc.
Project ..... Illinois Route 21 (Milwaukee Avenue)
Location ..... T44N R11E and T45N R11E

Datum: NGVD
Elevation: 682.50 ft
North: 2055959.58 ft
East: 1084396.49 ft
Station: 254+77.72
Offset: 32.27 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	682.5	5-inch thick, black SILTY CLAY LOAM --TOPSOIL--						
		Stiff, brown SANDY CLAY LOAM, little gravel --FILL--			1	2 3 3	1.75 P	15
	679.5	Loose, brown, medium SAND	5		2	2 3 3	NP	21
	677.0	Loose, brown, SANDY LOAM, trace gravel			3	2 3 3	NP	14
	674.5	Loose to medium dense, brown, medium SAND	10		4	3 4 5	NP	10
					5	3 3 4	NP	8
		--MOIST--			6	3 4 6	NP	21
	667.5	Boring terminated at 15.00 ft	15					
			20					

GENERAL NOTES				WATER LEVEL DATA	
Begin Drilling	07-06-2011	Complete Drilling	07-06-2011	While Drilling	DRY
Drilling Contractor	Wang Testing Service	Drill Rig	TMR B-57	At Completion of Drilling	DRY
Driller	K&R	Logger	F. Borzga	Time After Drilling	NA
Drilling Method	2.25" HSA	Checked by	A. Bohac	Depth to Water	NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax 630 953-9938

BORING LOG RW6-02

WEI Job No.: 486-07-03

Client ..... Collins Engineers Inc.
Project ..... Illinois Route 21 (Milwaukee Avenue)
Location ..... T44N R11E and T45N R11E

Datum: NGVD
Elevation: 687.00 ft
North: 2055882.02 ft
East: 1084415.84 ft
Station: 255+59.09
Offset: 26.08 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	686.8	3-inch thick, black SILTY CLAY LOAM --TOPSOIL--						
		Hard, brown and gray SILTY CLAY --FILL--			1	4 6 5	4.50 P	14
	684.0	Very stiff to hard, brown and gray SILTY CLAY, trace gravel	5		2	3 5 5	4.10 B	16
					3	2 4 5	3.20 B	16
			10		4	4 5 5	2.46 B	16
					5	2 3 4	2.30 B	21
	672.0	Boring terminated at 15.00 ft	15		6	2 5 6	2.46 B	20
			20					

GENERAL NOTES				WATER LEVEL DATA	
Begin Drilling	07-06-2011	Complete Drilling	07-06-2011	While Drilling	DRY
Drilling Contractor	Wang Testing Service	Drill Rig	TMR B-57	At Completion of Drilling	DRY
Driller	K&R	Logger	F. Borzga	Time After Drilling	NA
Drilling Method	2.25" HSA	Checked by	A. Bohac	Depth to Water	NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax 630 953-9938

BORING LOG RW6-03

WEI Job No.: 486-07-03

Client ..... Collins Engineers Inc.
Project ..... Illinois Route 21 (Milwaukee Avenue)
Location ..... T44N R11E and T45N R11E

Datum: NGVD
Elevation: 688.50 ft
North: 2055825.70 ft
East: 1084436.34 ft
Station: 256+20.32
Offset: 25.61 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	688.3	3-inch thick, black CLAY LOAM --TOPSOIL--						
		Very stiff, brown and gray SILTY CLAY, trace gravel			1	3 4 4	3.28 B	16
			5		2	2 4 4	3.12 B	18
					3	3 3 4	2.30 B	15
			10		4	6 7 7	NR	
					5	3 5 6	3.85 B	18
	673.5	Boring terminated at 15.00 ft	15		6	3 4 6	3.36 B	19
			20					

GENERAL NOTES				WATER LEVEL DATA	
Begin Drilling	07-06-2011	Complete Drilling	07-06-2011	While Drilling	DRY
Drilling Contractor	Wang Testing Service	Drill Rig	TMR B-57	At Completion of Drilling	DI
Driller	K&R	Logger	F. Borzga	Time After Drilling	NA
Drilling Method	2.25" HSA	Checked by	A. Bohac	Depth to Water	NA

The stratification lines represent the approximate b
between soil types; the actual transition may be gra

WANGENGINC 486703.GPJ WANGENG.GDT 7/13/11

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	SOIL BORING I STRUCTURE NO. Ø49-WØ41
		CHECKED - JMH	REVISED -		SHEET NO. S9-9 OF S9-9 SHEETS
	PLOT SCALE =	DRAWN - DR	REVISED -		
	PLOT DATE =	CHECKED - JMH	REVISED -		

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	348
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax 630 953-9938

BORING LOG RW6-04

WEI Job No.: 486-07-03

Client: Collins Engineers Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 692.00 ft
North: 2055759.56 ft
East: 1084468.43 ft
Station: 256+95.10
Offset: 30.11 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	691.7	4-inch thick, black SILTY CLAY LOAM --TOPSOIL--						
		Loose, brown SANDY LOAM --MOIST--			1	4 3 3	NP	16
	689.0	Loose, brown, coarse SAND, trace gravel	5		2	4 3 4	NP	14
	686.5	Loose, gray, fine SAND, with silt --WET--			3	3 3 4	NP	19
	684.0	Very stiff, gray SILTY CLAY, trace gravel	10		4	3 4 5	3.28 B	17
					5	3 4 6	3.20 B	16
	677.0		15		6	3 5 8	3.77 B	16
		Boring terminated at 15.00 ft						
			20					

GENERAL NOTES				WATER LEVEL DATA	
Begin Drilling	07-06-2011	Complete Drilling	07-06-2011	While Drilling	▽ 6.00 ft
Drilling Contractor	Wang Testing Service	Drill Rig	TMR B-57	At Completion of Drilling	▼ 14.00 ft
Driller	K&R	Logger	F. Borzga	Time After Drilling	NA
Drilling Method	2.25" HSA	Checked by	A. Bohac	Depth to Water	▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENGINC 486\703.GPJ WANGENG.GDT 7/13/11

BORING LOG RW6-05

WEI Job No.: 486-07-03

Client: Collins Engineers Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 693.00 ft
North: 2055701.12 ft
East: 1084494.04 ft
Station: 257+58.87
Offset: 29.35 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	692.8	3-inch thick, black SILTY CLAY LOAM --TOPSOIL--						
		Stiff, brown SANDY CLAY LOAM			1	3 2 2	1.50 P	14
	687.5	Loose to medium dense, brown, fine to coarse SAND, some gravel	5		2	2 2 3	1.00 P	17
	685.0				3	3 4 4	NP	12
		--WET--	10		4	3 7 8	NP	22
		Very stiff, gray CLAY, trace gravel			5	2 3 3	2.38 P	14
	678.0		15		6	2 4 4	2.21 P	17
		Boring terminated at 15.00 ft						
			20					

GENERAL NOTES				WATER LEVEL DATA	
Begin Drilling	07-06-2011	Complete Drilling	07-06-2011	While Drilling	▽ 8.00 ft
Drilling Contractor	Wang Testing Service	Drill Rig	TMR B-57	At Completion of Drilling	▼ 14.50 ft
Driller	K&R	Logger	F. Borzga	Time After Drilling	NA
Drilling Method	2.25" HSA	Checked by	A. Bohac	Depth to Water	▼ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

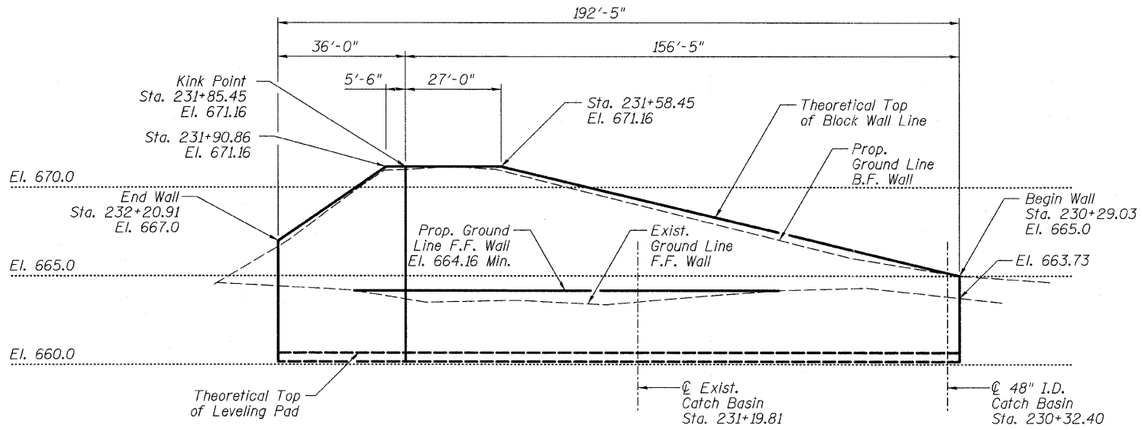
WANGENGINC 486\703.GPJ WANGENG.GDT 7/13/11

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	SOIL BORING II STRUCTURE NO. Ø49-WØ41
		CHECKED - JMH	REVISED -		
	PLOT SCALE =	DRAWN - DR	REVISED -		
	PLOT DATE =	CHECKED - JMH	REVISED -		SHEET NO. S9-9A OF S9-9 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	348A
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

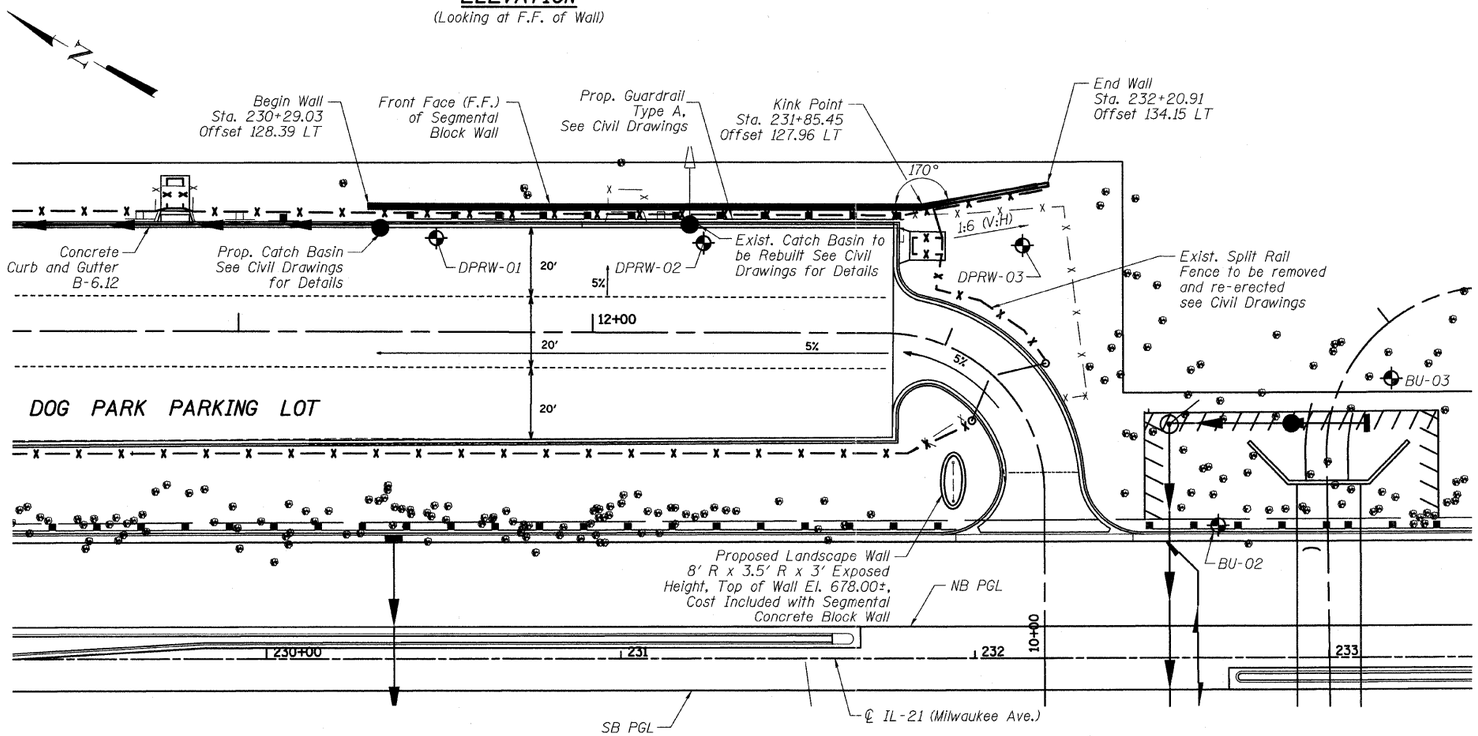
Bench Mark: Chiseled box on top of S.E. wingwall of the existing bridge over Bull Creek, El. 669.64.

Existing Structure: None.



ELEVATION

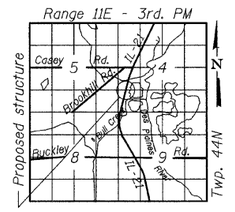
(Looking at F.F. of Wall)



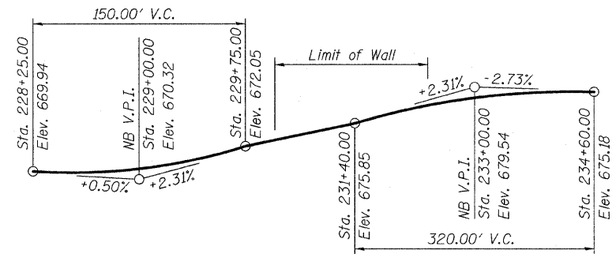
PLAN

Notes:

1. Wall dimensions are measured along F.F. of wall.
2. Stations and offsets for the wall are given from the ℄ IL-21 to the F.F. of wall at proposed wall cap. See proposed cross-section on sheet S10-2 for other details.



LOCATION SKETCH



PROFILE GRADE

(Along NB PGL-IL21)

DESIGN STRESSES

See Segmental Block Wall Special Provision

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges (17th Edition)

See Segmental Block Wall Special Provision

Legend:

- F.F. Front Face
- B.F. Back Face
- Boring Location
- Tree, to Remain

GENERAL PLAN AND ELEVATION
IL-21 (MILWAUKEE AVENUE) - RETAINING WALL NO. 10
DOG PARK PARKING LOT
F.A.P. 330 - SEC. 128R-3
LAKE COUNTY
STATION 230+29.03 TO 232+20.91

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	GENERAL PLAN AND ELEVATION STRUCTURE NO. 000-0000	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - JMH	REVISED -			330	128R-3	LAKE	518	349
	PLOT SCALE =	DRAWN - DR	REVISED -						CONTRACT NO. 60953	
	PLOT DATE =	CHECKED - JMH	REVISED -		SHEET NO. S10-1 OF S10-3 SHEETS			ILLINOIS	FED. AID PROJECT	

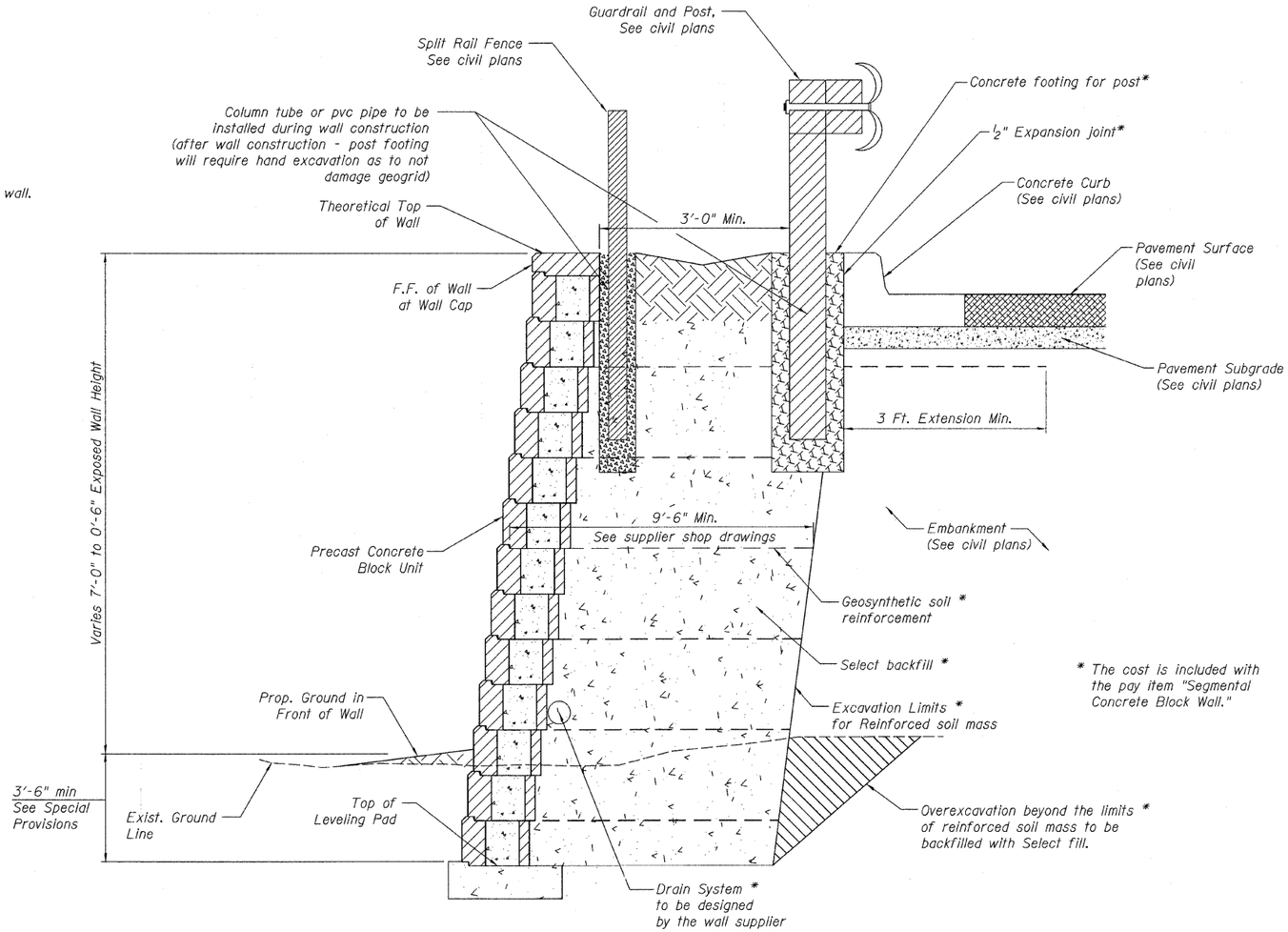
INDEX OF SHEETS

TOTAL BILL OF MATERIAL

ITEM DESCRIPTION	UNIT	TOTAL
Segmental Concrete Block Wall	Sq. Ft.	1,120

GENERAL NOTES:

1. The Contractor shall locate all existing utilities prior to construction. Any damage to utilities to be repaired at the Contractor's expense.
2. The segmental concrete block wall supplier shall design load transfer system to accommodate concrete pipes and catch basins.
3. The color of the blocks shall match the colors of natural limestone. The color mix shall also achieve the color variations present in natural limestone. This work shall be included in the pay item for Segmental Concrete Block Wall.
4. Final grading in front and behind the wall shall divert the surface run-off away from the wall. The cost of grading is included in the pay item for Segmantal Concrete Block Wall. See civil plans for Landscaping details.



TYPICAL SECTION THRU CONCRETE BLOCK WALL

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -
		CHECKED - JMH	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
	PLOT DATE =	CHECKED - JMH	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES, BILL OF MATERIALS AND INDEX OF SHEETS
STRUCTURE NO. 000-0000
SHEET NO. S10-2 OF S10-2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	350
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax 630 953-9938

BORING LOG DPRW-01

WEI Job No.: 486-07-03

Client: Collins Engineers Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 665.50 ft
North: 2058296.57 ft
East: 1084775.16 ft
Station: 230+48.45
Offset: 119.18 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	665.5	5-inch thick ASPHALT						
	665.0	--PAVEMENT--						
		2-inch thick GRAVELLY SAND --AGGREGATE BASE--						
	663.3	Hard, black SILTY CLAY LOAM --FILL--						
		Loose to medium dense, brown SANDY LOAM, trace to some gravel			1	5 4 4	4.50 P	27
			5		2	3 3 3	NP	16
					3	4 11 7	NP	18
			10		4	4 9 9	NP	12
	654.0	Hard, gray SILTY CLAY, trace gravel			5	4 6 10	NR	
			15		6	3 6 8	5.33 B	15
	650.0	Medium dense, gray SILT --WET--			7	3 7 6	NP	17
	647.5	Very stiff, gray SILTY CLAY, trace gravel						
	646.0	Medium dense, gray, fine SAND	20		8	3 4 6	2.38 B	13
	635.5	Boring terminated at 30.00 ft	30		12	8 11 15	NP	27

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			25		9	6 12 13	NP	23
					10	8 13 15	NP	21
					11	7 10 11	NP	28
			35		12	8 11 15	NP	27
			40					

GENERAL NOTES

Begin Drilling: 07-05-2011 Complete Drilling: 07-05-2011
Drilling Contractor: Wang Testing Service Drill Rig: TMR B-57
Driller: K&R Logger: F. Borzga Checked by: A. Bohac
Drilling Method: 2.25" HSA

WATER LEVEL DATA

While Drilling: ▽ 15.50 ft
At Completion of Drilling: ▼ 4.00 ft
Time After Drilling: NA
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENGINC 486703.GPJ WANGENG.GDT 7/13/11

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax 630 953-9938

BORING LOG DPRW-02

WEI Job No.: 486-07-03

Client: Collins Engineers Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 669.00 ft
North: 2058221.66 ft
East: 1084755.52 ft
Station: 231+25.89
Offset: 118.53 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	668.8	5-inch thick ASPHALT						
	668.5	--PAVEMENT--						
	667.6	12-inch thick, brown, gravelly LOAM			1	7 4 3	1.00 P	22
		--FILL--						
		Stiff, brown SANDY CLAY LOAM, trace gravel			2	3 3 3	1.00 P	20
	664.5	--FILL--	5					
		Loose, brown, coarse to gravelly SAND			3	1 3 5	NP	17
	660.0	Very stiff to hard, gray SILTY CLAY, trace gravel	10		4	3 5 6	5.66 B	14
					5	5 6 9	4.50 P	12
			15		6	2 4 6	2.46 B	14
	652.5	Very loose, gray, fine SAND --WET--			7	3 2 1	3.00 B	30
	651.0	Medium dense to dense, gray, fine SAND	20		8	1 3 8	NP	24
	639.0	Boring terminated at 30.00 ft	30		12	5 10 15	NP	22

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			25		9	7 10 14	NP	22
					10	9 14 17	NP	23
					11	9 13 26	NP	28
			35					
			40					

GENERAL NOTES

Begin Drilling: 07-05-2011 Complete Drilling: 07-05-2011
Drilling Contractor: Wang Testing Service Drill Rig: TMR B-57
Driller: K&R Logger: F. Borzga Checked by: A. Bohac
Drilling Method: 2.25" HSA

WATER LEVEL DATA

While Drilling: ▽ 16.50 ft
At Completion of Drilling: ▼ 4.00 ft
Time After Drilling: NA
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENGINC 486703.GPJ WANGENG.GDT 7/13/11

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax 630 953-9938

BORING LOG DPRW-03

WEI Job No.: 486-07-03

Client: Collins Engineers Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 667.50 ft
North: 2058138.55 ft
East: 1084735.02 ft
Station: 232+11.49
Offset: 119+07 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	667.0	6-inch thick SILTY CLAY LOAM --TOPSOIL--						
		Loose to medium dense, brown SANDY LOAM, some gravel			1	7 8 5	NP	11
			5		2	4 4 4	NP	14
	662.0	Medium dense brown, coarse to gravelly SAND			3	7 11 13	NP	8
			10		4	5 5 9	NP	13
					5	5 9 9	NP	11
			15		6	5 6 10	NP	10
					7	3 6 6	NP	14
			20		8	5 7 8	NP	9
	637.5	Boring terminated at 30.00 ft	30		12	7 12 17	NP	21

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	647.0	Stiff to very stiff, gray SILTY CLAY, trace gravel			9	4 5 7	3.61 B	19
			25		10	3 4 6	3.20 B	14
		--cobbles--			11	7 13 13	1.25 P	14
	640.0	Medium dense, gray, fine SAND						
			35					
			40					

GENERAL NOTES

Begin Drilling: 07-05-2011 Complete Drilling: 07-05-2011
Drilling Contractor: Wang Testing Service Drill Rig: TMR B-57
Driller: K&R Logger: F. Borzga Checked by: A. Bohac
Drilling Method: 2.25" HSA

WATER LEVEL DATA

While Drilling: ▽ 10.50 ft
At Completion of Drilling: ▼ 5.00 ft
Time After Drilling: NA
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENGINC 486703.GPJ WANGENG.GDT 7/13/11

FILE NAME =	USER NAME =	DESIGNED - EM	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - JMH	REVISED -	
	PLOT SCALE =	DRAWN - DR	REVISED -	
	PLOT DATE =	CHECKED - JMH	REVISED -	

SOIL BORING
STRUCTURE NO. 000-0000
SHEET NO. S10-3 OF S10-3 SHEETS

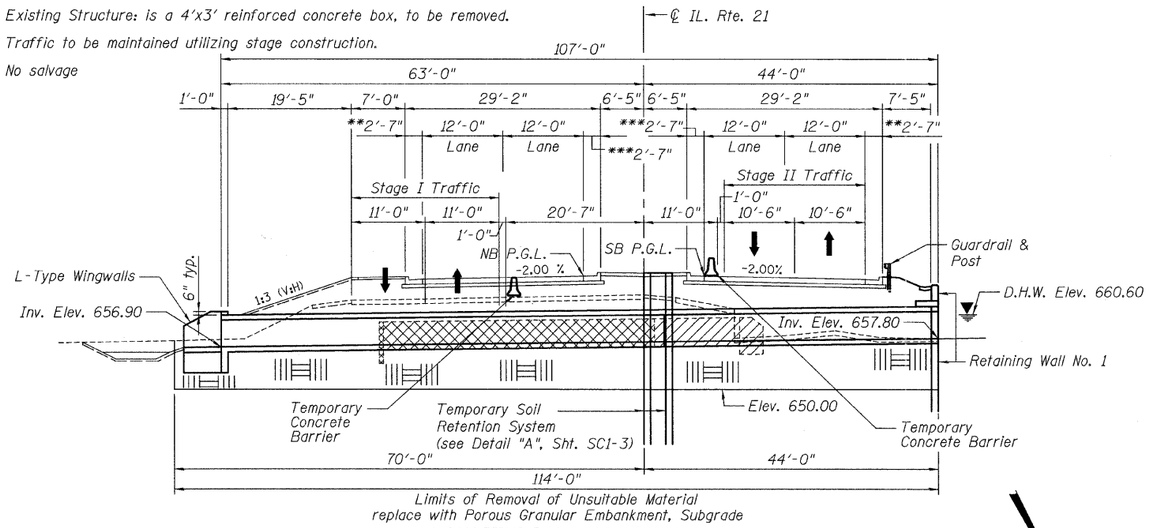
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	351
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

B.M.: Chiseled box on top of S.E. wingwall of bridge over Bull Creek. Elevation 669.64

Existing Structure: is a 4'x3' reinforced concrete box, to be removed.

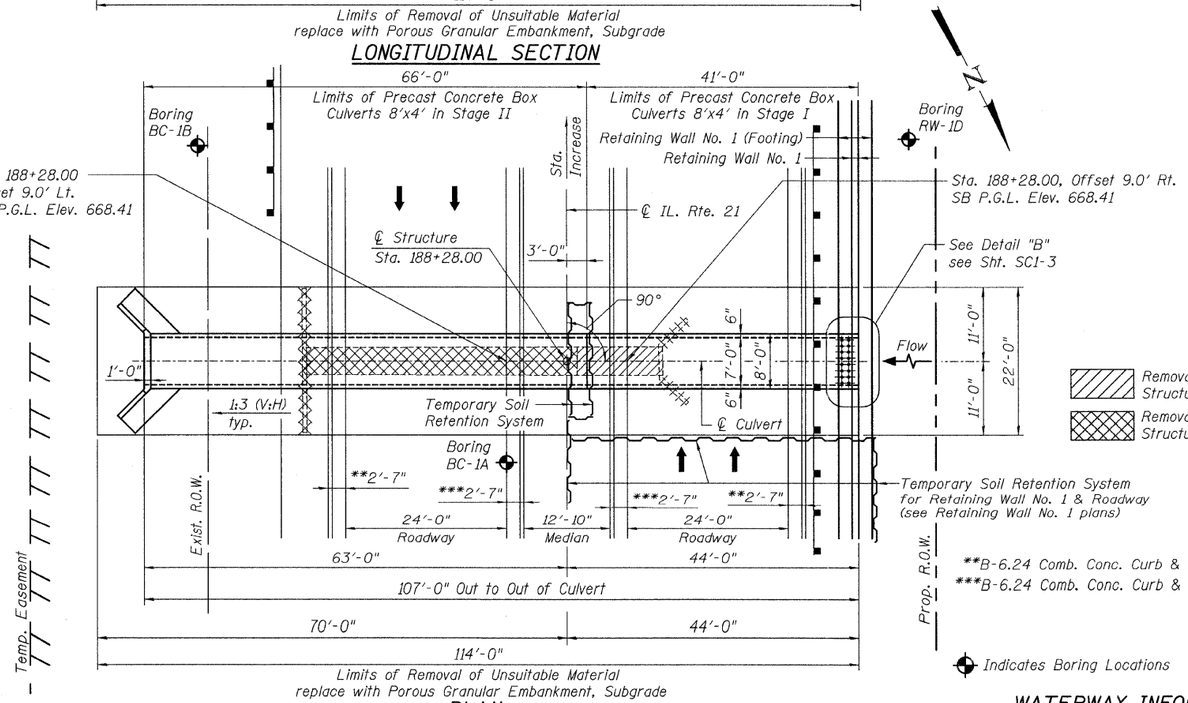
Traffic to be maintained utilizing stage construction.

No salvage



Limits of Removal of Unsuitable Material replace with Porous Granular Embankment, Subgrade

LONGITUDINAL SECTION



Limits of Removal of Unsuitable Material replace with Porous Granular Embankment, Subgrade

PLAN

Removal of Existing Structures No. 1 - Stage I

Removal of Existing Structures No. 1 - Stage II

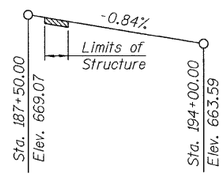
**B-6.24 Comb. Conc. Curb & Gutter

***B-6.24 Comb. Conc. Curb & Gutter (Special)

Indicates Boring Locations

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (ft.)	Upstream	Downstream
	653.00	653.90



PROFILE GRADE

(Along NB & SB P.G.L.)

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges

LOADING HS20-44

Allow 50#/sq. ft. for future wearing surface.

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 5,000 psi
fy = 65,000 psi (Welded wire fabric)

GENERAL NOTES:

1. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
2. All exposed concrete edges shall be chamfered $\frac{3}{4}$" unless otherwise noted.
3. Reinforcement Bars designated (E) shall be Epoxy Coated.
4. The limits and quantities of removal and replacement shown are based on the boring data and may be modified by the District Geotechnical and Field Engineers for variable subsurface conditions encountered in the field.
5. The Porous Granular Embankment, Subgrade shall be capped with 6 in. of CA7 and satisfy the Standard Specifications unless otherwise indicated in the Special Provisions. The cost of the capping material shall be included in the Pay Item for "Porous Granular Embankment, Subgrade".

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Removal of Existing Structures No. 1	Each	1
Removal and Disposal of Unsuitable Material for Structures	Cu. Yd.	1,160
Reinforcement Bars	Pound	300
Reinforcement Bars, Epoxy Coated	Pound	50
Concrete Box Culverts	Cu. Yd.	4.7
Precast Concrete Box Culverts 8'x4'	Foot	107
Temporary Soil Retention System	Sq. Ft.	626
Porous Granular Embankment, Subgrade	Cu. Yd.	625

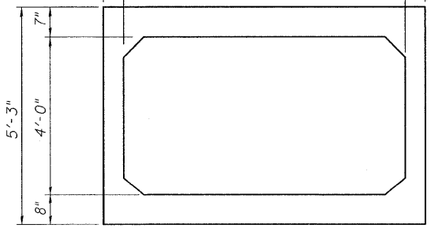
WATERWAY INFORMATION

Drainage Area = 0.8 Sq. Mi. Low Grade Elev.: 661.45 (Exist.) at Sta. 191+00 (Exist.)
663.26 (Prop.) at Sta. 195+08 (Prop.)

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head - Ft. Exist.	Head - Ft. Prop.	Headwater El. Exist.	Headwater El. Prop.
	10	38	3.2	9.6	658.3 / 658.1	1.6	1.0	659.9	659.1
Design	50	93	3.6	10.4	658.4 / 658.2	3.7	2.0	662.1	660.2
Base	100	129	3.6	10.4	658.4 / 658.2	4.2	2.7	662.6	660.9
Overtopping	50 / 500	93 / 219	3.6	-	658.4 / -	3.7	-	662.1	-
Max. Calc.	500	219	4.4	12.0	658.6 / 658.4	4.4	4.0	663.0	662.4
	1.	2.	1.	2.	1. / 2.				

WATERWAY INFORMATION TABLE NOTES

1. Existing conditions
2. Proposed conditions
3. FIS Datum Correlation:
   FIS RM #55 (Chiseled square on west D/S wingwall of IL. Rte. 21 bridge) Elev. 669.72 = Surveyed BM #36 (Per IDOT survey notes - 12/05/90) Elev. 669.64.
4. Based on the Re-Study Data, Des Plaines River water surface elevations are: 50 Year = 660.3 and 100 = 661.3

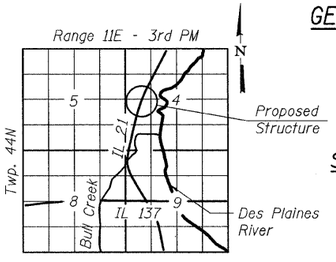


SECTION THRU PRECAST CULVERT

(Wall and slab thickness may vary as per manufacturer)

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
LICENSED STRUCTURAL ENGINEER
CHICAGO

BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12



LOCATION SKETCH

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 188+28.00
STRUCTURE NO. 049-0239
OUTLET NO. 14

CHRISTIAN-ROGE & ASSOCIATES, INC.

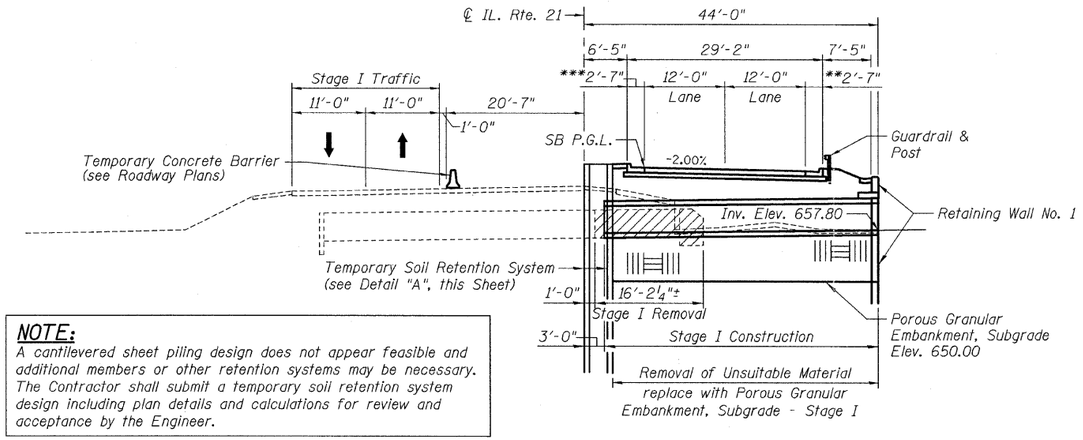
FILE NAME = D1628953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-0239

SHEET NO. SC1-1 OF SC1-5 SHEETS

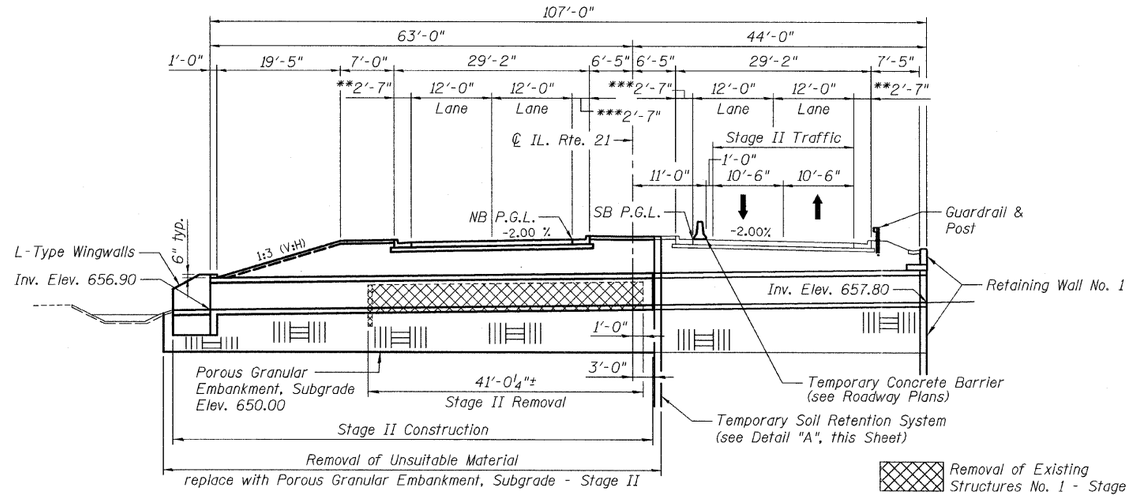
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	352
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



NOTE:
A cantilevered sheet piling design does not appear feasible and additional members or other retention systems may be necessary. The Contractor shall submit a temporary soil retention system design including plan details and calculations for review and acceptance by the Engineer.

STAGE I CONSTRUCTION

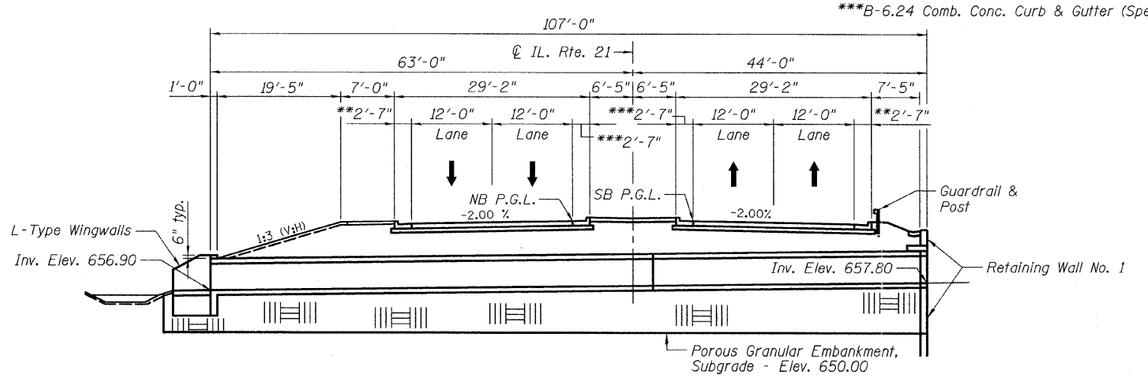
Removal of Existing Structures No. 1 - Stage I



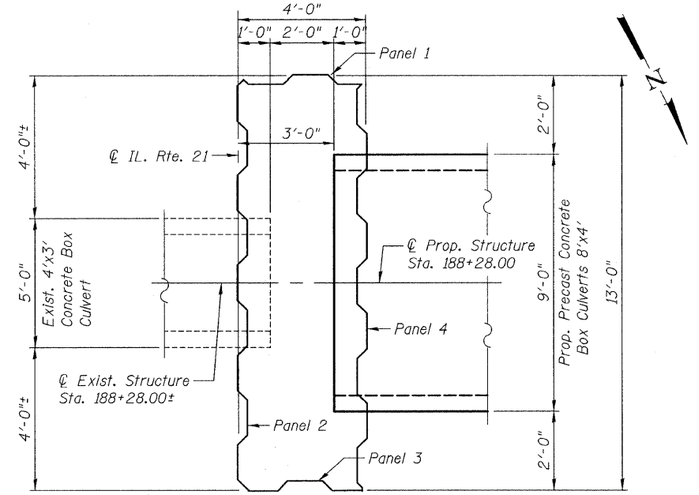
Removal of Existing Structures No. 1 - Stage II

STAGE II CONSTRUCTION

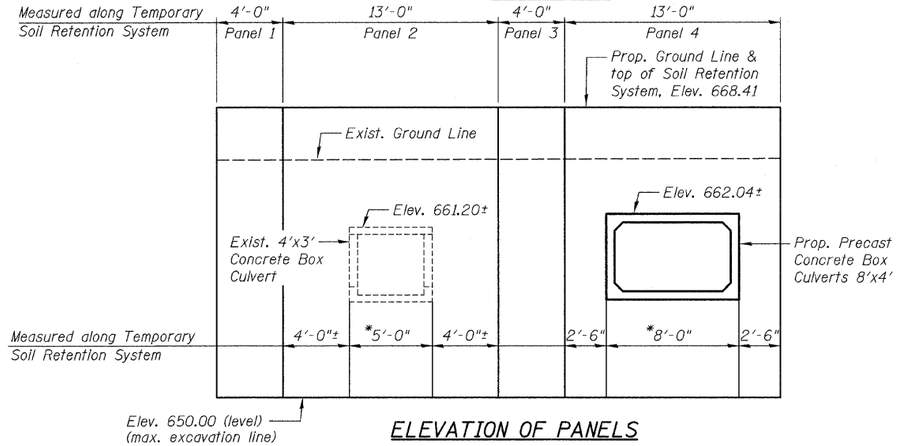
**B-6.24 Comb. Conc. Curb & Gutter
***B-6.24 Comb. Conc. Curb & Gutter (Special)



PROPOSED CROSS SECTION



DETAIL "A"



ELEVATION OF PANELS
TEMPORARY SOIL RETENTION SYSTEM

CONSTRUCTION SEQUENCE

STAGE I

1. Install Temporary Soil Retention System Panels 1, 2 & 3.
2. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
3. Excavate to limits as shown in Elevation, see Sht. SC1-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Install Temporary Soil Retention System Panel 4.
7. Install Stage I portion of the new Roadway.

STAGE II

1. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
2. Remove Temporary Soil Retention System Panels 1, 2 & 3.
3. Excavate to limits as shown in Elevation, see Sht. SC1-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Remove Temporary Soil Retention System Panel 4
7. Install Stage II portion of the new Roadway.

**Do not disturb soil under the existing & proposed culverts during placement of Temporary Soil Retention System*

STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0239
OUTLET NO. 14

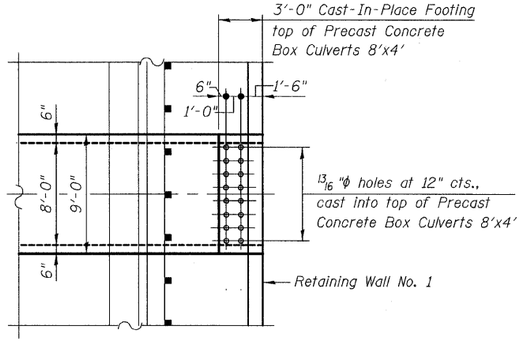
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D1602953-02-stage_const_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

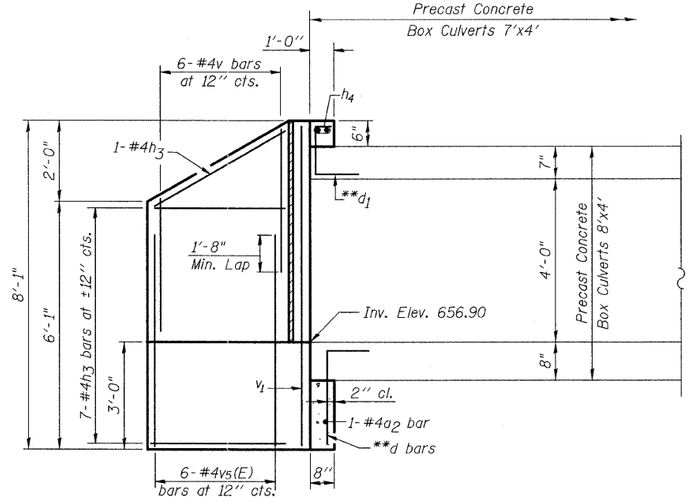
STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0239
SHEET NO. SC1-2 OF SC1-5 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	353
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		



DETAIL "B"

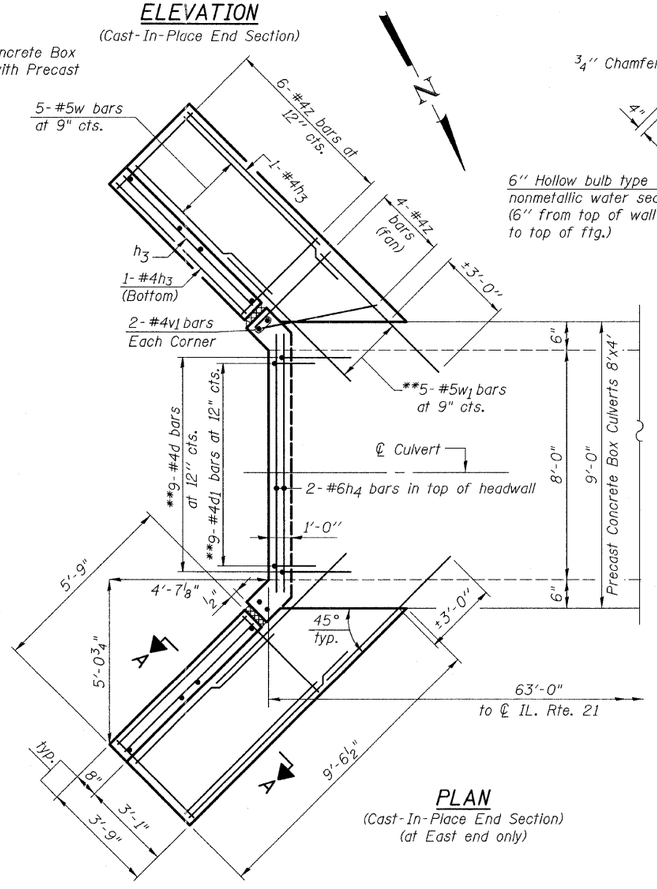
(For remainder of details, see Retaining Wall No. 1)



ELEVATION

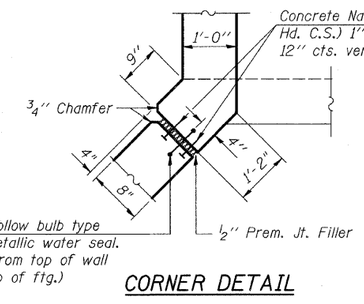
(Cast-In-Place End Section)

**Cast Reinf. Bars into Precast Concrete Box Culvert as shown. Cost included with Precast Concrete Box Culverts 7'x4'



PLAN

(Cast-In-Place End Section)
(at East end only)

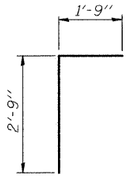


CORNER DETAIL

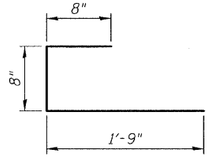
BILL OF MATERIAL

(FOR REINF. BARS CAST INTO PRECAST CONCRETE BOX CULVERT)

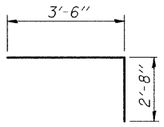
	Bar	No.	Size	Length	Shape
**	d	9	#4	4'-6"	⌐
**	d_1	9	#4	3'-1"	⊏
**	w_1	10	#5	8'-0"	—



**BAR d



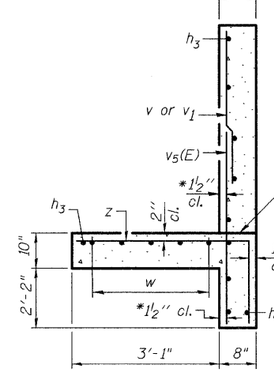
**BAR d_1



BAR z

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a_2	1	#4	8'-8"	—
h_3	20	#4	5'-5"	—
h_4	2	#6	8'-8"	—
v	12	#4	3'-8"	—
v_1	4	#6	7'-8"	—
v_5(E)	12	#4	5'-8"	—
w	10	#5	6'-0"	—
z	20	#4	6'-2"	⌐
Reinforcement Bars			Pound	320
Reinforcement Bars, Epoxy Coated			Pound	50
Concrete Box Culverts			Cu. Yd.	4.7



*v bars shall not be placed more than 1½" cl. from back face of wingwall

SECTION A-A

Max. Soil Pressure under footing = 2,025 psf

CAST-IN-PLACE END SECTION DETAILS STRUCTURE NO. 049-0239 OUTLET NO. 14

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D168953-03-end_sect_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CAST–IN–PLACE END SECTION DETAILS
STRUCTURE NO. 049–0239

SHEET NO. SC1-3 OF SC1-5 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	354
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BC-1A

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 664.69 ft
North: 2062208.41 ft
East: 1086304.71 ft
Station: 188+13
Offset: 9.0 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	663.9	9-inch thick ASPHALT --PAVEMENT--						
	663.1	10-inch thick CONCRETE --PAVEMENT--						
		Very stiff, brown SILTY CLAY, some gravel			1	10 10 6	2.25 P	10
	661.7	--FILL--						
		Brown SANDY LOAM, some gravel			2	35 13 6	NP	10
	660.7	--FILL--						
		Medium stiff, black CLAY --FILL--	5					
						2 3 5	0.90 B	46
	657.7	Medium dense, gray SANDY LOAM, trace to little gravel			3			
			10		4	3 6 5	NP	25
					5	11 15 14	NP	18
			15		6	8 12 10	NP	
					7	6 7 13	NP	9
	646.7	Medium dense, gray SANDY GRAVEL	20		8	4 12 13	NP	

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
					9	5 8 20	NP	
					10	15 10 16	NP	
	639.7	Boring terminated at 25.00 ft	25					
			30					
			35					
			40					

GENERAL NOTES

Begin Drilling 04-10-2001 Complete Drilling 04-10-2001
Drilling Contractor Rock and Soil Drilling Drill Rig D-120
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 2.75" ID HSA; backfilled w/ bentonite chip and cuttings conc at top.

WATER LEVEL DATA

While Drilling ▽ 11.00 ft
At Completion of Drilling ▼ 8.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.GDT 11/5/10
WANGENG INC 722301.GPJ

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BC-1B

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 658.03 ft
North: 2062157.38 ft
East: 1086333.32 ft
Station: 188+60
Offset: 55 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Stiff, black SILTY CLAY LOAM --FILL--			1	2 3 4	1.00 P	44
	654.0	Soft to medium stiff, brown and gray CLAY	5		2	3 3 3	0.62 B	34
					3	2 4 7	0.41 B	26
	650.0	Loose to dense, brown to gray SANDY LOAM, trace to little gravel						
			10		4	3 6 8	NP	18
					5	21 9 8	NP	16
			15		6	3 3 4	NP	20
					7	12 19 15	NP	14
			20		8	19 11 15	NP	15

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
					9	29 29 18	NP	16
	635.0	Very stiff, gray CLAY						
			25		10	29 12 21	3.40 B	21
	631.5	Medium dense, gray SANDY LOAM			11	17 19 17	NP	17
	630.5	Boring terminated at 27.50 ft						
			30					
			35					
			40					

GENERAL NOTES

Begin Drilling 04-17-2001 Complete Drilling 04-17-2001
Drilling Contractor Rock and Soil Drilling Drill Rig Acker 82
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 4.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling ▽ 13.00 ft
At Completion of Drilling ▼ 5.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.GDT 11/5/10
WANGENG INC 722301.GPJ

SOIL BORING LOGS-I
STRUCTURE NO. 049-0239
OUTLET NO. 14

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D160953-04-soil_boring_logs-1.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

SOIL BORING LOGS–I
STRUCTURE NO. 049–0239
SHEET NO. SC1-4 OF SC1-5 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	355
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-1C

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 660.23 ft
North: 2062265.32 ft
East: 1086259.48 ft
Station: 187+81
Offset: 68 RT

Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (bl/w6 in)	Qu (tsf)	Moisture Content (%)
Medium stiff, black CLAY --FILL--					
657.2					
Medium stiff, brown and gray CLAY --FILL--					
5		1	3 4 5	0.75 P	55
		2	3 2 1	0.50 P	43
		3	2 3 4	0.91 B	26
652.2					
Very soft, dark gray CLAY					
10		4	2 2 1	*0.25 P	35
		5	0 1 1	*0.25 P	34
15		6	0 2 1	*0.25 P	32
		7	1 1 1	*0.25 P	34
640.2		8	1 1 1	*0.25 P	29
20					

Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (bl/w6 in)	Qu (tsf)	Moisture Content (%)
Medium dense to very dense, white SANDY GRAVEL					
		9	15 14 8	NP	15
25		10	50/4"	NP	19
634.7					
Medium dense, brown, coarse SAND, wet					
		11	7 11 7	NP	
632.2					
Medium dense, brown SANDY LOAM, wet					
30		12	4 8 8	NP	12
628.2					
Hard, gray CLAY					
		13	8 15 23	4.38 B	15
625.2					
Boring terminated at 35.00 ft					
40					

GENERAL NOTES

Begin Drilling: 04-16-2001 Complete Drilling: 04-16-2001
Drilling Contractor: Rock and Soil Drilling Drill Rig: Acker 82
Driller: Dave Logger: T. Chen Checked by: P. Wang
Drilling Method: 4.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling: ▽ 23.50 ft
At Completion of Drilling: ▼ 4.00 ft
Time After Drilling: 24 hours
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG RW-1D

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 657.75 ft
North: 2062197.27 ft
East: 1086232.78 ft
Station: 188+61
Offset: 51 RT

Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (bl/w6 in)	Qu (tsf)	Moisture Content (%)
Medium stiff to very stiff, dark brown to black CLAY --FILL--					
		1	3 5 5	2.00 P	63
5		2	2 2 3	0.50 P	21
651.3					
Medium dense to dense, light gray SANDY GRAVEL					
		3	3 4 9	1.07 B	11
10		4	41 15 11	NP	7
		5	8 12 9	NP	11
15		6	59 35 16	NP	7
		7	28 12 10	NP	
		8	4 8 7	NP	
20					

Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (bl/w6 in)	Qu (tsf)	Moisture Content (%)
		9	4 6 8	NP	
25		10	3 4 7		
		11	9 11 11	NP	
30		12	9 9 10	NP	
		13	13 26 22	NP	
622.8					
Boring terminated at 35.00 ft					
40					

GENERAL NOTES

Begin Drilling: 04-16-2001 Complete Drilling: 04-17-2001
Drilling Contractor: Rock and Soil Drilling Drill Rig: Acker 82
Driller: Dave Logger: T. Chen Checked by: P. Wang
Drilling Method: 2.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling: ▽
At Completion of Drilling: ▼ 1.00 ft
Time After Drilling: 24 hours
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.INC 722301.GPJ WANGENG.GDT 11/5/10

SOIL BORING LOGS-II
STRUCTURE NO. 049-0239
OUTLET NO. 14

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-05-soil_boring_logs-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOIL BORING LOGS-II
STRUCTURE NO. 049-0239
SHEET NO. SC1-5 OF SC1-5 SHEETS

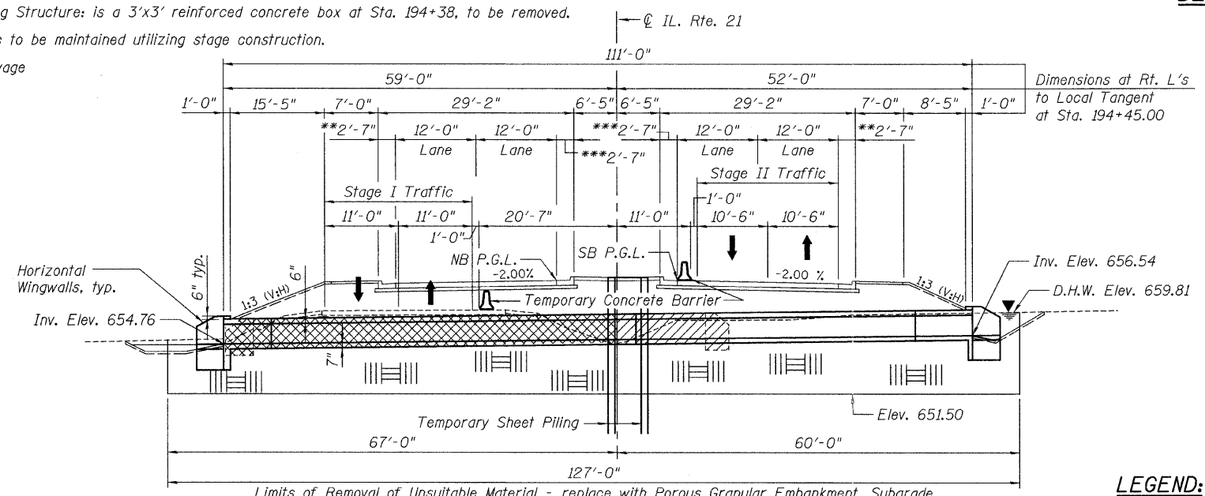
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	356
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

B.M.: Chiseled box on top of S.E. wingwall of bridge over Bull Creek. Elevation 669.64

Existing Structure: is a 3'x3' reinforced concrete box at Sta. 194+38, to be removed.

Traffic to be maintained utilizing stage construction.

No salvage

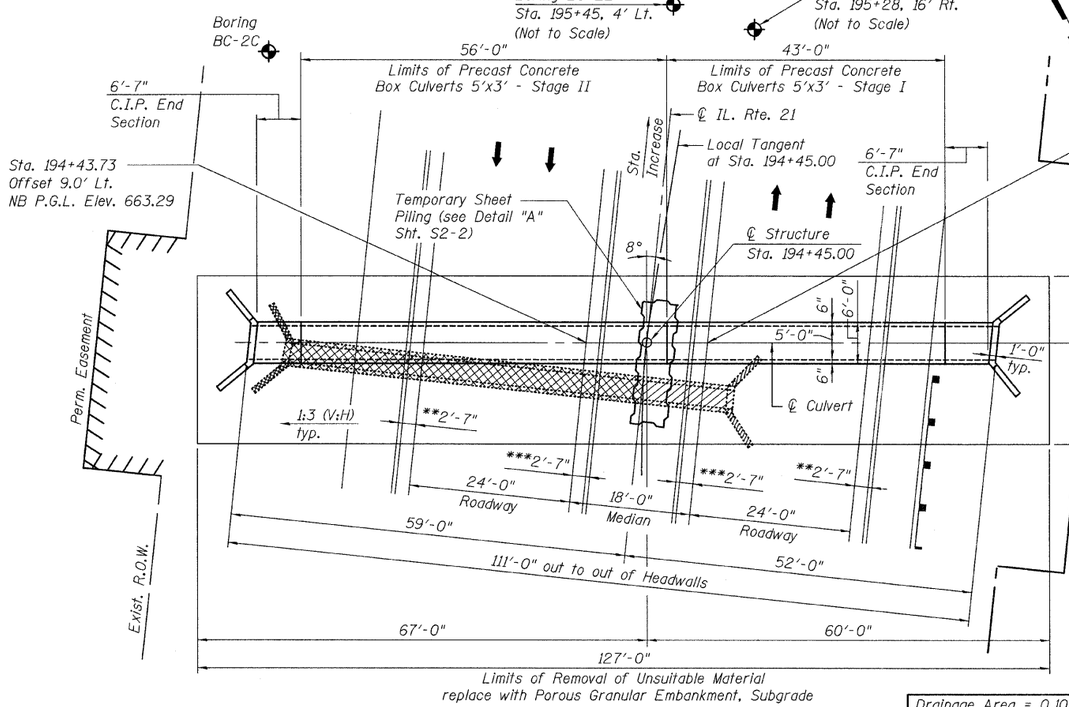


Limits of Removal of Unsuitable Material - replace with Porous Granular Embankment, Subgrade

LONGITUDINAL SECTION

Boring BC-2B
Sta. 195+45, 4' Lt.
(Not to Scale)

Boring BC-2A
Sta. 195+28, 16' Rt.
(Not to Scale)



Limits of Removal of Unsuitable Material replace with Porous Granular Embankment, Subgrade

PLAN

LEGEND:

C.I.P. = Cast-in-Place

Sta. 194+46.27
Offset 9.0' Rt.
SB P.G.L. Elev. 663.28

Removal of Existing Structures No. 2 - Stage I

Removal of Existing Structures No. 2 - Stage II

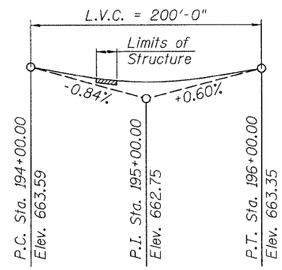
**B-6.24 Comb. Conc. Curb & Gutter

***B-6.24 Comb. Conc. Curb & Gutter (Special)

Indicates Boring Locations

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (ft.)	Upstream	Downstream
	653.54	651.76



PROFILE GRADE

(Along NB & SB P.G.L.)

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges

LOADING HS20-44

Allow 50#/sq. ft. for future wearing surface.

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 5,000 psi
fy = 65,000 psi (Welded wire fabric)

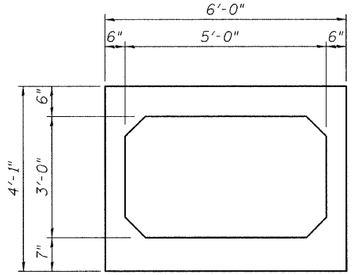
CURVE DATA

(℄ IL. Rte. 21)
Δ = 1°-11'-49" (Lt.)
D = 0°-15'-00"
T = 239.38'
L = 478.75'
E = 1.25'
S.E. = N/A
R = 22,918.31'
P.C. Sta. = 193+64.45
P.T. Sta. = 198+43.20
P.I. Sta. = 196+03.84

WATERWAY INFORMATION

Drainage Area = 0.107 Sq. Mi. Low Grade Elev. 663.26 @ Sta. 195+00.00

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head - Ft. Exist.	Head - Ft. Prop.	Headwater El. Exist.	Headwater El. Prop.
Design	50	76	9.0	9.0	659.78	2.0	0.0	660.89	659.81
Base	100	87	15.0	15.0	659.78	2.9	0.4	661.78	660.17
Overtopping								663.14	663.26
Max. Calc.									



SECTION THRU PRECAST CULVERT

(Wall and slab thickness may vary as per manufacturer)

GENERAL NOTES:

1. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
2. All exposed concrete edges shall be chamfered 3/4" unless otherwise noted.
3. Reinforcement Bars designated (E) shall be Epoxy Coated.
4. The limits and quantities of removal and replacement shown are based on the boring data and may be modified by the District Geotechnical and Field Engineers for variable subsurface conditions encountered in the field.
5. The Porous Granular Embankment, Subgrade shall be capped with 6 in. of CA7 and satisfy the Standard Specifications unless otherwise indicated in the Special Provisions. The cost of the capping material shall be included in the Pay Item for "Porous Granular Embankment, Subgrade".

INDEX OF SHEETS

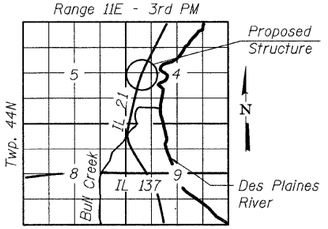
TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Removal of Existing Structures No. 2	Each	1
Removal and Disposal of Unsuitable Material for Structures	Cu. Yd.	900
Reinforcement Bars	Pound	1,200
Concrete Box Culverts	Cu. Yd.	9.9
Precast Concrete Box Culverts 5'x3'	Foot	99
Temporary Sheet Piling	Sq. Ft.	1,243
Porous Granular Embankment, Subgrade	Cu. Yd.	600

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
CHICAGO
LICENSED STRUCTURAL ENGINEER

BN Shah AUG. 15, 2011

BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12



LOCATION SKETCH

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 194+45.00
STRUCTURE NO. 049-C004
OUTLET NO. 15

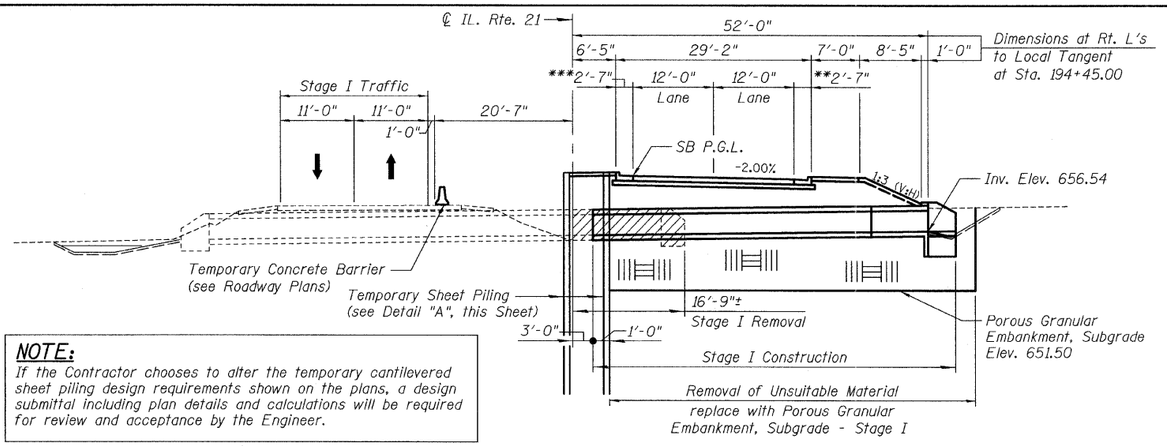
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-C004
SHEET NO. SC2-1 OF SC2-4 SHEETS

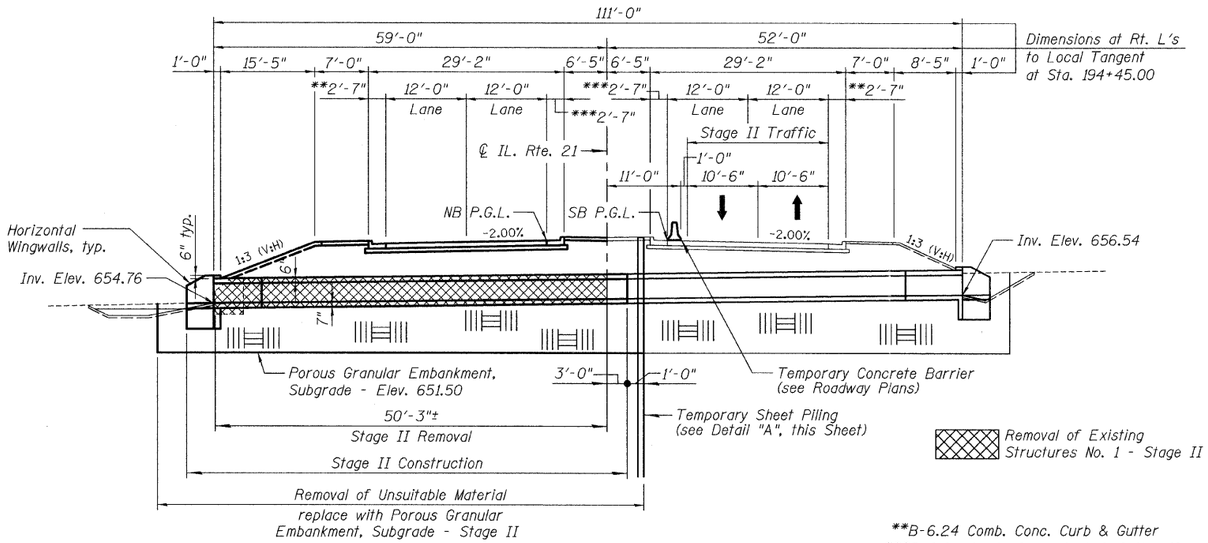
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	357
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



NOTE:
If the Contractor chooses to alter the temporary cantilevered sheet piling design requirements shown on the plans, a design submittal including plan details and calculations will be required for review and acceptance by the Engineer.

STAGE I CONSTRUCTION

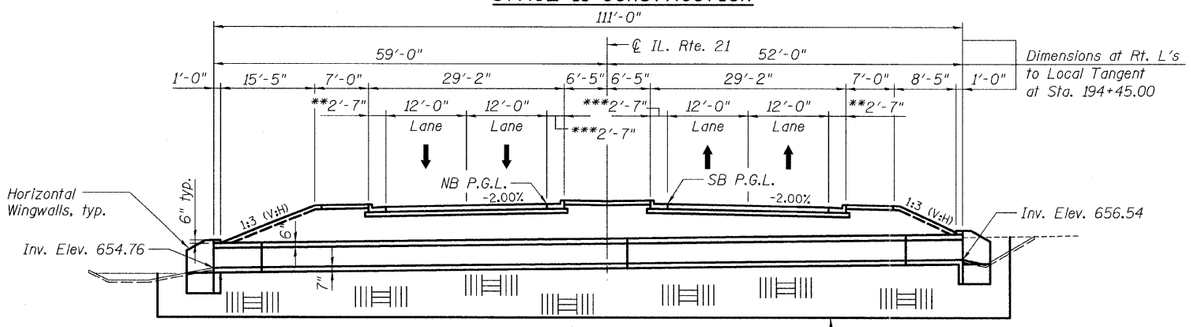
Removal of Existing Structures No. 1 - Stage I



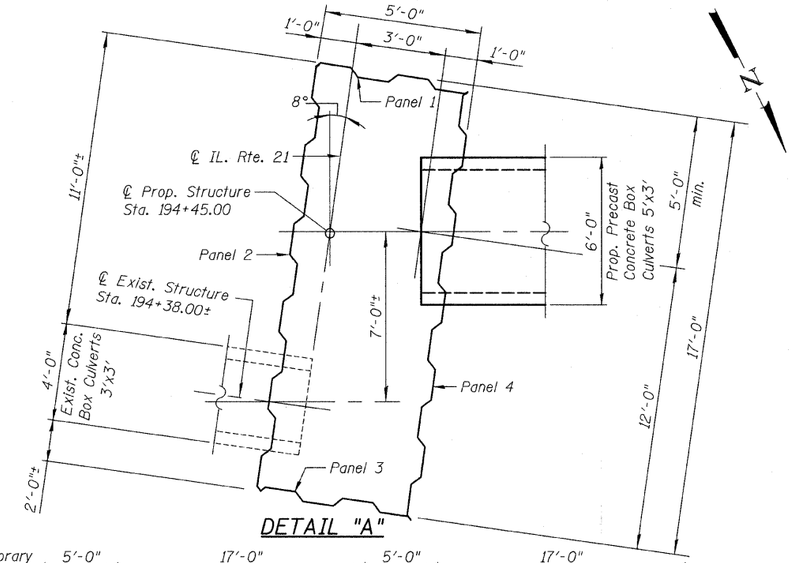
Removal of Existing Structures No. 1 - Stage II

**B-6.24 Comb. Conc. Curb & Gutter
***B-6.24 Comb. Conc. Curb & Gutter (Special)

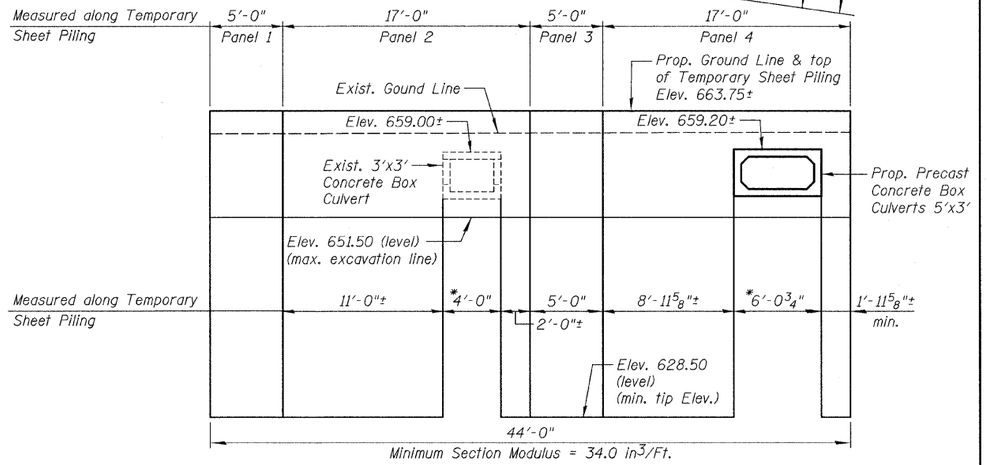
STAGE II CONSTRUCTION



PROPOSED CROSS SECTION



DETAIL "A"



ELEVATION OF PANELS TEMPORARY SHEET PILING

*Do not disturb soil under the existing & proposed culverts during placement of Temporary Sheet Piling

CONSTRUCTION SEQUENCE

STAGE I

1. Install Temporary Sheet Piling Panels 1, 2 & 3.
2. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
3. Excavate to limits as shown in Elevation, see Sht. SC2-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Install Temporary Sheet Piling Panel 4.
7. Install Stage I portion of the new Roadway.

STAGE II

1. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
2. Remove Temporary Sheet Piling Panels 1, 2 & 3.
3. Excavate to limits as shown in Elevation, see Sht. SC2-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Remove Temporary Sheet Piling System Panel 4
7. Install Stage II portion of the new Roadway.

STAGE CONSTRUCTION DETAILS STRUCTURE NO. 049-C004 OUTLET NO. 15

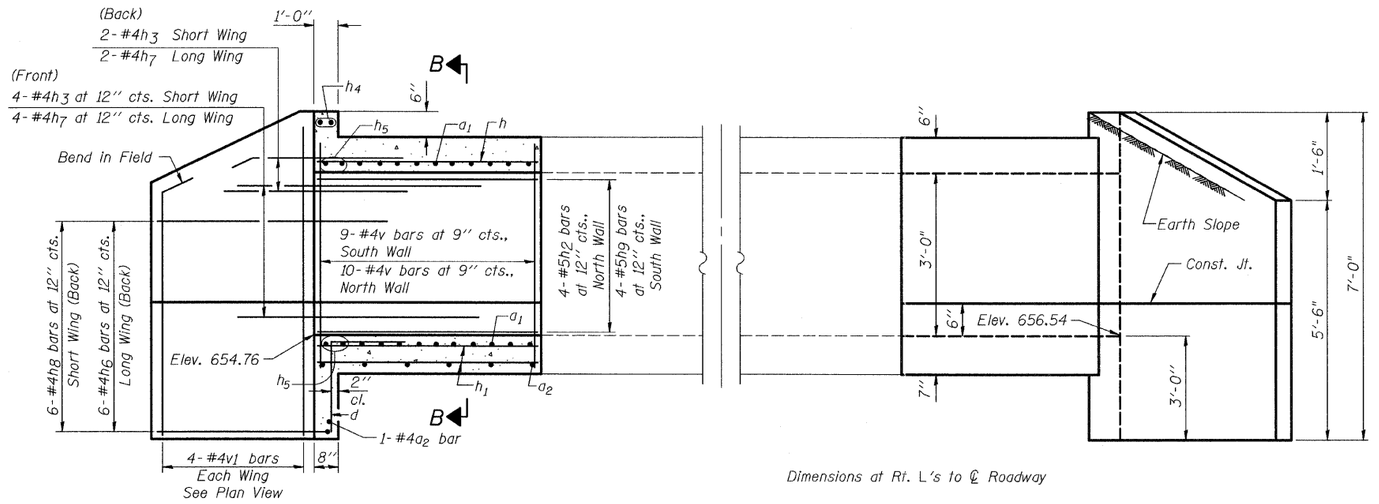
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = 0160953-02-stage_const-det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-C004
SHEET NO. SC2-2 OF SC2-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	358
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

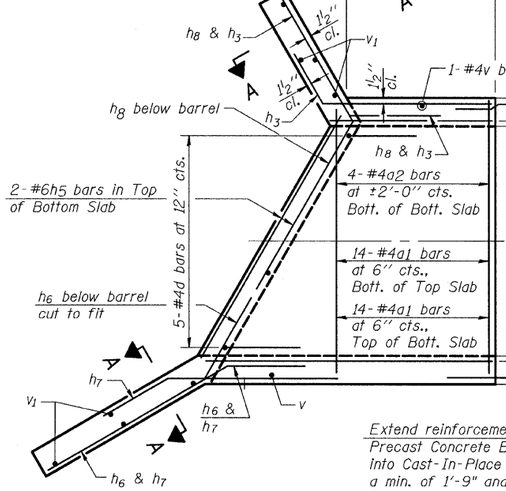


Dimensions at Rt. L's to ℄ Roadway

SHOWING REINFORCEMENT

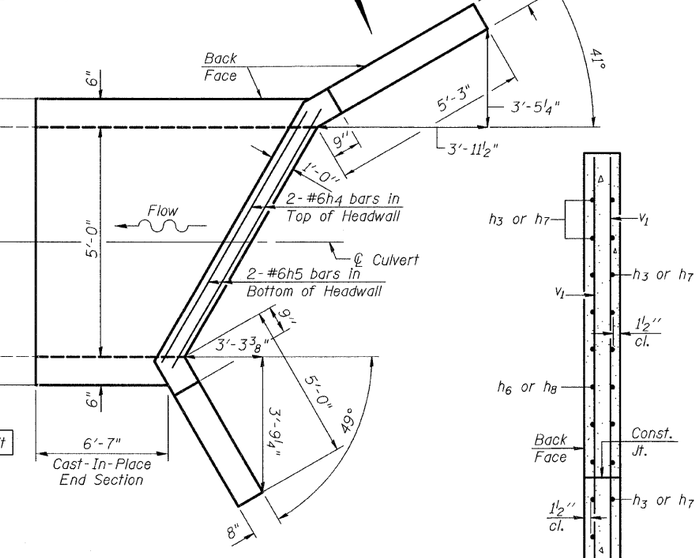
SHOWING DIMENSIONS

ELEVATION
(Cast-In-Place End Section)
(at East end)

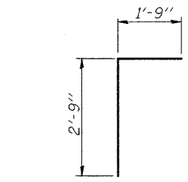


PLAN
(Cast-In-Place End Section)
(at East end)

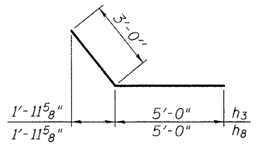
ELEVATION
(Cast-In-Place End Section)
(at West end)



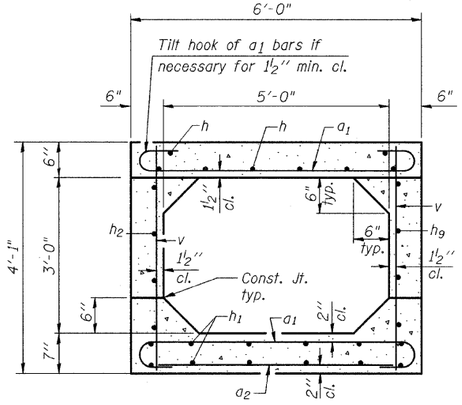
PLAN
(Cast-In-Place End Section)
(at West end)



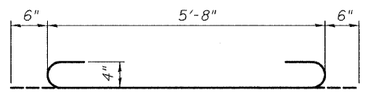
BAR d



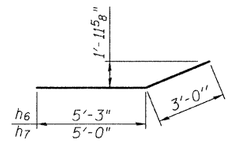
BARS h3 & h8



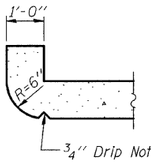
SECTION B-B



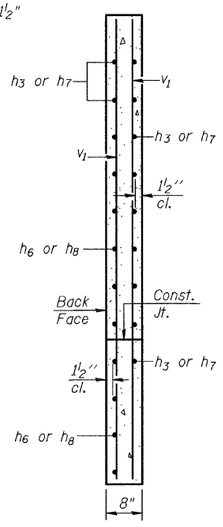
BAR a1



BARS h6 & h7



SECTION THRU HEADWALL
(Up Stream End Only)



SECTION A-A

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a1	56	#4	6'-8"	
a2	10	#4	5'-2"	
d	10	#4	4'-6"	
h	16	#5	7'-1"	
h1	24	#4	7'-1"	
h2	8	#5	7'-2"	
h3	12	#4	8'-0"	
h4	4	#6	5'-9"	
h5	8	#6	5'-9"	
h6	12	#4	8'-3"	
h7	12	#4	8'-0"	
h8	12	#4	8'-0"	
h9	8	#5	6'-9"	
v	42	#4	3'-8"	
v1	16	#4	6'-8"	
Reinforcement Bars		Pound	1,200	
Concrete Box Culverts		Cu. Yd.	9.9	

CAST-IN-PLACE END SECTION DETAILS
STRUCTURE NO. 049-C004
OUTLET NO. 15

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D162953-03-end_sect-det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CAST–IN–PLACE END SECTION DETAILS
STRUCTURE NO. 049–C004

SHEET NO. SC2-3 OF SC2-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	359
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BC-2A

WEI Job No.: 950-12-01
Client: Christian-Roge & Associates, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 657.00 ft
North: 2061584.48 ft
East: 1085942.76 ft
Station: 195+28.70
Offset: 16.1 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	24-inch thick black CLAY LOAM --TOPSOIL--		PUSH	1		1.00 P	29
655.0	Medium stiff, dark brown CLAY LOAM, trace gravel	5	PUSH	2		0.50 P	32
			PUSH	3		0.50 P	27
651.5	Brown SANDY LOAM, trace gravel		PUSH	4	NP		17
649.5	Brown, fine, poorly-graded SAND, trace gravel	10	PUSH	5	NP		16
647.5	Gray SILTY LOAM		PUSH	6	NP		17
645.3	Gray, fine, poorly-graded SAND with some silt	15	PUSH	7	NP		25
			PUSH	8	NP		23
640.5	Gray, medium to coarse, well-graded SAND, trace gravel		PUSH	9	NP		16
		20	PUSH	10	NP		17
637.0	Boring terminated at 20.00 ft						

GENERAL NOTES

Begin Drilling: 03-30-2011 Complete Drilling: 03-30-2011
Drilling Contractor: WTS Drill Rig: Hand Auger
Driller: F & N Logger: F. Bozga Checked by: M. Snider
Drilling Method: Pneumatic Hand Auger and Geoprobe Sampler

WATER LEVEL DATA

While Drilling: 6.00 ft
At Completion of Drilling: 2.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

BORING LOG BC-2B

WEI Job No.: 950-12-01
Client: Christian-Roge & Associates, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 662.50 ft
North: 2061560.33 ft
East: 1085952.83 ft
Station: 195+45.44
Offset: 3.95 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
662.5	24-inch thick, black CLAY LOAM --TOPSOIL--						
	Soft to stiff, brown SANDY CLAY LOAM, trace gravel --FILL--			1	2 2 3	1.00 P	23
		5		2	1 2 2	0.25 P	21
				3	1 1 3	0.50 P	36
652.5	Medium dense, brown SANDY GRAVEL --WET--	10		4	2 3 4	NR	
				5	6 9 9	NP	18
648.0	Loose, brown GRAVELLY SAND	15		6	5 6 7	NR	
				7	2 3 5	NP	13
644.5	Medium dense, brown to gray, coarse, poorly-graded SAND, some gravel	20		8	6 12 12	NP	17

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
				9	5 6 5		NP 10
639.5	Loose to medium dense, gray, fine, poorly-graded SAND, some silt	25		10	4 5 5		NP 18
				11	4 5 5		NP 21
	--HARD DRILLING-- --POSSIBLE COBBLES--	30		12	2 2 4		NP 20
630.5	Very stiff, gray CLAY	35		13	5 8 9	2.30 B	21
627.5	Boring terminated at 35.00 ft						

GENERAL NOTES

Begin Drilling: 03-18-2011 Complete Drilling: 03-18-2011
Drilling Contractor: WTS Drill Rig: Mobile B-57 TMR
Driller: K&R Logger: F. Bozga Checked by: M. Snider
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 10.50 ft
At Completion of Drilling: 10.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

BORING LOG BC-2C

WEI Job No.: 950-12-01
Client: Christian-Roge & Associates, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 658.00 ft
North: 2061587.45 ft
East: 1086026.00 ft
Station: 194+87.59
Offset: 56.28 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
657.5	5-inch thick, black CLAY LOAM --TOPSOIL--						
	Medium dense, brown GRAVELLY SAND			1	4 5 7	NP	8
		5		2	3 5 5	NP	13
				3	2 4 7	NP	13
650.0	Medium dense, gray SANDY GRAVEL	10		4	2 4 6	NR	
				5	6 9 9	NP	9
		15		6	3 9 14	NP	16
642.8	Medium dense to dense, gray, fine to coarse, well-graded SAND, some gravel and silt			7	4 9 8	NP	17
		20		8	10 7 9	NP	8

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
				9	3 10 12		NP 18
		25		10	6 7 6		NP 17
				11	3 5 5		NP 17
628.0	Boring terminated at 30.00 ft	30		12	4 15 17		NP 10
		35					
		40					

GENERAL NOTES

Begin Drilling: 03-18-2011 Complete Drilling: 03-18-2011
Drilling Contractor: WTS Drill Rig: Mobile B-57 TMR
Driller: K&R Logger: F. Bozga Checked by: M. Snider
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 8.00 ft
At Completion of Drilling: 2.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

SOIL BORING LOGS
STRUCTURE NO. 049-C004
OUTLET NO. 15

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-04-soil_boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOIL BORING LOGS
STRUCTURE NO. 049-C004
SHEET NO. SC2-4 OF SC2-4 SHEETS

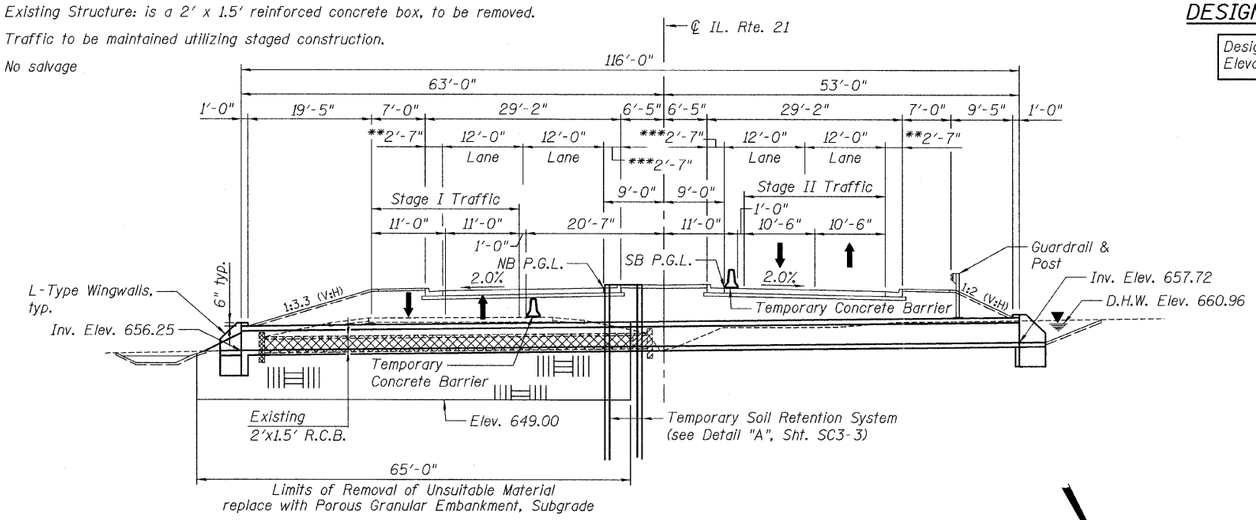
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	360
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

B.M.: Chiseled box on top of S.E. wingwall of bridge over Bull Creek. Elevation 669.64

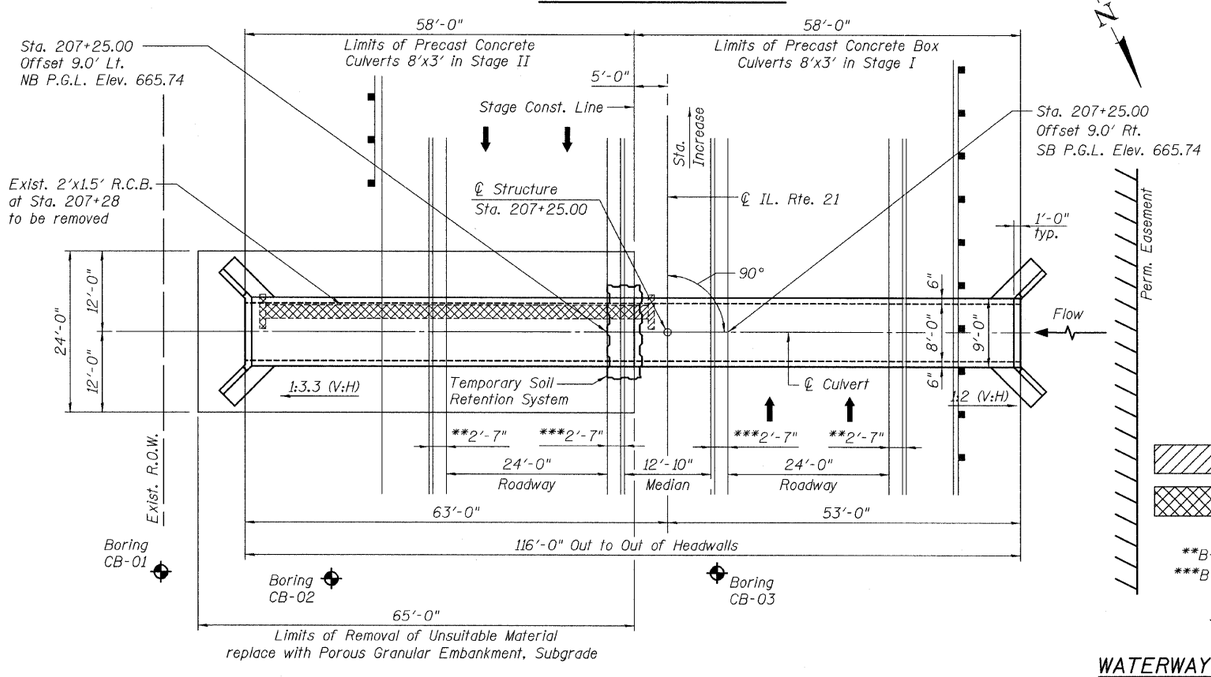
Existing Structure: is a 2' x 1.5' reinforced concrete box, to be removed.

Traffic to be maintained utilizing staged construction.

No salvage



LONGITUDINAL SECTION



PLAN

Removal of Existing Structures No. 3 - Stage I

Removal of Existing Structures No. 3 - Stage II

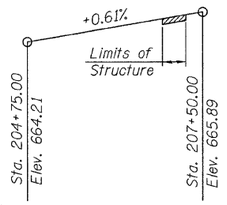
**B-6.24 Comb. Conc. Curb & Gutter

***B-6.24 Comb. Conc. Curb & Gutter (Special)

⊕ Indicates Boring Locations

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (ft.)	Upstream	Downstream
	654.72	653.25



PROFILE GRADE

(Along NB & SB P.G.L.)

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges

LOADING HS20-44

Allow 50#/sq. ft. for future wearing surface.

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 5,000 psi
fy = 65,000 psi (Welded wire fabric)

WATERWAY INFORMATION

Drainage Area = 0.109 Sq. Mi. Low Grade Elev. 663.93 @ Sta. 203+84.34

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head - Ft. Exist.	Head - Ft. Prop.	Headwater El. Exist.	Headwater El. Prop.
Design	50	79	45*	19.84	656.65	4.31	4.31	660.96	660.96
Base	100	92	59*	22.00	656.69	4.29	4.29	660.98	660.98
Overtopping									
Max. Calc.									

*Includes roadway overtopping

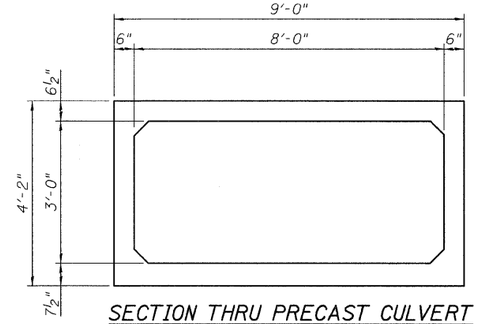
GENERAL NOTES:

1. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
2. All exposed concrete edges shall be chamfered $\frac{3}{4}$" unless otherwise noted.
3. Reinforcement Bars designated (E) shall be Epoxy Coated.
4. The limits and quantities of removal and replacement shown are based on the boring data and may be modified by the District Geotechnical and Field Engineers for variable subsurface conditions encountered in the field.
5. The Porous Granular Embankment, Subgrade shall be capped with 6 in. of CA7 and satisfy the Standard Specifications unless otherwise indicated in the Special Provisions. The cost of the capping material shall be included in the Pay Item for "Porous Granular Embankment, Subgrade".

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Removal of Existing Structures No. 3	Each	1
Removal and Disposal of Unsuitable Material for Structures	Cu. Yd.	705
Reinforcement Bars	Pound	550
Reinforcement Bars, Epoxy Coated	Pound	70
Concrete Box Culverts	Cu. Yd.	7.7
Precast Concrete Box Culverts 8'x3'	Foot	115
Temporary Soil Retention System	Sq. Ft.	604
Porous Granular Embankment, Subgrade	Cu. Yd.	440



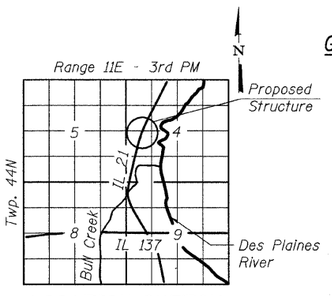
SECTION THRU PRECAST CULVERT

(Wall and Slab thickness may vary as per manufacturer)

STATE OF ILLINOIS BHADRESH N. SHAH 081-004476 CHICAGO LICENSED STRUCTURAL ENGINEER

Bhadresh N. Shah AUG. 15, 2011

BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12



LOCATION SKETCH

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 207+25.00
STRUCTURE NO. 049-0240
OUTLET NO. 16

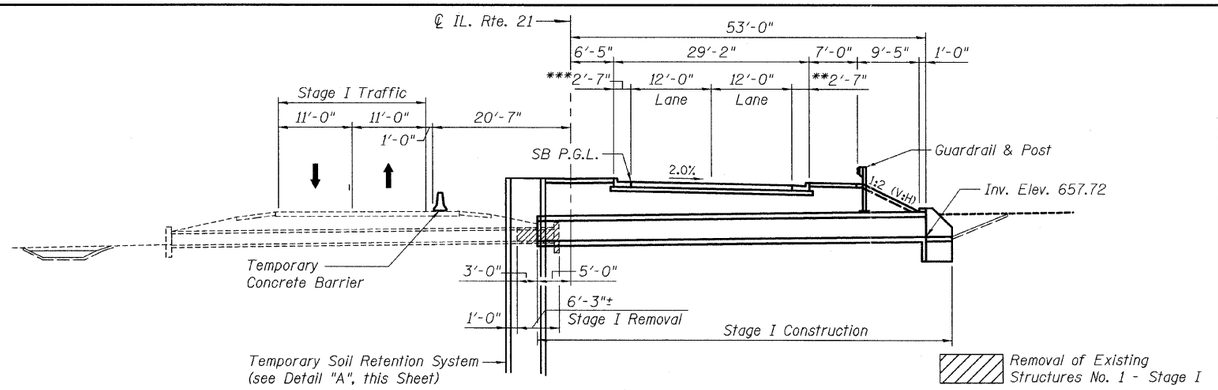
CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D168953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

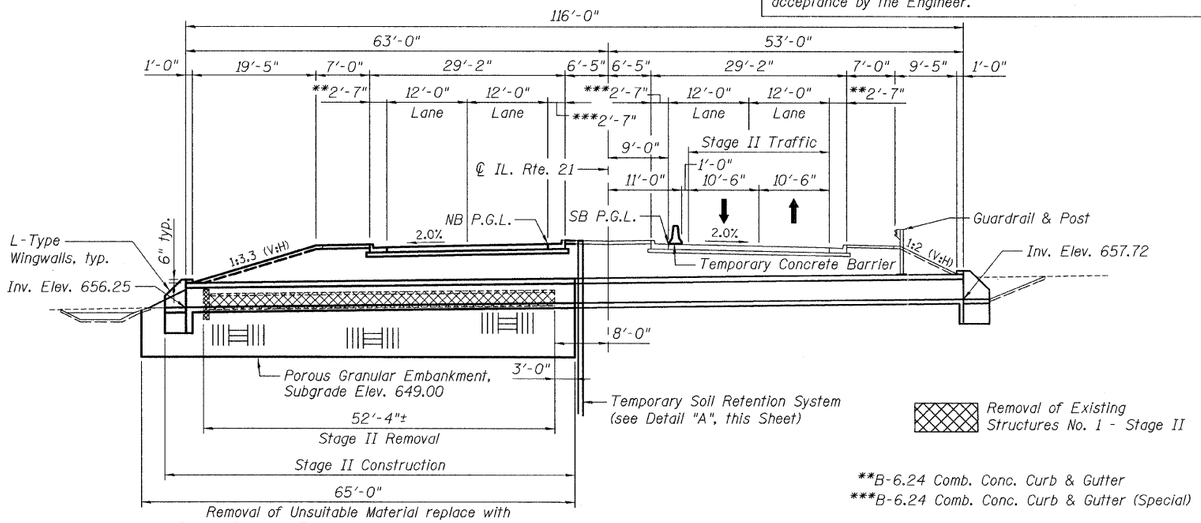
GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-0240
SHEET NO. SC3-1 OF SC3-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	361
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



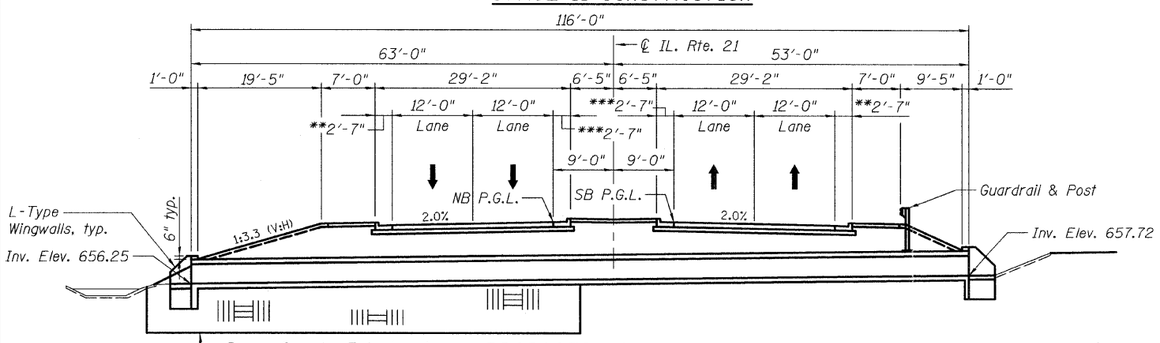
STAGE I CONSTRUCTION

NOTE:
A cantilevered sheet piling design does not appear feasible and additional members or other retention systems may be necessary. The Contractor shall submit a temporary soil retention system design including plan details and calculations for review and acceptance by the Engineer.

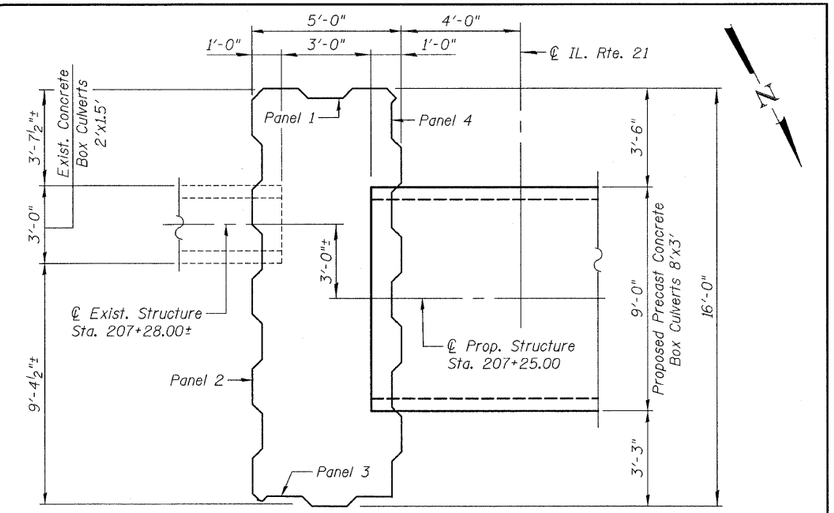


**B-6.24 Comb. Conc. Curb & Gutter
***B-6.24 Comb. Conc. Curb & Gutter (Special)

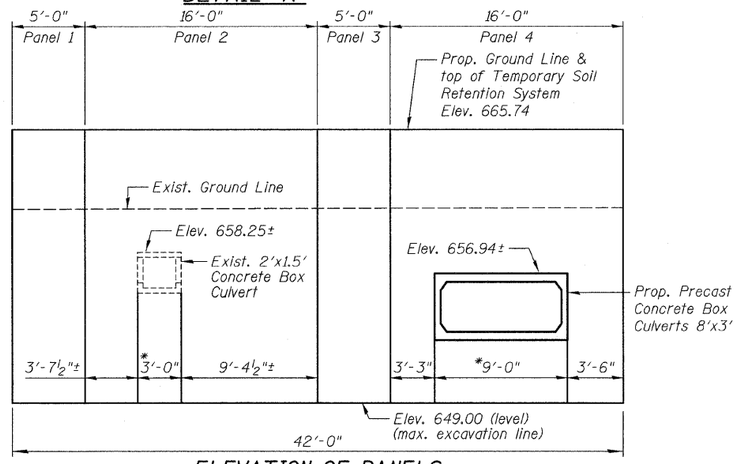
STAGE II CONSTRUCTION



PROPOSED CROSS SECTION



DETAIL "A"



ELEVATION OF PANELS

CONSTRUCTION SEQUENCE

STAGE I

1. Install Temporary Soil Retention System Panels 1, 2 & 3.
2. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
3. Excavate to limits as shown in Elevation, see Sht. SC3-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Install Temporary Soil Retention System Panel 4.
7. Install Stage I portion of the new Roadway.

STAGE II

1. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
2. Remove Temporary Soil Retention System Panels 1, 2 & 3.
3. Excavate to limits as shown in Elevation, see Sht. SC3-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Remove Temporary Soil Retention System Panel 4
7. Install Stage II portion of the new Roadway.

TEMPORARY SOIL RETENTION SYSTEM

*Do not disturb soil under the existing & proposed culverts during placement of Temporary Soil Retention System

STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0240
OUTLET NO. 16

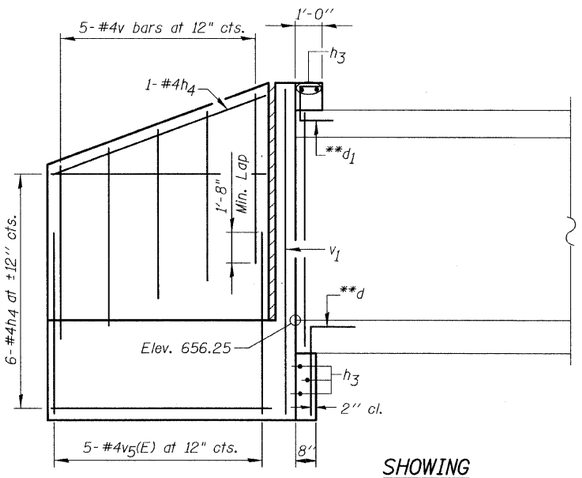
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-02-stage_const_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

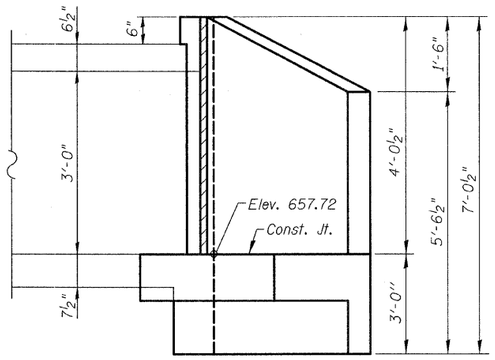
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0240
SHEET NO. SC3-2 OF SC3-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	362
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

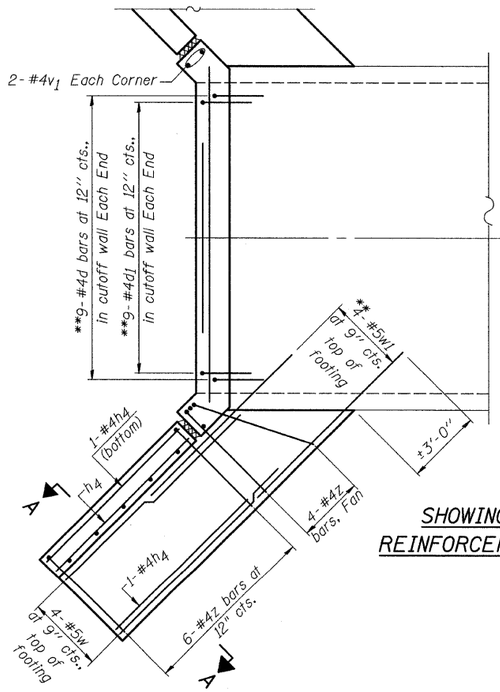


SHOWING REINFORCEMENT

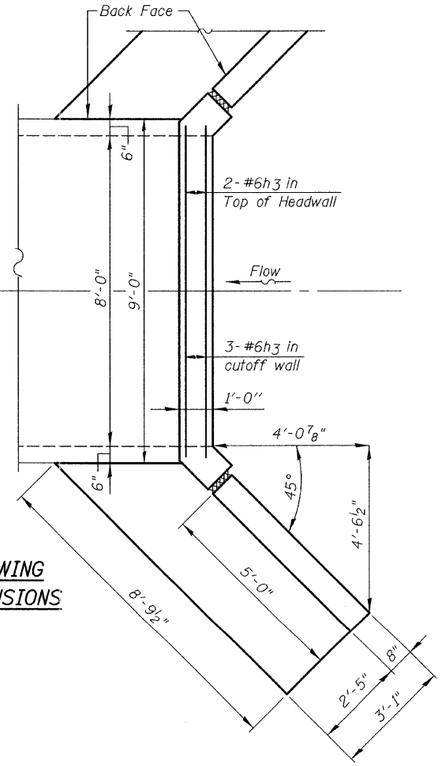


SHOWING DIMENSIONS

ELEVATION

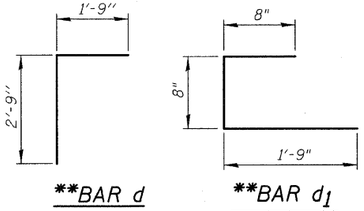


SHOWING REINFORCEMENT

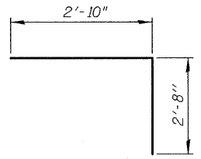


SHOWING DIMENSIONS

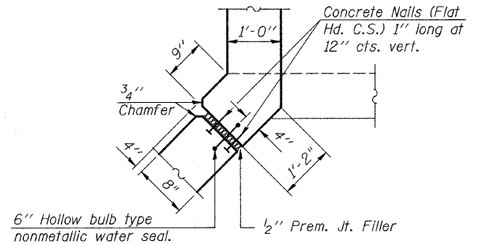
PLAN



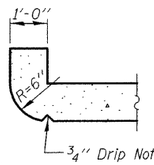
**BAR d **BAR d_1



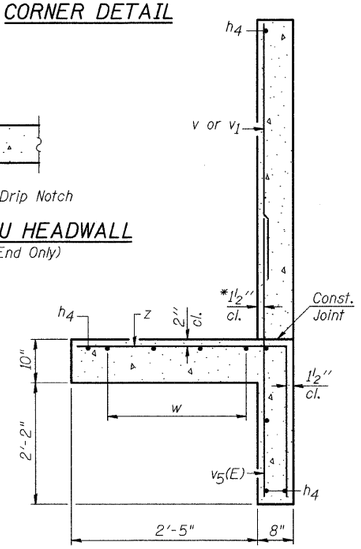
BAR z



CORNER DETAIL



SECTION THRU HEADWALL
(Up Stream End Only)



SECTION A-A

*v_5(E) bars shall not be placed more than 1½" cl. from back face of wingwall.

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h_3	10	#6	8'-6"	—
h_4	36	#4	4'-8"	—
v	20	#4	3'-2"	—
v_1	8	#4	6'-8"	—
v_5(E)	20	#4	5'-2"	—
w	16	#5	5'-3"	—
z	40	#4	5'-6"	⌐
Reinforcement Bars			Pound	550
Reinforcement Bars, Epoxy Coated			Pound	70
Concrete Box Culverts			Cu. Yd.	7.7

BILL OF MATERIAL (FOR REINFORCEMENT BARS CAST INTO PRECAST CULVERTS)

Bar	No.	Size	Length	Shape
**d	18	#4	4'-6"	⌐
**d1	18	#4	3'-1"	⌐
**w1	16	#5	8'-0"	—

**Cast Reinforcement Bars into Precast Concrete Box Culvert as shown. Cost included with Precast Concrete Box Culverts 8'x3'

CAST-IN-PLACE END SECTION DETAILS
STRUCTURE NO. 049-0240
OUTLET NO. 16

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D1629953-03-end_sect_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CAST–IN–PLACE END SECTION DETAILS
STRUCTURE NO. 049–0240
SHEET NO. SC3-3 OF SC3-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	363
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG CB-01

WEI Job No.: 722-23-02

Client: MACTEC Engineering and Consulting, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 659.00 ft
North: 2060413.93 ft
East: 1085460.16 ft
Station: 206+93.69
Offset: 75.53 LT

Depth (ft)	Elevation (ft)	Profile	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
0	659.0		Very stiff, black CLAY LOAM --TOPSOIL--		1	2 3 4	3.00 P	30
	657.0		Very stiff, dark brown to black CLAY LOAM		2	2 3 3	2.00 P	26
5	654.5		Soft, dark gray SILTY CLAY LOAM		3	2 1 1	0.33 B	37
	652.0		Stiff, brown to dark gray CLAY		4	2 3 4	1.15 B	21
	650.5		Brown SILTY LOAM					
10	649.5		Loose, brown, coarse SAND		5	2 4 4	NP	20
	647.0		Medium dense, brown and gray SANDY GRAVEL		6	2 6 9	NP	12
15					7	9 8 7	NP	13
	640.0		Boring terminated at 19.00 ft		8	7 10 11	NP	8
20								

MANGENG.INC 722302.GPJ MANGENG.GDT 5/6/11

GENERAL NOTES

Begin Drilling: 11-24-2010 Complete Drilling: 11-24-2010
Drilling Contractor: STS Drill Rig: D-50 TMR
Driller: B&S Logger: A. Kurnia Checked by: A. Bohac
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 9.00 ft
At Completion of Drilling: 6.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG CB-02

WEI Job No.: 722-23-02

Client: MACTEC Engineering and Consulting, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 661.00 ft
North: 2060426.08 ft
East: 1085437.82 ft
Station: 206+92.77
Offset: 50.13 LT

Depth (ft)	Elevation (ft)	Profile	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
0	661.0		Very stiff to hard, dark brown CLAY LOAM with trace gravel --FILL--		1	4 5 7	4.50 P	18
	657.3		Soft, black CLAY LOAM --BURIED TOPSOIL--		2	1 3 4	2.00 P	17
5	654.0		Very soft, gray SILTY CLAY LOAM with some organic matter		3	1 2 2	0.25 P	26
					4	0 0 1	* 0.25 P	39
10			--LL = 40%, PL = 22%-- --% Gravel = 0.0%-- --% Sand = 1.1%-- --% Silt = 77.3%-- --% Clay = 21.6%--		5	0 0 3	* 0.25 P	43
	649.0		Medium stiff, gray CLAY					
	647.8		Medium dense to dense, brown SAND and GRAVEL to SANDY GRAVEL		6	7 15 18	0.50 P	19
15					7	7 9 10	NP	9
	644.0		Medium dense, brown SAND		8	7 8 10	NP	15
	642.0		Boring terminated at 19.00 ft					
20								

MANGENG.INC 722302.GPJ MANGENG.GDT 5/6/11

GENERAL NOTES

Begin Drilling: 11-23-2010 Complete Drilling: 11-23-2010
Drilling Contractor: STS Drill Rig: D-50 TMR
Driller: B&J Logger: A. Kurnia Checked by: A. Bohac
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 12.50 ft
At Completion of Drilling: 10.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG CB-03

WEI Job No.: 722-23-02

Client: MACTEC Engineering and Consulting, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 660.00 ft
North: 2060450.98 ft
East: 1085386.06 ft
Station: 206+93.57
Offset: 07.33 RT

Depth (ft)	Elevation (ft)	Profile	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
0	660.0		24-inch thick, black and brown CLAY LOAM --TOPSOIL--		1	2 1 1	3.50 P	36
	658.0		Stiff to hard, brown SANDY CLAY LOAM		2	3 3 2	4.00 P	9
5	654.0		Medium dense, brown SAND		3	3 5 6	1.75 P	11
	653.0		Loose to medium dense, brown SILTY LOAM		4	3 4 5	NP	25
10			--LL = 24%, PL = 15%-- --% Gravel = 1.0%-- --% Sand = 7.3%-- --% Silt = 77.6%-- --% Clay = 14.1%--		5	3 4 7	1.15 B	21
	648.0		Loose, brown SAND		6	3 3 5	NP	21
15	644.5		Medium dense, brown SANDY GRAVEL		7	5 6 9	NP	16
	643.0		Medium dense, brown SAND		8	3 5 7	NP	10
	641.0		Boring terminated at 19.00 ft					
20								

MANGENG.INC 722302.GPJ MANGENG.GDT 5/6/11

GENERAL NOTES

Begin Drilling: 11-23-2010 Complete Drilling: 11-23-2010
Drilling Contractor: STS Drill Rig: D-50 TMR
Driller: B&J Logger: A. Kurnia Checked by: A. Bohac
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 10.00 ft
At Completion of Drilling: 7.50 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

SOIL BORING LOGS
STRUCTURE NO. 049-0240
OUTLET NO. 16

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-04-soil_boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	**SOIL BORING LOGS STRUCTURE NO. 049-0240**
		CHECKED - B.N.S.	REVISED -		
	PLOT SCALE =	DRAWN - F.M.	REVISED -		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. SC3-4 OF SC3-4 SHEETS

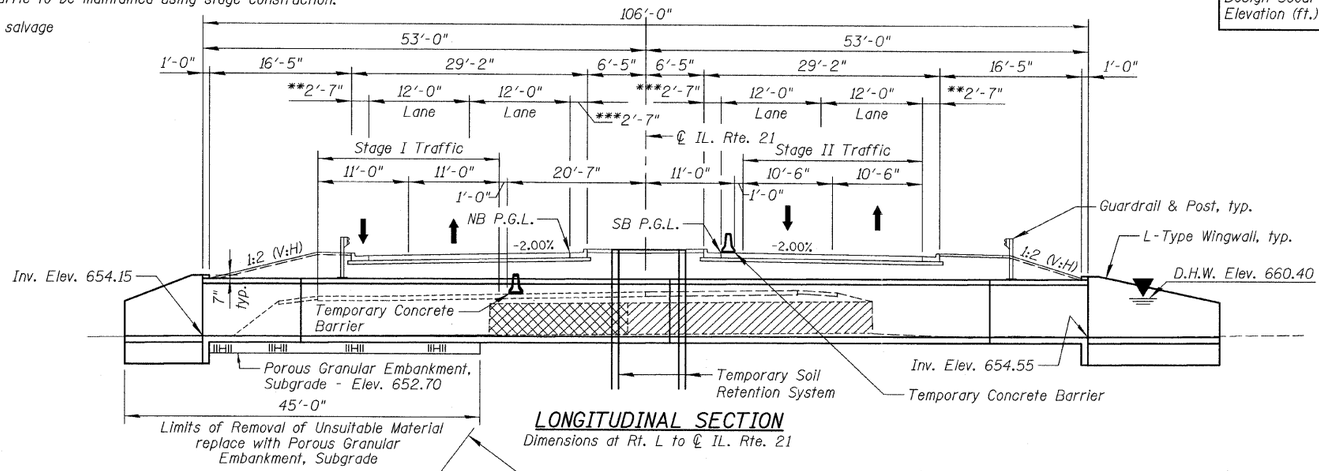
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	364
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

B.M.: Chiseled box on top of S.E. wingwall of existing bridge over Bull Creek. Elevation 669.64

Existing structure is a 5'x5' reinforced concrete box culvert, to be removed.

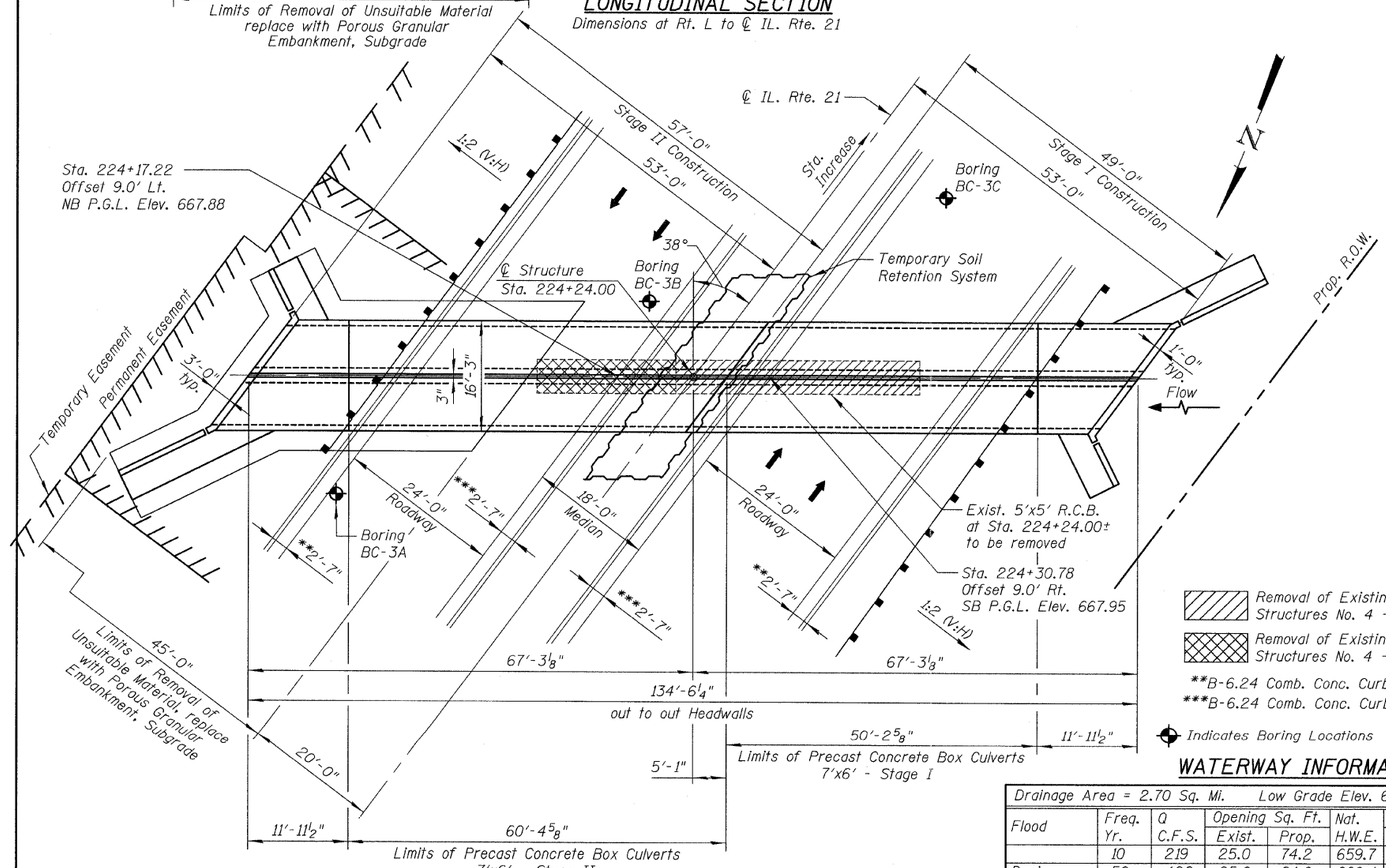
Traffic to be maintained using stage construction.

No salvage



LONGITUDINAL SECTION

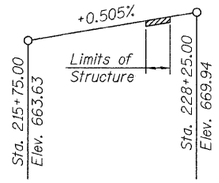
Dimensions at Rt. L to ℄ IL. Rte. 21



PLAN

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (ft.)	Upstream	Downstream
	651.55	651.15



PROFILE GRADE

(Along NB & SB P.G.L.)

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications For Highway Bridges

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 5,000 psi
fy = 65,000 psi (Welded wire fabric)

LOADING HS-20

Allow 50#/sq. ft. for future wearing surface.

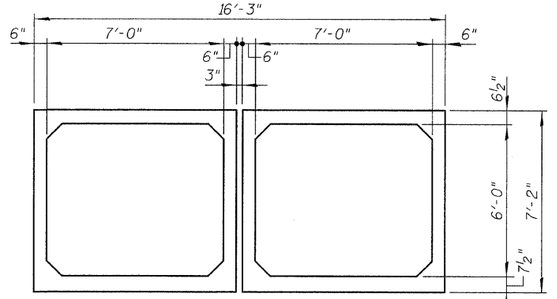
GENERAL NOTES:

1. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
2. All exposed concrete edges shall be chamfered ¾" unless otherwise noted.
3. Reinforcement Bars designated (E) shall be Epoxy Coated.
4. The limits and quantities of removal and replacement shown are based on the boring data and may be modified by the District Geotechnical and Field Engineers for variable subsurface conditions encountered in the field.
5. The Porous Granular Embankment, Subgrade shall be capped with 6 in. of CA7 and satisfy the Standard Specifications unless otherwise indicated in the Special Provisions. The cost of the capping material shall be included in the Pay Item for "Porous Granular Embankment, Subgrade".

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Removal of Existing Structures No. 4	Each	1
Removal and Disposal of Unsuitable Material for Structures	Cu. Yd.	80
Reinforcement Bars	Pound	7,850
Reinforcement Bars, Epoxy Coated	Pound	170
Name Plates	Each	1
Concrete Box Culverts	Cu. Yd.	34.0
Precast Concrete Box Culverts 7'x6'	Foot	222
Temporary Soil Retention System	Sq. Ft.	932
Porous Granular Embankment, Subgrade	Cu. Yd.	50



SECTION THRU PRECAST CULVERT

(Wall and Slab thickness may vary as per manufacturer)

Removal of Existing Structures No. 4 - Stage I

Removal of Existing Structures No. 4 - Stage II

**B-6.24 Comb. Conc. Curb & Gutter

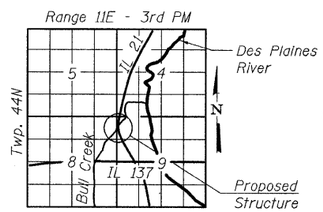
***B-6.24 Comb. Conc. Curb & Gutter (Special)

Indicates Boring Locations

WATERWAY INFORMATION

Drainage Area = 2.70 Sq. Mi. Low Grade Elev. 664.20 @ Sta. 216+90.00

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head - Ft. Exist.	Head - Ft. Prop.	Headwater El. Exist.	Headwater El. Prop.
	10	219	25.0	74.2	659.7	1.6	0.3	661.4	660.0
Design	50	422	25.0	84.0	660.4	1.7	0.6	662.1	661.0
Base	100	542	25.0	84.0	660.6	1.7	1.1	662.3	661.7
Overtopping	340	825	25.0	84.0	661.2	1.2	2.5	660.6	663.7
Max. Calc.	500	921	25.0	84.0	661.4	1.2	2.8	662.6	664.2



LOCATION SKETCH

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
LICENSED STRUCTURAL ENGINEER
CHICAGO

BHADRESH N. SHAH AUG. 15, 2011
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21
TRIBUTARY NO. 1 TO THE DES PLAINES RIVER
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 224+24.00
STRUCTURE NO. 049-0241
OUTLET NO. 18

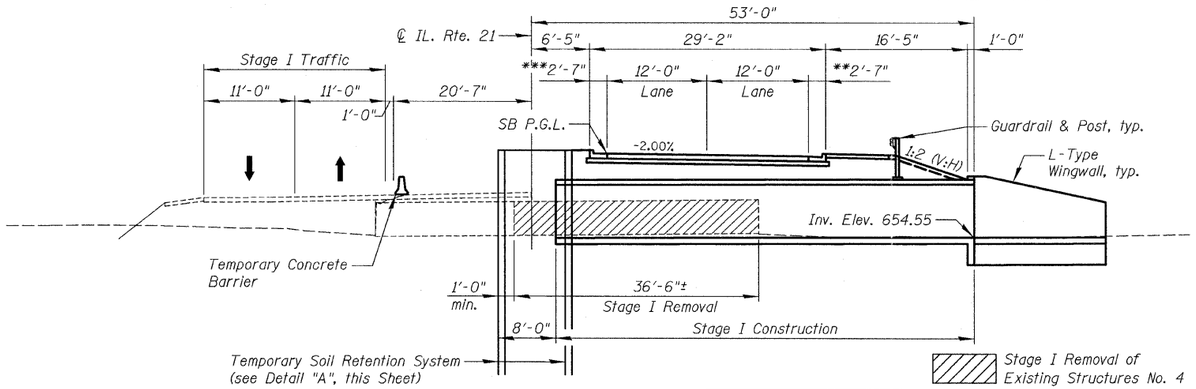
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D168953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-0241
SHEET NO. SC4-1 OF SC4-5 SHEETS

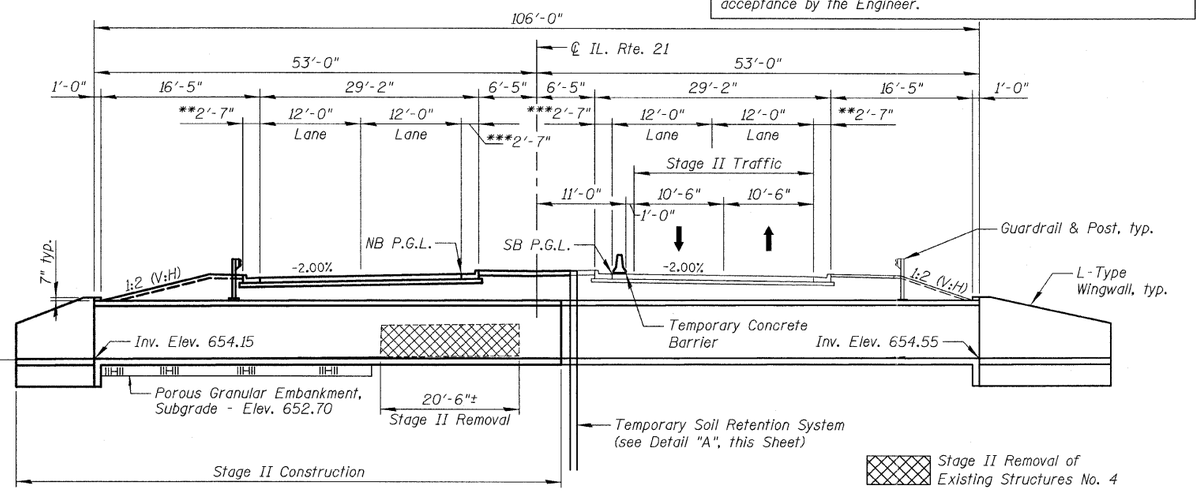
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	365
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



STAGE I CONSTRUCTION

Dimensions at Rt. L to ℄ IL. Rte. 21

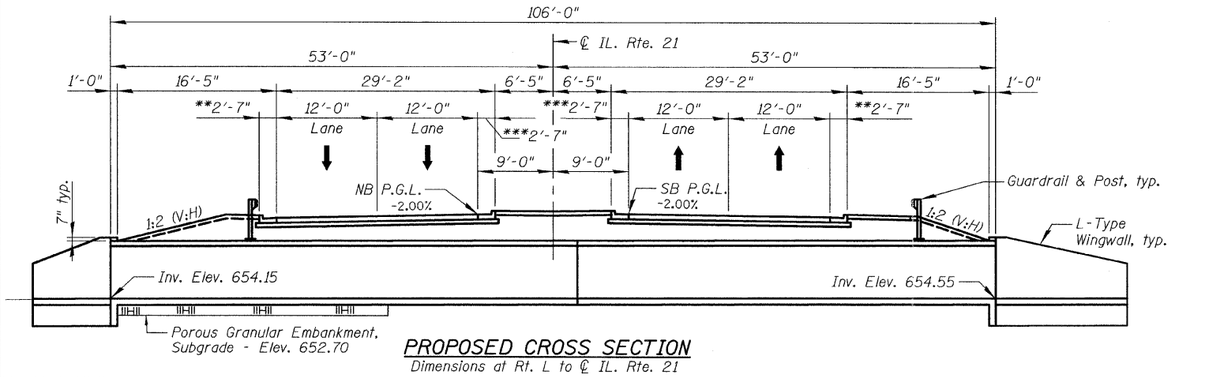
NOTE:
A cantilevered sheet piling design does not appear feasible and additional members or other retention systems may be necessary. The Contractor shall submit a temporary soil retention system design including plan details and calculations for review and acceptance by the Engineer.



STAGE II CONSTRUCTION

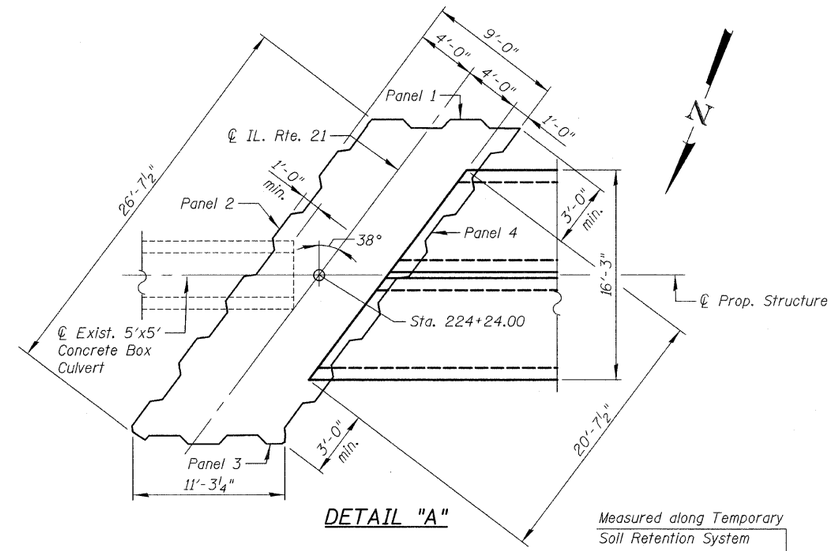
Dimensions at Rt. L to ℄ IL. Rte. 21

**B-6.24 Comb. Conc. Curb & Gutter
***B-6.24 Comb. Conc. Curb & Gutter (Special)

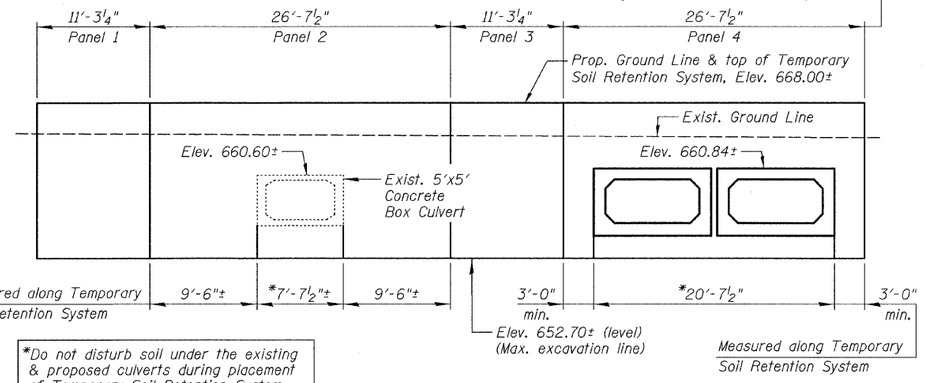


PROPOSED CROSS SECTION

Dimensions at Rt. L to ℄ IL. Rte. 21



DETAIL "A"



*Do not disturb soil under the existing & proposed culverts during placement of Temporary Soil Retention System

ELEVATION OF PANELS TEMPORARY SOIL RETENTION SYSTEM

CONSTRUCTION SEQUENCE

STAGE I

1. Install Temporary Soil Retention System Panels 1, 2 & 3.
2. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
3. Excavate to limits as shown in Elevation, see Sht. SC4-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Install Temporary Soil Retention System Panel 4.
7. Install Stage I portion of the new Roadway.

STAGE II

1. Remove existing precast concrete box culvert. See Stage Construction Details & limits of removal, this Sheet.
2. Remove Temporary Soil Retention System Panels 1, 2 & 3.
3. Excavate to limits as shown in Elevation, see Sht. SC4-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culvert. See Stage Construction Details & limits of replacement, this Sheet.
6. Remove Temporary Soil Retention System Panel 4
7. Install Stage II portion of the new Roadway.

STAGE CONSTRUCTION DETAILS STRUCTURE NO. 049-0241 OUTLET NO. 18

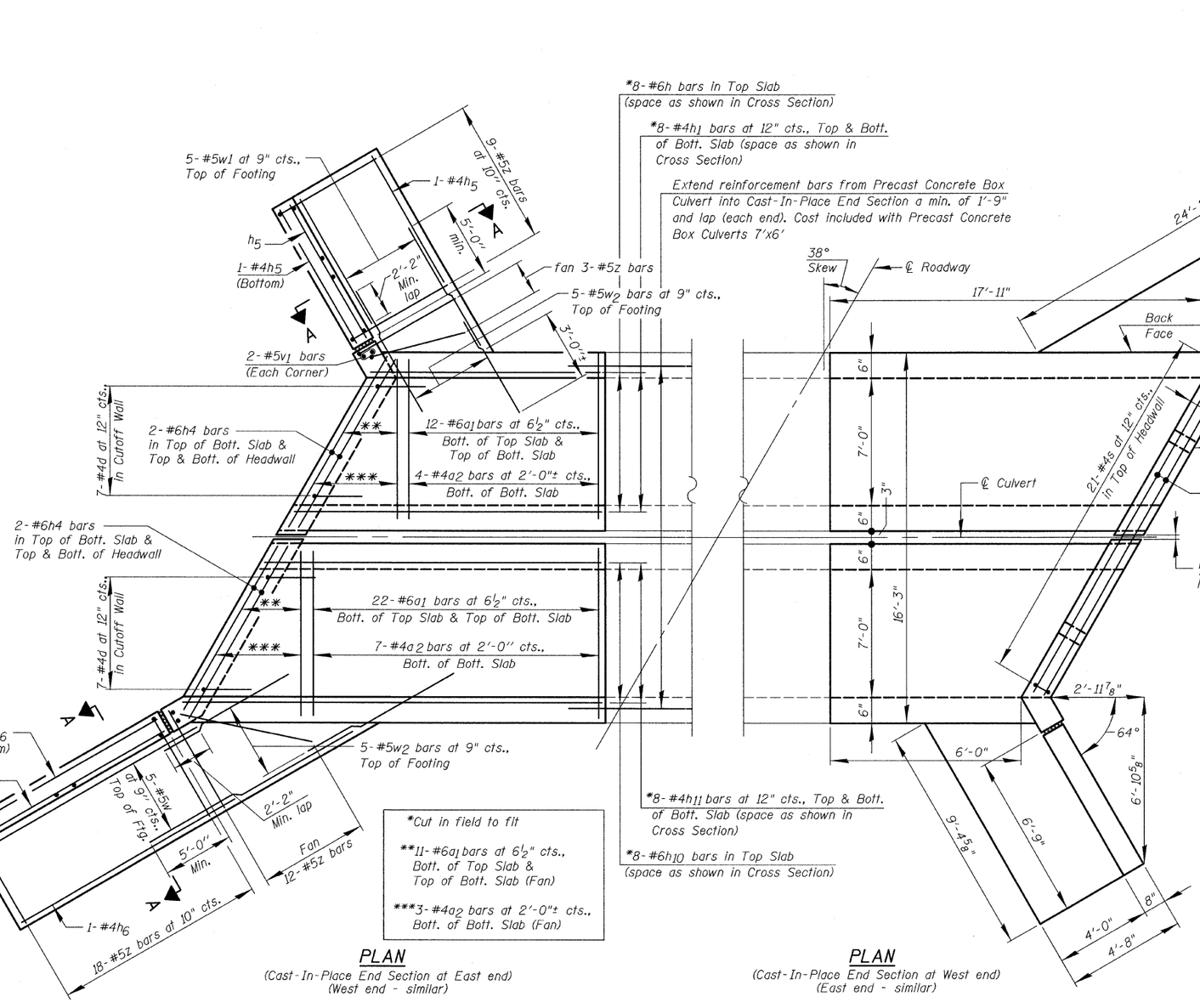
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-02-stage_const_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0241
SHEET NO. SC4-2 OF SC4-5 SHEETS

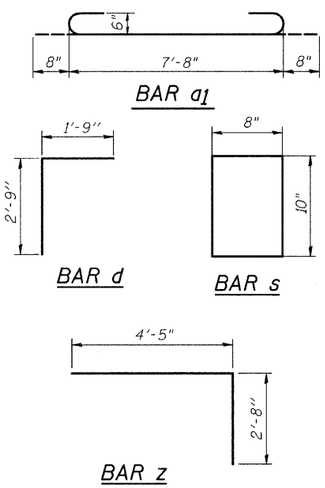
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	366
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a1	224	#6	9'-0"	
a2	34	#4	7'-6"	
d	28	#4	4'-6"	
h	16	#6	11'-6"	
h1	32	#4	11'-6"	
h2	12	#5	5'-6"	
h3	6	#6	19'-8"	
h4	24	#6	9'-8"	
h5	18	#4	6'-5"	
h6	18	#4	13'-11"	
h7	12	#5	11'-0"	
h8	12	#5	12'-0"	
h9	12	#5	17'-5"	
h10	16	#6	17'-5"	
h11	32	#4	17'-5"	
s	42	#4	3'-9"	
v	140	#4	6'-8"	
v1	8	#5	9'-10"	
v2	14	#4	3'-6"	
v3	14	#4	4'-6"	
v4	14	#4	5'-6"	
v5(E)	42	#4	6'-0"	
w	10	#5	14'-6"	
w1	10	#5	7'-0"	
w2	20	#5	6'-0"	
z	84	#5	7'-1"	

Concrete Box Culverts	Cu. Yd.	34.0
Reinforcement Bars, Epoxy Coated	Pound	170
Reinforcement Bars	Pound	7,850

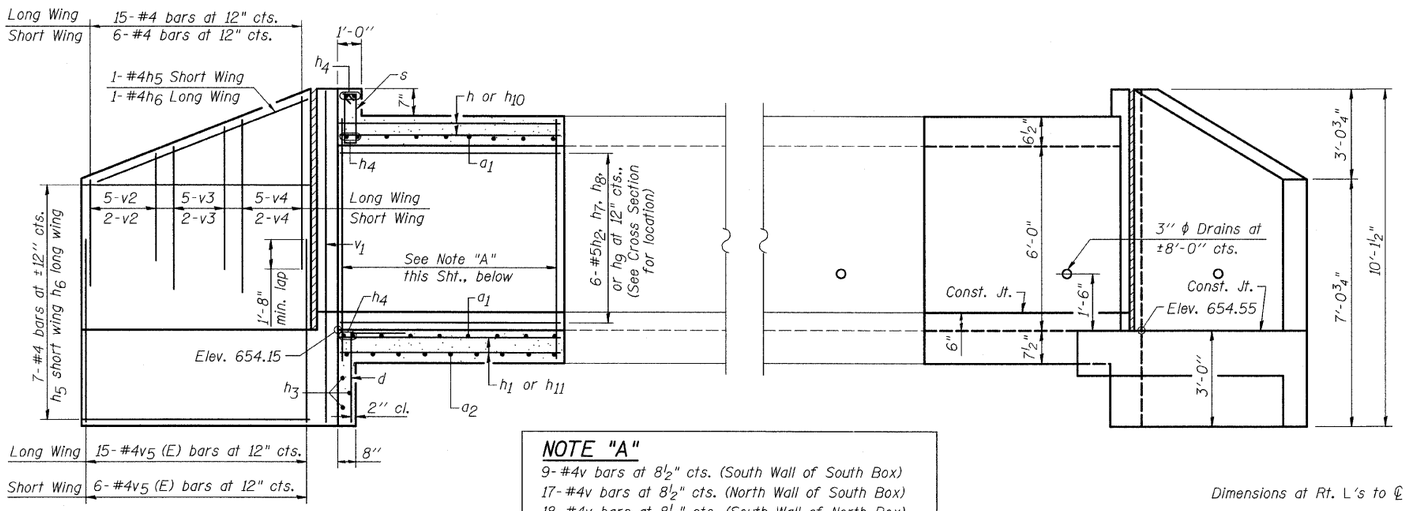


CAST-IN-PLACE END SECTION DETAILS-I STRUCTURE NO. 049-0241 OUTLET NO. 18

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-03-end_sect_det-I.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	CAST-IN-PLACE END SECTION DETAILS-I STRUCTURE NO. 049-0241
		CHECKED - B.N.S.	REVISED -		SHEET NO. SC4-3 OF SC4-5 SHEETS
	PLOT SCALE =	DRAWN - F.M.	REVISED -		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	367
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



NOTE "A"

9-#4v bars at 8½" cts. (South Wall of South Box)
17-#4v bars at 8½" cts. (North Wall of South Box)
18-#4v bars at 8½" cts. (South Wall of North Box)
26-#4v bars at 8½" cts. (North Wall of North Box)

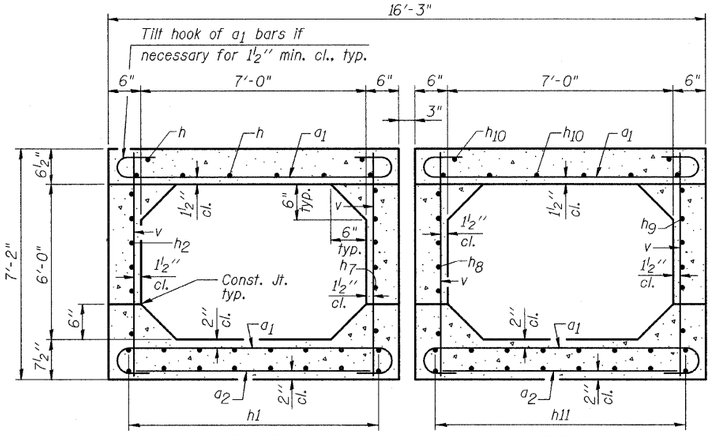
SHOWING REINFORCEMENT

ELEVATION
(Cast-In-Place End Section)
(at East end)

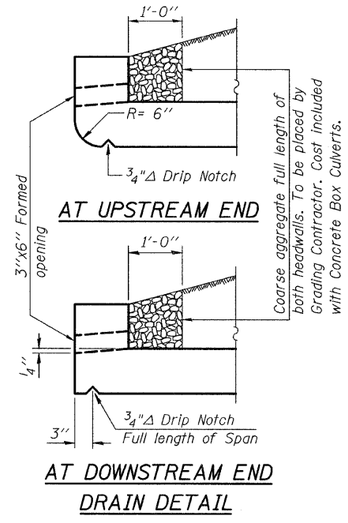
SHOWING DIMENSIONS

ELEVATION
(Cast-In-Place End Section)
(at West end)

Dimensions at Rt. L's to ℄ Roadway

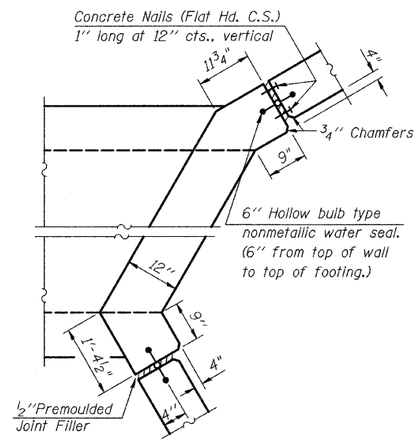


SECTION THRU BARREL
(Looking West)

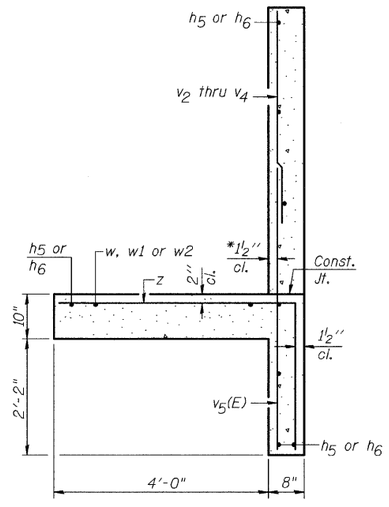


AT UPSTREAM END

AT DOWNSTREAM END DRAIN DETAIL



CORNER DETAIL



SECTION A-A

*v5(E) bars shall not be placed more than 1½" cl. from back face of wingwalls.

CAST-IN-PLACE END SECTION DETAILS-II STRUCTURE NO. 049-0241 OUTLET NO. 18

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D160953-04-end_sect_det-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CAST–IN–PLACE END SECTION DETAILS–II
STRUCTURE NO. 049–0241
SHEET NO. SC4-4 OF SC4-5 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	368
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BC-3A

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 659.20 ft
North: 2058964.64 ft
East: 1084857.60 ft
Station: 223+78
Offset: 32 LT

Elevation (ft)	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	SOIL AND ROCK DESCRIPTION
							Medium stiff, dark brown to black CLAY LOAM
652.7	6.5		1	4 4 6	0.50 P	29	
			2	4 7 11	0.50 P	36	
			3	3 9 18	0.75 P	12	
646.7	12.5		4	12 20 8	NP	14	Medium dense to very dense, gray SANDY LOAM, trace to little gravel
			5	30 27 27	NP	16	
			6	50/1"	NP		
			7	7 14 24	NP	23	
			8	11 17 28	NP	12	
637.2	22.0		9	9 50/5"	NP	15	Boring terminated at 22.00 ft

GENERAL NOTES

Begin Drilling 04-18-2001 Complete Drilling 04-18-2001
Drilling Contractor Rock and Soil Drilling Drill Rig Acker 82
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 4.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling ▽ 8.00 ft
At Completion of Drilling ▽ 6.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MAWENG.INC 7222301.GPJ MAWENG.GDT 11/5/10

BORING LOG BC-3B

Page 1 of 1

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 662.00 ft
North: 2058919.39 ft
East: 1084820.17 ft
Station: 224+29
Offset: 13.5 LT

Elevation (ft)	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	SOIL AND ROCK DESCRIPTION
661.82	0.2						2-inch thick ASPHALT --PAVEMENT--
			1	6 4 5	1.50 P	13	Stiff, brown and black SILTY CLAY, trace gravel --FILL--
659.0	3.0						
			2	5 7 6	NP	11	Medium dense, brown SAND, trace gravel --FILL--
656.5	5.5						
			3	9 11 5	NP	11	Medium dense to dense, gray SANDY LOAM, little to some gravel
			4	7 9 12	NP	10	
			5	5 6 7	NP	10	
			6	3 9 20	NP	9	
			7	3 5 7	NP	12	
			8	9 22 9	NP	13	
			9	8 14 11	NP	10	
			10	8 7 7	NP	11	
			11	4 17 11	NP		
634.5	27.5						Boring terminated at 27.50 ft

GENERAL NOTES

Begin Drilling 04-09-2001 Complete Drilling 04-09-2001
Drilling Contractor Rock and Soil Drilling Drill Rig D-120
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 2.75" ID HSA; backfilled w/ bentonite chip and AC blacktop.

WATER LEVEL DATA

While Drilling ▽ 9.50 ft
At Completion of Drilling ▽ 9.50 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MAWENG.INC 7222301.GPJ MAWENG.GDT 11/5/10

BORING LOG BC-3C

Page 1 of 1

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

WEI Job No.: 722-23-01

Client MACTEC Engineering and Consulting, Inc.
Project FAP 330, IL 21 (Milwaukee Avenue)
Location Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 662.55 ft
North: 2058886.34 ft
East: 1084783.81 ft
Station: 224+68
Offset: 14 RT

Elevation (ft)	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	SOIL AND ROCK DESCRIPTION
662.33	0.2						2-inch thick ASPHALT --PAVEMENT--
			1	4 4 4	1.25	30	Stiff, black SILTY CLAY --FILL--
			2	3 3 4	1.00	32	
656.1	6.5						
			3	3 3 5	NP	20	Medium dense, gray SANDY LOAM, wet
			4	5 5 7	NP	15	
			5	3 8 17	NP	15	
			6	13 14 8	NP	13	
646.1	16.5		7	6 4 7	NP	19	Medium dense, gray SILTY LOAM
644.6	18.0		8	3 7 5	NP	13	Medium dense, gray SANDY LOAM, trace gravel
642.1	20.5		9	5 7 6	NP	12	Medium dense, gray SILTY LOAM
640.8	21.8		10	7 8 9	3.50 B	12	Medium dense, gray SANDY LOAM
638.6	24.0		11	2 4 5	2.50 P	14	Very stiff, gray SILTY CLAY
635.6	27.0		12	9 6 10	NP	20	Medium dense, gray SILT
			13	5 10 8	NP	20	
627.6	35.0						Boring terminated at 35.00 ft

GENERAL NOTES

Begin Drilling 04-09-2001 Complete Drilling 04-09-2001
Drilling Contractor Rock and Soil Drilling Drill Rig D-120
Driller Dave Logger T. Chen Checked by P. Wang
Drilling Method 2.75" ID HSA; backfilled w/ bentonite chip and AC blacktop.

WATER LEVEL DATA

While Drilling ▽ 9.50 ft
At Completion of Drilling ▽ 9.00 ft
Time After Drilling 24 hours
Depth to Water ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MAWENG.INC 7222301.GPJ MAWENG.GDT 11/5/10

SOIL BORING LOGS
STRUCTURE NO. 049-0241
OUTLET NO. 18

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D160953-05-soil_boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

SOIL BORING LOGS
STRUCTURE NO. 049-0241
SHEET NO. SC4-5 OF SC4-5 SHEETS

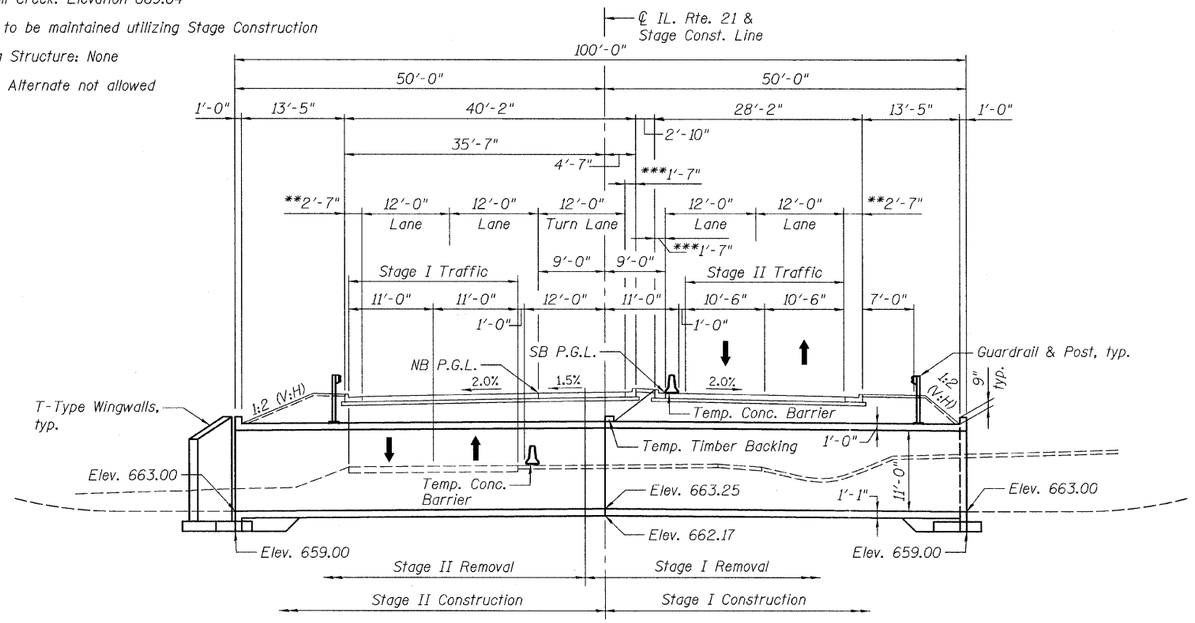
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	369
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		

B.M.: Chiseled box on top of S.E. wingwall of bridge over Bull Creek. Elevation 669.64

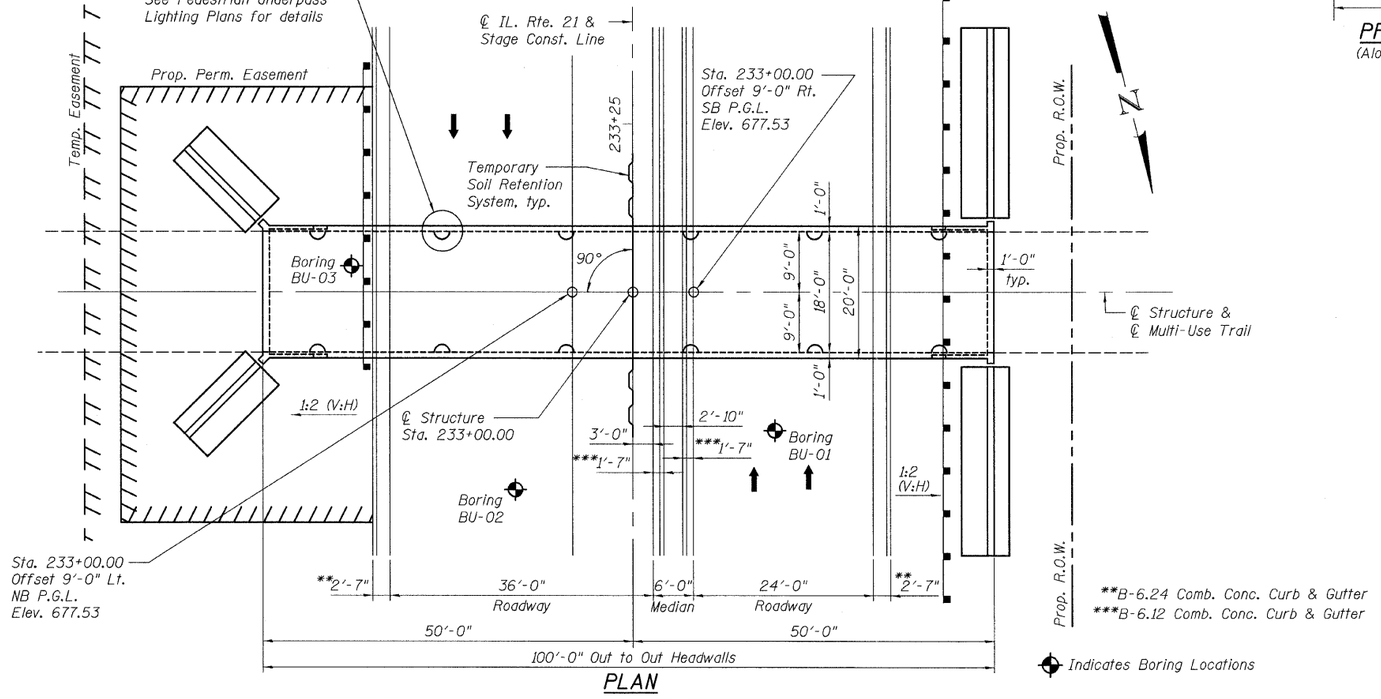
Traffic to be maintained utilizing Stage Construction

Existing Structure: None

Precast Alternate not allowed



LONGITUDINAL SECTION



**B-6.24 Comb. Conc. Curb & Gutter

***B-6.12 Comb. Conc. Curb & Gutter

Indicates Boring Locations

PLAN

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges

DESIGN STRESSES

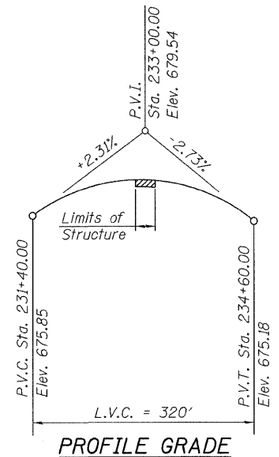
FIELD UNITS

f'c = 3,500 psi

fy = 60,000 psi (Reinforcement)

LOADING HS-20

Allow 50#/sq. ft. for future wearing surface.



PROFILE GRADE

(Along NB & SB P.G.L.)

GENERAL NOTES:

1. All exposed concrete edges shall be chamfered $\frac{3}{4}$" unless otherwise noted.
2. Temporary Timber Blocking for Stage Construction shall be designed by the Contractor. Cost of Temporary Timber Blocking is included with Concrete Box Culverts.
3. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
4. Reinforcement Bars designated (E) shall be Epoxy Coated.

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Form Liner Textured Surface	Sq. Ft.	926
Reinforcement Bars	Pound	60,210
Reinforcement Bars, Epoxy Coated	Pound	1,590
Bar Splicers	Each	128
Concrete Box Culverts	Cu. Yd.	324.0
Temporary Soil Retention System	Sq. Ft.	183
Stain For Concrete Structures	Sq. Yd.	103

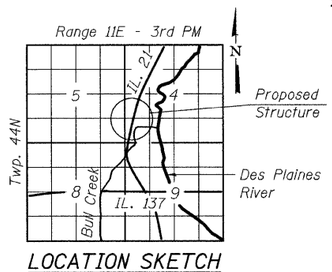
APPROVED
FOR STRUCTURAL ADEQUACY ONLY

ENGINEER OF BRIDGES AND STRUCTURES

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
LICENSED STRUCTURAL ENGINEER
CHICAGO

Bhadresh N. Shah AUG. 15, 2011

BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12



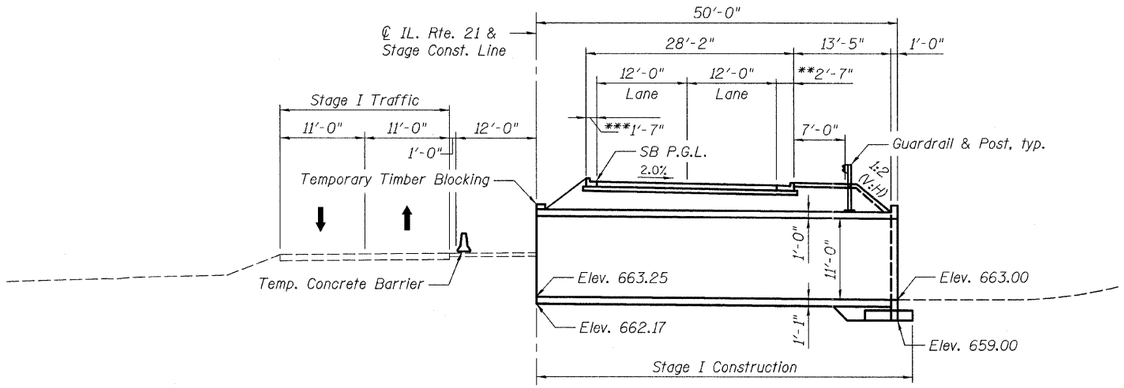
LOCATION SKETCH

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21 OVER MULTI-USE TRAIL
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 233+00.00
STRUCTURE NO. 049-0243

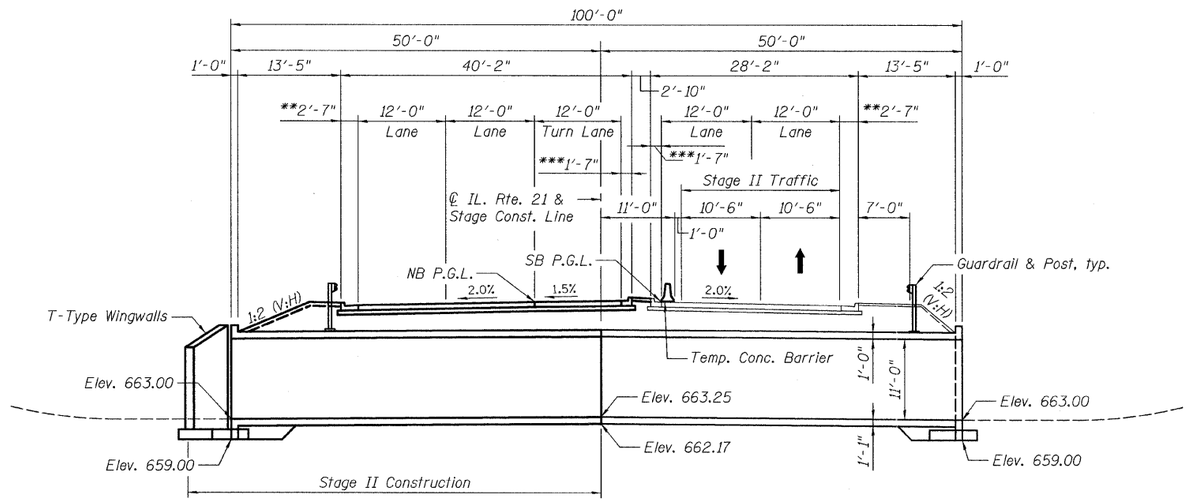
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	GENERAL PLAN & ELEVATION STRUCTURE NO. 049-0243
		CHECKED - B.N.S.	REVISED -		
	PLOT SCALE =	DRAWN - F.M.	REVISED -		SHEET NO. SC5-1 OF SC5-6 SHEETS
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	370
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

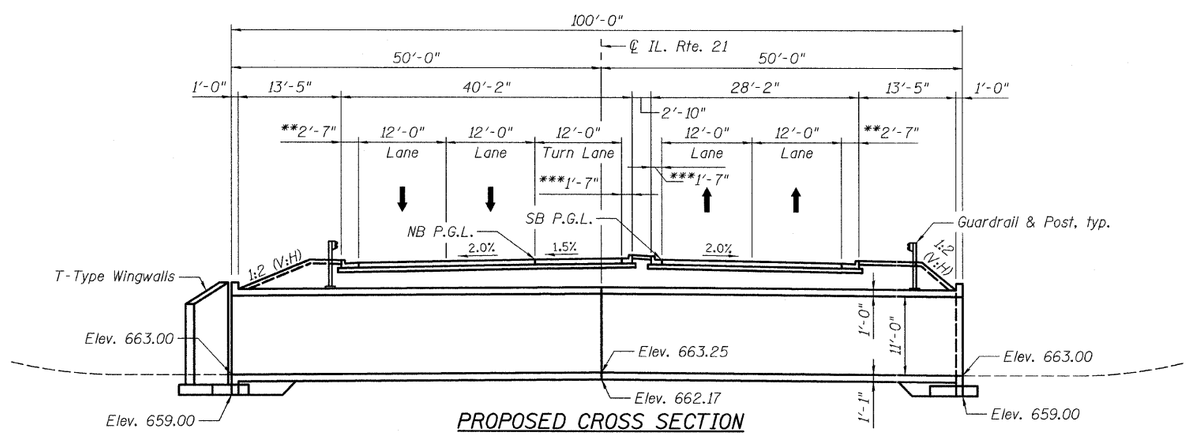


STAGE I CONSTRUCTION

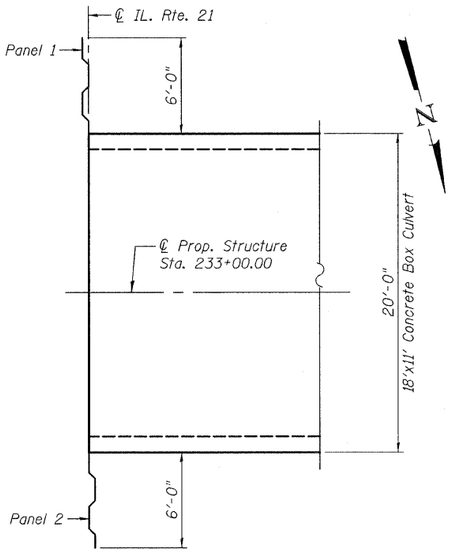


STAGE II CONSTRUCTION

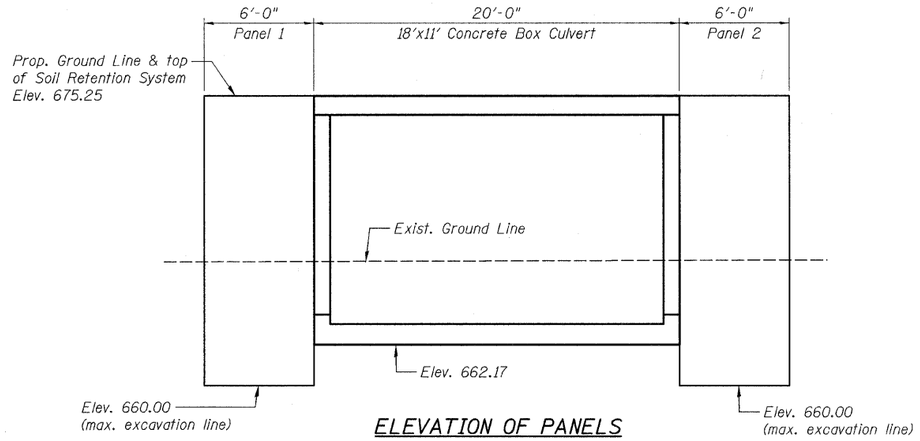
**B-6.24 Comb. Conc. Curb & Gutter
***B-6.12 Comb. Conc. Curb & Gutter



PROPOSED CROSS SECTION



DETAIL "A"



ELEVATION OF PANELS
TEMPORARY SOIL RETENTION SYSTEM

STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0243

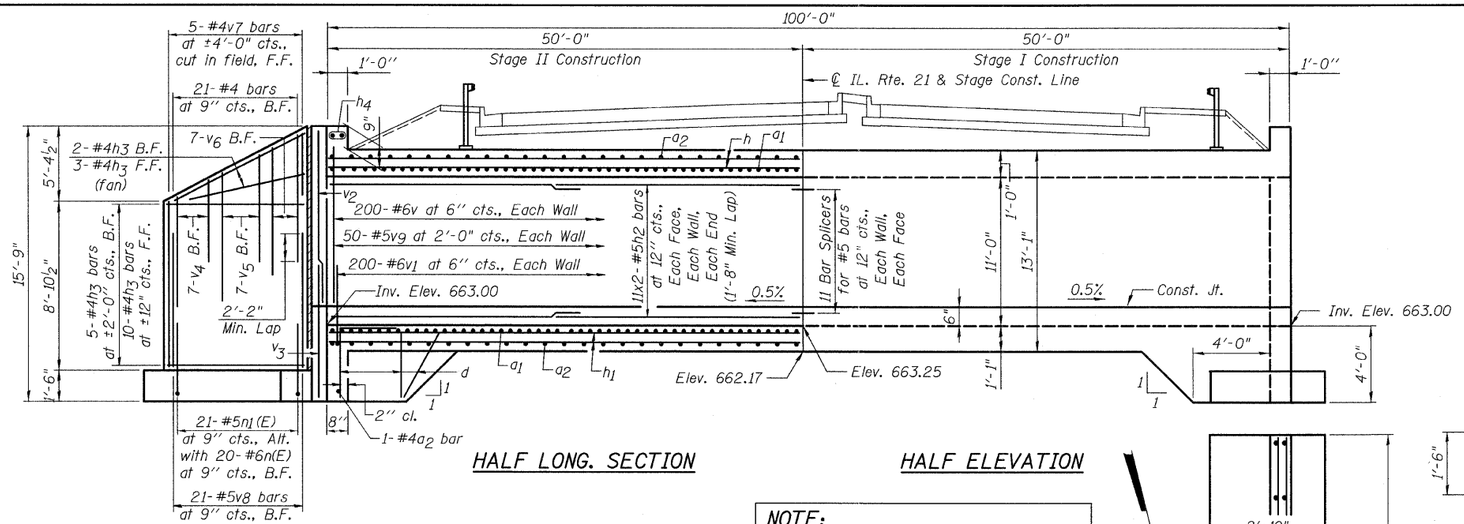
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D1601953-02-stage_const_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

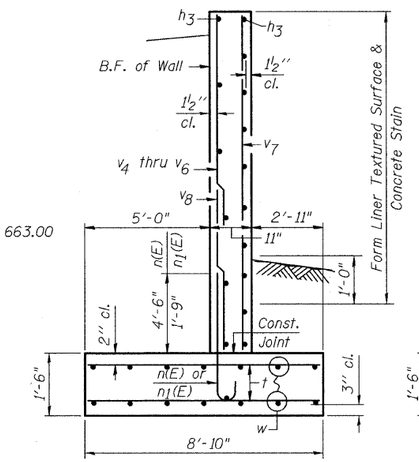
STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0243
SHEET NO. SC5-2 OF SC5-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	371
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			



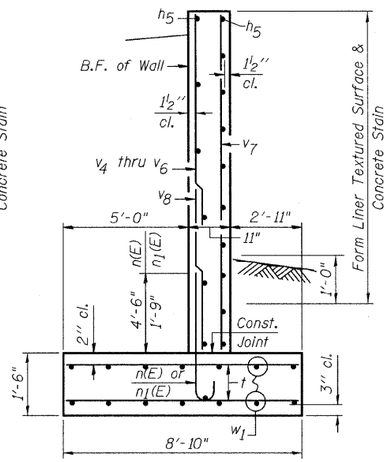
HALF LONG. SECTION

HALF ELEVATION



SECTION A-A

Max. Soil Pressure under footing = 3,273 psf

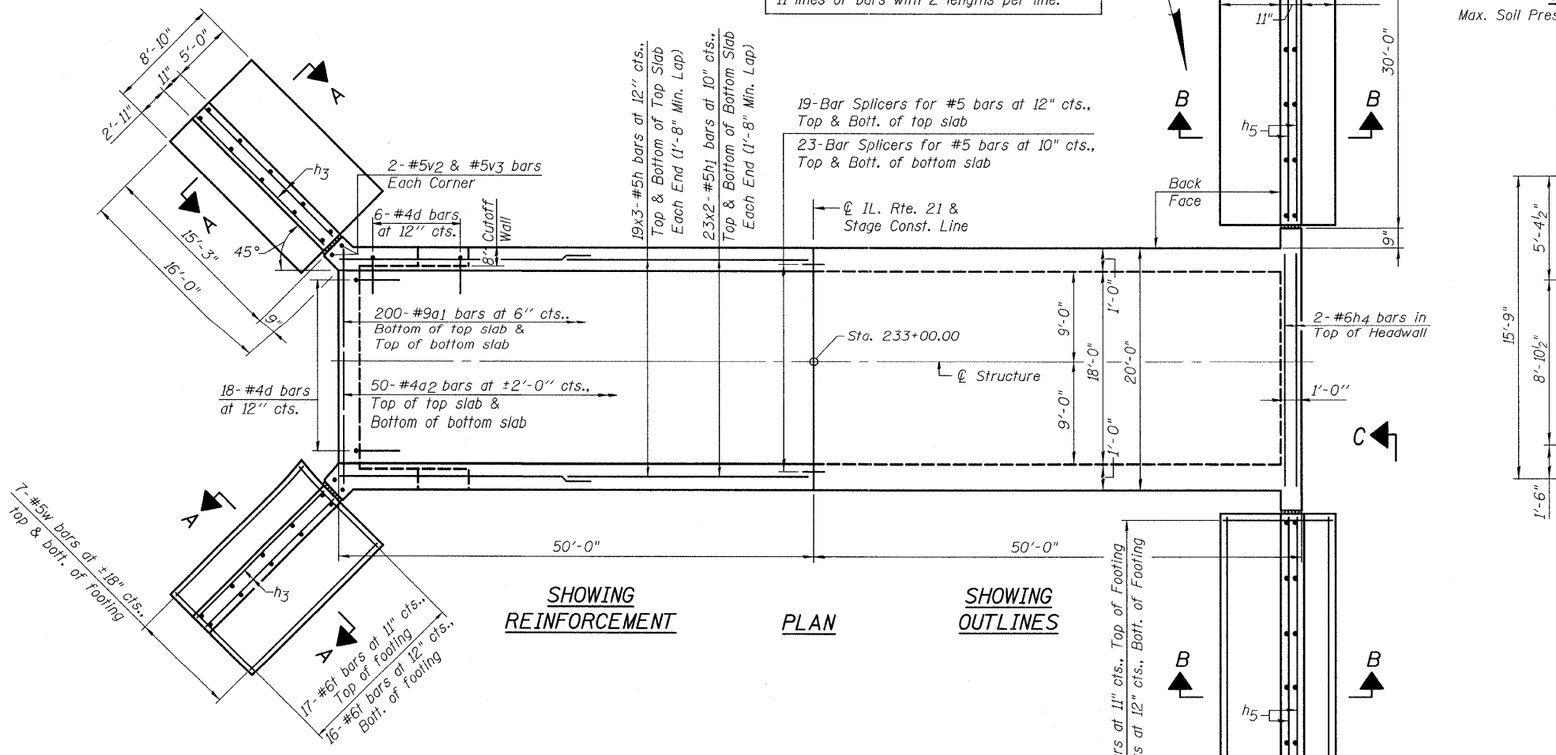


SECTION B-B

Max. Soil Pressure under footing = 3,273 psf

REINF.-EAST WINGWALLS

NOTE:
Bars indicated thus 11x2-#5 etc. indicates 11 lines of bars with 2 lengths per line.



SHOWING REINFORCEMENT

PLAN

SHOWING OUTLINES

ELEVATION C-C

Northwest Wingwall - shown
Southwest Wingwall - similar

LEGEND:
B.F. = Back Face
F.F. = Front ace

REINFORCEMENT DETAILS-I
STRUCTURE NO. 049-0243

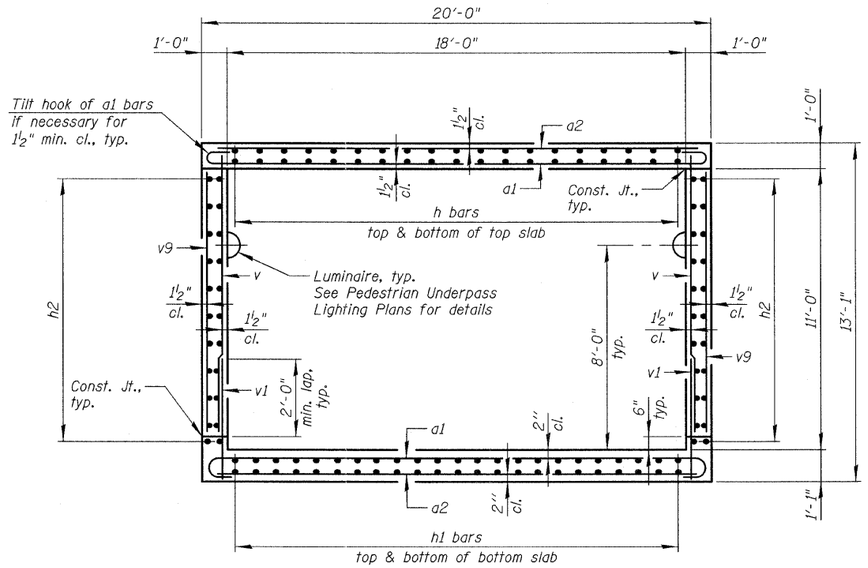
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-03-reinforcement_det_I.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

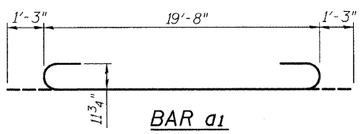
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS-I
STRUCTURE NO. 049-0243
SHEET NO. SC5-3 OF SC5-6 SHEETS

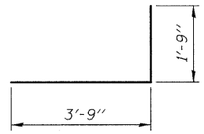
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	372
		CONTRACT NO. 60953		
	ILLINOIS	FED. AID PROJECT		



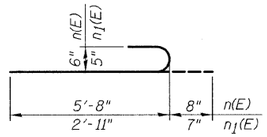
SECTION THRU BARREL



BAR a1



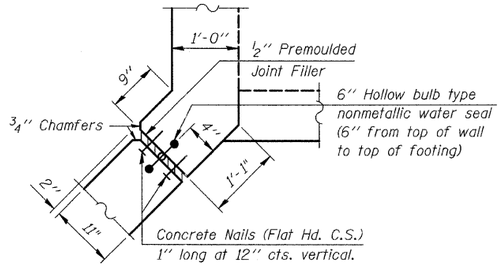
BAR d



BARS n(E) & n1(E)

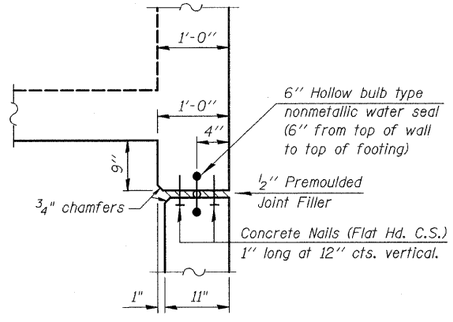
BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a1	400	#9	22'-2"	
a2	102	#4	18'-3"	
d	60	#4	5'-6"	
h	228	#5	17'-9"	
h1	184	#5	25'-9"	
h2	88	#5	25'-10"	
h3	40	#4	14'-11"	
h4	4	#6	19'-9"	
h5	40	#4	29'-8"	
n(E)	120	#6	6'-4"	
n1(E)	124	#5	3'-6"	
t	194	#6	8'-7"	
v	400	#6	11'-3"	
v1	400	#6	3'-8"	
v2	8	#5	12'-0"	
v3	8	#5	6'-6"	
v4	42	#4	5'-10"	
v5	42	#4	7'-7"	
v6	40	#4	9'-5"	
v7	28	#4	14'-0"	
v8	124	#5	6'-9"	
v9	100	#5	10'-3"	
w	28	#5	14'-11"	
w1	28	#5	29'-8"	
Concrete Box Culverts			Cu. Yd.	324.0
Reinforcement Bars, Epoxy Coated			Pound	1,590
Reinforcement Bars			Pound	60,210
Bar Splicers			Each	128



CORNER DETAIL-EAST WINGWALLS

(North East corner - shown)
(South East corner - similar)



CORNER DETAIL-WEST WINGWALLS

(North West corner - shown)
(South West corner - similar)

REINFORCEMENT DETAILS-II
STRUCTURE NO. 049-0243

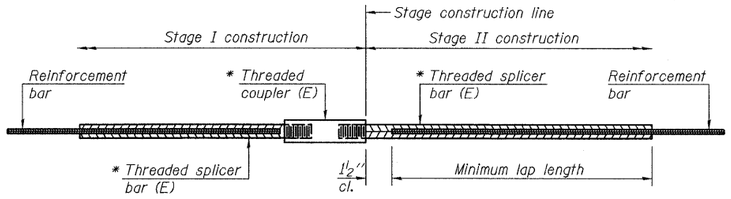
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = 0162953-04-reinforcement_det-II.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS-II
STRUCTURE NO. 049-0243
SHEET NO. SC5-4 OF SC5-6 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	373
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



STANDARD BAR SPLICER ASSEMBLY

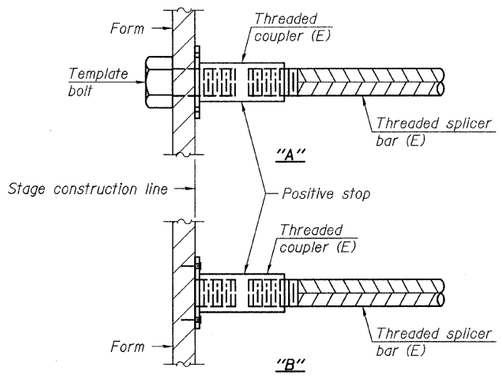
Minimum Lap Lengths					
Bar size to be spliced	Table 1	Table 2	Table 3	Table 4	Table 5
3, 4	1'-5"	1'-11"	2'-1"	2'-4"	2'-3"
5	1'-9"	2'-5"	2'-7"	2'-11"	2'-10"
6	2'-1"	2'-11"	3'-1"	3'-6"	3'-4"
7	2'-9"	3'-10"	4'-2"	4'-8"	4'-6"
8	3'-8"	5'-1"	5'-5"	6'-2"	5'-10"
9	4'-7"	6'-5"	6'-10"	7'-9"	7'-5"

Table 1: Black bar, 0.8 Class C
Table 2: Black bar, Top bar lap, 0.8 Class C
Table 3: Epoxy bar, 0.8 Class C
Table 4: Epoxy bar, Top bar lap, 0.8 Class C
Table 5: Epoxy bar, Top bar lap, Class B

Threaded splicer bar length = min. lap length + 1½" + thread length

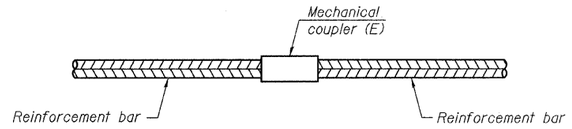
* Epoxy not required on Bar Splicer Assembly components used in conjunction with black bars.

Location	Bar size	No. assemblies required	Table for minimum lap length
Cluvert: top slab, bottom slab & walls	#5	128	Table 1



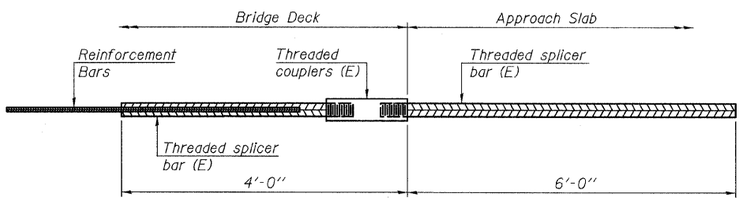
INSTALLATION AND SETTING METHODS

"A" : Set bar splicer assembly by means of a template bolt.
"B" : Set bar splicer assembly by nailing to wood forms or cementing to steel forms.
(E) : Indicates epoxy coating.



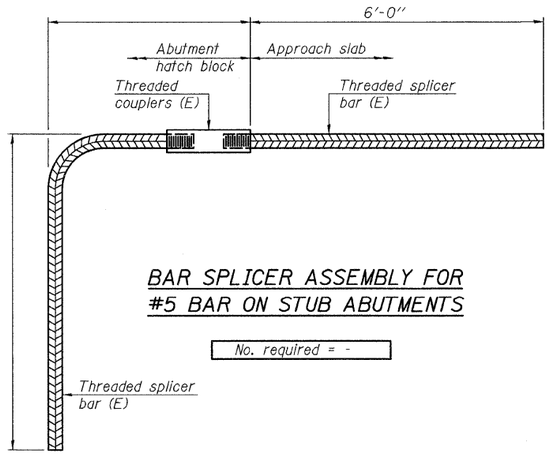
STANDARD MECHANICAL SPLICER

Location	Bar size	No. assemblies required



BAR SPLICER ASSEMBLY FOR #5 BAR ON INTEGRAL OR SEMI-INTEGRAL ABUTMENTS

No. required = -



BAR SPLICER ASSEMBLY FOR #5 BAR ON STUB ABUTMENTS

No. required = -

NOTES

Splicer bars shall be deformed with threaded ends and have a minimum 60 ksi yield strength.

All reinforcement shall be lapped and tied to the splicer bars.

Bar splicer assemblies shall be epoxy coated according to the requirements for reinforcement bars. See Section 508 of the Standard Specifications.

See special provision for Mechanical Splicers.

See approved list of bar splicer assemblies and mechanical splicers for alternatives.

BAR SPLICER ASSEMBLY AND MECHANICAL SPLICER DETAILS STRUCTURE NO. 049-0243

CHRISTIAN–ROGE & ASSOCIATES, INC.

BSD-1 7-1-10

FILE NAME = D160953-05-bar_splicer_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	BAR SPLICER ASSEMBLY AND MECHANICAL SPLICER DETAILS STRUCTURE NO. 049-0243	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - B.N.S.	REVISED -			330	128R-3	LAKE	518	374
	PLOT SCALE =	DRAWN - F.M.	REVISED -					CONTRACT NO. 60953		
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -		SHEET NO. SC5-5 OF SC5-6 SHEETS			ILLINOIS FED. AID PROJECT		

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BU-01

WEI Job No.: 722-23-02

Client: MACTEC Engineering and Consulting, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 669.50 ft
North: 2057997.22 ft
East: 1084532.32 ft
Station: 232+79.20
Offset: 19.43 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
668.8	9-inch thick CRUSHED STONE							
	--SHOULDER AGGREGATE--							
	Loose, brown SILTY LOAM --FILL--				1	3 2 4	NP	32
666.5	Medium stiff to very stiff, brown and gray SILTY CLAY				2	2 2 3	0.75 P	17
					3	5 6 7	2.54 B	16
					4	3 5 6	2.95 B	17
					5	3 5 7	2.87 B	14
					6	3 5 6	3.36 B	17
	--LL = 35%, PL = 15%--				7	4 5 9	2.62 B	18
	--% Gravel = 0.8%--							
	--% Sand = 5.0%--							
	--% Silt = 54.8%--							
	--% Clay = 39.3%--				8	3 5 8	2.00 P	14

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
649.0	Medium dense to dense, gray, fine SAND				9	3 4 7	NP	19
					10	4 4 7	NP	19
					11	7 10 22	NP	22
					12	18 20 26	NP	22
639.5	Boring terminated at 30.00 ft							

GENERAL NOTES

Begin Drilling: 11-12-2010 Complete Drilling: 11-12-2010
Drilling Contractor: WTS Drill Rig: B-57 TMR
Driller: R&J Logger: B. Wilson Checked by: A. Bohac
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 18.00 ft
At Completion of Drilling: 19.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.GDT 5/6/11 WANGENG 722390.GPJ

BORING LOG BU-02

WEI Job No.: 722-23-02

Client: MACTEC Engineering and Consulting, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 668.50 ft
North: 2057996.89 ft
East: 1084568.86 ft
Station: 232+70.57
Offset: 16.08 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
667.6	11-Inch thick SAND and GRAVEL							
	--SHOULDER AGGREGATE--							
	Medium dense, brown SILTY LOAM with trace gravel --FILL--				1	3 5 5	NP	23
665.5	Medium stiff, brown and gray SILTY CLAY with trace gravel				2	2 3 3	0.82 B	26
663.0	Medium dense, brown and gray, fine to coarse SAND with some gravel				3	3 4 6	NP	9
660.5	Very stiff to hard, brown and gray SILTY CLAY with trace gravel				4	5 7 9	4.84 B	15
					5	4 6 8	5.05 B	15
					6	4 6 8	4.10 B	16
					7	6 6 8	5.00 B	17
648.5					8	5 6 8	2.87 B	13

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	Medium dense, gray, fine SAND				9	4 4 6	NP	31
					10	4 8 15	NP	18
					11	6 8 11	NP	21
					12	5 6 17	NP	24
638.5	Boring terminated at 30.00 ft							

GENERAL NOTES

Begin Drilling: 11-12-2010 Complete Drilling: 11-12-2010
Drilling Contractor: WTS Drill Rig: B-57 TMR
Driller: R&J Logger: B. Wilson Checked by: A. Bohac
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 20.00 ft
At Completion of Drilling: 10.50 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.GDT 5/6/11 WANGENG 722390.GPJ

BORING LOG BU-03

WEI Job No.: 722-23-02

Client: MACTEC Engineering and Consulting, Inc.
Project: Illinois Route 21 (Milwaukee Avenue)
Location: T44N R11E and T45N R11E

Datum: NGVD
Elevation: 668.00 ft
North: 2057977.38 ft
East: 1084587.02 ft
Station: 233+04.37
Offset: 38.48 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	24-inch thick, black CLAY LOAM --TOPSOIL--				1	3 4 5	4.54 B	30
666.0	Hard, brown and gray SANDY CLAY LOAM with trace gravel				2	5 6 7	4.55 B	9
663.5	Medium dense, brown and gray GRAVELLY SAND to SANDY GRAVEL				3	5 6 6	NP	5
					4	8 12 17	NP	6
					5	5 7 8	NP	14
656.0	Very stiff to hard, gray CLAY				6	7 10 14	4.59 B	15
					7	9 12 15	3.77 B	16
651.0	Medium dense, brown and gray SANDY GRAVEL				8	5 6 11	NP	11
648.5	Hard, gray CLAY							

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	sand seams at 23.5'				9	8 13 22	5.82 B	19
					10	9 11 13	4.00 P	21
643.5	Medium dense, gray, fine to coarse SAND				11	5 8 10	NP	10
					12	9 14 25	NP	23
639.0	Boring terminated at 29.00 ft							

GENERAL NOTES

Begin Drilling: 11-24-2010 Complete Drilling: 11-24-2010
Drilling Contractor: STS Drill Rig: D-50 TMR
Driller: B&S Logger: A. Kurnia Checked by: A. Bohac
Drilling Method: 3.25 IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: 7.00 ft
At Completion of Drilling: 7.00 ft
Time After Drilling: NA
Depth to Water: NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENG.GDT 5/6/11 WANGENG 722390.GPJ

SOIL BORING LOGS
STRUCTURE NO. 049-0243

CHRISTIAN–ROGE & ASSOCIATES, INC.

FILE NAME = D160953-06-soil_boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOIL BORING LOGS
STRUCTURE NO. 049-0243
SHEET NO. SC5-6 OF SC5-6 SHEETS

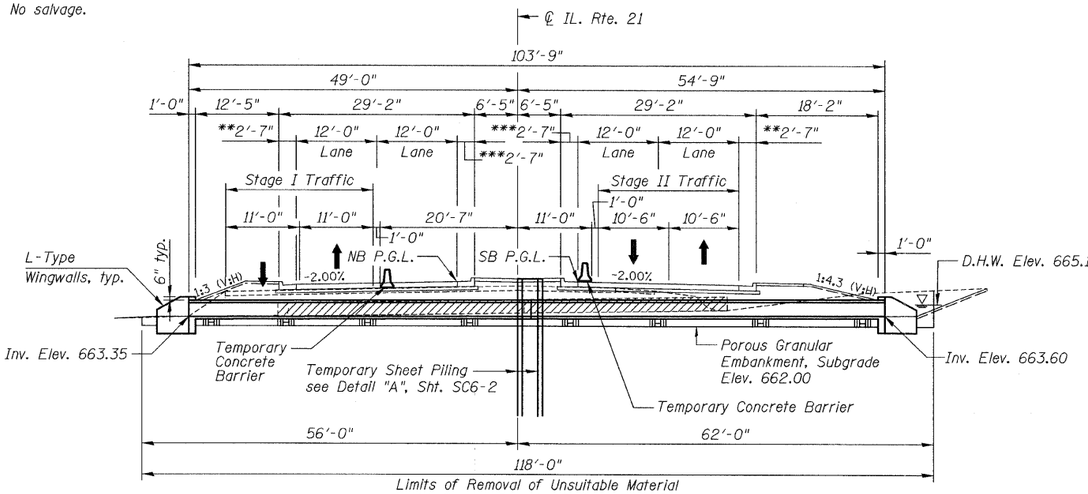
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	375
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

B.M.: Chiseled box on top of S.E. wingwall of existing bridge over Bull Creek. Elevation 669.64

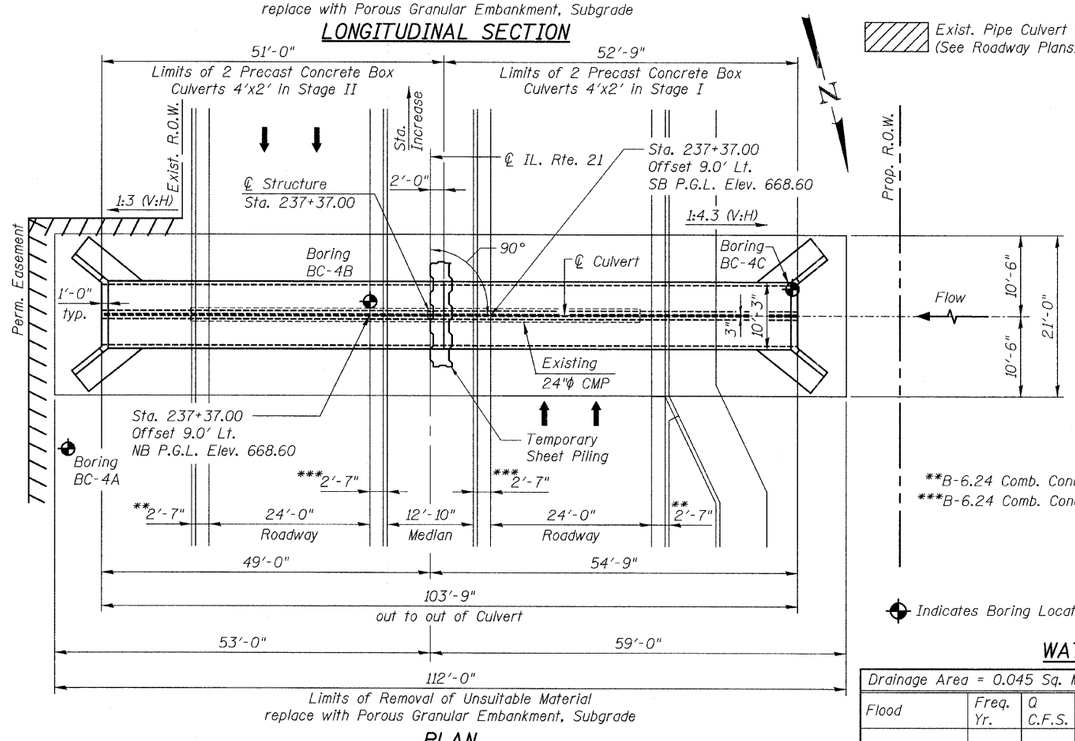
Existing structure is a 24" dia. corrugated metal pipe, to be removed.

Traffic to be maintained using staged construction.

No salvage.



LONGITUDINAL SECTION



PLAN

Exist. Pipe Culvert Removal (See Roadway Plans)

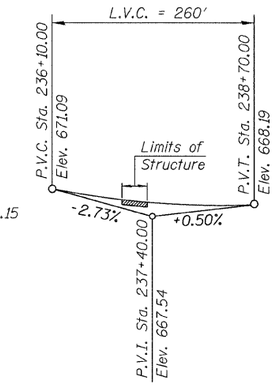
**B-6.24 Comb. Conc. Curb & Gutter

***B-6.24 Comb. Conc. Curb & Gutter (Special)

Indicates Boring Locations

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (ft.)	Upstream	Downstream
	660.60	660.35



PROFILE GRADE

LOADING HS20-44

Allow 50#/sq. ft. for future wearing surface.

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications For Highway Bridges

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 5,000 psi
fy = 65,000 psi (Welded wire fabric)

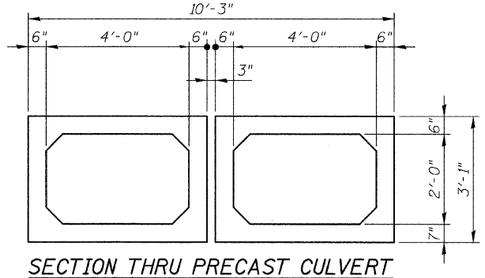
GENERAL NOTES:

1. Reinforcement Bars shall conform to the requirements of ASTM A 706, Gr. 60. See Special Provisions.
2. All exposed concrete edges shall be chamfered $\frac{3}{4}$" unless otherwise noted.
3. Reinforcement Bars designated (E) shall be Epoxy Coated.
4. The limits and quantities of removal and replacement shown are based on the boring data and may be modified by the District Geotechnical and Field Engineers for variable subsurface conditions encountered in the field.
5. The Porous Granular Embankment, Subgrade shall be capped with 6 in. of CA7 and satisfy the Standard Specifications unless otherwise indicated in the Special Provisions. The cost of the capping material shall be included in the Pay Item for "Porous Granular Embankment, Subgrade".

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

DESCRIPTION	UNIT	QUANTITY
Removal and Disposal of Unsuitable Material for Structures	Cu. Yd.	480
Reinforcement Bars	Pound	430
Reinforcement Bars, Epoxy Coated	Pound	50
Name Plates	Each	1
Concrete Box Culverts	Cu. Yd.	5.7
Precast Concrete Box Culverts 4'x2'	Foot	184
Temporary Sheet Piling	Sq. Ft.	480
Porous Granular Embankment, Subgrade	Cu. Yd.	129



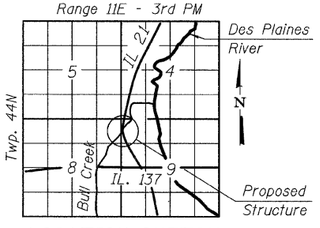
SECTION THRU PRECAST CULVERT

(Wall and slab thickness may vary as per slab manufacturer)

WATERWAY INFORMATION

Drainage Area = 0.045 Sq. Mi. Low Grade Elev. 668.09 @ Sta. 238+29.70

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head - Ft. Exist.	Head - Ft. Prop.	Headwater El. Exist.	Headwater El. Prop.
Design	50	39	21.14	6.9	664.46	3.2	0.7	667.99	665.15
Base	100	52	25.14	7.3	664.52	3.2	1.0	668.02	665.48
Overtopping									
Max. Calc.									



LOCATION SKETCH

STATE OF ILLINOIS
BHADRESH N. SHAH
081-004476
CHICAGO
LICENSED STRUCTURAL ENGINEER

Bhadresh N. Shah
AUG. 15, 2011

BHADRESH N. SHAH
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS LIC. No. 081-004476
EXPIRES: 11-30-12

GENERAL PLAN & ELEVATION
ILLINOIS ROUTE 21
F.A.P. 330 SEC. 128R-3
LAKE COUNTY
STATION 237+37.00
STRUCTURE NO. 049-0242
OUTLET NO. 19

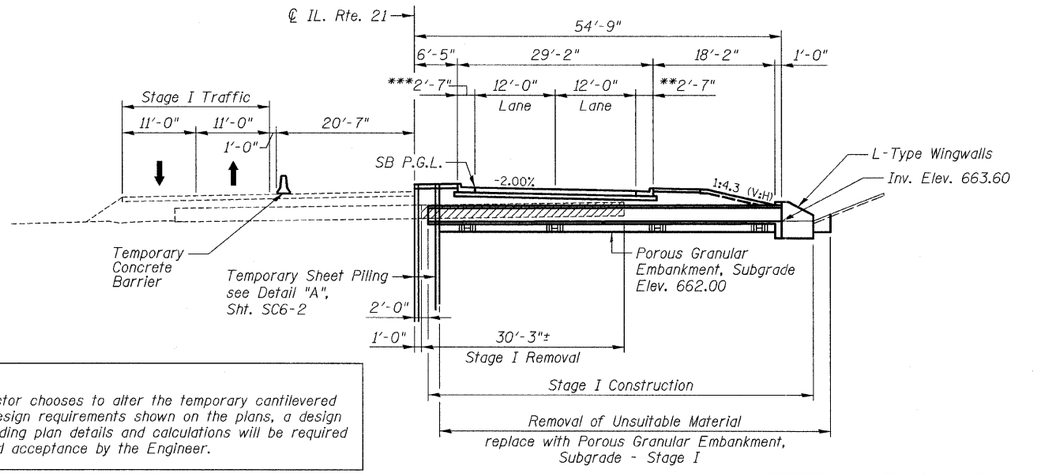
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-01-GPE.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 049-0242
SHEET NO. SC6-1 OF SC6-4 SHEETS

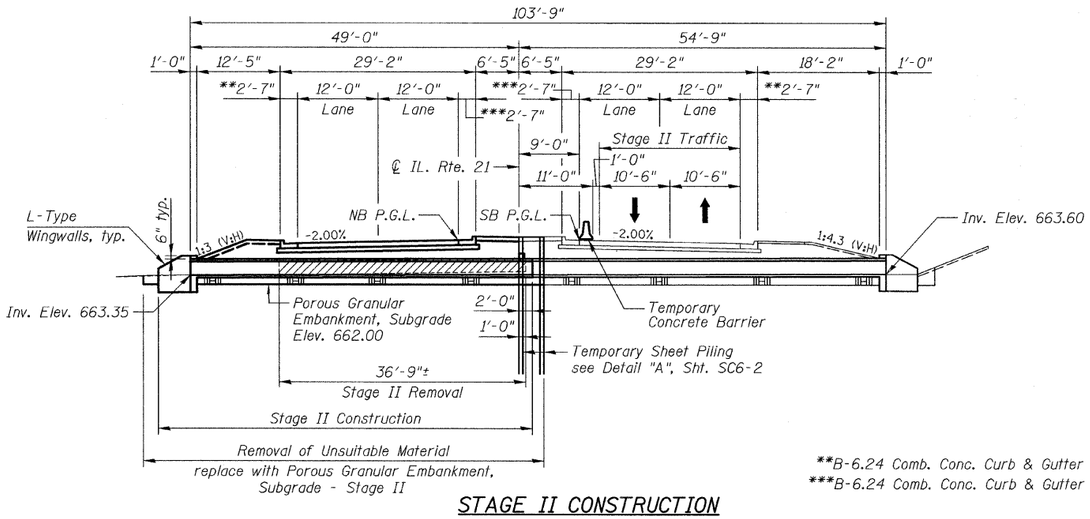
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	376
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		



NOTE:
If the Contractor chooses to alter the temporary cantilevered sheet piling design requirements shown on the plans, a design submittal including plan details and calculations will be required for review and acceptance by the Engineer.

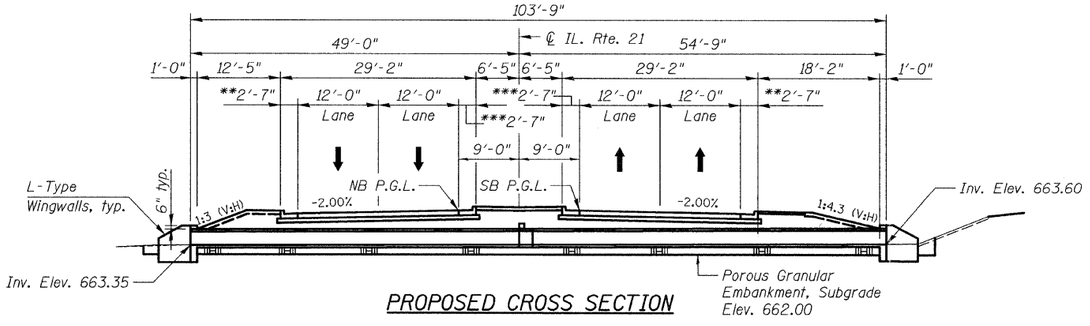
Exist. Pipe Culvert Removal (See Roadway Plans)

STAGE I CONSTRUCTION

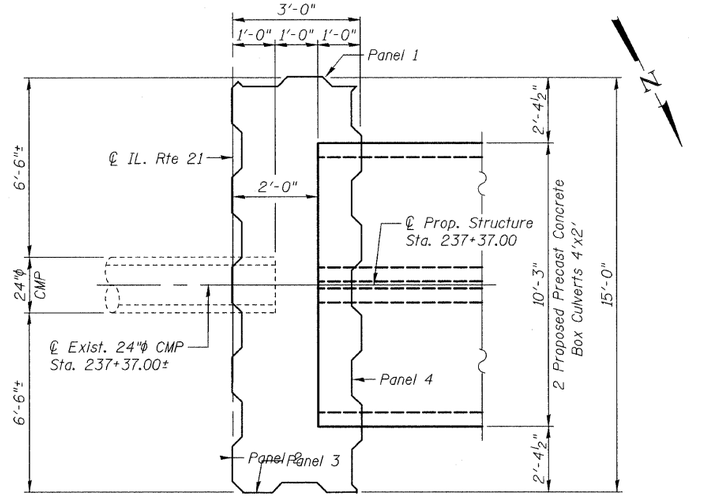


**B-6.24 Comb. Conc. Curb & Gutter
***B-6.24 Comb. Conc. Curb & Gutter (Special)

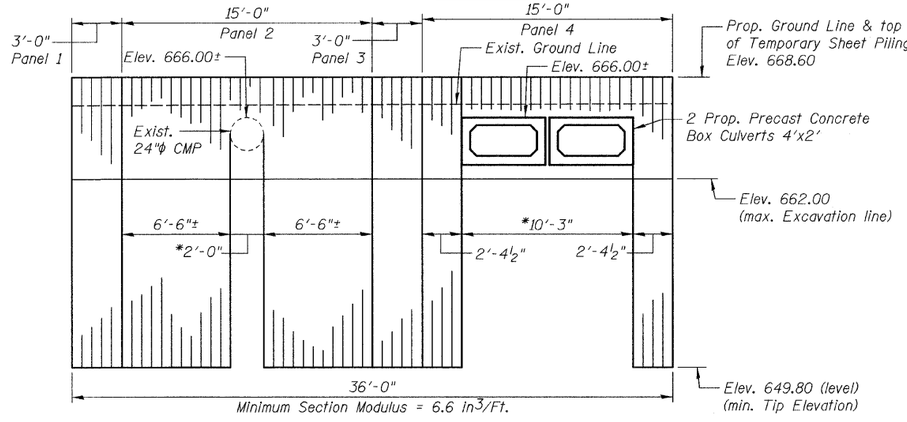
STAGE II CONSTRUCTION



PROPOSED CROSS SECTION



DETAIL "A"



ELEVATION OF PANELS TEMPORARY SHEET PILING

*Do not disturb soil under the existing 24"ϕ CMP & proposed culvert during placement of Temporary Sheet Piling

CONSTRUCTION SEQUENCE

STAGE I

1. Install Temporary Sheet Piling Panels 1, 2 & 3.
2. Remove existing 24"ϕ Corrugated Metal Pipe (CMP). See Stage Construction Details & limits of removal, this Sheet.
3. Excavate to limits as shown in Elevation, see Sht. SC6-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culverts. See Stage Construction Details & limits of replacement, this Sheet.
6. Install Temporary Sheet Piling Panel 4.
7. Install Stage I portion of the new Roadway.

STAGE II

1. Remove existing 24"ϕ Corrugated Metal Pipe (CMP). See Stage Construction Details & limits of removal, this Sheet.
2. Remove Temporary Sheet Piling Panels 1, 2 & 3.
3. Excavate to limits as shown in Elevation, see Sht. SC6-1.
4. Install Porous Granular Embankment, Subgrade in the excavated area.
5. Install new precast concrete box culverts. See Stage Construction Details & limits of replacement, this Sheet.
6. Remove Temporary Sheet Piling Panel 4
7. Install Stage II portion of the new Roadway.

STAGE CONSTRUCTION DETAILS STRUCTURE NO. 049-0242 OUTLET NO. 19

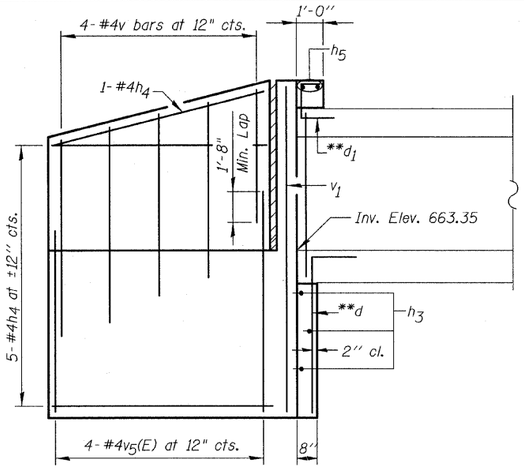
CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-02-stage_const_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

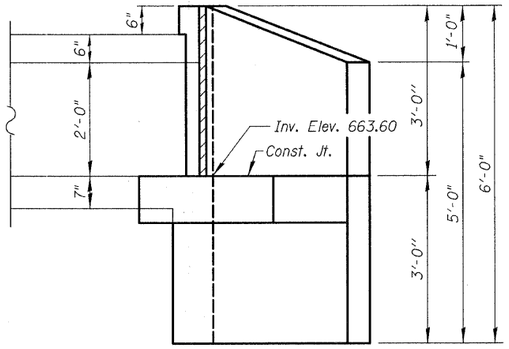
STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 049-0242
SHEET NO. SC6-2 OF SC6-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	377
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

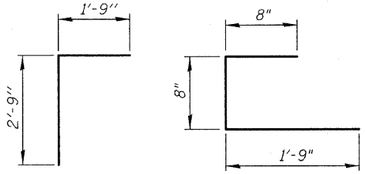


SHOWING REINFORCEMENT

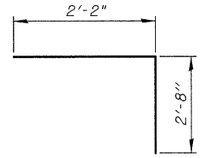
ELEVATION



SHOWING DIMENSIONS



**BAR d **BAR d_1



BAR z

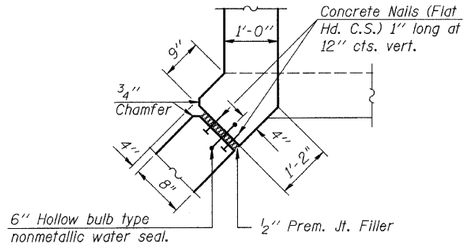
BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h_3	6	#6	9'-9"	—
h_4	28	#4	3'-5"	—
h_5	8	#6	4'-9"	—
v	16	#4	2'-8"	—
v_1	8	#4	5'-8"	—
v_5(E)	16	#4	4'-8"	—
w	12	#5	4'-7"	—
z	32	#4	4'-10"	⌐
Reinforcement Bars			Pound	430
Reinforcement Bars, Epoxy Coated			Pound	50
Concrete Box Culverts			Cu. Yd.	5.7

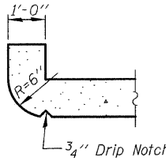
BILL OF MATERIAL (FOR REINFORCEMENT BARS CAST INTO PRECAST CULVERTS)

Bar	No.	Size	Length	Shape
**d	20	#4	4'-6"	⌐
**d1	20	#4	3'-1"	⌐
**w1	12	#5	6'-7"	—

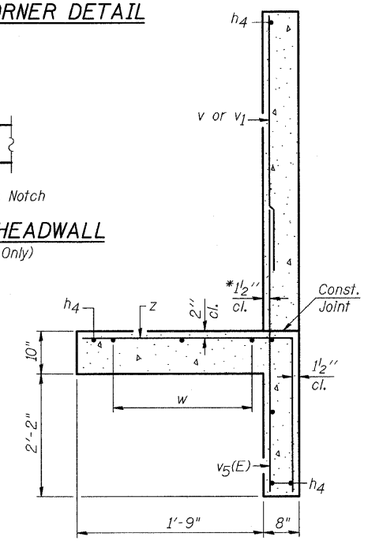
**Cast Reinforcement Bars into Precast Concrete Box Culvert as shown. Cost included with Precast Concrete Box Culverts 4'x2'



CORNER DETAIL

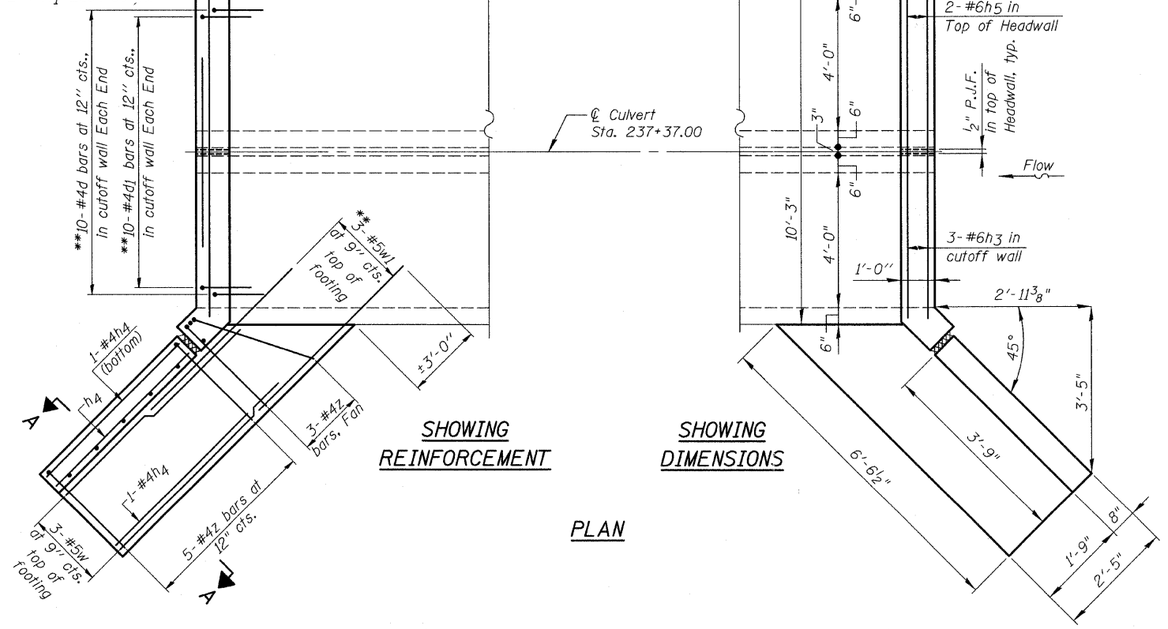


SECTION THRU HEADWALL
(Up Stream End Only)



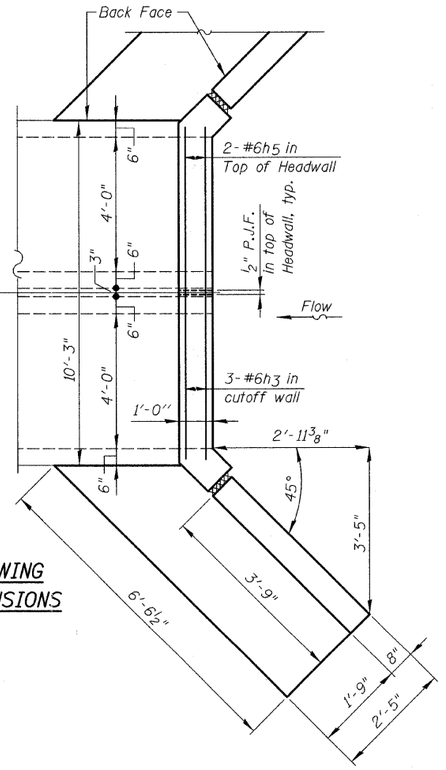
SECTION A-A
Maximum soil pressure under footing = 1,371 psf

*v_5(E) bars shall not be placed more than 1 1/2" cl. from back face of wingwall



SHOWING REINFORCEMENT

PLAN



SHOWING DIMENSIONS

CAST-IN-PLACE END SECTION DETAILS
STRUCTURE NO. 049-0242
OUTLET NO. 19

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D1602953-03-end_sect_det.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -
		CHECKED - B.N.S.	REVISED -
	PLOT SCALE =	DRAWN - F.M.	REVISED -
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CAST-IN-PLACE END SECTION DETAILS
STRUCTURE NO. 049-0242
SHEET NO. SC6-3 OF SC6-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	378
		CONTRACT NO. 60953		
	ILLINOIS FED. AID PROJECT			

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BC-4A

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 666.66 ft
North: 2057661.54 ft
East: 1084443.29 ft
Station: 237+17
Offset: 54 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (b/w/6 in)	Qu (tsf)	Moisture Content (%)
		Soft, dark brown SANDY CLAY LOAM --FILL--			1	3 3 5	0.25 P	29
	663.7	Medium dense to dense, brown SANDY LOAM, little gravel	5		2	2 12 18	NP	13
					3	5 13 16	NP	13
			10		4	6 13 21	NP	14
					5	13 22 22	NP	10
	652.7	Dense, white GRAVEL	15		6	10 21 23	NP	
	651.2	Very dense, gray, fine SAND			7	27 35 43	NP	20
			20		8	20 22 24	NP	17
	646.7	Boring terminated at 20.00 ft						

GENERAL NOTES

Begin Drilling: 04-18-2001 Complete Drilling: 04-18-2001
Drilling Contractor: Rock and Soil Drilling Drill Rig: Acker 82
Driller: Dave Logger: T. Chen Checked by: P. Wang
Drilling Method: 4.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling: ▽ 4.00 ft
At Completion of Drilling: ▼ 2.00 ft
Time After Drilling: 24 hours
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.GDT 11/5/10
722201.GPJ

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BC-4B

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 667.67 ft
North: 2057650.86 ft
East: 1084497.61 ft
Station: 237+39
Offset: 9 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (b/w/6 in)	Qu (tsf)	Moisture Content (%)
	667.3	3-inch thick ASPHALT --PAVEMENT--						
	666.9	11-inch thick CONCRETE --PAVEMENT--			1	14 15 8	1.25 P	15
	665.7	Medium dense, brown SANDY GRAVEL --FILL--	5		2	3 2 3	0.75 P	17
		Stiff to medium stiff black SILTY CLAY, trace gravel --FILL--			3	13 7 8	NP	
	662.2	Medium dense to dense, gray SANDY LOAM	10		4	7 8 10	NP	11
					5	8 10 11	NP	13
			15		6	4 12 16	NP	11
					7	9 14 19	NP	9
			20		8	12 15 34	NP	10
	647.2	Very dense, gray, coarse SAND, trace to little gravel			9	12 56	NP	
	645.7	Boring terminated at 22.00 ft						

GENERAL NOTES

Begin Drilling: 04-09-2001 Complete Drilling: 04-09-2001
Drilling Contractor: Rock and Soil Drilling Drill Rig: D-120
Driller: Dave Logger: T. Chen Checked by: P. Wang
Drilling Method: 2.75" ID HSA; backfilled w/ bentonite chip and AC blacktop.

WATER LEVEL DATA

While Drilling: ▽ 9.00 ft
At Completion of Drilling: ▼ 4.5*
Time After Drilling: 24 hours
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.GDT 11/5/10
722201.GPJ

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG BC-4C

WEI Job No.: 722-23-01

Client: MACTEC Engineering and Consulting, Inc.
Project: FAP 330, IL 21 (Milwaukee Avenue)
Location: Section 128 R-3, Lake County, Illinois

Datum: NAV88
Elevation: 665.09 ft
North: 2057658.38 ft
East: 1084545.72 ft
Station: 237+41
Offset: 54 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (b/w/6 in)	Qu (tsf)	Moisture Content (%)
		Stiff, dark brown CLAY LOAM			1	7 7 11	1.00 P	49
	661.1	Medium dense to dense gray SANDY LOAM, little to some gravel	5		2	3 10 11	1.50 P	15
					3	10 12 15	NP	14
			10		4	12 16 18	NP	15
					5	10 14 18	NP	
			15		6	12 20 10	NP	11
					7	20 17 20	NP	11
			20		8	13 26 26	NP	17
	645.1	Boring terminated at 20.00 ft						

GENERAL NOTES

Begin Drilling: 04-18-2001 Complete Drilling: 04-18-2001
Drilling Contractor: Rock and Soil Drilling Drill Rig: Acker 82
Driller: Dave Logger: T. Chen Checked by: P. Wang
Drilling Method: 4.25" ID HSA; backfilled w/ bentonite chip.

WATER LEVEL DATA

While Drilling: ▽ 5.50 ft
At Completion of Drilling: ▼ 4.00 ft
Time After Drilling: 24 hours
Depth to Water: ▽ NA

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

MANGENG.GDT 11/5/10
722201.GPJ

SOIL BORING LOGS
STRUCTURE NO. 049-0242
OUTLET NO. 19

CHRISTIAN-ROGE & ASSOCIATES, INC.

FILE NAME = D160953-04-soil_boring_logs.dgn	USER NAME =	DESIGNED - J.C.N./B.N.S.	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
		CHECKED - B.N.S.	REVISED -	
	PLOT SCALE =	DRAWN - F.M.	REVISED -	
	PLOT DATE =	CHECKED - B.N.S./J.C.N.	REVISED -	

SOIL BORING LOGS
STRUCTURE NO. 049-0242
SHEET NO. SC6-4 OF SC6-4 SHEETS

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	379
		CONTRACT NO. 60953		
		ILLINOIS FED. AID PROJECT		

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	380
	ILLINOIS	CONTRACT NO. 60953		

D-91-199-00

FOR INDEX OF SHEETS, SEE SHEET NO. 381

PROJECT LOCATED IN VILLAGE OF GURNEE
PROJECT LOCATED IN CITY OF WAUKEGAN
PROJECT LOCATED IN VILLAGE OF LIBERTYVILLE
PROJECT LOCATED IN LIBERTYVILLE TOWNSHIP

DESIGN DESIGNATION

MILWAUKEE AVENUE: (IL 21) ARTERIAL 6.03 (PCC-20)
BUCKLEY ROAD: (IL 137) ARTERIAL ; CASEY ROAD – MINOR ARTERIAL

	ADT(2010)	DESIGN SPEED	POSTED SPEED
MILWAUKEE AVENUE	28,000	45 MPH	35-45MPH
BUCKLEY ROAD	32,000	45 MPH	35-45MPH
CASEY ROAD	2,950	45 MPH	35-45 MPH

PROPOSED IMPROVEMENT

RECONSTRUCTION OF ILLINOIS ROUTE 21 SOUTH OF ILLINOIS ROUTE 120 TO SOUTH OF ILLINOIS ROUTE 137 (BUCKLEY ROAD) INCLUDING STRUCTURE REPLACEMENT OF IL 21 OVER BULL CREEK, BOX CULVERTS REPLACED AT THE DESPLAINES RIVER TRIBUTARIES (NO.1 SOUTH OF CASEY ROAD, AND NO.2 NORTH OF EGIDI) , AND A MULTI-USE TRAIL UNDERPASS CROSSING SOUTH OF CASEY, 8 RETAINING WALLS, DRAINAGE IMPROVEMENTS, TRAFFIC SIGNALS AND OTHER RELATED WORK.

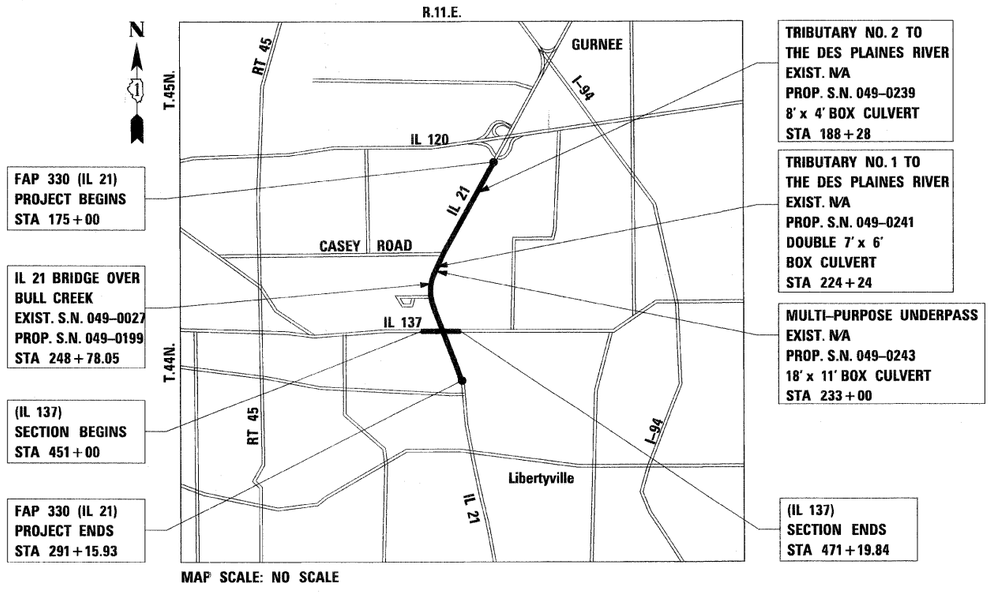
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROPOSED
HIGHWAY PLANS

F.A.P. 330 (ILLINOIS ROUTE 21 – MILWAUKEE AVENUE) SOUTH OF ILLINOIS ROUTE 120 TO SOUTH OF ILLINOIS ROUTE 137 (BUCKLEY ROAD) ROADWAY AND BRIDGE RECONSTRUCTION, ADD LANES AND TRAFFIC SIGNAL MODERNIZATION AND INSTALLATION

SECTION 128R-3
LAKE COUNTY
C-91-199-00

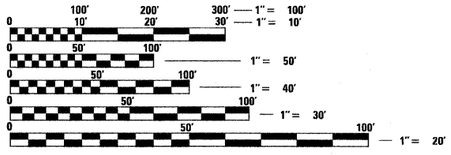
VOLUME II OF II

LOCATION OF SECTION INDICATED THUS: —



MAP SCALE: NO SCALE

GROSS LENGTH OF PROJECT = 11,615.93 FEET = 2.200 MILES
NET LENGTH OF PROJECT = 11,615.93 FEET = 2.200 MILES



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS
1-800-892-0123
OR 811

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED _____ 20 _____

_____
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER

_____ 20 _____

_____
ENGINEER OF DESIGN AND ENVIRONMENT

_____ 20 _____

_____
DIRECTOR OF HIGHWAYS, CHIEF ENGINEER

PROJECT ENGINEER TIM SCHMIDT (847) 705-4482
PROJECT MANAGER SERIN KELLER (847) 705-4556

CONTRACT NO. 60953

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

INDEX OF SHEETS

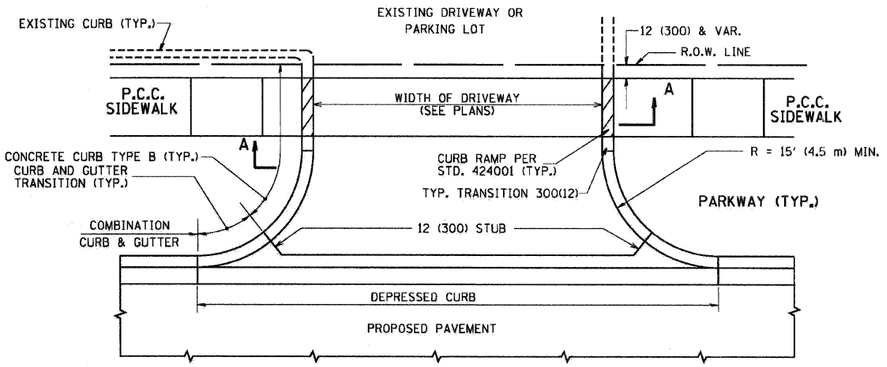
FILE NAME =	USER NAME = IDOT	DESIGNED - EJM	REVISED -
u:\102901\cadd sheets\sht-index_VOL2.dgn		DRAWN - BK	REVISED -
	PLOT SCALE = 50.0000 ' / IN.	CHECKED - GFL	REVISED -
	PLOT DATE = 8/17/2011	DATE - 12/17/10	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

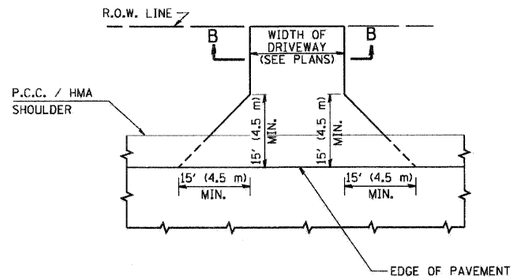
INDEX OF SHEETS

SCALE: | SHEET NO. OF SHEETS | STA. | TO STA.

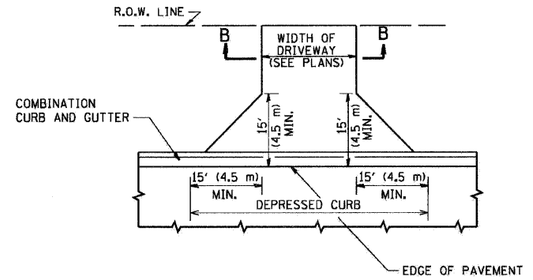
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	381
		CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



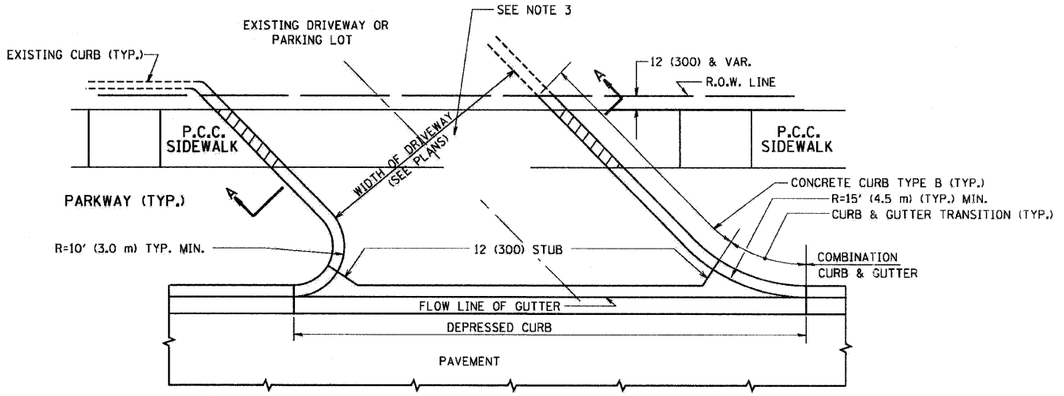
WITH CONCRETE CURB, TYPE B



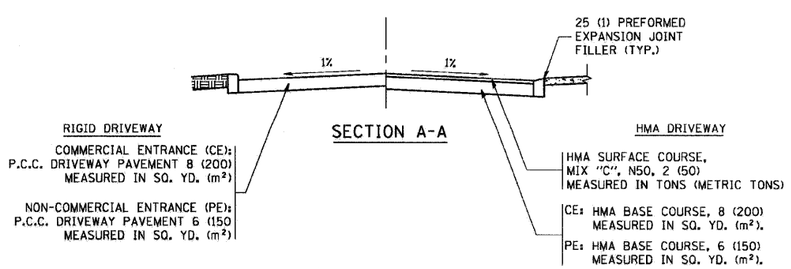
ADJACENT TO P.C.C. / HMA SHOULDER

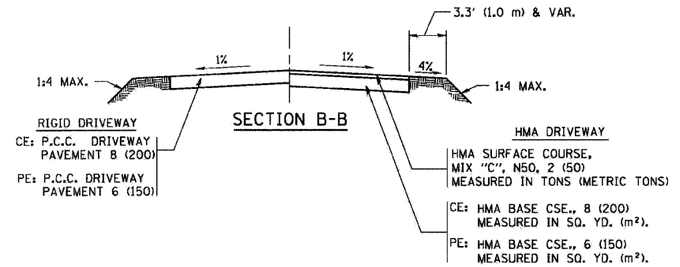


ADJACENT TO CURB AND GUTTER



WITH CONCRETE CURB, TYPE B





RURAL FIELD ENTRANCE (FE)

HMA SURFACE COURSE, MIX "C", N50, 2 (50) MEASURED IN TONS (METRIC TONS)

AGGREGATE BASE CSE., TYPE B, 8 (200) MEASURED IN SQ. YD. (m²).

GENERAL NOTES:

DRIVEWAY SLOPES, LOCATIONS, & GEOMETRIC LAYOUT SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "HANDBOOK FOR POLICY ON PERMITS FOR ACCESS DRIVEWAYS TO STATE HIGHWAYS". FOR FURTHER LAYOUT REQUIREMENTS, REFER TO ILLUSTRATIONS IN THE PERMIT HANDBOOK. DRIVEWAYS SHALL BE REPLACED IN KIND, UNLESS OTHERWISE NOTED ON THE PLANS.

COMMERCIAL DRIVEWAYS SHALL BE CONSTRUCTED WITH CONCRETE CURB, TYPE B RETURNS EXCEPT WHEN THE SIDEWALK EDGE IS 4 FEET (1.2 METERS) OR LESS FROM THE BACK OF CURB, CONSTRUCT A FLARE DRIVEWAY WITHOUT CURB.

THE RESIDENT ENGINEER SHALL CONTACT THE TRAFFIC PERMIT OFFICE AT 847/ 705-4131 FOR ANY QUESTIONS ON DRIVEWAYS SHOWN IN THE PLANS; SPECIFICALLY IN REFERENCE TO ADDITIONAL AND/OR RELOCATION/REMOVAL OF A DRIVEWAY.

COMBINATION CONCRETE CURB & GUTTER SHALL BE MEASURED STRAIGHT ACROSS THE DRIVEWAY. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THE CURB & GUTTER TRANSITION.

1 (25) PREFORMED EXPANSION JOINT FILLER WILL NOT BE PAID SEPARATELY, BUT SHALL BE CONSIDERED INCLUDED IN THE COST OF THE P.C.C. DRIVEWAY PAVEMENT OR P.C.C. SIDEWALK.

WHEN THE P.C.C. SIDEWALK EXTENDS THROUGH THE DRIVEWAY, THE THICKNESS OF THE SIDEWALK IN THE DRIVEWAY AREA SHALL BE THE SAME AS THE DRIVEWAY THICKNESS. SIDEWALK WILL BE PAID FOR AS P.C.C. SIDEWALK OF THE THICKNESS SPECIFIED. SIDEWALK CROSS SLOPE THRU DRIVEWAY AREA TO BE A MAXIMUM OF 1:50.

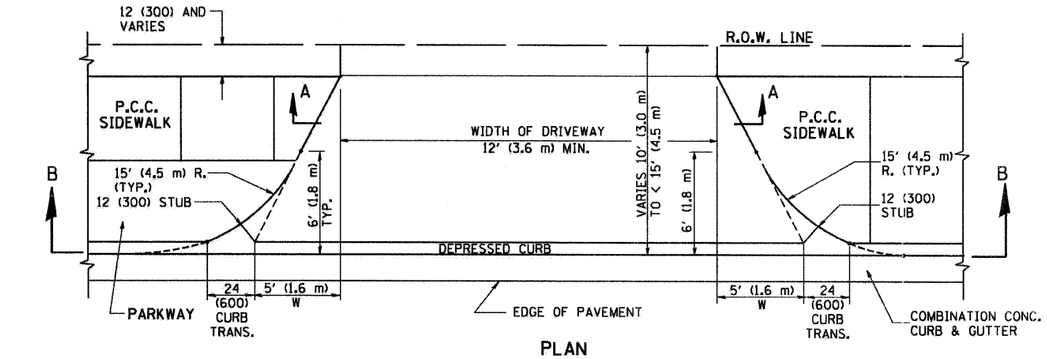
FILE NAME = a:\projects\distatd22x34\bd01.dgn	USER NAME = bauerdl	DESIGNED - R. SHAH	REVISED - M. GOMEZ 04-06-01
		DRAWN -	REVISED - P. LaFLUER 04-15-03
	PLOT SCALE = 49.9999 '/ IN.	CHECKED -	REVISED - R. BORO 01-01-07
	PLOT DATE = 6/12/2008	DATE - 11-04-95	REVISED - R. BORO 06-11-08

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DRIVEWAY DETAILS – DISTANCE BETWEEN R.O.W. AND FACE OF CURB & EDGE OF SHOULDER >= 15' (4.5 m)

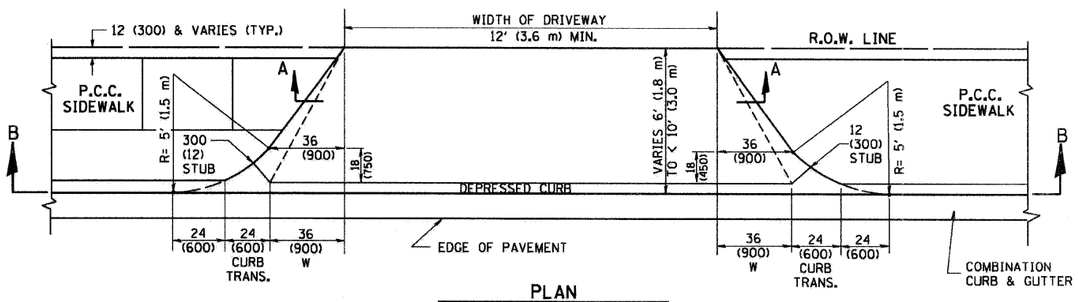
SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	382
	BD0156-07 (BD-01)	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



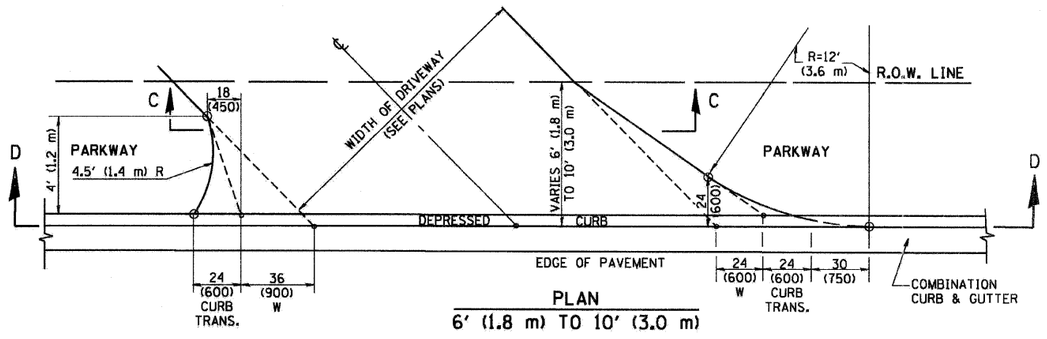
PLAN

10' (3.0 m) TO < 15' (4.5 m)



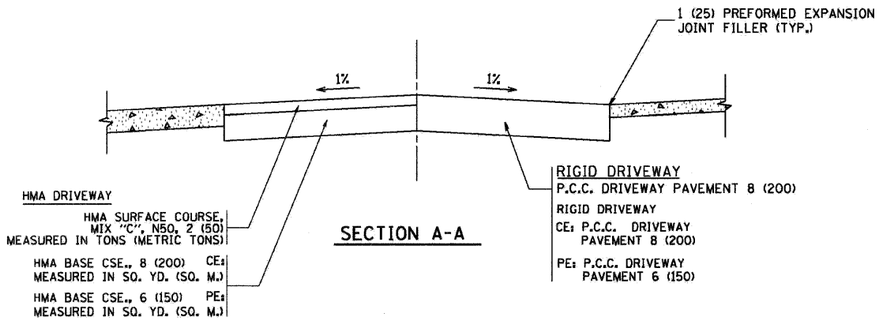
PLAN

6' (1.8 m) TO < 10' (3.0 m)

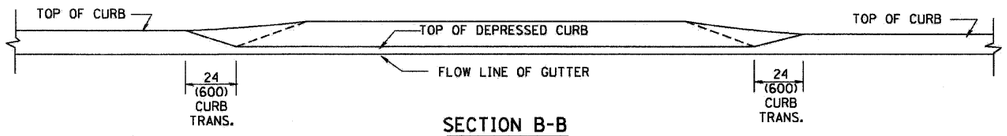


PLAN

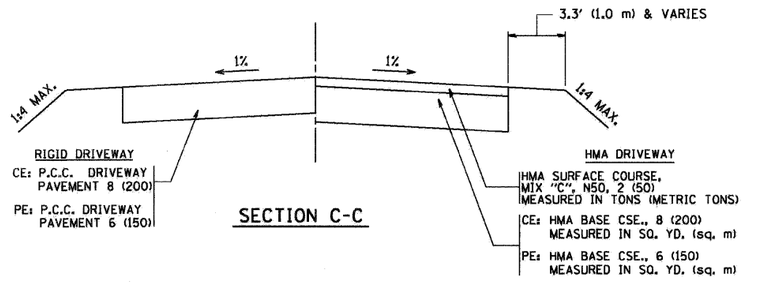
6' (1.8 m) TO 10' (3.0 m)



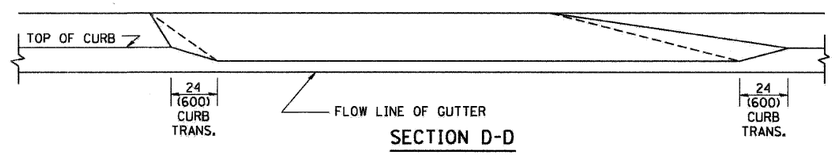
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

GENERAL NOTES

DRIVEWAY SLOPES, LOCATIONS, & GEOMETRIC LAYOUT SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "HANDBOOK FOR POLICY ON PERMITS FOR ACCESS DRIVEWAYS TO STATE HIGHWAYS". FOR FURTHER LAYOUT REQUIREMENTS, REFER TO ILLUSTRATION 10 IN THE PERMIT HANDBOOK. WHERE SIDEWALKS EXIST, DRIVEWAYS SHALL BE REPLACED WITH RIGID PAVEMENT. WHERE NO SIDEWALKS EXIST, DRIVEWAYS SHALL BE REPLACED IN KIND. SIDEWALK CROSS SLOPE THRU DRIVEWAY AREA TO BE A MAXIMUM OF 1:50.

WHEN THE DISTANCE BETWEEN R.O.W. AND THE BACK OF CURB IS EQUAL TO OR LESS THAN 8' (2.4 m), THE P.C.C. SIDEWALK SHALL EXTEND TO THE BACK OF CURB.

THE RESIDENT ENGINEER SHALL CONTACT THE TRAFFIC PERMIT OFFICE AT 847/ 705-4131 FOR ANY QUESTIONS ON DRIVEWAYS SHOWN IN THE PLANS; SPECIFICALLY IN REFERENCE TO ADDITIONAL AND/OR RELOCATION/REMOVAL OF A DRIVEWAY.

COMBINATION CONCRETE CURB & GUTTER SHALL BE MEASURED STRAIGHT ACROSS THE DRIVEWAY. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THE CURB & GUTTER TRANSITION.

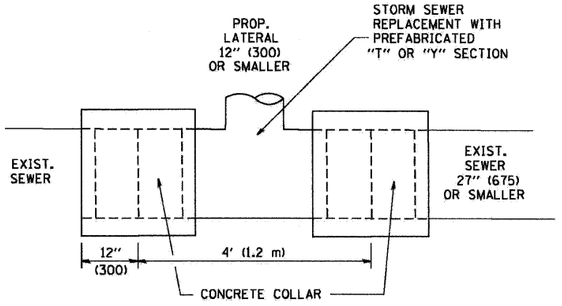
THE 1 (25) PREFORMED EXPANSION JOINT FILLER WILL NOT BE PAID SEPARATELY, BUT SHALL BE CONSIDERED INCLUDED IN THE COST OF THE P.C.C. DRIVEWAY PAVEMENT OR P.C.C. SIDEWALK.

"W" VARIES FROM 36 (900) TO 5' (1.5 m) PROPORTIONAL TO THE LENGTH (L), FROM 6' (1.8 m) TO 10' (3 m).

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE NOTED.

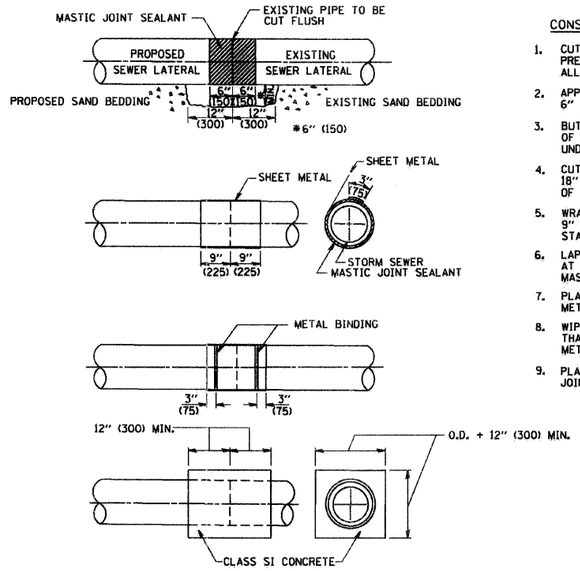
FILE NAME = W:\diststd\22x34\bd02.dgn	USER NAME = gaglianobt	DESIGNED - R. SHAH	REVISED - T. HOLTZ 04-08-97	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	DRIVEWAY DETAILS DISTANCE BETWEEN ROW AND FACE OF CURB < 15' (4.5 m)				
		DRAWN -	REVISED - M. GOMEZ 04-06-01						
	PLOT SCALE = 50.0000 ' / IN.	CHECKED -	REVISED - P. LaFLEUR 04-15-03						
	PLOT DATE = 1/4/2008	DATE - 11-06-95	REVISED - R. BORO 01-01-07		SCALE: NONE	SHEET NO. 1 OF 1 SHEETS	STA.	TO STA.	

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	383
BD400-02 (BD-02)		CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



DETAIL "A"

LATERAL CONNECTION TO EXISTING SEWER
OF 27" (675) OR SMALLER

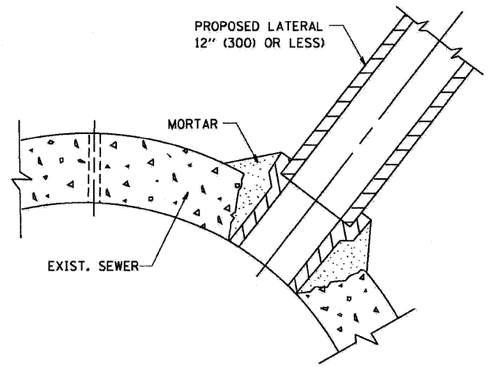


DETAIL "B"

CLASS SI CONCRETE COLLAR

CONSTRUCTION SEQUENCE

1. CUT THE EXISTING END OF THE PIPE SO AS TO PRESENT A FLUSH BUTT JOINT. BRUSH AND CLEAN ALL PIPES.
2. APPLY THE MASTIC JOINT SEALANT TO THE FIRST 6" (150) OF EACH PIPE.
3. BUTT THE PIPES TOGETHER LEAVING A MINIMUM OF 12' x 6' (300 x 150) DEEP EXCAVATION UNDER AND AROUND EACH PIPE END.
4. CUT A PIECE OF SHEET METAL GAGE NO. 19 I.I (0.0418) 18" (450) WIDE BY THE OUTSIDE CIRCUMFERANCE OF THE PIPE PLUS 3" (75) LONG.
5. WRAP THE SHEET METAL AROUND THE PIPES, 9" (225) ON EACH SIDE OF THE JOINT, STARTING AT THE TOP OF THE PIPE.
6. LAP THE SHEET METAL AT LEAST 3" (75) AT THE TOP OF THE PIPE AND PLACE THE MASTIC JOINT SEALANT BETWEEN THE LAP.
7. PLACE TWO METAL BANDS AROUND THE SHEET METAL AND TIGHTEN.
8. WIPE OFF ANY EXCESS MASTIC JOINT SEALANT THAT OOZES OUT FROM BETWEEN THE SHEET METAL AND THE PIPES.
9. PLACE CLASS SI CONCRETE AROUND THE JOINT.



DETAIL "C"

PROPOSED LATERAL
CONNECTION TO EXISTING SEWER
OF 30" (750) OR LARGER

NOTES

MATERIAL

MATERIAL USED FOR THE TEE OR WYE SECTION SHALL BE COMPATIBLE WITH THE EXISTING STORM SEWER OR THE PROPOSED STORM SEWER.

CONSTRUCTION METHODS

I. THIS WORK SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE APPLICABLE PORTIONS OF SECTION 550 OF THE STANDARD SPECIFICATIONS.

II. CONNECTION TO AN EXISTING STORM SEWER SHALL BE BY EITHER OF THE FOLLOWING METHODS:

A) PROPOSED STORM SEWER CONNECTION TO EXISTING SEWER OF 27" (675) OR SMALLER SEE DETAIL "A" AND "B".

B) PROPOSED STORM SEWER CONNECTION TO EXISTING SEWER OF 30" (750) OR LARGER SEE DETAIL "C".

IF THE EXISTING SEWER PIPE IS CRACKED, BROKEN OR OTHERWISE DAMAGED BY THE CONTRACTOR IN MAKING THE CIRCULAR OPENING, THE CONTRACTOR SHALL REPLACE THAT SECTION OF PIPE WITH PIPE EQUAL AND SIMILAR IN ALL RESPECTS TO THE PIPE IN THE EXISTING SEWER, IN A CAREFUL WORKMANLIKE MANNER, WITHOUT EXTRA COMPENSATION.

GENERAL

CARE MUST BE TAKEN TO PREVENT DEBRIS FROM ENTERING THE SEWER. ALL DEBRIS WHICH ENTERS THE SEWER MUST BE REMOVED. THE SEWER MUST BE LEFT CLEAN AND UNOBSTRUCTED UPON COMPLETION OF THE CONTRACT.

CARE MUST BE TAKEN TO PREVENT ANY PART OF THE NEW PIPE CONNECTION FROM PROJECTING INTO THE EXISTING SEWER.

BASIS OF PAYMENT

TEE OR WYE CONNECTIONS SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH FOR STORM SEWER TEE OR WYE OF THE TYPE AND SIZE SPECIFIED IN THE PLANS, THIS PRICE SHALL INCLUDE ALL EXCAVATION OF THE TRENCH, REMOVAL OF THE EXISTING STORM SEWER, FURNISHING AND INSTALLING THE SPECIFIED TEE OR WYE SECTION, FURNISHING AND INSTALLING THE REQUIRED CONCRETE COLLAR, AND ALL OTHER MATERIAL NECESSARY TO COMPLETE THIS WORK AS SHOWN AND SPECIFIED.

REMOVAL AND REINSTALLATION OF EXISTING STORM SEWER ADJACENT TO THE PROPOSED TEE OR WYE SECTION, FOR THE PURPOSE OF FACILITATING THE INSTALLATION OF THE TEE OR WYE SECTION, WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE WORK.

TRENCH BACKFILL, EXCAVATION IN ROCK AND REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL BELOW PLAN BEDDING GRADE WILL BE PAID FOR SEPARATELY.

CONCRETE COLLAR FOR CONNECTING A PROPOSED STORM SEWER TO AN EXISTING STORM SEWER WILL NOT BE PAID PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE PROPOSED STORM SEWER.

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN.

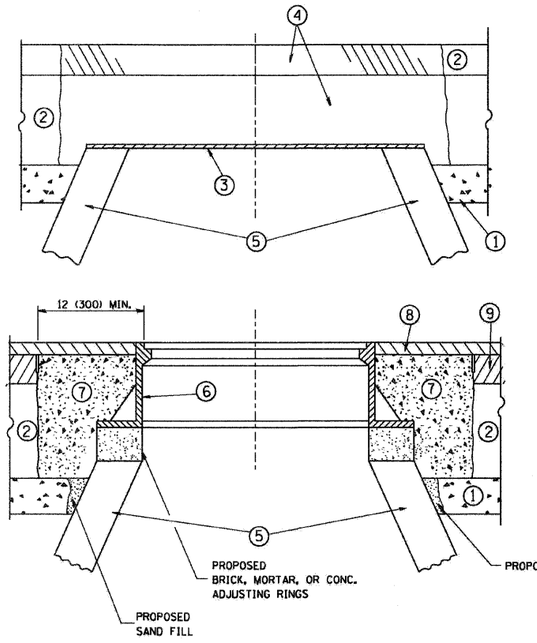
FILE NAME = W:\diststd\22x34\bd07.dgn	USER NAME = gaglianobt	DESIGNED - M. DE YONG	REVISED - M. DE YONG 05-08-92
		DRAWN -	REVISED - R. SHAH 09-09-94
	PLOT SCALE = 50.000 ' / IN.	CHECKED -	REVISED - R. SHAH 10-25-94
	PLOT DATE = 1/4/2000	DATE - 07-25-90	REVISED - R. SHAH 06-12-96

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DETAIL OF STORM SEWER CONNECTION TO EXISTING SEWER

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	384
	BD500-01 (BD-7)	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



CONSTRUCTION PROCEDURES

STAGE 1 (BEFORE PAVEMENT MILLING)

A) REMOVE A MINIMUM OF 12 (300) OF THE PAVEMENT FROM AROUND THE STRUCTURE.

B) REMOVE THE EXISTING FRAME AND LID FROM THE STRUCTURE.

C) COVER THE STRUCTURE OPENING WITH A 36 (900) DIAMETER METAL PLATE.

D) BACKFILL WITH CRUSHED STONE AND A MINIMUM 1½ (40) THICK HMA SURFACE MIX APPROVED BY THE ENGINEER.

STAGE 2 (AFTER PAVEMENT MILLING)

A) REMOVE THE HMA SURFACE MIX AND CRUSHED STONE.

B) INSTALL THE FRAME AND LID; ADJUST THE FRAME TO ITS FINAL SURFACE ELEVATION.

C) THE SURROUNDING SPACE SHALL BE FILLED WITH CLASS SI CONCRETE, OR HMA SURFACE COURSE OR HMA BINDER COURSE TO THE ELEVATION OF THE SURFACE OF THE EXISTING BASE COURSE OR THE BINDER COURSE.

THE PROCEDURE EXPLAINED ABOVE SHALL CONFORM TO THE APPLICABLE PORTIONS OF SECTIONS 353, 406, 602, AND 603 OF THE STANDARD SPECIFICATIONS.

LEGEND

1. SUB-BASE GRANULAR MATERIAL
2. EXISTING PAVEMENT
3. 36 (900) DIAMETER METAL PLATE
4. PROPOSED CRUSHED STONE AND HMA SURFACE MIX
5. EXISTING STRUCTURE
6. FRAME AND LID (SEE NOTES)
7. CLASS SI CONCRETE, HMA SURFACE COURSE OR HMA BINDER COURSE
8. PROPOSED HMA SURFACE COURSE
9. PROPOSED HMA BINDER COURSE

NOTES:

EXISTING BROKEN FRAMES AND LIDS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AND SHALL BE REPLACED AS DIRECTED BY THE ENGINEER. REPLACEMENT FRAMES AND LIDS WILL BE PAID FOR IN ACCORDANCE WITH ARTICLE 109.04 OF THE STANDARD SPECIFICATIONS UNLESS A SEPARATE PAY ITEM HAS BEEN PROVIDED.

IF THE EXISTING LIDS ARE OPEN, THE FRAME WILL BE ADJUSTED TO THE ELEVATION OF THE MILLED PAVEMENT SURFACE PRIOR TO THE MILLING OPERATION. THE FRAME WILL NOT BE REMOVED AND COVERED BY THE METAL PLATE.

CITY OF CHICAGO CASTINGS ARE THE PROPERTY OF THE CITY AND THE CONTRACTOR SHALL NOTIFY THE CITY FOR REMOVAL AND DISPOSITION OF THE CASTINGS.

THE METAL PLATE USED TO COVER THE STRUCTURE SHALL REMAIN THE PROPERTY OF THE CONTRACTOR.

WHEN STRUCTURES ARE TO BE ADJUSTED OR RECONSTRUCTED, THE LOWERING AND RAISING OF THE FRAMES AND LIDS WILL NOT BE PAID FOR SEPARATELY BUT WILL BE INCLUDED IN THE COST OF THE CORRESPONDING PAY ITEM.

LOCATION OF STRUCTURES:

THE CONTRACTOR WILL BE REQUIRED TO KEEP A RECORD OF THE LOCATIONS OF THE BURIED STRUCTURES ACCORDING TO THE STATION AND DISTANCE LEFT OR RIGHT OF THE CENTERLINE OF PAVEMENT. UPON COMPLETION OF THE WORK, THE CONTRACTOR WILL DELIVER THE RECORD TO THE ENGINEER.

BASIS OF PAYMENT: THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH FOR "FRAMES AND LIDS TO BE ADJUSTED, SPECIAL"

NEW FRAMES AND LIDS, WHEN SPECIFIED, WILL BE PAID FOR SEPARATELY.

DETAILS FOR FRAMES AND LIDS ADJUSTMENT WITH MILLING

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN

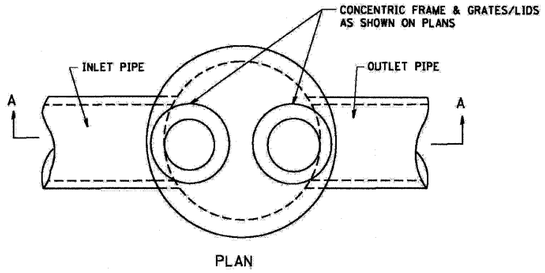
FILE NAME = W:\diststd\22x34\bd08.dgn	USER NAME = gaglionabt	DESIGNED - R. SHAH	REVISED - R. SHAH 03-10-95
		DRAWN -	REVISED - A. ABBAS 03-21-97
	PLOT SCALE = 50.0000 '/ IN.	CHECKED -	REVISED - R. WIEDEMAN 05-14-04
	PLOT DATE = 1/4/2008	DATE - 10-25-94	REVISED - R. BORO 01-01-07

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

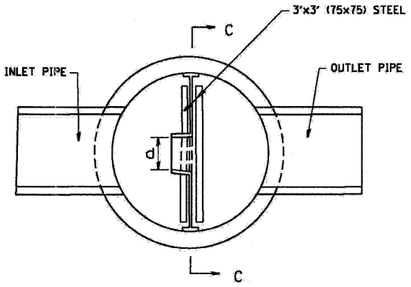
DETAILS FOR FRAMES AND LIDS ADJUSTMENT WITH MILLING

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

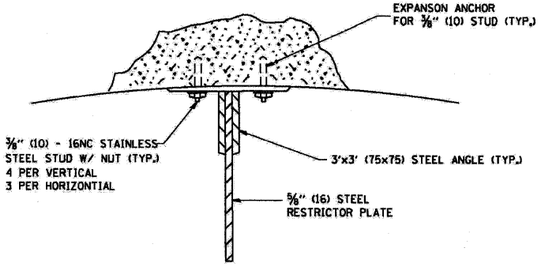
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	385
	BD600-03 (BD-8)	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



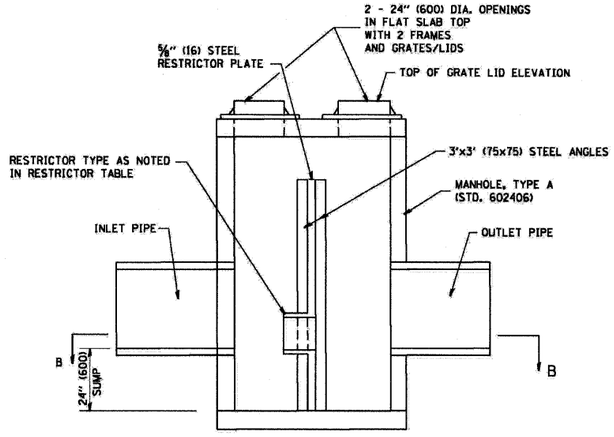
PLAN



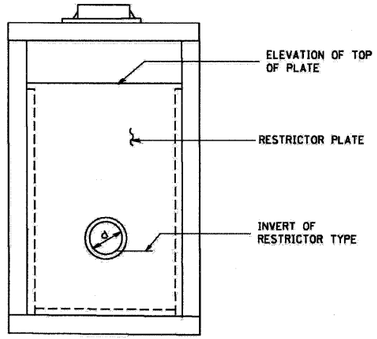
SECTION B-B



ANGLE FASTENER DETAIL



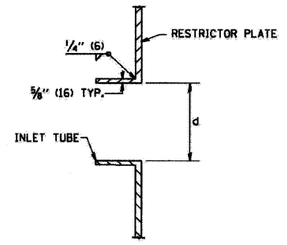
SECTION A-A



SECTION C-C

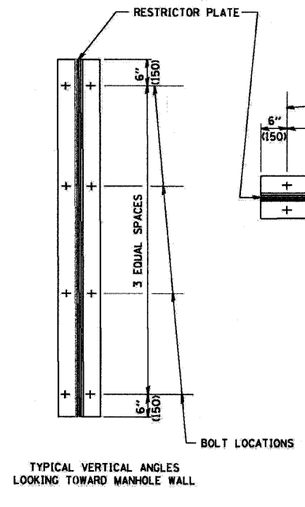
NOTES:

1. ALL STEEL ANGLES AND PLATES TO BE GALVANIZED AFTER FABRICATION.
2. ALL RESTRICTOR PLATES, ANGLES AND HARDWARE TO BE INCLUDED IN THE COST OF THE MANHOLE.
3. BASIS OF PAYMENT: "MANHOLES ,TYPE A, 6 FT. (1.8 m)-DIAMETER, TYPE 1 FRAME, CLOSED LID, RESTRICTOR PLATE" EACH

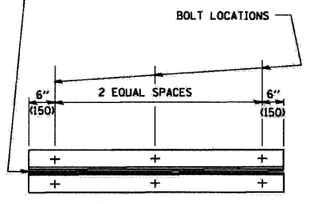


INLET TUBE DETAIL

STATION	MANHOLE DIAMETER	FRAME AND GRATE	RESTRICTOR TYPE	INSIDE RESTRICTOR TYPE DIAMETER in. (mm) (d)	INVERT OF RESTRICTOR TYPE	ELEVATION OF TOP OF PLATE OVERFLOW
ILL RTE 137						
463+86.06 RT.	6' DIA.	T 1 CL	2	14.50	690.89	695.00
465+70.00 LT.	6' DIA.	T 1 CL	2	14.00	660.76	664.00
ILL RTE 21						
290+50.00	6' DIA.	T 1 CL	2	12.50	694.60	696.80



TYPICAL VERTICAL ANGLES LOOKING TOWARD MANHOLE WALL



TYPICAL HORIZONTAL ANGLES LOOKING TOWARD BOTTOM OF MANHOLE

TOTAL BOLTS REQUIRED: 22

NOTE:

1. ANGLES SHOULD BE 3x3x3/8 (75x75x75)
2. VERTICAL ANGLES SHOULD EXTEND FROM THE BOTTOM OF THE RESTRICTOR PLATE TO THE TOP.
3. HORIZONTAL ANGLES SHOULD EXTEND FROM VERTICAL ANGLE TO VERTICAL ANGLE.

STEEL ANGLE BOLTING DETAILS

RESTRICTOR TYPE					
1	2	3	4	5	6
RE-ENTRANT TUBE	SHARP EDGED	SQUARE EDGED	RE-ENTRANT TUBE	SQUARE EDGED	ROUNDED
LENGTH: 1/2 TO 1 DIA.		STREAM CLEARS SIDES	LENGTH: 2-1/2 DIA.	LENGTH: 2-1/2 DIA.	
C=.52	C=.61	C=.61	C=.73	C=.82	C=.98

VALUES OF "C" FOR CIRCULAR AND SQUARE ORIFICES

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN.

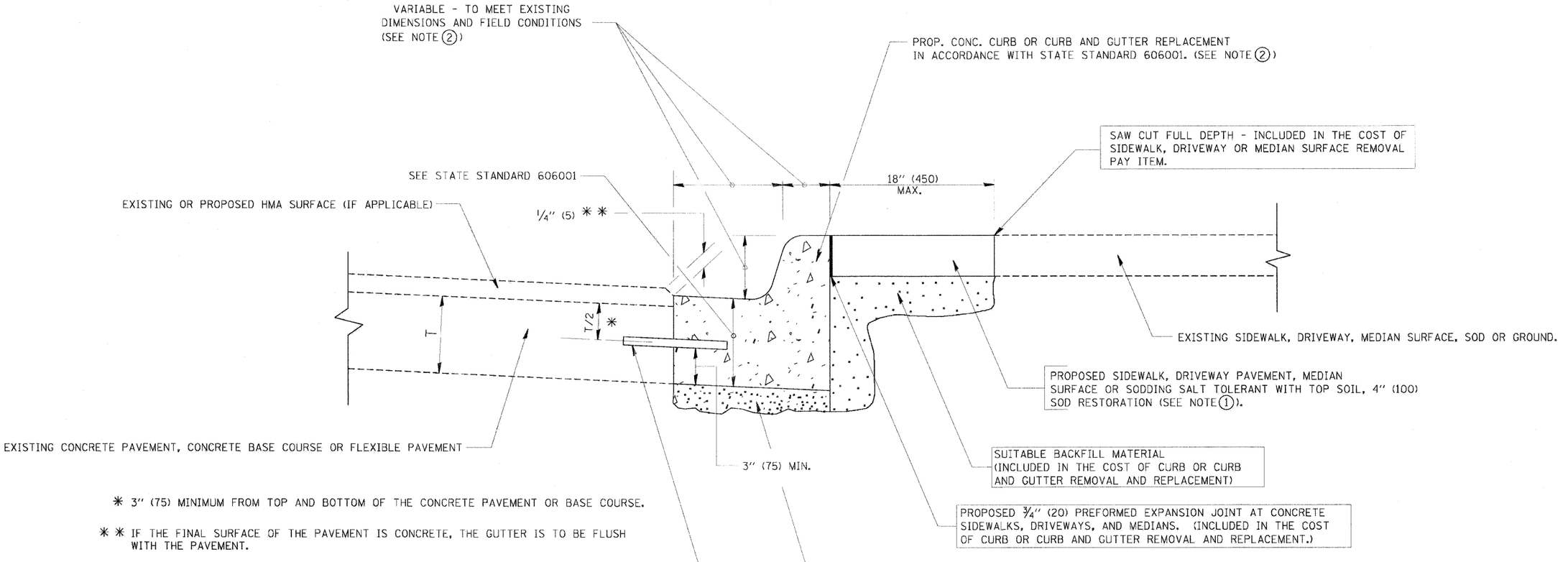
FILE NAME = W:\dstatd\22x34\bd12.dgn	USER NAME = gaglionobt	DESIGNED - R. SHAH	REVISED - R. SHAH 10-25-94
		DRAWN -	REVISED - E. GOMEZ 08-28-00
	PLOT SCALE = 50.000 ' / IN.	CHECKED -	REVISED - M. GOMEZ 01-08-01
	PLOT DATE = 1/4/2008	DATE - 09-09-94	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MANHOLE WITH RESTRICTOR PLATE

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	386
	BD600-04 (BD-12)	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



* 3" (75) MINIMUM FROM TOP AND BOTTOM OF THE CONCRETE PAVEMENT OR BASE COURSE.

* * IF THE FINAL SURFACE OF THE PAVEMENT IS CONCRETE, THE GUTTER IS TO BE FLUSH WITH THE PAVEMENT.

NOTE: (1) SIDEWALK, DRIVEWAY PAVEMENT OR MEDIAN SURFACE SHALL BE SIMILAR TO THE MATERIAL BEING REMOVED AND WILL BE PAID FOR SEPARATELY.

SODDING, SALT TOLERANT AND TOP SOIL, FURNISH AND PLACE 4" WILL BE PAID FOR SEPARATELY.

(2) FERTILIZER FOR THE PLACEMENT OF THE SOD IS NOT REQUIRED

(3) CURB OR CURB AND GUTTER REPLACEMENT SHALL MATCH THE SHAPE OF THE EXISTING CURB OR CURB AND GUTTER UNLESS OTHERWISE SPECIFIED.

(4) FOR CURB OR CURB AND GUTTER REMOVAL AND REPLACEMENT ADJACENT TO FLEXIBLE PAVEMENT DELETE EPOXY COATED TIE BARS.

(5) LONGITUDINAL BARS, IF ENCOUNTERED IN THE EXISTING CURB OR CURB AND GUTTER, ARE NOT TO BE REPLACED. CUTTING AND REMOVING LONGITUDINAL BARS SHALL BE INCLUDED IN THE COST OF CURB OR CURB AND GUTTER REMOVAL AND REPLACEMENT.

(6) THE COST OF HMA SURFACE REMOVAL IN THE EXISTING GUTTER FLAG SHALL BE INCLUDED IN THE COST OF THE CURB AND GUTTER REMOVAL AND REPLACEMENT.

(7) THE REMOVAL AND REPLACEMENT OF THE EXISTING CURB OR CURB AND GUTTER SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF SECTION 440 AND 606 OF THE STANDARD SPECIFICATIONS.

(8) THE LOCATIONS OF REMOVAL AND REPLACEMENT OF EXISTING CURB OR CURB AND GUTTER SHALL BE DETERMINED BY THE RESIDENT ENGINEER AT THE TIME OF CONSTRUCTION.

BASIS OF PAYMENT:

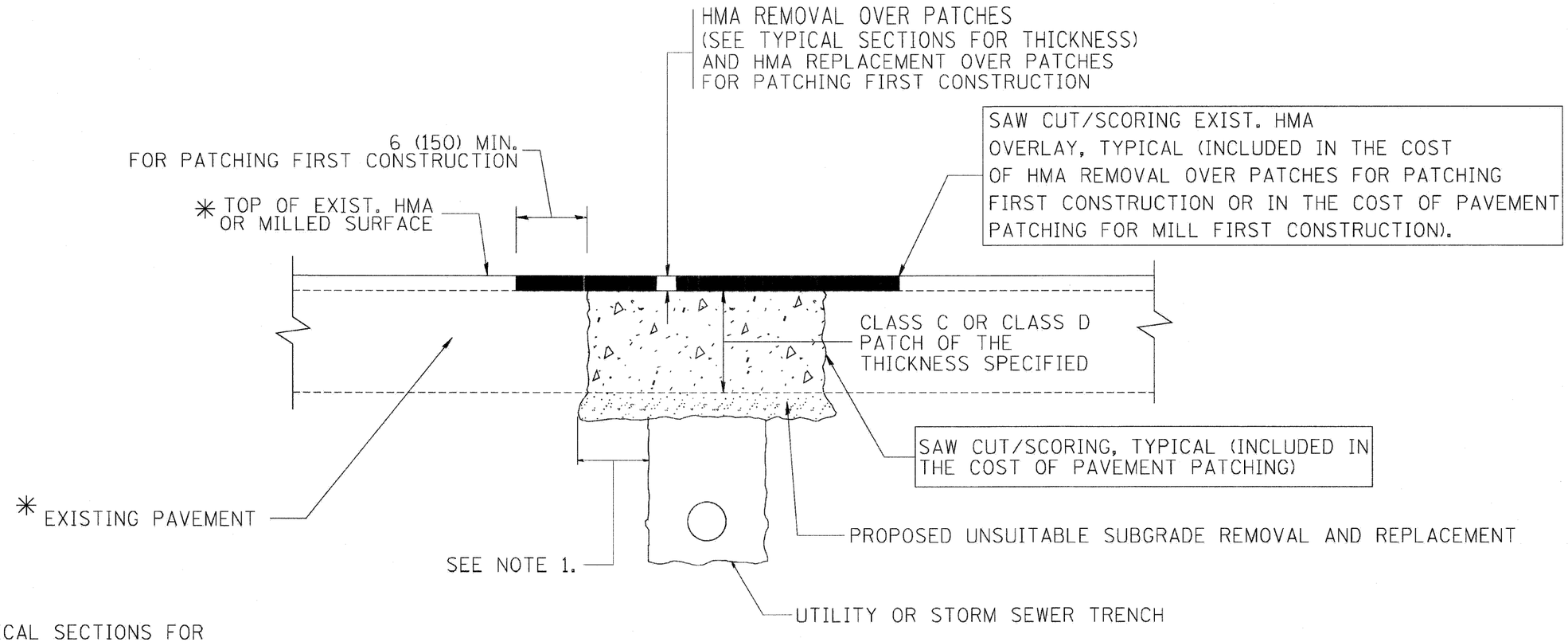
THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER FOOT (METER) FOR "CURB REMOVAL AND REPLACEMENT" OR "COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT".

CURB OR CURB AND GUTTER REMOVAL AND REPLACEMENT

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN.

FILE NAME = e:\pw_work\pwidot\dr.vakosgn\d0108315\bd24.dgn	USER NAME = drivakosgn	DESIGNED - A. HOUSEH	REVISED - R. SHAH 10-03-96	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	**CURB OR CURB AND GUTTER REMOVAL AND REPLACEMENT**
	PLOT SCALE = 50.000 ' / IN.	DRAWN -	REVISED - A. ABBAS 03-21-97		SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.
	PLOT DATE = 12/15/2009	CHECKED -	REVISED - M. GOMEZ 01-22-01		
		DATE - 03-11-94	REVISED - R. BORO 12-15-09		

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	387
	BD600-06 (BD-24)	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



* SEE TYPICAL SECTIONS FOR THICKNESS AND MATERIALS

NOTES:

1. THE WIDTH OF THE FULL DEPTH PATCH OVER A TRENCH SHALL BE 12 (300) WIDER ON EACH SIDE OF THE TRENCH.
2. FOR METHOD OF MEASUREMENT AND BASIS OF PAYMENT, SEE RECURRING SPECIAL PROVISION "PATCHING WITH HOT-MIX ASPHALT OVERLAY REMOVAL".

SEQUENCE OF CONSTRUCTION (PATCHING FIRST)

1. REMOVE THE EXISTING HMA MATERIAL OVER THE AREA TO BE PATCHED.
2. REMOVE AND REPLACE WITH CLASS C OR D PATCH.
3. REPLACE HMA MATERIAL OVER THE AREA TO BE PATCHED.

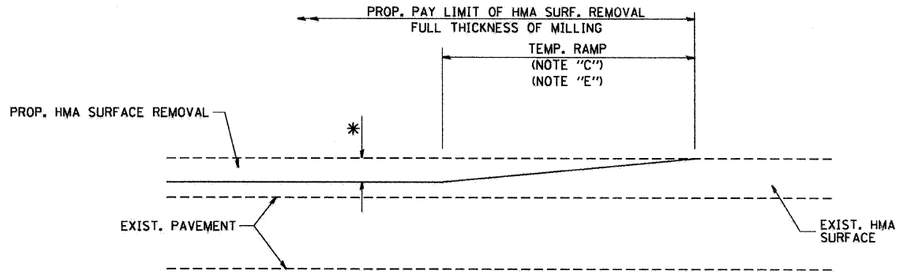
SEQUENCE OF CONSTRUCTION (MILLING FIRST)

1. MILL HMA FIRST IF THERE IS AT LEAST $4\frac{1}{2}$ INCHES OR MORE OF HMA MATERIAL ON TOP OF THE EXISTING PAVEMENT OR IF THE PAVEMENT IS FULL DEPTH HMA. A MINIMUM OF 2 INCHES OF HMA MATERIAL SHALL BE IN PLACE AFTER MILLING.
2. REMOVE AND REPLACE WITH FULL DEPTH CLASS D PATCHES TO TOP OF MILLED SURFACE.

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN.

FILE NAME = c:\projects\distatd22x34\bd22.dgn	USER NAME = bauerdl	DESIGNED - R. SHAH	REVISED - A. ABBAS 04-27-98	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PAVEMENT PATCHING FOR HMA SURFACED PAVEMENT
		DRAWN -	REVISED - R. BORO 01-01-07		
	PLOT SCALE = 50.000 '/ IN.	CHECKED -	REVISED - R. BORO 09-04-07		
	PLOT DATE = 10/27/2008	DATE - 10-25-94	REVISED - K. ENG 10-27-08		SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

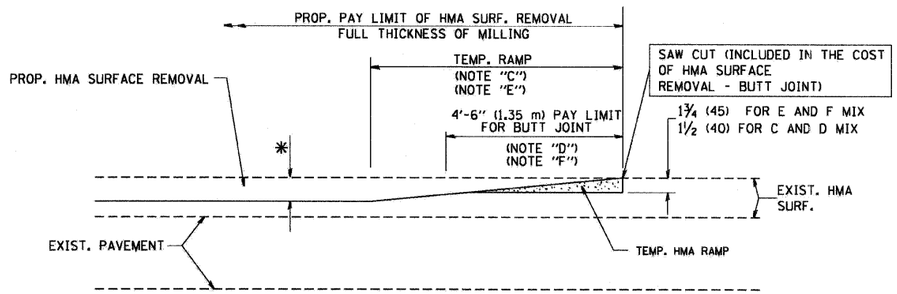
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	388
	BD400-04 (BD-22)	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



MILLED TEMPORARY RAMP

(FOR BUTT JOINT AND HMA TAPER SEE DETAIL BELOW)

OPTION 1

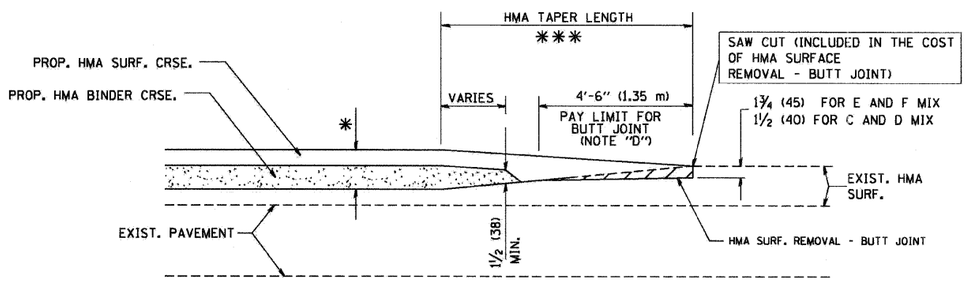


HMA CONSTRUCTED TEMPORARY RAMP

(FOR BUTT JOINT AND HMA TAPER SEE DETAIL BELOW)

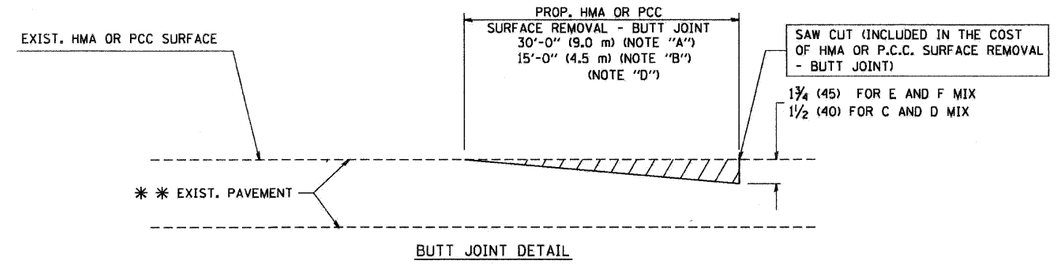
OPTION 2

TYPICAL TEMPORARY RAMP

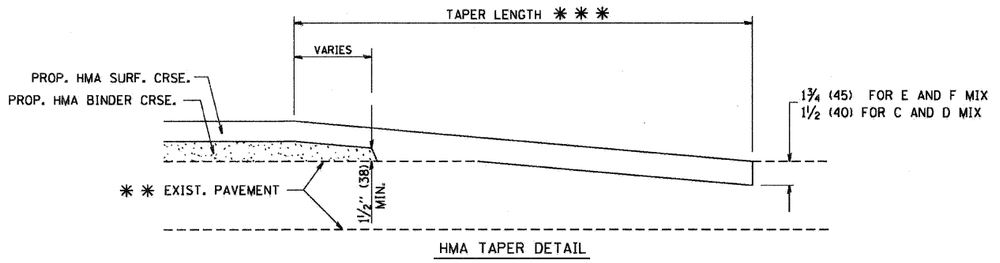


BUTT JOINT AND HMA TAPER

TYPICAL BUTT JOINT AND HMA TAPER FOR MILLING AND RESURFACING



BUTT JOINT DETAIL



HMA TAPER DETAIL

TYPICAL BUTT JOINT AND HMA TAPER FOR RESURFACING ONLY

* * PC CONCRETE, HMA OR HMA RESURFACED PAVEMENT.

NOTES

A: MAINLINE ROADWAYS AND MAJOR SIDE ROADS.

B: MINOR SIDE ROADS.

C: THE TEMP. RAMP SHALL BE CONSTRUCTED IMMEDIATELY UPON REMOVAL OF THE EXISTING HMA SURFACE.

D: THE BUTT JOINT SHALL BE CONSTRUCTED IMMEDIATELY PRIOR TO PLACING THE PROPOSED HMA COURSES.

E: TAPER THE TEMP. RAMP AT A RATE OF 3'-0" (900 mm) PER 1 INCH (25 mm) OF MILLING THICKNESS.

F: INSTALLATION AND REMOVAL OF THE 4'-6" (1.35 m) TEMP. RAMP IS INCLUDED IN COST OF HMA SURFACE REMOVAL - BUTT JOINT

G: SEE ARTICLE 406.08 AND 406.14 OF THE STANDARD SPECIFICATIONS FOR "HMA AND/OR PCC SURFACE REMOVAL, BUTT JOINT".

* SEE TYPICAL SECTIONS FOR MILLING THICKNESS.

* * * 20'-0" (6.1 m) PER 1 (25) RESURFACING (NOTE "A")
10'-0" (3.0 m) PER 1 (25) RESURFACING (NOTE "B")

BASIS OF PAYMENT:

THE BUTT JOINT WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER SQUARE YARD (SQUARE METER) FOR "HOT-MIX ASPHALT SURFACE REMOVAL - BUTT JOINT" OR FOR "PORTLAND CEMENT CONCRETE SURFACE REMOVAL- BUTT JOINT".

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN.

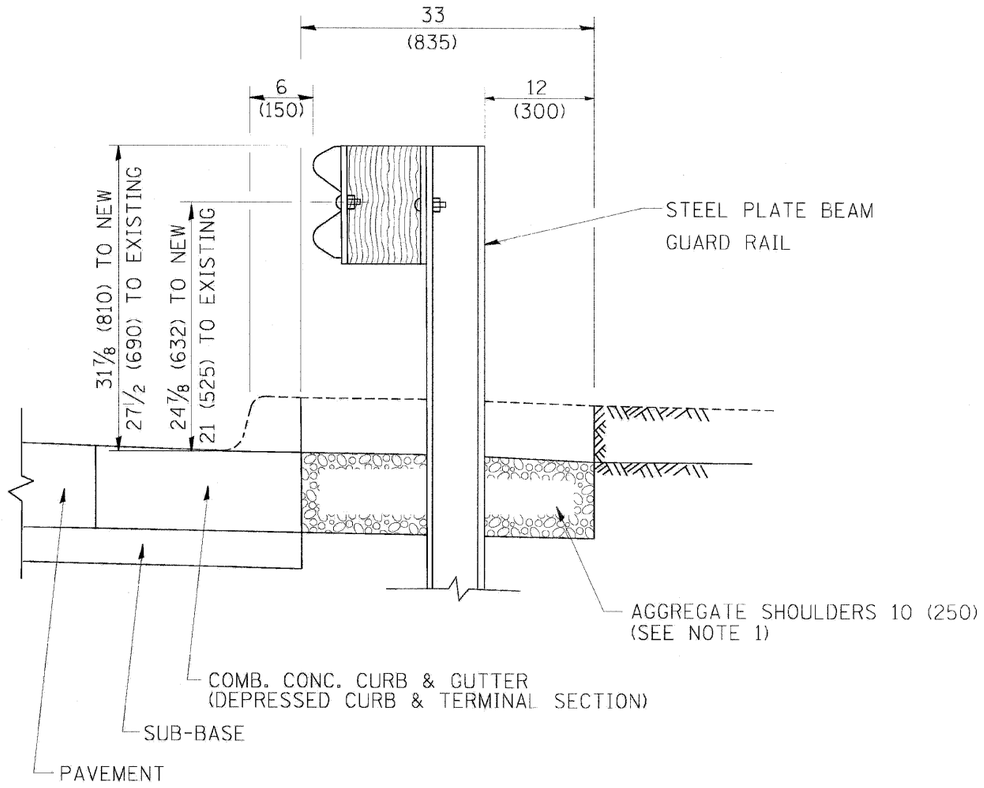
FILE NAME = W:\diststd\22x34\bd32.dgn	USER NAME = gaglianobt	DESIGNED - M. DE YONG	REVISED - R. SHAH 10-25-94
		DRAWN -	REVISED - A. ABBAS 03-21-97
	PLOT SCALE = 50.0000 ' / IN.	CHECKED -	REVISED - M. GOMEZ 04-06-01
	PLOT DATE = 1/4/2008	DATE - 06-13-90	REVISED - R. BORO 01-01-07

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BUTT JOINT AND HMA TAPER DETAILS

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	389
	BD400-05 BD32	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

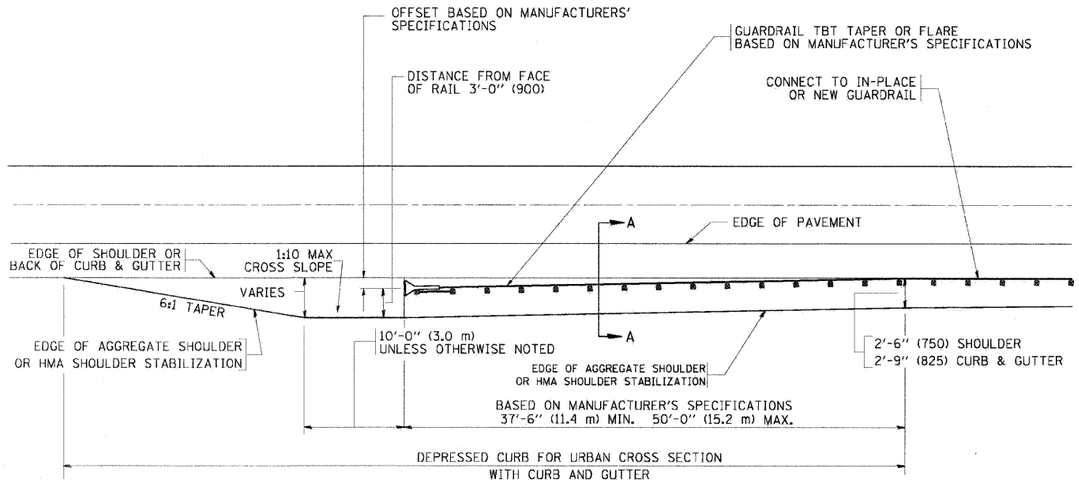


SECTION A-A

NOTES:
1. THE AGGREGATE SHOULDER, 10" OR HMA SHOULDER, 6" (IF REQUIRED) SHALL EXTEND UNDER THE TRAFFIC BARRIER TERMINAL.
2. "EXISTING" GUARDRAIL REFERS TO CONNECTING TERMINAL SECTION TO GUARD RAILING PRIOR TO THE MIDWEST GUARDRAIL SYSTEM.
3. THE CONTRACTOR SHALL VERIFY THE TYPE/HEIGHT OF GUARDRAIL IN-PLACE BEFORE ORDERING THE NEW TERMINAL SECTION. COST INCLUDED WITH THE COST OF THE TERMINAL. THE TERMINAL SECTION HEIGHT TO BE PLACED MUST MATCH THE HEIGHT OF THE IN-PLACE GUARDRAIL.

DETAILS FOR STEEL PLATE BEAM GUARD RAIL ADJACENT TO CURB AND GUTTER

[FOR ROADWAY SPEED 35 MPH (60 kmh) TO 45 MPH (70 kmh)]



DEPRESSED CURB AND GUTTER AND SHOULDER TREATMENT AT TBT TY. 1 SPL.

BASIS OF PAYMENT: HMA SHOULDERS 6 (150) (IF REQUIRED) WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER SQUARE YARD (SQUARE METER) FOR "HOT-MIX ASPHALT SHOULDERS 6" (150 mm)".

STEEL PLATE BEAM GUARD RAIL AND TRAFFIC BARRIER TERMINAL, OF THE TYPE SPECIFIED WILL BE PAID FOR SEPARATELY.

TBT = TRAFFIC BARRIER TERMINAL

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN.

FILE NAME = e:\pw_work\PWIDOT\DRIVAKOSGN\d0128315\bd34.dgn	USER NAME = drivakosgn	DESIGNED - M. DE YONG	REVISED - E. GOMEZ 08-28-00
		DRAWN -	REVISED - R. BORO 01-01-07
	PLOT SCALE = 49.9999 '/ IN.	CHECKED -	REVISED - R. BORO 12-08-2008
	PLOT DATE = 9/21/2009	DATE - 09-22-90	REVISED - R. BORO 09-14-2009

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DETAILS FOR DEPRESSED CURB & GUTTER AND SHOULDER TREATMENT AT TBT TY 1 SPL.

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

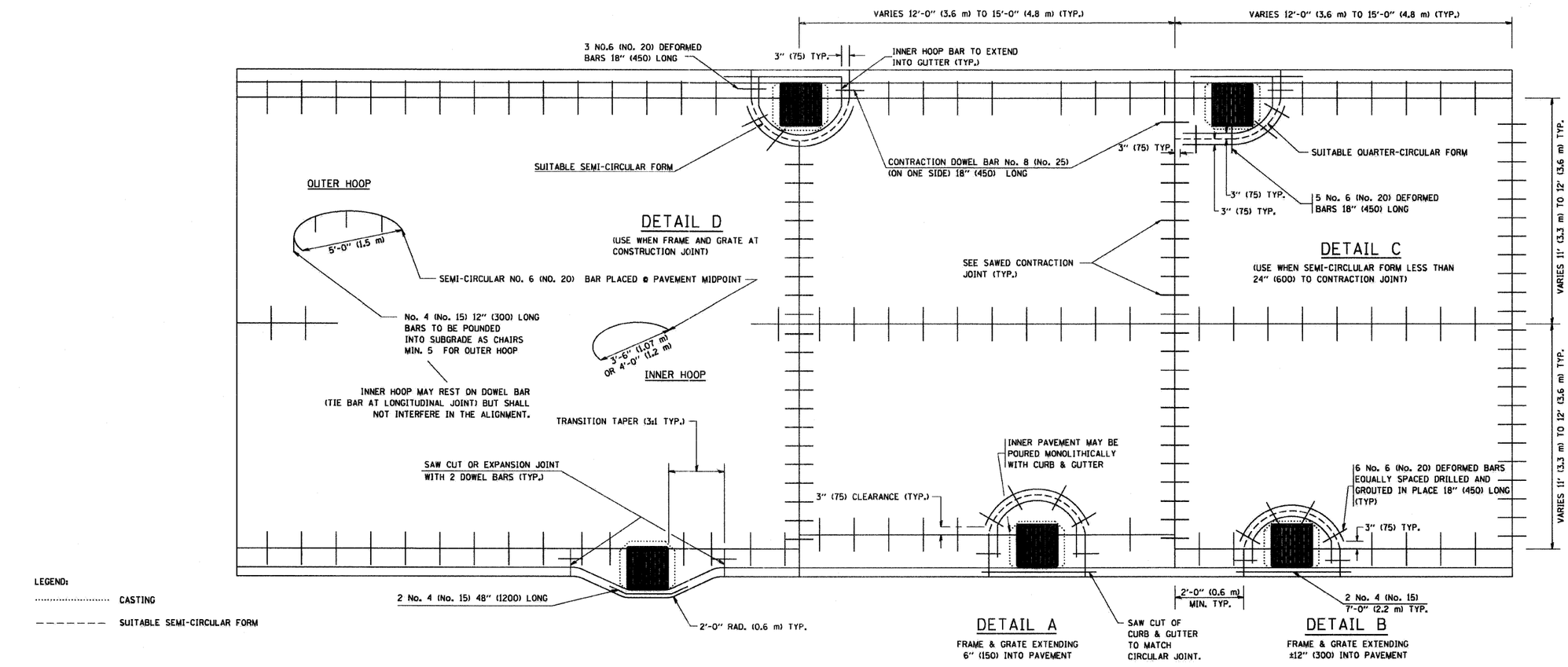
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	390
	BD600-10 (BD 34)	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

FRAME EXTENSION INTO PAVEMENT	INNER HOOP REINFORCEMENT DIAMETER	SEMI CIRCULAR FORM DIAMETER	OUTER HOOP REINFORCEMENT DIAMETER
UP TO 8" (200)	3'-6" (1.1 m)	4'-0" (1.2 m)	5'-0" (1.5 m)
> 8" (200) TO 14" (360)	4'-0" (1.2 m)	4'-6" (1.4 m)	5'-0" (1.5 m)

NOTES :

1. THE ROUNDOUT AND ADDED REINFORCEMENT WILL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE PAVEMENT.
2. TRANSVERSE JOINTS MAY BE MOVED TO ACCOMMODATE ROUNDOUT. EDGE OF CIRCULAR JOINT SHALL BE MINIMUM 12" (300) FROM TRANSVERSE JOINT. RELOCATED TRANSVERSE JOINT SHALL BE CONTINUOUS FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT.
3. SEMI-CIRCULAR FORM SHALL BE REMOVED PRIOR TO DRILL AND GROUT OF TIE BARS.
4. ALL REINFORCED BARS SHALL BE EPOXY COATED.
5. DRILL AND GROUT IS PREFERRED, HOWEVER TIE BARS CAN BE POURED IN PLACE IF CLEARANCE IS PROVIDED TO OUTER EDGE OF FRAME. MINIMUM 2" (50) CLEARANCE.
6. WOOD SHIMS SHALL BE USED TO ADJUST ALL FRAMES. AFTER ADJUSTING MORTAR HAS CURED, THE WOOD SHIMS SHALL BE REMOVED AND THE VOIDS UNDER THE FRAMES FILLED WITH NON SHRINK GROUT.
7. HOOP REINFORCEMENT SHALL BE ONE PIECE CONSTRUCTION.
8. CIRCULAR FRAMES AND GRATES MAY BE SUBSTITUTED.
9. CURB DOWELS MUST BE PLACED LEVEL & TRUE TO ALLOW CONTRACTION MOVEMENT.

DESIGNER NOTE:
THIS DETAIL IS TO BE USED WHEN THE GUTTER FLAG IS LESS THAN 24"



TRANSITION CURB & AND GUTTER INTO PARKWAY
(PREFERRED BECAUSE PAVING OF MAINLINE NOT AFFECTED.)

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE NOTED

FILE NAME = W:\diststd\22x34\bd48.dgn	USER NAME = gaglianobt	DESIGNED - A. ABBAS	REVISED - T. MATOUSEK 08-28-00
		DRAWN - TOM MATOUSEK	REVISED - T. MATOUSEK 10-02-00
	PLOT SCALE = 50.0000 ' / IN.	CHECKED - A. ABBAS	REVISED - T. MATOUSEK 04-25-02
	PLOT DATE = 1/4/2008	DATE - 01-04-99	REVISED - P. LAFLEUR 08-27-02

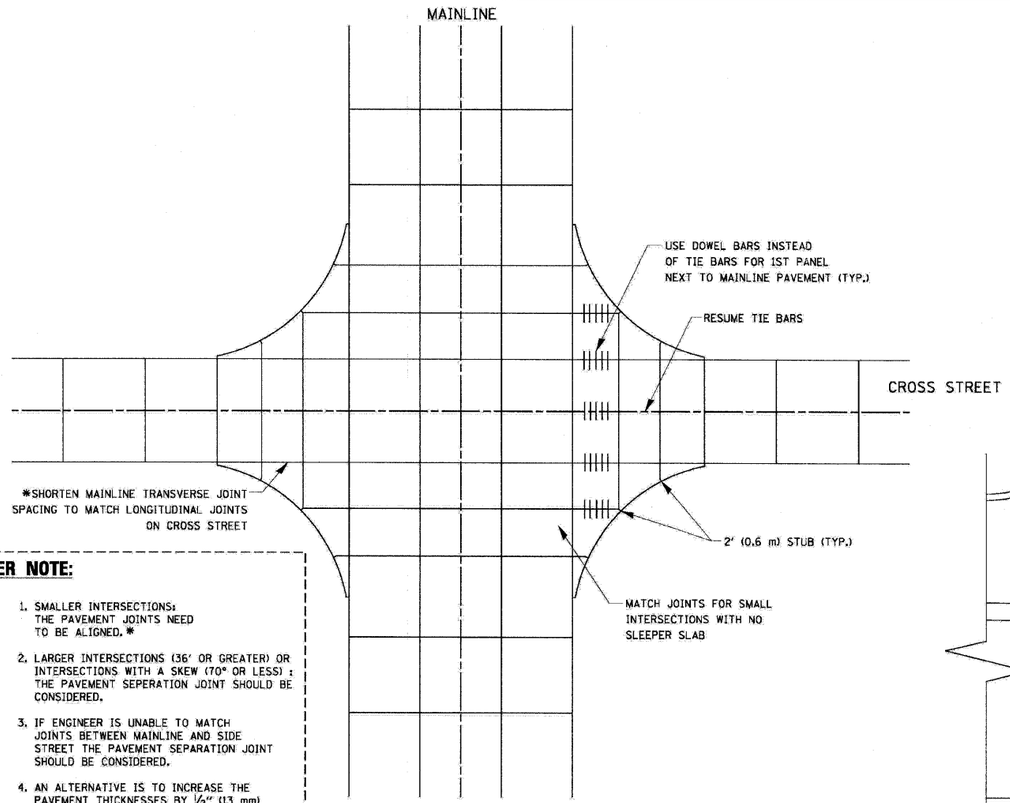
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PCC PAVEMENT ROUNDOUTS AT CURB AND GUTTER

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	391
	BD-48	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

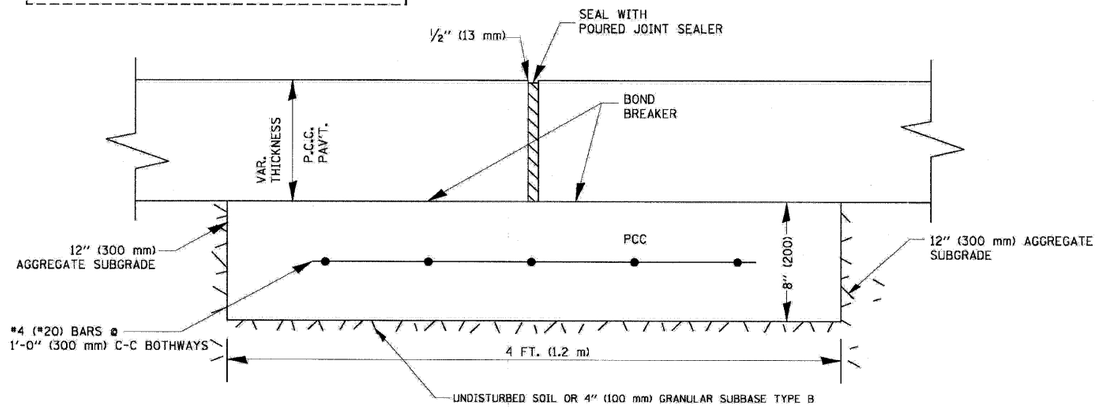
THE USE OF CROSS STREET PAVEMENT SEPARATION JOINTS FOR SKEWED OR LARGE INTERSECTIONS WHERE JOINTS MAY NOT MATCH



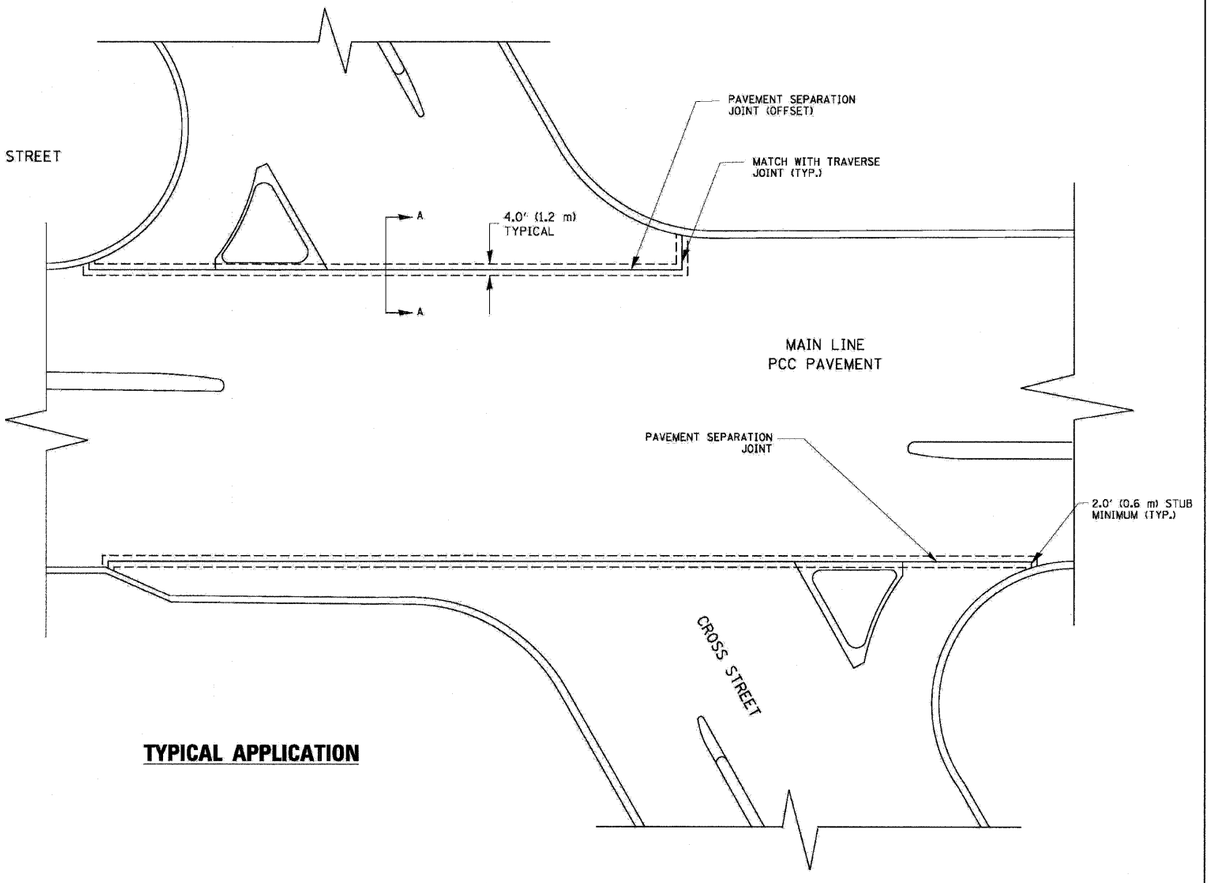
DESIGNER NOTE:

1. SMALLER INTERSECTIONS: THE PAVEMENT JOINTS NEED TO BE ALIGNED. *
2. LARGER INTERSECTIONS (36' OR GREATER) OR INTERSECTIONS WITH A SKEW (70° OR LESS) : THE PAVEMENT SEPERATION JOINT SHOULD BE CONSIDERED.
3. IF ENGINEER IS UNABLE TO MATCH JOINTS BETWEEN MAINLINE AND SIDE STREET THE PAVEMENT SEPARATION JOINT SHOULD BE CONSIDERED.
4. AN ALTERNATIVE IS TO INCREASE THE PAVEMENT THICKNESSES BY ½" (13 mm) FOR THE LENGTH OF THE AFFECTED PANELS AT THE INTERSECTION.
5. FOR LARGE INTERSECTIONS (6 LANES OR MORE) WHERE JOINTS CAN BE MATCHED, USE #8 (25) DOWEL BARS INSTEAD OF #8 (25) TIE BARS AT EDGE OF MAINLINE PAVEMENT WHEN NO PAVEMENT SEPARATION JOINTS USED.

PLAN



PROPOSED SECTION A-A



TYPICAL APPLICATION

NOTE:

1. JOINT FILLER SHALL CONSIST OF A SHEET OF ½" (13 mm) BITUMINOUS PREFORMED FIBER JOINT FILLER CONFORMING TO ARTICLE 1051.03 OF THE STANDARD SPECIFICATIONS.
2. THE JOINT SHALL BE SEALED WITH A HOT POUR JOINT SEALER CONFORMING TO ARTICLE 1050.02 OF THE STANDARD SPECIFICATIONS.
3. A SINGLE LAYER OF FELT ROOFING PAPER SHALL SERVE AS A BOND BREAKER.
4. JOINT SHALL CONTINUE THROUGH COMBINATION CURB & GUTTER OR PCC SHOULDER.
5. PAVEMENT SEPARATION JOINT IS TO BE PAID FOR AS "SLEEPER SLAB" AND IS TO BE MEASURED IN PLACE BY THE LINEAL FOOT.
6. BOND BREAKER AND ½" (13 mm) JOINT AND FILLER SHALL BE INCIDENTAL TO THE PAY ITEM "SLEEPER SLAB".

FILE NAME = bd52.dgn	USER NAME = gaglianobt	DESIGNED -	REVISED - CADD 06-18-10
		DRAWN -	REVISED -
	PLOT SCALE = 50.0000 ' / IN.	CHECKED -	REVISED -
	PLOT DATE = 6/18/2010	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

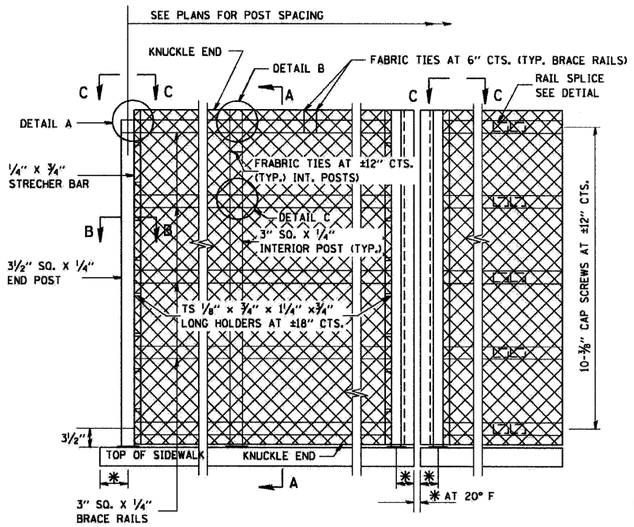
DETAIL OF PAVEMENT SEPARATION JOINT FOR JOINTED PCC PAVEMENTS AT INTERSECTIONS

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. 90+00 | TO STA. 255+00

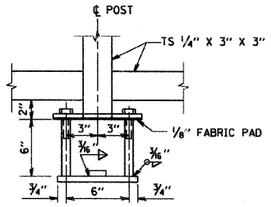
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	392

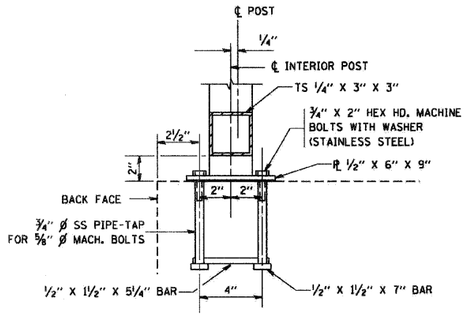
BD52 CONTRACT NO. 60953

ILLINOIS FED. AID PROJECT

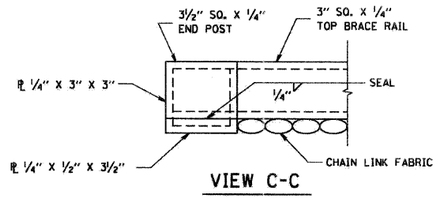


ELEVATION
(INSIDE FACE)

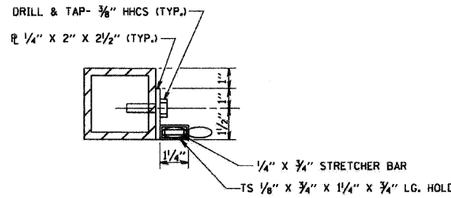




ANCHOR BOLT DETAILS
DETAILS SHOWN ARE FOR FENCE RAILING
DEATAILS FOR PARAPET RAILING ARE SIMALAR



VIEW C-C



SECTION B-B

NOTES

RAILING SHALL BE IN ACCORDANCE WITH SECTION 508 OF THE STANDARD SPECIFICATIONS. EXCEPT AS NOTED, AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE LINEAL FOOT FOR BRIDGE FENCE RAILING AND PARAPET RAILING.
THE 9 GAUGE FABRIC TIES SHALL BE IN ACCORDANCE WITH ARTICLE 710.33(f) OF THE STANDARD SPECIFICATIONS.
INSTALLATION OF THE CHAIN LINK FABRIC SHALL BE IN ACCORDANCE WITH SECTION 629 OF THE STANDARD SPECIFICATIONS.
HOLLOW STRUCTURAL STEEL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A 500, GRADE B, STRUCTURAL STEEL TUBING.
ALL OTHER STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M183.
THE CHAIN LINK FABRIC SHALL BE PLACED ALONG PEDESTRAIN SIDE AS SHOWN ON SECTION A-A
STRETCHER BARS SHALL BE USED AT EACH END OF FABRIC.
A MINIMUM OF ONE COMPLETE TURN IS REQUIRED AT ENDS OF ALL FABRIC TIES.
COATING:

A. WHEN RAILING IS GALVANIZED:
ALL POSTS, RAILING, SPLICES, ANCHOR DEVICES, AND PLATES SHALL BE GALVANIZED AFTER SHOP FABRICATION IN ACCORDANCE WITH AASHTO M-111 AND ASTM A-385. ALL BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M-232.
VENT HOLES FOR GALVANIZING SHALL BE PLACED IN THE POSTS AND RAILS AT LOCATIONS THAT WILL NOT ALLOW THE ACCUMULATION OF MOISTURE IN THE MEMBERS.
THE CHAIN LINK FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE 710.33 (a) (1) (2) OR (3) OF THE STANDARD SPECIFICATIONS.

B. WHEN RAILINIG IS PAINTED:
ALL POST, RAILLING, SPLICES, ANCHOR DEVICES, AND PLATES SHALL BE PAINTED USING THE ZINC-SILLICATE AND VINYL PAINT SYSTEM.
THE CHAIN LINK FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE 710.33 (a) (4) OF THE STANDARD SPEC'S.

NOTES

THE 9 GAUGE FABRIC TIES SHALL BE IN ACCORDANCE WITH ARTICLE 710.33(f) OF THE STANDARD SPECIFICATIONS.
INSTALLATION OF THE CHAIN LINK FABRIC SHALL BE IN ACCORDANCE WITH SECTION 629 OF THE STANDARD SPECIFICATIONS.
HOLLOW STRUCTURAL STEEL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A 500. GRADE B. STRUCTURAL STEEL TUBING.
ALL OTHER STEEL SHAPES AND PLATES SHALL COMFORM TO THE REQUIREMENTS OF ASSHTO M183.
THE CHAIN LINK FABRIC SHALL BE PLACED ALONG PDESTRIAN SIDE AS SHOWN ON SECTION A-A.
STRECHER BARS SHALL BE USED AT EACH END OF FABRIC.
A MINIMUM OF ONE COMPLETE TURN IS REQUIRED AT ENDS OF ALL FABRIC TIES.

COATING:

ALL POSTS, RAILING, SPLICES, ANCHOR DEVICES. AND PLATES SHALL BE GALVANIZED AFTER SHOP FABRICATION IN ACCORDANCE WITH AASHTO M-111 AND ASTM A-385. ALL BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M-232.
VENT HOLES FOR GALVANIZING SHALL BE PLACED IN THE POSTS AND RAILS AT LOCATIONS THAT WILL NOT ALLOW THE ACCUMULATION OF MOISTURE IN THE MEMBERS.
THE CHAIN LINK FABRIC SHALL COMFORM TO THE REQUIREMENTS OF ARTICLE 710.33 (a)(1)(2) OR (3) OF THE STANDARD SPECIFICATIONS.

NOTES:

PLAN DIMENSIONS AND DETAILS RELATIVE TO EXISTING STRUCTURE HAVE BEEN TAKEN FROM EXISTING PLANS AND ARE SUBJECT TO NOMINAL CONSTUCTION VARIATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY SUCH DIMENSIONS AND DETAILS IN THE FIELD AND MAKE NECESSARY APPROVED ADJUSTMENTS PRIOR TO CONSTRUCTION OR ORDERING OF MATERIALS. SUCH VARIATIONS SHALL NOT BE CAUSE FOR ADDITIONAL COMPENSATION FOR A CHANGE IN THE SCOPE OF THE WORK, HOWEVER THE CONTRACTOR WILL BE PAID FOR THE QUANTITY ACTUALLY FURNISHED AT THE UNIT PRICE BID FOR THE WORK.

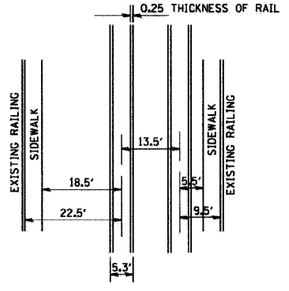
FIRST AND LAST FENCE POST TO BE PLACED INSIDE OF THE FIRST AND LAST EXISTING RAIL POST ON THE BRIDGE DECK.

DEMSIONS GIVEN ALONG CENTERLINE PROPOSED FENCE POST.

NOTE:

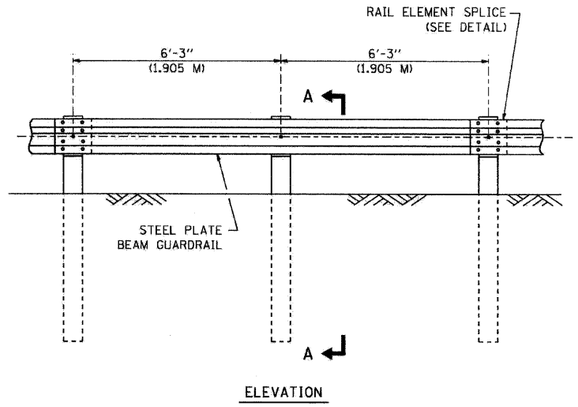
THE CONTRACTOR SHOULD ALWAYS MAINTAIN A MINIMUM HORIZONTAL CLEARANCE OF 8'-6" FROM THE CENTERLINE OF THE CLOSEST RAILROAD TRACK.

THE CONTRACTOR SHOULD HAVE THE SERVICES OF A RAILROAD FLAGMAN ALL THE TIME WORKING ON THE BRIDGE.



LOCATION OF IMPROVEMENT

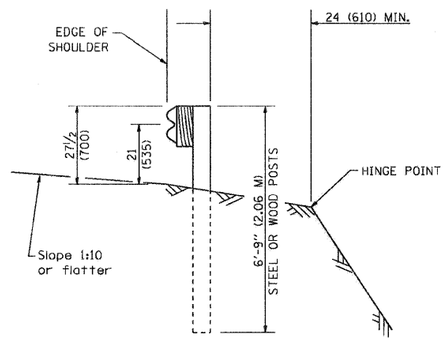
FILE NAME = W:\diststd\22x34\bm17.dgn	USER NAME = gaglionobt	DESIGNED -	REVISED - A. HOUSEH 10-29-92	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PEDESTRIAN BARRIER	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED - R. RITCHIE 05-10-00			330	128R-3	LAKE	518	393
	PLOT SCALE = 50.000 ' / IN.	CHECKED -	REVISED -				BM-17	CONTRACT NO. 60953		
	PLOT DATE = 1/4/2000	DATE -	REVISED -		SCALE: NONE SHEET NO. 1 OF 1 SHEETS STA. TO STA.		FED. ROAD DIST. NO. 1 ILLINOIS	FED. AID PROJECT		



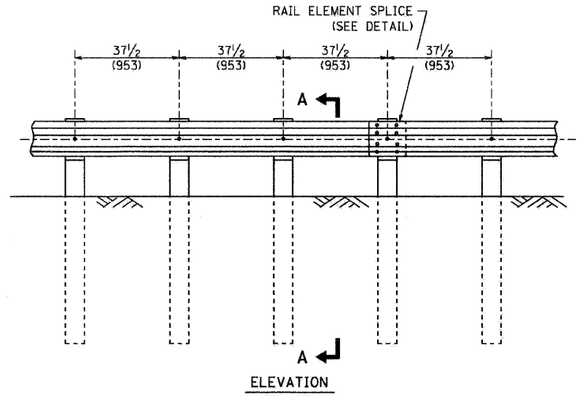
ELEVATION

TYPE A

6'-3" (1.905 M) TYPICAL POST SPACING



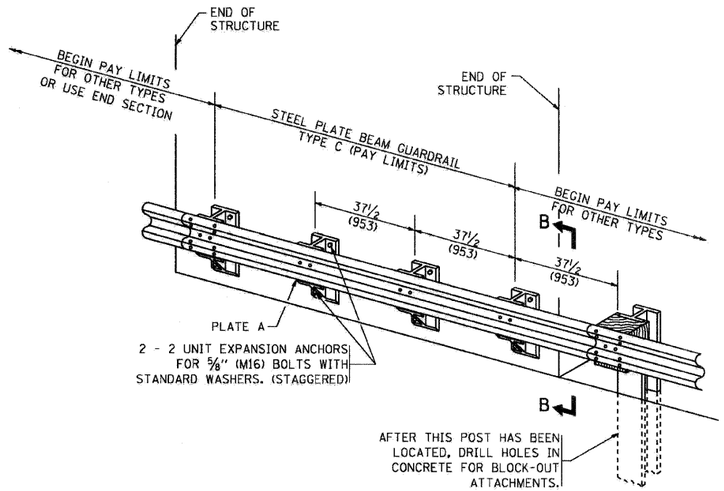
SECTION A-A



ELEVATION

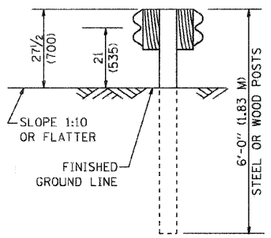
TYPE A

37½ (953) CLOSED POST SPACING

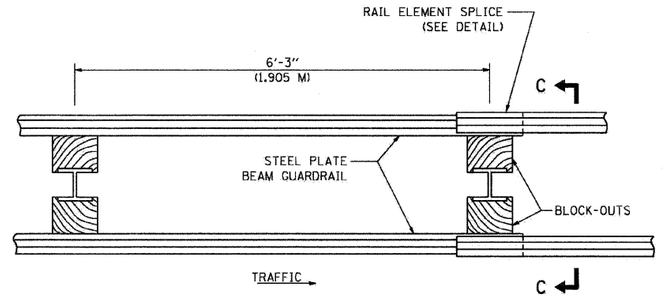


TYPE C

37½ (953) BLOCK-OUT SPACING



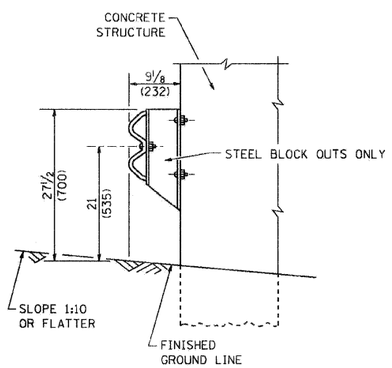
SECTION C-C



PLAN

TYPE D

DOUBLE STEEL PLATE BEAM GUARDRAIL
6'-3" (1.905 M) TYPICAL POST SPACING



SECTION B-B

GENERAL NOTES

ALL SLOPE RATIOS ARE EXPRESSED AS UNITS OF VERTICAL DISPLACEMENT TO UNITS OF HORIZONTAL DISPLACEMENT (V:H).

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS) UNLESS OTHERWISE SHOWN.

THE EXISTING STEEL POSTS MAY BE DRILLED TO MATCH THE BOLT PATTERN SHOWN HEREIN FOR THE WOOD BLOCK-OUT, OR A NEW STEEL POST SHALL BE PROVIDED.

THIS DETAIL IS APPLICABLE TO THE GUARDRAIL SYSTEM USED PRIOR TO JANUARY 1, 2007. FOR DETAILS ON THE MIDWEST GUARDRAIL SYSTEM, SEE STANDARD 630001.

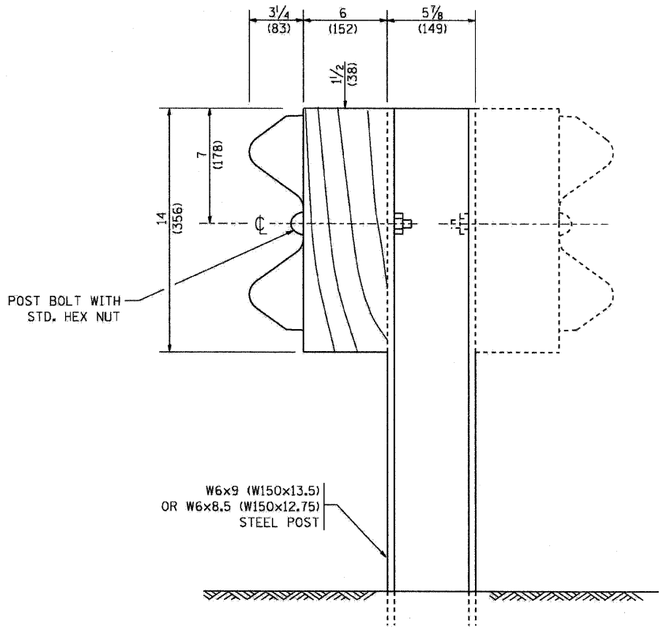
FILE NAME = W:\diststd\22x34\bm21.dgn	USER NAME = gaglianobt	DESIGNED -	REVISED - 10-31-06
		DRAWN -	REVISED -
	PLOT SCALE = 50.0000 '/ IN.	CHECKED -	REVISED -
	PLOT DATE = 1/4/2008	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

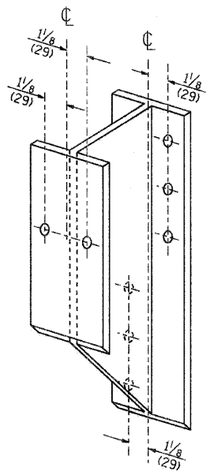
REMOVE AND REERECT
STEEL PLATE BEAM GUARDRAIL

SCALE: NONE | SHEET NO. 1 OF 4 SHEETS | STA. | TO STA.

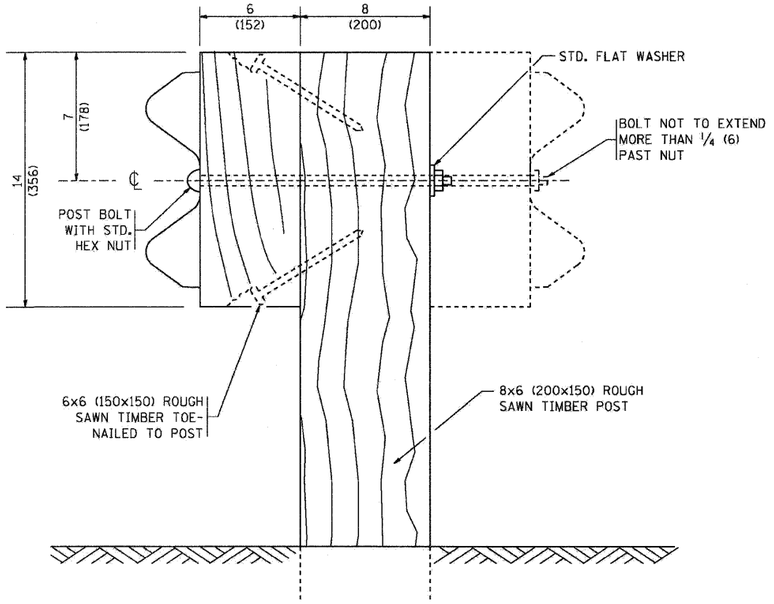
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	394
	BM-21	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



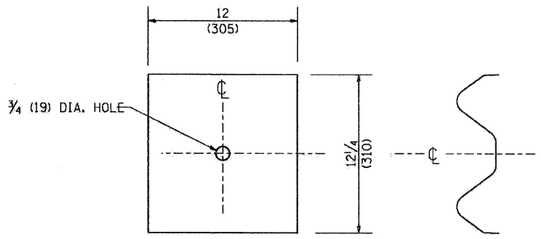
STEEL POST CONSTRUCTION



STEEL BLOCK-OUT DETAIL



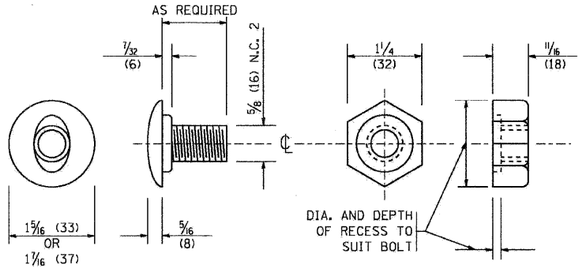
WOOD POST CONSTRUCTION



NOTE:

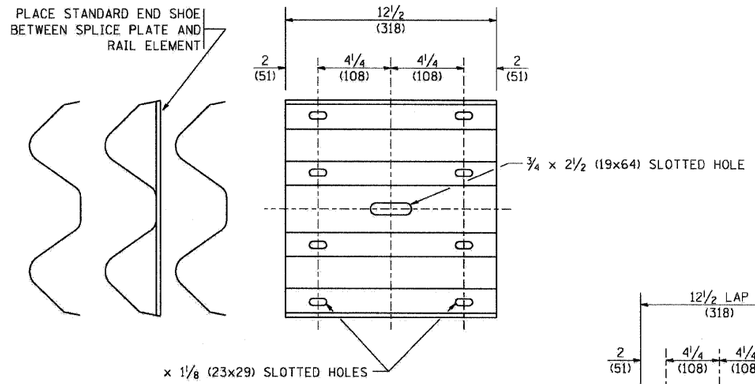
PLATE A SHALL BE PLACED BETWEEN RAIL ELEMENT AND BLOCK-OUT AT NON-SPLICE MOUNTING POINTS ONLY WHEN STEEL BLOCK-OUTS ARE USED.

PLATE A

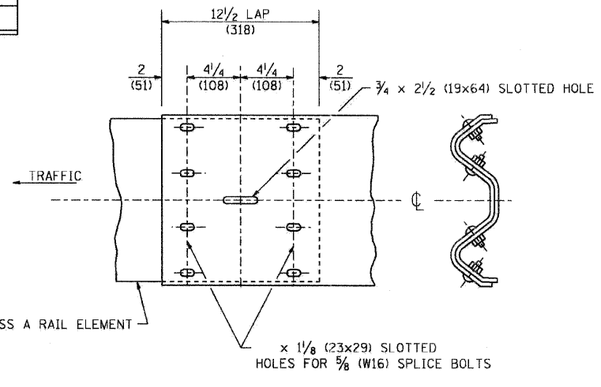


POST OR SPLICE BOLT & NUT

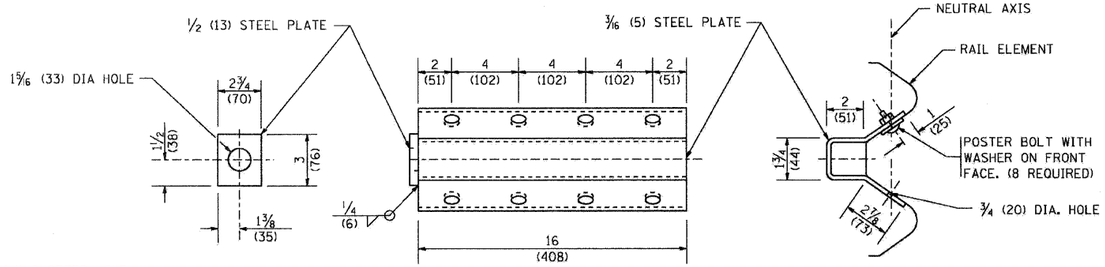
FILE NAME = W:\diststd\22x34\bm21.dgn	USER NAME = gaglianabt	DESIGNED -	REVISED - 10-31-06	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	**REMOVE AND REERECT STEEL PLATE BEAM GUARDRAIL**			F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED -					330	128R-3	LAKE	518	395
	PLOT SCALE = 50.0000 ' / IN.	CHECKED -	REVISED -						BM-21		CONTRACT NO. 60953	
	PLOT DATE = 1/4/2008	DATE -	REVISED -		SCALE: NONE	SHEET NO. 2 OF 4 SHEETS	STA. TO STA.		FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT	



SPLICE PLATE



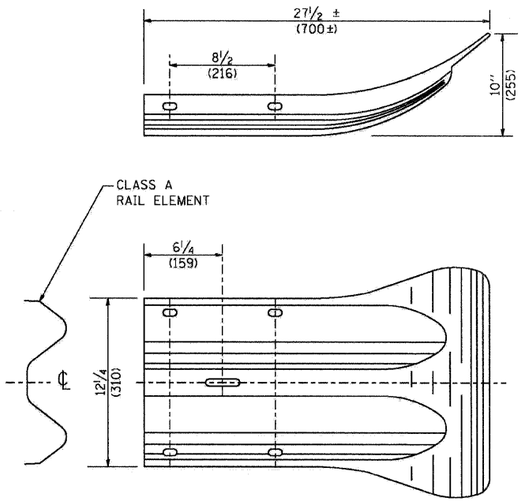
RAIL ELEMENT SPLICE



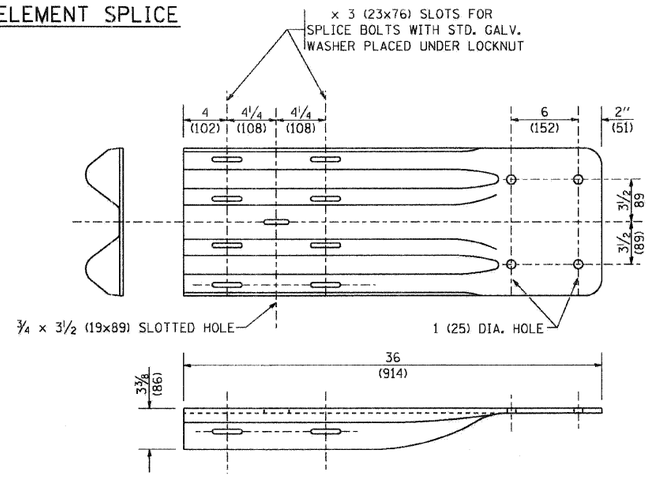
NOTE:

ANCHOR PLATE T SHALL BE USED TO ATTACH CABLE ASSEMBLY TO GUARDRAIL WHEN REQUIRED ON TRAFFIC BARRIER TERMINALS.

ANCHORE PLATE T DETAILS



END SECTION



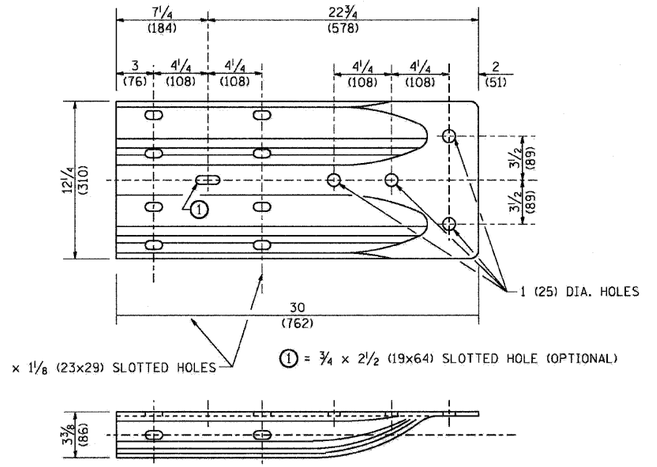
END SHOE

NOTE:

WHEN END SHOE IS ATTACHED TO A BRIDGE PARAPET WHICH HAS AN EXPANSION JOINT, THE BOLTS SHALL BE PROVIDED WITH A LOCKNUT OR DOUBLE NUT AND SHALL BE TIGHTENED ONLY TO A POINT THAT WILL ALLOW GUARDRAIL MOVEMENT.

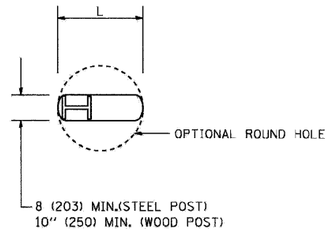
THE STANDARD END SHOE SHALL BE ATTACHED TO THE CONCRETE WITH PRE-DRILLED OR SELF-DRILLING ANCHOR BOLTS. THE ANCHOR CONE SHALL BE SET FLUSH WITH THE SURFACE OF THE CONCRETE.

EXTERNALLY THREADED STUDS PROTRUDING FROM THE SURFACE OF THE CONCRETE WILL NOT BE PERMITTED.

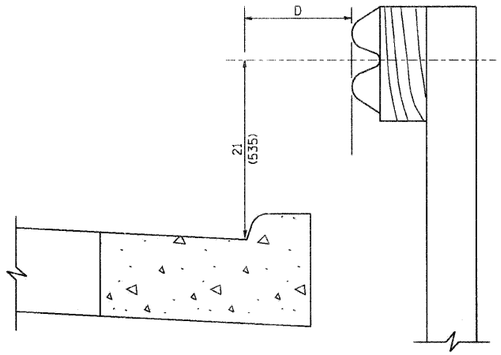


ALTERNATE END SHOE

FILE NAME = W:\diststd\22x34\bm21.dgn	USER NAME = gaglionobt	DESIGNED -	REVISED - 10-31-06	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	REMOVE AND REERECT STEEL PLATE BEAM GUARDRAIL	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED -			330	128R-3	LAKE	518	396
	PLOT SCALE = 50.0000 '/ IN.	CHECKED -	REVISED -				BM-21	CONTRACT NO. 60953		
	PLOT DATE = 1/4/2008	DATE -	REVISED -		SCALE: NONE | SHEET NO. 3 OF 4 SHEETS | STA. | TO STA.	FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



PLAN

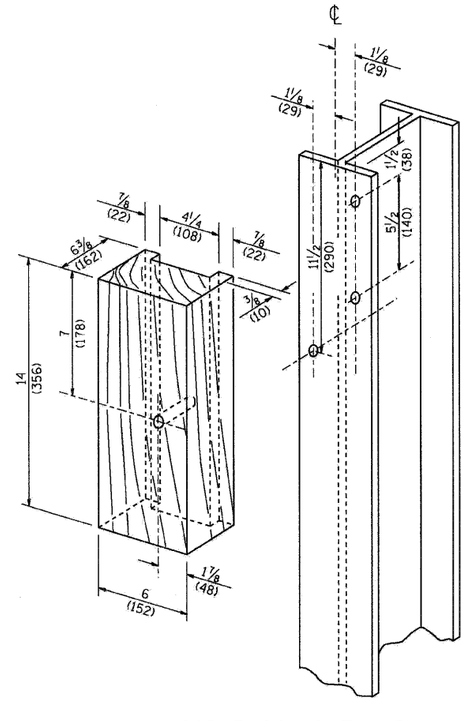


NOTE:

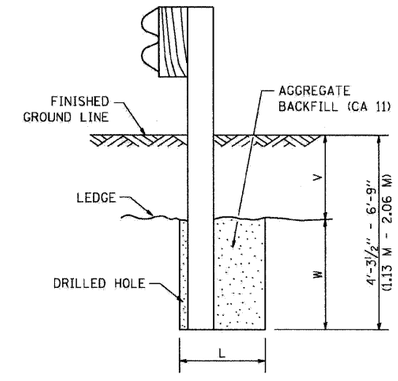
IF IT IS NECESSARY FOR D TO BE MORE THAN 12 (300) AND LESS THAN 10'-0" (3.0 M) TYPE M-2 (M-5) CURB AND GUTTER (STD. 606001) SHALL BE USED IN FRONT OF AND IN ADVANCE OF THE GUARDRAIL.

GUARDRAIL PLACED BEHIND CURB

(D = 0 DESIRABLE TO 12 (300) MAXIMUM)



WOOD BLOCK-OUT AND STEEL POST DETAILS



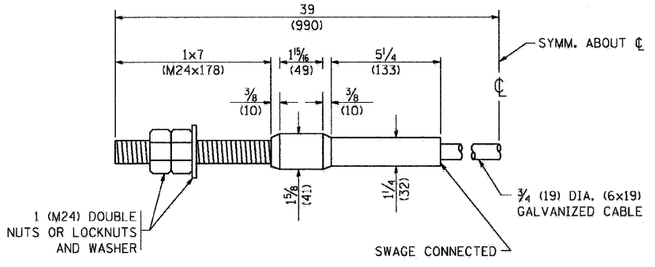
NOTE:

LEDGE LINE IS TOP OF ROCK LEDGE OR HARD SLAG FILL.

ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

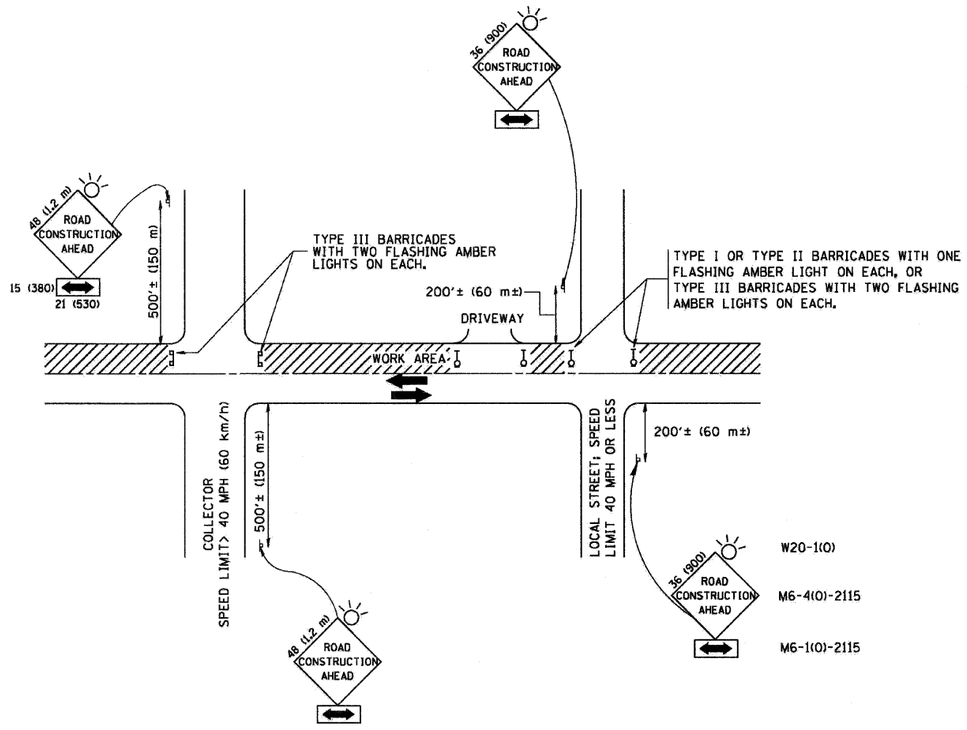
V	W	L	
		STEEL POST	WOOD POST
0 - 18 (0 - 460)	24 (610)	21 (530)	23 (580)
>18 - 41.5 (> 460 - 825)	12 (305)	8 (203)	10 (250)
>41.5 - 53.5 (> 825 - 1.13 M)	12 - 0 (350 - 0)	8 (203)	10 (250)



CABLE ASSEMBLY

(40,000 LBS (18,100 KG) MIN. BREAKING STRENGTH)
TIGHTEN TO TAUT TENSION

FILE NAME = W:\diststd\22x34\bm21.dgn	USER NAME = gaglianobt	DESIGNED -	REVISED - 10-31-06	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	REMOVE AND REERECT STEEL PLATE BEAM GUARDRAIL		F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED -				330	128R-3	LAKE	518	397
	PLOT SCALE = 50.0000 ' / IN.	CHECKED -	REVISED -					BM-21		CONTRACT NO. 60953	
	PLOT DATE = 1/4/2008	DATE -	REVISED -		SCALE: NONE	SHEET NO. 4 OF 4 SHEETS STA. TO STA.		FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT	



TRAFFIC CONTROL AND PROTECTION FOR SIDE ROADS, INTERSECTIONS, AND DRIVEWAYS

NOTES:

A. FOR NO LANE RESTRICTION ON THE SIDE ROAD OR DRIVEWAYS

1. SIDE ROAD WITH A SPEED LIMIT OF 40 MPH (60 km/h) OR LESS AS SHOWN ON THE DRAWING AND AS DIRECTED BY THE ENGINEER:

   a) ONE **ROAD CONSTRUCTION AHEAD** SIGN 36 x 36 (900x900) WITH A FLASHER AND FLAG MOUNTED ON IT APPROXIMATELY 200' (60 m) IN ADVANCE OF THE MAIN ROUTE.

   b) THE CLOSED PORTION OF THE MAIN ROUTE SHALL BE PROTECTED BY BLOCKING WITH TYPE I, TYPE II OR TYPE III BARRICADES, 1/3 OF THE CROSS SECTION OF THE CLOSED PORTION.

2. SIDE ROAD WITH A SPEED LIMIT GREATER THAN 40 MPH (60 km/h) AS SHOWN ON THE DRAWING AND AS DIRECTED BY THE ENGINEER:

   a) ONE **ROAD CONSTRUCTION AHEAD** SIGN 48 x 48 (1.2 m x 1.2 m) WITH A FLASHER MOUNTED ON IT APPROXIMATELY 500' (150 m) IN ADVANCE OF THE MAIN ROUTE.

   b) THE CLOSED PORTION OF THE MAIN ROUTE SHALL BE PROTECTED BY BLOCKING WITH TYPE III BARRICADES, 1/2 OF THE CROSS SECTION OF THE CLOSED PORTION.

3. WHEN THE SIDE ROAD LIES BETWEEN THE BEGINNING OF THE MAINLINE SIGNING AND THE WORK ZONE, A SINGLE HEADED ARROW (M6-1) SHALL BE USED IN LIEU OF THE DOUBLE HEADED ARROW (M6-4).

B. FOR A LANE CLOSURE ON A SIDE ROAD OR DRIVEWAY:

USE APPLICABLE PORTIONS OF THE TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES (STD. 701501, STD. 701606 OR THE APPROPRIATE STANDARD). THE SPACING OF SIGNS AND BARRICADES SHALL BE ADJUSTED FOR FIELD CONDITIONS AS DIRECTED BY THE ENGINEER. THE DIRECTIONAL ARROW SHALL BE COVERED OR REMOVED WHEN NO LONGER CONSISTENT WITH THE SIDE ROAD LANE CLOSURE.

C. ADVANCE WARNING SIGNS ARE TO BE OMITTED ON DRIVEWAY UNLESS OTHERWISE NOTED.

D. THE TRAFFIC CONTROL AND PROTECTION FOR SIDE ROADS, INTERSECTIONS, AND DRIVEWAYS SHALL BE INCIDENTAL TO THE COST OF SPECIFIED TRAFFIC CONTROL STANDARDS OR ITEMS.

All dimensions are in millimeters (inches) unless otherwise shown.

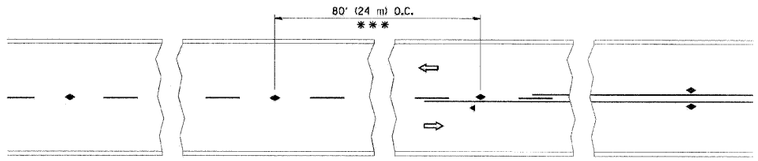
FILE NAME = W:\diststd\22x34\tc10.dgn	USER NAME = gaglianobt	DESIGNED - LHA	REVISED - J. OBERLE 10-18-95
		DRAWN -	REVISED - A. HOUSEH 03-06-96
	PLOT SCALE = 60.000 ' / IN.	CHECKED -	REVISED - A. HOUSEH 10-15-96
	PLOT DATE = 1/4/2008	DATE - 06-89	REVISED -T. RAMMACHER 01-06-00

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL AND PROTECTION FOR SIDE ROADS, INTERSECTIONS, AND DRIVEWAYS

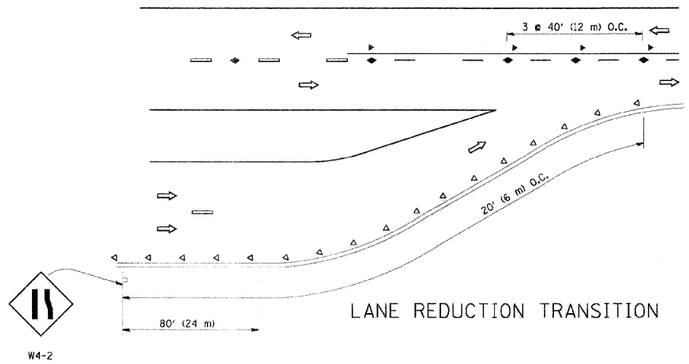
SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	398
	TC-10	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		

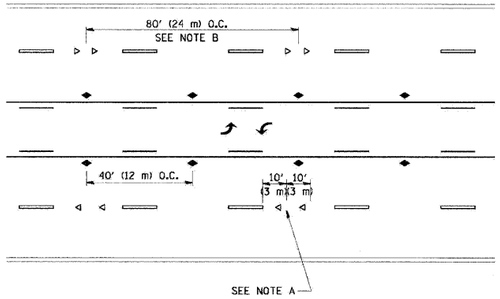


*** REDUCE TO 40' (12 m) O.C. ON CURVES WITH POSTED OR ADVISORY SPEED 45 M.P.H. (70 Km/h) OR LESS.

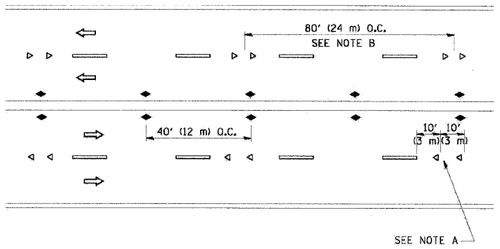
TWO-LANE/TWO-WAY



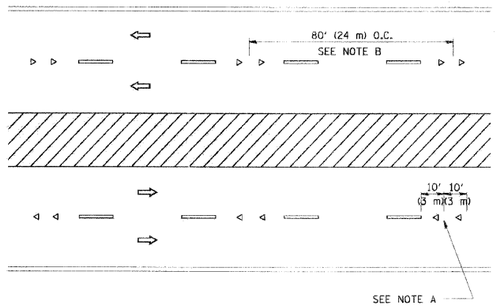
LANE REDUCTION TRANSITION



TWO-WAY LEFT TURN



MULTI-LANE/UNDIVIDED



MULTI-LANE/DIVIDED

GENERAL NOTES

1. MARKERS USED WITH DASHED LINES SHALL BE CENTERED IN THE GAP BETWEEN SEGMENTS.
2. MARKERS USED ADJACENT TO SOLID LINES SHALL BE OFFSET 2 TO 3 (50 TO 75) TOWARD TRAFFIC AS SHOWN.
3. MARKERS THROUGH TANGENTS LESS THAN 500' (150 m) IN LENGTH BETWEEN CURVES SHALL BE INSTALLED AT THE LESSER OF THE TWO CURVE SPACINGS.

SYMBOLS

- YELLOW STRIPE
- WHITE STRIPE
- ONE-WAY AMBER MARKER
- ONE-WAY CRYSTAL MARKER (W/O)
- TWO-WAY AMBER MARKER

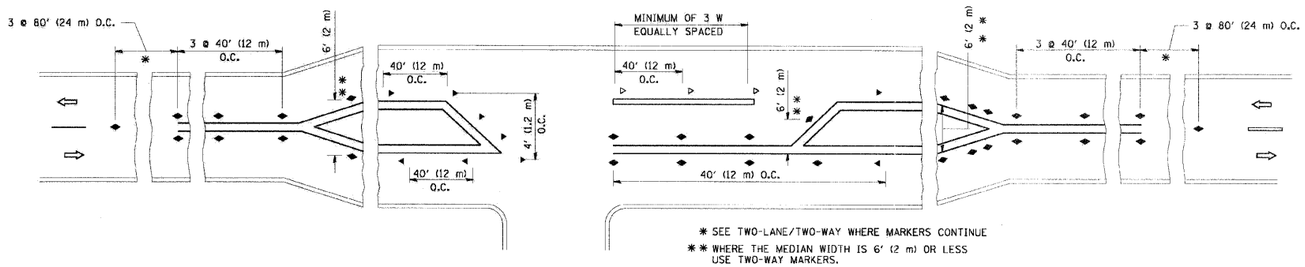
LANE MARKER NOTES

A. USE DOUBLE LANE LINE MARKERS SPACED AS SHOWN.

B. REDUCE TO 40' (12 m) O.C. ON CURVES WHERE ADVISORY SPEEDS ARE 10 M.P.H (20 km/h) LOWER THAN POSTED SPEEDS.

DESIGN NOTES

1. DOUBLE LANE LINE MARKERS SHALL BE USED UNLESS SPECIFIED OTHERWISE.
2. EXCEPT AS SHOWN ON THE LANE REDUCTION TRANSITION AND FREEWAY EXIT RAMP DETAIL, MARKERS ARE NOT TO BE SPECIFIED ON RIGHT EDGE LINES.
3. THE EXACT MARKER LIMITS, SPACING, AND COLOR SHOULD BE INCLUDED IN THE PLANS.
4. MARKERS SHOULD NOT BE USED ALONGSIDE CURBS EXCEPT FOR EXTREMELY SHORT SECTIONS OF CURBS WHERE NOT MORE THAN TWO MARKERS WOULD BE INVOLVED.



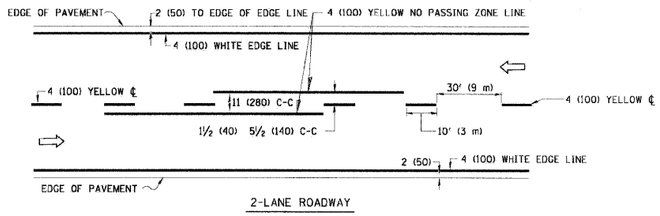
* SEE TWO-LANE/TWO-WAY WHERE MARKERS CONTINUE

** WHERE THE MEDIAN WIDTH IS 6' (2 m) OR LESS USE TWO-WAY MARKERS.

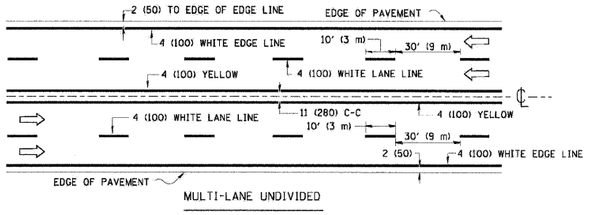
LEFT TURN

All dimensions are in inches (millimeters) unless otherwise shown.

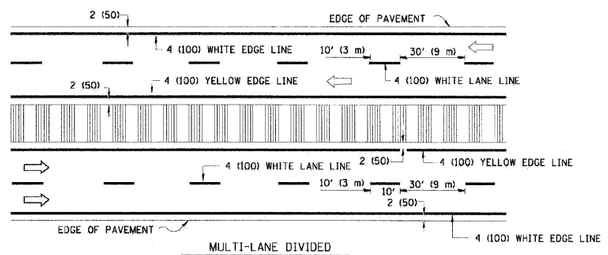
FILE NAME = d:\pw_work\pwidot\dc.vakosgn\d0128315\tc11.dgn	USER NAME = dr.vakosgn	DESIGNED -	REVISED - T. RAMMACHER 09-19-94	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL APPLICATIONS RAISED REFLECTIVE PAVEMENT MARKERS (SNOW-PLOW RESISTANT)			F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED - T. RAMMACHER 03-12-99					330	128R-3	LAKE	518	399
	PLOT SCALE = 50.000 ' / IN.	CHECKED -	REVISED - T. RAMMACHER 01-06-00						TC-11	CONTRACT NO. 60953		
	PLOT DATE = 9/9/2009	DATE -	REVISED - C. JUCIUS 09-09-09		SCALE: NONE	SHEET NO. 1 OF 1 SHEETS	STA. TO STA.	FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



2-LANE ROADWAY



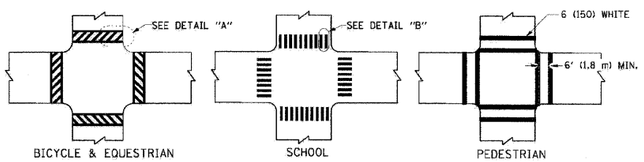
MULTI-LANE UNDIVIDED

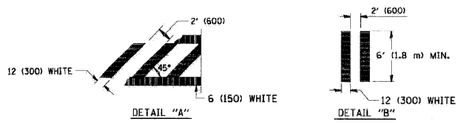


MULTI-LANE DIVIDED
WITH MOUNTABLE MEDIAN

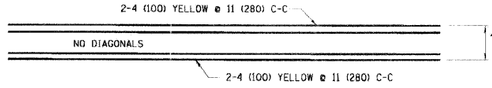
NOTE: MEDIANS WITH BARRIER CURB DO NOT REQUIRE AN EDGE LINE

TYPICAL LANE AND EDGE LINE MARKING

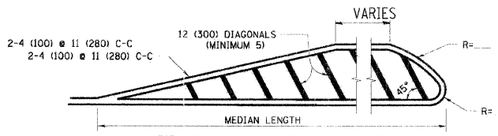




TYPICAL CROSSWALK MARKING



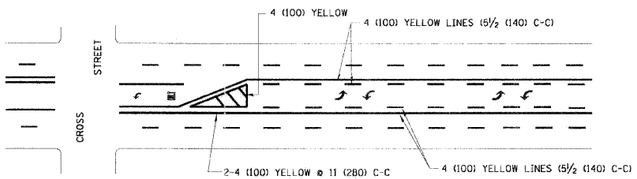
4' (1.2 m) WIDE MEDIANS ONLY



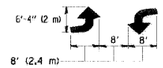
FOR MEDIAN LENGTHS WHERE DIAGONAL SPACING CANNOT BE ATTAINED, USE 5 (FIVE) EQUALLY SPACED DIAGONAL LINES.

DIAGONAL LINE SPACING: 50' (15 m) C-C (LESS THAN 30MPH (50 km/h))
75' (25 m) C-C 30MPH (50 km/h) TO 45MPH (70 km/h)
150' (45 m) C-C (MORE THAN 45MPH (70 km/h))

MEDIANS OVER 4' (1.2 m) WIDE

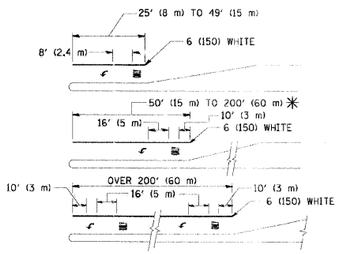


A MINIMUM OF TWO PAIRS OF TURN ARROWS SHALL BE USED, WHITE IN COLOR. ADDITIONAL PAIRS SHALL BE PLACED AT 200' (60 m) TO 300' (90 m) INTERVALS.



MEDIAN WITH TWO-WAY LEFT TURN LANE

TYPICAL PAINTED MEDIAN MARKING

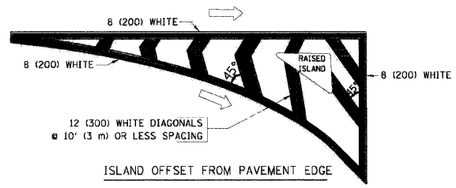


FULL SIZE LETTERS 8' (2.4 m) AND ARROWS SHALL BE USED.
↰ AREA = 15.6 SQ. FT. (1.5 m^2) ONLY AREA = 20.8 SQ. FT. (1.9 m^2)

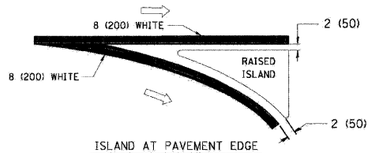
✳ TURN LANES IN EXCESS OF 400' (120 m) IN LENGTH MAY HAVE AN ADDITIONAL SET OF ARROW - "ONLY" INSTALLED MIDWAY BETWEEN THE OTHER TWO SETS OF ARROW - "ONLY".

TYPICAL LEFT (OR RIGHT) TURN LANE

TYPICAL TURN LANE MARKING



ISLAND OFFSET FROM PAVEMENT EDGE



ISLAND AT PAVEMENT EDGE

TYPICAL ISLAND MARKING

TYPE OF MARKING	WIDTH OF LINE	PATTERN	COLOR	SPACING / REMARKS
CENTERLINE ON 2 LANE PAVEMENT	4 (100)	SKIP-DASH	YELLOW	10' (3 m) LINE WITH 30' (9 m) SPACE
CENTERLINE ON MULTI-LANE UNDIVIDED PAVEMENT	2 @ 4 (100)	SOLID	YELLOW	11 (280) C-C
NO PASSING ZONE LINES: FOR ONE DIRECTION FOR BOTH DIRECTIONS	4 (100) 2 @ 4 (100)	SOLID SOLID	YELLOW YELLOW	5½ (140) C-C FROM SKIP-DASH CENTERLINE 11 (280) C-C OMIT SKIP-DASH CENTERLINE BETWEEN
LANE LINES	4 (100) 5 (125) ON FREEWAYS	SKIP-DASH SKIP-DASH	WHITE WHITE	10' (3 m) LINE WITH 30' (9 m) SPACE
DOTTED LINES (EXTENSIONS OF CENTER, LANE OR TURN LANE MARKINGS)	SAME AS LINE BEING EXTENDED	SKIP-DASH	SAME AS LINE BEING EXTENDED	2' (600) LINE WITH 6' (1.8 m) SPACE
EDGE LINES	4 (100)	SOLID	YELLOW-LEFT WHITE-RIGHT	OUTLINE MOUNTABLE MEDIANS IN YELLOW; EDGE LINES ARE NOT USED NEXT TO BARRIER CURB
TURN LANE MARKINGS	6 (150) LINE; FULL SIZE LETTERS & SYMBOLS (8' (2.4m))	SOLID	WHITE	SEE TYPICAL TURN LANE MARKING DETAIL
TWO WAY LEFT TURN MARKING	2 @ 4 (100) EACH DIRECTION 8' (2.4m) LEFT ARROW	SKIP-DASH AND SOLID IN PAIRS	YELLOW WHITE	10' (3 m) LINE WITH 30' (9 m) SPACE FOR SKIP-DASH; 5½ (140) C-C BETWEEN SOLID LINE AND SKIP-DASH LINE SEE TYPICAL TWO-WAY LEFT TURN MARKING DETAIL
CROSSWALK LINES (PEDESTRIAN) A. DIAGONALS (BIKE & EQUESTRIAN) B. LONGITUDINAL BARS (SCHOOL)	2 @ 6 (150) 12 (300) @ 45° 12 (300) @ 90°	SOLID SOLID SOLID	WHITE WHITE WHITE	NOT LESS THAN 6' (1.8 m) APART 2' (600) APART 2' (600) APART SEE TYPICAL CROSSWALK MARKING DETAILS.
STOP LINES	24 (600)	SOLID	WHITE	PLACE 4' (1.2 m) IN ADVANCE OF AND PARALLEL TO CROSSWALK, IF PRESENT. OTHERWISE, PLACE AT DESIRED STOPPING POINT. PARALLEL TO CROSSROAD CENTERLINE, WHERE POSSIBLE
PAINTED MEDIANS	2 @ 4 (100) WITH 12 (300) DIAGONALS @ 45° NO DIAGONALS USED FOR 4' (1.2 m) WIDE MEDIANS	SOLID	YELLOW: TWO WAY TRAFFIC WHITE: ONE WAY TRAFFIC	11 (280) C-C FOR THE DOUBLE LINE SEE TYPICAL PAINTED MEDIAN MARKING.
GORE MARKING AND CHANNELIZING LINES	8 (200) WITH 12 (300) DIAGONALS @ 45°	SOLID	WHITE	DIAGONALS: 15' (4.5 m) C-C (LESS THAN 30MPH (50 km/h)) 20' (6 m) C-C 30MPH (50 km/h) TO 45MPH (70 km/h) 30' (9 m) C-C (OVER 45MPH (70 km/h))
RAILROAD CROSSING	24 (600) TRANSVERSE LINES; "RR" IS 6' (1.8 m) LETTERS; 16 (400) LINE FOR "X"	SOLID	WHITE	SEE STATE STANDARD 780001 AREA OF: "R"=3.6 SQ. FT. (0.33 m^2) EACH "X"=54.0 SQ. FT. (5.0 m^2)
SHOULDER DIAGONALS	12 (300) @ 45°	SOLID	WHITE - RIGHT YELLOW - LEFT	50' (15 m) C-C (LESS THAN 30MPH (50 km/h)) 75' (25 m) C-C (30 MPH (50 km/h) TO 45MPH (70 km/h)) 150' (45 m) C-C (OVER 45MPH (70 km/h))

FOR FURTHER DETAILS ON PAVEMENT MARKING REFER TO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND STATE STANDARD 780001.

All dimensions are in inches (millimeters) unless otherwise shown.

FILE NAME = d:\pw_work\pwidot\drivakosgn\d0108315\tc13.dgn	USER NAME = drivakosgn	DESIGNED - EVERS	REVISED - T. RAMMACHER 10-27-94
		DRAWN -	REVISED - C. JUCIUS 09-09-09
	PLOT SCALE = 50.000 ' / IN.	CHECKED -	REVISED -
	PLOT DATE = 9/9/2009	DATE - 03-19-90	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISTRICT ONE
TYPICAL PAVEMENT MARKINGS

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
330	128R-3	LAKE	518	400
	TC-13	CONTRACT NO. 60953		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		