TG07.3 – Miscellaneous Metals

Questions are numbered in the order received. Numbers missing in the sequence either have been answered in a previous response set or will be answered in a future set.

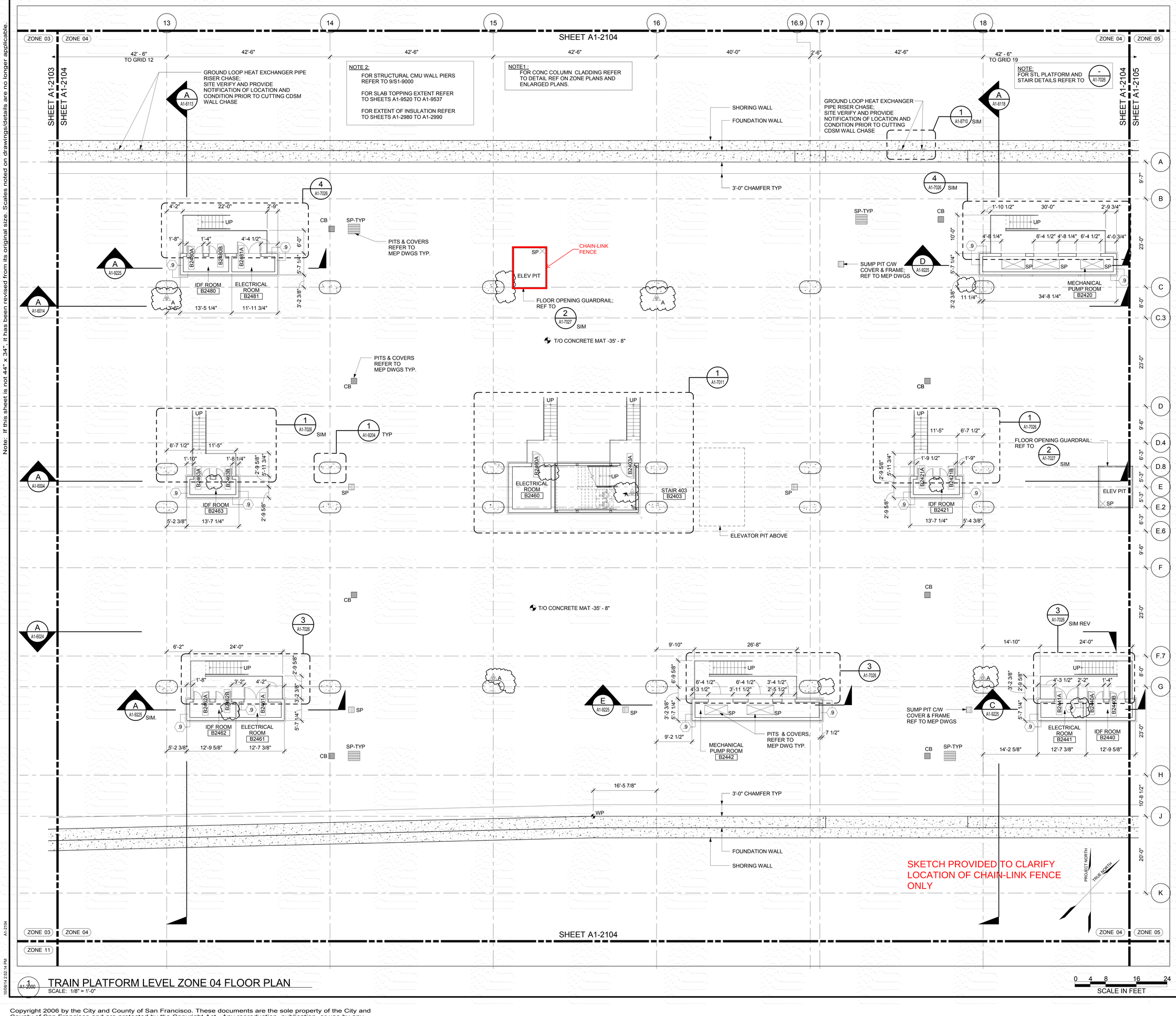
Question No.	Submission Date	Drawing No.	Document / Spec. No.	Question	Response
TG07.3-032	10/30/2014	1, 3, 5, & 10/A1-9317, 2/A1-9311	Exhibit A 05 51 00	Is the 1" plate inside web shown in detail 1 part of Bid Package TG07.3? If so; How is plate attached (size and type of weld)? Does this scope represent Item No. 14? Do I assume the 1" cover plate per detail 2 is attached similar to 2/A1-9311.	1. 1-inch plate shown inside web in details 1, 2, 3, 5/A1-9317 is part of TG07.3 package. 2. Plate thickness shall be reduced to ½ inch in ASI 0128. 3. Plate shall be attached with double-sided ¼-inch fillet welds at column flanges and web.
TG07.3-041	10/30/2014	All details on A1-8550, S1-9101	05 50 00	Please clarify what Bid Package TG07.3 is responsible for? Is it the support steel and plate that is shown on 5/S1-9100 and details on S1-9101? All other components per A1-8580, 8581 and 8582 look to be by others or are not shown in structural details as noted. Please advise.	Inclusion 13, overhead catenary system support, will be deleted in the next addendum.
TG07.3-059	10/30/2014		Exhibit A, Inclusion Item No 16	Please provide details to use for reference. Do I use 30 tons for "Above Ground" and "Below Ground"? (15 tons each?) Please advise.	Details are not currently available, but will be developed by TG14.1 trade subcontractor for use by TG07.3 trade subcontractor. Inclusion 16 will be revised to show 25% Below Ground Level, and 75% at Ground Level and Above. Exhibit A will be updated to reflect this in the next addendum.
TG07.3-060	10/30/2014	A1-2107, 4/A1-7027		Guardrail along grid line 35 is called out as "chain-link fence" in detail; is this railing or fence? Where detail 4/A1-7027 is called out, will it always be "chain link fence"?	The Guardrail along grid line 35 adjacent to the Seismic Joint is chain-link fence. See attached sketches SKA-4277 to 4286 for clarification of chain-link fence locations (shown in red line).
TG07.3-078	10/30/2014	A1-2107, 4/A1-7027		Guardrail along grid line 35 is called out as "chain-link fence" in detail; is this railing or fence? Where detail 4/A1-7027 is called out, will it always be "chain link fence"?	See Response to Question No. TG07.3-060.

Question No.	Submission Date	Drawing No.	Document / Spec. No.	Question	Response
TG07.3-082	10/30/2014	2/A1-0035	05 50 00	Is the 1/2" plate shown part of Bid Package TG07.3? If so; Can I please get more information?	All metal wall plate and protective plating, excluding metal wall plate identified in Exclusion 3, is included in the work of TG07.3. Refer to finish schedule and remaining contract documents for additional information. NOTE: Question references A1-0035, which is not a valid sheet; response refers to Sheet A-0035.
TG07.3-092	11/4/2014	6/A1-9321	05 50 00	Can you please provide a manufacturer or product that provides architect's intent? Will you need (2) spigots and (2) caps per rail?	1. Queue Rail heading shall be removed from Specification Section 05 50 00 – 2.5.C, per attached mark-up. 2. Queue Rail heading shall be added to Specification Sections 05 75 00 – 2.4.B.3, and 2.4.B.4, per attached mark-up. 3. Confirmed, two (2) spigots and two (2) caps will be required for each rail.
TG07.3-097	11/6/2014		TG07.3_12	I am confused about the SKA drawings; Are we to include all information on SKA drawings into our base bid? Or do we have to price the changes in the SKA drawings separately? Regarding the "Scoping Drawings"; Do new addendum's replace these dwg.'s? Example: Removed "8'-0 high chk. plate" per A1-3100 and deleted work at "Superintendent Station" per A1-8169.	Costs associated with SKAs are to be included in the base bid price, not broken out separately. Scoping documents are supplementary documents intended help bidders understand the written scope of work, and not intended to add or delete scope. If the contract documents, including addenda, add or delete specific items as described in the written scope of work, bidders are required to furnish and install the work only as described in the written scope of work.
TG07.3-099	11/6/2014		TG07.3_16	Per QBD response #016 "Pipe and Duct Protection"; Please provide detail of rail and clear locations. (I do not know how to read plumbing and duct drawings.)	1. Currently, there are no pipe and duct locations that require this protection. 2. Refer to attached SKA-4307 for visualization of the Specification Section 05 50 00 – 2.5.S language. 3. For bidding purposes, assume 2 locations per floor.
TG07.3-102	11/6/2014	A1-2102(Scope Dwg.)		Can you please provide a detail to apply to the highlighted concrete walls? Same with concrete walls shown on A1-2203?	Refer to Inclusion 23 and Scoping Drawing S1-9051 for additional information regarding highlighted concrete walls on Scoping Drawings A1-2102 and A1-2203.

Question No.	Submission Date	Drawing No.	Document / Spec. No.	Question	Response
TG07.3-108	11/6/2014	2/A1-7870 (Scope Dwg.)		Please explain "SEAL ALL AROUND TYP". Welded, caulked? What size weld or type of sealant? If this is not welded; would this not be provided by the same contractor providing all the exterior closure material? (This really looks like something we do not do.)	The note "Seal all around Typ." is stating the requirement to provide a sealant joint with DOW 756 sealant with backing rod, or similar product meeting the requirements of the specifications.
TG07.3-122	11/7/2014	All/A1-8550, All/A1-8551 (Scope Dwg.)	05 51 00	(This is also a follow up question to Olson's QBD_65 / TG07.3-041) Are we responsible for "plate shields" and "C-Shapes" only? (including clip angles per 1/A1-8551, shop welded) Will we FOB these items for bolted install by others? We would like to exclude: Tension Struts, Fiber Glass, Isolators, Isolator shaped steel per 4/A1-8551 and installation. (This scope item is typically done by others)	Inclusion 13, overhead catenary system support, will be deleted in the next addendum.
TG07.3-125	11/12/2014	3/A1-9067	05 50 00 pg. 10 Item J-3 05 50 00	Is the wood blocking by Bid Package TG07.3? Can we exclude the spec on sealing our bolts? If not; Please provide detail or explain what is needed to do this. Also, does the vanity steel need to be primed over the galvanize?	1. Treated wood horizontal reinforcement as shown on 3/A1-9067 is not included in the work of TG07.3. 2. Bolts penetrating through waterproofing will be sealed by the waterproofing supplier. If bolts are installed after waterproofing, TG07.3 shall pay the waterproofing installer to seal their bolts. 3. Galvanized vanity support steel does not need to be primed.
TG07.3-128	11/12/2014	All/A1-7416, All/A1-7417	05 50 00, Exhibit A Item #24	Can you please provide the structural details that the note "REF TO STRUCT" refers too? Is there any other details? Are we responsible for Steel Door Track and Angle at door jamb per 3/A1-7416? Are we responsible for the "STRUCT HSS WALL FRAMING" per 2/A1-7416? If so; please provide details.	1. Refer to 1/S1-9100. 2. Steel track is integral to a “W” system; therefore, the steel-door track and angle as shown on 3/A1-7416 are not included in the work of TG07.3. 3. Structural HSS wall framing is integral to a “W” system; therefore, the structural HSS wall framing as shown on 2/A1-7416 is not included in the work of TG07.3.

Question No.	Submission Date	Drawing No.	Document / Spec. No.	Question	Response
TG07.3-139	11/14/2014	4/A1-7550	05 50 00	Is the "Galvanized Steel Support Angle" by Bid Package TG07.3? If so; Please provide intent and detail of connection.	The galvanized steel support angle directly below the stainless-steel escalator closure panel with support system is not included in the work of TG07.3.
TG07.3-140	11/14/2014	8/A1-7579	Exhibit A pg. 8 Item #6 05 50 00	Per Exhibit A "CMU wall bracing" is excluded, but on "Scope Drawing" it's highlighted. Is this bracing by Bid Package TG07.3? If so; Please provide locations and details.	Bracing of CMU walls is excluded from the work of TG07.3.
TG07.3-142	11/14/2014	6/A1-7836	05 50 00	After I hunted this beam down through A1-7306, A1-7307, S1-2406, 3/S1-7015, 1 and 5/S1-7662, the beam that's on the second level at the grid lines shown is a MF (moment) beam. Is this in bid package TG07.3? (typically this would be by structural steel contractor)	Moment frame steel structural steel is not included in the work of TG07.3. Escalator support steel, where required, is included as part of Exhibit A, Inclusion 16.
TG07.3-143	11/14/2014	5 & 7/A1-7551	05 50 00	The galv. angle in detail 7 and the structural plate in detail 5 is by other, correct? If not; can you please provide enough information so I can find the all locations?	The galvanized angle soffit support as shown on Detail 7/A1-7551 is not included in the work of TG07.3. The structural steel support plate as shown on Detail 5/A1-7551 is not included in the work of TG07.3.

Note: If this sheet is not 44" x 34", it has been revised from its original size. Scales noted on drawings/details are no longer applicable.



1 A1-2000 TRAIN PLATFORM LEVEL ZONE 04 FLOOR PLAN
SCALE: 1/8" = 1'-0"

0 4 8 16 24
SCALE IN FEET

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BASED ON A1-2104

Transbay Transit Center
TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:
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01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16
Key Map

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3	03/31/14	ISSUED FOR CONSTRUCTION	GM
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CONTRACT NO. 08-04-CMGC-000

PROJECT TITLE
TRANSBAY TRANSIT CENTER PROGRAM
TRANSBAY TRANSIT CENTER
SAN FRANCISCO, CA

SHEET TITLE
TRAIN PLATFORM LEVEL
ZONE 04 FLOOR PLAN

ARCHITECT / ENGINEER SEAL

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APPROVED PRINCIPAL ARCHITECT	G. METZGER
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DESIGNED BY: P. MACPHAIL	CHECKED BY: W.R. BRADLEY
DRAWN BY: G. RAMLOCHAN	DATE: 06/20/2014
SCALE: 1/8" = 1'-0"	SIZE: E; FACILITY NO.: 140; REVISION: 1
SHEET NUMBER	SEQUENCE NUMBER
SKA - 4277	of

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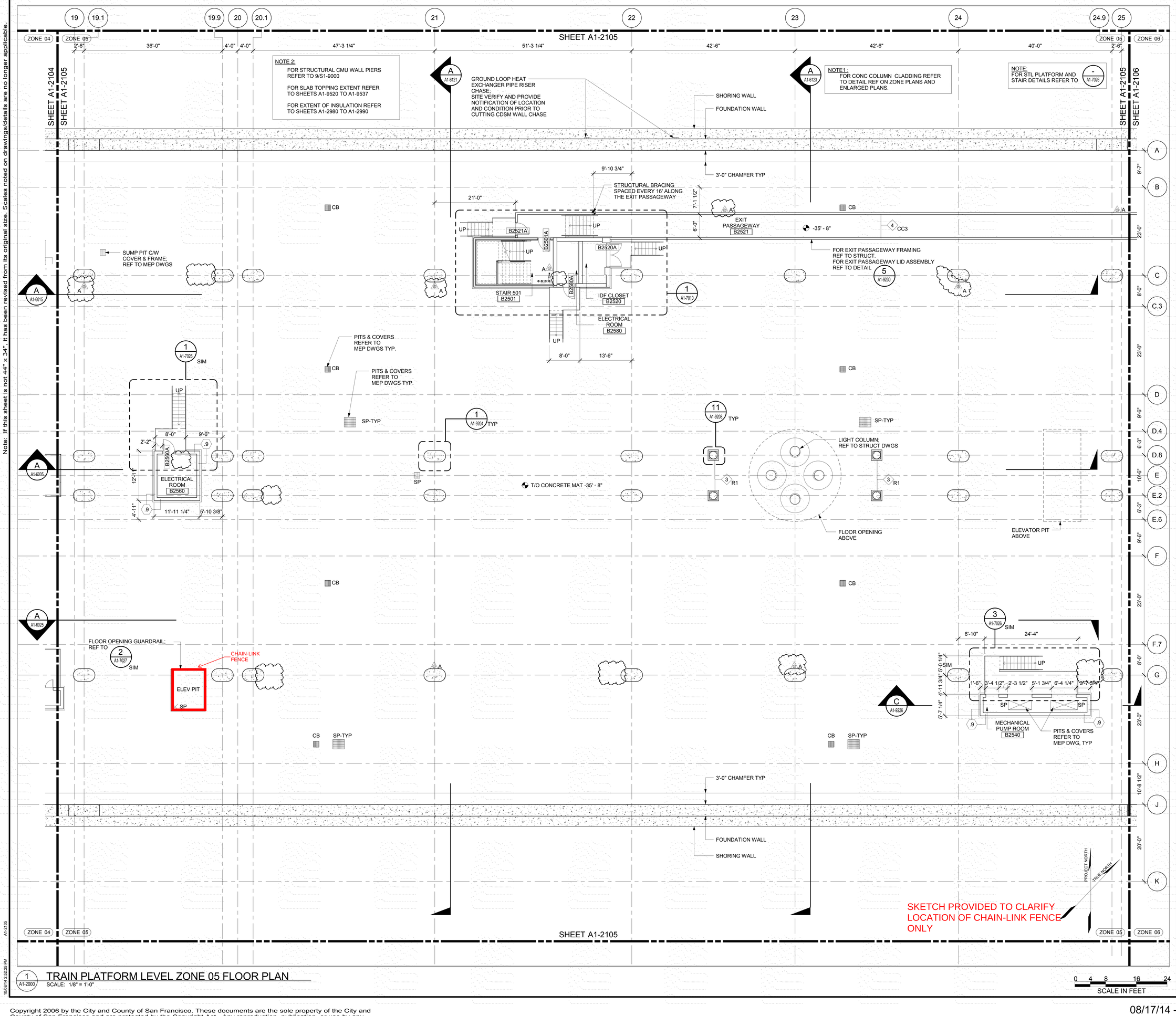

1 A1-2000 TRAIN PLATFORM LEVEL ZONE 05 FLOOR PLAN
SCALE: 1/8" = 1'-0"

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01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16
Key Map N

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PROJECT TITLE TRANSBAY TRANSIT CENTER PROGRAM
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SAN FRANCISCO, CA
SHEET TITLE TRAIN PLATFORM LEVEL
ZONE 05 FLOOR PLAN

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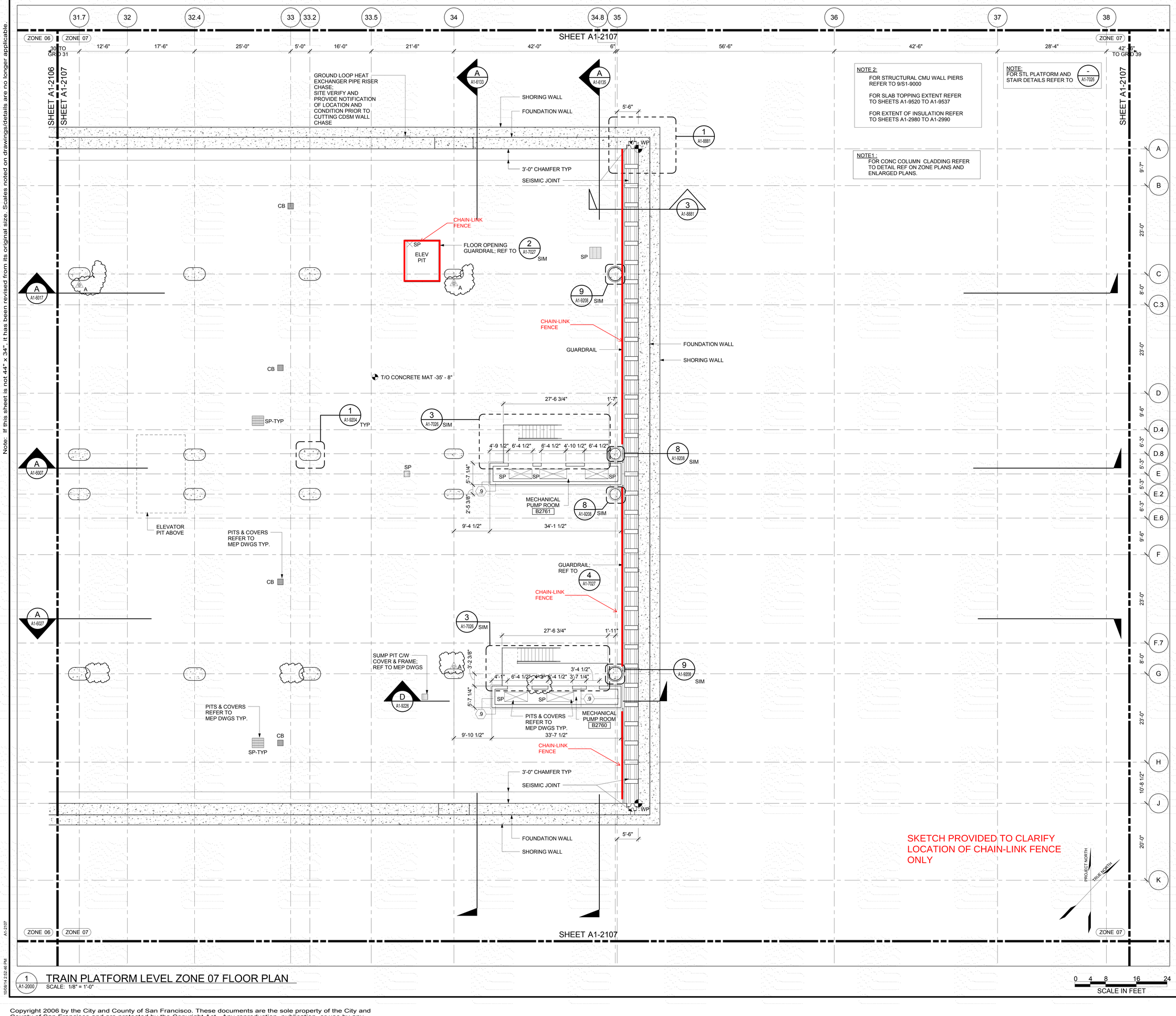

1 / A1-2000 TRAIN PLATFORM LEVEL ZONE 07 FLOOR PLAN
SCALE: 1/8" = 1'-0"

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SCALE IN FEET

BASED ON A1-2105

Transbay Transit Center
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CONSULTANT:
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01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16
Key Map

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SAN FRANCISCO, CA
SHEET TITLE: TRAIN PLATFORM LEVEL ZONE 07 FLOOR PLAN

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SHEET A1-2202

ZONE 02 | ZONE 03

1'-6" | 14'-6" | 26'-6" | 42'-6" | 42'-6" | 42'-6" | 42' - 6" TO GRID 6

1 | 1.1 | 1.4 | 2 | 3 | 4 | 5

NOTE 2:
FOR STRUCTURAL CMU WALL PIERS REFER TO 9/S1-9000

FOR SLAB TOPPING EXTENT REFER TO SHEETS A1-9520 TO A1-9537

FOR EXTENT OF INSULATION REFER TO SHEETS A1-2980 TO A1-2990

NOTE 3:
FURNITURE/EQUIPMENT LAYOUT ONLY FOR REFERENCE

NOTE :
FOR STL COLUMN CLADDING REFER TO DETAIL REF ON ZONE PLANS AND ENLARGED PLANS.

SHEET A1-2202 | SHEET A1-2203

A | B | C | C.3 | D | D.4 | D.8 | E | E.2 | E.6 | F | F.7 | G | H | J | K

9'-7" | 23'-0" | 8'-0" | 23'-0" | 9'-6" | 6'-3" | 5'-3" | 6'-3" | 9'-6" | 8'-0" | 23'-0" | 20'-0"

SHORING WALL
FOUNDATION WALL
FIRE MAIN P.O.E. B1290
TRANSFORMER VAULTS B1223
TRANSFORMER VAULTS B1224
B1223A
GROUND LOOP HEAT EXCHANGER PIPE RISER CHASE; SITE VERIFY AND PROVIDE NOTIFICATION OF LOCATION AND CONDITION PRIOR TO CUTTING CDSM WALL CHASE
TELECOM ENCLOSURE TYP; REF TO SECURITY TELECOM DWGS
CONC PAD REFER TO MEP & STRUCT DWGS
NORTH ELECTRICAL ROOM B1289
ELEC OPNG
ELEC OPENING
CONC PAD REFER TO MEP & STRUCT DWGS
MAIN SWITCHGEAR ROOM B1222
LANDSCAPE STORAGE B1288
SERVICE CORRIDOR B1220
PLUMBING INTAKE ROOM/ STORAGE ROOM B1229
STAIR 203 B1203
PRE-ACTION & FM 200 SYSTEM ROOM B1258
FENCE GATE
IDF ROOM B1234
MEN'S RESTROOM LOCKER ROOM B1240
LIBRARY B1236
RECEPTION B1235
CORRIDOR B1259
ENG OFFICE 1 B1241
ENG OFFICE 2 B1242
JANITORIAL OFFICE B1244
LINE OF SLAB ABOVE
FAN ROOM B1283
MEN'S RESTROOM & LOCKER ROOM B1225
JANITORIAL CLOSET B1291
WOMEN'S RESTROOM & LOCKER ROOM B1228
VEHICLE STORAGE B1233
FENCE GATE
ELEVATOR CONTROL ROOM B1285
STAIR 202 B1202
BREAK ROOM B1227
SCC VESTIBULE B1230
SERVICE ELEVATOR VESTIBULE FOR BUILDING B1238
SERVICE ELEVATOR VESTIBULE FOR SOC B1237
WORKSPACE B1231
ALTERNATE NO. 13 PER SECTION 01 10 30 DEFER SE201 INSTALLATION
FILE ROOM B1221
SOM ROOM B1239
SCC B1232
RECEPTION B1268
IDF ROOM B1284
OPEN TO BELOW
INTERVIEW ROOM B1287
MUSTER ROOM B1282
ENTRY B1269
UPS ROOM B1250
TECH OFFICE B1248
TECH SUPPORT ROOM B1249
ENTRY B1251
MECH OPNG
ELEC OPNG
LINE OF ENCLOSURE ABOVE
ENGINEERING EQUIPMENT STORAGE B1246
CORRIDOR B1255
EMERGENCY EQUIPMENT STORAGE B1253
SOC MECHANICAL ROOM B1252
SERVICE CORRIDOR B1280
INTERVIEW ROOM B1286
RESTROOM B1275
SFPD ADMIN STAFF B1271
CONFERENCE ROOM B1265
SECURITY ADMIN STAFF B1263
SECURITY OFFICE 2 B1262
SECURITY OFFICE 3 B1254
RESTROOM B1274
MEN'S LOCKER ROOM B1276
WOMEN'S LOCKER ROOM B1277
SFPD OFFICE B1272
CONFERENCE ROOM B1266
SECURITY OFFICE 1 B1264
STORAGE & COPY ROOM B1278
SFPD BREAK ROOM B1273
STORAGE & COPY ROOM B1267
OPEN TO BELOW
CAST-IN PRE-MANUFACTURED TRENCH DRAIN
VEHICLE RAMP B1256
BICYCLE RAMP B1361
CHAIN-LINK FENCE
WET JANITORIAL STORAGE B1281
OUTLINE OF RAMP LANES ABOVE; REF TO
PLENUM B1261
MECH OPENING
OPEN TO BELOW
FLOOR OPENING GUARDRAIL; REF TO
FOR CONC WALLS BELOW RAMPS REF TO
CHAIN-LINK FENCE
TOC -5' - 5"
FUTURE WEST FAN ROOM B1260
SKETCH PROVIDED TO CLARIFY LOCATION OF CHAIN-LINK FENCE ONLY
CLEANING SUPPLY STORAGE B1981
TELECOM ENCLOSURE TYP; REF TO SECURITY / TELECOM DWGS
TO GRID INTERSECTION
TOFF -4'-11"
TOFF -4' - 11"
TOFF -4' - 5"
5.0%
PROJECT NORTH
TRUE NORTH

ZONE 10 | ZONE 11

V | W | X

SHEET A1-2202
SHEET A1-2210

1 A1-2000 LOWER CONCOURSE LEVEL ZONE 02 FLOOR PLAN
SCALE: 1/8" = 1'-0"

0 4 8 16 24
SCALE IN FEET

BASED ON A1-2202

Transbay Transit Center
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01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16
Key Map

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0	03/31/14	ISSUED FOR CONSTRUCTION	GM
1	04/23/14	ISSUED FOR BID - ADDENDUM #3	GM
2	06/20/14	ISSUED FOR BID - ADDENDUM #4	GM
3	07/18/14	PER ASI No. 0121	GM
4	09/12/14	PER ASI No. 0127	GM

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TRANSBAY TRANSIT CENTER
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SHEET TITLE LOWER CONCOURSE LEVEL ZONE 02 FLOOR PLAN

ARCHITECT / ENGINEER SEAL

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SCALE: 1/8" = 1'-0"	SIZE: E; FACILITY NO.: 140; REVISION: 4
SHEET NUMBER: SKA - 4280	SEQUENCE NUMBER: of

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SHEET A1-2203

NOTE 2:
FOR STRUCTURAL CMU WALL PIERS REFER TO 9/S1-9000

FOR SLAB TOPPING EXTENT REFER TO SHEETS A1-9520 TO A1-9537

FOR EXTENT OF INSULATION REFER TO SHEETS A1-2980 TO A1-2990

NOTE 3:
FURNITURE/EQUIPMENT LAYOUT ONLY FOR REFERENCE

NOTE:
FOR STL COLUMN CLADDING REFER TO DETAIL REF ON ZONE PLANS AND ENLARGED PLANS.

GROUND LOOP HEAT EXCHANGER PIPE RISER CHASE; SITE VERIFY AND PROVIDE NOTIFICATION OF LOCATION AND CONDITION PRIOR TO CUTTING CDSM WALL CHASE

SHEET A1-2202 / SHEET A1-2203 / SHEET A1-2203 / SHEET A1-2204

ZONE 02 | ZONE 03 | ZONE 04

42'-6" | 42'-6" | 42'-6" | 38'-6" | 4'-0" | 4'-0" | 38'-6" | 42'-6" | 42'-6"

42' - 6" TO GRID 5 | 42' - 6" TO GRID 13

6 | 7 | 8 | 9 | 9.9 | 10 | 10.1 | 11 | 12

16'-8" | 4'-7" | 11'-0" | 31'-8 1/4"

A | B | C | C.3 | D | D.4 | D.8 | E | E.2 | E.6 | F | F.7 | G | H | J | K

9'-7" | 23'-0" | 8'-0" | 23'-0" | 9'-6" | 6'-3" | 5'-3" | 5'-3" | 9'-6" | 23'-0" | 8'-0" | 23'-0" | 10'-8 1/2" | 20'-0"

MEN'S RESTROOM & LOCKER ROOM B1240 | SERVICE CORRIDOR B1220 | OPEN TO BELOW | FD | B1389B | ELEC OPNG | STORAGE & COPY ROOM B1389 | MAINTENANCE WORKSHOP B1390 | PLBG | B1240A | B1389A | CORRIDOR B1257 | B1257A | B1243A | B1388A | WATER HEATER B1391 | FSK | B1387B | WOMEN'S RESTROOM & LOCKER ROOM B1243 | LOCK SHOP B1388 | B1387A | MAINTENANCE EQUIPMENT REPAIR SHOP B1387 | TOFF -4' - 11" | B1220A | B1390A | B1383A | B1384A | TSER ROOM B1383 | IDF ROOM B1384 | MECH | SIM | FENCE GATE | 1'-8 5/8" | 10'-10" | 11'-8" | 3'-1 3/4" | 1'-1" | 4'-6" | 4'-4" | 8'-3" | 4'-4 1/4" | 5'-6 1/4" | 1'-0 1/2" | 13'-8" | 2'-5 3/4" | 9'-0" | 6'-3 1/4"

B1348A | B1385A | B1385B | TOFF -4' - 11" | 22'-2" | WEST MDF ROOM B1385 | CONC PAD REFER TO MEP & STRUCT DWGS | CONC PAD REFER TO MEP & STRUCT DWGS | MECHANICAL ROOM B1382 | B1382A | PLBG | ELEC OPNG | 17'-4 5/8" | UP | 11'-0" | TOC -5' - 5" | TOC -8' - 2" | LINE OF STRUCT SLAB BELOW | FOR STL STAIRS AND LANDING DETAILS REF TO | MTL FAB GUARD AND HANDRAIL | GUARDRAIL | MTL FAB GUARD AND HANDRAIL

SERVICE CORRIDOR B1348 | TOFF -6' - 6" | 5.0% | TOFF -7' - 9" | SHORING WALL | FOUNDATION WALL | TRANSFORMER VAULTS B1323 | B1324A | TRANSFORMER VAULTS B1324 | B1322A | B1326A | IDF ROOM B1326 | FENCE GATE | 14'-6" | ELEC OPNG | PLBG | B1322B | CONC PAD REFER TO MEP & STRUCT DWGS | MAIN SWITCHGEAR ROOM B1322 | 3'-6 1/2" | 5'-5" | 1'-10" | 4'-10 1/2" | 5'-8 1/4" | 9'-6" | CONC PAD REFER TO MEP & STRUCT DWGS

FLOOR OPENING GUARDRAIL; REF TO 2/A1-7027 SIM | CHAIN-LINK FENCE | ESCALATOR PIT | OPENING FOR FUTURE ENCLOSED EXIT STAIR | OPEN TO BELOW | ESCALATOR PIT | FLOOR OPENING GUARDRAIL; REF TO 2/A1-7027 SIM | TOC -8' - 2" | 9/A1-9207 TYP

FLOOR OPENING GUARDRAIL; REF TO 2/A1-7027 SIM | CHAIN-LINK FENCE | 6'-7" | 10'-11 1/4" | FUTURE STAIR | OPEN TO BELOW | PLBG | 8'-1" | 9'-0" | FENCE GATE | IDF ROOM B1341 | 8'-4" | 16'-7 3/4" | B1341A | 2'-5" | 5'-11" | 7'-11" | TOFF -7' - 9" | TOC -8' - 2" | 6/A1-7027 TYP | 11'-3 1/2" | TELECOM ENCLOSURE TYP; REF TO SECURITY / TELECOM DWGS

JANITORIAL BREAK ROOM B1245 | B1365C | WORKSPACE B1231 | OVERSIZED EQUIPMENT STORAGE B1365 | OHD-2 | B1365B | B1365A | TOFF -4' - 5" | B1366B | B1366A | JANITORIAL EQUIPMENT STORAGE B1247 | OHD-1 | FD | 2% | PARKING AREA B1366 | B1366A | 5.0% | CORRIDOR B1366 | UPS ROOM B1381 | CONC PAD REFER TO MEP & STRUCT DWGS | B1381A | B1361A | B1361B | BICYCLE RAMP B1361 | CAST-IN PRE-MANUFACTURED TRENCH DRAIN BICYCLE SAFE GRILL | 9'-10 1/2" | B1925A | FOR CONTINUATION OF CORRIDOR WALL SETTING OUT REF TO 1/A1-2250 | IDF ROOM B1360 | B1360A | TOFF -4'-5" | TOFF -5' - 5" | TOC -5' - 5" | 12'-6" | 9'-0 3/8" | 10'-11 5/8" | 11'-0 3/4" | 8'-11 1/4" | TRAINBOX B1200

RAMP | ELEV CONTROL ROOM B1380 | B1380A | PE301 | PE302 | TOFF -4' - 11" | No guard or fence required at small ramp and landing | GUARDRAIL | STEP IN SLAB | CHAIN-LINK FENCE | TOC -8' - 2" | LOCATION OF HPU FOR RETRACTABLE BOLLARDS AT GROUND LEVEL | REV/SIM | RPC | R 685'-8 5/8" | 2'-9 1/4" | 10'-6 7/8" | 3'-0" | 7'-5 1/8" | 2PDG | GUARDRAIL | 5.0% | 6/A1-7027 TYP | 9'-10" | SHORING WALL | FOUNDATION WALL | 17'-6 3/4" | SKETCH PROVIDED TO CLARIFY LOCATION OF CHAIN-LINK FENCE ONLY | PROJECT NORTH | TRUE NORTH

SHEET A1-2203 / SHEET A1-2211

ZONE 02 | ZONE 03 | ZONE 10 | ZONE 11 | ZONE 03 | ZONE 04 | ZONE 11

1/A1-2000 LOWER CONCOURSE LEVEL ZONE 03 FLOOR PLAN
SCALE: 1/8" = 1'-0"

0 4 8 16 24
SCALE IN FEET

10/08/14 3:18:09 PM A1-2203

BASED ON A1-2203

Transbay Transit Center
TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:
Pelli Clarke Pelli Architects
adamson ASSOCIATES, INC

Key Map
01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16

REVISIONS

NO.	DATE	DESCRIPTION	BY
0	03/31/14	ISSUED FOR CONSTRUCTION	GM
1	04/22/14	ISSUED FOR BID - ADDENDUM #3	GM
2	06/20/14	ISSUED FOR BID - ADDENDUM #4	GM
3	07/18/14	PER ASI No. 0121	GM

CONTRACT NO: 08-04-CMGC-000
PROJECT TITLE: TRANSBAY TRANSIT CENTER PROGRAM / TRANSBAY TRANSIT CENTER / SAN FRANCISCO, CA
SHEET TITLE: LOWER CONCOURSE LEVEL / ZONE 03 FLOOR PLAN

ARCHITECT / ENGINEER SEAL

NOT FOR CONSTRUCTION

APPROVED PRINCIPAL ARCHITECT	G. METZGER
APPROVED PROJECT MANAGER	S. ROTT
APPROVED PROJECT MANAGER	E. DEL ANGEL
DESIGNED BY: P. MACPHAIL	CHECKED BY: W.R. BRADLEY
DRAWN BY: K. WROBLEWSKI	DATE: 07/18/2014
SCALE: 1/8" = 1'-0"	SIZE: E / FACILITY NO: 140 / REVISION: 3
SHEET NUMBER: SKA - 4281	SEQUENCE NUMBER: of

Note: If this sheet is not 44" x 34", it has been revised from its original size. Scales noted on drawings/details are no longer applicable.

SHEET A1-2204

ZONE 03 | ZONE 04 | ZONE 05 | ZONE 11

SHEET A1-2203 | SHEET A1-2204 | SHEET A1-2205

13 | 14 | 15 | 16 | 16.9 | 17 | 18

42' - 6" TO GRID 12 | 42'-6" | 42'-6" | 42'-6" | 40'-0" | 2'-6" | 42'-6" | 42' - 6" TO GRID 19

A | B | C | C.3 | D | D.4 | D.8 | E | E.2 | E.6 | F | F.7 | G | H | J | K

9'-7" | 23'-0" | 8'-0" | 23'-0" | 9'-6" | 6'-3" | 5'-3" | 5'-3" | 6'-3" | 9'-6" | 23'-0" | 8'-0" | 23'-0" | 10'-8 1/2" | 20'-0"

NOTE 2:
FOR STRUCTURAL CMU WALL PIERS REFER TO 9/S1-9000

FOR SLAB TOPPING EXTENT REFER TO SHEETS A1-9520 TO A1-9537

FOR EXTENT OF INSULATION REFER TO SHEETS A1-2980 TO A1-2990

GROUND LOOP HEAT EXCHANGER PIPE RISER CHASE; SITE VERIFY AND PROVIDE NOTIFICATION OF LOCATION AND CONDITION PRIOR TO CUTTING CDSM WALL CHASE

TELECOM ENCLOSURE TYP; REF TO SECURITY / TELECOM DWGS

FOUNDATION WALL

SHORING WALL

FENCE GATE

IDF ROOM B1326

CONC PAD REFER TO MEP & STRUCT DWGS

EMERGENCY ELECTRICAL ROOM B1325

ELEC OPNG

ELEC OPNG

FAN ROOM B1482

OPEN TO BELOW

FLOOR OPENING GUARDRAIL; REF TO 1/A1-7027 SIM

CHAIN-LINK FENCE

CONC PAD; REF TO MEP & STRUCT DWGS

ELEV DOOR SILL SUPPORT ANGLE; REF TO STRUCT DWGS

FLOOR OPENING GUARDRAIL; REF TO 2/A1-7027 TYP

EAST FSR B1485

TRAIN BOX B1200

TOC -8' - 2"

TOFF -7' - 9"

PLBG

FSK

FD

CJ

UP

MTL FAB GUARD AND HANDRAIL NOT REQUIRED

CHAIN-LINK TO BE 4' HIGH FOR GUARD HEIGHT ADJACENT TO RAMP AND LANDING

MECH OPENING

FUTURE PLBG

ELEVATOR DOOR SILL SUPPORT ANGLE; REF TO STRUCT DWGS

ELEV CONTROL ROOM B1461

STAIR 403 B1403

FAN ROOM B1440

PE403

PE404

TOFF -7'-9"

DN

TRAIN BOX B1200 TYP

FUTURE FD

FUTURE PLBG

MECH OPENING; REF TO SLAB EDGE PLAN FOR DIMENSIONS

SOUTH ELEC ROOM B1441

MECHANICAL ROOM B1445

IDF ROOM B1444

RCW

TOC -8' - 2"

FENCE GATE

TELECOM ENCLOSURE TYP; REF TO SECURITY / TELECOM DWGS

SHORING WALL

FOUNDATION WALL

NOTE :
FOR STL COLUMN CLADDING REFER TO DETAIL REF ON ZONE PLANS AND ENLARGED PLANS.

SKETCH PROVIDED TO CLARIFY LOCATION OF CHAIN-LINK FENCE ONLY

PROJECT NORTH | TRUE NORTH

1 / A1-2000 LOWER CONCOURSE LEVEL ZONE 04 FLOOR PLAN
SCALE: 1/8" = 1'-0"

0 4 8 16 24
SCALE IN FEET

10/08/14 3:18:22 PM

A1-2204

Transbay Transit Center

TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:

Pelli Clarke Pelli Architects

adamson ASSOCIATES, INC

01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16

Key Map

REVISIONS

NO.	DATE	DESCRIPTION	BY
0	03/31/14	ISSUED FOR CONSTRUCTION	GM
1	04/22/14	ISSUED FOR BID - ADDENDUM #3	GM
2	06/20/14	ISSUED FOR BID - ADDENDUM #4	GM
3	07/18/14	PER ASI No. 0121	GM

CONTRACT NO.: 08-04-CMGC-000

PROJECT TITLE: TRANSBAY TRANSIT CENTER PROGRAM
TRANSBAY TRANSIT CENTER
SAN FRANCISCO, CA

SHEET TITLE: LOWER CONCOURSE LEVEL
ZONE 04 FLOOR PLAN

ARCHITECT / ENGINEER SEAL

NOT FOR CONSTRUCTION

APPROVED PRINCIPAL ARCHITECT	G. METZGER
APPROVED PROJECT MANAGER	S. ROTT
APPROVED PROJECT MANAGER	E. DEL ANGEL
DESIGNED BY: P. MACPHAIL	CHECKED BY: W.R. BRADLEY
DRAWN BY: K. WROBLEWSKI	DATE: 07/18/2014
SCALE: 1/8" = 1'-0"	SIZE: E; FACILITY NO.: 140; REVISION: 3
SHEET NUMBER: SKA - 4282	SEQUENCE NUMBER: of

BASED ON A1-2204

Note: If this sheet is not 44" x 34", it has been revised from its original size. Scales noted on drawings/details are no longer applicable.

SHEET A1-2205

ZONE 04 | ZONE 05 | ZONE 06

SHEET A1-2204 | SHEET A1-2205 | SHEET A1-2206

2'-6" | 36'-0" | 4'-0" | 4'-0" | 47'-3 1/4" | 51'-3 1/4" | 42'-6" | 42'-6" | 40'-0" | 2'-6"

19 | 19.1 | 19.9 | 20 | 20.1 | 21 | 22 | 23 | 24 | 24.9 | 25

A | B | C | C.3 | D | D.4 | D.8 | E | E.2 | E.6 | F | F.7 | G | H | J | K

9'-7" | 23'-0" | 8'-0" | 23'-0" | 9'-6" | 6'-3" | 5'-3" | 5'-3" | 6'-3" | 9'-6" | 23'-0" | 8'-0" | 23'-0" | 10'-8 1/2" | 20'-0"

NOTE 2:
FOR STRUCTURAL CMU WALL PIERS REFER TO 9/S1-9000

FOR SLAB TOPPING EXTENT REFER TO SHEETS A1-9520 TO A1-9537

FOR EXTENT OF INSULATION REFER TO SHEETS A1-2980 TO A1-2990

NOTE :
FOR STL COLUMN CLADDING REFER TO DETAIL REF ON ZONE PLANS AND ENLARGED PLANS.

GROUND LOOP HEAT EXCHANGER PIPE RISER CHASE. SITE VERIFY AND PROVIDE NOTIFICATION OF LOCATION AND CONDITION PRIOR TO CUTTING CDSM WALL CHASE

TELECOM ENCLOSURE TYP; REF TO SECURITY / TELECOM DWGS

FOUNDATION WALL

SHORING WALL

TOFF -7' - 9"

TOC -8' - 2"

CHAIN-LINK FENCE

FENCE GATE

ELECTRICAL ROOM B1582

IDF ROOM B1580

IDF ROOM B1584

IDF ROOM B1564

IDF ROOM B1523

IDF ROOM B1545

FAN ROOM B1521

FAN ROOM B1544

MAIN SWITCHGEAR ROOM B1560

TRANSFORMER VAULTS B1562

TRANSFORMER VAULTS B1561

STAIR 501 B1501

STAIR 501B B1501

ELEV CONTROL ROOM B1524

JANITOR'S CLOSET B1540

RECLAIMED WATER TREATMENT SYSTEM & PUMP ROOM B1522

EMERGENCY ELECTRICAL ROOM B1563

TRAIN BOX B1200

MECH OPENING GUARDRAIL

TYP CMU PIER AT WALL OPENING; REF TO STRUCT DWGS

CONC PAD REFER TO MEP & STRUCT DWGS

LINE OF EXIT PASSAGEWAY SLAB ABOVE; REF TO 1/A1-3020

LINE OF EXIT PASSAGEWAY SLAB ABOVE REFER TO: 1/A1-3021

LINE OF EXIT PASSAGEWAY SLAB ABOVE

LINE OF EXIT PASSAGEWAY SLAB ABOVE

ESC PIT

ESC PIT 13'-5 1/2"

FLOOR OPENING GUARDRAIL; REF TO 2/A1-7027

MTL FAB GUARD AND HANDRAIL NOT REQUIRED

OPEN TO BELOW

UPTURNED BEAM ; REF TO STRUCT DWGS

FUTURE PLBG

FUTURE FD

PLENUM

PLBG

FSK

ELEC OPNG

RCW

MECH OPENING; REF TO SLAB EDGE PLAN FOR DIMENSIONS

TELECOM ENCLOSURE TYP; REF TO SECURITY / TELECOM DWGS

SKETCH PROVIDED TO CLARIFY LOCATION OF CHAIN-LINK FENCE ONLY

PROJECT NORTH

TRUE NORTH

SHEET A1-2205

ZONE 04 | ZONE 05 | ZONE 06

1 / A1-2000 LOWER CONCOURSE LEVEL ZONE 05 FLOOR PLAN
SCALE: 1/8" = 1'-0"

0 4 8 16 24
SCALE IN FEET

10/09/14 3:18:38 PM A1-2205

BASED ON A1-2205

Transbay Transit Center

TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:
Pelli Clarke Pelli Architects
adamson ASSOCIATES, INC

Key Map

01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16

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NO.	DATE	DESCRIPTION	BY
0	03/31/14	ISSUED FOR CONSTRUCTION	GM
1	04/25/14	ISSUED FOR BID - ADDENDUM #3	GM
2	06/20/14	ISSUED FOR BID - ADDENDUM #4	GM

CONTRACT NO. 08-04-CMGC-000

PROJECT TITLE: TRANSBAY TRANSIT CENTER PROGRAM
TRANSBAY TRANSIT CENTER
SAN FRANCISCO, CA

SHEET TITLE: LOWER CONCOURSE LEVEL
ZONE 05 FLOOR PLAN

ARCHITECT / ENGINEER SEAL

NOT FOR CONSTRUCTION

APPROVED PRINCIPAL ARCHITECT	G. METZGER
APPROVED PROJECT MANAGER	S. ROTT
APPROVED PROJECT MANAGER	E. DEL ANGEL
DESIGNED BY: P. MACPHAIL	CHECKED BY: W.R. BRADLEY
DRAWN BY: K. WROBLEWSKI	DATE: 06/20/2014
SCALE: 1/8" = 1'-0"	SIZE: E; FACILITY NO.: 140; REVISION: 2
SHEET NUMBER: SKA - 4283	SEQUENCE NUMBER: of

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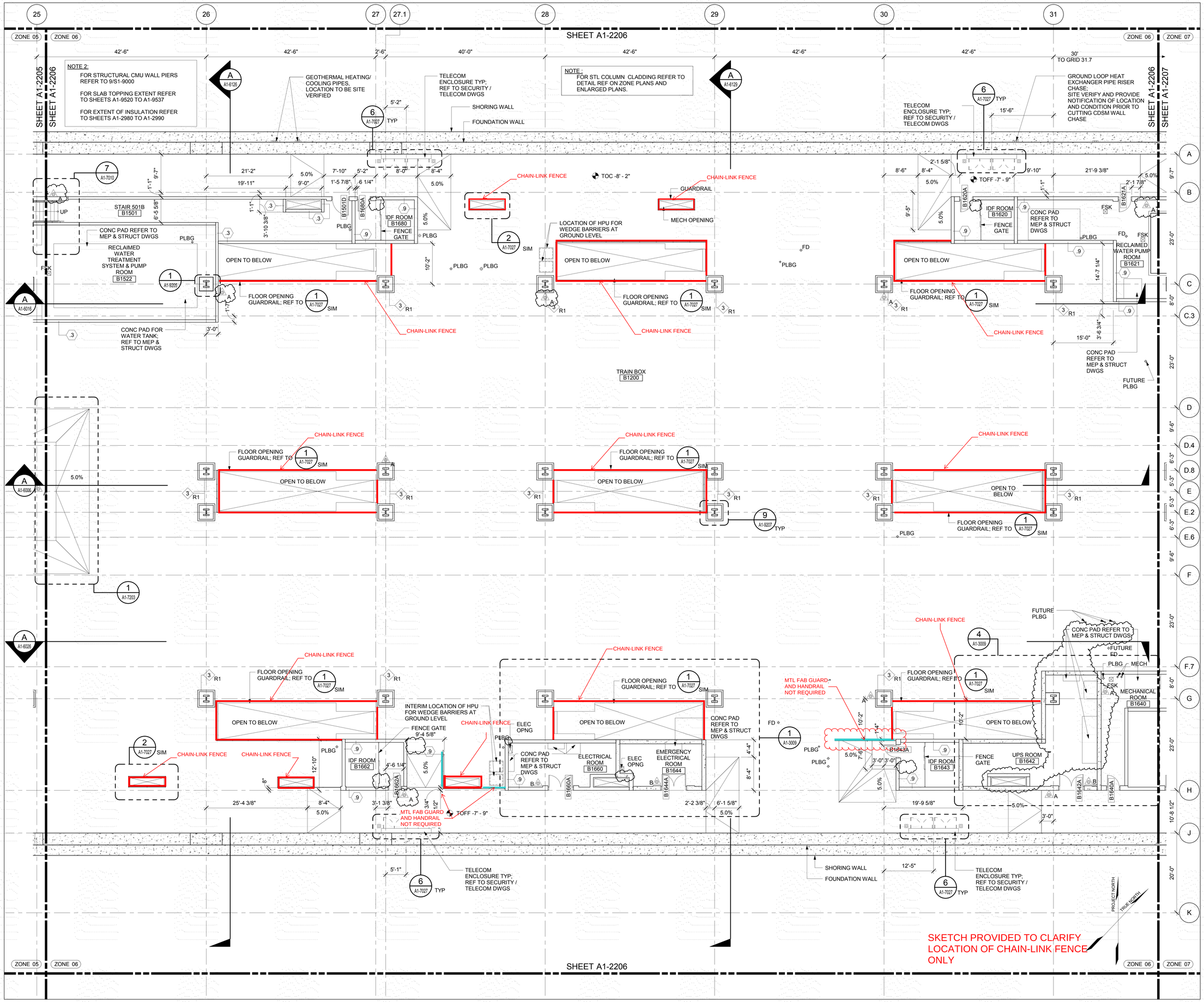

1 A1-2000 LOWER CONCOURSE LEVEL ZONE 06 FLOOR PLAN
SCALE: 1/8" = 1'-0"

Transbay Transit Center

TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:
Pelli Clarke Pelli Architects
adamson ASSOCIATES, INC

Key Map

NO.	DATE	DESCRIPTION	BY
0	03/31/14	ISSUED FOR CONSTRUCTION	GM
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2	06/20/14	ISSUED FOR BID - ADDENDUM #4	GM

CONTRACT NO: 08-04-CMGC-000
PROJECT TITLE: TRANSBAY TRANSIT CENTER PROGRAM
TRANSBAY TRANSIT CENTER
SAN FRANCISCO, CA
SHEET TITLE: LOWER CONCOURSE LEVEL
ZONE 06 FLOOR PLAN

ARCHITECT / ENGINEER SEAL

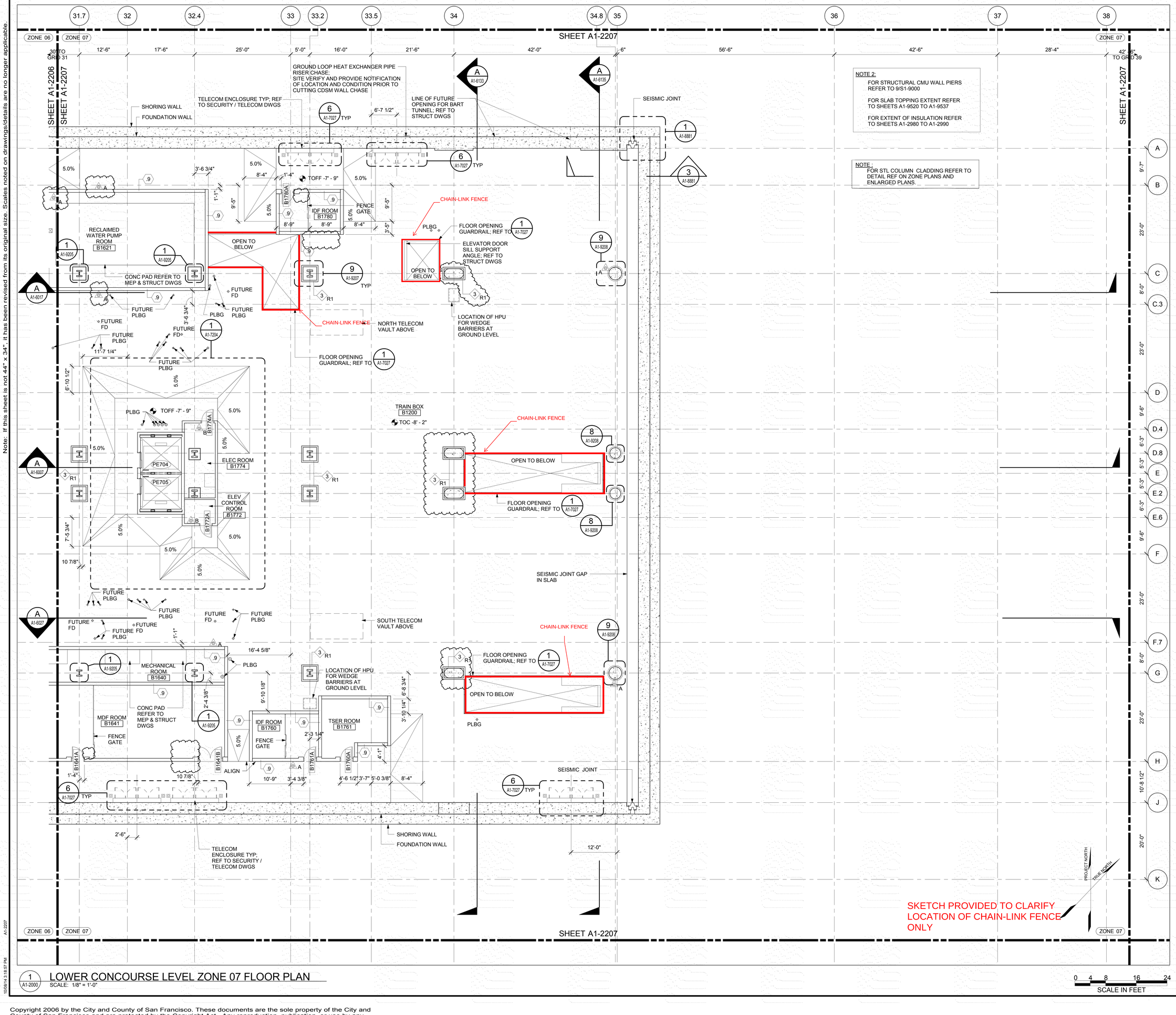
NOT FOR CONSTRUCTION

APPROVED PRINCIPAL ARCHITECT	G. METZGER
APPROVED PROJECT MANAGER	S. ROTT
APPROVED PROJECT MANAGER	E. DEL ANGEL
DESIGNED BY: P. MACPHAIL	CHECKED BY: W.R. BRADLEY
DRAWN BY: K. WROBLEWSKI	DATE: 06/20/2014
SCALE: 1/8" = 1'-0"	SIZE: E; FACILITY NO.: 140; REVISION: 2
SHEET NUMBER: SKA - 4284	SEQUENCE NUMBER: of

BASED ON A1-2206

A1-2206
10/08/14 3:18:48 PM

Note: If this sheet is not 44" x 34", it has been revised from its original size. Scales noted on drawings/details are no longer applicable.



1 A1-2000 LOWER CONCOURSE LEVEL ZONE 07 FLOOR PLAN
SCALE: 1/8" = 1'-0"

BASED ON A1-2207

Transbay Transit Center
TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:
Pelli Clarke Pelli Architects
adamson ASSOCIATES, INC

01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16
Key Map

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1	04/22/14	ISSUED FOR BID - ADDENDUM #3	GM
2	06/20/14	ISSUED FOR BID - ADDENDUM #4	GM
3	09/12/14	PER ASI No. 0127	GM

CONTRACT NO. 08-04-CMGC-000
PROJECT TITLE: TRANSBAY TRANSIT CENTER PROGRAM
TRANSBAY TRANSIT CENTER
SAN FRANCISCO, CA
SHEET TITLE: LOWER CONCOURSE LEVEL ZONE 07 FLOOR PLAN

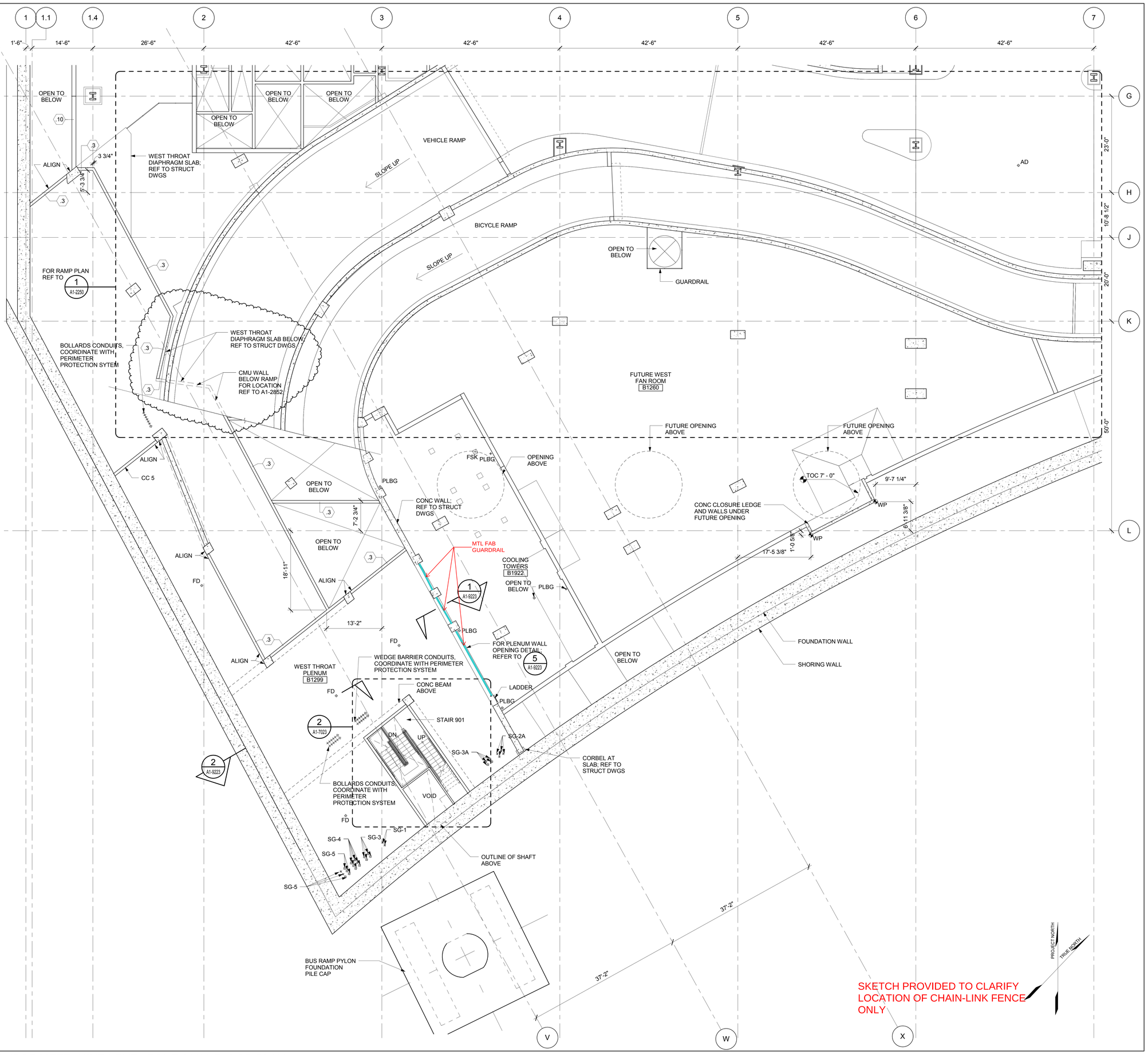
ARCHITECT / ENGINEER SEAL

NOT FOR CONSTRUCTION

APPROVED PRINCIPAL ARCHITECT	G. METZGER
APPROVED PROJECT MANAGER	S. ROTT
APPROVED PROJECT MANAGER	E. DEL ANGEL
DESIGNED BY: P. MACPHAIL	CHECKED BY: W.R. BRADLEY
DRAWN BY: K. WROBLEWSKI	DATE: 09/12/2014
SCALE: 1/8" = 1'-0"	SIZE: E; FACILITY NO.: 140; REVISION: 3
SHEET NUMBER: SKA - 4285	SEQUENCE NUMBER: of

A1-2207
10/09/14 3:18:57 PM

Note: If this sheet is not 44" x 34", it has been revised from its original size. Scales noted on drawings/details are no longer applicable.



1 A1-2000 LOWER CONCOURSE MEZZANINE LEVEL ZONE 02/10 FLOOR PLAN
SCALE: 1/8" = 1'-0"

0 4 8 16 24
SCALE IN FEET

10/08/14 3:28:04 PM A1-2252

Transbay Transit Center

TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:
Pelli Clarke Pelli Architects
adamson ASSOCIATES, INC

01	02	03	04	05	06	07	08
09	10	11	12	13	14	15	16

Key Map

REVISIONS

NO.	DATE	DESCRIPTION	BY
0	03/31/14	ISSUED FOR CONSTRUCTION	GM
1	06/20/14	ISSUED FOR BID - ADDENDUM #4	GM
2	09/15/14	PER ASI No. 0127	GM

CONTRACT NO. 08-04-CMGC-000

PROJECT TITLE: TRANSBAY TRANSIT CENTER PROGRAM
TRANSBAY TRANSIT CENTER
SAN FRANCISCO, CA

SHEET TITLE: LOWER CONCOURSE LEVEL
WEST THROAT + 7' - 0" SLAB
FLOOR PLAN

ARCHITECT / ENGINEER SEAL

NOT FOR CONSTRUCTION

APPROVED PRINCIPAL ARCHITECT	G. METZGER
APPROVED PROJECT MANAGER	S. ROTT
APPROVED PROJECT MANAGER	E. DEL ANGEL
DESIGNED BY: P. MACPHAIL	CHECKED BY: W.R. BRADLEY
DRAWN BY: S. PALAZOV	DATE: 09/12/2014
SCALE: 1/8" = 1'-0"	SIZE: E; FACILITY NO.: 140; REVISION: 2
SHEET NUMBER: SKA - 4286	SEQUENCE NUMBER: ____ of ____

BASED ON A1-2252

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous metal fabrications not specified in other Sections.
2. See Schedule of Items, but not limited to.
3. Installation of finish hardware, specified in Section 08 71 00, on steel gates.
4. Electrical continuity and grounding of this work.
5. Mockups.
6. Source and field quality control testing.
7. Warranties and indemnities.

B. ***1 . . .*** Stainless ~~steel bollard covers, stainless~~ steel railings and railings attached to steel stairs and their shaft walls, stainless steel queuing posts and top rails, structural glass railings, metal gratings, ~~and stainless steel decorative railing and mesh on Park Level,~~ and architectural metal fabrications are specified elsewhere in Division 05 75 00 Architectural Metal Fabrications.

C. **DELETED** ~~Refer to Part B Documents applicable to the Section.~~ ***. . . 1***

D. General: Certain components of the metal assemblies may not be fully detailed on the Drawings which indicate only desired profile and design intent.

1. Engineer, fabricate, and install these components within the physical limitations indicated on the Drawings.
2. Drawings and calculations for the assemblies shall be prepared, signed and sealed by the Contractor's Engineer.
3. Submit drawings and calculations to AHJ for approval, and pay fee(s) incurred thereby before start of installation.
4. Fasteners and connections are shown schematically. Final fasteners or connections size and location shall not conflict with or require revision of the finish profiles of the supporting and supported work.
5. Connections to the supports shall not impose eccentric loading, or induce twisting or warping and shall be able to accommodate misalignment of the structure within limits allowed by the ACI and AISC tolerances.
6. Mockup construction, when specified, is also a requirement of this Section and its cost shall be included in the Contractor's bid.

1.2 ABBREVIATIONS AND ACRONYMS

A. AHJ: Authorities Having Jurisdiction.

B. AISC: American Institute of Steel Construction.

C. AISI: American Iron and Steel Institute.

D. ANSI: American National Standards Institute.

E. AWS: American Welding Society.

F. BAAQMD: Bay Area Air Quality Management District.

G. LEED: Leadership in Energy and Environmental Design.

H. MSDS: Material Safety Data Sheets.

I. SCAQMD: South Coast Air Quality Management District.

J. SSPC: Society for Protective Coatings (formerly known as Steel Structures Painting Council).

K. TIG: Tungsten Inert Gas (Welding).

L. TJPA: Transbay Joint Powers Authority.

M. VOC: Volatile Organic Compound.

1.3 DEFINITIONS

A. General: In addition to definitions specified in Article 1.01 of the General Conditions, the following applies to this Section. Where the provisions are in conflict, the more restrictive requirements apply.

B. Contractor's Engineer: California-licensed structural engineer, employed by the Contractor, with a minimum 5 years' experience in the design of assemblies similar in scope to those for the Project, including drawings, testing program development, test-result interpretation, and comprehensive engineering analysis that show the assemblies' compliance with the specified requirements.

C. Engineer (verb) and Engineering: As used in this Section, includes engineering, fabrication and installation.

D. Engineering Services: Services performed for installation of assemblies similar to those indicated for this Project in material, design, and extent.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Comply with Section 01 12 00 and Section 01 14 00, except as specified below. Where the provisions are in conflict, the more restrictive requirements apply.

B. Coordination:

1. Coordinate installation of anchors for the work of this Section. Furnish setting drawings, templates and directions for installing anchorages, including inserts, anchor bolts and items with integral anchors to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
2. Coordinate respective work to establish relationship between these other Sections and to provide completed installations shown and required.

C. General: The Contractor is responsible for engineering, fabrication and installation the work of this Section in accordance with the design intent, design criteria, performance requirements, applicable codes and ordinances at the time of award, and requirements of AHJ. Structural and operational design requires the certification of a California-registered civil or structural engineer who shall also become the engineer of record for this portion of the work.

1.5 SUBMITTALS – GENERAL

A. Comply with Article 3.12 of the General Conditions, and Sections 01 13 00, except as specified below. Where the provisions are in conflict, the more restrictive requirements apply. Do not submit items not requested.

B. Product Data:

1. Submit manufacturer Product Data, specifications and installation instructions for manufactured items.
2. Submit the manufacturers' literature, including engineering data for anchors.

C. Shop Drawings:

1. Submit plans, elevations and scale details of members, materials and connections. Draw plans and sections at not less than 1:48 scale, and details at not less than 1:4 scale.
2. Include jointing details, methods of setting, sealing, securing, anchorage, and field connections.
3. A California-licensed structural engineer specified herein shall be responsible for:

    a. Production and review of Shop Drawings.
    b. Stamping and signing each Shop Drawing and any associated calculations performed.

4. Final review of Shop Drawings shall be contingent upon complete submission of structural calculations, where appropriate, documentation, certifications, and approvals of anchorage, samples, mockups and test reports. Cross-reference structural calculations to appropriate Shop Drawing details.
5. For components to be embedded in concrete and masonry work, furnish templates supplemented by dimensioned Shop Drawings to trades placing those components in their work. Assist in location of these components where so requested by those trades.

D. Samples: Submit following Samples in sizes indicated.

1. Extruded and formed metals: Minimum 12 inches long.
2. Metal sheet: Minimum 12-inch square and of specified thickness.
3. Posts Inserts: Full size unit with cap.
4. Resilient Bumpers: 12-inch long.

E. Engineering Calculations: For components of the metal fabrications engineered by the Contractor, submit calculations signed and sealed by the Contractor's Engineer to demonstrate Code compliance for the components, including railings.

F. Corrosion Analysis: Together with other submittals, submit a letter from a professional engineer, specialized in corrosion prevention, stating that components of the work of this Section and attachments to adjacent construction are designed or isolated to eliminate galvanic action between them.

G. Certificates: Manufacturer certification, on manufacturers' letterhead, and test results conducted by a testing laboratory acceptable to TJPA, on the K-12-rated bollards.

1.6 CLOSEOUT SUBMITTALS

A. Submit maintenance instructions in accordance with Section 01 70 00. Include in Maintenance Manual:

1. Printed copies of maintenance instructions for assemblies and their finishes.
2. Proper care and maintenance of assemblies and hardware.
3. Recommended inspection schedule.
4. Copy of each duly reviewed Shop Drawings in their most recent amended form.
5. Complete explanation of operation principles and sequences.
6. Complete parts and materials list with numbers, sizes, method statement of replacement of component parts of installation.

B. Coordinate and incorporate Operating Procedures Outline as defined in Section 11 24 23 into training requirements for maintenance workers prior to accessing specified assemblies.

C. Submit instructions for proper cleaning and routine maintenance of assemblies together with recommended cleaning materials and frequency.

D. Provide touchup repair kit or touchup instructions to TJPA for each type of factory-applied finish.

1.7 LEED SUBMITTALS

A. Within 30 days of Contract award, assemble and submit all LEED material information on the "LEED Material Tracking Spreadsheets" and forms provided in the Project Manual, together with all supplemental documentation as required by LEED.

B. Credit MR 4: Product data indicating percentage by weight of post-consumer and post-industrial recycled content for products having recycled content. Include a statement indicating projected costs for each product having recycled content.

C. Credit MR 5: Product data indicating location of extraction and processing and location of manufacture. Include a statement indicating projected costs for each product being extracted, processed, and manufactured within a straight-line 500 mile (800 kilometer) total travel distance of the project site using a weighted average determined through the following formula: (Distance by rail/3) + (Distance by inland waterway/2) + (Distance by sea/15) + (Distance by all other means) = 500 miles [800 kilometers].

D. Credit IEQ 4.1: If field applied, provide manufacturer's MSDS or technical data sheet showing a printed statement of VOC content for all adhesives and sealants used on the project and demonstrating compliance with SCAQMD Rule #1168, effective July 1, 2005 and amended January 7, 2005. Provide manufacturer's product data for aerosol adhesives, including printed statement of VOC content that demonstrates compliance with the limits defined in Green Seal standard GS-36, in effect October 19, 2000.

E. Credit IEQ 4.2: If field applied, provide manufacturer's MSDS or technical data sheet showing a printed statement of VOC content for all paints and coatings used on the project and demonstrating compliance with Green Seal standard GS-11, Paints, May 20, 1993; with Green Seal GC-03, Anti-Corrosive Paints, January 7, 1997; with SCAQMD Rule #1113, effective January 1, 2004.

1.8 QUALITY CONTROL

A. General: Certain components of the metal assemblies may not be fully detailed on the Drawings which indicate only desired profile and design intent.

1. Engineer, fabricate, and install these components within the physical limitations indicated on the Drawings.
2. Drawings and calculations for the assemblies shall be prepared, signed and sealed by the Contractor's Engineer.
3. Submit drawings and calculations to AHJ for approval, and pay fee(s) incurred thereby before start of installation.
4. Fasteners and connections are shown schematically. Final fasteners or connections size and location shall not conflict with or require revision of the finish profiles of the supporting and supported work.
5. Connections to the supports shall not impose eccentric loading, or induce twisting or warping and shall be able to accommodate misalignment of the structure within limits allowed by the ACI and AISC tolerances.

B. Structural Design and Inspection: Structural design and inspection of structural components related to stairs, railings, landings, platforms and similar structural elements shall be performed by the Contractor's engineer.

C. Qualifications

1. Installers: Competent installers with minimum 5 years experience in installation of AMF. Upon request provide record of successful in-service performance, as well as sufficient production capacity to produce required work. Installers shall be thoroughly conversant with laws, by-laws and regulations which govern.
2. Welders: Welding of structural components related to stairs, railings, landings, platforms and similar structural elements shall be performed by fabricator having minimum certification of AWS. Welders shall be familiar with welding procedures for structural welding for steel; structural welding for aluminum, and structural welding for sheet steel.
3. Organic-Coating Applicator Qualifications: Firm experienced in successfully applying organic coatings of type indicated to aluminum extrusions and employing competent control personnel to conduct continuing, effective quality-control program to ensure compliance with requirements.
4. Licensed Professionals: California-licensed structural engineer carrying professional liability insurance.

D. Welding: Quality procedures and personnel according to ANSI/AWS D1.1/D1.1M, ANSI/AWS D1.2/D1.2M and ANSI/AWS D1.3/D1.3M. Certify each welder has satisfactorily passed AWS qualification test for welding processes involved and if pertinent, has undergone recertification.

E. Certifications: Submit certification from the Contractor’s engineer stating that assemblies are capable of supporting their own weight and specified live loads, without failure and within the criteria specified.

F. Mockup: Erect at the Project site a full height by 3 vertical supports mockup of the crash rail, complete with resilient bumpers.

1. Make mockup complete with all accessories, features required for the final assembly on the building.
2. Modify as necessary to achieve a mockup satisfactory to the TJPA Representative, or remove and construct additional mockup(s).
3. Approved mockup shall serve as the standard for the same work on the building.
4. Remove mockup only after completion and acceptance of final work unless its incorporation in the Work is authorized by the TJPA Representative.
5. Protect mockup until its removal or incorporation in the Work is authorized by the TJPA Representative.

G. Corrosion Prevention:

1. Engage a California-licensed Corrosion Engineer who is an expert in corrosion, to conduct a component-by-component analysis of potential corrosion resulting from galvanic action between materials, for components of curtain wall and aluminum panels and provide report.
2. Submit Engineering Report to TJPA Representative, for review prior to submission of Shop Drawings. Ensure Sample and test results are available upon request.

1.9 DELIVERY, STORAGE AND HANDLING

A. Storage and Handling:

1. Handle and store materials at job site to prevent damage to other materials, existing construction or property.
2. Handle components with care, and provide protection for surfaces against marring or other damage. Ship and store members with cardboard or other resilient spacers between surfaces. Use lifting chokers of material that will not damage surface of steel members.

1.10 WARRANTY

A. General:

1. The warranties are governed by the requirements herein, those of Section 01 17 40, and the General Conditions of the Contract.
2. Warranties specified in this Article shall not deprive the TJPA of other rights the TJPA may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Manufacturer shall warrant work of this Section for 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct defects or deficiencies which become apparent within warranty period, to satisfaction of TJPA Representative and at no expense to TJPA.

1.11 RECORD DOCUMENTS (AS-BUILT)

A. Maintain and submit record documents as specified in Article 3.09 of the General Conditions and Sections 01 17 20

PART 2 - PRODUCTS

2.1 LEED MATERIAL REQUIREMENTS

A. Credit MR 4: Provide cast nodes, W-shapes, and plates steel materials with minimum 70% recycled content where the total recycled content equals the sum of post-consumer recycled content and ½ post-industrial recycled content.

B. Credit IEQ 4.1: All VOC containing materials applied on site inside of the waterproofing barrier shall comply with LEED credits IEQ 4. Provide adhesives and sealants with VOC content and chemical component limits not exceeding the content limits defined by SCAQMD Rule #1168, July 1, 2005, amended January 1, 2005, and Green Seal GS-36, effective October 19, 2000 for aerosol adhesives as applicable.

C. Credit IEQ 4.2: All VOC containing materials applied on site inside of the waterproofing barrier shall comply with LEED credits IEQ 4. Provide paints and coatings that comply with the limits defined by Green Seal Standard GS-11, effective May 20, 1993, GC-03, January 7, 1997, and SCAQMD Rule #1113, effective January 1, 2004, as applicable.

2.2 MANUFACTURERS

A. One of the manufacturers named, or equal, with a record of successful performance, acceptable to the TJPA Representative and subject to conformance to requirements of Drawings, Schedules and Specifications.

2.3 PERFORMANCE REQUIREMENTS

A. General:

1. Provide railings capable of withstanding the loads prescribed by the CBC without exceeding the allowable design working stress of the materials involved, including anchors and connections.
2. Apply each load to produce the maximum stress in each component.
3. Other loading criteria applicable to this Section are specified in Sections 08 05 00 and 08 05 13.

B. Deflection: Limit deflection under uniform load to L/360; L/120 under concentrated load; or 1/4 inch maximum, whichever is more restrictive.

C. Design Criteria for Critical and Non Critical Areas: Refer to Note CD 6 on Structural Drawing S-0005.

1 . . .

D. **Provide bonding where required by the specific equipment installation requirements of by other requirements of the project contract documents.** ***. . . 1***

2.4 MATERIALS

A. Stainless Steel: Austenitic stainless steel as follows.

1. Tubing: ASTM A 554, Grade MT 316L.
2. Pipe: ASTM A 312/A 312M, Grade TP 316L.
3. Sheet, strip, plate, and flat bar: ASTM A 666, Type 316L.
4. Bars and shapes: ASTM A 276, Type 316L.

B. Structural Steel Shapes, Plates, Etc.: Material conforming to ASTM A 36.

C. Hollow Structural Steel Sections: Material conforming to ASTM A 36.

D. ***1 . . .*** Steel Pipe Handrails: Conforming to ASTM A **500** ~~53, Type "S", Schedule 40, Grade A steel pipe~~.

E. Steel Pipe Bumpers: Conforming to ASTM A **500** ~~53, Schedule 80~~. ***. . . 1***

F. Galvanized Sheet Steel: Supply 20-gage core thickness commercial quality to ASTM A 653, CS Type A, with Z275 (G90) zinc coating designation to ASTM A 653.

G. Cast Steel Handrail Wall Brackets: In compliance with local building code requirements and to meet design requirements indicated on Drawings.

H. Welding electrodes and filler metal: Types recommended by AWS for each type of metal required, and as required for conditions of use. Ensure color match, strength and compatibility in the fabricated items.

I. High Strength Bolts:

1. Steel: Bolts, nuts and washers conforming to ASTM A 32. Supply each type and size of bolt and nut of same manufacture and of same lot.

   a. Bolts: Heavy, hexagon head high strength structural bolts, of standard size, of lengths required for thickness of members joined and for type of connection.
   b. Nuts: Heavy, hexagonal, semi-finished nuts.
   c. Washers: Flat and smooth hardened washers, quenched and tempered to suit applications, ASTM F 844.

d. Hardened Steel Washers: To suit applications and conforms to ASTM F 436.
e. Lock Washers: Helical spring type steel "lock" washers to suit applications and conforming to ASME standards.

2. Stainless Steel: For exterior locations, unless otherwise indicated, use AISI Type 316.

a. Bolts: To suit applications and conforms to ASTM F 738.
b. Nuts: To suit applications and conforms to ASTM F 836.
c. Lock Washers: Helical spring type steel "lock" washers to suit applications, conforming to ASME standards.

3. Vandal-Resistant Fasteners: AISI Type 304 stainless steel, dual pin type to suit applications and acceptable to TJPA Representative. Use for exposed fasteners in public areas, unless otherwise indicated.
4. Security Fasteners: Button head "Torx® Plus R," tamper-resistant No. 10 stainless steel machine screws.

J. Common or Ordinary Bolts and Anchor Bolts: Unfinished bolts conforming to ASTM A 307, Grade A, with hexagon heads and nuts where exposed in the finish work. Provide common bolts of lengths required to suit thickness of material being joined, but not projecting more than 1/4 inch beyond nut, without the use of washers. Supply anchor bolts of lengths noted, but projecting not less than 1/2 inch beyond nut unless otherwise noted.

K. Dielectric Separator: Provide quick drying non-staining alkali-resistant bituminous paint or epoxy resin solution or membrane type to acceptance of TJPA Representative.

L. Cast-In-Place and Post-Installed Anchors in Concrete: Torque-controlled expansion type or chemical type with capability to sustain, without failure, load imposed with a safety factor of 4.

1. Material for interior locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 unless otherwise indicated.
2. Material for exterior locations: Alloy Group 1 or Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

M. Grout and Anchoring Cement:

1. Non-shrink non-metallic grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C 621. Provide grout specifically recommended by manufacturer for application of type specified in this Section.
2. Manufacturer: Bonsal Anchor Cement by WR Bonsal Co., Por-Rok by Minwax Construction Products Division.

N. Primer: The following by Tnemec, or equal of the same generic type and with equivalent characteristics by Carboline, and Sherwin Williams.

1. Shop Applied: "90-97 TnemeZinc".
2. ***1 . . .*** ~~Field Applied: "94-H20 Hydro-Zinc".~~ **Shop Applied Primer of the same generic type and with equivalent characteristics by Carboline.**
3. ~~For surfaces receiving high-performance coatings, coordinate with Section 09 97 15.~~ **Shop Applied Primer of the same generic type and with equivalent characteristics by Sherwin Williams.**
4. ~~For surfaces receiving paint, coordinate with Section 09 91 00.~~ **Field Applied: "94-H20 Hydro-Zinc".**
5. **Field Applied Primer of the same generic type and with equivalent characteristics by Carboline.**

6. **Field Applied Primer of the same generic type and with equivalent characteristics by Sherwin Williams. . . . *1***

O. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC Paint 12 but containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 SCHEDULE OF ITEMS:

A. Unistrut Framing:

1. ***1 . . .*** Multipurpose steel profiles by Unistrut, Cooper B-Line, Inc. **or** Power-Strut U.S., ~~or Famet,~~ complete with manufacturer's standard steel fasteners and connectors, nuts integrally self-locking or fitted with locking devices. ***. . . 1***
2. Provide hot-dip galvanized finish on steel members, hanger rods, nuts, bolts, connectors, and anchors.

B. Chain: Hot-dip galvanized Torus chain, Grade 30, 1/2-inch size, with hot-dip galvanized round eye bolt snap and bolt type shackles sized to fit the chain.

C. ~~Queuing Post Inserts:~~

1. ~~Type 316, heavy wall, threaded female sleeves provided with studs for embedment in concrete, removable watertight threaded covers of the same material, and designed to receive the queuing posts with a matching thread.~~
2. ~~Unless otherwise indicated, make post inserts 4 inches long.~~
3. ~~Coat surfaces that will be embedded in concrete with bituminous paint applied to a DFT of 5 mils minimum.~~

D. ***1 . . .*** **DELETED** ~~Hot Dipped Galvanized Steel Mesh and Closure Plates At Bus Deck Guardrail:~~

1. **DELETED** ~~Supply and install 1 inch by 1 inch hot dipped galvanized steel mesh set in angle frame bolted to galvanized horizontal steel tubes provided by Structural Division.~~

   a. **DELETED** ~~Comply with ASTM A 510.~~
   b. **DELETED** ~~Supplier: Equal to Gerard Daniel Worldwide.~~

2. **DELETED** ~~Mesh shall use galvanized No. 9 Gage wire interwoven is vertical and horizontal grid pattern.~~
3. **DELETED** ~~Frame shall be constructed of 1 inch by 1 inch by 1/4 inch thick galvanized plates and angles to receive mesh with 1/4inch galvanized pressure bar attached with galvanized bolts/screws. Attach to horizontal tubes with galvanized angle and galvanized bolts connection with peened threads to prevent loosening.~~
4. **DELETED** ~~At Guardrail vertical posts provide 1/4inch galvanized steel closure plate sloped to drain with bent and curved edges.~~
5. **DELETED** ~~Provide 1/4inch thick galvanized steel flat plate within mesh area to receive light fixtures by Division 26. See Drawings for locations.~~
6. **DELETED** ~~Complete assembly to be painted by Section 09 97 15 High Performance Coatings.~~
7. **DELETED** ~~At expansion joints, provide galvanized pipe sleeves fixed to one side and vertical pipe as shown on drawings, see sheet A1 8675 and A1 3190.~~

E. **DELETED** ~~M 50 Rated Bollards: Both of the following by RSA Protective Technologies, LLC.~~

1. **DELETED** ~~BOL 1 at the East and West End of the Bus Deck Drive Aisle: Of the dimension and profile indicated, model SWB3610 steel bollards by Secure USA.~~

2. **DELETED** ~~BOL 2 at the Pedestrian Islands: Of the dimension and profile indicated, shallow mount steel bollards, model SWB3610 "Sentry Bollards" by RSA Protective Technologies.~~
3. **DELETED** ~~Characteristics:~~

    a. **DELETED** ~~Bollard Protection Rating: ASTM F2656-07 criteria M 50.~~
    b. **DELETED** ~~Maximum Allowed Embedment: 5 inches.~~
    c. **DELETED** ~~Maximum Diameter: 10.75 inches.~~
    d. **DELETED** ~~Hot dipped galvanized after fabrication. Prepare for painting by Section 09 91 00.~~

F. **DELETED** ~~Steel Bollards BOL 3~~

1. **DELETED** ~~Interior hot dipped galvanized steel bollard complete with base plate, anchor bolts and through slab plate as detailed.~~
2. **DELETED** ~~Fill pipe with concrete to profile shown as detailed.~~
3. **DELETED** ~~Hot dipped galvanized after fabrication. Prepare for painting by Section 09 91 00.~~
4. **DELETED** ~~Design Bollard BOL 3 to comply with CFC 312 2007.~~ ***. . . 1***

G. Retractable Bollard: See Specification Section 28 16 44 Perimeter Security Systems.

H. ***1 . . .*** Bollards in Landscape Areas: See Specification Section ~~12 93 30 Site Bollards~~ **28 16 44 Perimeter Security Systems**. ***. . . 1***

I. Expanded Steel Mesh for Gypsum Board Partition Reinforcement: See Section 09 22 19 Metal Framing.

J. Vanity Support Steel Frame

1. Design for 1600 lb concentrated load at any point along the spans with a maximum deflection of L/360 or higher as necessary to prevent stone cladding from forming cracks.
2. Supply and install hot dipped galvanized steel H.S.S. posts, beams and frame complete with base plates and expansion bolts as shown on drawings. Provide framing to underside of structure to provide required stiffness.
3. Seal all bolted connections through waterproofing membrane.
4. Co-ordinate with carpentry and other trades for final design.
5. Provide frame for restroom mock-up works. Modify after field review if required.

K. Deflection And Lateral Seismic Support Steel For Masonry Walls (Non-Load Bearing): as detailed; steel angles, fixed both sides to structure above, continuous where exposed in finished areas. For size and extent, see structural drawings. See plan details of masonry for required support plates at seismic joints.

L. Support steel for ceiling hung toilet partitions (at all pilaster locations):

1. Design for 1000 lbs per pilaster.
2. Provide 8" x 2 ¼" hot dipped galvanized steel channel for support of ceiling hung toilet partitions hung from 2" x 2" x ¼" diagonal angle struts at ends and at 4'-0" centers max. Provide expansion type anchorage or unistrut type cast-in attachment to satisfy AHJ. Anchor to underside of slab.
3. Drill for and provide two galvanized 3/8" dia. Bolts at each toilet partition pilaster, according to reviewed shop drawings. Coordinate with toilet partition manufacturer (see Section 10 21 13 Toilet Partitions and Screens).
4. Provide additional steel angle bracing for seismic requirements and for partition support above ceiling.

5. Coordinate with Mechanical and Electrical Divisions with ductwork, conduits, etc. Span over or under ductwork and the like as required, to support partitions. Provide site mock-up for approval before proceeding.

M. ***1 . . .*** Corner Guards**:** ~~For Concrete Columns/Concrete Block Walls: as detailed, 4' x 4" x ½" fabricated aluminum angles, 4' 0" high minimum and as shown on drawings with anchor straps at 12" o.c.~~

1. **For Concrete Columns/Concrete Block Walls: As detailed, 4" x 4" x ½" fabricated aluminum angles, 8'-0" high typical, or as shown on drawings with anchor straps at 12" o.c.**
2. **For Gypsum Board Wall: As detailed, 4" x 4" x ½" fabricated aluminum angles, 8'-0" high typical, or as shown on drawings. Flush countersunk fasteners. *. . . 1***

N. Aluminum Checkered Plate:

1. ***1 . . .*** 1/8" thick aluminum checkered plate (1/4" thick at loading dock) for ~~stair walls and~~ miscellaneous enclosures. (See enclosures in loading dock). ***. . . 1***
2. Attach with 400 series stainless steel recessed fasteners through to steel studs in gypsum board, maximum 2'-0" o.c., coordinate. Flush countersunk fasteners.
3. When used as enclosure, attach to aluminum 1/8" thick "Z" clips/channels to structure as shown.
4. Provide movement allowance in anchorage.
5. Clear grey anodized finish.
6. ***1 . . .*** **Attach, per CID A-A-1922A, 400 series stainless steel recessed fasteners through to stainless steel expanding sleeve in CMU wall. Flush countersunk fasteners maximum 2'-0" o.c. *. . . 1***

O. Catwalks:

1. Design, supply and install galvanized steel catwalk and railings and floor grating as detailed on drawings.
2. Design floor with 1-3/16" o.c. spaced 1" x 1/8" bearing bars floor grating grille with cross bars at 4" o.c. to support minimum of 200 lb per square foot and to authorities having jurisdiction whichever is higher.
3. Hot dip galvanize after fabrication.
4. Refer to structural drawings for work by that division for this section. Coordinate.
5. Provide removable handrail complete with steel H.S.S. sleeves and galvanized bolt fasteners as shown on drawings.

P. Security Screens:

1. Complete with hot dipped galvanized steel H.S.S. and angle frame, mesh with #10 gage wire, fasteners, clips to heights and widths as shown on drawings.
2. Provide galvanized sliding doors, with track rail and roller wheels with limit pins and HASP for padlock.
3. Coordinate with Electrical division to allow for penetrations of cable trays and the like.
4. Provide 1" x 1" wire grid.
5. By California Wire Products, Corona, CA (Basis of Design).
6. Coordinate with 08 71 10 Hardware. For hardware set number 15.
7. Color: Machinery Gray Powder Coated.

Q. Elevator Pit Divider Screens:

1. Complete with hot dipped galvanized steel angle frame, brackets, steel mesh with #9 wire, and to height and width as shown on drawings.

2. Coordinate with gypsum board Section 09 21 16 for installation of gypsum board sloped cants.
3. Prepare surfaces for priming and painting by Section 09 91 00.

R. Elevator Ladders:

1. Complete with hot dipped galvanized stringer rail, rungs and brackets and fasteners to size shown on drawings.
2. Coordinate with steel liner wall provided by others.
3. Prepare surfaces for priming and painting by Section 09 91 00.

S. Pipe and duct protection

1. All pipes and ductwork within 4'-0" of the floor shall be surrounded by three 4" x ¼" bent steel plate guards, 12" wide and 6" deep at 16" o.c., galvanized and anchored to structure behind with 2" x 2" clip angles. See drawings for locations.

T. Miscellaneous Railings: Part of Section 05 51 00 Steel Stairs and Section 11 13 00 Loading Dock Equipment.

U. Overhead Catenary System (OCS) Steel Framing

1. Design, supply and install hot dipped galvanized Overhead Catenary System with steel framing to support transit overhead wires.
2. Steel framing system shall be an extension of the steel framing H.S.S. supports provided by the Structural Steel section. Coordinate work.
3. Provide H.S.S. vertical adjustable extensions complete with H.S.S. tubes to fit, through bolt attachment, with washers and nuts, plates, clips and continuous steel channel as shown on drawings.
4. All attachment shall be by bolted connections with no welding on site. Hot dipped after fabrication.
5. Provide tamper-resistant fastening.
6. Coordinate with Transit Authority for anchor points and levels and allowance for the framing system for attachment of cable.
7. Fiber-Reinforced Plastics Extruded Isolation Material: Manufactured by Liberty Pultrusions (Basis of Design) of West Mifflin, PA. Provide continuous length with minimum joints of fiber-reinforced plastic isolation material extruded to fit continuous channel and fastened to channel as recommended by manufacturer. Treat and seal joints per manufacturer's standard details. Internal and external of channel material thickness not less than 0.375" thick. Custom color to be provided. Polyglass "F" or "C" as recommended by manufacturer using fire retardant type material.

    a. Other manufactures below are acceptable provided they meet the performance requirements:

        1) Advance Fiber Products, La Crosse, WI 54601
        2) Bedford Reinforced Plastics, Bedford, PA 15522

8. See sheets beginning at A1-8550.

V. Manhole Covers (MHC):

1. Design, supply and install hot dipped galvanized steel framed and concrete lift-out lid for the transformer vaults at the sidewalk level to SFPUC standards. See Architectural drawings beginning on A1-3001.

2. Design for a minimum uniform load of 250 lbs/sf or a concentrated load of 8000 lbs/f and to SFPUC standards whichever produces the greatest stress. Provide hot dipped galvanized and epoxy coated reinforcing bars required for loading. Hot dipped galvanized frame to be minimum 1/8" thick. Emboss SFPUC lettering to standard requirements.
3. Manhole Cover #1 (MHC #1): Manhole cover constructed with nominal 5'-0" x 5'-0" concrete with beveled steel frame with 39" circular fixed hot dipped galvanized grating and frame. Frame and rebars to be hot dipped galvanized to SFPUC standards. Provide four (4) brass lifting lugs (couplings) 1-1/2" diameter to SFPUC standard. Finish concrete to be minimum 5000 PSI air-entrained with color and finish to match Landscape Division. Provide water tight perimeter seal with backing and sealant. Design similar to drawing A1-7275. SFPUC grating to be SFPUC standard to vented installations similar to Swiveloc vented cover. Vented cover shall be minimum 60% open.
4. Manhole Cover #2 (MHC #2): Manhole constructed of nominal 10'-0" x 7'-0" concrete with hot dipped galvanized steel frame similar to MHC #1 except without grating. Provide minimum six (6) brass lifting lugs (couplings) 1-1/2" diameter to SFPUC standard. Coordinate final number and load limits of lifting lugs with SFPUC requirements. Provide hot dipped galvanized rebars. Provide minimum 5000 PSI with color and finish to match Landscape Division, with air-entrained concrete. Provide water tight seal with backing and sealant.
5. Manhole Cover #3 (MHC #3): Provide 39" diameter manhole cover by Swiveloc (basis of design) complete with UG-2 design vented cast grated cover carrier rail, exhaust ports, bent head actuator bolt and drain grooves. No. 072154.

W. Masonry Vertical Seismic Joints:

1. Supply and install galvanized steel cover plates on masonry seismic joints.
2. Attach plates on one end at maximum 2'-0" o.c.
3. Joint to be filled with fire safing and smoke seal by 07 21 00.
4. See drawings beginning at A1-3192.

X. Janitor Closet Galvanized Crash Rail:

1. Supply and install hot dipped galvanized floor mounted crash rail complete with hot dipped galvanized flanges and fasteners.
2. See Architectural drawings for detail and location.

Y. Cast-In Steel Angle

1. In Loading Docks provide hot dipped galvanized cast-in slab edge angle at edge of raised slabs and at ramp location not covered by other sections.
2. Angle to be 6" x 6" x 3/8" thick. Miter fit all corners.

Z. ***1 . . .*** Transformer Vault Steel Landing Platforms, Railings and Stairs: Design, supply and install all steel work in transformer vaults including but not limited to ladders, stairs, platform railing guards gratings as shown on drawings. All material which is taken from SFPUC standard details. All material shall be hot dipped galvanized except for railings that are blast cleaned and prime coated. All structural steel conforming to latest ASTM specification A-36 and detailing and fabrication to latest AISC specifications. Provide surfaces smooth and face from burs and sharp projections. All grating shall be welded type with 1" x 1/8" bearing bars at 1-3/16" o.c. and cross bars at 4'-0" o.c. Design to OSHA requirements. **Swing gate with automatic closures at access ladder landings.**

AA. **DELETED** ~~Galvanized Angle at Bus Deck Level Curb: Supply and install hot dipped galvanized angle 6" x 4" x ¼" thick for WMP splice joint. See details beginning at Detail #4 on drawing A1-8675.~~ ***. . . 1***

BB. Miscellaneous required steel supports and metal fabrications which are not part of a manufactured item or covered under another Section of the Specifications, including items from installation by other Sections.

CC. Escalator Pit Curb Angle: Provide angles at escalators E304, E305, E510 and E512. Angles are to form parts of escalator pits. See drawings started at A1-7550.

2.6 FABRICATION

A. General:

1. Design assemblies to avoid or minimize site welding, except where attached to a concealed support.
2. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
3. Remove sharp and rough areas on exposed surfaces. Projecting edges are not permitted. Ease exposed edges to a radius of approximately 1/32 inch.
4. Cut, reinforce, drill, punch, thread and tap metal work as required to receive finish hardware and similar items of work.
5. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
6. Form exposed connections with flush, hairline joints unless welded, in which case connections shall be invisible.
7. Close exposed ends of handrail and railing members.
8. Provide wall returns at ends of wall-mounted handrails.
9. Provide sheet or plate fillers to support structural loads of handrails where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thickness. Size fillers to produce adequate bearing to prevent bracket rotation and overstressing of substrate.

B. Preassemble and prime assemblies in shop to greatest extent possible to minimize field splicing and assembly. Clearly mark units for reassembly and coordinated installation.

1. Disassemble units only as necessary for shipping and handling limitations.
2. Clearly mark units for reassembly and coordinated installation.
3. Use connections that maintain structural value of joined pieces.
4. Form changes in direction of railing members by radius bends of radius indicated.

C. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain profile of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Weld connections continuously.

1. Do not use stitch, spot or tack welds on exposed surfaces.
2. Use materials, methods and welding sequence that minimize distortion and develop strength and corrosion resistance of base metals.
3. Comply with AWS D 91 for recommended practices in shop welding. Welds on exposed surfaces shall be continuous.
4. Use only technicians qualified to weld stainless steel using TIG equipment.
5. Maintain proper welding temperature to avoid discoloring adjacent metal.
6. Clamp components in jigs during welding to avoid distortion.
7. Alligatored, discolored and warped components will be rejected.
8. Obtain fusion without undercut or overlap.
9. Remove welding flux immediately.

E. At exposed connections, finish exposed welds and surfaces to be invisible from adjacent surfaces, under normal lighting conditions, and so those contours of welded surface match those adjacent.

F. Provide wall brackets, flanges, miscellaneous fittings, and anchors required for connection of metal components to other construction fabricated to the profiles and dimensions indicated on approved shop drawings.

G. Provide inserts and other anchorage devices for connecting metal components to concrete or masonry work. Fabricate anchorage devices capable of withstanding loadings imposed by the assemblies with a reasonable factor of safety. Coordinate anchorage devices with supporting structure.

H. Fabrication Tolerances:

1. Squareness: 1/8 inch maximum difference in diagonal measurements.
2. Maximum offset between components at joints: 1/16 inch except that at welded joints no offset is allowed.
3. Maximum misalignment of adjacent members: 1/16 inch.
4. Maximum bow: 1/8 inch in 48 inches.
5. Maximum deviation from plane: 1/16 inch in 48 inches.

2.7 CORROSION PROTECTION

A. Design assembly components to ensure that no metals, including alloys of the same base metal, are placed in contact with materials that will produce damage due to electrolytic action or other forms of corrosion.

B. Separate dissimilar metals to prevent electrolytic action. Provide letter of confirmation, from corrosion engineer, that infill components, accompanying trims and flashings and attachments to adjacent construction are designed to eliminate potential for galvanic action between components.

C. Comply with recommendations of the corrosion engineer approved by the TPJA Representative, as specified above.

2.8 FINISHES

A. Hot Dip Galvanizing: Galvanize all items listed, as specified in Section 05 05 12 Hot Dip Galvanizing with minimized spangles, and chemically treated.

B. Cleaning and Shop Painting:

1. Clean steel to SSPC-SP 6, “Commercial Blast Cleaning,” and remove loose mill scale, weld flux and splatter.
2. Shop prime steel, including galvanized steel, with one coat of primer (except 2 coats of primer on bollards) to dry film thickness of one mil for a single coat and 2 mils for 2 coats.
3. Paint on dry surfaces, free from rust, scale or grease. Do not paint when temperature is lower than 45 degrees F. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature and humidity conditions.
4. Clean but do not prime surfaces to be field welded. Touchup these surfaces in the field as specified below.

C. Protection: Protect surfaces of prefabricated items with an electrostatically-applied strippable film. Remove film promptly after installation is complete.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work.

1. Examine adjacent construction and supports.
2. Examine wall flashings, water and weather barriers, and other built-in components to ensure coordinated, weathertight installations.
3. Verify that substrates are within allowable tolerances, plumb, level, clean, and will provide a solid anchoring surface.
4. Restroom Mock-up: Provide vanity support installation for 1 male and 1 female public restroom for review and approval prior to continuation of work. Complete deficiencies and receive approval before proceeding with the work.

B. Notification: Notify General Contractor in writing, with copy to TJPA Representative, of conditions detrimental to the installation.

C. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

A. General:

1. Do not install damaged and defective components.
2. Do not cut, trim or weld parts during erection.
3. Return components that require alteration to the shop for refabrication, if possible, or for replacement by new parts.
4. Install work with tight, flush joints accurately fitted.

B. Fastening to in-place construction:

1. Set railings accurately in location, alignment and elevation, plumb, level and true, measured from established lines and levels. Provide toe guards where indicated.
2. Set posts plumb within a tolerance of 1/16 inch of plumb.
3. Align rails so that variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/8 inch in 12 feet.
4. Install chain so it sags no more than 2 inches for its entire length.
5. Provide required anchorage devices and fasteners to attach components securely to in-place construction.
6. Tap posts to receive crash rail bumpers. Install bumpers fastened at each post with Type 316 stainless steel bolts driven thru a washer of the same material.

C. Installation tolerances: Adjust metal fabrications for squareness, alignment, twist, levelness and plumbness to the following tolerances.

1. Squareness where applicable: Plus or minus 1/16 inch, measured on the diagonal.
2. Alignment: Plus or minus 1/16 inch where fabrications are separated by one inch or more; where components join or are separated by less than one inch, components shall be aligned; no deviations permitted.
3. Twist: Plus or minus 1/16 inch, except that deviation shall be such that joined panelized components are flush at joints; no deviations permitted.
4. Plumbness: Plus or minus 1/16 inch, except that deviation shall be such that joined panelized components are flush at joints; no deviations permitted.

5. Levelness: 1/8 inch from level, except where tighter tolerances are required for joining or alignment with adjacent work.
6. Deviation from theoretical location in plan: 1/4 inch, except where tighter tolerances are required for joining or alignment with adjacent work.

D. Field Painting and Touchup:

1. Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touchup with matching paint.
2. For shop primer damaged during transit and installation, sand or wire brush damaged area down to bright metal extending the cleaning a minimum of 2 inches unto undamaged primer and immediately touchup with same primer used for shop priming.

3.3 SITE QUALITY ASSURANCE

A. Site Tests and Inspections:

1. TJPA will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
2. Testing agency will report test results promptly and in writing to the Contractor and TJPA Representative.
3. Extent and Testing Methodology: Testing agency will randomly select completed load-bearing assemblies for testing that are representative of different designs and conditions in the completed Work.
4. Weldments: For single pass fillet welds, inspect welds visually. For other types of welds, the weld testing provisions of Section 05 10 00 apply to this Section.
5. Testing agency will report test results promptly and in writing to Contractor and TJPA Representative.
6. Additional Testing: Where load-bearing assemblies are removed and replaced or are repaired, additional testing will be performed to determine compliance of replaced or additional work with specified requirements.
7. Structural Inspection: Ensure a California-licensed structural engineer specified herein inspects work of this Section during erection/installation.

B. Non-Conforming Work: Replace damaged work that cannot be satisfactorily repaired, restored or cleaned, to satisfaction of TJPA Representative at no cost to TJPA.

3.4 CLEANING AND PROTECTING

A. Cleaning: On completion of installation, clean the work of marks and other foreign substances. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Protection: Protect work against stains and damages until acceptance by TJPA.

1. Protect finishes of AMF from damage during construction period with temporary protective coverings approved by architectural metal fabricator. Remove protective covering at the time of Substantial Completion.
2. Provide protective covering on finished surfaces. Remove protection when installed work will be inspected. Do not use protective coverings that will damage finishes or become permanently bonded. Do not leave coating residue on finished surfaces.

C. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint, and paint exposed areas with same material.

2. Cleaning and touchup painting of field welds, bolted connections and abraded areas of shop paint are specified in Section 09 91 00.

D. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and repair galvanizing to comply with ASTM A780.

E. Refinishing: Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 50 00

SPECIFICATION ISSUE LOG

Revision	Date
0	03/31/14
1	09/12/14

SECTION 05 75 00 – ARCHITECTURAL METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes architectural metal fabrications (AMF) not limited to the following:

1. ***2 . . .*** ~~Permanent and r~~ **R**emovable stainless steel pipe railings including LED lighted type.
2. ~~Stainless~~ **Hot dipped galvanized** steel railings, including those with ~~stainless~~ **hot dipped galvanized** steel decorative mesh infill panels in painted galvanized steel assembly at Roof Park. ***. . . 2***
3. Stainless steel handrails and railings.
4. Stainless steel bases and cart rails.
5. Stainless steel bicycle tracks in terrazzo clad stairs.
6. Stainless steel door surrounds (portals).
7. Stainless steel cladding of stair soffits**,** stringers and risers.
8. ***2 . . .*** **DELETED** ~~Stainless steel clad air vents.~~ ***. . . 2***
9. Aluminum column covers in Lower Concourse Level and those not already covered by W-2 work.
10. This Section also establishes general requirements for architectural metal fabrications (AMF) that make reference to this Section but specified in other Sections.
11. Electrical continuity and grounding of this work.
12. Visual mockups.
13. Source and field quality control testing.
14. Warranties and indemnities.
15. Stainless steel free-standing fire hose cabinet enclosures.
16. ***2 . . .*** ~~Stainless~~ **Hot dipped galvanized** steel air vents. ***. . . 2***

B. General: Certain components of the metal assemblies may not be fully detailed on the Drawings which indicate only desired profile and design intent.

1. Engineer, fabricate, and install these components within the physical limitations indicated on the Drawings.
2. Drawings and calculations for the assemblies shall be prepared, signed and sealed by the Contractor's Engineer.
3. Submit drawings and calculations to AHJ for approval, and pay fee(s) incurred thereby before start of installation.
4. Fasteners and connections are shown schematically. Final fasteners or connections size and location shall not conflict with or require revision of the finish profiles of the supporting and supported work.
5. Connections to the supports shall not impose eccentric loading, or induce twisting or warping and shall be able to accommodate misalignment of the structure within limits allowed by the ACI and AISC tolerances.
6. Mockup construction, when specified, is also a requirement of this Section and its cost shall be included in the Contractor's bid.
7. Mockup construction is also a requirement of this Section and its cost shall be included in the Contractor's bid.

C. Products furnished, but not installed in this Section: Bicycle channel in terrazzo treads, and slip-fit metal sockets for temporary/removable railings cast in concrete.

D. Related requirements:

1. Galvanized metal railings specified elsewhere in Division 05.
2. Stainless steel components of structural glass railings.

3. Stainless steel-clad flush doors, stile and rail glazed doors, stainless steel cladding (wall and soffit panels), and stainless steel storefront doors specified in Division 08.
4. Stainless steel-cladding specified in Divisions 07 and 14 (escalators).
5. Stainless steel-roofing and associated flashings specified in Division 08.
6. Stainless steel-flashings specified in Division 07.
7. Stainless steel thresholds in Hardware Division 08.

1.2 DEFINITIONS

A. General: In addition to definitions specified in Article 1.01 of the General Conditions, the following applies to this Section. Where the provisions are in conflict, the more restrictive requirements apply.

B. Contractor's Engineer: California-licensed structural engineer, employed by the Contractor, with a minimum 5 years' experience in the design of assemblies similar in scope to those for the Project, including drawings, testing program development, test-result interpretation, and comprehensive engineering analysis that show the assemblies' compliance with the specified requirements.

C. Engineer (verb) and Engineering: As used in this Section, includes engineering, fabrication and installation.

D. Engineering Services: Services performed for installation of assemblies similar to those indicated for this Project in material, design, and extent.

1.3 ABBREVIATIONS AND ACRONYMS

A. AAMA: American Architectural Manufacturers Association.

B. AHJ: Authorities Having Jurisdiction.

C. AMF: Architectural Metal Fabrications.

D. AWS: American Welding Society.

E. LEED: Leadership in Energy and Environmental Design.

F. MSDS: Material Safety Data Sheets.

G. NAAMM: National Association of Architectural Metal Manufacturers.

H. BAAQMD: South Coast Air Quality Management District.

I. SCAQMD: South Coast Air Quality Management District.

J. SSPC: The Society for Protective Coatings (formerly known as Steel Structures Painting Council).

K. VOC: Volatile Organic Compound.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Comply with Section 01 12 00 and Section 01 14 00, except as specified below. Where the provisions are in conflict, the more restrictive requirements apply.

B. Coordination:

1. Coordinate installation of anchorages for AMF. Furnish setting drawings, templates and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
2. Coordinate respective work to establish relationship between these other Sections and to provide completed installations shown and required.

1.5 SUBMITTALS

A. General: Comply with the General Conditions, and Section 01 13 00 except as specified below. Where the provisions are in conflict, the more restrictive requirements apply. Do not submit items not requested.

B. Product Data: Provide manufacturer product data for each product used in AMF, including grout, anchoring cement, finishing materials and methods.

C. Shop Drawings:

1. Show fabrication and installation of AMF. Include plans, elevations, component details and attachments to other work. Draw plans and sections at not less than 1:48 scale, and details at not less than 1:4 scale.
2. Indicate materials and profiles of each AMF member, fittings, joinery, finishes, fasteners, anchorages and accessory items.
3. Include setting drawings, templates and directions for installing anchor bolts and other anchorages.
4. A California-licensed structural engineer specified herein shall be responsible for:

    a. Production and review of Shop Drawings.
    b. Stamping and signing each Shop Drawing and any associated calculations performed.

5. Final review of Shop Drawings shall be contingent upon complete submission of structural calculations, where appropriate, documentation, certifications, and approvals of anchorage, samples, mockups and test reports. Cross-reference structural calculations to appropriate Shop Drawing details.

D. Samples: Submit manufacturer's finishes charts showing full range of colors and textures (where applicable), and other finish characteristics available for prefinished items indicated below. Make Samples a minimum of 24 inches long for bars, extrusions and tubes; 24 inches square for sheets and Roof Park guard rail infill mesh.

1. AMF consisting of stainless steel with the specified finish.
2. AMF with baked-enamel coating.
3. AMF with high-performance coating.
4. ***2 . . .*** **DELETED** ~~Twelve-inch-square Samples of stainless steel wire mesh.~~ ***. . . 2***

E. Engineering Calculations: For components of the metal fabrications engineered by the Contractor, submit calculations signed and sealed by the Contractor's Engineer to demonstrate Code compliance for the components, including railings. Refer also to Sections 80 05 00 and 80 05 13 for other loading criteria applicable to this Section.

F. Corrosion Analysis: Together with other submittals, submit a letter from a professional engineer, specialized in corrosion prevention, stating that components of the work of this Section and attachments to adjacent construction are designed or isolated to eliminate galvanic action between them.

1.6 CLOSEOUT SUBMITTALS

A. Submit maintenance instructions in accordance with Section 01 70 00. Include in maintenance Manual:

1. Printed copies of maintenance instructions for AMF assemblies and their finishes.
2. Proper care and maintenance of assemblies and hardware.
3. Recommended inspection schedule.
4. Copy of each reviewed Shop Drawings in their most recent amended form.
5. Complete parts and materials list with numbers, sizes, method statement of replacement of components of the installation.

B. Submit instructions for proper cleaning and routine maintenance of assemblies together with recommended cleaning materials and frequency.

C. Provide touchup repair kit and touchup instructions to TJPA for each type of factory-applied finish.

1.7 LEED SUBMITTALS

A. Within 30 days of Contract award, assemble and submit all LEED material information on the "LEED Material Tracking Spreadsheets" and forms provided in the Project Manual, together with all supplemental documentation as required by LEED.

B. Credit MR 4: Product data indicating percentage by weight of post-consumer and post-industrial recycled content for products having recycled content. Include a statement indicating projected costs for each product having recycled content.

C. Credit MR 5: Product data indicating location of extraction and processing and location of manufacture. Include a statement indicating projected costs for each product being extracted, processed, and manufactured within a straight-line 500 mile (800 kilometer) total travel distance of the project site using a weighted average determined through the following formula: (Distance by rail/3) + (Distance by inland waterway/2) + (Distance by sea/15) + (Distance by all other means) = 500 miles [800 kilometers].

D. Credit IEQ 4.1: If field applied, provide manufacturer's MSDS or technical data sheet showing a printed statement of VOC content for all adhesives and sealants used on the project and demonstrating compliance with SCAQMD Rule #1168, effective July 1, 2005 and amended January 7, 2005. Provide manufacturer's product data for aerosol adhesives, including printed statement of VOC content that demonstrates compliance with the limits defined in Green Seal standard GS-36, in effect October 19, 2000.

E. Credit IEQ 4.2: If field applied, provide manufacturer's MSDS or technical data sheet showing a printed statement of VOC content for all paints and coatings used on the project and demonstrating compliance with Green Seal standard GS-11, Paints, May 20, 1993; with Green Seal GC-03, Anti-Corrosive Paints, January 7, 1997; with SCAQMD Rule #1113, effective January 1, 2004.

1.8 QUALITY CONTROL

A. Regulatory Requirements: In addition to LEED requirements, comply with BAAQMD requirements referenced in Section 01 14 10.

B. General: Certain components of the metal assemblies may not be fully detailed on the Drawings which indicate only desired profile and design intent.

1. Engineer, fabricate, and install these components within the physical limitations indicated on the Drawings.
2. Drawings and calculations for the assemblies shall be prepared, signed and sealed by the Contractor's Engineer.
3. Submit drawings and calculations to AHJ for approval, and pay fee(s) incurred thereby before start of installation.
4. Fasteners and connections are shown schematically. Final fasteners or connections size and location shall not conflict with or require revision of the finish profiles of the supporting and supported work.
5. Connections to the supports frame shall not impose eccentric loading, or induce twisting or warping and shall be able to accommodate misalignment of the structure within limits allowed by the ACI and AISC tolerances.

C. Structural Design and Inspection: Structural design and inspection of structural components related to railings, platforms and similar structural elements shall be performed by the Contractor's engineer.

D. Qualifications:

1. Installers: Competent installers with minimum 5 years experience in installation of AMF. Upon request provide record of successful in-service performance, as well as sufficient production capacity to produce required work. Installers shall be thoroughly conversant with laws, by-laws and regulations which govern.
2. Welders: Welding of structural components related to stairs, railings, landings, platforms and similar structural elements shall be performed by fabricator having minimum certification of AWS. Welders shall be familiar with welding procedures for structural welding for steel; structural welding for aluminum, and structural welding for sheet steel.
3. Organic-Coating Applicator Qualifications: Firm experienced in successfully applying organic coatings of type indicated to aluminum extrusions and employing competent control personnel to conduct continuing, effective quality-control program to ensure compliance with requirements.
4. Licensed Professionals: California-licensed structural engineer carrying professional liability insurance.

E. Preconstruction Testing:

1. Engage a qualified independent testing agency to test handrails and railings for compliance with specified requirements for performance and test methods. Conduct tests using specimens and assemblies representative of proposed materials and construction.
2. Fabricate and install test assemblies using personnel who will perform same tasks for Project.
3. Select sizes and configurations of assemblies to adequately demonstrate capability of handrails and railings to comply with performance requirements.
4. Notify TJPA Representative 7 Days in advance of dates and times when assemblies will be constructed.
5. When testing is complete, remove assemblies; do not reuse materials on Project.

F. Certification:

1. Submit certification from Contractor's engineer with his/her seal and signature to certificate, stating assemblies are capable of supporting their own weight, specified live loads, and other loading criteria applicable to this Section specified in Sections 80 05 00 and 80 05 13.
2. Welding quality procedures and personnel according to ANSI/AWS D1.1/D1.1M, ANSI/AWS D1.2/D1.2M and ANSI/AWS D1.3/D1.3M. Certify that each welder satisfactorily passed AWS qualification test for welding processes involved and if pertinent, has undergone recertification.
3. Welders employed on this Project may be asked by TJPA Representative at any time for their welding certificate.

G. Mockups: Provide on site mockups as indicated on the Drawings and if not indicated provide site mockups for each item listed prior to continuing work.

1. Make mockups complete with all accessories, features required for the final assembly on the building. As a minimum, provide railing and cart rail mockups consisting of minimum 3 balusters and a return at least 12 inches long. Provide full height column covers and air vents.
2. Modify mockups to achieve results satisfactory to the TJPA Representative, or remove and construct additional mockup(s).
3. Approved mockups shall serve as the standard for the same work on the Project.
4. Remove mockups only after completion and acceptance of final work unless its incorporation in the Work is authorized by the TJPA Representative.
5. Protect mockups until their removal.

H. Corrosion Prevention:

1. Engage a California-licensed Corrosion Engineer who is an expert in corrosion, to conduct a component-by-component analysis of potential corrosion resulting from galvanic action between materials, for components of curtain wall and aluminum panels and provide report.
2. Submit Engineering Report to TJPA Representative, for review prior to submission of Shop Drawings. Ensure Sample and test results are available upon request.

1.9 DELIVERY, STORAGE AND HANDLING

A. Protection: Provide strippable, electrostatic films over prefinished metal fabrications immediately after finishing.

B. Delivery and Acceptance:
1. Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off-the-ground, undercover storage locations.
2. Protect surfaces and prevent damage to AMF during delivery.

C. Storage and Handling:

1. Store AMF under cover and off ground.
2. Protect surfaces and prevent damage to AMF during storage. Use lifting chokers of material that will not damage surface of members.

1.10 SITE CONDITIONS

A. Field Measurements: Where AMF is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying work.

B. Established Dimensions: Where field measurements cannot be made without delaying work, establish dimensions and proceed with fabricating AMF without field measurements. Coordinate other construction to ensure that actual dimensions correspond to established dimensions.

1.11 WARRANTY

A. General:

1. The warranties are governed by the requirements herein, those of Section 01 74 00, and the General Conditions of the Contract.
2. Warranties specified in this Article shall not deprive the TJPA of other rights the TJPA may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Manufacturer shall warrant work of this Section for 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct defects or deficiencies which become apparent within warranty period, to satisfaction of TJPA Representative and at no expense to TJPA. Defects include but are not limited to; buckling, bond failure and extensive color fading.

1.12 RECORD DOCUMENTS (AS-BUILT)

A. Maintain and submit record documents as specified in Article 3.09 of the General Conditions and in Section 01 17 20.

PART 2 - PRODUCTS

2.1 MANUFACTURERS/FABRICATORS

A. One of the manufacturers/fabricators named, or equal, with a record of successful performance, acceptable to the TJPA Representative and subject to conformance to requirements of Drawings, Schedules and Specifications.

B. For Custom Metal Work:

1. CR Lawrence.
2. Architectural Material Resources.
3. Contrarian Metal Resources (CMR).
4. For Prefabricated Item: As specified below.

2.2 LEED REQUIREMENTS

A. Credit MR 4: Provide aluminum materials with minimum 50% recycled content where the total recycled content equals the sum of post-consumer recycled content and ½ post-industrial recycled content.

B. Credit IEQ 4.1: All VOC containing materials applied on site inside of the waterproofing barrier shall comply with LEED credits IEQ 4. Provide adhesives and sealants with VOC content and chemical component limits not exceeding the content limits defined by SCAQMD Rule #1168, July 1, 2005, amended January 1, 2005, and Green Seal GS-36, effective October 19, 2000 for aerosol adhesives as applicable.

C. Credit IEQ 4.2: All VOC containing materials applied on site inside of the waterproofing barrier shall comply with LEED credits IEQ 4. Provide paints and coatings that comply with the limits defined by Green Seal Standard GS-11, effective May 20, 1993, GC-03, January 7, 1997, and SCAQMD Rule #1113, effective January 1, 2004, as applicable.

2.3 MATERIALS

A. General:

1. Select materials for their surface flatness, smoothness and absence of blemishes wherever exposed to view in the finished work.
2. Materials shall have been cold-rolled, cold-finished, cold-drawn, extruded, stretcher-leveled and machine cut to the highest commercial standards for flatness, with edges and corners sharp and true to angle or curvature as required.
3. Castings shall be of uniform quality, free from blowholes, porosity, hard spots, shrinkage distortion, or other defects. Surfaces in contact with other materials shall be machined for a tight fit.

    a. Castings shall conform to the dimensions indicated with a tolerance of plus or minus 1/8-inch; except in the dimensions of covers and the openings to receive them, tolerance shall be limited to 1/16-inch.
    b. Covers subject to vehicular or pedestrian traffic shall have machined horizontal bearing surfaces, with machined bearing on contact surfaces for other joints.

4. Exposed-to-view surfaces which exhibit pitting, seam marks, roller marks, oil-canning, stains, discolorations or other imperfections will not be acceptable and shall be removed from the job site.

B. Stainless Steel: The following made of Type 316

1. Bar stock: ASTM A 276.
2. Plate: ASTM A 167.
3. Tubing: ASTM A 269.
4. Sheet: ASTM A 666 minimum 1/8” thick and reinforced.

C. Aluminum: Provide minimum nominal wall thickness of 0.125 inch for all extrusions.

1. Basic Material: Aluminum Association Alloy AA6063-T5 for extruded shapes, commercial quality AA1100-H14 aluminum sheet for formed shapes.
2. Acceptable alloy and temper combinations for extrusions subject to fabrication, finish and structural requirements: 6063-T5; 6063-T6; 6061-T6. Other alloys of the 6xxx series and other tempers may be submitted for approval.

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Sole Source.

2.4.B.3. a. HDI Railing Systems.
b. CR Lawrence.
c. Or equal.

2.4.B.4 Queuing Post Inserts:
a. Type 316, heavy wall, threaded female sleeves provided with studs for embedment in concrete, removable watertight threaded covers of the same material, and designed to receive queuing posts with a matching thread. Provide 4" diameter removable escutcheon plate.
b. Unless otherwise indicated, make post inserts 4 inches long.
c. Coat surfaces that will be embedded in concrete with bituminous paint applied to a DFT of 5 mils minimum.

plate subject to fabrication, her alloys of the 3xxx, 5xxx oval.
imensions indicated on the rmance.
e.
steners, but complying with
ed by producer of the metal y in the fabricated items.

2. For aluminum: Aluminum or Type 316 stainless steel.

G. Structural Steel Bolts: ASTM A 307; where higher strength required, submit bolt specifications with Shop Drawings.

H. Paint:

1. Shop Primer for Ferrous Metal: Manufacturer or fabricator standard, fast-curing, lead-free, universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems specified in Section 09 90 00, and complying with performance requirements of FS TT-P645. 91
2. Galvanizing Repair Paint: High zinc dust content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC Paint 20.
3. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC Paint 12, except containing no asbestos fibers.

M.M

2.4 SCHEDULE OF ITEMS

A. Column Covers: At those column covers not covered in W-2 Section 08 44 25. Minimum 0.125-inch thick reinforced aluminum, finished with a fluorocarbon powder coating system, by one of the following. Provide back scribed corners at square columns; at joints provide butt joint design with Aluminum angle closure back-up.

1. Gordon (basis of design).
2. CR Lawrence.
2
3. **FRY Reglett** ... 2

B. Stainless Steel Lighted Handrail and Queuing Rail with Post Inserts

a. HDI Railing Systems.
b. Wagner Companies.
c. Or equal

Lighted Handrail

1. Basis of Design: CR Lawrence LED Premium Cap Rail; low voltage DC power (24 volt); 1.5" outer diameter with 316 stainless steel. Complete with cast stainless steel supports and accessories including caps, closures, wiring. Support shall be 4'-0" O.C. max with 304 stainless steel fasteners. Finish being brushed stainless steel with warm white LED fixture at min 4.3 watts per linear foot. Return ends vertically into slab/floor level to extend electrical cabling to driver electrical box by this section. Coordinate with Electrical Division for power junction box. Provide watertight installation and allow for thermal movements. Acceptable equals include:
2. See Architectural Drawings beginning on A1-8648 for details.
3. Queuing Rail Basis of Design: Wagner Companies, 1.5" outer diameter x .120" Wall Type 316 Stainless Steel two line Queue Rail, mitered corner construction per drawings, welded and ground smooth. #6 circumferential finish. Acceptable equals include:

C. ***1*** Roof Park Level Restaurant Guard Rail and Stair Railing:

1. Provide stainless steel lighted handrail in assembly with hot dipped galvanized support posts and stainless steel cables as shown on drawings.
2. Provide hardwood timber top rail where shown attached to stainless steel plate with stainless steel fasteners.
3. Stainless steel lighted handrail to be as described in 2.4.B of this Section.
4. Design handrail for assembly occupancy per CBC.
5. Provide hot dipped galvanized and stainless steel gate with stainless steel hardware with lockable latch.
6. See Architectural details starting on A1-8910.
7. Wood railing top rail to be IPE hardwood precut with smooth finish. IPE to be left natural with no finish to naturally age to grey color.

D. Stainless Steel Free Standing Cabinet Enclosures

1. Design, supply and install stainless steel clad Fire Valve Cabinet enclosure complete with 1/8" thick 316 stainless steel
2. Provide all hot dipped galvanized sub-framing complete with 1/8" pre-finished aluminum pan and WPM 10A to shed water infiltration. Fasteners shall be 300 series.
3. Provide sealed joints with rain screen sealant material described in sealant section.
4. Provide drainage/weep holes to the exterior. See Architectural sheet beginning at A1-9322.
5. See Plans for locations.
6. Provide stainless steel latches and piano hinges as shown.

E. Roof Park Railing

1. ***2 . . .*** Design supply and install hot dipped galvanized Roof Park Railing with ~~stainless~~ **hot dipped galvanized** steel wire mesh complete with hot dipped galvanized embeds and anchor supports. Hot dip galvanizing after fabrication.
2. Provide tamper-proof ~~stainless~~ **hot dipped galvanized** steel bolts, nuts and washer fasteners as shown on drawings. Coordinate with Structural Division. ***. . . 2***
3. Seal all bolted connections through waterproofing membrane. Provide bolted connections throughout with no welding on site. Isolate dissimilar metals.
4. ***2 . . .*** Provide ~~horizontal stainless steel and~~ **painted** hot dip galvanized tube rails, ~~bars and cables~~ **posts and** as shown on details. **Basis of Design shall be Wagner Companies part number ARSFBRKTLEVEL series.** Provide sleeves in horizontal ~~bars~~ **tubes** with same tube material as ~~bar~~ **tube** for thermal movements. Sleeve connections shall be no longer than 20' – 0" nominal and be at tangent locations as necessary.
5. ~~Stainless~~ **Painted hot dipped galvanized** steel wire mesh to be ~~"Xtend Flexible Mesh with AISI 316 L stainless steel seamless ferrules" by Carl Stahl Decorcable (sales@decorcable.com). Mesh shall be 1.5mm with mesh in diagonal pattern with 30mm x 52mm spacing. Connect mesh to pipe on top and cable below. Attach mesh to vertical posts with stainless steel clamp bar, silicone gaskets, stainless steel and washers.~~ **"ARCHIMESH" BWL-62 steel mesh panel with a 1.5" deep 13 Gage U-edge frame, with painted mounted stainless steel hubs no. GR320R.4 by Wagner Companies (Basis of Design). Connect mesh to vertical posts.** ***. . . 2***
6. Design of Roof Park Railing to comply with Authorities Having Jurisdiction for railings and guards and have a maximum deflection on the vertical posts and horizontal members to max L/240 when loads are imposed.
7. At seismic joint areas, provide railing expansion joint detail by overlapping railing with itself and cantilevering railing assembly past fixed area using stainless steel cables for bracing and stabilization. Provide silicone bumpers as necessary to isolate railings from damage from movement.

2 . . .

8. **All surfaces to be shop primed and coated with High Solids Epoxy and modified urethane finish.**

   a. High Solids Epoxy Prime Coat shall be:

      1) Macropoxy 646, by Sherwin Williams.
      2) Carboguard 89 VOC, by Carboline.
      3) Series 69 Epoxoline, by Tnemec.
      4) Or equal.

   b. Modified Urethane Finish coat shall be:

      1) Waterbased Acrolon 100, by Sherwin Williams.
      2) Carboxane 2000, by Carboline.
      3) Series 750UVX, by Tnemec.
      4) Or equal.

9. **Prior to fabrication and installation, field verify dimensions and as-built conditions by an experienced railing installer.**
10. Color: PT-2

F. ~~Stainless~~ **Hot Dipped Galvanized and Painted** Steel Air Vents (Air Shaft Enclosures)

1. Design/build ~~stainless~~ **hot dipped galvanized tubular** steel air vents ~~complete with structure for air vents~~ at locations shown on drawings. The Contractor awarded this portion of the work shall engineer, fabricate and install the work of this item in accordance with the design intent, design criteria performance requirements, applicable codes, ordinances and requirements of Authorities Having Jurisdiction.
2. Air vents shall consist of **self supported** ¾**"** ~~3/16"~~ thick ~~316 stainless~~ **hot dipped galvanized 42" O.D. tubular** steel complete with internal ~~304 stainless steel fins attached to stainless steel base steel "H" Section~~ **hot dipped galvanized steel base** bolted to ~~stainless~~ **hot dipped galvanized** steel-lined concrete curb. ~~Fasteners all 304 stainless steel.~~ **Use hot dipped galvanized anchor bolts. Hot dip galvanize after fabrication.** ***. . . 2***
3. Coordinate with Structural Engineer Thornton Tomasetti for curb reinforcement and hot dip galvanized locations.
4. ***2 . . .*** **DELETED** ~~Provide removable stainless steel base for access with flush tamper proof stainless steel fasteners.~~
5. At top, provide ~~stainless~~ **hot dipped galvanized** steel sloped 1" x 1" x #9 wire mesh using tamper proof ~~stainless~~ **galvanized** steel fasteners and a ~~stainless~~ **galvanized** steel perimeter frame.
6. Fabricate in factory and erect on site with minimum site work without site welding with all bolted connections. Design ~~enclosure panels and sub-framing~~ **vent structure** and fixings to allow for thermal stresses and forces, including but not limiting to wind and seismic loads. ***. . . 2***
7. Wind loads: As defined in R.W.D.I. Report, "Cladding Wind Load Study, Transbay Transit Center, San Francisco, CA June 7, 2013 or latest revision. Design air vents to satisfy wind loads. Maximum deflection under maximum wind load not to exceed L/400. For seismic see Structural Engineer Drawing S-0005 Note CO-6.
8. ***2 . . .*** ~~Finish: Finish stainless steel to brushed No. 4 finish.~~ **Surface Preparation: All exterior longitudinal and circumferential weld seams shall be ground flush to comply with AESS SSPC-SP6 finish.**
9. **Finish: High Performance Coating per 09 97 15.** ~~**Color to be selected by the TJPA Representative.**~~ ***. . . 2***
10. Color: PT-21

G. Stainless Steel Door Surrounds (Portals)

1. Supply and install 1/8” thick 316 stainless steel sheet panels complete with aluminum or stainless steel anchors and support framing with concealed stainless steel fasteners. Provide reveal joints to stainless steel door frames and to adjacent work as shown on drawings. Coordinate with W-5 work and W-16B stainless steel work and with elevator doors and transom work. Finish: As directed by TJPA Representative.

H. Stainless Steel Bases and Cart Rails

1. Design, supply and install stainless steel base and cart rail complete with stainless steel support clips, 1/8” thick minimum stainless reinforced steel base, ¼” thick minimum cart rail with stainless steel fasteners. All work to be 316 stainless steel. Provide extruded EPDM gasket to stainless steel base, mechanically fasten. Design cart rail to support 500lb point load at any location. Provide hot dipped galvanized expansion bolts in concrete curb for support. Seal penetrations in waterproofing membrane. Finish: As directed by TJPA Representative.

I. Stainless Steel Cable Wire: 1/8” diameter 316 stainless steel concealed cable wire to support disengaged column covers during seismic event.

J. ***1*** Stainless Steel Countertops: 16 gage 316 stainless steel #4 brushed finish**.**

2.5 FABRICATION

A. Design exterior components to allow for expansion and contraction for a temperature range of temperature change (range) of 120 degrees F, ambient, 180 degrees F, material surfaces, without causing buckling, excessive opening of joints, and over-stressing of welds and fasteners.

B. Design assemblies to minimize site welding.

C. Provide matching alloy (for color) for exposed metal surfaces. Form metal work to the required shapes.

D. Comply with AWS for recommended practices in shop welding. Welds on exposed surfaces shall be continuous.

E. Welding: Comply with AWS D9.1, the metal producer's recommendations for recommended practices in shop welding, and the following.

1. Use welding for joining pieces together, unless otherwise accepted by the TJPA Representative on shop drawings.
2. Welds on exposed surfaces shall be continuous and lightproof and shall be of quality and finish equal to NOMMA Finish #1; elsewhere provide weld quality and finish equal to NOMMA Finish #4.
3. Use stitch and spot welding only where specifically permitted.
4. Where joints will be exposed to the elements, at any time including during construction, close welded joint to air and water infiltration either by welding interface completely, or by sealing remaining space with silicone sealant specified in Section 07 92 00.
5. For stainless steel, use only technicians qualified to weld stainless steel using TIG equipment.
6. Maintain proper welding temperature to avoid discoloring adjacent metal.
7. Clamp components in jigs during welding to avoid distortion.
8. Undercut metal edges where welds are required to be ground flush and dressed smooth.

9. Grind welds exposed to view flush, and fill and dress to match adjacent parent metal surfaces so that joint will be invisible. Where welds are concealed but exposed to the elements, make welds to shed water.
10. Weld on or behind surfaces so that finished surface exposed to view will be free of imperfections such as pits, runs, splatter, cracks, warping, dimpling, depressions and other forms of distortion or discoloration.
11. Remove weld spatter and welding oxides from welded surfaces.

F. Cut components square. Remove burrs from cut edges. Mill joints to a tight, hairline, flush fit. Cope or miter corner joints. Show all field joint location on the shop drawings.

G. Unless otherwise shown or accepted on the Shop Drawings, conceal fasteners in the finish work. Back-up joints with either sleeves or back-up plates.

H. For built-in work, furnish anchor bolts, inserts, plates other anchorage devices, and other items for AMF work to be built into concrete, masonry, or work of other trades. Furnish necessary templates and instructions to facilitate proper placing and installation.

I. For removable stainless steel railing posts, fabricate slip-fit sockets from stainless steel tube whose inside diameter is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than 1/40th of post height. Provide socket covers designed and fabricated to resist being dislodged.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated.

J. Fabrication Tolerances:

1. Squareness: 1/8 inch maximum difference in diagonal measurements.
2. Maximum offset between components at joints: None.
3. Maximum misalignment of adjacent members: 1/32 inch.
4. Maximum bow: 1/8 inch in 48 inches.
5. Maximum deviation from plane: 1/16 inch in 48 inches.

2.6 CORROSION PROTECTION

A. Design assembly components to ensure that no metals, including alloys of the same base metal, are placed in contact with materials that will produce damage due to electrolytic action or another corrosion.

B. Separate dissimilar metals to prevent electrolytic action. Provide letter of confirmation, from corrosion engineer, that infill components, accompanying trims and flashings and attachments to adjacent construction are designed to eliminate potential for galvanic action between components.

C. Comply with recommendations of the corrosion engineer approved by the TPJA Representative, as specified above.

2.7 FINISHING EXPOSED METAL SURFACES

A. Finish surfaces as follows to match approved samples.

B. Stainless steel: Provide a non-directional “angel-hair” finish matching the TJPA Representative control sample.

C. Steel surfaces: After cleaning and degreasing, galvanize and prime as specified in Section 05 50 00.

D. Protection: After finishing, protect surfaces with an electrostatically-applied strippable film. Remove film promptly after installation is complete.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work.

1. Examine adjacent construction and supports.
2. Examine wall flashings, water and weather barriers, and other built-in components to ensure coordinated, weathertight installations.
3. Verify that substrates are within allowable tolerances, plumb, level, clean, and will provide a solid anchoring surface.

B. Notification: Notify General Contractor in writing, with copy to TJPA Representative, of conditions detrimental to the installation.

C. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

A. General:

1. Do not install components damaged or defective in any way. Remove and replace members damaged during installation or thereafter, before the time of final acceptance.
2. Do not cut, trim or weld parts during erection, in any manner which would damage the finish, decrease the strength, or result in a visual imperfection or a failure in performance of the work.
3. Return components which require alteration to the shop for refabrication, if possible, or for replacement by new parts.
4. Install work with tight joints accurately fitted.
5. Where cutting is required for proper fitting and jointing, restore finish to eliminate evidence of corrective work.
6. Joints at changes in direction in stainless steel railings shall be shop welded; field joints shall be a minimum of 2 feet from a change in direction, and assembled with concealed sleeves or back-up plates and set screws.
7. Install this work with concealed fasteners.
8. Apply a bituminous coating of approximately 30 mils DFT, or other suitable permanent separator, on surfaces of dissimilar metals (except where exposed to view) and metal surfaces in contact with cementitious materials. Where the metals are exposed to view, provide a plastic or neoprene separators between dissimilar metals.
9. Comply with AWS Code for manual shielded metal-arc welding procedures, the appearance and quality of welds made, and the methods used in correcting welding work which must be approved by the TJPA Representative in each case.

B. Fastening to in-place construction:

1. Set this work accurately in location, alignment and elevation, plumb, level and true, measured from established lines and levels.

2. Provide required anchorage devices and fasteners for securing AMFs to in-place construction; coordinate the embedment of anchors with the work of the concrete trades.

C. Restore protective coverings damaged during shipment or installation. Remove protective coverings only when there is no possibility of damage from other work yet to be performed at same location.

D. Retain protective coverings intact; remove coverings simultaneously from similarly finished items to preclude non-uniform oxidation and discoloration.

E. Field Welding:

1. Comply with applicable AWS specification for procedures of manual shielded metal arc welding, for appearance and quality of welds and for methods used in correcting welding work.
2. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Grind exposed welded joints smooth and restore finish to match finish of adjacent surfaces.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, and dissimilar metals with a heavy coat of bituminous paint.

G. Handrails and Railings:

1. General: Adjust handrails and railings before anchoring to ensure alignment at abutting joints.
2. Concrete-Anchored Posts in Sleeves: Insert posts in preset sleeves, cast into concrete and fill annular space between posts and sleeve with non-shrink, non-metallic grout, mixed and placed to comply with grout manufacturer's written instructions.
3. Concrete-Anchored Posts in Core-Drilled Holes: Core-drill concrete to produce holes with a diameter at least 3/4" larger than OD of post and not less than 5" deep. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with grout manufacturer's written instructions. Cover anchorage joint with flange or escutcheon plate attached to post after filling annular space.
4. Leave anchorage joint exposed; wipe off excess grout; and leave a 1/8" build-up, sloped away from post.
5. Anchor posts to metal surfaces with fittings designed for this purpose.
6. Non-welded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of handrails and railings.
7. Welded Connections: Use fully welded joints for permanently connecting railing components by welding. Cope or butt components to provide 100% contact or use fittings designed for this purpose.
8. Anchor railing ends into concrete or masonry with fittings designed for this purpose.
9. Anchor railing ends to metal surfaces with fittings using concealed fasteners.
10. Anchor railing ends to metal surfaces by welding.
11. Expansion Joints: Provide expansion joints at locations indicated or, if not indicated, at intervals not to exceed 40'. Provide slip-joint internal sleeve extending 2" beyond joint on either side, fasten internal sleeve securely to ~~1~~ one side and locate joint within 6~~"~~ inches of post.

H. Installation tolerances: Adjust metal fabrications for squareness, alignment, twist, levelness and plumbness to the following tolerances.

1. Squareness where applicable: Plus or minus 1/16 inch, measured on the diagonal.

2. Alignment: Plus or minus 1/16 inch where fabrications are separated by one inch or more; where components join or are separated by less than one inch, components shall be aligned; no deviations permitted.
3. Twist: Plus or minus 1/16 inch, except that deviation shall be such that joined panelized components are flush at joints; no deviations permitted.
4. Plumbness: Plus or minus 1/16 inch, except that deviation shall be such that joined panelized components are flush at joints; no deviations permitted.
5. Levelness: 1/8 inch from level, except where tighter tolerances are required for joining or alignment with adjacent work.
6. Deviation from theoretical location in plan: 1/4 inch, except where tighter tolerances are required for joining or alignment with adjacent work.

3.3 SITE QUALITY ASSURANCE

A. Site Tests and Inspections:

1. TJPA will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
2. Extent and Testing Methodology: Testing agency will randomly select completed handrail and railing assemblies for testing that are representative of different railing designs and conditions in the completed Work. Handrails and railings will be tested according to ASTM E894 and ASTM E935 for compliance with ASTM E985.
3. Testing agency will report test results promptly and in writing to Contractor and TJPA Representative.
4. Additional Testing: Where handrails and railings are removed and replaced or are repaired, additional testing will be performed to determine compliance of replaced or additional work with specified requirements.
5. Structural Inspection: Ensure a California-licensed structural engineer specified herein inspects work of this Section during erection/installation.

B. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of TJPA Representative at no cost to TJPA.

3.4 CLEANING AND PROTECTING

A. Cleaning: On completion of installation, clean the work of marks and other foreign substances. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Protection: Protect work against stains and damages until acceptance by TJPA.

1. Protect finishes of AMF from damage during construction period with temporary protective coverings approved by architectural metal fabricator. Remove protective covering at the time of Substantial Completion.
2. Provide protective covering on finished surfaces. Remove protection when installed work will be inspected. Do not use protective coverings that will damage finishes or become permanently bonded. Do not leave coating residue on finished surfaces.

C. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint, and paint exposed areas with same material.
2. For shop primer and zinc coating damaged during transit and installation, sand or wire brush damaged area down to bright metal extending cleaning a minimum of 2 inches unto undamaged primer and immediately touchup with same primer used for shop priming.

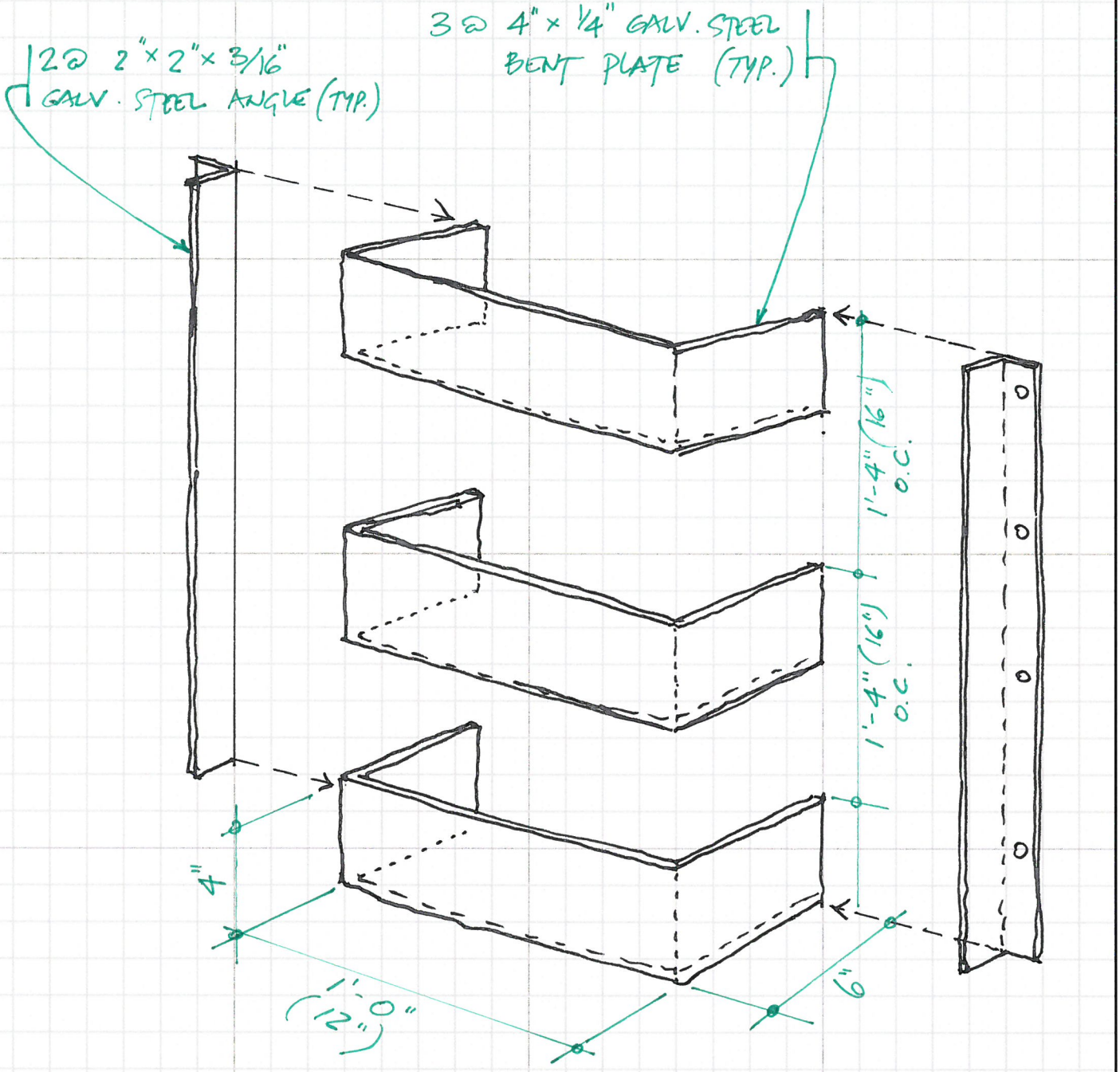
D. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and repair galvanizing to comply with ASTM A780 using zinc-rich paint specified.

E. Refinishing: Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 75 00

SPECIFICATION ISSUE LOG

Revision	Date
0	03/31/14
1	05/30/14
2	09/12/14



Transbay Transit Center

AAI ARCHITECTS, INC.

DRAWING TITLE:
PIPE & DUCT PROTECTION
RFI TG Ø7.3 _ Ø99

SCALE: NTS
DATE: 11/17/2014
PROJECT NO. 0803

SKA-4307

DRAWN BY: SR
CHECKED BY: