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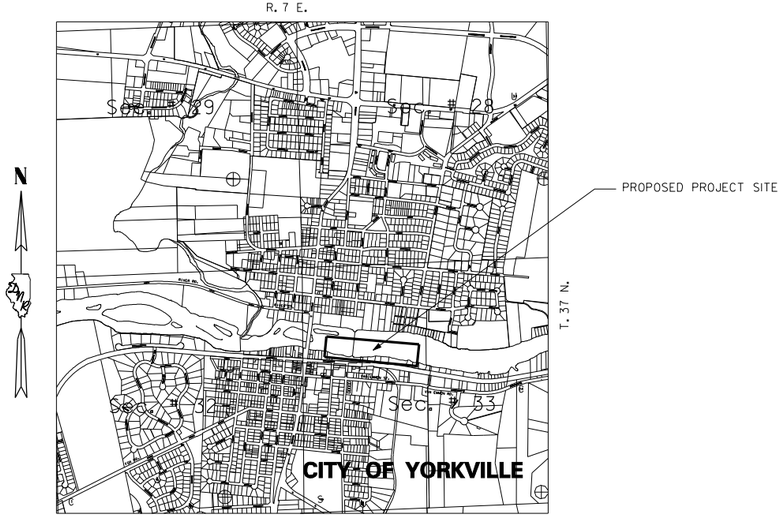
FOR INDEX OF SHEETS AND STANDARDS, SEE SHEET A2

STATE OF ILLINOIS
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF WATER RESOURCES

MULTI–PURPOSE DAM PROJECT – PHASE 2 – CANOE AND FISH BYPASS CHANNEL YORKVILLE DAM – FOX RIVER

YORKVILLE, ILLINOIS
KENDALL COUNTY
FR–423
2007

REGIONAL MAP



LOCATION MAP

0 ½ mile 1 mile

Scale: 1"=1500'

0 100′ 200′ 300′ 1"= 100′
0 10′ 20′ 30′ 1"= 10′
0 50′ 100′ 1"= 50′
0 50′ 100′ 1"= 40′
0 50′ 100′ 1"= 30′
0 50′ 100′ 1"= 20′

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.

BYRON T. DANLEY 062-044058 LICENSED PROFESSIONAL ENGINEER OF ILLINOIS 4/4/07

STATE OF ILLINOIS BYRON T. DANLEY 081-004737 CHICAGO IL LICENSED STRUCTURAL ENGINEER 4/4/07

081-004737
ILLINOIS REGISTERED STRUCTURAL ENGINEER NO.
LICENSE EXPIRES 11-30-2008

062-044058
ILLINOIS REGISTERED PROFESSIONAL ENGINEER NO.
LICENSE EXPIRES 11-30-2007

SUBMITTED BY William J. Stuck MANAGER, DIVISION OF PROJECT IMPLEMENTATION DATE Oct. 10, 2007

APPROVED BY [signature] DIRECTOR DATE Oct. 10, 2007

INDEX OF SHEETS

STANDARDS

280001	TEMPORARY EROSION CONTROL SYSTEM
664001	CHAIN LINK FENCE
720001	SIGN PANEL MOUNTING DETAILS
720006	SIGN PANEL ERECTION DETAILS
720021-01	SIGN PANELS EXTRUDED ALUMINUM TYPE
602401	MANHOLE TYPE A
602601	PRECAST REINFORCED CONCRETE FLAT SLAB TOP

ILL. DEPT. OF NATURAL RESOURCES
OFFICE OF WATER RESOURCES
CANOE AND FISH BYPASS CHANNEL

BUILT 200* FR - 423

NOTE:
1. Place this name plate adjacent to the plate placed for Phase 1
2. For Name Plate Details see sheet A3
* To be determined IDNR at time of construction

UTILITY REFERENCE TABLE

J.U.L.I.E.	Call 48 hours prior to construction	(800) 892-0123
City of Yorkville Water & Sewer	Eric Dhuse, Director of Public Works 800 Game Farm Road Yorkville, IL 60560 -	(630) 553-4370
Electricity	Commonwealth Edison - - -	(800) 334-7661
Telephone/SBC	John Evers, Plan Engineer 40 S. Mitchell Court Addison, IL 60101 -	(630) 620-3897
Gas	Monty Johns Nicor Gas - -	(815) 433-3850 Ext.244

BILL OF MATERIALS

ITEM	UNIT	QUANTITY
Name Plates	EACH	1.0

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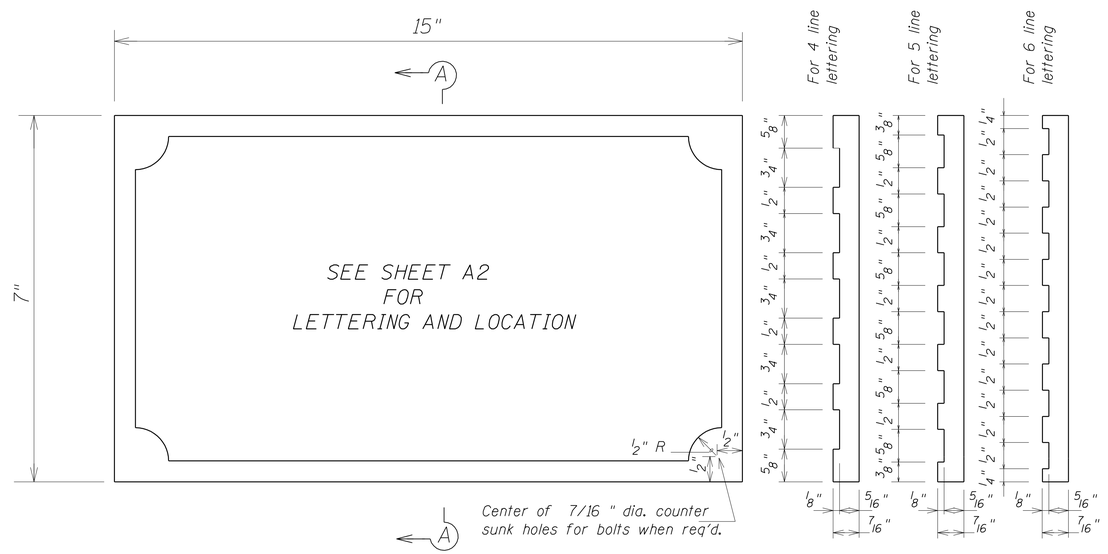
Designed By JPR Checked By TKL
Drawn By JPR Checked By TKL

STANDARD SYMBOLS

Center Line
Property Line
Existing Right of Way
Proposed Right of Way
Permanent Easement — Perm. Ease.
Temporary Easement — Temp. Ease.
Railroad Tracks
Existing Culvert
Culvert to be Constructed
Guy Wire or Anchor
Guy Pole
Powerline Pole
Telephone or Telegraph Pole
Pipelines
Gas — G
Water — W
Oil — O
Storm Sewer — SS
Sanitary Sewer — San
Electric Cable, U (Underground), A (Aerial) — E
Telephone Cable, U (Underground), A (Aerial) — T
Cable Television, U (Underground), A (Aerial) — TV
Catch Basin
Manhole
Inlet
Waterline Valve
Fire Hydrant
Vents — V
Meter Boxes — M
Traps, Grease etc. — T
Cistern or Well — C
Cesspool or Septic Tank
Fountain — F
Fenceline
Direction of Flow
Bridge
Tailwater Gage Pipe

Tree
Existing Concrete Revetment Blocks
Median Water Surface Elevation (W.S.E.)
Median Water Surface
Tree to be Removed



SECTION A-A

DETAIL OF NAME PLATE

Material - Best quality brass or bronze.

Bordering and Lettering - Raised 1/8", square cut and not tapered. Top surface polished.

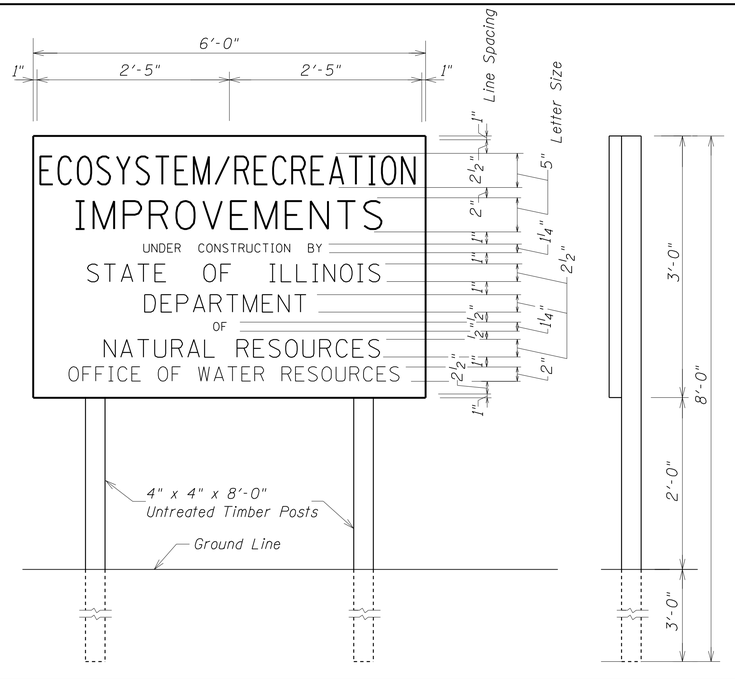
Fastenings - For concrete rails and culvert headwalls: 4 lugs at least 3" long cast on back of plate.
For steel rails: plate to be bolted on with 4 - 3/8" dia. brass or bronze hex head bolts.

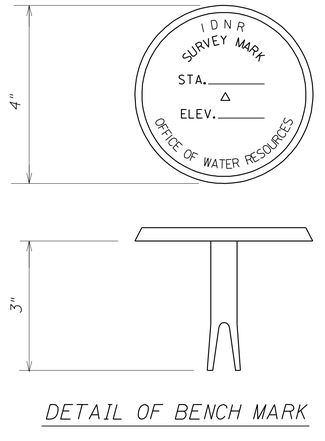
GENERAL NOTES

Signs shall be made of 1" lumber rigidly cleated, or of metal (18 ga.). The Contractor shall furnish all material and labor for constructing and erecting the signs. The signs shall be placed prior to the starting of actual construction operations at each end of the construction section or as directed by the Engineer. Before any sign is erected, it shall be approved by the Engineer as to its appearance and quality of construction. The signs shall remain in place and shall be maintained in satisfactory condition until the project is accepted by the department. The Contractor shall then remove the signs and the material will become his property.

The letters on the sign shall be black mechanical style on a white background and appropriate border lines. The signs shall be painted by a professional painter, and the size of the letters shall be as shown on these Plans.

No extra compensation will be allowed the Contractor for these signs and the cost shall be considered incidental to the contract.





DETAIL OF BENCH MARK

Bench Mark to be furnished by the Office of Water Resources.

See Design Plans for location.

Cost of placing shall be considered incidental to the Contract.

NOTE TO CONTRACTOR

The Standards for the Construction Sign, Name Plate and Bench Mark shown on this sheet shall be used only when called for on the Plans.

FR–423

TENG
TENG & ASSOCIATES, INC.
ENGINEERS/ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

STANDARD SYMBOLS, PROJECT NAME PLATE, SIGNS AND BENCH MARK

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Designed By JPR Checked By TKL
Drawn By JPR Checked By TKL

SUMMARY OF QUANTITIES

S.P.	CODE NO.	PAY ITEM	UNIT	QUANTITY
	20100110	TREE REMOVAL (6 TO 15 UNIT DIAMETER)	UNIT	64
	20101000	TEMPORARY FENCE	FOOT	1,410.0
	20101100	TREE TRUNK PROTECTION	EACH	15
	20200100	EARTH EXCAVATION	CU YD	8,652
	20200200	ROCK EXCAVATION	CU YD	1,968
	20201200	REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	3,848
	21101505	TOPSOIL EXCAVATION AND PLACEMENT	CU YD	1,030
	25100630	EROSION CONTROL BLANKET	SQ YD	6,114
	28000250	TEMPORARY EROSION CONTROL SEEDING	POUND	268
	28100210	STONE RIPRAP, CLASS A5	TON	4,305
	28200200	FILTER FABRIC	SQ YD	50
	42400200	PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	18,903
	44000600	SIDEWALK REMOVAL	SQ FT	460
	48101200	AGGREGATE SHOULDERS, TYPE B	TON	19
	50102400	CONCRETE REMOVAL	CU YD	283
	50300225	CONCRETE STRUCTURES	CU YD	159
	50500405	FURNISHING AND ERECTING STRUCTURAL STEEL	POUND	1,690
	50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	12,680
	50900805	PEDESTRIAN RAILING	FOOT	88
	51500100	NAME PLATES	EACH	1
	54010503	PRECAST CONCRETE BOX CULVERT 5′ x 3′	FOOT	5
	550A0410	STORM SEWERS CLASS A, TYPE 2 24"	FOOT	88
	551B0200	STORM SEWER INSTALLATION (PVC) CLASS B 6"	FOOT	45
	60224600	RESTRICTED DEPTH MANHOLE, 4′-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	2
	67000400	ENGINEER'S FIELD OFFICE, TYPE A	CAL MO	24
	67100100	MOBILIZATION	LSUM	1
	72000200	SIGN PANEL TYPE 3	SQ FT	352
	73000100	WOOD SIGN SUPPORT	FOOT	327
*	X0323973	SEDIMENT CONTROL, SILT FENCE	FOOT	775
*	X0323974	SEDIMENT CONTROL, SILT FENCE MAINTENANCE	FOOT	390
	XX002196	CLEARING	ACRE	0.10
*	XX003949	CONSTRUCTION STAKING	L SUM	1
*		STONE RIPRAP REMOVAL	TON	342
*		RIPRAP FOR STILLING BASIN RELOCATION	TON	1,361
*		GROUTED BOULDERS	CU YD	2,431
*		FEATURE BOULDERS	TON	1,016
*		STONE RIPRAP CLASS A5 (SPECIAL)	TON	10,362
*		TEMPORARY COFFERDAM SYSTEM	L SUM	1
*		SEEDING AND FERTILIZING	ACRE	1.26
*		WET PRAIRIE SEED MIX	ACRE	1.42
*		GALVANIZED WELDED STEEL BAR GRATING	SQ FT	39
*		ROLLER COMPACTED CONCRETE	CU YD	4,081
*		RECORDER GAGE HOUSE REMOVAL	L SUM	1
*		BUOYS	EACH	8
*		WEEP DRAIN	EACH	17
*		BYPASS TESTING AND ADJUSTMENTS	DAY	8
*		STEEL TRASH RACK	EACH	1
*		SLIDE GATE	EACH	1
*		PRECAST STOPLOG BLOCKS	L SUM	1
*		CONCRETE COLLAR	EACH	2
*		FLOATING SIGN	EACH	3
*		FLEXIBLE GROWTH MEDIUM	ACRE	1.42
*		GENERAL FILL	CU YD	618

* ITEM REQUIRES SPECIAL PROVISION

EARTHWORK SUMMARY TABLE

(ALL UNITS IN CUBIC YARDS)

EARTH EXCAVATION	EXCAVATION TO BE USED IN EMBANKEMENT (15% SHRINKAGE)	EMBANKEMENT (GENERAL FILL)	EARTHWORK BALANCE WASTE + OR SHORTAGE -
8,651.6	7,353.9	7,972.3	-618.4

GENERAL NOTES

1. All elevations are based on N.G.V.D. (National Geodetic Vertical Datum) 1929.

2. All coordinates are NAD 1983 with 1986 Adjustment.

3. The plan and profile drawings reflect detailed topographic contours. These contours reflect intent. Generally, the orientation and relationship of the boulders is a determining factor in satisfactory work to avoid creating hazards, accomplishing hydraulic performance and satisfactory appearance. The various sections and details illustrate the rock placement. At hydraulic controls such as entries to waterways, crests of chutes, sills and constriction, and other designated locations on the drawings or in the field, placement dimensions or variations allowed are illustrated and will be verified or clarified in the field by the Engineer.

4. The Contractor shall furnish, erect, and when directed by the Engineer, completely remove two construction signs. The exact location of the signs shall be determined by the Engineer in the field.

5. All lateral drainage that exists prior to construction shall be restored as shown on the plans and as directed by the Engineer. Unless otherwise specified all costs of restoration shall be considered incidental to the Contract, and no additional compensation will be allowed.

6. All construction operations shall be contained within the easement area or work limits as indicated on the plans.

7. Class SI Concrete shall be used throughout unless specifically called out elsewhere.

8. The Contractor shall submit his or her proposed method of river diversion and dewatering to the Engineer for approval prior to beginning construction.

9. The Contractor is reminded to protect and restore at his or her expense, in accordance with Article 107.20 of the Standard Specifications, any private or public property, including access roads, which may be damaged or destroyed due to construction operations.

10. All utilities affected by the improvement shall be adjusted by others except as noted in the plans. Prior to beginning work in the vicinity of the utilities, the Contractor shall contact the respective owners as shown on sheet A2, and shall schedule work so as not to interfere with these adjustments.

11. Unless otherwise specified, all utilities shall be protected and not disturbed. All drainage outfalls shall be protected and maintained. All costs of protection shall be considered incidental to the contract, and no additional compensation will be allowed.

12. All open excavations are to be surrounded with a 4′-0" construction fence during non-working hours. The fence material shall be approved by the Engineer. The cost shall be included in the contract unit price per cubic yard for the type of excavation specified.

13. All borrow and/or disposal sites off project right-of-way shall be approved through the IDNR CERP (Comprehensive Enviromental Review Process) to avoid potential wetland, cultural resource or endangered species impacts.

14. All access to the construction site shall be provided by the Contractor within the temporary easement shown on the plans. Cost of providing access to the site for construction equipment, materials and other items shall not be paid for separately, but shall be included in the overall constructed price for the project.

15. All dimensions on plans are in feet unless otherwise noted.

16. Contractor employee vehicles shall be parked within the temporary construction easement.

17. Access to Commonwealth Edison Company Substation and Parks Department Building shall not be obstructed by the Contractor.

18. Competent rock or firm bedrock shall exhibit a rock fabric that is solid and that is not removable with hand tools. It shall offer notable resistance when impacted by a Swiss or Schmidt hammer. Easily fractured materials or materials exhibiting a soil-like matrix shall not be considered as firm bedrock or competent rock.

19. Contractor must submit cofferdam plans and computations sealed by a Structural Engineer in Illinois to both Engineer and INDR/Office of Water Resources, Division of Resource Management for approval prior to implementation.

20. The vertical alignment for the sidewalks can be determined using the cross sections. The cross sections provide the south sidewalk Station (SW STA. is along the south edge of the sidewalk) and north sidewalk Station (DI STA. is along the north edge of the sidewalk) and their corresponding elevation.

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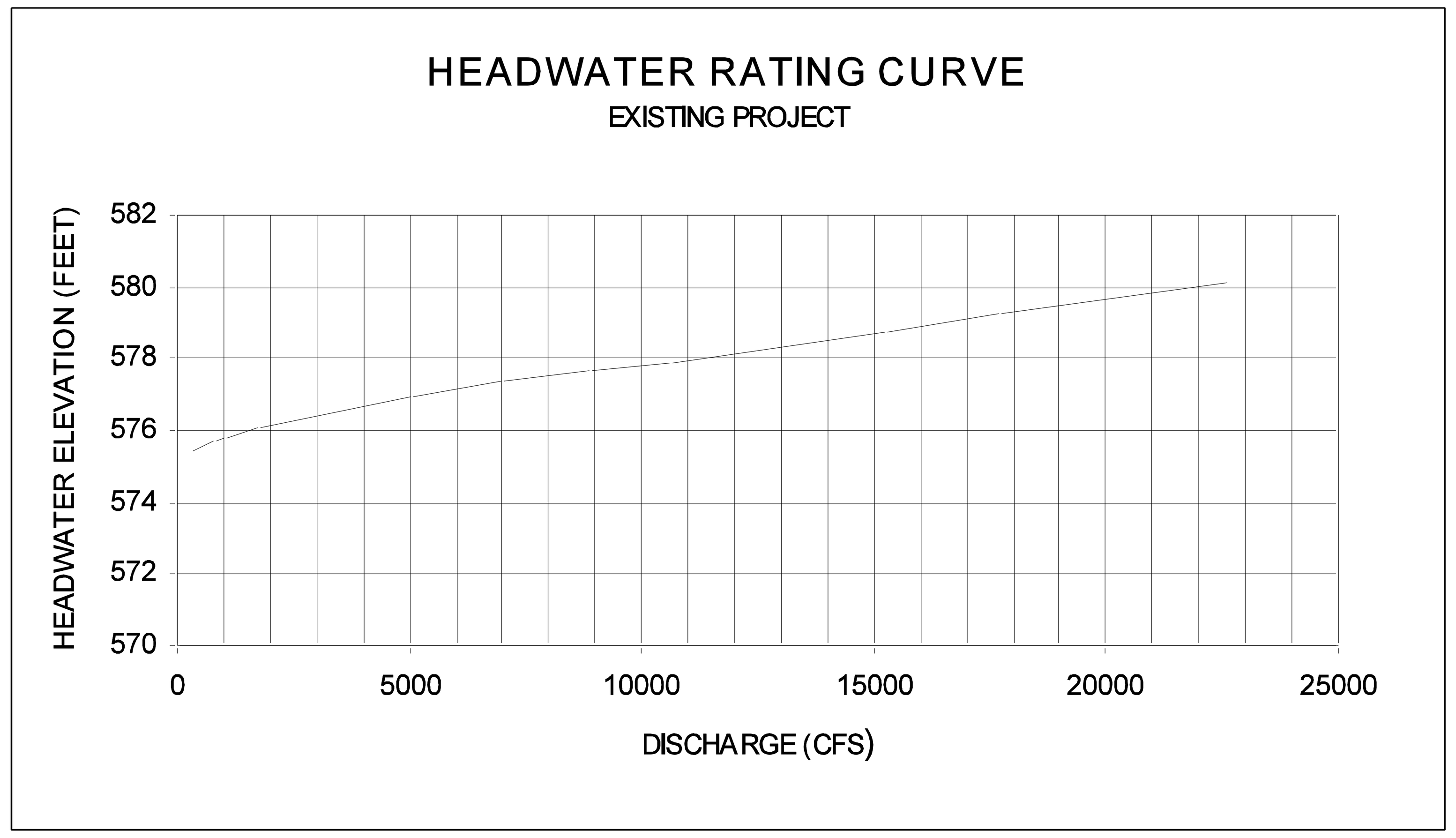

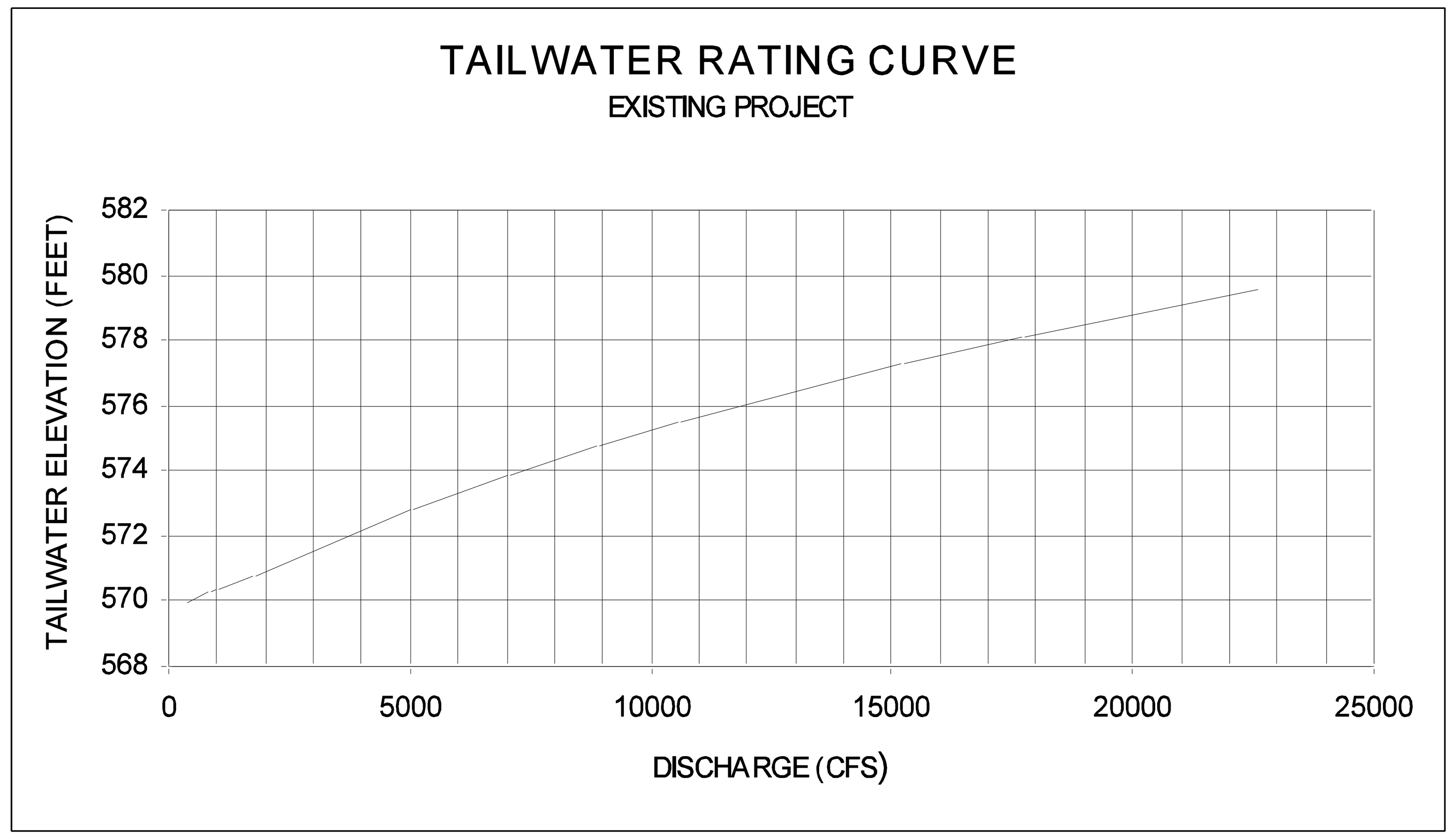

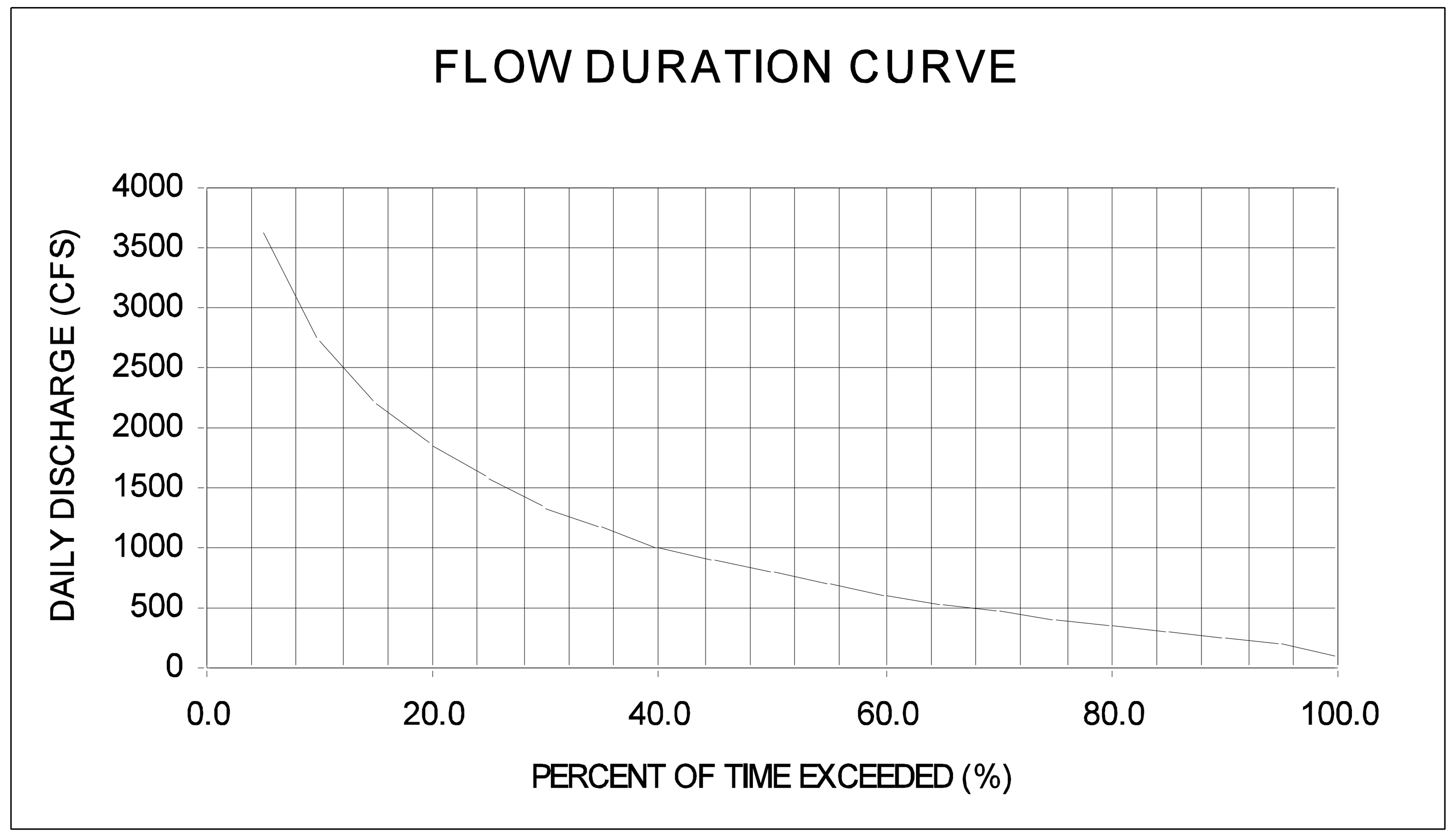

Floods Frequency Estimates

Recurrence Interval (yr)	River* Flow (cfs)
Annual Mean Discharge	790
April Mean Discharge	1750
1	5000
2	7000
5	8900
10	10580
50	15221
100	17697
500	22615

* These river flows were estimated in the Kendall County Flood Insurance Study dated May 15, 2002

NOTES:

1. The rating curves and duration curve for the dam site are shown on this sheet solely for the information of the Contractor in timing his construction operations to prepare for such flood storage and/or to bypass such flows as may be necessary. The Department assumes no responsibility for any deductions, interpretations, or conclusions that may be made from the curves.

2. Existing staff gage location is labeled on sheet C7.

TENG
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ENGINEERS/ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

HYDROLOGIC AND HYDRAULIC INFORMATION

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LOWER DIVIDER ISLAND

- 5 FT. WIDE CONCRETE PATH TO PROVIDE ACCESS.
- OVERFLOWS CAN SPILL EITHER WAY, PATHS ON BOTH SIDES OF BYPASS WILL BE INUNDATED BY FLOODS.
- USE RIPRAP SPECIAL ON EXPOSED SURFACES.

PROTECT YORKVILLE WATERLINE AND COORD. W/ PHASE 1 IMPROVEMENTS

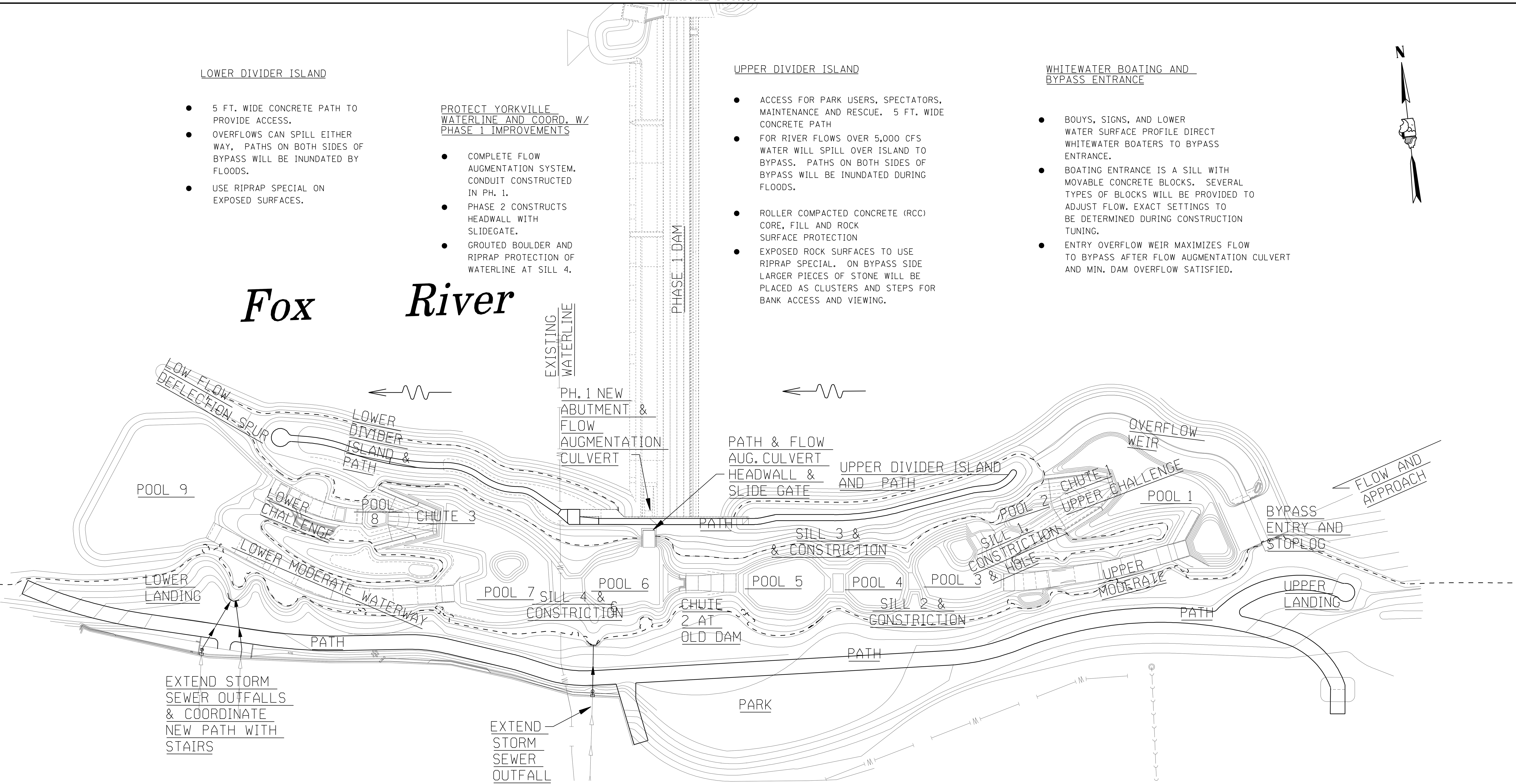
- COMPLETE FLOW AUGMENTATION SYSTEM. CONDUIT CONSTRUCTED IN PH. 1.
- PHASE 2 CONSTRUCTS HEADWALL WITH SLIDEGATE.
- GROUTED BOULDER AND RIPRAP PROTECTION OF WATERLINE AT SILL 4.

UPPER DIVIDER ISLAND

- ACCESS FOR PARK USERS, SPECTATORS, MAINTENANCE AND RESCUE. 5 FT. WIDE CONCRETE PATH
- FOR RIVER FLOWS OVER 5,000 CFS WATER WILL SPILL OVER ISLAND TO BYPASS. PATHS ON BOTH SIDES OF BYPASS WILL BE INUNDATED DURING FLOODS.
- ROLLER COMPACTED CONCRETE (RCC) CORE, FILL AND ROCK SURFACE PROTECTION
- EXPOSED ROCK SURFACES TO USE RIPRAP SPECIAL. ON BYPASS SIDE LARGER PIECES OF STONE WILL BE PLACED AS CLUSTERS AND STEPS FOR BANK ACCESS AND VIEWING.

WHITEWATER BOATING AND BYPASS ENTRANCE

- BOUYS, SIGNS, AND LOWER WATER SURFACE PROFILE DIRECT WHITEWATER BOATERS TO BYPASS ENTRANCE.
- BOATING ENTRANCE IS A SILL WITH MOVABLE CONCRETE BLOCKS. SEVERAL TYPES OF BLOCKS WILL BE PROVIDED TO ADJUST FLOW. EXACT SETTINGS TO BE DETERMINED DURING CONSTRUCTION TUNING.
- ENTRY OVERFLOW WEIR MAXIMIZES FLOW TO BYPASS AFTER FLOW AUGMENTATION CULVERT AND MIN. DAM OVERFLOW SATISFIED.



LOWER LANDING AND POOL 9

- ACCESS FOR BOATING
- POOL 9 AND TRANSITION TO DOWNSTREAM WATERWAYS
- EDDY TURNS FROM BYPASS

LOWER DUAL WATERWAYS

- MODERATE WATERWAY FOR EASIER BOATING
- CHALLENGE WATERWAY MORE DIFFICULT. CHUTE AND FAST WATERWAY WITH EDDIES AND WAVES.
- ADJUSTABLE ENTRANCE TO MODERATE WATERWAY ALLOWS FLOW SPLIT AND UPSTREAM POOL LEVEL TUNING
- TWO STORM OUTFALLS.
- 12 FT. WIDE CONCRETE PATH ALLOWS EMERGENCY VEHICLE ACCESS

MIDDLE OF BYPASS AND PARK

- CHUTE 2 CONSTRUCTED IN NOTCH THROUGH EXISTING DAM.
- 4 POOLS AND 2 CONSTRICTION/SILLS WHICH ARE ADJUSTABLE FOR WATER LEVEL AND PERFORMANCE TUNING.
- STORM SEWER OUTFALL
- PARK GRADING AND 12 FT. WIDE CONCRETE PATH ALLOWS EMERGENCY VEHICLE ACCESS
- PROTECT EXISTING 24-IN DIP WATERLINE RIVER CROSSING

UPPER DUAL WATERWAYS

- MODERATE WATERWAY FOR EASIER BOATING
- CHALLENGE WATERWAY MORE DIFFICULT. INCLUDES CHUTE AND HOLE.
- ADJUSTABLE ENTRANCE TO MODERATE WATERWAY ALLOWS FLOW TO SPLIT AND UPSTREAM POOL LEVEL TUNING
- PARK REGRADING AND 12 FT. WIDE CONCRETE PATH ALLOWS EMERGENCY VEHICLE ACCESS

UPPER LANDING AND PRIMARY MAINTENANCE ACCESS

- ACCESS FOR BOATING, HEAVY MAINTENANCE, AND ADJUSTMENTS.
- BUOYS AND SIGNAGE HERE AND UPSTREAM
- LANDING FOR TAKEOUT FOR UPSTREAM PADDLE BOATERS.
- TEMPORARY CONSTRUCTION COFFERS PLACED THROUGH UPSTREAM OF ENTRY STOPLOG AND OVERFLOW WEIR

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LEGEND:
C-1 DAM CORES WITH MIN. 5' ROCK CORE BELOW
B1 SOIL BORINGS WITH 10' ROCK CORES
A1 SOIL BORINGS TO TOP OF BED ROCK
W1 SOIL BORINGS TO TOP OF CONCRETE APRON
ET-1 EXPLORATORY TRENCHES
F1 BRIDGE ABUTMENT BORING - SOIL AND 10' ROCK CORE
S1 SOIL DREDGINGS - SEDIMENT TESTING

Bill of Material

Item	Unit	Qty
Clearing	Acres	0.10
Temporary Fence	foot	1410.0
Tree Removal (6 to 15 unit diameter)	Unit	64
Tree Trunk Protection	Ea.	15
Sidewalk Removal	Sq. Ft.	460.0
Sediment Control, Silt Fence	foot	775.0
Sediment Control, Silt Fence Maintenance	foot	390.0
Erosion Control Blanket	Sq. Yd.	6,113.6
Portland Cement Concrete Sidewalk 5 Inch	Sq. Ft.	18,902.6

PARCEL NO.	TYPE	REQUIRED ACQUISITIONS AREA (SQ FT)	COORDINATES OF CORNERS							
			NORTHEAST		NORTHWEST		SOUTHWEST		SOUTHEAST	
1	PERM. EASEMENT	1109.58	N 1812303.55	E 954455.90	N 1812300.78	E 954423.93	N 1812265.19	E 954421.35	N 1812269.96	E 954453.62
1	TEMP. EASEMENT	901.31	N 1812269.96	E 954453.62	N 1812265.19	E 954421.35	N 1812234.88	E 954419.15	N 1812244.06	E 954451.86
2	PERM. EASEMENT	3032.75	N 1812313.11	E 954556.78	N 1812303.55	E 954455.90	N 1812269.96	E 954453.62	N 1812284.85	E 954554.86
2	TEMP. EASEMENT	1907.85	N 1812284.85	E 954554.86	N 1812269.96	E 954453.62	N 1812244.06	E 954451.86	N 1812273.13	E 954553.99
3	PERM. EASEMENT	6465.05	N 1812323.61	E 954730.06	N 1812313.11	E 954556.78	N 1812284.85	E 954554.86	N 1812272.00	E 954721.65
3	TEMP. EASEMENT	187.91	N 1812282.31	E 954586.22	N 1812284.85	E 954554.86	N 1812273.13	E 954553.99	N 1812282.31	E 954586.22
4	PERM. EASEMENT	6472.28	N 1812310.17	E 954854.52	N 1812323.61	E 954730.06	N 1812272.00	E 954721.65	N 1812262.44	E 954846.60
4	TEMP. EASEMENT	11332.23	N 1812262.44	E 954846.60	N 1812272.00	E 954721.65	N 1812183.34	E 954707.22	N 1812172.38	E 954832.08
5	PERM. EASEMENT	1203.87	N 1812301.25	E 954933.88	N 1812310.17	E 954854.52	N 1812295.47	E 954852.12	N 1812286.49	E 954931.79
5	TEMP. EASEMENT	9956.66	N 1812286.49	E 954931.79	N 1812295.47	E 954852.12	N 1812172.38	E 954832.08	N 1812163.96	E 954912.02

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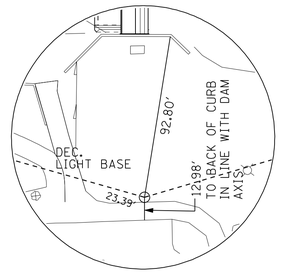
TENG & ASSOCIATES, INC.
ENGINEERS/ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

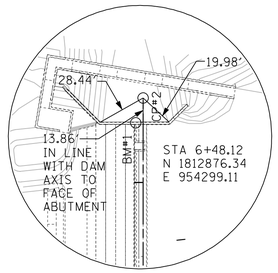
GENERAL PROJECT PLAN AND BORING LOCATIONS

CURVE C1	CURVE C2	CURVE C3
PROP CURVE C1	PROP CURVE C2	PROP CURVE C3
PI STA = 7+09.81	PI STA = 12+70.74	PI STA = 13+36.88
Δ = 31° 51′ 51″	Δ = 8° 36′ 13″	Δ = 7° 30′ 10″
D = 38° 51′ 7″	D = 23° 52′ 24″	D = 23° 52′ 24″
R = 150.000	R = 240.000	R = 240.000
T = 42.82	T = 18.07	T = 15.77
L = 82.34	L = 36.01	L = 31.44
E = 5.99	E = 0.68	E = 0.52
P.C. STA = 6+67.73	P.C. STA = 12+57.70	P.C. STA = 13+31.50
P.T. STA = 7+05.26	P.T. STA = 12+88.75	P.T. STA = 13+62.61

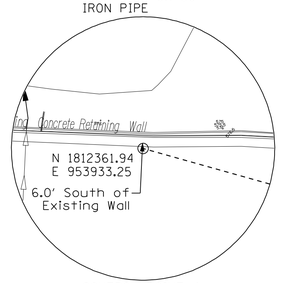
CURVE C4	CURVE C5
PROP CURVE C4	PROP CURVE C5
PI STA = 14+16.14	PI STA = 6+70.16
Δ = 7° 31′ 1″	Δ = 23° 59′ 38″
D = 23° 52′ 24″	D = 47° 46′ 51″
R = 240.000	R = 119.914
T = 15.74	T = 25.54
L = 31.43	L = 49.87
E = 0.52	E = 2.69
P.C. STA = 14+10.42	P.C. STA = 6+55.03
P.T. STA = 14+41.89	P.T. STA = 7+05.26



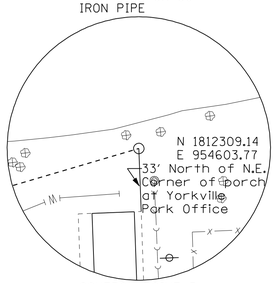
CONTROL POINT 1
IDNR DISK ON 30″
IRON PIPE



CONTROL POINT 2
IDNR DISK ON 30″
IRON PIPE



CONTROL POINT 4
2″ DIA IDNR CAP
ON IRON PIPE



CONTROL POINT 5
2″ DIA IDNR CAP
ON IRON PIPE

0 50′ 100′ 1″= 40′

BENCHMARK 1
METAL PLUG IN CHISELED SQUARE ON NORTH ABUTMENT
ELEVATION = 582.096 (NGVD '29)
N 1812862.756
E 954293.472

BENCHMARK 2
METAL PLUG IN CHISELED SQUARE ON SOUTH ABUTMENT
ELEVATION = 582.00 (NGVD '29)
N 1812333.455
E 954238.328

BENCHMARK 3
⅝″ DIAMETER IRON PIN WITH DNR CAP
ELEVATION = 582.575 (NGVD '29)
N 1812264.495
E 953943.582

LEGEND:

- ○ CP - CONTROL POINT
- ○ BM - BENCHMARK

CURVE S1

PROP. CURVE S1
PI STA. = 5+24.68
Δ = 15° 05′ 52″ (LT)
D = 14° 41′ 28″
R = 390.00′
T = 51.68′
L = 102.77′
E = 3.41′
P.C. STA. = 4+73.00
P.T. STA. = 5+75.77

CURVE S2

PROP. CURVE S2
PI STA. = 7+06.64
Δ = 9° 24′ 40″ (LT)
D = 13° 28′ 53″
R = 425.00′
T = 34.98′
L = 69.81′
E = 1.44′
P.C. STA. = 6+71.65
P.T. STA. = 7+41.46

CURVE S3

PROP. CURVE S3
PI STA. = 8+08.90
Δ = 14° 31′ 52″ (RT)
D = 42° 26′ 16″
R = 135.01′
T = 17.21′
L = 34.24′
E = 1.09′
P.C. STA. = 7+91.69
P.T. STA. = 8+25.93

CURVE S4

PROP. CURVE S4
PI STA. = 8+85.37
Δ = 4° 33′ 25″ (RT)
D = 39° 24′ 36″
R = 145.38′
T = 5.78′
L = 11.56′
E = 0.12′
P.C. STA. = 8+79.58
P.T. STA. = 8+91.15

CURVE S5

PROP. CURVE S5
PI STA. = 9+28.58
Δ = 21° 09′ 18″ (LT)
D = 57° 17′ 45″
R = 100.00′
T = 18.67′
L = 36.92′
E = 1.73′
P.C. STA. = 9+09.91
P.T. STA. = 9+46.83

CURVE S6

PROP. CURVE S6
PI STA. = 12+69.32
Δ = 18° 25′ 03″ (LT)
D = 30° 09′ 20″
R = 190.00′
T = 30.80′
L = 61.08′
E = 2.48′
P.C. STA. = 12+38.52
P.T. STA. = 12+99.59

CURVE S7

PROP. CURVE S7
PI STA. = 14+18.21
Δ = 41° 16′ 09″ (RT)
D = 18° 11′ 21″
R = 315.00′
T = 118.62′
L = 226.89′
E = 21.59′
P.C. STA. = 12+99.59
P.T. STA. = 15+26.48

CURVE S8

PROP. CURVE S8
PI STA. = 15+56.36
Δ = 50° 52′ 27″ (RT)
D = 86° 48′ 42″
R = 66.00′
T = 34.88′
L = 64.17′
E = 8.65′
P.C. STA. = 15+26.48
P.T. STA. = 15+85.08

TENG
TENG & ASSOCIATES, INC.
ENGINEERS/ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

0 50' 100' — 1"= 40'

TEMPORARY COFFERDAM SYSTEM NOTES:
THE TEMPORARY COFFERDAM SYSTEM SHALL BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR. THE WIDTH OF THE COFFERDAM PERPENDICULAR TO THE RIVER SHALL BE DETERMINED BY THE CONTRACTOR BASED UPON THE "ENCROACHMENT VERSUS DISCHARGE" OPERATION CURVE SHOWN ON THIS SHEET. THE POOL STAGE VS. DISCHARGE RATING CURVE REPRESENTS ACCEPTABLE WATER SURFACE ELEVATIONS DIRECTLY UPSTREAM OF THE COFFERDAM SYSTEM FOR VARIOUS DISCHARGES AT THE MAXIMUM COFFERDAM ENCROACHMENT. THE CURVE ESTABLISHES THE LIMITS FOR AN EARTHEN TYPE COFFERDAM SYSTEM CONSTRUCTED IN THE POOL AREA UPSTREAM OF THE DAM.

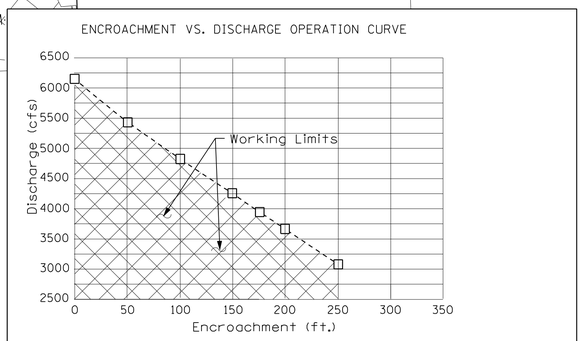
THE CONTRACTOR SHALL AT ALL TIMES OPERATE WITHIN THE LIMITS STATED ABOVE. IN ADDITION TO THESE LIMITS THE CONTACTOR SHALL NOT CONSTRUCT A COFFERDAM OR MULTIPLE COFFERDAMS WITH A TOTAL ENCROACHMENT WIDER THAN 250 FEET PERPENDICULAR TO THE RIVER. THE CONTRACTOR SHALL DETERMINE THE MAXIMUM WIDTH OF THE COFFERDAM PERPENDICULAR TO THE RIVER BASED UPON THE ENCROACHMENT VS. DISCHARGE OPERATION CURVES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS IF THE CONTRACTOR CHOOSES TO BUILDAND/OR OPERATE THE COFFERDAM SUCH THAT THE UPPER LIMITS ON THE "ENCROACHMENT VERSUS DISCHARGE" OPERATION CURVES ARE VIOLATED, AT NO EXTRA COST TO THE DEPARTMENT.

THE CONTRACTOR SHALL ASSUME ALL RISKS OF DAMAGES TO HIS EQUIPMENT AND MATERIALS CAUSED BY COFFERDAM OVERTOPPING OR FAILURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF PERSONNEL IN THE CASE OF COFFERDAM OVERTOPPING OR FAILURE.

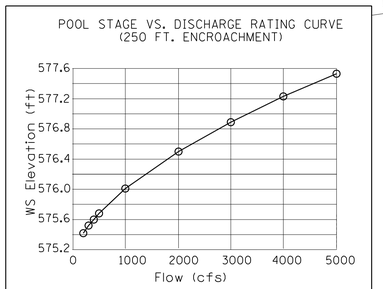
THE COFFERDAM SYSTEM SHALL BE MOVED DOWN TO THE TOP OF THE EXISTING DAM CREST ELEVATION WHEN IT BECOMES EVIDENT THAT THE COFFERDAM SYSTEM WILL VIOLATE THE CRITERIA SET FORTH ABOVE. THE COST OF THIS ADJUSTMENT SHALL BE INCLUDED IN "TEMPORARY COFFERDAM SYSTEM".

THE CONTRACTOR MAY BE REQUIRED TO STAGE REMOVAL OF THE COFFERDAM TO ACCOMMODATE LOW, INTERMEDIATE, AND HIGH FLOW CONDITIONS. SEE SPECIAL PROVISIONS FOR BYPASS TESTING AND ADJUSTMENTS.



OPERATION CURVE ORDINATES

	Encroachment (feet)						
Type	250	200	175	150	100	50	0
Earthen	3,080	3,667	3,950	4,250	4,833	5,433	6,150
	Discharge (cubic feet per second)						

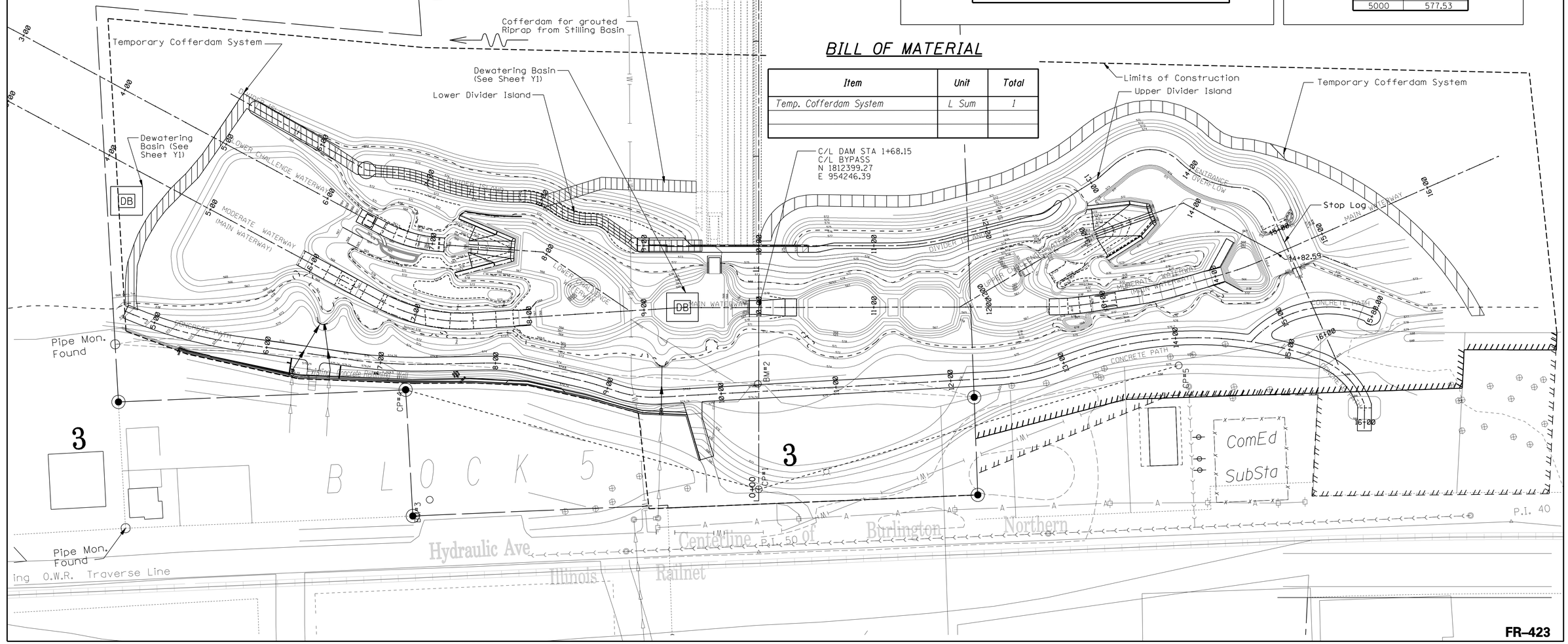


RATING CURVE ORDINATES

Flow (cfs)	WS Elev. (ft)
200	575.42
300	575.52
400	575.60
500	575.68
1000	576.01
2000	576.50
3000	576.89
4000	577.23
5000	577.53

BILL OF MATERIAL

Item	Unit	Total
Temp. Cofferdam System	L Sum	1



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TELEPHONE 312/616-0000

TEMPORARY COFFERDAM SYSTEM

STATE OF ILLINOIS
DEPARTMENT OF NATURAL RESOURCES

YORKVILLE DAM – MULTI-PURPOSE DAM PROJECT – PHASE 2 – CANOE AND FISH BYPASS CHANNEL
KENDALL COUNTY

OFFICE OF WATER RESOURCES

0 50' 100' — 1"= 20'

N

Grouted Boulders - 44.0 cu yd
Grouted Boulders - 310.5 cu yd
Grouted Boulders - 32.7 cu yd
Grouted Boulders 495.2 cy yd
Grouted Boulders - 38.3 cu yd
Grouted Boulders - 180.8 cu yd
Grouted Boulders - 363.4 cu yd
MATCHLINE SEE SHEET 12
FLOW MEASUREMENT LOCATION
Median W.S.E.
Side Pool See Profile
MAIN WATERWAY
DIVIDER ISLAND
UPPER CHALLENGE WATERWAY
MODERATE WATERWAY
MAIN WATERWAY
CONCRETE PATH
CONCRETE PATH
CONCRETE PATH
14+82.59
ComEd

LEGEND

- 24" Grouted Boulders as Shown in Plan
- Stone Riprap Class A5 as Shown in Plan
- Stone Riprap Class A5 Special as Shown in Plan
- 24" Grouted Boulders as Shown in Profile

*Bill of Materials**

Item	Unit	Qty
Grouted Boulders	cu. yd.	1374.9
Stone Riprap Class A5	Tons	3180.9
Stone Riprap Class A5 Special	Tons	5462.1

*Quantities for both Upper Challenge and Upper Moderate are included

Concrete Path - Stationing follows Concrete Path C. L. El. represents Path Bank Side Elevations
Concrete Path Sta 10+67, El. 574.74
Concrete Path Sta 12+06, El. 576.00
Concrete Path Sta 14+90, El. 577.00
Concrete Path Sta 15+77, El. 581.00
Median W.S.E. 572.0
Ex. Dam
Ex. River Bottom
Pr. Profile
Median W.S.E. 573.0
Median W.S.E. 574.0
Median W.S.E. 575.0
Median W.S.E. 575.5
2.0' Thick Stone Riprap Class A5
24" Grouted Boulders
Approx. Bedrock
Stacked Grouted Boulders
RCC
SIDE POOL
MAIN WATERWAY — CHUTE
Entry Stoplog

STA.10+20.26, El. 569.50
STA.10+30.28, El. 569.50
STA.10+45.02, El. 567.00
STA.11+5.36, El. 567.00
STA.11+12.35, El. 568.50
STA.11+21.12, El. 568.50
STA.11+23.48, El. 567.00
STA.11+70.09, El. 567.00
STA.11+72.41, El. 569.00
STA.11+81.94, El. 569.00
STA.11+86.83, El. 567.00
STA.12+50.44, El. 567.00
STA.12+52.70, El. 568.13
STA.12+68.88, El. 569.75
STA.12+78.88, El. 569.75
STA.13+14+06, El. 570.75
STA.13+31+15, El. 570.91
STA.13+61+12, El. 571.86
STA.13+91+51, El. 571.95
STA.13+96+51, El. 571.55
STA.14+06+51, El. 571.55
STA.14+12+06, El. 566.20
STA.14+17.63, El. 566.00
STA.14+37+69, El. 566.00
STA.14+43+12, El. 571.00
STA.14+45+12, El. 571.50
STA.14+57+12, El. 572.00
STA.14+67.12, El. 572.00

1%
0.3%
0.5%
5%

9+60	10+00	10+40	10+80	11+20	11+60	12+00	12+40	12+80	13+20	13+60	14+00	14+40	14+80	15+20	15+60
569.56 / 565.79	575.08 / 568.50	572.50 / 567.70	571.06 / 567.00	570.51 / 567.00	570.66 / 567.00	571.11 / 567.00	571.22 / 567.00	571.96 / 569.77	572.23 / 570.80	571.35 / 571.78	572.04 / 571.55	571.06 / 568.40	570.14 / 571.51		

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DRWG. C1 OF C7

TENG

TENG & ASSOCIATES, INC.
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205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

PLAN & PROFILE – UPPER MODERATE

Sheet 10 of 66

STATE OF ILLINOIS
DEPARTMENT OF NATURAL RESOURCES

YORKVILLE DAM – MULTI-PURPOSE DAM PROJECT – PHASE 2 – CANOE AND FISH BYPASS CHANNEL
KENDALL COUNTY

OFFICE OF WATER RESOURCES

Grouted Boulders
310.5 cu yd **

Grouted Boulders
44.0 cu yd **

Grouted Boulders
32.7 cu yd **

Grouted Bouders
405.2 cu yd **

Grouted Bouders
38.3 cu yd **

Grouted Boulders
180.8 cu yd **

Grouted Boulders
363.4 cu yd **

0 50' 100' — 1"= 20'

N

MAIN WATERWAY

DIVIDER ISLAND

UPPER CHALLENGE WATERWAY

MIDDLE CHALLENGE WATERWAY

MAIN WATERWAY CHUTE

ENTRANCE OVERFLOW

CONCRETE PATH

MATCHLINE SEE SHEET 13

14+82.59

ComEd

** QUANTITY ACCOUNTED FOR IN BILL OF MATERIALS ON SHEET C1

LEGEND

- 24" Grouted Boulders as Shown in Plan
- Stone Riprap Class A5 as Shown in Plan
- Stone Riprap Class A5 Special as Shown in Plan
- 24" Grouted Boulders as Shown in Profile

Median W.S.E. 572.0
Median W.S.E. 574.0
Median W.S.E. 573.0
Median W.S.E. 575.0
Median W.S.E. 575.5

STA.11+72.41, El. 569.00
STA.11+81.94, El. 569.00
STA.11+86.83, El. 567.00
STA.12+05.61, El. 567.00
STA.12+24.61, El. 567.00
STA.12+18.61, El. 565.00
STA.12+33.61, El. 565.00
STA.12+36.61, El. 568.00
STA.12+46.81, El. 570.00
STA.12+66.61, El. 571.00
STA.12+70.61, El. 569.00
STA.13+05.90, El. 569.00
STA.13+11.47, El. 570.66
STA.13+30.81, El. 571.98
STA.13+32.99, El. 572.00
STA.13+46.33, El. 573.00
STA.13+57.51, El. 573.00
STA.13+61.93, El. 572.95
STA.13+64.75, El. 571.00
STA.14+12.06, El. 570.00
STA.14+43.30, El. 570.00
STA.14+47.16, El. 569.00
STA.14+50.28, El. 569.00
STA.14+53.16, El. 568.11
STA.14+72.39, El. 571.65
STA.14+45.56, El. 569.58

2.5%

Pr. Profile

Ex. River Bottom

Approx. Bedrock

2.0' Thick Stone Riprap Class A5

2.0' Thick Stone Riprap Class A5

24" Grouted Boulders

MAIN WATERWAY CHUTE

STA.11+74.63

580 575 570 565 560 555

569.56 575.08 572.50 571.06 570.51 570.66 571.11 567.00 571.22 568.68 571.96 569.00 572.23 571.25 571.35 572.97 572.04 570.00 571.06 570.00 570.14 571.77

9+60 10+00 10+40 10+80 11+20 11+60 12+00 12+40 12+80 13+20 13+60 14+00 14+40 14+80 15+20 15+60

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DRWG. C2 OF C7

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PLAN & PROFILE – UPPER CHALLENGE

Sheet 11 of 66

STATE OF ILLINOIS
DEPARTMENT OF NATURAL RESOURCES

YORKVILLE DAM – MULTI-PURPOSE DAM PROJECT – PHASE 2 – CANOE AND FISH BYPASS CHANNEL
KENDALL COUNTY

OFFICE OF WATER RESOURCES

0 50′ 100′ — 1″= 20′

LEGEND

- 24″ Grouted Boulders as Shown in Plan
- Stone Riprap Class A5 as Shown in Plan
- Stone Riprap Class A5 Special as Shown in Plan
- 24″ Grouted Boulders as Shown in Profile

Grouted Boulders 410.1 cu yd

Riprap from Stilling Basin Relocation to be grouted in place. D/S limits Sta. 7+23 - 1361 tons

Grouted Boulders - 54.6 cu yd

Grouted Boulders - 591.0 cu yd

Concrete Path
Sta 4+70.00
N 1812456.52
E 953698.66

Median W.S.E.

MATCHLINE SEE SHEET 10

Bill of Materials*		
Item	Unit	Qty
Grouted Boulders	cu. yd.	1055.7
Stone Riprap Class A5	Tons	1124.2
Stone Riprap Class A5 Special	Tons	4244.9
Riprap from Stilling Basin Relocation	Tons	1361

*Quantites for both Lower Challenge and Lower Moderate are included

Concrete Path Sta 4+70, El. 570.00
End of Path
STA 4+86.00, El. 567.80
STA 4+96.01, El. 565.00
5%
Begin Pool
Pool Line
Begin Waterway
STA 5+42.24, El. 565.00
STA 5+88.32, El. 565.00
STA 5+89.82, El. 565.75
4%
0.18%
End Pool
Sides of Watering Basin Follow Design Grade
Concrete Path Sta 5+81, El. 575.25
Concrete Path Sta 6+44, El. 575.25
Median W.S.E. 596.5
STA 6+14.81, El. 566.75
STA 6+26.07, El. 566.83
STA 6+28.07 El. 564.49
STA 6+40.57 El. 564.49
STA 6+41.07, El. 567.00
STA 6+71.11, El. 567.63
Waterway Depression Elev. 564.5. Use Drop-Off Detail
Concrete Path - Stationing follows Concrete Path C. El. represents Path Bank Side Elevations
Concrete Path Sta 7+15, El. 575.00
0.3%
Median W.S.E. 570.0
STA 7+50.64 El. 568.43
24″ Grouted Boulders
2.0′ Thick Stone Riprap Class A5
Median W.S.E. 571.0
STA 7+86.15 El. 568.49
STA 7+91.15 El. 567.99
Concrete Path Sta 7+81, El. 574.74
STA 8+01.15 El. 567.99
STA 8+13.95 El. 566.00
0.8%
Ex. River Bottom
Pr. Profile
Approx. Bedrock
STA 8+82.57, El. 567.00
16″ Dip Concrete Encased Water Do Not Disturb Pipe Encasement or adjacent shale below top of encasement, or as directed. Top Encasement El. 565.0. Verify before grading or placing material.
STA 9+06.66, El. 567.00
STA 9+16.66, El. 566.00

4+80	5+20	5+60	6+00	6+40	6+80	7+20	7+60	8+00	8+40	8+80	9+20
567.75 / 567.29	567.76 / 565.00	567.53 / 565.00	567.49 / 566.14	567.51 / 564.50	568.94 / 567.70	568.88 / 568.05	569.25 / 568.46	569.04 / 568.00	568.58 / 566.00	569.03 / 566.09	569.09 / 565.88

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Drawn By JPR Checked By TKL

FR–423

DRWG. C3 OF C7

TENG

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908 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

PLAN & PROFILE – LOWER MODERATE

Sheet 12 of 66

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** QUANTITY ACCOUNTED FOR IN BILL OF MATERIALS ON SHEET C3

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Checked By TKL

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NOTES:

1. See drawing C6 for sign details and elevations.
2. Northerly and Easterly points are for the ℄ of the center post on all Signs
3. ——▸ Denotes orientation of sign face
4. Floating sign shall be Rolyan model B4872PF "KEEP OUT" or approved equal.
5. Sign 5 extends into the roller compacted concrete. Required coring is included in the cost for wood sign support.

Bill of Material

Item	Unit	Qty
Sign Panel-Type 3	Sq. Ft.	352.0
Wood Sign Support	foot	327.0
Floating Sign	Ea	3

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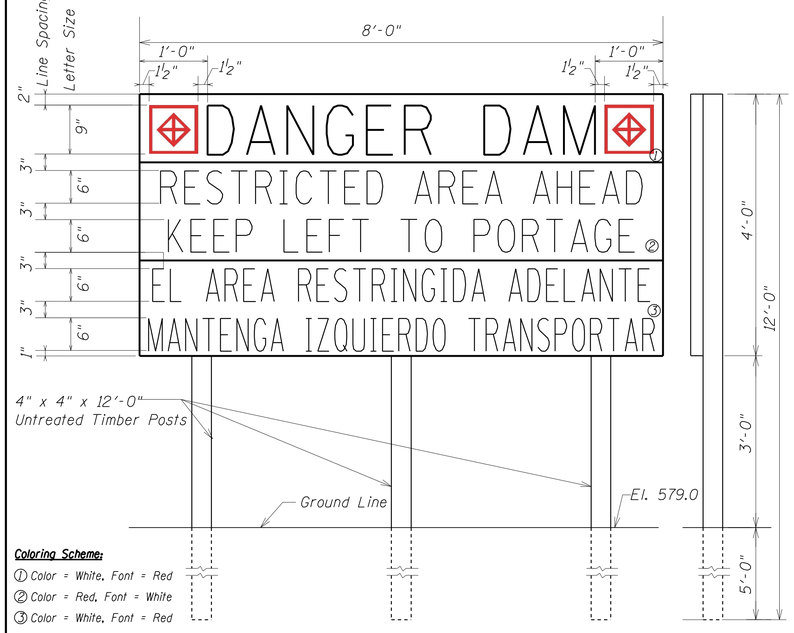
TENG & ASSOCIATES, INC.
ENGINEERS/ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

BOATING AND PARK SIGNAGE

Notes:

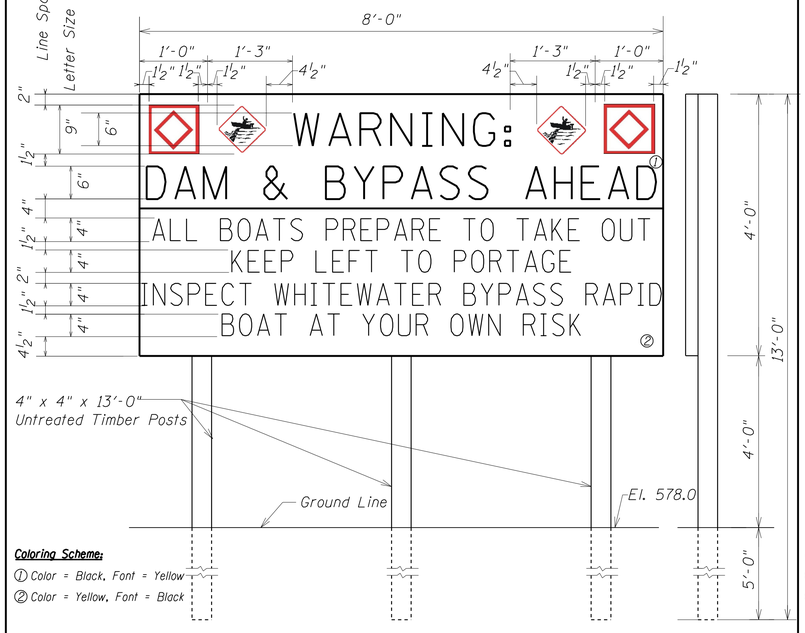
1. Vertical Dimension is given. If horizontal dimension is not given, size text as shown. Do not print text less than 1" from each edge of sign.

SIGN 1
(1 required)



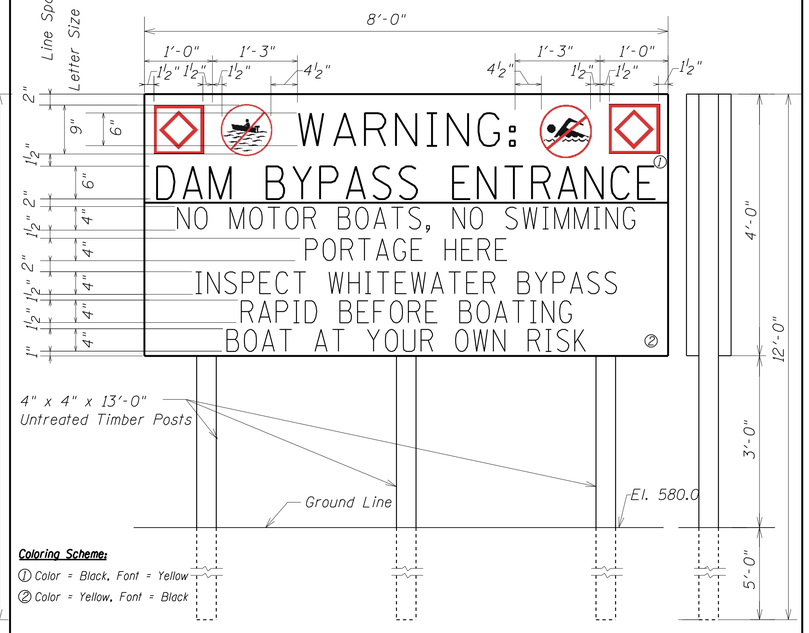
Coloring Scheme:
① Color = White, Font = Red
② Color = Red, Font = White
③ Color = White, Font = Red

SIGN 2
(1 required)



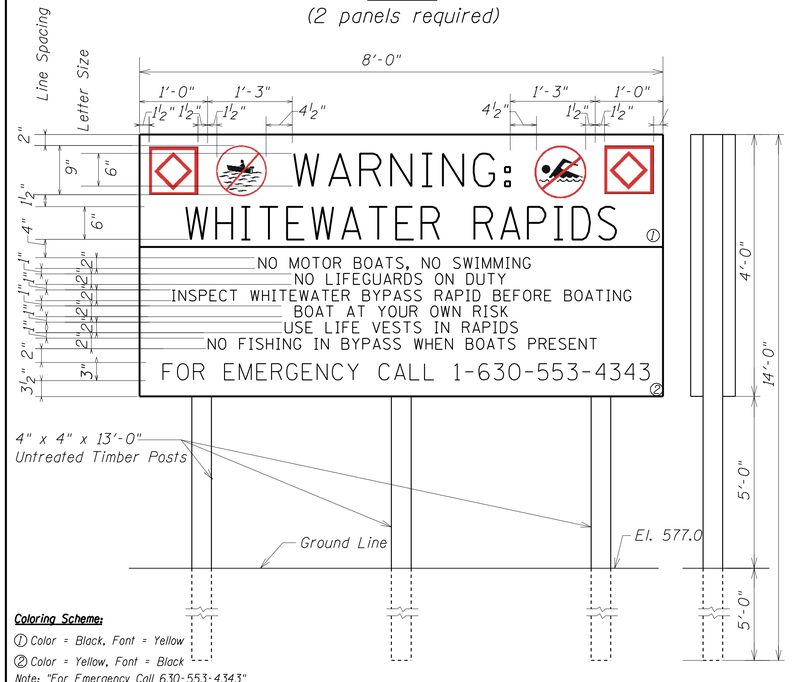
Coloring Scheme:
① Color = Black, Font = Yellow
② Color = Yellow, Font = Black

SIGN 3
(2 panels required)



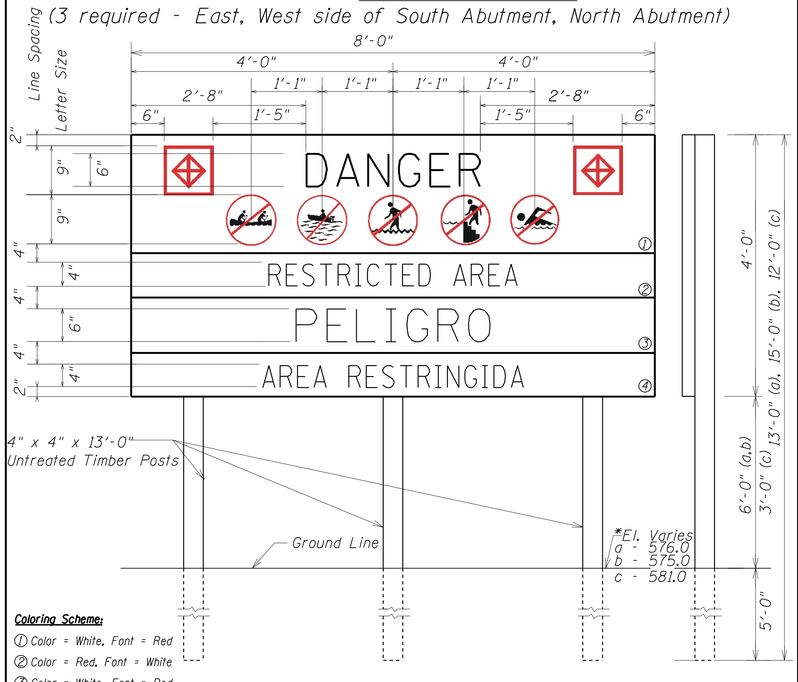
Coloring Scheme:
① Color = Black, Font = Yellow
② Color = Yellow, Font = Black

SIGN 4
(2 panels required)



Coloring Scheme:
① Color = Black, Font = Yellow
② Color = Yellow, Font = Black
Note: "For Emergency Call 630-553-4343" shall be Red Font.

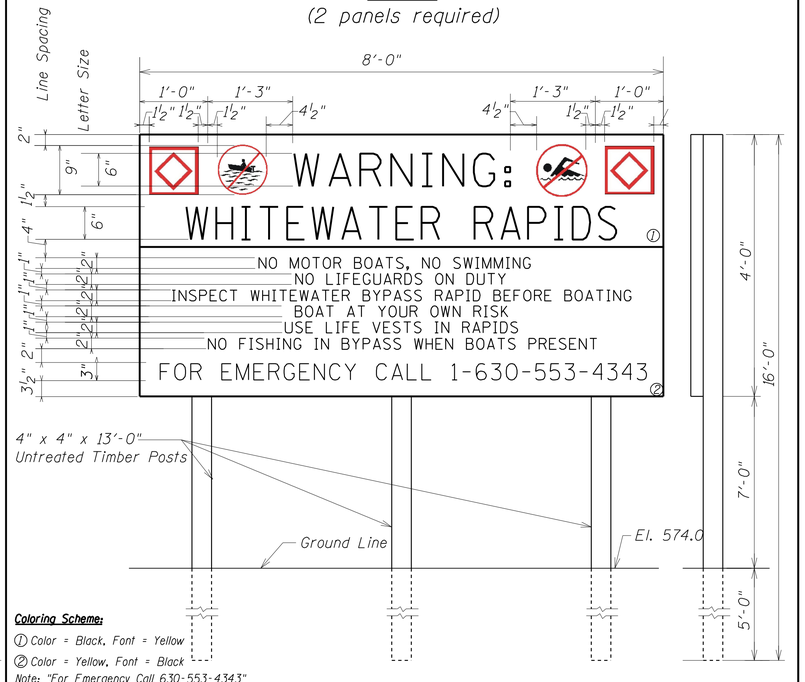
SIGN 5 (a, b, or c)*
(3 required - East, West side of South Abutment, North Abutment)



Coloring Scheme:
① Color = White, Font = Red
② Color = Red, Font = White
③ Color = White, Font = Red
④ Color = Red, Font = White

NOTE: SEE SHEET S10 FOR 5a POST TREATMENT

SIGN 6
(2 panels required)



Coloring Scheme:
① Color = Black, Font = Yellow
② Color = Yellow, Font = Black
Note: "For Emergency Call 630-553-4343" shall be Red Font.

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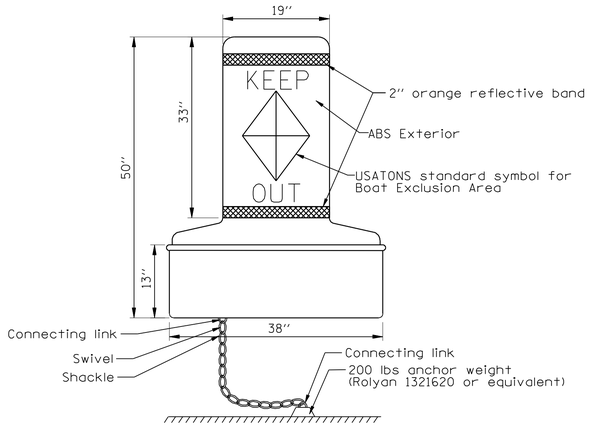


BUOY DETAIL

Legend:

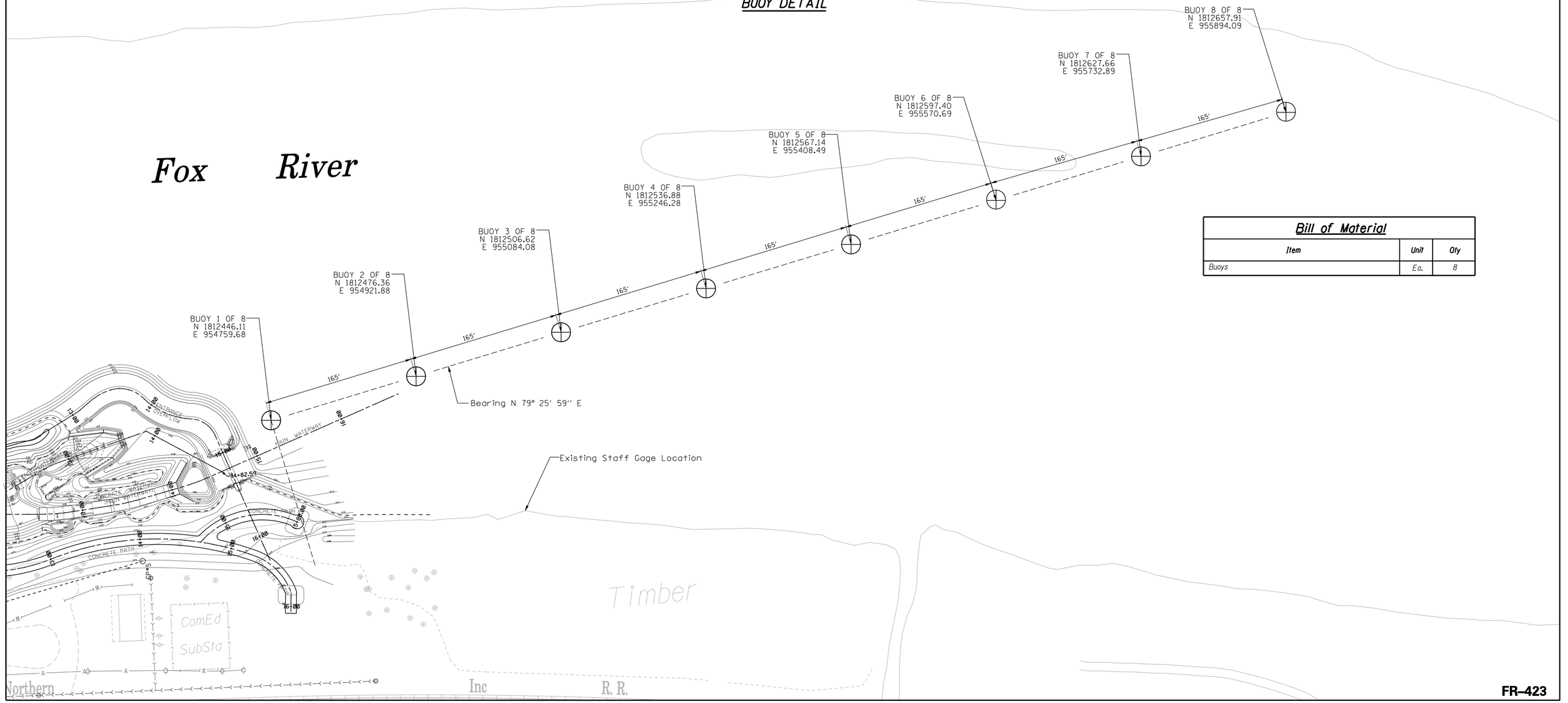
COAST GUARD TYPE ABS
CHANNEL AND DAM WARNING BUOYS

Notes:

1. Buoyance/IN. Submerged shall be approximately 39
2. Draft shall be approximately 9 in.
3. Submerged Buoyancy shall be approximately 700 lbs.
4. Dimensions and specifications reference Rolyan Buoys Coast Guard Type ABS, B5CPRSW. Actual buoy must be at least an approved equal.
5. Cost for buoy includes connecting links, chain, swivels, shackles, and anchor weight.
6. Chain length is depth at flood stage plus 3 feet. Estimated length for each buoy is 11 feet, however Contractor should verify in the field.

0 50′ 100′ 1″= 50′

N



Bill of Material

Item	Unit	Qty
Buoys	Ea.	8

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LEGEND FOR GENERAL AND DETAILED SECTIONS

GENERAL FILL•
CONCRETE PATH
6" TOPSOIL
STONE RIPRAP CLASS A5
ROLLER COMPACTED CONCRETE
UNSUITABLE MATERIAL••
STONE RIPRAP CLASS A5 (SPECIAL)
GROUTED BOULDERS
PHASE 1 TEMPORARY RIPRAP FOR STILLING BASIN

• GENERAL FILL MATERIAL IS TO BE COMPRISED OF EXCAVATED RIVERBED MATERIAL THAT IS NON-ORGANIC (LESS THEN 5%), SAND/GRAVEL (GENERAL CUT).

••UNSUITABLE MATERIAL IS TO BE REPLACED WITH GENERAL FILL OR RIPRAP (WHERE INDICATED IN CROSS SECTIONS) UNLESS IN A CUT SECTION.

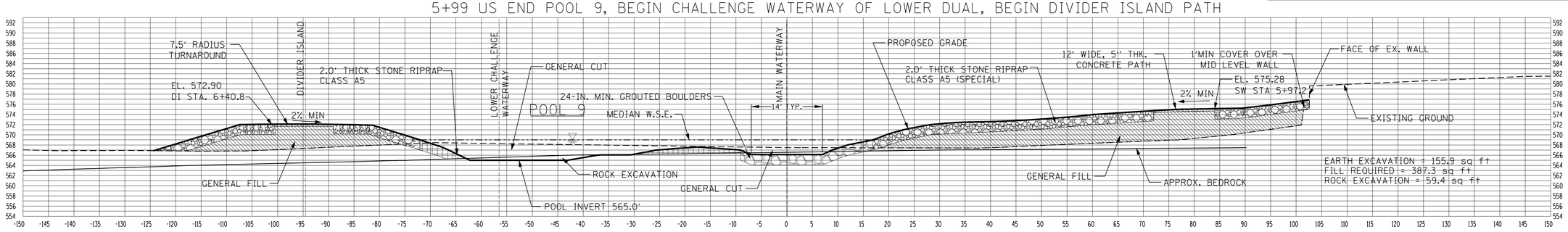
0 10' 20' 30' 1"= 10'

SUMMARY OF DRAWINGS DX1 TO DX10

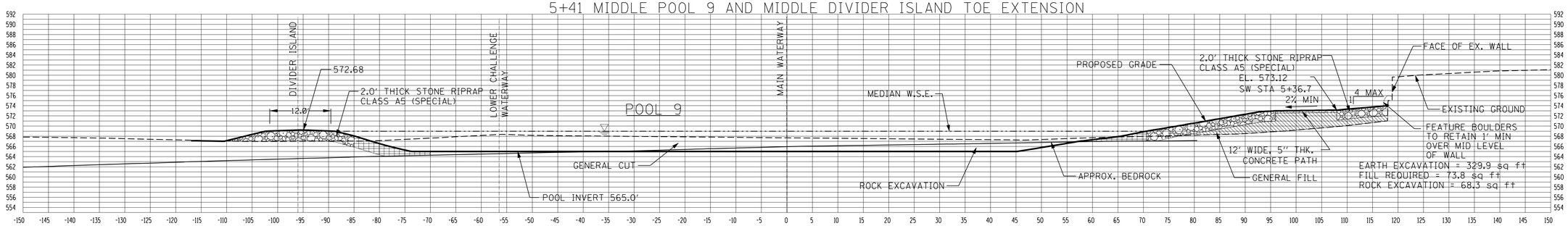
Bill of Material

Item	Unit	Qty
Earth Excavation	Cu. Yd.	9,088.7
Rock Excavation	Cu. Yd.	1,968.0
Removal and Disposal of Unsuitable Material	Cu. Yd.	4,066.6

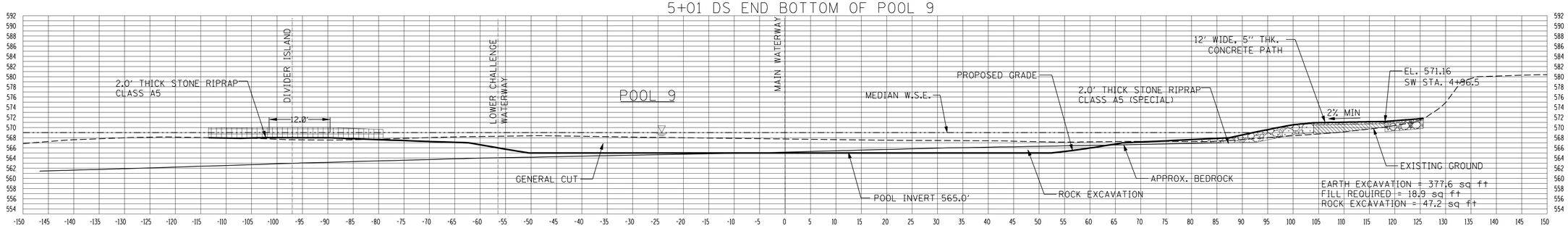
5+99 US END POOL 9, BEGIN CHALLENGE WATERWAY OF LOWER DUAL, BEGIN DIVIDER ISLAND PATH



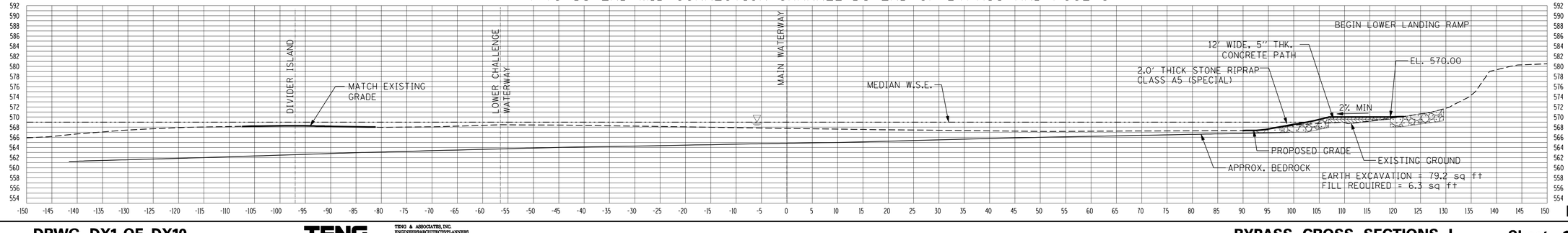
5+41 MIDDLE POOL 9 AND MIDDLE DIVIDER ISLAND TOE EXTENSION



5+01 DS END BOTTOM OF POOL 9



4+78 US END MID CONNECTION CHANNEL-DS END OF BYPASS AND POOL 9



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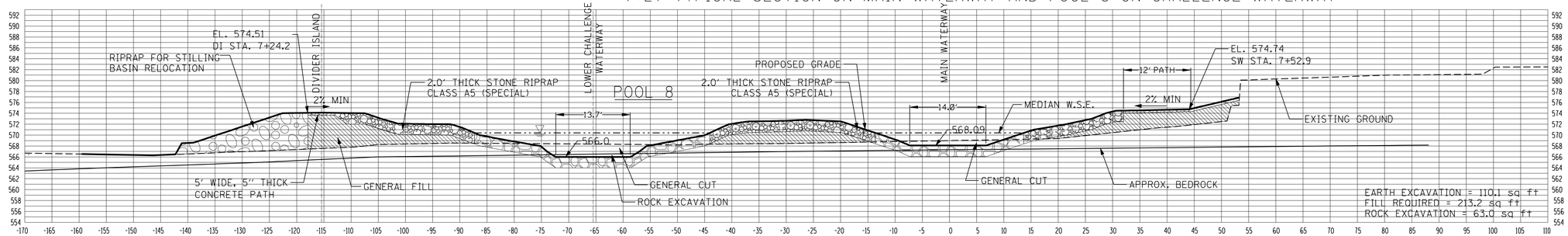
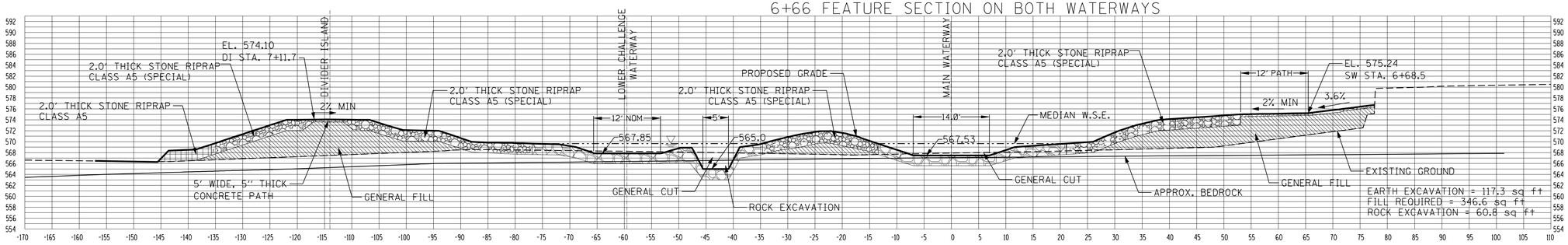
0 10' 20' 30' 1"= 10'

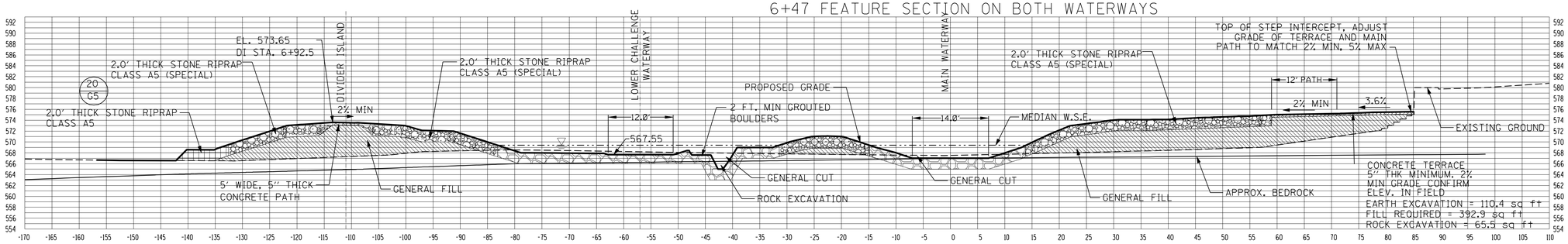
7+27 TYPICAL SECTION ON MAIN WATERWAY AND POOL 8 ON CHALLENGE WATERWAY



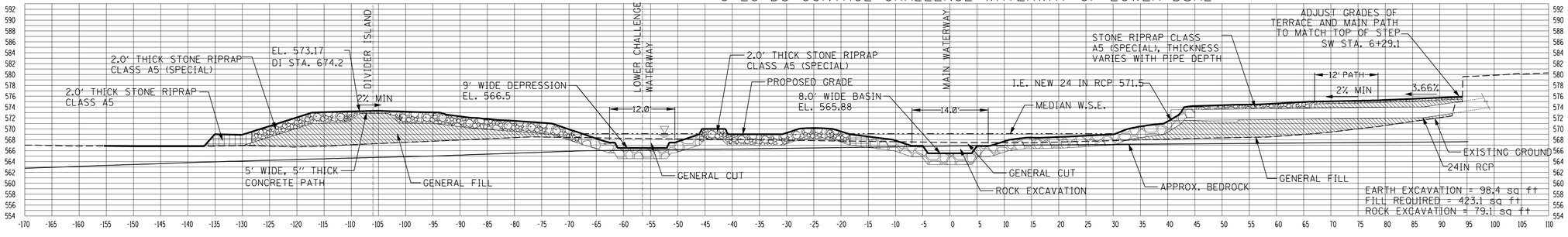
6+66 FEATURE SECTION ON BOTH WATERWAYS



6+47 FEATURE SECTION ON BOTH WATERWAYS



6+29 DS CONTROL CHALLENGE WATERWAY OF LOWER DUAL



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DRWG. DX2 OF DX10

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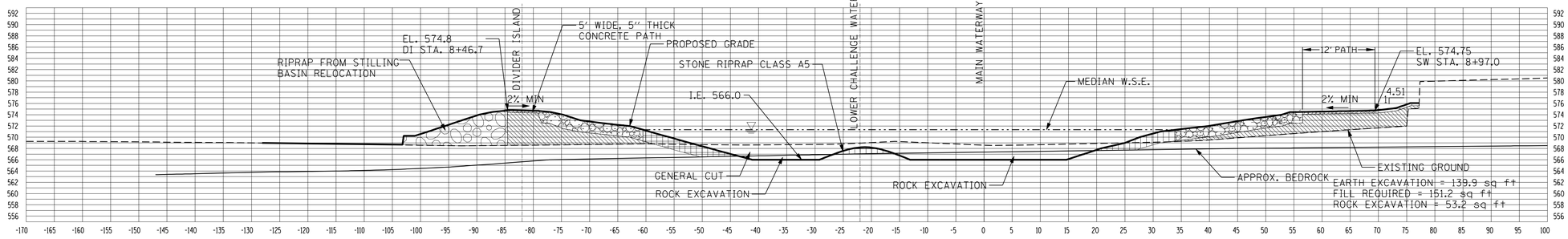
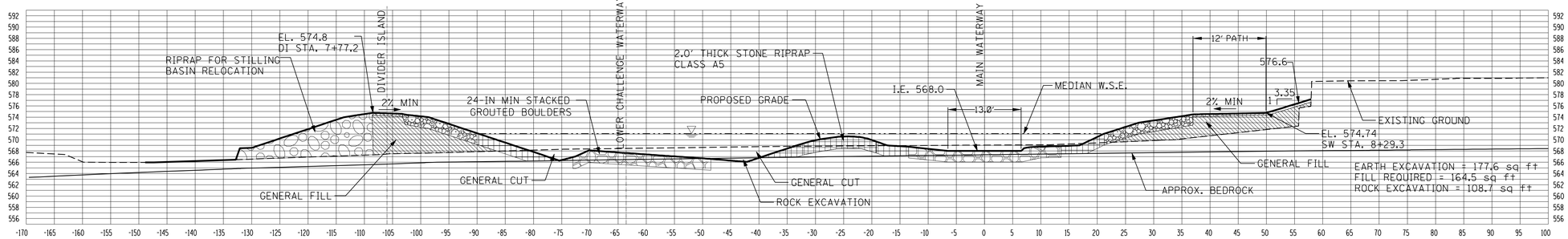
BYPASS CROSS SECTIONS II

0 10' 20' 30' 1"= 10'

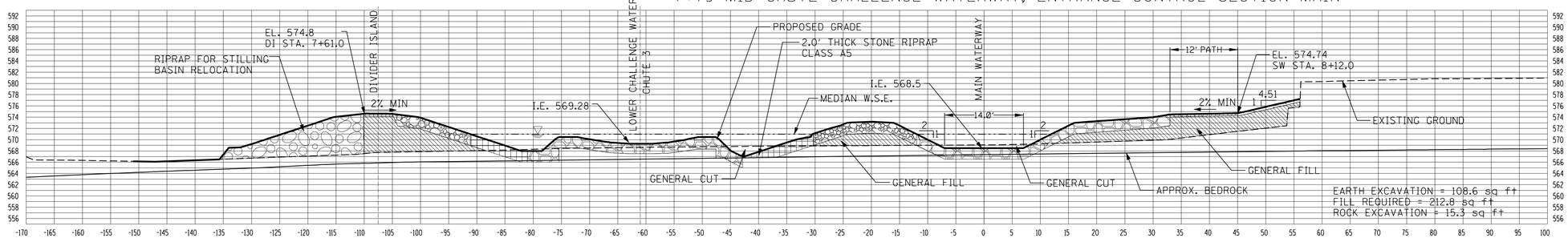
8+59 MIDDLE POOL 7



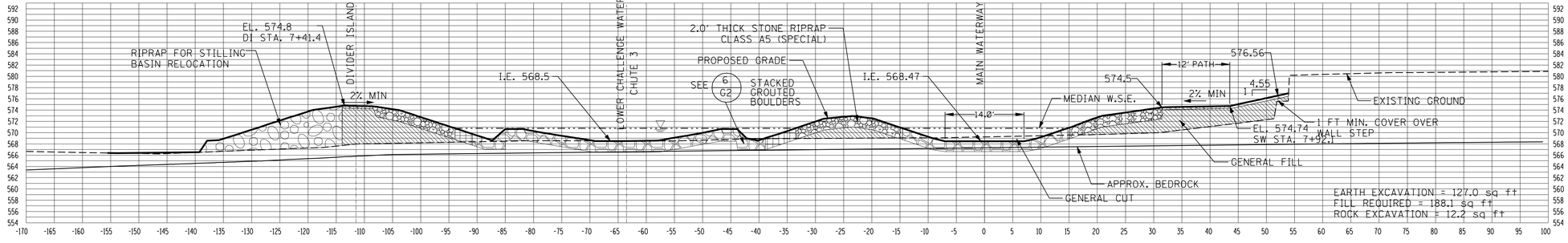
7+95 CHUTE ENTRANCE CONTROL SECTION CHALLENGE WATERWAY, ADJUSTABLE ENTRANCE CONTROL SECTION MAIN



7+79 MID CHUTE CHALLENGE WATERWAY, ENTRANCE CONTROL SECTION MAIN



7+60 MID CHUTE CHALLENGE WATERWAY, TYPICAL SECTION MAIN



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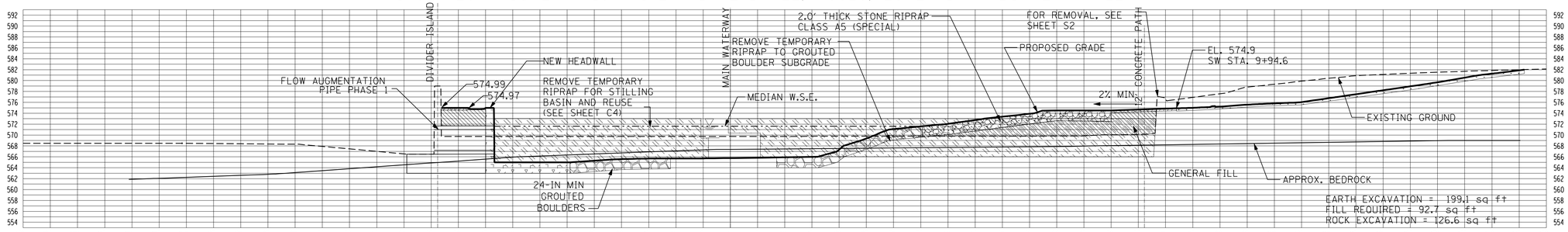
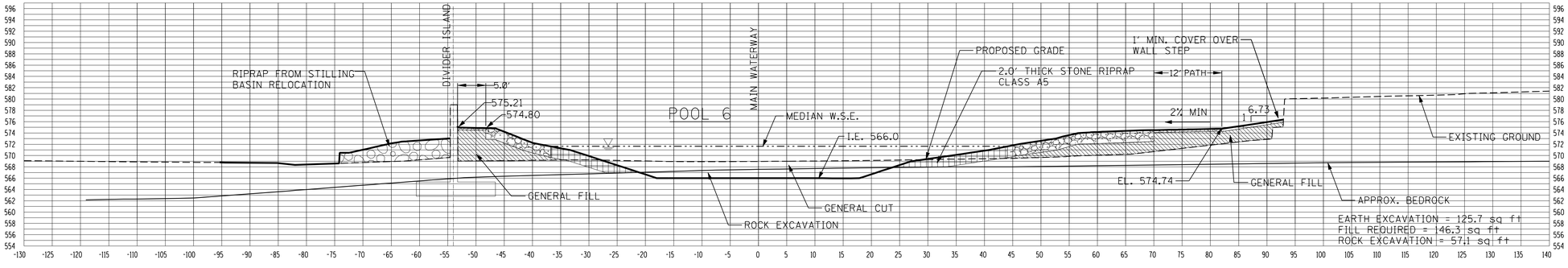
0 10' 20' 30' 1"= 10'

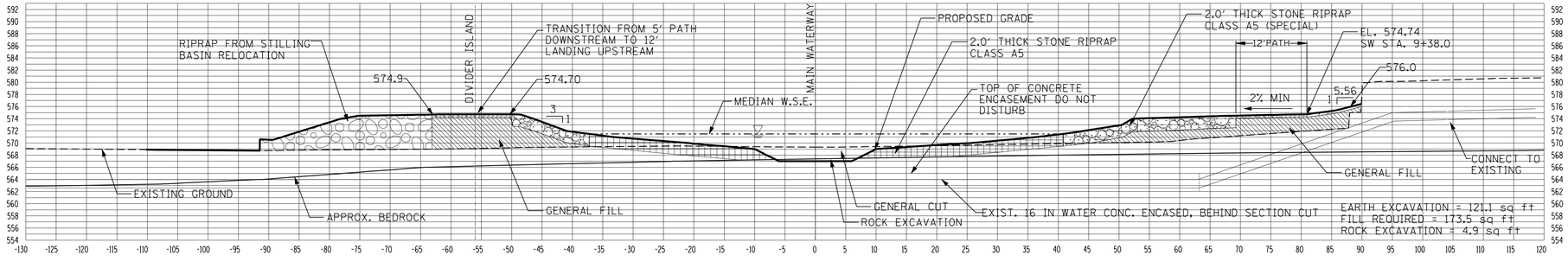
9+62 FLOW AUGMENTATION PIPE AND HEADWALL, POOL6, LOWER DAM ABUTMENT WALL



9+32 LOWER DAM



9+00 STAIR LANDING AND US END LOWER DIVIDER ISLAND, SILL AND CONSTRUCTION FOR PROTECTION OF WATERLINE



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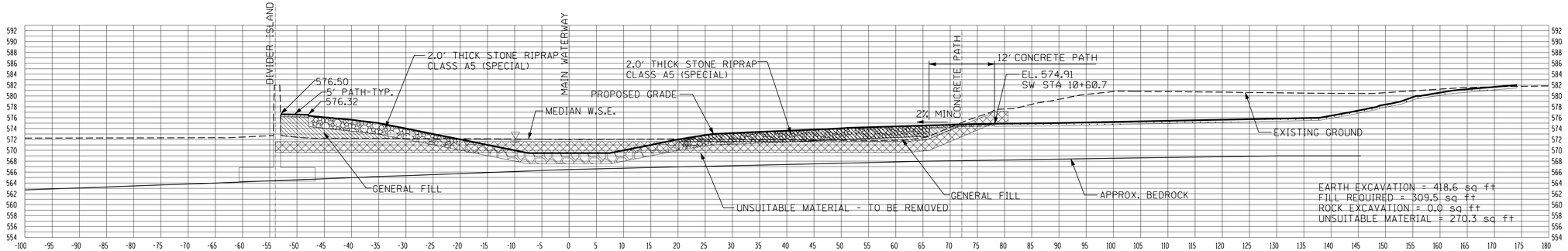
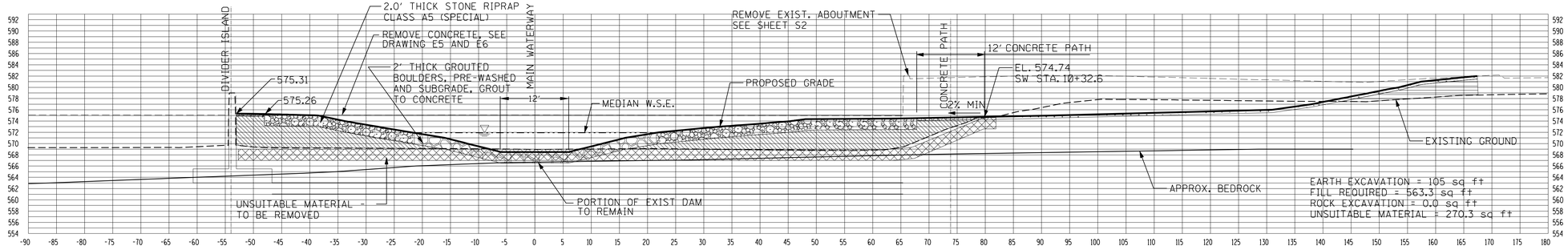
0 10' 20' 30' 1"= 10'

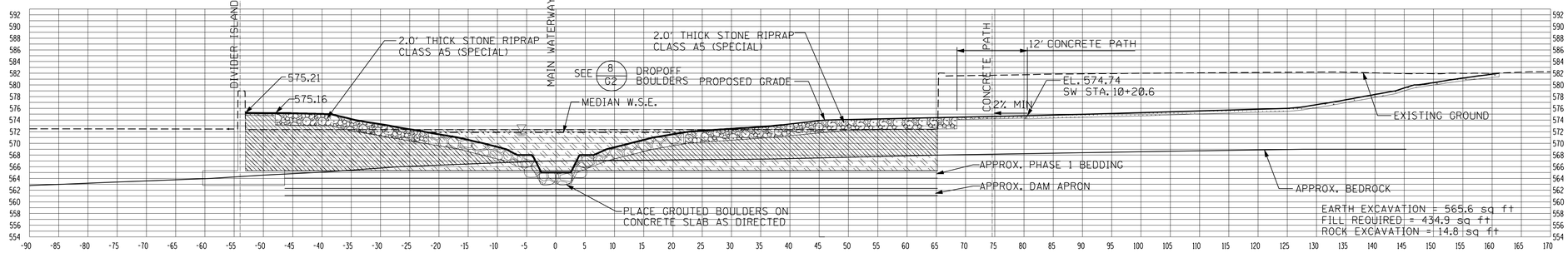
10+28 CONTROL CREST OF CHUTE 2, UPSTREAM OF EXIST. DAM UPSTREAM WINGWALL



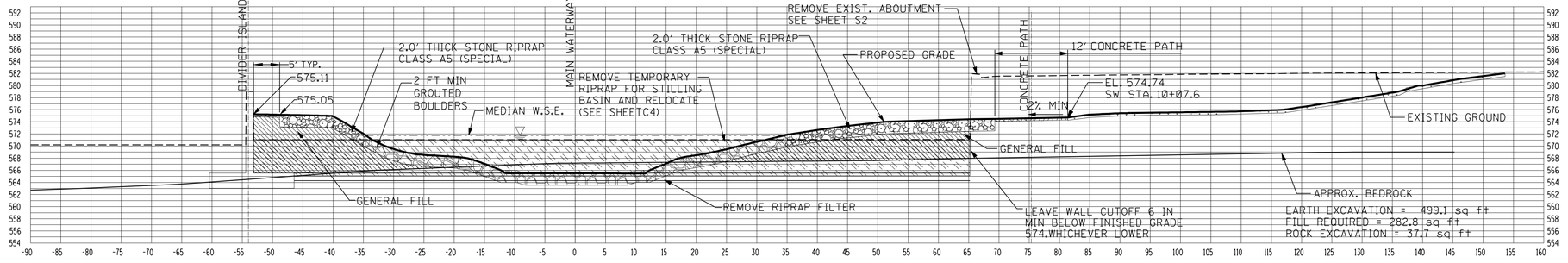
10+00 BOTTOM CHUTE 2, CREST OF EXIST. CONCRETE DAM AND MID-EXIST. DAM ABUTMENT WINGWALL



9+88 TOE TEMPORARY DAM ROCK RAMP, SCOUR HOLE AND APRON ORIGINAL DAM EXIST. DAM ABUTMENT WINGWALL, BOT. CHUTE DROF OFF



9+75 TRANSITION TO CHUTE DROPOFF, TEMPORARY DAM ROCK RAMP, DS CORNER EXISTING DAM ABUTMENT WALL



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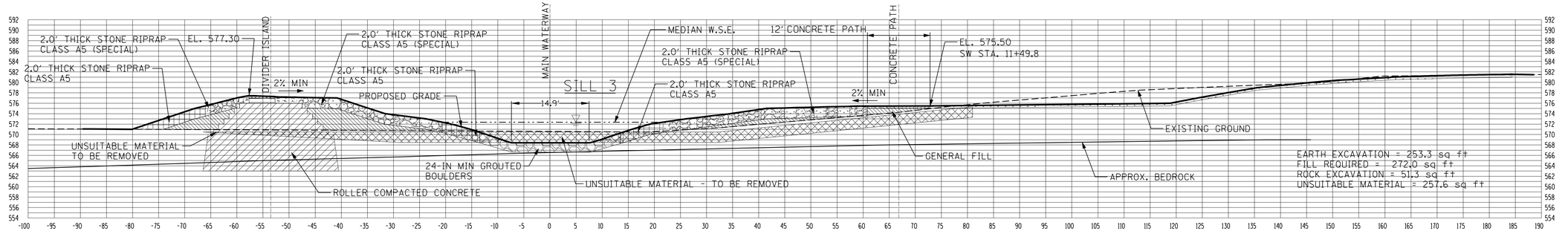
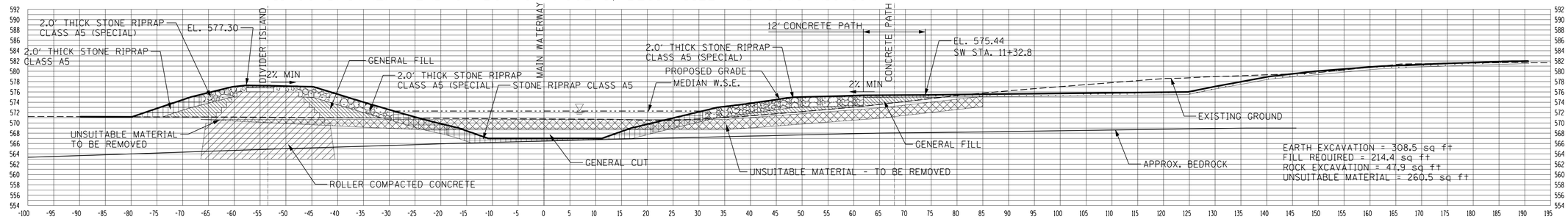
0 10' 20' 30' 1"= 10'

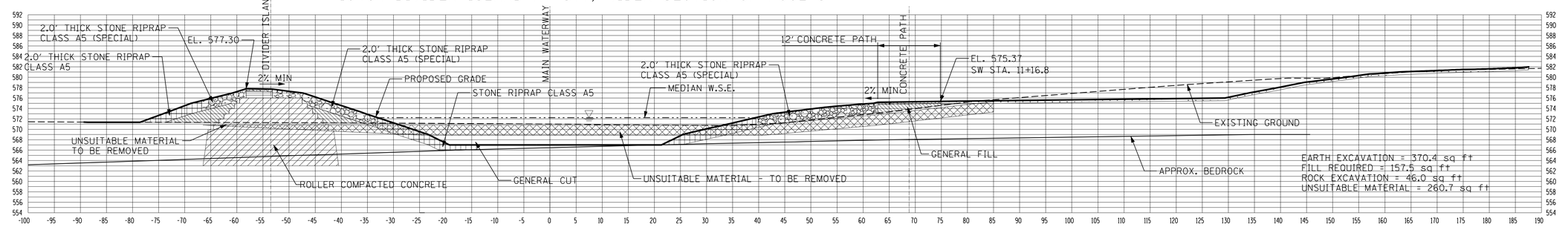
11+17 SILL AND CONSTRICTION CONTROL SECTION, WIDER DIVIDER ISLAND



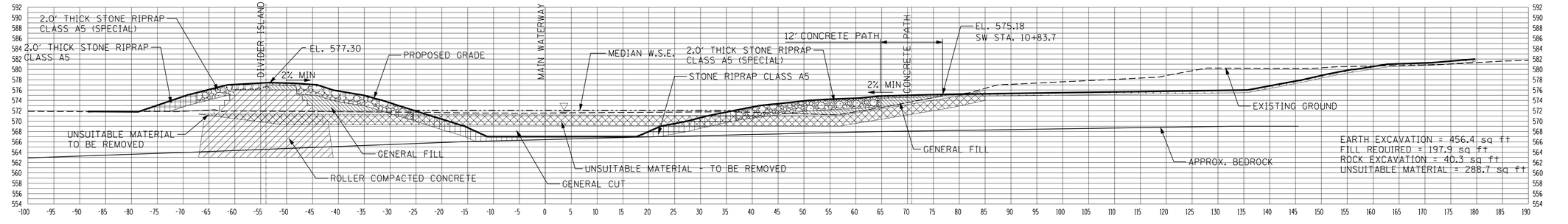
11+00 UPSTREAM END OF BOTTOM POOL 5, BEGIN SILL AND CONSTRICTION



10+84 DIVIDER ISLAND AT 577, WIDER SECTION OF POOL 5



10+51 UPSTREAM DIVIDER ISLAND AT 578 AND BEGIN RAMP DOWN, BEGIN BOTTOM POOL 5



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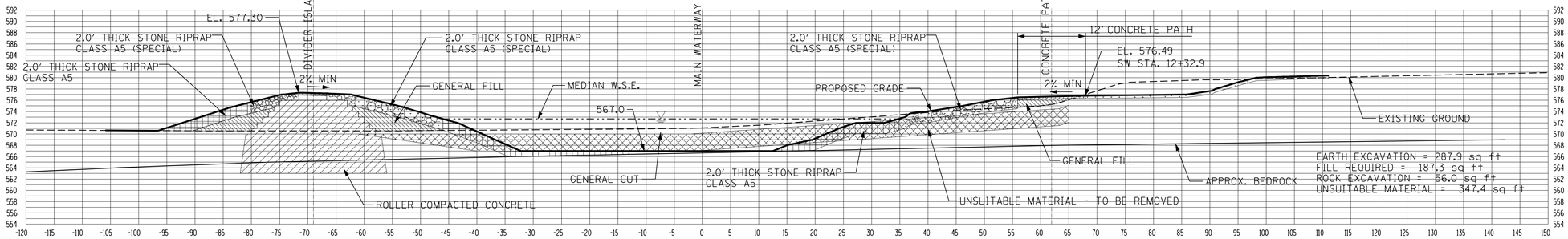
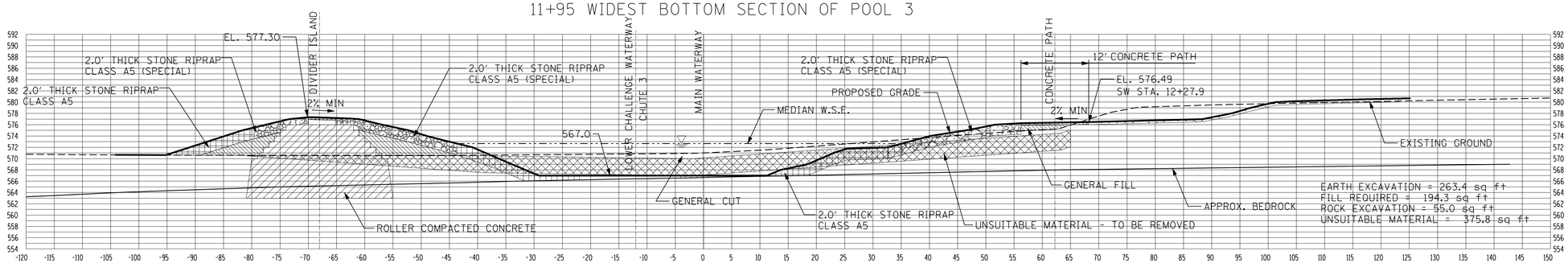
0 10' 20' 30' 1"= 10'

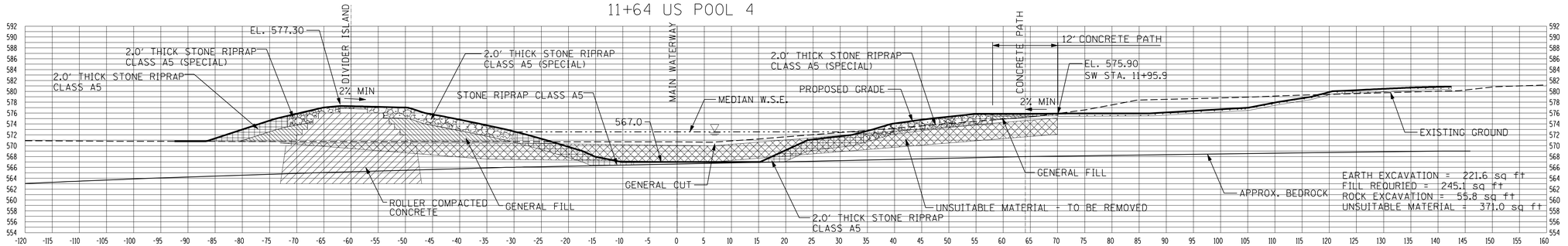
12+00



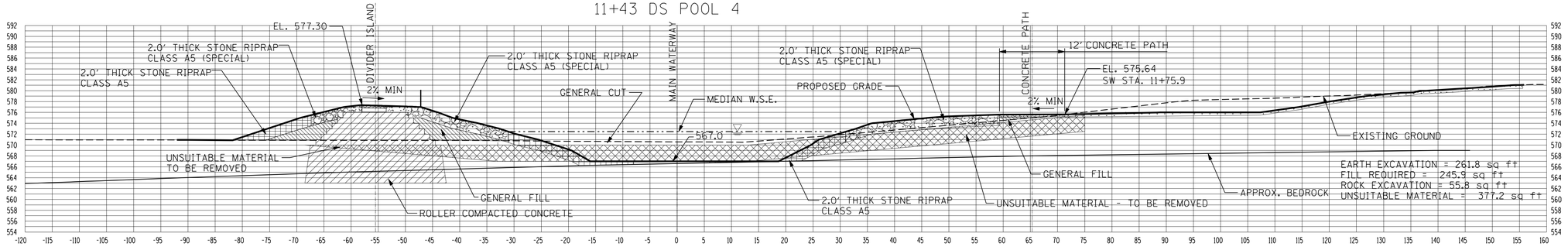
11+95 WIDEST BOTTOM SECTION OF POOL 3



11+64 US POOL 4



11+43 DS POOL 4



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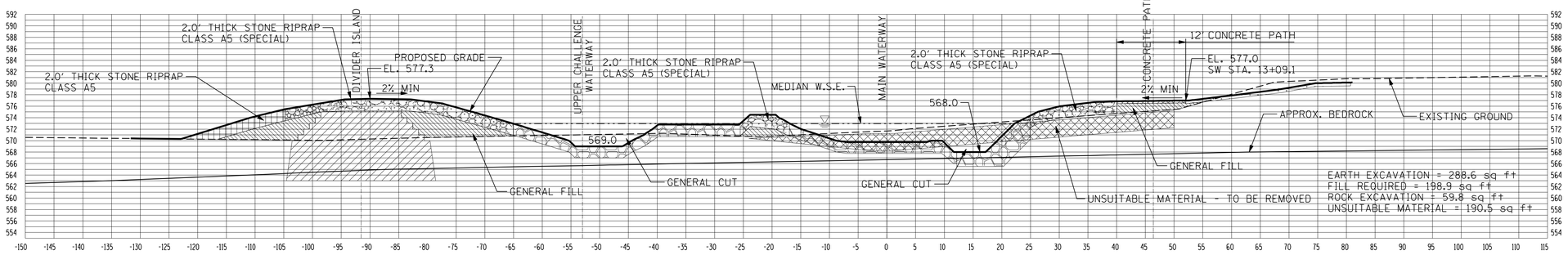
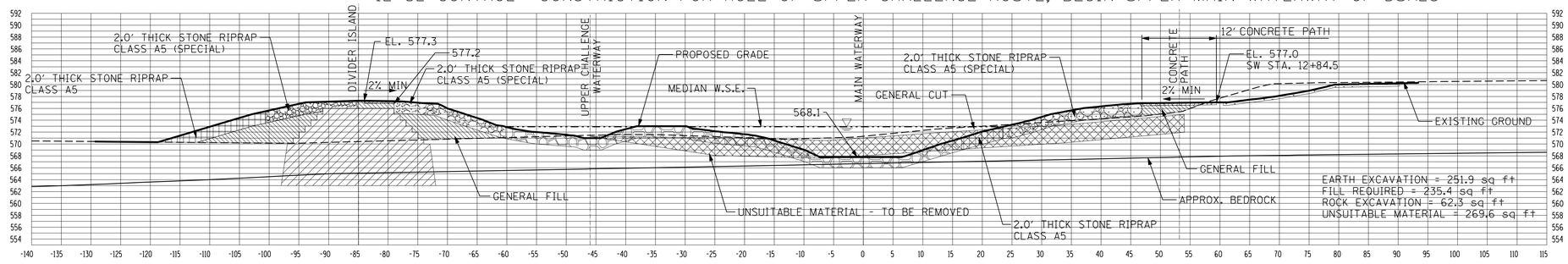
0 10′ 20′ 30′ 1″= 10′

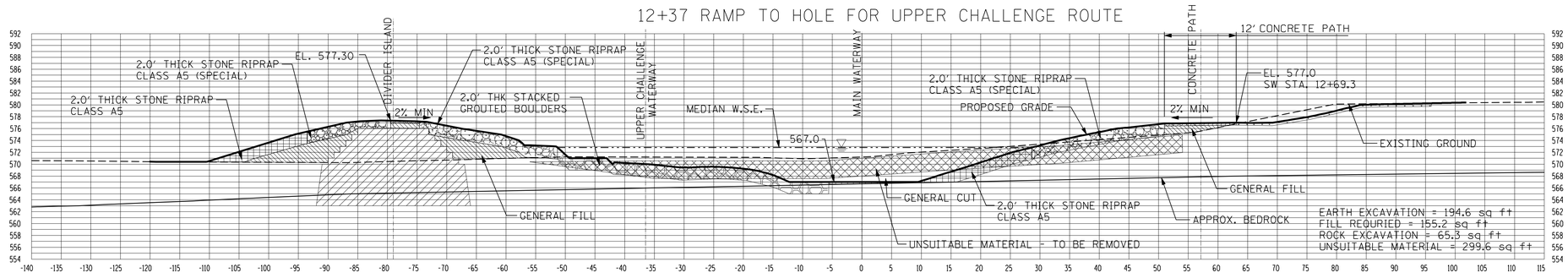
12+70 UPPER CHALLENGE ROUTE, UPPER MAIN WATERWAY FEATURE OF DUALS



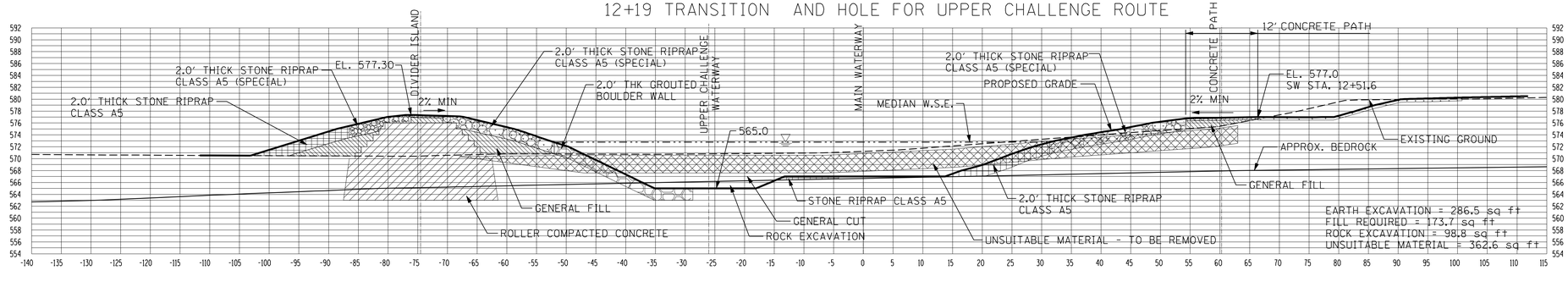
12+52 CONTROL CONSTRICTION FOR HOLE OF UPPER CHALLENGE ROUTE, BEGIN UPPER MAIN WATERWAY OF DUALS



12+37 RAMP TO HOLE FOR UPPER CHALLENGE ROUTE



12+19 TRANSITION AND HOLE FOR UPPER CHALLENGE ROUTE



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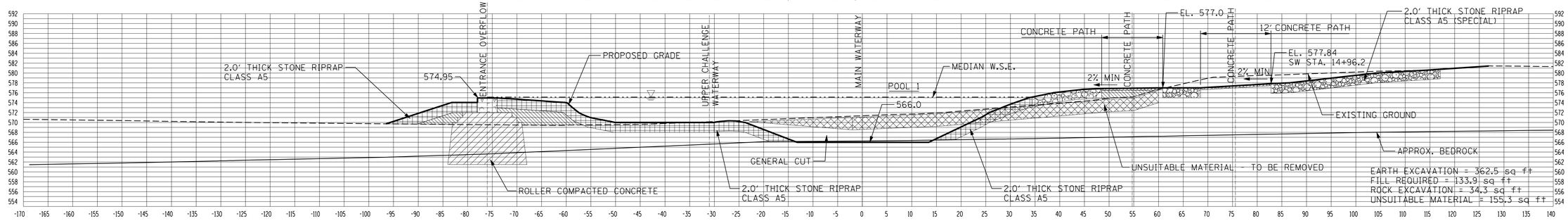
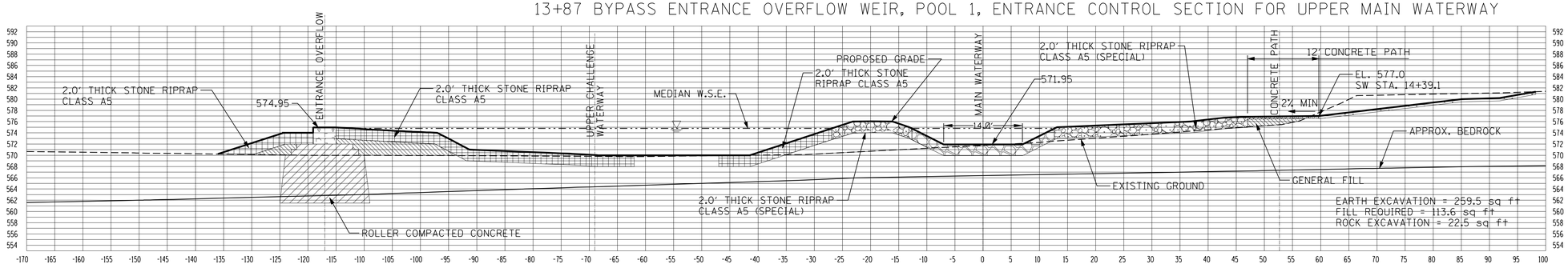
0 10' 20' 30' 1"= 10'

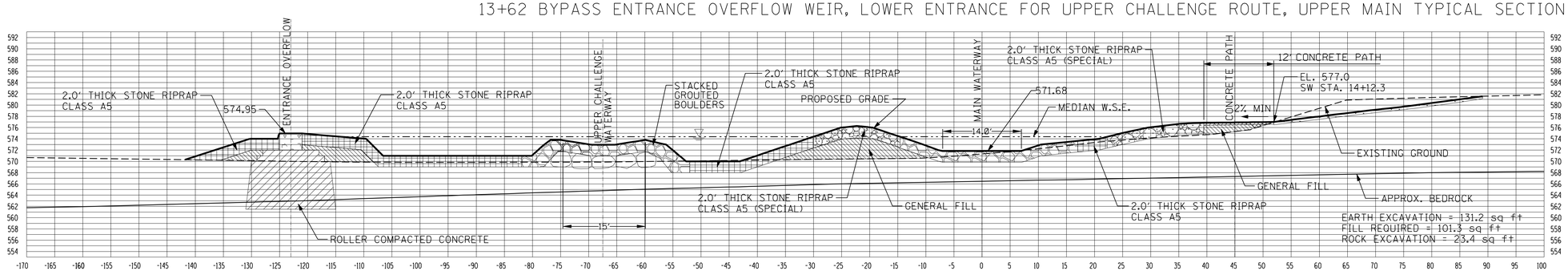
14+31 BYPASS ENTRANCE OVERFLOW WEIR, POOL 1, ENTRANCE CONTROL SECTION FOR UPPER MAIN WATERWAY



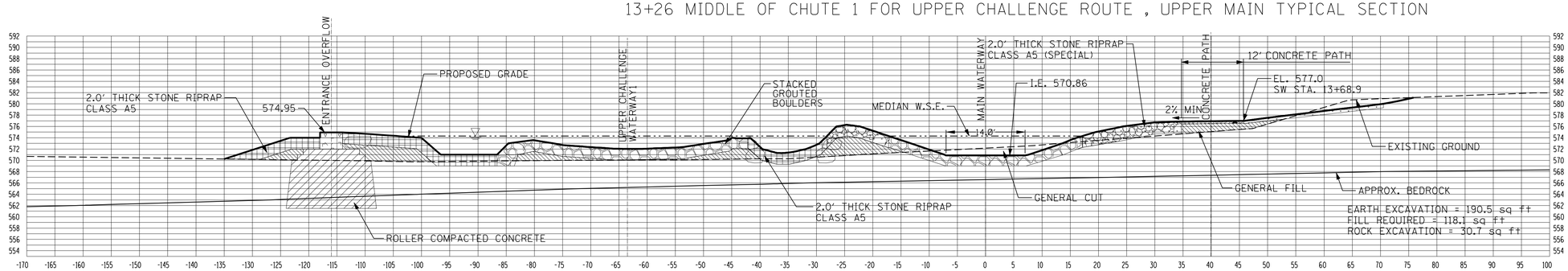
13+87 BYPASS ENTRANCE OVERFLOW WEIR, POOL 1, ENTRANCE CONTROL SECTION FOR UPPER MAIN WATERWAY



13+62 BYPASS ENTRANCE OVERFLOW WEIR, LOWER ENTRANCE FOR UPPER CHALLENGE ROUTE, UPPER MAIN TYPICAL SECTION



13+26 MIDDLE OF CHUTE 1 FOR UPPER CHALLENGE ROUTE , UPPER MAIN TYPICAL SECTION



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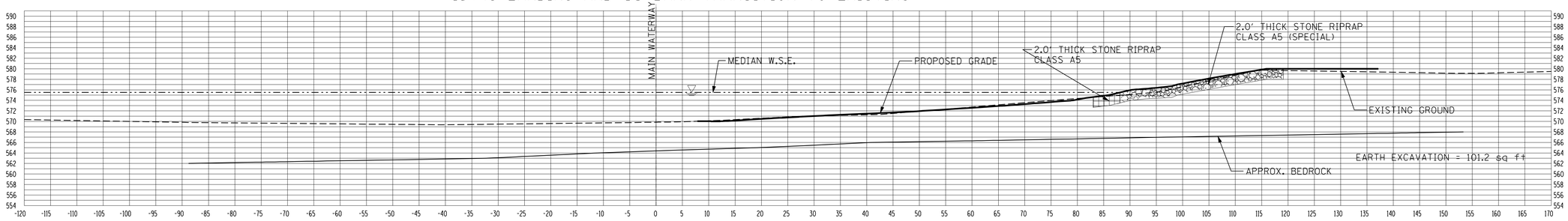
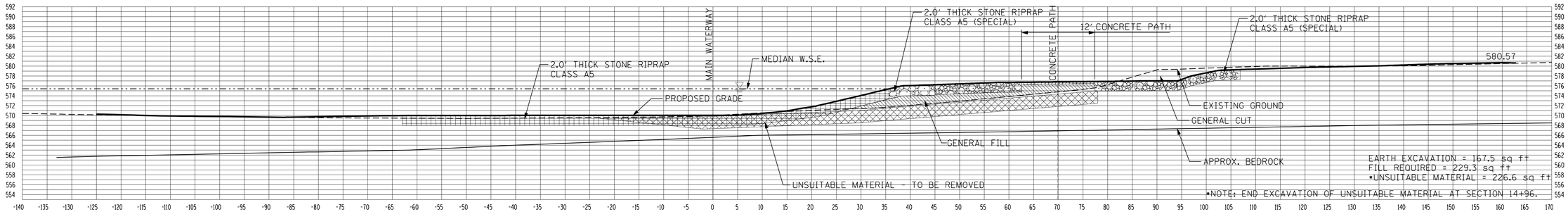
0 10' 20' 30' 1"= 10'

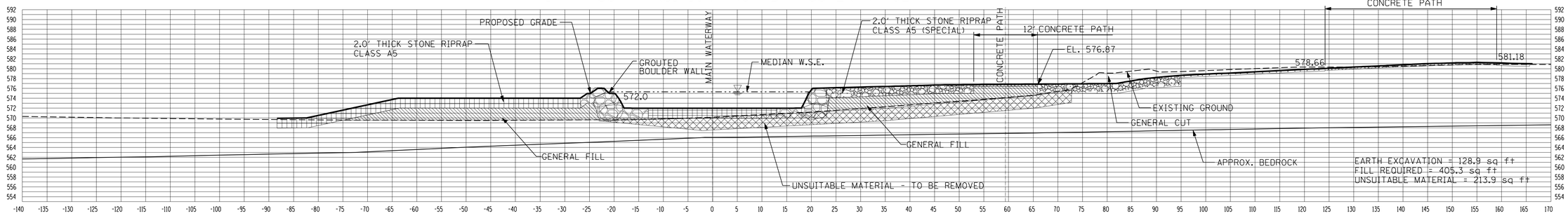
15+48 LANDING AND US BANK TRANSITION TO EXISTING



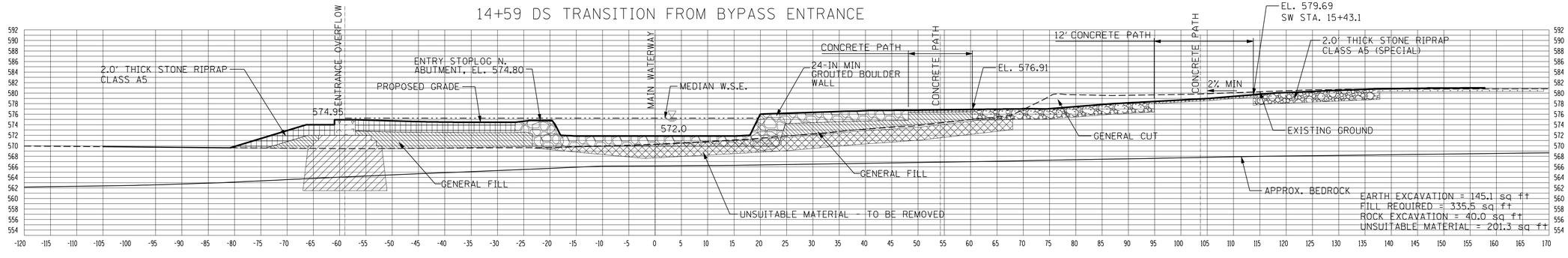
14+96 US END OF BYPASS WATERWAY AND LANDING



14+77 US TRANSITION FROM BYPASS ENTRANCE



14+59 DS TRANSITION FROM BYPASS ENTRANCE



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LEGEND

A / E1 Cross-Section Sheet Number

A Weep Drain - Type A or Type B

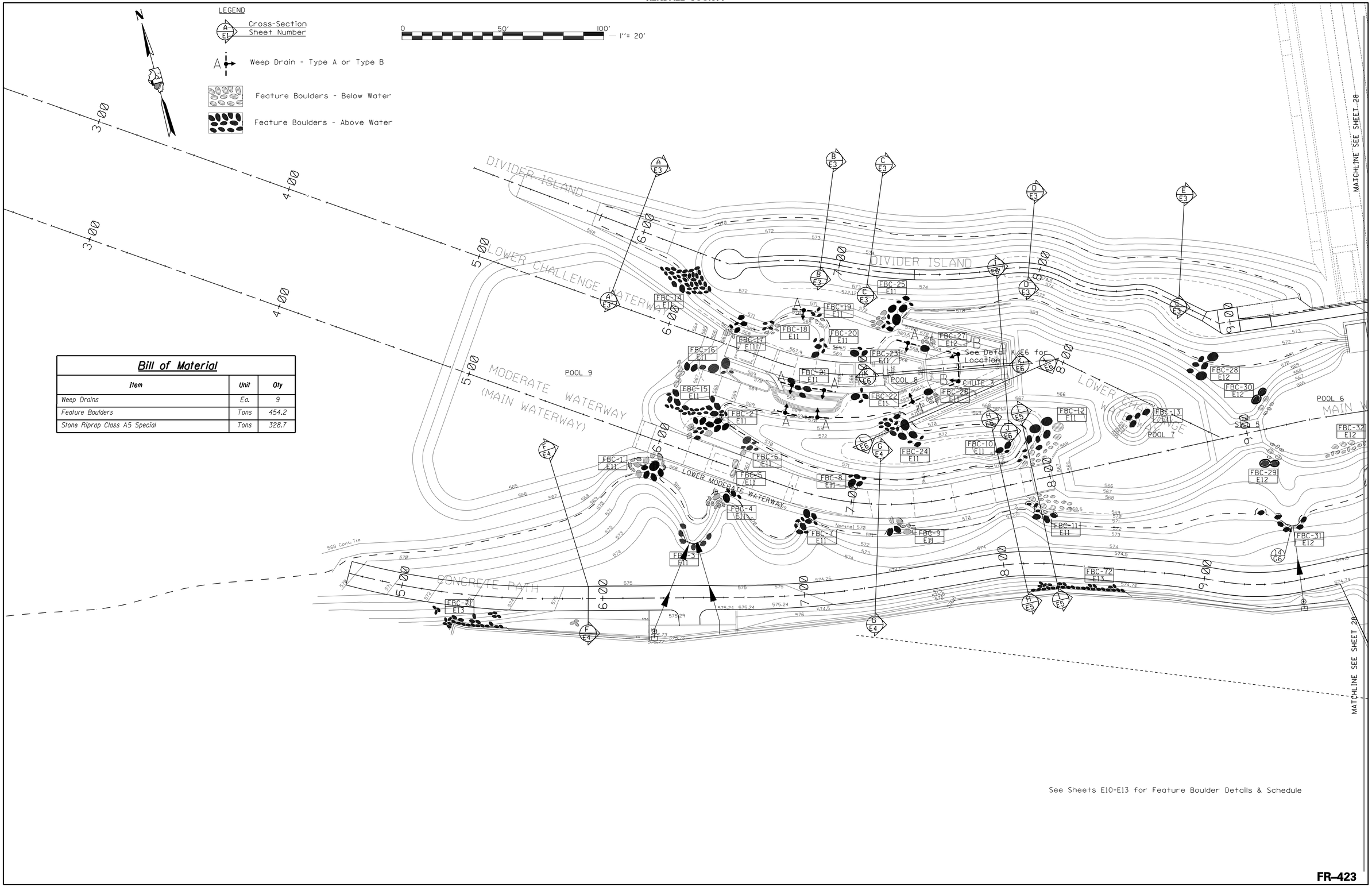
Feature Boulders - Below Water

Feature Boulders - Above Water

0 50' 100' — 1"= 20'

Bill of Material

Item	Unit	Qty
Weep Drains	Ea.	9
Feature Boulders	Tons	454.2
Stone Riprap Class A5 Special	Tons	328.7



See Sheets E10-E13 for Feature Boulder Details & Schedule

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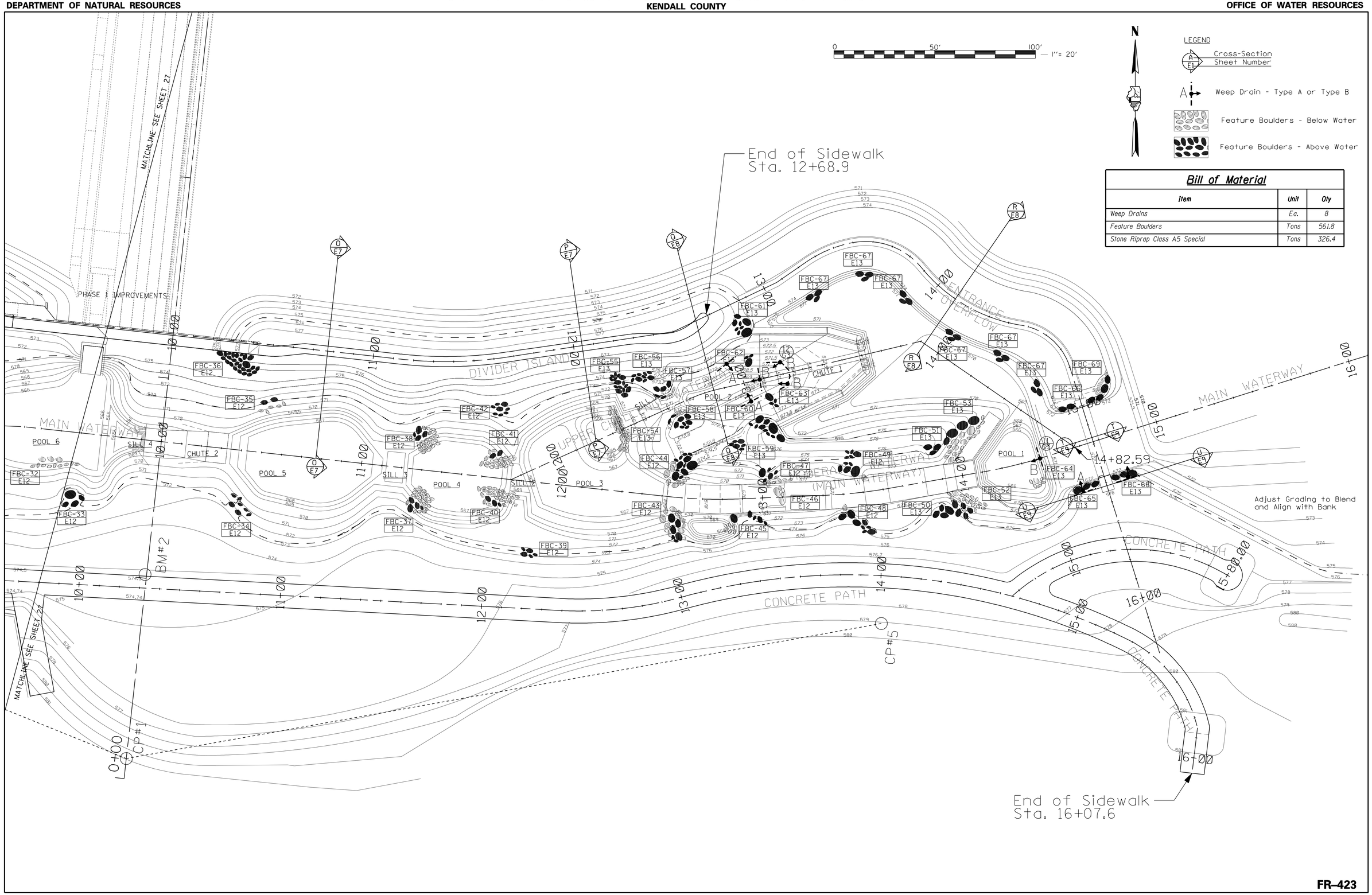

Bill of Material

Item	Unit	Qty
Weep Drains	Ea.	8
Feature Boulders	Tons	561.8
Stone Riprap Class A5 Special	Tons	326.4

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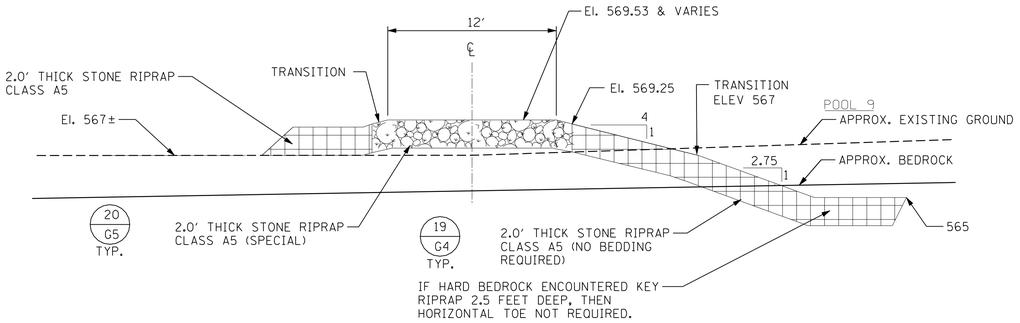
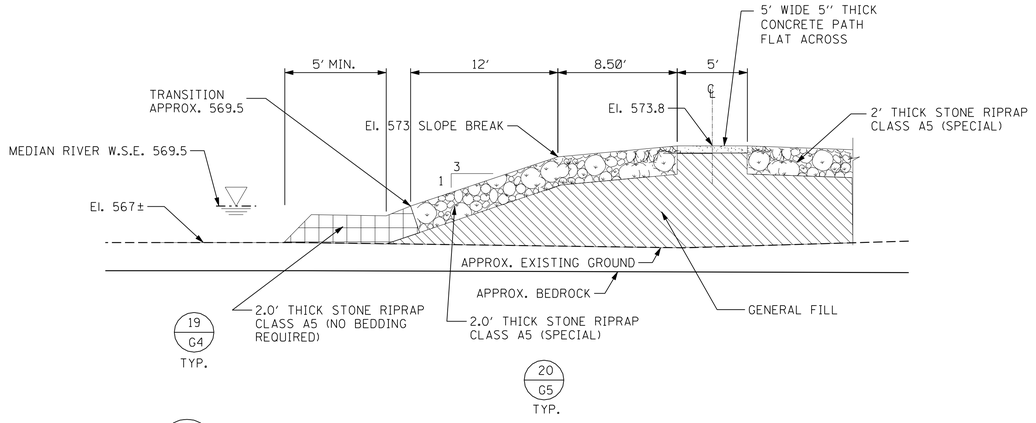
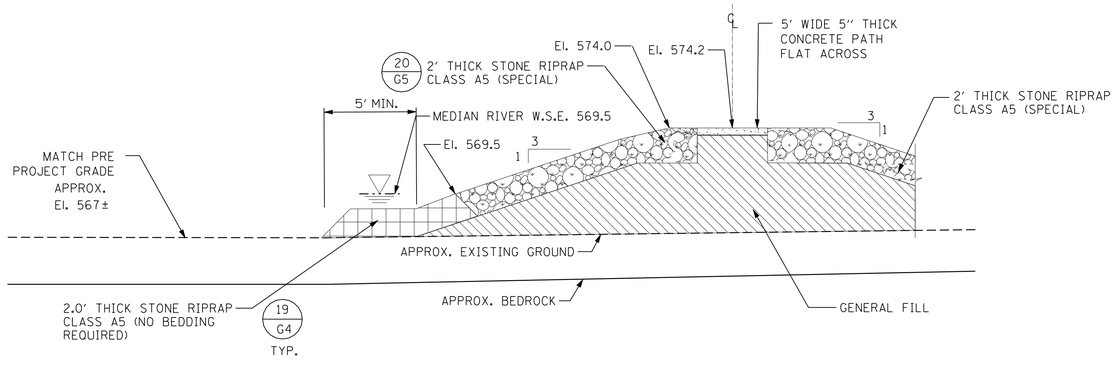
DETAIL SECTIONS & FEATURE BOULDERS II



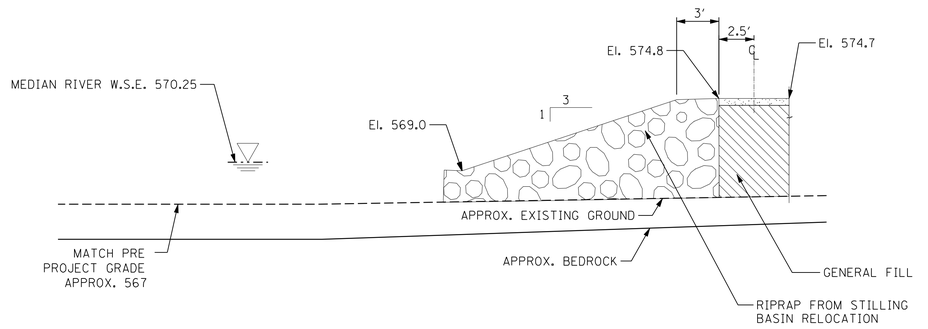
A / E1 SPUR DOWNSTREAM OF LOWER DIVIDER ISLAND



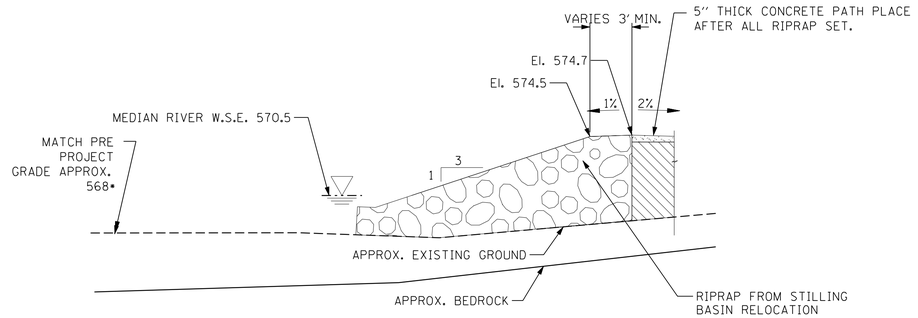
B / E1 RIVERSIDE-LOWER DIVIDER ISLAND NEAR DOWNSTREAM END



C / E1 RIVERSIDE-LOWER DIVIDER ISLAND



D / E1 RIVERSIDE-LOWER DIVIDER ISLAND MIDWAY



E / E1 RIVERSIDE-LOWER DIVIDER ISLAND JUST DOWNSTREAM ABUTMENT WALL

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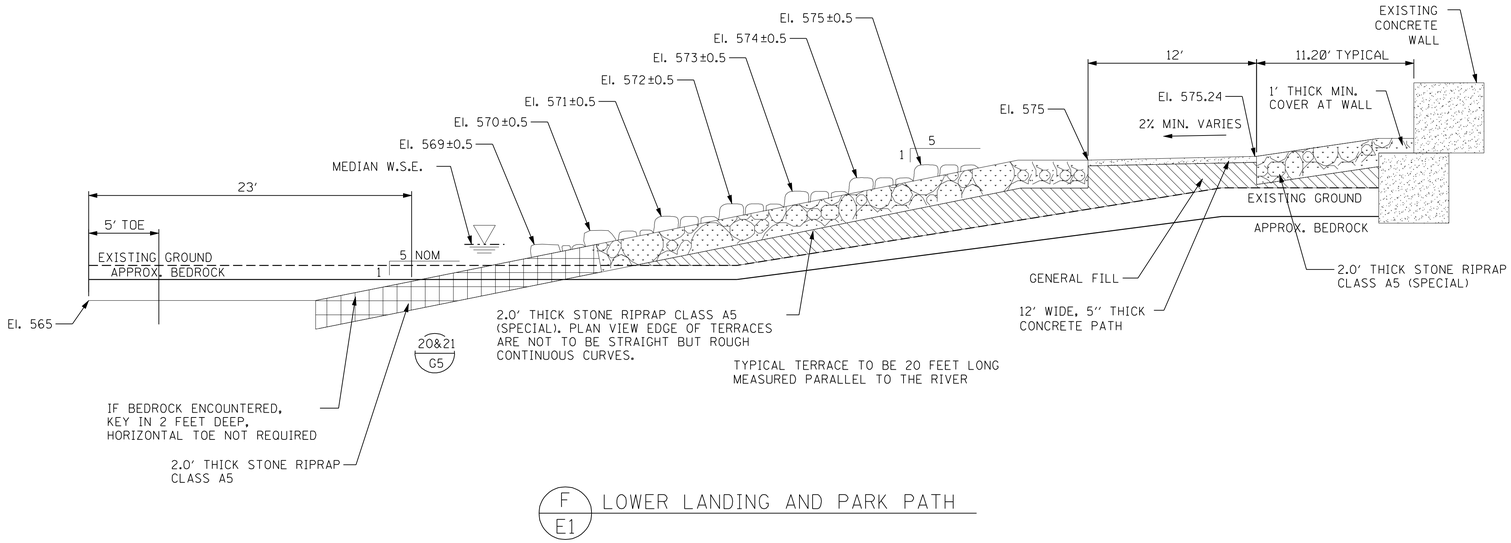
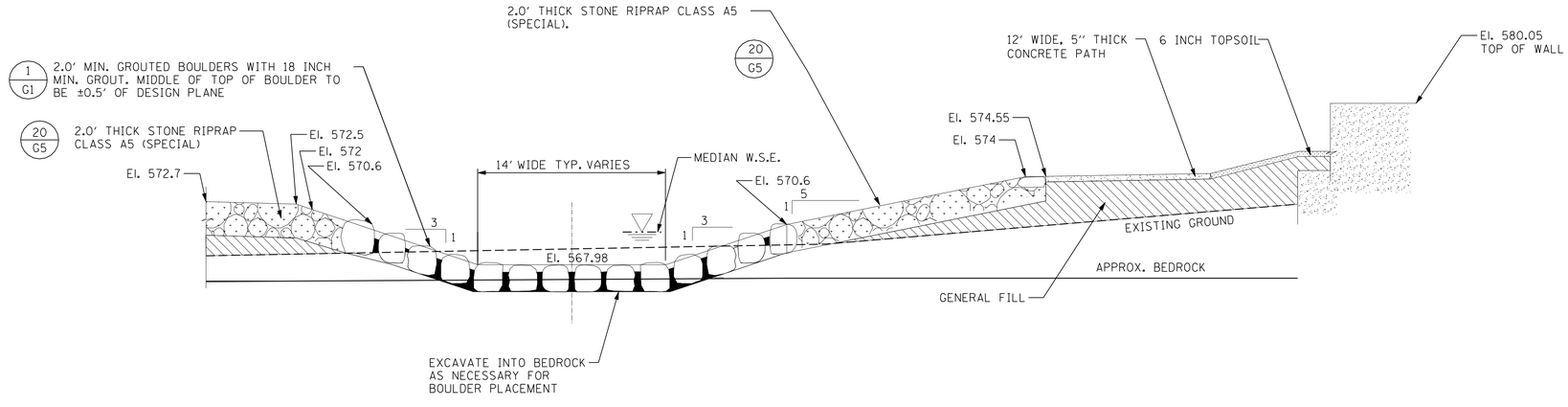


F / E1 LOWER LANDING AND PARK PATH



G / E1 TYPICAL MODERATE WATERWAY SECTION OF LOWER DUAL

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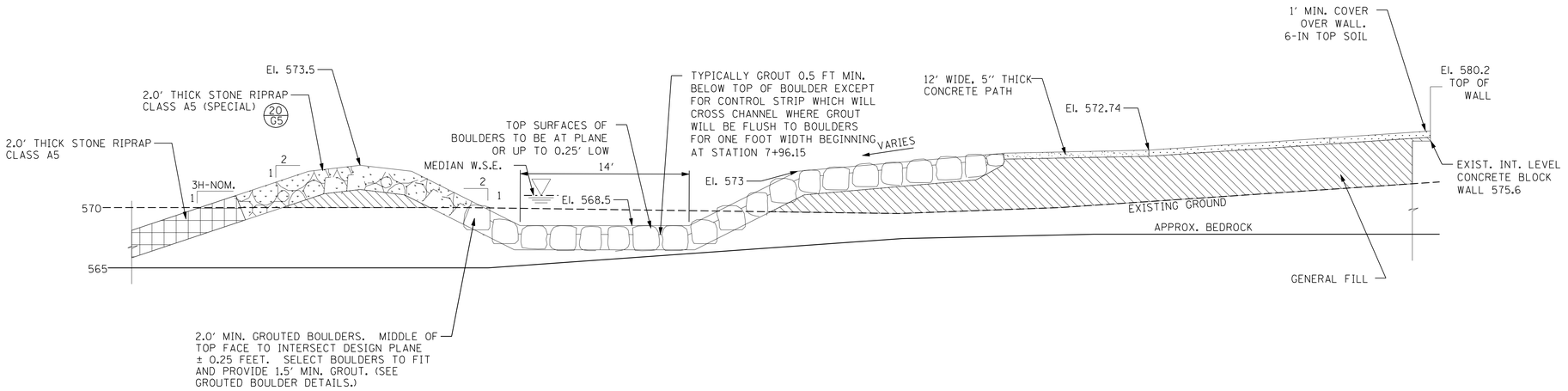
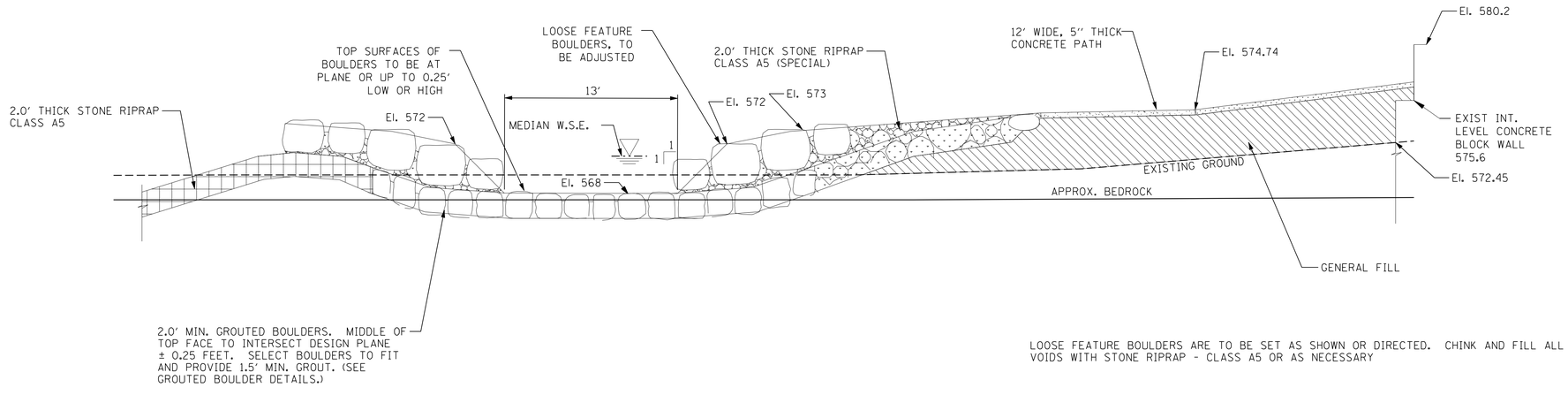


H / E1 FIXED ENTRY SECTION TO MODERATE WATERWAY OF LOWER DUAL



LOOSE FEATURE BOULDERS ARE TO BE SET AS SHOWN OR DIRECTED. CHINK AND FILL ALL VOIDS WITH STONE RIPRAP - CLASS A5 OR AS NECESSARY

I / E1 ADJUSTABLE ENTRY SECTION TO MODERATE WATERWAY OF LOWER DUAL

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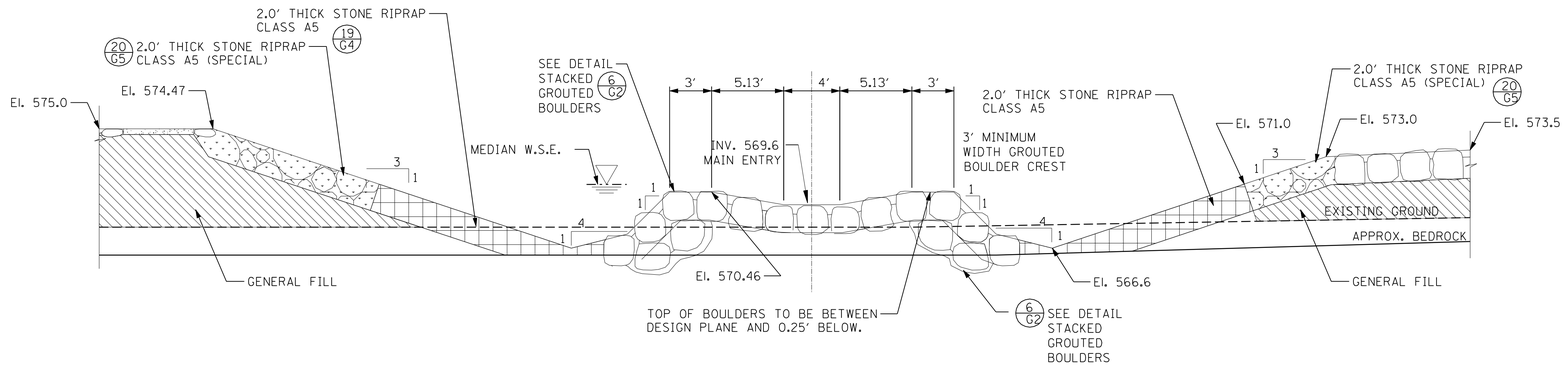
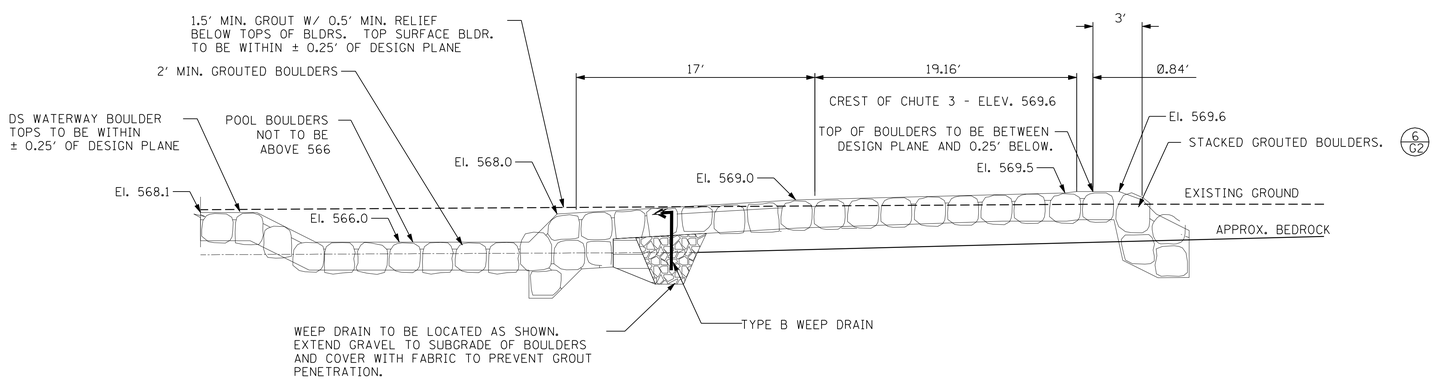
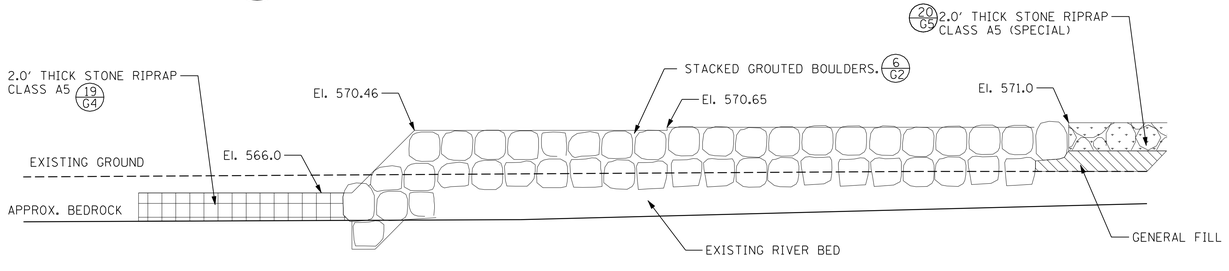


J/E1 CREST SECTION CHUTE 3 CHALLENGE WATERWAY OF LOWER DUAL



K/E1 DETAILED PROFILE CHUTE 3 - LOWER CHALLENGE WATERWAY



L/E1 CHUTE 2 SIDE ENTRY WIER

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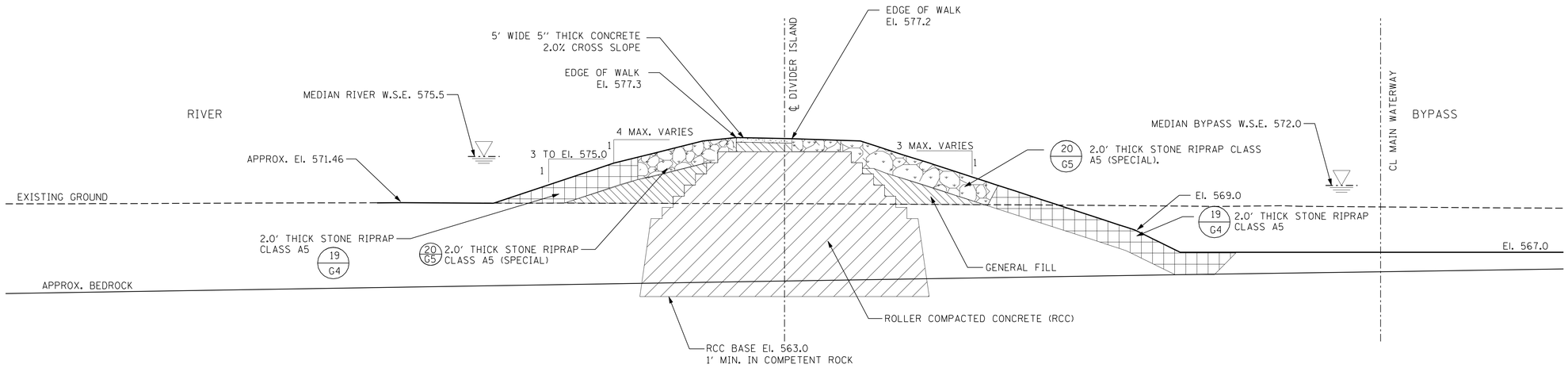
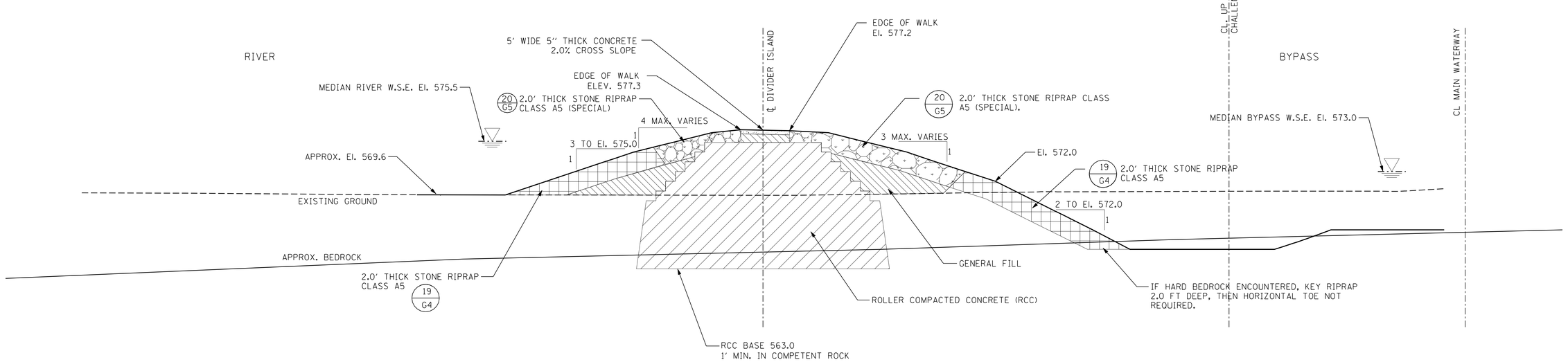


0 E2 UPPER DIVIDER ISLAND JUST UPSTREAM OF PHASE 1 ABUTMENT WALL - STA 10+77



P E2 MIDDLE UPPER DIVIDER ISLAND - STA 12+04

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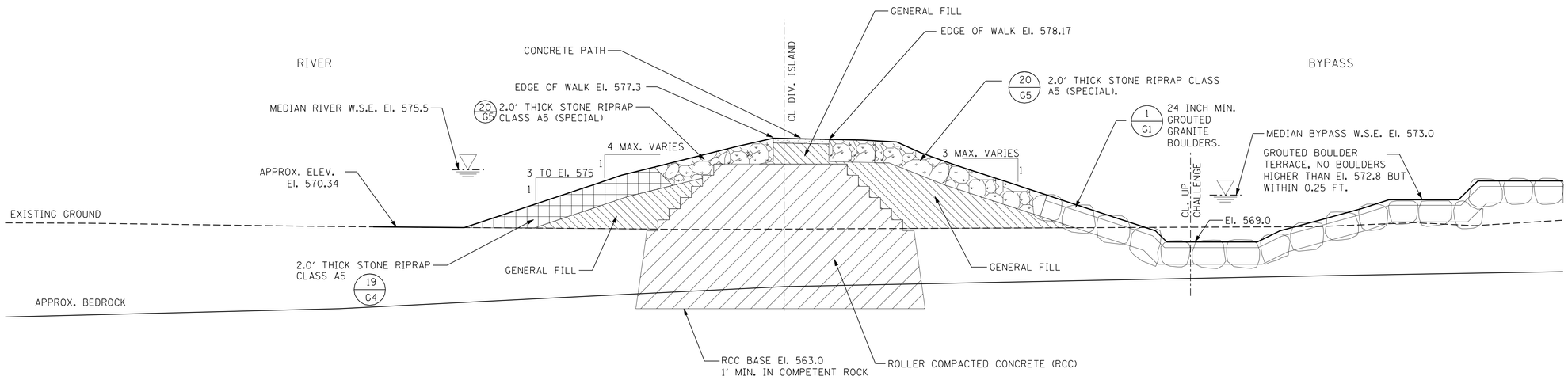
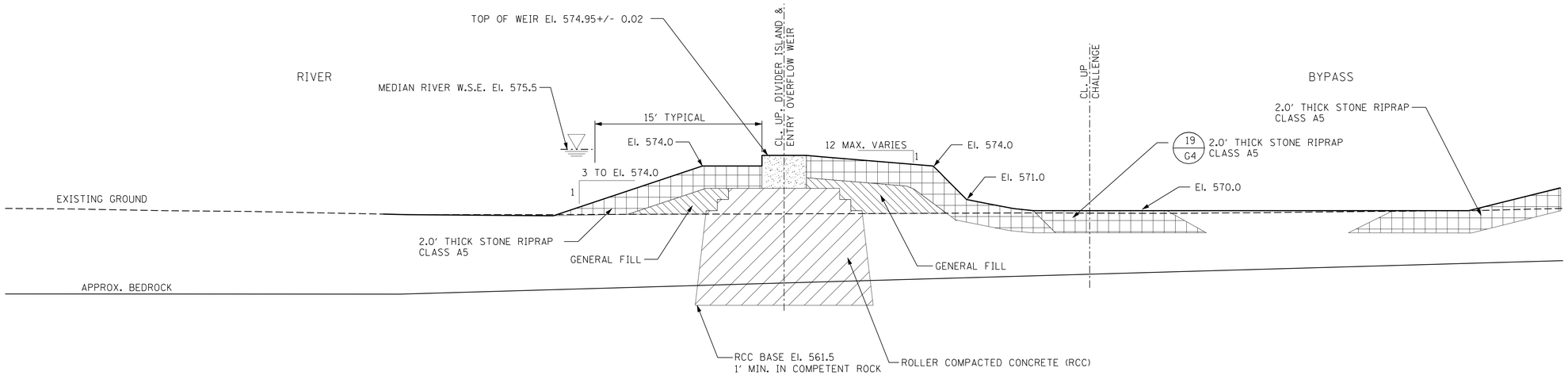


Q/E2 END OF UPPER DIVIDER ISLAND NEAR OVERFLOW WEIR - STA 12+62



R/E2 ENTRY OVERFLOW WEIR ALONG UPPER DIVIDER ISLAND CENTERLINE - TYPICAL

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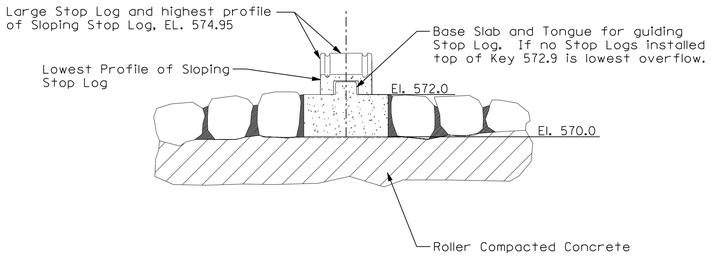
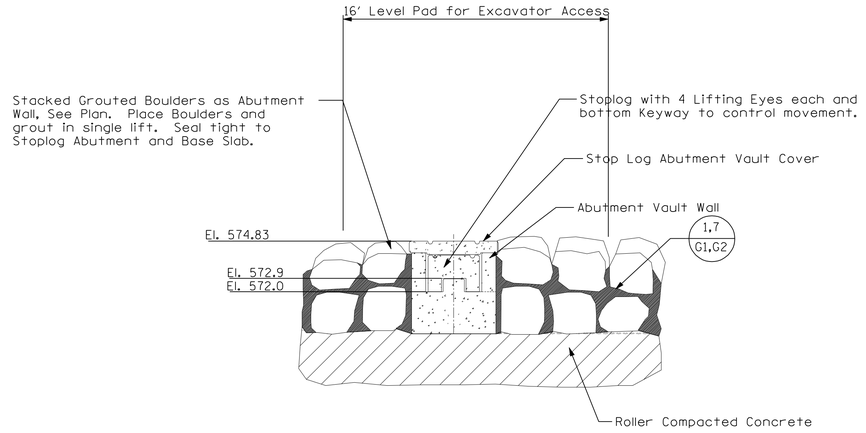
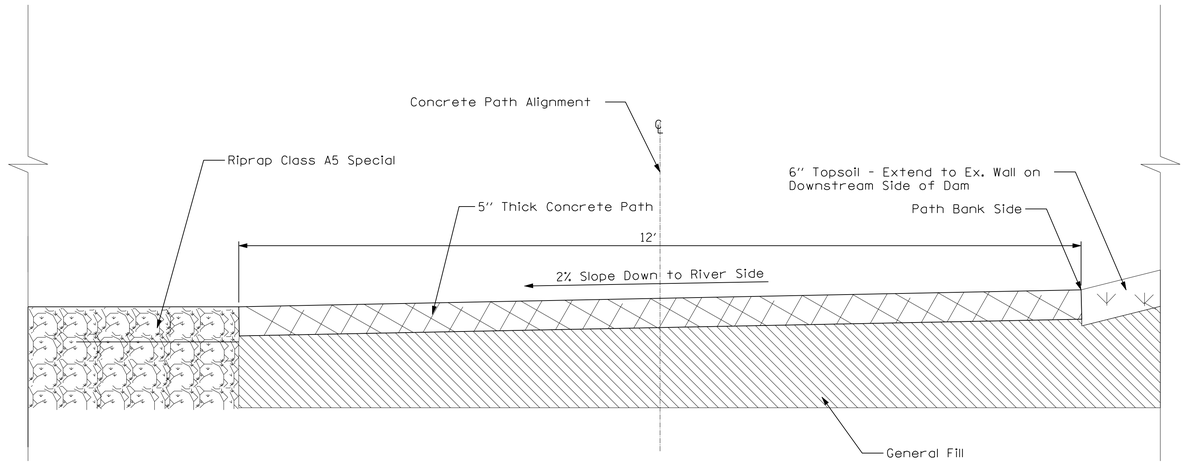
UPPER DIVIDER ISLAND & ENTRY OVERFLOW SECTIONS



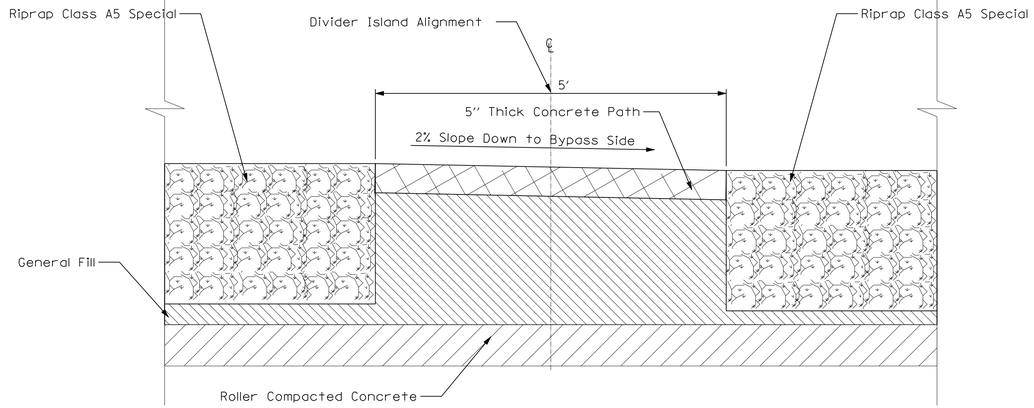
T/E2 ENTRANCE SILL AND STOPLOG DETAIL THROUGH MIDDLE OF STOPLOG



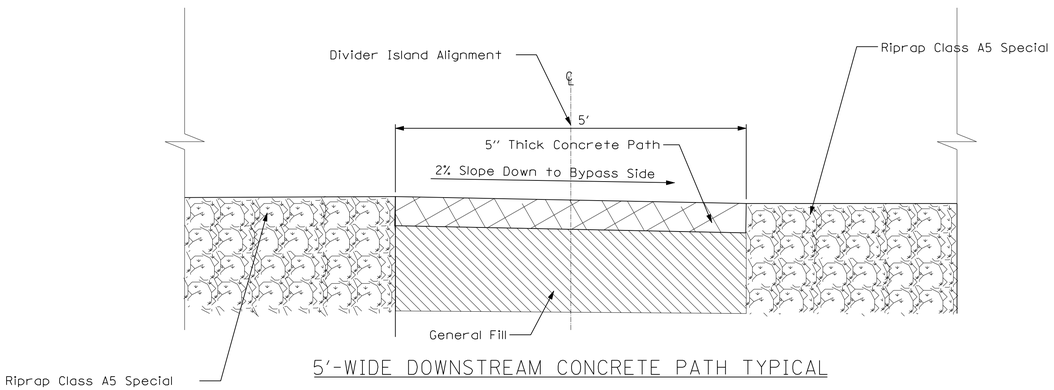
U/E2 ENTRANCE SILL AND STOPLOG DETAIL THROUGH VAULT



12'-WIDE CONCRETE PATH TYPICAL



5'-WIDE UPSTREAM CONCRETE PATH TYPICAL



5'-WIDE DOWNSTREAM CONCRETE PATH TYPICAL

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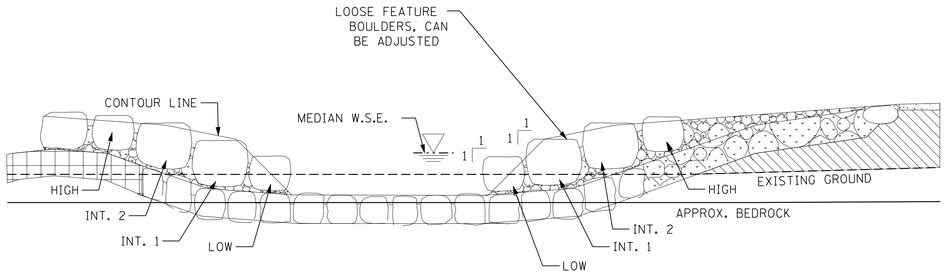
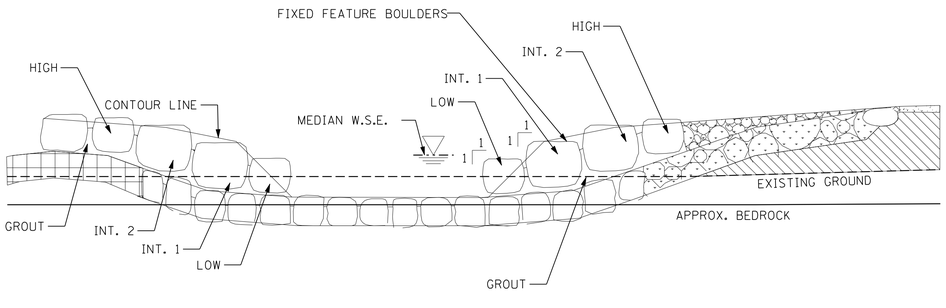


LOOSE FEATURE BOULDERS ARE TO BE SET AS SHOWN OR DIRECTED. IF FLOW SPLIT OR WATER LEVEL ADJUSTMENT NECESSARY DURING TESTING LOOSE BOULDERS TO BE MOVED INTO STREAM. CHINK AND FILL ALL VOIDS WITH STONE RIPRAP - CLASS A5 OR AS NECESSARY

ADJUSTABLE FEATURE BOULDER PLACEMENT DETAIL



FIXED FEATURE BOULDER PLACEMENT DETAIL

FEATURE BOULDER NOTES

1. Feature Boulders are for a number of purposes such as hydraulic controls and their adjustment, whitewater features such as waves and eddys, habitat, and appearance.

2. Details on the drawings and specifications apply to the construction and placement of Feature Boulders. Specific references to details or specifications do not exclude other general details and specifications.

3. This drawing depicts general requirements and details of combination features. Other Feature Boulder details are with Grouted Boulder, Riprap Special and miss. detail drawings. The detail (E drawings) and general sections (DX drawings), and profiles (C1-C4 drawings) do not depict the Feature Boulders.

4. The Feature Boulder Plans depict the general location and identify each Feature Boulder Cluster (FBC). Exact placement of boulders for appearance, material supply, sitting, walking is not critical so long as related requirements are met (general orientation, level related to path and structures, etc.). Fixed Feature Boulder for controls such as weirs, entrances to waterways, constrictions and sills have more specific elevations and placement requirements. Loose Feature Boulders are inherently adjustable and their data is for initial setting.

5. The following drawings present tables giving data about each FBC including location, key purposes, numbers, types, elevations, accessory riprap needs, comments, and reference to key related details.

6. All Feature Boulders will be the same as that used for the Grouted Boulders. No substitution of rock from other supplies will be allowed. The intent is to select specific boulders from the approved supply delivered, so long as the requirements and intent of the design is satisfied.

7. The size of boulders is given on the table. There is latitude as to the size provided. The values given are the plan view horizontal dimensions. The boulders provided may be six inches smaller in either axis for up to 15 s.f. and 1 foot smaller in either axis for boulders greater than 15 s.f., so long as the area is equal to or exceeds that of the specified dimensions (e.g. the requirement for a 2.5 by 4 ft boulder may be satisfied by a boulder which is 2 by 5 ft; or a 4 by 5 ft boulder may be satisfied by a 3 by 6.66 ft. See Boulder Plan View Example below.) The vertical axis will generally be less than or
equal to the smallest horizontal dimension, and suitable to the particular situation. The boulders are to be selected and matched to the other boulders in the cluster and the situation.

8. In some cases, a lesser number of larger boulders may be substituted as may be approved or indicated, in particular boulders for walls, appearance or certain hydraulic controls. The substrate may be lowered, as may be approved. To allow for vertical heights of boulders (loose boulders over Riprap Special or Grouted Boulders). The ratio of the largest dimension to the smallest will not exceed 3 except as approved or directed.

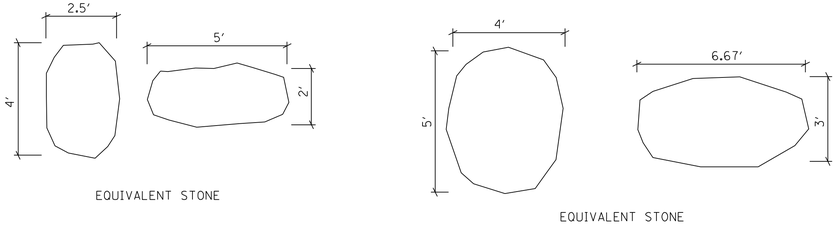
9. Fixed Feature Boulders are to be placed with the regular Grouted Boulders in the orientation and elevation indicated. The contractor will review the intent of each cluster with the engineer in advance of placement.

10. Loose Feature Boulders are to be placed in two types of situations: in Riprap or Riprap Special, and on Grouted Boulders. Either can be used to adjust hydraulic controls. Loose Feature Boulders on or adjacent to Grouted Boulders will be placed after the grout has set for 2 weeks minimum or otherwise judged by the engineer to be satisfactory to allow loose boulder placement. Feature Boulders may be placed with Riprap construction as it proceeds. Placement of loose boulders will be observed by the engineer typically after initial construction, coordinated with other observations of Grouted Boulders or various work. Adjustments will be made by the contractor as directed by the engineer.

11. Loose Feature Boulders may be reset or adjusted at latter times, such as after or during flow tests.

12. In order to achieve the various purposes above, Feature Boulders typically project above the design topography and into flow. Thus the profile, shapes and combination surface roughness can potentially create debris catchers, hazards, and other problems. The drawings indicate measures and materials which can prevent or minimize such conditions. The contractor will select and match Feature Boulders, and place clusters which comply with details, specifications, and directions of the engineer.

BOULDER PLAN VIEW EXAMPLE



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FEATURE BOULDER CLUSTER NUMBER	LOCATION	GENERAL PURPOSES)	COMMENTS	KEY DETAIL - DRAWING NUMBER	FIXED BOULDERS (GROUTED WITH ADJACENT 2 FT. MIN. GROUTED BOULDERS OR AS SHOWN)							FIXED BOULDER PLACEMENT ELEVATIONS - COMMENTS				MOVABLE BOULDERS WITH RIPRAP AND RIPRAP SPECIAL								MOVABLE BOULDER PLACEMENT ELEVATIONS - COMMENTS				RIPRAP FOR MOVABLE BOULDER VOID FILLING, SUPPORT, AND ADJUSTMENT	
					2.5 FT. X 3.5 FT.	2.5 FT. X 4.0 FT.	3. FT. BY 4.5 FT.	3.5 FT BY 5.5 FT.	4.5 FT. BY 6 FT.	SPECIAL	TOTAL	LOW	INT. 1	INT. 2	HIGH	2.5 FT. X 3.5 FT.	2.5 FT. X 4.0 FT.	3. FT. BY 4.5 FT.	3.5 FT BY 5.5 FT.	4.5 FT. BY 6 FT.	SPECIAL	TOTAL	LOW	INT. 1	INT. 2	HIGH	CUBIC YARDS	COMMENT
FBC- 1	LOWER MODERATE WATERWAY, DS. END, SOUTH BANK	SPUR TO DEFLECT CURRENT, WHITEWATER EDDY AND WAVE, APPEARANCE	LOWER GROUTED BOULDER EXTENDS INTO WATERWAY 2.5 FT AT ELEV. 567.5.	E1	2		4		1		7	1 EA. 567.5	1 EA. 568.3	3 EA. 569.5	2 EA. 570.5	6		2	1			9	5 EA. 569.5	1 EA. 570.5		3 EA. 571.5	1.5	FINES TO LOCK IN LOW BLDR., FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS ON BOTTOM.
FBC- 2	LOWER MODERATE WATERWAY, NEAR DS. END, NORTH BANK	SPUR-EDDY BOULDER FOR DEPTH , WHITEWATER EDDY AND WAVE, APPEARANCE	LOWER GROUTED BOULDER EXTENDS INTO WATERWAY 2.5 FT AT ELEV. 567.5.	E1	2	6		1			9	1 EA. 567.5	568. 3 , 568.5	4 EA. 569.5	2 EA. 570.5	4		1				5	2 EA. 570.5			1 EA. 571.0	2.5	FINES TO LOCK IN LOW BLDRS., FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER.
FBC- 3	WEST STORM OUTFALL NEAR STAIRS	GROUTED BOULDER TO PROVIDE RISE FOR HEADWALL	PLACE CAREFULLY AND SUPPORT PIPE, SEE DETAIL	E1	6						6	2 EA. 573.5			4 EA. 574.5							0						
FBC- 4	LOWER MODERATE WATERWAY, MIDWAY CONSTRICTION, S. BANK	CONSTRICTION AND SILL TO MAINTAIN DEPTH AND WHITEWATER WAVE	LOWER GROUTED BOULDER EXTENDS TO TOE OF WATERWAY BANK AT ELEV. 568.5.	E1	2	2		1			5	1 EA. 568.5	2 EA. 569.5	1 EA. 570.0	1EA. 572.2	8			1			9	3EA. 571.5	4 EA. 571.8	1 EA. 571.8	1 EA. 573.0	5	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 5	ADJUSTABLE BOTTOM SILL ASSOCIATED WITH FBC4 AND 5	WHITEWATER WAVE AND TO MAINTAIN DEPTH	A FLAT, RECTANGULAR SHAPE BOULDER IS NECESSARY WHICH CAN FORM SILL +- 0.5 FT. OF UPSTREAM INVERT OF WATERWAY.	E1							0									2	2.5 BY 5.5 BY 2 FT. T.	2				2 EA. 567.5	1	FINES TO LOCK IN AND LEVEL BOULDERS. FILL ALL VOIDS.
FBC- 6	LOWER MODERATE WATERWAY, MIDWAY CONSTRICTION, N. BANK	CONSTRICTION AND SILL TO MAINTAIN DEPTH AND WHITEWATER WAVE	LOWER GROUTED BOULDER EXTENDS TO TOE OF WATERWAY BANK AT ELEV. 568.5.	E1	3	2		1			6	1 EA. 568.5	3 EA. 569.5		1EA. 570.5							0						
FBC- 7	LOWER MODERATE WATERWAY, MIDWAY CONSTRICTION, S. BANK	WHITEWATER WAVE, EDDY, AND TO MAINTAIN DEPTH	LOWER GROUTED BOULDER EXTENDS TO TOE OF WATERWAY BANK AT ELEV. 569.5.	E1	2	2	1				5	2 EA. 569.5	1 EA. 570.5		2 EA. 571.5	3	1	1				5	2 EA. 570.5		1 EA. 573.2	2 EA. 573.5	2.5	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 8	LOWER MODERATE WATERWAY, MIDWAY CONSTRICTION, N. BANK	WHITEWATER WAVE, EDDY, AND TO MAINTAIN DEPTH	LOWER GROUTED BOULDER EXTENDS TO TOE OF WATERWAY BANK AT ELEV. 569.5.	E1	2		2	1			5	2 EA. 570.5	1 EA. 570.5		2 EA. 572.5							0						
FBC- 9	LOWER MODERATE WATERWAY, MIDWAY SPUR, S. BANK	WHITEWATER WAVE, EDDY, AND TO MAINTAIN DEPTH	LOWER GROUTED BOULDER EXTENDS 2.0 FT INTO WATERWAY BANK AT ELEV. 569.5.	E1		3					3	1 EA. 569.5	1 EA. 570.3		1EA. 570.5	3	1	1				5	4 EA. 571.5			1 EA. 572.5	2.5	FINES TO LOCK IN LOW BLDR., FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS DOWNSTREAM.
FBC- 10	N. BANK OF ENTRY SECTION TO LOWER MODERATE WATERWAY	ENHANCE VISIBILITY OF ENTRY TO LOWER MODERATE WATERWAY	SELECT BOULDER WITH EMPHASIS ON AESTHETICS AND ROUNDED EDGES	E1	1			2			3	1 EA. 573.5			2 EA. 574.5							0						
FBC- 11	S. BANK, ENTRY SECTION TO LOWER MODERATE WATERWAY	ADJUSTMENT OF WATER LEVELS, FLOW PATTERN, AND ELEV., FRAME ENTRY VIEW	LOWER TWO BOULDERS EXTENDS TO TOE OF SLOPE OF ENTRY, LARGER 571.5, SML. 570.5	E1							0					13	2	2	2			19	7 EA. 570.5	5 EA. 571.5	5 EA. 572.5	2 EA. 573.5	10	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 12	N. BANK, ENTRY SECTION TO LOWER MODERATE WATERWAY	ADJUSTMENT OF WATER LEVELS, FLOW PATTERN, AND ELEV., FRAME ENTRY VIEW; SCREEN VISIBILITY OF LOWER CHALL. ENTRY	LOWER TWO BOULDERS EXTENDS TO TOE OF SLOPE OF ENTRY, LARGER 571.5, SML. 570.5	E1							0					13	2	3	2	3		23	5 EA. 569.5	1 EA. 570.5		3 EA. 571.5	11	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 13	SMALL ISLAND IN POOL 7	SCREEN VIEW OF ENTRY TO LOWER CHALLENGE, FEATURE	BOULDERS ARE PLACED ON RIPRAP BASE PAID SEPARATELY, PLACE TIGHT AND MINIMIZE VISIBILITY OF RIPRAP	E1							0							2	2			4	1 EA. 573	2 EA. 573.8		1 EA. 573.9	9	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER BUT MINIMIZE VISIBILITY, LEAVE EXCESS BELOW WATER.
FBC- 14	LANDING BELOW LOWER CHALLENGE AT DIVIDER ISLAND	LANDING FOR EXPERT BOATERS TO TAKEOUT AND WALK UPSTREAM, FEATURE	PORTION OF ROCK CAN BE REUSED TO ADJUST WHITEWATER FEATURES AND REPAIR SPUR	E1							0					31	3	1	1			36	4 EA. 569.5	6 EA. 570.5	25 EA. 571.5	1 EA. 571.9	16	FILL ALL VOIDS AND LEVEL TERRACES, ADD STAB. SOIL ABOVE LOW WATER, USE EXCESS FOR BANK TRANSITION.
FBC- 15	LOWER CHALL., END OF ISLAND BETWEEN MAIN WW AND CHALL. OVERFLOW	FLOW PATTERN, SURFING WAVE, ADJUSTMENT, APPEARANCE, SEPARATE WATERWAYS.	MATCH BLDR FACES TO MINIMIZE JOINTS AND FLOW THRU ROCK.	E1							0					12	7	7	6			32	5 EA. 569.5	1 EA. 570.5		3 EA. 571.5	21	FINES TO LOCK IN BOULDERS FOR SILL AND ON SLOPING BASE. ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS DOWNSTREAM OF DIVIDER.
FBC- 16	S. BANK OF LOWER CHALLENGE AT DS. CONSTRICTION	WAVE, EDDY, WS. ELEV. UPSTREAM, AND FLOW SPLIT TO HIGH FLOW WATERWAY	LOWER BOULDER EXTENDS TO TOE OF SLOPE OF SILL. 572.5.	E1	2			1	2		5	2 EA. 571.5			2 EA. 572.5							0						RIPRAP FROM ADJACENT CLUSTERS MAY BE MOVED HERE FOR ADJUSTMENTS
FBC- 17	N. BANK OF LOWER CHALLENGE AT DS. CONSTRICTION	WAVE, EDDY, WS. ELEV. UPSTREAM, AND FLOW SPLIT TO HIGH FLOW WATERWAY	TWO BOULDERS AT TOE OF SLOPE, LARGER EXTENDS 2.25 FT. INTO SILL, SMALLER 2.5 FT., ELEV. BOTH 568.5	E1	3		3	1			7	2 EA. 568.5	2 EA. 569.5	2 EA. 570.5	1EA. 571.5							0						RIPRAP FROM ADJACENT CLUSTERS MAY BE MOVED HERE FOR ADJUSTMENTS
FBC- 18	NW. BANK OF DOWNSTREAM SIDE EDDY, LOWER CHALLENGE	SOURCE OF BOULDERS FOR ADJUSTMENTS AND APPEARANCE.	FILL ALL VOIDS AND PLACE BOULDERS LEVEL FOR SITTING.	E1							0					2	6					8	3 EA. 570.5	2 EA. 571.0	2 EA. 571.5	1 EA. 572.5	4	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS BELOW WATER.
FBC- 19	N. BANK OF MIDDLE OF EDDY, LOWER CHALLENGE	SOURCE OF BOULDERS FOR ADJUSTMENTS AND APPEARANCE.	FILL ALL VOIDS AND PLACE BOULDERS LEVEL FOR SITTING.	E1							0					6						6	2 EA. 571.0	2 EA. 571.5	1 EA. 572.0	1 EA. 572.5	3	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS BELOW WATER.
FBC- 20	NE. BANK OF UPSTREAM SIDE OF SIDE EDDY, LOWER CHALLENGE	EDDY, WAVES, SOURCE OF BOULDERS FOR ADJUSTMENTS AND APPEARANCE.	FILL ALL VOIDS AND PLACE BOULDERS LEVEL FOR SITTING. LARGEST BOULDER SET AT 573.5	E1							0					4		1	1			6	1 EA. 570.5	1 EA. 571.5	2 EA. 572.5	1 EA. 573.5	4	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS BELOW WATER.
FBC- 21	S. OF WATERWAY ON SIDE SILL, MIDDLE LOWER CHALLENGE	EDDY, WAVES, SOURCE OF BOULDERS FOR ADJUSTMENTS AND APPEARANCE.	FILL ALL VOIDS. BOULDER SET ON AND ADJACENT TO SIDE SILL.	E1							0					2	2					4	1 EA. 569.5	2 EA. 571.5		1 EA. 572.0	4	FINES TO LOCK IN BOULDERS AT SILL AND ON SLOPING BASE.. FILL ALL VOIDS. LEAVE EXCESS ON S. SIDE OF SILL.
FBC- 22	S. BANK OF LOWER CHALLENGE MIDDLE CONSTRICTION	WAVE AND EDDY, ADJUSTMENT OF WATER LEVELS AND FLOW PATTERN.	LOWER BOULDERS EXTENDS 0.5 FT INTO WATERWAY, ELEVATION 569.5.	E1	2		1	1			4	1 EA. 569.5	1EA. 570.5		2 EA. 571.5													
FBC- 23	N. BANK OF LOWER CHALLENGE MIDDLE CONSTRICTION	WAVE AND EDDY, ADJUSTMENT OF WATER LEVELS, FLOW PATTERN, AND ELEV.	LOWER BOULDERS EXTENDS 0.5 FT INTO WATERWAY, ELEVATION 569.5.	E1	2		1	1			4	1 EA. 569.5	1EA. 570.5		2 EA. 571.5													
FBC- 24	SOUTH ABUT. CHUTE 3 ENTRY WEIR ABUTMENT	ABUTMENT TO CONTROL FLOW, WHITEWATER FEATURE, BOULDERS FOR ADJUSTMENTS	GROUTED BLDR. ABUTMENT MUST BE WATERTIGHT, TIGHT JOINTS, RECESS GROUT.	E1	5	2		2	1		10		3 EA. 572.5	1 EA. 573.0	6 EA. 573.5	5		2				7	3 EA. 572.5	1 EA. 572.5	2 EA. 574	1 EA. 574.5	4	FILL ALL VOIDS, ADD STAB. SOIL TO ALL RIPRAP, PLACE EXCESS AS BANK TRANSITION TO WEST.
FBC- 25	NORTH ABUT. CHUTE 3 ENTRY WEIR ABUTMENT	ABUTMENT TO CONTROL FLOW, WHITEWATER FEATURE, BOULDERS FOR ADJUSTMENTS	GROUTED BLDR. ABUTMENT MUST BE WATERTIGHT, TIGHT JOINTS, RECESS GROUT.	E1	5	2		2	1		10		3 EA. 572.5	1 EA. 573.0	6 EA. 573.5	5		2				7	3 EA. 572.5	1 EA. 572.5	2 EA. 574	1 EA. 574.5	4	FILL ALL VOIDS, ADD STAB. SOIL TO ALL RIPRAP, PLACE EXCESS AS BANK TRANSITION TO WEST.
FBC- 26	S. SIDE OF CHUTE 3	WHITEWATER FEATURE WITH SURFING WAVE UPSTREAM AND EDDY BELOW	SMALL BOULDERS TO BE PLACED AS TERRACE FOLLOWED BY LARGE ROUNDED BOULDER.	E1	6				1		7	6 EA. 570.5			1 EA. 572.0							0						

FEATURE BOULDER CLUSTER NUMBER	LOCATION	GENERAL PURPOSES)	COMMENTS	KEY DETAIL - DRAWING NUMBER	FIXED BOULDERS (GROUTED WITH ADJACENT 2 FT. MIN. GROUTED BOULDERS OR AS SHOWN)							FIXED BOULDER PLACEMENT ELEVATIONS - COMMENTS				MOVABLE BOULDERS WITH RIPRAP AND RIPRAP SPECIAL								MOVABLE BOULDER PLACEMENT ELEVATIONS - COMMENTS				RIPRAP FOR MOVABLE BOULDER VOID FILLING, SUPPORT, AND ADJUSTMENT	
					2.5 FT. X 3.5 FT.	2.5 FT. X 4.0 FT.	3. FT. BY 4.5 FT.	3.5 FT BY 5.5 FT.	4.5 FT. BY 6 FT.	SPECIAL	TOTAL	LOW	INT. 1	INT. 2	HIGH	2.5 FT. X 3.5 FT.	2.5 FT. X 4.0 FT.	3. FT. BY 4.5 FT.	3.5 FT BY 5.5 FT.	4.5 FT. BY 6 FT.	SPECIAL	TOTAL	LOW	INT. 1	INT. 2	HIGH	CUBIC YARDS	COMMENT
FBC- 27	N. SIDE OF CHUTE 3	WHITEWATER FEATURE WITH SURFING WAVE UPSTREAM AND EDDY BELOW	SMALL BOULDERS TO BE PLACED AS TERRACE FOLLOWED BY LARGE ROUNDED BOULDER.	E1	6				1		7	6 EA. 570.5			1 EA. 572.0							0						
FBC- 28	NORTH BANK OF UPSTREAM SIDE POOL 7	SCREEN VIEW OF LOWER CHALL. ENTRY, FEATURE, ADJUSTMENT BOULDERS	BOULDERS ARE PLACED ON RIPRAP BASE, MINIMIZE VISIBILITY OF RIPRAP	E1							0							2	2	2		6	1 EA. 572.5	4 EA. 573.5		1 EA. 574.5	7	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER BUT, LEAVE EXCESS BELOW WATER.
FBC- 29	S. BANK, SILL 4 CONSTRICTION MAIN WATERWAY	ADJUST WATER LEVELS & FLOW PATTERN, ORIENT VIEW TO MOD. WATERWAY, EDDY	OVERLAP (SHINGLE) BOULDERS TO AVOID DEBRIS.	E1							0					4	3		1			8	3 EA. 568.5	3 EA. 571.5		2 EA. 572.5	9	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 30	N. BANK, SILL 4 CONSTRICTION MAIN WATERWAY	ADJUST WATER LEVELS & FLOW PATTERN, ORIENT VIEW TO MOD. WATERWAY, EDDY	OVERLAP (SHINGLE) BOULDERS TO AVOID DEBRIS.	E1							0					4	3		1			8	3 EA. 568.5	3 EA. 571.5		2 EA. 572.5	9	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 31	MID-PARK STORM OUTFALL	GROUTED BOULDER TO PROVIDE RISE FOR HEADWALL	PLACE CAREFULLY AND SUPPORT PIPE, SEE DETAIL	E1	6						6	1 EA. 572.5	2 EA. 573.5		3 EA. 574.5							0						
FBC- 32	SOUTH BANK OF MIDDLE POOL 6	ADJUSTMENT BOULDERS	LOOSE BLDRS. ON POOL BOTTOM AND LOWER SLOPE, FILL ALL VOIDS FLUSH TO TOPS.	E1												9			3			12	12 EA. 568.5			3 EA. 570.5	14	FILL WEDGE SOUTH OF BOULDERS WITH LARGER RIPRAP, FILL ALL VOIDS IN BOULDERS TIGHT.
FBC- 33	SOUTH BANK OF UPSTREAM SIDE POOL 6	POOL AND EDDY FEATURE, APPEARANCE	MAY ADD LOOSE BOULDERS FROM FBC 32 DURING TUNING OR IN FUTURE	E2		2	1	1			4											0						
FBC- 34	S. BANK POOL 5 AT ENTRY TO CHUTE 2	ADJUSTMENT OF WATER LEVELS, FLOW PATTERN, AND ELEV., FRAME ENTRY VIEW	PLACE BOULDERS WITH FLAT TOPS FOR SITTING.	E2							0						5		2			7	5 EA. 573.5			2 EA. 574.	10	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON POOL BANK BELOW BLDRS.
FBC- 35	N. BANK POOL 5 NEAR ENTRY TO CHUTE 2	ADJUSTMENT OF WATER LEVELS, FLOW PATTERN, AND ELEV., FRAME ENTRY VIEW	PLACE BOULDERS WITH FLAT TOPS FOR SITTING.	E2							0						5		2			7	5 EA. 573.5			2 EA. 574.	10	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON POOL BANK BELOW BLDRS.
FBC- 36	ADJACENT TO STEPS AT UPSTREAM END OF NEW ABUTMENT WALL	DIVERT SPILLAGE AWAY FROM AREA BELOW STEPS, SUPPORT STEPS, TERRACES TO SIT, APPEARANCE.	PLACE BLDRS. SO STEP RISE CONCEALED AND FLUSH TO PAVING. MAY SUBSTITUTE 2 FT. NOMINAL BLDRS. FOR EASE OF FITTING STEPS.	E2	22	3	1				26	10 EA. 576.	9 EA. 576.5	4 EA. 577.0	1 EA. 578.5, 2 EA. 577.5							0						
FBC- 37	SOUTH SIDE OF SILL 3 CONSTRICTION APPROACH	CONTROL OF POOL LEVEL UPSTREAM, WHITEWATER EDDY, APPEARANCE, ADJUSTABILITY	OVERLAP (SHINGLE) BOULDERS TO AVOID DEBRIS.	E2							0	12 EA. 570.5	5 EA. 570.9 572.5	572.7 572.8 2EA. 572.9	573.8, 573.2 572.8	22		2	1			25	5 EA. 569.5	1 EA. 570.5		3 EA. 571.5	13	PLACE RIPRAP IN ALL BOULDER VOIDS AND PLACE AS TRANSITION TO UPSTREAM AND POOL BOTTOM GRADES.
FBC- 38	NORTH SIDE OF SILL 3 CONSTRICTION APPROACH	ADJUSTMENT OF POOL LEVEL UPSTREAM, WHITEWATER EDDY, APPEARANCE, ADJUSTABILITY	OVERLAP (SHINGLE) BOULDERS TO AVOID DEBRIS.	E2							0	12 EA. 570.5	5 EA. 570.9 572.5	572.7 572.8 2EA. 572.9	573.8, 573.2 572.8	22		2	1			25	5 EA. 569.5	1 EA. 570.5		3 EA. 571.5	13	PLACE RIPRAP IN ALL BOULDER VOIDS AND PLACE AS TRANSITION TO UPSTREAM AND POOL BOTTOM GRADES.
FBC- 39	SOUTH BANK ABOVE SILL 2 NEAR PATH JUNCTION	VIEWPOINT, APPEARANCE	PLACE BOULDERS WITH FLAT TOPS FOR SITTING.	E2							0					3		2				5	3 EA. 575.5			2 EA. 575.7	2	USE RIPRAP TO FILL VOIDS AND ADD SOIL FOR RIPRAP SPECIAL.
FBC- 40	SOUTH SIDE OF SILL 2 CONSTRICTION	ADJUSTMENT OF POOL LEVEL UPSTREAM, WHITEWATER EDDY, APPEARANCE, ADJUSTABILITY	OVERLAP (SHINGLE) BOULDERS TO AVOID DEBRIS.	E2		2					2	1 EA. 570.5			1 EA. 571.5	27		2				29	16 EA. 570.5	5 EA. 570.9, 1 EA. 571.5	1 EA. 572.5, 2EA. 572.7	573.1, 573.2, 573.8	12	PLACE RIPRAP IN ALL BOULDER VOIDS AND PLACE AS TRANSITION TO UPSTREAM AND POOL BOTTOM GRADES.
FBC- 41	NORTH SIDE OF SILL 2 CONSTRICTION	ADJUSTMENT OF POOL LEVEL UPSTREAM, WHITEWATER EDDY, APPEARANCE, ADJUSTABILITY	OVERLAP (SHINGLE) BOULDERS TO AVOID DEBRIS.	E2		2					2	1 EA. 570.5			1 EA. 571.5	20	2	2				24	14 EA. 570.5	5 EA. 570.9, 1 EA. 571.5	2EA. 572.7	1 EA. 573.1, 1 EA. 573.8	12	PLACE RIPRAP IN ALL BOULDER VOIDS AND PLACE AS TRANSITION TO UPSTREAM AND POOL BOTTOM GRADES.
FBC- 42	NORTH BANK ABOVE SILL 2	VIEWPOINT, APPEARANCE	PLACE BOULDERS WITH FLAT TOPS FOR SITTING.	E2							0					6		2				8	4 EA. 575.0	2 EA 575.3		2 EA. 576.5	2.5	USE RIPRAP TO FILL VOIDS AND ADD SOIL FOR RIPRAP SPECIAL.
FBC- 43	CONSTRICTION AT END OF UPPER MODERATE WATERWAY, S. BANK	WHITEWATER WAVE, EDDY, AND TO MAINTAIN DEPTH	LOWER GROUTED BOULDER EXTENDS 2.0 FT INTO WATERWAY BANK AT ELEV. 569.5.	E2		2		4			6	1 EA. 569.5	1 EA. 570.5	1 EA. 571.5	2 EA. 572.5	9	1	2				12	6 EA. 571.5	3 EA. 572.5	1 EA. 573.2	2 EA. 573.5	5.5	FINES TO LOCK IN LOW BLDR., FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS DOWNSTREAM.
FBC- 44	CONSTRICTION AT END OF UPPER MODERATE WATERWAY, N. BANK.	WHITEWATER WAVE, EDDY, AND TO MAINTAIN DEPTH; MINIMIZES HYDRAULIC EFFECTS FROM CHALLENGE.	LOWER GROUTED BOULDER EXTENDS 2.0 FT INTO WATERWAY BANK AT ELEV. 569.5.	E2	3	2	4	1	1		11	1 EA. 569.5 1 EA. 570.5	1 EA. 571.5 2 EA. 572.5	1 EA. 572.8 1 EA. 573.5	2 EA. 573.8 2 EA. 574.8	9		1				10	4 EA. 571.5	1 EA. 572.0 1 EA. 572.5	1 EA. 573.2	3 EA. 574.5	4.5	FINES TO LOCK IN BLDRS., FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS DOWNSTREAM.
FBC- 45	SOUTH SIDE OF UPPER MOD. WATERWAY ABOUT 40 FT. FROM DOWNSTREAM END.	CONSTRICTION TO MAINTAIN FLOW DEPTH, WHITEWATER WAVE AND SIDE EDDY POOL JUST DOWNSTREAM.	LOOSE BLDRS IN SIDE POOL CAN BE SET JUST UPSTREAM OF FIXED BOULDER CONSTRICTION TO CREATE WAVES AND INCREASE DEPTH.	E2	2	2		1			5	571	573	2EA. 573.5	575	6						6	2 EA. 570.0	2 EA. 570.5		2 EA. 571.8	1.5	LEAVE EXCESS RIPRAP IN. SUBMERGED ADJ. SIDE POOL BOTTOM.
FBC- 46	ADJUSTABLE BOTTOM SILL ASSOCIATED WITH FBC45 AND 47	WHITEWATER WAVE AND TO MAINTAIN DEPTH	A FLAT, RECTANGULAR SHAPE BOULDER IS NECESSARY WHICH CAN FORM SILL +- 0.5 FT. OF UPSTREAM INVERT OF WATERWAY	E2							0					3					2	2.5 BY 5.5 BY 2 FT. T. 5					5 EA. 571.2	2	FINES TO LOCK IN, RAISE OR LOWER AND LEVEL BOULDERS. FILL ALL VOIDS.
FBC- 47	NORTH SIDE OF UPPER MOD. WATERWAY ABOUT 50 FT. FROM DOWNSTREAM END.	CONSTRICTION TO MAINTAIN FLOW DEPTH AND WHITEWATER WAVE.	LOOSE BLDRS CAN BE SET JUST UPSTREAM OF FIXED BOULDER CONSTRICTION TO CREATE WAVES AND INCREASE DEPTH.	E2	3		2	1			6	572	2 EA. 573.5	2 EA. 574.5	575	5						5	572	3 EA. 572.0		573	1.5	LEAVE EXCESS UPHILL OF BOULDERS BELOW LOW WATER.
FBC- 48	SOUTH SIDE OF UPPER MOD. WATERWAY ABOUT 90 FT. FROM DOWNSTREAM END.	CONSTRICTION TO MAINTAIN FLOW DEPTH AND WHITEWATER FEATURE.	LOOSE BLDRS ON BANK CAN BE SET JUST UPSTREAM OF FIXED BOULDER CONSTRICTION TO CREATE WAVES AND INCREASE DEPTH.	E2	1			3			4	572	575	575	576	3	1	1				5	3 EA. 575.5			2 EA. 576.0	2	USE RIPRAP TO FILL VOIDS AND ADD SOIL.
FBC- 49	NORTH SIDE OF UPPER MOD. WATERWAY ABOUT 90 FT. FROM DOWNSTREAM END.	CONSTRICTION TO MAINTAIN FLOW DEPTH AND WHITEWATER FEATURE.	LOOSE BLDRS ON BANK CAN BE SET JUST UPSTREAM OF FIXED BOULDER CONSTRICTION TO CREATE WAVES AND INCREASE DEPTH.	E2	1		2		1		4	572	2 EA. 574.5		575	6		1				7	4 EA. 576.0	576		577	2	USE RIPRAP TO FILL VOIDS AND ADD SOIL.

FEATURE BOULDER	LOCATION	GENERAL PURPOSES)	COMMENTS	KEY DETAIL - DRAWING NUMBER	FIXED BOULDERS (GROUTED WITH ADJACENT 2 FT. MIN. GROUTED BOULDERS OR AS SHOWN)							FIXED BOULDER PLACEMENT ELEVATIONS - COMMENTS				MOVABLE BOULDERS WITH RIPRAP AND RIPRAP SPECIAL							MOVABLE BOULDER PLACEMENT ELEVATIONS - COMMENTS				RIPRAP FOR MOVABLE BOULDER VOID FILLING, SUPPORT, AND ADJUSTMENT	
CLUSTER NUMBER					2.5 FT. X 3.5 FT.	2.5 FT. X 4.0 FT.	3. FT. BY 4.5 FT.	3.5 FT BY 5.5 FT.	4.5 FT. BY 6 FT.	SPECIAL	TOTAL	LOW	INT. 1	INT. 2	HIGH	2.5 FT. X 3.5 FT.	2.5 FT. X 4.0 FT.	3. FT. BY 4.5 FT.	3.5 FT BY 5.5 FT.	4.5 FT. BY 6 FT.	SPECIAL	TOTAL	LOW	INT. 1	INT. 2	HIGH	CUBIC YARDS	COMMENT
FBC- 50	S. BANK OF ENTRY SECTION TO LOWER MODERATE WATERWAY	ENHANCE VISIBILITY OF ENTRY TO LOWER MODEST WATERWAY	SELECT BOULDER WITH EMPHASIS ON AESTHETICS AND ROUNDED EDGES	E2		1	2	1			4	3 EA. 567.5			577							0						
FBC- 51	N. BANK OF ENTRY SECTION TO LOWER MODERATE WATERWAY	ENHANCE VISIBILITY OF ENTRY TO LOWER MODEST WATERWAY	SELECT BOULDER WITH EMPHASIS ON AESTHETICS AND ROUNDED EDGES	E2			1	2			3	577	577		578							0						
FBC- 52	S. BANK, ENTRY SECTION TO UPPER MODERATE WATERWAY	ADJUSTMENT OF WATER LEVEL AND FLOW PATTERN, FRAME ENTRY VIEW	LOWER TWO BOULDERS EXTENDS TO TOE OF SLOPE OF ENTRY, LARGER 573.0, SML. 573.5	E2							0					16	4	2				22	2 EA. 573.0	13 EA. 573.5	3 EA. 574.5, 1 EA. 575.0	3 EA. 575.5	6.5	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 53	N. BANK, ENTRY SECTION TO UPPER MODERATE WATERWAY	ADJUSTMENT OF WATER LEVEL AND FLOW PATTERN, FRAME ENTRY VIEW; SCREEN VISIBILITY OF UPPER CHALL. ENTRY	LOWER BOULDERS EXTENDS TO TOE OF SLOPE OF ENTRY, LARGER 573.5	E2							0					14	2	4	1	3		24	2 EA. 572.5	13 EA. 573.5, 3 EA. 574.5	1 EA. 574.8, 2 EA. 574.5	1 EA. 576.0, 2 EA. 576.5	12	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM.
FBC- 54	ADJUSTABLE BOTTOM SILL JUST DOWNSTREAM OF SILL 1 AND WHITEWATER HOLE	ADJUSTMENT OF WHITEWATER WAVE AT HOLE.	A FLAT, RECTANGULAR SHAPE BOULDER IS NECESSARY WHICH CAN BE ADJUSTED TO A VARIETY OF LEVELS AND LOCATION UPSTREAM ON UNDERWATER RAMP.	E2							0					14					4 2.5 BY 5.5 BY 2 FT. T.	18				18 EA. 568.5	5	FINES TO LOCK IN AND LEVEL BOULDERS TO SLOPING RAMP. FILL ALL VOIDS. LEAVE ANY EXCESS ADJACENT DOWNSTREAM.
FBC- 55	N. SIDE SPUR DOWNSTREAM OF SILL 1 AND WHITEWATER HOLE	EDDY AND WAVE EFFECTS, SOURCE OF MATERIALS, APPEARANCE	ADJUST BOULDERS TO BE EASY TO WALK AND SIT ON (TYPICAL)	E2							0					10		5				15	12 EA. 574.5			3 EA. 574.8	5	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BOTTOM OUT OF FLOW.
FBC- 56	N. SIDE OF CONSTRICTION ABUTMENT AT SILL 1	SOURCE OF MATERAILS FOR CONSTRICTION, EDDY AND WAVE EFFECTS, APPEARANCE.	ADJUST BOULDERS TO BE EASY TO WALK AND SIT ON (TYPICAL)	E2							0					7		2				9	2 EA. 575.5	5 EA. 576.0		2 EA. 576.5	3	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BOTTOM OUT OF FLOW.
FBC- 57	NORTH SIDE OF CONSTRICTION AT SILL 1.	HYDRAULIC CONTROL OF THE CHALLENGE WATERWAY AND WHITEWATER "HOLE"	SLOPE IS A 3H:1V. CREATE WITH THE FEWEST NUMBER OF BOULDERS. A LARGE BOULDER MATCHED TO DESIGN WOULD BE PREFERABLE. TOP ELEVATION IS 573, NO HIGHER THAN 573.2.	E2		3				4 3.5 FT BY 1.5 FT. TOP WITH WIDER BASE	7	4 EA. 572.5			3 EA. 573.2							0						
FBC- 58	S. SIDE OF CONSTRICTION AT SILL 1.	BASIC HYDRAULIC CONTROL OF THE CHALLENGE WATERWAY AND WHITEWATER "HOLE"	SLOPE IS A 2H:1V. CREATE WITH THE FEWEST NUMBER OF BOULDERS. A LARGE BOULDER MATCHED TO DESIGN WOULD BE PREFERABLE. TOP ELEVATION IS 573, NO HIGHER THAN 573.2	E2		3				4 3.5 FT BY 1.5 FT. TOP WITH WIDER BASE	7	4 EA. 572.5			3 EA. 573.2	3		1				4	3 EA. 575.3			576	1.5	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM JUST DOWNSTREAM. PLACE OUT OF FLOW AREA.
FBC- 59	JUST US OF END OF DIVIDER BETWEEN UPPER WATERWAYS	APPEARANCE, MATERIALS, FLOW PATTERNS AND DISTRIBUTION ON CHALL. WATERWAY.	FILL TRANSITION UPSTREAM OF BOULDERS LEVEL.	E2							0					4		2				6	2 EA. 576.3	2 EA. 576.5		2 EA. 576.8	2	FILL ALL VOIDS, ADD STAB. SOIL ABOVE LOW WATER, LEAVE EXCESS RIPRAP ON BENCH BOTTOM JUST DOWNSTREAM. PLACE OUT OF FLOW AREA.
FBC- 60	SOUTH ABUTMENT CHUTE 1 SIDE WEIR.	ABUTMENT TO CONTROL FLOW, WHITEWATER FEATURE.	GROUTED BLDR. ABUTMENT MUST BE WATERTIGHT, TIGHT JOINTS, RECESS GROUT.	E2	5	2		2	1		10	1 EA. 575.5	7 EA. 576.5		2 EA. 576.8							0						
FBC- 61	NORTH ABUTMENT CHUTE 1 SIDE WEIR	ABUTMENT TO CONTROL FLOW, WHITEWATER FEATURE.	GROUTED BLDR. ABUTMENT MUST BE WATERTIGHT, TIGHT JOINTS, RECESS GROUT.	E2	4		2	1	1		8	6 EA. 575.5			2 EA. 576.5							0						
FBC- 62	N. SIDE OF CHUTE 1	WHITEWATER FEATURE WITH WAVE UPSTREAM, CONSTRICTION, AND EDDY BELOW	SMALL BOULDERS TO BE PLACED AS TERRACE FOLLOWED BY LARGE ROUNDED BOULDER.	E2	2			1			3	2 EA. 573.5			1 EA. 573.8							0						
FBC- 63	S. SIDE OF CHUTE 1	WHITEWATER FEATURE WITH WAVE UPSTREAM, CONSTRICTION, AND EDDY BELOW	SMALL BOULDERS TO BE PLACED AS TERRACE FOLLOWED BY LARGE ROUNDED BOULDER.	E2	3			1			4	3 EA. 573.5			1 EA. 573.8							0						
FBC- 64	S. SIDE OF POOL 1	MATERIAL SOURCE FOR ADJUSTMENTS.	CHINK ANY VOIDS AND FILL HORIZONTAL FROM TOPS TO ADJACENT SLOPE.	E2							0					6		1				7	6 EA. 567.5			569	3.5	LEAVE EXCESS IN POOL BOTTOM ON GROUTED BOULDERS.
FBC- 65	DOWNSTREAM SIDE OF SOUTH STOPLOG ABUTMENT.	USE LARGE BOULDERS AS PART OF STACKED BOULDER WALL, APPEARANCE.	TOP OF SURFACE SHOULD BE FLAT AND EVEN WITH ADJACENT TERRACE).	E2			2	1			3				3 EA. 575. 95							0						
FBC- 66	DOWNSTREAM SIDE OF NORTH STOPLOG ABUTMENT.	USE LARGE BOULDERS AS PART OF STACKED BOULDER WALL, APPEARANCE.	TOP OF SURFACE SHOULD BE FLAT AND EVEN WITH ADJACENT TERRACE).	E2			2				2				2 EA. 574. 95							0						
FBC- 67	DOWNSTREAM OF ENTRY OVERFLOW GROUTED BOULDER DROP-OFF, 6 LOCATIONS.	THREE LARGE BOULDERS AT EACH LOCATION TO DEFLECT CURRENT HORIZONTALLY AND BREAK UP ANY KEEPER WAVE.	THIS WILL PROVIDE VARIETY IN THE SURFING WAVE AND FLUSH OUT BOATERS THAT CAPSIZE.	E2			6	12			18	6 EA. 572.8	6 EA. 573.0		6 EA. 573.5							0						
FBC- 68	UPSTREAM SIDE OF SOUTH STOPLOG ABUTMENT.	USE LARGE BOULDERS AS PART OF STACKED BOULDER WALL, APPEARANCE.	TOP OF SURFACE SHOULD BE FLAT AND EVEN WITH ADJACENT TERRACE).	E2			2	1			3				3 EA. 575. 95							0						
FBC- 69	UPSTREAM SIDE OF NORTH STOPLOG ABUTMENT.	PART OF STACKED BOULDER WALL, APPEARANCE. GUIDE BOATERS TO ENTRY.	TOP OF SURFACE SHOULD BE FLAT AND EVEN WITH ADJACENT TERRACE).	E2			2	1	1		4	2 EA. 574. 95		576	578							0						
FBC- 71	WEST END OF PARK RETAINING WALL AND PATH RAMP TO LOWER LANDING	RETAIN SOIL TO COVER END OF LOWER WALL, FLATTER SLOPE SOUTH OF PATH, APPEARANCE, SOURCE OF MATERIALS.	THE RIPRAP TO BE USED WITH FEATURE BOULDERS IS RIPRAP SPECIAL.	E1							0					25	6					31	9 EA. 575.0	5 EA. 575.5	12 EA. 576.0	5 EA. 576.5	9	MAINTAIN 1 FT MIN. OF SOIL AND RIPRAP OVER WALL. CHINK VOIDS BETWEEN BOULDERS BUT DO NOT FILL IN FRONT OF BOULDERS ABOVE DESIGN GRADE.
FBC- 72	BEND NEAR EAST END OF PARK RETAINING WALL	RETAIN SOIL TO COVER END OF LOWER WALL, FLATTER SLOPE SOUTH OF PATH, APPEARANCE, SOURCE OF MATERIALS.	THE RIPRAP TO BE USED WITH FEATURE BOULDERS IS RIPRAP SPECIAL.	E1							0					29						29	8 EA. 576.2	1 EA. 575.5		20 EA. 576.7	8	MAINTAIN 1 FT MIN. OF SOIL AND RIPRAP OVER WALL. CHINK VOIDS BETWEEN BOULDERS BUT DO NOT FILL IN FRONT OF BOULDERS ABOVE DESIGN GRADE.
TOTALS					103	43	41	48	12	8	255					403	56	61	30	8	8	566					293	

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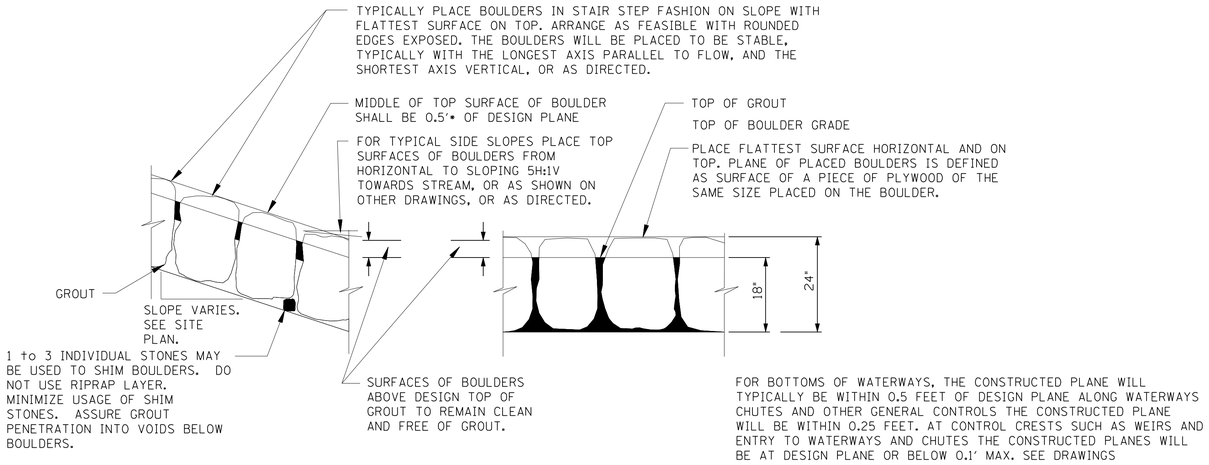

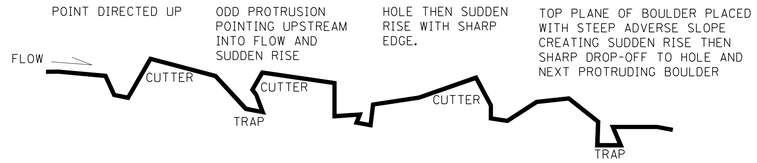

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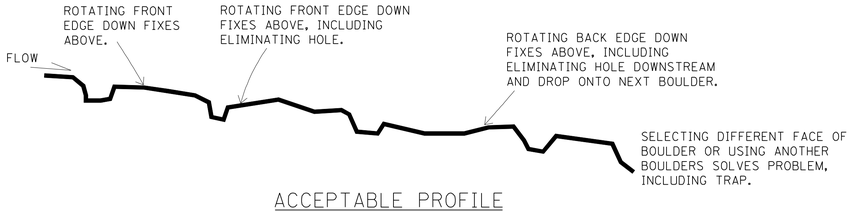
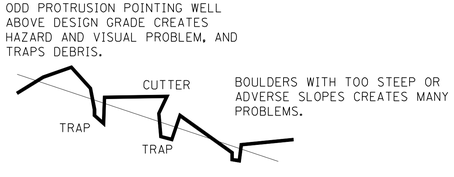


ACCEPTABLE PROFILE



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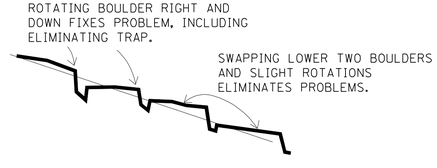

ACCEPTABLE SECTION

1 TYPICAL GROUTED BOULDER DETAILS
NOT TO SCALE

GENERAL

1. THE GROUTED BOULDER LINING IS INTENDED FOR FLOOD AND EROSION CONTROL, DIVERSION AND RIVER GRADE CONTROL, WHITEWATER BOATING, AND ENVIRONMENTAL PURPOSES. THE INTENT IS TO ACHIEVE A ROUGH, NATURALISTIC APPEARANCE, SIMILAR TO A MODERATE RAPID. PRECISION CUT STONE, SMOOTH CONCRETE LINING, OR PATIO LIKE STONE PAVING, GROUT METICULOUSLY PLACED TO THE TOP AND COVERING BOULDERS IS NOT REQUIRED OR DESIRED. A ROUGH SURFACE WITH DEEP JOINTS BETWEEN BOULDERS IS CALLED FOR TO SUSTAIN FLOW DEPTHS, DISSIPATE ENERGY, LESSEN VELOCITIES, PROVIDE HABITAT, AND FISH PASSAGE.

2. THE OVERALL PROFILE OF A PLACEMENT ZONE AND COMBINATIONS OF INDIVIDUAL ROCK SHAPES IS KEY TO SATISFACTORY PERFORMANCE AND FOR EFFICIENT CONSTRUCTION.

3. THE CONTOURS SHOWN ON THE PLANS ARE GUIDELINE EXCEPT FOR HYDRAULIC CONTROL SURFACES. SEE TYPICAL AND EXAMPLE DETAILS FOR PLACEMENT REQUIREMENTS.

CONSTRUCTION REQUIREMENTS:

1. PREPARE AND COMPACT SUBGRADE. DO NOT PLACE BOULDERS ON FREE DRAINING GRAVEL OR LAYER OF RIPRAP MORE PERMEABLE THAN "FILL MATERIAL" OR NATURAL SUBGRADE. SELECT AND ARRANGE BOULDERS TO MINIMIZE VOID SPACE AND AREA OF EXPOSED GROUT.

2. BEFORE GROUTING, CLEAN ALL DIRT AND MATERIALS FROM ROCK THAT COULD PREVENT THE GROUT FROM BONDING TO ROCK. REMOVE ANY LOOSE SOIL BETWEEN BOULDERS. FINAL PLACEMENT OF BOULDERS TO BE APPROVED ONE DAY MIN. PRIOR TO GROUTING. COMPLETE CORRECTIONS ONE DAY PRIOR TO GROUTING.

3. PLACE GROUT BY INJECTION METHODS TO FILL VOIDS TO ACHIEVE THE MINIMUM THICKNESS AND TO RECESS THE TOP GROUT SURFACE BELOW THE TOP OF BOULDER AS SHOWN. PAINT PERIODIC MARKS SUFFICIENT TO GUIDE GROUTING THICKNESS OR RELIEF BELOW TOP OF BOULDER. DURING PLACEMENT, CLEAN EXCESS GROUT FROM ALL BOULDER SURFACES TO BE LEFT EXPOSED. VIBRATE ALL GROUT AND ASSURE THAT ALL VOIDS UNDER AND BETWEEN BOULDERS ARE GROUTED.

4. CONTROL GROUT MIX AND PLACEMENT PROCEDURES TO ACHIEVE THE SPECIFIED THICKNESS, EASY MOVEMENT INTO VOIDS GRADE AND CONFIGURATION OF THE GROUT. GROUT IN SINGLE BOULDER LIFTS. AT STEEP LOCATIONS ADJUST TO STIFFER MIX, REDUCING PLACEMENT THICKNESS AND/OR CONTAIN GROUT SO THAT VIBRATION CAN TAKE PLACE AND GROUT DOES NOT RUN LATERALLY OR EXCEED DESIGN GRADES.

5. FINISH GROUT SURFACE WITH WOOD FLOAT AND/OR STIFF BROOM. SMOOTH FINISH NOT DESIRED. PROVIDE CONTINUOUS GROUT SURFACE GRADES. FILL ANY ZONES THAT WOULD OTHERWISE CREATE FOOT TRAPS, BUT DO NOT PLACE GROUT TO TOP OF BOULDERS.. BRUSH AND WASH OFF ANY RESIDUAL GROUT ON BOULDERS UNLESS CULLED FOR AT CONTROL SURFACES. APPLY A NON-WHITE SEALER THAT DRIES CLEAR SAME DAY OF GROUT PLACEMENT.

6. AFTER GROUT HAS SET INSPECT BOULDER AND GROUT SURFACES FOR ANY HAZARDOUS SITUATIONS. KNOCK OFF SHARP EDGES THAT COULD CUT. IDENTIFY VOIDS THAT MAY CREATE TRAPS. GROUT TO FILL SUCH VOIDS. MAKE OTHER MINOR CORRECTIONS AS DIRECTED.

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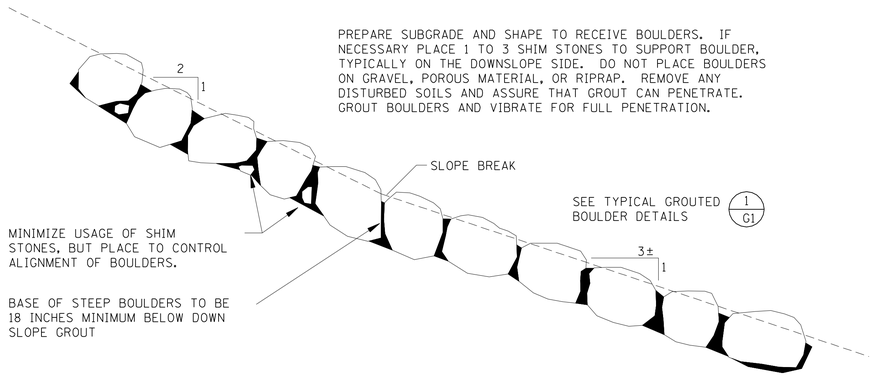
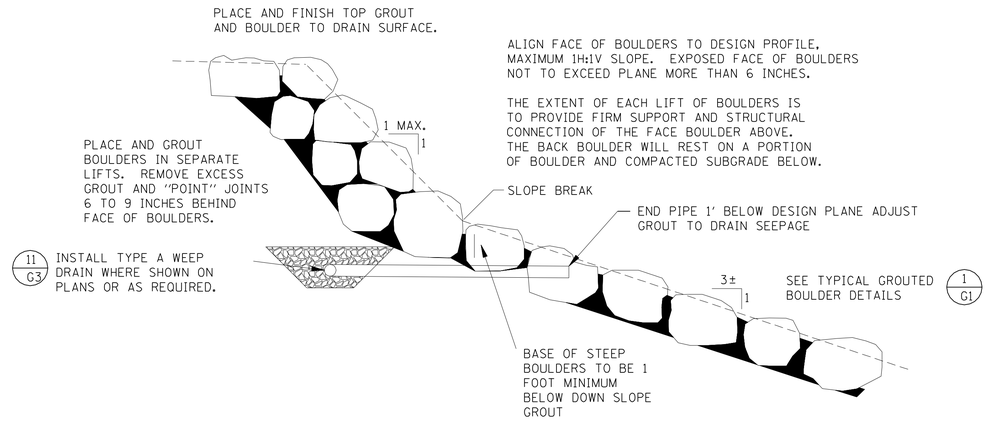
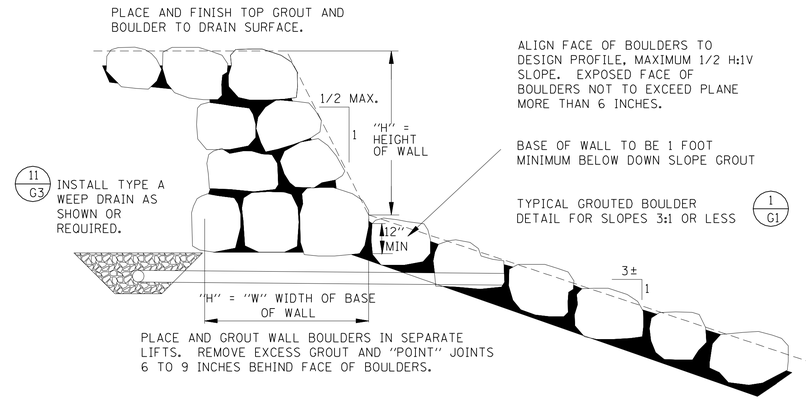


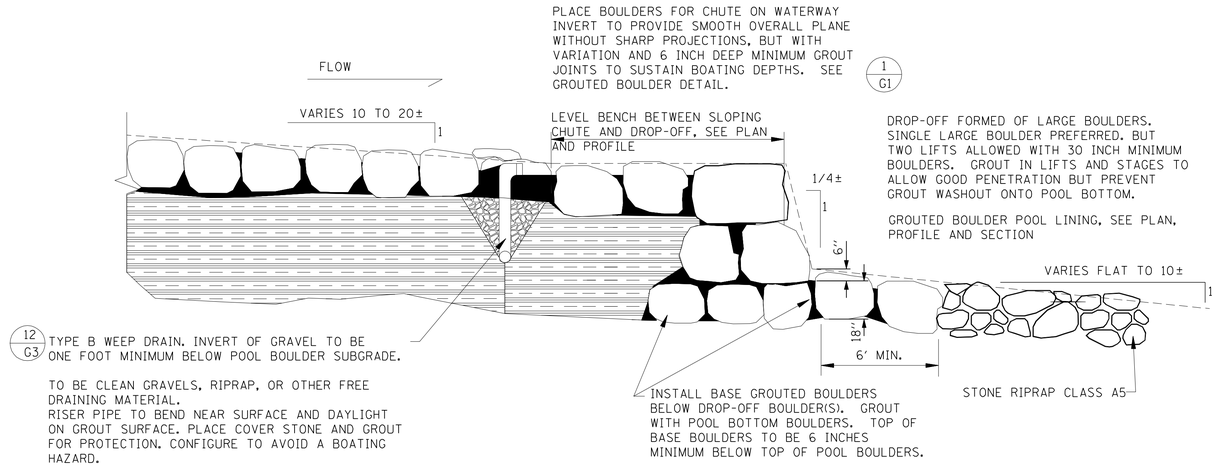
5 TYPICAL STEEP (2:1) SLOPE GROUTED BOULDER DETAIL
NOT TO SCALE



6 TYPICAL STACKED GROUTED BOULDER DETAIL (2H:1V TO 1H:1V)
NOT TO SCALE



7 TYPICAL GROUTED BOULDER WALL (STEEPER THAN 1H:1V) DETAIL
NOT TO SCALE



8 TYPICAL GROUTED BOULDER CHUTE OR WATERWAY DROPOFF DETAIL
NOT TO SCALE

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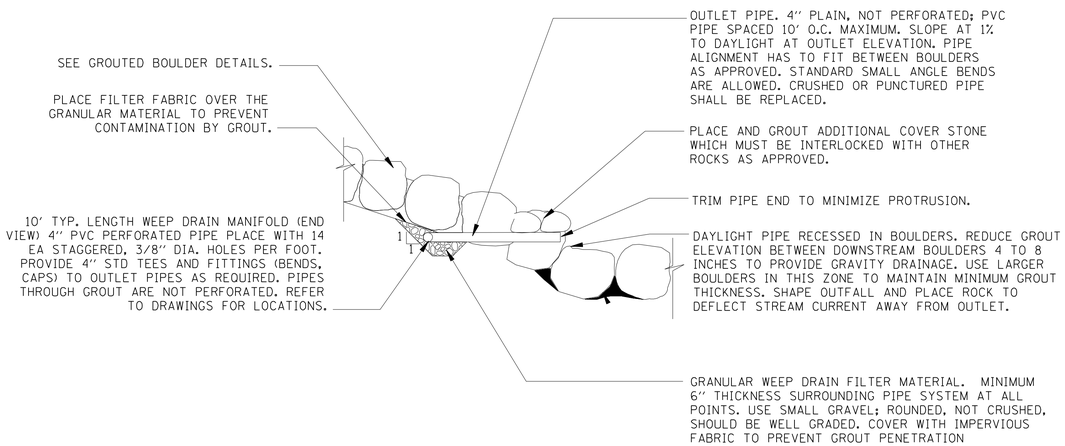
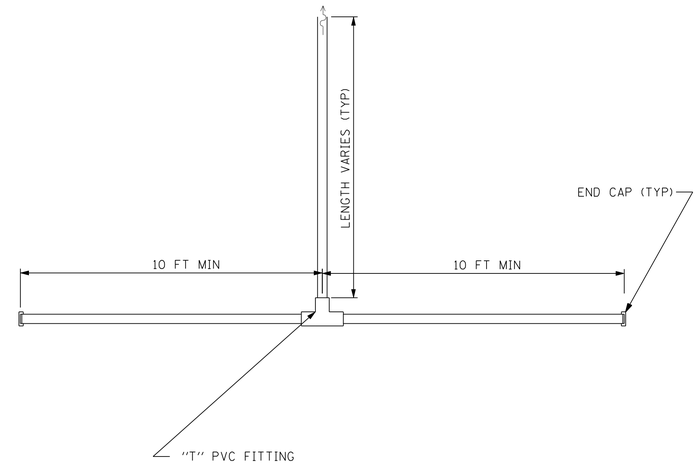


11 TYPICAL TYPE A WEEP DRAIN SYSTEM
NOT TO SCALE



TYPICAL TYPE A WEEP DRAIN SYSTEM PLAN
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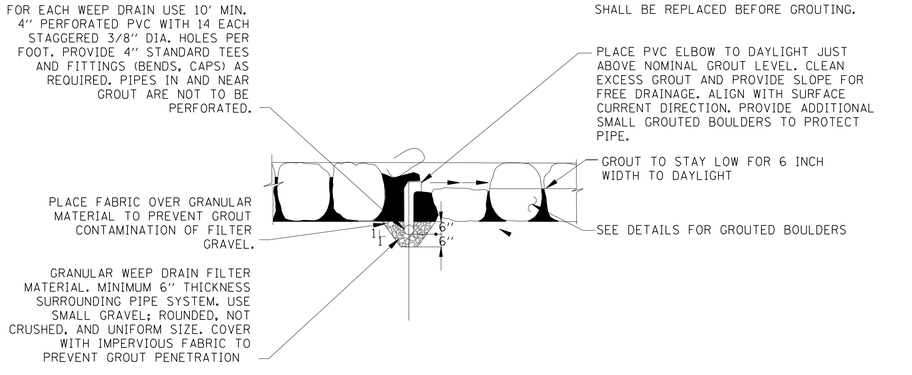
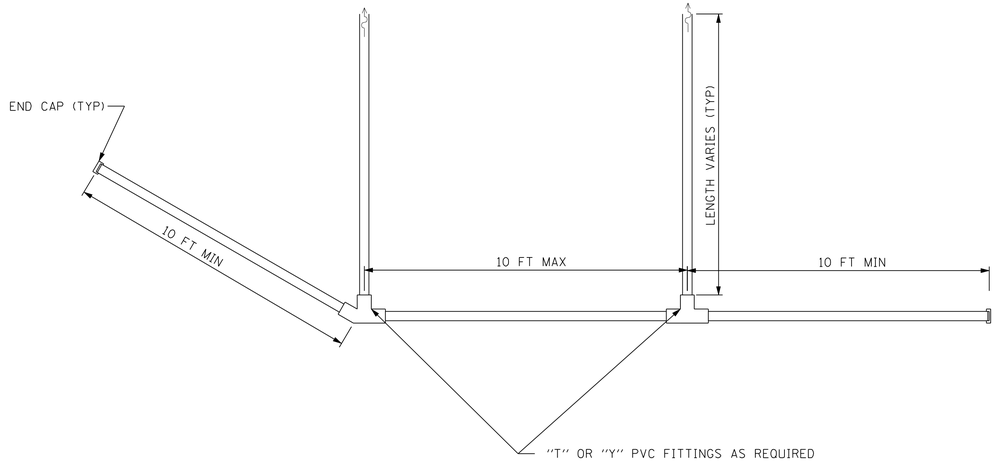


12 TYPICAL TYPE B WEEP DRAIN SYSTEM
NOT TO SCALE



TYPICAL TYPE B WEEP DRAIN SYSTEM PLAN
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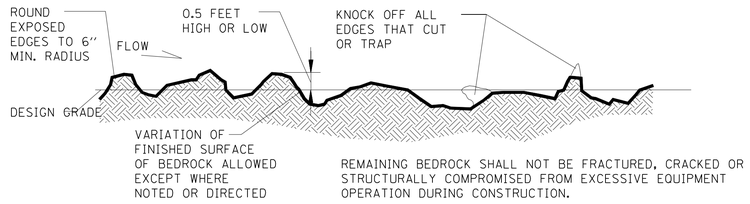
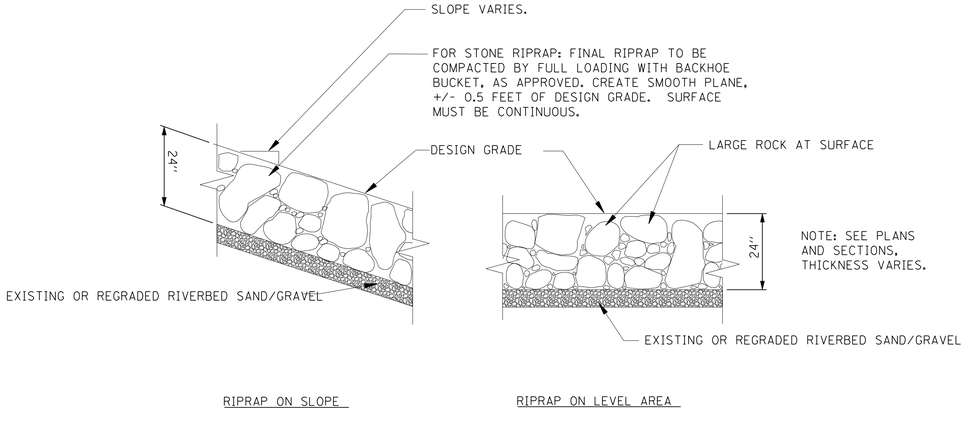
WEEP DRAIN DETAILS



17 POOL BOTTOM EXCAVATED BEDROCK
NOT TO SCALE

18 DETAIL REMOVED



GENERAL PLACEMENT TECHNIQUES SHOULD RESULT IN LARGER ROCK AT THE SURFACE WITH ROCK SECURELY INTERLOCKED AT THE DESIGN THICKNESS AND GRADE. COMPACTION AND LEVELING SHOULD RESULT IN MINIMAL VOIDS AND PROJECTIONS ABOVE GRADE. TYPICAL FOR BOTH BURIED AND EXPOSED RIPRAP.

19 TYPICAL STONE RIPRAP PLACEMENT
NOT TO SCALE

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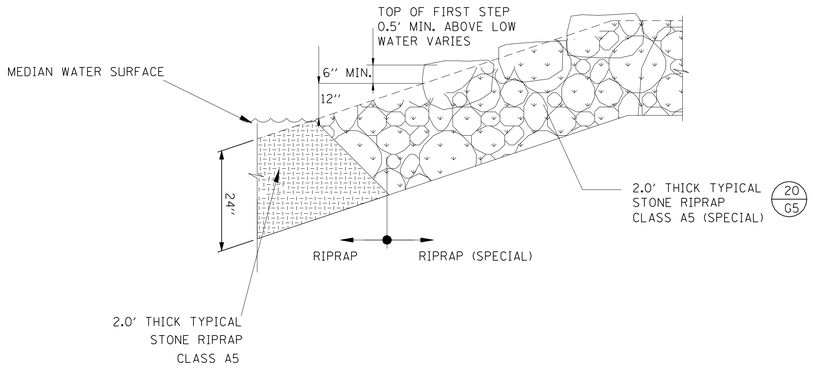
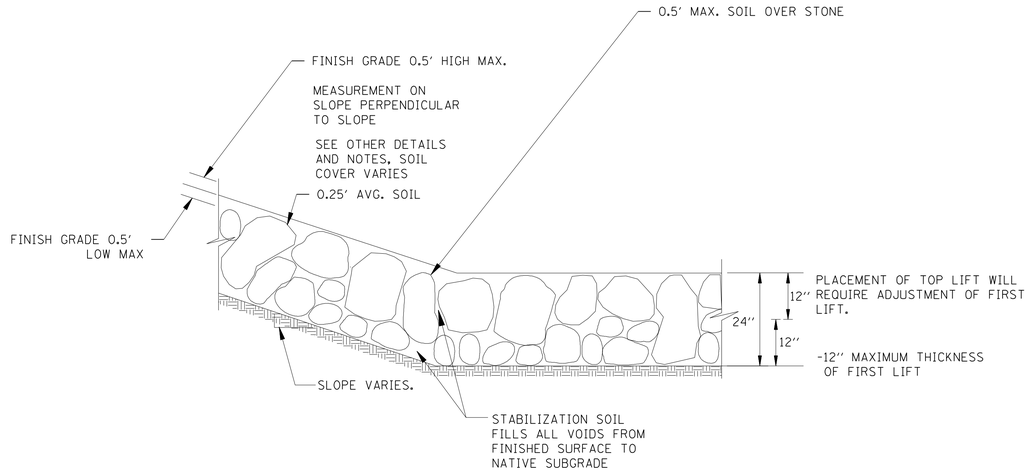


21 STEPPED RIPRAP (SPECIAL) DETAIL



NOTES:
RIPRAP SPECIAL IS A MIXTURE OF REGULAR RIPRAP WITH STABLIZATION SOIL. STABLIZATION SOIL IS A MIXTURE OF ON-SITE SOILS, APPROVED ORGANIC MATERIAL, TOPSOIL, AND AMENDMENTS THAT WILL ENCOURAGE PLANT GROWTH. AT MINIMUM THE MIX PROVIDED BY THE CONTRACTOR WILL BE A CLAY (20% MINIMUM) SOIL THAT IS EROSION RESISTANT. THE INTENT IS TO PROVIDE A MIX OF ON-SITE SOILS WITH AMENDMENT SUCH AS STABILIZED SLUDGES OR MANURE AND FERTILIZER. AN IMPORTED TOPSOIL OR OTHER 100% IMPORT IS NOT NECESSARY. SEE SPECIAL PROVISIONS FOR FURTHER DETAILS.

BEFORE PLACEMENT MIX RIPRAP WITH STABILIZATION SOIL AT APPROXIMATE RATIO OF 75% RIPRAP : 25% STABILIZATION SOIL. PLACE IN TWO LIFTS (MINIMUM) WITH LARGER ROCK ON TOP. ROCK VOIDS TO BE COMPLETELY FILLED FORMING A HOMOGENEOUS MASS FOR THE FORMATION OF A ROOT MAT INTERTWINED WITH THE RIPRAP. STABILIZATION SOIL IS TO FILL RIPRAP VOIDS, NOT DISPLACE RIPRAP.

GENERAL PLACEMENT TECHNIQUES SHOULD RESULT IN LARGER ROCK AT THE SURFACE WITH ROCK SECURELY INTERLOCKED AT THE DESIGN THICKNESS AND GRADE. COMPACTION AND LEVELING SHOULD RESULT IN MINIMAL VOIDS AND PROJECTIONS ABOVE GRADE. TYPICAL FOR BOTH BURIED AND EXPOSED RIPRAP.

20 TYPICAL STONE RIPRAP (SPECIAL) PLACEMENT
NO SCALE

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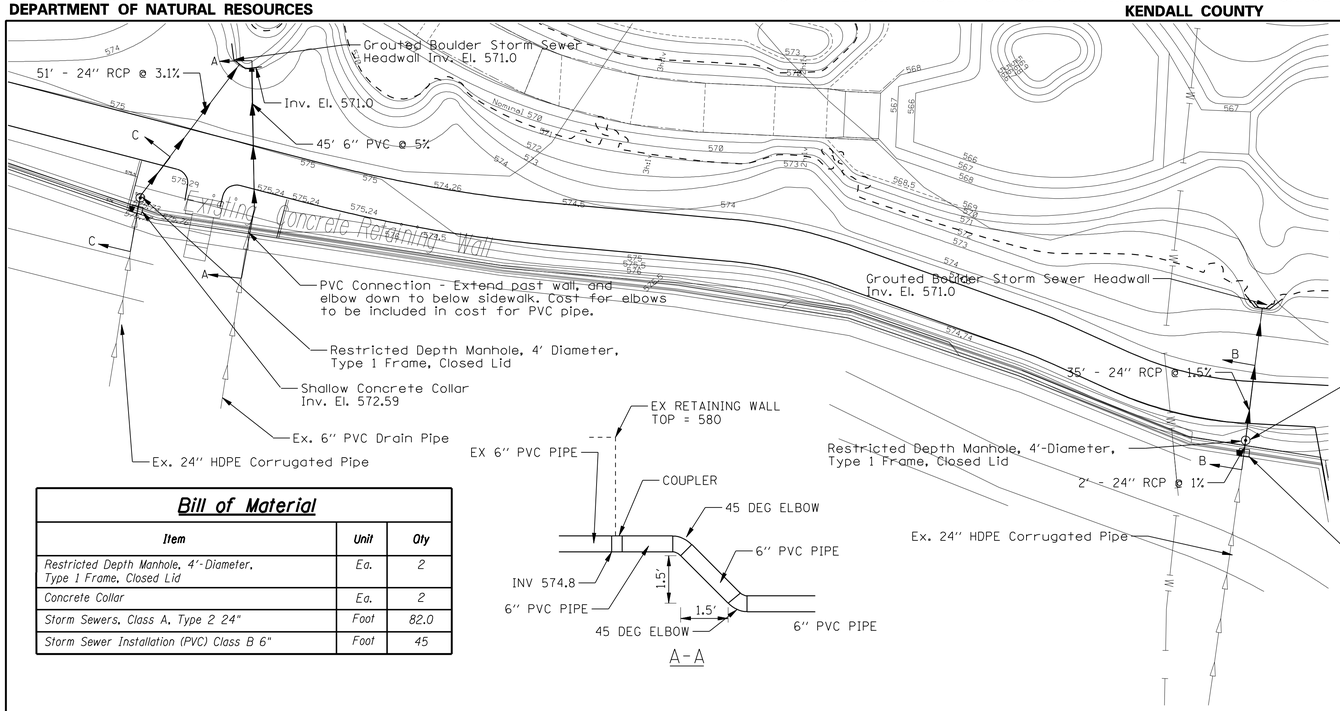
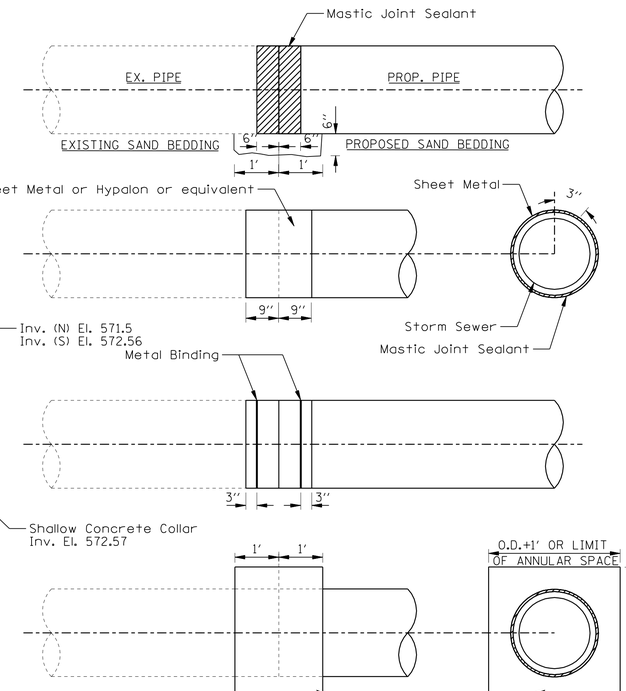


Bill of Material		
Item	Unit	Qty
Restricted Depth Manhole, 4'-Diameter, Type 1 Frame, Closed Lid	Ea.	2
Concrete Collar	Ea.	2
Storm Sewers, Class A, Type 2 24"	Foot	82.0
Storm Sewer Installation (PVC) Class B 6"	Foot	45

A-A

STORM SEWER EXTENSION DETAILS



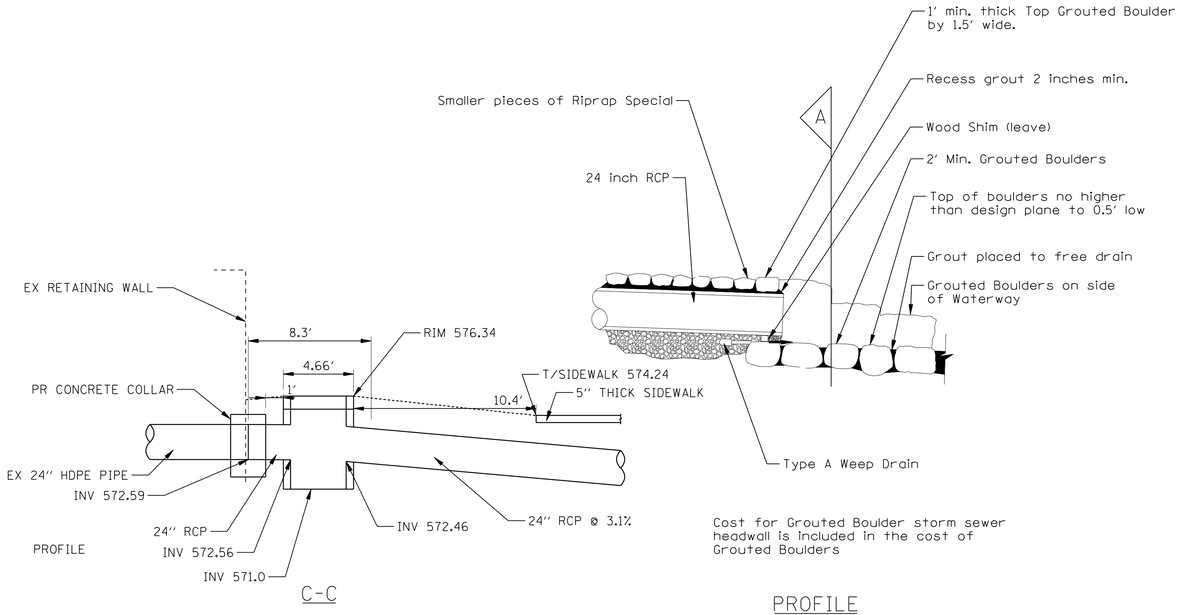
13 CONCRETE COLLAR

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" OF EACH PIPE.
3. BUTT THE PIPES TOGETHER LEAVING A MINIMUM OF 1' X 6" DEEP EXCAVATION UNDER AND AROUND EACH PIPE END (CHIP AND REMOVE EXISTING CONCRETE AS REQUIRED.)
4. CUT A PIECE OF SHEET METAL GAGE 10, HYPALON OR EQUIVALENT 1.5' WIDE BY THE OUTSIDE CIRCUMFERENCE OF THE PIPE PLUS 3" LONG.
5. WRAP THE SHEET METAL, HYPALON OR EQUIVALENT AROUND THE PIPES, 9" ON EACH SIDE OF THE JOINT, STARTING AT THE TOP OF THE PIPE
6. LAP THE SHEET METAL, HYPALON OR EQUIVALENT AT LEAST 3"AT THE TOP OF THE PIPE AND PLACE THE MASTIC JOINT SEALANT BETWEEN THE LAP.
7. PLACE TWO METAL BANDS AROUND THE SHEET METAL, HYPALON OR EQUIVALENT AND TIGHTEN.
8. WIPE OFF ANY EXCESS MASTIC JOINT SEALANT THAT OOZES OUT FROM BETWEEN THE SHEET METAL AND THE PIPES.
9. PLACE CONCRETE AROUND THE JOINT.

GENERAL NOTES:

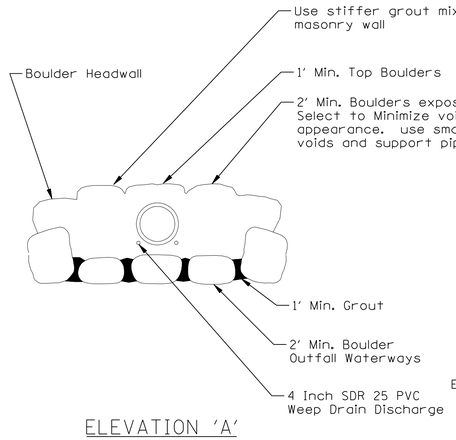
1. CARE MUST BE TAKEN TO PREVENT DEBIS FROM ENTERING THE PIPE CULVERT. ALL DEBRIS WHICH ENTERS THE PIPE CULVERT MUST BE REMOVED. THE PIPE CULVERT MUST BE LEFT CLEAN AND UNOBSTRUCTED UPON COMPLETION OF THE CONTRACT
2. CARE MUST BE TAKEN TO PREVENT ANY PART OF THE NEW PIPE CONNECTION FROM PROJECTING INTO THE EXISTING PIPE CULVERT.
3. PAID FOR AS CONCRETE COLLAR.



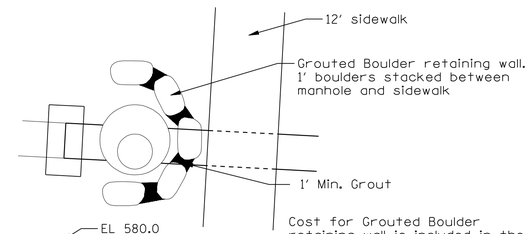
C-C

Cost for Grouted Boulder storm sewer headwall is included in the cost of Grouted Boulders

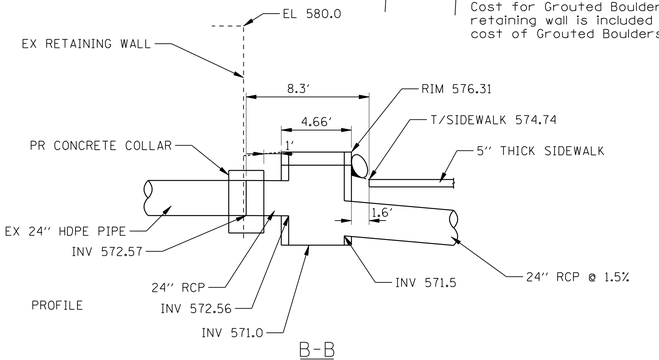
PROFILE



ELEVATION 'A'



Cost for Grouted Boulder retaining wall is included in the cost of Grouted Boulders



B-B

WEST RESTRICTED DEPTH MANHOLE DETAIL

NOT TO SCALE STD 602601 AND 602401

14 GROUTED BOULDER STORM SEWER HEADWALL

NOT TO SCALE

EAST RESTRICTED DEPTH MANHOLE DETAIL

NOT TO SCALE STD 602601 AND 602401

FR-423

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Designed By JPR Checked By TKL
Drawn By JPR Checked By TKL
lilientk 10/09/2007 4:50:05 PM
S:\DOCUMENT\02348801\CIVIL\DGN\DRD00Q87.DGN

Bill of Material

Item	*Unit*	*Qty*
Wet Prairie Seed Mix	*Acres*	*1.42*
Seeding and Fertilizing	*Acres*	*1.26*
Aggregate Shoulders, Type B	*Tons*	*18.5*
Filter Fabric	*Sq Yd*	*50*
Topsoil Excavation and Placement	*Cu Yd*	*1030.4*
Flexible Growth Medium	*Acres*	*1.42*

FR-423

INDEX OF SHEETS

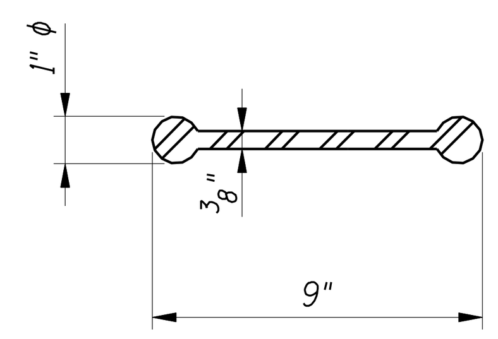
GENERAL NOTES

1. Reinforcement bars shall conform to the requirements of AASHTO M31 or M322, Grade 60.
2. Plan Dimensions and details relative to existing structures have been taken from existing plans and/or past surveys and reports are subject to nominal construction 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 work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.
3. All construction joints in cast-in-place concrete shall be bonded.
4. Excavation for structures within the temporary cofferdam system will not be paid for as Cofferdam Excavation but shall be paid for as Earth Excavation or Rock Excavation.
5. The Earth Excavation and Rock Excavation quantities billed with the civil plans include all excavation work for structures.

BILL OF MATERIAL

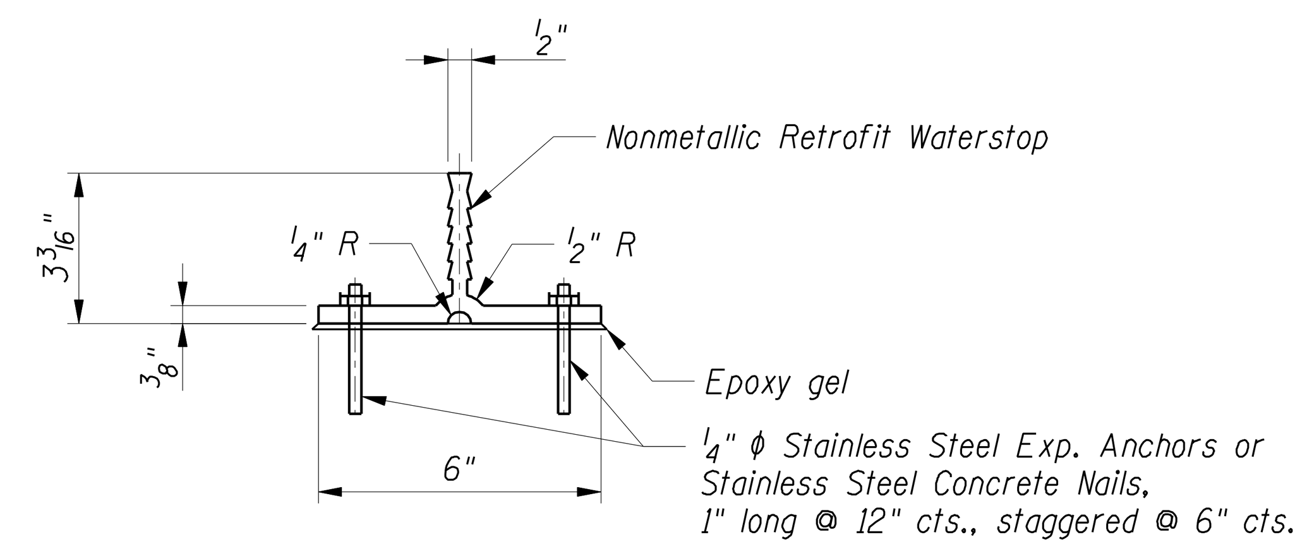
SUMMARY FOR DRAWINGS S1-S10

Item	Unit	Total
Concrete Removal	Cu yd	283
Recorder Gage House Removal	L Sum	1
Stone Riprap Removal	Ton	341.8
Riprap for Stilling Basin Relocation	Ton	1361
Galvanized Welded Steel Bar Grating	sq ft	38.8
Furnishing and Erecting Structural Steel	lb	1686
Precast Concrete Box Culvert 5'x3'	ft	5.0
Concrete Structures	Cu yd	159
Reinforcement Bars, Epoxy Coated	lb	12,680
Slide Gate	each	1
Steel Trash Rack	each	1
Pedestrian Railing	ft	88
Precast Stoplog Blocks	L sum	1
Roller Compacted Concrete	Cu yd	4081



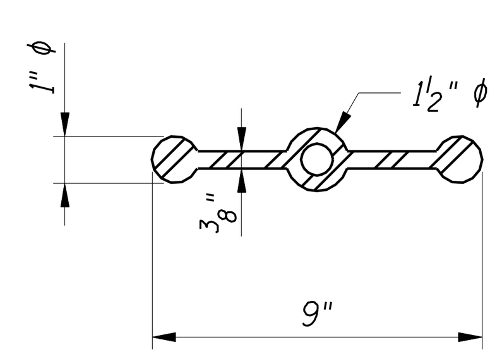
TYPE A WATERSTOP

Two Bulb Waterstop shall be provided at all vertical construction joints and as noted on the plans (Cost included with Concrete Structures)



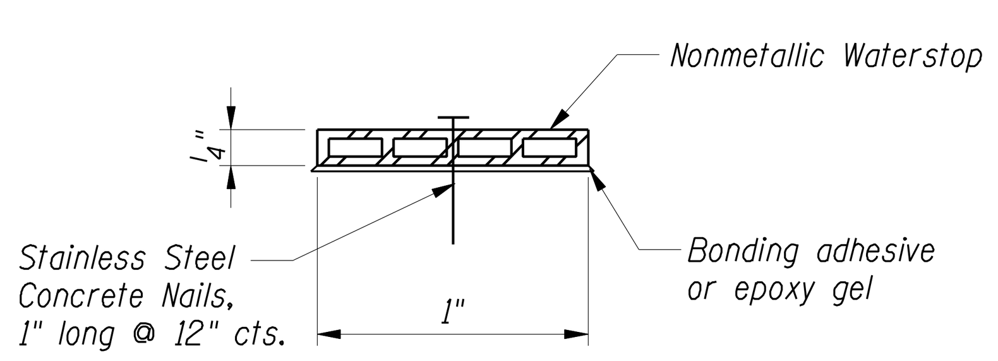
TYPE B WATERSTOP

Existing concrete surfaces in contact with waterstop shall be cleaned by sand blasting or grinding to assure a good bond. An epoxy gel bonding agent shall be applied per the manufacturer's instructions. (Cost included with Concrete Structures)



TYPE C WATERSTOP

Three Bulb Waterstop shall be provided at all expansion joints. (Cost included with Concrete Structures)



TYPE D WATERSTOP

Existing concrete surfaces in contact with waterstop shall be cleaned by sand blasting or grinding to assure a good bond. An epoxy gel bonding agent or bonding adhesive shall be applied per the manufacturer's instructions. (Cost included with Concrete Structures)

DESIGN SPECIFICATIONS

U.S. Army C.O.E. EM1110-2-2104 - Strength Design for Reinforced Concrete Hydraulic Structures (2003)
U.S. Army C.O.E. EC1110-2-6058 - Stability Analysis of Concrete Structures (2003)

DESIGN LOADING

	Fox River		Bypass Channel	
Load Case	Headwater	Tailwater	Headwater	Tailwater
Case 1 - Normal Operating Condition	577.7	574.7	575.6	575.6
Case 2 - Maintenance Condition	577.7 or 565.0	574.7 or 565.0	575.6 or 565.0	575.6 or 565.0
Case 3 - Seismic Condition	575.6	569.8	572.4	571.0
Case 4 - Design Flood Condition	579.7	578.6	579.0	579.0

(Headwater is upstream and Tailwater is downstream of the existing dam)

DESIGN STRESSES

Cast-in-Place Concrete	f'c = 3,500 psi
Roller Compacted Concrete	f'c=3500 psi (28 day)
Reinforcement	fy = 60,000 psi
Allowable Rock Bearing	Qall = 50 tsf

SEISMIC DATA

Sa (t=0.3 sec):
0.04g at Tr = 144 Yr
0.09g at Tr = 1000 Yr

Designed By TCU Checked By TKL
Drawn By JPR Checked By TCU

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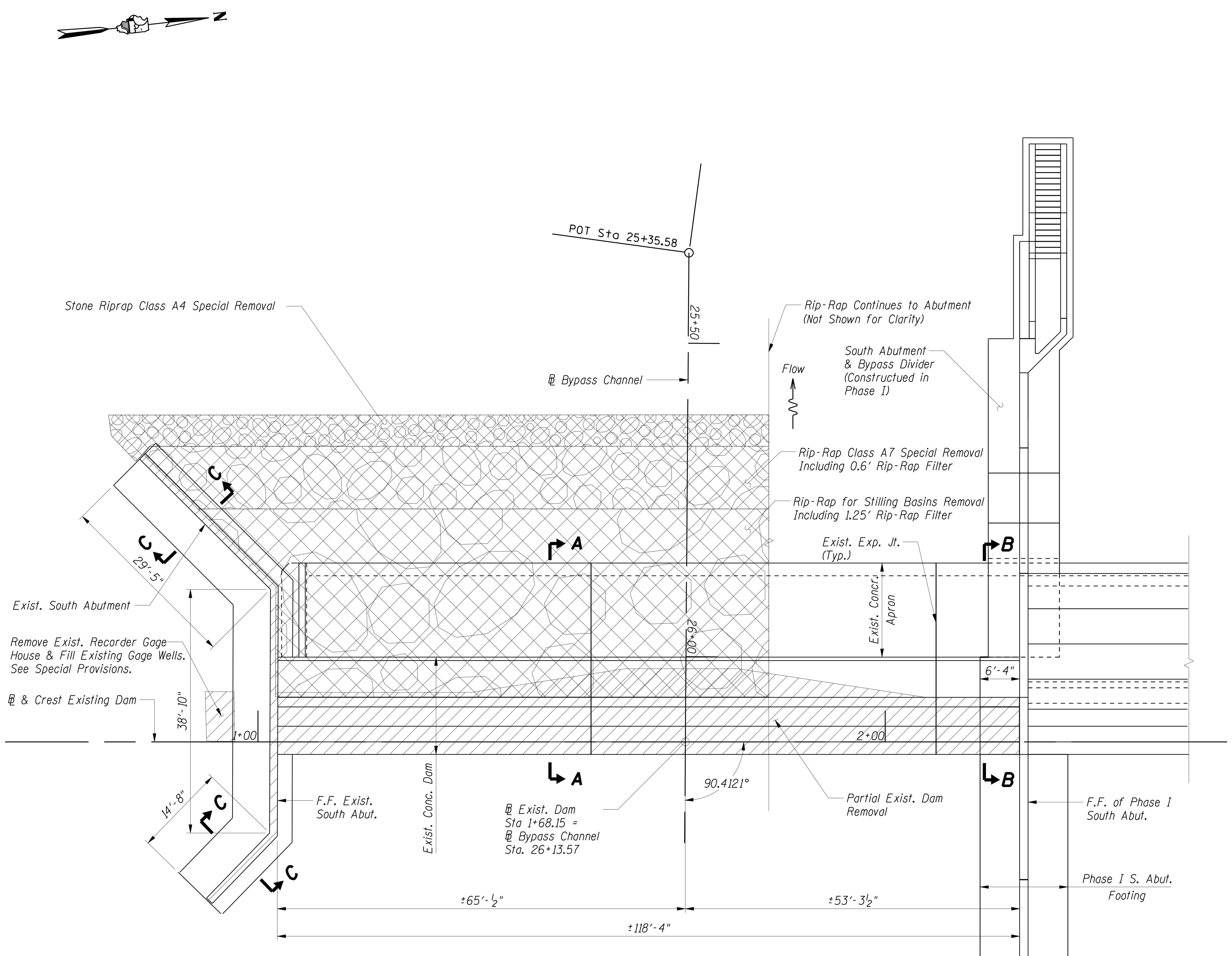
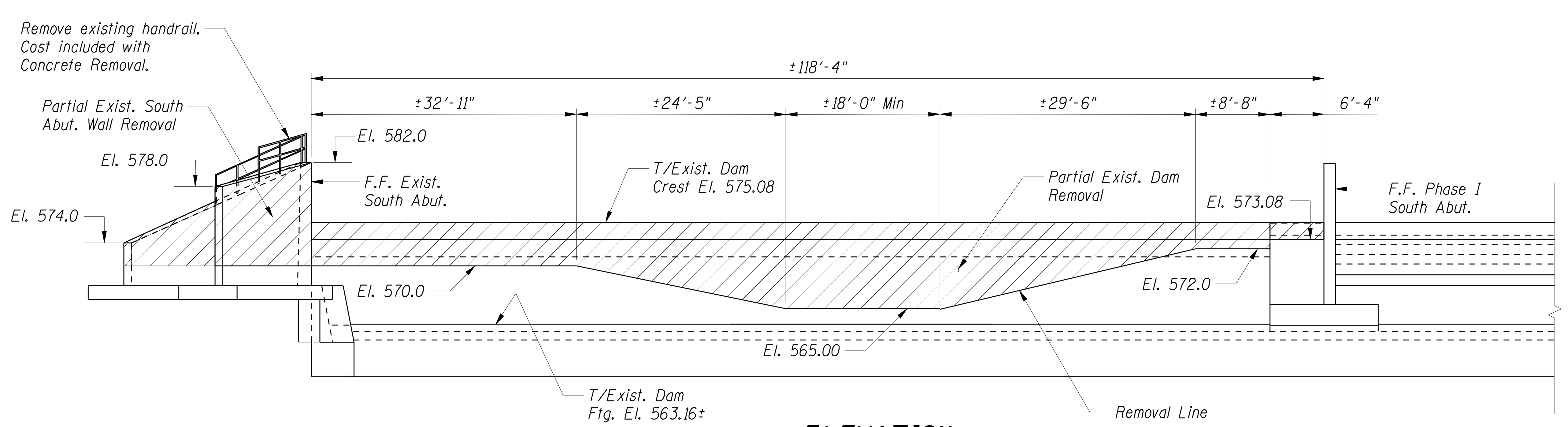
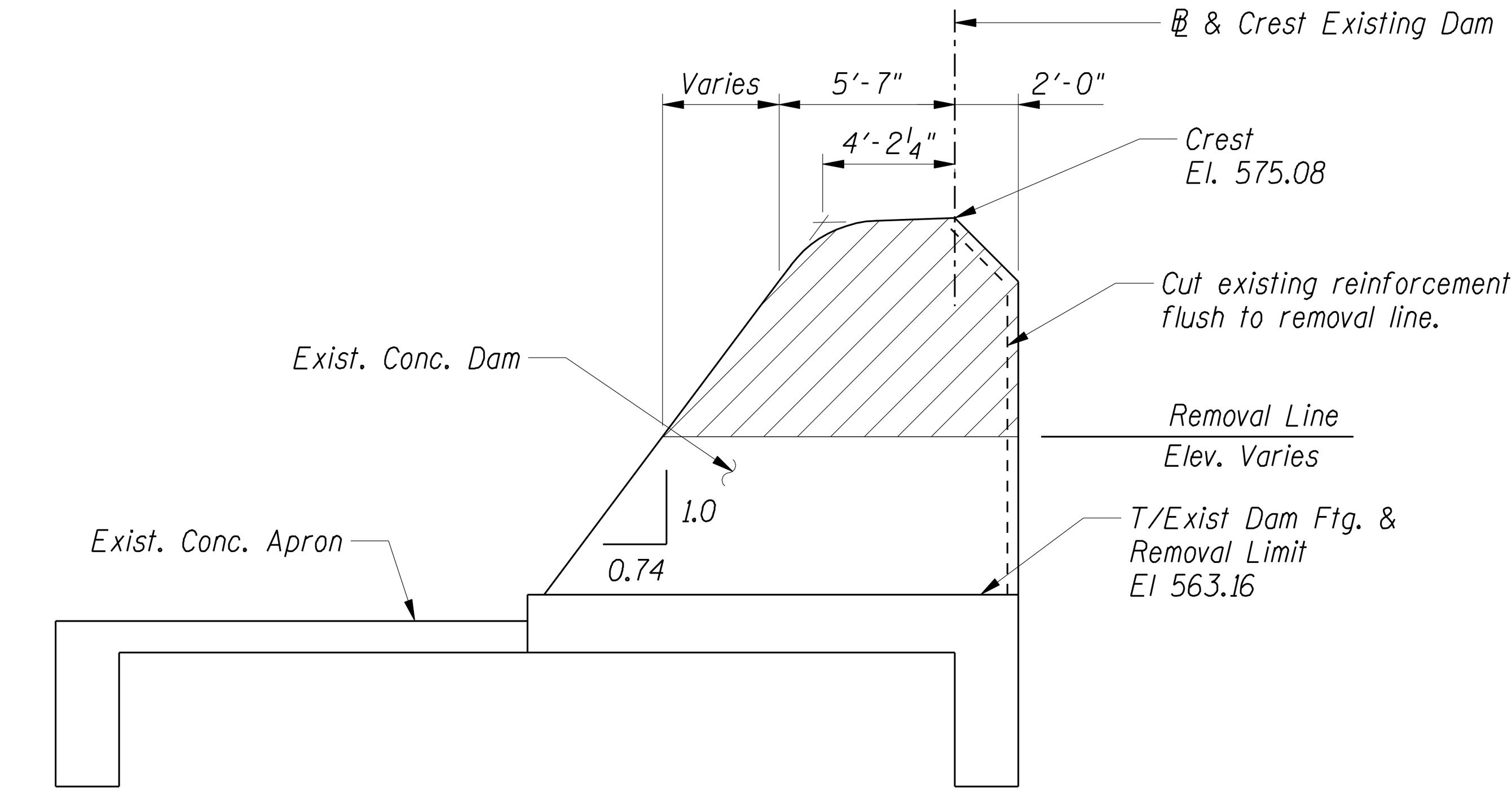


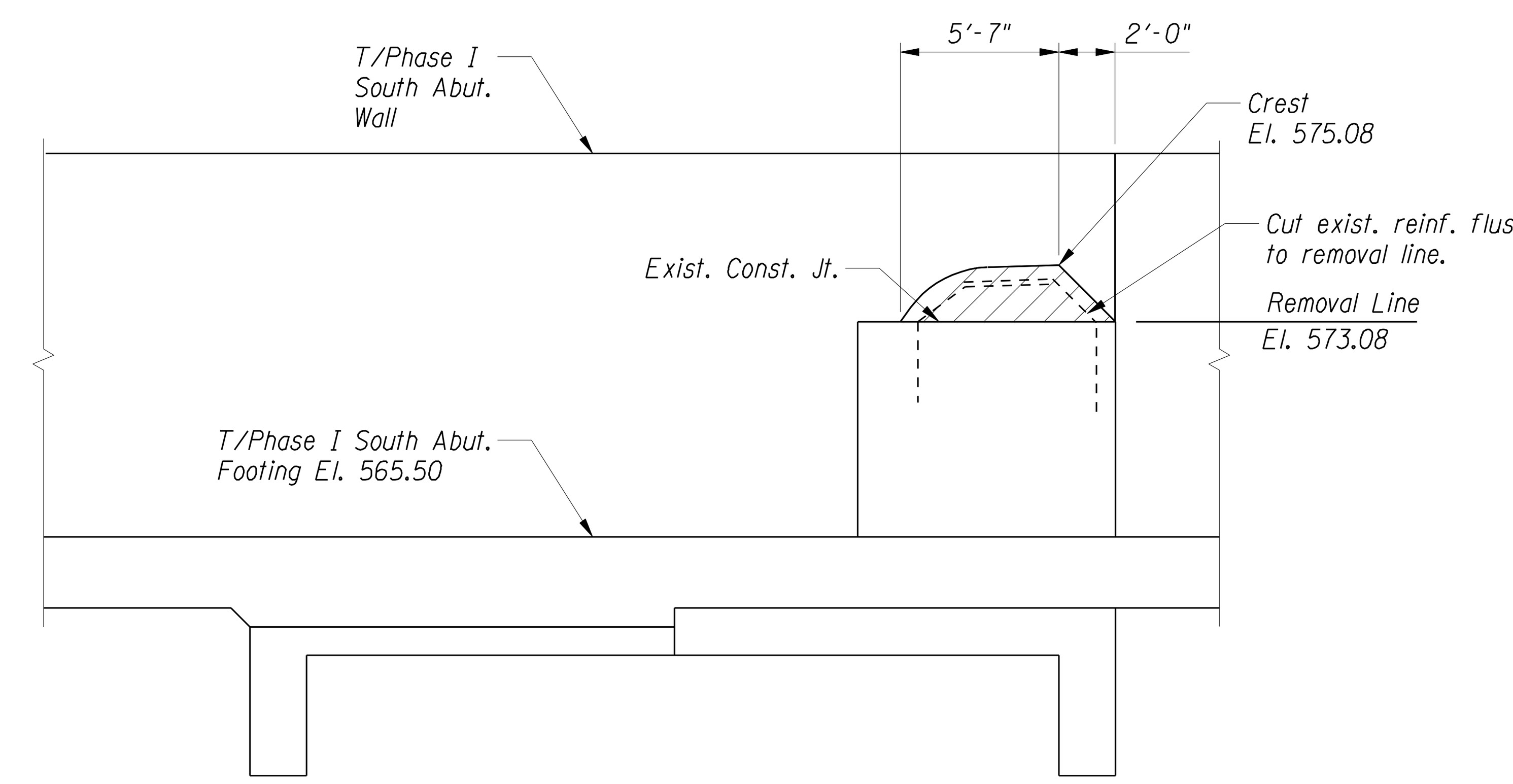
PLAN



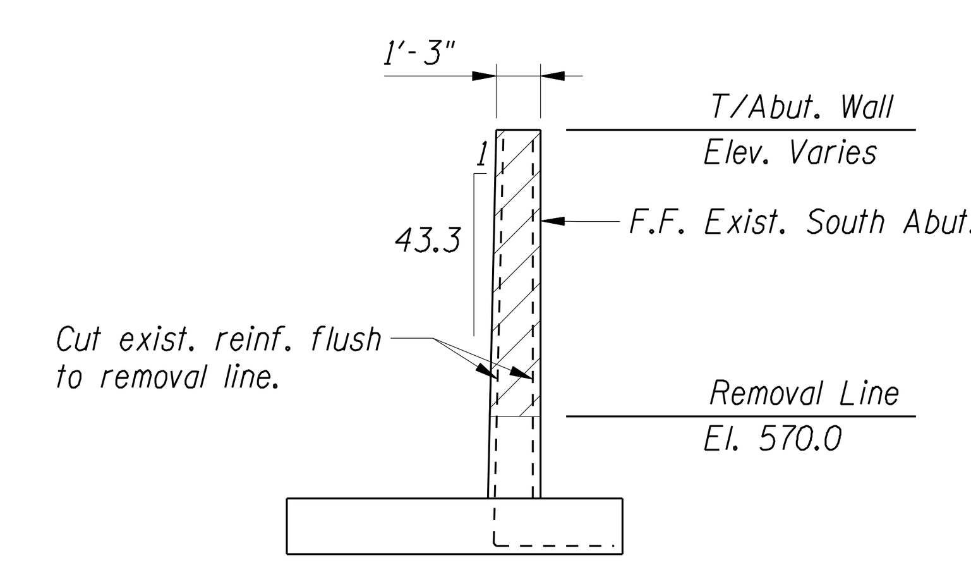
ELEVATION



SECTION A-A



SECTION B-B



SECTION C-C

Legend:

- Concrete Removal
- Riprap Class A4 Special Removal
- Riprap Class A7 Special Removal
- Riprap for Stilling Basin Removal

Bill of Material

Item	Unit	Qty
Concrete Removal	Cu yd	283
Recorder Gage House Removal	L Sum	1
Stone Riprap Removal	Ton	341.8
Riprap for Stilling Basin Relocation	Ton	1361

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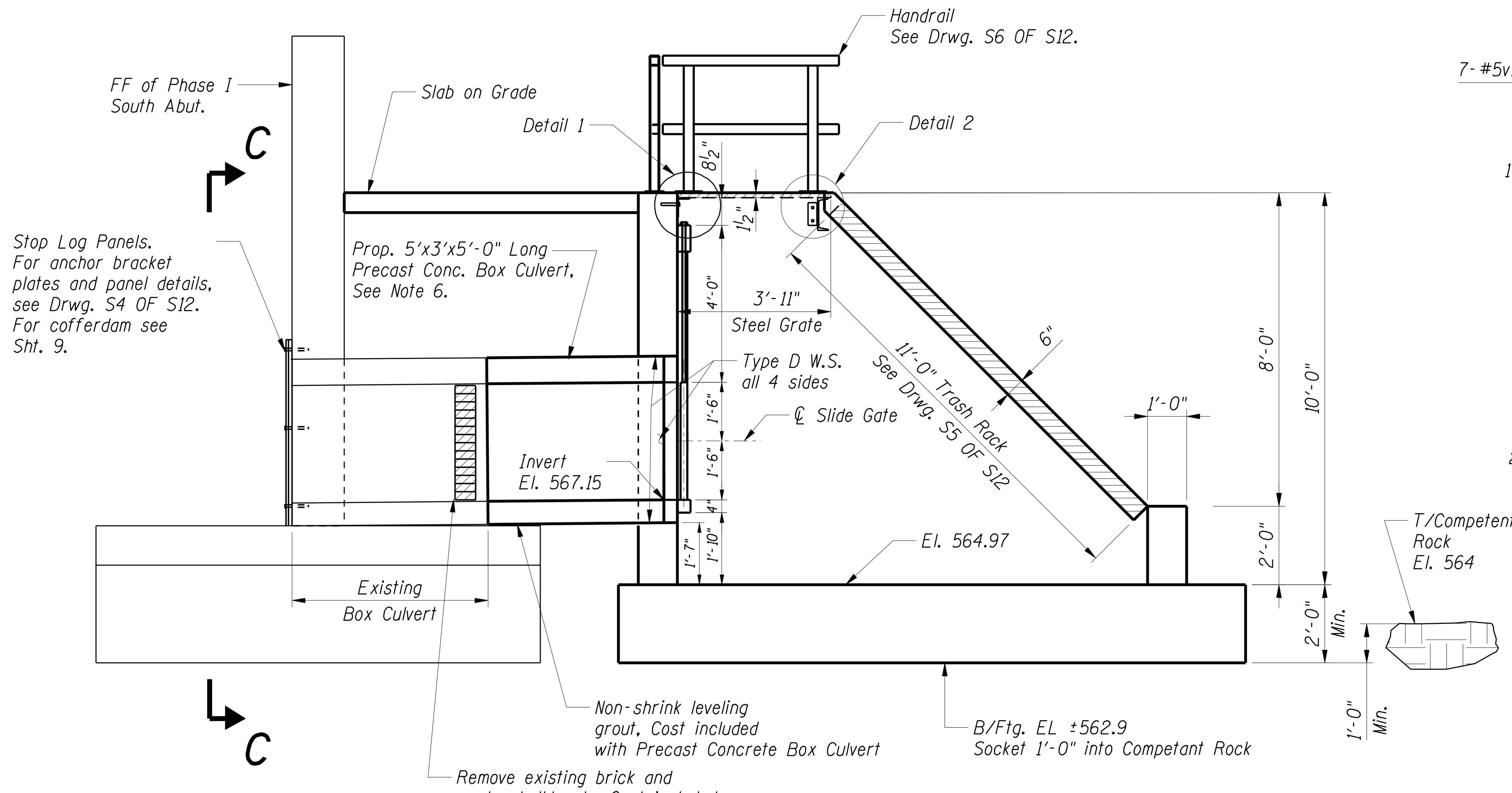
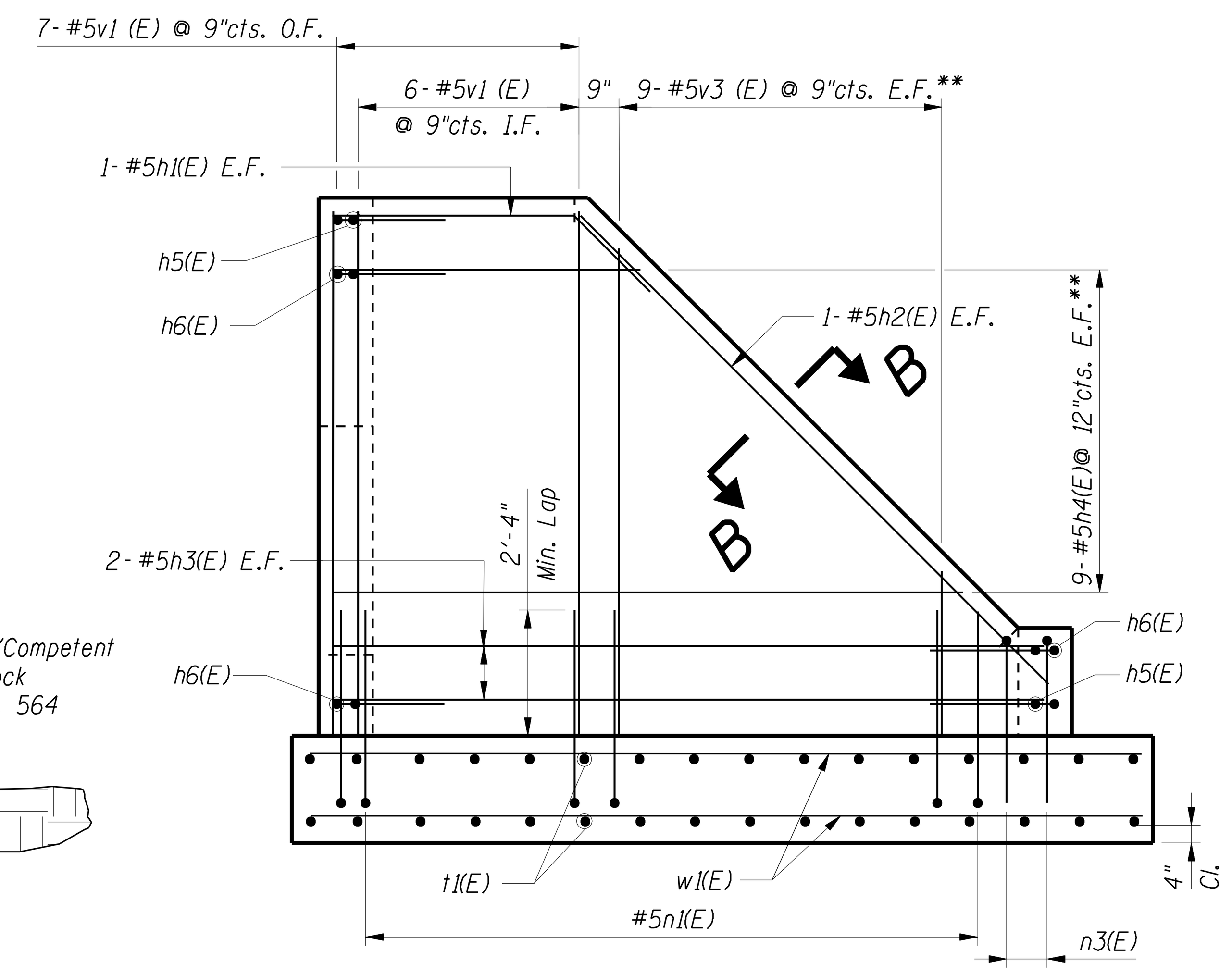
Drawn By JFG Checked By TCU



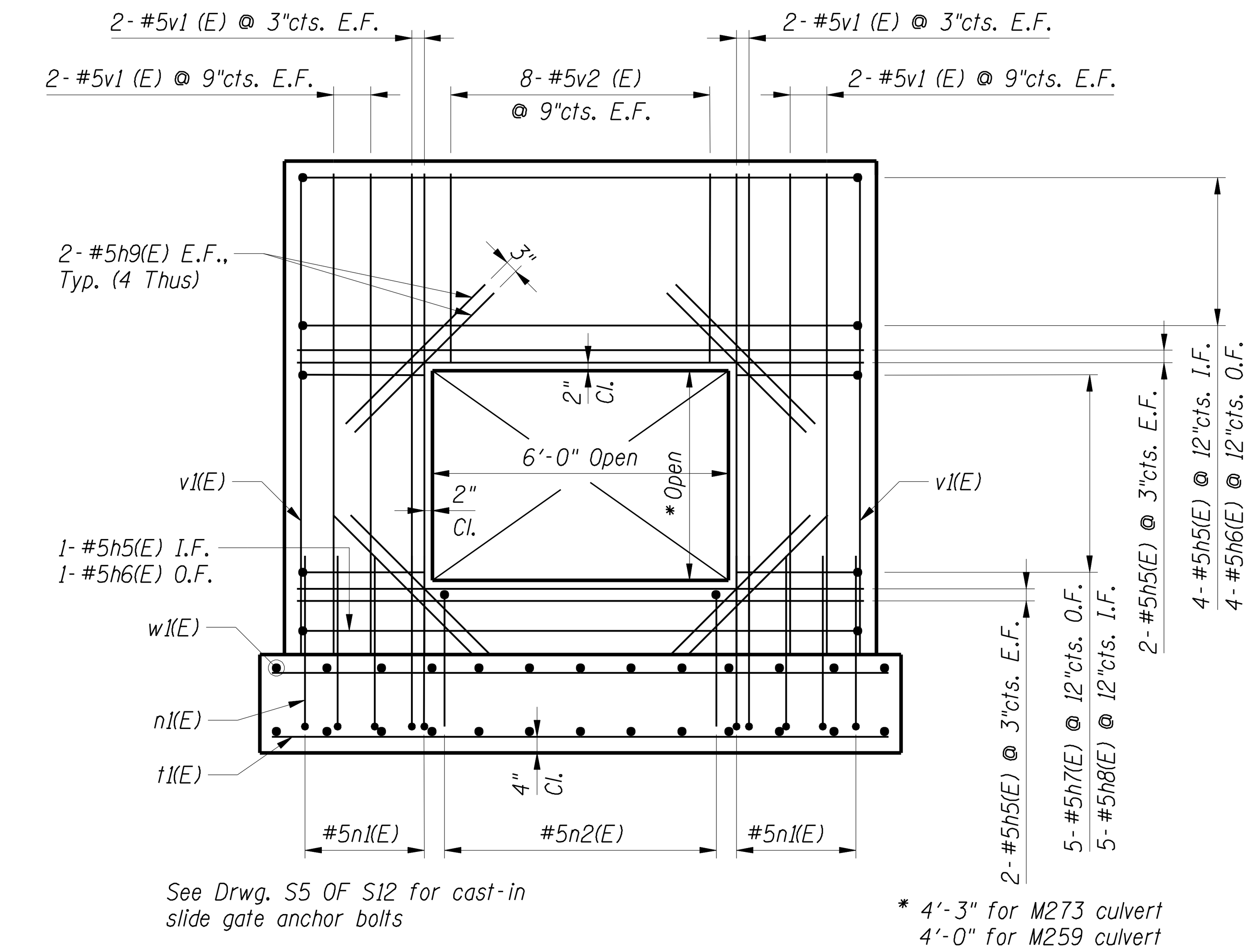
SECTION A-A



** Cut Bars as shown
in Bar Cutting Diagram

WEST WALL ELEVATION

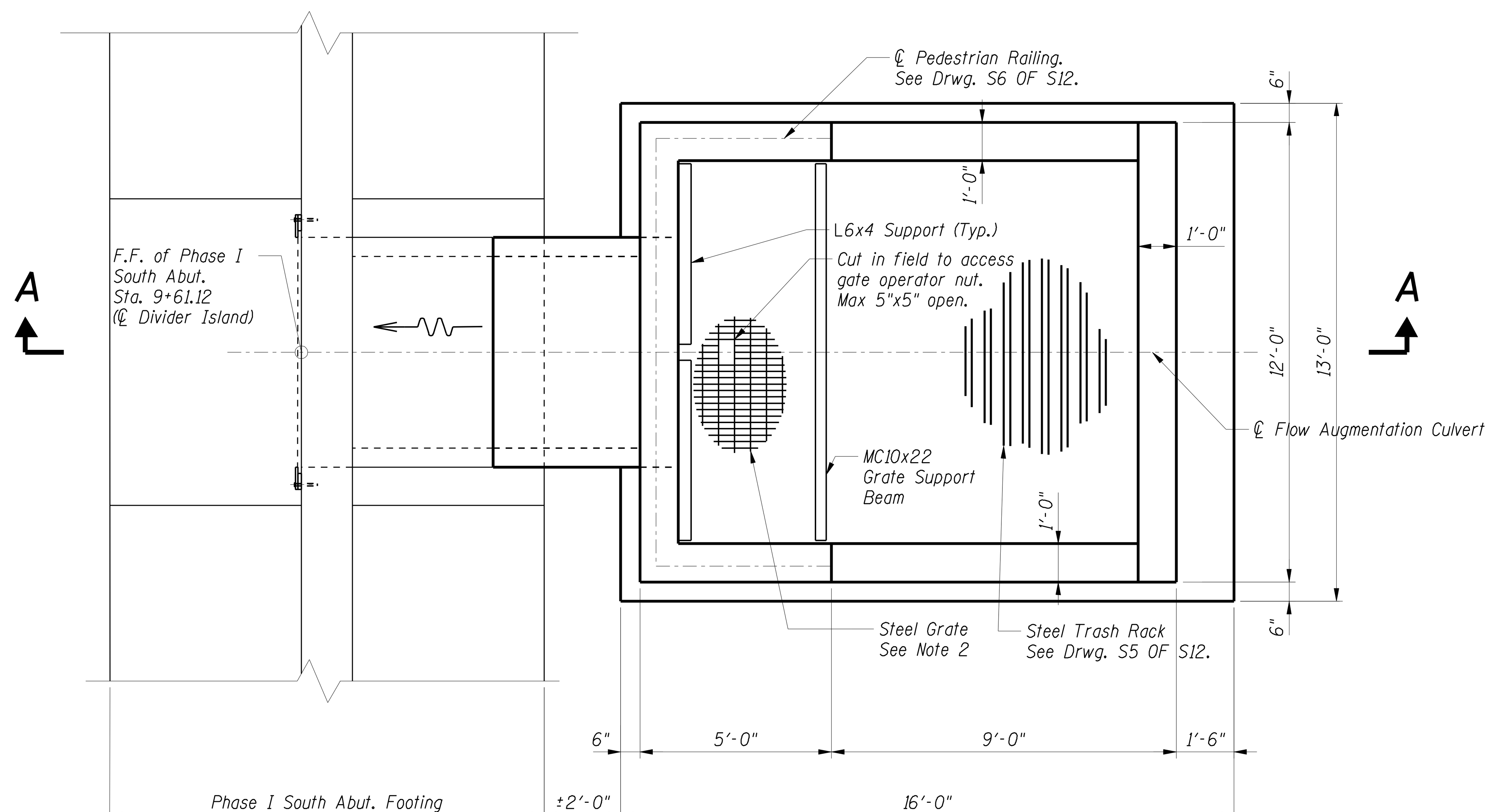
(East Wall Opp. Hand)



See Drwg. S5 OF S12 for cast-in
slide gate anchor bolts

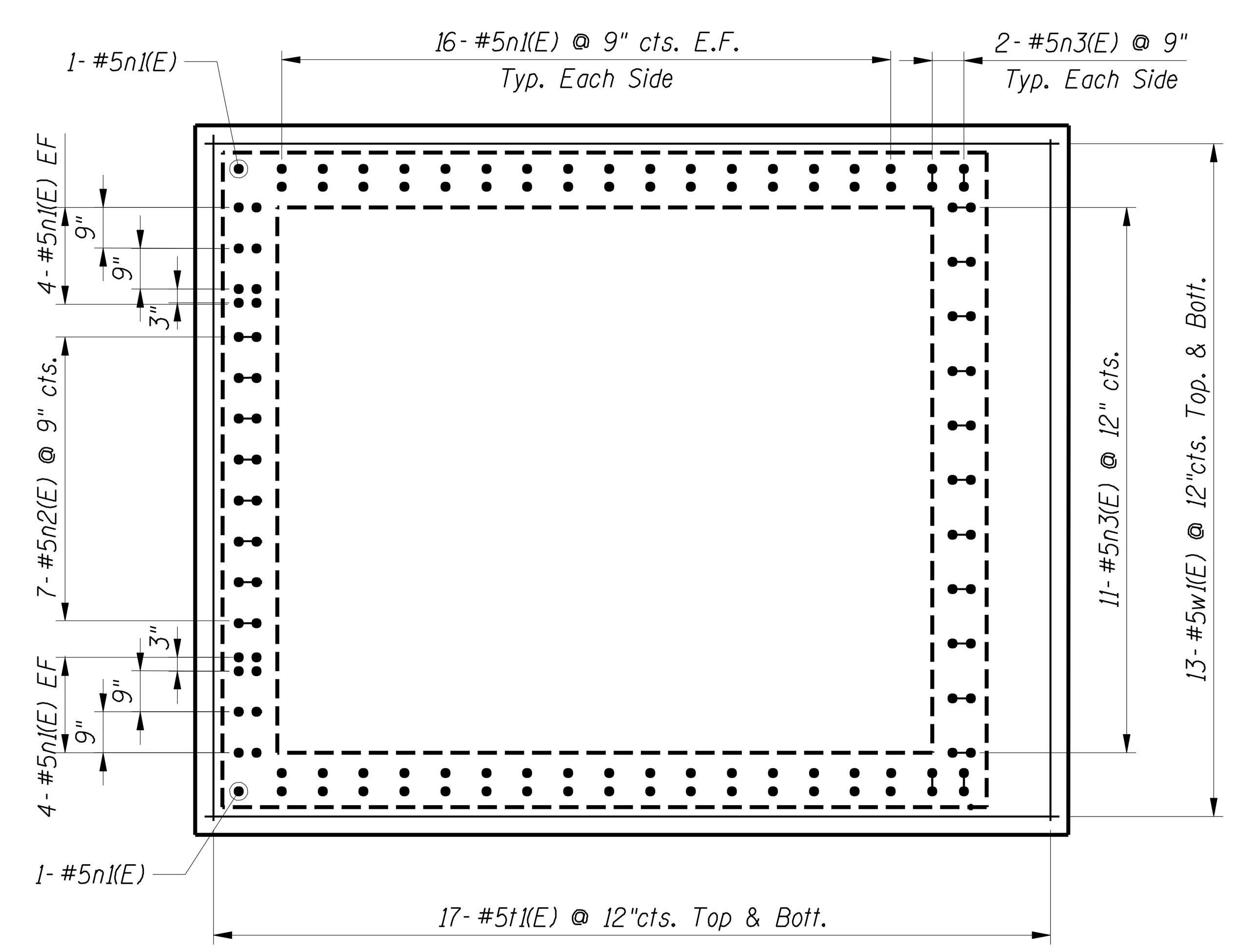
* 4'-3" for M273 culvert
4'-0" for M259 culvert
See Note 6.

NORTH WALL ELEVATION

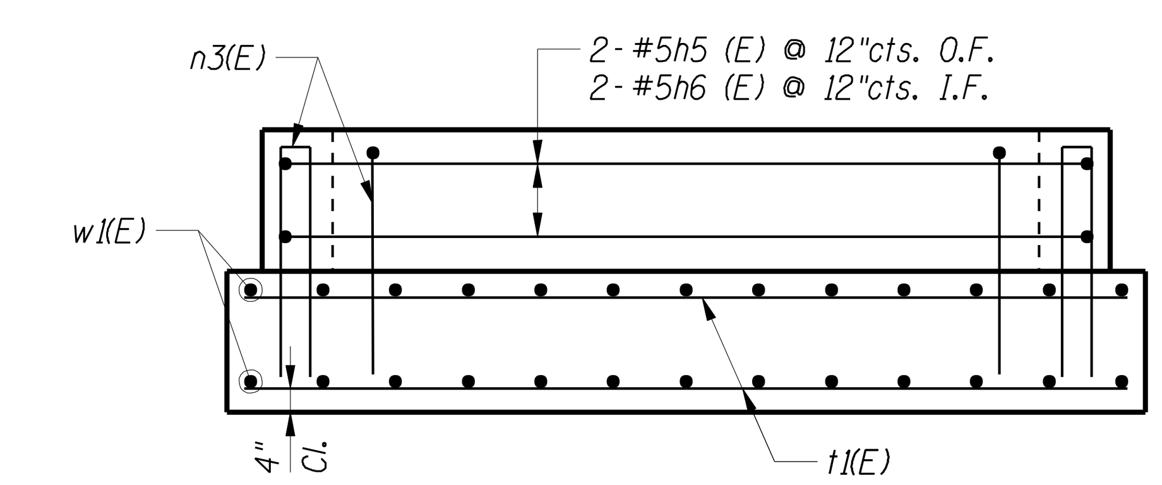


Layout culvert headwall structure
to match terminal location of extended
5x3 precast concrete culvert.

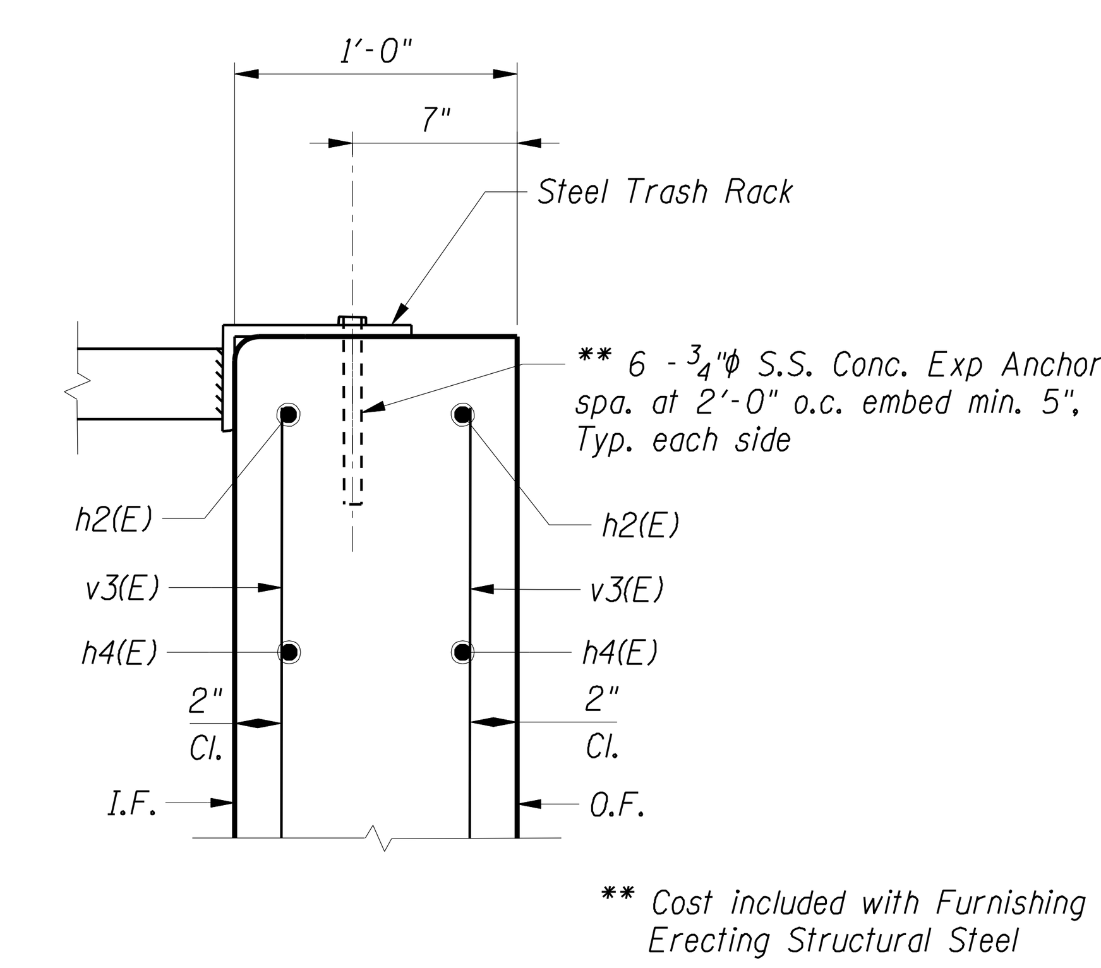
PLAN



FOOTING PLAN

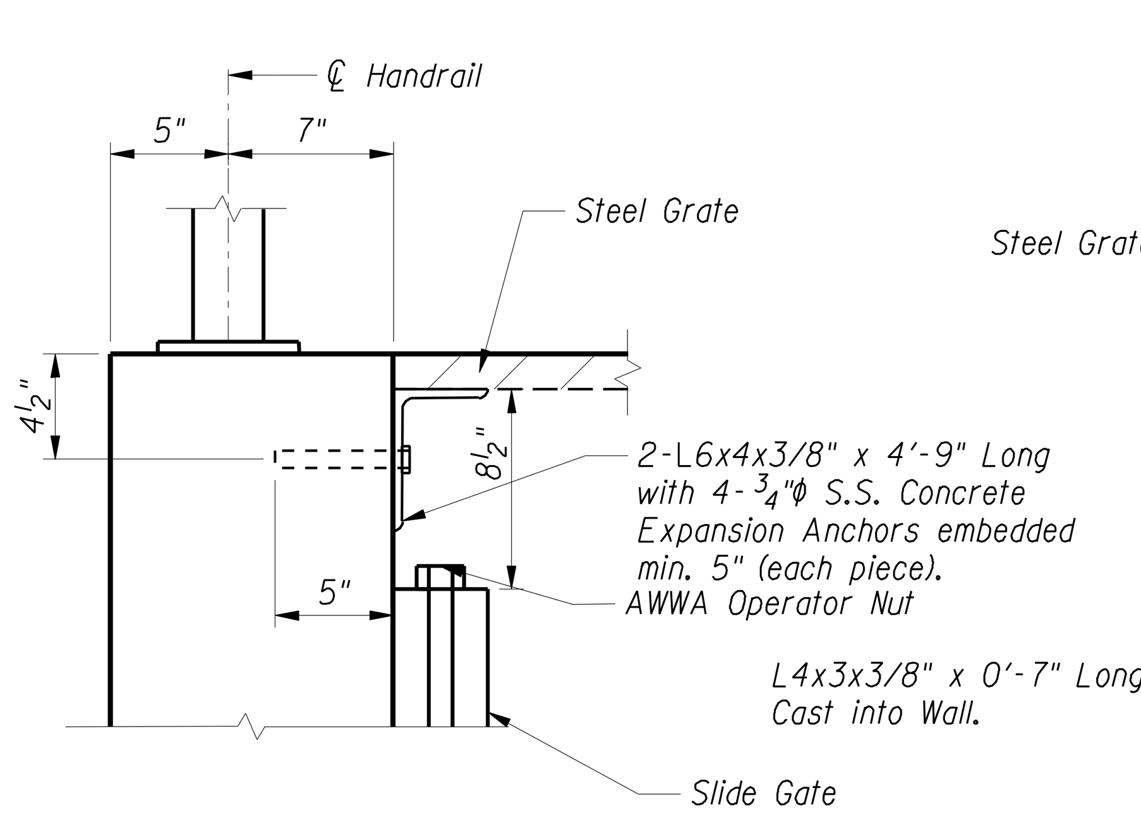


SOUTH WALL ELEVATION

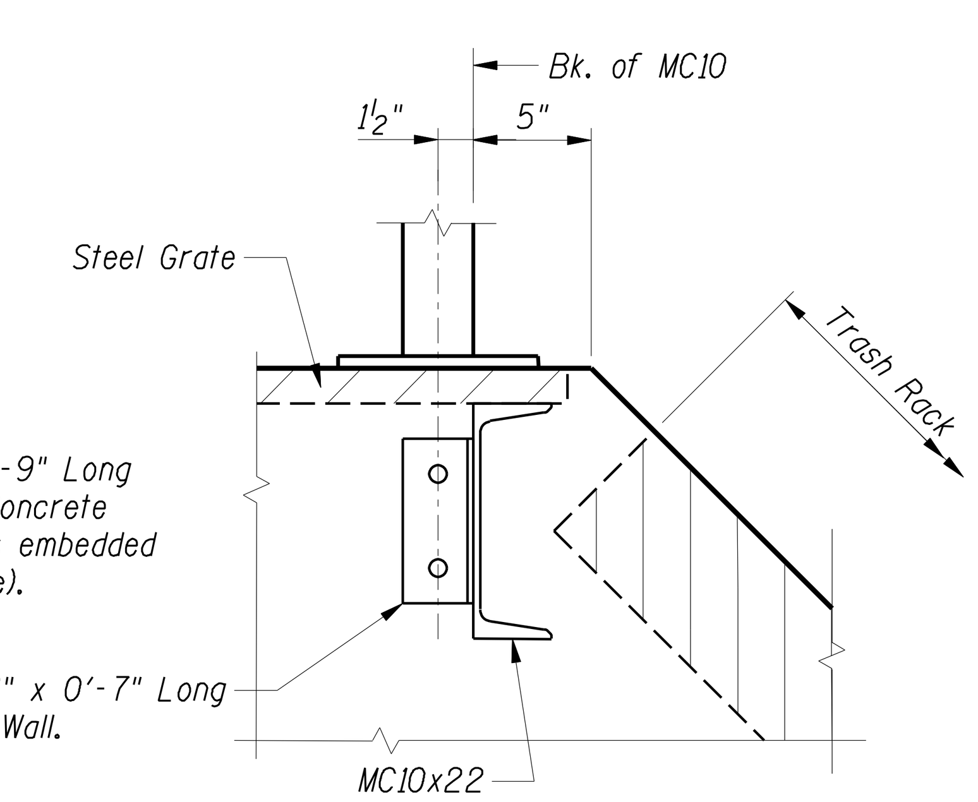


** Cost included with Furnishing &
Erecting Structural Steel

SECTION B-B



DETAIL 1



DETAIL 2

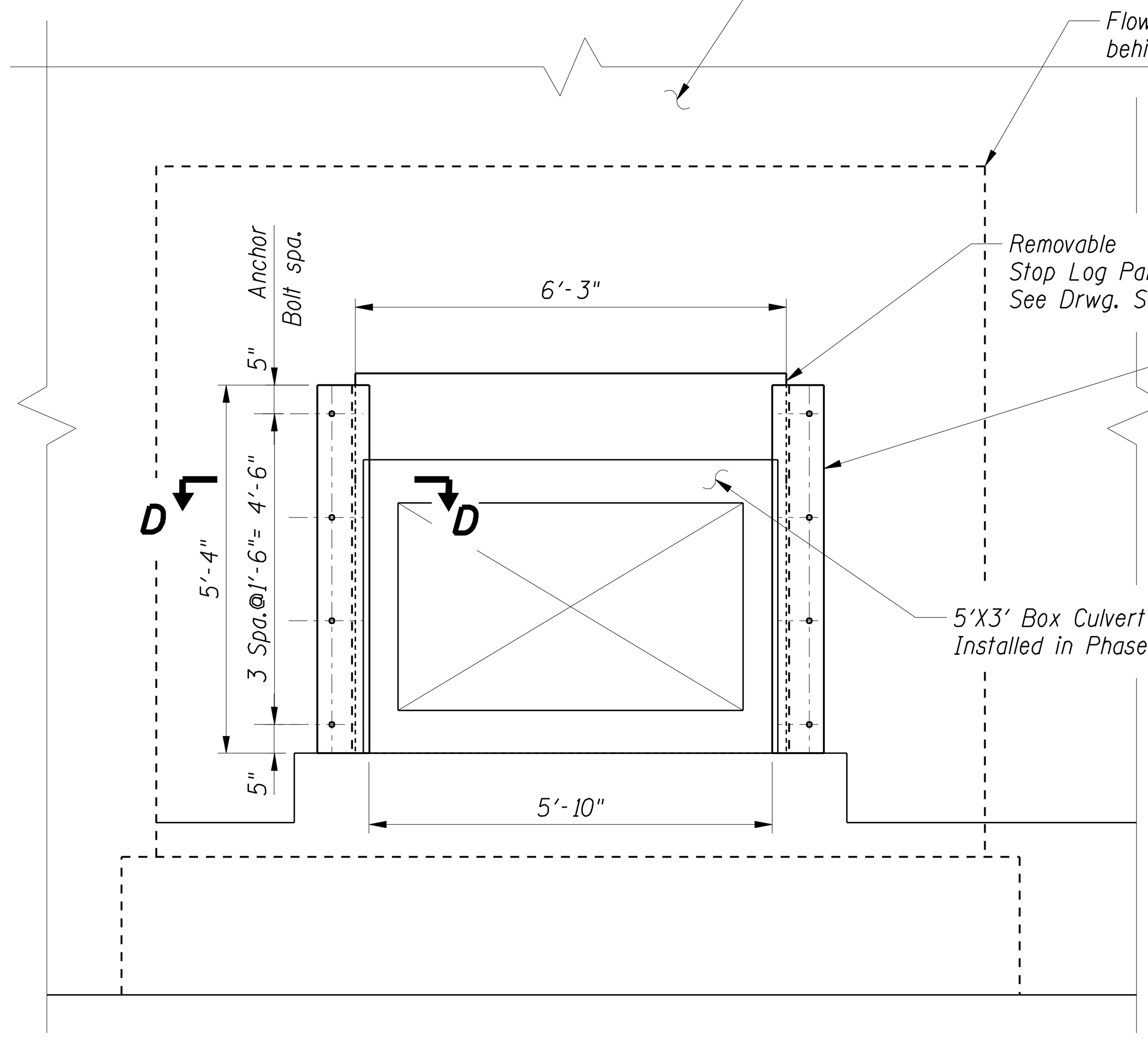
BILL OF MATERIAL

Item	Unit	Total
Galvanized Welded Steel Bar Grating	sq ft	38.8
Precast Concrete Box Culvert 5'x3'	ft	5.0

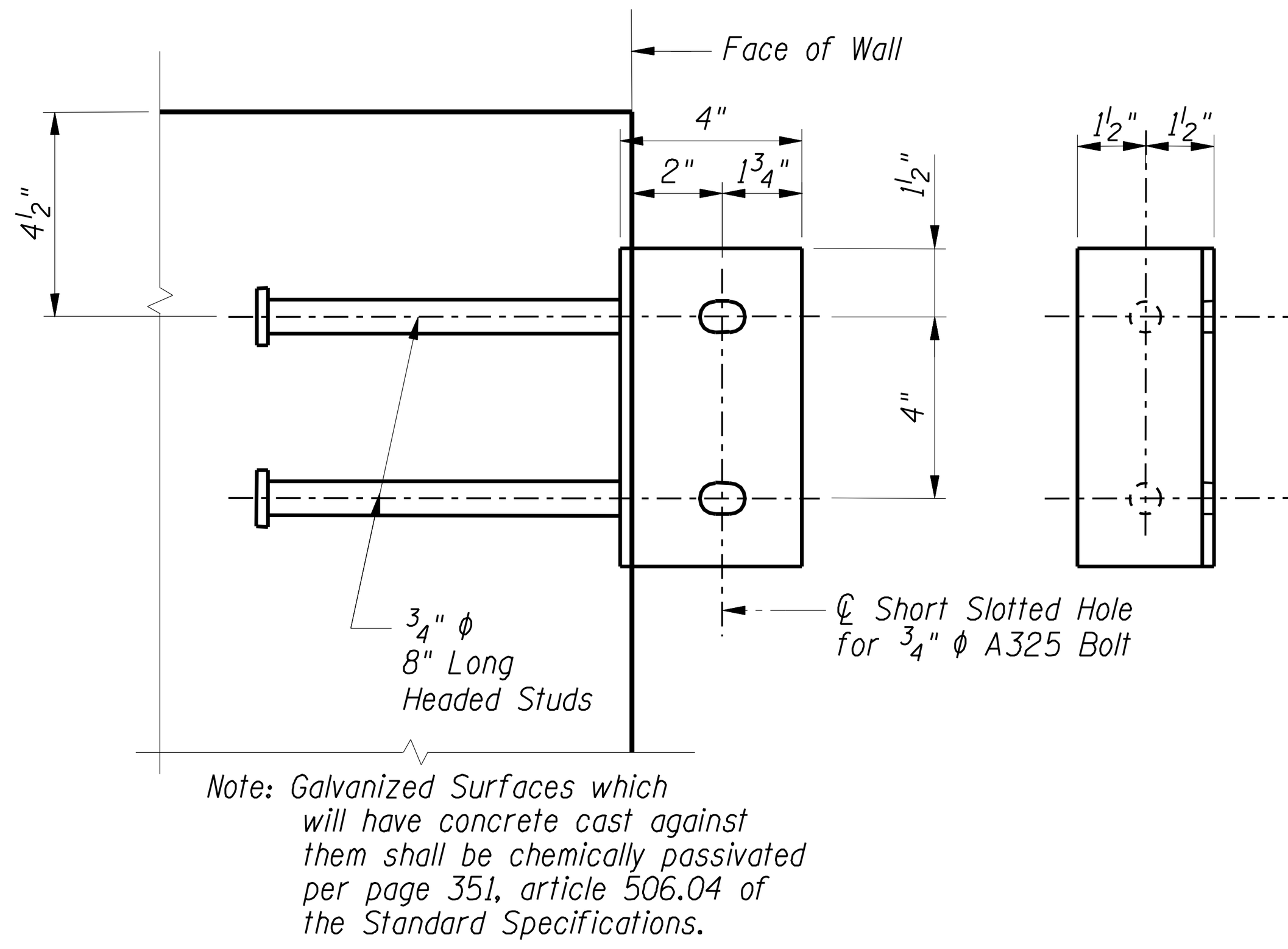
Notes:

1. Work this sheet with Drwg. S4 OF S12 & S5 OF S12
2. Provide Galvanized Welded Steel Bar Grating in accordance with the Special Provisions. Total panel size 9'-11"x3'-11". Bearing bars oriented N-S. Attach to supporting angles and channel in accordance with manufacturer recommended hold-down clips.
3. For details of grate support members, see Drwg. S4 OF S12. Reinforcement bars designated (E) shall be epoxy coated.
4. For Type D W.S. see Drwg. S1 OF S12.
5. I.F. denotes Inside Face; O.F. denotes Outside Face; F.F. denotes Front Face; E.F. denotes Each Face.
6. Size, type, and mating end condition of existing culvert section shall be verified in field prior to ordering material. New section shall be 5'-0" long, in conformance with AASHTO M273 or AASHTO M259, as required to match existing. Provide a flush culvert end at I.F. of headwall.

Designed By TCU Checked By TKL
Drawn By JFG Checked By TCU

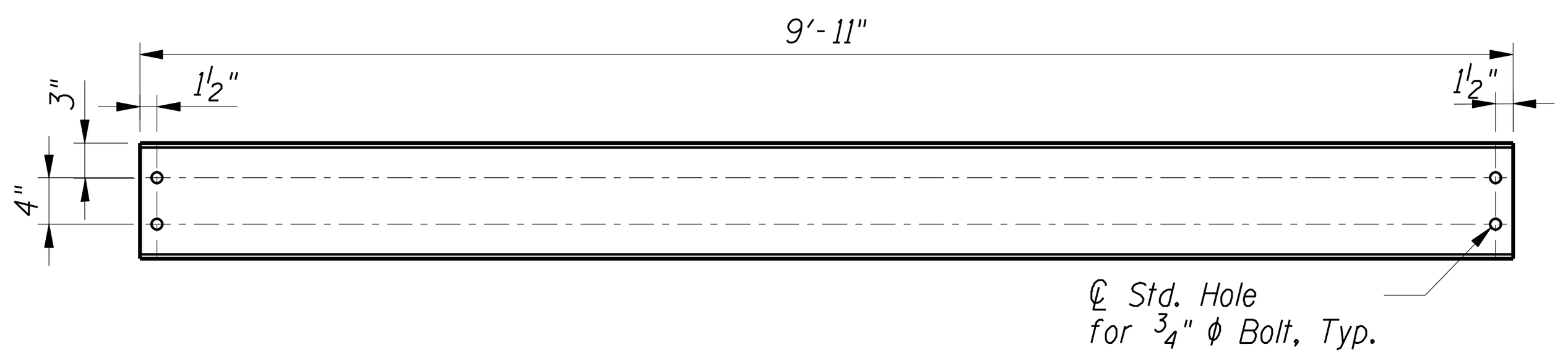


ELEVATION C-C



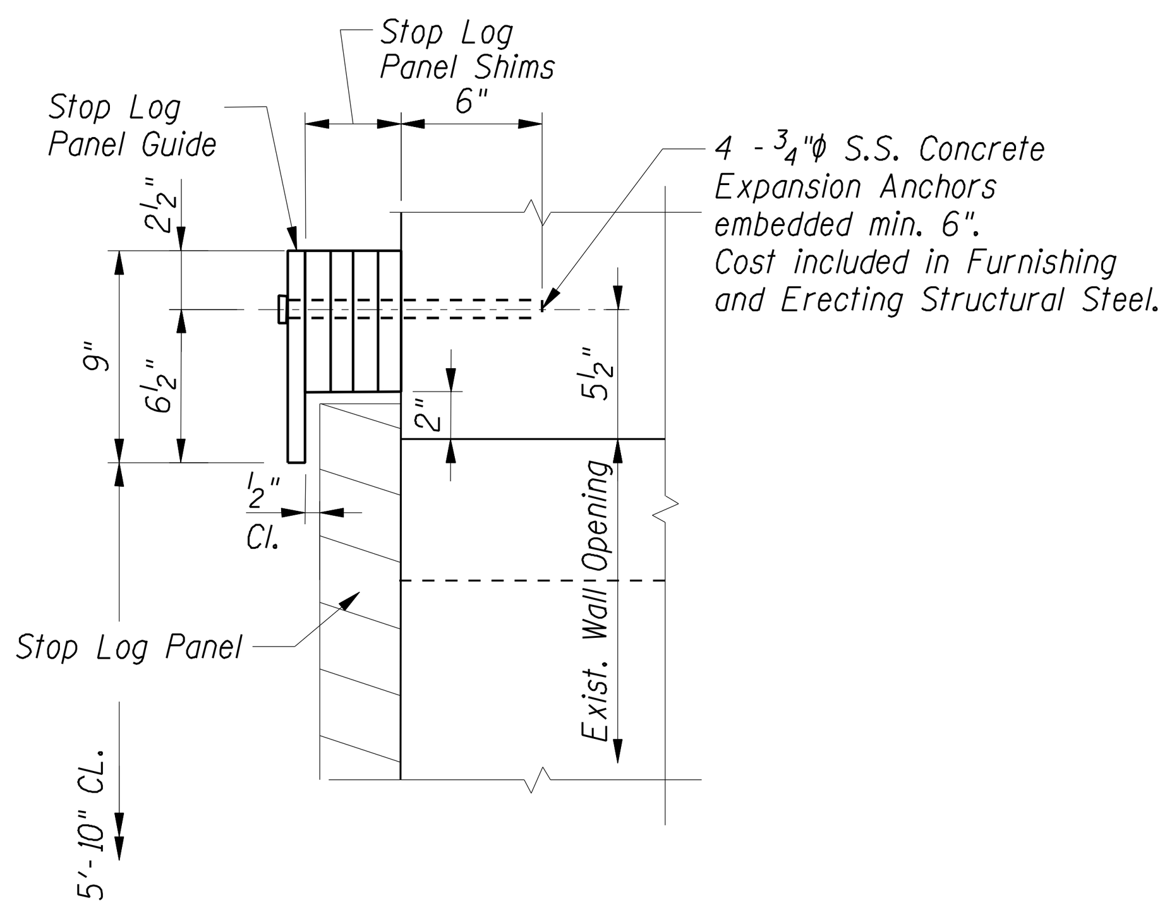
RETAINER ANGLE

(2 Required. Paid for as Furnishing & Erecting Structural Steel)



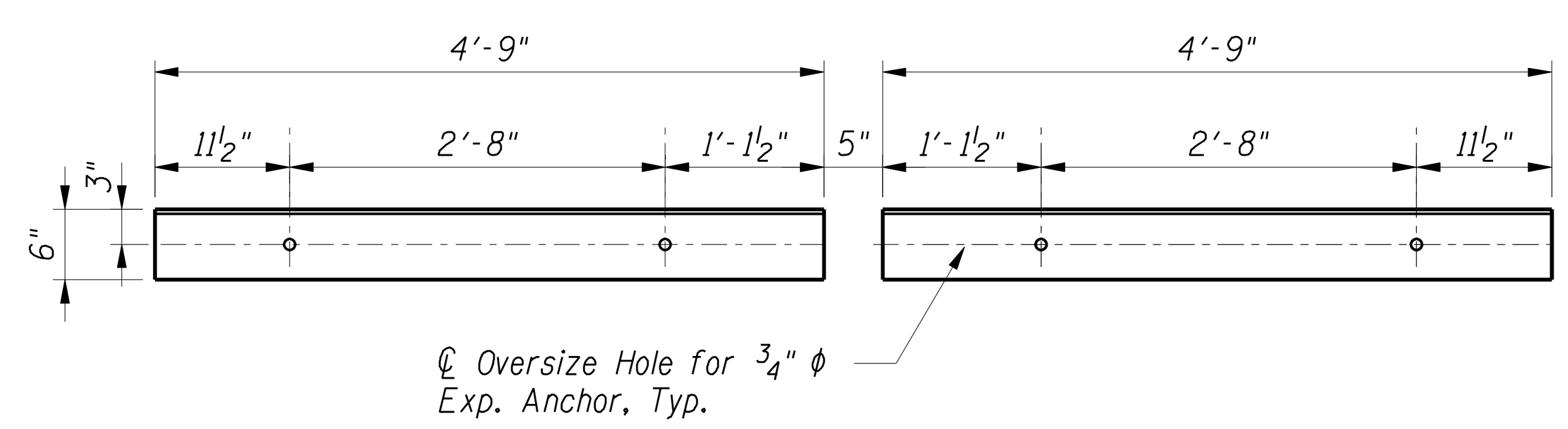
MC10x22 GRATE SUPPORT BEAM

(1 Req'd, Paid for as Furnishing & Erecting Structural Steel)



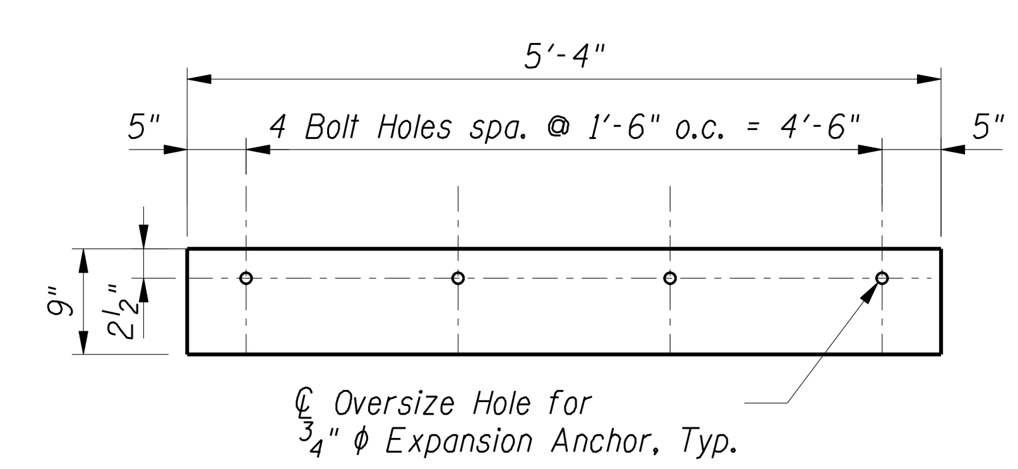
SECTION D-D

(Typ. Each Side of Culvert Opening)



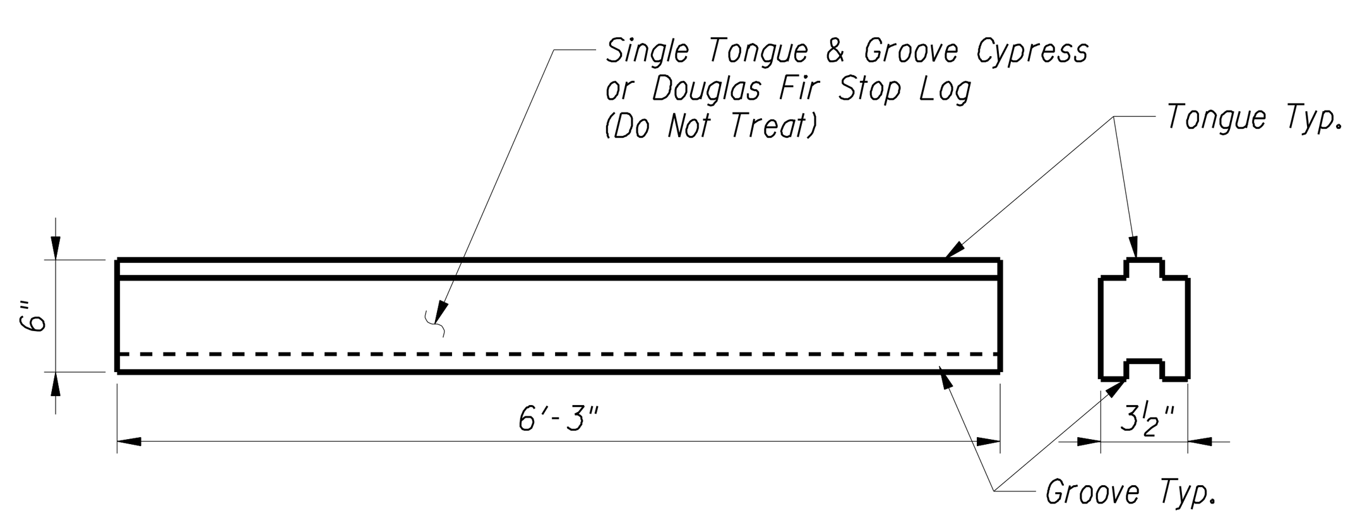
L6x4 GRATE SUPPORT

(1 Req'd, Paid for as Furnishing & Erecting Structural Steel)



ℙ ¾" x 9" x 5'-4" STOP LOG PANEL GUIDE

(2 Req'd, Paid for as Furnishing & Erecting Structural Steel)

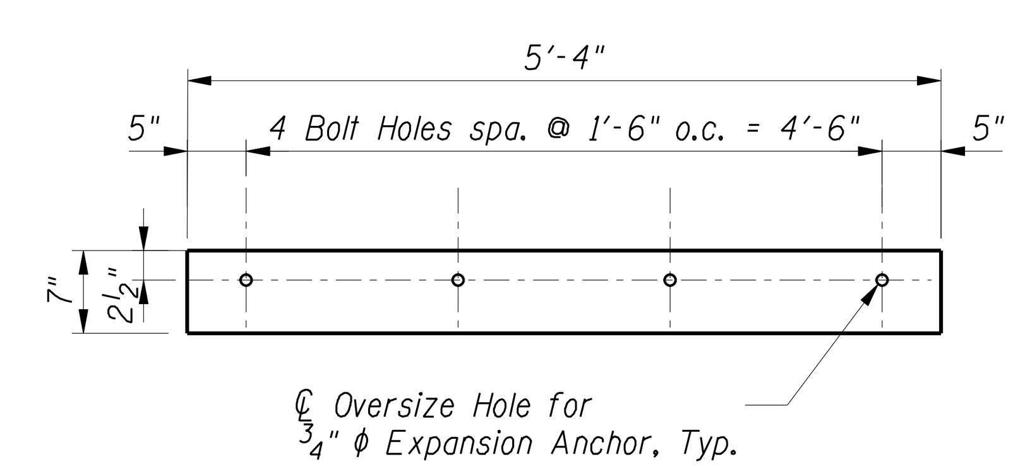


STOP LOG PANEL DETAIL

11 Required

Cost of furnishing stop logs shall be included in Furnishing and Erecting Structural Steel.

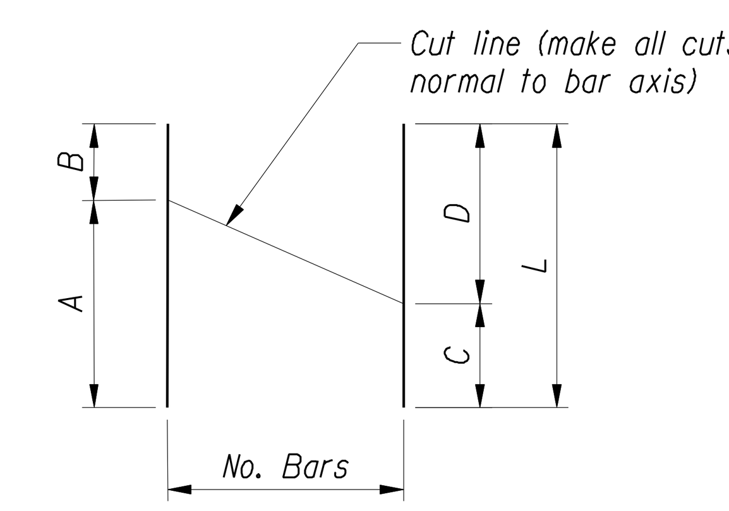
Store stop logs on site according to direction of the Engineer.



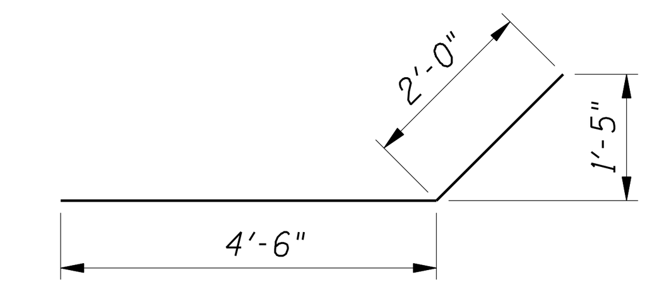
ℙ 1" x 7" x 5'-4" STOP LOG PANEL SHIMS

(8 Req'd, Paid for as Furnishing & Erecting Structural Steel)

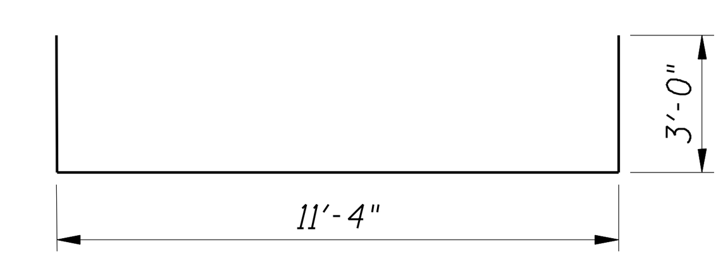
BAR CUTTING DIAGRAM



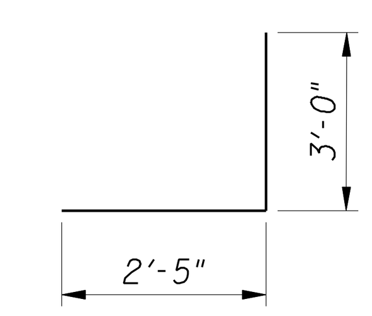
Bar	A	B	C	D	L	No. bars
h4(E)	11'-8"	5'-8"	5'-8"	11'-8"	14'-4"	18
v3(E)	9'-0"	3'-1"	3'-1"	9'-0"	12'-1"	18



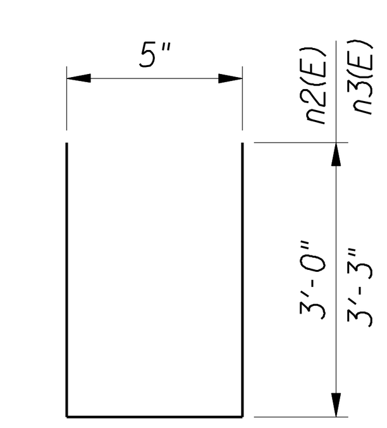
Bar h1(E)



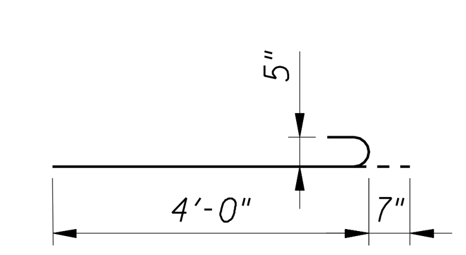
Bar h6(E)



Bar h8(E)



Bars n2(E) & n3(E)



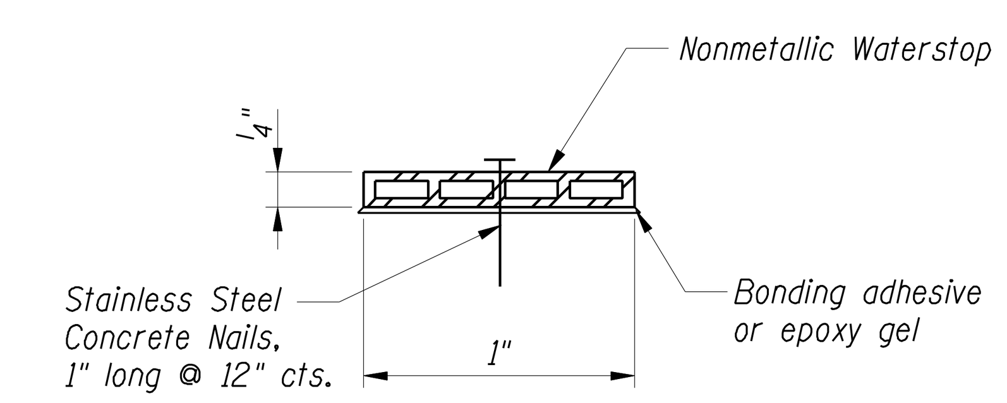
Bar n1(E)

BAR LIST

Bar	No.	Size	Length	Shape
h1(E)	4	#5	6'-6"	
h2(E)	4	#5	12'-4"	
h3(E)	8	#5	13'-4"	
h4(E)	18	#5	17'-4"	
h5(E)	15	#5	11'-4"	
h6(E)	7	#5	17'-4"	
h7(E)	10	#5	2'-5"	
h8(E)	10	#5	5'-5"	
h9(E)	16	#5	4'-0"	
n1(E)	82	#5	4'-7"	
n2(E)	7	#5	6'-5"	
n3(E)	15	#5	6'-11"	
t1(E)	34	#5	12'-4"	
v1(E)	42	#5	9'-8"	
v2(E)	16	#5	3'-8"	
v3(E)	18	#5	12'-1"	
w1(E)	26	#5	15'-4"	

BILL OF MATERIAL

Item	Unit	Total
Concrete Structures	Cu yd	27.6
Reinforcement Bars, Epoxy Coated	lb	3,080
Furnishing and Erecting Structural Steel	lb	1686



TYPE D WATERSTOP

Existing concrete surfaces in contact with waterstop shall be cleaned by sand blasting or grinding to assure a good bond. An epoxy gel bonding agent or bonding adhesive shall be applied per the manufacturer's instructions.
(Cost included with Concrete Structures)

Notes:

1. Work this sheet with Drwg. S3 OF S12 & S5 OF S12.
2. All structural steel this sheet shall be galvanized after shop fabrication according to AASHTO M 111 and ASTM A 385. All bolts, nuts, washers, and anchor rods shall be galvanized according to AASHTO M 232 except stainless steel bolts as noted.
3. Reinforcement designated (E) shall be epoxy coated.

Designed By TCU Checked By TKL
Drawn By JFG Checked By TCU

FR-423

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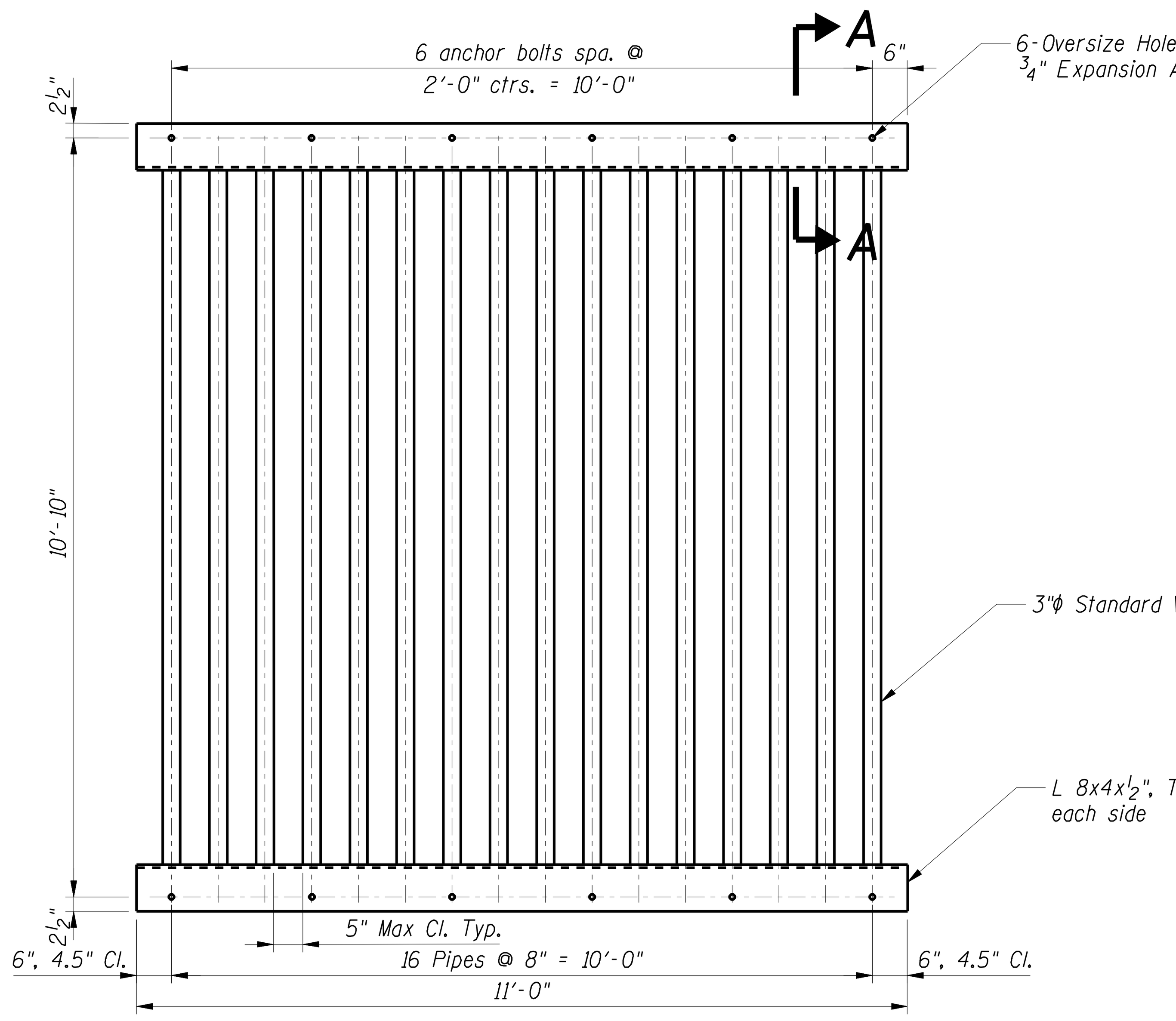
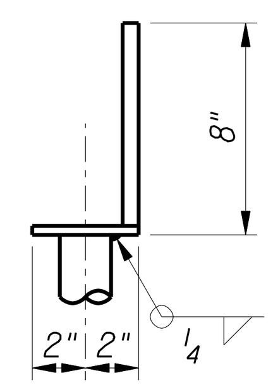
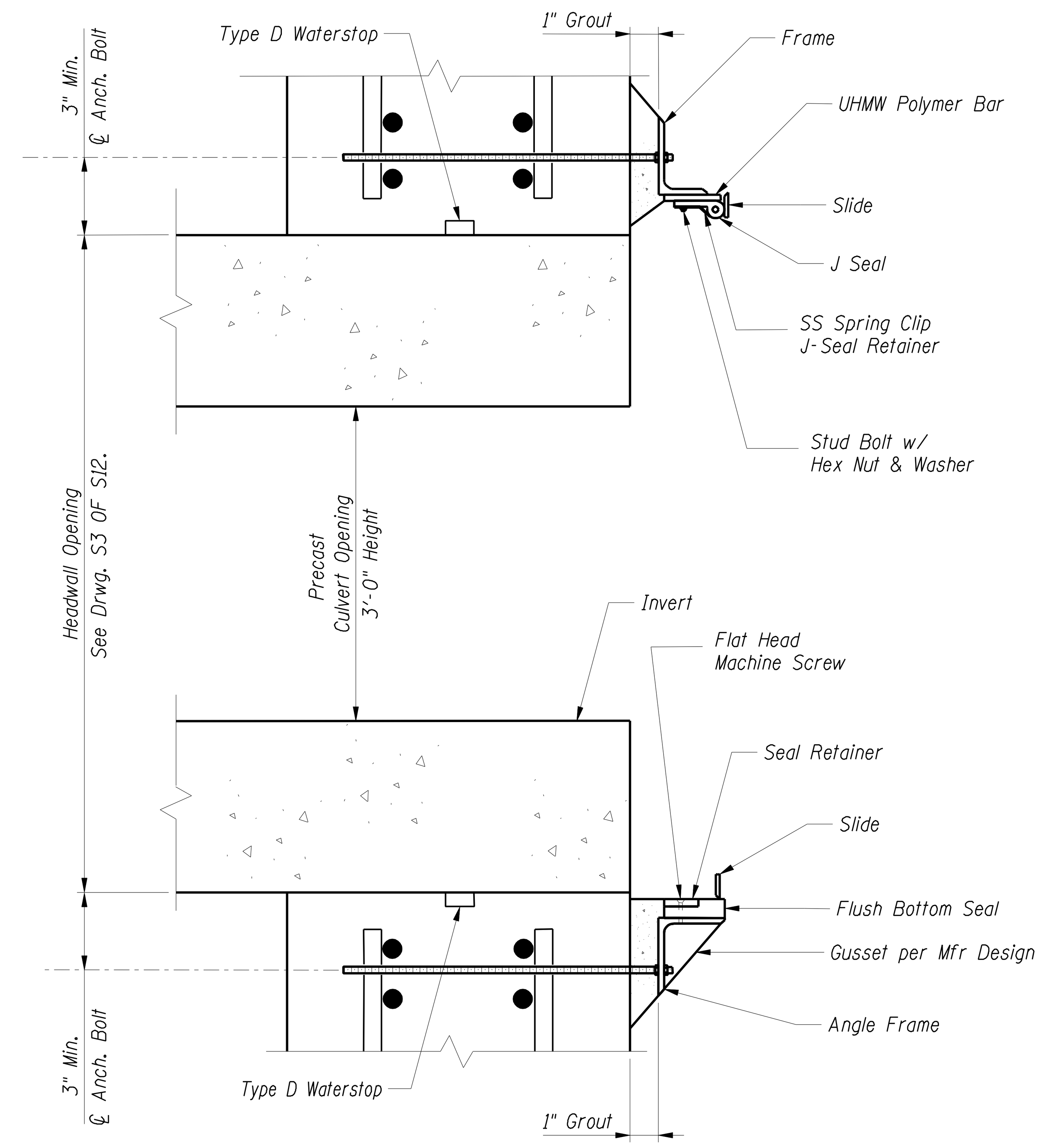
TELEPHONE 312/616-0000



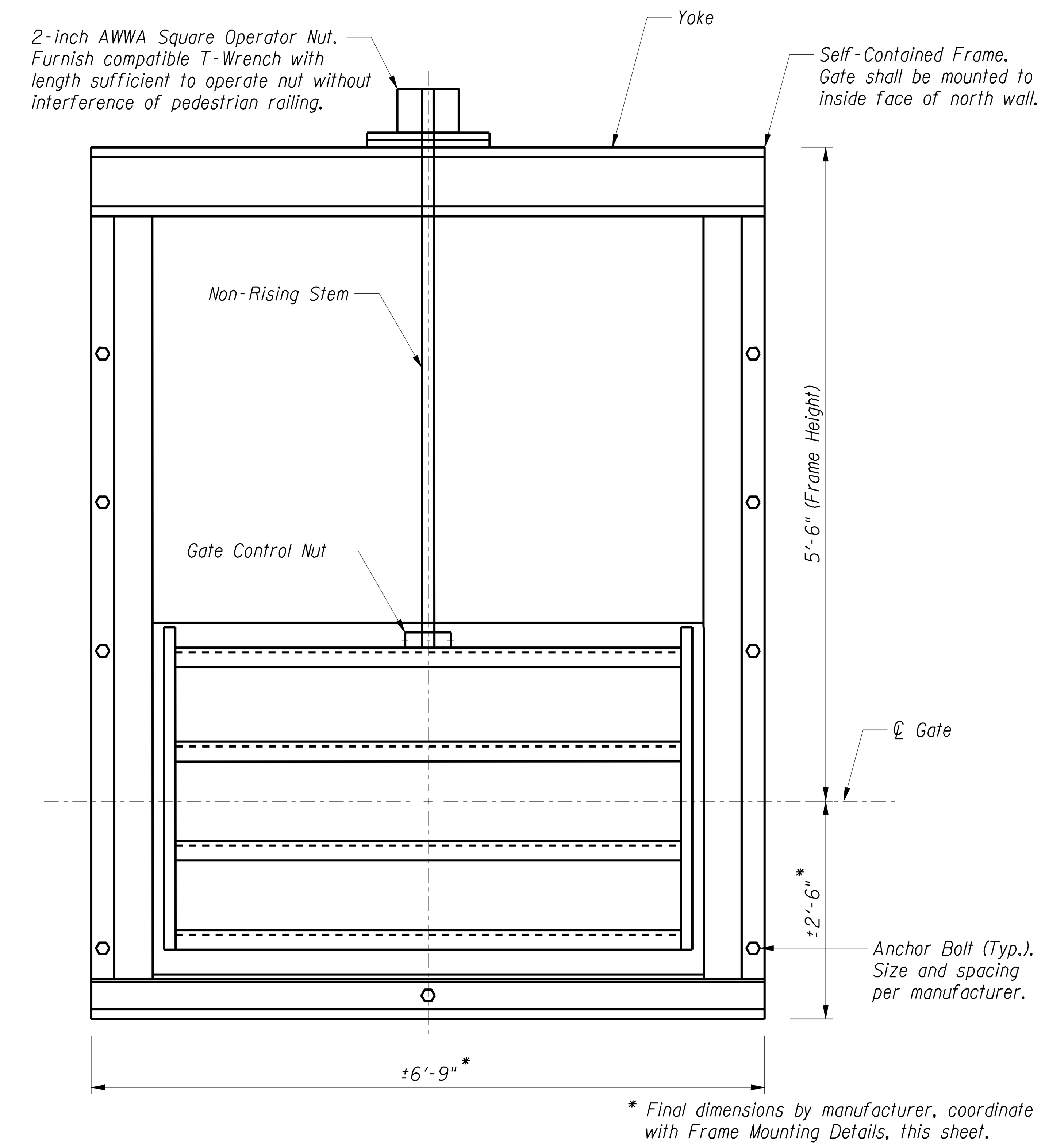
ELEVATION - STEEL TRASH RACK



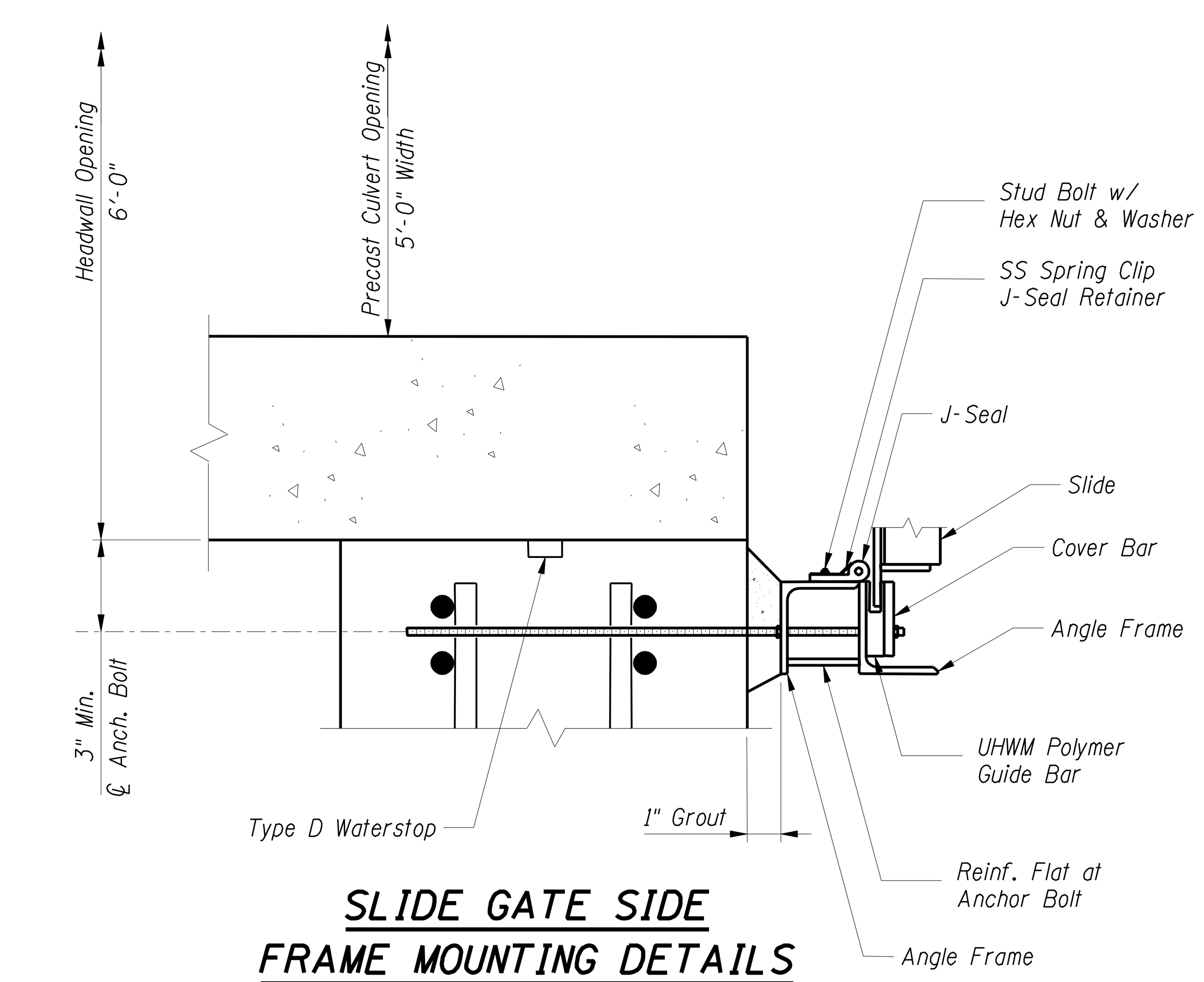
SECTION A-A



SLIDE GATE TOP & BOTTOM
FRAME MOUNTING DETAILS



SLIDE GATE DETAILS

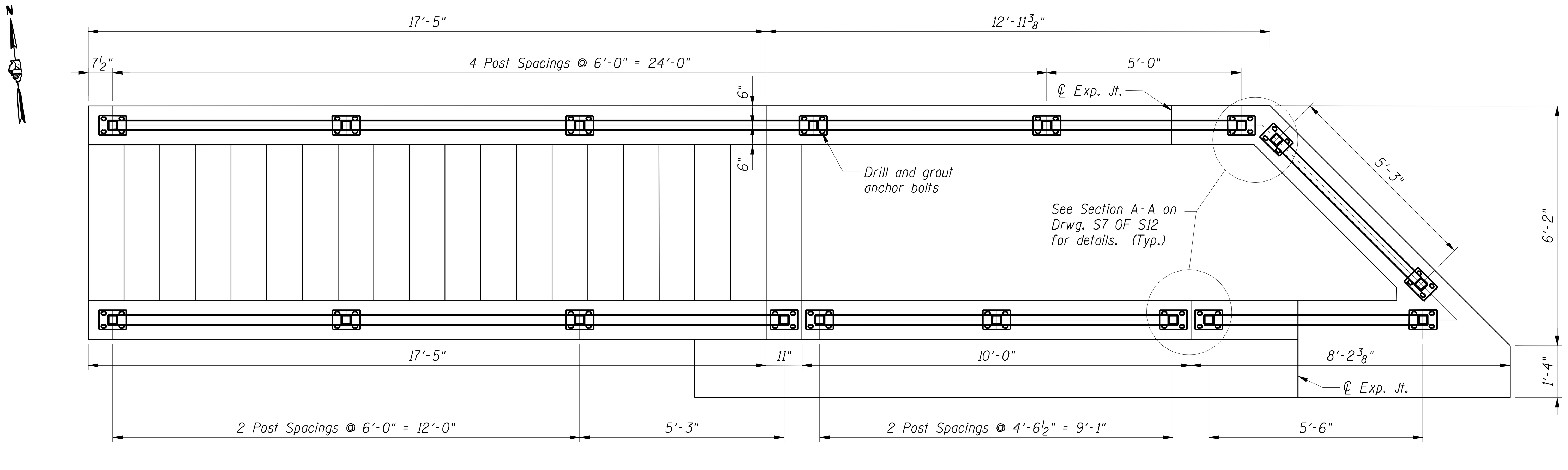


SLIDE GATE SIDE
FRAME MOUNTING DETAILS

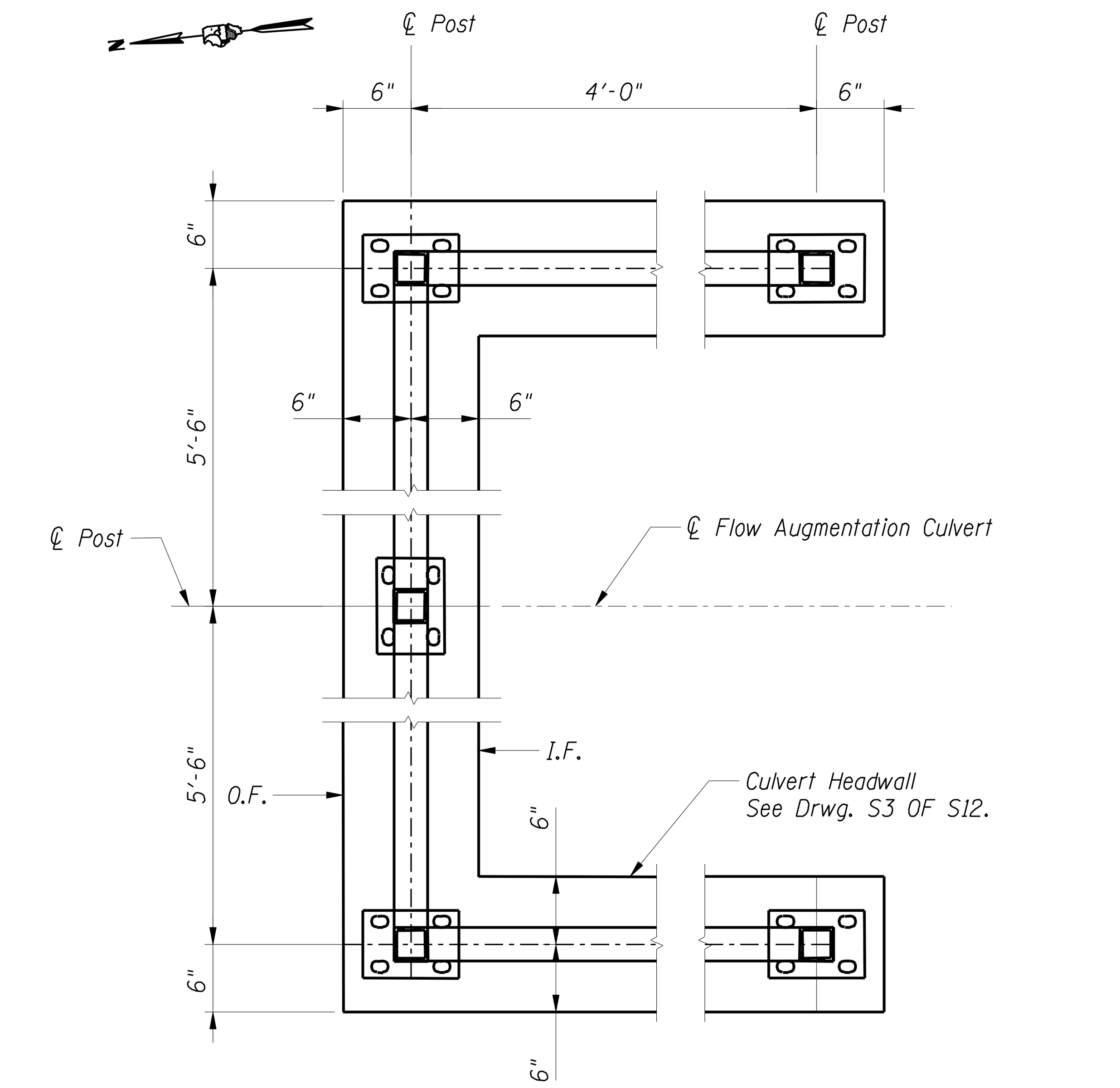
Notes:
1. Steel Trash Rack shall be galvanized after shop fabrication according to AASHTO M 111 and ASTM A 385.
All bolts, nuts, washers, and anchor rods shall be galvanized according to AASHTO M 232 except Stainless steel bolts as noted. Vent holes for galvanizing shall be placed in the 4" leg of the angles.
2. Work this sheet with Drwg. S3 OF S12 & S4 OF S12.

BILL OF MATERIAL

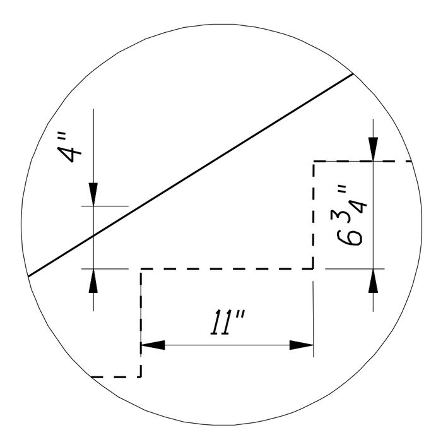
Item	Unit	Total
Slide Gate	each	1
Steel Trash Rack	each	1



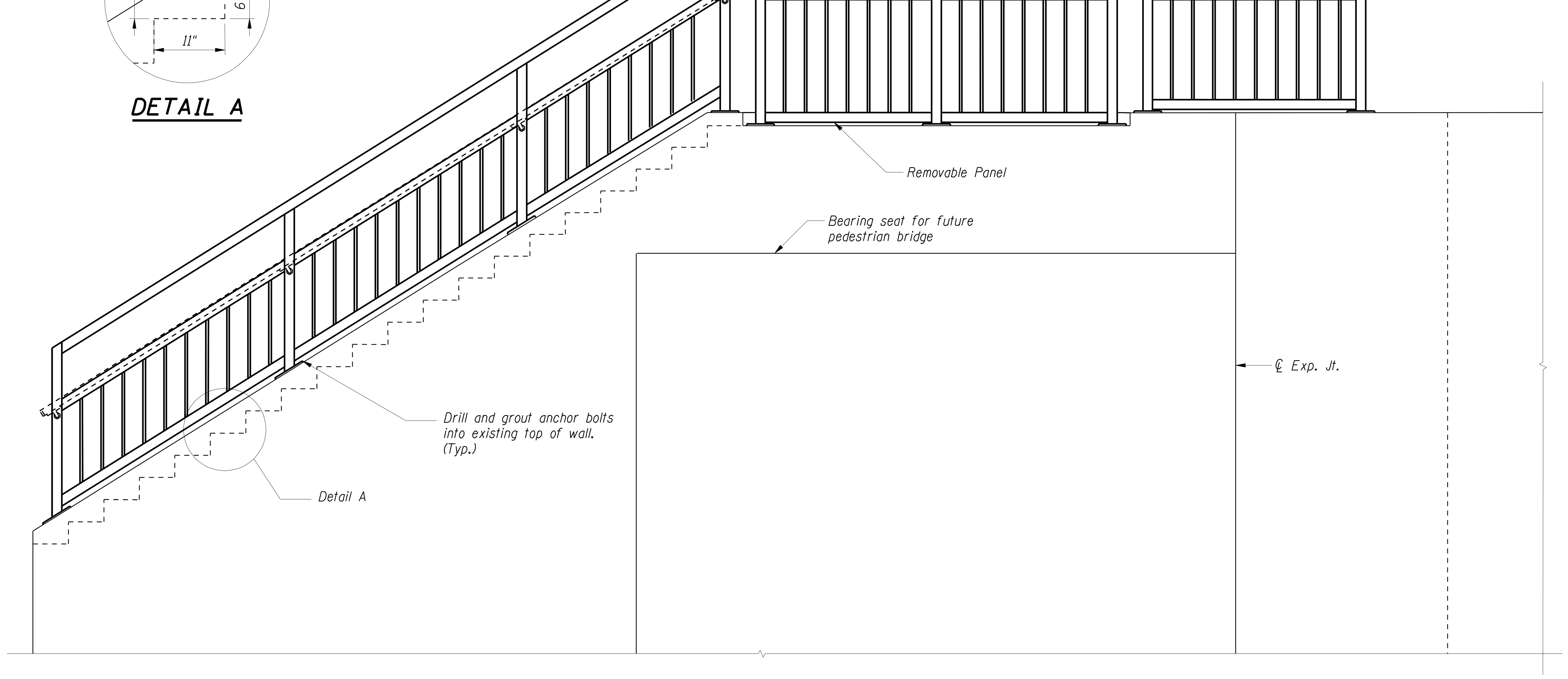
STAIR AND LANDING PLAN



FLOW AUGMENTATION CULVERT PLAN

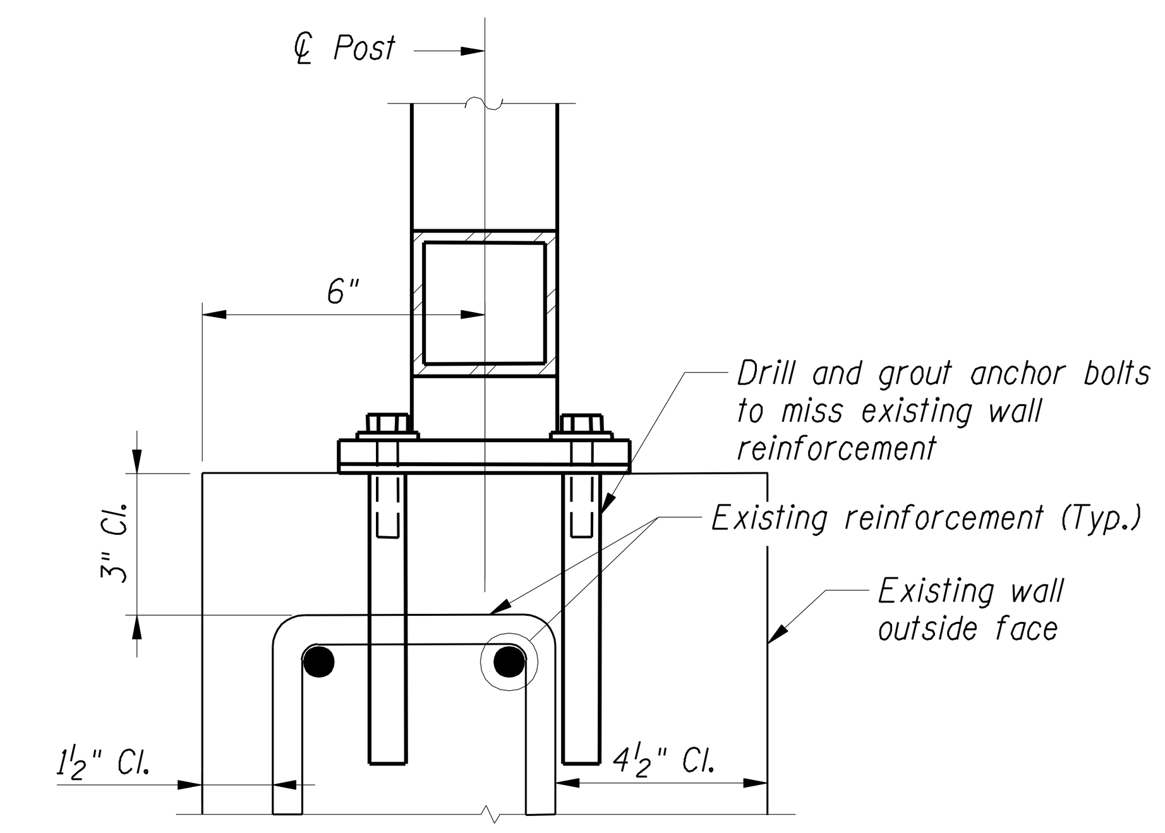


DETAIL A

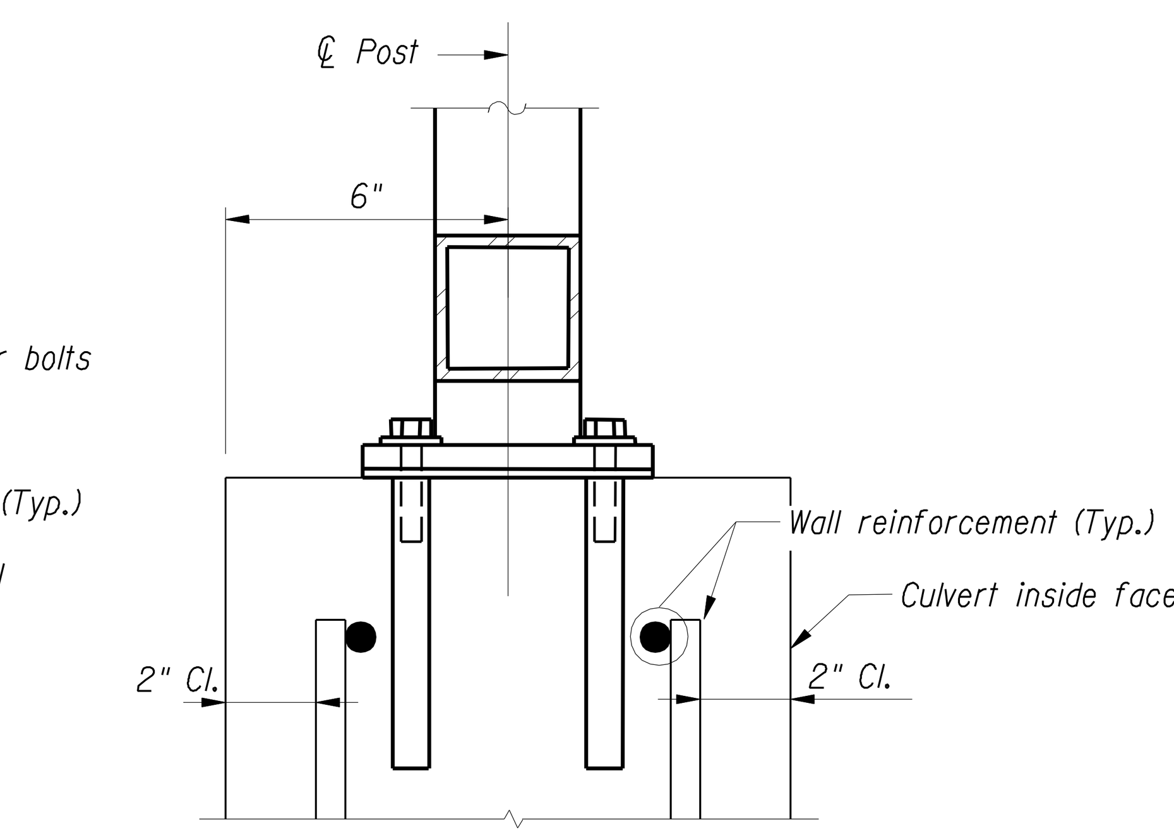


STAIR ELEVATION

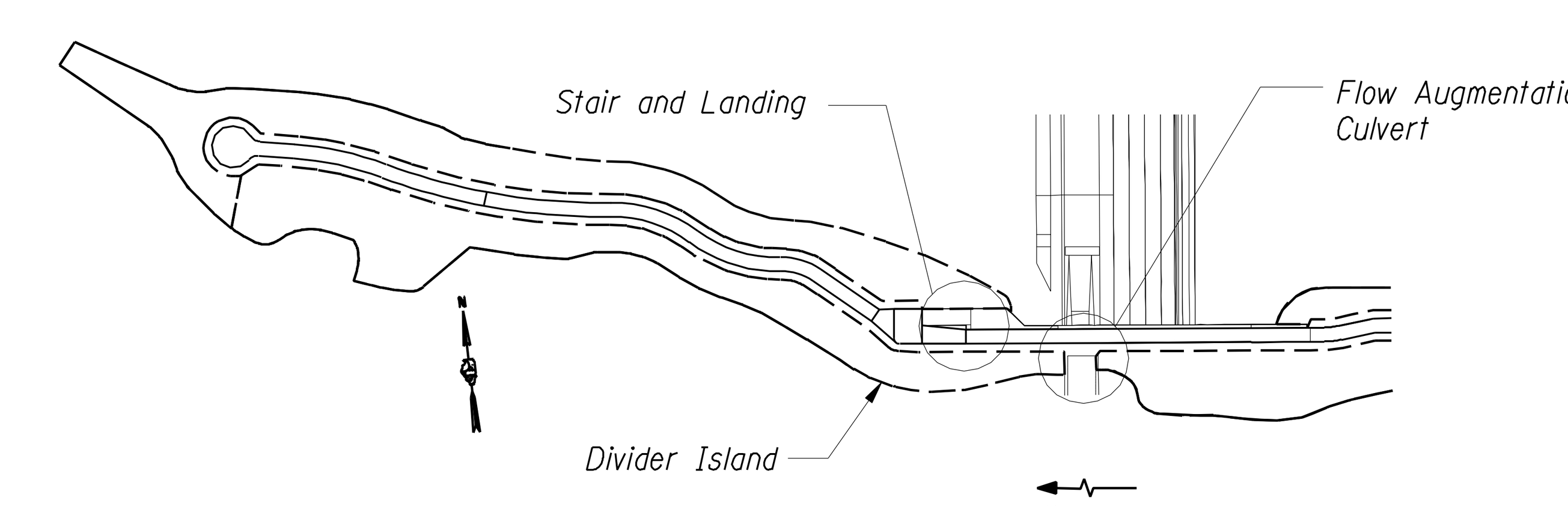
Stairs and landing constructed during Phase I



STAIR CURB SECTION



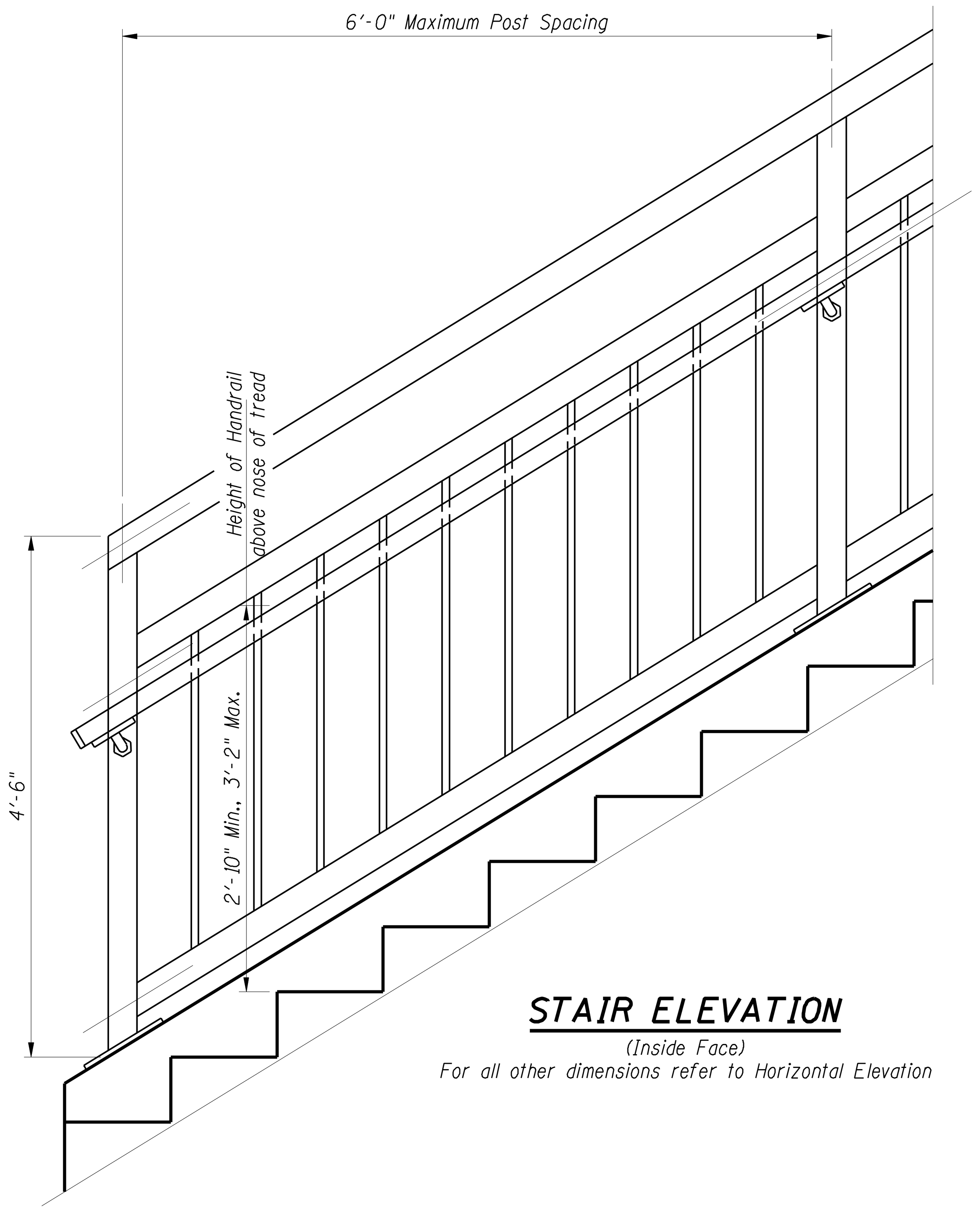
CULVERT SECTION



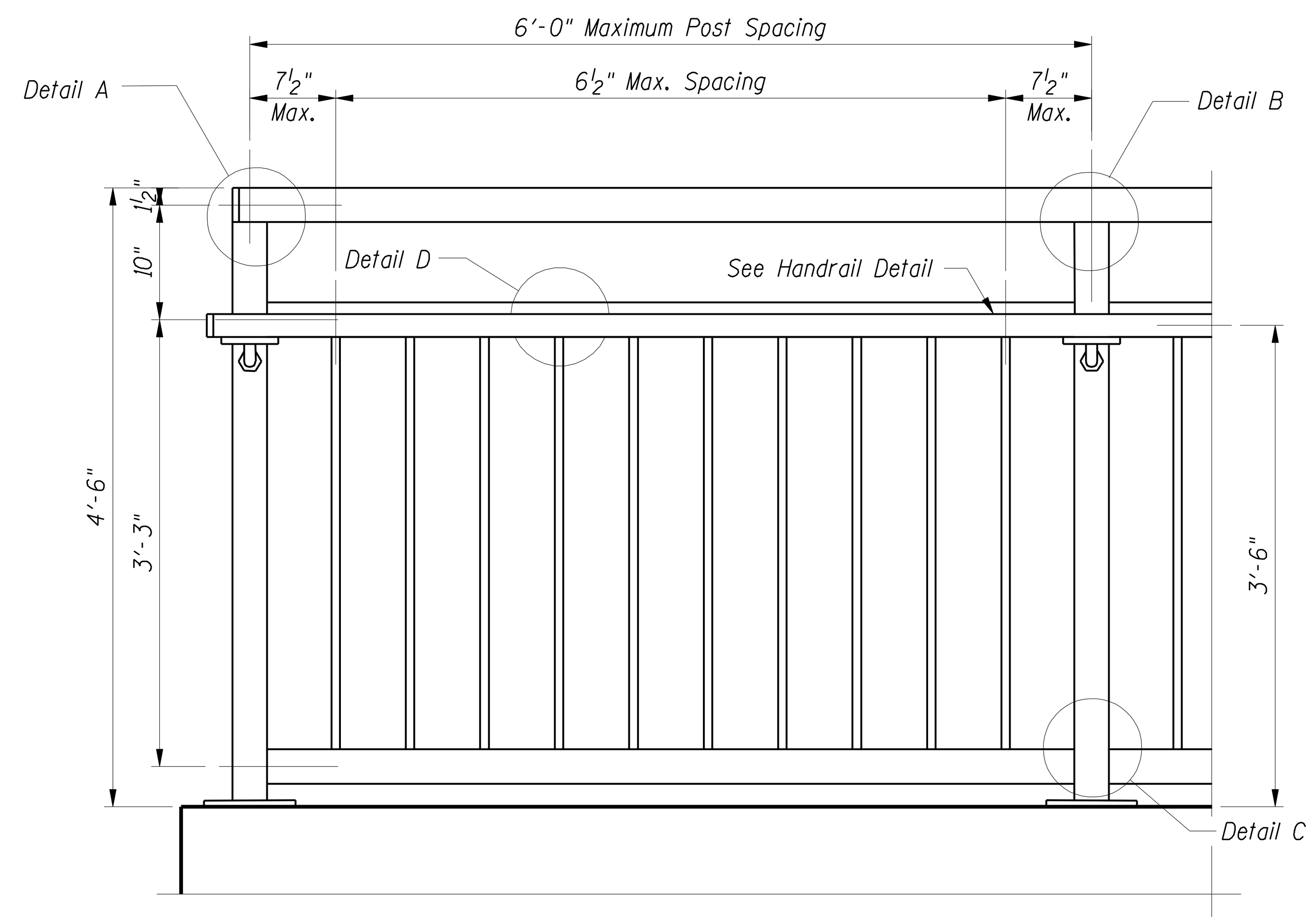
KEY PLAN

Designed By TCU Checked By TKL
Drawn By JPR Checked By TCU

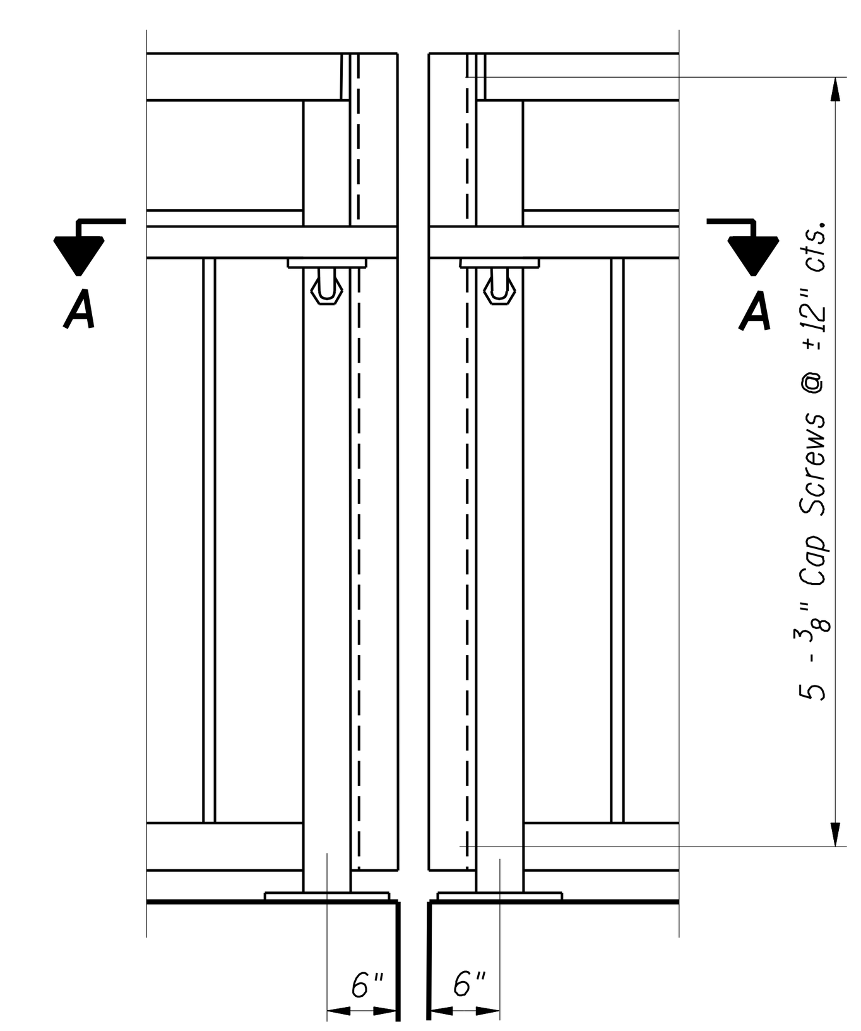
FR-423



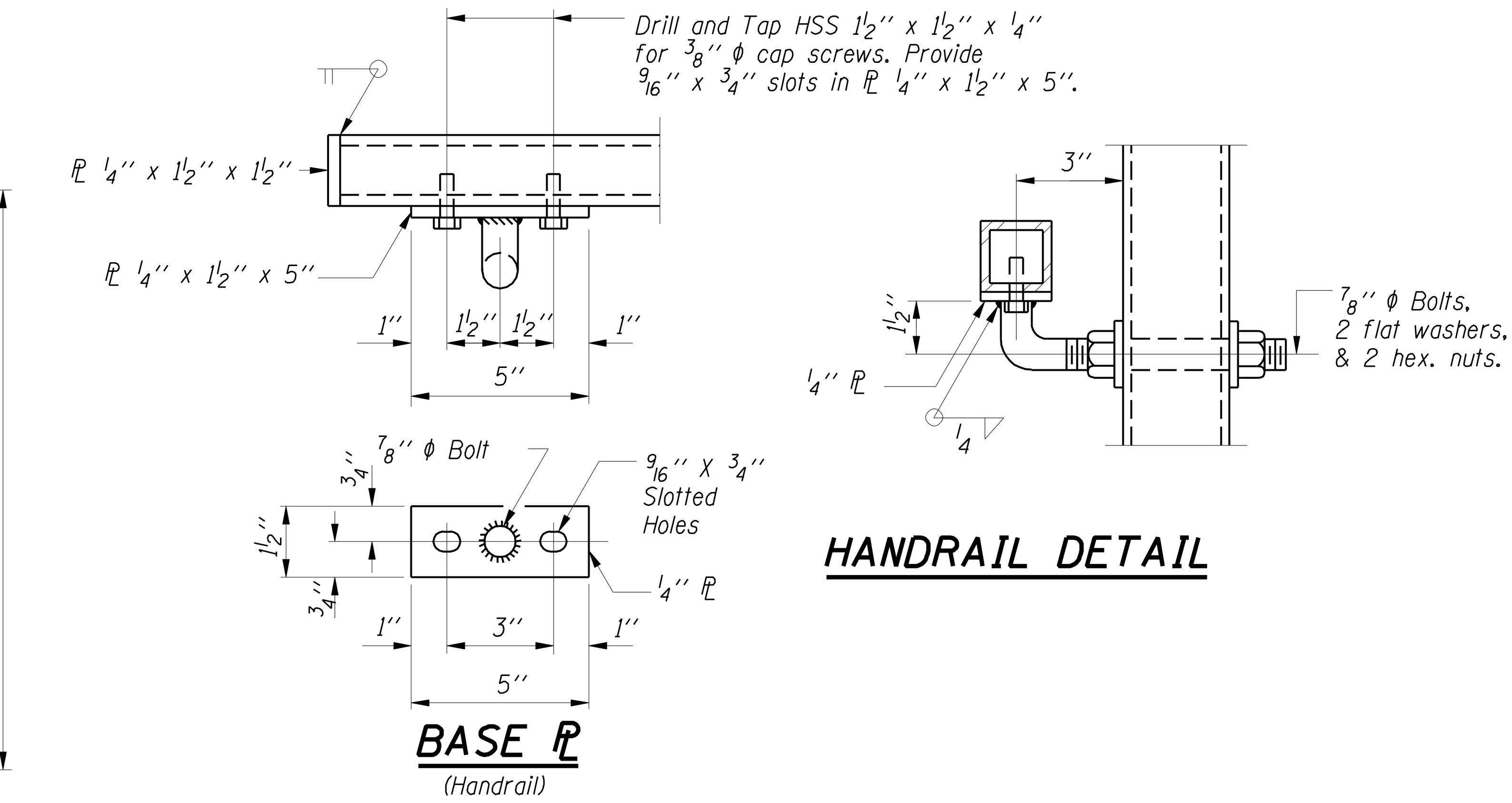
STAIR ELEVATION
(Inside Face)
For all other dimensions refer to Horizontal Elevation



HORIZONTAL ELEVATION
(Inside Face)

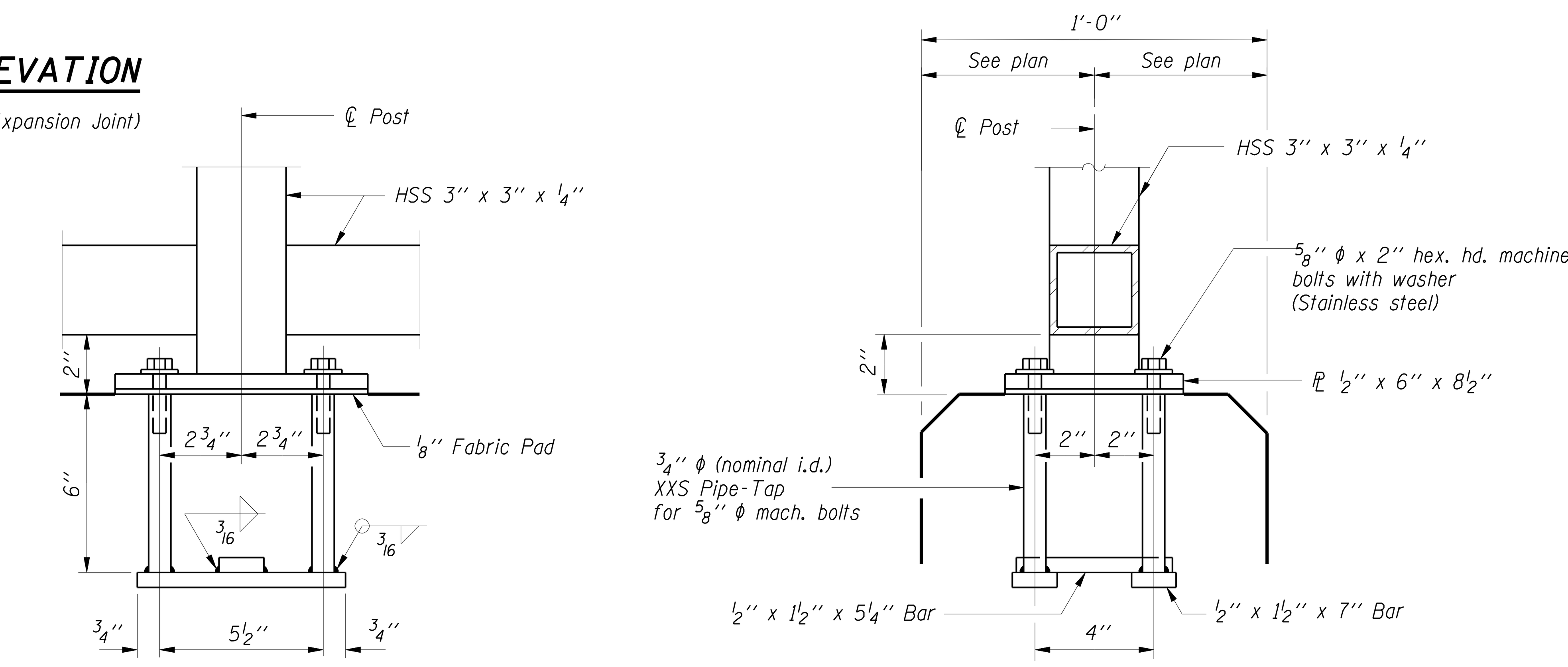


ELEVATION
(At Expansion Joint)



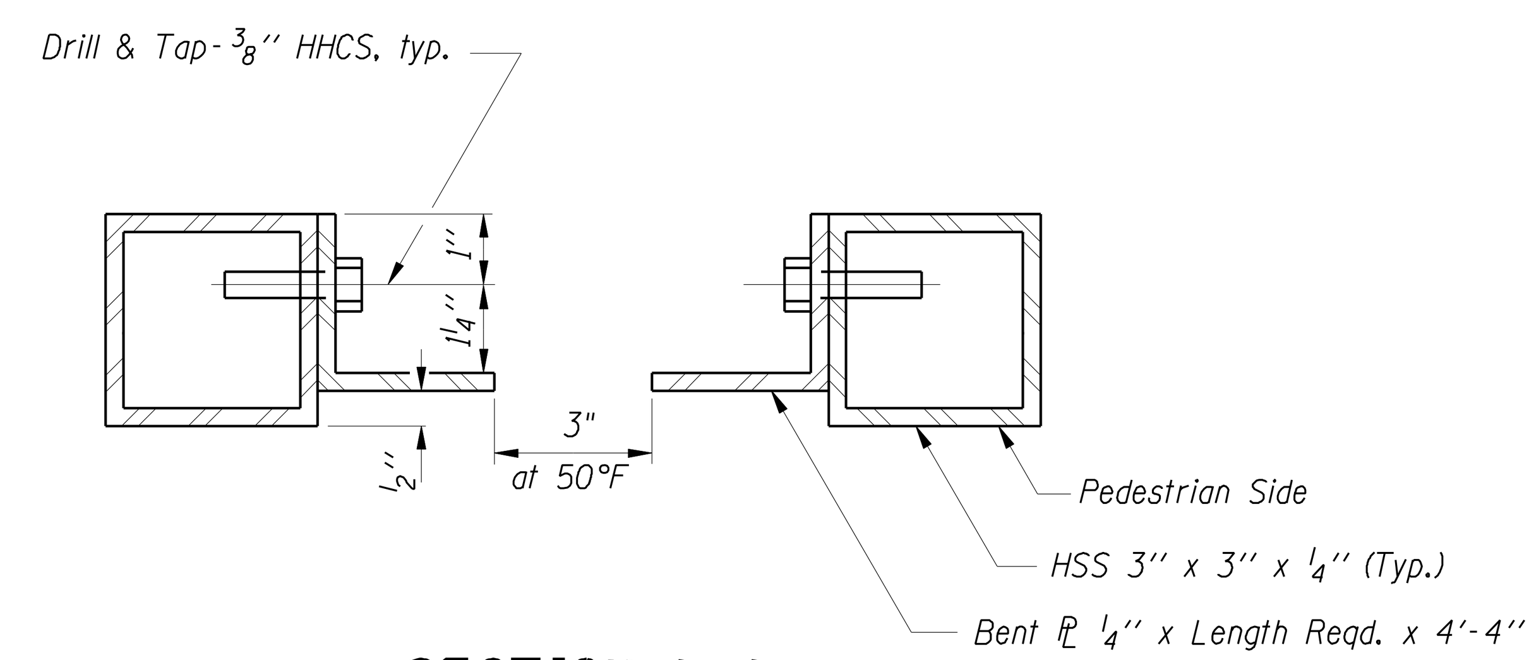
BASE ℙ
(Handrail)

HANDRAIL DETAIL

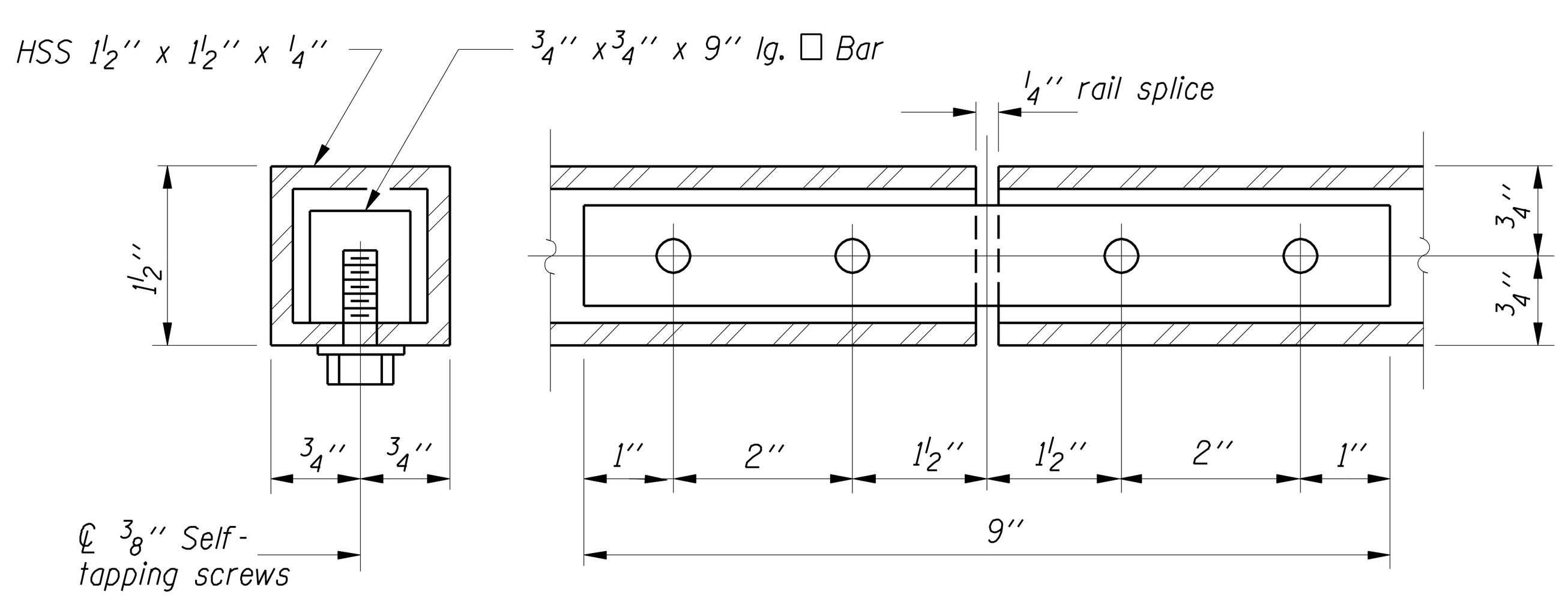


ANCHOR BOLT DETAILS

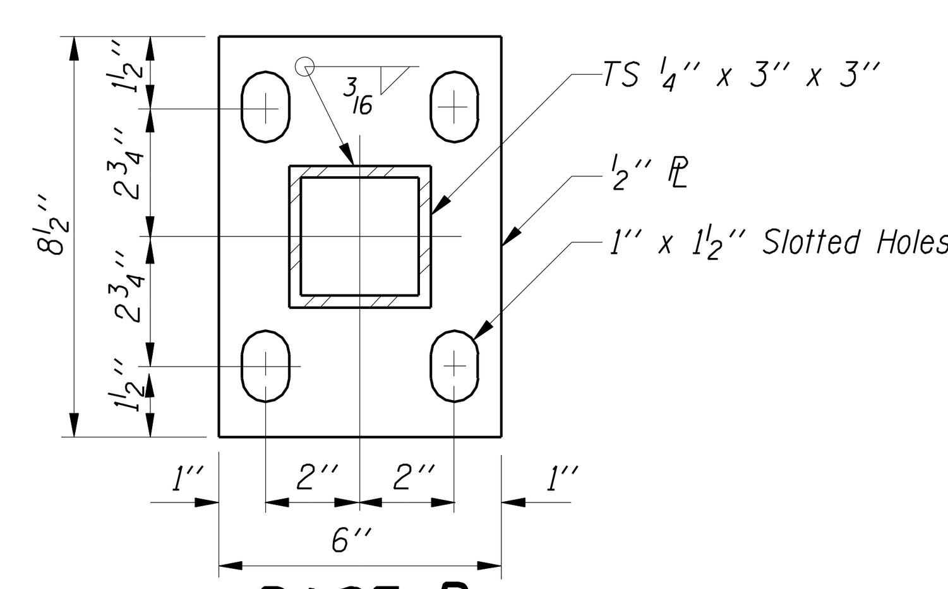
In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and epoxy grouting ⅝" ϕ anchor rods. Embedment shall be according to the manufacturer's specifications.



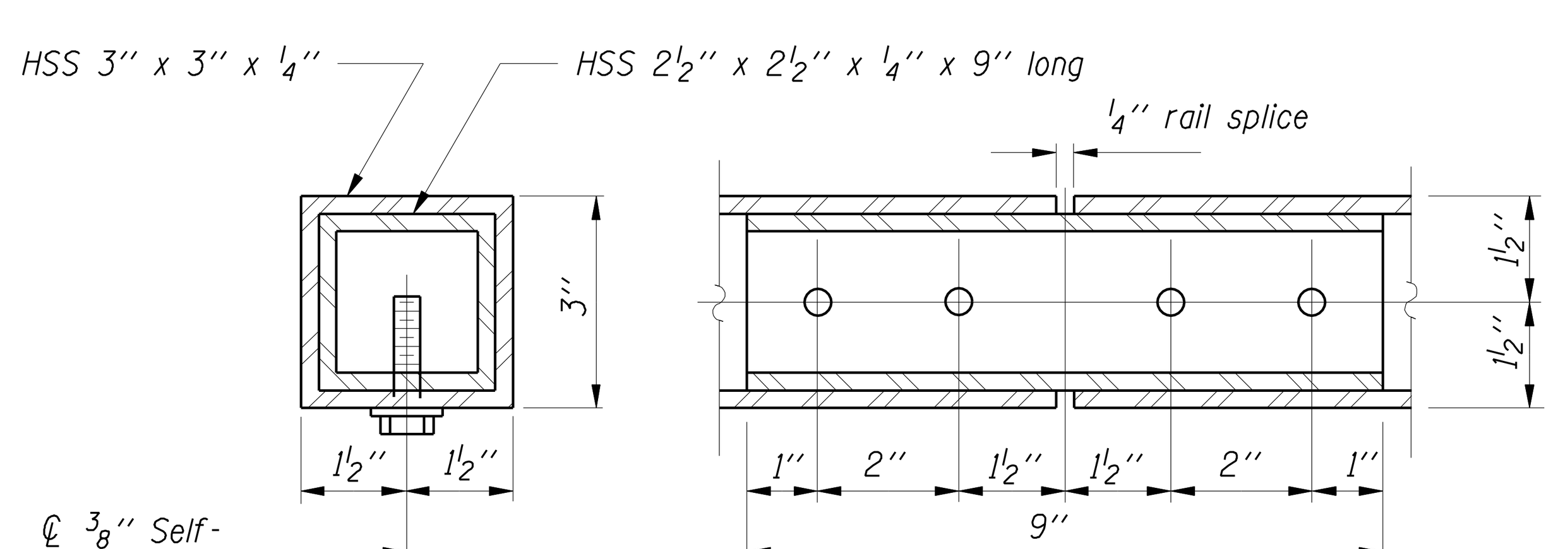
SECTION A-A



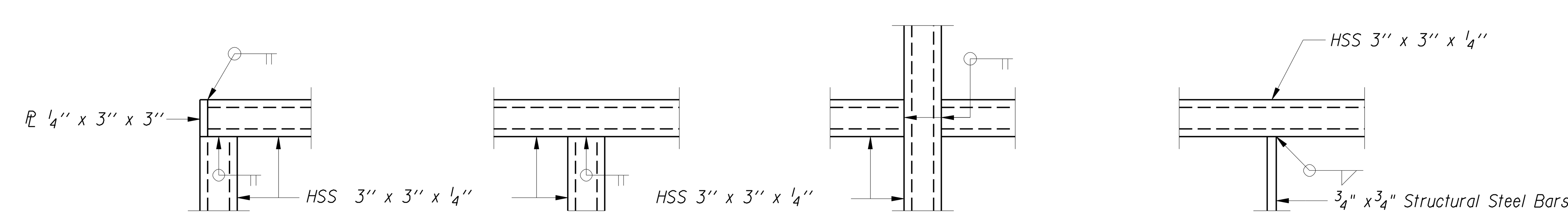
HANDRAIL SPLICE



BASE ℙ



RAIL SPLICE



DETAIL A   DETAIL B   DETAIL C   DETAIL D

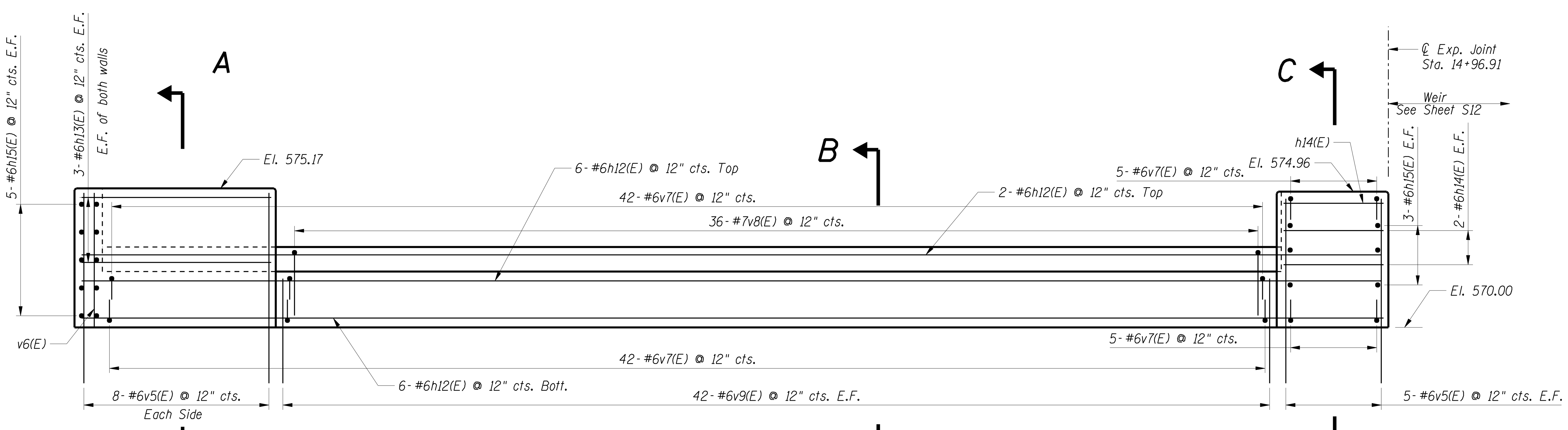
NOTES

1. Railing shall be according to Section 509 of the Standard Specifications, except as noted, and will be paid for at the Contract Unit Price per foot for Pedestrian Railing.
2. Hollow structural sections shall conform to the requirements of ASTM designation A 500, Grade B, structural steel tubing.
3. All other steel shapes and plates shall conform to the requirements of AASHTO M 270 Grade 36.
4. If the option of drilling and epoxy grouting the anchor rods is chosen, the Contractor shall use the capsule or the adhesive cartridge type anchor rods that have been previously tested and given a prior approval by the Department. The Contractor shall install these anchor rods in pre-drilled holes according to the manufacturer's recommendations and procedures. The capsule or the adhesive cartridge shall be sealed with pre-measured amounts of the adhesive chemical.
5. All post, railing, anchor devices, and bent plates shall be galvanized after shop fabrication according to AASHTO M 111 and ASTM A 385. All bolts, nuts, washers, and anchor rods shall be galvanized according to AASHTO M 232 except stainless steel bolts as noted. Vent holes for galvanizing shall be placed in the posts and railings at locations that will not allow the accumulation of moisture in the members.

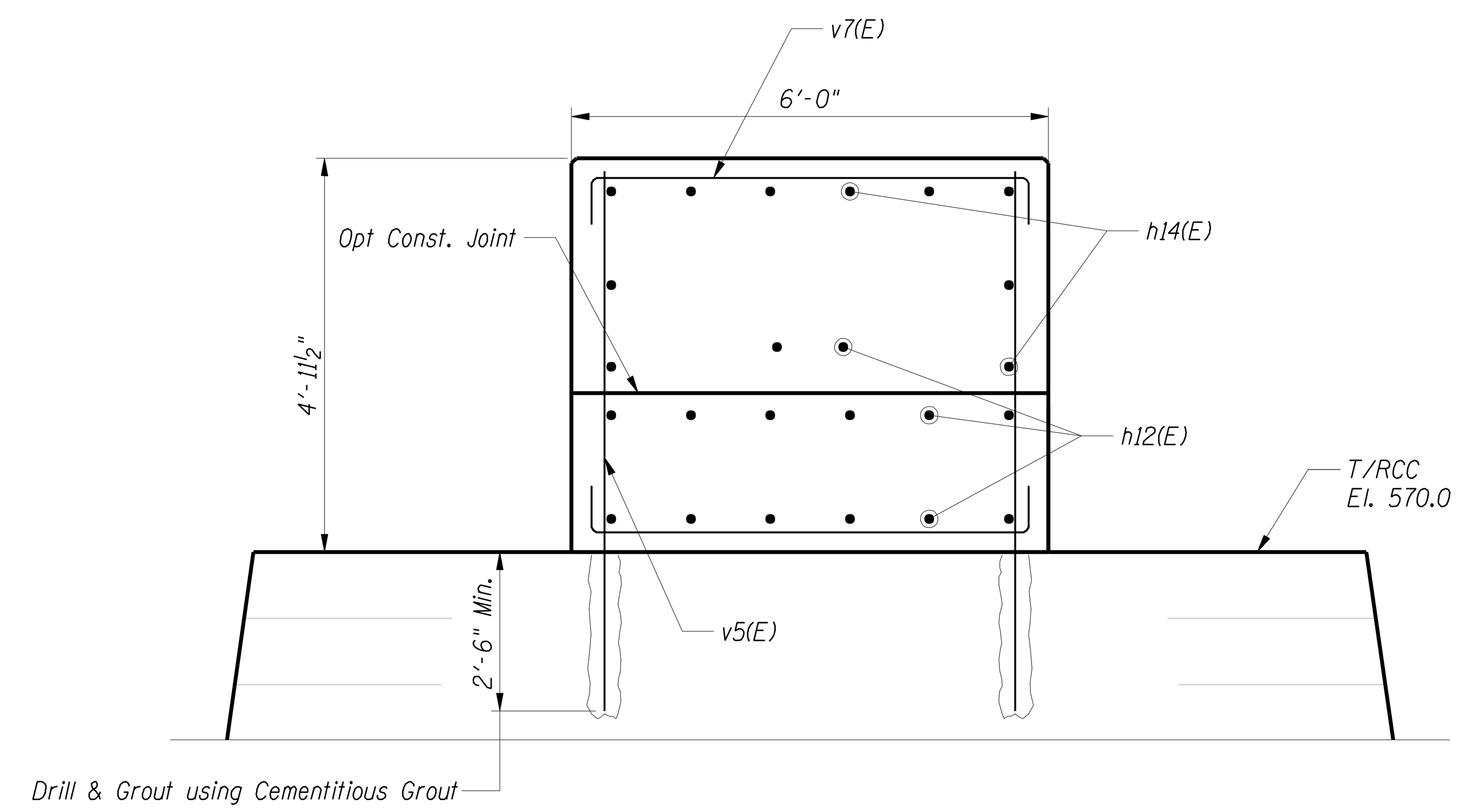
BILL OF MATERIAL

Item	Unit	Quantity
Pedestrian Railing	Foot	88

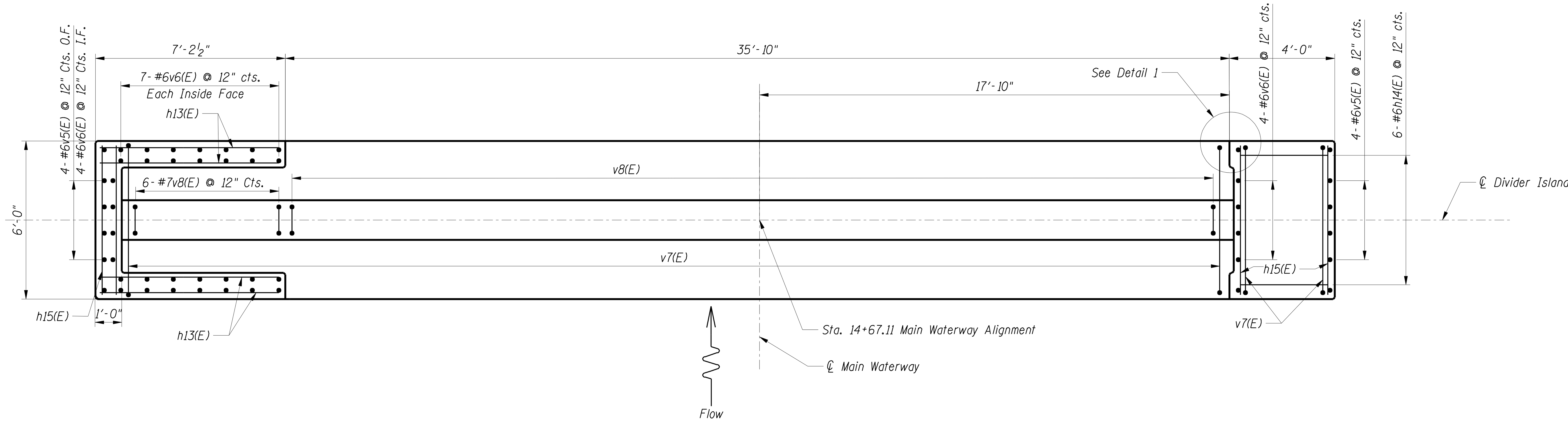
Designed By TCU Checked By TKL
Drawn By JPR Checked By TCU



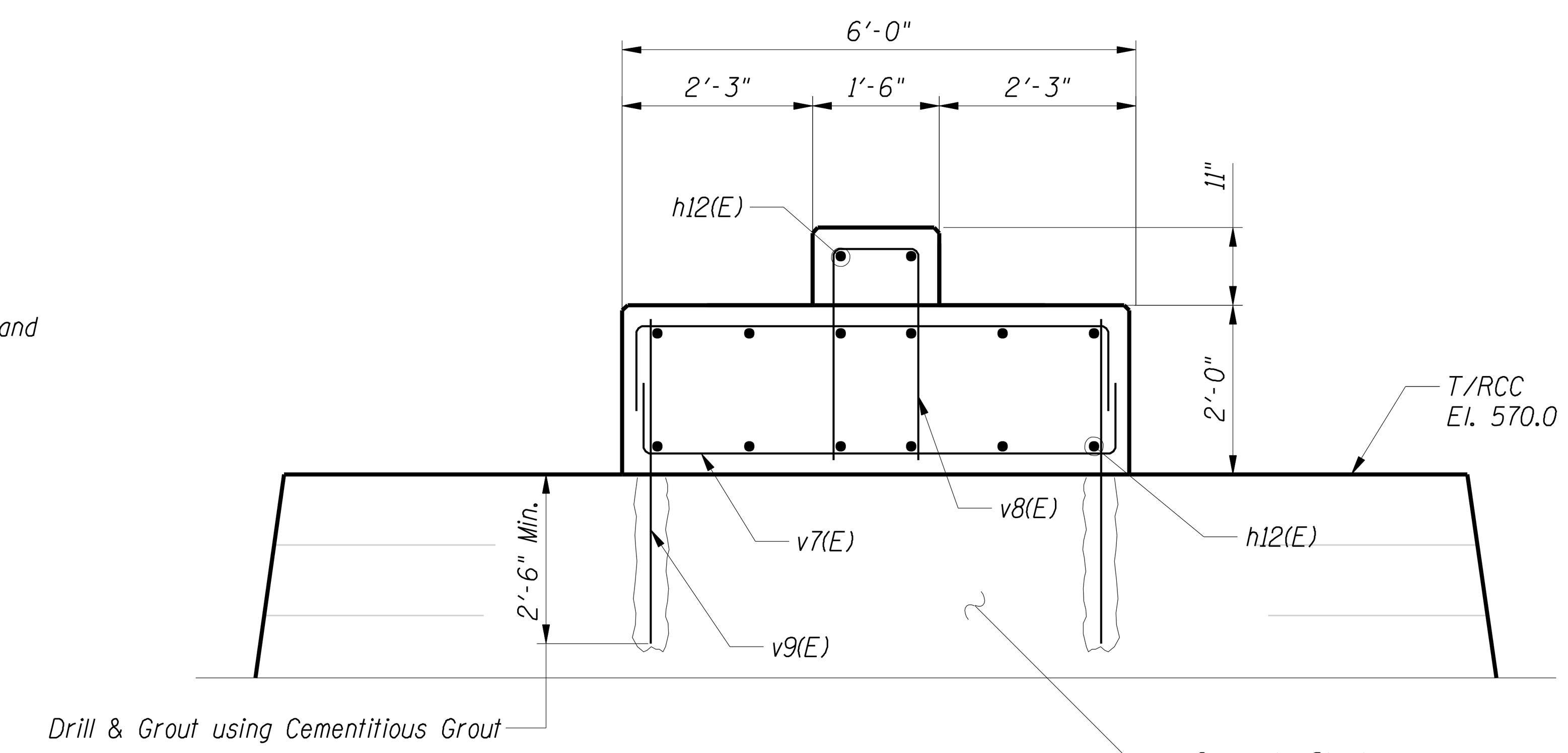
ELEVATION



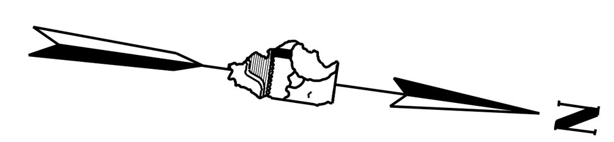
SECTION C-C

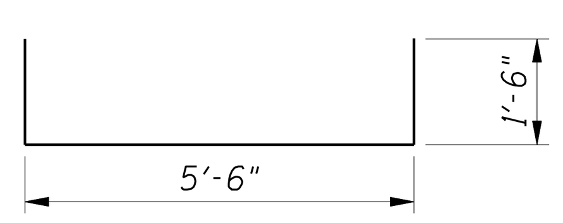


PLAN

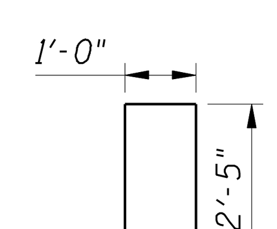


SECTION B-B

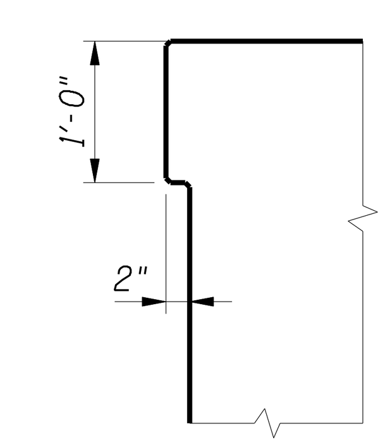




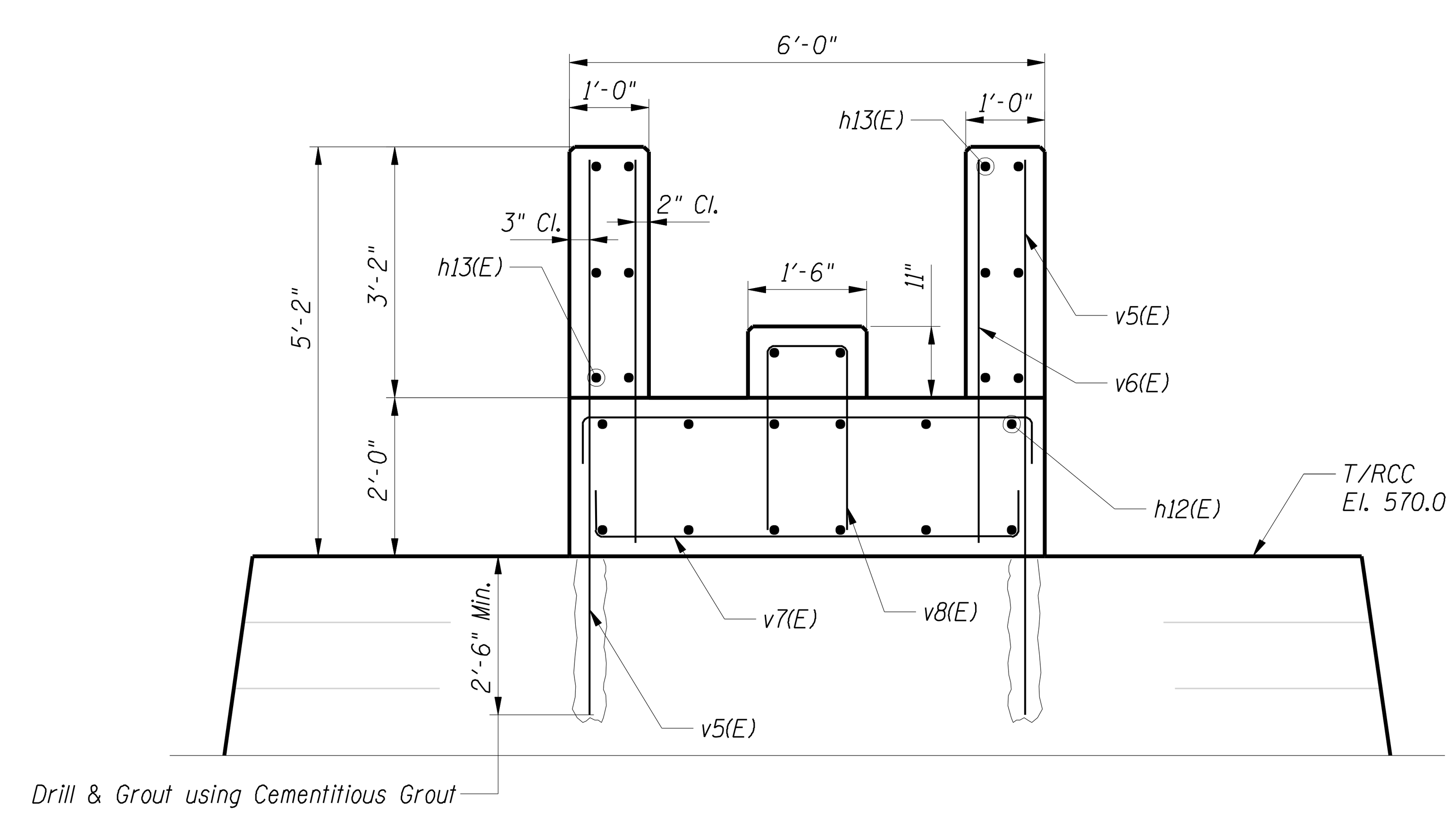
Bar v7(E)



Bar v8(E)



Detail 1



SECTION A-A

BAR LIST

Bar	No.	Size	Length	Shape
h12(E)	14	#6	46'-6"	——
h13(E)	12	#6	6'-8"	——
h14(E)	10	#6	3'-4"	——
h15(E)	16	#6	5'-6"	——
v5(E)	30	#6	7'-5"	——
v6(E)	22	#6	4'-10"	——
v7(E)	94	#6	8'-6"	⊔
v8(E)	42	#7	5'-10"	⊐
v9(E)	84	#6	4'-3"	——

BILL OF MATERIAL

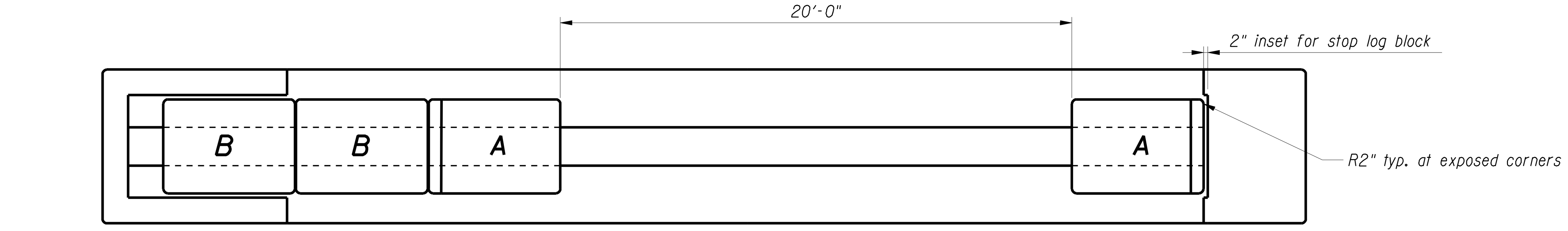
Item	Unit	Total
Concrete Structures	Cu yd	28.4
Reinforcement Bars, Epoxy Coated	lb	4,010

Notes:

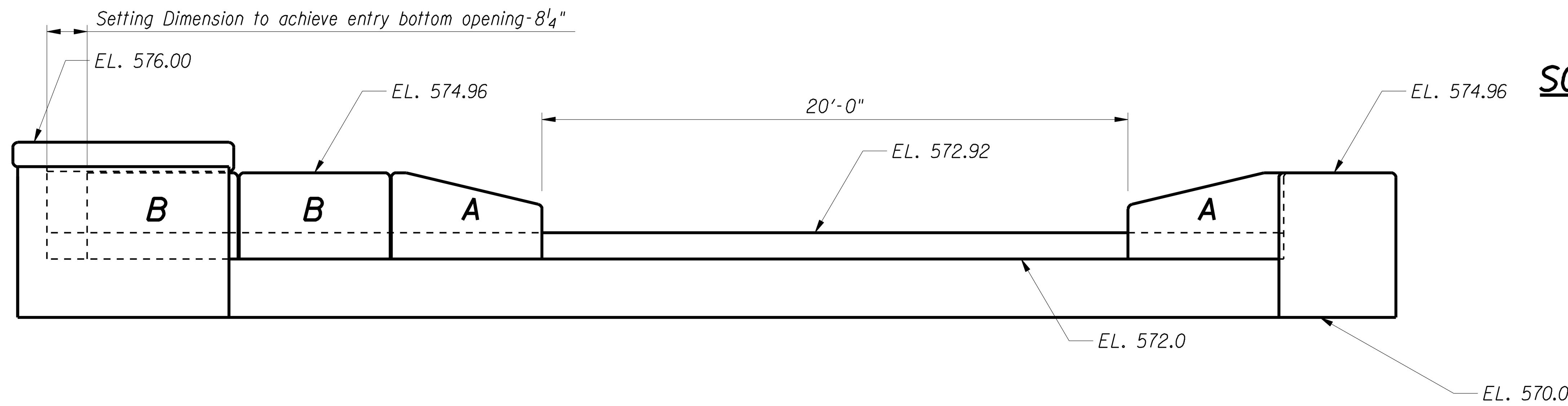
1. All lap lengths shall be 2'-10" min.
2. Reinforcement designated (E) shall be epoxy coated.
3. The minimum typical clearance shall be 3" unless noted.
4. Non-radiused corners shall be chamfered ¾" x ¾".
5. Anchor dowels to RCC with cementitious grout in accordance with Section 1024 of the Specifications. Cost included with Concrete Structures.

Designed By TCU Checked By TKL
Drawn By JFG Checked By TCU

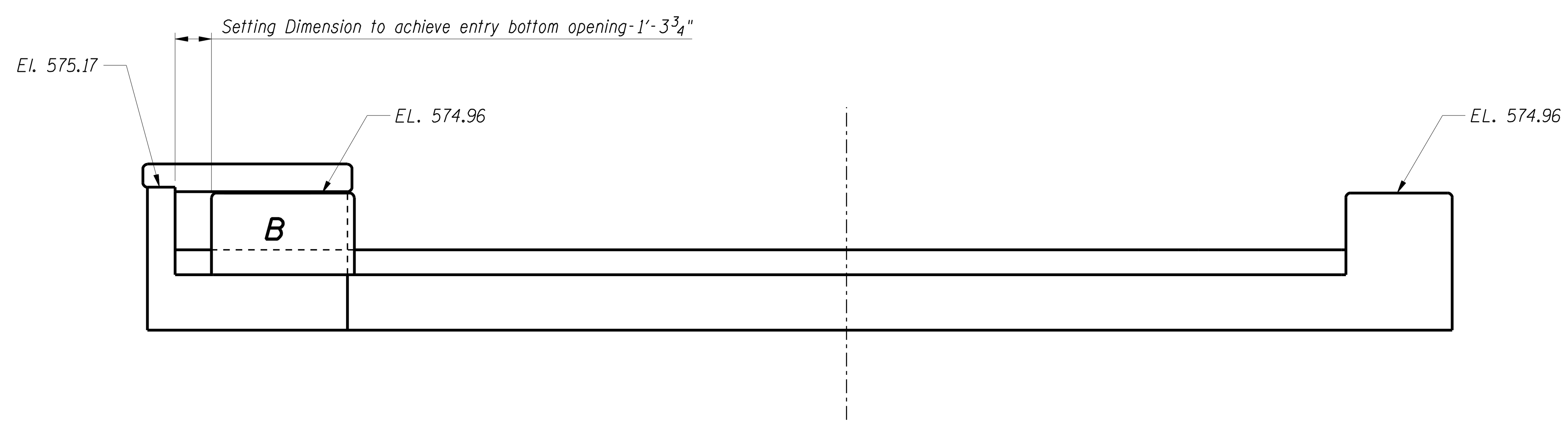
FR-423



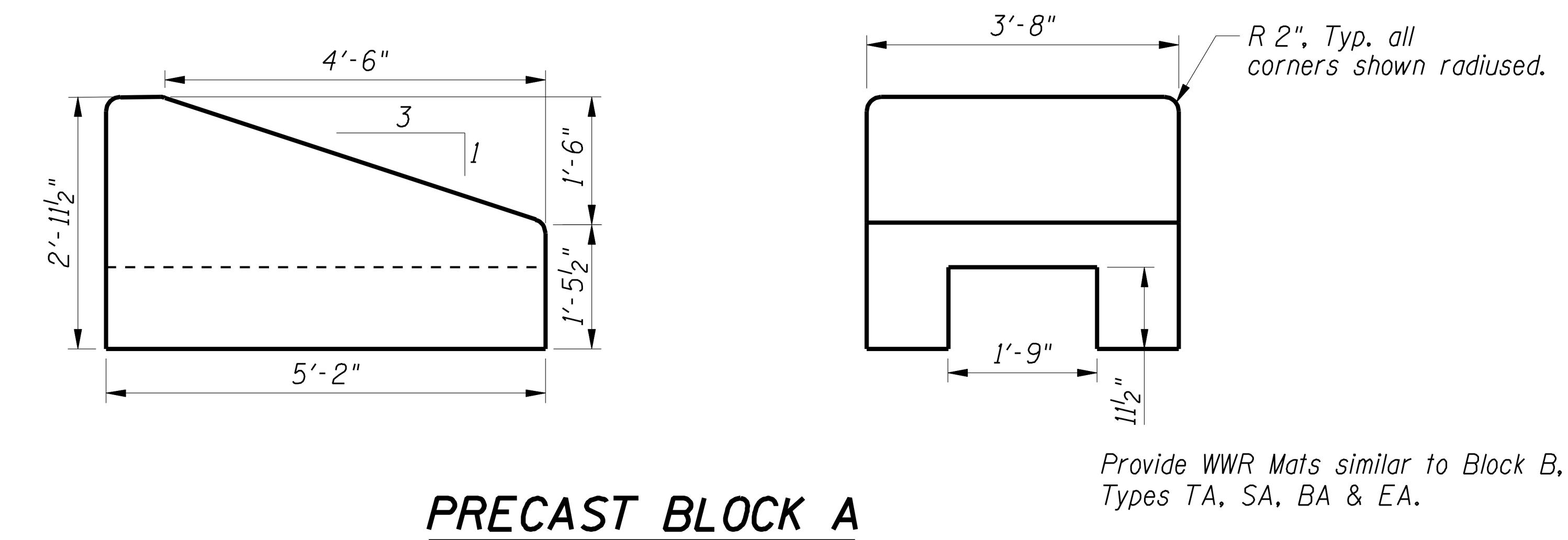
HORIZONTAL SECTION THROUGH STOPLOG



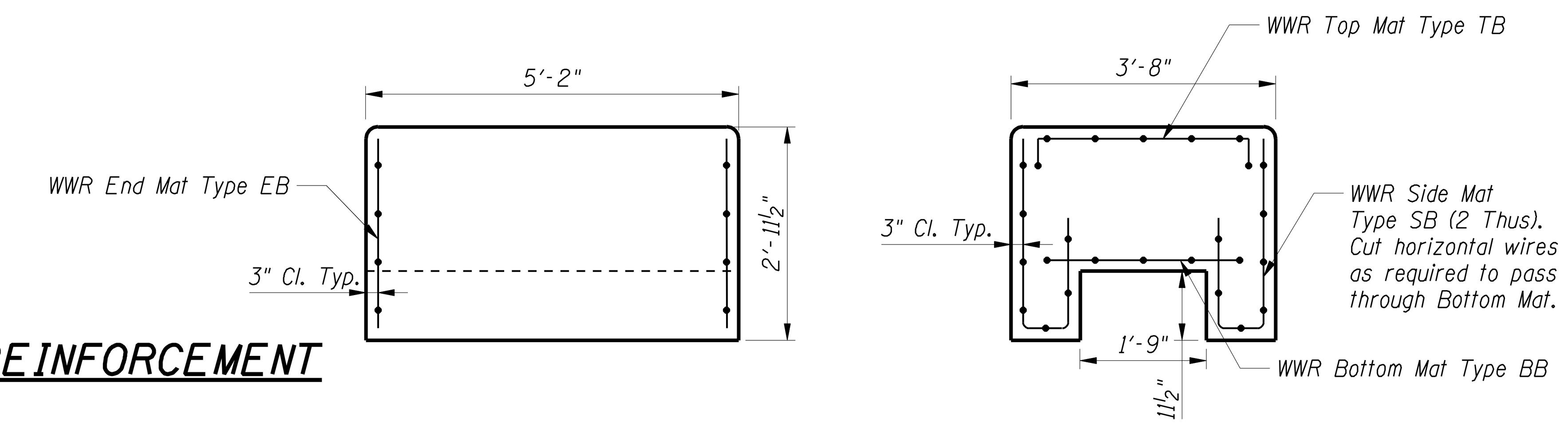
ADJUSTABLE CREST ENTRANCE SILL - ELEVATION (ANTICIPATED INITIAL SETTING)



FULL FLOW OPEN CONDITION (COMPETITION)



PRECAST BLOCK A
(2 Required)



PRECAST BLOCK B
(2 Required)

SCHEDULE OF BLOCK REINFORCEMENT

Type	QTY	Approx. Dims.
TA	2	64"x48"
SA	4	60"x64" *
BA	2	60"x40"
EA	4	32"x40" *
TB	2	60"x48"
SB	4	60"x64"
BB	2	60"x40"
EB	4	32"x40"
L	4	88"x72"

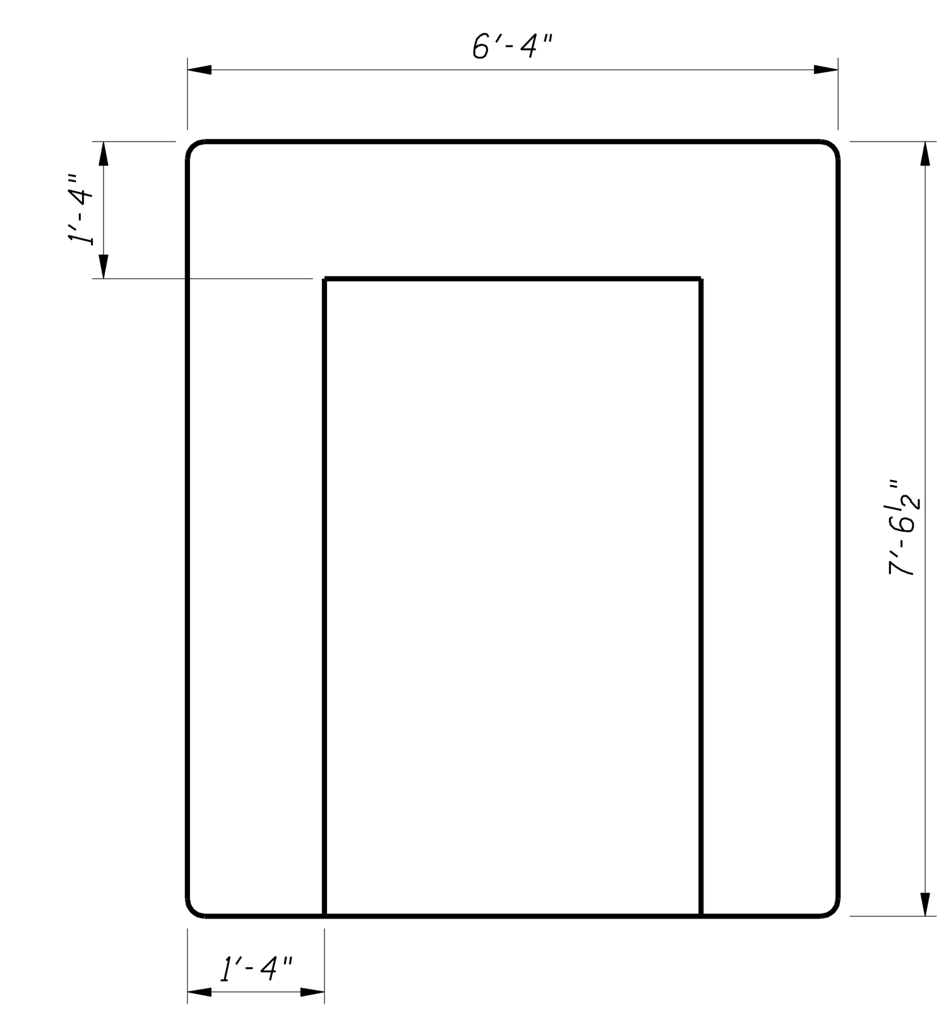
* Cut or Fold to accomodate sloping surface. All Welded Wire Reinforcement (WWR) shall be 4 x 4 - W5 x W5, Epoxy Coated

BILL OF MATERIAL

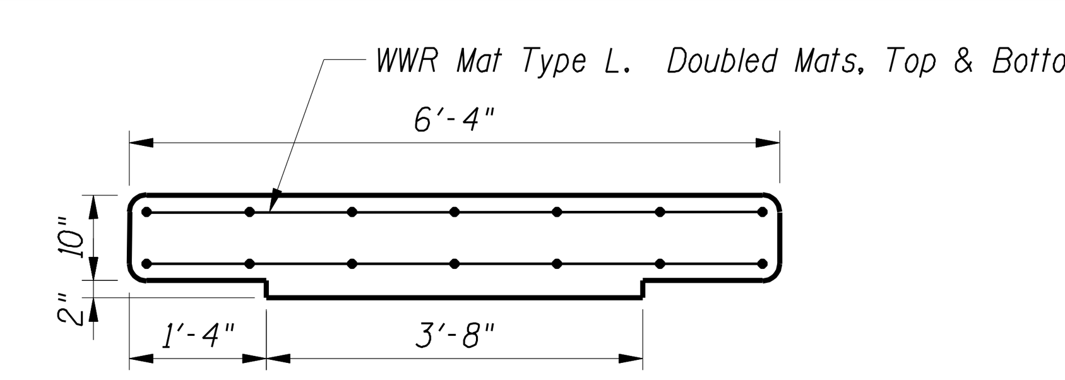
Item	Unit	Total
Precast Stoplog Blocks	L sum	1

Notes:

1. All dimensions are shown to intersection of surface planes.
2. For further information regarding the precast elements, see the special provision Precast Stoplog Blocks.
3. WWR shall be epoxy coated.
4. Non-radiused corners shall be chamfered ¾" x ¾".



PRECAST CONCRETE VAULT LID - UNDERSIDE



PRECAST CONCRETE VAULT LID - SECTION

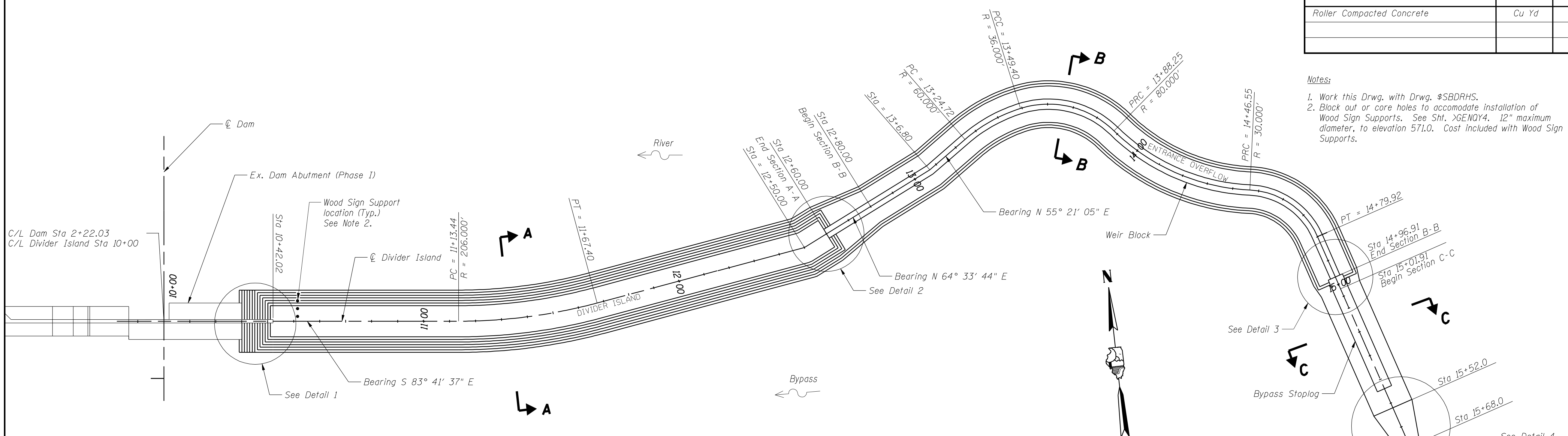
Designed By TCU Checked By TKL
Drawn By JPR Checked By TCU

BILL OF MATERIAL

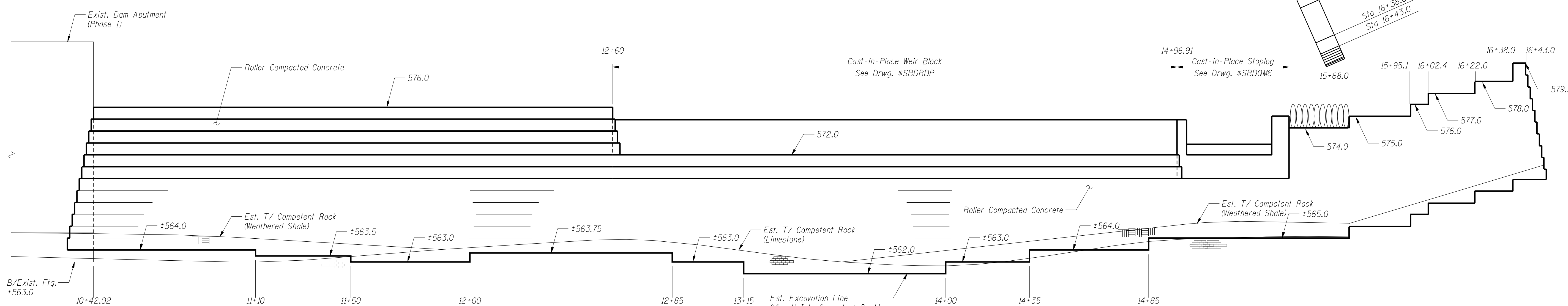
Item	Unit	Total
Roller Compacted Concrete	Cu Yd	4081

Notes:

1. Work this Drwg. with Drwg. $SBDRHS.
2. Block out or core holes to accomodate installation of Wood Sign Supports. See Sht. >GENQY4. 12" maximum diameter, to elevation 571.0. Cost included with Wood Sign Supports.



PLAN



DEVELOPED ELEVATION

(5x Vertical Exaggeration)

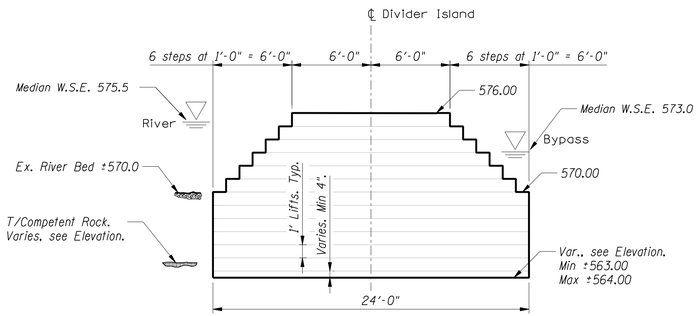
Designed By TCU Checked By TKL
Drawn By JPR Checked By TCU

$FILE$ $TIME$ $DATE$

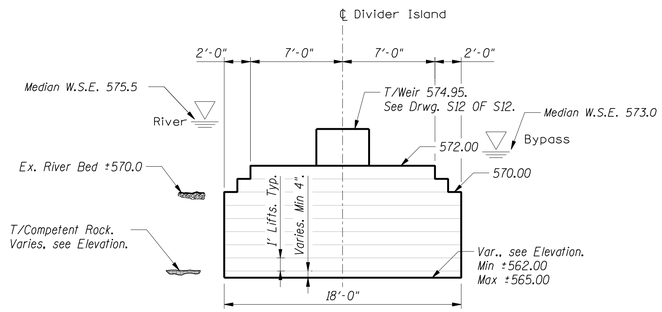
FR-423

TENG
TENG & ASSOCIATES, INC.
ENGINEERS/ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

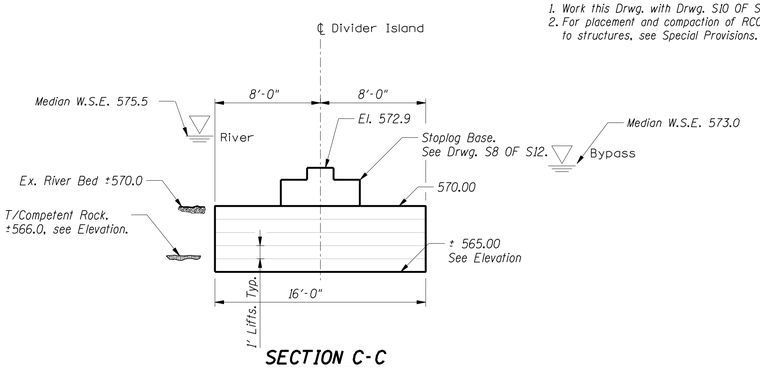
UPPER DIVIDER ISLAND ROLLER COMPACTED CONCRETE



SECTION A-A

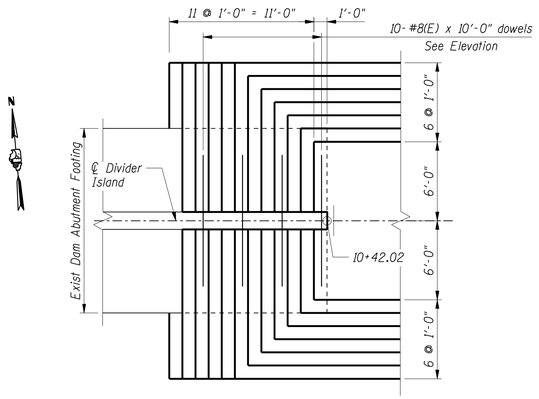


SECTION B-B



SECTION C-C

Notes:
1. Work this Drwg. with Drwg. S10 OF S12.
2. For placement and compaction of RCC adjacent to structures, see Special Provisions.



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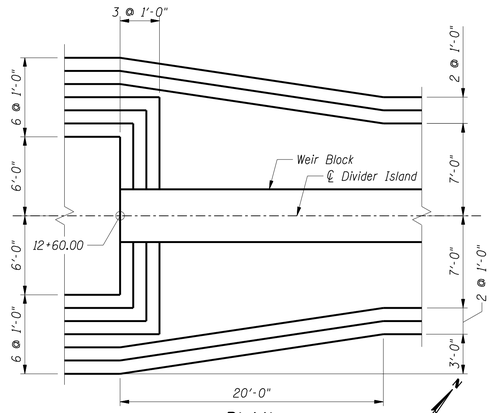

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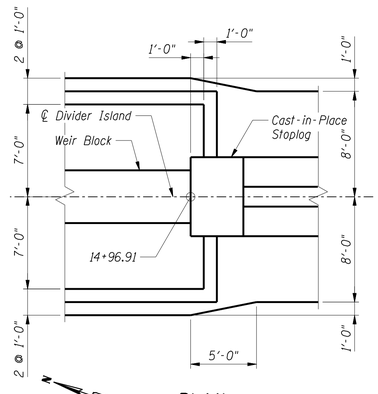

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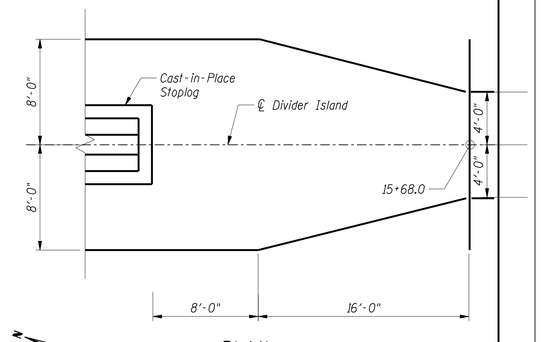
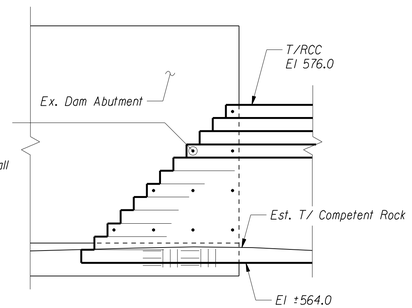


PLAN

#8(E) Dowel (typ.)

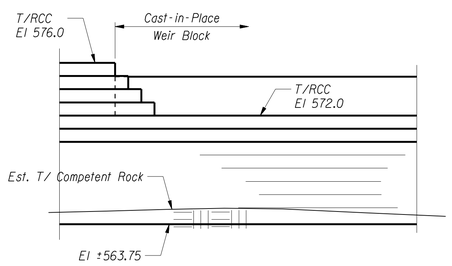
Core hole through existing abutment wall for dowel. Anchor dowel in abutment wall in accordnance with Section 584 of the Standard Specifications. Cost included with Roller Compacted Concrete

5" Min Cl.



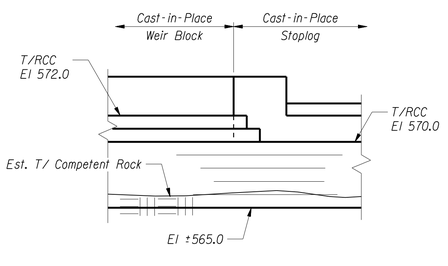
ELEVATION

DETAIL 1



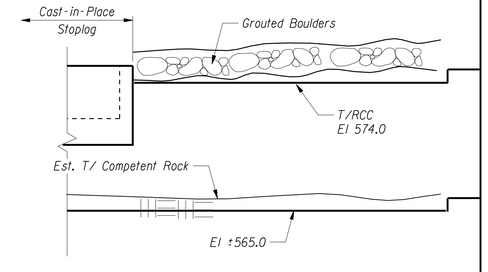
ELEVATION

DETAIL 2



ELEVATION

DETAIL 3

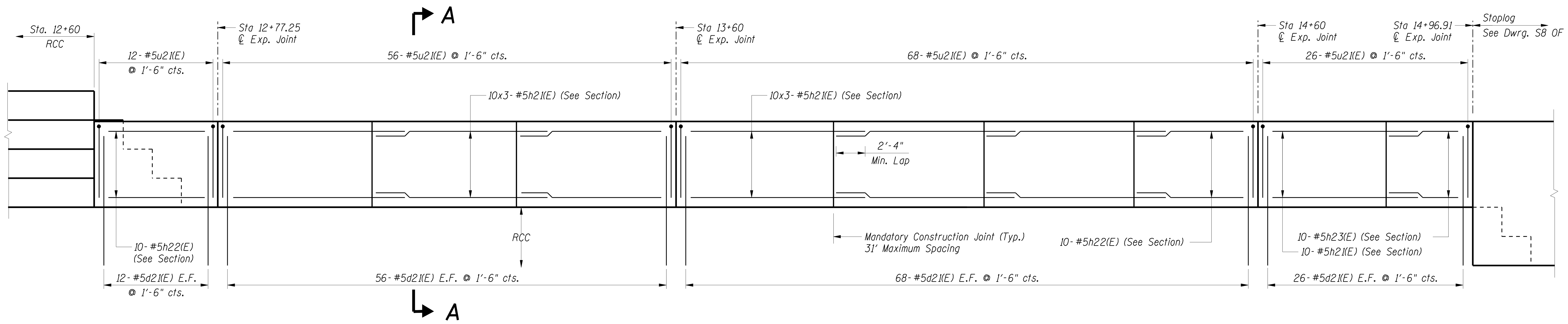


ELEVATION

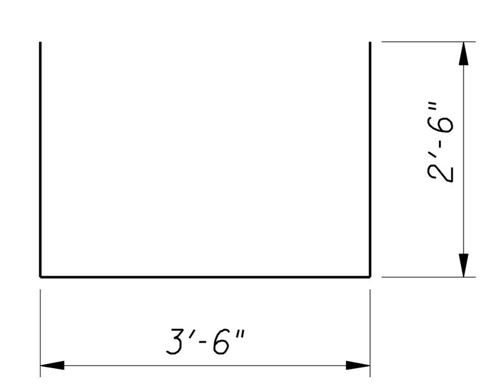
DETAIL 4

Designed by JR
Drawn by
Checked by TKL
Checked by TCU

**Plotted
a:\DOCUMENT\0284800\STRUCT\DGN\S0000SHEETS.DGN
45614 PM
Illinois
10/02/2007

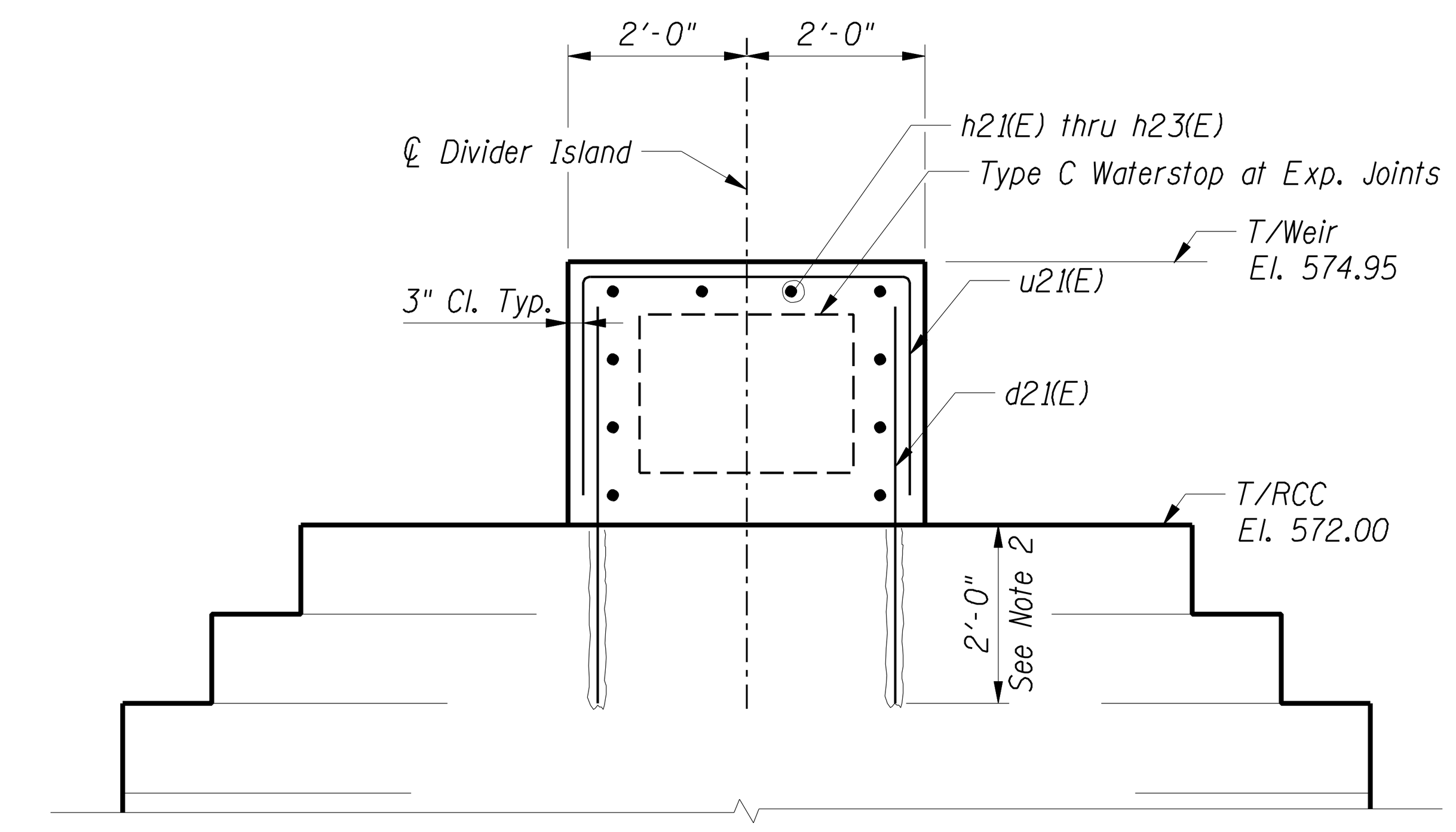


DEVELOPED ELEVATION

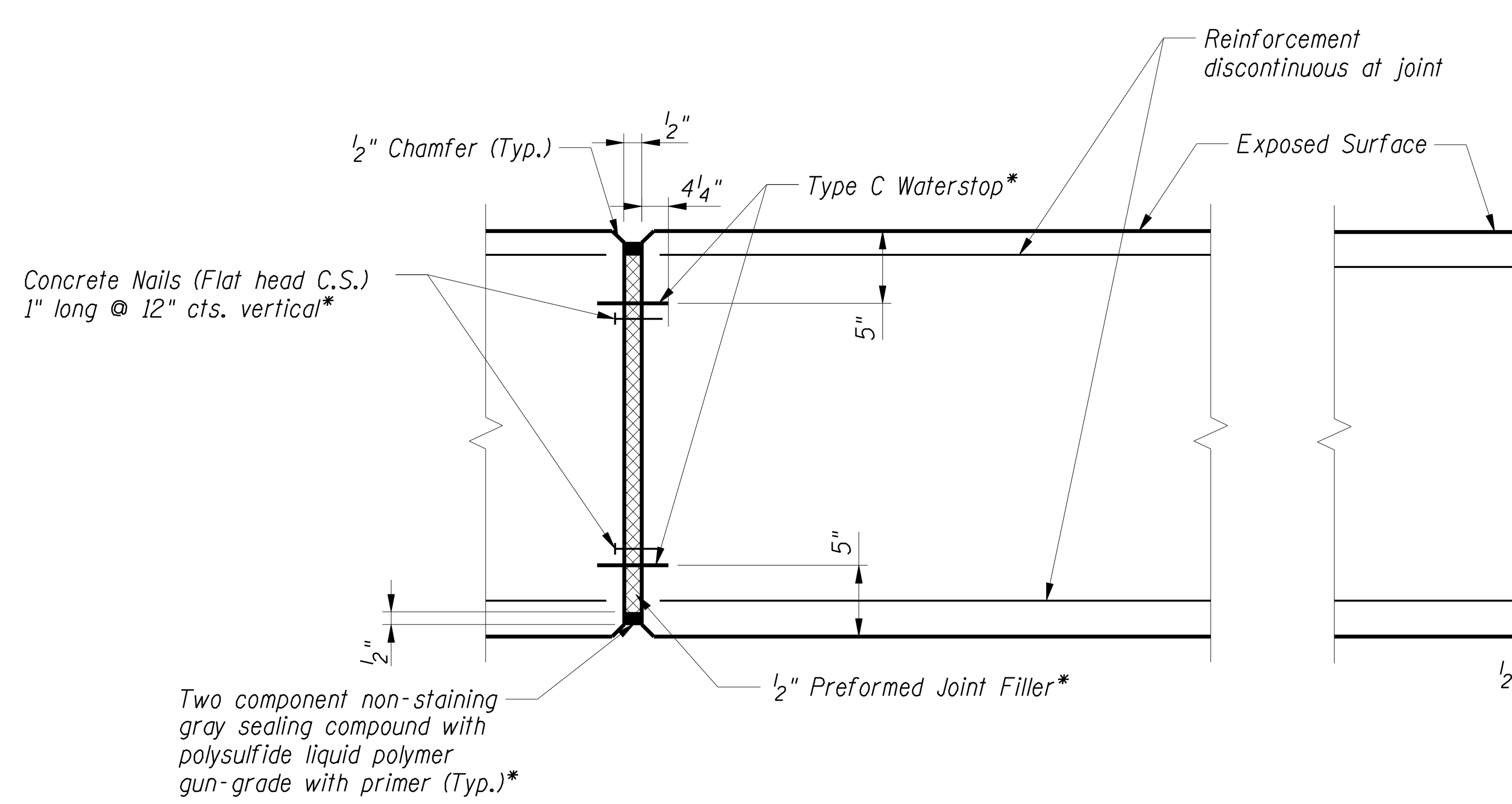


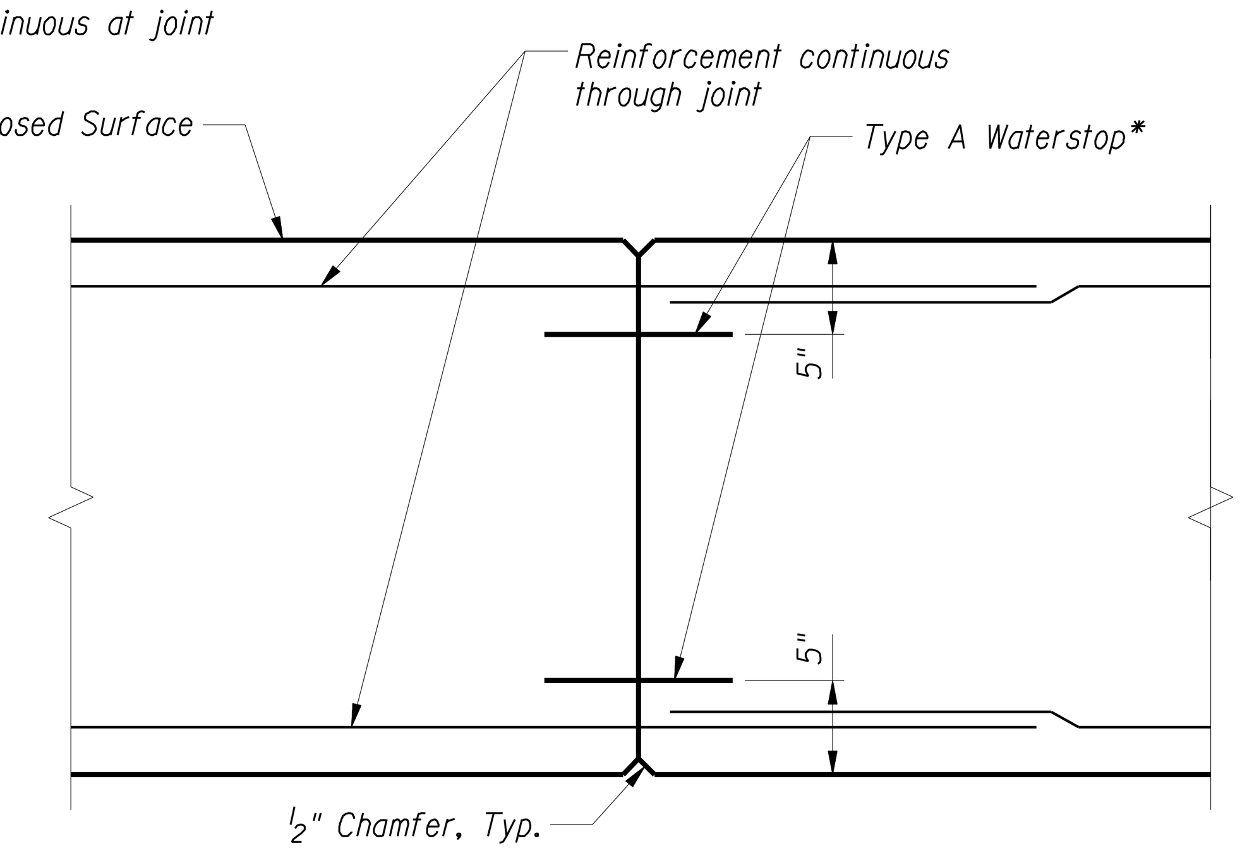
Bar u21(E)

BAR LIST				
Bar	No.	Size	Length	Shape
h21(E)	70	#5	30'-0"	——
h22(E)	20	#5	16'-9"	——
h23(E)	10	#5	9'-0"	——
d21(E)	324	#5	4'-6"	——
u21(E)	162	#5	8'-6"	⊐



SECTION A-A





* Cost included with Concrete Structures

EXPANSION JOINT

CONSTRUCTION JOINT

Notes

1. Bars indicated thus 10x3 - #5 etc. indicates 10 lines of bars with 3 lengths per line.
2. Anchor Dowels to RCC using Cementitious Grout in accordance with Section 1024 of the Specifications. Cost included w/Concrete Structures.

BILL OF MATERIAL		
Item	Unit	Total
Concrete Structures	Cu yd	103
Reinforcement Bars, Epoxy Coated	lb	5,590

Designed By TCU Checked By TKL
Drawn By JPR Checked By TCU

BORING A-2

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +570.0 NGVD

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
			Gravelly fine to coarse sand, trace silt, clay and organics - gray - medium dense (GM-SM) With boulders and cobbles.	
1	SS			12
PA				
2	SS*			4/5"
2A	SS		Highly weathered soft shale	50/6"
PA				
			End of Boring Borehole backfilled upon completion. Automatic-Diedrich Hammer used for Standard Penetration Tests. SS* = SPT value based on first 6 in.	

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/19/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/19/04 | ENTERED BY KKB | SHEET NO. 1 OF 1
RIG FOREMAN Bomb/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

BORING A-3

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +569.6 NGVD

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
			Water	
1	SS		Gravelly fine to coarse sand, trace silt, clay and organics - gray - very dense (GM-SM)	18/6"
PA			Highly weathered shale	
2	AS			
			End of Boring Borehole backfilled upon completion. Automatic-Diedrich Hammer used for Standard Penetration Tests.	

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/19/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/19/04 | ENTERED BY KKB | SHEET NO. 1 OF 1
RIG FOREMAN Bomb/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

BORING A-4

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +575.5 NGVD

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
			Water	
1	SS		Sandy organic silt, little gravel, trace shells - black - very soft (ML)	2
2	SS		Gravelly fine to coarse sand, little gravel, trace clay - gray - medium dense (GM-SM)	25
3	SS*		Cobbles and boulders below 8.5 ft.	60/4"
RB			Weathered soft shale	
			End of Boring Borehole backfilled upon completion. Safety Hammer used for Standard Penetration Tests.	

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/30/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/30/04 | ENTERED BY KKB | SHEET NO. 1 OF 1
RIG FOREMAN D-25/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

BORING A-5

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +576.6 NGVD

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
			Water	
1	SS		Organic silt, trace gravel, sand and shells - black - very soft (ML)	WOH
2	SS*		Gravelly fine to coarse sand, little silt, trace clay - gray - dense (GM-SM) With large gravel and cobbles noted.	105/6"
2A	SS		Weathered soft shale	55/6"
RB				
			End of Boring Borehole backfilled upon completion. Safety Hammer used for Standard Penetration Tests. SS* = SPT value based on first 6 in. WOH = Weight of Hammer	

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/30/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/30/04 | ENTERED BY KKB | SHEET NO. 1 OF 1
RIG FOREMAN D-25/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

BORING A-6

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +575.5 NGVD

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
			Water	
1	SS		Organic silt, trace clay and sand - black - very soft (ML)	WOH
2	SS		Gravelly fine to coarse sand, little silt, trace clay - brownish gray - dense (SM-GM)	91/4
RB			Boulders and cobbles noted below 8.5 ft.	35/6"
RB			Moderately weathered soft shale	
			. . . continued	

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/27/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/27/04 | ENTERED BY KKB | SHEET NO. 2 OF 2
RIG FOREMAN Joy 12-Barge/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

BORING A-6

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +575.5 NGVD (Continued)

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
	RB		Moderately weathered soft shale	
			End of Boring Borehole backfilled upon completion. Casing used: 10 ft. of 4 in. Safety Hammer used for Standard Penetration Tests. WOH = Weight of Hammer	

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/27/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/27/04 | ENTERED BY KKB | SHEET NO. 2 OF 2
RIG FOREMAN Joy 12-Barge/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

BORING A-7

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +575.5 NGVD

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
			Water	
1	SS		Silty fine to coarse sand, little gravel - brown and black - loose (SM) With occasional organic seams noted.	WOH
2	SS		Silty fine to coarse sand, little gravel, trace organics - brownish gray - medium dense (SM) With occasional soft clay seams noted.	18
3	SS		Highly weathered shale	4/6"
			. . . continued	

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/30/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/30/04 | ENTERED BY KKB | SHEET NO. 1 OF 2
RIG FOREMAN D-25/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

BORING A-7

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
STS Consultants Ltd.

SURFACE ELEVATION +575.5 NGVD (Continued)

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	N VALUE
	RB		Moderately weathered soft shale	
			End of Boring Borehole backfilled upon completion. Casing used: 10 ft. of 4 in. Safety Hammer used for Standard Penetration Tests. WOH = Weight of Hammer	

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

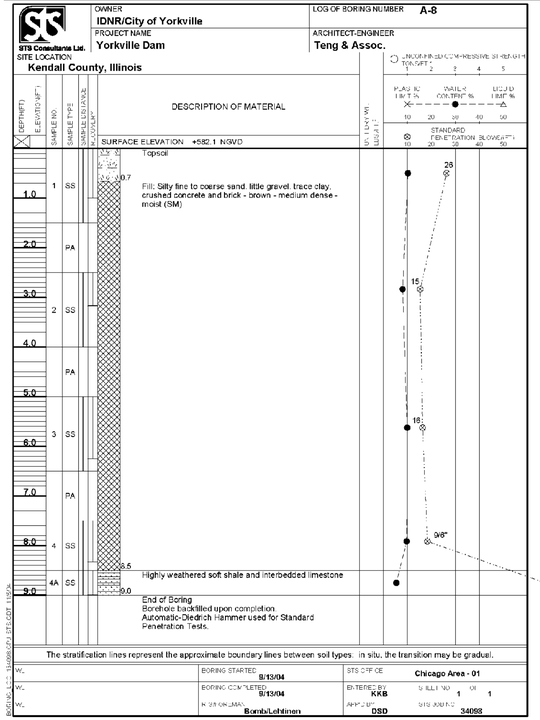
BORING STARTED 8/27/04 | STS OFFICE Chicago Area - 01
BORING COMPLETED 8/27/04 | ENTERED BY KKB | SHEET NO. 2 OF 2
RIG FOREMAN Joy 12-Barge/Lehtinen | APP'D BY DSD | STS JOB NO. 34098

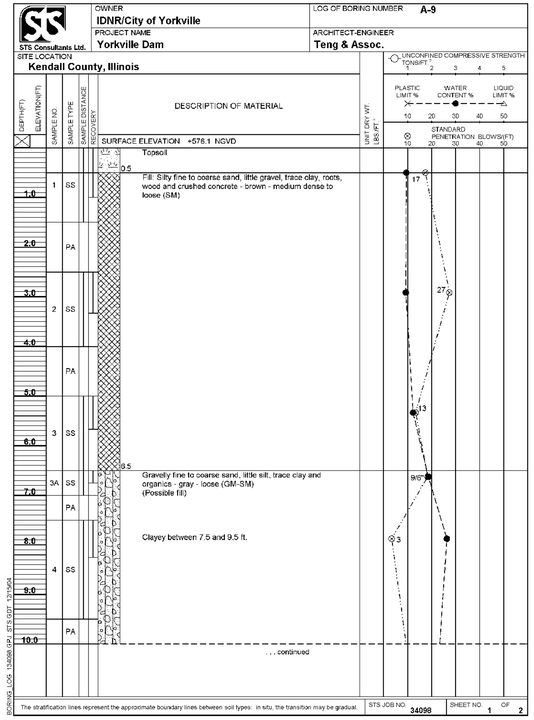
LOCATION OF BORINGS ON SHEET B2

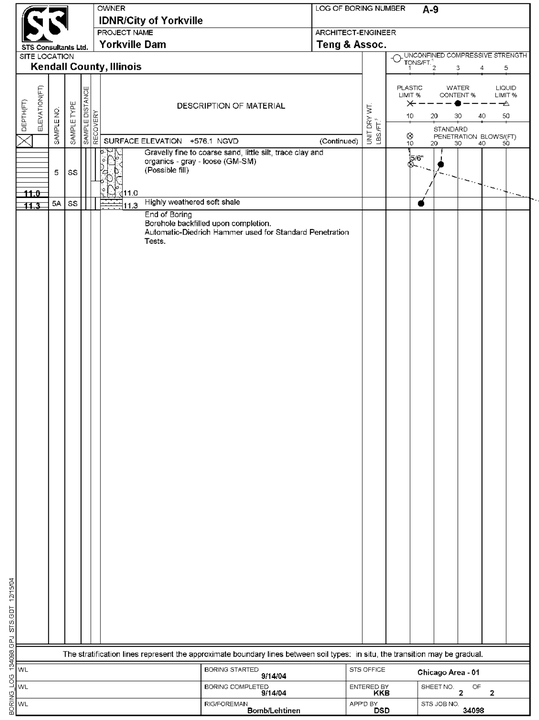
STATE OF ILLINOIS
DEPARTMENT OF NATURAL RESOURCES

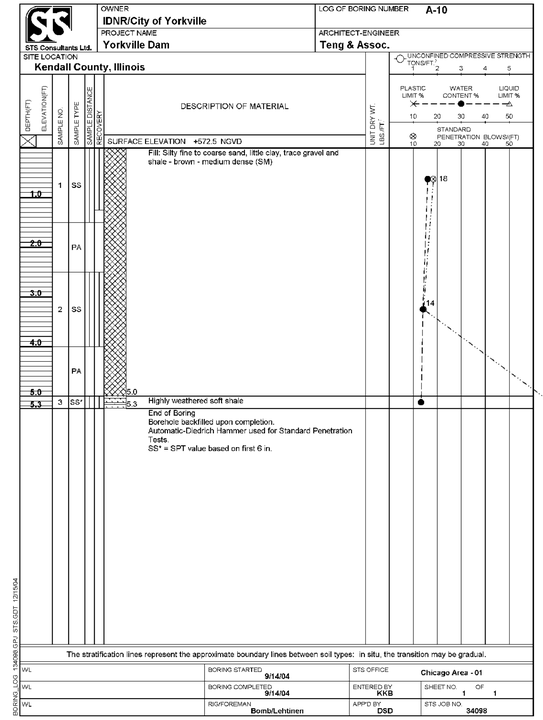
YORKVILLE DAM – MULTI–PURPOSE DAM PROJECT – PHASE 2 – CANOE AND FISH BYPASS CHANNEL
KENDALL COUNTY

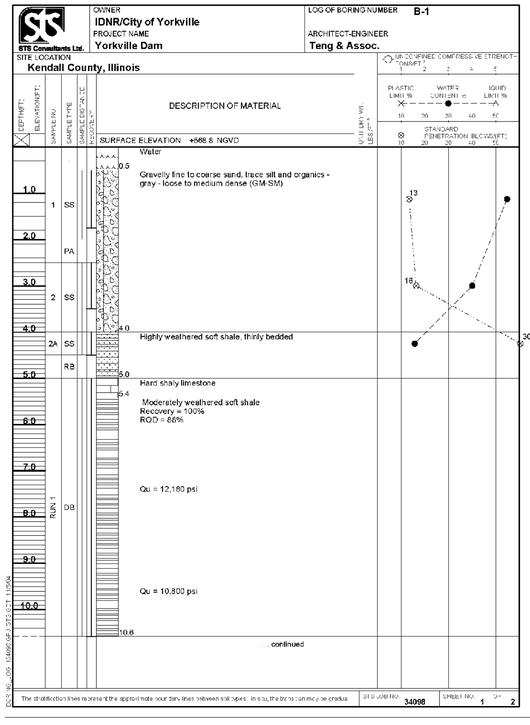
OFFICE OF WATER RESOURCES

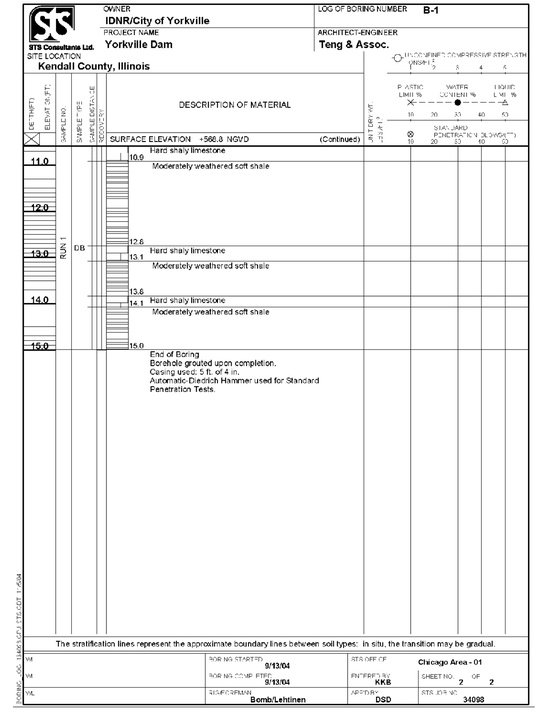


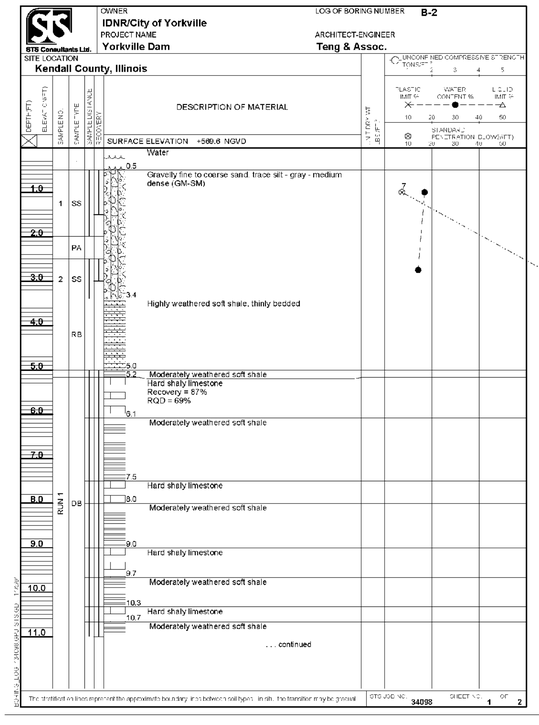


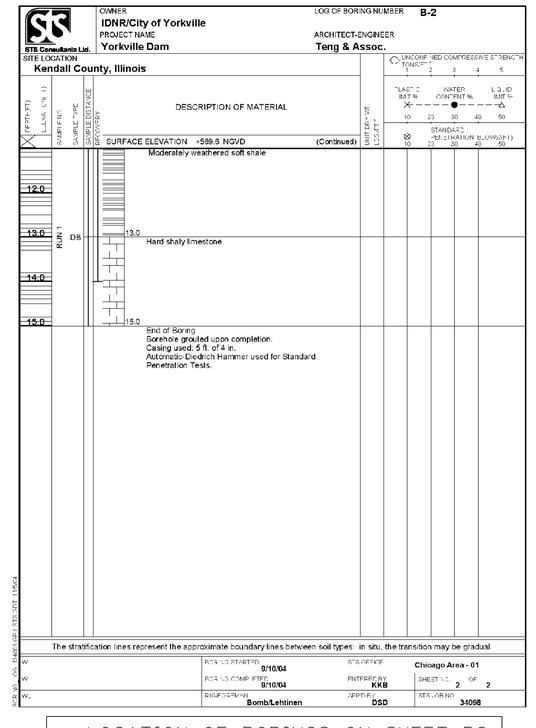












LOCATION OF BORINGS ON SHEET B2

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DRWG. X2 OF X7

TENG

TENG & ASSOCIATES, INC.
ENGINEERS/ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

BORINGS II

LOG OF BORING NUMBER B-3 (Sheet 1 of 2)

STS Consultants Ltd. — OWNER: IDNR/City of Yorkville — PROJECT NAME: Yorkville Dam — ARCHITECT-ENGINEER: Teng & Assoc. — SITE LOCATION: Kendall County, Illinois

SURFACE ELEVATION +569.6 NGVD

Depth (ft)	Sample No.	Sample Type	Description of Material
0.0–0.5			Water
0.5–3.5	1, 2	SS, PA, SS	Gravelly fine to coarse sand, little silt, trace clay, organics and shells - gray - very dense (SM-GM)
3.5–5.0	2A	SS, RB	Highly weathered shale, thinly bedded
5.0–6.4	RUN 1	DB	Hard shaly limestone Recovery = 90% RQD = 65%
6.4–7.0			Moderately weathered soft shale
7.0–7.6			Hard shaly limestone
7.6–			Moderately weathered soft shale

SPT values: 76, 76, 11/6"

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. STS JOB NO. 34098 — SHEET NO. 1 OF 2

LOG OF BORING NUMBER B-3 (Sheet 2 of 2)

SURFACE ELEVATION +569.6 NGVD (Continued)

Depth (ft)	Sample No.	Sample Type	Description of Material
–13.2	RUN 1	DB	Moderately weathered soft shale
13.2–15.0			Hard shaly limestone

End of Boring
Borehole grouted upon completion.
Casing used: 5 ft. of 4 in.
Automatic-Diedrich Hammer used for Standard Penetration Tests.

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WL	BORING STARTED 9/9/04	STS OFFICE	Chicago Area - 01
WL	BORING COMPLETED 9/9/04	ENTERED BY KKB	SHEET NO. 2 OF 2
WL	RIG/FOREMAN Bomb/Lehtinen	APP'D BY DSD	STS JOB NO. 34098

LOG OF BORING NUMBER B-4 (Sheet 1 of 3)

SURFACE ELEVATION +575.5 NGVD

Depth (ft)	Sample No.	Sample Type	Description of Material
0.0–5.0			Water
5.0–6.0			Organic silt, little sand, trace gravel and shells - brown and black - very soft (ML)
6.0–	1	SS	Gravelly fine to coarse sand, little silt, trace clay - gray - loose (GM-SM)

SPT: WOH; water content 84.7

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. STS JOB NO. 34098 — SHEET NO. 1 OF 3

LOG OF BORING NUMBER B-4 (Sheet 2 of 3)

SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No.	Sample Type	Description of Material
–10.5	2	SS	Gravelly fine to coarse sand, little silt, trace clay - gray - loose (GM-SM)
10.5–12.5		RB	Highly weathered soft shale, thinly bedded
12.5–13.2	RUN 1	DB	Hard shaly limestone Recovery = 78% RQD = 44%
13.2–14.4			Moderately weathered soft shale
14.4–15.0			Hard shaly limestone
15.0–17.7			Moderately weathered soft shale Field Permeability (Packer) Test @ 14 to 23 ft.:
17.7–			Hard shaly limestone

Pressure	Time	Flow Volume
2.5 psi	5 min.	0.5 Gal.
5.0 psi	5 min.	0 Gal
10 psi	5 min.	0 Gal

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. STS JOB NO. 34098 — SHEET NO. 2 OF 3

LOG OF BORING NUMBER B-4 (Sheet 3 of 3)

SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No.	Sample Type	Description of Material
18.1–19.0	RUN 1	DB	Moderately weathered soft shale
19.0–19.5			Hard shaly limestone
19.5–20.0			Moderately weathered soft shale
20.0–21.5			Hard shaly limestone

End of Boring
Borehole backfilled upon completion.
Casing used: 15 ft. of 4 in.
Safety Hammer used for Standard Penetration Tests.
WOH = Weight of Hammer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WL	BORING STARTED 8/30/04	STS OFFICE	Chicago Area - 01
WL	BORING COMPLETED 8/30/04	ENTERED BY KKB	SHEET NO. 3 OF 3
WL	RIG/FOREMAN D-25/Lehtinen	APP'D BY DSD	STS JOB NO. 34098

LOG OF BORING NUMBER B-5 (Sheet 1 of 3)

SURFACE ELEVATION +575.5 NGVD

Depth (ft)	Sample No.	Sample Type	Description of Material
0.0–5.0			Water
5.0–7.0	1	SS	Silty fine to coarse sand, little gravel, trace clay, shells and wood - brown and black - loose (SM)
7.0–8.5	2	SS	Gravelly fine to coarse sand, little silt and clay, trace shells - brownish gray - medium dense (SM-GM)
8.5–	3	SS, RB	Gravelly fine to coarse sand, little silt, trace clay - brownish gray - medium dense to very dense (SM-GM)

SPT: WOH, 15, 13/6"

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. STS JOB NO. 34098 — SHEET NO. 1 OF 3

LOG OF BORING NUMBER B-5 (Sheet 2 of 3)

SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No.	Sample Type	Description of Material
–10.5		RB	Gravelly fine to coarse sand, little silt, trace clay - brownish gray - medium dense to very dense (SM-GM)
10.5–14.0		RB	Hard shaly limestone
14.0–15.5	RUN 1	DB	Moderately weathered soft shale Recovery = 73% RQD = 65%
15.5–15.8			Hard shaly limestone
15.8–16.7			Moderately weathered soft shale
16.7–17.1			Hard shaly limestone
17.1–18.6			Moderately weathered soft shale Field Permeability (Packer) Test @ 15 to 25 ft.:
18.6–19.2			Hard shaly limestone
19.2–20.0			Moderately weathered soft shale

Pressure	Time	Flow Volume
10 psi	5 min.	0 Gal.
20 psi	5 min.	0 Gal

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. STS JOB NO. 34098 — SHEET NO. 2 OF 3

LOG OF BORING NUMBER B-5 (Sheet 3 of 3)

SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No.	Sample Type	Description of Material
–21.2	RUN 1	DB	Hard shaly limestone
21.2–23.5			Moderately weathered soft shale

End of Boring
Borehole backfilled upon completion.
Casing used: 12 ft. of 4 in.
Safety Hammer used for Standard Penetration Tests.
WOH = Weight of Hammer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WL	BORING STARTED 8/24/04	STS OFFICE	Chicago Area - 01
WL	BORING COMPLETED 8/24/04	ENTERED BY KKB	SHEET NO. 3 OF 3
WL	RIG/FOREMAN Joy 12-Barge/Lehtinen	APP'D BY DSD	STS JOB NO. 34098

LOCATION OF BORINGS ON SHEET B2

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LOG OF BORING NUMBER B-6 (Sheet 1 of 3)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +575.5 NGVD

Depth (ft)	Sample No. / Type	Description of Material	SPT (blows/ft)
0.0–5.0		Water	
5.0–8.5	1 SS; 2 SS	Gravelly fine to coarse sand, little silt, trace clay and organics - brownish gray - medium dense (SM) With coarse gravel at 5 to 7 ft.	11; 17
8.5–10.0	3 SS	Gravelly fine to coarse sand, little silt, trace clay - gray - medium dense (SM-GM) With occasional thin organic seams noted.	13

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.
STS JOB NO. 34098 — SHEET NO. 1 OF 3

LOG OF BORING NUMBER B-6 (Continued, Sheet 2 of 3)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No. / Type	Description of Material
10.0–13.0	RB	Gravelly fine to coarse sand, little silt, trace clay - gray - medium dense (SM-GM) With occasional thin organic seams noted.
13.0–13.7		Hard shaly limestone
13.7–14.9	RUN 1 DB	Moderately weathered soft shale Recovery = 74% RQD = 64%
14.9–15.2		Hard shaly limestone
15.2–16.0		Moderately weathered soft shale
16.0–16.4		Hard shaly limestone
16.4–17.8		Moderately weathered soft shale
17.8–18.3		Hard shaly limestone
18.3–18.9		Moderately weathered soft shale
18.9–20.0		Hard shaly limestone

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.
STS JOB NO. 34098 — SHEET NO. 2 OF 3

LOG OF BORING NUMBER B-6 (Continued, Sheet 3 of 3)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No. / Type	Description of Material
20.0–23.5	RUN 1 DB	Moderately weathered soft shale Field Permeability (Packer) Test @ 17 to 25 ft.

Pressure	Time	Flow Volume
2.5 psi	5 min.	0.2 Gal.
5.0 psi	5 min.	0 Gal
10 psi	5 min.	0.3 Gal

23.5 End of Boring
Borehole backfilled upon completion.
Casing used: 15 ft. of 4 in.
Safety Hammer used for Standard Penetration Tests.

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/26/04 — STS OFFICE Chicago Area - 01
BORING COMPLETED 8/26/04 — ENTERED BY KKB — SHEET NO. 3 OF 3
RIG/FOREMAN Joy 12-Barge/Lehtinen — APP'D BY DSD — STS JOB NO. 34098

LOG OF BORING NUMBER B-7 (Sheet 1 of 3)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +575.5 NGVD

Depth (ft)	Sample No. / Type	Description of Material	SPT (blows/ft)
0.0–6.5		Water	
6.5–8.5	1 SS	Silty fine to coarse sand, little gravel, trace clay, organics and shells - brown - loose (SM)	5
8.5–9.3	2 SS	Clayey fine to coarse sand, little gravel - gray - medium dense to dense (SC-GM)	47/3"
9.3–		Highly weathered soft shale, thinly bedded	

. . . continued

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.
STS JOB NO. 34098 — SHEET NO. 1 OF 3

LOG OF BORING NUMBER B-7 (Continued, Sheet 2 of 3)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No. / Type	Description of Material	SPT (blows/ft)
10.0–10.8	3 SS*	Highly weathered soft shale, thinly bedded	50/4"
10.8–11.6	RB	Hard shaly limestone	
11.6–17.8	RUN 1 DB	Moderately weathered soft shale Recovery = 77% RQD = 51%	
17.8–18.4		Hard shaly limestone Qu = 12,525 psi	
18.4–		Moderately weathered soft shale	

Field Permeability (Packer) Test @ 12 to 19.5 ft.:

Pressure	Time	Flow Volume
2.5 psi	5 min.	0.5 Gal.
5.0 psi	5 min.	0 Gal.
10 psi	5 min.	0.2 Gal.

. . . continued

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.
STS JOB NO. 34098 — SHEET NO. 2 OF 3

LOG OF BORING NUMBER B-7 (Continued, Sheet 3 of 3)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +575.5 NGVD (Continued)

Depth (ft)	Sample No. / Type	Description of Material
20.0–21.5	RUN 1 DB	Moderately weathered soft shale

21.5 End of Boring
Borehole backfilled upon completion.
Casing used: 12 ft. of 4 in.
Safety Hammer used for Standard Penetration Tests.
SS* = SPT value based on first 6 in. or less.

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 8/27/04 — STS OFFICE Chicago Area - 01
BORING COMPLETED 8/27/04 — ENTERED BY KKB — SHEET NO. 3 OF 3
RIG/FOREMAN Joy 12-Barge/Lehtinen — APP'D BY DSD — STS JOB NO. 34098

LOG OF BORING NUMBER B-11 (Sheet 1 of 2)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +569.6 NGVD

Depth (ft)	Sample No. / Type	Description of Material	SPT (blows/ft)
0.0–1.0		Water	
1.0–7.5	1 SS; 2 SS; RB; 3 SS; RB	Gravelly fine to coarse sand, trace silt and organics - gray - dense (GM-SM)	26; 23; 68
7.5–9.0	4 SS*; RB	Highly weathered shale	50/3"
9.0–11.0	RUN 1 DB	Moderately weathered soft shale Recovery = 64% RQD = 41%	

. . . continued

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.
STS JOB NO. 34098 — SHEET NO. 1 OF 2

LOG OF BORING NUMBER B-11 (Continued, Sheet 2 of 2)

OWNER: IDNR/City of Yorkville
PROJECT NAME: Yorkville Dam
ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois
SURFACE ELEVATION +569.6 NGVD (Continued)

Depth (ft)	Sample No. / Type	Description of Material
11.0–11.9	RUN 1 DB	Moderately weathered soft shale Recovery = 64% RQD = 41%
11.9–12.6		Hard shaly limestone
12.6–13.5		Moderately weathered soft shale
13.5–14.8		Hard shaly limestone
14.8–19.0		Moderately weathered soft shale Qu = 11,055 psi

19.0 End of Boring
Borehole grouted upon completion.
Casing used: 8 ft. of 4 in.
Automatic/Diedrich Hammer used for Standard Penetration Tests.
SS* = SPT value based on first 6 in.

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

BORING STARTED 9/10/04 — STS OFFICE Chicago Area - 01
BORING COMPLETED 9/10/04 — ENTERED BY KKB — SHEET NO. 2 OF 2
RIG/FOREMAN Bomb/Lehtinen — APP'D BY DSD — STS JOB NO. 34098

LOCATION OF BORINGS ON SHEET B2

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Designed By JPR — Checked By TKL
Drawn By JPR — Checked By TKL

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER C-1
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +575.0 NGVD
Portland Cement Concrete
Compressive strength = 7,350 psi
7/16 in. diameter rebar at 2.8 ft.
. . . continued

The stratification lines represent the approximate boundary lines between soil types; in situ, the transition may be gradual.
STS JOB NO. 34098 | SHEET NO. 1 OF 3

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER C-1
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +575.0 NGVD (Continued)
Portland Cement Concrete
Compressive strength = 5,840 psi
Unit height = 145.3 pcf
Cold joint at 12.25 ft.
Compressive strength = 1,850 psi
Unit weight = 146.1 pcf
15.1 Shaly limestone
15.5 Moderately weathered soft shale
Recovery = 100%
RQD = 78%
. . . continued

The stratification lines represent the approximate boundary lines between soil types; in situ, the transition may be gradual.
STS JOB NO. 34098 | SHEET NO. 2 OF 3

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER C-1
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +575.0 NGVD (Continued)
18.0 Hard shaly limestone
18.3 Moderately weathered soft shale
18.8 Hard shaly limestone
19.3 Moderately weathered soft shale
20.1 End of Boring
Borehole grouted upon completion.

The stratification lines represent the approximate boundary lines between soil types; in situ, the transition may be gradual.
BORING STARTED 8/31/04 | BORING COMPLETED 8/31/04 | RIG FOREMAN D-25/Lehtinen
STS OFFICE Chicago Area - 01 | ENTERED BY KKB | CHECKED BY DSD
SHEET NO. 3 OF 3 | STS JOB NO. 34098

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER C-2
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +575.0 NGVD (Continued)
Portland Cement Concrete
Cold joint at 17.17 ft.
Compressive strength = 3000 psi
Unit weight = 143.5 pcf
. . . continued

The stratification lines represent the approximate boundary lines between soil types; in situ, the transition may be gradual.
STS JOB NO. 34098 | SHEET NO. 2 OF 3

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER C-2
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +575.0 NGVD (Continued)
Portland Cement Concrete
19.5 Moderately weathered soft shale
Recovery = 80%
RQD = 69%
20.2 Hard shaly limestone
21.3 Moderately weathered soft shale
24.5 End of Boring
Borehole grouted upon completion.

The stratification lines represent the approximate boundary lines between soil types; in situ, the transition may be gradual.
BORING STARTED 1/1/00 | BORING COMPLETED 9/1/04 | RIG FOREMAN D-25/Lehtinen
STS OFFICE Chicago Area - 01 | ENTERED BY KKB | CHECKED BY DSD
SHEET NO. 3 OF 3 | STS JOB NO. 34098

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER C-2
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +675.0 NGVD
Portland Cement Concrete
Compressive strength = 2920 psi
Unit weight = 150.7 pcf
Compressive Strength = 10,050 psi
Unit weight = 150.1 pcf
. . . continued

The stratification lines represent the approximate boundary lines between soil types; in situ, the transition may be gradual.
STS JOB NO. 34098 | SHEET NO. 1 OF 3

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER F-1
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +580.0 NGVD
0.3 Topsoil
Fill: Gravelly clay, little silt, trace sand, crushed concrete and brick fragments - brown - moist (CL)
11.3
. . . continued

OWNER IDNR/City of Yorkville | LOG OF BORING NUMBER F-1
PROJECT NAME Yorkville Dam | ARCHITECT-ENGINEER Teng & Assoc.
STS Consultants Ltd. SITE LOCATION Kendall County, Illinois

DESCRIPTION OF MATERIAL

SURFACE ELEVATION +580.0 NGVD (Continued)
Highly weathered shale
15.0 Moderately weathered soft shale
15.3 Hard shaly limestone
Recovery = 99%
RQD = 83%
16.1 Moderately weathered soft shale
16.7 Hard shaly limestone
17.8 Moderately weathered soft shale
19.8 Hard shaly limestone
Qu = 15,345 psi
20.5 Moderately weathered soft shale
21.0 Hard shaly limestone
21.4 Moderately weathered soft shale
. . . continued

The stratification lines represent the approximate boundary lines between soil types; in situ, the transition may be gradual.
STS JOB NO. 34098 | SHEET NO. 2 OF 3

LOCATION OF BORINGS ON SHEET B2

TENG
TENG & ASSOCIATES, INC.
ENGINEERS&ARCHITECTS/PLANNERS
205 W. MICHIGAN AVE. CHICAGO, IL 60601
TELEPHONE: 312/616-0000

OWNER: IDNR/City of Yorkville | LOG OF BORING NUMBER: F-1
PROJECT NAME: Yorkville Dam | ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois

DEPTH (FT)	ELEVATION (FT)	RUN #	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT²	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT
						SURFACE ELEVATION +560.0 NGVD (Continued)						
23.0						Moderately weathered soft shale						
	23.2					Hard shaly limestone						
	23.5	RUN 1	DB			Moderately weathered soft shale						
24.0	24.1					Hard shaly limestone						
	24.3					Moderately weathered soft shale						
25.0	25.0					End of Boring Borehole grouted upon completion. Casing used: 15 ft. of 4 in. Automatic Diedrich Hammer used for Standard Penetration Tests. SS* = SPT value based on first 6 in.						

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

DRILLING STARTED: 9/8/04	STS OFFICE: Chicago Area - 01		
BORING COMPLETED: 9/9/04	ENTERED BY: KKB	SHEET NO.: 3	OF: 3
FOREMAN: Bomb/Lehtinen	APPD BY: DSD	STS JOB NO.: 34098	

OWNER: IDNR/City of Yorkville | LOG OF BORING NUMBER: W-1
PROJECT NAME: Yorkville Dam | ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT²	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT
						SURFACE ELEVATION +569.6 NGVD						
						Water						
1.0												
2.0	2.0					Gravelly fine to coarse sand, little silt, trace clay and organics - black and gray - dense (GM-SM) Boulders and cobbles at 2 to 4 ft.						
3.0		1	SS									36
4.0	4.0					Silty fine to coarse sand, trace clay and organics - black and gray - medium dense (SM)						
5.0		2	SS									14
6.0						Gravelly below 6 ft.						
7.0		3	SS									56/7"
7.1	7.0					Portland Cement Concrete (spillway apron) End of Boring Borehole backfilled upon completion. Automatic Diedrich Hammer used for Standard Penetration Tests.						

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

DRILLING STARTED: 9/16/04	STS OFFICE: Chicago Area - 01		
BORING COMPLETED: 9/16/04	ENTERED BY: KKB	SHEET NO.: 1	OF: 1
FOREMAN: Bomb/Lehtinen	APPD BY: DSD	STS JOB NO.: 34098	

OWNER: IDNR/City of Yorkville | LOG OF BORING NUMBER: W-2
PROJECT NAME: Yorkville Dam | ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT²	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT
						SURFACE ELEVATION +569.6 NGVD						
						Water						
1.0												
2.0	2.0					Gravelly fine to coarse sand, little silt, trace clay and organics - grey and black - loose to medium dense (GM-SM)						
3.0		1	SS									4
4.0												10
5.0		2	SS									8
6.0												
7.0		3	SS									
8.0	8.0											
8.1	8.1					Portland Cement Concrete (spillway apron) End of Boring Borehole backfilled upon completion. Automatic Diedrich Hammer used for Standard Penetration Tests.						

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

DRILLING STARTED: 9/16/04	STS OFFICE: Chicago Area - 01		
BORING COMPLETED: 9/16/04	ENTERED BY: KKB	SHEET NO.: 1	OF: 1
FOREMAN: Bomb/Lehtinen	APPD BY: DSD	STS JOB NO.: 34098	

OWNER: IDNR/City of Yorkville | LOG OF BORING NUMBER: W-3
PROJECT NAME: Yorkville Dam | ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT²	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT
						SURFACE ELEVATION +569.6 NGVD						
						Water						
1.0												
2.0												
3.0		1	SS									13
4.0												14
5.0		2	SS									23
6.0												
7.0		3	SS									14
8.0												
9.0		4	SS									23
10.0	1.5					Gravelly fine to coarse sand, little silt, trace clay, organics and shells - brown and black - medium dense (GM-SM)						
						. . . continued						

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

		STS JOB NO.: 34098	SHEET NO.: 1 OF: 2

OWNER: IDNR/City of Yorkville | LOG OF BORING NUMBER: W-3
PROJECT NAME: Yorkville Dam | ARCHITECT-ENGINEER: Teng & Assoc.
SITE LOCATION: Kendall County, Illinois

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT²	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT
						SURFACE ELEVATION +569.6 NGVD (Continued)						
		5	SS			Gravelly fine to coarse sand, little silt, trace clay, organics and shells - brown and black - medium dense (GM-SM)						50/4"
11.0												
12.0		6	SS									
12.3	12.0					Portland Cement Concrete (spillway apron)						
	12.3					End of Boring Borehole backfilled upon completion. Automatic Diedrich Hammer used for Standard Penetration Tests.						

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

DRILLING STARTED: 9/16/04	STS OFFICE: Chicago Area - 01		
BORING COMPLETED: 9/16/04	ENTERED BY: KKB	SHEET NO.: 2	OF: 2
FOREMAN: Bomb/Lehtinen	APPD BY: DSD	STS JOB NO.: 34098	

STS CONSULTANTS
STS Consultants, Ltd.
111 W Washington St., Suite 1950
Chicago, Illinois 60602
Voice 312-214-4420
Fax 312-214-4500

Memorandum

Date October 18, 2004
To Mr Robert Murdock, P E
Cc
From D Diehm P E. and W Walton P.E , S.E

RE Particle Size Analysis of the Test Pit Bulk Samples for the Yorkville/Glen Palmer Dam Rehabilitation, Fox River at Yorkville, Kendall County, Illinois - STS Project No 1-34098

In response to your request, STS Consultants, Ltd (STS) has revised the particle size distribution results provided in the draft report (issued October 8, 2004) to reflect the estimated contribution of the +9-inch diameter materials that were excluded from the tested bulk samples. For each of the three locations (TP-1, TP-2, and TP-3), a theoretical gradation is provided based on visual observation of the nominal maximum particle size. The as-tested gradation is shown for comparison The revised distribution curves are provided in the attachments to this letter report

A composite of the three theoretical gradations with the interpreted limits of the particle distributions is also provided Due to the limited number of tests, and the potential for variability between sampling locations, it is recommended that the design be based on the interpreted distribution envelope rather than the location specific gradations

We appreciate this opportunity to be of service to you If there are any questions with regard to the information contained in this letter report, or if we may be of further assistance, please do not hesitate to contact us.

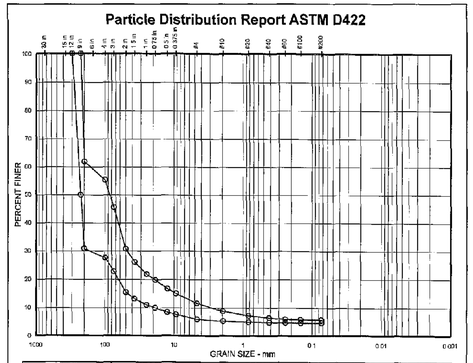
Respectfully,

STS CONSULTANTS, LTD

Yorkville Dam Rehabilitation
Fox River at Yorkville
Kendall County, IL
STS Project No 1-34098

ORIGINATED BY DSD 10/18/2004
CHECKED BY WWW 10/18/2004

Particle Distribution Report ASTM D422



% +3"	% GRAVEL	% SAND	% SILT	% CLAY

SIEVE SIZE	PERCENT FINER*	PERCENT FINER**	US SIEVE SIZE
304.8 mm		100.0	12 in
228.6 mm	100.0	49.7	9 in
203.2 mm	61.6	30.6	8 in
101.6 mm	55.1	27.3	4 in
76.2 mm	45.3	22.5	3 in
50.8 mm	30.5	15.1	2 in
38.1 mm	25.8	12.8	1.5 in
25.4 mm	21.5	10.7	1 in
19.05 mm	19.5	9.7	0.75 in
12.7 mm	16.4	8.1	0.5 in
9.525 mm	14.7	7.3	0.375 in
4.75 mm	11.3	5.6	#4
2 mm	8.9	4.4	#10
0.85 mm	6.9	3.4	#20
0.425 mm	5.1	2.5	#40
0.25 mm	4.1	2.0	#60
0.15 mm	3.5	1.7	#100
0.075 mm	2.9	1.4	#200

* Gradation of Bulk Sample
** Theoretical Gradation Based on Visual Observation of Nominal Maximum Particle Size

Soil Description
COBBLES SOME COARSE TO FINE GRAVEL TRACE COARSE TO MEDIUM SAND AND FINES – DARK GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{85}= D_{30}= D_{15}=
D_{60}= D_{10}= D_{50}=
C_u= C_c=

Classification
USCS= GM AASHTO=

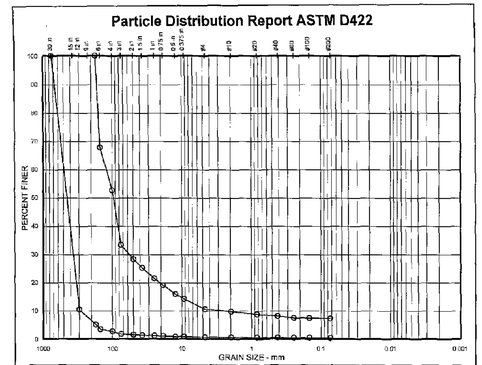
Remarks

Sample No.: TP-1 Source of Sample: Date: 9/28/04
Location: Elev./Depth: 0.0-2.0 FT

Yorkville Dam Rehabilitation
Fox River at Yorkville
Kendall County, IL
STS Project No. 1-34098

ORIGINATED BY DSD 10/18/2004
CHECKED BY WWW 10/18/2004

Particle Distribution Report ASTM D422



% +3"	% GRAVEL	% SAND	% SILT	% CLAY

SIEVE SIZE	PERCENT FINER*	PERCENT FINER**	US SIEVE SIZE
762 mm		100.0	30 in
304.8 mm		89.2	12 in
177.8 mm	100.0	43.1	7 in
152.4 mm	67.5	33.3	6 in
101.6 mm	52.5	26.1	4 in
76.2 mm	33.0	18.1	3 in
50.8 mm	28.0	14.4	2 in
38.1 mm	25.0	12.2	1.5 in
25.4 mm	21.2	10.1	1 in
19.05 mm	18.8	8.9	0.75 in
12.7 mm	16.7	8.0	0.5 in
9.525 mm	14.0	6.7	0.375 in
4.75 mm	10.4	5.0	#4
2 mm	9.5	4.5	#10
0.85 mm	8.6	4.1	#20
0.425 mm	7.9	3.8	#40
0.25 mm	7.3	3.4	#60
0.15 mm	7.2	3.4	#100
0.075 mm	7.0	3.4	#200

* Gradation of Bulk Sample
** Theoretical Gradation Based on Visual Observation of Nominal Maximum Particle Size

Soil Description
COBBLES SOME COARSE TO FINE GRAVEL TRACE COARSE TO MEDIUM SAND AND FINES – DARK GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{85}= D_{30}= D_{15}=
D_{60}= D_{10}= D_{50}=
C_u= C_c=

Classification
USCS= GW AASHTO=

Remarks

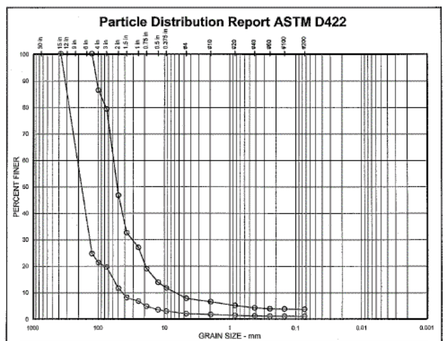
Sample No.: TP-2 Source of Sample: Date: 9/28/04
Location: Elev./Depth: 0.0-2.5 FT

LOCATION OF BORINGS ON SHEET B2

Yorkville Dam Rehabilitation
Fox River at Yorkville
Kendall County, IL
STS Project No. 1-34098

ORIGINATED BY: DSO 10/18/2004
CHECKED BY: WHW 10/18/2004

Particle Distribution Report ASTM D422



% +3"	% GRAVEL	% SAND	% SILT	% CLAY

SIEVE SIZE	PERCENT FINER*	PERCENT FINER**	US SIEVE SIZE
381 mm		100.0	15 in
127 mm	100.0	24.4	5 in
101.6 mm	96.2	21.0	4 in
76.2 mm	78.1	19.3	3 in
50.8 mm	46.5	11.4	2 in
38.1 mm	32.3	7.6	1.5 in
25.4 mm	26.7	6.5	1 in
19.05 mm	18.7	4.6	0.75 in
12.7 mm	13.8	3.3	0.5 in
9.525 mm	11.5	2.8	0.375 in
4.75 mm	7.6	1.9	#4
2 mm	6.3	1.6	#10
0.85 mm	4.9	1.2	#20
0.425 mm	4.1	1.0	#40
0.25 mm	3.7	0.9	#60
0.15 mm	3.6	0.9	#100
0.075 mm	3.5	0.9	#200

Soil Description
COBBLES SOME COARSE TO FINE GRAVEL TRACE COARSE TO MEDIUM SAND AND FINES – DARK GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= D_{60}= D_{30}=
D_{50}= D_{15}= D_{10}=
C_u= C_c=

Classification
USCS= GM AASHTO=

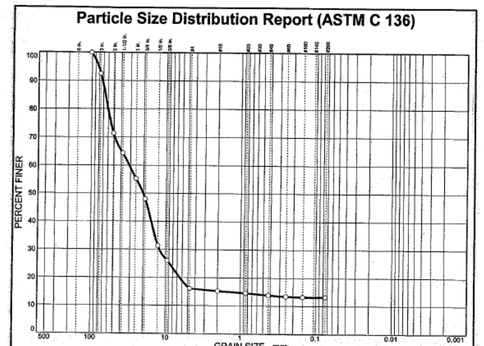
Remarks

* Gradation of Bulk Sample
** Theoretical Gradation Based on Visual Observation of Nominal Maximum Particle Size

Sample No.: TP-3 Source of Sample: Date: 9/28/04
Location: Elev./Depth: 0.0-3.5 FT

gradation (tp-3)

Particle Size Distribution Report (ASTM C 136)



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
7.5	76.4	2.9	13.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4 in.	100.0		
3 in.	92.5		
2 in.	71.4		
1.5 in.	64.3		
1 in.	55.3		
.75 in.	48.0		
.5 in.	31.3		
.375 in.	26.0		
#4	16.1		
#10	15.2		
#20	14.5		
#40	13.8		
#60	13.4		
#100	13.2		
#200	13.2		

Soil Description
COARSE TO FINE GRAVEL TRACE COBBLES TRACE MEDIUM SAND LITTLE FINES – DARK GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 65.7 D_{60}= 31.2 D_{50}= 20.3
D_{30}= 12.1 D_{15}= 1.55 D_{10}=
C_u= C_c=

Classification
USCS= GM AASHTO=

Remarks

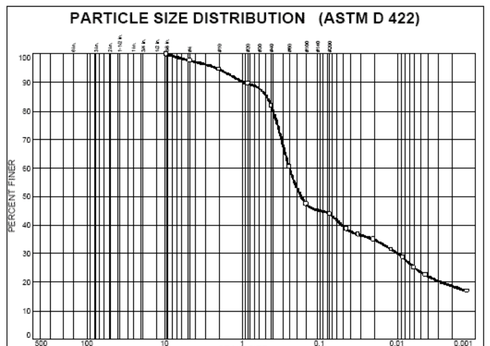
* (no specification provided)

Sample No.: TP-4 Source of Sample: Date: 9/28/04
Location: Elev./Depth: 0.0-3.5 FT

STS Consultants Ltd.
750 Corporate Woods Parkway
Vernon Hills, IL 60061

Client:
Project: YORKVILLE DAM
Project No: 34098 Plate

PARTICLE SIZE DISTRIBUTION (ASTM D 422)



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.3	53.8	20.5	23.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	97.7		
#10	94.7		
#20	89.6		
#40	81.8		
#60	60.5		
#100	47.5		
#200	43.9		

Soil Description
F-C SAND SOME CLAY SOME SILT TRACE FINE GRAVEL - DK. GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 0.484 D_{60}= 0.247 D_{50}= 0.175
D_{30}= 0.0069 D_{15}= D_{10}=
C_u= C_c=

Classification
USCS= SM AASHTO=

Remarks

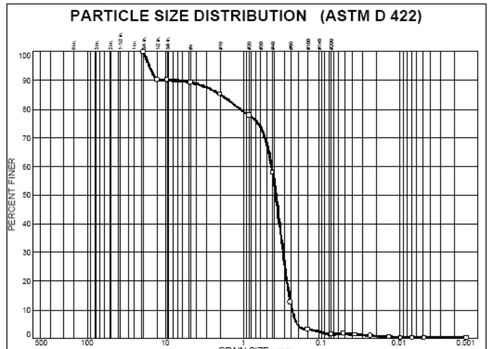
* (no specification provided)

Sample No.: 1 Source of Sample: BORING S-1 Date: 9/13/05
Location: Elev./Depth: 0.0-8.0"

STS Consultants Ltd.
750 Corporate Woods Parkway
Vernon Hills, IL 60061

Client: IDNR-OFFICE OF WATER RESOURCES
Project: YORKVILLE DAM REHABILITATION
Project No: 34098-A Plate

PARTICLE SIZE DISTRIBUTION (ASTM D 422)



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.7	87.8	1.3	0.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.50 in.	99.2		
.375 in.	99.2		
#4	89.3		
#10	85.2		
#20	77.9		
#40	57.9		
#60	12.6		
#100	3.2		
#200	1.5		

Soil Description
F-C SAND LITTLE FINE GRAVEL TRACE SILT TRACE CLAY - GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 1.95 D_{60}= 0.438 D_{50}= 0.386
D_{30}= 0.311 D_{15}= 0.260 D_{10}= 0.238
C_u= 1.84 C_c= 0.93

Classification
USCS= SP AASHTO=

Remarks

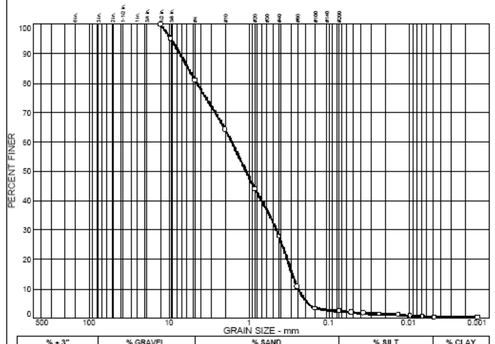
* (no specification provided)

Sample No.: 2 Source of Sample: BORING S-2 Date: 9/13/05
Location: Elev./Depth: 0.0-8.0"

STS Consultants Ltd.
750 Corporate Woods Parkway
Vernon Hills, IL 60061

Client: IDNR-OFFICE OF WATER RESOURCES
Project: YORKVILLE DAM REHABILITATION
Project No: 34098-A Plate

PARTICLE SIZE DISTRIBUTION (ASTM D 422)



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	19.0	78.6	2.2	0.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	95.1		
#4	81.0		
#10	64.2		
#20	44.1		
#40	27.9		
#60	10.7		
#100	3.3		
#200	2.4		

Soil Description
F-C SAND LITTLE FINE GRAVEL TRACE CLAY - GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 5.77 D_{60}= 1.66 D_{50}= 1.10
D_{30}= 0.456 D_{15}= 0.289 D_{10}= 0.243
C_u= 6.84 C_c= 0.52

Classification
USCS= SP AASHTO=

Remarks

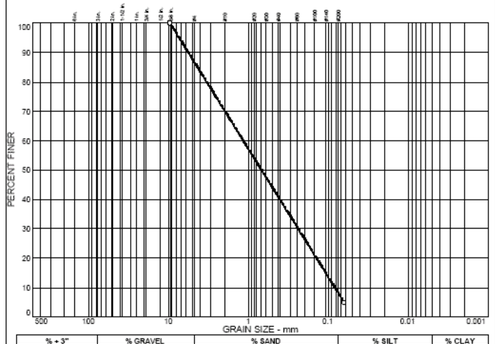
* (no specification provided)

Sample No.: 1 Source of Sample: BORING S-3 Date: 9/13/05
Location: Elev./Depth: 0.0-14.0"

STS Consultants Ltd.
750 Corporate Woods Parkway
Vernon Hills, IL 60061

Client: IDNR-OFFICE OF WATER RESOURCES
Project: YORKVILLE DAM REHABILITATION
Project No: 34098-A Plate

IEPA MATERIAL ANALYSIS FOR DREDGE & FILL ACTIVITIES



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	13.2	78.7	8.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#230	4.8		

Soil Description
F-C SAND SOME CLAY SOME SILT TRACE FINE GRAVEL - DK. GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 4.32 D_{60}= 1.16 D_{50}= 0.683
D_{30}= 0.238 D_{15}= 0.108 D_{10}= 0.0829
C_u= 13.95 C_c= 0.59

Classification
USCS= SM AASHTO=

Remarks

* (no specification provided)

Sample No.: 2 Source of Sample: BORING S-1 Date: 9/21/05
Location: Elev./Depth: 0.0-8.0"

STS Consultants Ltd.
750 Corporate Woods Parkway
Vernon Hills, IL 60061

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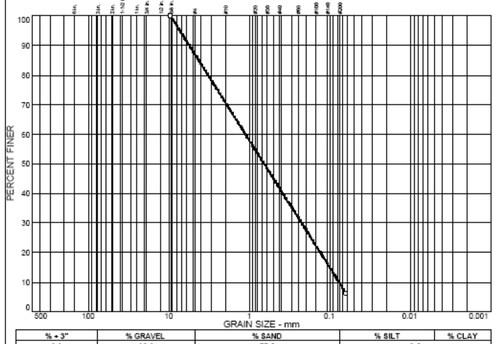
IEPA MATERIAL ANALYSIS FOR DREDGE & FILL ACTIVITIES



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	13.0	77.5	9.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#230	6.2		

Soil Description
F-C SAND LITTLE FINE GRAVEL TRACE SILT TRACE CLAY - GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 4.27 D_{60}= 1.12 D_{50}= 0.656
D_{30}= 0.225 D_{15}= 0.101 D_{10}= 0.0772
C_u= 14.51 C_c= 0.59

Classification
USCS= SP AASHTO=

Remarks

* (no specification provided)

Sample No.: 3 Source of Sample: BORING S-2 Date: 9/21/05
Location: Elev./Depth: 0.0-8.0"

STS Consultants Ltd.
750 Corporate Woods Parkway
Vernon Hills, IL 60061

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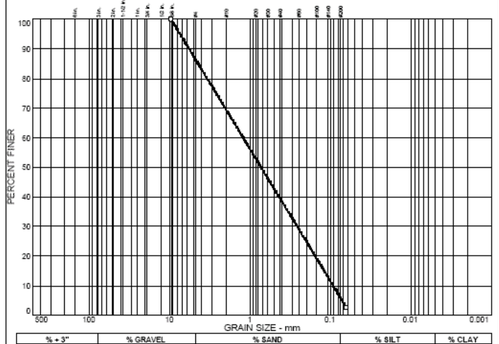
Project: YORKVILLE DAM REHABILITATION
Project No: 34098-A Plate

IEPA MATERIAL ANALYSIS FOR DREDGE & FILL ACTIVITIES



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	13.5	80.6	5.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#230	2.5		

Soil Description
F-C SAND LITTLE FINE GRAVEL TRACE CLAY - GRAY

Atterberg Limits
PL= LL= PI=

Coefficients
D_{90}= 4.49 D_{60}= 1.22 D_{50}= 0.726
D_{30}= 0.259 D_{15}= 0.120 D_{10}= 0.0927
C_u= 13.11 C_c= 0.60

Classification
USCS= SP AASHTO=

Remarks

* (no specification provided)

Sample No.: 2 Source of Sample: BORING S-3 Date: 9/21/05
Location: Elev./Depth: 0.0-14.0"

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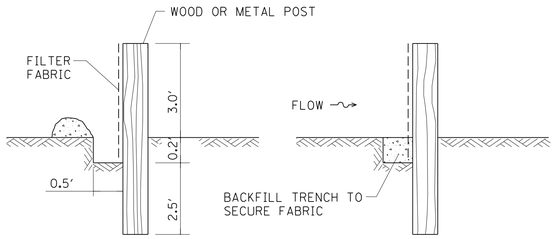
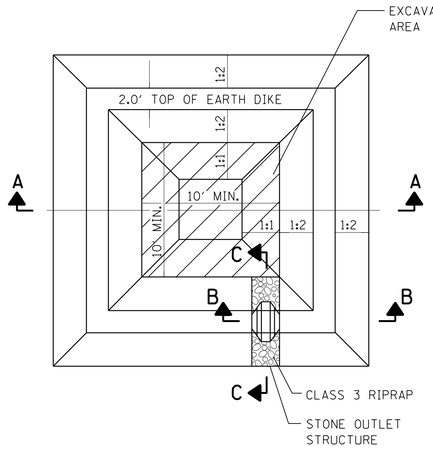
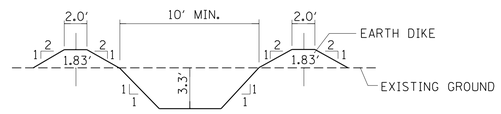


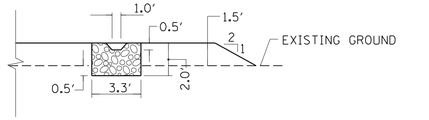
SILT FILTER FENCE AS PERIMETER EROSION BARRIER



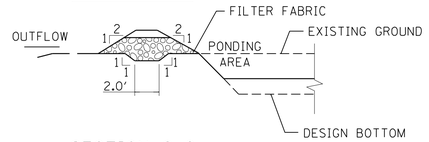
PLAN VIEW



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:

1. ANY DEWATERING OF THE CONSTRUCTION AREA SHALL BE FILTERED THROUGH A DEWATERING BASIN PRIOR TO ENTERING THE WATERWAY.

2. PUMPING INTO THESE BASINS SHALL CEASE WHEN THE EFFLUENT FROM THE BASIN BECOMES SEDIMENT LADEN. THE BASIN MAY BE BYPASSED IF THE WATER BEING PUMPED IS NON SEDIMENT LADEN AND THERE IS A STABILIZED OUTFALL. SURFACE FLOWS SHALL BE DIVERTED AROUND THE DEVICE.

3. THE DEWATERING BASIN SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 3FT WITH A FLAT BOTTOM.

4. ONCE THE DEWATERING BASIN BECOMES FILLED TO ½ OF THE EXCAVATED DEPTH, ACCUMULATED SEDIMENT SHALL BE REMOVED.

5. THE OUTFALL FROM THE BASIN(S) SHALL HAVE A STABILIZED CONVEYANCE TO RECEIVING WATERS.

6. THE MINIMUM VOLUME OF THE CONSTRUCTION DEWATERING DISCHARGE BASIN (DEAD VOLUME) SHALL BE CALCULATED AS: DEWATERING PUMP CAPACITY IN GAL/MINUTE X 16 = REQUIRED VOLUME IN CUBIC FEET

7. DEWATERING BASINS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE CONTRACT LUMP SUM BID PRICE FOR "TEMPORARY COFFERDAM SYSTEM".

DEWATERING BASINS

STANDARD SYMBOL

DB

S:\DOCUMENT\02348801\CIVIL\DGN\STD00R3N.DGN
liientk
10/09/2007
4:52:57 PM
Designed By JPR Checked By TKL
Drawn By JPR Checked By TKL

TENG
TENG & ASSOCIATES, INC.
ENGINEERS&ARCHITECTS/PLANNERS
205 N. MICHIGAN AVE. CHICAGO, IL 60601
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