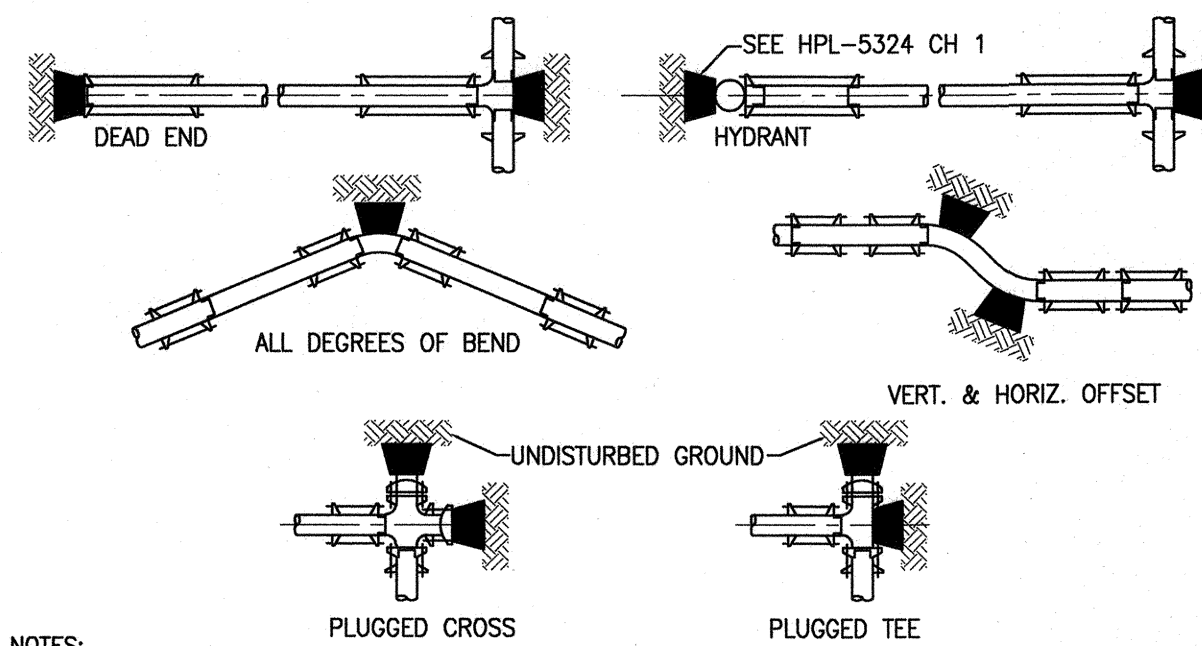
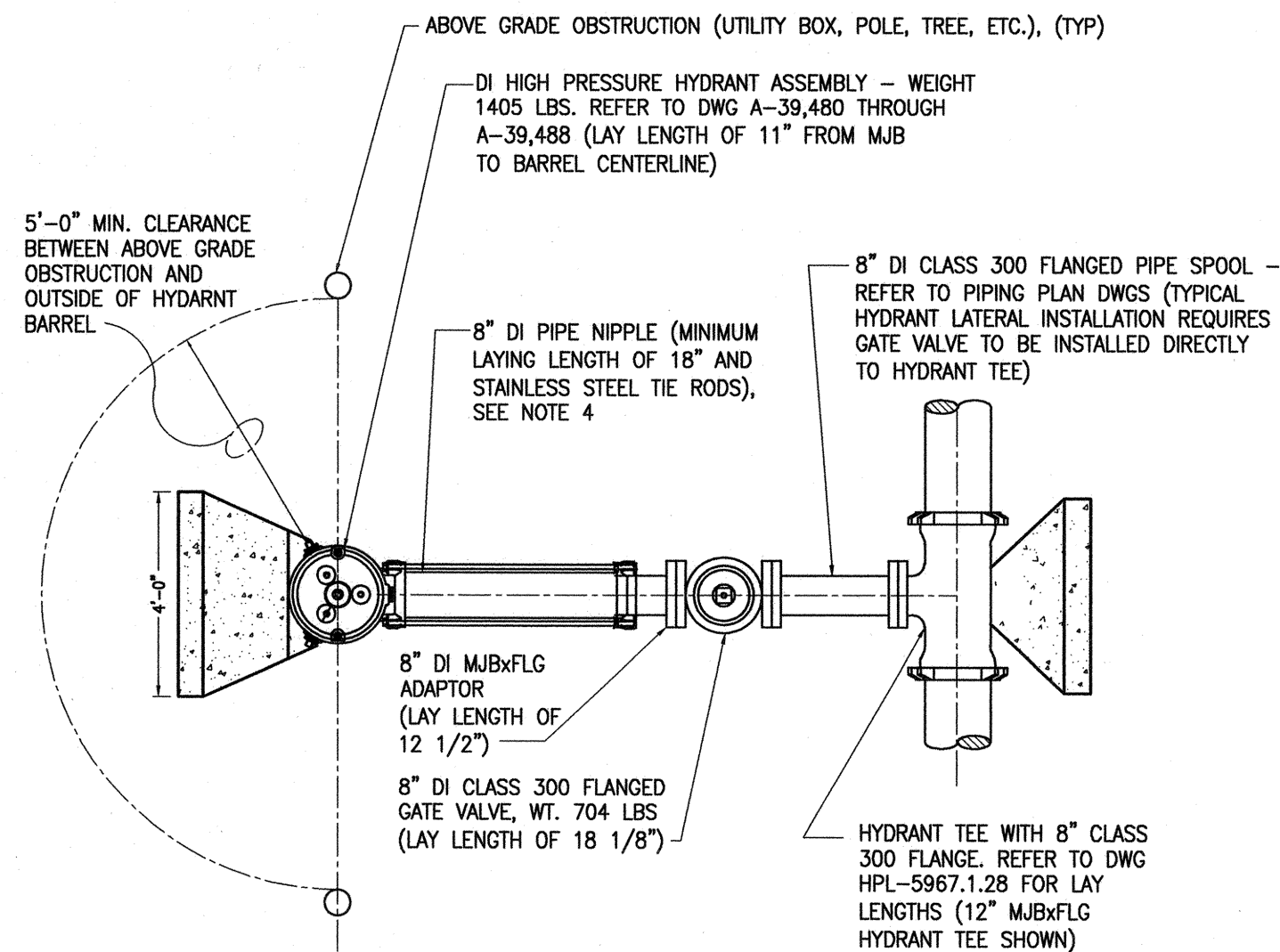
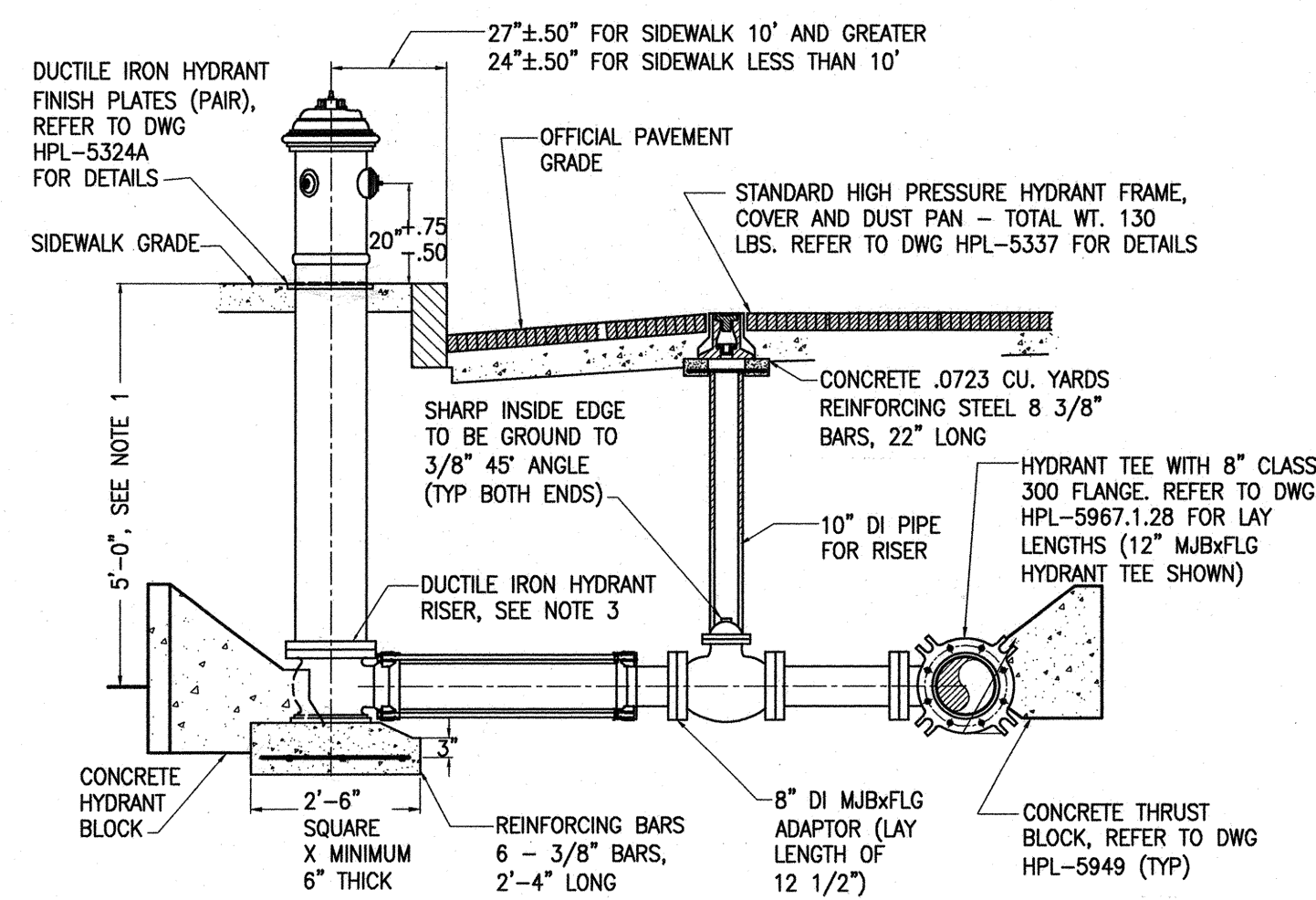


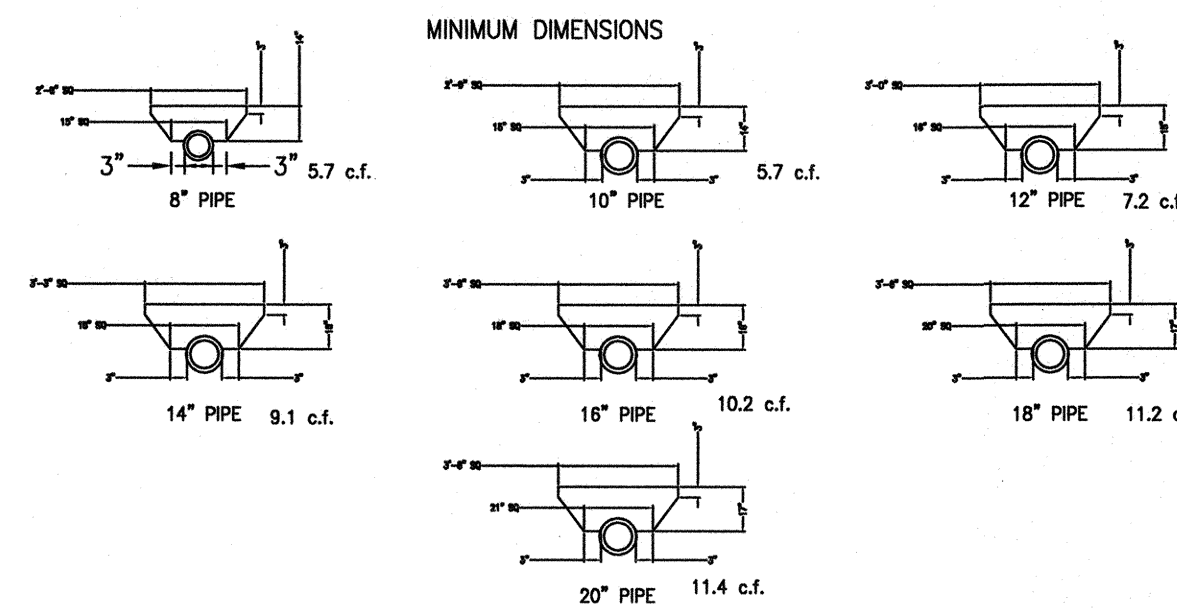
NOTES:

1. TYPICAL DEPTH OF HYDRANT LATERAL PIPING IS 5'-0" FROM FINISHED STREET GRADE TO CENTERLINE OF PIPE. WHERE PIPE DEPTH IS GREATER, INSTALL DUCTILE IRON HYDRANT RISER(S) PER NOTE 3.
2. CONCRETE HYDRANT BLOCK SHALL BE POURED/CURED PRIOR TO THE INSTALLATION OF THE HYDRANT ASSEMBLY AND THE POURING OF THE CONCRETE THRUST BLOCK. CONCRETE HYDRANT BLOCK AND THRUST BLOCKS SHALL BE POURED AGAINST SOLID/UNDISTURBED SOIL.
3. HYDRANT RISER(S) (MAXIMUM OF 24" AND THREE RISERS TOTAL) TO BE INSTALLED AS SHOWN ON THE PLAN/ELEVATION DWGS OR AS DIRECTED BY THE ENGINEER. CONTRACTOR TO INSTALL RISERS WHERE REQUIRED. REFER TO DWGS HPL-39,417A AND HPL-39,417B FOR HYDRANT RISER FABRICATION DETAILS.
4. MAXIMUM LENGTH OF TIE RODS IS 5'-5". WHERE THE LENGTHS OF THE TIE RODS WOULD EXCEED 5'-5", REFER TO PIPING PLAN DWG FOR INSTALLATION OF STOP COLLARS AND COLLAR STOPS. REFER TO DWG 49,102 FOR STAINLESS STEEL TIE RODS, NUTS, WASHERS AND DWG HPL-A-5975.1 FOR COLLAR STOPS.
5. ALL FLANGE/BOLTS/NUTS/WASHERS TO BE MANUFACTURED FROM TYPE 316 STAINLESS STEEL. FOR CLARITY NOT ALL THE RODS, BOLTS, NUTS, WASHERS ARE SHOWN ON THIS DWG.
6. THE MINIMUM DISTANCE BETWEEN THE CENTERLINES OF A 12" HYDRANT TEE AND HYDRANT BARREL IS 72 1/8".
7. REFER TO DWG HPL-5142.1 WHEN HIGH PRESSURE HYDRANT IS TO BE INSTALLED OVER A SIDEWALK BASEMENT.
8. REFER TO SPECIFICATION SECTION 02723 IN THE SPECIAL PROVISIONS FOR ADDITIONAL PRODUCT AND INSTALLATION INFORMATION, INCLUDING TRENCHING, SHORING, BACKFILLING AND TESTING OF THE INSTALLED HYDRANT LATERAL.



NOTES:

PIPE SHOWN IS LUGGED CAST IRON, CONCRETE THRUST BLOCKS FOR DUCTILE IRON PIPE SHALL BE SIMILAR. FOR VERTICAL BENDS, THE UPPER CONCRETE THRUST BLOCK SHALL BE SECURED TO THE ELBOW WITH 2-#8 REBARS CROSSED AND EMBEDDED WITH J-BENDS.

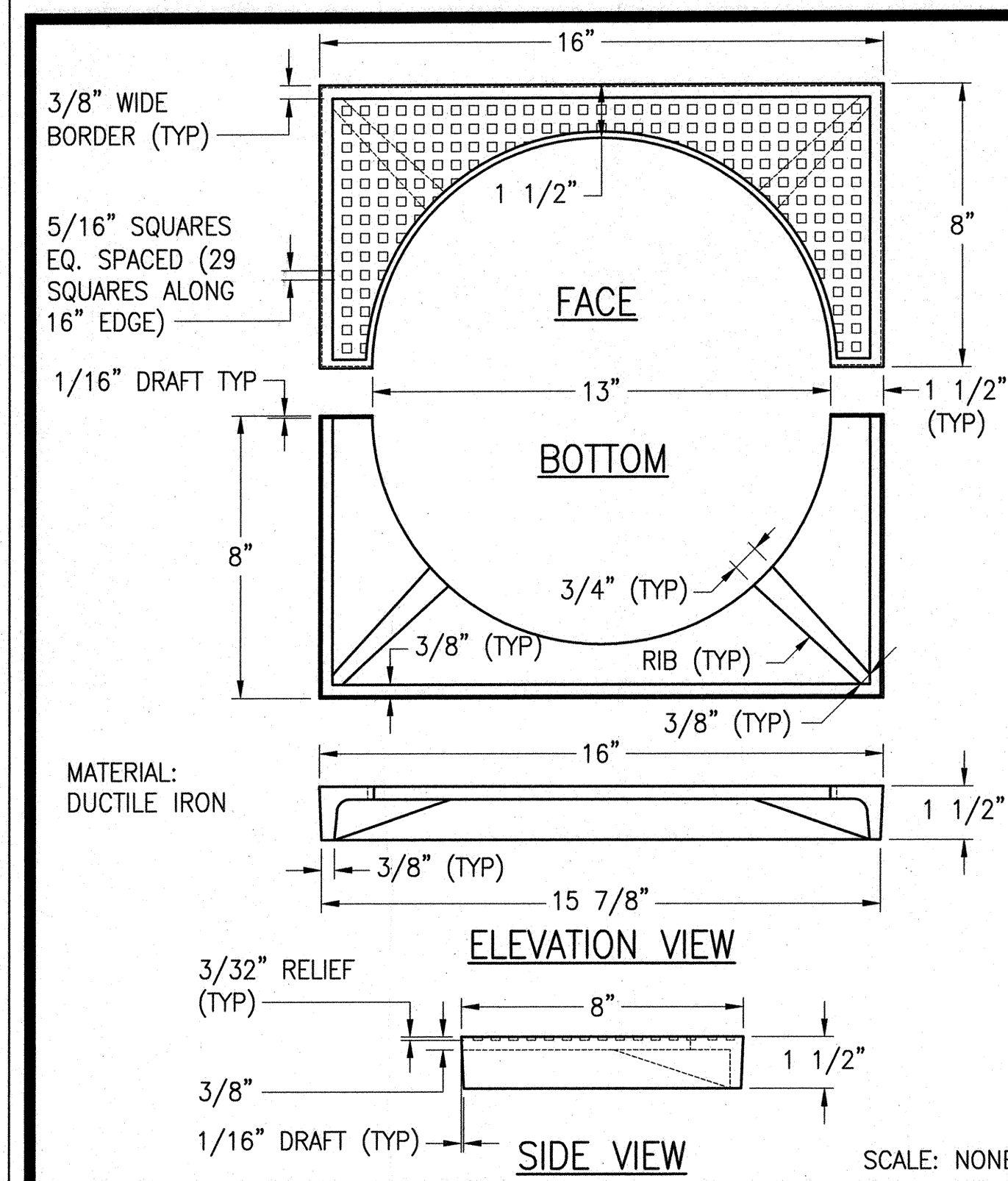


NOTES: DIAGRAMMATIC ARRANGEMENT OF CONCRETE THRUST BLOCK. BLOCKS MUST BEAR AGAINST COMPACTED OR UNDISTURBED SOIL. THRUST BLOCKS SIZES SHOWN WHEN PIPE RESTRAINED PER REQUIRED DISTANCE FROM ELBOW, CROSS, CAP OR HP HYDRANT.

SCALE: NONE

**CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
AWSS THRUST BLOCKS**

DESIGNED: DEM	APPROVED: _____	DATE: 10/21/2008
CH'D: MBS	APPROVED: _____	REVISION: 1
	APPROVED: _____	DETAIL: HPL-5949



**CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
HIGH PRESSURE HYDRANT FINISH PLATE**

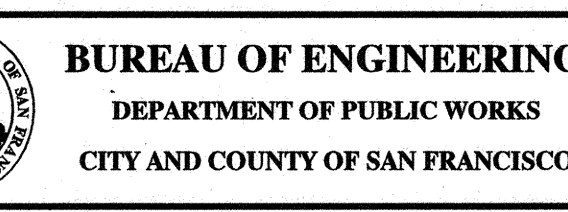
BY: NL	APPROVED: _____	DATE: 10/20/2008
CH'D: MBS	APPROVED: _____	REVISION: 0
	APPROVED: _____	DETAIL: HPL-5324A

S:\MFC\AWSS\STD-DET-DWG\HIGH-PRESSURE HYDRANTS\HPL-5324A

NO.	DATE	DESCRIPTION	BY	APP.

REFERENCE INFORMATION & FILE NO. OF SURVEYS

AWSS DWG NOS. HPL-5950 REV. 2 DATED 03/04/05 AND HPL-5324 CH3 REV2 DATED 10/21/08



DESIGNED: DATE: 06/10	APPROVED: DATE: _____	SCALE: NONE	CITY AND COUNTY OF SAN FRANCISCO	SPECIFICATION NO.
CHECKED: DATE: 06/10	BUREAU MANAGER: DATE: _____	SHEET OF SHEETS	AUXILIARY WATER SUPPLY SYSTEM	DRAWING NO. HPL-5324
			TYPICAL LAYOUT FOR DUCTILE IRON HIGH PRESSURE HYDRANT LATERAL	REV. NO. 3

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

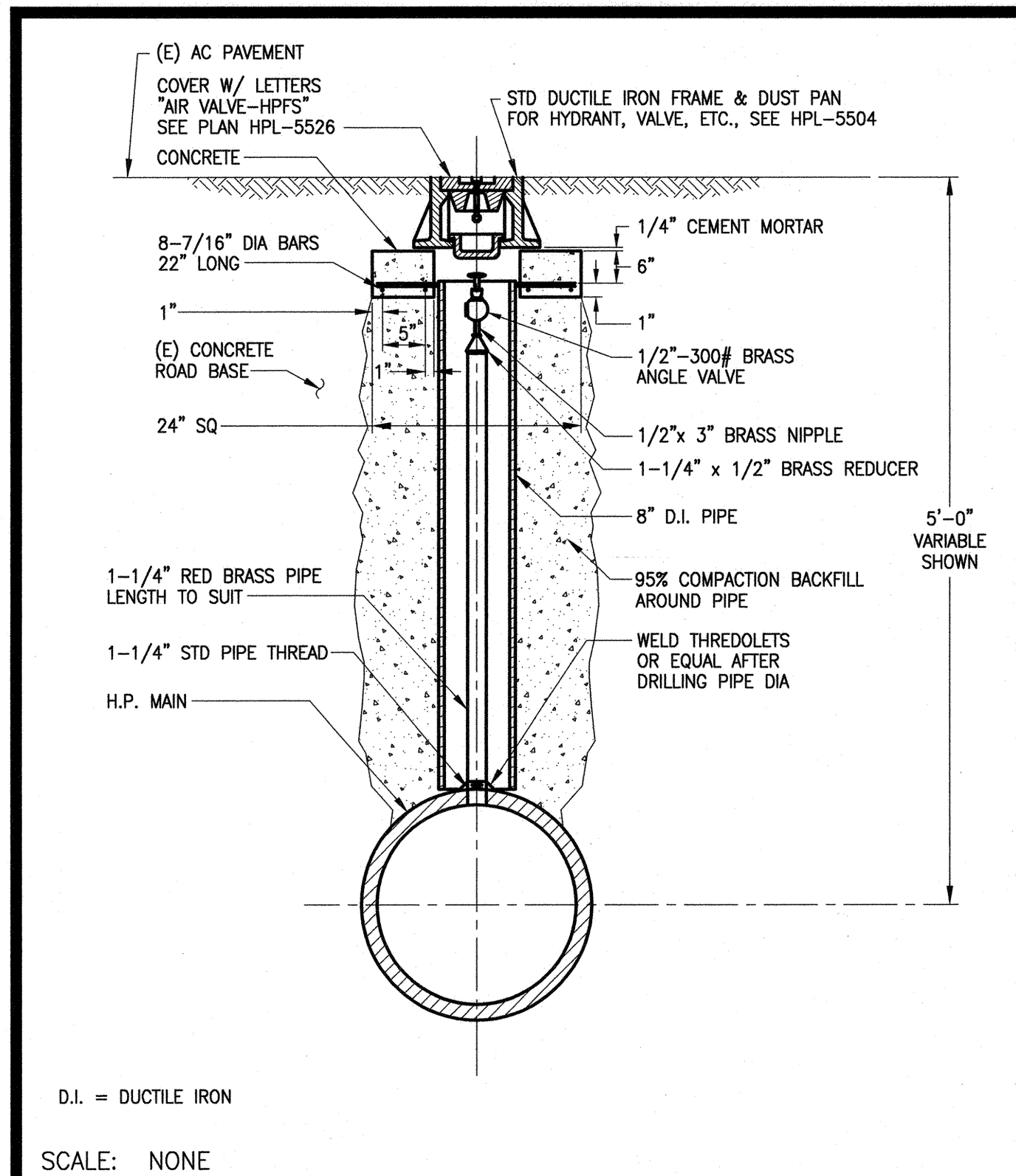


**BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO**

DESIGNED: DATE: 11/10	APPROVED: DATE: _____	SCALE: 1 OF 10
CHECKED: DATE: 11/10	BUREAU MANAGER: DATE: _____	SHEET OF SHEETS

**CITY AND COUNTY OF SAN FRANCISCO
AUXILIARY WATER SUPPLY SYSTEM
AWSS STANDARD DRAWING I**

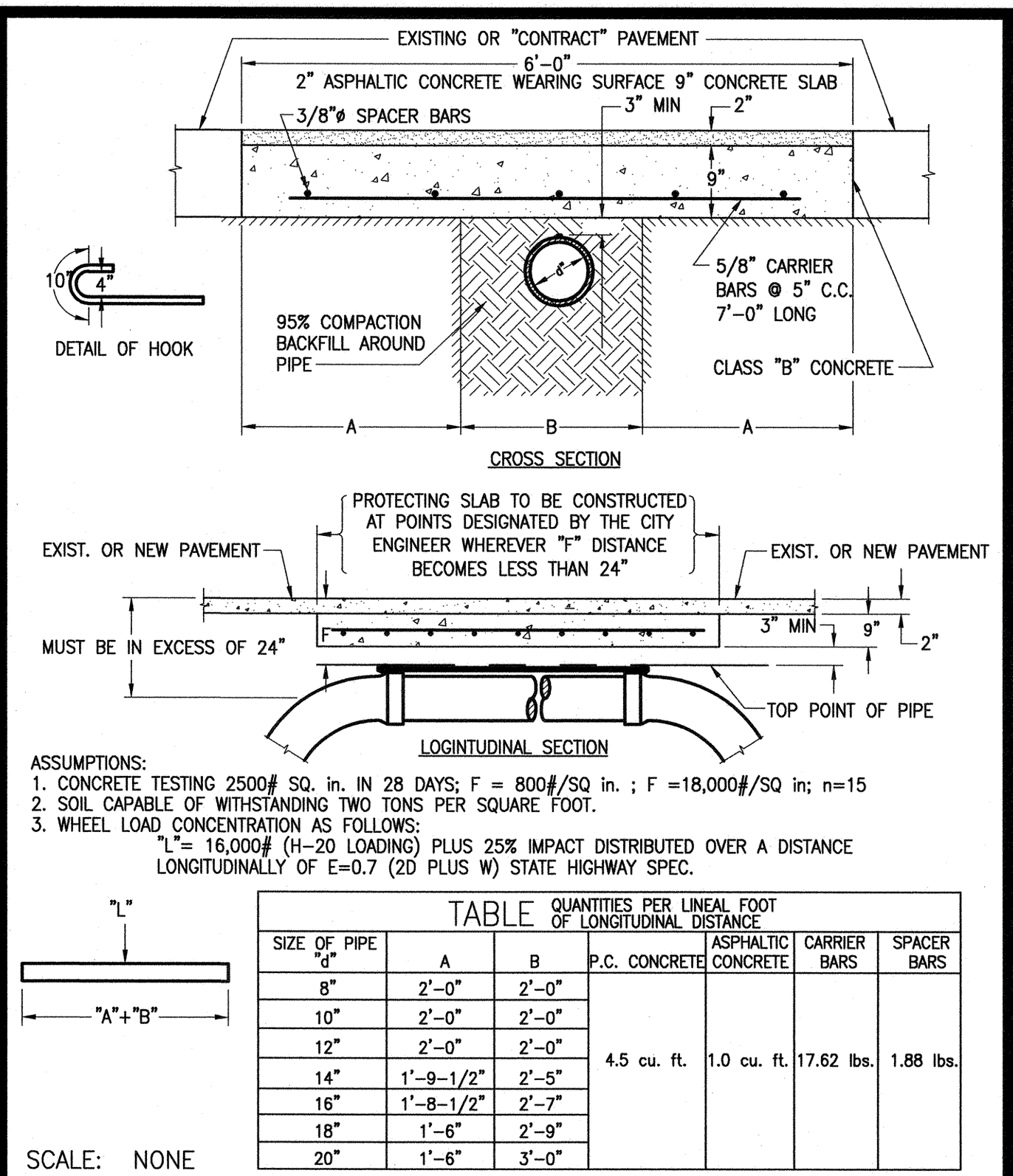
SPECIFICATION NO.
DRAWING NO. AWSS 1
FILE NO.
REV. NO. 0



CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
AWSS STANDARD DETAIL - AIR VALVE ASSEMBLY

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 8/13/2004
REVISION: 3

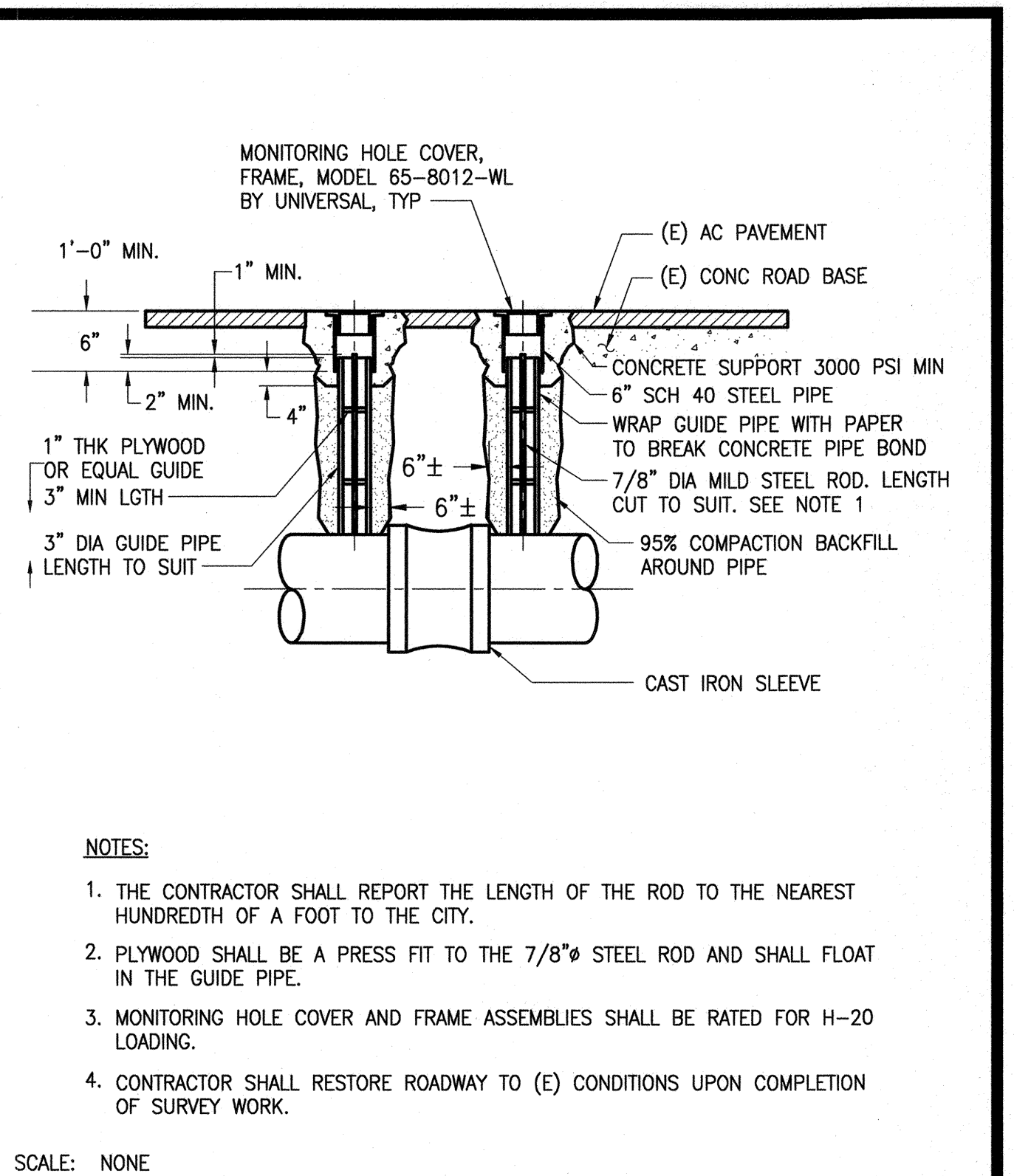
CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5322.2



CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
AWSS PROTECTING SLAB OVER H.P. PIPE LINE

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 2/7/2005
REVISION: 0

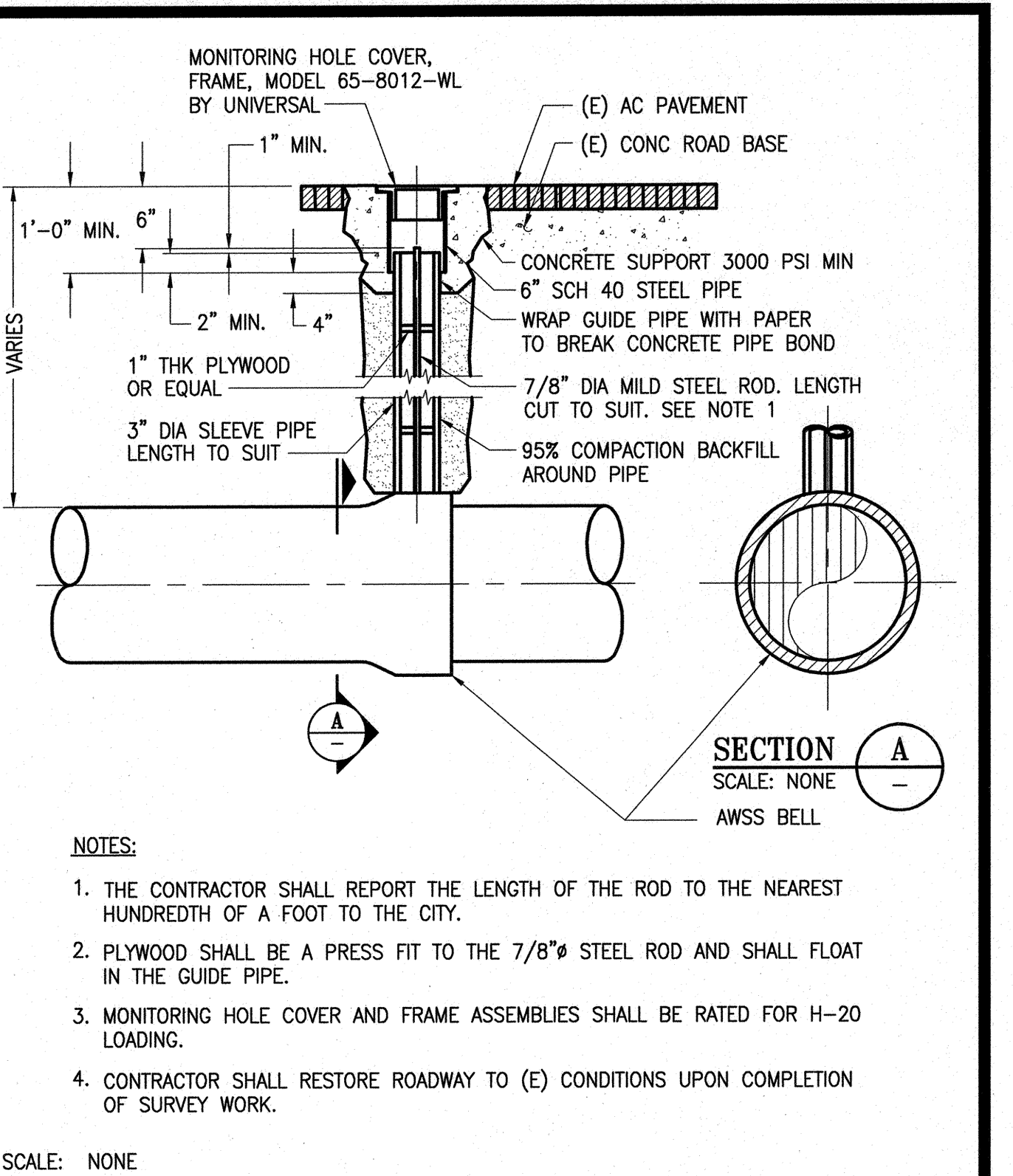
CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL 5620



CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
AWSS SETTLEMENT REFERENCE POINT FOR DOUBLE SPIGOT PIPE

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 2/4/2005
REVISION: 0

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5993.1CH1



CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
AWSS SETTLEMENT REFERENCE POINT FOR BELL AND SPIGOT PIPE

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 2/4/2005
REVISION: 0

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5993-CH3

NO.	DATE	DESCRIPTION	BY	APP.
TABLE OF REVISIONS				
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION				

REFERENCE INFORMATION & FILE NO. OF SURVEYS



BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

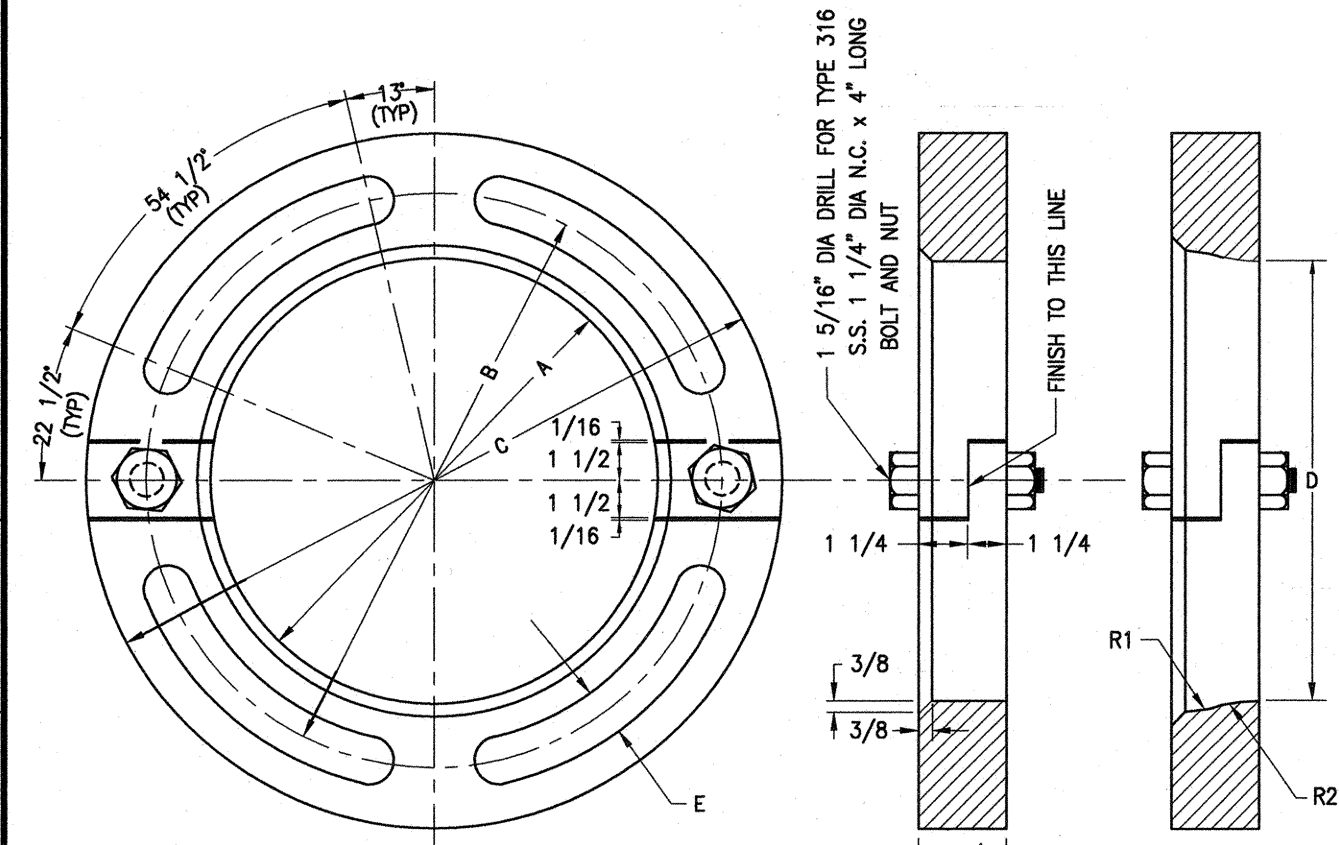
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DRAWN: DATE:	SECTION MANAGER DATE:	NONE
NL/VW 11/10	DEPUTY BUREAU MANAGER DATE:	SHEET OF SHEETS
CHECKED: DATE:	BUREAU MANAGER DATE:	2 OF 10
MBS 11/10		

CITY AND COUNTY OF SAN FRANCISCO
AUXILIARY WATER SUPPLY SYSTEM
AWSS STANDARD DRAWING II

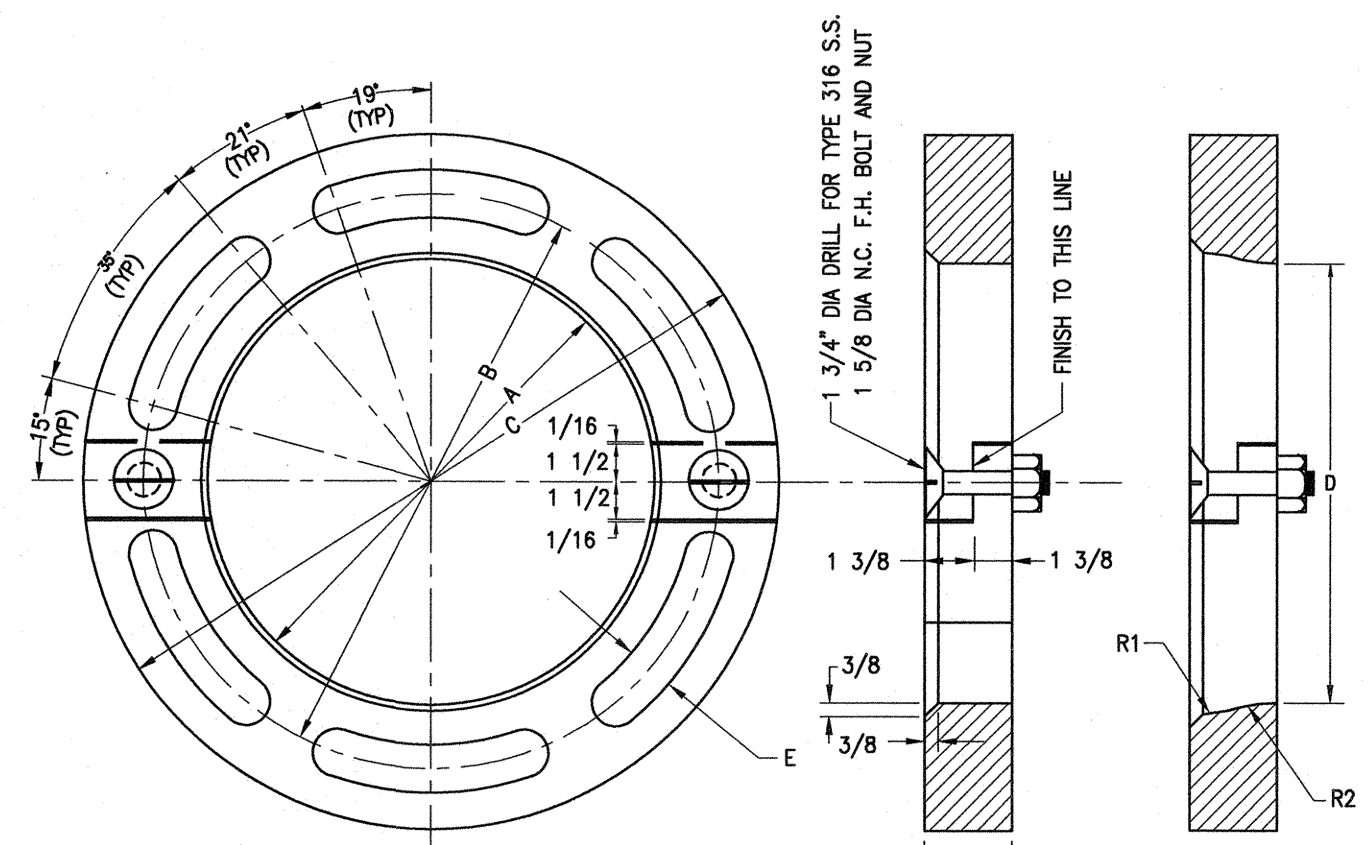
SPECIFICATION NO.
DRAWING NO. AWSS 2
FILE NO.
REV. NO. 0

NOMINAL DI PIPE SIZE	TYPE	DIMENSIONS (IN INCHES)						
		A	B	C	D	E	R1	R2
8"	A	9.30	15.75	18.75	9.37	1.37	6	6
10"	A	11.35	18.37	21.62	11.42	1.50	6	6
12"	A	13.45	21.12	24.87	13.52	1.75	6	6
14"	B	15.55	23.62	22.37	15.65	1.82	8	8
16"	B	17.65	26.37	30.12	17.84	1.75	8	8
18"	B	19.75	29.0	32.75	20.00	2.00	8	8
20"	B	21.85	31.87	37.62	22.10	2.12	8	8

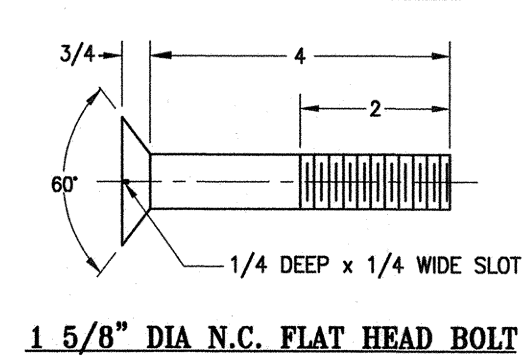
- NOTES-
- MATERIAL TO BE CAST STEEL (IN ACCORDANCE WITH A.S.T.M. SPEC. A-27-24) AND ALL SUBSEQUENT REVISIONS THERETO, OR PLATE STEEL MARK PATTERN IN RAISED LETTERS NOT LESS THAN 5/8" HIGH AND NOT LESS THAN 1/8" IN RELIEF; WITH THE LETTERS SF-A.W.S.S., THE DATE OF MANUFACTURE AND THE MANUFACTURER'S INITIALS. CASTINGS TO BE COATED IN A SIMILAR MANNER TO THAT SPECIFIED IN THE STANDARD SPECIFICATIONS FOR THE A.W.S.S. FOR CAST STEEL SPECIALS. PLATE STEEL STRONG BACKS SHALL HAVE THE ABOVE INFORMATION BEAD WELDED ONTO THE OUTSIDE CIRCUMFERENCE. THE WELD BEAD SHALL BE A MINIMUM OF 1/8" HIGH. THE PIPE MANUFACTURER SHALL FURNISH THE MANUFACTURER OF THE STRONG BACK WITH THE NECESSARY BELL CONTOUR DIMENSIONS AND ANY PROJECTION ON BEARING SURFACES SHALL BE GROUND SMOOTH.
 - DIMENSIONS A, D, R1, R2 SHALL HAVE A TOLERANCE OF + 0.06. ALL OTHER DIMENSIONS SHALL HAVE A TOLERANCE OF ±0.06.
 - INSIDE DIAMETER DIMENSIONS GIVEN IN THE TABLE ARE BASED ON THOSE AS PROVIDED BY THE DUCTILE IRON PIPE MANUFACTURERS. THE CONTRACTOR SHALL FIELD VERIFY THE PIPE WHERE THE STRONG BACK IS TO BE INSTALLED PRIOR TO FABRICATION.
 - THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING CAST IRON PIPE PRIOR TO FABRICATING THE BELL END STRONG BACK AND ADJUST THE INSIDE DIAMETER AND RADIUS DIMENSIONS ACCORDINGLY.



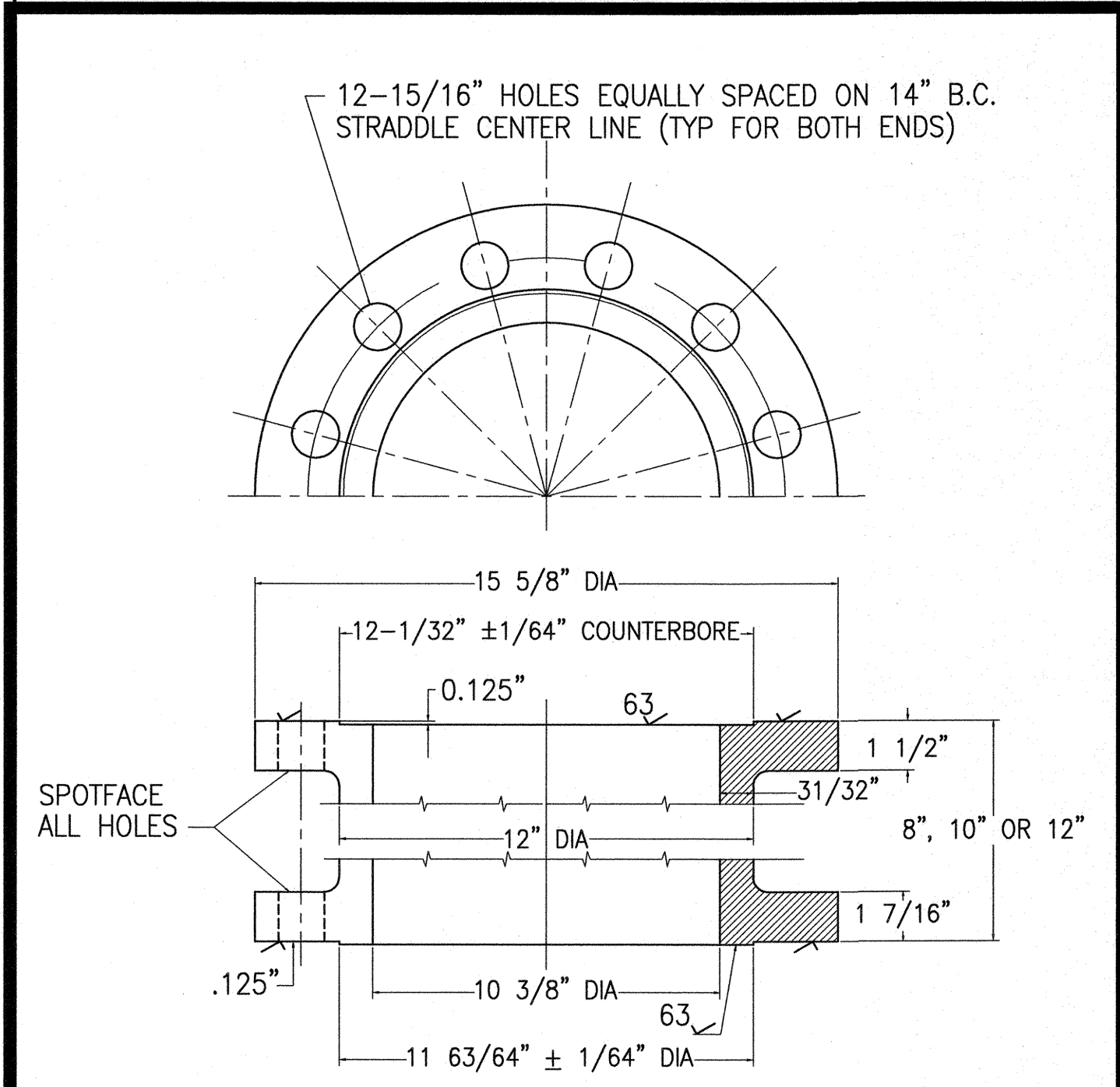
TYPE A



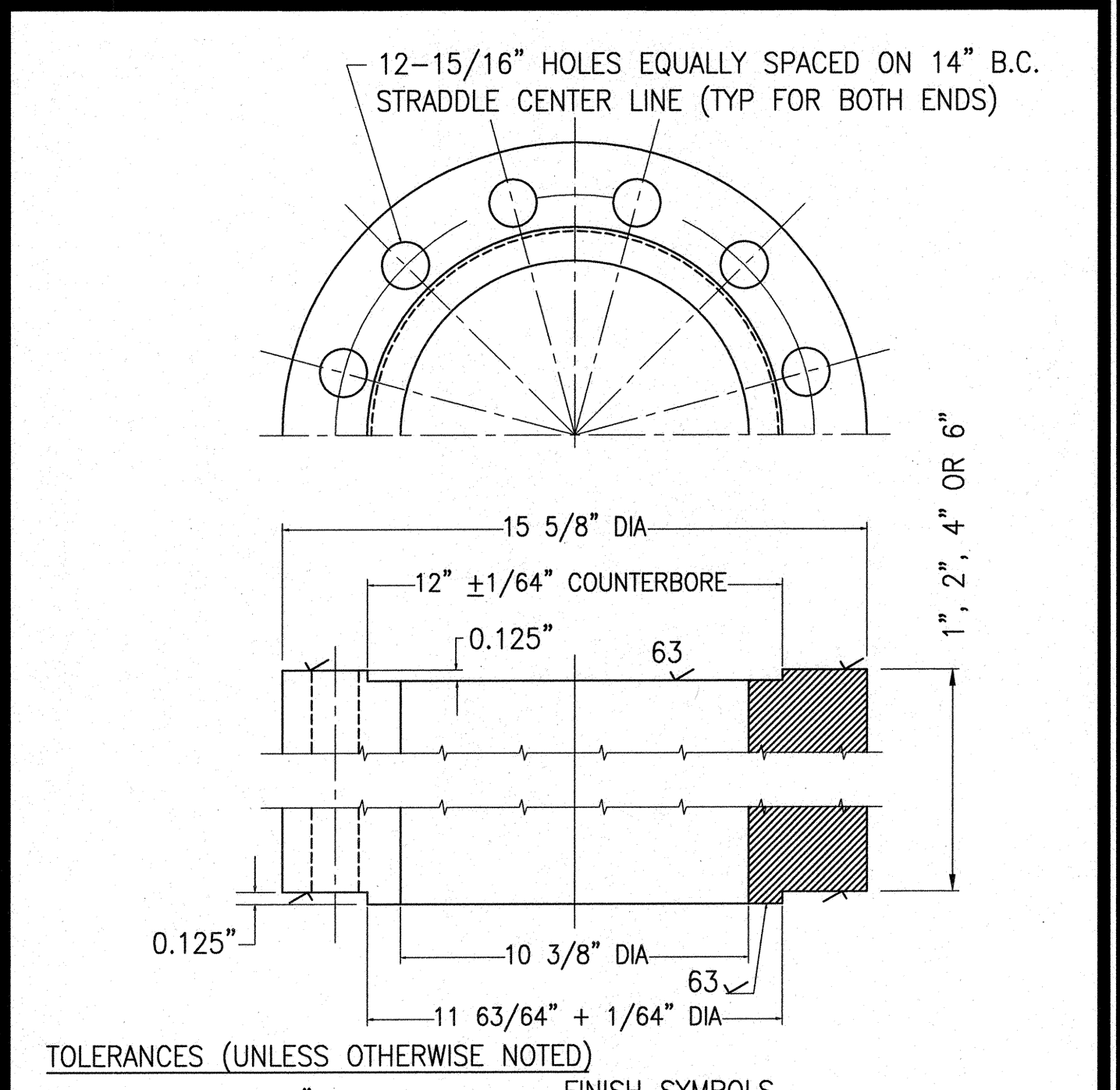
TYPE B



1 5/8" DIA N.C. FLAT HEAD BOLT



TOLERANCES (UNLESS OTHERWISE NOTED)
 DECIMALS: ± 0.003"
 FRACTIONS ± 1/32"
 SCALE: NONE



TOLERANCES (UNLESS OTHERWISE NOTED)
 DECIMALS: ± 0.003"
 FRACTIONS: ± 1/32"
 FINISH SYMBOLS 250 UNLESS OTHERWISE INDICATED
 NOTE: HYDRANT INSTALLATION REQUIRING HYDRANT RISERS SHALL HAVE THE MINIMUM NUMBER OF RISERS INSTALLED. IN NO CASE SHALL THERE BE MORE THAN THREE HYDRANT RISERS INSTALLED.

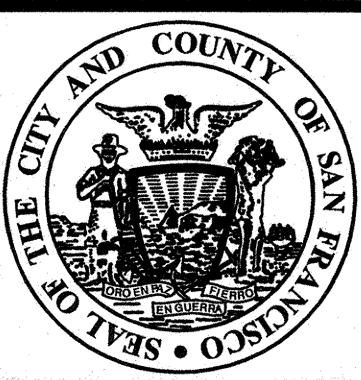
CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING		DUCTILE IRON RISER FOR HIGH PRESSURE HYDRANT	
BY: DEM	APP'D _____	DATE: 01/23/06	REVISION: 0
CH'D: MBS	APP'D _____	DETAIL: HPL-39,417A	

CITY AND COUNTY OF SAN FRANCISCO DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING		DUCTILE IRON RISER FOR HIGH PRESSURE HYDRANT	
BY: DEM	APP'D _____	DATE: 01/23/2006	REVISION: 0
CH'D: MBS	APP'D _____	DETAIL: HPL-39,417.B	

NO.	DATE	DESCRIPTION	BY	APP.
1	11/10	ADDED NOTES 3 AND 4		

TABLE OF REVISIONS
 CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

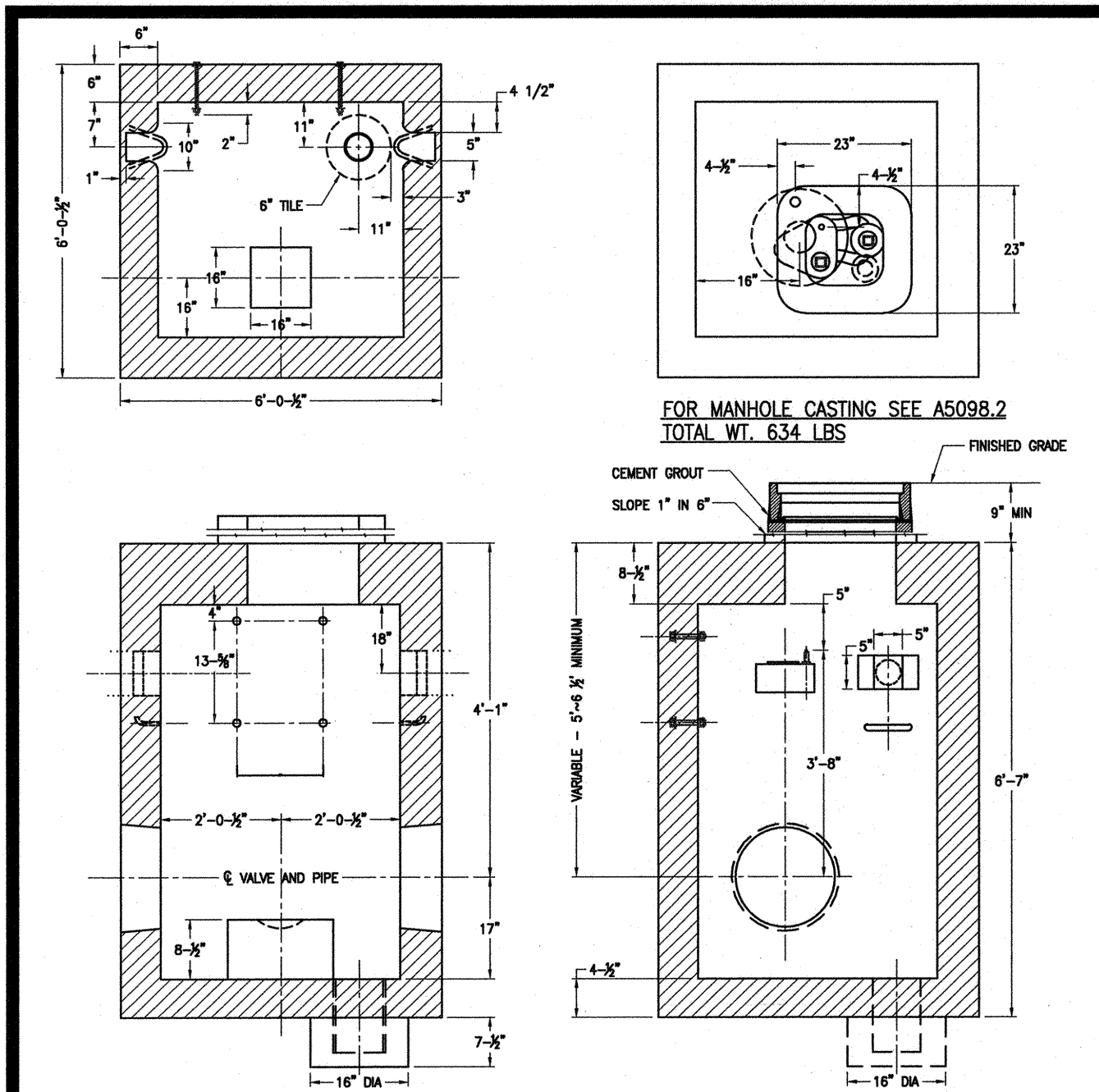


BUREAU OF ENGINEERING
 DEPARTMENT OF PUBLIC WORKS
 CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: MBS	DATE: 11/10	APPROVED: _____	DATE: _____	SCALE: NONE
CHECKED: MBS	DATE: 11/10	DEPUTY BUREAU MANAGER: _____	DATE: _____	SHEET OF SHEETS: 3 OF 10
		BUREAU MANAGER: _____	DATE: _____	

CITY AND COUNTY OF SAN FRANCISCO
 AUXILIARY WATER SUPPLY SYSTEM
 AWSS STANDARD DRAWING III

SPECIFICATION NO.	
DRAWING NO.	AWSS 3
FILE NO.	
REV. NO.	0



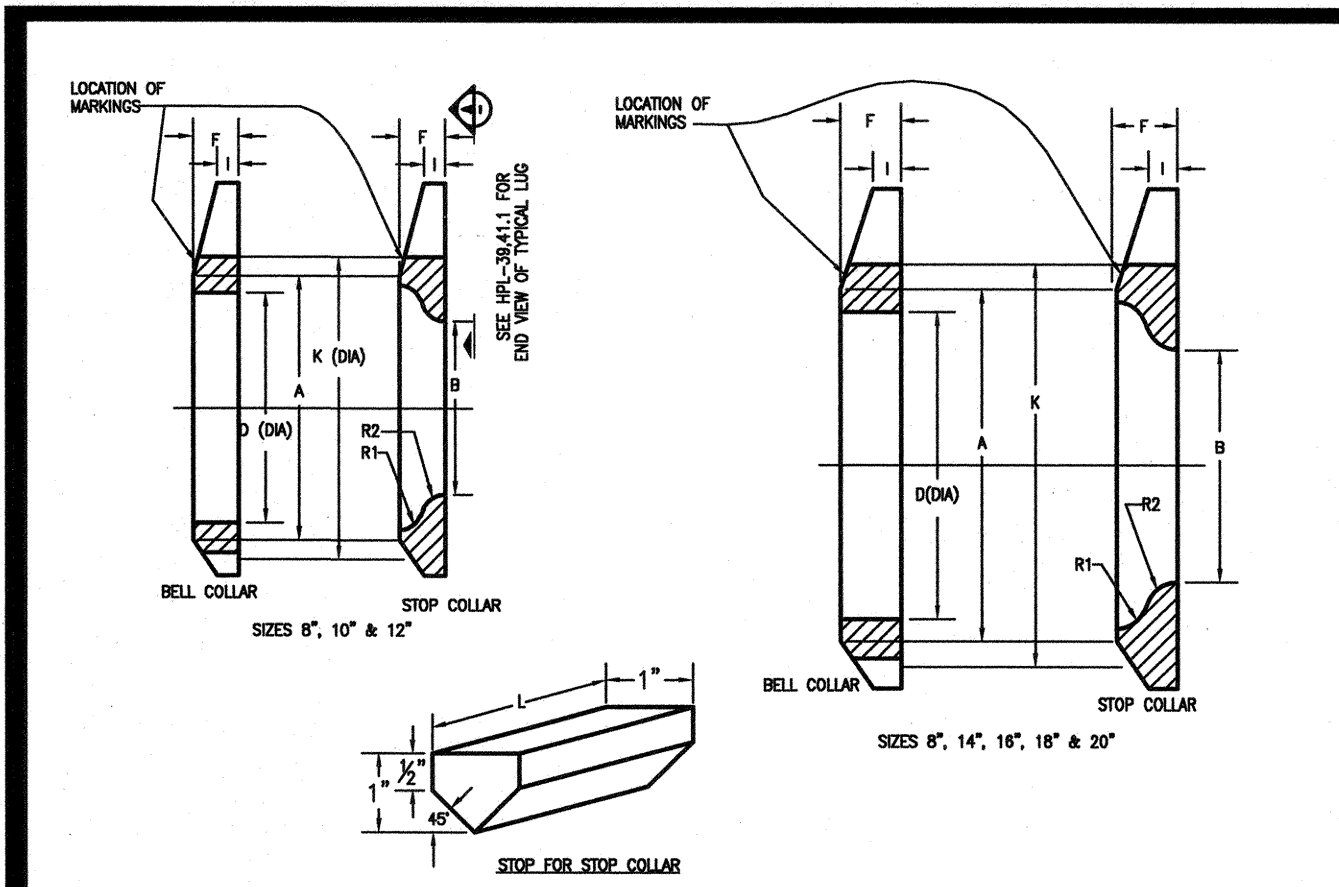
EXCAVATION AS SHOWN 10.16 CU.YDS - PER 1FT EXTRA DEPTH 1.37 CU.YD
 CONCRETE AS SHOWN 2.84 CU.YDS - PER 1FT EXTRA DEPTH .34 CU.YD
 REINFORCING STEEL 294 LBS
 PAVING 37.01 SQ FT
 FIGURES FOR EXCAVATION AND PAVING ALLOW 6" ALL AROUND HORIZONTAL MEASUREMENTS.
 SCALE: NONE

ORIGINAL DWG 08/25/37
 APPROVED BY JOHN J. CASEY
 CITY ENGINEER

CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
 SFFD AWSS STANDARD DETAILS - 12" VALVE VAULT

BY: DEM/VW APP'D _____ MANAGER, GES DIVISION DATE: _____
 REVISION: 0

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5512.2



NOMINAL SIZE	DIMENSIONS FOR AWSS BELL AND STOP COLLARS & STOP (INCHES)										NO. OF STOPS
	A	B	D (DIA)	E	F	I	K (DIA)	R1	R2	L	
8	11-1/2	9.37	9.30	1-1/2	1-3/4	3/4	14-3/8	6	6	3.5	4
10	14	11.42	11.35	1-7/8	2.0	7/8	16-7/8	8	8	3.5	4
12	16-1/2	13.52	13.45	2-1/4	2-1/2	1.0	19-3/8	6	6	3.5	4
14	18-1/2	15.65	15.55	2-3/8	2-3/4	1-1/8	22	8	8	3.5	6
16	20-1/2	17.84	17.65	2-5/8	3-1/8	1-1/4	24-5/8	8	8	4.5	6
18	23	20.00	19.75	3	3-3/8	1-3/8	27	8	8	4.5	9
20	24-1/2	22.10	21.85	3-1/8	3-1/2	1-1/2	29-3/4	8	8	4.5	9

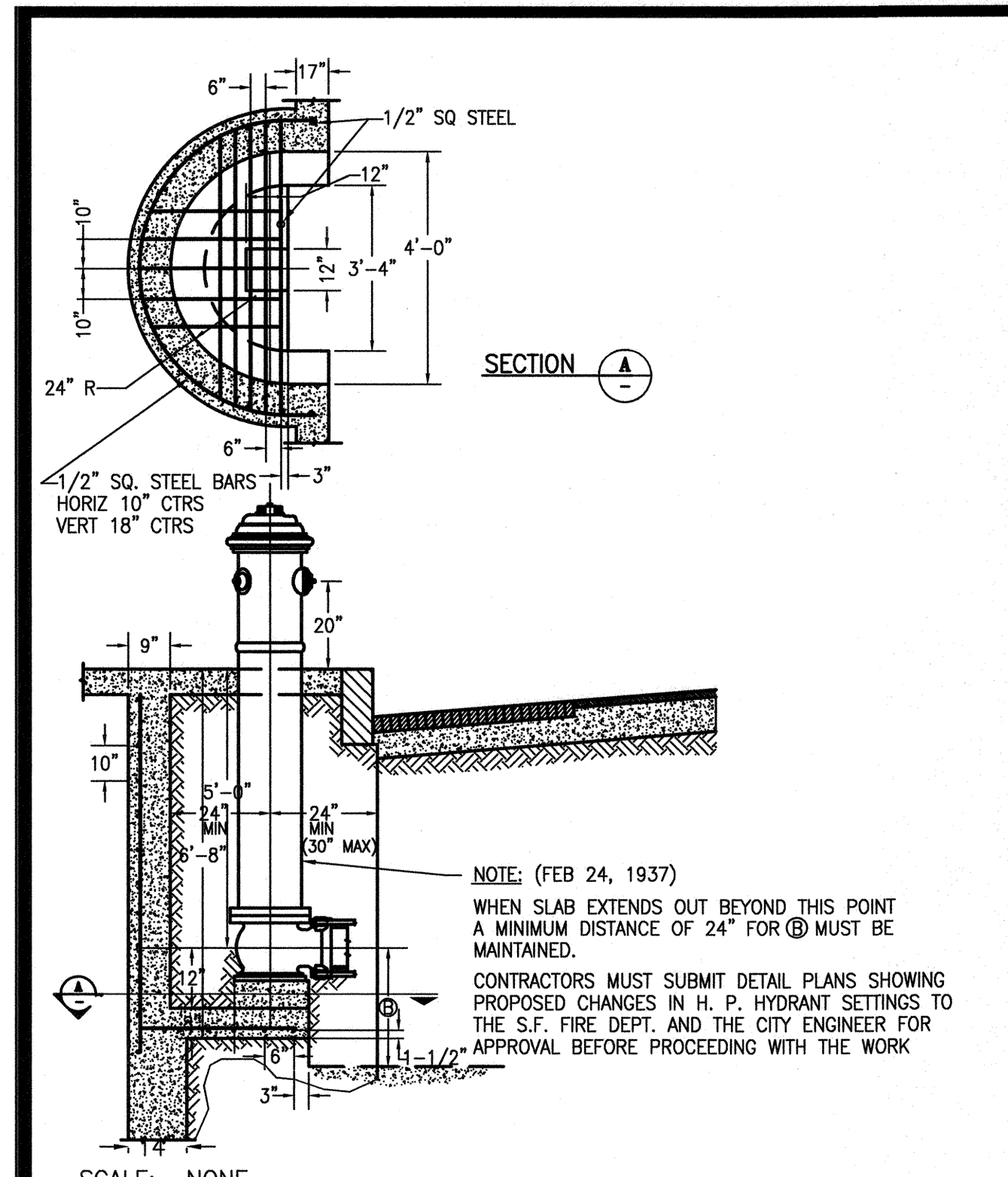
NOTE:
 1. DIMENSIONS D, B, R1 AND R2 SHALL HAVE +0.00 TOLERANCES, ALL OTHER DIMENSIONS SHALL HAVE ±0.06 TOLERANCE.

SCALE: NONE

CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
 AWSS PIPE COLLARS & STOPS

BY: DEM/VW APP'D _____ MANAGER, GES DIVISION DATE: 3/07/2005
 REVISION: 0

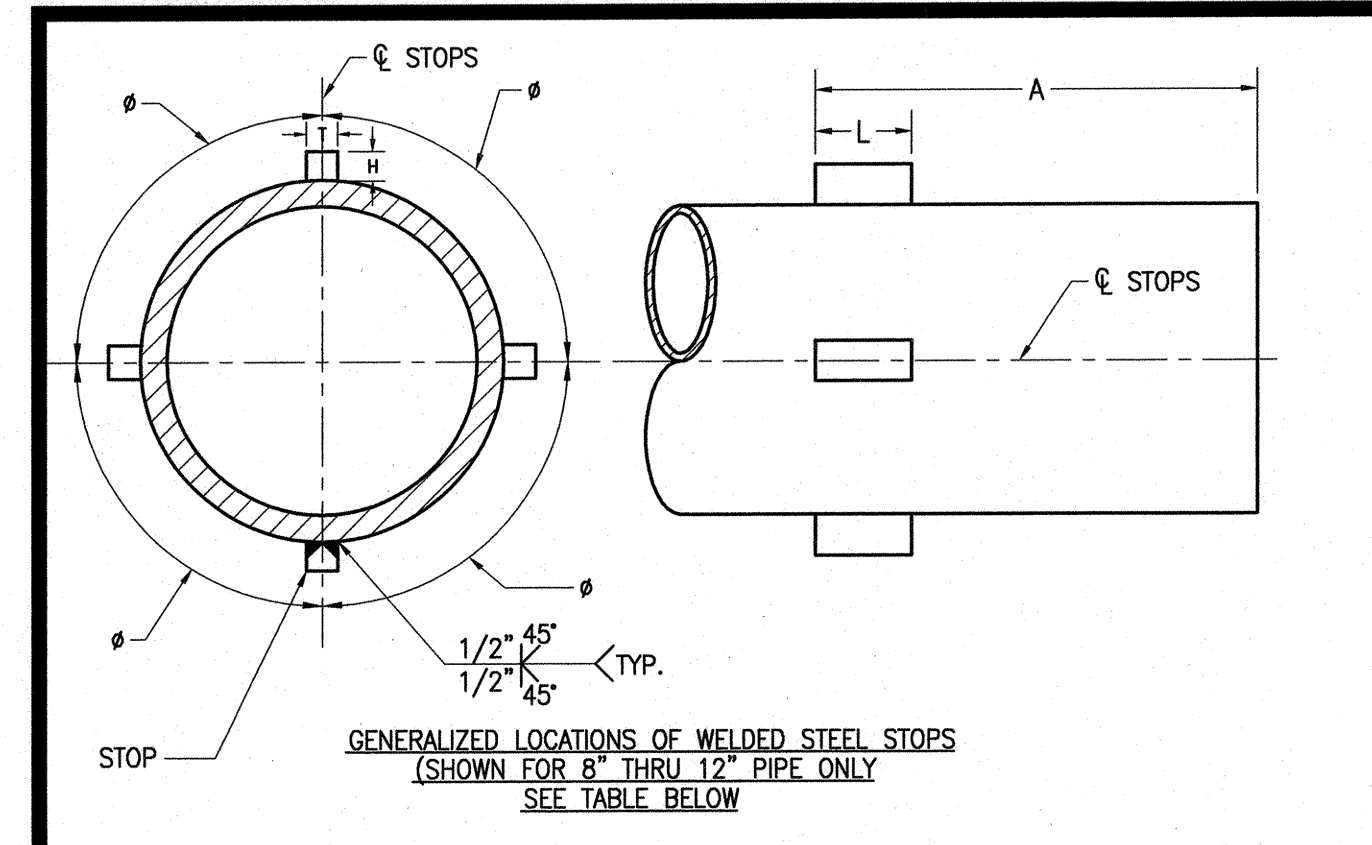
CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-39,414



CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
 AREAWAY SETTING FOR H.P. HYDRANT

BY: DEM/VW APP'D _____ MANAGER, GES DIVISION DATE: 8/17/2004
 REVISION: 0

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5142.1



GENERALIZED LOCATIONS OF WELDED STEEL STOPS
 (SHOWN FOR 8" THRU 12" PIPE ONLY
 SEE TABLE BELOW)

NOMINAL PIPE SIZE IN.	NUMBER OF STOPS	ANGLE BETWEEN STOPS DEG. Ø	HEIGHT IN.	WIDTH IN.	LENGTH IN.	DISTANCE FROM PIPE END, IN.
8	4	90	1	1	3.5	12
10	4	90	1	1	3.5	13.5
12	4	90	1	1	3.5	15
14	6	60	1	1	3.5	16.5
16	6	60	1	1	4.5	18
18	9	40	1.5	1	4.5	19.5
20	9	40	1.5	1	4.5	21

NOTES:
 1. COLLAR STOP MATERIAL SHALL BE MILD STEEL & WELDING ROD SHALL BE NI-ROD 55.
 2. AREAS TO BE WELDED SHALL BE THOROUGHLY CLEANED & FREE OF PAINT, RUST OR SCALE BEFORE STOPS ARE WELDED ONTO PIPE.
 3. THE WELDED STOPS & ADJACENT AREAS SHALL BE SANDBLASTED & COATED AS PER THE SPECIFICATIONS.
 4. THE PIPE COLLARS SHALL BE SLID ONTO THE PIPE PRIOR TO WELDING OF THE COLLAR STOPS.
 5. THE CONTRACTOR SHALL USE A STOP COLLAR OR OTHER POSITIONING DEVICE ON THE PIPE TO ENSURE THAT THE COLLAR STOPS ARE POSITIONED SO AS TO HAVE UNIFORM CONTACT WITH THE STOP COLLAR.
 6. STEEL STOPS SHALL BE BEVELED PRIOR TO WELDING.

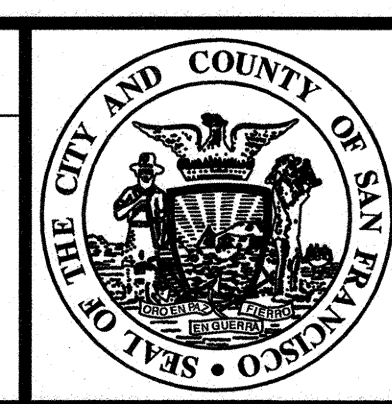
CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
 WELDS STEEL COLLAR STOPS FOR DUCTILE IRON PIPE

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 3/10/2005
 REVISION: 1 OF 1

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-A-5975.1

NO.	DATE	DESCRIPTION	BY	APP.
TABLE OF REVISIONS CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION				

REFERENCE INFORMATION & FILE NO. OF SURVEYS



BUREAU OF ENGINEERING
 DEPARTMENT OF PUBLIC WORKS
 CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: DATE: _____ APPROVED: _____
 DRAWN: DATE: 11/10 SECTION MANAGER DATE: _____
 NL DEPUTY BUREAU MANAGER DATE: _____
 CHECKED: DATE: 11/10 BUREAU MANAGER DATE: _____

SCALE: NONE
 SHEET OF SHEETS: 4 OF 10

CITY AND COUNTY OF SAN FRANCISCO
 AUXILIARY WATER SUPPLY SYSTEM
 AWSS STANDARD DRAWING IV

SPECIFICATION NO. _____
 DRAWING NO. AWSS 4
 FILE NO. _____
 REV. NO. 0

YARN PACKING SHALL BE THOROUGHLY AND EVENLY COMPACTED INTO THE BELL TO EXACTLY 1" DEEP. THE REMAINING SPACE SHALL THEN BE FILLED WITH LEAD, A BEAD BEING LEFT ON THE OUTSIDE FACE OF BELL SUFFICIENT THAT WHEN JOINT IS PROPERLY CALKED, LEAD WILL BE FLUSH WITH OUTSIDE FACE OF BELL.

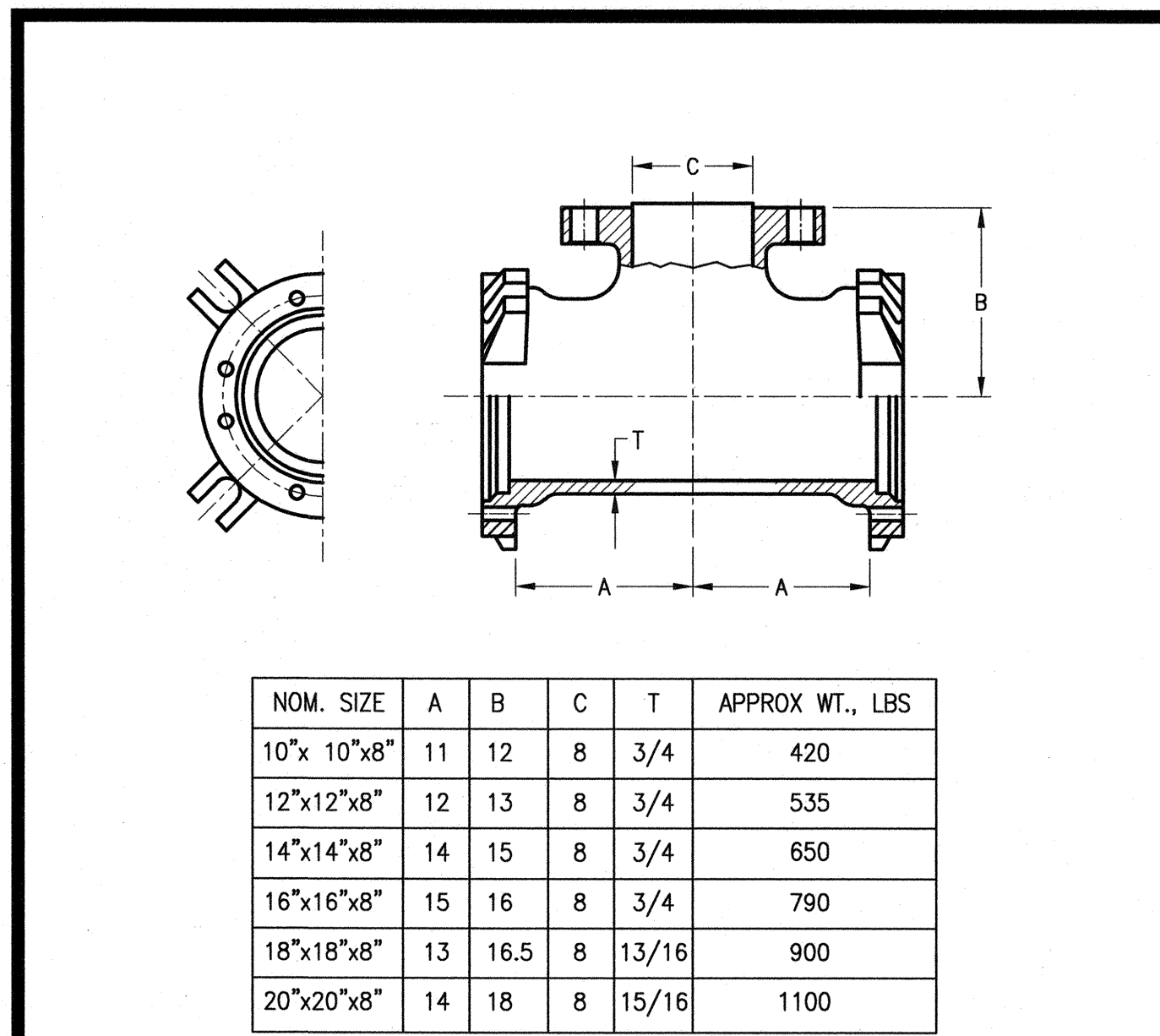
SPIGOT CLASS	MAT.	E-F BELL CAST STEEL	G-H BELL CAST STEEL	BELL CAST IRON	SLEEVE CAST STEEL	SLEEVE CAST IRON
20"	A-B C.I.		141.65	43.84		96.18
	C-D C.I.		117.57	45.18		100.34
	E-F C.I.	64.93	92.52	61.06		131.16
	G-H C.I.		66.27	61.51	144.33	136.57
18"	C-D C.I.		101.46	40.18		89.31
	E-F C.I.	58.53	81.71	56.06		120.32
	G-H C.I.		59.93	56.36	130.61	122.56
16"	G-H C.I.		53.68	49.95	116.90	108.55
14"	E-F C.I.	41.22	55.31	38.09		82.60
	G-H C.I.		42.13	37.80	90.50	81.86
12"	E-F C.I.	35.93	46.60	33.47		72.61
	G-H C.I.		36.68	34.59	78.88	75.15
10"	A C.I.			19.83		43.84
	E-F C.I.	30.49	37.73	28.11		60.98
	G-H C.I.		31.09	29.00	66.50	62.92
8"	C-D C.I.		32.20			
	E-F C.I.	24.97	29.53	22.89		49.64
	G-H C.I.		25.42	23.49		50.84

NOTE: FIGURES IN TABULATION ARE INCREASED BY 5% OVER CALCULATED LEAD QUANTITIES. PAYMENT FOR LEAD JOINTS SHALL BE MADE ACCORDING TO QUANTITIES SHOWN ON THIS TABLE.
 ORIGINAL DRAWING DATED JANUARY 1935 AND APPROVED BY JOHN J. CASEY, CITY ENGINEER.
 REVISED 06/17/36 BY ADDING TABULATION FOR 10" PIPE.
 SCALE: NONE

CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
LEAD QUANTITIES IN STANDARD CI JOINTS

BY: NL 07/10 APP'D _____ MANAGER, GES DIVISION DATE: 7/9/2010
 SHEET 1 OF 1

CH'D: MBS 07/10 APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5541.2

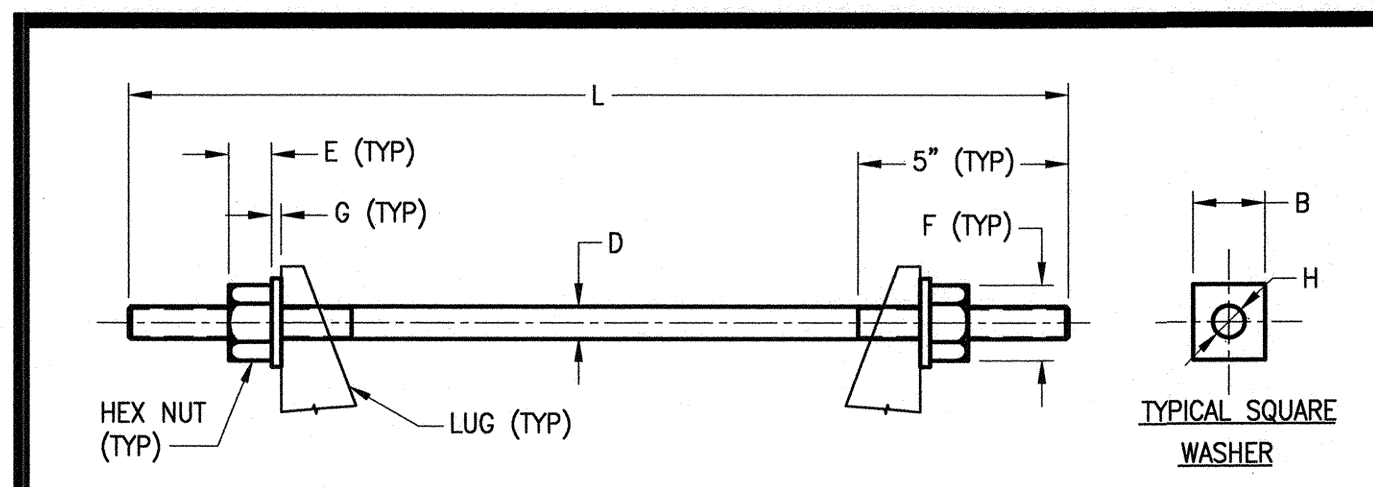


NOTES:
 1. FOR AWSS MECHANICAL JOINT BELL, REFER TO DWG NO. HPL-39,412, CH3.
 2. FLANGE DIMENSION SHALL CONFORM TO ANSI B16.42-1979 CLASS 300.

CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
DUCTILE IRON M.J. BELL x AWSS M.J. BELL x FLANGE HYDRANT TEE

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 2/08/2005
 REVISION: 28

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5967.1



PIPE SIZE	DIMENSIONS IN INCHES						STANDARD BELL & SPIGOT JOINTS	STANDARD SLEEVE JOINTS
	D	E	F	G	H	B		
8	1-1/8"	1	1-3/16"	1/4"	1-7/16"	2-1/2"	22	32
10	1-1/4"	1-1/8"	2	1/4"	1-9/16"	2-3/4"	24	36
12	1-3/8"	1-1/4"	2-3/16"	5/16"	1-11/16"	3-1/4"	26	40
14	1-3/8"	1-1/4"	2-3/16"	5/16"	1-11/16"	3-1/2"	20	41
16	1-1/2"	1-3/8"	2-3/8"	5/16"	1-11/16"	3-1/2"	29	47
18	1-3/4"	1-5/8"	2-3/4"	3/8"	2-1/16"	3-3/4"	31	51
20	1-7/8"	1-3/4"	2-15/16"	7/16"	2-3/16"	4	33	54

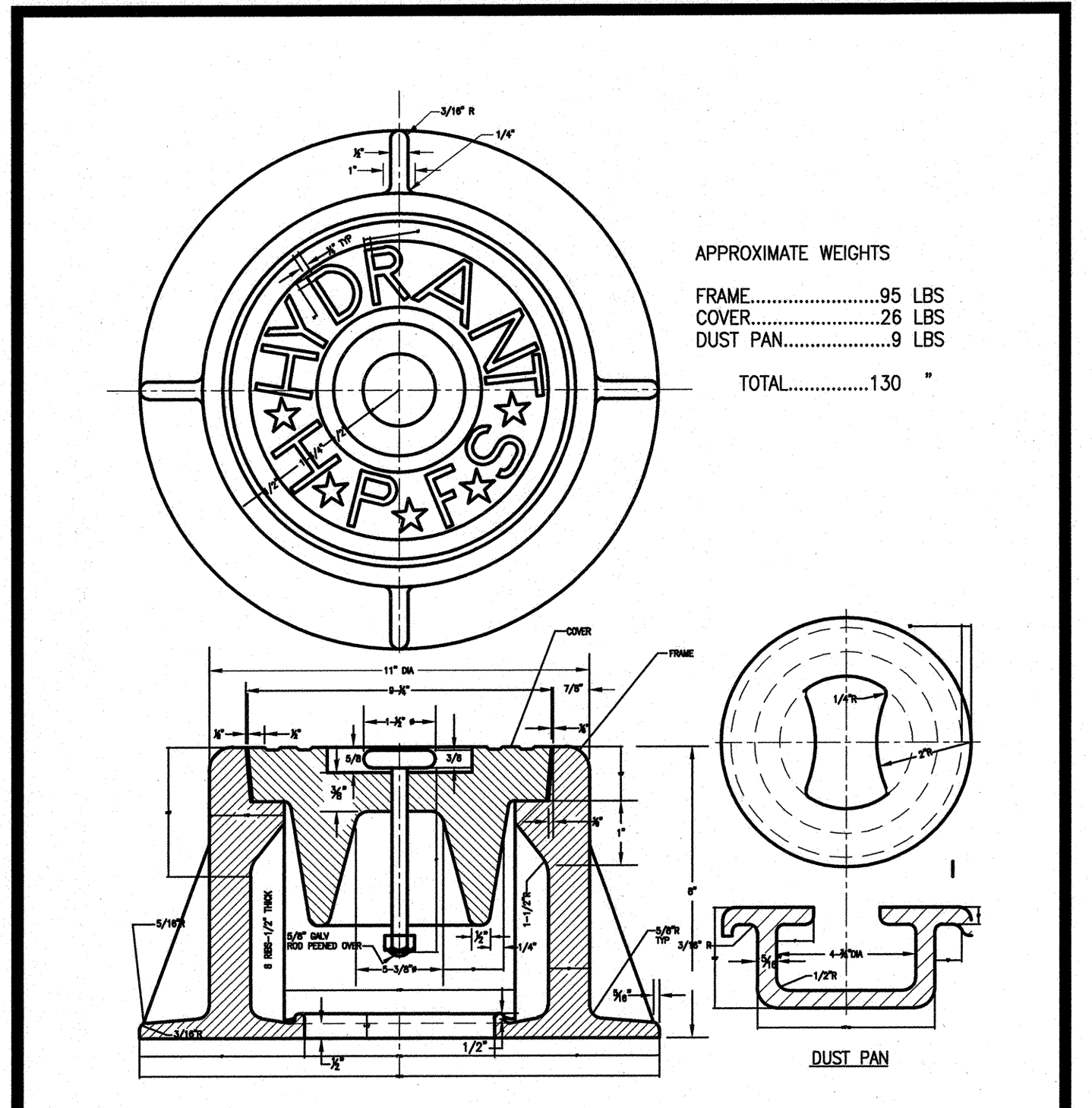
GENERAL NOTES
 1. THREADS SHALL CONFORM TO THE ANSI FOR SCREW THREADS B1.1 COARSE THREAD SERIES WITH CLASS 2A TOLERANCE FOR BOLTS AND CLASS 2B FOR NUTS. 1-5/8" THREADS MAY BE RUN.
 2. BOLTS, TIE RODS, NUTS AND WASHERS SHALL BE OF AUSTENITIC STAINLESS STEEL CONFORMING TO AMERICAN IRON AND STEEL INSTITUTE (ANSI) AND AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) SPECIFICATIONS. ALL BOLTS SHALL CONFORM TO ASTM A-193, SYMBOL BBM (ANSI TYPE 316). ALL NUTS AND SLEEVES SHALL CONFORM TO ASTM 194, SYMBOL BM (ANSI TYPE 316). ALL TIE RODS, THREADED RODS AND WASHERS SHALL CONFORM TO ANSI TYPE 316.
 3. EXACT BOLT LENGTHS REQUIRED FOR OTHER JOINTS SHALL BE DETERMINED IN THE FIELD.
 4. CONTINUOUSLY THREADED RODS MAY BE SUBSTITUTED.

SCALE: NONE

CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
STAINLESS STEEL BOLTS, NUTS AND WASHERS

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 2/23/2005
 REVISION: 3

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-49,102



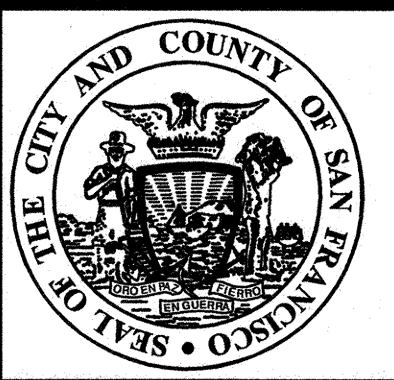
CITY AND COUNTY OF SAN FRANCISCO
 DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
DETAIL OF GATE VALVE COVER, FRAME AND DUST PAN FOR H.P. HYDRANT

BY: DEM APP'D _____ MANAGER, GES DIVISION DATE: 2/22/05
 REVISION: 0

CH'D: MBS APP'D _____ CHIEF, BUREAU OF ENGINEERING DETAIL: HPL-5337

NO.	DATE	DESCRIPTION	BY	APP.
TABLE OF REVISIONS				
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION				

REFERENCE INFORMATION & FILE NO. OF SURVEYS

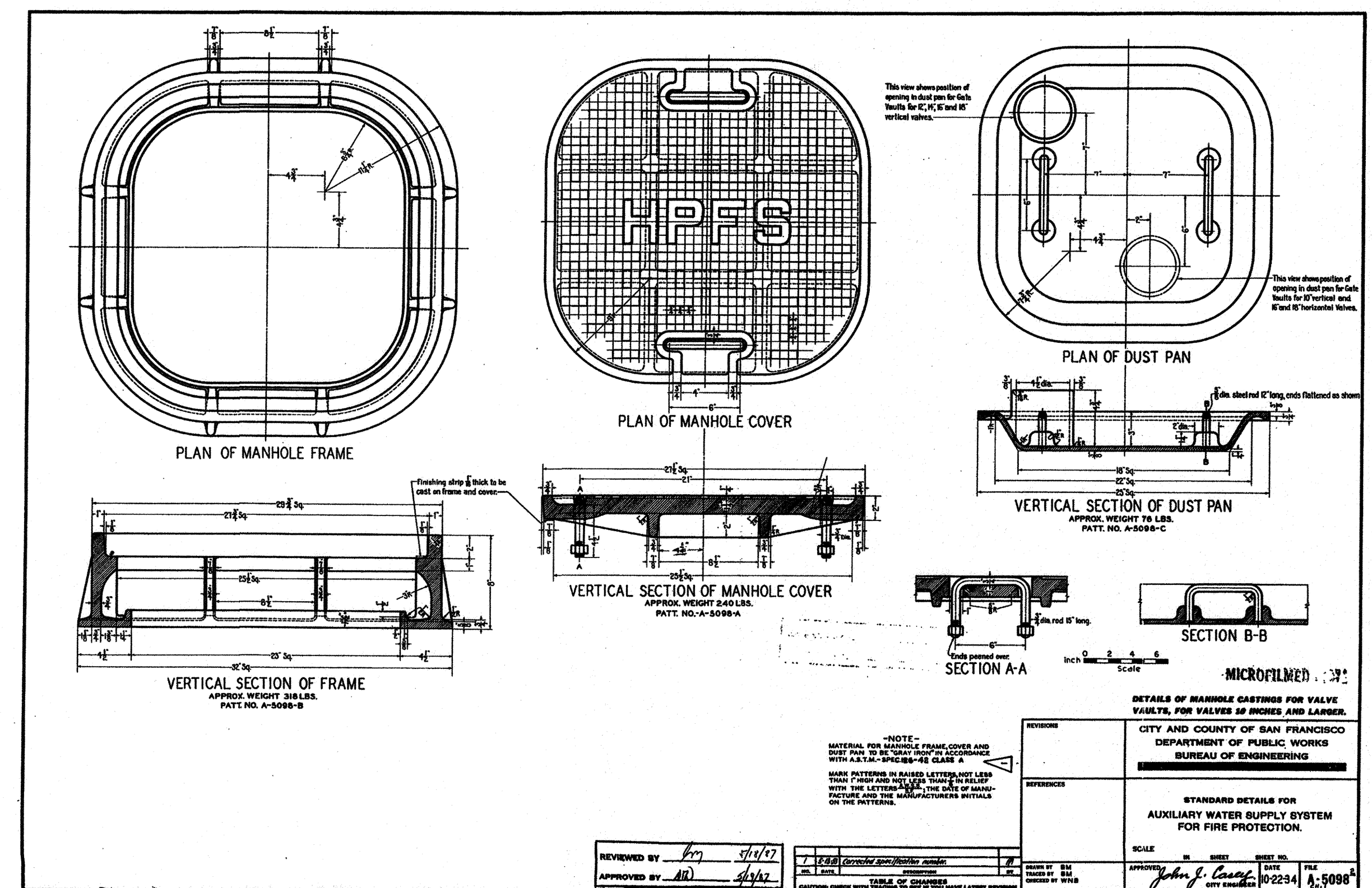
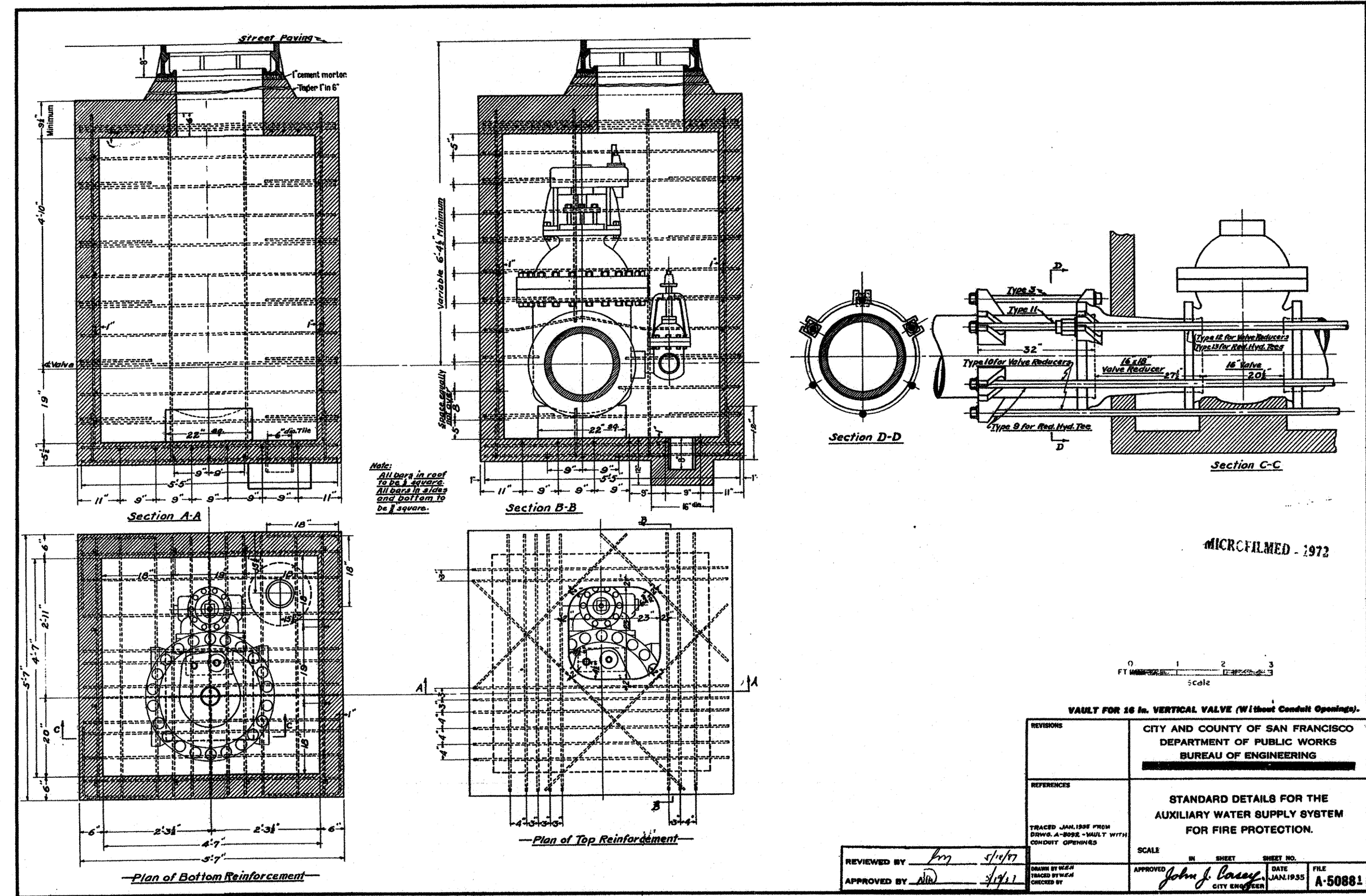


BUREAU OF ENGINEERING
 DEPARTMENT OF PUBLIC WORKS
 CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: DATE:	APPROVED	SCALE:
DRAWN: DATE:	SECTION MANAGER DATE:	NONE
CHECKED: DATE:	DEPUTY BUREAU MANAGER DATE:	SHEET OF SHEETS
MBS 11/10	BUREAU MANAGER DATE:	5 OF 10

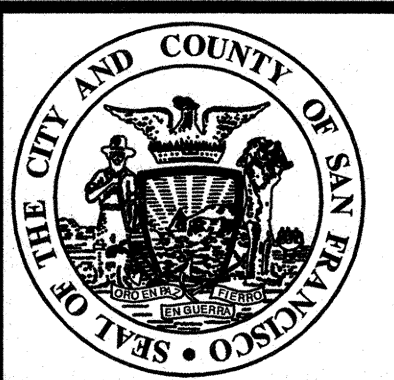
CITY AND COUNTY OF SAN FRANCISCO
 AUXILIARY WATER SUPPLY SYSTEM
 AWSS STANDARD DRAWING V

SPECIFICATION NO.
DRAWING NO. AWSS 5
FILE NO.
REV. NO. 0



NO.	DATE	DESCRIPTION	BY	APP.
TABLE OF REVISIONS CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION				

REFERENCE INFORMATION
& FILE NO. OF SURVEYS



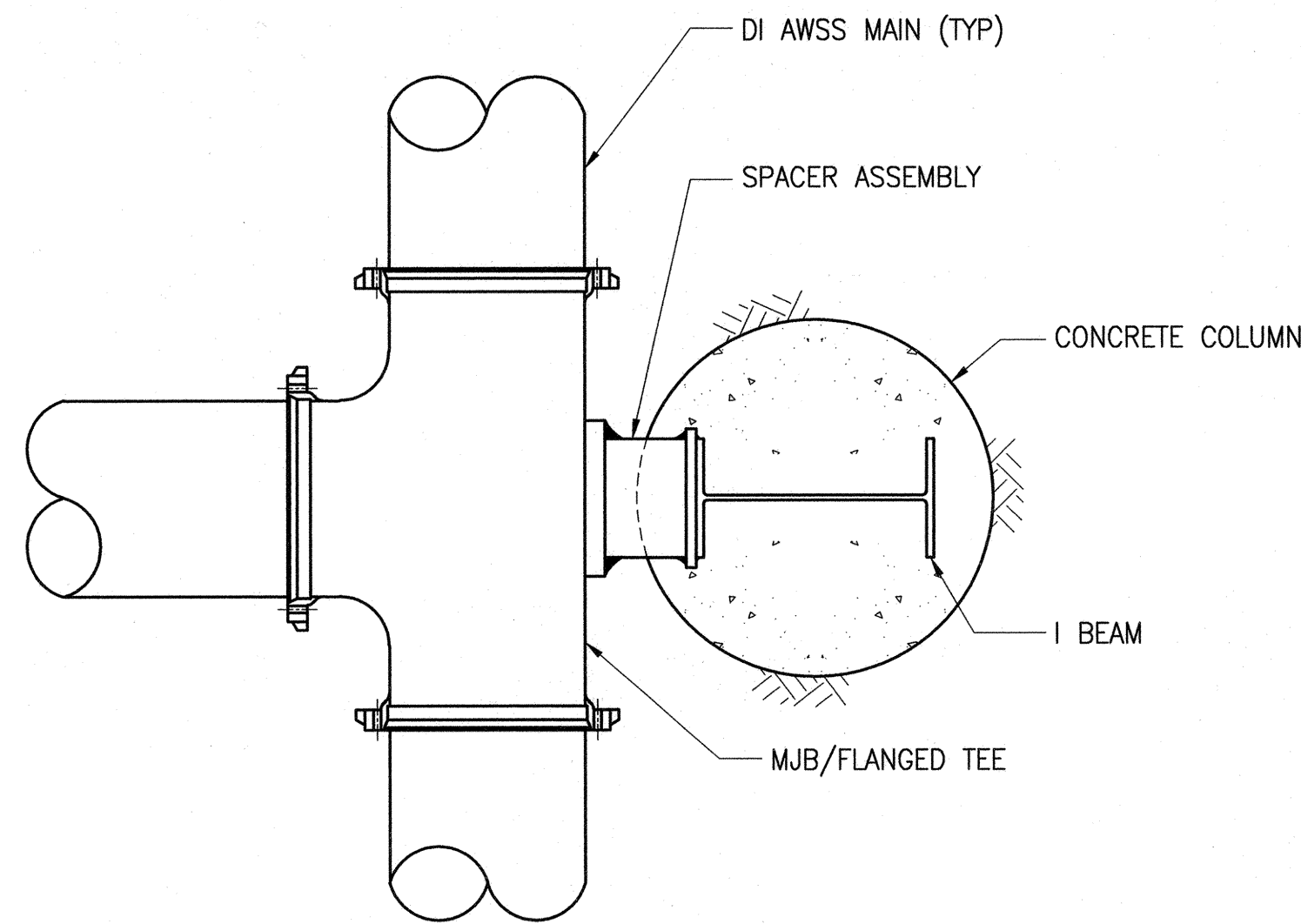
BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: DATE:	APPROVED
DRAWN: DATE: NL 11/10	SECTION MANAGER DATE:
CHECKED: DATE: MBS 11/10	DEPUTY BUREAU MANAGER DATE:
	BUREAU MANAGER DATE:

SCALE:
NONE
SHEET OF SHEETS
6 OF 10

CITY AND COUNTY OF SAN FRANCISCO	
AUXILIARY WATER SUPPLY SYSTEM	
AWSS STANDARD DRAWING VI	

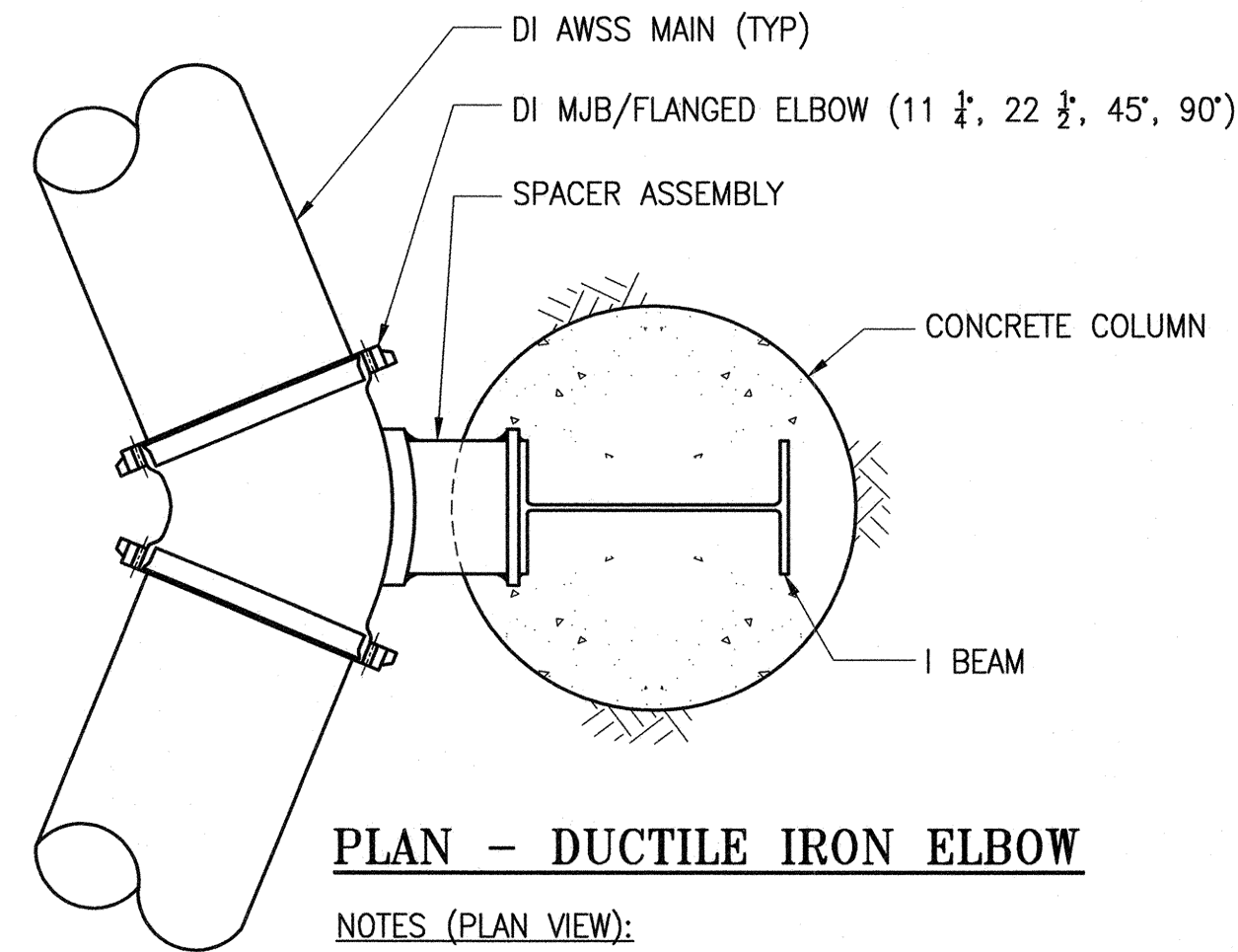
SPECIFICATION NO.
DRAWING NO. AWSS 6
FILE NO.
REV. NO. 0



PLAN - DUCTILE IRON TEE

NOTES (PLAN VIEW):

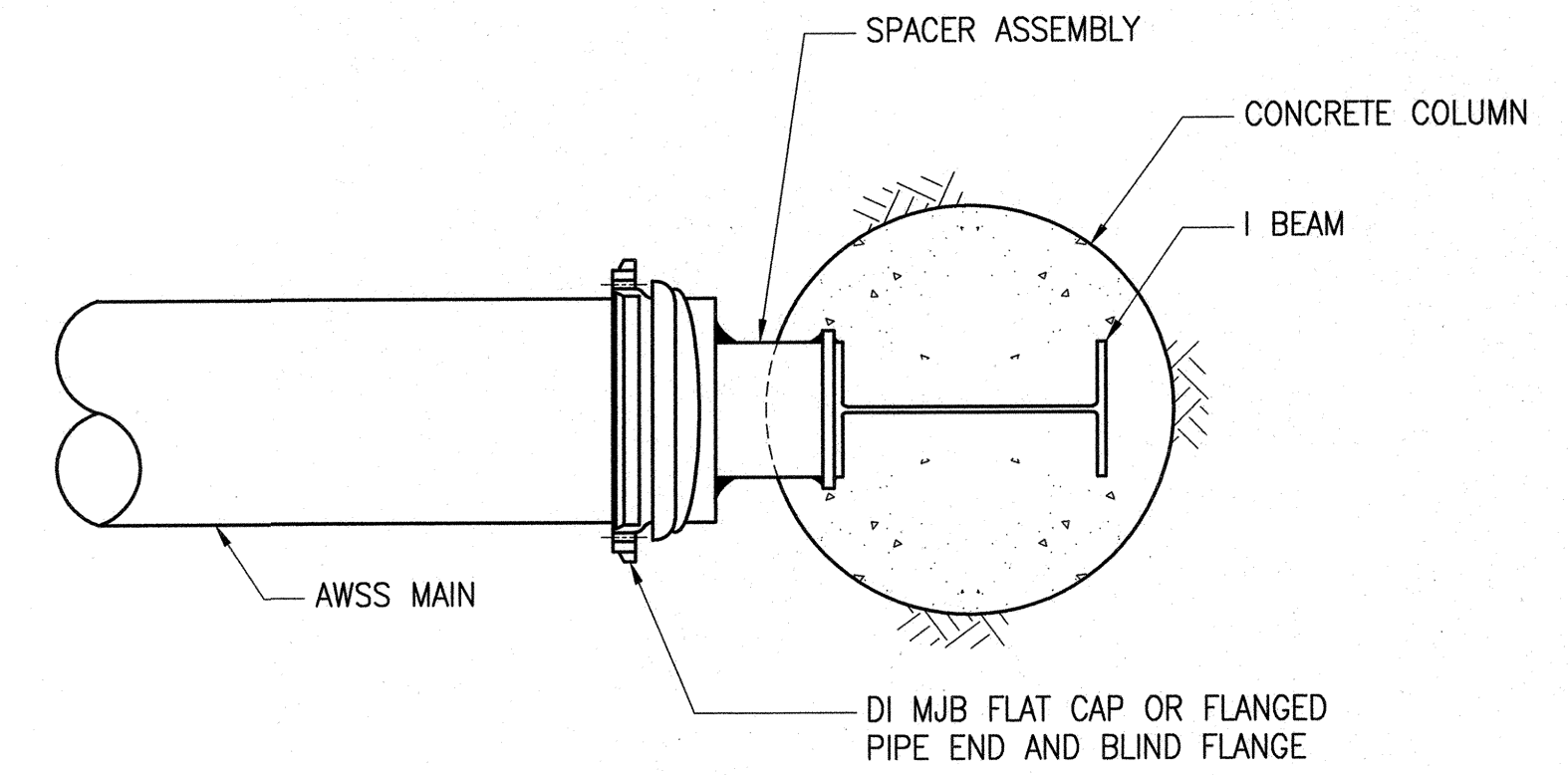
1. STOP COLLARS, TIE RODS, NUTS, WASHERS, COLLAR STOPS NOT SHOWN. REFER TO NEW WORK DWGS FOR REQUIREMENTS.
2. REFER TO "TABLE OF DIMENSIONS" ON THIS SHEET FOR SPACER ASSEMBLY DIAMETER, I BEAM SIZE AND LENGTH, AND CONCRETE COLUMN DIAMETER.



PLAN - DUCTILE IRON ELBOW

NOTES (PLAN VIEW):

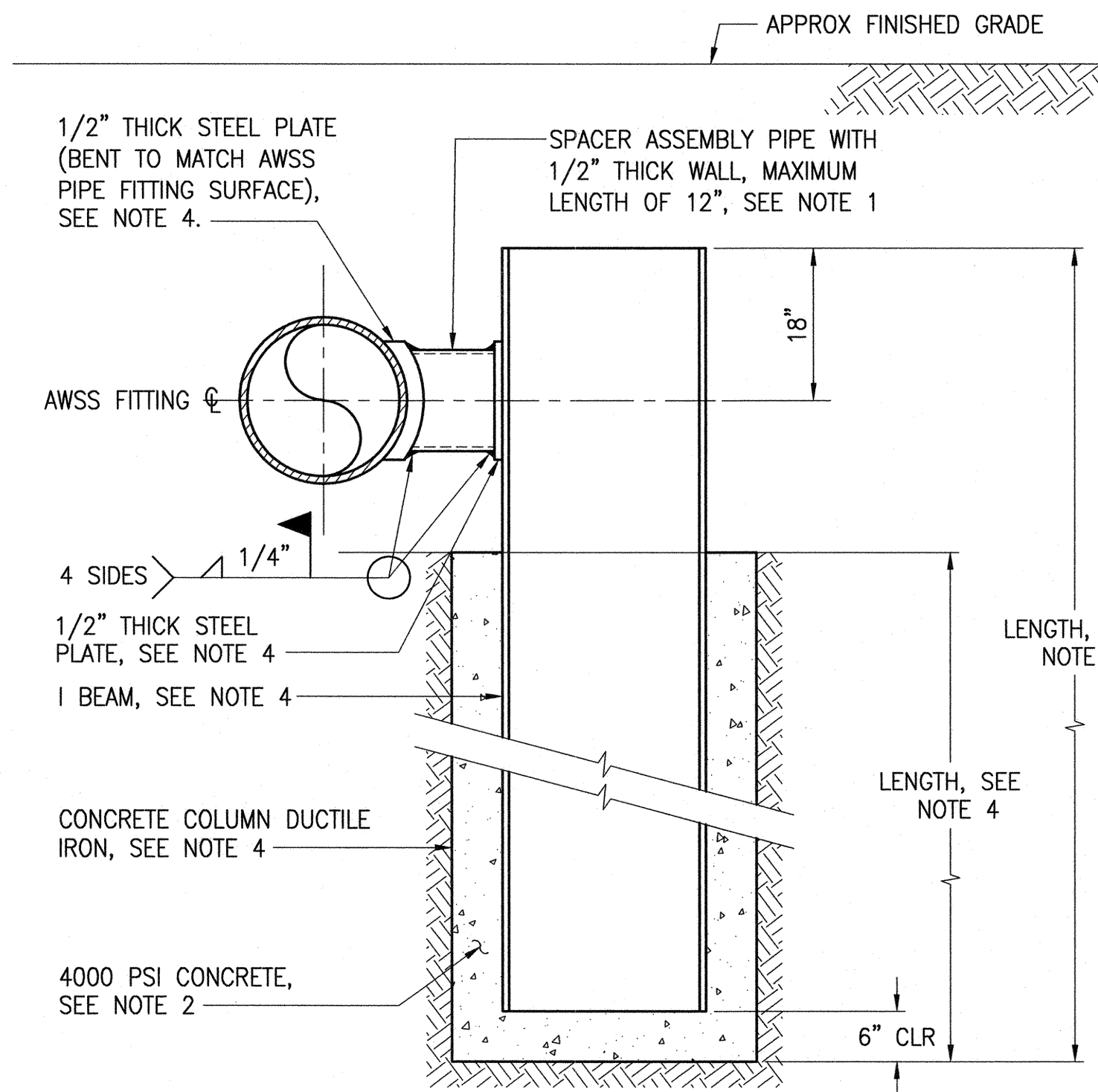
1. STOP COLLARS, TIE RODS, NUTS, WASHERS, COLLAR STOPS NOT SHOWN. REFER TO NEW WORK DWGS FOR REQUIREMENTS.
2. REFER TO "TABLE OF DIMENSIONS" ON THIS SHEET FOR SPACER ASSEMBLY DIAMETER, I BEAM SIZE AND LENGTH, AND CONCRETE COLUMN DIAMETER.



PLAN - DUCTILE IRON FLAT CAP/BLIND FLANGE

NOTES (PLAN VIEW):

1. STOP COLLARS, TIE RODS, NUTS, WASHERS, COLLAR STOPS NOT SHOWN. REFER TO NEW WORK DWGS FOR REQUIREMENTS.
2. REFER TO "TABLE OF DIMENSIONS" ON THIS SHEET FOR SPACER ASSEMBLY DIAMETER, I BEAM SIZE AND LENGTH, AND CONCRETE COLUMN DIAMETER.



ELEVATION

CONCRETE/STEEL THRUST POST DETAIL

SCALE: NONE

NOTES:

1. STEEL SPACER ASSEMBLY PIPE END SHALL BE CUT TO MATCH BENT STEEL PLATE. REFER TO "TABLE OF DIMENSIONS" FOR DIAMETER.
2. FILL ENTIRE VOID BETWEEN I BEAM AND DRILLED SHAFT WITH CONCRETE, VIBRATE TO ENSURE NO VOIDS REMAIN.
3. I BEAM SHALL BE CENTERED IN DRILLED SHAFT.
4. REFER TO "TABLE OF DIMENSIONS" ON THIS SHEET FOR STEEL PLATE SIZE, I BEAM SIZE AND LENGTH AND CONCRETE SHAFT DIAMETER AND DEPTH.
5. REFER TO NEW WORK PLAN/PROFILE DRAWINGS FOR DEPTH OF AWSS PIPE FROM FINISHED GARDE.

TABLE OF DIMENSIONS

AWSS PIPE SIZE (INCHES)	SPACER ASSEMBLY DIA. (INCHES)	STEEL PLATE (INCHES)	I BEAM	I BEAM LENGTH (FEET)	CONCRETE COLUMN DIA. (INCHES)
8-12	8	12 X 12	W12 X 72	20	30
14-16	10	14 X 14	W16 X 88	26	32
18-20	12	18 X 18	W24 X 100	33	36

NO.	DATE	DESCRIPTION	BY	APP.
TABLE OF REVISIONS				
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION				

REFERENCE INFORMATION & FILE NO. OF SURVEYS



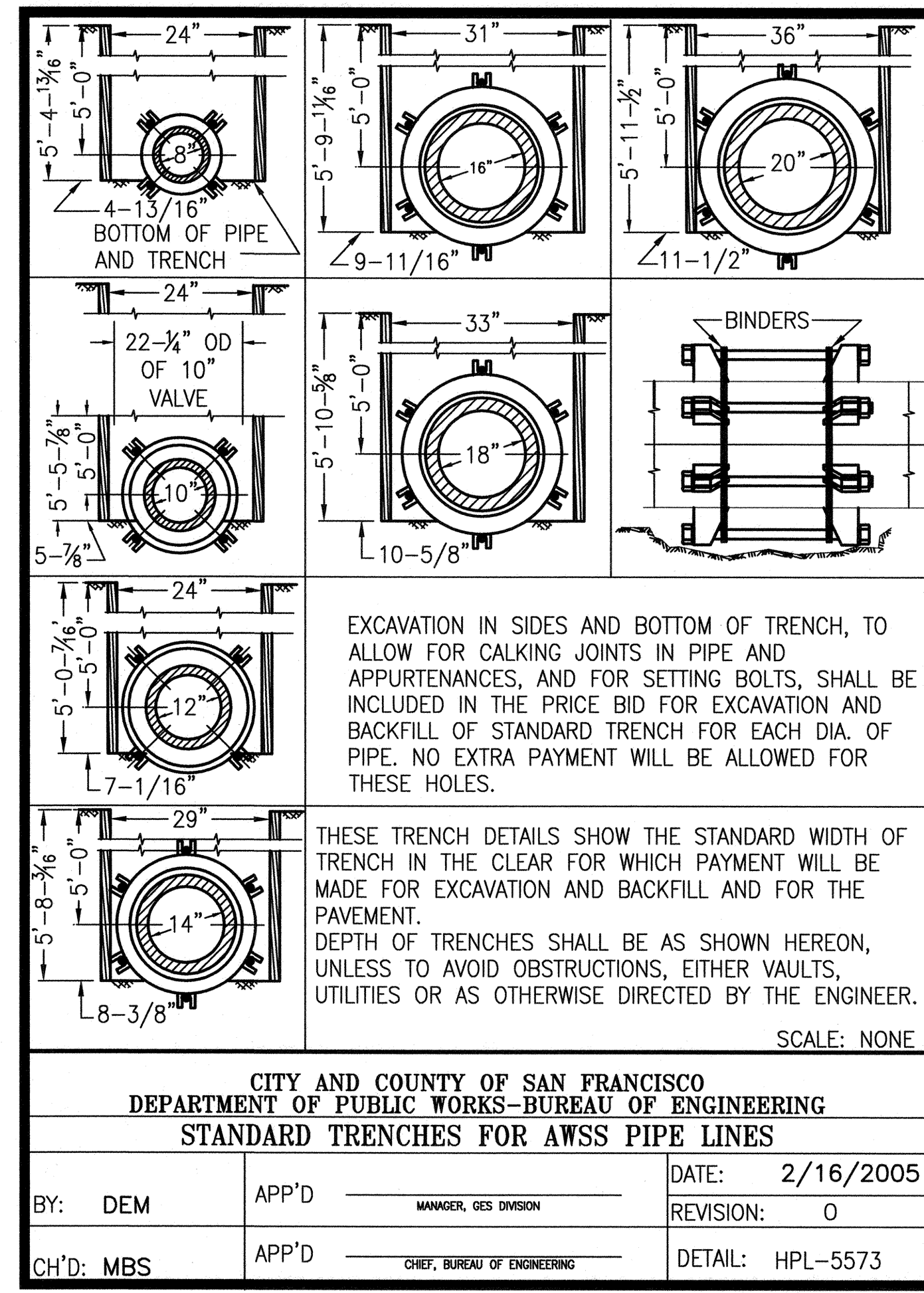
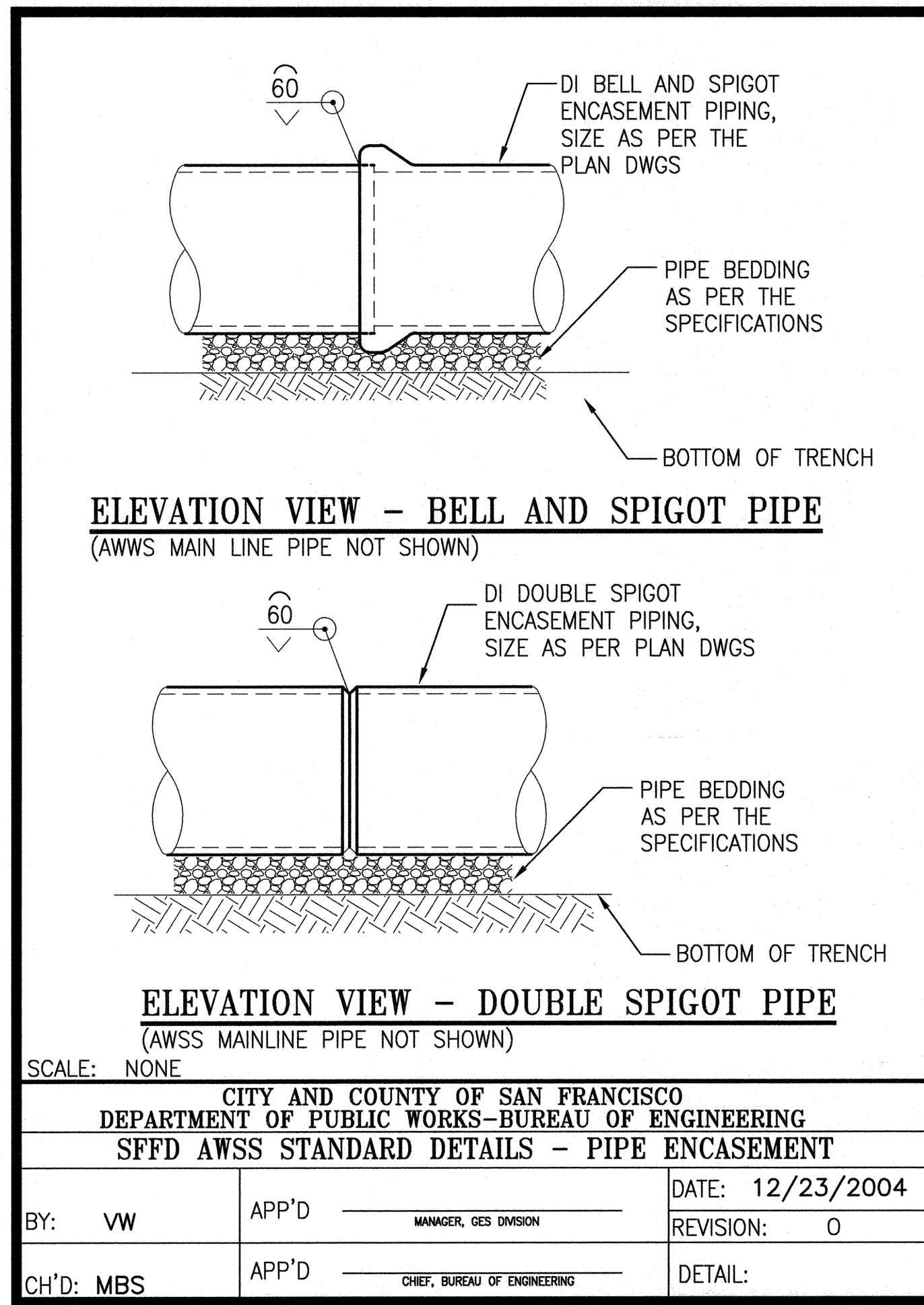
BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: DATE:	APPROVED
DRAWN: DATE:	SECTION MANAGER DATE:
CHECKED: DATE:	DEPUTY BUREAU MANAGER DATE:
MBS 11/10	BUREAU MANAGER DATE:

SCALE: NONE
 SHEET OF SHEETS
 7 OF 10

CITY AND COUNTY OF SAN FRANCISCO
AUXILIARY WATER SUPPLY SYSTEM
AWSS STANDARD DRAWING VII

SPECIFICATION NO.
DRAWING NO. AWSS 7
FILE NO.
REV. NO. 0



SETTLEMENT REFERENCE POINT PIPE DEFLECTION

PIPE SIZE (Diameter)	MAX. DEFLECTION (Degrees)	30% OF MAX. (Degrees)	70% OF MAX. (Degrees)
8"	2.3869°	.7161°	1.6708°
10"	2.4283°	.7285°	1.6998°
12"	2.0367°	.6110°	1.4257°
14"	1.7531°	.5259°	1.2272°
16"	1.5428°	.4628°	1.08°
18"	1.38°	.4140°	.9660°
20"	1.2456°	.3737°	.8719°

$\infty_{\text{Ton}} = 1 \frac{(X1 - X1') - (X2 - X2')}{Z}$

∞ = DEFLECTION ANGLE IN DEGREES
 $X1$ = INITIAL READING OF 1ST SRP
 $X1'$ = CURRENT READING OF 1ST SRP
 $X2$ = INITIAL READING OF 2ND SRP
 $X2'$ = CURRENT READING OF 2ND SRP
 Z = DISTANCE BETWEEN SRP'S

NOTE: IF ∞ COMES OUT NEGATIVE, DISREGARD THE MINUS SIGN. SCALE: NONE

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
SETTLEMENT REFERENCE POINT PIPE DEFLECTION

BY: DEM	APP'D _____ MANAGER, GES DIVISION	DATE: 12/23/2004
CH'D: MBS	APP'D _____ CHIEF, BUREAU OF ENGINEERING	REVISION: 0
		DETAIL: HPL-5625.1

DEFLECTION TABLE FOR CLASS GH PIPE

SIZE OF PIPE	8"	10"	12"	14"	16"	18"	20"
CAULKING MIN.	3/16"	3/16"	3/16"	1/4"	5/16"	11/32"	11/32"
SPACE MAX. Gr=	9/16"	9/16"	9/16"	1/2"	9/16"	9/16"	17/32"

8" PIPE DATA

12" LENGTH	R EQ 288'-6-3/4"
8" "	R EQ 192'-6-1/8"
4" "	R EQ 96'-5-1/2"

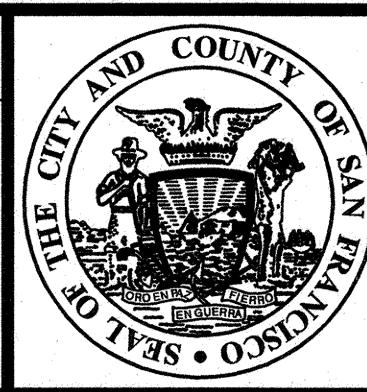
SCALE: NONE

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS-BUREAU OF ENGINEERING
DEFLECTION TABLE FOR CLASS GH PIPE

BY: DEM	APP'D _____ MANAGER, GES DIVISION	DATE: 12/23/2004
CH'D: MBS	APP'D _____ CHIEF, BUREAU OF ENGINEERING	REVISION: 0
		DETAIL: HPL-5625

NO.	DATE	DESCRIPTION	BY	APP.
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION				

REFERENCE INFORMATION & FILE NO. OF SURVEYS

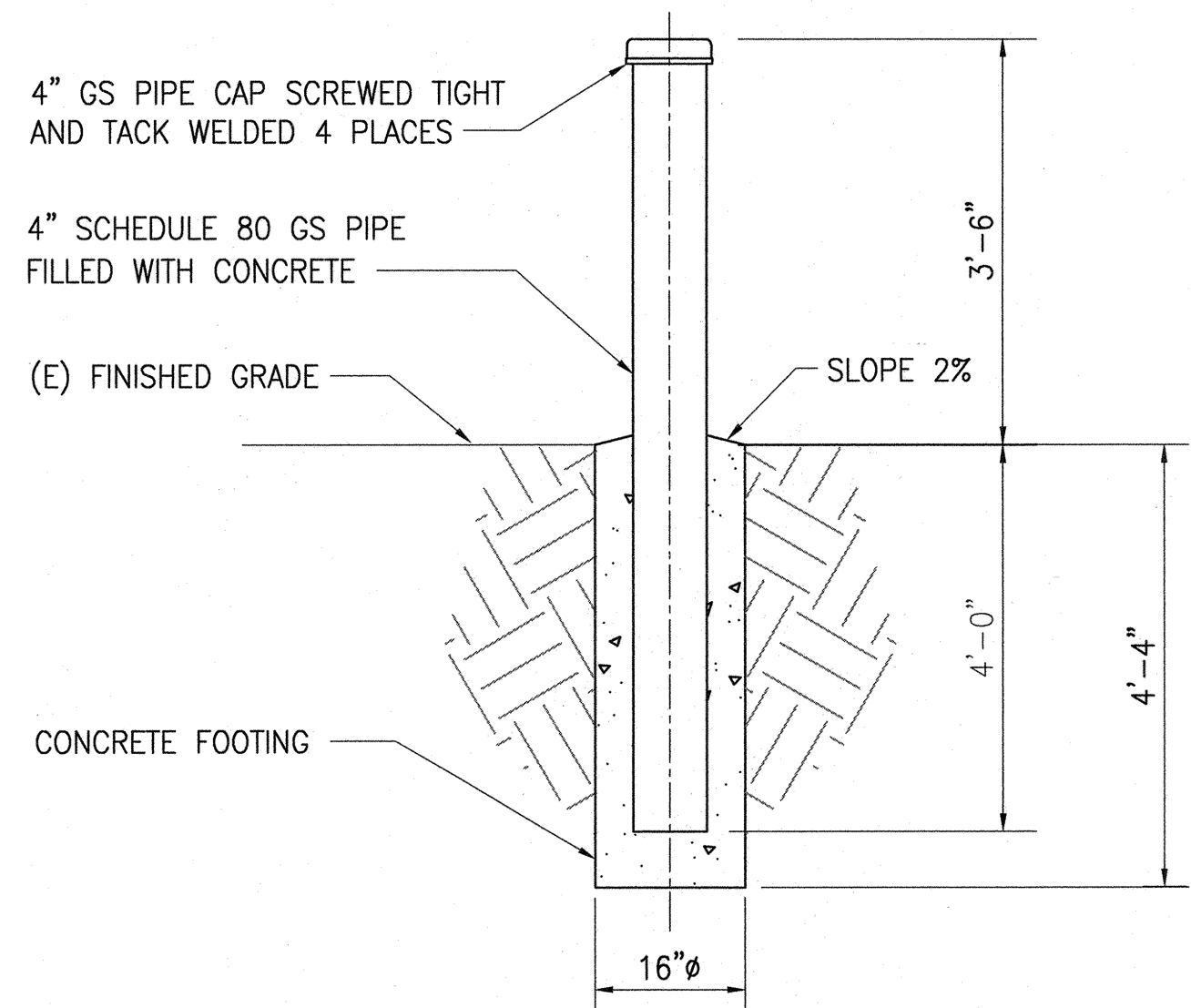


BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: DATE:	APPROVED	SCALE:
DRAWN: DATE:	SECTION MANAGER DATE:	NONE
CHECKED: DATE:	DEPUTY BUREAU MANAGER DATE:	SHEET OF SHEETS
MBS 11/10	BUREAU MANAGER DATE:	8 OF 10

CITY AND COUNTY OF SAN FRANCISCO
AUXILIARY WATER SUPPLY SYSTEM
AWSS STANDARD DRAWING VIII

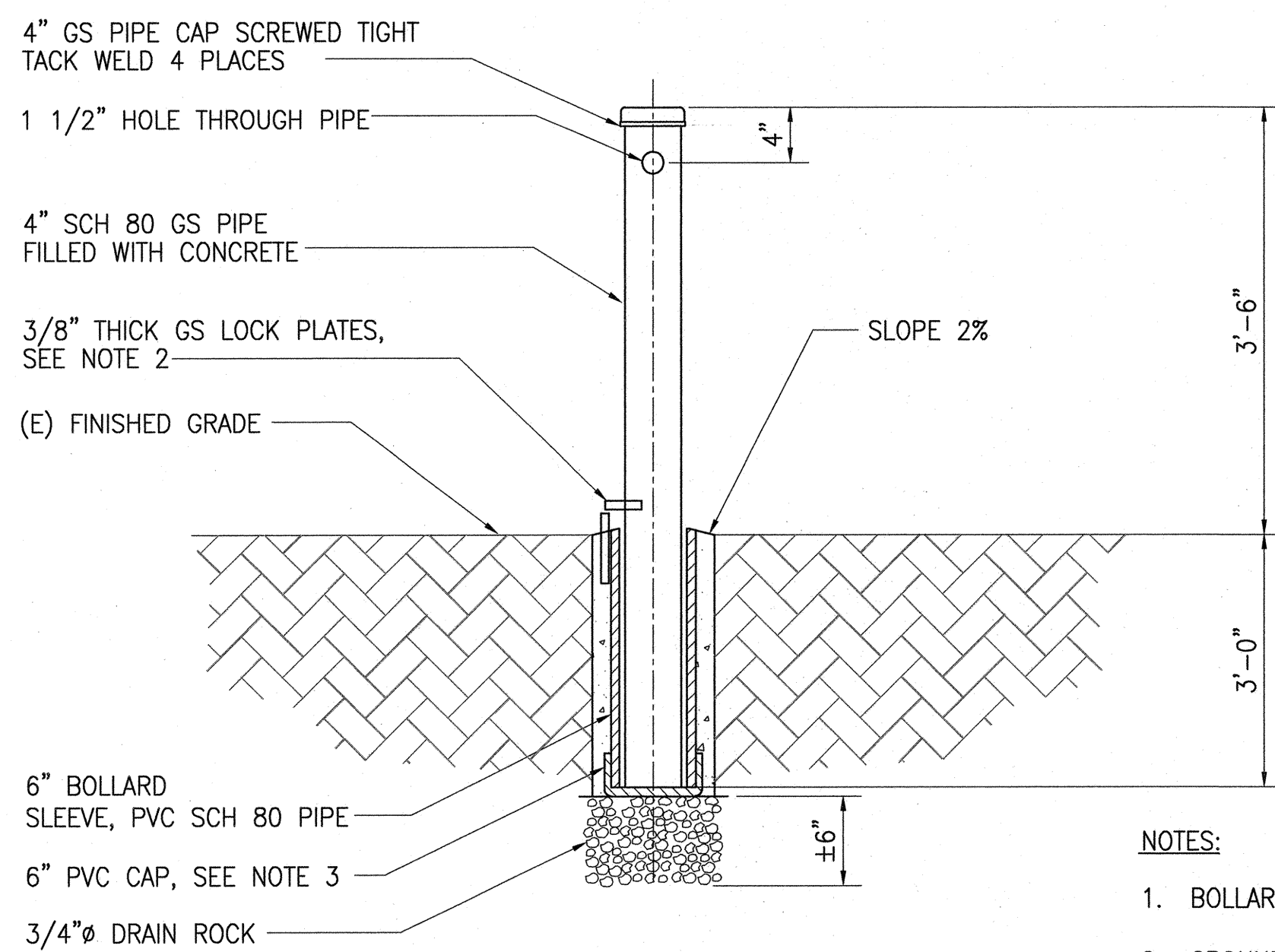
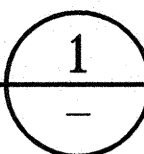
SPECIFICATION NO.
DRAWING NO. AWSS 8
FILE NO.
REV. NO. 0



ELEVATION

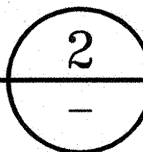
- NOTE:
1. BOLLARD SHALL BE PAINTED SAFETY YELLOW.

PERMANENT BOLLARD
SCALE: NONE

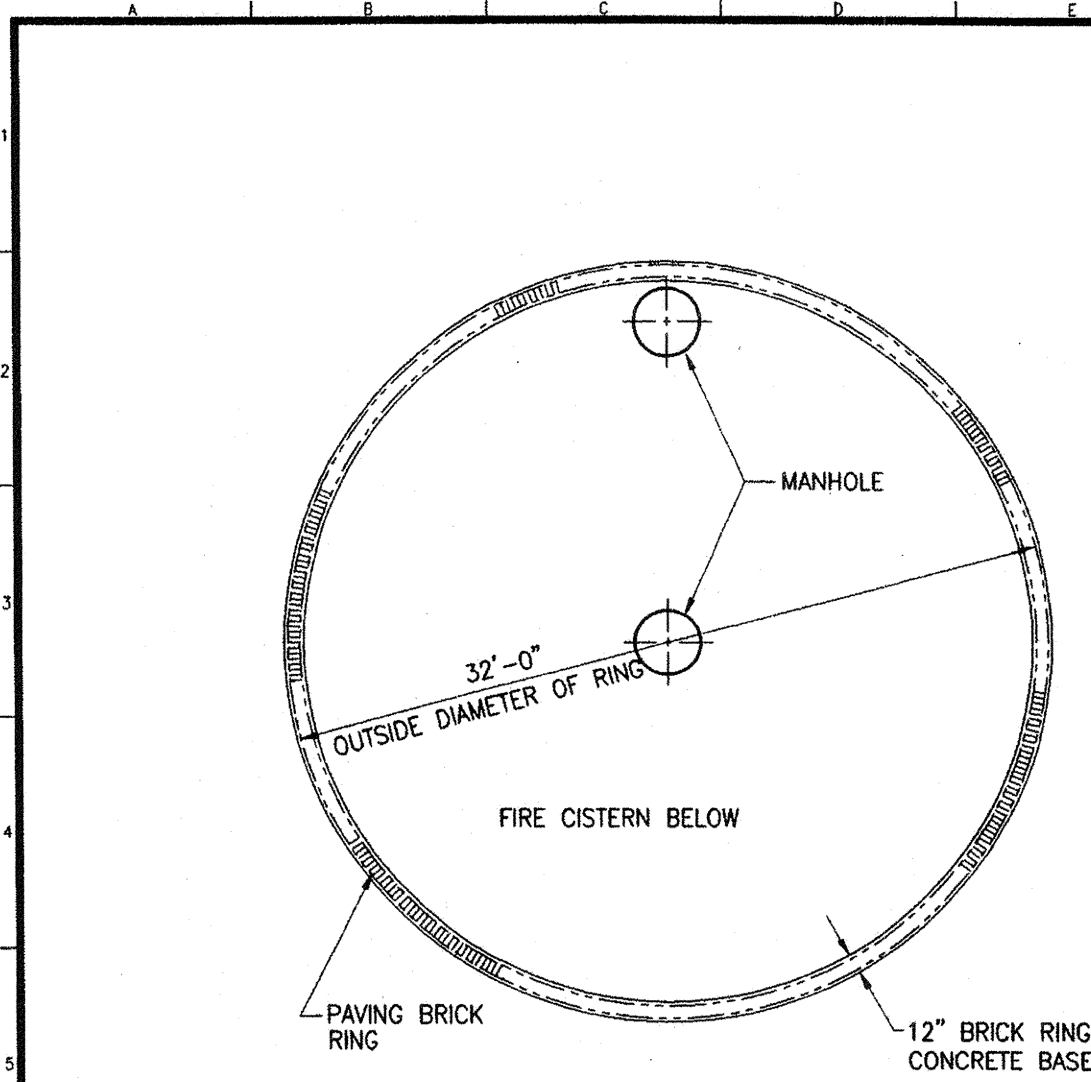


ELEVATION

REMOVABLE BOLLARD
SCALE: NONE



- NOTES:
1. BOLLARD SHALL BE PAINTED SAFETY YELLOW.
2. GROUND MOUNTED LOCK PLATE SHALL BE EMBEDDED 8" INTO CONCRETE AND PROTRUDE 1 1/4" ABOVE CONCRETE FOOTING.
3. SOLVENT WELD PVC CAP TO PIPE SLEEVE, DRILL 6 (SIX) 1/2" HOLES THROUGH PVC CAP BOTTOM.



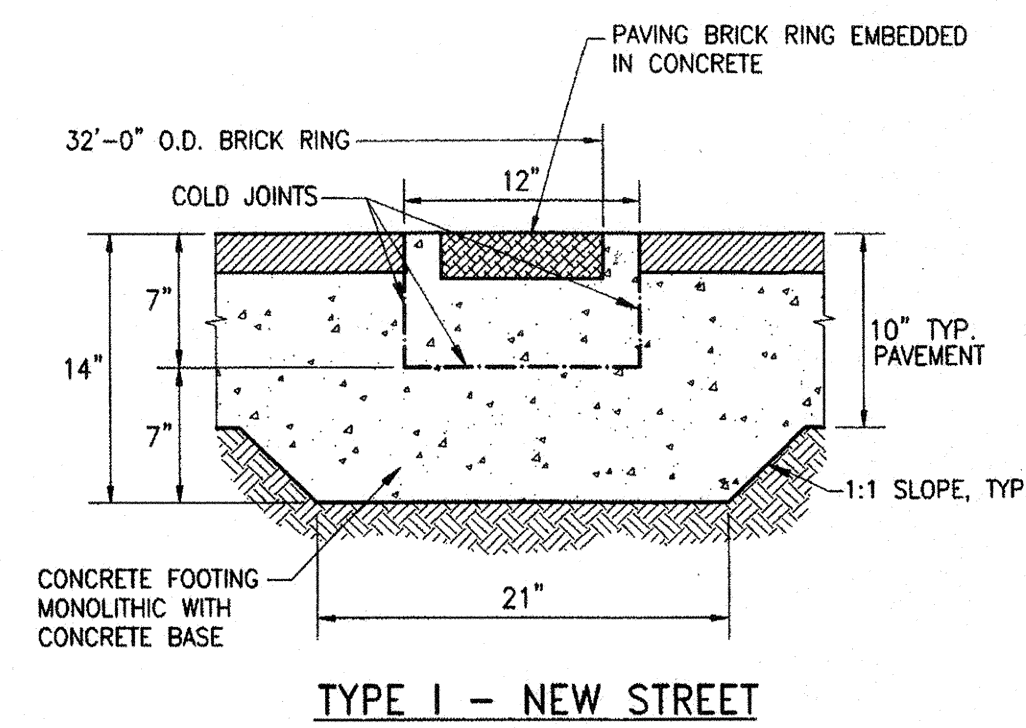
PLAN - TYPICAL AWSS FIRE CISTERN RING

GENERAL NOTES

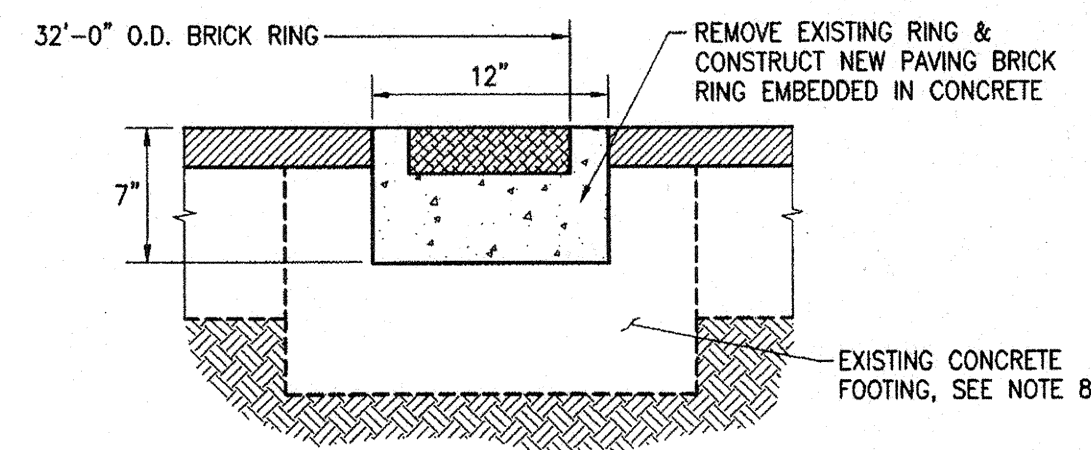
- FIRE CISTERNS SHALL BE IDENTIFIED WITH A RING OF PAVING BRICKS 32'-0" IN DIAMETER TO THE OUTSIDE EDGE.
- BRICKS SHALL BE 4" x 8-1/4" x 2-3/8" RED REPPRESSED PAVING BRICKS HAVING ROUND EDGES. ASTM C7-42 LAID FLAT.
- CONCRETE SHALL BE CLASS E.
- TOPS OF BRICKS SHALL BE FLUSH WITH STREET PAVEMENT, SPACED 1/2" BETWEEN BRICKS AND LAYED WITH LONG DIMENSION OF BRICK SET RADIALLY.
- WHERE A CISTERN IS LOCATED PARTIALLY UNDER A SIDEWALK, INSTALL CISTERN IDENTIFICATION RING IN THE STREET AREA ONLY.
- DO NOT INSTALL CISTERN IDENTIFICATION RING IN THE GUTTER OR PARKING STRIP AREAS.
- USE THE SAME DETAIL FOR CONSTRUCTING BRICK RING ON EXISTING CONCRETE PAVEMENT.
- EXISTING BRICK RING CONCRETE FOOTING MAY VARY.

ABBREVIATIONS:

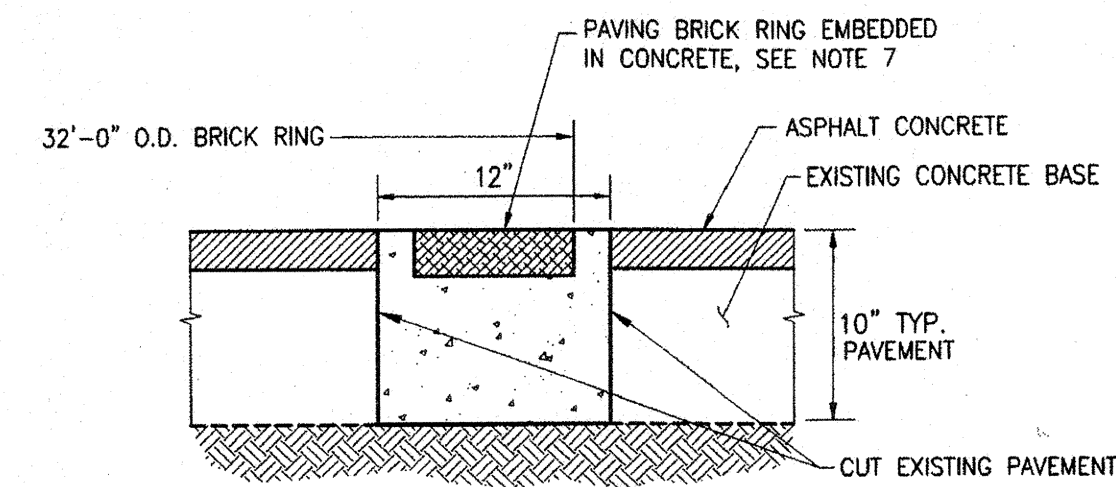
AWSS = AUXILIARY WATER SUPPLY SYSTEM
O.D. = OUTSIDE DIAMETER
TYP. = TYPICAL



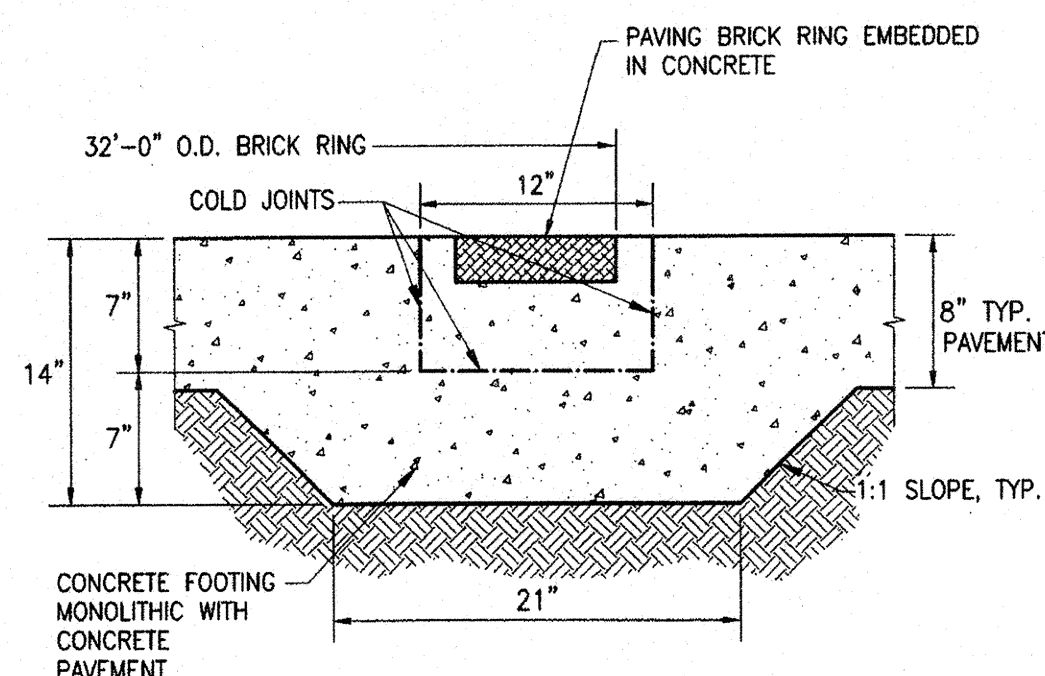
TYPE I - NEW STREET



TYPE III - RESURFACING WITH EXISTING RING



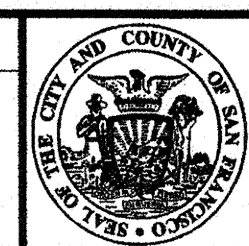
TYPE II - RESURFACING WITH NO EXISTING RING



TYPE IV - CONCRETE PAVEMENT

This Standard Plan was developed for use on public works projects in the City and County of San Francisco, and shall not be used without consulting a Registered Professional Engineer. The Department of Public Works reserves the right to make revisions to this Standard Plan at any time.

NO.	DATE	DESCRIPTION	BY	APP.
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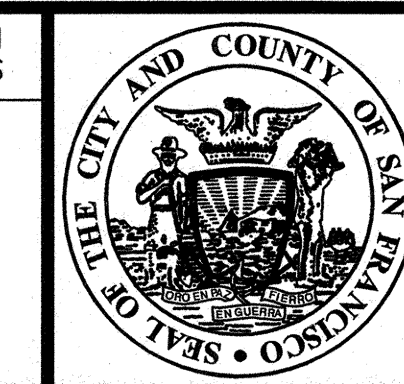
BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

REVIEWED: DATE: 04/20/07	PLANS APPROVAL DATE: APRIL 30, 2007
PR: 04/20/07	SECTION MANAGER: 4/20/07
DRAWN: DATE: 04/20/07	JC: 04/20/07
CHECKED: DATE: 04/20/07	DEPUTY BUREAU MANAGER: 4/20/07
EK: 04/20/07	BUREAU MANAGER: 4/20/07

STANDARD PLAN	OLD FILE NO.
STREETS AND HIGHWAYS	HPL-5132.8 CH 1
AWSS CISTERN IDENTIFICATION PAVEMENT RING	FILE NO. 87,179
	REV. NO.

NO.	DATE	DESCRIPTION	BY	APP.
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION				

REFERENCE INFORMATION & FILE NO. OF SURVEYS



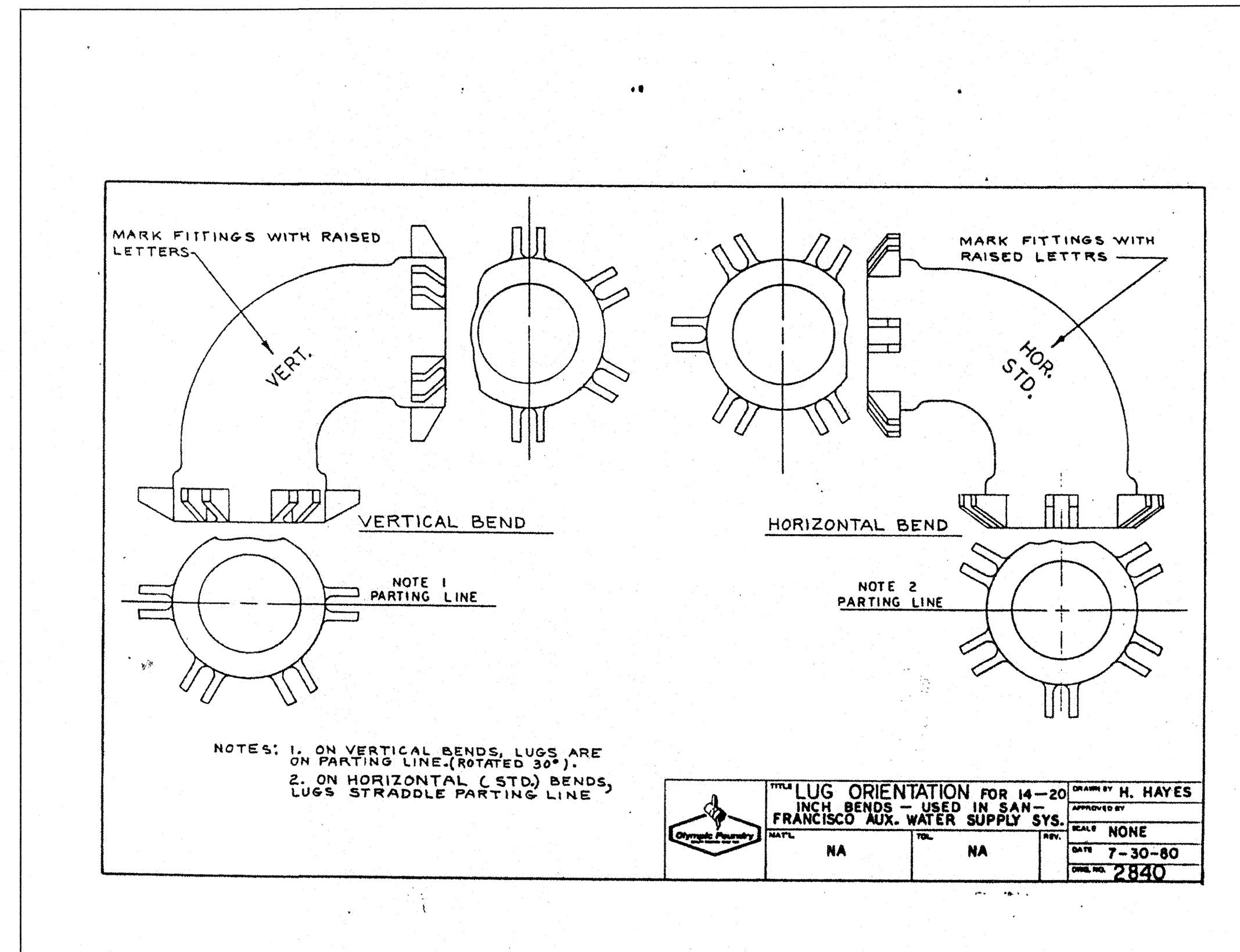
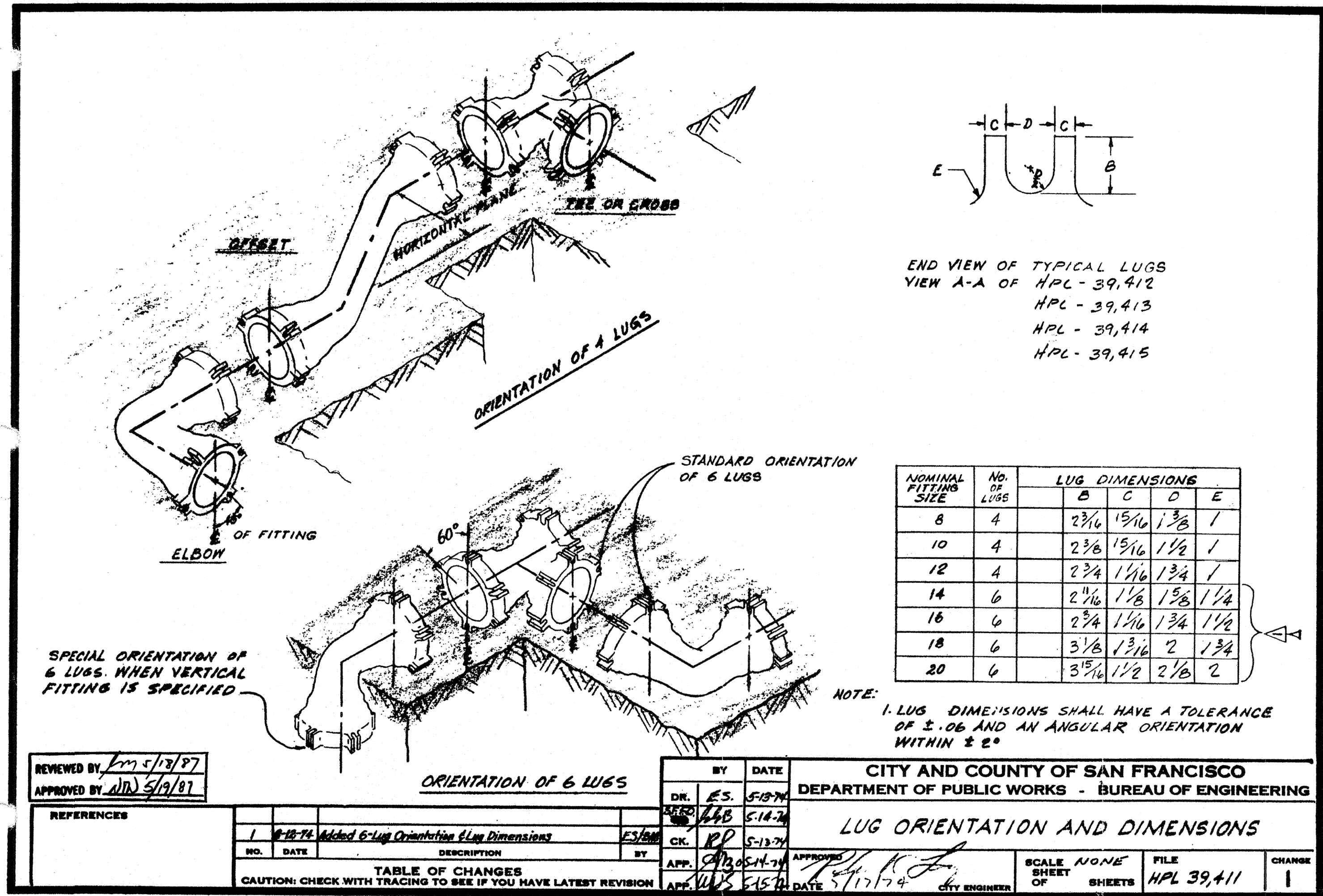
BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: DATE:	APPROVED:
DRAWN: DATE: 11/10	SECTION MANAGER: DATE:
CHECKED: DATE: 11/10	DEPUTY BUREAU MANAGER: DATE:
MBS: 11/10	BUREAU MANAGER: DATE:

SCALE:	NONE
SHEET OF SHEETS:	9 OF 10

CITY AND COUNTY OF SAN FRANCISCO
AUXILIARY WATER SUPPLY SYSTEM
AWSS STANDARD DRAWING IX

SPECIFICATION NO.
DRAWING NO. AWSS 9
FILE NO.
REV. NO. 0



REVIEWED BY *lm* 5/13/87
APPROVED BY *alm* 5/19/87

BY DATE
DR. *ES* 5-18-74
CHK. *MB* 5-18-74
APP. *PP* 5-13-74
APP. *WBS* 5-15-74 DATE 5/17/74

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS - BUREAU OF ENGINEERING

LUG ORIENTATION AND DIMENSIONS

SCALE NONE SHEET OF SHEETS HPL 39,411 CHANGE 1

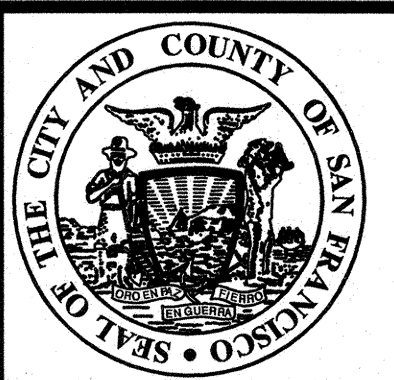
NO.	DATE	DESCRIPTION	BY	APP.
1	8-12-74	Added 6-Lug Orientation & Lug Dimensions	<i>ES</i>	

TABLE OF CHANGES
CAUTION: CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

NO.	DATE	DESCRIPTION	BY	APP.

TABLE OF REVISIONS
CHECK WITH TRACING TO SEE IF YOU HAVE LATEST REVISION

REFERENCE INFORMATION & FILE NO. OF SURVEYS

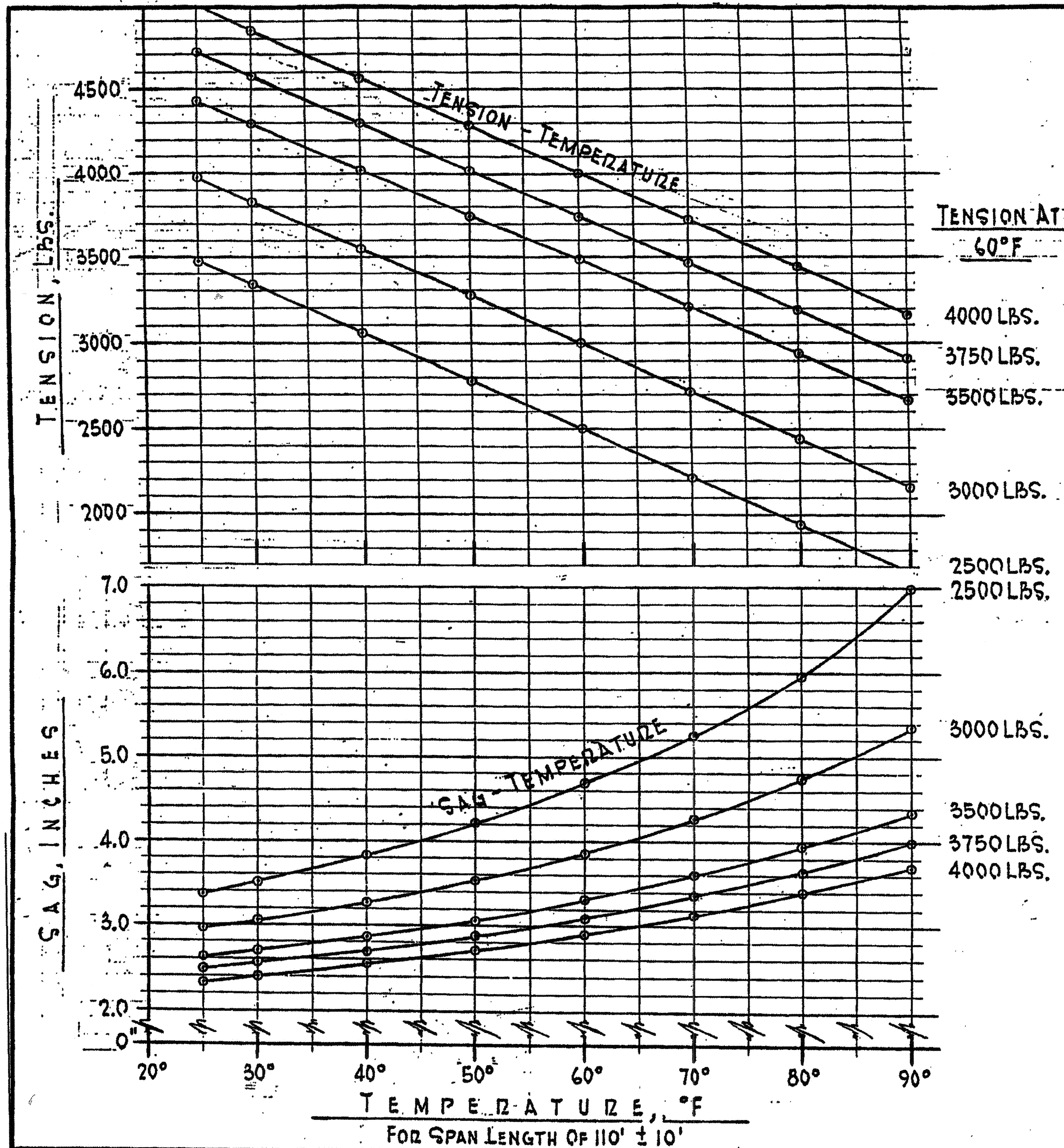


BUREAU OF ENGINEERING
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF SAN FRANCISCO

DESIGNED: DATE:	APPROVED:	SCALE:
DRAWN: DATE: NL 02/11	SECTION MANAGER DATE:	NONE
CHECKED: DATE: MBS 02/11	DEPUTY BUREAU MANAGER DATE:	SHEET OF SHEETS 10 OF 10
	BUREAU MANAGER DATE:	

CITY AND COUNTY OF SAN FRANCISCO
AUXILIARY WATER SUPPLY SYSTEM
AWSS STANDARD DRAWING X

SPECIFICATION NO.
DRAWING NO. AWSS 10
FILE NO.
REV. NO. 0



CITY AND COUNTY OF SAN FRANCISCO PUBLIC UTILITIES COMMISSION
 HETCH HETCHY WATER AND POWER

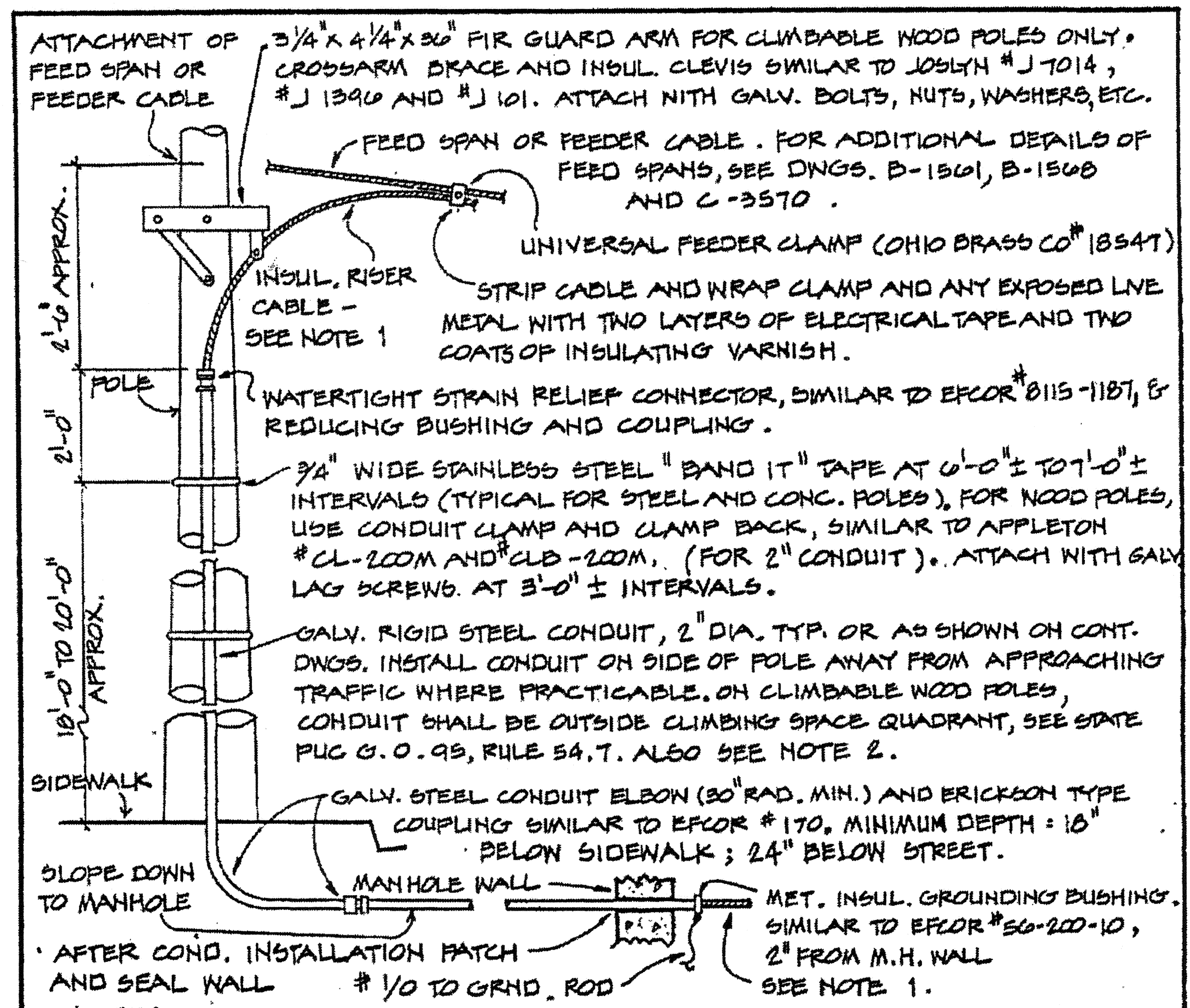
TRANSIT POWER FACILITIES

TENSION & SAG VS TEMPERATURE
 #4/0 GROOVED BRONZE TROLLEY WIRE

BY T.N.	TR.	APPROVED <i>W. Keith</i>	SCALE NONE	DATE NOV. 1974	LATEST REVISION MAR. 1979
DR. TSJU	CH. <i>28</i>	APPROVED <i>R. L. Stein</i>		DRAWING NO. A-1413	REVISION NO. 1
RECOMMENDED <i>R. L. Stein</i>		GENERAL MANAGER <i>Amosone</i>			

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
 STANDARD DRAWING

OVERHEAD
 A-1413 REV 1

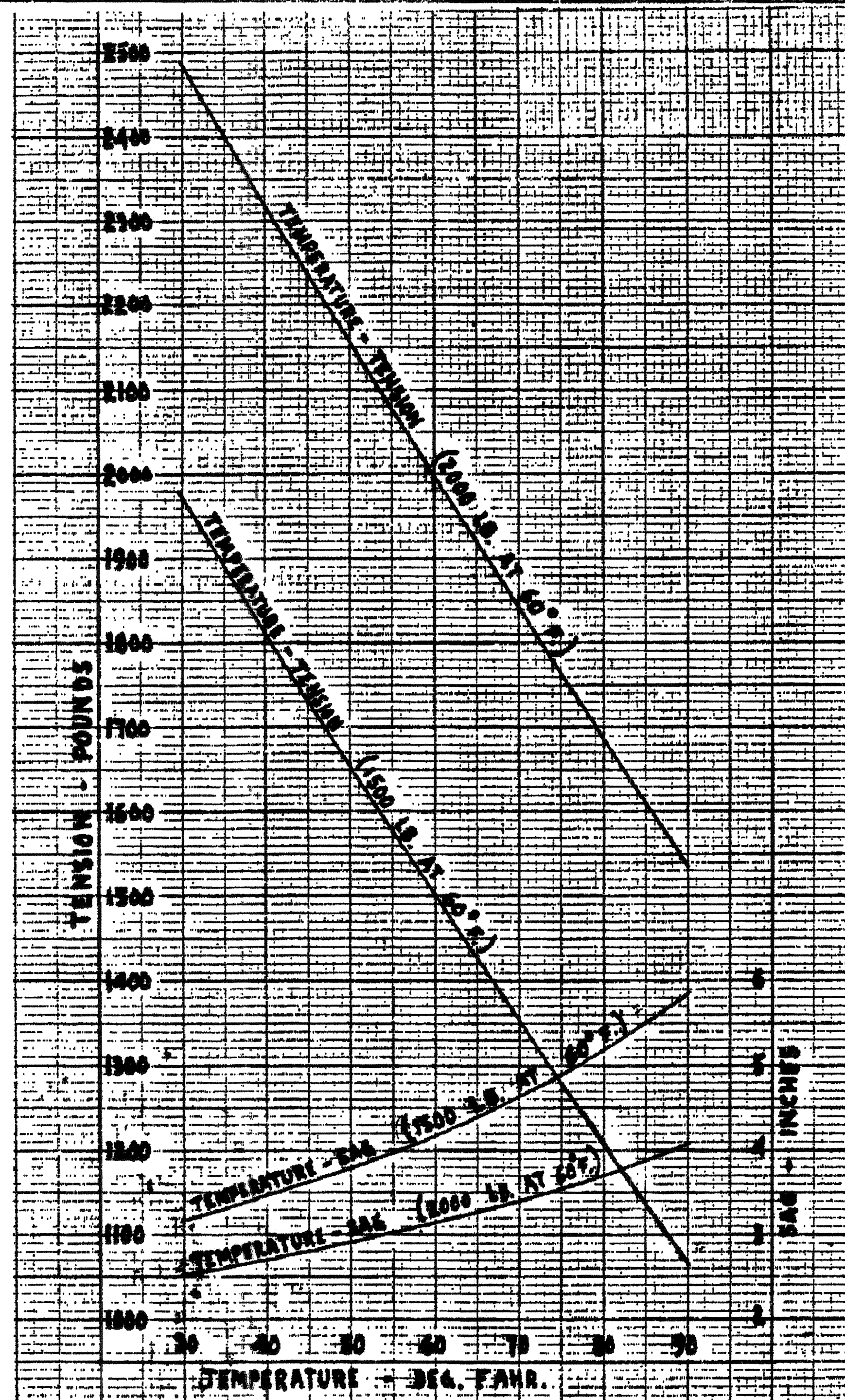


- NOTES:**
- 1 REFER TO SPECIFICATIONS AND CONTRACT DWGS. FOR SIZE AND TYPE OF RISER CABLE AND CONNECTION IN MANHOLE.
 2. ON CLIMBABLE WOOD POLES, CONDUIT SHALL HAVE SUITABLE PROTECTIVE COVERING. FOR LIMITS AND MATERIAL, SEE STATE PUC G.O. 95, RULES 22.2 AND 54.6E.

SUPERSEDED DWG. A-1428

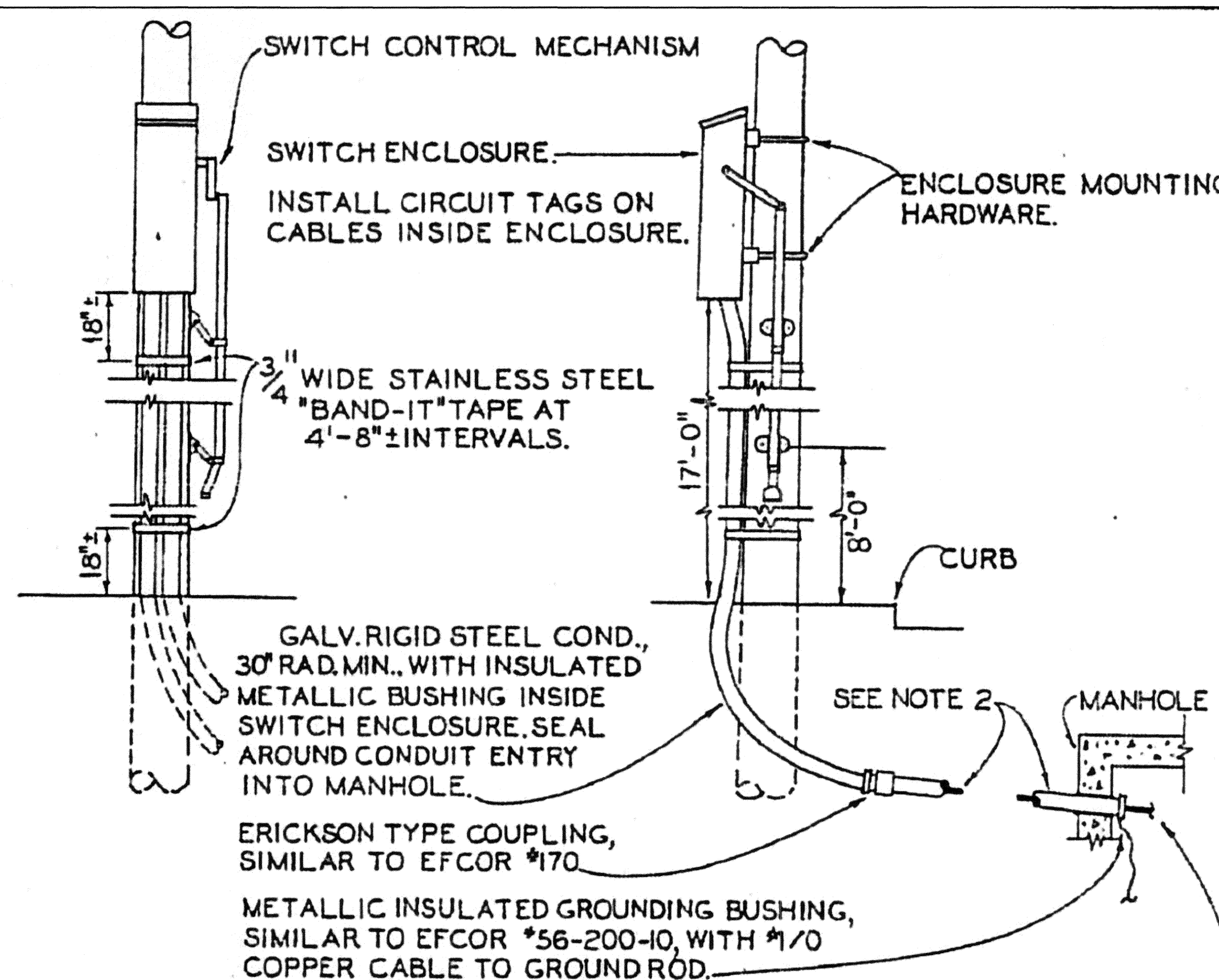
CITY AND COUNTY OF SAN FRANCISCO		PUBLIC UTILITIES COMMISSION	
HETCH HETCHY WATER AND POWER			
TRANSIT POWER FACILITIES			
POSITIVE OR NEGATIVE RISER DETAIL			
BY G.S.	TR.	APPROVED <i>R. Himmelman</i>	SCALE NONE
DR. P.P.	CH. <i>BB</i>	APPROVED <i>Olson</i>	DATE MARCH 1978
RECOMMENDED <i>R. L. Stein</i>		GENERAL MANAGER	LATEST REVISION
			DRAWING NO. A-1456
			REVISION NO. 0

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
 STANDARD DRAWING
 POSITIVE OR NEGATIVE RISER DETAIL
 A-1456 REV 0



CITY AND COUNTY OF SAN FRANCISCO		PUBLIC UTILITIES COMMISSION	
HETCH HETCHY WATER AND POWER			
TRANSIT POWER FACILITIES			
TENSION & SAG VS. TEMPERATURE			
#2/0 BRONZE GROOVED TROLLEY WIRE - 100 FOOT SPANS			
BY G.S.	TR.	APPROVED <i>[Signature]</i>	SCALE NONE
DR. TGIU	CHK. <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DATE JUNE 1980
RECOMMENDED <i>[Signature]</i>		CHIEF ENGINEER	LATEST REVISION JUNE 1980
		GENERAL MANAGER <i>[Signature]</i>	DRAWING NO. A-1585
			REVISION NO. 0

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
 STANDARD DRAWING
 OVERHEAD
 A-1585 REV 0



NOTES

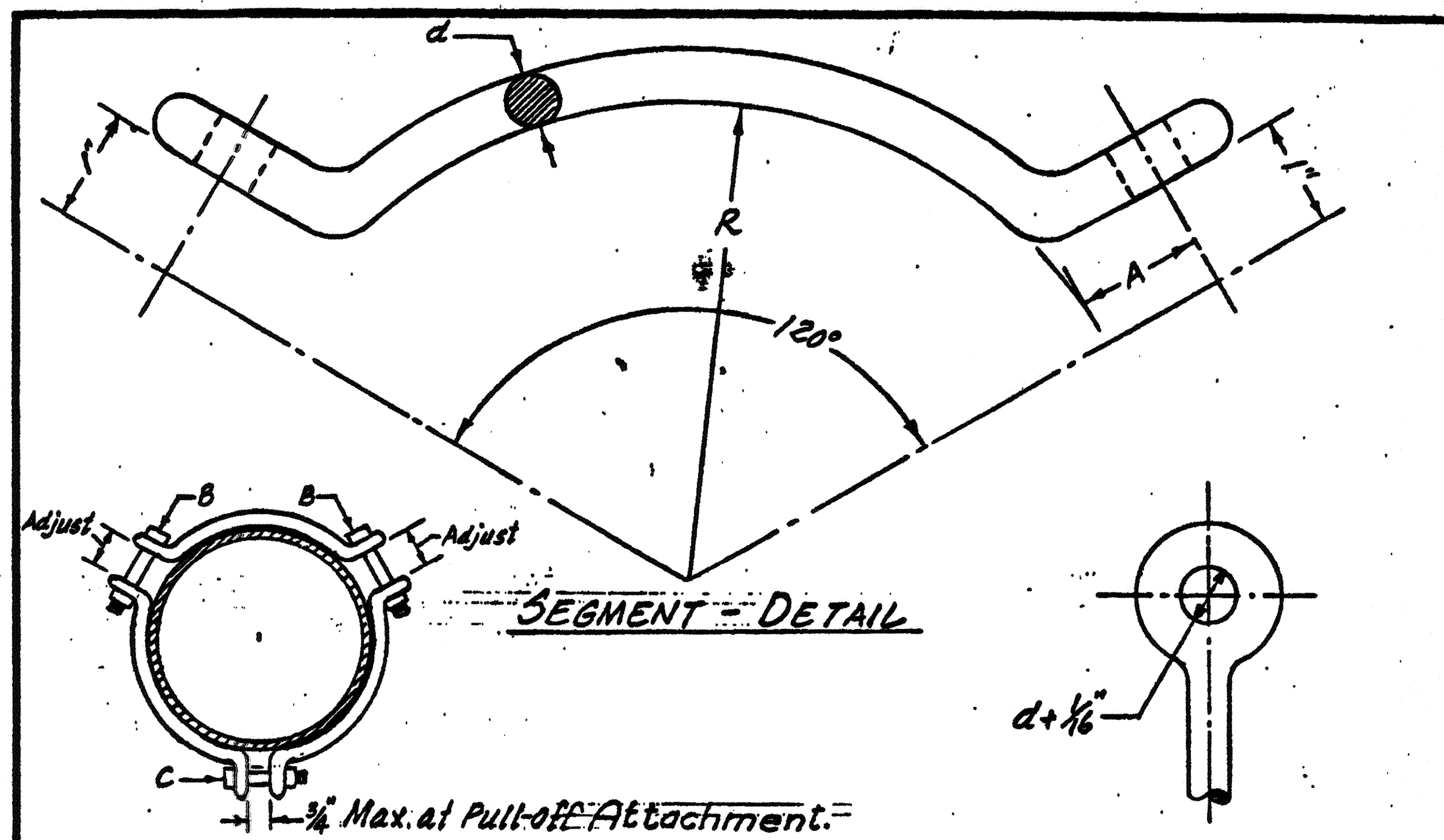
- 1. F & I SWITCH, CONDUIT & RELATED ACCESSORIES. PAINT CONDUIT, "BAND-IT" TAPE & SWITCH ENCLOSURE & MOUNTING HARDWARE TO MATCH POLE.
- 2. REFER TO PLANS FOR SIZES OF RISER CABLES & CONDUITS.

CITY AND COUNTY OF SAN FRANCISCO PUBLIC UTILITIES COMMISSION
 HETCH HETCHY WATER AND POWER

TRANSIT POWER FACILITIES
 INSTALLATION OF MANUAL SWITCH ON POLE
 UNDERGROUND CONNECTION

BY GS	TR. -	APPROVED <i>[Signature]</i>	SCALE NONE	DATE JAN. 1981	LATEST REVISION APR. 1981
DR. RK	CH. 48	APPROVED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. A-1612	REVISION NO. 1
RECOMMENDED <i>[Signature]</i>		CHIEF ENGINEER	GENERAL MANAGER		

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
 STANDARD DRAWING
 TRACTION POWER
 A-1612, REV 1



ASSEMBLY

EYE DETAIL

BAND No.	DIAMETER RANGE	POLE SIZE		R	d	A	BOLT SIZE	
		BUTT DIAM.	HEIGHT OF ATTACHMENT				B	C
1	4 1/2" to 5 1/2"	8"	19' to 24'	3"	3/4"	1 1/4"	3/4" x 3 1/2"	3/4" x 2 1/2"
2	6" to 7 1/4"	10"	19' to 29'	3 3/8"	3/4"	1 1/2"	3/4" x 4"	3/4" x 3"
3	7" to 8 1/4"	11"	19' to 29'	4 3/8"	3/4"	1 1/2"	3/4" x 4"	3/4" x 3"
4	8" to 9 1/4"	12"	19' to 29'	4 7/8"	3/4"	1 3/4"	3/4" x 4 1/2"	3/4" x 3"
5	9" to 10 1/4"	13"	19' to 29'	5 3/8"	3/4"	1 3/4"	3/4" x 4 1/2"	3/4" x 3"
6	8" to 9 1/4"	12"	19' to 29'	4 7/8"	1"	1 3/4"	1" x 4 1/2"	1" x 3"
7	9" to 10 1/4"	13"	19' to 29'	5 3/8"	1"	1 3/4"	1" x 4 1/2"	1" x 3"

Use band No. 6 & 7 for Pull-off tensions of 4000* or more

NOTES:

- All bolts & nuts shall meet the requirements ASTM Designation A325N.
- Pole band shall meet the requirements of ASTM-A-27, Casting steel Grade 65-35-24, ASTM A536, Ductile iron castings Grade 60-40-18, or ASTM A66B, Class C.
- All materials, bolts, lock washers, and nuts shall be galvanized.

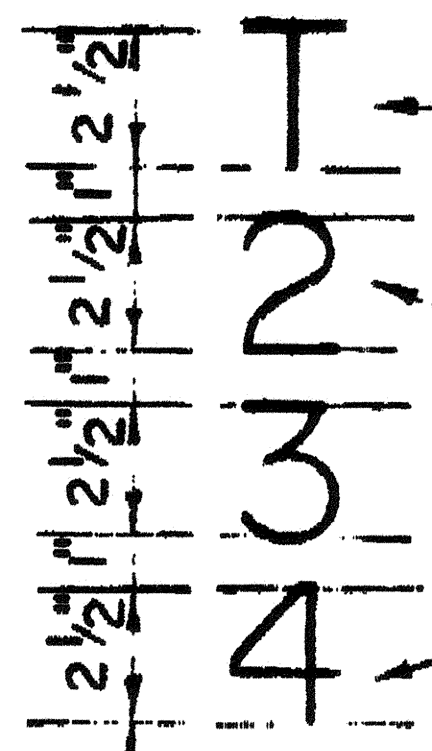
CITY AND COUNTY OF SAN FRANCISCO PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU

THREE PIECE ADJUSTABLE BAND FOR STEEL POLES

BY A.Y.	TR. R	APPROVED G. Mullany for PTM	SCALE NONE	DATE Mar. 1982	LATEST REVISION Nov. 1982
DR. R	CH. HQ/WJB	APPROVED G. Mullany CHIEF ENGINEER AND DEPUTY GENERAL MANAGER PUBLIC UTILITIES COMMISSION		DRAWING NO. A-1652	REVISION NO. 5

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
STANDARD DRAWING

OVERHEAD
A-1652 REV 5



DESIGNATES TROLLEY POLE

NUMBERS DESIGNATES POLE NUMBER WHICH CORRESPOND TO STREET ADDRESS OR WHERE NO ADDRESS IS AVAILABLE (LOTS, PARKS, ETC.) DESIGNATE APPROXIMATE ADDRESS.

MIN. 15' ABOVE SIDEWALK FROM BOTTOM NUMBER

NOTE: ALL STROKES SHALL BE 3/8" WIDE, 2 1/2" HIGH. NUMBERS ARE TO BE INSTALLED FACING STREET.

CITY AND COUNTY OF SAN FRANCISCO PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU

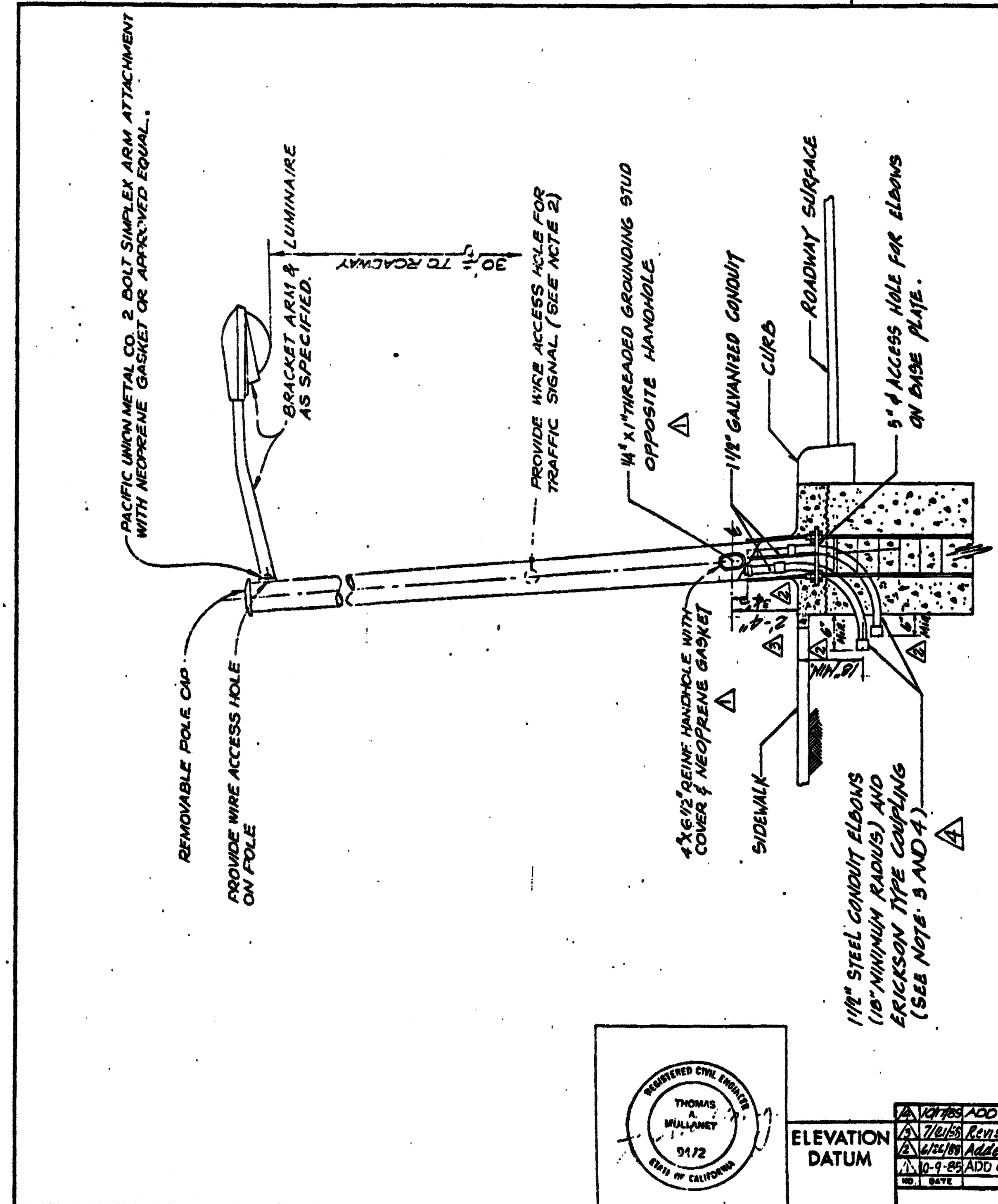
ENGINEERING STANDARD
NUMBER ARRANGEMENT
FOR TROLLEY POLES

DESIGNED BY <i>L. N. Mirona</i>	RECOMMENDED <i>J. M. P. O'Brien</i>	APPROVED <i>K. J. Howard</i>	SCALE NONE	DATE 6-3-1987
CHECKED BY <i>AT</i>	APPROVED <i>[Signature]</i>	APPROVED <i>William J. Stand</i>	DRAWING NO. A-1708	LATEST REVISION REVISION NO. 0
DR. A. CHAN	DEPUTY GENERAL MANAGER PUBLIC UTILITIES COMMISSION	GENERAL MANAGER MUNICIPAL RAILWAY		

SHEET 2 OF 2

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
STANDARD DRAWING

OVERHEAD
A-1708 REV 0



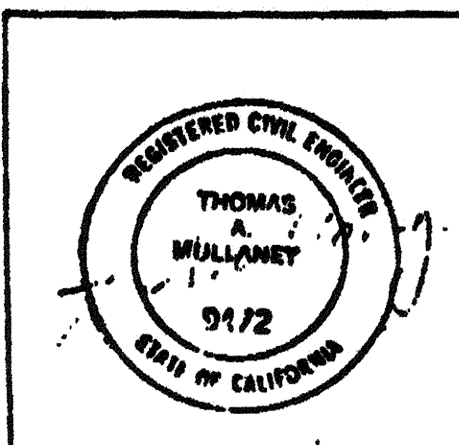
ELEVATION
SCALE: NONE

- NOTES:**
1. POLE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
 2. ACCESS HOLE FOR TRAFFIC SIGNAL SHALL BE DETERMINED IN THE FIELD.
 3. WHEN TRAFFIC AND STREET LIGHTING ARE FROM THE SAME PULL BOX, ONE 2" STEEL CONDUIT ELBOW SHALL BE USED INSTEAD OF THE TWO 1 1/2" STEEL CONDUIT ELBOWS.
 4. CONDUIT ELBOWS ARE PAID UNDER FOUNDATION BID ITEM.

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
UTILITIES ENGINEERING BUREAU

**COMBINATION ANCHOR BOLT BASE
TROLLEY POLE WITH STREET
LIGHTING & TRAFFIC SIGNAL DETAILS**

DESIGNED BY <i>Williamson</i>	DESIGNED BY AY	IN CH CH	SCALE NONE
CHECKED BY <i>W. J. ...</i>	CHECKED BY	DATE JAN. 1928	
APPROVED BY <i>Williamson</i>		MATCH HEIGHT WATER AND POWER	
SHEET 1 OF 1		DRAWING NO. B-1645	REVISION NO. A

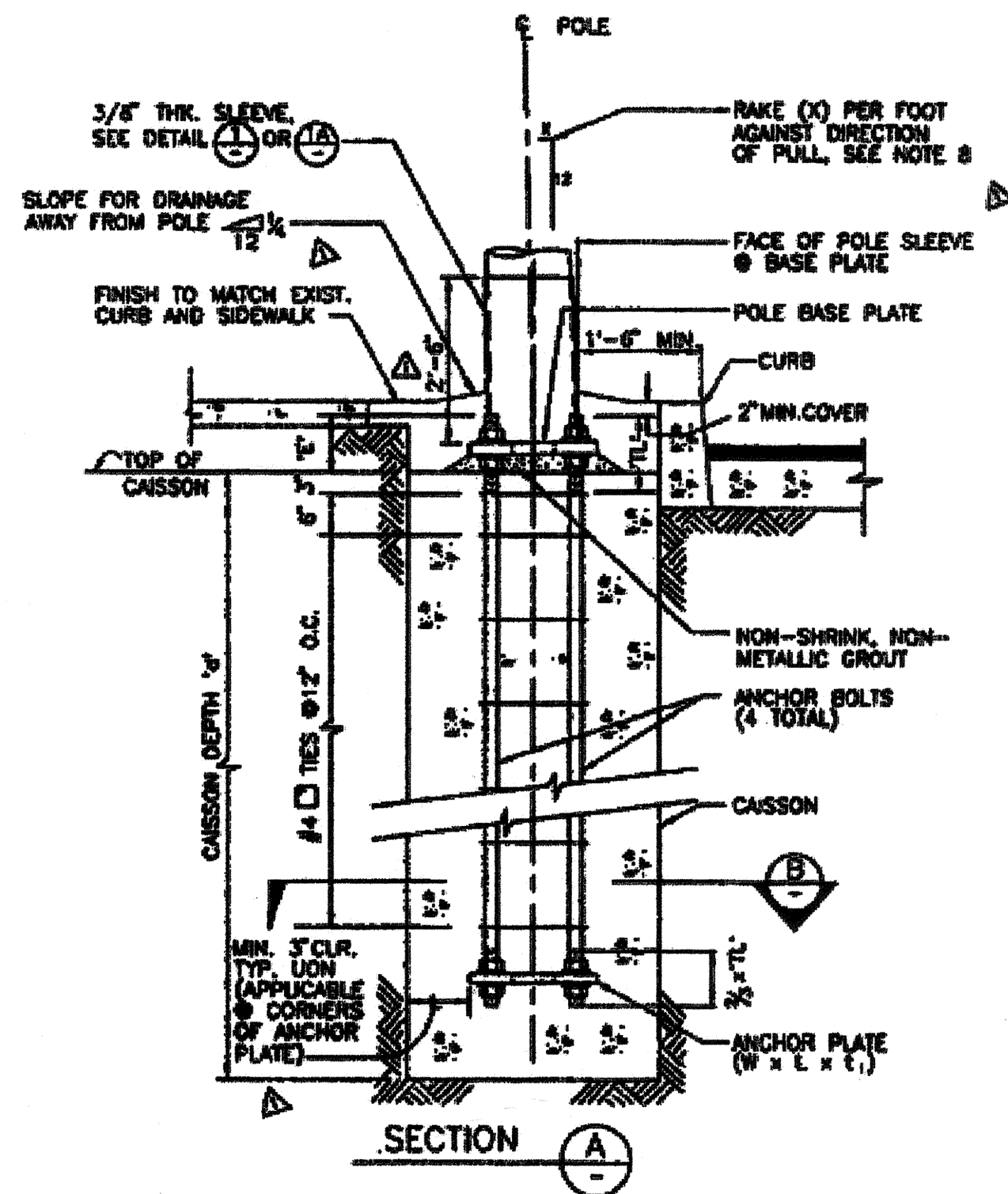
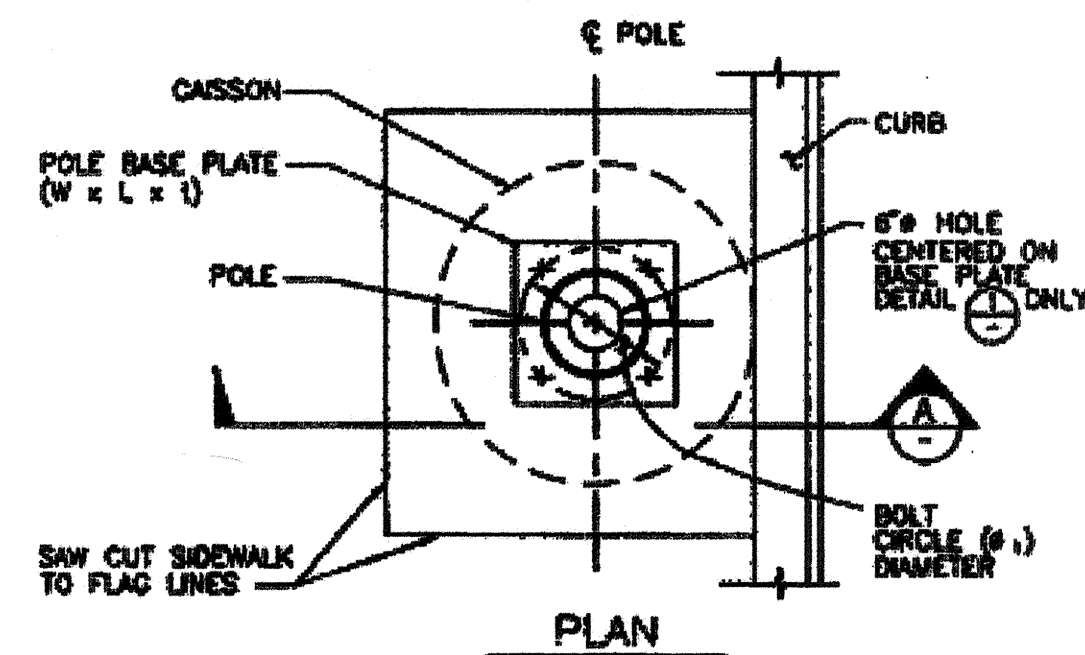


ELEVATION
DATUM

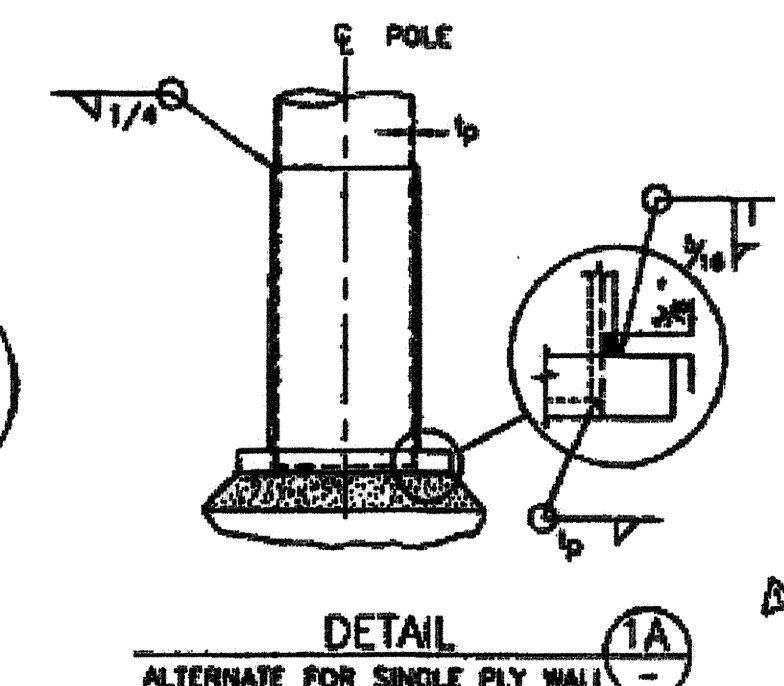
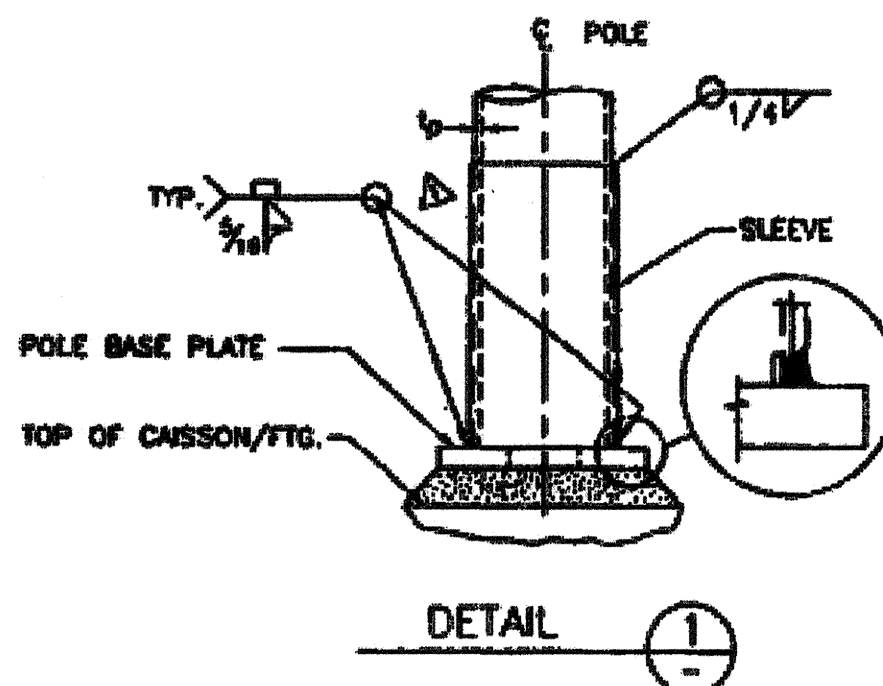
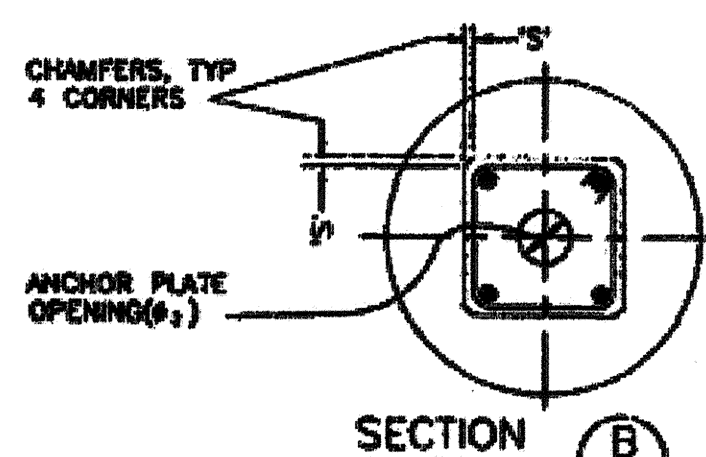
NO.	DATE	DESCRIPTION	BY	APPR'D
1	1/27/28	ADD NOTE 4.	NL	WJW
2	7/26/28	Revised hand hole height	R	WJW
3	6/22/29	Added Dimension	RG	WJW
4	10-9-28	ADD GROUNDING STUD & GASKET	CH	AA

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
STANDARD DRAWING

OVERHEAD
B-1645 REV 4



POLE NO.	POLE PROPERTIES				BASE PLATES			ANCHOR BOLTS			ANCHOR PLATES			CAISSONS				
	OVERALL LENGTH (FT)	O.D. AT BOTTOM (INCHES)	O.D. AT TOP (INCHES)	WALL THICKNESS GAGE, tp (INCHES)	MAX. ALLOW. MOMENT (KIP-FT)	SIZE W x L (INCHES)	t (INCHES)	LOCATION OF BOLTS (INCHES)	DIAMETER OF BOLT HOLES (INCHES)	DIAMETER (INCHES)	LENGTH (FT-IN)	E (INCHES)	THREAD LENGTH "TL" (INCHES)	l (INCHES)	HOLE (a) DIAMETER (INCHES)	CHAMFER "S" (INCHES)	DIAMETER (INCHES)	DEPTH "d" (FT-IN)
720	26	8	4.36	SPLY-83 (0.228)	28.6	14x14	1 1/2	12	1 1/2	1 1/2	7'-0"	9	1'-0"	3/4	6	1 1/2	24	7'-0"
723N	26	10	6.36	SPLY-83 (0.228)	45.6	17x17	1 1/2	15	2 1/2	1 1/2	7'-0"	9	1'-0"	1	6	1 1/2	30	7'-0"
724	26	11	7.36	SPLY-83 (0.228)	55.6	17x17	1 1/2	16	2 1/2	1 1/2	8'-0"	9	1'-0"	1	6	1 1/2	30	8'-0"
727N	26	12	8.36	SPLY-83 (0.228)	81.5	19x19	2	17 1/2	2 1/2	1 1/2	9'-0"	9	1'-0"	1	6	1 1/2	30	9'-0"
728A	26	11	7.36	SPLY-83 (0.228)	105.2	23x23	2 1/2	22	2 1/2	2	10'-1"	10	1'-3"	1 1/2	8	2 1/2	36	10'-0"
728	26	12	8.36	SPLY-83 (0.228)	126.6	23x23	2 1/2	22	2 1/2	2	10'-1"	10	1'-3"	1 1/2	8	2 1/2	36	10'-0"
729	26	12.5	8.86	SPLY-83 (0.228)	156.4	24x24	2 1/2	22	2 1/2	2 1/2	11'-2"	11	1'-3"	1 1/2	8	2 1/2	36	11'-0"
731	26	13	9.36	SPLY-83 (0.228)	183.0	24x24	2 1/2	22	2 1/2	2 1/2	11'-2"	11	1'-3"	1 1/2	8	2 1/2	36	11'-0"
742N	26	10	6.08	SPLY-83 (0.228)	45.6	17x17	1 1/2	15	2 1/2	1 1/2	7'-0"	9	1'-0"	1	6	1 1/2	30	7'-0"
743	26	11	7.08	SPLY-83 (0.228)	55.6	17x17	1 1/2	16	2 1/2	1 1/2	8'-0"	9	1'-0"	1	6	1 1/2	30	8'-0"
748N	28	12	8.08	SPLY-83 (0.228)	81.5	19x19	2	17 1/2	2 1/2	1 1/2	9'-0"	9	1'-0"	1	6	1 1/2	30	9'-0"
747A	28	11	7.08	SPLY-83 (0.228)	105.2	23x23	2 1/2	22	2 1/2	2	10'-1"	10	1'-3"	1 1/2	8	2 1/2	36	10'-0"
747	28	12	8.08	SPLY-83 (0.228)	126.6	23x23	2 1/2	22	2 1/2	2	10'-1"	10	1'-3"	1 1/2	8	2 1/2	36	10'-0"
748	28	12.5	8.58	SPLY-83 (0.228)	156.4	24x24	2 1/2	22	2 1/2	2 1/2	11'-2"	11	1'-3"	1 1/2	8	2 1/2	36	11'-0"
750	28	13	9.08	SPLY-83 (0.228)	183.0	24x24	2 1/2	22	2 1/2	2 1/2	11'-2"	11	1'-3"	1 1/2	8	2 1/2	36	11'-0"
760	30	8.5	4.30	SPLY-83 (0.228)	32.0	14x14	1 1/2	13	1 1/2	1 1/2	7'-0"	9	1'-0"	3/4	6	1 1/2	24	7'-0"
761N	30	10	5.8	SPLY-83 (0.228)	45.6	17x17	1 1/2	16	2 1/2	1 1/2	7'-0"	9	1'-0"	1	6	1 1/2	30	7'-0"
762N	30	11	6.8	SPLY-83 (0.228)	55.6	17x17	1 1/2	16 1/2	2 1/2	1 1/2	8'-0"	9	1'-0"	1	6	1 1/2	30	8'-0"
765N	30	12	7.8	SPLY-83 (0.228)	81.5	19x19	2	17 1/2	2 1/2	1 1/2	9'-0"	9	1'-0"	1	6	1 1/2	30	9'-0"
767A	30	11	6.8	SPLY-83 (0.228)	105.2	23x23	2 1/2	22	2 1/2	2	10'-1"	10	1'-3"	1 1/2	8	2 1/2	36	10'-0"
767	30	12	7.8	SPLY-83 (0.228)	126.6	23x23	2 1/2	22	2 1/2	2	10'-1"	10	1'-3"	1 1/2	8	2 1/2	36	10'-0"
769	30	12.5	8.3	SPLY-83 (0.228)	156.4	24x24	2 1/2	22	2 1/2	2 1/2	11'-2"	11	1'-3"	1 1/2	8	2 1/2	36	11'-0"
770	30	13	8.8	SPLY-83 (0.228)	183.0	24x24	2 1/2	22	2 1/2	2 1/2	11'-2"	11	1'-3"	1 1/2	8	2 1/2	36	11'-0"



ABBREVIATIONS:
 DIA - Diameter
 FTG - Footing
 FT - Feet
 IN - Inches
 L - Length
 MAX - Maximum
 MIN - Minimum
 O.D. - Outside Diameter
 t - Thickness
 THK - Thick
 TYP - Typical
 UN - Unless Otherwise Noted
 W - Width

MATERIALS:
 Concrete: 28 day compressive strength (fc) = 4000psi
 Aggregate Size: 3/4\"/>

- NOTES:**
- The allowable moment capacity specified shall not be exceeded under all vertical, lateral and combined loads.
 - All anchor bolts shall be tightened to snug tight condition plus an additional 2/3 turn. See AISC "Specification for Structural Joints using ASTM A325 or A490 Bolts" for procedure and requirements.
 - Galvanization of specified parts shall be in accordance with ASTM Specification A123.
 - Surfaces to receive ties shall be roughened by means of hand wire brushing. Power wire brushing is not permitted. Ties shall be securely fastened to anchor bolts by tie wires.
 - Contractor shall provide means (e.g. sonotubes, steel casings, etc.) as required, to stabilize and prevent caving in of soil during and after drilling of holes for caissons. Backfill all voids between casing and soil with sand and compact the top 2'-0" of backfill to 95% dry density.
 - See Technical Specifications for additional requirements.
 - Furnish clipped washers, where necessary, to avoid encroachment into the welding at pole bases.
 - See Contract Drawings for raking of poles.

FOR ORIGINAL SIGNATURES, SEE DWG. CL-7971, REV. 0

DESIGNED BY CHECKED BY APPROVED BY DATE 1-28-94	CITY AND COUNTY OF SAN FRANCISCO PUBLIC UTILITIES COMMISSION UTILITIES ENGINEERING BUREAU APPROVED R.E. BRANDT VICE PRESIDENT	SAN FRANCISCO MUNICIPAL RAILWAY ENGINEERING STANDARD APPROVED JOHNNY S. STEW CHIEF ENGINEER	DRAWING NO. CL-7971 SHEET NO. 1 OF 2
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CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
 STANDARD DRAWING
OVERHEAD
 CL-7971 REV 2

MATERIALS LIST I (ITEMS 1 - 100)

SHEET NOTES FOR DRAWING CL-12940 TO CL-12942:

ITEM NO.	DESCRIPTION	MANUFACTURER AND PART NO.
WIRES, CABLES AND JUMPERS		
1	2/0 TROLLEY WIRE, GROOVED BRONZE ALLOY 80	-
2	4/0 TROLLEY WIRE, GROOVED BRONZE ALLOY 80	-
3	NOT USED	-
4	GUY WIRE, 1/4" STEEL STRAND, HIGH STRENGTH GRADE, GALVANIZED, ASTM A475 CLASS A, 7 STRAND	-
5	GUY WIRE 3/8" STEEL STRAND, UTILITY GRADE, GALVANIZED, ASTM A475 CLASS A, 7 STRAND W/MINIMUM STRENGTH OF 11,500 LBS	-
6	DEADEND FOR 1/4" STRAND	PREFORMED LINE PRODUCTS GDE 2104
7	DEADEND FOR 3/8" STRAND	PREFORMED LINE PRODUCTS GDE 2107
8	AUTOMATIC GUY WIRE DEADEND, 3/8"	HUBBELL-FARGO GDE 5202
9	AUTOMATIC GUY WIRE DEADEND, 1/4"	HUBBELL-FARGO GDE 5200
10	CONTROL CABLE, #12 AWG, 7 STRAND, 4 CONDUCTORS, 1000 VOLTS, ICEA S-73-532, WITH CABLE TIE AT 20 in SPACING AND WEATHER RESISTANT POLYETHYLENE BLACK SPIRAL WRAPPING ENTIRE LENGTH	DRAKA PANDUIT PLT25-CO PANDUIT T50F-CO
11	FEEDER CABLE, 4/0 COPPER, INSULATED CLASS B STRANDING	-
12	JACKETED SHIELD CABLE	ALPHA 3246
13	JUMPER WIRE ASSEMBLY	IMPulse 56591-6638, IMPulse 56590-6453
14	4/0 INSULATED TROLLEY WIRE JUMPER, LENGTH AS REQUIRED	-
15	CABLE, BARE COPPER, 500 KCMIL	-
16	NOT USED	-
17	NOT USED	-
18	NOT USED	-
19	NOT USED	-
20	NOT USED	-
TIPS AND SPLICERS		
21	TIP, TYPE BR, FOR 2/0 GROOVED WIRE	IMPulse 690472-3001, PHOENIX MINING 9646
22	TIP, TYPE BR, FOR 4/0 GROOVED WIRE	IMPulse 690472-3002, PHOENIX MINING 9648
23	TIP, TYPE T, FOR 2/0 GROOVED WIRE	IMPulse 16831-2000, PHOENIX MINING 9622
24	TIP, TYPE T, FOR 4/0 GROOVED WIRE	IMPulse 18210-2000, PHOENIX MINING 9624
25	TIP, TYPE TC, FOR 2/0 GROOVED WIRE	IMPulse 17795-2000, PHOENIX MINING 9632
26	TIP, TYPE TC FOR 4/0 GROOVED WIRE	IMPulse 17797-2000, PHOENIX MINING 9634
27	TIP, TYPE TCL FOR 2/0 GROOVED WIRE	IMPulse 54950-3001, PHOENIX MINING 9612
28	TIP, TYPE TCL, FOR 4/0 GROOVED WIRE	IMPulse 54950-3002, PHOENIX MINING 9614
29	TIP, TYPE TL FOR 2/0 GROOVED WIRE	IMPulse 22433-2000, PHOENIX MINING 9602
30	TIP, TYPE TL, FOR 4/0 GROOVED WIRE	IMPulse 23720-3003, PHOENIX MINING 9604
31	SPLICER, BULLDOG TW, FOR SPLICING 2/0 TO 4/0 GROOVED WIRE	IMPulse 54944-3001
32	SPLICER, FOR SPLICING 2/0 GROOVED WIRE	IMPulse 16607-2000, PHOENIX MINING 9150
33	SPLICER, FOR SPLICING 4/0 GROOVED WIRE	IMPulse 16685-2000, PHOENIX MINING 9155
34	SPLICER FOR UNIVERSAL SPACER BAR	IMPulse 18553-2000, PHOENIX MINING 4002
35	TIP, TYPE SR, FOR 2/0 WIRE	IMPulse 20748
36	TIP, TYPE SR, FOR 4/0 WIRE	IMPulse 20749
37	TIP WITH TONGUE FOR UNIVERSAL SPACER BAR	IMPulse 18431-2000, PHOENIX MINING 4004
38	TIP WITH CLEVIS FOR UNIVERSAL SPACER BAR	IMPulse 18430-2000, PHOENIX MINING 4003
39	SPLICE, HIGH SPEED, FOR SPLICING 4/0 TO 350 MCM (6/0)	IMPulse 21233-3001
40	NOT USED	-
CLAMPS AND HANGERS		
41	CLAMP, SINGLE STRAIN	IMPulse 16907-2000, PHOENIX MINING 7540
42	CLAMP, DOUBLE STRAIN	IMPulse 17700-2000, PHOENIX MINING 7542
43	CLAMP, STRAIN, TYPE TS	IMPulse 19004
44	CLAMP, STRAIN C/E	IMPulse 679446
45	CLAMP, FEEDER WIRE STRAIN WITH EYE	IMPulse 10571-2000, PHOENIX MINING 5861
46	CLAMP, FEEDER WIRE STRAIN WITH CLEVIS	IMPulse 22798-2000
47	CLAMP, TROLLEY WIRE DEAD END, FOR 4/0 WIRE	IMPulse 15964-2000
48	CLAMP, TROLLEY WIRE DEAD END, FOR 2/0 WIRE	IMPulse 21326-2000
49	CLAMP, TROLLEY WIRE, 14" LONG	IMPulse 19440-2000, PHOENIX MINING 5665
50	CLAMP, FEEDER TAB, 14" LONG	IMPulse 19441-2000, PHOENIX MINING 5667

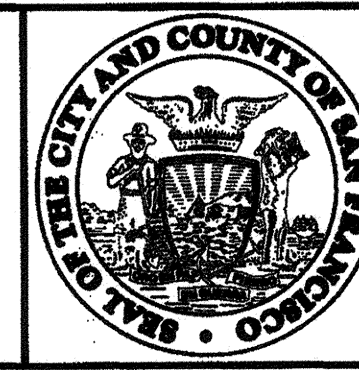
ITEM NO.	DESCRIPTION	MANUFACTURER AND PART NO.
CLAMPS AND HANGERS		
51	CLAMP, 14" LONG, BRONZE	IMPulse 19880-2000, PHOENIX MINING 5669
52	CLAMP, HOLLOW SCREW, BRONZE	IMPulse 60021-3001, PHOENIX MINING 5476
53	CLAMP, DUPLEX, 4/0 TO 4/0, HOLLOW SCREW	IMPulse 16103-2000
54	CLAMP, DUPLEX, 4/0 TO 4/0	IMPulse 16373-3001
55	CLAMP, DUPLEX	IMPulse 13853-3006
56	CLAMP, INSULATED LEAD WIRE, 2/0 TO 4/0 GROOVED WIRE	IMPulse 19655-2000, PHOENIX MINING 9413
57	CLAMP, UNIVERSAL FEEDER	IMPulse 18547-2000, PHOENIX MINING 8123
58	CLAMP, UNIVERSAL SPACER SUPPORT	IMPulse 18554, PHOENIX MINING 4001
59	CLAMP, STRAIGHT LINE DEADEND, FOR 1/4" STRAND	HUBBELL-FARGO ADS48N
60	CLAMP, COPPER TEE, 500 KCMIL TO 4/0	BURNDY QPX 3428
61	CLAMP, SPECIAL DETROIT FEED	IMPulse 54205
62	CLAMP, CABLE	BURNDY BARTAP QGFL31B1
63	CLAMP BODY	IMPulse 56034-4001
64	CLAMP, COVER PLATE W/ FEEDER TAB, BRONZE	IMPulse 21088, PHOENIX MINING 5671
65	HANGER ASSEMBLY, DOUBLE CURVE, TYPE PH	IMPulse 54962-3001
66	HANGER, CLEVIS	IMPulse 11653-2000
67	HANGER, FEEDER SPAN	IMPulse 60118-3002
68	HANGER, POSITIVE OR NEGATIVE FEED SPAN, NON-ADJUST	IMPulse 54999-3001
69	HANGER, POSITIVE FEED SPAN, TYPE PH-4	IMPulse 54937-3001
70	HANGER, NEGATIVE FEED SPAN, TYPE PH-5	IMPulse 54936-3001
71	HANGER, INSULATED FEED SPAN, TYPE PH-7	IMPulse 55011-3001
72	HANGER, TYPE EZ	IMPulse 677427
73	HANGER, TANGENT SPAN, TYPE KW WITH ADJUSTABLE YOKE	IMPulse 56489-3001
74	HANGER, TANGENT SPAN, WITH ADJUSTABLE CLAMP	IMPulse 19360-2000, PHOENIX MINING 8220
75	HANGER, ADJUSTABLE HEIGHT WITH INSULATOR	IMPulse 691837, PHOENIX MINING 8225
76	TROLLEY WIRE SUPPORT ASSEMBLY	IMPulse 54962-3003
77	NOT USED	-
78	STEEL ARM FOR DOUBLE CURVE HANGER BODY	IMPulse 16220
79	CLAMP, 2" PIPE, CLEVIS	IMPulse 55375-3001
80	TUNNEL SUPPORT ASSEMBLY	IMPulse 59461
81	SWIVEL CLAMP FOR CONTACT WIRE	IMPulse 57219-3001
82	NOT USED	-
83	NOT USED	-
84	NOT USED	-
85	NOT USED	-
86	NOT USED	-
87	NOT USED	-
88	NOT USED	-
89	NOT USED	-
90	NOT USED	-
INSULATORS		
91	SPOOL INSULATOR, 11/16" STUD	IMPulse 16835-2000, PHOENIX MINING 8525
92	SPOOL INSULATOR, 7/8" STUD	IMPulse 19305-3015
93	SPOOL INSULATOR, 1-1/4" STUD	IMPulse 20560-2000, PHOENIX MINING 8525 LS
94	STRAIN INSULATOR, PORCELAIN, TYPE JB	IMPulse 31504-3060, LAPP INSULATORS CO 8504-70, PHOENIX MINING 6504, PPC INSULATORS 504
95	STRAIN INSULATOR, 5/8" CLEVIS & CLEVIS AT RIGHT ANGLE, 12"	IMPulse 54984-6121
96	STRAIN INSULATOR, 5/8" CLEVIS & CLEVIS IN SAME PLANE, 12"	IMPulse 54985-6121
97	STRAIN INSULATOR, 5/8" CLEVIS & EYE AT RIGHT ANGLE, 13"	IMPulse 54961-6132
98	STRAIN INSULATOR, 5/8" CLEVIS & EYE IN SAME PLANE, 13"	IMPulse 55289-6132
99	STRAIN INSULATOR, 5/8" EYE & EYE AT RIGHT ANGLE, 13"	IMPulse 56261-6132
100	STRAIN INSULATOR, 5/8" EYE & EYE IN SAME PLANE, 13"	IMPulse 55263-6132

- NOT ALL MATERIALS LISTED IN THE MATERIAL LIST ARE TO BE USED. IN ADDITION, ITEMS OTHER THAN THOSE LISTED IN THE MATERIAL LIST MAY BE NECESSARY TO COMPLETE THIS CONTRACT. REFER TO LAYOUT PLANS AND DETAILS FOR THE SPECIFIED MATERIALS TO BE USED.
- ALL PART NUMBERS ARE SUBJECT TO CHANGE. THE CONTRACTOR SHALL VERIFY ALL PART NUMBERS WITH THE MANUFACTURER BEFORE ORDERING.
- ALL FERROUS METALS, FABRICATED OR MACHINED, SHALL CONFORM TO THE FOLLOWING:
 - BOLTS, NUTS, WASHERS AND LAG SCREWS: ASTM A307.
 - THREADS: ANSI B1.1 AND B1.10.
 - STEEL STRANDS: ASTM A475 CLASS C.
 - DUCTILE IRON CASTINGS: ASTM A536-84 GRADE 60-40-18.
 - MALLEABLE IRON CASTINGS: ASTM A47 GRADE 32510.
- ALL FERROUS METALS, FABRICATED OR MACHINED, INCLUDING BOLTS, NUTS, WASHERS, LAG SCREWS, STRANDS, DUCTILE IRON AND MALLEABLE IRON CASTINGS SHALL BE GALVANIZED PER ASTM A123 AND A153.
- STEEL PIPE SHALL BE MANUFACTURED AND GALVANIZED PER ASTM A153.

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NO.	DATE	DESCRIPTION	REVISION	CHECKED	APPROVED
6	5/21/02	REVISED ITEM NO 56 AND 59	CD	JW	CLW
5	02/08/10	REVISED ITEM DESCRIPTIONS, MANUFACTURERS AND PART NOS	SML	TP	JW
4	6/15/09	REVISED ITEM NO 10	SML	TP	CCW
3	5/28/08	ADDED EQUIVALENT PART NOS; REVISED ITEM NO 39 AND BORDER TEXT	SML	TP	JW
2	08/29/05	REVISED SHEET NOTE 3D, SHEET NOTE 4, AND ITEM NO. 58	HW	EGV	AH
1	06/30/04	REVISED ITEM NOS. 97, 98, 99, AND 100	HW	EY	AH

DESIGNED	T. PHANG
DRAWN	M. LUC
CHECKED	E. VIRAY
REVIEWED	A. HOE
RECOMMENDED	Y. GU
APPROVED	W. NELSON
DATE	OCTOBER 12, 2001



CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL RAILWAY
 APPROVED
 VINCE HARRIS
 FOR THE EXECUTIVE DIRECTOR / CEO

MUNI METRO SYSTEM / TROLLEY COACH SYSTEM		CONTRACT
		DRAWING
		CL-12940
		REVISION
		6

FOR ORIGINAL SIGNATURES, SEE CL-12940, REV 0