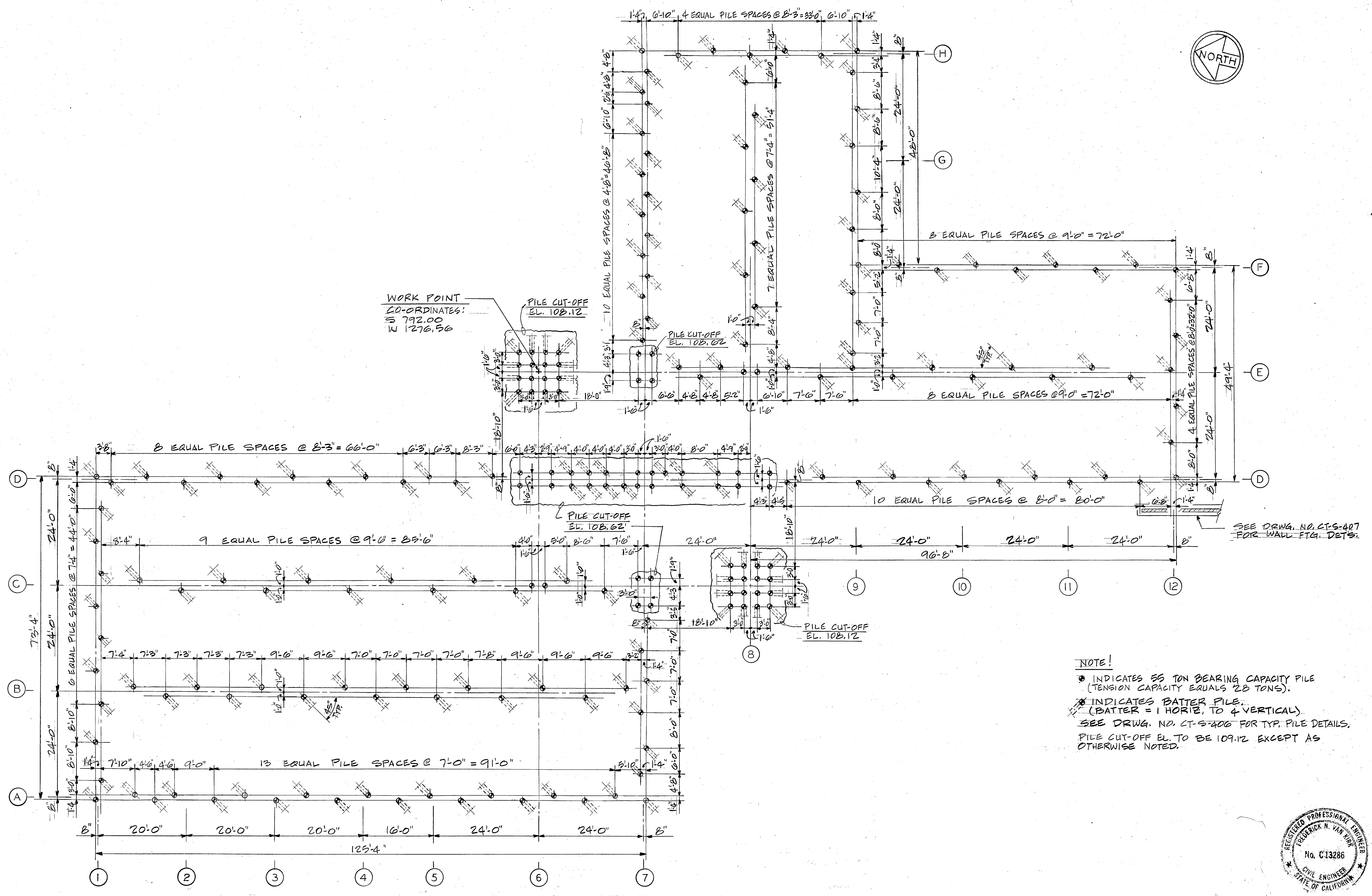
EXHIBIT F

REFERENCE MATERIAL

The documents provide may contain errors, omissions, or may be out of date.

1. Administration/Laboratory Building (Admin/Lab)
    a. 1974 Admin/Lab Original SD-122A Select Drawings
    b. 1984 Admin/Lab Lab Expansion SD-152 Select Drawings
    c. 1988 Admin/Lab Seismic Improvements SD-176 Select Drawings
    d. 1991 Admin/Lab Expansion II SD-185 Select Drawings
    e. 2020 Admin/Lab Evaluation TM Excerpts
    f. 2021 Admin/Lab Conceptual Retrofit TM Excerpts
2. Field Services Building (FSB)
    a. 1951 FSB Original SD-80 Select Drawings
    b. 1996 FSB Upgrade SD-222 Select Drawings
    c. 2020 FSB Evaluation TM Excerpts
    d. 2021 FSB Conceptual Retrofit TM Excerpts
3. Building 1084
    a. 1964 Bldg. 1084 Army Select Drawings
    b. 2008 Bldg. 1084 Structural Review Excerpt
    c. 2019 Bldg. 1084 Photos
4. Electrical Main Distribution Lines and Substations
    a. 1987 PGS1 to Main Substation Power Distribution Line Plan SD-135 Drawing E-2
    b. 2009 PGS2 to Main Substation Power Distribution Line Plan SD-317A Drawing E-101
    c. 2017 Substations Site Map
    d. 2020 Substation List
    e. 2020 Photos Power Distribution Lines
    f. 2020 Photos Substations
5. Digester Gallery Slab & Effluent Pump Station Entry Canopy
    a. 2020 Information Slides
6. Criteria & Seismic Hazard
    a. 2021 Information Slide

Administration/Laboratory Building
(Admin/Lab)



NOTE!

- INDICATES 55 TON BEARING CAPACITY PILE (TENSION CAPACITY EQUALS 28 TONS).
- INDICATES BATTER PILE. (BATTER = 1 HORIZ. TO 4 VERTICAL).

SEE DRWG. NO. CT-S-406 FOR TYP. PILE DETAILS.

PILE CUT-OFF EL. TO BE 109.12 EXCEPT AS OTHERWISE NOTED.

REGISTERED PROFESSIONAL ENGINEER FREDERICK N. VAN KIRK No. C13286 CIVIL ENGINEER STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/79	AS-BUILT	XV	

REVISIONS

CONSOER TOWNSEND & ASSOCIATES CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED CT&A Frederick N. Van Kirk PARTNER
EBMUD

DESIGNED W.T., E.H.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD122-A
ADMINISTRATION CENTER
PILE PLAN

DATE SCALE 3/32" = 1'-0"
DRWG. NO. CT-S-401

71100

NOTE!

GRADE FLOOR CONSTRUCTION SHALL CONSIST OF 2½" THICK REINFORCED CONCRETE GROUT OVER 8" THICK PRECAST, PRESTRESSED STANDARD WEIGHT CONCRETE SLABS WITH LONGITUDINAL VOIDS EXCEPT AS OTHERWISE SHOWN OR NOTED.

WEIGHT OF PRECAST, PRESTRESSED CONCRETE SLABS SHALL BE APPROXIMATELY 65 LBS./SQ.FT.

PRECAST MANUFACTURER SHALL PROVIDE A NON-COMPOSITE SLAB DESIGN TO SUPPORT THE FOLLOWING SUPERIMPOSED LOADS:
LIVE LOAD .... 100 LBS./SQ.FT.
DEAD LOAD .... 50 LBS./SQ.FT.
(INCLUDING WT. OF TOPPING)

SEE DRWG. NO. CT-S-406 FOR COLUMN SCHEDULE.

REGISTERED PROFESSIONAL ENGINEER FREDERICK N. VAN KIRK No. C13286 CIVIL ENGINEER STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/79	AS-BUILT		

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS — SAN JOSE, CALIFORNIA

APPROVED
CT&A: PARTNER
EBMUD: MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
GRADE FLOOR PLAN

DATE JAN. 1974 SCALE 3/32"=1'-0" EXCEPT AS NOTED
DRWG. NO. CT-S-402

71100

2/79	AS-BUILT		YV
NO.	DATE	DESCRIPTION	BY / APPR'D

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS — SAN JOSE, CALIFORNIA

APPROVED
CT&A — PARTNER
EBMUD — MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
ROOF PLAN

DATE JAN. 1974 — SCALE 3/32"=1'-0" EXCEPT AS NOTED
DRWG. NO. CT-S-403

71100

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/79	AS-BUILT	SW	
		REVISIONS		

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED
CT&A Frederick N. Van Kirk PARTNER
EBMUD E.E. Roe MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
SECTIONS

DATE JAN 1974 SCALE 3/8"=1'-0"
DRWG. NO.
CT-S-404

71100

STAIR EXIT "C" - PLANS AND SECTIONS

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/79	AS-BUILT		YV

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS   SAN JOSE, CALIFORNIA

APPROVED
CT&A Frederick N. Van Kirk PARTNER
EBMUD E.E. Ross MGR. WPCD

DESIGNED W.7.
DRAWN W.7.
CHECKED E.H.

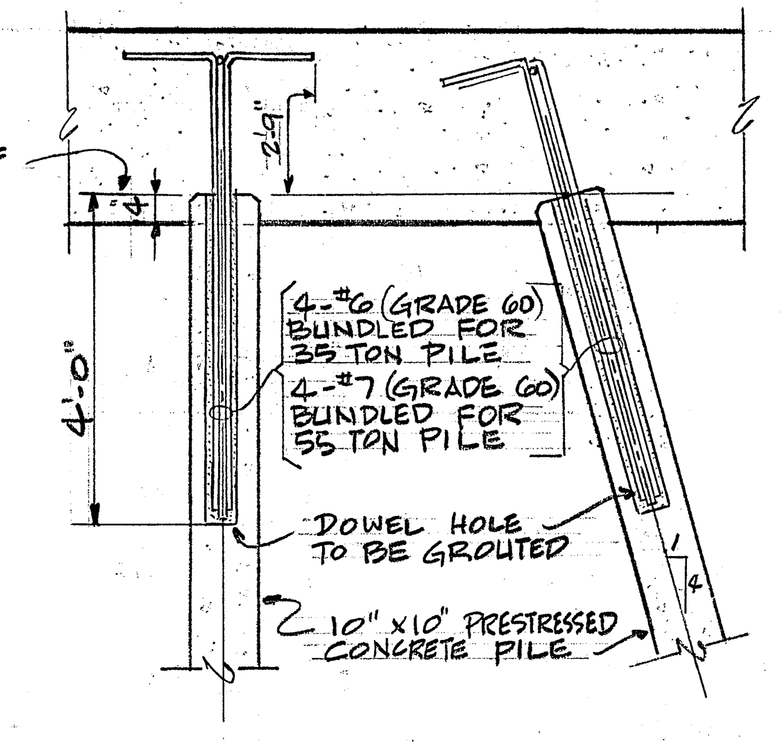
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

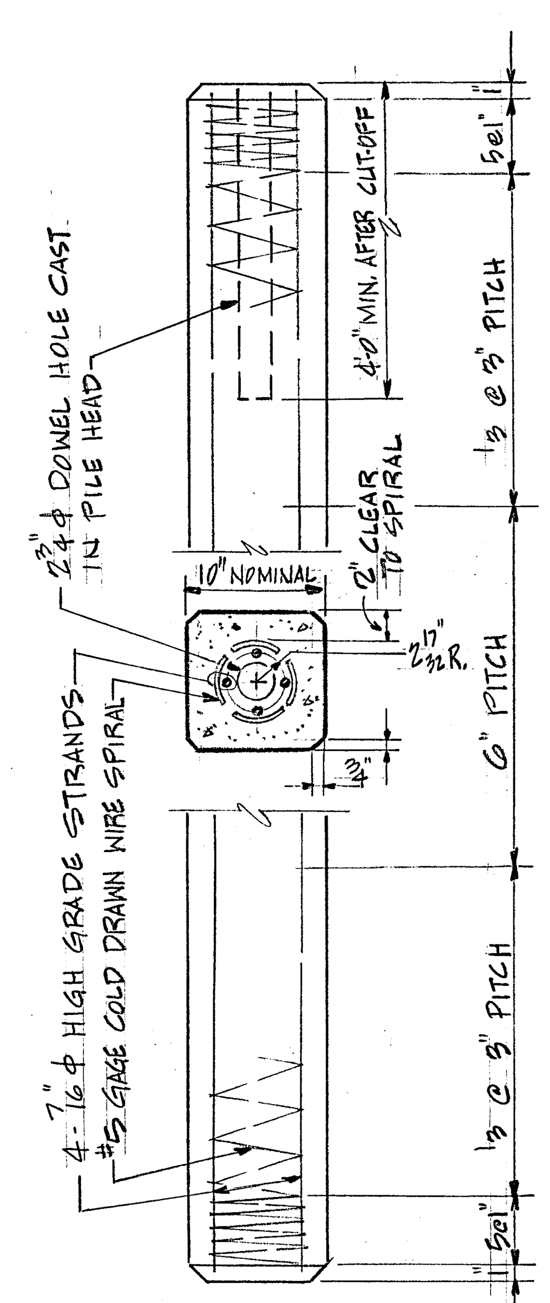
SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
PLANS, SECTIONS & DETAILS

DATE JAN. 1974 SCALE AS NOTED
DRWG. NO.
CT-S-405

71100



PILE CAP DETAIL $1\frac{1}{2}$" = 1'-0"
(TYP. EXCEPT AS OTHERWISE SHOWN OR NOTED)



ELEVATION
1" = 1'-0"

NOTES:

CONCRETE

CEMENT: TYPE II PRESTRESS

f'_c = 6000 P.S.I. @ 28 DAYS

f_{ci} = 3,500 P.S.I. @ TRANSFER

AGGREGATE: 1" MAX.

STEAM CURE AS PER STATE OF CALIF. STANDARD SPECS. 90-7.04

PRESTRESSING:

STRANDS 7/16" DIA. A.S.T.M. A416-68 GRADE 270

A = 0.115 SQ. IN.

MIN. BREAKING STRENGTH = 31,000#

INITIAL TENSION = 21,700# / STRAND MIN.

WORKING FORCE = 70,700#

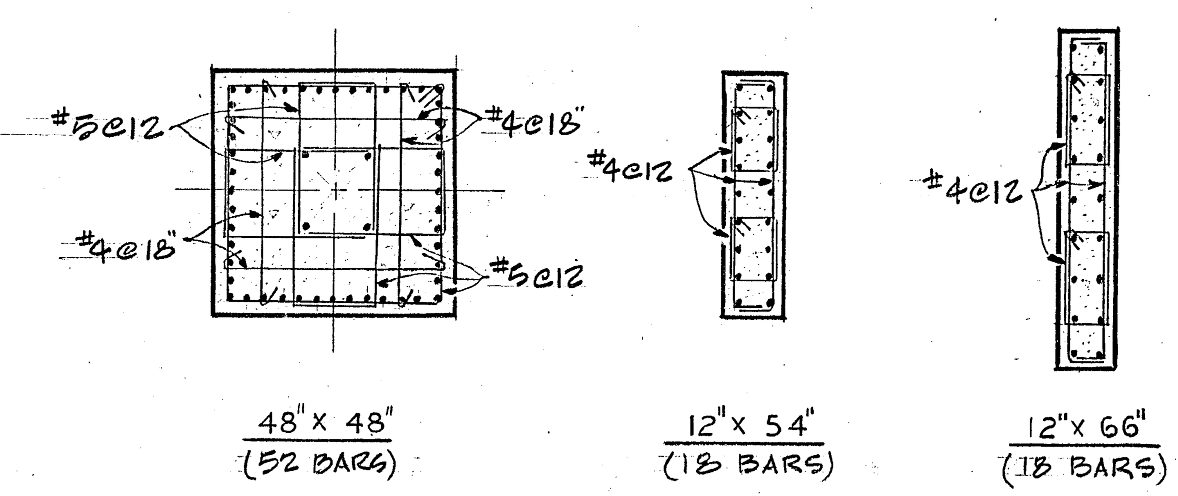
EFFECTIVE PRESTRESS = 720 P.S.I.

TYPICAL PILE DETAILS

10" SQUARE PRESTRESSED CONCRETE PILE

COLUMN SCHEDULE

COLUMN MARK	B2, C2, B3, C3, B4, C4, B5, C5, B6, G8, E9, E10, E11	C6, E8	D7	C8, E6	C7, E7	D6, D8	F8
HIGH ROOF		COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	COL. CUT-OFF EL. 140.58	
COL. SIZE		W8x24	W8x28	W8x24	W8x24	W8x24	
				1"x12½"x1'-0½" BASE PL	1"x12½"x1'-0½" BASE PL	1"x12½"x1'-0½" BASE PL	
ROOF & PENTHOUSE FL.	COL. CUT-OFF EL. 127.25	COL. SPLICE EL. 128.75	COL. SPLICE EL. 128.75	BOTT. OF BASE PL EL. 128.67	BOTT. OF BASE PL EL. 128.67	BOTT. OF BASE PL EL. 128.67	COL. CUT-OFF EL. 127.25
COL. SIZE	5"ϕ STD. STL. PIPE COL. (14.62#/FT.)	W8x31	W10x60	48"x48" 52-#11	12"x54" 18-#11	12"x66" 18-#11	W10x21
	⅝"x10"x0'-10" BASE PL	1"x14"x1'-2" BASE PL	1¾"x20"x1'-8" BASE PL				⅝"x11"x0'-11" BASE PL
GRADE FL.	BOTT. OF BASE PL EL. 111.87	BOTT. OF BASE PL EL. 111.87	BOTT. OF BASE PL EL. 111.81				BOTT. OF BASE PL EL. 111.87

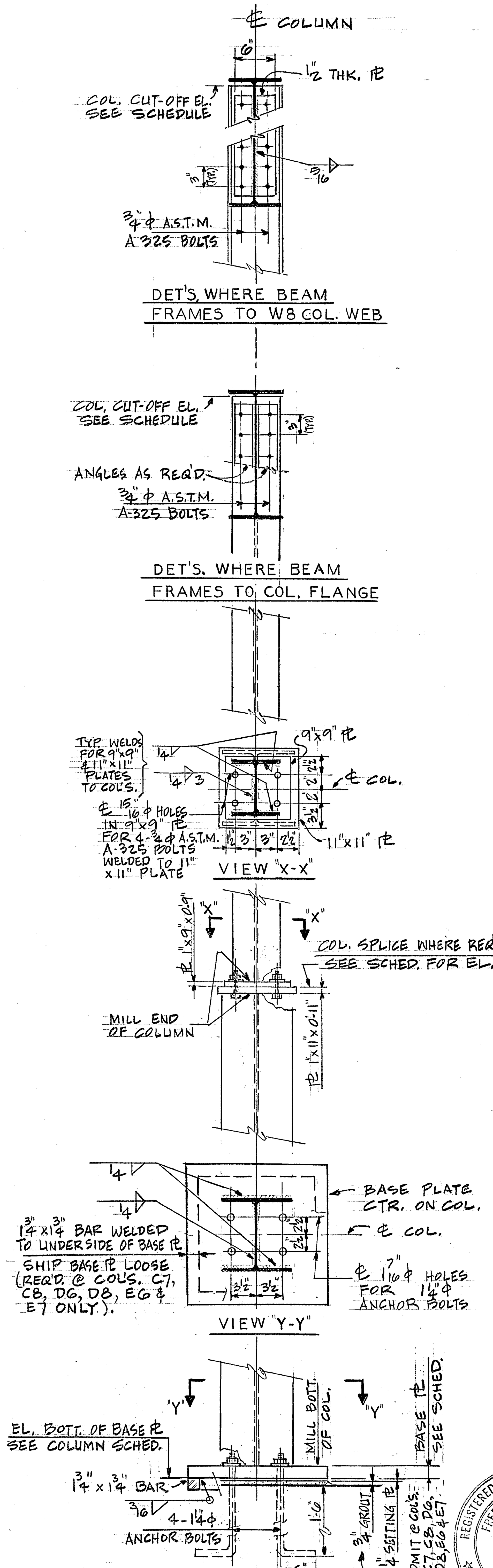


TYPICAL CONCRETE COLUMN TIE DETAILS ⅜" = 1'-0"

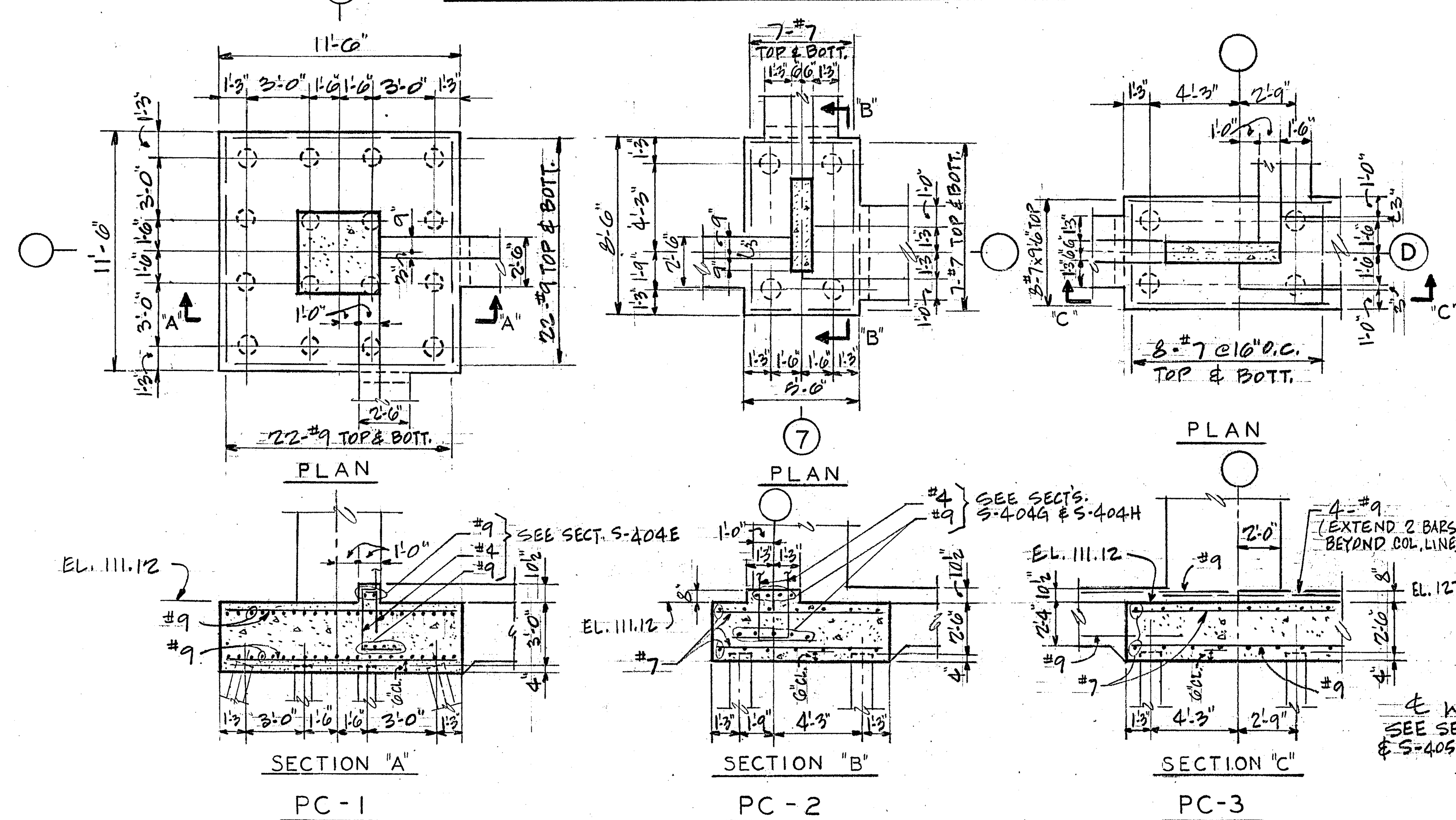
NOTE!

CONCRETE COLUMNS SHALL HAVE DOWELS FROM FOUNDATIONS OR CONSTRUCTION BELOW OF SAME SIZE & SPACING AS COL. VERTICAL STEEL.

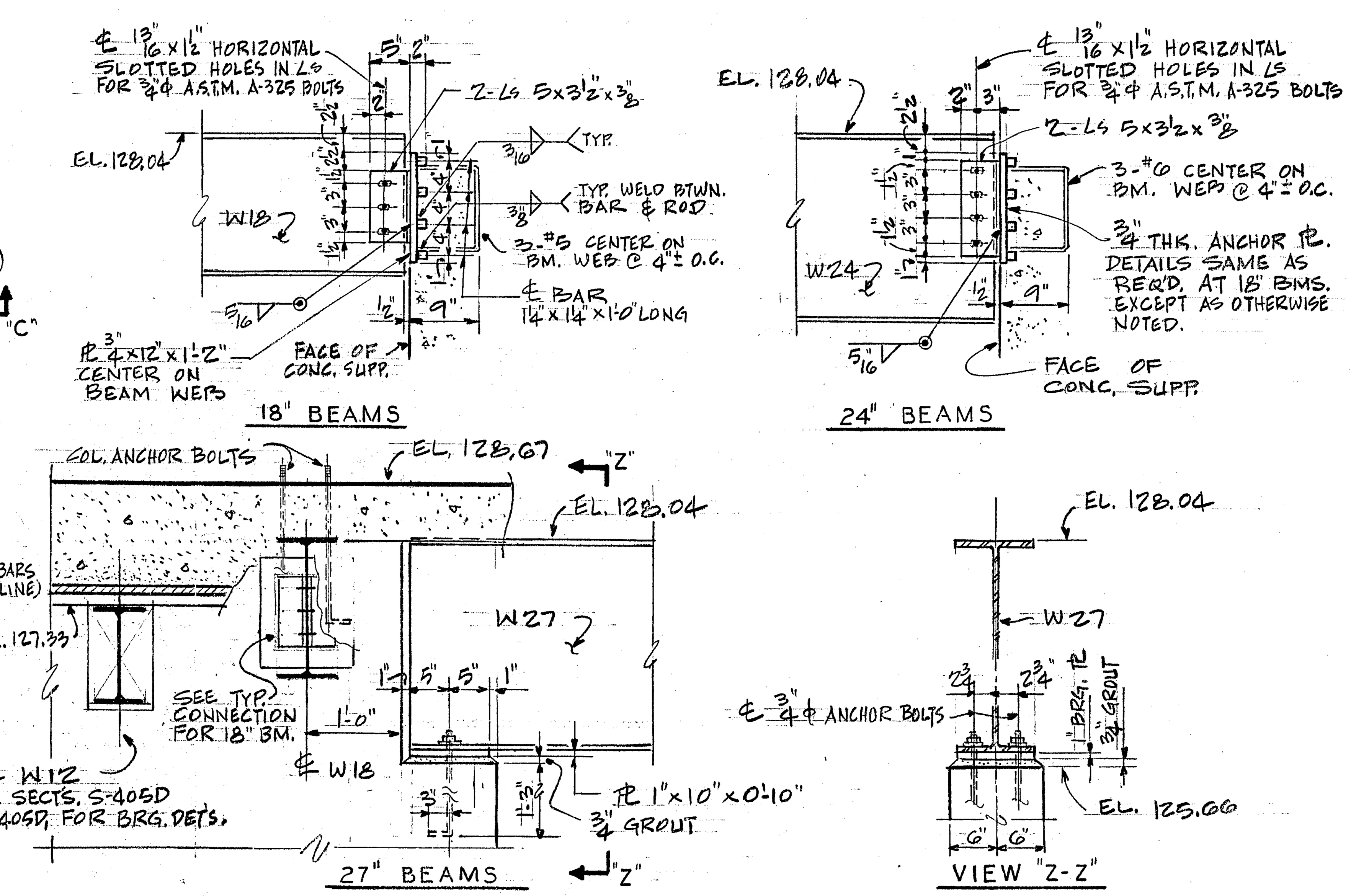
SEE SECTIONS S-404E, S-404F & FOR CONCRETE COLUMN ELEVATIONS.



TYPICAL "W" COLUMN DETAILS
1" = 1'-0"



TYPICAL PILE CAP DETAILS
3/16" = 1'-0"



TYPICAL CONNECTION DETAILS

STEEL BEAM TO CONCRETE COLUMN ¾" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER
FREDERICK N. VAN NESS
No. C13286
CIVIL ENGINEER
STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION	BY	APPR'D
	2/79	AS-BUILT	YW	

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS   SAN JOSE, CALIFORNIA

APPROVED
CT&A [signature] PARTNER
EBMUD [signature] MGR. WPCD

DESIGNED W.T.
DRAWN W.T.
CHECKED E.H.

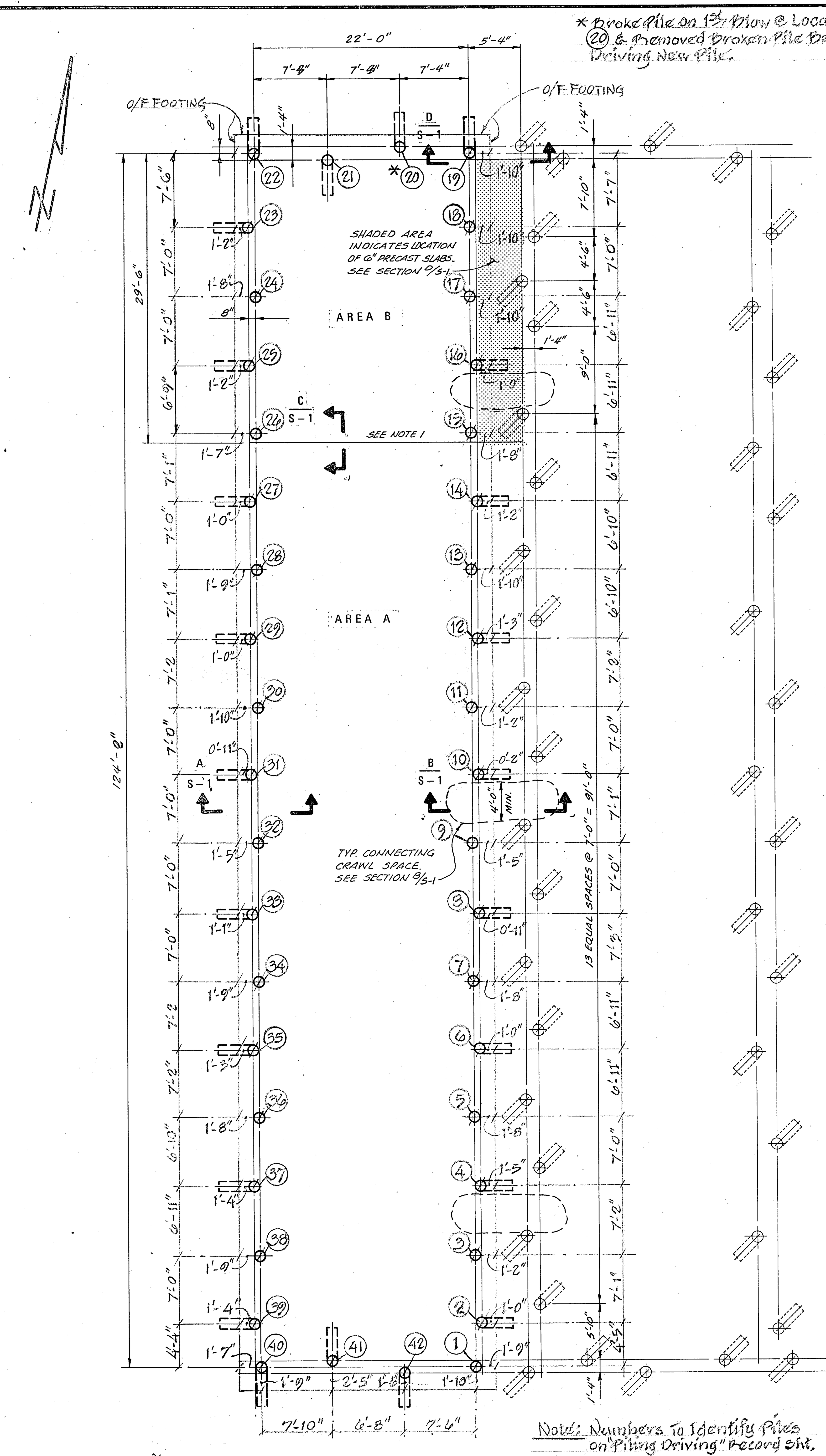
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

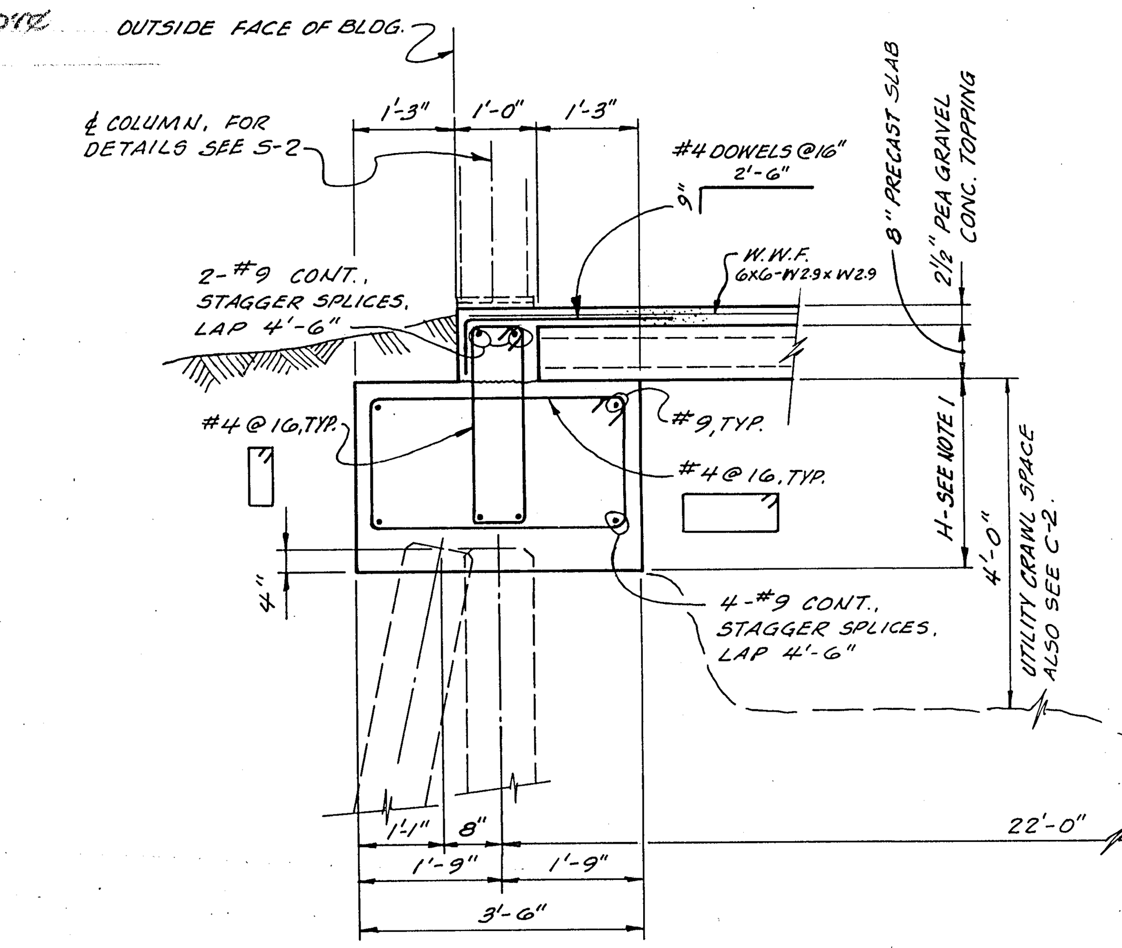
SPECIFICATION NO. SD 122-A
ADMINISTRATION CENTER
COLUMN SCHEDULE & DETAILS

DATE JAN. 1974 SCALE AS NOTED
DRWG. NO.
CT-S-406

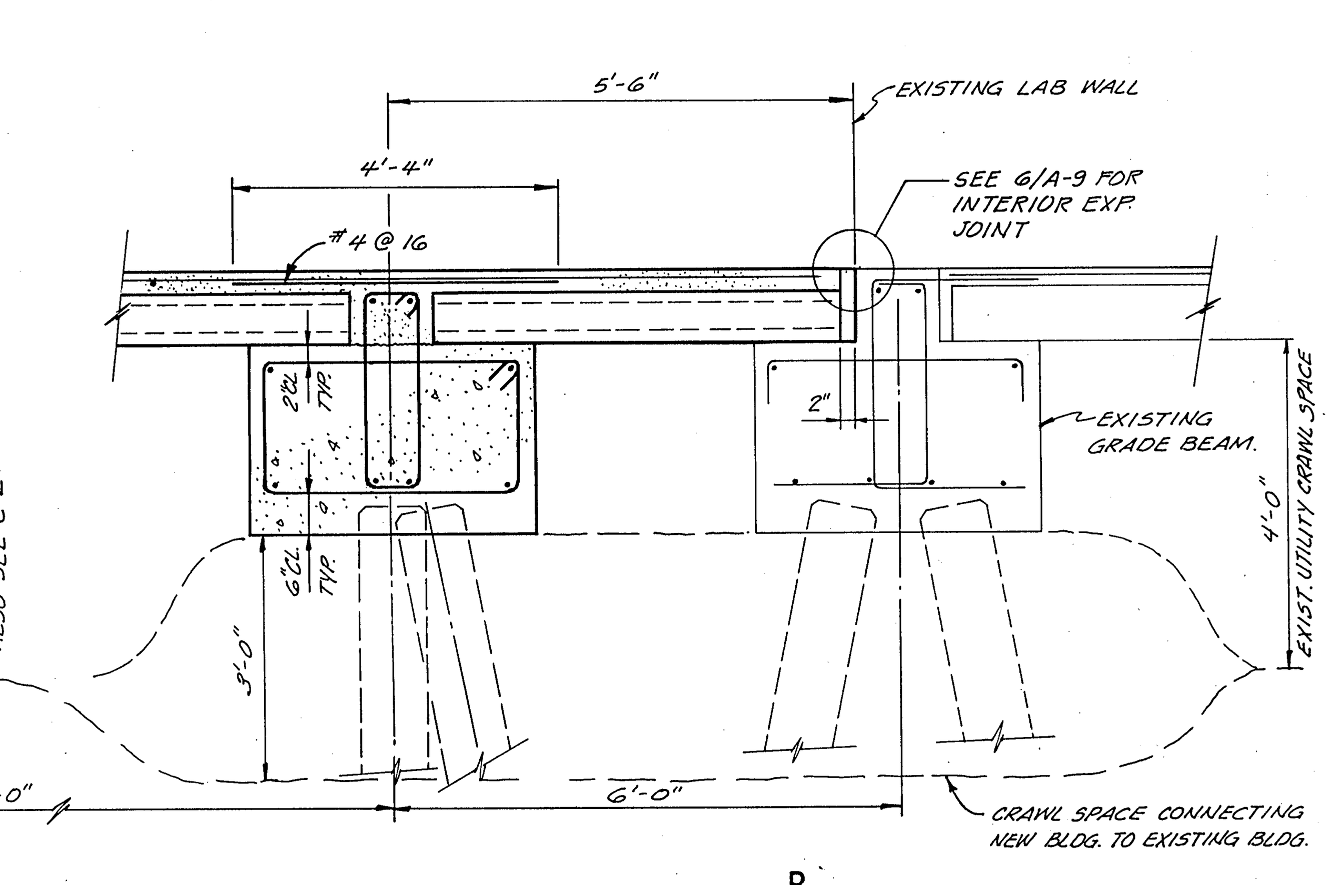
71100



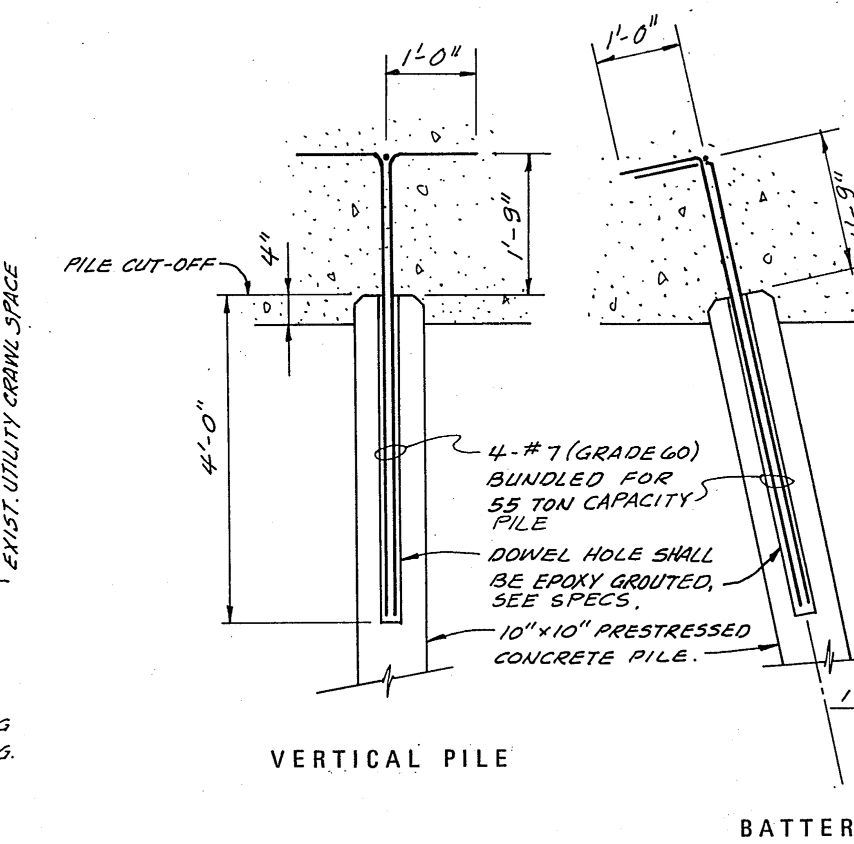
PILE PLAN
1/8" = 1'-0"



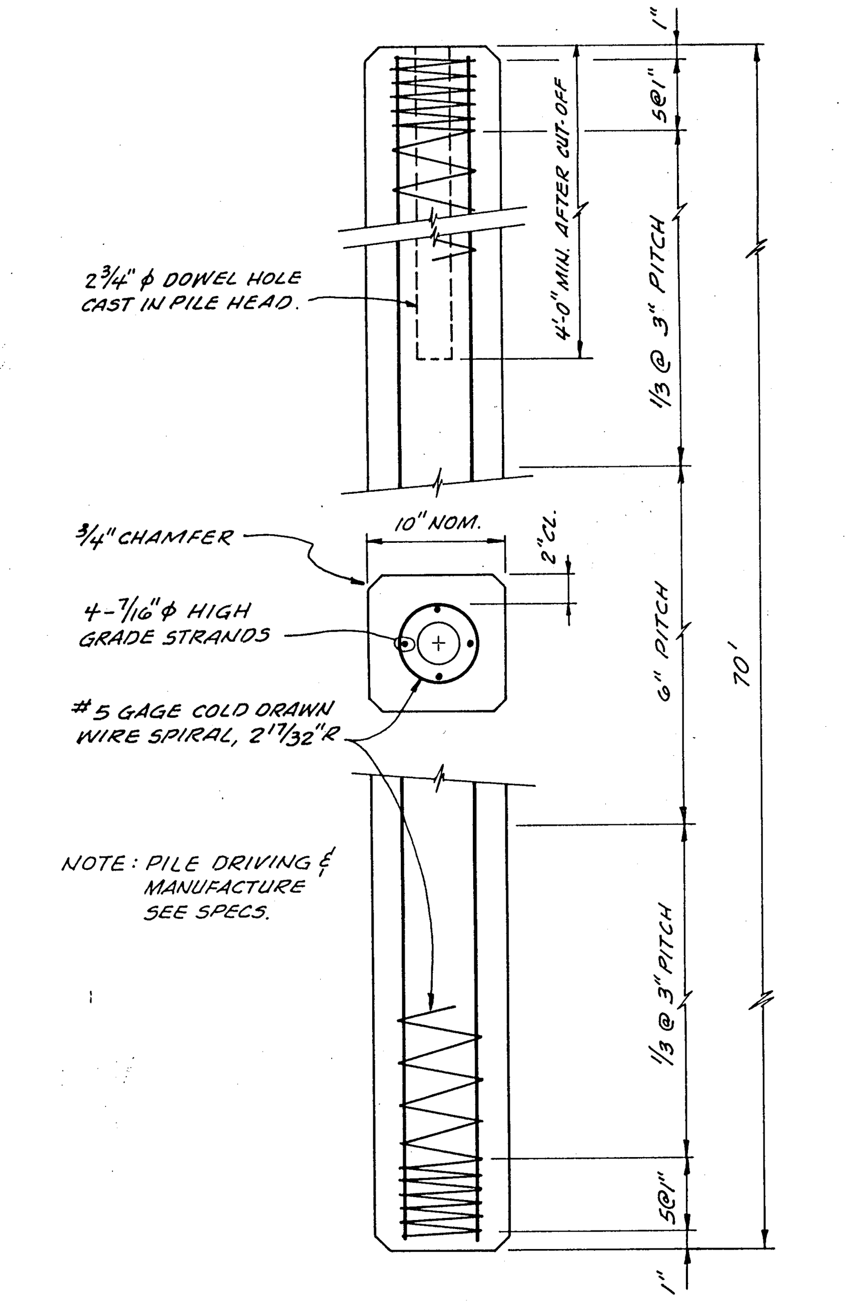
SECTION A/S-1
1/2" = 1'-0"



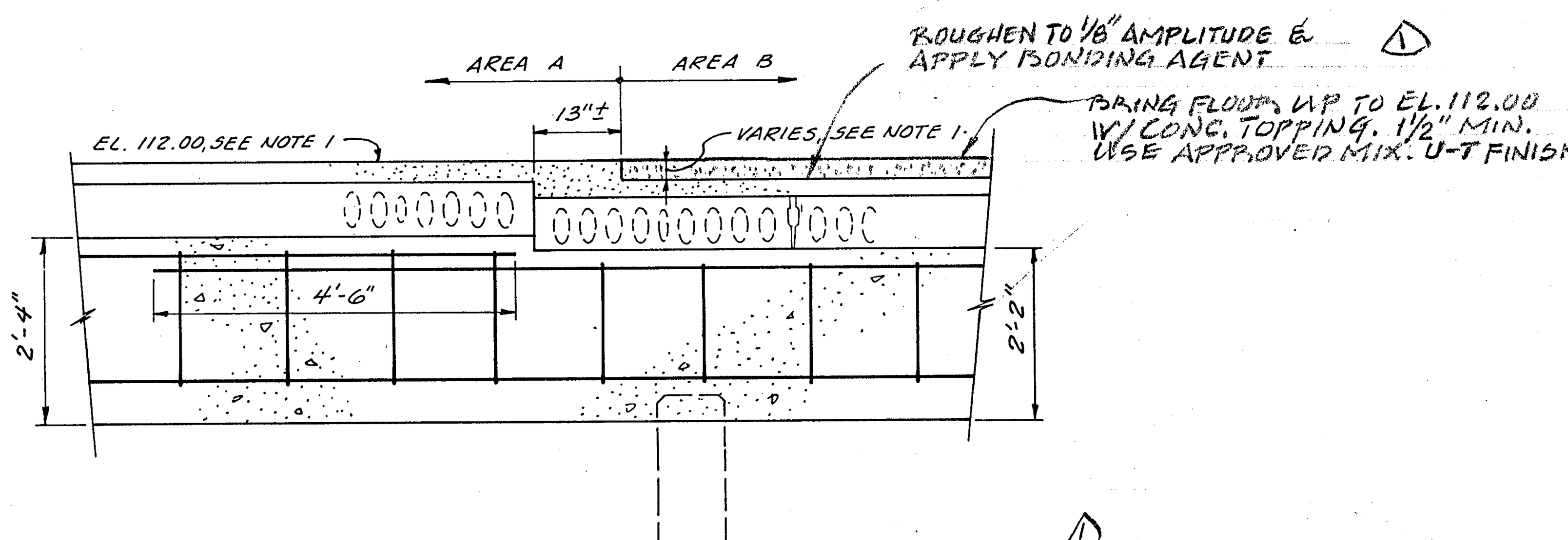
SECTION B/S-1
1/2" = 1'-0"



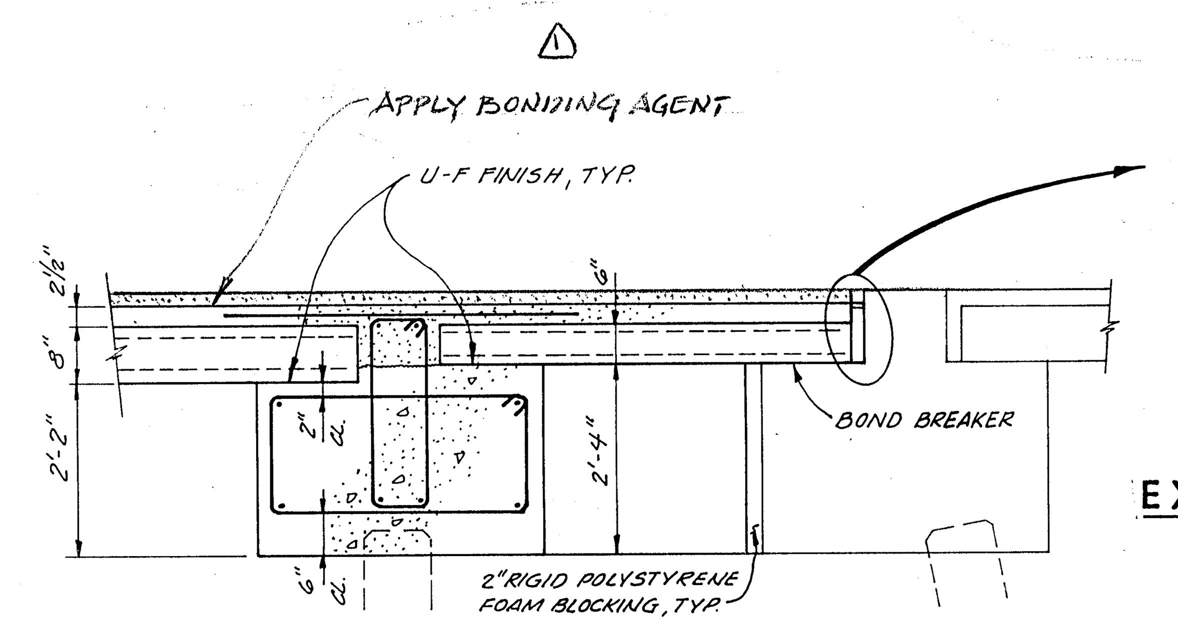
PILE CAP DETAIL
1/2" = 1'-0"



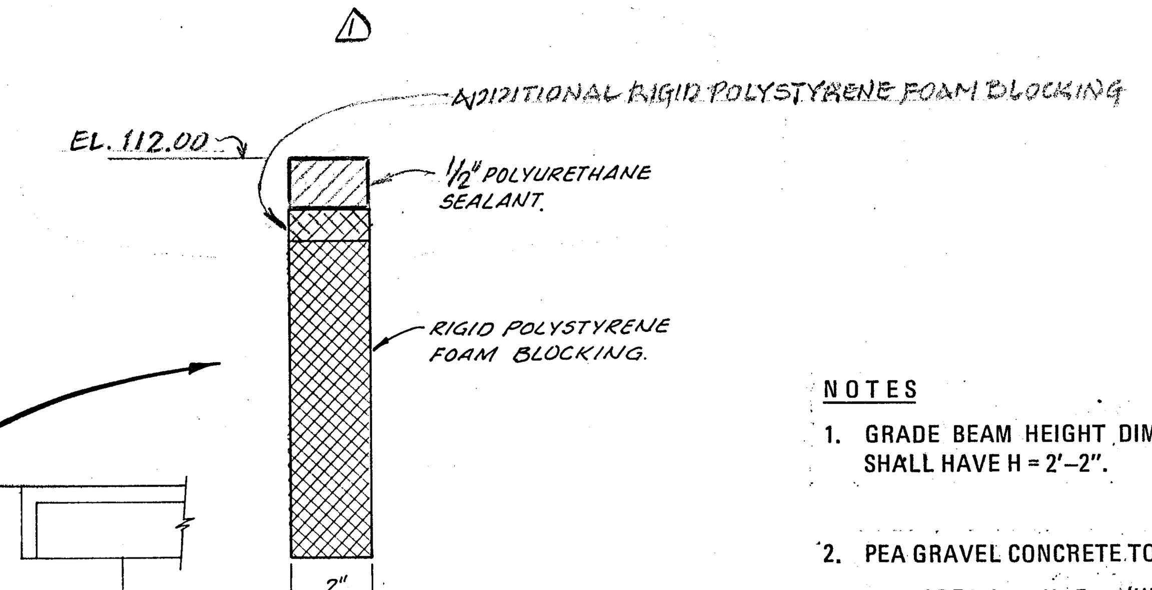
10'' SQUARE PRESTRESSED CONCRETE PILE
1" = 1'-0"



SECTION C/S-1
1/2" = 1'-0"



SECTION D/S-1
1/2" = 1'-0"



EXTERIOR JOINT

NOTES

1. GRADE BEAM HEIGHT DIMENSION H SHALL BE 2'-4" IN AREA "A". AREA "B" SHALL HAVE H = 2'-2".

2. PEA GRAVEL CONCRETE TOPPING FINISHES: SEE SPECS.
   AREA A: U-F (UNFORMED, FLOAT)
   AREA B: U-TB (UNFORMED, TROWELED, HAIR BRUSH)

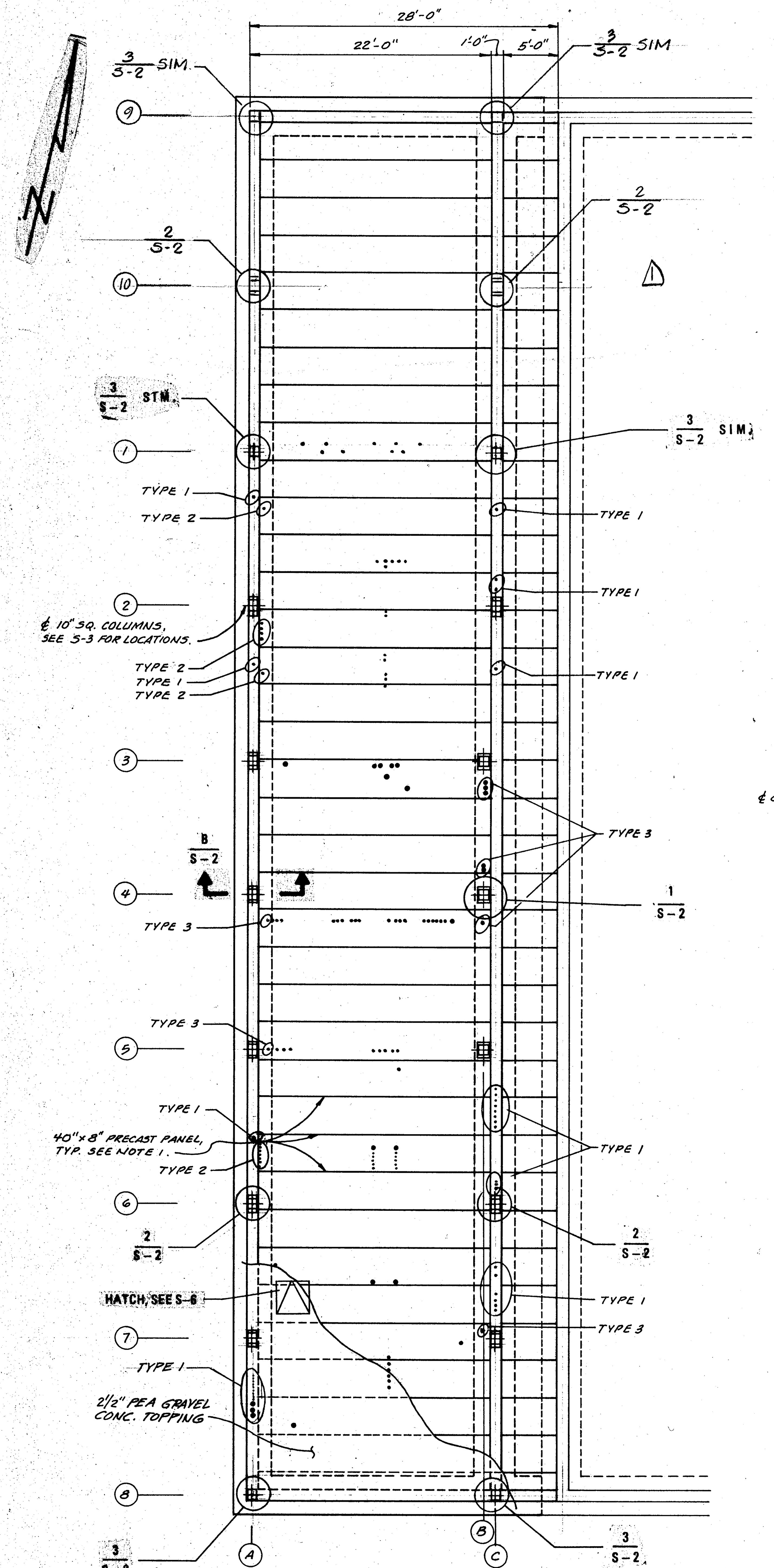
APPROVED Walter J. Bishop
MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED C. Way for
CHIEF ENGINEER, R.P.E. NO. C 8216

NO.	DATE	REVISION	BY	APP.
	10/86	As-Built		
1	11/14/84	Revised for Storage Room		

DESIGN BY F. NESTLERODE / DJJ	EAST BAY MUNICIPAL UTILITY DISTRICT OAKLAND, CALIFORNIA
DESIGN CHECK BY D. Taylor	LABORATORY EXPANSION, SPECIFICATION SD 152
DRAWN BY T.W. BYRNE	STRUCTURAL
PIPELINE — CORR — FNDN	PILE FOUNDATION PLAN & PILE DETAILS
CIVIL — STRUCT. —	
ELEC. — MECH. —	
PROJ. ENG., DESIGN D. Taylor	
SPVR., SPEC. PROJ. D.M. Dreiner	STRUCTURE OR ZONE DESIGNATION
MGR., DESIGN	SCALE AS SHOWN
ASST. CH. ENG., DES. & CONST. R.P.E. NO. C 26724 C. Way	DATE 6 MARCH 84 — SD-S-1

E-160 • 3/82

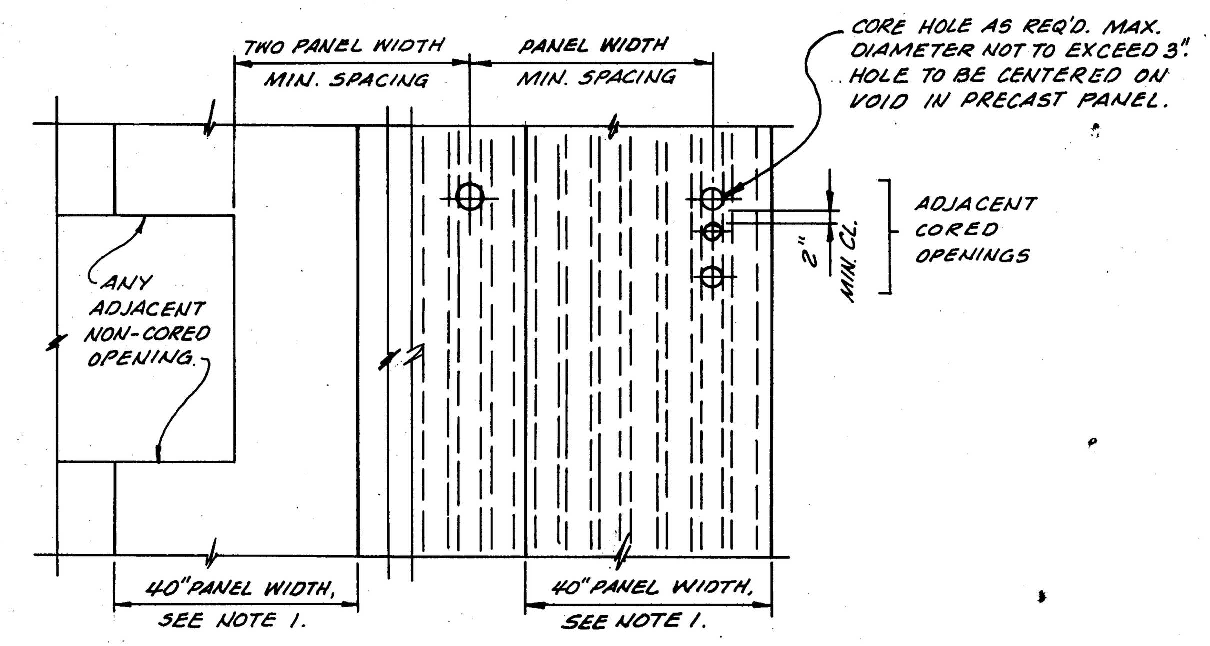


FLOOR PLAN
1/8" = 1'-0"

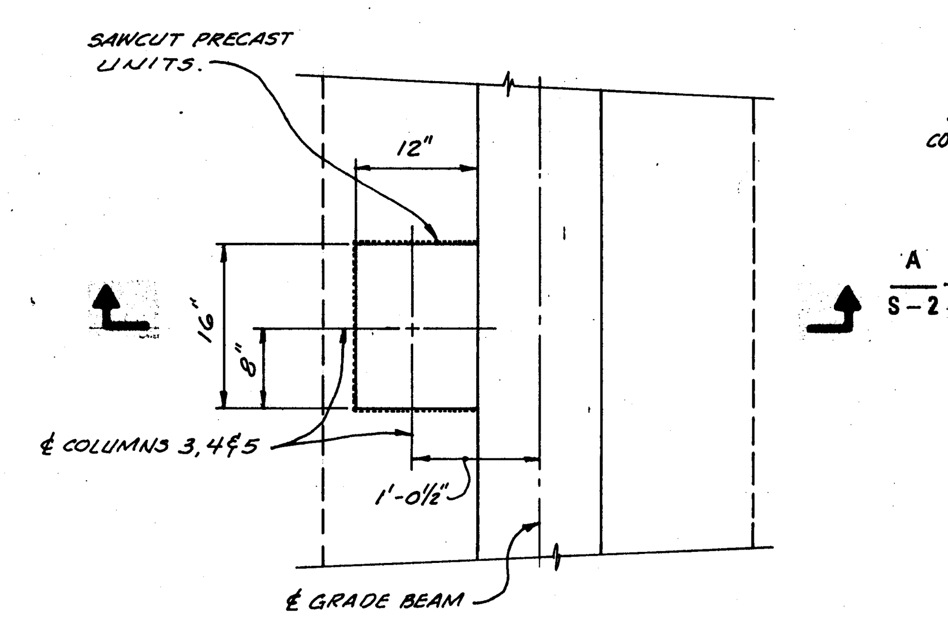
LEGEND

••••• PIPE PENETRATIONS

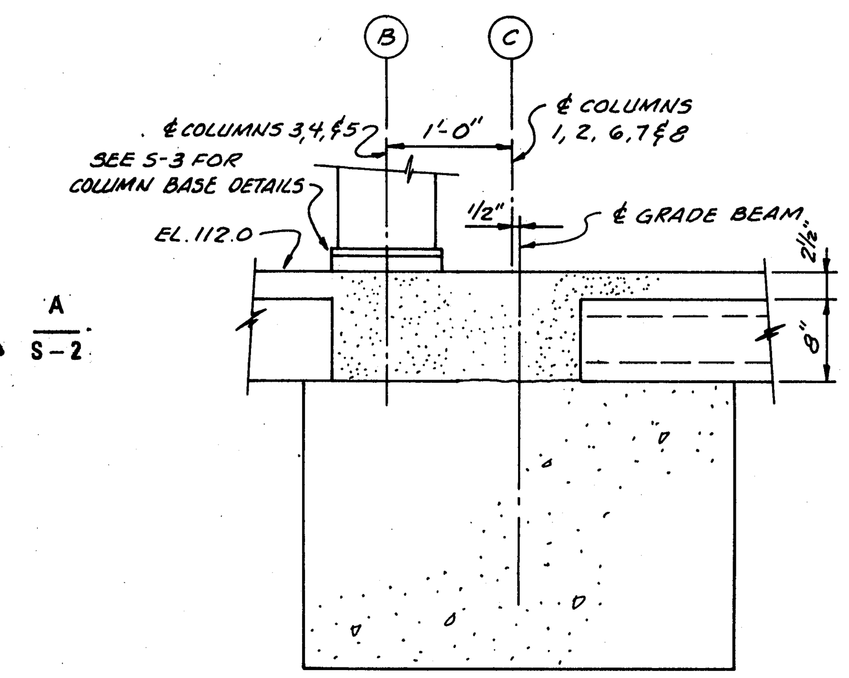
HATCH



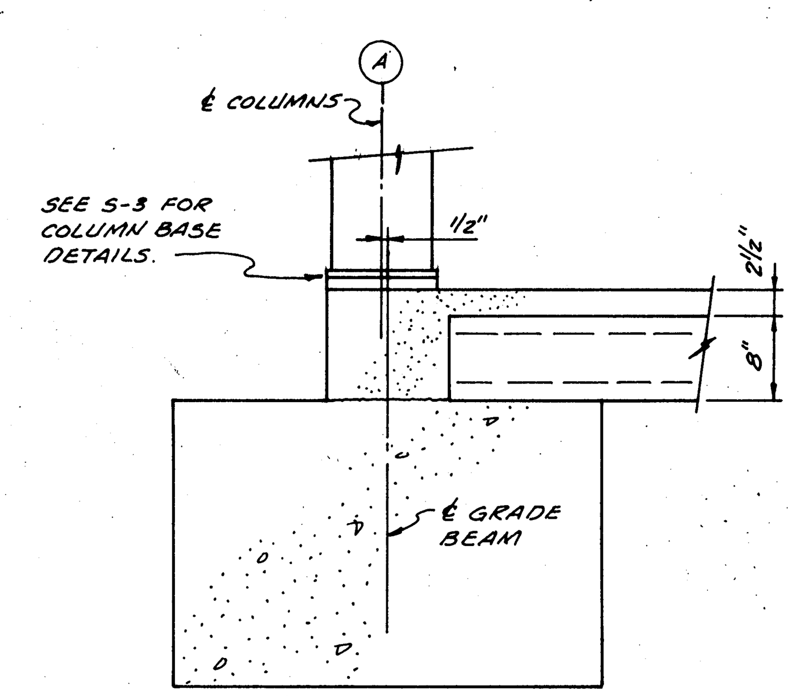
TYPICAL CORE OPENINGS IN PRECAST PANEL
NO SCALE



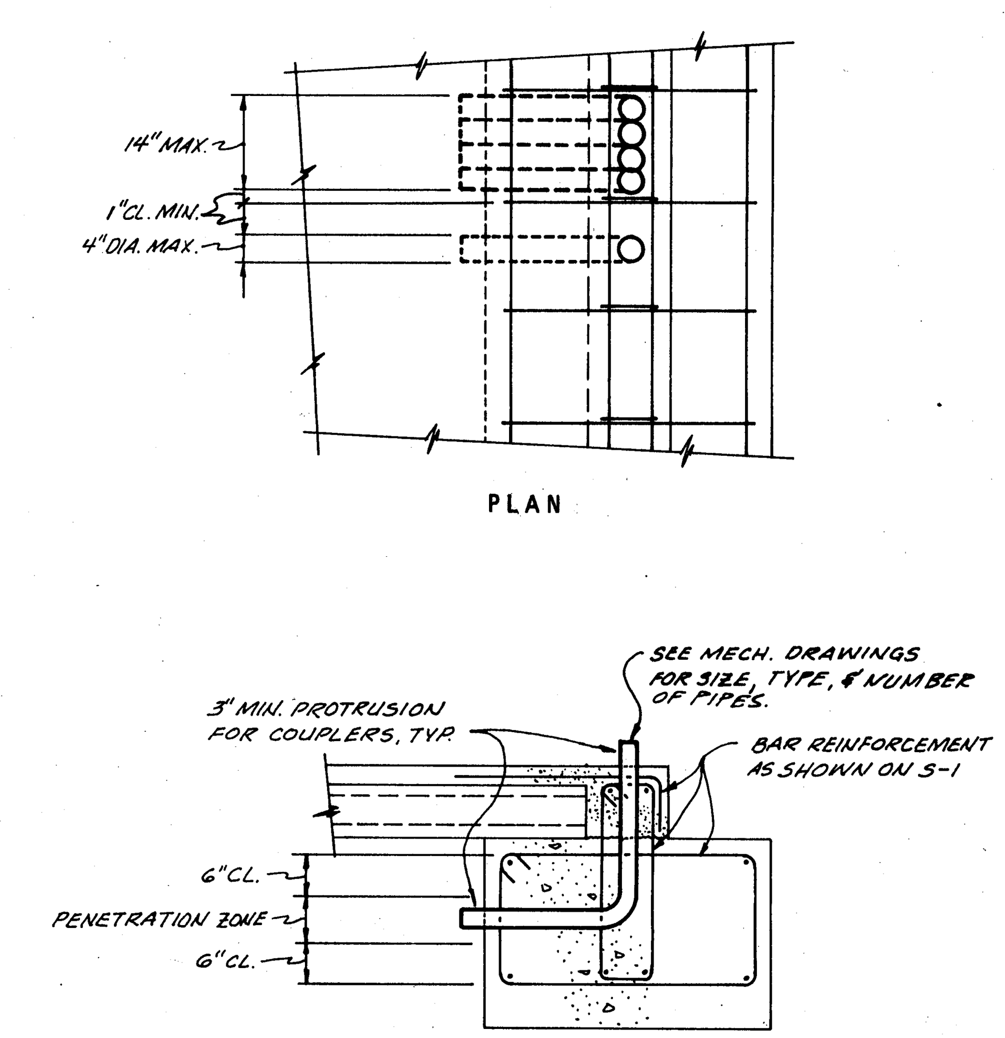
DETAIL 1/S-2
3/4" = 1'-0"



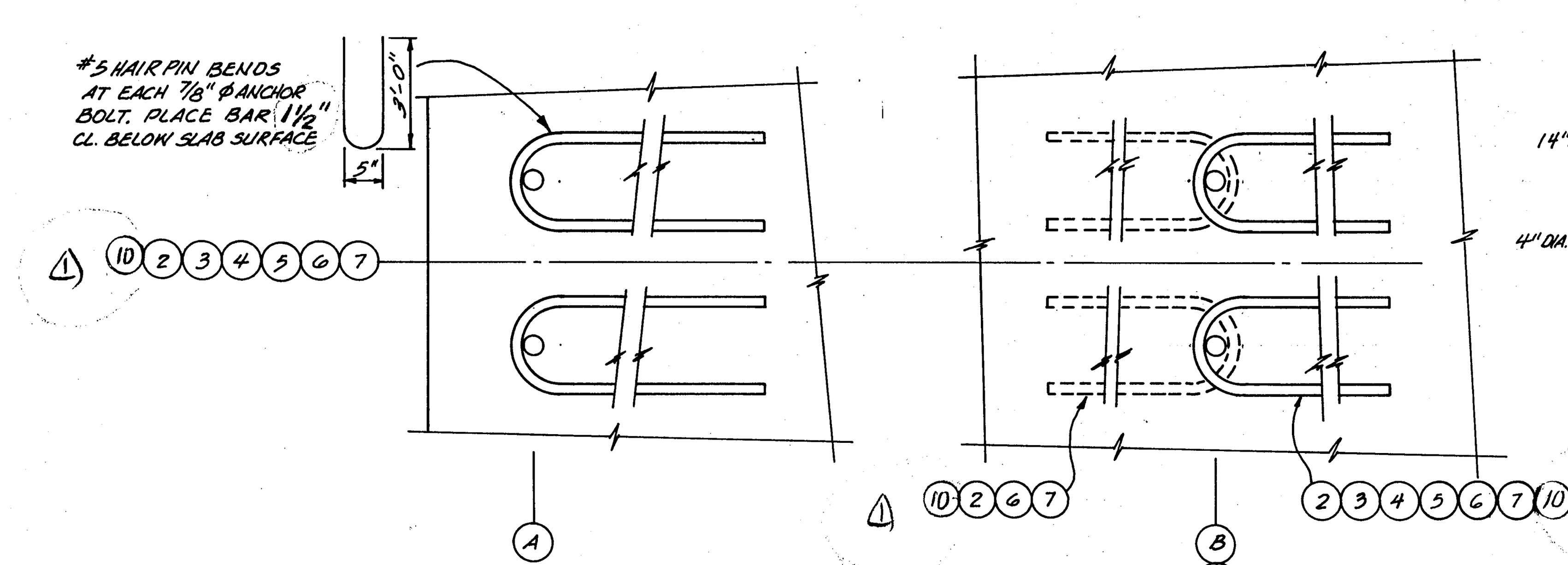
SECTION A/S-2
3/4" = 1'-0"



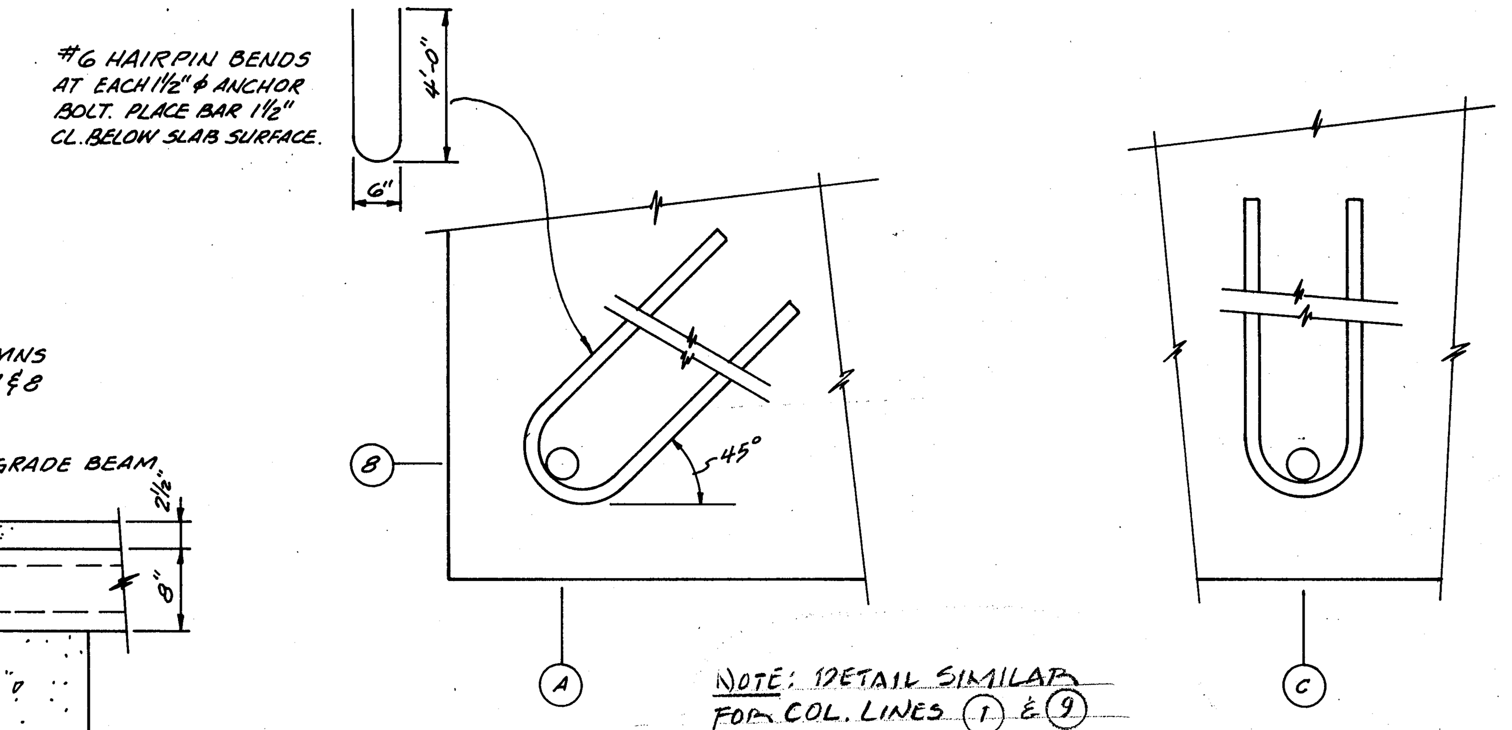
SECTION B/S-2
3/4" = 1'-0"



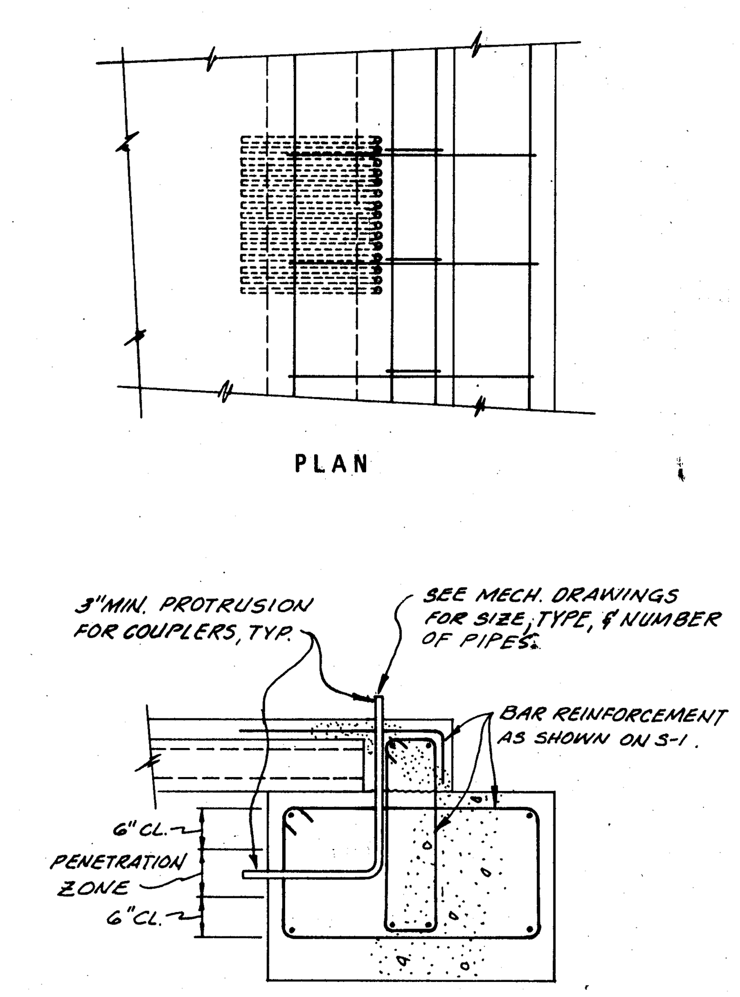
TYPE 1 PIPE PENETRATIONS
1/2" = 1'-0"



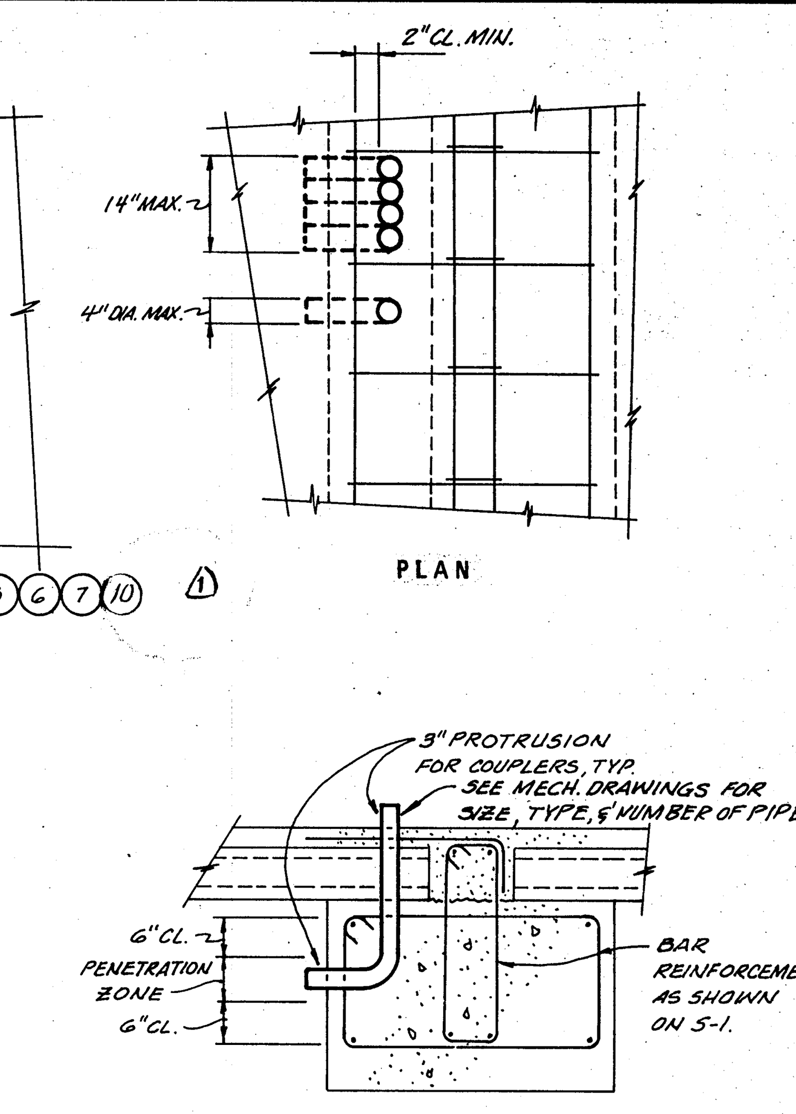
DETAIL 2/S-2
NO SCALE



DETAIL 3/S-2
NO SCALE



TYPE 2 PIPE PENETRATIONS
1/2" = 1'-0"



TYPE 3 PIPE PENETRATIONS
1/2" = 1'-0"

NOTES

1. THE CONTRACTOR MAY SUBMIT ALTERNATIVE PRECAST CONCRETE PANEL SIZES AND DETAILS, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, SUBJECT TO THE REVIEW AND APPROVAL OF THE ENGINEER. SEE SPECIFICATIONS FOR SUBMITTAL REQUIREMENTS.
2. PRECAST CONCRETE PANEL SYSTEMS SHALL ACCOMMODATE ALL FLOOR PENETRATIONS AND OPENINGS INDICATED ON THE FLOOR PLAN AND ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.
3. REFER TO THE SPECIFICATIONS FOR PRECAST CONCRETE PANEL LOAD REQUIREMENTS.
4. ALL PENETRATIONS AND OPENINGS SHALL BE 12" MIN. CLEAR OF COLUMNS.
5. ALL PIPE PENETRATIONS ON THIS DRAWING ARE SHOWN SYMBOLICALLY. ACTUAL PENETRATION LOCATIONS, SIZES, AND NUMBER OF PENETRATIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO MANUFACTURE OF PRECAST FLOOR PANELS AND CONSTRUCTION OF GRADE BEAMS.
6. SEE CIVIL, STRUCTURAL, ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR DRAINS, HATCHES, PLUMBING, PIPE, CONDUITS, AND OTHER OPENINGS WHICH PENETRATE THE FLOOR AND GRADE BEAMS. NOT ALL PENETRATIONS ARE SHOWN ON THE FLOOR PLAN.

APPROVED Walter J. Bishop
MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED CTWay for
CHIEF ENGINEER, R.P.E. NO. C 8216

NO.	DATE	REVISION	BY	APP.
	10/86	AS-BUILT		
1	Nov. 14, 84	ADDED STORAGE RM.		

DESIGN BY F. NESTLERODE / DJS
DESIGN CHECK BY D. Lozter
DRAWN BY T.W. BYRNE
PIPELINE —— CORR —— FNDN
CIVIL —— STRUCT. ——
ELEC. —— MECH. MW
PROJ. ENG., DESIGN D. Lozter
SPVR., SPEC. PROJ. D.M. Brener
MGR., DESIGN
ASST. CH. ENG., DES. & CONST. R.P.E. NO. C 26724 CTWay

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

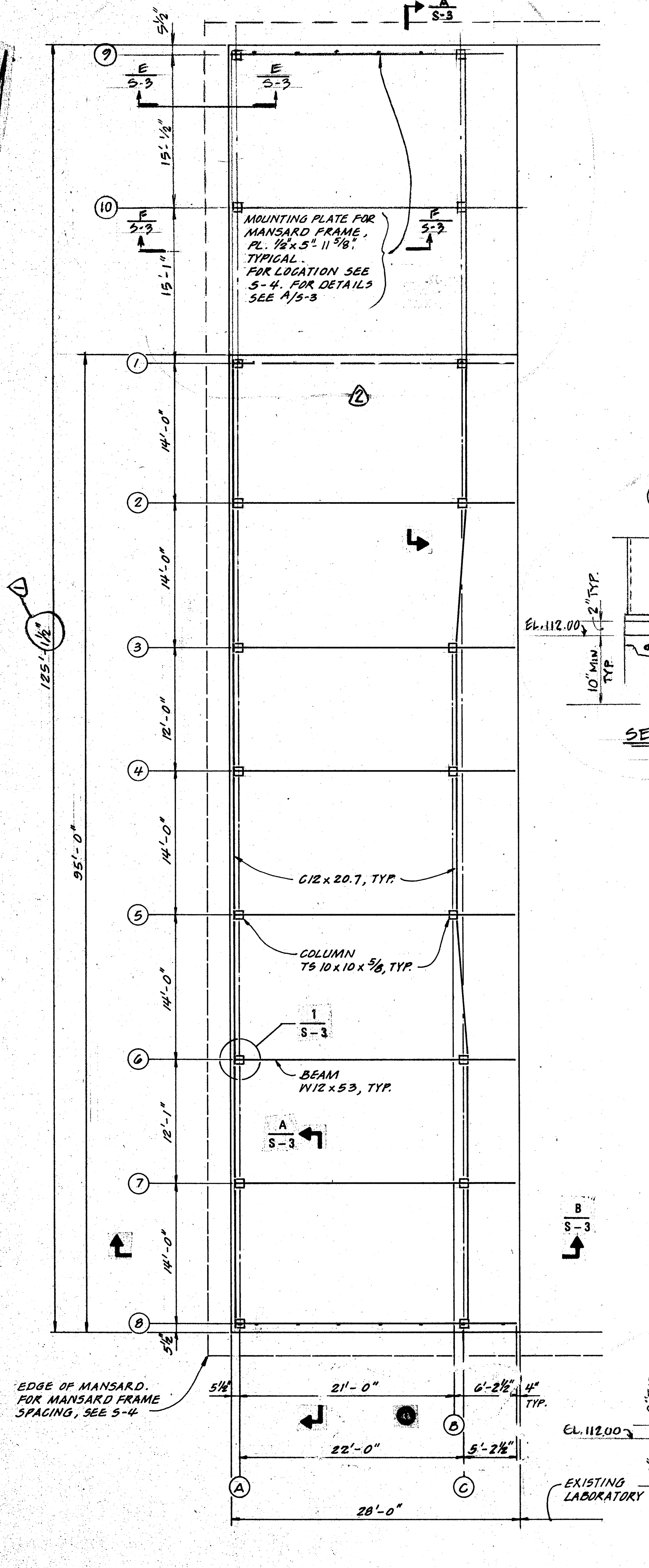
LABORATORY EXPANSION, SPECIFICATION SD 152
STRUCTURAL

FLOOR PLAN & DETAILS

STRUCTURE OR ZONE DESIGNATION
SCALE AS SHOWN
DATE 6 MARCH 84

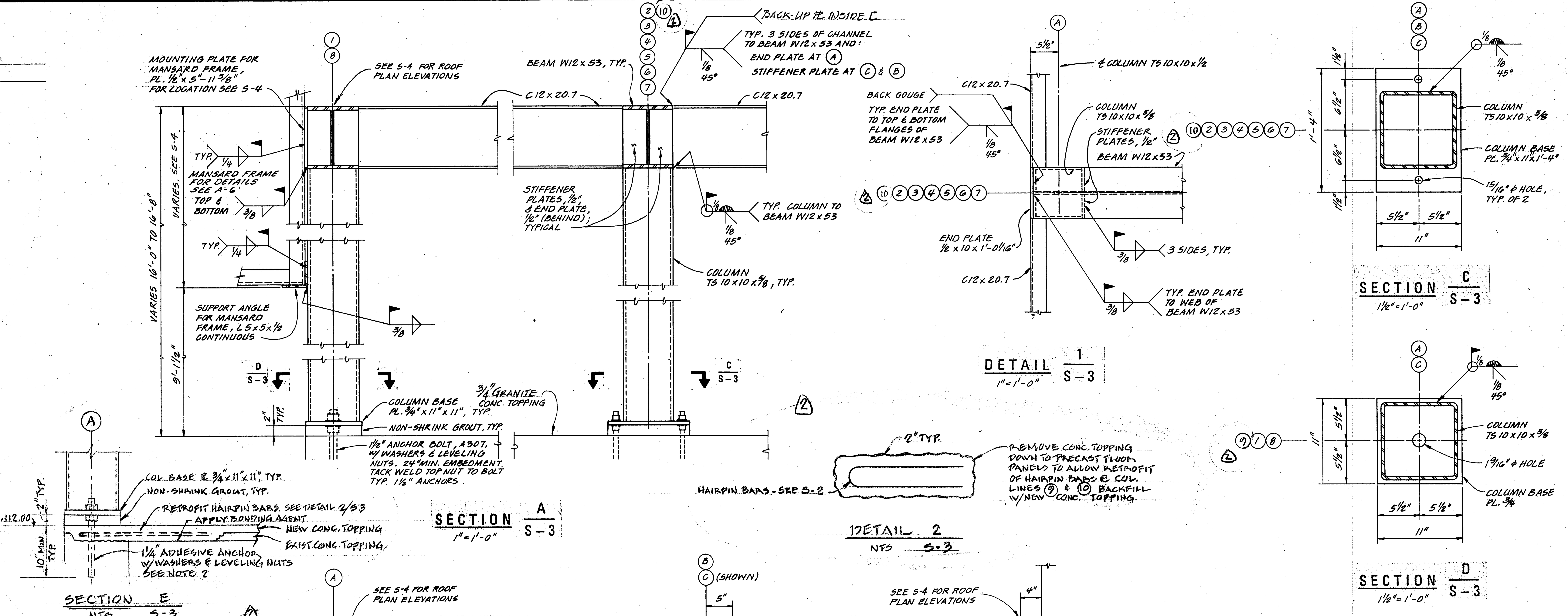
SD-S-2

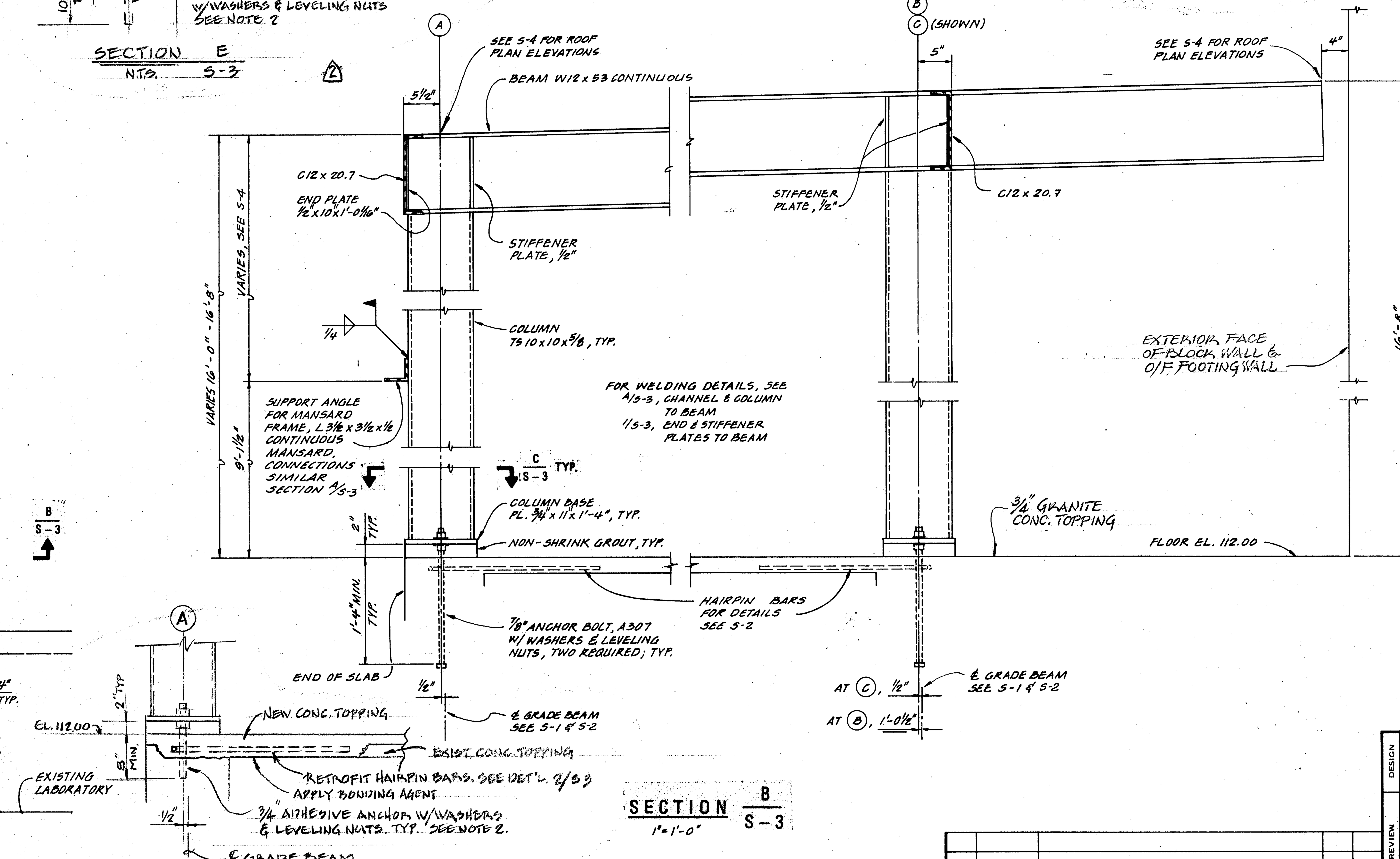
E-160 3/82



PLAN - STRUCTURAL FRAME

1/8" = 1'-0"





SECTION F NTS S-3

NOTES:

1. WELDING ROD SHALL BE E70XX.
2. ADHESIVE ANCHORS SHALL BE MOLLY PARABOND CAPSULE ANCHORS, HILTI HVA ADHESIVE ANCHOR, OR EQUAL. ANCHORS SHALL OTHERWISE CONFORM TO SPEC. SEC. 05070.

APPROVED Walter J. Bishop — MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED C. Way for — CHIEF ENGINEER, R.P.E. NO. C 8216

DESIGN BY	F. HESTLERODE / DH
DESIGN CHECK BY	D. Yortoo
DRAWN BY	E. JOW & M. FONG
PIPELINE — CORR — FNDN —	
CIVIL — STRUCT.	SLL
ELEC. — MECH. —	
PROJ. ENG., DESIGN	D. Yortoo
SPVR., SPEC. PROJ.	D.M. Bieme
MGR., DESIGN	J. Tom
ASST. CH. ENG., DES. & CONST. R.P.E. NO. C 26724	C. Way

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

LABORATORY EXPANSION, SPECIFICATION SD 152
STRUCTURAL

STRUCTURAL FRAME & DETAILS

STRUCTURE OR ZONE DESIGNATION

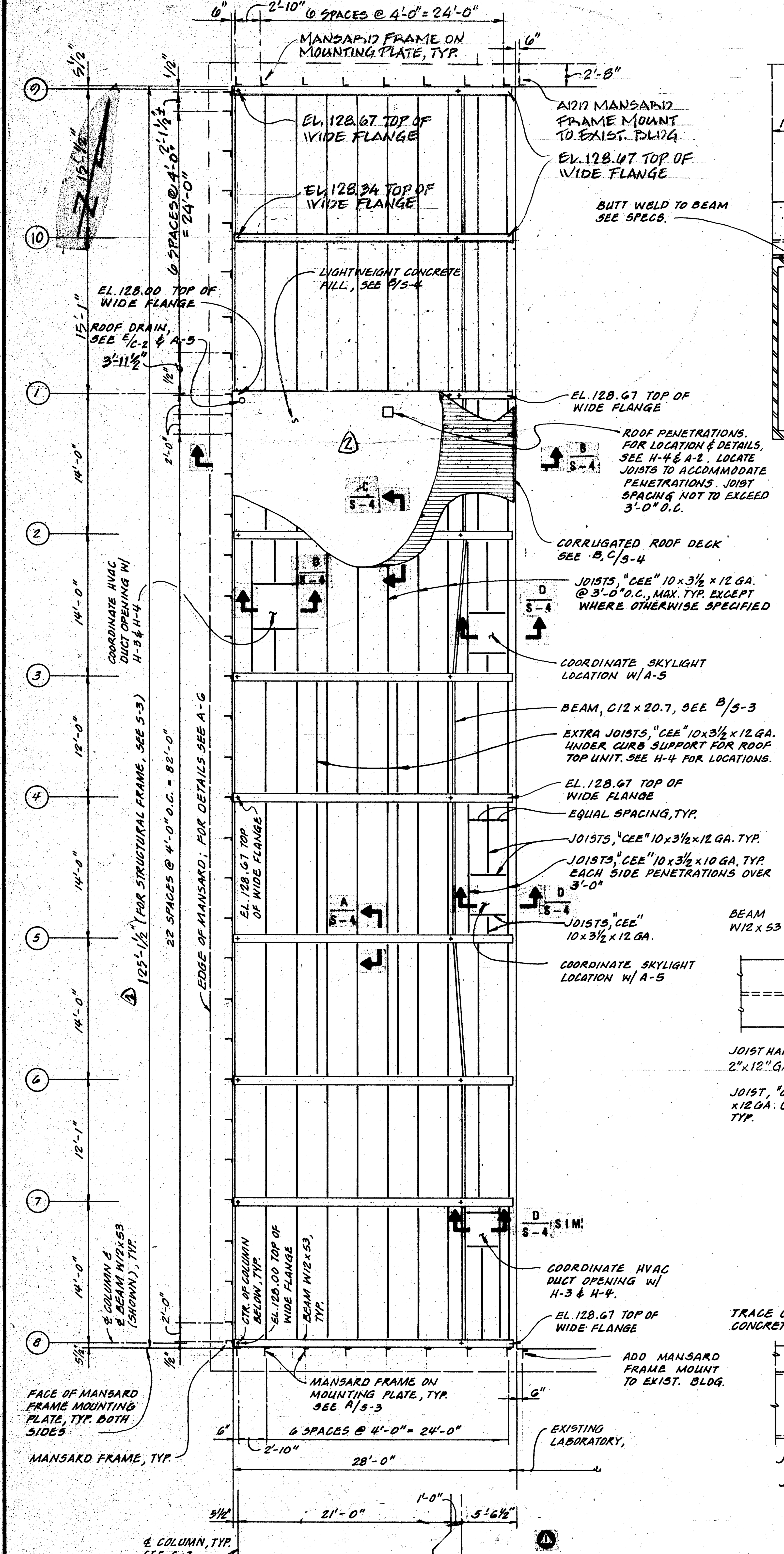
SCALE AS SHOWN

DATE 6 MARCH 84

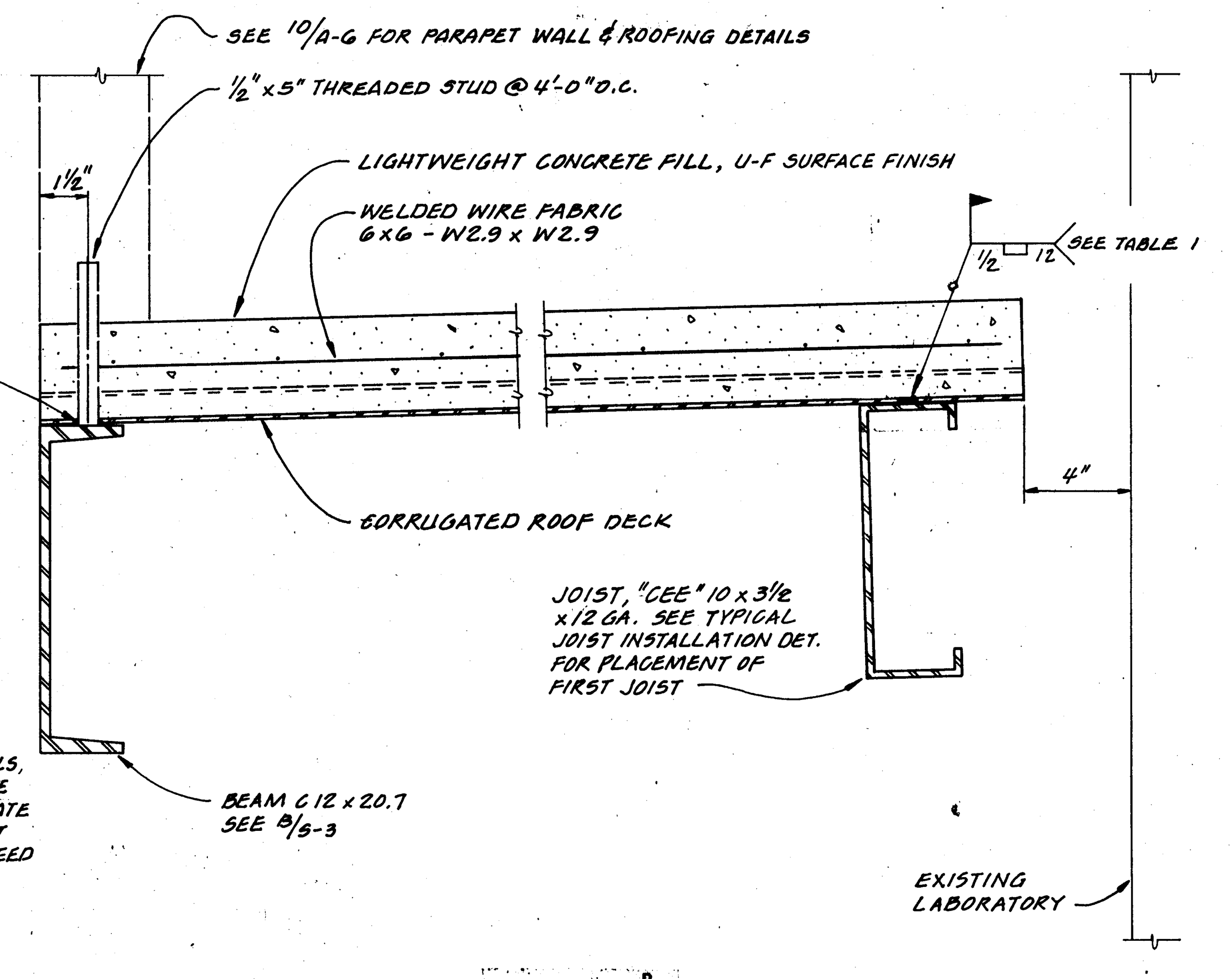
SD-S-3

NO.	DATE	REVISION	BY	APP.
	10/86	AS-BUILT		
2	NOV. 13, 84	ADDED STORAGE RM.		
1	14 AUG 84	REVISED DIMENSIONS		

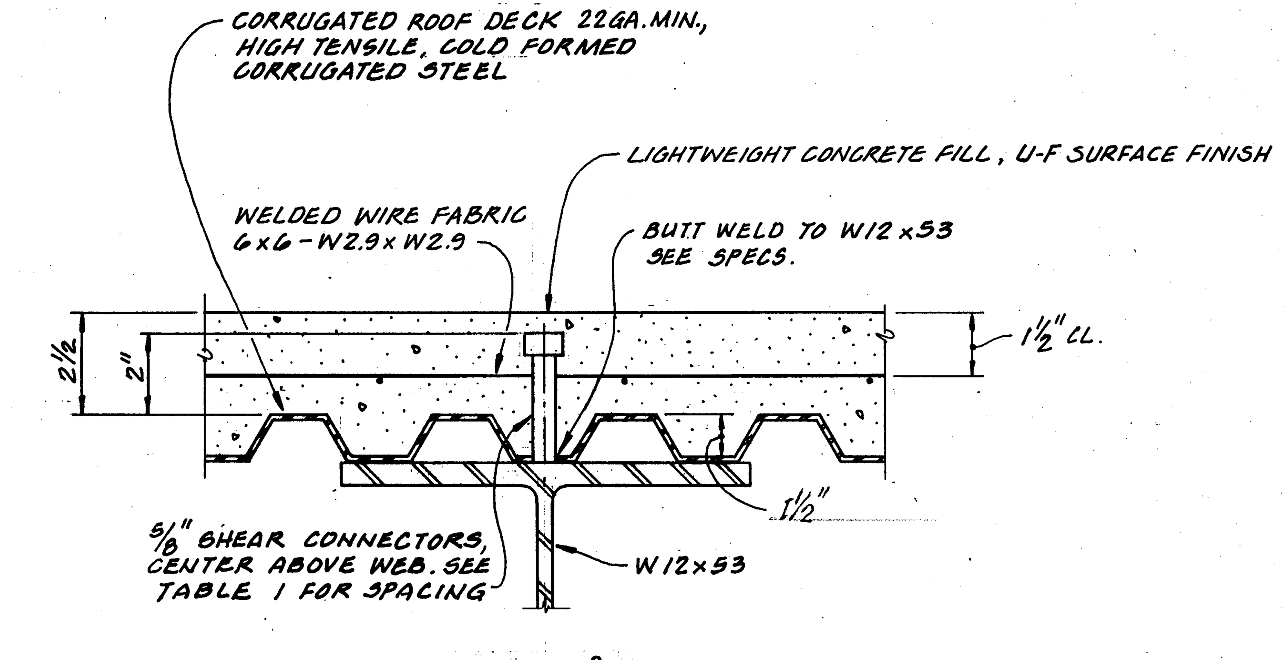
E-160 3/82



ROOF PLAN
1/8" = 1'-0"



SECTION B/S-4
3/16" = 1'-0"



SECTION C/S-4
3" = 1'-0"

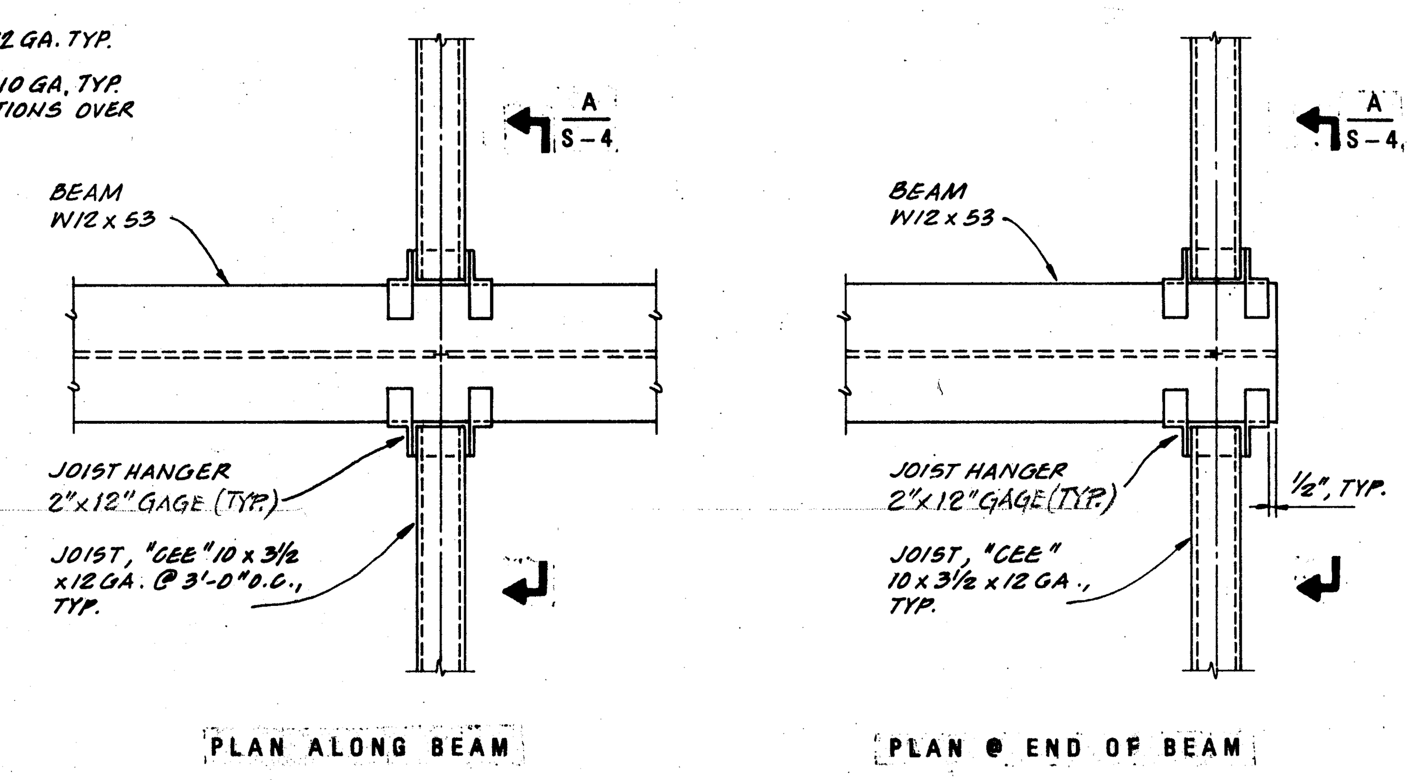
TABLE 1

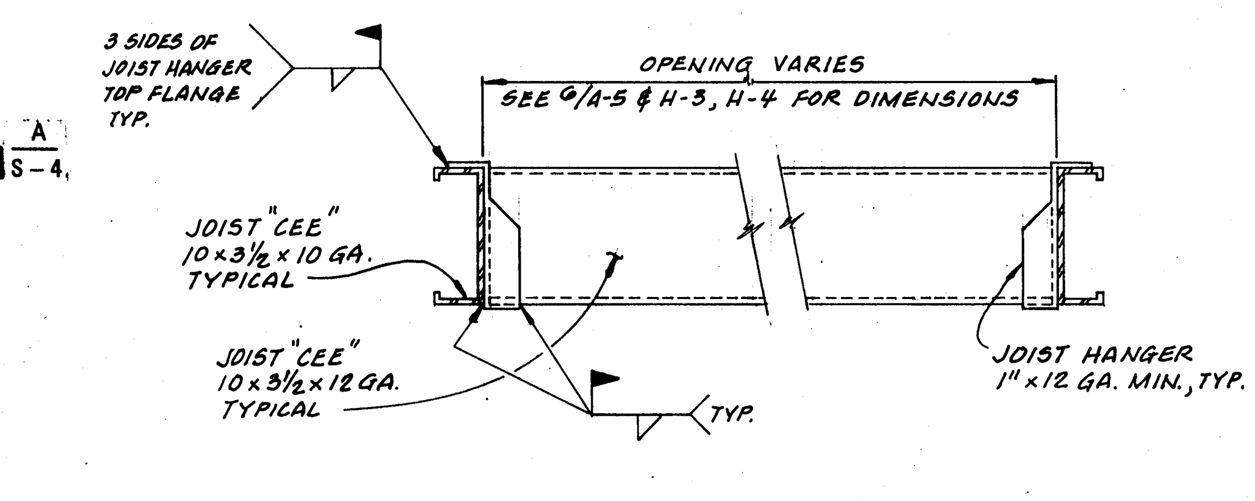
ANCHOR AND PLUG WELD SPACING SCHEDULE

SUPPORTING MEMBER	ALONG SUPPORTING MEMBER
JOIST, "CEE" 10 x 3-1/2 x 12 GA. & JOIST, "CEE" 10 x 3-1/2 x 10 GA.	1'-0" O.C., 1/2" PLUG WELDS
BEAM, W 12 x 53	1'-0" O.C. 3/4" SHEAR CONNECTORS
BEAM, 2 C 12 x 20.7	1'-1½" O.C. 3/4" SHEAR CONNECTORS

TYPICAL ROOF INSTALLATION DETAIL

THIS TYPICAL DETAIL SHOWS ATTACHMENT OF CORRUGATED ROOF DECK TO BEAM C12 x 20.7 AND JOIST. THE DECK IS ALSO ATTACHED TO BEAM W12 x 53 AS SHOWN ON A/S-4. FOR ROOF INSULATION, BUILT-UP ROOFING AND FLASHINGS NOT SHOWN, SEE A-5 AND A-6.

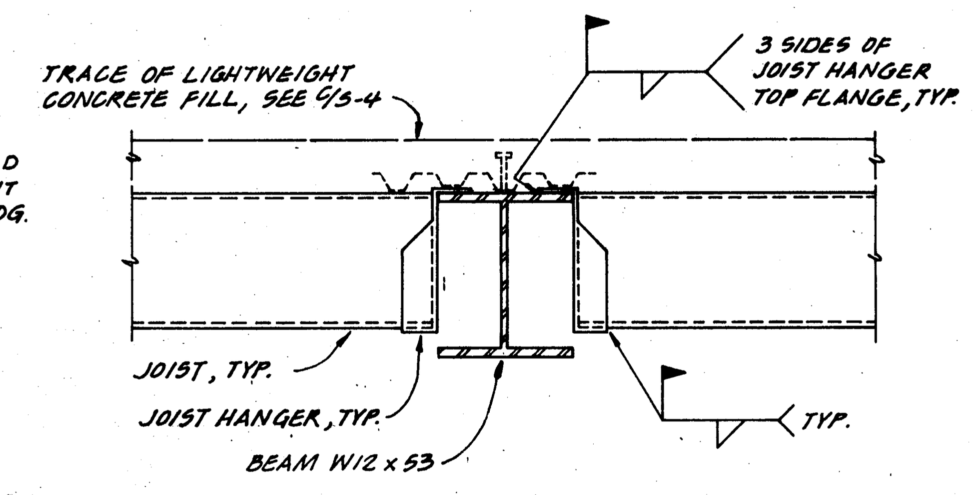




SECTION D/S-4
1" = 1'-0"

NOTES

1. SLOPE OF ROOF SHALL BE CONSTANT BETWEEN SPOT ELEVATIONS GIVEN.



SECTION A/S-4

TYPICAL JOIST INSTALLATION DETAIL

1" = 1'-0"

NO.	DATE	REVISION	BY	APP.
	10/86	AS-BUILT		
2	NOV. 14, 84	ADDED STORAGE RM.		
1	14 AUG 84	REVISED DIMENSIONS		

APPROVED [signature] MANAGER, WASTEWATER OPERATIONS, R.P.E. NO. C 26855

APPROVED [signature] CHIEF ENGINEER, R.P.E. NO. C 8216

DESIGN BY	F. NESTLERODE / D.S.
DESIGN CHECK BY	D. Sertoo
DRAWN BY	E. JOW & M. FONG
PIPELINE — CORR — FNDN —	
CIVIL — STRUCT.	SLL
ELEC. — MECH. —	
PROJ. ENG., DESIGN	D. Sertoo
SPVR., SPEC. PROJ.	D. M. Dreiner
MGR., DESIGN	[signature]
ASST. CH. ENG., DES. & CONST., R.P.E. NO. C 26724	[signature]

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

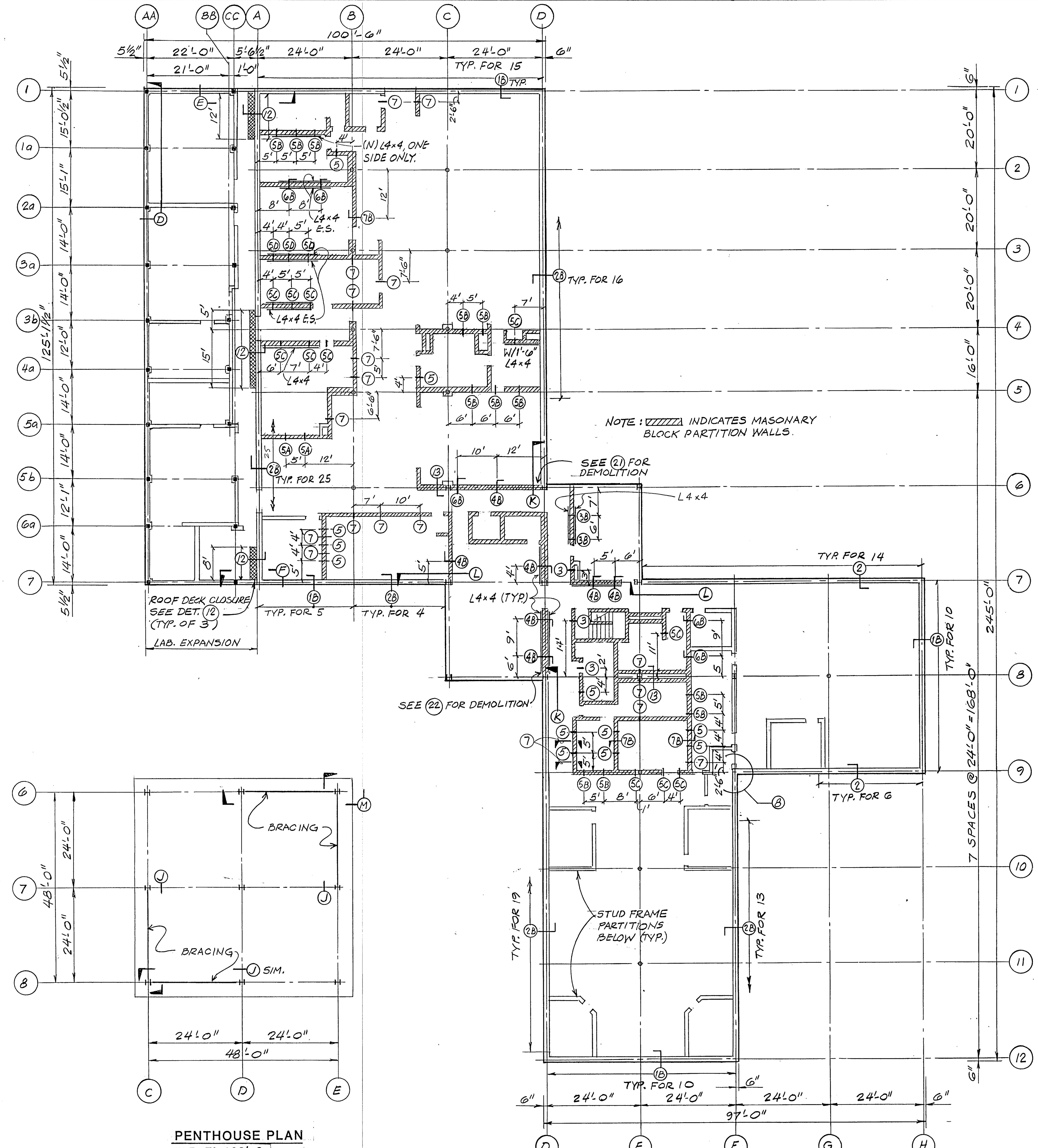
LABORATORY EXPANSION, SPECIFICATION SD 152
STRUCTURAL

ROOF PLAN & DETAILS

STRUCTURE OR ZONE DESIGNATION
SCALE AS SHOWN
DATE 6 MARCH 84

SD-S-4

E-180 * 3/82



ADMINISTRATION BUILDING T.O.S. EL.127'-4"

KEY PLAN

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

PENTHOUSE PLAN

FLR. EL.128'-8

LIST OF DRAWINGS

SHEET NO.	DRAWING NO.	DESCRIPTION
1	VG-1505	LOCATION MAP, VICINITY MAP, KEY PLANS AND LIST OF DRAWINGS
2	VG-1506	SECTIONS AND DETAILS SHEET 1 OF 3
3	VG-1507	SECTIONS AND DETAILS SHEET 2 OF 3
4	VG-1508	SECTIONS AND DETAILS SHEET 3 OF 3
5	VG-1509	ARCHITECTURAL DETAILS AND TYPICAL DETAILS

NOTE:

(1) A = Section A

3 = Detail 3

(2) For Sections A, B & C see Drawing VG-1506

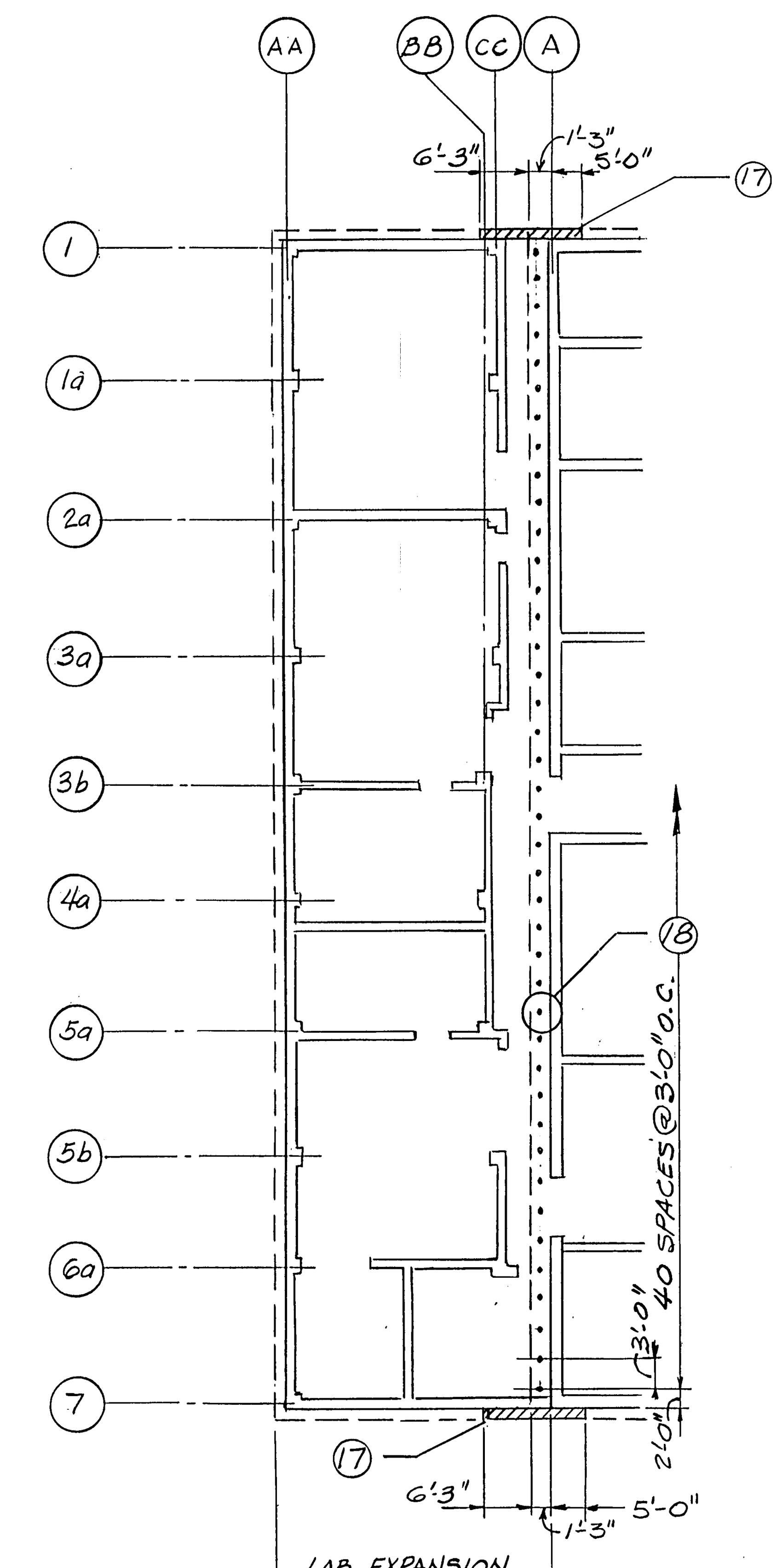
For Sections D thru H see Drawing VG-1507

For Sections J thru M see Drawing VG-1508

(3) For Details 1 thru 8 see Drawing VG-1506

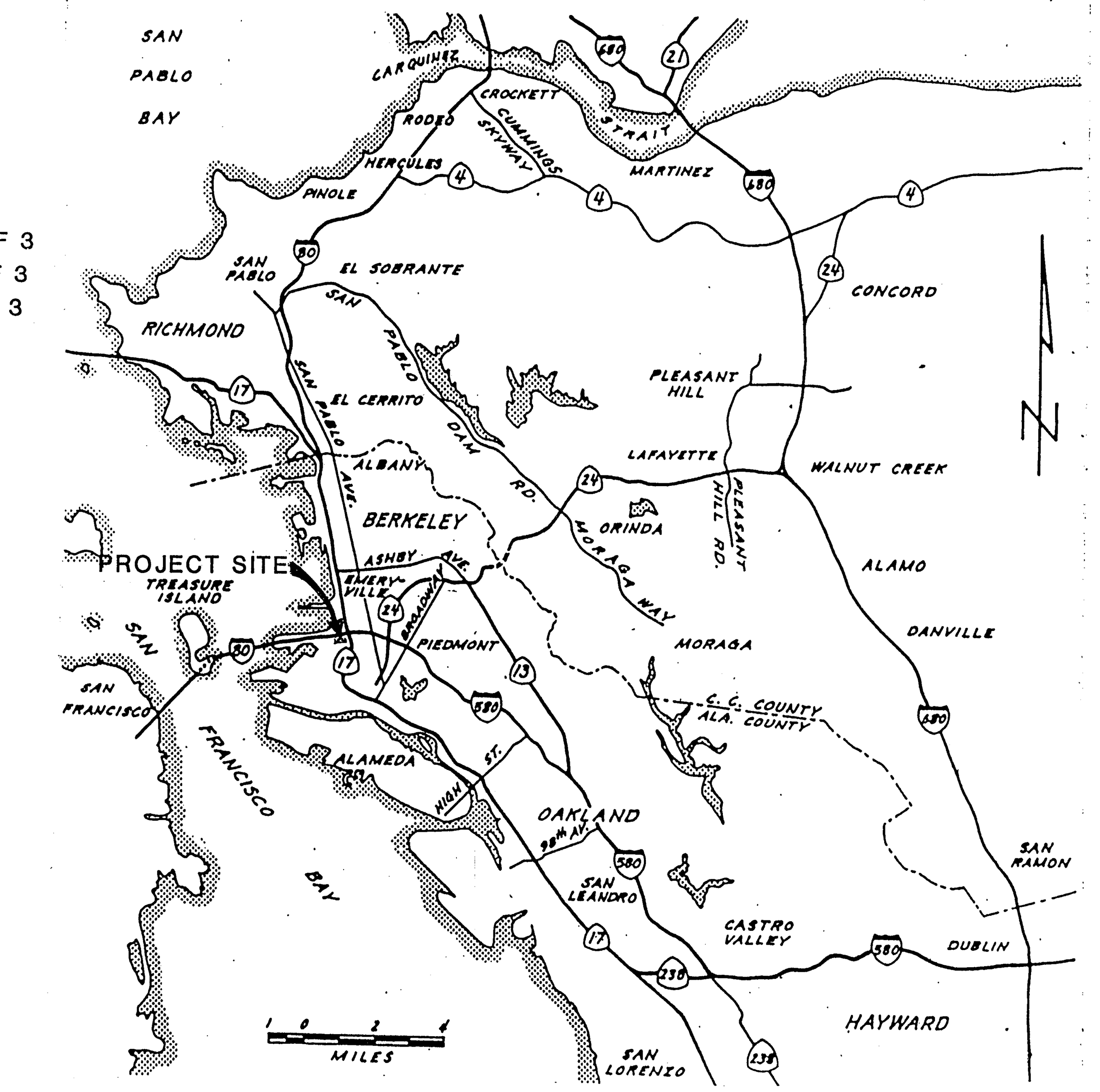
For Details 9 thru 13 see Drawing VG-1507

For Details 14 thru 22 see Drawing VG-1508

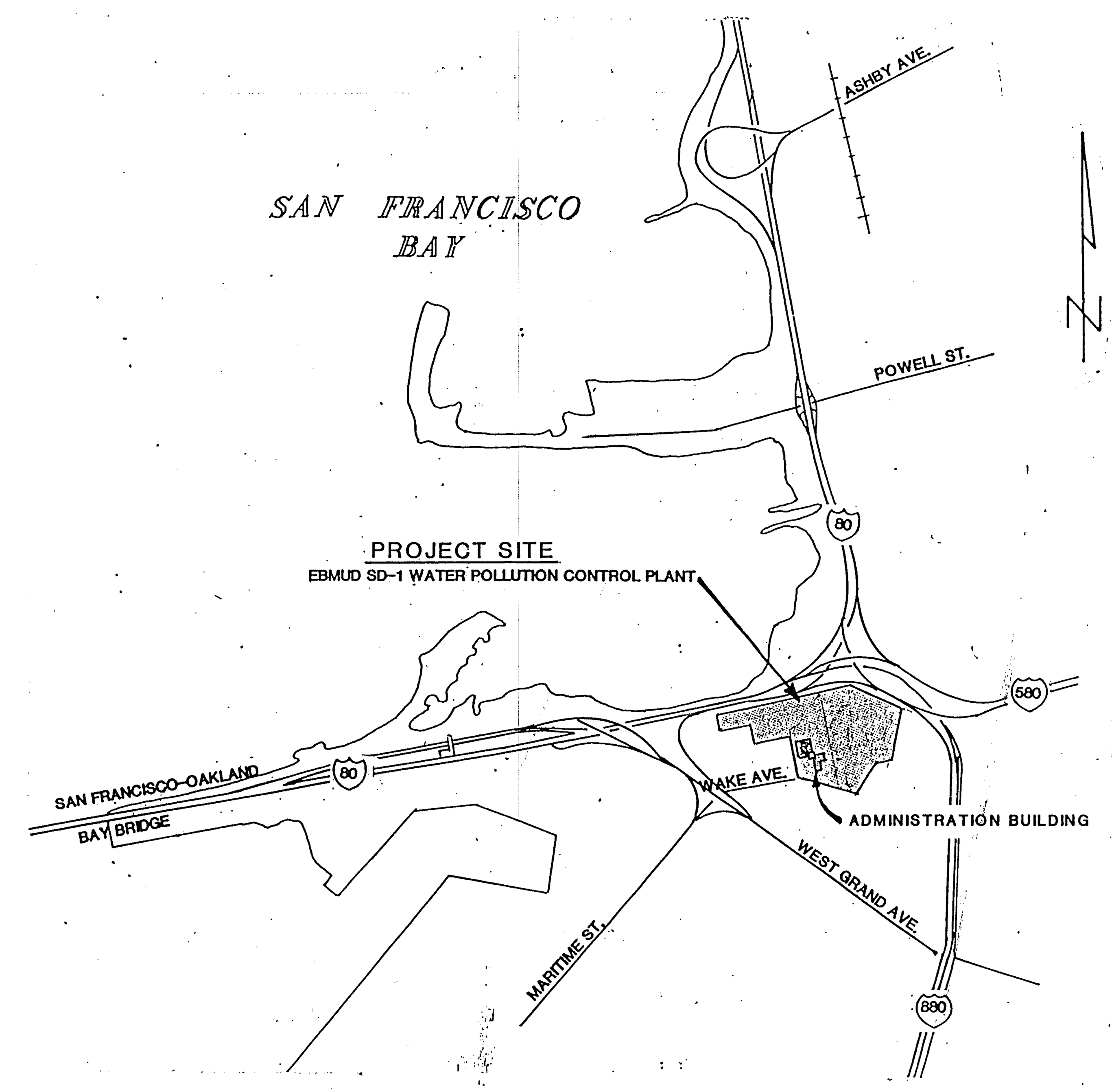


PARTIAL FOUNDATION KEY PLAN

FLR. EL.112'-0"



LOCATION MAP



VICINITY MAP

N.T.S.

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
	13DEC89	IN SERVICE 24MAR89 AS BUILT INSP. J. Farrell			

H. J. Degenkolb Associates, Engineers
350 Sansome Street, Suite 500
San Francisco, CA 94104
415-392-6952

Degenkolb

JOB # 86042.02

DESIGNED BY DWC
DESIGN CHECKED BY CDP
DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. K.B. Haunschild
PROJECT MGR. R.P.E. No. C33317 E.H. McCormick
MGR. OF SUPPORT SERVICES R.P.E. No. C29111 Dennis M Diemer
MANAGER OF WASTEWATER R.P.E. No. C29855 Walter J. Bishop

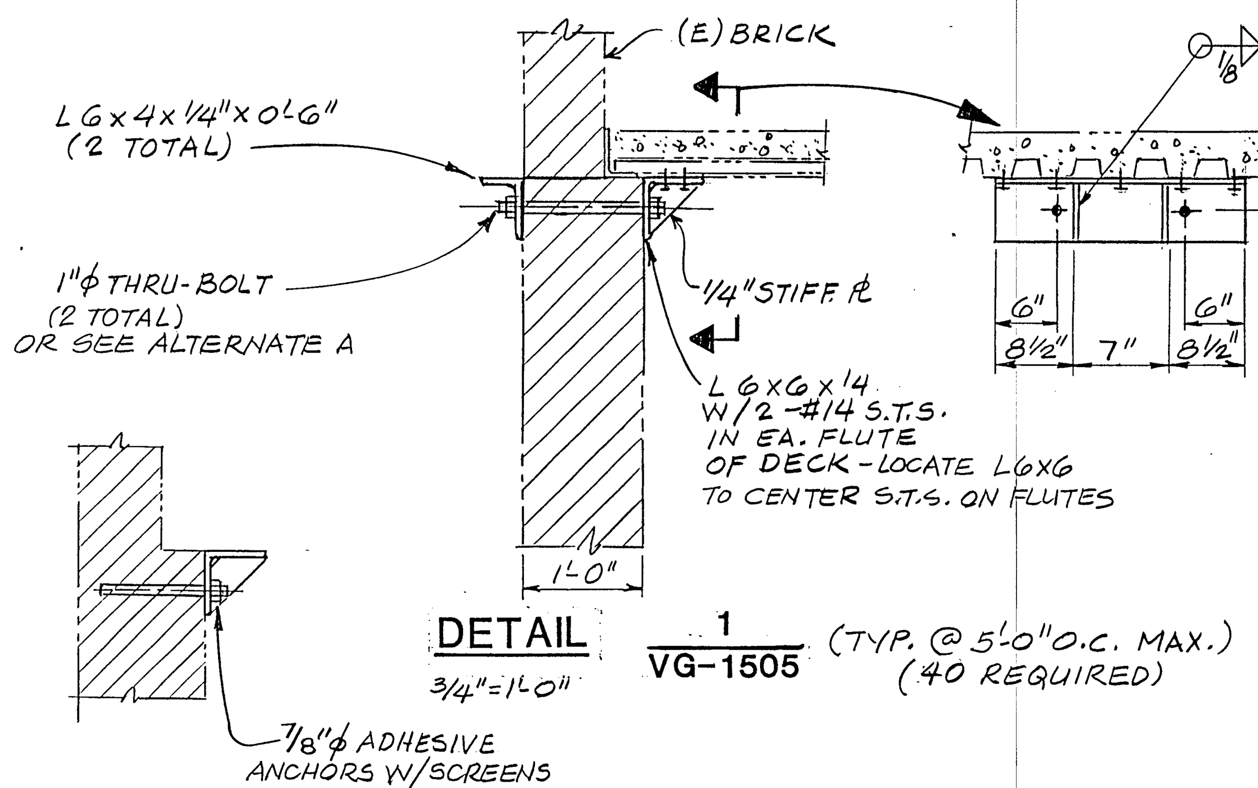
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

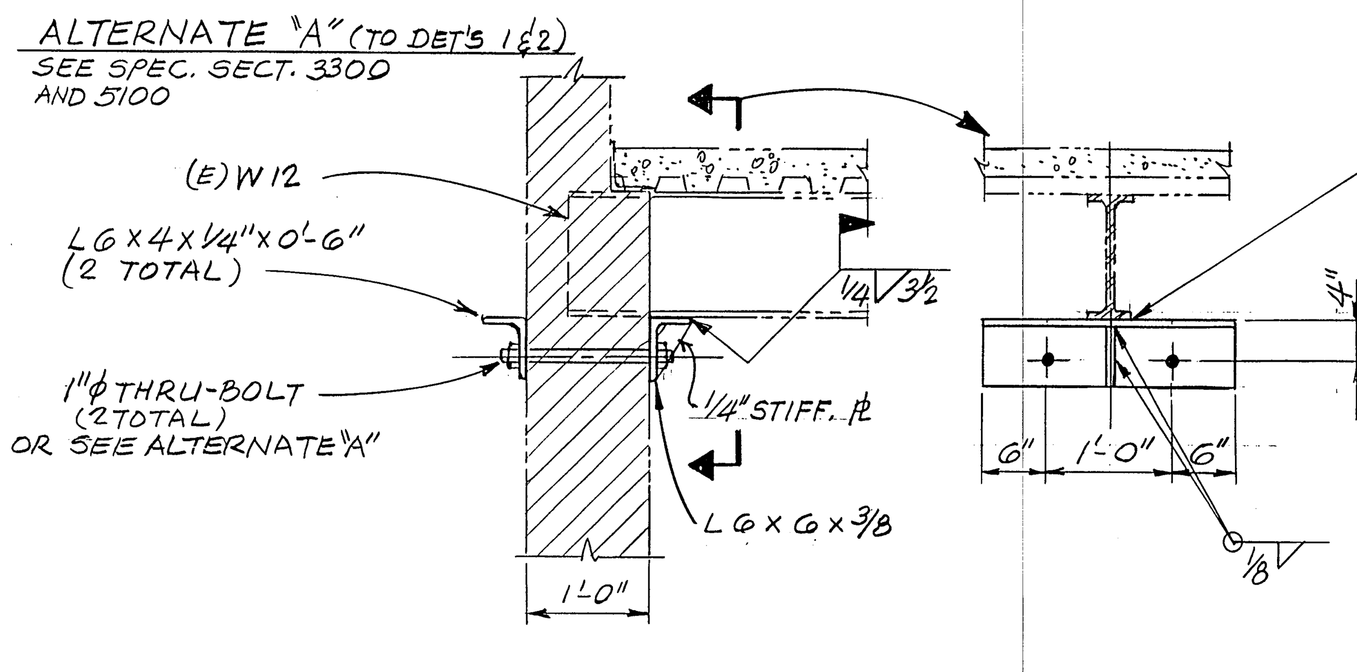
LOCATION MAP, VICINITY MAP, KEY PLANS AND LIST OF DRAWINGS

DRAWN BY R. M. EBY
SCALE AS SHOWN
DATE MAY 17, 1988
DRAWING No. VG-1505
SHEET 1 OF 5

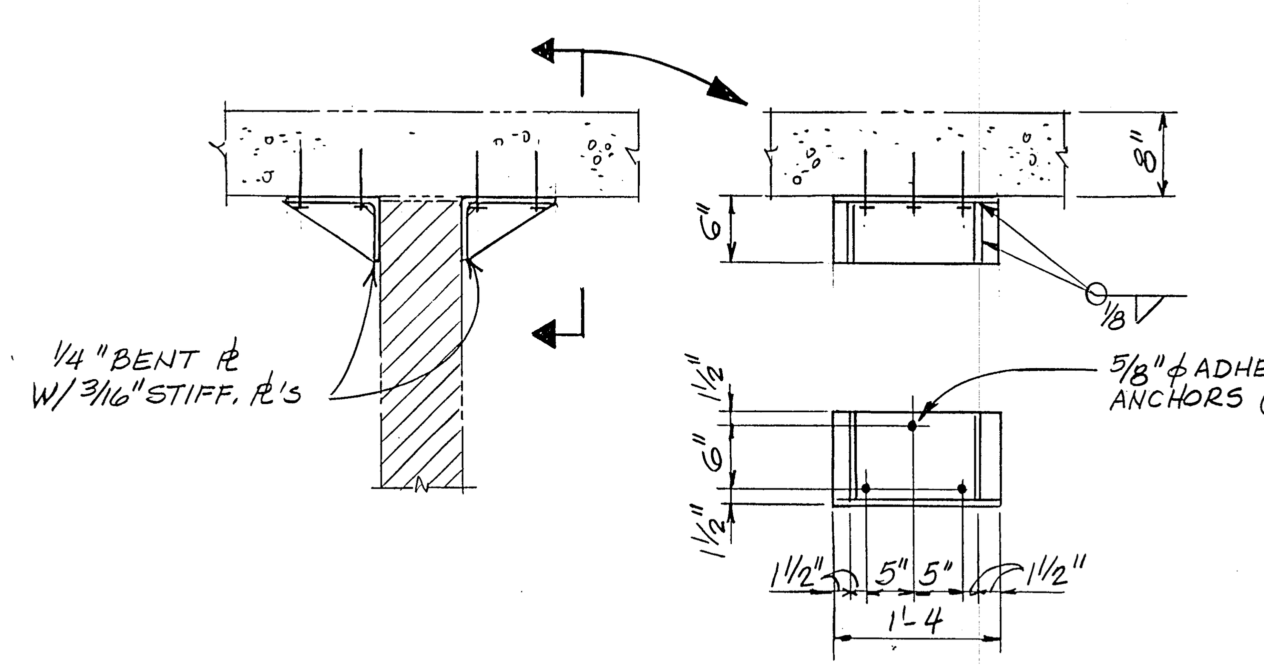
SD-167.1 10/87



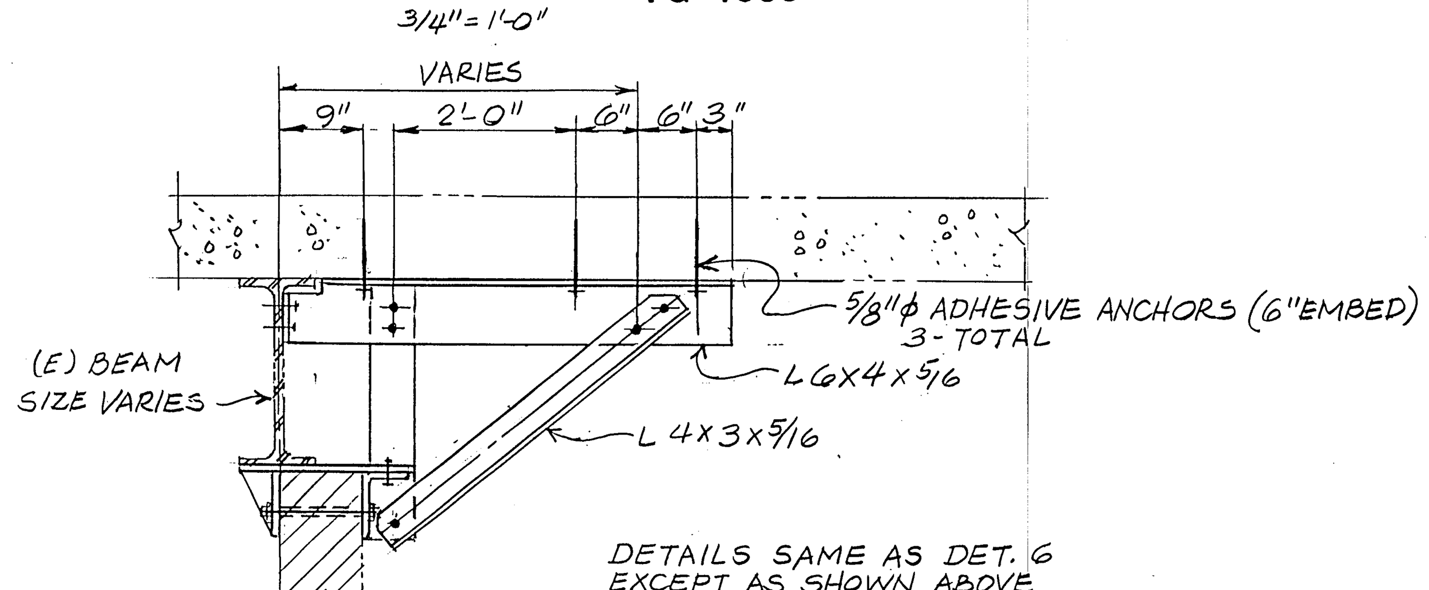
DETAIL 1/VG-1505 (TYP. @ 5'-0" O.C. MAX.) (40 REQUIRED)
3/4"=1'-0"



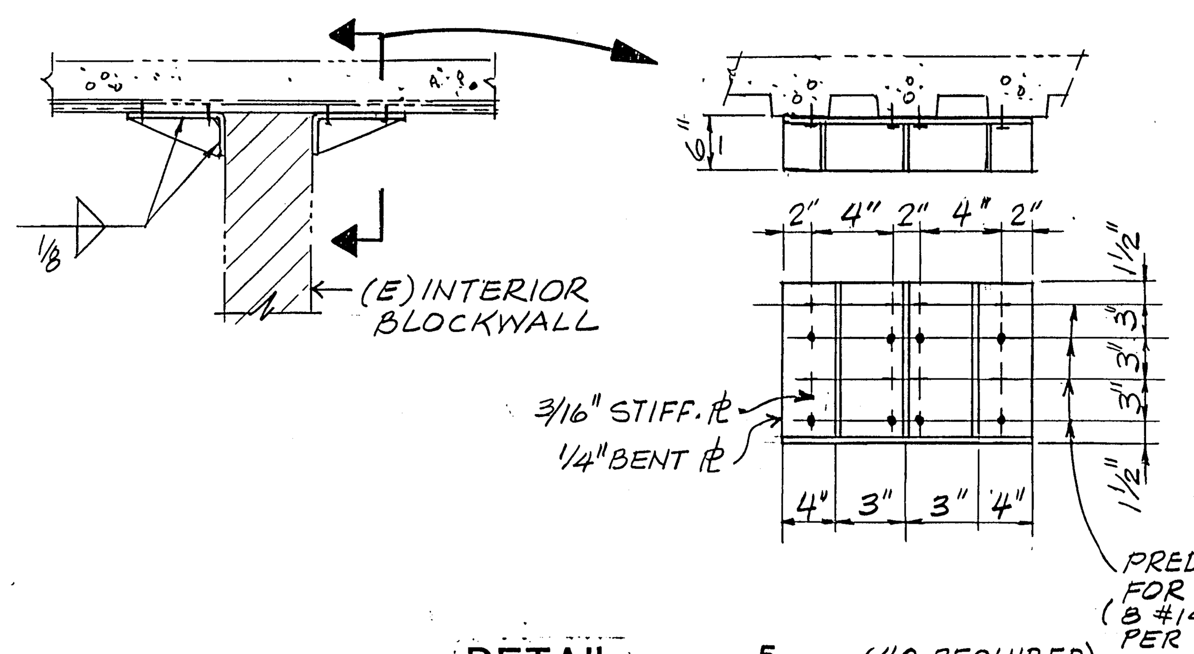
DETAIL 2/VG-1505 (TYP. @ EA. BEAM) (97 REQUIRED)
3/4"=1'-0"



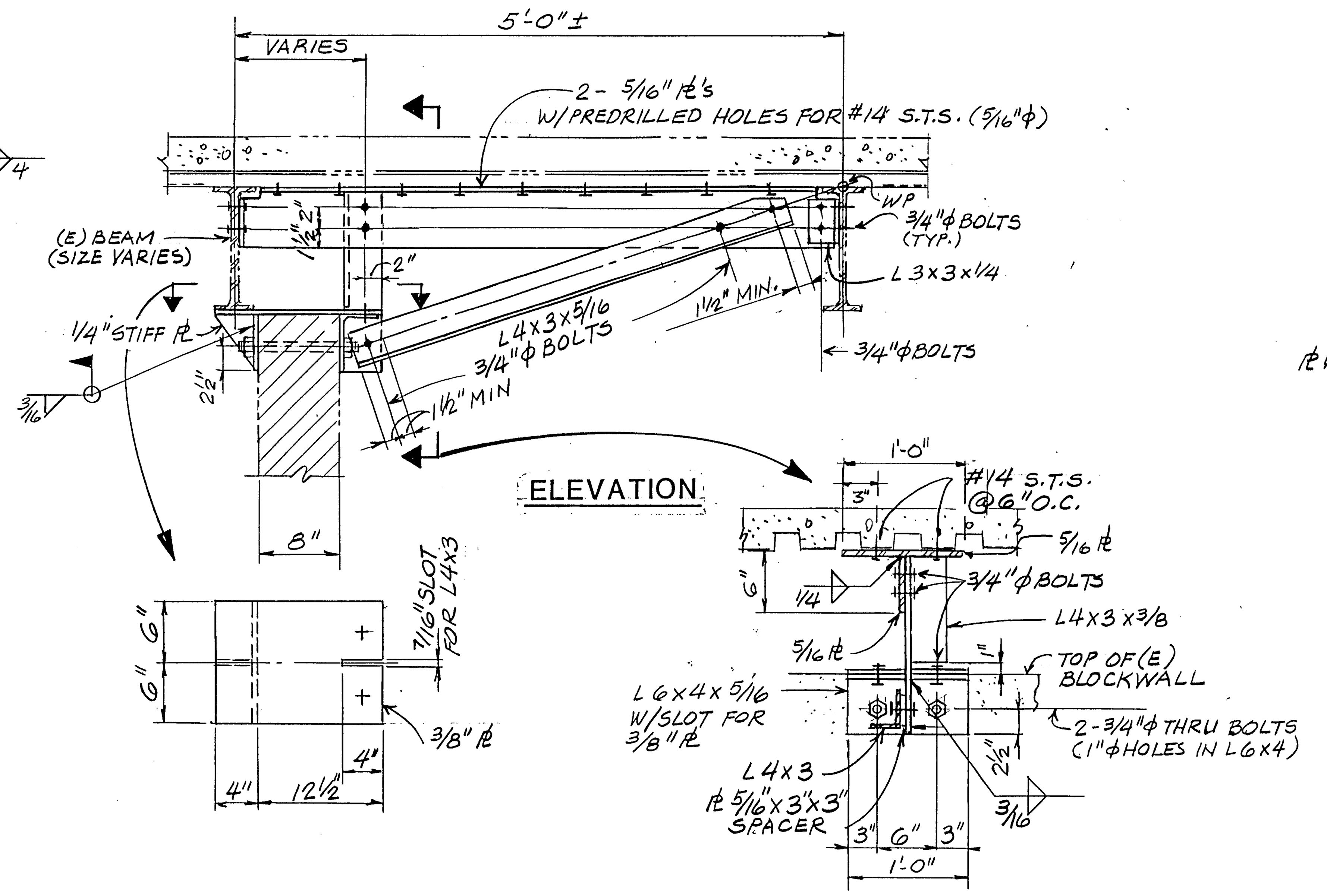
DETAIL 3/VG-1505 (5 REQUIRED)
3/4"=1'-0"



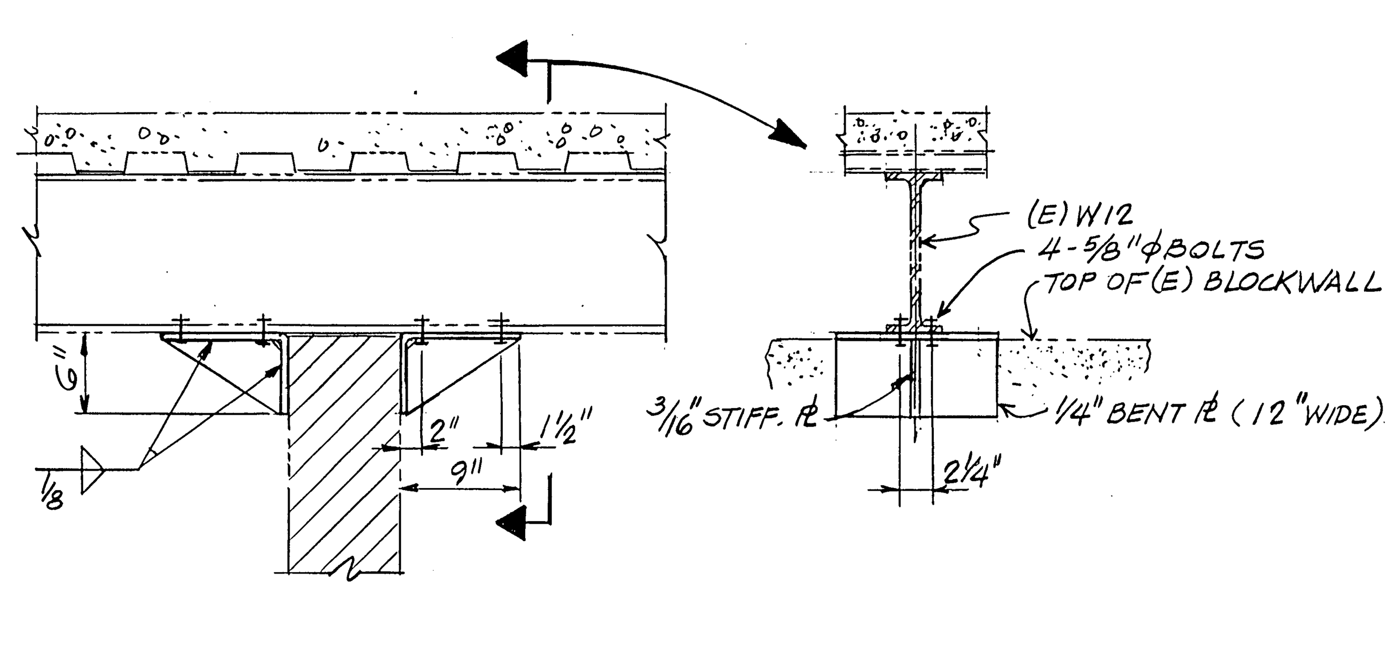
DETAIL 4/VG-1505 (8 REQUIRED)
3/4"=1'-0"



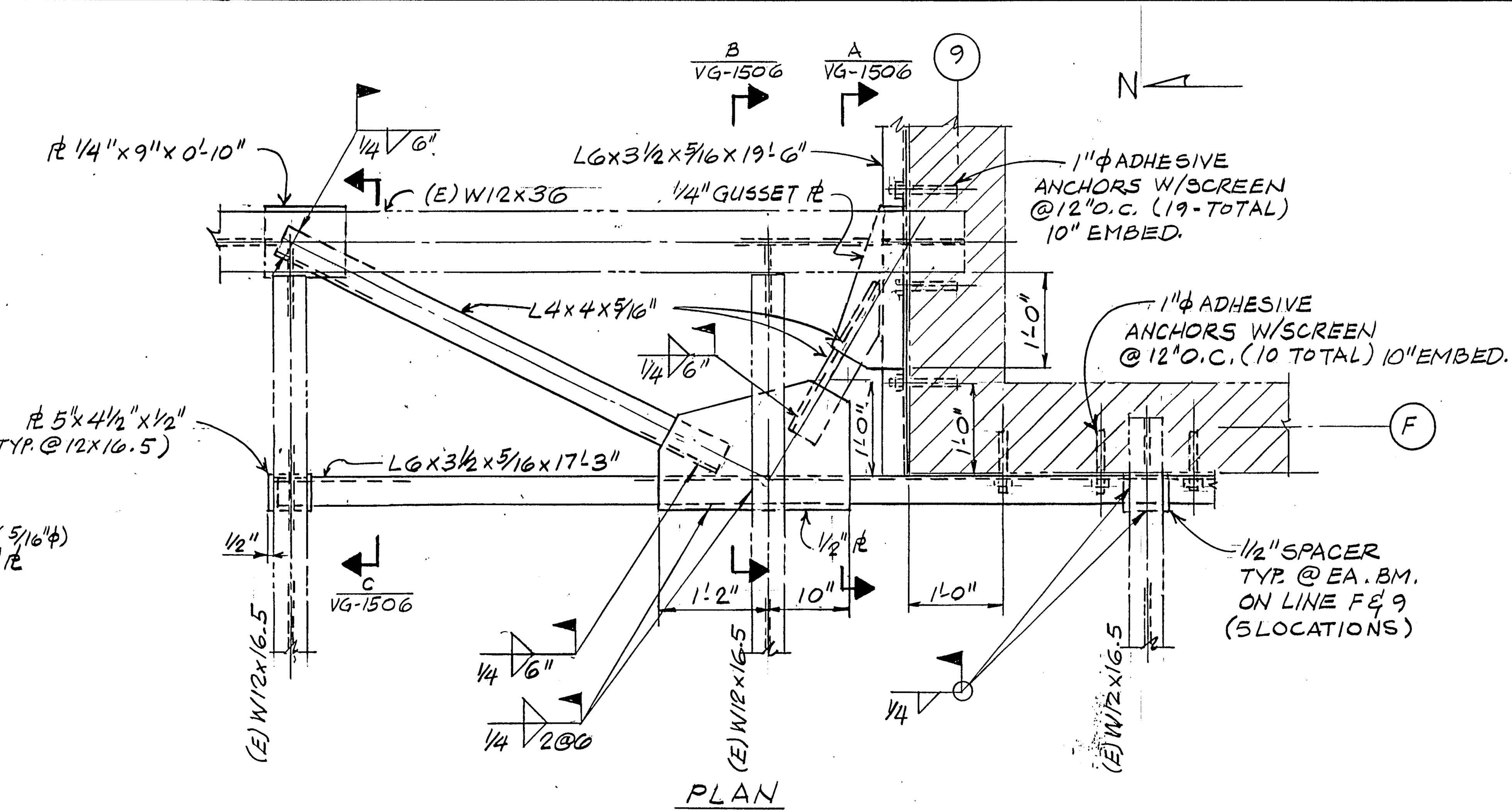
DETAIL 5/VG-1505 (40 REQUIRED)
N.T.S.



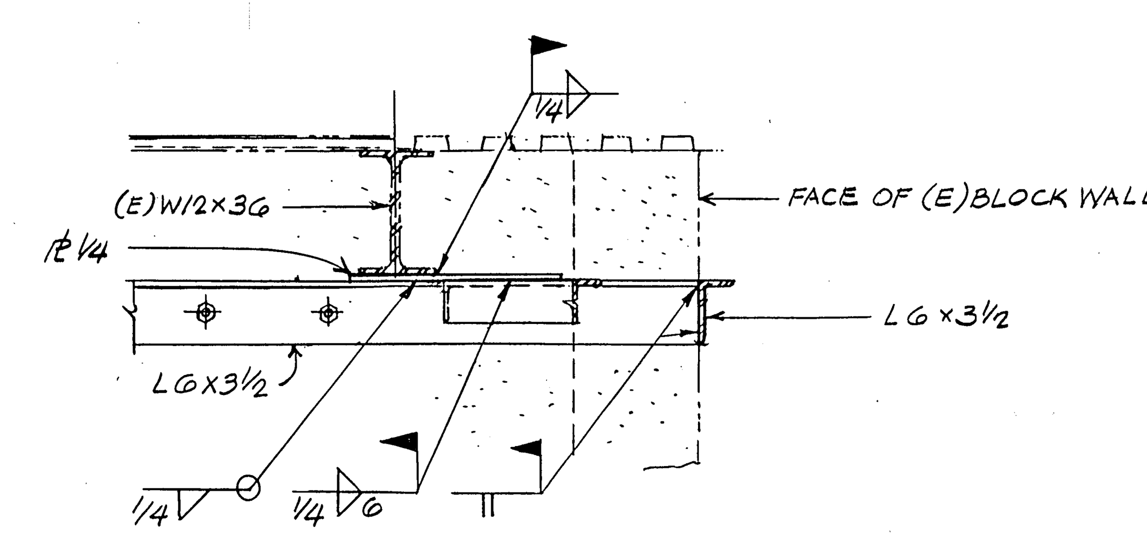
DETAIL 6/VG-1505 (5 REQUIRED)
1"=1'-0"



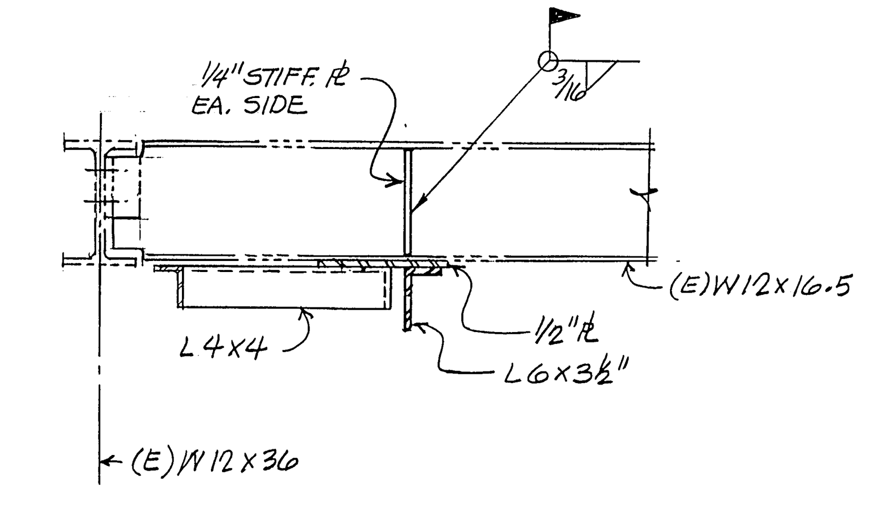
DETAIL 7/VG-1505 (15 REQUIRED)
1"=1'-0"



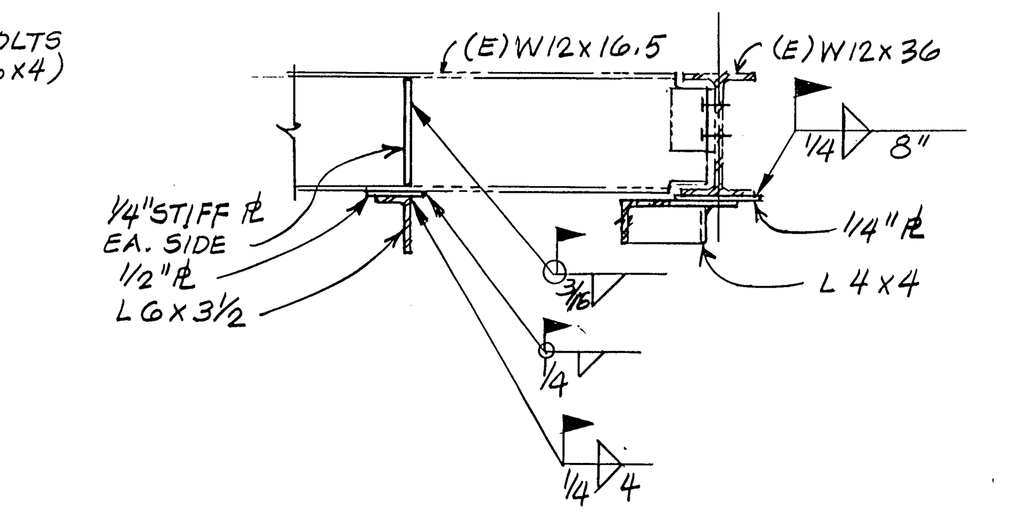
PLAN
DETAIL 8/VG-1505
3/4"=1'-0"



SECTION A/VG-1506
3/4"=1'-0"



SECTION B/VG-1506
3/4"=1'-0"



SECTION C/VG-1506
3/4"=1'-0"

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE		REVISION	BY	REC.	APP.
	13DEC89	IN SERVICE 24MAR89	AS BUILT INSP J. Farrell	RJE		

H. J. Degenkolb Associates, Engineers
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San Francisco, CA 94104
415-392-6952
Degenkolb
JOB # 86042.02

DESIGNED BY DWC
DESIGN CHECKED BY CDP
DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. K. B. Haunschild
PROJECT MGR. R.P.E. No. C33317 E. H. McCormick
MGR. OF SUPPORT SERVICES R.P.E. No. C29112 Dennis M. Diemer
MANAGER OF WASTEWATER R.P.E. No. C 16855 Walter J. Bishop

EAST BAY MUNICIPAL UTILITY DISTRICT
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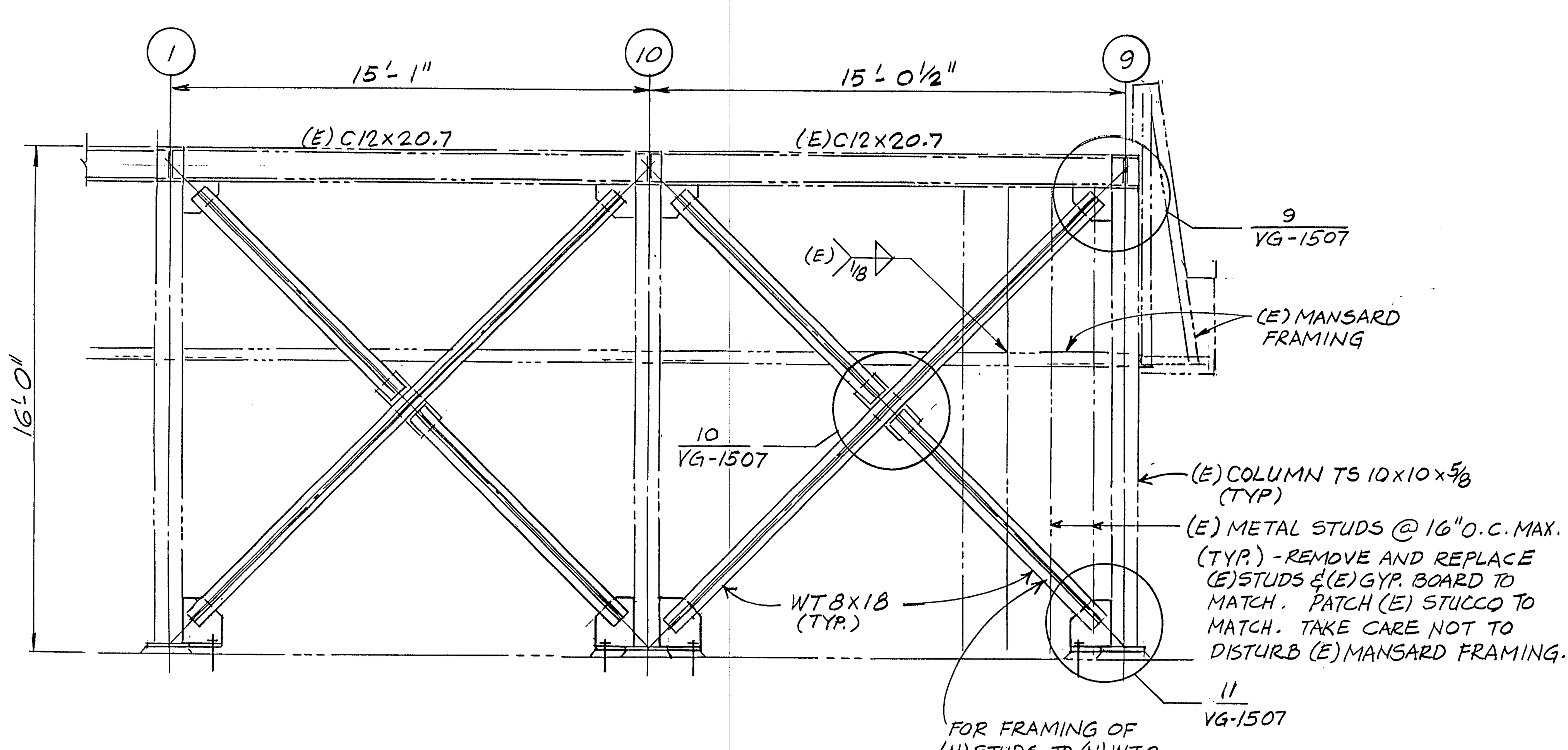
ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

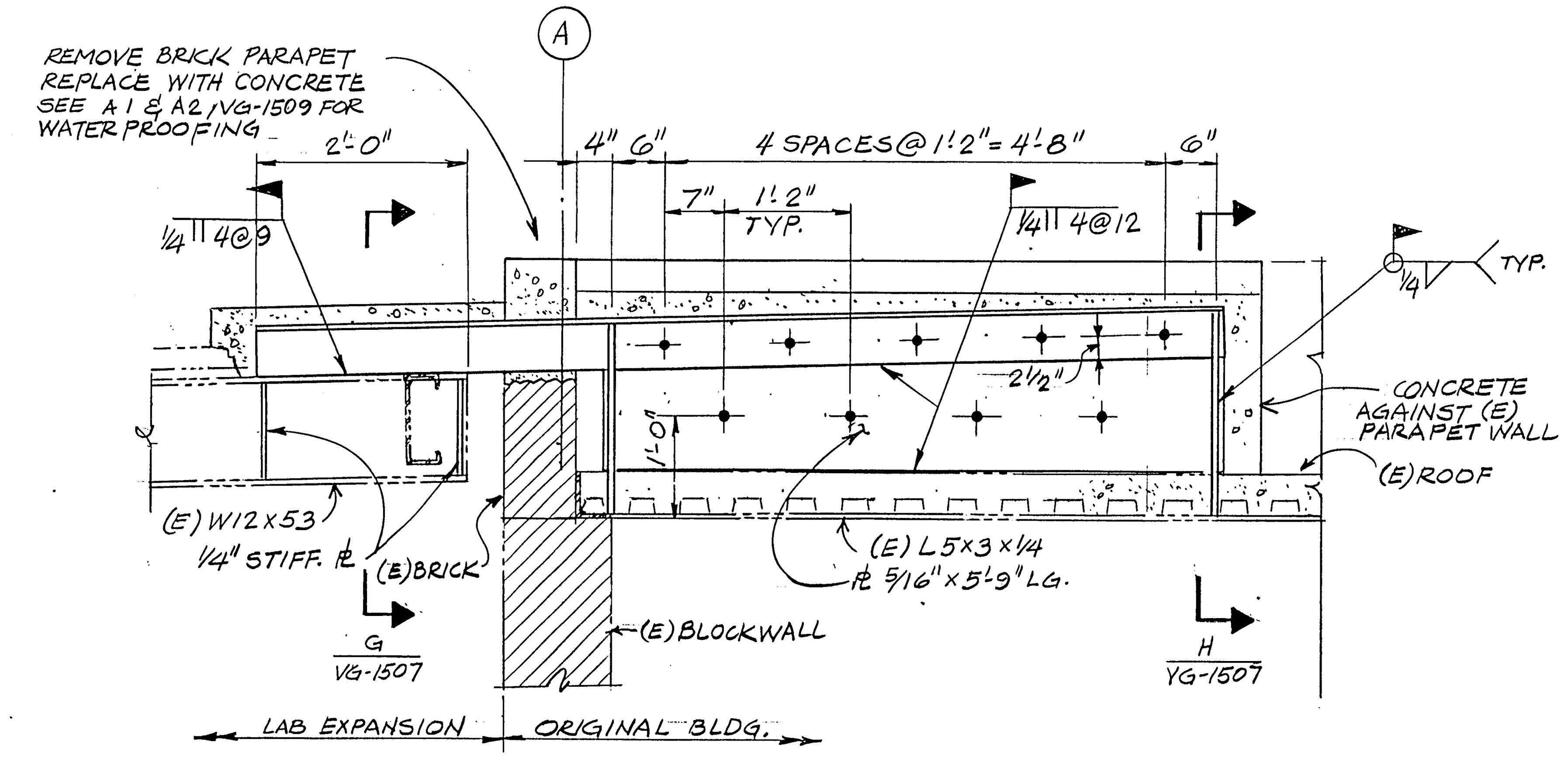
SHEET 1 OF 3

DRAWN BY R. M. EBY
SCALE AS SHOWN
DATE MAY 17, 1988
DRAWING No. VG-1506
SHEET 2 OF 5

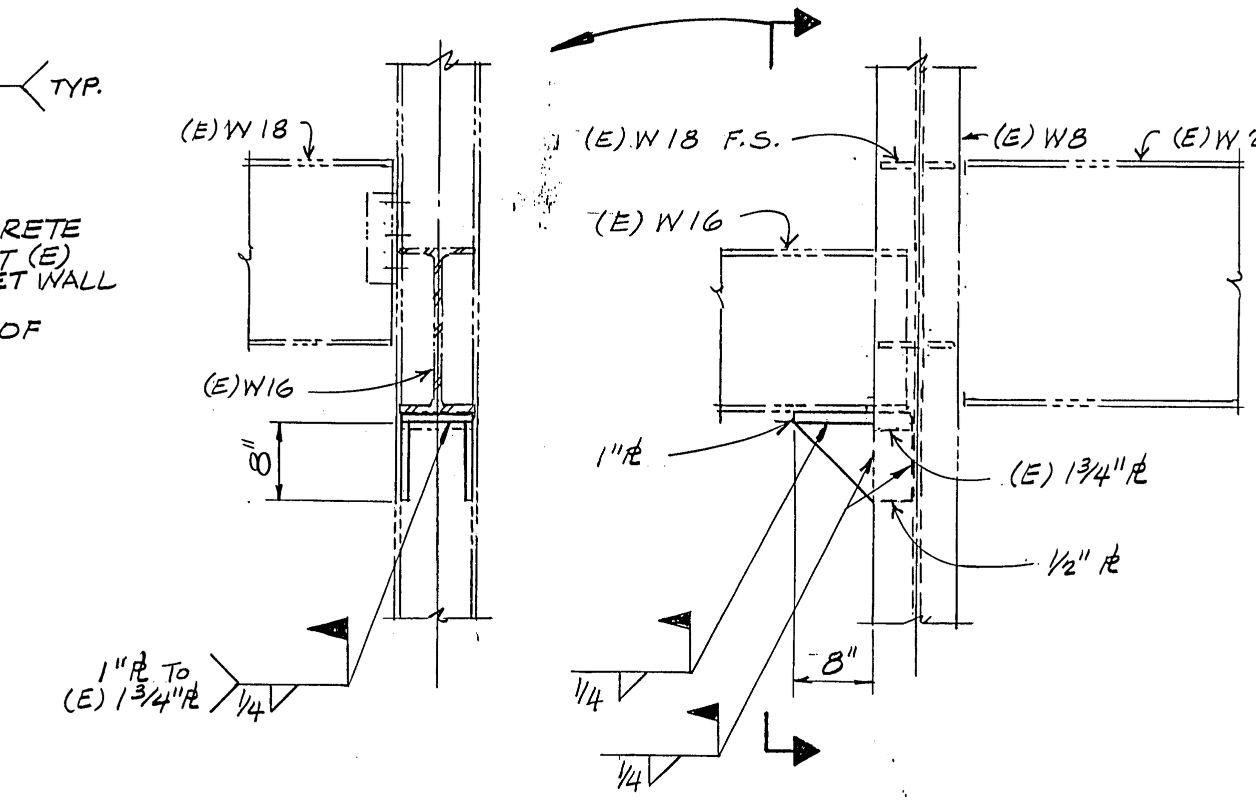
SD-167.1 10/87



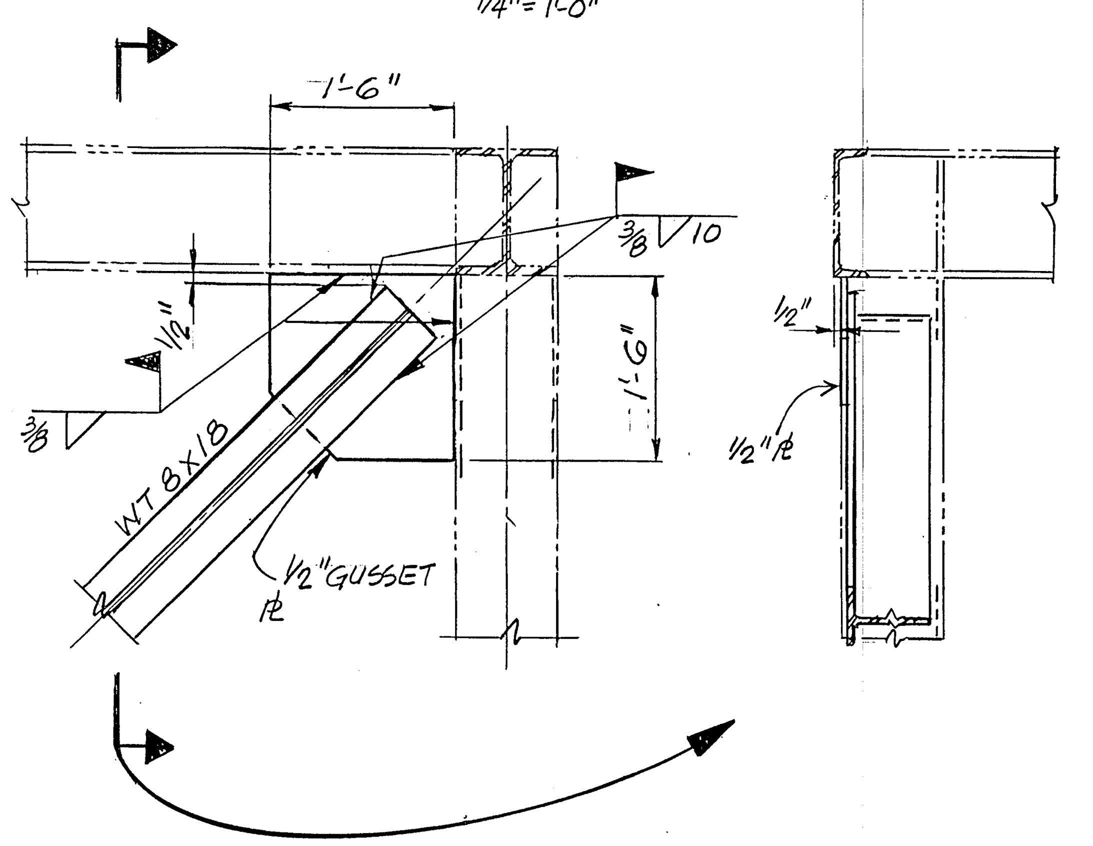
SECTION D / VG-1505
1/4"=1'-0"



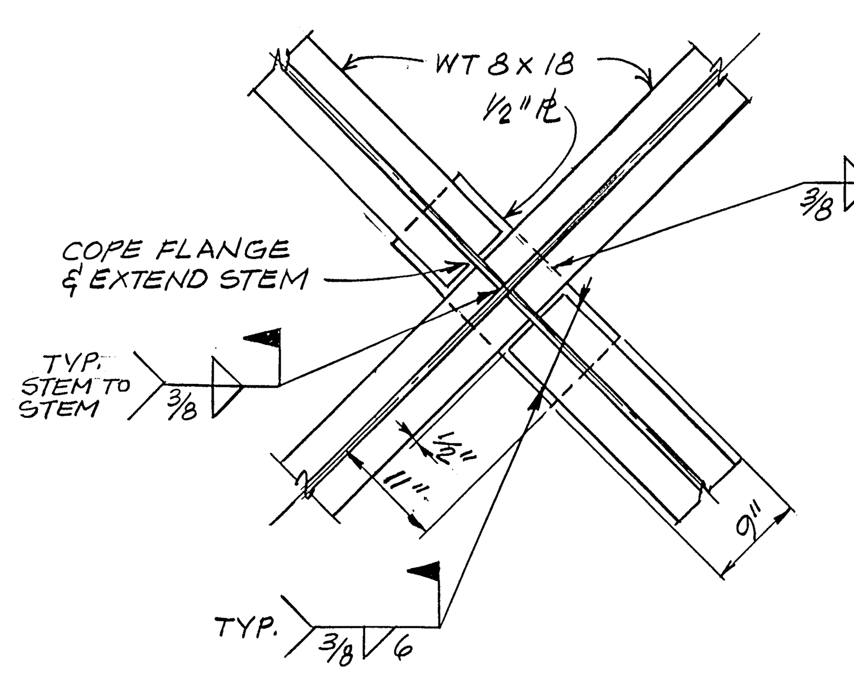
SECTION E / VG-1505 , SECTION F / VG-1505 (OPPOSITE HAND)



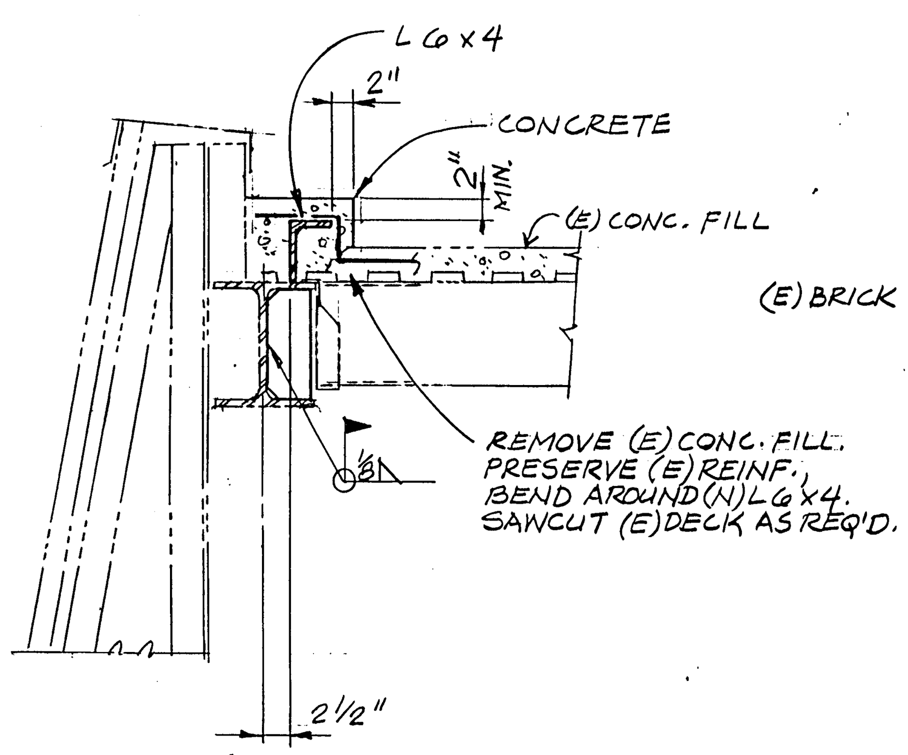
DETAIL 13 / VG-1505 (2 REQUIRED)



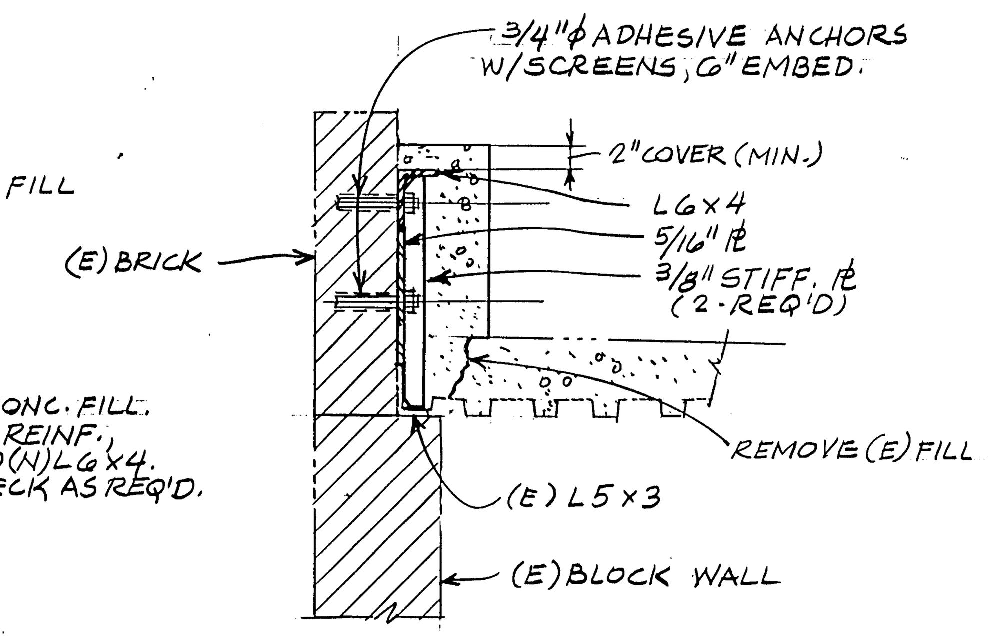
DETAIL 9 / VG-1507



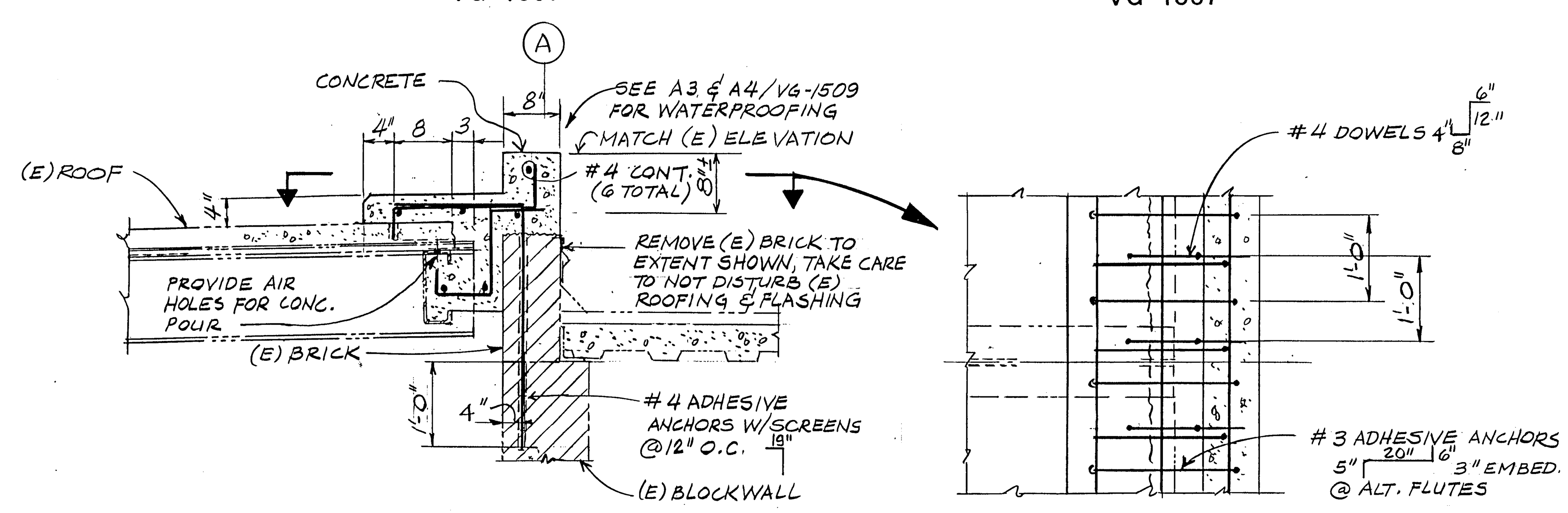
DETAIL 10 / VG-1507



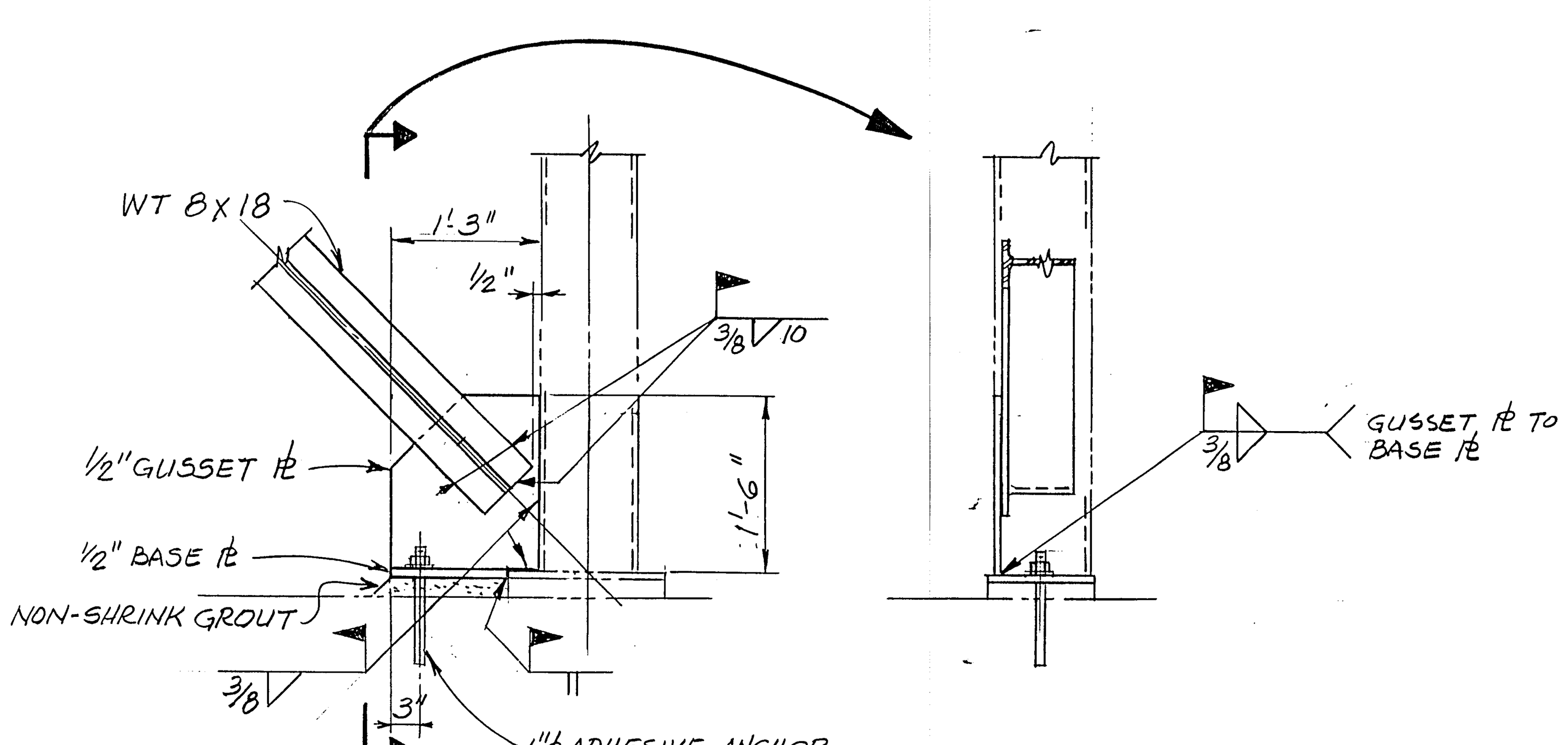
SECTION G / VG-1507



SECTION H / VG-1507



DETAIL 12 / VG-1505 (AT 3 PLACES)



DETAIL 11 / VG-1507

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
	13DEC89	IN SERVICE 24MAR89 AS BUILT INSP. J. Farrell	24		

H.J. Degenkolb Associates, Engineers
350 Sansome Street, Suite 500
San Francisco, CA 94104
415-392-6952
Degenkolb
JOB #86042.02

DESIGNED BY DWC
DESIGN CHECKED BY CDP
DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. K.B. Haunschild
PROJECT MGR. R.P.E. No. C 33317
MGR. OF SUPPORT SERVICES R.P.E. No. C 29111
MANAGER OF WASTEWATER R.P.E. NO. C 26850

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA
ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

SHEET 2 OF 3

DRAWN BY RMEBY
SCALE 3/4"=1'-0 U.O.N.
DATE MAY 17,1988
DRAWING No. VG-1507
SHEET 3 OF 5

SD-167.1 10/87

SECTION J / VG-1505 — 1/4" = 1'-0"

DETAIL 17 / VG-1505 (AT 2 PLACES) — 3/4" = 1'-0"

SECTION M / VG-1505 — 1/4" = 1'-0"

DETAIL 18 / VG-1505 (41 REQUIRED) — 3/4" = 1'-0"

DETAIL 19 / VG-1508 — 3/4" = 1'-0"

DETAIL 14 / VG-1508 — 3/4" = 1'-0"

DETAIL 15 / VG-1508 — 3/4" = 1'-0"

DETAIL 21 / VG-1508 — N.T.S.

DETAIL 20 / VG-1508 — 3/4" = 1'-0"

DETAIL 16 / VG-1508 — 3/4" = 1'-0"

SECTION K / VG-1505, SECTION L / VG-1505 (OPPOSITE HAND) — 3/8" = 1'-0"

DETAIL 22 / VG-1508 — N.T.S.

TABLE 1		
TOP OF C12 LOCATION		
COL.	h	COMMENTS
D8	52"	
E7	46"	LOWER 1" CONDUIT
D6	20 1/2"	MOVE 1" CONDUIT
C7	42"	

REGISTERED PROFESSIONAL ENGINEER — CHRIS D. POLAND — No. 2336 — EXP. 3-89 — STRUCTURAL — STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
	13 DEC 89	24 MAR 89 IN SERVICE — AS BUILT — INSP. J. Farrell			

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JOB # 86042.02

DESIGNED BY DWC
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DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. K.B. Hauschild
PROJECT MGR. R.P.E. No. C 33317
MGR. OF SUPPORT SERVICES R.P.E. No. C 29111 — Dennis M. Diemer
MANAGER OF WASTEWATER R.P.E. NO. C 36855 — Walter J. Bishop

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

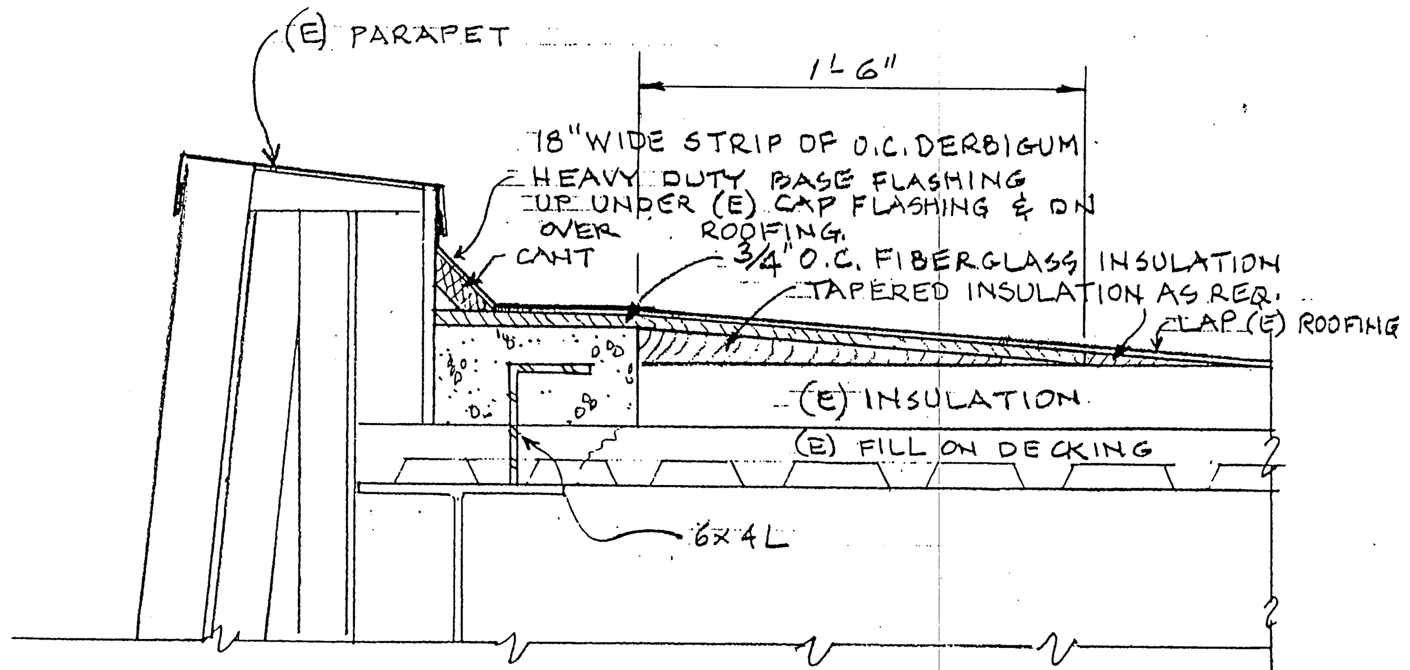
ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

SHEET 3 OF 3

DRAWN BY R M EBY
SCALE AS SHOWN
DATE MAY 17, 1988
DRAWING No. VG-1508
SHEET 4 OF 5

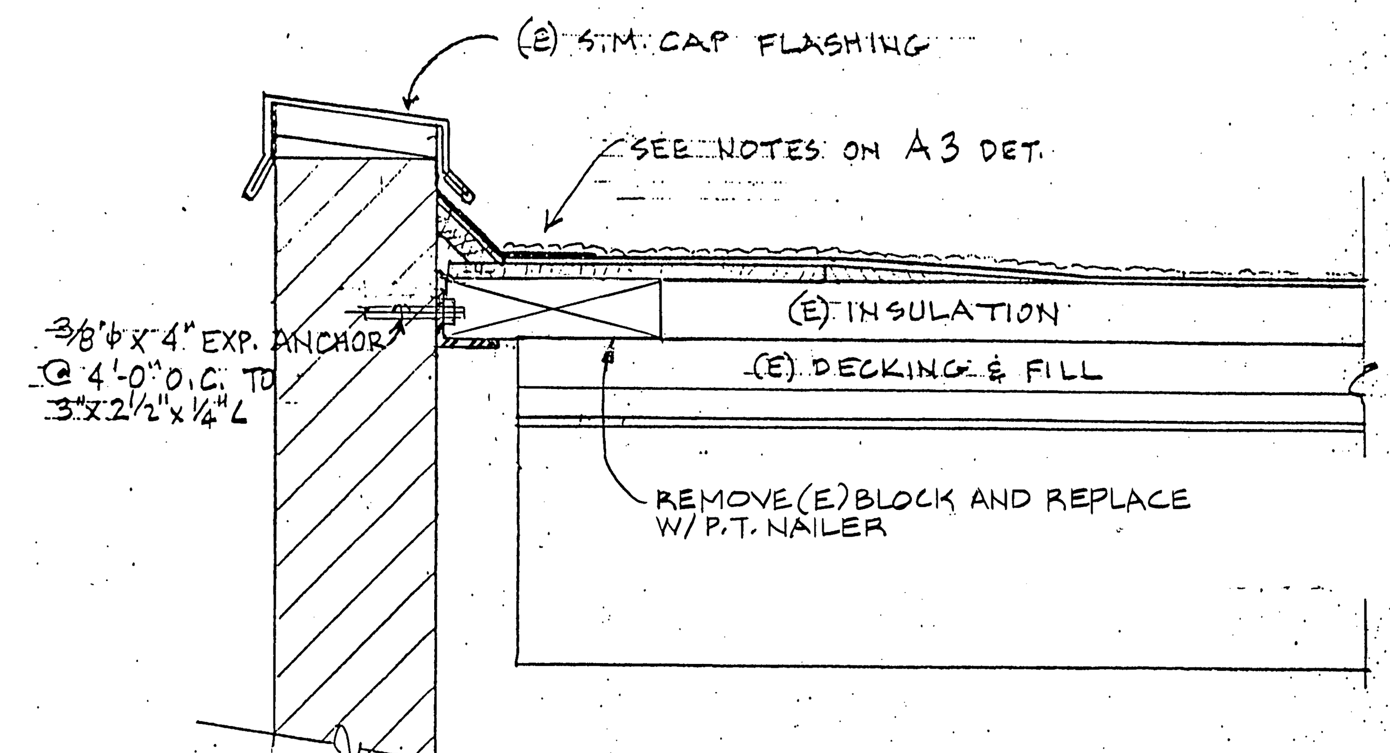
SD-167.1 10/87



FLASHING DETAIL A1 / VG-1507 (USE AT SECT'S E & F/VG-1507)

1½" = 1'-0"

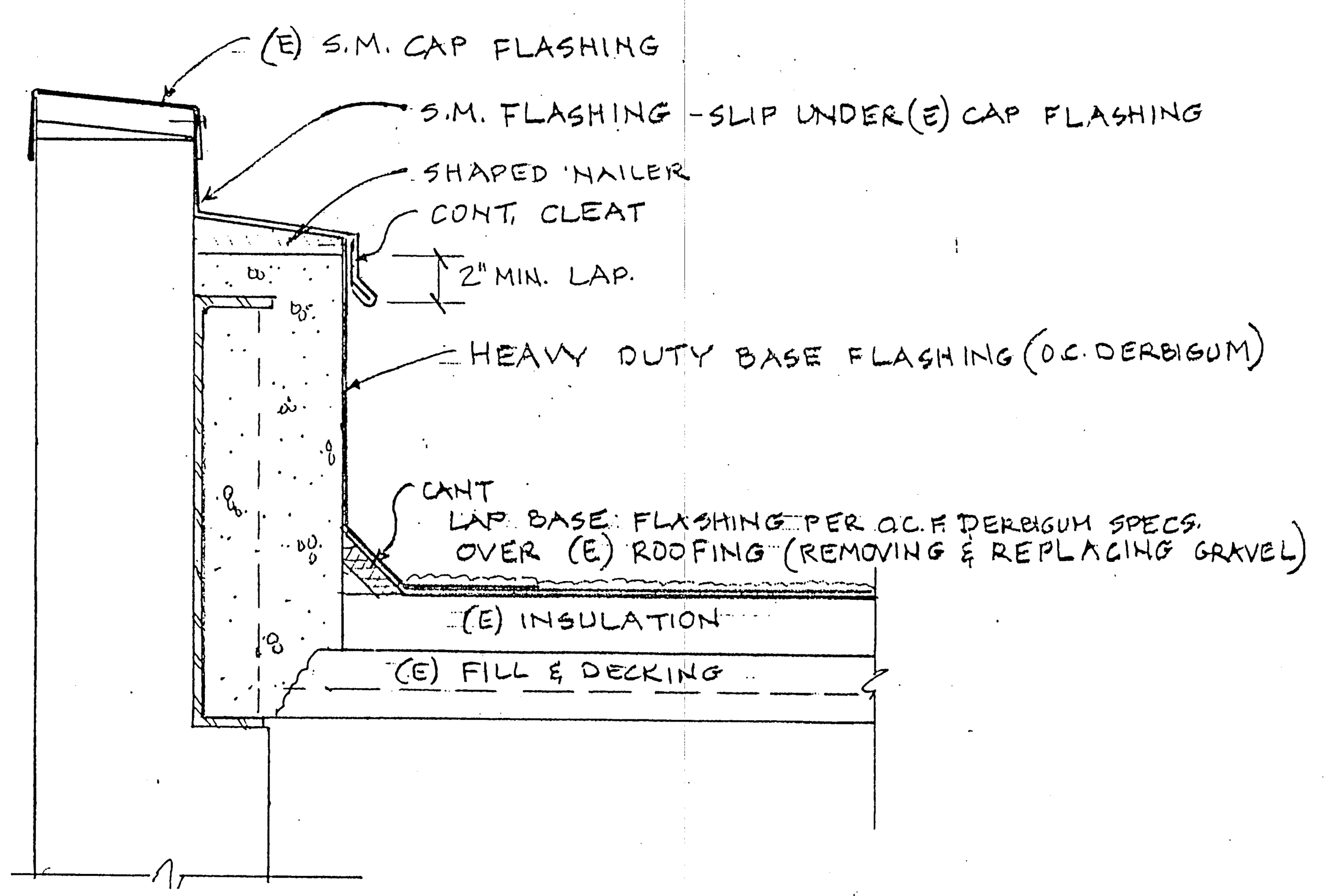
SEE KEY PLAN FOR ROOFING DETAIL LOCATION



REROOFING DETAIL A4 / VG-1507

1½" = 1'-0"

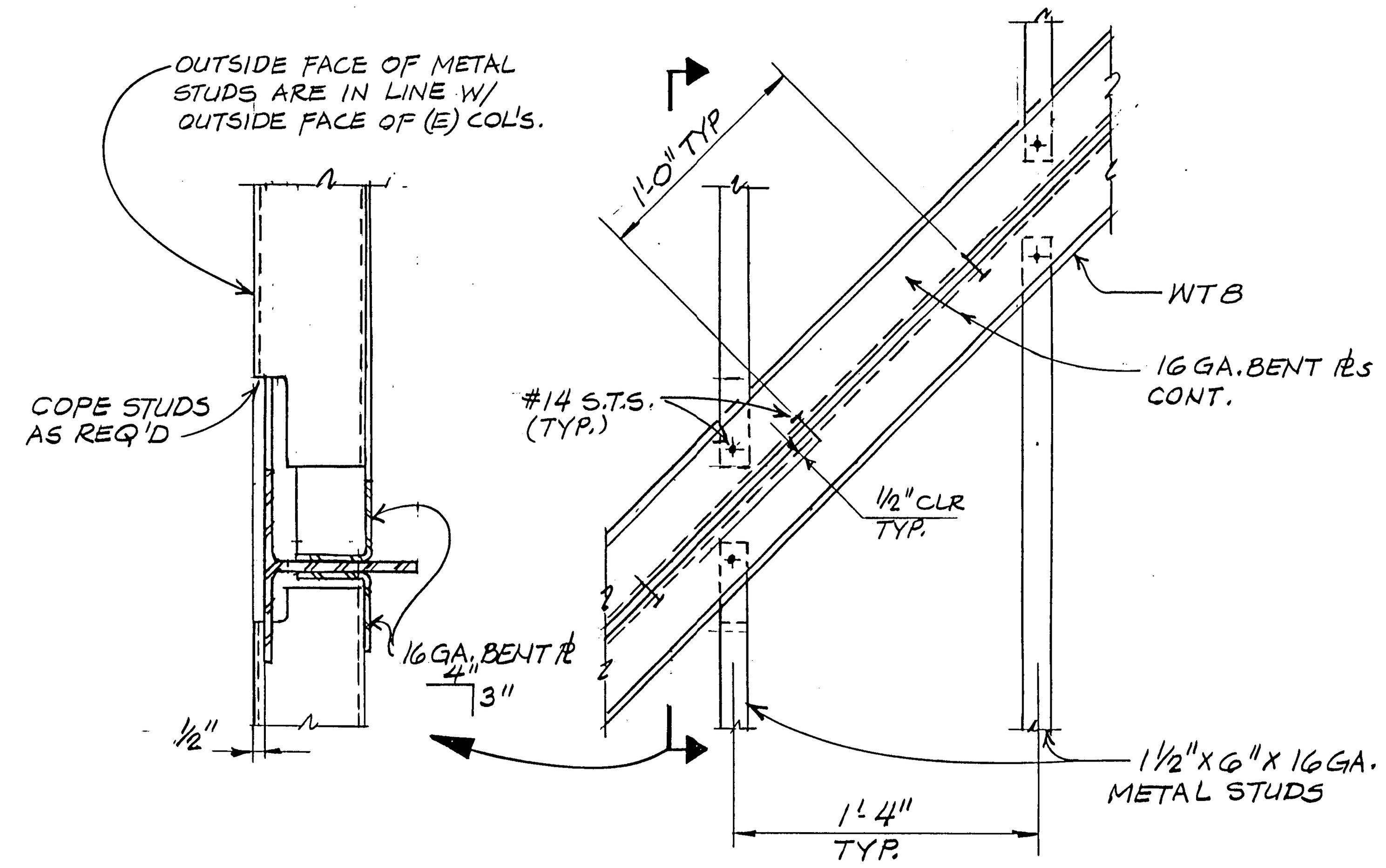
SEE KEY PLAN FOR ROOFING DETAIL LOCATION



FLASHING DETAIL A2 / VG-1507 (USE AT SECT'S E & F/VG-1507)

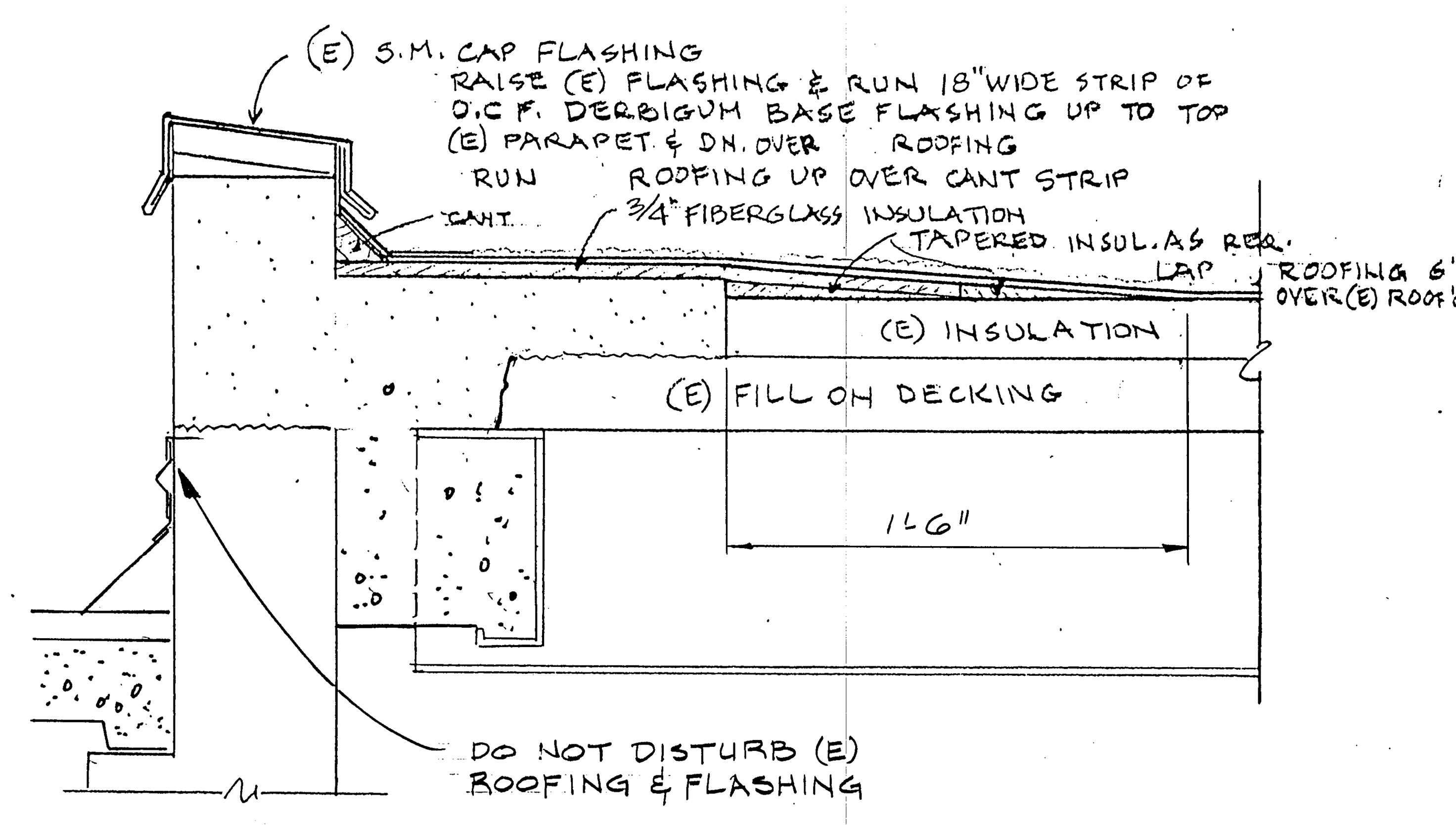
1½" = 1'-0"

SEE KEY PLAN FOR ROOFING DETAIL LOCATION



TYPICAL STUD FRAMING DETAIL A5 / VG-1507 (USE AT SECT. D/VG-1507)

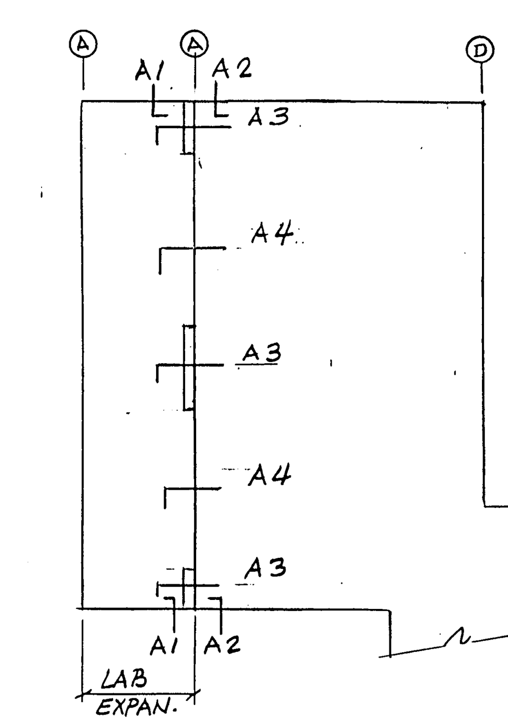
1½" = 1'-0"



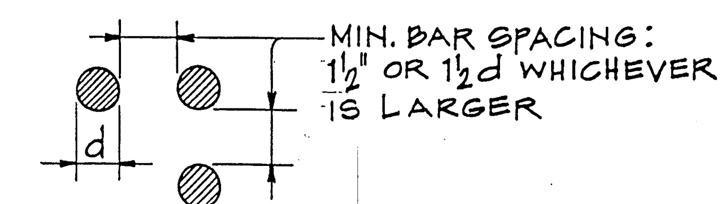
REROOFING DETAIL A3 / VG-1507 (USE AT DET. 12/VG-1507)

1½" = 1'-0"

SEE KEY PLAN FOR ROOFING DETAIL LOCATION

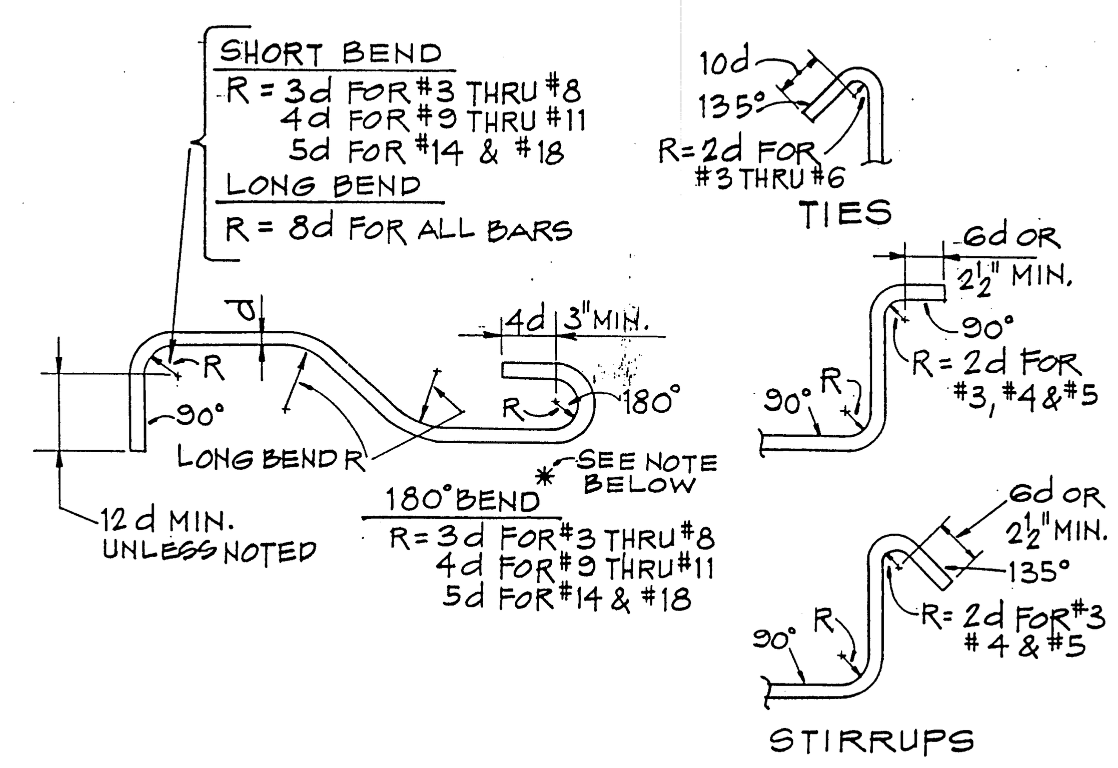


KEY PLAN FOR ROOFING DETAILS



NOTE: COLUMN DOWELS, TYPICAL HORIZONTAL WALL STEEL AND TYPICAL WALL STEEL DOWELS MAY BE WIRED TOGETHER INSTEAD OF SPACING AS SHOWN ABOVE.

TYP. REINFORCING BAR SPACING DETAIL



TYP. HOOKS & BENDS DETAIL

FOR GRADE 60 STEEL

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE 1985 EDITION OF THE UNIFORM BUILDING CODE AND THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
2. ALL CONCRETE SHALL BE STONE CONCRETE OF THE FOLLOWING CLASSES:

CLASS	28-DAY STRENGTH	USE
A	3250	ALL CONCRETE COLLECTOR BEAMS AT ROOF LEVEL, FOUNDATION STRENGTHENING
B	2500	SIDEWALKS

3. ALL REINFORCING STEEL SHALL CONSIST OF DEFORMED BARS CONFORMING TO ASTM A-615, GRADE 60.
4. ALL STRUCTURAL AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A-36 AND SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE EIGHTH EDITION OF THE A.I.S.C. SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, EIGHTH EDITION.
5. ALL BOLTS AND THREADED RODS SHALL CONFORM TO ASTM A-307.
6. ALL SELF-TAPPING SCREWS, DESIGNATED AS S.T.S. ON THESE DRAWINGS, ARE TO BE TEKS SCREWS BY BUILDEX, OR BY U.S. GYPSUM CO., OR EQUAL.

REGISTERED PROFESSIONAL ENGINEER CHRIS D. POLAND No. 2336 EXP. 3-31-89 STRUCTURAL STATE OF CALIFORNIA

NO.	DATE	REVISION	BY	REC.	APP.
	13DEC89	IN SERVICE 24MAR89 AS BUILT INSP J. Farrell	RYE		

H. J. Degenkolb Associates, Engineers
350 Sansome Street, Suite 500
San Francisco, CA 94104
415-392-6952
Degenkolb

JOB # 86042.02

DESIGNED BY DWC
DESIGN CHECKED BY CDP
DRAWN BY
SR. PROJ. ENGR. DWC
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. R.B. Haunschild
PROJECT MGR. R.P.E. No. C33317
MGR. OF SUPPORT SERVICES R.P.E. No. C 29111
MANAGER OF WASTEWATER R.P.E. NO. C 26855

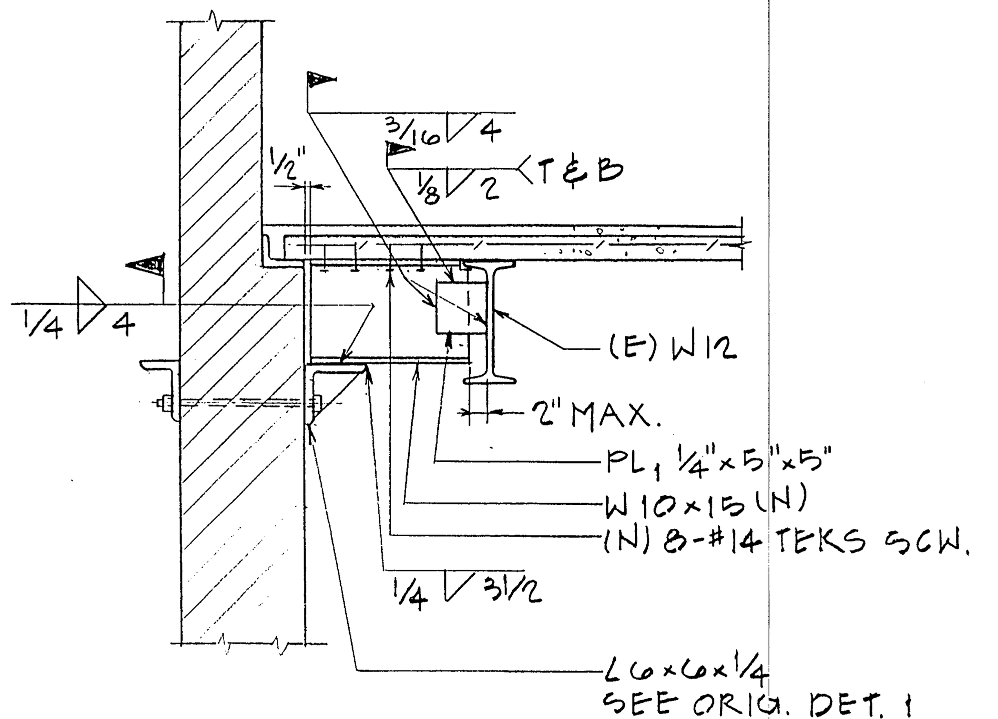
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

ARCHITECTURAL DETAILS AND TYPICAL DETAILS

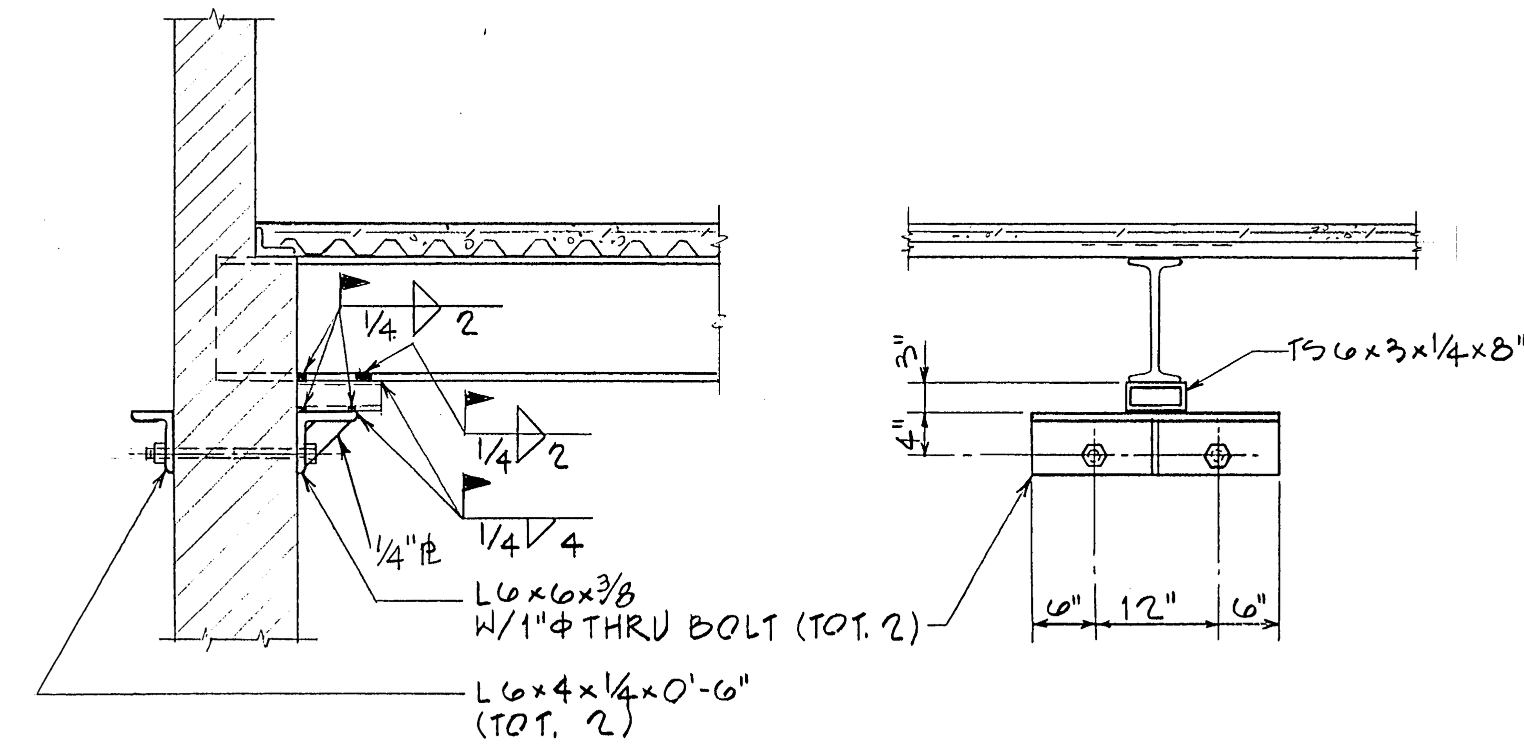
DRAWN BY R M EBY
SCALE AS SHOWN
DATE MAY 17, 1988
DRAWING No. VG-1509
SHEET 5 OF 5

SD-167.1 10/87

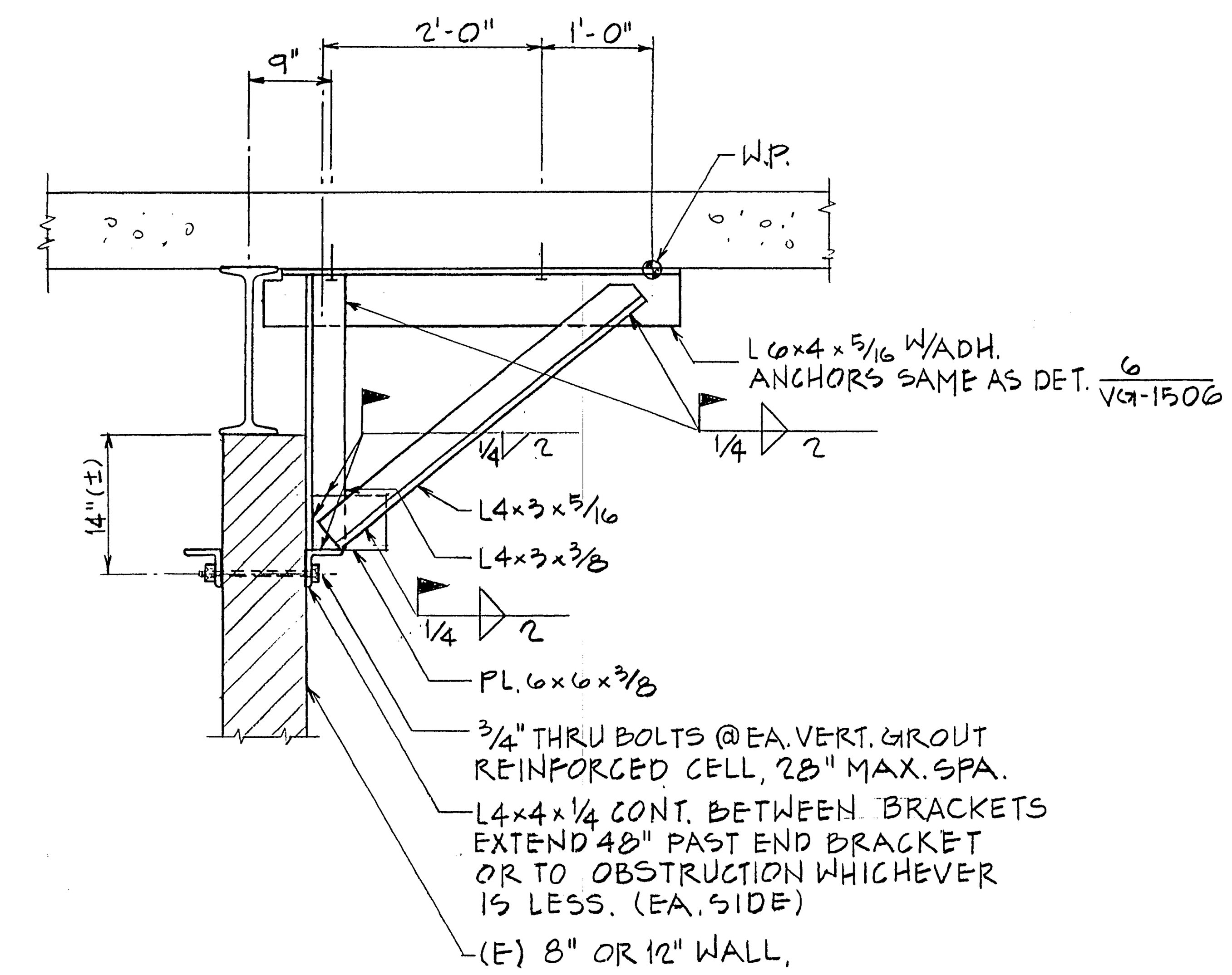


FOR PARTS NOT SHOWN
SEE DET. 1/VG-1506

DETAIL $\frac{1B}{VG\ 1505}$

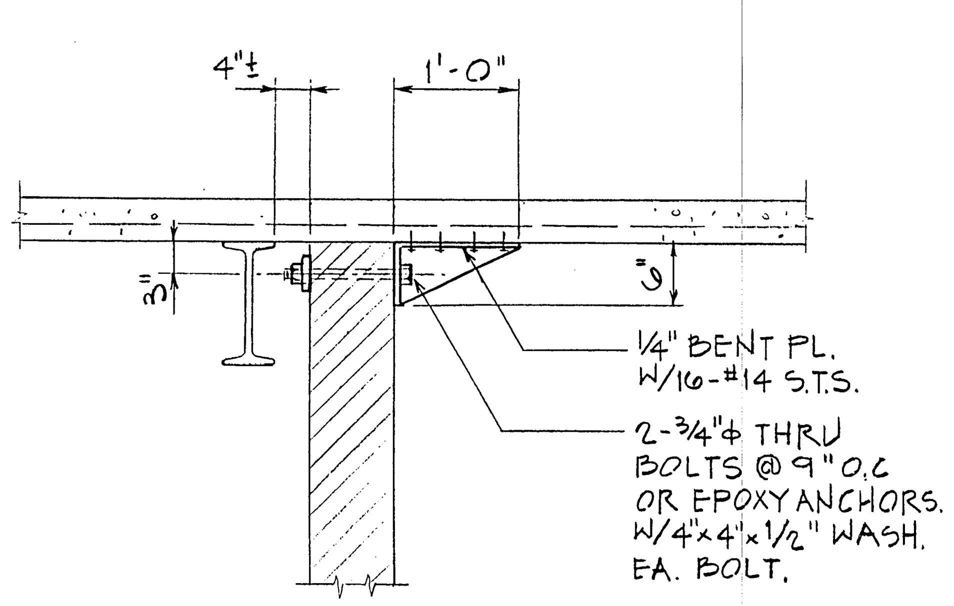


DETAIL $\frac{2-B}{VG\ 1505}$



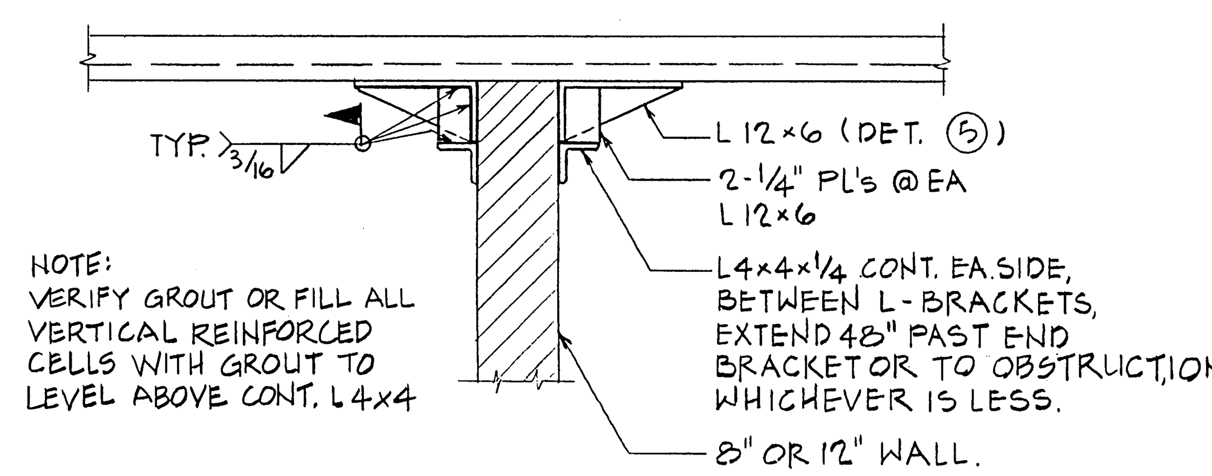
NOTE: VERIFY GROUT OR FILL ALL VERT. REINF. CELLS W/GROUT TO LEVEL ABOVE THRU. BOLT.

DETAIL $\frac{4-B}{VG\ 1505}$



FOR PARTS NOT SHOWN
SEE DET. 5/VG-1506

DETAIL $\frac{5-A}{VG\ 1505}$

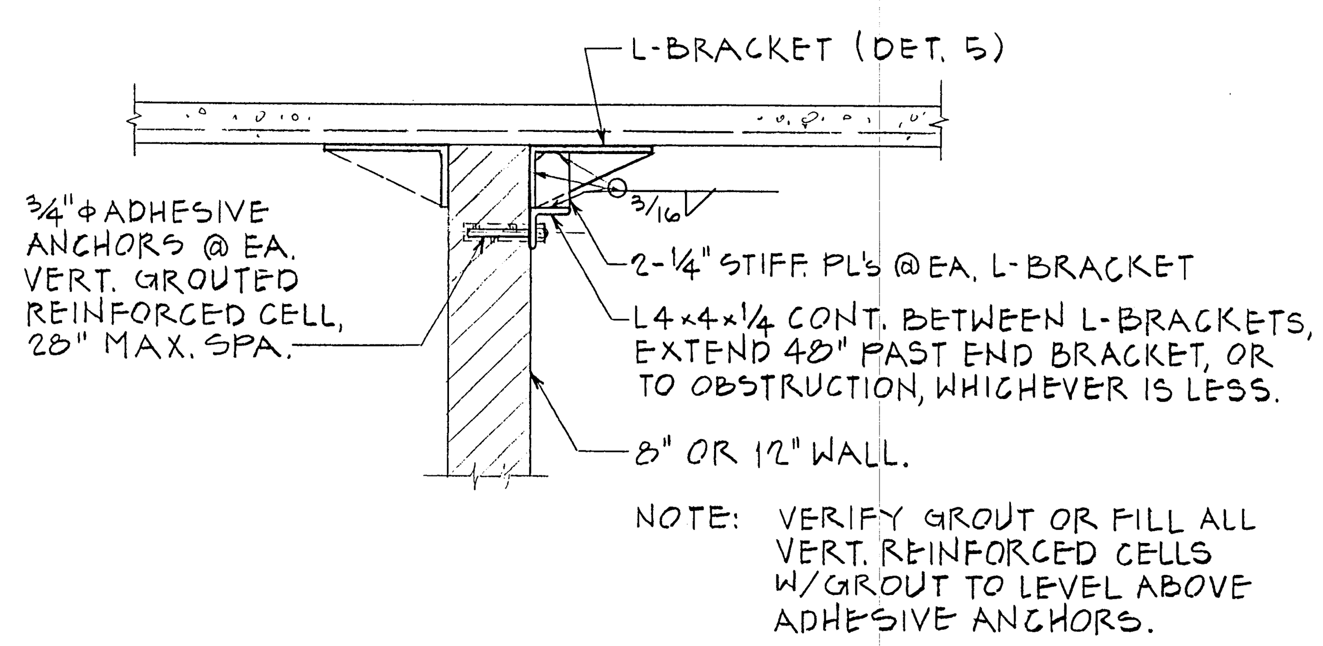


NOTE:
VERIFY GROUT OR FILL ALL
VERTICAL REINFORCED
CELLS WITH GROUT TO
LEVEL ABOVE CONT. L4x4

FOR PARTS NOT SHOWN
SEE DET. 5/VG-1506

DETAIL $\frac{5-B}{VG\ 1505}$

FOR DETAIL $\frac{3-B}{VG\text{-}1505}$ ADD CONT. L4x4x1/4
SAME AS ABOVE



NOTE: VERIFY GROUT OR FILL ALL
VERT. REINFORCED CELLS
W/GROUT TO LEVEL ABOVE
ADHESIVE ANCHORS.

DETAIL $\frac{5-C}{VG\ 1505}$

NO.	DATE	REVISION	BY	REC.	APP.
	12 DEC 89	24 MAR 89 IN SERVICE · AS BUILT · INSP. J. Farrell	RYE		

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DESIGNED BY
DESIGN CHECKED BY
DRAWN BY
SR. PROJ. ENGR.
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. R.P.E. No. C
PROJECT MGR. R.P.E. No. C
MGR. OF SUPPORT SERVICES R.P.E. No. C
MANAGER OF WASTEWATER R.P.E. NO. C

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

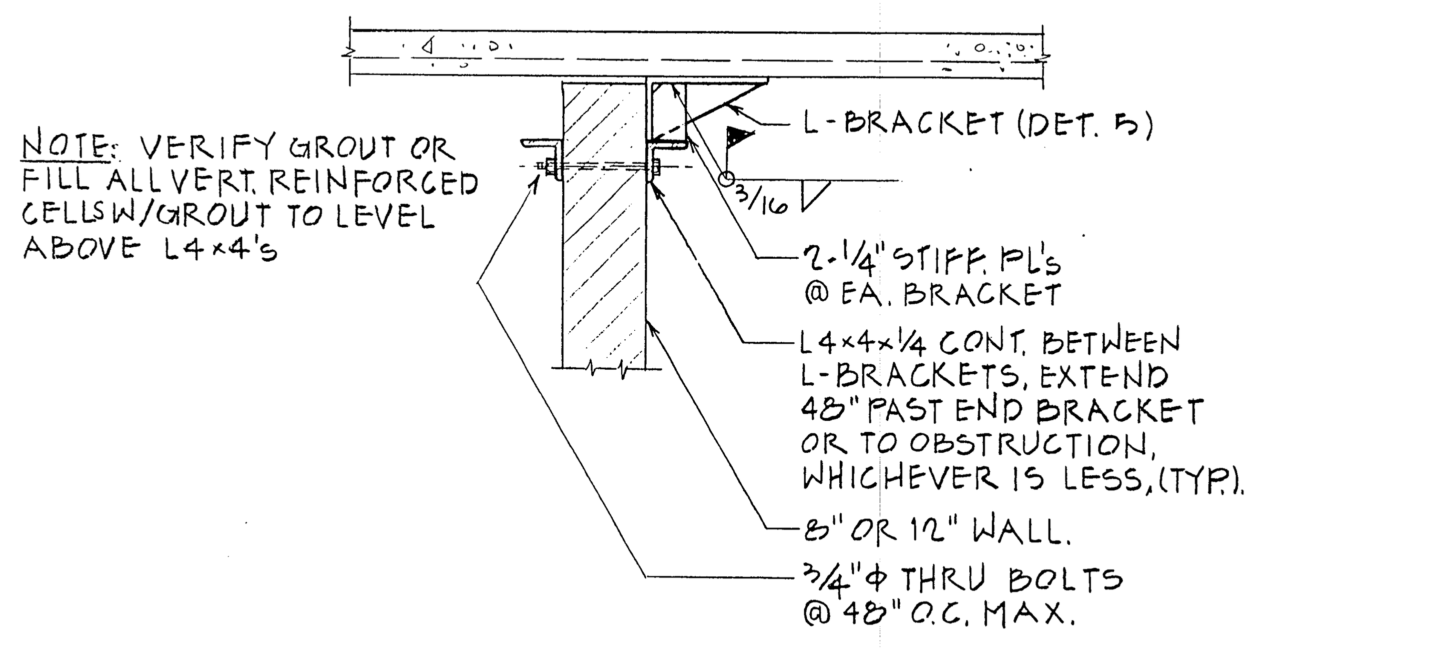
ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

SHEET 4

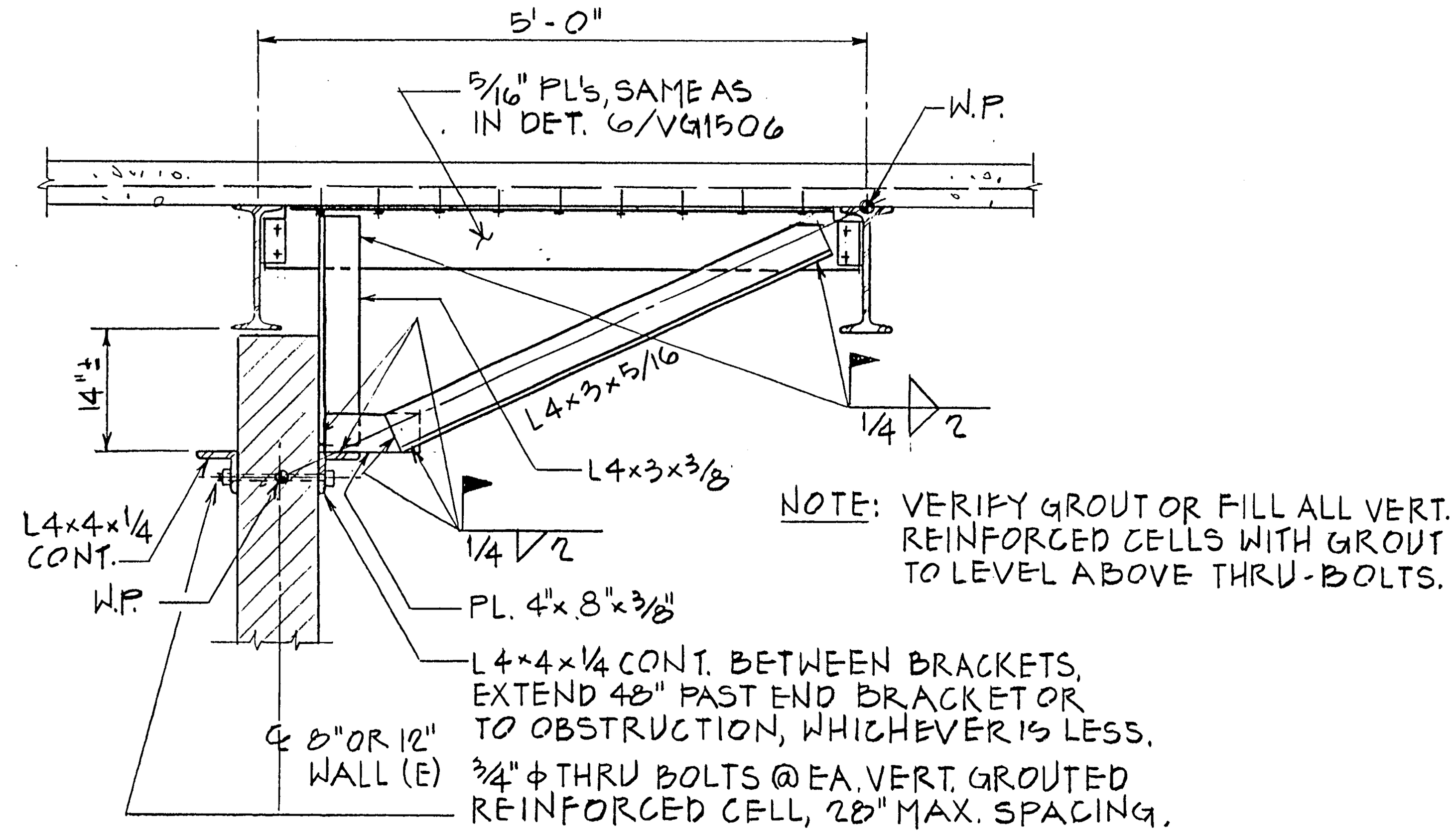
DRAWN BY G. OW-YANG
SCALE 3/4" = 1'-0"
DATE 11-27-1989
DRAWING No. VG-1511
SHEET OF

SD-167.1 10/87

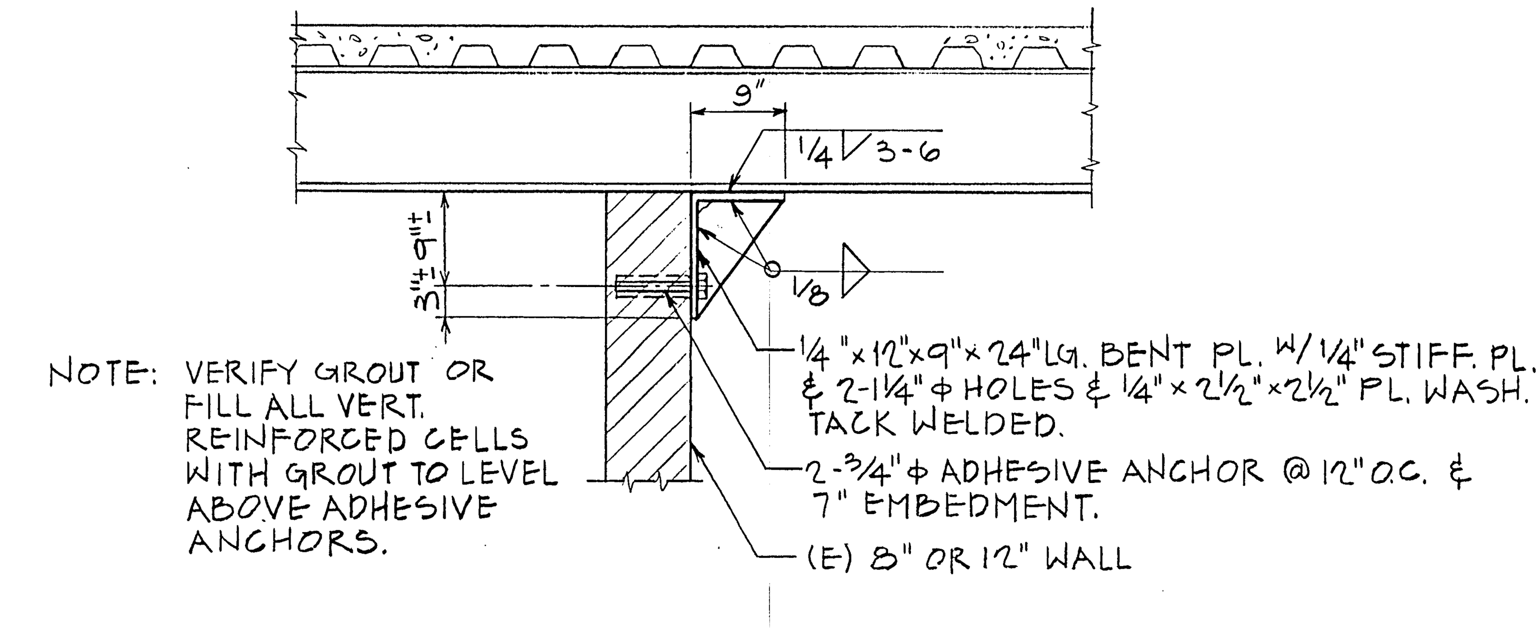


FOR PARTS NOT SHOWN SEE DET. 5/VG-1506

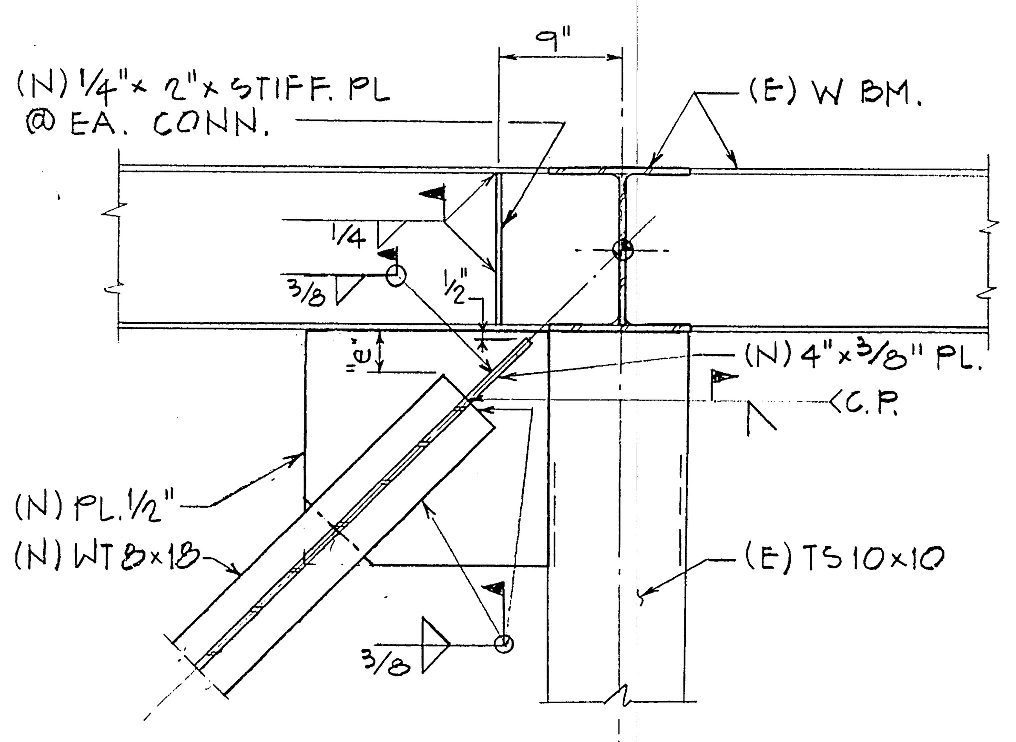
DETAIL 5-D / VG 1505
3/4" = 1'-0"



DETAIL 6-B / VG 1505
3/4" = 1'-0"



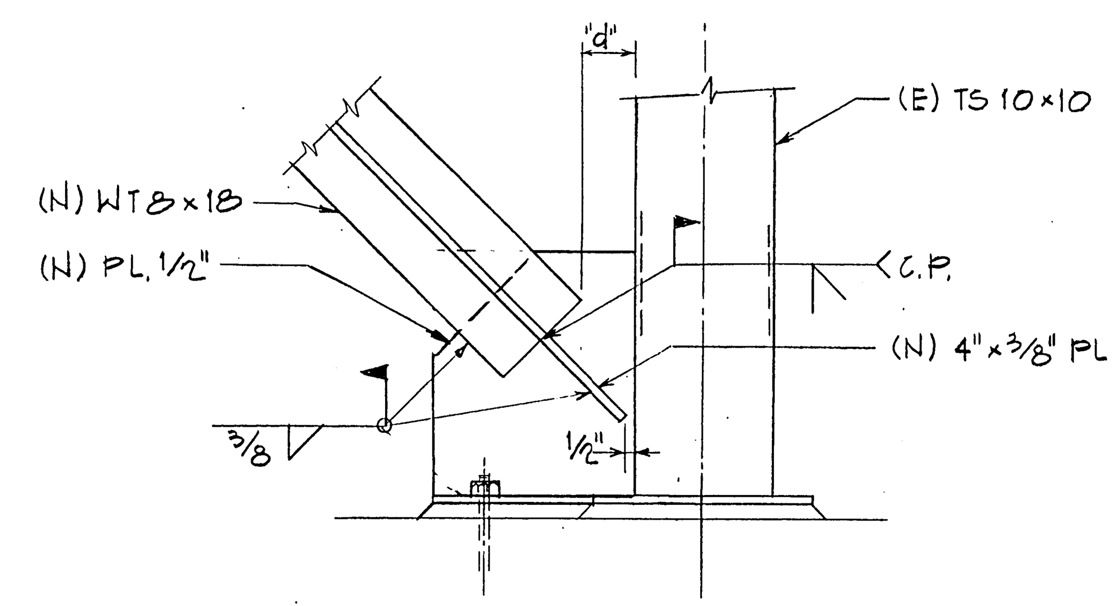
DETAIL 7-B / VG 1505
3/4" = 1'-0"



NOTE: ADD (N) 3/8" PL. WHEN "e" IS GREATER THAN 2". ADD (N) 1/4" PL. STIFF. PL. @ CHANNEL AT ALL TOP CONNECTIONS - 4 TOTAL.

FOR PARTS NOT SHOWN SEE DET. 9/VG-1507

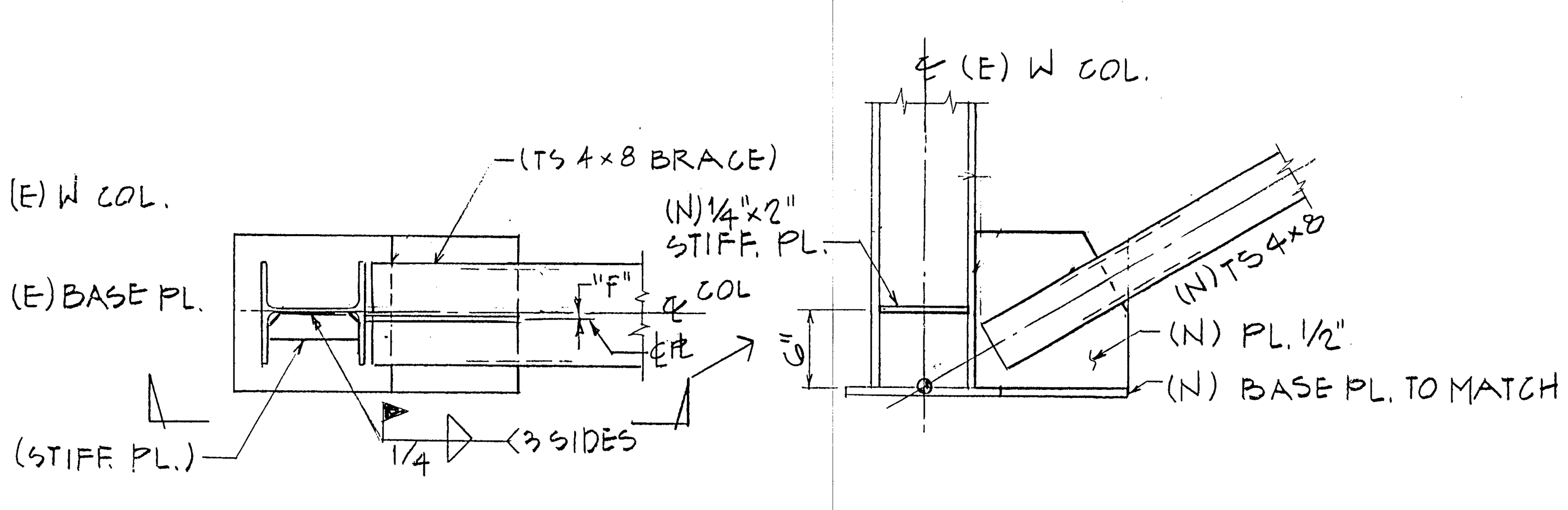
DETAIL 9-A / VG 1507
1" = 1'-0"



NOTE: ADD (N) PL. WHEN "d" IS GREAT THAN 2"

FOR PARTS NOT SHOWN SEE DET. 11/VG-1507

DETAIL 11-A / VG 1507
1" = 1'-0"



PLAN

ELEVATION

ADD NEW 1/4" STIFFENER PLATE WHEN "f" > 1/2"

FOR PARTS NOT SHOWN SEE DET. 16/VG-1508

DETAIL 16-A / VG-1508
1" = 1'-0"

NO.	DATE	REVISION	BY	REC.	APP.
	13DEC89	IN SERVICE 24MAR89 AS BUILT INSP. J. Farrell	RYE		

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350 Sansome Street, Suite 500
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Degenkolb

JOB # 86042.02

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DESIGN CHECKED BY
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PRINCIPAL-IN-CHARGE, R.P.E. NO. C

EBMUD
PROJECT ENG. R.P.E. No. C
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

ADMINISTRATION BUILDING
SEISMIC IMPROVEMENT PROJECT
SD-176

SECTIONS AND DETAILS

SHEET 5

DRAWN BY G. OW-YANG
SCALE AS NOTED
DATE 11-27-1989
DRAWING No. VG-1512
SHEET OF

SD-167.1 10/87

NOTE: IF THIS SHEET IS NOT 30"x42" IT IS A REDUCED PRINT

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE 1988 UNIFORM BUILDING CODE.
2. THESE NOTES SHALL APPLY TO ALL STRUCTURAL DRAWINGS UNLESS OTHERWISE NOTED OR SHOWN.
3. FEATURES OF CONSTRUCTION SHOWN ARE TYPICAL AND SHALL APPLY GENERALLY THROUGHOUT SIMILAR CONDITIONS.
4. UNLESS SHOWN OTHERWISE, DETAILS SHOWN ON "TYPICAL DETAIL" SHEETS SHALL BE USED WHEREVER APPLICABLE. SPECIFIC DETAILS ON THE STRUCTURAL DRAWINGS TAKE PRECEDENCE OVER "TYPICAL DETAILS". SPECIFIC NOTES ON STRUCTURAL DRAWINGS TAKE PRECEDENCE OVER NOTES SHOWN IN "GENERAL NOTES".
5. THE STRUCTURAL DRAWINGS SHOW STRUCTURAL FEATURES. CONFIGURATION OF INTERIOR PARTITION WALLS SHOWN ON STRUCTURAL DRAWINGS IS FOR GENERAL REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF PARTITIONS. PROVIDE ANCHORAGE, INSERTS, ANCHOR BOLTS, ETC. FOR STRUCTURAL CONNECTIONS OF TOP, SIDES AND BOTTOM OF ALL PARTITION WALLS AS LOCATED ON THE ARCHITECTURAL DRAWINGS.
6. REFER TO THE ARCHITECTURAL DRAWINGS AND THE SPECIFICATIONS FOR THE FOLLOWING: FLOOR FINISHES; DEPRESSIONS AND CURBS ON FLOORS; OPENINGS REQUIRED FOR WINDOWS, DOORS, DUCTS, VENTS, PLUMBING, ETC.; FLASHING, INSERTS, ANCHORAGES, HANGERS ETC., EMBEDDED IN OR ATTACHED TO THE STRUCTURE; WALKS, PAVING, STAIRS, RAMPS, TERRACES, EXTERIOR GRADES, ELEVATIONS OF ROOF SURFACE AND LOCATIONS OF DRAINS AND PARTITION WALLS.
7. THE CONTRACTOR SHALL COMPARE THE STRUCTURAL DRAWINGS WITH ARCHITECTURAL, PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS AS TO ALL LAYOUTS, DIMENSIONS AND ELEVATIONS. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER FOR PROPER ADJUSTMENT BEFORE PROCEEDING WITH THE WORK.
8. IN THE EVENT THAT CERTAIN FEATURES OF THE CONSTRUCTION ARE NOT FULLY SHOWN ON THE DRAWINGS OR CALLED FOR IN THE GENERAL NOTES OR SPECIFICATIONS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS SHOWN FOR SIMILAR CONDITIONS.
9. BEAMS, PRECAST PLANKS AND ANY OTHER STRUCTURAL ELEMENTS SHALL NOT BE CUT OR PENETRATED, EXCEPT AS SHOWN IN STRUCTURAL DETAILS OR AS APPROVED BY THE ENGINEER.
10. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD PRIOR TO POURING CONCRETE. ANY DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
11. FEATURES OF EXISTING CONSTRUCTION SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD AND DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER.
12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADEQUATELY SHORE AND BRACE EXISTING BUILDING AS REQUIRED DURING CONSTRUCTION.

SYMBOLS AND ABBREVIATIONS

A-S2	INDICATES	SECTION A ON DRAWING S2, ETC.
AB	"	ANCHOR BOLT
C	"	CONTROL JOINT
CJ	"	CONSTRUCTION JOINT
CMU	"	CONCRETE MASONRY UNIT
CP	"	COMPLETE PENETRATION WELD
EB	"	EXPANSION BOLT
EF	"	EACH FACE
EW	"	EACH WAY
FOC	"	FACE OF CONCRETE
FOM	"	FACE OF MASONRY
FOS	"	FACE OF STEEL
FTG	"	FOOTING
GB	"	GRADE BEAM
HR	"	HARD ROCK
MECH	"	MECHANICAL
NTS	"	NOT TO SCALE
PDS	"	POWDER DRIVEN STUDS
SAD	"	SEE ARCHITECTURAL DRAWING OR SEE ARCHITECTURAL DETAIL
SIM	"	SIMILAR
SMD	"	SEE MECHANICAL DRAWINGS OR SEE MECHANICAL DETAILS
SMS	"	SHEET METAL SCREW
TOC	"	TOP OF CONCRETE
TOS	"	TOP OF STEEL
UON	"	UNLESS OTHERWISE NOTED
WWM	"	WELDED WIRE MESH
(E)	"	EXISTING
(N)	"	NEW

FOUNDATION NOTES

1. THE SOIL REPORT APPLICABLE TO THIS PROJECT SITE IS BY (GEO/RESOURCE CONSULTANTS, INC., REPORT #1618-09-0, DATED OCTOBER 15, 1990) AND IS AVAILABLE FOR REVIEW AT THE ENGINEERS OFFICE. THE CONTRACTOR SHALL READ THE SOIL REPORT PREPARED FOR THIS PROJECT SITE AND SHALL BE RESPONSIBLE FOR PERFORMING ALL WORK DESCRIBED THEREIN.
2. FOUNDATION SYSTEM IS A DRIVEN PILE AND GRADE BEAM SYSTEM. DRIVEN PILES DERIVE FRICTIONAL SUPPORT FROM FIRM CLAYEY SOIL UNDERLYING BAY MUD.
3. FOR BIDDING PURPOSES, THE PILE LENGTHS SHALL BE AS INDICATED ON THE FOUNDATION PLAN AND ON DETAILS. THESE LENGTHS ARE MINIMUM AND SHALL BE VERIFIED BY THE SOIL ENGINEER AFTER DRIVING OF INDICATOR PILES.
4. GRADE BEAMS SHALL BE CENTERED ON GRID LINES UNLESS OTHERWISE NOTED.
5. SEE ARCHITECTURAL, PLUMBING, MECHANICAL, ELECTRICAL AND ANY OTHER INCLUDED DRAWINGS, AND CONSULT WITH THE RESPECTIVE TRADES FOR VERIFICATION OF ALL ITEMS SHOWN OR NOT SHOWN ON STRUCTURAL PLANS PRIOR TO POURING CONCRETE GRADE BEAMS, FOOTINGS AND FLOOR SLABS.
6. VERIFY LOCATIONS FOR OPENINGS OR PENETRATIONS THROUGH CONCRETE, CONCRETE CURBS, FLOOR DEPRESSIONS, FLOOR SLOPES AND DRAINS, INSERTS, ETC.

CONCRETE NOTES

1. ALL CONCRETE SHALL BE REINFORCED UNLESS NOTED "NOT REINFORCED".
2. SEE SPECIFICATIONS FOR THE REQUIREMENTS IN THE PRODUCTION, TESTING AND INSTALLATION OF CONCRETE.
3. SEE ARCHITECTURAL DRAWINGS FOR LOCATION AND EXTENT OF EXTERIOR WALKS AND PAVEMENTS AND FOR REINFORCEMENT REQUIREMENTS.
4. REINFORCEMENT SHALL BE PER ASTM A615-60, WITH BAR MARKS LEGIBLY ROLLED INTO THE SURFACE INDICATING SIZE, TYPE OF STEEL, AND YIELD STRENGTH DESIGNATION.
5. SEE SPECIFICATIONS FOR REQUIRED CONCRETE STRENGTHS.
6. LAP ALL REINFORCING BARS 40 BAR DIAMETERS AT SPLICES. STAGGER SPLICES WHEREVER POSSIBLE. VERTICAL WALL REINFORCING BARS SHALL EXTEND INTO FOOTINGS, BUT MAY BE DOWELLED WITH 40 BAR DIAMETER LAPS OF SAME SIZE BARS.
7. REINFORCEMENT, ANCHOR BOLTS, PIPE SLEEVES, AND OTHER INSERTS SHALL BE POSITIVELY SECURED IN PLACE BEFORE CONCRETE IS POURED.
8. REINFORCING BARS WELDED TO STRUCTURAL STEEL SHALL BE SUPPLIED BY REINFORCING BAR SUB-CONTRACTOR AND ALL WELDING SHALL BE DONE BY STRUCTURAL STEEL SUB-CONTRACTOR.
9. BAR COVERAGE TO FACE OF BAR, EXCEPT AS OTHERWISE SHOWN, SHALL BE:
   - 3" WHERE CONCRETE IS POURED AGAINST EARTH OR AGAINST GROUND CONTACT.
   - 2" FOR BARS LARGER THAN #5, WHERE CONCRETE SURFACES ARE EXPOSED TO EARTH OR TO WEATHER AFTER REMOVAL OF FORMS.
   - 1-1/2" FOR #5 BARS OR SMALLER, WHERE CONCRETE SURFACES ARE EXPOSED TO EARTH OR TO WEATHER AFTER REMOVAL OF FORMS.
10. INTERIOR SLABS ON GROUND SHALL BE REINFORCED AS SHOWN ON STRUCTURAL PLANS. LOCATIONS OF CONSTRUCTION JOINTS OTHER THAN SHOWN ON DRAWINGS MUST BE APPROVED BY THE ENGINEER.
11. ALL CONCRETE CURBS ARE 4 INCHES HIGH UNLESS OTHERWISE NOTED.
12. THE SURFACE OF ALL CONSTRUCTION JOINTS SHALL BE CLEANED AND ROUGHENED BY REMOVING THE ENTIRE SURFACE AND EXPOSING CLEAN AGGREGATE SOLIDLY EMBEDDED IN MORTAR MATRIX.

EXISTING CONCRETE NOTES

1. WHERE NEW CONSTRUCTION IS INTEGRATED WITH EXISTING CONCRETE CONSTRUCTION, CARE SHALL BE TAKEN SO AS NOT TO DAMAGE EXISTING REMAINING CONCRETE AND REINFORCING. WHERE NEW CONCRETE ABUTS EXISTING CONCRETE ROUGHEN EXISTING CONCRETE SURFACE SO AS TO EXPOSE SOLID MORTAR MATRIX WITH 1/4" MINIMUM AMPLITUDE TYPICAL. APPLY APPROVED BONDING AGENT TO SURFACE OF EXISTING CONCRETE.
2. HOLES FOR GROUTED ANCHORS SHALL BE DRILLED WITH ROTARY HAMMER OR OTHER SUITABLE METHODS TO ENSURE EXISTING REINFORCEMENT IS NOT DAMAGED. HOLE DIAMETER SHALL BE 1/8" GREATER THAN ANCHOR ROD DIAMETER, UNLESS OTHERWISE NOTED. GROUT SHALL BE NON-SHRINK AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 6000 PSI. LOCATE EXISTING REINFORCING BARS PRIOR TO DRILLING HOLES. DO NOT DAMAGE EXISTING REINFORCING. METHOD OF LOCATING REINFORCING BARS SHALL BE APPROVED BY THE ENGINEER. ALL MIS-DRILLED OR UNACCEPTABLE HOLES HOLES SHALL BE GROUTED SOLID.

PRECAST PLANK NOTES

1. SEE SPECIFICATIONS FOR MINIMUM CONCRETE STRENGTH, REINFORCING REQUIREMENTS, ERECTION NOTES AND SHOP DRAWING SUBMITTAL REQUIREMENTS.
2. PLANKS SHALL BE DESIGNED BY A CIVIL ENGINEER REGISTERED IN CALIFORNIA. SUPERIMPOSED LOADS (PSF) FOR DESIGN SHALL BE AS FOLLOWS:

	DEAD LOAD	LIVE LOAD	TOTAL LOAD
TYPICAL LOADING	65.0**	50.0	115.0
CORRIDOR	45.0**	100.0	145.0
STORAGE (TYPICAL)	65.0	125.0	190.0
STORE ROOM (SEE SHEET S2.4)	45.0	400.0	445.0
FIELD SERVICES (OPEN BAY)	65.0**	50.0*	115.0

- * DESIGN FOR 50 PSF LIVE LOAD OR 2000 POUND CONCENTRATED AT ANY POINT, WHICHEVER PRODUCES GREATER STRESSES.
- ** NOTE ADDITIONAL CONCRETE FILL AT TEMPORARY SAMPLE HOLDING AND AT DEPRESSED PLANKS ADJACENT TO RESTROOMS, LOCKER ROOMS, COLD ROOM AND FLOOR DRAIN IN FIELD SERVICES OPEN BAY.

3. CORE DRILL OPENINGS THROUGH NEW OR EXISTING PRECAST PLANKS WHERE SHOWN ON MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS. SEE SPECIFICATIONS FOR PROCEDURE.

STRUCTURAL STEEL NOTES

1. ALL STRUCTURAL STEEL SHALL BE ASTM A36. ALL STRUCTURAL TUBING SHALL BE ASTM A500 GRADE B. ALL STEEL PIPE COLUMNS SHALL BE GRADE B PIPE, ASTM A53. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS, LATEST EDITION.
2. ALL BOLTED CONNECTIONS STEEL TO STEEL SHALL BE MADE WITH 3/4" DIAMETER HIGH-STRENGTH (A325F) BOLTS UNLESS OTHERWISE NOTED.
3. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS.
4. ALL TESTING AND INSPECTION OF SHOP AND FIELD WELDING OPERATIONS SHALL BE MADE BY A CERTIFIED WELDING INSPECTOR.
5. ALL WELDS SHALL BE TESTED AND INSPECTED IN ACCORDANCE WITH THE SPECIFICATIONS, THE UNIFORM BUILDING CODE AND AWS D1.1. THE WELDING INSPECTOR SHALL CHECK THE MATERIAL, EQUIPMENT, FIT UP AND PROCEDURES AS WELL AS THE WELDS. THE INSPECTOR SHALL USE ALL MEANS NECESSARY TO DETERMINE THE QUALITY OF THE WELDS, INCLUDING THE USE OF GAMMA RAY, MAGNAFLUX, TREPANNING, SONICS OR ANY OTHER AID TO VISUALLY INSPECT AND TO ASCERTAIN THE ADEQUACY OF THE WELDING. THE INSPECTOR SHALL FURNISH THE DISTRICT WITH A REPORT VERIFYING THAT ALL WELDS HAVE BEEN DONE IN CONFORMITY WITH THE PLANS, SPECIFICATIONS, AWS D1.1 AND ANY APPLICABLE CODES. UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE FABRICATION AND ERECTION REQUIREMENTS MAY DICTATE FIELD WELDING AND/OR SHOP WELDING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE METHOD OF WELDING TO FULFILL THESE REQUIREMENTS. ALL ASSOCIATED COSTS SHALL BE INCLUDED IN THE CONTRACT PRICE.
6. WHERE CLOSER THAN AISC TOLERANCES ARE NECESSARY, SUCH AS FOR ALIGNMENT OF STEEL STUDS, MULLIONS, ETC., FIELD WELDING WILL BE REQUIRED TO MEET THE NECESSARY TOLERANCES WITH NO ADDITIONAL COSTS TO THE DISTRICT.
7. WELDING OF REBAR TO STRUCTURAL STEEL SHALL BE DONE BY STRUCTURAL STEEL SUB-CONTRACTOR.
8. BOLT HOLES IN STEEL SHALL BE 1/16" OVERSIZE UNLESS OTHERWISE NOTED.
9. STRUCTURAL STEEL SUB-CONTRACTOR SHALL EXCHANGE SHOP DRAWINGS WITH STEEL DECK SUB-CONTRACTOR FOR COORDINATION.

STEEL DECKING NOTES

1. SEE STRUCTURAL DETAILS FOR TYPE OF STEEL DECKING REQUIRED FOR THIS PROJECT.
2. STEEL DECKING PANEL UNITS SHALL BE FORMED FROM ZINC COATED STEEL SHEETS WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI. ZINC COATING SHALL BE G60 AND 0.5 OUNCE MINIMUM PER SQUARE FOOT OF STEEL SHEET.
3. SECTION PROPERTIES SHALL CONFORM TO THE AISI SPECIFICATIONS FOR THE DESIGN OF LIGHT GAGE COLD FORMED STEEL STRUCTURAL MEMBERS.
4. DECK PANELS SHALL SPAN OVER THREE OF MORE SUPPORTS WHERE STRUCTURAL FRAMING PERMITS AND AS SHOWN ON STRUCTURAL PLANS AND DETAILS AND SHALL INCLUDE ALL ACCESSORIES FOR THIS TYPE OF DECKING SUCH AS CLOSURES, FLASHING, COVER CAPS, ETC. PANELS SHALL BE ALIGNED AND PLACED IN ACCORDANCE WITH THE MANUFACTURER'S APPROVED STANDARD DETAILS AND SHOP DRAWINGS.
5. WELDING OF STEEL DECK PANELS TO SUPPORTING STRUCTURAL FRAMING AS NOTED ON STRUCTURAL DETAILS AND/OR AS CALLED FOR ON APPROVED SHOP DRAWINGS SHALL BE DONE BY CERTIFIED WELDERS.
6. PRIOR TO APPLICATION OF CONCRETE, THE STEEL DECKING SHALL BE CLEANED OF ALL DIRT, DEBRIS, OIL, WATER OR ANY OTHER FOREIGN MATERIAL.
7. CONCRETE FILL ON STEEL DECKING SHALL TEST NOT LESS THAN 3000 PSI AT 28 DAYS, AND SHALL BE REINFORCED WITH #3 @ 12" O.C. E.W. PLACED AT THE CENTER OF THE CONCRETE FILL.
8. STEEL DECKING SUB-CONTRACTOR SHALL EXCHANGE SHOP DRAWINGS WITH STRUCTURAL STEEL SUB-CONTRACTOR FOR COORDINATION.
9. SHEAR CONNECTOR DETAILS AND TESTING SHALL BE IN ACCORDANCE WITH TYPICAL DETAILS.

LIGHT GAGE STEEL FRAMING NOTES

1. METAL STUD FABRICATION SHALL CONFORM TO AISI SPECIFICATIONS FOR THE DESIGN OF LIGHT GAGE COLD FORMED SECTIONS.
2. ALL GALVANIZED STUDS (AND/OR) JOISTS, 12, 14 AND 16 GAGE, SHALL BE FORMED FROM STEEL THAT CONFORMS TO THE REQUIREMENTS OF ASTM A446, GRADE D, WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI.
3. ALL GALVANIZED 18 AND 20 GAGE STUDS (AND/OR) JOISTS, AND ALL GALVANIZED TRACK, BRIDGING AND ACCESSORIES SHALL BE FORMED FROM STEEL THAT CONFORMS TO THE REQUIREMENTS OF ASTM A446, GRADE A, WITH OF MINIMUM YIELD STRENGTH OF 33,000 PSI.
4. METAL STUDS SHALL BE AT 16" O.C. MAXIMUM. SEE SPECIFICATIONS FOR REQUIRED MINIMUM SECTION PROPERTIES.
5. ALL WELDS FOR LIGHT GAGE STEEL SHALL BE IN ACCORDANCE WITH AISC AND AISI SPECIFICATIONS.
6. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS.
7. ALL WELDS SHALL BE INSPECTED BE A CERTIFIED WELDING INSPECTOR.
8. BEARING STUDS SHALL BE INSTALLED IN A MANNER WHICH WILL ASSURE THAT ENDS OF THE STUDS ARE POSITIONED AGAINST THE TRACK WEBS, PRIOR TO STUD AND TRACK ATTACHMENT.
9. STUDS SHALL BE SEATED SQUARELY IN THE TRACK WITH THE STUD WEB AND FLANGE ABUTTING THE TRACK WEB, PLUMBED AND ALIGNED, AND SECURELY ATTACHED TO THE FLANGES OR WEB OF BOTH THE UPPER AND LOWER TRACKS.
10. WALL STUD BRIDGING SHALL BE ATTACHED IN A MANNER TO PROVIDE RESISTANCE TO BOTH MINOR AXIS BENDING AND ROTATION, BRIDGING ROWS SHALL BE EQUALLY SPACED NOT TO EXCEED 3'-4" O.C.
11. SPLICES IN STUDS SHALL NOT BE PERMITTED.
12. JOISTS SHALL BE LOCATED DIRECTLY OVER BEARING STUDS UNLESS OTHERWISE DETAILED.
13. JOIST BRIDGING SHALL BE PROVIDED AS SHOWN ON PLANS AND AS RECOMMENDED BY THE STEEL JOIST INSTITUTE.
14. END BLOCKING SHALL BE PROVIDED WHERE JOIST ENDS ARE NOT OTHERWISE RESTRAINED FROM ROTATION.
15. TEMPORARY BRACING SHALL BE PROVIDED UNTIL ERECTION IS COMPLETE.
16. FRAMED WALL OPENINGS SHALL INCLUDE HEADERS AND SUPPORTING STUDS AS SHOWN ON TYPICAL FRAMING DETAILS PROVIDED BY MANUFACTURER UNLESS OTHERWISE NOTED.

EXPANSION ANCHORS IN HARDENED CONCRETE OR CONCRETE MASONRY UNIT NOTES

1. INSTALLATION: THE ANCHORS MUST BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS GIVEN IN THE ICBO RESEARCH COMMITTEE RECOMMENDATIONS FOR THE SPECIFIC ANCHOR.
2. JOB TESTING: 50% OF THE ANCHORS SHALL BE TENSION PROOF LOAD TESTED TO TWICE THE ANCHORS ALLOWABLE TENSION LOAD. IF ANY ANCHOR FAILS, THEN ALL ANCHORS MUST BE TESTED. THE LOAD TEST SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. THE LOAD MAY BE APPLIED BY ANY METHOD THAT WILL EFFECTIVELY MEASURE THE TENSION IN THE ANCHOR, SUCH AS DIRECT PULL WITH A HYDRAULIC JACK, A TORQUE WRENCH CALIBRATED USING THE SPECIFIC ANCHOR, CALIBRATED SPRING-LOADED DEVICES, ETC. ANCHORS IN WHICH THE TORQUE IS USED TO EXPAND THE ANCHOR WITHOUT APPLYING TENSION TO THE BOLT MAY NOT BE VERIFIED WITH A TORQUE WRENCH.
3. ALL EXPANSION ANCHORS SHALL BE PHILLIPS RED HEAD WEDGE ANCHORS (W.A.), HILTI HSL HEAVY DUTY ANCHOR OR APPROVED EQUAL.
4. TEST INSPECTOR SHALL VERIFY ALL EXPANSION ANCHORS NOT TENSION LOAD TESTED FOR MINIMUM INSTALLATION TORQUE NOTED IN SCHEDULE BELOW.
5. TENSION PROOF LOAD SHALL BE BY AN INDEPENDENT TESTING LABORATORY.
6. EXPANSION ANCHOR BOLT SCHEDULE:

NORMAL WEIGHT CONCRETE WITH f'c = 3000 psi

ANCHOR DIAMETER	MINIMUM EMBEDMENT	MINIMUM INSTALLATION TORQUE (FT-LBS.)
1/4"	2"	5
3/8"	3"	20
1/2"	4"	40
5/8"	5"	70
3/4"	6"	125

CONCRETE MASONRY UNIT WITH f'm = 1500 psi

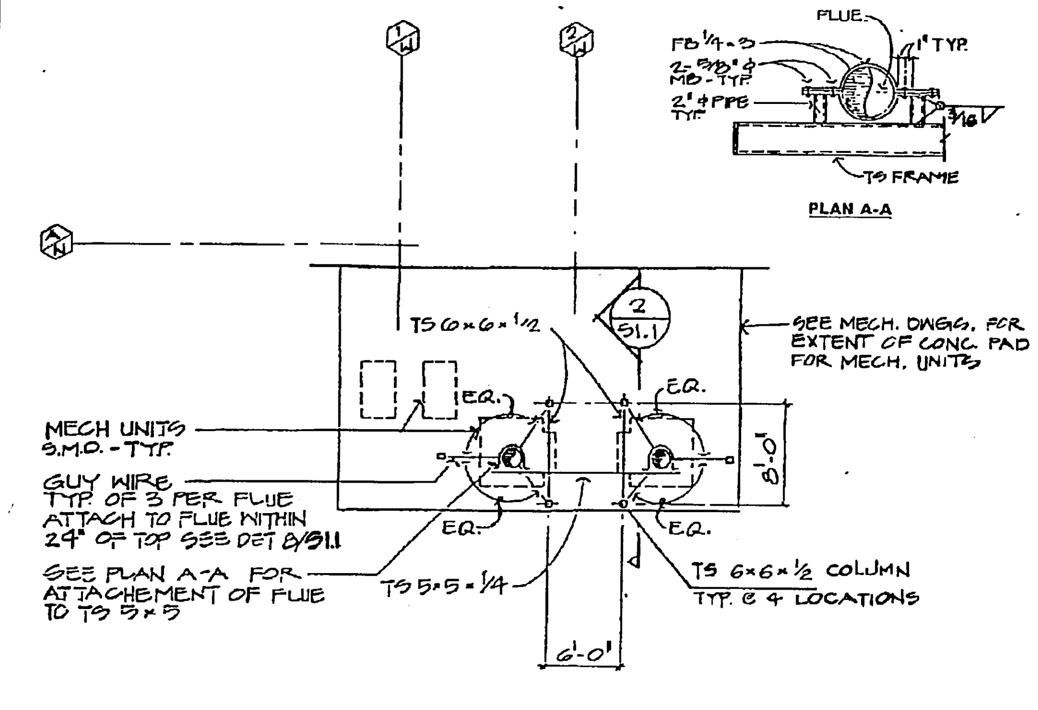
ANCHOR DIAMETER	MINIMUM EMBEDMENT	MINIMUM INSTALLATION TORQUE (FT-LBS.)
1/4"	2"	5
3/8"	3"	20
1/2"	4"	40
5/8"	5"	70
3/4"	6"	125

TEST AND INSPECTION NOTES

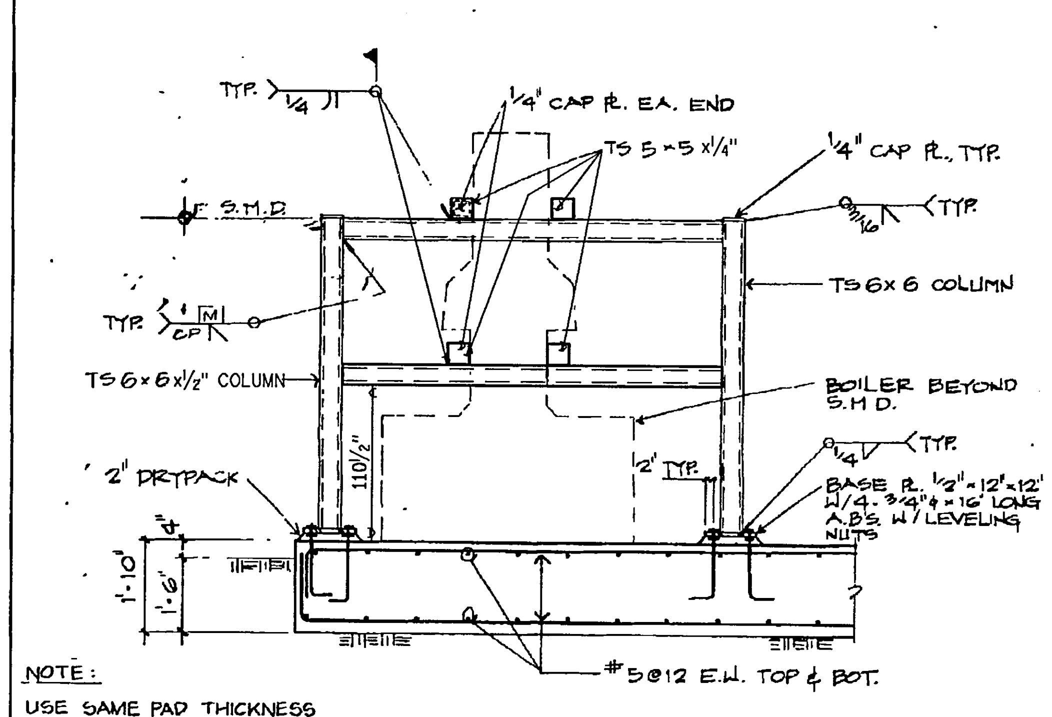
1. TESTS AND INSPECTIONS SHALL BE PROVIDED FOR ALL ITEMS AS REQUIRED BY THE UNIFORM BUILDING CODE.
2. THE DISTRICT SHALL BE RESPONSIBLE FOR RETAINING AN INDEPENDENT TESTING AND INSPECTION LABORATORY TO PERFORM ALL REQUIRED TESTING AND INSPECTIONS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE TESTING AND INSPECTION LABORATORY WITH CONSTRUCTION SCHEDULES TO ENSURE PROPER COORDINATION OF WORK.
4. THE FOLLOWING SPECIFIED ITEMS SHALL BE INSPECTED BY AN APPROVED TESTING AND INSPECTION LABORATORY:
   - A. PRESTRESSING STEEL IN PILES AND PRECAST PLANKS.
   - B. PILE DRIVING OPERATIONS (CONTINUOUS INSPECTION BY SOIL ENGINEER)
   - C. REINFORCING STEEL
   - D. CONCRETE PLACEMENT
   - E. ALL STRUCTURAL WELDING
   - F. EXPANSION BOLTS (SEE NOTES ABOVE)
5. THE DISTRICT SHALL RETAIN AN INDEPENDENT TESTING AND INSPECTION LABORATORY TO PERFORM TESTING OF ALL STRUCTURAL CONCRETE.
6. THE CONTRACTOR SHALL NOTIFY THE INSPECTOR A MINIMUM OF 48 HOURS PRIOR TO THE TIME OF A REQUIRED INSPECTION.

LEGEND

	DENOTES	
	"	EARTH
	"	EXISTING CONCRETE MASONRY IN PLAN
	"	EXISTING CONCRETE MASONRY TO BE REMOVED
	"	EXISTING CONCRETE IN SECTION
	"	NEW CONCRETE IN SECTION
	"	STRUCTURAL STEEL IN SECTION

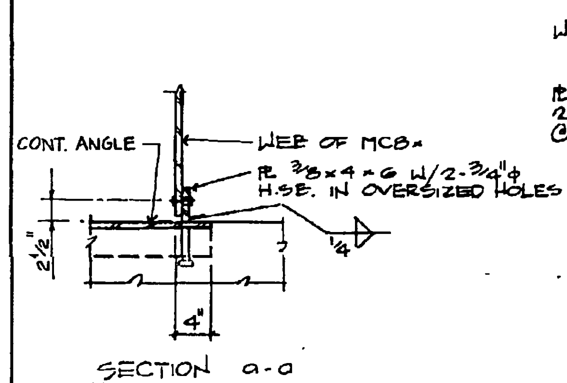


1/S1.1 BOILER FLUE BRACING - PLAN 1/8" = 1'-0"

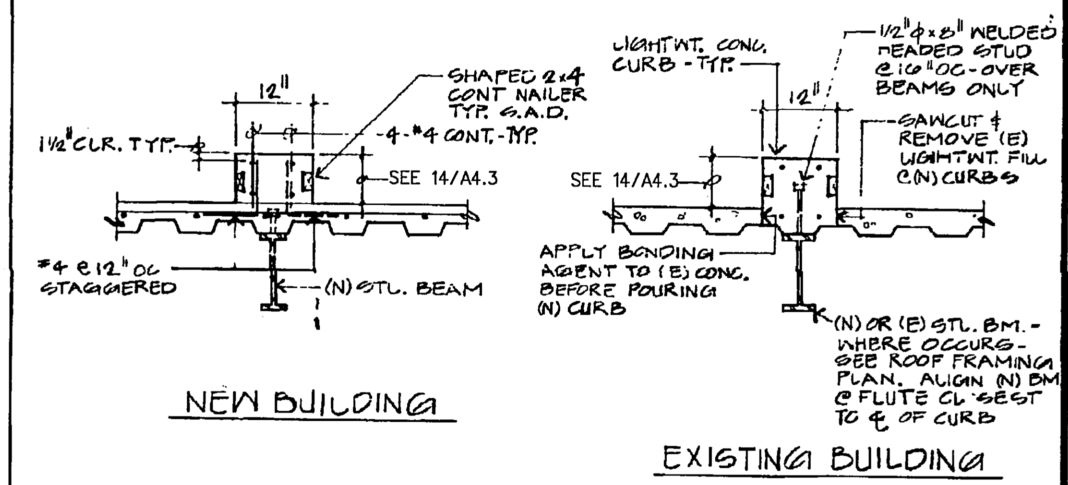


2/S1.1 BOILER FLUE BRACING 1/2" = 1'-0"

NOTE: USE SAME PAD THICKNESS & REINF. AT PAD FOR ELECTRICAL GENERATOR

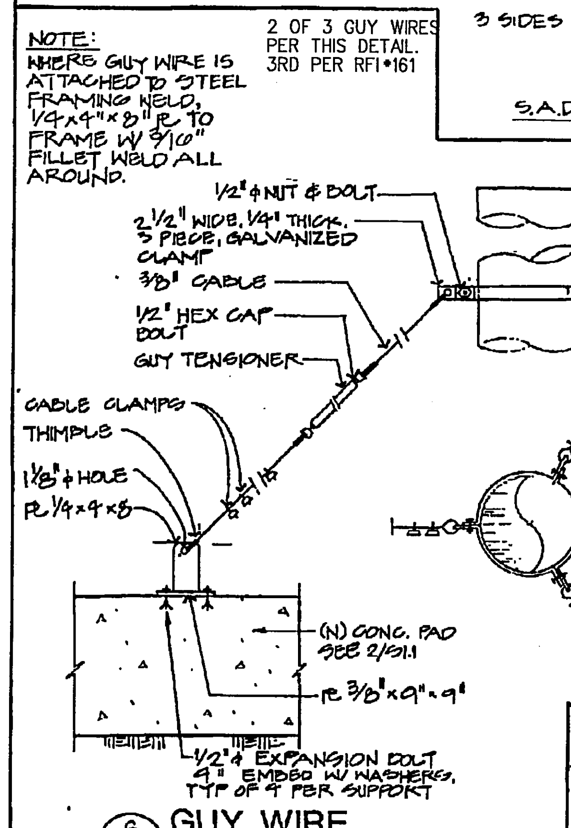


SECTION a-a

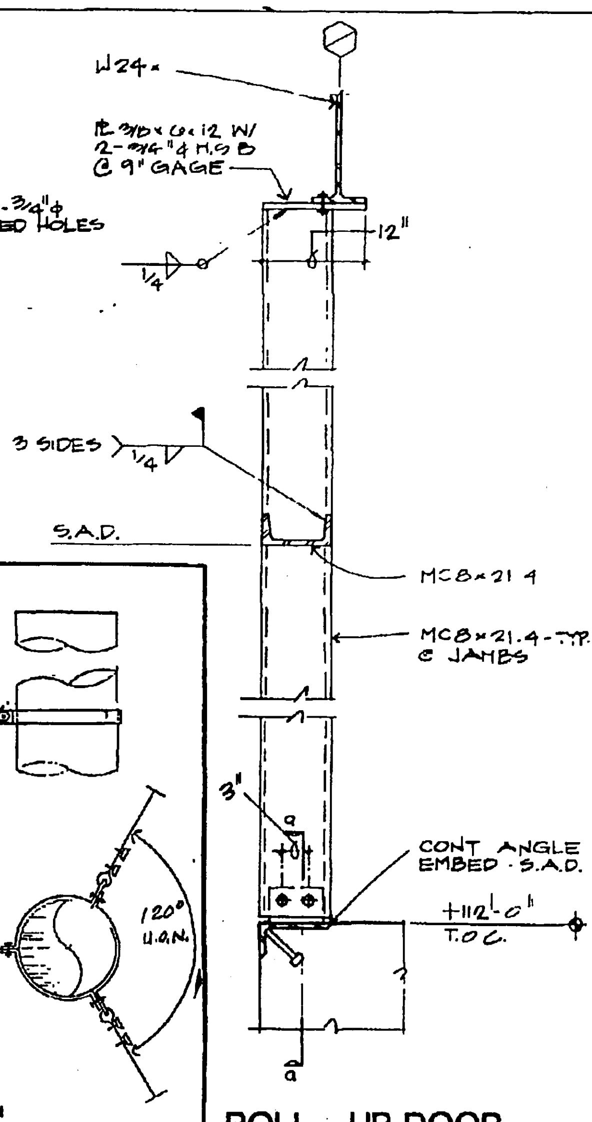


4/S1.1 MECHANICAL UNIT ROOF CURBS 3/4"=1'-0"

VERIFY LOCATION W/ APPROVED SHOP DRAWINGS

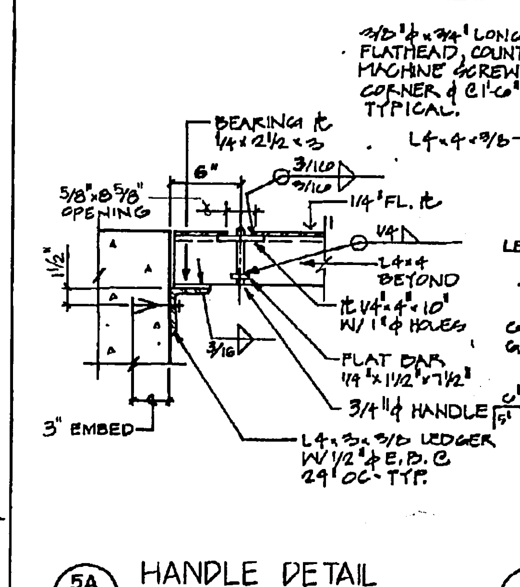


8/S1.1 GUY WIRE FLUE BRACING N.T.S.

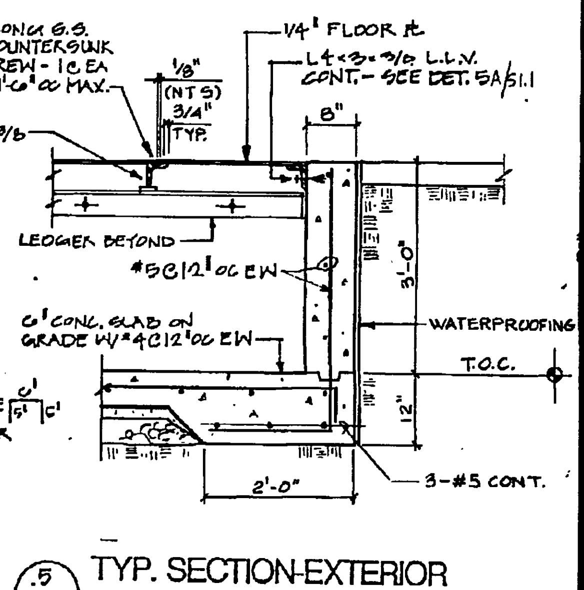


3/S1.1 ROLL - UP DOOR FRAMING DETAIL

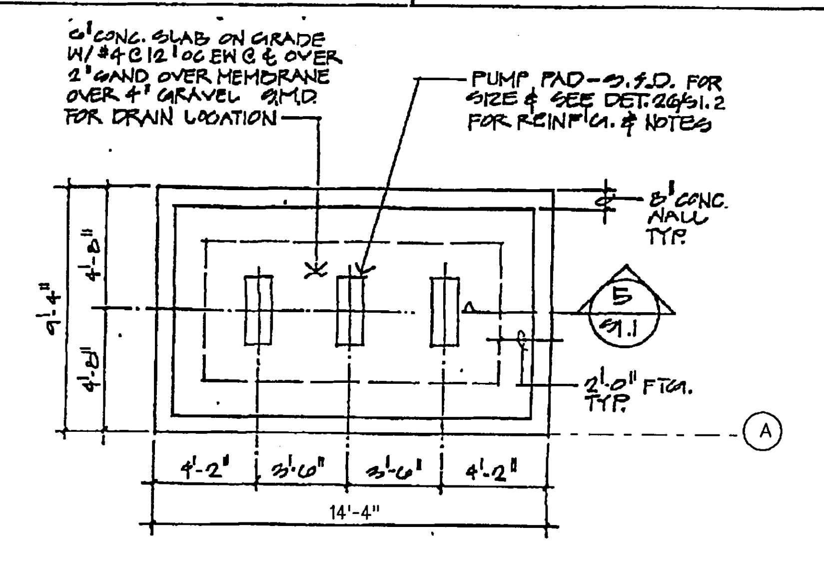
S.A.D. FOR LOCATION 1" = 1'-0"



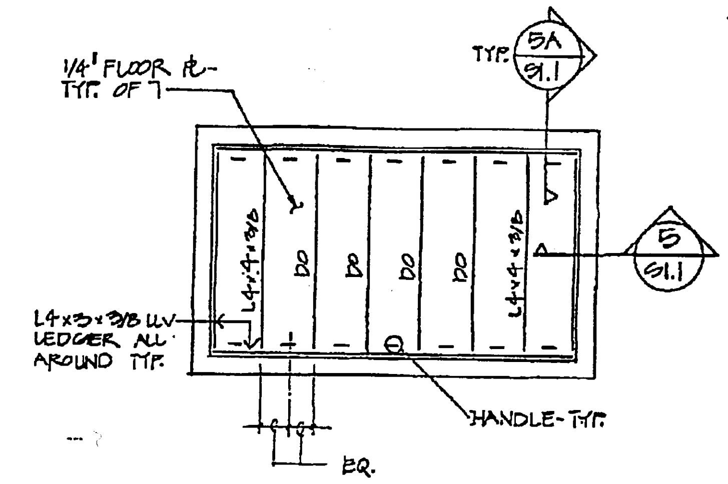
5A/S1.1 HANDLE DETAIL 1 1/2"=1'-0"



5/S1.1 TYP. SECTION-EXTERIOR PUMP VAULT 3/4"=1'-0"



6/S1.1 EXTERIOR PUMP VAULT FOUNDATION PLAN 1/4"=1'-0"



7/S1.1 EXTERIOR PUMP VAULT ROOF FRAMING PLAN 1/4"=1'-0"

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Issuances and Revisions

No.	Date	Description
△	1/29/92	ISSUE FOR CONSTRUCTION ADDENDUM 4
	9/28/93	PHASE 1 AS BUILTS
	11/24/93	NOV. AS BUILTS
	1-17-96	28 AUG 94 AS BUILT

Date 7/29/91

Sheet Title
General Notes
Miscellaneous Details

Project No 9002

S1.1 | 0

Sheet No. 84/178 | Revision

USER: RGA
DATE: 1-17-96
FILE: /USR2/SD185/STRUCT/S1.1.DGN

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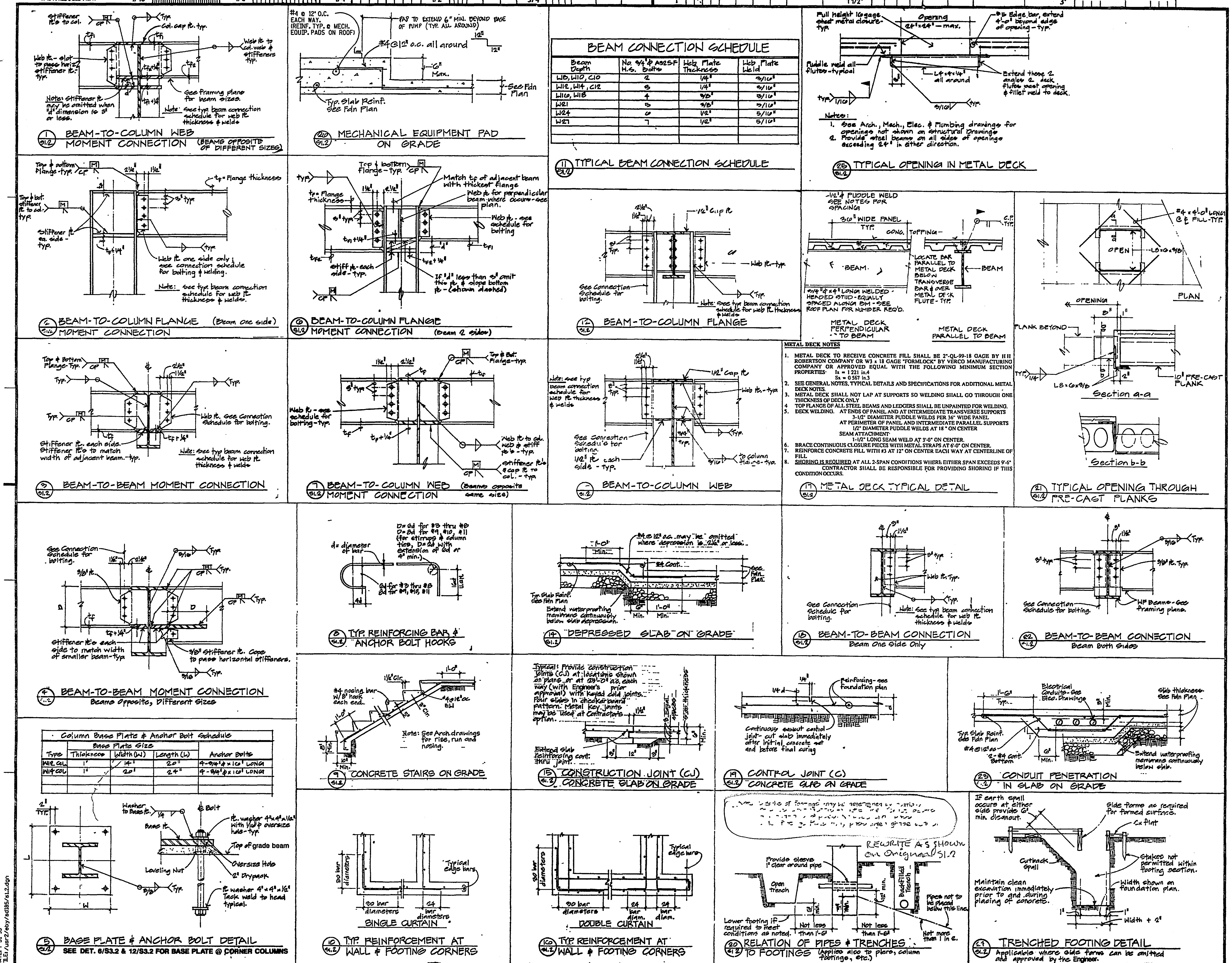

BEAM CONNECTION SCHEDULE

Beam Depth	No. 3/4" ⌀ A325-F H.S. Bolts	Web Plate Thickness	Web Plate Weld
W8, W10, C10	2	1/4"	3/16"
W12, W14, C12	3	1/4"	3/16"
W16, W18	4	3/8"	3/16"
W21	5	3/8"	3/16"
W24	6	1/2"	5/16"
W27	7	1/2"	5/16"

11 S1.2 TYPICAL BEAM CONNECTION SCHEDULE

METAL DECK NOTES

1. METAL DECK TO RECEIVE CONCRETE FILL SHALL BE 2"-QL-99-18 GAGE BY H H ROBERTSON COMPANY OR W3 x 18 GAGE "FORMLOCK" BY VERCO MANUFACTURING COMPANY OR APPROVED EQUAL WITH THE FOLLOWING MINIMUM SECTION PROPERTIES: Ix = 1 221 in.4; Sx = 0 567 in.3
2. SEE GENERAL NOTES, TYPICAL DETAILS AND SPECIFICATIONS FOR ADDITIONAL METAL DECK NOTES.
3. METAL DECK SHALL NOT LAP AT SUPPORTS SO WELDING SHALL GO THROUGH ONE THICKNESS OF DECK ONLY
4. TOP FLANGE OF ALL STEEL BEAMS AND LEDGERS SHALL BE UNPAINTED FOR WELDING.
5. DECK WELDING. AT ENDS OF PANEL AND AT INTERMEDIATE TRANSVERSE SUPPORTS 3-1/2" DIAMETER PUDDLE WELDS PER 36" WIDE PANEL. AT PERIMETER OF PANEL AND INTERMEDIATE PARALLEL SUPPORTS 1/2" DIAMETER PUDDLE WELDS AT 18" ON CENTER. SEAM ATTACHMENT: 1-1/2" LONG SEAM WELD AT 3'-0" ON CENTER.
6. BRACE CONTINUOUS CLOSURE PIECES WITH METAL STRAPS AT 6'-0" ON CENTER.
7. REINFORCE CONCRETE FILL WITH #3 AT 12" ON CENTER EACH WAY AT CENTERLINE OF FILL.
8. SHORING IS REQUIRED AT ALL 2-SPAN CONDITIONS WHERE EITHER SPAN EXCEEDS 9'-6". CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SHORING IF THIS CONDITION OCCURS.

17 S1.2 METAL DECK TYPICAL DETAIL

Column Base Plate & Anchor Bolt Schedule

Type	Base Plate Size: Thickness	Width (W)	Length (L)	Anchor Bolts
W12 COL	1"	14"	20"	4-3/4" ⌀ x 16" LONG
W14 COL	1"	20"	24"	4-3/4" ⌀ x 16" LONG

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Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION ADDENDUM 4
	7-31-95	IN SERVICE 26 AUG 1994 AS BUILT INSP. PYL

Date 7/29/91

Sheet Title
Typical Details

Scale: None

Project No. 9002

S1.2 | 0

Sheet No. 85/178 | Revision

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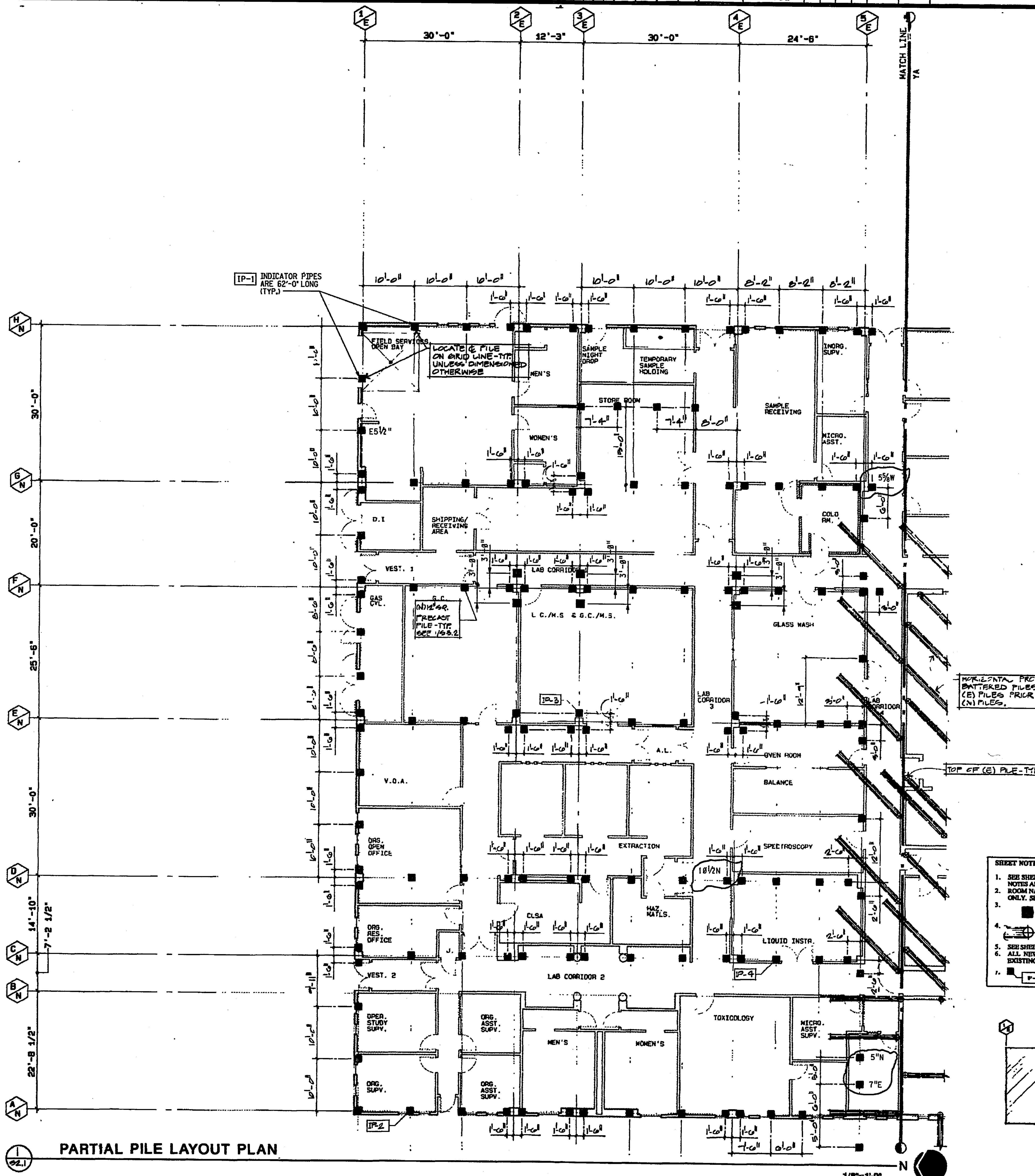
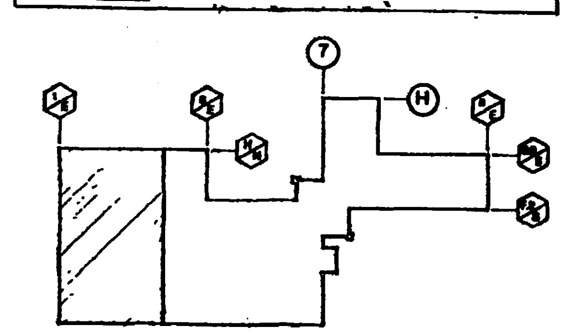


PARTIAL PILE LAYOUT PLAN

1/8"=1'-0"

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
3. DENOTES NEW 12" SQUARE x 60'-0" LONG PRECAST, PRESTRESSED DRIVEN PILE. TOP OF PILE ELEVATION = +107'-3-1/2" UNLESS OTHERWISE NOTED.
4. DENOTES TOP OF EXISTING VERTICAL OR BATTERED PILE. LOCATE EXISTING PILES PRIOR TO PREDRILLING FOR NEW PILES.
5. SEE SHEET S2.4 FOR GRADE BEAM AND PILE CAP LAYOUT.
6. ALL NEW PILES SHALL BE PREDRILLED. VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO PREDRILLING.
7. IP-# DENOTES INDICATOR PILE SEE SPECIFICATIONS



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Issuances and Revisions

No.	Date	Description
A	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE I AS BUILTS
	1-18-96	26 AUG 94 AS BUILT

Date: 7/29/91

Sheet Title: Partial Pile Layout Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 86/178

S2.1

Revision 0

USER: RCA
DATE: 1-18-96
FILE: /USR2/SD185/STRUCT/S2.1.DGN

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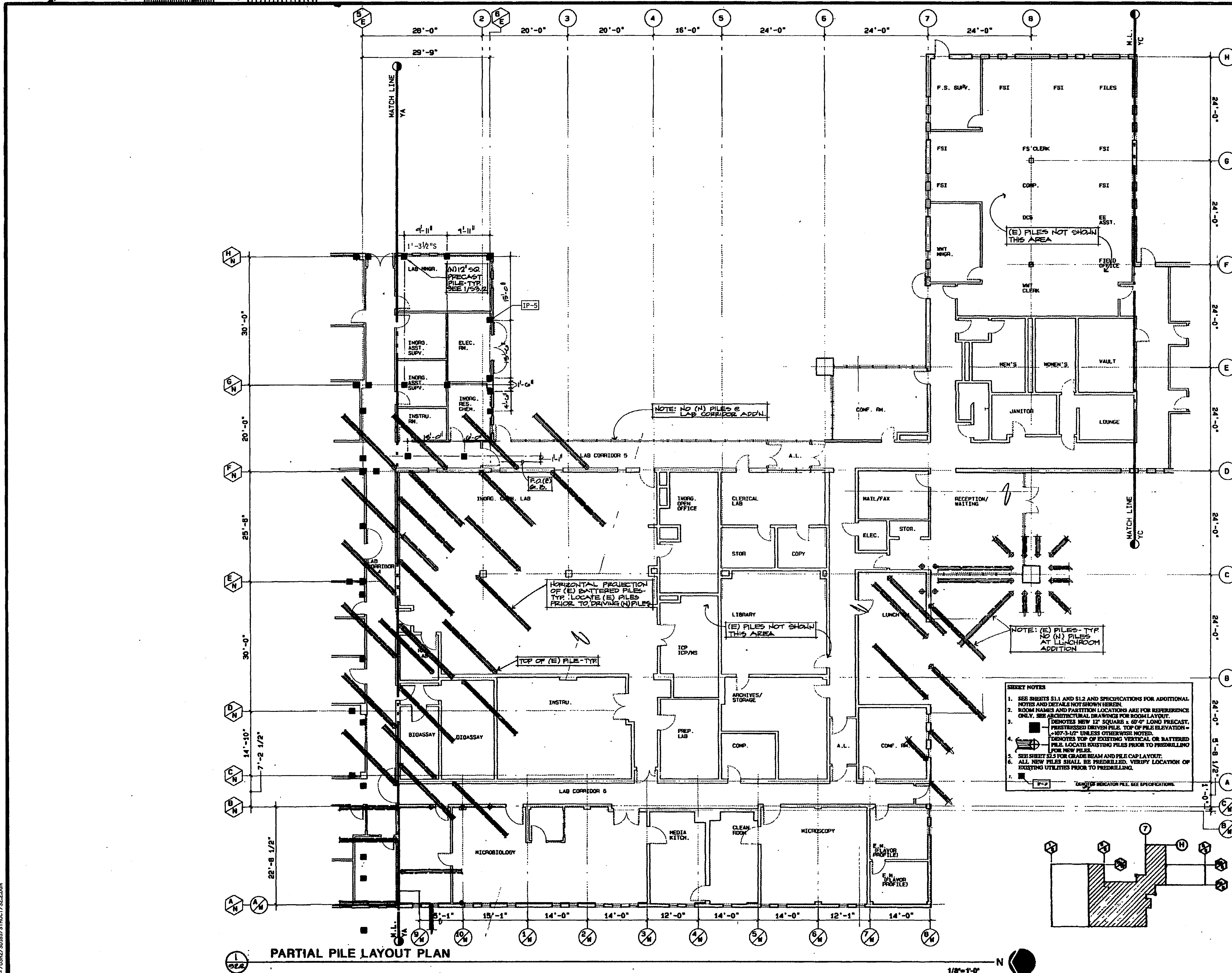

SHEET NOTES

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2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
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4. DENOTES TOP OF EXISTING VERTICAL OR BATTERED PILE. LOCATE EXISTING PILES PRIOR TO PREDRILLING FOR NEW PILES.
5. SEE SHEET S2.5 FOR GRADE BEAM AND PILE CAP LAYOUT.
6. ALL NEW PILES SHALL BE PREDRILLED. VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO PREDRILLING.
7. IP-# DENOTES INDICATOR PILE. SEE SPECIFICATIONS.

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Issuances and Revisions

No.	Date	Description
1	1/25/92	ISSUE FOR CONSTRUCTION
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Date: 7/29/91
Sheet Title: Partial Pile Layout Plan
Scale: 1/8"=1'-0"
Project No. 9002
Sheet No. 87/118
S2.2
Revision 0

USER: RGA
DATE: 1-18-96
FILE: /USR2/SD185/STRUCT/S2.2.DGN

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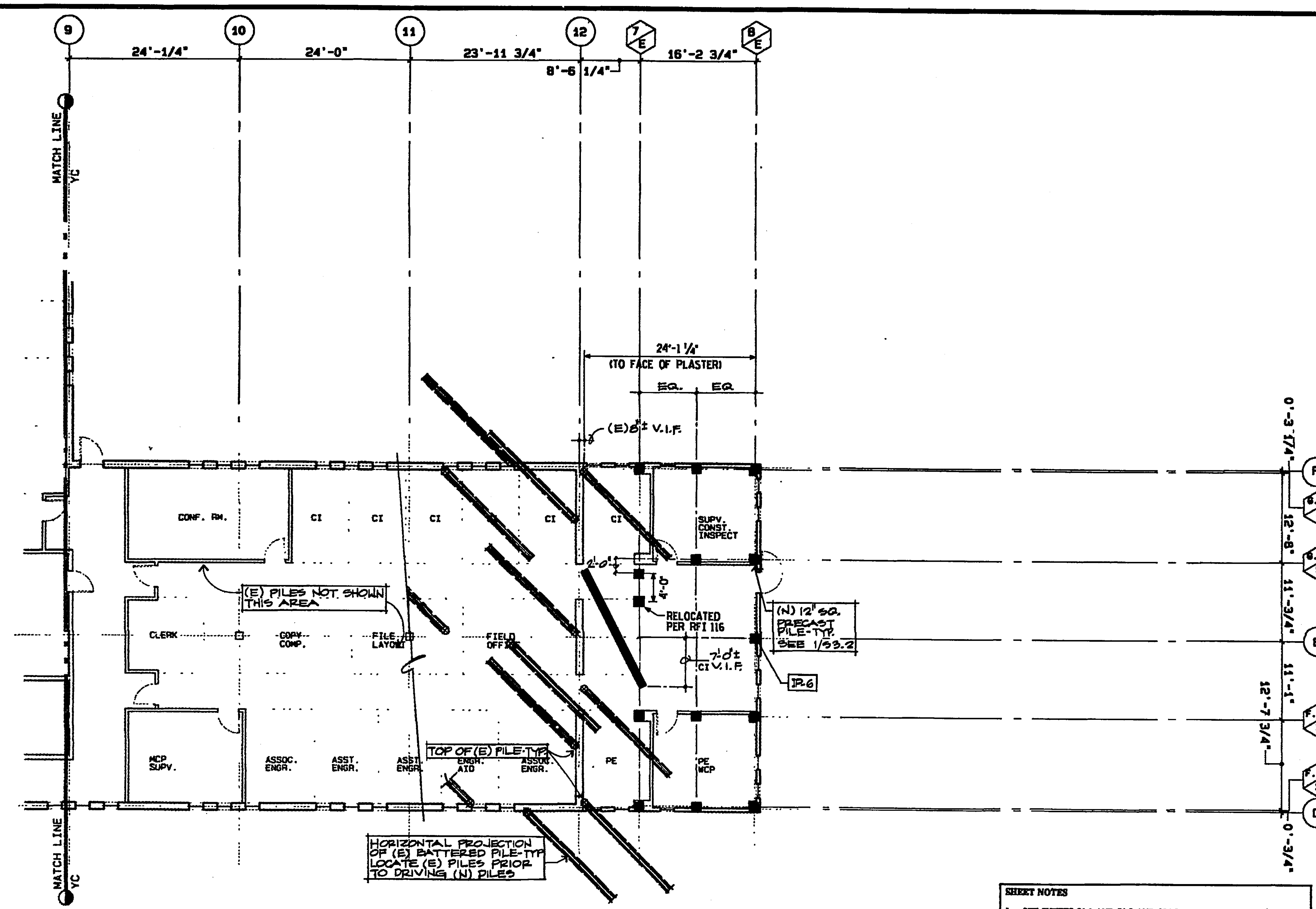
1/16" 0 8 16 24 32 1/8" 0 4 8 12 16

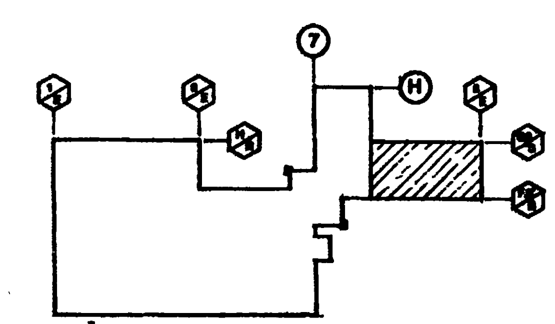


SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
3. DENOTES NEW 12" SQUARE x 60'-0" LONG PRECAST. PRESTRESSED DRIVEN PILE. TOP OF PILE ELEVATION = +109'-4" UNLESS OTHERWISE NOTED.
4. DENOTES TOP OF EXISTING VERTICAL OR BATTERED PILE. LOCATE EXISTING PILES PRIOR TO PREDRILLING FOR NEW PILES.
5. SEE SHEET S2.6 FOR GRADE BEAM AND PILE CAP LAYOUT.
6. ALL NEW PILES SHALL BE PREDRILLED. VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO PREDRILLING.
7. P-# DENOTES INDICATOR PILE SEE SPECIFICATIONS

1/S2.3 PARTIAL PILE LAYOUT PLAN

1/8"=1'-0" N



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Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	8-1-95	IN SERVICE 26 AUG 1994 AS BUILT INSP. PYL

Date: 7/29/91

Sheet Title: Partial Pile Layout Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 88/178 S2.3

Revision 0

USER: ROW
DATE: 8-1-95
FILE: /usr2/eby/sd185/s2.3.dgn

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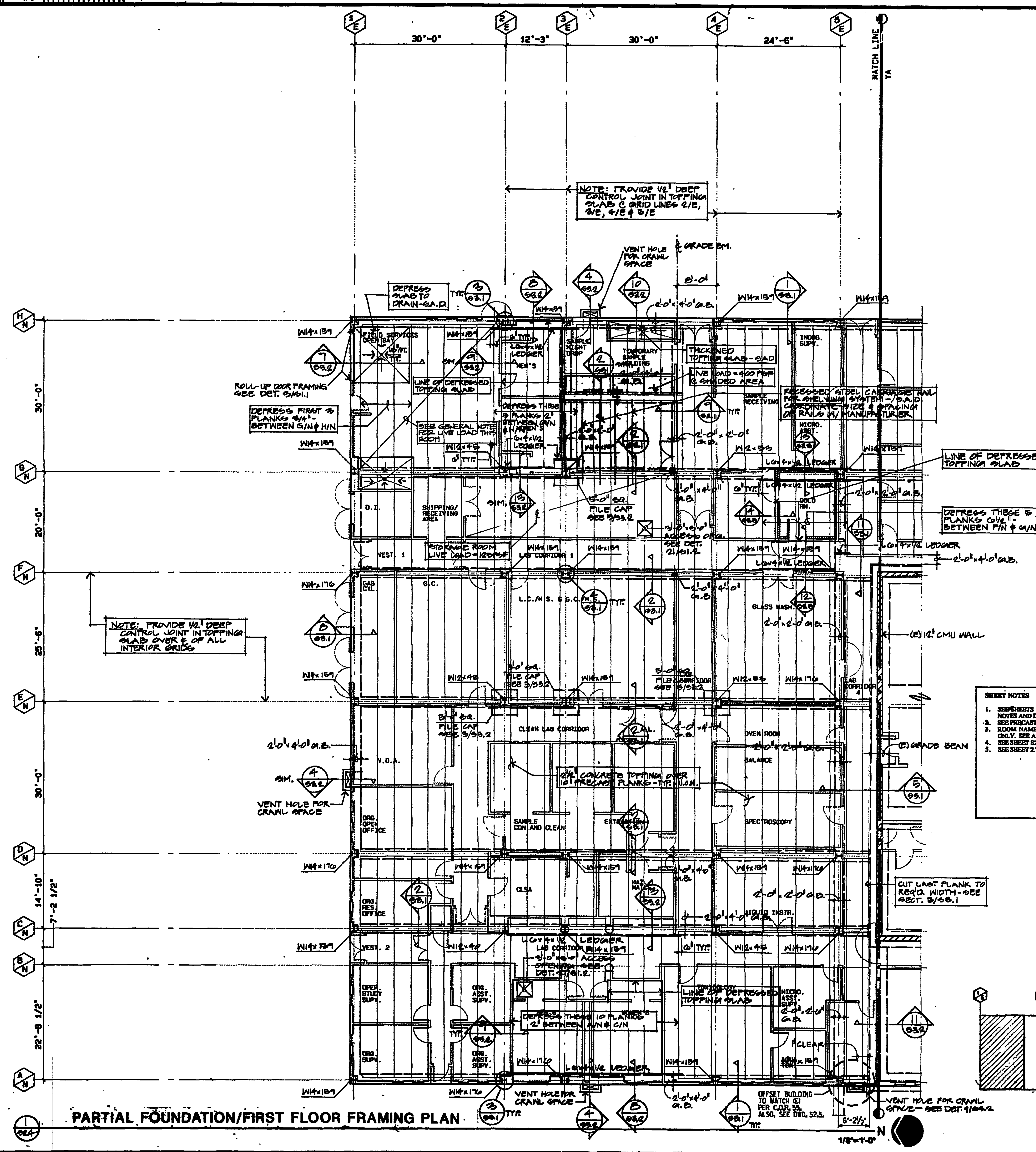

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. SEE PRECAST PLANK NOTES, SHEET S1.1 FOR PLANK LOADING.
3. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
4. SEE SHEET S2.1 FOR PILE LAYOUT.
5. SEE SHEET 2.7 FOR ROOF FRAMING.

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Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9-28-93	PHASE 1 AS BUILTS
	8-1-95	26 AUG 1994 AS BUILT

Date: 7/29/91

Sheet Title

Partial Foundation/First Floor Framing Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 89/178

S2.4	Revision 0

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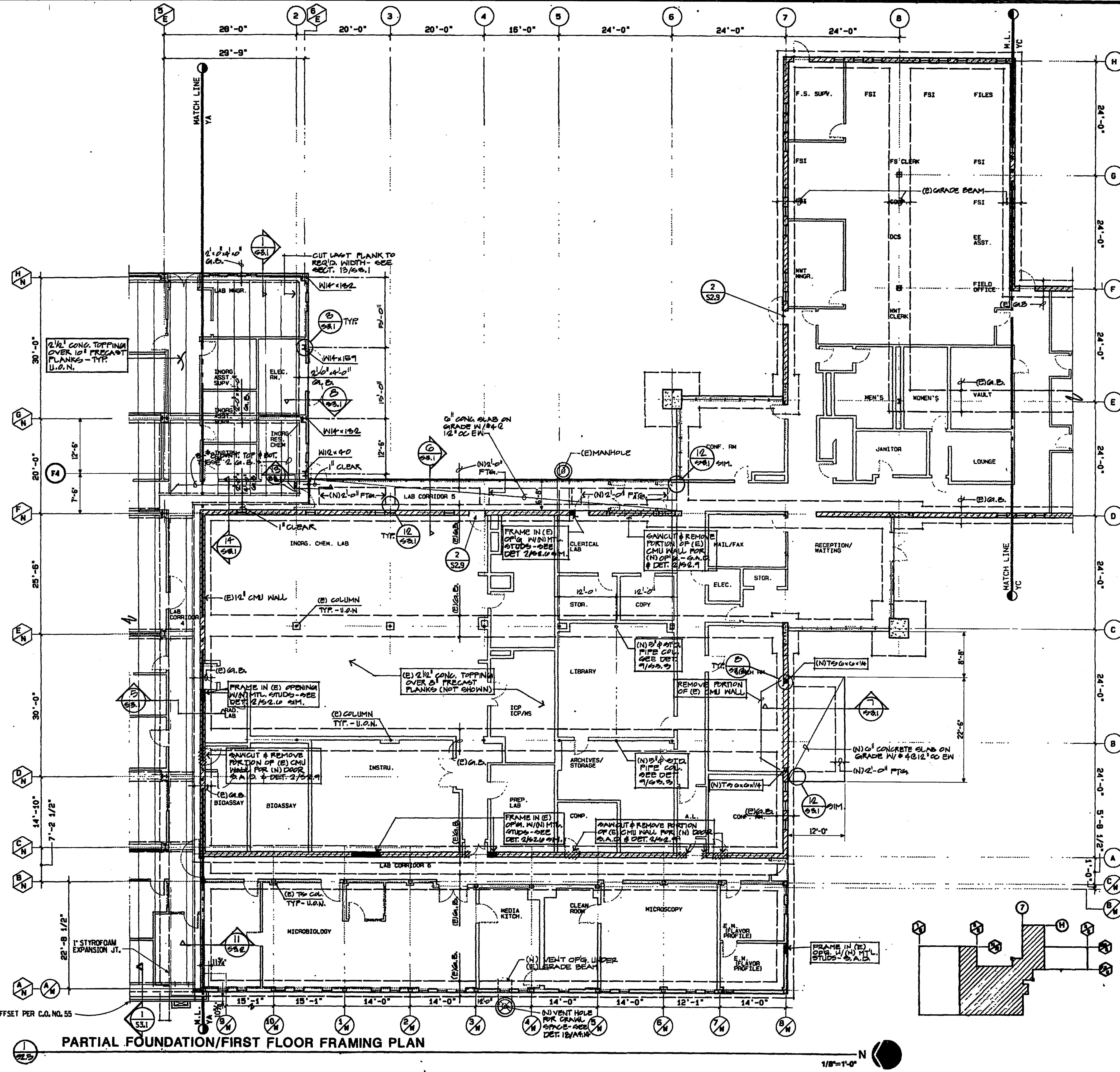

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. SEE PRECAST PLANK NOTES, SHEET S1.1 FOR PLANK LOADING.
3. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
4. SEE SHEET S2.2 FOR PILE LAYOUT.
5. SEE SHEET 2.8 FOR ROOF FRAMING.

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No.	Date	Description
1	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE I AS BUILTS
	29SEP95	AS BUILT

Date: 7/29/91
Sheet Title
Partial Foundation/First Floor Framing Plan
Scale: 1/8"=1'-0"
Project No. 9002
Sheet No. 90/178 S2.5
Revision 0

USER: RME
DATE: 29SEP95
FILE: SD185/STRUCT/S2.5.DGN

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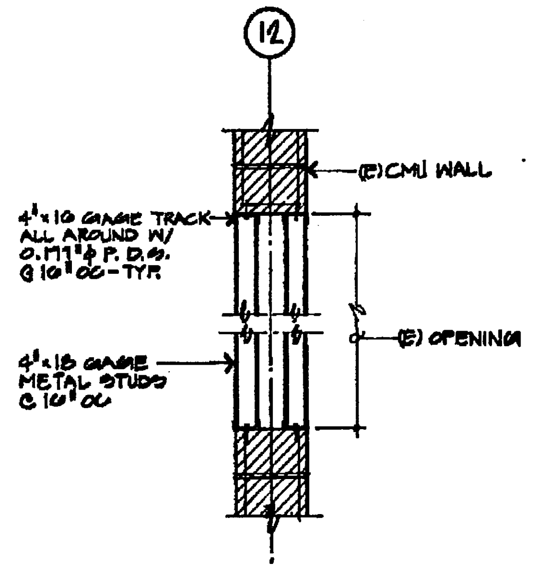
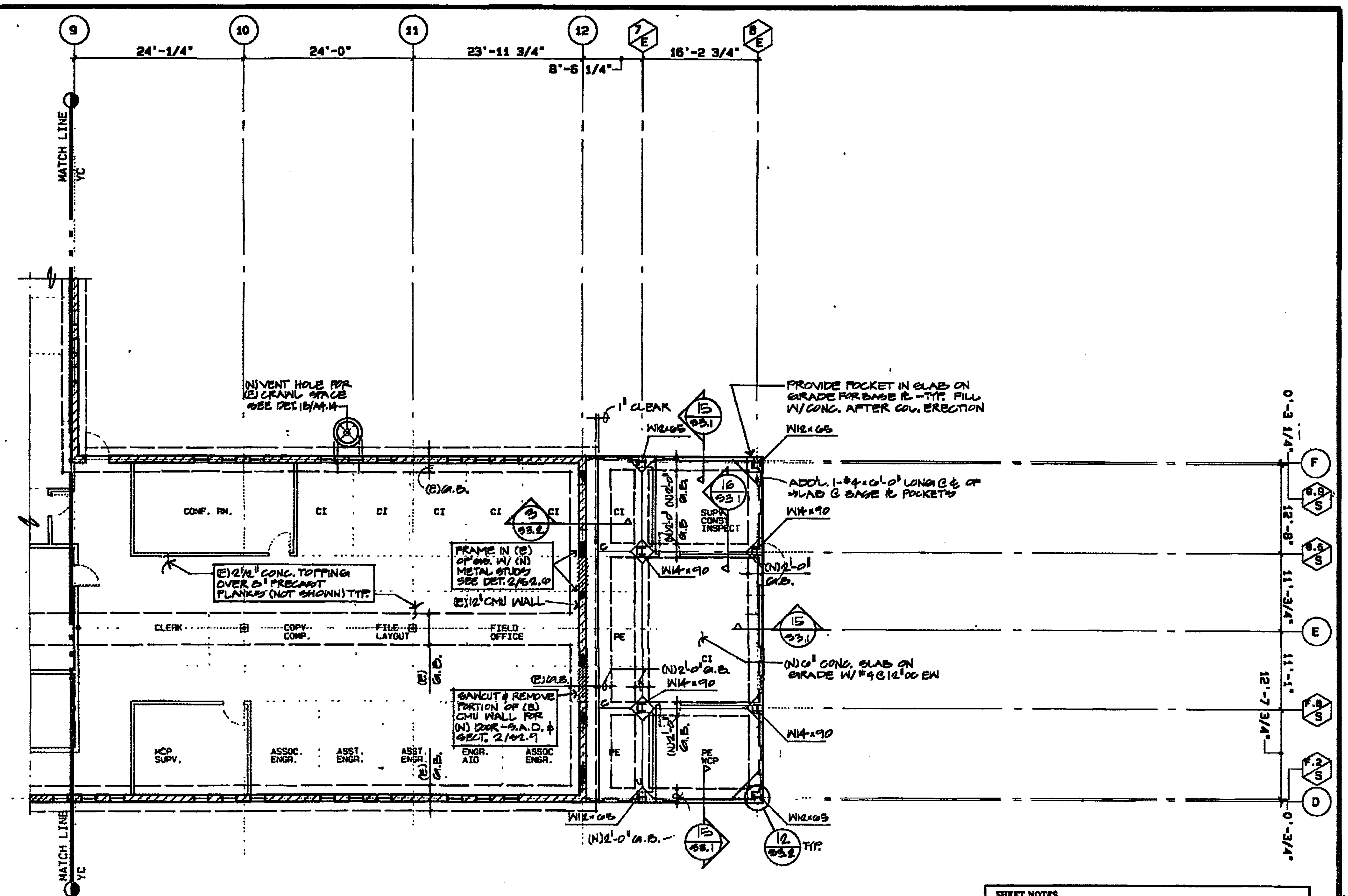


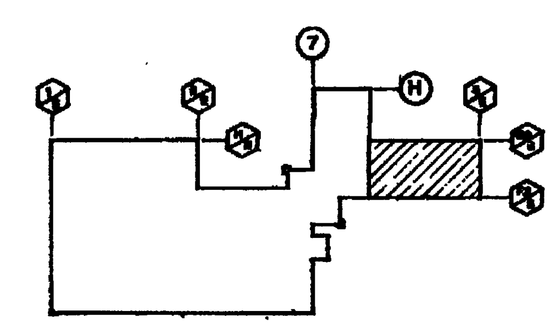
2 / S2.6 DETAIL @ "FRAMED IN" (E) OPENING 3/4"=1'-0"



1 / S2.6 PARTIAL FOUNDATION/FIRST FLOOR FRAMING PLAN 1/8"=1'-0" N

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
2. SEE PRECAST PLANK NOTES, SHEET S1.1 FOR PLANK LOADING.
3. ROOM NAMES AND PARTITION LOCATIONS ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR ROOM LAYOUT.
4. SEE SHEET S2.3 FOR PILE LAYOUT.
5. SEE SHEET 2.9 FOR ROOF FRAMING.



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EAST BAY MUNICIPAL UTILITY DISTRICT
Oakland, CA

Nolte Ingraham Associates Inc.
Consulting Structural Engineers

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EBMUD PROJECT MGR. R.P.E. NO. C 31966
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Issuances and Revisions

No.	Date	Description
1	1/23/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	10-17-95	26 AUG 1994 AS BUILT

Date: 7/29/91

Sheet Title: Partial Foundation/First Floor Framing Plan

Scale: 1/8"=1'-0" U.O.N.

Project No. 9002

Sheet No. 91/178

S2.6

Revision 0

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FILE: /SD185/STRUCT/S2.6.DGN

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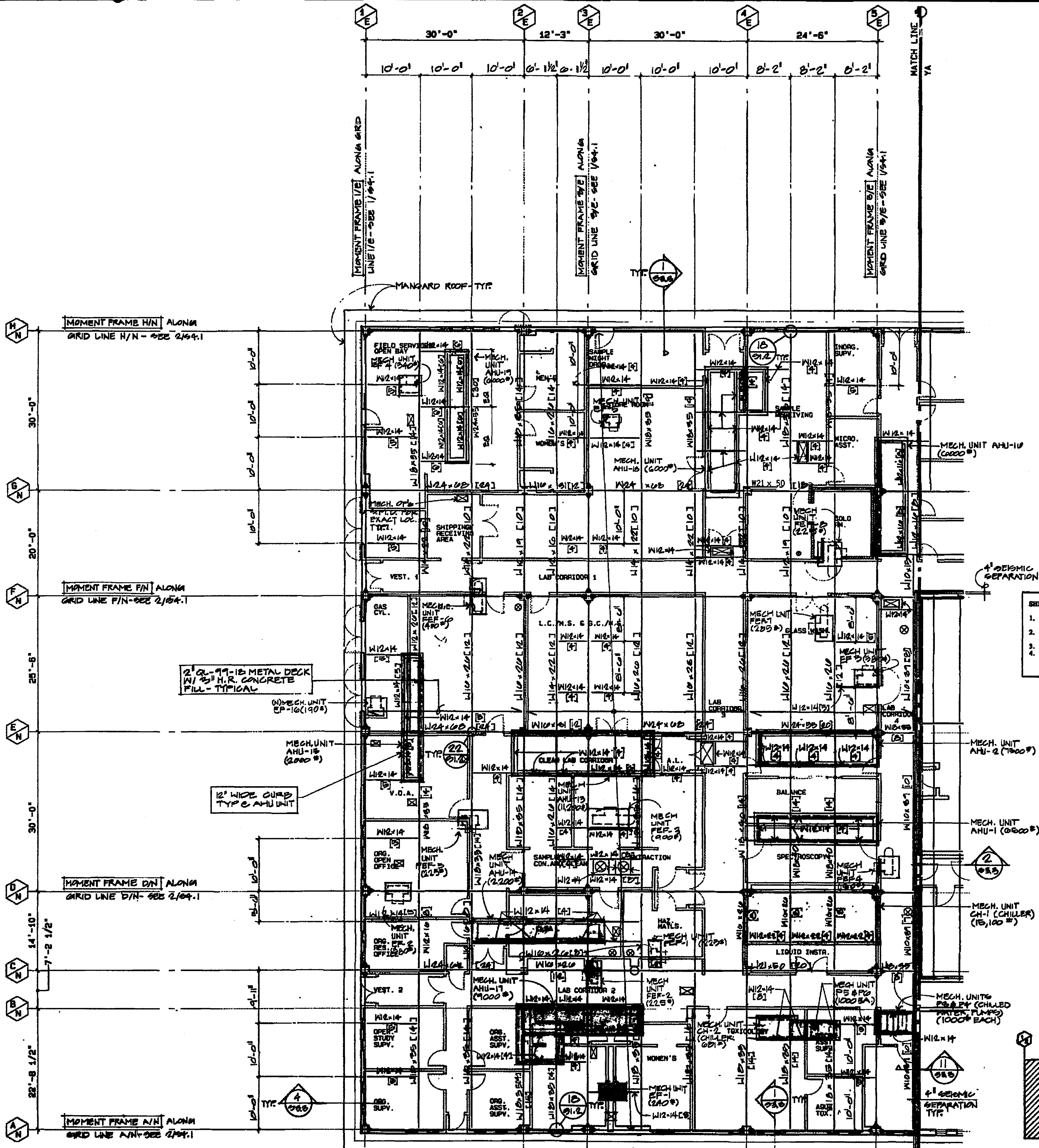

PARTIAL ROOF FRAMING PLAN

1/8"=1'-0"

SHEET NOTES

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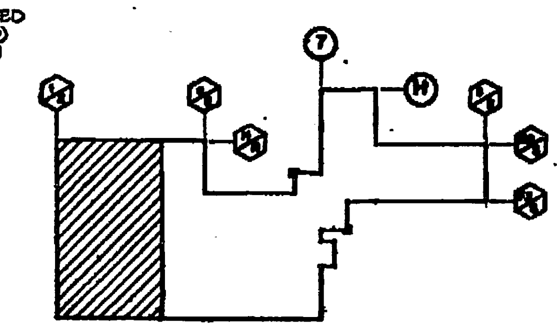
4. [12] DENOTES NUMBER OF 3/4" DIAMETER WELDED HEADED STUDS EQUALLY SPACED ALONG BEAM LENGTH. SEE DETAIL 17/S1.2.



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Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	10-19-95	IN SERVICE 26 AUG 1994 AS BUILT INSP. PYL

Date: 7/29/91

Sheet Title: Partial Roof Framing Plan

Scale: 1/8"=1'-0"

Project No. 9082

Sheet No. 92/178 S2.7

Revision 0

USER: RME
DATE: 10/19/95
FILE: /USR2/SD185/STRUCT/S2.7.DGN

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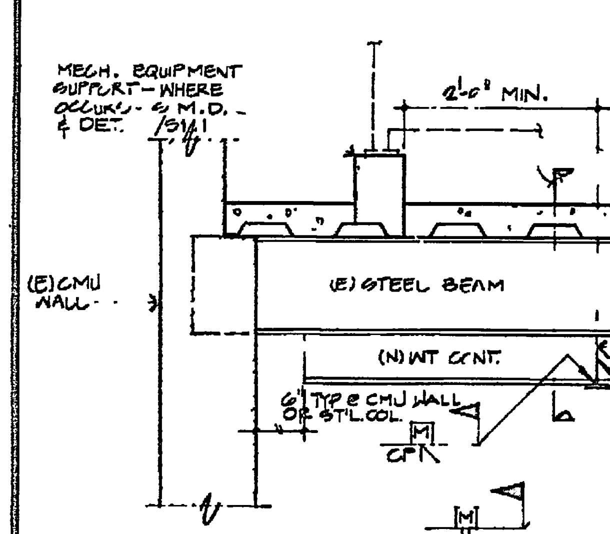
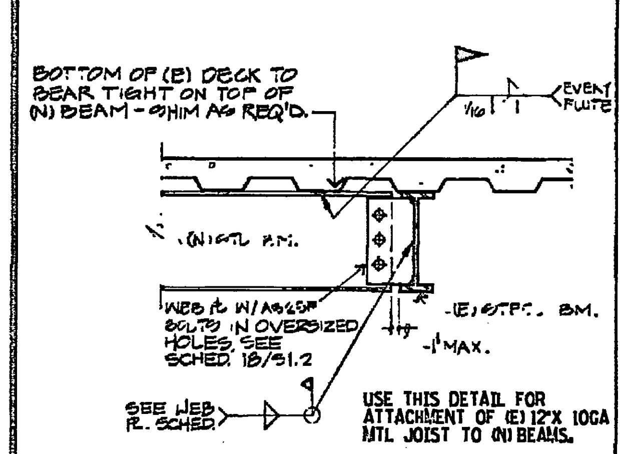


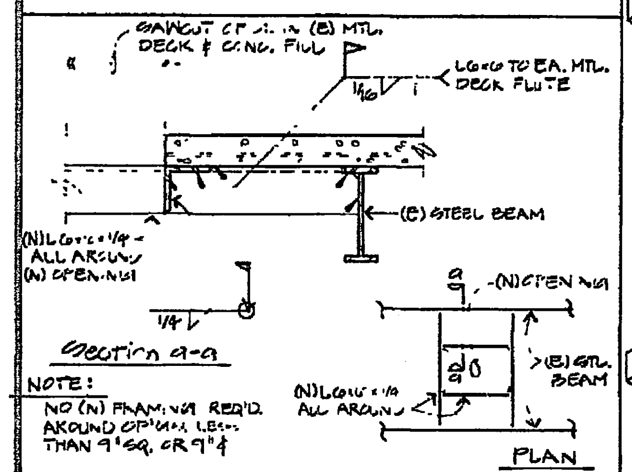
STRENGTHENED EXISTING BEAM SCHEDULE

MARK	(E) STL. BM.	(N) WT CONT.
(N) BEAM A	W12x14	WT6x15
(N) BEAM B	W12x16.5	WT6x15
(N) BEAM C	W12x31	WT5x11
(N) BEAM D	W16x40	WT6x15
(N) BEAM E	W12x30	WT6x13
(N) BEAM F	W12x16.5	WT4x10.5
(N) BEAM G	W16x45	WT6x15

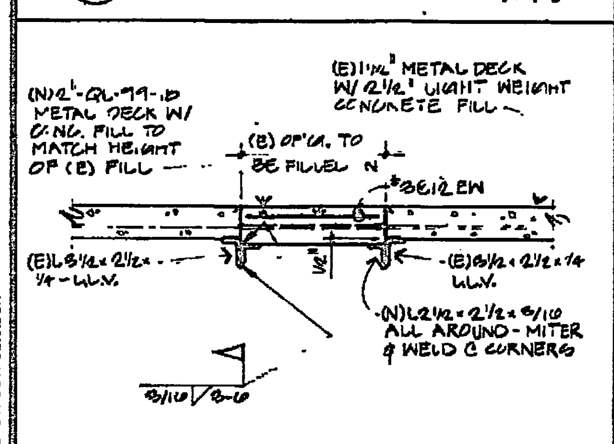
2/S2.8 DETAIL FOR STRENGTHENING (E) STEEL BEAMS 1"=1'-0"



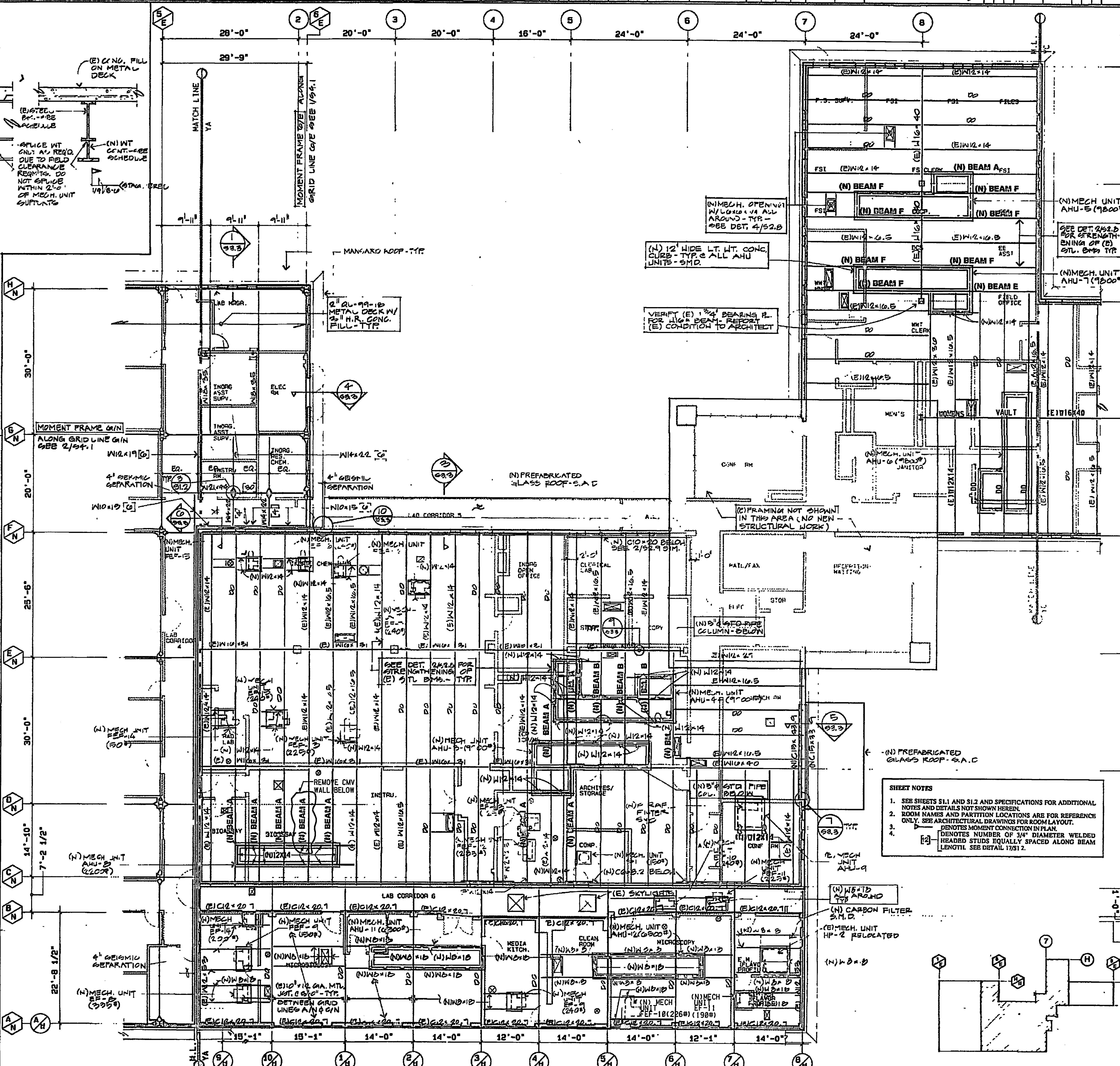
3/S2.8 (N) TO (E) STL. BM. CONNECTION 1"=1'-0"



4/S2.8 TYP. (N) OPG. IN (E) MTL. DECK 1"=1'-0"



5/S2.8 TYP. INFILL OF (E) ROOF OPGS. 1"=1'-0"



1/S2.8 PARTIAL ROOF FRAMING PLAN 1/8"=1'-0"

SHEET NOTES

1. SEE SHEETS S1.1 AND S1.2 AND SPECIFICATIONS FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN HEREIN.
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Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
	10-24-95	IN SERVICE 26 AUG 1994 AS BUILT DISP. PYL

Date: 7/29/91

Sheet Title
Partial Roof Framing Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 93/178 S2.8 Revision 0

USER: RGA
DATE: 1-19-96
FILE: /USR2/SD185/STRUCT/S2.8.DGN

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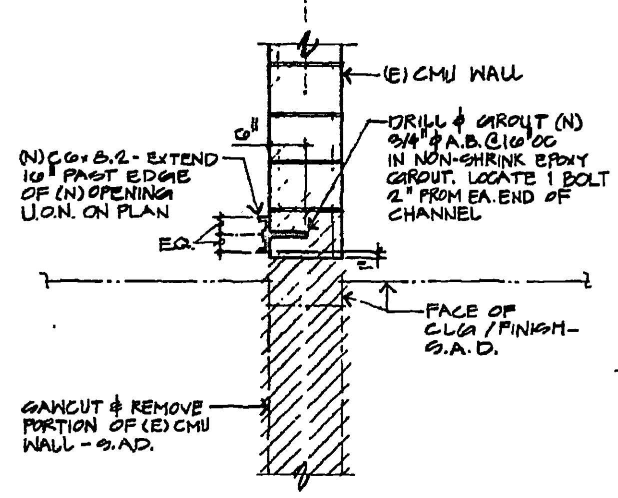
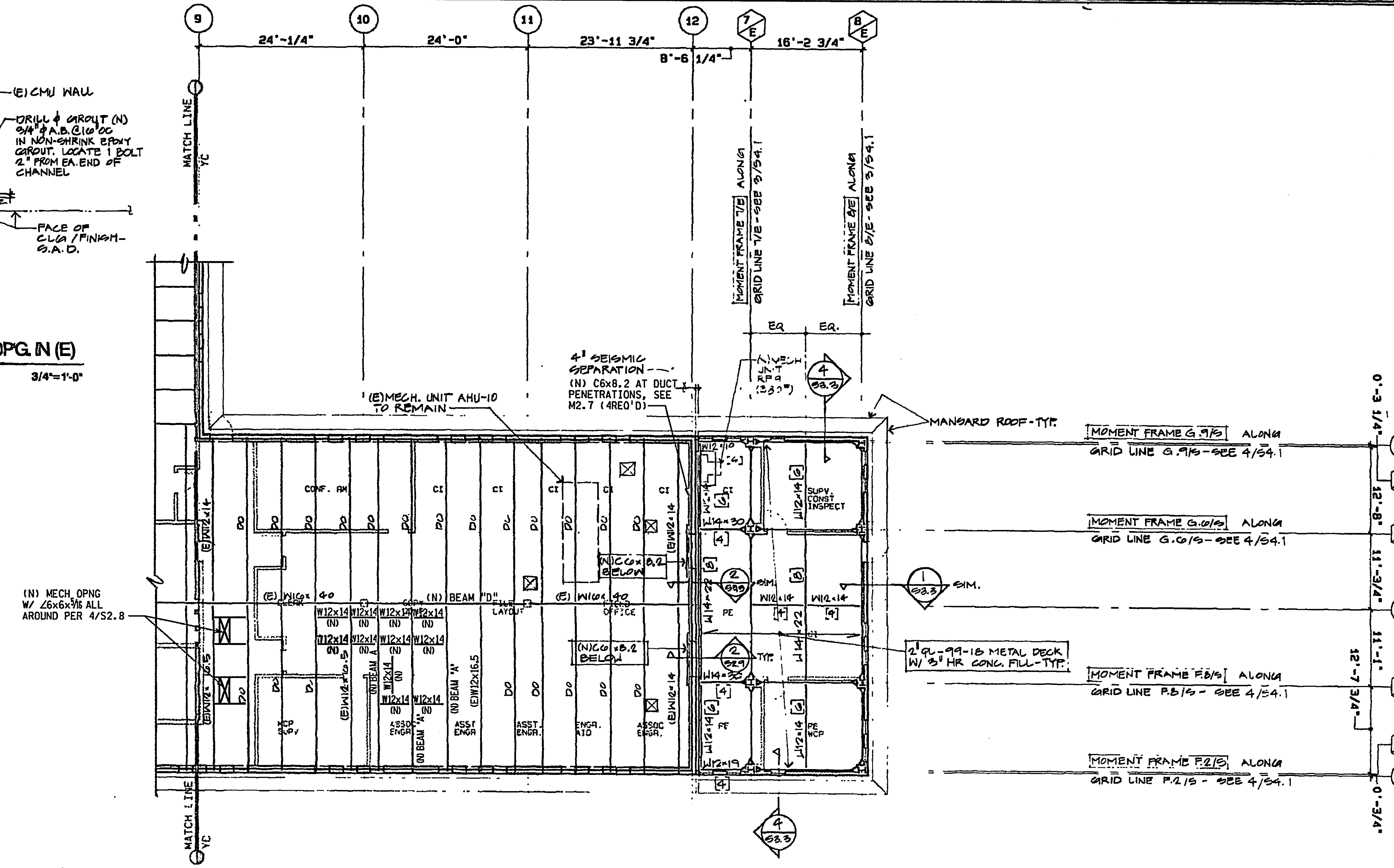


2/S2.9 SECT. @ (N) OPG. IN (E) CMU WALL 3/4"=1'-0"



PARTIAL ROOF FRAMING PLAN

1/S2.9 1/8"=1'-0" N

SHEET NOTES

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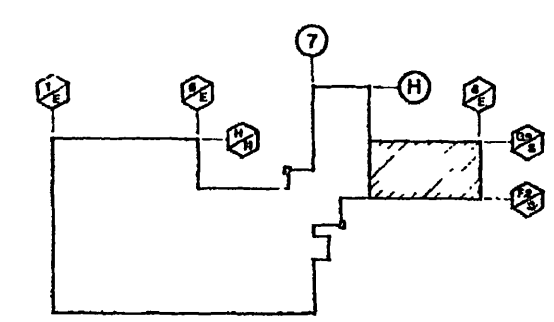

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Issuances and Revisions

No.	Date	Description
0	1/25/92	ISSUE FOR CONSTRUCTION
	9/28/93	PHASE 1 AS BUILTS
		AS BUILT

Date: 7/29/91

Sheet Titl.: Partial Roof Framing Plan

Scale: 1/8"=1'-0"

Project No. 9002

Sheet No. 94/178 S2.9

Revision 0

USER: RGA
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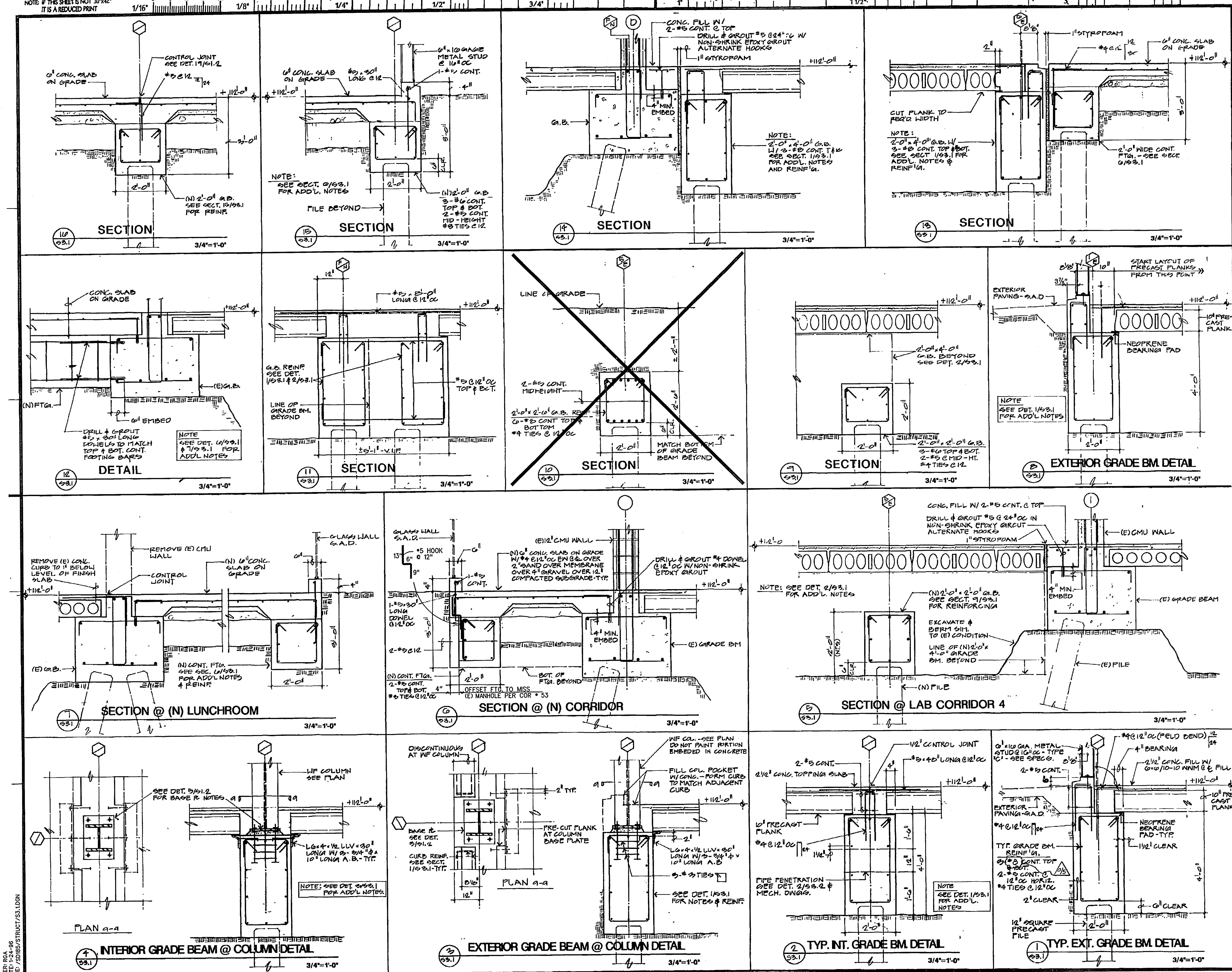

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Issuances and Revisions

No.	Date	Description
5	1/25/92	ISSUE FOR CONSTRUCTION ADDENDUM 5
	9/28/93	PHASE 1 AS BUILTS
	10-17-95	25 AUG 1994 AS BUILT

Date 7/29/91

Sheet Title

Foundation Sections & Details

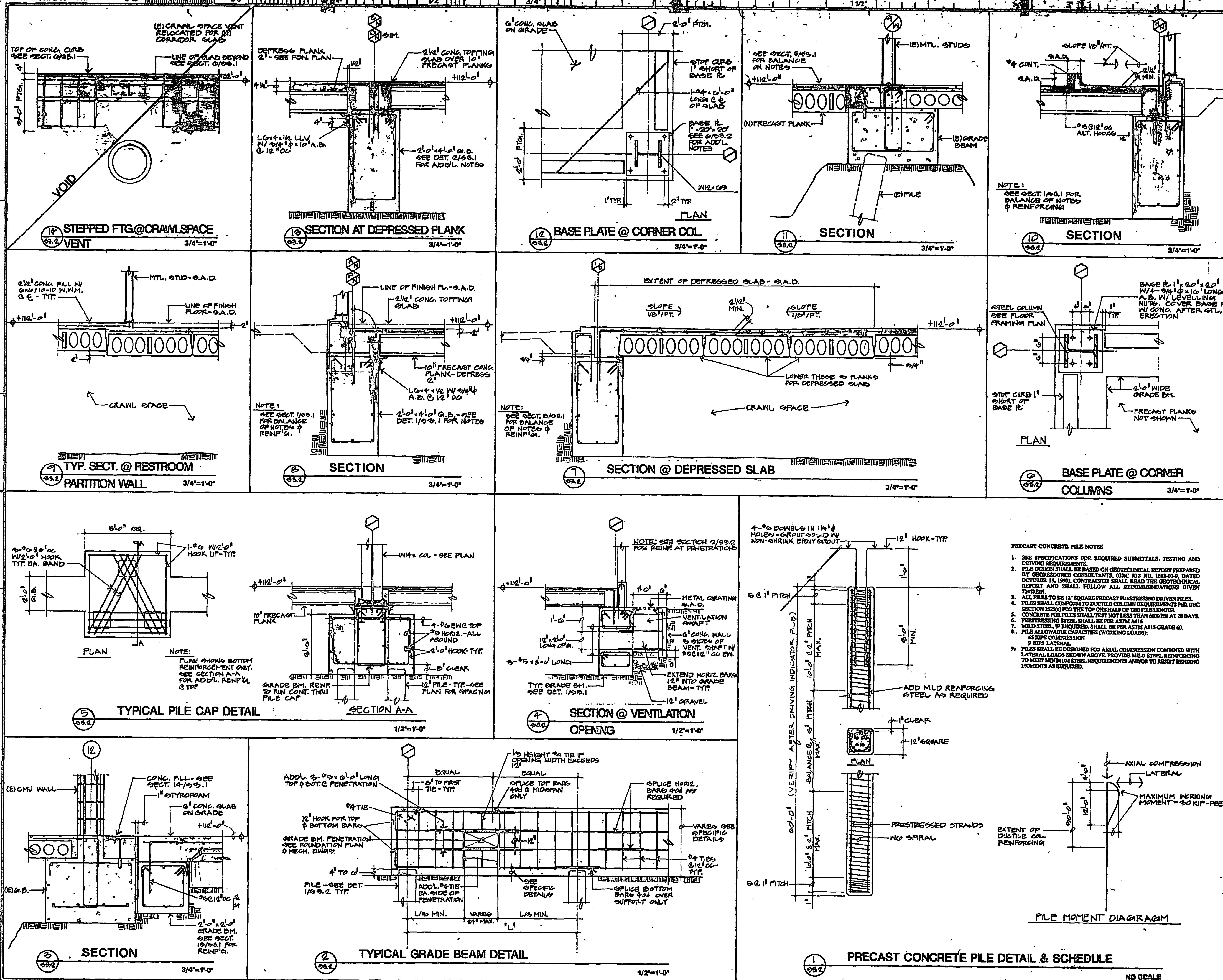
Scale: 3/4"=1'-0"

Project No. 9002

S3.1 0

Sheet No. 95/178 Revision

USER: RGA
DATE: 1-24-96
FILE: /SD185/STRUCT/S3.1.DGN



PRECAST CONCRETE PILE NOTES

1. SEE SPECIFICATIONS FOR REQUIRED SUBMITTALS, TESTING AND DRIVING REQUIREMENTS.
2. PILE DESIGN SHALL BE BASED ON GEOTECHNICAL REPORT PREPARED BY GEORESOURCE CONSULTANTS, (GRC JOB NO. 1618-00-0, DATED OCTOBER 15, 1990). CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL FOLLOW ALL RECOMMENDATIONS GIVEN THEREIN.
3. ALL PILES TO BE 12" SQUARE PRECAST PRESTRESSED DRIVEN PILES.
4. PILES SHALL CONFORM TO DUCTILE COLUMN REQUIREMENTS PER UBC SECTION 2625(c) FOR THE TOP ONE HALF OF THE PILE LENGTH.
5. CONCRETE FOR PILES SHALL TEST NOT LESS THAN 6000 PSI AT 28 DAYS.
6. PRESTRESSING STEEL SHALL BE PER ASTM A416
7. MILD STEEL, IF REQUIRED, SHALL BE PER ASTM A615-GRADE 60.
8. PILE ALLOWABLE CAPACITIES (WORKING LOADS):
   65 KIPS COMPRESSION
   9 KIPS LATERAL
9. PILES SHALL BE DESIGNED FOR AXIAL COMPRESSION COMBINED WITH LATERAL LOADS SHOWN ABOVE. PROVIDE MILD STEEL REINFORCING TO MEET MINIMUM STEEL REQUIREMENTS AND/OR TO RESIST BENDING MOMENTS AS REQUIRED.

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Issuances and Revisions

No.	Date	Description
0	1/29/92	ISSUE FOR CONSTRUCTION
	1-24-96	AS BUILT

Date 7/29/91

Sheet Title
Pile & Foundation Sections & Details

Scale: 3/4"=1'-0" U.O.N.

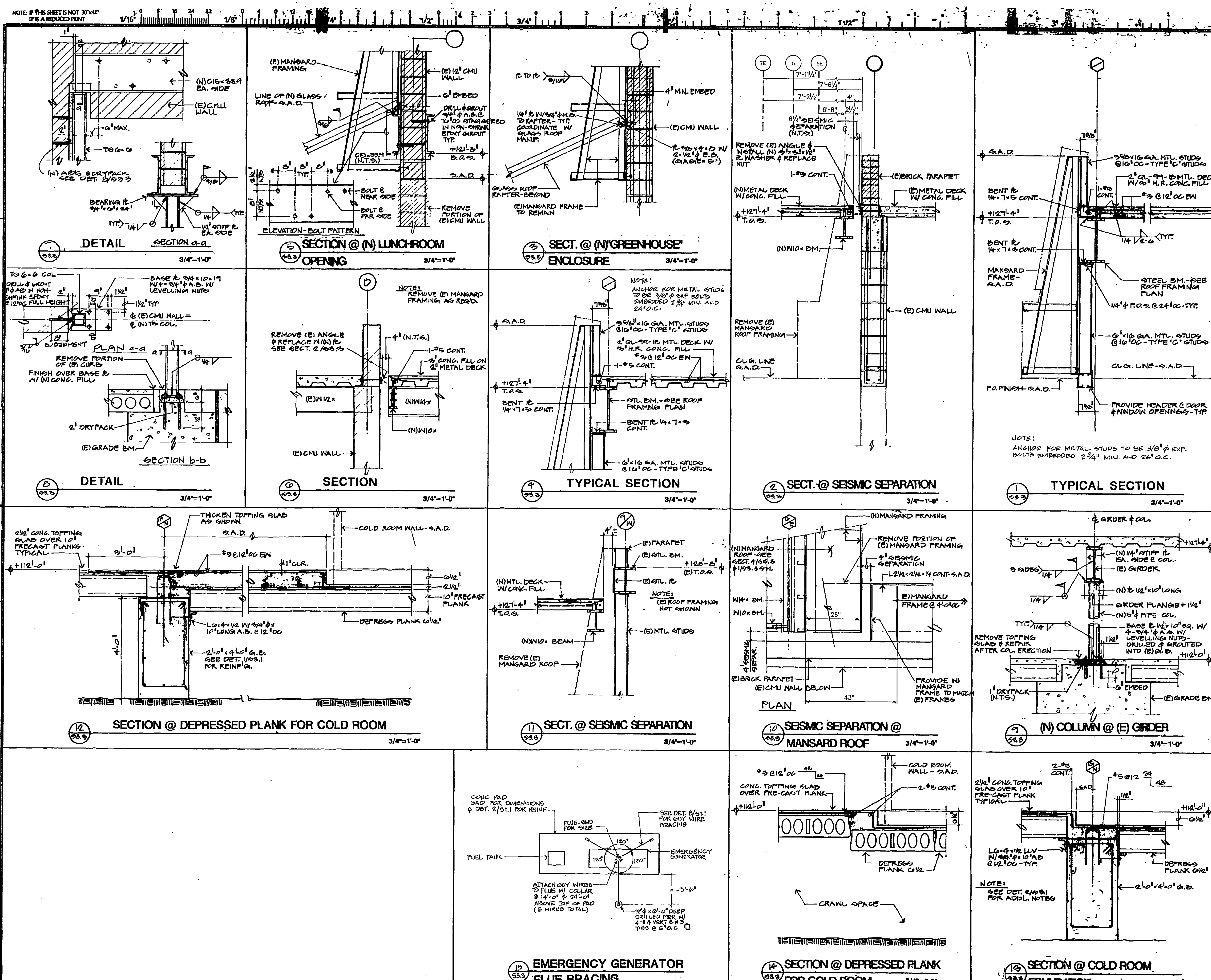
Project No. 9002

S3.2 | 0

Sheet No. 96/178 Revision

USER: RGA
DATE: 1-24-96
FILE: I:/SD185/STRUCT/S3.2.DGN

OK 9/18/96



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Issuances and Revisions

No.	Date	Description
4	1/25/92	ISSUE FOR CONSTRUCTION ADDENDUM No 4,5
	9/28/93	PHASE 1 AS BUILTS
	1-24-96	29 AUG 94 AS BUILT

Date 7/29/91

Sheet Title

Sections & Details

Scale: 3/4"=1'-0" U.O.N.

Project No. 9002

S3.3 | 0

Sheet No. 91/178 Revision

(Excerpts)

Seismic Evaluation Administrative Building and Laboratory

East Bay Municipal Utility District

Main Wastewater Treatment Plant Seismic Structural Evaluation and Conceptual Design Project

2.0 STRUCTURE DESCRIPTION

The Admin building and Lab are structurally connected as a single building. The entire building is a single-story structure except for a two-story “pop-up” located in the middle portion of the building.

The building was constructed in three phases with the original construction in 1974, the West Lab addition in 1984 and the North Lab and South Admin additions in 1994. A seismic retrofit of the 1974 and 1984 construction was performed in 1988.

2.1 AVAILABLE DATA

The available data for the building includes 15 structural drawings for the original, 1974, structure, 7 structural drawings for West Lab addition and seismic improvements, and 19 structural drawings for the South Admin and the North Lab additions. Additionally, 30 architectural drawings were available for review. Material properties for only some of the structural components are specified in the drawings. Data not available was assumed based on ASCE 41-17 recommendations.

2.2 GENERAL DESCRIPTION

The Admin and Lab building is a complex structure consisting of the original Admin building, the original Lab building, the Pop-Up structure, the West Lab addition, the North Lab addition, and the South Admin addition. Plan view of the entire structure, with the various additions highlighted, is shown in Figure 1. The North and South elevations of the building are shown in Figure 2 with photographs of the building exterior shown in Figure 3 through Figure 7.

In 1974, as part of project SD122A, the Admin and Lab buildings were designed as a single building with two wings. The 1974 construction consisted of concrete-filled metal deck roof diaphragms supported by steel beams, interior steel columns, perimeter reinforced masonry shear walls, and precast vertical and battered concrete piles. A two-story Pop-Up is located between the two wings. The Pop-Up consists of cast-in-place concrete slabs and steel braced frames at the upper story, and reinforced concrete shear walls at the lower story.

In 1984, as part of project SD152, a one-story steel moment frame structure with a concrete-filled metal deck and precast vertical and battered concrete piles was added along the west side of the original Lab.

In 1988, as part of project SD176, the original Lab and Admin wings were seismically retrofitted. The retrofit work addressed deficiencies in the out-of-plane masonry wall anchorage throughout the original building. The steel braces at the upper-story of the Pop-Up structure were replaced with stronger braces. The work also included eliminating the seismic gap between the roof of the West Lab addition (project SD152) and the original Lab. The roof of the West Lab addition was tied into the walls of the original Lab to address the out-of-plane anchorage deficiencies in the original Lab. Deficiencies in the steel moment frame of the West Lab addition (project SD152) were addressed by adding two bays of steel braced frames along the west side of the West Lab addition.

In 1991, as part of project SD185, the south side of the original Admin building and the north side of the original Lab were expanded. Both additions are seismically-separate from the main building and consist of steel moment frames with concrete-filled metal deck roofs and vertical precast concrete piles. As part of the SD185 project, two light frame greenhouse-like structures were added. These structures consist of a lunch room extension located on the south side of the original lab building and the lab corridor addition located on the east side of the original lab building as shown in Figure 1.

Figure 1: Admin/Lab Buildings – Plan View Showing the Building Parts

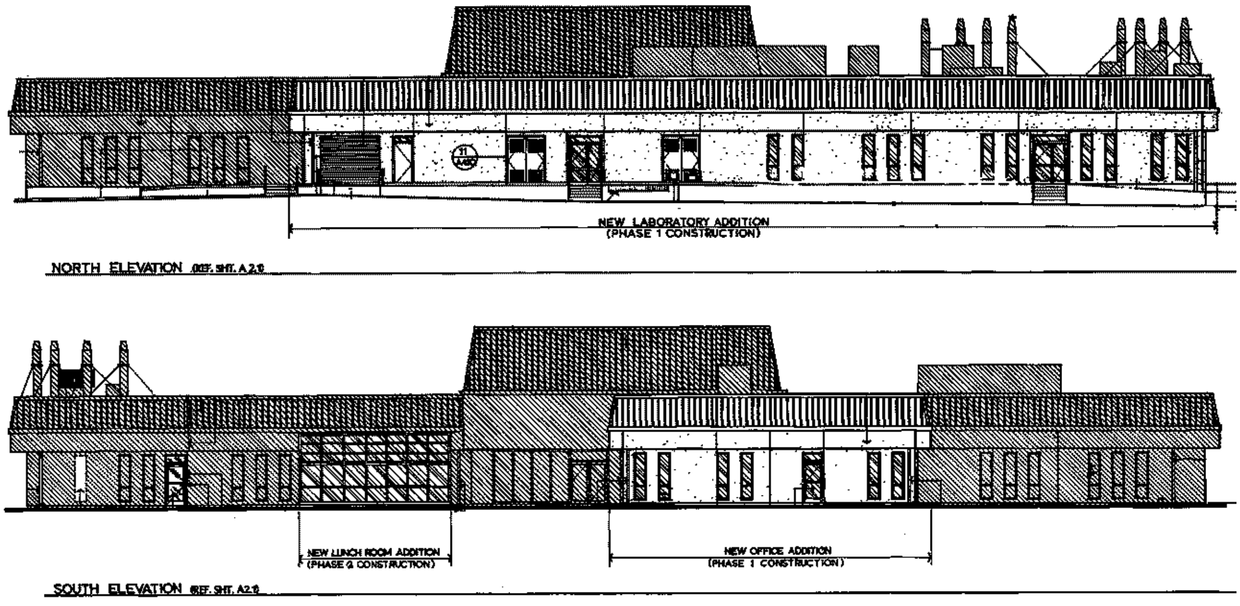

Figure 2: Admin/Lab Buildings – North (top) and South (bottom) Elevations

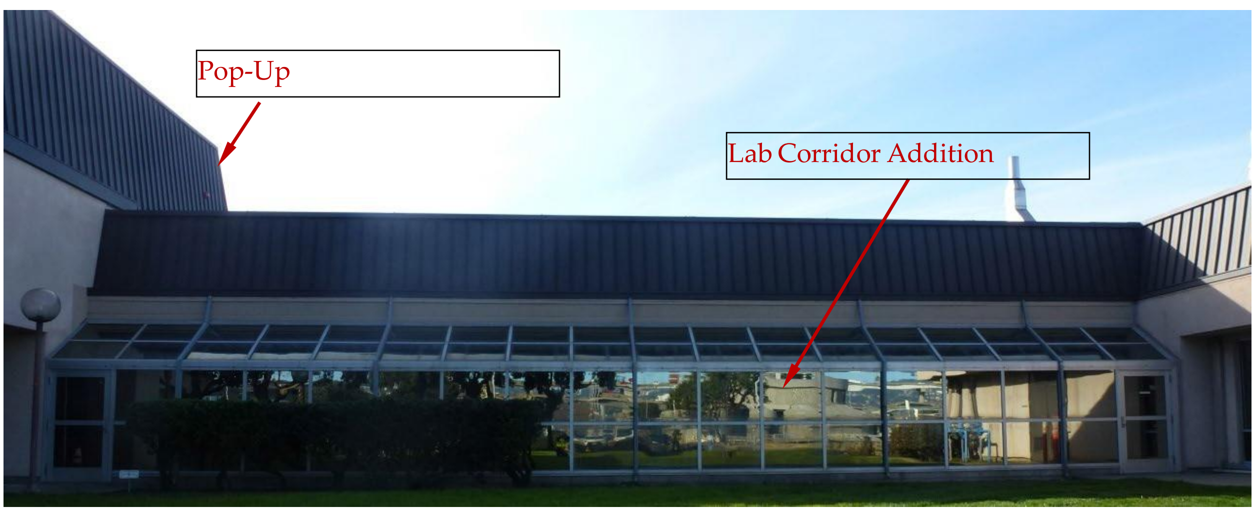

Figure 3: The Original Lab Building, Corridor Addition and the Pop-Up – View from East

Figure 4: The Original Admin Building and Addition (left) – View from East

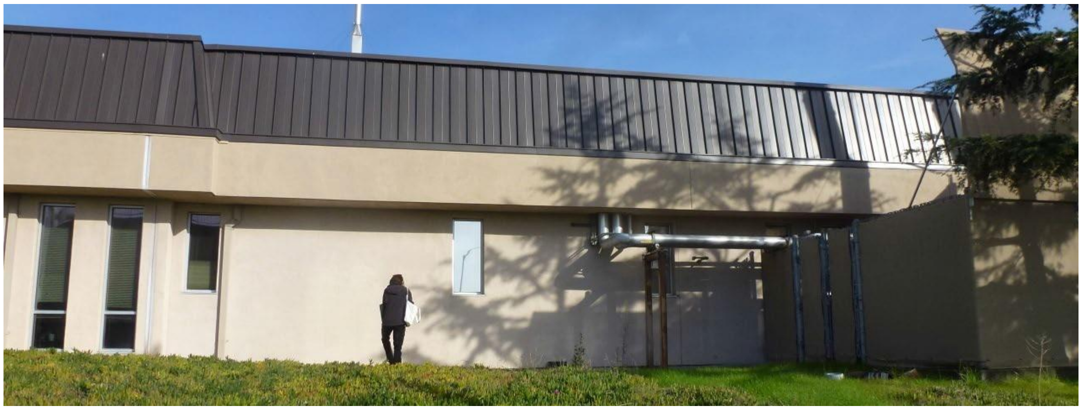

Figure 5: West Lab Addition – View from West

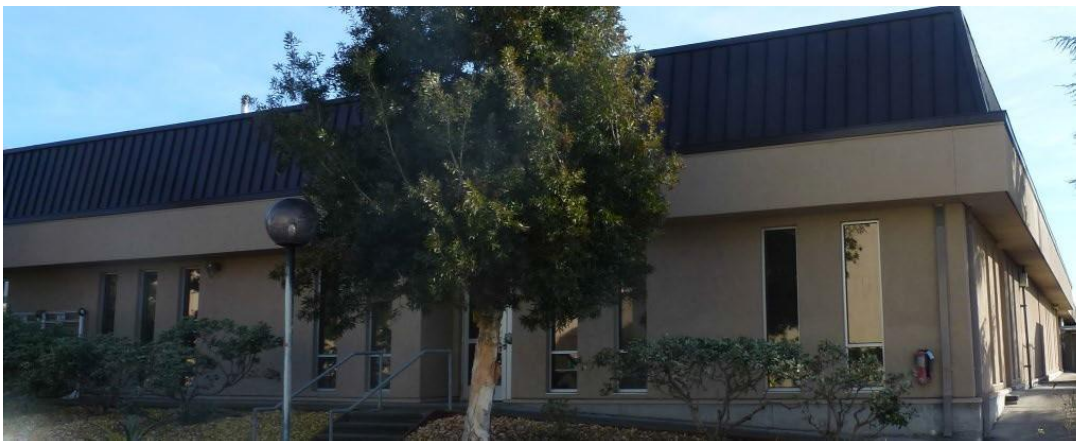

Figure 6: North Lab Addition – Northwestern Corner

Figure 7: The Two-Story Pop-Up Portion – View from South

2.3 GRAVITY LOAD RESISTING SYSTEM

2.3.1 Original Structure

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns and the exterior load bearing concrete block masonry walls. The columns and the walls are supported on grade beams, pile caps and piles. The two-story Pop-Up portion has reinforced concrete slabs supported on steel girders and beams. The steel girders transfer their loads to steel columns and two massive concrete columns at the northeastern and southwestern corners. Each column is 4-foot square in cross-section supported on a pile cap with 16 piles.

2.3.2 West Lab Addition

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns. The columns are supported on grade beams with piles.

2.3.3 North Lab Addition

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns. The columns are supported on grade beams, pile caps and piles.

2.3.4 South Admin Addition

The gravity load resisting system of the buildings consists of a lightweight concrete-filled metal deck roof supported by steel girders and beams. The steel beams are supported by steel columns. The columns are supported on grade beams with piles.

2.4 FOUNDATION SYSTEM

The Admin and Lab building complex consists of multiples seismically independent structures separated by expansion joints. Each individual part is described below.

2.4.1 Original Structure

The foundation system of the original building (shown in Figure 8) consists of foundation beams, pile caps and 219 vertical and batter piles. Pile details are shown in Figure 9. It is important to note that almost all batter piles are oriented in the northeast-southwest plane, and there is very little batter action in the northwest-southeast direction.

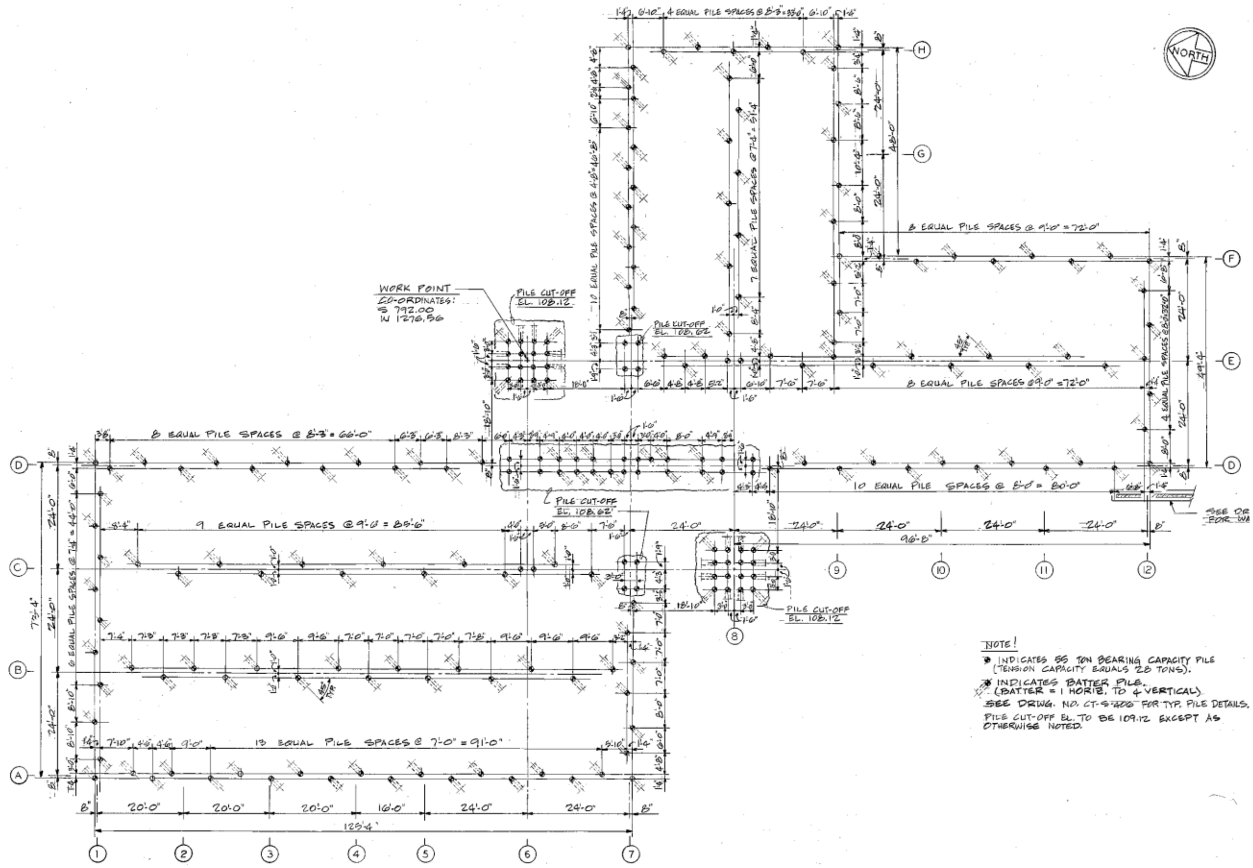

Figure 8: Foundation Plan of the Original Structure

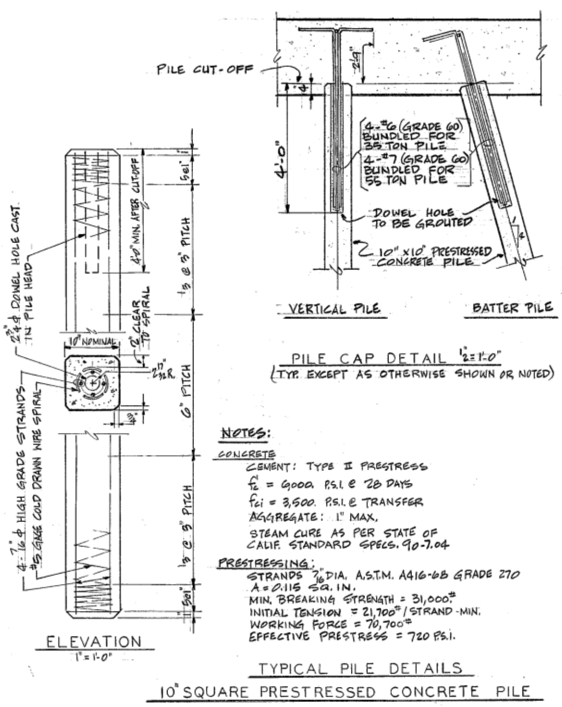

Figure 9: Typical Pile Details for the Original Structure

2.4.2 West Lab Addition

The foundation system of the West Lab addition (shown in Figure 10) consists of foundation grade beams and 42 twelve-inch square precast vertical and batter piles. The foundation beams of the West Lab addition are decoupled from the original building foundations.

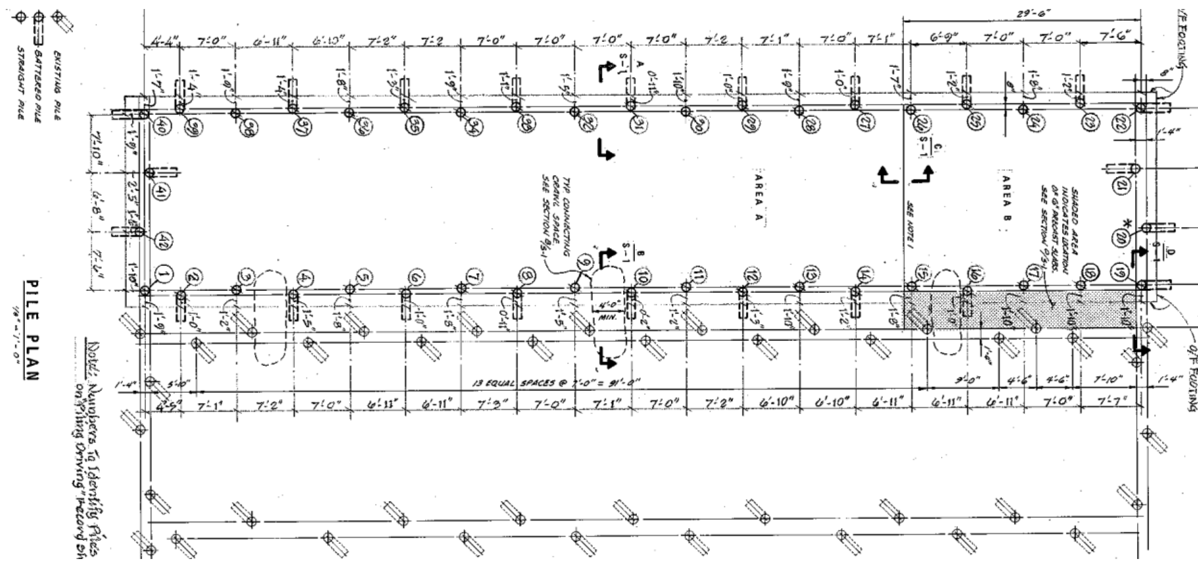

Figure 10: Foundation Plan of the West Lab Addition

2.4.3 North Lab Addition

The foundation system of the building consists of foundation beams, pile caps and 148 twelve-inch square precast vertical piles. The foundation beams of the North Lab addition are decoupled from the original building foundations (as shown in Figure 11 left).

2.4.4 South Admin Addition

The foundation system of the structure consists of foundation beams and 14 twelve-inch square precast vertical piles. The foundation beams of the South Admin addition are decoupled from the original building foundations (as shown in Figure 11 right).

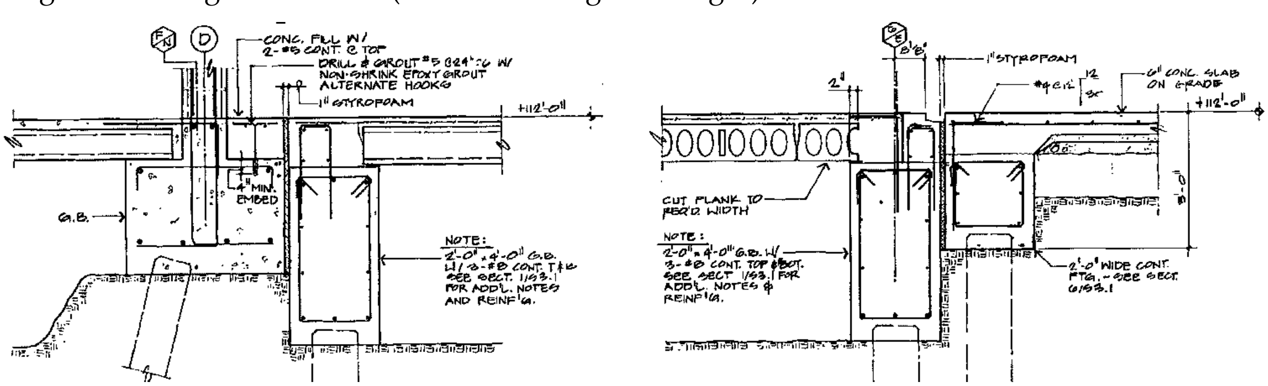

Figure 11: Foundation Details of the Lab and Admin Additions

2.5 LATERAL LOAD RESISTING SYSTEM

The Admin and Lab building complex consists of multiples seismically independent structures separated by expansion joints. Each individual part is described below.

2.5.1 Original Structure

The original structure, designed and constructed in 1974, consists of the original Admin building, the original Lab building and the Pop-Up structure.

The main lateral load resisting system of the Admin and Lab portions of the building consists of reinforced concrete floor and roof diaphragms and perimeter shear walls. The shear walls are reinforced concrete masonry units (CMU) with grout infill. The roof diaphragm is assumed to be concrete-filled as indicated on number of drawings. For example, the roofing detail at the roof to wall connection (taken from DWG CT-A-423) shows lightweight concrete fill for the roof diaphragm (Figure 12) shows. However, previously the roof diaphragm was described as non-concrete-filled, but additional information obtained from EBMUD confirms that the roof diaphragm is a concrete-filled metal deck.

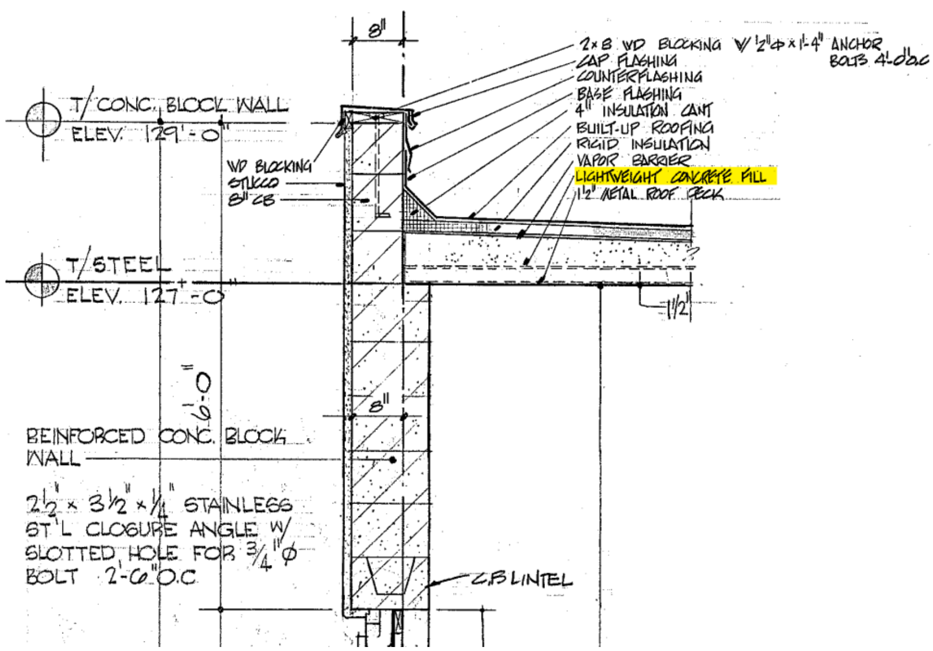

Figure 12: Original Building – Roofing Detail

The mid-level floor of the two-story Pop-Up structure is at the same elevation as the roof level of the Admin and Lab buildings and is part of a single floor diaphragm that connects all parts as one continuous structure. The mid-level floor of the Pop-Up structure has two massive (48-inch square) columns at the northeastern and southwestern corners. Two 12-inch by 66-inch shear walls in the north-south direction and two 12-inch by 54-inch shear walls in the east-west direction provide connection to the Admin and the Lab buildings. The plan view of connection is shown in Figure 13. The lateral load resisting system for the second floor of the Pop-Up consists of four steel braces, two in each direction. The steel braces are supported on the concrete piers and shear walls below.

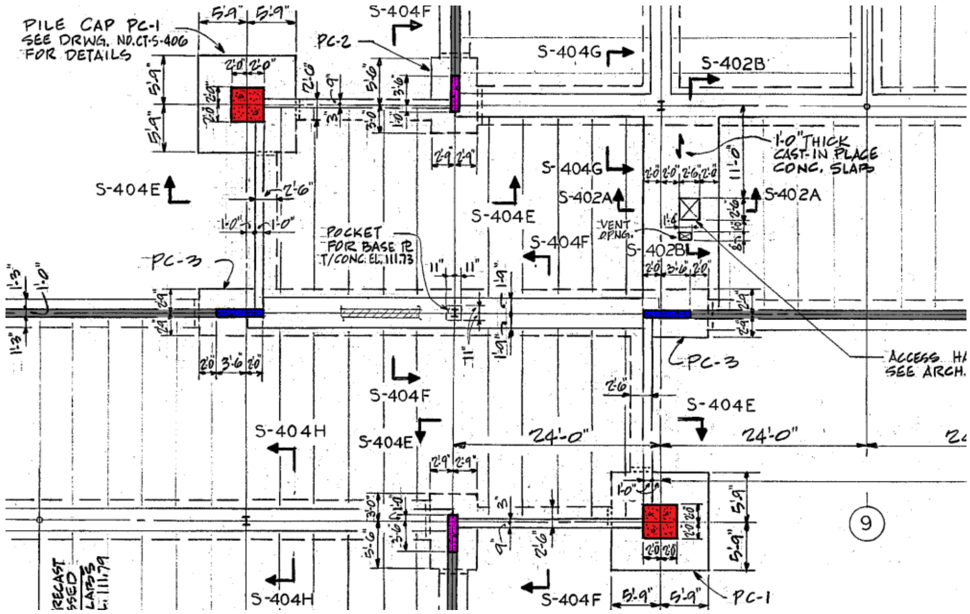

Figure 13: The Pop-Up Structure Connection to the Admin and Lab Buildings

2.5.2 West Lab Addition

The West Lab addition was originally designed and constructed in 1984 and is located on the west side of the original structure. The addition is seismically connected to the original structure.

The West Lab addition is a single-story steel moment and braced frame structure with a concrete-filled metal deck. The moment frames are located in the east-west direction. Two steel braces are provided along the west elevation. As part of the seismic retrofit project, the structure in the east-west direction was connected at the roof level to the original Lab building at two locations. Details of this connection are shown in Figure 14.

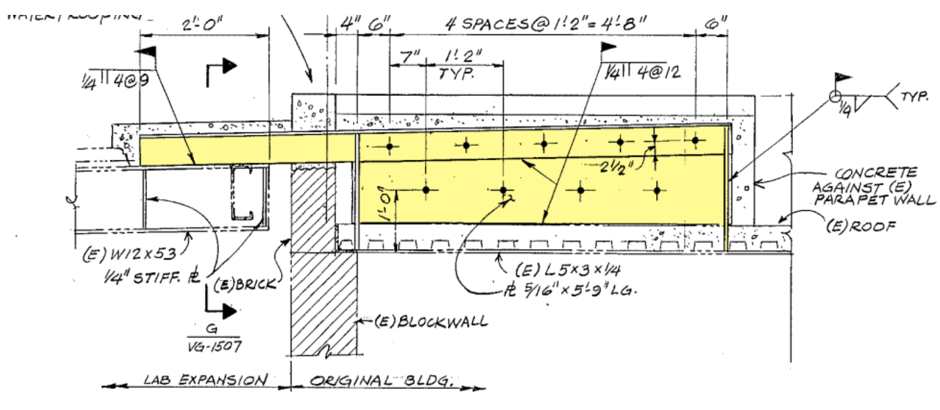

Figure 14: Connection of the West Lab Addition to the Original Lab Building

2.5.3 North Lab Addition

The North Lab addition is a single-story steel moment frame structure with a concrete-filled metal deck. The addition is located on the north side of the original Lab building. The structure is seismically independent from the rest of the building. A 4-inch seismic separation is provided between the North Lab addition and the original Lab building.

2.5.4 South Admin Addition

The South Admin addition is a single-story steel moment frame structure with a concrete-filled metal deck. The addition is located along the south side of the original Admin building. The structure is seismically independent from the rest of the building. A 4-inch seismic separation is provided between the addition and the original Admin building.

2.5.5 Lunch Room Extension

The lunch room extension is a light frame greenhouse-like structure located at the south portion of the original Lab building. While the extension itself does not significantly impact the seismic performance of the building, a portion of the original lab exterior wall was removed (Figure 15, right) to connect the extension to the rest of the building. This results in a potential vulnerability as the exterior masonry walls are load bearing element of the gravity system and are needed to support steel beams from the roof structure as shown in Figure 15 (left). Furthermore, a note on drawing DWG CT-S-413 states "the masonry walls are designed as shear walls and shall not be altered without the approval of the engineer". It is not clear if this note was followed prior to addition of the lunch room extension.

From DWG CT-S-403

From DWG S2.5

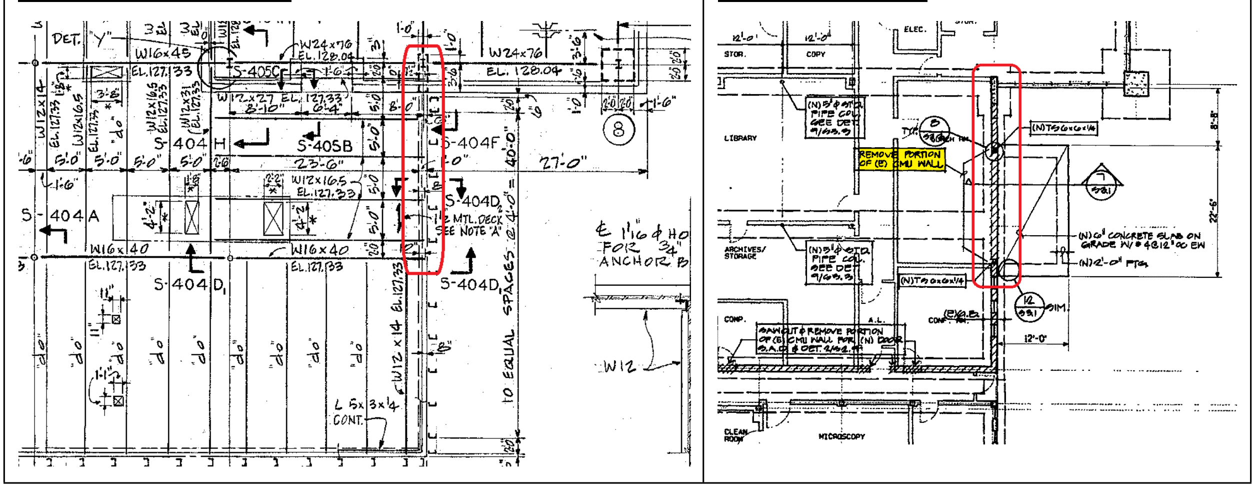

Figure 15: Lunch Room Extension

2.5.6 Lab Corridor Addition

The lab corridor addition is a light frame greenhouse-like structure located at the east side of the original Lab building. The glass wall (shown in Figure 16) sits on 3-foot wide spread footing foundation without piles. The addition does not significantly impact the seismic performance of the lab building, however, if subjected to a significant permanent ground deformation, the structure may separate from the lab building.

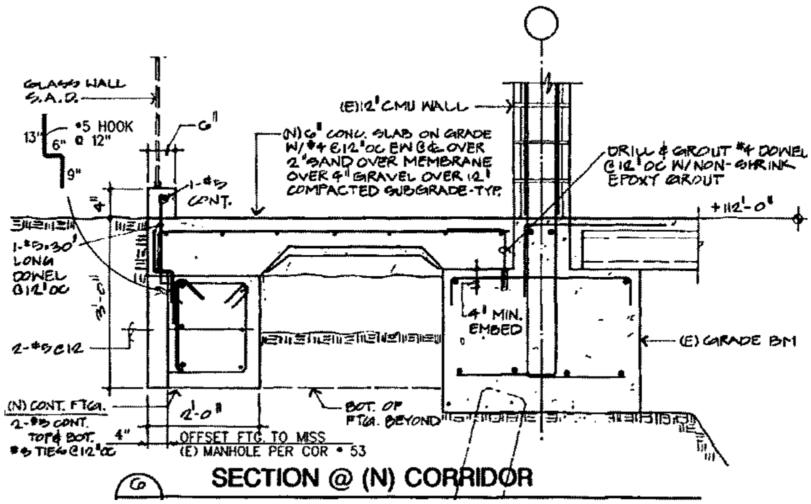

Figure 16: Lab Corridor Addition

7.0 IDENTIFIED VULNERABILITIES

This section presents the summary of the identified vulnerabilities.

7.1 ORIGINAL BUILDING AND WEST LAB ADDITION

The vulnerabilities of the above ground structure are shown in Figure 116.

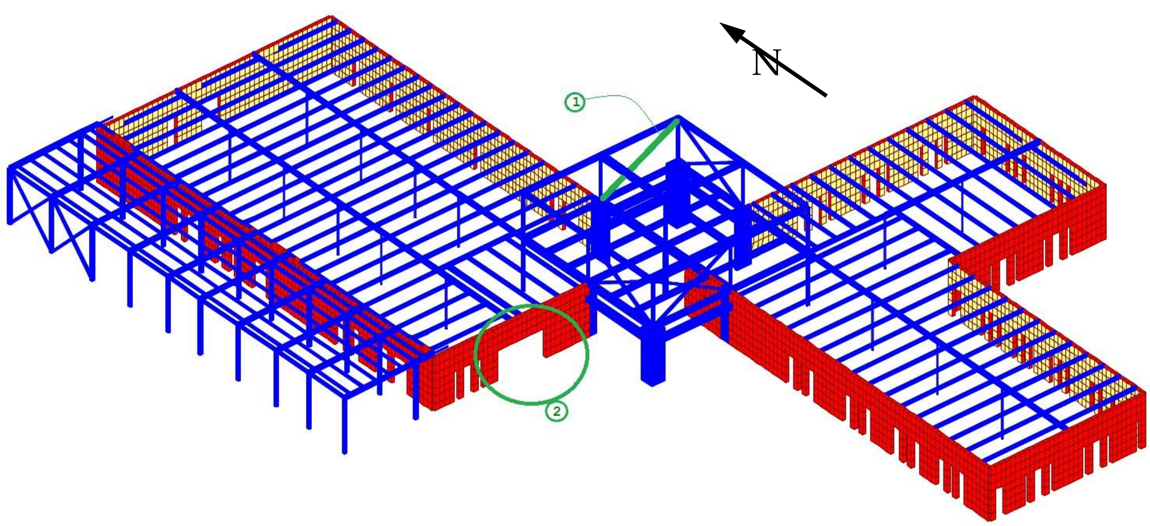

Figure 116: Original Building – Identified Vulnerabilities

7.1.1 Steel Elements around Single Brace at Pop-Up Structure

There are 4 steel braces at the second floor of the Pop-Up structure. Three of the braces are TS8x4x1/4 X-braces. The fourth brace is single diagonal TS7x7x5/16 shown as (1) on Figure 116. For the fixed base model, multiple steel members of the Pop-Up structure are overstressed with DCR exceeding the m-factor for LS (BSE-2E) and IO (BSE-1E). However, results from the flexible base model show that the DCRs below the acceptance criteria for Risk Category IV. It is our judgement that the flexible base model is more representative of the building. If the building is assumed as Risk Category I & II, the results show that the building meets the acceptance criteria.

7.1.2 South Wall of the Original Lab Building

The lunch room extension is a light frame greenhouse-like structure located at the south portion of the original Lab building. While the extension itself does not significantly impact the seismic performance of the overall building, a portion of the original lab exterior wall was removed to connect the extension to the rest of the building shown as (2) on Figure 116. The available drawings do not show details of any strengthening of the wall prior to the removal of the existing wall piers to create access to the lunch room extension. It is recommended to confirm that no strengthening of the wall section was performed. Lack of any strengthening creates stress concentrations around the large opening. DCR for the wall in this area exceeds the m-factor for both the fixed base and the flexible base models and the building does not meet the acceptance criteria for Risk Category IV or that for Risk Category I & II.

7.1.3 Piles

The analysis shows that for the fixed base analysis case, the DCRs for lateral forces and/or bending moments are higher than the m-factor for both the BSE-1E and BSE-2E case. For the finite element model with flexible base, only the pile bending DCRs are slightly above the m-factors. Therefore, the piles do not meet the acceptance criteria for Risk Category IV. However, for the flexible base model, the piles meet the acceptance criteria for Risk Category I & II. It is our judgement that the flexible base model is more representative of the building.

7.1.4 Roof Diaphragm

For the analysis, the roof diaphragm is assumed to be concrete-filled metal deck as shown on a number of drawings. Previously the roof diaphragm was described as non-concrete-filled. Based on additional information obtained from EBMUD, the roof diaphragm is a concrete-filled metal deck. No additional vulnerabilities are identified for the roof diaphragm.

7.2 NORTH LAB ADDITION

The vulnerabilities of the North Lab addition are described below.

7.2.1 Steel Moment Frames

The finite element models show that most steel elements have DCRs below the m-factors and meet the acceptance criteria for Risk Category IV. However, for the fixed and flexible base finite element models, one beam (highlighted in Figure 117) shows DCR exceeding the m-factor for the BSE-1E case. Nevertheless, the North Lab addition meets the code-based acceptance criteria for Risk Category I & II.

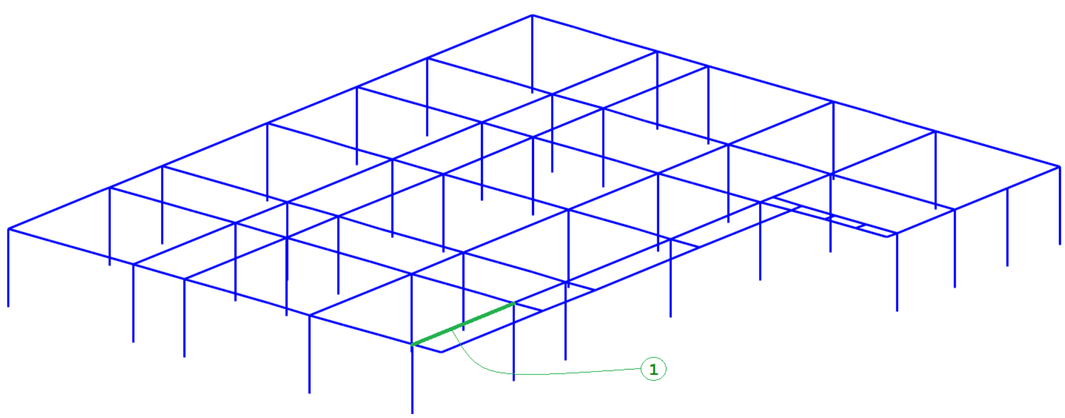

Figure 117: North Lab Addition – Identified Vulnerabilities

7.2.2 Steel Column to Foundation Connection

The base plate detail for the moment frame column connection to the foundation, shown in Figure 118, is inadequate to transfer bending moment from the column to the foundations. If the column base is considered pinned, the roof drifts will be unacceptable and the ponding between the structures will be excessive. To address this vulnerability, the following options may be considered:

1. Structurally connect the North Lab Addition and the Original structure (similar to the connection of the West Lab Addition to the Original structure). However, due to the size of the North Lab Addition, such a retrofit may impact the overall structural response.
2. Add additional structural elements such as shear walls or braced frames to stiffen the North Lab Addition.
3. Retrofit the column base plate connections (at each column base) to fully develop the imposed moments and forces from the moment resisting frames.

Out of these three options, it is our opinion that Options 2 and 3 are less disruptive.

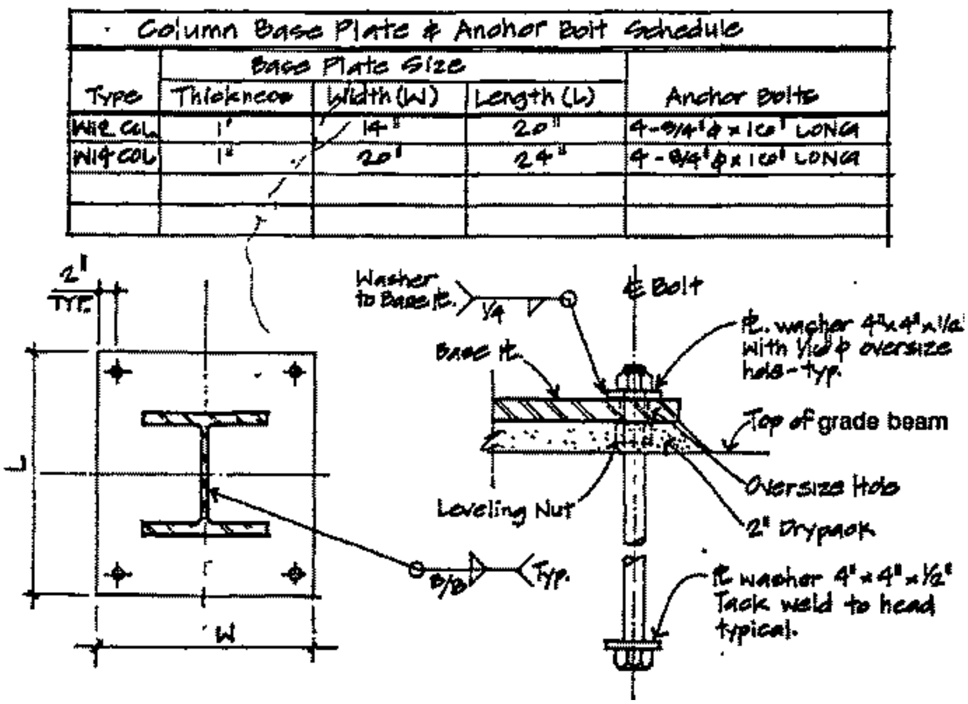

Figure 118: Base Plate and Anchor Bolt Detail

7.2.3 Piles

The analysis shows that for the fixed and flexible base analysis cases, the DCRs for bending moments are higher than the m-factor for both the BSE-1E and BSE-2E cases. Therefore, the piles do not meet the acceptance criteria for Risk Category IV. However, the piles meet the acceptance criteria for Risk Category I & II. It is our judgement that the flexible base model is more representative for the building.

7.2.4 Displacements at Roof Diaphragm

The BSE-2E displacements are greater than the seismic gap between the north lab addition and the original building. Pounding between the two structures is likely and potential localized damage at the impact areas.

7.3 SOUTH ADMIN ADDITION

The vulnerabilities of the South Admin addition are described below.

7.3.1 Steel Column to Foundation Connection

Similar to the North Lab addition, the base plate detail is not adequate to transfer the bending moment from the column to the foundations. The three retrofit option identified for the North Lab Addition are also feasible for the South Admin Addition; however, due to the relatively small footprint of the South Admin Addition, Option 1 may be the preferred option in this case.

7.3.2 Piles

The analysis shows that for the fixed base analysis case, DCRs for lateral forces and/or bending moments are higher than the m-factor for both the BSE-1E and BSE-2E cases. For the finite element model with flexible base, all DCRs are below the m-factors. For Risk Category I & II only the fixed base DCR for BSE-2E case is slightly above the m-factor. It is our judgement, that the flexible base model is more representative of the building. Therefore, the piles meet the acceptance criteria for Risk Category IV and Risk Category I & II.

(Excerpts)

Seismic Retrofit Administrative Building and Laboratory

East Bay Municipal Utility District

Main Wastewater Treatment Plant Seismic Structural Evaluation and Conceptual Design Project

2.3 RETROFIT DESIGN RISK CATEGORY I & II

In his section presents the final retrofit design is described.

2.3.1 Original Building and West Lab Addition

The retrofit model shows that the south wall opening and pile vulnerabilities are resolved. No retrofit is needed for the Original Building and West Lab Addition.

2.3.2 North Lab Addition

Four new 12-inch thick shear walls are added to exterior walls of the building. The shear walls are shown on the building framing plan in Figure 4 and on the pile layout plan in Figure 5. The photos of the four new shear walls over the building façade are shown in Figure 6. The locations of the east, west and north shear walls were selected so that the ends of the walls are over double pile locations. The location of the south wall is selected so it will not interfere with the doors and windows along the south face. The north and west shear walls will require covering of some windows. The east and west shear walls are 12.25-feet long and the north and south walls are 14.83-feet and 8.67-feet long, respectively.

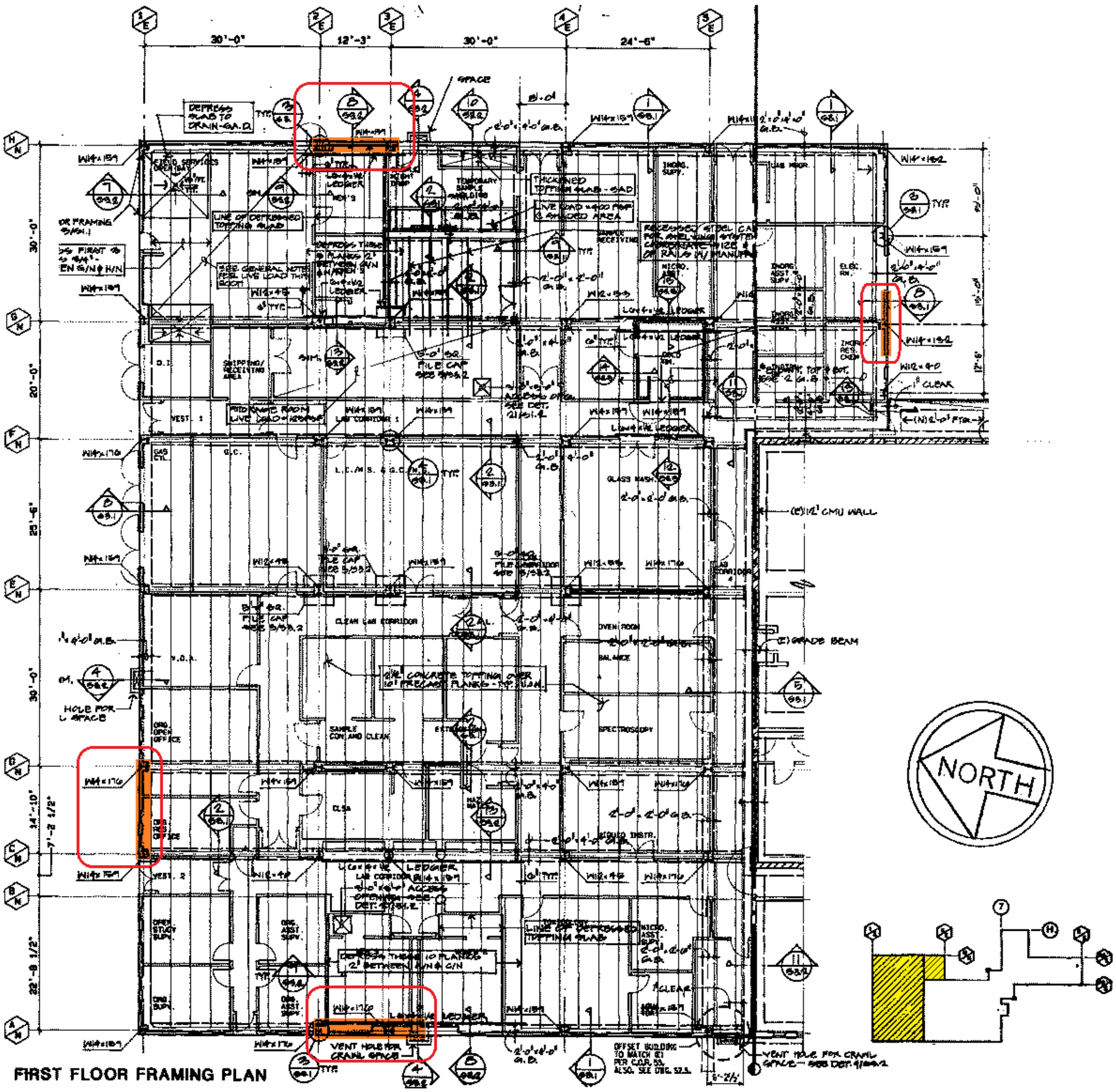

Figure 4: North Lab Addition – Framing Plan Showing the New Shear Walls

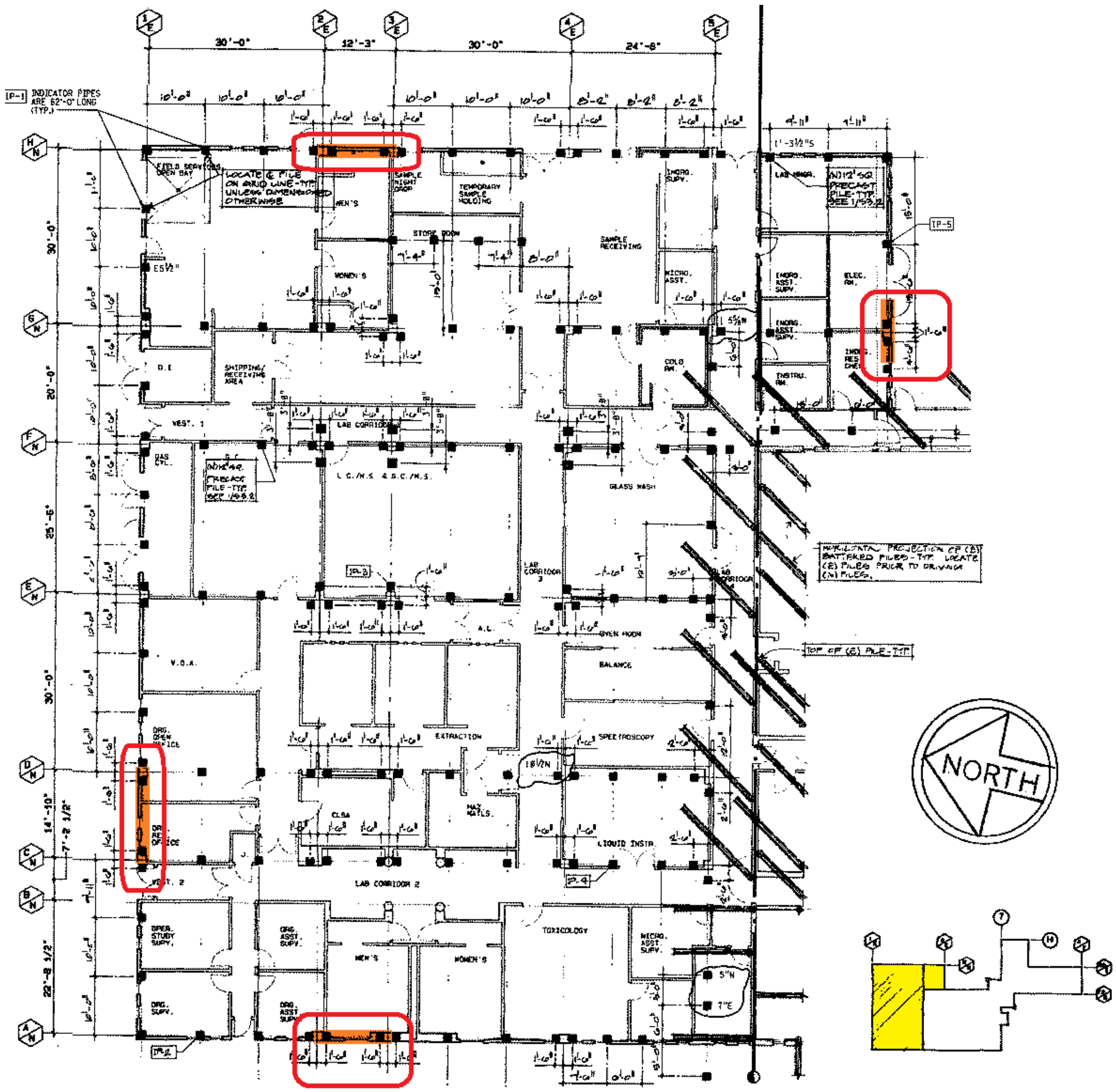

Figure 5: North Lab Addition – Pile Layout Plan Showing the New Shear Walls

East Shear Wall

West Shear Wall

North Shear Wall

South Shear Wall

Figure 6: North Lab Addition – New Shear Wall Locations

2.3.3 South Admin Addition

Three new 8-inch thick shear walls are added to each exterior wall of the building. The shear walls are shown on the building framing plan in Figure 7 and on the pile layout plan in Figure 8. The photos of the two of the new shear walls over the building façade are shown in Figure 9. The locations of the east, west and south shear walls are selected such that the corners of each shear wall are on top of a pile group rather than a single pile. All three shear walls are approximately 8-feet long. No shear walls will require covering of doors or large windows. The location of the south wall is selected so it will not interfere with the doors and windows.

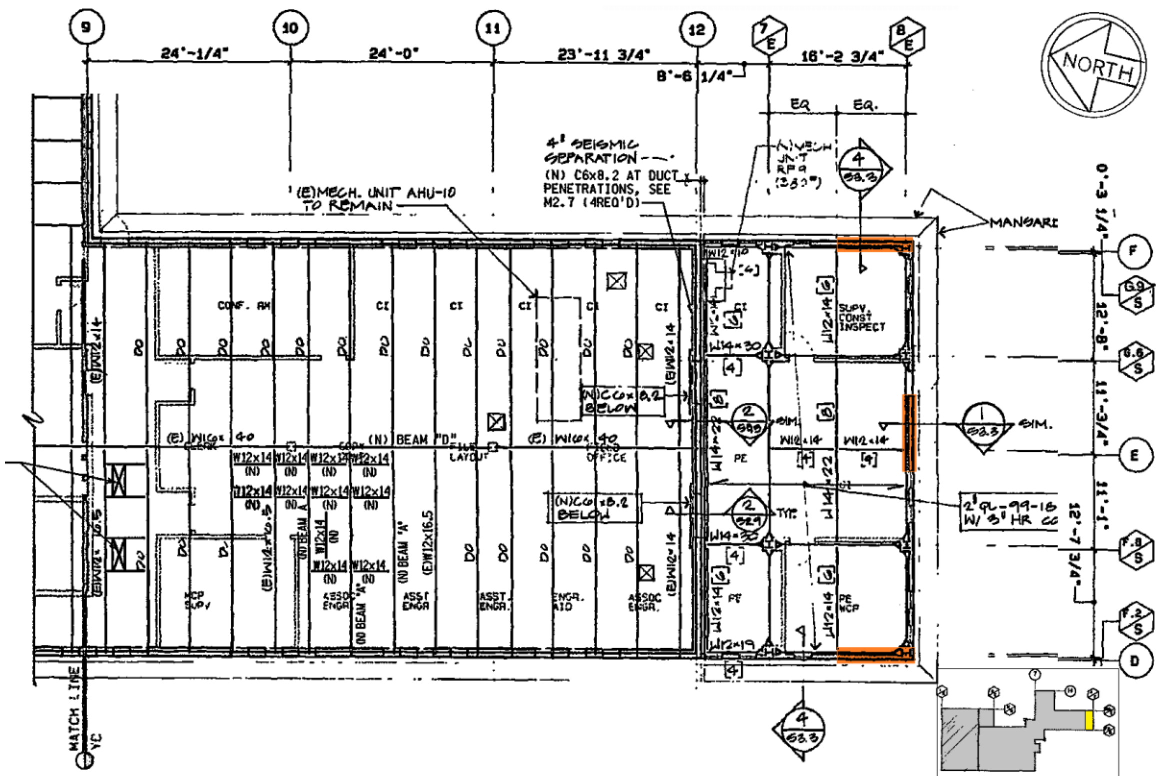

Figure 7: South Admin Addition – Framing Plan Showing the New Shear Walls

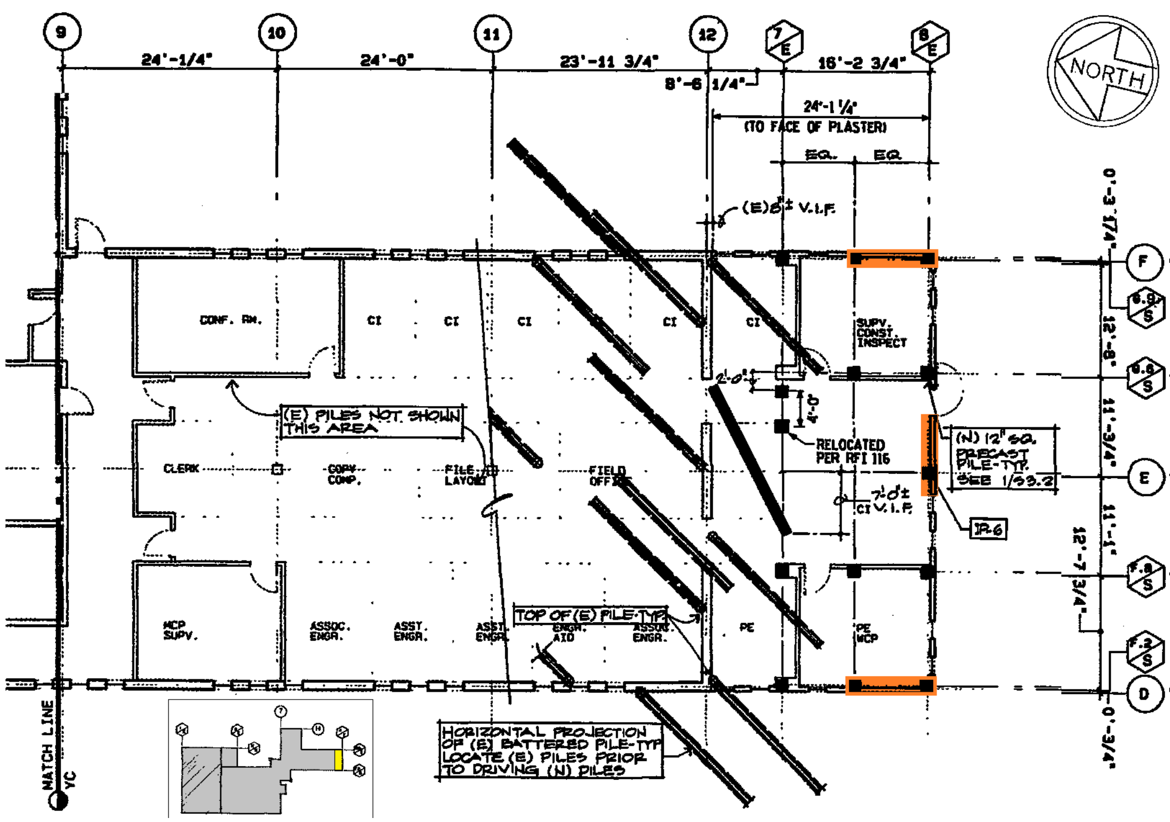

Figure 8: South Admin Addition – Pile Layout Plan Showing the New Shear Walls

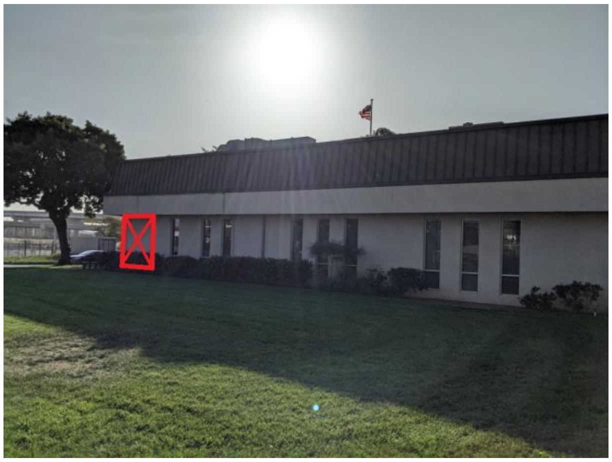	
East Façade Shear Wall	South Façade Shear Wall

Figure 9: South Admin Addition – New Shear Wall Locations

2.5 RETROFIT DESIGN RISK CATEGORY IV

2.5.1 Original Building and West Lab Addition

The seismic evaluation showed overstress in bending for all of the piles supporting the original structure and the West lab Addition. This may cause damage to the piles, which may manifest itself through cracking in the grade slabs and walls, breakage of windows, cracking of partition wall, and ceiling damage resulting in the building to be temporarily unoccupiable. However, it is unlikely that this damage would result in damage to the load bearing elements of the structure or structural collapse. The original structure is supported on 219 10-inch square piles and the West Lab Addition on 42 12-inch square piles. It is estimated that additional 80 piles (see Section 4.6.1) would be needed to meet Risk Category IV requirements. The additional piles must be connected to the existing foundation system to equally share load with the existing piles.

2.5.2 North Lab Addition

The seismic evaluation for Risk Category IV showed overstress in bending for all of the piles supporting the North Lab Addition. Damage to the piles may manifest itself through cracking in the grade slabs and walls, breakage of windows, cracking of partition wall, and ceiling damage resulting in the building to be temporarily unoccupiable. It is unlikely that this damage would result in damage to the load bearing elements of the structure or structural collapse.

The existing structure is supported on 157 piles. It is estimated that 47 (see Section 5.6.2) additional piles will be required. The additional piles must be connected to the existing foundation system to equally share load with the existing piles.

In addition to overstress in the piles, the roof diaphragm at the location of the four new shear walls (required for Risk Category I & II) is slightly overstressed for Risk Category IV (computed m-factors are 4% higher than the allowable m-factors for Risk Category IV). This slight overstress may result in some cracking of the diaphragm but not likely to cause major damage.

2.5.3 South Admin Addition

The retrofit for the South Admin Addition (as described in Section 2.4.3) would be sufficient to meet Risk Category IV requirements.

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7.1 RETROFIT DESIGN DETAILS

7.1 SHEAR WALL DETAILS

The conceptual retrofit design is presented in Figure 85. The basic information for the new shear walls is shown in Table 21 and the design parameters of the shear walls are shown in Table 22.

The cross sections at foundations are shown in Figure 86 throughout Figure 92, the cross sections at roof beams are shown in Figure 93 and side view of typical shear wall is shown in Figure 94.

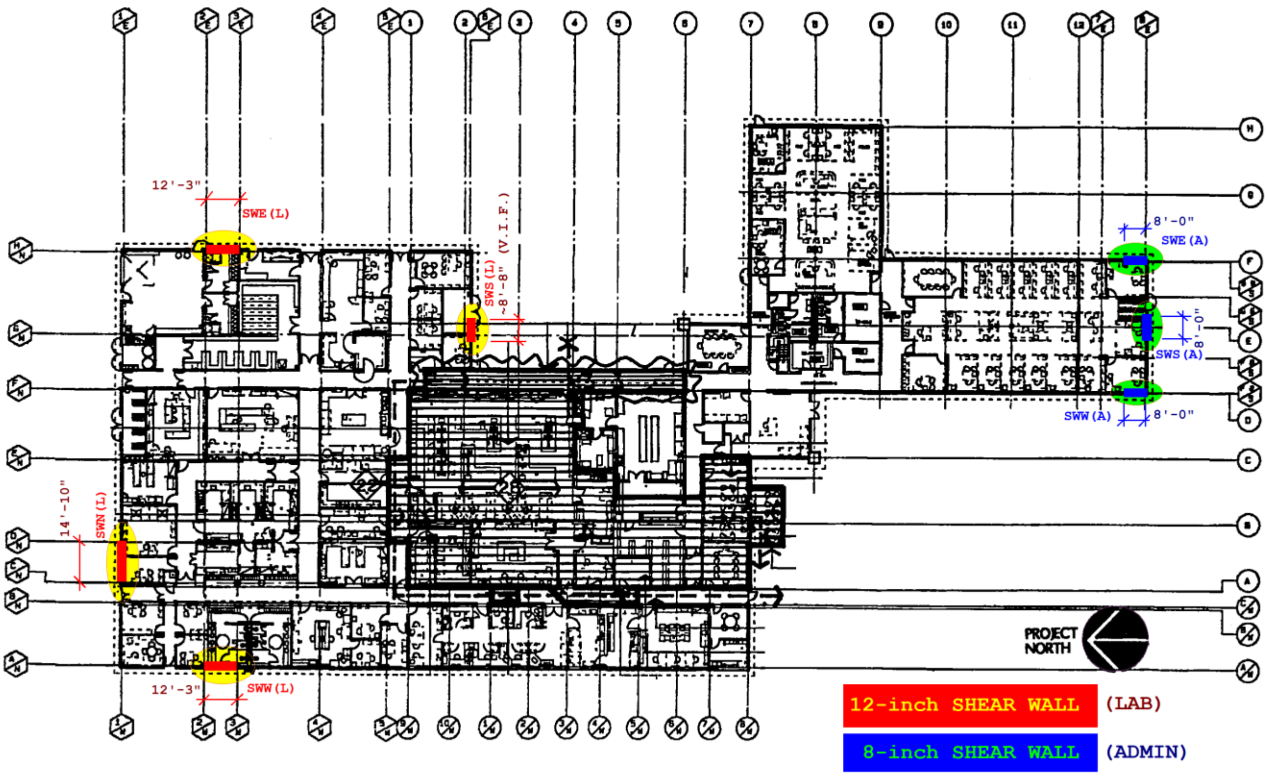
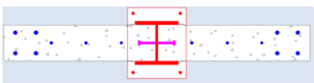
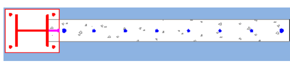


Figure 85: Admin/Lab Building Retrofit

Details of the connections between the new shear wall and the existing structures is as follows:

- Connection to foundation beams:
    - North Lab Addition: 54" long #6 rebars @ 12 inches, 9-inch embedment
    - South Admin Addition: 36 long #4 rebars @ 12 inches, 6-inch embedment
- Connection to the Roof Beams:
    - North Lab Addition: 6-inch long, ¾"Ø S3L Nelson Stud @ 6".
    - South Admin Addition: 5-inch long, ½"Ø H4L Nelson Stud @ 6".
- Connection to the Steel Columns:
    - North Lab Addition: 6-inch long, ¾"Ø S3L Nelson Stud @ 6".
    - South Admin Addition: 5-inch long, ½"Ø H4L Nelson Stud @ 6".

Table 21: New Shear Walls – General Information

Component	Length [feet]	Thick. [inch]	Column Left [(1)]	Column Middle [(1)]	Column Right [(1)]	Top Beam
Shear Wall East - Lab [SWE(L)] 	12′-3″	12	W14x159	-	W14x159	W24x55
Shear Wall North - Lab [SWN(L)] 	14′-10″	12	W14x176	-	W14x176	W24x55
Shear Wall West - Lab [SWW(L)] 	12′-3″	12	W14x176	-	W14x176	W24x55
Shear Wall South - Lab [SWS(L)] 	8′-8″	12	-	W14x132	-	W21x44
Shear Wall East -Admin [SWE(A)] 	8′-0″	8	W12x65	-	-	W16x26
Shear Wall West -Admin [SWW(A)] 	8′-0″	8	-	-	W12x65	W16x26
Shear Wall South -Admin [SWS(A)]	8′-8″	8	-	-	-	W18x35

(1) DCR Columns are left, right or middle when looking from outside the building

Table 22: New Shear Walls – Design parameters

Wall	Corner Reinforcement	Wall Reinforcement	Connection to Column Left [(1)]	Connection to Column Mid [(1)]	Connection to Column Right [(1)]	Connection to Top Beam	Connection to Foundation Beam
SWE(L)	4-#11	#4@12 [(2)]	¾″ Studs [(4)]	-	¾″ Studs [(4)]	¾″ Studs [(4)]	#6@12″
SWN(L)	4-#11	#4@12 [(2)]	¾″ Studs [(4)]	-	¾″ Studs [(4)]	¾″ Studs [(4)]	#6@12″
SWW(L)	4-#11	#4@12 [(2)]	¾″ Studs [(4)]	-	¾″ Studs [(4)]	¾″ Studs [(4)]	#6@12″
SWS(L)	4-#9	#4@12 [(2)]	-	¾″ Studs [(4)]	-	¾″ Studs [(4)]	#6@12″
SWE(A)	1-#10	#4@12 [(3)]	½″ Studs [(4)]	-	-	½″ Studs [(4)]	#4@12″
SWW(A)	1-#10	#4@12 [(3)]	-	-	½″ Studs [(4)]	½″ Studs [(4)]	#4@12″
SWS(A)	1-#10	#4@12 [(3)]	-	-	-	½″ Studs [(4)]	#4@12″

(1) DCR Columns are left, right or middle when looking from outside the building
(2) Each face, each direction
(3) Each direction
(4) All Nelson Studs are at 12-inch spacing

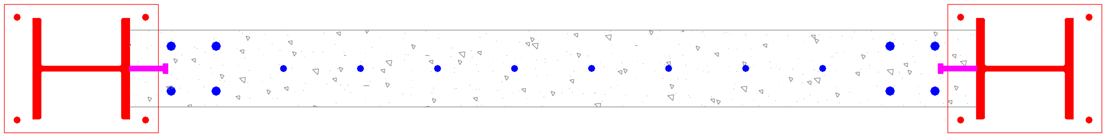


Figure 86: Plan View at Foundations – SWE(L)

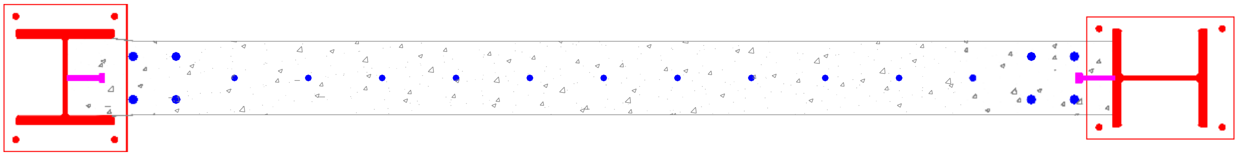


Figure 87: Plan View at Foundations – SWW(L)

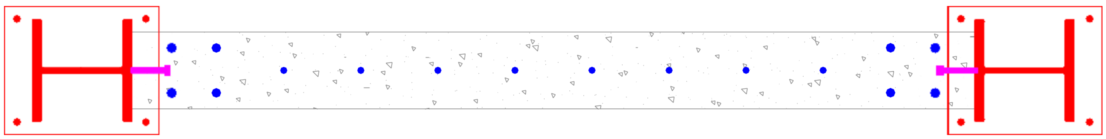


Figure 88: Plan View at Foundations – SWN(L)

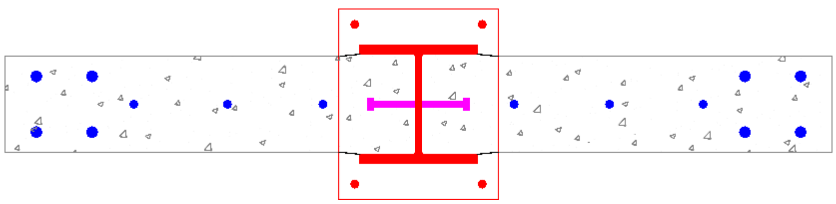


Figure 89: Plan View at Foundations – SWS(L)

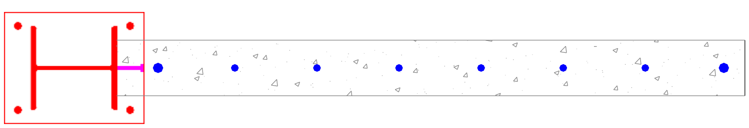


Figure 90: Plan View at Foundations – SWE(A)

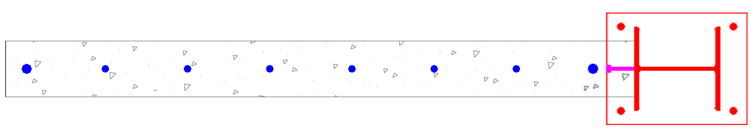


Figure 91: Plan View at Foundations – SWW(A)

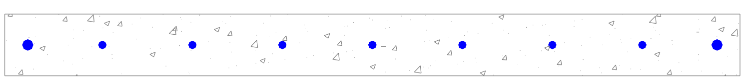
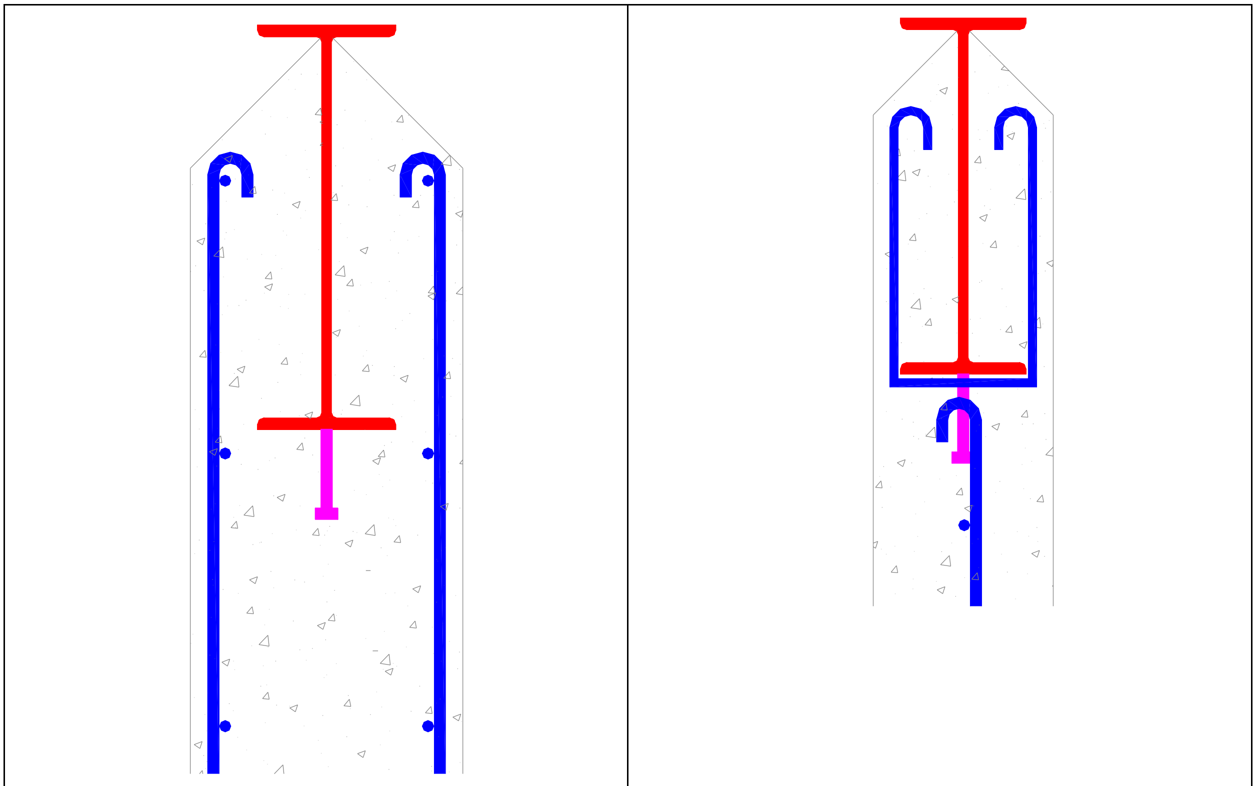


Figure 92: Plan View at Foundations – SWS(A)



Section at North Lab Addition	Section at South Admin Addition

Figure 93: Cross Section at Roof Beams

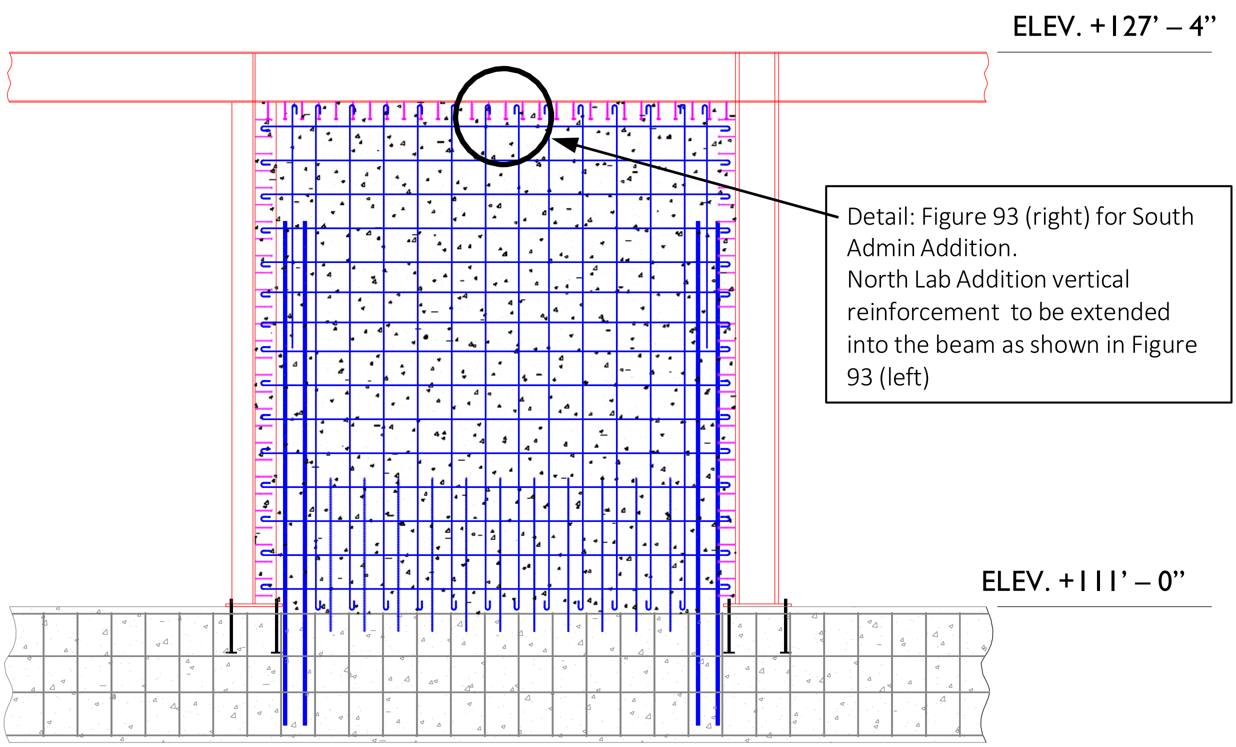


Figure 94: Side View of Typical Shear wall

7.2 ADDITIONS REQUIRED TO MEET CATEGORY IV

This section discusses the additional retrofit required to meet the Risk Category IV.

7.2.1 Original Building and West Lab Addition

It is estimated that additional 80 piles are needed to meet Risk Category IV requirements. The number is calculated, so the average DCR for the all piles (existing and new) would be below the m-factor. The piles must be evenly distributed along the exterior walls of the building. Extension of the foundation beams will also be required to connect the new piles to the existing structure.

The building meets ASCE 41-17 Basic Performance Objectives for Existing structures (BPOE) for Risk Category I & II. Addition of 80 new piles that are uniformly spaced around the building in between existing battered piles may present a significant constructability challenge. The cost for the retrofit to meet the more stringent Risk Category IV criteria is judged to be excessive.

7.2.2 North Lab Addition

It is estimated that additional 40 piles are needed to meet Risk Category IV requirements. The number is calculated, so the average DCR for the all piles (existing and new) would be below the m-factor. In addition to new piles, strengthening of the foundation beams and roof diaphragm are also required. The piles must be evenly distributed along the exterior walls of the building. At least one additional pile must be installed at each corner of each of the four new shear walls (required for Risk Category I & II). Extension of the foundation beams will also be required to connect the new piles to the existing structure. Given the already heavy reinforcement in the new shear walls (for Risk Category I & II), longer or additional shear walls may be needed. Force collectors will also be needed at the roof diaphragm.

Addition of new piles as well as significant additional foundation work may pose a significant constructability challenge. The cost for the retrofit to meet the more stringent Risk Category IV criteria is judged to be excessive.

7.2.3 South Admin Addition

The retrofit for the South Admin Addition (for Risk Category I & II) would be sufficient to meet the requirements for Risk Category IV.

Field Services Building (FSB)

As built Jan. 2, 1953

NO.	DATE	REVISIONS	MADE BY	CHKD. BY
7	8-30-51	Changed slab reinforceing	LM	V.G.
6	8-20-51	Add. and/or revised details	R.W.C.	V.G.
5	8-7-51	Miscellaneous corrections & add.	R.W.C. EF	L.C.
4	8-1-51	Chlorine building relocated	R.W.C.	L.C.
3	7-16-51	Added vertical bars to footing	K.R.	A.K.J.
2	7-13-51	Added footing for pipe col.	K.R.	A.K.J.
1	7-12-51	Changed scale pit dimensions	K.R.	E.R.

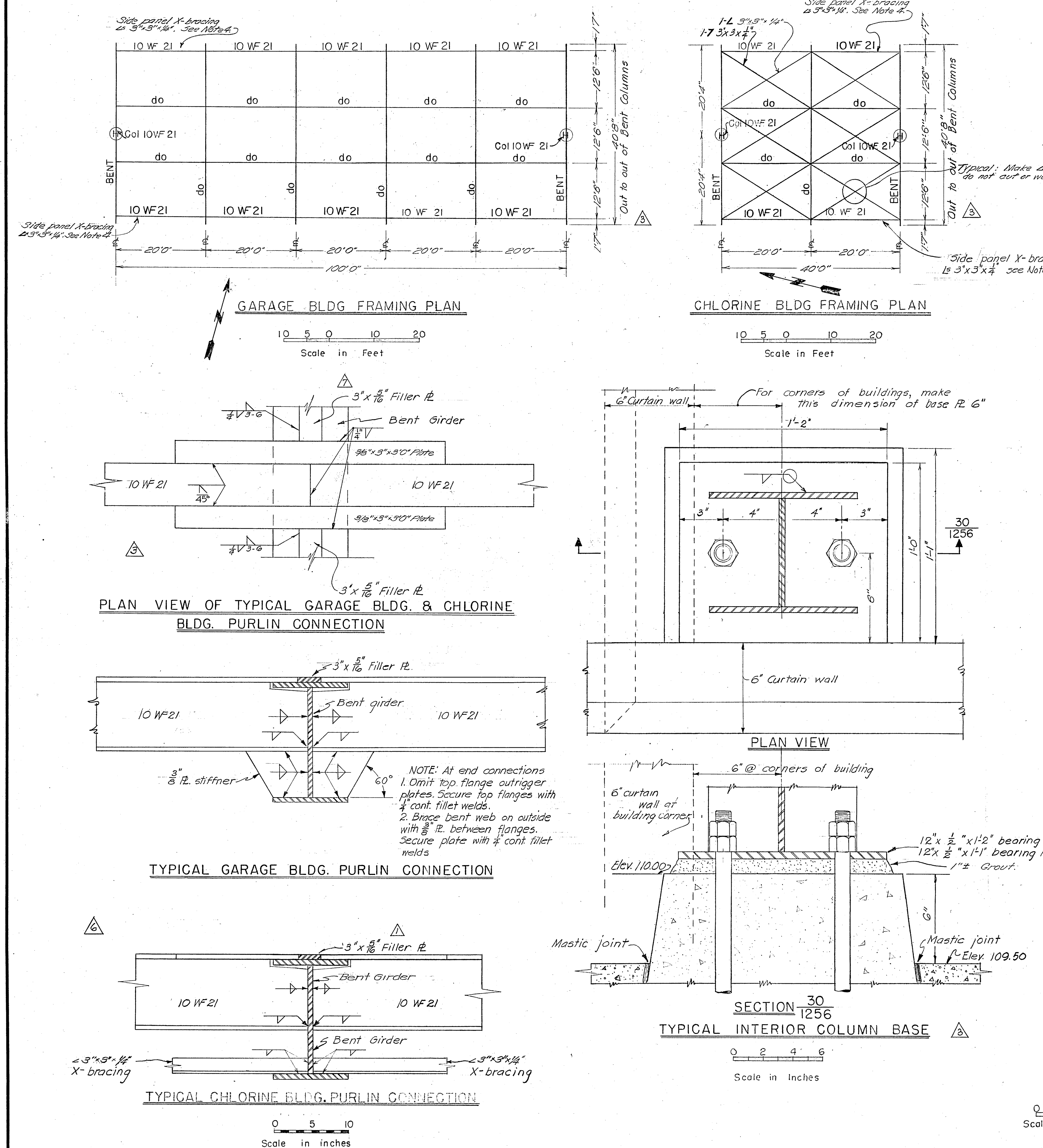
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

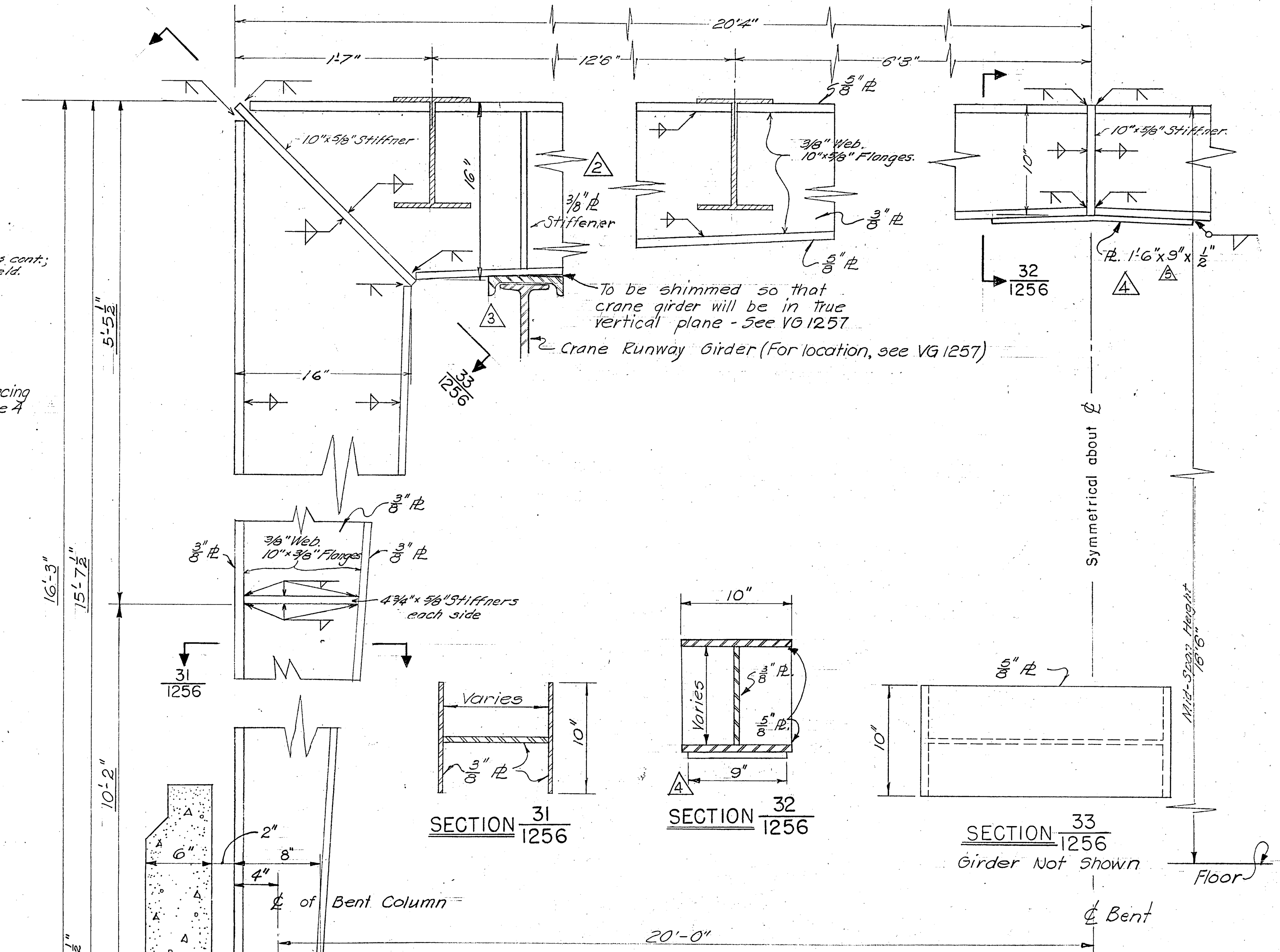
GARAGE BUILDING & CHLORINE BUILDING
PLOT PLAN & FOUNDATION DETAIL

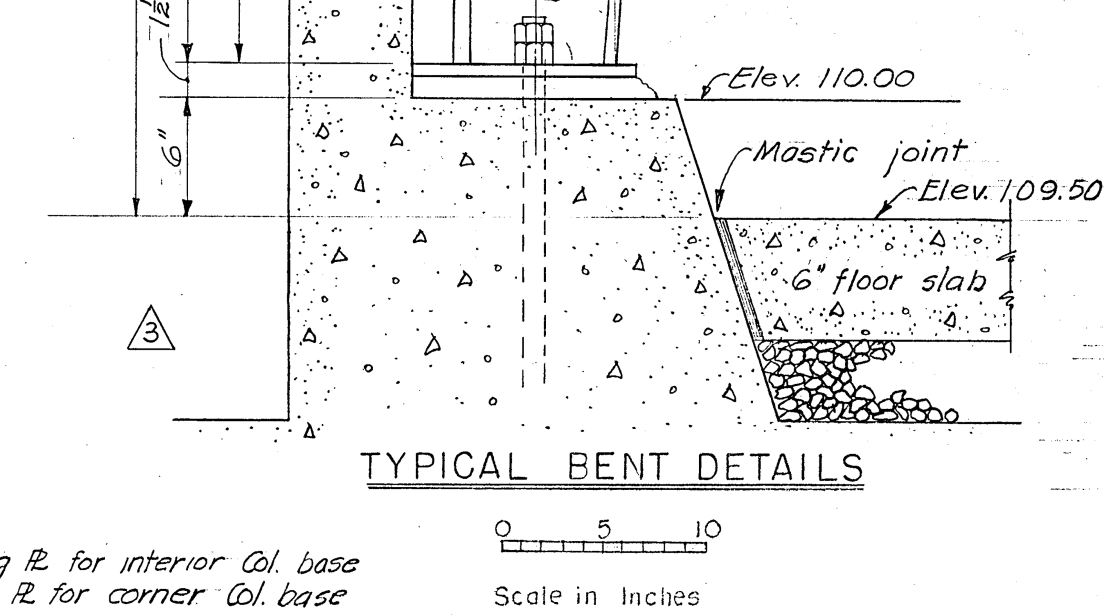
DESIGNED BY | DRAWN BY K.R. | TRACED BY
CHECKED BY | DATE 6-29-51 | SCALE
RECOMMENDED BY
APPROVED BY

APPROVED ____ CHIEF ENGINEER

No. VG 1255

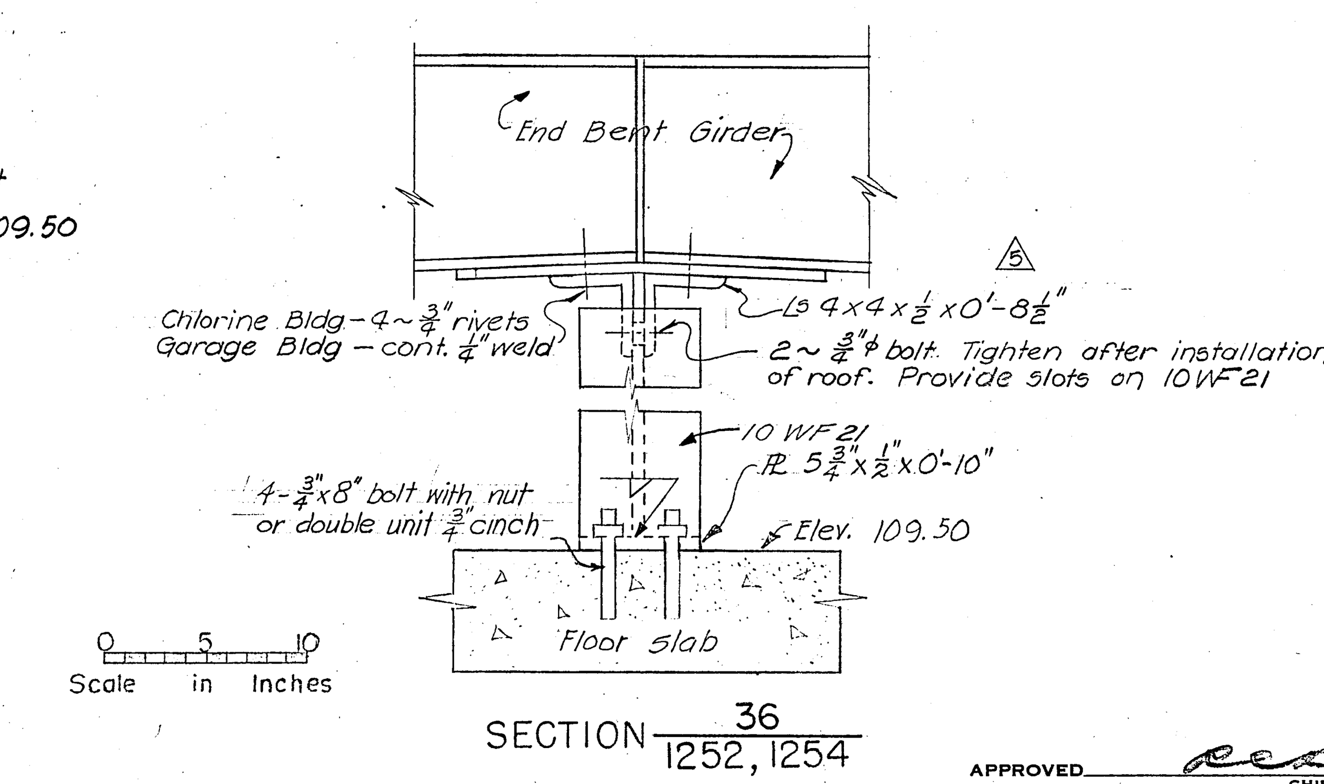






NOTES

1. All structural steel to be fabricated and erected in accordance with standard A.I.S.C specifications for buildings.
2. All rivets to be ¾" dia. in 13/16" dia. holes.
3. All welds to be ¼" continuous, unless shown otherwise
4. Side panel cross-bracing to be installed only where specifically designated (two panels in Garage Bldg., two panels in Chlorine Bldg.) Attach bracing to Bents at inside of outer flange as near top and bottom of Bent column web. Secure bracing to Bent in Garage Bldg. with ¼" continuous weld. In Chlorine Bldg. secure bracing to Bent with two ¾" rivets at each connection. At intersection of bracing make angles continuous; do not cut or weld.



APPROVED ____ CHIEF ENGINEER

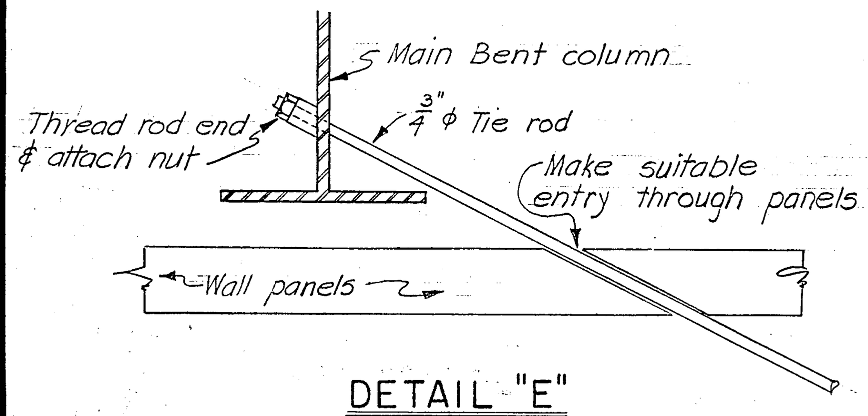
NO.	DATE	REVISIONS	MADE BY	CHKD. BY
		As built Jan. 5, 1953		
7	9-25-51	Added filler Plates	EF	A.K.J.
6	9-19-51	Revisions to Purlin Connections - Chlorine Building	E.H.	A.K.J.
5	8-31-51	Changed size of plate & connection to column at Bent Girder End	EF	L.C.
4	8-20-51	Add. and/or revised details	R.W.C	V.G.
3	8-8-51	Miscellaneous corrections & add.	R.W.C	L.C.
2	7-13-51	Added stiffener plate for crane girder, note pertaining to shimming crane girder	K.R.	A.K.J.
1	7-13-51	Added 2 rivets to purlin conn.	K.R.	A.K.J.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

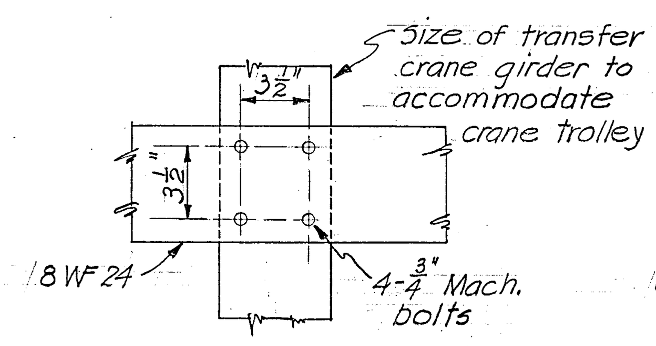
GARAGE BUILDING & CHLORINE BUILDING

STEEL FRAMING

DESIGNED BY E. O. May	DRAWN BY MAY	TRACED BY
CHECKED BY Alvin K. Jo[illegible]	DATE 6-29-51	~~SCALE~~
RECOMMENDED BY S. Kaplatsky	No. VG 1256	
APPROVED BY [illegible]		



DETAIL "E"



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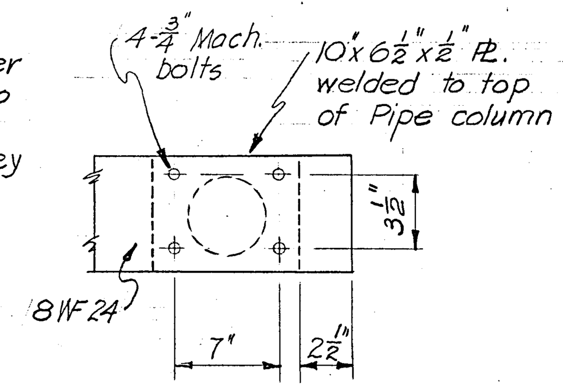

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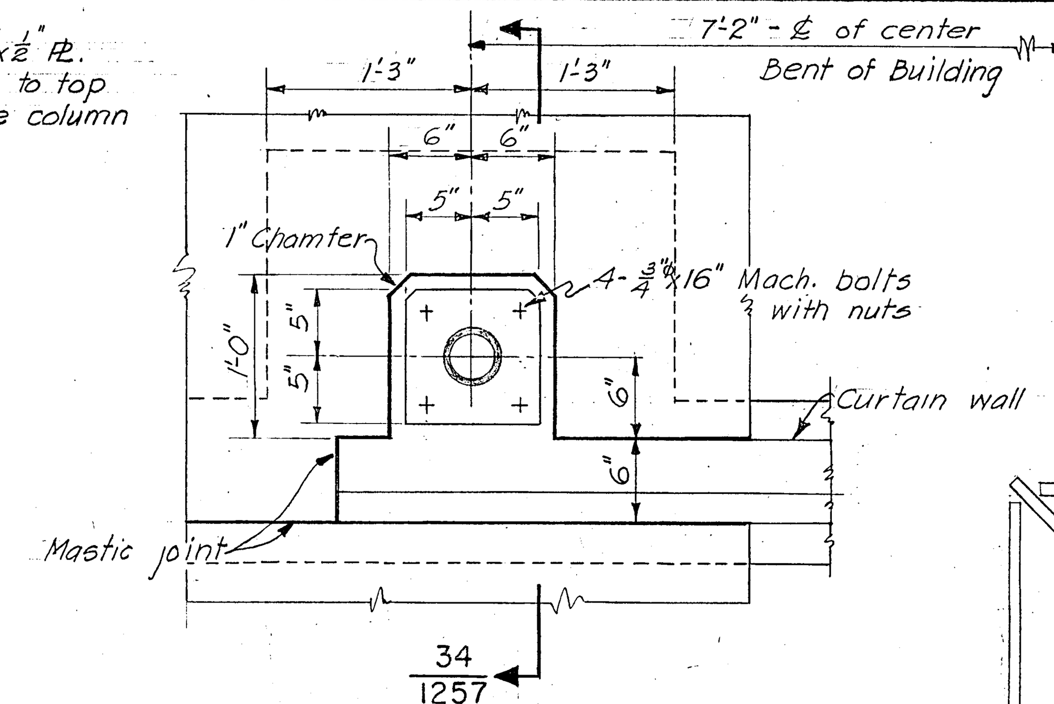
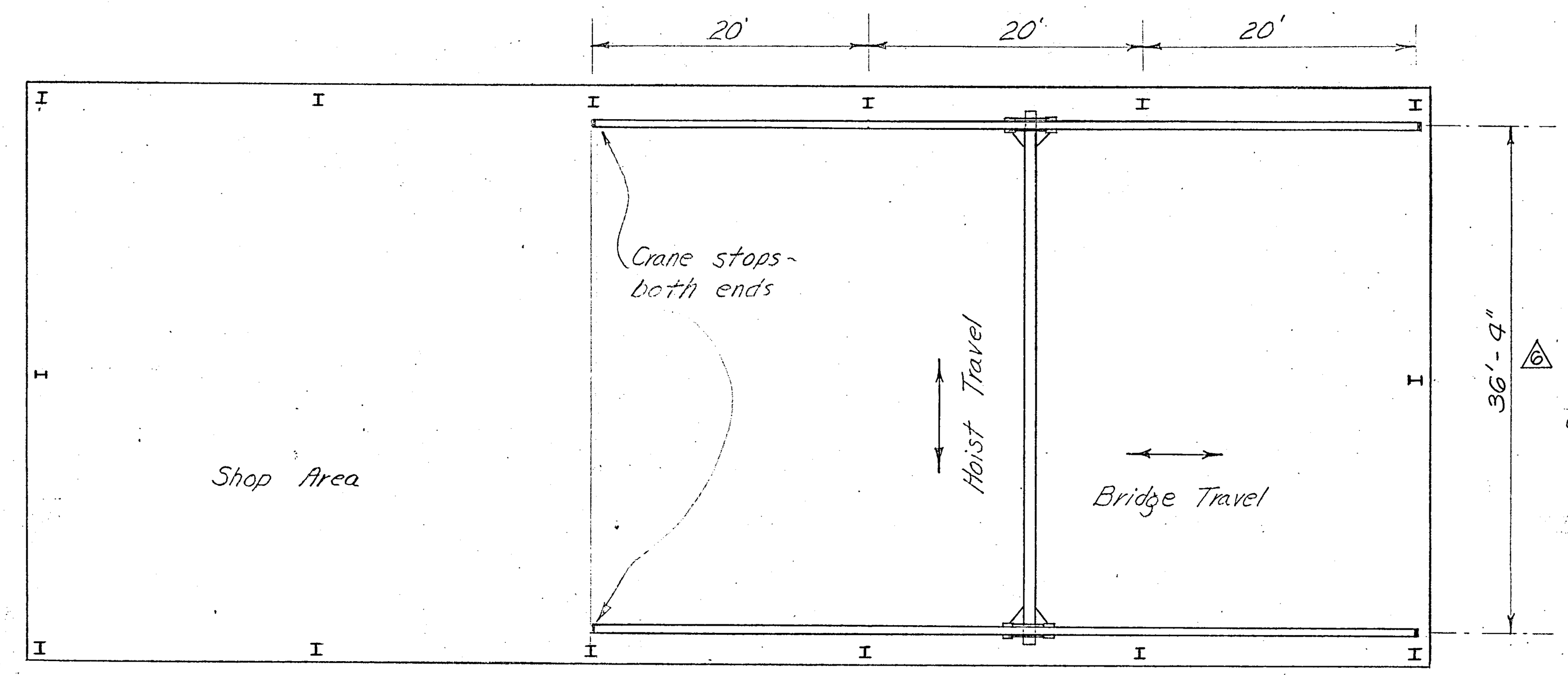
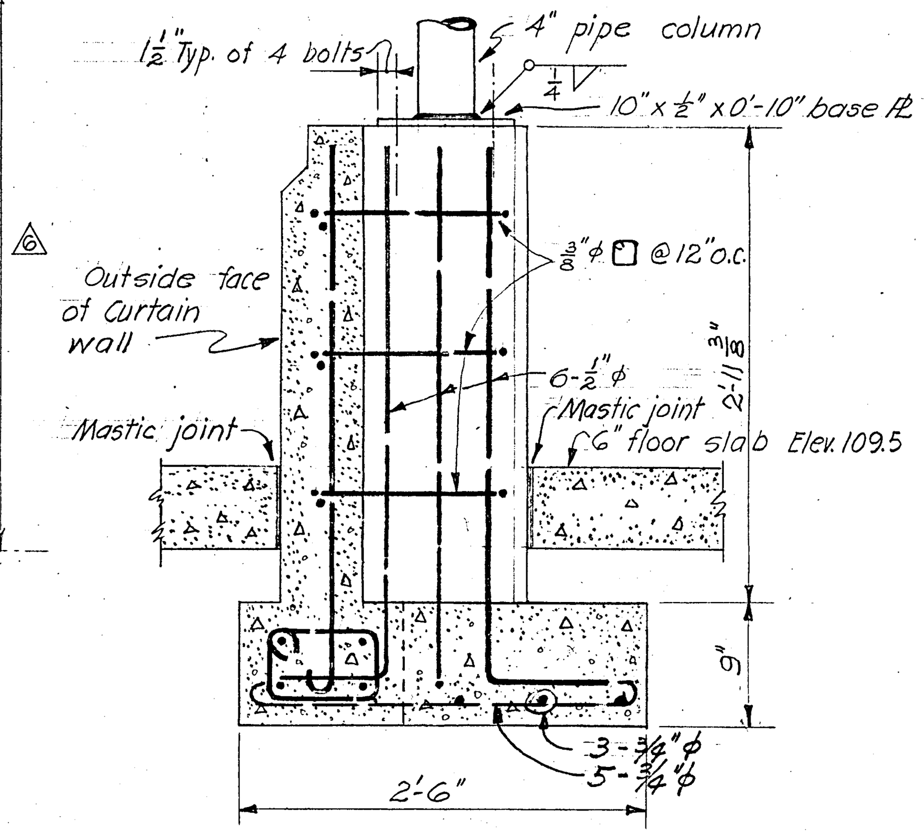




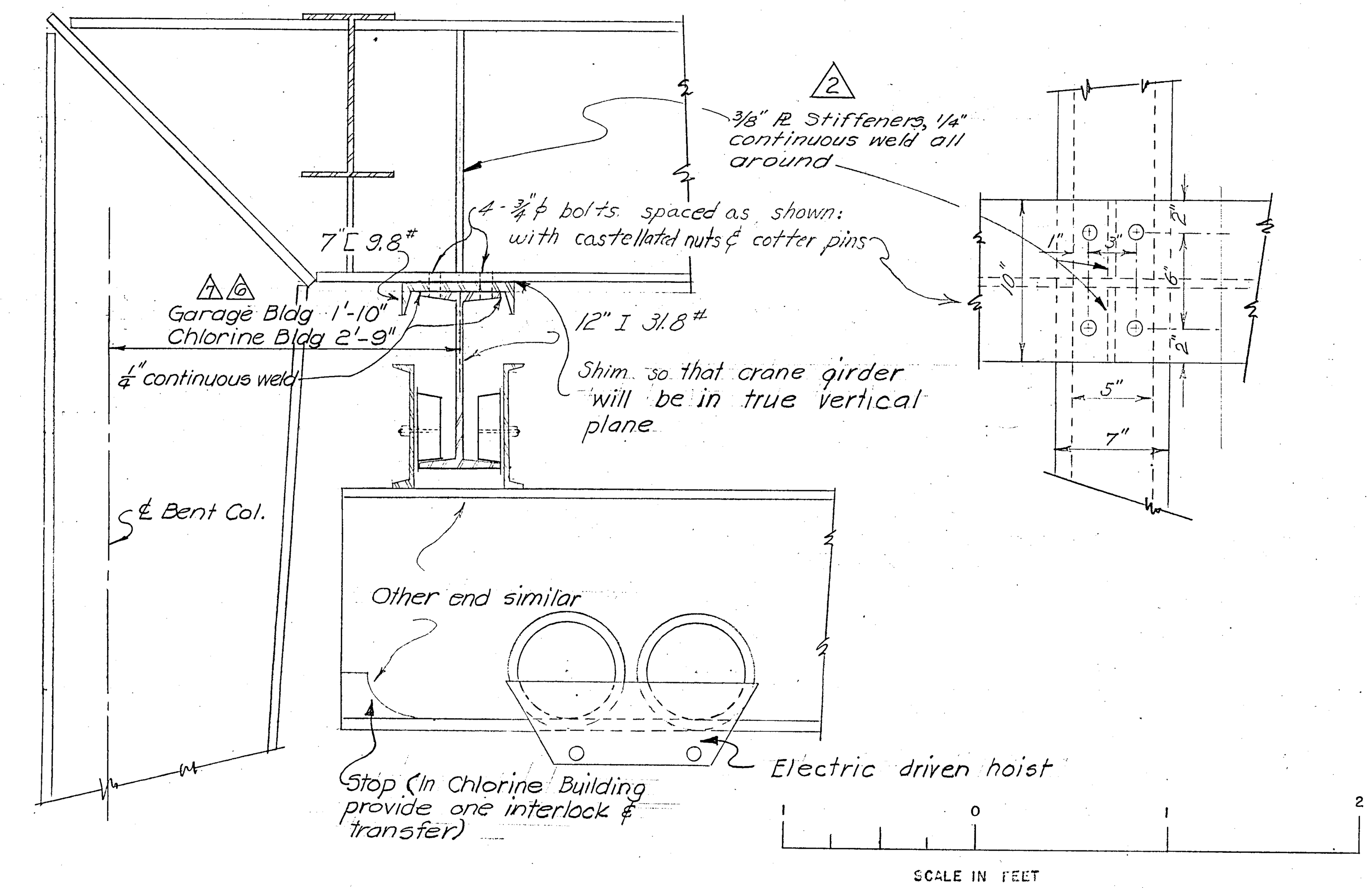
GARAGE BLDG. PLAN

SCALE IN FEET

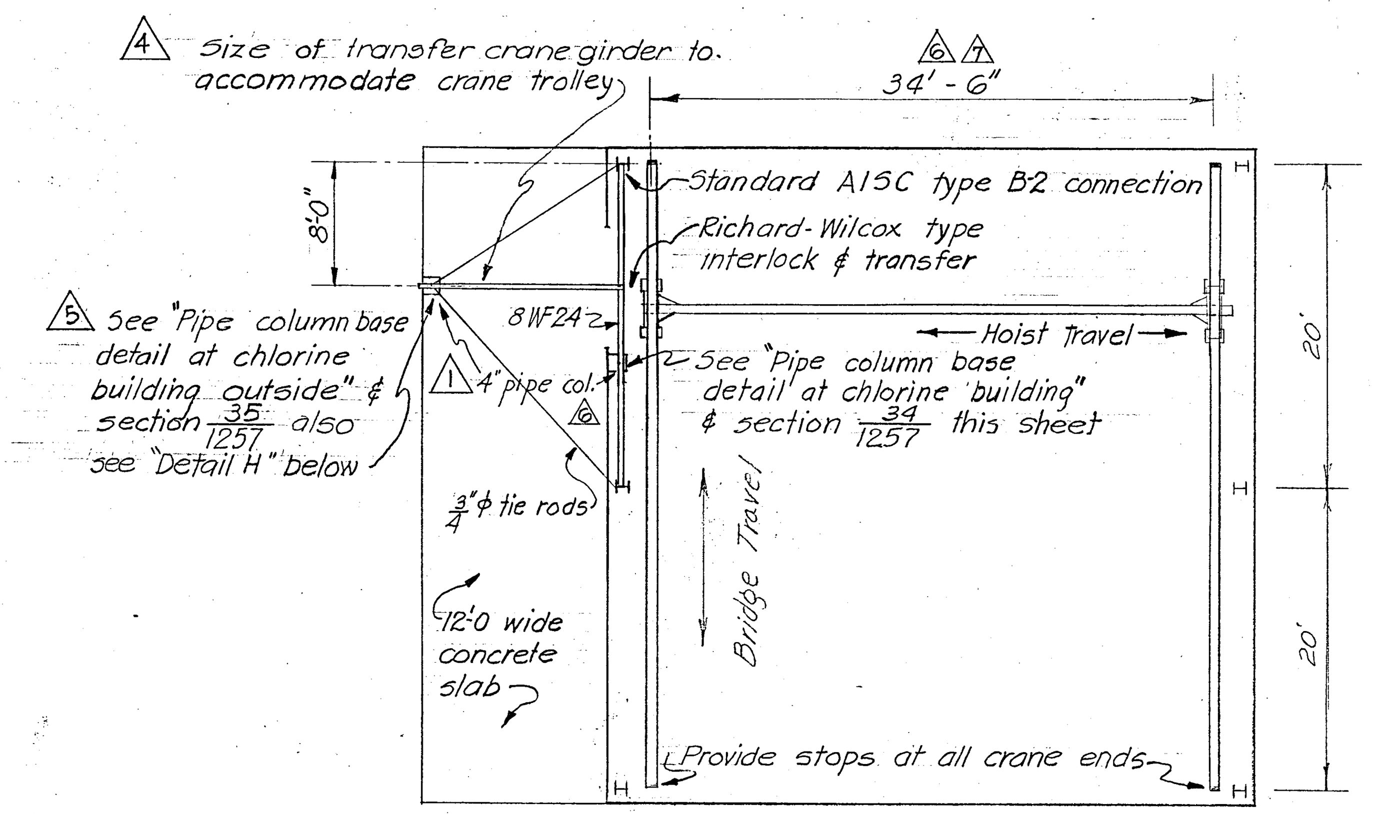


SECTION $\frac{34}{1257, 1254}$

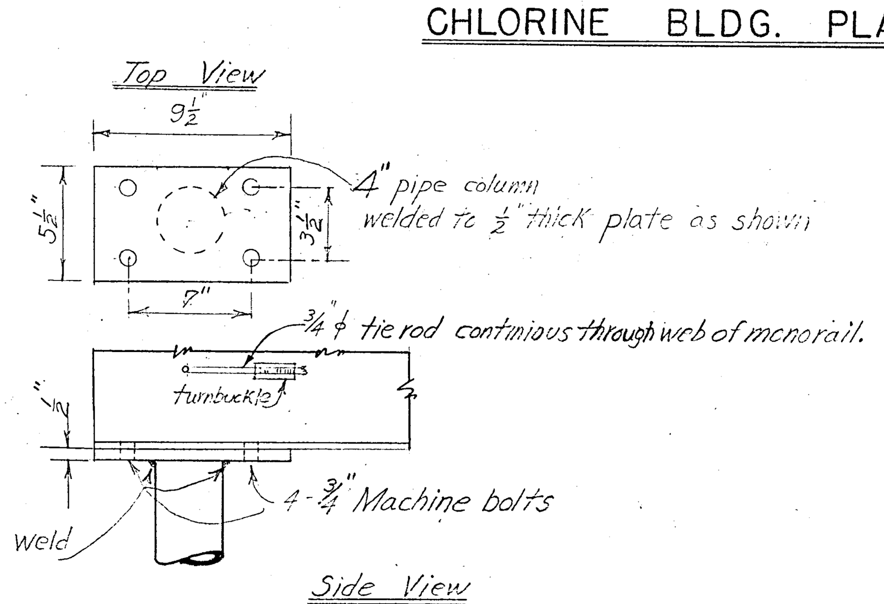
PIPE COLUMN BASE DETAIL AT CHLORINE BUILDING



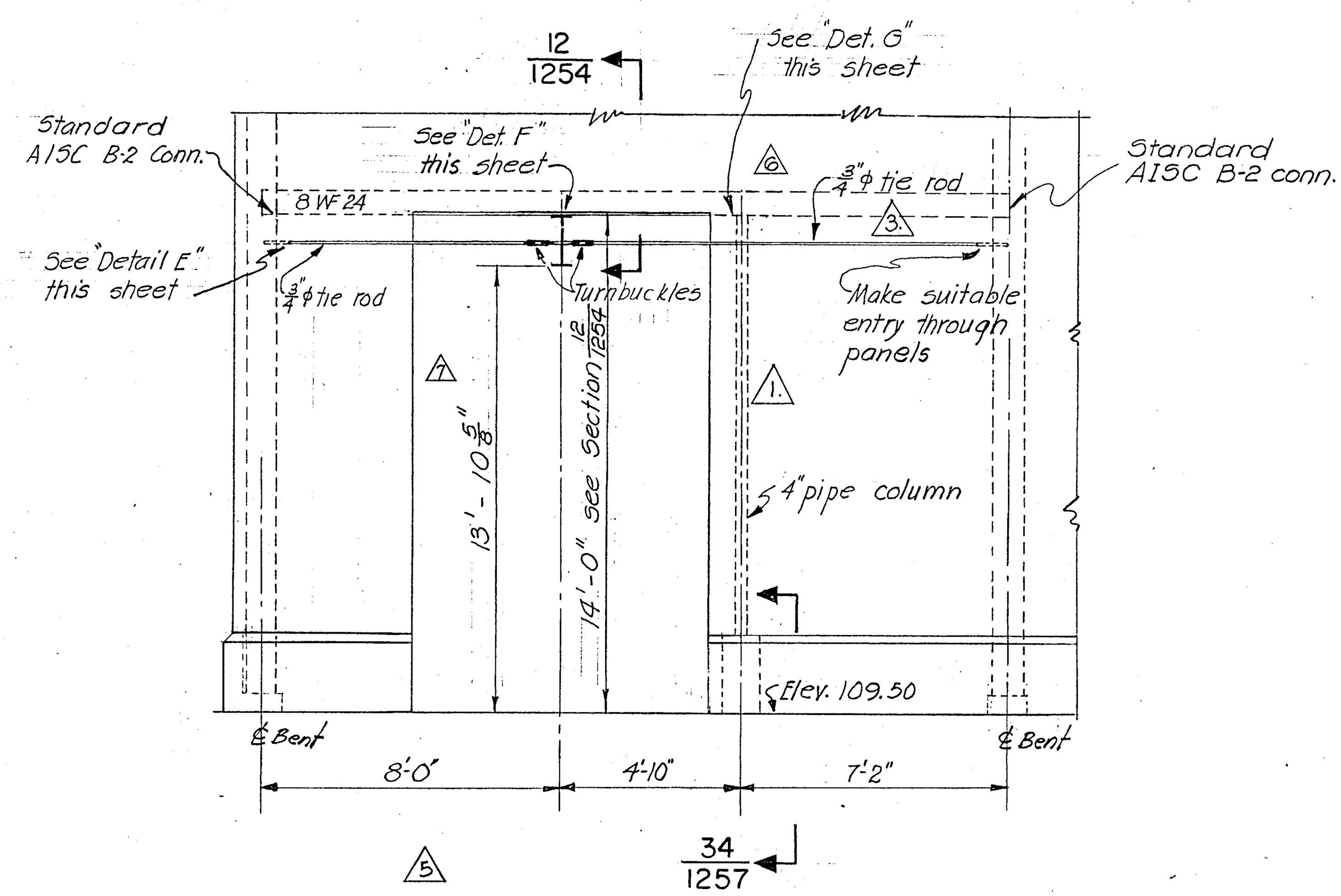
CRANE RUNWAY GIRDER TYPICAL CONNECTION



CHLORINE BLDG. PLAN

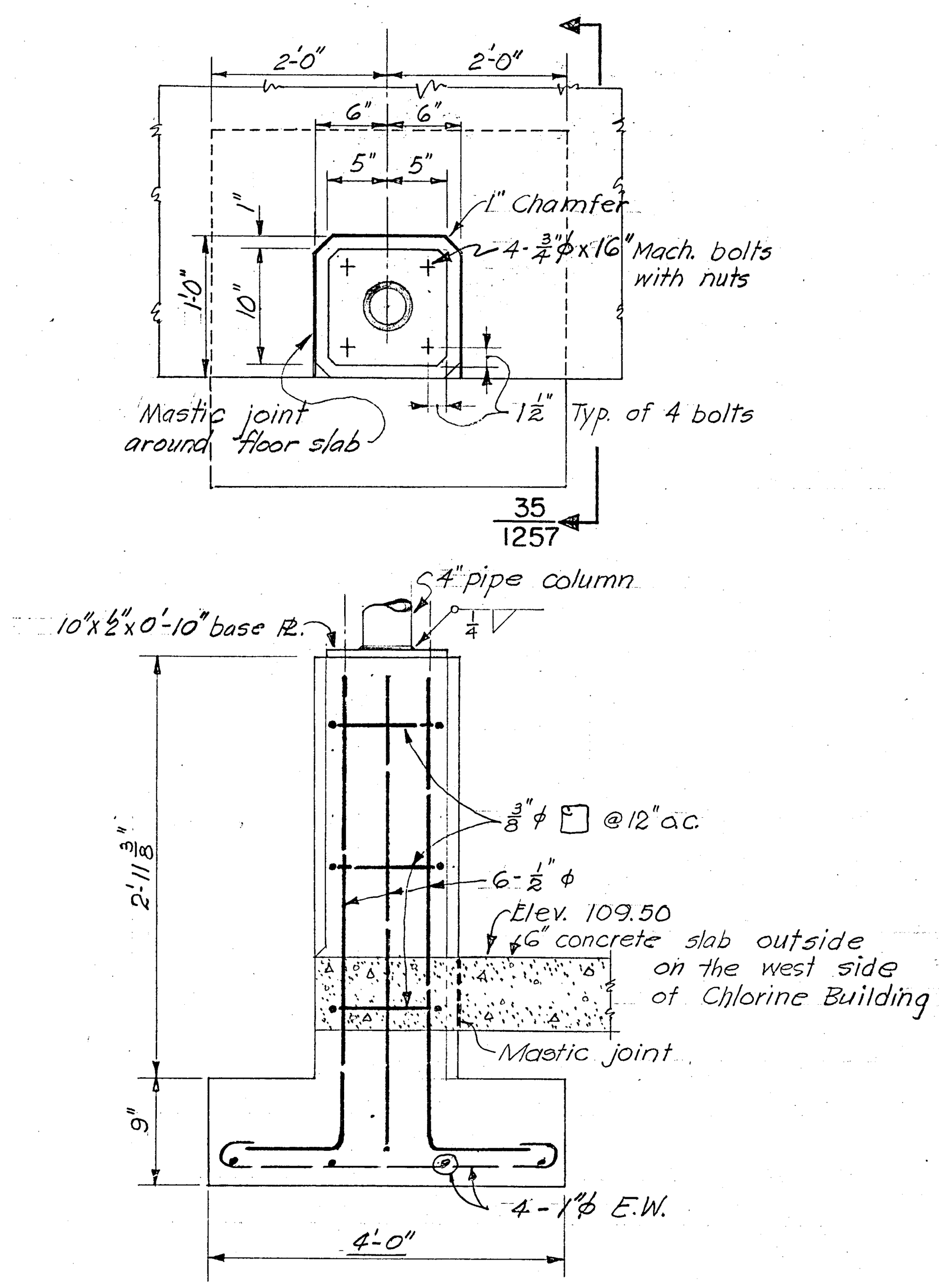


DETAIL "H"



WEST ELEVATION CHLORINE BUILDING

SCALE IN FEET



SECTION $\frac{35}{1257, 1254}$

PIPE COLUMN BASE DETAIL AT CHLORINE BUILDING OUTSIDE

APPROVED ______ CHIEF ENGINEER

As built Jan. 6, 1953

NO.	DATE	REVISIONS	MADE BY	CHKD. BY
7	9-27-51	Fixed Crane Girder spacing dimen.	EF	A.K.J.
6	8-20-51	Revised Crane Runway Girder spacing dimension. Extend 8WF24 to span from Bent Col. to Bent Col.	EF	VG
5	8-10-51	Miscellaneous corrections & add.	R.W.C	L.C.
4	8-1-51	Size of trans. crane girder	L.C.	E.P.
3	7-13-51	Added tie rods-monorail	K.R.	A.K.J.
2	7-13-51	Added stiffener to crane gir.	K.R.	A.K.J.
1	7-13-51	Changed internal support of monorail & size of pipe column	K.R.	A.K.J.

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

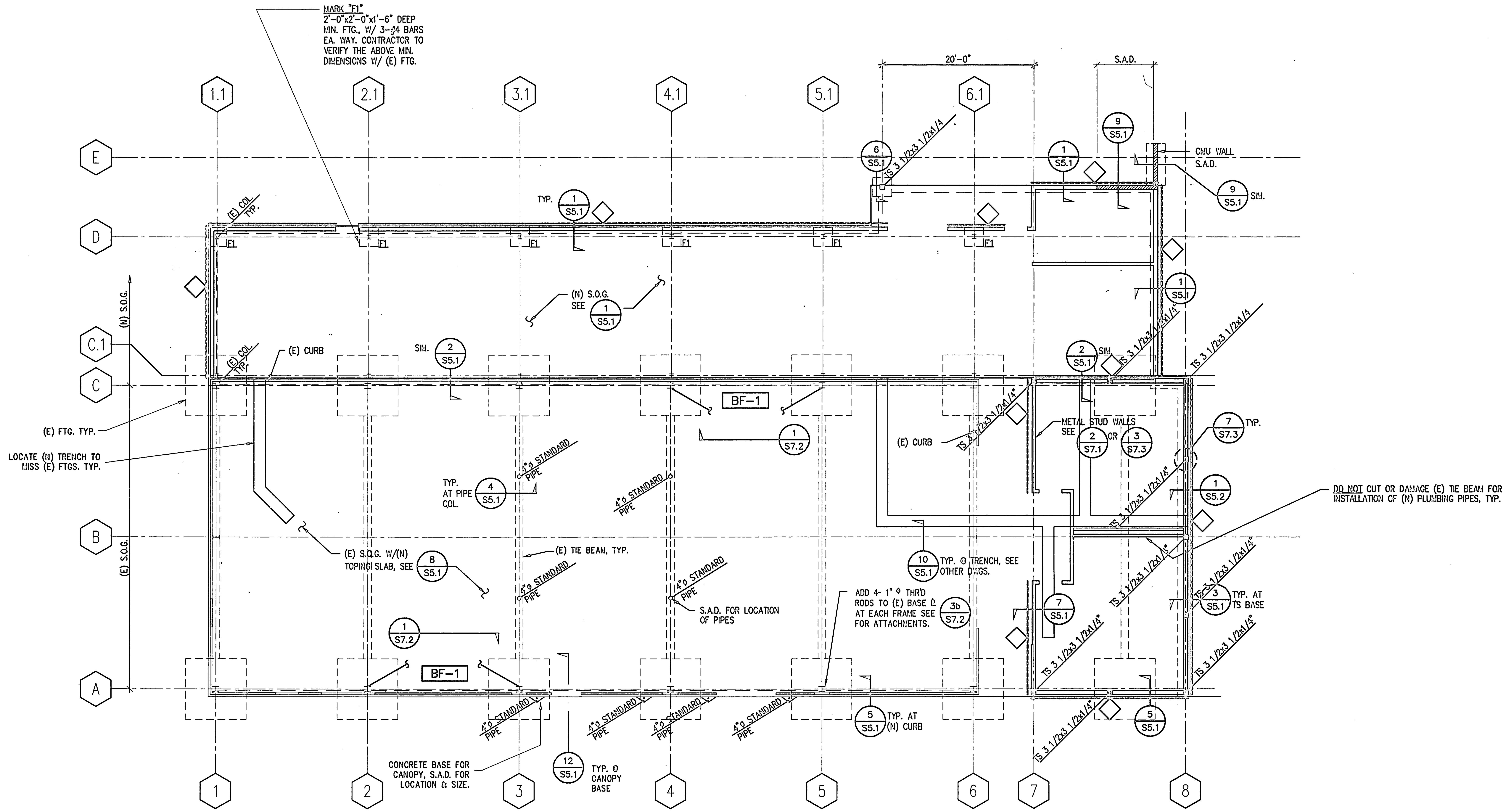
GARAGE BUILDING & CHLORINE BUILDING

OVERHEAD CRANE LOCATION

DESIGNED BY | DRAWN BY | TRACED BY
CHECKED BY | DATE 6-29-51 | SCALE
RECOMMENDED BY
APPROVED BY | No. VG 1257

FOUNDATION NOTES:

1. SEE GENERAL NOTES ON SHEET S1.1.
2. TOP OF EXISTING SLAB ON GRADE SHALL BE TAKEN TAKEN AS ELEVATION +0'-0" (DATUM ELEVATION = 109'-6")
3. FOR TYPICAL METAL STUD WALL, SEE 2/S7.1.
4. FOR METAL STUD WALL NOTES, SEE 1/S7.1.
5. PLYWOOD SHEATHED WALLS ARE INDICATED ON PLAN THUS: SEE DETAIL 3/S7.3 FOR ATTATCHMENT OF WALL SHEATHING TO METAL STUDS.
6. ALL ITEMS SHOWN ARE NEW UNLESS OTHERWISE NOTED THUS: (E)
7. ALL WALLS SHOWN ARE STRUCTURAL WALLS. FOR TYPICAL NONE-STRUCTURAL WALLS S.A.D.



FOUNDATION PLAN

1/8"=1'-0"

0 5' 10' 15' 20'

REGISTERED PROFESSIONAL ENGINEER S.E. 3131 Exp. 3-31-97 STRUCTURAL STATE OF CALIFORNIA

DATE:
FILE: 6165S21

DASSE DESIGN INC.
STRUCTURAL ENGINEERS
33 New Montgomery St., Suite 850
San Francisco CA 94105
415/243-8400 – Fax 415/243-9165

The Ratcliff Architects

NO.	DATE	REVISION	BY	REC.	APP.

DESIGNED BY	JGW
DESIGN CHECKED BY	DCH
DRAWN BY	CC
SR. PROJ. ENGR.	DCH
APPROVED	
PRINCIPAL-IN-CHARGE, R.P.E. NO.C	

EBMUD

PROJECT MGR. R.P.E. No.

PROJECT SUPERVISOR R.P.E. No. RPE# 46324

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

FIELD SERVICES WAREHOUSE IMPROVEMENTS

STRUCTURE

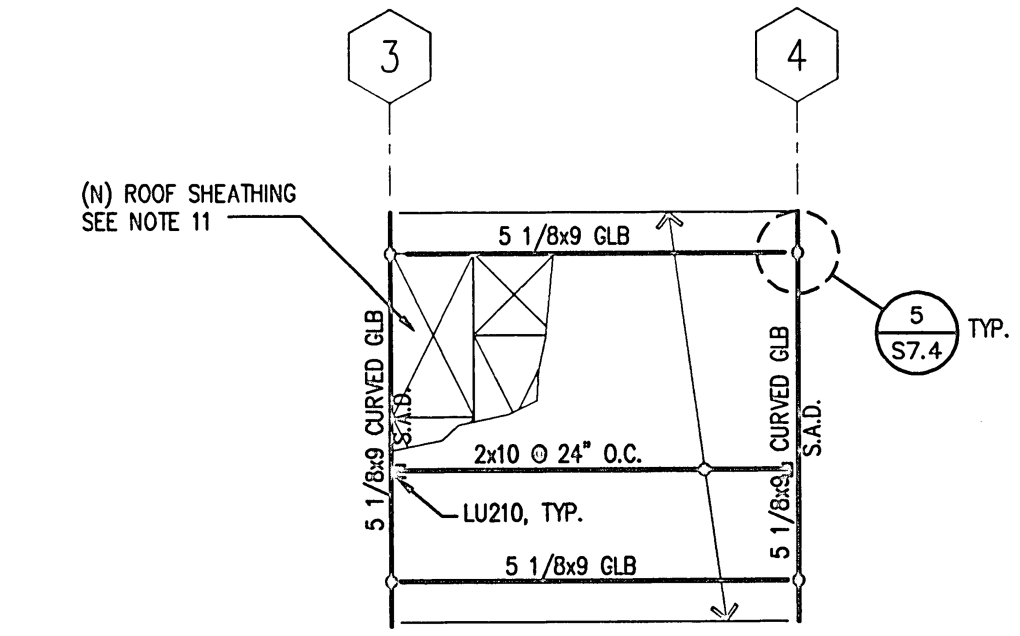
FOUNDATION PLAN

FACILITY	
SCALE	1/8" = 1'-0"
DATE	22 JULY 1993

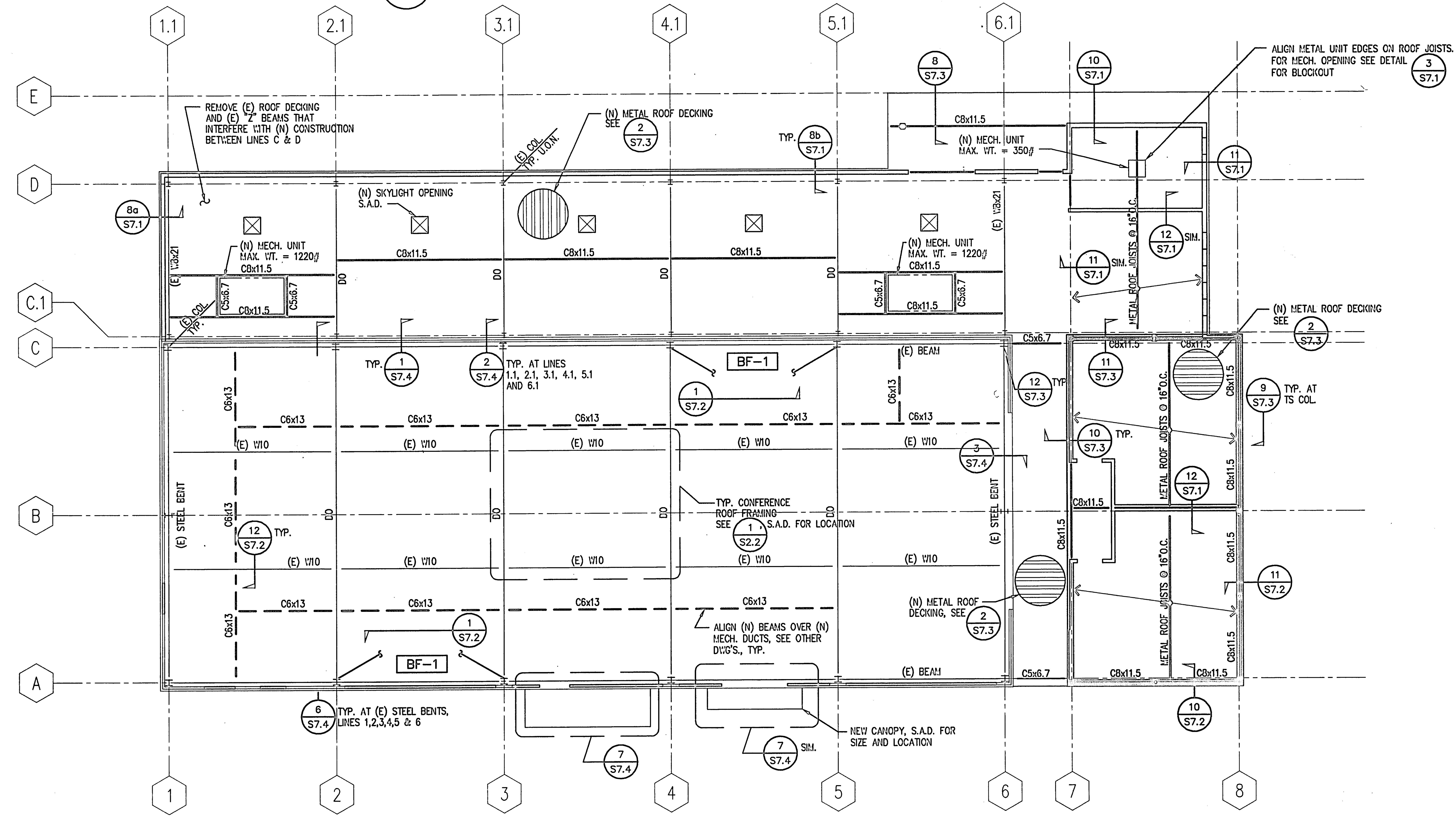
DRAWING No.
S2.1

SHEET – 29 OF – 62

SPECIFICATION NO.



1 CONFERENCE ROOM ROOF FRAMING PLAN
1/8"=1'-0"



EXISTING AND NEW ROOF FRAMING PLAN
1/8"=1'-0"

0 5' 10' 15' 20'

ROOF FRAMING NOTES

1. SEE GENERAL NOTES ON SHEET S1.1
2. FOR STRUCTURAL STEEL NOTES, SEE 6/S7.2
3. FOR STEEL DECKING NOTES, SEE 1/S7.3
4. FOR TYPICAL NEW METAL ROOF DECKING AND ATTACHMENT, SEE 2/S7.3
5. FOR TYPICAL METAL ROOF JOISTS, SEE 9/S7.1
6. FOR TYPICAL BEAM CONNECTIONS, SEE 8/S7.2 AND 9/S7.2.
7. ALL BEAMS SUPPORTED BY METAL STUD WALL SHALL HAVE A BOXED STUD SUPPORT, SEE 7C/S7.1.
8. WEIGHT OF NEW ROOFING MATERIAL SHALL NOT EXCEED 3 PSF.
9. FOR TYPICAL OPENINGS IN THE ROOF DECKING, SEE 4/S7.3, 5/S7.3 AND 6/S7.3.
10. ALL ITEMS SHOWN ARE NEW UNLESS OTHERWISE NOTED THUS: (E).
11. TYPICAL NEW ROOF SHEATHING AT THE CONFERENCE ROOM ROOF SHALL BE 15/32" CDX, WITH 10d AT 6"O.C. AT ALL PANEL EDGES AND 12"O.C. IN THE FIELD. SHEATHING SHALL BE PLACED WITH FACE GRAIN PERPENDICULAR TO THE FRAMING AND WITH END JOINTS STAGGERED. NO SHEATHING SHALL BE LESS THAN 2'-0" IN IT'S LEAST DIMENSION.

REGISTERED PROFESSIONAL ENGINEER S.E. 3131 Exp. 3-31-97 STRUCTURAL STATE OF CALIFORNIA

DATE:
FILE: 61651S22

DASSE DESIGN INC.
STRUCTURAL ENGINEERS
33 New Montgomery St., Suite 850
San Francisco CA 94105
415/243-8400 – Fax 415/243-9165

The Ratcliff Architects
5856 DOYLE STREET EMERYVILLE, CA 94608
(510) 652-1072

NO.	DATE	REVISION	BY	REC.	APP.

DESIGNED BY JCW
DESIGN CHECKED BY DCH
DRAWN BY CC
SR. PROJ. ENGR. DCH
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO.C

EBMUD
PROJECT MGR. R.P.E. No.
PROJECT SUPERVISOR R.P.E. No. RPE# 46324

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

FIELD SERVICES WAREHOUSE IMPROVEMENTS

STRUCTURE
ROOF FRAMING PLAN

FACILITY
SCALE 1/8" = 1'-0"
DATE 22 JULY 1993

DRAWING No. S2.2
SHEET - 30 OF - 62

SPECIFICATION NO.

GENERAL STRUCTURAL NOTES

I. GENERAL

A. SEE DRAWINGS OTHER THAN STRUCTURAL FOR: KINDS OF FLOOR FINISH AND THEIR LOCATION, FOR DEPRESSIONS IN FLOOR SLABS, FOR OPENINGS IN WALLS AND FLOORS REQUIRED BY ARCHITECTURAL AND MECHANICAL FEATURES, FOR ROADWAY PAVING, WALKS, RAMPS, STAIRS, CURBS, ETC.

B. HOLES AND OPENINGS THROUGH WALLS AND FLOORS FOR DUCTS, PIPING AND VENTILATIONS SHALL BE COORDINATED BY THE CONTRACTOR WHO SHALL VERIFY SIZES AND LOCATION OF SUCH HOLES OR OPENINGS WITH THE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS AND THESE SUB-CONTRACTORS.

C. NO PIPES OR DUCTS SHALL BE EMBEDDED IN SLABS OR WALLS UNLESS SPECIFICALLY DETAILED OR APPROVED BY THE OWNER.

D. DRAWINGS AND SPECIFICATIONS REPRESENT FINISHED STRUCTURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION INCLUDING BUT NOT LIMITED TO SHORING AND TEMPORARY BRACING. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO INSURE SAFETY OF ALL PERSONS AND STRUCTURES AT THE SITE AND ADJACENT TO THE SITE.

E. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AT JOB SITE BEFORE COMMENCING WORK AND SHALL REPORT ANY DISCREPANCIES TO THE OWNER.

F. OMISSIONS OR CONFLICTS BETWEEN VARIOUS ELEMENTS OF THE DRAWINGS, NOTES, AND DETAILS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND RESOLVED BEFORE PROCEEDING WITH THE WORK.

G. DO NOT USE SCALED DIMENSIONS; USE WRITTEN DIMENSIONS. WHERE NO DIMENSION IS PROVIDED, CONSULT THE OWNER FOR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.

H. IF CERTAIN FEATURES ARE NOT FULLY SHOWN OR CALLED FOR ON THE DRAWINGS OR SPECIFICATIONS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS FOR SIMILAR CONDITIONS THAT ARE CALLED FOR OR SHOWN.

I. WORK SHOWN IS NEW UNLESS NOTED AS EXISTING: (E).

J. EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM EXISTING CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL VERIFY ALL EXISTING JOB CONDITIONS, REVIEW ALL DRAWINGS AND VERIFY DIMENSIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ALL DISCREPANCIES AND EXCEPTIONS BEFORE PROCEEDING WITH THE WORK. DRAWINGS FOR THE EXISTING CONSTRUCTION ARE AVAILABLE FOR REVIEW.

K. THE REMOVAL, CUTTING, DRILLING, ETC. OF EXISTING WORK SHALL BE PERFORMED WITH GREAT CARE AND SMALL TOOLS IN ORDER NOT TO JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE BUILDING. IF STRUCTURAL MEMBERS OR MECHANICAL, ELECTRICAL, OR ARCHITECTURAL FEATURES NOT INDICATED FOR REMOVAL INTERFERE WITH THE NEW WORK, THE OWNER SHALL BE IMMEDIATELY NOTIFIED AND PRIOR APPROVAL SHALL BE OBTAINED BEFORE REMOVAL OF MEMBERS.

L. THE CONTRACTOR SHALL SAFELY SHORE EXISTING CONSTRUCTION WHEREVER EXISTING SUPPORTS ARE REMOVED TO ALLOW THE INSTALLATION OF THE NEW WORK. ALL SHORING METHODS AND SEQUENCING OF DEMOLITION SHALL BE SPECIFIED BY A LICENSED STRUCTURAL ENGINEER TO BE RETAINED BY THE CONTRACTOR. SEE SPECIFICATIONS FOR DETAILED REQUIREMENTS.

M. THE CONTRACTOR SHALL PERFORM THE WORK WITH A MINIMUM OF INCONVENIENCE TO THE OWNER AND SO AS NOT TO INTERRUPT THE DAY TO DAY WORK OPERATIONS. THE CONTRACTOR SHALL ENSURE SAFE PASSAGE OF PERSONS AROUND AREAS OF CONSTRUCTION AND SHALL CONDUCT OPERATIONS TO PREVENT DAMAGE OR HARM TO THE FACILITIES AND PEOPLE. COORDINATE ALL OPERATIONS WITH THE OWNER OR HIS AGENT.

N. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES BEFORE BEGINNING WORK. SPECIAL CARE SHALL BE TAKEN TO PROTECT UTILITIES THAT ARE TO REMAIN IN SERVICE DURING CONSTRUCTION.

O. THE CONTRACTOR SHALL PROMPTLY REPAIR DAMAGE CAUSED DURING OPERATIONS WITH SIMILAR MATERIALS AND WORKMANSHIP.

II. DEMOLITION NOTES

A. GENERAL

1. DEMOLITION SHALL BE LIMITED TO STRUCTURAL MEMBERS AS NOTED ON THE PLANS.

2. WHERE ANY DOUBT EXISTS AS TO THE EXTENT, METHOD, OR SEQUENCE OF DEMOLITION, THE CONTRACTOR SHALL CONTACT THE OWNER BEFORE PROCEEDING.

3. ALL DEMOLITION WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN NATIONAL STANDARDS INSTITUTE, "AMERICAN NATIONAL STANDARD SAFETY REQUIREMENTS FOR DEMOLITION" (ANSI A10.6).

4. ALL SHORING METHODS AND SEQUENCING OF DEMOLITION SHALL BE SPECIFIED BY A LICENSED STRUCTURAL ENGINEER TO BE RETAINED BY THE CONTRACTOR. SEE SPECIFICATIONS FOR DETAILED REQUIREMENTS.

B. PROTECTION

1. PROVIDE ADEQUATE PROTECTION FOR EXISTING BUILDING AND ITS CONTENTS WHERE WORK IS BEING PREFORMED; UTILIZE TEMPORARY ENCLOSURES TO PREVENT PUBLIC ACCESS TO CONSTRUCTION WORK; AND PROVIDE BARRIERS FOR NOISE AND DUST WHERE NEEDED.

2. ERECT AND MAINTAIN TEMPORARY BRACING, SHORING, LIGHTS, BARRICADES, WARNING SIGNS, AND GUARDS NECESSARY TO PROTECT THE PUBLIC, THE OWNER'S EMPLOYEES, CONSTRUCTION PERSONNEL, BUILDING FINISHES AND IMPROVEMENTS TO REMAIN AND ADJOINING PROPERTY FROM DAMAGE, ALL IN ACCORDANCE WITH APPLICABLE REGULATIONS.

3. THE CONTRACTOR SHALL SAFELY SHORE EXISTING CONSTRUCTION WHEREVER EXISTING SUPPORTS ARE REMOVED TO ALLOW THE INSTALLATION OF THE NEW WORK. SHORING SHALL BE COORDINATED WITH EXISTING CONSTRUCTION TO REMAIN AS WELL AS NEW CONSTRUCTION. SHORING SHALL REMAIN IN PLACE UNTIL ALL NEW CONSTRUCTION HAS BEEN COMPLETED.

C. EXECUTION

1. ENTIRE BEAMS, GIRDERS, SLABS, COLUMNS, AND WALLS SHALL BE CONTINUOUSLY SUPPORTED WITH SHORING AND ADEQUATELY BRACED DURING DEMOLITION OF ANY PORTION THEREOF.

2. SHORING SHALL BE SUPPORTED OVER AS LARGE AN AREA AS PRACTICAL SUCH THAT CONSTRUCTION LOADING IS WELL DISTRIBUTED.

3. ALL CUTTING, CHIPPING, AND DRILLING SHALL BE LIMITED TO DEPTHS AS SHOWN. NO OVERCUTTING IS PERMITTED.

4. WHERE EXISTING REINFORCING IS TO BE LEFT INTACT, CARE SHALL BE TAKEN TO AVOID BENDING SUCH REINFORCING.

5. ALL PATCHING SHALL BE PRECEDED WITH THE APPLICATION OF A BONDING AGENT (SEE SPECIFICATIONS).

6. IF CONDITIONS EXIST, OTHER THAN THOSE SITUATIONS NOTED ON THE DRAWINGS, WHICH REQUIRE REINFORCING TO BE CUT, THE OWNER SHALL BE NOTIFIED BEFORE PROCEEDING.

III. DESIGN BASIS

A. APPLICABLE CODE: UNIFORM BUILDING CODE (UBC), 1994 EDITION.

B. VERTICAL LIVE LOADS:

1. ROOF: 20 PSF PLUS MECHANICAL.

C. LATERAL LOADS:

1. DESIGN WIND PRESSURE = 17.4 #/s.f., Ce = 1.06, Cq = 1.3, qs = 12.6, I = 1.0

2. SEISMIC: V = 0.206 W, Z = 0.4, I = 1.0, Rw = 8, C = 2.75, S = 2.0, N = 1.5 (EBMUD FACTOR) S4 SITE

IV. MATERIALS

A. CONCRETE

1. REINFORCING STEEL:

a. BARS: ASTM A615, GRADE 60.

b. WELDED BARS: ASTM A706, GRADE 60.

c. WELDED WIRE FABRIC: ASTM 185.

d. ALL CONCRETE SHALL BE REINFORCED UNLESS SPECIFICALLY MARKED 'NOT REINFORCED.'

2. CONCRETE CLASSES: SEE SPECIFICATIONS FOR REQUIREMENTS.

CLASS	USE	WT	STRENGTH
A.	FOUNDATIONS. SLABS-ON-GRADE	145 PCF	3000 PSI

3. MINIMUM CONCRETE COVER FOR REINFORCING STEEL:

a. SURFACES PLACED AGAINST EARTH 3"

b. FORMED SURFACES BELOW GRADE 2"

c. SURFACES EXPOSED TO WEATHER 2"

d. SLABS AND WALLS NOT EXPOSED TO WEATHER 1"

4. EPOXY FOR DOWELS AND ANCHORS SHALL BE HS 200 SOLID BOND AS MANUFACTURED BY "ANCHOR IT" FASTENING SYSTEMS OR APPROVED EQUAL. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

B. WOOD

1. FRAMING LUMBER - DOUGLAS FIR;

a. JOISTS AND RAFTERS: NO. 1.

b. POSTS, BEAMS, AND HEADERS: NO. 1.

c. STUDS, PLATES, BLOCKS, LIGHT FRAMING AND MISC: NO. 2.

d. ALL LUMBER IN CONTACT WITH CONCRETE OR MASONRY TO BE PRESERVATIVE TREATED.

2. PLYWOOD SHEATHING:

a. ROOF SHEATHING: 15/32 INCH C-D EXTERIOR APA RATED 32/16.

3. GLUED-LAMINATED BEAMS:

a. 24F V4 FOR SIMPLE SPANS AND 24F V8 FOR CANTILEVERED AND CONTINUOUS BEAMS.

b. INDUSTRIAL GRADE TYP., ARCHITECTURAL GRADE IF EXPOSED.

c. CAMBER TO RADIUS OF 1600' U.O.N.

4. FRAMING HARDWARE: AS MANUFACTURED BY SIMPSON CO. OR APPROVED EQUAL. SIMPSON DESIGNATIONS USED.

5. NAILS: COMMON WIRE GAGE U.O.N. NAILING TO CONFORM TO UBC TABLE 23-I-G U.O.N.

6. BOLTS: ASTM A307.

C. STEEL

1. SHAPES AND PLATES: ASTM A36 EXCEPT COLUMNS: ASTM A572 GRADE 50; TUBES: ASTM A500, GRADE B; PIPES: ASTM A53, GRADE B.

2. BOLTS: ASTM A325SC.

3. STEEL DECK: ASTM A446, GRADE A.

4. WELDING ELECTRODES: E-70.

5. ANCHOR BOLTS: ASTM A307 AND ASTM A449 AS NOTED.

V. QUALITY CONTROL

A. THE FOLLOWING WORK REQUIRES TESTS AND/OR INSPECTIONS. FOR SPECIFIC REQUIREMENTS SEE SPECIFICATION. INSPECTIONS SHALL BE MADE IN ACCORDANCE WITH UBC 1701 BY A CERTIFIED SPECIAL INSPECTOR RETAINED BY THE OWNER.

1. FOOTING EXCAVATION

2. REINFORCING STEEL

3. CONCRETE

4. EXPANSION BOLTS

5. GROUTED DOWELS

6. WELDING: STRUCTURAL STEEL, METAL DECK

B. A PARTIAL LISTING OF REQUIRED STRUCTURAL SUBMITTALS FOLLOWS. CONSULT THE SPECIFICATION FOR A COMPLETE LISTING OF SUBMITTAL REQUIREMENTS.

1. CONCRETE MIX DESIGNS

2. CONSTRUCTION JOINT LAYOUT & CONTROL JOINT LAYOUT

3. REINFORCING STEEL SHOP DRAWINGS

5. STRUCTURAL STEEL SHOP DRAWINGS

6. GLULAM BEAM SHOP DRAWINGS

7. MANUFACTURER'S DATA FOR INSERTS, GROUTS & EPOXIES

C. EXPANSION ANCHOR GENERAL NOTES

1. TYPICAL EXPANSION BOLTS ARE HILTI KWIK-BOLTS II AND SHALL COMPLY TO ICBO REPORT #4627 (5/91). ALLOWABLE LOAD WITH F'c=3000 PSI (NORMAL WEIGHT CONCRETE).

DIA.	MINIMUM EMBED.	SHEAR	TENSION	TENSION TEST VALUE	TORQUE TEST VALUE
3/8"	1-5/8"	780#	492#	984#	25 FT-LBS.
1/2"	2-1/4"	1472#	984#	1968#	50 FT-LBS.
3/4"	3-1/4"	3100#	1740#	3480#	150FT-LBS.

THESE LOADS CORRESPOND TO 80% OF THE ICBO ALLOWABLES. INCREASE FOR COMBINATION WITH WIND OR SEISMIC FORCES IS NOT ALLOWED. SPECIAL INSPECTION OF EXPANSION BOLTS IS REQUIRED.

2. INSTALLATION: INSTALL EXPANSION BOLTS IN ACCORDANCE WITH THE REQUIREMENTS GIVEN IN ICBO RESEARCH COMMITTEE RECOMMENDATIONS FOR THE SPECIFIC EXPANSION BOLT.

3. FIELD TESTING: TENSION TEST DRILLED IN ANCHORAGE TO 100 PERCENT TIMES THE ICBO ALLOWABLE LOAD WITH SPECIAL INSPECTION, OR TORQUE TEST TO VALUES AS TABULATED IN NOTE 1 ABOVE. TESTS SHALL BE MADE IN THE PRESENCE OF THE OWNER'S PROJECT REPRESENTATIVE. TEST 50% OF EACH DIAMETER GROUP OF EXPANSION BOLTS. IF ANY ANCHOR FAILS TESTING, TEST ALL ANCHORS OF THE SAME CATEGORY NOT PREVIOUSLY TESTED UNTIL 20 CONSECUTIVE PASS. TESTING SHOULD OCCUR 24 HOURS MINIMUM AFTER INSTALLATION OF THE SUBJECT ANCHORS. ALL ANCHORS INSTALLED THAT DAY SHALL BE TESTED, ALL COSTS OF SUCH TESTS AND INSPECTIONS SHALL BE AT THE CONTRACT'S EXPENSE.

4. TENSION TESTS: APPLY TEST LOADS TO EXPANSION BOLTS WITHOUT REMOVING THE NUT, IF POSSIBLE. IF NOT, REMOVE NUT AND INSTALL A THREADED COUPLER TO THE SAME TIGHTNESS OF THE ORIGINAL NUT USING A TORQUE WRENCH AND APPLY LOAD. REACTION LOADS FROM TEST FIXTURES MAY BE APPLIED CLOSE TO THE ANCHOR BEING TESTED, PROVIDED THE BOLT IS NOT RESTRAINED FROM WITHDRAWING BY THE FIXTURE. TEST EQUIPMENT IS TO BE CALIBRATED BY AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH STANDARD RECOGNIZED PROCEDURES. BOLTS SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE TEST LOAD TO BE ACCEPTABLE. (OBSERVABLE MOVEMENT IS DEFINED AS THE WASHER UNDER THE NUT BECOMING LOOSE).

5. TORQUE WRENCH TEST: THE APPLICABLE TEST TORQUE MUST BE REACHED WITHIN ONE-HALF (1/2) TURN OF THE NUT.

6. WHEN INSTALLING DRILLED-IN ANCHORS AND /OR POWDER DRIVEN PINS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS.

VI. ABBREVIATIONS

	DIAMETER	MECH.	MECHANICAL
&	AND	MFR	MANUFACTURER
@	AT	MTL.	METAL
A.B.	ANCHOR BOLT	MIN.	MINIMUM
ARCH.	ARCHITECTURAL	MISC.	MISCELLANEOUS
BLDG.	BUILDING	N.I.C.	NOT IN CONTRACT
BLKG.	BLOCKING	NOM.	NOMINAL
BM.	BEAM	NTS.	NOT TO SCALE
BOT.	BOTTOM	O.C.	ON CENTER
℄	CENTER LINE	O.D. (I.D.)	OUTSIDE (INSIDE) DIAMETER
C.B.	COLUMN BASE	OPG.	OPENING
C.J.	CONSTRUCTION JOINT	OPP.	OPPOSITE
CLR.	CLEAR	P.A.	PURLIN ANCHOR
CMU.	CONCRETE MASONRY UNIT	P.A.F.	POWER ACTUATED FASTENER
COL.	COLUMN	PL	PLATE
CONN.	CONNECTION	P.P.	PARTIAL PENETRATION
CONT.	CONTINUOUS	PLY.	PLYWOOD
C.P. (P.P.)	COMPLETE PENETRATION	PT.	POINT
CTR.	CENTER	PTN.	PARTITION
CTRSK	COUNTERSINK	REF.	REFERENCE
DET.	DETAIL	REINF.	REINFORCEMENT
D.F.	DOUGLAS FIR	REQ.	REQUIRED
DWG.	DRAWING	RWD.	REDWOOD
(E)	EXISTING	S.A.D.	SEE ARCHITECTURAL DRAWINGS
EA.	EACH	SCHED.	SCHEDULE
E.F.	EACH FACE	SECT.	SECTION
EL. OR ELEV.	ELEVATION	SHT.	SHEET
ELECT.	ELECTRICAL	SIM.	SIMILAR
E.N.	END (OR EDGE) NAILING	S.M.S.	SHEET METAL SCREWS
E.W.	EACH WAY	SPA	SPACE
EXT.	EXTERIOR	SPEC.	SPECIFICATION
FDN.	FOUNDATION	SQ.	SQUARE
FIN.	FINISH	ST.	STRAP TIE
FL. OR FLR	FLOOR	STAGG.	STAGGERED
F.O.C.	FACE OF CONCRETE	STD.	STANDARD
F.O.S.	FACE OF STUD	STL.	STEEL
FRM'G	FRAMING	STRUCT.	STRUCTURAL
FTG.	FOOTING	SYM.	SYMMETRICAL
GA.	GAUGE	T&B	TOP AND BOTTOM
GALV.	GALVANIZED	T&G	TONGUE AND GROOVE
GLB.	GLU-LAMINATED BEAM	THD.	THREADED
H.D.	HOLD DOWN	T.D.	TIE DOWN
HORIZ.	HORIZONTAL	T.O.C.	TOP OF CONCRETE
HSB	HIGH STRENGTH BOLT	T.O.S.	TOP OF STEEL
HT.	HEIGHT	T.W.	TOP OF WALL
INT.	INTERIOR	T.P.	TOP OF PLATE
J.H.	JOIST HANGER	TYP.	TYPICAL
JT.	JOINT	U.O.N.	UNLESS OTHERWISE NOTED
LLH (LLV)	LONG LEG HORIZONTAL (OR VERTICAL)	VERT.	VERTICAL
LT.	LIGHT	W/	WITH
LT. WT.	LIGHT WEIGHT	W/O	WITHOUT
M.B.	UNFINISHED MACHINE BOLTS	W.P.	WORK POINT
MAX.	MAXIMUM	WT.	WEIGHT

REGISTERED PROFESSIONAL ENGINEER
S.E. 3131
Exp. 3-31-97
STRUCTURAL
STATE OF CALIFORNIA

DATE:
FILE: 61651541

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NO.	DATE	REVISION	BY	REC.	APP.

DESIGNED BY JGW
DESIGN CHECKED BY DCH
DRAWN BY CC
SR. PROJ. ENGR. DCH
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO.C

EBMUD
PROJECT MGR. R.P.E. No.
PROJECT SUPERVISOR R.P.E. No. 46324

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

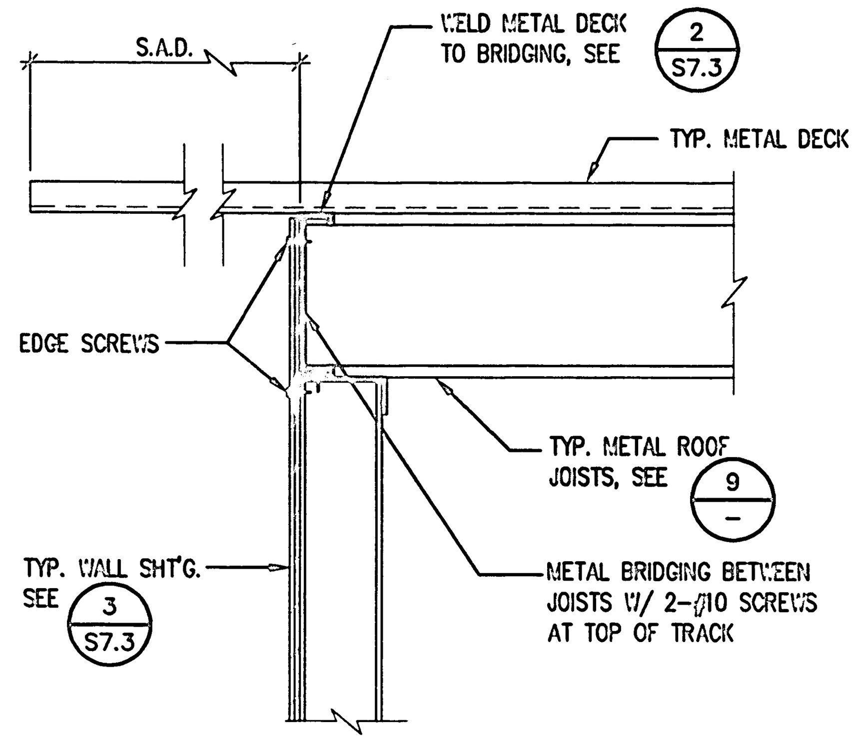
FIELD SERVICES WAREHOUSE IMPROVEMENTS

STRUCTURE
GENERAL NOTES

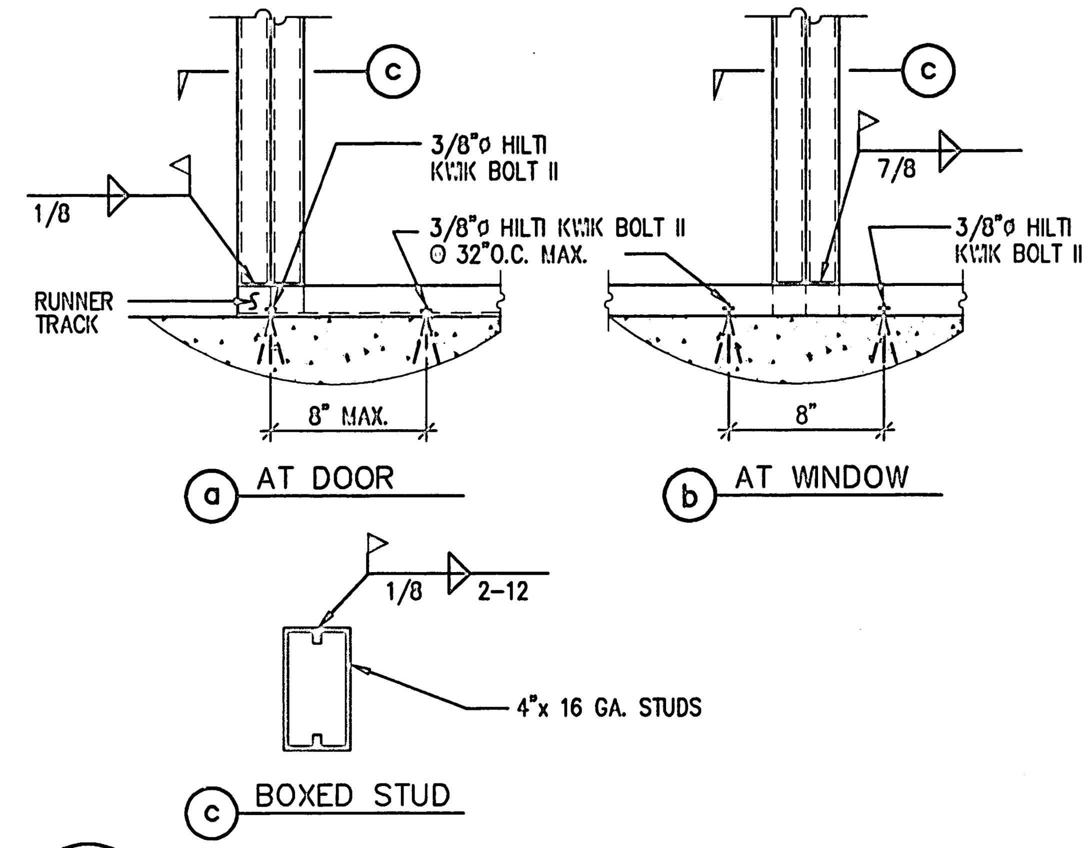
FACILITY
SCALE AS NOTED
DATE 22 JULY 1996

DRAWING No.
S4.1 31
SHEET SHEET ~~OF~~ OF 62

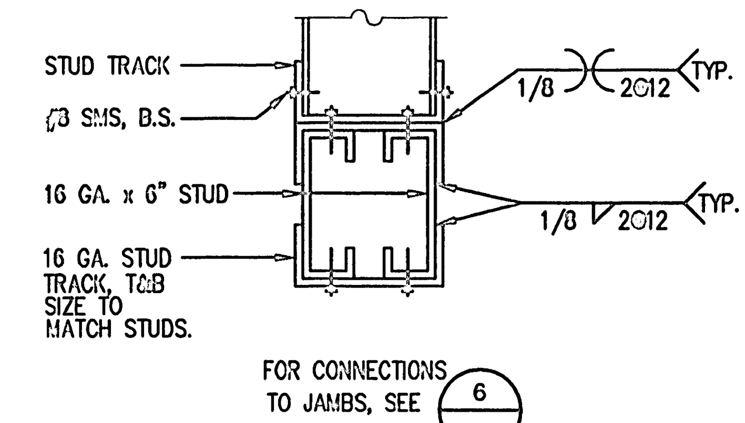
SPECIFICATION NO.



10 / – DETAIL
1 1/2"=1'-0"



7 / – BOXED STUD JAMB BASE SIMILAR AT TOP
1 1/2"=1'-0"

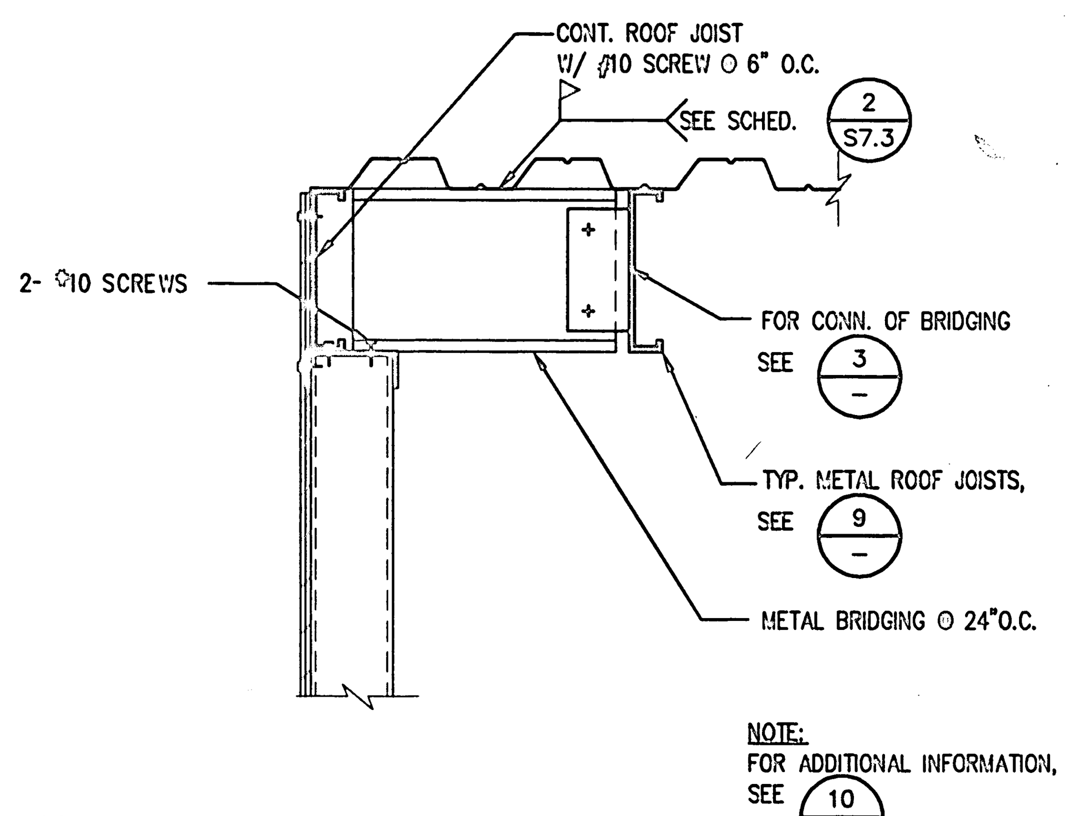


4 / – TYP. HEADER

STEEL STUD NOTES

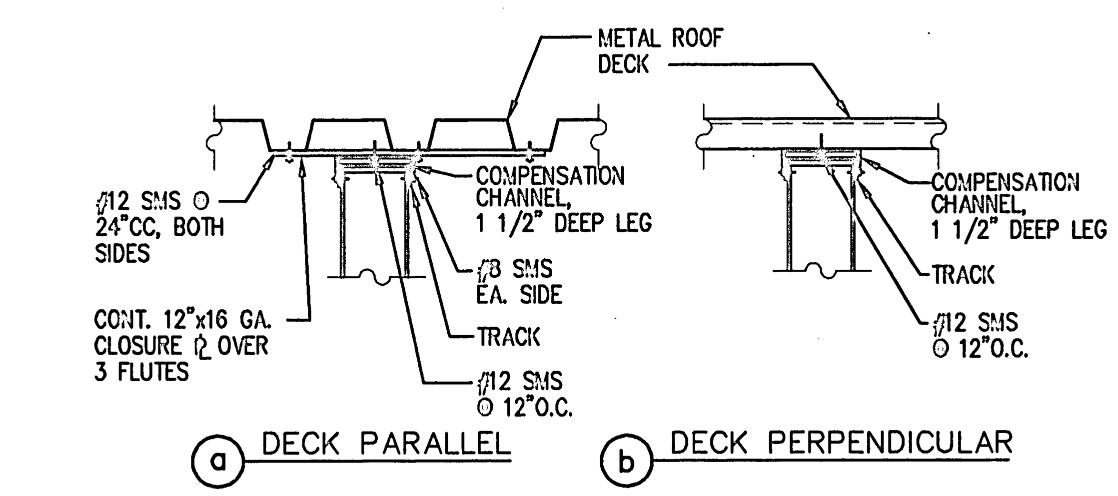
1. ALL STUDS AND TRACKS SHALL BE FORMED FROM STANDARD COMMERCIAL STEEL ASTM A570, WITH A MINIMUM YIELD POINT OF 33,000 PSI FOR MATERIAL 18 GAUGE AND THINNER AND 50,000 PSI FOR MATERIAL 16 GAUGE AND THICKER.
2. ALL FRAMING COMPONENTS SHALL BE CUT SQUARELY OR ON AN ANGLE (SUCH AS BRACING) TO SQUARELY FIT AGAINST ABUTTING MEMBERS. MEMBERS SHALL BE HELD FIRMLY IN POSITION UNTIL PROPERLY FASTENED.
3. STUDS AND TRACKS SHALL BE ATTACHED BY WELDING AND SELF DRILLING SCREWS AS NOTED ON THE DRAWINGS.
4. BUTT WELDS OR SPLICES SHALL BE USED AT ALL JOINTS IN TRACK. SPLICES IN STUDS OR BRACES SHALL NOT BE PERMITTED. ALL WELDS SHALL BE FILLET PLUG, BUTT OR SEAM WELDS. WHERE STUDS ARE BURNED THROUGH BY WELDING, PROVIDE SUITABLE STITCH PLATE OF SAME GAUGE.
5. STEEL STUDS SHALL BE AS MANUFACTURED BY ANGELES METAL SYSTEMS OR EQUAL PRODUCT SUBSTITUTED PER SPECIFICATIONS. MINIMUM STUD PROPERTIES SHALL BE AS LISTED IN SPECIFICATIONS SECTION 05400. MAXIMUM STUD SPACING IS 16" c.c. UNLESS OTHERWISE NOTED.
6. RUNNER TRACKS SHALL BE THE SAME GAGE AS STUDS SUPPORTED, UNLESS OTHERWISE NOTED. TRACKS SHALL BE FASTENED TO STRUCTURE AT 24" c.c. MAXIMUM UNLESS OTHERWISE NOTED.
7. PROVIDE BLOCKING OF WALL STUDS AT 3'– 6" c.c. MAXIMUM PER DETAIL 3 / – WHERE SHEATHING IS NOT PRESENT ON BOTH SIDES OF STUDS.
8. WHERE NECESSARY, STEEL STUDS SHALL BE COORDINATED WITH GLAZING MANUFACTURER, MECHANICAL, ELECTRICAL AND ALL OTHER TRADES. SEE GENERAL NOTES ON S4.1.

1 / – STEEL STUD NOTES

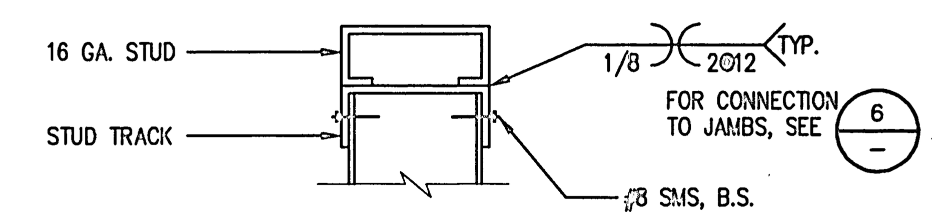


NOTE:
FOR ADDITIONAL INFORMATION, SEE 10 / –

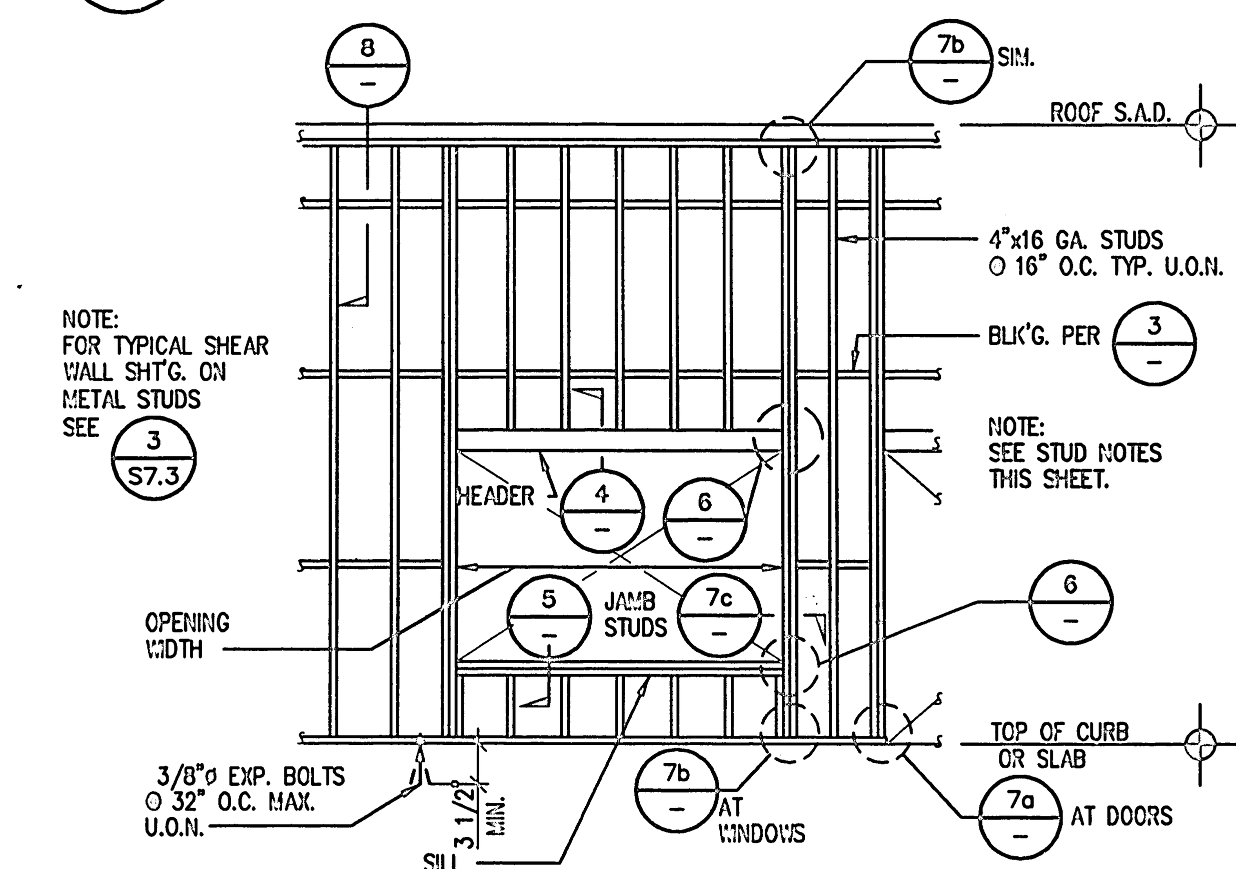
11 / – DETAIL
1 1/2"=1'-0"



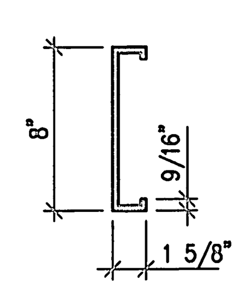
8 / – TRACK TO ROOF DECK
1 1/2"=1'-0"



5 / – TYPICAL SILL



2 / – TYPICAL WALL FRAMING
1/4"=1'-0"

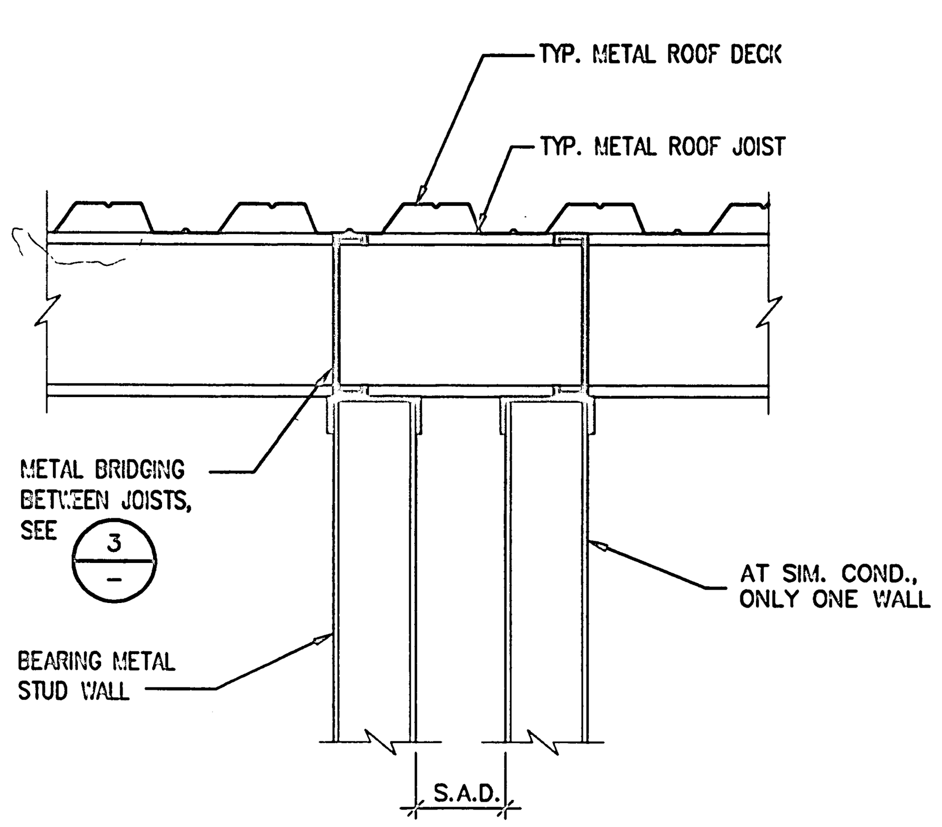


8WCS16
$A = 0.563 \text{ IN}^3$
$S_x = 1.509 \text{ IN}^3$
$I_x = 6.038 \text{ IN}^4$

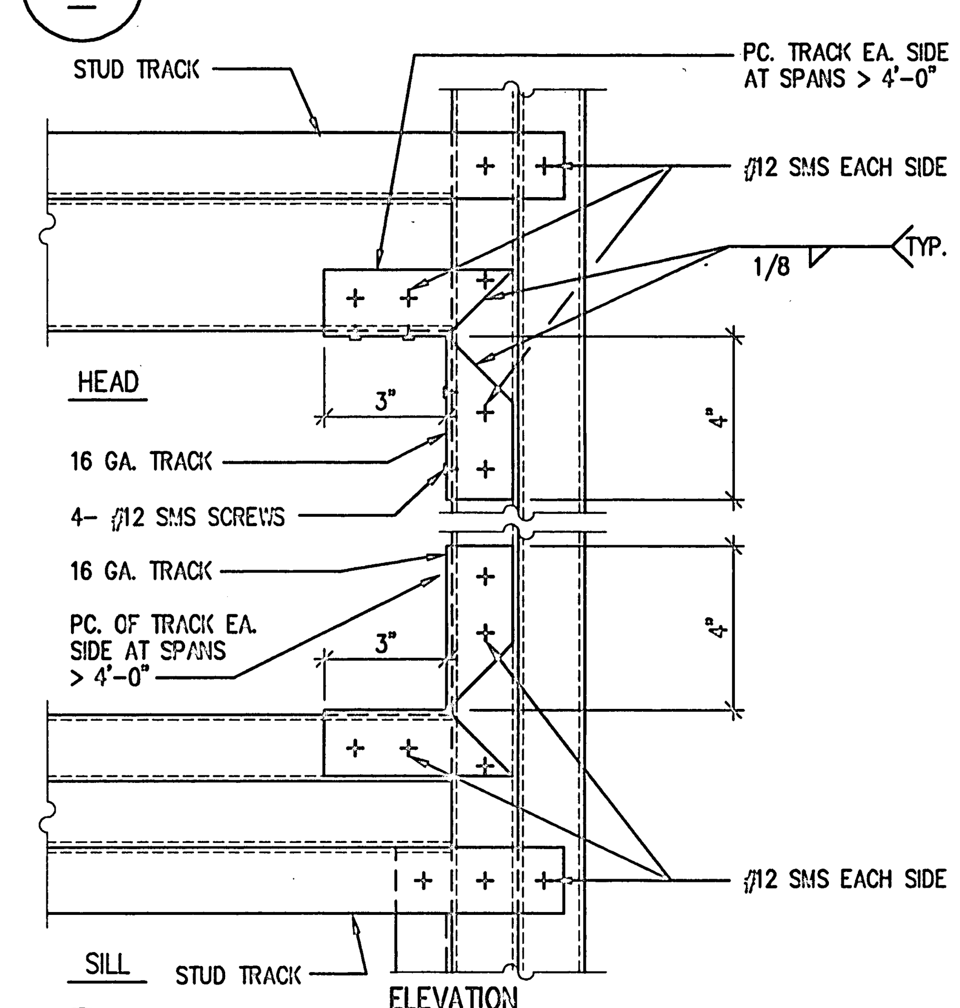
STEEL JOIST NOTES

1. SEE GENERAL NOTES ON SHEET S4.1.
2. STEEL JOISTS SHALL BE MANUFACTURED USING HOT ROLLED STEEL SECTIONS HAVING A MINIMUM YIELD STRENGTH OF 50,000 PSI.
3. STEEL JOISTS SHALL BE AS MANUFACTURED BY WESTERN METAL LATH AND STEEL FRAMING FOR BOTH LOAD CARRYING AND DEFLECTION RATING. ANY SUBSTITUTION MUST BE APPROVED BY THE STRUCTURAL ENGINEER AND OCS.
4. JOIST MANUFACTURER TO PROVIDE FULL DEPTH BRIDGING AT 8'-0" O.C.
5. DO NOT FIELD CUT, DRILL OR ALTER STEEL JOISTS U.O.N. IN DETAILS.

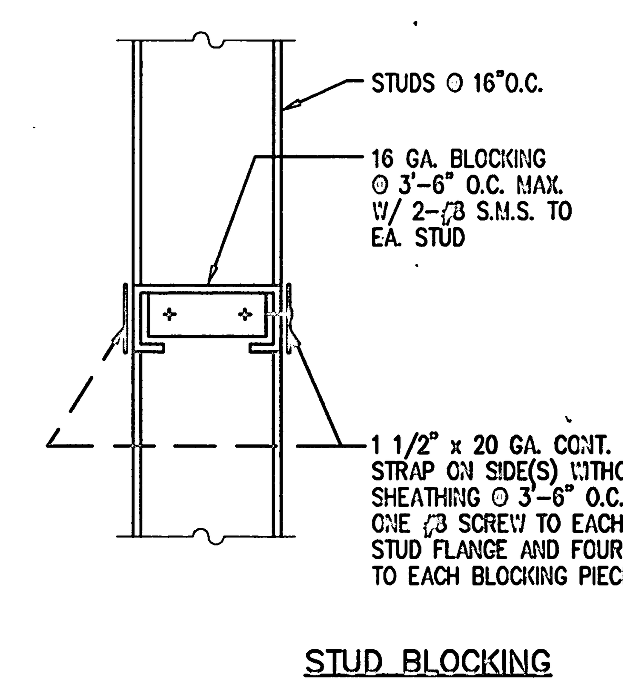
9 / – TYPICAL METAL ROOF JOISTS



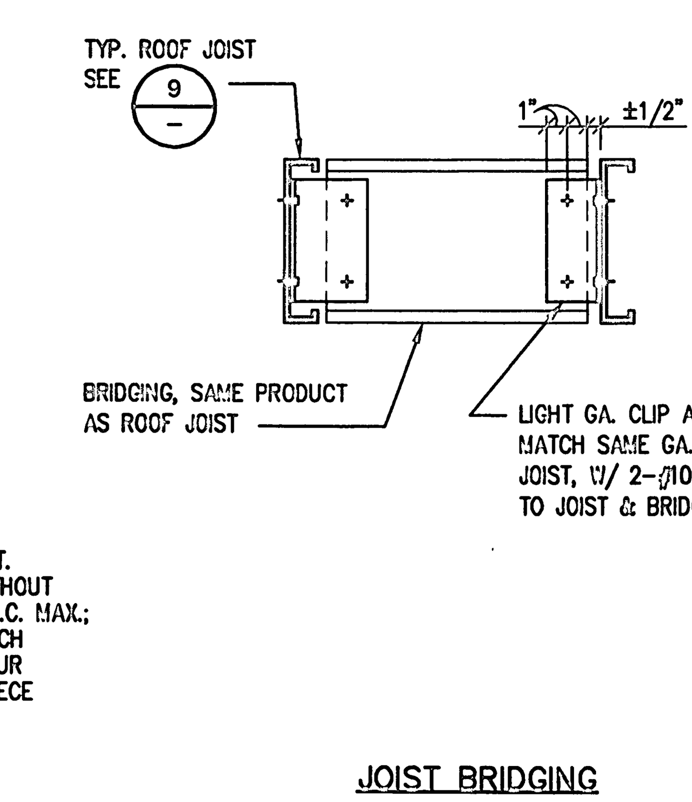
12 / – DETAIL
1 1/2"=1'-0"



6 / – HEAD & SILL DETAILS AT JAMB



STUD BLOCKING



JOIST BRIDGING

3 / – BLOCKING
3"=1'-0"

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
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FIELD SERVICES WAREHOUSE IMPROVEMENTS

STRUCTURE

FRAMING DETAILS

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NO.	DATE	REVISION	BY	REC.	APP.

DESIGNED BY	JOW
DESIGN CHECKED BY	DCH
DRAWN BY	CC
SR. PROJ. ENGR.	DCH
APPROVED	
PRINCIPAL-IN-CHARGE, R.P.E. NO.C	

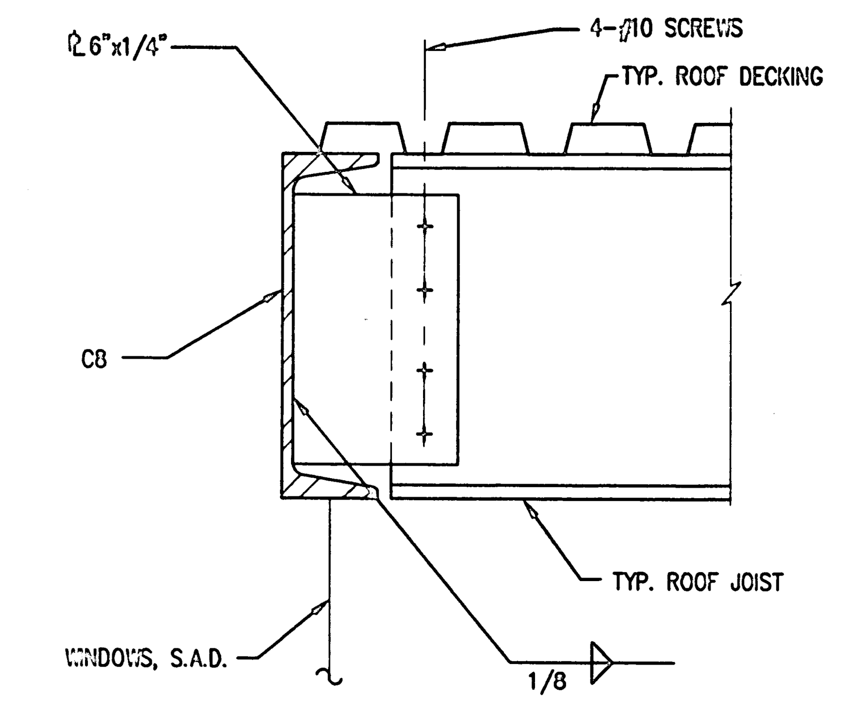
EBMUD
PROJECT MGR. R.P.E. No.
PROJECT SUPERVISOR R.P.E. No. 46324

FACILITY	DRAWING No. S7.1
SCALE AS NOTED	
DATE 7/8/03	SHEET – 34 OF – 62

SPECIFICATION NO.

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS C. HOHBACH
No. SE 3131
Exp. 3-31-97
STRUCTURAL
STATE OF CALIFORNIA

DATE:
FILE: 61651S71



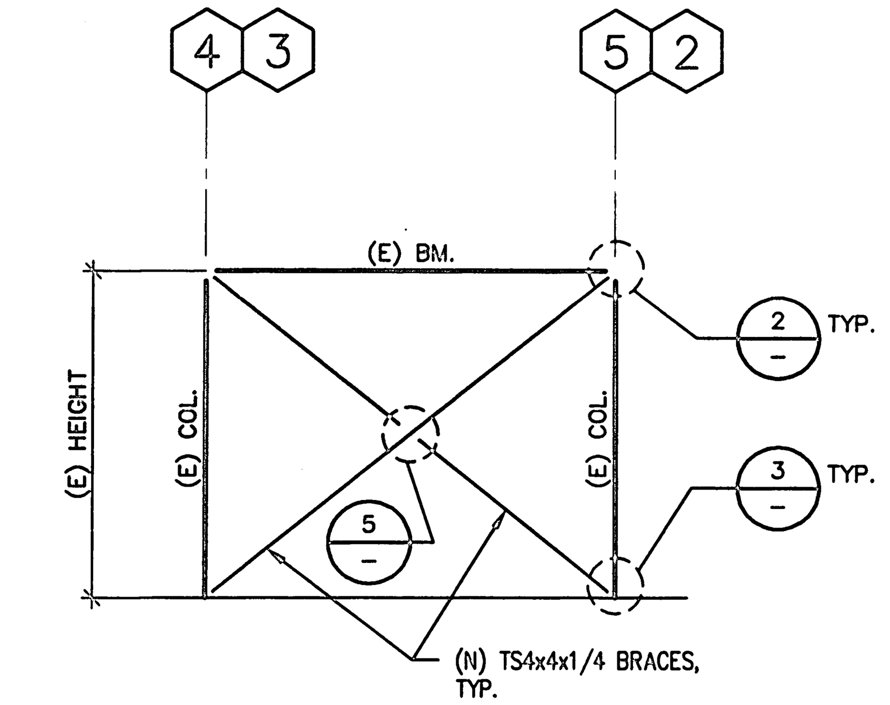
NOTE:
FOR ADDITIONAL INFORMATION,
SEE 8/–

10/– N.T.S.

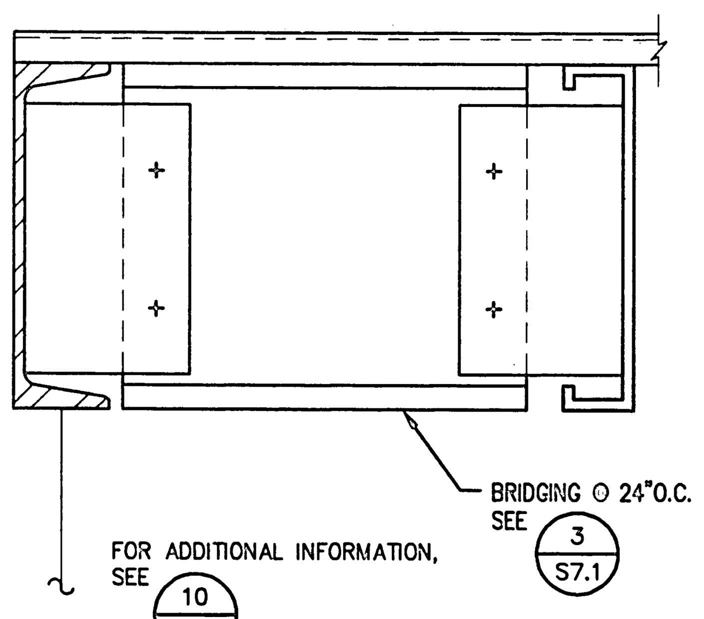
DEPTH OR SIZE OF BEAM	NO. OF BOLTS 3/4"ø A325SC U.O.N.	SHEAR PLATE	WELD SIZE (1)
5",6",8",C5,C6,C8	2	1/4"	1/4"

NOTES:
(1) USE COMPLETE PENETRATION WELDS AT ALL SKEWED CONNECTIONS WHERE AISC PRE-QUALIFIED FILLET WELDS ARE NOT POSSIBLE

7/– BEAM CONNECTION SCHEDULE NO SCALE

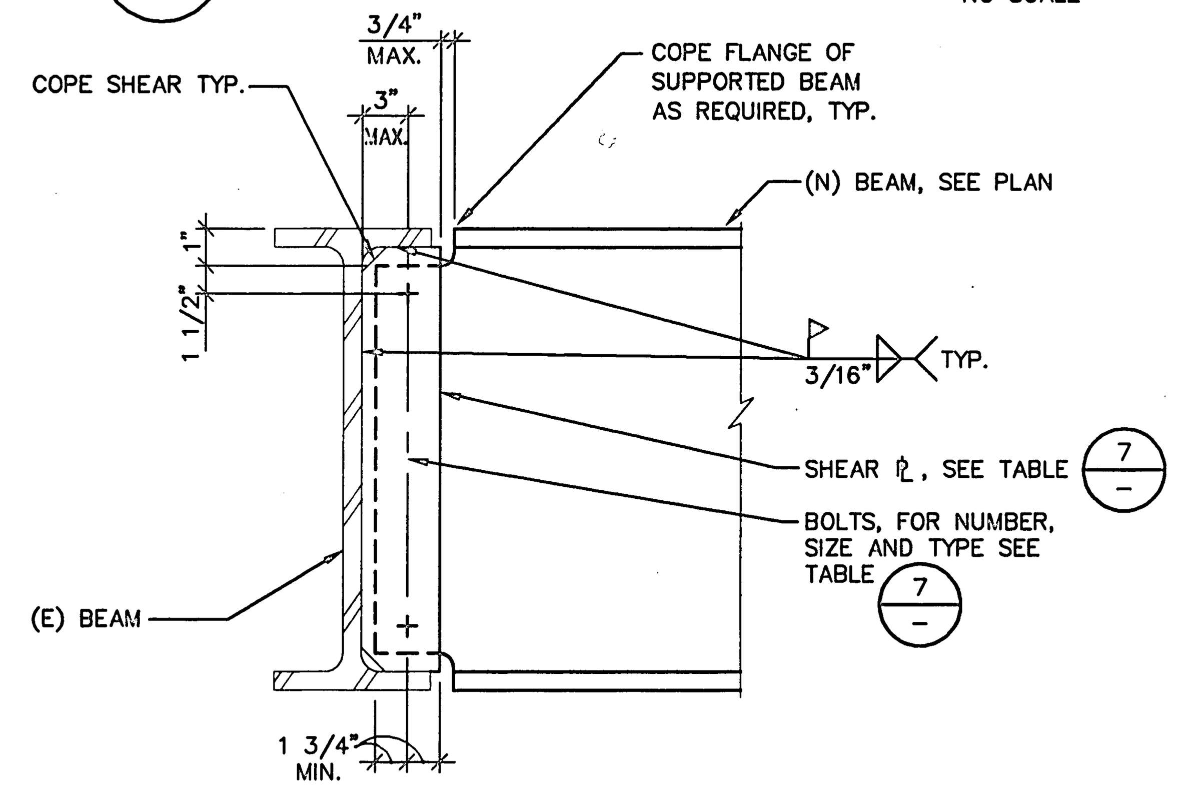


1/– BRACED FRAME ELEVATION 1/8"=1'-0"

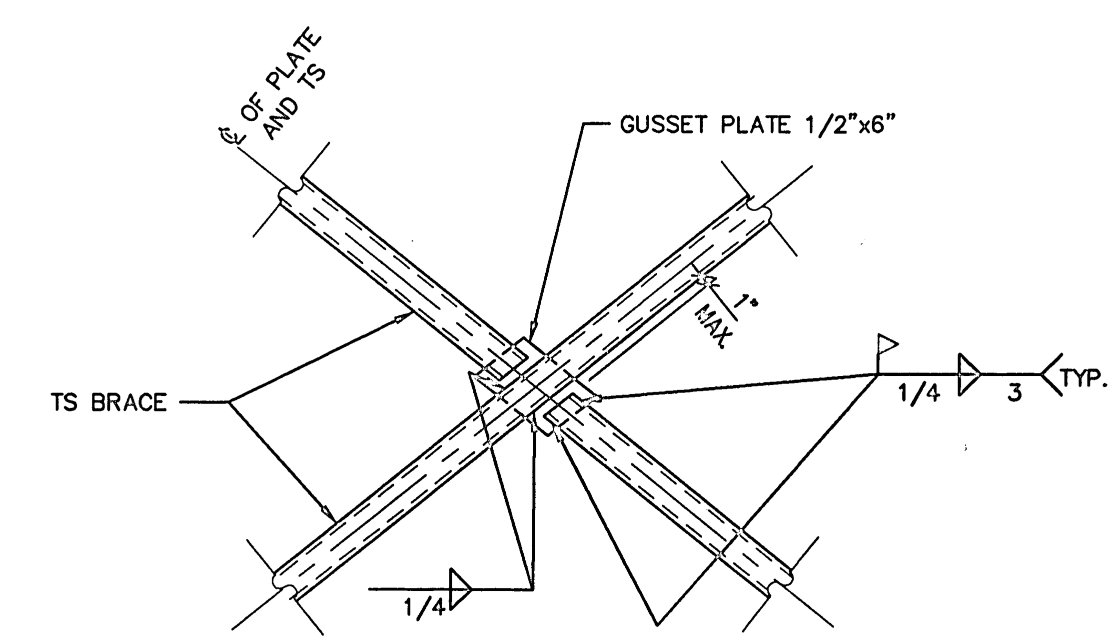


FOR ADDITIONAL INFORMATION,
SEE 10/–

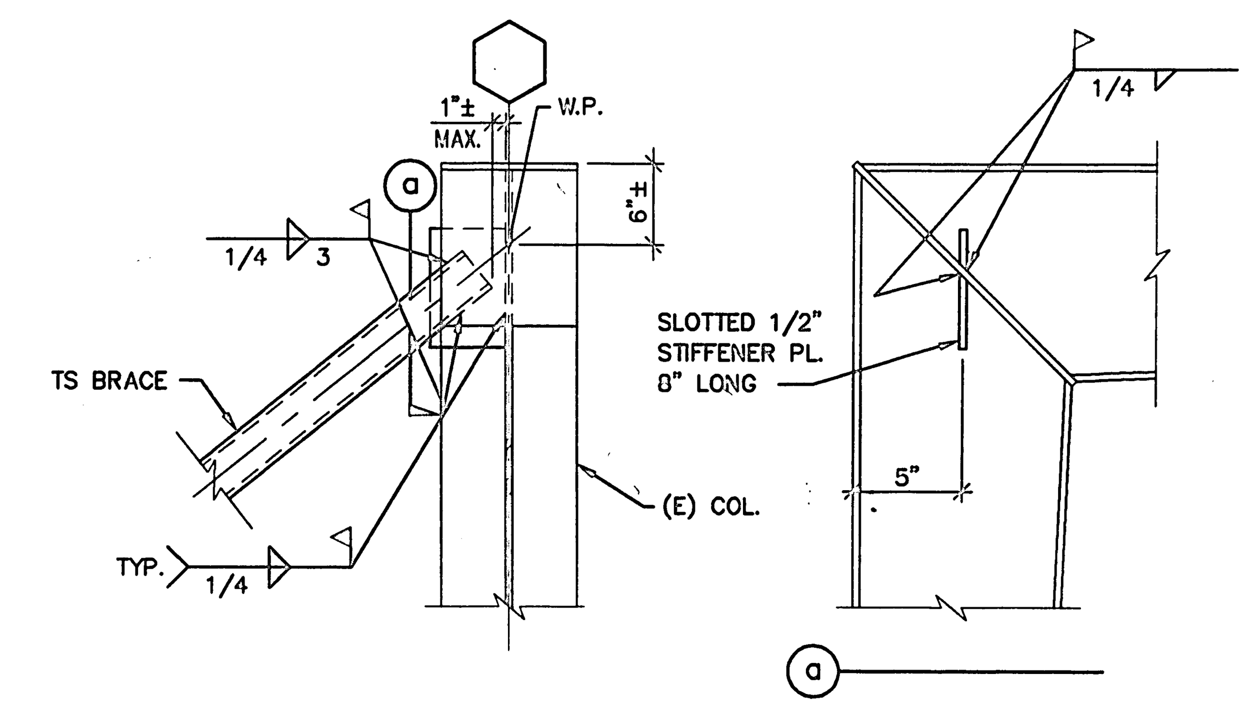
11/– N.T.S.



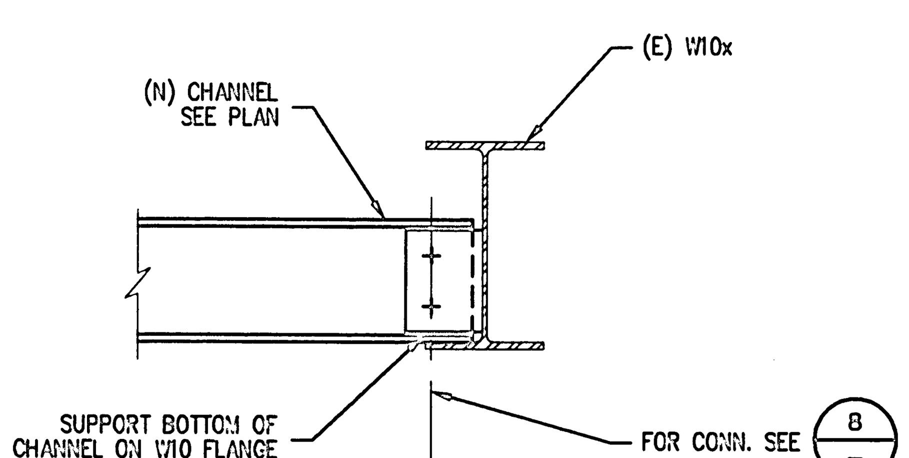
8/– (N) BEAM TO (E) BEAM CONNECTION N.T.S.



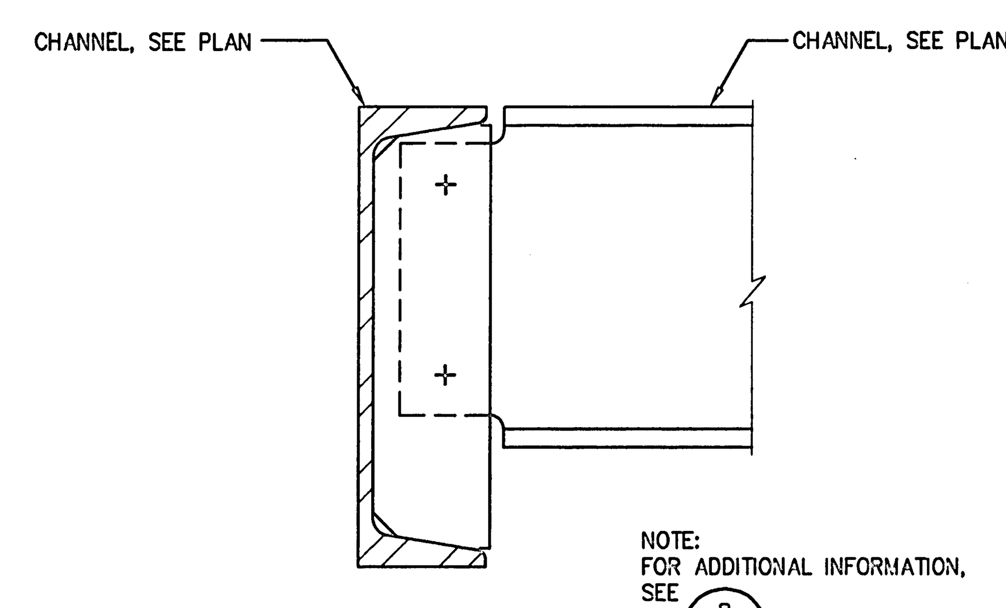
5/– BRACE INTERSECTION 3/4"=1'-0"



2/– N.T.S.



12/– N.T.S.

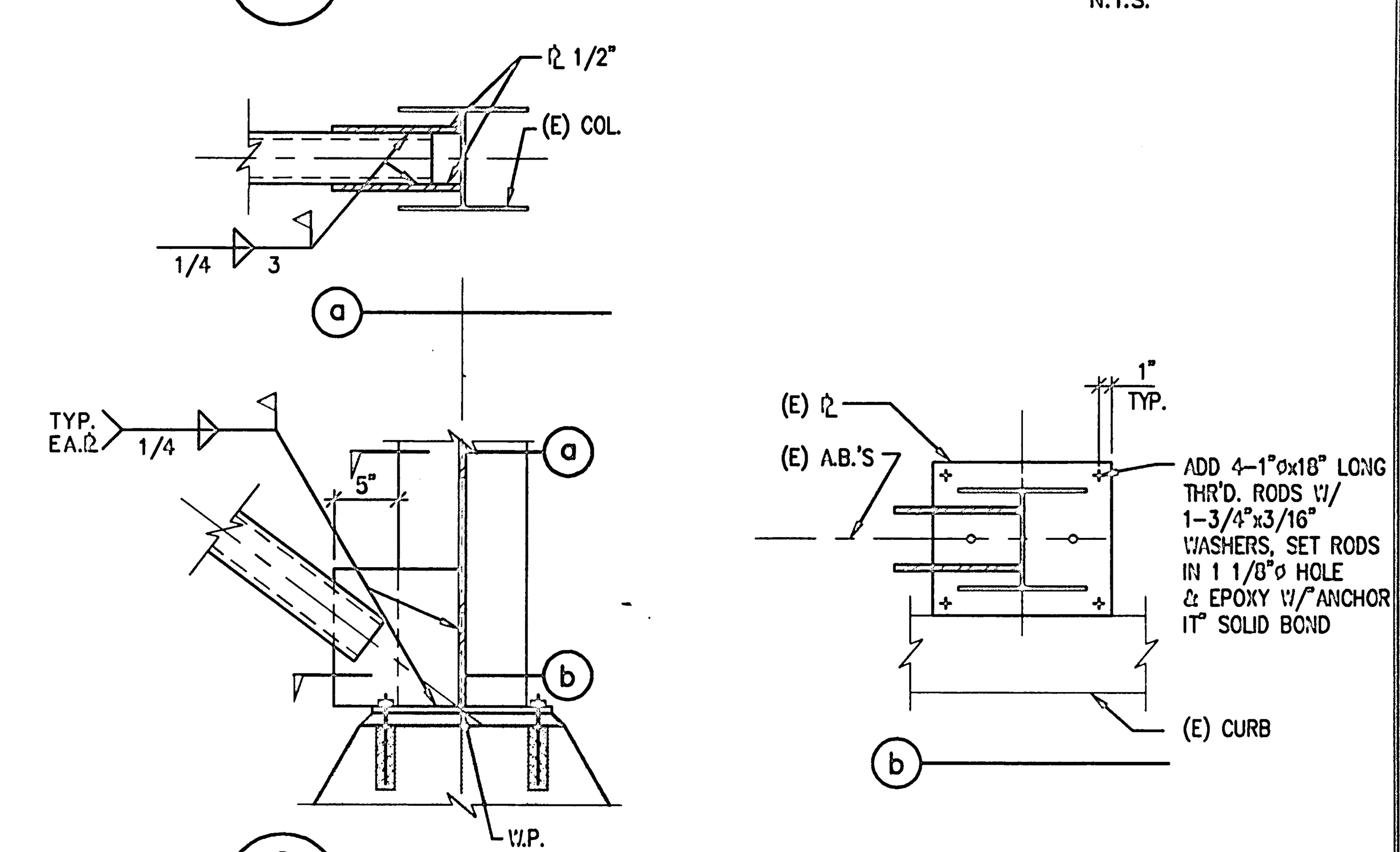


NOTE:
FOR ADDITIONAL INFORMATION,
SEE 8/–

9/– BEAM TO BEAM CONNECTION N.T.S.

1. SEE GENERAL NOTES ON SHEET S4.1.
2. UNLESS OTHERWISE NOTED:
   A. ALL PLATES ARE 3/8".
   B. ALL BOLTS ARE 3/4"ø A325SC U.O.N.
   C. ALL BUTT OR GROOVE WELDS ARE COMPLETE PENETRATION WELDS.
3. EACH COMPLETE PENETRATION WELD SHALL BE INSPECTED BY DISTRICT, SEE SPECIFICATIONS.
4. WELDING DETAILS SHALL COMPLY WITH THE "CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION" OF THE AMERICAN WELDING SOCIETY, LATEST ISSUE. FOR FURTHER WELDING REQUIREMENTS, SEE SPECIFICATIONS.
5. SCHEDULE WELDING AND BOLT TIGHTENING SEQUENCE TO MINIMIZE LOCKED UP STRESSES.
6. ERECTION CLIPS, BRACING, ETC. AS REQUIRED BY CONTRACTOR ARE NOT SHOWN.
7. THE DETAILS ON THIS SHEET SHOW STRUCTURAL FEATURES ONLY. FOR DETAILS AND DIMENSIONS NOT SHOWN, REFER TO DRAWINGS OTHER THAN STRUCTURAL.

6/– STRUCTURAL STEEL NOTES NO SCALE



3/– N.T.S.

DATE:
FILE: 61651S72

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NO.	DATE	REVISION	BY	REC.	APP.

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DESIGN CHECKED BY DCH
DRAWN BY CC
SR. PROJ. ENGR. DCH
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO.C

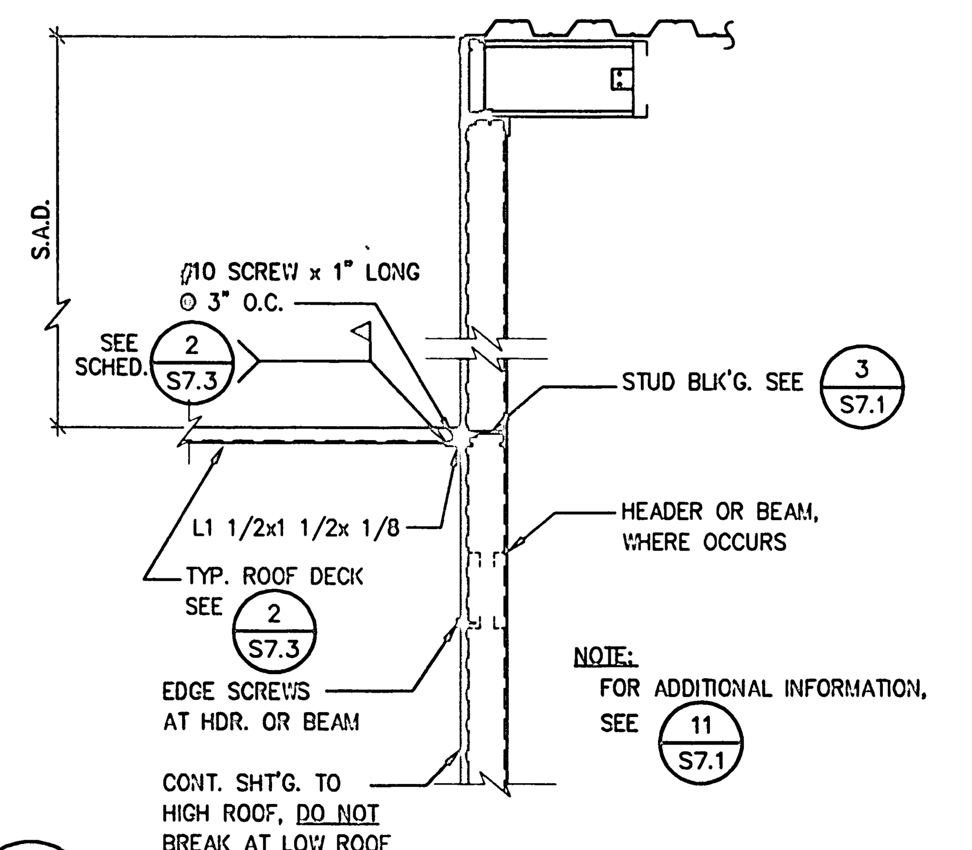
EBMUD
PROJECT MGR.
R.P.E. No.
PROJECT SUPERVISOR
R.P.E. No. 46324

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

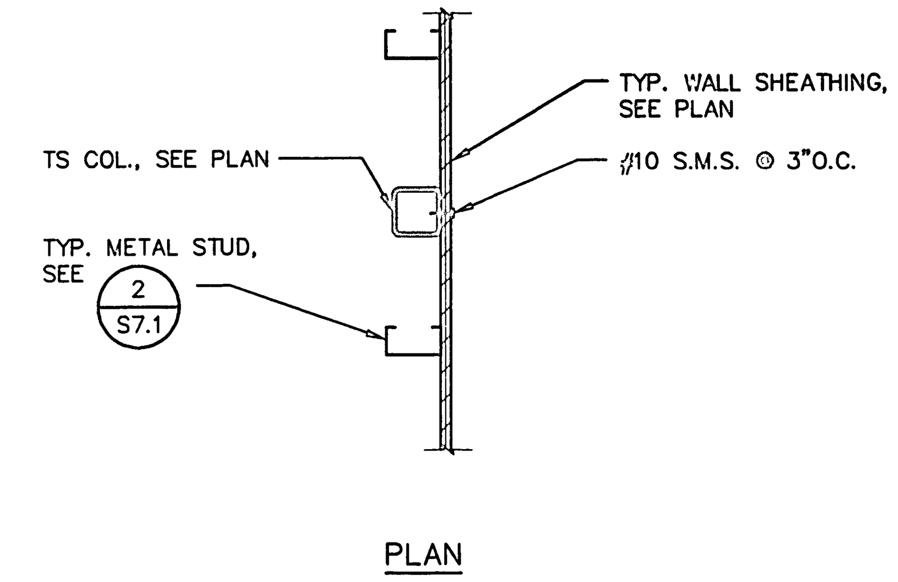
FIELD SERVICES WAREHOUSE IMPROVEMENTS

STRUCTURE
FRAMING DETAILS

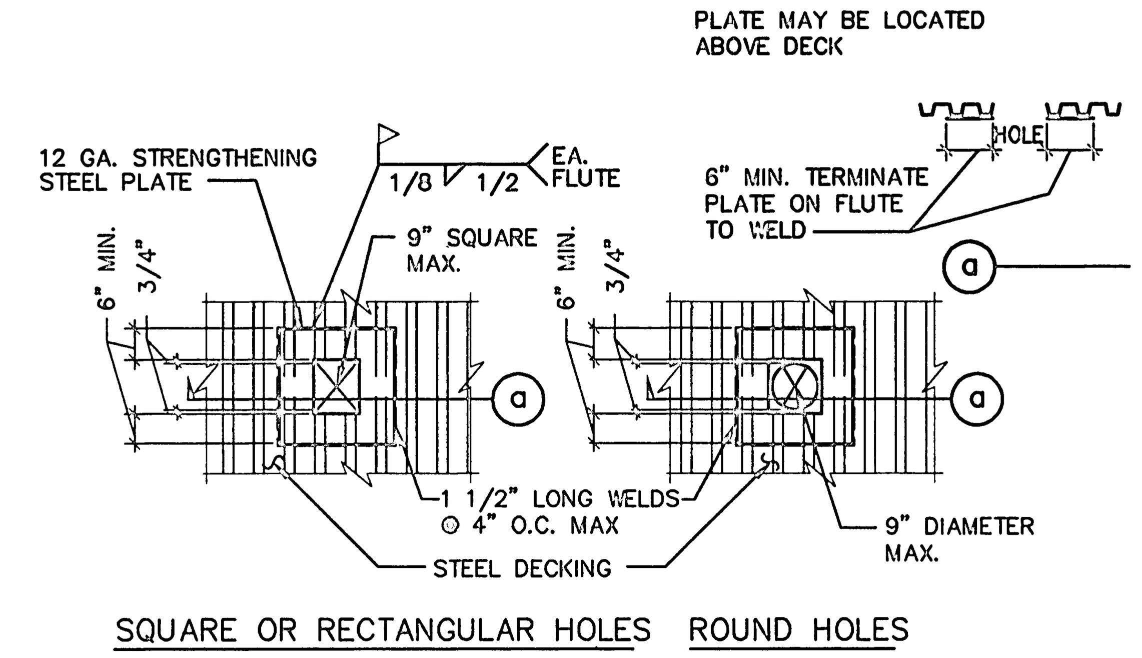
FACILITY
SCALE AS NOTED
DATE 22 JULY 1993
DRAWING No. S7.2
SHEET – 35 OF – 62
SPECIFICATION NO.



10 DETAIL — 3/4"=1'-0"



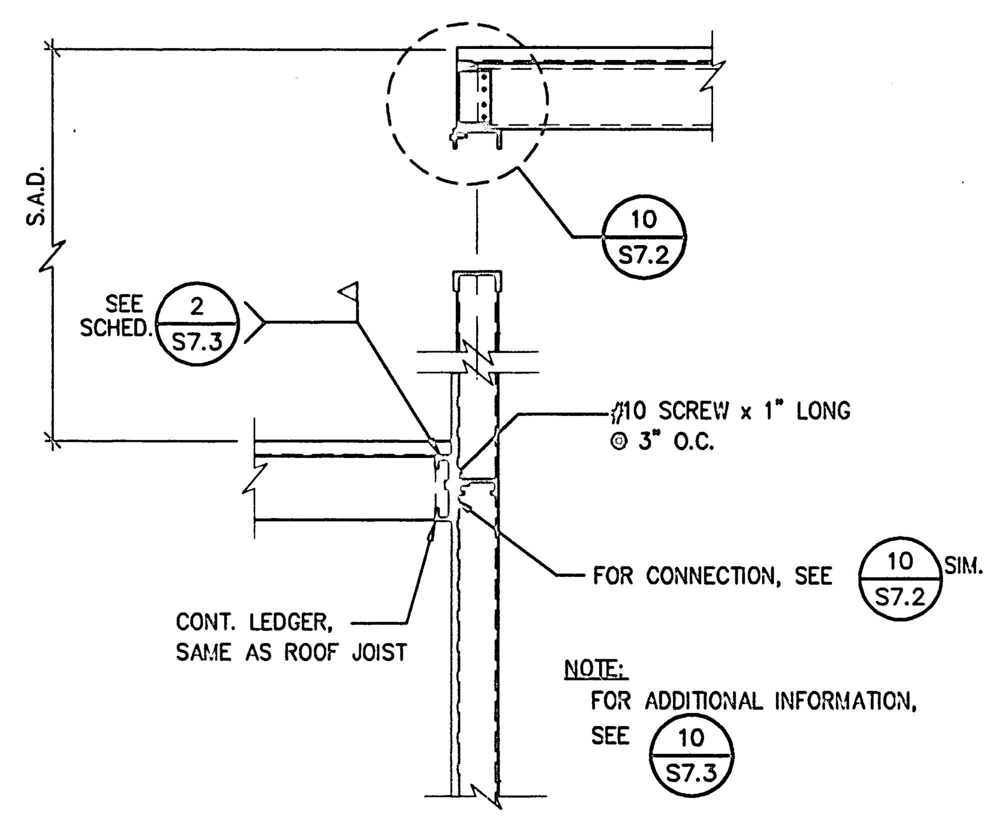
7 TS COL TO WALL SHEATHING CONN.



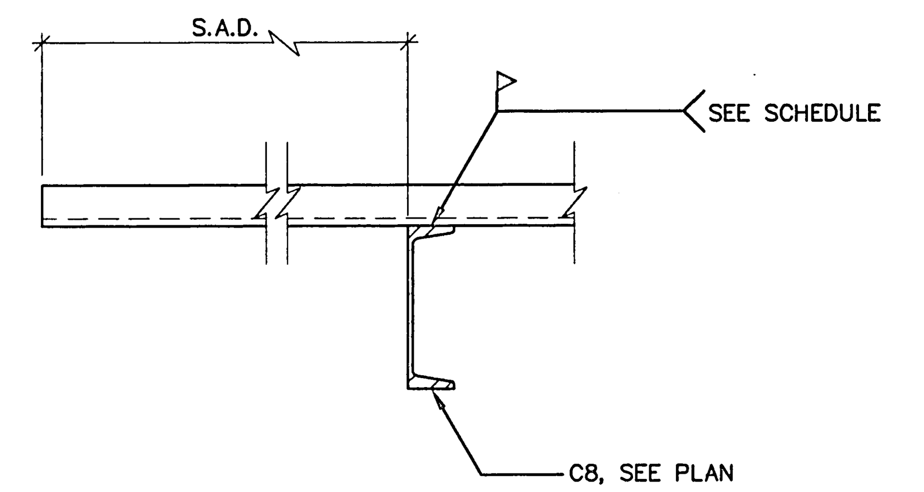
4 SMALL OPENING IN STEEL DECK

1. SEE GENERAL NOTES ON SHEET S4.1 FOR MATERIAL SPECIFICATIONS.
2. STRUCTURAL PROPERTIES OF STEEL DECK SYSTEM SHALL EQUAL OR EXCEED THE PROPERTIES LISTED IN DETAIL 2 ON THIS SHEET.
3. DECKING SHALL BE CONTINUOUS OVER 3 OR MORE SUPPORTS WHEREVER POSSIBLE. OTHERWISE PROVIDE SHORING AS REQUIRED PER MANUFACTURER'S RECOMMENDATIONS. SPLICES SHALL BE LOCATED OVER SUPPORTS.
4. DECK SHALL HAVE A MINIMUM OF 2" BEARING AT ALL SUPPORTING MEMBERS (MEMBERS PERPENDICULAR TO DECK SPAN), AND 1-1/2" AT ALL PARALLEL MEMBERS.
5. DECK WELDING SHALL BE AS NOTED IN DETAIL 2 ON THIS SHEET.
6. OPENINGS THROUGH DECKING SHOWN ON FRAMING PLANS ARE NOT COMPLETE AS TO NUMBER, SIZE AND LOCATION. FOR COMPLETE INFORMATION REFER TO DRAWINGS OTHER THAN STRUCTURAL.
7. USE STRENGTHENING AT OPENINGS AS SHOWN IN DETAILS 4, 5 OR 6 ON THIS SHEET UNLESS OTHERWISE NOTED. PROVIDE STRENGTHENING BEFORE CUTTING OPENING.
8. DETAILS SHOWN ARE FOR TYPICAL REINFORCING OF DECKS AT OPENINGS. FOR SPECIAL CONDITIONS, SUBMIT LAYOUT OF OPENINGS AND PROPOSED REINFORCING OF DECK FOR REVIEW.
9. MULTIPLE OPENINGS WITH A CLEAR DISTANCE LESS THAN THREE TIMES THE SIZE OF THE LARGER OPENING TO BE TREATED AS A SINGLE GROUP OPENING.
10. FOR OPENINGS THROUGH DECK THAT CUT ONLY ONE WEB AND ARE 5" SQUARE OR 5" DIAMETER MAXIMUM, NO STRENGTHENING IS REQUIRED.
11. SEE MECHANICAL / PLUMBING DRAWINGS FOR DETAILS OF UTILITIES SUSPENDED FROM THE STEEL ROOF DECK SYSTEM. POINT LOADS TO THE DECK FROM THESE DETAILS SHALL NOT EXCEED 100 POUNDS.

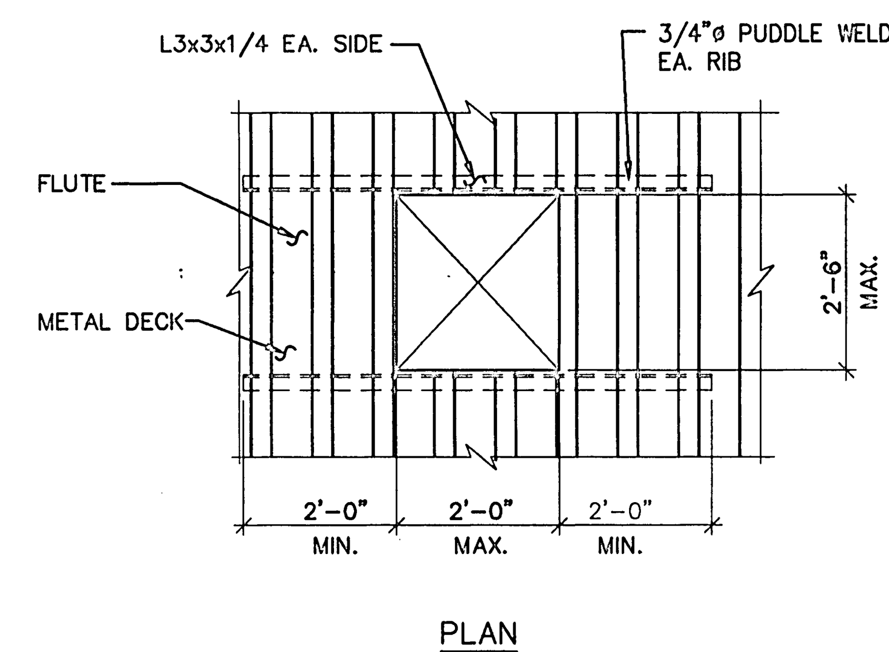
1 STEEL DECKING NOTES



11 DETAIL — 3/4"=1'-0"

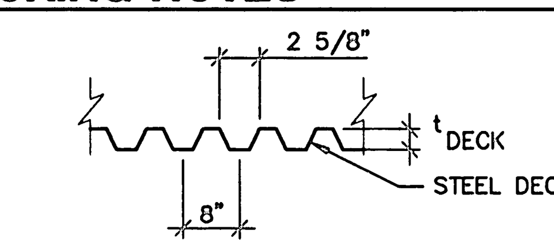


8 DETAIL — 1 1/2"=1'-0"



NOTE:
FRAMING TO BE FURNISHED & INSTALLED BY DECKING CONTRACTOR.

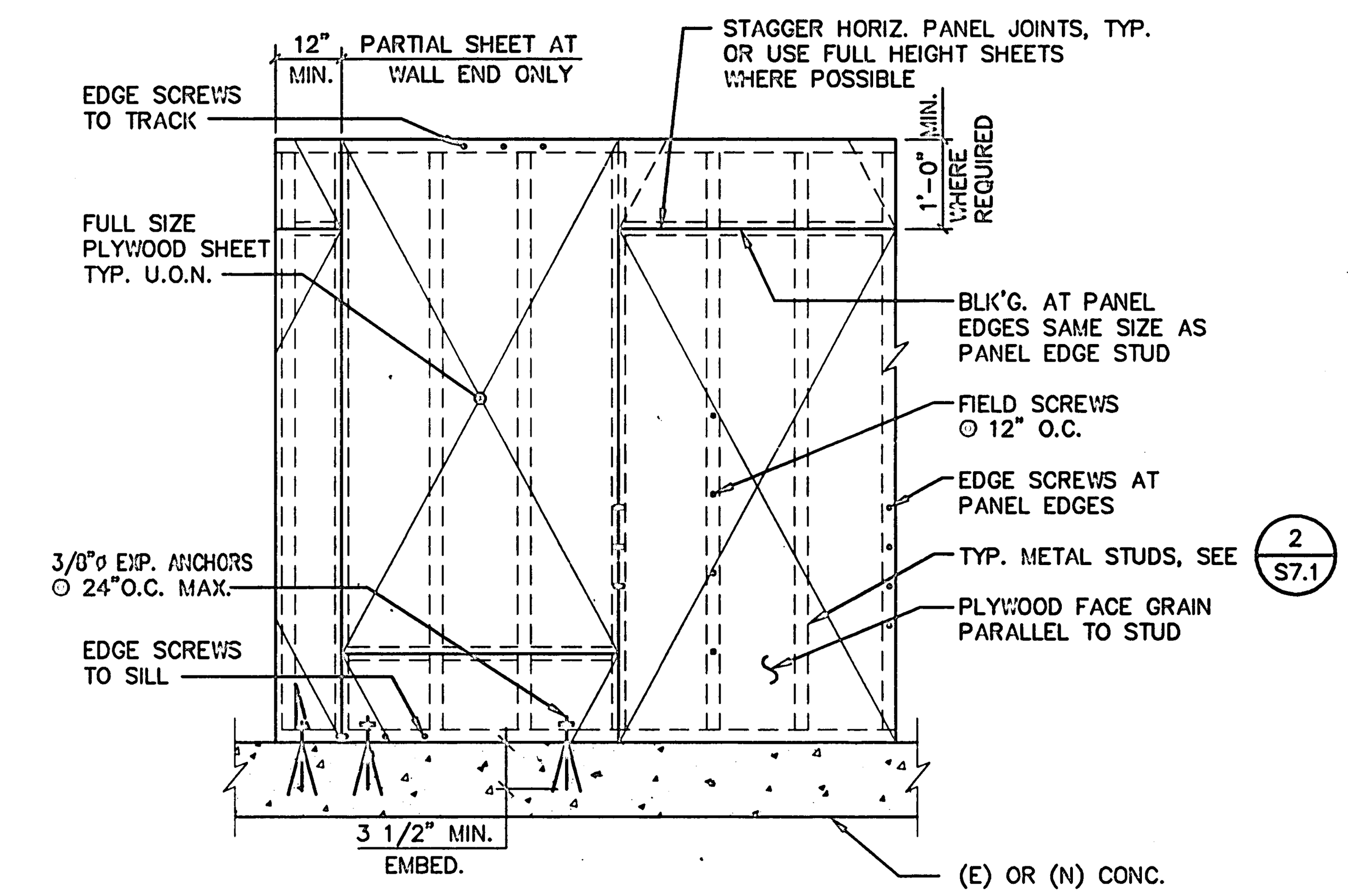
5 MEDIUM OPENING IN STEEL DECK



DECK TYPE & GAUGE	tDECK	STEEL DECK			1/2"ø PUDDLE WELDS (EFFECTIVE MIN. DIA.)		ATTACHMENTS AT SIDELAPS
		I(in⁴)	+S(in³)	-S(in³)	AT SUPPORT MEMBERS	AT PARALLEL MEMBERS	
TYPE NS 20 GA.	3"	0.82	0.49	0.54	6"O.C.	6"O.C.	#10 SCREW @ 6"O.C.

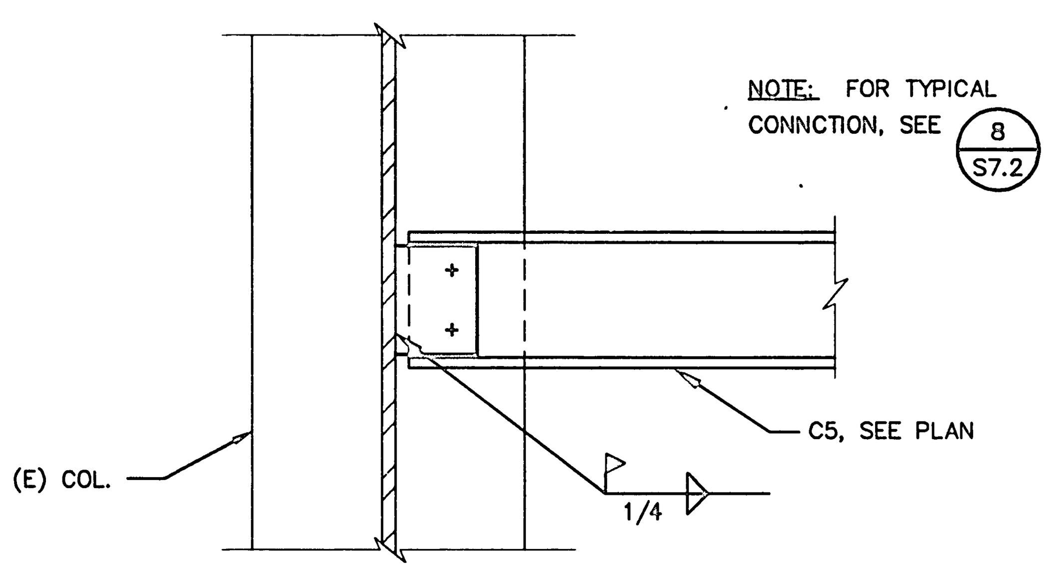
* SECTION PROPERTIES ARE PER FOOT OF WIDTH

2 STEEL ROOF DECK

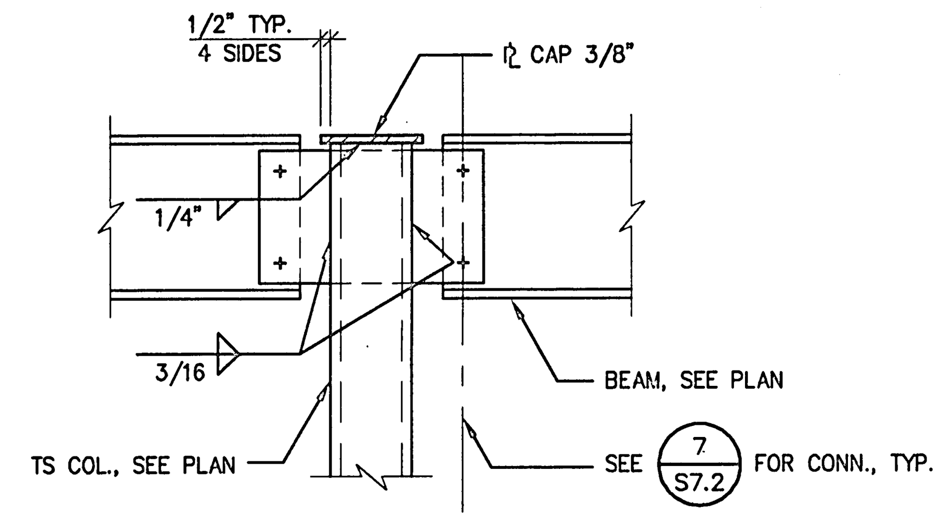


NOTES:
1. USE #10 SCREW @ 4"O.C. AT ALL EDGES AND #10 SCREW @ 12"O.C. IN THE FIELD.
2. WHERE A TOPPING SLAB OCCURS OVER THE EXISTING SLAB-ON-GRADE, EMBEDMENT OF EXPANSION ANCHORS SHALL BE IN THE EXISTING SLAB.

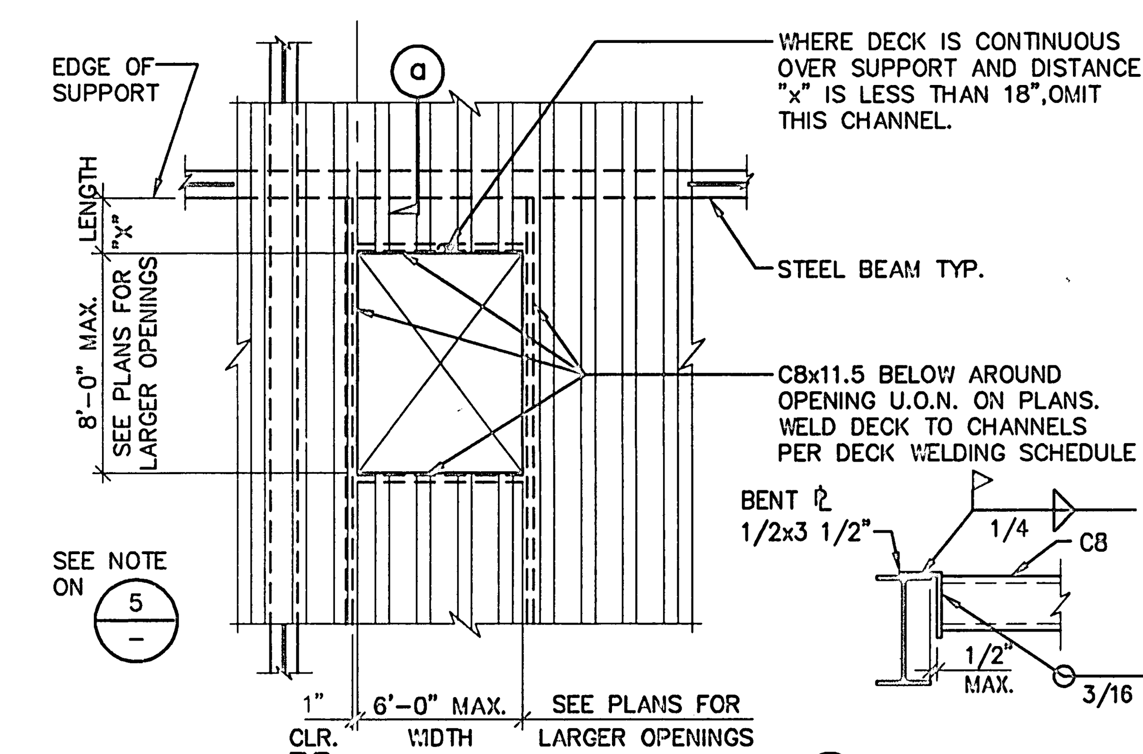
3 TYPICAL SHEAR WALL FRAMING AND SCHEDULE



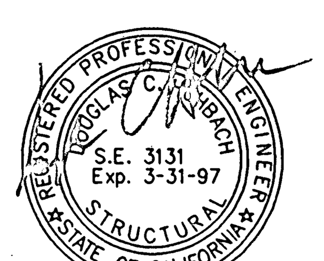
12 TYPICAL (N) BEAM TO (E) COLUMN CONNECTION — 3/4"=1'-0"



9 BEAM TO COLUMN CONNECTION — 1 1/2"=1'-0"



6 LARGE OPENING IN STEEL DECK



DATE:
FILE: 61651S73

DASSE DESIGN INC.
STRUCTURAL ENGINEERS
33 New Montgomery St., Suite 850
San Francisco CA 94105
415/243-8400 – Fax 415/243-9165

The Ratcliff Architects

NO.	DATE	REVISION	BY	REC.	APP.

DESIGNED BY	JGW
DESIGN CHECKED BY	DCH
DRAWN BY	CC
SR. PROJ. ENGR.	DCH
APPROVED	
PRINCIPAL-IN-CHARGE, R.P.E. NO.C	

EBMUD
PROJECT MGR. R.P.E. No.
PROJECT SUPERVISOR R.P.E. No. 46324

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

FIELD SERVICES WAREHOUSE IMPROVEMENTS

STRUCTURE

FRAMING DETAILS

FACILITY
SCALE AS NOTED
DATE 22 JULY 1993
DRAWING No. S7.3
SHEET – 36 OF – 62

SPECIFICATION NO.

REGISTERED PROFESSIONAL ENGINEER DOUGLAS C. HOHBACH S.E. 3131 Exp. 3-31-97 STRUCTURAL STATE OF CALIFORNIA

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NO.	DATE	REVISION	BY	REC.	APP.

DESIGNED BY JGW
DESIGN CHECKED BY DCH
DRAWN BY MTC
SR. PROJ. ENGR. DCH
APPROVED
PRINCIPAL-IN-CHARGE, R.P.E. NO.C

EBMUD
PROJECT MGR. R.P.E. No.
PROJECT SUPERVISOR R.P.E. No. 46324

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

FIELD SERVICES WAREHOUSE IMPROVEMENTS

STRUCTURE
FRAMING DETAILS

FACILITY
SCALE AS NOTED
DATE 22 JULY 1996
DRAWING No. S7.4
SHEET - 37 OF - 62
SPECIFICATION NO.

USER:
DATE:
FILE: 61651S74

(Excerpts)

Seismic Evaluation

Field Services Building

East Bay Municipal Utility District

Main Wastewater Treatment Plant

Seismic Structural Evaluation and

Conceptual Design Project

STRUCTURE DESCRIPTION

2.0 AVAILABLE DATA

Information on the building included the following:

- Structural drawings for the original 1951 construction
- Architectural drawings, dated 1993, by The Ratcliff Architect for the 1996 improvements
- Structural drawings by DASSE Design, Inc., dated 1993, for the 1996 improvements

These drawing sets include a total of 63 drawings including 24 architectural and 10 structural drawings. In the 1996 improvement drawings, the storage building located north of FSB is marked as existing; however, the original 1951 drawings do not show the storage building. Therefore, it appears that the storage building was added between 1951 and 1993. Design drawings for the storage building are not available. Partial information from the 1993 drawings and observations during site visit was used for the seismic evaluation of the storage building.

2.1 GENERAL DESCRIPTION

The current FSB originally was the garage building constructed in 1951. The 1951 project included a 100-foot by 40-foot garage building and an adjacent 42 foot by 40-foot chlorine building. The chlorine building was later demolished and in 1996 the garage building was remodeled as FSB. Between 1951 and 1996 a 100-foot by 19-foot storage building and a 27-foot by 25-foot shed was added to the northern portion of the garage building. The date of construction of the storage building and the shed is not known.

In 1996, as part of the Field Services Warehouse improvements project, the garage, the storage building and the shed were remodeled and converted to the current FSB. The project also included a new 28-foot by 42-foot locker room building added to the east of the garage. The locker room building is separated from the garage by an 8-foot wide corridor. The roof over the corridor and the storage building is at a lower elevation than the FSB roof. Figure 1 shows a plan view of FSB with the original building and various additions identified with different colors. Figure 2 shows the south elevation view of FSB and the locker room building. A photograph of the south elevation of FSB and the locker room building is shown in Figure 3. Elevation of the storage building located on the north side of FSB is shown in Figure 4 and Figure 5. The east and west elevations are shown in Figure 6 through Figure 8. A new conference room with its own independent structural system was also added in the interior of the existing garage space as shown in Figure 9 and Figure 10.

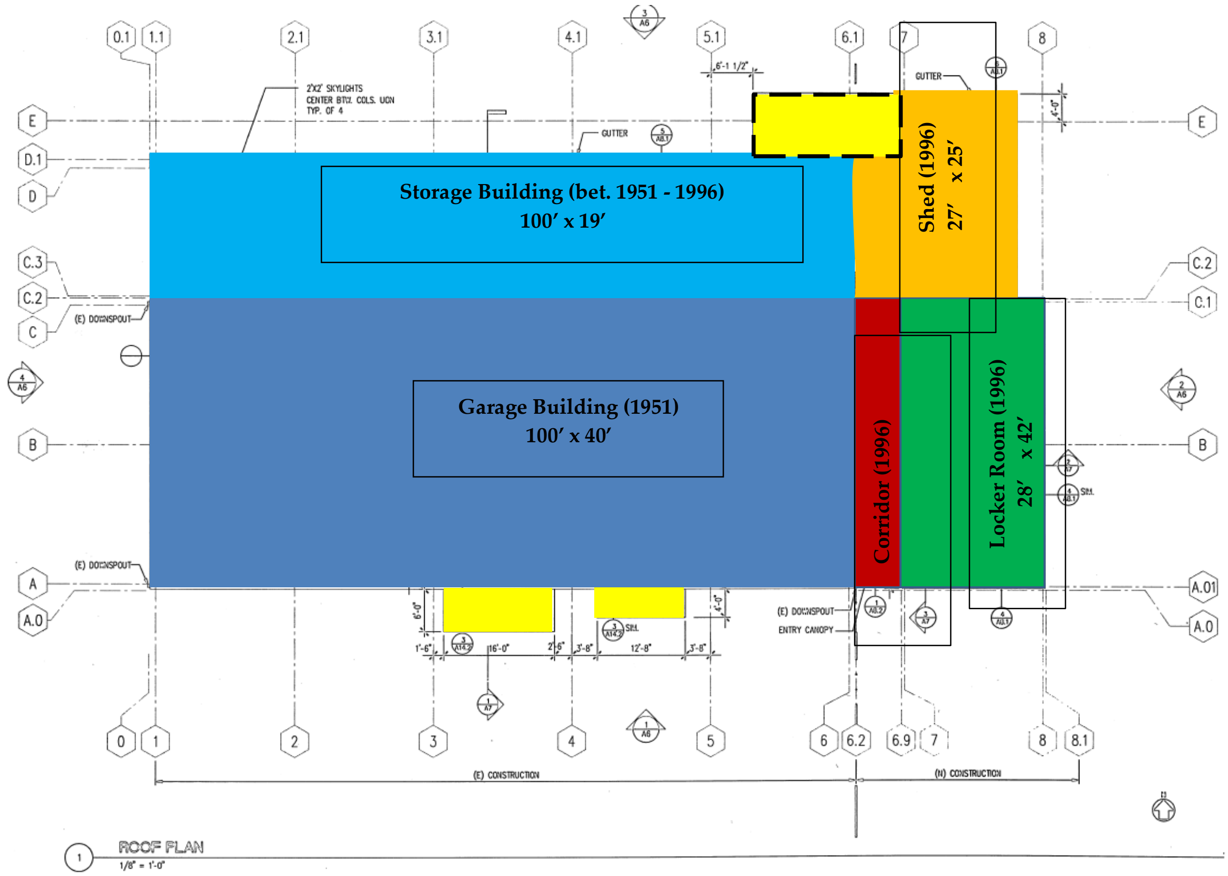


Figure 1: Existing Structures Forming the Current FSB

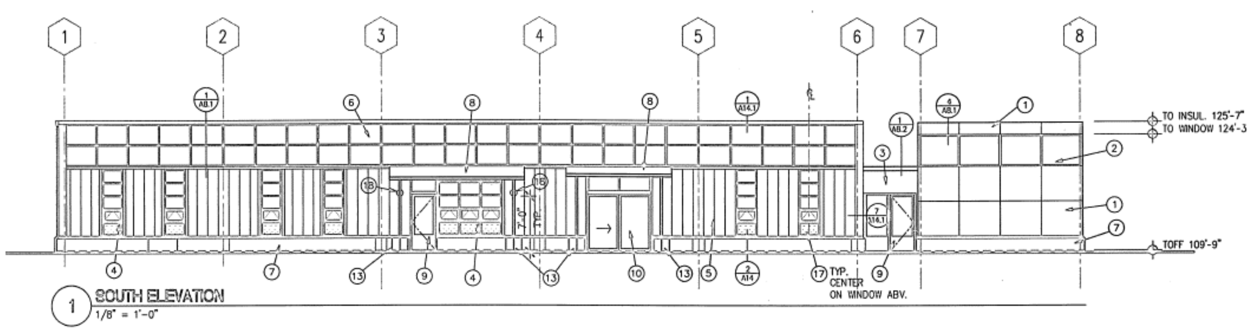


Figure 2: FSB and Lockers South Elevation

Figure 3: FSB and Lockers South Elevation

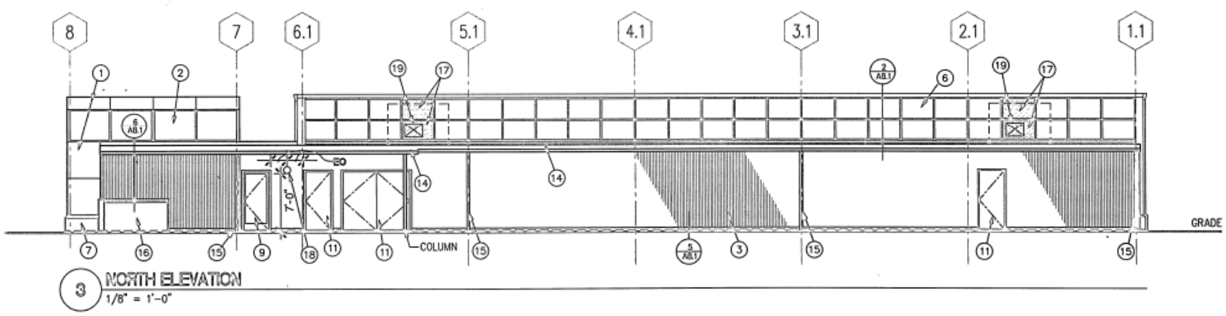


Figure 4: Storage Building North Elevation

Figure 5: Storage Building North Elevation

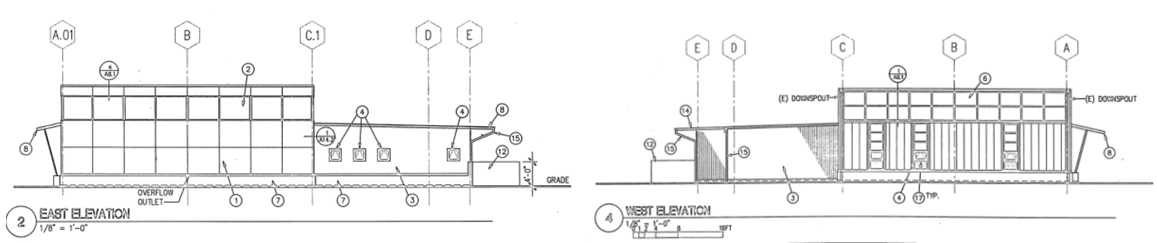


Figure 6: FSB and Storage Building East and West Elevations

Figure 7: FSB and Storage Buildings East Elevation

Figure 8: FSB and Storage Buildings West Elevation

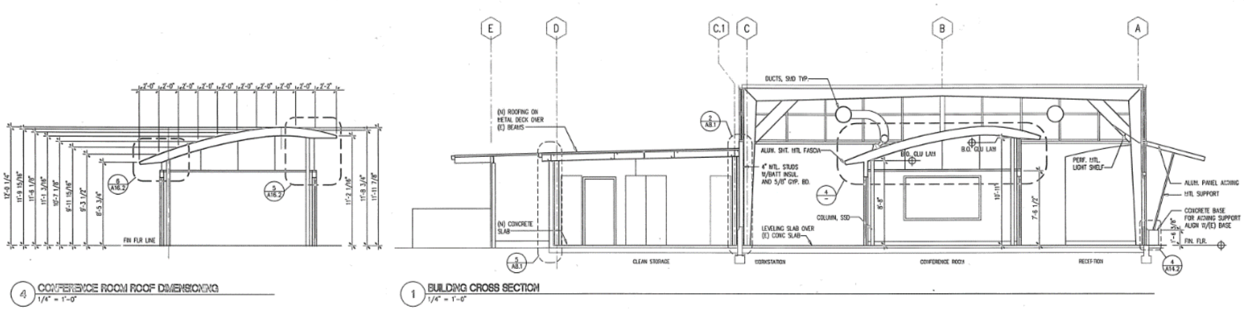


Figure 9: FSB New Conference Room

Figure 10: FSB New Conference Room

2.2 GRAVITY LOAD RESISTING SYSTEM

The roof over all parts of FSB consists of steel metal deck supported by steel beams and girders including the upper roof over the original garage building and the lower roof over the storage building and the corridor. The steel girders and columns for the original garage building are built-up sections and are part of the steel moment frame as shown in Figure 11. For the locker room, the roof beams are supported by steel tube section columns, and for the storage building, roof beams are supported by steel wide flange columns. The two entrance canopy structures at the south facade are supported by two tube section columns each and are connected to the longitudinal steel beams along the south wall.

Foundation systems for all portions of FSB are on spread footings.

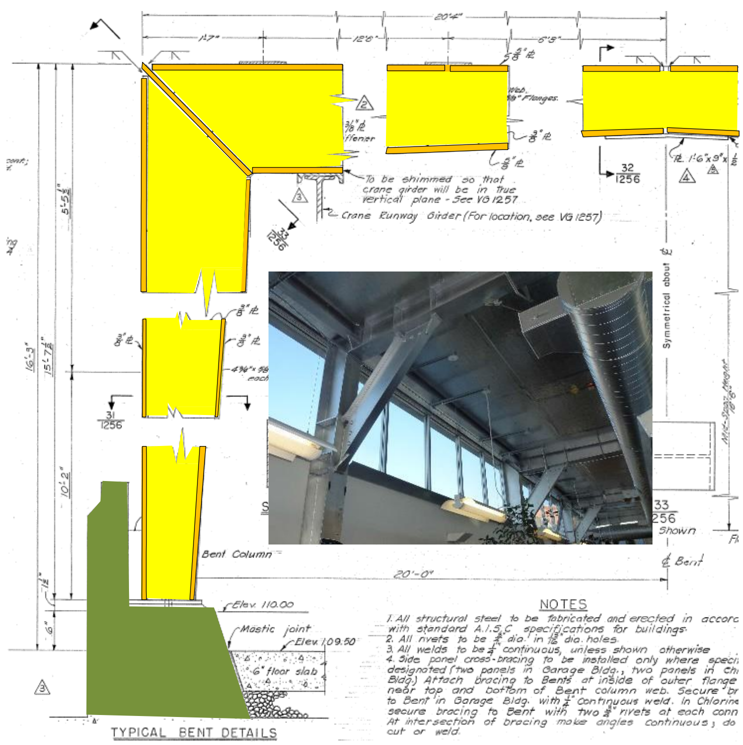


Figure 11: Moment Frame Cross-Section – Original Building

2.3 LATERAL LOAD RESISTING SYSTEM

The roof for all structural sections consists of flexible metal deck diaphragms. The roof diaphragms transfer the loads to the lateral load resisting structural elements. For the original garage structure, the lateral load resisting system consists of moment resisting frames in north-south direction and two X-braces in east-west direction. For the storage building, the corridor and the locker room, the lateral load resisting system consists of plywood shear walls over cold-formed steel wall studs. The original garage is connected to the various additions (as shown in Figure 12) forming one continuous structure for seismic load transfer.

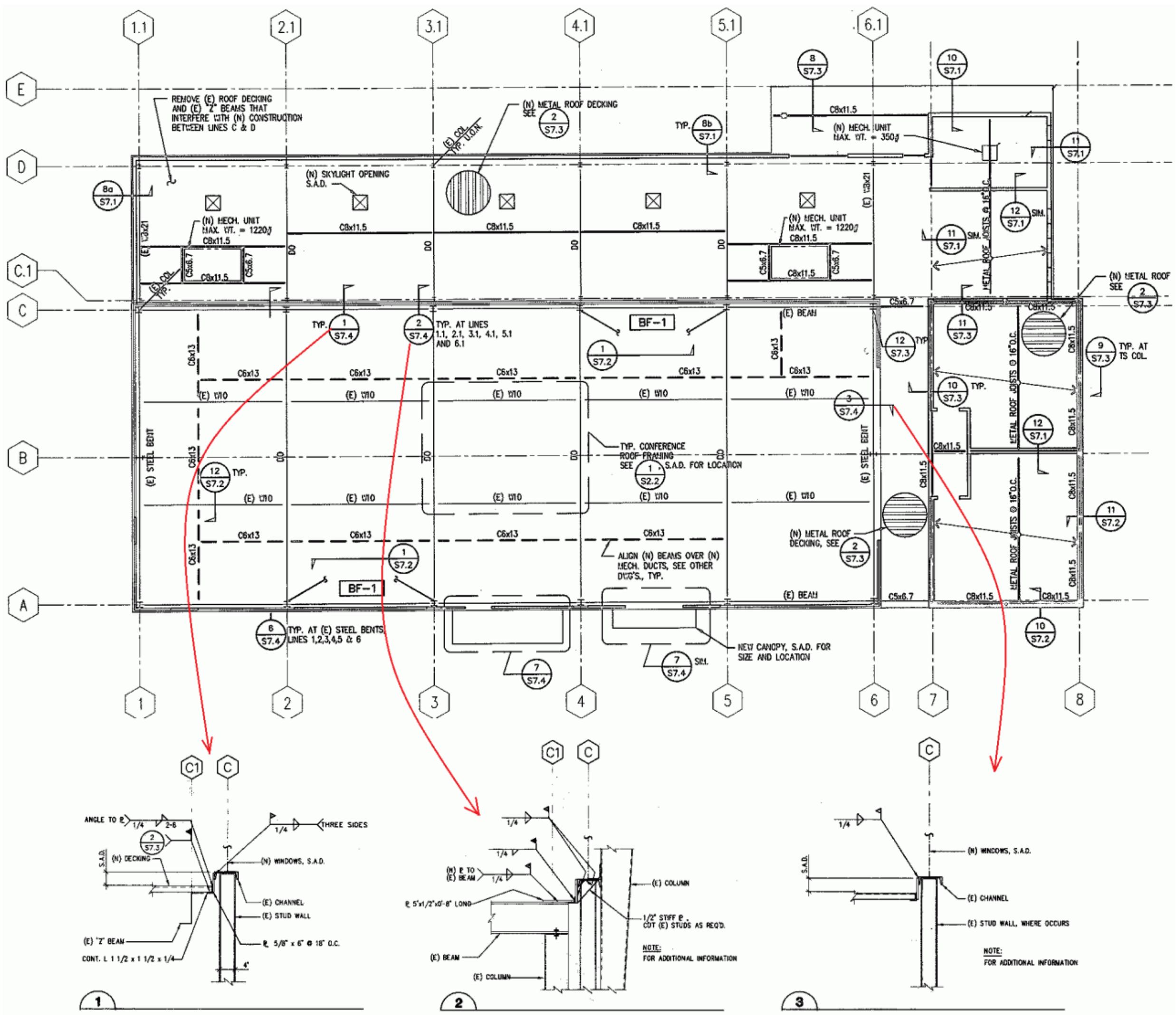


Figure 12: FSB – Connections between the Parts

6.0 IDENTIFIED VULNERABILITIES

This section presents the summary of the identified vulnerabilities.

6.1.1 Deflections

The structure has high displacements and story drifts, therefore, significant damage to nonstructural elements such as windows and HVAC components is likely, and could be a life safety hazard. Better attachments of the overhead HVAC ducts, light fixtures, and other non-structural elements is recommended.

6.1.2 Lack of Shear Walls between the Low Roof of the Corridor and High Roof at the Locker Room

There are large relative displacements between the lower roof of the corridor and the upper roof of the locker room resulting from the lack of shear walls with lateral resistance provided only by the steel tube sections (shown in Figure 66). Damage to the windows is likely and this could be a life safety hazard. Stiffening of the steel tube columns under the roof for BSE-2E event is recommended.

6.1.3 Conference Room Structure

The structure of the conference room has an inadequate lateral load resisting system. The steel pipe columns are pin-connected to the base and to the canopy. Columns should have a fixed-base connection for adequate moment transfer to create a complete lateral load resisting system.

6.1.4 Plywood Shear Wall at Line 1

The building has an irregular placement of shear walls as shown in Figure 32, which results in high DCRs for the short plywood shear wall and anchor bolts along the west wall of the storage room. The shear wall is marked in Figure 66. The high DCR in the plywood shear wall at line 1, is partially due to the original garage structure leaning against the storage building.

The DCR for Risk Category IV is higher than the m-factors, however the DCR for Risk Category I & II is below the acceptable m-factors.

6.1.5 Steel Structure

For Risk Category IV and fixed base model, all DCRs for the steel structure are below the m-factors. However, for the flexible base model, a single column (at column line A and line 2 intersection as shown in Figure 66) has DCR (2.06) slightly higher than the m-factor of 2.0. The high DCR is mostly caused by the bending moment in the column at the diagonal element connection. As shown in Figure 18, the tapered section of the column is modeled with four constant cross sections. At the location of the maximum moment the actual cross section (14.0-inches deep) is deeper than the section in the FE model (13.5-inches deep). If the actual cross section properties are used with the forces and moments in the critical section, the DCR would be 1.97, just below the m-factor. Based on this, it is judged that the column has acceptable performance. The DCR for Risk Category I & II are below the acceptable m-factor for both the fixed base and the flexible base models.

6.1.6 Permanent Ground Displacement Damage

The bending capacity of the grade foundation beam is insufficient for passive soil pressure loading in East-West direction (see Section 5.1.5).

There are no connections between the foundations of the original building and the extensions; therefore, separation of the building sections of FSB due to an estimated 6 inches of lateral spread will result in damage to the steel elements connecting the extensions to the original building. Soil improvement to reduce liquefaction-induced lateral spread hazard or structurally tying the building sections together are possible options for mitigating this hazard.

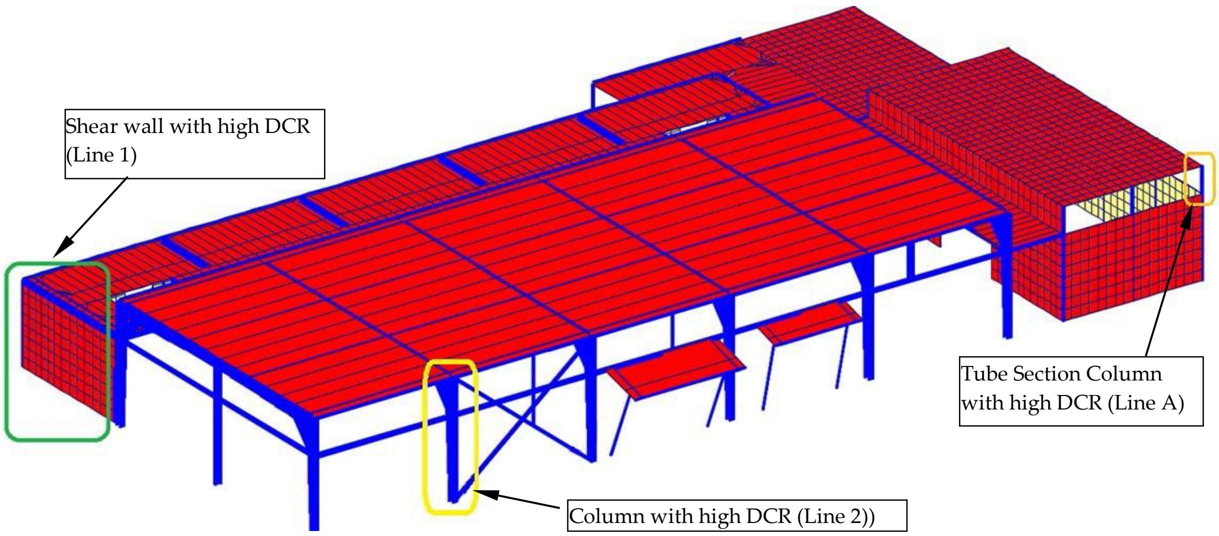


Figure 66: Field Services Building – Identified Vulnerably

(Excerpts)

Seismic Retrofit

Field Services Building

East Bay Municipal Utility District

Main Wastewater Treatment Plant Seismic Structural Evaluation and Conceptual Design Project

2.1 PROPOSED RETROFIT

2.1.1 Building Deflection and Drift

To reduce building deflection and drifts three retrofit options are considered feasible:

1. Option 1: Add additional structural braces (as shown in Figure 2) to two of the six frames of the original structure. The new braces are added to the frame at the west wall and the frame between the original building and the locker room. This option will satisfy the drift requirements for both Risk Category IV and Risk Category I & II. However, this option may require new foundations (possibly piles) and could create accessibility issues as well as disruption of building function during construction.
2. Option 2: The cross-sections of the primary moment frames are stiffened by welding 4-#10 rebars at the web to flange connection (as shown in Figure 3) of the columns and the beams. Other options such as adding steel plates to the flanges instead of rebars could also be considered. This option will not require foundation modifications and will not create accessibility issues; however, every single frame will need to be retrofitted, which will cause disruption throughout the building interior and will impact building function during construction. This option will satisfy the drift requirements for Risk Category I & II only.
3. Option 3: Add two exterior buttress walls (as shown in Figure 4) at the south elevation of the building. The new walls will be connected to the south-west and south-east columns of the original building. This option will satisfy the drift requirements for both Risk Category IV and Risk Category I & II. This option will require new piles foundations and will change the architectural appearance of the building, but it will be least disruptive to the interior functions of the building. However, it may create some accessibility issues during construction because one of the buttress wall will be located close to one of the building entrances.

Option 2 has been developed further in this conceptual design due to ease of modeling and some uncertainly as to the need to pursue a Risk Category IV performance level for this facility. Also, the cost of disrupting building function has not been reflected into this conceptual design cost estimate.

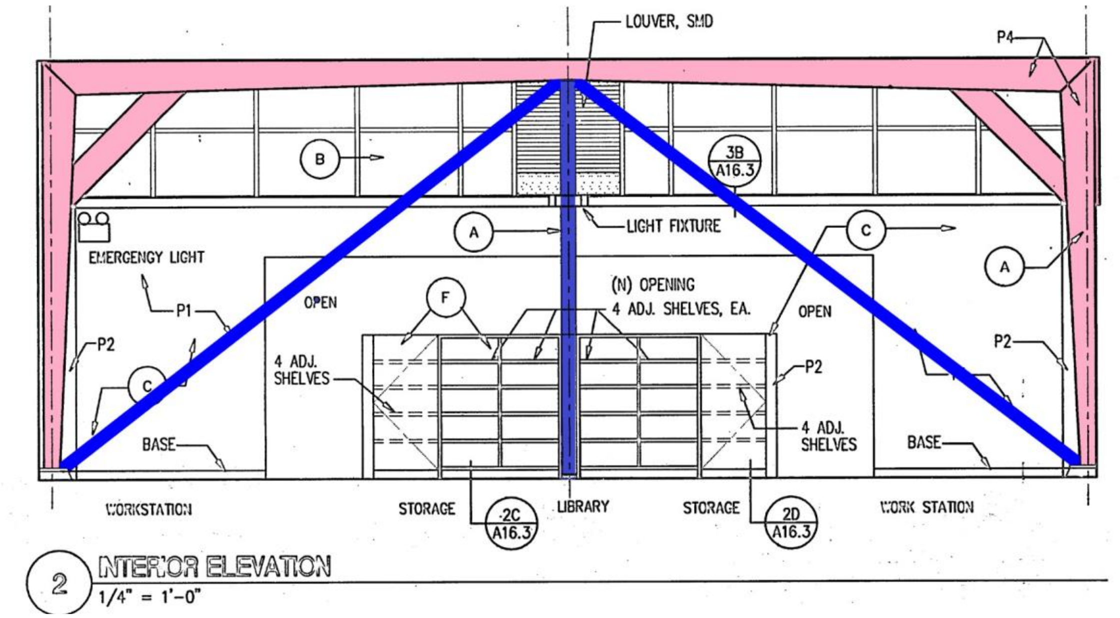


Figure 2: Field Services Building – Retrofit Option No. 1

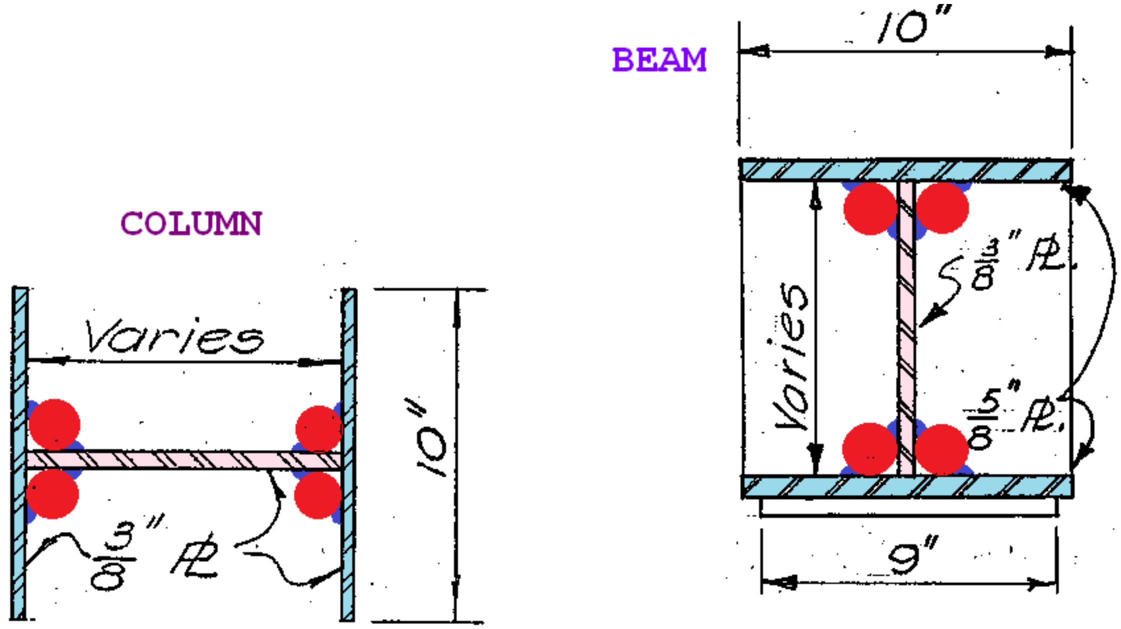


Figure 3: Field Services Building – Retrofit Option No. 2

Figure 4: Field Services Building – Retrofit Option No. 3

2.1.2 New Shear Walls between the Low and High Roof at the Locker Room

At the locker room add new shear walls and extended to the roof as shown in Figure 5. Alternatively, stiffening tube columns is an option but not preferred as it will be more costly and disruptive.

	
South Elevation	North Elevation

Figure 5: Field Services Building – Extending Shear Walls at Locker Room

2.1.3 Plywood Shear Wall at Line 1

To increase the capacity of the shear wall at line 1 (Figure 6), the nails/screws are doubled.

Figure 6: Field Services Building – Shear Wall at Line 1

2.1.4 Conference Room Structure

The conference room is a standalone partition structure within the building that currently does not have a complete lateral load resisting system. The structure is vulnerable to ground shaking in the north-south direction due to lack of moment connection at the base. Retrofitting the four column bases (shown in Figure 7) of the conference room structure to make moment connection in both directions will reduce its seismic vulnerability. With this retrofit, the structure will have acceptable strength, however, the drift at the canopy level will still be high. High drifts can result in glass breakage. Bracing between columns or other means of stiffening the system can be considered to reduce drift and the potential for glass breakage. However, additions may impact current access and aesthetics. The option of making the column to canopy beam moment resisting in both north-south and east-west direction is not considered feasible.

Figure 7: Field Services Building – Conference Room Column Base Retrofit

2.1.5 Foundation Retrofit for PGD

To increase the capacity of the foundation beam and to prevent separation, all around foundation beam (as shown in Figure 10) is added. The lateral spread PGD is in the direction toward the nearby body of water (Bay) which would predominately cause loading on the north and south side foundation beams. However, since the lateral spread direction is not exactly perpendicular to the building's north-south axis, the east-west foundations beams may see a component of lateral spread. The geotechnical report (AGS, 2020) shows that relatively small ground deformation results in full passive pressure, which will load the east-west foundation beams.

This retrofit will not be required if a ground improvement solution to reduce lateral spread hazard is implemented. Ground improvements, being considered for the Outfall, Effluent Pump Station and Plant Effluent Channel facilities, will also support the reduction of lateral spreading at the Field Services Building and the Effluent Sampling Station.

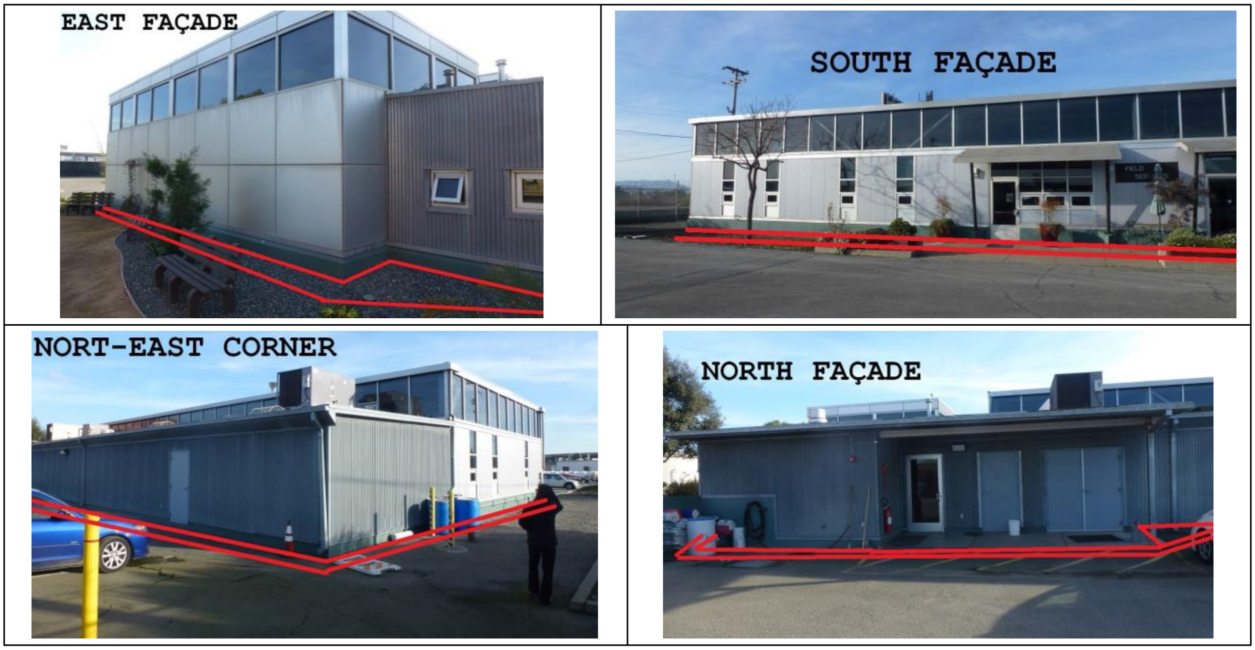


Figure 8: Field Services Building – Foundation Retrofit

5.0 RETROFIT DESIGN DETAILS

This section presents the summary of the structural retrofit of FSB structure.

5.1 ORIGINAL STRUCTURE

To limit the displacements/drifts (to less than 2%) of the original structure, the moment frames are retrofitted to increase their stiffness. Four #10 rebars (or equivalent round bars) are welded (Option 2) to the cross-sections of the columns and the beams as shown in Figure 38.

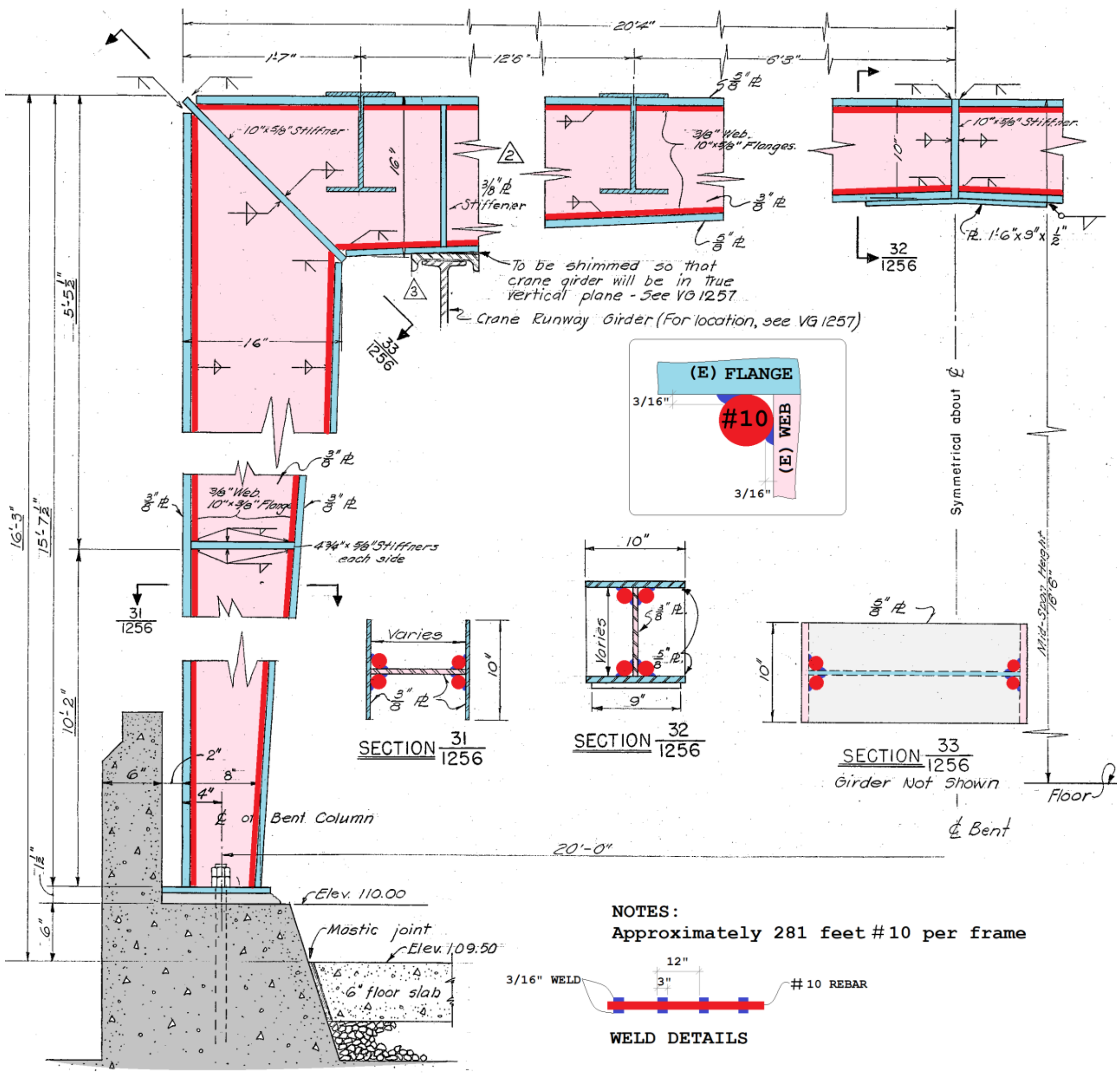


Figure 38: Field Services Building – Moment Frame Retrofit

Other options such as internal steel braces (Option 1) or exterior buttress wall (Option 3) can also be considered.

5.2 SHEAR WALLS AT THE LOCKER ROOM

The shear walls at south elevation and the shear walls at north elevation are partially extended to the roof structure to reduce the displacements at the roof level. The new shear walls are designed same as the existing shear walls. The details are shown in Figure 39 (from EBMUD SD122 Drawing No. A6, S7.1, and S7.3).

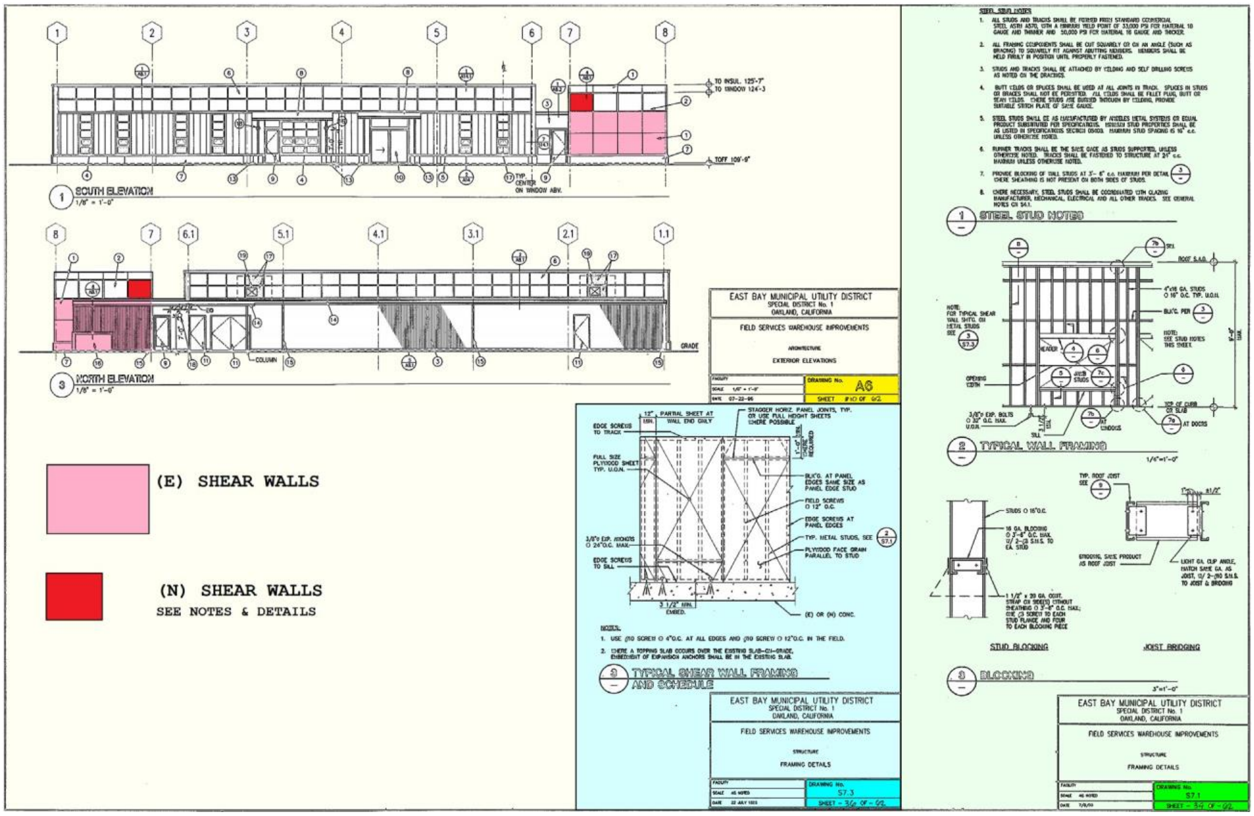


Figure 39: Field Services Building – New Shear Walls at Locker Room

5.3 CONFERENCE ROOM STRUCTURE

The retrofit of the four column bases as shown in Figure 40.

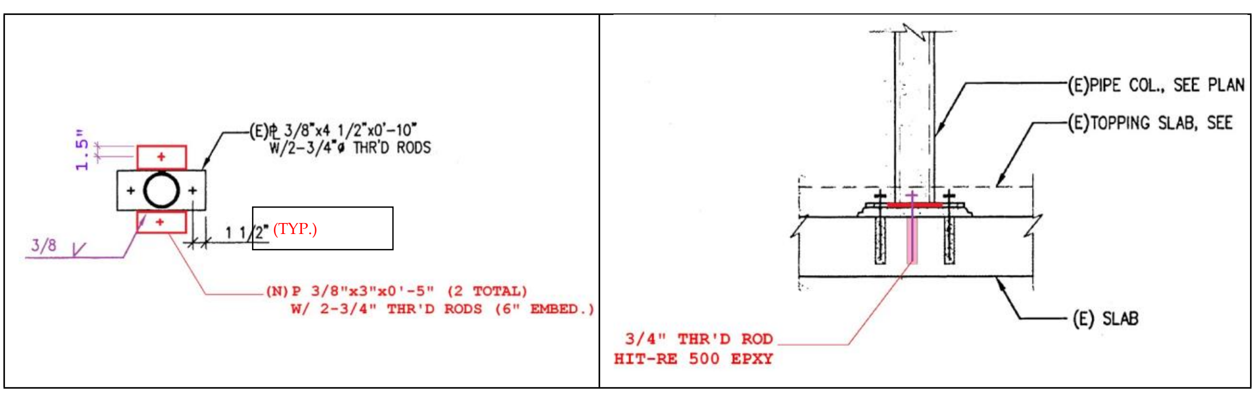


Figure 40: FSB – Conference Room Column Connections – Retrofit

5.4 PLYWOOD SHEAR WALL AT LINE 1

The shear wall is shown in Figure 41 (from EBMUD SD122 Drawing No. S2.1). The nails/screws are doubled to increase capacity.

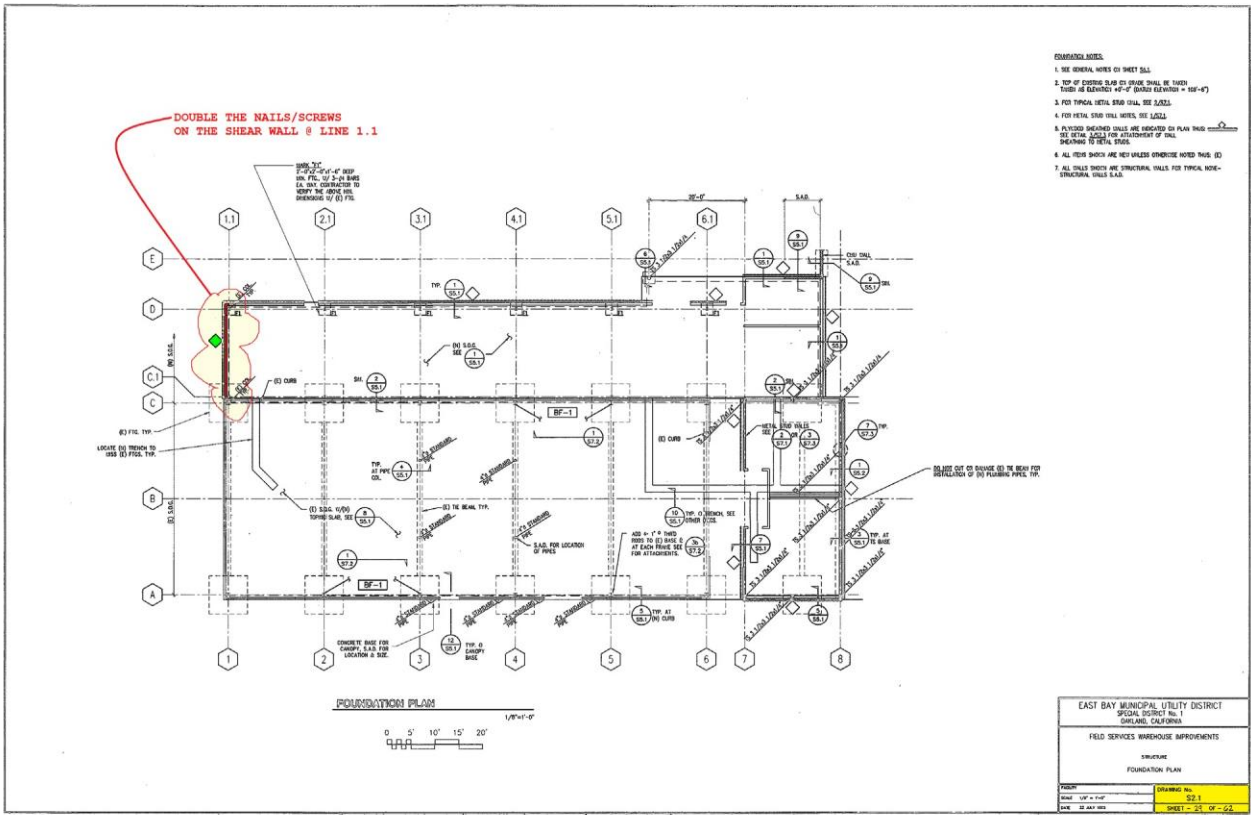


Figure 41: Shear Wall at Line 1 in the Storage Room– Retrofit

5.5 FOUNDATION RETROFIT

The foundation retrofit will not be required if ground improvements to mitigate lateral spread hazard are performed.

The capacity of the foundation beams on the East and West sides of the building are insufficient to withstand PGD from liquefaction-induced lateral spread (assuming that the lateral spread direction is not exactly parallel to the building foundations). Also, the foundation of the north addition is not tied to the foundation of the original building and will separate under the estimated PGD. A foundation ring (Figure 42 and Figure 43) around the building is designed to retrofit the foundations and to tie the foundation of the original building and the additions.

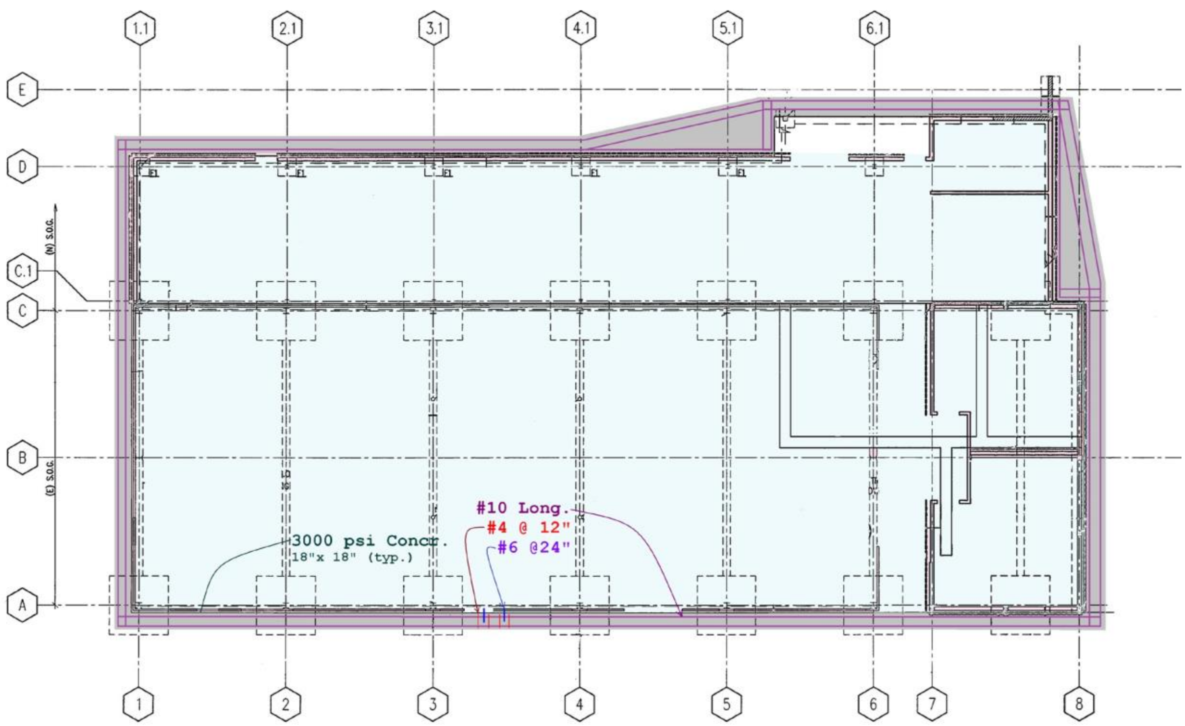
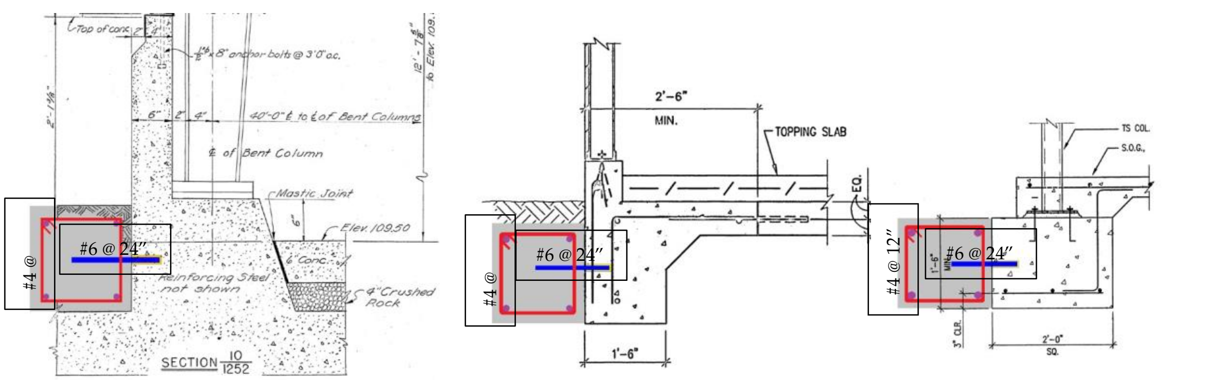


Figure 42: Field Services Building –Foundation Retrofit Plan View



At Original Building | At Walls at Additions | At Columns at Additions

Figure 43: Field Services Building –Foundation Retrofit Details

5.6 CONSTRUCTION SEQUENCE

The five major retrofit activities can be performed independent from each other without following any particular construction sequence.

5.7 ADDITIONS REQUIRED TO MEET CATEGORY IV

As shown in Table 2, the retrofitted structure will meet the initial risk Category IV requirements without any additional work, except for story drift in the north-south direction. In order to meet the story drift requirement of 1% drift in the north-south direction Retrofit Option 1 (Figure 2) or Option 3 (Figure 4) will be required. As discussed previously, these options may create accessibility issues and/or require new foundations. However, Option 3 may be preferrable over Option 1 because of disruption in the interior of the building during construction.

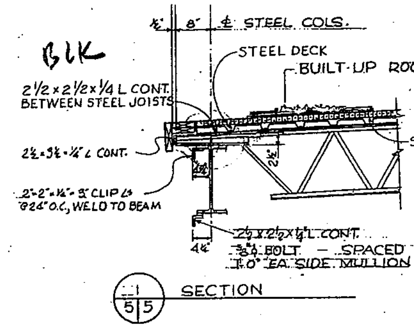
Building 1084

CORPS OF ENGINEERS

U.S. ARMY

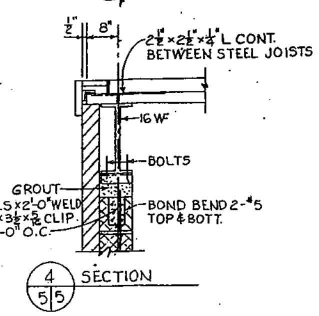
ROOF BEAM SCHEDULES

	GYPSUM OR LIGHTWEIGHT CONC. DECK MK	BEAM SIZE	EL. TOP OF BEAM		METAL DECK MK	BEAM SIZE	EL. TOP OF BEAM
40#/□LL	RB1	18WF50	EL.+116'-7¼"	40#/□LL	RB1	18WF50	EL.+116'-7¼"
	RB2	16WF36	EL.+115'-7⅞"		RB2	16WF36	EL.+115'-7⅞"
	RB3	16WF50	EL. 115'-8¼"		RB3	16WF45	EL. 115'-8¼"
	RB4 (b)	12B16.5	EL. VARIES		RB4	12B16.5	EL. VARIES
	RB5	12B16.5	EL. VARIES		RB5	12B16.5	EL. VARIES
30#/□LL	RB1	18WF50	EL.+116'-7¼"	30#/□LL	RB1	16WF40	EL.+116'-7¼"
	RB2	16WF36	EL.+115'-7⅞"		RB2	16WF36	EL.+115'-7⅞"
	RB3	16WF45	EL. 115'-8⅛"		RB3	16WF40	EL. 115'-8⅛"
	RB4	12B16.5	EL. VARIES		RB4	12B16.5	EL. VARIES
	RB5	12B16.5	EL. VARIES		RB5	12B16.5	EL. VARIES
20#/□LL	RB1	16WF40	EL.+116'-7¼"	20#/□LL	RB1	16WF36	EL.+116'-7¼"
	RB2	16WF36	EL.+115'-7⅞"		RB2	16WF36	EL.+115'-7⅞"
	RB3	16WF40	EL.+115'-8"		RB3	16WF40	EL.+115'-8"
	RB4	12B16.5	EL. VARIES		RB4	12B16.5	EL. VARIES
	RB5	12B16.5	EL. VARIES		RB5	12B16.5	EL. VARIES

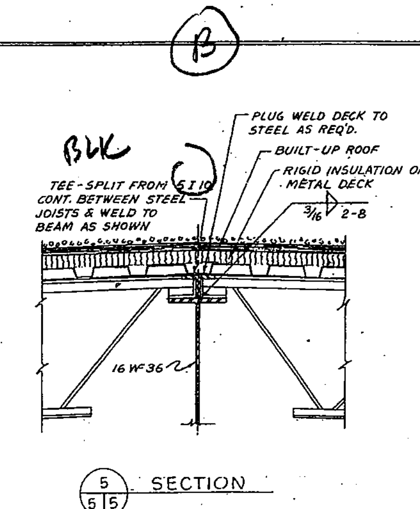


1/5 SECTION

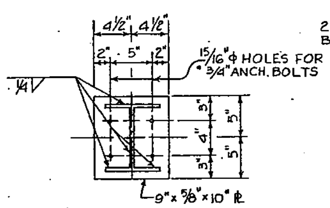
SCALE OF ALL SECTIONS ¾" = 1'-0"



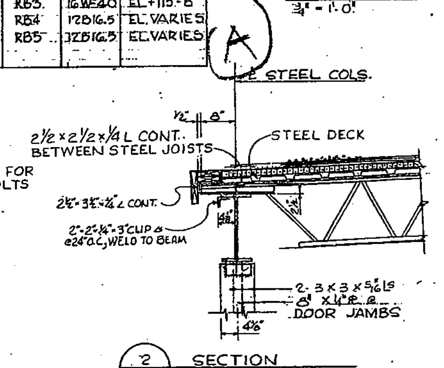
4/5 SECTION



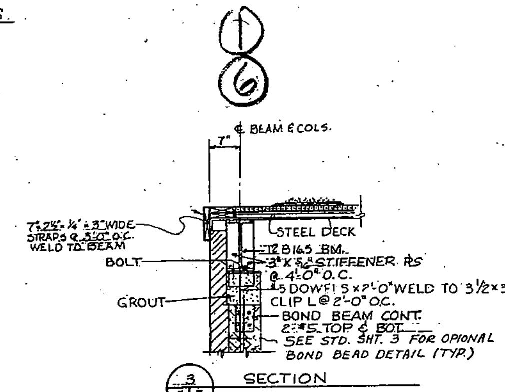
5/5 SECTION



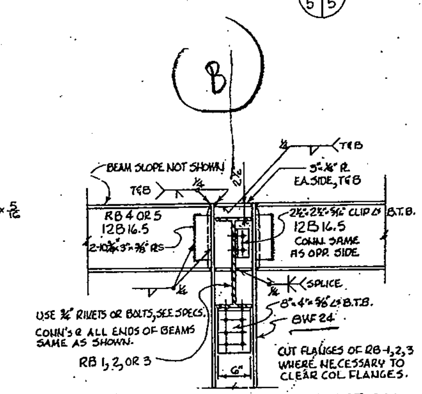
COLUMN BASE PLATE DETAIL



2/5 SECTION



3/5 SECTION



TYPICAL BEAM-COLUMN CONNECTION

SCALE: 1" = 1'-0"

GENERAL NOTES

FLOOR SLAB: THE MAINTENANCE SHOP FLOOR SLAB IS DESIGNED AS STRUCTURAL SLAB. LIVE LOAD WILL BE 12,500 WHEEL LOAD OR 200 P.S.F.

DESIGN LOADS:
ROOF LIVE LOAD: 20 PSF
WIND LOAD: 20 PSF; SEISMIC ZONE 3 U.B.C. 1961 EDITION.
FOUNDATION: PILE CAPACITY LIVE LOAD + DEAD = 50 TONS ⚠1

WELDED CONNECTIONS SHALL BE DESIGNED AND EXECUTED ACCORDING TO THE LATEST REVISED CODE OF THE "AMERICAN WELDING SOCIETY".

STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.

STEEL JOISTS: SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF THE "STEEL JOIST INSTITUTE".

CONCRETE: ALL CONCRETE SHALL HAVE A MIN. 28 DAY COMPRESSIVE STRENGTH OF 3000 P.S.I. (CLASS "A") EXCEPT USE CLASS "P" FOR FLOORS AND APRONS & CLASS "B" 2,500 PSI FOR PILE FILLER.

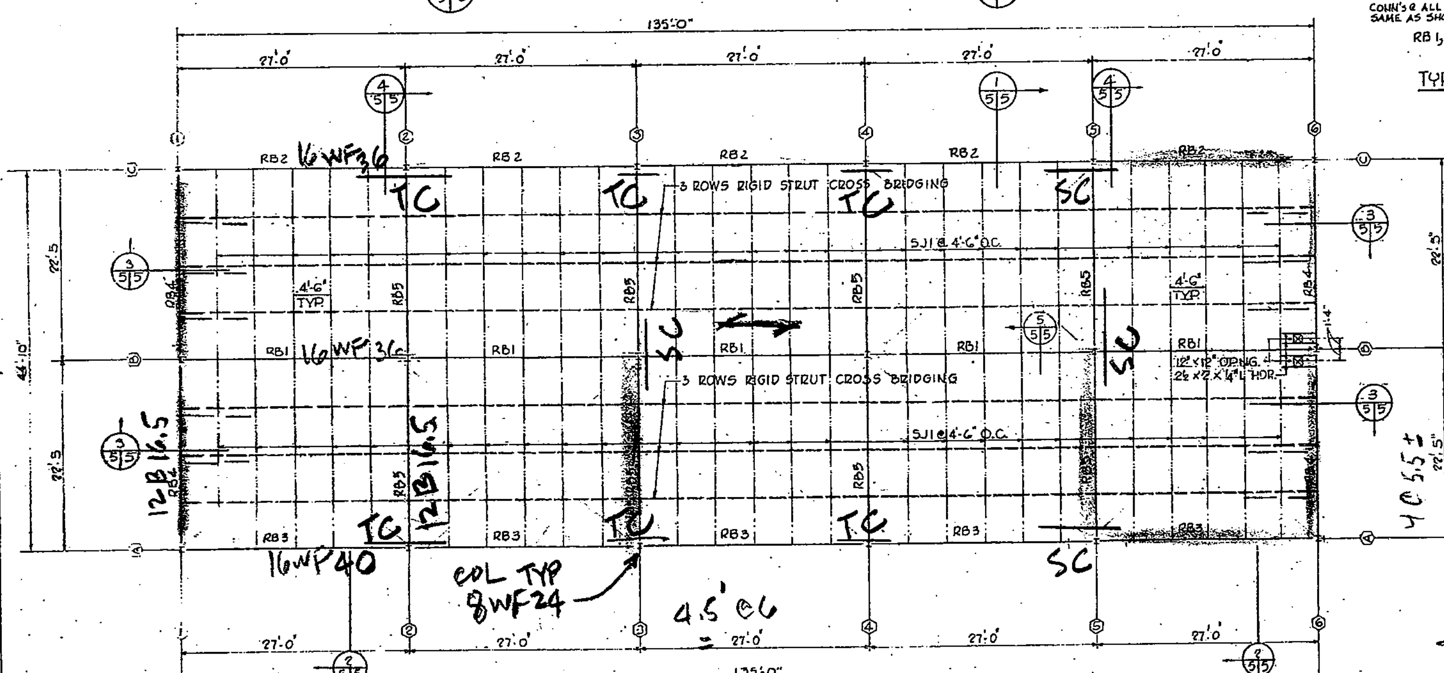
REINFORCING: ALL REINFORCING SHALL BE HARD OR INTERMEDIATE GRADE REINFORCING STEEL IN ACCORDANCE WITH THE SPECIFICATIONS. $f_y = 40$

STEEL LOOSE LINTELS: ALL STEEL LOOSE LINTELS SHALL BEAR A MIN. OF 8 INCHES EACH END.

COLUMN SCHEDULE

STORY	DESCRIPT. \ COLUMN NOS.	A1 ~~(5 BAY)~~	A2-A3 A4-A5	A6	B1	B2-B3 B4-B5	B6	C1 ~~(5 BAY)~~	C2-C3-C4 C5	C6	~~A1 (3 & 4 BAY)~~	~~C1 (3, 4 BAY)~~
1 ST.	COL. SIZE	8WF24	8WF24	8WF24	8WF24	8WF24	8WF24	8WF24	8WF24	8WF24	~~8WF24~~	~~8WF24~~
	BASE R	10"×8"×0'-9"	10"×8"×0'-9"	10"×8"×0'-9"	10"×8"×0'-9"	10"×8"×0'-9"	10"×8"×0'-9"	10"×8"×0'-9"	10"×8"×0'-9"	10"×8"×0'-9"	~~10"×8"×0'-9"~~	~~10"×8"×0'-9"~~
	ANC. BOLTS	4-¾"φ×24"	4-¾"φ×24"	4-¾"φ×24"	4-¾"φ×24"	4-¾"φ×24"	4-¾"φ×24"	4-¾"φ×24"	4-¾"φ×24"	4-¾"φ×24"	~~4-¾"φ×24"~~	~~4-¾"φ×24"~~
~~PEDESTAL~~	~~SIZE~~	~~12×12~~	~~12×14~~	~~12×12~~	~~12×12~~	~~12×12~~	~~12×12~~	~~12×12~~	~~12×14~~	~~12×12~~	~~12×14~~	~~12×14~~
	~~VERT. REINF.~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~
	~~TIES~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~	~~#3@12"~~
	~~DOWELS TO FOOTINGS~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~	~~4-#6~~
~~GYPSUM & LIGHTWEIGHT CONC. DECK~~ 40#/□LL	~~LOAD-FOOTING MK~~	~~47.9-J~~	~~44.6-H~~	~~47.9-J~~	~~72.5-C~~	~~43.7-D~~	~~73.7-C~~	~~58.9-F~~	~~67.0-C~~	~~66.8-C~~	~~51.7-J~~	~~73.8-C~~
30#/□LL	~~LOAD-FOOTING MK~~	~~45.2-J~~	~~40.7-H~~	~~45.2-J~~	~~67.8-C~~	~~37.6-D~~	~~69.1-C~~	~~56.2-F~~	~~63.1-C~~	~~64.1-C~~	~~47.8-J~~	~~69.9-C~~
20#/□LL	~~LOAD-FOOTING MK~~	~~42.4-J~~	~~36.6-H~~	~~42.4-J~~	~~63.2-C~~	~~31.3-K~~	~~64.6-C~~	~~53.6-F~~	~~59.2-C~~	~~61.4-F~~	~~43.7-J~~	~~66.0-C~~
~~METAL DECK~~ 40#/□LL	~~LOAD-FOOTING MK~~	~~45.2-J~~	~~40.7-H~~	~~45.2-J~~	~~67.8-C~~	~~37.6-D~~	~~69.1-C~~	~~56.2-F~~	~~63.1-C~~	~~64.1-C~~	~~47.8-J~~	~~69.9-C~~
30#/□LL	~~LOAD-FOOTING MK~~	~~42.4-J~~	~~36.6-H~~	~~42.4-J~~	~~63.2-C~~	~~31.3-K~~	~~64.6-C~~	~~53.6-F~~	~~59.2-F~~	~~61.4-F~~	~~43.7-J~~	~~66.0-C~~
20#/□LL	~~LOAD-FOOTING MK~~	~~39.6-J~~	~~32.6-H~~	~~39.6-J~~	~~58.6-F~~	~~25.1-K~~	~~60.0-F~~	~~50.8-F~~	~~55.3-F~~	~~58.7-F~~	~~39.7-J~~	~~62.1-C~~

NOTE: ALL LOADS IN SCHEDULE ABOVE IN KIPS



ROOF FRAMING PLAN
SCALE: ⅛" = 1'-0"

NOTE: REF. ELEV. 100'-0" = 14.75' ON SITE PLAN

TC: Tension chord

SC: Shear collector

SW: Shear wall

6/5/64

ROOF DECK

RIGID INSULATION OVER ST'L DECK, WITH PROPERTIES AS FOLLOWS:

(A) DECK TO BE COMPOSED OF ONE FLUTED PANEL ATTACHED TO A FLAT BOTTOM PANEL, TOTAL DEPTH APPROXIMATELY 1½".

(B) CROSS SECTION OF STEEL DECKING TO HAVE A MIN. MOMENT OF INERTIA OF 0.51 IN^4/FT. AND A MIN. SECTION MODULUS OF 0.43 IN^3/FT. WIDTH.

(C) DECK AND ITS CONNECTIONS TO BE ABLE TO RESIST A LATERAL SHEAR OF 348 LBS/FT MIN. IN DIAPHRAGM ACTION.

(D) MIN. GAGE: 18 GA.

STEEL ROOF JOIST SCHEDULE		
~~GYPSUM OR LIGHTWEIGHT CONC. DECK~~		
~~LIVE LOAD~~	~~MK~~	~~SIZE~~
~~40~~	~~5J1~~	~~5J14J6~~
~~30~~	~~5J1~~	~~5J14J5~~
~~20~~	~~5J1~~	~~5J14J4~~
METAL DECK		
LIVE LOAD	MK	SIZE
~~40~~	~~5J1~~	~~5J14J5~~
~~30~~	~~5J1~~	~~5J14J4~~
20	5J1	5J14J3

GRAPHIC SCALES

1/8" = 1'-0" 8' 0' 5' 10' 16'

3/4" = 1'-0" 1' 0' 1' 2' 3'

AS BUILT

⚠1	REV. PILE CAPACITY	710	5 JUNE 64	
REVISION	DESCRIPTION		DATE	BY

PREPARED BY:

MODIFIED FOR SITE ADAPTATION AT OAKLAND, CALIFORNIA

DIST. SPEC. NO. 3118

U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

APPROVAL RECOMMENDED: [signature] APPROVED: [signature] DATE: 18 MAY 64

PREPARED UNDER THE DIRECTION OF ROBERT E. MATHE

GEORGE L. DAHL
ARCHITECTS & ENGINEERS
DALLAS, TEXAS

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION — ENGINEERING DIVISION
WASHINGTON, D.C.

DRAWN BY: KLEIN DAY
TRACED BY:
CHECKED BY: STEIRDAM ROSENLUND
SUBMITTED BY: [signature] GEORGE L. DAHL
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR:
DATE:

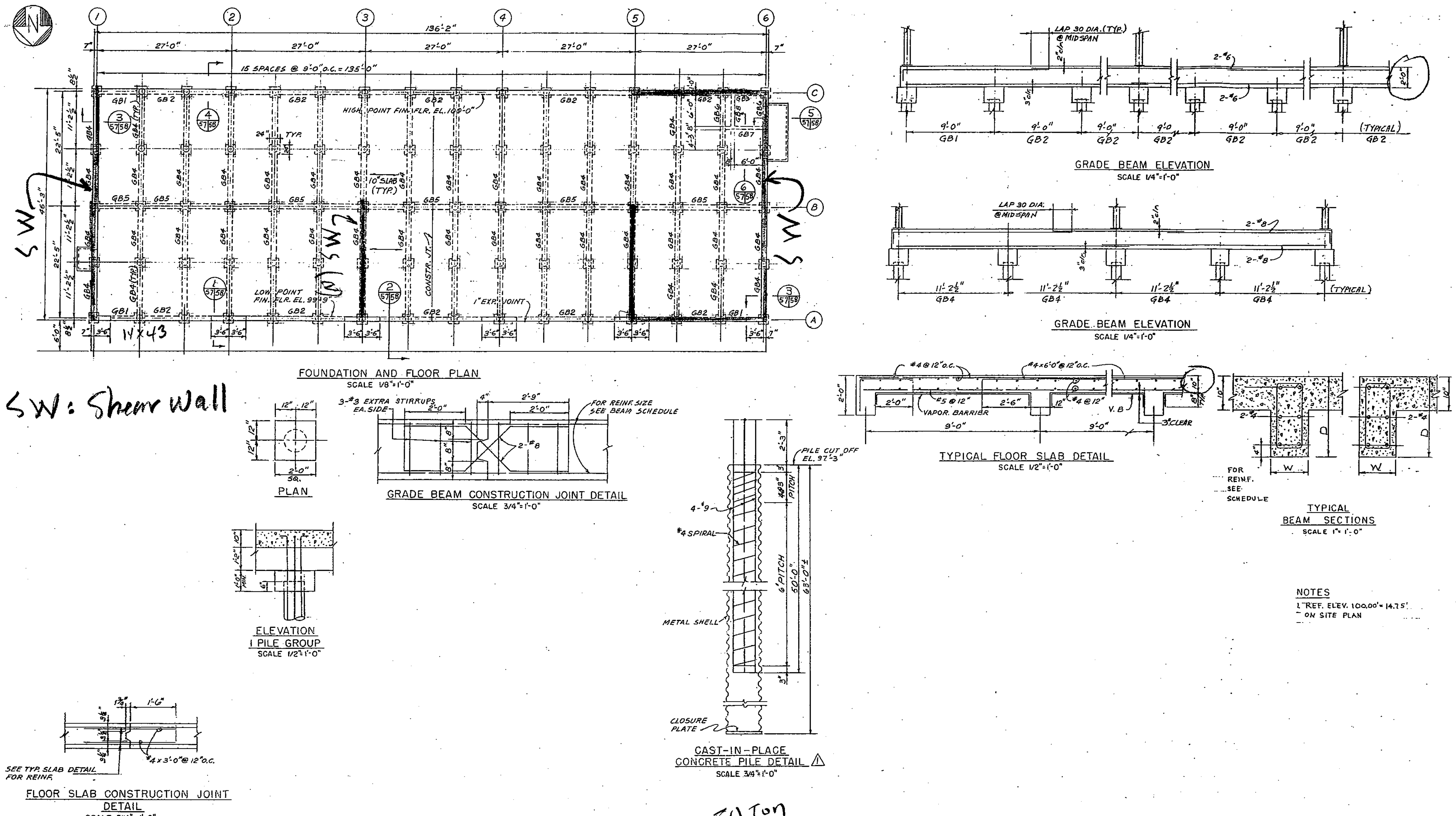
UNITED STATES ARMY RESERVE
U.S. ARMY RESERVE CENTER
MAINTENANCE SHOP
EXPANSIBLE—TWO TO FIVE BAYS
ROOF FRAMING PLAN, ROOF SECTIONS, COLUMN & BAR TYPE SCHEDULES

DATE: 25 APR 1960
SCALE: AS SHOWN
SPEC. NO. 35-00-42-67-06
DRAWING NUMBER 35-02-42
SHEET 8

SPEC. NO. 3118

DISTRICT FILE NO. 184-25-37 2653 59

FIGURE A-1



BEAM SCHEDULE

BEAM			REINFORCING									REMARKS
			TOP			BOTTOM			STIRRUPS			
MK	W	D	NO.	SIZE	TYPE	NO.	SIZE	TYPE	SIZE	TYPE	SPACING EA. END	
GB1	12"	24"	2	#6	—	2	#6	—	#3	⊡	@ 18" O.C.	
GB2	12"	24"	2	#6	—	2	#6	—	#3	⊡	@ 18" O.C.	
GB3	12"	24"	2	#8	—	2	#8	—	#3	⊡	@ 18" O.C.	
GB4	12"	24"	2	#8	—	2	#8	—	#3	⊡	2@9, BAL @ 18"	
GB5	12"	18"	2	#5	—	2	#5	—	#3	⊡	@ 18" O.C.	
GB6	12"	24"	3	#8	—	3	#8	—	#3	⊡	2@9, BAL. @ 18"	
GB7	8"	20"	2	#6	—	2	#6	—	#3	⊡	@ 18" O.C.	
GB8	8"	20"	2	#5	—	2	#5	—	#3	⊡	@ 18" O.C.	

AS BUILT

REVISION	DATE	DESCRIPTION	BY	BY
△				
△1	2 SEP 64	REVISED REINF. BARS IN CONCRETE PILE.	TJW	

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED: TJW
DRAWN: AH
CHECKED: TJW
SUBMITTED: E.B. Mellon
CHIEF, MIL. DES. SECTION

ALAMEDA COUNTY, CALIFORNIA
OAKLAND ARMY TERMINAL
U.S. ARMY RESERVE CENTER
MAINTENANCE ~~SHOP~~ 5 BAY
FOUNDATION & FLOOR FRAMING PLAN

APPROVAL RECOMMENDED:
APPROVED:
DATE: 18 MAY 64

PREPARED UNDER THE DIRECTION OF
ROBERT E. MATHE
DISTRICT ENGINEER

SCALE: AS SHOWN
SPEC. No. 3118
SHEET 57
DWG. No. 35-02-42
FILE No. 184-25-37

SAFETY PAYS

FIGURE A-2

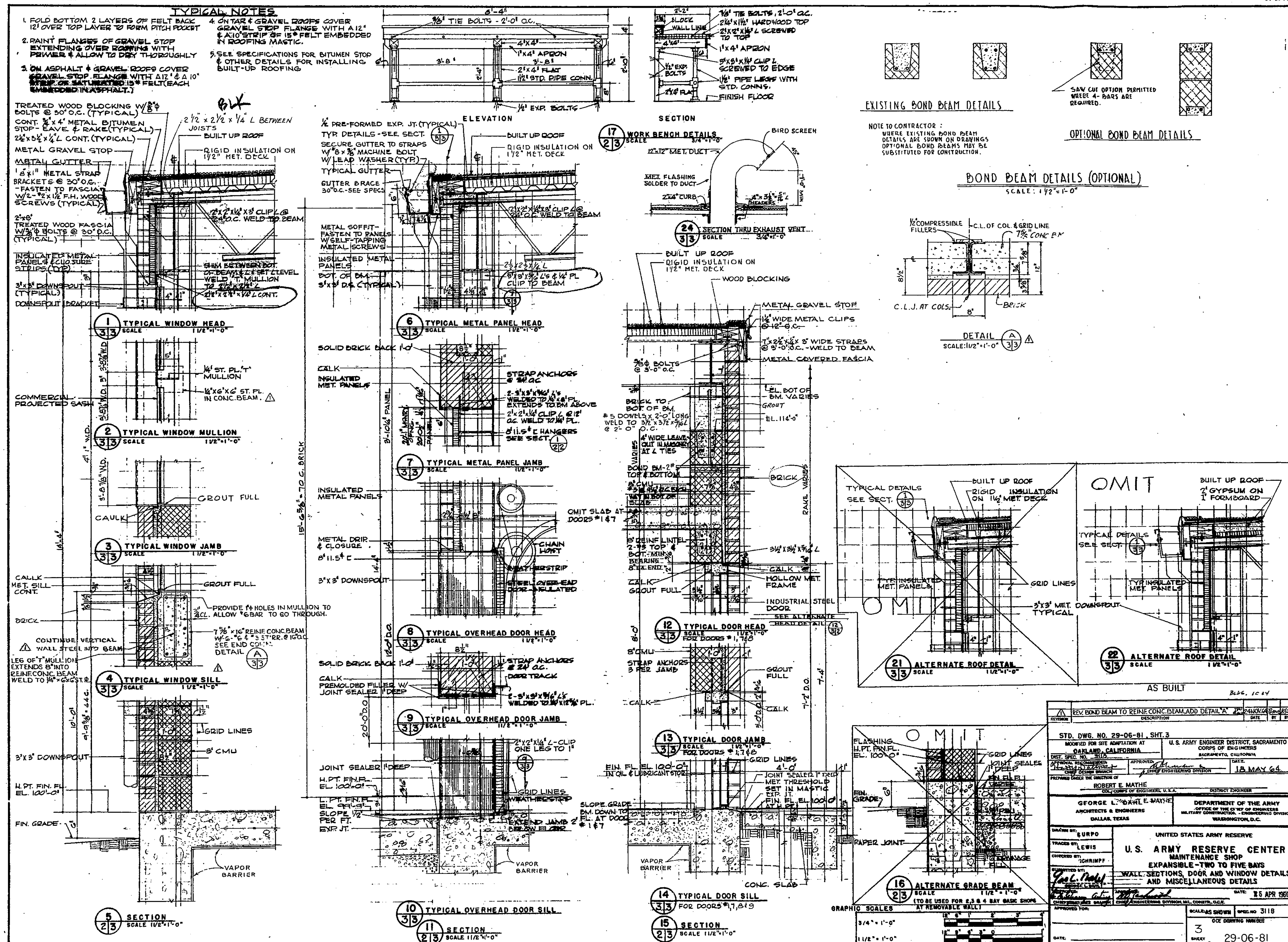
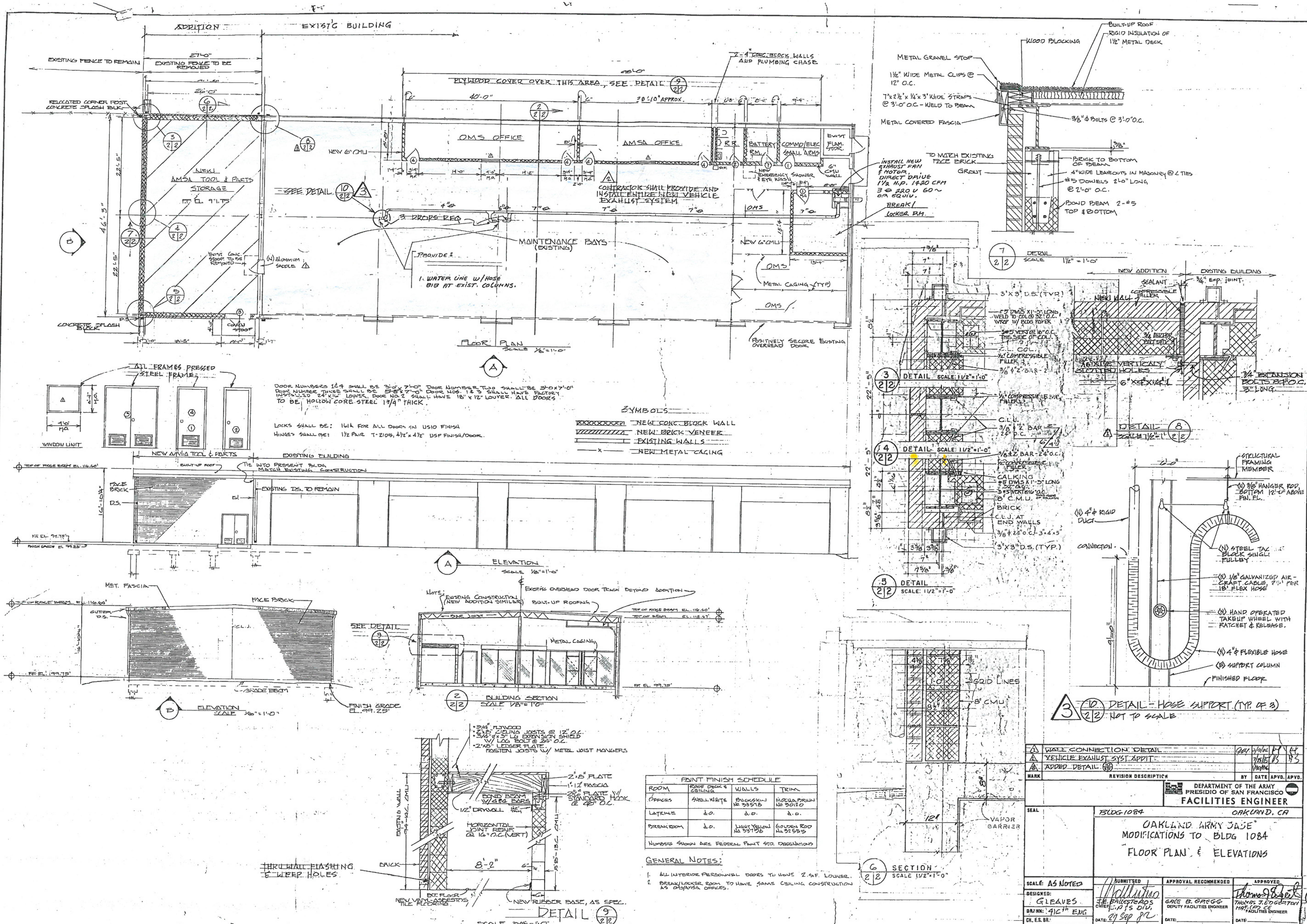

TYPICAL NOTES
1. FOLD BOTTOM 2 LAYERS OF FELT BACK 12" OVER TOP LAYER TO FORM PITCH POCKET
2. PAINT FLANGES OF GRAVEL STOP EXTENDING OVER ROOFING WITH PRIMER & ALLOW TO DRY THOROUGHLY
3. ON ASPHALT & GRAVEL ROOFS COVER GRAVEL STOP FLANGE WITH A 12" & A 10" STRIP OF SATURATED 15# FELT (EACH EMBEDDED IN ASPHALT.)
4. ON TAR & GRAVEL ROOFS COVER GRAVEL STOP FLANGE WITH A 12" & A 10" STRIP OF 15# FELT EMBEDDED IN ROOFING MASTIC.
5. SEE SPECIFICATIONS FOR BITUMEN STOP & OTHER DETAILS FOR INSTALLING BUILT-UP ROOFING
ELEVATION
SECTION
17 WORK BENCH DETAILS
24 SECTION THRU EXHAUST VENT
EXISTING BOND BEAM DETAILS
OPTIONAL BOND BEAM DETAILS
NOTE TO CONTRACTOR: WHERE EXISTING BOND BEAM DETAILS ARE SHOWN ON DRAWINGS OPTIONAL BOND BEAMS MAY BE SUBSTITUTED FOR CONSTRUCTION.
SAW CUT OPTION PERMITTED WHERE 4- BARS ARE REQUIRED.
BOND BEAM DETAILS (OPTIONAL)
SCALE: 1 1/2"=1'-0"
DETAIL A
SCALE: 1 1/2"=1'-0"
1 TYPICAL WINDOW HEAD
2 TYPICAL WINDOW MULLION
3 TYPICAL WINDOW JAMB
4 TYPICAL WINDOW SILL
5 SECTION
6 TYPICAL METAL PANEL HEAD
7 TYPICAL METAL PANEL JAMB
8 TYPICAL OVERHEAD DOOR HEAD
9 TYPICAL OVERHEAD DOOR JAMB
10 TYPICAL OVERHEAD DOOR SILL
11 SECTION
12 TYPICAL DOOR HEAD
13 TYPICAL DOOR JAMB
14 TYPICAL DOOR SILL
15 SECTION
16 ALTERNATE GRADE BEAM (TO BE USED FOR 2,3 & 4 BAY BASIC SHOPS AT REMOVABLE WALL)
21 ALTERNATE ROOF DETAIL
22 ALTERNATE ROOF DETAIL
OMIT
AS BUILT
GRAPHIC SCALES
STD. DWG. NO. 29-06-81, SHT. 3
U. S. ARMY ENGINEER DISTRICT, SACRAMENTO CORPS OF ENGINEERS
OAKLAND, CALIFORNIA
18 MAY 64
ROBERT E. MATHE
GEORGE L. DAHL & E. MAYHE ARCHITECTS & ENGINEERS DALLAS, TEXAS
DEPARTMENT OF THE ARMY
UNITED STATES ARMY RESERVE
U. S. ARMY RESERVE CENTER
MAINTENANCE SHOP
EXPANSIBLE - TWO TO FIVE BAYS
WALL SECTIONS, DOOR AND WINDOW DETAILS AND MISCELLANEOUS DETAILS
15 APR 1960
AS SHOWN
3118
29-06-81

FIGURE A-3



PAINT FINISH SCHEDULE			
ROOM	ROOF DECK & CEILING	WALLS	TRIM
OFFICES	SHELL WHITE	BUCKSKIN No. 33578	MOCHA BRWN No. 30120
LATRINE	d.o.	d.o.	d.o.
BREAK ROOM	d.o.	LIGHT YELLOW No. 33798	GOLDEN ROD No. 32555
NUMBERS SHOWN ARE FEDERAL PAINT STD. DESIGNATIONS			

GENERAL NOTES:

1. ALL INTERIOR PERSONNEL DOORS TO HAVE 2 S.F. LOUVER.
2. BREAK/LOCKER ROOM TO HAVE SAME CEILING CONSTRUCTION AS OMS/AMSA OFFICES.

MARK	REVISION DESCRIPTION	BY	DATE	APVD.	APVD.
1	WALL CONNECTION DETAIL		2/13/84		
2	VEHICLE EXHAUST SYST ADDIT		7/25/85		
3	ADDED DETAIL 10/2-2		1/30/86		

DEPARTMENT OF THE ARMY
PRESIDIO OF SAN FRANCISCO
FACILITIES ENGINEER

SEAL

BLDG 1084 OAKLAND, CA

OAKLAND ARMY BASE
MODIFICATIONS TO BLDG 1084
FLOOR PLAN & ELEVATIONS

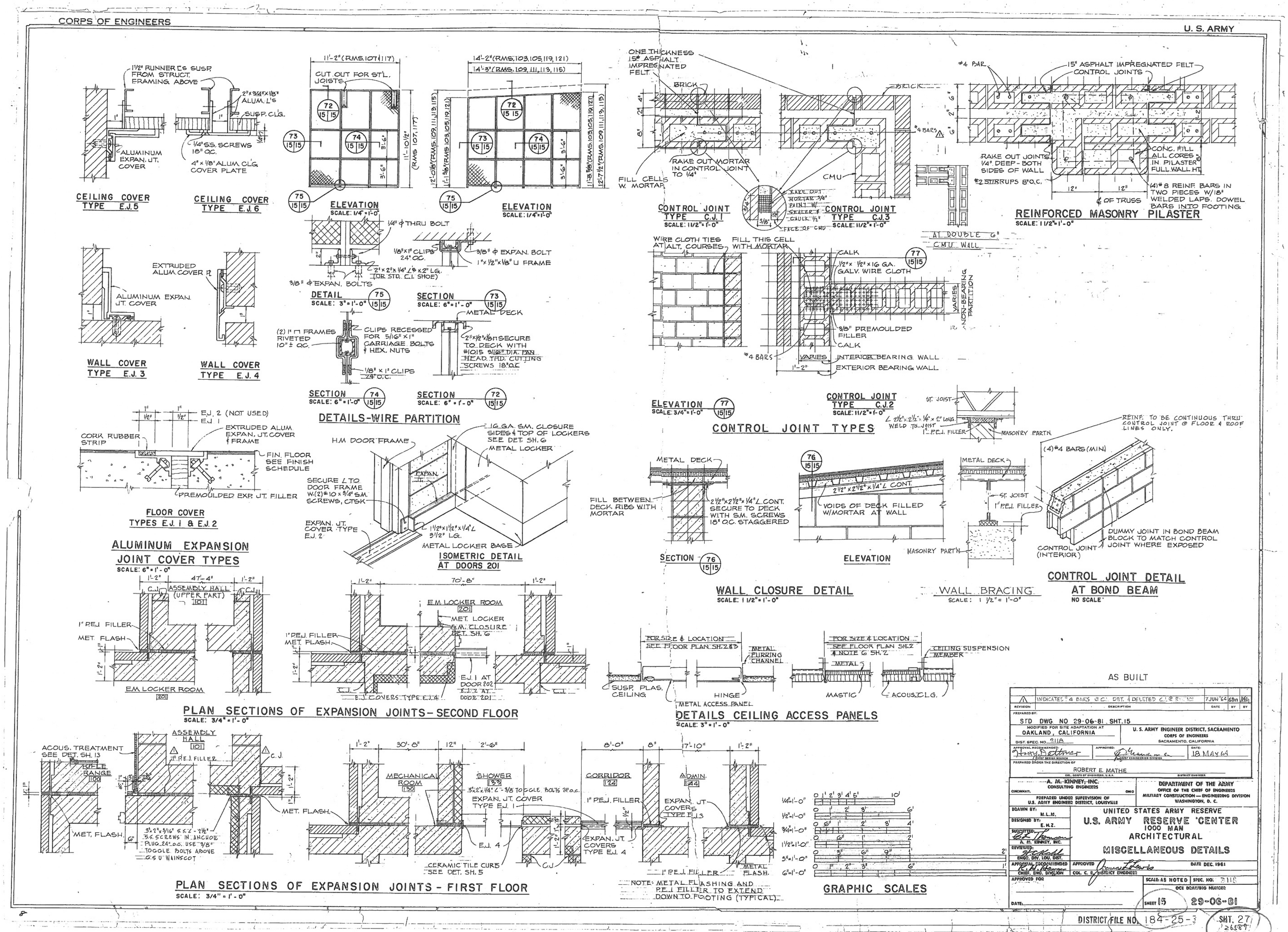
SCALE: AS NOTED
DESIGNED: GLEAVES
DRAWN: 416th ENG
CH., E.S. BR.:
CHECKED:

SUBMITTED: J.E. BALLESTEROS, CHIEF, E.P.&S DIV. DATE: 27 Sep 82
APPROVAL RECOMMENDED: GALE B. GREGG, DEPUTY FACILITIES ENGINEER. DATE:
APPROVED: THOMAS J. EDGERTON, MAJ. (P) CE, FACILITIES ENGINEER. DATE:

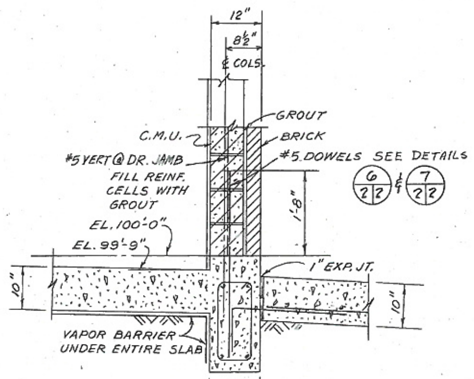
APPROVAL BY USING SERVICE
SIGNATURE [signature] TITLE Ch., Res. Fac. DATE 27 Sep 82

LZ-09661-1 (PROJECT NO.)
P-220-82 (PLAN NO.)
SHEET 2 OF 6

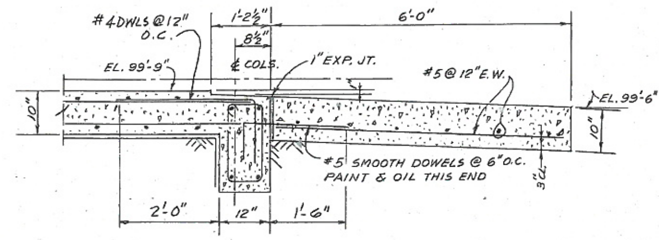
Only Addition dwg dated: ~1986



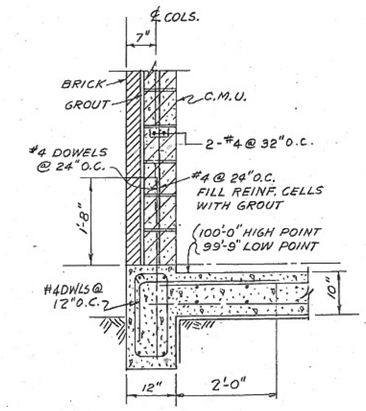
CORPS OF ENGINEERS
U. S. ARMY
CEILING COVER TYPE E.J.5
CEILING COVER TYPE E.J.6
WALL COVER TYPE E.J.3
WALL COVER TYPE E.J.4
FLOOR COVER TYPES E.J. 1 & E.J. 2
ALUMINUM EXPANSION JOINT COVER TYPES
SCALE: 6" = 1'-0"
ELEVATION SCALE: 1/4" = 1'-0"
DETAIL SCALE: 3" = 1'-0"
SECTION SCALE: 6" = 1'-0"
DETAILS-WIRE PARTITION
ISOMETRIC DETAIL AT DOORS 201
CONTROL JOINT TYPE C.J.1 SCALE: 1 1/2" = 1'-0"
CONTROL JOINT TYPE C.J.3 SCALE: 1 1/2" = 1'-0"
CONTROL JOINT TYPE C.J.2 SCALE: 1 1/2" = 1'-0"
ELEVATION SCALE: 3/4" = 1'-0"
CONTROL JOINT TYPES
REINFORCED MASONRY PILASTER SCALE: 1 1/2" = 1'-0"
WALL CLOSURE DETAIL SCALE: 1 1/2" = 1'-0"
WALL BRACING SCALE: 1 1/2" = 1'-0"
CONTROL JOINT DETAIL AT BOND BEAM NO SCALE
PLAN SECTIONS OF EXPANSION JOINTS - SECOND FLOOR SCALE: 3/4" = 1'-0"
PLAN SECTIONS OF EXPANSION JOINTS - FIRST FLOOR SCALE: 3/4" = 1'-0"
DETAILS CEILING ACCESS PANELS SCALE: 3" = 1'-0"
NOTE: METAL FLASHING AND P.E.J. FILLER TO EXTEND DOWN TO FOOTING (TYPICAL)
GRAPHIC SCALES
AS BUILT
STD DWG NO 29-06-81 SHT. 15
MODIFIED FOR SITE ADAPTATION AT OAKLAND, CALIFORNIA
U. S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA
ROBERT E. MATHE
A. M. KINNEY, INC. CONSULTING ENGINEERS
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION — ENGINEERING DIVISION
WASHINGTON, D. C.
UNITED STATES ARMY RESERVE
U.S. ARMY RESERVE CENTER
1000 MAN
ARCHITECTURAL
MISCELLANEOUS DETAILS
DATE DEC. 1961
SCALE: AS NOTED
SHEET 15
29-06-81
DISTRICT FILE NO. 184-25-3
SHT. 27



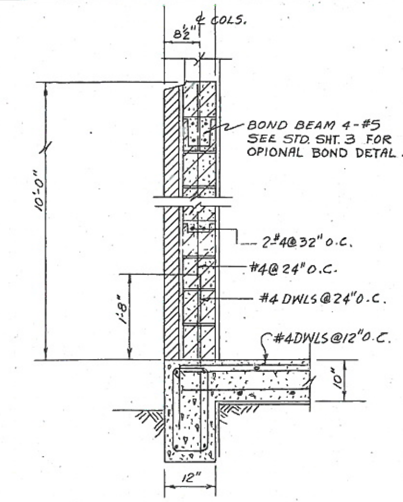
SECTION 1
SCALE 3/4"=1'-0" 57 58



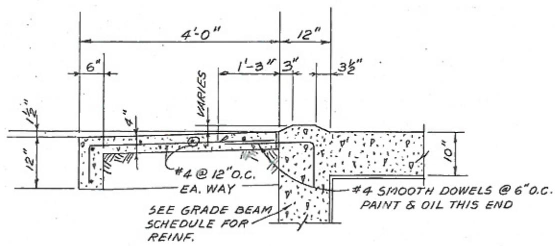
SECTION 2
SCALE 3/4"=1'-0" 57 58



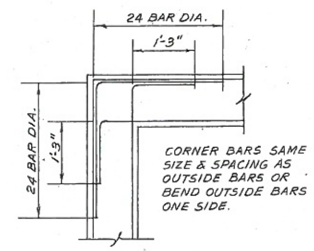
SECTION 3
SCALE 3/4"=1'-0" 57 58



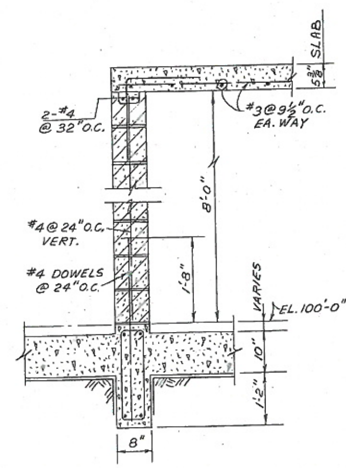
SECTION 4
SCALE 3/4"=1'-0" 57 58



SECTION 5
SCALE 3/4"=1'-0" 57 58



TYPICAL CORNER REINFORCING DETAIL
SCALE 3/4"=1'-0"



SECTION 6
SCALE 3/4"=1'-0" 57 58

GRAPHIC SCALE
3/4"=1'-0" 0 1' 2' 3' 4'

AS BUILT

REVISION	DATE	DESCRIPTION	BY	BY

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED: TJW
DRAWN: AH
CHECKED: TJW
SUBMITTED: E.B. Mellon, CHIEF, MIL. DESIGN SECTION
APPROVAL RECOMMENDED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION
DATE: 18 MAY 64

ALAMEDA COUNTY, CALIFORNIA
OAKLAND ARMY TERMINAL
U.S. ARMY RESERVE CENTER
MAINTENANCE SHOP-5 BAY
SECTIONS AND DETAILS

PREPARED UNDER THE DIRECTION OF
ROBERT E. MATHE
COL. CORPS OF ENGINEERS, U.S.A. DISTRICT ENGINEER

SCALE: AS SHOWN | SPEC. No. 3118
SHEET 58 | DWG. No. 35-02-42 | FILE No. 184-25-37

UNITED STATES ARMY RESERVE

U. S. ARMY RESERVE CENTER

MAINTENANCE SHOP

EXPANSIBLE – TWO TO FIVE BAYS

INDEX OF DRAWINGS

MATERIAL INDICATIONS

- GLASS
- BRICK
- CONCRETE MASONRY UNITS
- GLAZED STRUCTURAL UNITS
- CONCRETE
- PLASTER
- METAL
- WOOD
- INSULATION
- GRANULAR FILL
- EARTH
- PLYWOOD

REFERENCE SYMBOL

- DETAIL OR SECTION NUMBER
- SHOWN ON SHEET NUMBER
- TAKEN ON SHEET NUMBER

STRUCTURAL SYMBOLS

[	CHANNEL
L	ANGLE
PL	PLATE
@	AT
ø	DIAMETER
□"	SQUARE INCH
℄	CENTER LINE
#	POUNDS OR NUMBER
fs	STEEL STRESS
fc	CONCRETE STRESS
WF	WIDE FLANGE

MECHANICAL SYMBOLS

- —FOS— FUEL OIL SUPPLY
- —FOR— FUEL OIL RETURN
- ELBOW, TURNED DOWN
- ELBOW, TURNED UP
- REDUCER, CONCENTRIC
- REDUCER, ECCENTRIC
- CAP
- VALVE, GATE
- VALVE, GLOBE
- —FOV— FUEL OIL VENT
- (T) THERMOSTAT
- FUEL OIL GAUGE LINE
- 12 × 20 DUCT
- 4" RD ROUND DUCT
- FAN SHOWING DUCT & FLEXIBLE CONNECTIONS
- DUCT SHOWING TURNING VANES
- DUCT, EXHAUST, SECTION
- DUCT, SUPPLY, SECTION

PLUMBING SYMBOLS

- STORM DRAIN
- COLD WATER
- —G— GAS PIPING
- GATE VALVE
- GLOBE VALVE
- SWING CHECK VALVE
- PLUG COCK VALVE
- HOSE BIBB OR WALL HYDRANT

H. PT.	HIGH POINT
HR.	HOUR
HTG.	HEATING
HDW.	HARDWARE
H.W.	HOT WATER
W.	WATT
W/	WITH
W.B.	WET BULB
W.D.	WINDOW DIMENSION
W.P.	WEATHER PROOF
WPG.	WEATHERPROOFING

MODULAR MEASURE

- USES A HORIZONTAL & VERTICAL GRID OF REFERENCE LINES SPACED 4" APART IN LENGTH, WIDTH & HEIGHT.
- GRID LINES SHOWN ON LARGE SCALE DETAILS ONLY.
- DIMENSION ARROWS ARE TO GRID LINES
- DIMENSIONS OFF THE GRID LINES USE A DOT

LIST OF ABBREVIATIONS

AMP.	AMPERES
ABV.	ABOVE
A.C.	AIR CONDITIONING
A.C.	ALTERNATING CURRENT
A.C.	AIR CHAMBER
ACST.	ACOUSTIC
AL.	ALUMINUM
ALT.	ALTERNATE
A.P.	ACCESS PANEL
APPROX.	APPROXIMATELY
ARCH.	ARCHITECT
ASB.	ASBESTOS
ASSY.	ASSEMBLY
AVG.	AVERAGE
BD.	BOARD
B.HP.	BRAKE HORSEPOWER
B.L.	BUILDING LINE
BLDG.	BUILDING
BLR.	BOILER
BM.	BEAM
BOT.	BOTTOM
BR.	BRANCH
BRKT.	BRACKET
B.T.U.	BRITISH THERMAL UNIT
COMPR.	COMPRESSOR
C	COURSE
CAP.	CAPACITY
CEM.	CEMENT
CER.	CERAMIC
C.F.E.	CONTRACTOR FURNISHED EQUIP.
CFLG.	COUNTER FLASHING
C.F.M.	CUBIC FEET PER MINUTE
C.I.	CAST IRON
C.L.J.	CONTROL JOINT
C.L.	CENTER LINE
C.L.G.	CEILING
CLR.	CLEAR
CND.	CONDUIT
C.O.	COMMANDING OFFICER
CO.	CLEANOUT
COL.	COLUMN
CONC.	CONCRETE
CNDS.	CONDENSATE
CONN.	CONNECTION
CONSTR.	CONSTRUCTION
CONT.	CONTINUOUS
CONTR.	CONTRACTOR
CSK	COUNTERSINK
CU. FT.	CUBIC FEET
C.W.	COLD WATER
CY	CYCLE
C.J.	CONSTRUCTION JOINT
C.M.U.	CONCRETE MASONRY UNITS
D.B.	DRY BULB
DBL.	DOUBLE
DET.	DETAIL
DIA.	DIAMETER
DIM.	DIMENSION
DISC.	DISCONNECT
DISTR.	DISTRIBUTION
D.L.	DEAD LOAD
DN.	DOWN
D.O.	DOOR OPENING
DS.	DOWNSPOUT
DWG.	DRAWING
E	ENAMEL
EA	EACH
E.D.R.	EQUIVALENT DIRECT RADIATION
E.F.	EACH FACE
EL.	ELEVATION
ELEC.	ELECTRIC
E.M.	EXPOSED MASONRY
E.M.	ENLISTED MEN
ENCL.	ENCLOSURE
ENT.	ENTRANCE
EQUIP.	EQUIPMENT
E.W.D.	ELECTRIC WATER DISPENSER
EXH.	EXHAUST
EXP.	EXPANSION
F	FAHRENHEIT
F.D.	FLOOR DRAIN
FIN.	FINISH
FIX.	FIXTURE
FL.	FLOOR
FL.	FLASHING
FLUOR.	FLUORESCENT
F.P.M.	FEET PER MINUTE
F. PT.	FIRING POINT
FTG.	FOOTING
FUNN. DR.	FUNNEL DRAIN
GA.	GAGE
GAL.	GALLONS
GL.	GLASS
GRD.	GROUND
G.P.M.	GALLONS PER MINUTE
G.S.U.	GLAZED STRUCTURAL UNIT
HGT.	HEIGHT
HOR.	HORIZONTAL
H.P.	HORSEPOWER
I.F.	INSIDE FACE
INS.	INSULATION
I.P.S.	IRON PIPE SIZE
J.C.	JANITORS CLOSET
JT.	JOINT
JR.	JUNIOR
LAV.	LAVATORY
LG.	LENGTH OR LONG
L.L.	LIVE LOAD
L.PT.	LOW POINT
LT.	LIGHT
LTG.	LIGHTING
LV.D.	LOUVERED DOOR
M.	MEGA (10^3)
MACH.	MACHINE
MATL.	MATERIAL
MAX.	MAXIMUM
M.C.M.	THOUSANDS OF CIRCULAR MILLS
MECH.	MECHANICAL
MET.	METAL
MIN.	MINIMUM
MK.	MARK
M.O.	MASONRY OPENING
MSNRY.	MASONRY
MT.	MOUNT
MTD.	MOUNTED
MTG.	MOUNTING
N.I.C.	NOT IN CONTRACT
NO.	NUMBER
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.F.	OUTSIDE FACE
OFF.	OFFICERS
O.GL.	OBSCURE GLASS
OPNG.	OPENING
PTN.	PARTITION
PCT.	PERCENTUM
P.D.P.	POWER DISTRIBUTION PANEL
PH.	PHASE
PL.	PLATE
PLMB.	PLUMBING
PNL.	PANEL
POL.	POLISHED
PSF	PER SQUARE FOOT
PSI	PER SQUARE INCH
PT.	POINT
PEJ	PREMOLDED EXPANSION JOINT
R	RISER
RD.	ROUND
RECP.	RECEPTICLE
REG.	REGISTER
REINF.	REINFORCING OR REINFORCED
REQD.	REQUIRED
RM.	ROOM
R.P.M.	REVOLUTIONS PER MINUTE
RUB.	RUBBER
S.A.T.C.	SUSPENDED ACOUSTIC TILE CEILING
S.B.I.	STEEL BOILER INSTITUTE
SCH.	SCHEDULE
S.D.	SHOWER DRAIN
SECT.	SECTION
SH.	SHEET
SIM.	SIMILAR
S.J.	STEEL JOIST
SK.	SINK
S/N	SOLID NEUTRAL
S.P.	STATIC PRESSURE
SPEC.	SPECIFICATION
SQ.FT.	SQUARE FEET
S.S.	SERVICE SINK
STL.	STEEL
STD.	STANDARD
STOR.	STORAGE
STR.	STRUCTURAL
SW.	SWITCH
T.	TREAD
TEL.	TELEPHONE
TEMP.	TEMPERATURE
T & G	TONGUE & GROOVE
THK.	THICK
T.L.	TOTAL LOAD
TRIG.	TRIGGER
TYP.	TYPICAL
V	VOLTS
VENT	VENTILATE
VERT	VERTICAL

AS BUILT

REVISION	DESCRIPTION	DATE	BY	BY

PREPARED BY:

STD. DWG. NO. 29-06-81, SHT. 1

MODIFIED FOR SITE ADAPTATION AT OAKLAND, CALIFORNIA

DIST. SPEC. NO. 311A

U. S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

APPROVAL RECOMMENDED: Harry Dettmer — CHIEF DESIGN BRANCH

APPROVED: [signature] CHIEF ENGINEERING DIVISION

DATE: 13 MAY 64

PREPARED UNDER THE DIRECTION OF ROBERT E. MATHE, COL., CORPS OF ENGINEERS, U.S.A., DISTRICT ENGINEER

GEORGE L. DAHL
ARCHITECTS & ENGINEERS
DALLAS, TEXAS

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION – ENGINEERING DIVISION
WASHINGTON, D.C.

DRAWN BY: LEWIS

TRACED BY: LEWIS

CHECKED BY: SCHRIMPF

SUBMITTED BY: Geo. L. Dahl — GEORGE L. DAHL

UNITED STATES ARMY RESERVE
U. S. ARMY RESERVE CENTER
MAINTENANCE SHOP
EXPANSIBLE – TWO TO FIVE BAYS
INDEX OF DRAWINGS & LEGEND

APPROVED: [signature] CHIEF, STRUCTURES BRANCH

APPROVED: F. B. Jackson [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

DATE: 25 APR 1960

APPROVED FOR: THE CHIEF, U.S. ARMY RESERVE AND R.O.T.C. AFFAIRS
Henry F. Ross Col. [signature]

DATE: 22 April 1960

SCALE: NONE

SPEC NO. 3118

SHEET 1

OCE DRAWING NUMBER 29-06-81

DISTRICT FILE NO. 184-25-37 SHT. 54 26550

BLDG 1084

Year Built: 1964, with Storeroom added in 1980's

Build Code Used: 1961 UBC

Build Code Used for Evaluation: 2007 CBC and ASCE 7-05

Description: The building is a one-story building with approximate dimensions of 35 feet long, 45 feet wide and 16 feet high. The total area of the building is approximately 6,000 square feet.

The ground floor is of concrete beams and slab construction. It is supported on 50-ton concrete piers.

The roof is a metal deck structure that is supported on a series of steel joists and steel beams. The roofing materials consist of insulation, composition roof, and tar and gravel. The roof deck appears to be a flexible diaphragm.

The vertical loads of the building are carried by both concrete masonry unit (CMU) walls and steel frames. The CMU walls apparently are load-bearing walls for carrying the vertical load along the building perimeters. The steel frames consist of steel columns and roof beams for carrying the vertical loads within the building. The CMU walls also serve as shear walls that are part of the lateral-load-resisting system.

See Figures A-1 to A-3 (attached).

Findings

1. CMU walls are connected with dowels welded to clip angles and fastened to the bottom flange of roof beams. This connection appears to be a weak link in the load path for delivering out-of-plane wall force to the roof diaphragm.

2. Calculations indicate that the existing 8 inches CMU walls are under-reinforced for out-of-plane force and axial load.

3. Length-to-width ratio of the roof diaphragm exceeds that allowed in the Code.

4. Flexible roof diaphragm is inadequate for transferring shears to shear walls.

5. Roof tension chords appear to be inadequate.

6. Shear collectors in the roof appear to be inadequate.

Recommended Retrofit Elements

1. Add two new interior shear walls to reduce length-to-width ratio of roof diaphragm and diaphragm shears transferred to shear walls.

2. Strengthen all exterior CMU walls with steel posts and horizontal members. Steel posts may be wide flanges or tubing and are spaced at about 9 feet on centers. Steel posts will be fastened to roof interior beams or perimeter beams to transfer lateral loads to roof diaphragm. Horizontal members are used to provide lateral supports to the posts.

3. Strengthen all roof perimeter beam connections for tension chord action.

4. Add shear collectors to collect and deliver diaphragm shears to shear walls.

5. Add struts to deliver out-of-plane force in end walls to roof diaphragm.

6. Improve the roof metal deck joints and supports by adding blockings in the roof diaphragm.

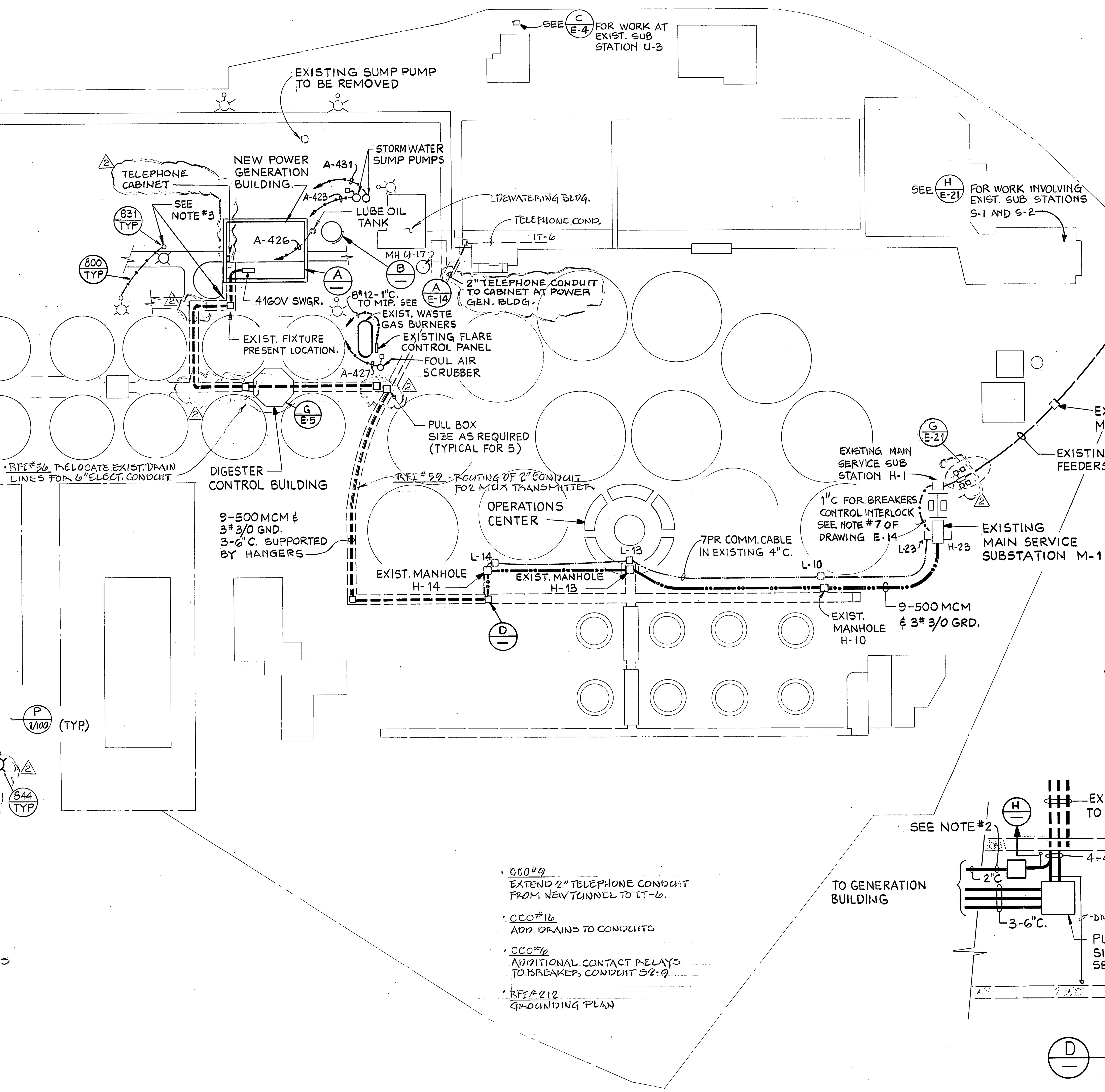

173


173

Electrical Main Distribution Lines and Substations

NOTES

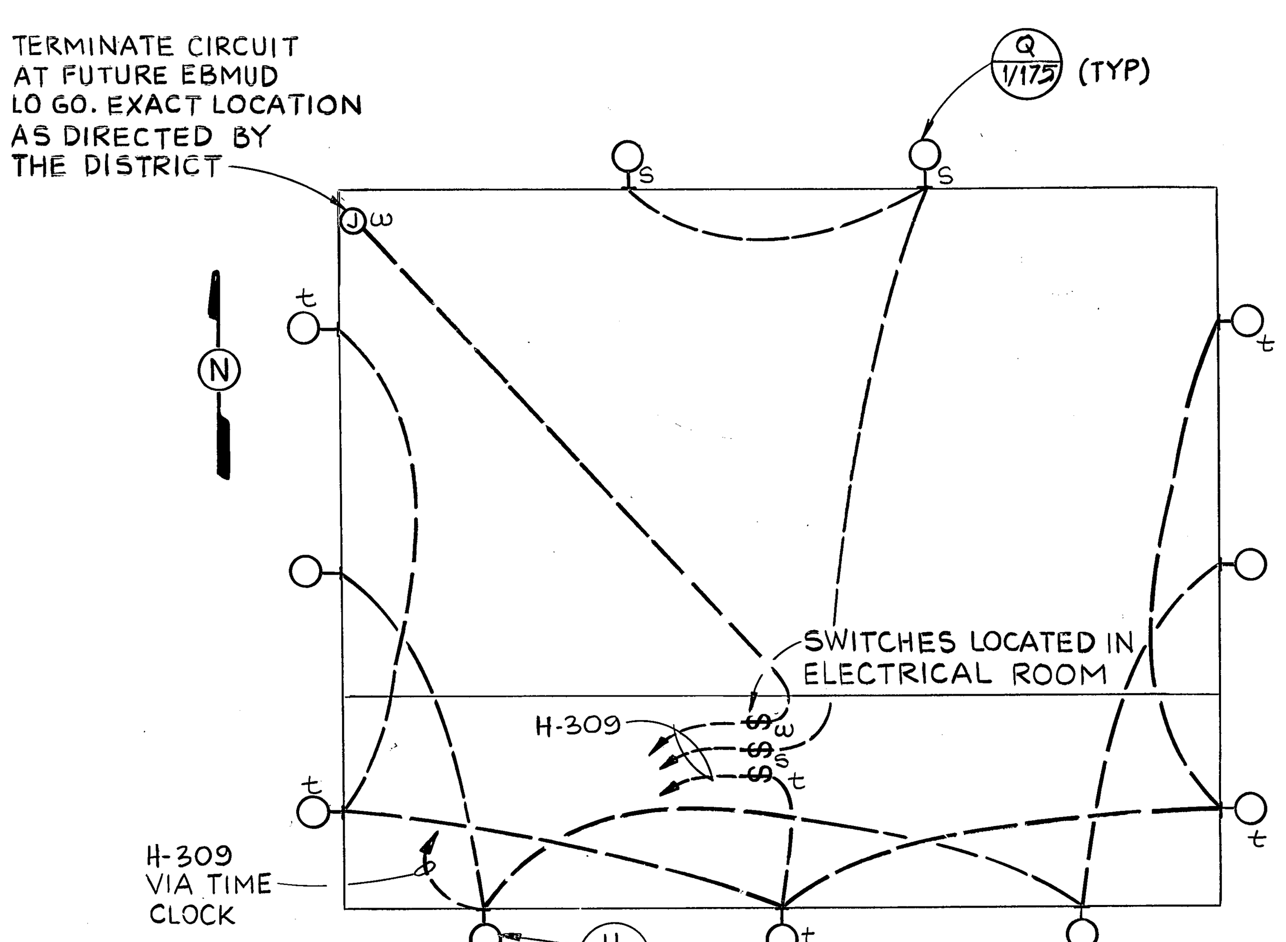
1. 5KV FEEDER CABLES SHALL BE SPLICED IN PULL BOX. TERMINATIONS & SPLICES SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS AND BE IN ACCORDANCE WITH DIV. 16 SPECIFICATIONS.
2. NEW 2"C AND 7PR. COMM. CABLE TO BE TERMINATED IN MUX TRANSMITTER CABINET LOCATED IN ELECTRICAL ROOM IN POWER GENERATION BUILDING.
3. EXISTING POLE MOUNTED FIXTURE AND POLE TO BE RELOCATED AS SHOWN. EXISTING CIRCUITING TO REMAIN. CONNECT RELOCATED FIXTURE TO EXISTING FIXTURE AS SHOWN.
4. ELECTRICAL CONTRACTOR SHALL RELOCATE EXIST. LIGHTING FIXTURES AND ELECTRIC EQUIPT. AS REQUIRED FOR INSTALLATION OF PIPING BY OTHERS IN THE TUNNELS.



- CCO#9 EXTEND 2" TELEPHONE CONDUIT FROM NEW TUNNEL TO IT-6.
- CCO#16 ADD DRAINS TO CONDUITS
- CCO#6 ADDITIONAL CONTACT RELAYS TO BREAKER, CONDUIT 52-9
- RFI#212 GROUNDING PLAN

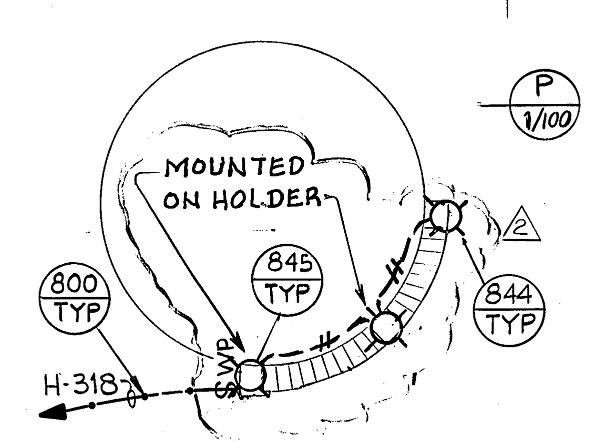
PLOT PLAN

SCALE 1" = 100'



A — NEW POWER GENERATION BUILDING PERIMETER LIGHTING PLAN

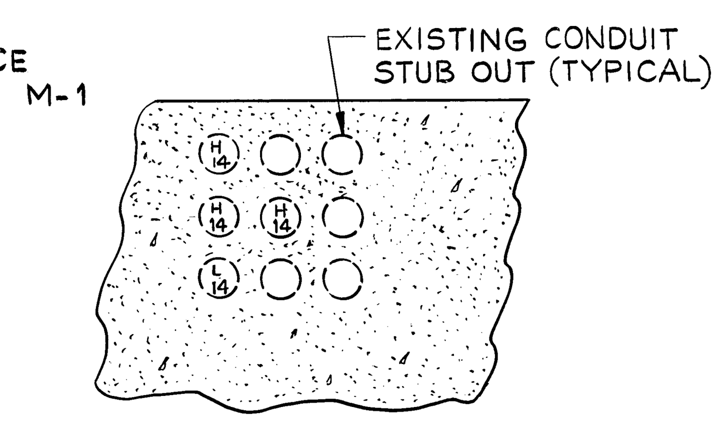
SCALE 1" = 20'



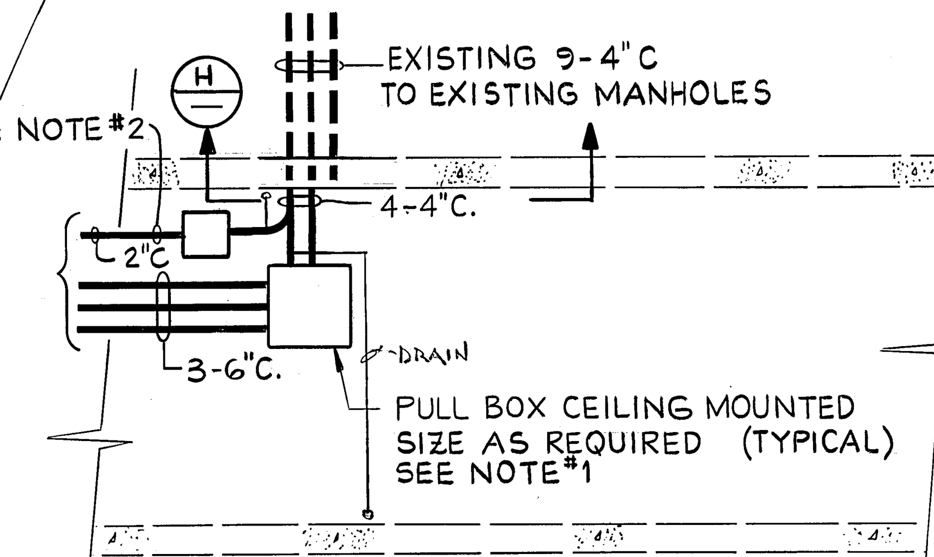
B — GAS HOLDER

SCALE 1" = 20'

RFI#156 PERIMETER LIGHT FIXTURES ELEV. 123.87



H — SECTION



D — DETAIL

REV.	DATE	BY	DESCRIPTION
2	Nov 89	ZYE	IN SERVICE 1987 AS BUILT INSP. D. Nguyen
	FEB 86	XV	AS-Built

DESIGNED DTN · DRAWN JRN · CHECKED GOH · DATE FEB. 1983

APPROVED BY: Walter R Howard RCE 14909 — PARTNER, P.E. NO.; Salwan W. Wason M18392 — PROJECT ENGINEER, P.E. NO.; E.B.M.U.D.

JOHN CAROLLO ENGINEERS

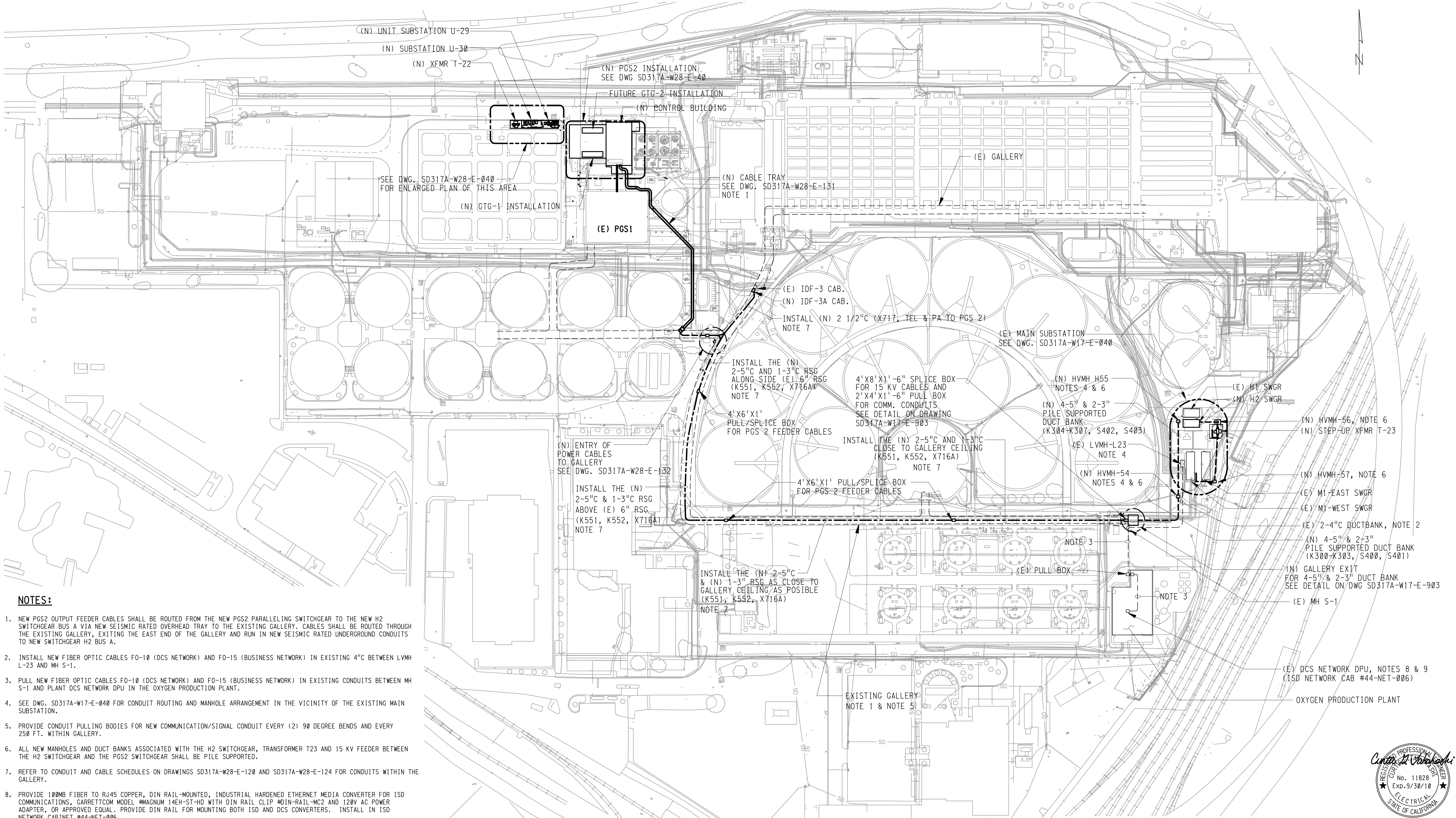
PHOENIX, ARIZONA · WALNUT CREEK, CALIFORNIA · FOUNTAIN VALLEY, CALIFORNIA · VISALIA, CALIFORNIA

JOHN A. CAROLLO, P.E. (1906-1971) · H. HARVEY HUNT, P.E. · HOWARD M. WAY, P.E. · DONALD R. PREISLER, P.E. · GAIL P. LYNCH, P.E. · WALTER R. HOWARD, P.E. · J. DAVID GRIFFITH, P.E. · G. WILLIAM KNOPF, P.E.

EAST BAY MUNICIPAL UTILITY DISTRICT — EBMUD

WATER POLLUTION CONTROL PLANT
POWER GENERATION STATION SPECIFICATION SD-135
ELECTRICAL
SITE PLAN AND DETAILS

JOB NO. W 02401A12 · DRAWING NO. JC-E-2 · SHEET NO. 83 of 106



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REF 3: REF3$FILENAME

PLOT SCALE: PLOT$SCALE

USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$$$$$$$$$$

NOTES:

1. NEW PGS2 OUTPUT FEEDER CABLES SHALL BE ROUTED FROM THE NEW PGS2 PARALLELING SWITCHGEAR TO THE NEW H2 SWITCHGEAR BUS A VIA NEW SEISMIC RATED OVERHEAD TRAY TO THE EXISTING GALLERY. CABLES SHALL BE ROUTED THROUGH THE EXISTING GALLERY, EXITING THE EAST END OF THE GALLERY AND RUN IN NEW SEISMIC RATED UNDERGROUND CONDUITS TO NEW SWITCHGEAR H2 BUS A.

2. INSTALL NEW FIBER OPTIC CABLES FO-10 (DCS NETWORK) AND FO-15 (BUSINESS NETWORK) IN EXISTING 4"C BETWEEN LVMH L-23 AND MH S-1.

3. PULL NEW FIBER OPTIC CABLES FO-10 (DCS NETWORK) AND FO-15 (BUSINESS NETWORK) IN EXISTING CONDUITS BETWEEN MH S-1 AND PLANT DCS NETWORK DPU IN THE OXYGEN PRODUCTION PLANT.

4. SEE DWG. SD317A-W17-E-040 FOR CONDUIT ROUTING AND MANHOLE ARRANGEMENT IN THE VICINITY OF THE EXISTING MAIN SUBSTATION.

5. PROVIDE CONDUIT PULLING BODIES FOR NEW COMMUNICATION/SIGNAL CONDUIT EVERY (2) 90 DEGREE BENDS AND EVERY 250 FT. WITHIN GALLERY.

6. ALL NEW MANHOLES AND DUCT BANKS ASSOCIATED WITH THE H2 SWITCHGEAR, TRANSFORMER T23 AND 15 KV FEEDER BETWEEN THE H2 SWITCHGEAR AND THE PGS2 SWITCHGEAR SHALL BE PILE SUPPORTED.

7. REFER TO CONDUIT AND CABLE SCHEDULES ON DRAWINGS SD317A-W28-E-120 AND SD317A-W28-E-124 FOR CONDUITS WITHIN THE GALLERY.

8. PROVIDE 100MB FIBER TO RJ45 COPPER, DIN RAIL-MOUNTED, INDUSTRIAL HARDENED ETHERNET MEDIA CONVERTER FOR ISD COMMUNICATIONS, GARRETTCOM MODEL #MAGNUM 14EH-ST-HD WITH DIN RAIL CLIP #DIN-RAIL-MC2 AND 120V AC POWER ADAPTER, OR APPROVED EQUAL. PROVIDE DIN RAIL FOR MOUNTING BOTH ISD AND DCS CONVERTERS. INSTALL IN ISD NETWORK CABINET #44-NET-006.

9. PROVIDE FIBER OPTIC TO RS-232, INDUSTRIAL HARDENED MEDIA CONVERTER FOR DCS COMMUNICATIONS. MEDIA CONVERTER SHALL BE GARRETTCOM #5843HRT WITH MOUNTING BRACKET #ACC-LCS, DIN RAIL CLIP #DIN-RAIL-MC2, PIGTAIL CABLE #ACC-CBL1 AND AC POWER ADAPTER #4310, OR APPROVED EQUAL. MOUNT CONVERTER ON DIN RAIL WITH ISD SYSTEM ETHERNET MEDIA CONVERTER. PROVIDE 6 POINT TERMINAL BLOCK FOR PIGTAIL TERMINATION.

10. CONDUIT INSTALLATION IN THE GALLERY SHALL BE PROVIDED WITH EXPANSION FITTINGS AND BONDING JUMPERS FOR EVERY 100 FT. OF STRAIGHT RUN, FOR EVERY CONDUIT TERMINATING TO PULL BOX, AD FOR CONDUIT CHANGE IN DIRECTION.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Curtis Takahashi
REGISTERED PROFESSIONAL ENGINEER No. 11828 Exp.9/30/10 ELECTRICAL STATE OF CALIFORNIA

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-02

carollo

NO.	DATE	REVISION	BY	REC.	APP.

DESIGNED BY:	ART CENIZAL
DRAWN BY:	JOHN MAY
DESIGN CHECKED BY: R.P.E. No. E11828	CURTIS TAKAHASHI
PROJECT MANAGER R.P.E. No. E11828	CURTIS TAKAHASHI
APPROVED: PRINCIPAL IN CHARGE R.P.E. No. E9580	JULIO HERDOCIA
PROJECT MANAGER R.P.E. No. C61336	JOHN KYSER
RECOMMENDED: SR. ENGINEER R.P.E. No. C69576	JOSEPH L. WONG

CONSULTANT

EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT No. 1
OAKLAND, CALIFORNIA

POWER GENERATION STATION 2
PGS RENEWABLE ENERGY EXPANSION
ELECTRICAL
PGS 2 TO MAIN SUBSTATION
CONDUIT AND CABLE ROUTING

SHEET NO. 167

SCALE 1"=80'
DATE JAN. 2009
SD317A-W17-E-101
DRAWING NUMBER
0
REV.

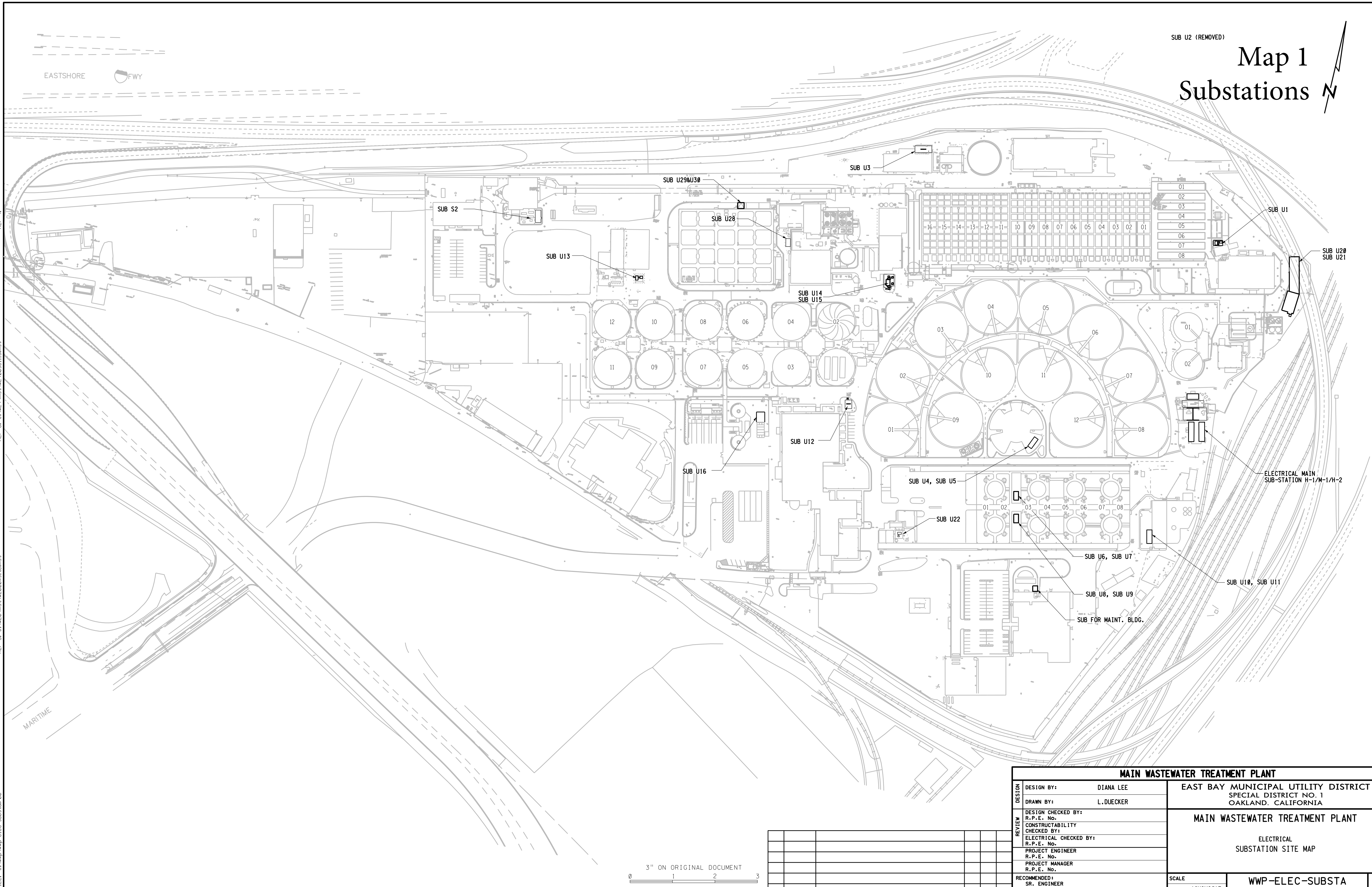
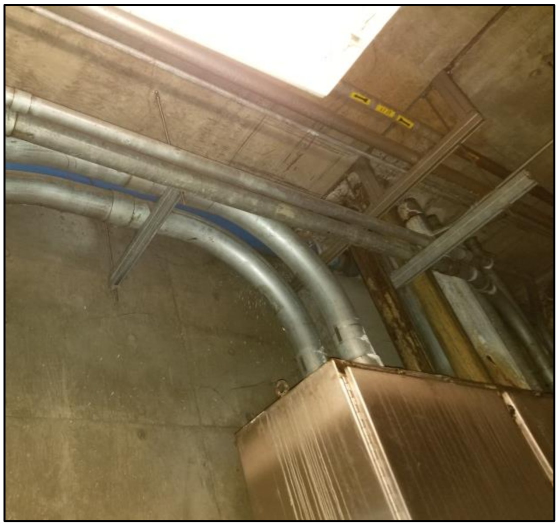
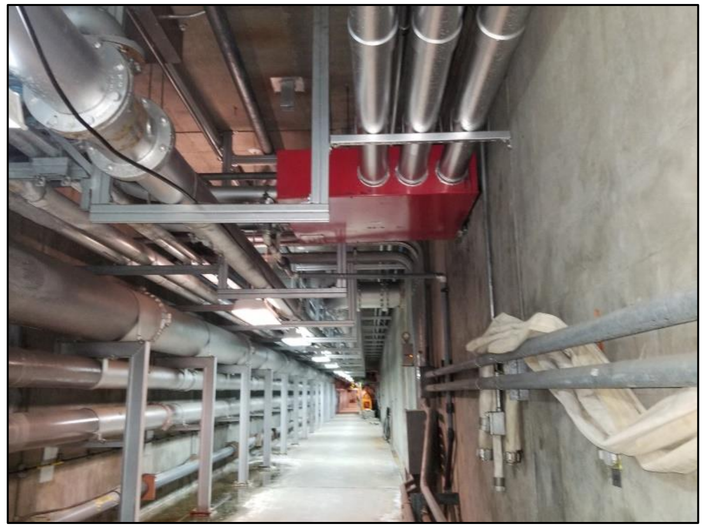

Map 1
Substations
SUB U2 (REMOVED)
EASTSHORE
FWY
MARITIME
SUB U3
SUB U29&U30
SUB S2
SUB U28
SUB U13
SUB U1
SUB U20
SUB U21
SUB U14
SUB U15
SUB U12
SUB U16
SUB U4, SUB U5
ELECTRICAL MAIN
SUB-STATION H-1/M-1/H-2
SUB U22
SUB U6, SUB U7
SUB U10, SUB U11
SUB U8, SUB U9
SUB FOR MAINT. BLDG.
3" ON ORIGINAL DOCUMENT
0 1 2 3
NO. DATE REVISION BY REC. APP.
MAIN WASTEWATER TREATMENT PLANT
DESIGN
DESIGN BY: DIANA LEE
DRAWN BY: L.DUECKER
REVIEW
DESIGN CHECKED BY: R.P.E. No.
CONSTRUCTABILITY CHECKED BY:
ELECTRICAL CHECKED BY: R.P.E. No.
PROJECT ENGINEER R.P.E. No.
PROJECT MANAGER R.P.E. No.
RECOMMENDED: SR. ENGINEER R.P.E. No.
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA
MAIN WASTEWATER TREATMENT PLANT
ELECTRICAL
SUBSTATION SITE MAP
SCALE
DATE 16NOV2017
WWP-ELEC-SUBSTA
DRAWING NUMBER
1
REV.
REF 7:
REF 8:
REF 9:
REF 4: J:\w10\MST\w1000\sel114.mst
REF 5: J:\wwp\wwp-area-sd-number_text.mst
REF 6: J:\w24\mst\w2400\sel113.mst
REF 1: J:\WWP\ref\wbdr.mst
REF 2: J:\w13\mst\w1300struct_el115.mst
REF 3: J:\w20\mst\w2000-site.mst
PLOT SCALE: 225:1
USER: lduecker
DATE: 20-NOV-2017 11:02
FILE: J:\wwp\wwp-elec-substa.00

Photo Sheet
Electrical Distribution Lines





In the Galleries

On Cable Trays (Outdoor)

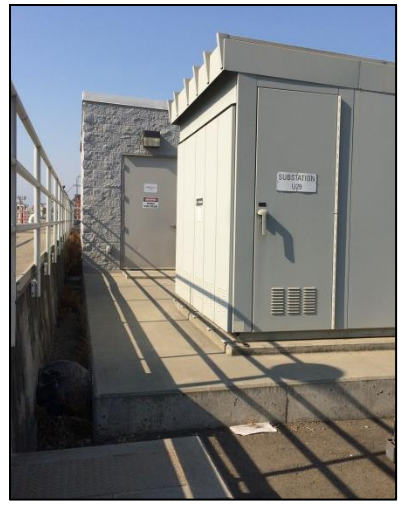
On Cable Trays (Indoor)

In buried duct banks

Substation List

GENERAL COMPONENT DATA		CONSTRUCTION		Anchor Calcs
LABEL	NAME	YEAR	SD#	
Anchorage Information for Substations				
E1	Elect Main Substation	1973, 1998, 2009	SD120, SD227, SD317A	SD317A AnchorageSub SD227 AnchorageSub
E3	Elect Sub Sta S2	1990	SD170	1990 SD170 Seismic Calcs
E4	Elect Sub Sta U1	1972, 1998	SD118, SD227	SD227Sub57B
E6	Elect Sub Sta U3	1998	SD227	SD227Sub57B 1990 SD170 Seismic Calcs
E7	Elect Sub Sta U4 and U5	1973, 1998	SD120, SD227	
E8	Elect Sub Sta U6 and U7	1973, 1998	SD120, SD227	
E9	Elect Sub Sta U8 and U9	1973, 1998	SD120, SD227	SD227Sub34A_U8U9_AnchCalcs.pdf
E10	Elect Sub Sta S3, U10 and U11	1973, 1998	SD120, SD227	
E11	Elect Sub Sta U12	1998	SD227	SD227Sub57B
E12	Elect Sub Sta U13	1998	SD227	SD227Sub57B
E13	Elect Sub Sta U14 and U15	1998	SD227	SD227Sub57B
E14	Elect Sub Sta U16	2008	SD319	E14 - Substa U16
E15-A	Elect Sub Sta S1, U20, and U21	1990	SD170	1990 SD170 Seismic Calcs
E16	Elect Sub Sta U22	1998	SD227	SD227Sub57B 1990 SD170 Seismic Calcs
E17	Elect Sub Sta U28	2004	SD275	U28 Anchorage Submittal.pdf
E18	Elect Sub Sta U29 & U30	2009	SD317A	Substas U29 U30\AnchorSub
EF4	Elect Sub Sta for Maint. Bldg.	1998	SD233A	
E19	Elect Sub Sta for Dechlor (PG&E owned)			

W:\nab\WED\Planning\Programs\Seismic\2022 AdminFacRetro\Scope ReferenceDocs\ElectDistr\2020 Substa List



Portion of Main Substation

U29 and U30 (PGS2)

U1 (AGT)

U20 and U21 (IPS)

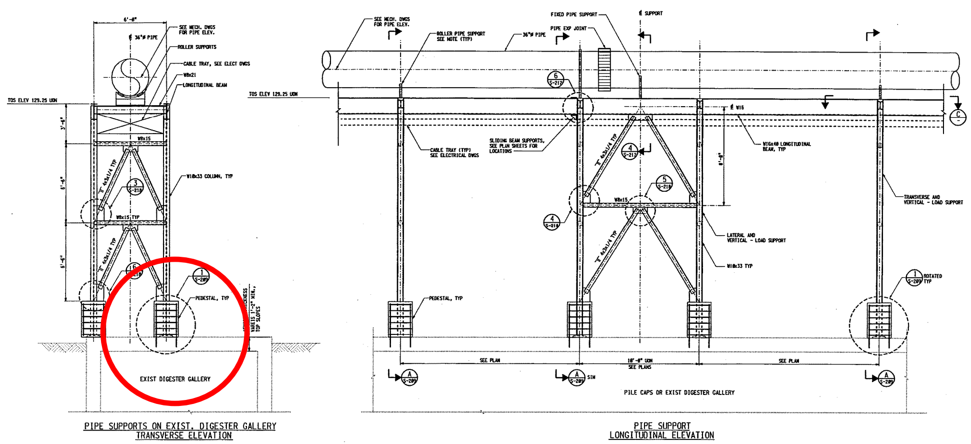
EF4 Substation at Maintenance Center

Typical Interior Substation

Digester Gallery Slab and EPS Canopy

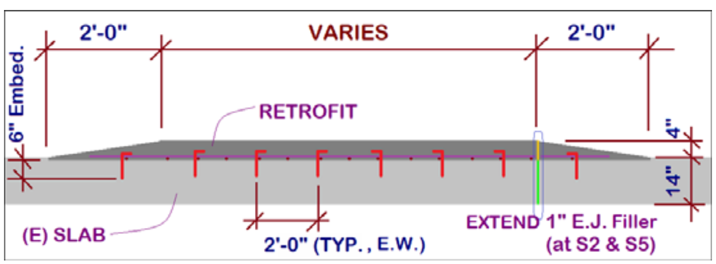
Evaluation
Digester Gallery & Pipe Chase

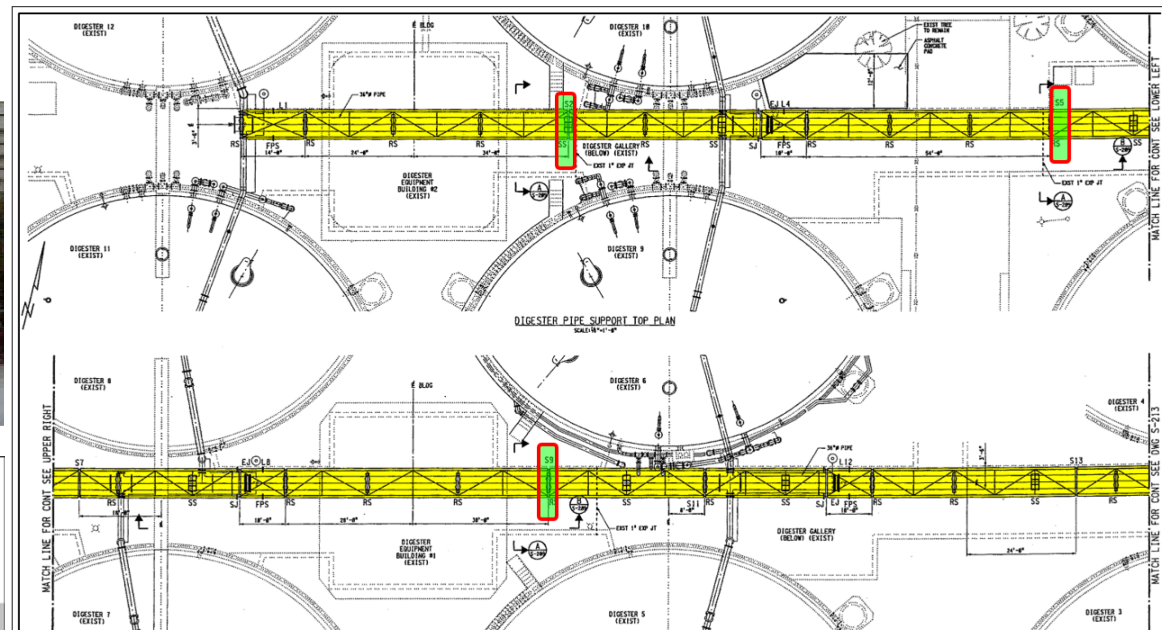
- Identified Vulnerabilities
  - Digester gallery slab is overstressed at 3 out of 17 overhead pipe chase supports
- Consequences
  - Damage to digester gallery roof
  - Damage or tilting of overhead pipe chase
  - Damage to gas pipe and other pipelines in gallery and on chase



Mitigation
Digester Gallery & Pipe Chase

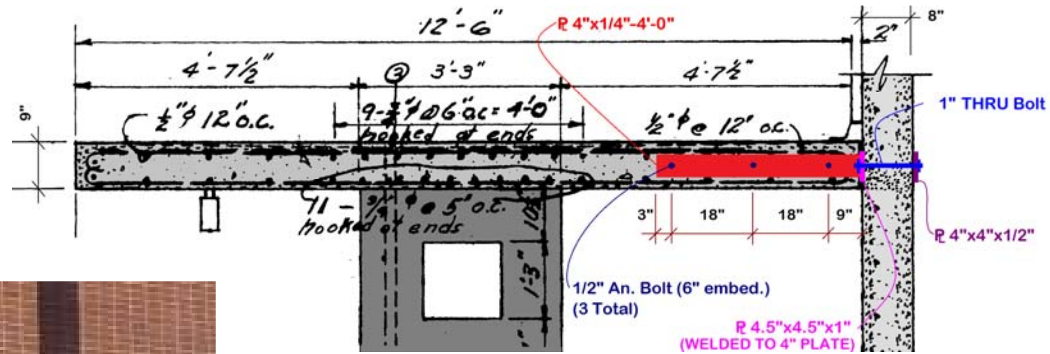
- Recommended Retrofit
  - Thicken digester gallery roof slab
  - Three locations

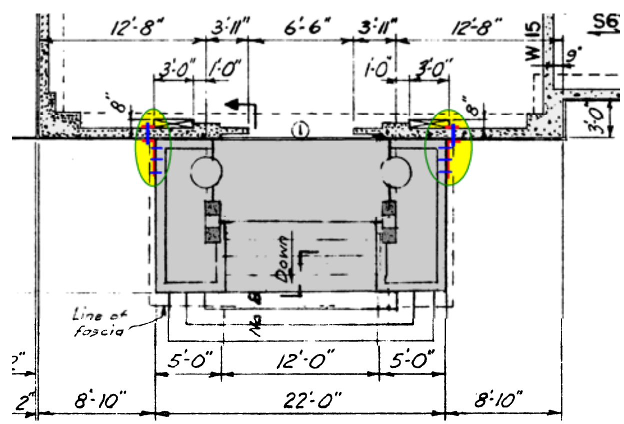




Mitigation
Effluent Pump Station

- Recommended Retrofits
  - Retrofit entrance canopy by anchoring it to EPS wall





2021 Criteria and

Seismic Hazard Information

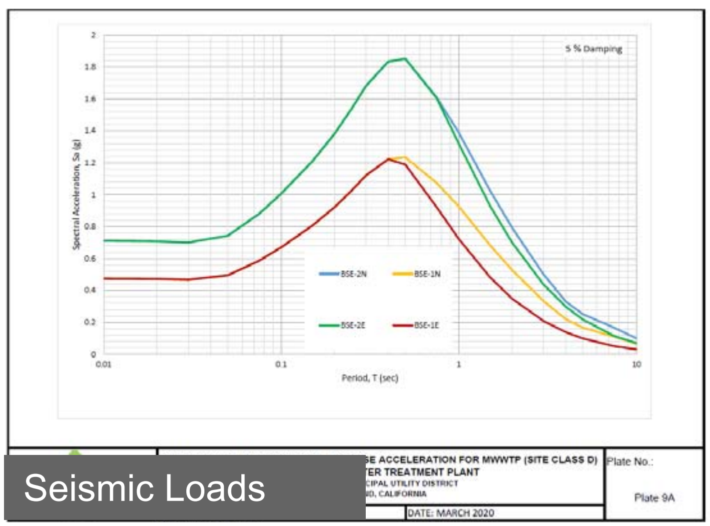
Evaluation Criteria

- **Evaluation Standards:** ASCE 41-17, ACI 350.3-06, ASCE 7-16, CBC

ASCE 41-17 Earthquake Levels for Existing Structures

ASCE 41-17 Designation	Probability of Exceedance (p/e)	Equivalent Return Period (Years)
BSE-2E	5% p/e in 50 years	975
BSE-1E	20% p/e in 50 years	225

- **Seismic Hazard Information:** 2020 Geotechnical Investigation Findings



Seismic Loads

Liquefaction