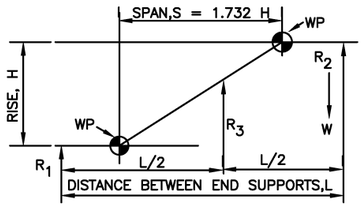
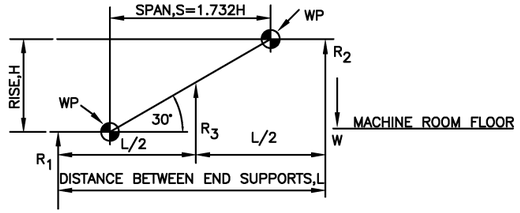


TWO END SUPPORTS, ONE INTERMEDIATE SUPPORT WHERE SHOWN

RISE,H (FT)	R_1 (KIPS)	R_2 (KIPS)	R_3* (KIPS)	DRIVE WEIGHT,W (KIPS)
10	19	20	NONE	INTERNAL
11	19	20		
12	20	21		
13	21	22		
14	21	22		
15	22	23		
16	23	24		
17	23	24	NONE	
18*	12	13	24	
19*	13	13	26	
20*	13	14	26	INTERNAL

FIG.1

LOADING ON CLASS "A1" STRUCTURE IN KIPS



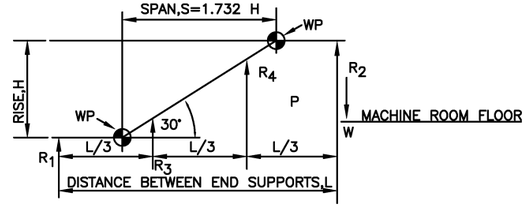
TWO END SUPPORTS, ONE INTERMEDIATE SUPPORT

RISE,H (FT)	R_1 (KIPS)	R_2 (KIPS)	R_3 (KIPS)	DRIVE WEIGHT,W (KIPS)
*20+	16	17	33	INTERNAL
**25	18	20	36	
**30	21	23	40	
**35	23	26	44	
**40	26	29	48	INTERNAL

FIG.2

LOADING ON CLASS"A2"&"B2"STRUCTURE IN KIPS

*CLASS "A2"
**CLASS "B2"

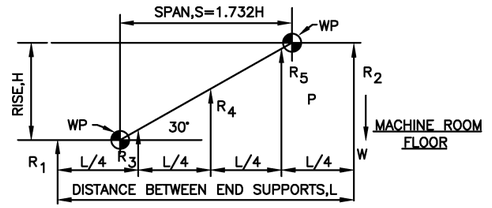


TWO END SUPPORTS, TWO INTERMEDIATE SUPPORTS

RISE,H (FT)	R_1 (KIPS)	R_2 (KIPS)	R_3 (KIPS)	R_4 (KIPS)	DRIVE WEIGHT,W (KIPS)
40+	22	24	29	29	INTERNAL
45	24	26	31	31	
50	26	28	34	34	
50+	27	29	42	44	
55	28	31	44	47	
60	30	34	48	49	INTERNAL

FIG.3

LOADING ON CLASS"B3"STRUCTURE IN KIPS

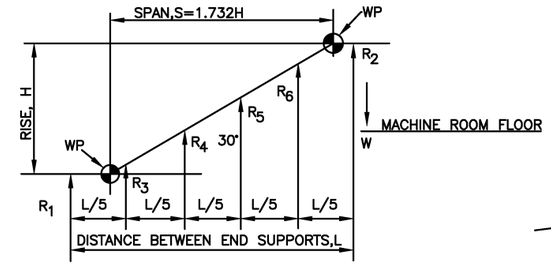


TWO END SUPPORTS, THREE INTERMEDIATE SUPPORTS

RISE,H (FT)	R_1 (KIPS)	R_2 (KIPS)	R_3 (KIPS)	R_4 (KIPS)	R_5 (KIPS)	DRIVE WEIGHT,W (KIPS)
60 +	25	27	39	28	42	INTERNAL
65	26	28	41	30	43	
70	27	30	43	32	45	
75	29	32	45	34	47	
80	31	34	47	37	49	INTERNAL

FIG.4

LOADING ON CLASS "C4" STRUCTURE IN KIPS



TWO END SUPPORTS, FOUR INTERMEDIATE SUPPORT

RISE,H (FT)	R_1 (KIPS)	R_2 (KIPS)	R_3 (KIPS)	R_4 (KIPS)	R_5 (KIPS)	R_6 (KIPS)		DRIVE WEIGHT, W (KIPS)
80+	26	28	42	32	32	46		INTERNAL
85	27	29	44	33	32	48		
90	29	31	46	34	33	50		
95	30	32	48	35	35	53		
100	31	34	50	37	36	55		INTERNAL

CLASS "A" UNDERGROUND MEZZANINE TO PLATFORM ESCALATOR AND STRUCTURAL WELLWAY

FIG. 5

LOADING ON CLASS "C5" STRUCTURE IN KIPS

FOR CLASS "C6 SEE NOTE 8

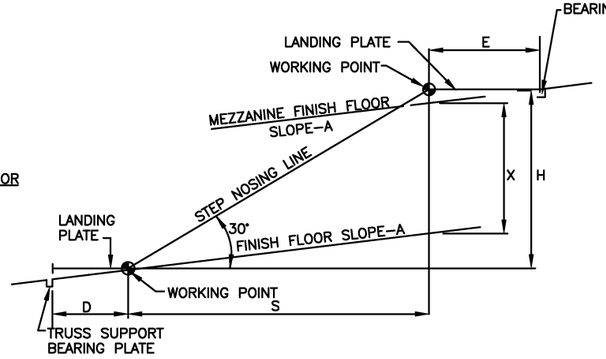


FIG.6

L

OF ESCALATOR
S= ESCALATOR SPAN H=ESCALATOR RISE.
A= SLOPE OF FINISH (RISE/RUN)
D= DISTANCE BETWEEN LOWER SUPPORT AND WORKING POINT.
E= DISTANCE BETWEEN UPPER SUPPORT AND WORKING POINT.

$$S=\frac{X+A(E)}{0.57735-A}$$

$$H=\frac{S}{1.7321}$$

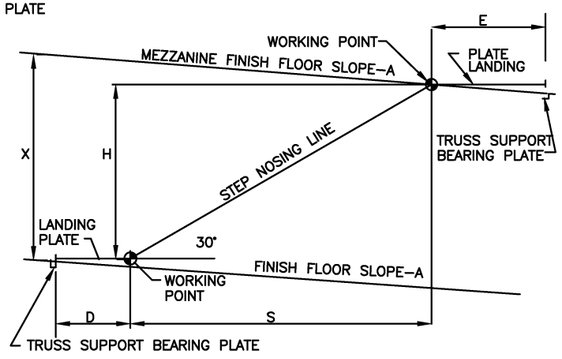


FIG.7

X= VERTICAL HEIGHT BETWEEN PLATFORM FINISH FLOORS @ ℄ OF ESCALATOR
S= ESCALATOR SPAN H=ESCALATOR RISE.
A= SLOPE OF FINISH (RISE/RUN)
D= DISTANCE BETWEEN LOWER SUPPORT AND WORKING POINT.
E= DISTANCE BETWEEN UPPER SUPPORT AND WORKING POINT.

$$S=\frac{X-A\ (D)}{0.57735+A}$$

$$H=\frac{S}{1.7321}$$

NOTES:

1 LINEAR INTERPOLATION USING VALUES IN ADJACENT ROWS MAY BE USED FOR RISES NOT GIVEN.

2 DRIVE UNITS ARE GENERALLY LOCATED WITHIN THE TRUSS OR DIRECTLY BELOW (ALIGNED) WITH THE RESPECTIVE UNITS.

3. SYMBOLS AND ABBREVIATIONS
WP= WORKING POINT
KIP= UNIT OF WEIGHT, 1000 LBS.

4. FIG 6 AND FIG 7 ARE THE CORRECT METHOD OF CALCULATING ESCALATOR RISE AND SPAN WHEN A FLOOR SLOPE IS USED AT MEZZANINE AND TRAIN PLATFORM. THE FINISHED FLOOR SHALL BE LAID AFTER THE ESCALATOR LANDING PLATES ARE IN PLACE.

5. DEFINITION OF WORKING POINTS :
THE WORKING POINTS, UPPER & LOWER, ARE DETERMINED BY THE INTERSECTION OF THE HORIZONTAL PROJECTIONS OF THE UPPER AND LOWER LANDING PLATE ELEVATIONS WITH THE ESCALATOR STEP NOSING LINE. THE LANDING PLATES SHALL BE HORIZONTAL AND AT THE SAME ELEVATIONS AS THE RESPECTIVE FINISH FLOORS.

6. THE FINISH FLOOR SHALL HAVE A TRANSVERSE SLOPE.

7 THE INTERMEDIATE SUPPORTS TO BE EQUIDISTANT BETWEEN THE END SUPPORTS.

8. FOR H>100'–0" COORDINATE WITH AUTHORITY & GEC.

DESIGNED	R. PITSCH	1–71 DATE
DRAWN	R. SKIRBE	1–71 DATE
CHECKED	R. LARSEN	4–71 DATE
APPROVED	R.S. O'NEAL	4–71 DATE
UPDATED	J. BUMANIS	12–98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–063	CLASS "A" UNDERGROUND MEZZANINE TO PLATFORM ESCALATOR AND STRUCTURAL WELLWAY
DD–M–064	CLASS "A" ESCALATOR AND STRUCTURAL WELLWAY
DD–M–065	CLASS "B" ESCALATOR AND STRUCTURAL WELLWAY
DD–M–066	CLASS "C" ESCALATOR AND STRUCTURAL WELLWAY
DD–M–079	ESCALATOR DETAILS, SECTIONS AND SUPPORTS
DD–M–080	ESCALATOR DETAILS AND SUPPORTS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

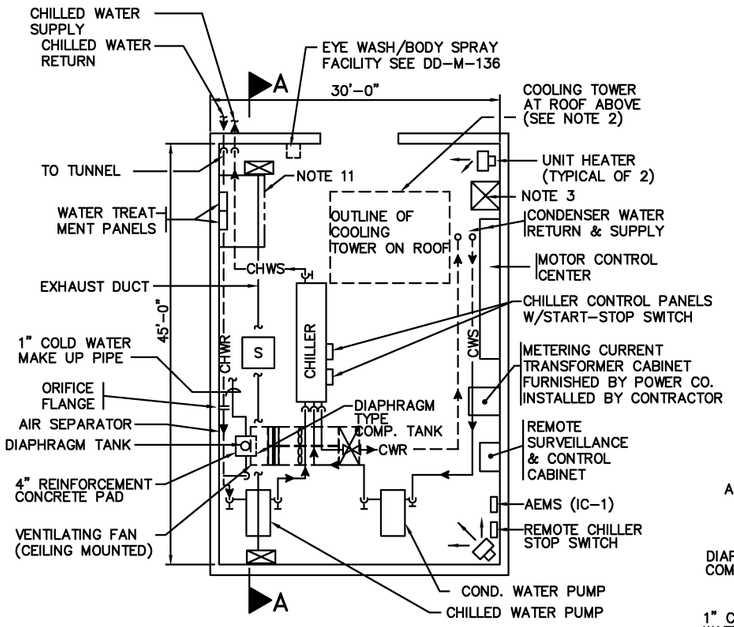
SUBMITTED DATE

APPROVED DIRECTOR May 3, 2001 DATE

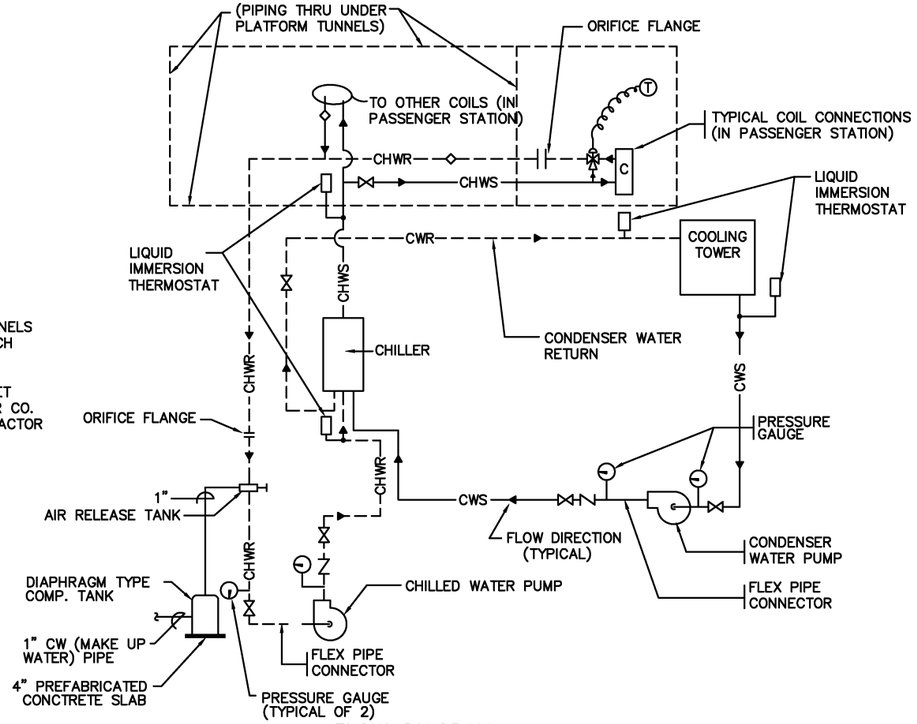
MECHANICAL DESIGN DRAWING
ESCALATOR LOADS AND DETAILS

SCALE NONE

DRAWING NO. DD–M–067



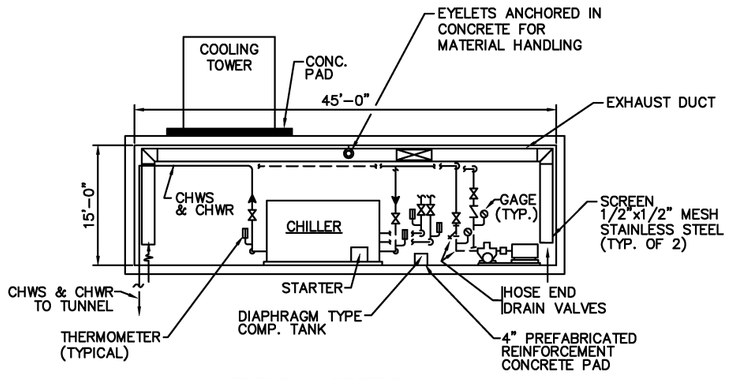
TYPICAL CHILLED WATER PLANT LAYOUT



FLOW DIAGRAM
TYPICAL CHILLED WATER PLANT

GENERAL NOTES

1. CHILLED WATER PLANT LAYOUT SHOWN IS TYPICAL ONLY. THE CHILLED WATER PLANT SHALL BE DESIGNED IN DETAIL BY THE DESIGNER TO SUIT LOCAL CONDITIONS AND AIR CONDITIONING REQUIREMENTS. DIMENSIONS GIVEN ARE MINIMUM TO INSIDE FACE OF WALLS, FLOOR, OR CEILING.
2. MINIMUM 3'-0" X 3'-0" ACCESS HATCH TO COOLING TOWER REQUIRED.
3. LOCATIONS SHOWN FOR ALL EQUIPMENT AND APPURTENANCES ARE FOR PURPOSE OF ILLUSTRATION. RELOCATION MAY BE NECESSARY TO SUIT PARTICULAR REQUIREMENTS.
4. LOCATION OF INTERFACE CABINETS FOR AEMS CONTROLS TO BE COORDINATED WITH TRAIN CONTROL CONTRACTOR.
5. FLOOR DRAINS FOR VARIOUS PIECES OF EQUIPMENT SHALL BE LOCATED TO SUIT ACTUAL LAYOUT. SEE REFERENCE DRAWINGS AND EQUIPMENT SELECTED.
6. LOCATION OF POWER CO. C.T. CABINET, METERING & SERVICE REQUIREMENTS SHALL BE COORDINATED BY THE DESIGNER WITH THE POWER CO. WRITTEN CONCURRENCE SHALL BE OBTAINED PRIOR TO INSTALLATION.
7. BURIED CONDENSER WATER PIPING TO REMOTE COOLING TOWERS SHALL NOT BE INSULATED.
8. BURIED CHILLED WATER SUPPLY AND RETURN PIPING SHALL BE IN CONDUIT.
9. EXPOSED HORIZONTAL RUN OF RETURN WATER LINE TO COOLING TOWER (CWR) SHALL BE HELD TO MINIMUM.
10. PROVIDE HEAT TRACING FOR CONDENSER WATER AND MAKE UP WATER PIPING SUBJECT TO FREEZING.
11. PROVIDE CLEARANCE AROUND WATER TREATMENT PANELS FOR SERVICE AS SHOWN.
12. DESIGNER SHALL DETERMINE LOCATION OF AUTOMATIC AIR VENT TO THE HIGHEST POINT IN THE CHILLED WATER SYSTEM.
13. REFRIGERANT DISCHARGE PIPING FROM RUPTURE DISC ON CHILLER SHALL CONFORM TO ALL APPLICABLE CODES AND SHALL BE TERMINATED IN A MANER THAT DOES NOT PRESENT A HAZARD TO PEOPLE. INSTALL ADEQUATE CAPACITY DIFFUSER FOR DISCHARGE OF REFRIGERANT AND TO PROTECT PIPE INTERIOR AGAINST RAIN. COORDINATE DESIGN AND LOCATION WITH ARCHITECT.
14. PROVIDE VENTILATION SYSTEM TO CONFORM ALL APPLICABLE CODES WITH ONE FAN RUNNING FOR ENTIRE COOLING SEASON. PROVIDE IDENTICAL FANS WITH STEP CONTROLLER TO OPERATE LEAD LAG OPERATION.



TYPICAL SECTION A-A

ARCHITECTURAL TREATMENT OF COOLING TOWERS ON ROOFS

1. SCREENING MATERIALS SHALL PROVIDE ADEQUATELY FOR ANY SOUND DAMPENING REQUIRED IN CASES WHERE FACTORY FABRICATED ATTENUATORS ARE INADEQUATE.
2. MATERIALS SHALL BE IN HARMONY WITH THOSE OF THE BUILDING ON WHOSE ROOF THE COOLING TOWERS ARE PLACED.
3. MINIMUM HEIGHT NECESSARY TO SCREEN THE COOLING TOWERS FROM THE VIEW OF PASSERS-BY, BOTH PEDESTRIAN AND VEHICULAR.

DESIGNED	R. PITSCH	1-25-71 DATE
DRAWN	E. PENNINGTON	1-25-71 DATE
CHECKED	R. LARSEN	4-24-71 DATE
APPROVED	R.S. O'NEAL	4-24-71 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-153	AIR CONDITIONING & VENTILATION SYMBOLS
ST-M-118	CHILLED WATER PLANT DETAILS
DD-M-136	TYPICAL EMERGENCY EYE WASH AND BODY SPRAY FACILITIES

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

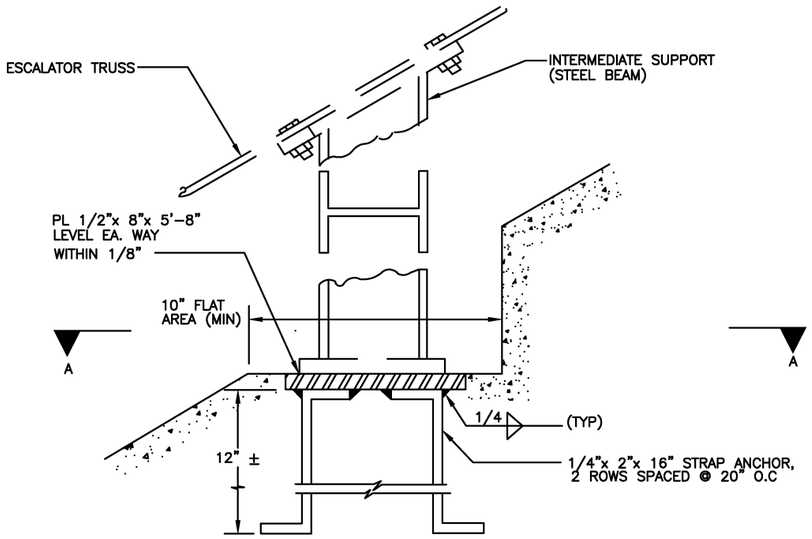
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING

TYPICAL CHILLED WATER PLANT LAYOUT
FOR UNDERGROUND STATIONS

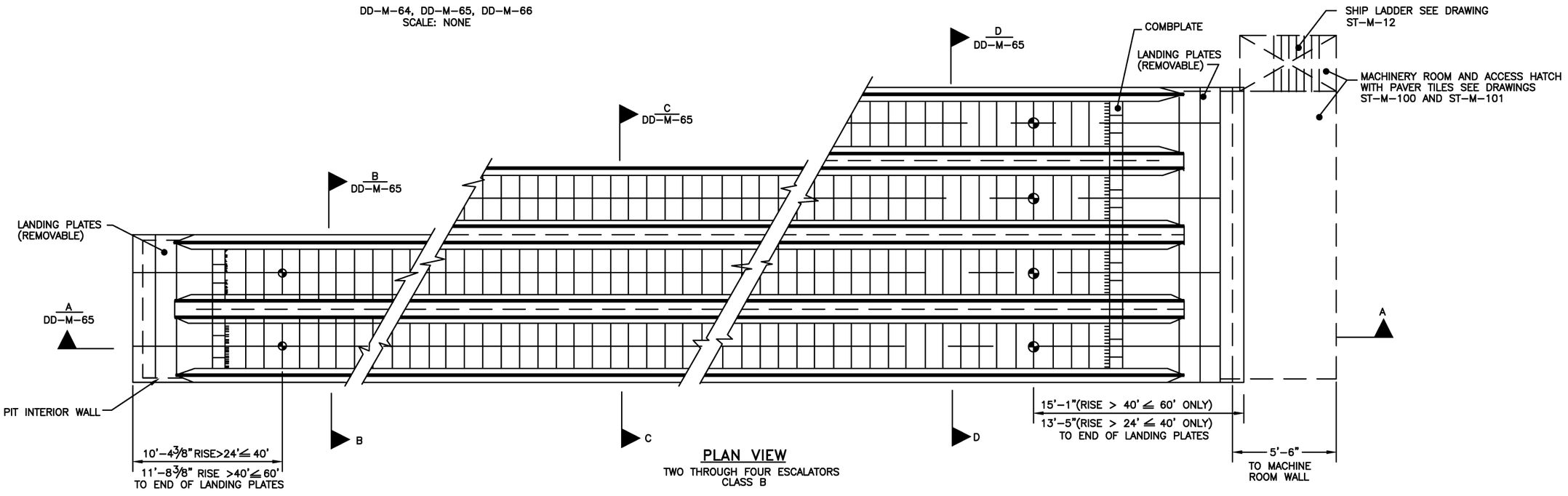
SCALE	DRAWING NO.
NONE	DD-M-68



NOTE: THE INTERMEDIATE SUPPORT RECESS AND BASE PLATE TO BE PROVIDED BY CONTRACTOR.

DETAIL E

DD-M-64, DD-M-65, DD-M-66
SCALE: NONE



PLAN VIEW

TWO THROUGH FOUR ESCALATORS
CLASS B

DESIGNED	R. PITSCH	1-71
DRAWN	E. PENNINGTON	1-71
CHECKED	R. LARSEN	4-71
APPROVED	R.S. O'NEAL	4-71
UPDATED	ENGA	12-98

(DATE)

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-065	CLASS "B" ESCALATOR AND STRUCTURAL WELLWAY
DD-M-066	CLASS "C" ESCALATOR AND STRUCTURAL WELLWAY
DD-M-080	ESCALATOR DETAILS AND SUPPORTS
DD-M-067	ESCALATOR LOADS AND DETAILS

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DATE	BY	DESCRIPTION
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DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

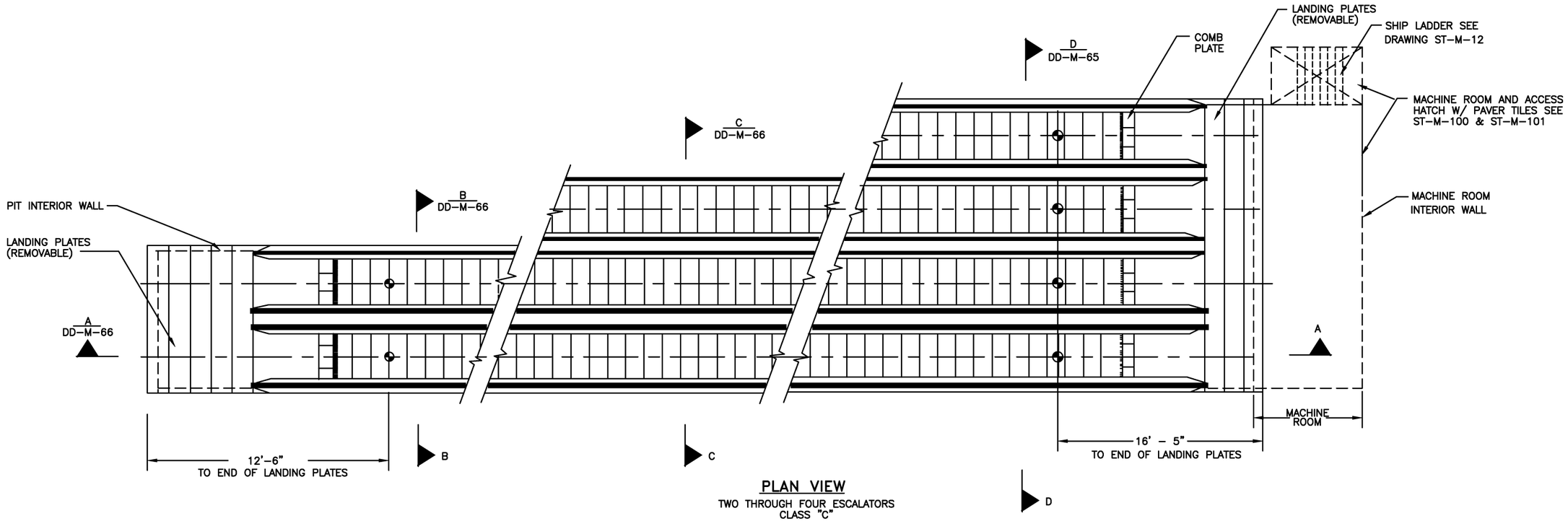
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
ESCALATOR DETAILS SECTIONS AND SUPPORTS

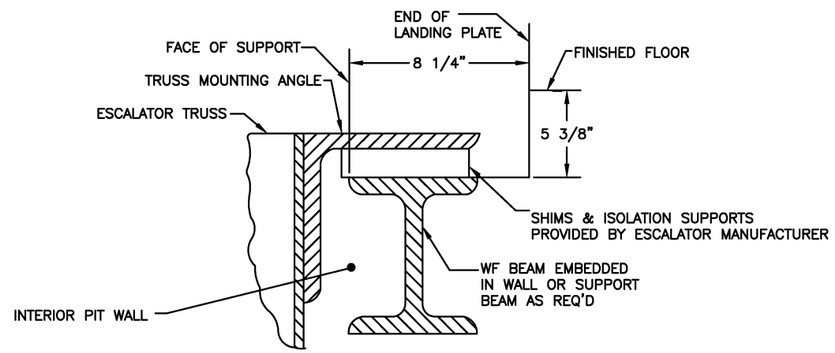
SCALE: NONE

DRAWING NO. DD-M-079



PLAN VIEW

TWO THROUGH FOUR ESCALATORS
CLASS "C"



DETAIL F

DD-M-63, DD-M-64, DD-M-65, DD-M-66

DESIGNED	R. PITSCH	1-71 DATE
DRAWN	E. PENNINGTON	1-71 DATE
CHECKED	R. LARSEN	4-71 DATE
APPROVED	R.S. O'NEAL	6-71 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-063	CLASS "A" ESCALATOR AND STRUCTURAL WELLWAY
DD-M-064	CLASS "A" ESCALATOR AND STRUCTURAL WELLWAY
DD-M-066	CLASS "C" ESCALATOR AND STRUCTURAL WELLWAY
DD-M-079	ESCALATOR DETAILS,SECTIONS AND SUPPORTS
DD-M-067	ESCALATOR LOADS AND DETAILS.

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

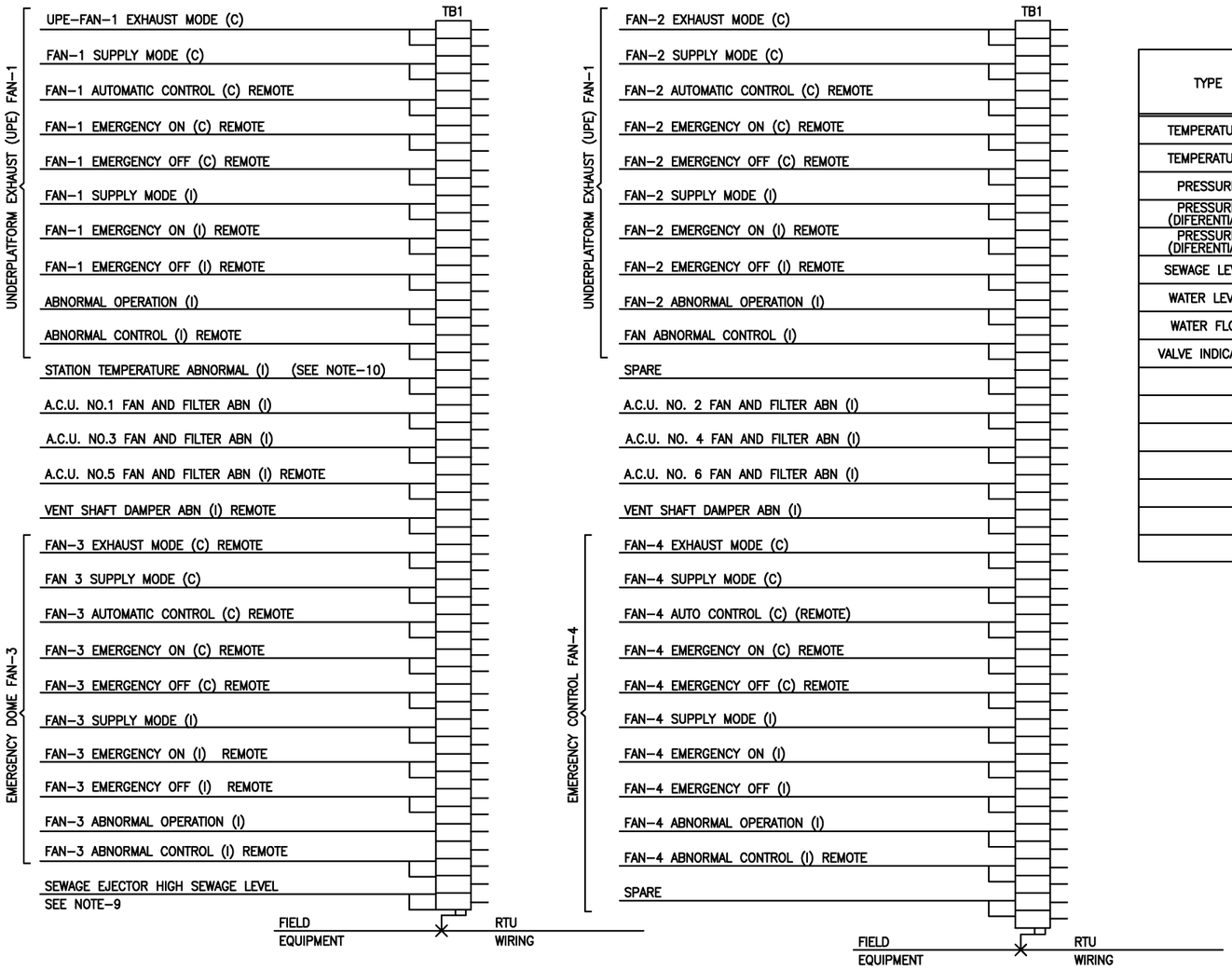
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
ESCALATOR DETAILS AND SUPPORTS

SCALE: NONE

DRAWING NO.: DD-M-080



SWITCHBOARD ROOM (NEAR)

SWITCHBOARD ROOM (FAR)

DTS TERMINALS
FOR STATION AND ADJACENT VENT SHAFTS

SENSOR SCHEDULE

TYPE	FUNCTION	LOCATION	SCALE READING		INDICATION		SCALE INCREMENTS	NOTES BELOW	COMPUTER ALARMS	
			RANGE	ACCURACY	HIGH	LOW			HIGH	LOW
TEMPERATURE	SPACE AIR	TUNNEL AT FAN SHAFT	ALARM INDICATION ONLY		100°	40°	N/A	5, 9	100°	40°
TEMPERATURE	SPACE AIR	STATION PLATFORM	ABNORMAL INDICATION ONLY		95°	N/A	N/A	5, 9	95°	N/A
PRESSURE	CONTROL AIR	DISCHARGE COMPRESSED AIR	NORMAL/ABNORMAL		105 PSIG	90 PSIG	N/A	–	N/A	N/A
PRESSURE (DIFERENTIAL)	AIR FLOW (STATIC PRESSURE)	ACROSS FILTER AND COIL	NORMAL/HIGH		2" WG	1" WG	N/A	6	N/A	N/A
PRESSURE (DIFERENTIAL)	AIR FLOW (VELOCITY PRESSURE)	ACROSS EXHAUST AND F.A. FANS	ALARM INDICATION ONLY		0.4" WG	0.2" WG	N/A	7	N/A	N/A
SEWAGE LEVEL	HIGH LEVEL	SEWAGE EJECTORS	ALARM INDICATION ONLY		–	–	N/A	8	N/A	N/A
WATER LEVEL	HIGH OR LOW WATER	DRAINAGE PUMP STATION	ALARM INDICATION ONLY		–	–	N/A	10	N/A	N/A
WATER FLOW	SPRINKLER LINE FLOW	FIRE PROTECTION SPRINKLER LINE	ALARM INDICATION ONLY		–	–	N/A	11, 13	N/A	N/A
VALVE INDICATOR	VALVE POSITION	MAIN FIRE LINE	ALARM INDICATION ONLY		–	–	N/A	13	N/A	N/A

NOTES:

1. SEE AIR CONDITIONING AND VENTILATION PLANS FOR EXACT LOCATION OF ACU, AND EXHAUST FANS.
2. COORDINATE WITH FILTER AND ACU MANUFACTURERS FOR OPERATING AND ABNORMAL PRESSURES.
3. COORDINATE WITH FAN MANUFACTURERS FOR OPERATING AND ABNORMAL PRESSURES.
4. COORDINATE WITH SEWAGE EJECTOR MANUFACTURER–SELECT PRESSURES TO SUIT SITE.
5. HI – LO INDICATION WILL BE PART OF COMPUTER SOFTWARE PROGRAM
6. COORDINATE WITH FILTER AND COIL MANUFACTURERS.
7. COORDINATE WITH FIRE PROTECTION SYSTEM MANUFACTURER FOR MAXIMUM WATERFLOW PERMISSIBLE.
8. SENSORS PROVIDED BY SEWAGE EJECTOR PUMP MANUFACTURER.
9. TERMINALS TO BE LOCATED IN NEAREST A.C. SWITCHBOARD ROOM.
10. TERMINALS TO BE LOCATED IN A.C. SWITCHBOARD ROOM NEAREST TO TRAIN CONTROL ROOM.
11. LOW – HIGH SCALE READINGS SHALL BE EQUIVALENT TO 3–15 PSI TRANSDUCER OUTPUT.
12. FOR NUMBERING AND ORDER OF TERMINALS SEE ST–TC–10 AND ST–TC–11.
13. NEAR AND FAR ARE RELATIVE TO TRAIN CONTROL ROOM.

DESIGNED J. BICKLEY 5–71
DRAWN ED PENNINGTON 5–71
CHECKED I.M. SOLOMON 6–71
APPROVED R.S. O'NEAL 7–71
UPDATED J. BUMANIS 12–98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–088	STATION AND VENT SHAFT DETAILS
DD–M–097	SUPERVISORY CONTROL AND INDICATION FAN SHAFT, JET FAN, VENT SHAFT AND DRAINAGE PUMP STATION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

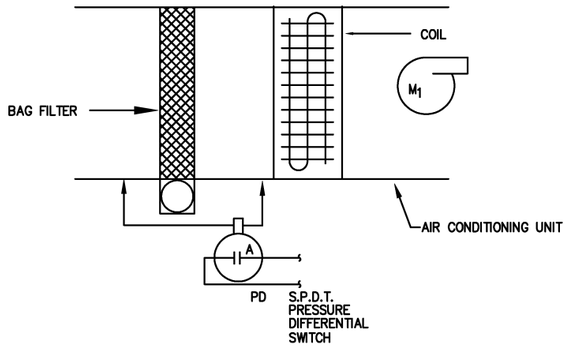
SUBMITTED DATE

APPROVED DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
SUPERVISORY CONTROL AND INDICATION TERMINAL AND SENSOR SCHEDULE

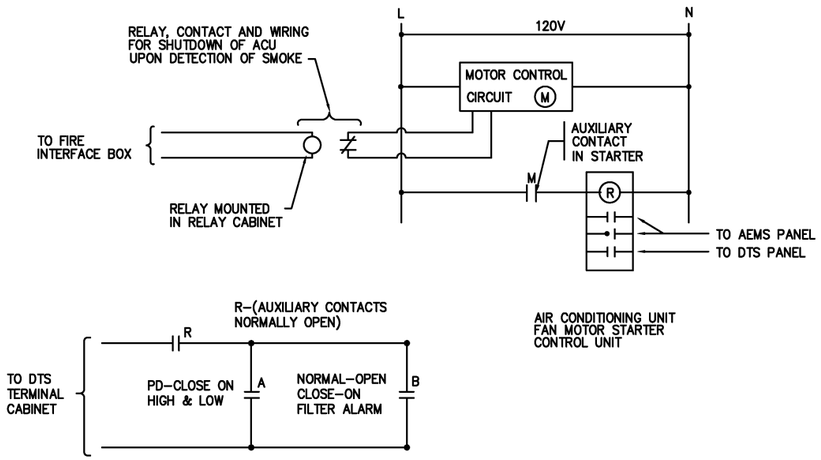
SCALE NONE

DRAWING NO. DD–M–087



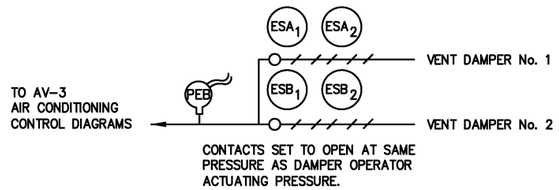
FLOW DIAGRAM

AIR CONDITIONING UNIT, COIL, FAN & FILTER SECTION

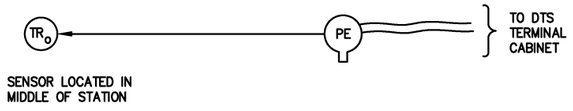


AIR CONDITIONING COIL–FAN

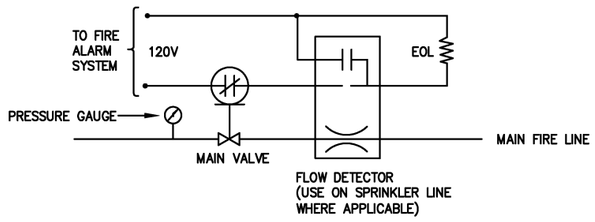
& FILTER SURVEILLANCE WIRING SCHEMATIC



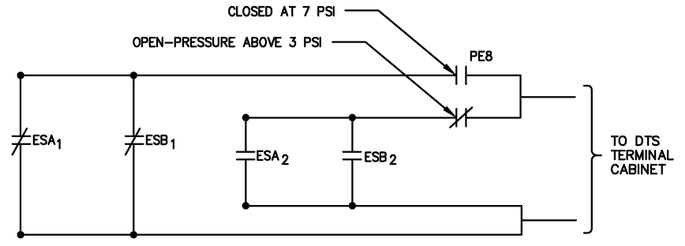
VENT SHAFT CONTROL DIAGRAM



STATION SURVEILLANCE



FIRE PROTECTION SURVEILLANCE



CONTACT WIRING FOR VENT SHAFT

ABNORMAL OPERATION

NOTE:

SYSTEM IS SHOWN FOR TWO VENT DAMPERS. WHERE MORE DAMPERS ARE PROVIDED, PROVIDE ADDITIONAL END SWITCHES. FOR EACH DAMPER MOTOR COORDINATE WITH REFERNCED CONTROL DRAWING FOR NUMBER OF CIRCUIT REQUIRED.

DESIGNED	W.D. BROWN	5–71 DATE
DRAWN	ED PENNINGTON	5–71 DATE
CHECKED	I.M. SOLOMON	6–71 DATE
APPROVED	R.S. O'NEAL	7–71 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–087	TERMINAL AND SENSOR SCHEDULE
ST–TC–DTS–006	DATA TRANSMISSION SYSTEM (DTS) FAN SHAFT & JET FAN INTERFACE CONTROL ROOM
ST–TC–DTS–003	DATA TRANSMISSION SYSTEM (DTS) CABINET A.C. SERVICE SWITCHBOARD ROOM (COMBINED)
ST–TC–DTS–004	DATA TRANSMISSION SYSTEM (DTS) CABINET A.C. SERVICE SWITCHBOARD ROOM (ASAP)
ST–TC–DTS–005	DATA TRANSMISSION SYSTEM (DTS) CABINET A.C. SERVICE SWITCHBOARD ROOM (FAR)
ST–TC–DTS–002	VENT SHAFT & DRAINAGE PUMP STATION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

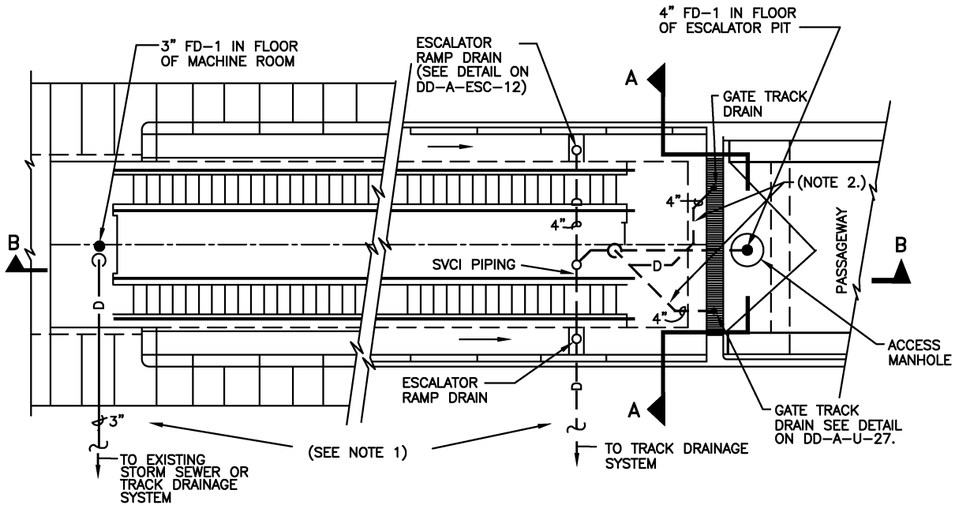
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

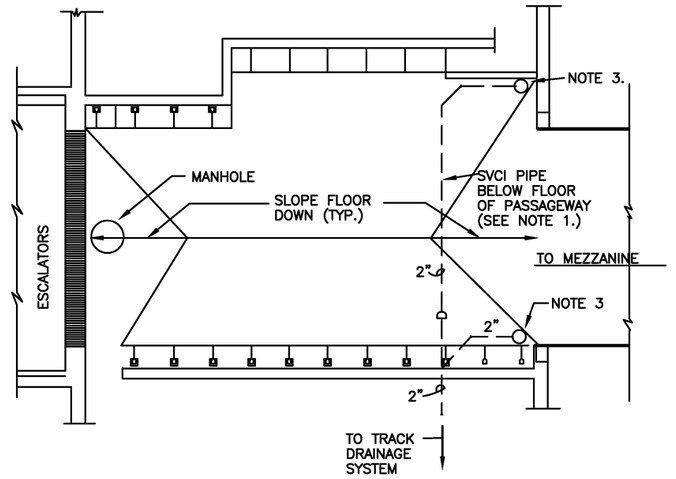
APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
SUPERVISORY CONTROL AND INDICATION STATION AND VENT SHAFT DETAILS

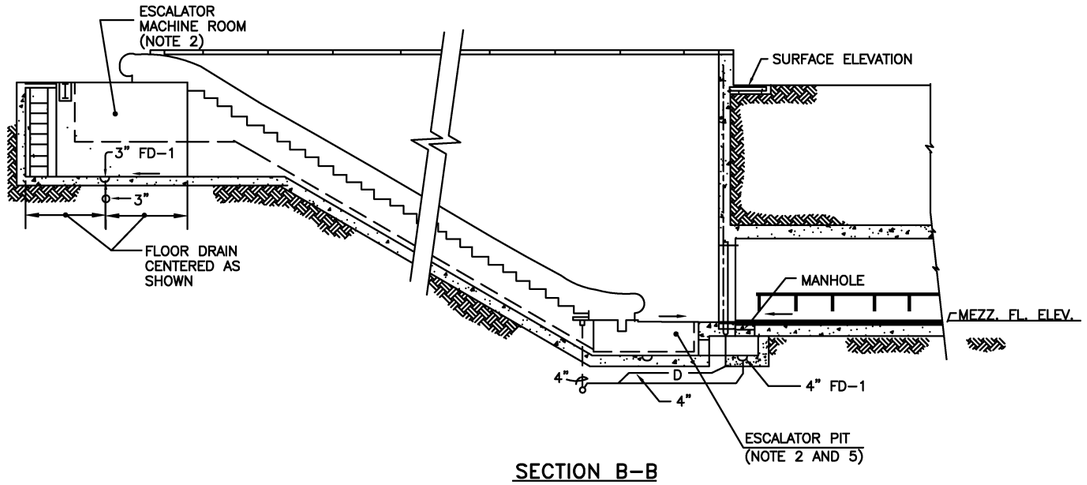
SCALE	DRAWING NO.
NONE	DD–M–088



SURFACE ENTRANCE TO PASSAGEWAY PLAN

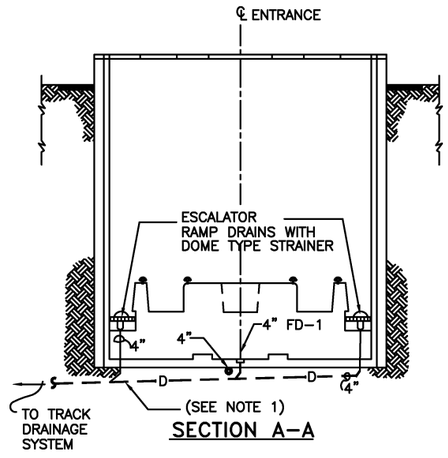


TYPICAL PASSAGEWAY PLAN



SECTION B-B

SURFACE ENTRANCE TO PASSAGEWAY SECTION
(SEE NOTE 1.)



SECTION A-A

GENERAL NOTES

1. DESIGNER SHALL MODIFY THE GENERAL PIPING ARRANGEMENTS SHOWN TO SUIT LOCAL CONDITIONS.
2. ALL PIPING SHALL RUN CLEAR OF ESCALATOR PIT AND MACHINE ROOM (OUTSIDE OF/OR BELOW FLOOR).
3. PASSAGEWAY DRAIN IN ACCORDANCE WITH DWG. ST-M-53.
4. FOR SYMBOLS AND ABBREVIATIONS REFER TO DWG DD-M-155
5. PROVIDE GREASE INTERCEPTOR IN DRAIN SYSTEM CONNECTING TO STORM DRAIN SYSTEM PER LOCAL CODE.

DESIGNED	P.E. EASLEY	7-71 DATE
DRAWN	C.A. GRAHAM	7-71 DATE
CHECKED	I.M. SOLOMON	8-71 DATE
APPROVED	J. HIDMAN	8-71 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-149	DRAINAGE DETAILS AND CASTINGS SHT.1
DD-M-152	DRAINAGE DETAILS AND CASTINGS SHT.4
DD-M-155	PLUMBING AND FIRE PROTECTION SYMBOLS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

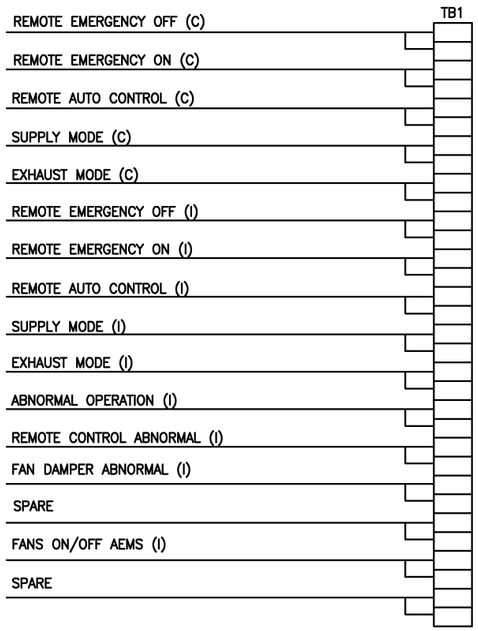
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
TYPICAL DRAINAGE DETAILS FOR ENTRANCES TO UNDERGROUND STATIONS

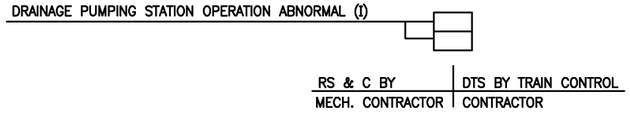
SCALE 1"/8=1'-0"

DRAWING NO. DD-M-096



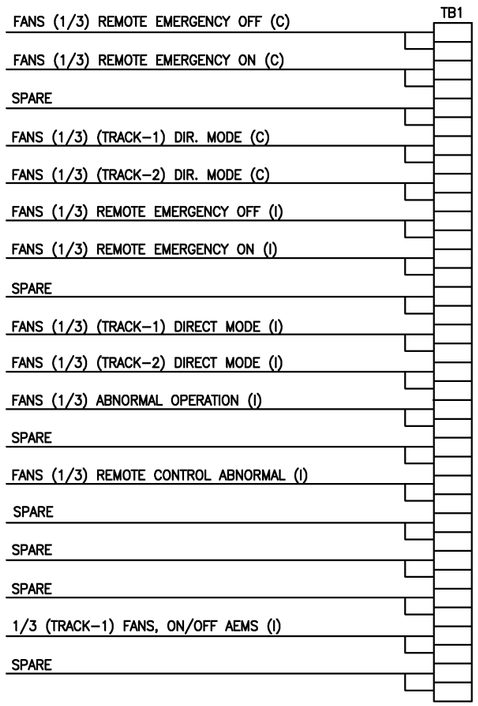
FIELD EQUIPMENT	RTU WIRING

TUNNEL FAN SHAFT



RS & C BY MECH. CONTRACTOR	DTS BY TRAIN CONTROL CONTRACTOR

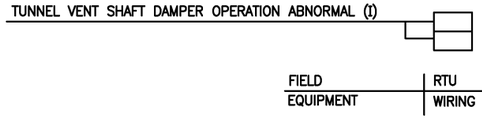
DTS TERMINAL IN DRAINAGE PUMP STATION



FIELD EQUIPMENT	RTU WIRING

JET FANS (1&3) ON TRACK-1

(NOTE 2)

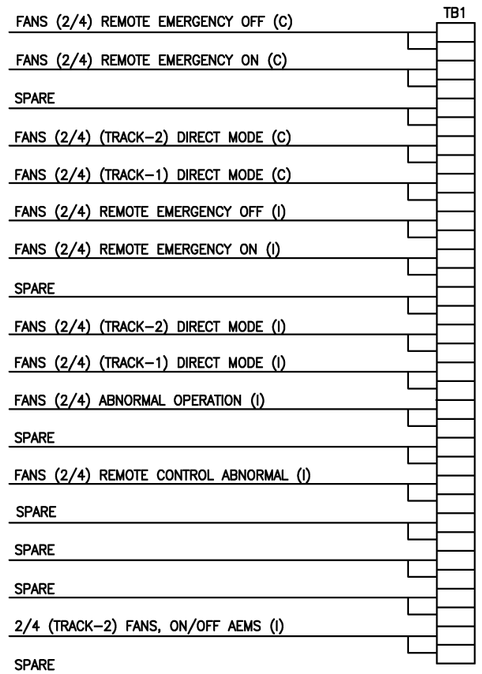


FIELD EQUIPMENT	RTU WIRING

DTS TERMINAL IN TUNNEL VENT SHAFT

NOTE:

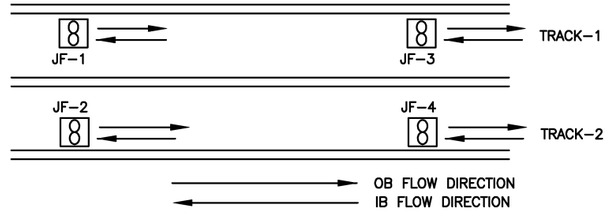
1. FOR NUMBERING AND ORDER OF TERMINALS SEE DRAWING ST-TC-18.
2. JET FANS 1 AND 3 SERVING TRACK-1 JET FANS 2 AND 4 SERVING TRACK-2. SEE FLOW DIAGRAM.
3. THE SECTION DESIGNER TO CONFIRM THE TRACK NUMBER WITH WMATA.



FIELD EQUIPMENT	RTU WIRING

JET FANS (2&4) ON TRACK-2

(NOTE 2)



JET FAN FLOW DIAGRAM (TYP. FOR JF-1 THROUGH JF-4)

DESIGNED	R. PATEL	9-98 DATE
DRAWN	C.BUITRAGO	9-98 DATE
CHECKED	J. BUMANIS	9-98 DATE
APPROVED	R.GANERIWAL	9-98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
ST-M-148	STANDARD CONTROL AND FLOW DAIGRAM JET FANS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
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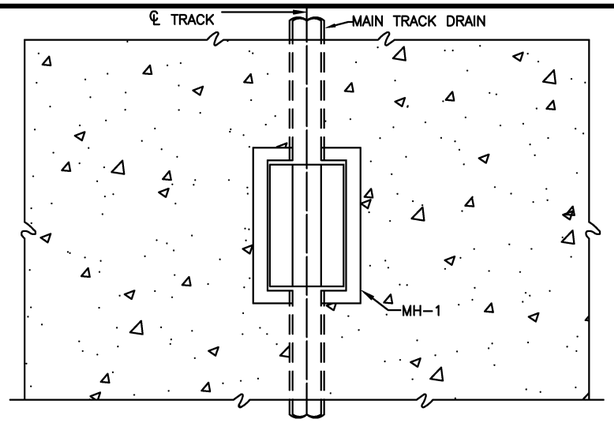
SUBMITTED _____ DATE

APPROVED DIRECTOR _____ May 3, 2001 DATE

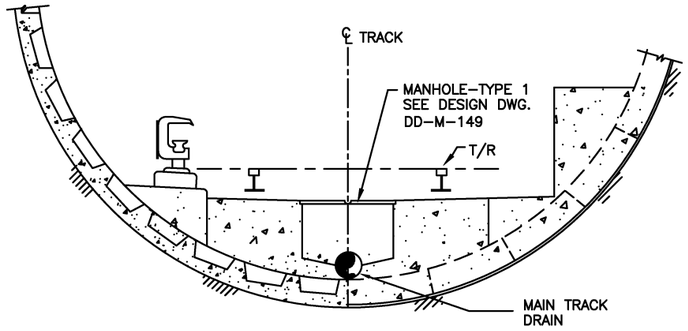
MECHANICAL DESIGN DRAWING
SUPERVISORY CONTROL AND INDICATION FAN SHAFT, JET FAN, VENT SHAFT AND DRAINAGE PUMP STATION

SCALE: NONE

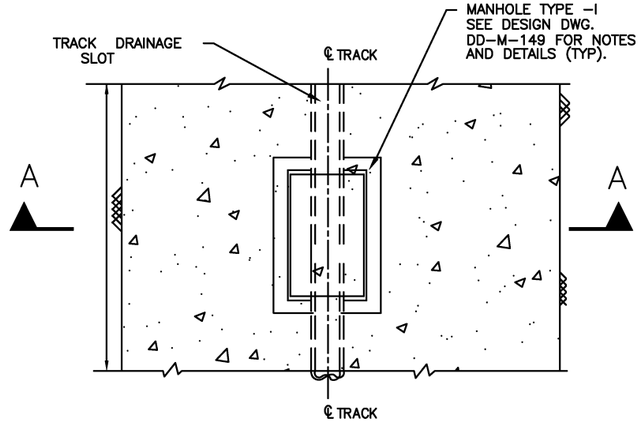
DRAWING NO.: DD-M-097



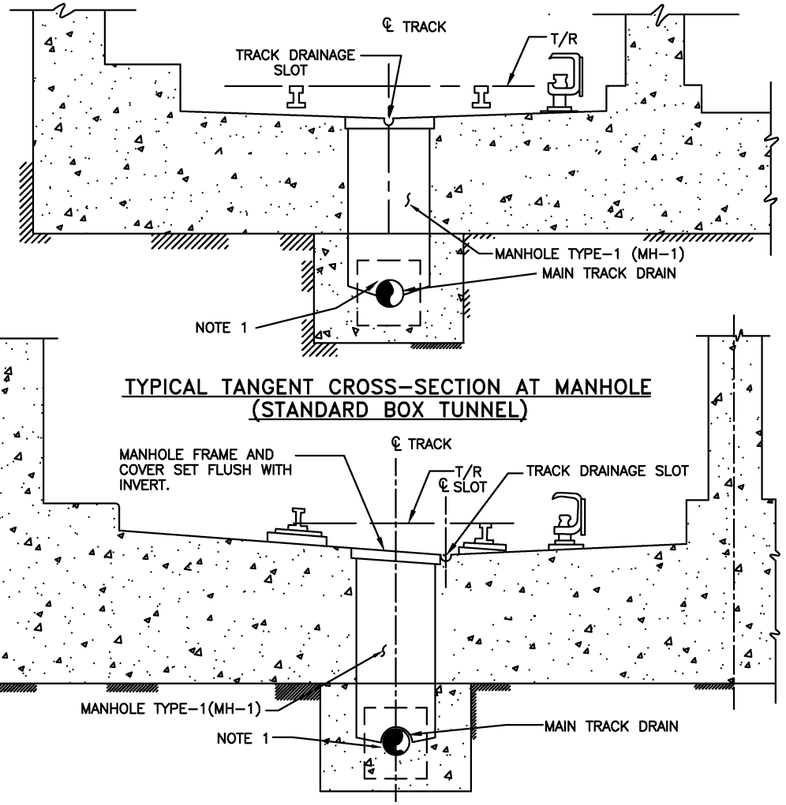
PARTIAL PLAN
(STANDARD BOX TUNNEL)



TYPICAL TANGENT CROSS-SECTION
FOR PRECAST CONCRETE LINED CIRCULAR TUNNEL

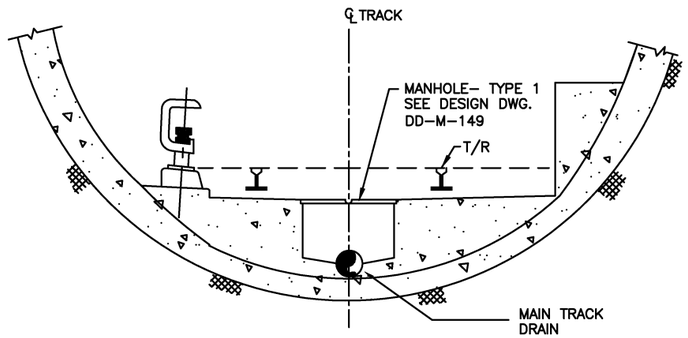


PARTIAL PLAN
(SUPERELEVATED CIRCULAR TUNNEL)

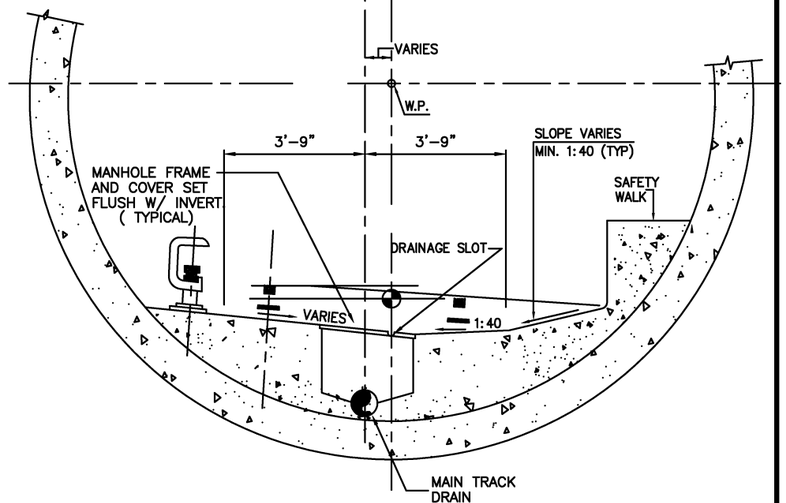


TYPICAL TANGENT CROSS-SECTION AT MANHOLE
(STANDARD BOX TUNNEL)

TYPICAL SUPERELEVATED CROSS-SECTION AT DRAIN INLET
& MANHOLE
STANDARD BOX SECTION



TYPICAL TANGENT CROSS-SECTION
FOR CONCRETE LINED CIRCULAR TUNNEL



SECTION A-A

TYPICAL SUPERELEVATED CROSS-SECTIONS
FOR CONCRETE LINED CIRCULAR TUNNEL

GENERAL NOTES

1. MAIN TRACK DRAIN TREATMENT AT MANHOLES AS PER DWG. DD-M-149
2. REFER TO DRAWING NO. DD-M-155 FOR ABBREVIATIONS USED ON THIS DRAWING.

DESIGNED	P. EASLEY	10-71 DATE
DRAWN	A. BURNS	10-71 DATE
CHECKED	I.M. SOLOMON	2-72 DATE
APPROVED	R.S. O'NEAL	2-72 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-M-149	DRAINAGE DETAILS AND CASTINGS SHEET 1
DD-M-155	PLUMBING AND FIRE PROTECTION SYMBOLS

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

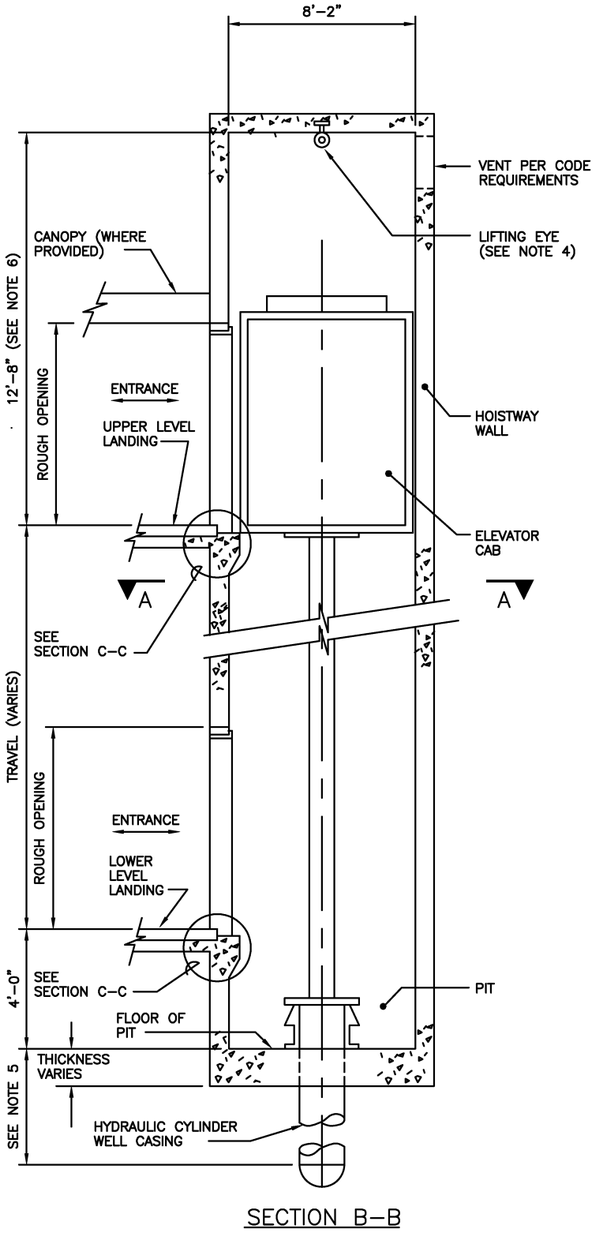
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

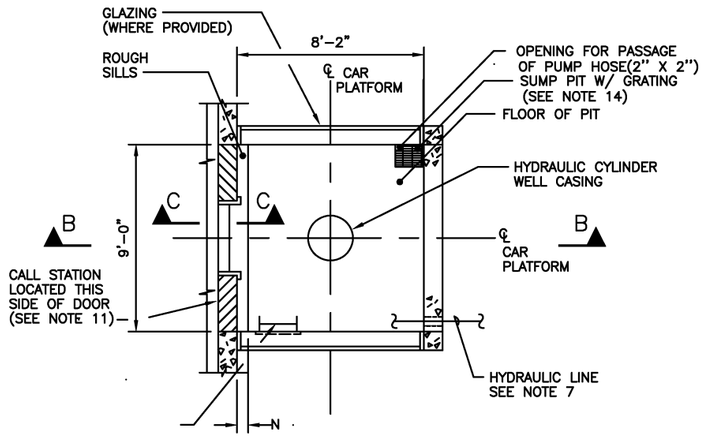
APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
TYPICAL DRAINAGE CROSS-SECTIONS & DETAILS FOR STD.BOX & CIRCULAR TUNNEL

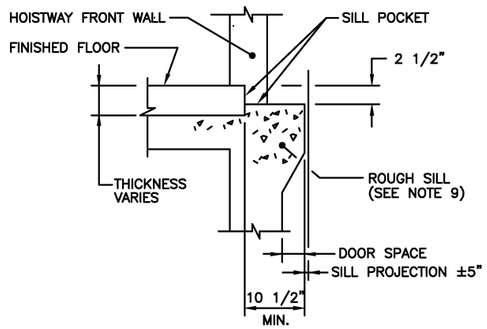
SCALE	DRAWING NO.
1/2"=1'-0"	DD-M-098



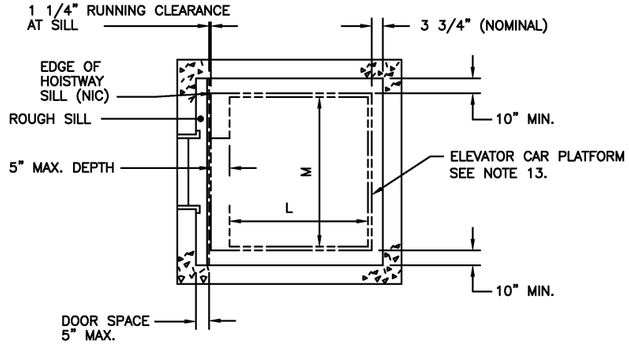
SECTION B–B



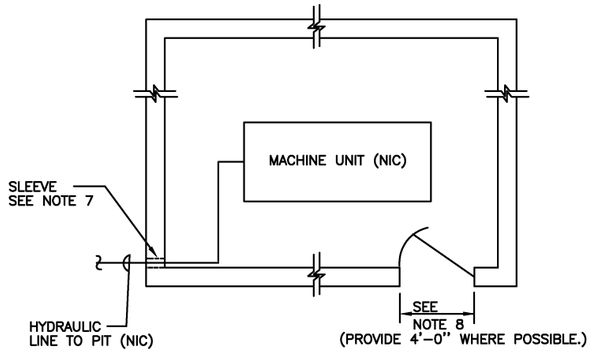
SECTION A–A



SECTION C–C : ROUGH SILL



HOISTWAY/CAR INTERIOR DESIGN ALLOWANCES



ELEV. MACHINE ROOM PLAN
(SEE NOTE 3)

ABBREVIATIONS

I.D.	–	INSIDE DIAMETER	MAX.	–	MAXIMUM
FRT.	–	FRONT	FT.	–	FEET
ADJ.	–	ADJACENT	HEADRM.	–	HEAD ROOM
MIN.	–	MINIMUM	NIC	–	NOT IN CONTRACT

NOTES:

1. SEE ARCHITECTURAL DESIGN DRAWINGS FOR ADDITIONAL DETAILS AND GLASS/STEEL HOISTWAY CONSTRUCTION.
2. MACHINE ROOM MAY BE LOCATED REMOTE FROM THE HOISTWAY.
3. MINIMUM MACHINE ROOM DIMENSIONS FOR A SINGLE HYDRAULIC ELEVATOR ARE 12'– 0" BY 12'–0" BY 9'–0" HIGH.MINIMUM MACHINE ROOM DIMENSIONS FOR A SINGLE MACHINE ROOM SERVING TWO HYDRAULIC ELEVATORS ARE 12' BY 18'–0" BY 9'–0" HIGH.
4. LIFTING EYE SHALL BE DESIGNED FOR 1500 POUNDS CAPACITY. LOCATION SHALL BE DETERMINED BY ELEVATOR CONTRACTOR.
5. DEPTH OF HYDRAULIC CYLINDER WELL CASING EQUALS ELEVATOR TRAVEL PLUS 7 FEET.
6. MAINTAIN CLEAR HEAD ROOM ABOVE CAB AS NECESSARY TO PROVIDE REFUGE AREA AS REQUIRED BY ASME A17.1.
7. PROVIDE 10" DIAMETER STRAIGHT CONDUIT FOR FUTURE HYDRAULIC LINES. ARRANGE CONDUIT TO ALLOW REMOVAL OS HYDRAULIC LINES.PROVIDE SLEEVES SIZED TO ACCEPT WALL PENETRATIONS. WALL PENETRATIONS.
8. REFER TO DD–A–SC–8 FOR DOOR TYPE AND SIZES.
9. UPPER AND LOWER LANDING ROUGH SILL MAY BE CONCRETE AS SHOWN OR 3/8" MINIMUM THICK ANGLE.
10. THE HOISTWAY SILL IS TO BE FURNISHED AND INSTALLED BY THE ELEVATOR CONTRACTOR.
11. THE HOISTWAY ENTRANCE CLADDING AND CUT–OUTS FOR ELEVATOR CONTROLS IN ENTRANCE CLADDING BY ELEVATOR CONTRACTOR, EXCEPT FOR CUT–OUTS IN EXTRUDED BRONZE CLADDING ON CONCRETE HOISTWAY AT STREET LEVEL WHICH ARE PROVIDED BY STATION CONTRACTOR.
12. PROVIDE HIGH WATER ALARM IN SUMP PIT REPORTING IN KIOSK
13. THE OVERALL CAR (OUTSIDE TO OUTSIDE) SIZE IS 7'–4" x 7'–4".
14. SUMP PIT CAPACITY TO EQUAL THE VOLUME OF OIL REQUIRED TO LIFT THE ELEVATOR TO THE TOP LANDING PLUS A RESERVE OF 10 GALLONS.

DESIGNED	D.W. HOWE	12–71 DATE
DRAWN	A.J. BURNS	12–71 DATE
CHECKED	I.M. SOLOMON	7–72 DATE
APPROVED	R. O'NEAL	8–72 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

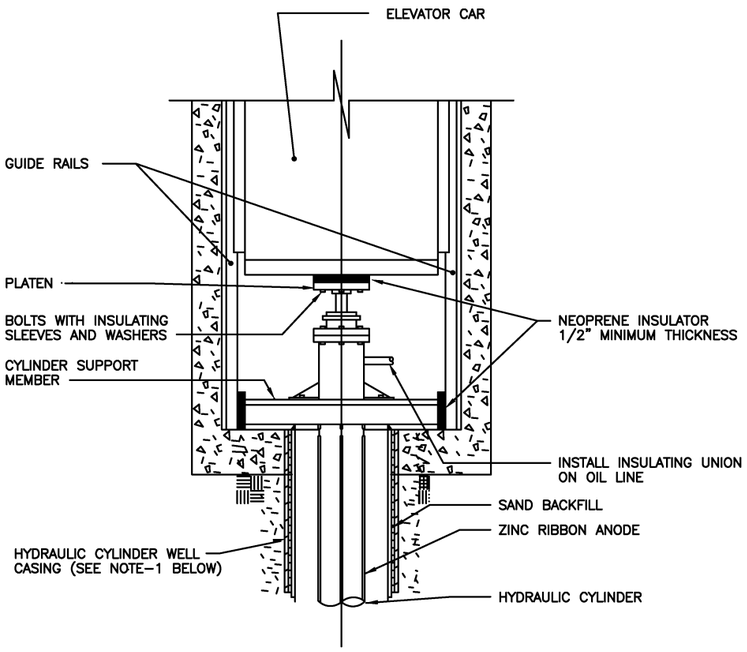
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
HYDRAULIC ELEVATOR INSTALLATIONS
ELEVATOR PLANS AND SECTIONS

SCALE N.T.S

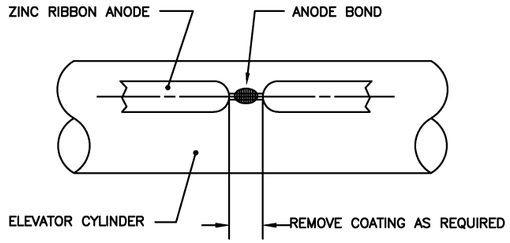
DRAWING NO. DD–M–108



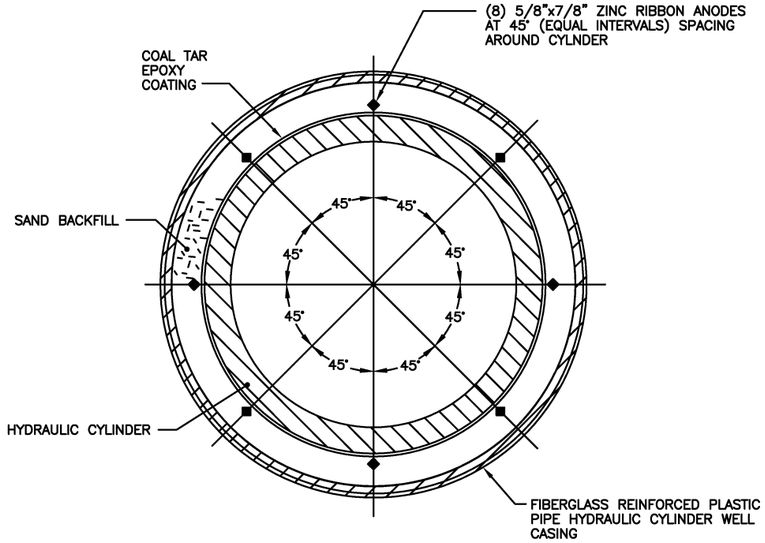
PARTIAL ELEVATION

DIELECTRIC INSULATION
FOR HYDRAULIC ELEVATORS

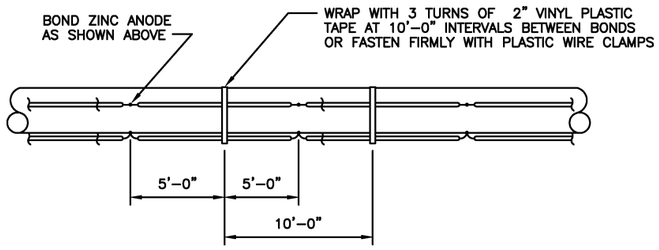
NOTE:
1. HYDRAULIC CYLINDER WELL CASING SHALL BE FIBERGLASS PLASTIC PIPE.



ANODE ATTACHMENT



ANODE ORIENTATION



BOND SPACING

DESIGNED	P. HORT	3-26-73 DATE
DRAWN	G. HARRISON	3-26-73 DATE
CHECKED	DON HOWE	3-26-73 DATE
APPROVED	R.S. O'NEAL	2-8-74 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
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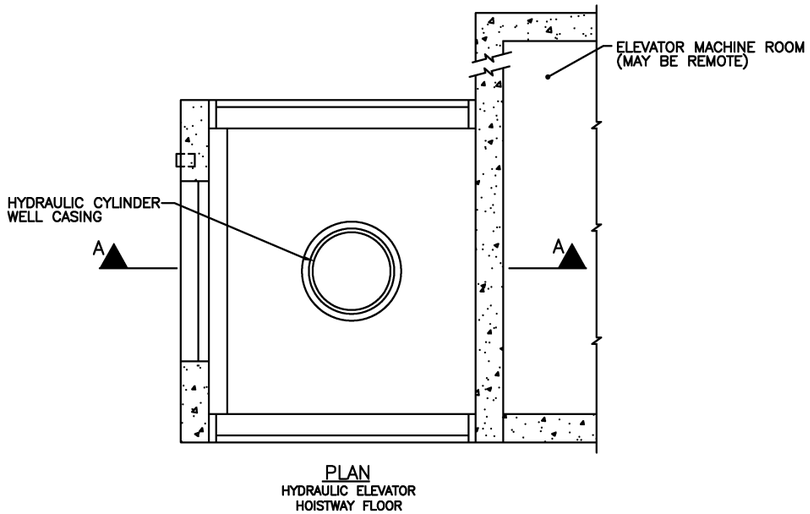
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

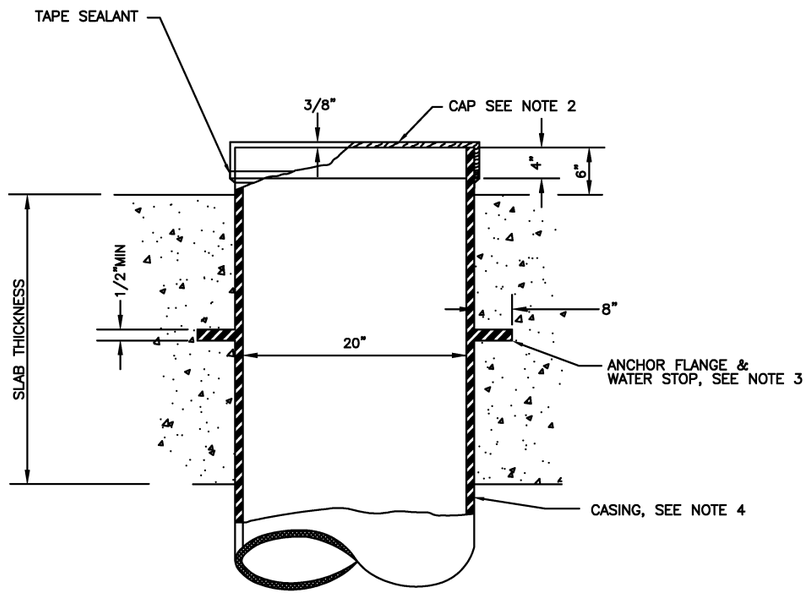
MECHANICAL DESIGN DRAWING
CATHODIC PROTECTION DETAILS FOR WMATA HYDRAULIC ELEVATORS

SCALE N.T.S

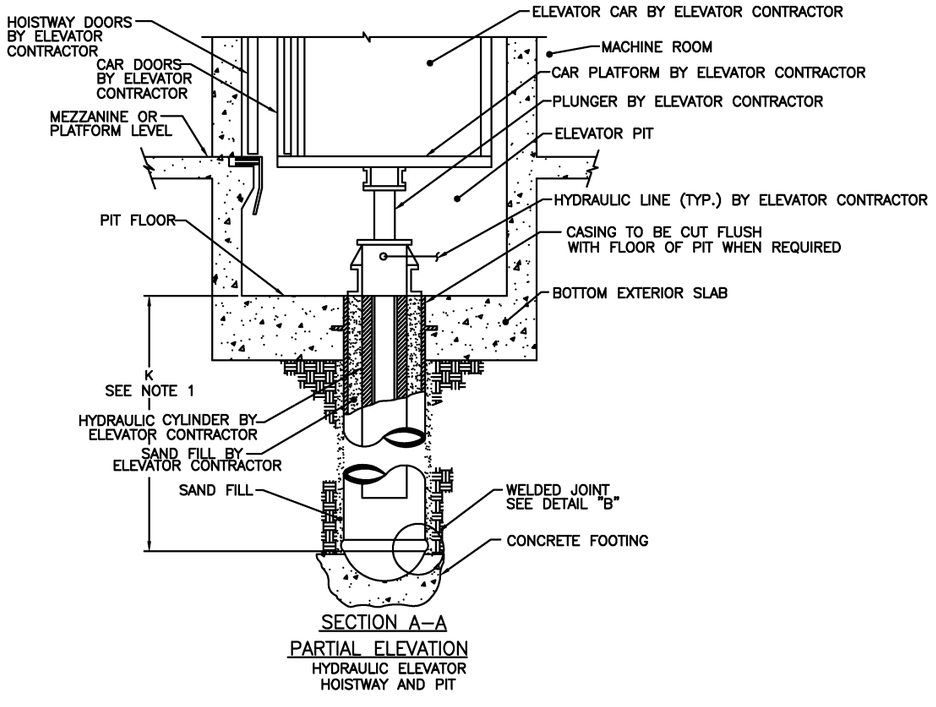
DRAWING NO. DD-M-122



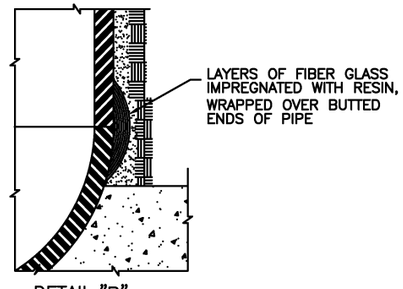
PLAN
HYDRAULIC ELEVATOR
HOISTWAY FLOOR



DETAIL "A"
HYDRAULIC CYLINDER WELL
CASING W/ CAPPED TOP END



SECTION A–A
PARTIAL ELEVATION
HYDRAULIC ELEVATOR
HOISTWAY AND PIT



DETAIL "B"
WELDED JOINT

NOTES:

1. THE DEPTH OF HYDRAULIC CYLINDER WELL CASING (DIMENSION K) EQUALS TRAVEL OF ELEVATOR +7'–0".
2. CAP IS FOR THE PROTECTION OF THE WELL UNTIL TIME OF REMOVAL WHEN ELEVATOR IS INSTALLED. THE CAP IS ONLY REMOVED BY ELEVATOR CONTRACTOR.
3. ANCHOR FLANGE & WATER STOP HAS TO BE DESIGNED TO WITHSTAND THE UP LIFT PRESSURE FROM WATER, WHEN CASING IS EMPTY AND THE WEIGHT OF SAND ETC, WHEN THE CYLINDER IS INSTALLED.
4. WALL THICKNESS OF PIPE, COUPLINGS AND CAP SHALL BE DESIGNED TO WITH STAND THE EARTH AND HYDROSTATIC PRESSURE TO WHICH IT WILL BE EXPOSED BUT SHALL NOT BE LESS THAN 0.375 INCH. THE WALL THICKNESS SHALL BE DESIGNED WITH A SAFETY FACTOR OF FIVE AFTER INSTALLATION OF ELEVATOR CYLINDER AND SAND FILL. A SAFETY FACTOR OF TWO IS REQUIRED FOR THE TEMPORARY CONDITION WHICH WILL EXIST PRIOR TO INSTALLATION OF CYLINDER AND SAND FILL. TEST PRESSURE SHALL BE 125% OF MAXIMUM ANTICIPATED EXTERNAL PRESSURE. CALCULATIONS ESTABLISHING WALL THICKNESS AND TEST PRESSURE TO BE FURNISHED BY SECTION DESIGNER.

DESIGNED	A.S. GILL	9–73 DATE
DRAWN	G.I. HARRISON	9–73 DATE
CHECKED	T. HANSEN	7–74 DATE
APPROVED	R.S. O'NEAL	1–75 DATE
UPDATED	J. BUMANIS	12–98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority
9/2000	SYSP	Revised and issued by the Authority

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DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

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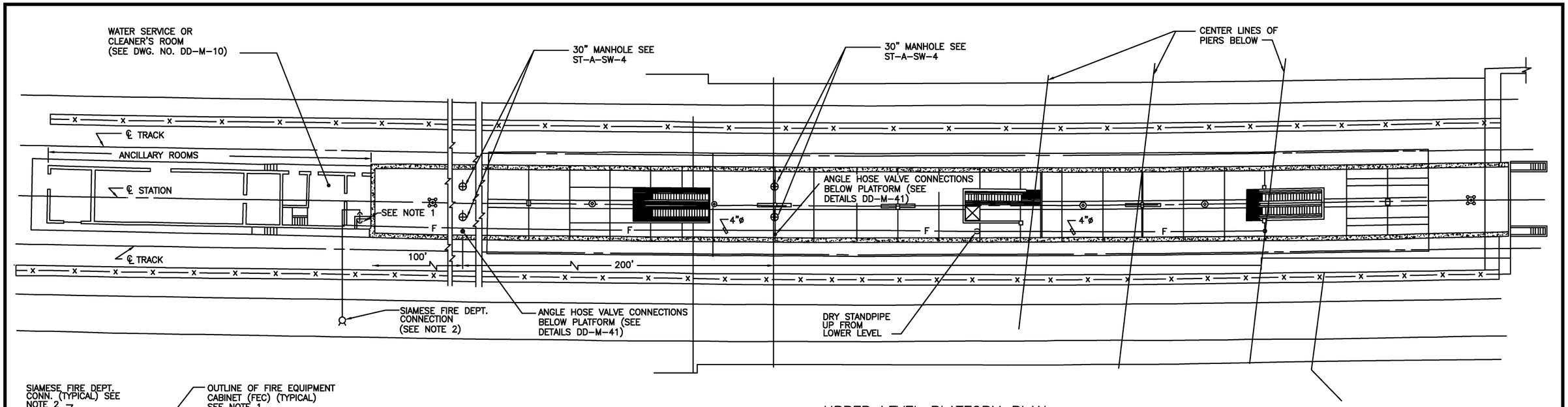
APPROVED _____ DIRECTOR May 3, 2001 DATE

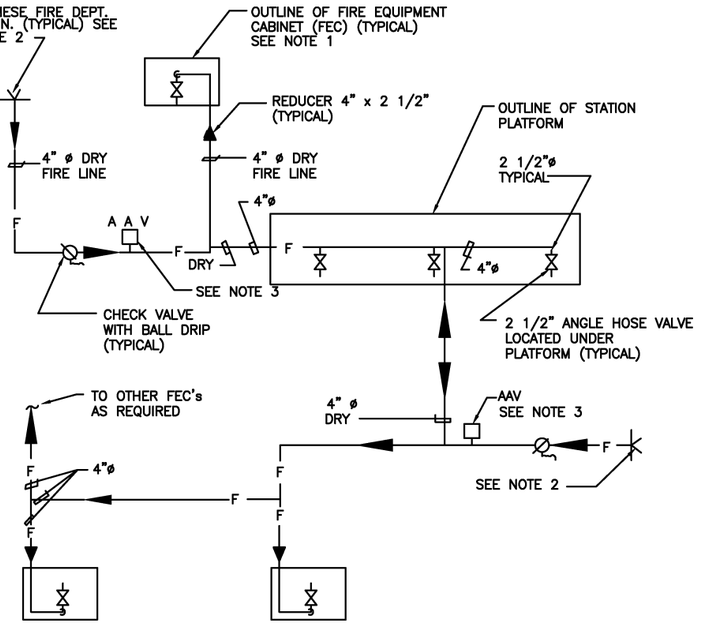
MECHNICAL DESIGN DRAWING
FIBERGLASS REINFORCED PLASTIC WELL CASING FOR HYDRAULIC ELEVATOR CYLINDER

SCALE N.T.S

DRAWING NO. DD–M–123

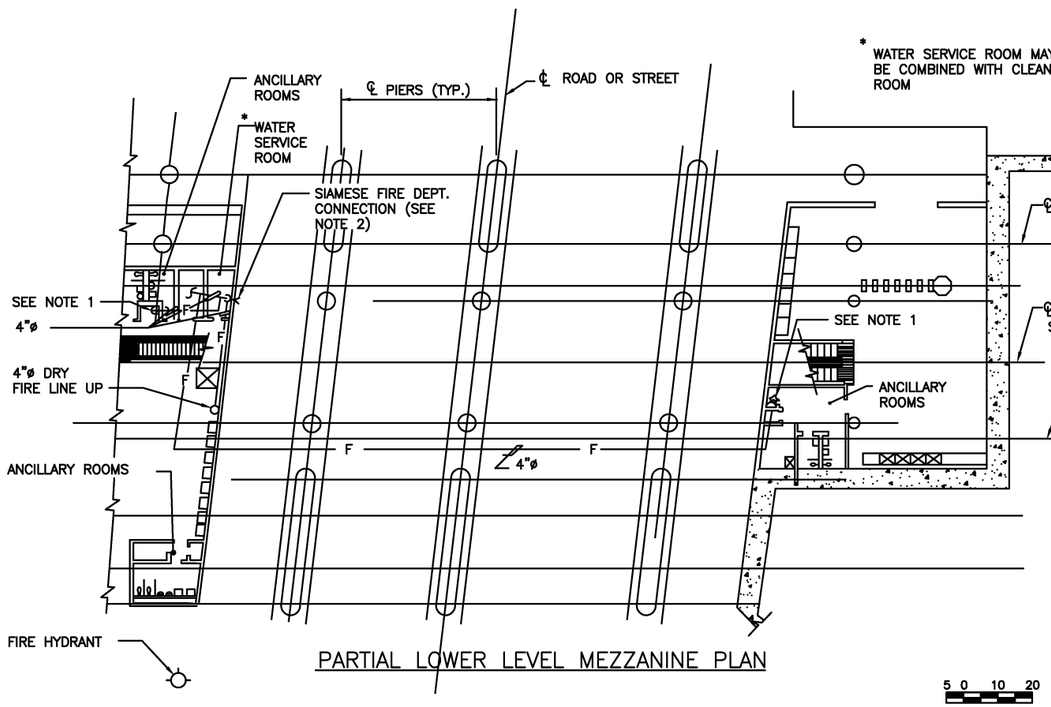


UPPER LEVEL PLATFORM PLAN



SCHEMATIC ARRANGEMENT OF FIRELINES

NO SCALE



PARTIAL LOWER LEVEL MEZZANINE PLAN

5 0 10 20
AND AS NOTED

GENERAL NOTES

1. 2 1/2" ANGLE HOSE VALVE IN FIRE EQUIPMENT CABINET
2. FREE STANDING OR WALL MOUNTED AS REQUIRED (DRAWING NO. DD–M–41) ONLY ONE SIAMESE NORMALLY REQUIRED, COORDINATE WITH LOCAL FIRE DEPARTMENT.
3. PROVIDE AUTOMATIC AIR VENT IN PIPING SYSTEM ON END OPPOSITE THE SIAMESE FIRE DEPT. CONNECTION.
4. 90° TURNS SHOULD BE ANCHORED TO WITHSTAND REACTION FORCES AT FULL FLOW CONDITIONS.
5. PROVIDE ANGLE HOSE VALVE AT MAXIMUM 200 FOOT INTERVALS.
6. REFER TO DWG. NO. DD–M–155 FOR SYMBOLS AND ABBREVIATIONS.

DESIGNED	D. LEWIS W. ELL	2–76 DATE
DRAWN	D.H. KERR	2–76 DATE
CHECKED	D. HOWE	3–76 DATE
APPROVED	T. HANSEN	3–76 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–155	PLUMBING AND FIRE PROTECTION SYMBOLS
ST–A–SW–004	ARCHITECTURAL STANDARD DRAWING
	OUTLET PLAQUE AND MANHOLE SECTION NO.

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

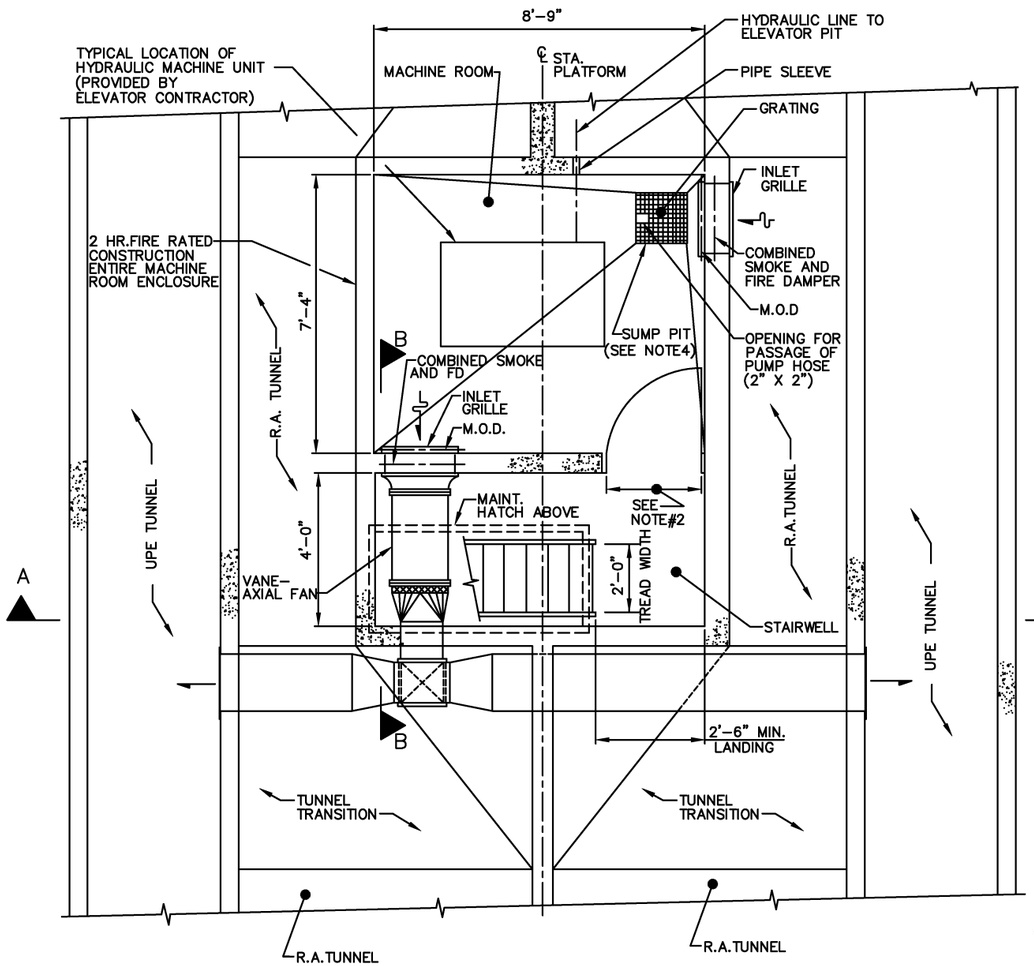
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
TYPICAL DRY STANDPIPE SYSTEM

SCALE	DRAWING NO.
1"=20'–0"	DD–M–124

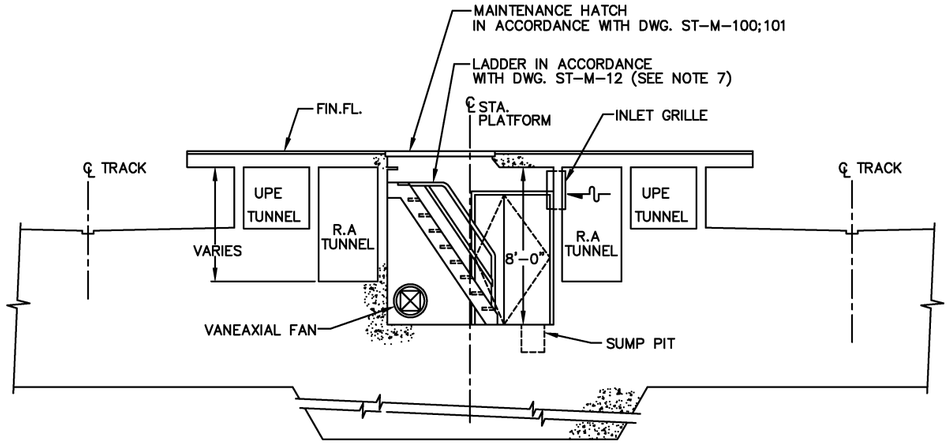


ELEVATOR MACHINE RM PLAN

NOT TO SCALE

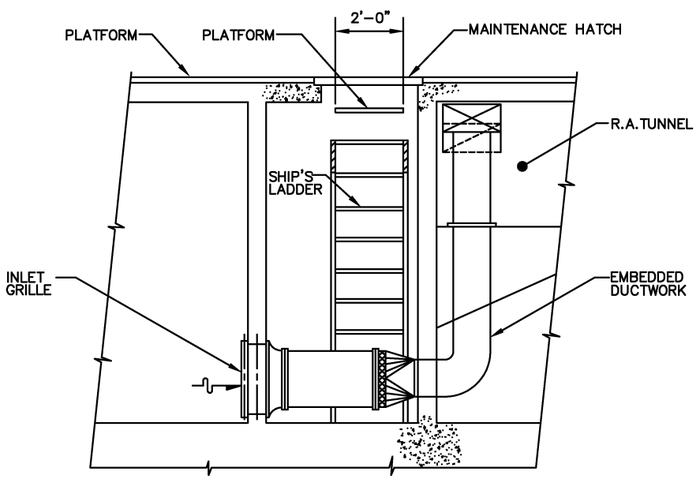
ABBREVIATIONS

UPE	UNDERGROUND PLATFORM EXHAUST
R.A.	RETURN AIR
M.O.D	MOTOR OPERATED DAMPER
F.D.	FIRE DAMPER



SECTION A–A

NOT TO SCALE



SECTION B–B

NOT TO SCALE

REFER TO DD–A–SC–8 FOR DOOR TYPE & SIZE

NOTES:

1. THE MACHINE ROOM SHOULD BE LOCATED AS CLOSE AS POSSIBLE TO THE ASSOCIATED ELEVATOR PIT.(DESIGNER SHALL CONSIDER LOCATING ELEVATOR MACHINE ROOM IN THE ANCILLARY SPACE IF ECONOMICALLY FEASIBLE.
   REFER TO DD–A–SC–8 FOR DOOR TYPE AND SIZE.
2. 1'–6" WIDE LEAF OF DOUBLE DOOR SHALL BE EITHER AN INACTIVE SEMI–FIXED LEAF OR REMOVABLE PANEL.
3. THE MACHINE ROOM DOUBLE DOOR SHALL BE A HOLLOW METAL 'B' LABEL FIRE DOOR SUITABLE FOR A CLASS 'B' OPENING.
4. SUMP PIT CAPACITY TO EQUAL THE VOLUME OF OIL REQUIRED TO LIFT THE ELEVATOR TO THE TOP LANDING PLUS A RESERVE VOLUME OF 10 GALLONS.
5. VENTILATION AIR ENTERING MACHINE ROOM SHALL BE FILTERED THRU 2 INCH THICK THROW–AWAY FILTERS.
6. EXTERIOR SURFACE OF MAINTENANCE HATCH SHALL BE OF THE SAME MATERIAL AS PLATFORM FINISHED FLOOR.
7. THE SHIP'S LADDER SHALL BE PROVIDED BY ELEVATOR CONTRACTOR.
8. REFER TO DRAWING DD–M–153 FOR AIR CONDITIONING AND VENTILATION SYMBOLS.

DESIGNED	D. HOWE	7–74 DATE
DRAWN	B.D. BROWN	7–74 DATE
CHECKED	PARROTT	7–74 DATE
APPROVED	R.S. O'NEAL	8–74 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
ST–M–101	MAINTENANCE HATCH FOR ESCALATOR MACH. RM.
ST–M–012	STAIRS, LADDERS, AND HANDRAILS
DD–E–072	ELECTRICAL SERVICE TO HYDRAULIC ELEVATORS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

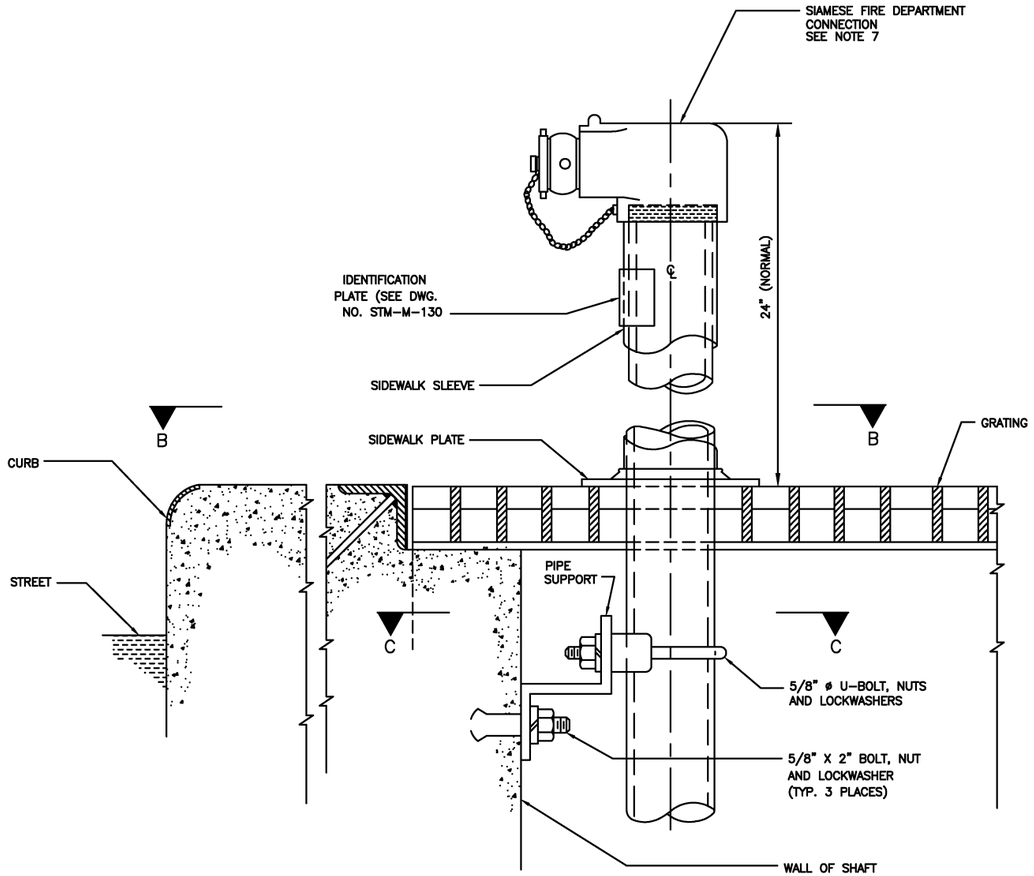
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
HYDRAULIC ELEVATOR MACHINE ROOM UNDER CENTER PLATFORM OF UNDERGROUND STATIONS

SCALE NONE

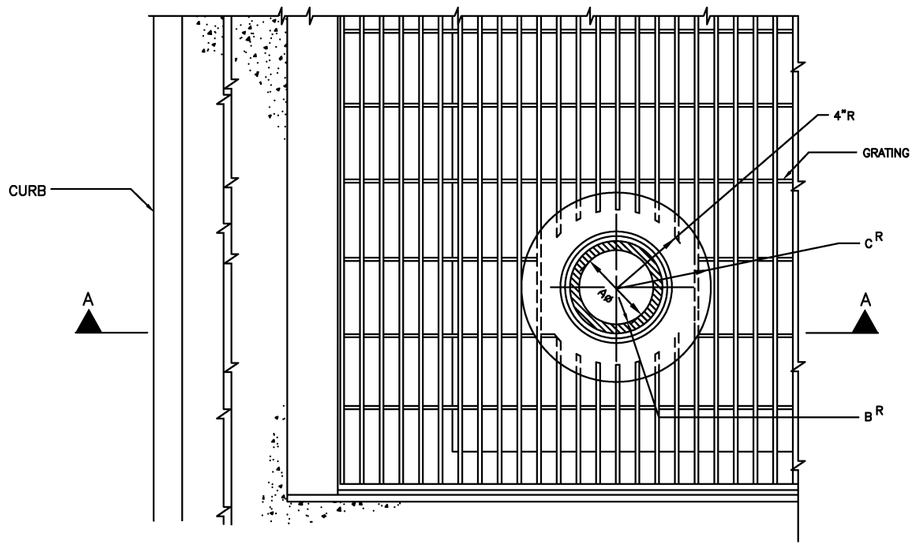
DRAWING NO. DD–M–126



SECTION A–A

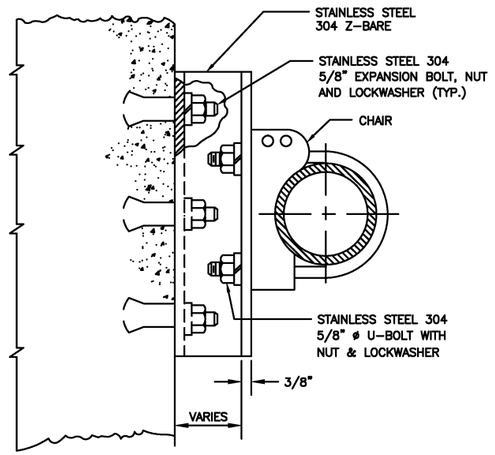
SHAFT IDENT. NO.	VERTICAL DROP	HORIZONTAL RUN
BY WMATA	BY DESIGNER	BY DESIGNER

SIAMESE FIRE DEPT. CONNECTION IDENTIFICATION PLATE DATA
(SEE NOTE 5)



SECTION B–B

TABLE OF DIMENSIONS		
A ø	B R	C R
4"	2.3"	4.6"
6"	3.3"	5.6"



SECTION C–C

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SIAMESE FIRE DEPARTMENT CONNECTION SHOWN WITH AXIS OF SYMMETRY NORMAL TO CURB. COORDINATE ORIENTATION WITH LOCAL FIRE DEPARTMENT.
3. NO PART OF THE SIAMESE FIRE DEPARTMENT CONNECTION SHALL BE LESS THAN TWO FT. OR MORE THAN THREE FEET FROM FACE OF CURB.
4. SEE DWG. DD–M–130 (SECTION A–A & DETAIL A) FOR DIMENSIONS OF PIPE SUPPORT.
5. THE DESIGNER SHALL PROVIDE THE INDICATED FIRE DEPT. CONNECTION DATA FOR ALL CONNECTIONS WITHIN HIS CONTRACT.
6. ALL HARDWARE SHALL BE STAINLESS STEEL 304.
7. DISTANCE FROM THE CURB TO THE SIAMESE CONNECTION MAY VARY AND BOLLARDS MAY BE REQUIRED TO PROTECT THE SIAMESE CONNECTION FROM VEHICULAR IMPACT DAMAGE.

DESIGNED	V. ELL/D.H. KERR	1–75 DATE
DRAWN	D.H. KERR	1–75 DATE
CHECKED	D. HOWE	4–73 DATE
APPROVED	T. HANSEN	4–95 DATE
UPDATED	J. BUMANIS	12–98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–130	FIRE PROTECTION LINE DETAIL FOR DOUBLE BOX TUNNEL SECTIONS AND DETAILS
ST–M–130	ANGLE HOSE VALVE IDENTIFICATION & SIAMESE FIRE DEPT. CONN. IDENT. PLATE DETAILS

REVISIONS

DATE	BY	DESCRIPTION
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DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

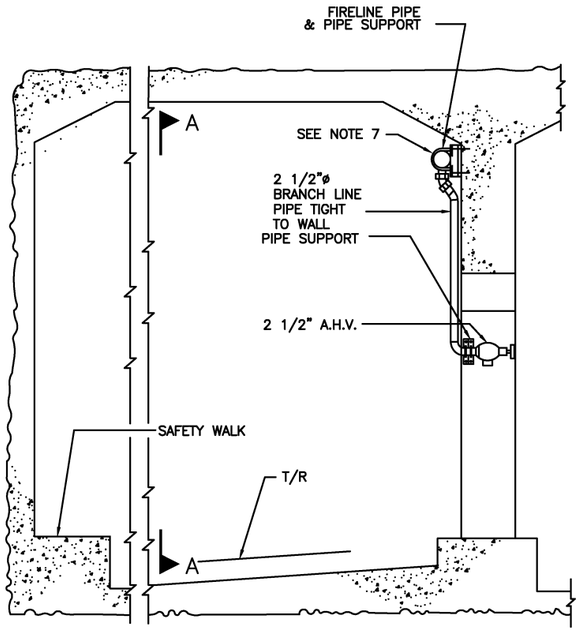
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

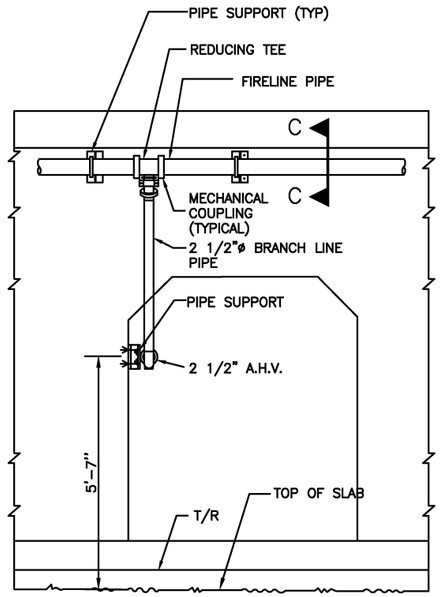
MECHANICAL DESIGN DRAWING
ABOVE–GRADE SIAMESE FIRE DEPARTMENT CONNECTION

SCALE N.T.S

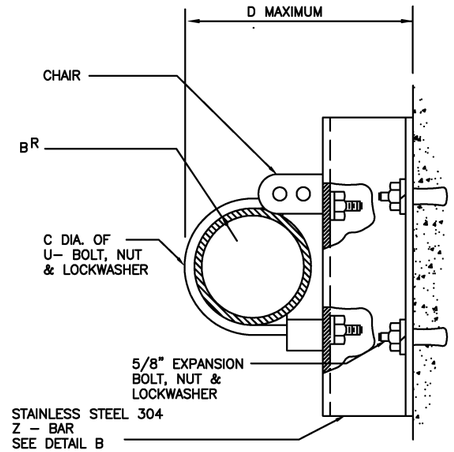
DRAWING NO. DD–M–129



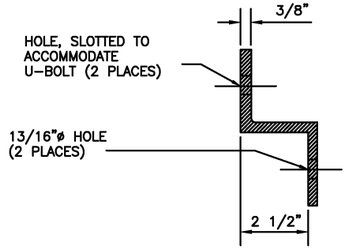
FIRELINE DETAIL FOR DOUBLE BOX TUNNEL (TYPICAL)
FIRELINE MOUNTED ON CENTER WALL
(SUPERELEVATED SIDE OF TUNNEL)
SCALE:1/2"=1'-0"



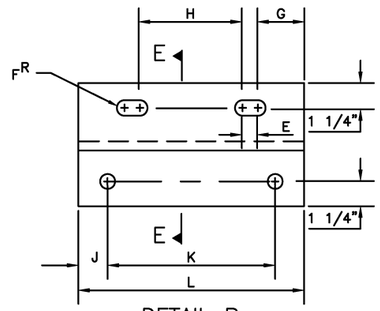
SECTION A-A
SCALE:1/2"=1'-0"



SECTION C-C
SCALE: NONE



SECTION E-E
N.T.S.



DETAIL B
N.T.S.

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. VERTICAL BRANCH LINES AND HOSE VALVES MUST NOT BE LOCATED NEAR INTERLOCKINGS WHERE THEY WILL INTERFERE WITH THE VIEW OF SIGNALS, NOR SHALL THEY OBSTRUCT THE VIEW OF EMERGENCY TRIP STATION LIGHT.
3. PIPE RUN TO CLEAR CABLES.
4. A.H.V. SHALL NOT BE LOCATED WITHIN 15 FEET OF EMERGENCY TRIP STATION.
5. 4" Z BAR PLUS 1/2" SHIM ACCEPTABLE.
6. ALL PIPE SUPPORT HARDWARE SHALL BE STAINLESS STEEL 304
6. REFER TO DRAWING ST-M-85 FOR ABBREVIATION AND SYMBOLS.
7. PROVIDE MIN. 2" CLEARANCE FROM THE DYNAMIC OUTLINE OF THE TRAIN.

* TABLE OF DIMENSIONS (INCHES)

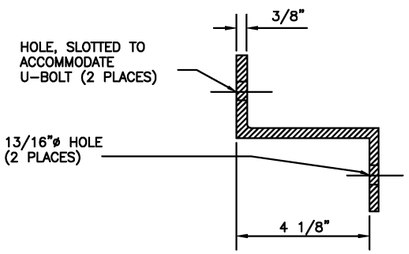
E	F R	G	H	J	K	L
2	3/8	1.75	5.22	1 1/2	7	10
1 1/2	1/4	1.80	3.37	1 1/2	5	8
2 1/2	3/8	1.64	7.23	1 1/2	11	14

FOR PIPE SIZE
4"ø
2 1/2"ø
6"ø

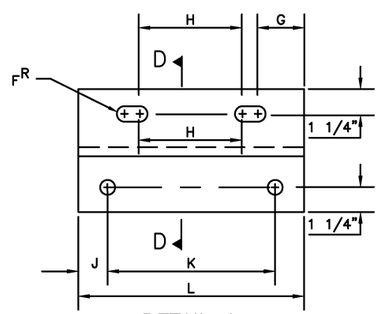
* FOR USE WITH EITHER DETAIL 'A' OR DETAIL 'B'

TABLE OF DIMENSIONS (INCHES)

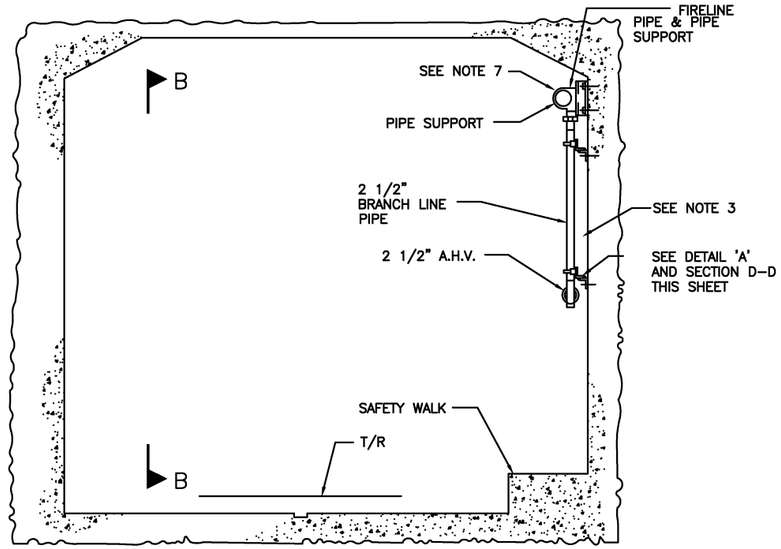
Aø	B R	C	D
4	2.3	5/8	9.6
2 1/2	1.5	3/8	7.8
6	3.3	5/8	11.6



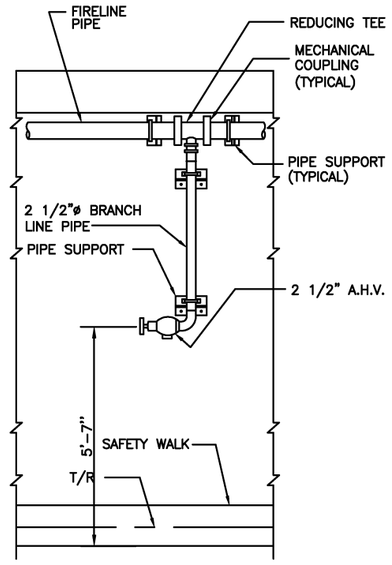
SECTION D-D
N.T.S.



DETAIL A
N. T. S.



FIRELINE DETAIL FOR SINGLE BOX TUNNEL (TYPICAL)
SCALE:1/2"=1'-0"



SECTION B-B
SCALE:1/2"=1'-0"

DESIGNED	D. KERR/W. ELL	1-75 DATE
DRAWN	D. KERR	1-75 DATE
CHECKED	D. HOWE	2-75 DATE
APPROVED	T. HANSEN	4-75 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-155	PLUMBING & FIRE PROTECTION SYMBOLS
DD-S-014	CUT AND COVER, SINGLE BOX DETAILS
DD-S-020	CUT AND COVER, DOUBLE BOX DETAILS

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

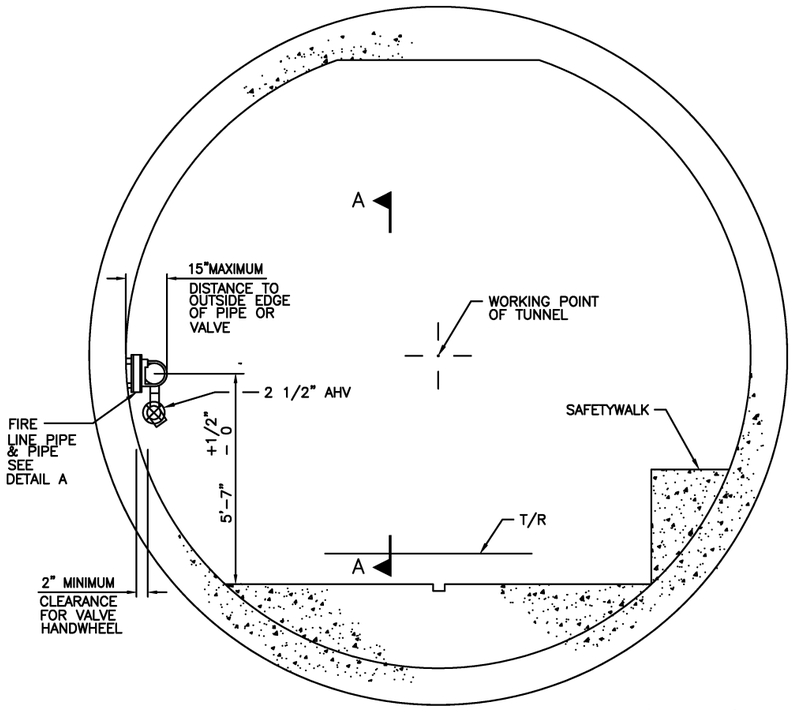
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
FIRE PROTECTION LINE FOR DOUBLE BOX AND DETAILS

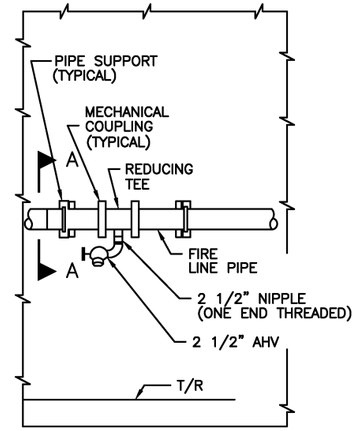
SCALE 1/2"=1'-0" AND AS NOTED

DRAWING NO. DD-M-130



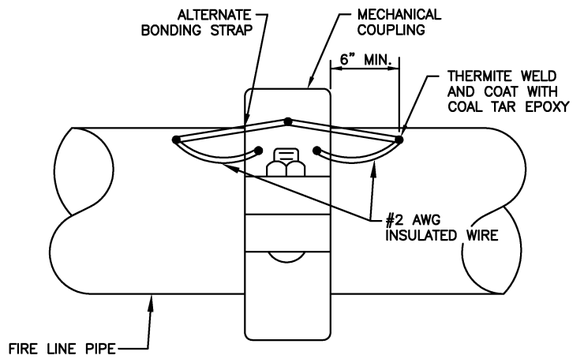
FIRELINE DETAIL FOR CIRCULAR TUNNEL (TYPICAL)

SCALE: 1/2"=1'-0"



VIEW 'A-A'

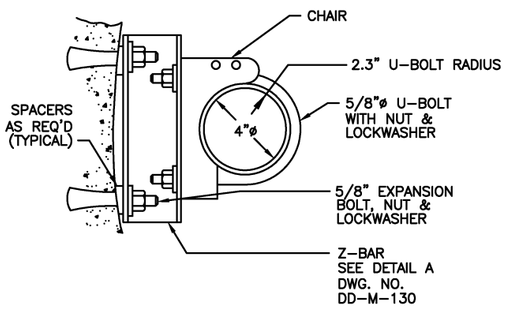
SCALE: 1/2"=1'-0"



PIPE JOINT BOND

REQUIRED FOR ALL PIPE JOINTS WITH COUPLINGS
SCALE: NONE

NOTE: SIMILAR BONDING REQUIRED FOR ALL IN-LINE VALVES AND THREADED CONNECTIONS.



DETAIL A

SCALE: NONE

NOTE: REFER TO NOTES ON DRAWING NO. DD-M-130.

DESIGNED	D. KERR W. ELL	1-75 DATE
DRAWN	D. KERR	1-75 DATE
CHECKED	D. HOWE	1-75 DATE
APPROVED	T. HANSEN R.S. O'NEAL	1-75 DATE
UPDATED	J. BUMANIS	12-98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-130	FIRE PROTECTION LINE DETAIL FOR DOUBLE BOX TUNNEL, SINGLE BOX TUNNEL, SECT. & DETAILS
DD-M-155	PLUMBING & FIRE PROTECTION SYMBOLS

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

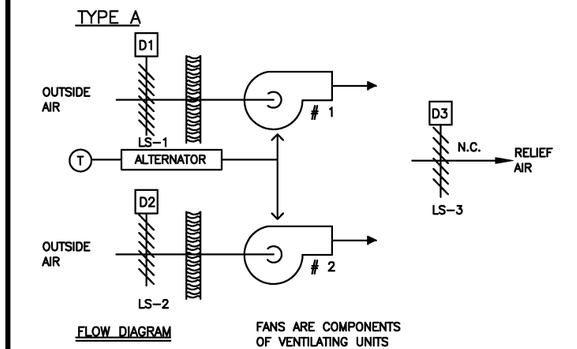
APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING.
FIRE PROTECTION LINE FOR CIRCULAR TUNNEL, SECTION AND DETAIL

SCALE: AS NOTED

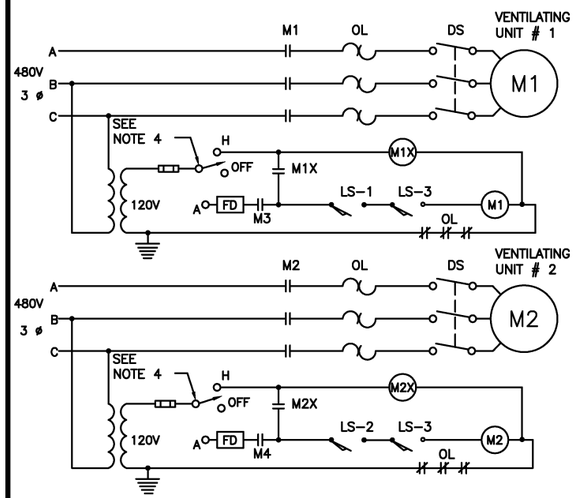
DRAWING NO. DD-M-131

TYPE A

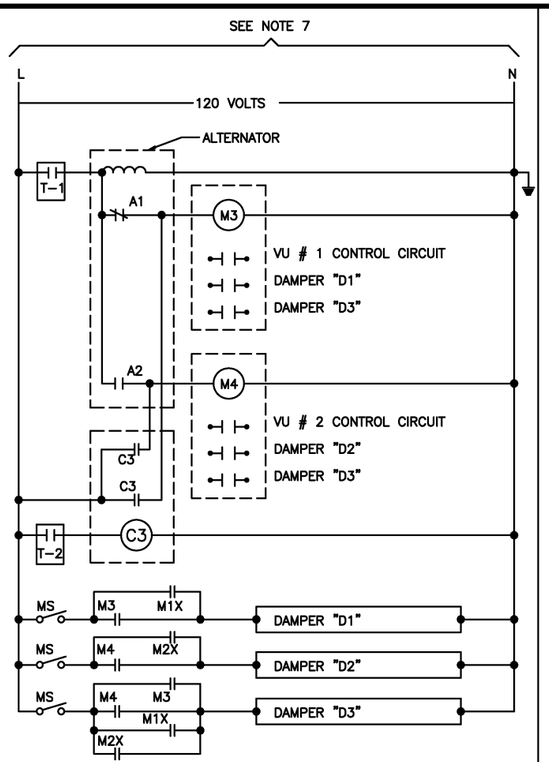


FLOW DIAGRAM

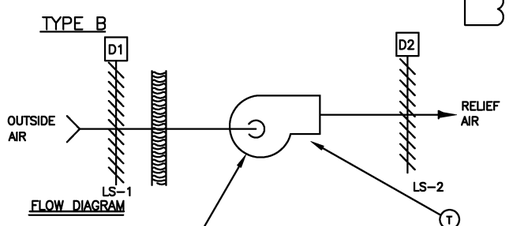
FANS ARE COMPONENTS OF VENTILATING UNITS



CONTROL DIAGRAM

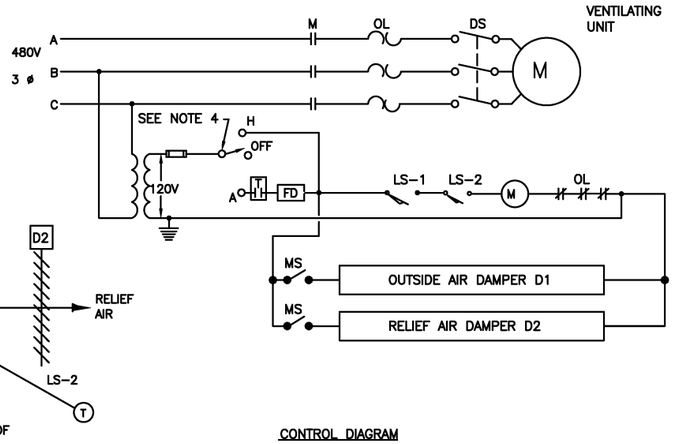


TYPE B



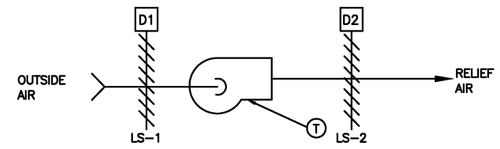
FLOW DIAGRAM

FAN IS A COMPONENT OF A VENTILATING UNIT

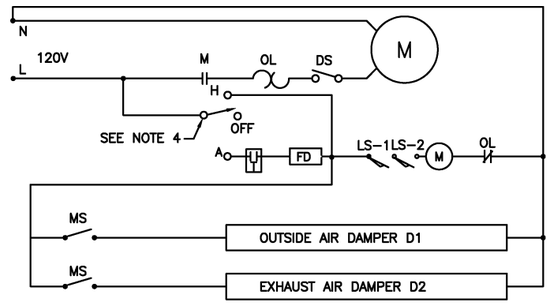


CONTROL DIAGRAM

TYPE C (SEE NOTE 1)

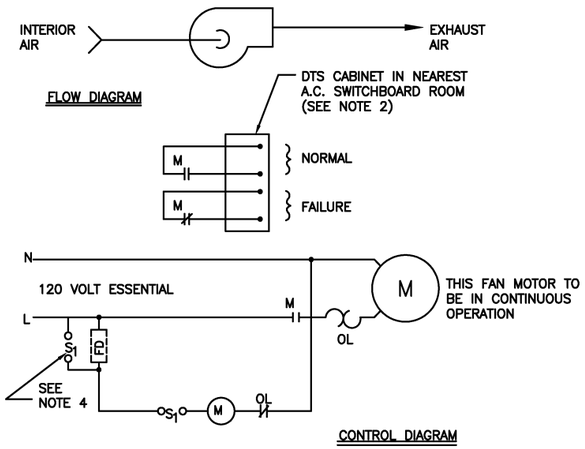


FLOW DIAGRAM



CONTROL DIAGRAM

TYPE D



FLOW DIAGRAM

CONTROL DIAGRAM

NOTES:

1. THE TYPE C AIR FLOW DIAGRAM IS TYPICAL FOR BELOW GROUND INSTALLATIONS. THE VENTILATING FAN CAN OPERATE IN EITHER SUPPLY OR EXHAUST MODE IN ABOVE GROUND INSTALLATIONS.
2. CONDUIT FROM MOTOR STARTER TO DTS CABINET SHALL BE SHOWN ON CONTRACT DRAWINGS BY DESIGNER. USE #14 AWG CONDUCTOR CABLE FOR WIRING TO TERMINAL CABINET.INSTALL OUTSIDE THE ROOM.
3. JUNCTION BOX FOR CONNECTION TO FIRE DETECTION SYSTEM.
4. PROVIDE LABEL STATING THAT SWITCH OVER-RIDING "FD" IS FOR USE BY FIRE DEPARTMENT PERSONNEL ONLY
5. ALL CONTROL POWER SHALL BE SUPPLIED BY A CONTROL TRANSFORMER SIZED TO PROVIDE POWER FOR ALL CONTROLS AND ANCILLARY DEVICES

SYMBOLS AND ABBREVIATIONS

(M) ACROSS THE LINE MAGNETIC STARTER COIL	FUSE
GROUND	(M) MOTOR
(C) CONTROL RELAY COIL	TRANSFORMER
OL THERMAL OVERLOAD RELAY	H OFF A HAND-OFF-AUTOMATIC SELECTOR SWITCH
CONTACT NORMALLY CLOSED	DAMPER
CONTACT NORMALLY OPEN	FILTER
LS LIMIT SWITCH NORMALLY OPEN	FAN *
(T) THERMOSTAT	D ELECTRICAL DAMPER OPERATOR
T THERMOSTAT CONTACT	DS DISCONNECT SWITCH AS REQUIRED BY N.E.C.
FD JUNCTION BOX FOR CONNECTION TO FIRE DETECTION SYSTEM (SEE NOTE 3) [1]	S_1 ON-OFF SNAP SWITCH
MS MANUAL STARTER WITH THERMAL OVERLOAD	DS SINGLE POLE DISCONNECT SWITCH

* FAN MAY BE OF THE CENTRIFUGAL, AXIAL, OR PROPELLER TYPE, DEPENDING ON THE APPLICATION.

TYPE "A"
TYPICAL FOR THOSE TRACTION POWER SUBSTATIONS WITH TWO FANS.

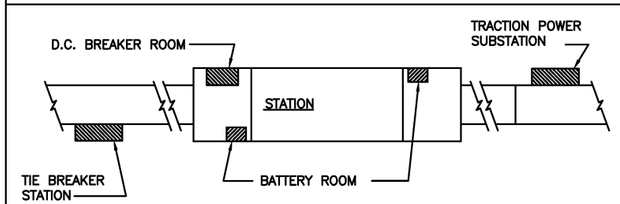
TYPE "B"
TYPICAL FOR AT GRADE TRACTION POWER SUBSTATIONS WITH ONE VENTILATING UNIT.

TYPE "C"
TYPICAL FOR TIE BREAKER STATIONS

TYPE "D"
TYPICAL FOR BATTERY ROOMS

NOTES:

6. DAMPER ARRANGEMENTS SHOWN ARE TYPICAL FOR AIR FLOW DIAGRAM SHOWN. SECTION DESIGNER SHALL MODIFY TO SUIT ACTUAL DESIGN.
7. FAN CONTROL CIRCUIT AND FAN MOTORS SHALL BE CONNECTED TO SEPARATE CIRCUITS BUT SHALL BE SUPPLIED FROM THE SAME SOURCE.



TYPICAL KEY PLAN

DESIGNED	J. BUMANIS	8-76 DATE
DRAWN	D.H. KERR	8-76 DATE
CHECKED	D. COHEN	12-76 DATE
APPROVED	T. HANSEN	8-77 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

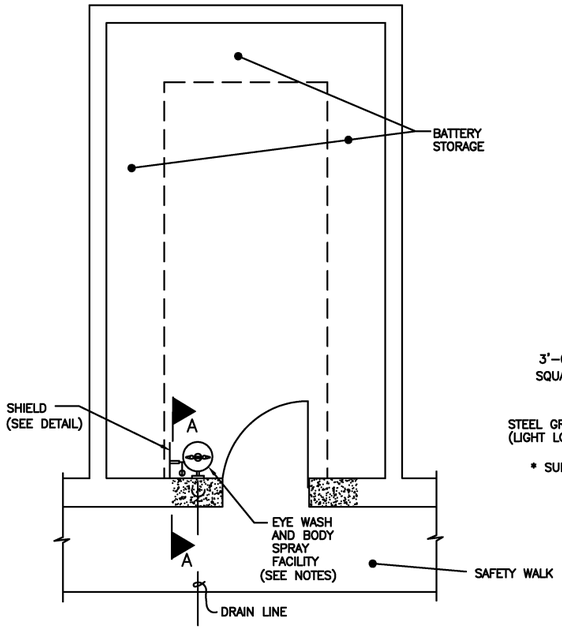
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

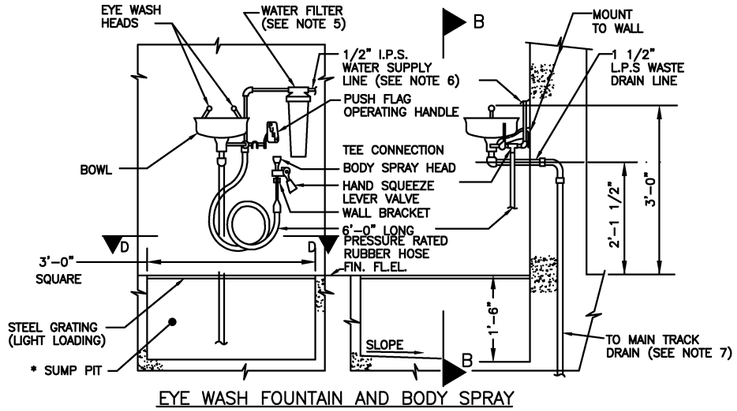
MECHANICAL DESIGN DRAWING
VENTILATION CONTROL DIAGRAMS TBS, TPSS AND BATTERY ROOMS

SCALE N.T.S

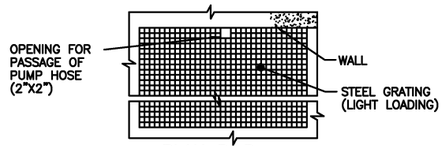
DRAWING NO. DD-M-134



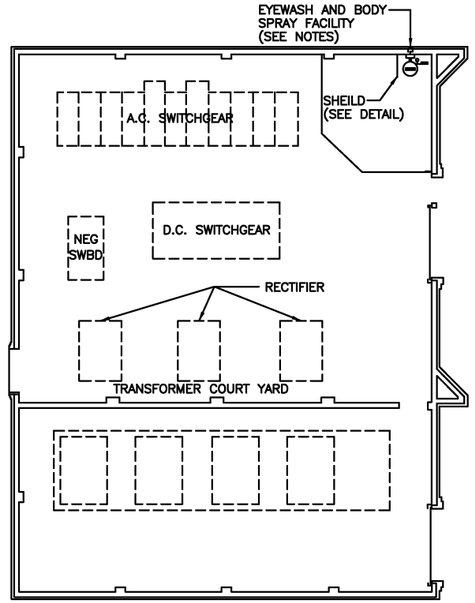
PLAN
TYPICAL BATTERY ROOM
SCALE: 3/8"=1'-0"
(SEE NOTE 10)



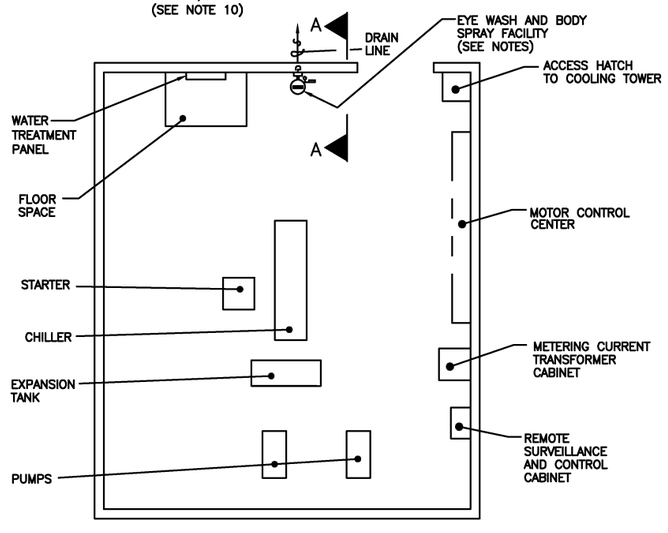
EYE WASH FOUNTAIN AND BODY SPRAY
ELEVATION B–B SECTION A–A
SCALE: 3/4"=1'-0"
* SUMP PIT NOT REQUIRED IN BATTERY ROOMS AND CHILLED WATER PLANTS



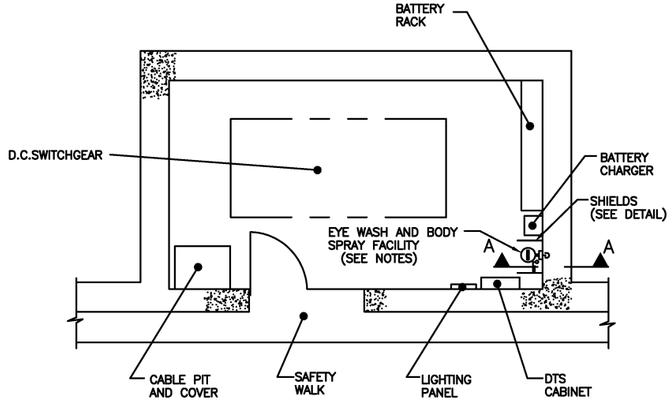
PLAN D–D



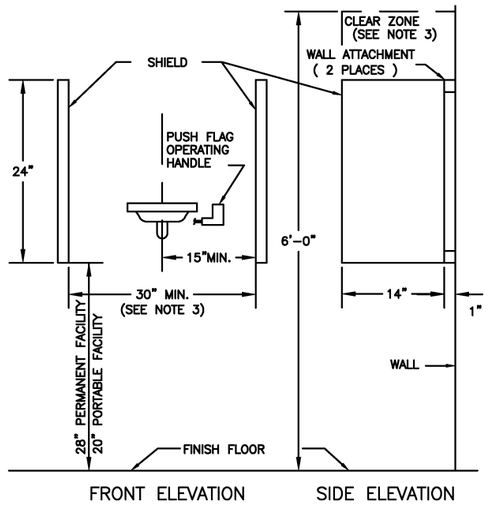
PLAN
TYPICAL WIDE UNDERGROUND SUBSTATION
SCALE: 1/16"=1'-0"
(SEE NOTE 9 & 10)



PLAN
TYPICAL CHILLED WATER PLANT
NTS
(SEE NOTE 9)



PLAN
TYPICAL TIE BREAKER STATION
SCALE: 3/16"=1'-0"
(SEE NOTE 9 & 10)



SHIELD DETAIL

NOTES:

1. PROVIDE PERMANENT OR SPACE FOR PORTABLE EYE WASH AND BODY SPRAY FACILITIES WITHIN 25 FEET OF THE FOLLOWING:
   A. AREAS WITHIN CHILLED WATER PLANTS WHERE CORROSIVE WATER TREATMENT CHEMICALS ARE TO BE STORED AND/OR USED.
   B. BATTERY ROOMS.
   C. BATTERY INSTALLATIONS WITHIN TRACTION POWER SUBSTATIONS AND TIE BREAKER STATIONS.
2. PERMANENT EYE WASH FOUNTAIN AND BODY SPRAY FACILITIES ARE TO BE PROVIDED ONLY WHERE WATER SERVICE IS ALREADY BEING PROVIDED TO THE STRUCTURE AND ALSO TO THE GENERAL AREA WHERE THE FACILITIES ARE TO BE INSTALLED, I.E. WATER SERVICE WILL NOT BE EXTENDED TO A TIE BREAKER STATION OR A SUPPLY LINE RUN THE FULL LENGTH OF A STATION JUST TO SERVE AN EYE WASH AND BODY SPRAY FACILITY.
3. PORTABLE FACILITIES WILL BE PROVIDED BY WMATA AT LOCATIONS NOT HAVING PERMANENT FACILITIES. AT THESE LOCATIONS, PROVIDE CLEAR WALL SPACE OF NOT LESS THAN 30 INCHES WIDE BY 6'-0" HIGH.
4. PROVIDE SHIELDS TO PROTECT ADJACENT ELECTRICAL EQUIPMENT FROM WATER SPRAY (AT BOTH PERMANENT AND PORTABLE FACILITY LOCATIONS). CLEARANCES BETWEEN THESE SHIELDS AND THE ELECTRICAL EQUIPMENT ARE TO COMPLY WITH APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
5. LOCATE WATER FILTER WITHIN SAME AREA AS EYE WASH FOUNTAIN.
6. WATER SUPPLY LINE SHALL BE CAPABLE OF DELIVERING A MINIMUM OF 20 PSI FLOW PRESSURE TO EYE WASH FOUNTAIN AND BODY SPRAY.
7. WHERE MAIN TRACK DRAIN IS NOT AVAILABLE, DRAIN TO OTHER DRAINAGE SYSTEM AS PERMITTED BY LOCAL CODES.
8. PROVIDE EYE WASH FOUNTAIN AND BODY SPRAY IN CAR WASH BUILDINGS AS DETAILED IN SECTION A–A AND ELEVATION B–B HEREON. IN ADDITION, EYE WASH FOUNTAIN AND BODY SPRAY SHALL IN THIS CASE BE FREEZE PROOF.LOCATE WITHIN 25 FEET OF WASH EQUIPMENT AREA.
9. FOR ADDITIONAL DETAILS OF EYE WASH AND BODY SPRAY FACILITY LOCATIONS WITHIN TYPICAL CHILLER PLANTS, TRACTION POWER SUBSTATIONS AND TIE BREAKER STATIONS, SEE REFERENCE DRAWINGS.
10. NOT USED
11. PROVIDE CONTAINMENT BARRIER OR CURB AROUND BATTERY RACKS OR AT ROOM ENTRANCE IN ACCORDANCE WITH LOCAL CODES.

DESIGNED	P.E.E./B.D.B.	8–75 DATE
DRAWN	B.D.B./L.P.	8–75 DATE
CHECKED	D. LEWIS	5–76 DATE
APPROVED	T. HANSEN	5–76 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

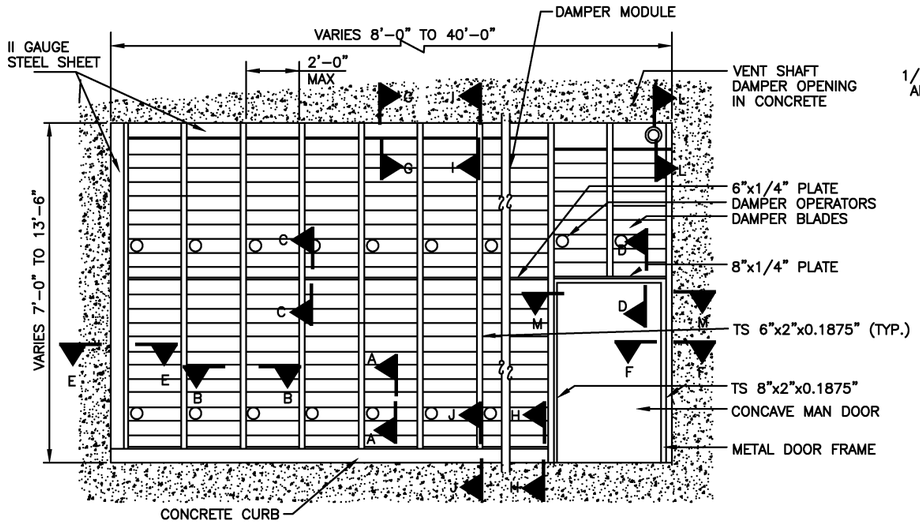
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

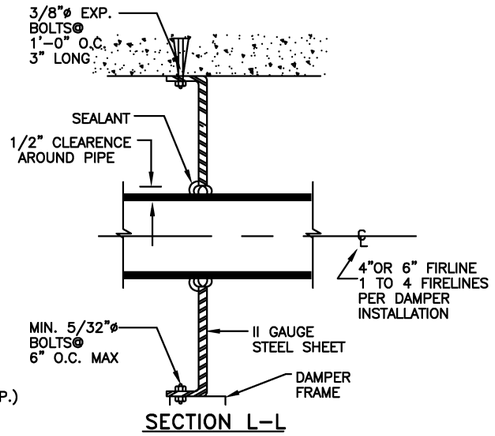
MECHANICAL DESIGN DRAWING
TYPICAL EMERGENCY EYE WASH AND BODY SPRAY FACILITIES

SCALE: AS NOTED

DRAWING NO. DD–M–136



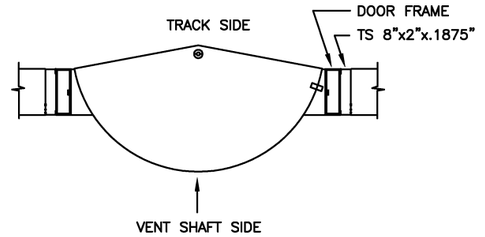
ELEVATION OF TYPICAL DAMPER INSTALLATION



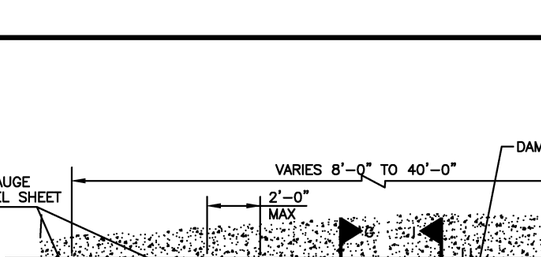
SECTION L-L

NOTES:

1. TUBES, ANGLES, BENT AND STRUT PLATES ARE TO BE A-38 GALVANIZED STEEL. STEEL SHEET SHALL BE GALVANIZED
2. DAMPER MODULES WITH DAMPER BLADES AND DAMPER OPERATORS ARE TO BE SUPPLIED BY THE DAMPER MANUFACTURER.
3. DAMPER MODULE DIMENSIONS:12" TO 96" HIGH IN 6" INCREMENTS, 12" TO 24" WIDE IN 3" INCREMENTS.
4. DAMPER OPERATORS SHALL BE MOUNTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
5. STEEL SHEET DETAILS SHOWN ARE TO APPLY ONLY WHERE MODULES FOR DAMPER DO NOT CLOSE CONCRETE OPENING COMPLETELY. WHERE STEEL SHEET IS NOT REQUIRED, EXPANSION BOLT SHALL BE ANCHORED DIRECTLY TO THE CONCRETE SIMILAR TO SECTION H-H AND F-F.
6. ALL BOLTED CONNECTIONS SHALL BE THROUGH BOLTED. SHEET METAL SCREWS ARE PROHIBITED.
7. WHERE EXPANSION BOLTS ARE INDICATED THERE SHALL BE NO SUBSTITUTIONS.
8. GALVANIZING DAMAGED BY WELDING SHALL BE REPAIRED BY COLD GALVANIZING OR HOT STICK GALVANIZING.
9. INSERT BOLTS IN ALL HOLES PROVIDED BY THE MANUFACTURER IN THE VERTICAL DAMPER MEMBERS.
10. AN EXHAUST ATTACHMENT TO BE USED WHEN WELDING TO AVOID EFFECTS OF TOXIC ZINC OXIDE FUMES.
11. THIS DESIGN IS APPROPRIATE FOR VENT SHAFT DAMPER INSTALLATIONS ADJACENT TO STATIONS.
12. PROVIDE 1 1/2" OPENING TO ALLOW INSERTION OF EXPANSION BOLTS.

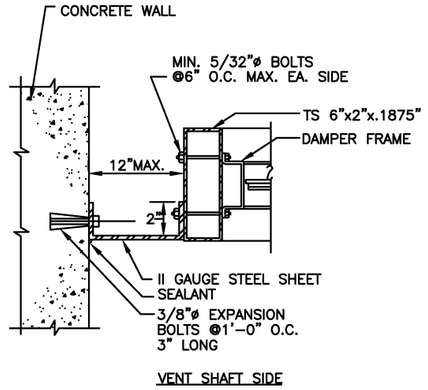


SECTION M-M

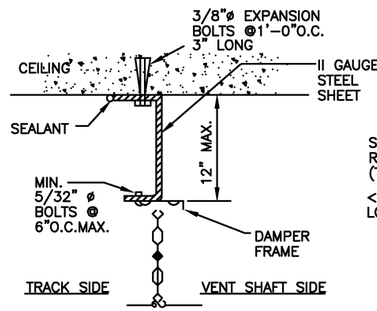


SECTION A-A

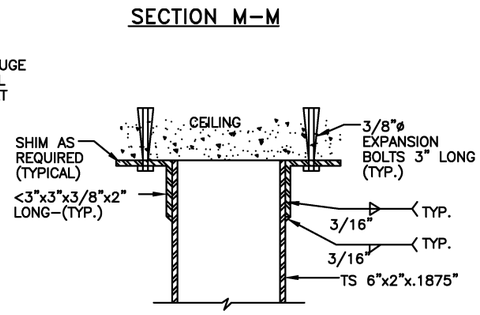
SECTION C-C



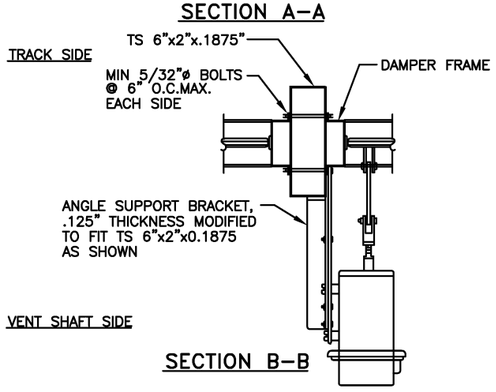
SECTION E-E



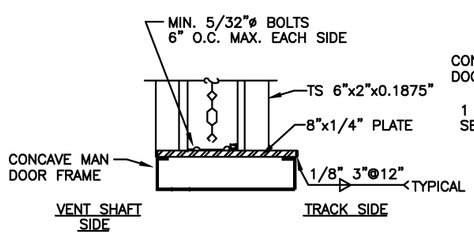
SECTION G-G



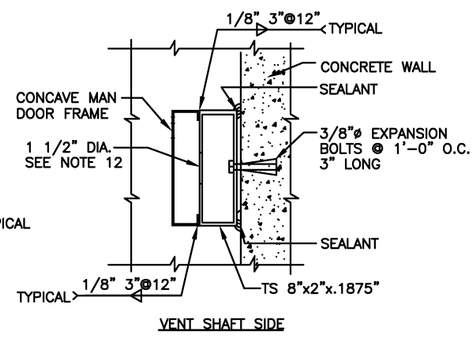
SECTION I-I



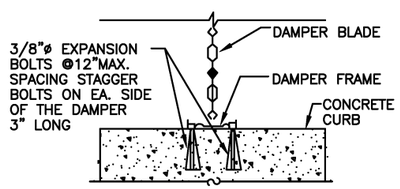
SECTION B-B



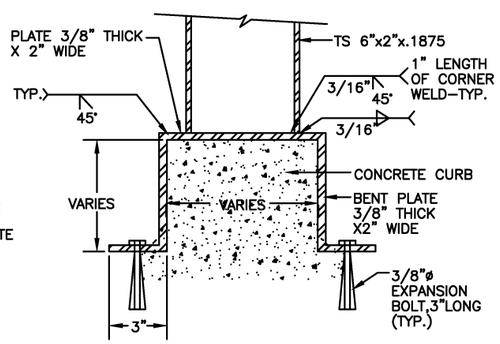
SECTION D-D



SECTION F-F



SECTION H-H



SECTION J-J

DESIGNED	A. ZAKRZEWSKI R. MINER	9-76 DATE
DRAWN	J. PROCYK J. BOYD	9-76 DATE
CHECKED	D. HOWE	5-77 DATE
APPROVED	T. HANSEN	5-77 DATE
UPDATED	R.S.O. ENGA	12-98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-008	TYP.INTER.VENT SHAFT IN EARTH-TYPE 1
DD-M-015	TYPICAL INTER.VENT SHAFT IN EARTH -TYPE 3
DD-M-024	TYPICAL INTER.VENT SHAFT IN EARTH -TYPE 2
DD-M-029	TYPICAL STATION END VENT SHAFT IN EARTH
DD-A-SC-009	DOOR SCHEDULE,ELEV & DETAILS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

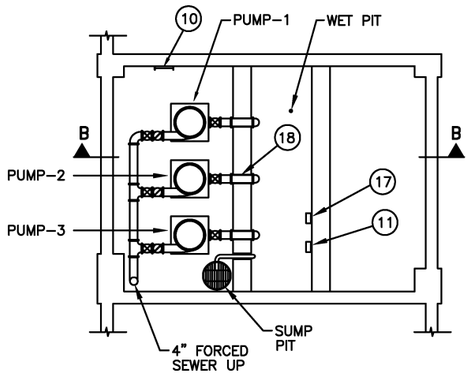
SUBMITTED DATE

APPROVED DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
TYPICAL VENT SHAFT DAMPER INSTALLATION DETAILS

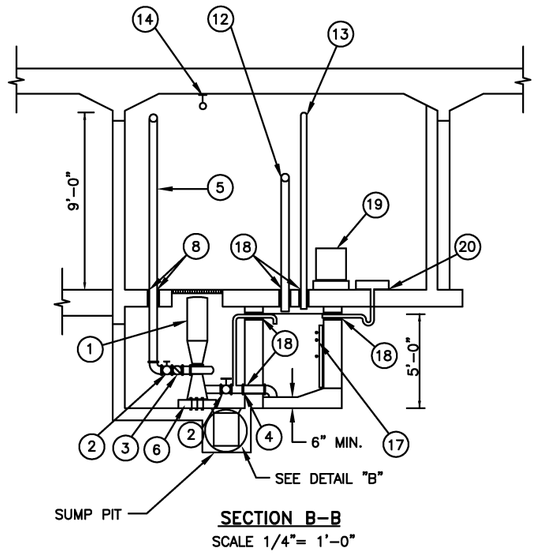
SCALE NO SCALE

DRAWING NO. DD-M-137



PUMP PIT PLAN

SCALE 1/4"= 1'–0"

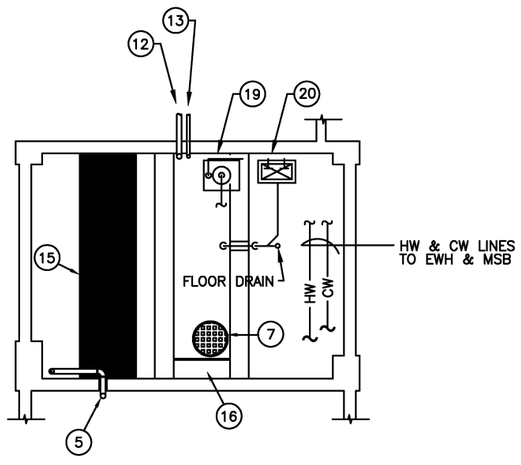


SECTION B–B

SCALE 1/4"= 1'–0"

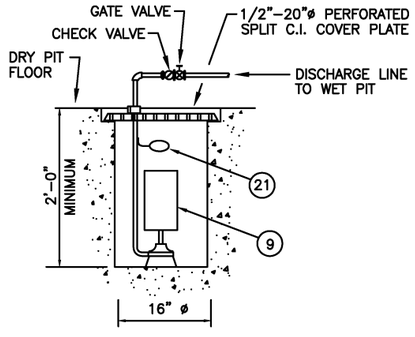
EQUIPMENT LIST

1. DRY PIT PUMP
2. SERVICE VALVE
3. WEIGHTED CHECK VALVE
4. CAST IN PLACE FLANGE CONNECTOR WITH WATER STOP RING
5. DISCHARGE PIPE
6. 24"x 24"x 6" HIGH CONCRETE PAD
7. 24" DIA. GAS TIGHT MANHOLE, COVER
8. SLEEVE
9. SUMP PUMP
10. ACCESS LADDER
11. MANHOLE STEPS
12. SOIL PIPE
13. VENT
14. LIFTING EYE (ONE PER PUMP)
15. DRY PIT GRATING
16. SEWAGE EJECTOR CONTROL PANEL
17. MERCURY FLOAT SWITCH AND ELECTRONIC SENSOR (ONE PER PUMP)
18. GAS TIGHT SLEEVES THROUGH WET PIT
19. ELECTRIC WATER HEATER (EWH) COMPLETE WITH PRESSURE AND TEMP RELIEF, AND DRAIN VALVE
20. MOP SERVICE BASIN (FLOOR MOUNTED)
21. HIGH WATER ALARM FLOAT SWITCH CONNECTED TO DATA TRANSMISSION SYSTEM



CLEANERS AND EJECTOR ROOM PLAN

SCALE 1/4"= 1'–0"



DETAIL "B"

TYPICAL SUMP PUMP DETAIL

NOT TO SCALE

NOTES:

1. LAYOUT OF ROOM IS TYPICAL ONLY.
2. ROOM SIZES SHALL BE DETERMINED BY THE DESIGNER TO SUIT STRUCTURE.
3. MINIMUM HEAD ROOM IS 8'–0".
4. ACCESS LADDER, RAILING ETC. ARE OMITTED FOR CLARITY. REFER TO DWG. DD–M–10 AND ST–M–12 FOR DIMENSIONS AND DETAILS NOT SHOWN HERE.
5. DEPTH OF THE EJECTOR PIT AS REQUIRED BY ELEVATION.
6. FOR SYMBOL AND ABBREVIATIONS SEE DRAWING ST–M–85.
7. PIPE SIZES SHALL BE DETERMINED BY DESIGNER.

DESIGNED	R. PATEL	9–98 DATE
DRAWN	C. BUITRAGO	9–98 DATE
CHECKED	J. BUMANIS	9–98 DATE
APPROVED	R. GANERISAL	9–98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–010	TYPICAL MECHANICAL SERVICE ROOMS
DD–M–155	PLUMBING AND FIRE PROTECTION SYMBOLS
ST–M–012	STAIRS, LADDERS AND SYMBOLS
DD–M–097	SUPERVISORY CONTROL AND INDICATION FAN SHAFT, JET FAN ,VENT SHAFT AND DRAINAGE PUMP STATION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

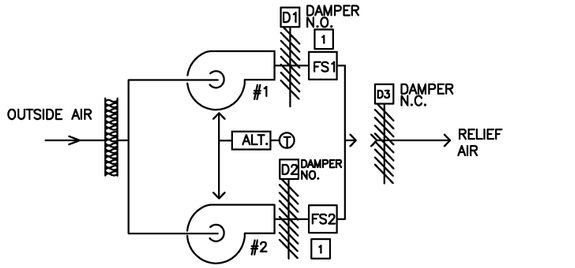
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

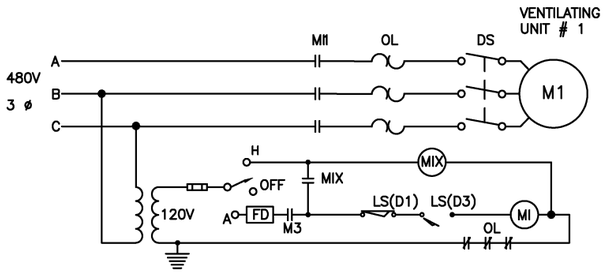
MECHANICAL DESIGN DRAWING
TYPICAL ARRANGEMENT OF EQUIPMENT IN CLEANERS AND EJECTOR ROOM

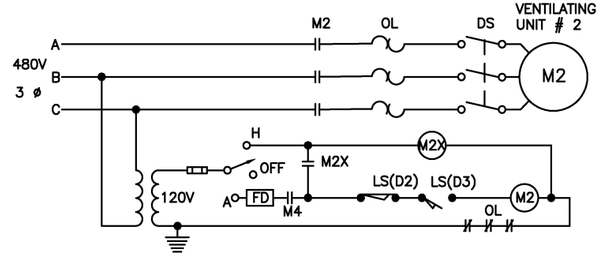
SCALE: AS NOTED

DRAWING NO.: DD–M–138

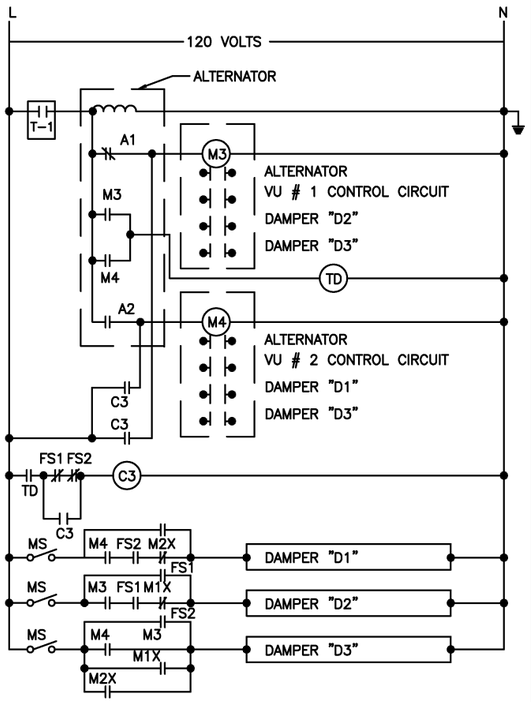


FLOW DIAGRAM





CONTROL DIAGRAM



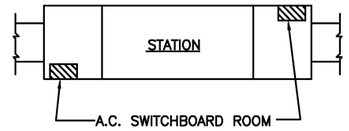
CONTROL DIAGRAM

SYMBOLS & ABBREVIATIONS

(M) ACROSS THE LINE MAGNETIC STARTER COIL	FUSE
GROUND	(M) MOTOR
(C) CONTROL RELAY COIL	TRANSFORMER
OL THERMAL OVERLOAD RELAY	H OFF A HAND–OFF–AUTOMATIC SELECTOR SWITCH
CONTACT NORMALLY CLOSED	DAMPER
CONTACT NORMALLY OPEN	FILTER
LS(D) LIMIT SWITCH–NORMALLY OPEN WHEN DAMPER IS CLOSED. PARENTHESIS IDENTIFY THE DAMPER ON WHICH THE LIMIT SWITCH IS MOUNTED	FAN
(T) THERMOSTAT	D ELECTRICAL DAMPER OPERATOR
T THERMOSTAT CONTACT	DS DISCONNECT SWITCH AS REQUIRED BY N.E.C.
FD JUNCTION BOX FOR CONNECTION TO FIRE DETECTION SYSTEM (SEE NOTE 3)	S1 ON–OFF SNAP SWITCH
MS MANUAL STARTER WITH THERMAL OVERLOAD	DS SINGLE POLE DISCONNECT SWITCH
FS FLOW SWITCH CONTACT SHOWN W/ NO AIR FLOW (NORMALLY CLOSED)	TD TIME DELAY CONTACT
FS FLOW SWITCH CONTACT SHOWN W/ NO AIR FLOW (NORMALLY OPEN)	FS1 FLOW SWITCH (FAN NO.1)
(TD) TIME DELAY PICKUP RELAY SET FOR 90 SECOND DELAY	

NOTES :

1. CONDUIT FROM MOTOR STARTER TO DTS CABINET SHALL BE SHOWN ON CONTRACT DRAWINGS BY DESIGNER.USE #14 AWG CONDUCTOR CABLE FOR WIRING TO TERMINAL CABINET.
2. FAN CONTROL CIRCUIT AND FAN MOTORS SHALL BE CONNECTED TO SEPARATE CIRCUITS BUT SHALL BE SUPPLIED FROM THE SAME SOURCE.
3. NOT USED
4. ALL CONTROL POWER SHALL BE SUPPLIED BY A CONTROL TRANSFORMER SIZED TO PROVIDE POWER FOR ALL CONTROLS AND ANCILLARY DEVICES.
5. RELIEF DAMPER ARRANGEMENT SHOWN IS TYPICAL FOR AIR FLOW DIAGRAM SHOWN. SECTION DESIGNER SHALL MODIFY TO SUIT ACTUAL DESIGN.
6. PROVIDE LABELS MOUNTED IN CLOSE PROXIMITY TO THE SELECTOR SWITCHES STATING THAT "THE MANUAL MODE OF OPERATION IS TO BE USED ONLY FOR TESTS OR IN CASES OF EMERGENCY".
7. CONTROL DIAGRAMS SHOWN ARE FOR ELECTRICAL CONTROLS. IF PNEUMATIC CONTROLS ARE USED, SECTION DESIGNER SHALL DEVELOP CONTROL DIAGRAMS TO PERFORM EQUIVALENT CONTROL FUNCTIONS.
8. DAMPERS ARE DESIGNATED AS FOLLOWS:
   DAMPER N.O.–MECHANICALLY BIASED TO THE OPEN POSITION, ENERGIZE TO CLOSE.
   DAMPER N.C.–MECHANICALLY BIASED TO THE CLOSED POSITION, ENERGIZE TO OPEN.
9. SEE NOTES 2,3&4 ON DRAWING DD–M–134.



TYPICAL KEY PLAN

DESIGNED	J. BUMANIS	4–81 DATE
DRAWN	W.D. BROWN	4–81 DATE
CHECKED	D. LEWIS	4–24–81 DATE
APPROVED	R.S. O'NEIL	4–24–81 DATE
UPDATED	J. BUMANIS	12–98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–134	VENTILATION CONTROL DIAGRAMS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

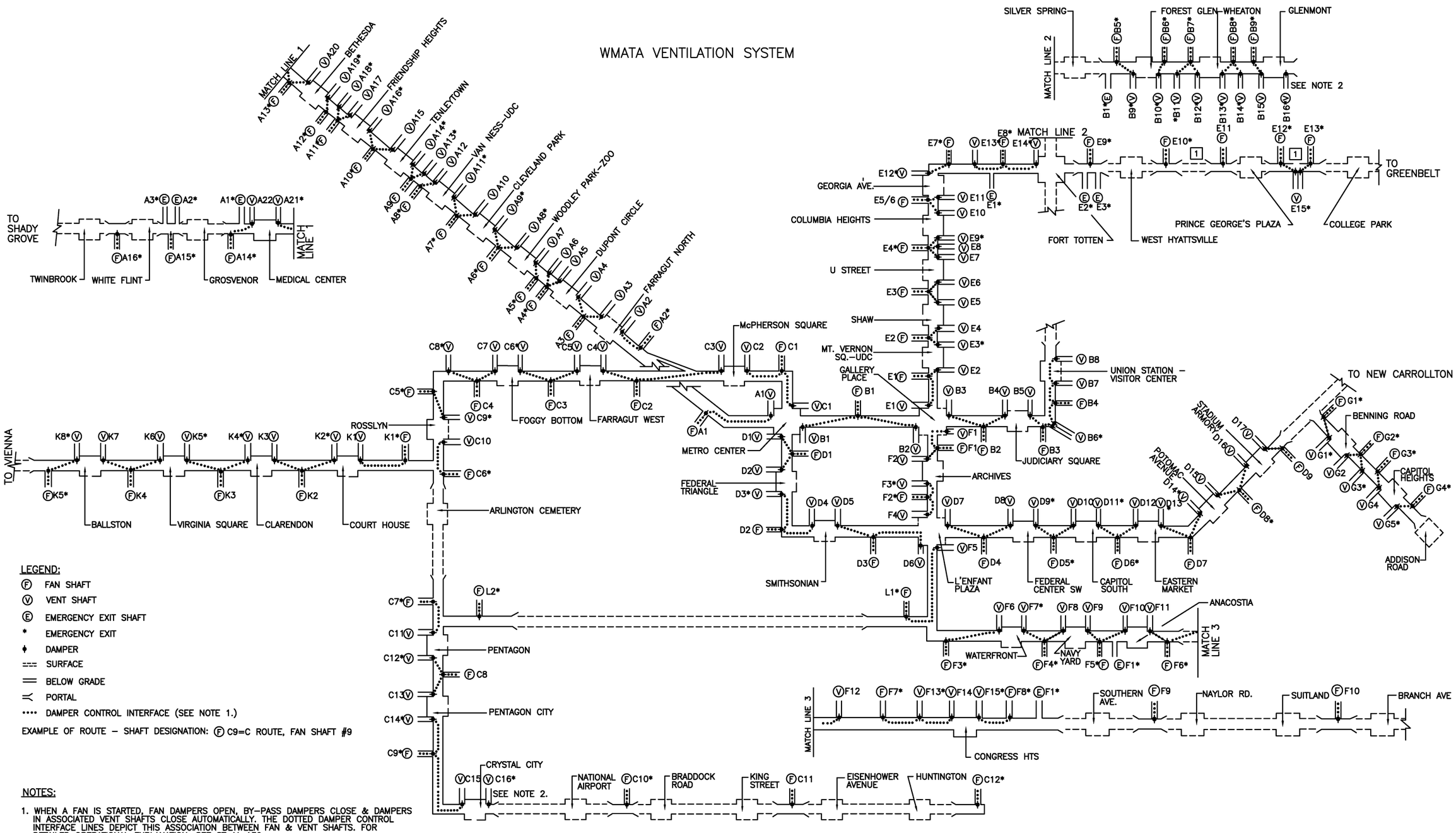
APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
VENTILATION CONTROL DIAGRAMS A.C. SWITCHBOARD ROOMS

SCALE N.T.S

DRAWING NO. DD–M–139

WMATA VENTILATION SYSTEM



LEGEND:

- (F) FAN SHAFT
- (V) VENT SHAFT
- (E) EMERGENCY EXIT SHAFT
- * EMERGENCY EXIT
- ♦ DAMPER
- SURFACE
- BELOW GRADE
- PORTAL
- •••• DAMPER CONTROL INTERFACE (SEE NOTE 1.)

EXAMPLE OF ROUTE – SHAFT DESIGNATION: (F) C9=C ROUTE, FAN SHAFT #9

NOTES:

1. WHEN A FAN IS STARTED, FAN DAMPERS OPEN, BY–PASS DAMPERS CLOSE & DAMPERS IN ASSOCIATED VENT SHAFTS CLOSE AUTOMATICALLY. THE DOTTED DAMPER CONTROL INTERFACE LINES DEPICT THIS ASSOCIATION BETWEEN FAN & VENT SHAFTS. FOR DETAILED OPERATIONAL EXPLANATION, SEE ST–M–139.
2. VENT SHAFT DAMPERS ADJACENT TO PORTALS ARE ONLY OPERATED BY OCC COMMANDS.
3. "IB" DENOTES SHAFT ON THE INBOUND TRACK, "OB" DENOTES SHAFT ON THE OUTBOUND TRACK.

DESIGNED	J. MORRIS	3–80 DATE
DRAWN	P. EASLEY	4–80 DATE
CHECKED	E. PENNINGTON	4–80 DATE
APPROVED	B. MORIARTY	9–83 DATE

REFERENCE DRAWINGS		
NUMBER	DESCRIPTION	
ST–M–139	STANDARD PNEUMATIC CONTROL,FLOW DIAGRAMS	
	TUNNEL VENTILATION, UNDER PLATFORM EXH.FANS	

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

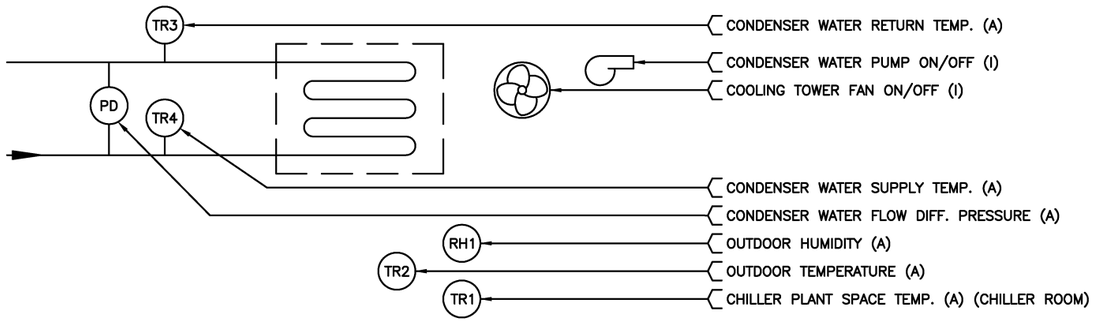
MECHANICAL DESIGN DRAWING
WMATA VENTILATION SYSTEM
SCHEMATIC AND EMERGENCY EXITS

SCALE N.T.S

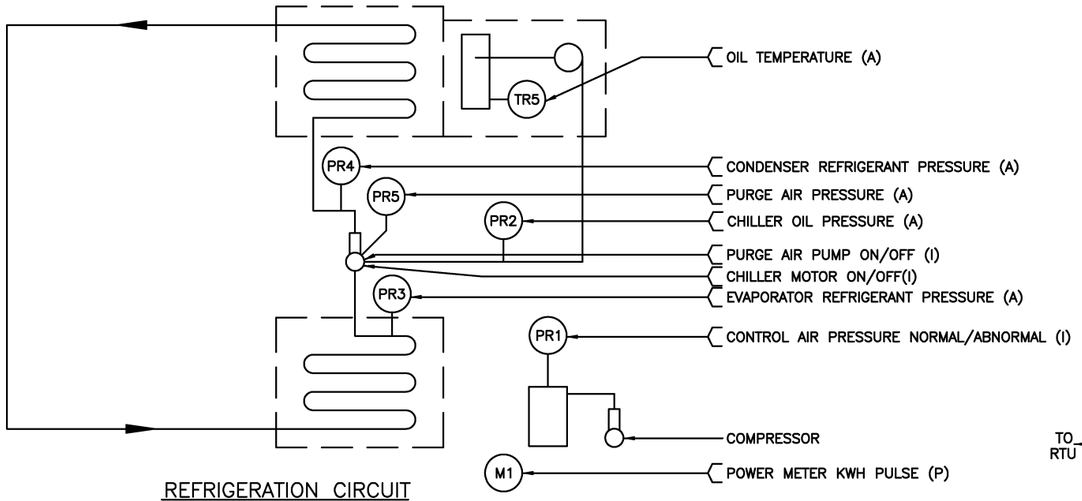
DRAWING NO. DD–M–140

LEGEND

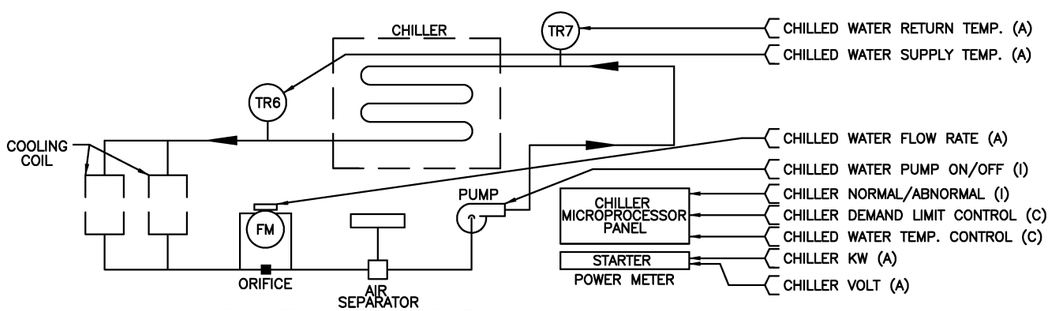
(I) CONTACT CLOSURE INDICATION TO RTU
(A) 4–20mA ANALOG OUTPUT TO RTU
(P) CONTACT CLOSURE PULSE OUTPUT TO RTU
(C) 4–20mA ANALOG CONTROL INPUT FROM RTU



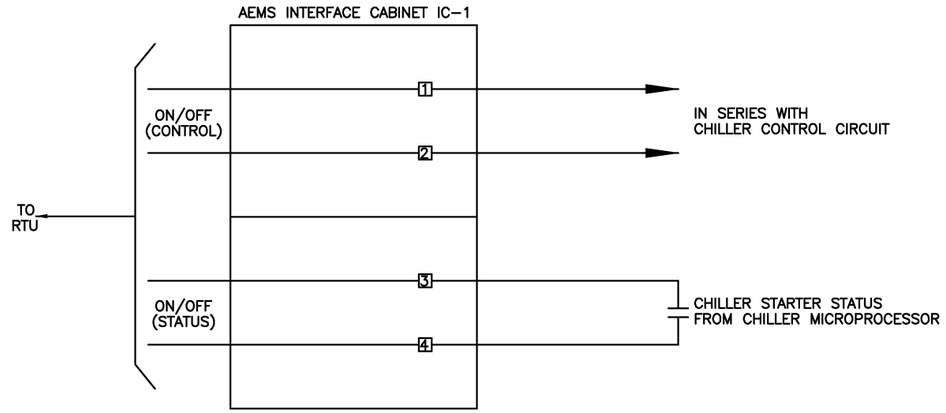
CONDENSER WATER CIRCUIT



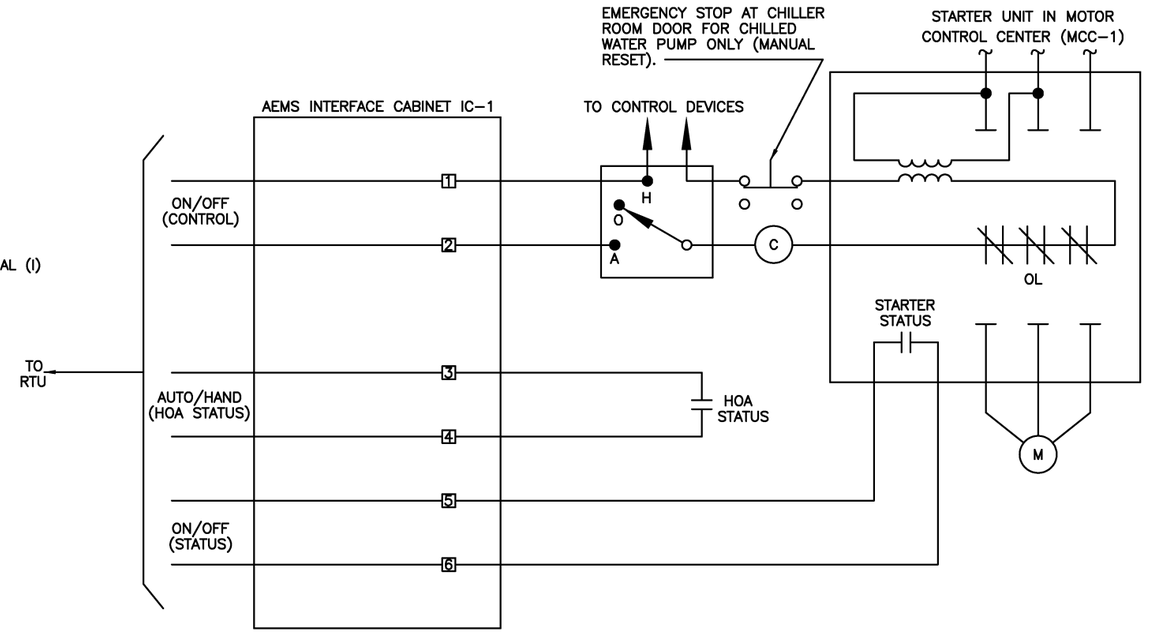
REFRIGERATION CIRCUIT



CHILLED WATER CIRCUIT



CHILLER CONTROL



MOTOR STARTER CONTROL

TYPICAL FOR CONDENSER WATER PUMP, REFRIGERANT PURGE AIR PUMP, CHILLED WATER PUMP, COOLING TOWER FAN.

DESIGNED	R. PATEL	9–98 DATE
DRAWN	R. THOMAS, JR.	9–98 DATE
CHECKED	J. BUMANIS	9–98 DATE
APPROVED	R. GANERIWAL	9–98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–E–098	INTERFACE CABINET CHIILER PLANT

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

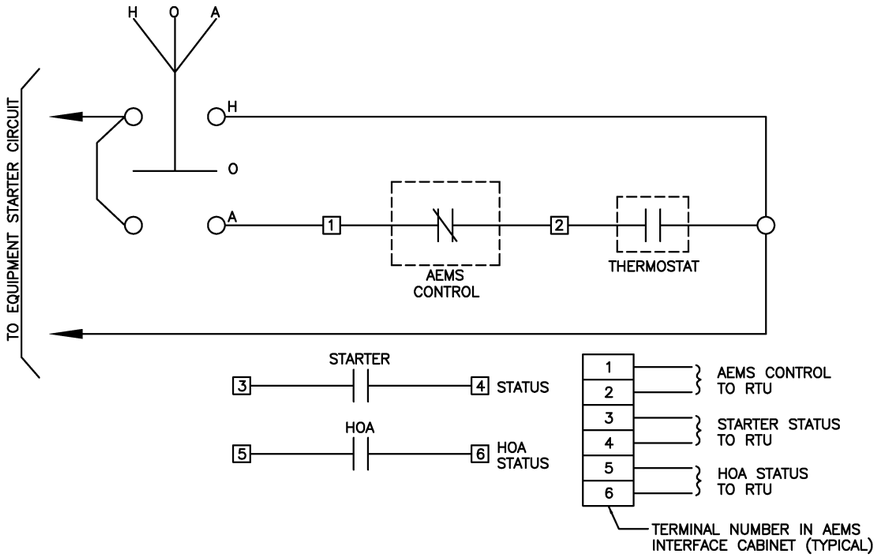
SUBMITTED _____ DATE

APPROVED DIRECTOR _____ May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
AUTOMATED ENERGY MANAGEMENT SYSTEM
TYPICAL DIAGRAMS–CHILLED WATER PLANT

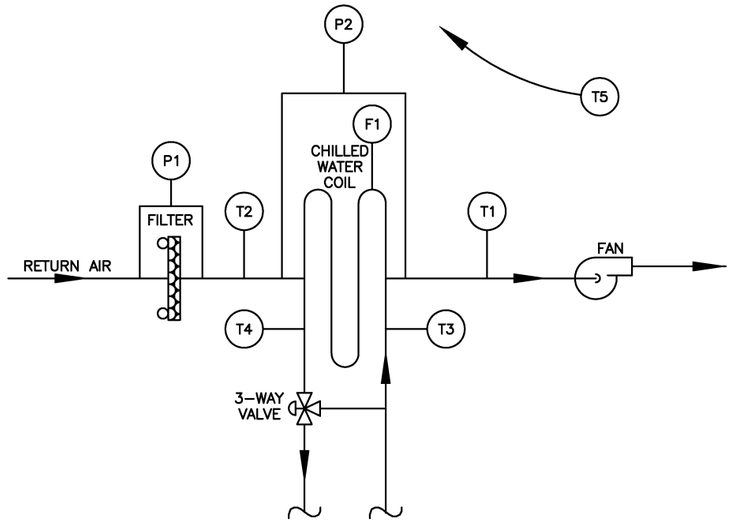
SCALE: NONE

DRAWING NO.: DD–M–141



EQUIPMENT CONTROL DIAGRAM

TYPICAL FOR PLATFORM AND MEZZANINE ACU'S AND UNIT HEATERS



T1 – SUPPLY AIR TEMPERATURE (4–20MA TO RTU) (A)

T2 – RETURN AIR TEMPERATURE (4–20MA TO RTU) (A)

T3 – SUPPLY CHILLED WATER TEMPERATURE (4–20MA TO RTU) (A)

T4 – RETURN CHILLED WATER TEMPERATURE (4–20MA TO RTU) (A)

T5 – STATION SPACE TEMPERATURE (4–20MA TO RTU) (A)

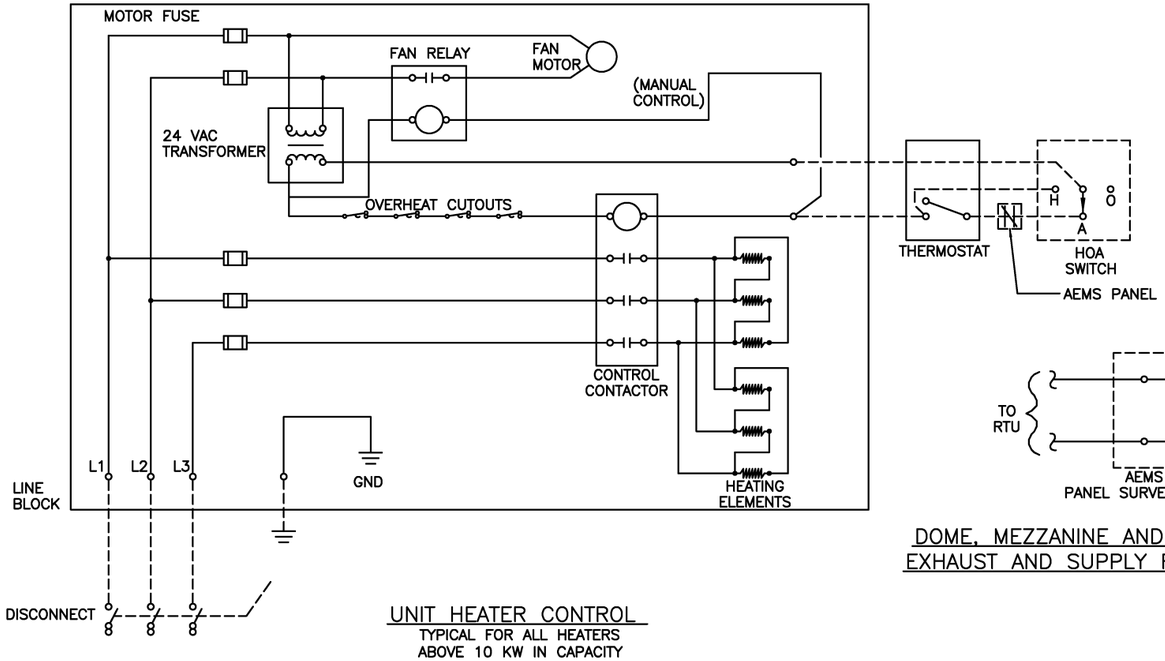
F1 – CHILLED WATER FLOW RATE (4–20MA TO RTU) (A)

P1 – PRESSURE DROP ACROSS FILTER (I)

P2 – PRESSURE DROP ACROSS COIL (I)

AIR CONDITIONING UNIT (ACU) FLOW DIAGRAM

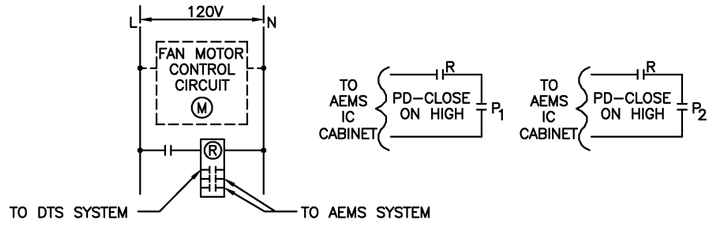
TYPICAL FOR PLATFORM AND MEZZANINE ACU'S



UNIT HEATER CONTROL

TYPICAL FOR ALL HEATERS ABOVE 10 KW IN CAPACITY

DOME, MEZZANINE AND UNDERPLATFORM EXHAUST AND SUPPLY FAN SURVEILLANCE



ACU COIL AND FILTER SURVEILLANCE SCHEMATIC

DESIGNED	R. PATEL	9–98 DATE
DRAWN	R. THOMAS, JR.	9–98 DATE
CHECKED	J. BUMANIS	9–98 DATE
APPROVED	R. GANERIWAL	9–98 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
AUTOMATED ENERGY MANAGEMENT SYSTEM
TYPICAL DIAGRAMS – ACU'S, UH'S AND FANS

SCALE NONE

DRAWING NO. DD–M–142

ENERGY MANAGEMENT ANALOG TELEMETRY SENSOR SCHEDULE

NO.	TYPE	FUNCTION	LOCATION	SCALE READING		SCALE INCREMENTS	NOTES	AEMS INTERFACE CABINET ASSIGNMENT
				RANGE	ACCURACY			
1	LIQUID IMMERSION TEMP.	CHILLED WATER SUPPLY	ON CHILLER	20–70°F	±0.2°F	0.5°F	2,3,4	AEMS PANEL
2	LIQUID IMMERSION TEMP.	CHILLED WATER RETURN	ON CHILLER	20–70°F	±0.2°F	0.5°F	2,3,4	AEMS PANEL
3	LIQUID IMMERSION TEMP.	CONDENSER WATER SUPPLY	ON CHILLER	60–140°F	±0.2°F	1.0°F	2,3,4	AEMS PANEL
4	LIQUID IMMERSION TEMP.	CONDENSER WATER RETURN	ON CHILLER	60–140°F	±0.2°F	1.0°F	2,3,4	AEMS PANEL
5	FLOW METER	CHILLED WATER SUPPLY FLOW	ON CHILLER PIPING	0–1000 GPM	±1.0 GPM	1.0 GPM	1,3,9	AEMS PANEL
6	PRESSURE TRANSMITTER	CONDENSER REFRIG. PRESSURE	ON CHILLER	0–200 PSIG	±0.3 PSI	–	3,4,9	AEMS PANEL
7	PRESSURE TRANSMITTER	EVAPORATOR REFRIG. PRESSURE	ON CHILLER	0–200 PSIG	±0.3° PSI	–	3,4,9	AEMS PANEL
8	PRESSURE TRANSMITTER	CHILLER OIL PRESSURE	ON CHILLER	0–200 PSIG	±0.3° PSI	–	2,3,4	AEMS PANEL
9	TEMP. TRANSMITTER	OUTSIDE AIR	AS REQ'D	0–122°F	±1.5°F	0.5°F	7	AEMS PANEL
10	HUMIDITY TRANSITTER	OUTSIDE AIR	AS REQ'D	0 TO 100% RH	±0.5%	1.0 RH	8	AEMS PANEL
11	LIQUID IMMERSION TEMP.	CHILLED WATER SUPPLY TO COIL	ACU'S	20–70°F	±0.2°F	0.5°F	9,10	AEMS PANEL
12	LIQUID IMMERSION TEMP.	COIL CHILLED WATER RETURN	ACU'S	20–70°F	±0.2°F	0.5°F	9,10	AEMS PANEL
13	FLOW METER	CHILLED WATER SUPPLY COIL FLOW	ACU'S	0–500 GPM	±1.0 GPM	1.0 GPM	9,10	AEMS PANEL
14	DUCT TEMP. TRANSMITTER	SUPPLY AIR TEMP.	ACU'S	–20 to 120°F	±1.2°F	1.0°F	9,10	AEMS PANEL
15	DUCT TEMP. TRANSMITTER	RETURN AIR TEMP.	ACU'S	–20 to 120°F	±1.2°F	1.0°F	9,10	AEMS PANEL
16	TEMP. TRANSMITTER	INTERIOR SPACE TEMP.	PLATFORM	–20 to 120°F	±0.5°F	0.5°F	6	AEMS PANEL
17	LIQUID IMMERSION TEMP.	OIL TEMPERATURE	CHILLER	0–200°F	±0.5°F	1.0°F	2,3,4	AEMS PANEL
18	PRESSURE TRANSMITTER	PURGE AIR PRESSURE	CHILLER	0–300 PSI	±1 PSI	–	2,3,4	AEMS PANEL
19	KW METER	CHILLER KW DEMAND	CHILLER	10–500 KW	±0.5 KW	–	3	AEMS PANEL
20	DIFFERENTIAL PRESSURE COND. WATER FLOW TRANS.	CONDENSER WATER FLOW	CHILLER	0–200 PSIG	±0.3 PSI	–	1,3,4	AEMS PANEL
21	CHILLER ROOM THERMOSTAT	CHILLER RM AIR TEMP.	CHILLER PLANT	0–120°F	±0.2°F	0.5°F	6	AEMS PANEL
22	VOLT METER	VOLTAGE AT CHILLER	CHILLER	0–600 V	±0.5 V	–	–	AEMS PANEL

ENERGY MANAGEMENT STATUS AND INDICATION SCHEDULE

NO.	SENSOR FUNCTION	LOCATION	INDICATION	NOTES	AEMS INTERFACE CABINET ASSIGNMENT
1	PRESSURE DROP ACROSS FILTER	ACU–1,2,3	NORMAL/HIGH	3,4	AEMS PANEL
2	PRESSURE DROP ACROSS COOLING COIL	ACU–1,2,3	NORMAL/HIGH	3,4	AEMS PANEL
3	CONTROL AIR PRESSURE	CONTROL AIR	NORMAL/ABNORMAL	3,4	AEMS PANEL

NOTES:

1. PROVIDE ORIFICE PLATE UNDER CONTROL SECTION. COORDINATE FLOW INDICATOR WITH ORIFICE PLATE. ORIFICE PLATE, METER AND CONVERTER SHALL READ TO 3% ACCURACY AND 10 GPM DIGITAL SPACING.
2. WELLS AND SENSORS SHALL BE PROVIDED AND INSTALLED ON CHILLER. COORDINATE RANGE ACCURACY AND SCALE INCREMENTS OF PRESSURE AND TEMPERATURES. SIGNALS SHALL BE CONNECTED TO INDICATED TERMINALS.
3. COORDINATE RANGE OF OPERATION WITH MANUFACTURER FOR EQUIPMENT TO OPERATE HIGH–LOW AND NORMAL–ABNORMAL.
4. HIGH–LOW INDICATION WILL BE PART OF COMPUTER SOFTWARE PROGRAM.
5. HIGH–LOW SCALE READINGS SHALL BE EQUIVALENT TO 3–15 PSI TRANSDUCER OUTPUT.
6. SENSOR LOCATED ON PYLON @ PLATFORM STATION WITH RESTRICTED COVER PLATE OR ON WALL IN CHILLER PLANT WITH RESTRICTED COVER PLATE.
7. PLATE PROVIDES TAMPERPROOF PROTECTIVE COVER WITH SUN SHADE.
8. PROVIDE TAMPERPROOF SHIELDED COVER, JUNCTION BOX AND GASKET WITH NEMA RATING.
9. COORDINATE RANGE OF ALL SENSORS AT ACU'S WITH ACU'S MANUFACTURERS.
10. COORDINATE WITH ACU'S MANUFACTURER FOR OPERATING NORMAL, ABNORMAL, HIGH–LOW TEMPERATURE AND FLOW.

DESIGNED R. PATEL 9–98 DATE
DRAWN R. THOMAS, JR. 9–98 DATE
CHECKED J. BUMANIS 9–98 DATE
APPROVED R. GANERIWAL 9–98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
AUTOMATED ENERGY MANAGEMENT SYSTEM
SYSTEM EQUIPMENT SCHEDULES SHEET 1 of 2

SCALE NONE

DRAWING NO. DD–M–143

AUTOMATED ENERGY MANAGEMENT SYSTEM EQUIPMENT SCHEDULE

NO.	EQUIPMENT	DESCRIPTION	STATUS OR INDICATION	CONTROL FUNCTION	AEMS INTERFACE CABINET ASSIGNMENT	NOTES
1	CHILLER–1	MOTOR OPERATION	ON/OFF	ON/OFF	AEMS PANEL	1
2	CHILLED WATER PUMP (P–1)	MOTOR OPERATION	ON/OFF	ON/OFF	AEMS PANEL	2
3	CONDENSER WATER PUMP (P–2)	MOTOR OPERATION	ON/OFF	ON/OFF	AEMS PANEL	2
4	COOLING TOWER FAN (CT–1)	MOTOR OPERATION	ON/OFF	ON/OFF	AEMS PANEL	3
5	REFRIGERANT PURGE AIR PUMP	MOTOR OPERATION	ON/OFF	N/A	AEMS PANEL	1
6	CHILLER–1	CHILLER	NORMAL/ABNORMAL	N/A	AEMS PANEL	1
7	CONDENSER WATER PUMP (P–2)	HOA SWITCH	AUTO/HAND	N/A	AEMS PANEL	2
8	CHILLED WATER PUMP (P–1)	HOA SWITCH	AUTO/HAND	N/A	AEMS PANEL	2
9	COOLING TOWER FAN (CT–1)	HOA SWITCH	AUTO/HAND	N/A	AEMS PANEL	3
10	CHILLER–1	DEMAND LIMIT	–	0–100%	AEMS PANEL	6
11	AIR CONDITIONING UNITS	FAN OPERATION	ON/OFF	ON/OFF	AEMS PANEL	4
12	UNDER PLATFORM FANS	FAN OPERATION	ON/OFF	N/A	AEMS PANEL	4
13	DOME & MEZZANINE EXHAUST FANS	FAN OPERATION	ON/OFF	N/A	AEMS PANEL	4
14	UNIT HEATER	HOA SWITCH	AUTO/HAND	N/A	AEMS PANEL	5
15	AIR CONDITIONING UNIT	HOA SWITCH	AUTO/HAND	N/A	AEMS PANEL	4
16	CHILLER DIGITAL POWER METER	ENERGY USAGE	KWH	N/A	AEMS PANEL	1
17	CHILLER–1	CHILLED WATER TEMP.	–	35–50°F	AEMS PANEL	7
18	UNIT HEATER	HEATER OPERATION	ON/OFF	ON/OFF	AEMS PANEL	5
19	FAN SHAFT – FANS	FAN OPERATION	ON/OFF	–	AEMS PANEL	8

NOTES:

1. COORDINATE REMOTE CONTROL AND FUNCTIONS WITH CHILLER MANUFACTURER.
2. COORDINATE REMOTE CONTROL AND FUNCTIONS WITH PUMP MANUFACTURER.
3. COORDINATE REMOTE CONTROL AND FUNCTIONS WITH COOLING TOWER MANUFACTURER.
4. COORDINATE REMOTE CONTROL AND FUNCTIONS WITH FAN MANUFACTURER.
5. COORDINATE REMOTE CONTROL AND FUNCTION WITH UNIT HEATER MANUFACTURER.
6. RANGE 0–100% WITH ±1% ACCURACY AND 1% INCREMENT.
7. RANGE 35–50°F WITH ±1.0°F ACCURACY AND 1.0°F INCREMENT.
8. FANS ARE LOCATED IN THE FAN SHAFT.

DESIGNED R. PATEL 9–98 DATE
DRAWN R. THOMAS, JR. 9–98 DATE
CHECKED J. BUMANIS 9–98 DATE
APPROVED R. GANERIWAL 9–98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

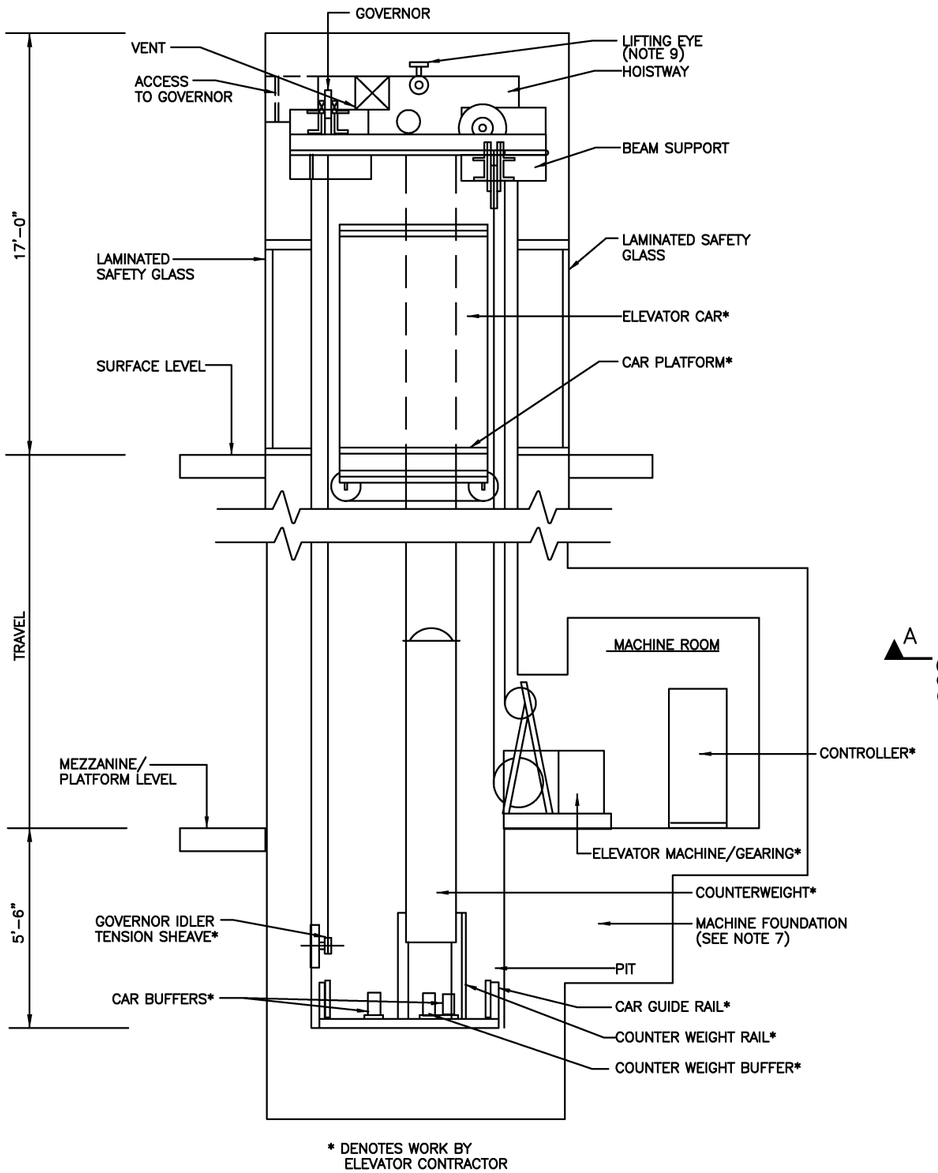
SUBMITTED DATE

APPROVED DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
AUTOMATED ENERGY MANAGEMENT SYSTEM
SYSTEM EQUIPMENT SCHEDULES SHEET 2 of 2

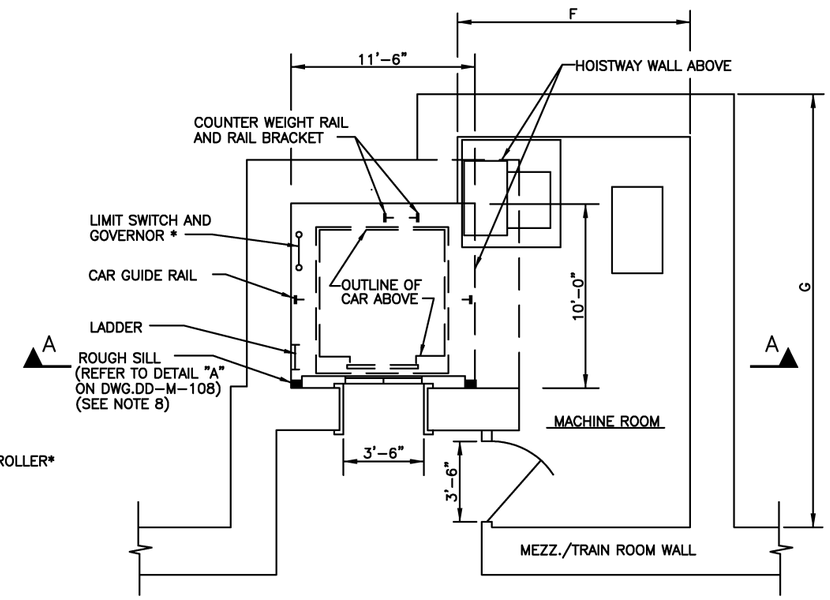
SCALE NONE

DRAWING NO. DD–M–144



* DENOTES WORK BY ELEVATOR CONTRACTOR

SECTION A–A



PLAN

NOTES:

1. THE MACHINE ROOM FOR TRACTION ELEVATORS MUST BE LOCATED IMMEDIATELY ADJACENT TO AND NEAR THE TOP OR BOTTOM OF THE HOISTWAY. APPROVAL OF WMATA IS REQUIRED WHERE IT IS DESIRED TO LOCATE THE MACHINERY DIRECTLY OVERHEAD.
2. CENTER OPENING DOORS ARE PREFERRED WHEREVER POSSIBLE TWO–SPEED DOORS (OFFSET) WILL BE USED WHERE SPACE IS LIMITED.
3. THE LADDER SHALL EXTEND NOT LESS THAN FORTY–TWO (42) INCHES ABOVE THE SILL OF THE ACCESS DOOR, AND HAND–GRIPS SHALL BE PROVIDED TO THE SAME HEIGHT WITH A MINIMUM WIDTH OF EIGHTEEN (18) INCHES AND SIX AND ONE HALF (6–1/2) INCHES BETWEEN WALL AND BACK OF RUNG. THE LADDER MAY BE LOCATED IN A WALL RECESS.
4. ALLOW FOR TWO INCH CAR WALL THICKNESS.
5. MINIMUM MACHINE ROOM DIMENSIONS FOR THE ELECTRIC ELEVATOR ARE: F=9'–0", G=11'–0" AND HEIGHT=8'–0".
6. THE MACHINE ROOM LAYOUT SHOWN IS CONSIDERED APPROPRIATE FOR AN INSTALLATION ADJACENT TO A TRAIN ROOM WALL. HOWEVER, OTHER INSTALLATION MAY REQUIRE THAT THE MACHINE ROOM BE LOCATED ON THE OPPOSITE SIDE OF OR TO THE REAR OF THE HOISTWAY.
7. MACHINE FOUNDATION IS TO BE POURED MONOLITHICALLY AND TIED WITH REINFORCING BARS OF PIT WALL, MACHINE ROOM FLOOR AND SIDEWALLS. POURING TO BE DONE AFTER MACHINE BOLTS ARE SET. FINISH CONTRACTOR TO COORDINATE WITH ELEVATOR CONTRACTOR.
8. ROUGH SILLS MAY BE EITHER CONCRETE OR STEEL.
9. LIFTING EYE TO BE DESIGNED FOR 1500 LBS. CAPACITY. LOCATION TO BE DETERMINED BY ELEVATOR CONTRACTOR.
10. REFER TO ARCHITECTURAL DESIGN DRAWINGS FOR ADDITIONAL DETAILS.
11. THE OVERALL CAR (OUTSIDE TO OUTSIDE) SIZE IS 7'–4" BY 7'–4".

DESIGNED	J. BUMANIS	9–98
DRAWN	R. THOMAS, JR.	9–98
CHECKED	J. BUMANIS	9–98
APPROVED	R. GANERIWAL	9–98
UPDATED	J. BUMANIS	12–98

(DATE)

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

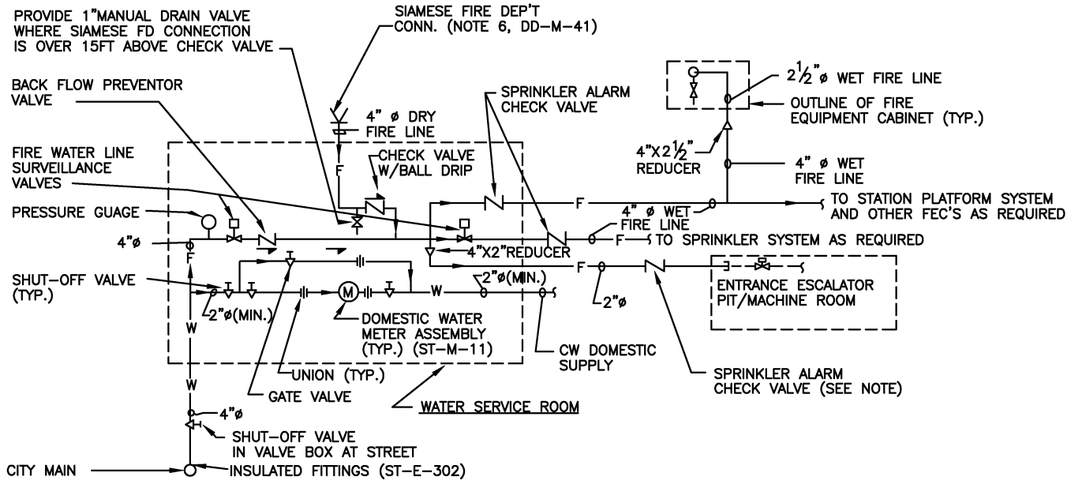
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
TRACTION ELEVATOR INSTALLATION
ELEVATOR PLAN AND SECTIONS

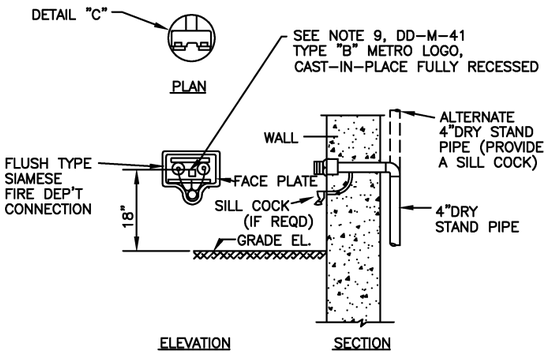
SCALE: NOT TO SCALE

DRAWING NO.: DD–M–145



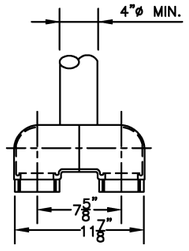
SCHEMATIC ARRANGEMENT OF FIRE AND DOMESTIC WATER LINES

NOTE: LOCATE ESCALATOR SPRINKLER VALVES IN HEATED & LIGHTED ACCESSIBLE SPACE



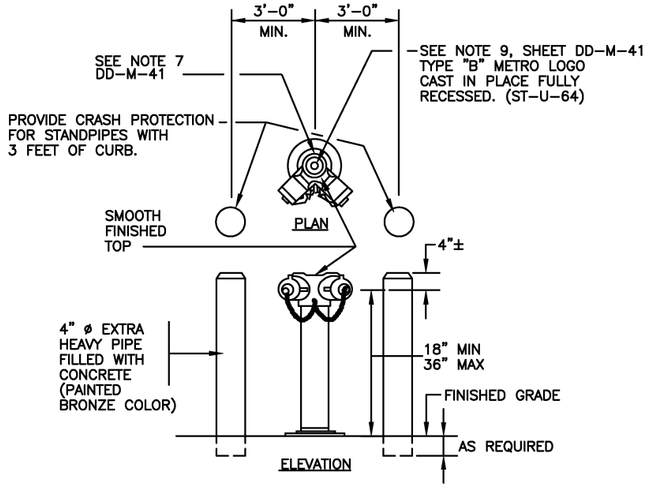
SIAMESE FIRE DEPARTMENT CONNECTION IN WALL AT GRADE

NOT TO SCALE



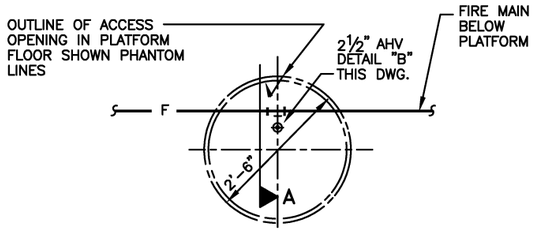
DETAIL "C"
NOT TO SCALE

THESE DETAILS ARE MANDATORY



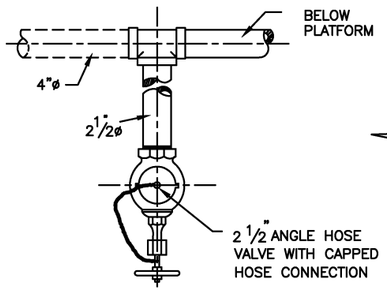
FREE STANDING SIAMESE FIRE DEPARTMENT CONNECTION AT GRADE

NOT TO SCALE



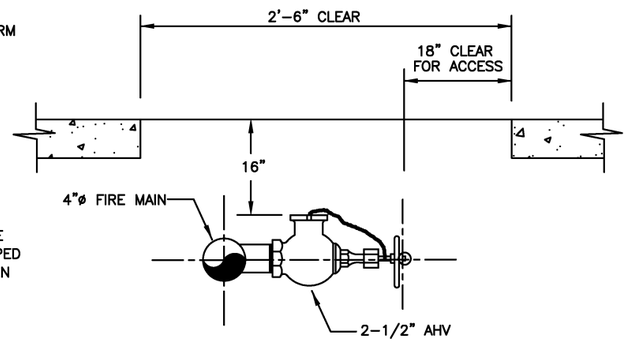
SCHEMATIC PLAN ARRANGEMENT OF BELOW PLATFORM HOSE CONNECTIONS WITH RELATION TO ACCESS PANEL

NOT TO SCALE



DETAIL "B" PLAN VIEW OF HOSE CONNECTION BELOW PLATFORM

NOT TO SCALE



SECTION "A-A"

NOT TO SCALE

DESIGNED R.D. BAKER 6-68
DRAWN P.E. EASLEY 6-68
CHECKED I. SOLOMON 7-68
APPROVED L.W. DAUGHERTY 10-68
DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-M-035	DETAILS OF WALKWAY TO STATION ANCILLARY ROOMS
DD-M-010	TYPICAL MECHANICAL SERVICE ROOMS
DD-M-61	FIRE EQUIPMENT CABINET - MEZZ. LEVEL
DD-M-041	TYPICAL STATION FIRE WATER LINE SYSTEM FOR
	UNDERGROUND STATION.
DD-M-088	SUPERVISORY CONTROL & IND.-STA & VENT SHAFT DETAILS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

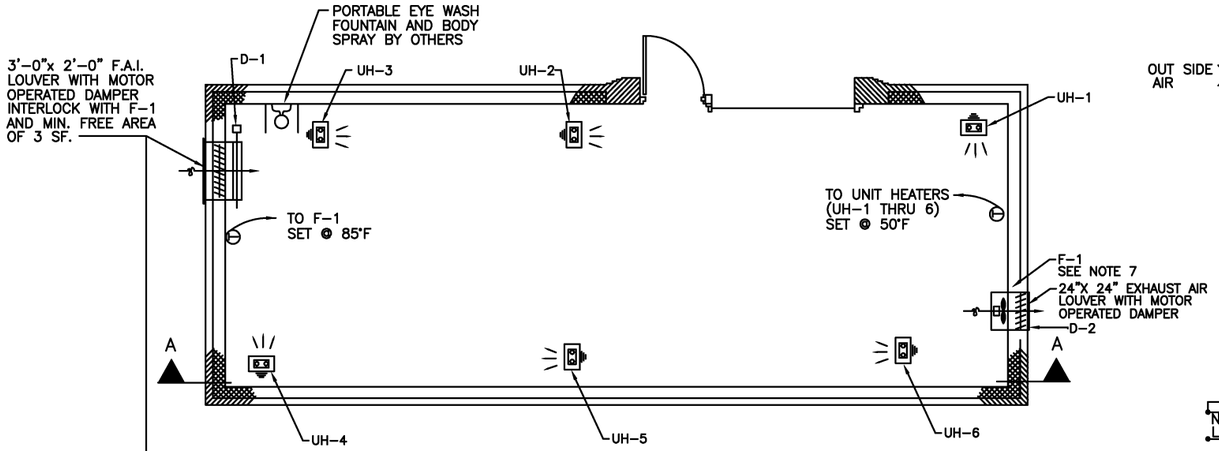
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
TYPICAL STATION FIRE WATER LINE SYSTEMS DETAILS

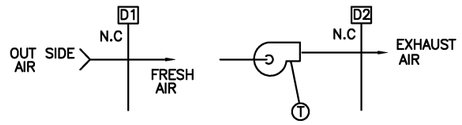
SCALE AS NOTED

DRAWING NO. DD-M-146



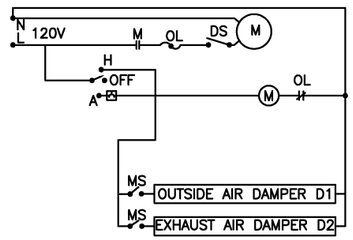
PLAN

SCALE 1/4"= 1'-0"



FLOW DIAGRAM

NO SCALE

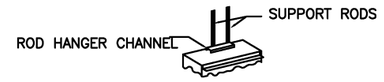


CONTROL DIAGRAM

NO SCALE

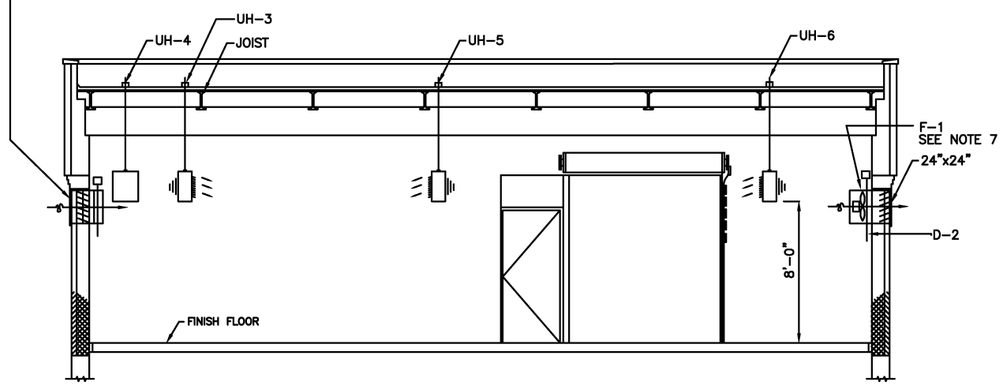
SYMBOLS AND ABBREVIATIONS

M	MAGNETIC STARTER COIL	DS	SINGLE POLE DISCONNECT SWITCH
MS	MANUAL STARTER WITH THERMAL OVERLOAD	CFM	CUBIC FEET / MINUTE
N.C.	NORMALLY CLOSED	M	MOTOR
OL	THERMAL OVERLOAD RELAY	H OFF A	HAND(H)–OFF(O)–AUTOMATIC(A) SELECTOR SWITCH
	CONTACT NORMALLY CLOSED		DAMPER
	CONTACT NORMALLY OPEN		THERMOSTAT CONTACT
SP.	STATIC PRESSURE		FAN
T	THERMOSTAT	D	ELECTRICAL DAMPER OPERATOR
	ELECTRIC UNIT HEATER (UH–)	DS	DISCONNECT SWITCH
F.A.I.	FRESH AIR INTAKE	M	MAGNETIC STARTER



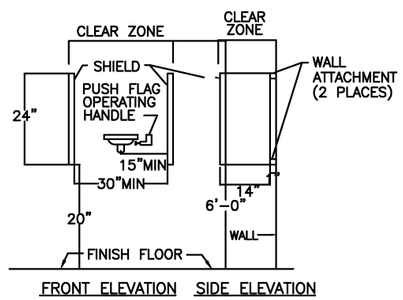
UNIT HEATER HANGER DETAIL

NO SCALE



SECTION A–A

SCALE 1/4"= 1'-0"



SHIELD DETAIL

NO SCALE

NOTES:

1. ELECTRIC UNIT HEATER SHALL BE CALCULATED BY THE DESIGNER. MOUNTING HEIGHT 8'–0 ABOVE FINISH FLOOR.
2. AUTOMATIC DAMPERS TO BE MOTOR OPERATED. ELECTRICAL CHARACTERISTICS TO BE BASED ON 115V. FOR POWER INPUT SEE ELECTRICAL DRAWING NO. DD–E–113.
3. EXHAUST FAN AND DAMPERS TO OPERATE SIMULTANEOUSLY.
4. FOR ROOF DRAINAGE SEE ARCHITECTURAL DRAWINGS.
5. FOR EXHAUST FAN, DAMPER AND LOUVER MOUNTING DETAILS SEE ARCHITECTURAL DRAWINGS.
6. FOR PLAN SELECTION, REFER TO ELECTRICAL DRAWINGS. SELECTION IS BASED ON DUCT BANK PENETRATION INTO THE BUILDING AND SPECIAL TRACKWORK LOCATION.
7. FRESH AIR INTAKE LOUVER AND EXHAUST FAN CAPACITY SHALL BE CALCULATED BY THE DESIGNER.PROVIDE 1" MESH ENCLOSURE TO GUARD MOTOR AND FAN BLADES. SCREEN TO BE EASILY REMOVABLE TYPE FOR SERVICE.

DESIGNED	R. PATEL	8–98 DATE
DRAWN	C. BUITRAGO	8–98 DATE
CHECKED	J. BUMANIS	8–98 DATE
APPROVED	R. GANERIWAL	8–98 DATE
UPDATED	ENGA	12–98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–A–TB–001	TIE BREAKER STATION–FLOOR PLANS AND ELEVATIONS
DD–A–TB–002	TIE BREAKER STATION–ROOF PLANS AND ELEVATIONS
DD–A–TB–003	TIE BREAKER STATION–WALL SECTIONS AND DETAILS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

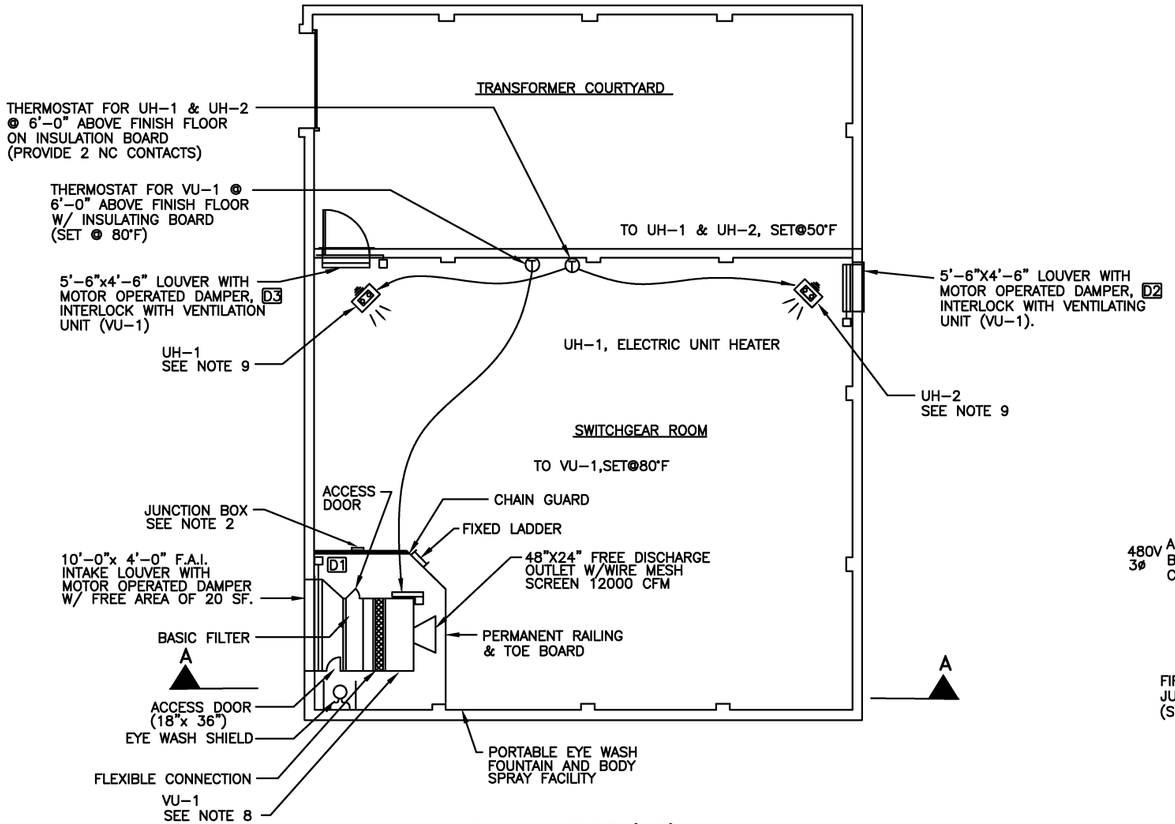
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECAHNICAL DESIGN DRAWING
TIE BREAKER STATION
MECHANICAL FLOOR PLAN, SECTION, DIAGRAMS, DETAILS, SYMBOLS, ABBREVIATIONS AND NOTES

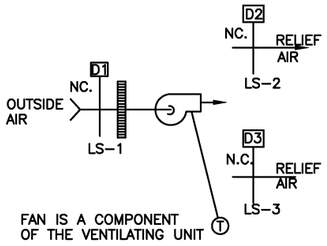
SCALE AS SHOWN

DRAWING NO. DD–M–147



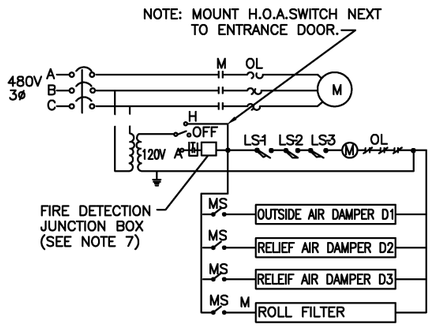
PLAN – TYPE ' B'

(SCALE: 1/4"=1'-0" SEE NOTE 1)
(LAYOUT FOR TYPE 'A' IS SIMILIAR ONLY OPPOSITE HAND)



FLOW DIAGRAM

NO SCALE



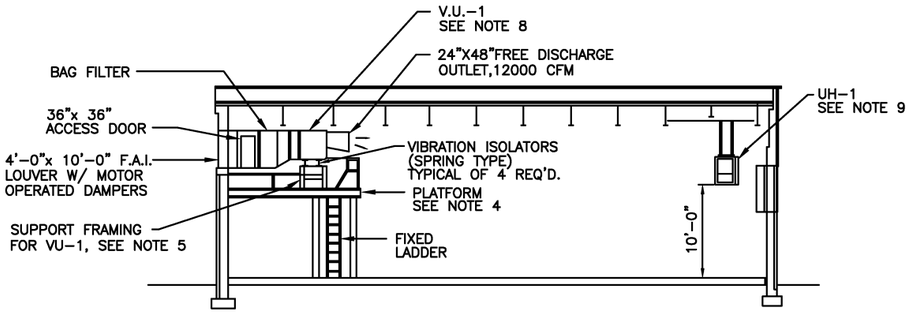
CONTROL DIAGRAM

NO SCALE

SYMBOLS AND ABBREVIATIONS

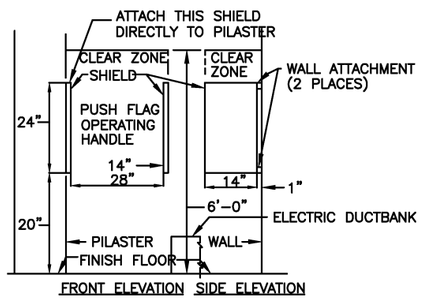
M	MAGNETIC STARTER COIL	DS	SINGLE POLE DISCONNECT SWITCH
MS	MANUAL STARTER WITH THERMAL OVERLOAD	CFM	CUBIC FEET / MINUTE
N.C.	NORMALLY CLOSED	M	MOTOR
OL	THERMAL OVERLOAD RELAY	H OFF A	HAND–OFF–AUTOMATIC SELECTOR SWITCH
	CONTACT NORMALLY CLOSED		DAMPER
	CONTACT NORMALLY OPEN		THERMOSTAT CONTACT
SP.	STATIC PRESSURE		FAN
T	THERMOSTAT	D	ELECTRICAL DAMPER OPERATOR
	ELECTRIC UNIT HEATER (UH–)	DS	DISCONNECT SWITCH
M	MAGNETIC STARTER	LS–X	LIMIT SWITCH NORMALLY OPEN
F.A.I.	FRESH AIR INTAKE		

UNIT HEATER HANGER DETAIL



SECTION A–A

(SCALE: 1/4"=1'-0")



SHIELD DETAIL

NO SCALE

NOTES:

1. FOR PLAN SELECTION, REFER TO ELECTRICAL DRAWING DD–S–160. MECHANICAL EQUIPMENT TO BE SHOWN OPPOSITE HAND WHEN DICTATED BY THE ELECTRICAL POWER PLAN LAYOUT.
2. JUNCTION BOX FOR FUTURE CONNECTION TO FIRE DETECTION SYSTEM. (SEE DRAWING DD–E–117.)
3. ALL CONTROL POWER SHALL BE SUPPLIED BY A CONTROL TRANSFORMER SIZED TO PROVIDE POWER FOR ALL CONTROLS AND ANCILLARY DEVICES.
4. FOR PLATFORM SUPPORT PLANS AND DETAILS SEE DESIGN STRUCTURAL DRAWING NO. DD–S–156.
5. MOUNT THE VENTILATING UNIT ON SUPPORT FRAMING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MOUNTING HEIGHT TO ACCOMMODATE DUCT CONNECTIONS.
6. PROVIDE 1" INSULATION ON OUTSIDE TOP AND SIDE OF INTAKE DUCT PLENUM.
7. PROVIDE LABEL MOUNTED IN CLOSE PROXIMITY TO THE SELECTOR SWITCH STATING THAT "THE MANUAL MODE OF OPERATION IS TO BE USED ONLY FOR TESTS OR IN CASES OF EMERGENCY"
8. VENTILATING UNIT CAPACITY SHALL BE CALCULATED BY DESIGNER.
9. ELECTRIC UNIT HEATER CAPACITY SHALL BE CALCULATED BY DRSIGNER.
10. PROVIDE HIGH EFFICIENCY BACK FILTERS WITH 80–85 % EFFICIENCY AND 2" THICK THROW AWAY FILTER INSIDE SERVICE FILTER ENCLOSURE.

DESIGNED	W.D.B.	4–82 DATE
DRAWN	W.D.B.	5–82 DATE
CHECKED	J. BUMANIS	1–83 DATE
APPROVED	R. GANERIWAL	4–83 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–S–156	STRUCTURAL SUBSTATION DWGS.
DD–E–116 TO DD–E–119	ELECTRICAL SUBSTATION DWGS.

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

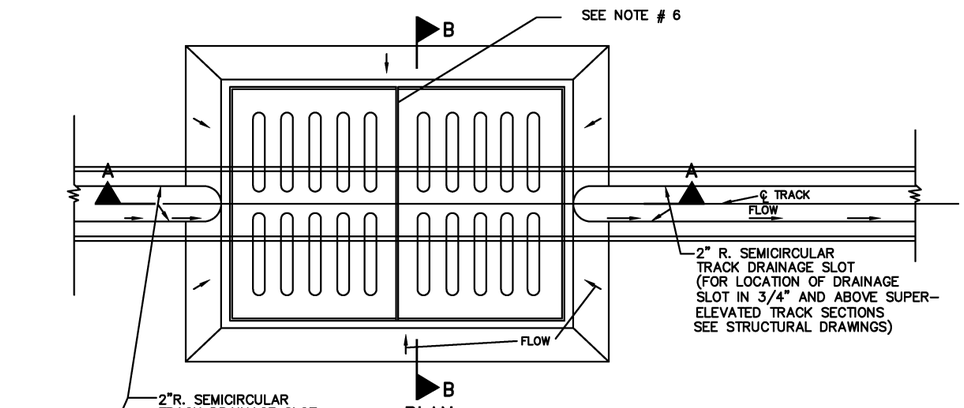
APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWINGS

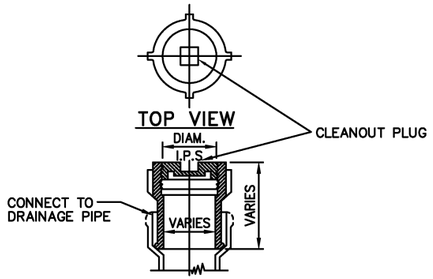
TRACTION POWER SUBSTATION–MECHANICAL FLOOR PLAN, SECTION, DIAGRAMS, SYMBOLS, ABBREVIATIONS AND NOTES

SCALE: AS NOTED

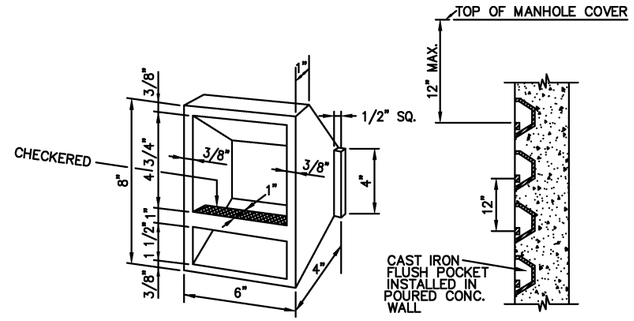
DRAWING NO. DD–M–148



PLAN



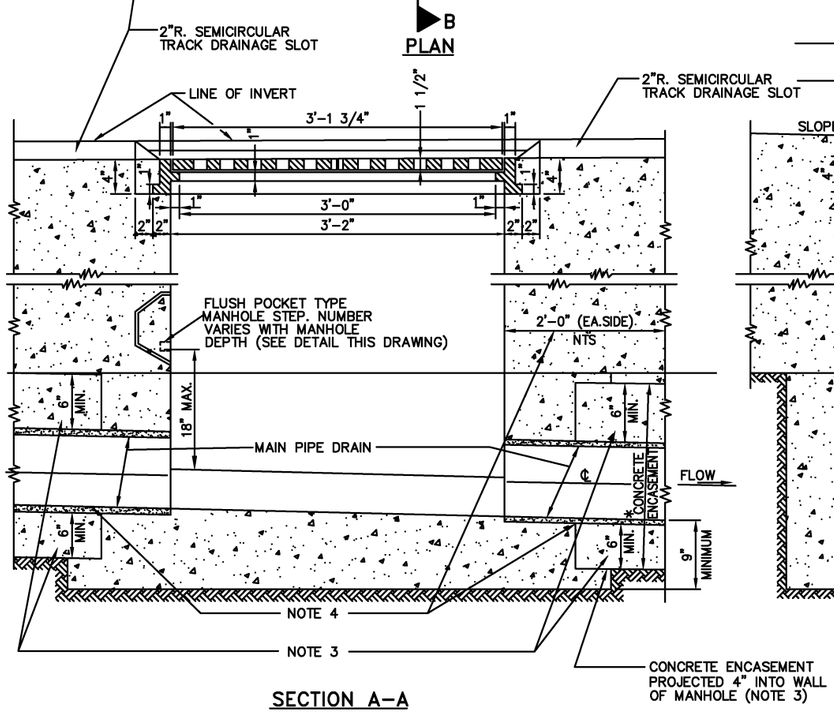
DETAIL OF CLEANOUT–TYPE I



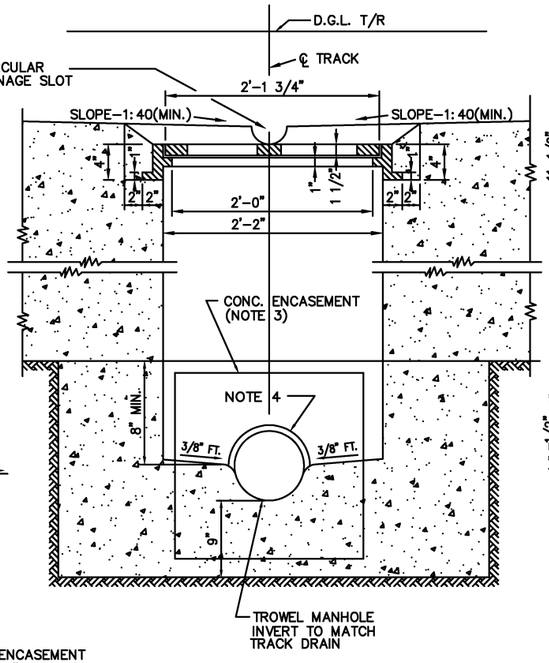
3–DIMENSIONAL VIEW

TYPICAL INSTALLATION

DETAIL OF FLUSH POCKET TYPE MANHOLE STEP



SECTION A–A

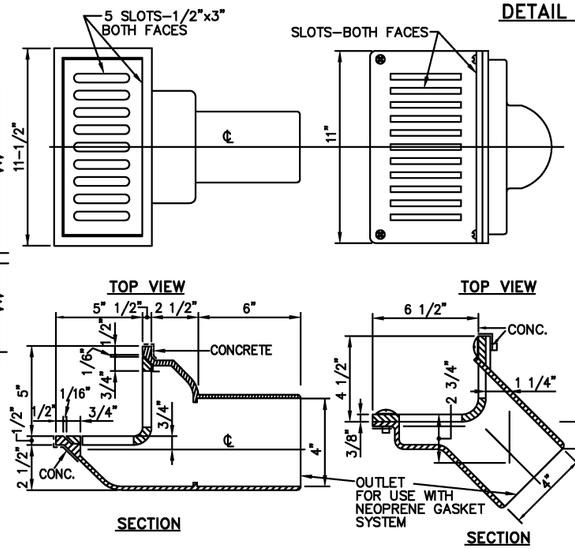


SECTION B–B

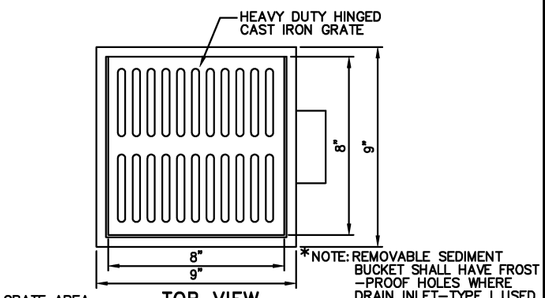
DETAIL OF MANHOLE–TYPE I

NOTES:

1. PROVIDE MANHOLES–TYPE 1 FOR ACCESS TO MAIN TRACK DRAIN WHERE INDICATED. WEIGHT OF GRATE AND FRAME: 325 POUNDS.
2. FOR STRUCTURAL DIMENSIONS AND REINFORCING SEE STRUCTURAL CONTRACT DRAWINGS.
3. CONCRETE ENCASEMENT IS NOT REQUIRED FOR PERFORATED PIPES AS INDICATED FOR ROCK TUNNEL.
4. WHERE POLYVINYL CHLORIDE OR POLYETHYLENE IS THE MAIN PIPE DRAIN MATERIAL, USE CAST IRON PIPE FOR MINIMUM OF 2 FT. EACH SIDE OF MANHOLE.
5. MATERIAL: FRAME AND GRATE, CAST IRON PER ASTM A48 CLASS 35.
6. PROVIDE SPLIT MANHOLE GRATING.

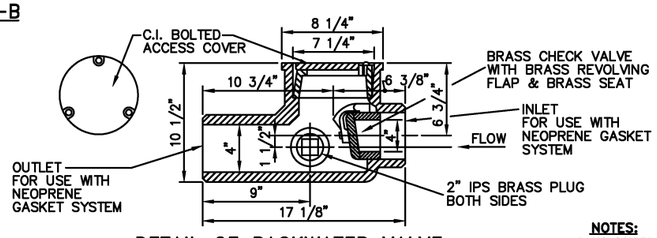


DETAIL OF SCUPPER DRAINS



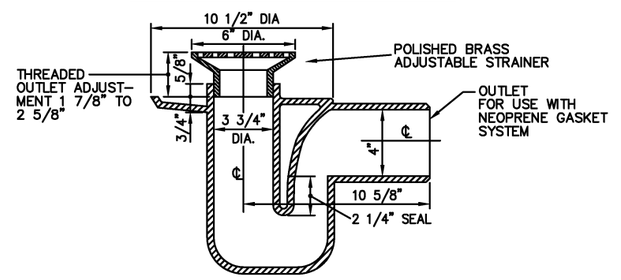
SECTION

DETAIL OF DRAIN INLET–TYPE I



DETAIL OF BACKWATER VALVE

MATERIAL: CAST IRON & (BRASS AS NOTED)



DETAIL OF FLOOR DRAIN–TYPE I

NOTES:

1. NO OAKUM AND LEAD CAULKING–ALL CASTINGS TO BE USED WITH NEOPRENE GASKET SYSTEM. ALL NEOPRENE GASKETS SHALL BE DESIGNED EXCLUSIVELY FOR USE WITH FLOOR AND SCUPPER DRAINS.
2. CASTING DIMENSIONS SHALL BE PER MANUFACTURER'S STANDARDS FOR THE SPECIFIED SIZE OF PIPE.

DESIGNED ____ DATE
DRAWN ____ DATE
CHECKED ____ DATE
APPROVED ____ DATE
UPDATED ENGA 12–96

REFERENCE DRAWINGS		REVISIONS		
NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
DD–M–150	DRAINAGE DETAILS AND CASTINGS SHT. 2.	08/2001	ENGA	Revised and issued by the Authority
DD–M–151	DRAINAGE DETAILS AND CASTINGS SHT. 3.			

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED ____ DATE

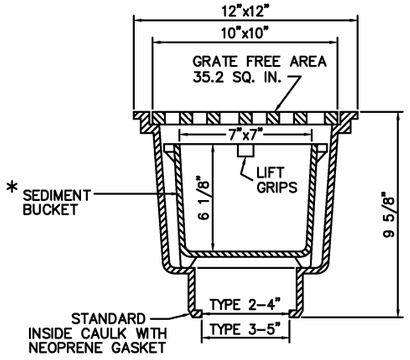
APPROVED ____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING

DRAINAGE DETAILS AND CASTINGS
SHEET 1

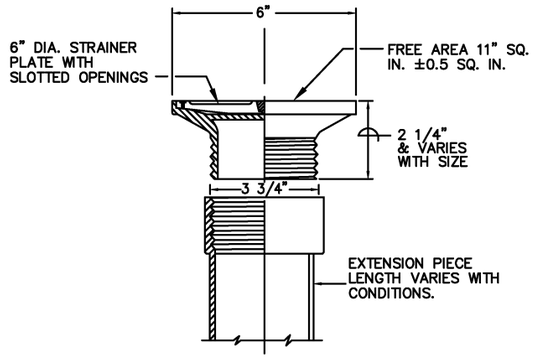
SCALE: NOT TO SCALE

DRAWING NO. DD–M–149

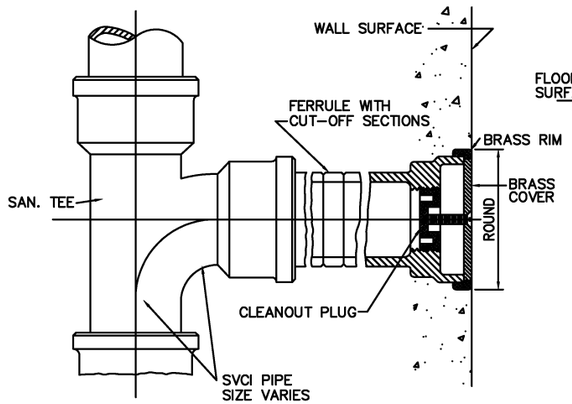


DRAIN INLET – TYPE 2

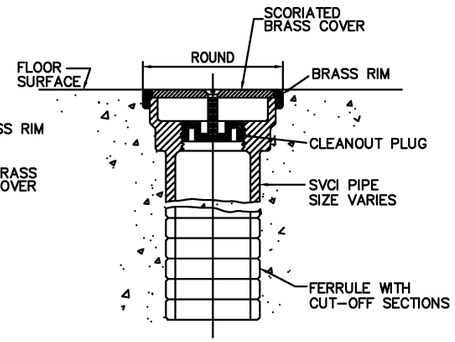
*NOTE: SEDIMENT BUCKET SHALL HAVE FROST-PROOF HOLES WHERE DRAIN INLETS-TYPES 2 IS USED IN LOCATIONS SUBJECT TO FREEZING.



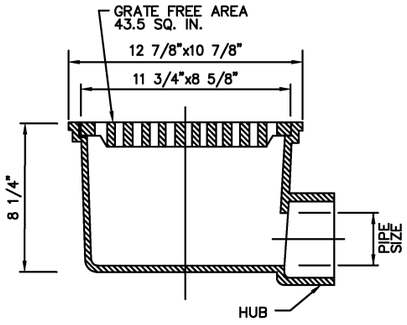
DRAIN INLET – TYPE 4



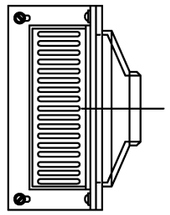
CLEANOUT – TYPE 2



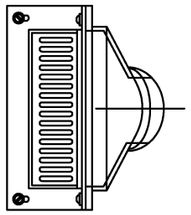
CLEANOUT – TYPE 3



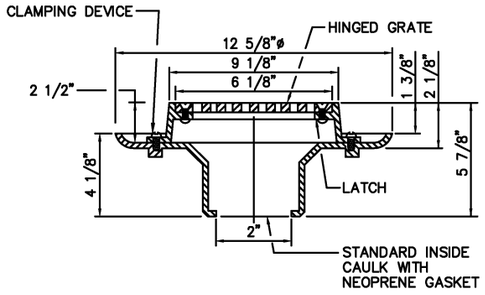
FLOOR DRAIN–TYPE 2



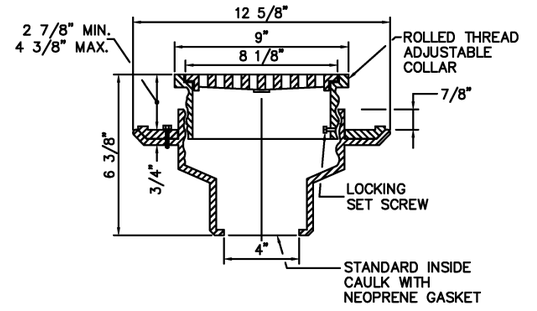
PLAN



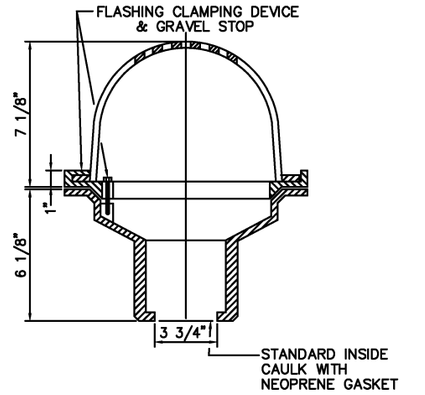
PLAN



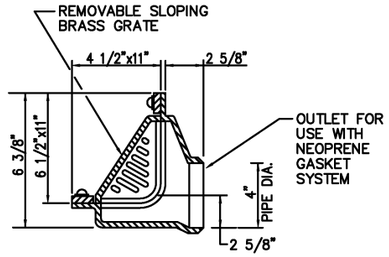
FLOOR DRAIN – TYPE 3



FLOOR DRAIN – TYPE 4

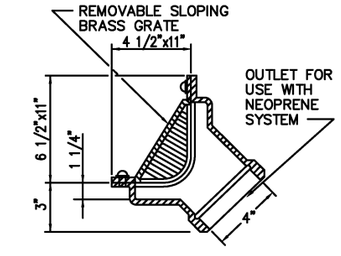


FLOOR DRAIN – TYPE 5



SECTION

SCUPPER DRAIN –TYPE 3

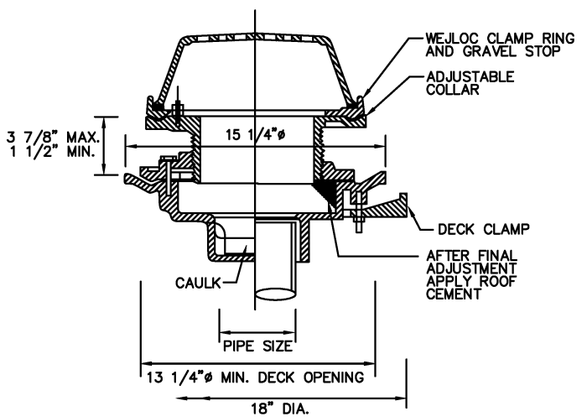


SECTION

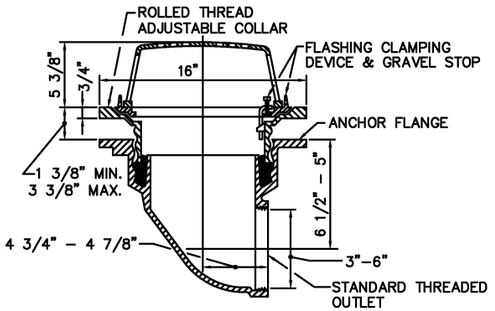
SCUPPER DRAIN – TYPE 4

NOTES:

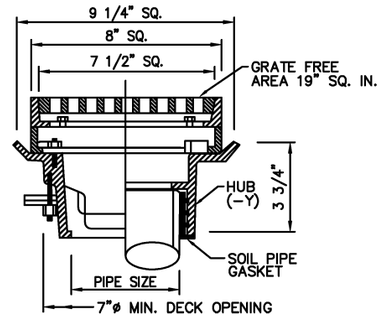
1. NO OAKUM AND LEAD CAULKING–ALL CASTINGS TO BE USED WITH NEOPRENE GASKET SYSTEM UNLESS OTHERWISE NOTED. NEOPRENE GASKETS SHALL BE DESIGNED EXCLUSIVELY FOR USE WITH FLOOR AND ROOF DRAINS.
2. REFER TO NOTE # 2 ON DRAWING DD–M–149.



ROOF DRAIN – TYPE 1



ROOF DRAIN – TYPE 2



ROOF DRAIN – TYPE 3

DESIGNED	W.D.B.	4–82 DATE
DRAWN	W.D.B.	5–82 DATE
CHECKED	J. BUMANIS	1–83 DATE
APPROVED	R. GANERIWAL	4–83 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–149	DRAINAGE DETAILS AND CASTINGS SHT.1
DD–M–151	DRAINAGE DETAILS ANS CASTINGS SHT.3

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

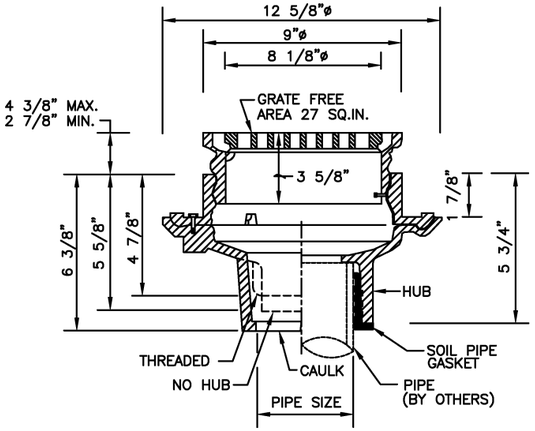
APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING

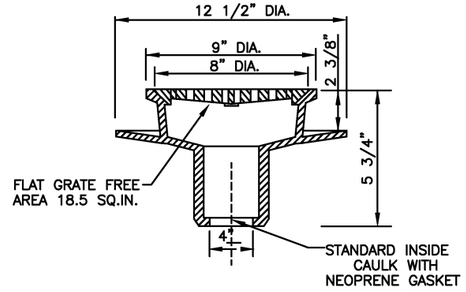
DRAINAGE DETAILS AND CASTINGS
SHEET 2

SCALE: NOT TO SCALE

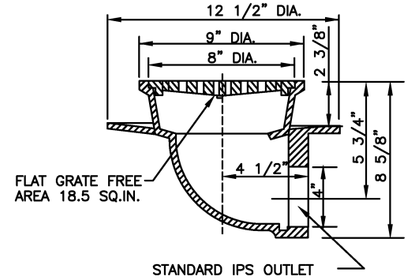
DRAWING NO. DD–M–150



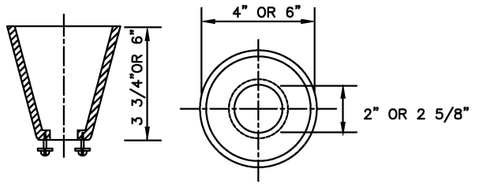
FLOOR DRAIN – TYPE 6



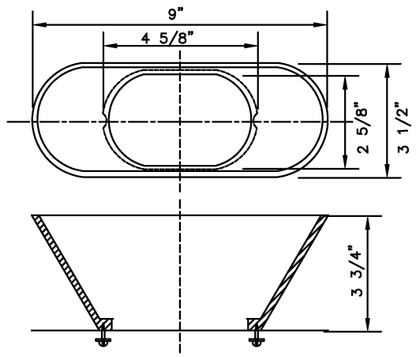
AREA DRAIN – TYPE 1



AREA DRAIN – TYPE 2

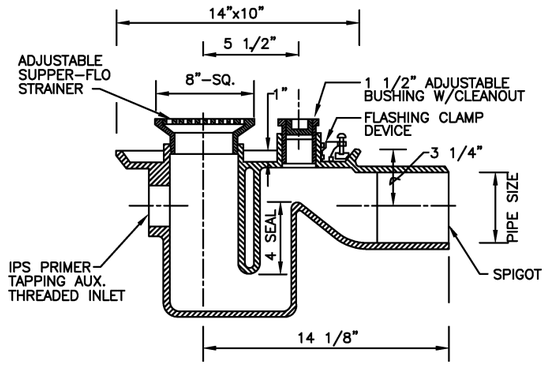


TYPE 1

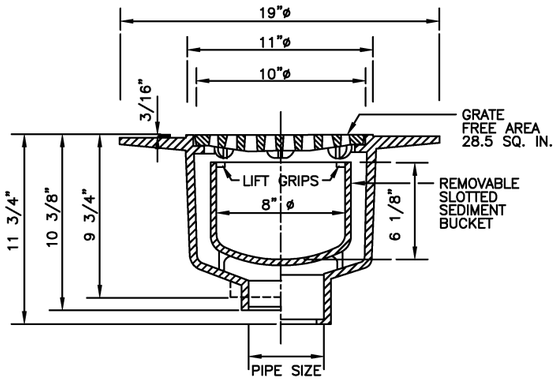


TYPE 2

FUNNEL CONVERSION ASSEMBLY
(FOR USE WITH ANY FLAT GRATE OR STRAINER

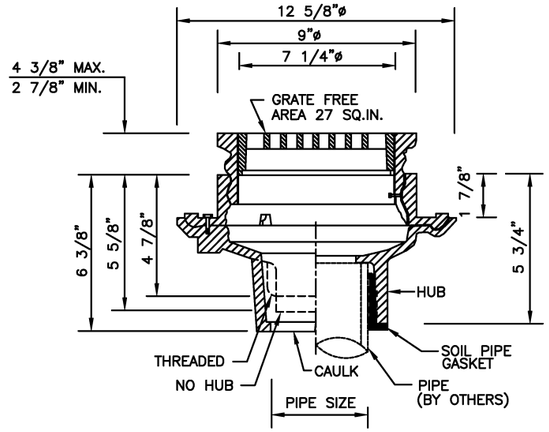


FLOOR DRAIN – TYPE 7 & 8



DRAIN INLET – TYPE 5 6 & 7

NOTE: REMOVABLE SLOTTED SEDIMENT BUCKET SHALL HAVE FROST–PROOF HOLES WHERE DRAIN INLETS TYPES 5,6 & 7 ARE USED IN LOCATIONS SUBJECT TO FREEZING.



ROOF DRAIN – TYPE 4

NOTES:

1. NO OAKUM AND LEAD CAULKING–ALL CASTINGS TO BE USED WITH NEOPRENE GASKET SYSTEM UNLESS OTHERWISE NOTED. NEOPRENE GASKETS SHALL BE DESIGNED EXCLUSIVELY FOR USE WITH AREA, FLOOR OR ROOF DRAINS.
2. REFER TO NOTE # 2 ON DD–M–149

DESIGNED ____ DATE
DRAWN ____ DATE
CHECKED ____ DATE
APPROVED ____ DATE
UPDATED ENGA 12–98

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD–M–149	DRAINAGE DETAILS AND CASTINGS SHEET 1
DD–M–150	DRAINAGE DETAILS AND CASTINGS SHEET 2

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED ____ DATE

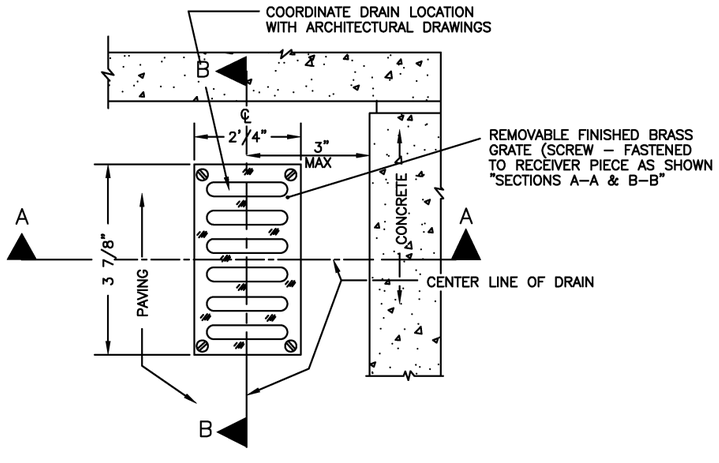
APPROVED ____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING

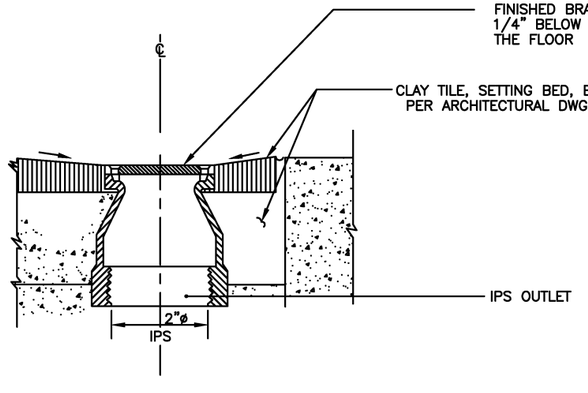
DRAINAGE DETAILS AND CASTINGS
SHEET 3

SCALE: NO TO SCALE

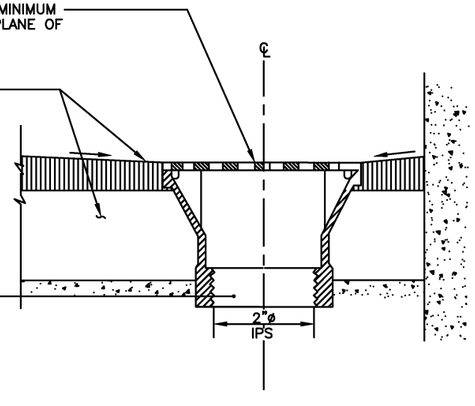
DRAWING NO. DD–M–151



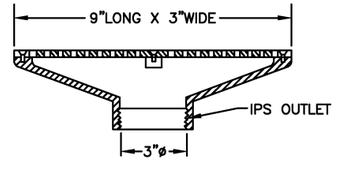
PLAN



SECTION A–A



SECTION B–B



DRAIN INLET–TYPE 8
NOT TO SCALE

PASSAGEWAY FLOOR DRAIN
NOT TO SCALE

DESIGNED	W.D.B.	4–82 DATE
DRAWN	W.D.B.	5–82 DATE
CHECKED	J. BUMANIS	1–83 DATE
APPROVED	R. GANERIWAL	4–83 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING

DRAINAGE DETAILS AND CASTINGS
SHEET 4

SCALE AS NOTED

DRAWING NO. DD–M–152

AIR CONDITIONING AND VENTILATION SYMBOLS

- CHILLED WATER PLANT
- CHILLED WATER SUPPLY — CHWS
- CHILLED WATER RETURN — CHWR
- CONDENSER WATER SUPPLY — CWS
- CONDENSER WATER RETURN — CHR
- CONDENSATE DRAIN — CD
- WATER MAKE–UP SUPPLY — M
- CHILLED WATER RISER — CW / NO
- PIPE RISING
- PIPE TURNING DOWN
- UNION
- EXPANSION JOINT, PIPING
- CONCENTRIC REDUCER OR INCREASER
- ECCENTRIC REDUCER OR INCREASER — TOP LEVEL
- ECCENTRIC REDUCER OR INCREASER — BOTTOM LEVEL
- ORIFICE OR VENTURI FLANGE
- PIPING ANCHOR
- GRADE IN DIRECTION OF FLOW — (UP) (DOWN)
- DIRECTION OF FLOW
- SLEEVE FOR PIPING
- STRAINER
- VALVE, GATE
- VALVE, GLOVE
- VALVE ON RISER
- VALVE, CHECK
- VALVE, PRESSURE REDUCING
- VALVE, PRESSURE RELIEF
- BALANCING COCK
- VACUUM BREAKER — V
- BACK FLOW PREVENTER
- FLEXIBLE CONNECTOR (PIPING)
- REFRIGERANT LIQUID LINE — RL
- REFRIGERANT SUCTION LINE — RS
- VALVE, THERMOSTATIC EXPANSION
- VALVE, MAGNETIC STOP — S
- FILTER–DRIER, REFRIGERANT
- PRESSURE SWITCH — P
- THERMOSTAT, REMOTE SENSING ELEMENT — T
- THERMOSTAT — T
- HUMIDISTAT — H

- PRESSURE GAUGE
- THERMOMETER
- AIR ENTERS GRILLE OR DUCT
- AIR LEAVES GRILLE OR DUCT
- AIR FLOW THROUGH DOOR LOUVER OR UNDERCUT DOOR — A
- SECTION, SUPPLY AIR DUCT
- SECTION, DUCT ON SUCTION SIDE OF FAN
- SECTION, FRESH AIR INTAKE DUCT — F / A
- DUCT SIZE, FIRST DIMENSION IS FOR SIDE SHOWN — 36X20
- DUCT SECTION, FIRST DIMENSION IS FOR DUCT WIDTH — 30X14
- DUCT TRANSITION
- DUCT TRANSITION
- SQUARE ELBOW WITH TURNING VANES
- DAMPER, MANUAL
- DAMPER, MOTOR OPERATED
- MOTOR OPERATOR, DAMPER — MO
- MANUAL OVER–RIDE FOR DAMPER OPERATOR — MOD
- DAMPER, SPLITTER WITH ADJUSTING ROD
- DIRECTION OF FLOW
- INCLINED DROP (WITH RESPECT TO AIR FLOW) — D
- INCLINED RISE (WITH RESPECT TO AIR FLOW)
- TURNING VANES
- FLEXIBLE DUCT AND EQUIPMENT CONNECTOR
- POINT OF CONNECTION TO EXISTING WORK
- DIRECTION OF SLOPE FOR A PIPE — D

AIR CONDITIONING UNIT	ACU
UNDER PLATFORM EXHAUST FAN	UPE
ELECTRIC REHEAT COIL–NUMBER	ERH–( )
ACCESS DOOR	AD
DOUBLE DEFLECTION GRILLE	DDG
DDG/OPPOSED BLADE DAMPER	DDG/OBD
GRILLE/OPPOSED BLADE DAMPER	G/OBD
CEILING DIFFUSER	CD
CEILING GRILLE	CG
CD/OPPOSED BLADE DAMPER	CD/OBD
CG/OPPOSED BLADE DAMPER	CG/OBD
DAMPER	DPR
SPLITTER DAMPER	SD
OPPOSED BLADE DAMPER	OBD
SUPPLY AIR	SA
RETURN AIR	RA
DISCHARGE AIR	DA
FRESH AIR	FA
OUTSIDE AIR	OA
B T U PER HOUR	BTUH
THOUSANDS B T U PER HOUR	MBH
CIRCULAR SECTION DUCT	ϕ
EXHAUST	EXH
UNIT HEATER	
FIRE DAMPER	FD
AUTOMATED ENERGY MANGEMENT SYSTEM	A.E.M.S.
ROOF TOP AIR CONDITIONING UNIT	R T U

MAIN, CONTROL AIR	M
CONTROL AIR	CA
CONTROL VALVE	V
AIR VALVE	AV
SIGNAL DIVIDER	SD
COMMON	C
SOLENOID VALVE	SOL
HAND–OFF–AUTOMATIC	HOA
ELECTRIC–PNEUMATIC SWITCH	EP
PNEUMATIC–ELECTRIC SWITCH	PE
FLOW SWITCH	F
MAKE	M
BREAK	B
NORMALLY OPEN	NO
NORMALLY CLOSED	NC
LOW LIMIT	LL
AUXILIARY	AUX
LOAD SIDE FAN STARTER	LSFS
CONTROL VALVE, 3–WAY	
CONTROL VALVE, 2–WAY	
RECEIVER–CONTROLLER	R–C
REVERSE ACTION	R/A
DIRECT ACTING	D/A
TIME CLOCK	CL
REMOTE SURVEILLANCE & CONTROL	RS&C
DATA TRANSMISSION SYSTEM	DTS
INDICATION FUNCTION, R.S. &C.	(I)
CONTROL FUNCTION, R.S. &C.	(C)
CIRCUIT, R.S. &C.	CRT
PRESSURE SWITCH, R.S. & C.	PS
PRESSURE DIFFERENTIAL SWITCH, R.S. &C.	PDS
END SWITCH, R.S.& C.	ES
RELAY COIL, R.S.& C.	
RELAY CONTACTS, R.S. &C.	
FLOW METER, R.S. &C.	FM
THERMOMETER, R.S. &C.	TRC
PNEUMATIC ELECTRIC SWITCH	PE

DESIGNED ____ DATE
DRAWN ____ DATE
CHECKED ____ DATE
APPROVED ____ DATE
UPDATED ENGA 12–98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

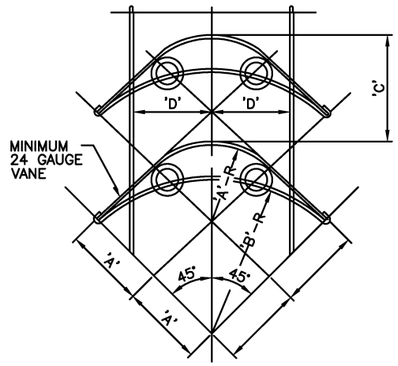
SUBMITTED ____ DATE

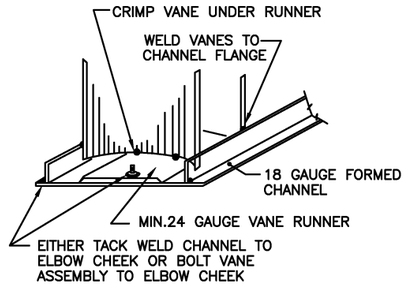
APPROVED ____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
AIR CONDITIONING & VENTILATION SYMBOLS

SCALE: NO SCALE

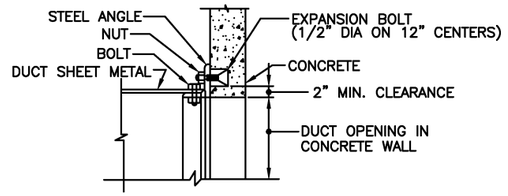
DRAWING NO.: DD–M–153



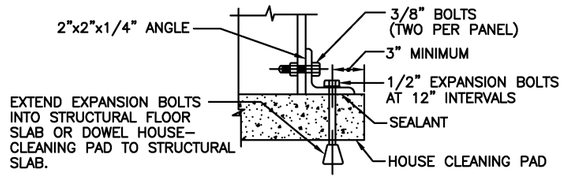


DUCT SIZES	DIMENSIONS			
	A	B	C	D
UP TO 20"	1"	2"	1 1/2"	1 1/8"
20"AND OVER	2 1/4"	4 1/2"	3 1/4"	2 1/4"

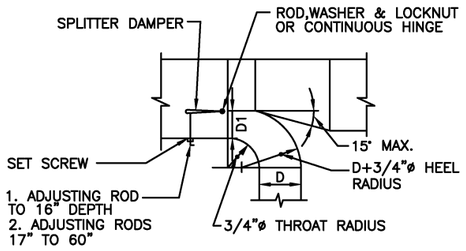
TURNING VANES DETAIL



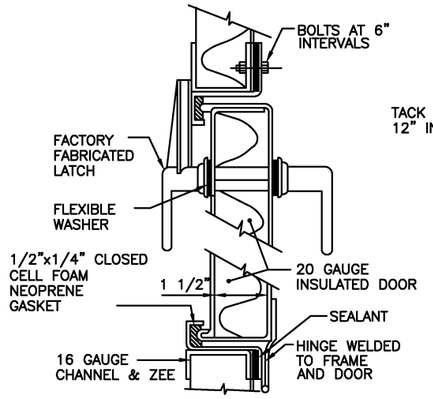
DETAIL OF CONNECTION OF METAL DUCT TO CONCRETE DUCT



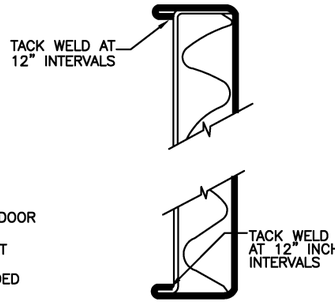
PLENUM CASING DETAIL



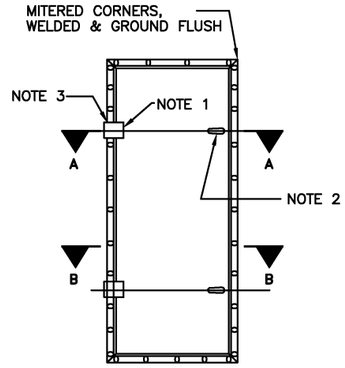
SPLITTER DAMPER DETAIL



SECTION A–A



SECTION B–B

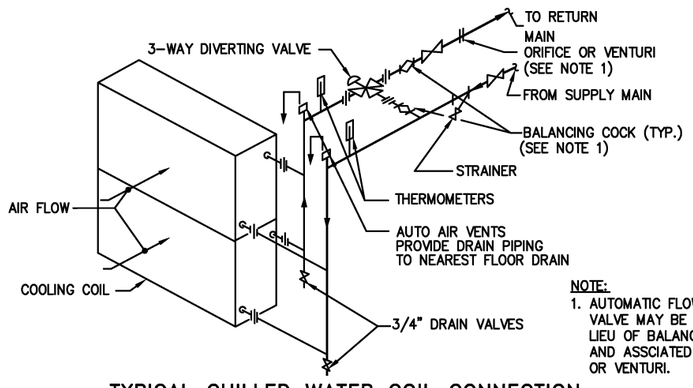


ELEVATION

NOTES: 1. 2 HINGES MINIMUM
2. 2 LATCHES ON DOORS OVER 16"x16"

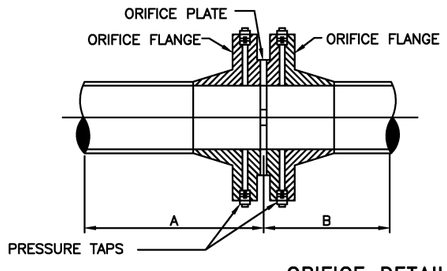
3. HINGES TO BE MADE OF 1/8" THICK GALVANIZED IRON WITH BRASS PINS

PLENUM ACCESS DOOR DETAIL



NOTE:
1. AUTOMATIC FLOW CONTROL VALVE MAY BE INSTALLED IN LIEU OF BALANCING COCKS AND ASSCIATED ORIFICE OR VENTURI.

TYPICAL CHILLED WATER COIL CONNECTION



ORIFICE DETAIL

PIPE SIZE	MINIMUM STRAIGHT A LENGTH IN FEET	MINIMUM STRAIGHT B LENGTH IN FEET
1"	1'–6"	0'–6"
1 1/4"	2'–0"	0"–6"
1 1/2"	2'–0"	0'–6"
2"	3'–0"	0'–8"
2 1/2"	3'–6"	1'–0"
3"	4'–6"	1'–4"
4"	5'–6"	2'–0"
6"	8'–0"	2'–6"
8"	11'–0"	3'–6"
10"	13'–6"	4'–0"
12"	16'–0"	5"–0"

DESIGNED W.D.B. 4–82 DATE
DRAWN W.D.B. 5–82 DATE
CHECKED J. BUMANIS 1–83 DATE
APPROVED R. GANERIWAL 4–83 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING

MECHANICAL DETAILS

SCALE NO SCALE

DRAWING NO. DD–M–154

PLUMBING AND FIRE PROTECTION SYMBOLS

PIPE BELOW STRUCTURAL SLAB SANITARY OR DRAIN — S D
EXPOSED PIPE SANITARY OR DRAIN — S D
CONCEALED PIPE SANITARY OR DRAIN — S D

ROOF DRAIN PIPE — RD RD
SANITARY VENT PIPE — V V
PERFORATED DRAIN PIPE — PD
HOT WATER PIPING — HW
COLD WATER PIPING — CW
FIRE LINE PIPING — F
SPRINKLER PIPING — SP
PIPE TURNING UP
PIPE TURNING DOWN
PIPE ANCHOR
UNION
REDUCER
ECCENTRIC REDUCER
STRAINER
GLOBE VALVE
GATE VALVE
VALVE IN VERTICAL PIPE
CHECK VALVE
BALANCING VALVE
FLUSH VALVE WATER CLOSET — WC
FLUSH VALVE URINAL — UR
LAVATORY — LAV
MCP SERVICE BASIN — MSB
WATER HEATER — WH
CAST IRON — C.I.
EXTRA HEAVY CAST IRON — XHCI
SERVICE WEIGHT CAST IRON — SVCI
CAST IRON PRESSURE PIPE — C.I.P.P.
GALVANIZED IRON — G.I.
GALVANIZED STEEL — G.S.

VACUUM BREAKER — V
PRESSURE REDUCING VALVE
AUTOMATIC VALVE
AUTOMATIC AIR VENT — AAV
PRESSURE RELIEF VALVE
COMBINATION TEMPERATURE–PRESSURE RELIEF VALVE — T
CLEAN OUT
SCUPPER DRAIN — PLAN SECTION SD–I
DRAIN INLET — DI–I TYPE NO
FLOOR DRAIN — FD–I
AREA DRAIN — AO
OPEN SIGHT DRAIN — OSD
ROOF DRAIN — RD
ROOF LEADER — RL
PIPE SLEEVE
MANHOLE — MH–1 TYPE NO.
"P" TRAP
CAPPED CONNECTION
WALL HYDRANT — WH
HOSE BIBB — HB
FIRE HYDRANT — FH
SIAMESE FIRE DEPARTMENT CONNECTION — BUILDING WALL, AT GRADE
SOIL OR VENT STACK THROUGH ROOF — P NO.
EXTRA HEAVY GALVANIZED STEEL — XHGS
ACCESS DOOR — A.D.

TEST TEE — T.T.
INVERT ELEVATION — INV. ELEV.
VENT THROUGH ROOF — VTR
POINT OF CONNECTION–NEW WORK TO EXISTING WORK
WATER METER — M
DEMOLITION ENDS HERE–CAP PIPING & DUCTS
SIDE WALL SPRINKLER
FIRE LINE PIPING — F
FLUSH TYPE SPRINKLER
CONTROL PANEL FOR DETECTION UNITS — C
FIRE EQUIPMENT CABINET — FEC
PENDENT SPRAY SPRINKLER
FIRE EXTINGUISHER — E
2" CAP STUB
ANGLE HOSE VALVE — A.H.V.
MANUAL DAMPER OVERRIDE — M.D.O.
PNEUMATIC MOTOR–OPERATOR — P.M.O.
CUBIC FEET PER MINUTE — CFM
RADIUS — R.

DESIGNED ____ DATE
DRAWN ____ DATE
CHECKED ____ DATE
APPROVED ____ DATE
UPDATED J. BUMANIS 12-98

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–M–153	AIR CONDITIONING & VENTILATION SYMBOLS

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED ____ DATE
APPROVED ____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
PLUMBING AND FIRE PROTECTION
SYMBOLS

SCALE NO SCALE
DRAWING NO. DD–M–155

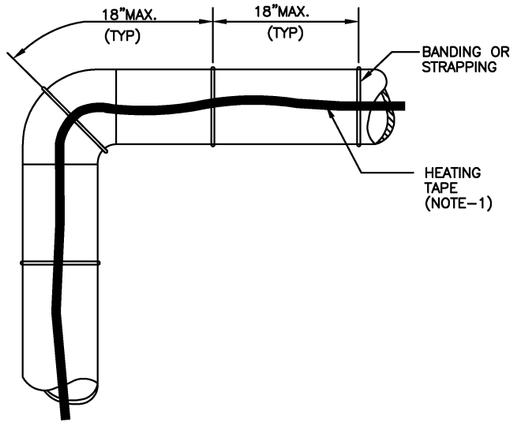
TABLE 1

WATTS PER FOOT REQUIRED WITH 1.0" THICK CELLULAR GLASS INSULATION (SEE NOTE–8)		
PIPE SIZE	WATTS PER FT.	INSULATION PIPE SIZE
1/2"	2.7	3/4"
3/4"	3.1	1"
1"	3.5	1 1/4"
1 1/2"	4.5	2"
2"	5.2	2 1/2"
3"	7.0	3 1/2"
4"	8.4	4 1/2"
5"	10.2	6"
6"	11.3	7"
7"	13.0	8"
8"	14.5	9"
9"	16.0	10"
10"	17.5	10"
12"	20.5	12"

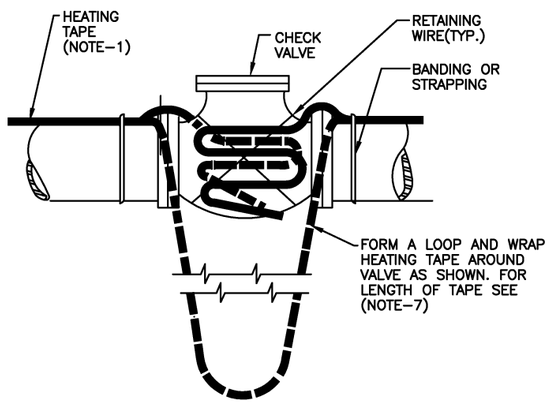
TABLE 2

FITTINGS – HEAT SINKS MINIMUM WATTS REQUIRED WITH 1.0" THICK CELLULAR GLASS INSULATION (SEE NOTE–8)					
PIPE SIZE	VALVE (WATT)	CHECK VALVE (WATT)	PIPE* SUPPORT (WATT)	FLANGE (WATT)	
1/2"	2.7	2.7	8.1	2.0	
3/4"	3.1	3.1	8.5	2.3	
1"	5.3	4.4	8.8	2.6	
1 1/2"	9.0	6.8	9.0	3.4	
2"	10.4	7.8	9.4	3.9	
3"	21.0	10.5	10.0	5.3	
4"	25.2	12.5	10.5	6.3	
5"	30.6	15.3	11.0	7.8	
6"	33.9	17.0	11.5	8.5	
7"	39.0	19.5	12.0	9.8	
8"	43.5	21.8	12.5	14.5	
9"	48.0	24.0	13.0	16.0	
10"	52.5	26.3	14.0	17.5	
12"	69.0	31.0	15.6	20.7	

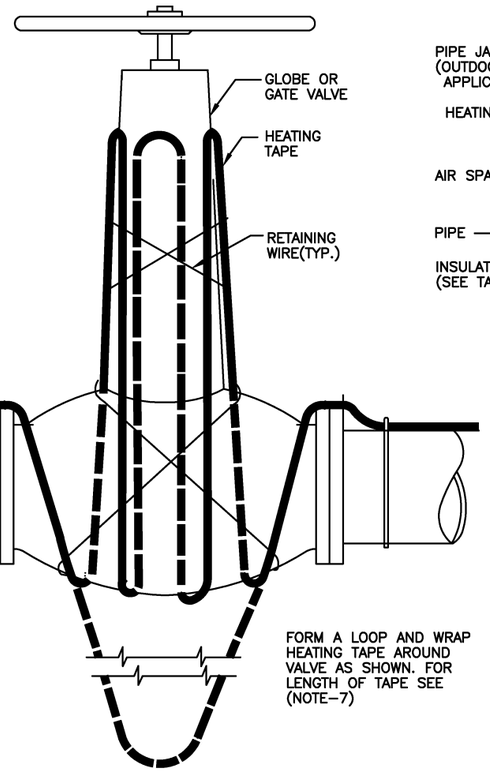
* SEE NOTE–6



HEATING TAPE ON ELBOW

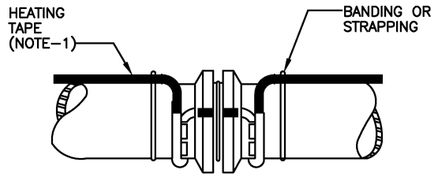


HEATING TAPE ON CHECK VALVE



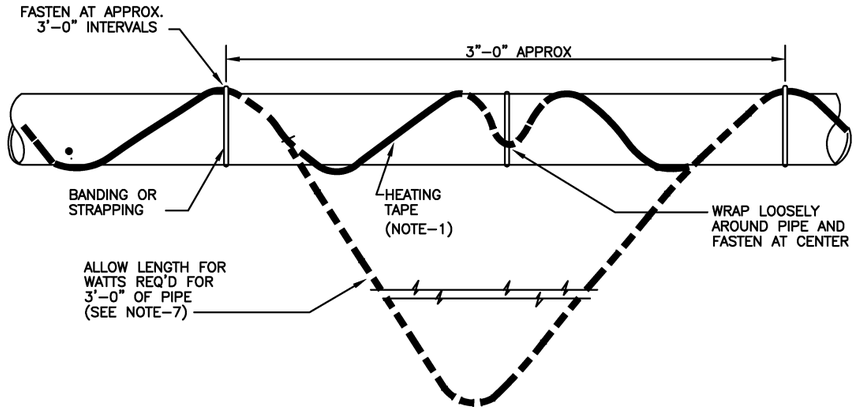
HEATING TAPE ON GATE OR GLOBE VALVE

END VIEW

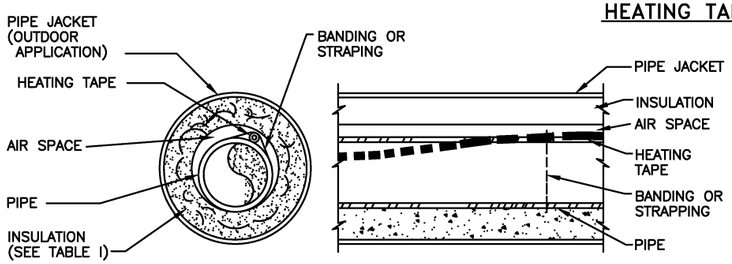


ELEVATION

HEATING TAPE ON PIPE FLANGE

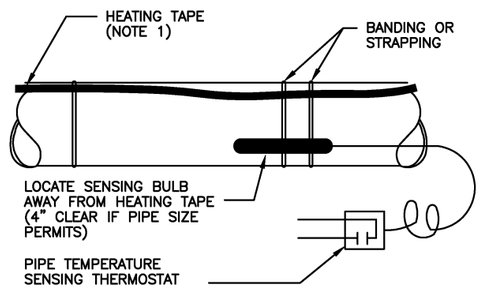


HEATING TAPE INSTALLATION ON PIPE



END VIEW ELEVATION

INSULATION FOR HEATING TAPE



THERMOSTAT BULB INSTALLATION

NOTES

1. PROVIDE REQUIRED WATTS PER FOOT BY A SINGLE TAPE ALONG THE SIDE OF , OR SPIRALING AROUND THE PIPE OR BY MULTIPLE TAPES PARALLELING THE PIPE.
2. DO NOT BEND TAPE TOO SHARPLY (MINIMUM BENDING RADIUS IS 6 TIMES THE TAPE DIAMETER).
3. DO NOT ALLOW TAPES TO OVERLAP OR TOUCH.
4. DO NOT PULL TAPES TIGHT. ALLOW FOR HEAT EXPANSION.
5. BANDING OR STRAPPING –MAXIMUM SPACE BETWEEN FASTENERS –18 INCHES;
   - A. STRAPPING –1/2"X.020 STAINLESS STEEL STRAP AND CLIPS FOR APPLICATIONS ABOVE 10 WATTS/FT.
   - B. WIRE –18 GAUGE (.047"DIA.) DEAD SOFT ANNEALED STAINLESS STEEL WIRE, FOR APPLICATION TO AND INCLUDING 10 WATTS/FT.
   - C. GLASS TAPE – ACCEPTABLE FOR APPLICATIONS BELOW 6 WATTS/FT.
6. NOT REQUIRED IF INSULATED PIPE SUPPORTS ARE USED.
7. L= LENGTH OF HEATING TAPE REQUIRED IN FEET. (PER FOOT OF PIPE)

$$L = \frac{\text{WATTS(PER FT.OF PIPE)REQUIRED(TABLE 1 OR 2)}}{\text{HEATING TAPE OUTPUT WATTS/FT.}}$$

8. IF 2.0" THICK INSULATION IS PROVIDED. REDUCE WATTS PER FOOT BY 35%.

DESIGNED	W.D.B.	4–82 DATE
DRAWN	W.D.B.	5–82 DATE
CHECKED	J. BUMANIS	1–83 DATE
APPROVED	R. GANERIWAL	4–83 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

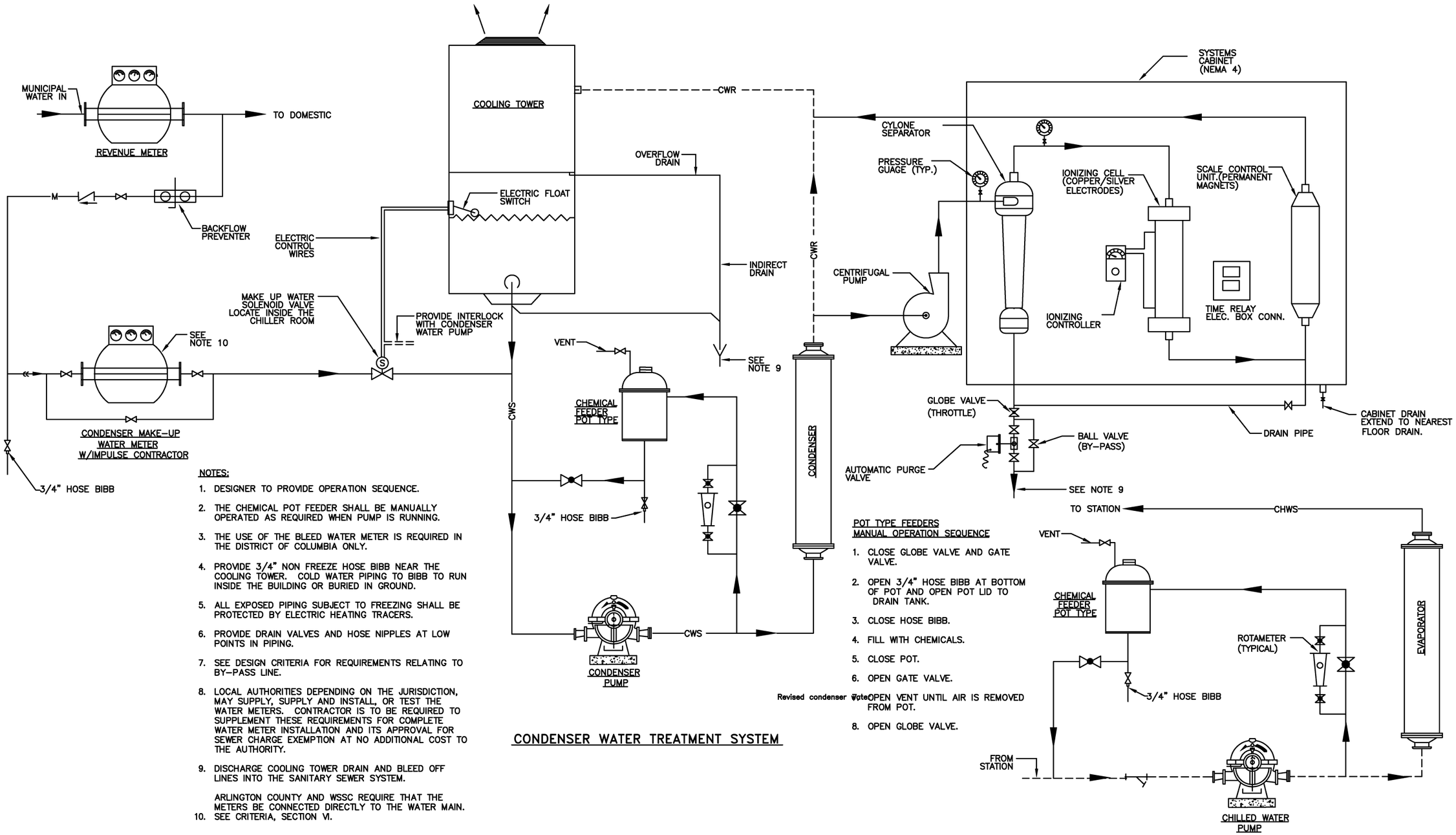
APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING

TYPICAL INSTALLATIONS OF HEATING TAPE FOR PIPING

SCALE: NONE

DRAWING NO.: DD–M–156



CONDENSER WATER TREATMENT SYSTEM

CHILLED WATER TREATMENT

NOTES:

1. DESIGNER TO PROVIDE OPERATION SEQUENCE.
2. THE CHEMICAL POT FEEDER SHALL BE MANUALLY OPERATED AS REQUIRED WHEN PUMP IS RUNNING.
3. THE USE OF THE BLEED WATER METER IS REQUIRED IN THE DISTRICT OF COLUMBIA ONLY.
4. PROVIDE 3/4" NON FREEZE HOSE BIBB NEAR THE COOLING TOWER. COLD WATER PIPING TO BIBB TO RUN INSIDE THE BUILDING OR BURIED IN GROUND.
5. ALL EXPOSED PIPING SUBJECT TO FREEZING SHALL BE PROTECTED BY ELECTRIC HEATING TRACERS.
6. PROVIDE DRAIN VALVES AND HOSE NIPPLES AT LOW POINTS IN PIPING.
7. SEE DESIGN CRITERIA FOR REQUIREMENTS RELATING TO BY-PASS LINE.
8. LOCAL AUTHORITIES DEPENDING ON THE JURISDICTION, MAY SUPPLY, SUPPLY AND INSTALL, OR TEST THE WATER METERS. CONTRACTOR IS TO BE REQUIRED TO SUPPLEMENT THESE REQUIREMENTS FOR COMPLETE WATER METER INSTALLATION AND ITS APPROVAL FOR SEWER CHARGE EXEMPTION AT NO ADDITIONAL COST TO THE AUTHORITY.
9. DISCHARGE COOLING TOWER DRAIN AND BLEED OFF LINES INTO THE SANITARY SEWER SYSTEM.

   ARLINGTON COUNTY AND WSSC REQUIRE THAT THE METERS BE CONNECTED DIRECTLY TO THE WATER MAIN.
10. SEE CRITERIA, SECTION VI.

POT TYPE FEEDERS
MANUAL OPERATION SEQUENCE

1. CLOSE GLOBE VALVE AND GATE VALVE.
2. OPEN 3/4" HOSE BIBB AT BOTTOM OF POT AND OPEN POT LID TO DRAIN TANK.
3. CLOSE HOSE BIBB.
4. FILL WITH CHEMICALS.
5. CLOSE POT.
6. OPEN GATE VALVE.
7. OPEN VENT UNTIL AIR IS REMOVED FROM POT.
8. OPEN GLOBE VALVE.

Revised condenser water

DESIGNED	D.F. ANDERSON	12-71
DRAWN	M. D. SULLIVAN	12-71
CHECKED		
APPROVED		
UPDATED	ENGA (PAF)	08-00

(DATE)

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

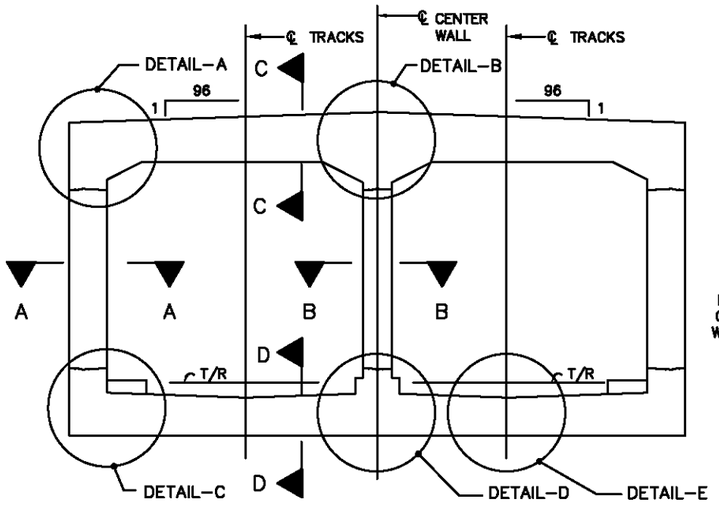
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

MECHANICAL DESIGN DRAWING
WATER TREATMENT
CONDENSING & CHILLED WATER SYSTEMS

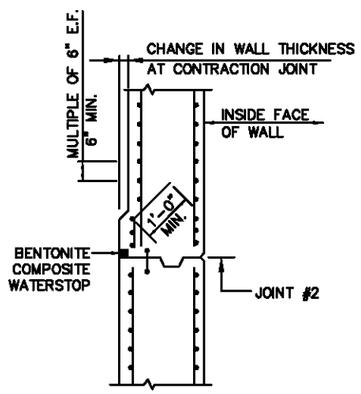
SCALE: NOT TO SCALE

DRAWING NO.: DD-M-157

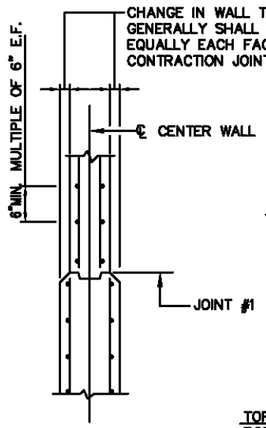


CROSS SECTION OF TYPICAL DOUBLE BOX SECTION

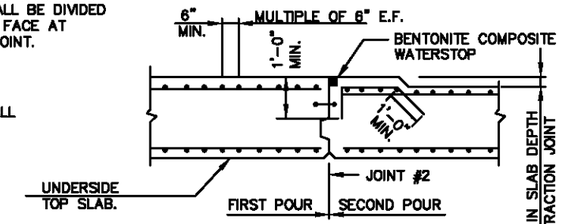
SCALE: 1/4"=1'-0"



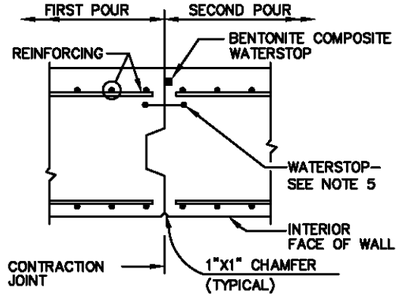
SECTION A-A



SECTION B-B
OMIT WATERSTOP IN CENTER WALL

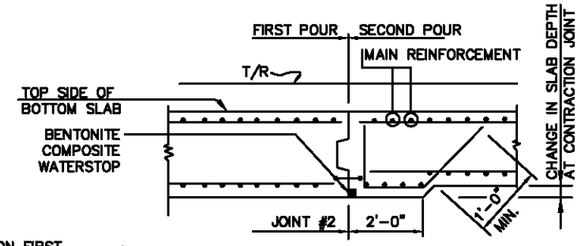


SECTION C-C

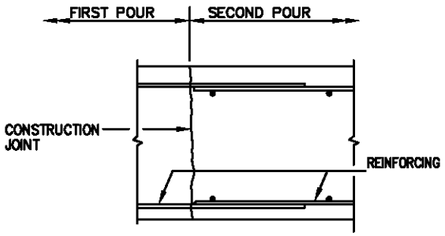


JOINT #2-CONTRACTION JOINT

SCALE: 1"=1'-0"

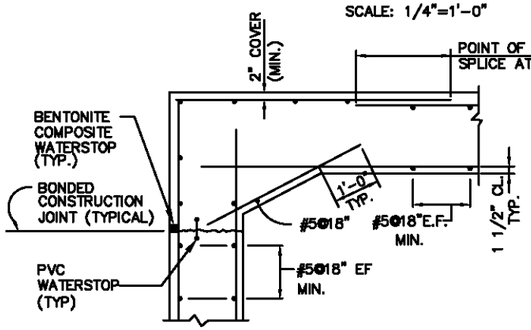


SECTION D-D

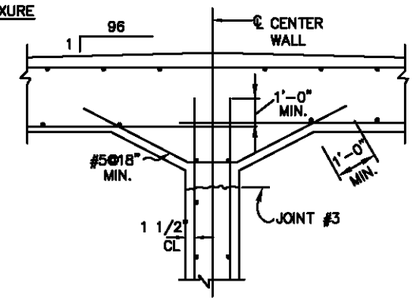


JOINT #3-CONSTRUCTION JOINT

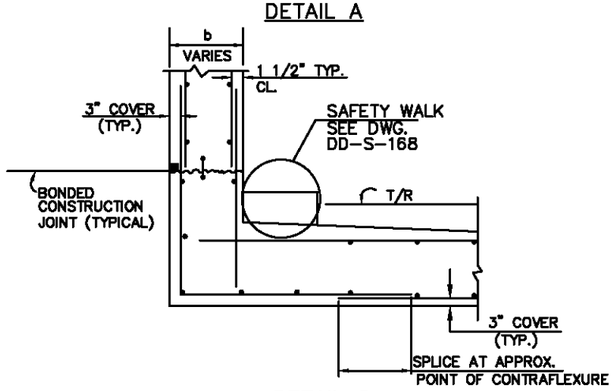
SCALE: 1"-1'-0"



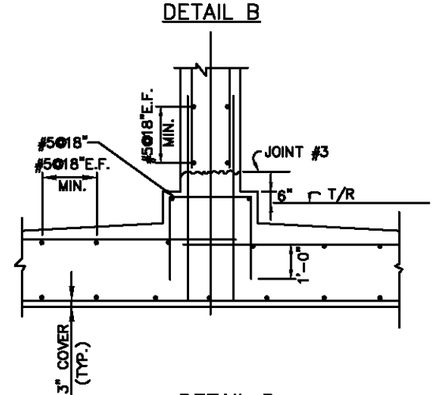
DETAIL A



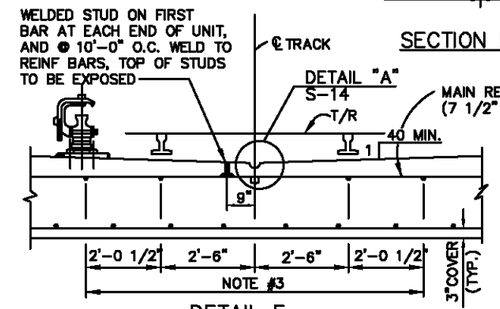
DETAIL B



DETAIL C

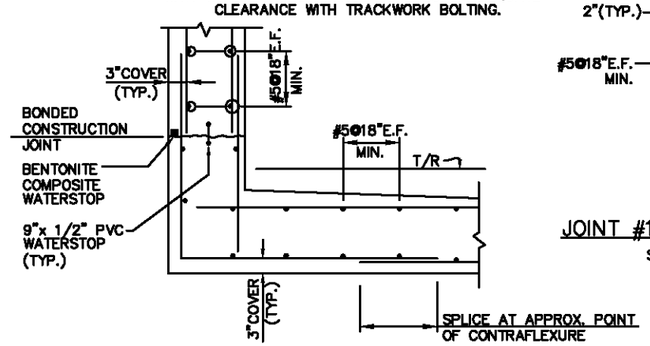


DETAIL D

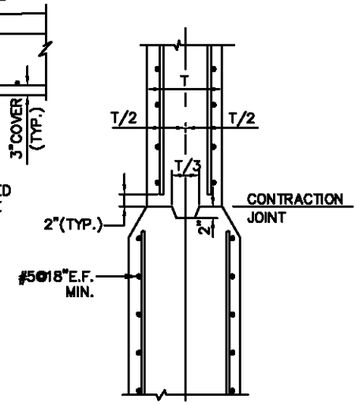


DETAIL E

NOTE: LOCATIONS OF REBARS MUST BE COORDINATED WITH TRACKWORK DRAWINGS TO ENSURE ADEQUATE CLEARANCE WITH TRACKWORK BOLTING.



CORNER DETAIL FOR BOX SECTION



JOINT #1-CONTRACTION JOINT

SCALE: 1"=1'-0"

NOTES:

1. MAXIMUM LENGTH BETWEEN TRANSVERSE CONTRACTION JOINTS, AS MEASURED ALONG THE INSIDE FACE OF WALL NEAREST THE CURVE CENTER, SHALL BE 50 FEET.
2. THE LIMITATIONS ON THE PLACEMENT OF REINFORCING STEEL IN THE TRACKBED ARE SHOWN ON DD-TW-1.
3. WATERSTOP TO BE POLYVINYLCHLORIDE, MINIMUM 9"x1/2".
4. FOR PVC WATERPROOFING DETAILS SEE DD-S-130, DD-S-131, DD-S-132, DD-S-133, FOR BENTONITE WATERPROOFING DETAILS, SEE DD-S134, DD-S-135.
5. FOR BENTONITE COMPOSITE WATERSTOP DETAILS AND NOTES, SEE DD-S-134.
6. DESIGNER IS RESPONSIBLE FOR CALCULATING DIMENSIONS a, b, T, T2, ETC.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	W. CUSTER JR.	05-88 DATE
DRAWN	L. SANCHEZ	11-88 DATE
CHECKED	A.R.	05-70 DATE
APPROVED	GEC(DCCO)	10-70 DATE
UPDATED	ENGA	05-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR DATE

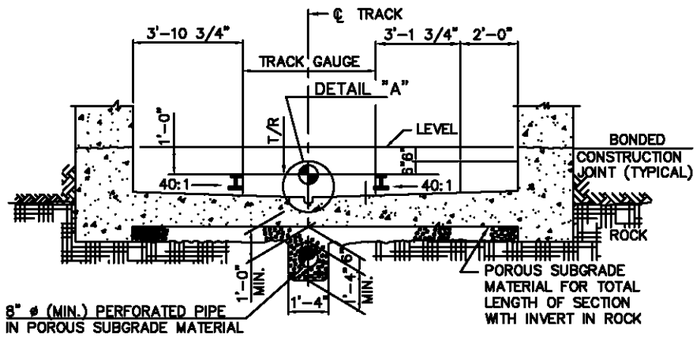
STRUCTURAL DESIGN DRAWING
CUT AND COVER
REINFORCEMENT AND JOINT DETAILS

SCALE 1/2"=1'-0" 1 0 1 2 AND AS NOTED

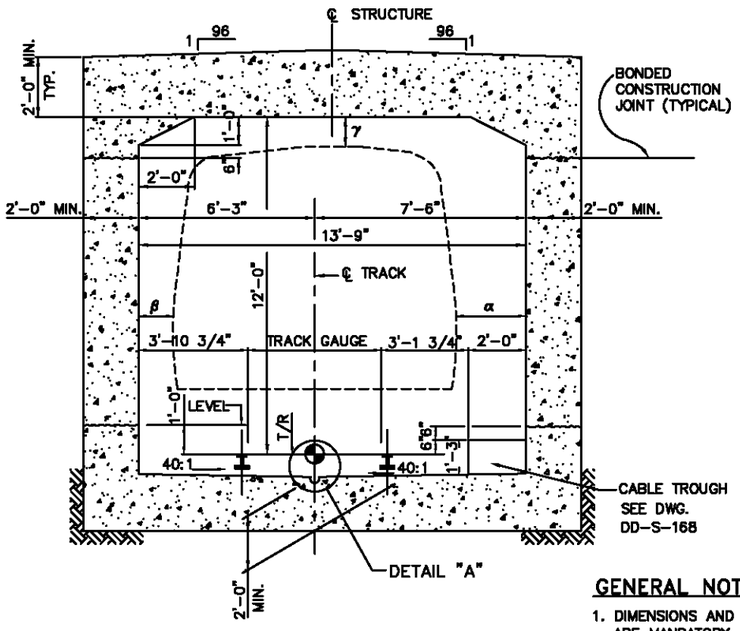
DRAWING NO. DD-S-003

LEGEND:

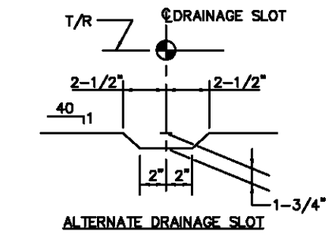
T/R = TOP OF RAIL.
T/LR = TOP OF LOW RAIL.
S.E = SUPERELEVATION (INCHES)–(VARIES FROM 0" TO 6")
56.25 = TRACK GAGE (INCHES). TANGENT SECTION, SEE WMATA CRITERIA FIG.III 10 FOR OTHERS.
15.25 = GAGE LINE TO ℄ DRAINAGE SLOT (3/4" < S.E ⩽ 4") (INCHES).
26.00 = GAGE LINE TO ℄ CONTACT RAIL (INCHES).



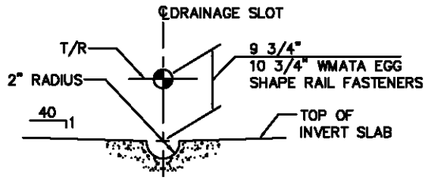
TANGENT SECTION IN ROCK
NO SUPERELEVATION
(SEE NOTE 5)



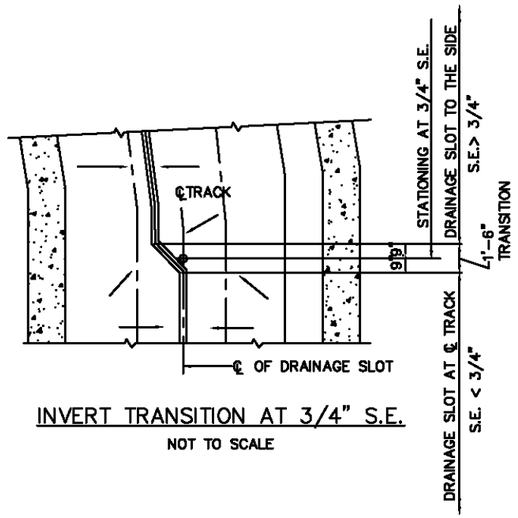
TANGENT SECTION
NO SUPERELEVATION



ALTERNATE DRAINAGE SLOT



DETAIL "A"
TYPICAL UNDERGROUND DRAINAGE SLOT
SCALE: 3" = 1'-0"



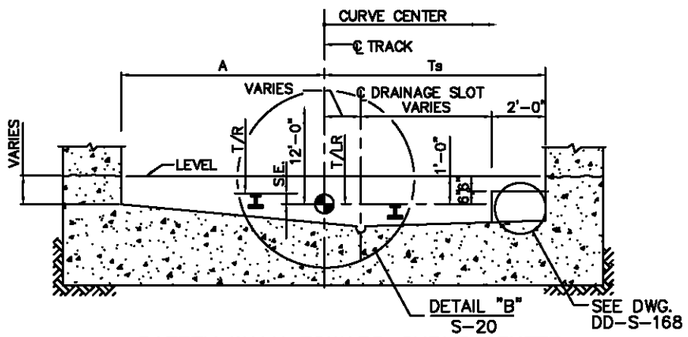
INVERT TRANSITION AT 3/4" S.E.
NOT TO SCALE

NOTES:

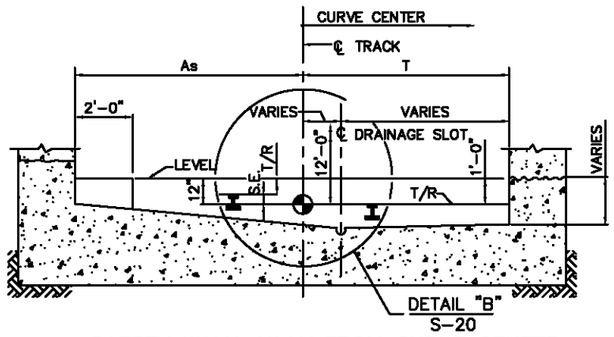
1. MAXIMUM LENGTH BETWEEN TRANSVERSE CONTRACTION JOINTS, AS MEASURED ALONG THE INSIDE FACE OF WALL NEAREST THE CURVE CENTER, SHALL BE 50 FEET.
2. DIMENSIONS AND DETAILS OF SINGLE BOX CONSTRUCTION SHOWN ON THIS DRAWING SHALL BE USED WHEREVER POSSIBLE. DIMENSIONS AND DETAILS OF SECTIONS NOT ADEQUATELY COVERED BY THIS DRAWING SHALL BE GOVERNED BY DESIGN CRITERIA.
3. FOR DIMENSION A, T, As AND Ts SEE TABLES I& SECTION II OF THE DESIGN CRITERIA.
4. FOR TYPICAL REINFORCING DETAILS AND CONSTRUCTION JOINTS, SEE DWG. NO. DD-S-3.
5. SUPERELEVATED SECTION FOR CUT & COVER WITH INVERT IN ROCK SHALL BE AS SHOWN ON THIS DRAWING.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS AND DETAILS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

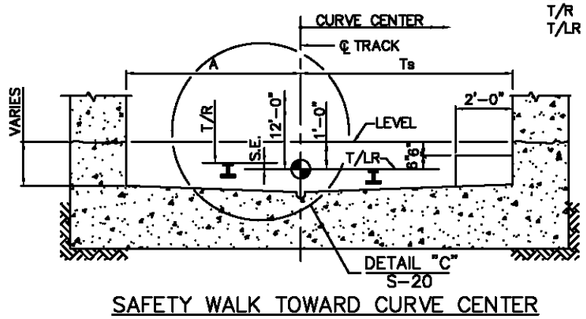


SAFETY WALK TOWARD CURVE CENTER
3/4" < S.E. ⩽ 4"

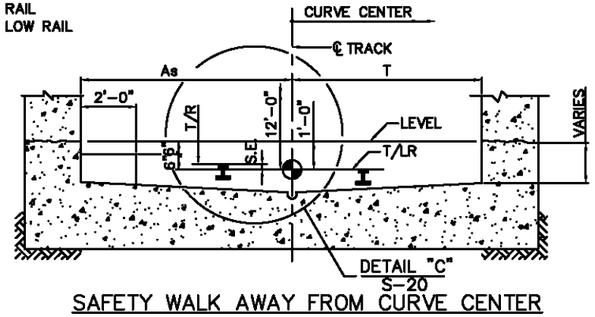


SAFETY WALK AWAY FROM CURVE CENTER
3/4" < S.E. ⩽ 4"

NOTE
S.E. – SUPER ELEVATION
T/R – TOP OF RAIL
T/LR – TOP OF LOW RAIL



SAFETY WALK TOWARD CURVE CENTER
0" < S.E. ⩽ 3/4"



SAFETY WALK AWAY FROM CURVE CENTER
0" < S.E. ⩽ 3/4"

HORIZONTAL CURVATURE SECTIONS

DESIGNED	W. CUSTER Jr.	03-68	DATE
DRAWN	L. SANCHEZ	11-68	DATE
CHECKED	A.B.	09-70	DATE
APPROVED	GEC(DCCO)	10-70	DATE
UPDATED	ENGA	08-00	DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

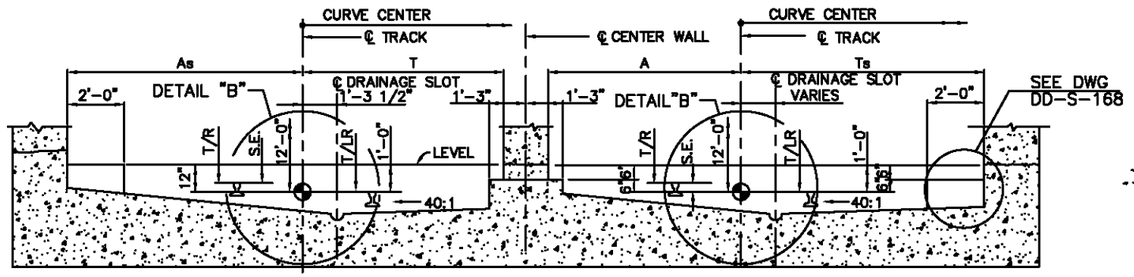
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
CUT AND COVER
SINGLE BOX DETAILS

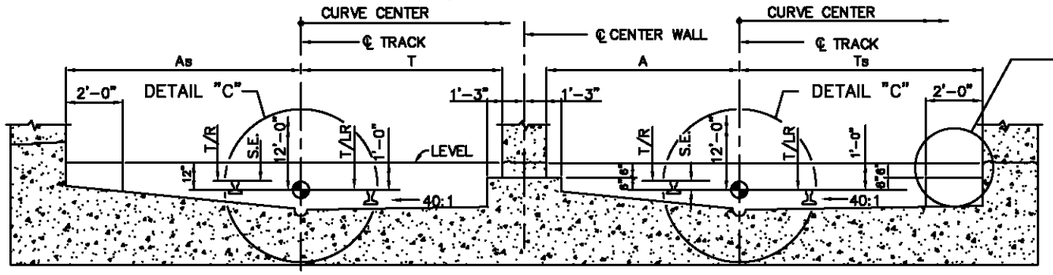
SCALE 3/8"=1'-0" 1 0 1 2 AND AS NOTED

DRAWING NO. DD-S-014



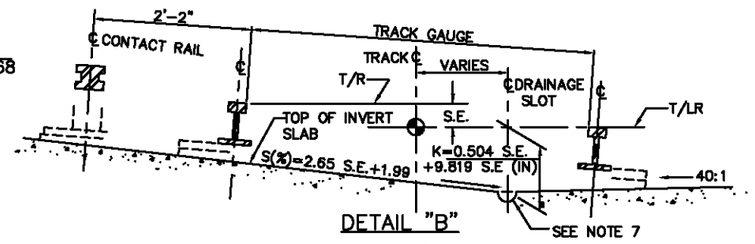
SAFETY WALK AWAY FROM CURVE CENTER SAFETY WALK TOWARD FROM CURVE CENTER

SUPERELEVATION SECTION
3/4" < S.E. ⩽ 4"



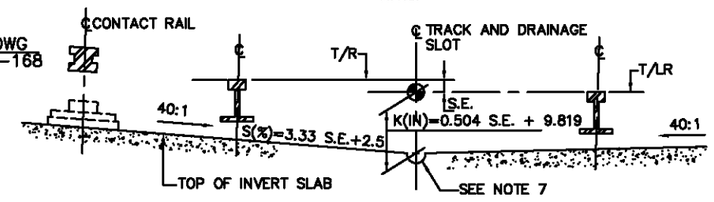
SAFETY WALK AWAY FROM CURVE CENTER SAFETY WALK TOWARD FROM CURVE CENTER

SUPERELEVATION SECTION
0"< S.E.⩽ 3/4"



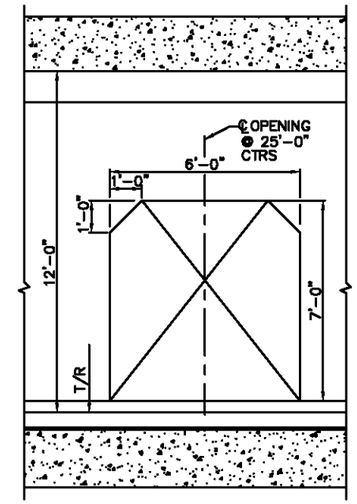
DETAIL "B"

UNDERGROUND DRAINAGE SLOT
W/O RESTRAINING RAIL
3/4"–S.E. ⩽ 4"
N.T.S.

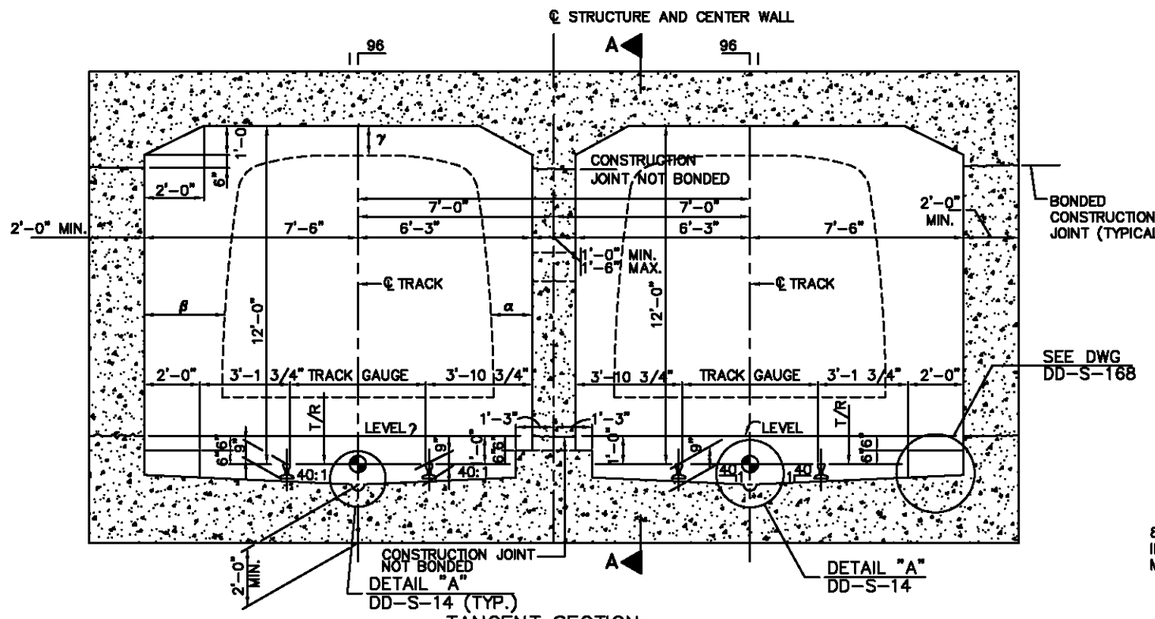


DETAIL "C"

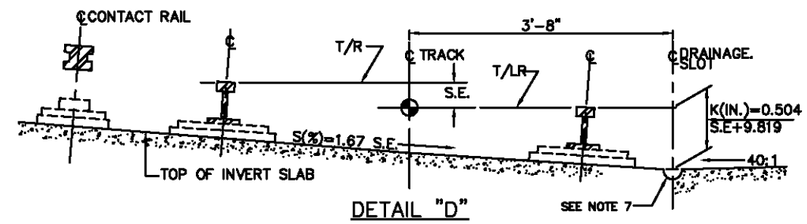
UNDERGROUND DRAINAGE SLOT
0"<S.E.< 3/4" W/O RESTRAINING RAIL
0"<S.E.< 1 1/2" WITH RESTRAINING RAIL



SECTION A–A

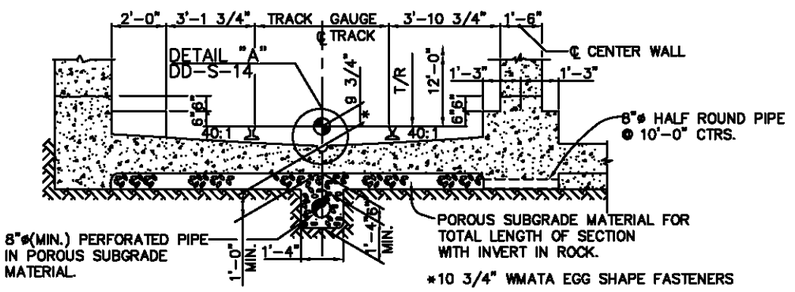


TANGENT SECTION
NO SUPERELEVATION



DETAIL "D"

UNDERGROUND DRAINAGE SLOT
WITH RESTRAINING RAIL
1 1/2" < S.E. < 4"



TANGENT SECTION IN ROCK
NO SUPERRELEVATION

NOTES:

1. FOR DIMENSIONS A, T, As AND Ts SEE TABLES IN SECTION II OF THE MANUAL OF DESIGN CRITERIA.
2. MAXIMUM LENGTH BETWEEN TRANSVERSE CONTRACTION JOINTS, AS MEASURED ALONG THE INSIDE FACE OF WALL NEAREST THE CURVE CENTER, SHALL BE 50 FEET.
3. DIMENSIONS AND DETAILS OF DOUBLE BOX CONSTRUCTION SHOWN ON THIS DRAWING SHALL BE USED WHEREVER POSSIBLE. DIMENSIONS AND DETAILS OF SECTIONS NOT ADEQUATELY COVERED BY THE DRAWING SHALL BE GOVERNED BY THE DESIGN CRITERIA.
4. FOR DETAILS OF INVERT TRANSITION AT 3/4" S.E., SEE DRAWING DD–S–14.
5. FOR TYPICAL REINFORCEMENT AND JOINT DETAILS, SEE DRAWING DD–S–3.
6. SUPERELEVATED SECTION FOR CUT & COVER WITH INVERT IN ROCK SHALL BE AS SHOWN ON THIS DRAWING.
7. FOR DRAINAGE SLOT DETAILS, SEE DETAIL "A" DWG. DD–S–14.

NOTE

S.E. – SUPER ELEVATION
T/R – TOP OF RAIL
T/LR – TOP OF LOW RAIL

DESIGNED	W. CUSTER Jr.	03–68 DATE
DRAWN	L. SAN CHEZ	11–68 DATE
CHECKED	A.B.	9–70 DATE
APPROVED	GEO(DCCO)	10–70 DATE
UPDATED	ENGA	08–00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

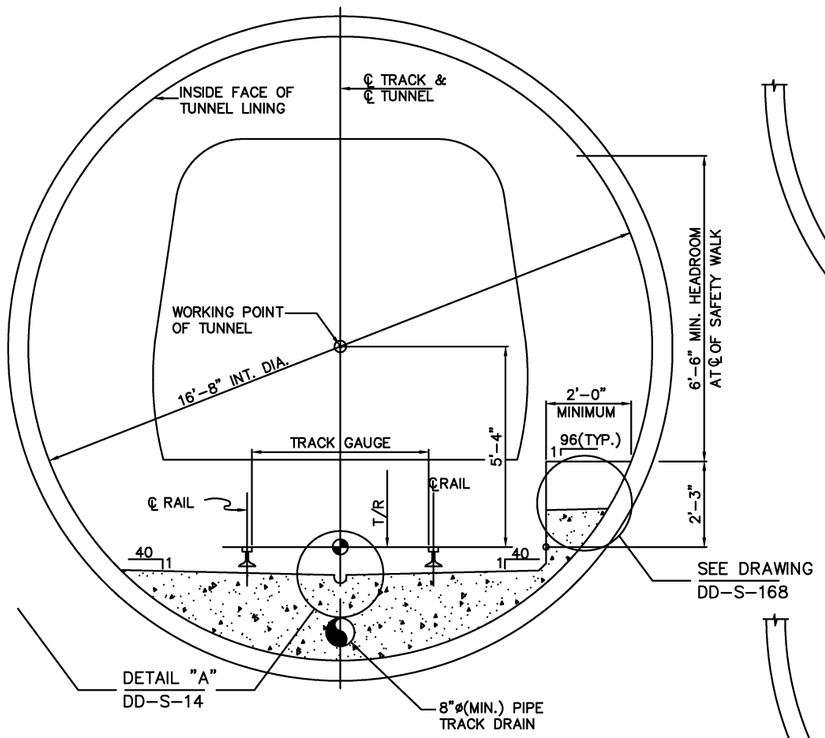
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

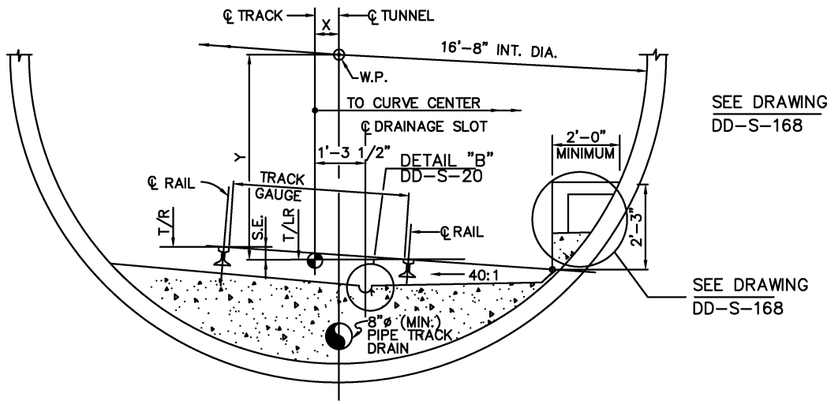
STRUCTURAL DESIGN DRAWING
CUT AND COVER
DOUBLE BOX DETAILS

SCALE 3/8"=1'-0" 1 0 1 2 3 AND AS NOTED

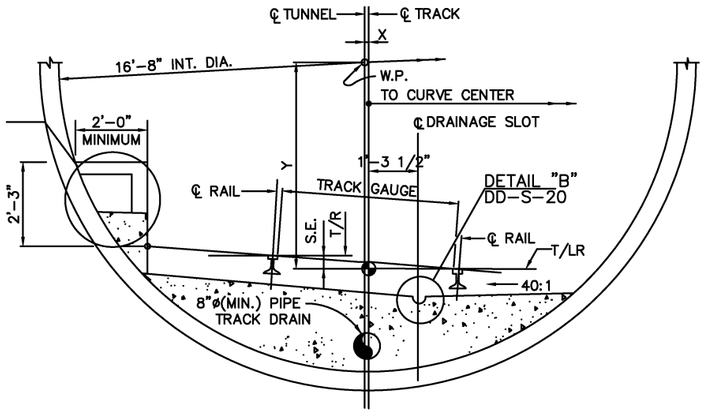
DRAWING NO. DD–S–020



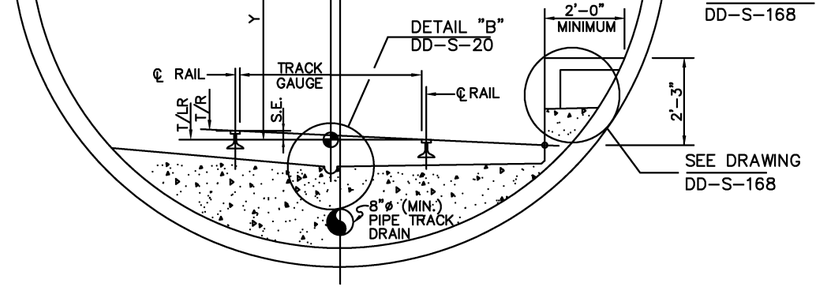
TANGENT SECTION
NO SUPERELEVATION



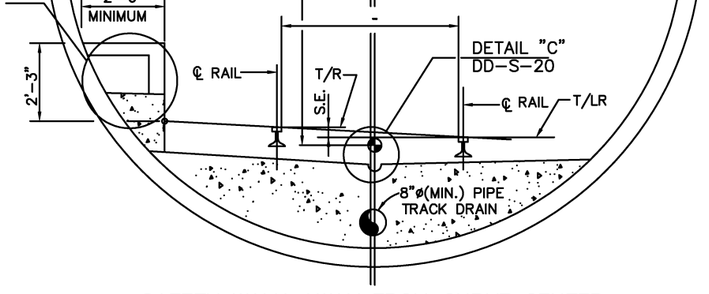
SAFETY WALK TOWARD CURVE CENTER
3/4" < S.E. ≤ 4"



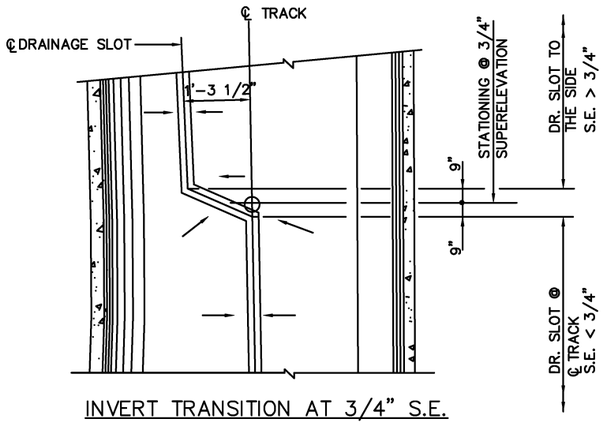
SAFETY WALK AWAY FROM CURVE CENTER
3/4" < S.E. ≤ 4"



SAFETY WALK TOWARD CURVE CENTER
0" < S.E. ≤ 3/4"



SAFETY WALK AWAY FROM CURVE CENTER
0" < S.E. ≤ 3/4"



INVERT TRANSITION AT 3/4" S.E.
NOT TO SCALE

NOTES

1- CONCRETE - f'=4,000 P.S.I.

2- STEEL REINFORCEMENT-ASTM A615-GRADE 60

3- REINFORCEMENT FOR INVERT SLAB & SIDEWALK, SEE DWG. ST-S-2.

4- FOR X, Y, AND SW DIMENSIONS SEE TABLES IN SECTION II OF THE DESIGN CRITERIA.

5- FOR INVERT AND SAFETY WALK LADDER RECESS DETAILS, SEE DWG. ST-S-2.

6- THE LIMITATIONS ON THE PLACEMENT OF REINFORCING STEEL IN THE TRACKBED ARE SHOWN ON DD-TW-1

LEGEND

R	=	HORIZONTAL CURVATURE RADIUS
T/R	=	TOP OF RAIL
T/LR	=	TOP OF LOW RAIL
SW	=	SAFETY WALK
S.E.	=	SUPERELEVATION (INCHES)
56.25	=	TRACK GAGE (IN.)
DR.	=	DRAINAGE

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED W. CUSTER Jr. 09-66 DATE
DRAWN C. BORDEAUX 09-66 DATE
CHECKED ____ DATE
APPROVED ____ DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED ____ DATE

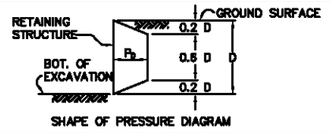
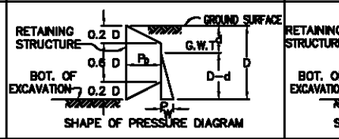
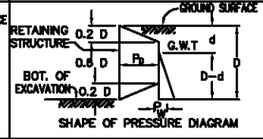
APPROVED DIRECTOR May 3, 2001 DATE

STRUCTURAL DESIGN DRAWING
CIRCULAR EARTH TUNNEL
INVERT AND SAFETY WALK DETAILS

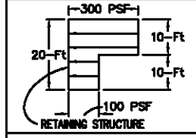
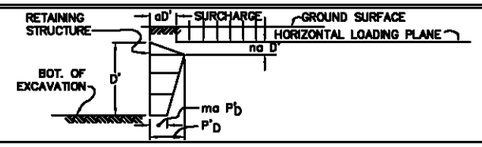
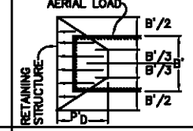
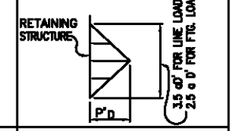
SCALE 1/2" =1'-0"

DRAWING NO. DD-S-028

LATERAL PRESSURE DUE TO WEIGHT OF SOIL AND WATER

LOCATION	DEPTH FROM GROUND SURFACE TO BOTTOM OF EXCAVATION D (FT.)	DEPTH FROM GROUND SURFACE TG. G.W.T. d (FT.)	DEWATERED SECTIONS				SECTIONS NOT DEWATERED					
							FLEXIBLE			RIGID		
			 SHAPE OF PRESSURE DIAGRAM			 SHAPE OF PRESSURE DIAGRAM			 SHAPE OF PRESSURE DIAGRAM		
			LATERAL EARTH PRESSURE P_D				LATERAL EARTH & HYDROSTATIC PRESSURE P_D & P_W			LATERAL EARTH & HYDROSTATIC PRESSURE P_D & P_W		
			MAIN BRACING MEMBERS	SOLDIER BEAMS (A)	SOLDIER BEAMS (B)	LAGGING THICKNESS	MAIN BRACING MEMBERS	SHEETING (A)	SHEETING (B)	MAIN BRACING MEMBERS	WALL	
				P_D	P_D			P_D R_W	P_D R_W	$P_{D=}$ $P_{W=}$	$P_{D=}$ $P_{W=}$	

ADDITIONAL LATERAL PRESSURE DUE TO SURCHARGE LOADS

TRAFFIC & CONSTRUCTION EQUIP. LOADS	BUILDING OR CONSTRUCTION LOADS		
	DISTRIBUTION OF HORIZ. PRESSURE ON VERTICAL PLANE	DISTRIBUTION OF HORIZ. PRESSURE IN PLAN	
		LOAD "A"	LOAD "B"
			
THIS LATERAL PRESSURE IS BASED ON AN ASSUMED TRAFFIC AND CONSTRUCTION EQUIPMENT SURCHARGE OF 600 PSF. FOR MORE SEVERE CONSTRUCTION LOADING SPECIAL ANALYSIS MUST BE MADE.		LOAD "A" AERIAL LOAD OR FINITE LINE LOAD PARALLEL TO EXCAVATION	LOAD "B" FOOTING LOAD OR LINE LOAD PERPENDICULAR TO EXCAVATION

PARAMETERS	n	m	P'_D
ISOLATED (INDIVIDUAL) FOOTING CONSIDERED AS POINT LOAD	0.6	0.4	$(2.1-1.8a)\ Q'/D'^2$
CONTINUOUS FOOTING CONSIDERED AS LINE LOAD PARALLEL TO RETAINING STRUCTURE	0.4	0.25	$(1.1-0.5a)\ Q'/D'$
AERIAL LOAD	0.4	0.25	$(0.8-0.5a)\ Q'/D'$
CONTINUOUS FOOTING CONSIDERED AS LINE LOAD PERPENDICULAR TO RETAINING STRUCTURE	0.6	0.4	$(1.4-1.2a)\ Q'/D'^2$

HORIZONTAL PRESSURES ON RETAINING STRUCTURES NEED NOT BE CONSIDERED FOR SURCHARGE LYING AT A DISTANCE $a \geq 1$ FROM THE RETAINING STRUCTURE.

PROCEDURE TO OBTAIN THE LATERAL EARTH PRESSURE PD:

1. FOR EACH TEMPORARY EARTH RETAINING STRUCTURE, THE BASIC LATERAL LOAD VALUE PD IS CALCULATED BY TAKING THE AREA OF THE HORIZONTAL TRAPEZOIDAL PRESSURE DIAGRAM AS THE AREA OF THE ACTIVE EARTH PRESSURE DIAGRAM MULTIPLIED BY THE STIFFNESS FACTOR LISTED BELOW:
   a. FOR SHEET PILE SUPPORT OF EXCAVATION OR COFFER DAM, WHERE SOME HORIZONTAL MOVEMENT OF THE RETAINED EARTH IS TOLERABLE, USE 1.1.
   b. FOR SOLDIER BEAM (PILE) SUPPORT OF EXCAVATION OR COFFER DAM, WHERE THE HORIZONTAL MOVEMENT OF THE RETAINED EARTH IS TO BE MINIMIZED OR PREVENTED, USE 1.25.
   b. FOR CAST-IN-PLACE CONCRETE WHERE MOVEMENT IS TO BE PREVENTED, USE 1.4.
2. THE ACTIVE EARTH PRESSURE DIAGRAM SHALL BE BASED ON THE EFFECTIVE FRICTION ANGLE ϕ, SHOWN IN TABLE NO. V.2 OF THE DESIGN CRITERIA, OR AS APPROVED BY THE AUTHORITY AND A MINIMUM TOTAL UNIT WEIGHT OF SOIL (7) AT 130 P.C.F.
3. FOR THE DESIGN OF THE MAIN BRACING MEMBERS, NOT IN CONTACT WITH SOIL LIKE WALERS, RAKERS AND STRUTS AND TIEBACKS, ENTER FULL VALUES OF PD. USE THIS FULL VALUE FOR BOTH EXCAVATION STAGE AS WELL AS FOR THE STRUT REMOVAL STAGE FOR THE DESIGN OF MAIN BRACING MEMBERS.
4. FOR THE DESIGN OF THE SOLDIER BEAMS AND SHEET PILES, THE DESIGN PRESSURE VALUES SHOWN IN COLUMN (A) SHALL BE 0.8xPD, AND THE VALUES INDICATED IN COLUMN (B) SHALL BE 0.6xPD, UNLESS SUBSURFACE CONDITIONS OR CHARACTER OF ADJACENT STRUCTURES AND SURCHARGE LOADS INDICATE THAT HIGHER DESIGN PRESSURES SHOULD BE REQUIRED.

   [THESE VALUES OF THE LATERAL EARTH PRESSURES FOR THE DESIGN ARE BASED ON A MAXIMUM VERTICAL SPACING OF 16 FT (12 FT IN CRITICAL AREAS) OF THE MAIN BRACING MEMBERS, AND THAT THE EXCAVATION IS NOT ALLOWED TO PROCEED MORE THAN TWO FEET BELOW THE LEVEL OF POINT SUPPORT BEFORE THE BRACING MEMBERS ARE INSTALLED AND PRELOADED.

   INSTRUCTIONS TO THE DESIGNER: THIS DRAWING SHALL BE COMPLETED BY THE DESIGNER AND INCLUDED IN THE SET OF THE CONTRACT DOCUMENTS AS A STRUCTURAL DRAWING. IF EXTRA SPACE IS REQUIRED, ANOTHER DRAWING MAY BE ADDED WITH A REFERENCE TO THIS DRAWING.

NOTES:

1. CALCULATIONS MAY BE BASED ON THE ASSUMPTION THAT THE EXCAVATION IS DEWATERED, WHEN SUPPORT OF EXCAVATION IS BY SOLDIER BEAMS AND LAGGING, OR WHEN OTHER POSITIVE METHODS OF DRAINING THE SOIL ARE USED.
2. SURCHARGE LOADS FROM STRUCTURES NOT UNDERPINNED ARE TO BE DETERMINED BY THE CONTRACTOR AND REVIEWED BY THE AUTHORITY.
3. FOR EVALUATION OF THE LATERAL PRESSURE UNDER A GIVEN SET OF CONDITIONS, LATERAL PRESSURE FROM SURCHARGE LOADS SHALL BE SUPERPOSED ON LATERAL PRESSURE FROM SOIL WEIGHT (TRAPEZOIDAL DIAGRAM) AND WATER (TRIANGULAR DIAGRAM).
4. IF ANY LOADINGS OCCUR, WHICH ARE NOT DESCRIBED HEREON, ADEQUATE MEASURES MUST BE TAKEN TO SUPPORT THE ACTUAL CONDITION, SUBJECT TO REVIEW BY THE ENGINEER,
5. PRESSURE TABULATED UNDER COLUMNS (A) TO BE USED FOR EXCAVATION SUPPORT DESIGN, PRESSURE TABULATED UNDER COLUMNS (B) TO BE USED FOR STRUT REMOVAL DESIGN FOLLOWING CONSTRUCTION OF INVERT SLAB.
6. THE TRAPEZOIDAL PRESSURE DIAGRAM SHOWN IS APPLICABLE ONLY TO THE MULTILEVEL HORIZONTAL STRUT AND MULTILEVEL TIEBACK SUPPORT SYSTEM. A TRIANGULAR PRESSURE DIAGRAM SHALL BE USED FOR THE SINGLE-LEVEL STRUT AND SINGLE LEVEL TIEBACK SUPPORT SYSTEM.
7. THE CONTRACTOR SHALL SUBMIT THE SUPPORT OF EXCAVATION MONITORING PROCEDURE WITH THRESHOLD VALUES AND CONTINGENCY MEASURES FOR APPROVAL PRIOR TO EXCAVATION. RECOMMENDED MAXIMUM DEFECTION FOR PILES IS 1/2" AND SLURRY WALLS IS 1/4".
8. THE DESIGN OF LAGGING SHALL BE PER THE CONTRACT SPECIFICATIONS.
9. THE DESIGNER SHALL CONSIDER ANY VARIATION OF SOIL PROPERTIES, AND ANY SPECIAL PROBLEMS, AND FEATURES OF THE SUBSURFACE CONDITIONS LIKE CLAY LAYERS ETC. IN EVALUATING THE DESIGN SOIL PRESSURES.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DEFINITION OF SYMBOLS:

- a D' = DISTANCE FROM RETAINING STRUCTURE TO: (1) FOOTING LOAD, (2) PARALLEL LINE LOAD, (3) LEADING EDGE OF AERIAL LOAD, (4) PERPENDICULAR LINE LOAD (FT).
- B' = LENGTH OF AERIAL LOAD IN DIRECTION PARALLEL TO THE SIDE OF EXCAVATION (FT).
- d = DEPTH FROM GROUND SURFACE TO G.W.T. (FT).
- D = DEPTH FROM GROUND SURFACE TO BOTTOM OF EXCAVATION (FT).
- D' = DEPTH FROM HORIZONTAL LOADING PLANE TO BOTTOM OF EXCAVATION (FT).
- G.W.T. = GROUND WATER TABLE.
- PD = CALCULATED LATERAL EARTH PRESSURE TO BE USED IN DESIGN OF TEMPORARY RETAINING STRUCTURES (PSF). USE THE BUOYANT WEIGHTS FOR SOIL BELOW THE G.W.T. FOR COMPUTING Pp.
- PD = CALCULATED MAXIMUM LATERAL PRESSURE DUE TO SURCHARGE (PSF).
- Q' = A SURCHARGE: (1) PARALLEL TO A RETAINING STRUCTURE AND AERIAL LOAD (PLF), (2) FROM ISOLATED FOOTING (LDS), (3) PERPENDICULAR TO A RETAINING STRUCTURE (1–a) D'W', (LBS).
- W' = LINEAR LINE LOAD (PLF) EXTENDING TO DISTANCE=D' PERPENDICULAR TO RETAINING STRUCTURE
- a,n,m = DIMENSION LESS FACTORS
- PW = HYDROSTATIC PRESSURE (psf).

DESIGNED	A.B.	06-00 DATE
DRAWN	R. LEA	12-00 DATE
CHECKED	A.B.	01-00 DATE
APPROVED	GEC(DCCO)	01-00 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

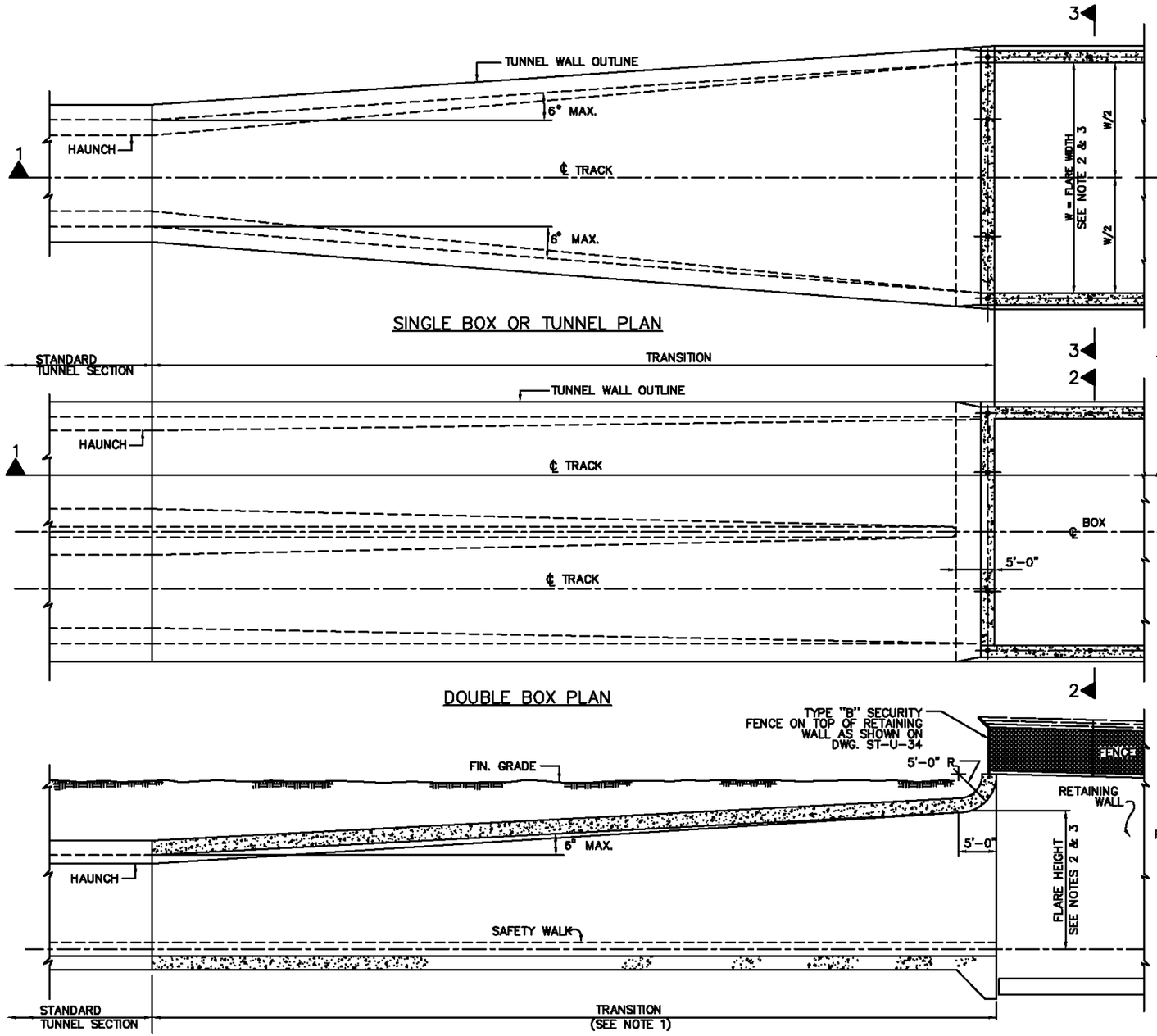
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

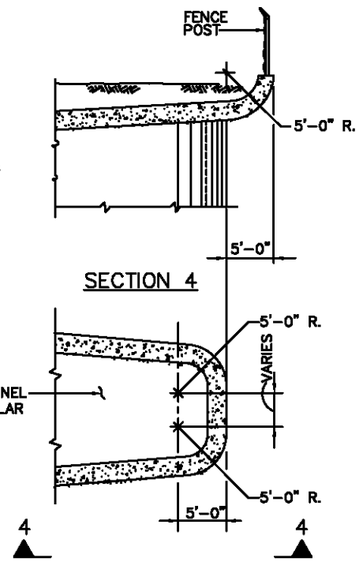
STRUCTURAL DESIGN DRAWING
LATERAL PRESSURE FOR THE DESIGN OF TEMPORARY EARTH RETAINING STRUCTURES

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-063



SECTION 1–1



PARTIAL PLAN

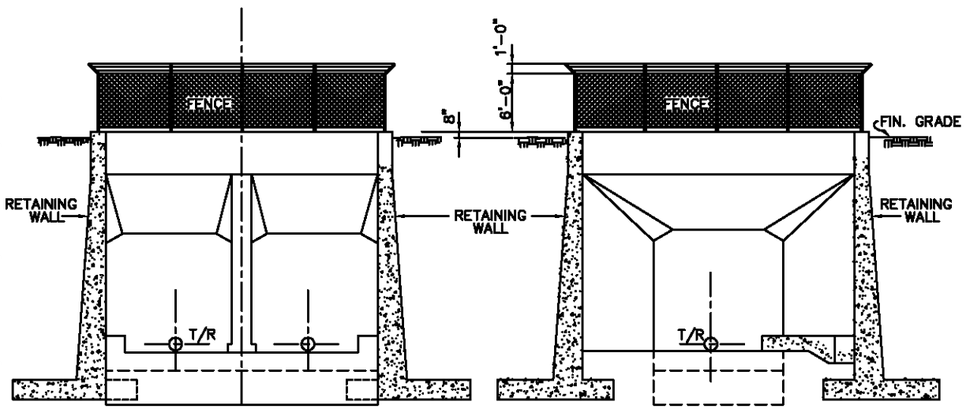
TYPICAL FOR DOUBLE TUNNEL PORTAL

NOTES:

1. FOR RECOMMENDED TRANSITION LENGTH SEE FIGURE V 10 (MANUAL OF DESIGN CRITERIA)
2. FOR REQUIRED CROSS-SECTION AREA AT PORTAL OPENING, SEE FIGURE V 11 (MANUAL OF DESIGN CRITERIA)
3. A FLARED ENTRANCE CAN BE FORMED USING ANY COMBINATION OF TAPERS ON TOP AND SIDES TO OBTAIN THE REQUIRED CROSS-SECTION AREA AT THE PORTAL OPENING, PROVIDED NO PLANE OR SURFACE OF THE TRANSITION SECTION EXCEEDS 6° RELATIVE TO THE TUNNEL CENTER LINE.
4. SIDE TAPER HAS TO BE SYMMETRICAL TO THE CENTER LINE OF EACH BOX OR TUNNEL SECTION.
5. DOUBLE BOX WITH FLARED ROOF WILL BE FEASIBLE ONLY FOR SPEEDS BELOW 50 MPH. SECTION DESIGNER HAS TO PERFORM STUDIES TO DETERMINE THE ECONOMICAL TYPE OF TRANSITION.
6. FOR FENCE DETAILS SEE DWG. ST-C-34.
7. FOR CONCRETE FINISHES SEE ARCH. DWG.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



SECTION 2–2

SECTION 3–3

DESIGNED	A. J.	05-70	DATE
DRAWN	L.R.	05-70	DATE
CHECKED	A.B.	05-70	DATE
APPROVED	GEC(DCCO)	05-70	DATE
UPDATED	ENGA	05-00	DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

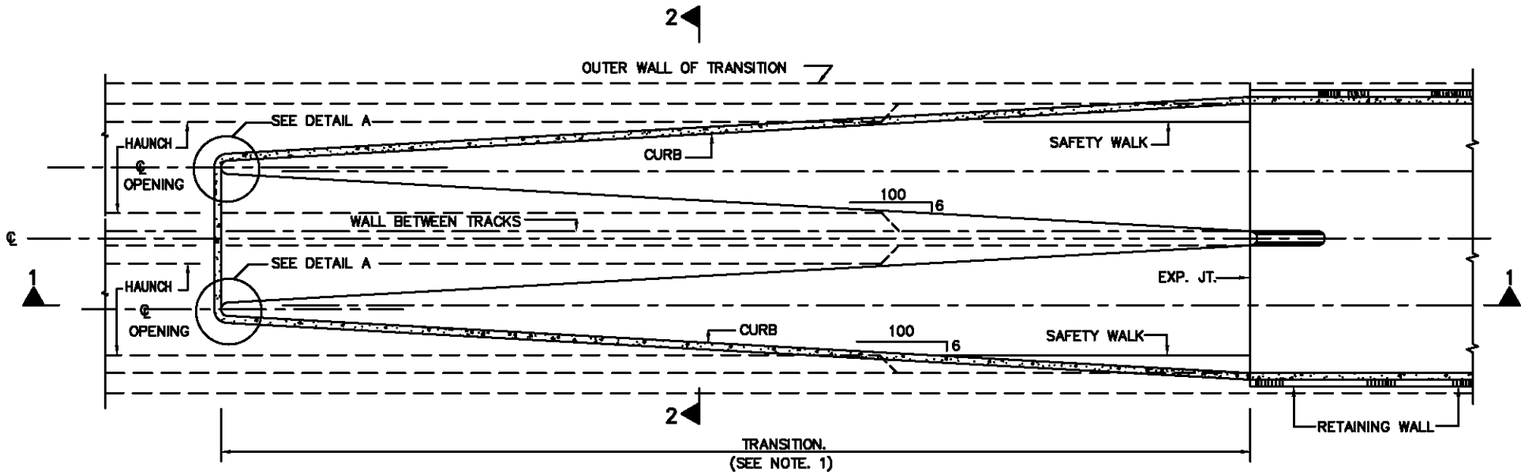
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

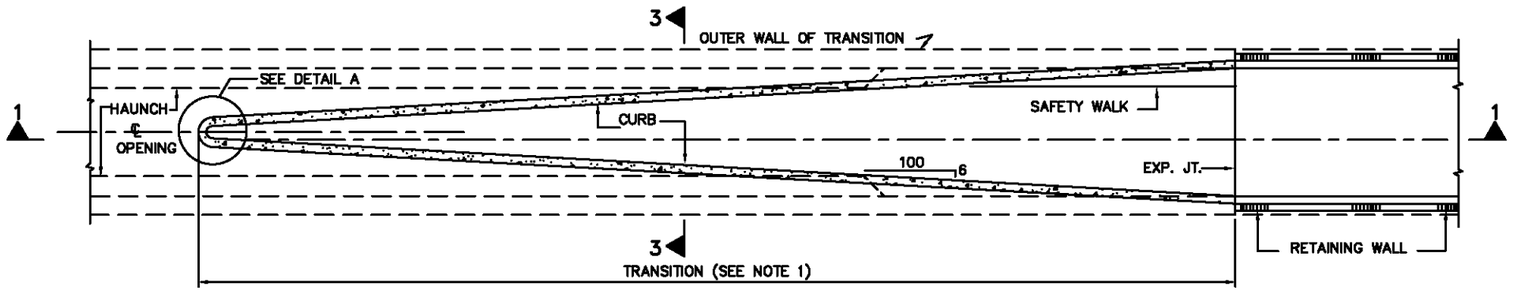
STRUCTURAL DESIGN DRAWING
FLARED TRANSITION FOR TUNNEL ENTRANCES

SCALE 1 0 2 4 6 8 10
1/8"=1'-0" AND AS SHOWN

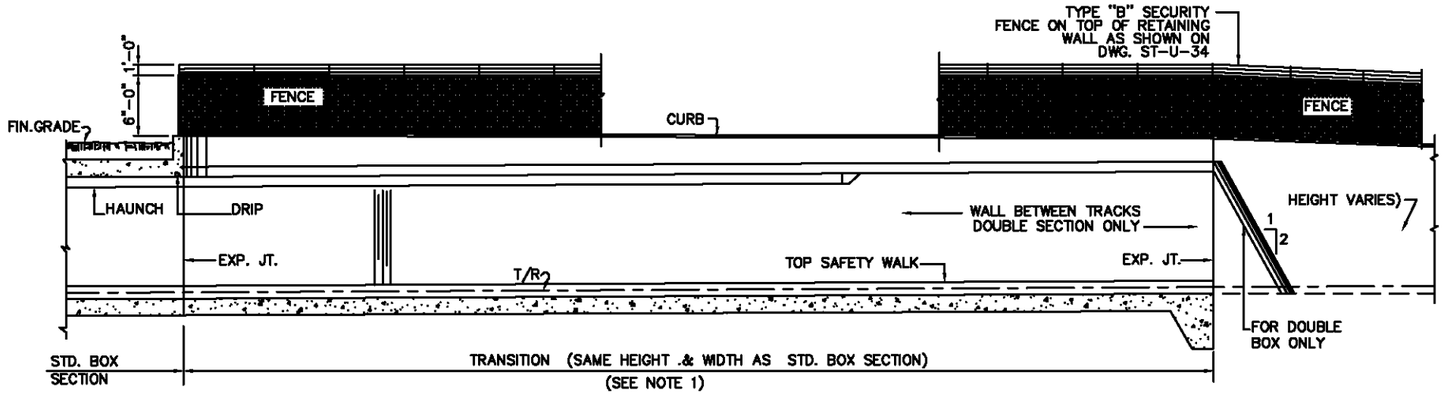
DRAWING NO. DD-S-064



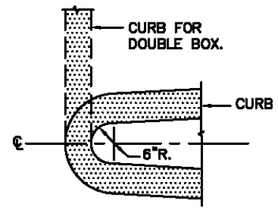
DOUBLE BOX PLAN



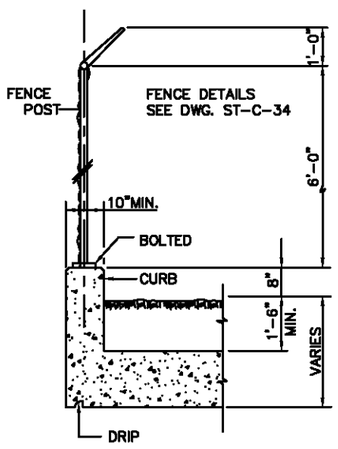
SINGLE BOX OR TUNNEL PLAN



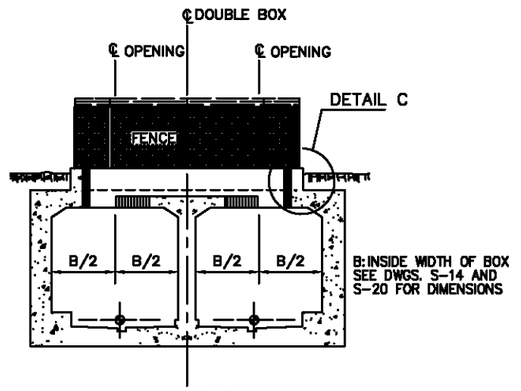
SECTION 1



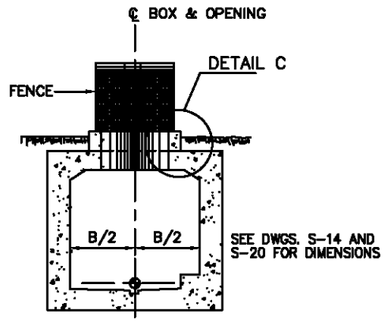
DETAIL A
SCALE. 1/2"=1'-0"



DETAIL C
TYPICAL AT TOP OF CURB AND RETAINING WALL
SCALE 1/2"=1'-0"



SECTION 2



SECTION 3

NOTES:

1. FOR RECOMMENDED TRANSITION LENGTH SEE FIGURE V-10 (MANUAL OF DESIGN CRITERIA)
2. SECTION DESIGNER HAS TO PERFORM STUDIES TO DETERMINE THE ECONOMICAL TYPE OF TRANSITION.
3. FOR FENCE DETAILS SEE DWG. ST-C-34
4. FOR CONCRETE FINISHES SEE ARCH. DWGS.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED A.J.	05-70 DATE	
DRAWN L.R.	05-70 DATE	
CHECKED A.B.	05-70 DATE	
APPROVED GEC(DCCO)	05-70 DATE	
UPDATED ENGA	08-00 DATE	

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

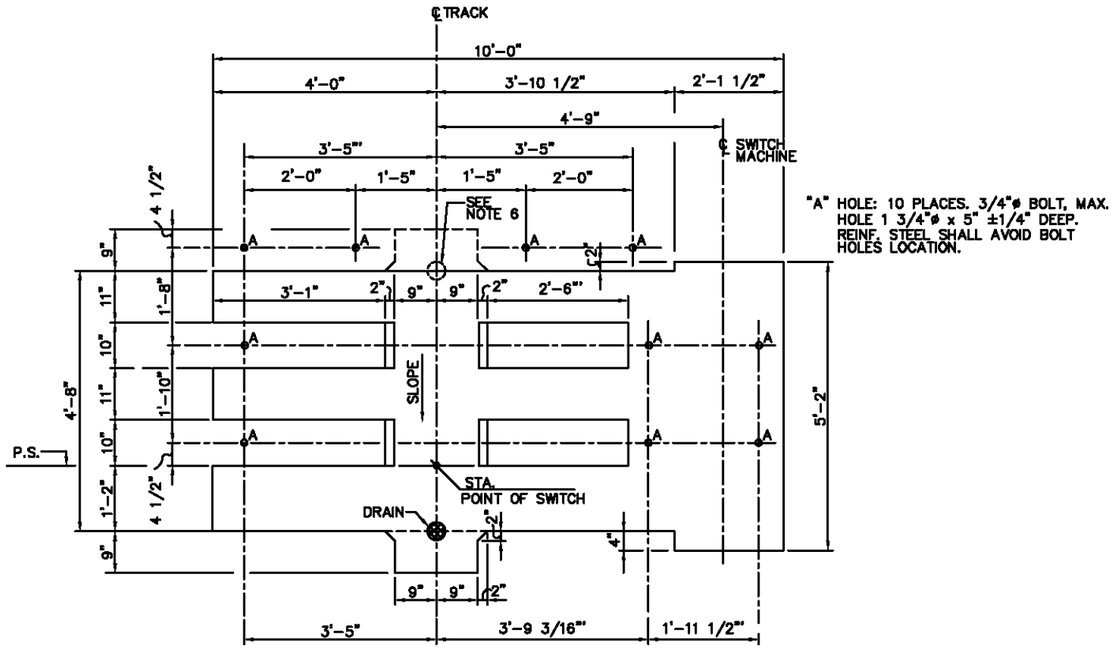
SUBMITTED _____ DATE

APPROVED _____ 5/2001 DATE
DIRECTOR

STRUCTURAL DESIGN DRAWING
TAPERED SLOT TRANSITION FOR TUNNEL OR BOX SECTION ENTRANCE

SCALE 1/2"=1'-0" 6" 0 1 AND AS NOTED

DRAWING NO. DD-S-065



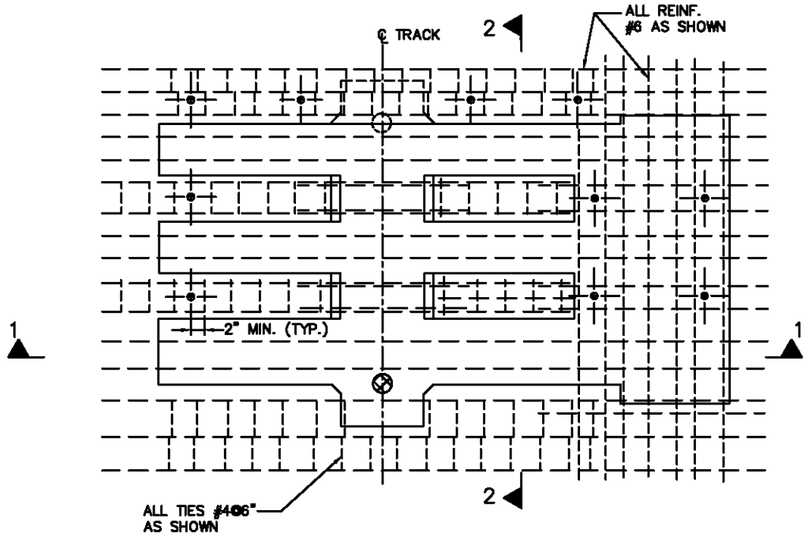
PLAN NO.8 TURNOUT

SEE NOTE "A"

SCALE 3/4"=1'-0"

NOTE "A"

FOR ORIENTATION OF SWITCH ROD TROUGH, SEE DWGS. DD-TW-33, DD-TC-19, DD-TC-40.

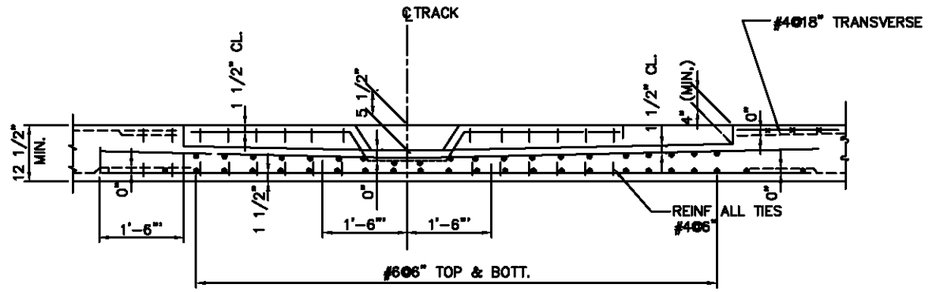


MIN. ADDITIONAL REINFORCING PLAN @ SWITCH ROD TROUGH

SCALE 3/4"=1'-0"

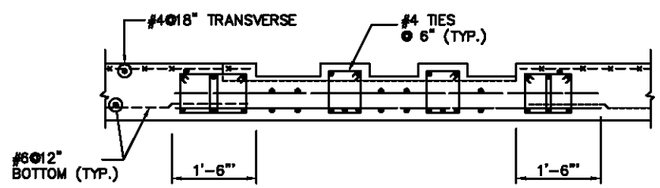
NOTES:

1. P.S. MEANS POINT OF SWITCH.
2. ALL TOLERANCES ON DIMENSIONS TO BE NON-CUMULATIVE.
3. ALL PLANS ARE DRAWN FOR RIGHT HAND TURNOUT. LEFT HAND TURNOUT SHALL BE OPPOSITE HAND.
4. BOLT HOLES "A" WILL BE DRILLED BY TRACKWORK CONTRACTORS.
5. A MINIMUM OF TWELVE (12) INCHES OF HORIZONTAL CLEARANCE SHALL BE PROVIDED BETWEEN THE SWITCH MACHINE TROUGH AND PEDESTAL WALL OR SAFETY WALK.
6. LOCATION OF DRAIN FOR SLOPE IN OPPOSITE DIRECTION (TYP.)
7. DESIGNER SHALL DESIGN THE SLAB THICKNESS & REINFORCEMENT.



SECTION 1-1

SCALE 3/4"=1'-0"



SECTION 2-2

SCALE 3/4"=1'-0"

NOTE:
ALL REINF. SHOWN ARE MIN.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	A. JAGARS	08-70 DATE
DRAWN	RINALDI	08-70 DATE
CHECKED	A.S.	11-70 DATE
APPROVED	GEC(DCCO)	10-70 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

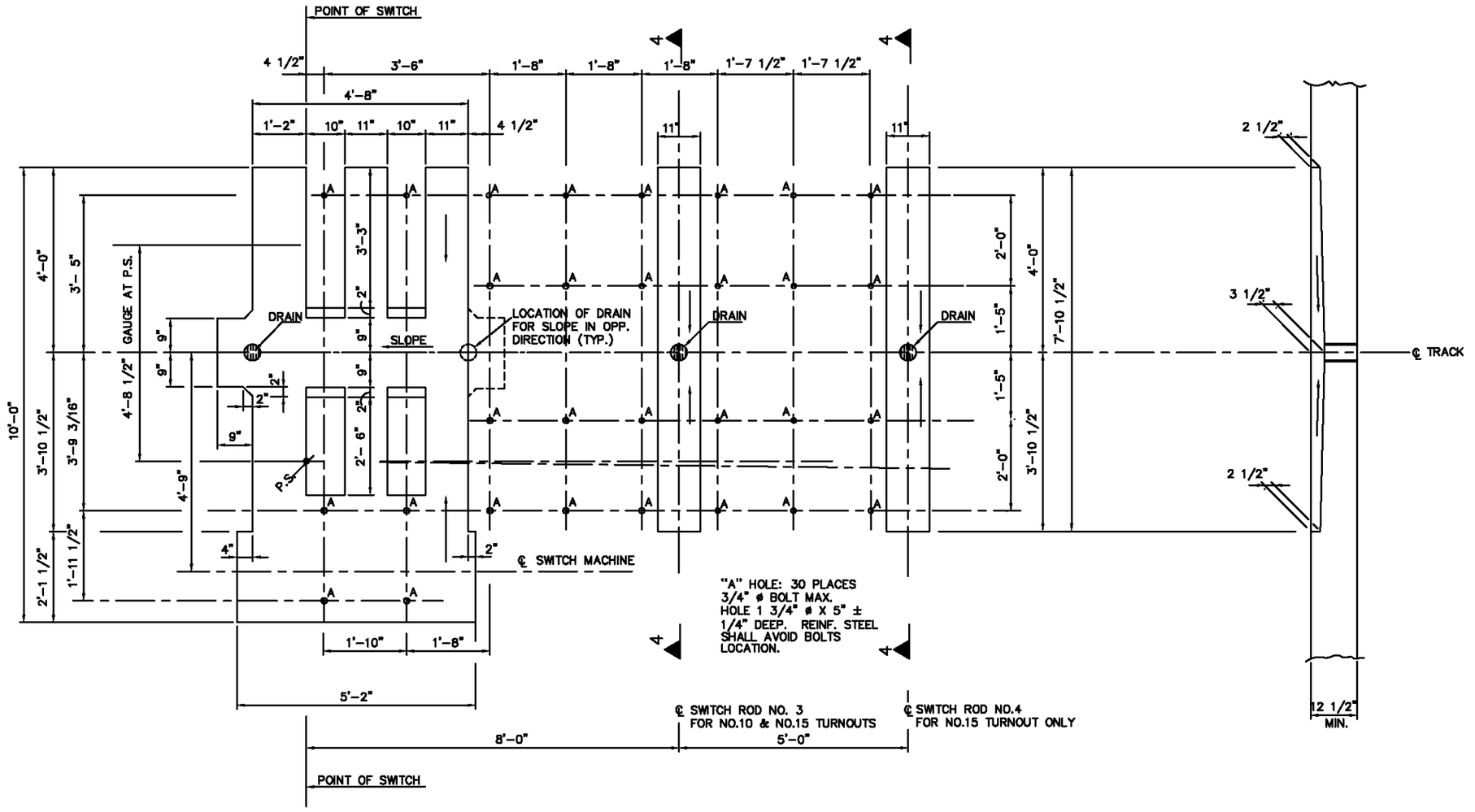
STRUCTURAL DESIGN DRAWING

TYPICAL DETAILS

NO. 8 TURNOUT SWITCH ROD TROUGH

SCALE: AS NOTED

DRAWING NO. DD-S-069



PLAN NO. 10 & NO. 15 TURNOUTS
SCALE 3/4"=1'-0"

SECTION 4
SCALE 3/4"=1'-0"

NOTE: FOR ORIENTATION OF SWITCH ROD TROUGHS. SEE DWGS. DD-TW-48, DD-TW-57 AND DWGS. DD-TC-19, DD-TC-40.

NOTES:
1. P.S. MEANS POINT OF SWITCH
2. ALL TOLERANCES ON DIMENSIONS TO BE NON-CUMULATIVE.
3. PLAN DRAWN FOR RIGHT HAND TURNOUT. LEFTHAND TURNOUT SHALL BE OPPOSITE HAND.
4. BOLT HOLES "A" WILL BE DRILLED BY TRACKWORK CONTRACTORS.
5. FOR REINFORCING STEEL SEE DWG. DD-S-69.

GENERAL NOTES:
1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	A. JAGARS 08-70 DATE
DRAWN	JINALDI 08-70 DATE
CHECKED	A.B. 11-70 DATE
APPROVED	GEC(DCCD) 11-70 DATE
UPDATED	ENGA 09-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

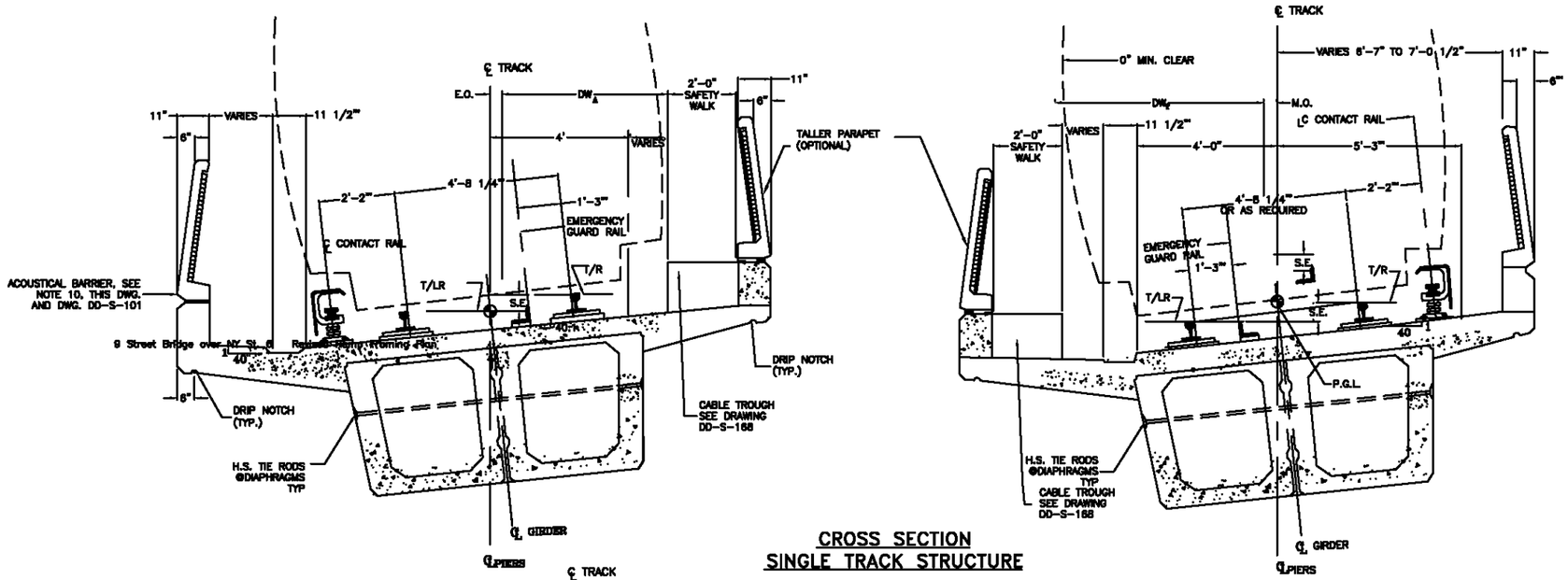
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

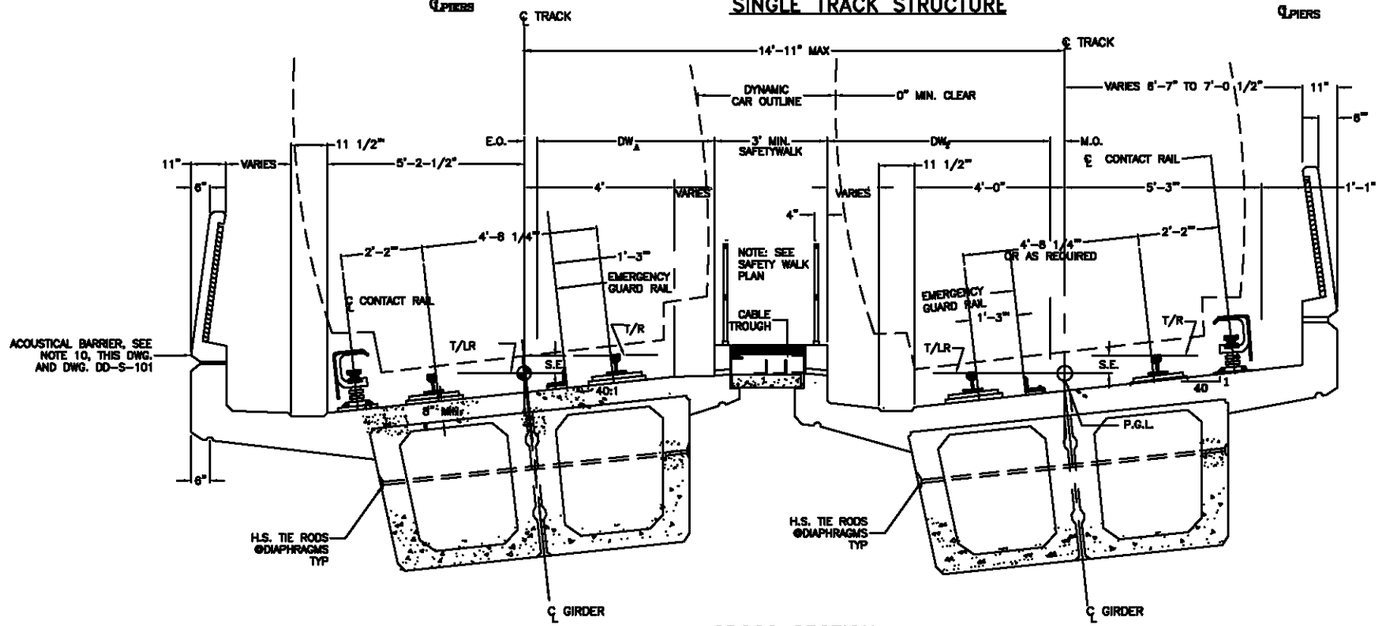
STRUCTURAL DESIGN DRAWING
TYPICAL DETAILS
No. 10 & No. 15 TURNOUTS SWITCH ROD TROUGHS

SCALE 3/4"=1'-0" 1 0 1 AND AS NOTED

DRAWING NO. DD-S-070



CROSS SECTION
SINGLE TRACK STRUCTURE



CROSS SECTION
DOUBLE TRACK STRUCTURE
SUPERELEVATED

OPTION 1

NOTES:

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESS AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. THE DRAWING REPRESENTS PRECAST CONCRETE CONSTRUCTION, FOR ADJACENT BEAMS WITH CAST IN PLACE MONOLITHIC DECK, SEE DWG DD-S-189.
4. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
5. GIRDER BEAM AND DECK ALIGNMENT ON CURVES, CURVATURE SHALL BE AS FOLLOWS:

TYPE OF BEAM	ALIGNMENT	
	GIRDER BEAM	DECK
CAST-IN-PLACE CONCRETE	CURVED OR CHORDED	CURVED
PRECAST CONCRETE BOX	CURVED OR CHORDED	CURVED

6. PIER COLUMNS AND PIER CAPS SHALL BE CONCRETE
7. FOR DW__ DIMENSIONS, REFER TO MANUAL OF DESIGN CRITERIA.
8. TILTED GIRDER CROSS SECTIONS ARE SHOWN FOR FULLY SUPERELEVATED CURVE ON SPIRALS. THE W.P. WILL CHANGE RELATIVE TO CENTER OF GIRDER. MIN. RADIUS = 1000'-0".
9. DIMENSION "A" IS CONSTANT.
10. ACOUSTICAL BARRIER TO BE USED ONLY AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILINGS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
11. ATTACHMENTS TO PRESTRESSED GIRDERS SHALL BE MADE BY WELDING TO EMBEDDED PLATES OR EMBEDDED FITTINGS. NO ATTACHMENTS SHALL BE MADE BY DRILLING INTO GIRDER EXCEPT FOR TRACK FASTENERS AND APPURTENANCES AND AS LIMITED BY DD-T-1 AND DD-S-93.
12. HANDRAIL POSTS SHALL BE INSTALLED IN A VERTICAL POSITION.
13. FOR TANGENT SECTION SEE DD-S-139 & DD-S-168.
14. FOR CABLE TROUGH SEE DETAIL A, DD-S-168.
15. S.E. MAX. 6 INCHES.
16. FOR SAFETY WALK/RAILING PLAN, SEE DWG DD-S-90.
17. FOR PRECAST CONCRETE ADJACENT BOX BEAMS WITH MONOLITHIC DECK, SEE DWG DD-S-189.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

		DATE
DESIGNED	CHYTRY	6-71
DRAWN	RINALDI	6-71
CHECKED	A.E.	7-71
APPROVED	GCC(DCCO)	07-71
UPDATED	ENGA	06-00

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-189	OPTION 2

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

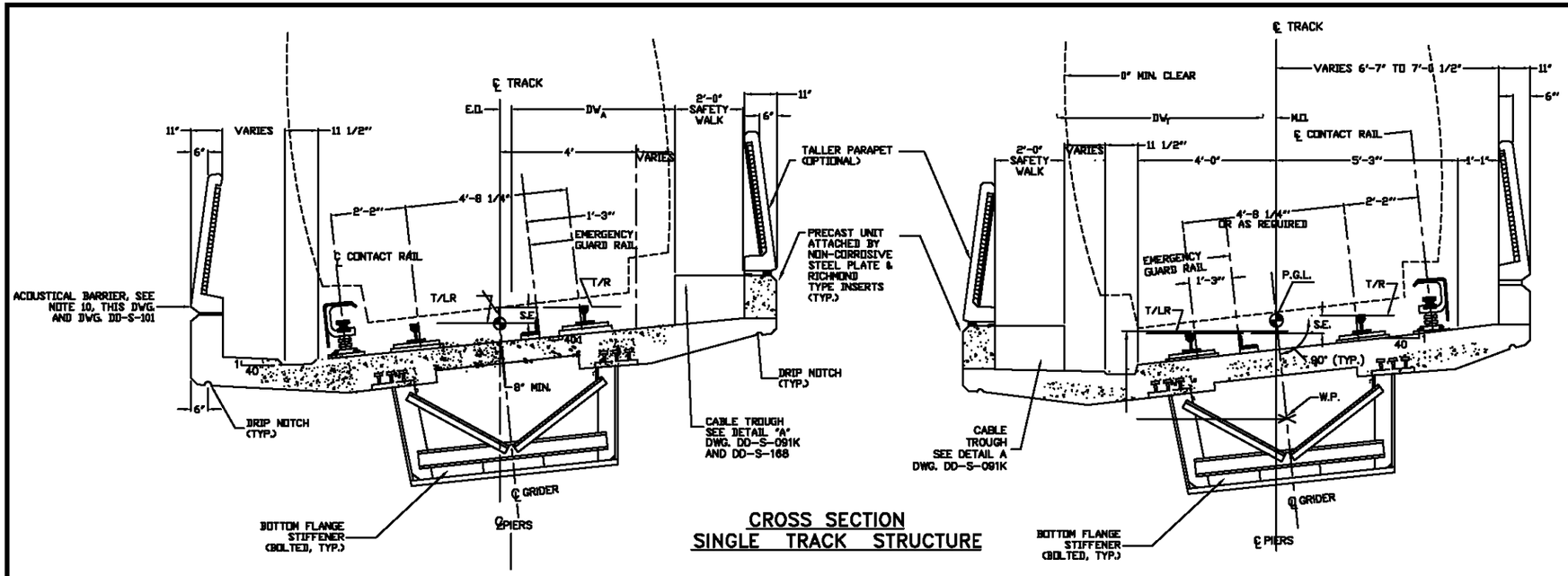
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

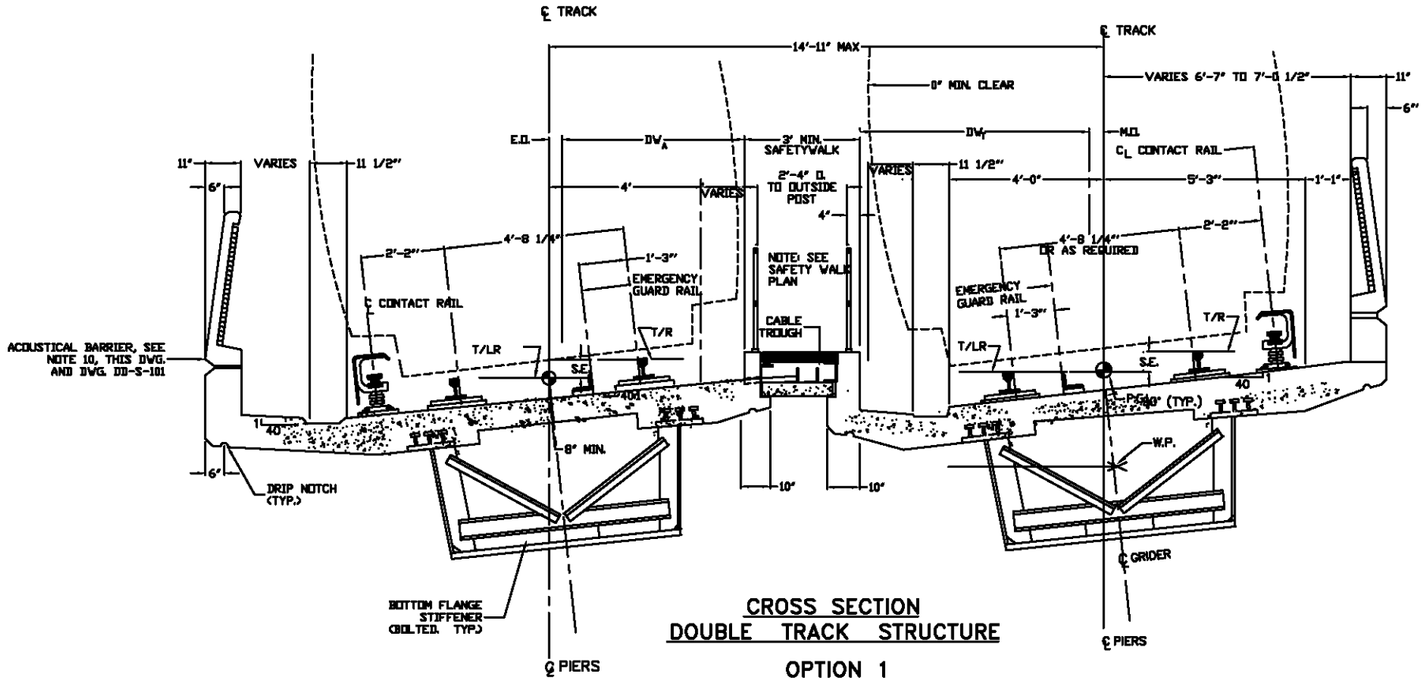
STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
PRECAST CONCRETE - ADJACENT BOX BEAMS CAST - IN - PLACE DECK

SCALE 1/2"=1'-0" AND AS NOTED

DRAWING NO. DD-S-089



CROSS SECTION
SINGLE TRACK STRUCTURE

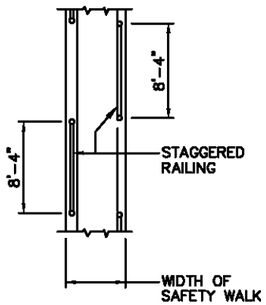


CROSS SECTION
DOUBLE TRACK STRUCTURE

OPTION 1

NOTES

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESSES AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
4. STEEL BOX GIRDER AND DECK ALIGNMENT ON CURVES, CURVATURE SHALL BE AS FOLLOWS:
   a. STEEL BOX GIRDER, CURVED OR CHORDED.
   b. DECK, CURVED.
5. PIER COLUMNS SHALL BE CONCRETE, PIER CAPS STEEL.
6. FOR DW_A, DW_T, E.O. AND M.O. VALUES, AND TRACK CENTER DIMENTIONS, REFER TO MANUAL OF DESIGN CRITERIA.
7. TILTED GIRDER CROSS SECTIONS ARE SHOWN FOR FULLY SUPERELEVATED CURVE, ON SPIRALS THE W.P. WILL CHANGE RELATIVE TO CENTER OF GIRDER, MIN. RADIUS = 1,000'-0"
8. STEEL GIRDER AND PIER CAP TO BE PAINTED BROWN FED. SPEC. NO. 20040. UNLESS WEATHERING STEEL IS USED.
9. DIMENSION "B" IS CONSTANT.
10. USE ACOUSTICAL BARRIER AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
11. HANDRAILS SHALL BE INSTALLED IN A VERTICAL POSITION.
12. TRANSVERSE TOP REINFORCEMENT SHALL BE SPACED AT 7 1/2" ON CENTERS IN CONCRETE DECK TO PROVIDE SPACE FOR RAIL FASTENER ANCHOR BOLTS.
13. FOR CABLE TROUGH, SEE DWG. DD-S-139 AND DD-S-168.
14. S.E. MAX. 6 INCHES.
15. FOR DETAILS OF INSPECTION ACCESS AND DRAINAGE PROVISIONS, SEE DWG. DD-S-128. BOX SIZE SHALL BE ADEQUATE FOR TRAVEL INSIDE THE BOX FOR INSPECTION.



SAFETY WALK PLAN

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR OPTION 2, SEE DWG DD-S-190.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	MA	08-00 DATE
CHECKED	MA/EC	08-00 DATE
APPROVED	J. RUDOLF	11-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

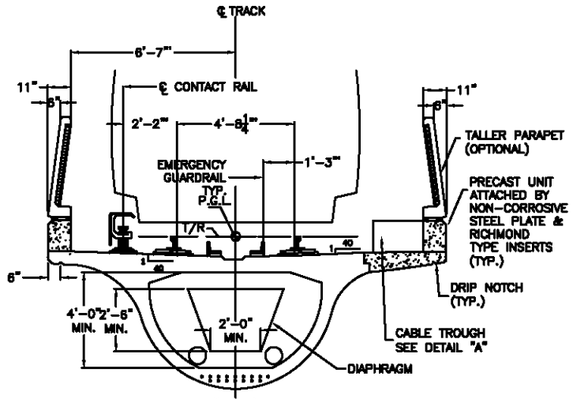
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
LONG RUNNING TRACK STRUCTURES
TILTED STEEL GIRDERS, COMPOSITE SECTION

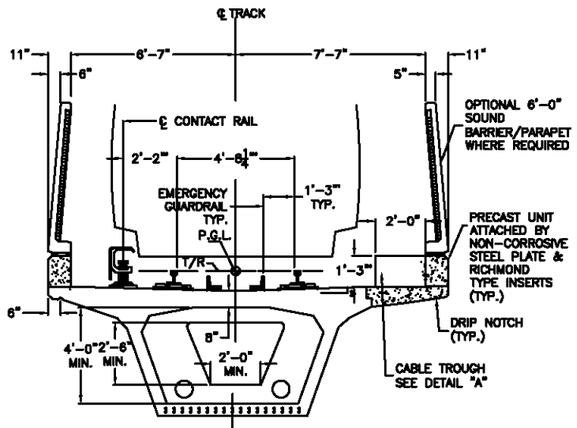
SCALE: NOT TO SCALE

DRAWING NO.: DD-S-090



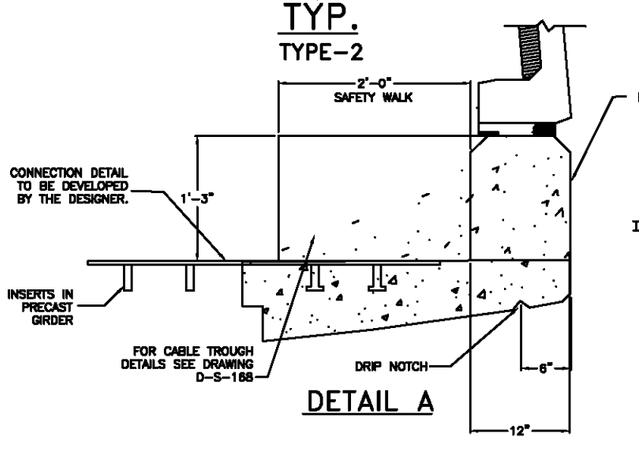
TYP.

TYPE-1

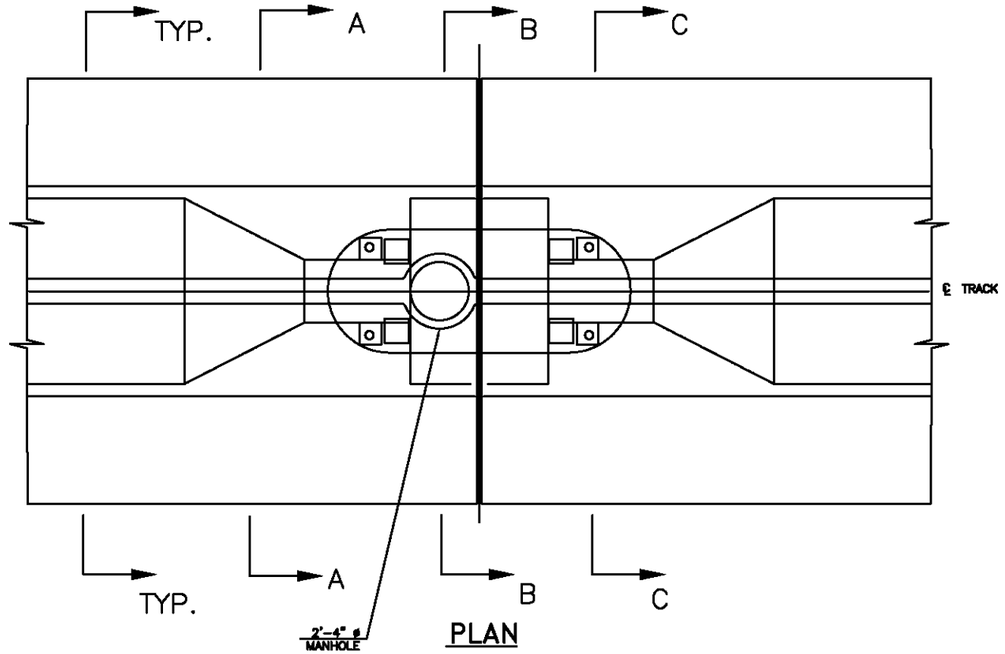


TYP.

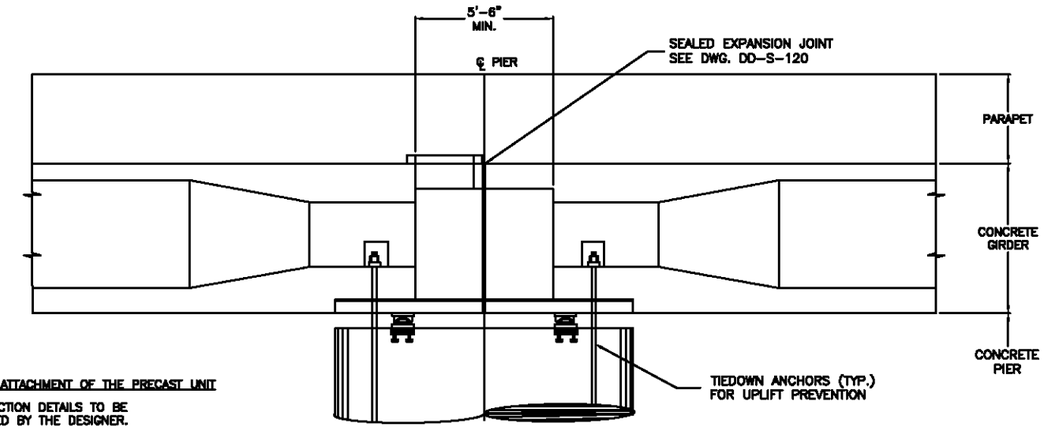
TYPE-2



DETAIL A



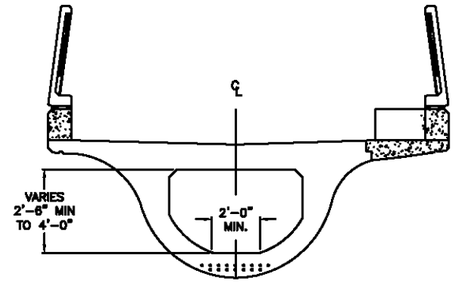
PLAN



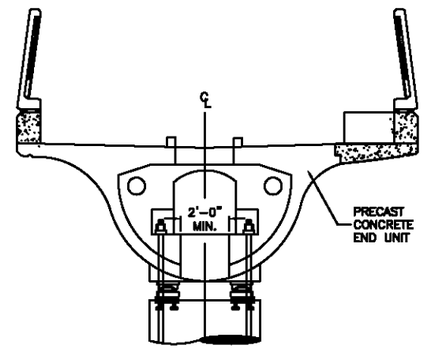
TYPICAL NOTE FOR ATTACHMENT OF THE PRECAST UNIT

ALL CONNECTION DETAILS TO BE DEVELOPED BY THE DESIGNER.

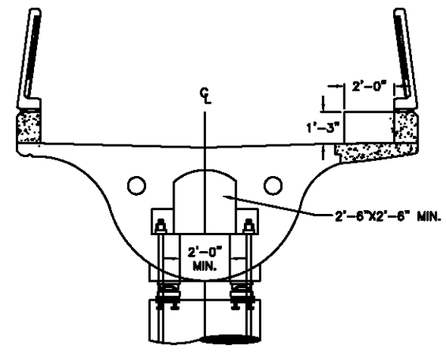
ELEVATION, SIMPLE SPAN GIRDER
SINGLE TRACK STRUCTURE



SEC A-A



SEC B-B



SEC C-C

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139.

DESIGNED	J. RUDOLF	08-00
DRAWN	M.A.	08-00
CHECKED	M.A./E.C.	08-00
APPROVED	J. RUDOLF	12-00
UPDATED		

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-168	SAFETY WALK/CABLE TROUGH
DD-S-101	ACOUSTICAL BARRIER

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

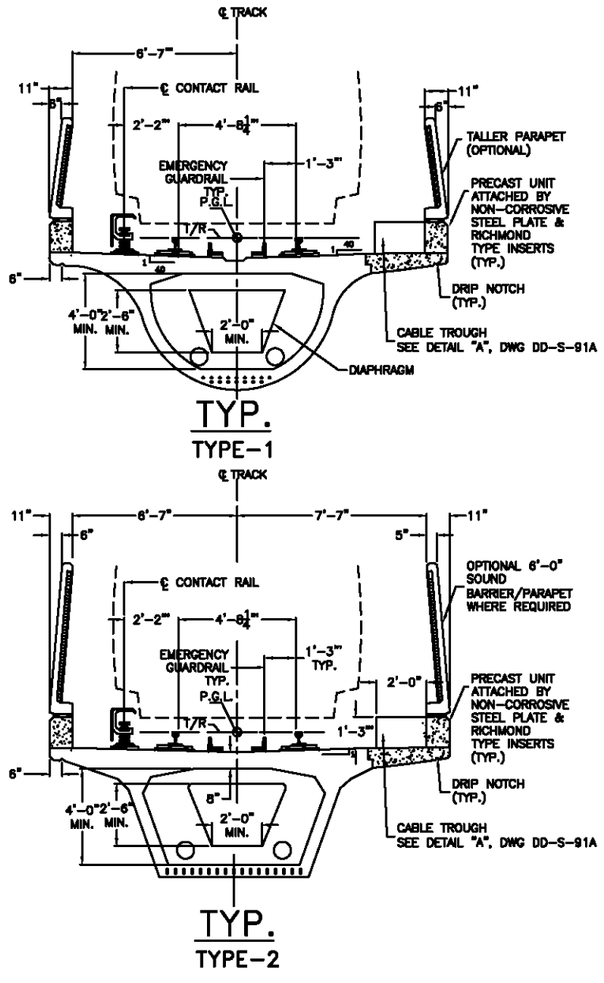
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

TYPICAL AERIAL STRUCTURAL GIRDER SECTIONS PRECAST PRESTRESSED SPAN

SCALE: NOT TO SCALE

DRAWING NO. DD-S-091A

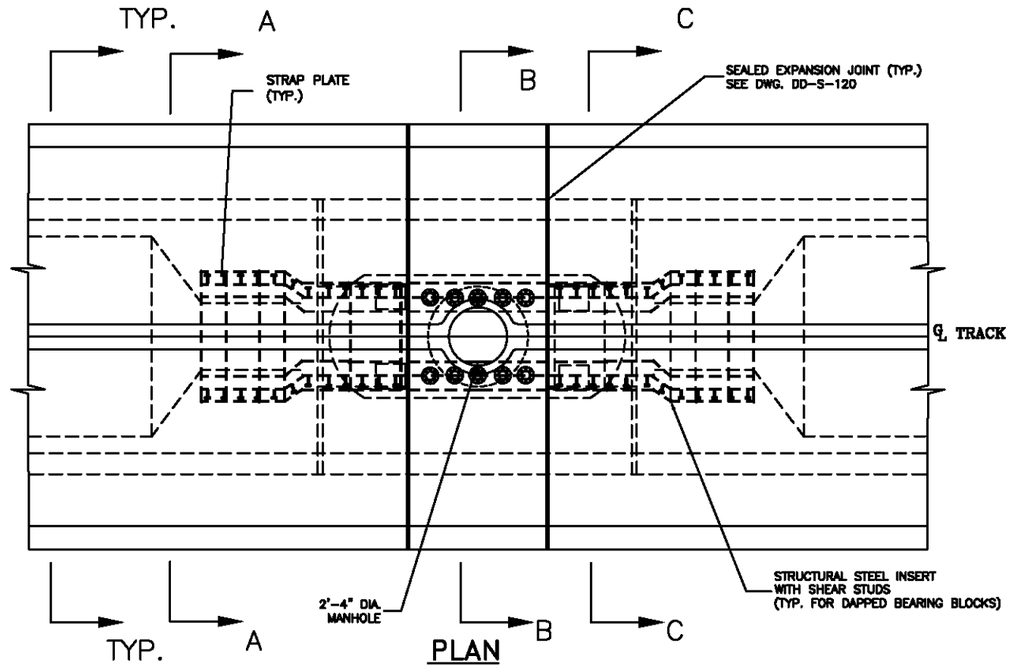


TYP.

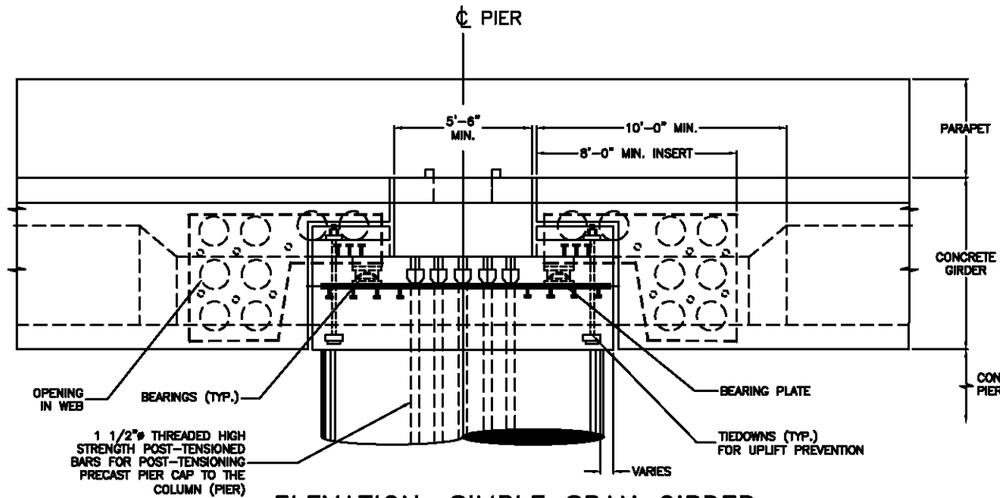
TYPE-1

TYP.

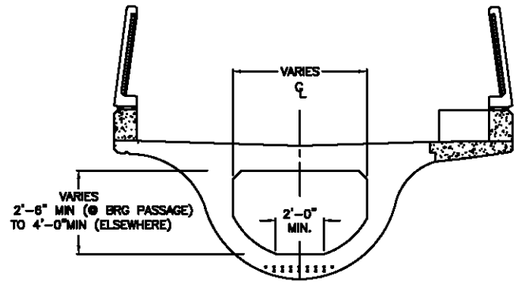
TYPE-2



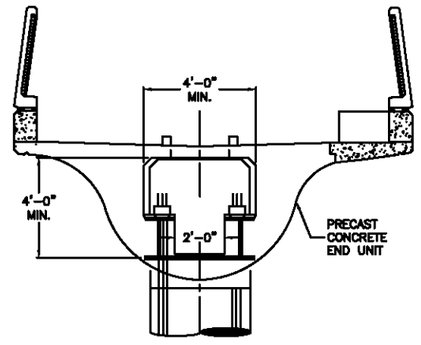
PLAN



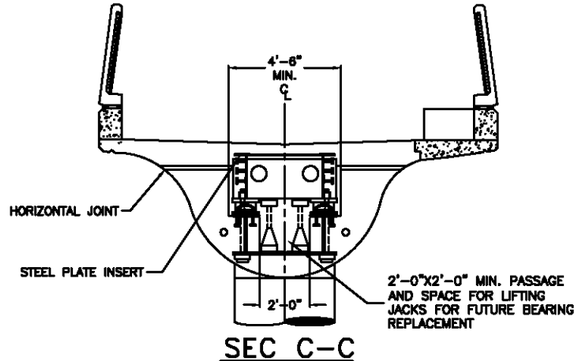
ELEVATION, SIMPLE SPAN GIRDER
SINGLE TRACK STRUCTURE



SEC A-A



SEC B-B



SEC C-C

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWG DD-S-89 & 139.
4. FOR PT END BLOCK, SEE DWG DD-S-91G.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-101	ACOUSTICAL BARRIER

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

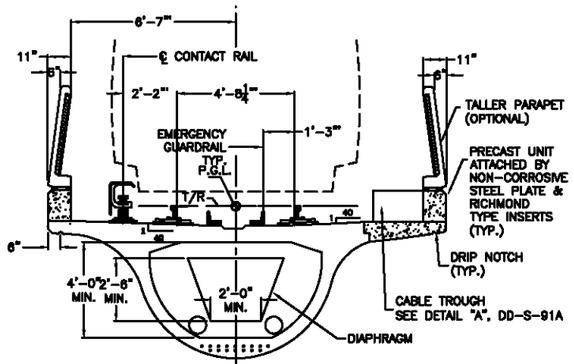
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN
PRECAST PIER CAP POST-TENSIONED TO OBLONG PIER

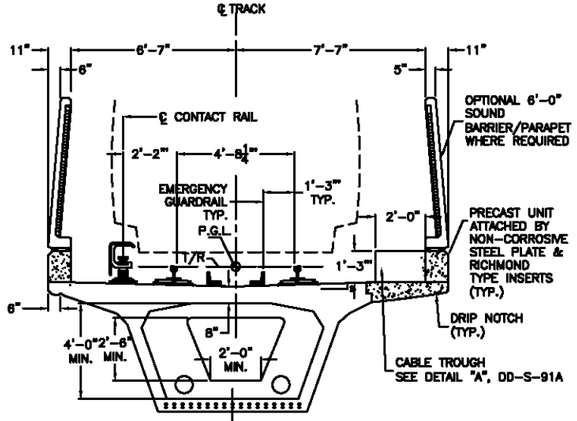
SCALE: NO TO SCALE

DRAWING NO.: DD-S-091B



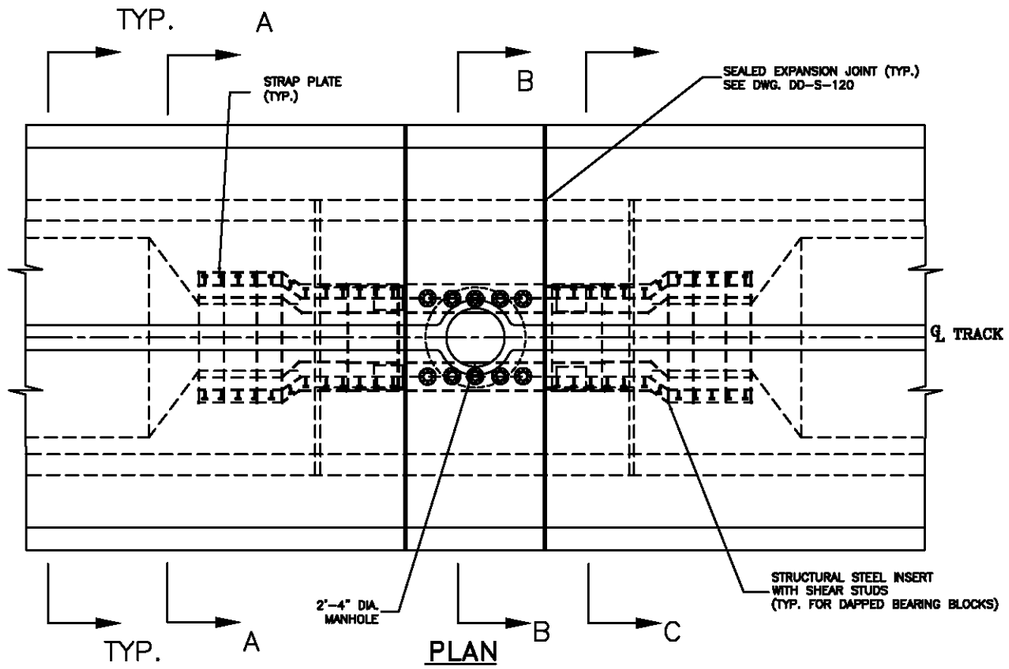
TYP.

TYPE-1

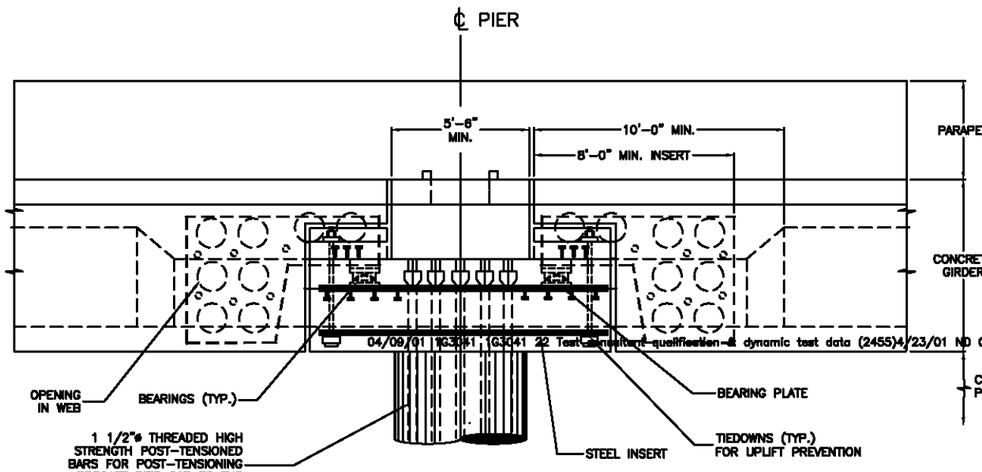


TYP.

TYPE-2



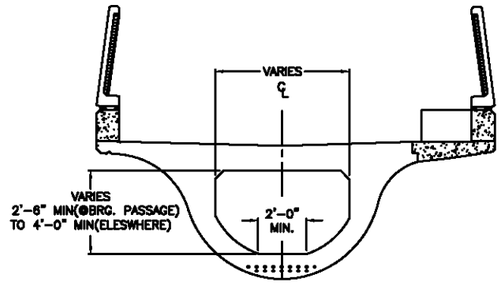
PLAN



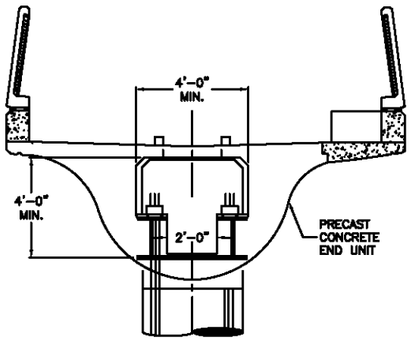
04/09/01 1G3051 G3C41 22 Test equipment qualification & dynamic test data (2455) 4/23/01 ND COMPLETED 04/18/01 1

ELEVATION, SIMPLE SPAN GIRDER

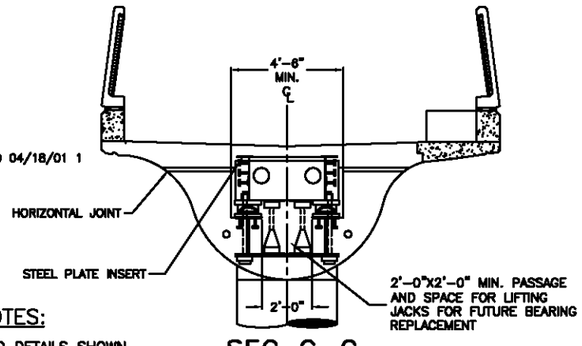
SINGLE TRACK STRUCTURE



SEC A-A



SEC B-B



SEC C-C

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139
4. FOR PT END BLOCK, SEE DWG DD-S-91G.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-101	ACOUSTICAL BARRIER

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

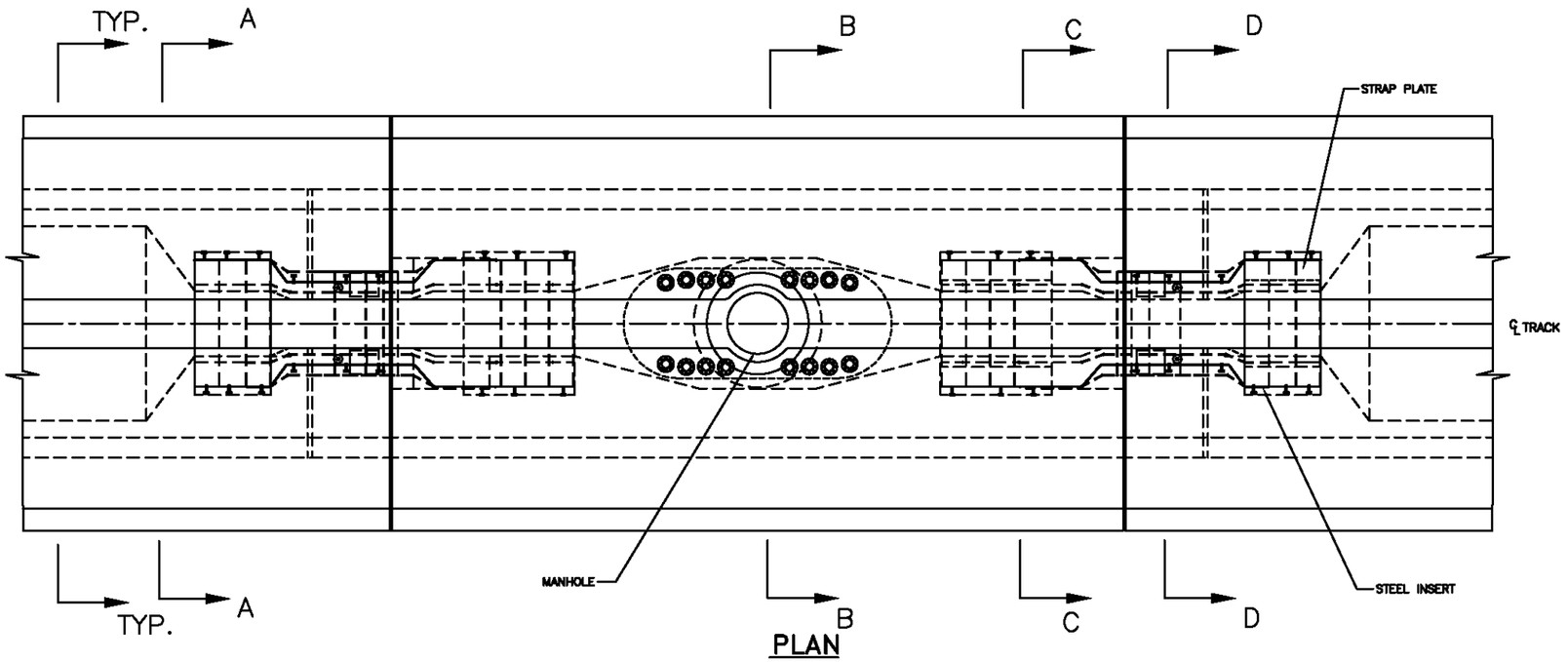
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

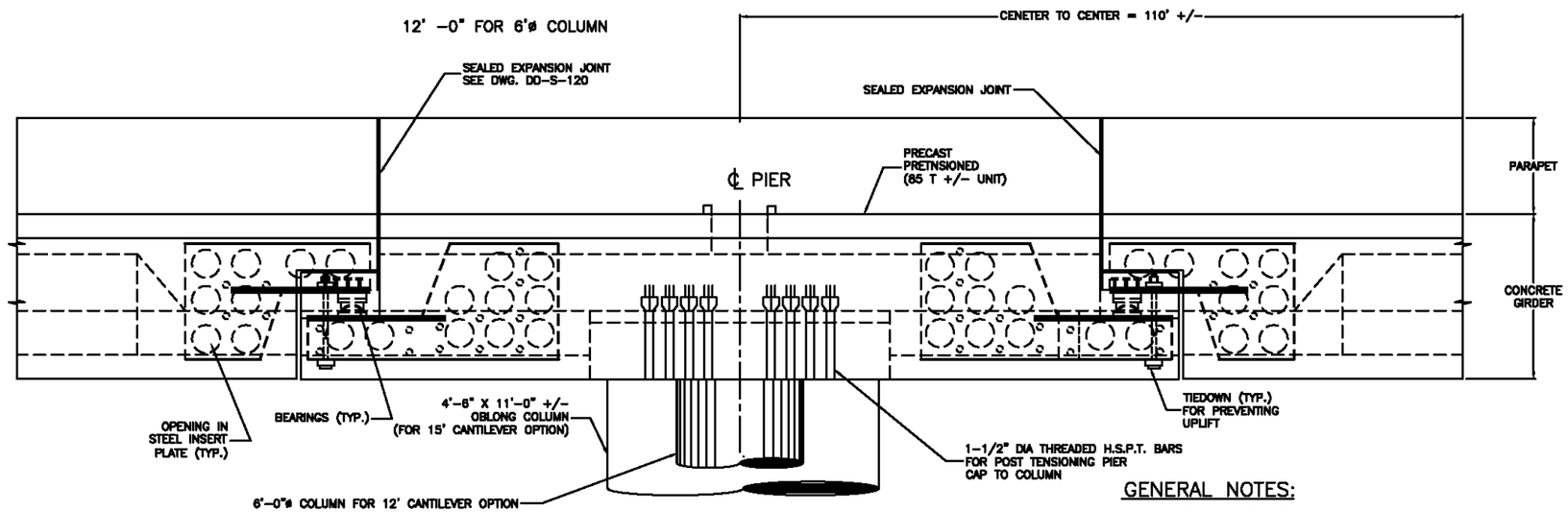
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN PRECAST PIER CAP POST-TENSIONED TO ROUND PIER

SCALE: NO TO SCALE

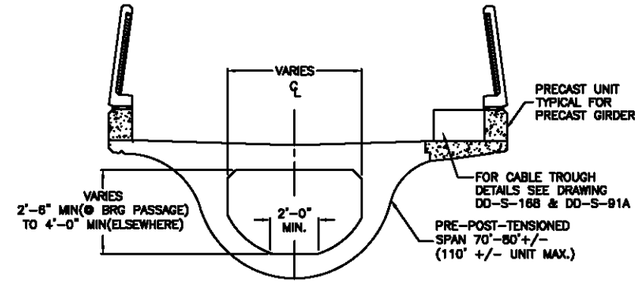
DRAWING NO. DD-S-091C



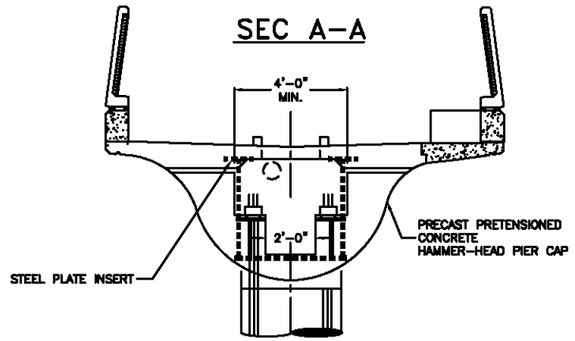
PLAN



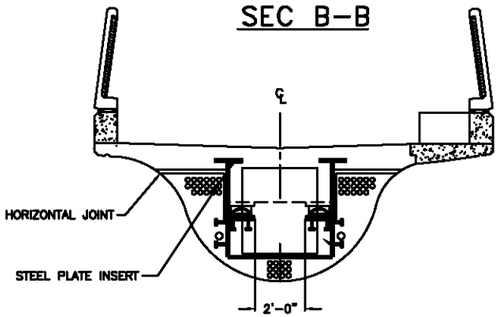
ELEVATION, SIMPLE SPAN GIRDER
SINGLE TRACK STRUCTURE



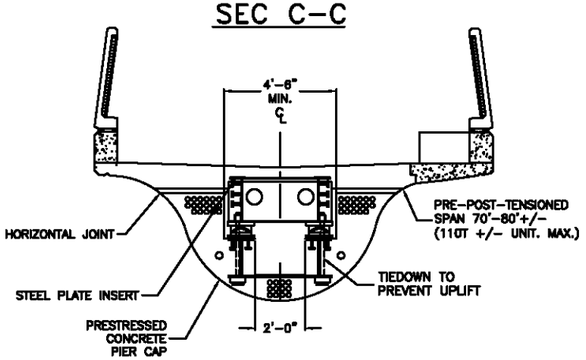
SEC A–A



SEC B–B



SEC C–C



SEC D–D

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD–S–89 & S–139.
4. FOR PT END BLOCK, SEE DWG DD–S–91G.

DESIGNED	J. RUDOLF	08–00 DATE
DRAWN	M.A.	08–00 DATE
CHECKED	M.A./E.C.	08–00 DATE
APPROVED	J. RUDOLF	12–00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD–S–91A	PRECAST SAFETY WALK UNIT
DD–S–101	ACOUSTICAL BARRIER

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

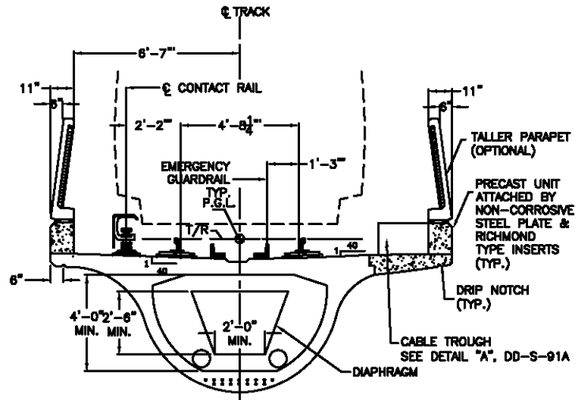
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN
PC PS PIER UNIT POST–TENSIONED TO OBLONG PIER

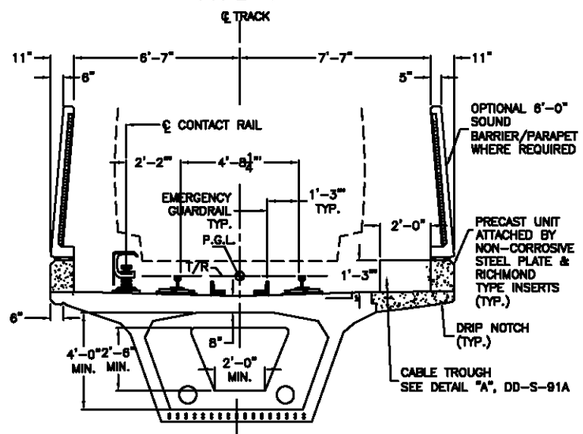
SCALE: NO TO SCALE

DRAWING NO. DD–S–091D



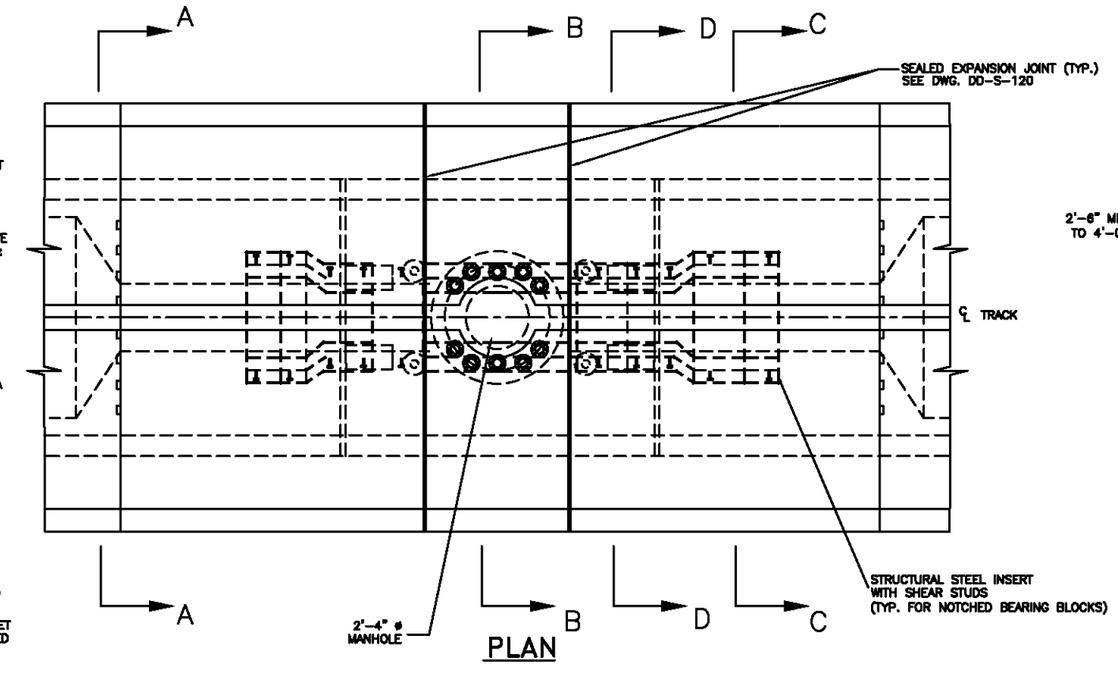
TYP.

TYPE-1

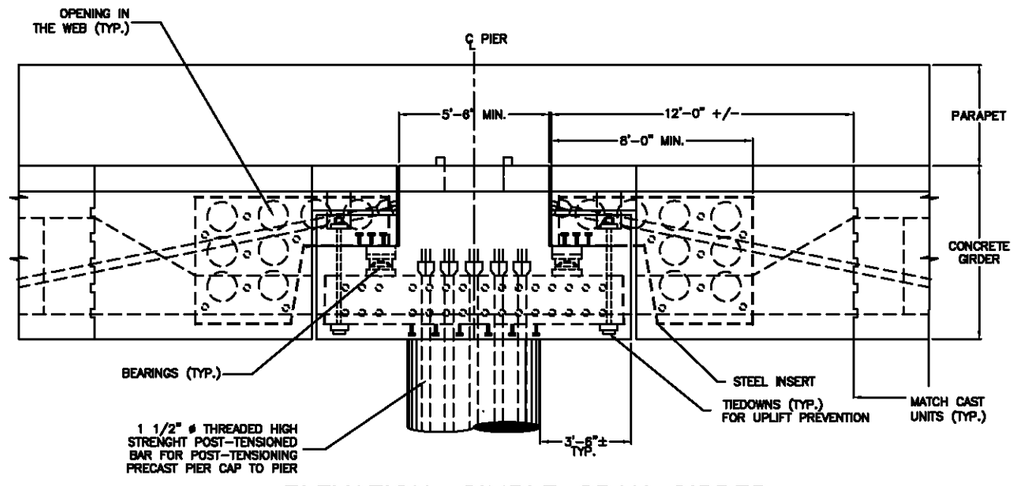


TYP.

TYPE-2

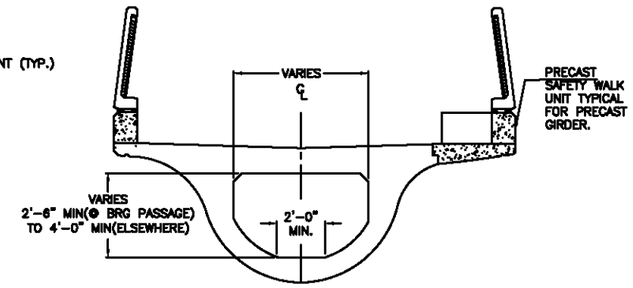


PLAN

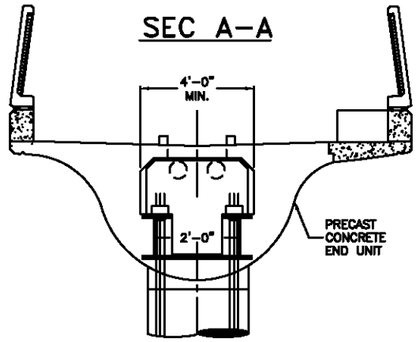


ELEVATION, SIMPLE SPAN GIRDER

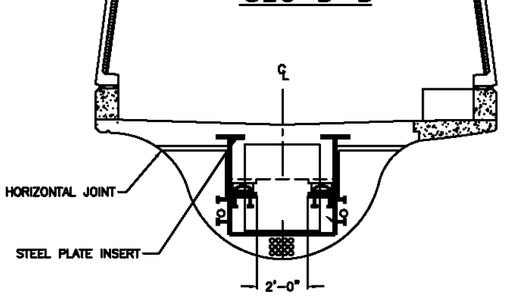
SINGLE TRACK STRUCTURE



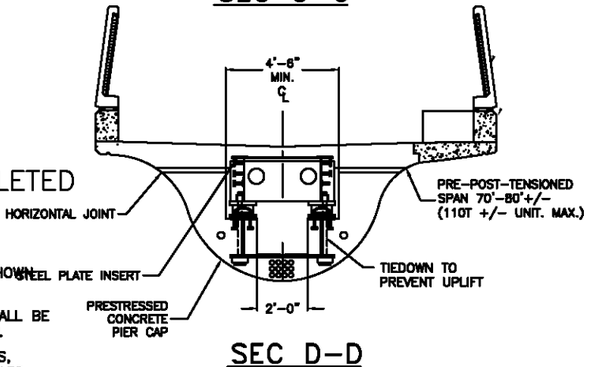
SEC A-A



SEC B-B



SEC C-C



SEC D-D

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-101	ACOUSTICAL BARRIER

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

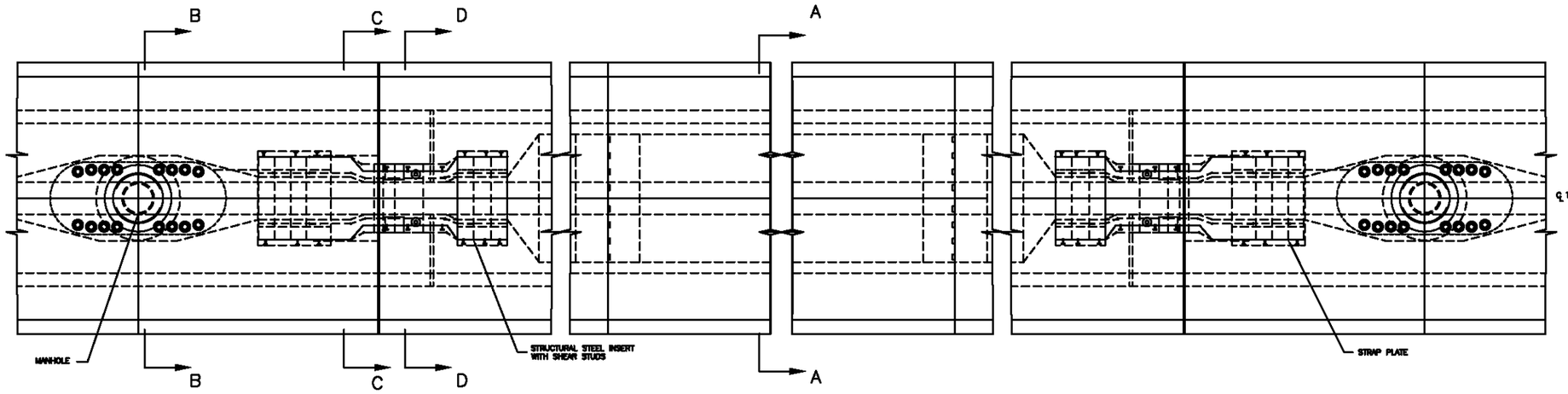
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

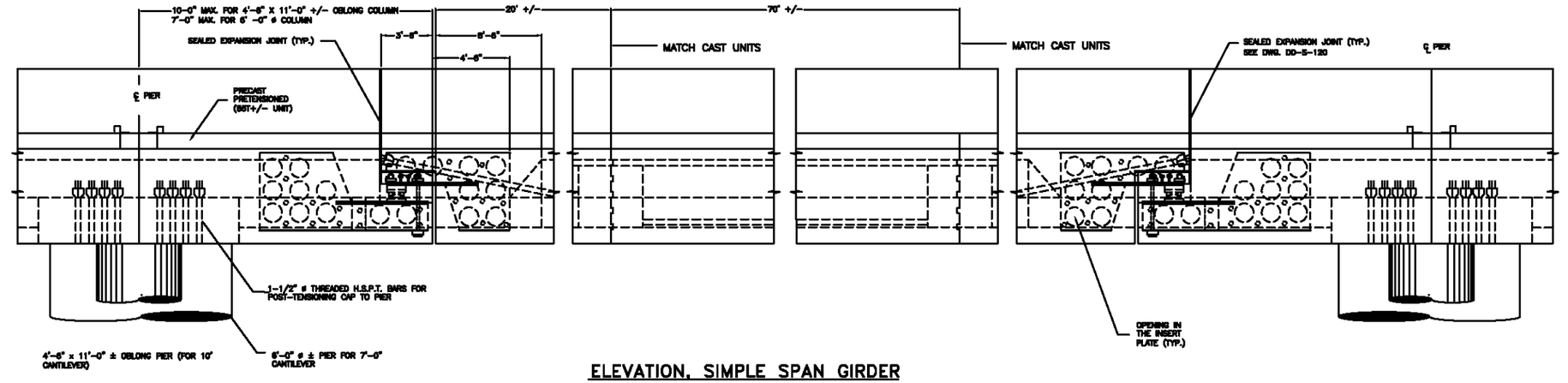
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN
PRECAST END BLOCK & PRECAST PIER CAP

SCALE: NO TO SCALE

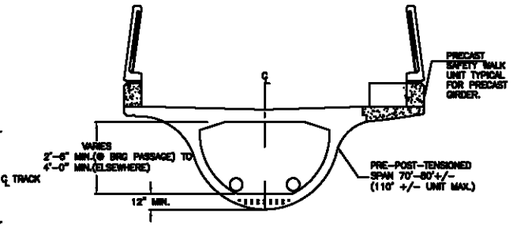
DRAWING NO. DD-S-091E



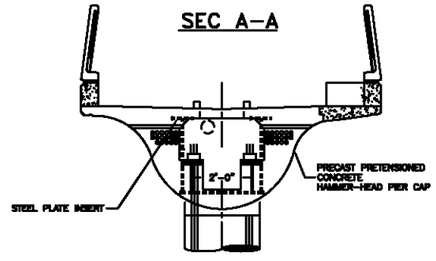
PLAN



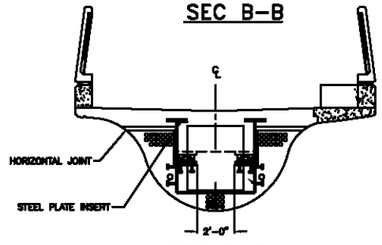
ELEVATION, SIMPLE SPAN GIRDER
SINGLE TRACK STRUCTURE



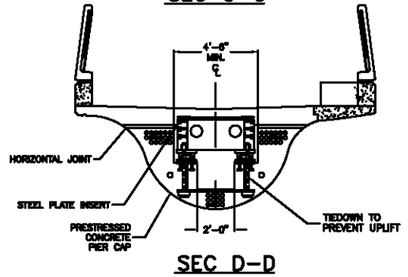
SEC A-A



SEC B-B



SEC C-C



SEC D-D

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-91A	PRECAST SAFETY WALK UNIT & CONNECTIONS
DD-S-101	ACOUSTICAL BARRIER
DD-S-168	SAFETY WALK/CABLE TROUGH

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

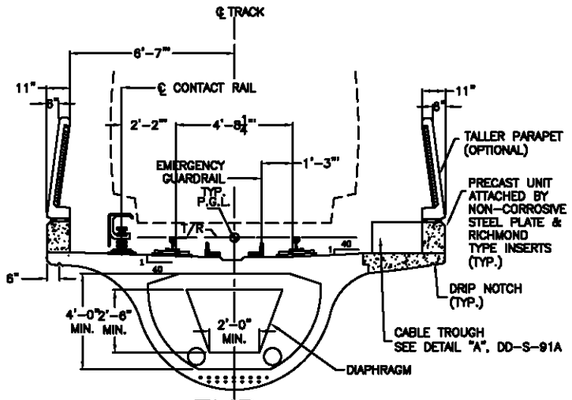
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN W/EXTENSION PC UNIT
PRECAST PRESTRESSED PIER UNIT

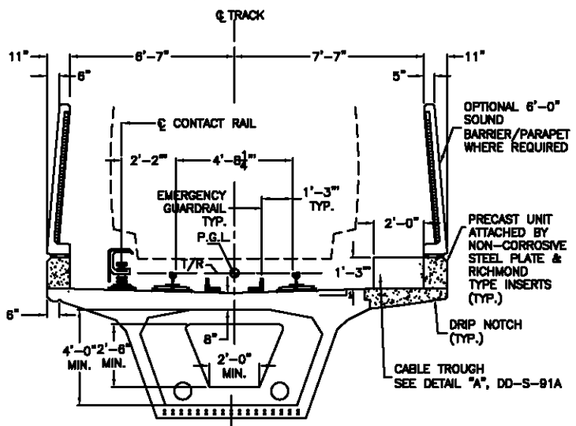
SCALE: NO TO SCALE

DRAWING NO.: DD-S-091F



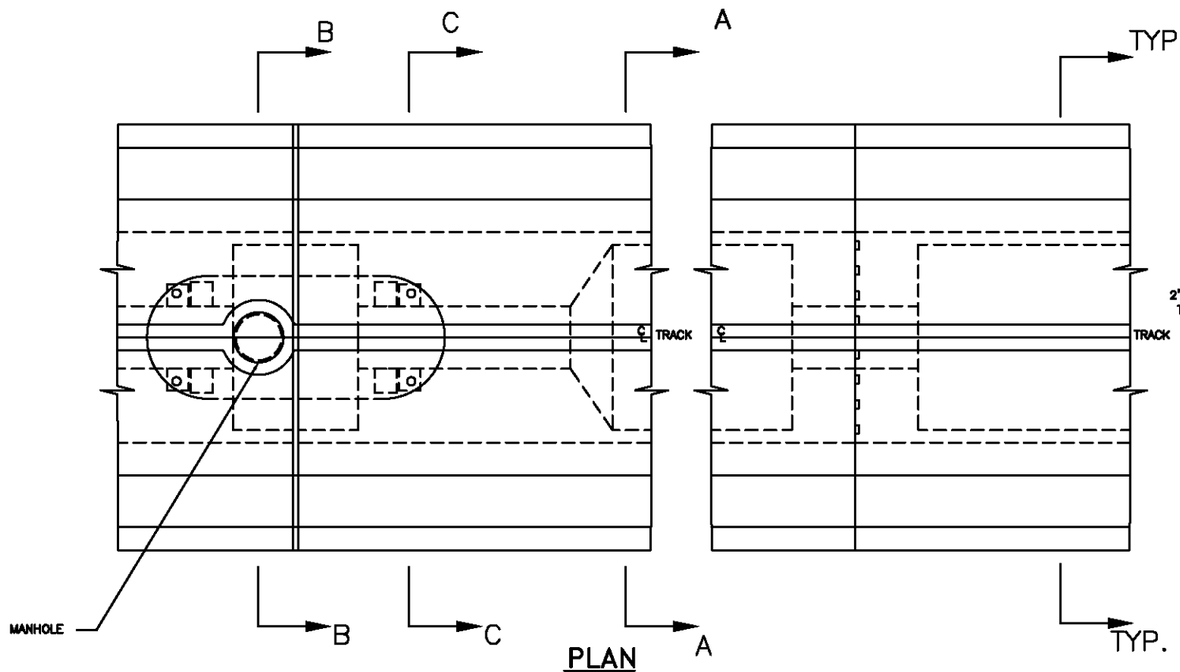
TYP.

TYPE-1

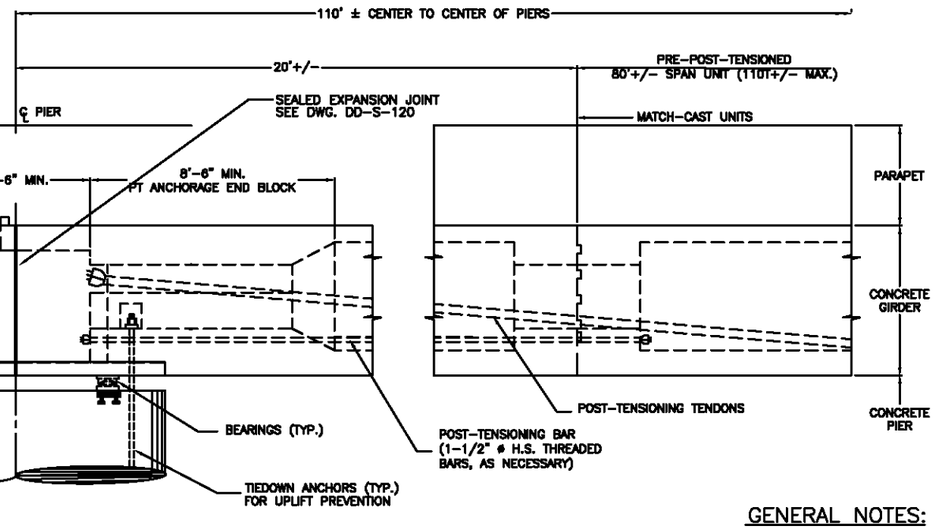


TYP.

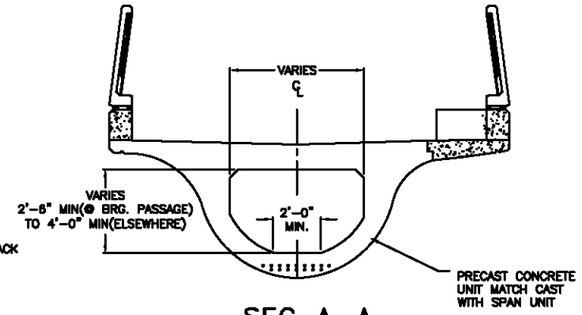
TYPE-2



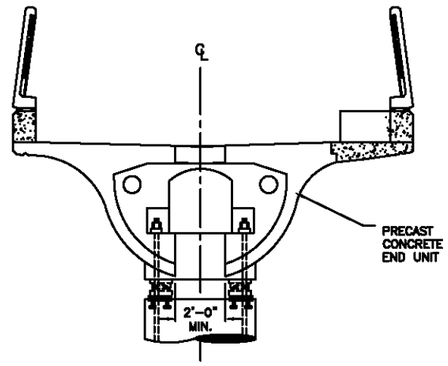
PLAN



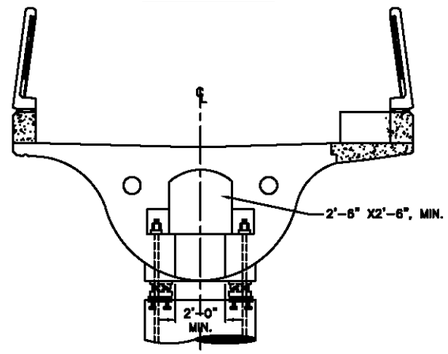
ELEVATION, SIMPLE SPAN GIRDER
SINGLE TRACK STRUCTURE



SEC A-A



SEC B-B



SEC C-C

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-101	ACOUSTICAL BARRIER

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

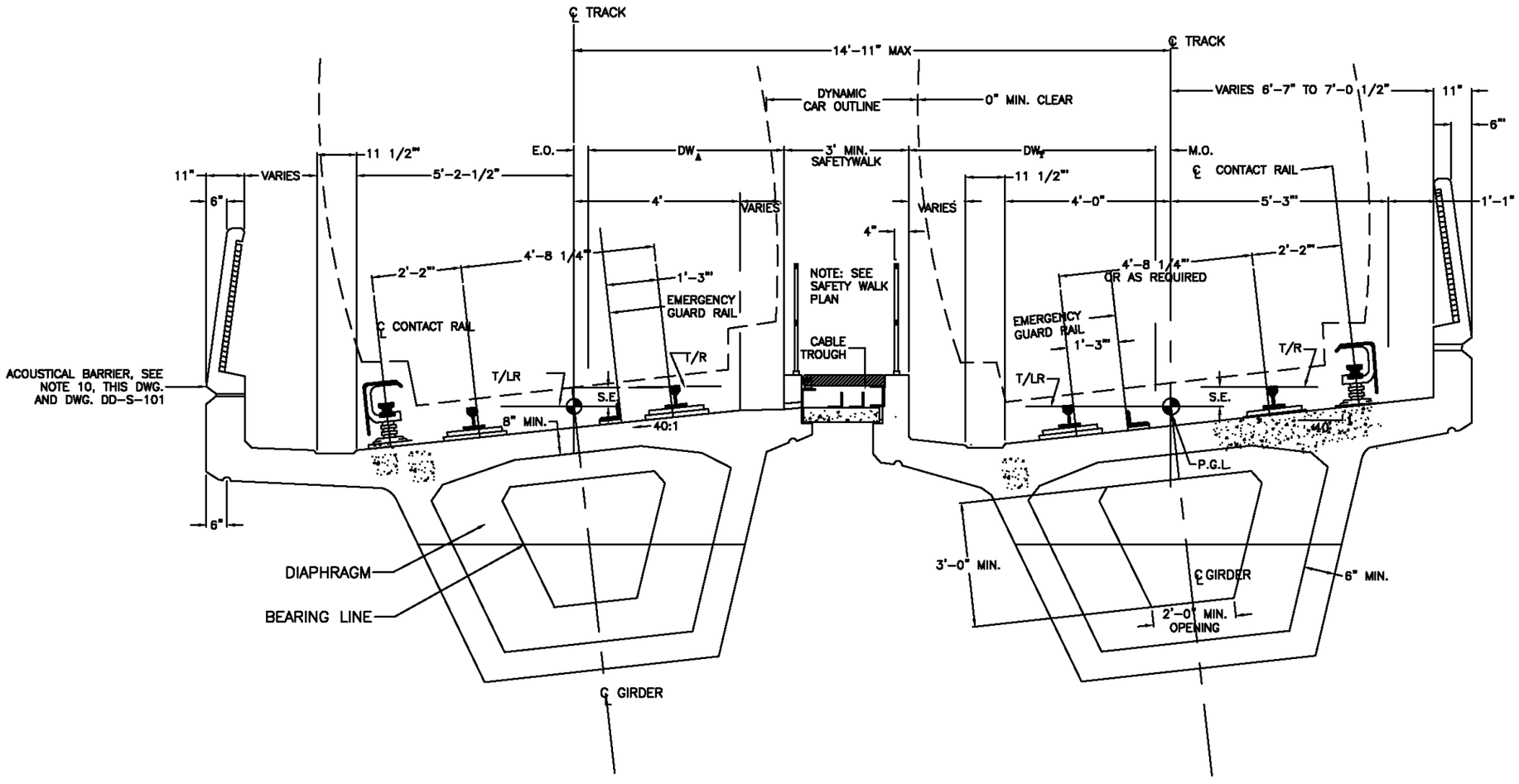
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN W/EXTENSION PC UNIT

SCALE: NO TO SCALE

DRAWING NO.: DD-S-091G



CROSS SECTION
DOUBLE TRACK STRUCTURE
SUPERELEVATED

OPTION 1
FOR OPTION 2 SEE DRAWING DD-S-191H

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139.

DESIGNED	J. RUDOLF	06-00 DATE
DRAWN	MA	06-00 DATE
CHECKED	MA/EC	06-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-93	TYPICAL RAILING DETAIL

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

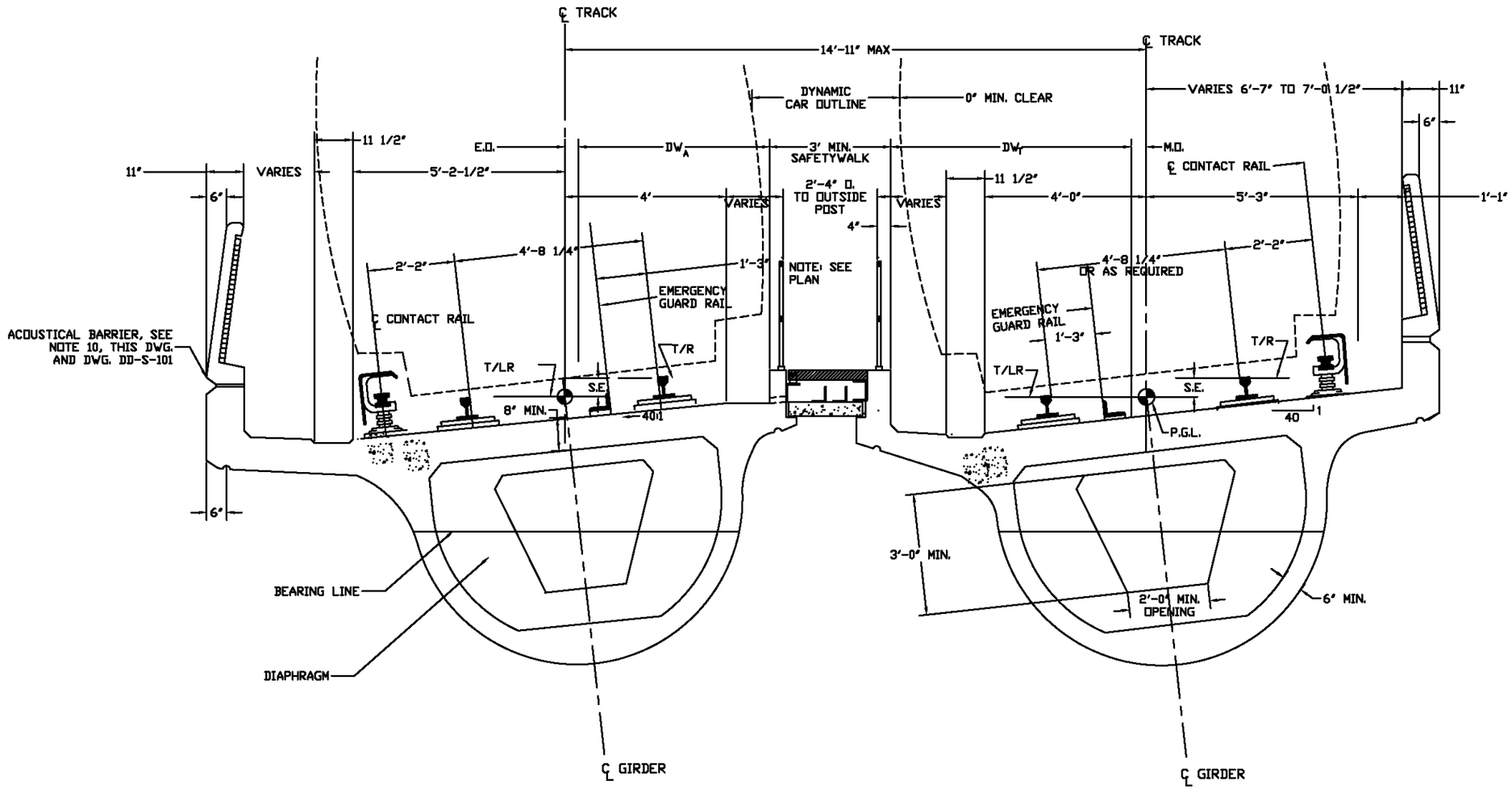
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN OR SEGMENTAL

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-091H



CROSS SECTION
DOUBLE TRACK STRUCTURE
SUPERELEVATED

OPTION 1
FOR OPTION 2, SEE DRAWING DD-S-191J

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	MA	08-00 DATE
CHECKED	MA/EC	08-00 DATE
APPROVED	J. RUDOLF	11-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

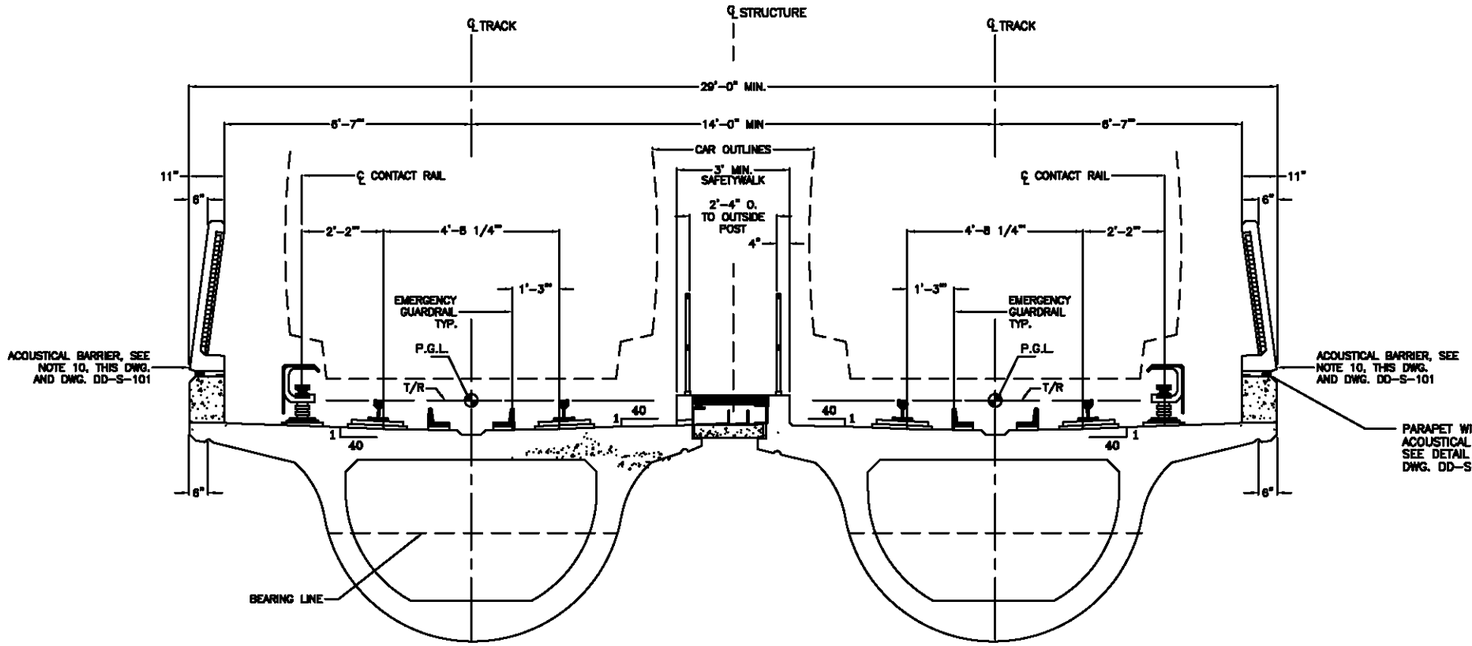
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN OR SEGMENTAL

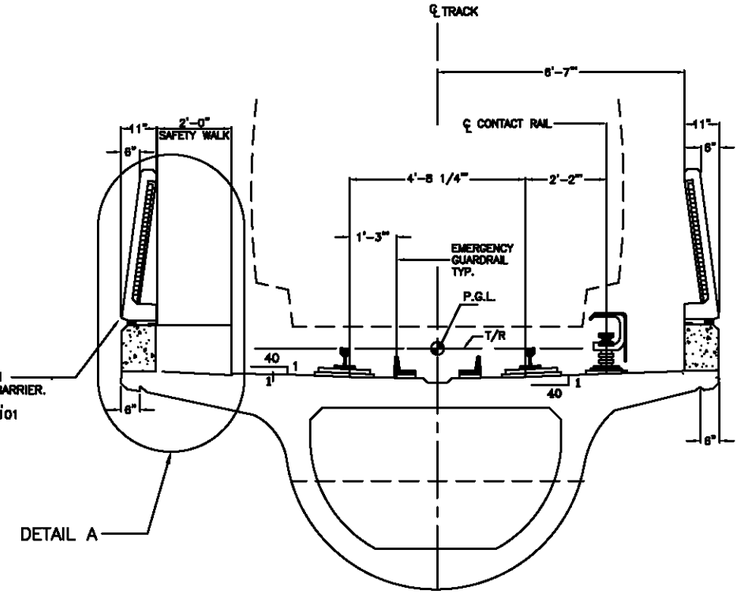
SCALE: NOT TO SCALE

DRAWING NO.: DD-S-091J

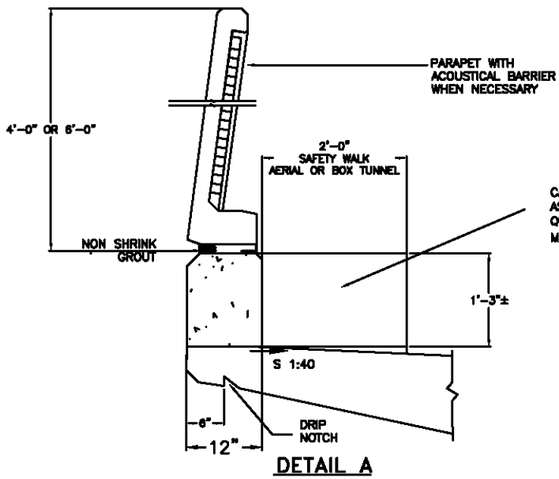


CROSS SECTION
DOUBLE TRACK STRUCTURE
TANGENT

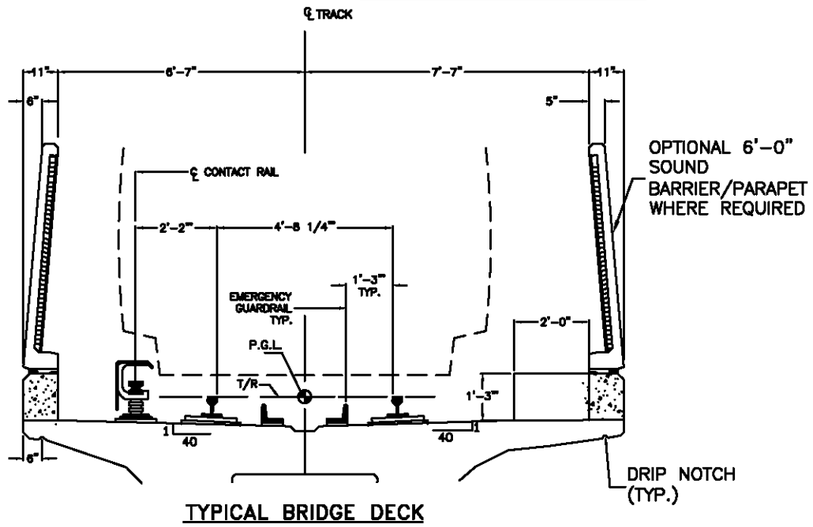
OPTION 1



CROSS SECTION
SINGLE TRACK STRUCTURE



DETAIL A
SCALE 1" = 1'-0"



TYPICAL BRIDGE DECK
W/ SHORT AND TALL PARAPETS FOR ACOUSTICAL BARRIER

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR DETAILS AT BEARINGS & PIER CAP SEE DWG. DD-S-91B.
4. FOR MORE NOTES, SEE DWG DD-S-139.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	MA	08-00 DATE
CHECKED	MA/EC	08-00 DATE
APPROVED	J. RUDOLF	08-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

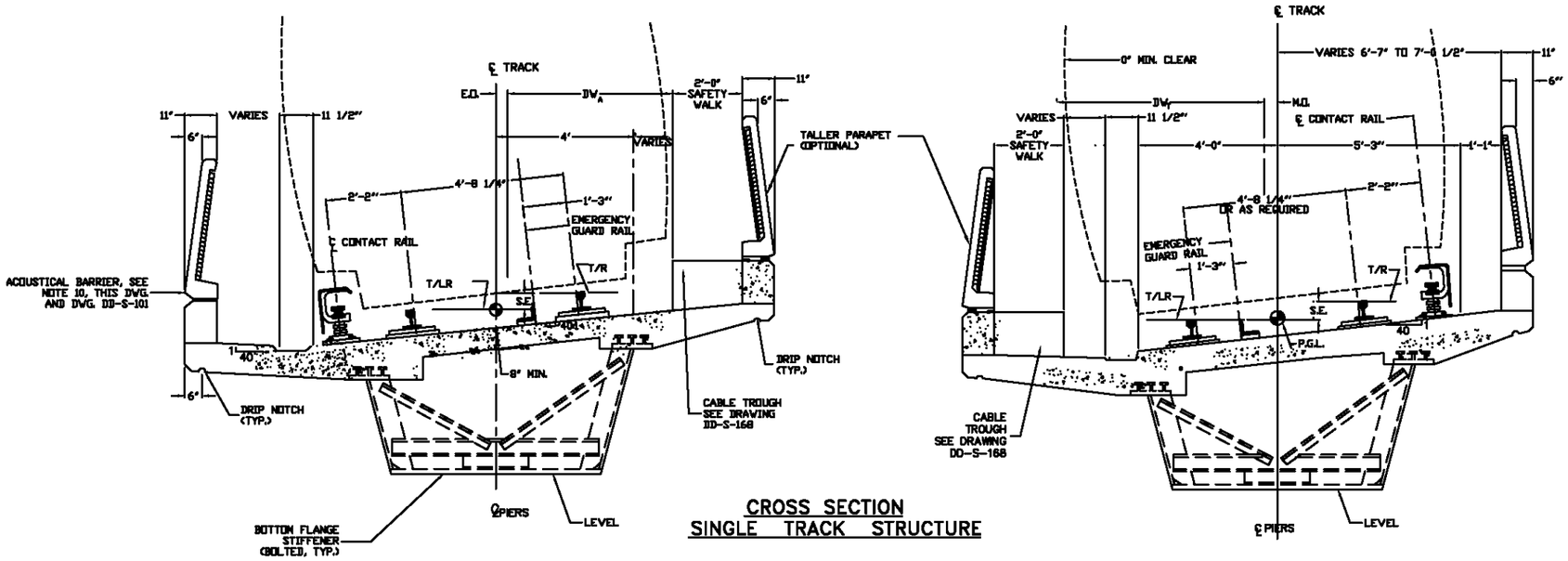
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

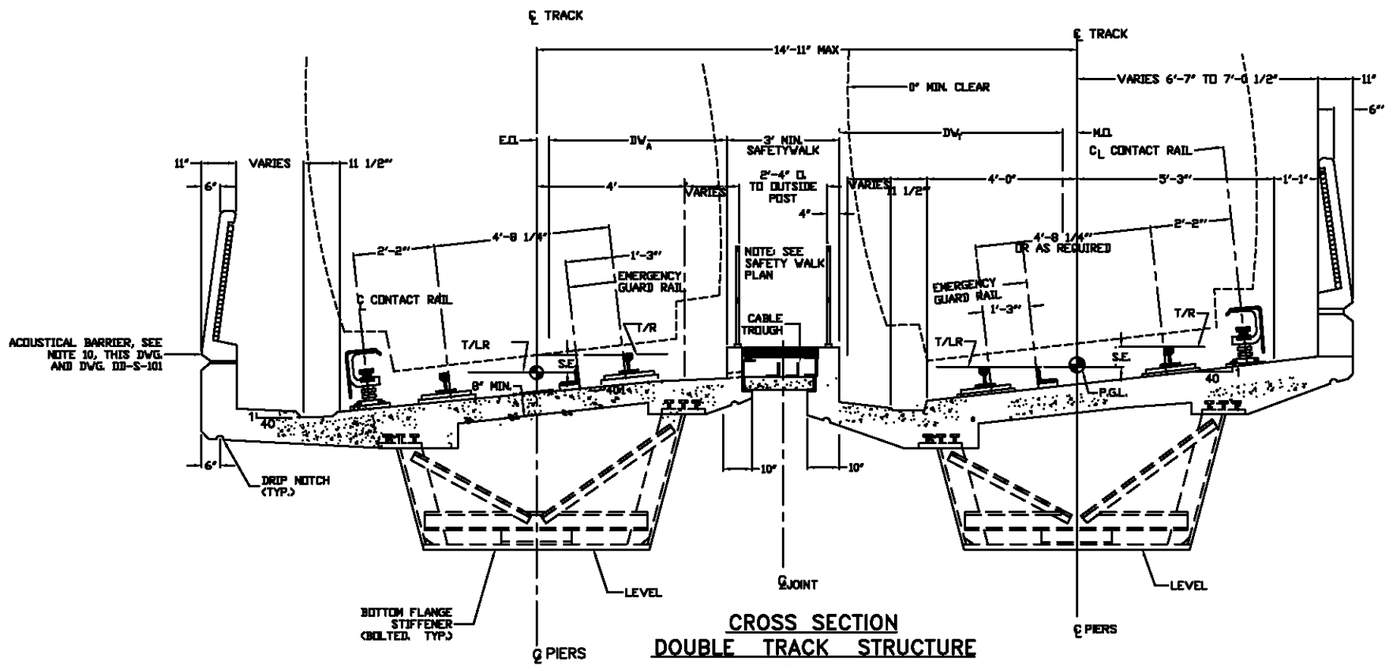
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SEGMENTAL OR CIP CONCRETE GIRDER SECTIONS & DETAILS

SCALE	DRAWING NO.
NOT TO SCALE	DD-S-091K



CROSS SECTION
SINGLE TRACK STRUCTURE



CROSS SECTION
DOUBLE TRACK STRUCTURE
OPTION 1

NOTES

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESSES AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
4. STEEL BOX GIRDER AND DECK ALIGNMENT ON CURVES, CURVATURE SHALL BE AS FOLLOWS:
   a. STEEL BOX GIRDER, CURVED OR CHORDED
   b. DECK, CURVED.
5. PIER COLUMNS SHALL BE CONCRETE, PIER CAPS STEEL.
6. FOR DW__ DIMENSIONS, REFER TO MANUAL OF DESIGN CRITERIA.
7. STEEL GIRDER AND PIER CAP TO BE PAINTED BROWN, FED. SPEC. NO. 20040
8. ACOUSTICAL BARRIER TO BE USED ONLY AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILINGS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
9. HANDRAILS POSTS SHALL BE INSTALLED IN A VERTICAL POSITION.
10. TRANSVERSE TOP REINFORCEMENT SHALL BE SPACED AT 7 1/2" ON CENTERS IN CONCRETE DECK TO PROVIDE SPACE FOR RAIL FASTENER ANCHOR BOLTS.
11. FOR SAFETY WALK PLAN, SEE DWG DD-S-90.
12. FOR CABLE TROUGH, SEE DWG. DD-S-139 AND DD-S-168.
13. FOR DETAILS OF INSPECTION ACCESS AND DRAINAGE PROVISIONS, SEE DWG. DD-S-128. BOX SIZE SHALL BE ADEQUATE FOR TRAVEL INSIDE THE BOX FOR INSPECTION.
14. S.E. MAX. 6 INCHES.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR OPTION 2, SEE DWG DD-S-190 & DD-S-248.

DESIGNED	J. RUDPLF	08-00 DATE
DRAWN	MA	08-00 DATE
CHECKED	MA/EC	08-00 DATE
APPROVED	J. RUDPLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

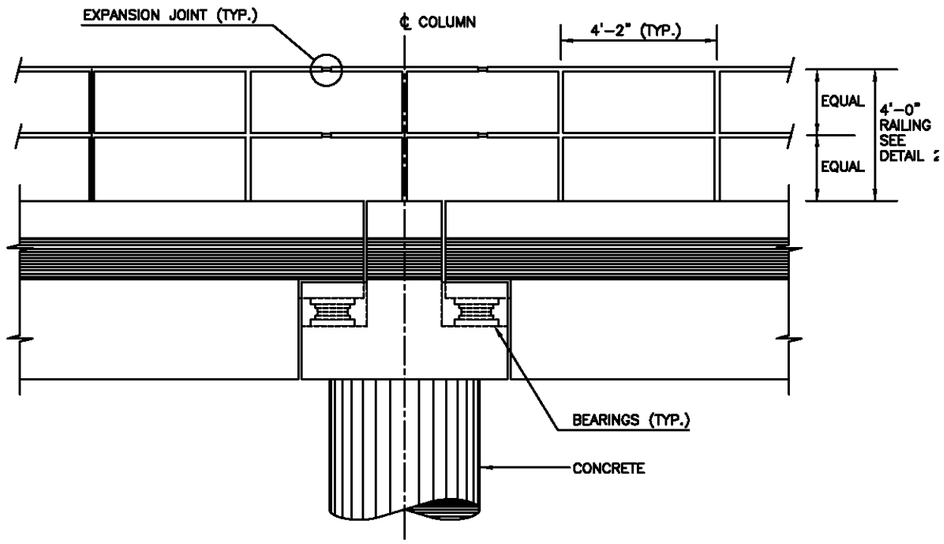
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

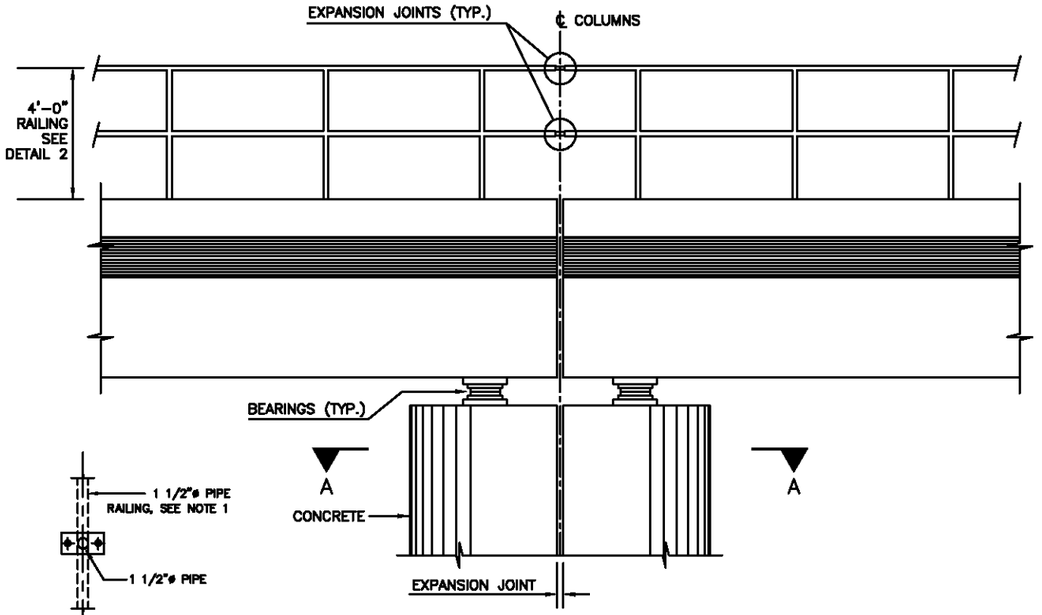
APPROVED _____ 5/2001 DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURES
NON-TILTED STEEL GIRDERS, COMPOSITE SECTION

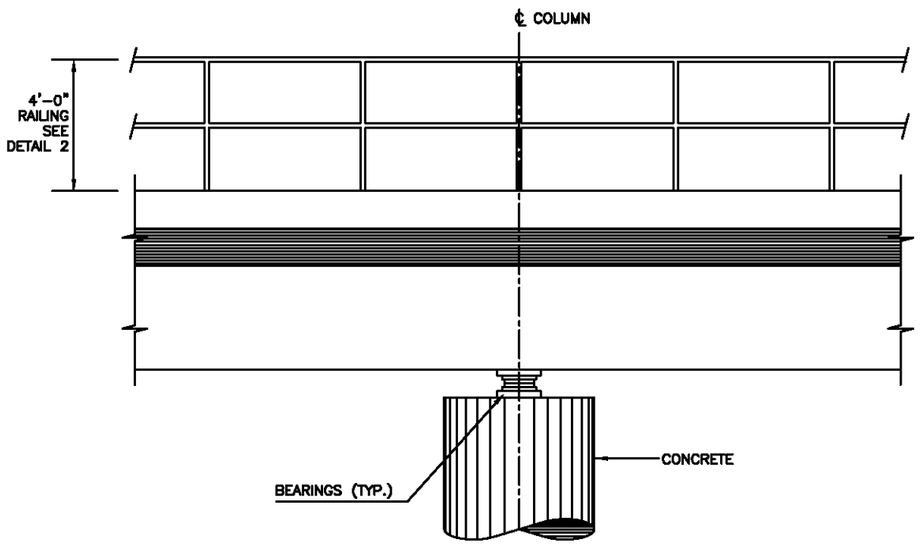
SCALE	DRAWING NO.
NOT TO SCALE	DD-S-092



PARTIAL ELEVATION, SIMPLE SPANS
SINGLE OR DOUBLE TRACK STRUCTURE



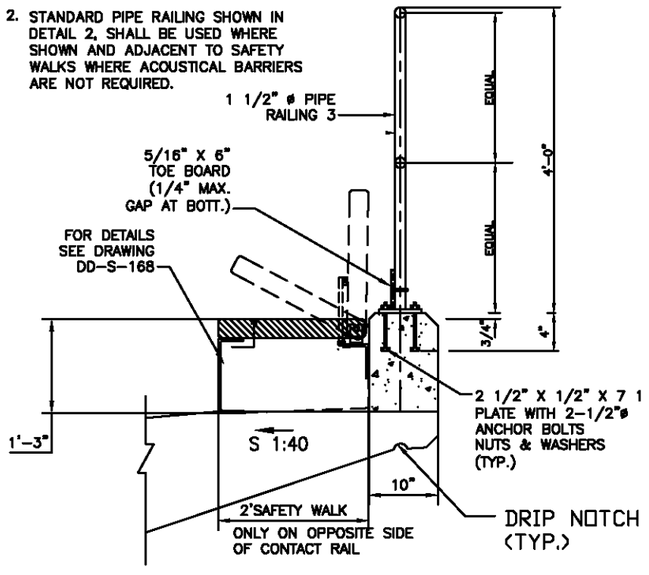
TYPICAL RAILING PLAN



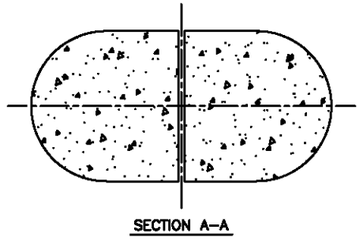
PARTIAL ELEVATION, CONTINUOUS SPANS
SINGLE OR DOUBLE TRACK STRUCTURE

RAILING NOTE:

1. PIPE RAILING (GALVANIZED):
   PIPE RAILINGS – SCHEDULE 40
   POST – SCHEDULE 80
   POST SPACING = 4'–2"±.
2. STANDARD PIPE RAILING SHOWN IN DETAIL 2, SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.



DETAIL 2
TYPICAL RAILING
SCALE 1"=1'–0"(SEE NOTE 2)



PARTIAL ELEVATION
SINGLE OR DOUBLE TRACK STRUCTURE

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	CHYTRY	06–71 DATE
DRAWN	RINALDI	06–71 DATE
CHECKED	A.R.	07–71 DATE
APPROVED	GEC(DCCO)	10–70 DATE
UPDATED	ENGA	08–00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

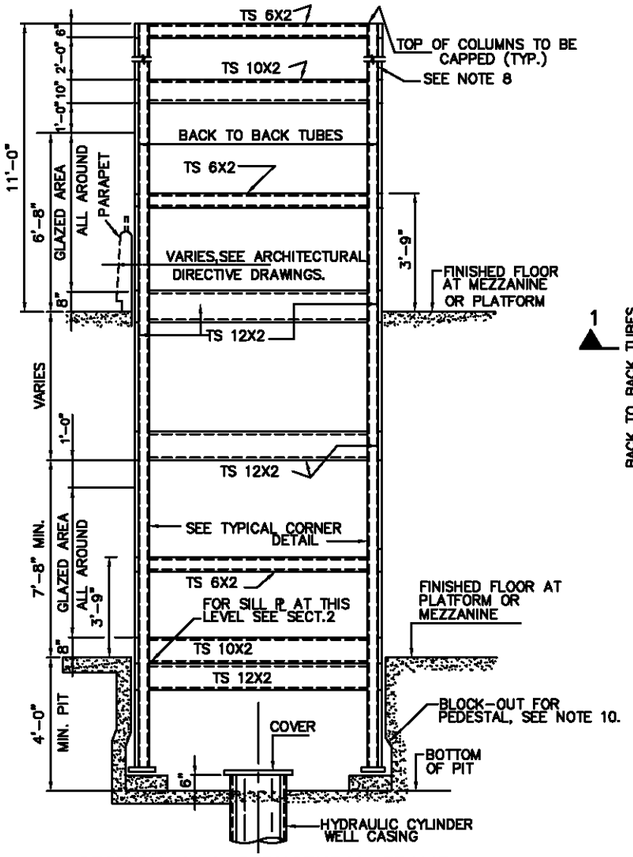
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
HANDRAIL & JOINTS

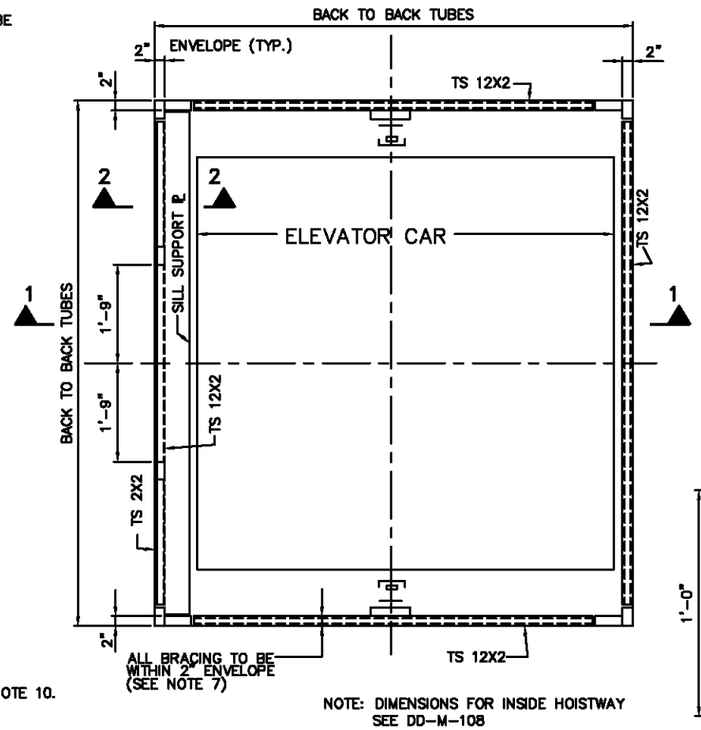
SCALE: NOT TO SCALE OR AS NOTED

DRAWING NO.: DD–S–093



SECTION 1–1 STRUCTURAL FRAME

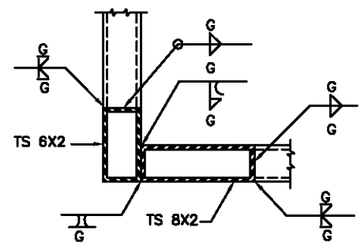
SCALE : 3/8"=1'–0"



NOTE: DIMENSIONS FOR INSIDE HOISTWAY SEE DD–M–108

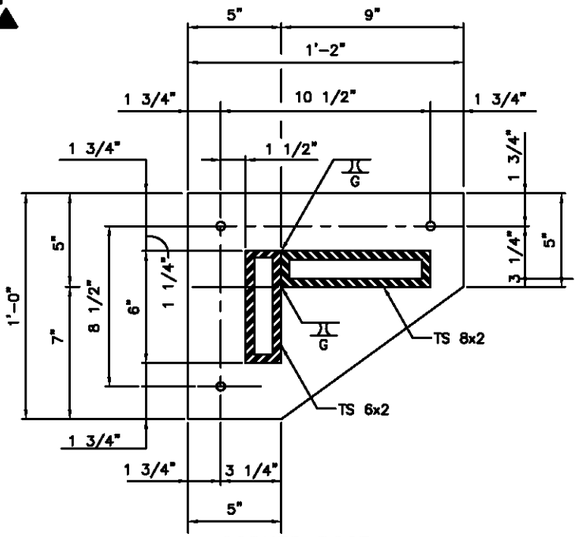
PLAN
MEZZANINE OR PLATFORM LEVEL

SCALE : 3/4"=1'–0"



CORNER DETAIL

SCALE : 3"=1'–0"

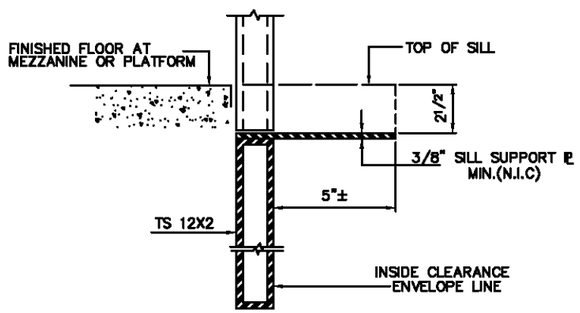


CORNER POST

SCALE : 3"=1'–0"

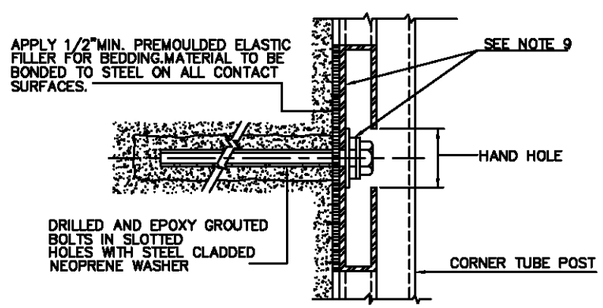
NOTES:

1. FIELD SPLICES–LOCATION AND DETAILS TO BE DETERMINED SO THAT FASTENERS OR PLATES DO NOT PROJECT OUTSIDE FACE OF THE CORNER TUBE OR ANGLE OR INSIDE THE 2" CLEARANCE ENVELOPE.
2. WHERE DIMENSIONS, DETAILS, SIZE OF PLATES, BOLTS OR SHAPES ARE SHOWN ON THIS DWG, THEY REPRESENT SPECIFIC REQUIREMENTS. WHERE DIMENSIONS, DETAILS, SIZE OF PLATES, BOLTS OR SHAPES ARE NOT SHOWN THEY ARE TO BE SIZED AND DETAILED AS REQUIRED BY THE DESIGN.
3. "ANCHORAGE TO CONCRETE DETAIL" IS APPLICABLE AT LOCATIONS WHERE STRUCTURAL FRAMING REQUIRES SUPPORT FOR TORSIONAL AND MOMENT RESTRAINT AND RELATED DEFORMATIONS.
4. HOISTWAYS LOCATED INSIDE OF STATION VAULTS AND MEZZANINE ENCLOSURES SHALL BE DESIGNED FOR HORIZONTAL UNIFORM LOAD OF 30 PSF FOR GLAZED AREAS AND 15 PSF FOR NON–GLAZED AREAS. HOISTWAY LOCATED DIRECTLY EXPOSED TO WIND LOAD SHALL BE DESIGNED FOR HORIZONTAL UNIFORM LOAD OF 40 PSF OVER ALL EXPOSED SURFACES. DEFORMATIONS OF STRUCTURAL FRAMES CONTAINING GLASS ARE TO BE DETERMINED SO AS NOT TO IMPACT THE INTEGRITY OF THE GLASS WITH SIZING OF THE JOINT DETAILS BEING DETERMINED ACCORDINGLY.
5. WELDING SYMBOLS SHOWN FOR HOISTWAY STRUCTURE ARE FOR GUIDANCE ONLY, WITHOUT DISTINGUISHING BETWEEN FIELD AND SHOP WELD. THE DESIGNER IS RESPONSIBLE FOR DETERMINING THE LIMITS OF SHOP WELD BASED UPON HIS EVALUATION OF LIMITATIONS IMPOSED BY SITE ACCESSIBILITY AND PROBABLE ERECTION SEQUENCE.
6. THE STRUCTURAL FRAME SHOWN ON THIS DRAWING IS SUBJECT TO CHANGE DUE TO ARCHITECTURAL/MECHANICAL REQUIREMENTS. THE MEMBERS AND MEMBER ARRANGEMENT SHOWN ARE TO BE CONSTRUED AS CONSTITUTING THE BASIC STRUCTURAL SYSTEM AND IT IS TO BE ANALYZED AS SUCH. CHANGES IN DIMENSIONS, SIZES OF MEMBERS OR ADDING OF NEW MEMBERS ARE TO BE CONSTRUED AS GIVING ADDITIONAL STIFFNESS AND STRENGTH TO THE STRUCTURAL FRAME SHOWN ON THIS DRAWING.
7. AT AERIAL STATIONS, IF NECESSARY, DIAGONAL BRACINGS MAY BE PROVIDED AT NON–GLAZED AREAS FOR THE ELEVATOR STRUCTURAL FRAMING.
8. SEE DWG. DD–A–EL–6 FOR HOISTWAY CONDITION UNDER CANOPY.
9. SIZING OF ELASTIC LAYER AND NEOPRENE AND SLOT IN STRUCTURAL TUBE TO BE DETERMINED SO AS TO PROVIDE FOR MOTIONS AND DEFORMATIONS OF STRUCTURAL FRAME, MEZZANINE AND/OR PLATFORM SUPPORTS.
10. BLOCK–OUT IS TO BE FILLED WITH CONCRETE AFTER HOISTWAY FRAME IS ERECTED.
11. FOR ARCHITECTURAL DETAILS SEE DWGS. DD–A–EL–4 AND DD–A–EL–8.
12. ALL STRUCTURAL STEEL CONNECTIONS IN THE PIT (BELOW PLATFORM OR MEZZANINE) SHALL BE OF STAINLESS STEEL. DESIGNER WILL PROVIDE NECESSARY CALCULATIONS/SPLICE DETAILS.



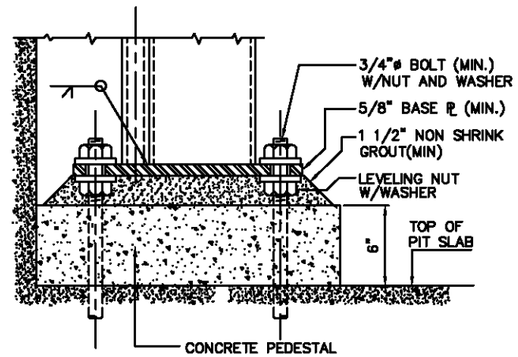
SECTION 2–2 (THRESHOLD)

SCALE: 3"=1'–0"



ANCHORAGE TO CONCRETE DETAIL

SCALE: 3"=1'–0"



CORNER POST BASE ELEVATION

NOT TO SCALE

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	ASAR	07–72 DATE
DRAWN	RINALDI	07–72 DATE
CHECKED	FRANKS	07–72 DATE
APPROVED	GEC(DCCO)	07–72 DATE
UPDATED	ENGA	08–00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

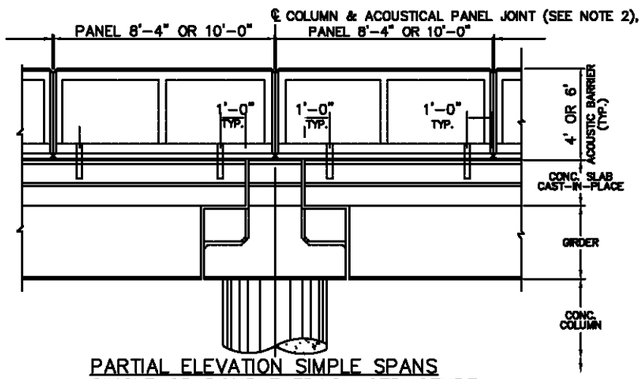
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

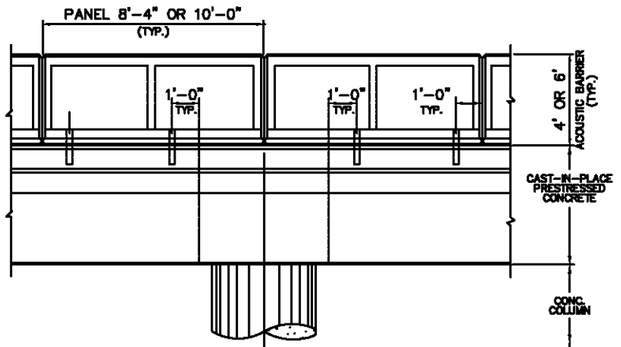
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
GLASS ELEVATOR–HYDRAULIC FRAMING DETAILS

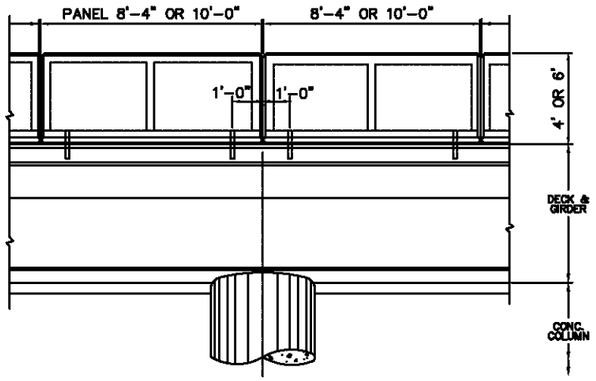
SCALE	DRAWING NO.
AS NOTED	DD–S–098



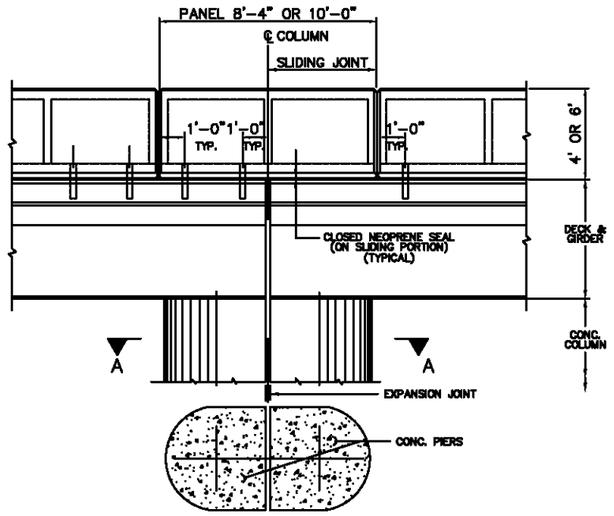
PARTIAL ELEVATION SIMPLE SPANS
SINGLE OR DOUBLE TRACK STRUCTURE
NOT TO SCALE



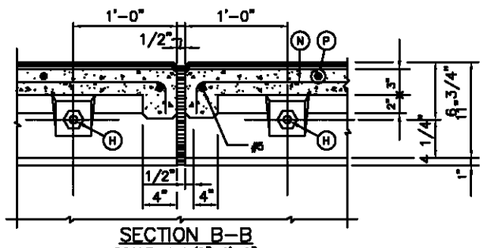
PARTIAL ELEVATION-CONTINUOUS SPANS
SINGLE OR DOUBLE TRACK STRUCTURE
NOT TO SCALE



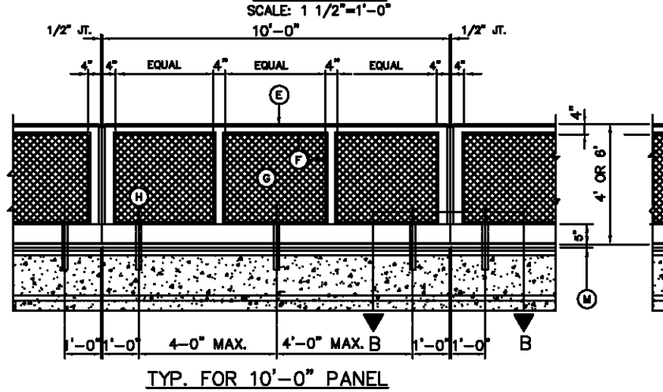
PARTIAL ELEVATION-FRAME SYSTEM
SINGLE TRACK TILTED STRUCTURE
NOT TO SCALE



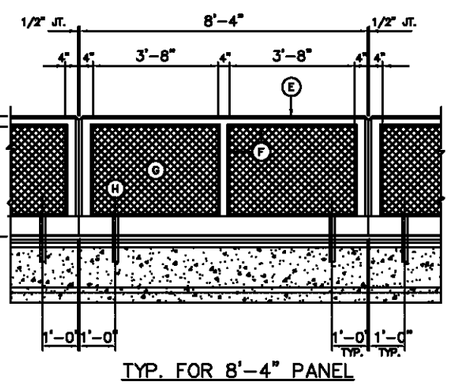
SECTION A-A
PARTIAL ELEVATION FRAME SYSTEM
SINGLE OR DOUBLE TRACK STRUCTURE
NOT TO SCALE



SECTION B-B
SCALE: 1 1/2"=1'-0"

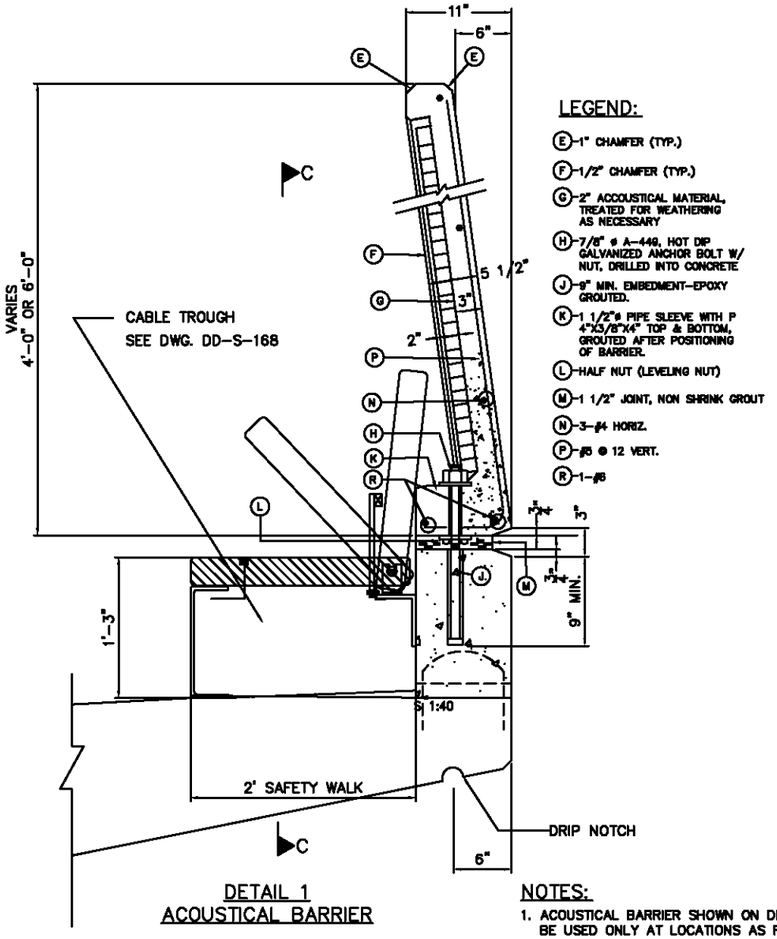


TYP. FOR 10'-0" PANEL



TYP. FOR 8'-4" PANEL

ELEVATION C-C
SCALE: 1/2"=1'-0"



DETAIL 1
ACOUSTICAL BARRIER

LEGEND:

- (E) 1" CHAMFER (TYP.)
- (F) 1/2" CHAMFER (TYP.)
- (G) 2" ACCOUSTICAL MATERIAL, TREATED FOR WEATHERING AS NECESSARY
- (H) 7/8" ø A-449, HOT DIP GALVANIZED ANCHOR BOLT W/ NUT, DRILLED INTO CONCRETE
- (J) 9" MIN. EMBEDMENT-EPOXY GROUTED.
- (K) 1 1/2"ø PIPE SLEEVE WITH P 4"X3/8"X4" TOP & BOTTOM, GROUTED AFTER POSITIONING OF BARRIER.
- (L) HALF NUT (LEVELING NUT)
- (M) 1 1/2" JOINT, NON SHRINK GROUT
- (N) 3-#4 HORIZ.
- (P) #5 @ 12 VERT.
- (R) 1-#8

NOTES:

1. ACOUSTICAL BARRIER SHOWN ON DETAIL 1, SHALL BE USED ONLY AT LOCATIONS AS REQUIRED. STAND PIPE RAILINGS SHOWN ON DETAIL 2, DD-S-93 SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
2. SPANS FOR AERIAL STRUCTURE SHALL, WHEREVER POSSIBLE, BE SO CHOSEN THAT AN ACOUSTICAL PANEL JOINT WILL COINCIDE WITH THE ℄ OF EACH COLUMN AS SHOWN, WHILE MAINTAINING THE STANDARD PANEL LENGTHS OF 8'-4" OR 10'-0" WHENEVER THIS BECOMES IMPRACTICABLE, AN ADJUSTMENT MAY BE MADE TO THE LAST SEGEMENT, AND A SLIDING JOINT, AS SHOWN ON THE PARTIAL ELEVATION FOR FRAME SYSTEM FOR SINGLE OR DOUBLE TRACK STRUCTURE SHALL BE USED. THE CENTER OF ACOUSTICAL PANEL SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE ℄ OF COLUMN.
3. FOR JOINT DETAILS, SEE DWG DD-S-120.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	CHYIRY	07-72 DATE
DRAWN	RINALDI	07-72 DATE
CHECKED	A.B.	08-72 DATE
APPROVED	GEC(DCCD)	08-72 DATE
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REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

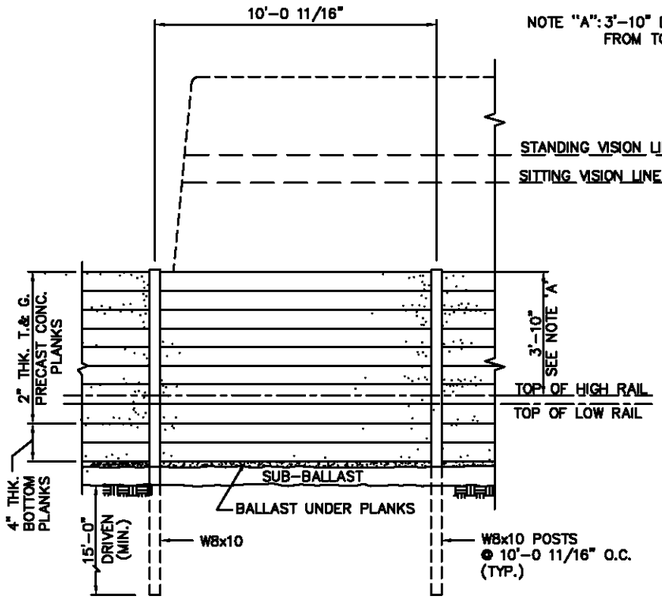
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
ELEVATIONS, SECTIONS AND DETAILS

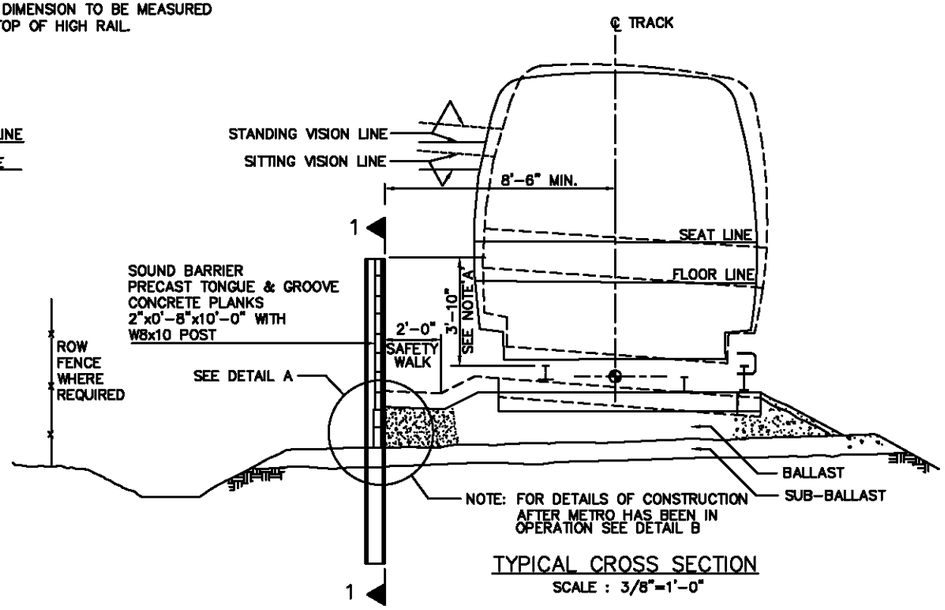
SCALE: NOT TO SCALE

DRAWING NO.: DD-S-101

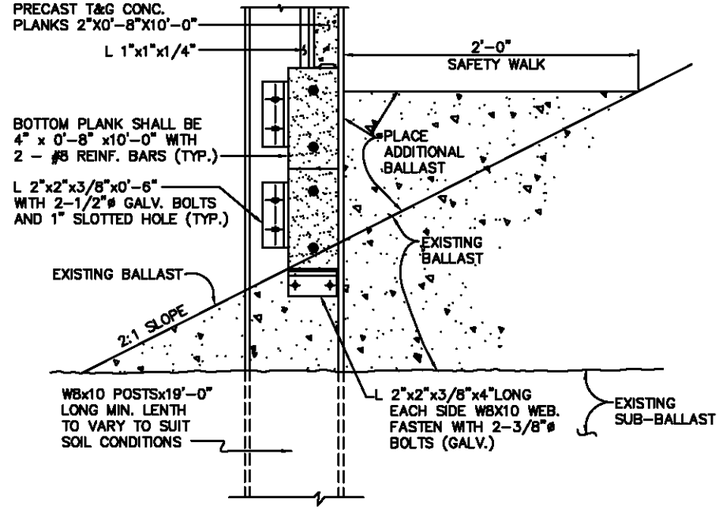


NOTE "A": 3'-10" DIMENSION TO BE MEASURED FROM TOP OF HIGH RAIL.

ELEVATION 1-1
(NOTE: CAR PROJECTED ONTO SECTION)
SCALE : 3/8"=1'-0"

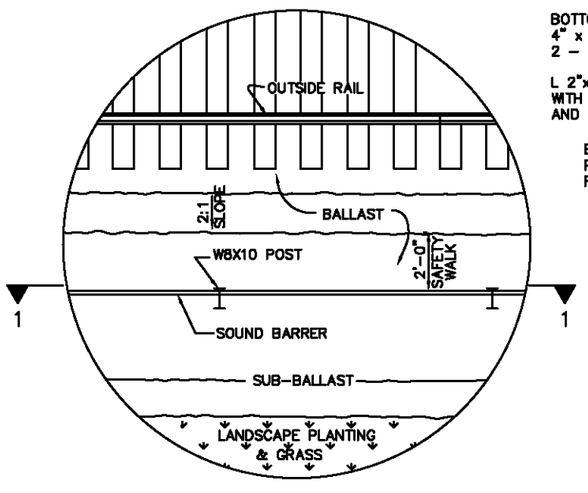


TYPICAL CROSS SECTION
SCALE : 3/8"=1'-0"

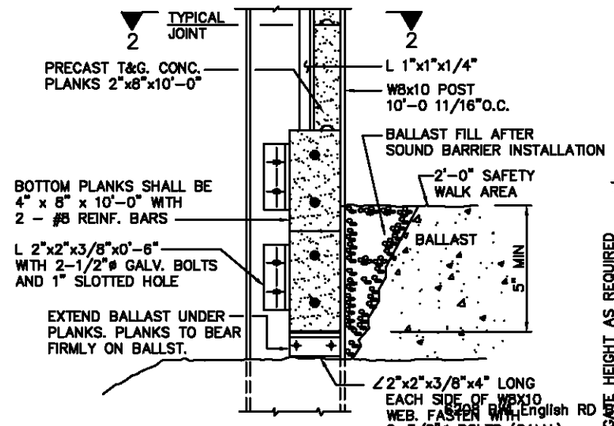


NOTE: FOR DETAILS AND DIMENSIONS NOT SHOWN SEE DETAIL A.

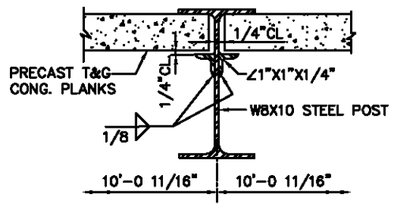
DETAIL B
SCALE :2"=1'-0"



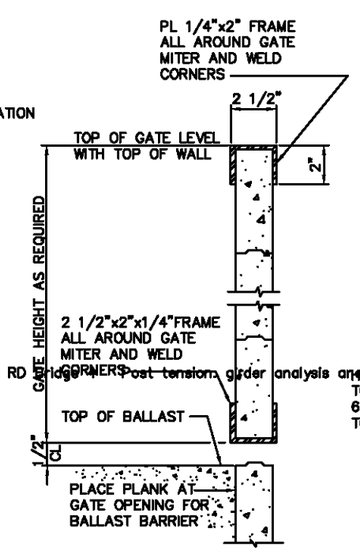
PLAN
SCALE : 3/8"=1'-0"



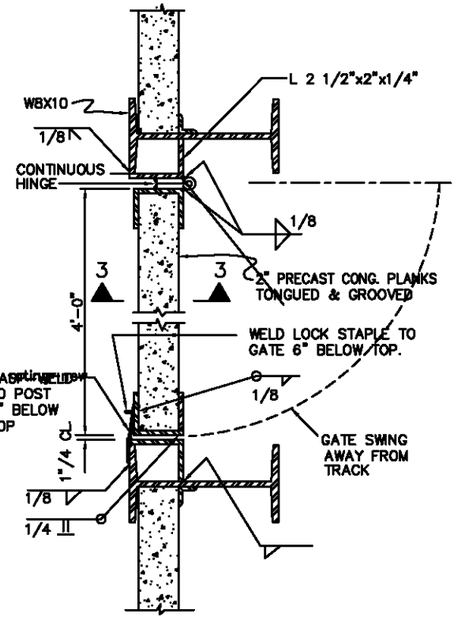
DETAIL A
SCALE : 2"=1'-0"



SECTION 2-2
SCALE :3"=1'-0"



SECTION 3-3
SCALE :3"=1'-0"



GATE DETAIL
SCALE: 3"=1'-0"

NOTE: GATES TO BE LOCATED AT EACH TRIP SWITCH. PROVIDE LOCK WITH KEYS.

NOTES:

1. ALL DETAILS ON THIS DRAWING EXCEPT DETAIL B ARE SHOWN FOR CONSTRUCTION PRIOR TO OPERATION OF METRO SYSTEM. HOWEVER, ALL OTHER DETAILS REQUIRED FOR CONSTRUCTION AFTER METRO HAS BEEN IN OPERATION ARE SIMILAR TO THOSE SHOWN.
2. CONCRETE FOR PRECAST PLANKS SHALL BE CLASS 3500 USING NORMAL WEIGHT AGGREGATE.
3. REINFORCING STEEL SHALL BE EPOXY COATED AND CONFORM TO ASTM A615, GRADE 60.
4. ALL STEEL SHALL CONFORM TO ASTM-A-36
5. TYPICAL 2" THICK CONCRETE PLANKS SHALL BE DESIGNED TO WITHSTAND LATERAL LOAD OF 30 PSF.
6. ALL STEEL TO BE HOT-DIPPED GALVANIZED.
7. PRECAUTIONS FOR GALVANIZING SHALL BE TAKEN IN ACCORDANCE WITH ASTM A-384.
8. W8x10 POSTS TO BE LENGTHENED WHERE REQUIRED BY SOIL CONDITIONS.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	ZAREWSKI	12-74 DATE
DRAWN	LUCAS	10-70 DATE
CHECKED		DATE
APPROVED	GEC(DCCO)	02-75 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

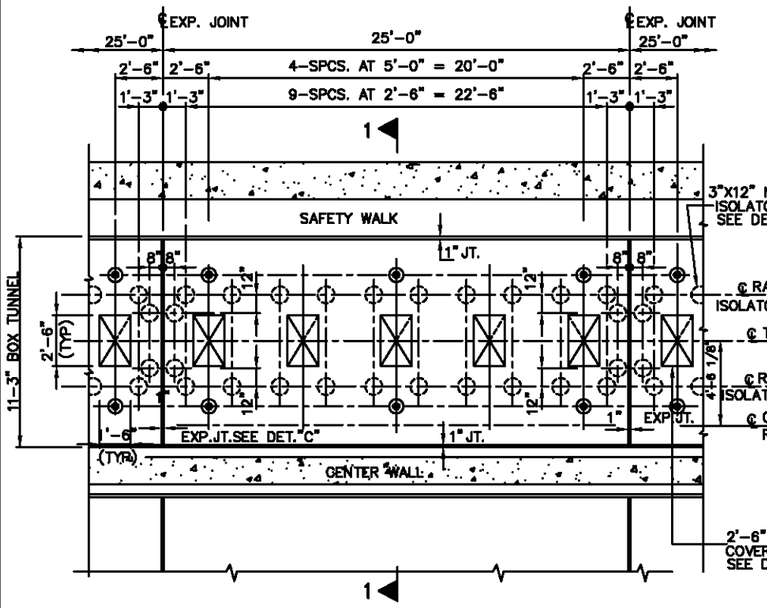
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

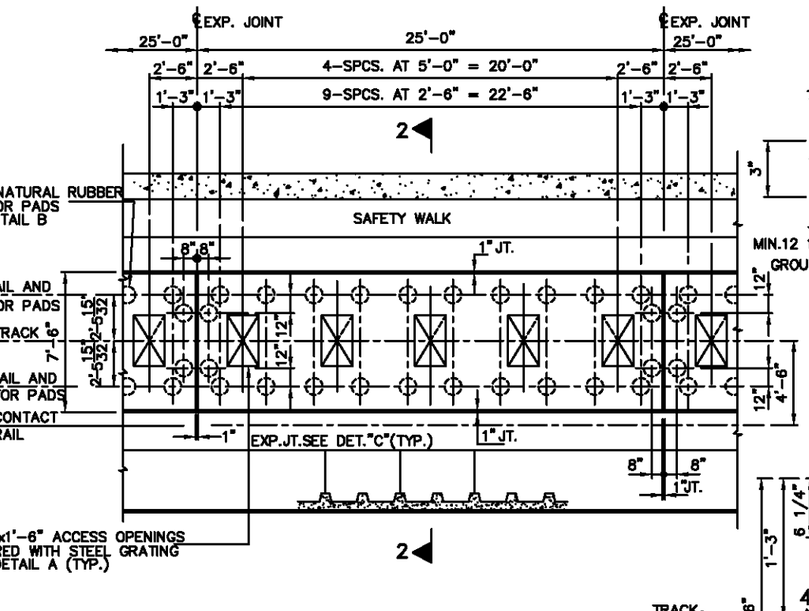
SOUND BARRIERS

SCALE: AS NOTED

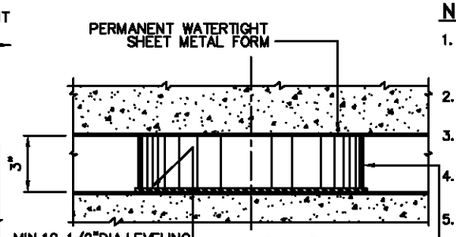
DRAWING NO.: DD-S-108



PLAN
TYPICAL LAYOUT FOR BOX
SCALE: 1/4"=1'-0"



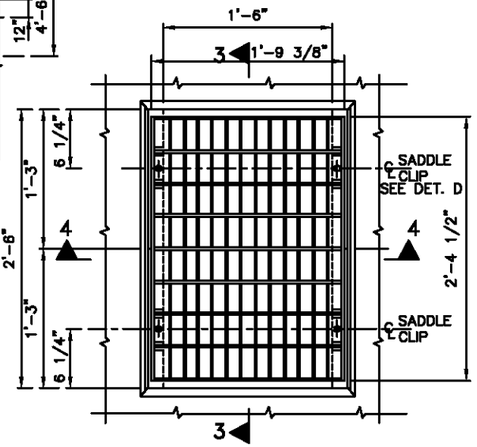
PLAN
TYPICAL LAYOUT FOR
CIRCULAR TUNNEL
SCALE: 1/4"=1'-0"



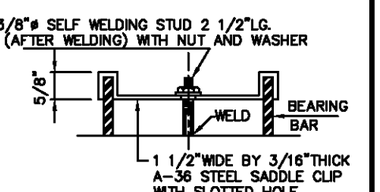
DETAIL B
TYPICAL ISOLATOR SHIMMING DETAIL
SCALE: 3"=1'-0"

NOTES:

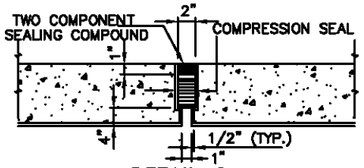
1. DIRECT FIXATION FASTENERS ARE TO BE LOCATED DIRECTLY ABOVE THE ISOLATOR PADS, UNLESS OTHERWISE NOTED.
2. LENGTH OF EACH CAST-IN-PLACE SEGMENT BETWEEN EXPANSION JOINTS NOT TO EXCEED 25 FT.
3. FOR LOCATION AND EXTENT OF FLOATING SLABS SEE GENERAL PLANS OR ACOUSTICAL REPORTS.
4. FLOATING SLAB IN STATIONS SHALL COMPLY WITH BOX TUNNEL PLAN AND SECTION THIS DRAWING.
5. STEEL GRATES AND THE SURFACES OF THE ASSOCIATED STEEL HARDWARE NOT EMBEDDED IN CONCRETE SHALL BE HOT DIP GALVANIZED.
6. THE DISTANCE BETWEEN ℄ OF RAILS AS SHOWN IS FOR TANGENT SECTION ONLY.
7. ◉ DENOTES 5"ø OPENINGS. LOCATE AS SHOWN, FOR LIFTING OF FLOATING SLABS. FOR ADDITIONAL REINFORCING AT THESE OPENINGS SEE NOTE 5 ON DWG. DD-S-119 (C-49).



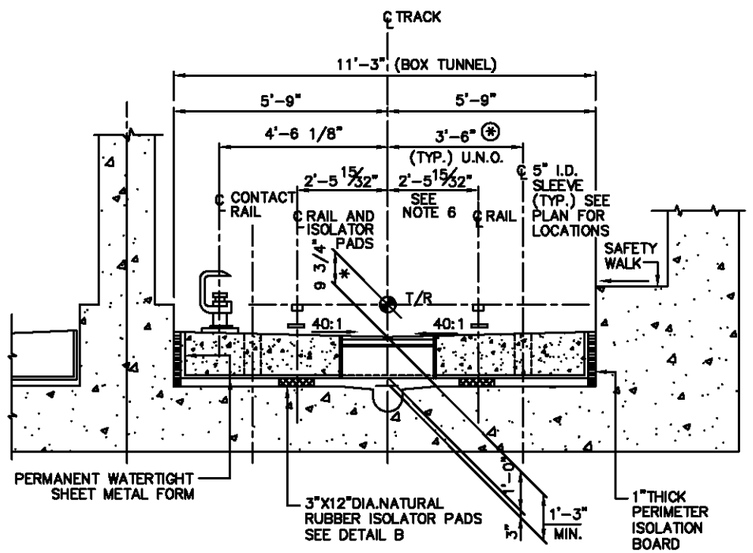
DETAIL A
SCALE:1 1/2"=1'-0"



DETAIL D
TYPICAL SADDLE CLIP DETAIL
NOT TO SCALE

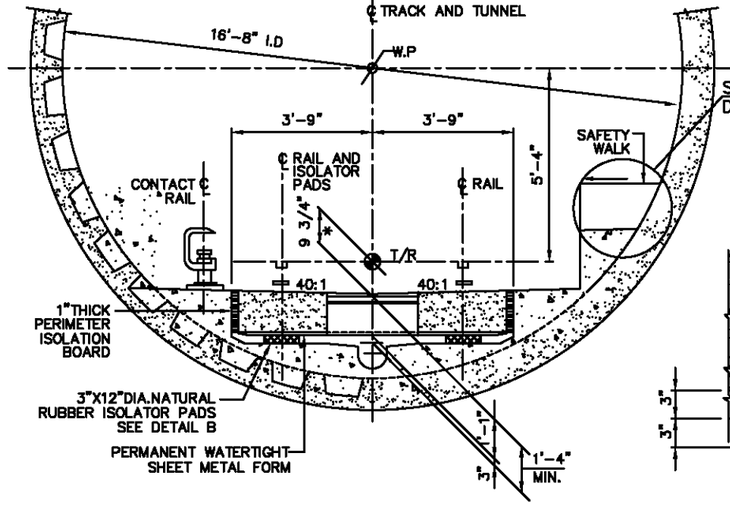


DETAIL C
FLOATING SLAB EXPANSION JOINT
NOT TO SCALE



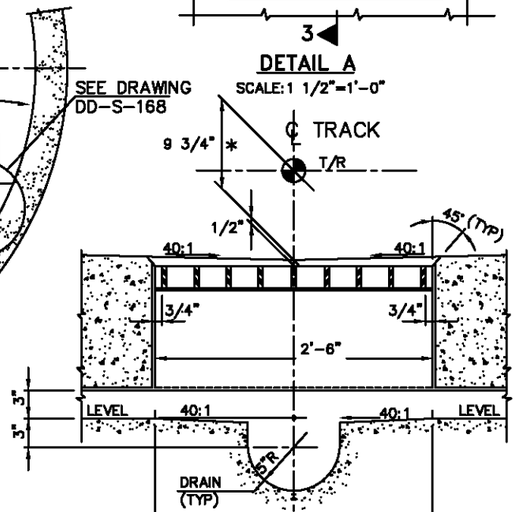
⊛ THE OPENING WITH SLEEVE MAY BE MOVED UP TO 3 1/2" TO CLEAR REBARS.

SECTION 1-1
SCALE: 1/2"=1'-0"

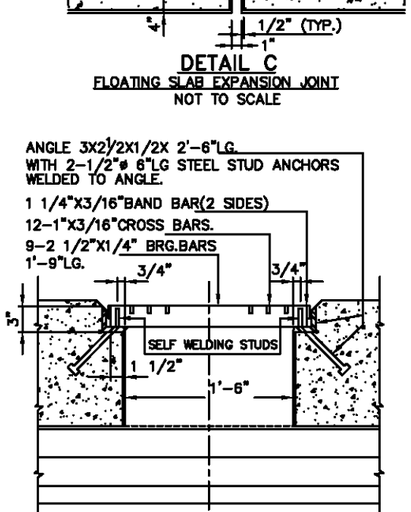


* 10 3/4" WMATA EGG SHAPE FASTENERS

SECTION 2-2
SCALE: 1/2"=1'-0"



SECTION 3-3
SCALE:1 1/2"=1'-0"



SECTION 4-4
SCALE:1 1/2"=1'-0"

DESIGNED	IRSHAD	06-83 DATE
DRAWN	RINALDI	02-77 DATE
CHECKED	GONCHAR	06-83 DATE
APPROVED	CEO(DCCO)	03-84 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

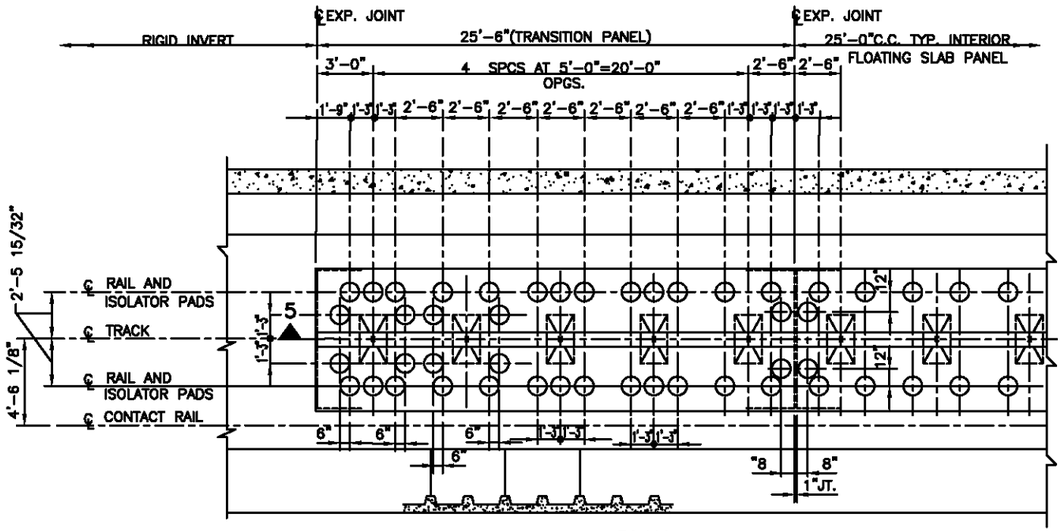
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

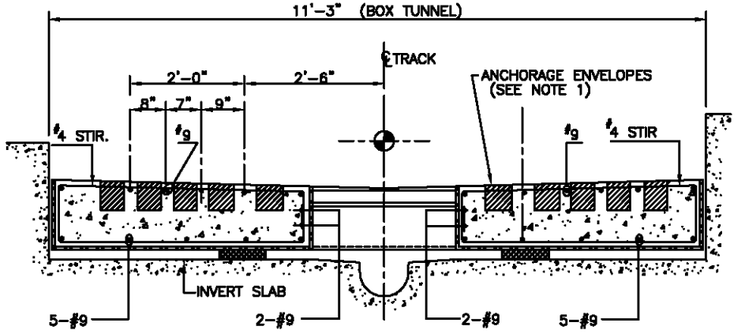
TYPE 2 FLOATING SLAB DETAILS - 1

SCALE	DRAWING NO.
1/4"=1'-0" 1 0 1 2 3 4 5 AND AS NOTED	DD-S-115



PLAN
ISOLATOR PAD LAYOUT FOR TRANSITION PANEL FOR CIRCULAR TUNNEL
(SIMILAR ARRANGEMENT REQUIRED FOR BOX)

SCALE: 1/4"=1'-0"



SECTION: 3
SCALE: 3/4"=1'-0"

NOTES

1- ALL REINFORCEMENT MUST CLEAR THE ANCHORAGE ENVELOPES SHOWN IN CROSS-SECTIONS AND IN PLAN VIEWS.
CLEARANCE OF ANCHORAGE ENVELOPES INDICATED ARE IN ACCORDANCE WITH DD-TW-01

2- ADDITIONAL CLEARANCES WILL BE REQUIRED FOR RESTRAINING RAIL ANCHORS ON CURVES HAVING RADII EQUAL TO OR LESS THAN 750 FEET. SECTION DESIGNER IS TO RE-ARRANGE THE REINFORCEMENT IN SUCH CASES WITH THE WMATA'S APPROVAL.

3- PROVIDE 2 INCH CONCRETE COVER TO ALL REINFORCEMENT INCLUDING STIRRUPS.

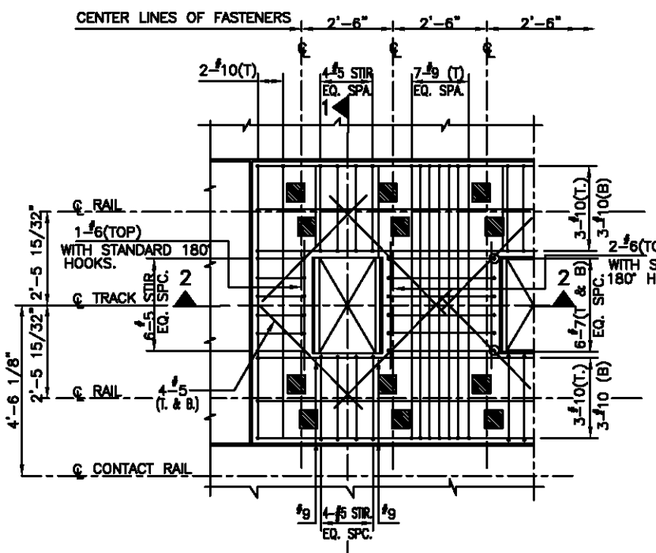
4- ALL FLOATING SLAB CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH (f'c) OF 3500 PSI AT 28 DAYS.

5- ALL REINFORCEMENT SHALL BE GRADE 60 STEEL.

6- REINFORCEMENT STEEL TO BE BONDED AS PER ST-S-7. SHEET METAL FORMS TO BE BONDED WITH 2-250 MCM COPPER CONDUCTORS ACROSS EXPANSION JOINTS.

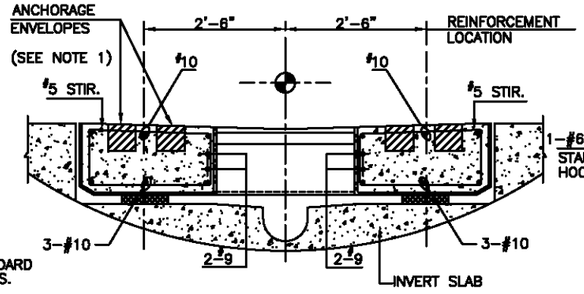
7- SHEET METAL FORMS SHALL BE HOT DIP GALVANIZED AND THEIR EXPOSED SURFACES SHALL BE COATED WITH COAL-TAR EPOXY AS SPECIFIED.

8- THE DISTANCE BETWEEN ℄ OF RAILS AS SHOWN IS FOR TANGENT SECTION ONLY.

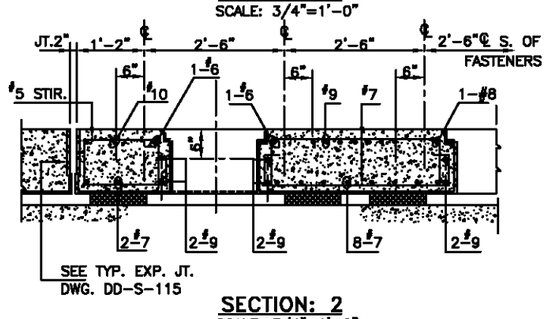


1

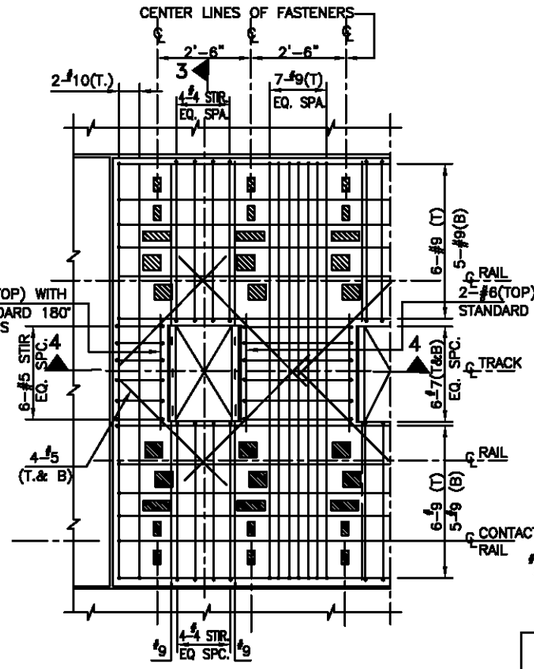
PARTIAL PLAN
TYPICAL FLOATING SLAB REINFORCEMENT FOR CIRCULAR TUNNEL
SCALE: 1/2"=1'-0"



SECTION: 1
SCALE: 3/4"=1'-0"

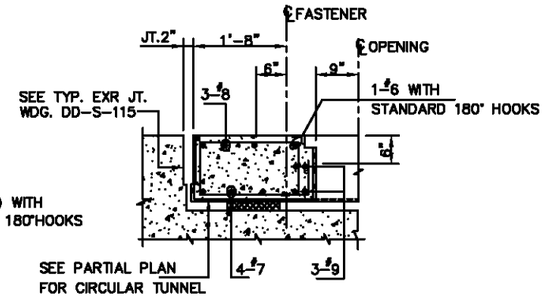


SECTION: 2
SCALE: 3/4"=1'-0"



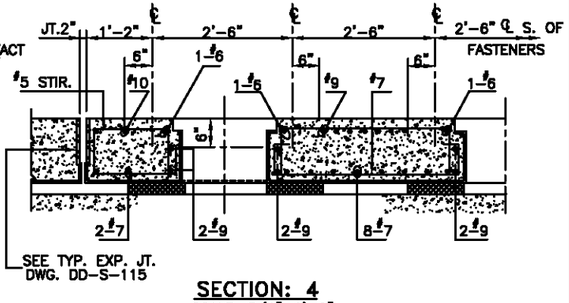
PARTIAL PLAN
TYPICAL FLOATING SLAB REINFORCEMENT FOR BOX TUNNEL
SCALE: 1/2"=1'-0"

LEGEND :-
- ANCHORAGE ENVELOPE
- ISOLATOR PAD



TYPICAL FOR ALL TRANSITION PANELS

SECTION: '5'
SCALE: 3/4"=1'-0"



SECTION: 4
SCALE: 3/4"=1'-0"

DESIGNED	IRSHAD	6-83 DATE
DRAWN	RINALDI	6-83 DATE
CHECKED	GONCHAR	6-83 DATE
APPROVED	GEC(DCCO)	3-84 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-115	TYPE-2 FLOATING SLAB DETAILS-1
DD-S-117	TYPE-2 FLOATING SLAB DETAILS-3
DD-S-118	TYPE-1 AND TYPE-2 FLOATING SLAB DETAILS.
DD-T-1	TRACK FASTENED TO CONC. TRACK BED.
ST-S-7	ELECTRICAL BONDING OF REINFORCING STEEL.

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

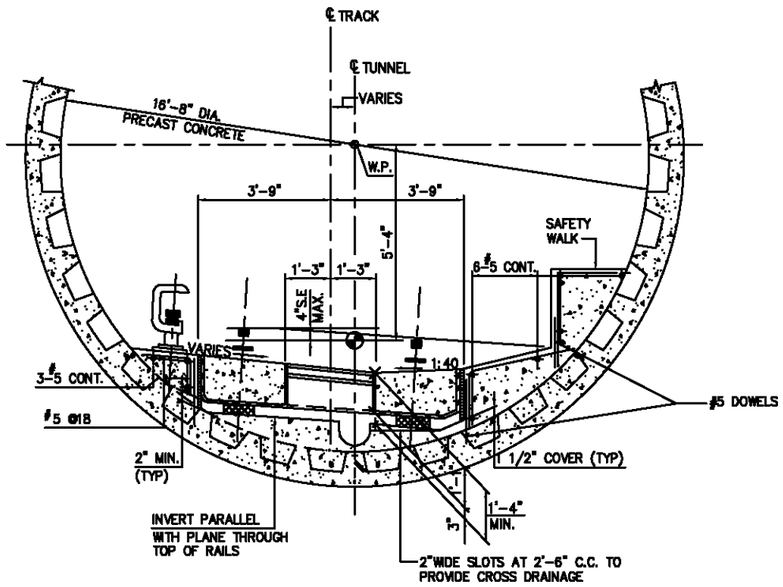
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

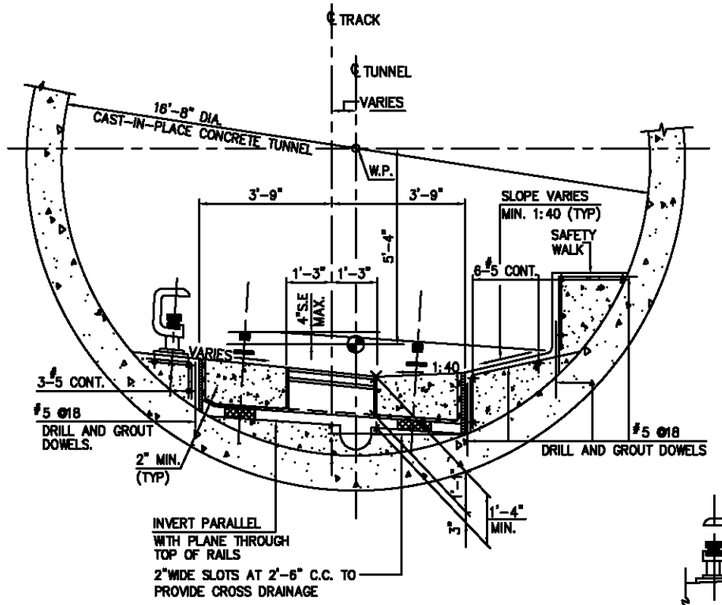
STRUCTURAL DESIGN DRAWING
TYPE 2 FLOATING SLAB DETAILS - 2

SCALE 1/4"=1'-0" 1 0 1 2 3 4 5 AND AS NOTED

DRAWING NO. DD-S-116



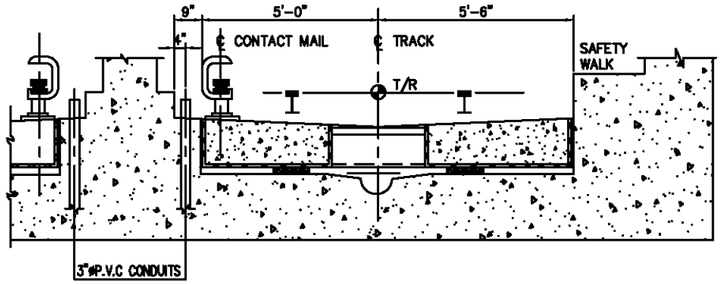
TYPICAL SUPERELEVATED SECTION FOR PRECAST CONCRETE CIRCULAR TUNNEL



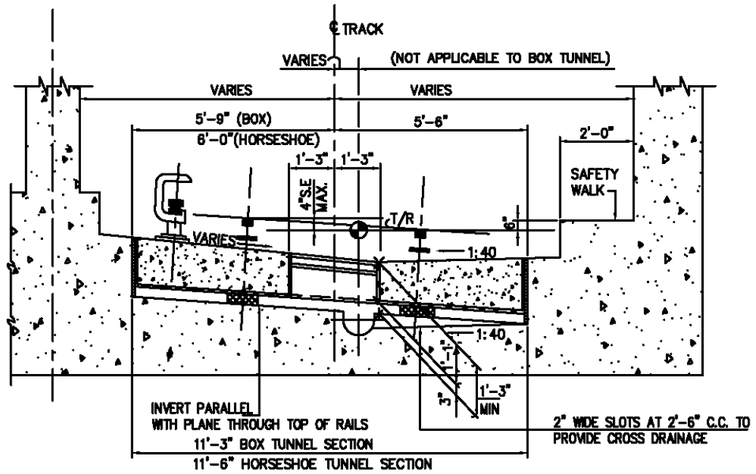
TYPICAL SUPERELEVATED SECTION FOR CAST-IN-PLACE CONCRETE CIRCULAR TUNNEL

NOTES:

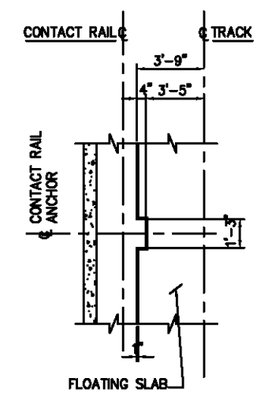
1. REINFORCEMENT DETAILS FOR SUPERELEVATED FLOATING SLABS ARE SIMILAR TO THOSE SHOWN FOR TANGENT SLABS ON DRAWING DD-S-116. ALL REINFORCEMENT SHALL BE PARALLEL TO CONCRETE FACES WITH 2 INCH COVER.
2. SUPERELEVATED SECTIONS SHOWN REPRESENT THE MAXIMUM CASE, SIMILAR DETAILS APPLY FOR SMALLER VALUES OF SUPERELEVATION.
3. THE LOCATIONS OF CONTACT RAIL, ANCHOR BLOCK-OUT AND THE CONDUIT STUB UPS SHALL BE COORDINATED WITH WMATA.
4. ◉ DENOTES 5"ø OPENINGS. LOCATE AS SHOWN, FOR LIFTING OF FLOATING SLABS. FOR ADDITIONAL REINFORCING AT THESE OPENINGS SEE NOTE 5 ON DWG. DD-S-119 (C-49).



SECTION I
SCALE: 1/2"=1'-0"



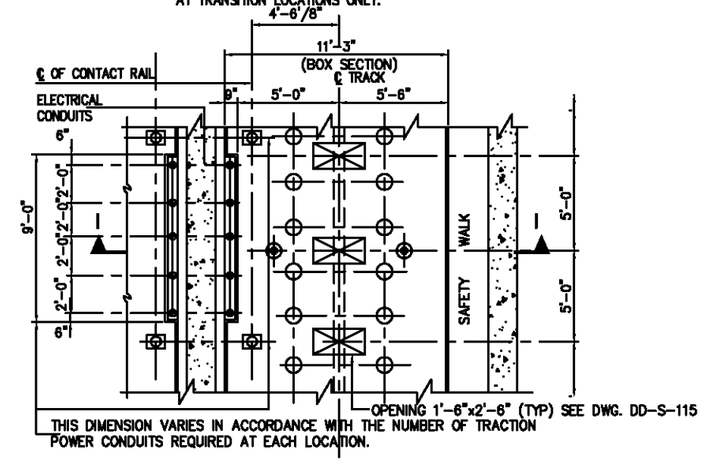
TYPICAL SUPERELEVATED SECTION FOR BOX OR HORSESHOE TUNNEL



PLAN

TYPICAL CONTACT-RAIL ANCHOR AREA DETAIL REQUIRED IN CIRCULAR TUNNEL ONLY
SCALE: 1/4"=1'-0"

NOTE: SAME ARRANGEMENT FOR BOTH SIDES OF DOUBLE BOX AT TRANSITION LOCATIONS ONLY.



FLOATING SLAB AT TRACTION POWER CONDUIT LOCATIONS
SCALE: 1/4"=1'-0"

DESIGNED	IRSHAD	6-83 DATE
DRAWN	RINALDI	6-83 DATE
CHECKED	GONCHAR	6-83 DATE
APPROVED	GEC(DCCO)	3-84 DATE
UPDATED	ENGA	06-00 DATE

REFERENCE DRAWINGS		REVISIONS		
NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
DD-S-115	TYPE-2 FLOATING SLAB DETAILS-1.	06/2001	ENGA	Revised and Issued by the Authority
DD-S-116	TYPE-2 FLOATING SLAB DETAILS-2.			
DD-S-118	TYPE-1 AND TYPE-2 FLOATING SLAB DETAILS.			
DD-T-1	TRACK FASTENED TO CONC. TRACK BED.			
DD-S-119	FLOATING SLAB MANHOLE DETAILS.			

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

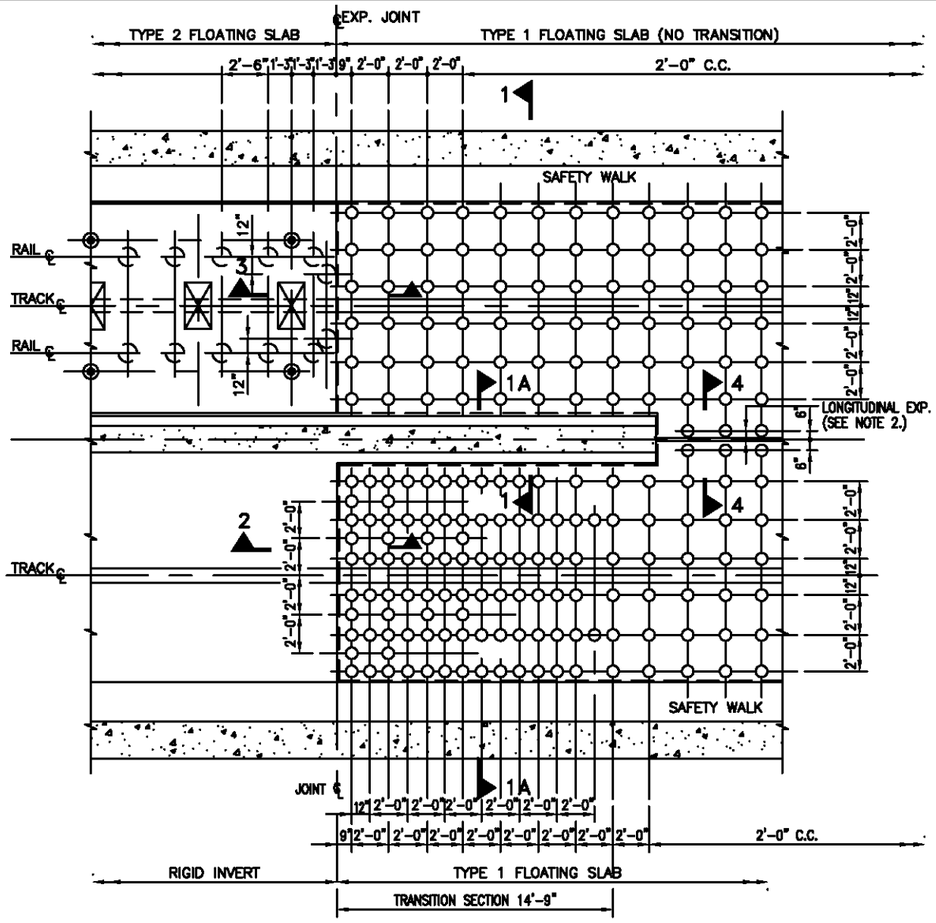
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

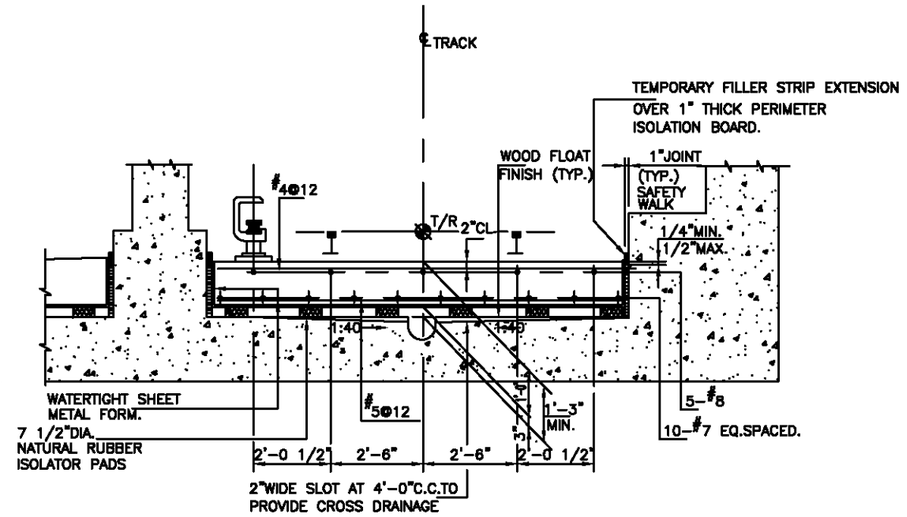
TYPE 2 FLOATING SLAB DETAILS - 3

SCALE 1/2"=1'-0" 6" 0 1 AND AS NOTED

DRAWING NO. DD-S-117



PAD LAYOUT FOR SPECIAL TRACKWORK FLOATING SLAB ABUTTING TYPE-2 FLOATING SLAB OR RIGID INVERT



SECTION: '1'

SECTION 1A SIMILAR EXCEPT FOR PAD LAYOUT

SCALE: 1/2"=1'-0"

NOTES :

FLOATING SLAB

1. TYPE-1 SPECIAL TRACK WORK FLOATING SLAB AT CROSSOVER

   TYPE-2 FLOATING SLAB AT CUT AND COVER BOX TUNNEL AND/OR BORED TUNNEL

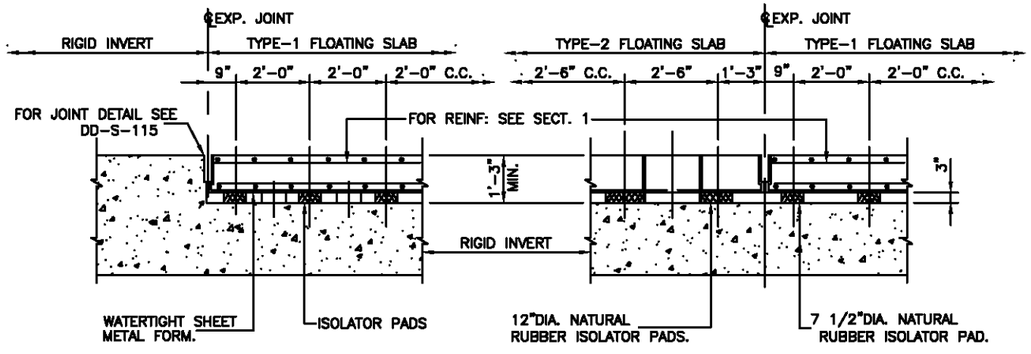
2. ISOLATOR PADS FOR TYPE-1 FLOATING SLAB SHALL BE 7 1/2 INCH DIAMETER BY 3 INCH THICK OVERALL AND SHALL BE MADE OF NATURAL RUBBER WITH BONDED STEEL PLATES 3/16 INCH THICK TOP AND BOTTOM.

3. FOR REINFORCEMENT DETAILS AT SWITCH ROD TROUGH LOCATIONS SEE DESIGN DRAWING DD-S-69.

4. FOR ALL SPECIAL TRACKWORK LOCATIONS PAD LAYOUT SHALL BE SYMMETRICAL WITH RESPECT TO THE CENTER LINE OF THE MAIN TRACK.

5. CONSTRUCTION SEQUENCE SHALL INCLUDE THE FOLLOWING STEPS:
   a-CLEAN INVERT DEPRESSION OF ALL DEBRIS.
   b-USING SPECIFIED ADHESIVE, BOND PERIMETER BOARDING TO CONCRETE INVERT DEPRESSION WALLS.
   c-CHECK TO SEE IF ANY PADS REQUIRE ELASTOMERIC SHIMS. ADHERE SHIMS OR PADS TO THE CONCRETE INVERT. (WHERE SHIMS ARE USED THEY ARE TO BE ADHERED TO THE RUBBER ISOLATOR AND TO EACH OTHER)
   d-PLACE SHEET METAL FORM SECTIONS ON ISOLATOR PADS, AND WATERPROOF THE FORM.
   e-ADHERE PERIMETER ISOLATION BOARDING TO THE SIDES OF THE SHEET METAL FORM.
   f-PLACE AND ELECTRICALLY BOND REBARS, PLACE TEMP-ORARY FILLER STRIP EXTENSION TO PERIMETER BOARDING
   g-PLACE AND ADHERE TRANSVERSE COMPRESSION SEALS AND THE ASSOCIATED FILLER STRIP EXTENSION.
   h-PLACE REBARS, POUR CONCRETE AND CURE.
   k-REMOVE TEMPORARY FILLER STRIPS, SEAL JOINTS AND CAULK ELECTRIC CONDUIT PENETRATION.

6. ◉ DENOTES 5"ø OPENINGS. LOCATE AS SHOWN, FOR LIFTING OF FLOATING SLABS. FOR ADDITIONAL REINFORCING AT THESE OPENINGS SEE NOTE 5 ON DWG. DD-S-119 (C-49).

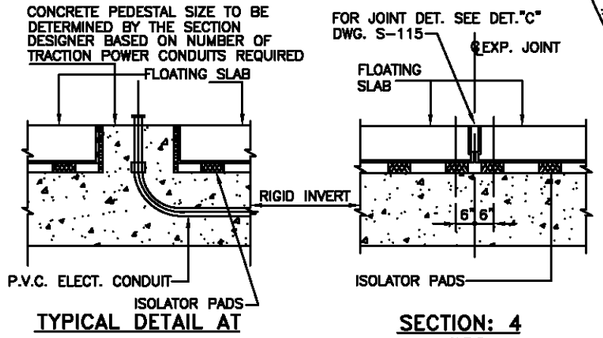


SECTION: 2

SCALE: 1/2"=1'-0"

SECTION: 3

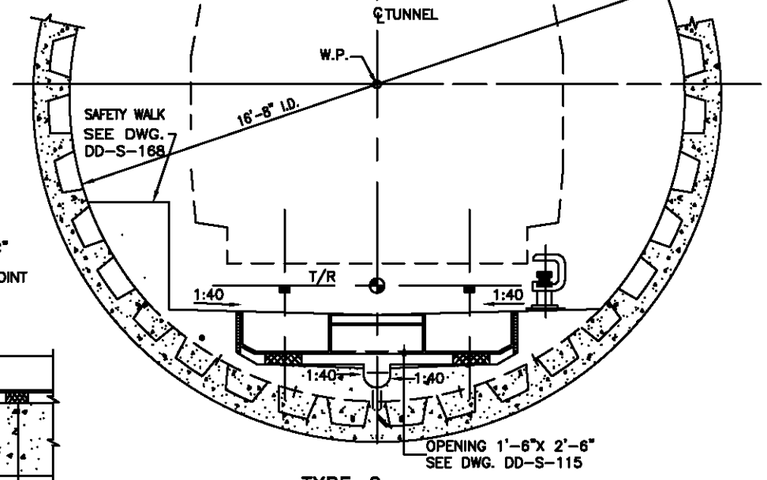
SCALE: 1/2"=1'-0"



TYPICAL DETAIL AT CONDUIT PEDESTAL

SECTION: 4

N.T.S.



TYPE-2 CIRCULAR TUNNEL,TYPICAL SECTION AT SUBSTATION AND TIE BREAKER STATION

SCALE: 3/8"=1'-0"

DESIGNED	IRSHAD	6-83 DATE
DRAWN	RINALDI	6-83 DATE
CHECKED	GONCHAR	6-83 DATE
APPROVED	DEC(DCCO)	3-84 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-T-16	TYPE 1 SPECIAL TRACKWORK FLOATING SLAB
DD-T-1	TRACK FASTENED TO CONC. TRACK BED.
DD-M-40	MISCELLANEOUS DRAINAGE DETAILS.
DD-S-69	TYP. DET. NO.10 & NO.8 SWITCH ROD TROUGH
ST-M-91	DRAINAGE DETAILS FOR FLOATING SLAB.
ST-S-7	ELECT. BONDING OF REINF. STEEL

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

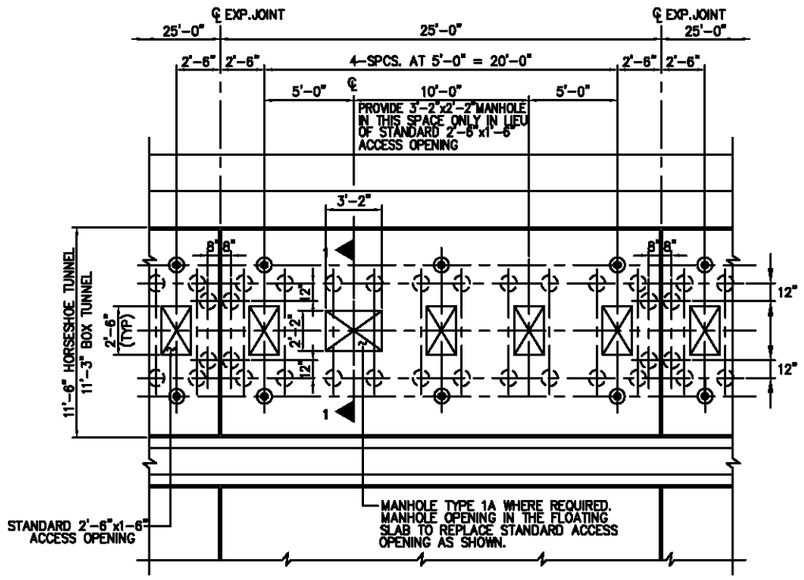
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

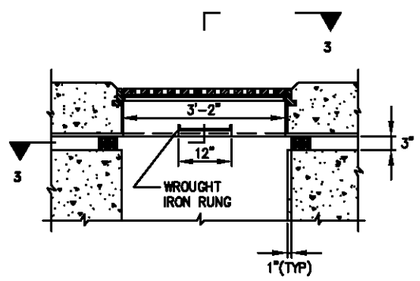
STRUCTURAL DESIGN DRAWING
TYPE 1 AND TYPE 2 FLOATING SLAB DETAILS

SCALE 1/4"-1'-0" 2 0 2 4 6 AND AS NOTED

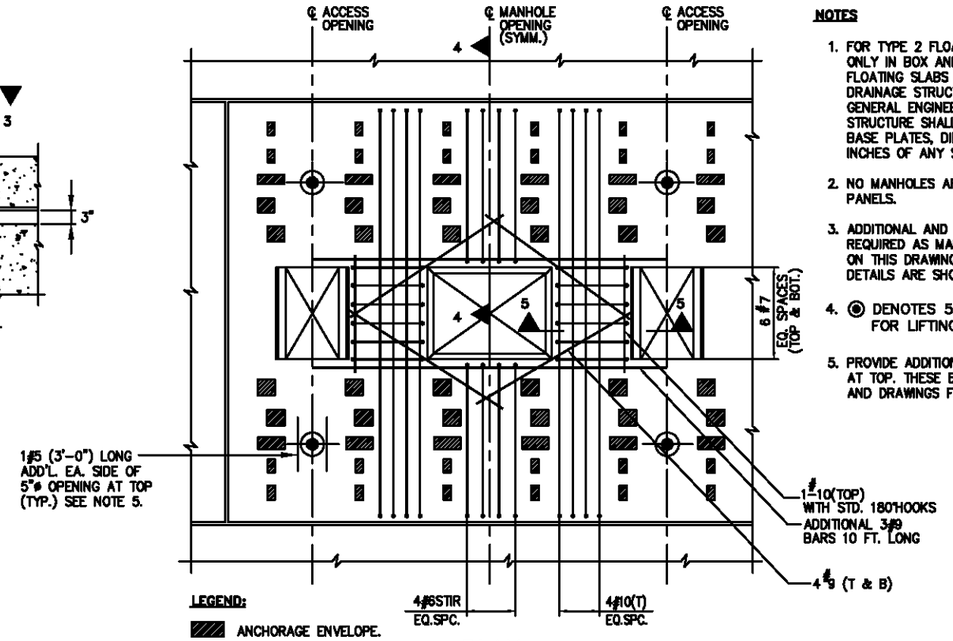
DRAWING NO. DD-S-118



PLAN
MANHOLE LOCATION IN BOX OR HORSESHOE TUNNEL
SCALE: 1/4"=1'-0"



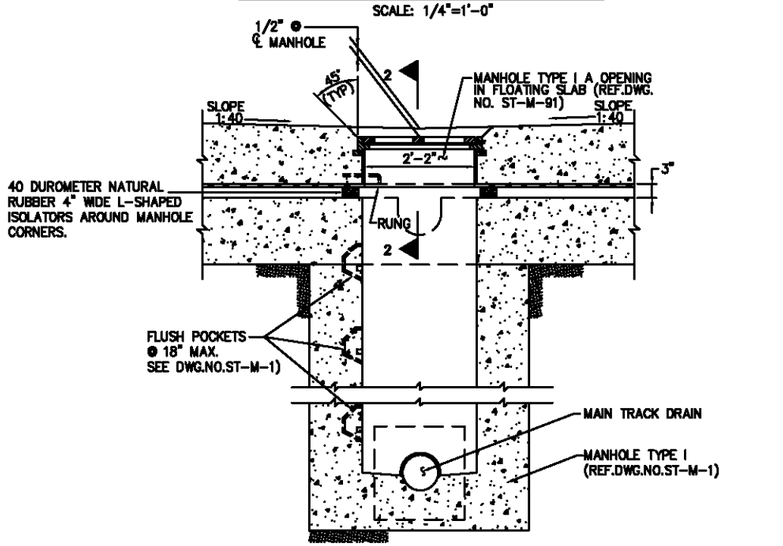
SECTION 2
SCALE: 3/4"=1'-0"



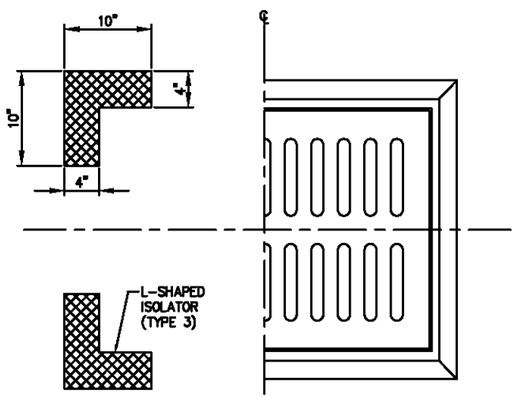
PLAN
TYPICAL MANHOLE OPENING REINFORCEMENT DETAIL
(READ IN CONJUCTION WITH PARTIAL PLAN DD-S-116)
SCALE: 1/2"=1'-0"

NOTES

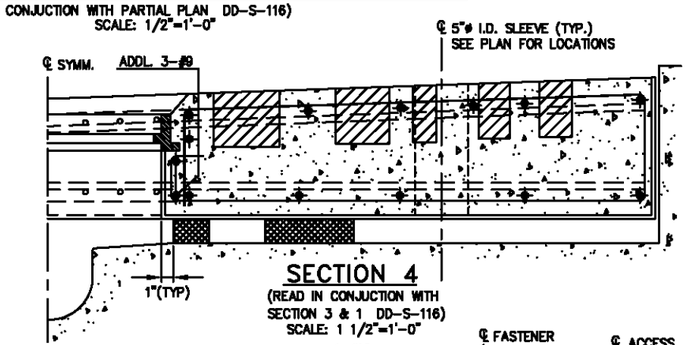
1. FOR TYPE 2 FLOATING SLABS, MANHOLES ARE REQUIRED ONLY IN BOX AND HORSESHOE TUNNELS, FOR TYPE 1 FLOATING SLABS THE LOCATION OF MANHOLES AND OTHER DRAINAGE STRUCTURES SHALL BE COORDINATED WITH THE GENERAL ENGINEERING CONSULTANT AND NO DRAINAGE STRUCTURE SHALL BE LOCATED UNDER SPECIAL TRACKWORK BASE PLATES, DIRECT FIXATION FASTENERS OR WITHIN 6 INCHES OF ANY SPECIAL TRACKWORK ANCHOR BOLTS.
2. NO MANHOLES ARE TO BE LOCATED IN THE TRANSITION PANELS.
3. ADDITIONAL AND NON-TYPICAL REINFORCING STEEL REQUIRED AS MANHOLE REINFORCEMENT IS SHOWN ON THIS DRAWING. ALL OTHER REINFORCEMENT DETAILS ARE SHOWN ON DRAWING DD-S-116.
4. ⊛ DENOTES 5"ø OPENINGS. LOCATE AS SHOWN, FOR LIFTING OF FLOATING SLABS ADDITIONAL.
5. PROVIDE ADDITIONAL #5 BARS ON EACH SIDE OF OPENING AT TOP. THESE BARS ARE NOT SHOWN AT OTHER LOCATIONS AND DRAWINGS FOR CLARITY.



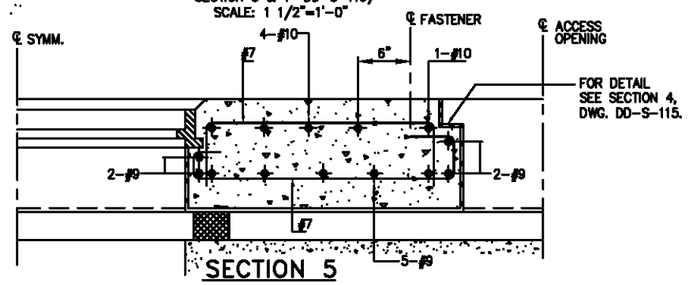
SECTION 1
SCALE: 3/4"=1'-0"



VIEW 3
SCALE: 1 1/2"=1'-0"



SECTION 4
(READ IN CONJUCTION WITH SECTION 3 & 1 DD-S-116)
SCALE: 1 1/2"=1'-0"



SECTION 5
(READ IN CONJUCTION WITH SECTION 4 & 2 DD-S-116)
SCALE: 1 1/2"=1'-0"

DESIGNED	IRSHAD	7-83 DATE
DRAWN	DERR	7-83 DATE
CHECKED	GONCHAR	7-83 DATE
APPROVED	SEC(DCCO)	3-84 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
ST-M-1	DRAINAGE DETAILS & CASTINGS – SHT. 1.
ST-M-91	DRAINAGE DETAILS FOR FLOATING SLAB.
DD-S-115	TYPE-2 FLOATING SLAB DETAILS-1.
DD-S-116	TYPE-2 FLOATING SLAB DETAILS-2.

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

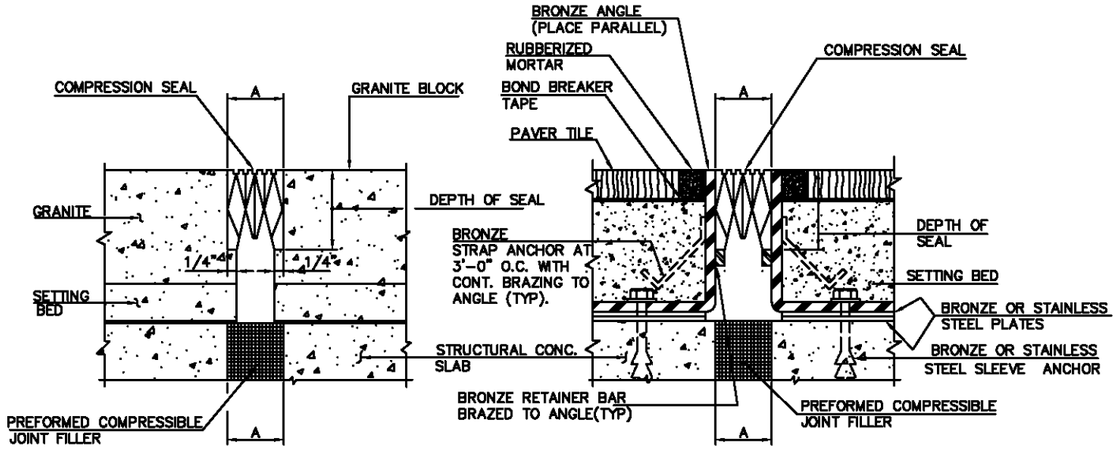
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
FLOATING SLAB MANHOLE DETAILS

SCALE 1/4"=1'-0" 1 0 1 2 3 4 5 AND AS NOTED

DRAWING NO. DD-S-119



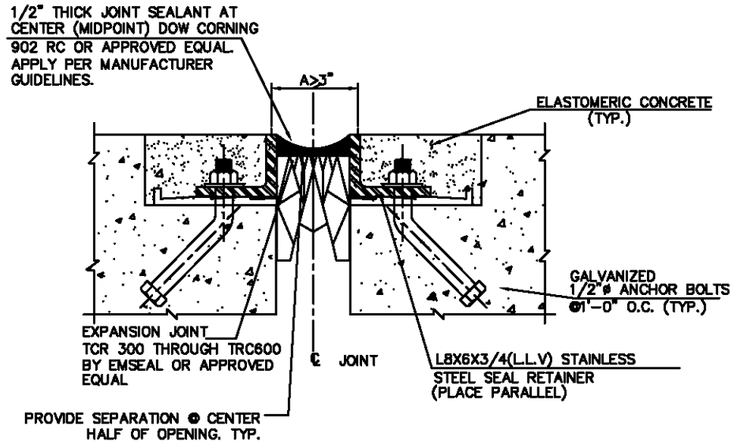
TYPICAL DETAILS FOR PLATFORM

NOT TO SCALE

JOINT OPENING DATA							
LOCATION	UNCOMPRESSED SEAL WIDTH	A=JOINT OPENING AT:					
		40°F	50°F	60°F	70°F	80°F	85°F

EXAMPLE OF JOINT-OPENING DATA TABLE

(SEE NOTE 6)



TYPICAL EXPANSION JOINT DETAIL
FOR LARGER JOINTS ON AERIAL STRUCTURE

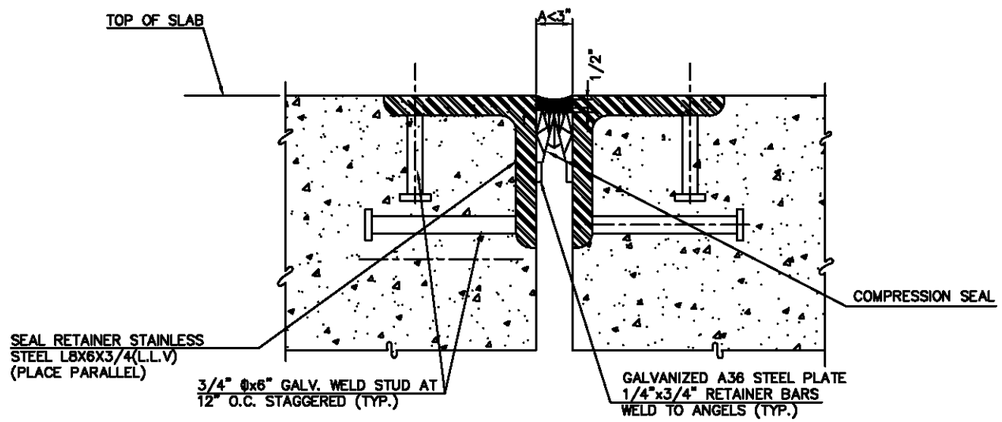
N.T.S. (SEE NOTE 10)

NOTES

1. THE SEAL SHALL BE PLACED AT THE CORRECT DEPTH AS SHOWN ON EACH DETAIL.
2. THE SEAL SHALL NOT BE STRETCHED MORE THAN 5% DURING PLACEMENT.
3. THE SEAL SHALL NOT BE SPLICED TOGETHER IN THE FIELD. IT MUST BE A CONTINUOUS UNBROKEN STRIP FROM EDGE TO EDGE AND END TO END.
4. JOINTS SHALL BE PRESET TO THE TEMPERATURE ANTICIPATED AT THE TIME OF INSTALLATION. INSTALLATION SHALL START DURING A PERIOD OF RISING TEMPERATURE, BUT AT A TEMPERATURE LESS THAN 85°F.
5. THE SEAL SHALL NOT BE INSTALLED WHEN THE TEMPERATURE IS LESS THAN 40°F
6. THE INFORMATION IN THE JOINT OPENING DATA TABLE MUST BE PROVIDED FOR EVERY SEAL BY THE DESIGNER.
7. THE EXPANSION JOINT SHALL PROVIDE A MINIMUM MOVEMENT OF 2 1/2" PER 100'.
8. THE SEALS ARE TO BE MADE OF NEOPRENE. ALL COMPRESSION SEALS SHALL HAVE A DIAMOND WEB CONFIGURATION.
9. THE STEEL ANGLES, MANUFACTURER'S EXTRUSION SHALL BE STAINLESS STEEL OR BRONZE AS SHOWN, AND WELD STUDS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. ALL AREAS WHERE THE GALVANIZING HAS BEEN DAMAGED SHALL BE COATED WITH A ZINC RICH PRIMER
10. LOCK-IN COMPRESSION OR STRIP SEALS MAY BE USED ON AERIAL STRUCTURES. STRIP SEALS ARE PREFERED WHERE THE JOINT FACES MAY BE SKEWED OR UNEVEN.
11. COMPRESSION SEALS MUST HAVE AN ASPECT RATIO (WIDTH:DEPTH) BETWEEN 1:1 AND 1:1.5, AND THE DESIGNER SHOULD CONSULT WITH THE MANUFACTURER ON ITEMS NOT COVERED IN THIS DRAWING.
    SEAL SPECIFICATIONS SHALL BE INCLUDED BY THE SECTION DESIGNER IN THE CONTRACT SPECIFICATIONS.
12. TEMPORARY BARS SHALL BE TACK WELDED TO THE TOP OF THE RETAINING ANGLES TO ENSURE THAT THE ANGLES FACES ARE PARALLEL AND AT THE SAME ELEVATION DURING CONCRETE POURING.
13. THE PLATES COVERING THE SEALS SHALL BE WIDE ENOUGH TO COVER THE BITUTHENE MEMBRANE AT ALL TEMPERATURES. PLATE MAY BE FLUSH WITH TOP OF SLAB WHEN IT IS NECESSARY.
14. PROVIDE CONTINUOUS SEAL ACROSS THE JOINT, AND FLARE THE JOINT SEALANT UPWARD (LIKE A GUTTER LIKE) AT TERMINALS AND/OR PARAPETS.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



TYPICAL STRIP SEAL DETAIL
FOR SMALLER JOINTS ON AERIAL STRUCTURE

NOT TO SCALE

DESIGNED	RODETT 08-94 DATE
DRAWN	BREDEMAN 08-94 DATE
CHECKED	ROSENBAUM 09-94 DATE
APPROVED	GEC(DCCO) 10-94 DATE
UPDATED	ENGA 08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

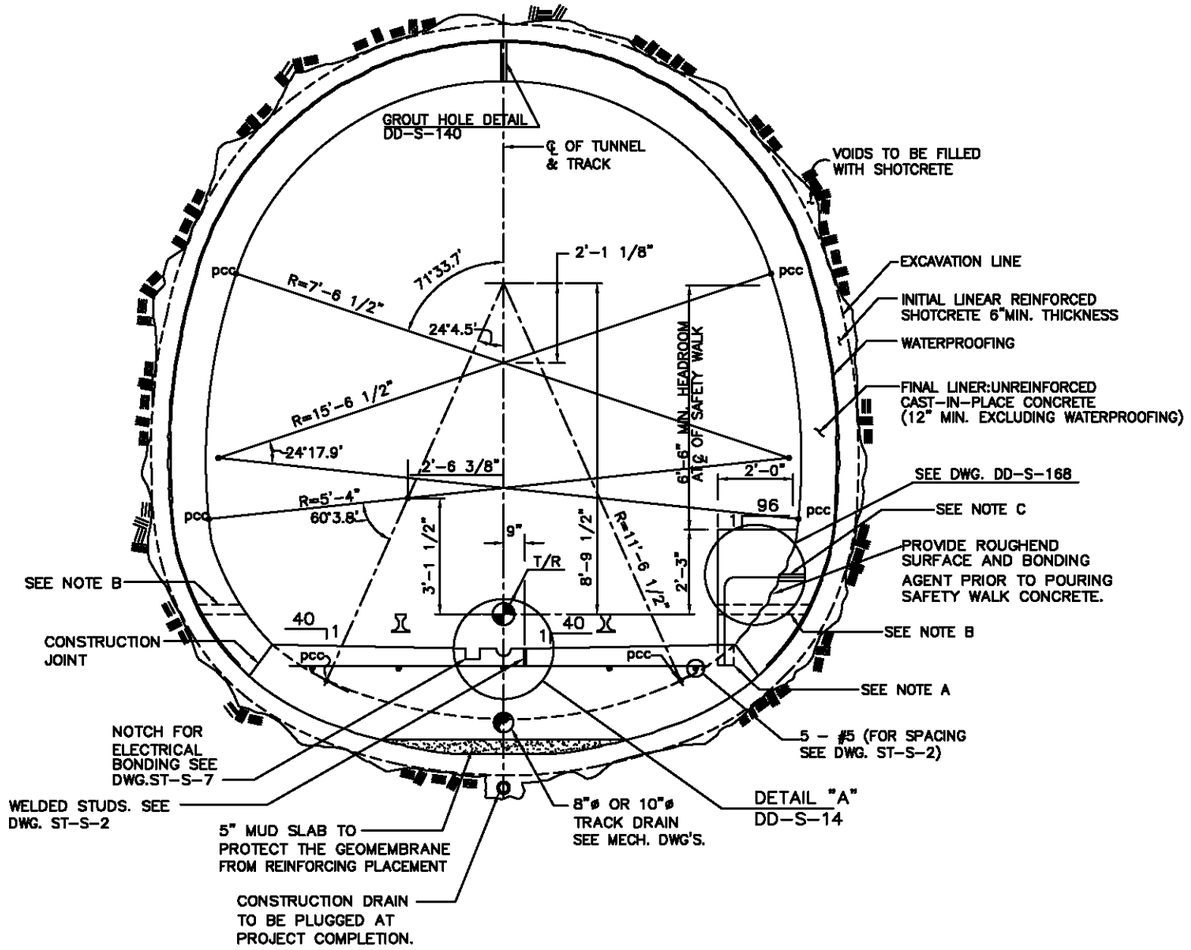
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING

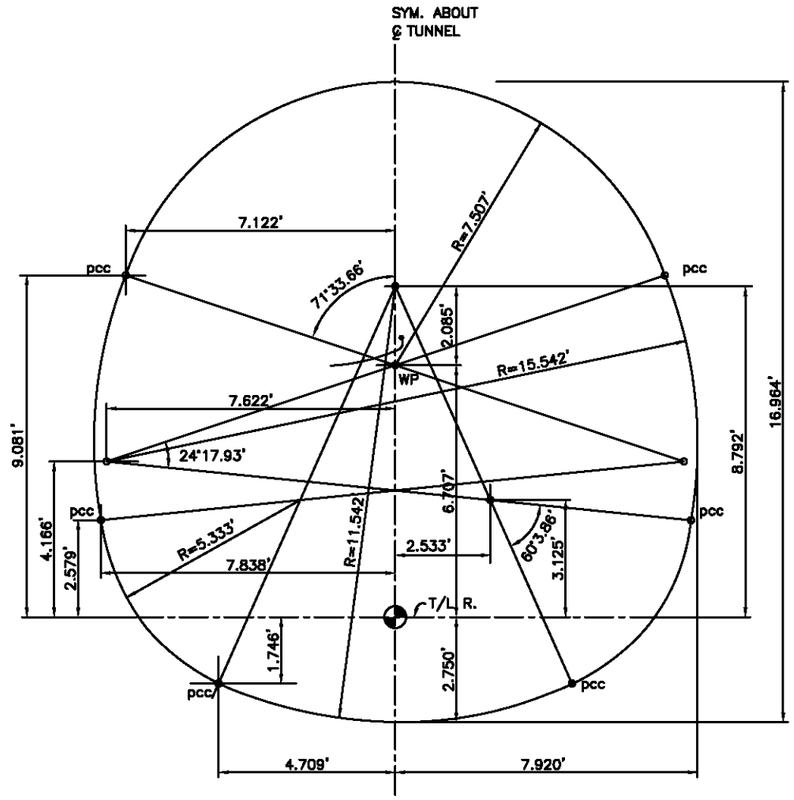
TYPICAL DETAILS OF EXPANSION JOINTS

SCALE	DRAWING NO.
AS SHOWN	DD-S-120



TUNNEL CROSS SECTION

SCALE 1/2"=1'-0"



TUNNEL GEOMETRY

TYPICAL CROSS SECTION
SCALE 1/2" = 1'-0"

NOTE A: MAKE BLOCKOUT TO SAFETY WALK REINFORCING AT EACH END OF SAFETY WALK POUR. BOND FINISHED INVERT REINFORCING TO SAFETY WALK REINFORCING BY WELDING SHORT PIECE OF #4 BAR TO EACH. PATCH BLOCKOUT IF NECESSARY.

NOTE B: 3"ø PVC WEEP HOLES W/ CENTER LINE AT 1'-6" ABOVE CONSTR. JOINT LOCATED AT END OF EACH UNIT, BOTH SIDES. SEE CONTRACTION JOINT DETAIL ON DWG. DD-S-129.

NOTE C: DRILL HOLE AND GROUT WITH EPOXY (SEE NOTE 10) BAR IN 8" MIN. EMBEDMENT ALTERNATELY PROVIDE RICHMOND DOWEL BAR COUPLERS OR OTHER APPROVED EQUAL MECHANICAL INSERTS.

NOTES

1. THIS DRAWING DOES NOT SHOW THE TUNNEL INVERT CONSTRUCTION SEQUENCE. THE DESIGNER MAY INCORPORATE CRITICAL CONSTRUCTION DETAILS AS CONSIDERED NECESSARY.
2. INVERT SLAB SHALL BE SUITABLY REINFORCED.
3. THE INITIAL LINER SHALL BE PROTECTED FROM THE CONSTRUCTION EQUIPMENT TRAFFIC BY MEANS OF A WORK SLAB OR GRAVEL BED HAVING A WIDTH OF 9'-6" MIN.
4. LINER DESIGN SHALL INCLUDE BOTH PARTIAL AND FULL HYDROSTATIC LOADING CONDITIONS.
5. DESIGNER IS CAUTIONED THAT FOR A CONSTANT VERTICAL DIMENSION BETWEEN WORKING POINT AND TOP OF LOW RAIL. THE DEPTH OF STRUCTURAL ELEMENTS BELOW THE INVERT WILL VARY.
6. FOR SPACING OF RUNNING RAILS, CONTACT RAIL AND TRACTION POWER CONDUIT STUB-UPS FROM CENTER LINE OF TRACK AND MINIMUM CLEARANCE REQUIREMENT SEE DRAWING NO. DD-E-5.
7. MATERIAL FOR FINAL LINER TO BE f'c=4000 PSI CONCRETE.
8. FOR WATERPROOFING DETAILS SEE DWG. DD-S-140.
9. MATERIAL FOR MUD SLAB TO BE f'c=4,000 PSI CONCRETE.
10. SPECIFY EPOXY GROUT IN THE CONTRACT SPECIFICATIONS. ALSO RECOMMEND SIZE OF HOLE FOR EMBEDDED BAR. MINIMUM REINFORCINGS #5@1'-6".

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED CHYTRY	07-98 DATE	
DRAWN A. VIDANGOS	07-98 DATE	
CHECKED J. ALLEN	08-98 DATE	
APPROVED GEC(DCCO)	08-98 DATE	
UPDATED ENGA	08-00 DATE	

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

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OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

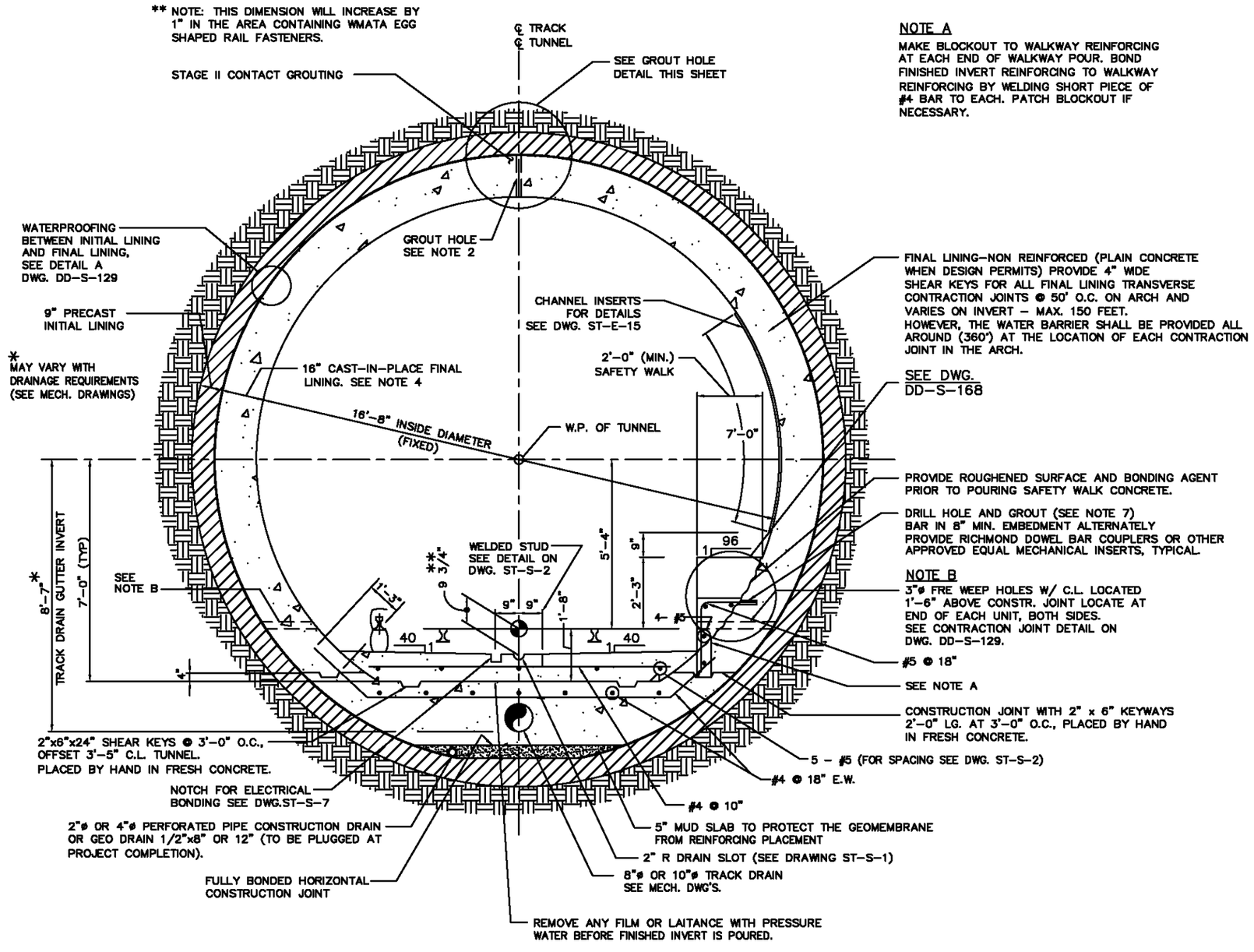
STRUCTURAL DESIGN DRAWING

SOFT GROUND NATM TUNNEL

CAST-IN-PLACE CONCRETE LINING DETAILS

SCALE 1/2"=1'-0" 6" 0 1 AND AS NOTED

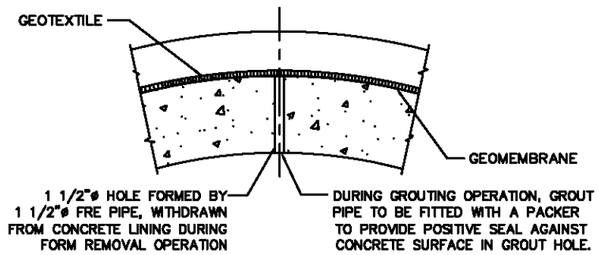
DRAWING NO. DD-S-121



TYPICAL TANGENT TUNNEL SECTION

NOTE A

MAKE BLOCKOUT TO WALKWAY REINFORCING AT EACH END OF WALKWAY POUR. BOND FINISHED INVERT REINFORCING TO WALKWAY REINFORCING BY WELDING SHORT PIECE OF #4 BAR TO EACH. PATCH BLOCKOUT IF NECESSARY.



GROUT HOLE DETAIL
NOT TO SCALE

NOTES

1. MATERIAL FOR FINAL LINING TO BE f'c=4000 PSI CONCRETE.
2. PROVIDE GROUT HOLES IN THE CROWN. TWO GROUT HOLES WITHIN EACH 50'-0" SEGMENT AT 15'-0" FROM EACH CONTRACTION JOINT.
3. FOR WATERPROOFING DETAILS SEE DWG. DD-S-129.
4. CAST-IN-PLACE CONCRETE LINING THICKNESS SHALL BE ADJUSTED TO MAINTAIN AN INSIDE TUNNEL DIAMETER OF 16'-8". THE THICKNESS OF THE CAST-IN-PLACE CONCRETE LINING MAY BE GREATER THAN 16 INCHES, BUT SHALL NOT BE LESS THAN 12 INCHES EXCLUDING THE THICKNESS OF WATERPROOFING. FOR CONTINGENCY REINFORCEMENT WHEN FINAL LINING THICKNESS BETWEEN 9 INCHES AND 12 INCHES, SEE DWG. DD-S-127.
5. FOR DESIGN OF TWO-PASS SYSTEM CIRCULAR EARTH TUNNELS REFER TO WMATA CRITERIA. THE DESIGN OF FINAL LINING SHALL BE BASED ON MIN. 12" THICK PLAIN CONCRETE. (EXCLUDING WATERPROOFING)
6. MATERIAL FOR MUD SLAB TO BE f'c=4,000 PSI CONCRETE.
7. SPECIFY EPOXY GROUT IN THE CONTRACT SPECIFICATIONS. ALSO RECOMMEND SIZE OF HOLE FOR EMBEDDED BAR.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED JR. MT.	02-28 DATE	
DRAWN JG.	02-28 DATE	
CHECKED MT. KM.	02-28 DATE	
APPROVED JR.	02-28 DATE	
UPDATED ENGA	08-00 DATE	

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

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DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

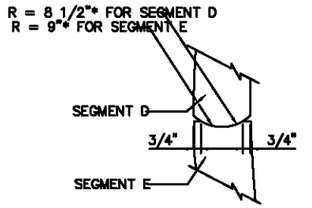
SUBMITTED DATE

APPROVED DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL CAST-IN-PLACE CONCRETE FINAL LINING DETAILS

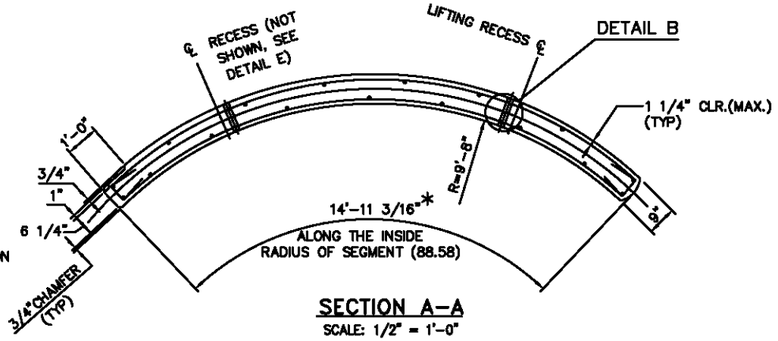
SCALE 1/2"=1'-0" AND AS NOTED (1 0 1 2)

DRAWING NO. DD-S-123

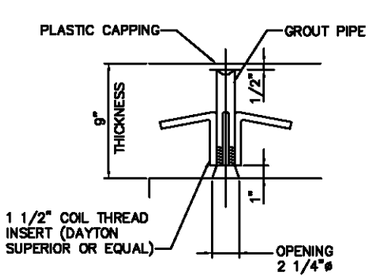


DETAIL A
(SPRINGLINE ONLY)
SCALE: 1" = 1'-0"

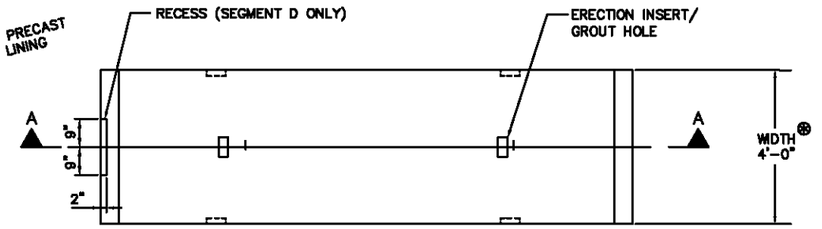
TUNNEL CROSS SECTION–PRECAST CONCRETE INITIAL LINER
(EXPANDED POSITION)
SINGLE–POINT JACKING SYSTEM
SCALE: 1/2" = 1'-0"



SECTION A–A
SCALE: 1/2" = 1'-0"



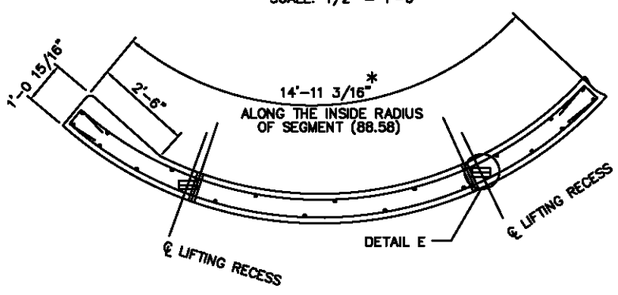
DETAIL B
COMBINATION ERECTION INSERT/ GROUT HOLE
SCALE: 2" = 1'-0"



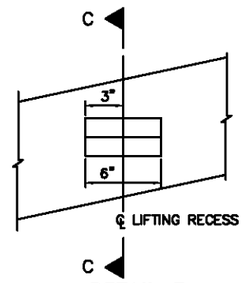
⊛ SEGMENTS ON CURVED ALIGNMENT MAY REQUIRE SOME ADJUSTMENT TO THE WIDTH OF SEGMENTS. DESIGNER TO PREPARE DESIGN AND DRAWINGS FOR SUCH TAPERED SEGMENTS.

* MAY VARY BY DESIGN & TUNNELING EQUIPMENT

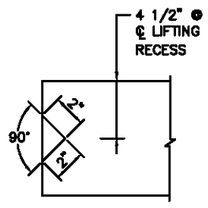
SEGMENT D – PLAN
SCALE: 1/2" = 1'-0"



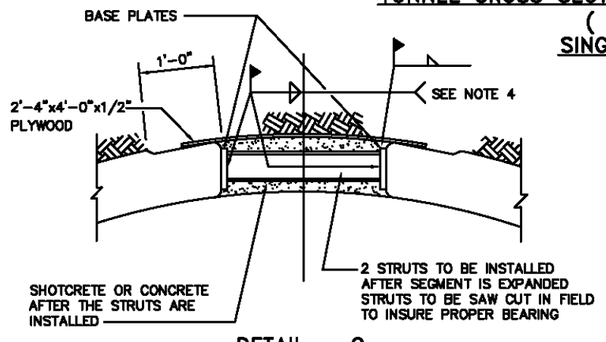
SEGMENT E – ELEVATION
SCALE: 1/2" = 1'-0"



DETAIL E
LIFTING RECESS
SCALE: 2" = 1'-0"



SECTION C–C



DETAIL – C
SCALE: 1" = 1'-0"

NOTES: – TO DESIGNER

1. DESIGN OF INITIAL LINER SHALL BE BASED ON 9" REINFORCED CONCRETE.

   MATERIALS: CONCRETE – NORMAL WEIGHT CONCRETE, f'c = 6,000 PSI.
   REINFORCEMENT – WELDED WIRE FABRIC CONFORMING TO ASTM A185.
   – BARS CONFORMING TO ASTM 615 Grade 60.
   STRUCTURAL STEEL – ASTM A36.

2. AT TIME OF FORM STRIPPING, PRECAST CONCRETE STRENGTH SHALL BE NO LESS THAN 2400 PSI
3. LOCATION AND TYPES OF ERECTION INSERTS, LIFTING RECESSES, LIFTING EYES AND GROUT HOLES ARE SHOWN. FOR SECTION DESIGNERS INFORMATION AND TO BE FINALIZED BY THE DESIGNER.
4. PROVIDE DESIGN OF THESE STRUTS (DUTCHMEN) INCLUDING WELDING, RETAINER SYSTEM IN THE GAP.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED JR. MT.	02-00 DATE	
DRAWN JG.	02-00 DATE	
CHECKED MT. KM.	02-00 DATE	
APPROVED JR.	05-00 DATE	
UPDATED ENGA	08-00 DATE	

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

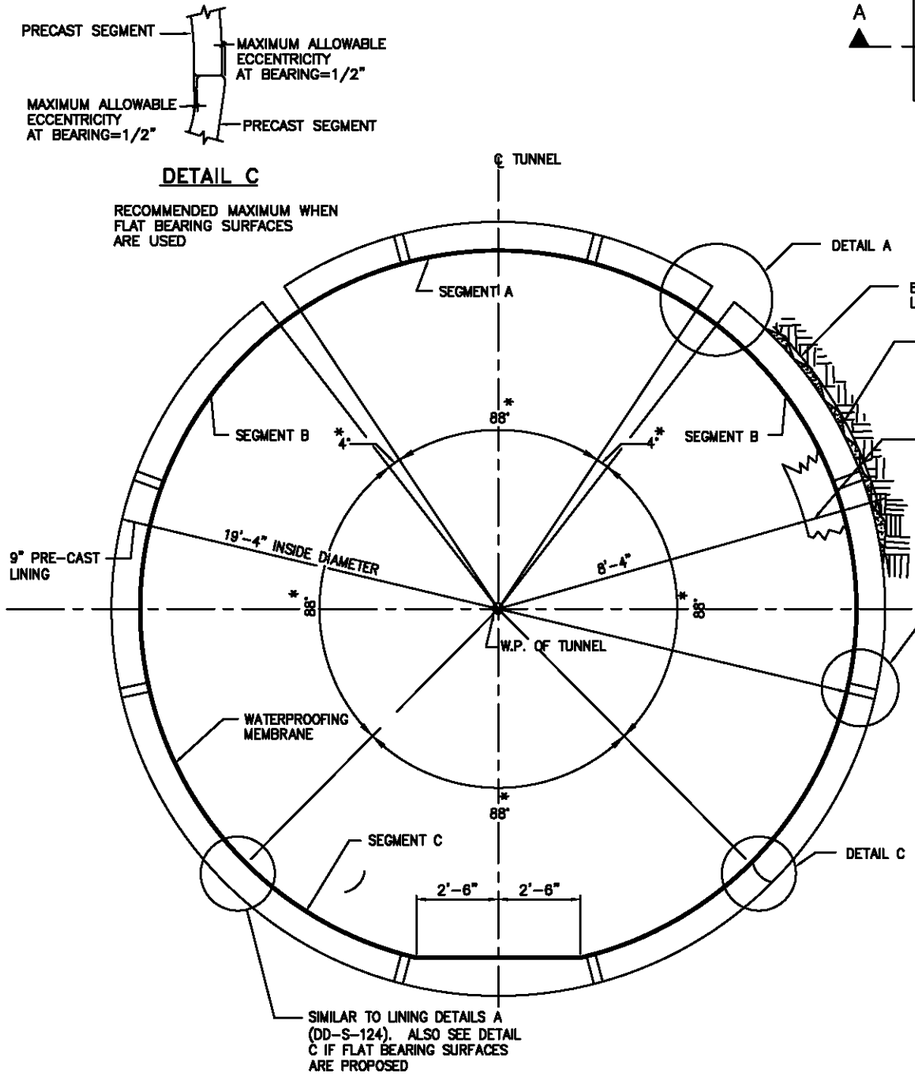
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TWO–PASS SYSTEM CIRCULAR EARTH TUNNEL
PRECAST INITIAL LINING ALTERNATE I

SCALE 1/2"=1'-0" 1 0 1 2 AND AS NOTED
DRAWING NO. DD–S–124

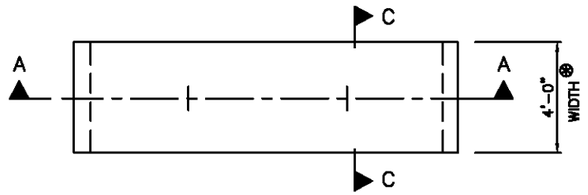


TUNNEL CROSS SECTION
PRECAST CONCRETE INITIAL LINER
EXPANDED POSITION
TWO-POINT JACKING SYSTEM

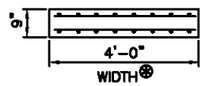
(BASED ON TUNNELING MACHINE AND EQUIPMENT THE CONTRACTOR MAY USE ONE POINT JACKING AT APPROX. 45° FROM VERTICAL, WITH AUTHORITY'S APPROVAL)

DETAIL C

RECOMMENDED MAXIMUM WHEN FLAT BEARING SURFACES ARE USED

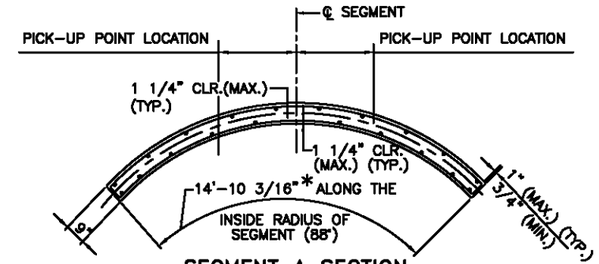


SEGMENT – PLAN
NO SCALE
(SEGMENT C–PLAN SIMILAR)

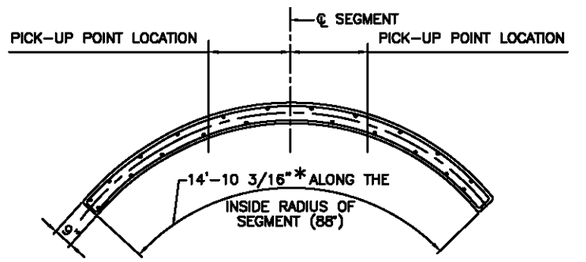


SECTION C C
NO SCALE

⊛ SEGMENTS ON CURVED ALIGNMENT MAY REQUIRE SOME ADJUSTMENT TO THE WIDTH OF SEGMENTS. DESIGNER TO PREPARE DESIGN AND DRAWINGS FOR SUCH TAPERED SEGMENTS.

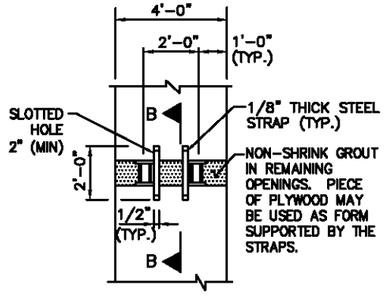


SEGMENT A SECTION
NO SCALE



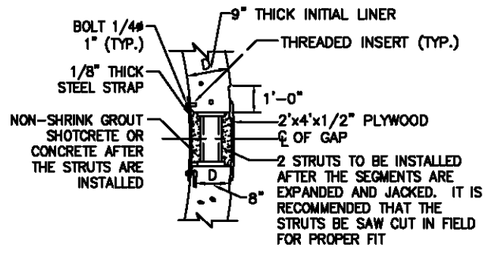
SEGMENT B SECTION
NO SCALE

* MAY VARY BY DESIGN AND TUNNELING MACHINE & EQUIPMENT



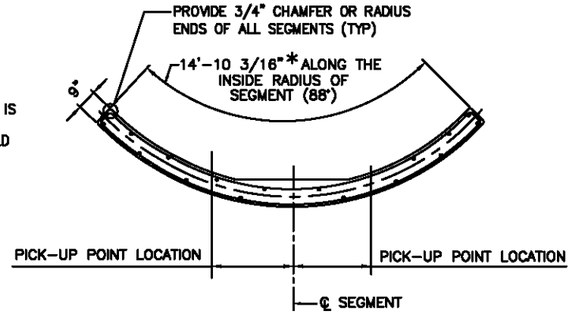
ELEVATION

DETAIL A
(EXPANDED POSITION)
NO SCALE



SECTION B B

NOTE: DESIGNER TO PROVIDE DESIGN OF STRUTS (DUTCHMEN), INCLUDING WELD SIZE AND STRUT RETAINER SYSTEM IN THE GAP



SEGMENT C SECTION
NO SCALE

NOTES: – TO DESIGNER

1. DESIGN OF INITIAL LINER SHALL BE BASED ON 9" REINFORCED CONCRETE.

   MATERIALS: CONCRETE – NORMAL WEIGHT CONCRETE, f'c = 6,000 PSI.
   REINFORCEMENT – WELDED WIRE FABRIC CONFORMING TO ASTM A185.
   – BARS CONFORMING TO ASTM 615 Grade 60.
   STRUCTURAL STEEL – ASTM A36.

2. AT TIME OF FORM STRIPPING, PRECAST CONCRETE STRENGTH SHALL BE NO LESS THAN 2400 PSI
3. LOCATION AND TYPES OF ERECTION INSERTS, LIFTING RECESSES, LIFTING EYES AND GROUT HOLES ARE SHOWN. FOR SECTION DESIGNERS INFORMATION AND TO BE FINALIZED BY THE DESIGNER.
4. PROVIDE DESIGN OF THESE STRUTS (DUTCHMEN) INCLUDING WELDING, RETAINER SYSTEM IN THE GAP.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	JR, MT.	02-99 DATE
DRAWN	JG.	02-99 DATE
CHECKED	MT, KM.	02-99 DATE
APPROVED	JR.	09-99 DATE
UPDATED	ENGA	05-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

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DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

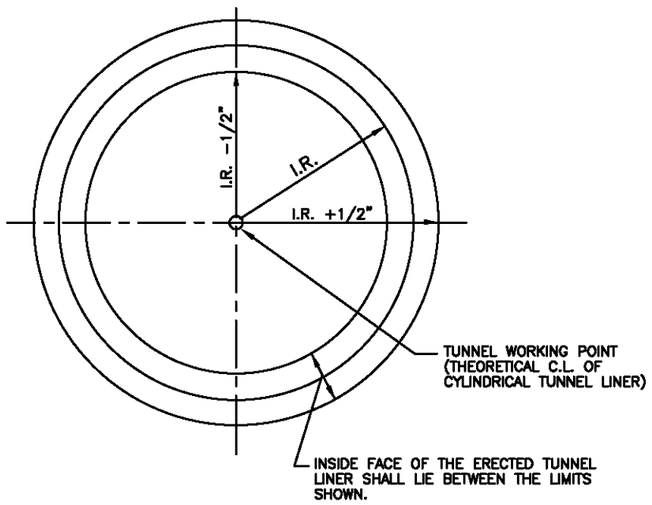
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL
PRECAST INITIAL LINING ALTERNATE II

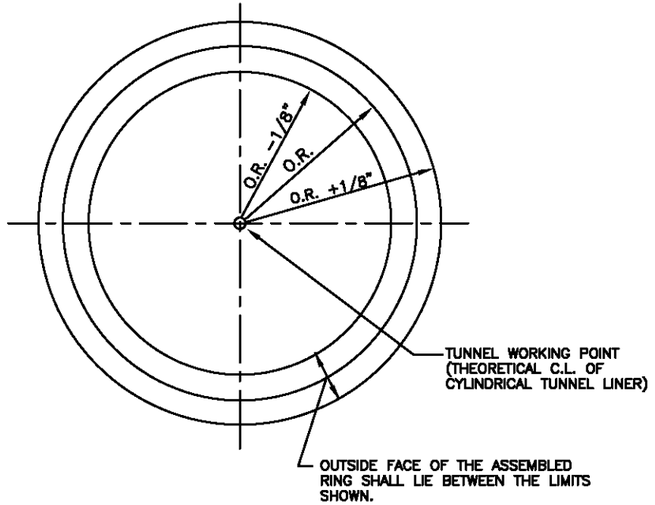
SCALE 1/2"=1'-0" 1 0 1 2 AND AS NOTED

DRAWING NO. DD-S-125



A – LOCATION TOLERANCE

NOT TO SCALE

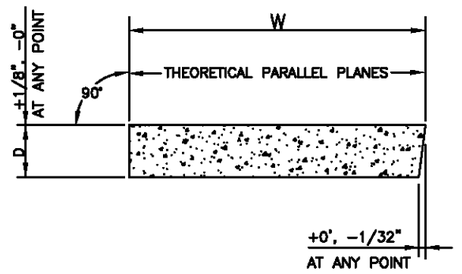


1 – RADIUS TOLERANCE

NOT TO SCALE

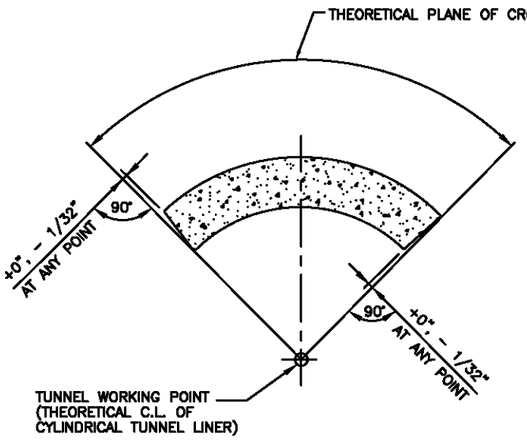
CIRCUMFERENCE OF OUTSIDE FACE OF ASSEMBLED RING AS MEASURED BY STEEL TAPE SHALL BE WITHIN +1/2 INCH. TO −1 INCH. OF THE THEORETICAL OUTSIDE CIRCUMFERENCE =π X O.D.

2 – CIRCUMFERENCE TOLERANCE



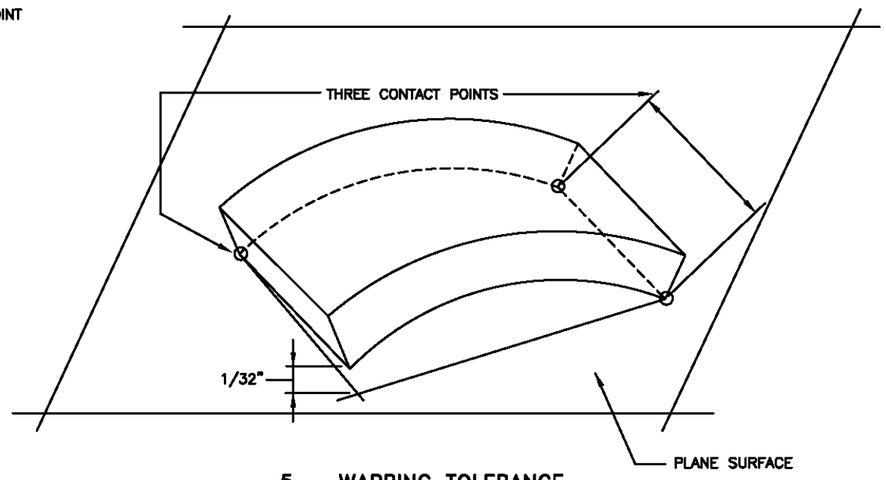
4 – WIDTH AND THICKNESS TOLERANCE

NOT TO SCALE



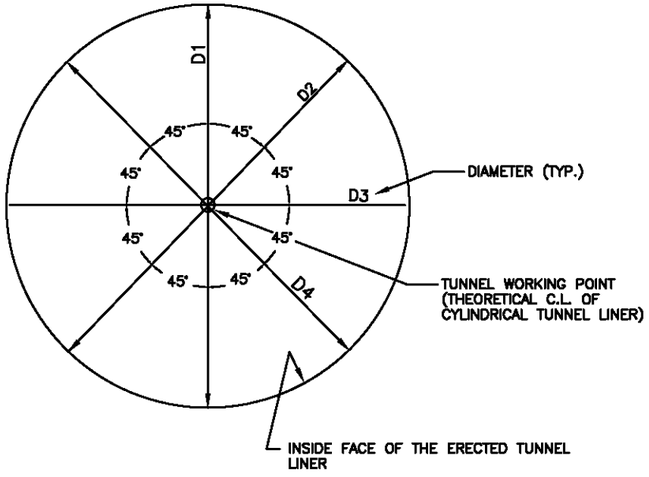
3 – SEGMENT TOLERANCE

NOT TO SCALE



5 – WARPING TOLERANCE

NOT TO SCALE



D1, D2, D3, D4, = I.D. +7/8" −3/8"

B – DIAMETER TOLERANCE

NOT TO SCALE

REQUIRED CONSTRUCTION TOLERANCES (A & B)

LEGEND OF ABBREVIATIONS

O.D. – THEORETICAL OUTSIDE DIAMETER OF THE RING

I.D. – THEORETICAL INSIDE DIAMETER OF THE RING

O.R. – THEORETICAL OUTSIDE RADIUS OF THE RING

I.R. – THEORETICAL INSIDE RADIUS OF THE RING

W – THEORETICAL WIDTH OF THE RING

D – THEORETICAL OVERALL RING DEPTH

REQUIRED FABRICATION TOLERANCES (1 TO 5)

NOTE: THE CONTRACTOR SHALL DETERMINE THE NECESSARY TAPER TO COPE WITH VERTICAL OR HORIZONTAL CURVES AND SUBMIT DETAILS FOR APPROVAL

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED JR. MT.	02-98 DATE	
DRAWN JQ.	02-98 DATE	
CHECKED MT. KM.	02-98 DATE	
APPROVED JR.	08-98 DATE	
UPDATED ENGA	08-00 DATE	

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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

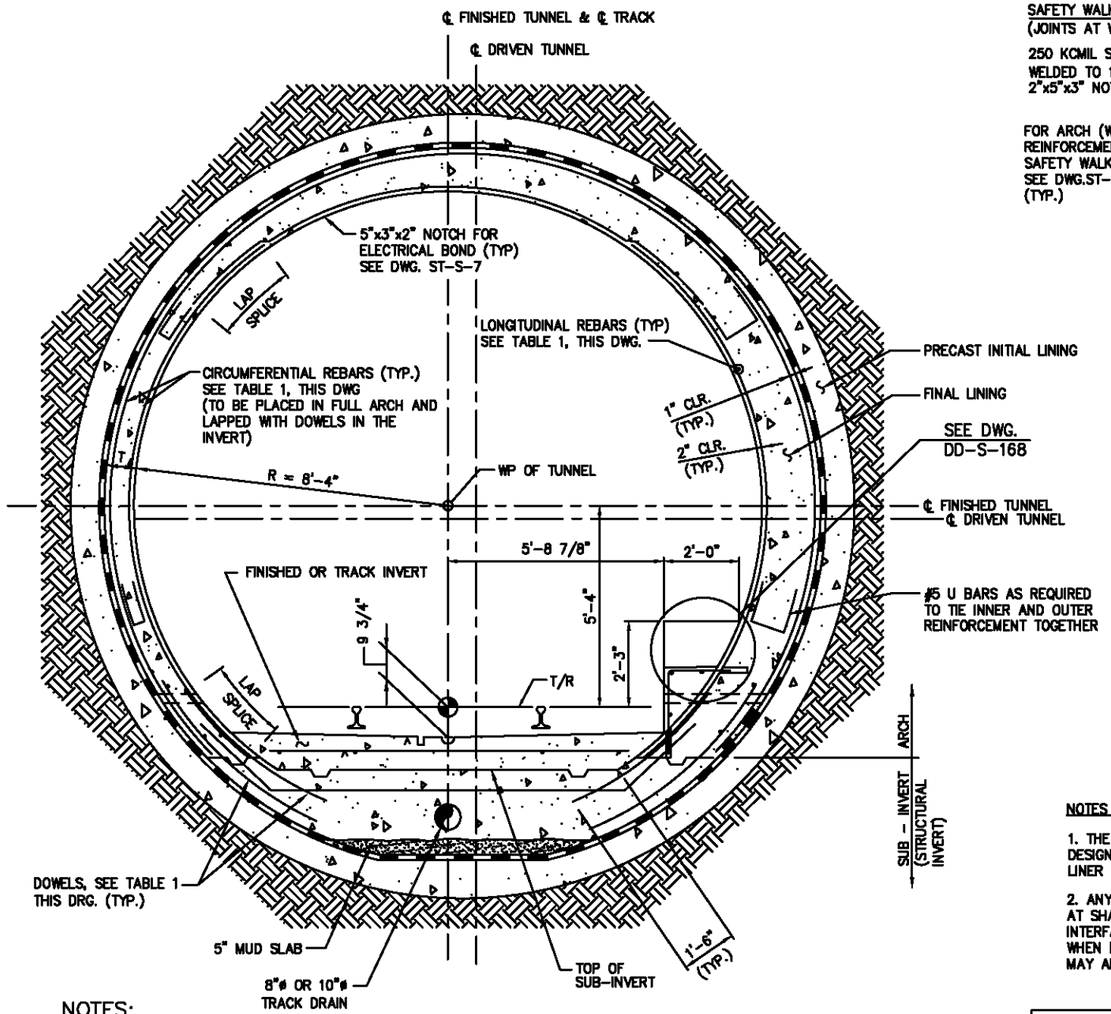
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL PRECAST LINING TOLERANCES

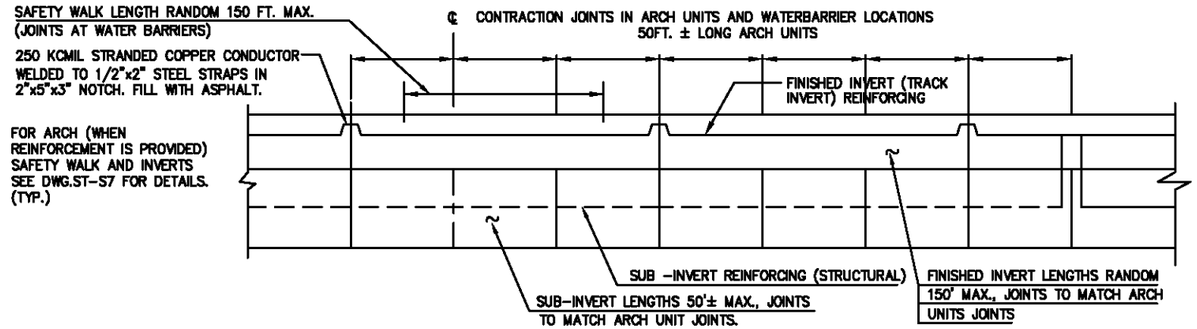
SCALE	DRAWING NO.
AS NOTED	DD-S-126



NOTES:

1. THE FINAL LINING ARCH DESIGN IS BASED ON 12" MINIMUM THICKNESS PLAIN (NON-REINFORCED) CONCRETE f'c=4,000 PSI. THE CONTINGENCY REINFORCEMENT FOR DEFICIENT FINAL LINING THICKNESS BETWEEN 9" AND 12" SHOWN ON THIS DRAWING MAY BE ALLOWED (ALSO SEE NOTE 2) IN CASE OF THE CONTRACTOR'S ACCIDENTAL TUNNELING MISALIGNMENT AT NO COST TO THE AUTHORITY. FINAL LINING WALL THICKNESS BELOW 9" WILL NOT BE ALLOWED. ANY TUNNEL RE-MINING NECESSARY TO MAINTAIN THE ALLOWABLE FINAL LINING THICKNESS OF MINIMUM 12" PLAIN CONCRETE OR MINIMUM 9" REINFORCED CONCRETE (CONTINGENCY REINFORCEMENT) WILL BE AT NO COST TO THE AUTHORITY.
2. WHEN ALLOWED BY THE AUTHORITY, THE CONTINGENCY REINFORCEMENT WHEN THE MINIMUM ARCH (FINAL LINING) THICKNESS IS LESS THAN 12 INCHES BUT NOT LESS 9 INCHES, SHALL BE PLACED IN FULL ARCH AS SHOWN, INCLUDING DOWELS IN SUB-INVERTS, EVEN IF THE MINIMUM THICKNESS MAY OCCUR ANYWHERE IN LIMITED AREA AROUND THE CIRCUMFERENCE OF THE LINING (ONE CASE IS SHOWN ABOVE)
3. WHERE CONTINGENCY REINFORCEMENT IS REQUIRED, PROVIDE THIS REINFORCEMENT FOR A DISTANCE OF AT LEAST 3'-0" IN THE LONGITUDINAL, DIRECTION BEYOND EACH SIDE OF THE DEFICIENT CAST-IN-PLACE LINING SECTION.
4. FOR FINAL LINING DETAILS NOT SHOWN OR INDICATED SEE DWG. NO. DD-S-123.
5. CONTINGENCY REINFORCEMENT LONGITUDINAL BARS SHALL NOT PASS THROUGH CONTRACTION JOINTS AND SHALL BE STOPPED AT 1" EACH SIDE OF CONTRACTION JOINTS.
6. FULL ARCH REINFORCEMENT SIMILAR TO THE REINFORCEMENT SHOWN ABOVE INDICATING ALL THICKNESS VARIATIONS SHALL BE PROVIDED BY THE CONTRACTOR AT LOCATIONS NOTED IN THE TABLE EVEN IF THE ARCH THICKNESS AT THESE LOCATIONS IS GREATER THAN 12 INCHES. (THESE MAY BE AT INTERFACES WITH SHAFTS, ETC., AND DUE TO UNEVEN SOIL PRESSURES).

CONTINGENCY REINFORCEMENT FOR 9"<T<12"



SCHEMATIC REPRESENTATION OF INVERT POURS

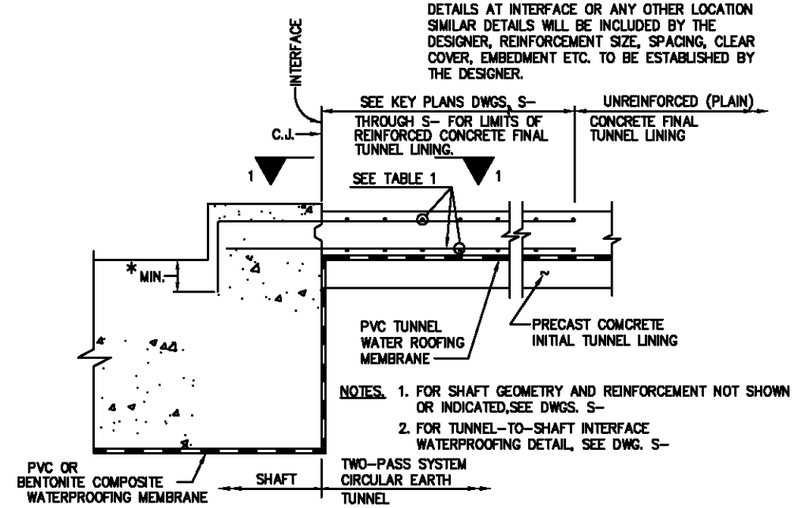
NOT TO SCALE

NOTES TO DESIGNER

1. THE DESIGNER MAY PROVIDE DIFFERENT REINFORCEMENT DESIGNS IN TABLE 1. SHOWING CONTINGENCY REINFORCEMENT FOR FINAL LINER THICKNESS BETWEEN 9" AND 10", 10"AND 11", 11" AND 12".
2. ANY SUCH REINFORCEMENT, FOR EXAMPLE AT SHAFT-TUNNEL OR STATION-TUNNEL INTERFACE OR WHERE REQUIRED BY DESIGN WHEN POOR SOIL CONDITIONS ARE ENCOUNTERED. MAY ALSO BE INCLUDED IN TABLE 1.,PART B.

NOTE TO DESIGNER:

WHERE NECESSARY TO CLARIFY REINFORCING DETAILS AT INTERFACE OR ANY OTHER LOCATION SIMILAR DETAILS WILL BE INCLUDED BY THE DESIGNER, REINFORCEMENT SIZE, SPACING, CLEAR COVER, EMBEDMENT ETC. TO BE ESTABLISHED BY THE DESIGNER.



NOTES. 1. FOR SHAFT GEOMETRY AND REINFORCEMENT NOT SHOWN OR INDICATED,SEE DWGS. S-
2. FOR TUNNEL-TO-SHAFT INTERFACE WATERPROOFING DETAIL, SEE DWG. S-

FINAL LINING REINFORCEMENT AT SHAFTS

* TO BE SHOWN BY THE DESIGNER

TABLE 1. FINAL LINING REINFORCEMENT REQUIREMENTS

	LOCATION	THICHKNESS REQUIREMENT T	CIRCUMFERENTIAL REBARS AND DOWELS	LONGITUDINAL REBARS
PART A	CONTINGENCY REINFORCEMENT WHERE REQ'D. DUE TO MISALIGNMENT	9"≤T<12"		
PART B	STA. TO STA. OB	T>12"		
	AT SHAFTS (SEE DET., THIS DWG.)	T>12"		
	CONTIGENCY REINFORCEMENT IF REQ'D WITHIN LIMITS INDICATED IN PART B ON THIS TABLE	9"≤T<12"		

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED JR. MT.	02-98 DATE	
DRAWN JG.	02-98 DATE	
CHECKED MT. KM.	02-98 DATE	
APPROVED JR.	09-98 DATE	
UPDATED ENGA	06-00 DATE	

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
06/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED DATE

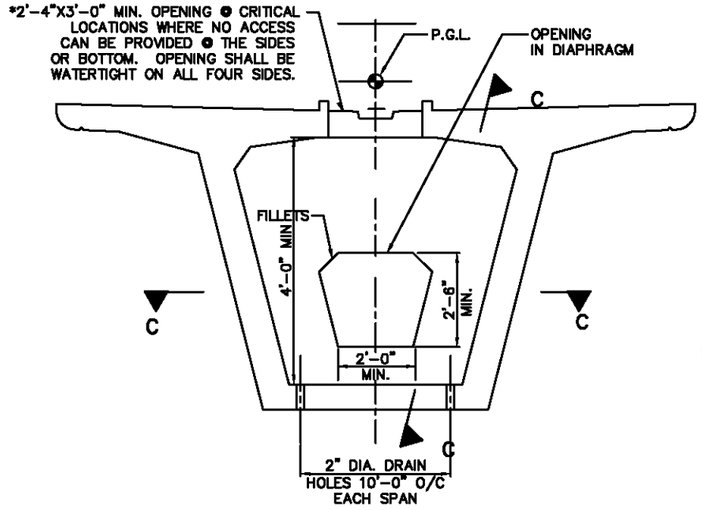
APPROVED DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

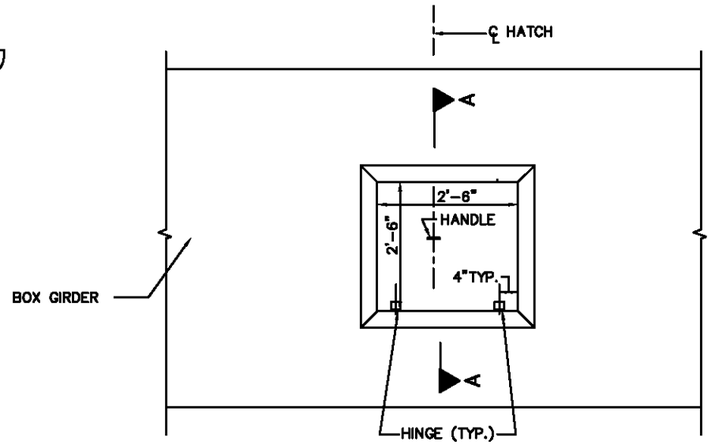
TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL-FINAL LINING AND CONTINGENCY REINFORCEMENT DETAILS

SCALE 1/2"=1'-0" 1 0 1 2 AND AS NOTED

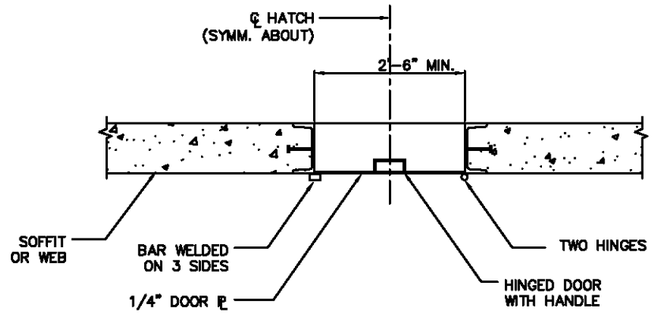
DRAWING NO. DD-S-127



TYPICAL ACCESS OPENING
AND DRAINAGE PROVISIONS
CONCRETE BOX GIRDER



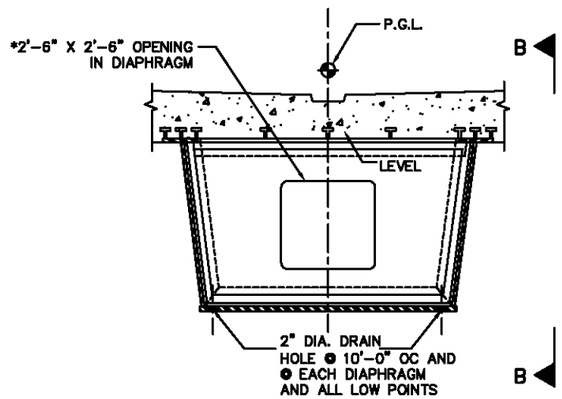
SECTION C–C
BOTTOM ACCESS HATCH OR
SIDE ACCESS HATCH IN PRECAST–PRETENSIONED SPANS



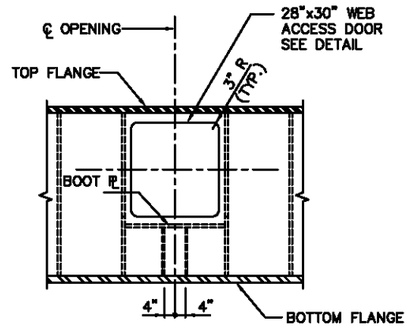
SECTION A–A

NOTE:
PLACE CABLE PULLING EYE AT THE TOP SLABS
CENTERED ABOVE THE ℄ OF EVERY HATCH

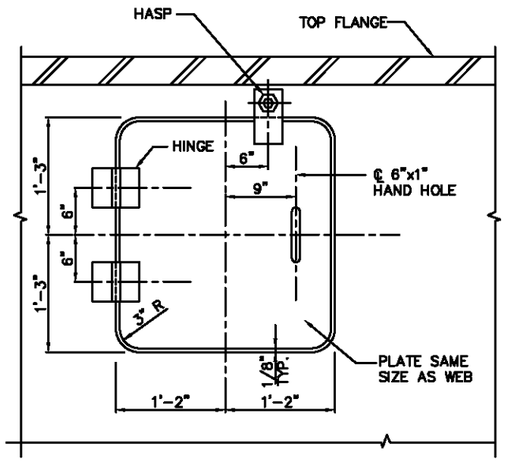
*INSPECTION OPENINGS SHALL NOT BE USED
FOR PASSAGE OF UTILITIES AND CONDUITS



TYPICAL ACCESS OPENING AT END DIAPHRAGM
AND DRAINAGE PROVISIONS
FOR STEEL BOX GIRDER



ELEVATION B–B
WEB ACCESS DOOR



DETAIL – STEEL BOX GIRDER
WEB ACCESS DOOR

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. AERIAL STRUCTURE DRAINAGE SYSTEM SHOULD BE DEVELOPED BY DESIGNER. DRAINAGE PIPING SHALL NOT OBSTRUCT INSPECTION PASSAGES & IT SHOULD BE ESTHETICALLY LOCATED.

DESIGNED	K. BARNES	05-96 DATE
DRAWN	PK. MELBOURNE	05-96 DATE
CHECKED	R. FENG	06-96 DATE
APPROVED	SEC(DCCO)	10-70 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

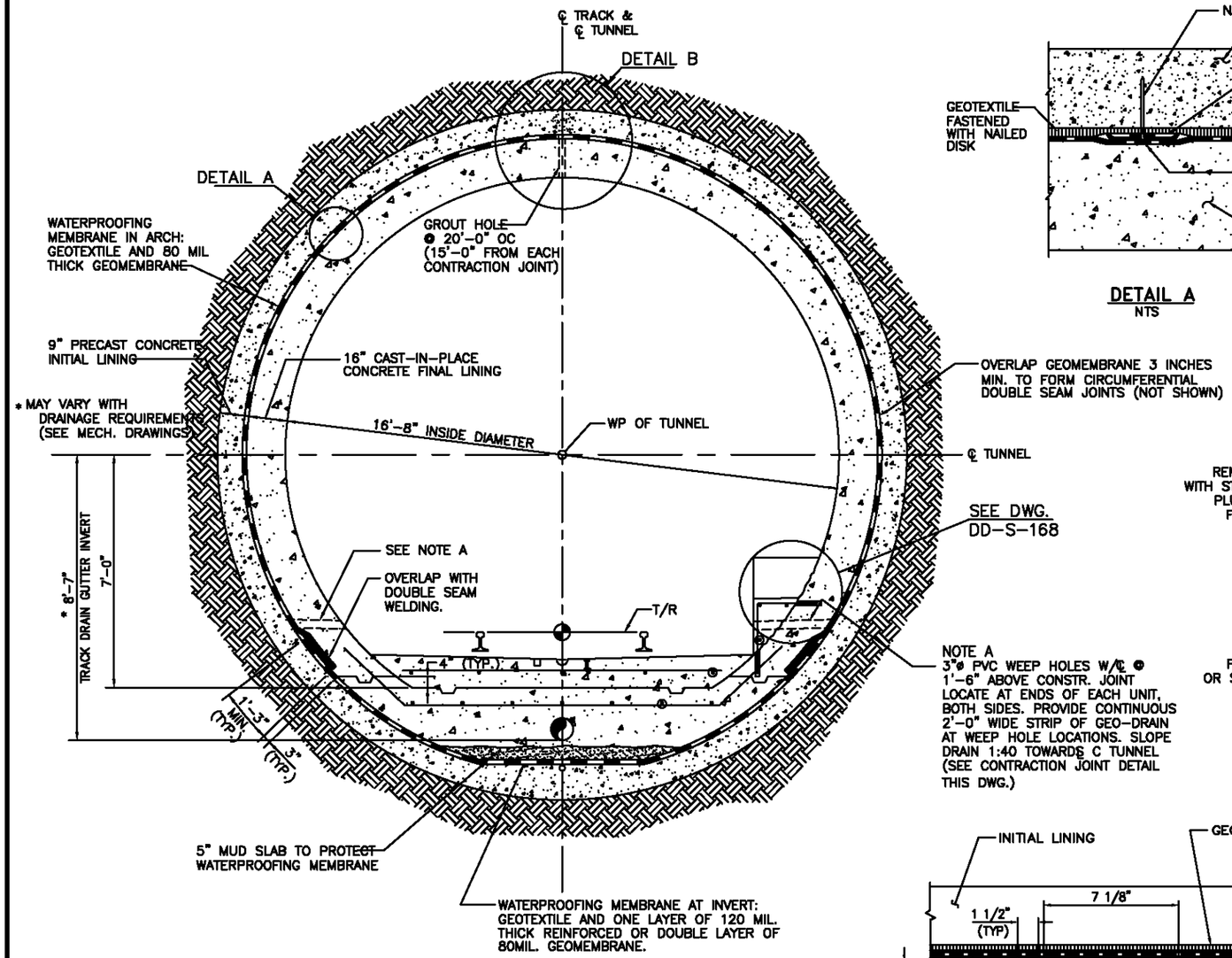
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
DETAILS FOR INSPECTION ACCESS AND DRAINAGE PROVISIONS

SCALE: NOT TO SCALE

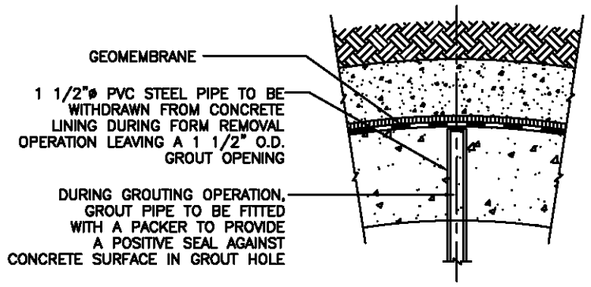
DRAWING NO.: DD-S-128



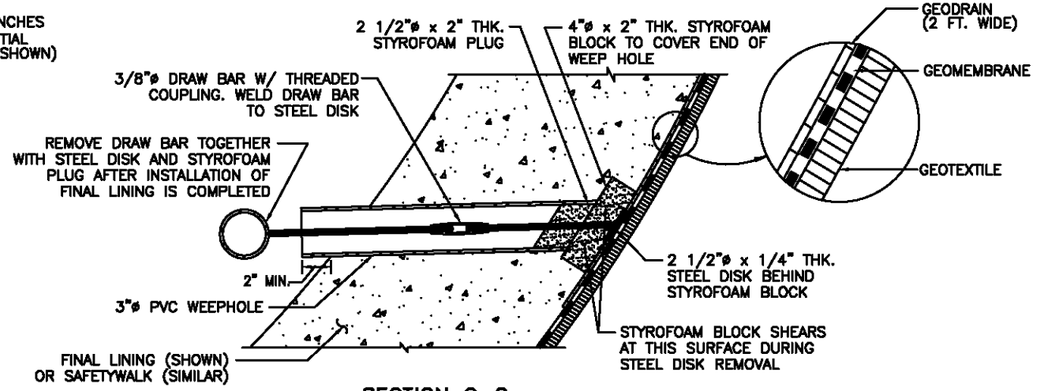
TYPICAL TUNNEL SECTION ON TANGENT

NOTE A
3"ø PVC WEEP HOLES W/℄ @ 1'-6" ABOVE CONSTR. JOINT LOCATE AT ENDS OF EACH UNIT, BOTH SIDES. PROVIDE CONTINUOUS 2'-0" WIDE STRIP OF GEO-DRAIN AT WEEP HOLE LOCATIONS. SLOPE DRAIN 1:40 TOWARDS ℄ TUNNEL (SEE CONTRACTION JOINT DETAIL THIS DWG.)

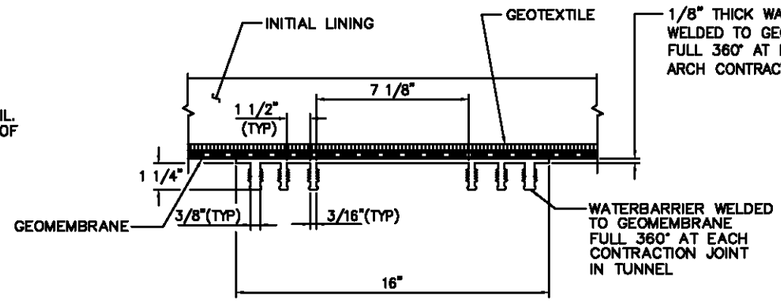
DETAIL A
NTS



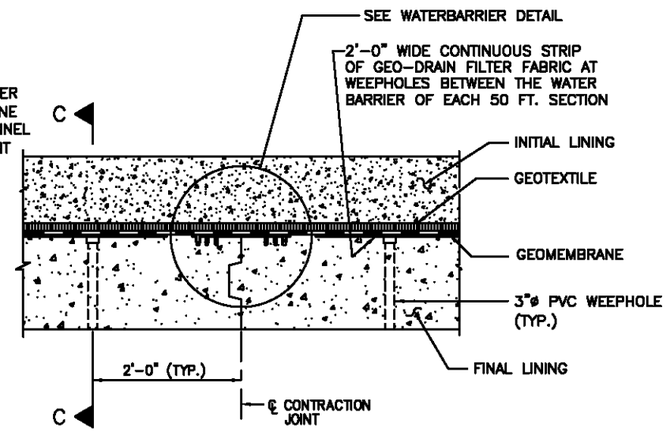
DETAIL B
NTS



SECTION C-C
NTS
(NOTE: DETAIL SIMILAR AT SAFETYWALK)



WATERBARRIER DETAIL
NOT TO SCALE



CONTRACTION JOINT DETAIL
NOT TO SCALE

NOTES:

1: FOR PRECAST CONCRETE INITIAL LINING DETAILS, SEE DWGS. DD-S-124, S-125 AND S-126.

2: FOR CAST-IN-PLACE CONCRETE FINAL LINING DETAILS, SEE DWGS. DD-S123 AND S-127.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	JR. MT.	02-96 DATE
DRAWN	JG.	02-96 DATE
CHECKED	MT. KM.	02-96 DATE
APPROVED	JR.	06-98 DATE
UPDATED	ENGA	08-00 DATE

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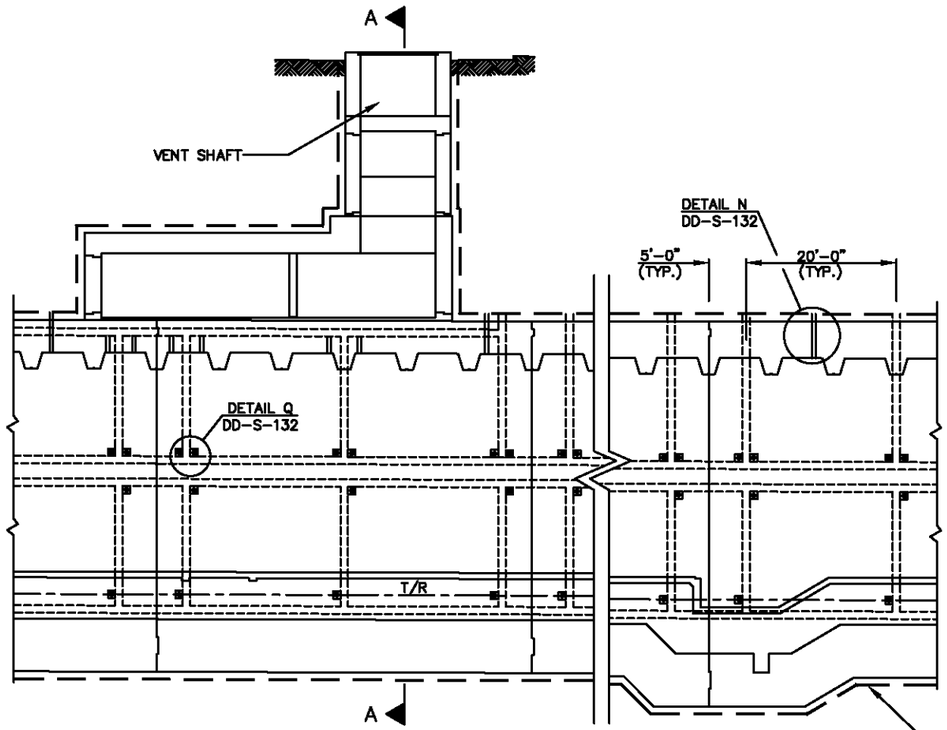
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

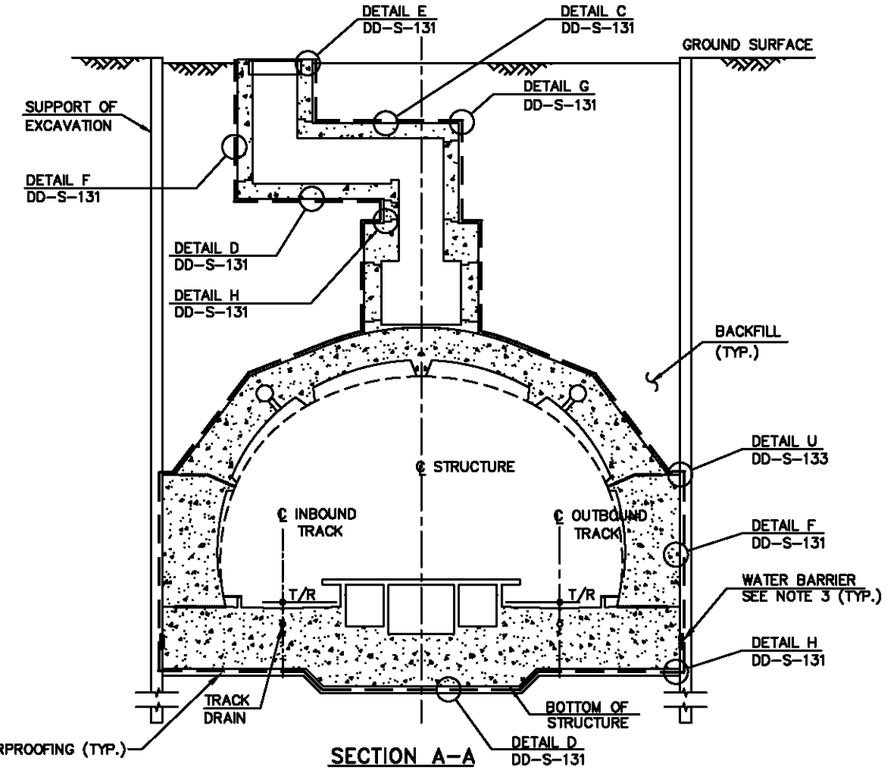
STRUCTURAL DESIGN DRAWING
TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL
WATERPROOFING DETAILS

SCALE 1/2"=1'-0" 1 0 1 2 AND AS NOTED

DRAWING NO. DD-S-129



LONGITUDINAL SECTION



SECTION A-A

NOTES:

1. GEOTEXTILE

   TYPE 1: 22 OZ/SY (285 MIL)
   TYPE 2: 28 OZ/SY (400 MIL)

   USE TYPE I AGAINST STRUCTURE WALL AND TYPE 2 AGAINST SUPPORT OF EXCAVATION.

   CHAMFER 2"x2" MIN. ALL CORNERS TO WHICH WATERPROOFING IS TO BE APPLIED.

2. PVC MEMBRANE

   SHALL BE NON REINFORCED 2.5MM (100 MIL) THICK

   WELD PATCH USING CONTINUOUS HOT WELD SEAMS TO MEMBRANE ON EVERY END.

   PVC MEMBRANE PATCH TO BE INSTALLED ONLY ON CORNERS.

3. WATER BARRIER

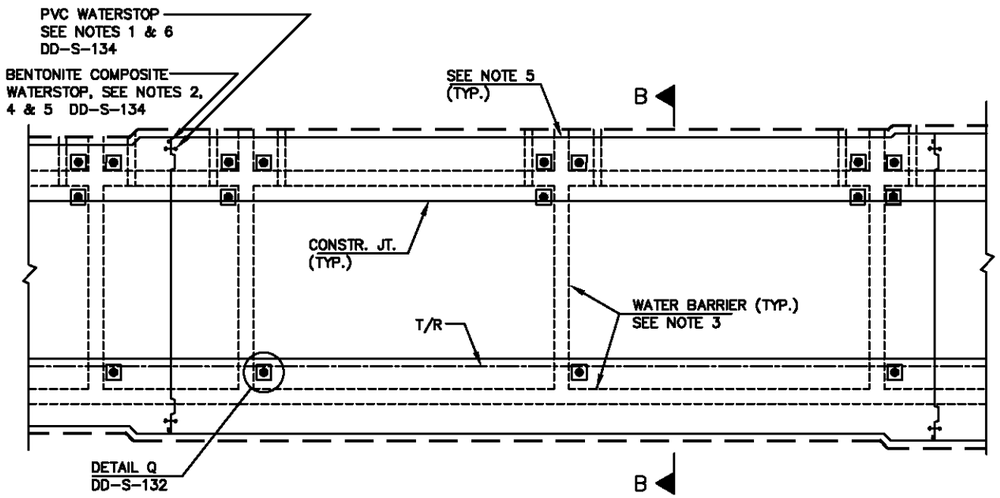
   INSTALL, U.O.N., AT 2' FROM TOP OF CONCRETE MUD SLAB.
   HANDWELD SPLICES BY SIDE WELD SEAMS.

4. PVC PIPE

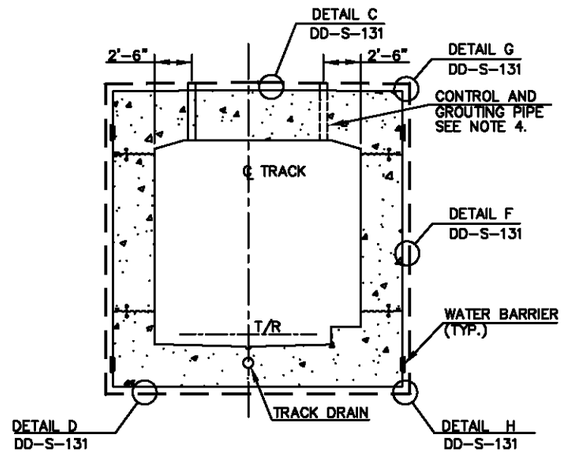
   SHALL BE 1" NOMINAL DIAMETER, SCHEDULE 40. APPLY SILICONE PASTE OR EQUAL BETWEEN PIPE AND SLEEVE.

5. CONTINUE VERTICAL WATER BARRIER ON THE ROOF.

6. SEE DWGS. DD-S-3, DD-S-14 AND DD-S-20 FOR DETAILS.



LONGITUDINAL SECTION



SECTION B-B

SINGLE BOX SHOWN (DOUBLE BOX SIMILAR)

LEGEND:

- WATERPROOFING
- WATER BARRIERS
- HORIZONTAL GROUNDING PIPES
- VERTICAL GROUTING PIPES

DESIGNED	K. BARNES	05-96 DATE
DRAWN	D. PRIME	05-96 DATE
CHECKED	J. PATEL	07-96 DATE
APPROVED	SEC(DCCO)	09-96 DATE
UPDATED	ENGA	06-00 DATE

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DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

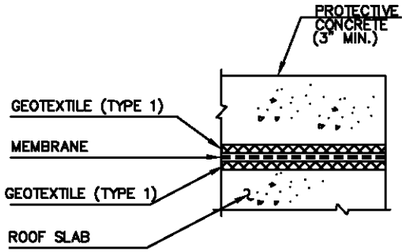
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

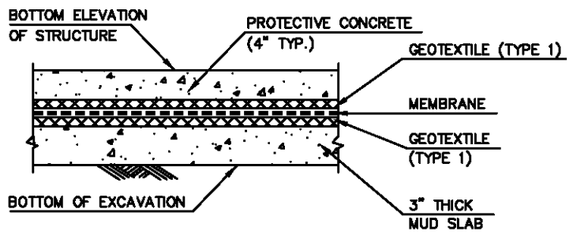
STRUCTURAL DESIGN DRAWING
CUT AND COVER STRUCTURES
PVC WATERPROOFING DETAILS, SHEET 1 OF 4

SCALE: NOT TO SCALE

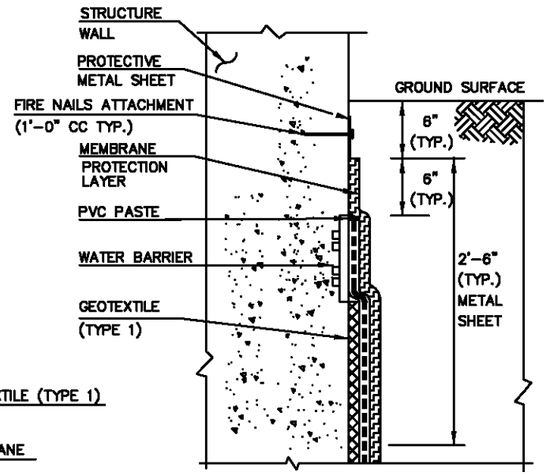
DRAWING NO.: DD-S-130



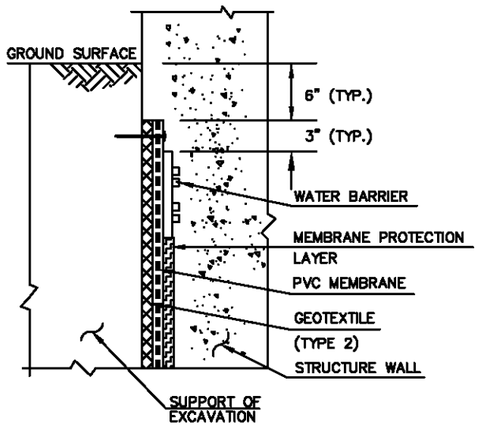
DETAIL C
DD-S-130
WATERPROOFING @ ROOF SLAB (TYP.)



DETAIL D
DD-S-130
DD-S-133
INVERT WATERPROOFING (TYP.)

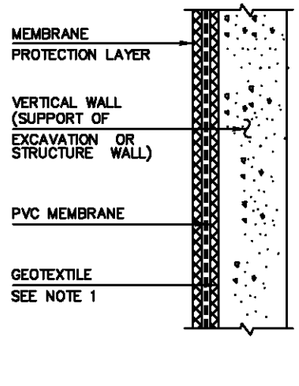


@ STRUCTURE WALL



@ SUPPORT OF EXCAVATION WALL

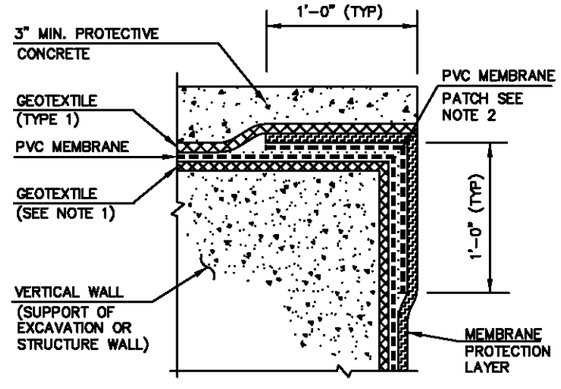
DETAIL E
DD-S-130
WATERPROOFING TERMINATION NEAR GROUND SURFACE (TYP.)



DETAIL F
DD-S-130
DD-S-133
WATERPROOFING @ VERTICAL WALLS (TYP.)

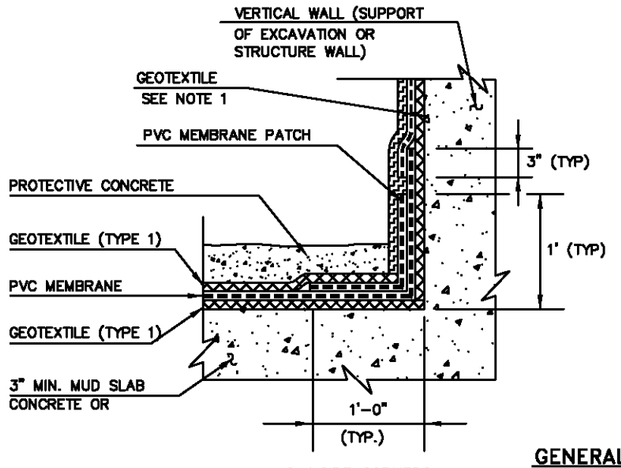
NOTES:

1. GEOTEXTILE
   TYPE 1: 22 OZ/SY (285 MIL)
   TYPE 2: 28 OZ/SY (400 MIL)
   USE TYPE I AGAINST STRUCTURE WALL AND TYPE 2 AGAINST SUPPORT OF EXCAVATION.
   CHAMFER ALL CORNERS TO WHICH WATERPROOFING IS TO BE APPLIED.
2. PVC MEMBRANE
   SHALL BE NON REINFORCED 2.5MM (100 MIL) THICK
   WELD PATCH USING CONTINUOUS HOT WELD SEAMS TO MEMBRANE ON EVERY END.
   PVC MEMBRANE PATCH TO BE INSTALLED ONLY ON CORNERS.
3. REVIEW THIS SHEET ALONG WITH DWGS. DD-S-130, DD-S-132 AND DD-S-133.



@ OUTSIDE CORNERS

DETAIL G
DD-S-130
DD-S-133



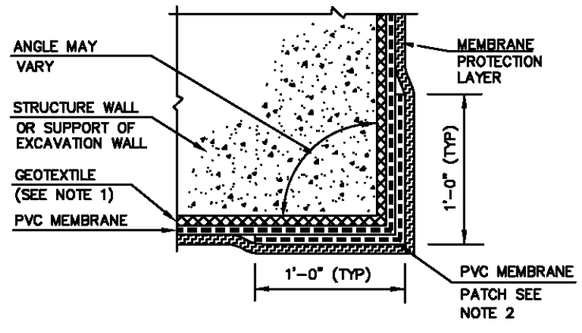
@ INSIDE CORNERS

DETAIL H
DD-S-130
DD-S-133

WATERPROOFING SLAB / WALL TRANSITION (TYP)

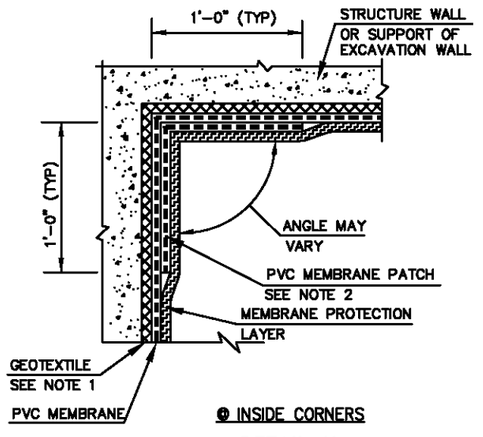
GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



@ OUTSIDE CORNERS

DETAIL J



@ INSIDE CORNERS

DETAIL K

PLAN – WATERPROOFING TRANSITION AT VERTICAL CORNERS (TYP.)

DESIGNED	K. BARNES	05-98 DATE
DRAWN	D. PRIME	05-98 DATE
CHECKED	J. PATEL	07-98 DATE
APPROVED	GEC(DCCO)	08-98 DATE
UPDATED	ENGA	06-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

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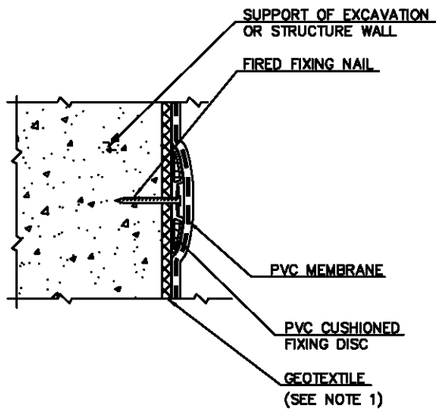
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
CUT AND COVER STRUCTURES
PVC WATERPROOFING DETAILS, SHEET 2 OF 4

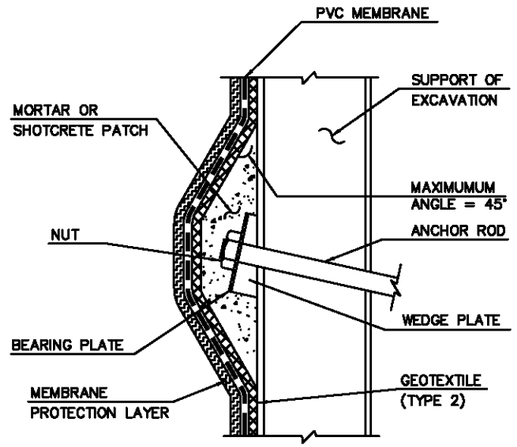
SCALE: NOT TO SCALE

DRAWING NO.: DD-S-131



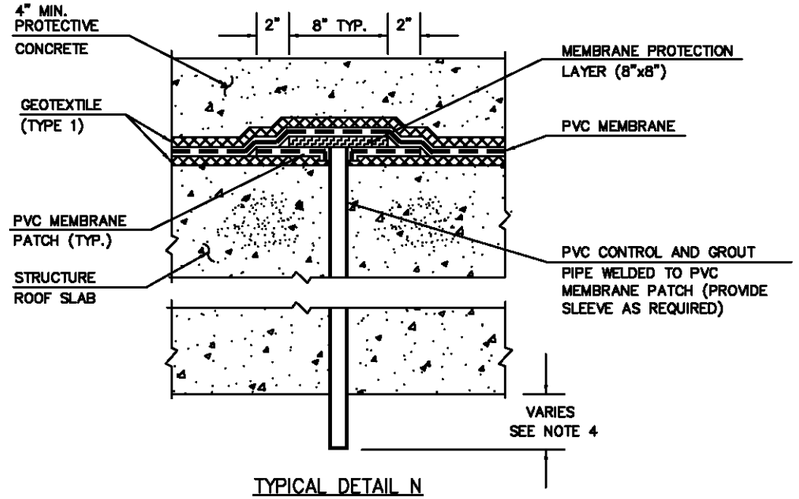
TYPICAL DETAIL L

MEMBRANE ATTACHMENT
FIRED FIXING NAIL AND STEEL WASHER



TYPICAL DETAIL M

WATERPROOFING AT TIE BACK
ANCHOR HEADS



TYPICAL DETAIL N

CONTROL AND GROUTING PIPE IN ROOF SLAB

NOTES:

1. GEOTEXTILE

   TYPE 1: 22 OZ/SY (285 MIL)

   TYPE 2: 28 OZ/SY (400 MIL)

   USE TYPE I AGAINST STRUCTURE WALL AND TYPE 2 AGAINST SUPPORT OF EXCAVATION.

   CHAMFER ALL CORNERS TO WHICH WATERPROOFING IS TO BE APPLIED.

2. PVC MEMBRANE

   SHALL BE NON REINFORCED 2.5MM (100 MIL) THICK.

   WELD PATCH USING CONTINUOUS HOT WELD SEAMS TO MEMBRANE ON EVERY END.

3. WATER BARRIER INTERSECTION

   PREMANUFACTURED BY MANUFACTURER OR AT WORKSHOP ON SITE.

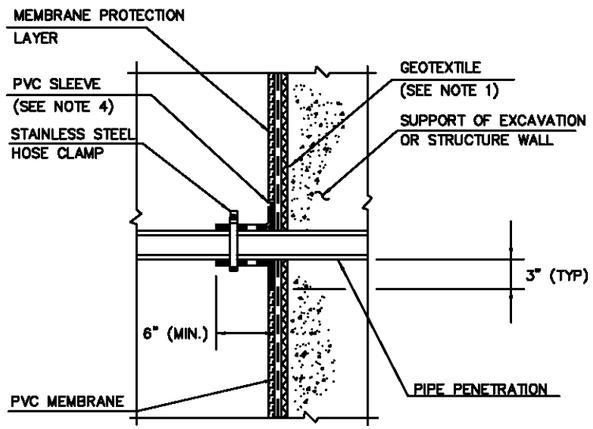
   HANDWELD SPLICES BY SIDE WELD SEAMS. OTHER INTERSECTION TYPES USE SIMILAR CONNECTION.

4. PVC PIPE

   WHEN VISIBLE IN PUBLIC AREAS: PROVIDE PVC PIPE WITH INSIDE THREADS AND REMOVABLE END CAP FLUSH WITH THE CONCRETE.

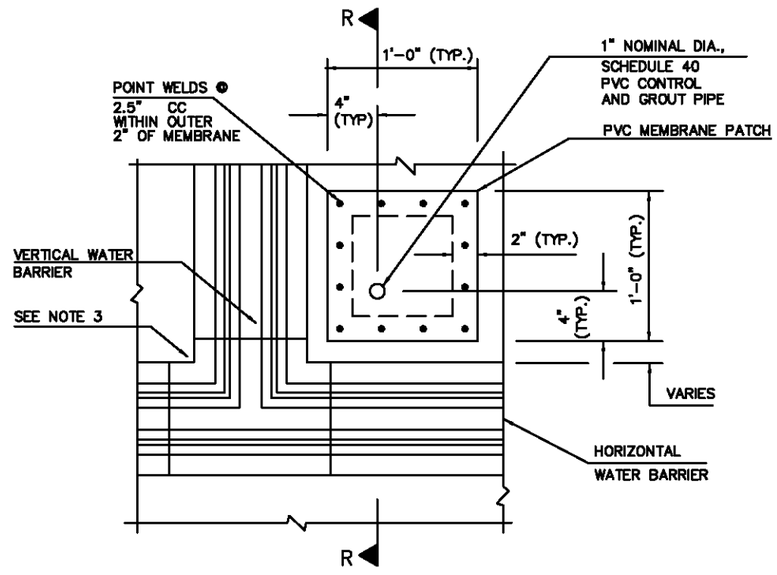
   WHEN NOT VISIBLE IN PUBLIC AREAS: 4" WITH OPEN END.

5. APPLY SILICONE PASTE OR EQUAL BETWEEN PVC PIPE AND SLEEVE.



TYPICAL DETAIL P

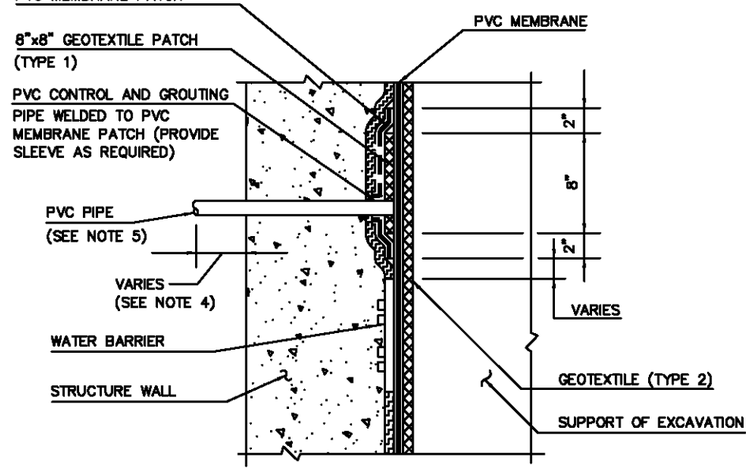
WATERPROOFING AT PIPE PENETRATIONS



ELEVATION

DETAIL Q

DD-S-130



SECTION R-R

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

SECTIONING CONTROL AND REPAIR SYSTEM
WATERPROOFING AT SUPPORT OF EXCAVATION WALL (TYPICAL)

DESIGNED	K. BARNES	05-99 DATE
DRAWN	D. PRIME	05-99 DATE
CHECKED	J. PATEL	07-99 DATE
APPROVED	GEC(DCCO)	09-95 DATE
UPDATED	ENGA	05-00 DATE

REFERENCE DRAWINGS	
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DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

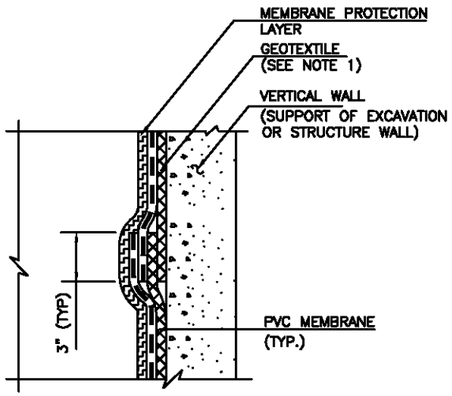
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
CUT AND COVER STRUCTURES
PVC WATERPROOFING DETAILS, SHEET 3 OF 4

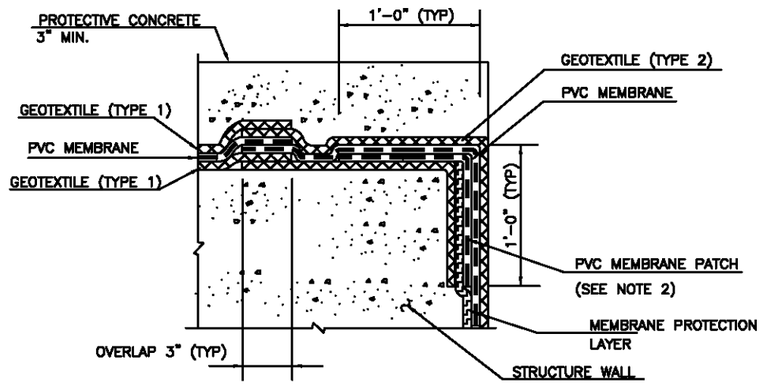
SCALE: NOT TO SCALE

DRAWING NO.: DD-S-132



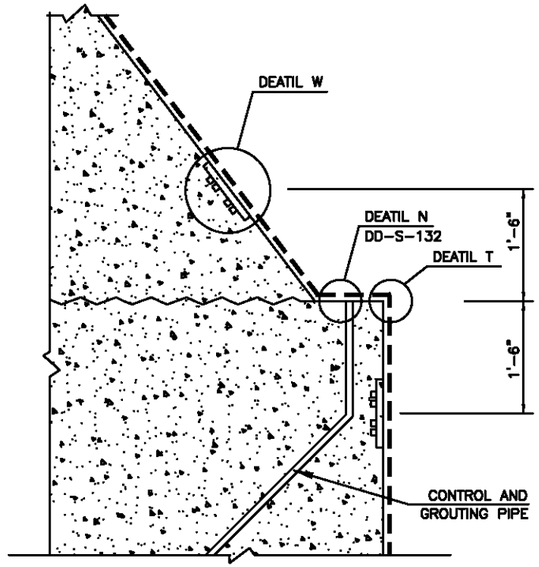
TYPICAL DETAIL S

WATERPROOFING CONNECTION AT VERTICAL WALLS



TYPICAL DETAIL T

WATERPROOFING CONNECTION FROM SUPPORT OF EXCAVATION WALL TO STRUCTURE SLAB

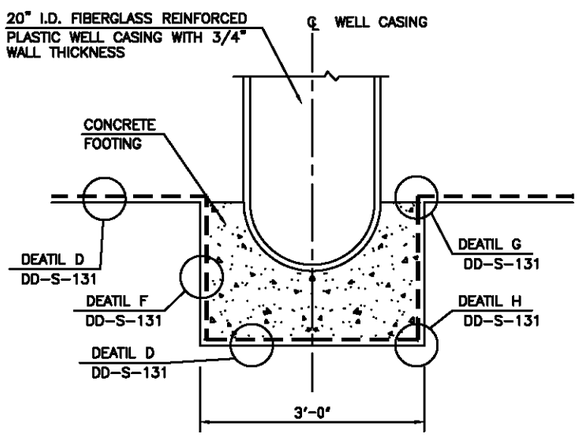


DETAIL U

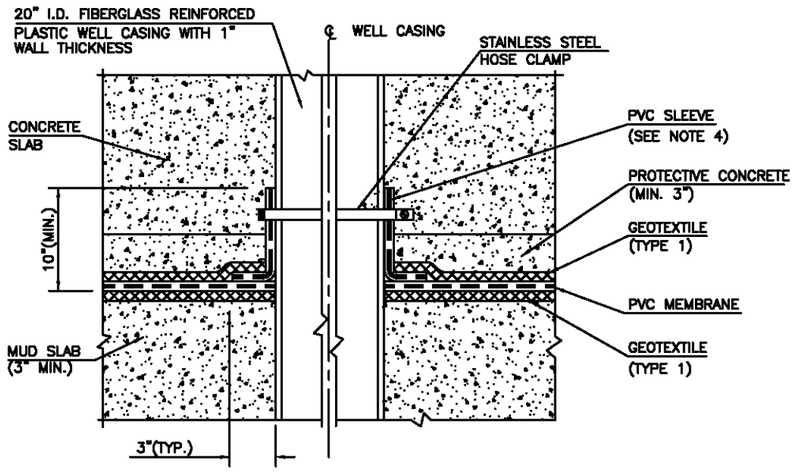
WATERPROOFING TRANSITION CONTROL AND GROUT PIPE AT VAULT SIDEWALL

NOTES:

1. GEOTEXTILE
   - TYPE 1: 22 OZ/SY (285 MIL)
   - TYPE 2: 28 OZ/SY (400 MIL)
   - USE TYPE I AGAINST STRUCTURE WALL AND TYPE 2 AGAINST SUPPORT OF EXCAVATION.
   - CHAMFER ALL CORNERS TO WHICH WATERPROOFING IS TO BE APPLIED.
2. PVC MEMBRANE
   - SHALL BE NON REINFORCED 2.5MM (100 MIL) THICK
   - WELD PATCH USING CONTINUOUS HOT WELD SEAMS TO MEMBRANE ON EVERY END.
   - PVC MEMBRANE PATCH TO BE INSTALLED AS SHOWN
3. WATER BARRIER
   - HANDWELD SPLICES BY SIDE WELD SEAMS.
4. APPLY SILICONE PASTE OR EQUAL BETWEEN WELL CASING AND SLEEVE.



SHALLOW



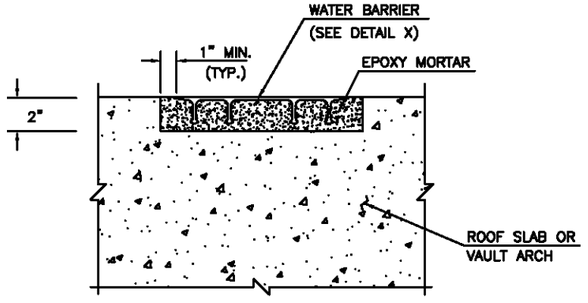
DEEP

DETAIL V

WATERPROOFING AT ELEVATOR'S HYDRAULIC CYLINDER CASING

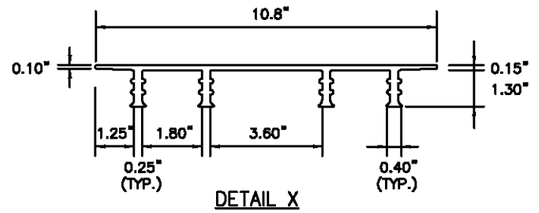
GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



DETAIL W

WATER BARRIER INSTALLATION IN ROOF SLAB OR VAULT ARCH



DETAIL X

TYPICAL WATER BARRIER CONFIGURATION

DESIGNED	K. BARNES	05-98 DATE
DRAWN	D. PRIME	05-98 DATE
CHECKED	J. PATEL	07-98 DATE
APPROVED	SEC(DCCO)	09-98 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

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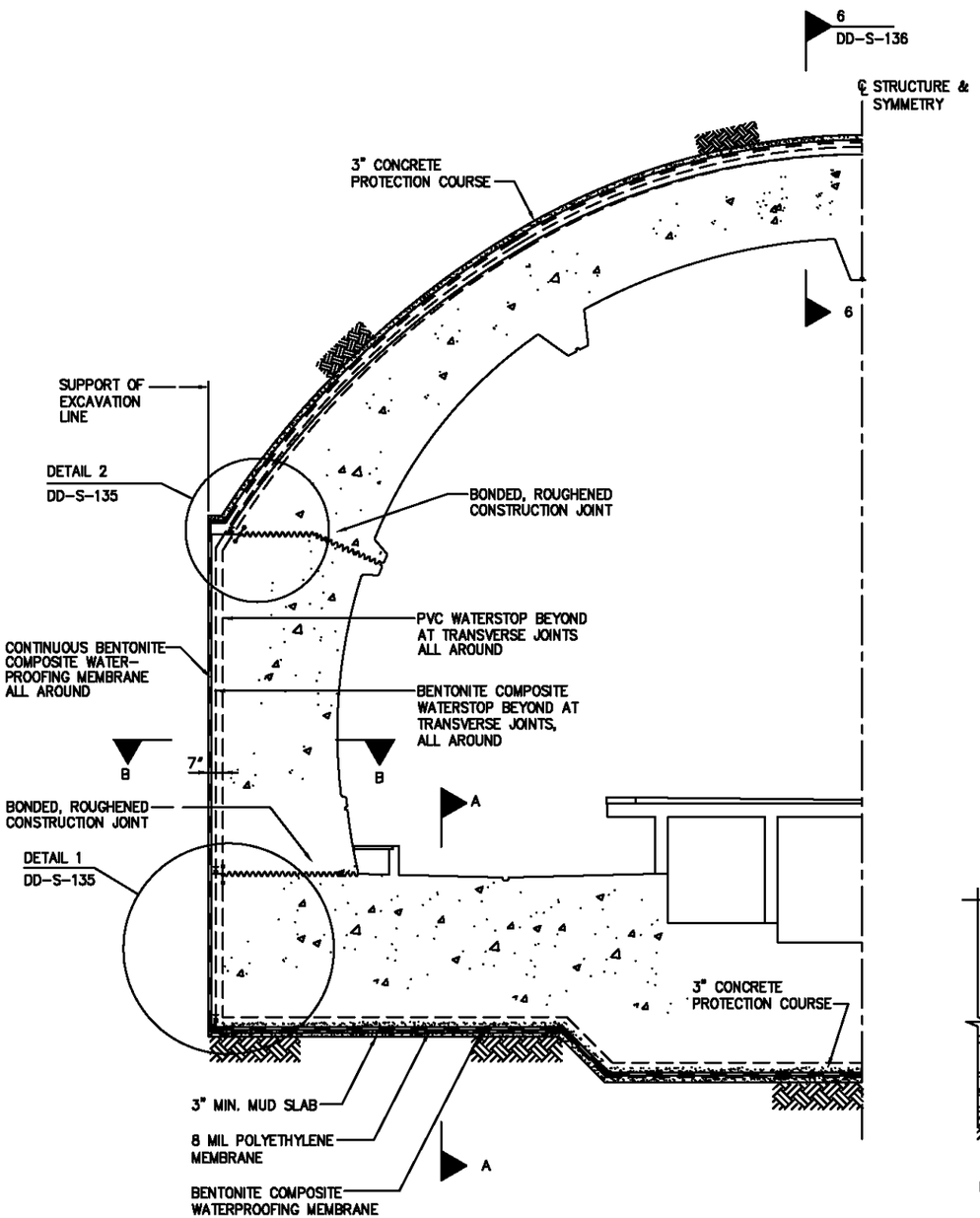
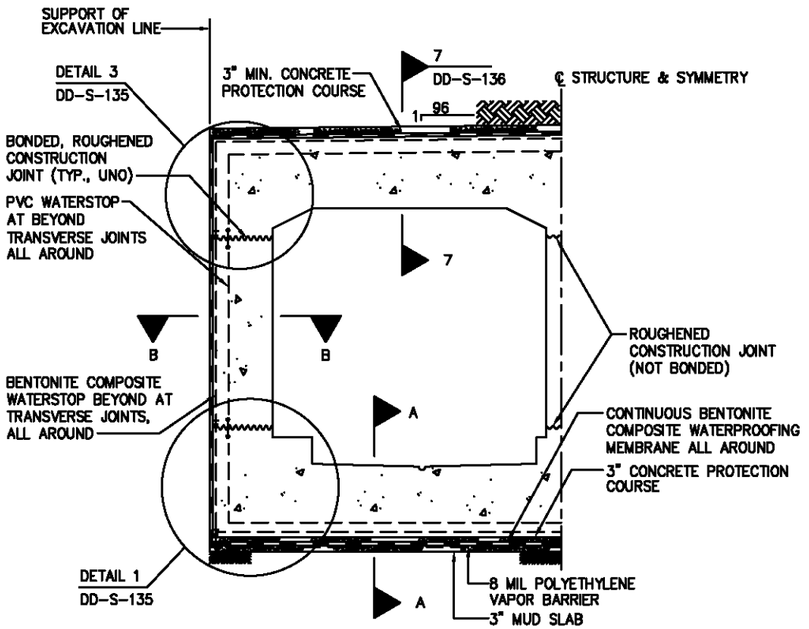
STRUCTURAL DESIGN DRAWING
CUT AND COVER STRUCTURES
PVC WATERPROOFING DETAILS, SHEET 4 OF 4

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-133



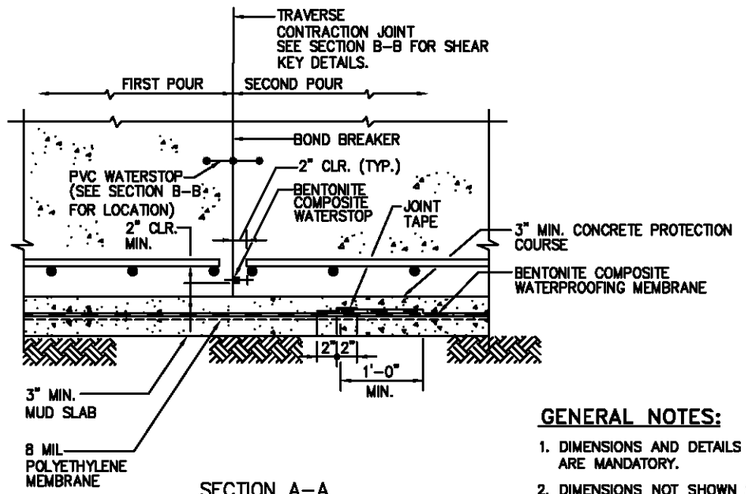
TYPICAL STATION CROSS SECTION



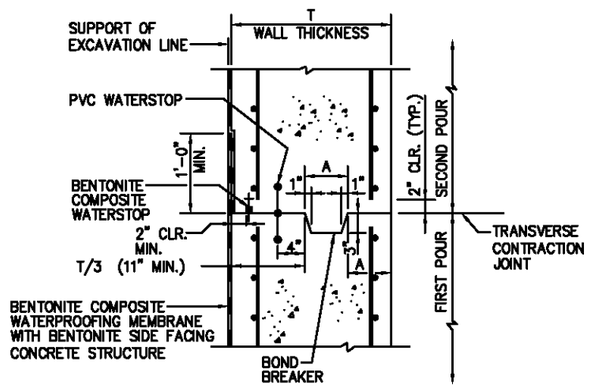
TYPICAL BOX TUNNEL CROSS SECTION

NOTES:

1. WATERPROOFING DETAILS FOR SHAFTS, AND SINGLE BOX TUNNEL SECTION TO BE CONTINUOUS ALL AROUND FOR THE ENTIRE LENGTH OF THE STRUCTURES.
2. BENTONITE COMPOSITE WATERSTOP, AND PVC WATERSTOP (DUMBBELL TYPE, CENTER BULB, 9 INCH WIDTH, 3/8 INCH STEM THICKNESS, 3/4 INCH BULBS) ARE TYPICAL FOR EXTERIOR TRANSVERSE CONTRACTION AND CONSTRUCTION JOINTS IN ROOFS, WALLS AND INVERT SLABS. PROVIDE BOND BREAKER AT CONTRACTION JOINTS ONLY.
3. THE MINIMUM SIZE OF BENTONITE COMPOSITE WATERSTOP SHALL BE 3/4 INCH THICK AND 1 INCH WIDE.
4. BENTONITE COMPOSITE WATERSTOP TO BE PLACED BETWEEN PVC WATERSTOP AND EXTERIOR FACE OF WALL OR SLAB, AS SHOWN. PROVIDE A MINIMUM OF 2" OF CONCRETE COVER ADJACENT TO THE WATERSTOP.
5. BENTONITE COMPOSITE WATERSTOP IN HORIZONTAL LONGITUDINAL DIRECTION SHALL BE LINED UP & ADHERED TO BENTONITE IN VERTICAL DIRECTION AT TRANSVERSE CONTRACTION JOINTS.
6. PVC WATERSTOP IN HORIZONTAL LONGITUDINAL DIRECTION SHALL BE LINED UP & WELDED TO VERTICAL PVC WATERSTOP AT TRANSVERSE CONTRACTION JOINTS.
7. FOR PIPE PENETRATION DETAILS AT ROOF SLAB, SEE DETAIL 4 / DD-S-135.
8. FOR PIPE PENETRATION DETAILS AT WALLS, SEE DETAIL 5 / DD-S-135.



SECTION A-A



SECTION B-B

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	C. BELLAM	1-98 DATE
DRAWN	J. SOUCY	2-98 DATE
CHECKED	A. B.	3-98 DATE
APPROVED	GEC(DCCO)	3-98 DATE
UPDATED	ENGA	9-98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

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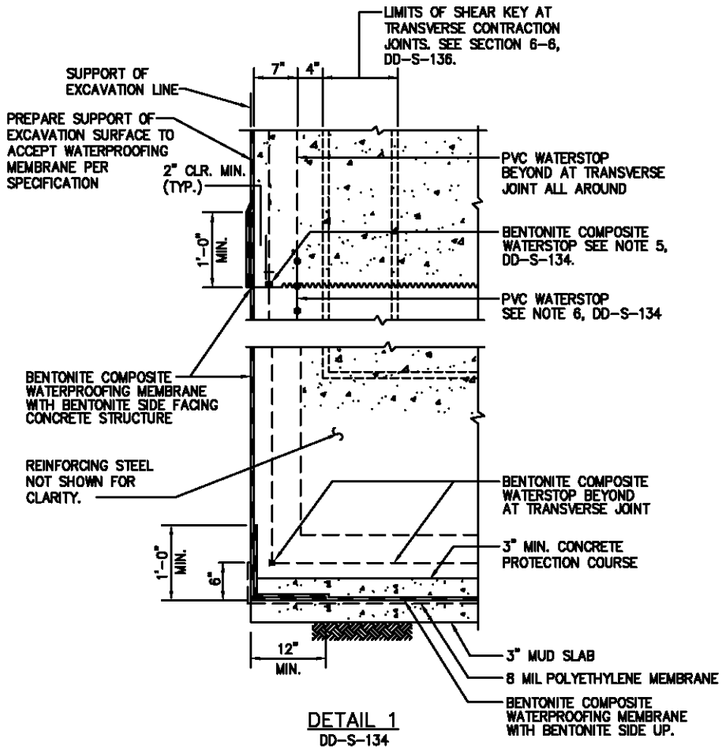
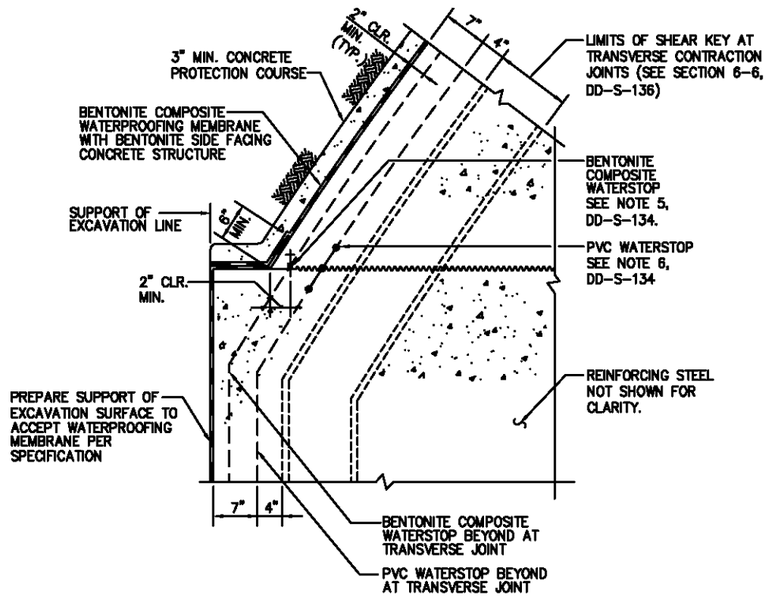
STRUCTURAL DESIGN DRAWING
CUT AND COVER STRUCTURES
BENTONITE WATERPROOFING DETAILS
SHEET 1 OF 3

SCALE: NOT TO SCALE

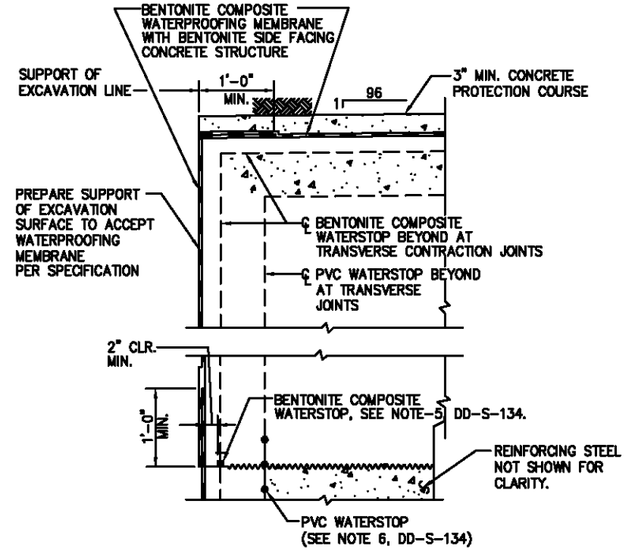
DRAWING NO.: DD-S-134



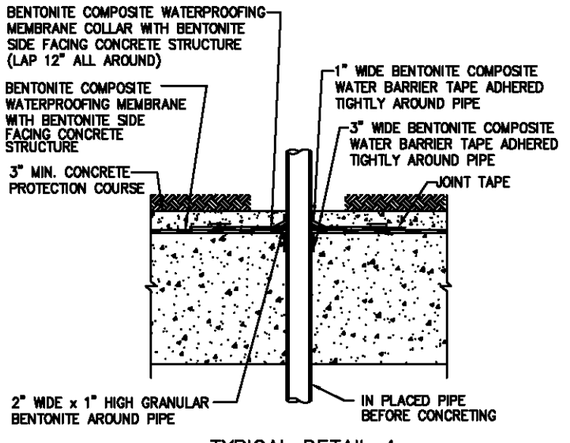
DETAIL 1
DD-S-134



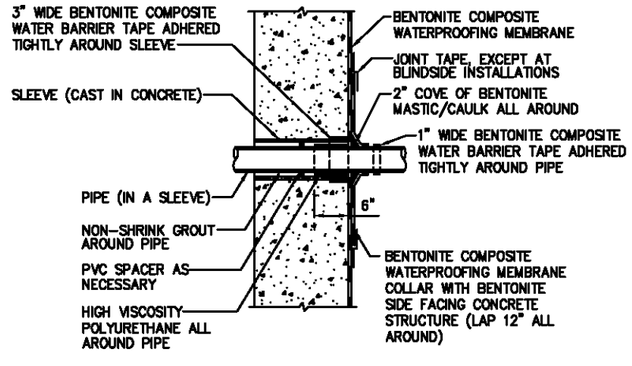
DETAIL 2
DD-S-134



DETAIL 3
DD-S-134



TYPICAL DETAIL 4
PIPE PENETRATION DETAIL
AT ROOF SLAB



TYPICAL DETAIL 5
PIPE PENETRATION DETAILS
AT WALLS

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

NOTES:

1. WATERPROOFING DETAILS FOR SHAFTS, AND SINGLE BOX TUNNEL SECTION TO BE CONTINUOUS ALL AROUND FOR THE ENTIRE LENGTH OF THE STRUCTURES.
2. BENTONITE COMPOSITE WATERSTOP, AND PVC WATERSTOP (DUMBBELL TYPE, CENTER BULB, 9 INCH WIDTH, 3/8 INCH STEM THICKNESS, 3/4 INCH BULBS) ARE TYPICAL FOR EXTERIOR TRANSVERSE CONTRACTION AND CONSTRUCTION JOINTS IN ROOFS, WALLS AND INVERT SLABS. PROVIDE BOND BREAKER AT CONTRACTION JOINTS ONLY.
3. THE MINIMUM SIZE OF BENTONITE COMPOSITE WATERSTOP SHALL BE 3/4 INCH THICK AND 1 INCH WIDE.
4. BENTONITE COMPOSITE WATERSTOP TO BE PLACED BETWEEN PVC WATERSTOP AND EXTERIOR FACE OF WALL OR SLAB, AS SHOWN. PROVIDE A MINIMUM OF 2" OF CONCRETE COVER ADJACENT TO THE WATERSTOP.
5. BENTONITE COMPOSITE WATERSTOP IN HORIZONTAL LONGITUDINAL DIRECTION SHALL BE LINED UP & ADHERED TO BENTONITE IN VERTICAL DIRECTION AT TRANSVERSE CONTRACTION JOINTS.
6. PVC WATERSTOP IN HORIZONTAL LONGITUDINAL DIRECTION SHALL BE LINED UP & WELDED TO VERTICAL PVC WATERSTOP AT TRANSVERSE CONTRACTION JOINTS.

DESIGNED	C. BELLAM	1-98 DATE
DRAWN	J. SOUCY	2-98 DATE
CHECKED	A. B.	3-98 DATE
APPROVED	GEC(DCCO)	3-98 DATE
UPDATED	ENGA	9-98 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
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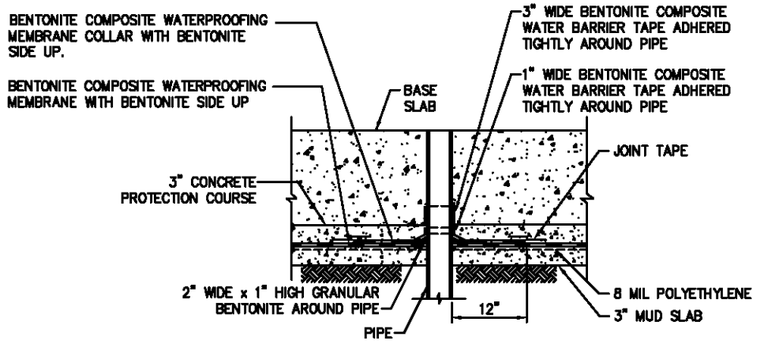
STRUCTURAL DESIGN DRAWING
CUT AND COVER STRUCTURES
BENTONITE WATERPROOFING DETAILS
SHEET 2 OF 3

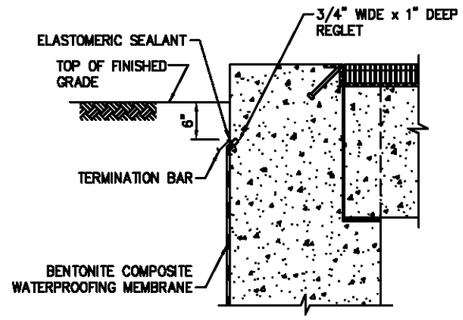
SCALE: NOT TO SCALE

DRAWING NO.: DD-S-135



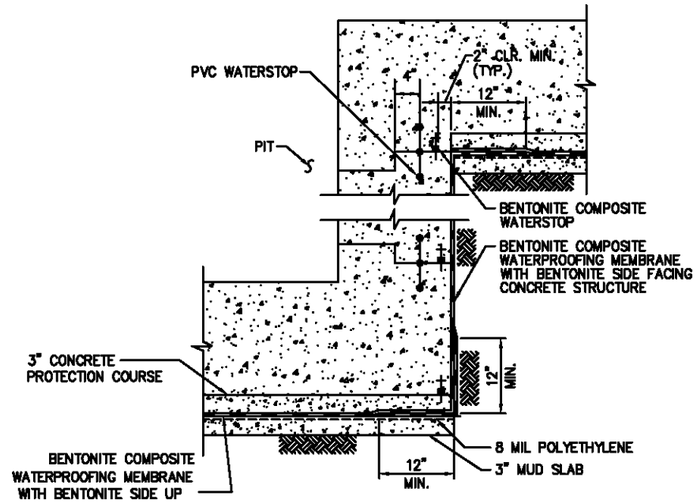
TYPICAL DETAIL 6

PIPE PENETRATION DETAIL
AT BASE SLAB



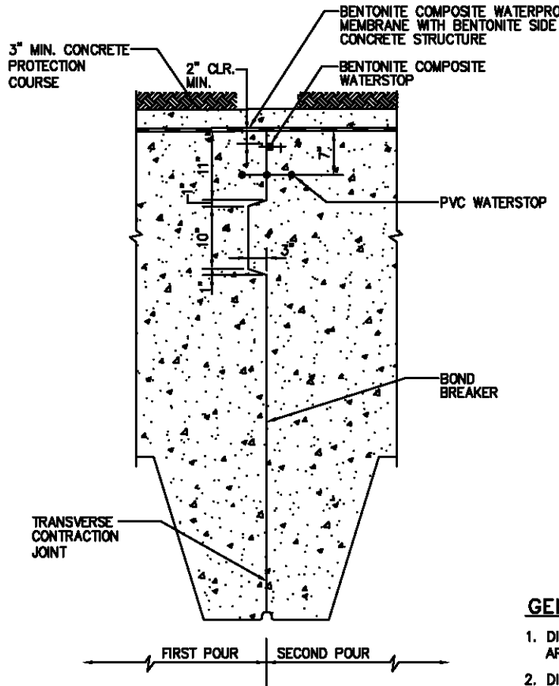
TYPICAL DETAIL 7

WATERPROOFING MEMBRANE
TERMINATION



TYPICAL DETAIL 8

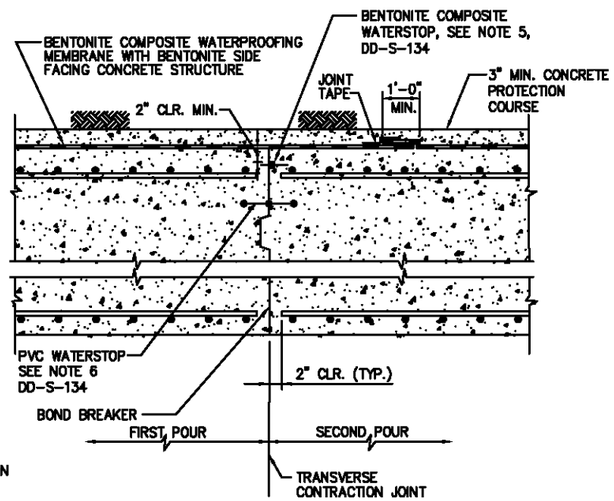
WATERPROOFING AT
PITS BELOW BASE SLABS



SECTION 6-6
DD-S-134

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



SECTION 7-7
DD-S-134

NOTES:

1. WATERPROOFING DETAILS FOR SHAFTS, AND SINGLE BOX TUNNEL SECTION TO BE CONTINUOUS ALL AROUND FOR THE ENTIRE LENGTH OF THE STRUCTURES.
2. BENTONITE COMPOSITE WATERSTOP, AND PVC WATERSTOP (DUMBBELL TYPE, CENTER BULB, 9 INCH WIDTH, 3/8 INCH STEM THICKNESS, 3/4 INCH BULBS) ARE TYPICAL FOR EXTERIOR TRANSVERSE CONTRACTION AND CONSTRUCTION JOINTS IN ROOFS, WALLS AND INVERT SLABS. PROVIDE BOND BREAKER AT CONTRACTION JOINTS ONLY.
3. THE MINIMUM SIZE OF BENTONITE COMPOSITE WATERSTOP SHALL BE 3/4 INCH THICK AND 1 INCH WIDE.
4. BENTONITE COMPOSITE WATERSTOP TO BE PLACED BETWEEN PVC WATERSTOP AND EXTERIOR FACE OF WALL OR SLAB, AS SHOWN. PROVIDE A MINIMUM OF 2" OF CONCRETE COVER ADJACENT TO THE WATERSTOP.
5. BENTONITE COMPOSITE WATERSTOP IN HORIZONTAL LONGITUDINAL DIRECTION SHALL BE LINED UP & ADHERED TO BENTONITE IN VERTICAL DIRECTION AT TRANSVERSE CONTRACTION JOINTS.
6. PVC WATERSTOP IN HORIZONTAL LONGITUDINAL DIRECTION SHALL BE LINED UP & WELDED TO VERTICAL PVC WATERSTOP AT TRANSVERSE CONTRACTION JOINTS.

DESIGNED	C. BELLAM	1-98 DATE
DRAWN	J. SOUCY	2-98 DATE
CHECKED	A. B.	3-98 DATE
APPROVED	GED(DCCO)	3-98 DATE
UPDATED	ENGA	6-98 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

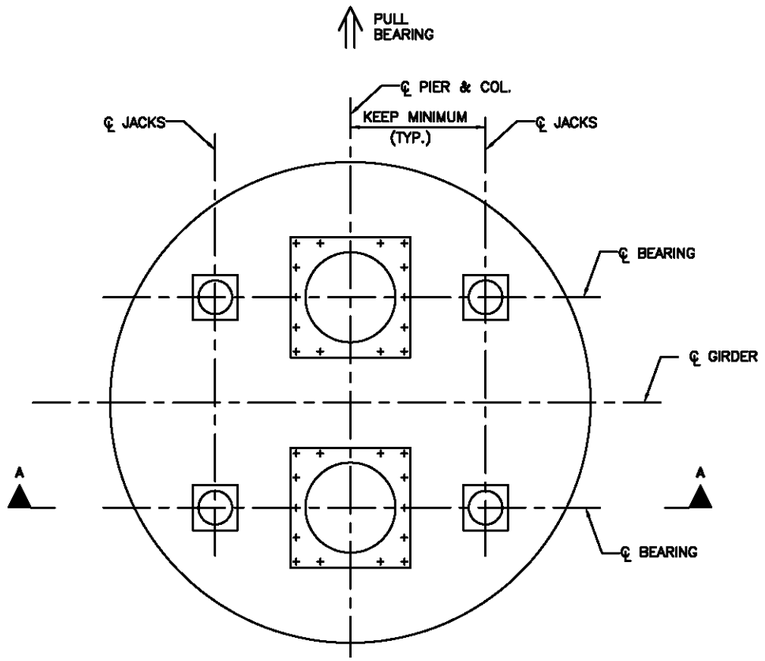
APPROVED _____ DIRECTOR

5/2001 DATE

STRUCTURAL DESIGN DRAWING
CUT AND COVER STRUCTURES
BENTONITE WATERPROOFING DETAILS
SHEET 3 OF 3

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-136



PLAN – FIXED BEARINGS
PIER CAP SHOWN

NOTES:

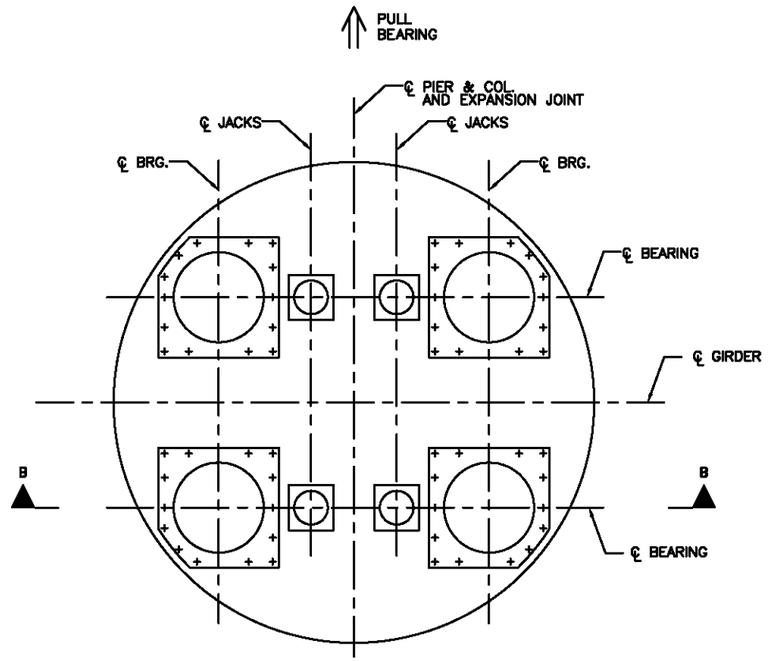
1. CONTRACTOR SHALL SUBMIT JACKING PROCEDURES TO THE ENGINEER FOR APPROVAL.
2. ALL JACKS IN THE SYSTEM SHALL BE SYNCHRONIZED FOR VERTICAL TRAVEL.
3. BRIDGE SHALL BE DESIGNED FOR THE JACKING LOAD IN ACCORDANCE WITH THE LIFTING OPERATION SEQUENCE.
4. EACH JACK SHALL HAVE A MINIMUM CAPACITY OF 200% JACK DESIGN LOAD.
5. JACKING LOCATION TO BE DETERMINED BY DESIGNER.

SUGGESTED SEQUENCE OF LIFTING OPERATION

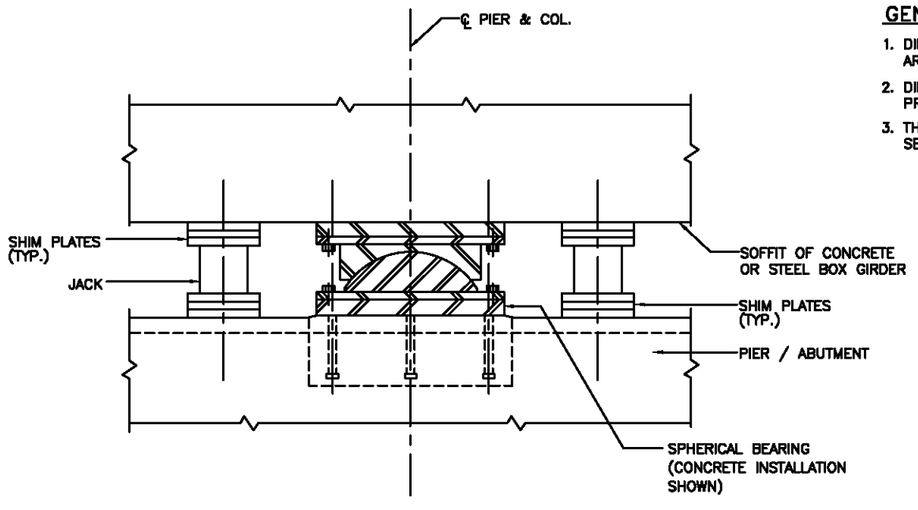
1. UNCLIP RAILS A MINIMUM DISTANCE OF 30FT. ON BOTH SIDES OF THE ABUTMENT/PIER AS REQUIRED BY THE ENGINEER. TEMPORARILEY REMOVE RAIL AT THE JOINT.
2. LIFT AND SHIM THE BRIDGE SPAN IN A MAX. OF 1/2" INCREMENTS, UNTIL THE FINAL LIFT ELEVATION IS REACHED.
3. JACK END OF THE SPAN AT EXPANSION JOINT. JACK ONE END TO A MAX. OF 1/2" AT A TIME. EXPANSION SEAL AT THE JOINT SHALL BE REPLACED WITH A NEW SEAL.
4. PROVIDE BLOCK ADJACENT TO THE JACK. BLOCK BRIDGE PROPERLY IN PLACE WHEN FINAL LIFT ELEVATION IS REACHED. REMOVE DISTRESSED BEARINGS.
5. INSPECT BEARING SURFACE, REPAIR IF REQUIRED. CLEAN BEARING SURFACES AND INSTALL NEW BEARINGS.
6. ACTIVATE JACKING SYSTEM. UNBLOCK BRIDGE SPAN, LOWER SPAN GRADUALLY IN 1/2" INCREMENT UNTIL PROPERLY SEATED ON NEW BEARINGS.
7. REATTACH RAILS TO PREVIOUSLY SPECIFIED CONDITIONS.

GENERAL NOTES:

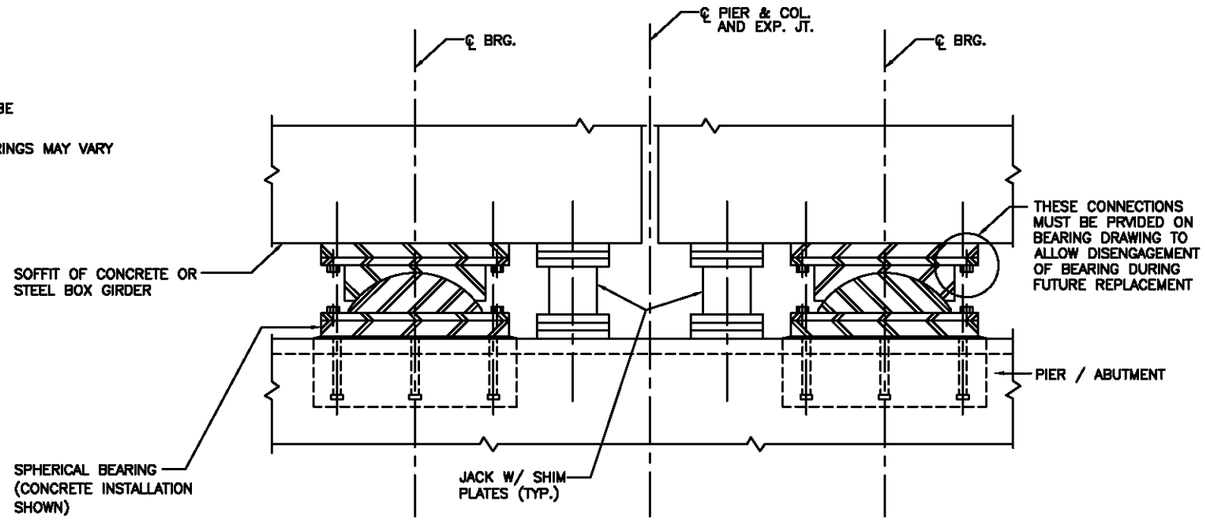
1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. THE LOCATION OF JACKS & BEARINGS MAY VARY SEE DWG DD–S–91A OR 91B.



PLAN – EXPANSION BEARINGS
PIER CAP SHOWN
(FIXED BEARING SIMILAR AT SIMPLE SPAN BRIDGES)



SECTION A–A



SECTION B–B

DESIGNED	K. BARNES	05–98 DATE
DRAWN	D. PRIME	05–98 DATE
CHECKED	R. FENG	06–98 DATE
APPROVED	GEC(DCCD)	06–98 DATE
UPDATED	ENGA	06–00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
06/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

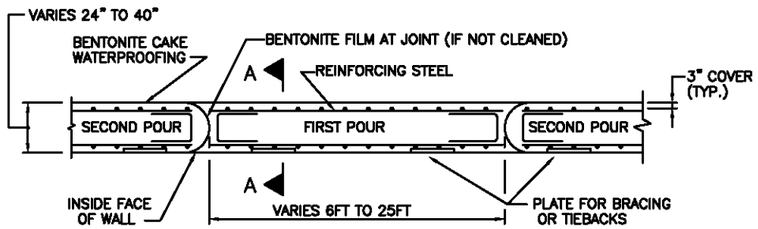
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

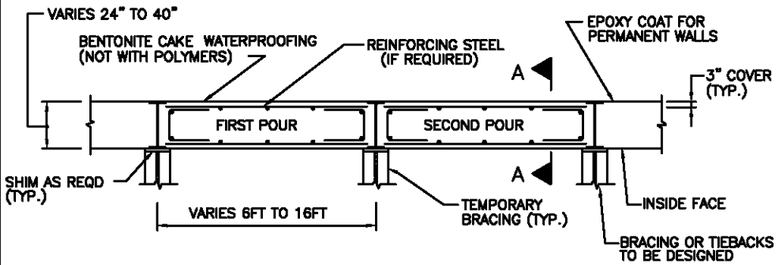
STRUCTURAL DESIGN DRAWING
BOX GIRDER
BEARING REPLACEMENT DETAILS

SCALE: NOT TO SCALE

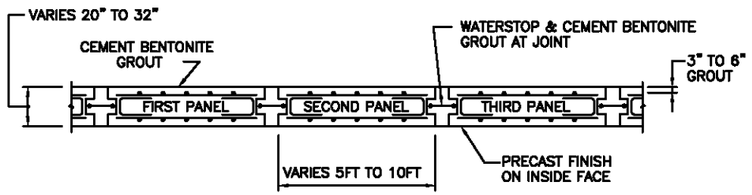
DRAWING NO.: DD–S–137



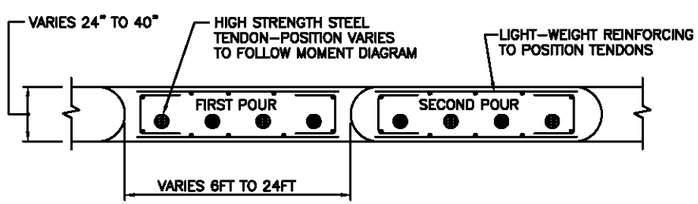
CONVENTIONAL REINFORCED CONCRETE WALL



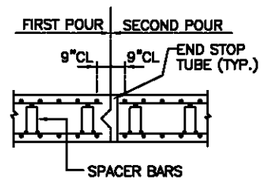
SOLDIER BEAM AND CONCRETE LAGGING WALL



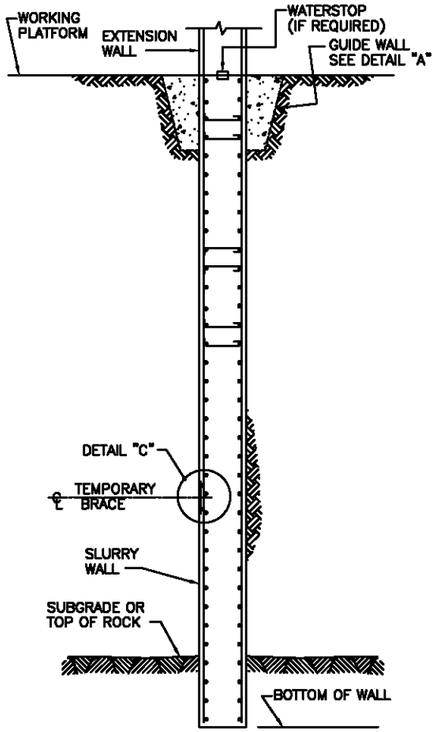
PRECAST CONCRETE PANEL WALL



POST TENSIONED CONCRETE WALL

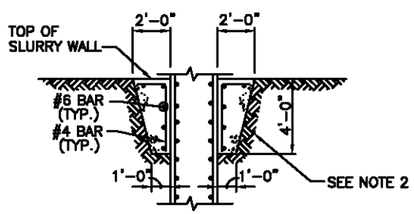


CONVENTIONAL REINFORCED CONCRETE WALL WITH SQUARE JOINT



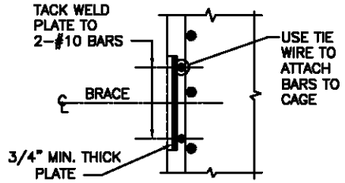
SECTION A–A

TEMPORARY INTERIOR BRACE OR TIEBACK ANCHORS

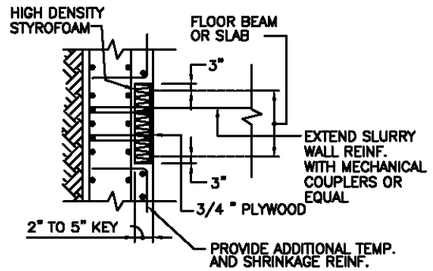


DETAIL "A"

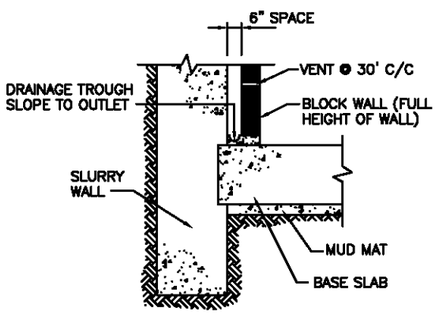
GUIDE WALL



DETAIL "C"



TYPICAL FLOOR BEAM OR SLAB KEY

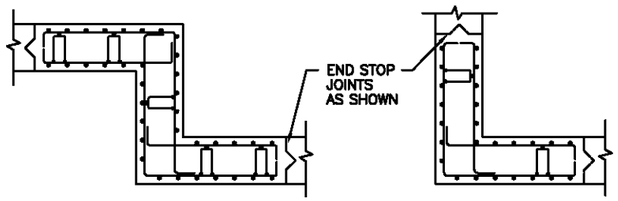


WALL DRAINAGE DETAILS

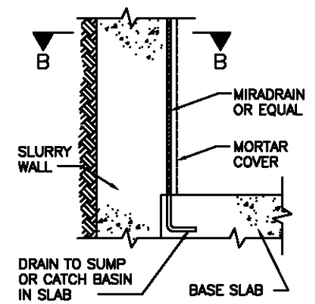
(REINFORCMENT NOT SHOWN)

NOTES:

1. BASED ON THE SOIL TYPE AND EXCAVATION EQUIPMENT GUIDE WALL MAY BE MODIFIED.
2. FOR PERMANENT SLURRY WALLS BONDING WILL BE REQUIRED.

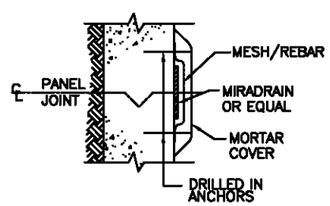


CORNER PANELS



WALL WATERPROOFING AT JOINTS

OPTION – CEMENT WATERPROOFING–LOW HEADS



SECTION B–B

DESIGNED	MRCE	05–98 DATE
DRAWN	MRCE	05–98 DATE
CHECKED	R. FENG	05–98 DATE
APPROVED	GEC(DCCO)	09–98 DATE
UPDATED	ENGA	05–00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

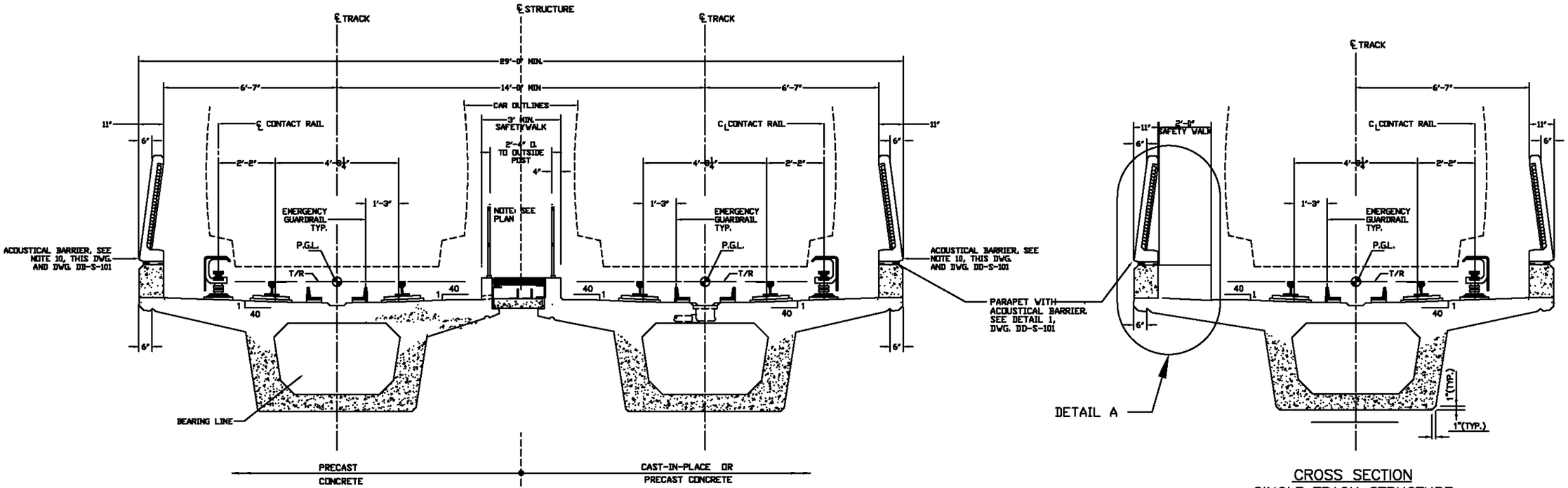
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

SLURRY WALL DETAILS

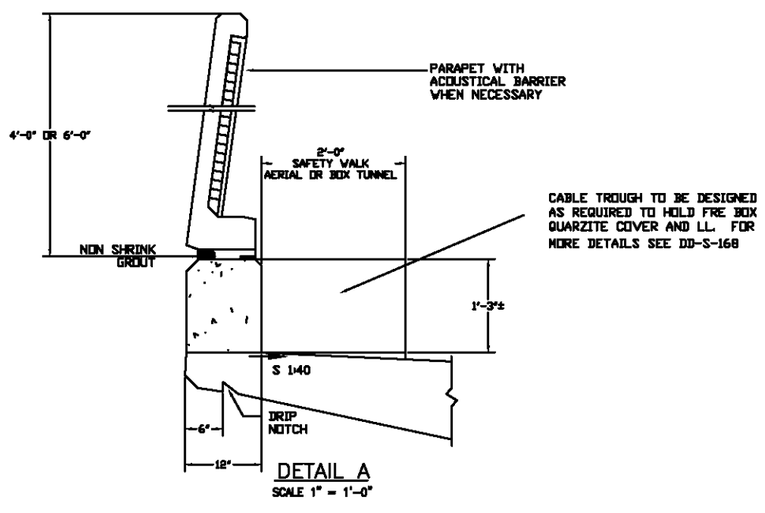
SCALE: NOT TO SCALE

DRAWING NO.: DD–S–138



CROSS SECTION
DOUBLE TRACK STRUCTURE
TANGENT

CROSS SECTION
SINGLE TRACK STRUCTURE



DETAIL A
SCALE 1" = 1'-0"

NOTES:

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESS AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. THE DRAWING REPRESENTS EITHER CAST-IN-PLACE OR PRECAST CONCRETE CONSTRUCTION.
4. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
5. PIER COLUMNS AND PIER CAPS SHALL BE CONCRETE.
6. ACOUSTICAL BARRIER TO BE USED ONLY AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILINGS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
7. ATTACHMENTS TO PRESTRESSED GIRDERS SHALL BE MADE BY WELDING TO EMBEDDED PLATES OR EMBEDDED FITTINGS. NO ATTACHMENTS SHALL BE MADE BY DRILLING INTO GIRDER EXCEPT FOR TRACK FASTENERS AND APPURTENANCES AND AS LIMITED BY DD-T-1 AND DD-S-93.
8. HANDRAIL POSTS SHALL BE INSTALLED IN A VERTICAL POSITION. FOR DETAIL SEE DWG DD-S-093.
9. FOR SAFETY WALK/RAILING PLAN, SEE DWG. DD-S-090.
10. FOR DETAILS OF INSPECTION AND DRAINAGE PROVISIONS, SEE DWG. DD-S-128. BOX SIZE SHALL BE ADEQUATE FOR TRAVEL INSIDE THE BOX FOR INSPECTION.
11. FOR MIN. PT ANCHORAGE END BLOCK REQUIREMENT, SEE DD-S-91G.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR DETAILS AT BEARINGS & PIER CAP SEE DWG. DD-S-91A OR 91B.

DESIGNED	CHYIRY	6-71 DATE
DRAWN	RINALDI	6-71 DATE
CHECKED	A.B.	7-71 DATE
APPROVED	GEC(DCCO)	07-71 DATE
UPDATE	ENGA	05-02 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-101	Acoustical barrier
DD-S-168	Safety walk/Cable Trough

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

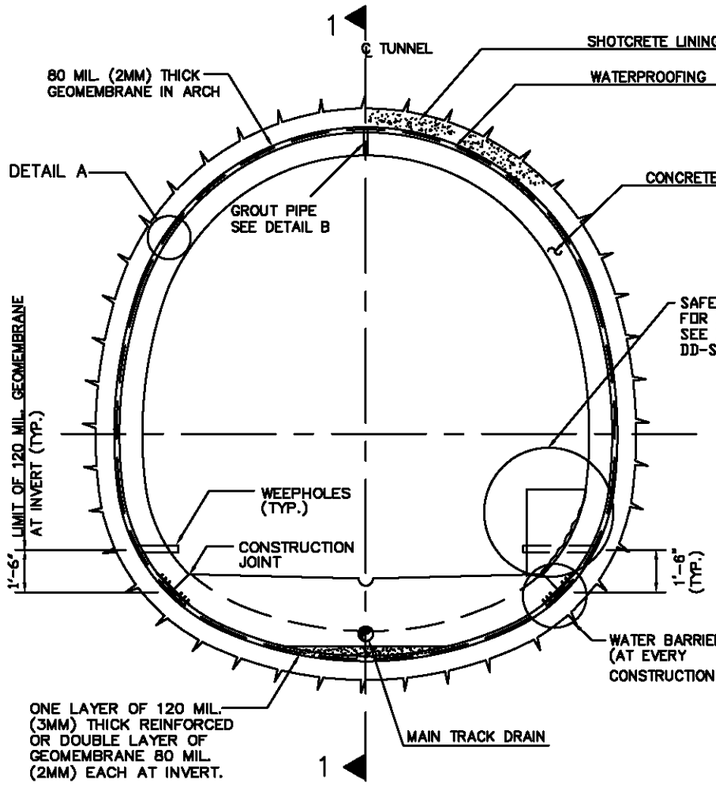
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

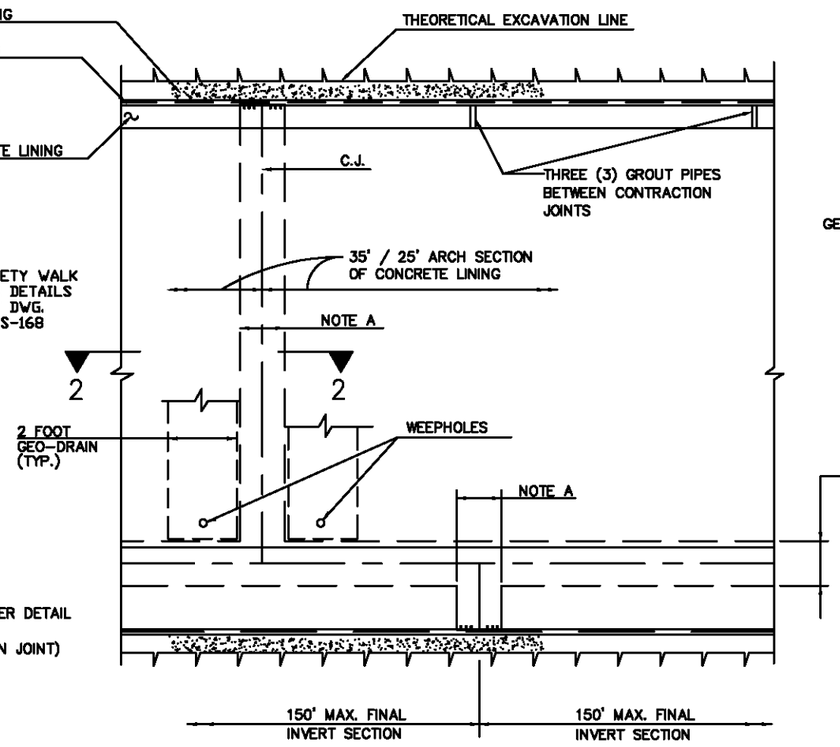
AERIAL STRUCTURE
CAST-IN-PLACE OR PRECAST SEGMENTAL CONCRETE GIRDER
TANGENT SECTION

SCALE 1/2"=1'-0" 1 0 1 2 AND AS NOTED

DRAWING NO. DD-S-139

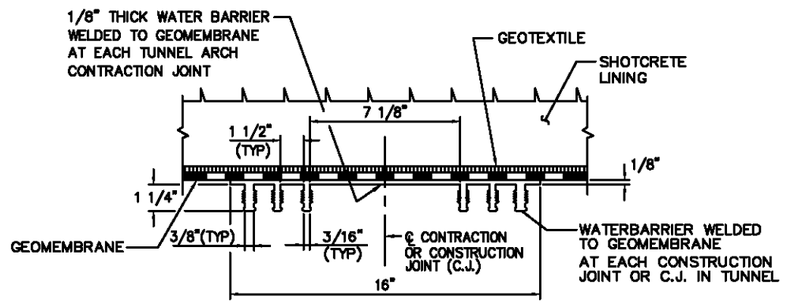


CROSS SECTION
SCALE: 3/8" = 1'-0"

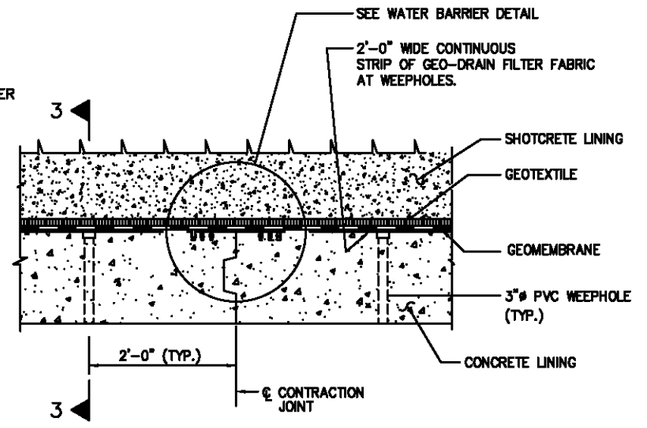


NOTE A:
16" VERTICAL WATER BARRIER AT EVERY CONTRACTION JOINT (C.J.)

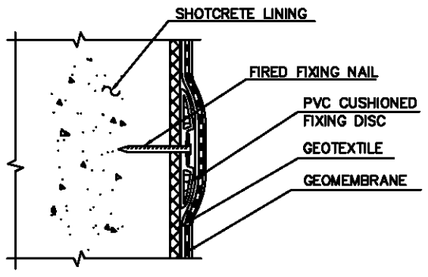
LONGITUDINAL SECTION 1-1
SCALE: 3/8" = 1'-0"



WATER BARRIER DETAIL
NTS



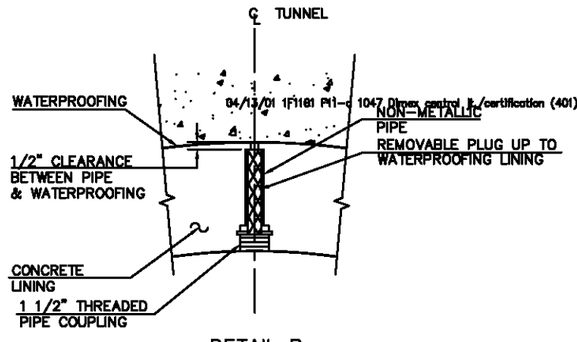
SECTION 2-2
NOT TO SCALE



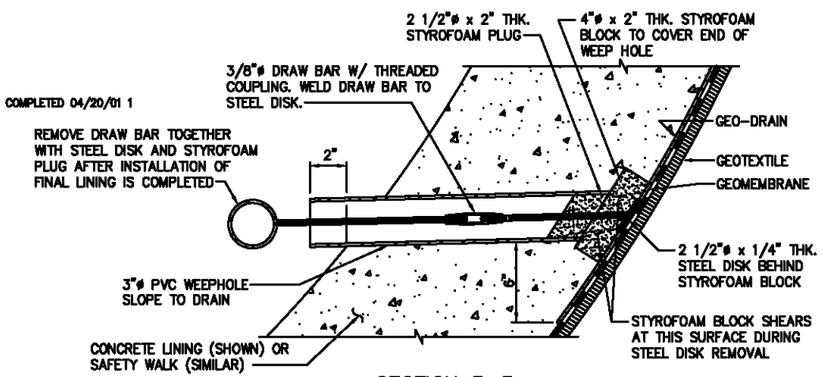
DETAIL A
NTS

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



DETAIL B
GROUT PIPE
N.T.S.



SECTION 3-3
NTS

DESIGNED	K. BARNES	05-98 DATE
DRAWN	D. PRIME	05-98 DATE
CHECKED	R. FENG	05-98 DATE
APPROVED	GEC(DCCO)	05-98 DATE
UPDATED	ENGA	05-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

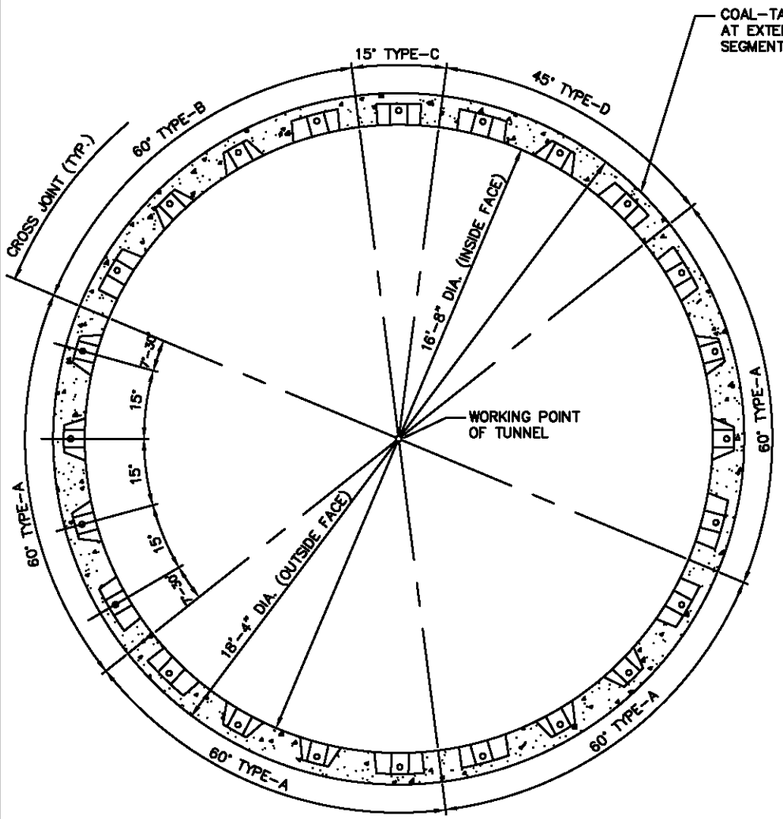
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

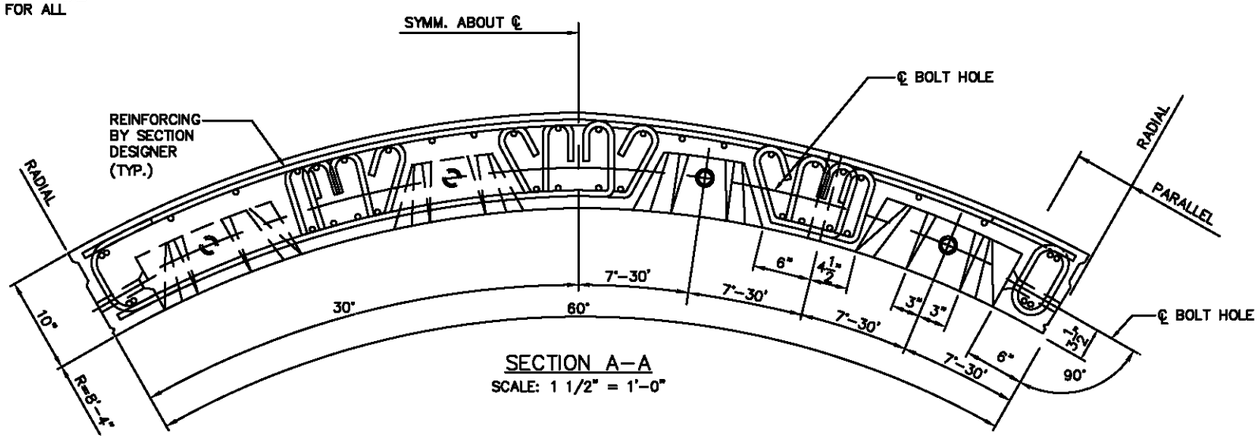
STRUCTURAL DESIGN DRAWING
SOFT GROUND NATM TUNNEL
WATERPROOFING DETAILS

SCALE: AS NOTED

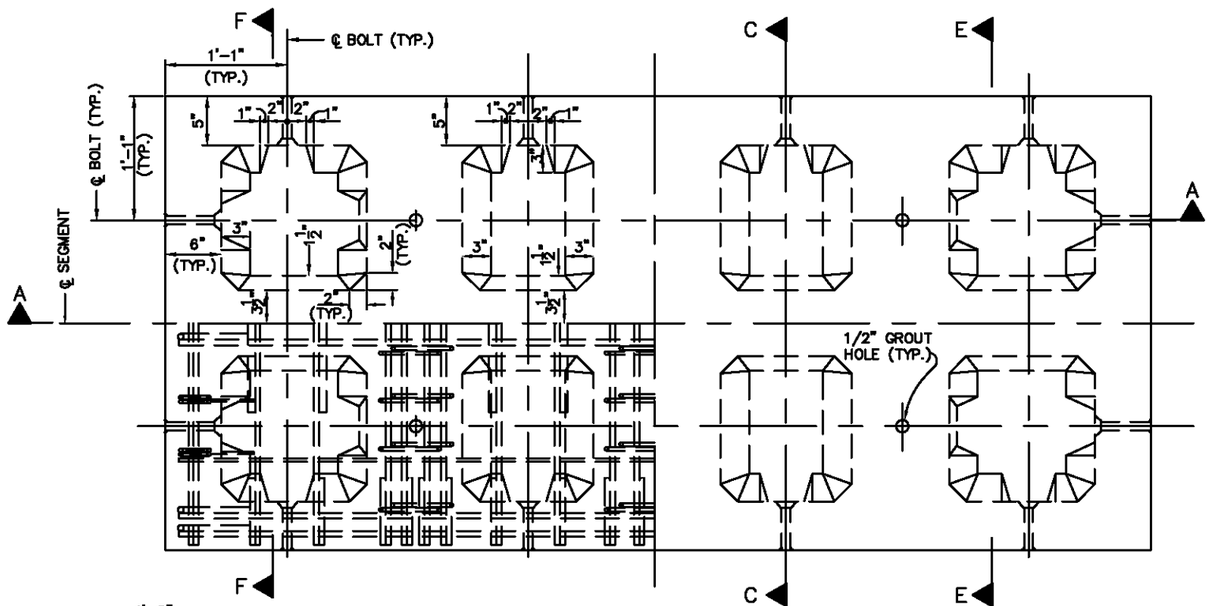
DRAWING NO.: DD-S-140



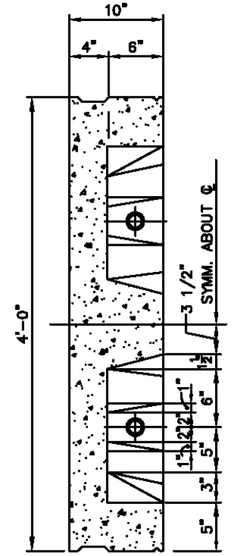
SECTION THRU TUNNEL LININGS
SCALE: 1/2" = 1'-0"



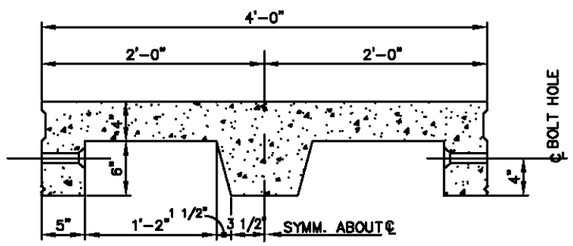
SECTION A-A
SCALE: 1 1/2" = 1'-0"



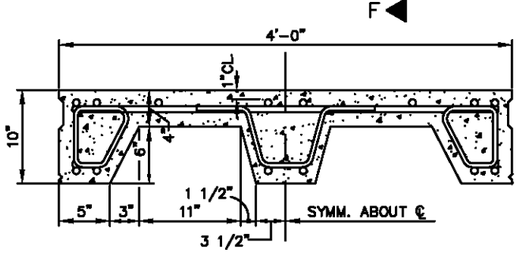
PLAN – SEGMENT TYPE-A
SCALE: 1 1/2" = 1'-0"



SECTION F-F
S-142, S-143, S-145
SCALE: 1 1/2" = 1'-0"



SECTION C-C
S-142, S-143, S-145
SCALE: 3/8" = 1'-0"



SECTION E-E
S-143, S-145
SCALE: 1 1/2" = 1'-0"

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

NOTE:

1. FOR TUNNEL LINING TOLERANCES SEE DWG. DD-S-144.
2. FOR TAPERED RING DETAILS SEE DWG. DD-S-144.

DESIGNED	K. SINGH	01-77 DATE
DRAWN	RINALDI	02-77 DATE
CHECKED	R. FENG	03-77 DATE
APPROVED	DED(DCCO)	04-77 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

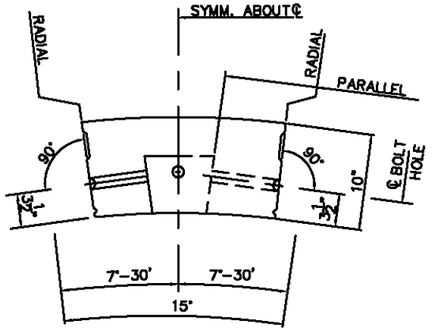
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

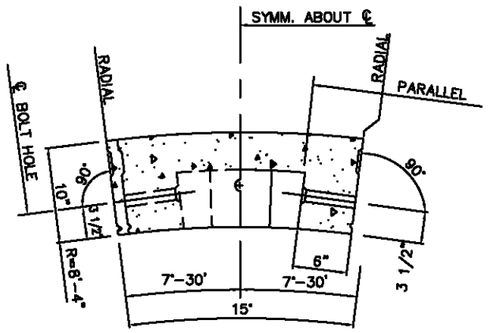
STRUCTURAL DESIGN DRAWING
CIRCULAR EARTH TUNNEL
PRECAST CONCRETE TUNNEL LINING (4FT. RINGS)
SHEET 1 OF 5

SCALE 1 1/2"=1'-0" 0 3" 6" 9" 12" AND AS NOTED

DRAWING NO. DD-S-141



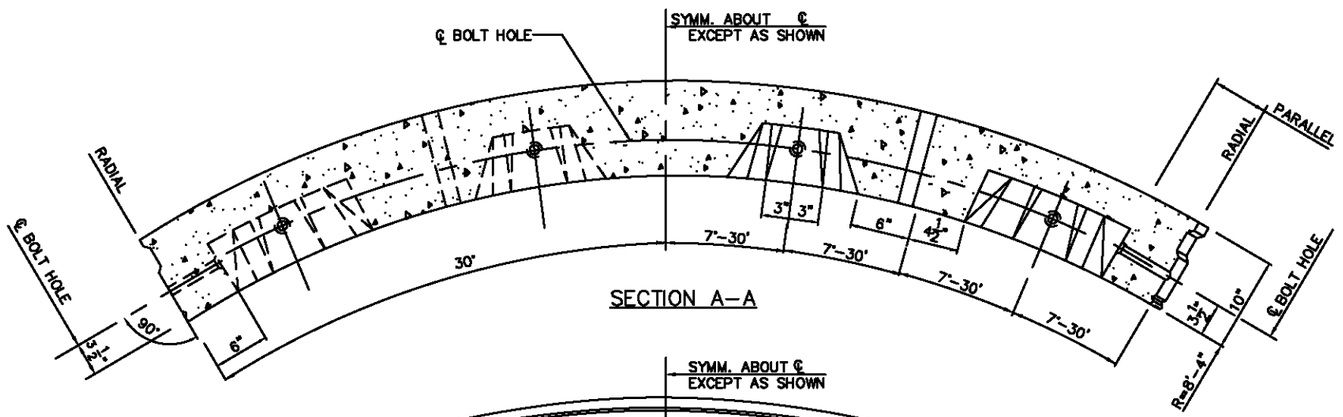
SECTION G–G



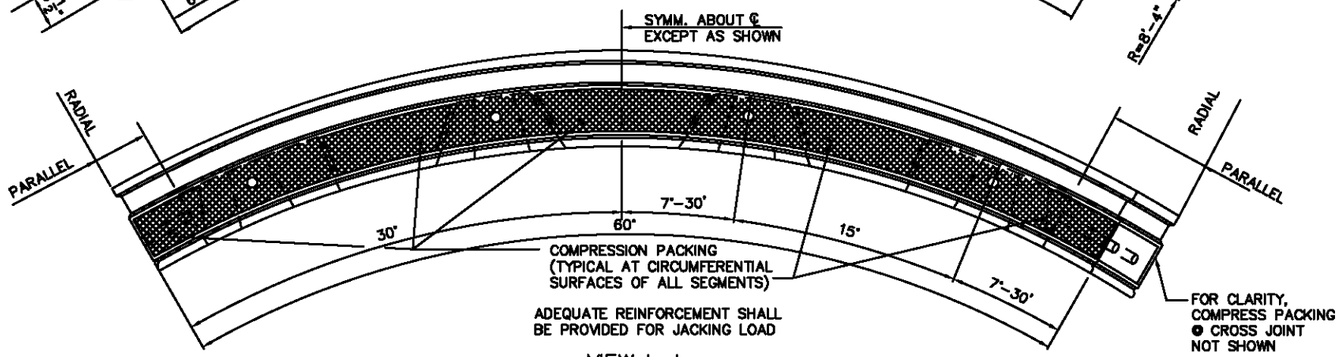
SECTION H–H

GENERAL NOTES:

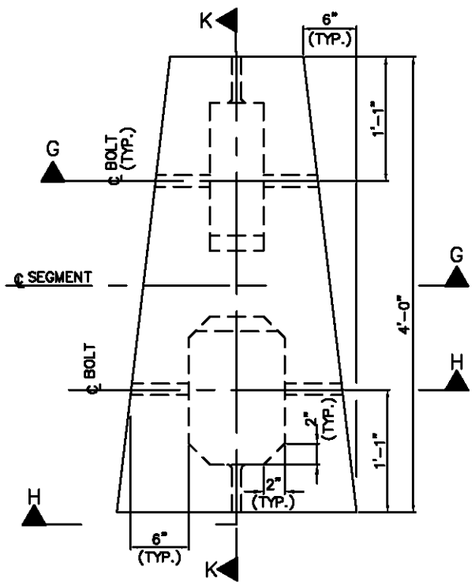
1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



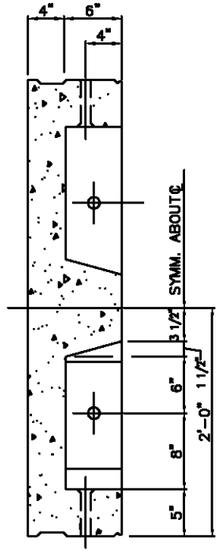
SECTION A–A



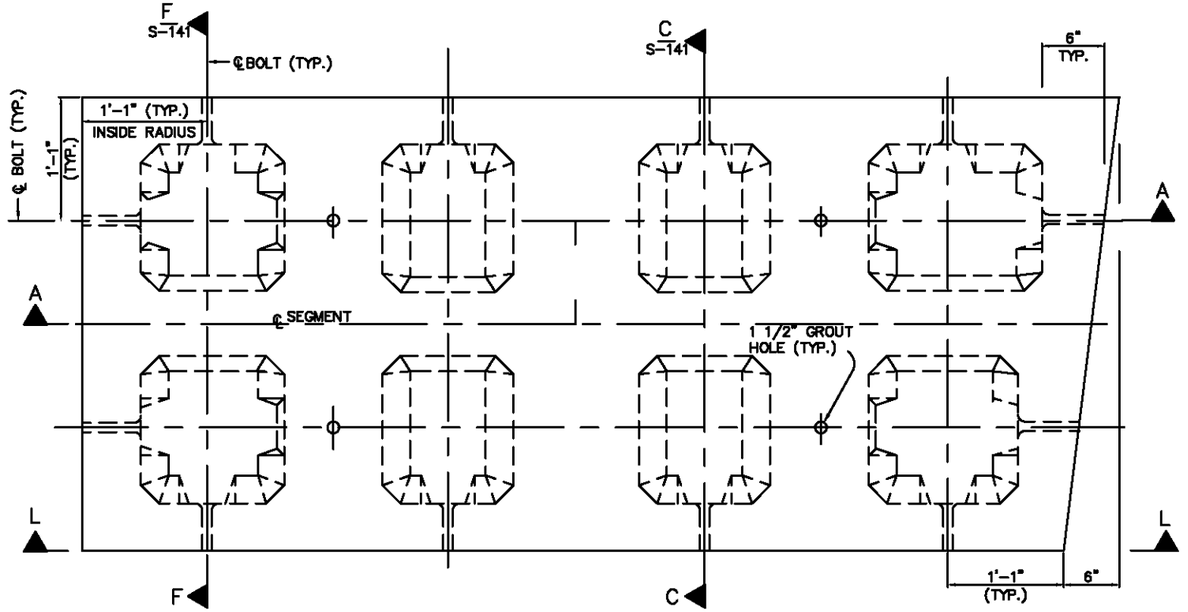
VIEW L–L



PLAN–KEY SEGMENT TYPE C



SECTION K–K



PLAN–SEGMENT TYPE B

DESIGNED	K. SINGH	02-77	DATE
DRAWN	RINALDI	02-77	DATE
CHECKED	R. FENG	03-77	DATE
APPROVED	GEC(DCCO)	04-77	DATE
UPDATED	ENGA	08-00	DATE

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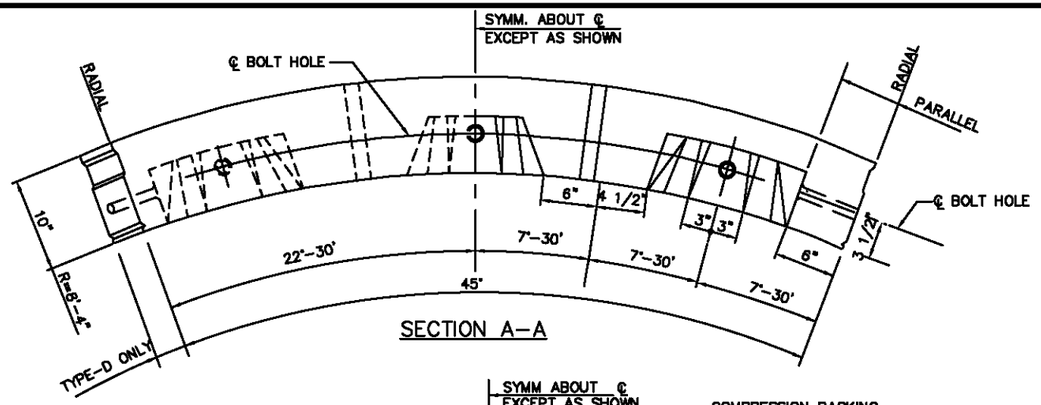
APPROVED _____ 5/2001
DIRECTOR DATE

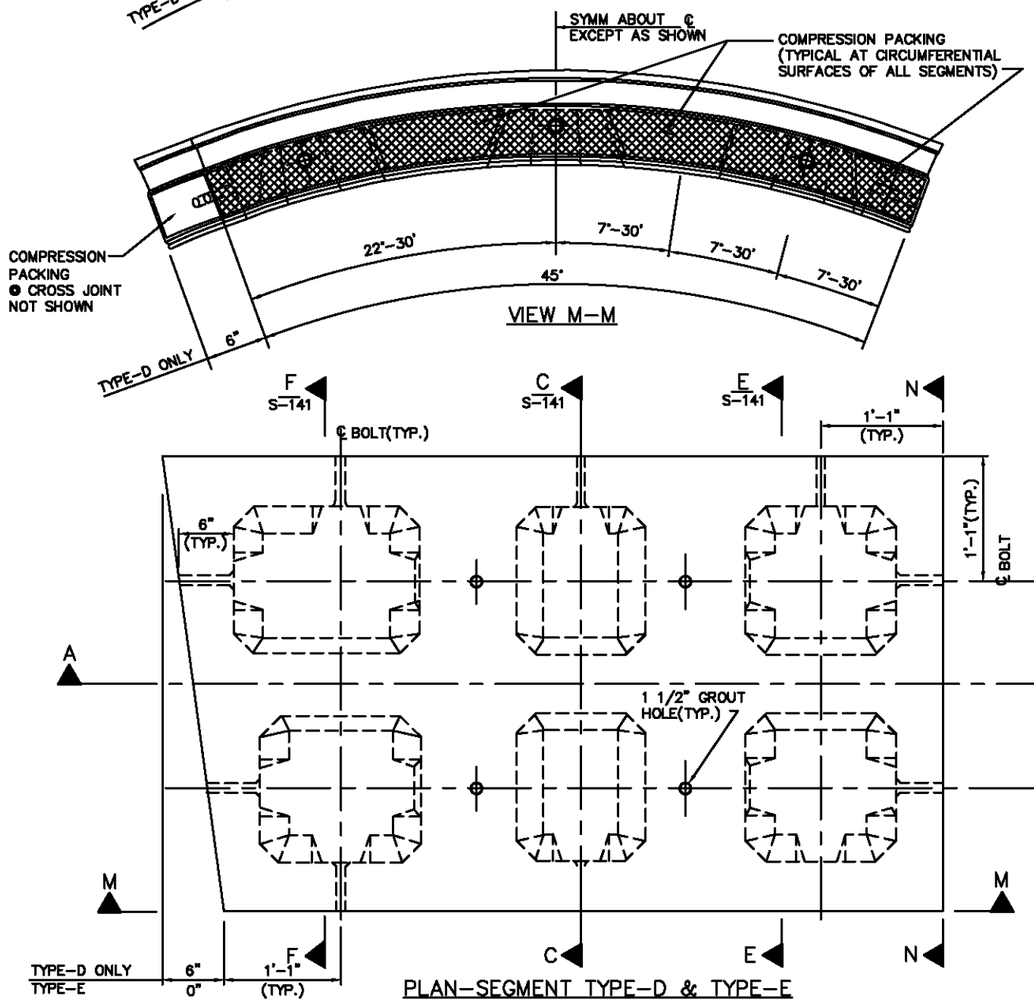
STRUCTURAL DESIGN DRAWING
CIRCULAR EARTH TUNNEL
PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS)
SHEET 2 OF 5

SCALE 1 1/2"=1'-0" 1" 3" 6" 9" 12" AND AS NOTED

DRAWING NO. DD-S-142



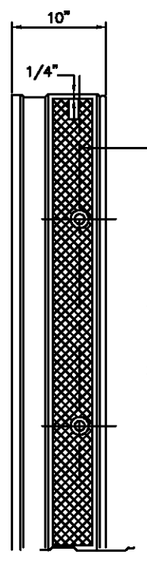
SECTION A–A



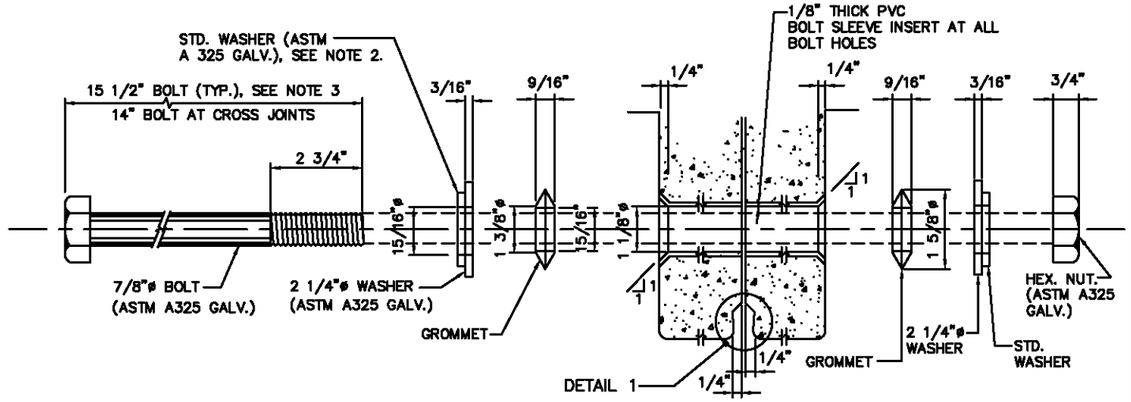
VIEW M–M

PLAN–SEGMENT TYPE-D & TYPE-E

NOTE: FOR SEGMENT TYPE-E AT CROSS ADIT, SEE DWG. DD-S-145



VIEW N–N



BOLT GROMMET AND COUNTERSUNK HOLE DETAIL

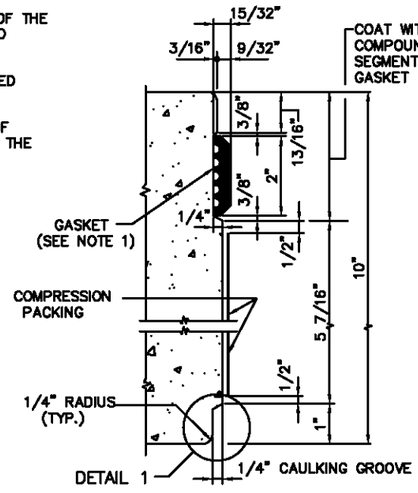
SCALE: 6"=1'-0"

NOTES:

1. THE GASKET ALONG THE CROSS JOINT SIDES OF THE KEY SEGMENT SHALL BE LUBRICATED PRIOR TO INSTALLATION OF KEY SEGMENT.
2. PROVIDE ADDITIONAL STD. WASHER AS REQUIRED WITH THE APPROVAL OF ENGINEER.
3. THE CONTRACTOR MAY WITH THE APPROVAL OF ENGINEER, ADJUST THE BOLT LENGTH TO SUIT THE FABRICATED SEGMENT.

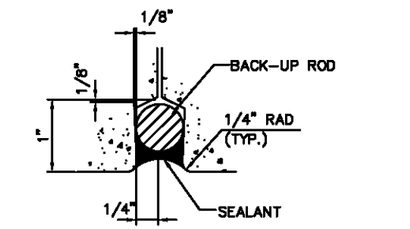
GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.



TYPICAL DETAIL AT
SEGMENT MATING SURFACES

SCALE: 6"=1'-0"



DETAIL 1

NOT TO SCALE

GASKET DETAIL

N.T.S.

NOTE: GASKET SHALL BE FABRICATED TO A SPECIAL TIGHT TOLERANCE OF ±1/64 INCH.

GROUT PLUG DETAIL

N.T.S.

DESIGNED	K. SINGH	2-77 DATE
DRAWN	RINALDI	2-77 DATE
CHECKED	R. FENG	3-77 DATE
APPROVED	GEC(DCCO)	4-77 DATE
UPDATED	ENGA	9-95 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
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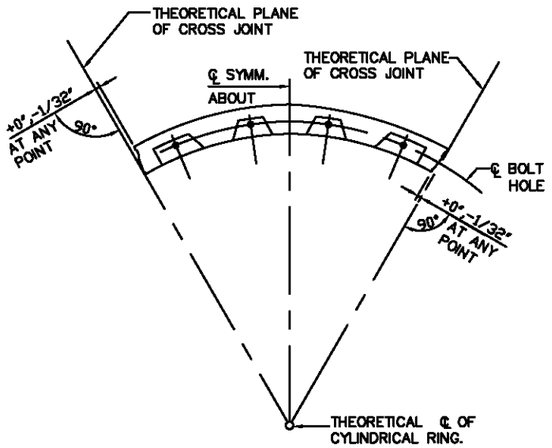
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
CIRCULAR EARTH TUNNEL
PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS)
SHEET 3 OF 5

SCALE 1-1/2"=1'-0" 0 3" 9" 12" AND AS NOTED

DRAWING NO. DD-S-143



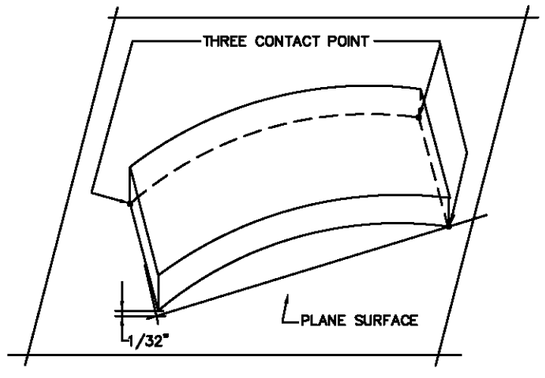
1–SEGMENT TOLERANCE

2–BOLT HOLE LOCATION TOLERANCE

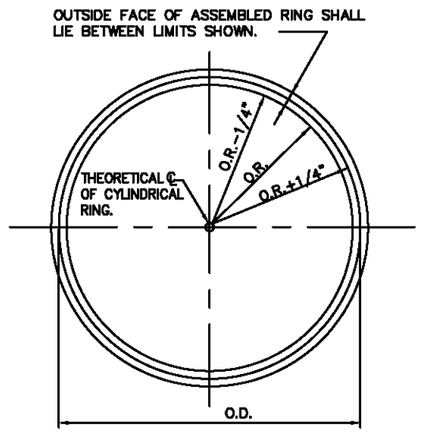
LOCATIONS OF CROSS JOINT AND CIRCUMFERENCE JOINT BOLT HOLES IN EACH SEGMENT SHALL BE WITHIN ±1/16 INCH OF THEORETICAL LOCATIONS AS SHOWN

3–CIRCUMFERENCE TOLERANCE

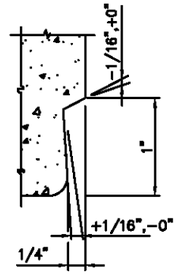
CIRCUMFERENCE OF OUTSIDE FACE OF ASSEMBLED RING AS MEASURED BY STEEL TAPE SHALL BE WITHIN + 1/2 INCH TO −1 INCH OF THEORETICAL OUTSIDE CIRCUMFERENCE = PI (π) x O.D.



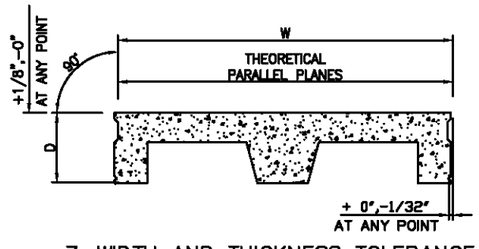
4–WARPING TOLERANCE



5–RADIUS TOLERANCE



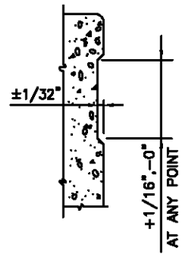
6–CAULKING GROOVE TOLERANCE



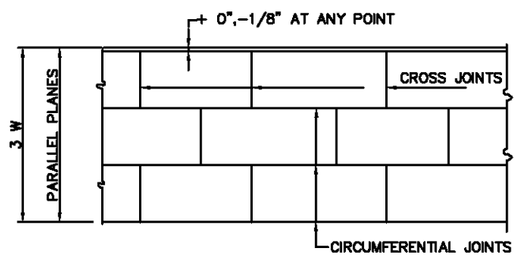
7–WIDTH AND THICKNESS TOLERANCE

LEGEND OF ABBREVIATIONS

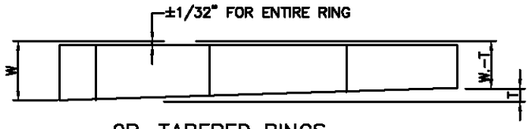
O.D.– THEORETICAL OUTSIDE DIAMETER OF RING.
I.D. – THEORETICAL INSIDE DIAMETER OF RING.
O.R.– THEORETICAL OUTSIDE RADIUS OF RING.
I.R. – THEORETICAL INSIDE RADIUS OF RING.
W – THEORETICAL WIDTH OF A LINER RING.
T – THEORETICAL TAPER OF A LINER RING.
D – THEORETICAL OVERALL RING DEPTH.



8–GASKET GROOVE TOLERANCE



9A–STRAIGHT RINGS

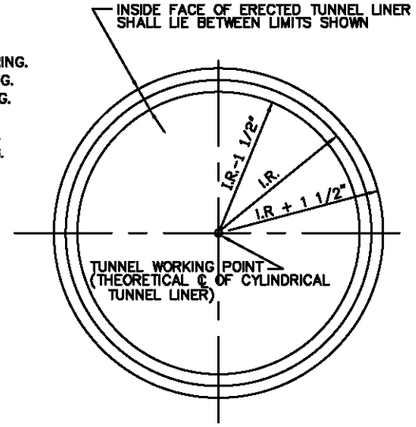


9B–TAPERED RINGS

9–ASSEMBLED RING WIDTH TOLERANCE

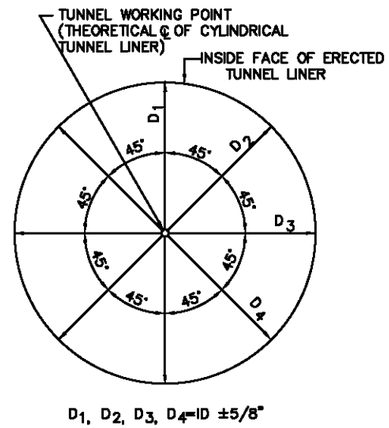
STAGGER JOINTS IN ADJACENT RINGS BY ONE–HALF OF SEGMENT LENGTH, BUT IN NO CASE LESS THAN 25% OF SEGMENT LENGTH.

REQUIRED FABRICATION TOLERANCES (1 THRU 9)



A–LOCATION TOLERANCE

THE LOCATION TOLERANCE IS FOR THE LOCATION OF THE CENTER OF THE TUNNEL ONLY AND NOT AN ADDITIONAL OUT–OF–ROUNDNESS TOLERANCE.

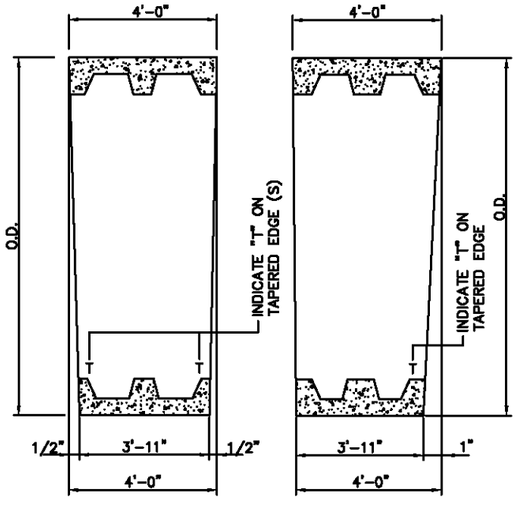


D_1, D_2, D_3, D_4=ID ±5/8"

B–DIAMETER TOLERANCE

THE DIAMETER TOLERANCE IS FOR THE DIAMETER OF A LOADED RING.

REQUIRED CONSTRUCTION TOLERANCES (A & B)



TYPE 1 TYPE 2

DETAIL–TAPERED RINGS

DETAILS SHOWN FOR TAPERED RINGS ARE INTENDED FOR USE IN CORRECTION OF MISALIGNMENT ONLY. CONTRACTOR SHALL DETERMINE THE NECESSARY TAPER TO COPE WITH HORIZONTAL OR VERTICAL CURVES AND SUBMIT DETAILS TO THE ENGINEER FOR APPROVAL.

DESIGNED	K. SINGH	02–77 DATE
DRAWN	RINALDI	02–77 DATE
CHECKED	R. FENG	03–77 DATE
APPROVED	DEC(DCCO)	04–77 DATE
UPDATED	ENGA	08–00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

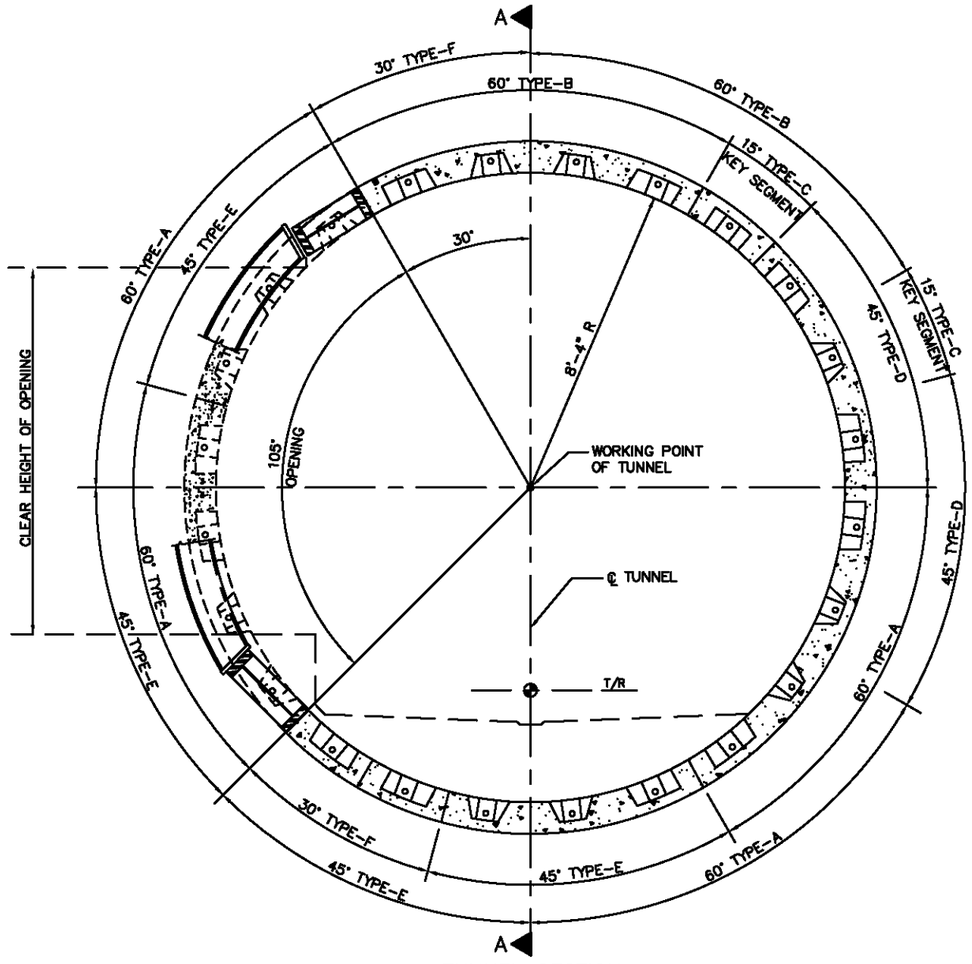
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

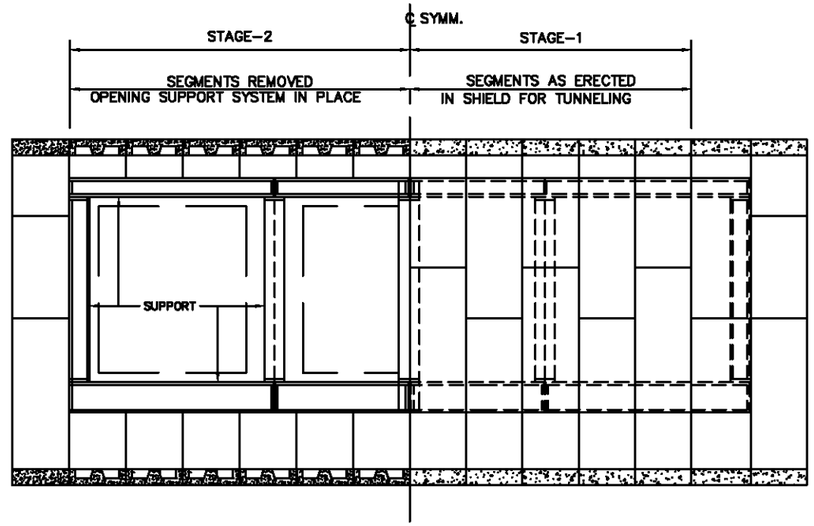
STRUCTURAL DESIGN DRAWING
CIRCULAR EARTH TUNNEL
PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS)
SHEET 4 OF 5

SCALE: NOT TO SCALE

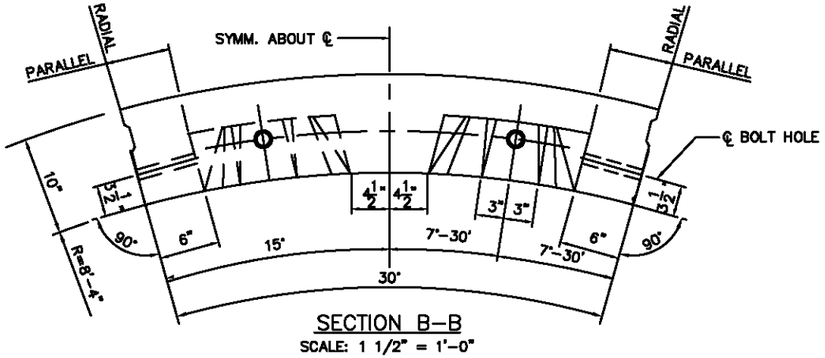
DRAWING NO.: DD–S–144



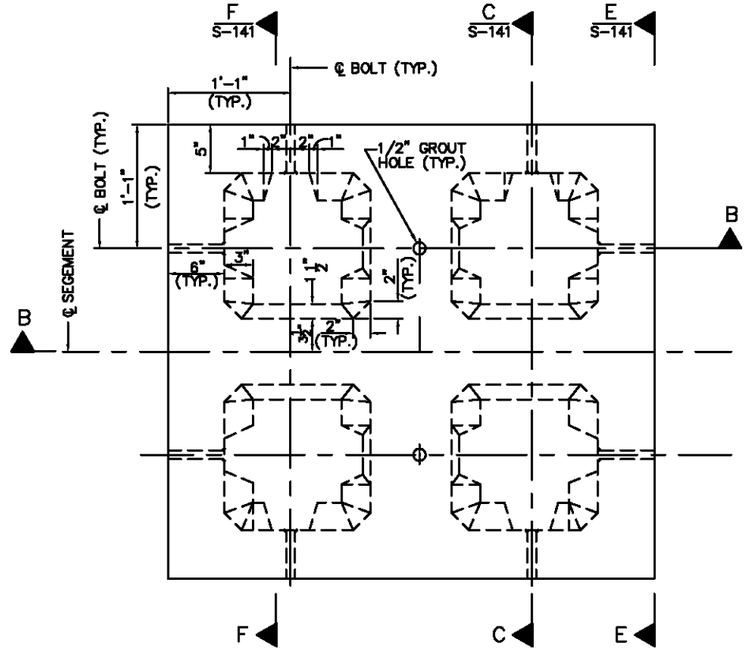
TUNNEL SECTION



SECTION A–A
SCALE: 1/4" = 1'-0"



SECTION B–B
SCALE: 1 1/2" = 1'-0"



PLAN – SEGMENT TYPE–F

NOTES:

1– THIS DRAWING SHOWS A CONCEPTUAL ARRANGEMENT OF PRECAST CONCRETE SEGMENTS AT A TUNNEL BREAKOUT. THE USE OF DETAILS SHOWN ON THIS DRAWING SHALL BE VERIFIED WITH RESPECT TO THE NECESSARY OPENING AT THE BREAKOUT, STRUCTURAL ADEQUACY AND OTHER SUPPLEMENTARY DESIGN DETAILS FOR THE COMPLETION OF SHAFT AND / OR CROSS ADIT.

2– FOR SEGMENT TYPE–A, SEE DWG. DD–S–141. FOR SEGMENT TYPE–B AND TYPE–C, SEE DWG. DD–S–142. FOR SEGMENT TYPE–D & TYPE–E, SEE DWG. DD–S–143.

3– FINAL DESIGN AND DRAWING SHALL BE PREPARED FOR THE ENTIRE TUNNEL BREAKOUT SECTIONS AS NECESSARY.

4– EXCAVATION AND TUNNEL BREAKOUT SHALL NOT TAKE PLACE UNTIL AFTER GROUTING TO FILL ALL VOIDS.

5– TUNNEL SECTIONS ADJACENT TO BREAKOUT ARE TO BE KEPT ADEQUATELY BRACED TO PREVENT MISALIGNMENT OR UNACCEPTABLE DEFORMATIONS OF ANY STRUCTURAL ELEMENT. BRACING SHALL BE INSTALLED PRIOR TO EXCAVATING AND SHALL NOT BE REMOVED UNTIL ALL CONCRETE OF THE ADJOINING TUNNEL UNITS AND STRUCTURE IS PLACED AND CURED TO THE SPECIFIED STRENGTH. THE TUNNEL BRACING ARRANGEMENT SHALL BE SUBMITTED FOR APPROVAL.

DESIGNED	K. SINGH	03-77 DATE
DRAWN	RINALDI	02-77 DATE
CHECKED	R. FENG	04-77 DATE
APPROVED	SEC(DCCO)	04-77 DATE
UPDATED	ENGA	05-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

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OFFICE OF ENGINEERING AND ARCHITECTURE

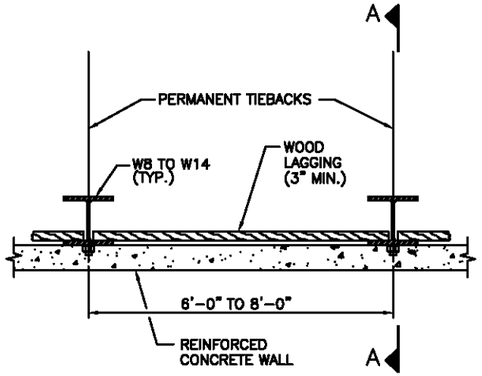
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

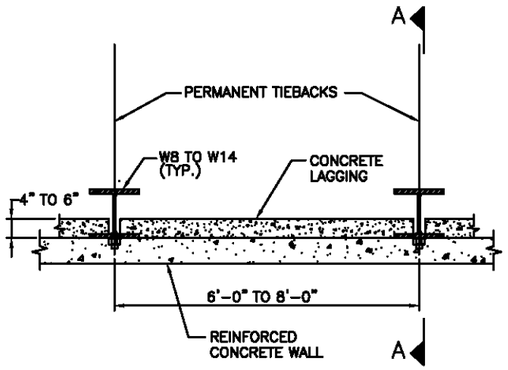
STRUCTURAL DESIGN DRAWING
CIRCULAR EARTH TUNNEL
PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS)
DETAILS AT CROSS ADIT, SHEET 5 OF 5

SCALE 1/2"=1'-0" 6" 0 1 AND AS NOTED

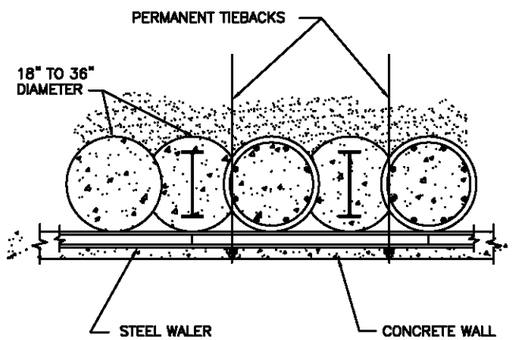
DRAWING NO. DD–S–145



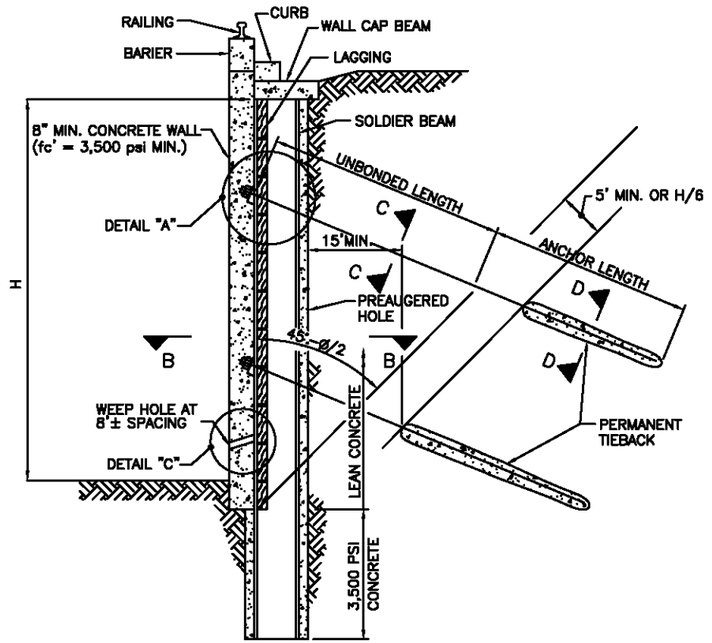
SOLDIER BEAM AND WOOD LAGGING



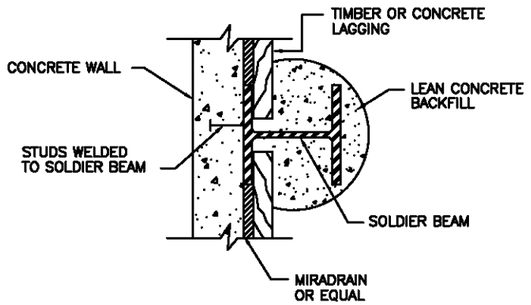
SOLDIER BEAM AND CONCRETE LAGGING



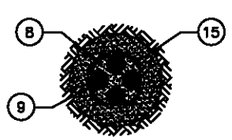
DRILLED CYLINDER PILES – SECANT



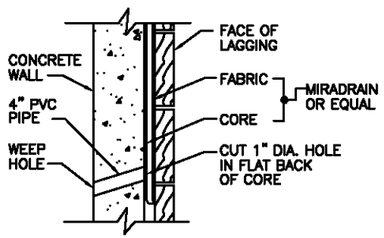
SECTION A–A



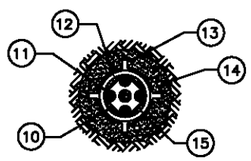
SECTION B–B



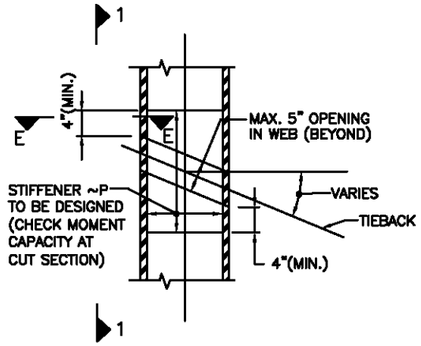
SECTION C–C



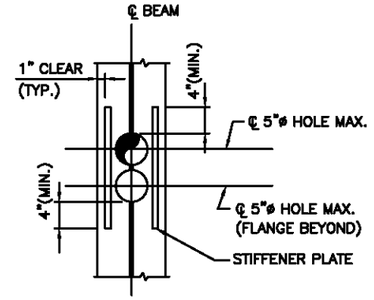
DETAIL C



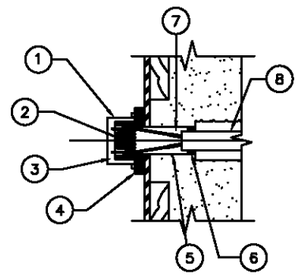
SECTION D–D



DETAIL A
CONCRETE WALL AND TIEBACK DETAILS NOT SHOWN



ELEVATION 1–1



SECTION E–E

LEGEND FOR PERMANENT TIEBACKS

1. ANCHORAGE COVER–EPOXY PAINTED
2. ANCHOR HEAD AND WEDGES
3. ANTICORROSION GREASE OR GROUT
4. BEARING PLATE–EPOXY PAINTED
5. TRUMPET
6. SEAL
7. PVC OR POLYETHYLENE TUBE – BOND BREAKER
8. INDIVIDUALLY GREASED AND SHEATHED STRANDS
9. SPACER
10. BARE STRAND TENDON
11. CORRUGATED POLYETHYLENE OR PVC
12. CENTRALIZER
13. ANCHOR GROUT
14. GROUT OR POLYESTER RESIN

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

NOTES:

1. THE TYPES OF PERMANENT RETAINING WALLS DEPICTED ON THIS DRAWING ARE PRIMARILY APPLICABLE TO RETAINED CUTS.
2. SOLDIER PILES OR CYLINDER PILES SHALL BE INSTALLED IN A HOLE DRILLED WITH THE AID OF CASING OR BIO–DEGRADABLE DRILLING FLUID SUCH AS "REVERT".
3. DRAINAGE DETAILS FOR CYLINDER PILES ARE SIMILAR TO THOSE FOR THE SOLDIER BEAM AND LAGGING SYSTEM.
4. PROVIDE LEAN CONCRETE WITH 200 PSI STRENGTH AND 3500 PSI CONCRETE USING 8" MINIMUM SLUMP.

DESIGNED	MRCE	05–98 DATE
DRAWN	MRCE	05–98 DATE
CHECKED	R. FENG	05–98 DATE
APPROVED	GEC(DCCO)	05–98 DATE
UPDATED	ENGA	05–00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

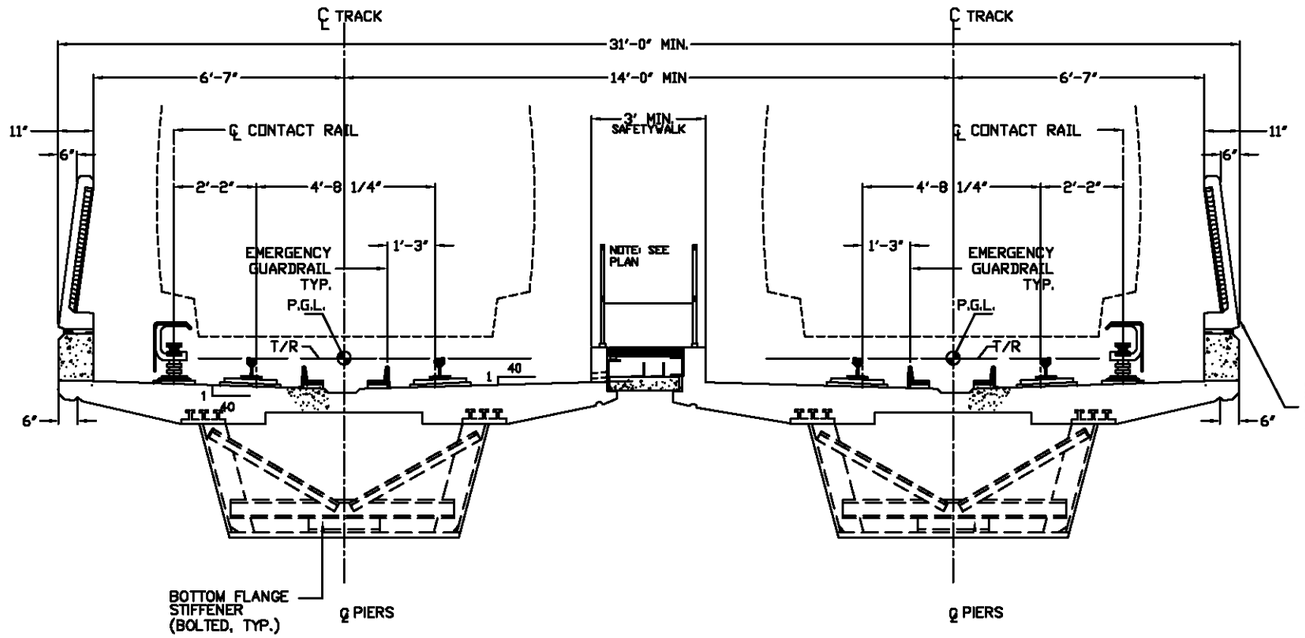
SUBMITTED _____ DATE

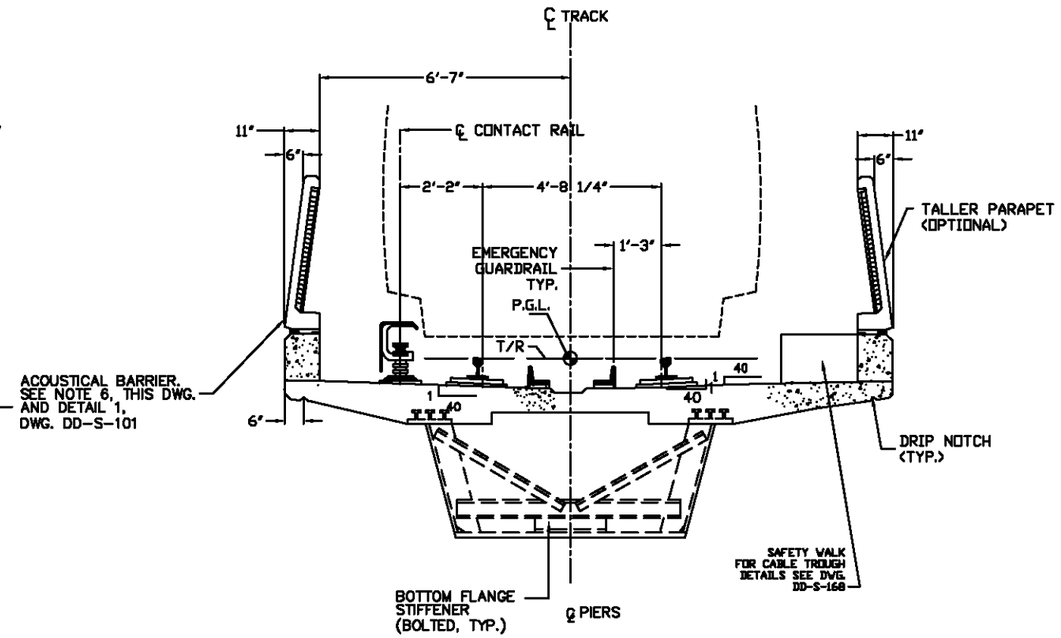
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
PERMANENT RETAINING WALLS FOR RETAINED CUTS

SCALE: NOT TO SCALE

DRAWING NO.: DD–S–146





CROSS SECTION
DOUBLE TRACK STRUCTURE

CROSS SECTION
SINGLE TRACK STRUCTURE

OPTION 1
FOR OPTION 2, SEE DWG DD-S-248

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

NOTES:

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESSES AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
4. PIER COLUMNS SHALL BE CONCRETE, PIER CAPS STEEL.
5. STEEL GIRDER AND PIER CAP TO BE PAINTED BROWN FED. SPEC. NO. 20040.
6. ACOUSTICAL BARRIER TO BE USED ONLY AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILINGS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
7. HANDRAILS SHALL BE INSTALLED IN A VERTICAL POSITION.
8. TRANSVERSE TOP REINFORCEMENT SHALL BE SPACED AT 7 1/2" ON CENTERS IN CONCRETE DECK TO PROVIDE SPACE FOR RAIL FASTENER ANCHOR BOLTS.
9. FOR SAFETY WALK PLAN, SEE DWG. DD-S-90.
10. FOR CABLE TROUGH, SEE DD-S-139 & DD-S-168.
11. FOR DETAILS OF INSPECTION ACCESS AND DRAINAGE PROVISIONS, SEE DWG. DD-S-128. BOX SIZE SHALL BE ADEQUATE FOR TRAVEL INSIDE THE BOX FOR INSPECTION.
12. FOR SUPERELEVATED CROSS SECTION, SEE DWG DD-S-92.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	MA	08-00 DATE
CHECKED	MA/EC	08-00 DATE
APPROVED	J. RUDOLF	08-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL
DD-S-248	OPTION 2

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

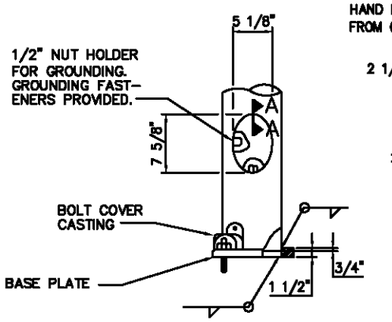
APPROVED _____ 5/2001
DIRECTOR DATE

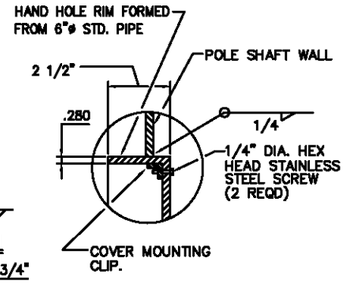
STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
TANGENT STEEL GIRDERS-COMPOSITE SECTION

SCALE: NOT TO SCALE

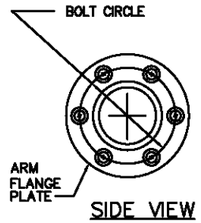
DRAWING NO.: DD-S-148

POLE & ARM SCHEDULE														
POLE SHAFT DATA				ARM SHAFT DATA				BASE PLATE DATA				ANCHOR BOLT DATA	
LENGTH	BASE DIA.	TOP DIA.	WALL THK.	LENGTH	ARM BASE DIA.	ARM END DIA.	THK.	SQUARE	BOLT HOLE	THK.	BOLT CIRCLE	DIA.	LENGTH
DATA TO BE FILLED IN AS REQUIRED													

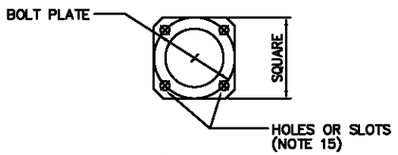




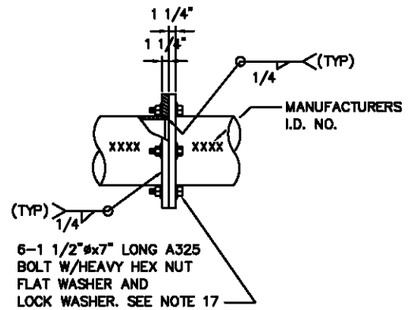
SECTION A–A



SIDE VIEW

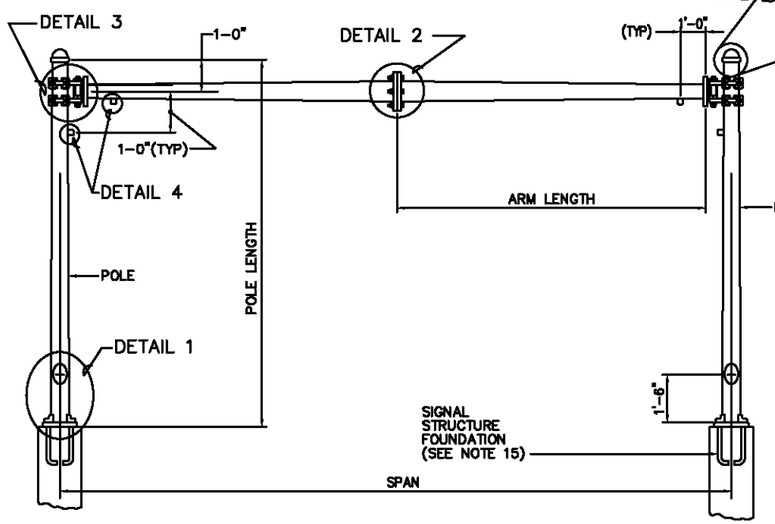


DETAIL 1

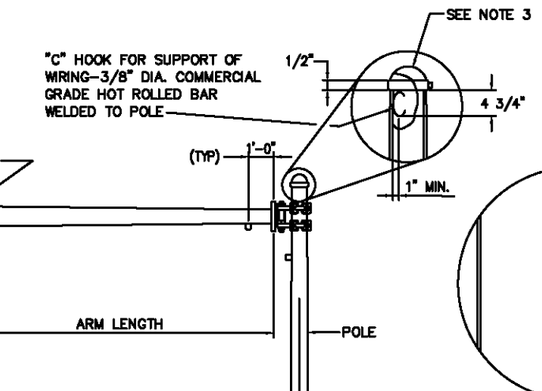


FRONT VIEW

DETAIL 2



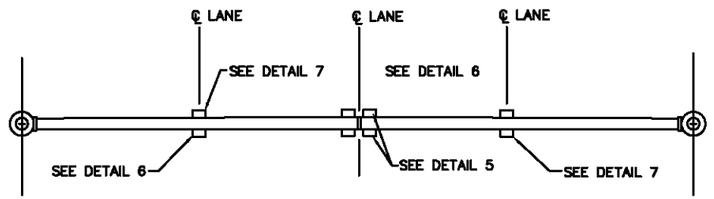
SIGNAL BRIDGE ELEVATION



DETAIL 4

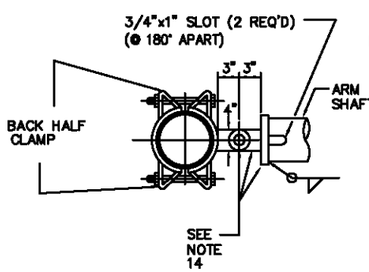
NOTES:

1. POLE SHAFT – ASTM DESIGNATION: A595–55 KSI MINIMUM YIELD STRENGTH.
2. ARM SHAFT – ASTM DESIGNATION: A595–55 KSI MINIMUM YIELD STRENGTH.
3. CAST POLE TOP CAP – SECURED IN PLACE WITH 3 PLATED SET SCREWS – A36 STEEL.
4. ARM FLANGE PLATE – ASTM DESIGNATION: A36–36 KSI MINIMUM YIELD STRENGTH.
5. POLE BASE PLATE – ASTM DESIGNATION: A36–36 KSI MINIMUM YIELD STRENGTH.
6. ARM END PLATE, POLE CLAMP–ASTM DESIGNATION: A572–50 KSI MINIMUM YIELD STRENGTH.
7. CONNECTION BOLTS AND ACCESSORIES TO BE GALVANIZED PER DESIGNATION: ASTM A153.
8. POLE AND ARM TO BE HOT DIP GALVANIZED PER ASTM A123. PRIME AND PAINT BROWN FED–STD 595. COLOR NO.20040.
9. ALL THREADED FASTENERS, NUTS, WASHERS, FLANGEPLATES AND ALL MISC. STEEL PARTS TO BE HOT DIP GALVANIZED PER ASTM A153.
10. ALL ASTM A325 BOLTS TO BE TYPE 1. NUTS TO BE ASTM A563 GRADE DH.
11. 4–1"ø – 8 UNCx8" LONG HEX CAP SCREWS EACH HEX CAP SCREW FURNISHED WITH 1–HEX NUT & 3–FLAT WASHERS (TO BE USED AS REQ'D) ALL CONFORMING TO ASTM DESIGNATION: A325 AND GALVANIZED TO ASTM DESIGNATION: A153 CLASS C.
12. CLAMPS MADE FROM 3/8" THICK ASTM:A36 PLATE.
13. 1 1/4"DIA.BOLT X 6 1/2" LONG W/HEX LOCK NUT & WASHER–ASTM A325.
14. CONNECTING LUGS & ARM SHAFT END PLATE TO BE MADE FROM 3/4" THICK STEEL PLATE CONFORMING TO ASTM DESIGNATION: A572 GR 65.
15. THE CONTRACTOR SHALL ENSURE THE COMPATIBILITY OF THE SIGNAL BRIDGE WITH STRUCTURE FOUNDATION AND ANCHOR BOLTS.
16. THE CONTRACTOR SHALL PROVIDE SUITABLE BRACKETS AND FASTENERS FOR MOUNTING THE TRAFFIC SIGNALS ON THE SIGNAL BRIDGE AND APPROVED BY THE ENGINEER.
17. SURFACE OF FLANGE PLATE TO BE PERPENDICULAR TO THE CENTERLINE OF SHAFT.
18. WELDING PER AWS D1. I 84.
19. REPAIR DAMAGED GALVANIZED COATING AFTER FABRICATION PER ASTM A780–90.

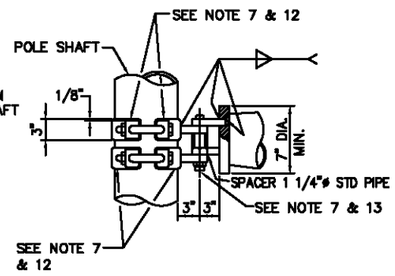


PLAN–TRAFFIC SIGNALS ON SIGNAL BRIDGE

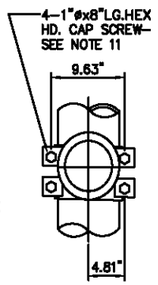
(NOTE 16)



TOP VIEW

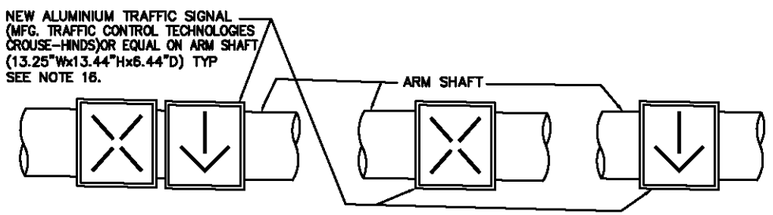


SIDE VIEW



SIDE VIEW

DETAIL 3



DETAIL 5 DETAIL 6 DETAIL 7

DESIGNED	K. BARNES	05–98 DATE	REFERENCE DRAWINGS		
DRAWN	D. PRIME	05–98 DATE	NUMBER	DESCRIPTION	
CHECKED	R. FENG	08–98 DATE			
APPROVED	GED(DCCO)	08–98 DATE			
UPDATED	ENGA	08–00 DATE			

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

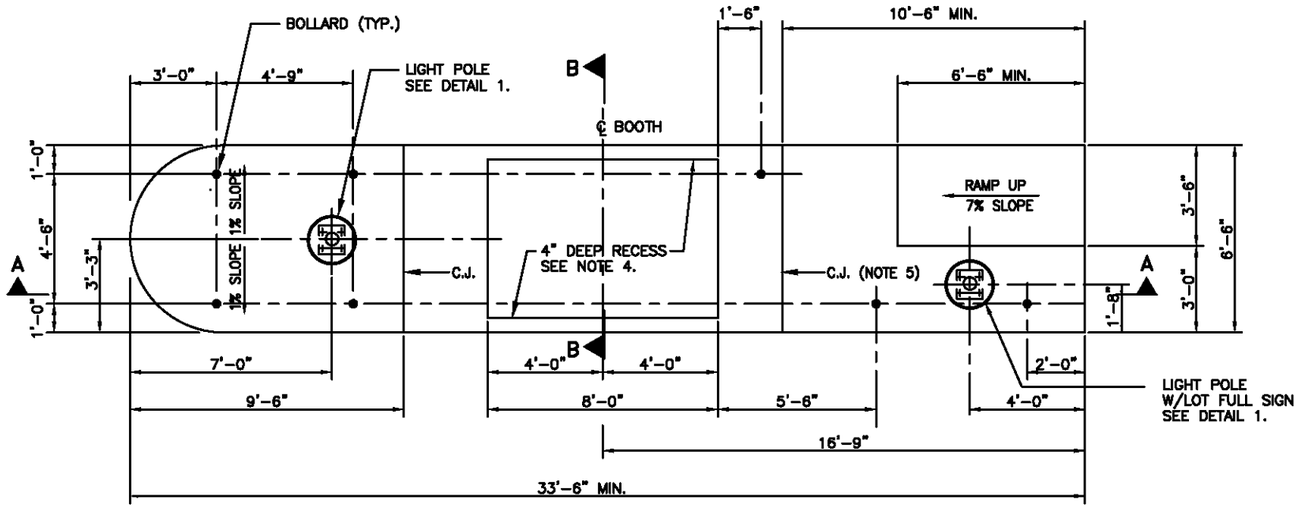
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

SIGNAL BRIDGE DETAILS

SCALE: NOT TO SCALE

DRAWING NO. DD–S–149

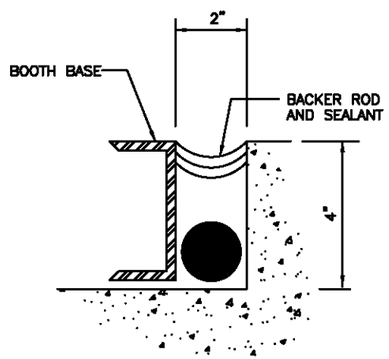


TYPICAL CONCRETE ISLAND PLAN

SCALE: 3/8" = 1'-0"

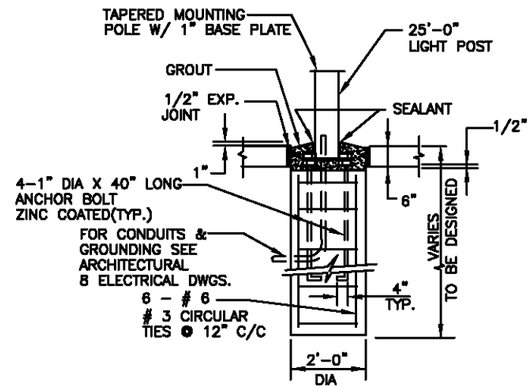
NOTES:

1. THE FOUNDATIONS FOR LIGHT POLE AND LOT FULL SIGN ARE DESIGNED FOR.
   A. AN ALLOWABLE VERTICAL SOIL BEARING CAPACITY OF 2500 PSF AND
   B. A LATERAL SOIL CAPACITYOF 345 PSF PER FOOT OF EMBEDMENT INCREASING LINEARLY WITH DEPTH.
2. TYPICAL CONCRETE ISLAND PLAN SHOWN IS APPLICABLE FOR MODIFIED TYPE-1 AND TYPE-2 ARRAY PARKING LOT CONTROL GATES. SEE ELECTRICAL FOR THE LOCATIONS AND QUANTITIES OF THE ISLAND
3. LOCATION OF CONTROL JOINTS CAN BE OFFSET TO AVOID JUNCTION BOXES AND OTHER ACCESSORIES. PROVIDE MINIMUM 8" CLEARANCE BETWEEN THE EDGE OF ANY JUNCTION BOX AND ANY JOINT IN CONCRETE.
4. BOTTOM TO BE LEVEL. NO CROSSLOPE REQUIRED. 4" DEPTH MAY VARY DUE TO SLOPE OF ROADWAY.
5. CONTROL JOINT (C.J.): 1/4" WIDTH x1" DEPTH PREFORMED JOINT WITH HOT POUR ASPHALT.



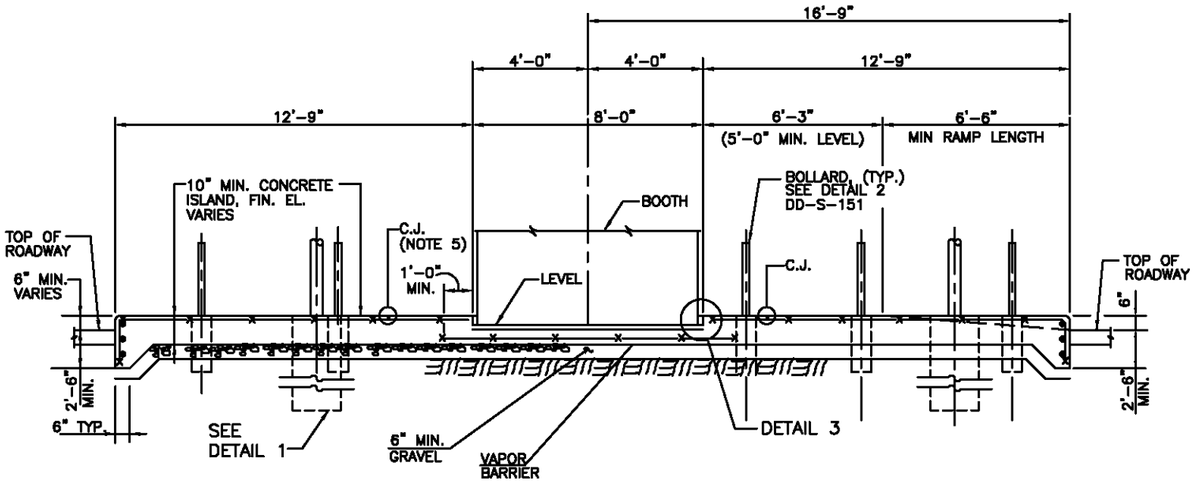
DETAIL – 3

SCALE: 1/2" = 1'-0"



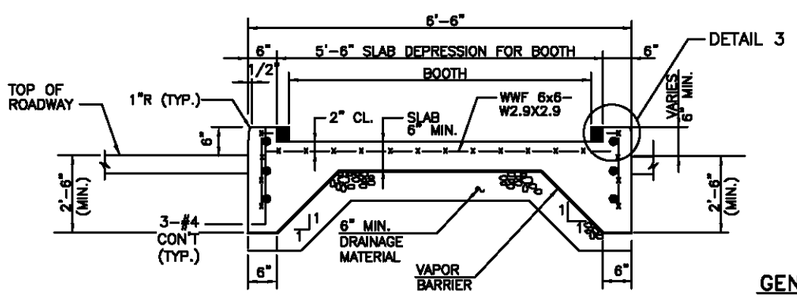
DETAIL – 1

SCALE: 1/2" = 1'-0"



SECTION A–A

SCALE: 3/8" = 1'-0"



SECTION B–B

SCALE: 3/4" = 1'-0"

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	A. VIDANGOS	05-88 DATE
DRAWN	J.S. GABRI	05-88 DATE
CHECKED	CHYTRY	05-88 DATE
APPROVED	(EC/DCCO)	05-88 DATE
UPDATED	ENGA	05-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

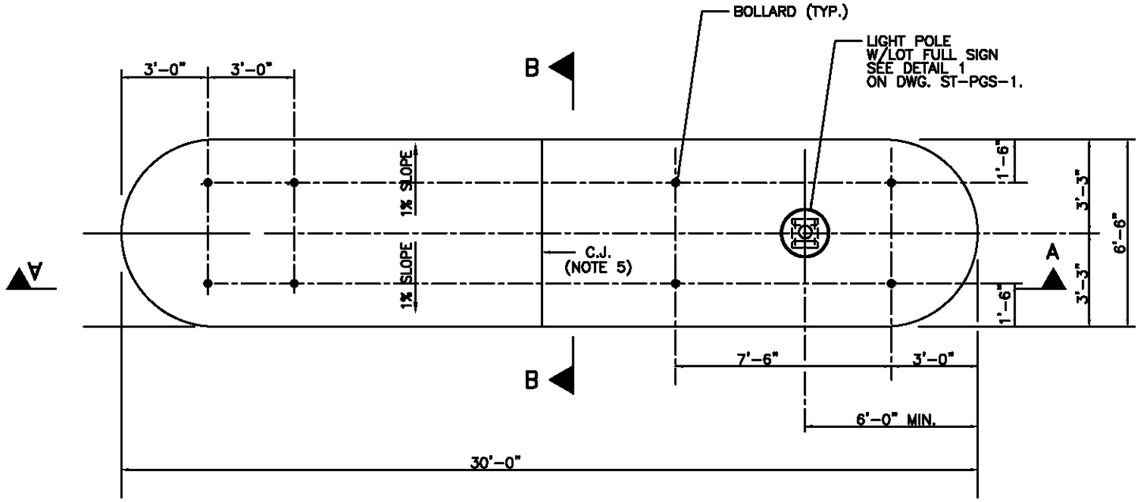
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

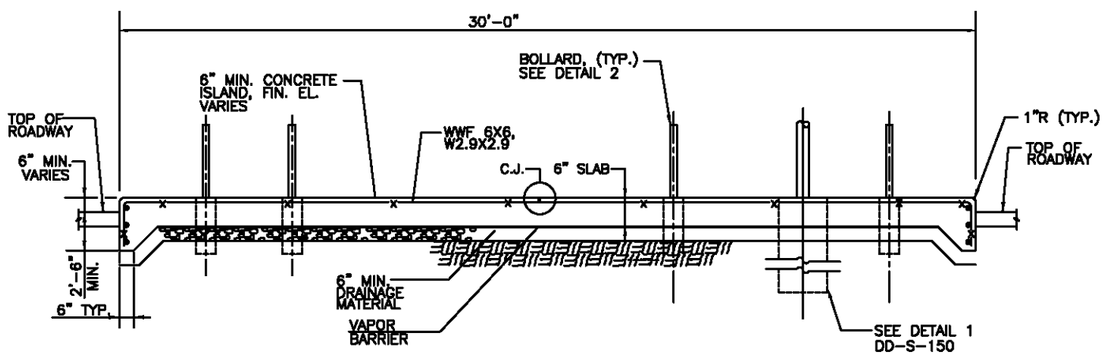
PARKING LOT CONTROL GATES

CONCRETE ISLAND–PLANS & DETAILS, SHEET 1 OF 2

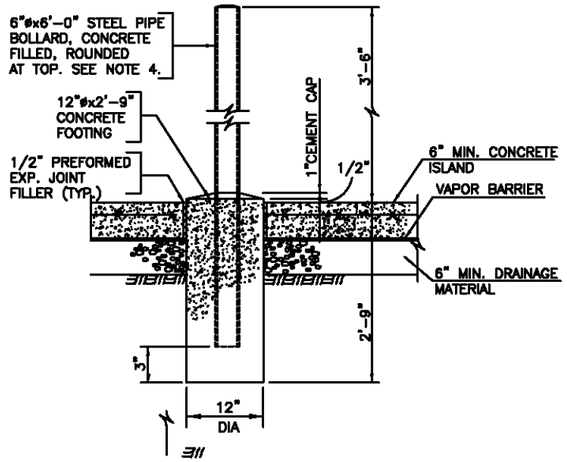
SCALE	DRAWING NO.
3/8"=1'-0" AND AS NOTED	DD-S-150



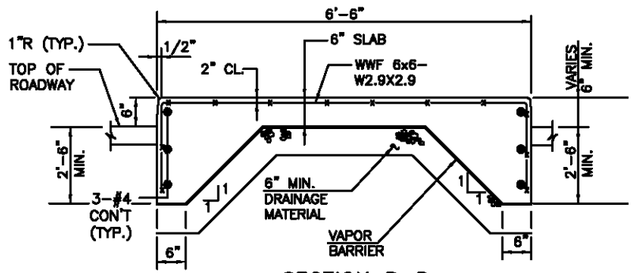
TYPICAL CONCRETE ISLAND PLAN
SCALE: 3/8" = 1'-0"



SECTION A-A
SCALE: 3/8" = 1'-0"



DETAIL - 2
SCALE: 1" = 1'-0"



SECTION B-B
SCALE: 3/4" = 1'-0"

NOTES

1. THE FOUNDATIONS FOR LIGHT POLE AND LOT FULL SIGN ARE DESIGNED FOR.
   A. AN ALLOWABLE VERTICAL SOIL BEARING CAPACITY OF 2500 PSF AND
   B. A LATERAL SOIL CAPACITYOF 345 PSF PER FOOT OF EMBEDMENT INCREASING LINEARLY WITH DEPTH.
2. TYPICAL CONCRETEISLAND PLAN SHOWN IS APPLICABLE FOR TYPE 3 ARRAY PARKING LOT CONTROL GATES. SEE ELECTRICAL AND CIVIL DRAWINGS FOR THE LOCATIONS AND QUANTITIES OF THE ISLAND
3. LOCATION OF CONTROL JOINTS CAN BE OFFSET TO AVOID JUNCTION BOXES AND OTHER ACCESSORIES. PROVIDE MINIMUM 8" CLEARANCE BETWEEN THE EDGE OF ANY JUNCTION BOX AND ANY JOINT IN CONCRETE.
4. USE BOLLARD MATERIALS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
   STEEL PIPE-SCHEDULE 30, ASTM. A120 PAINTS
   PAINTS:
   SHOP COAT-FS-TT-P-66 TYPE II
   SECOND COAT-HIGH BUILD EPOXY PRIMER
   THIRD COAT-ALIPHATIC POLYURETHANE
   COLOR-FEDERAL STANDARD 595, COLOR NO. 20040
5. CONTROL JOINT (C.J.): 1/4" WIDTH x 1" DEPTH SAWCUT, WITH HOT POUR ASPHALT.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	K. BARNES	07-98 DATE
DRAWN	PK. MELBOURNE	07-98 DATE
CHECKED	F. BLACHLY	09-98 DATE
APPROVED	GEC(DCCO)	09-98 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR DATE

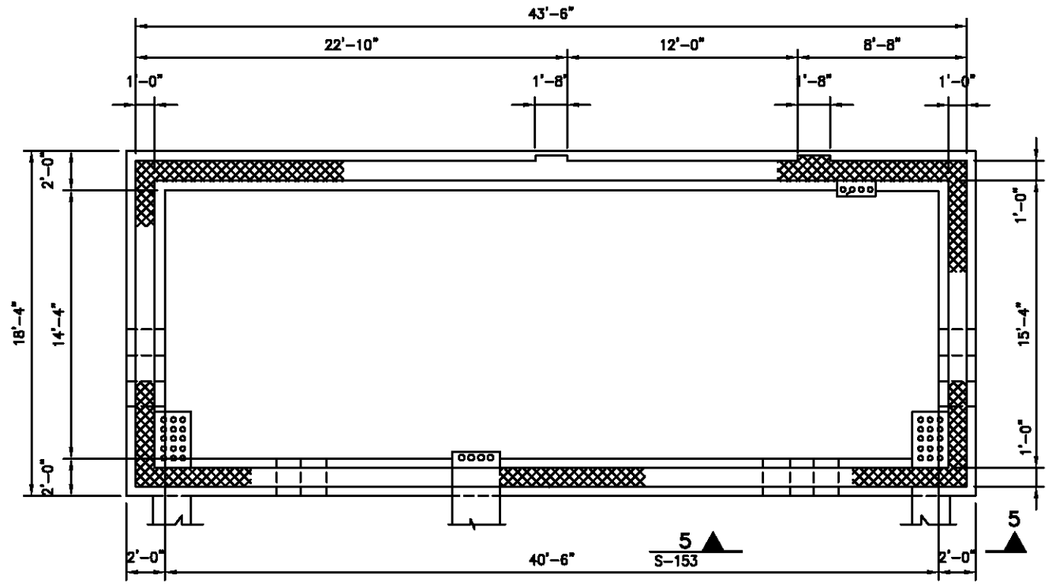
STRUCTURAL DESIGN DRAWING

PARKING LOT CONTROL GATES

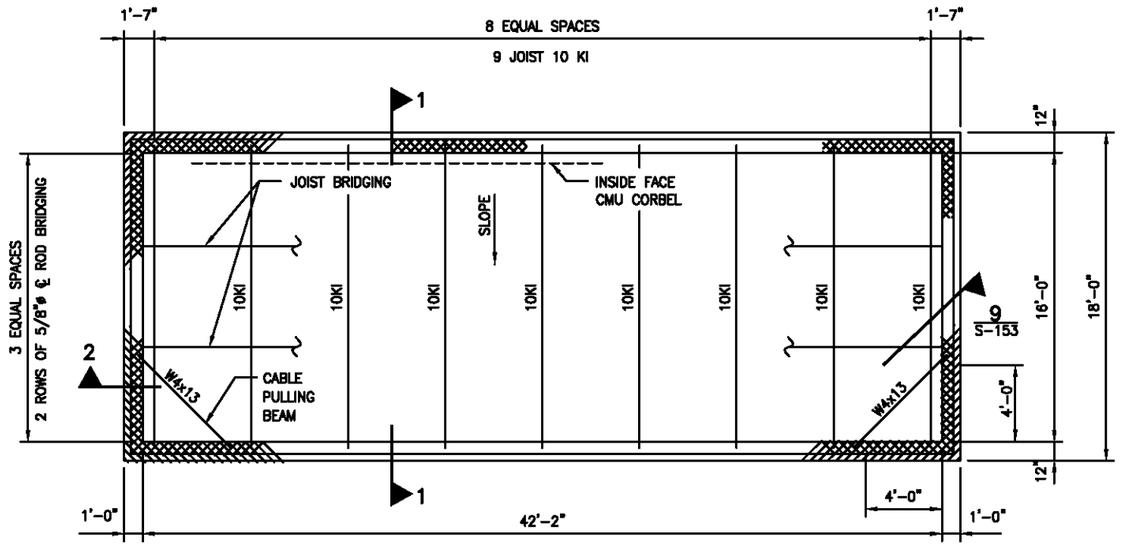
CONCRETE ISLAND-PLANS & DETAILS SHEET 2 OF 2

SCALE 3/8"=1'-0" AND AS NOTED

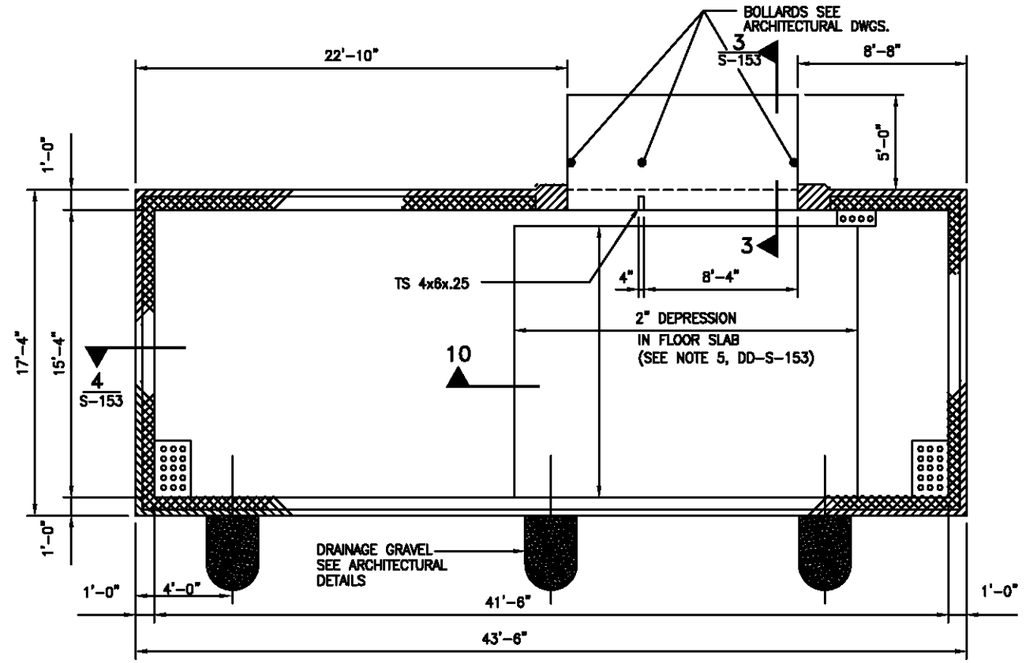
DRAWING NO. DD-S-151



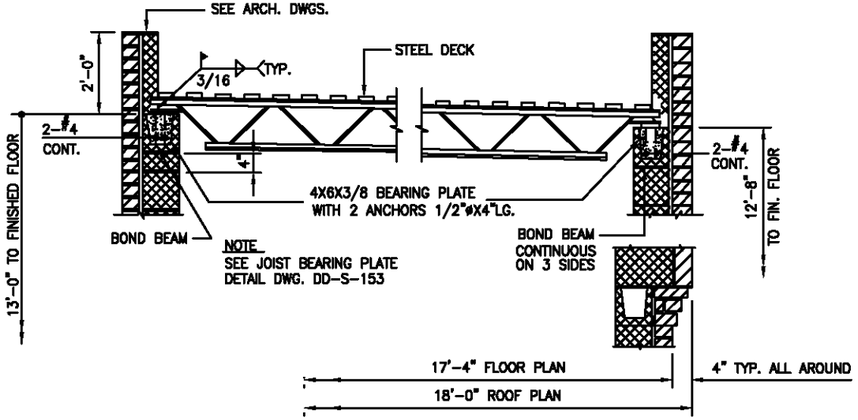
FOUNDATION PLAN



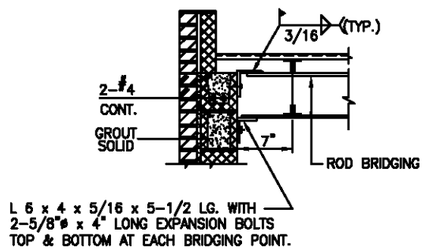
ROOF PLAN



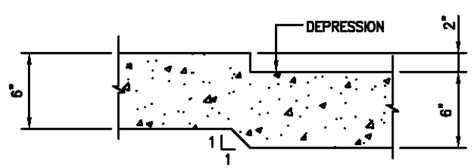
FLOOR PLAN



SECTION 1-1
SCALE: 3/4"=1'-0"



SECTION 2
SCALE: 3/4"=1'-0"



SECTION 10
NOT TO SCALE

DESIGNED	SINGH		05-82 DATE
DRAWN	RINALDI		05-82 DATE
CHECKED	GONCHAR		05-82 DATE
APPROVED	GEC(DCCO)		01-83 DATE
UPDATED	ENGA		08-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

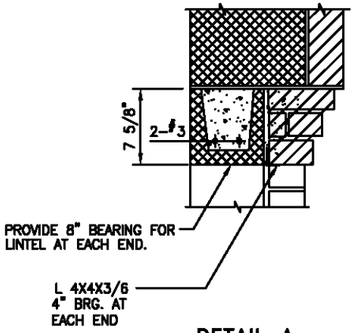
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
ABOVE GROUND TIE BREAKER STATION PLANS AND DETAILS - SHEET 1 OF 2

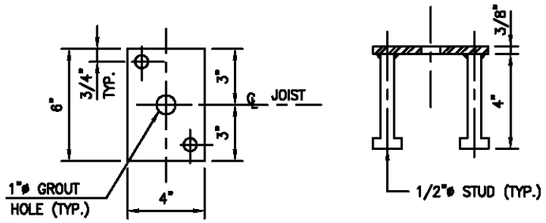
SCALE 1/4"=1'-0" 1 0 1 2 3 4 5 6 AND AS NOTED

DRAWING NO. DD-S-152



DETAIL A

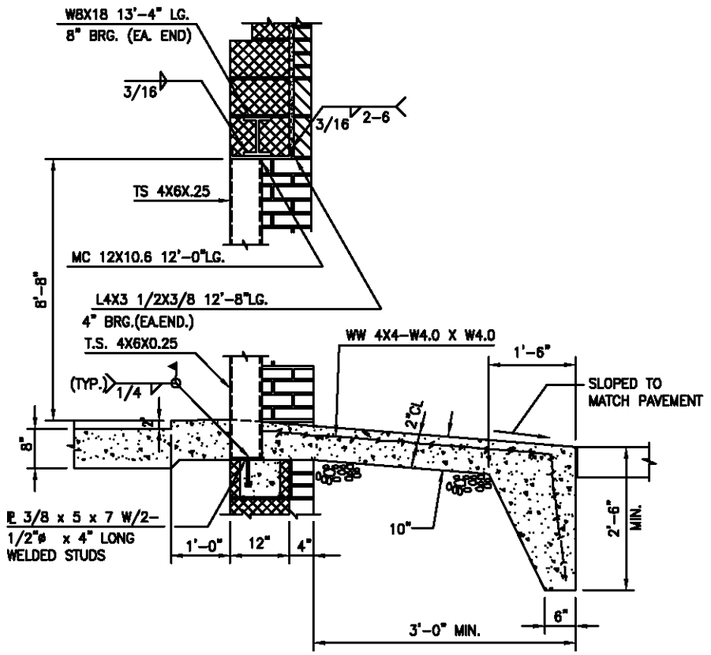
SCALE: 1–1/2"=1'–0"
TYP. LINTEL FOR LOUVER OPENINGS SEE ARCH DWGS.



PLAN SIDE ELEVATION

JOIST BEARING PLATE DETAILS

SECTION 1–1 DWG. DD–S–152
SCALE: 3"=1'–0"

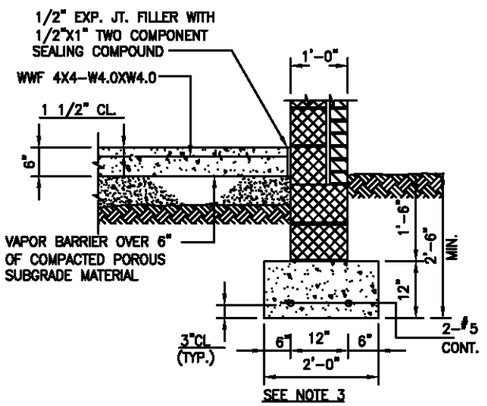


SECTION 3–3

SCALE: 3/4"=1'–0"
DD–S–152

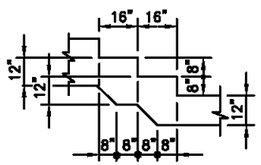
GENERAL NOTES:

1. PROVIDE CONTINUOUS WALL HORIZONTAL REINFORCEMENT AT EACH COURSE OF CMU (8" O.C.) BELOW FLOOR LEVEL AND AT EVERY SECOND COURSE OF CMU (16" O.C.) ABOVE FLOOR LEVEL. PROVIDE REINFORCEMENT IN EACH COURSE OF BRICK MASONRY CORBEL. FOR DETAILS AND LOCATIONS, SEE ARCH. DWGS.
2. THE DUCT BANK STUB–OUTS SHOWN ON THE FOUNDATION PLAN ARE FOR INFORMATION ONLY AND ARE INTENDED TO CLARIFY THE TYPICAL DETAILS SHOWN AT ELEVATION 5 AND SECTION 6 WITH REGARD TO THE DUCT BANK PENETRATION INTO THE BUILDING. FOR REQUIRED DIMENSIONS AND LOCATIONS OF ALL DUCT BANKS AND STUB–OUTS, SEE ELECTRICAL DRAWING DD–E–116.
3. FOOTINGS ARE DESIGNED FOR AN ALLOWABLE SOIL BEARING CAPACITY OF 2500LBS PER SQUARE FOOT. FOOTINGS SHALL NOT BE CONSTRUCTED UNTIL THE ALLOWABLE BEARING CAPACITY AT EACH FOOTING BOTTOM IS VERIFIED BY THE ENGINEER.
4. NUMBER OF STEPS IN FOOTING SHALL BE DETERMINED FROM THE REQUIRED DUCT BANK ELEVATION.
5. TIE BREAKER FLOOR OUTSIDE OF DEPRESSED AREA SHALL BE STEEL TROWEL FINISHED.
6. DESIGN LOADS PER WMATA DESIGN CRITERIA.



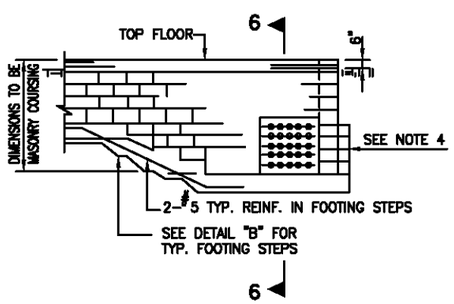
SECTION 4

SCALE: 3/4"=1'–0"
DD–S–152

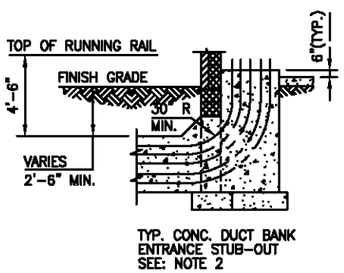


DETAIL B

SCALE: 3/8"=1'–0"

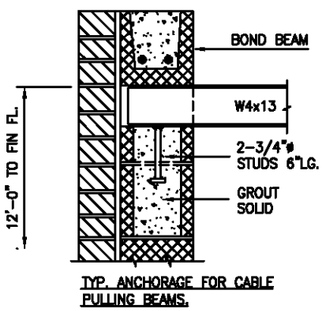


ELEVATION 5–5



TYP. CONC. DUCT BANK ENTRANCE STUB–OUT SEE: NOTE 2

SECTION 6–6



TYP. ANCHORAGE FOR CABLE PULLING BEAMS.

SECTION 9

SCALE: 1 1/2"=1'–0"
DD–S–152

DESIGNED	SINGH	05–82 DATE
DRAWN	RINALDI	05–82 DATE
CHECKED	GONCHAR	05–82 DATE
APPROVED	SEC(DCCO)	01–83 DATE
UPDATED	ENGA	08–00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

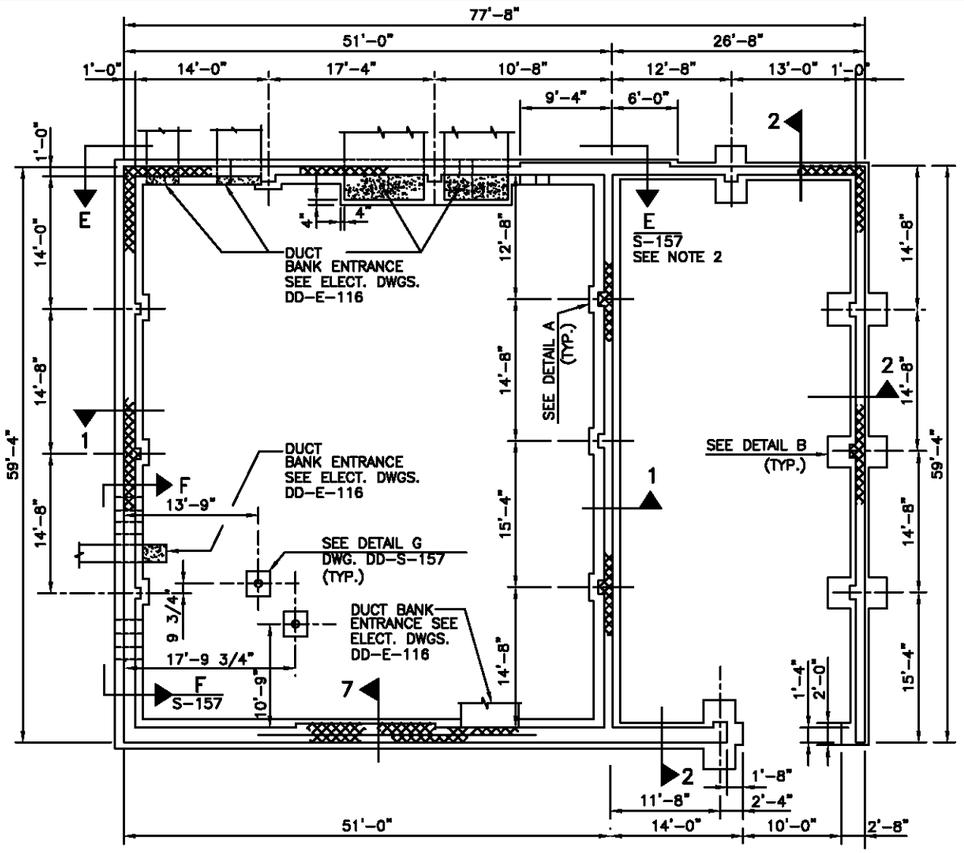
SUBMITTED DATE

APPROVED DIRECTOR 5/2001 DATE

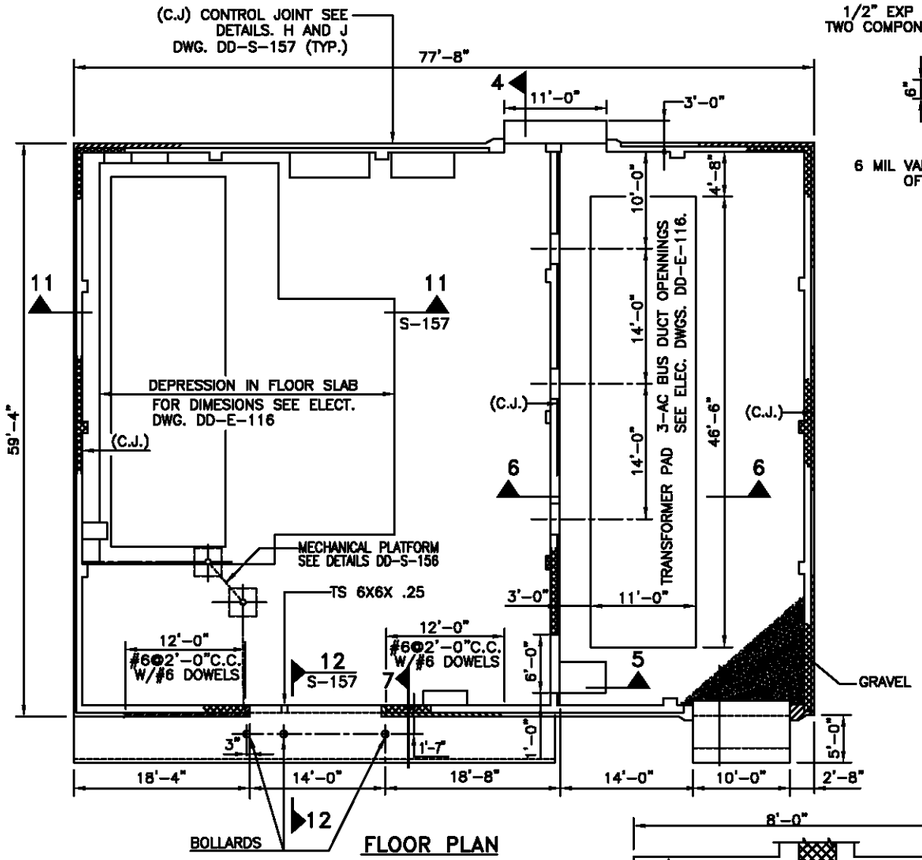
STRUCTURAL DESIGN DRAWING
ABOVE GROUND TIE BREAKER STATION
SECTIONS AND DETAILS
SHEET 2 OF 2

SCALE 1/4"=1'–0" AND AS NOTED

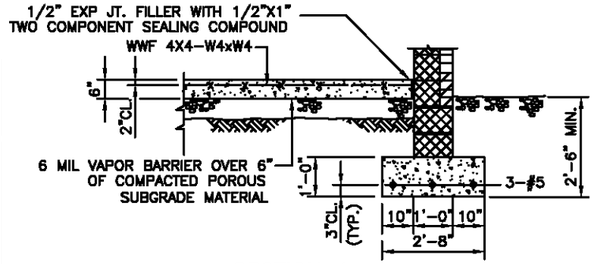
DRAWING NO. DD–S–153



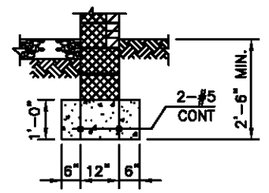
FOUNDATION PLAN



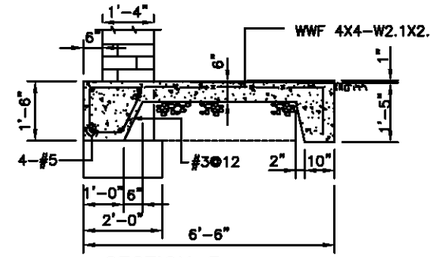
FLOOR PLAN



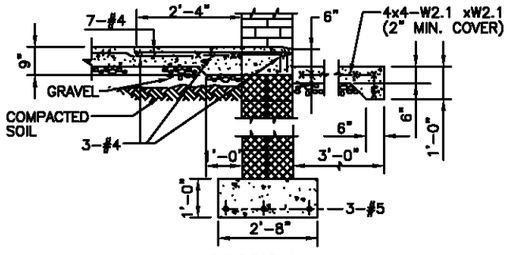
SECTION 1
SCALE: 1/2"=1'-0"



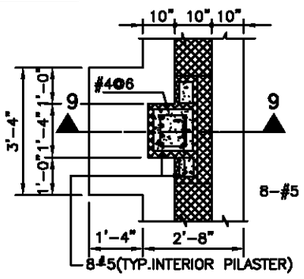
SECTION 2
SCALE: 1/2"=1'-0"



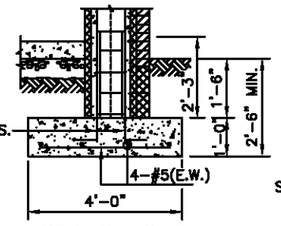
SECTION 3
SCALE: 1/2"=1'-0"



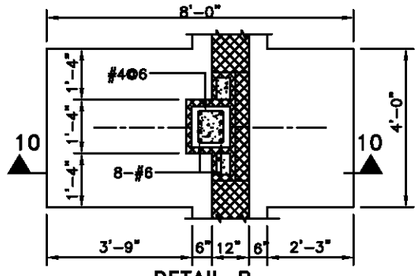
SECTION 4
SCALE: 1/2"=1'-0"



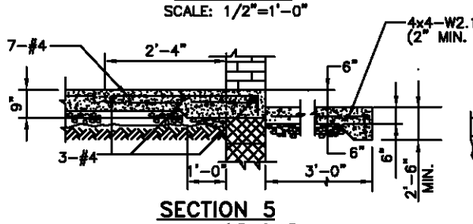
DETAIL A
SCALE: 1/2"=1'-0"



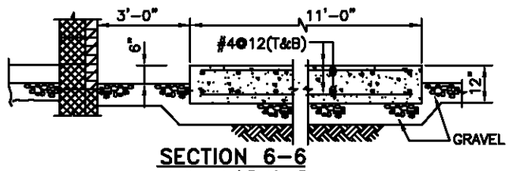
SECTION 9-9
SCALE: 1/2"=1'-0"



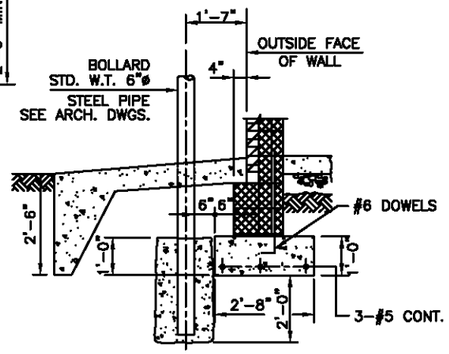
DETAIL B
SCALE: 1/2"=1'-0"



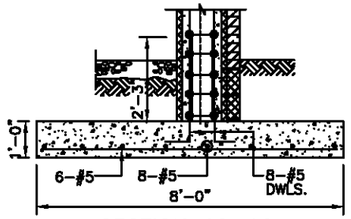
SECTION 5
SCALE: 1/2"=1'-0"



SECTION 6-6
SCALE: 1/2"=1'-0"



SECTION 7
SCALE: 1/2"=1'-0"



SECTION 10-10
SCALE: 1/2"=1'-0"

GENERAL NOTES:

1. PROVIDE CONTINUOUS WALL HORIZONTAL REINFORCEMENT AT EACH COURSE OF CMU (8" O.C.) BELOW FLOOR LEVEL AND AT EVERY SECOND COURSE OF CMU (16" O.C.) ABOVE FLOOR LEVEL. PROVIDE REINFORCEMENT IN EACH COURSE OF BRICK MASONRY CORBEL. FOR DETAILS AND LOCATIONS, SEE ARCH. DWGS.

2. THE DUCT BANKS AND STUB-OUTS SHOWN ON THE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE INTENDED TO CLARIFY THE TYPICAL DETAILS SHOWN ON "ELEVATION E-E" AND "ELEVATION F-F" DWG. DD-S-157 WITH REGARD TO THE DUCT PENETRATION INTO THE BUILDING. FOR REQUIRED DIMENSIONS AND LOCATIONS OF ALL DUCT BANKS AND STUB-OUTS, SEE ELECTRICAL DWG. DD-E-115.

3. FOOTINGS ARE DESIGNED FOR AN ALLOWABLE SOIL BEARING CAPACITY OF 2500 PSF. FOOTINGS SHALL NOT BE CONSTRUCTED UNTIL THE ALLOWABLE BEARING CAPACITY AT EACH FOOTING BOTTOM IS VERIFIED BY THE ENGINEER.

4. SUBSTATION FLOOR & TRANSFORMER PAD SHALL BE STEEL TROWEL FINISHED TO A TOLERANCE LEVEL OF 1/8" IN 10'-0".

DESIGNED	SINGH	06-82 DATE
DRAWN	SINALDI	06-82 DATE
CHECKED	MIANES	11-82 DATE
APPROVED	SEC(DCCO)	04-83 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

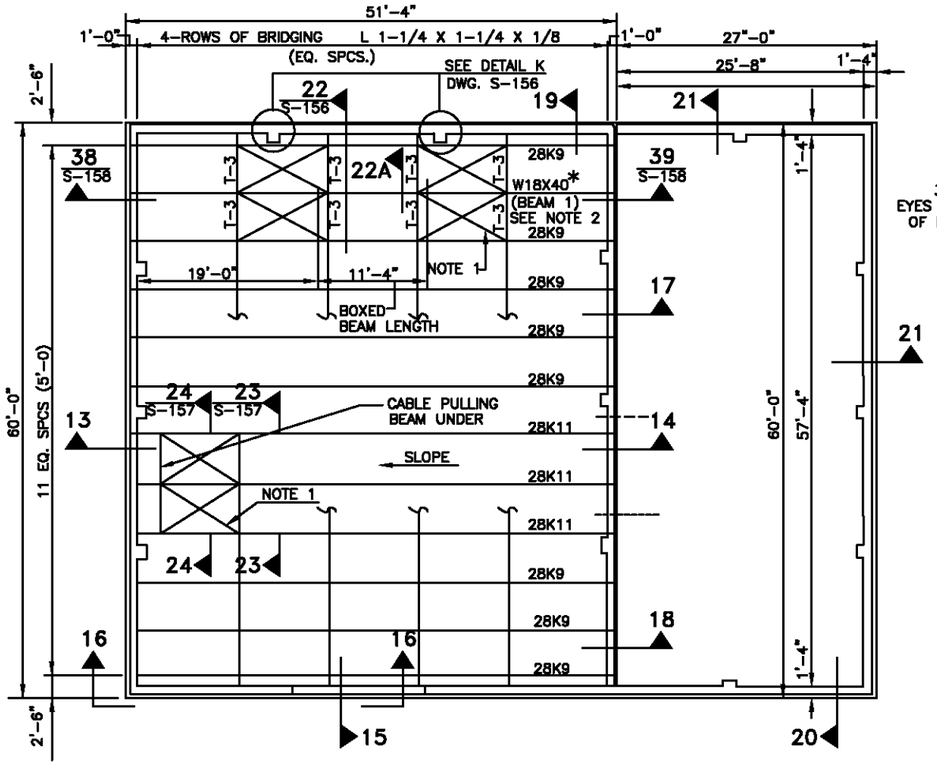
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

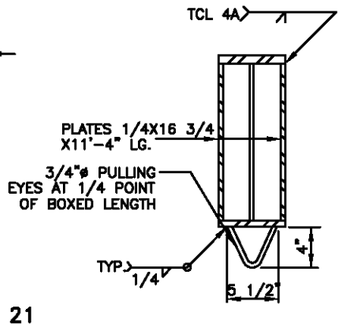
STRUCTURAL DESIGN DRAWING
ABOVE GROUND TRACTION POWER SUBSTATION BLDG. TYPE "A"-FOUNDATION & FLOOR PLANS SECTIONS AND DETAILS

SCALE 1/8"=1'-0" 2 0 2 4 6 8 10 AND AS NOTED

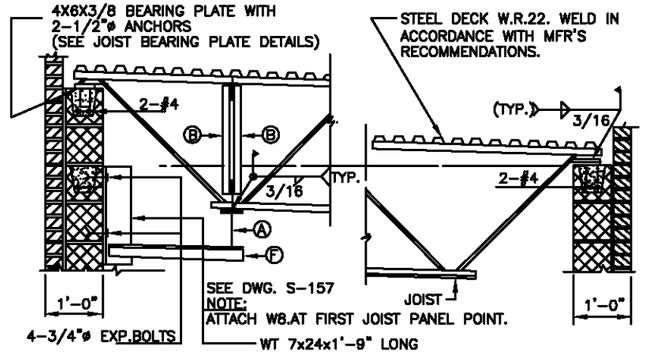
DRAWING NO. DD-S-154



ROOF PLAN
BLDG. TYPE-A

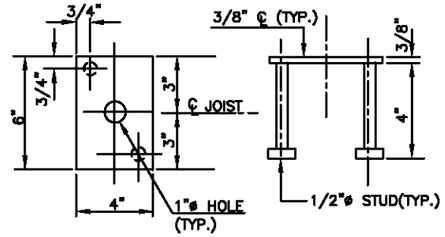


SECTION 22A
BOXED BEAM DETAIL
SCALE: 1 1/2"=1'-0"



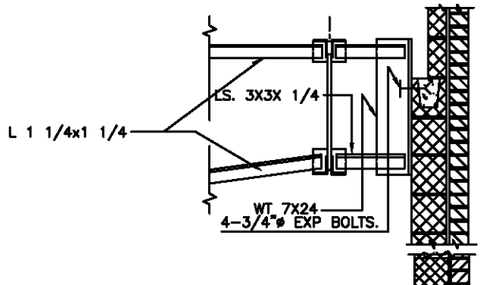
SECTION 13
SCALE: 3/4"=1'-0"

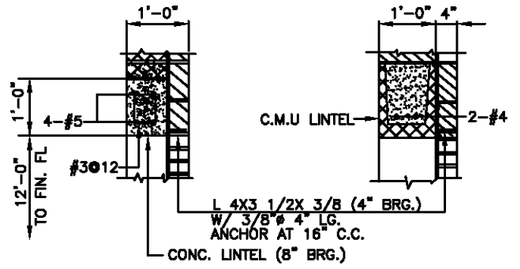
SECTION 14
SCALE: 3/4"=1'-0"



PLAN SIDE ELEVATION

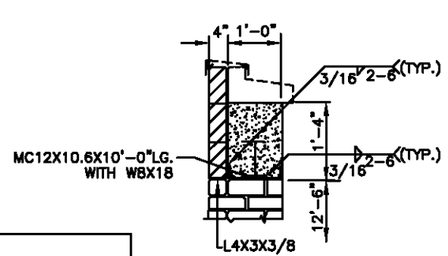
JOIST BEARING PLATE DETAILS
SCALE: 3"=1'-0"



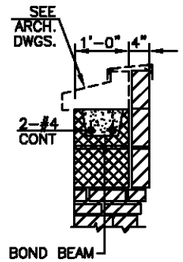


SECTION 18
SCALE: 3/4"=1'-0"

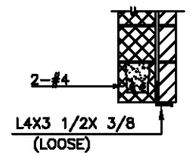
SECTION 19
SCALE: 3/4"=1'-0"



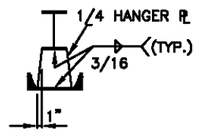
SECTION 20
SCALE: 3/4"=1'-0"



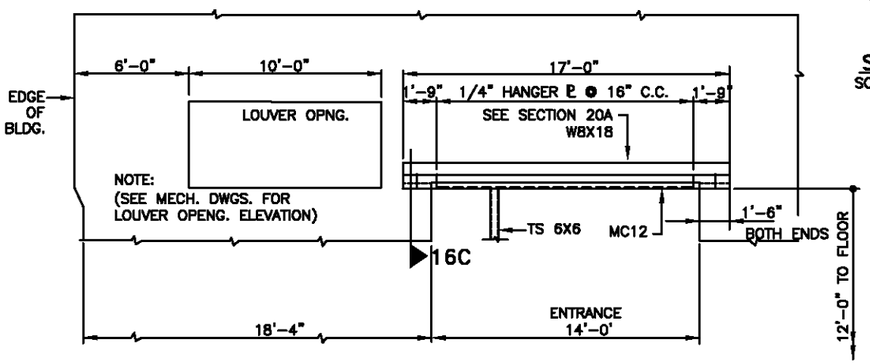
SECTION 21
SCALE: 3/4"=1'-0"



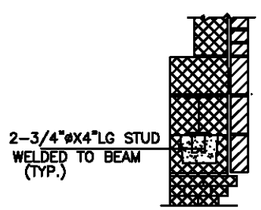
SECTION 17
TYP. LINTEL
FOR DUCT OPNGS
SCALE: 3/4"=1'-0"



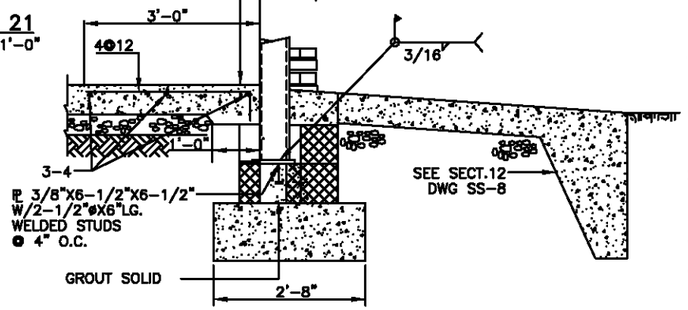
SECTION 20A
NOT TO SCALE



ELEVATION 16-16
SCALE: 1/4"=1'-0"



SECTION 16C
SCALE: 3/4"=1'-0"



SECTION 15
SCALE: 3/4"=1'-0"

ROOF FRAMING NOTES

1. HORIZONTAL X-BRACING IS COMPOSED OF 5/8"ø RODS AND EXTENDS FROM BOTTOM CHORDS OF JOISTS AND BOTTOM FLAGES OF W 18X40. EACH ROD SHALL HAVE A STANDARD 5/5"ø TURNBUCKLE FOR ADJUSTMENT.
2. CABLE PULLING SHEAVE MAY BE ATTACHED TO WIDE FLANGE MEMBERS MARKED WITH AN ASTERISK * ON ROOF PLAN.
3. ALL STEEL PIPE DIAMETERS ARE NOMINAL.
4. UNLESS NOTED DIFFERENTLY ALL BOLTS ARE ASTM A-325.
5. WHERE ALT LOCATION FOR TRACTION POAVER STUBSTATION CONDUITS IS USED REPLACE BEAM 1 WITH 28K9 ALSO SEE DWG. DD-S-156 NOTE A.

DESIGNED	SINGH	06-82 DATE
DRAWN	PK. MELBOURNE	DATE
CHECKED	MJARES	11-82 DATE
APPROVED	GEC(DCCO)	04-83 DATE
UPDATED	ENGA	06-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

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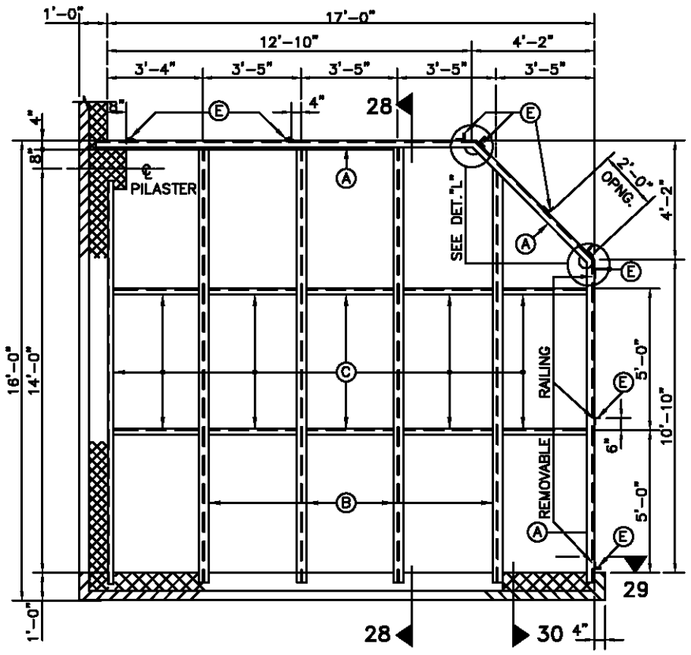
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

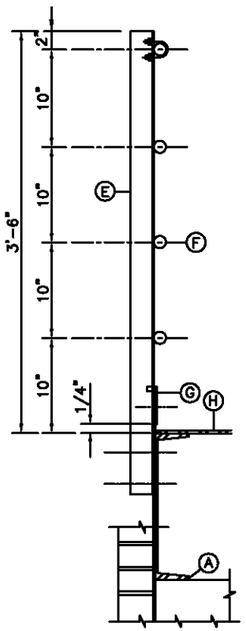
STRUCTURAL DESIGN DRAWING
ABOVE GROUND TRACTION POWER SUBSTATION
BLDG. TYPE "A" ROOF PLAN AND DETAILS

SCALE 1/8"=1'-0" 10 2 4 6 8 10 AND AS NOTED

DRAWING NO. DD-S-155



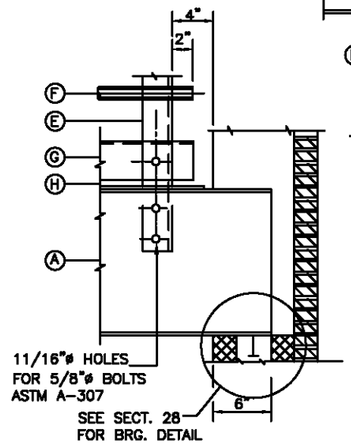
MECHANICAL PLATFORM PLAN
(BLDG. TYPE A)
SCALE: 3/8"=1'-0"



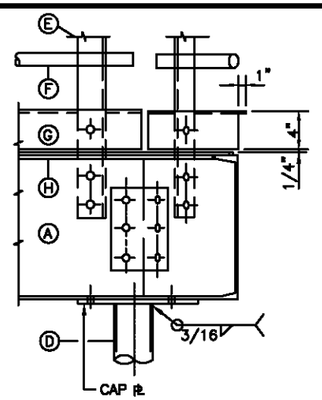
SECTION 29
(AS SHOWN)
SECTION 29A
(DD-S-160 OPPOSITE HAND)
NOT TO SCALE

LEGEND:

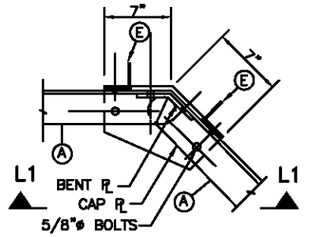
- (A) C 15 X 33.9
- (B) W 8 X 15
- (C) C 6 X 8.2
- (D) 4"ø STD. WT. STEEL PIPE
- (E) L 3 X 2 1/2 X 1/4
- (F) 1 1/4"ø STD. WT STEEL PIPE
- (G) TOE PLATE 10 GA.1" FLANGE
- (H) 1/4" RAISED PATTERN PLATE (HOT DIP GALVANIZE)



SECTION 30
SCALE: 1 1/2"=1'-0"

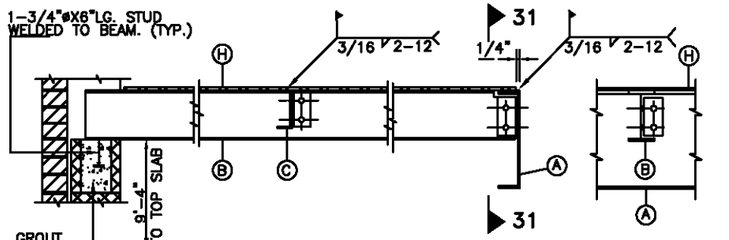


ELEVATION L1-L1
SCALE: 1 1/2"=1'-0"



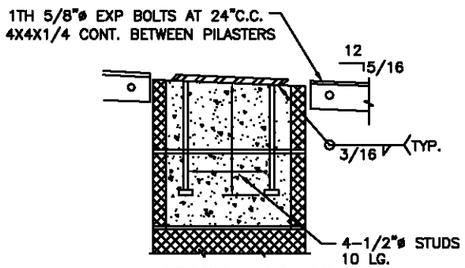
NOTE: BACK OF CHANNELS ARE TANGENT TO OUTSIDE OF PIPE.

DETAIL L
SCALE: 1 1/2"=1'-0"

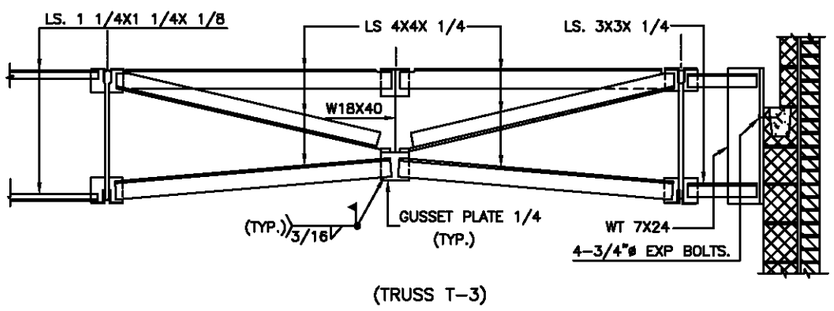


SECTION 28-28
SCALE: 1"=1'-0"
DD-S-156, DD-S-160

SECTION 31-31
SCALE: 1"=1'-0"

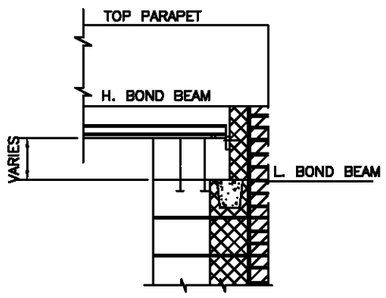


SECTION 25-25
SCALE: 1 1/2"=1'-0"

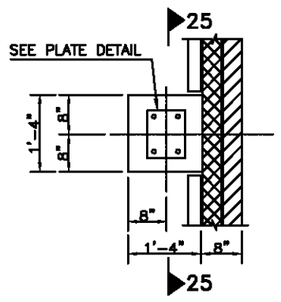


(TRUSS T-3)

SECTION 22
SCALE: 3/4"=1'-0"
DD-S-155



SECTION 26-26
SCALE: 3/4"=1'-0"



DETAIL K
SCALE: 3/4"=1'-0"
DD-S-155

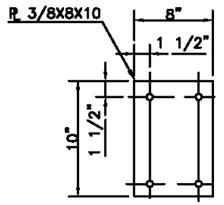
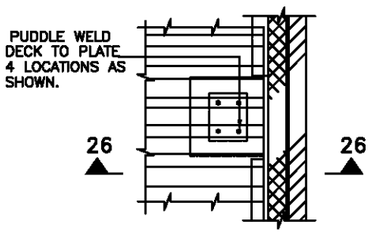


PLATE DETAIL
SCALE: 1/2"=1'-0"



PART PLAN
(AT END WALL PILASTER)

NOTE A:

TRUSSES T-3 AND DIAGONAL ROD BRACING TO BE OMITTED AND REPLACED BY STANDARD JOIST BRIDGING WHEN ALTERNATIVE LOCATION FOR TRACTION POWER CONDUITS IS USED SEE DWG. DD-S-160

DESIGNED	MURU	10-82 DATE
DRAWN	RINALDI	10-82 DATE
CHECKED	MJAMES	10-82 DATE
APPROVED	GED(DCCO)	04-83 DATE
UPDATED	ENGA	06-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
06/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

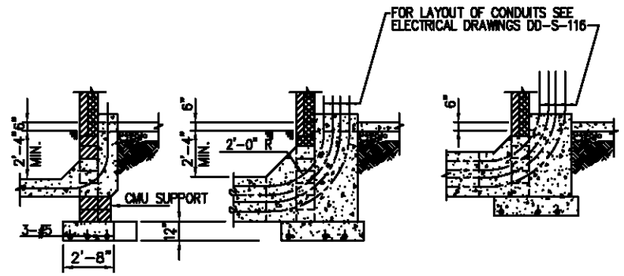
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
ABOVE GROUND TRACTION POWER SUBSTATION
MECHANICAL PLATFORM PLAN, DETAILS AND MISCELLANEOUS DETAILS

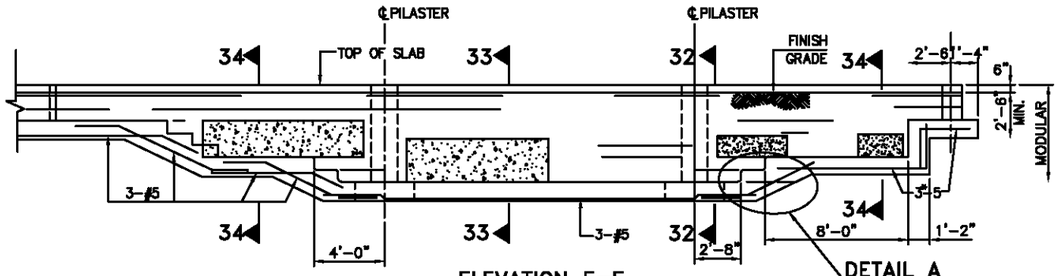
SCALE	DRAWING NO.
AS NOTED	DD-S-156



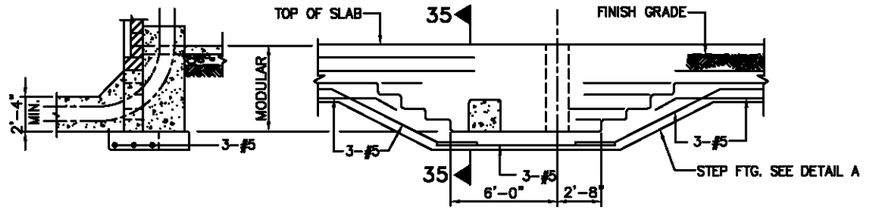
SECTION 32-32
SCALE: 1/4"=1'-0"

SECTION 33-33
SCALE: 1/4"=1'-0"

SECTION 34-34
SCALE: 1/4"=1'-0"

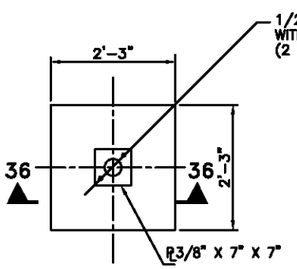


ELEVATION E-E
(DD-S-154 AS SHOWN)
ELEVATION E1-E1
(DD-S-159 OPPOSITE HAND
SCALE : 1/4" = 1'-0"

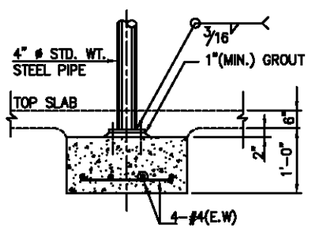


SECTION 35-35
SCALE: 1/4" = 1'-0"

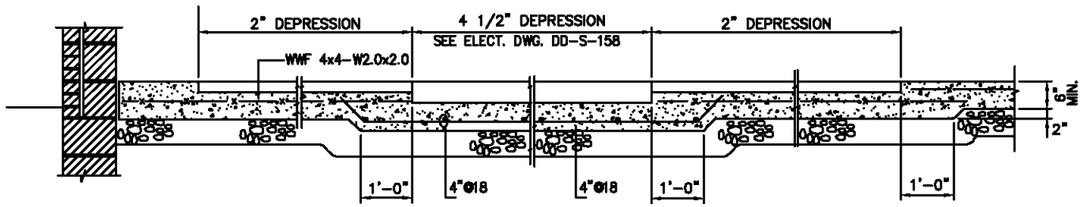
ELEVATION F-F
(DD-S-154 AS SHOWN)
ELEVATION F1-F1
(DD-S-159 OPPOSITE HAND)
SCALE: 1/4" x 1=0"



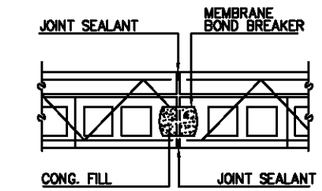
DETAIL G
SCALE: 3/4"=1'-0"
DD-S-154, DD-S-159



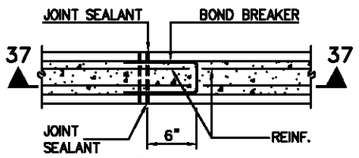
SECTION 36-36
SCALE: 3/8"=1'-0"



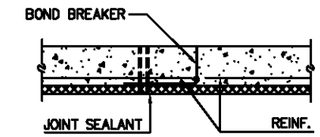
SECTION 11-11
SCALE: 3/4"=1'-0"
DD-S-154, DD-S-159



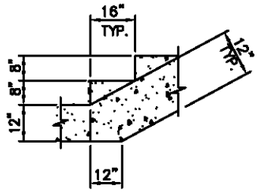
DETAIL H
CONTROL JOINT IN EXT. WALL
NOT TO SCALE
DD-S-154, DD-S-159



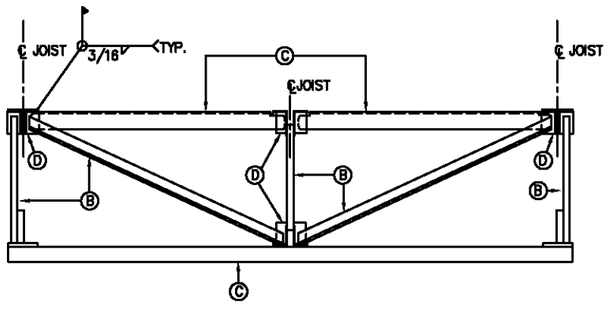
DETAIL J
CONTROL JOINT IN BOND BEAM
NOT TO SCALE
DD-S-154, DD-S-159



SECTION 37-37
NOT TO SCALE

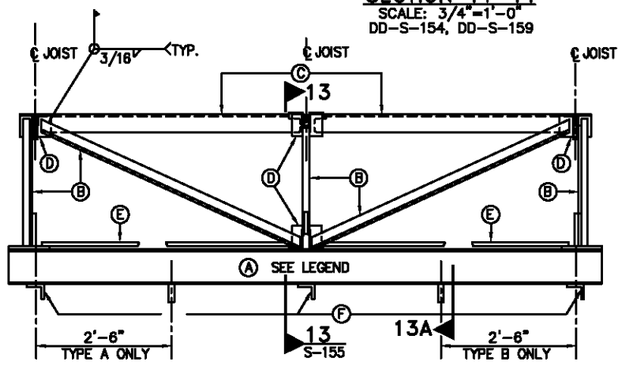


DETAIL A (TYP.)
NOT TO SCALE

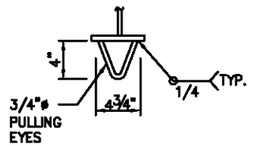


LEGEND:
- (A)- W8x18 CABLE PULLING BEAM
- (B)- 2 L's. 2-1/2x2-1/2 x3/16
- (C)- L 4x4x1/4
- (D)- 1/4 GUSSET PLATE
- (E)- 5/8"ø ROD
- (F)- L 2 1/2x2 1/2 x1/4

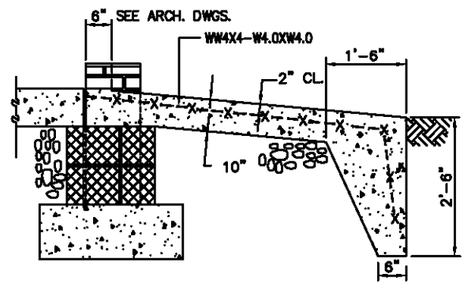
SECTION 23-23
SCALE: 3/4"=1'-0"
DD-S-155



SECTION 24-24
SCALE: 3/4"=1'-0"
DD-S-155



SECTION 13A
NOT TO SCALE



SECTION 12-12
SCALE: 3/4"=1'-0"
DD-S-154, DD-S-159

DESIGNED	SINGH	06-82 DATE
DRAWN	RINALDI	06-82 DATE
CHECKED	MJARES	06-82 DATE
APPROVED	GED(DCCO)	04-83 DATE
UPDATED	ENGA	05-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

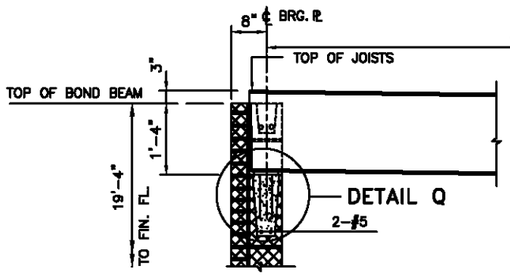
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

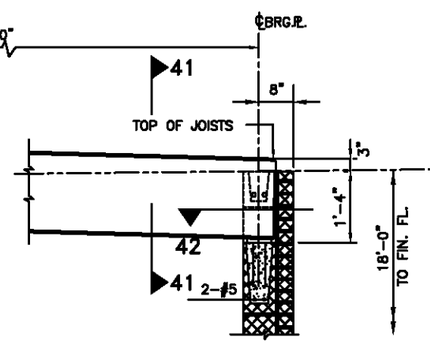
APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
ABOVE GROUND TRACTION POWER SUBSTATION
MISCELLANEOUS DETAILS

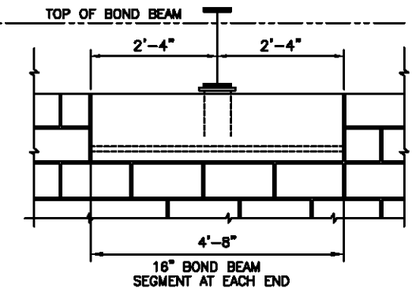
SCALE	DRAWING NO.
AS NOTED	DD-S-157



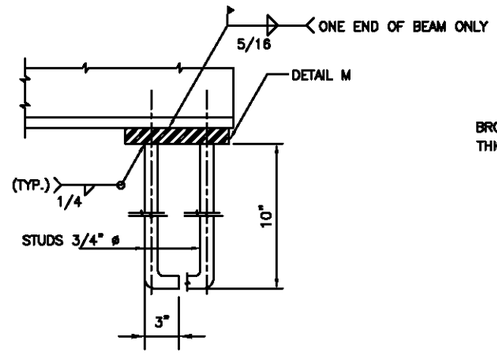
SECTION 38
SCALE: 3/4"=1'-0"
DD-S-155



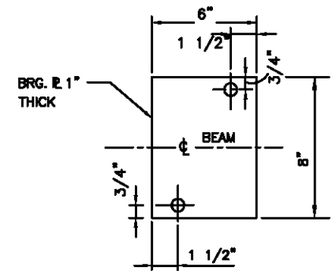
SECTION 39
SCALE: 3/4"=1'-0"
DD-S-155



SECTION 41-41
SCALE: 3/4"=1'-0"

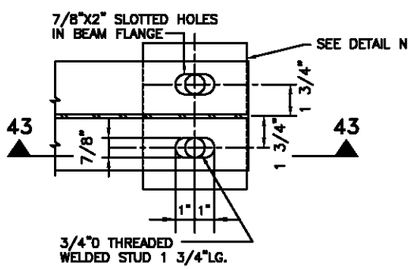


DETAIL Q
SCALE: 3"=1'-0"

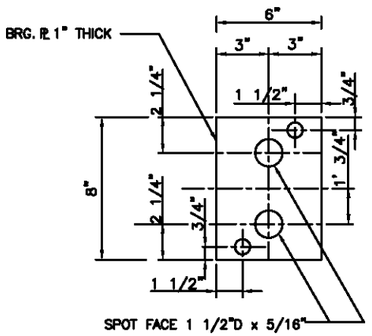


DETAIL M
SCALE: 3"=1'-0"

SECTION 43-43
SCALE: 3"=1'-0"



SECTION 42
SCALE: 3"=1'-0"



DETAIL N
SCALE: 3"=1'-0"

NOTE:
1. HOT DIP GALVANIZED BEARING PLATES

DESIGNED	GONCHAR	02-83 DATE
DRAWN	RINALDI	02-83 DATE
CHECKED	MUARES	02-83 DATE
APPROVED	SEC(DCCO)	04-83 DATE
UPDATED	ENGA	06-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

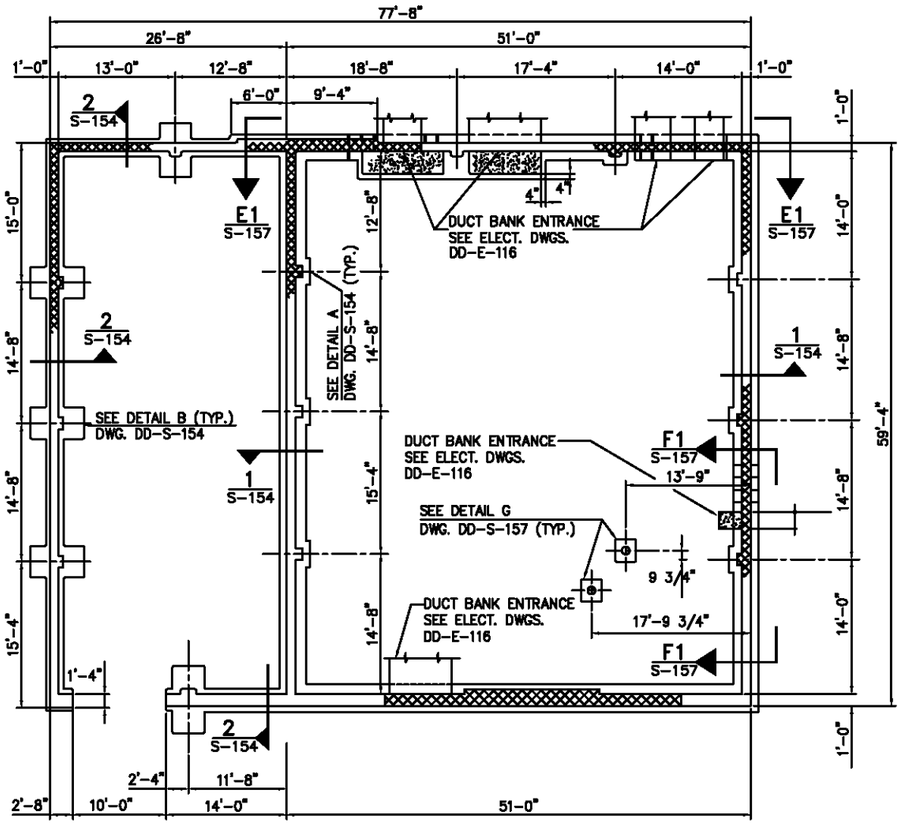
STRUCTURAL DESIGN DRAWING
ABOVE GROUND TRACTION POWER SUBSTATION
BEAM AND BEARING DETAILS

SCALE 1/8"=1'-0" AND AS NOTED

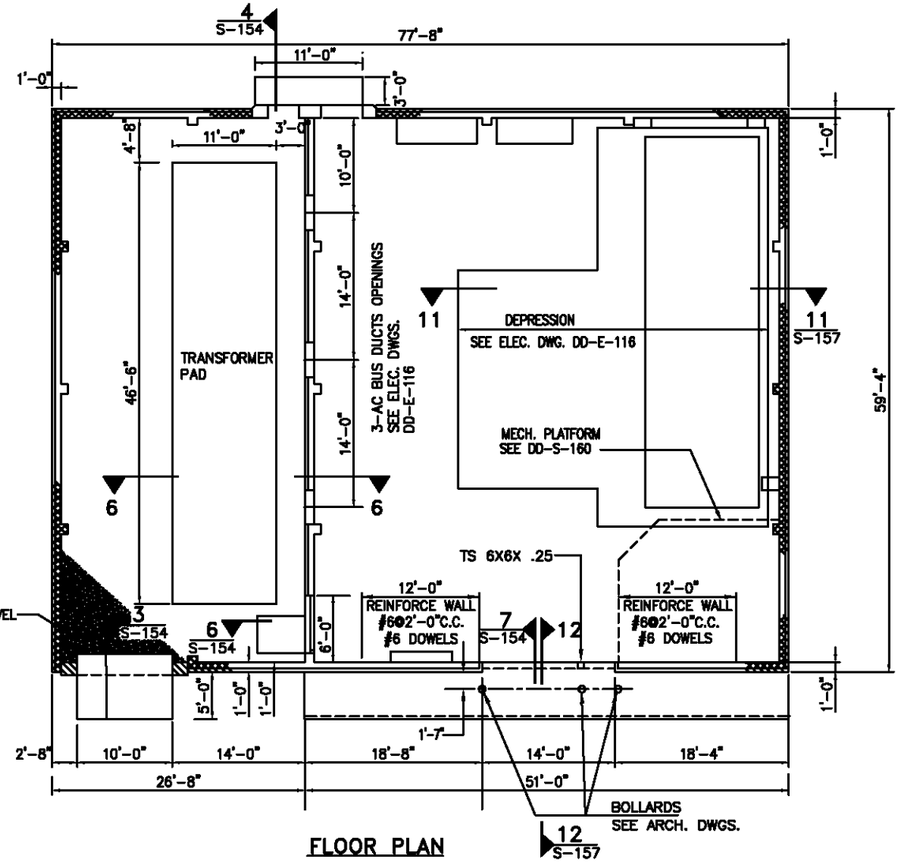
DRAWING NO. DD-S-158

NOTES:

1. SECTIONS NOT DEPICTED ON THIS DRAWING ARE SAME AS FOR BUILDING TYPE "A".
2. FOR ADDITIONAL NOTES SEE DWGS. DD-S-154 AND DD-S-155.



FOUNDATION PLAN



FLOOR PLAN

DESIGNED	GONCHAR	04-83	DATE
DRAWN	RINALDI	04-83	DATE
CHECKED	MJARES	04-83	DATE
APPROVED	GEC(DCCO)	04-83	DATE
UPDATED	ENGA	06-00	DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
06/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

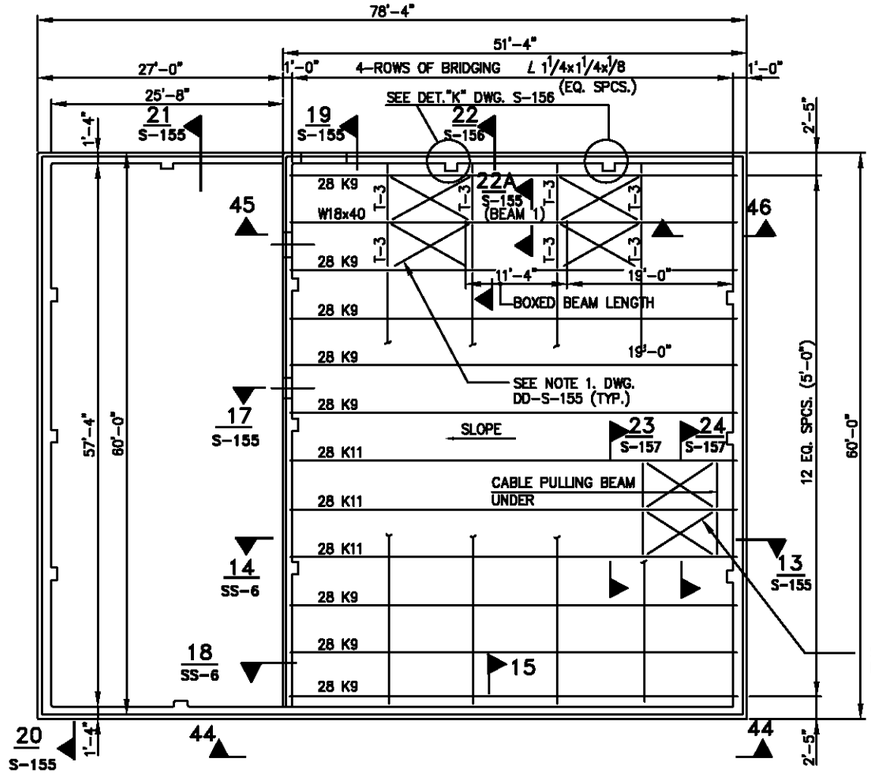
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

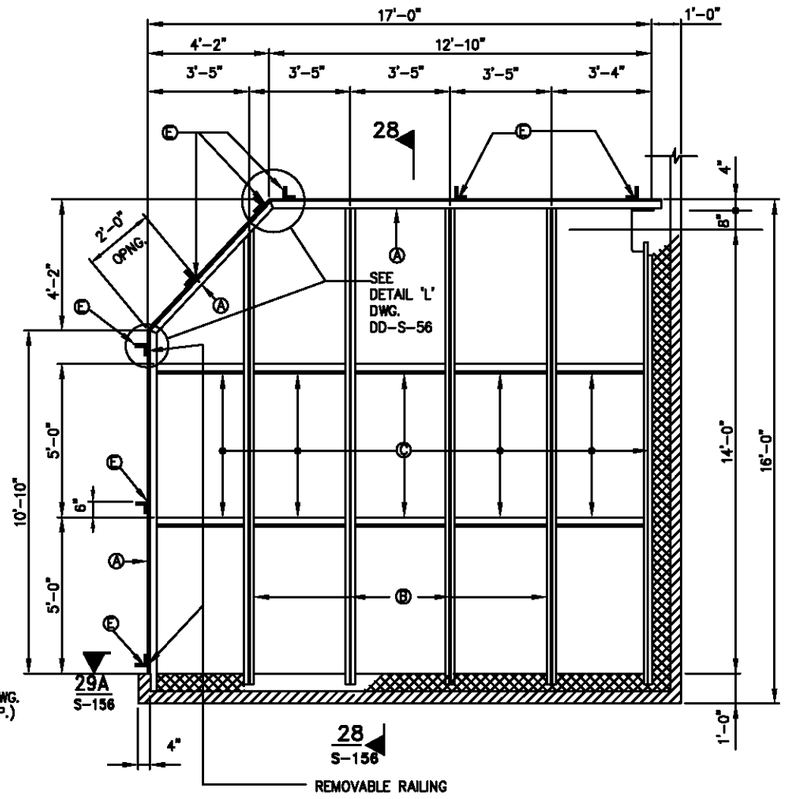
STRUCTURAL DESIGN DRAWING
ABOVE GROUND TRACTION POWER SUBSTATION FOUNDATION PLAN AND ROOF PLAN BLDG. TYPE "B"

SCALE 1/8"=1'-0" 0 3" 6" 12" AND AS NOTED

DRAWING NO. DD-S-159



ROOF PLAN

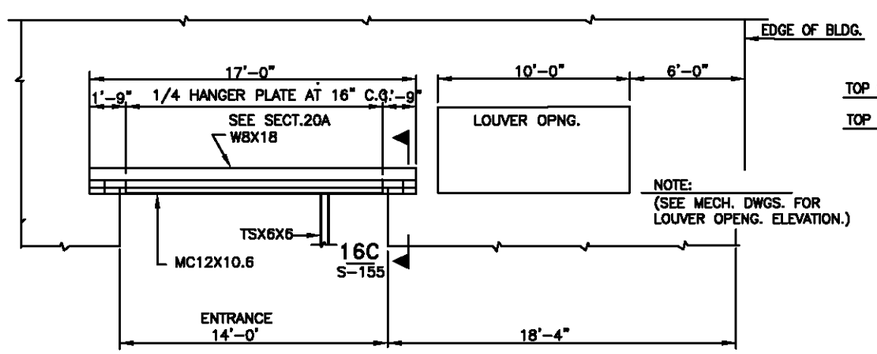


MECHANICAL PLATFORM PLAN

N.T.S

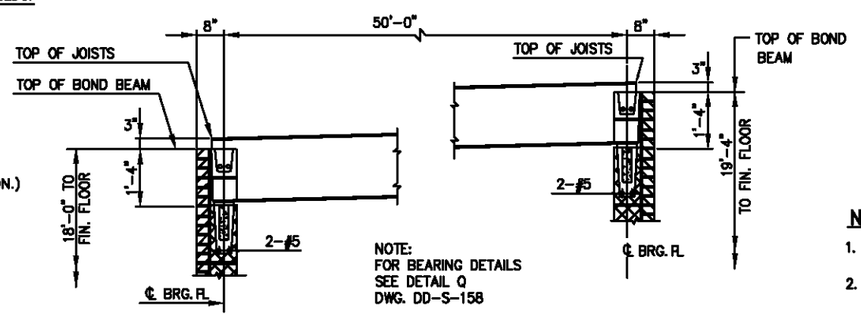
LEGEND:

- Ⓐ C 15 X 33.9
- Ⓑ W 8 X 15
- Ⓒ C 6 X 8.2
- Ⓓ 4"ø STD. WT. STEEL PIPE
- Ⓔ L 3 X 2 1/2 X 1/4
- Ⓕ 1 1/4"ø STD. WT STEEL PIPE
- Ⓖ TOE PLATE 10 GA.1" FLANGE
- Ⓗ 1/4" RAISED PATTERN PLATE



ELEVATION 44

SCALE:1/4"=1'-0"



SECTION 45

N.T.S

SECTION 46

N.T.S

NOTES:

1. SECTIONS NOT DEPICTED ON THIS DRAWING ARE SAME AS FOR BUILDING TYPE "A".
2. FOR ADDITIONAL NOTES SEE DWGS. DD-S-154 AND DD-S-155.

DESIGNED	K. BARNES	5-98 DATE
DRAWN	PK. MILBOURNE	5-98 DATE
CHECKED	R. FENG	8-98 DATE
APPROVED	GEC(DCCO)	9-98 DATE
UPDATED	ENGA	06-00 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
06/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

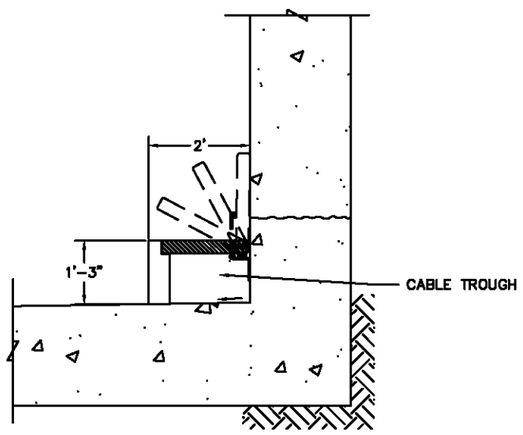
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

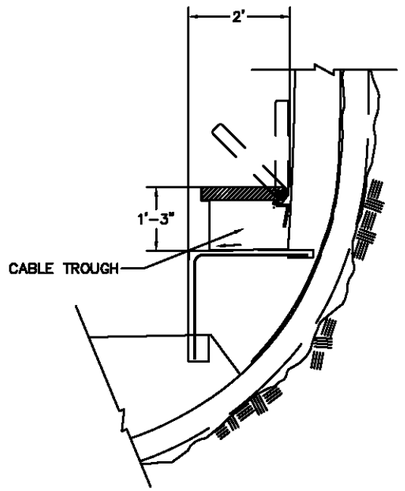
STRUCTURAL DESIGN DRAWING
TRACTION POWER SUBSTATION
ROOF PLAN, SECTIONS AND DETAILS
BLDG. TYPE "B"

SCALE 1/8"=1'-0" 0 3" 6" 12" AND AS NOTED

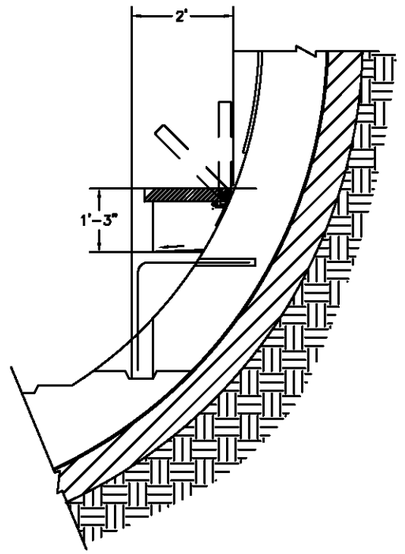
DRAWING NO. DD-S-160



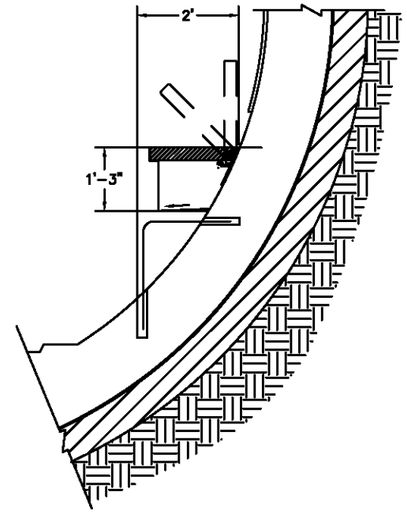
TYPICAL SAFETYWALK/ CABLE TROUGH
FOR BOX-TUNNELS



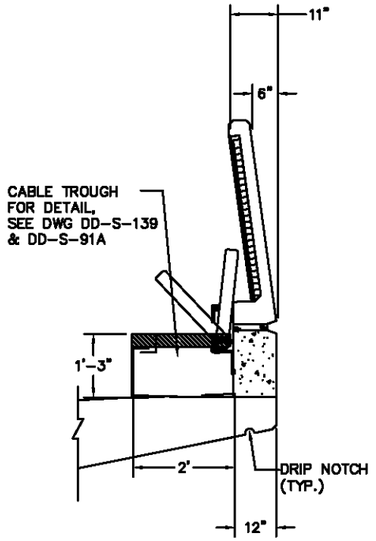
TYPICAL SAFETYWALK/ CABLE TROUGH
FOR N.A.T.M. TUNNELS



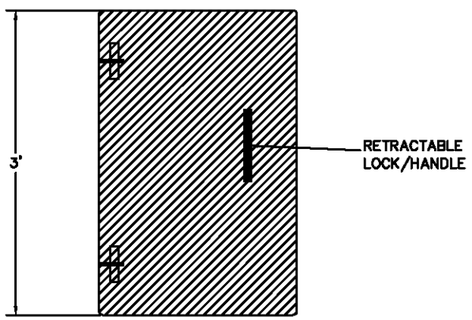
TYPICAL SAFETYWALK/ CABLE TROUGH
FOR CIRCULAR EARTH TUNNELS



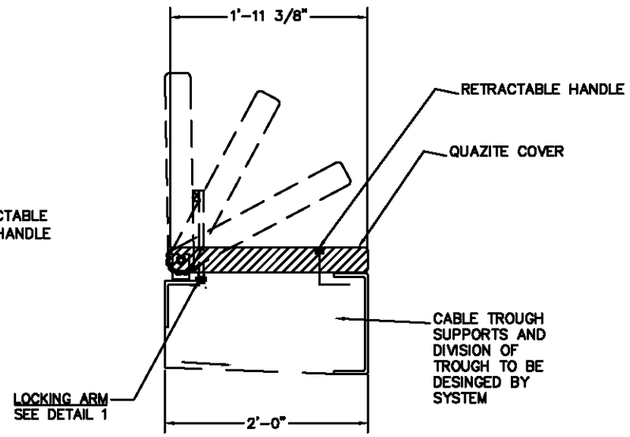
TYPICAL SAFETYWALK/ CABLE TROUGH
FOR CIRCULAR TUNNELS WITH PRECAST LINING

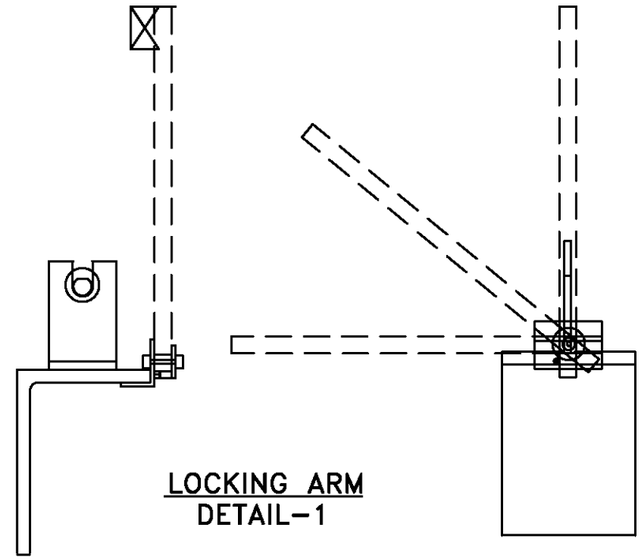


TYPICAL SAFETYWALK/ CABLE TROUGH
FOR AERIAL STRUCTURES



CABLE TROUGH
OPTION-1





LOCKING ARM
DETAIL-1

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	J.RUDOLF	11-00 DATE
DRAWN	M.A.	11-00 DATE
CHECKED	M.A.	11-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

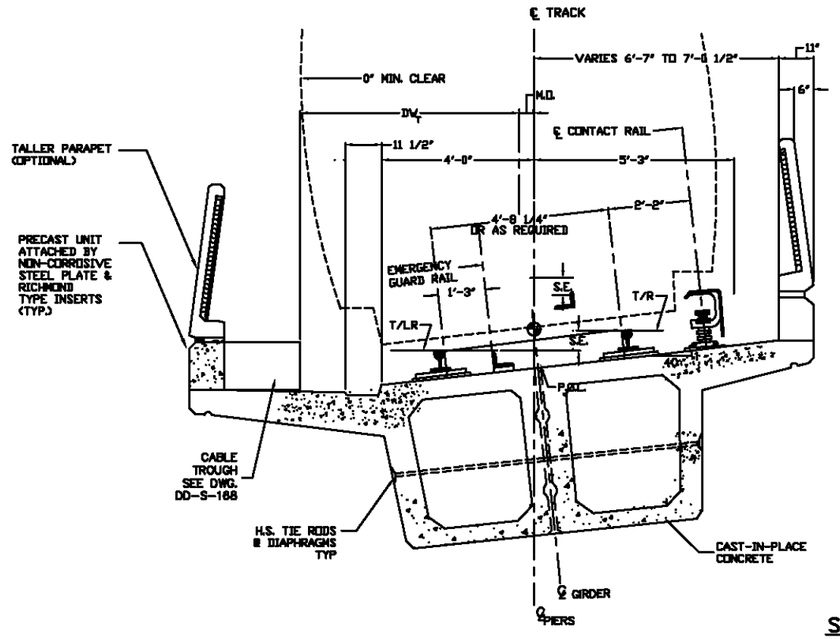
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

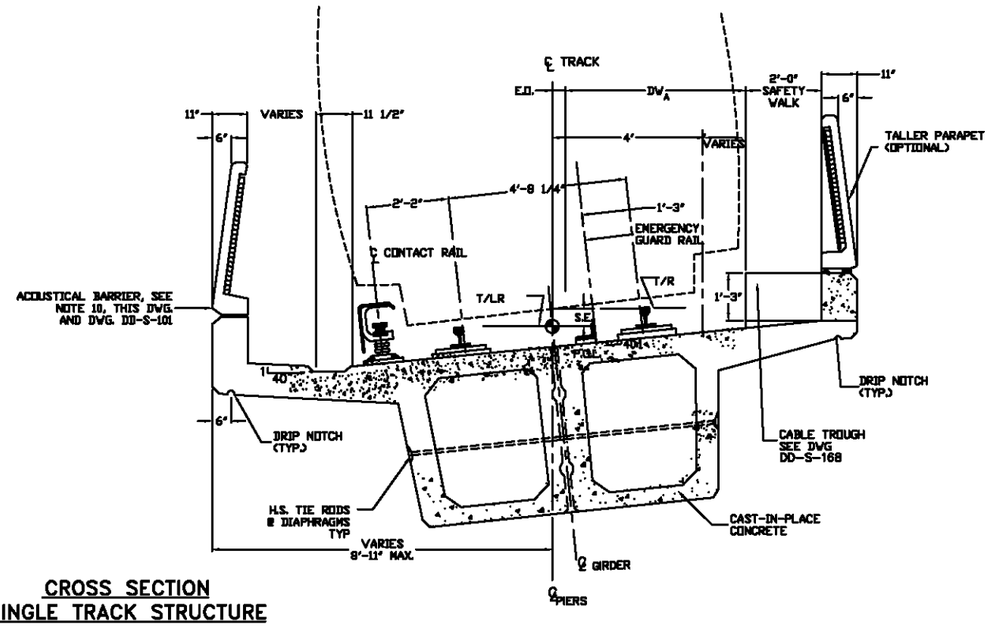
APPROVED _____ 5/2001
DIRECTOR DATE

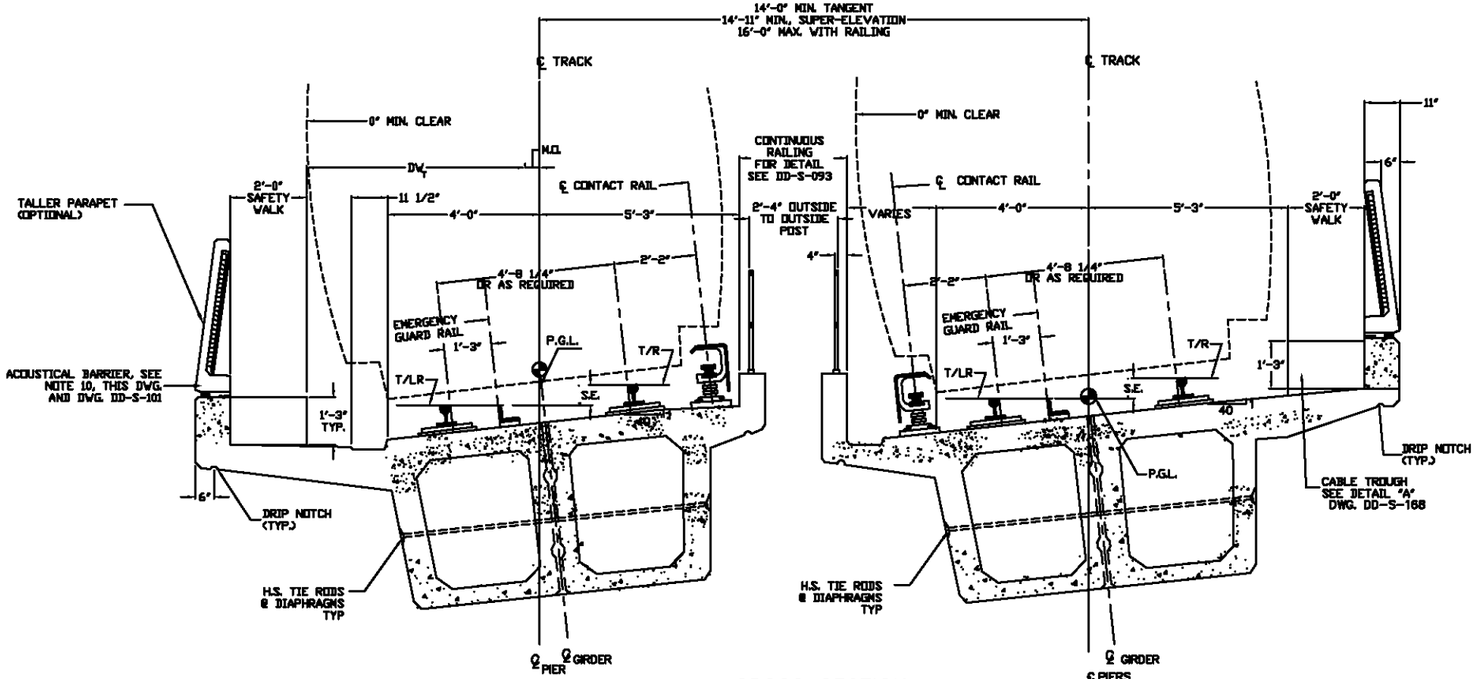
STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURAL / TUNNEL
CABLE TROUGH

SCALE	DRAWING NO.
NOT TO SCALE OR AS NOTED	DD-S-168



CROSS SECTION
SINGLE TRACK STRUCTURE





CROSS SECTION
DOUBLE TRACK STRUCTURE

OPTION 2

NOTES:

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESS AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. THE DRAWING REPRESENTS PRECAST CONCRETE CONSTRUCTION
4. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
5. GIRDER BEAM AND DECK ALIGNMENT ON CURVES, CURVATURE SHALL BE AS FOLLOWS:

TYPE OF BEAM	ALIGNMENT	
	GIRDER BEAM	DECK
CAST-IN-PLACE CONCRETE	CURVED OR CHORDED	CURVED
PRECAST CONCRETE BOX	CURVED OR CHORDED	CURVED

6. PIER COLUMNS AND PIER CAPS SHALL BE CONCRETE
7. FOR DW___ DIMENSIONS, REFER TO MANUAL OF DESIGN CRITERIA.
8. TILTED GIRDER CROSS SECTIONS ARE SHOWN FOR FULLY SUPERELEVATED CURVE ON SPIRALS. THE W.P. WILL CHANGE RELATIVE TO CENTER OF GIRDER. MIN. RADIUS = 1000'-0".
9. DIMENSION "A" IS CONSTANT.
10. ACOUSTICAL BARRIER TO BE USED ONLY AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILINGS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
11. ATTACHMENTS TO PRESTRESSED GIRDERS SHALL BE MADE BY WELDING TO EMBEDDED PLATES OR EMBEDDED FITTINGS. NO ATTACHMENTS SHALL BE MADE BY DRILLING INTO GIRDER EXCEPT FOR TRACK FASTENERS AND APPURTENANCES AND AS LIMITED BY DD-T-1 AND DD-S-93.
12. HANDRAIL POSTS SHALL BE INSTALLED IN A VERTICAL POSITION.
13. FOR TANGENT SECTION SEE DD-S-139.
14. FOR CABLE TROUGH SEE DETAIL A, DD-S-139 & DD-S-168.
15. S.E. MAX. 6 INCHES.
16. FOR OPTION 1, SEE DWG DD-S-89.

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	J. RUDOLF	11-00 DATE
DRAWN	M.A.	11-00 DATE
CHECKED	M.A./E.C.	11-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

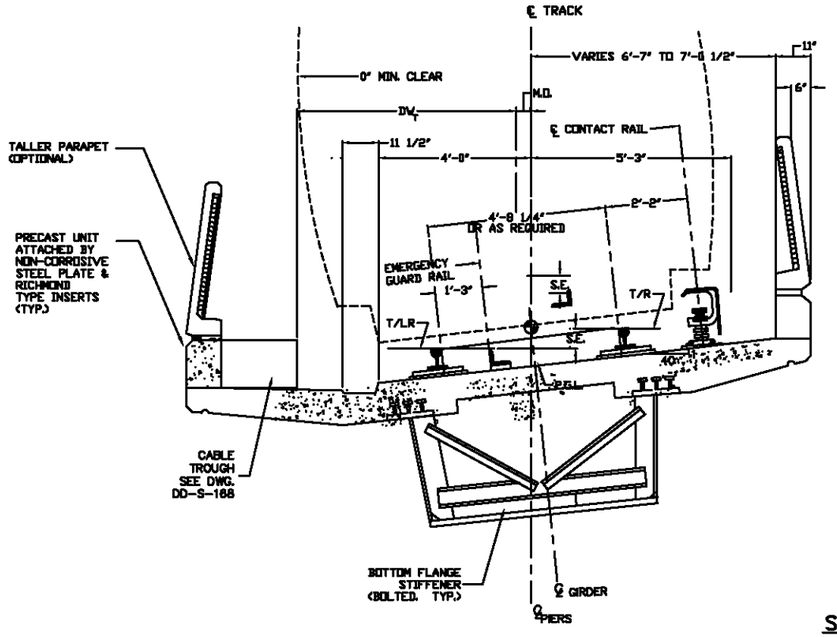
SUBMITTED _____ DATE

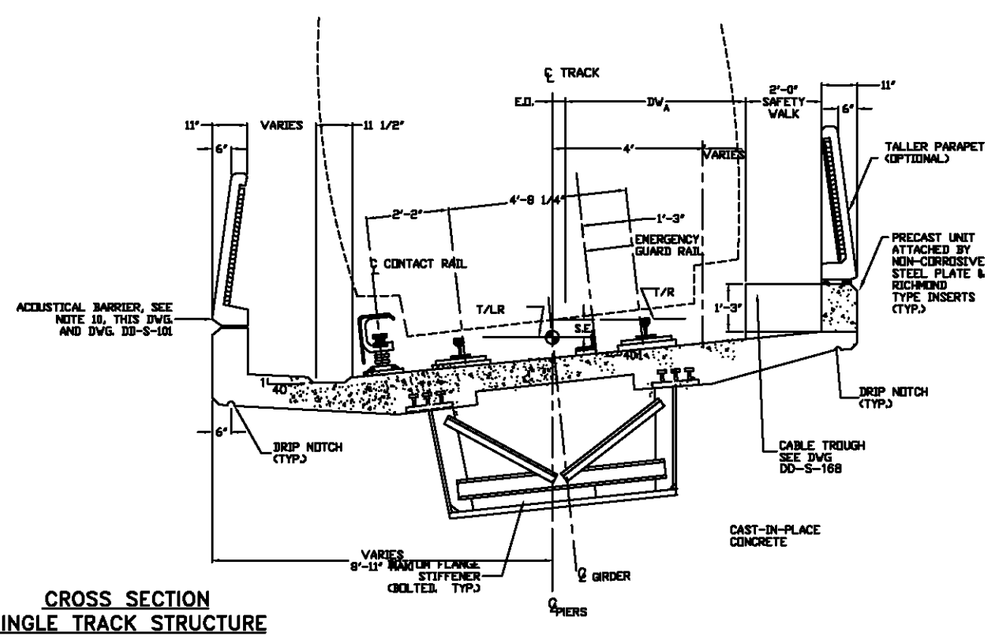
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
PRECAST CONCRETE – ADJACENT BOX BEAMS
WITH MONOLITHIC DECK / OPTION 2

SCALE 1/2"=1'-0" 1 0 1 2

DRAWING NO. DD-S-189

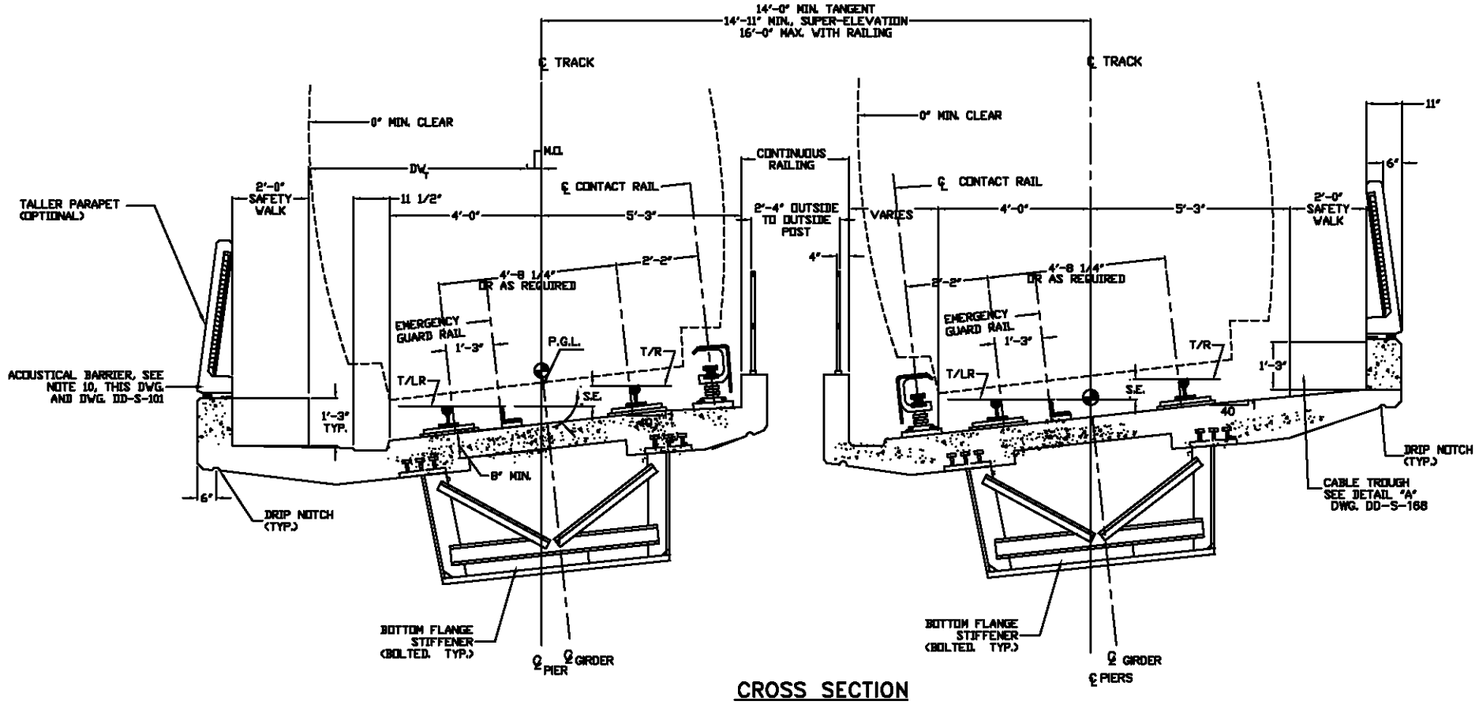




CROSS SECTION
SINGLE TRACK STRUCTURE

NOTES

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESSES AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
4. STEEL BOX GIRDER AND DECK ALIGNMENT ON CURVES, CURVATURE SHALL BE AS FOLLOWS:
   a. STEEL BOX GIRDER, CURVED OR CHORDED.
   b. DECK, CURVED.
5. PIER COLUMNS SHALL BE CONCRETE, PIER CAPS STEEL.
6. FOR DW_A, DW , E.O. AND M.O. VALUES, AND TRACK CENTER DIMENTIONS, REFER TO MANUAL OF DESIGN CRITERIA.
7. TILTED GIRDER $CROSS_T$ SECTIONS ARE SHOWN FOR FULLY SUPERELEVATED CURVE, ON SPIRALS THE W.P. WILL CHANGE RELATIVE TO CENTER OF GIRDER, MIN, RADIUS = 1,000'-0"
8. STEEL GIRDER AND PIER CAP TO BE PAINTED BROWN FED. SPEC. NO. 20040. UNLESS WEATHERING STEEL IS USED.
9. DIMENSION "B" IS CONSTANT.
10. USE ACOUSTICAL BARRIER AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
11. HANDRAILS SHALL BE INSTALLED IN A VERTICAL POSITION.
12. TRANSVERSE TOP REINFORCEMENT SHALL BE SPACED AT 7 1/2" ON CENTERS IN CONCRETE DECK TO PROVIDE SPACE FOR RAIL FASTENER ANCHOR BOLTS.
13. FOR CABLE TROUGH, SEE DWG. DD-S-139.
14. S.E. MAX. 6 INCHES.
15. FOR DETAILS OF INSPECTION ACCESS AND DRAINAGE PROVISIONS, SEE DWG. DD-S-128. BOX SIZE SHALL BE ADEQUATE FOR TRAVEL INSIDE THE BOX FOR INSPECTION.



CROSS SECTION
DOUBLE TRACK STRUCTURE

OPTION 2

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.

DESIGNED	J. RUDOLF	11-00 DATE
DRAWN	M.A.	11-00 DATE
CHECKED	M.A./E.C.	11-00 DATE
APPROVED	J. RUDOLF	11-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
06/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

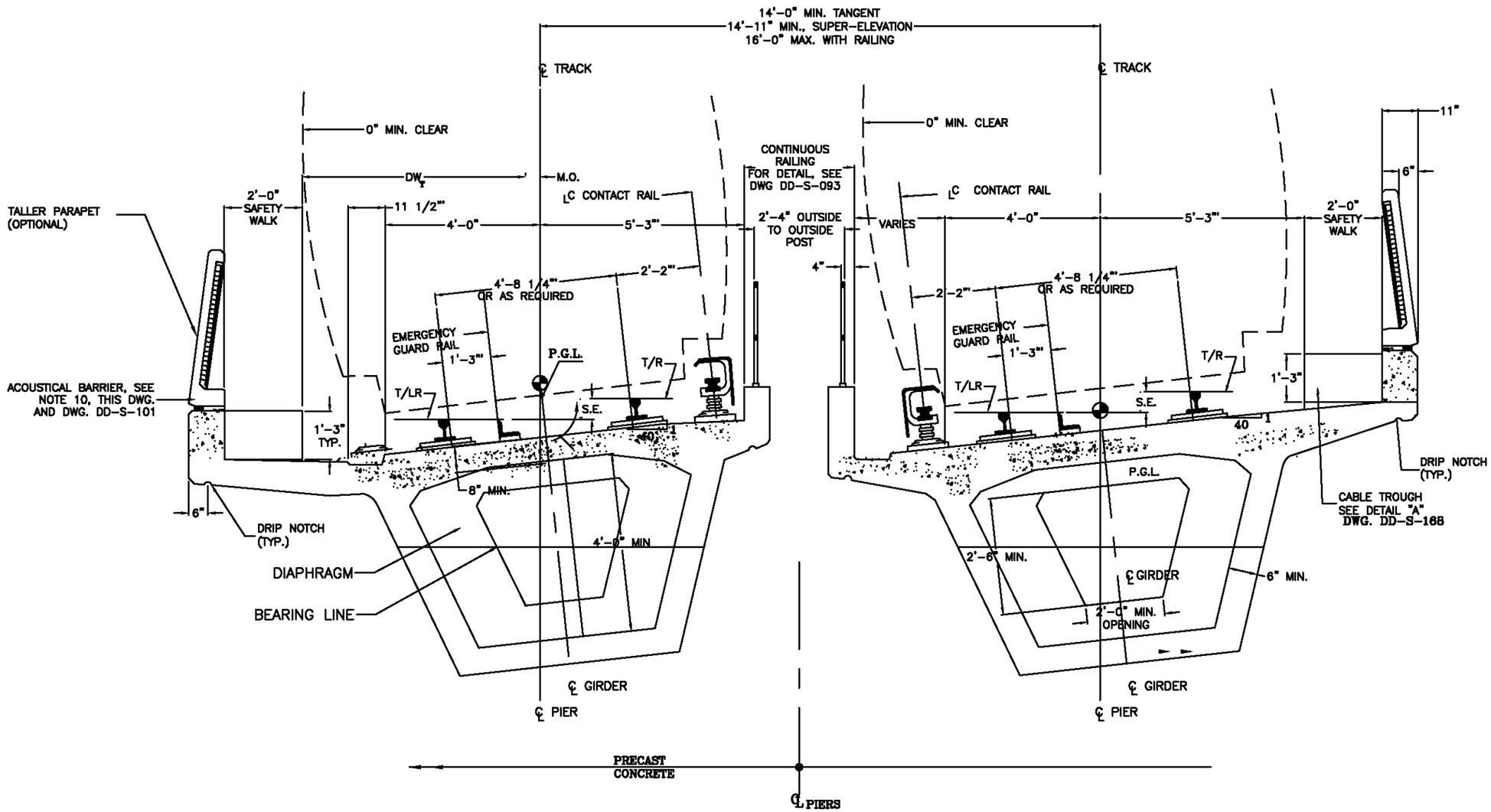
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
PRECAST CONCRETE – ADJACENT BOX BEAMS CAST-IN-PLACE DECK / OPTION 2

SCALE 1/2"=1'-0" 1 0 1 2 AND AS NOTED

DRAWING NO. DD-S-190



CROSS SECTION
DOUBLE TRACK STRUCTURE
SUPERELEVATED

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES, SEE DD-S-89 & DD-S-139.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

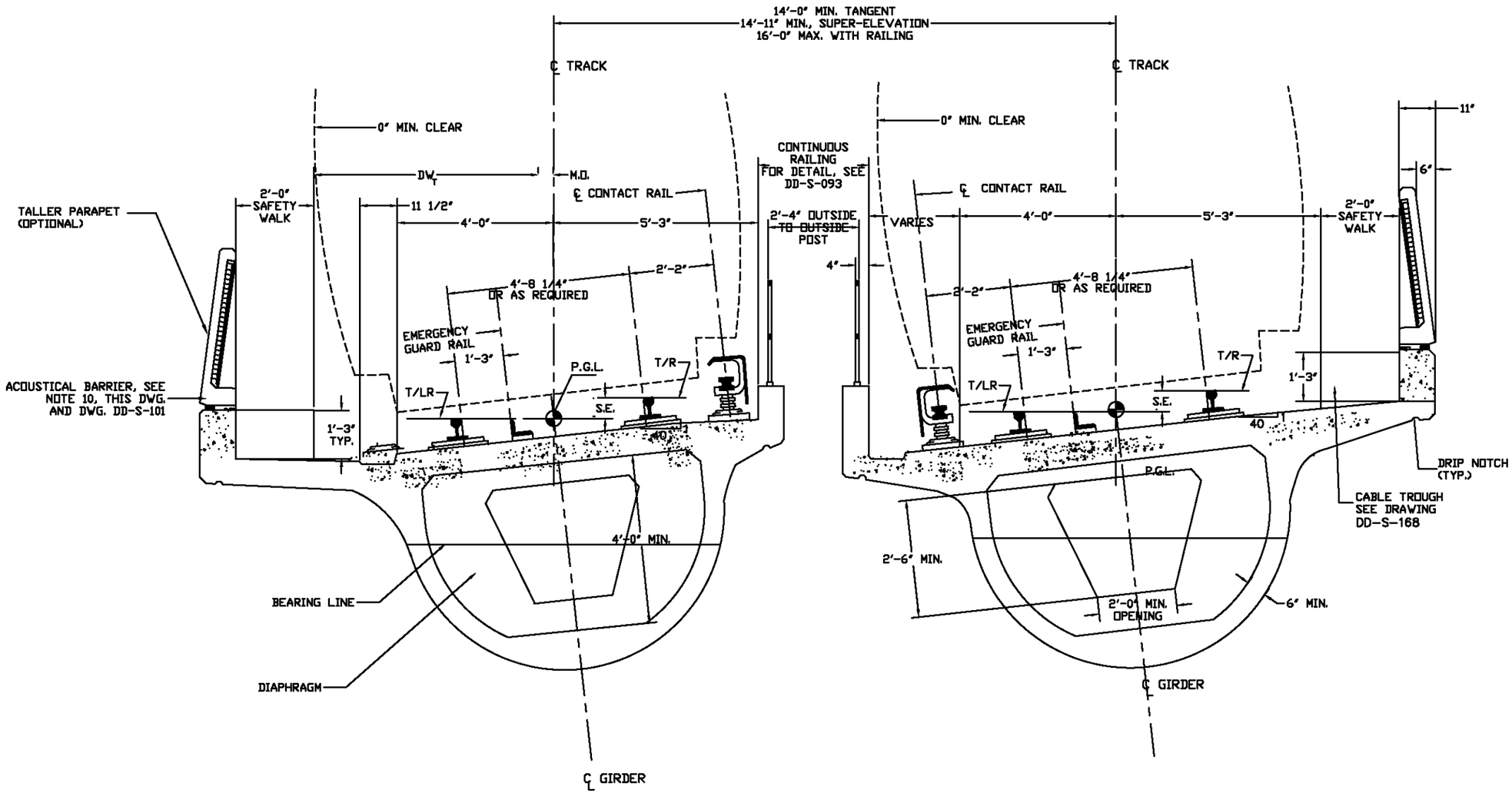
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN OR SEGMENTAL
OPTION 2

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-191H



CROSS SECTION
DOUBLE TRACK STRUCTURE
SUPERELEVATED

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES, SEE DD-S-89 & DD-S-139.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	12-00 DATE
UPDATED	ENGA	08-00 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

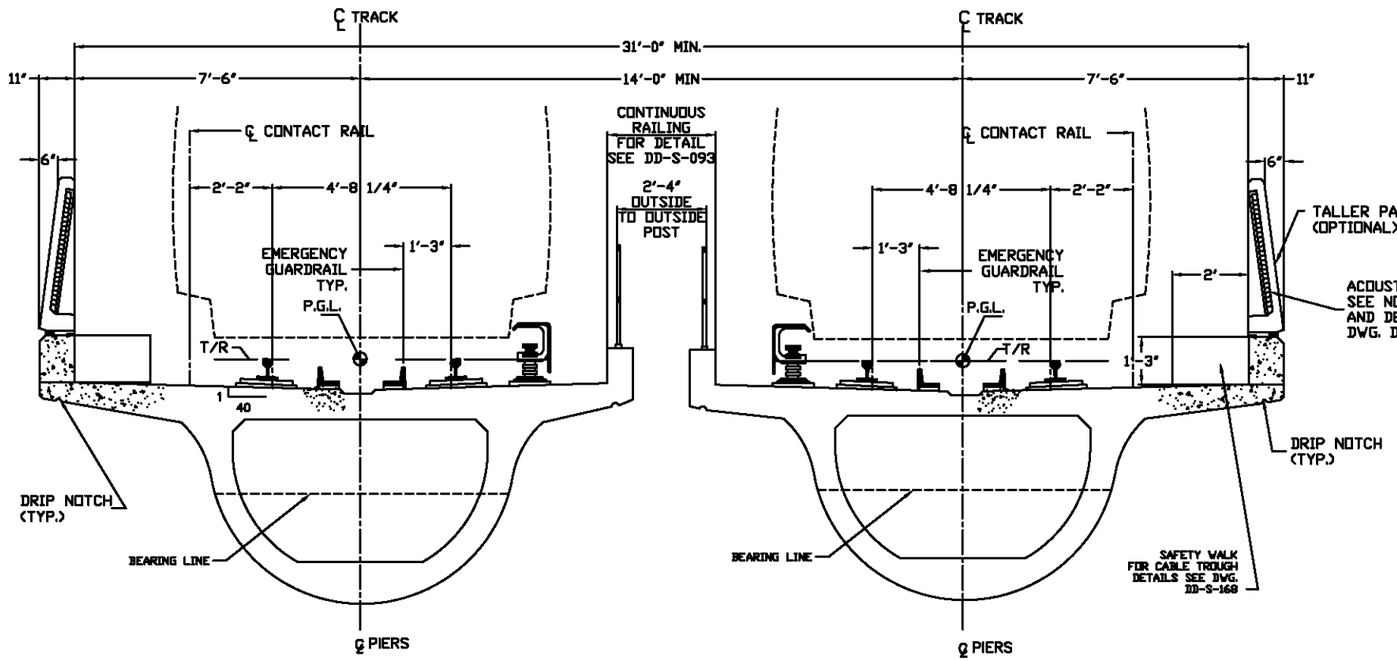
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

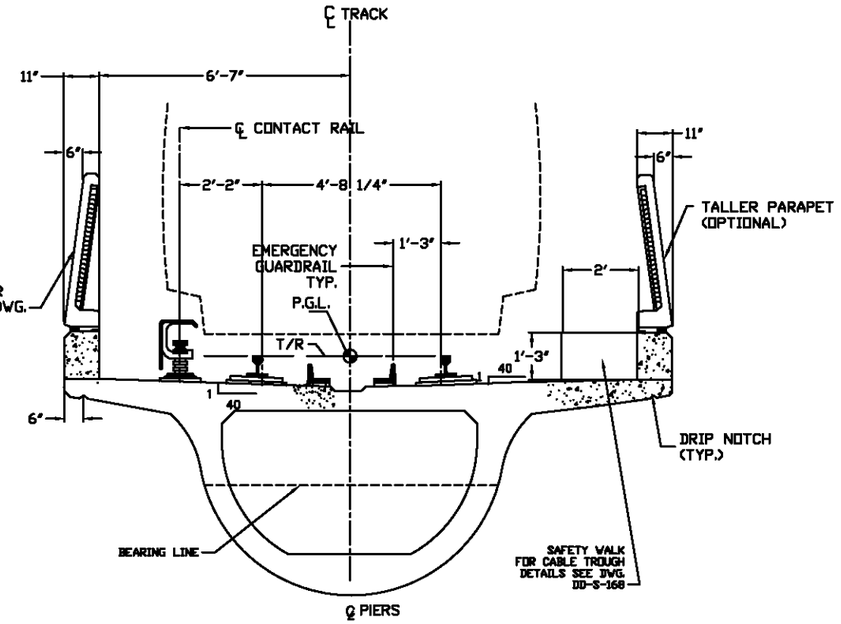
STRUCTURAL DESIGN DRAWING
TYPICAL AERIAL STRUCTURE GIRDER SECTIONS
PRECAST PRESTRESSED SPAN OR SEGMENTAL
OPTION 2

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-191J



CROSS SECTION
DOUBLE TRACK STRUCTURE



CROSS SECTION
SINGLE TRACK STRUCTURE

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR DETAILS AT BEARINGS & PIER CAP SEE DWG. DD-S-91A OR 91B.

NOTES:

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESSES AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
4. PIER COLUMNS SHALL BE CONCRETE.
5. STEEL GIRDER AND PIER CAP TO BE PAINTED BROWN FED. SPEC. NO. 20040.
6. ACOUSTICAL BARRIER TO BE USED ONLY AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILINGS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
7. HANDRAIL POSTS SHALL BE INSTALLED IN A VERTICAL POSITION.
8. TRANSVERSE TOP REINFORCEMENT SHALL BE SPACED AT 7 1/2" ON CENTERS IN CONCRETE DECK TO PROVIDE SPACE FOR RAIL FASTENER ANCHOR BOLTS.
9. FOR CABLE TROUGH, SEE DD-S-139 & DD-S-168.
10. FOR DETAILS OF INSPECTION ACCESS AND DRAINAGE PROVISIONS, SEE DWG. DD-S-128. BOX SIZE SHALL BE ADEQUATE FOR TRAVEL INSIDE THE BOX FOR INSPECTION.

DESIGNED	J. RUDOLF	08-00 DATE
DRAWN	M.A.	08-00 DATE
CHECKED	M.A./E.C.	08-00 DATE
APPROVED	J. RUDOLF	08-00 DATE
UPDATED		DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS

DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

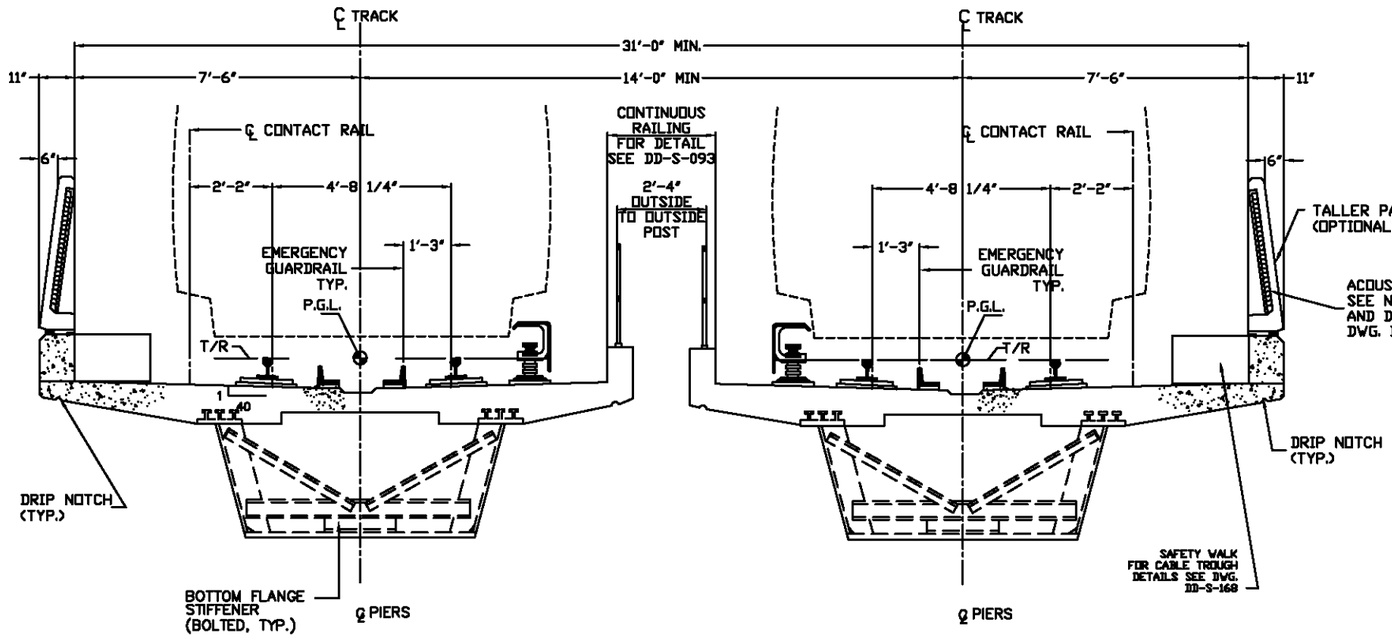
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

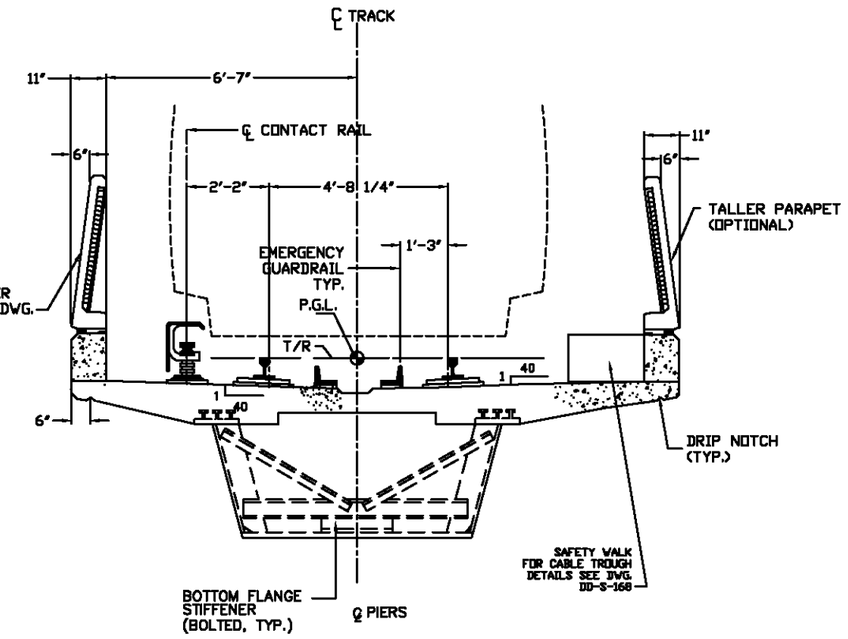
STRUCTURAL DESIGN DRAWING
AERIAL STRUCTURE
TANGENT PRECAST PRESTRESSED SEGMENTAL OR CIP GIRDER SECTIONS & DETAILS/OPTION 2

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-191K



CROSS SECTION
DOUBLE TRACK STRUCTURE



CROSS SECTION
SINGLE TRACK STRUCTURE

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR DETAILS AT BEARINGS & PIER CAP SEE DWG. DD-S-91.

NOTES:

1. THIS DRAWING DEFINES THE BASIC EXTERNAL STRUCTURAL SHAPE AND DECK CONFIGURATION. STRUCTURAL DEPTHS, WIDTHS, THICKNESSES AND OTHER DETAILS ARE TO BE DETERMINED BY THE DESIGNER.
2. DETAILS SUCH AS VOIDS, CHAMFERS AND OTHER ITEMS WHICH ARE SHOWN ON THIS DRAWING ARE NOT TO BE CONSIDERED CONTROLS.
3. SIMPLE AND CONTINUOUS STRUCTURES SHALL BE CONSIDERED.
4. PIER COLUMNS SHALL BE CONCRETE, PIER CAPS STEEL.
5. STEEL GIRDER AND PIER CAP TO BE PAINTED BROWN FED. SPEC. NO. 20040.
6. ACOUSTICAL BARRIER TO BE USED ONLY AT LOCATIONS DESIGNATED BY THE ACOUSTICAL CONSULTANT. STANDARD PIPE RAILINGS SHALL BE USED WHERE SHOWN AND ADJACENT TO SAFETY WALKS WHERE ACOUSTICAL BARRIERS ARE NOT REQUIRED.
7. HANDRAIL POSTS SHALL BE INSTALLED IN A VERTICAL POSITION.
8. TRANSVERSE TOP REINFORCEMENT SHALL BE SPACED AT 7 1/2" ON CENTERS IN CONCRETE DECK TO PROVIDE SPACE FOR RAIL FASTENER ANCHOR BOLTS.
9. FOR CABLE TROUGH, SEE DD-S-139 & DD-S-168.
10. FOR DETAILS OF INSPECTION ACCESS AND DRAINAGE PROVISIONS, SEE DWG. DD-S-128. BOX SIZE SHALL BE ADEQUATE FOR TRAVEL INSIDE THE BOX FOR INSPECTION.
11. FOR SUPERELEVATED SECTION, SEE DWG DD-S-92.
12. FOR OPTION 1, SEE DWG DD-S-148.

		DATE
DESIGNED	J. RUDOLF	08-00
DRAWN	M.A.	08-00
CHECKED	M.A./E.C.	08-00
APPROVED	J. RUDOLF	12-00
UPDATED		

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD-S-093	TYPICAL RAILING DETAIL

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

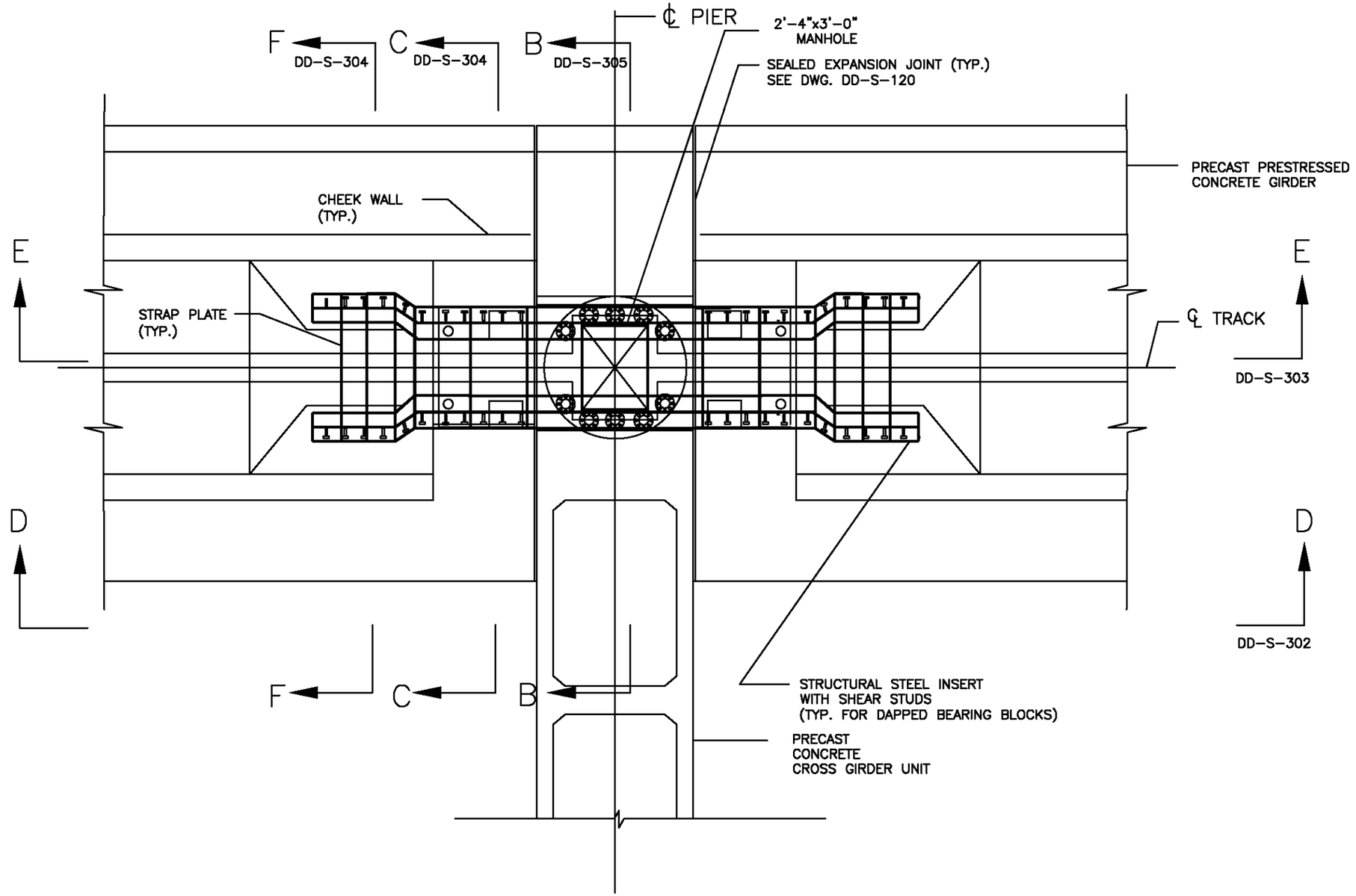
APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING

AERIAL STRUCTURE
TANGENT STEEL GIRDERS–COMPOSITE SECTION
OPTION 2

SCALE: NOT TO SCALE

DRAWING NO.: DD-S-248



PLAN

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139

DESIGNED	J. RUDOLF	02-01 DATE
DRAWN	E.C.	02-01 DATE
CHECKED	E.C.	02-01 DATE
APPROVED	J. RUDOLF	02-01 DATE
UPDATED	ENGA	04-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

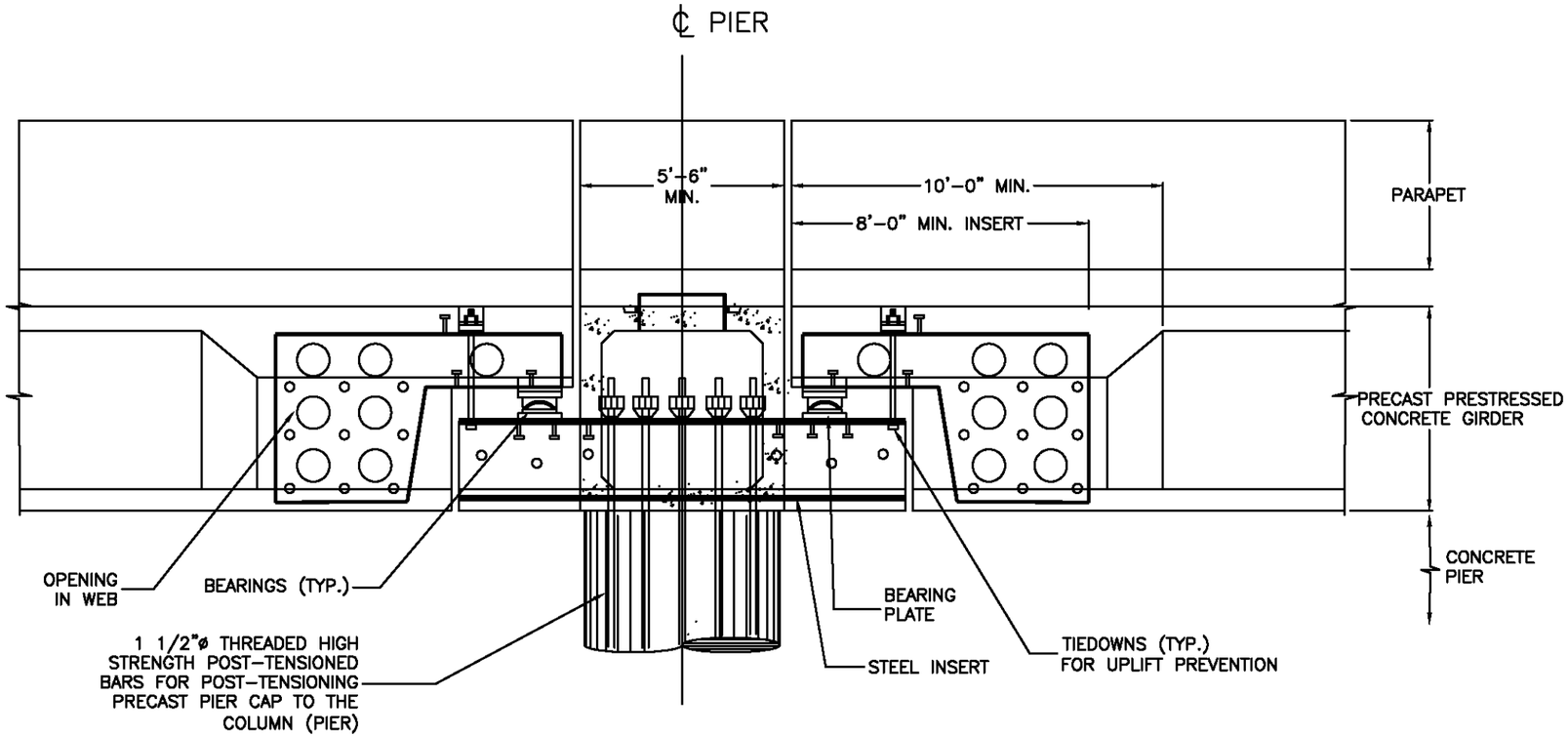
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
STATION AERIAL STRUCTURE
PRECAST PRESTRESSED SPAN
PRECAST PIER CAP POST-TENSIONED TO COLUMN

SCALE 1/2"=1'-0"

DRAWING NO. DD-S-301



ELEVATION, SIMPLE SPAN GIRDER
SINGLE TRACK STRUCTURE
SECTION D–D DD–S–301

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD–S–89 & S–139

DESIGNED	J. RUDOLF	02–01 DATE
DRAWN	E.C.	02–01 DATE
CHECKED	E.C.	02–01 DATE
APPROVED	J. RUDOLF	02–01 DATE
UPDATED	ENGA	04–01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

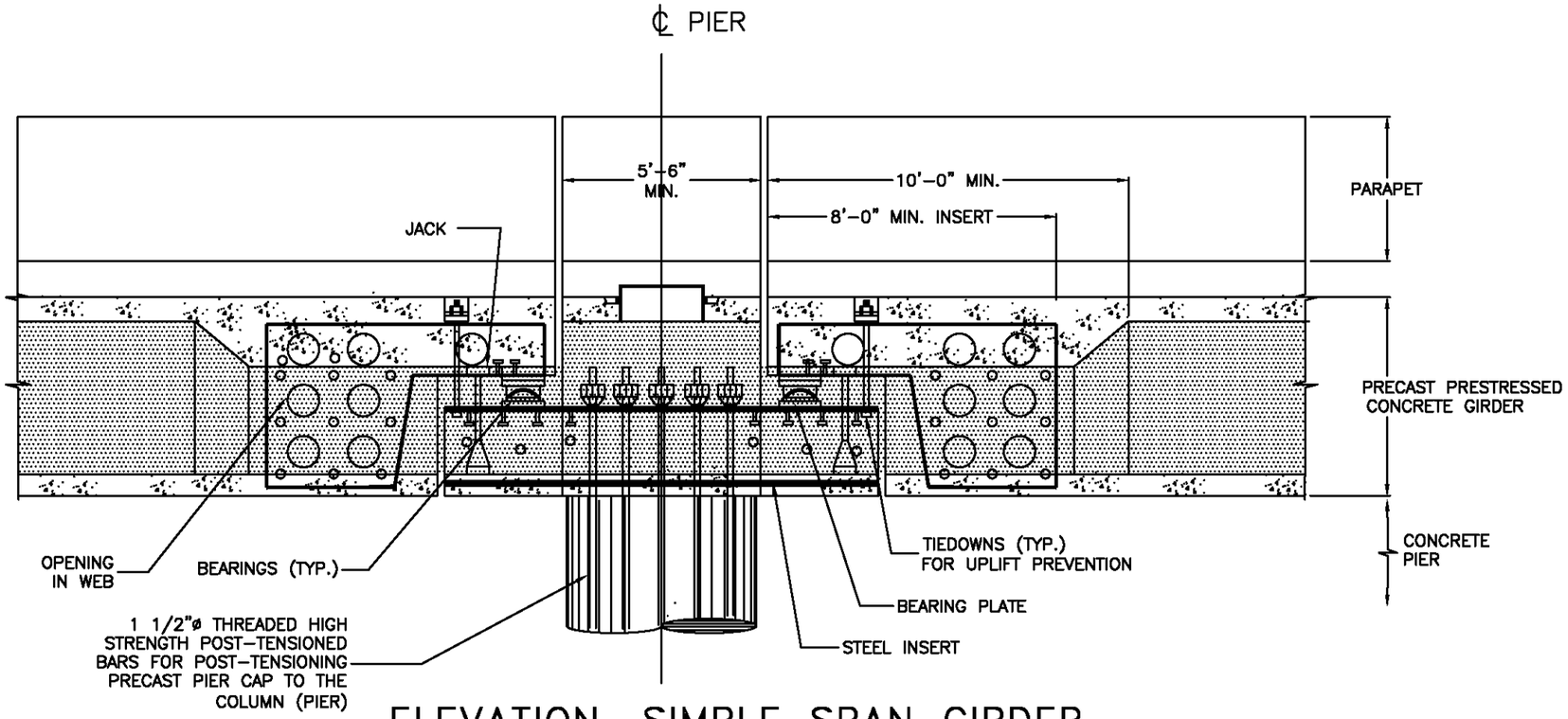
SUBMITTED _____ DATE

APPROVED _____ 5/2001 DATE
DIRECTOR

STRUCTURAL DESIGN DRAWING
STATION AERIAL STRUCTURE
SECTION D–D
PRECAST PIER CAP POST–TENSIONED TO COLUMN

SCALE 1/2"=1'–0"

DRAWING NO. DD–S–302



ELEVATION, SIMPLE SPAN GIRDER
SINGLE TRACK STRUCTURE
SECTION E-E DD-S-301

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139

DESIGNED	J. RUDOLF	02-01 DATE
DRAWN	E.C.	02-01 DATE
CHECKED	E.C.	02-01 DATE
APPROVED	J. RUDOLF	02-01 DATE
UPDATED	ENGA	04-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
05/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

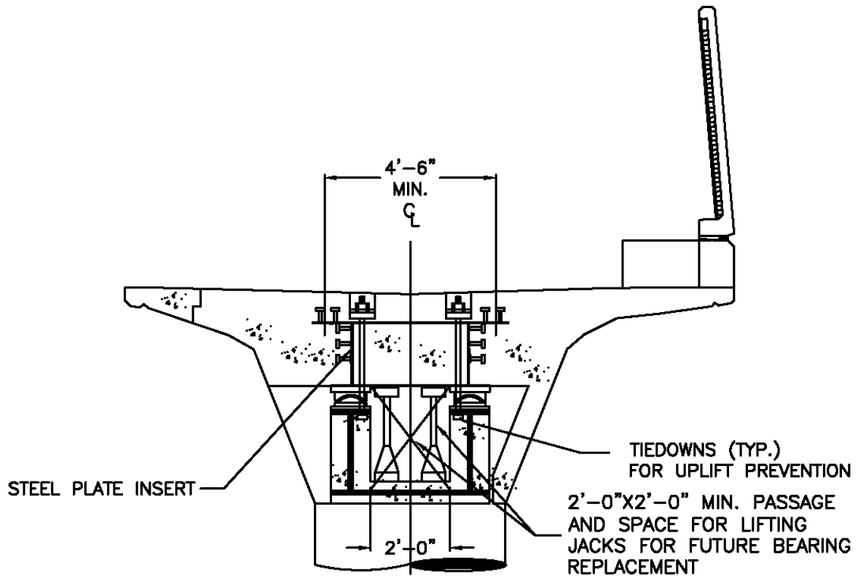
SUBMITTED _____ DATE

APPROVED _____ 5/2001 DIRECTOR DATE

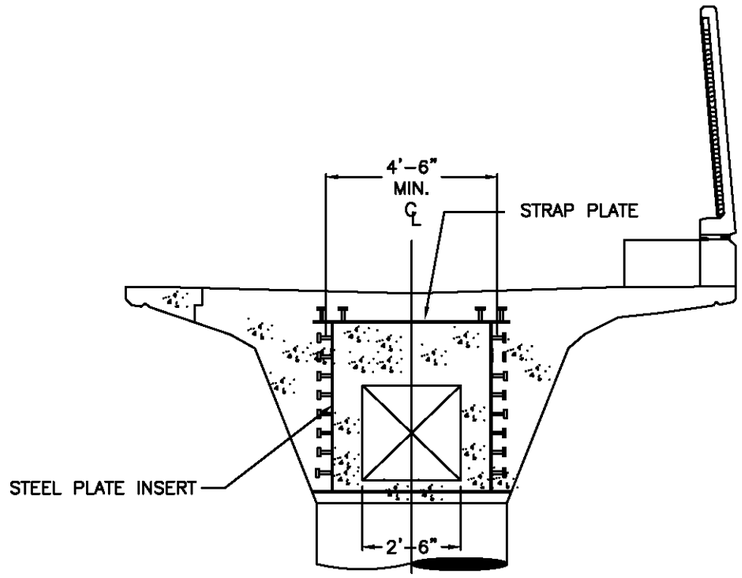
STRUCTURAL DESIGN DRAWING
STATION AERIAL STRUCTURE
SECTION E-E
PRECAST PIER CAP POST-TENSIONED TO COLUMN

SCALE 1/2"=1'-0"

DRAWING NO. DD-S-303



SECTION C-C DD-S-301



SEC F-F DD-S-301

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD-S-89 & S-139

DESIGNED	J. RUDOLF	02-01 DATE
DRAWN	E.C.	02-01 DATE
CHECKED	E.C.	02-01 DATE
APPROVED	J. RUDOLF	02-01 DATE
UPDATED	ENGA	04-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
06/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

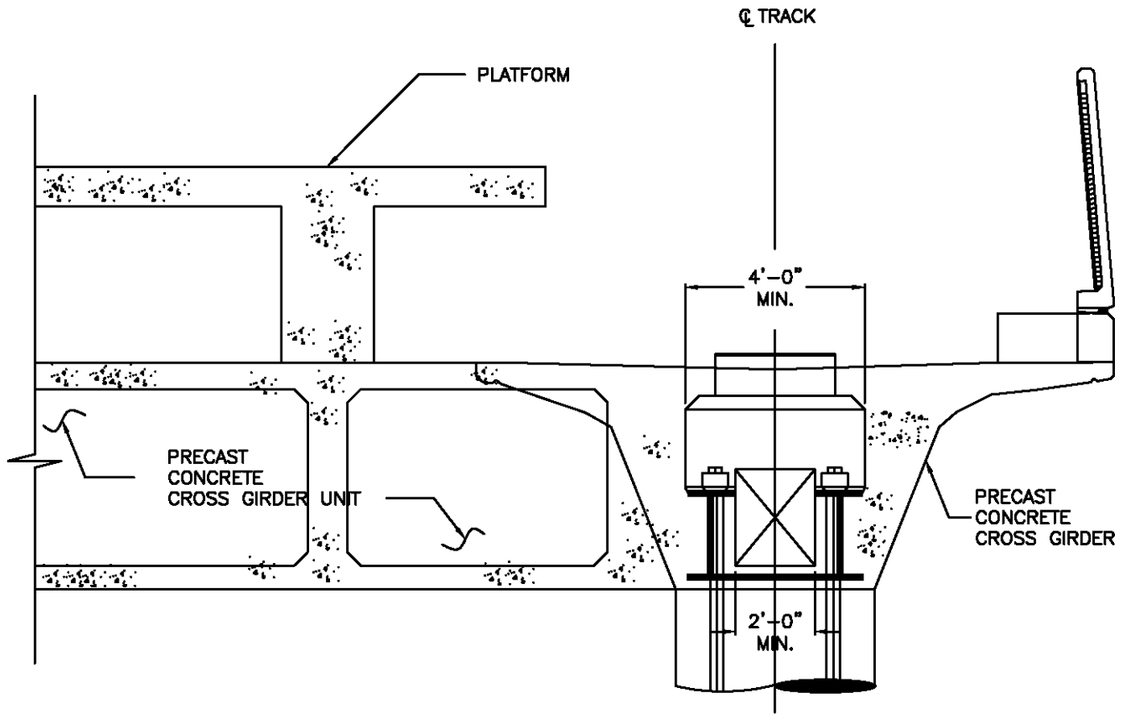
SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
STATION AERIAL STRUCTURE
SECTION C-C AND SECTION F-F
PRECAST PIER CAP POST-TENSIONED TO COLUMN

SCALE 1/2" = 1'-0"

DRAWING NO. DD-S-304



SECTION B–B DD–S–301

GENERAL NOTES:

1. DIMENSIONS AND DETAILS SHOWN ARE MANDATORY.
2. DIMENSIONS NOT SHOWN SHALL BE PROVIDED BY THE DESIGNER.
3. FOR MORE NOTES & DETAILS, SEE DWGS DD–S–89 & S–139

DESIGNED	J. RUDOLF	02–01 DATE
DRAWN	E.O.A.	02–01 DATE
CHECKED	ENG./E.C.	02–01 DATE
APPROVED	J. RUDOLF	02–01 DATE
UPDATED	ENGA	04–01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
DD–S–101	ACOUSTICAL BARRIER

REVISIONS		
DATE	BY	DESCRIPTION
9/2000	ENGA	Revised and issued by the Authority
11/2000	ENGA	Revised and issued by the Authority
12/2000	JR	NOTES & DELETED DETAIL A
05/2001	ENGA	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
STATION AERIAL STRUCTURE
SECTION B–B
PRECAST PIER CAP POST–TENSIONED TO COLUMN

SCALE 1/2" = 1'–0"

DRAWING NO. DD–S–305

INDEX OF STRUCTURAL DIRECTIVE DRAWINGS

SHEET NO.	DRAWING NO.	REV. NO.	TITLE
	DD-S-IX1		INDEX OF STRUCTURAL DIRECTIVE DRAWINGS SHEET 1 OF 3
	DD-S-IX2		INDEX OF STRUCTURAL DIRECTIVE DRAWINGS SHEET 2 OF 3
	DD-S-IX3		INDEX OF STRUCTURAL DIRECTIVE DRAWINGS SHEET 3 OF 3
	DD-S-3		CUT AND COVER REINFORCEMENT AND JOINT DETAILS
	DD-S-14		CUT AND COVER – SINGLE BOX DETAILS
	DD-S-20		CUT AND COVER – DOUBLE BOX DETAILS
	DD-S-63		LATERAL PRESSURES FOR THE DESIGN OF TEMPORARY EARTH RETAINING STRUCTURES
	DD-S-64		FLARED TRANSITION FOR TUNNEL OR BOX SECTION ENTRANCES
	DD-S-65		TAPER SLOT TRANSITION FOR TUNNEL OR BOX SECTION ENTRANCE
	DD-S-69		TYPICAL DETAILS NO. 8 TURNOUT SWITCH ROD TROUGHS
	DD-S-70		TYPICAL DETAILS NO.10 & NO.15 TURNOUTS SWITCH ROD TROUGHS
	DD-S-89		AERIAL STRUCTURE PRECAST CONCRETE – ADJACENT BOX BEAMS CAST-IN-PLACE DECK
	DD-S-139		AERIAL STRUCTURE CIP OR PRECAST SEGMENTAL CONCRETE GIRDERS, TANGENT SECTION
	DD-S-91A		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN
	DD-S-91B		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN PRECAST PIER CAP POST-TENSIONED TO OBLONG PIER
	DD-S-91C		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN PRECAST PIER CAP POST-TENSIONED TO ROUND PIER
	DD-S-91D		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN PC PS PIER UNIT POST-TENSIONED TO OBLONG PIER
	DD-S-91E		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN PRECAST END BLOCK & PRECAST PIER CAP
	DD-S-91F		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN W/EXTENSION PC UNIT PRECAST PRESTRESSED PIER UNIT
	DD-S-91G		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN W/EXTENSION PC UNIT
	DD-S-91H		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN OR SEGMENTAL
	DD-S-91J		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN OR SEGMENTAL
	DD-S-91K		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SEGMENTAL OR CIP CONCRETE GIRDER SECTIONS & DETAILS
	DD-S-92		AERIAL STRUCTURE STEEL GIRDERS, COMPOSITE SECTION
	DD-S-148		AERIAL STRUCTURES TANGENT STEEL GIRDERS, COMPOSITE SECTION
	DD-S-90		AERIAL STRUCTURE STEEL GIRDERS, COMPOSITE SECTION
	DD-S-93		AERIAL STRUCTURES HANDRAILS & JOINTS
	DD-S-137		AERIAL STRUCTURE BEARING REPLACEMENT DETAILS
	DD-S-101		BOX GIRDER ELEVATIONS, SECTIONS AND DETAILS
	DD-S-128		AERIAL STRUCTURE DETAILS FOR INSPECTION ACCESS AND DRAINAGE PROVISIONS
	DD-S-120		TYPICAL DETAILS OF EXPANSION JOINTS

This Drawing Reflects a WMATA standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy

DESIGNED	J. RUDOLF	04-01 DATE
DRAWN	E.C.	04-01 DATE
CHECKED	J. RUDOLF	04-01 DATE
APPROVED	J. RUDOLF	04-01 DATE
UPDATED	ENGA	04-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

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05/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 5/2001 DATE

STRUCTURAL DESIGN DRAWING
INDEX OF STRUCTURAL DIRECTIVE DRAWINGS
SHEET 1 OF 3

SCALE	DRAWING NO.
NONE	DD-S-IX-001

INDEX OF STRUCTURAL DIRECTIVE DRAWINGS

SHEET NO.	DRAWING NO.	REV. NO.	TITLE
	DD-S-98		GLASS ELEVATOR – HYDRAULIC FRAMING DETAILS
	DD-S-121		SOFT GROUND NATM TUNNEL CAST-IN-PLACE CONCRETE LINING DETAILS
	DD-S-28		CIRCULAR EARTH TUNNEL INVERT AND SAFETY WALK DETAILS
	DD-S-123		TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL CAST-IN-PLACE CONCRETE FINAL LINING DETAILS
	DD-S-124		TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL PRECAST INITIAL LINING ALTERNATE I
	DD-S-125		TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL PRECAST INITIAL LINING ALTERNATE II
	DD-S-126		TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL PRECAST LINING TOLERANCES
	DD-S-127		TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL – FINAL LINING AND CONTINGENCY REINFORCEMENT DETAILS
	DD-S-129		TWO-PASS SYSTEM CIRCULAR EARTH TUNNEL WATERPROOFING DETAILS
	DD-S-140		SOFT GROUND NATM TUNNEL WATERPROOFING DETAIL
	DD-S-130		CUT AND COVER STRUCTURES PVC WATERPROOFING DETAILS, SHEET 1 OF 4
	DD-S-131		CUT AND COVER STRUCTURES PVC WATERPROOFING DETAILS, SHEET 2 OF 4
	DD-S-132		CUT AND COVER STRUCTURES PVC WATERPROOFING DETAILS, SHEET 3 OF 4
	DD-S-133		CUT AND COVER STRUCTURES PVC WATERPROOFING DETAILS, SHEET 4 OF 4
	DD-S-134		CUT AND COVER STRUCTURES BENTONITE WATERPROOFING DETAILS, SHEET 1 OF 3
	DD-S-135		CUT AND COVER STRUCTURES BENTONITE WATERPROOFING DETAILS, SHEET 2 OF 3
	DD-S-136		CUT AND COVER STRUCTURES BENTONITE WATERPROOFING DETAILS, SHEET 3 OF 3
	DD-S-141		CIRCULAR EARTH TUNNEL PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS), SHEET 1 OF 5
	DD-S-142		CIRCULAR EARTH TUNNEL PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS), SHEET 2 OF 5
	DD-S-143		CIRCULAR EARTH TUNNEL PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS), SHEET 3 OF 5
	DD-S-144		CIRCULAR EARTH TUNNEL PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS), SHEET 4 OF 5
	DD-S-145		CIRCULAR EARTH TUNNEL PRECAST CONCRETE TUNNEL LINING (4 FT. RINGS) DETAILS AT CROSS ADIT, SHEET 5 OF 5
	DD-S-138		SLURRY WALL DETAILS
	DD-S-146		PERMANENT RETAINING WALLS FOR RETAINED CUTS
	DD-S-115		TYPE 2 FLOATING SLAB DETAILS – 1
	DD-S-116		TYPE 2 FLOATING SLAB DETAILS – 2
	DD-S-117		TYPE 2 FLOATING SLAB DETAILS – 3
	DD-S-118		TYPE 1 AND TYPE 2 FLOATING SLAB DETAILS
	DD-S-119		FLOATING SLAB MANHOLE DETAILS
	DD-S-149		SIGNAL BRIDGE DETAILS
	DD-S-108		SOUND BARRIERS
	DD-S-150		PARKING LOT CONTROL GATES CONCRETE ISLAND – PLANS & DETAILS SHEET 1 OF 2
	DD-S-151		PARKING LOT CONTROL GATES CONCRETE ISLAND–PLANS AND DETAILS SHEET 2 OF 2

DESIGNED	J. RUDOLF	04-01 DATE
DRAWN	E.C.	04-01 DATE
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UPDATED	ENGA	04-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ 5/2001
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING

INDEX OF STRUCTURAL DIRECTIVE DRAWINGS
SHEET 2 OF 3

SCALE: NONE

DRAWING NO.: DD-S-IX-002

INDEX OF STRUCTURAL DIRECTIVE DRAWINGS

SHEET NO.	DRAWING NO.	REV. NO.	TITLE
	DD-S-152		ABOVE GROUND TIE BREAKER STATION PLANS AND DETAILS SHEET 1 OF 2
	DD-S-153		ABOVE GROUND TIE BREAKER STATION PLANS AND DETAILS SHEET 2 OF 2
	DD-S-154		ABOVE GROUND TRACTION POWER SUBSTATION BLDG. TYPE "A"-FOUNDATION AND FLOOR PLANS SECTIONS AND DETAILS
	DD-S-155		ABOVE GROUND TRACTION POWER SUBSTATION BLDG. TYPE "A"-ROOF PLAN AND DETAILS
	DD-S-156		ABOVE GROUND TRACTION POWER SUBSTATION MECHANICAL PLATFORM PLAN, DETAILS AND MISCELLANEOUS DETAILS
	DD-S-157		ABOVE GROUND TRACTION POWER SUBSTATION MISCELLANEOUS DETAILS
	DD-S-158		ABOVE GROUND TRACTION POWER SUBSTATION BEAM AND BEARING DETAILS
	DD-S-159		ABOVE GROUND TRACTION POWER SUBSTATION FOUNDATION AND FLOOR PLANS, BUILDING TYPE "B"
	DD-S-160		ABOVE GROUND TRACTION POWER SUBSTATION ROOF PLAN, SECTIONS AND DETAILS BUILDING TYPE "B"
	DD-S-168		TYPICAL AERIAL STRUCTURE / TUNNEL CABLE TROUGH
	DD-S-189		AERIAL STRUCTURE PRECAST CONCRETE - ADJACENT BOX BEAMS WITH MONOLITHIC DECK, OPTON 2
	DD-S-190		AERIAL STRUCTURE LONG RUNNING TRACK STRUCTURES TILTED STEEL GIRDERS, OPTION 2
	DD-S-191H		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN OR SEGMENTAL OPTION 2
	DD-S-191J		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SPAN OR SEGMENTAL OPTION 2
	DD-S-191K		TYPICAL AERIAL STRUCTURE GIRDER SECTIONS PRECAST PRESTRESSED SEGMENTAL OR CIP CONCRETE GIRDER SECTIONS & DETAILS, OPTION 2
	DD-S-248		AERIAL STRUCTURE TANGENT STEEL GIRDERS, COMPOSITE SECTION OPTION 2
	DD-S-301		STATION AERIAL STRUCTURE PRECAST PRESTRESSED SPAN PRECAST PIER CAP POST-TENSIONED TO COLUMN
	DD-S-302		STATION AERIAL STRUCTURE SECTION D-D PRECAST PIER CAP POST-TENSIONED TO COLUMN
	DD-S-303		STATION AERIAL STRUCTURE SECTION E-E PRECAST PIER CAP POST-TENSIONED TO COLUMN
	DD-S-304		STATION AERIAL STRUCTURE SECTION C-C AND SECTION F-F PRECAST PIER CAP POST-TENSIONED TO COLUMN
	DD-S-305		STATION AERIAL STRUCTURE SECTION B-B PRECAST PIER CAP POST-TENSIONED TO COLUMN

DESIGNED J. RUDOLF 04-01 DATE
DRAWN E.C. 04-01 DATE
CHECKED J. RUDOLF 04-01 DATE
APPROVED J. RUDOLF 04-01 DATE

REFERENCE DRAWINGS	
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08/2001	ENGA	Revised and Issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

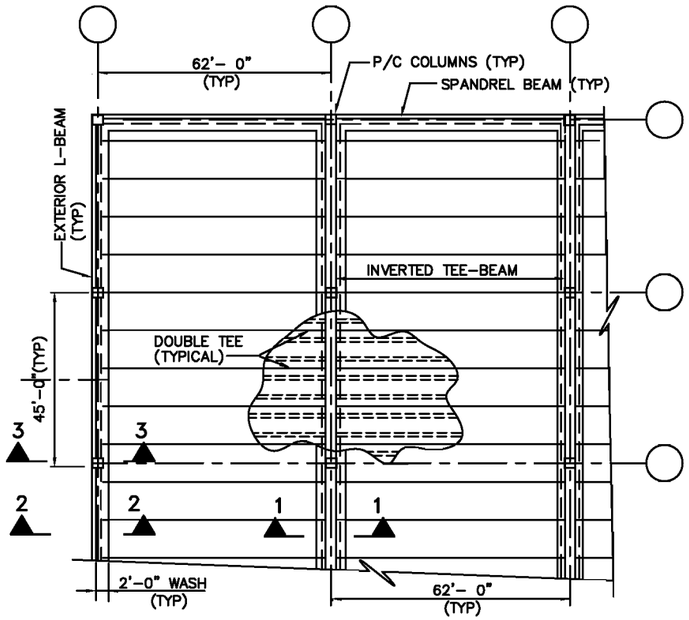
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

STRUCTURAL DESIGN DRAWING
INDEX OF STRUCTURAL DIRECTIVE DRAWINGS
SHEET 3 OF 3

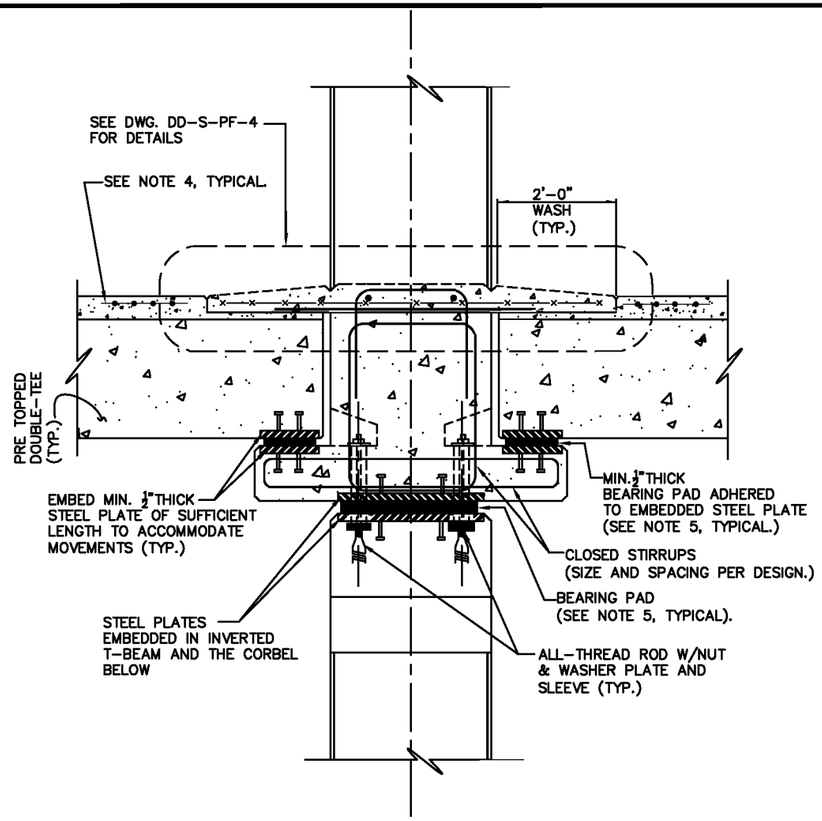
SCALE NONE

DRAWING NO. DD-S-IX-003



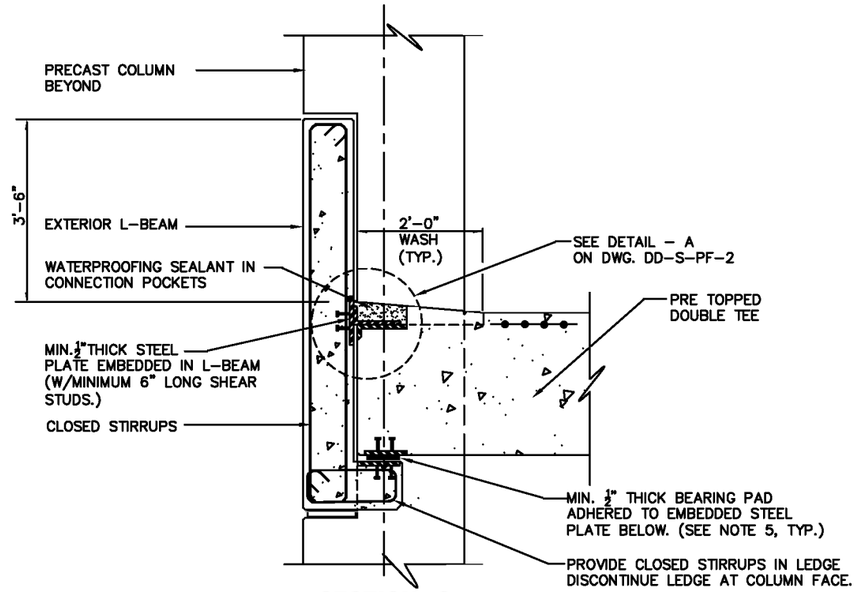
TYPICAL PARTIAL FRAMING PLAN

N.T.S.



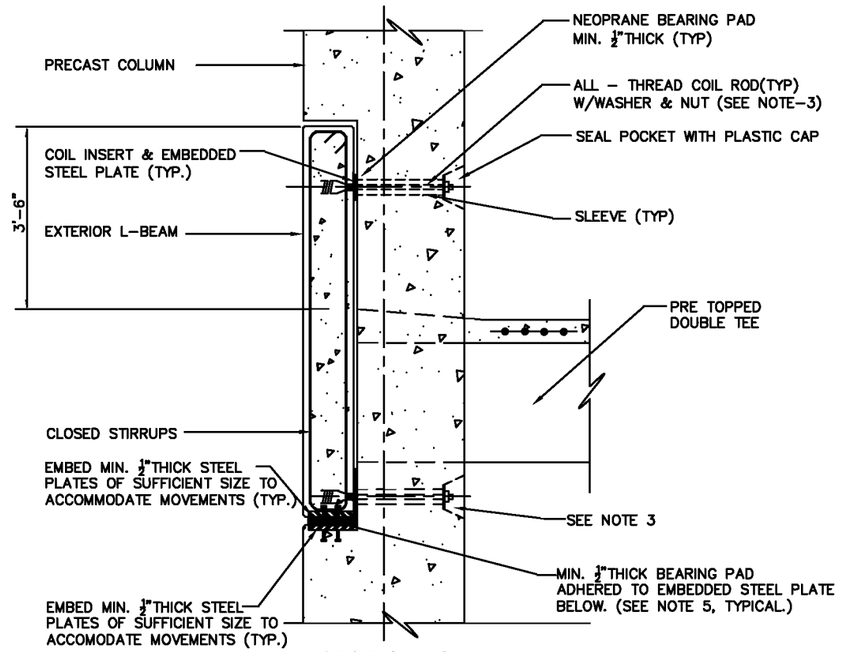
SECTION - 1
INVERTED TEE BEAM AT BEARING

N.T.S.



SECTION - 2
EXTERIOR L-BEAM

N.T.S.



SECTION - 3
EXTERIOR L-BEAM

N.T.S.

NOTES:

1. REINFORCING BARS AND/OR PRESTRESSING TENDONS IN COLUMNS, BEAMS, AND DOUBLE TEES ARE NOT SHOWN FOR CLARITY.
2. ONLY THE REBAR PATTERNS ARE SHOWN FOR BRACKETS, AND THE SPECIAL STIRRUP. PATTERNS ARE SHOWN FOR INVERTED TEES, SPANDREL BEAMS AND THE DOUBLE TEES. THE COMPLETE REINFORCEMENT IN THE STRUCTURAL ELEMENTS SHALL BE DESIGNED AND SHOWN ON DESIGN DRAWINGS, BY THE DESIGN/BUILD CONTRACTOR, AND SUBMITTED FOR APPROVAL TO THE AUTHORITY.
3. THE DESIGN/BUILD CONTRACTOR TO MAKE ADEQUATE PROVISION TO ENSURE THAT THE NUT WILL NOT GET LOOSE DURING THE SERVICE LIFE. SHOW THE REQUIRED TORQUE ON THE DESIGN DRAWINGS SUCH THAT THE PADS WILL NOT GET OVERCOMPRESSED. DO NOT OVERTIGHTEN THE NUTS.
4. PROVIDE LATERAL PRESTRESSING IN THE FLANGE SLAB AT EACH END OF DOUBLE TEES, TO PREVENT CRACKING AND OTHER DAMAGE DURING HANDLING AND TRASPORTATION. TWO FULL LOOPS OF PRESTRESSED STRAND, EACH 360°, AT EACH END SHALL BE REQUIRED.
5. THE BEARING PADS SUPPORTING INVERTED TEE BEAMS, SPANDRELS, L–BEAMS OR DOUBLE TEE BEAMS SHALL BE FABREEKA, CAPRALON OR APPROVED EQUAL. FOR ABOVE BEAMS WITH SMALLER SPANS AND LESSER LOADS ON BEARINGS, MASTICORD BEARING PADS MAY BE USED WITH THE AUTHORITY'S PRIOR APPROVAL.

SPECIAL NOTES:

1. This Drawing Reflects WMATA's standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy
2. Dimensions and details shown are mandatory. Dimensions not shown shall be provided by the designer.

DESIGNED	SKM	07–01 DATE
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REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVE
OFFICE OF ENGINEERING AND ARCHITI

SUBMITTED DATE

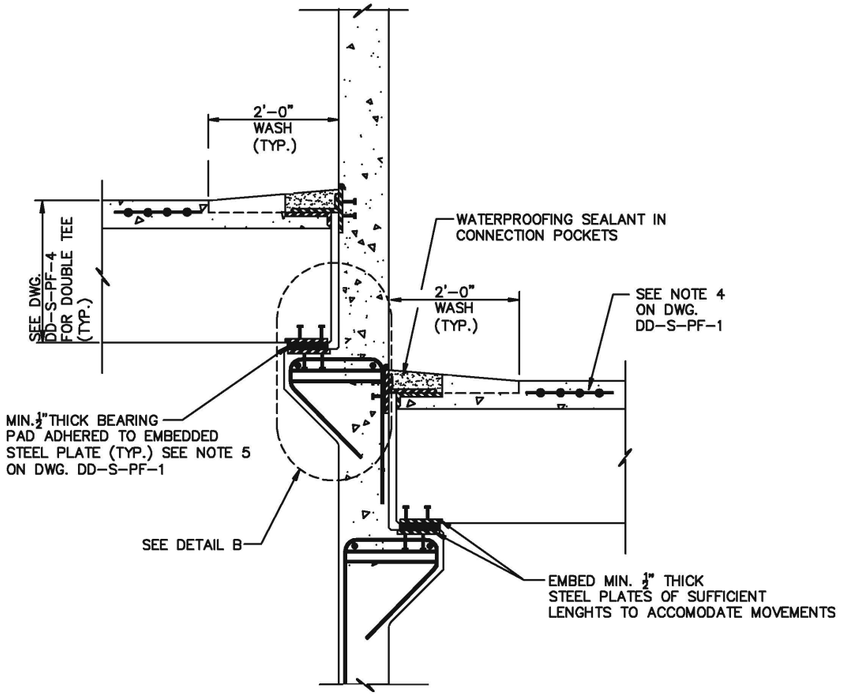
APPROVED 10/21/01
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING

PRECAST PRESTRESSED PARKING STRUCTURE

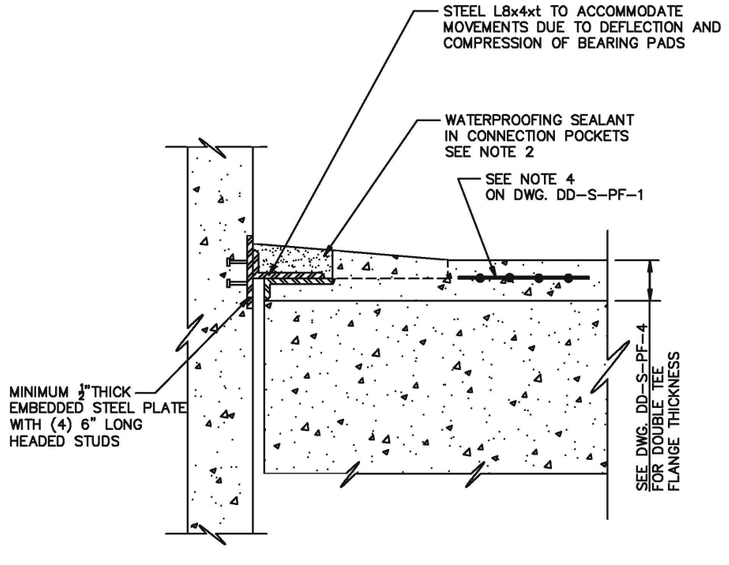
FLOOR PLAN SECTIONS AND DETAILS

SCALE	DRAWING NO.
AS NOTED	DD–S–PF–001



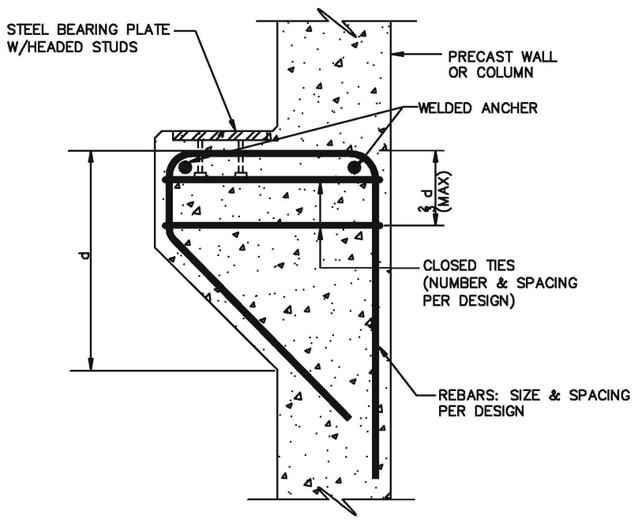
DOUBLE TEES OVER WALL BRACKETS/LEDGE

N.T.S.



DETAIL - A
DOUBLE TEE TOP CONNECTION

N.T.S.



DETAIL - B
CORBEL REINFORCING

N.T.S.

NOTES:

1. SEE NOTES ON DRAWINGS DD-S-PF-1.
2. CONNECTION POCKETS ARE NOT REQUIRED WHEN WASH IS CAST-IN-PLACE.
3. WALL REINFORCEMENT IS NOT SHOWN HERE FOR CLARITY. WALL REINFORCEMENT TO BE DESIGNED AND SHOWN ON THE DESIGN DRAWINGS BY DESIGN/BUILD CONTRACTOR.

SPECIAL NOTES:

1. **This Drawing Reflects WMATA's standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy.**
2. **Dimensions and details shown are mandatory. Dimensions not shown shall be provided by the designer.**

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DEPARTMENT OF TRANSIT SYSTEM DEVE
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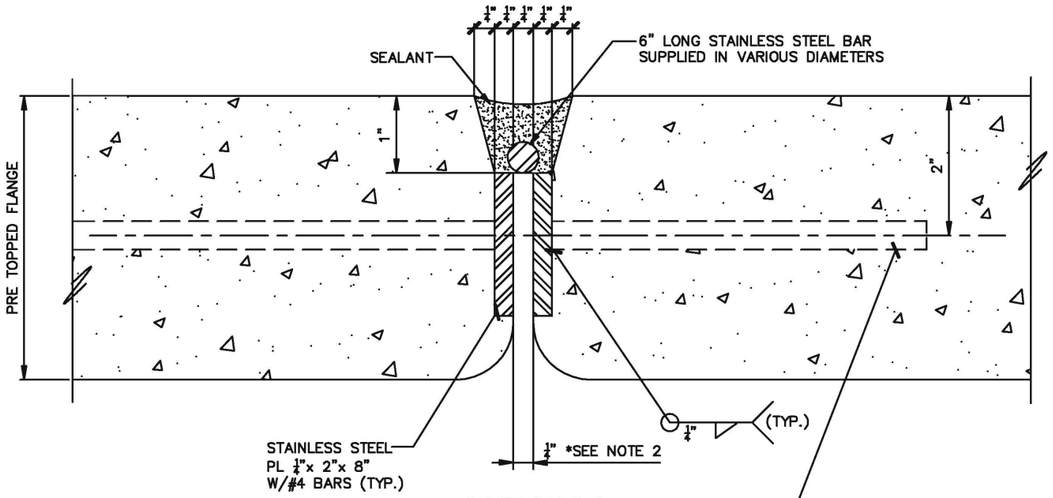
SUBMITTED _____ DATE

APPROVED 10/21/01
DIRECTOR DATE

STRUCTURAL DESIGN DRAWING
PRECAST PRESTRESSED PARKING STRUCTURE
SECTIONS & DETAILS

SCALE: AS NOTED

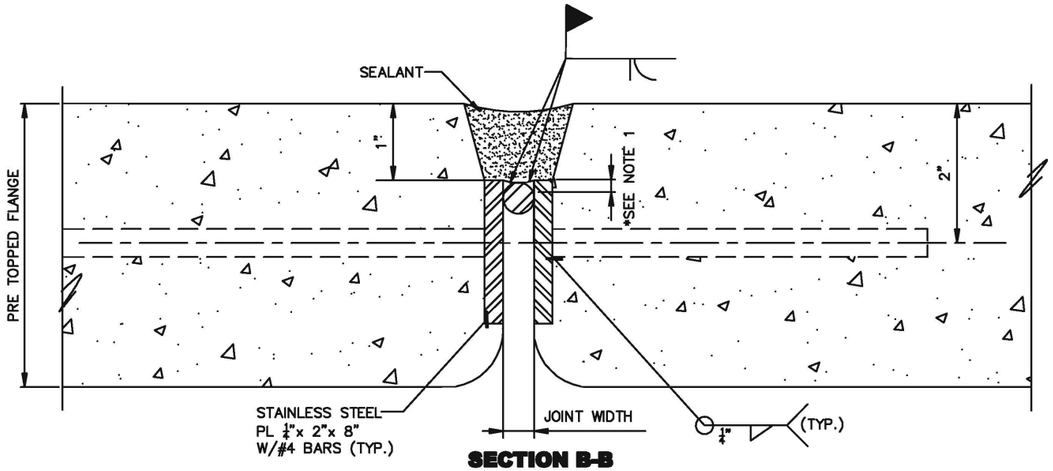
DRAWING NO.: DD-S-PF-002



SECTION A-A

N.T.S.

JOINT WIDTH SMALLER
THAN BAR DIAMETER



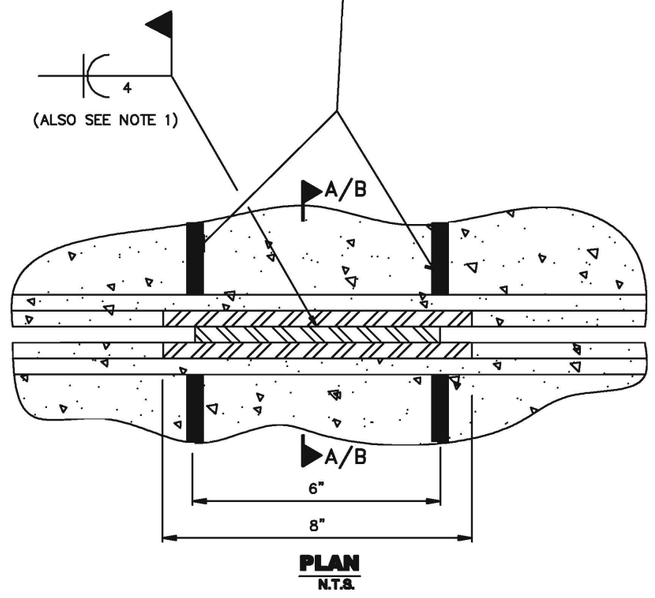
SECTION B-B

N.T.S.

JOINT WIDTH EQUAL OR LARGER THAN BAR DIAMETER.
(NOTE: SEE SECTION A–A FOR OTHER DETAILS)

*** NOTES:**

1. BAR /PLATE WELD RANGE
   UPPER ½" OF PLATE
2. ¼" JOINT BETWEEN TEE COMPONENTS MAY VARY IN FIELD
   ¼" (+½:–0') TYPICALLY
   ⅜" (+½:–0') @ RAMPS



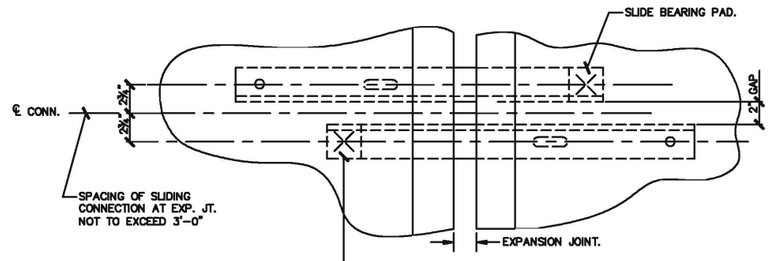
PLAN

N.T.S.

FLANGE TO FLANGE CONNECTION

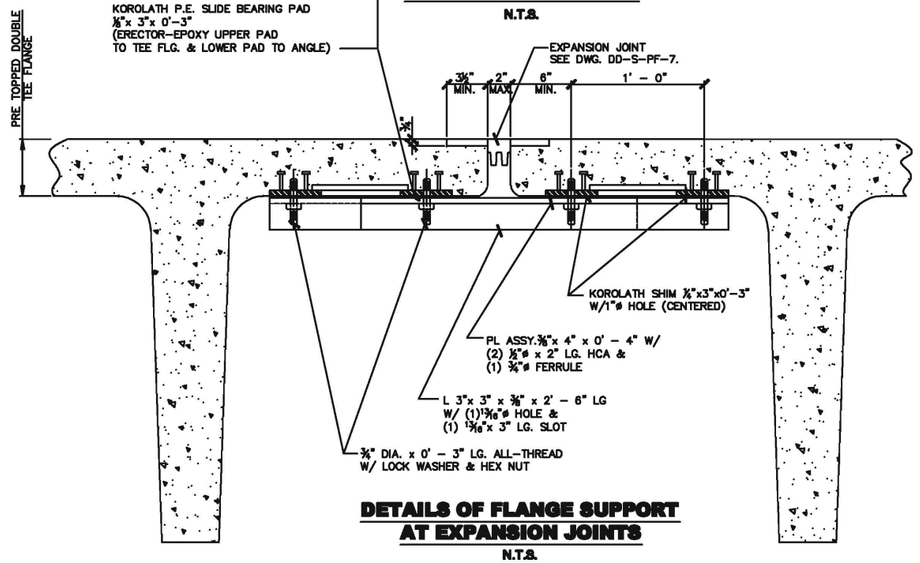
N.T.S.

(SPACING NOT TO EXCEED 4'- 0")



PARTIAL PLAN DETAIL

N.T.S.



DETAILS OF FLANGE SUPPORT AT EXPANSION JOINTS

N.T.S.

SPECIAL NOTES:

1. **This Drawing Reflects WMATA's standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy.**
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NUMBER	DESCRIPTION

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DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

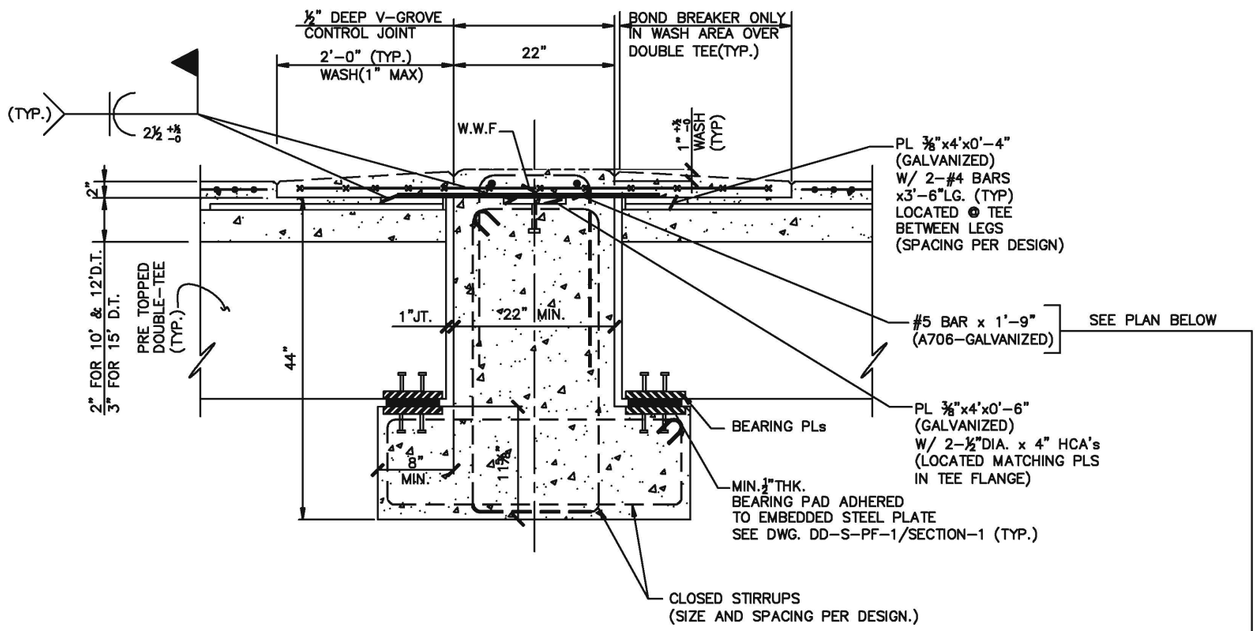
APPROVED _____ DIRECTOR 10/21/01 DATE

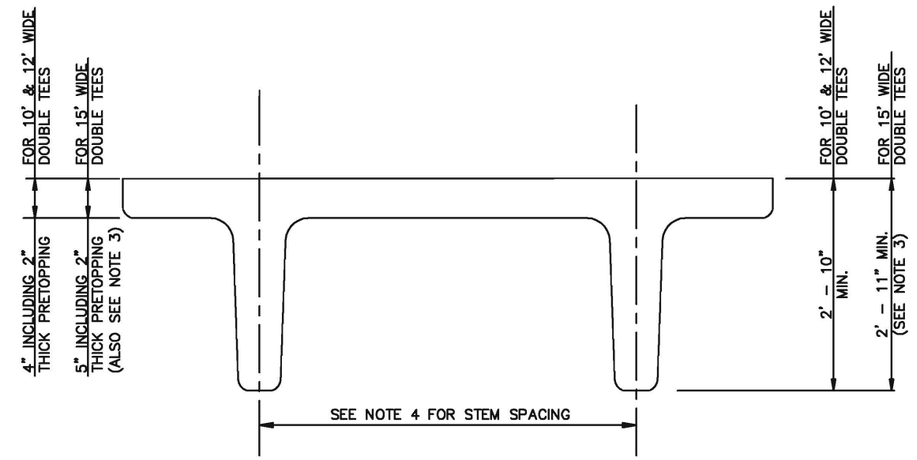
STRUCTURAL DESIGN DRAWING

PRECAST PRESTRESSED PARKING STRUCTURE

FLANGE CONNECTION DETAILS

SCALE	DRAWING NO.	
AS NOTED	DD–S–PF–003	





TYPICAL PRECAST DOUBLE TEE SECTION

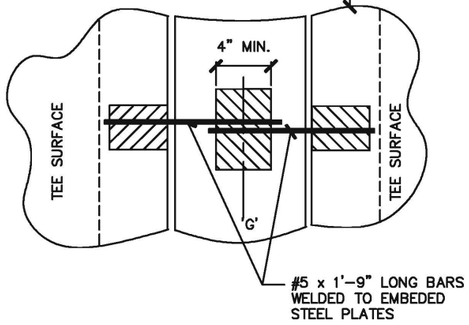
N.T.S.

NOTES:

1. STANDARD COMPONENT DATA:
   - STANDARD GIRDER STEM WIDTH SHALL BE 22" MINIMUM
   - GIRDER DEPTH SHALL BE DETERMINED BY JOB PARAMETERS AND SHALL BE MINIMUM OF 44"
2. PRESTRESSING TENDONS AND OTHER REINFOCEMENT NOT SHOWN FOR CLARITY SHALL BE IN ACCORDINANCE WITH THE ACTUAL DESIGN.

INVERTED TEE BEAMS SUPPORTING DOUBLE TEE BEAMS

N.T.S.



PARTIAL PLAN DETAIL

N.T.S.

NOTES:

1. THE PRECAST PRETENSIONED DOUBLE-TEES SHALL BE PRETOPPED.
2. CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 6000 PSI.
3. DOUBLE-TEE FLANGE THICKNESS SHALL BE 5" FOR 15'-0" WIDE DOUBLE TEES. HOWEVER, IF CONCRTE HAVING A MINIMUM 28-DAY STRENGTH OF 7000 PSI IS USED, A REDUCED FLANGE THICKNESS OF 4½" AND REDUCE TOTAL DEPTH OF 2'-10½" OF THE DOUBLE-TEE WILL BE ACCEPTABLE.
4. THE STEM SPACING OF THE DOUBLE-TEES SHALL BE HALF OF THE NOMINAL WIDTH OF THE DOUBLE-TEES. AN EXCEPTION TO THE STEM SPACING FOR THE 12'-0" DOUBLE-TEES SHALL BE AS NOTED BELOW:

   A STEM SPACING OF LESS THAN 6'-0", BUT NOT LESS THAN 5'-0", WOULD BE ACCEPTABLE WITH PRIOR APPROVAL OF WMATA, PROVIDED AND INCREASED FLANGE THICKNESS OF 4½" AND A MINIMUM 28-DAY STRENGTH OF CONCRETE OF 7000P.S.I. IS USED.
5. THE CANTILEVER LENGTH OF BOTH FLANGES SHALL BE EQUAL.

SPECIAL NOTES:

1. **This Drawing Reflects WMATA's standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy.**
2. **Dimensions and details shown are mandatory. Dimensions not shown shall be provided by the designer.**

DESIGNED	SKM	07-01 DATE
DRAWN	K.W., S.Z.	07-01 DATE
CHECKED	JR	07-01 DATE
APPROVED	JR	07-01 DATE
UPDATED		07-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

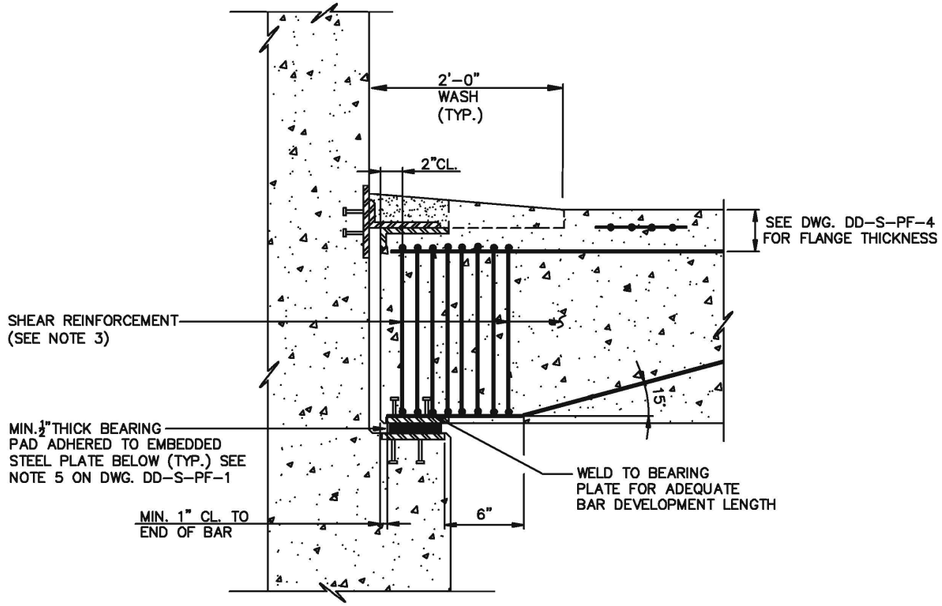
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 10/21/01 DATE

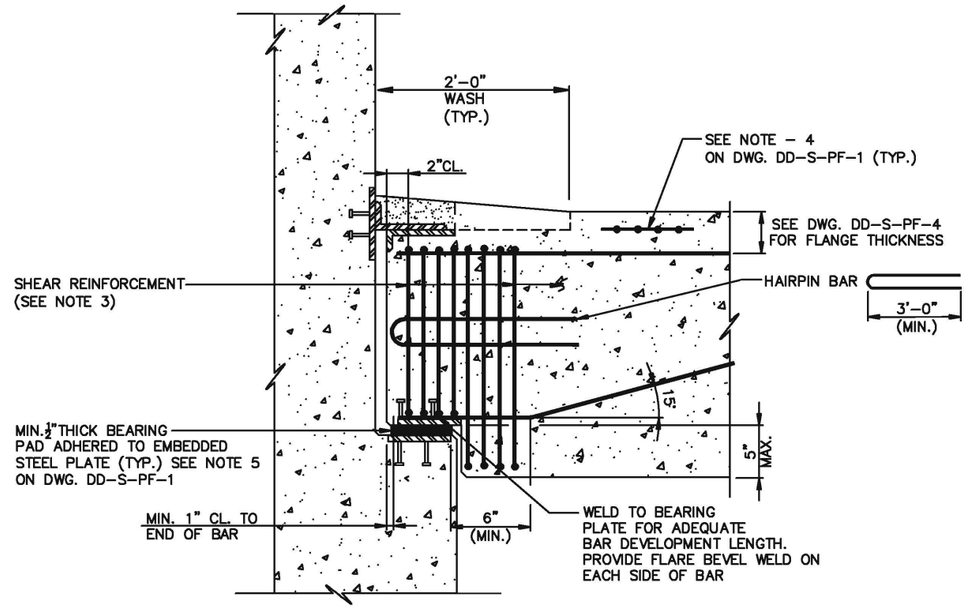
STRUCTURAL DESIGN DRAWING
PRECAST PRESTRESSED PARKING STRUCTURE
TYPICAL SECTIONS

SCALE: AS NOTED

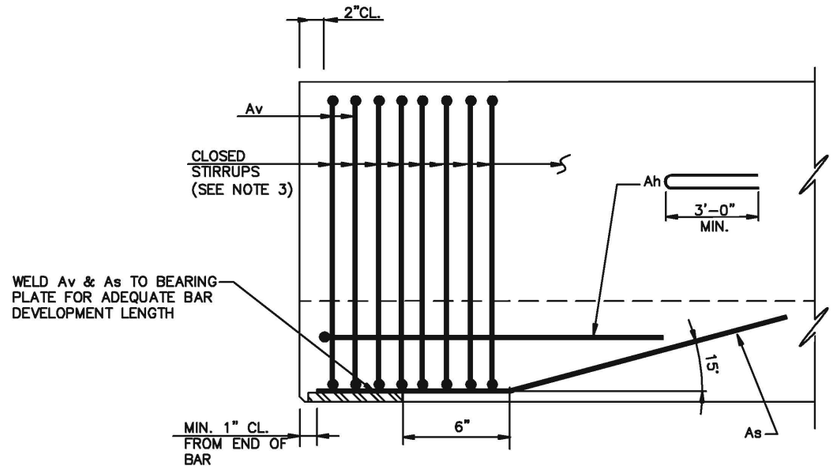
DRAWING NO.: DD-S-PF-004



REINFORCEMENT DETAILS
DOUBLE-TEE BEAM ENDS AT BEARING
N.T.S.



REINFORCEMENT DETAILS
AT DAPPED DOUBLE-TEE BEAM ENDS AT BEARING
N.T.S.



REINFORCEMENT DETAILS
INVERTED TEE BEAM ENDS AT BEARINGS
N.T.S.

NOTES:

1. DESIGN OF PRECAST DOUBLE TEES AND INVERTED TEE BEAMS SHALL BE BASED ON PERFORMANCE DESIGN, AND WMATA CRITERIA.
2. ONLY VERTICAL AND HORIZONTAL SHEAR REINFORCEMENTS ARE SHOWN. OTHER REINFORCING BARS ARE NOT SHOWN FOR CLARITY.
3. MINIMUM STIRRUPS FROM THE END OF BEAM SHALL BE TWO #4 BAR STIRRUPS AT 2" SPACING, FOUR AT 6" SPACING, AND THE REMAINING STIRRUPS SHALL BE AT 12" SPACING. AREA OF STEEL OF STIRRUPS MAY BE INCREASED AND/OR SPACING OF THE STIRRUPS DECREASED AS REQUIRED BY THE DESIGN.
4. THE BEARING PLATES MUST HAVE A FLAT BEARING SURFACE AFTER THE BARS AND OTHER ATTACHMENTS, ARE WELDED TO THEM.

SPECIAL NOTES:

1. **This Drawing Reflects WMATA's standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy.**
2. **Dimensions and details shown are mandatory. Dimensions not shown shall be provided by the designer.**

DESIGNED	SKM	07–01 DATE
DRAWN	K.W., S.Z.	07–01 DATE
CHECKED	JR	07–01 DATE
APPROVED	JR	07–01 DATE
UPDATED		07–01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

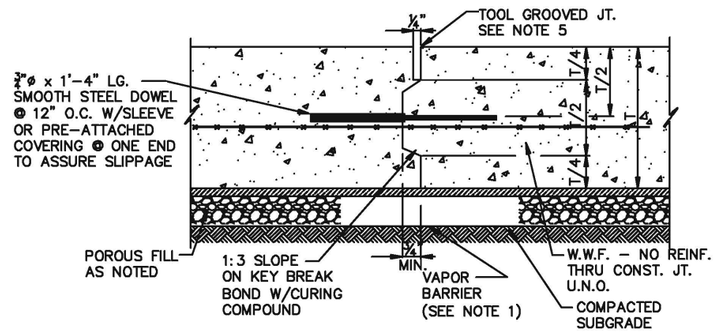
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

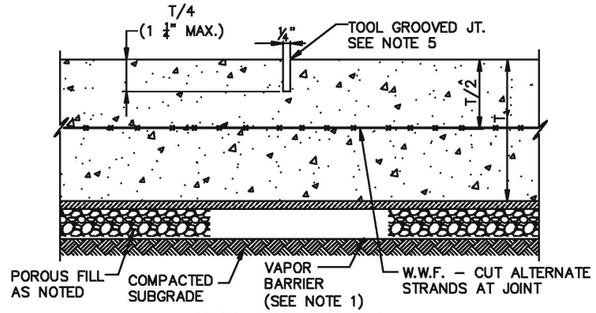
APPROVED _____ DIRECTOR 10/21/01 DATE

STRUCTURAL DESIGN DRAWING
PRECAST PRESTRESSED PARKING STRUCTURE
TYPICAL SECTIONS

SCALE	DRAWING NO.
AS NOTED	DD–S–PF–005



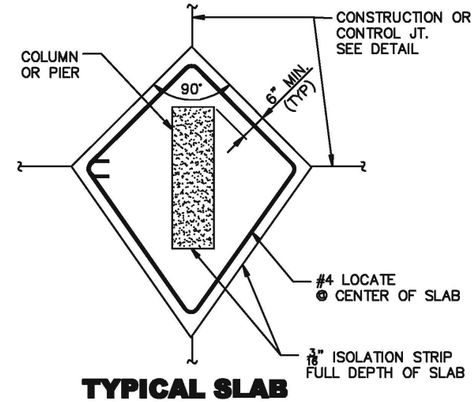
CONSTRUCTION JOINT
N.T.S.



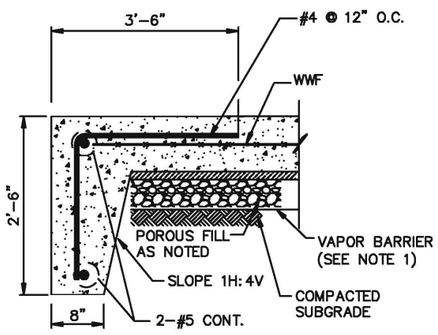
CONTROL JOINT
N.T.S.

1. PROVIDE SUPPORT TO HOLD REINF. IN BOTTOM
2. PROVIDE CONSTR. JOINT TO DIVIDE SLAB INTO NEAR SQUARE SHAPES NOT EXCEEDING 2,500 SQ. FT. IN AREA
3. SAW CUT CONTROL JOINTS NOT PERMITTED WITHOUT SPECIAL ACCEPTANCE. SEE SPEC.
4. CONSTRUCTION JOINT MAY REPLACE CONTROL JOINT
5. FILL JOINT W/EPOXY SEALANT AFTER SLAB HAS CURED
6. THE THICKNESS 'T' OF SLAB ON GRADE SHALL BE AS REQUIRED BY DESIGN BUT NET LESS THAN 6".

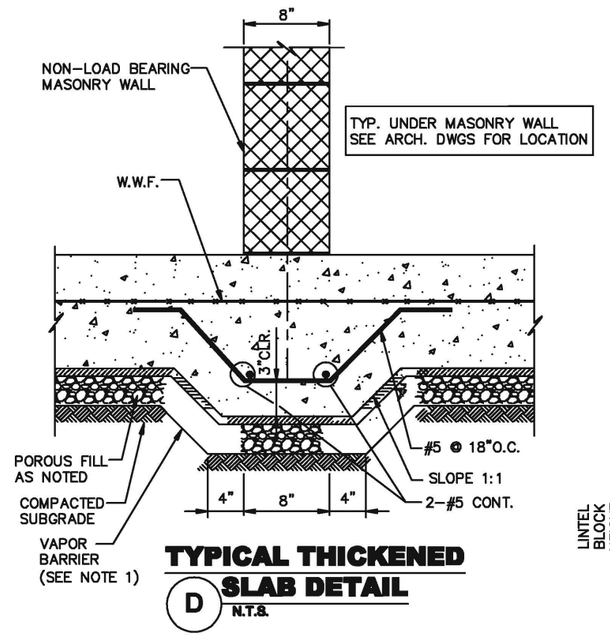
A JOINT DETAILS FOR PARKING GARAGE SLAB ON GRADE
N.T.S.



TYPICAL SLAB TREATMENT AT COLUMNS
B N.T.S.



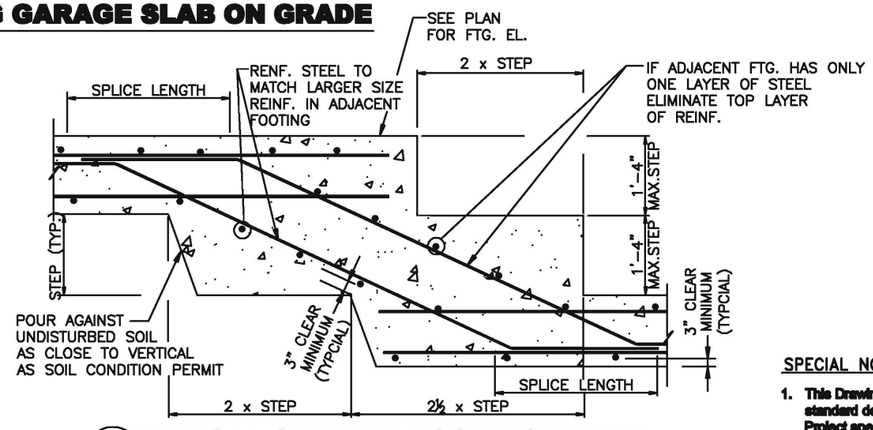
TYPICAL EDGE OF SLAB DETAIL @ ENTRANCE
C N.T.S.



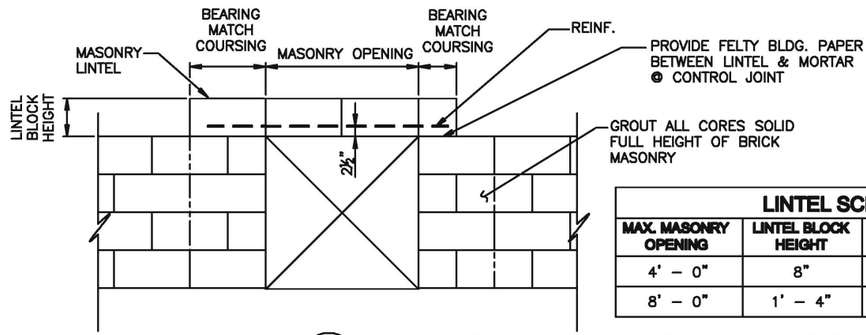
TYPICAL THICKENED SLAB DETAIL
D N.T.S.

NOTE 1

VAPOR BARRIER (RETARDER) SHALL NOT BE LESS THAN 10 MIL THICK POLYETHYLENE FILM. THE INSTALLATION OF VAPOR BARRIER AND POROUS FILL SHALL BE IN ACCORDANCE WITH SECTION 4.1.5 OF ACI 302.1 R-96 "GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION".



E TYPICAL STEPPED FOOTING DETAIL
N.T.S.



LINTEL SCHEDULE			
MAX. MASONRY OPENING	LINTEL BLOCK HEIGHT	REINFORCING	BEARING
4' – 0"	8"	2 # 5	4" MIN.
8' – 0"	1' – 4"	2 # 6	8" MIN.

F LINTEL SCHEDULE AND ELEVATION
N.T.S.

SPECIAL NOTES:

1. **This Drawing Reflects WMATA's standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy.**
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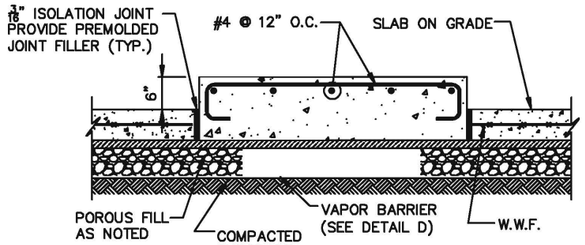
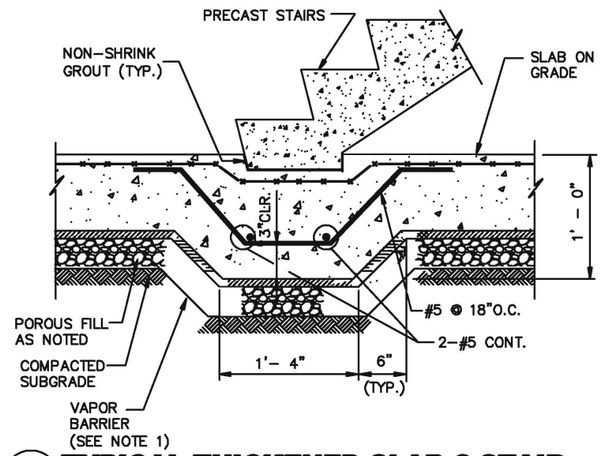


G TYPICAL SECTION AT CURB
N.T.S.



J TYPICAL THICKENED SLAB @ STAIR
N.T.S.

DESIGNED	SKM	07-01 DATE
DRAWN	K.W., S.Z.	07-01 DATE
CHECKED	JR	07-01 DATE
APPROVED	JR	07-01 DATE
UPDATED		07-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

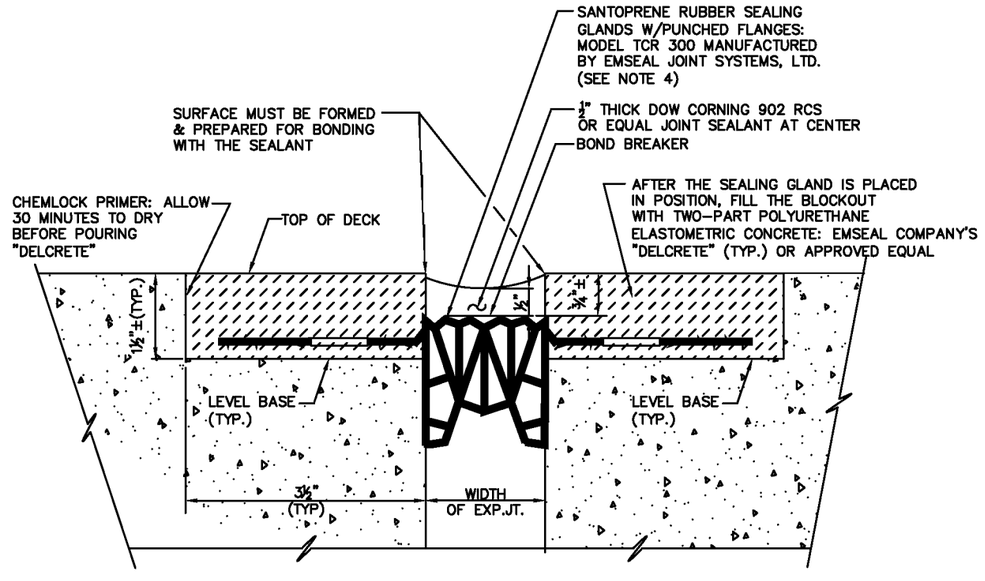
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR 10/21/01 DATE

STRUCTURAL DESIGN DRAWING
PRECAST PRESTRESSED PARKING STRUCTURE
TYPICAL SECTIONS

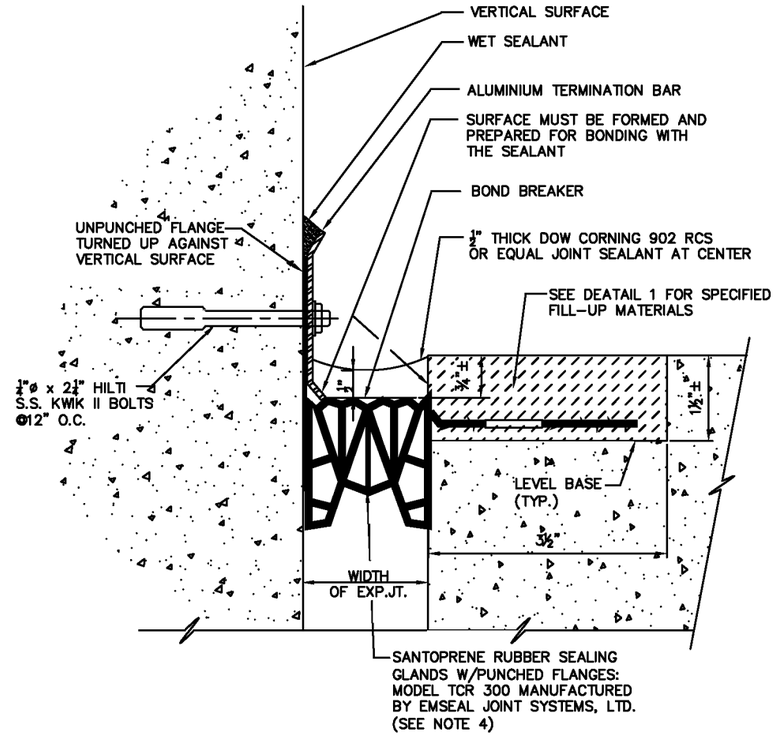
SCALE	DRAWING NO.
AS NOTED	DD-S-PF-006



EXPANSION JOINT DETAIL 1

BETWEEN HORIZONTAL SURFACES

N.T.S.



EXPANSION JOINT DETAIL 2

BETWEEN VERTICAL AND HORIZONTAL SURFACES

N.T.S.

TYPICAL EXPANSION JOINT DETAILS

NOTES:

1. REBARS, TENDONS AND EMBEDS NOT SHOWN FOR CLARITY.
2. VERTICAL TRANSITIONS SHALL BE FACTORY WELDED
3. AN APPROVED EQUAL PRODUCT CAN BE USED IN LIEU OF THE SPECIFIED
4. THIS MODEL IS BASED ON 2" EXPANSION JOINT, SPACED AT NOT GREATER THAN 150'. FOR OTHER SIZES AND SPACING, DESIGN AND USE OTHER MODEL.

SPECIAL NOTES:

1. This Drawing Reflects WMATA's standard design approach. Project specific drawings must be developed by the Contractor which reflect this Design Philosophy.
2. Dimensions and details shown are mandatory. Dimensions not shown shall be provided by the designer.

DESIGNED SKM 07-01 DATE	REFERENCE DRAWINGS	REVISIONS
DRAWN K.W., S.Z. 07-01 DATE	NUMBER / DESCRIPTION	DATE / BY / DESCRIPTION
CHECKED JR 07-01 DATE		
APPROVED JR 07-01 DATE		
UPDATED 07-01 DATE		

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF ENGINEERING AND ARCHITECTURE

SUBMITTED DATE

APPROVED DIRECTOR 10/21/01 DATE

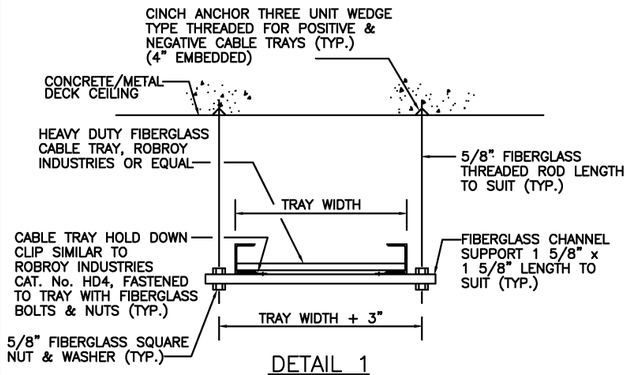
STRUCTURAL DESIGN DRAWING

PRECAST PRESTRESSED PARKING STRUCTURE

TYPICAL EXPANSION JOINT DETAILS

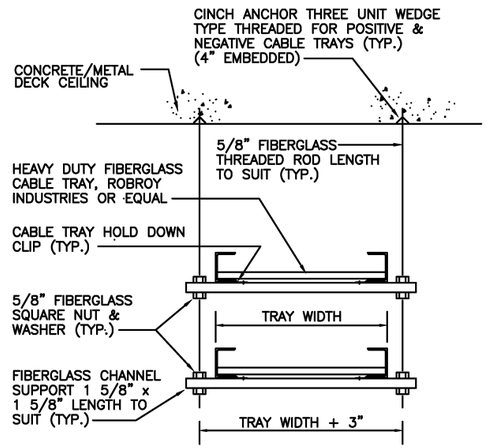
SCALE: AS NOTED

DRAWING NO.: DD-S-PF-007



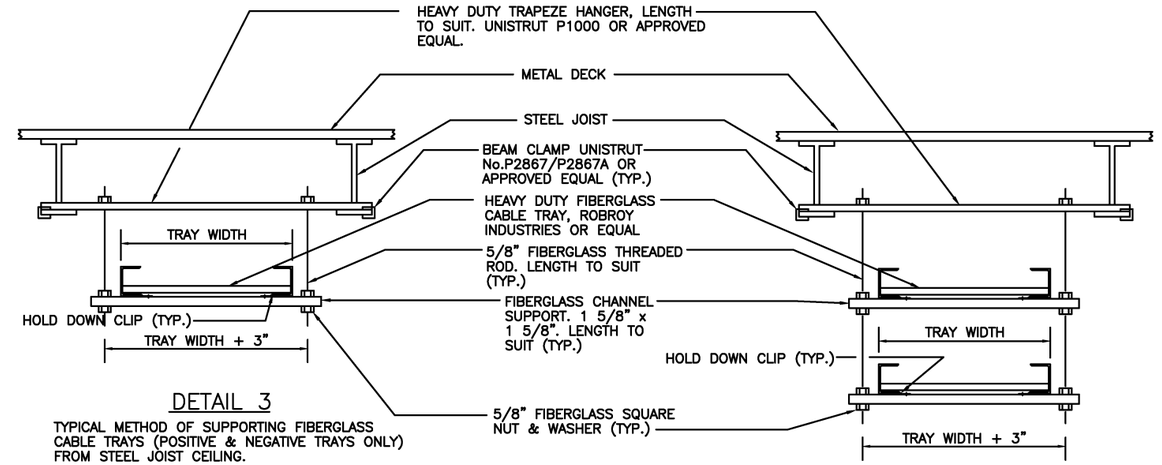
DETAIL 1

TYPICAL METHOD OF SUPPORTING FIBERGLASS CABLE TRAY (POSITIVE AND NEGATIVE TRAYS ONLY) FROM CONCRETE/METAL DECK CEILING.



DETAIL 2

TYPICAL METHOD OF SUPPORTING TWO FIBERGLASS CABLE TRAYS (POSITIVE & NEGATIVE TRAYS ONLY) FROM CONCRETE/METAL DECK CEILING.

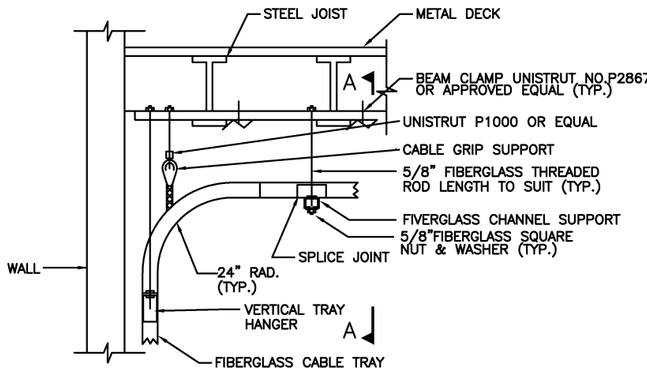


DETAIL 3

TYPICAL METHOD OF SUPPORTING FIBERGLASS CABLE TRAYS (POSITIVE & NEGATIVE TRAYS ONLY) FROM STEEL JOIST CEILING.

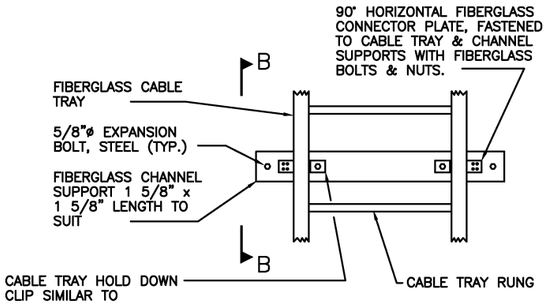
DETAIL 4

TYPICAL METHOD OF SUPPORTING TWO FIBERGLASS CABLE TRAYS (POSITIVE & NEGATIVE TRAYS ONLY) FROM STEEL JOIST CEILING



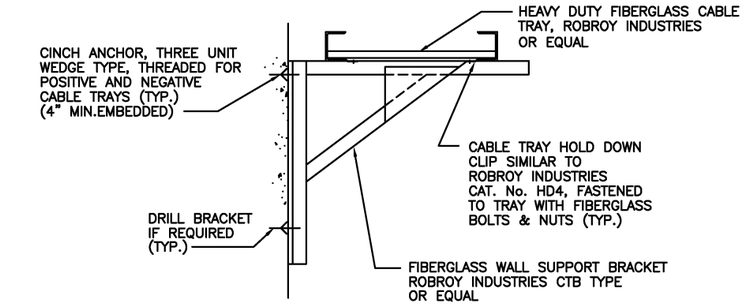
DETAIL 5

TYPICAL METHOD FOR SUPPORTING FIBERGLASS CABLE TRAYS (POSITIVE & NEGATIVE TRAYS ONLY) AND CABLE FOR VERTICAL DROPS GREATER THAN 9'–0"



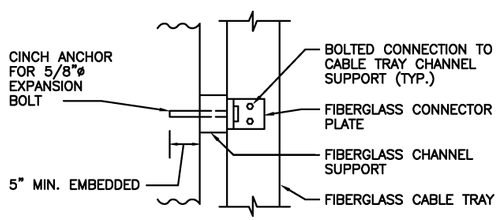
DETAIL 6

TYPICAL FOR ALL POSITIVE & NEGATIVE FIBERGLASS CABLE TRAYS SUPPORTED FLAT TO WALL (UNLESS OTHERWISE NOTED)

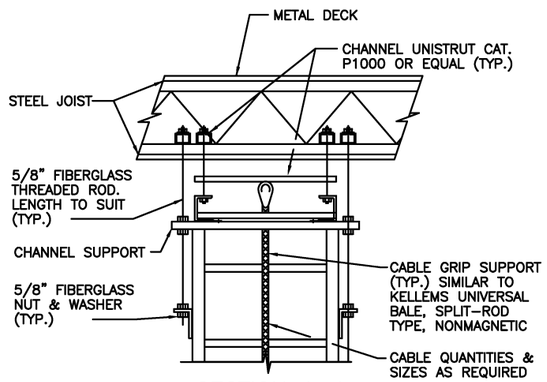


DETAIL 7

TYPICAL METHOD OF SUPPORTING FIBERGLASS CABLE TRAY (POSITIVE & NEGATIVE TRAY ONLY) FROM CONCRETE WALL.



SECTION B–B
(DETAIL 6)



SECTION A–A

NOTES:

1. ALL CABLE TRAYS SHALL BE SUPPORTED AT ELBOWS AND TEES, HORIZONTAL RUNS OF CABLE TRAYS SHALL BE SUPPORTED AT NOT MORE THAN 10'–0" ON CENTERS FOR POSITIVE AND NEGATIVE CABLE TRAYS AND NOT MORE THAN 12'–0" ON CENTERS FOR OTHER CABLE TRAYS.
2. FOR TRAY SUPPORTS OTHER THAN POSITIVE AND NEGATIVE CABLE TRAYS, BOLT SUPPORT CLIPS OR WALL BRACKETS DIRECTLY TO WALL WITH 5/8" EXPANSION BOLTS.

DESIGNED	J. KROLIK	2–01 DATE
DRAWN	R. THOMAS, JR.	2–01 DATE
CHECKED	D. GLEN	2–01 DATE
APPROVED	R. GANERIWAL	2–01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

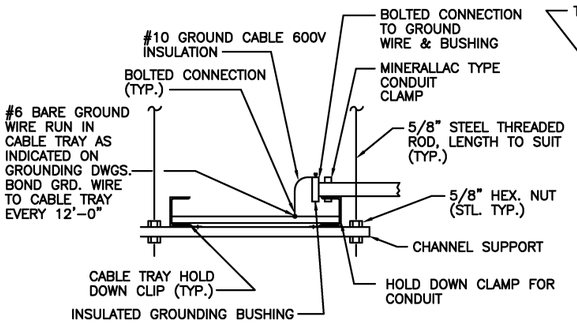
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
TYPICAL DETAILS
SHEET 1

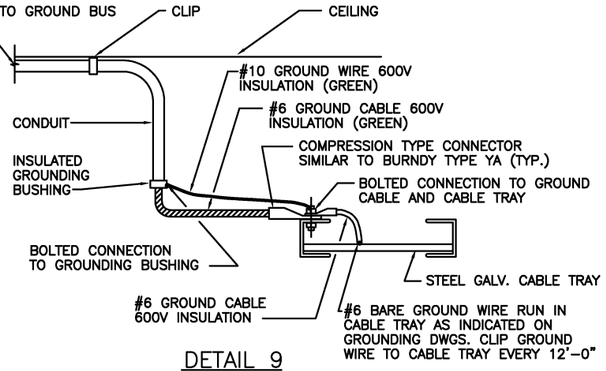
SCALE: NO SCALE

DRAWING NO.: DD–TP–SSI–001



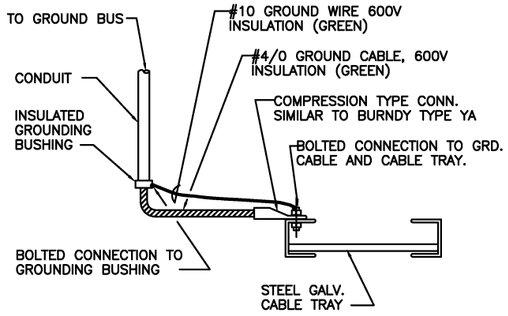
DETAIL 8

TYPICAL METHOD OF SUPPORTING GALV. STEEL TRAY AND GROUNDING OF CONDUIT. (FOR A.C. POWER AND CONTROL CIRCUITS)



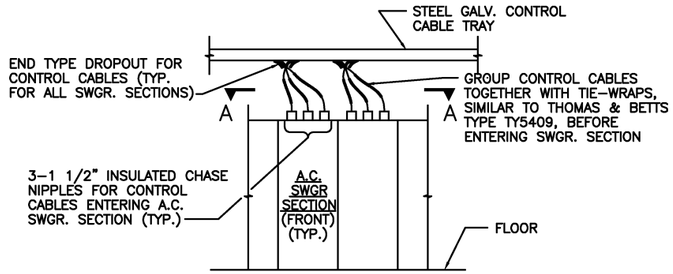
DETAIL 9

TYPICAL GROUND CONNECTION TO STEEL GALV. CONTROL CABLE TRAY



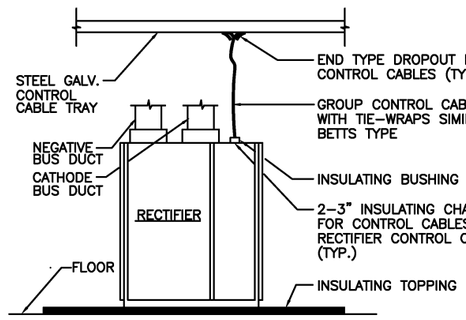
DETAIL 10

TYPICAL GROUND CONNECTION TO STEEL GALV. INCOMING LINE CABLE TRAY



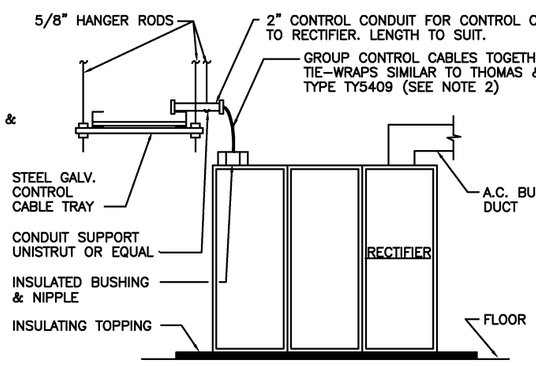
DETAIL 11

TYPICAL METHOD OF ROUTING CONTROL CABLES TO A.C. SWITCHGEAR



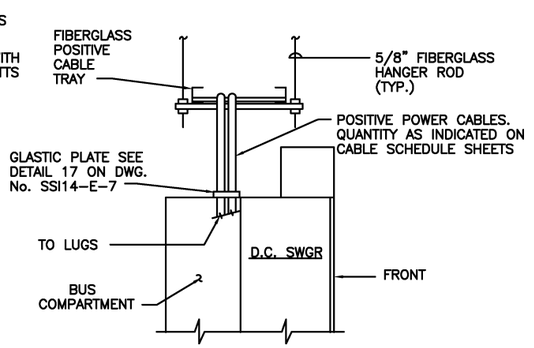
DETAIL 12

TYPICAL METHOD OF RUNNING CONTROL CABLES FROM CABLE TRAY TO RECTIFIER WHERE CONTROL CABLE TRAY IS LOCATED DIRECTLY OVER RECTIFIER



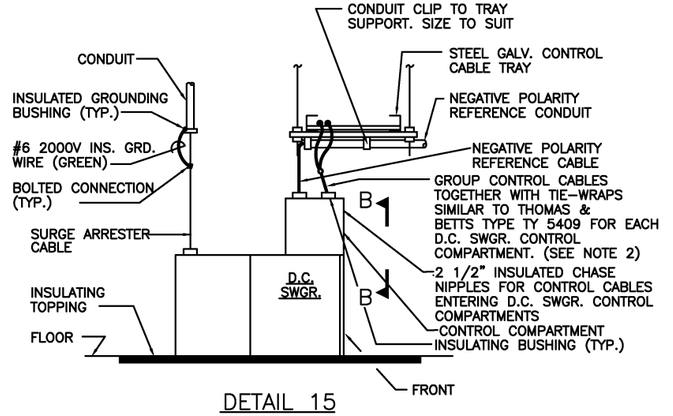
DETAIL 13

TYPICAL METHOD OF RUNNING CONTROL CABLES FROM CABLE TRAY TO RECTIFIER WHERE CONTROL CABLE TRAY IS NOT LOCATED DIRECTLY OVER RECTIFIER (UNLESS SHOWN OTHERWISE ON PLANS)



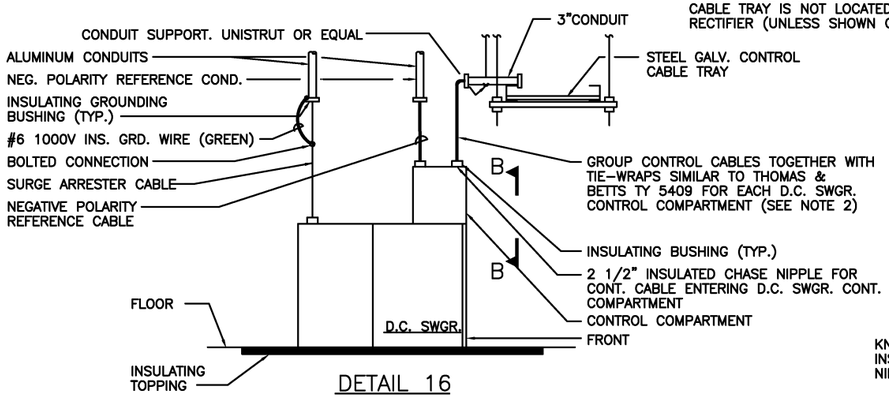
DETAIL 14

TYPICAL METHOD OF RUNNING POSITIVE POWER CABLES FROM CABLE TRAY TO D.C. SWITCHGEAR FEEDER BREAKER BUS



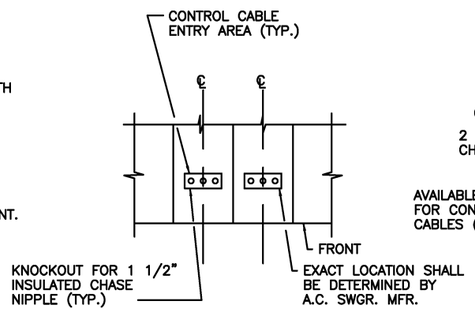
DETAIL 15

TYPICAL METHOD OF RUNNING CABLES FROM CABLE TRAY AND CONDUITS TO D.C. SWGR. WHERE CONTROL CABLE TRAY IS LOCATED DIRECTLY OVER CONTROL COMPARTMENT OF D.C. SWITCHGEAR



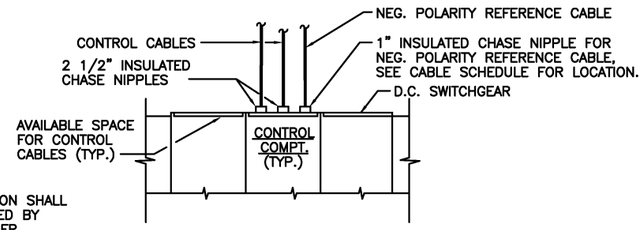
DETAIL 16

TYPICAL METHOD OF RUNNING CABLES FROM CABLE TRAY AND CONDUITS TO D.C. SWITCHGEAR WHERE CONTROL CABLE TRAY IS NOT LOCATED DIRECTLY OVER CONTROL COMPARTMENTS OF D.C. SWITCHGEAR



SECTION A-A

(DETAIL 11)



SECTION B-B

(DETAILS 15,16)

DESIGNED	J. KROLIK	2-01 DATE
DRAWN	R. THOMAS,JR.	2-01 DATE
CHECKED	D GLEN	2-01 DATE
APPROVED	R GANERIWAL	2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

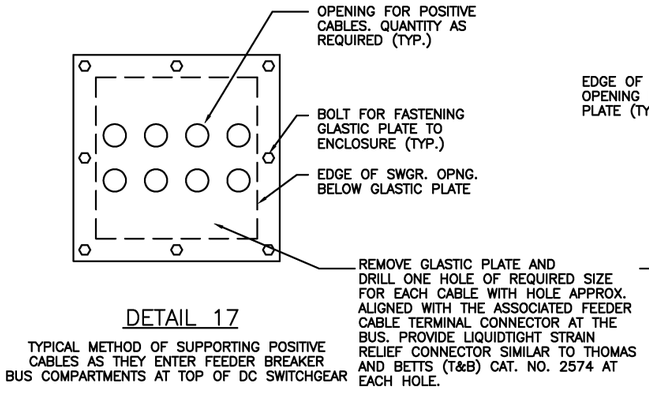
SUBMITTED _____ DATE

APPROVED _____ May 3, 2001 DIRECTOR DATE

TRACTION POWER DESIGN DRAWING
TYPICAL DETAILS
SHEET 2

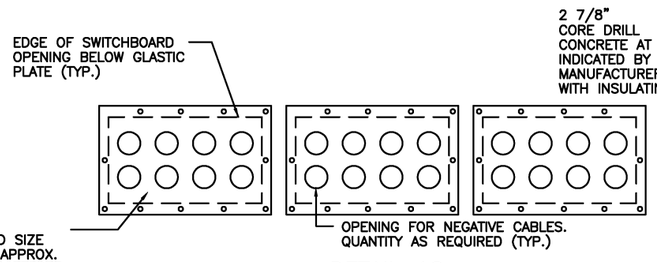
SCALE: NOT TO SCALE

DRAWING NO.: DD-TP-SSI-002



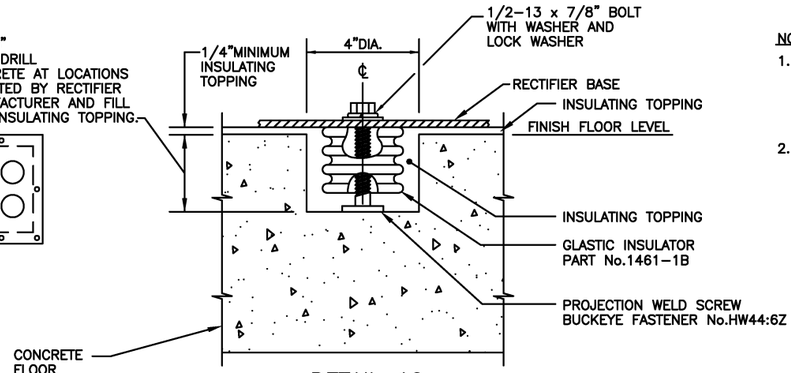
DETAIL 17

TYPICAL METHOD OF SUPPORTING POSITIVE CABLES AS THEY ENTER FEEDER BREAKER BUS COMPARTMENTS AT TOP OF DC SWITCHGEAR



DETAIL 18

TYPICAL METHOD OF SUPPORTING NEGATIVE CABLES AS THEY ENTER NEGATIVE SWITCHBOARD

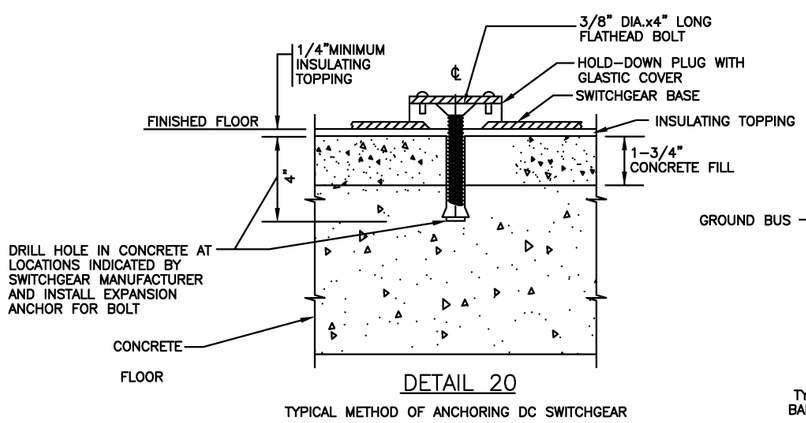


DETAIL 19

TYPICAL METHOD OF ANCHORING RECTIFIER

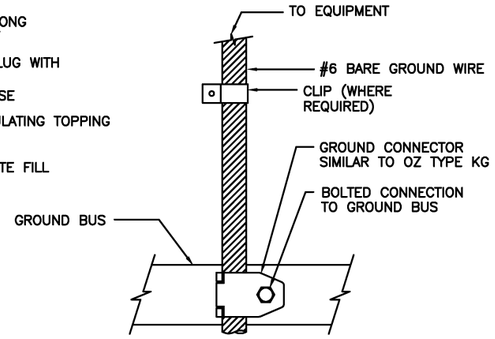
NOTES:

1. HORIZONTAL BUS DUCT SUPPORTS SHALL BE LOCATED ON CORNERS WITHIN 1'–0" OF THE INSIDE EDGE OF EACH LEG AND ON STRAIGHT SECTIONS AT A MAXIMUM INTERVAL OF 8'–0".
2. VERTICAL BUS DUCT SUPPORT(S) SHALL BE LOCATED AT THE TOP OF THE VERTICAL BUS DUCT SECTION AND AT INTERMEDIATE INTERVALS AS MARKED ON THE VERTICAL BUS DUCT SECTION OR AS RECOMMENDED BY THE MANUFACTURER.



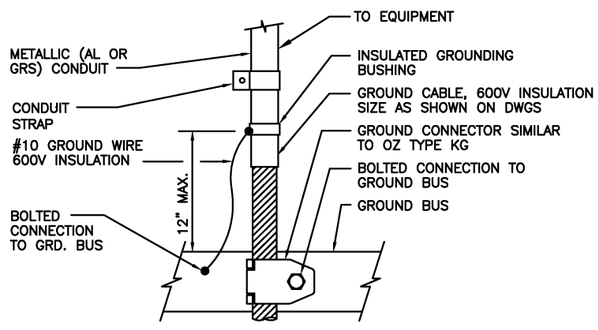
DETAIL 20

TYPICAL METHOD OF ANCHORING DC SWITCHGEAR



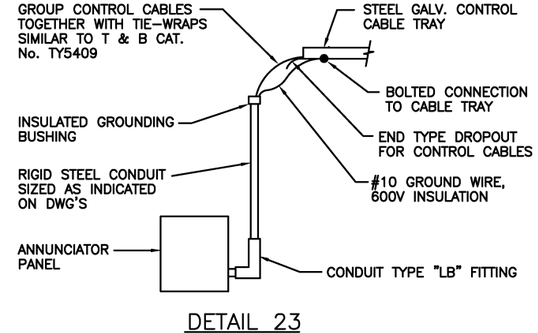
DETAIL 21

TYPICAL GROUND CONNECTION FROM BARE GROUND WIRE TO GROUND BUS



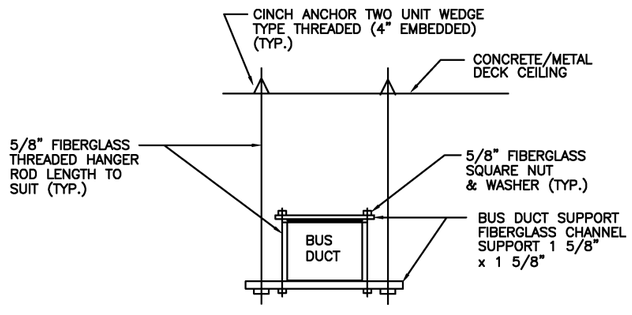
DETAIL 22

TYPICAL GROUND CONNECTION FROM INSULATED GROUND CABLE IN METALLIC CONDUIT TO GROUND BUS



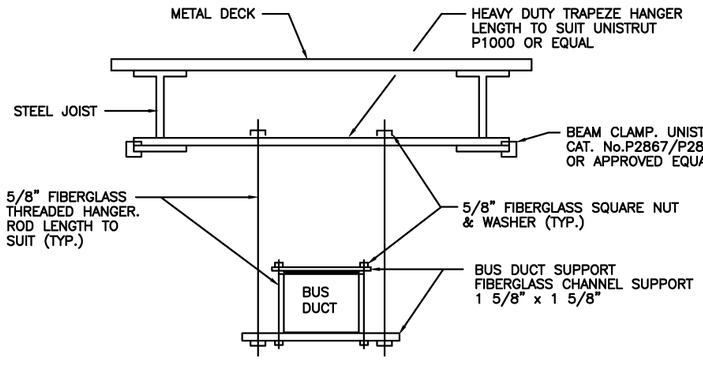
DETAIL 23

TYPICAL METHOD OF RUNNING CONTROL CABLES FROM CONTROL CABLE TRAY TO ANNUNCIATOR PANEL



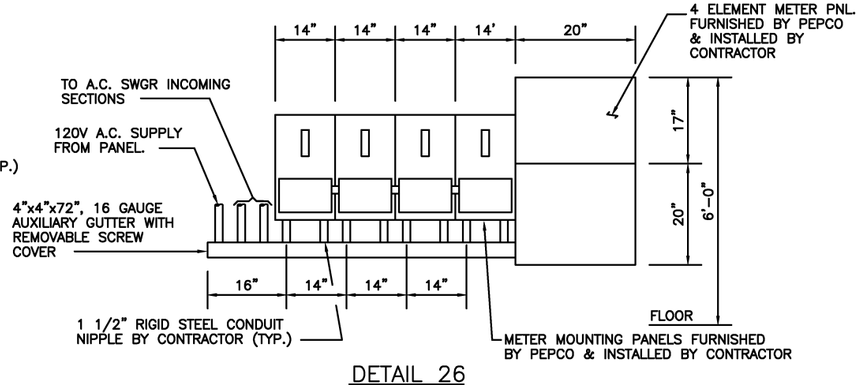
DETAIL 24

TYPICAL METHOD OF SUPPORTING BUS DUCT FROM CONCRETE/METAL DECK CEILING. SUPPORT BUS DUCT EVERY 8'–0" AND PROVIDE AT LEAST TWO SUPPORTS PER DUCT ASSEMBLY AT EACH CORNER.



DETAIL 25

TYPICAL METHOD OF SUPPORTING BUS DUCT FROM STEEL JOIST CEILING



DETAIL 26

TYPICAL METHOD OF INSTALLING METERING PANEL. ALL EQUIPMENT AND MATERIALS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS OTHERWISE NOTED.

DESIGNED	J. KROLIK	2–01 DATE
DRAWN	R. THOMAS,JR.	2–01 DATE
CHECKED	D GLEN	2–01 DATE
APPROVED	R GANERIWAL	2–01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

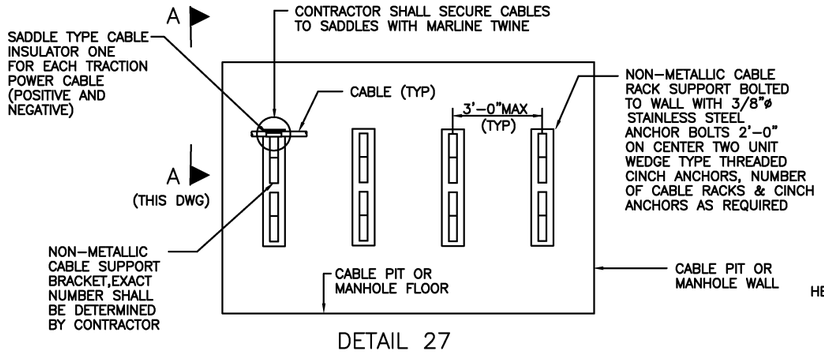
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
TYPICAL DETAILS
SHEET 3

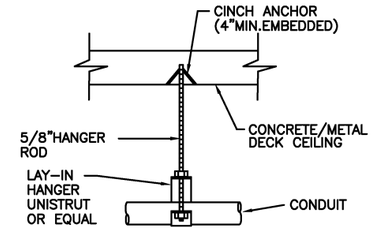
SCALE: NOT TO SCALE

DRAWING NO.: DD–TP–SSI–003



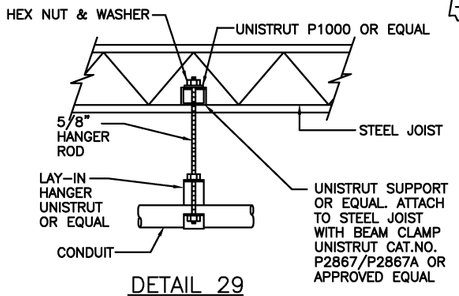
DETAIL 27

TYPICAL METHOD OF SUPPORTING TRACTION POWER CABLES IN CABLE PITS AND MANHOLES, CONTRACTOR SHALL PROVIDE CABLE RACKS AS REQD



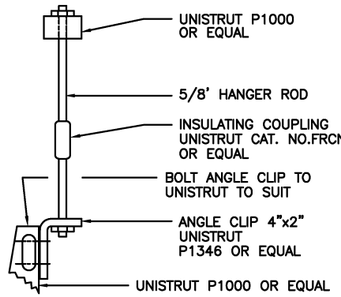
DETAIL 28

TYPICAL METHOD OF SUPPORTING CONDUIT FROM CONCRETE/METAL DECK CEILING



DETAIL 29

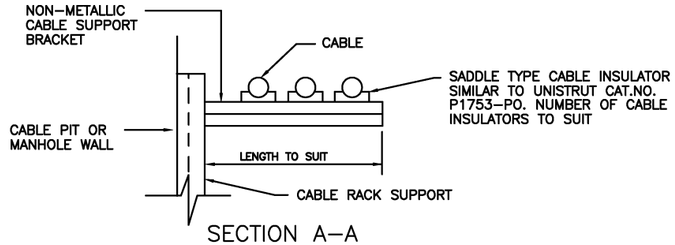
TYPICAL METHOD OF SUPPORTING CONDUIT FROM STEEL JOIST CEILING



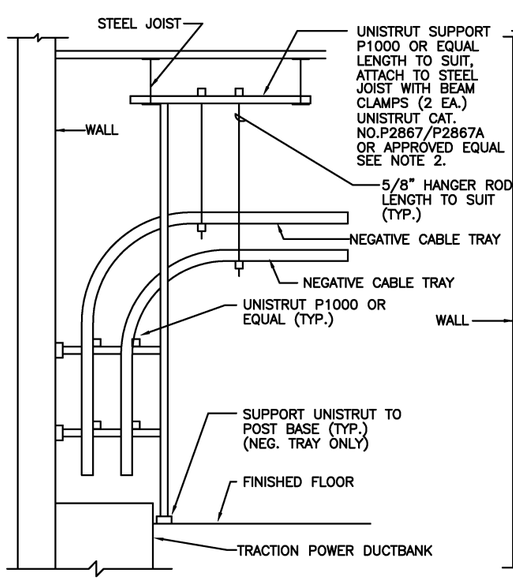
DETAIL 30
ENLARGED VIEW
HANGER SUPPORT

NOTES:

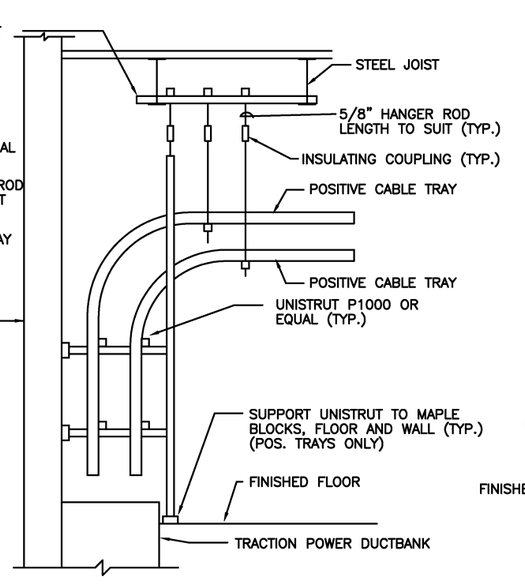
1. ALL CABLE TRAYS SHALL BE SUPPORTED AT ELBOWS AND TEES. HORIZONTAL RUNS OF CABLE TRAYS SHALL BE SUPPORTED AT NOT MORE THAN 10'-0" ON CENTERS FOR POSITIVE AND NEGATIVE CABLE TRAYS AND AT NOT MORE THAN 12'-0" ON CENTERS FOR OTHER CABLE TRAYS.
2. AT CONCRETE/METAL DECK CEILING, USE CINCH ANCHOR TWO-UNIT WEDGE TYPE THREADED TO SUPPORT HANGER RODS.



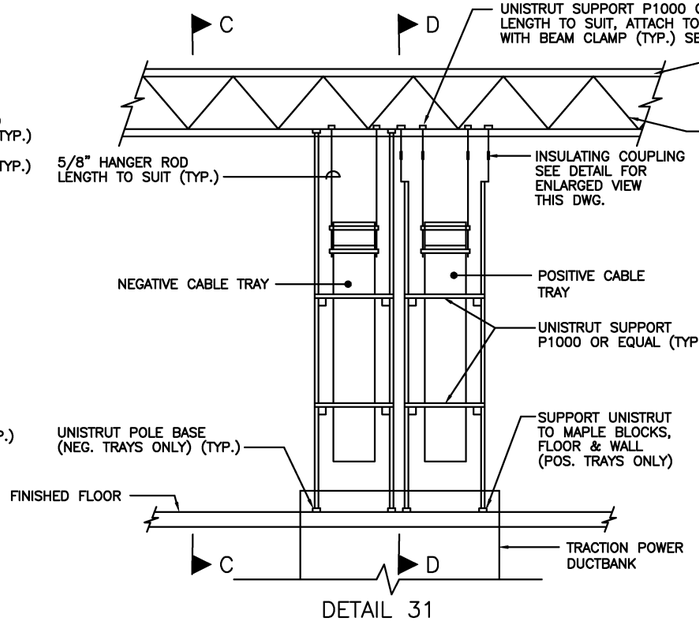
SECTION A-A
(DETAIL 27)



SECTION C-C
(DETAIL 31)

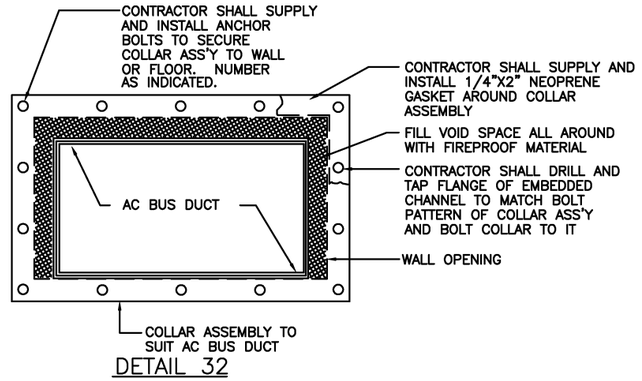


SECTION D-D
(DETAIL 31)



DETAIL 31

TYPICAL TRANSITION OF TRACTION POWER POSITIVE AND NEGATIVE CABLES FROM CABLE TRAYS TO DUCTBANK



DETAIL 32

TYPICAL METHOD OF SUPPORTING AC BUS DUCT PASSING THRU WALL TO RECTIFIER TRANSFORMER

DESIGNED	J. KROLIK	2-01 DATE
DRAWN	R. THOMAS, JR.	2-01 DATE
CHECKED	D GLEN	2-01 DATE
APPROVED	R GANERIWAL	2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

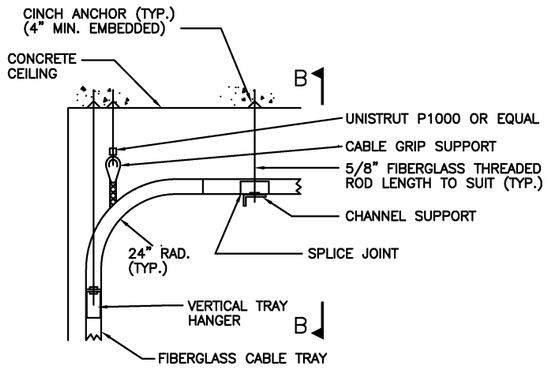
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
TYPICAL DETAILS
SHEET 4

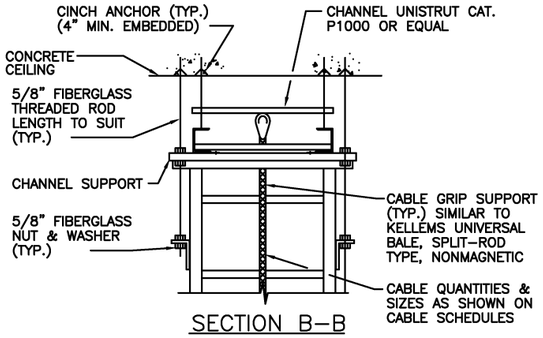
SCALE: NOT TO SCALE

DRAWING NO. DRAWING NO.: DD-TP-SSI-004

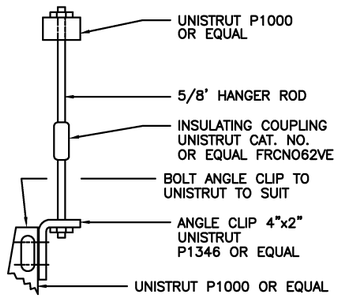


DETAIL 33

TYPICAL METHOD FOR SUPPORTING FIBERGLASS CABLE TRAYS (POSITIVE & NEGATIVE TRAYS ONLY) AND CABLE FOR VERTICAL DROPS GREATER THAN 9'–0"



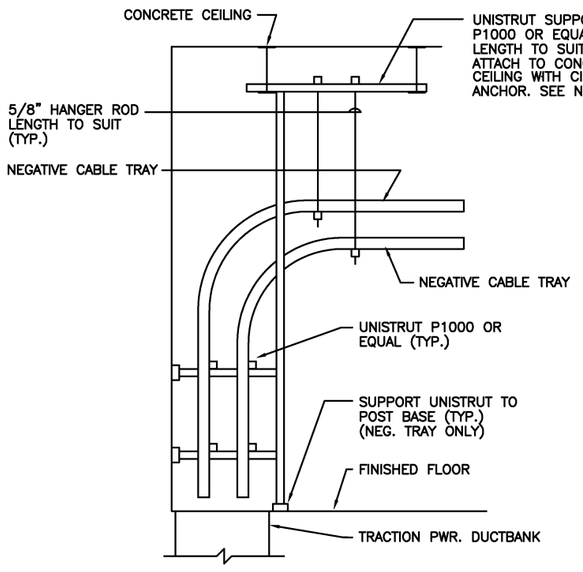
SECTION B–B
(DETAIL 33)



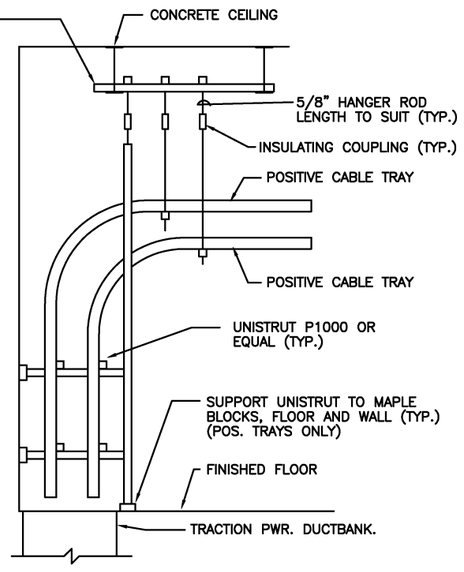
ENLARGED VIEW
HANGER SUPPORT

NOTES:

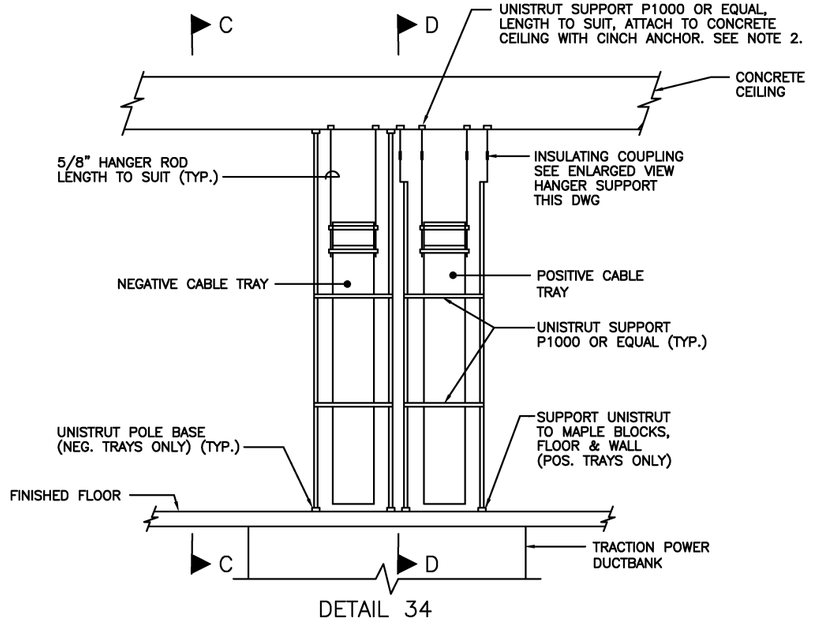
1. ALL CABLE TRAYS SHALL BE SUPPORTED AT ELBOWS AND TEES. HORIZONTAL RUNS OF CABLE TRAYS SHALL BE SUPPORTED AT NOT MORE THAN 10'–0" ON CENTERS FOR POSITIVE AND NEGATIVE CABLE TRAYS AND AT NOT MORE THAN 12'–0" ON CENTERS FOR OTHER CABLE TRAYS.
2. AT CONCRETE CEILING, USE CINCH ANCHOR TWO–UNIT WEDGE TYPE THREADED TO SUPPORT HANGER RODS.



SECTION C–C
(DETAIL 34)



SECTION D–D
(DETAIL 34)



DETAIL 34

TYPICAL TRANSITION OF TRACTION POWER POSITIVE AND NEGATIVE CABLES FROM CABLE TRAYS TO DUCTBANK

DESIGNED	W TINKHAM	2–01 DATE
DRAWN	R. THOMAS, JR.	2–01 DATE
CHECKED	D GLEN	2–01 DATE
APPROVED	R GANERIWAL	2–01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

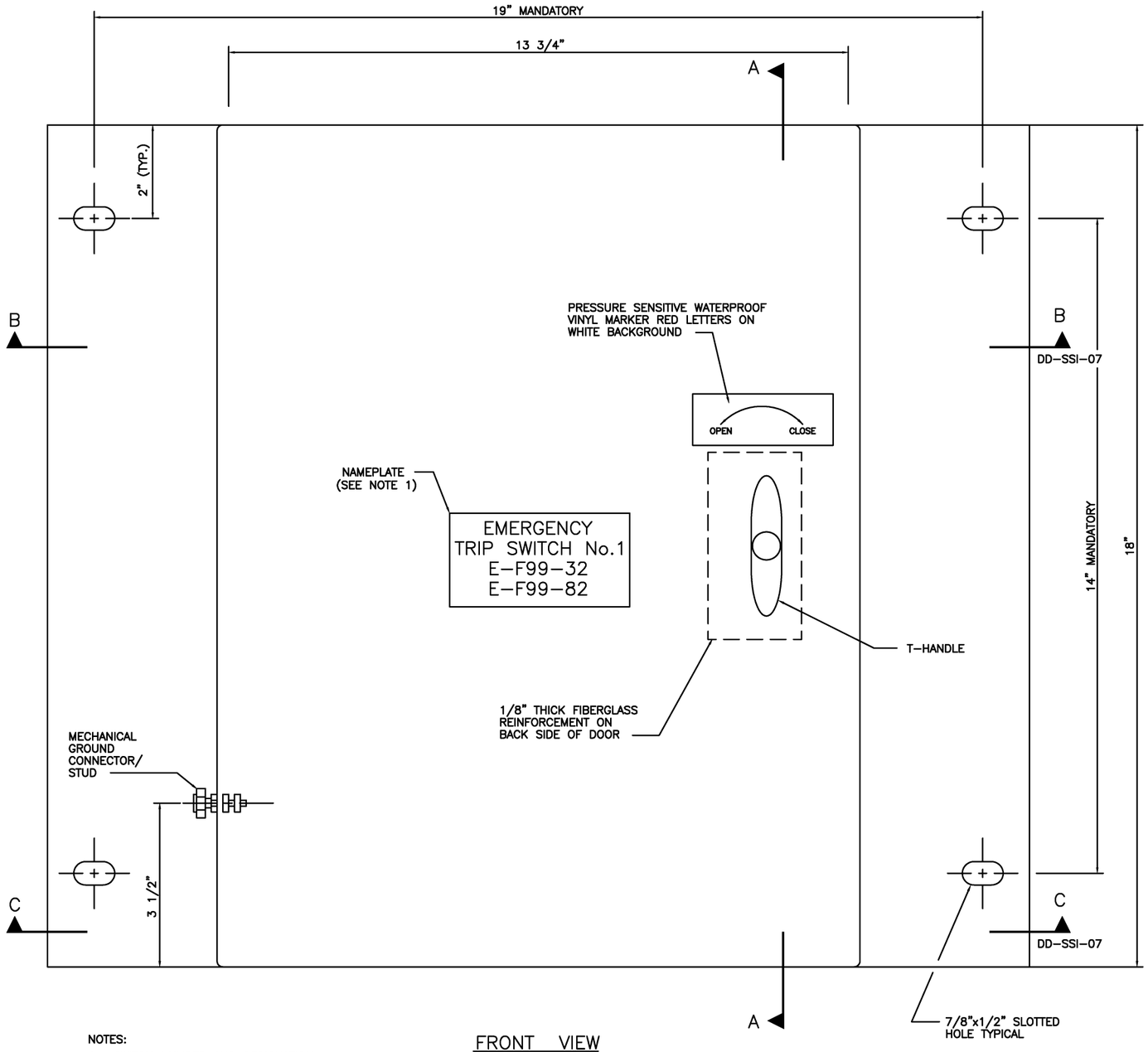
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

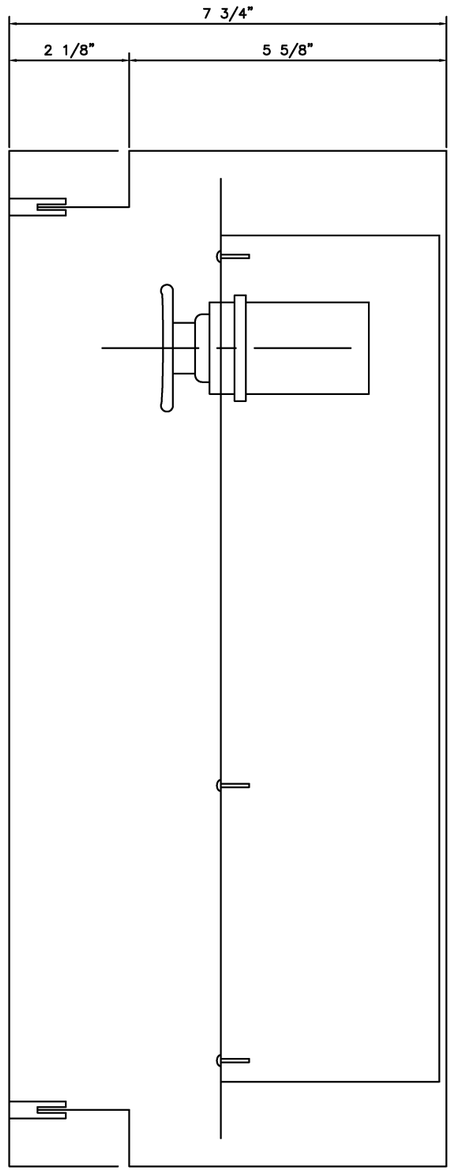
TRACTION POWER DESIGN DRAWING
TYPICAL
DETAILS – SHEET 5

SCALE: NOT TO SCALE

DRAWING NO. DRAWING NO.: DD–TP–SSI–005



FRONT VIEW



SECTION A–A

NOTES:

1. SWITCH NUMBER AND DESIGNATION TO BE COORDINATED WITH DESIGN.

DESIGNED	J. KROLIK	2-01 DATE
DRAWN	R. THOMAS, JR.	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

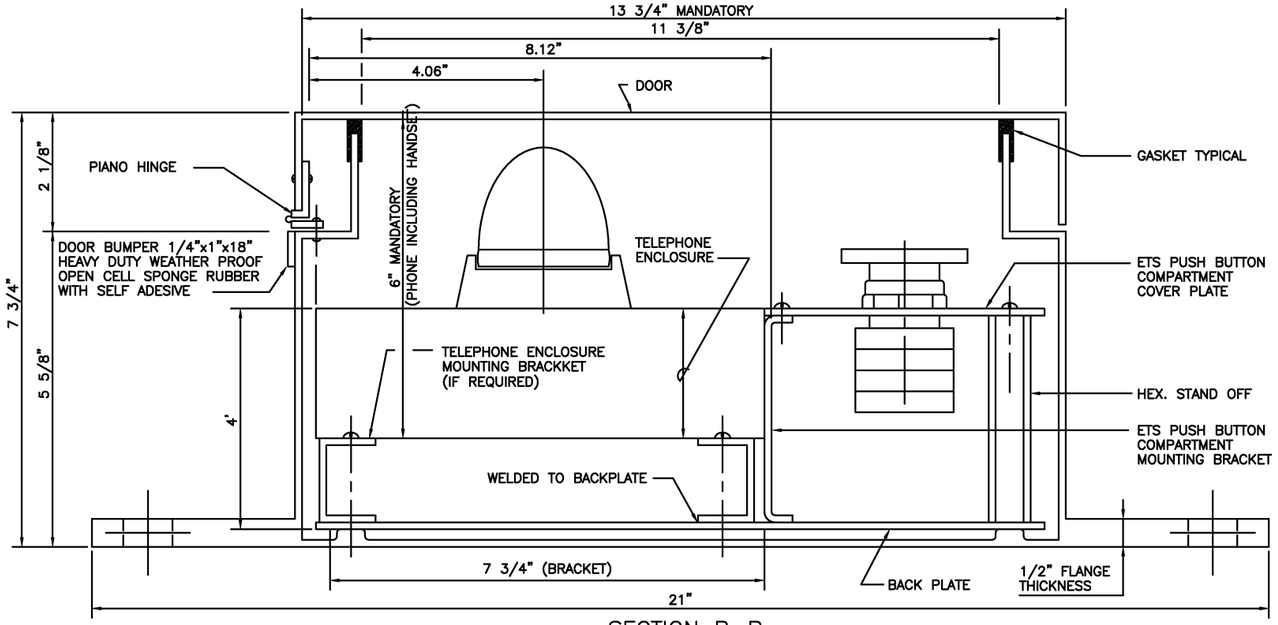
DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

SUBMITTED _____ DATE

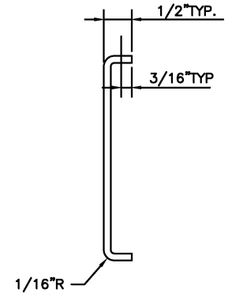
APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
EMERGENCY TRIP STATION
SHEET 1

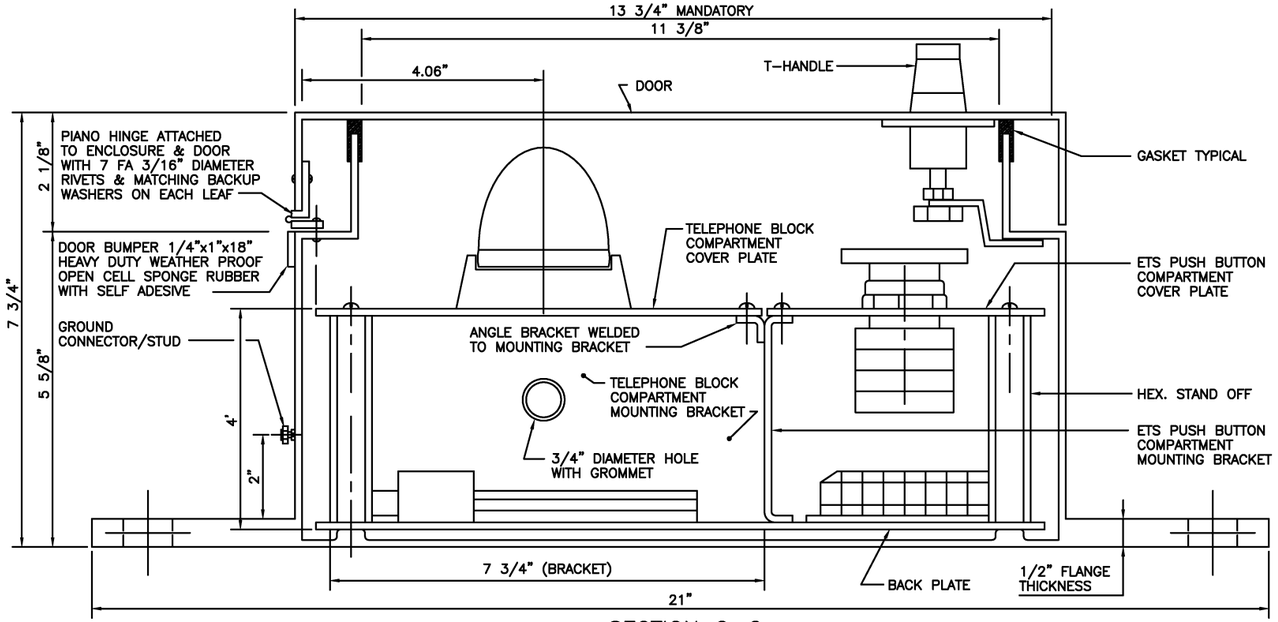
SCALE	DRAWING NO.
3/4"=1"	DD-TP-SSI-006



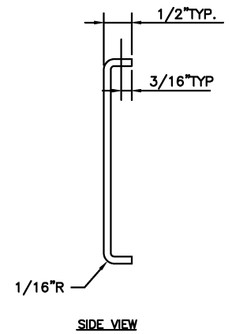
SECTION B–B



SIDE VIEW



SECTION C–C



SIDE VIEW

DESIGNED J. KROLIK 2-01 DATE
DRAWN R. THOMAS, JR. 2-01 DATE
CHECKED D. GLEN 2-01 DATE
APPROVED R. GANERIWAL 2-01 DATE

REFERENCE DRAWINGS

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DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

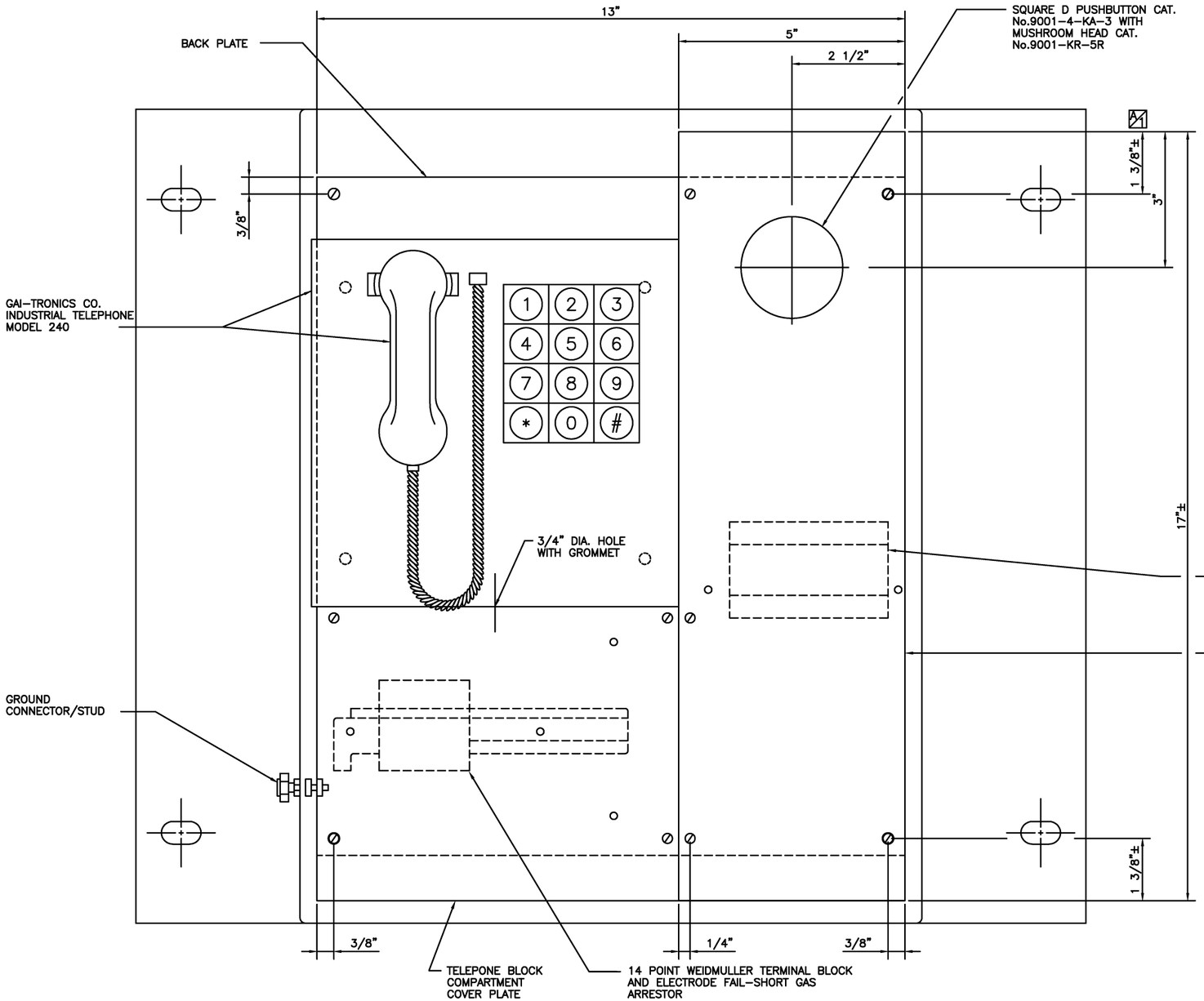
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
EMERGENCY TRIP STATION
SHEET 2

SCALE 3/4"=1"

DRAWING NO. DD–TP–SSI–007



SECTION D-D
(FRONT VIEW OF COVER PLATES AND TELEPHONE)

NOTE:
1. THE MAXIMUM DIMENSION FROM THE BACK OF THE ENCLOSURE TO THE EDGE OF THE DOOR OPENED 90 DEGREES SHALL NOT EXCEED 19 1/2".

DESIGNED J. KROLIK 2-01 DATE
DRAWN R. THOMAS, JR. 2-01 DATE
CHECKED D. GLEN 2-01 DATE
APPROVED R. GANERIWAL 2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

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DATE	BY	DESCRIPTION
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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

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OFFICE OF SYSTEMS

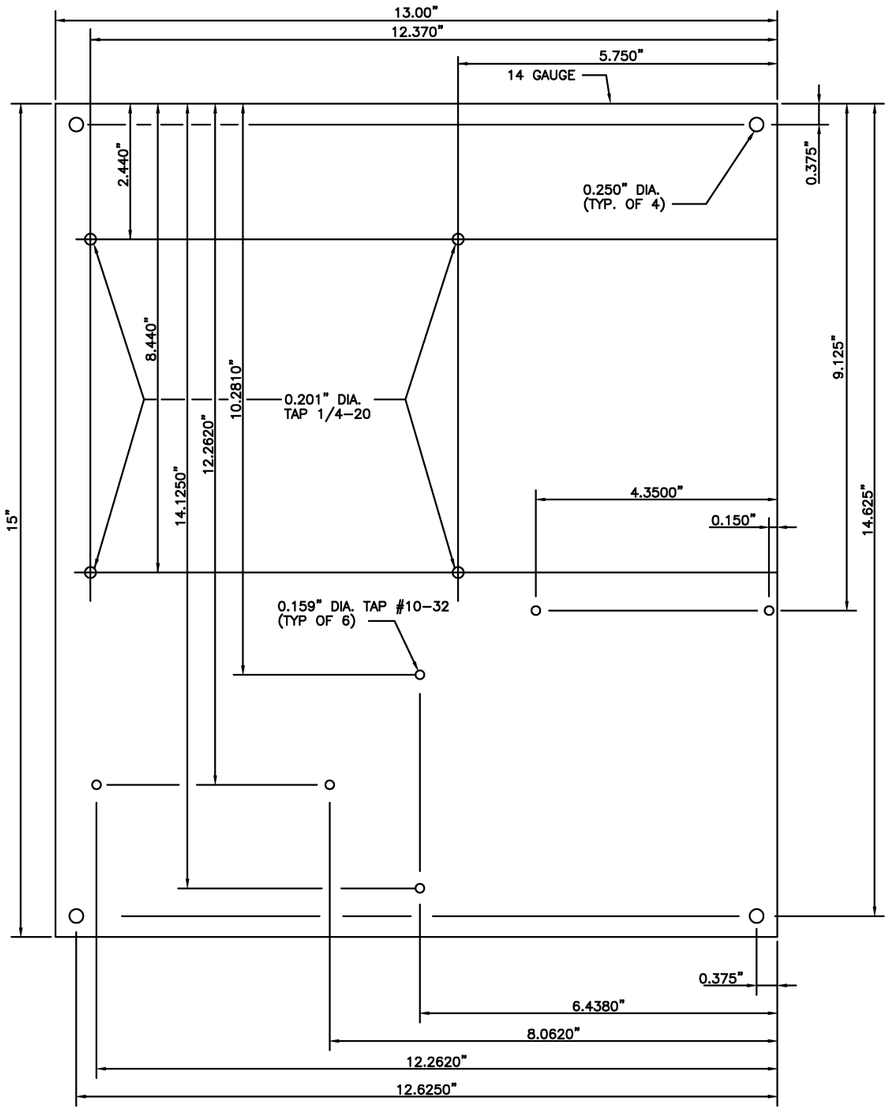
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

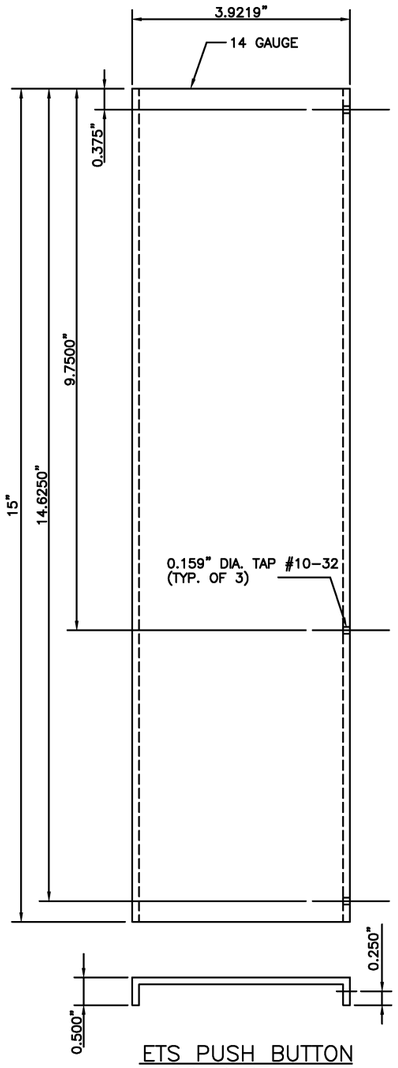
TRACTION POWER DESIGN DRAWING
EMERGENCY TRIP STATION
SHEET 3

SCALE 3/4"=1"

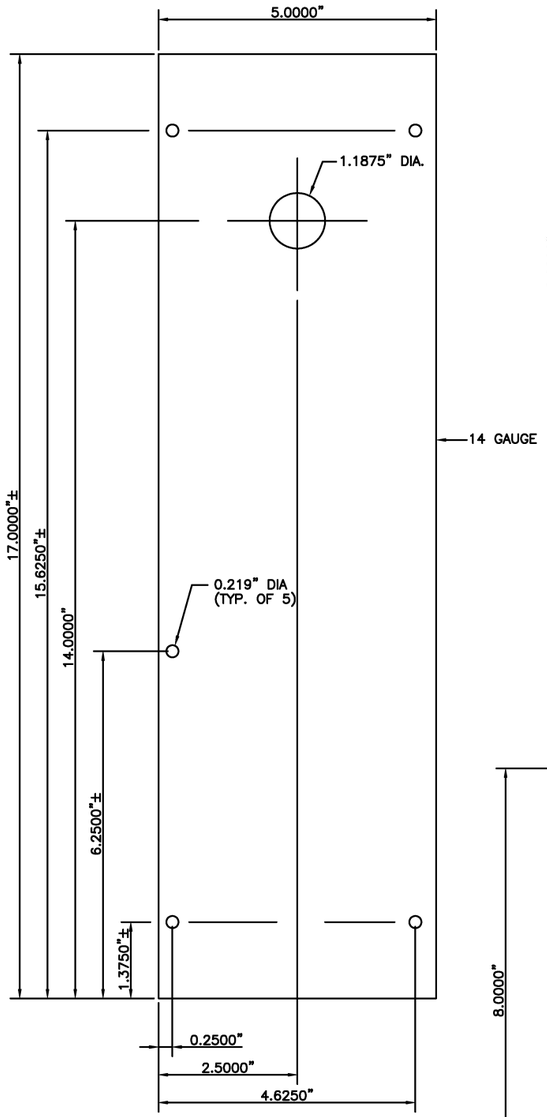
DRAWING NO. DD-TP-SSI-008



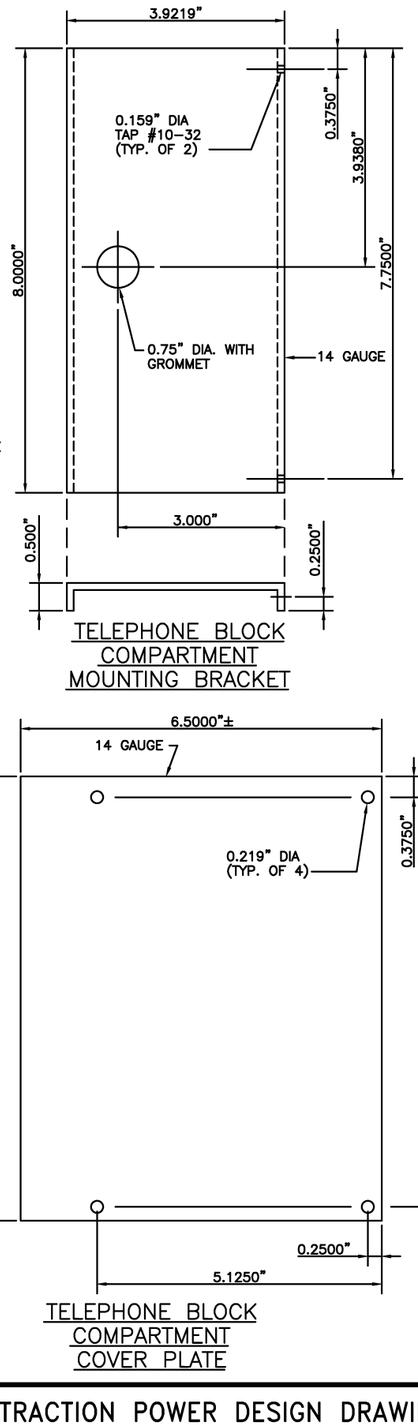
BACK PLATE



ETS PUSH BUTTON
COMPARTMENT
MOUNTING BRACKET



ETS PUSH BUTTON
COMPARTMENT
COVER PLATE



TELEPHONE BLOCK
COMPARTMENT
MOUNTING BRACKET

TELEPHONE BLOCK
COMPARTMENT
COVER PLATE

DESIGNED	J. KROLIK	2-01 DATE
DRAWN	R. THOMAS, JR.	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

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OFFICE OF SYSTEMS

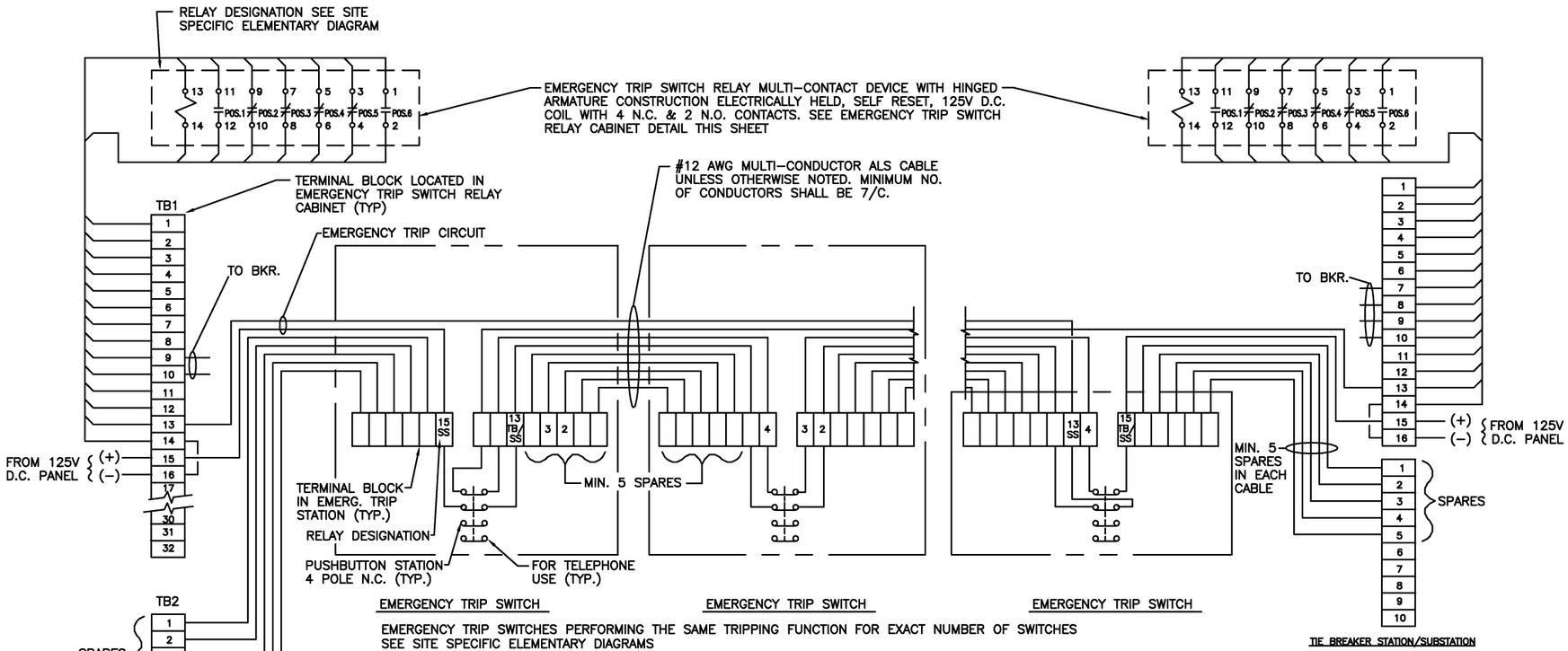
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

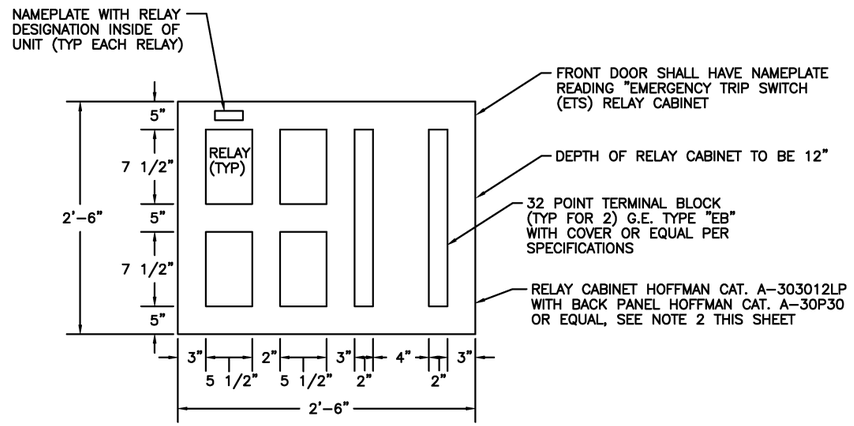
TRACTION POWER DESIGN DRAWING
EMERGENCY TRIP STATION
SHEET 4

SCALE 3/4"=1"

DRAWING NO. DD-TP-SSI-009



TYPICAL INTERCONNECTION DIAGRAM



EMERGENCY TRIP SWITCH RELAY CABINET DETAIL

NOTES:

1. EMERGENCY TRIP SWITCH RELAY SHALL BE SIMILAR TO G.E. "HFA" RELAY, FRONT CONNECTED CAT. NO.12HF51A42H CODE NO. 24 CONTACT ARRANGEMENT OR EQUAL.

2. EMERGENCY TRIP SWITCH RELAY CABINETS SHALL BE NEMA 12 CONSTRUCTION OF 14 GAUGE STEEL WITH REMOVABLE 12 GAUGE BACK PANEL MOUNTED ON COLLAR STUDS. DOOR SHALL HAVE BUTT HINGES AND FLUSH HANDLE LATCH. PROVIDE HOLES IN BACK OF THE ENCLOSURE FOR MOUNTING TO WALLS. FINISH SHALL BE GRAY PRIME INSIDE AND OUT OVER PHOSPHATIZED SURFACES. PANEL TO BE WHITE ENAMEL SIMILAR TO HOFFMAN CAT. NO. 303012LP OR APPROVED EQUAL.

DESIGNED	PK. ROY	2-01 DATE
DRAWN	L. POWELL	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

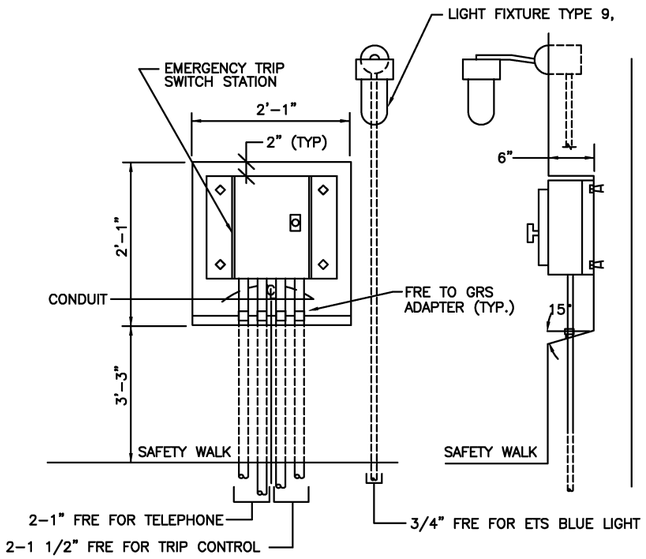
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

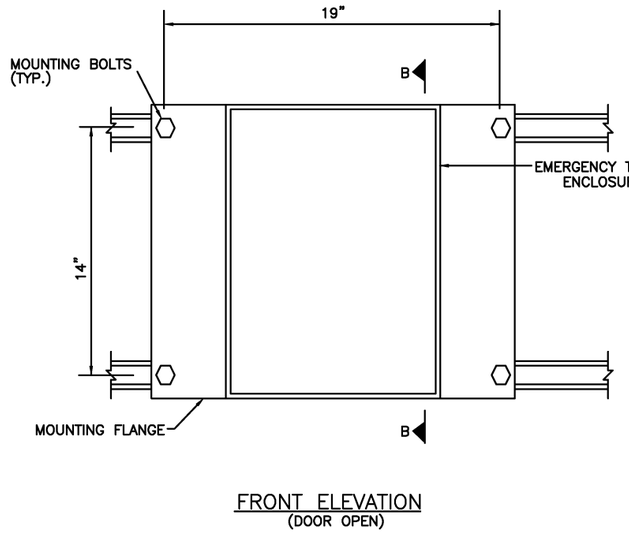
TRACTION POWER DESIGN DRAWING
EMERGENCY TRIP SWITCH DETAILS – SHEET 1

SCALE: NONE

DRAWING NO.: DD-TP-SSI-010

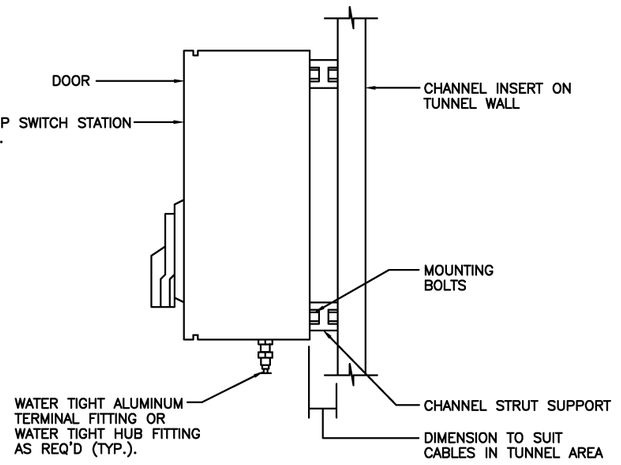


RECESS FOR EMERGENCY TRIP STATION
AT END OF STATION PLATFORM

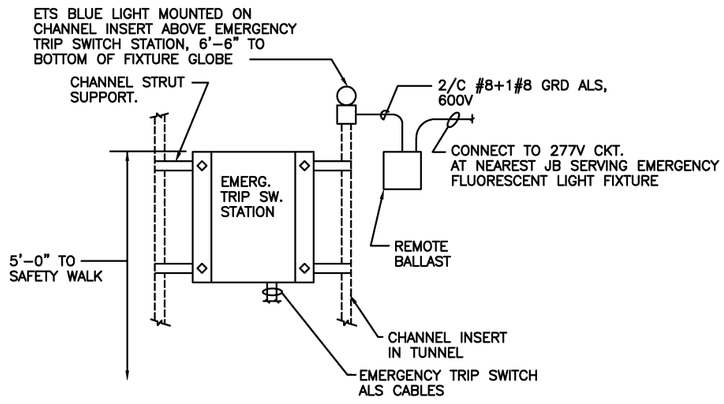


FRONT ELEVATION
(DOOR OPEN)

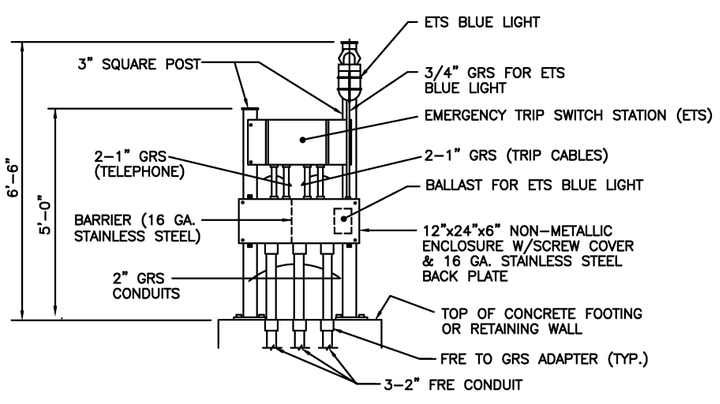
SURFACE MOUNTED
EMERGENCY TRIP STATION



SECTION B-B



TUNNEL WALL MOUNTED
EMERGENCY TRIP STATION



POST MOUNTED
EMERGENCY TRIP STATION

DESIGNED	J. KROLIK	2-01 DATE
DRAWN	L. POWELL	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

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WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

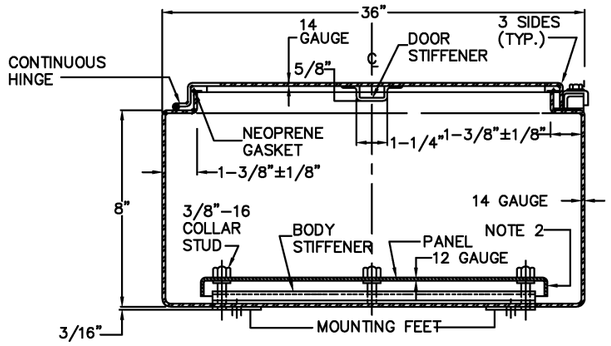
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

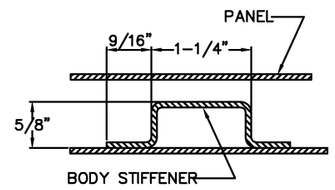
TRACTION POWER DESIGN DRAWING
EMERGENCY TRIP SWITCH DETAILS – SHEET 2

SCALE: NONE

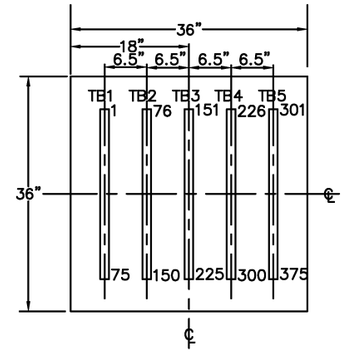
DRAWING NO.: DD-TP-SSI-011



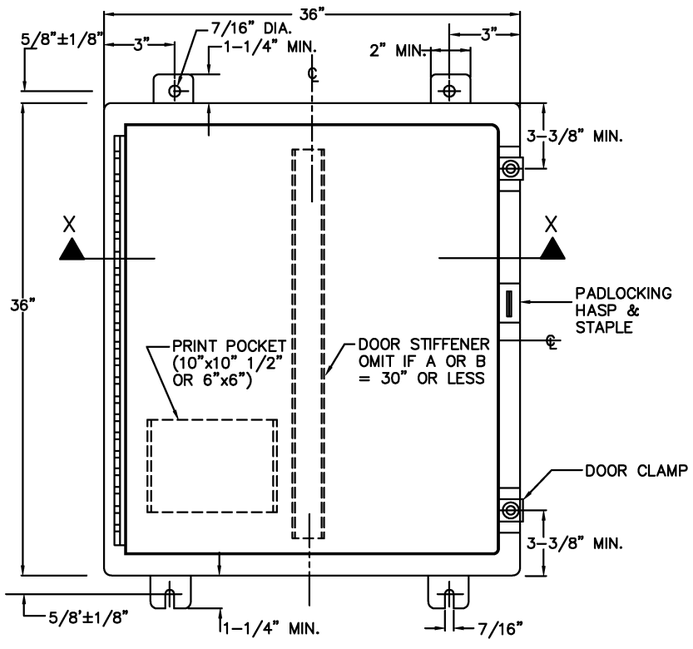
SECTION X–X



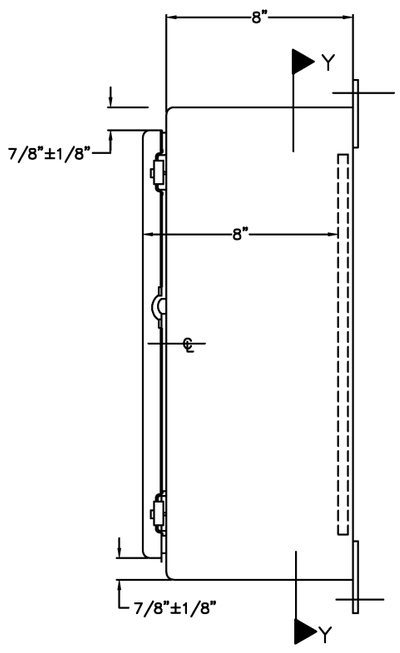
SECTION Z–Z



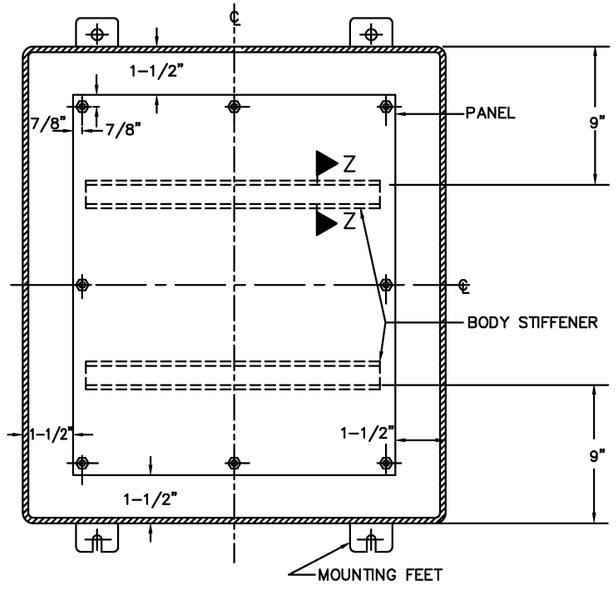
TRACTION POWER SUBSTATION
RC&M CABINET
TERMINAL BLOCK ARRANGEMENT



FRONT VIEW



SIDE VIEW



SECTION Y–Y

RC&M CABINET
SINGLE–DOOR ENCLOSURE

NOTES:

1. FOR ENCLOSURE TYPE, MATERIAL, FINISH AND OTHER GENERAL REQUIREMENTS, REFER TO SPECIFICATIONS.
2. PANELS ARE FLANGED ON ALL FOUR SIDES.

DESIGNED J. KROLIK 2–01 DATE
DRAWN R. THOMAS, JR. 2–01 DATE
CHECKED D. GLEN 2–01 DATE
APPROVED R. GANERIWAL 2–01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority
11–98	JK	NEW DRAWING

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

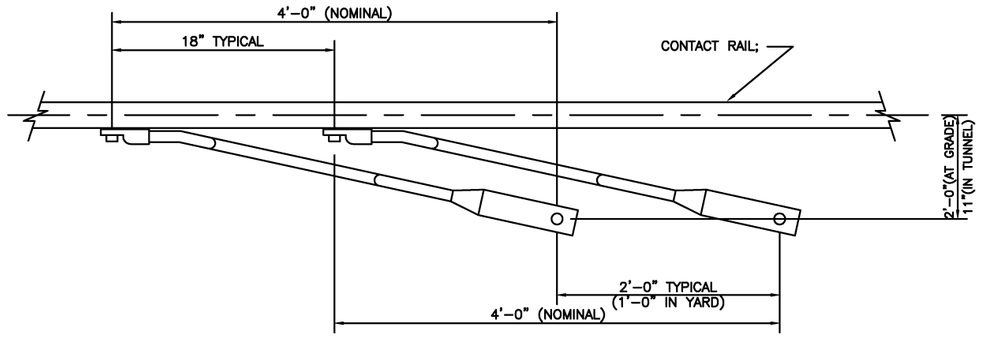
SUBMITTED DATE

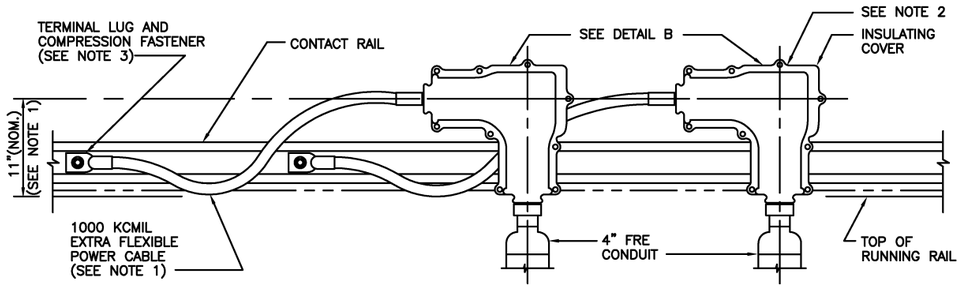
APPROVED DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
REMOTE CONTROL & MONITORING (RC&M)
CABINET DETAILS & TERMINAL BLOCK ARRANGEMENT

SCALE NONE

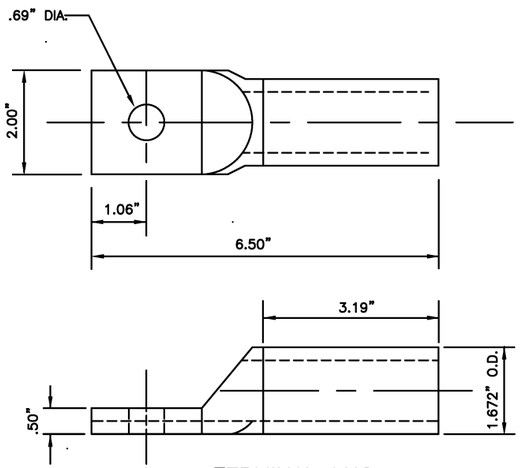
DRAWING NO. DD–TP–SSI–012





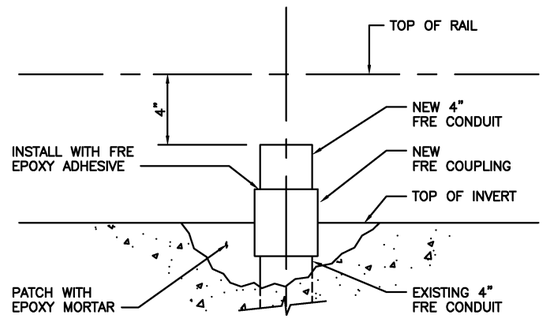
DETAIL "A"

TYPICAL CONNECTION FOR COMPOSITE CONTACT RAIL



TERMINAL LUG

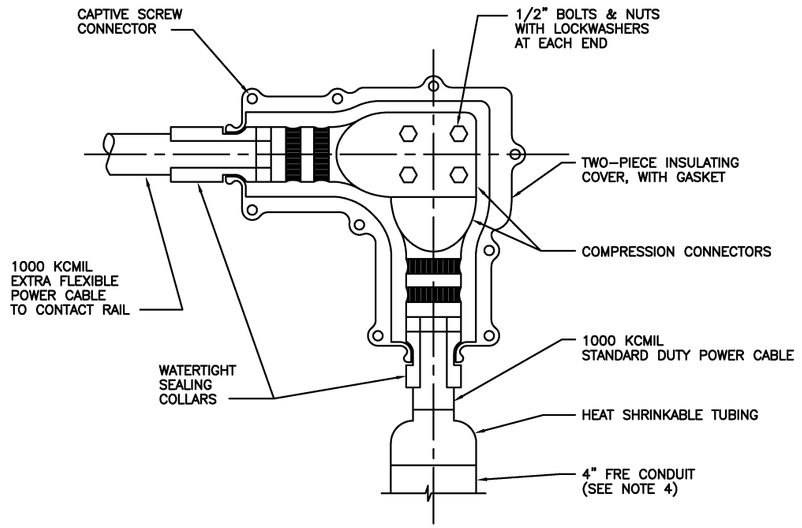
N.T.S.



METHOD FOR REPAIRING
BROKEN TRACTION POWER CONDUIT

NOTES:

1. CONTRACTOR SHALL INSTALL CABLES TO ALLOW FOR EXPANSION AND CONTRACTION OF CONTACT RAIL, AVOID INTERFERENCE WITH THE COVERBOARD AND AVOID CONTACT WITH THE CONTRETE INVERT OR BALLAST.
2. TOP OF INSTALLED CABLE CONNECTOR ASSEMBLY SHALL NOT EXTEND ABOVE TOP OF COVERBOARD.
3. INSTALL TERMINAL LUGS TO CONTACT RAIL USING 5/8" DIA. COMPRESSION FASTENERS, HUCK MFG. CO. OR EQUAL. CONTRACTOR MAY USE EXISTING COMPRESSION FASTENER HOLES IN CONTACT RAIL SPACED 18" ON CENTER AFTER REMOVAL OF EXISTING COMPRESSION FASTENER.
4. INSTALL A BLANK CONDUIT SEALING BUSHING, OZ GEDNEY TYPE CSBE-400P-0 OR EQUAL, IN EACH UNUSED 4" TRACTION POWER CONDUIT FROM SUBSTATION OR TIE BREAKER STATION. WHERE TRACTION POWER CONDUITS ARE CUT FLUSH WITH THE CONCRETE INVERT, INSTALL CONDUIT SEALING BUSHING OZ GEDNEY TYPE CSBE-400P-1 OR EQUAL.



DETAIL "B"

CABLE CONNECTOR ASSEMBLY

DESIGNED	W. TINKHAM	2-01 DATE
DRAWN	L. POWELL	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

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OFFICE OF SYSTEMS

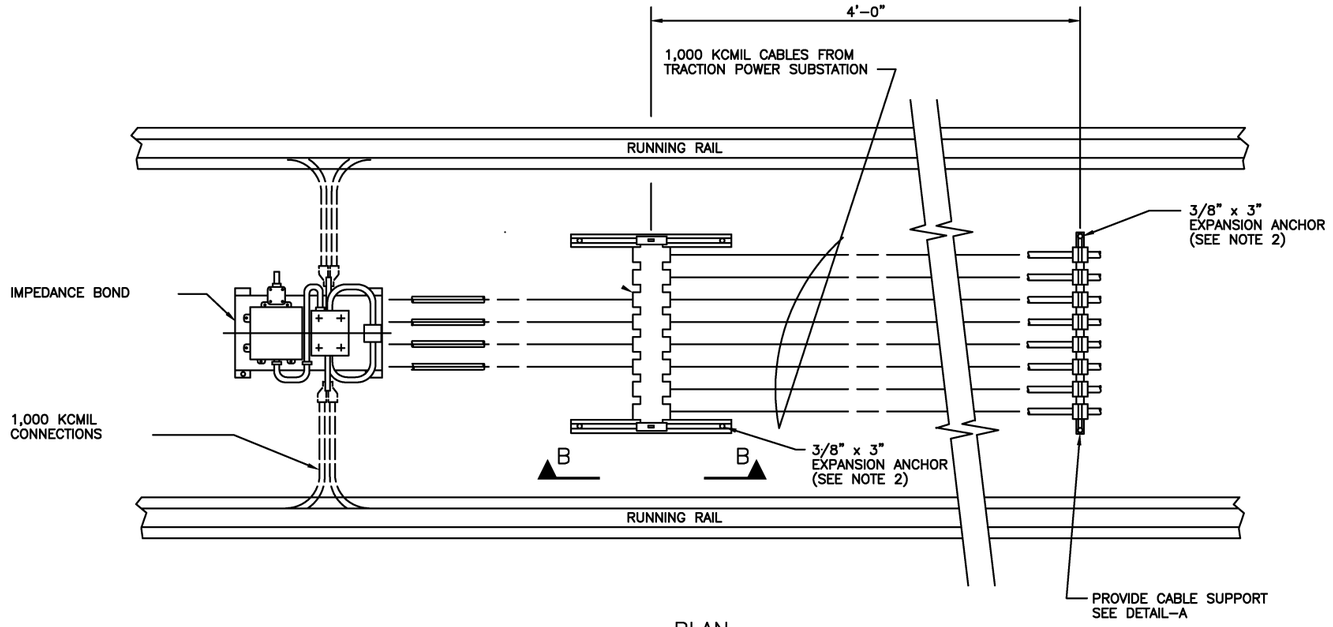
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
CONTACT RAIL
TYPICAL CABLE CONNECTION DETAILS

SCALE: NONE

DRAWING NO.: DD-TP-SSI-013

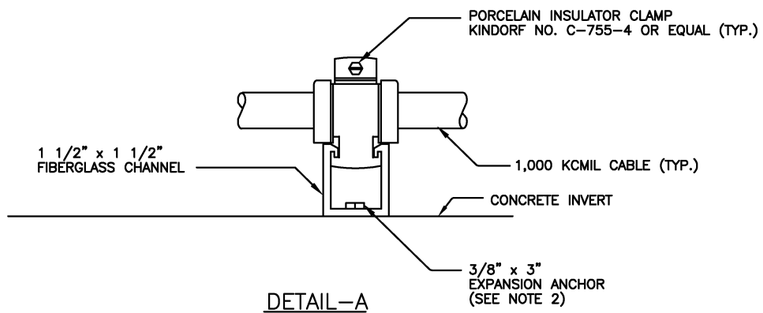


PLAN

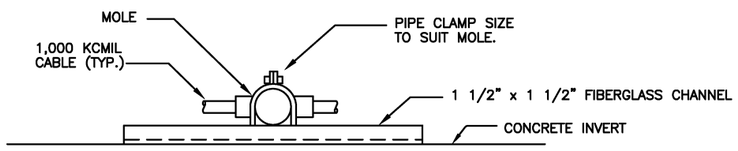
NEGATIVE RETURN CABLES AT IMPEDANCE BONDS

NOTES:

1. MOLES SHALL BE RATED 3,000A, 600V MAC PRODUCTS CATALOG NUMBER ME-300-16B OR EQUAL.
3. ATTACH CABLE SUPPORT CHANNELS TO CONCRETE INVERT IN TUNNELS USING 3/8" x 3" STAINLESS STEEL-316 EXPANSION ANCHORS.



DETAIL-A



SECTION B-B

DESIGNED	W. TINKHAM	2-01 DATE
DRAWN	L. POWELL	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

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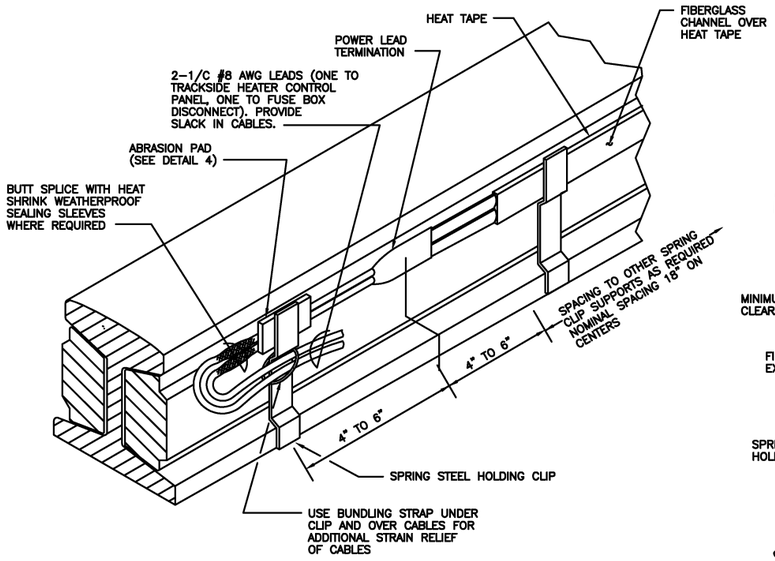
APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
NEGATIVE RETURN CABLE CONNECTIONS AT IMPEDANCE BONDS - SHEET 1

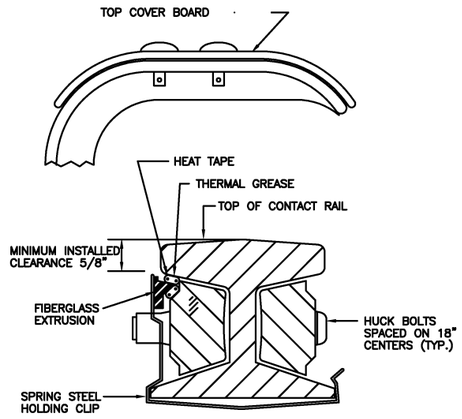
SCALE: NONE

DRAWING NO.: DD-TP-SSI-014



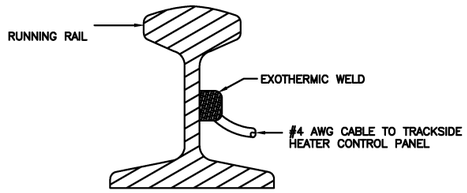
DETAIL 1

SECTION OF COMPOSITE CONTACT RAIL
SHOWING HEAT TAPE POWER LEAD TERMINATION



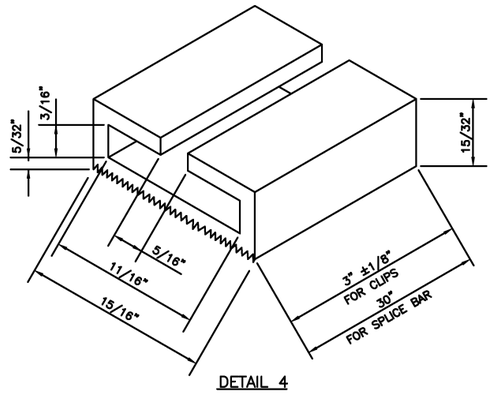
DETAIL 2

COMPOSITE RAIL
SHOWING HEAT TAPE INSTALLATION
(SEE DETAIL 5)



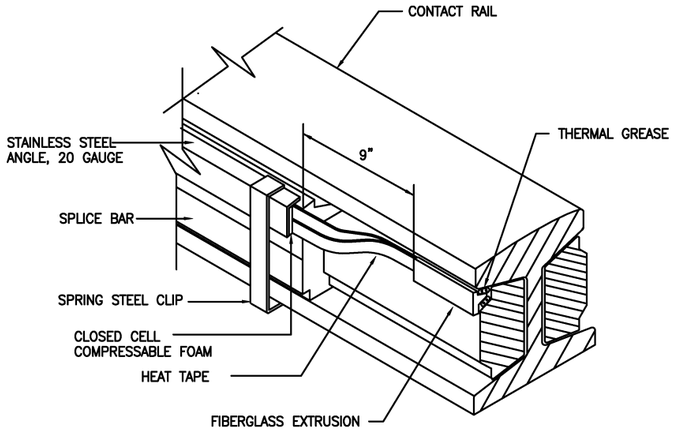
DETAIL 3

CABLE CONNECTION
TO STEEL RUNNING RAIL



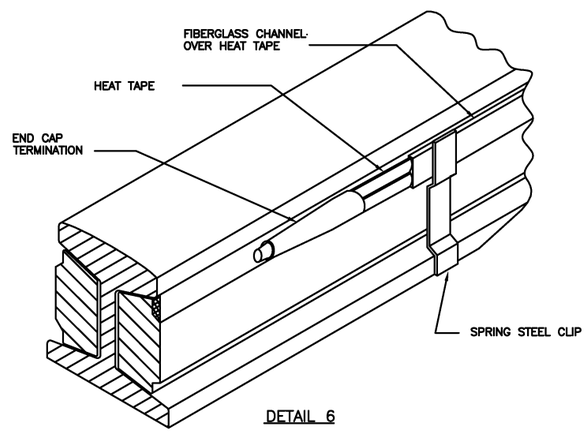
DETAIL 4

ABRASION PAD



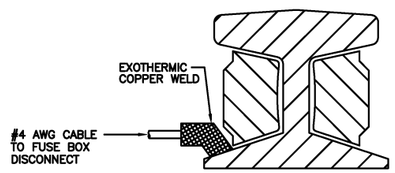
DETAIL 5

HEAT TAPE INSTALLATION ON
COMPOSITE CONTACT RAIL SPLICE BARS



DETAIL 6

SECTION OF COMPOSITE CONTACT RAIL
SHOWING HEAT TAPE END TERMINATION



DETAIL 7

CABLE CONNECTION TO
COMPOSITE CONTACT RAIL

DESIGNED	D. VANCOTT	2-01 DATE
DRAWN	L. POWELL	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

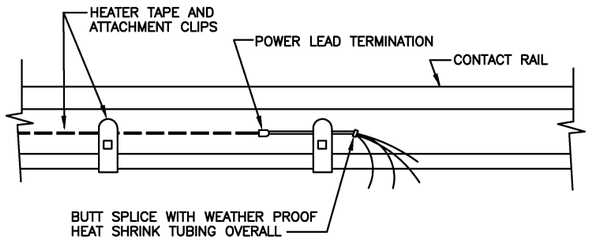
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
CONTACT RAIL HEATING
TYPICAL DETAILS-SHEET 1

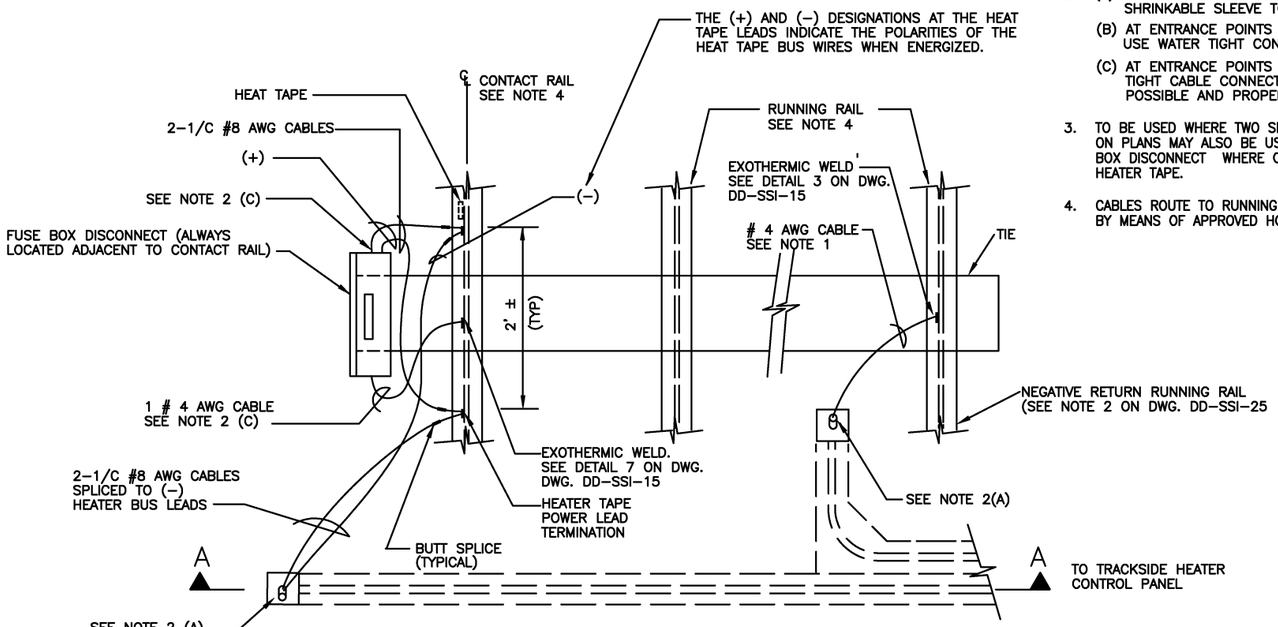
SCALE: NOT TO SCALE

DRAWING NO.: DD-TP-SSI-015



DOUBLE LEADS SPLICED TO HEAT TAPE TERMINAL LEADS (SEE NOTE 3)

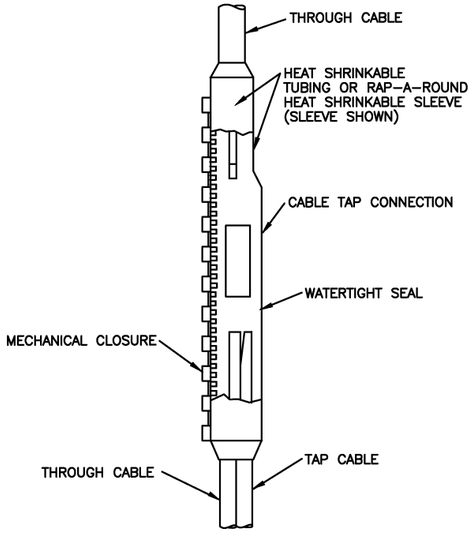
DETAIL–A



WIRING PLAN

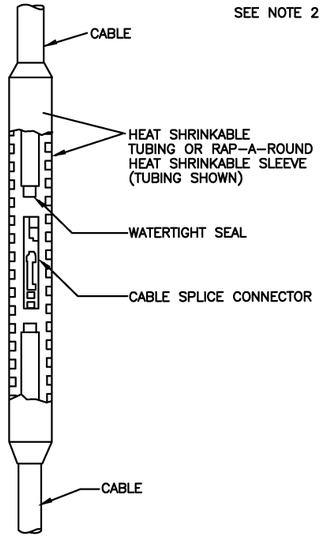
NOTES:

1. CONNECT THE HEATER NEGATIVE CABLE TO THE NEGATIVE RETURN RUNNING RAIL AS CLOSE AS PRACTICAL TO THE CONTROL PANEL.
2. (A) AT ALL TRACKSIDE FRE CONDUIT TERMINATION, USE HEAT SHRINKABLE SLEEVE TO SEAL CABLE AND CONDUIT.
   (B) AT ENTRANCE POINTS TO TRACKSIDE HEATER CONTROL PANELS, USE WATER TIGHT CONDUIT CONNECTORS.
   (C) AT ENTRANCE POINTS TO FUSE BOX DISCONNECTS, USE WATER TIGHT CABLE CONNECTORS CABLE LEADS TO BE KEPT AS SHORT AS POSSIBLE AND PROPERLY SECURED.
3. TO BE USED WHERE TWO SETS OF JUMPER LEADS ARE REQUIRED AS SHOWN ON PLANS MAY ALSO BE USED NEAR A TRACKSIDE CONTROLLER AND FUSE BOX DISCONNECT WHERE ONE SET JUMPER LEADS IS TAPPED TO A SECOND HEATER TAPE.
4. CABLES ROUTE TO RUNNING RAIL AND CONTACT RAIL SHALL BE PROTECTED BY MEANS OF APPROVED HOSE OR LIQUID TIGHT.



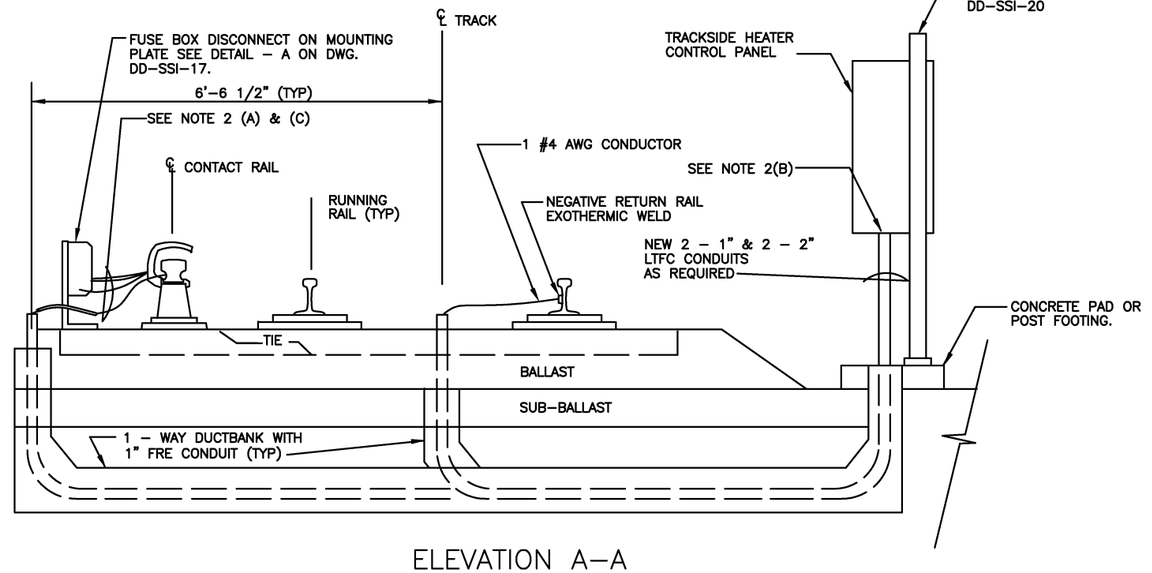
WATERTIGHT CABLE TAP

DETAIL–1



WATERTIGHT CABLE SPLICE

DETAIL–2



ELEVATION A–A

DESIGNED	D.VANCOTT	2–01 DATE
DRAWN	L. POWELL	2–01 DATE
CHECKED	D. GLEN	2–01 DATE
APPROVED	R. GANERIWAL	2–01 DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

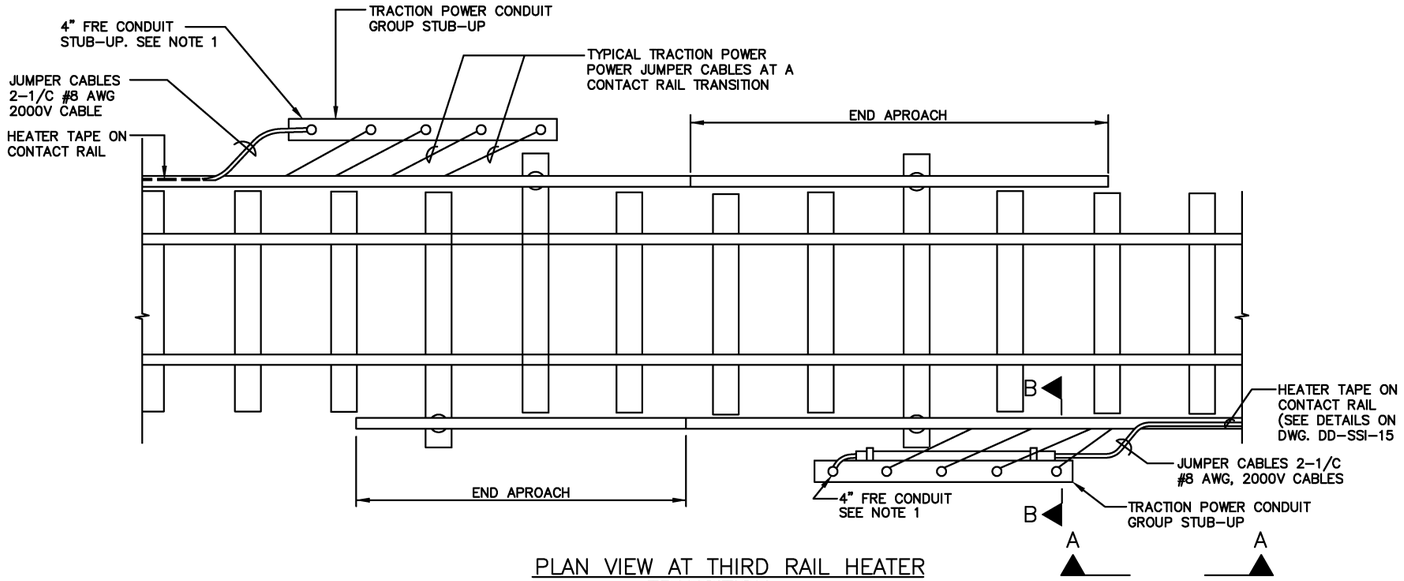
SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

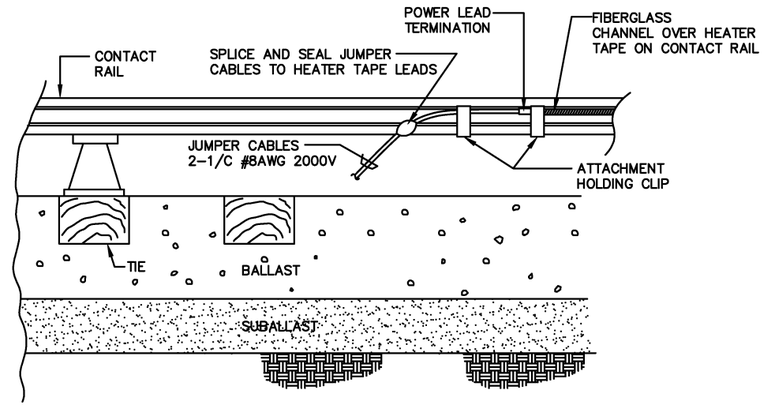
TRACTION POWER DESIGN DRAWING
CONTACT RAIL HEATING
TYPICAL DETAILS – SHEET 2

SCALE: NONE

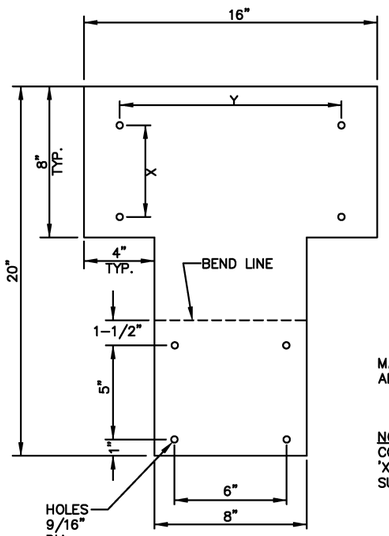
DRAWING NO.: DD–TP–SSI–016

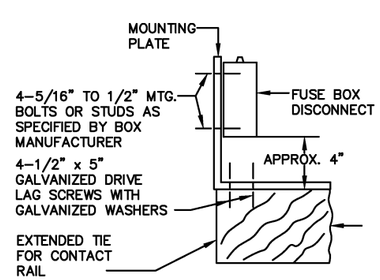


PLAN VIEW AT THIRD RAIL HEATER TRANSITION



SECTION A-A





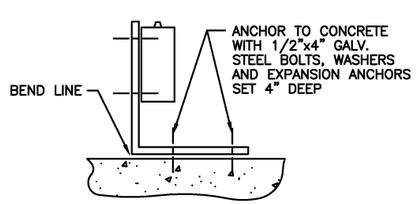
INSTALLATION TO TIE

MATERIAL 1/4" STEEL-HOT DIPPED GALVANIZED AFTER FABRICATION AND BENDING.

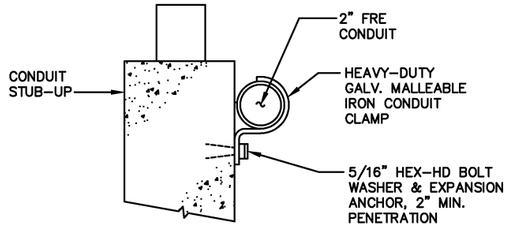
NOTE:
COORDINATE DRILLED HOLE DIMENSIONS 'X' & 'Y' WITH THE FUSE BOX DISCONNECT SUPPLIER FOR MOUNTING OF FUSE BOX.

DETAIL A

FUSE BOX DISCONNECT MOUNTING PLATE & TYPICAL MOUNTING



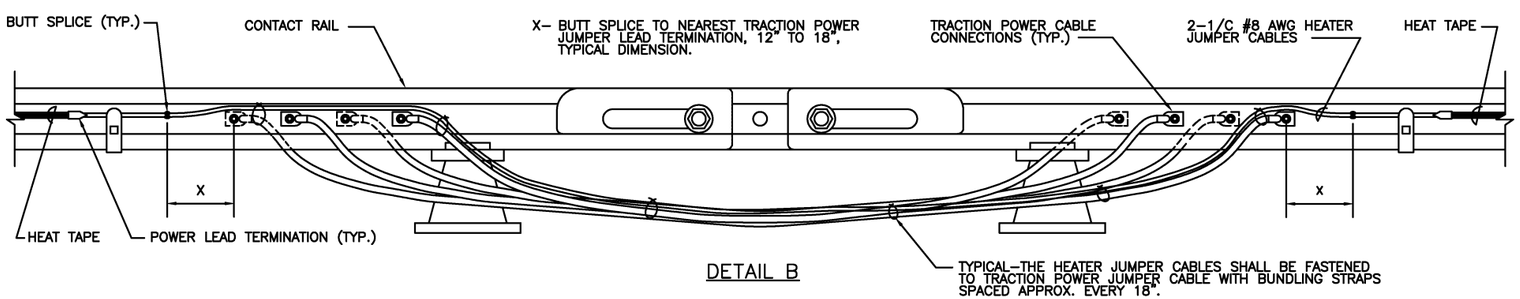
INSTALLATION TO CONCRETE INVERT



SECTION B-B

NOTE:

1. AT ALL TRACKSIDE FRE CONDUIT TERMINATIONS USE HEAT SHRINKABLE SLEEVE TO SEAL CABLE AND CONDUIT.



DETAIL B

HEATER JUMPER LEAD ROUTING AT CONTACT RAIL EXPANSION JOINTS

DESIGNED	D. VANCOTT	2-01 DATE
DRAWN	L. POWELL	2-01 DATE
CHECKED	D. GLEN	2-01 DATE
APPROVED	R. GANERIWAL	2-01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

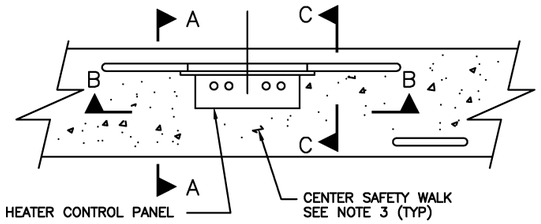
SUBMITTED _____ DATE

APPROVED DIRECTOR _____ May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
CONTACT RAIL HEATING
TYPICAL DETAILS - SHEET 3

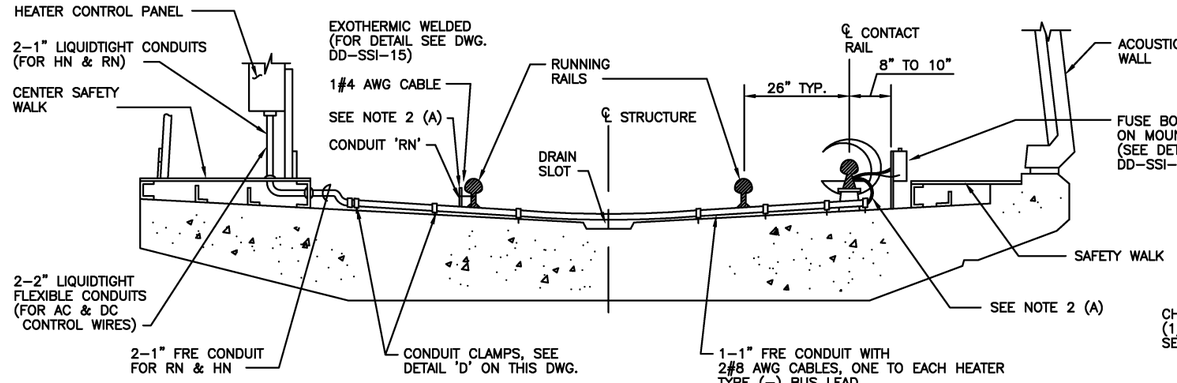
SCALE: NONE

DRAWING NO.: DD-TP-SSI-017

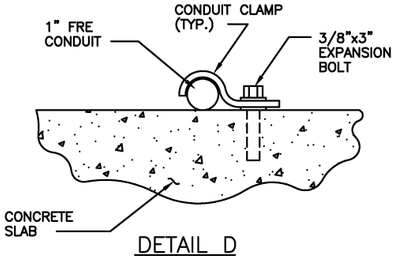


PLAN

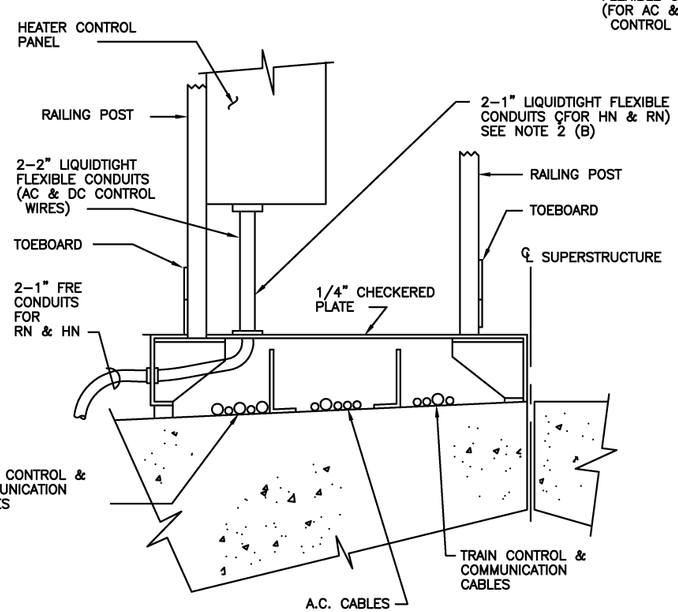
TYPICAL INSTALLATION OF TRACKSIDE HEATER CONTROL PANEL AT CENTER SAFETY WALK –ELEVATED STRUCTURE



SECTION C–C

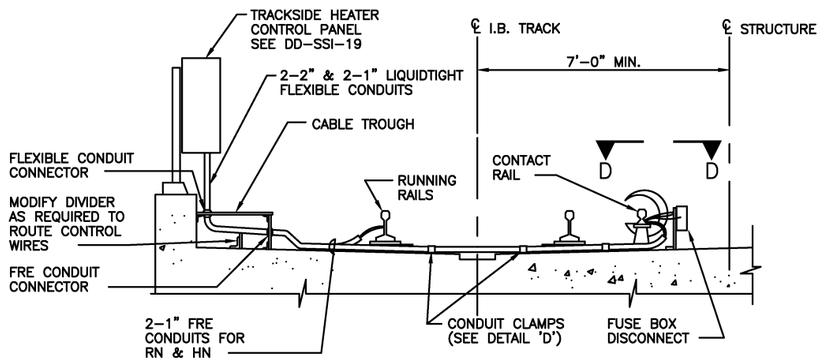


DETAIL D

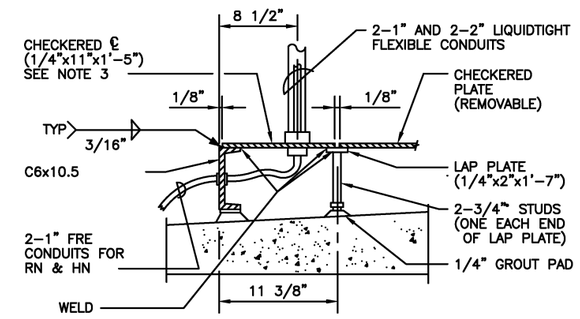


SECTION A–A

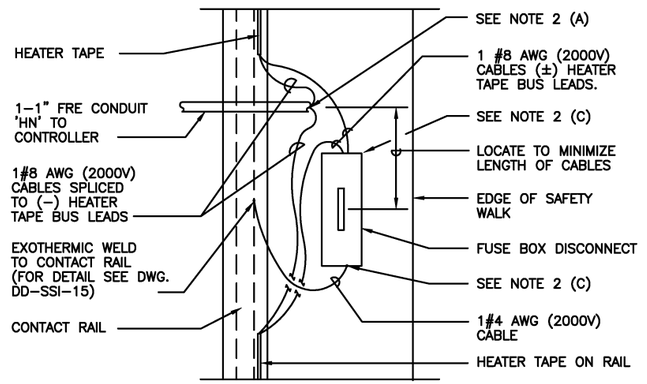
CENTER SAFETY WALK DETAIL



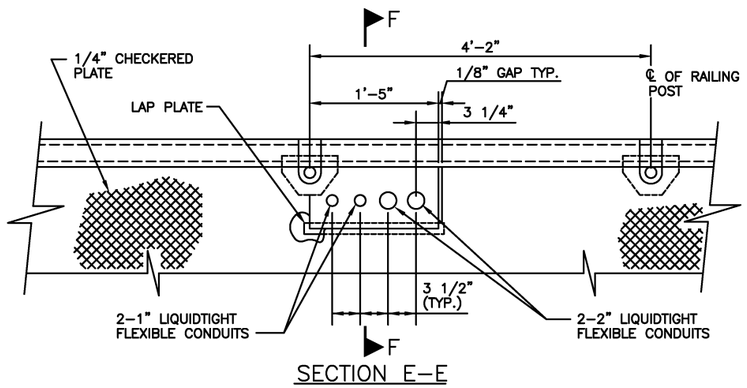
SECTION OF TYPICAL INSTALLATION OF TRACKSIDE HEATER CONTROLLER AT SIDE SAFETY WALK



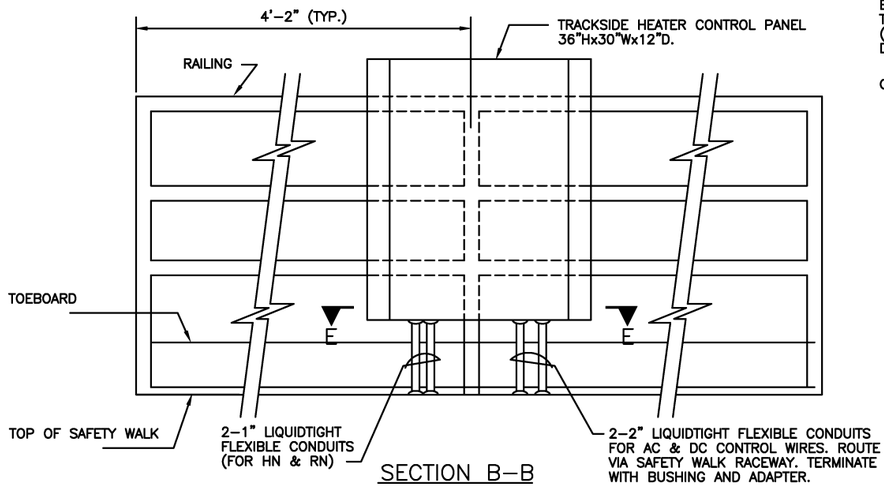
SECTION F–F



SECTION D–D



SECTION E–E



SECTION B–B

NOTES:

1. HEATER CONTROL PANEL LOCATIONS SHALL BE CENTERED ON 8'–4' LONG RAILING SECTIONS. LOCATION OF HEATER CONTROL PANEL SHALL BE ADJUSTED TO SUIT ACTUAL RAILING LOCATIONS.
2. (A) AT ALL TRACKSIDE FRE CONDUIT TERMINATIONS, USE HEAT SHRINKABLE SLEEVE TO SEAL CABLE AND CONDUIT.
   (B) AT ENTRANCE POINTS TO TRACTSIDE HEATER CONTROL PANELS, USE WATERTIGHT CONDUIT CONNECTORS.
   (C) AT ENTRANCE POINTS TO FUSE BOX DISCONNECTS, USE WATERTIGHT CABLE CONNECTORS. CABLE LEADS TO BE KEPT AS SHORT AS POSSIBLE AND PROPERLY SECURED.

DESIGNED	D. VANCOTT	2–01 DATE
DRAWN	L. POWELL	2–01 DATE
CHECKED	D. GLEN	2–01 DATE
APPROVED	R. GANERIWAL	2–01 DATE

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION
08/2001	SYSP	Revised and issued by the Authority

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT SYSTEM DEVELOPMENT
OFFICE OF SYSTEMS

SUBMITTED _____ DATE

APPROVED _____ DIRECTOR May 3, 2001 DATE

TRACTION POWER DESIGN DRAWING
CONTRACT RAIL HEATING
TYPICAL DETAILS–SHEET 4

SCALE	DRAWING NO.
NOT TO SCALE	DD–TP–SSI–018