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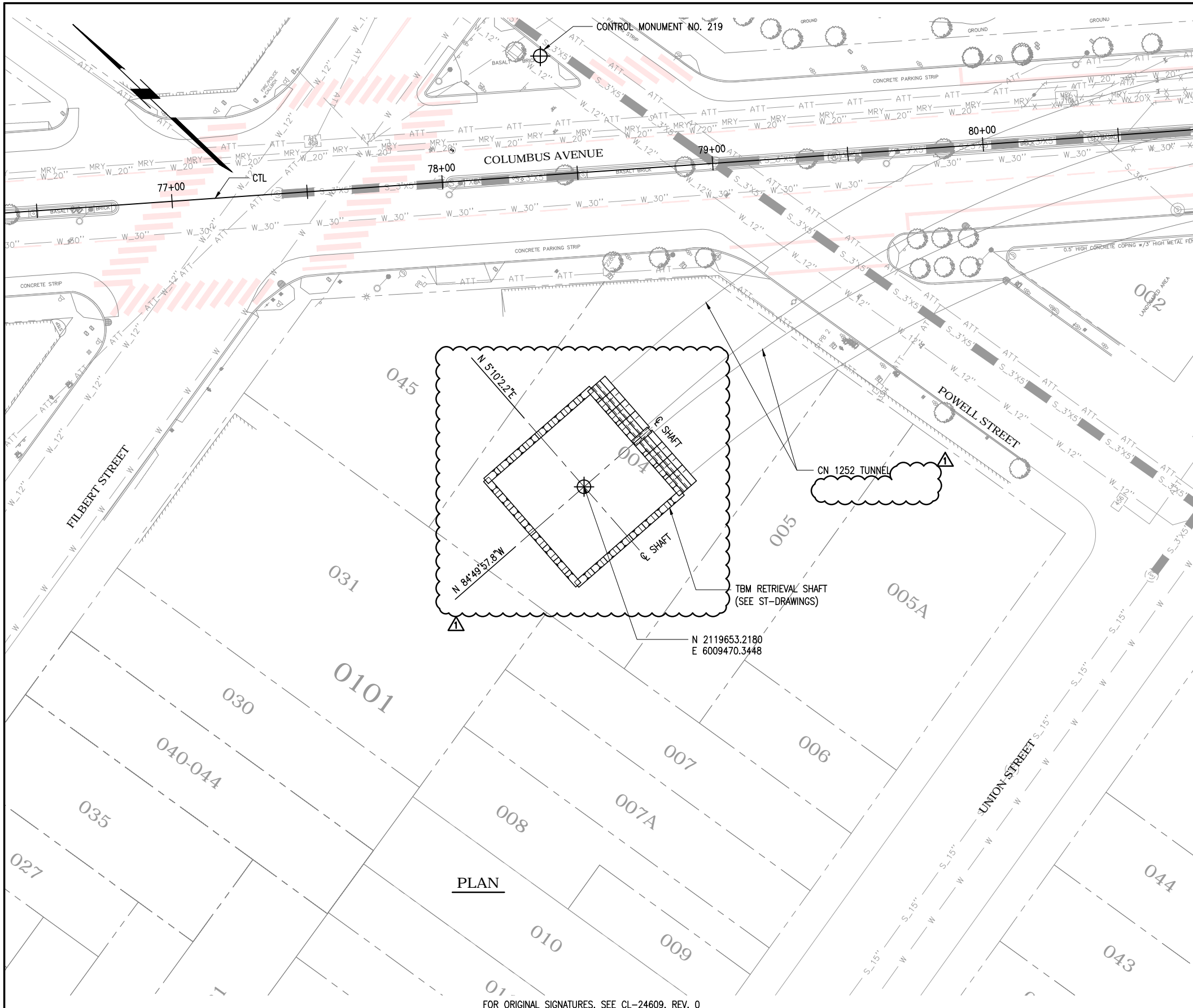
FOR ORIGINAL SIGNATURES, SEE CL-24608, REV. 0

T:\13285 CS DP1\CN 1278\Sheet Files\GE - General\GE-011.dwg Fusco Wed Jul 10, 2013 - 10:11 am GE-011

		DESIGNED D. ABRAHAMS DRAWN L. REYES CHECKED D. YAVORSKY REVIEWED A. READ RECOMMENDED M. FOWLER APPROVED R. EDWARDS DATE 05/31/2013		CITY AND COUNTY OF SAN FRANCISCO <b>MUNICIPAL TRANSPORTATION AGENCY</b>  APPROVED  DIRECTOR OF TRANSPORTATION	THIRD STREET LIGHT RAIL PROGRAM PHASE 2 - CENTRAL SUBWAY TEMPORARY TBM RETRIEVAL SHAFT	CONTRACT NO. <b>1278</b> SFMTA CONTROL NO. <b>CL-24608</b> DRAWING NO. <b>GE-011</b> SHEET NO. <b>2</b>	REVISION  <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%; text-align: center;">1</td> </tr> </table>		1																
	1																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th> <th>DESCRIPTION</th> <th>REV NO.</th> <th>BY</th> <th>CHECKED</th> <th>APPROVED</th> </tr> </thead> <tbody> <tr> <td>07/12/2013</td> <td>ISSUED FOR CONTRACT 1252 CMOD 18</td> <td>1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>05/31/2013</td> <td>ISSUED FOR BID</td> <td>0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	DATE	DESCRIPTION	REV NO.	BY	CHECKED	APPROVED	07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1				05/31/2013	ISSUED FOR BID	0										
DATE	DESCRIPTION	REV NO.	BY	CHECKED	APPROVED																				
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1																							
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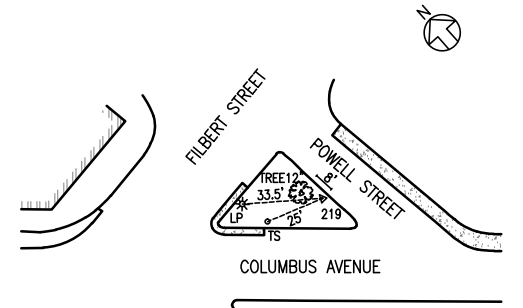
BORDER REVISED 03/25/2011

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**LEGEND:**

--- EXISTING PROPERTY LINE



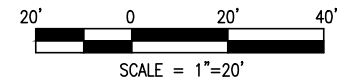
CONTROL MONUMENT No. 219  
NTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
219	2119774.69	6009574.08	59.24	DPW

**SURVEY CONTROL NOTE:**

THE BASIS OF BEARINGS FOR THIS SURVEY CONTROL NETWORK WAS ESTABLISHED USING THE "CALIFORNIA COORDINATE SYSTEM OF 1983, ZONE 3" (CCS83) (US SURVEY FOOT). SURVEY CONTROL COORDINATES ARE BASED ON A LOCAL SYSTEM USING GROUND DISTANCES AND ARE NOT INTENDED TO REFERENCE THE CALIFORNIA COORDINATE SYSTEM, WHICH WOULD REQUIRE USE OF A "GRID TO GROUND" COMBINED GRID FACTOR DISTANCE CONVERSION. ALL MEASUREMENTS AND CALCULATIONS ARE BASED ON GROUND DISTANCES.

ELEVATIONS SHOWN HEREIN ARE BASED ON NAVD88 AND ARE SHOWN IN FEET, DERIVED FROM A NAVD88 ELEVATION OF 6.633 METERS ON BM-0015 AT THE NORTHERLY CORNER OF 2ND AND TOWNSEND. THE ELEVATION WAS THEN CONVERTED TO APPROXIMATE CCSF DATUM (NAVD88 - 11.353 FT)



**PLAN**

FOR ORIGINAL SIGNATURES, SEE CL-24609, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED  
C. SUNTHUDKARN  
DRAWN  
O. KURNOVSKAYA  
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D. ABRAHAMS  
REVIEWED  
A. READ  
RECOMMENDED  
M. FOWLER  
APPROVED  
R. EDWARDS  
DATE  
05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

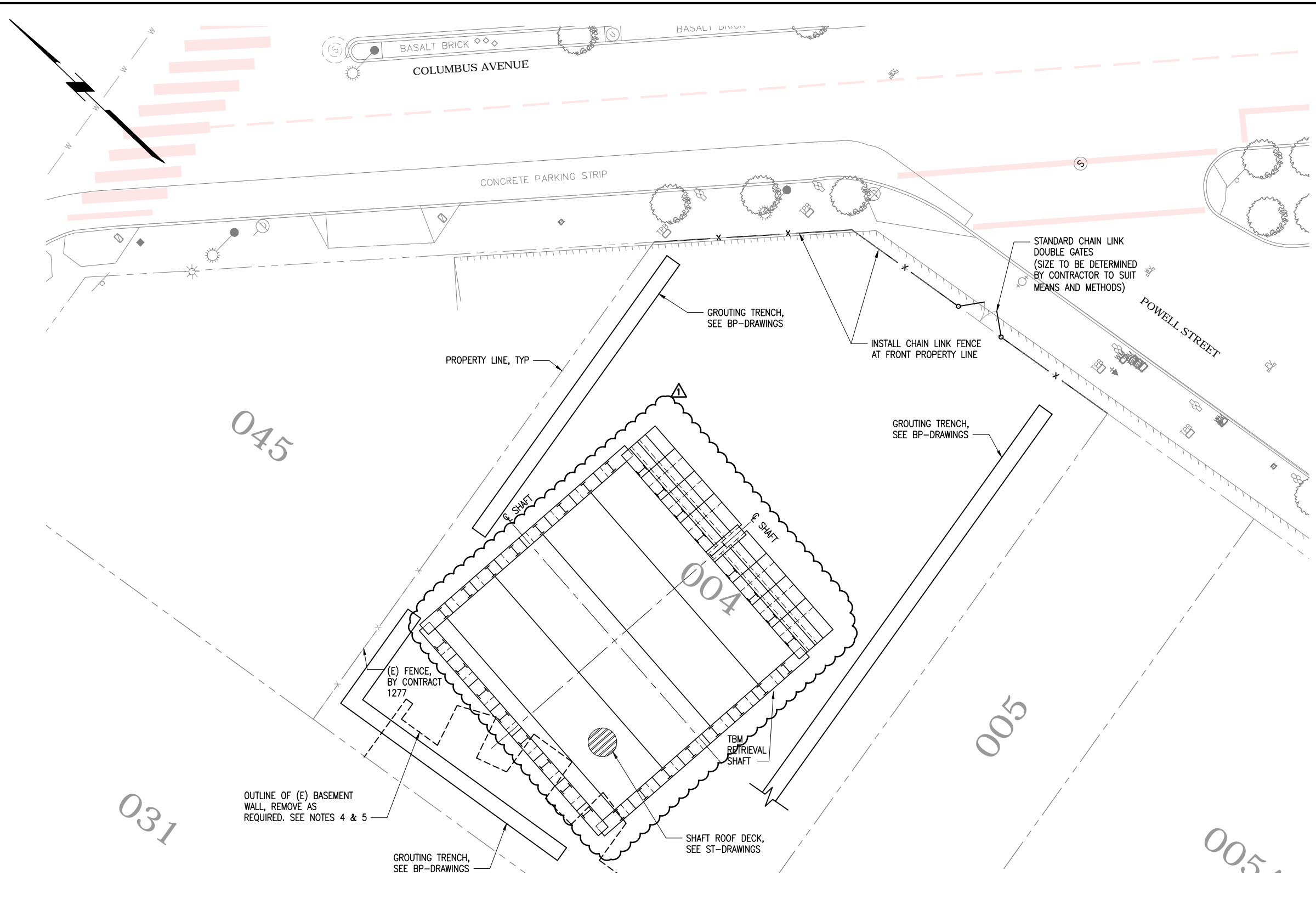
DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT

CIVIL  
SITE PLAN  
SHEET 1 OF 2

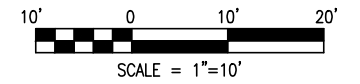
CONTRACT NO. <b>1278</b>	REVISION
SPMTA CONTROL NO. <b>CL-24609</b>	1
DRAWING NO. <b>CV-101</b>	
SHEET NO. <b>3</b>	

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- LEGEND:**
- PROTECT IN PLACE EXISTING FIRE HYDRANT
  - PROTECT IN PLACE EXISTING MUNI POLE
  - PROTECT IN PLACE EXISTING PARKING METER
  - PROTECT IN PLACE EXISTING SS VENT
  - PROTECT IN PLACE EXISTING STREET SIGN
  - PROTECT IN PLACE EXISTING STREET LIGHT
  - PROTECT IN PLACE EXISTING TELEPHONE PULL BOX
  - PROTECT IN PLACE EXISTING TRAFFIC SIGNAL
  - PROTECT IN PLACE EXISTING TREES
  - PROTECT IN PLACE EXISTING UTILITY BOX
  - PROTECT IN PLACE EXISTING WATER METER

- NOTE:**
1. FOR UNDER GROUND UTILITIES, SEE REFERENCE DRAWINGS.
  2. EXISTING FACILITIES ARE SHOWN SCREENED BACK, FOR REFERENCE ONLY.
  3. EXISTING UTILITY INFORMATION IS BASED ON RECORDS RECEIVED FROM UTILITY AGENCIES. THE LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE LOCATIONS. ACTUAL CONDITIONS MAY VARY.
  4. FOR 1731 POWELL ST. BUILDING (BLOCK 0101, LOT 4) DEMOLITION, SEE CN 1277 DOCUMENTS.
  5. FOR (E) BUILDING (BLOCK 0101, LOT 4) INFORMATION, SEE REFERENCE DRAWINGS.



**PLAN**

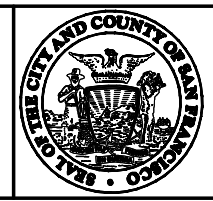
FOR ORIGINAL SIGNATURES, SEE CL-24610, REV. 0

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07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PARSONS BRINCKERHOFF**

DESIGNED: C. SUNTHUDKARN  
 DRAWN: O. KURNOVSKAYA  
 CHECKED: D. ABRAHAMS  
 REVIEWED: A. READ  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**  
 APPROVED  
 DIRECTOR OF TRANSPORTATION

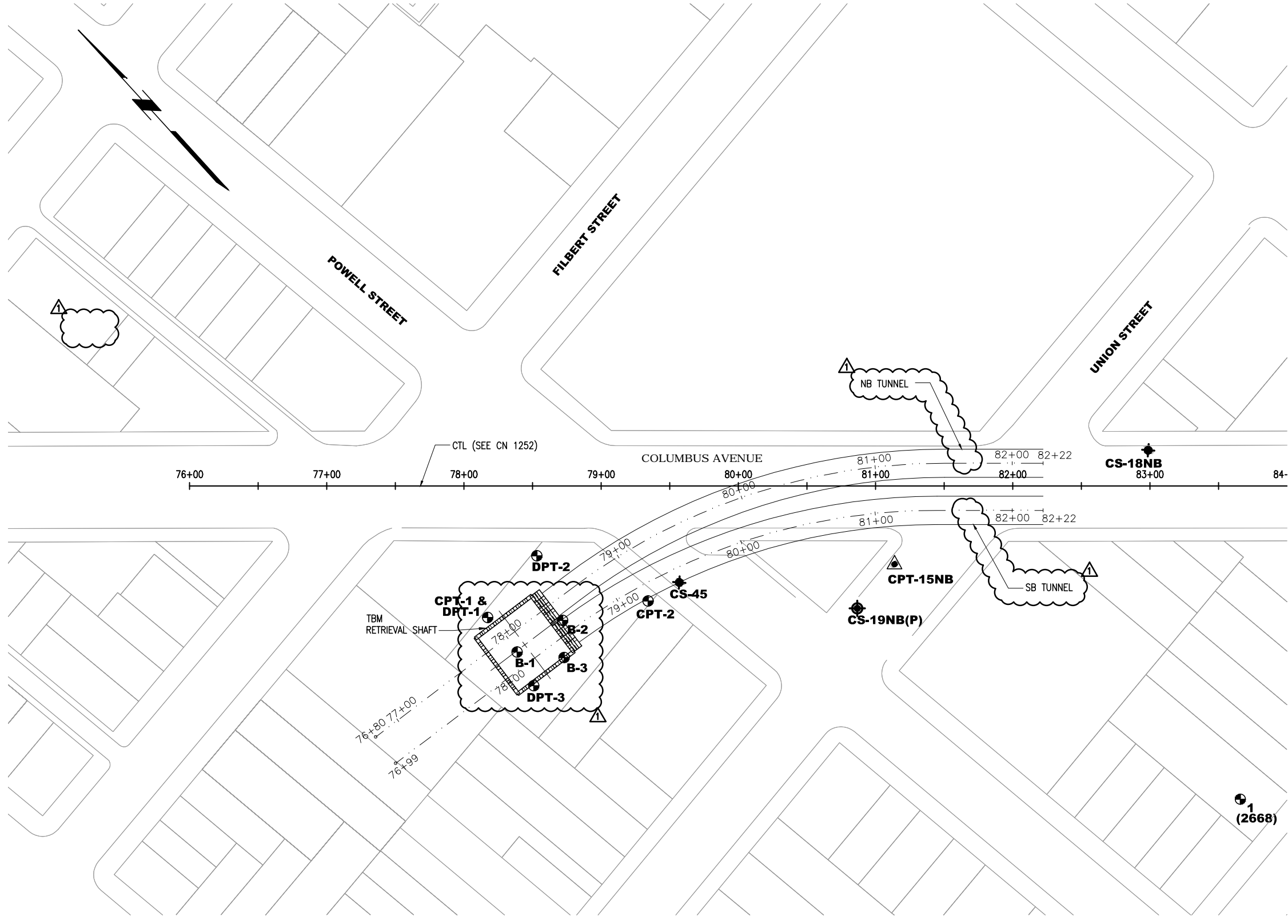
THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

CIVIL  
 SITE PLAN  
 SHEET 2 OF 2

CONTRACT NO. <b>1278</b>	REVISION
SFMTA CONTROL NO. <b>CL-24610</b>	
DRAWING NO. <b>CV-102</b>	1
SHEET NO. <b>4</b>	

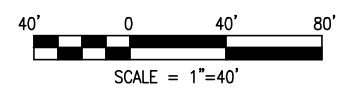
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T:\13285 CS DPI\CN 1278\Sheet Files\GT - Geotechnical\GT-101.dwg Llorico Fri Jul 12,2013 - 11:34 am GT101



- LEGEND**
- BORING FOR CENTRAL SUBWAY
  - ▲ CPT FOR CENTRAL SUBWAY
  - ⊕ PIEZOMETER FOR CENTRAL SUBWAY
  - ⊕ (in cloud) EXISTING BORING, CPT OR TEST PIT BY OTHERS

- NOTES:**
1. BASE MAP DATA PROVIDED BY SFMTA.
  2. SEE EXISTING BORINGS IN REFERENCE DOCUMENT (GEOTECHNICAL INVESTIGATION 1731-1741 POWELL STREET LA CORNETA PLACE, SAN FRANCISCO, CALIFORNIA, DECEMBER 1, 2008, PROJECT NO. 2766.03)
  3. BORINGS/TEST PITS BY OTHERS INCLUDE UNIQUE I.D. (IN PARENTHESES). THESE LOGS ARE CONTAINED IN PROJECT FILES.
  4. ALL BORINGS/PIEZOMETERS/TEST PIT LOCATIONS ARE APPROXIMATE.



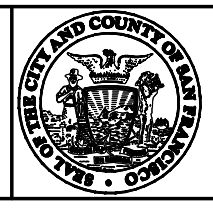
FOR ORIGINAL SIGNATURES, SEE CL-24612, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

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 CHECKED: S. KIM  
 REVIEWED: D. ABRAHAMS  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
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 DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

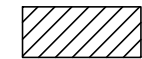

**GEOTECHNICAL  
 EXPLORATION LOCATIONS**

CONTRACT NO.	1278
SFMTA CONTROL NO.	CL-24612
DRAWING NO.	GT-101
SHEET NO.	6
REVISION	1

BORDER REVISED 03/25/2011

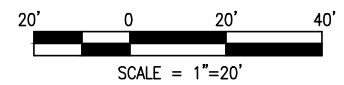
T:\13285 CS DPI\CN 1278\Sheet Files\GT - Geotechnical\GT-131.dwg Llorico Fri Jul 12,2013 - 12:56 pm GT-131

**LEGEND**

-  AREA TO BE DEWATERED WITHIN SHAFT EXCAVATION
-  CS-19NB(P) EXISTING PIEZOMETER

**NOTES:**

1. GROUNDWATER TABLE INSIDE SHAFT EXCAVATION AREA SHALL BE MAINTAINED AT 5 FT. BELOW FINAL BOTTOM OF EXCAVATION UNTIL BASE SLAB OF STRUCTURE REACHES ITS 28-DAY STRENGTH UNLESS OTHERWISE APPROVED BY ENGINEER.
3. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL SUBMIT DETAILS OF DEWATERING PLAN INCLUDING ALL WORKS NECESSARY TO MONITOR WATER LEVELS WITHIN EXCAVATION, CONTROL, HANDLE AND DISPOSE OF GROUNDWATER AND SURFACE WATER, AND WORKS NECESSARY TO REPAIR OR REPLACE PROPERTY DAMAGED DUE TO GROUND WATER DEWATERING.
4. BASELINE DEWATERING SYSTEM CAPACITY IS 100 GPM (GALLONS PER MINUTE)
5. CONTRACTOR SHALL SUBMIT DETAILS OF DEWATERING WELL AND PIEZOMETER PENETRATIONS THROUGH BASE SLAB, AND MEANS OF SEALING/CLOSURE OF WELLS AND BASE SLAB AFTER COMPLETION OF REQUIRED DEWATERING.
6. DEWATERING WORK SHALL CONFORM WITH REQUIREMENTS OF SPECIFICATION SECTION 31 23 19.



FOR ORIGINAL SIGNATURES, SEE CL-24614, REV. 0

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05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED S. KIM
DRAWN O. KURNOVSKAYA
CHECKED K. JOHNSON
REVIEWED D. ABRAHAMS
RECOMMENDED M. FOWLER
APPROVED R. EDWARDS
DATE 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**  
 APPROVED  
 DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT  
**GEOTECHNICAL DEWATERING PLAN**

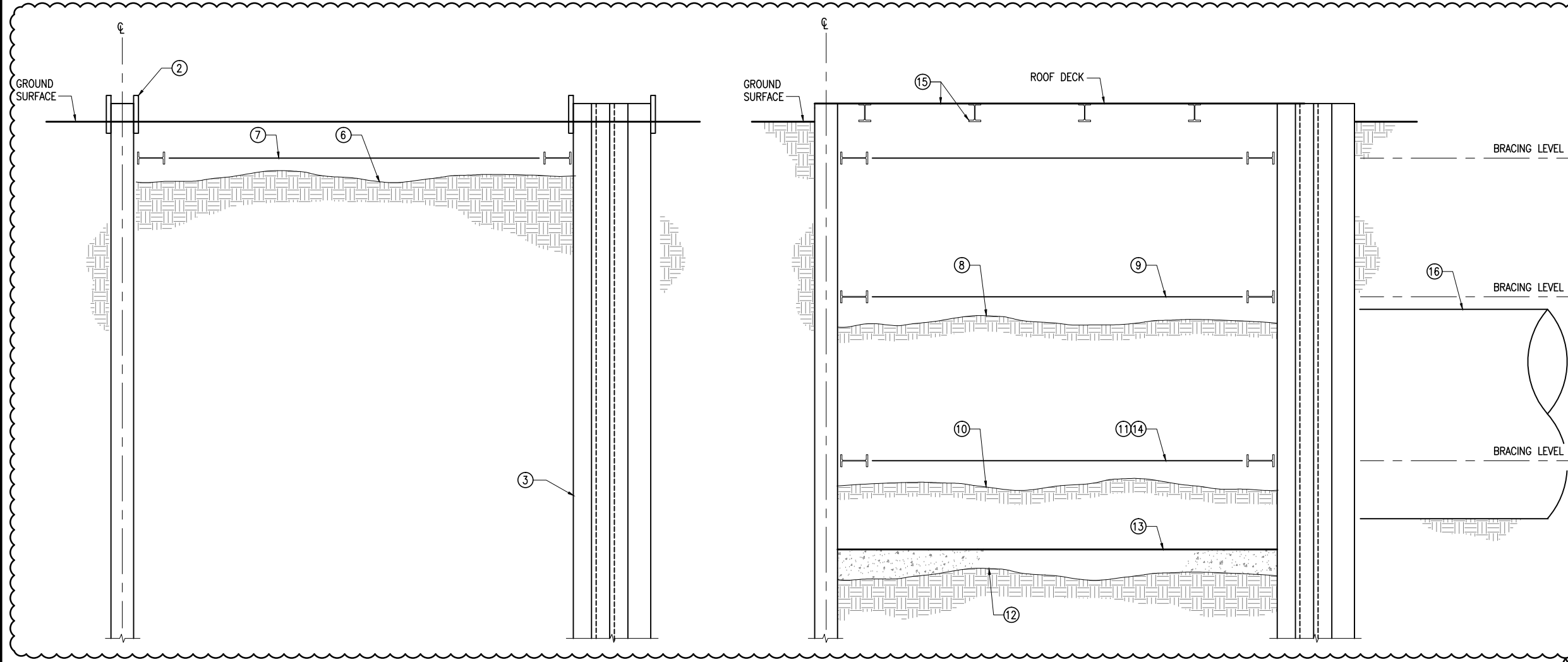
CONTRACT NO. <b>1278</b>
SFMTA CONTROL NO. <b>CL-24614</b>
DRAWING NO. <b>GT-131</b>
SHEET NO. <b>8</b>
REVISION <b>1</b>

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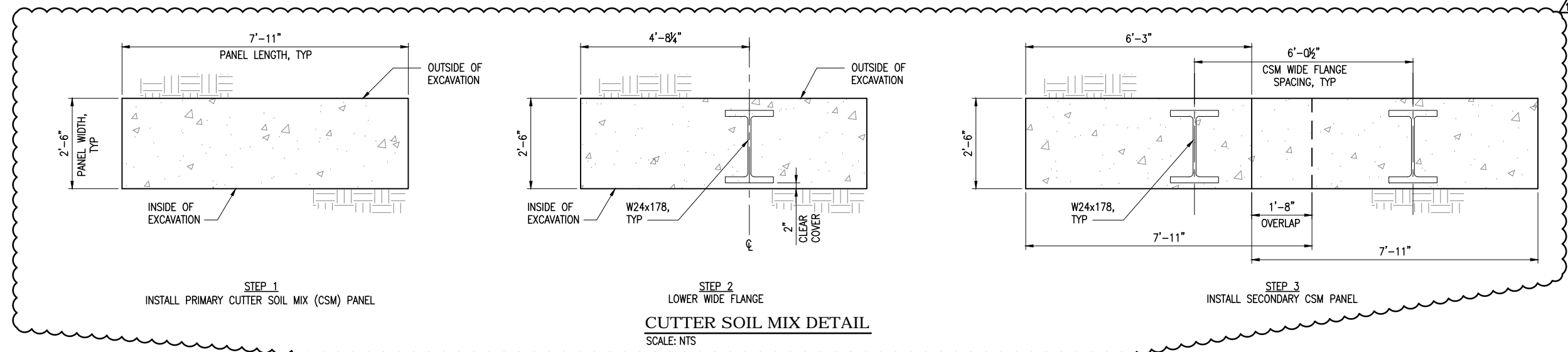
**NOTES:**

1. FOR STRUCTURAL FRAMING SIZES AND DETAILS, SEE ST-DRAWINGS.



- STAGE 1**
- ① INSTALL COMPENSATION GROUTING PIPES, AND INSTRUMENTATION.
  - ② INSTALL GUIDE TRENCH
  - ③ INSTALL CUTTER SOIL MIX PANELS, REPEAT ② AND ③ UNTIL SIDEWALL, BACKWALL & HEADWALL CSM PANEL CONSTRUCTION IS COMPLETE.
  - ④ NOT USED
  - ⑤ START DEWATERING.
  - ⑥ EXCAVATE TO BELOW BRACING LEVEL 1, EXPOSE CSM PANEL STEEL.
  - ⑦ INSTALL BRACING LEVEL 1. JACK STRUTS IN PLACE.
- STAGE 2**
- ⑧ EXCAVATE TO BELOW BRACING LEVEL 2.
  - ⑨ INSTALL BRACING LEVEL 2, JACK STRUT.
  - ⑩ EXCAVATE TO BELOW BRACING LEVEL 3.
  - ⑪ INSTALL BRACING LEVEL 3, JACK STRUTS.
  - ⑫ EXCAVATE TO BOTTOM.
  - ⑬ POUR BASE SLAB.
  - ⑭ REMOVE BRACING LEVEL 3.
  - ⑮ INSTALL ROOF DECK AND RESTORE SITE.
  - ⑯ CN 1252 BORES THROUGH AND EXTRACTS TBM.

**CONSTRUCTION SEQUENCE**  
SCALE: NTS



**CUTTER SOIL MIX DETAIL**  
SCALE: NTS

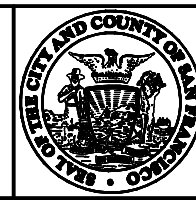
FOR ORIGINAL SIGNATURES, SEE CL-24618, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
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**PB TELAMON**

**PARSONS BRINCKERHOFF**

DESIGNED: D. ABRAHAMS  
 DRAWN: E. LLORICO  
 CHECKED: C. BARRATT  
 REVIEWED: A. READ  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**  
 APPROVED  
 DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

EXCAVATION AND GROUND SUPPORT  
 ASSUMED CONSTRUCTION SEQUENCE

CONTRACT NO.	1278
SFMTA CONTROL NO.	CL-24618
DRAWING NO.	ES-101
SHEET NO.	12
REVISION	1

BORDER REVISED 03/25/2011

# GENERAL NOTES

## CODES AND STANDARDS

AMERICAN CONCRETE INSTITUTE, ACI 318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, 2011

CALIFORNIA BUILDING CODE, CBC TITLE 24, 2011

AMERICAN INSTITUTE OF STEEL (AISC) SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, 2010

AMERICAN WELDING SOCIETY (AWS) D1.1 STRUCTURAL WELDING CODE - STEEL, 2010

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

AMERICAN SOCIETY OF CIVIL ENGINEERS, (ASCE) MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, 2010

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS, 2013

## REINFORCED CONCRETE

MINIMUM 28-DAY STRENGTH OF CONCRETE SHALL BE AS FOLLOWS:

MUD SLAB:  $f'c = 2,000$  PSI

BASE SLAB:  $f'c = 4,000$  PSI

REINFORCING STEEL (ASTM A706):  $f_y = 60,000$  PSI

NON-SHRINK GROUT (ASTM 1107)  $f'c = 6,000$  PSI

CUTTER SOIL MIX  $f'c = 350$  PSI

## GENERAL

CONTRACT 1278, TEMPORARY TBM RETRIEVAL SHAFT, IS TO BE CONSTRUCTED BELOW GROUND SURFACE AT 1731 POWELL STREET (BLOCK 0101, LOT 004) FOR THE FUTURE EXTRACTION OF THE CONTRACT 1252 TUNNEL BORING MACHINE AS PART OF PHASE 2 OF THE THIRD STREET LIGHT RAIL PROGRAM. THE SHAFT IS APPROXIMATELY 50 FEET LONG, 50 FEET WIDE, AND 50 FEET DEEP.

THE CONSTRUCTION METHOD ASSUMED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS IS CUTTER SOIL MIX PANEL (CSM) CONSTRUCTION AS GROUND SUPPORT REINFORCED WITH WIDE FLANGE SECTIONS WITH STEEL WALE AND DIAGONAL STRUTS FOR CROSS LOT BRACING. ONCE THE EXCAVATION HAS BEEN COMPLETED AND THE BASE SLAB HAS REACHED THE REQUIRED STRENGTH, THE THIRD LEVEL OF BRACING WILL BE REMOVED AND THE ROOF DECK SYSTEM WILL BE INSTALLED. THE ASSUMED CONSTRUCTION SEQUENCE IS SHOWN ON THE EXCAVATION AND GROUND SUPPORT (ES) DRAWINGS.

PRIOR TO EXCAVATION, A BUILDING AND UTILITY MONITORING SYSTEM SHALL BE INSTALLED TO MONITOR THE MOVEMENT OF THE SURROUNDING SOIL, STRUCTURES AND UTILITIES RESULTING FROM THE SHAFT CONSTRUCTION. IN ADDITION, COMPENSATION GROUTING TUBE A MACHETTES SHALL BE DRILLED FROM GROUND SURFACE TO MITIGATE EXCESSIVE MOVEMENT DUE TO SHAFT CONSTRUCTION. GROUT WILL BE PUMPED INTO THE GROUND IF MOVEMENTS OBSERVED BY THE INSTRUMENTATION EXCEED A SPECIFIED THRESHOLD. THE INSTRUMENTATION INSTALLATION SCHEDULE AND LIMITS OF COMPENSATION GROUTING ARE SHOWN ON THE BUILDING PROTECTION (BP) DRAWINGS. GROUTING TUBES AND INSTRUMENTATION SHALL BE CLEANED AND HANDED OVER TO THE SFMTA UPON COMPLETION OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO GROUTING RECORDS AND INSTRUMENTATION DATA.

THE BRACING SYSTEM SHALL BE CONSTRUCTED OF STEEL WIDE FLANGE WALE, PIPE STRUTS, PLATES AND BEAMS TO SUPPORT AND BRACE THE GROUND SUPPORT SYSTEM. DURING EXCAVATION THE STRUTS SHALL BE JACKED IN PLACE PER THE LOADS DESCRIBED IN THE DRAWINGS. UPON COMPLETION OF THE EXCAVATION, THE BASE SLAB CONNECTIONS SHALL BE EITHER WELDED TO THE WIDE FLANGE PILES OR DOWELED INTO THE HEADWALL AND THE REINFORCED CONCRETE BASE SLAB SHALL BE PLACED. THE CSM PANELS, FRAMING AND BASE SLAB DETAILS ARE SHOWN ON THE STRUCTURAL (ST) DRAWINGS.

THE CONTRACTOR SHALL CAREFULLY REVIEW THE DRAWINGS, TO IDENTIFY THE EXTENT OF THE SCOPE OF WORK, VISIT THE SITE TO RELATE THE SCOPE OF WORK TO THE EXISTING CONDITIONS AND DETERMINE THE EXTENT TO WHICH THOSE CONDITIONS AND PHYSICAL SURROUNDINGS WILL IMPACT THE WORK. LOT BOUNDARIES ARE APPROXIMATE AND DO NOT REFLECT THE ACTUAL OR LEGAL POSITION OF ANY EXISTING STRUCTURE OR FIXTURE SHOWN. BUILDING LINES, WHERE SHOWN, DO NOT SHOW ALL BUILDING INFORMATION SUCH AS CANOPIES, OVERHANG PROJECTIONS OR ACCESS.

THE CONTRACTOR SHALL SUBMIT FINAL AS-BUILT OR RECORD DRAWINGS PER SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO GUIDETRENCHES AND CSM PANELS.

DEMOLISH GUIDETRENCHES AS REQUIRED BY THE CONTRACT DOCUMENTS.

CONNECTIONS SHALL BE DESIGNED FOR GRADUAL UNLOADING OF STRUTS PRIOR TO THEIR REMOVAL. ALL COMPRESSION CONNECTIONS, IN ADDITION TO BEING DESIGNED FOR THEIR COMPRESSIVE LOADS, SHALL BE DESIGNED FOR TENSION AND SHEAR EQUAL TO A MINIMUM OF 10% OF THE COMPRESSIVE LOAD, UNLESS ACTUAL TENSION AND SHEAR ARE GREATER.

FOR ORIGINAL SIGNATURES, SEE CL-24620, REV. 0

## DESIGN BASIS

ROOF  
LIVE LOAD:  
HYDROSTATIC PRESSURE:  
(WATER TABLE AT SURFACE LEVEL)  
SOIL:  
CONSTRUCTION:  
EQ:

30 PSF OF 300 LB CONCENTRATED LOAD (ROOF IS PROVIDED FOR TEMPORARY WEATHER PROTECTION AND FALL PROTECTION ONLY)

SEE SHORING CRITERIA ES-DRAWINGS

## CONSTRUCTION AREA

WORK AREA SHALL BE FENCED AND BARRICADED FROM PUBLIC ACCESS. CONSTRUCTION AREA TRAFFIC RESTRICTIONS SHALL CONFORM TO SPECIFICATION. SEE DIV. 1 SPECIFICATIONS.

## STRUCTURAL STEEL FRAMING

IN ADDITION TO THE CONTRACT DRAWINGS AND SPECIFICATIONS, THE FOLLOWING REQUIREMENTS RELATE TO THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR THIS CONTRACT:

1. THE BASIC CODE FOR DESIGN AND FABRICATION OF STRUCTURAL STEEL IS THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", AMERICAN INSTITUTE OF STEEL CONSTRUCTION, APRIL 14, 2010. UNDER SECTION 3. "DESIGN DRAWINGS AND SPECIFICATION, ARTICLE 3.1.2.", THE OPTION SPECIFIED FOR THIS CONTRACT IS: (OPTION 3) IN THE STRUCTURAL DESIGN DRAWINGS OR SPECIFICATIONS, THE CONNECTIONS SHALL BE DESIGNATED TO BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER WORKING FOR THE CONTRACTOR'S FABRICATOR. IN ADDITION, THE PROFESSIONAL ENGINEER SHALL BE LICENSED IN THE STATE OF CALIFORNIA.

THE DESIGN CRITERIA FOR CONNECTION LOAD TABLES PROVIDED BY THE CONTRACT DRAWINGS IS LOAD AND RESISTANCE FACTOR DESIGN (LRFD). LOAD TABLES ARE PROVIDED FOR SHEAR CONNECTIONS, MOMENT CONNECTIONS, AND BRACING CONNECTIONS. THE CONNECTIONS SHOWN ON THE DRAWINGS THAT HAVE BEEN PROVIDED WITH LOAD TABLES SHALL BE CONSIDERED SCHEMATIC FOR ONE OF THE ABOVE THREE TYPICAL CONNECTION TYPES.

SHOP AND ERECTION DRAWINGS SHALL BE ACCOMPANIED BY FINAL SUBSTANTIATING CONNECTION INFORMATION IN THE FORM OF CALCULATIONS FOR ALL OPTION 3 CONNECTIONS AND A LETTER STATING THAT THE SHOP AND ERECTION DRAWINGS INCORPORATE OPTION 3 DESIGN REQUIREMENTS. THE CONNECTION DESIGN INFORMATION ON THE SHOP AND ERECTIONS DRAWINGS SHALL BE SIGNED AND SEALED BY THE LICENSED PROFESSIONAL ENGINEER IN RESPONSIBLE CHARGE OF THE CONNECTION DESIGNS. PROVIDE CROSS REFERENCING INFORMATION ON THE DRAWINGS TO DESIGN INFORMATION FOR THE PURPOSE OF SFMTA REVIEW.

2. FIELD CONNECTIONS SHALL BE BOLTED OR WELDED USING FILLET ONLY WELDS UNLESS OTHERWISE ALLOWED BY THE SFMTA'S ENGINEER OF RECORD.
3. MOMENT CONNECTIONS BETWEEN TWO END TO END BEAMS OR COLUMNS SHALL BE FULL STRENGTH MOMENT AND SHEAR CONNECTIONS DESIGNED FOR THE STRENGTH OF THE SMALLER SECTION;
4. WIDE FLANGE SHAPES PLATE  
PIPE STRUTS AND PILES  
HIGH STRENGTH BOLTS  
ANCHOR BOLTS  
ANCHORS  
STEEL DECKING  
THREADED RODS  
FORGED HARDWARE  
ANGLES




ASTM A992, GRADE 50 AS INDICATED;  
ASTM A572, GRADE 50, WHERE INDICATED, OR ASTM A36, TYPICAL UNLESS NOTED OTHERWISE;  
API 5L GRADE X50 AS INDICATED OR EQUIVALENT;  
ASTM A325 OR ASTM A490;  
ASTM F1554, GRADE 36 UNLESS NOTED OTHERWISE  
MIN. TENSILE STRENGTH=60 KSI;  
ASTM A653, SS GRADE 40;  
ASTM A307, GRADE A;  
ASTM A1035, CARBON STEEL  
ASTM A36

STEEL WORK SHALL CONFORM TO ALL REQUIREMENTS OF AISC, CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, LATEST EDITION.

## PAGODA PALACE DEMOLITION

PRIOR TO CN 1278, CN 1277 WILL BE THE DEMOLITION OF THE PAGODA PALACE BUILDING AT 1731-1741 POWELL ST. IN SAN FRANCISCO, CA. DEMOLITION INCLUDES REMOVAL OF ALL ABOVE GRADE WALLS AND ROOF, INTERIOR FINISHES, MECHANICAL, ELECTRICAL AND PLUMBING. SEE REFERENCE DOCUMENTS.

# LEGEND

& L @ # C OR MC @ @ = > < < < W W	AND ANGLE SECTION AT BAR SIZE CHANNEL SECTION CONTROL POINT DIAMETER EQUAL TO GREATER THAN GREATER THAN OR EQUAL TO LESS THAN LESS THAN OR EQUAL TO PERCENTAGE WORK POINT WIDE FLANGE SECTION GROUND WATER TABLE	 CONCRETE IN SECTION	 GROUND LINE	 STEEL IN SECTION
--	---	---	---	--

# ABBREVIATIONS

ADD'L	ADDITIONAL	LB.	POUND
BOT.	BOTTOM	LIN.	LINEAR
		LF	LINEAR FEET
C/L	CENTERLINE	MAX.	MAXIMUM
C.I.P.	CAST IN PLACE	MIN.	MINIMUM
CJ	CONSTRUCTION JOINT		
CLR.	CLEAR	NIC	NOT IN CONTRACT
CONC.	CONCRETE	PCF	POUNDS PER CUBIC FOOT
CONN.	CONNECTION	PL	PLATE
CONT.	CONTINUOUS	PROJ.	PROJECT
CSM	CUTTER SOIL MIX	PSF	POUNDS PER SQUARE FOOT
		PSI	POUNDS PER SQUARE INCH
DIAG.	DIAGONAL	REINF.	REINFORCING
Ø	DIAMETER		
DIA.	DIAMETER	SECT	SECTION
DN	DOWN	SPA.	SPACES
DWG	DRAWING	SPECS.	SPECIFICATIONS
		SIM.	SIMILAR
EA	EACH	STA.	STATION
EL.	ELEVATION	STD	STANDARD
EQ	EQUAL		
		T&B	TOP AND BOTTOM
FIN	FINISH	T.O.C.	TOP OF CONCRETE
FT	FEET	TYP	TYPICAL
FTG	FOOTING		
		UON	UNLESS OTHERWISE NOTED
GFRP	GLASS FIBER REINFORCED POLYMER		
HORIZ.	HORIZONTAL	VERT.	VERTICAL
		VF	VERIFY IN FIELD
IN.	INCH		

T:\13285 CS DP1\CN 1278\Sheet Files\ST - Structural\ST-001.dwg Fusco Wed Jul 10,2013 - 12:51 pm ST-001

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED D. ABRAHAMS
DRAWN E. LLORICO
CHECKED D. YAVORSKY
REVIEWED A. READ
RECOMMENDED M. FOWLER
APPROVED R. EDWARDS
DATE 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT

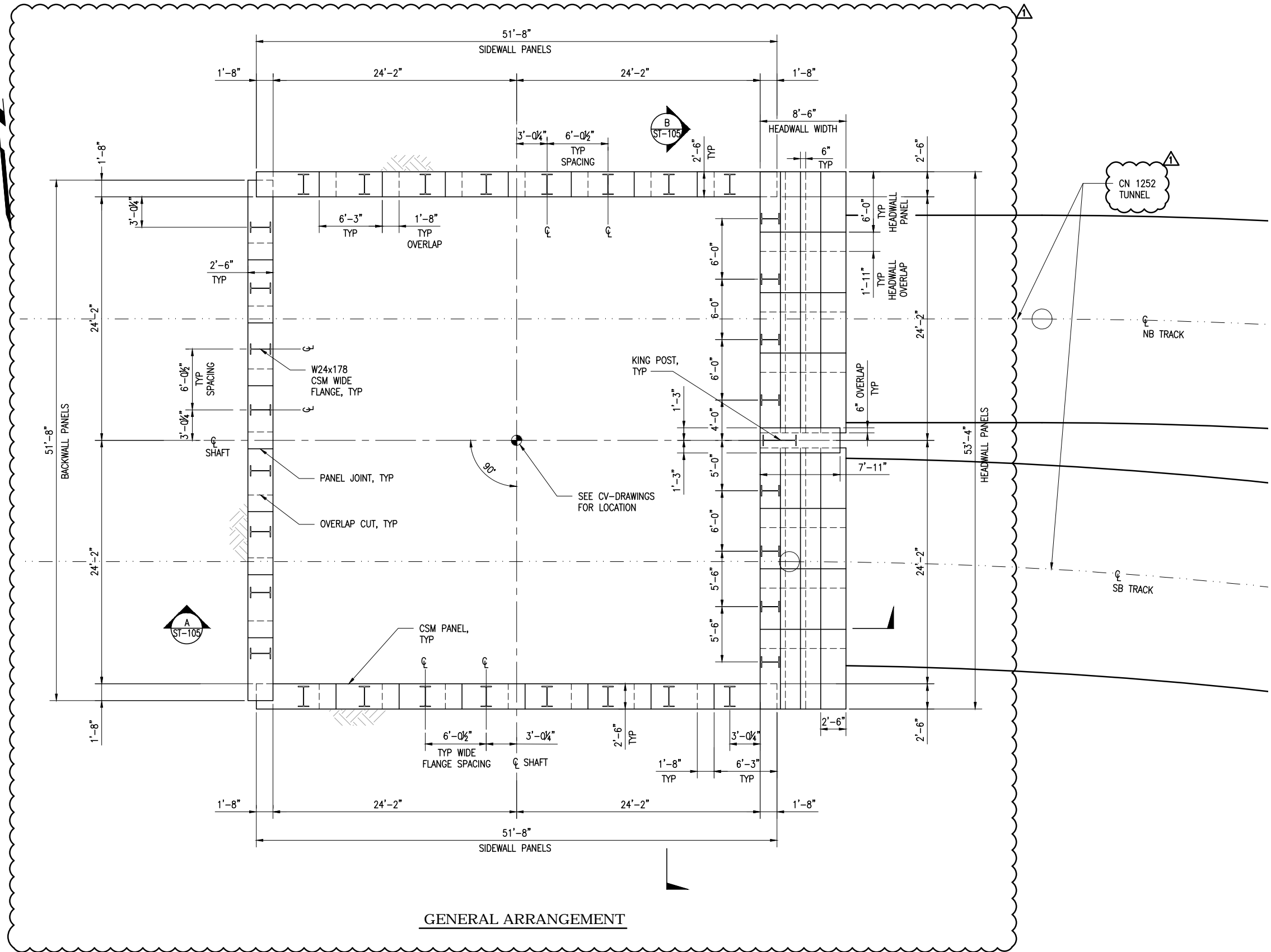
STRUCTURAL  
GENERAL NOTES

CONTRACT NO. <b>1278</b>
SFMTA CONTROL NO. <b>CL-24620</b>
DRAWING NO. <b>ST-001</b>
SHEET NO. <b>14</b>
REVISION <b>1</b>

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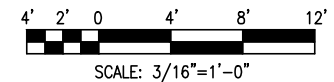
**NOTES:**

1. FOR GENERAL STRUCTURAL NOTES SEE DRAWING ST-001.
2. NOT USED
3. FOR TYPICAL PANEL DETAIL SEE ES-DRAWINGS



**GENERAL ARRANGEMENT**

FOR ORIGINAL SIGNATURES, SEE CL-24621, REV. 0



DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

DESIGNED  
D. ABRAHAMS

DRAWN  
O. KURNOVSKAYA

CHECKED  
C. BARRATT

REVIEWED  
A. READ

RECOMMENDED  
M. FOWLER

APPROVED  
R. EDWARDS

DATE  
05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT

**STRUCTURAL  
GENERAL PLAN**

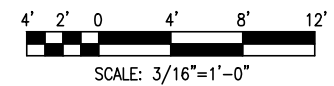
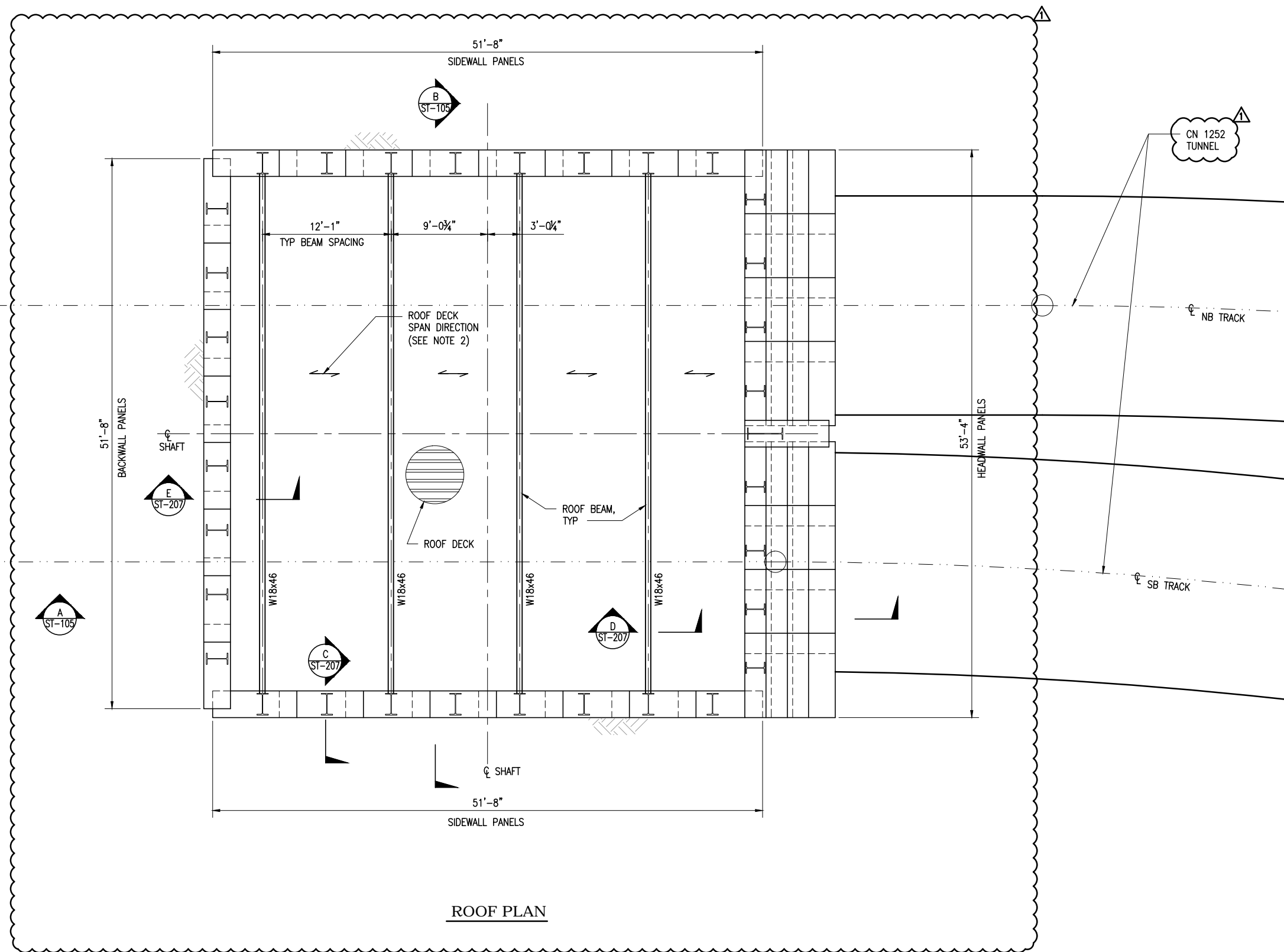
CONTRACT NO. <b>1278</b>	
SFMTA CONTROL NO. <b>CL-24621</b>	
DRAWING NO. <b>ST-101</b>	REVISION
SHEET NO. <b>15</b>	<b>1</b>

BORDER REVISED 03/25/2011



**NOTES:**

1. FOR GENERAL STRUCTURAL NOTES SEE DRAWING ST-001.
2. ROOF DECK
  - A. PROFILE: 3" DEEP RIB DECK
  - B. DECK TYPE: 20 GAGE
  - C. DECK FINISH: G90 GALVANIZED
  - D.  $F_y = 40$  KSI



**ROOF PLAN**

FOR ORIGINAL SIGNATURES, SEE CL-24622, REV. 0

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DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED D. ABRAHAMS
DRAWN O. KURNOVSKAYA
CHECKED C. BARRATT
REVIEWED A. READ
RECOMMENDED M. FOWLER
APPROVED R. EDWARDS
DATE 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

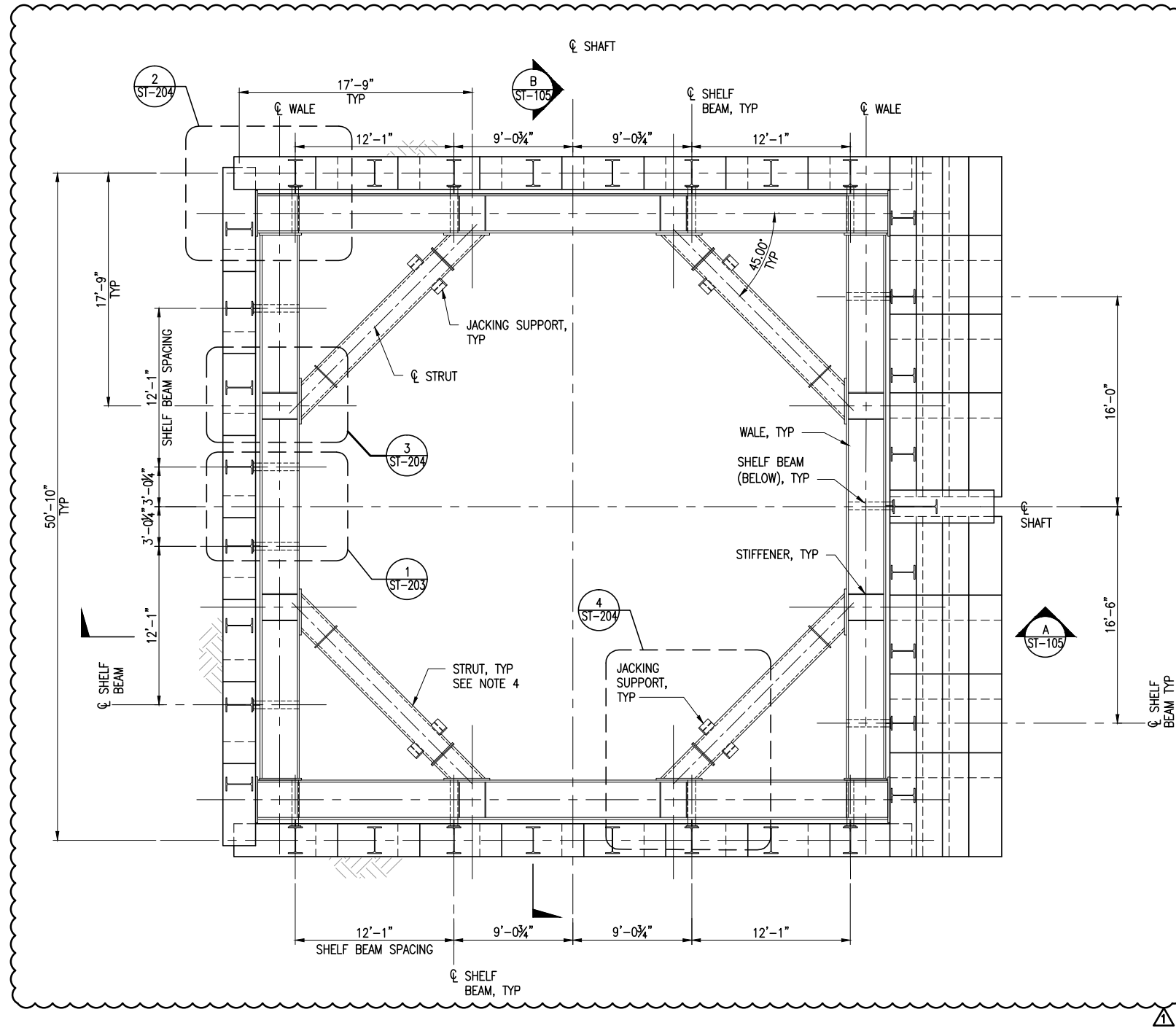
THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT

**STRUCTURAL  
ROOF PLAN**

CONTRACT NO. <b>1278</b>
SFMTA CONTROL NO. <b>CL-24622</b>
DRAWING NO. <b>ST-102</b>
SHEET NO. <b>16</b>
REVISION <b>1</b>

BORDER REVISED 03/25/2011

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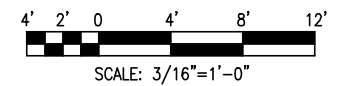


**BRACING LEVEL 1, 2 & 3**  
**PLAN**

JACKING LOAD PER STRUT	
LEVEL	LOAD (K)
LEVEL 1	400
LEVEL 2	1000
LEVEL 3	1400

**NOTES:**

- FOR GENERAL STRUCTURAL NOTES SEE DRAWING ST-001.
- FOR STRUT AND WALE PROPERTIES SEE DRAWING ST-203.
- BRACING LEVEL 3 TO BE REMOVED WHEN BASE SLAB HAS REACHED 28 DAY STRENGTH.
- INSTALL AND MONITOR GROUPINGS (TRIPLETS OR MORE) OF STRAIN GAGES AT EACH STRUT IN ACCORDANCE WITH SPECIFICATION SECTION 31 09 13 GEOTECHNICAL INSTRUMENTATION AND MONITORING.
- CN 1252 TUNNELS NOT SHOWN FOR CLARITY.
- PRE-LOAD STRUTS BY JACKING AGAINST THE STEEL WALES.
  - INSTALL LATERAL BRACING ELEMENTS REQUIRED PRIOR TO JACKING.
  - USE PROCEDURES THAT PRODUCE UNIFORM LOADING ON STRUTS WITHOUT INDUCING APPRECIABLE ECCENTRICITIES OR OVERSTRESSING AND DISTORTION.
  - MAKE PROVISIONS FOR PERMANENTLY FIXING EACH MEMBER WITH STEEL SHIMS OR WEDGES WELDED IN PLACE, OR WELDED KNIFE PLATES.
- CONTRACTOR SHALL SUBMIT SIGNED AND SEALED JACKING SYSTEM FOR APPROVAL TO THE RESIDENT ENGINEER. RESIDENT ENGINEER SHALL BE ON SITE DURING JACKING TO MONITOR MOVEMENT.



FOR ORIGINAL SIGNATURES, SEE CL-24623, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

DESIGNED  
D. ABRAHAMS

DRAWN  
O. KURNOVSKAYA

CHECKED  
C. BARRATT

REVIEWED  
A. READ

RECOMMENDED  
M. FOWLER

APPROVED  
R. EDWARDS

DATE  
05/31/2013

CITY AND COUNTY OF SAN FRANCISCO

**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM

PHASE 2 - CENTRAL SUBWAY

TEMPORARY TBM RETRIEVAL SHAFT

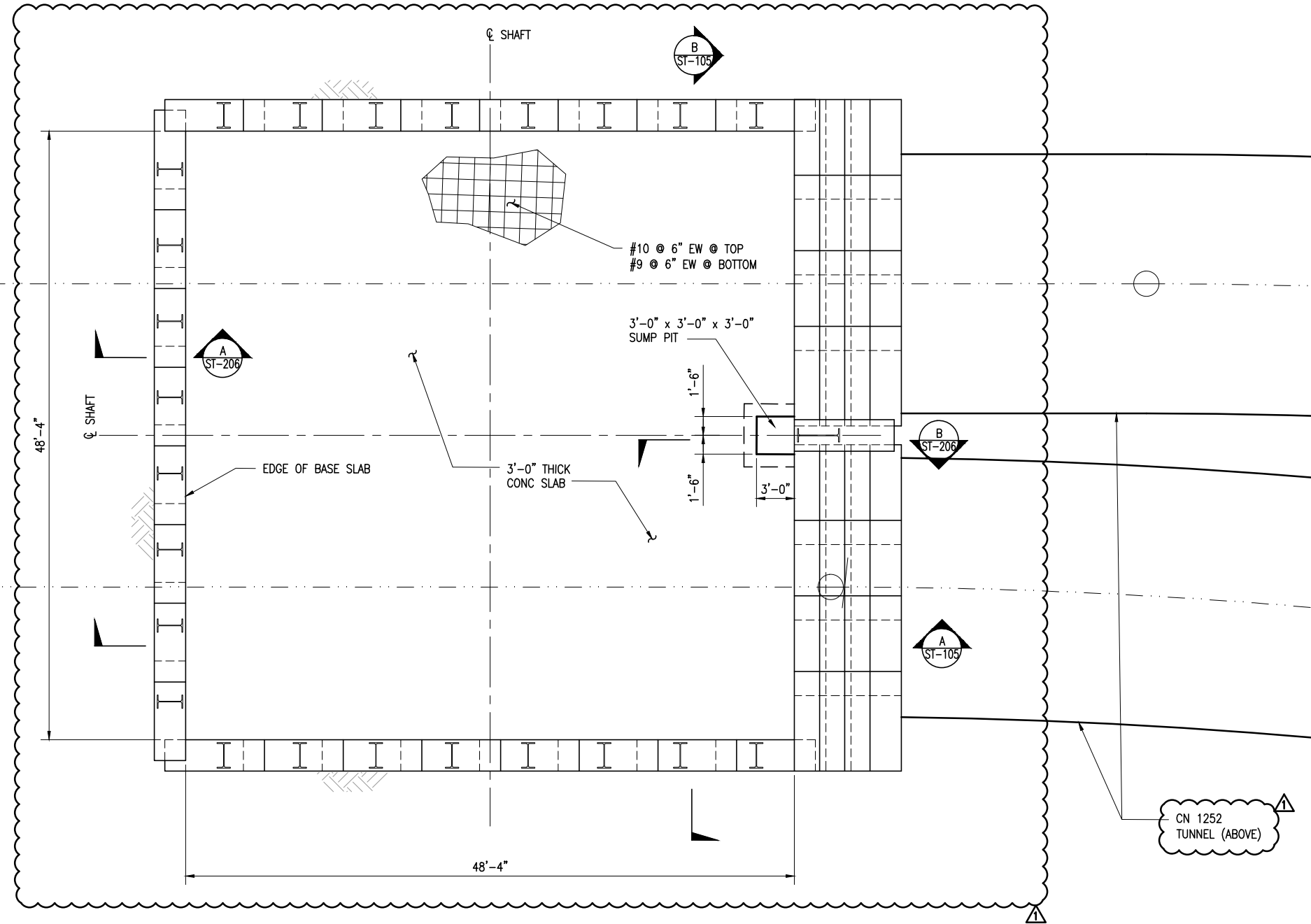
**STRUCTURAL**

**BRACING LEVEL 1, 2 & 3**

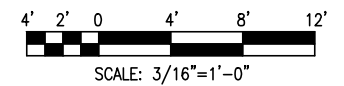
CONTRACT NO. <b>1278</b>	
SFMTA CONTROL NO. <b>CL-24623</b>	
DRAWING NO. <b>ST-103</b>	REVISION
SHEET NO. <b>17</b>	<b>1</b>

**NOTES:**

- FOR GENERAL STRUCTURAL NOTES SEE DRAWING ST-001.



**PLAN**



FOR ORIGINAL SIGNATURES, SEE CL-24624, REV. 0

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DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED D. ABRAHAMS
DRAWN O. KURNOVSKAYA
CHECKED C. BARRATT
REVIEWED A. READ
RECOMMENDED M. FOWLER
APPROVED R. EDWARDS
DATE 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

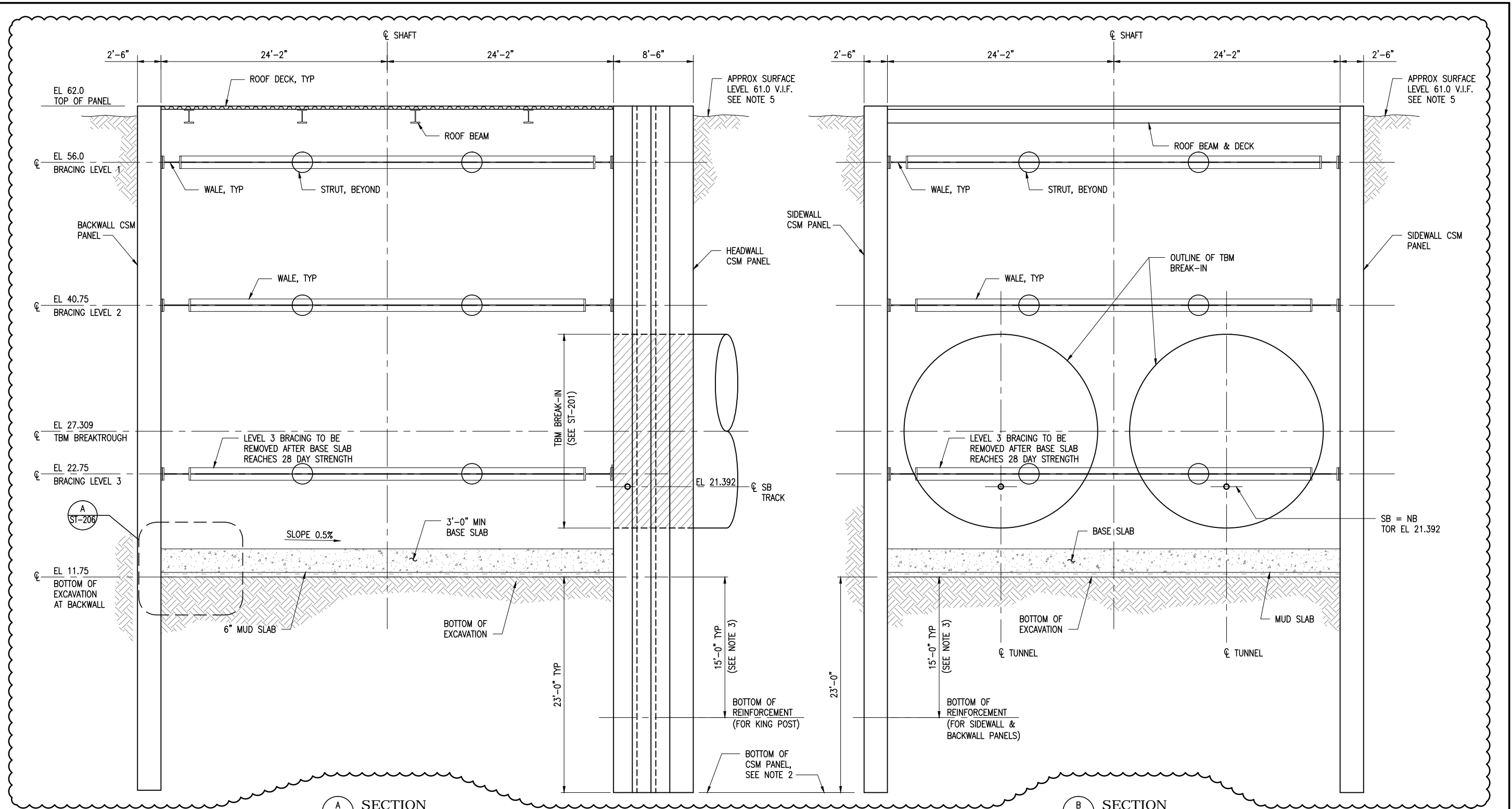
THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT

**STRUCTURAL  
BASE SLAB PLAN**

CONTRACT NO. <b>1278</b>
SFMTA CONTROL NO. <b>CL-24624</b>
DRAWING NO. <b>ST-104</b>
SHEET NO. <b>18</b>
REVISION <b>1</b>

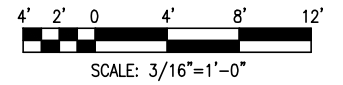
BORDER REVISED 03/25/2011

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**NOTES:**

- FOR GENERAL STRUCTURAL NOTES SEE DRAWING ST-001.
- IF KJF BEDROCK IS ENCOUNTERED, CSM PANELS SHALL SOCKET INTO ROCK, SEE ES-013.
- CSM PANEL REINFORCEMENT SHALL EXTEND A
- MIN. 15'-0" BELOW BOTTOM OF EXCAVATION IF ROCK IS ENCOUNTERED ABOVE 15'-0" BELOW BOTTOM OF EXCAVATION, SEE NOTE 2. FOR EXTENTS OF REINFORCEMENT @ TBM BREAK-IN, SEE ST-201.
- GROUND SURFACE APPROXIMATED BY USING SURVEYED CURB LINES AND SITE VISIT. CONTRACTOR SHALL SUBMIT GROUND SURFACE CONTOUR OF 1731 POWELL STREET TO ENGINEER FOR APPROVAL PRIOR TO ANY CSM INSTALLATION



FOR ORIGINAL SIGNATURES, SEE CL-24623, REV. 0

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05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED: D. ABRAHAMS  
 DRAWN: E. LLORICO  
 CHECKED: C. BARRATT  
 REVIEWED: A. READ  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013

CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

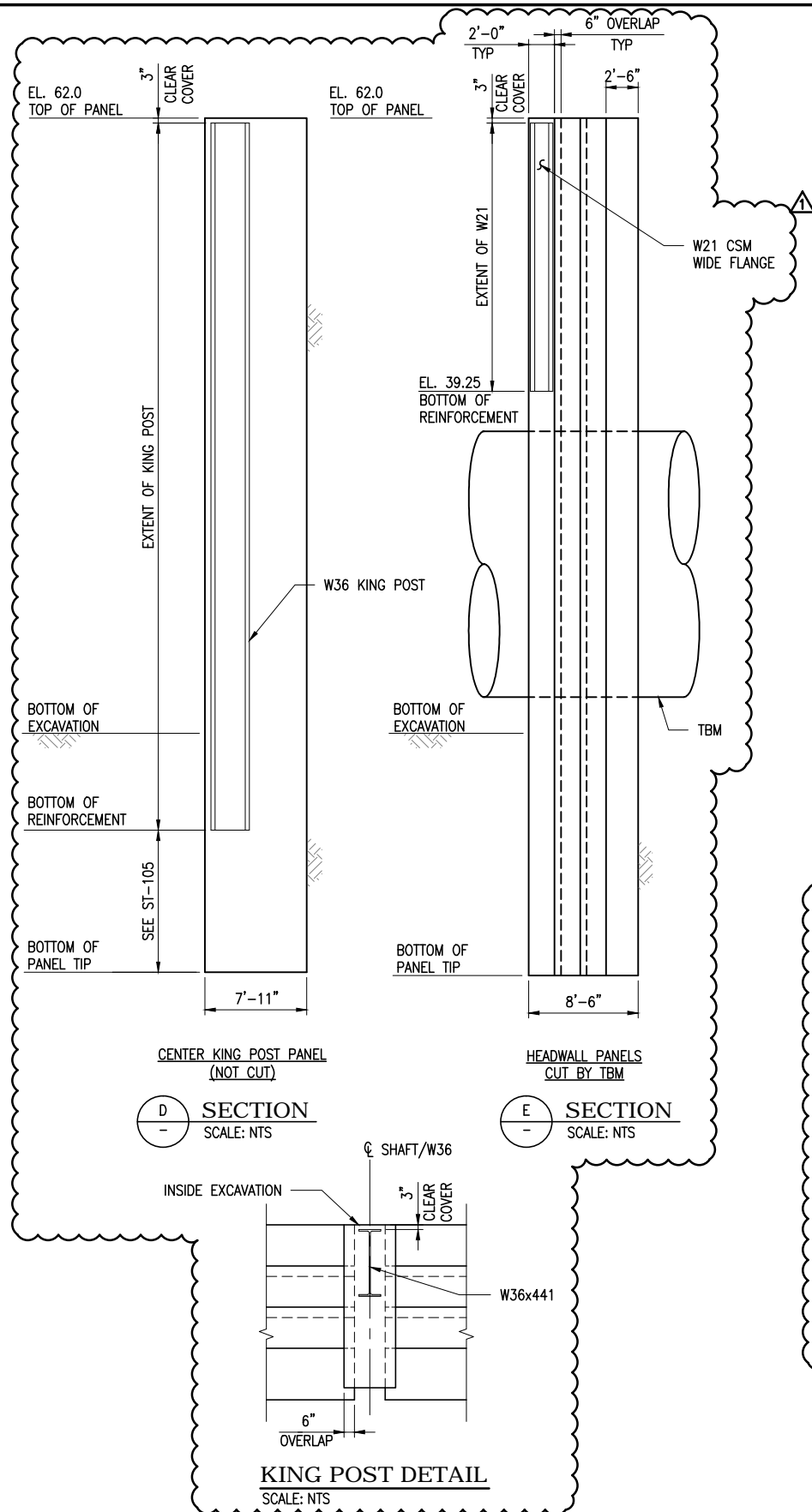
DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

**STRUCTURAL SECTIONS**

CONTRACT NO.	1278
SFMTA CONTROL NO.	CL-24625
DRAWING NO.	ST-105
SHEET NO.	19
REVISION	1

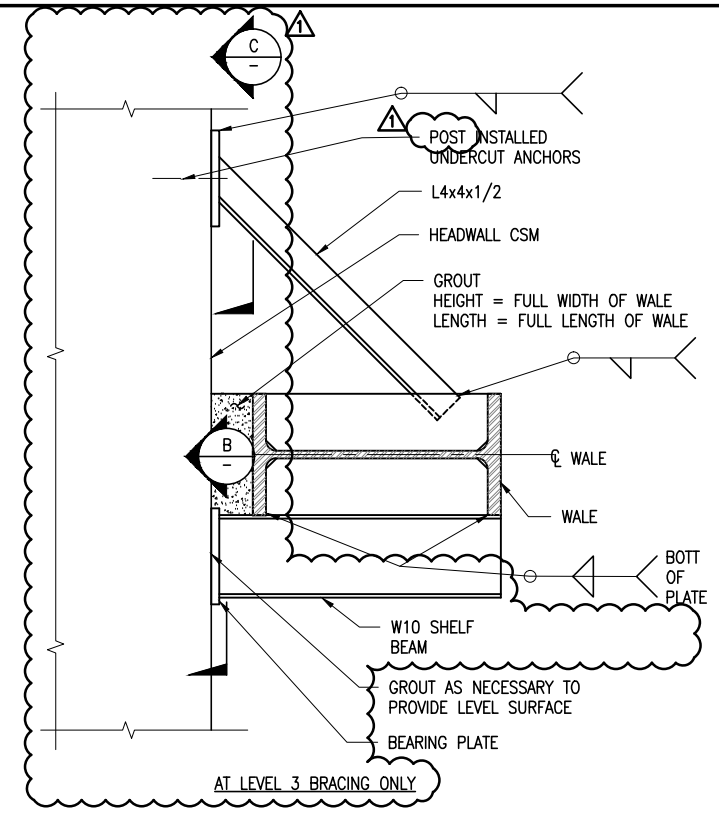
T:\13285 CS DP1\CN 1278\Sheet Files\ST - Structural\ST-201.dwg Fusco Tue Jul 16, 2013 - 1:37 pm ST-201



**D SECTION**  
SCALE: NTS

**E SECTION**  
SCALE: NTS

**KING POST DETAIL**  
SCALE: NTS

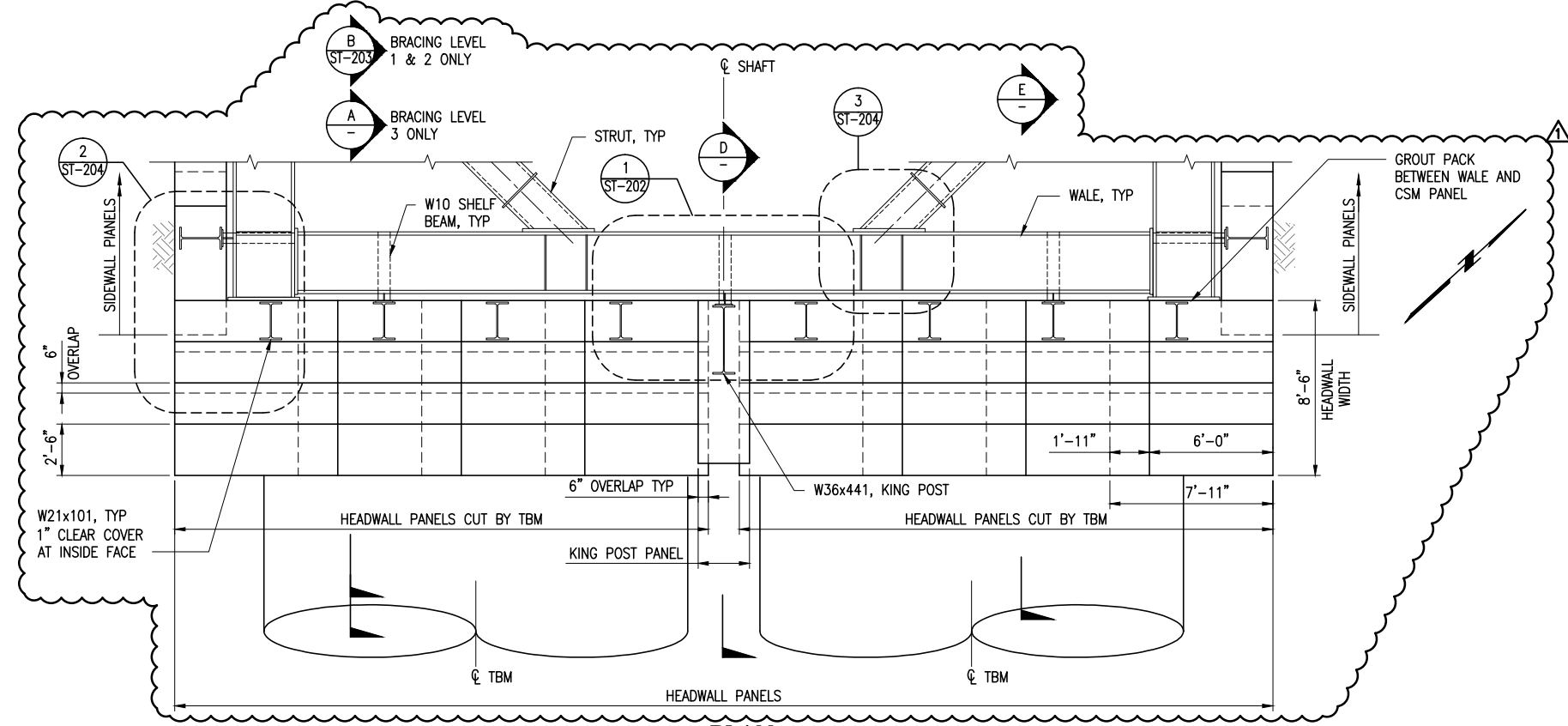


**A SECTION**  
SCALE: 1" = 1'-0"

**B SECTION**  
SCALE: NTS

**C SECTION**  
SCALE: NTS

**NOTES:**  
1. FOR GENERAL STRUCTURAL NOTES, SEE DRAWING ST-001.



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

FOR ORIGINAL SIGNATURES, SEE CL-24626, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PARSONS BRINCKERHOFF**

DESIGNED: D. ABRAHAMS  
 DRAWN: O. KURNOVSKAYA  
 CHECKED: C. BARRATT  
 REVIEWED: A. READ  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013

CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

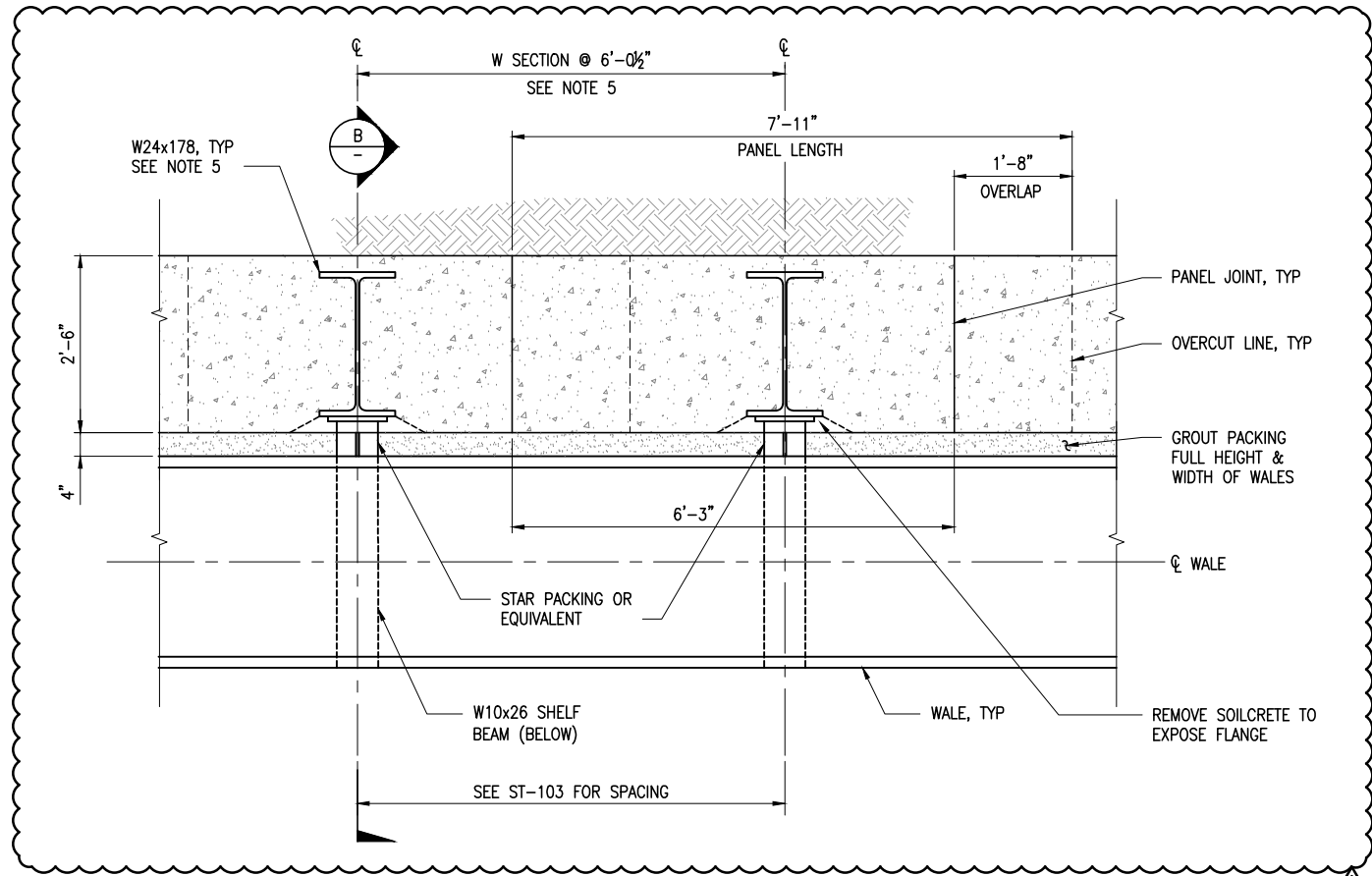
DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

**STRUCTURAL HEADWALL REINFORCEMENT DETAILS**  
 SHEET 1 OF 1

CONTRACT NO.	1278
SMFTA CONTROL NO.	CL-24626
DRAWING NO.	ST-201
SHEET NO.	20
REVISION	1

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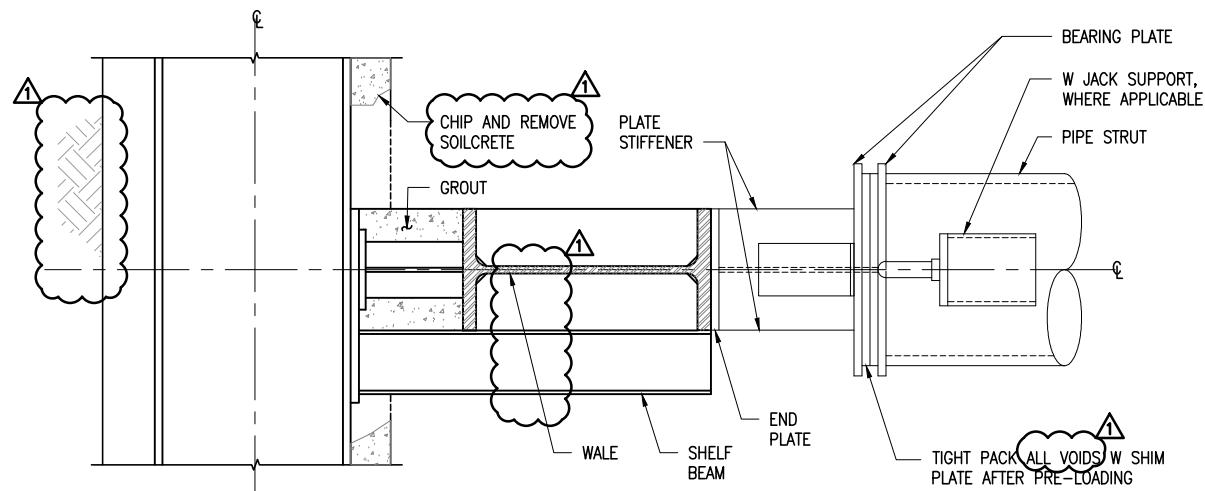
**1** DETAIL  
ST-103 SCALE: 3/4"=1'-0"  
(WALE LATERAL SUPPORT OMITTED FOR CLARITY)

WALE SCHEDULE	
LEVEL	SIZE
LEVEL 1	W24x131
LEVEL 2	W36x302
LEVEL 3	W36x302

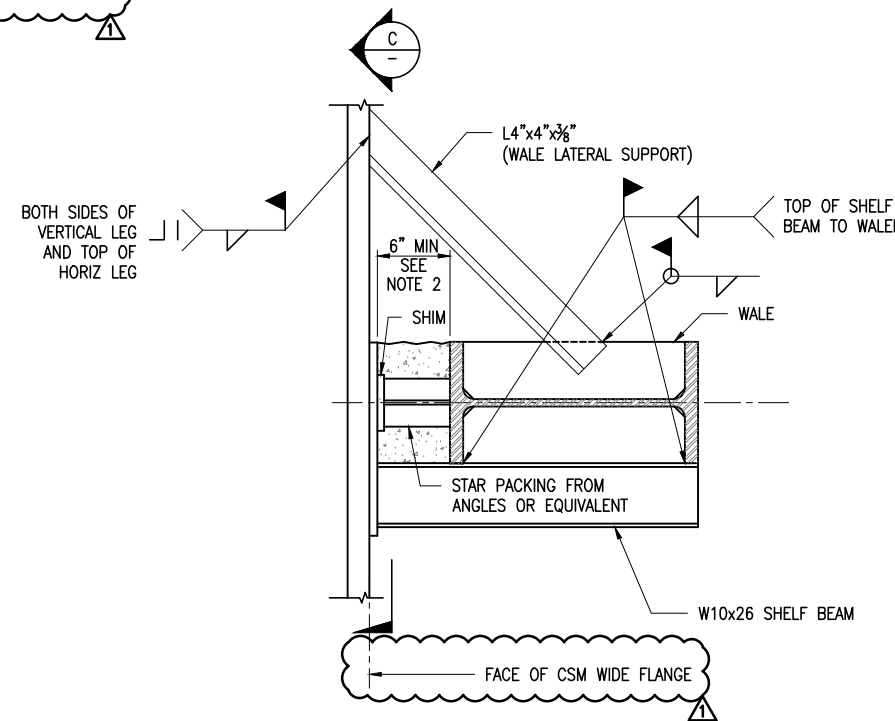
STRUT SCHEDULE	
LEVEL	SIZE
LEVEL 1	24"Ø x 3/4" PIPE
LEVEL 2	36"Ø x 1 1/2" PIPE
LEVEL 3	36"Ø x 1 1/2" PIPE

**NOTES:**

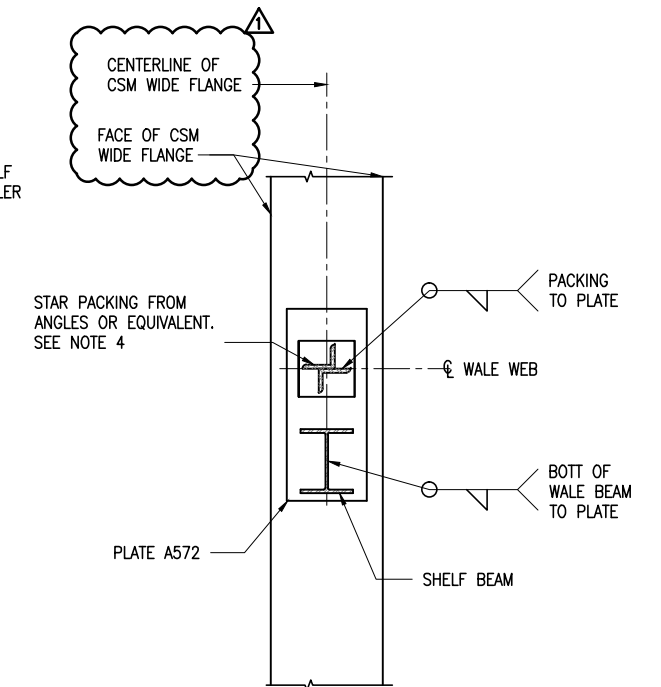
- FOR GENERAL STRUCTURAL NOTES, SEE DRAWING ST-001.
- MINIMUM STAR PACKING OR EQUIVALENT LENGTH SHALL BE BASED ON WORST CASE INWARD PILE INSTALLATION.
- CONNECTION DETAILS SHOWN FOR SUGGESTED CONCEPTUAL DESIGN ONLY. CONNECTIONS SHALL BE DESIGNED BY FABRICATOR'S ENGINEER BASED ON LOADS PROVIDED.
- STAR PACKING OR EQUIVALENT SHALL BE AT SHELF BEAM LOCATIONS AS SHOWN ON ST-103.
- WIDE FLANGE REINFORCEMENT SIZE AND SPACING IS FOR SIDEWALL AND BACKWALL PILES. FOR HEADWALL REINFORCEMENT SEE ST-201.



**A** SECTION  
ST-204 NTS



**B** SECTION  
NTS



**C** SECTION  
NTS

FOR ORIGINAL SIGNATURES, SEE CL-24628, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**  
**PARSONS BRINCKERHOFF**

DESIGNED D. ABRAHAMS
DRAWN O. KURNOVSKAYA
CHECKED C. BARRATT
REVIEWED A. READ
RECOMMENDED M. FOWLER
APPROVED R. EDWARDS
DATE 05/31/2013

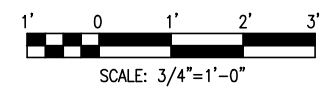
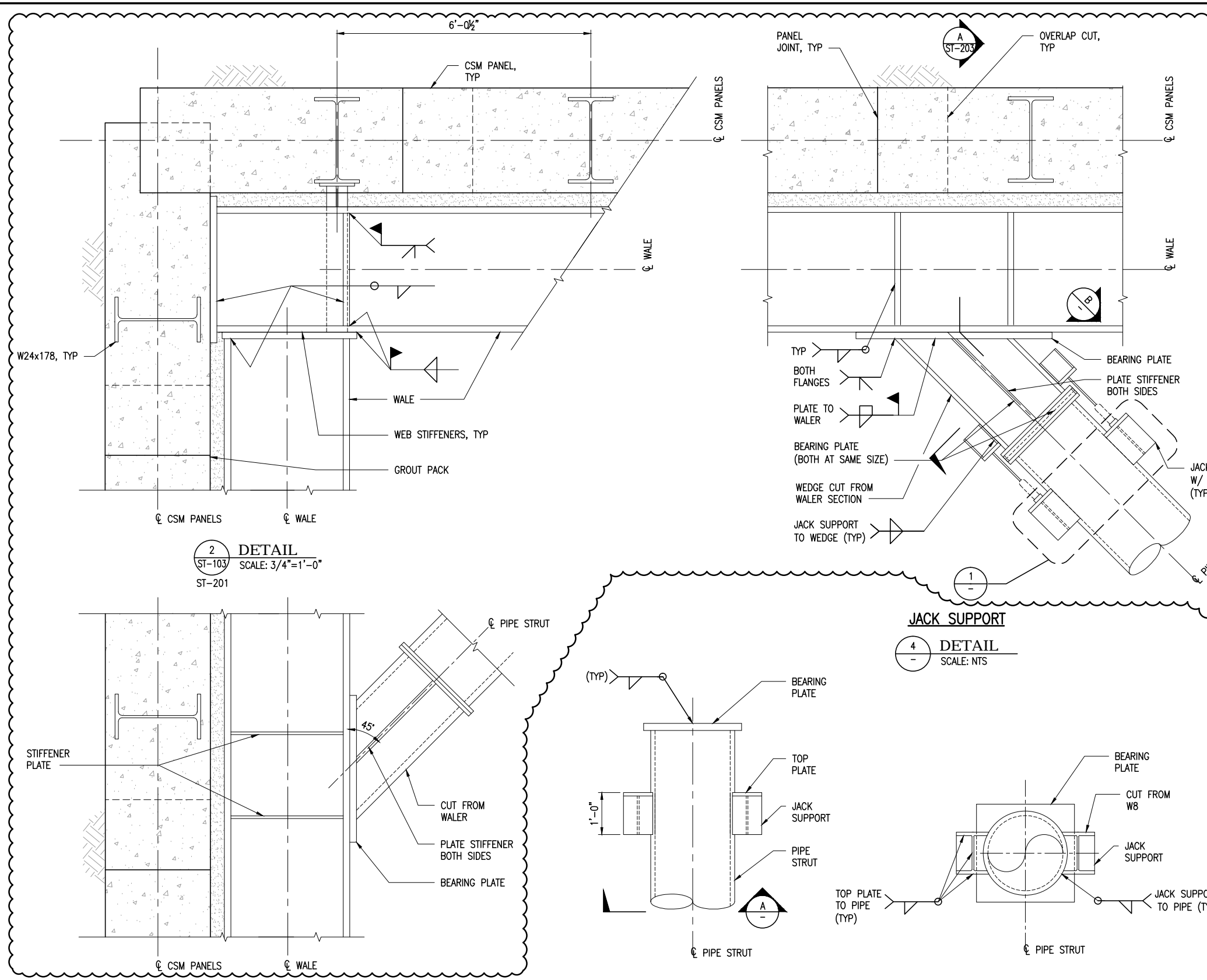


CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**  
APPROVED  
DIRECTOR OF TRANSPORTATION

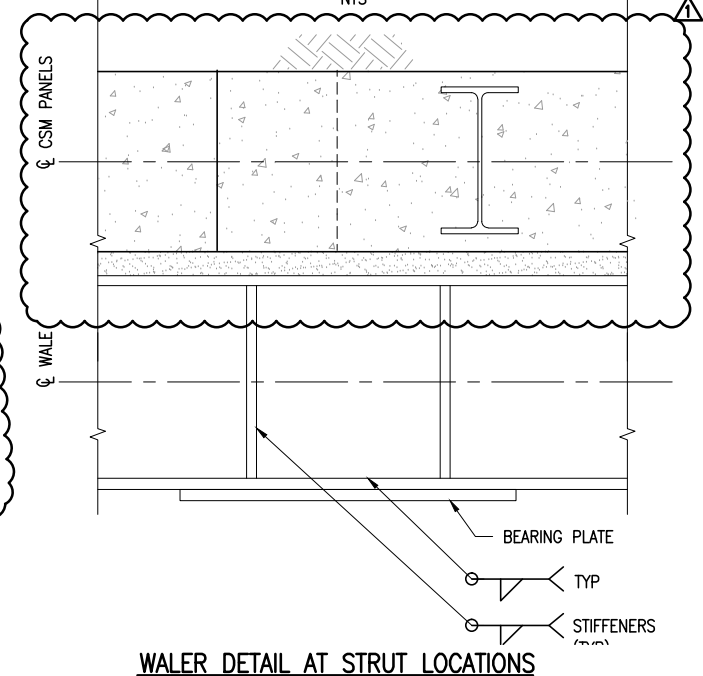
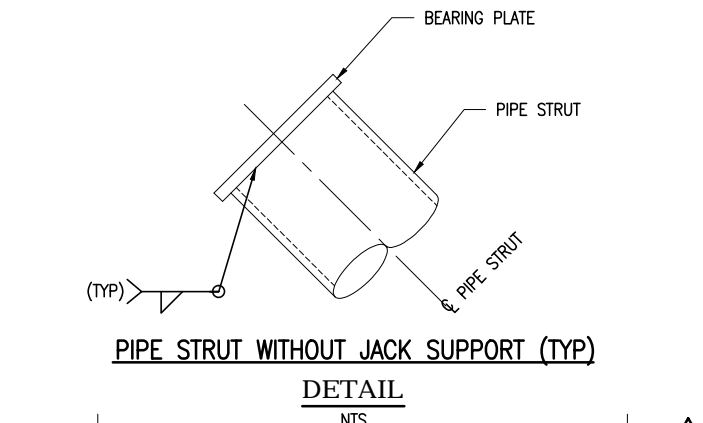
THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT  
**STRUCTURAL STEEL FRAMING DETAILS**  
SHEET 1 OF 2

CONTRACT NO. <b>1278</b>
SPMTA CONTROL NO. <b>CL-24628</b>
DRAWING NO. <b>ST-203</b>
SHEET NO. <b>22</b>
REVISION <b>1</b>

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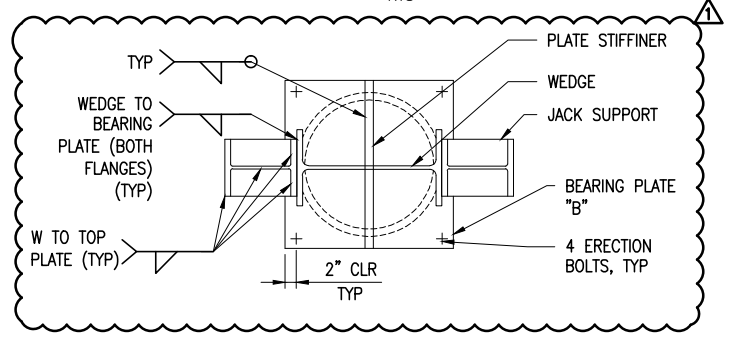
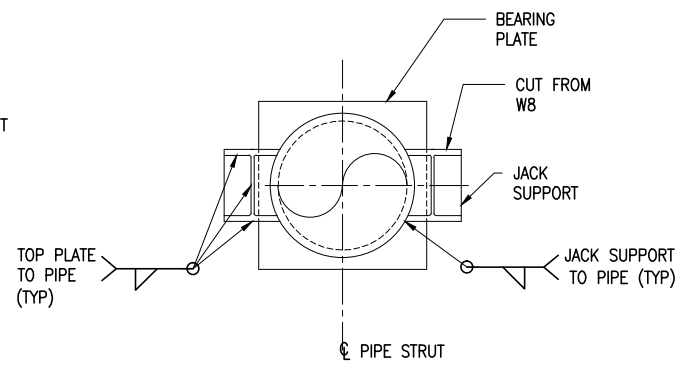
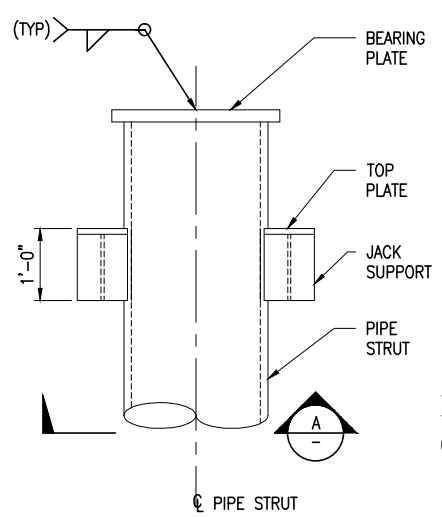


**NOTES:**  
 1. FOR GENERAL STRUCTURAL NOTES, SEE DRAWING ST-001.



**2 DETAIL**  
 ST-103 SCALE: 3/4"=1'-0"  
 ST-201

**JACK SUPPORT**  
**4 DETAIL**  
 SCALE: NTS



**NO JACKING SUPPORT**

**3 DETAIL**  
 ST-103 SCALE: 3/4"=1'-0"

**1 DETAIL**  
 SCALE: NTS

**A ELEVATION**  
 SCALE: NTS

**B SECTION**  
 SCALE: NTS

FOR ORIGINAL SIGNATURES, SEE CL-24629, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED: D. ABRAHAMS  
 DRAWN: O. KURNOVSKAYA  
 CHECKED: C. BARRATT  
 REVIEWED: M. FOWLER  
 RECOMMENDED: A. READ  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013

CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

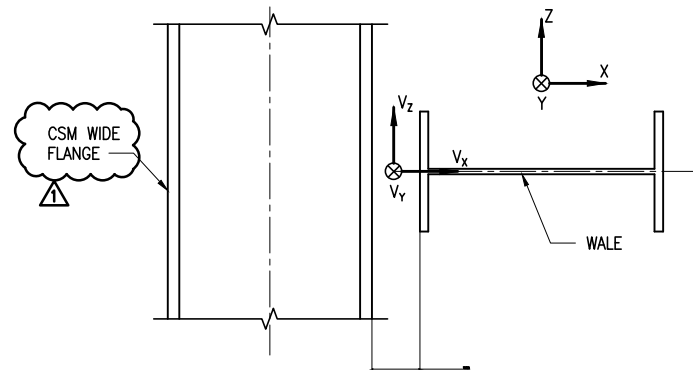
THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

**STRUCTURAL STEEL FRAMING DETAILS**  
 SHEET 2 OF 2

CONTRACT NO.	1278
SFMTA CONTROL NO.	CL-24629
DRAWING NO.	ST-204
SHEET NO.	23
REVISION	1

BORDER REVISED 03/25/2011

T:\13285 CS DP1\CN 1278\Sheet Files\ST - Structural\ST-205.dwg Fusco Wed Jul 10, 2013 9:45 am ST-205

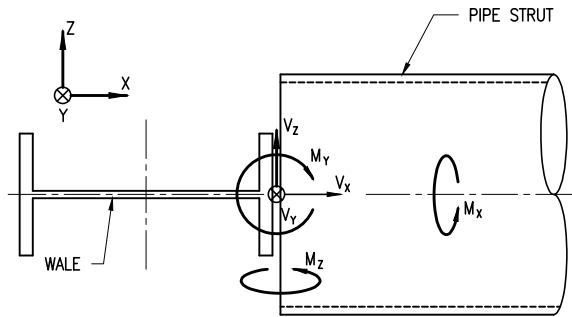


**CONNECTION TYPE A**

NTS

INCLUDES MIRRORRED CONFIGURATION ALONG SHAFT  $\phi$

CSM - TO - WALE

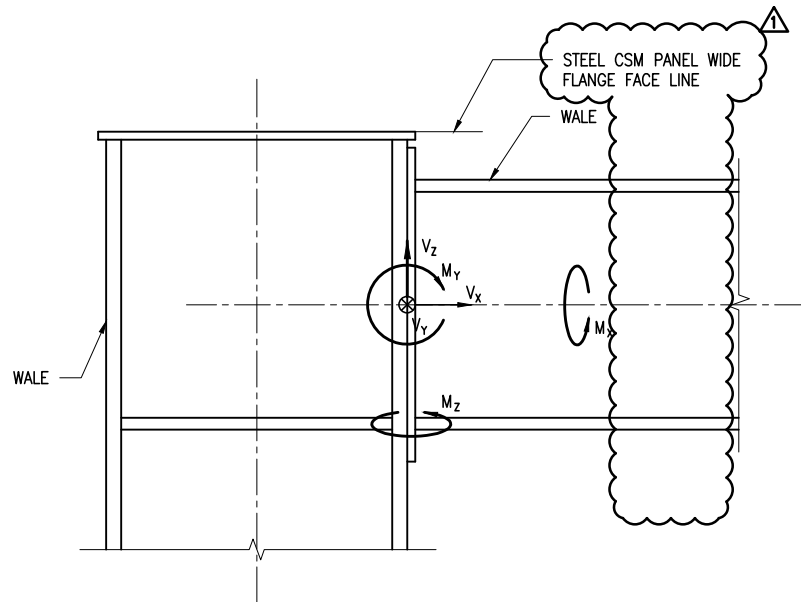


**CONNECTION TYPE B**

NTS

INCLUDES MIRRORRED CONFIGURATION ALONG SHAFT  $\phi$

WALE - TO - STRUT



**CONNECTION TYPE C**

NTS

WALE - TO - WALE CONNECTION

**NOTES:**

- FOR GENERAL STRUCTURAL NOTES, SEE DRAWING ST-001.
- GLOBAL +Y COORDINATE IS DEFINED ALONG STATION  $\phi$  AND IN UPPER STATIONING DIRECTION; GLOBAL +Z COORDINATE IS DEFINED IN THE UPWARD VERTICAL DIRECTION; AND GLOBAL +X COORDINATE IS DEFINED IN SHAFT TRANSVERSE DIRECTION BY RIGHT-HAND RULE.
- THE LETTER "M" IN THE TABLE ALSO DESIGNATES TORSION AND THE LETTER "V" ALSO DESIGNATES AXIAL LOAD.
- CONNECTIONS SHALL BE DESIGNED BY FABRICATOR'S ENGINEER BASED ON PROVIDED CONNECTION LOAD TABLE. CONNECTIONS SHALL ALSO BE CHECKED WITH EXCAVATION AND GROUND SUPPORT SHORING LOADS PROVIDED IN DESIGN CRITERIA IN ES DRAWINGS.
- THE BASIC CODE FOR DESIGN AND FABRICATION OF STRUCTURAL STEEL IS THE CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, AMERICAN INSTITUTE OF STEEL CONSTRUCTION, APRIL 14, 2010, UNDER SECTION 3, DESIGN DRAWINGS AND SPECIFICATION, ARTICLE 3.1.2, THE OPTION SPECIFIED FOR THIS CONTRACT IS: (3) IN THE STRUCTURAL DESIGN DRAWINGS OR SPECIFICATIONS, THE CONNECTION SHALL BE DESIGNATED TO BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER WORKING FOR THE FABRICATOR.
- FIELD CONNECTIONS SHALL BE BOLTED OR WELDED USING FILLET WELDS ONLY UNLESS OTHERWISE ALLOWED BY THE ENGINEER.
- MOMENT CONNECTIONS BETWEEN BEAMS AND COLUMNS WILL BE PRE-QUALIFIED CONNECTIONS FOR SEISMIC APPLICATION IN ACCORDANCE WITH ANSI/AISC 358-05, INCLUDING SUBSEQUENT SUPPLEMENTS IN FORCE AT THE TIME OF THE AWARD OF THE CONTRACT.
- MOMENT CONNECTIONS BETWEEN TWO END TO END BEAMS OR COLUMNS WILL BE FULL STRENGTH MOMENT AND SHEAR CONNECTIONS DESIGNED FOR THE STRENGTH OF THE SMALLER SECTION.

**CONNECTION LOAD TABLE**

LEVEL	CONNECTION TYPE	ASD LOADS					
		Vx* (K)	Vy (K)	Vz (K)	Mx (K-FT)	My (K-FT)	Mz (K-FT)
LEVEL 1	TYPE A	125	10	-	-	-	-
	TYPE B	500	-	-	-	-	-
	TYPE C	200	-	200	-	400	-
LEVEL 2	TYPE A	550	10	-	-	-	-
	TYPE B	1400	-	-	-	-	-
	TYPE C	550	-	550	-	1000	-
LEVEL 3	TYPE A	550	10	-	-	-	-
	TYPE B	1300	-	-	-	-	-
	TYPE C	550	-	550	-	1000	-

\* LOADS IN COMPRESSION

FOR ORIGINAL SIGNATURES, SEE CL-24630, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PARSONS BRINCKERHOFF**

DESIGNED: D. ABRAHAMS  
 DRAWN: O. KURNOVSKAYA  
 CHECKED: D. YAVORSKY  
 REVIEWED: A. READ  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013

CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

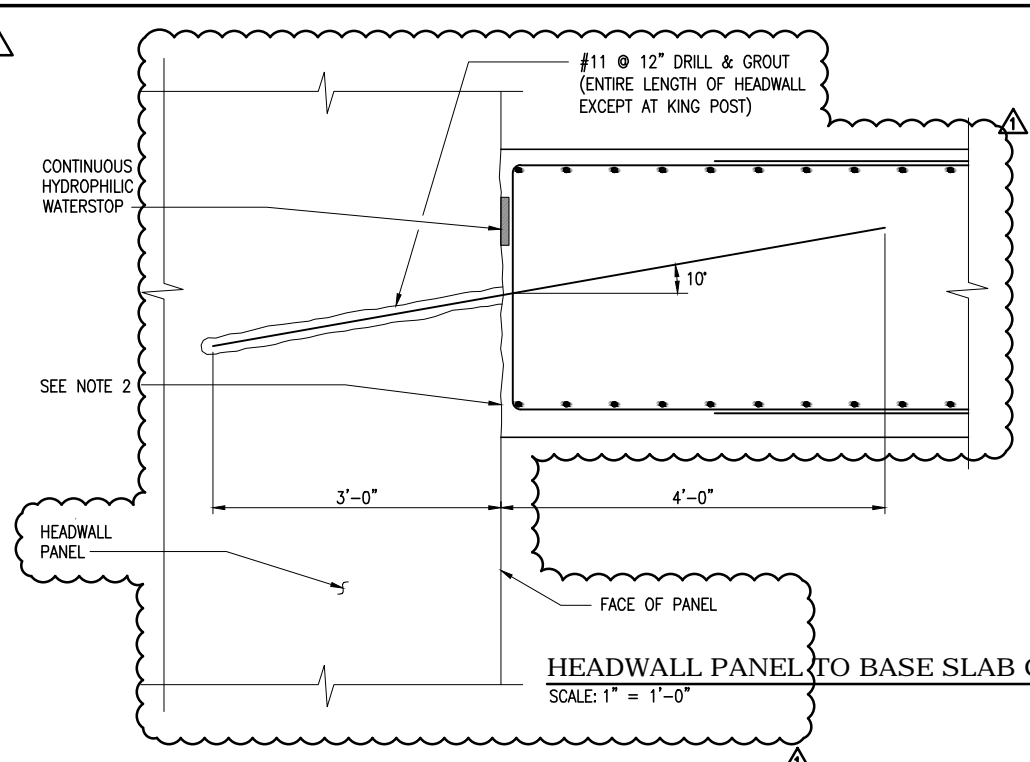
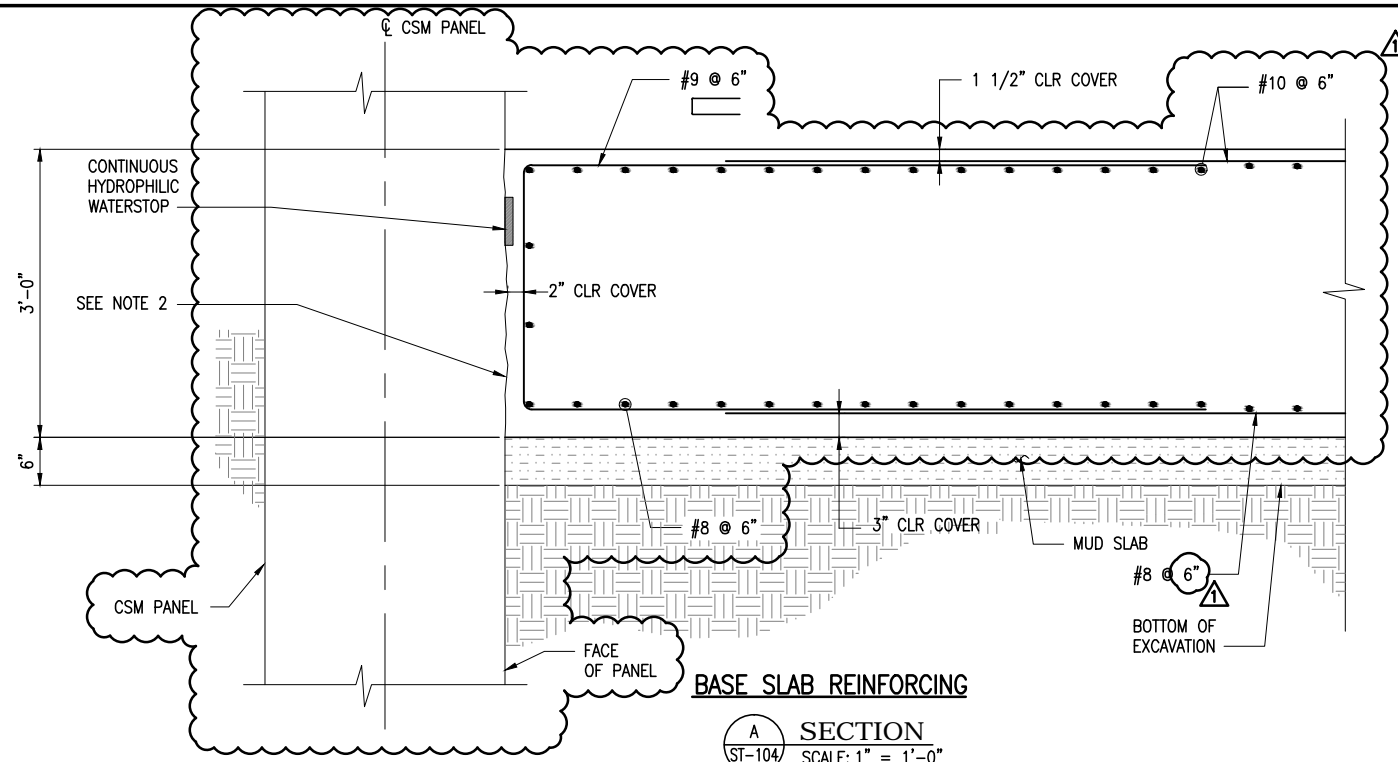
THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

STRUCTURAL  
 CONNECTION SCHEDULE

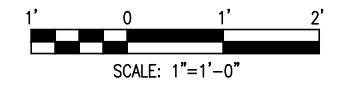
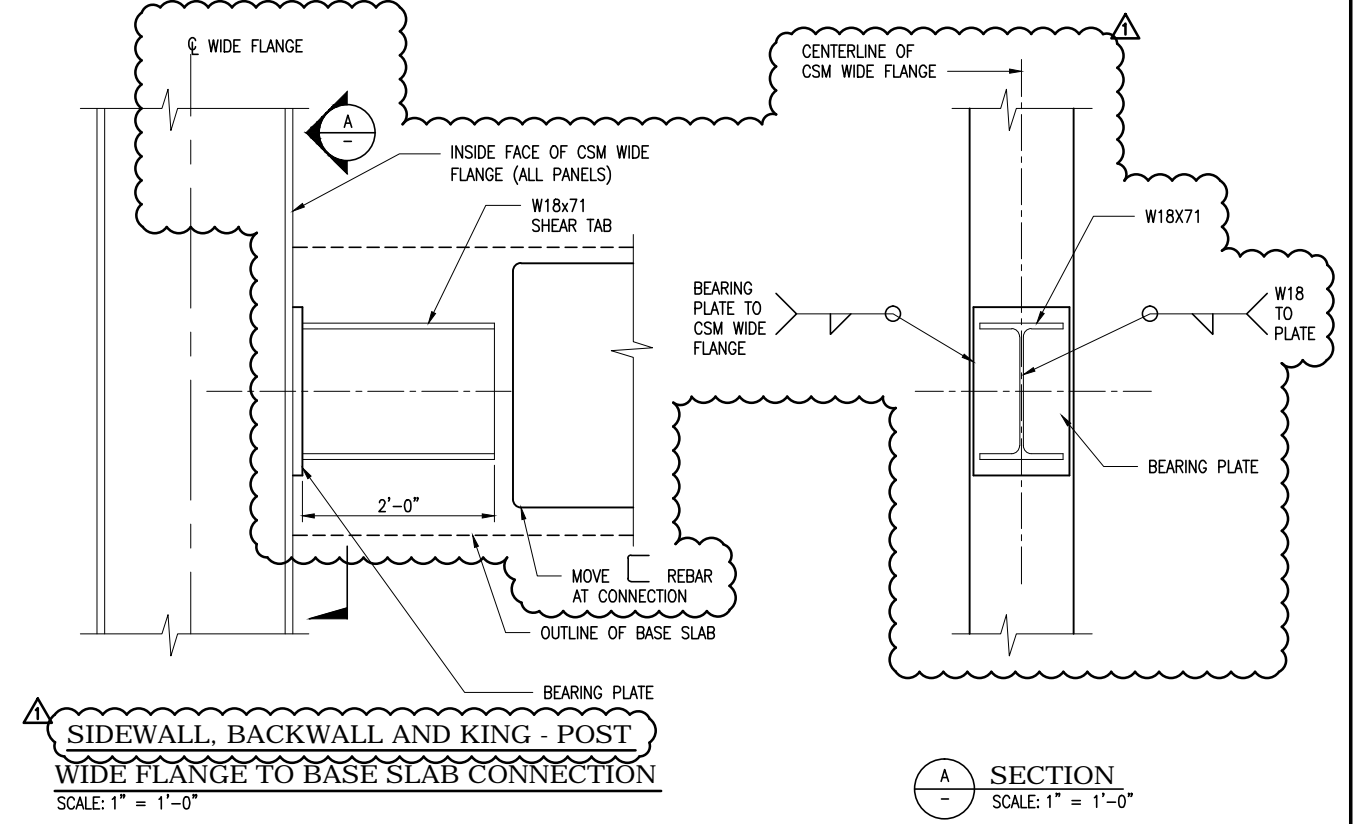
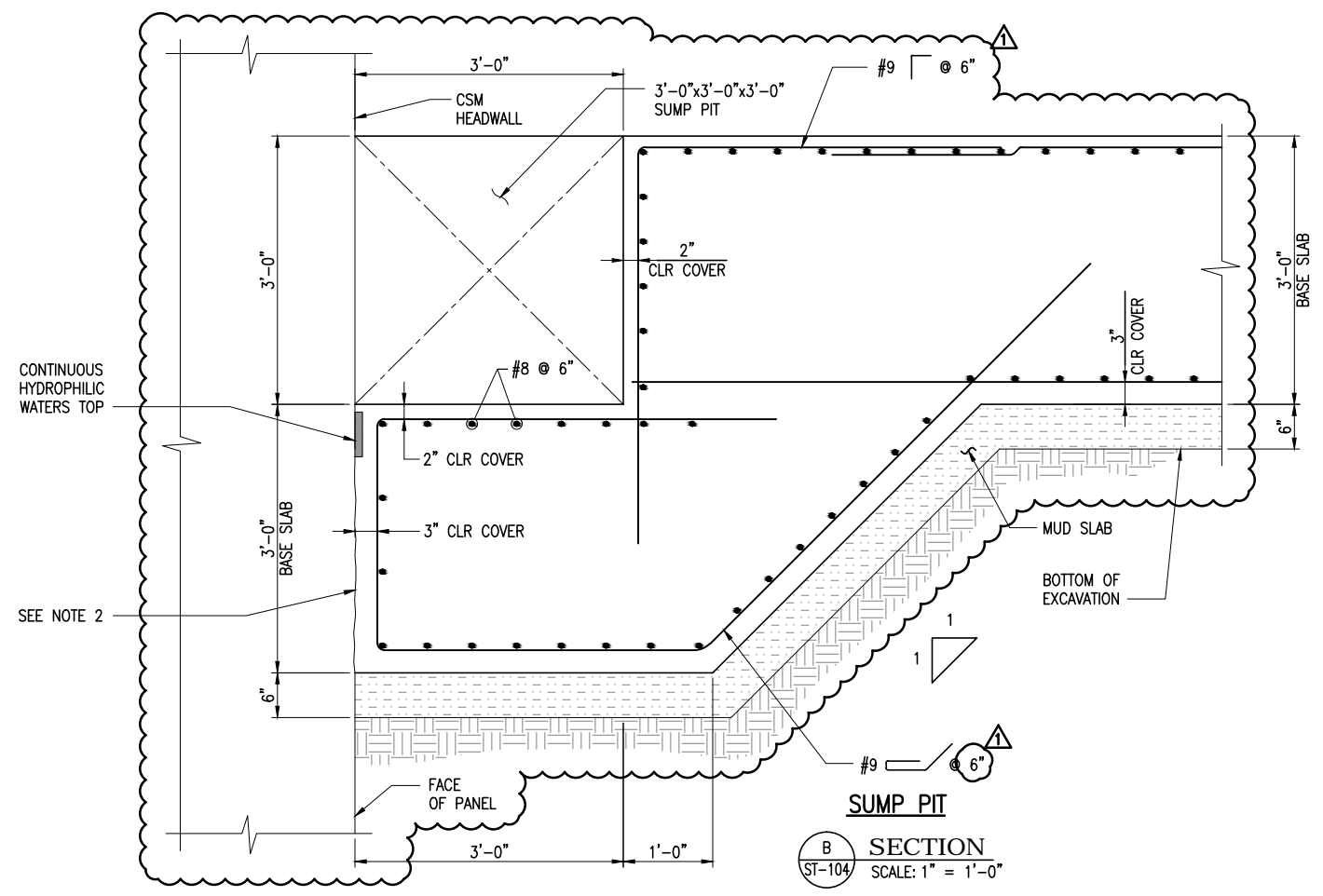
CONTRACT NO. <b>1278</b>
SFMTA CONTROL NO. <b>CL-24630</b>
DRAWING NO. <b>ST-205</b>
SHEET NO. <b>24</b>
REVISION <b>1</b>



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- NOTES:**
- FOR GENERAL STRUCTURAL NOTES, SEE DRAWING ST-001.
  - CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND REMOVE LAITENANCE FROM ALL SURFACES. ROUGHEN SURFACES TO  $\pm 1/4$ " AMPLITUDE AND PREPARE SURFACE TO SATURATED DRY BEFORE PROCEEDING WITH PLACEMENT. KEEP WET FOR FOUR HOURS.
  - CSM WIDE FLANGE TO BASE SLAB CONNECTION SHALL HAVE A 300K LRFD LOAD CAPACITY MIN.



FOR ORIGINAL SIGNATURES, SEE CL-24631, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PARSONS BRINCKERHOFF**

DESIGNED: D. ABRAHAMS  
 DRAWN: O. KURNOVSKAYA  
 CHECKED: C. BARRATT  
 REVIEWED: A. READ  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013

CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

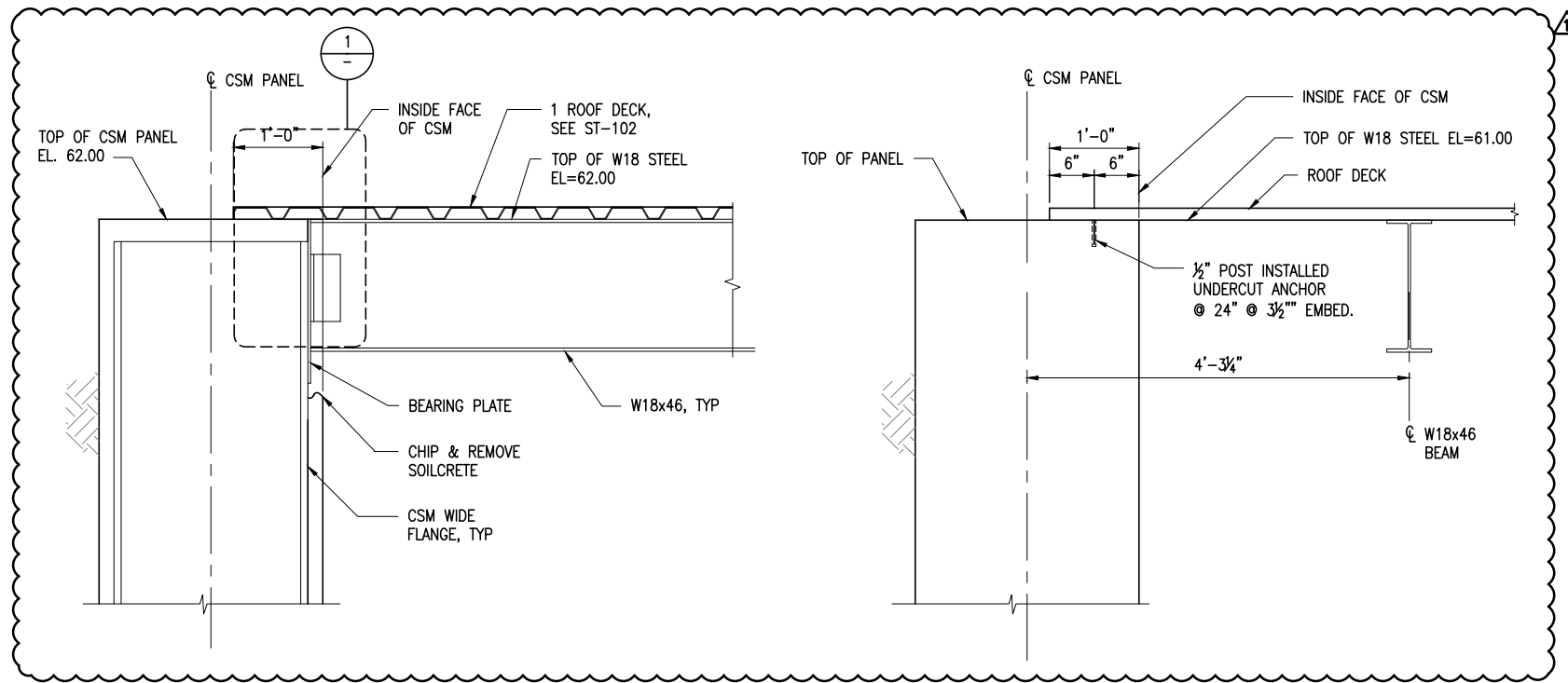
DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

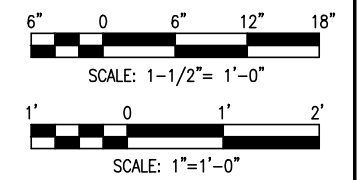
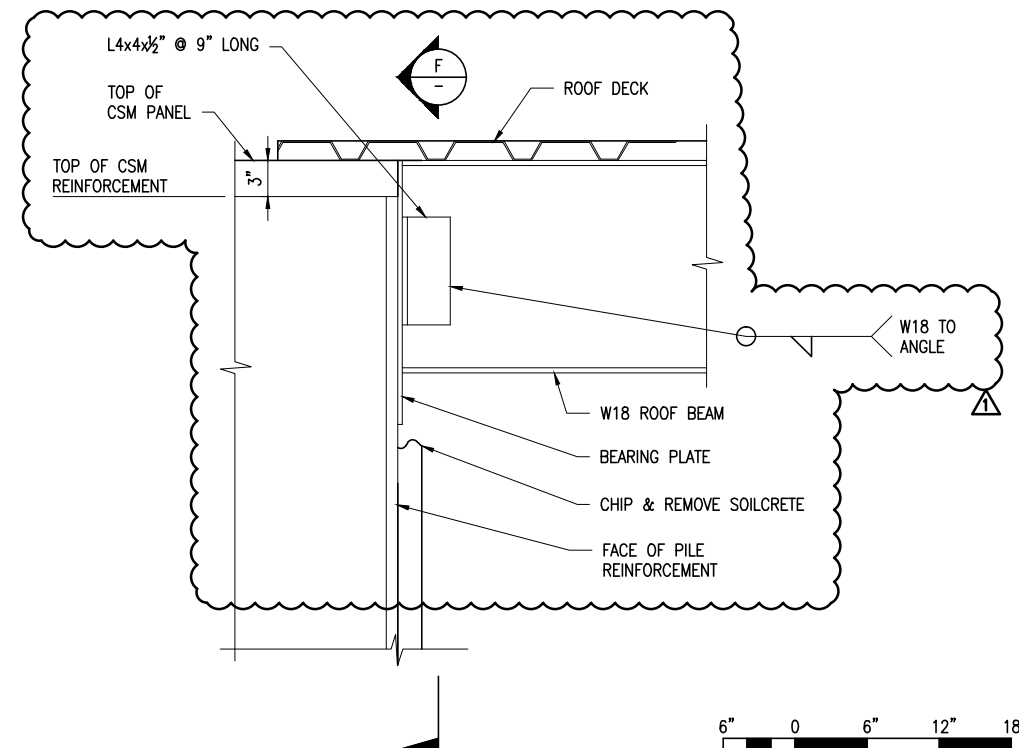
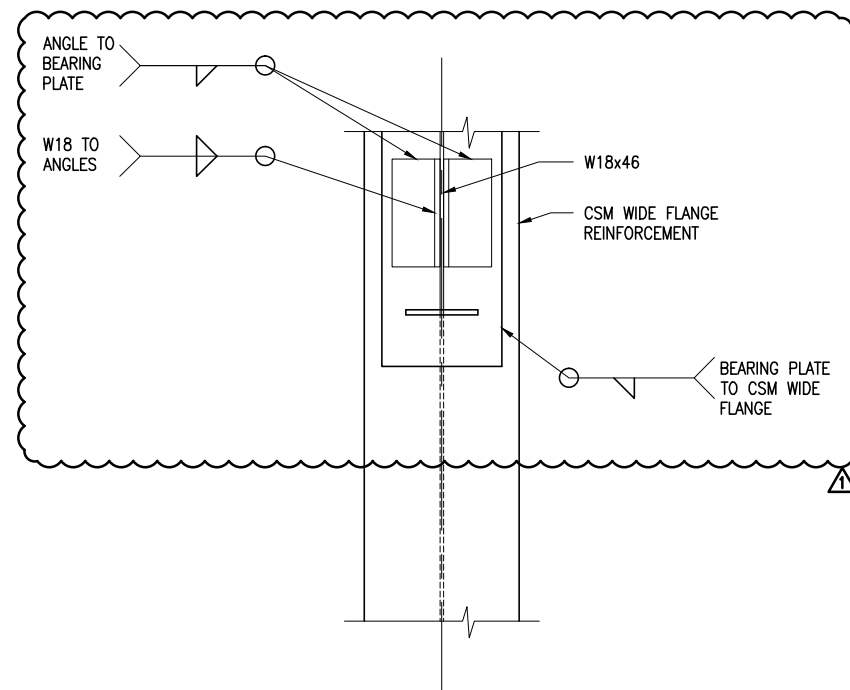
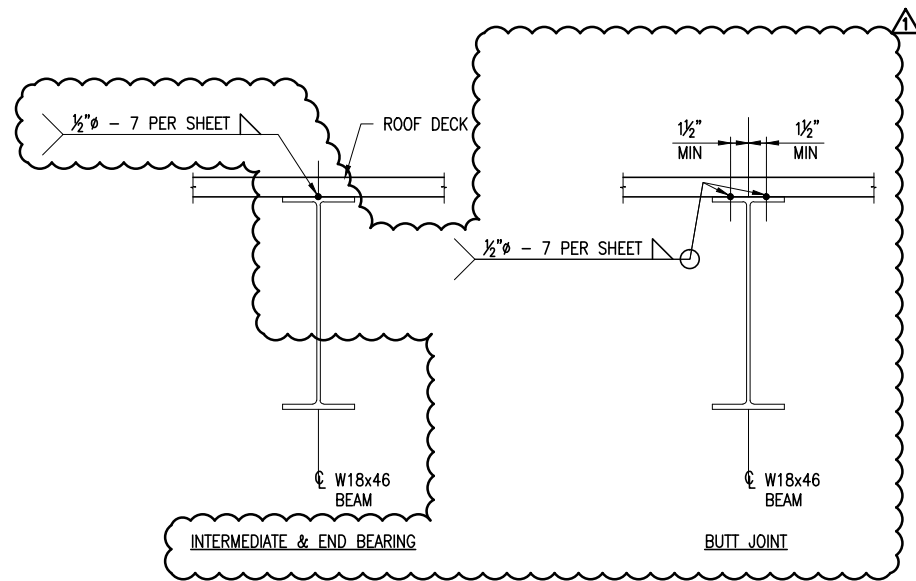
**STRUCTURAL BASE SLAB DETAILS**

CONTRACT NO. <b>1278</b>	REVISION
SPM/C CONTROL NO. <b>CL-24631</b>	
DRAWING NO. <b>ST-206</b>	1
SHEET NO. <b>25</b>	

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- NOTES:**
- FOR GENERAL STRUCTURAL NOTES, SEE DRAWING ST-001.
  - ROOF BEAM TO PILE CONNECTION SHALL HAVE A UPRD SHEAR CAPACITY OF 40 KIPS.



FOR ORIGINAL SIGNATURES, SEE CL-24632, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED D. ABRAHAMS
DRAWN O. KURNOVSKAYA
CHECKED C. BARRATT
REVIEWED A. READ
RECOMMENDED M. FOWLER
APPROVED R. EDWARDS
DATE 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

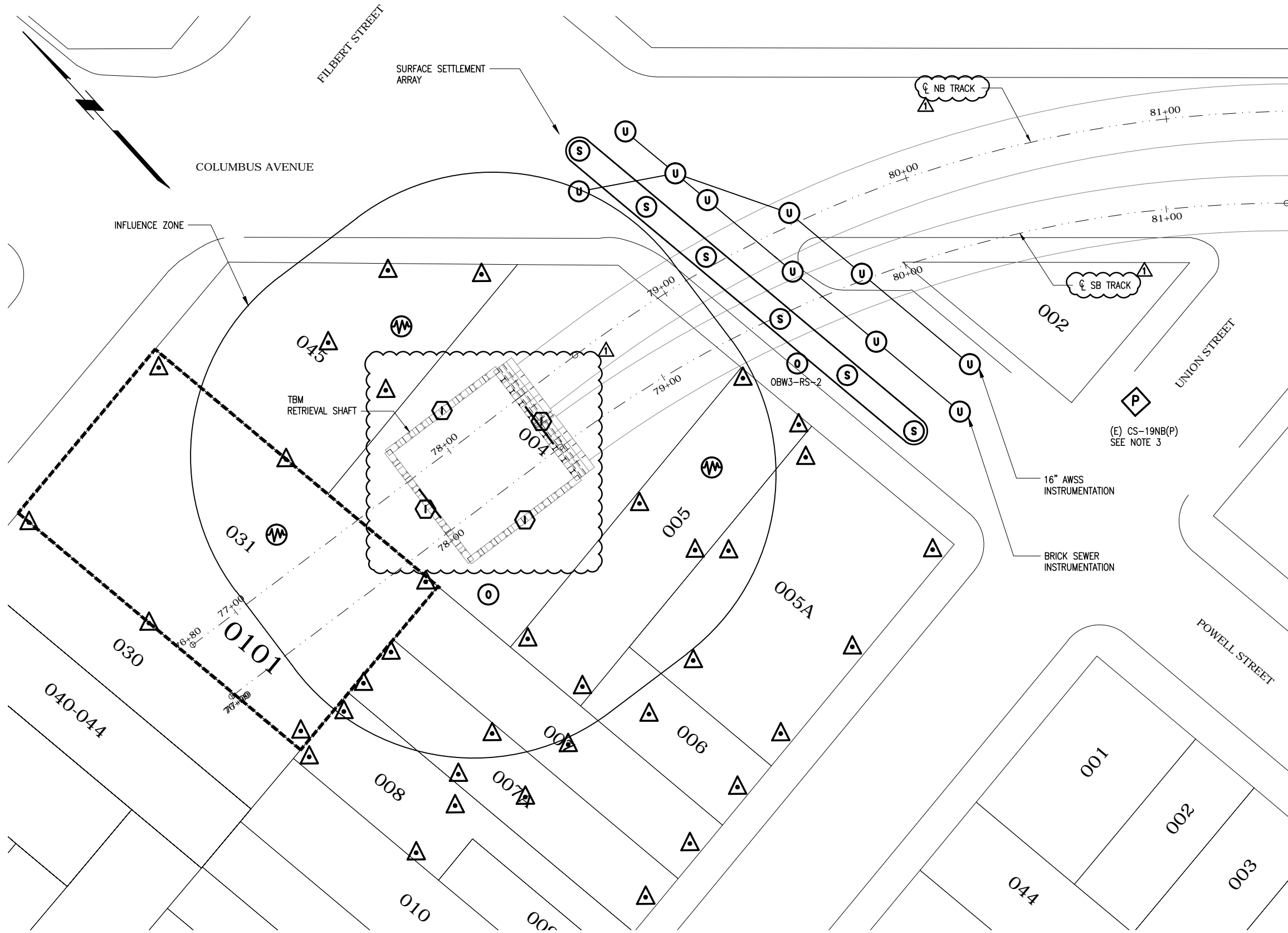
DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT

**STRUCTURAL ROOF DETAILS**

CONTRACT NO. <b>1278</b>
SFMTA CONTROL NO. <b>CL-24632</b>
DRAWING NO. <b>ST-207</b>
SHEET NO. <b>26</b>
REVISION <b>1</b>

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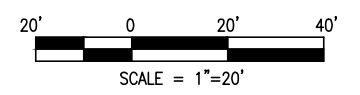
INSTRUMENTATION INSTALLATION SUMMARY TABLE (THIS DRAWING ONLY)		
SYMBOL	INSTRUMENT TYPE	QUANTITY (THIS DRAWING)
△	AUTOMATED BUILDING SETTLEMENT POINT (PRISM ON BUILDING ROOF TOP OR WALL FOR TOTAL STATION MONITORING)	36
○S	SURFACE SETTLEMENT POINT (TYPE B)	6
○U	UTILITY MONITORING POINT (SUBSURFACE ROD ON UTILITY FOR OPTICAL LEVELING MONITORING)	10
○I	INCLINOMETER	4
◇P	(E) PIEZOMETER	1
○O	OBSERVATION WELL	2
○W	VIBRATION MONITORING POINT (IN-PLACE SEISMOGRAPH)	3

**NOTE:**

- LOCATIONS OF INSTRUMENT POINTS ARE SHOWN AS APPROXIMATE ONLY. UMP FOR UTILITY MONITORING SHALL BE INSTALLED DIRECTLY ABOVE CORRESPONDING UTILITY. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY CONTRACTOR IN ACCORDANCE WITH SCHEDULE IN DWG BP-011, SPECIFICATION SECTION 31 09 13, GEOTECHNICAL INSTRUMENTATION AND MONITORING, AND SECTION 31 09 15, STRUCTURAL INSTRUMENTATION AND MONITORING, SUBJECT TO APPROVAL BY THE ENGINEER.
- SEE NOTES ON DWG BP-011.
- (E) CS-19NB(P) PIEZOMETER TO BE MONITORED IN ADDITION TO OBSERVATION WELLS INSTALLED DURING THIS CONTRACT.

**LEGEND:**

HISTORIC BUILDING. SEE SPECIFICATION SECTION 01 57 19 ENVIRONMENTAL MITIGATION AND MEASURES.



FOR ORIGINAL SIGNATURES, SEE CL-24638, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**TELAMON**

DESIGNED: S. KIM  
 DRAWN: O. KURNOVSKAYA  
 CHECKED: K. JOHNSON  
 REVIEWED: D. ABRAHAMS  
 RECOMMENDED: M. FOWLER  
 APPROVED: R. EDWARDS  
 DATE: 05/31/2013

CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

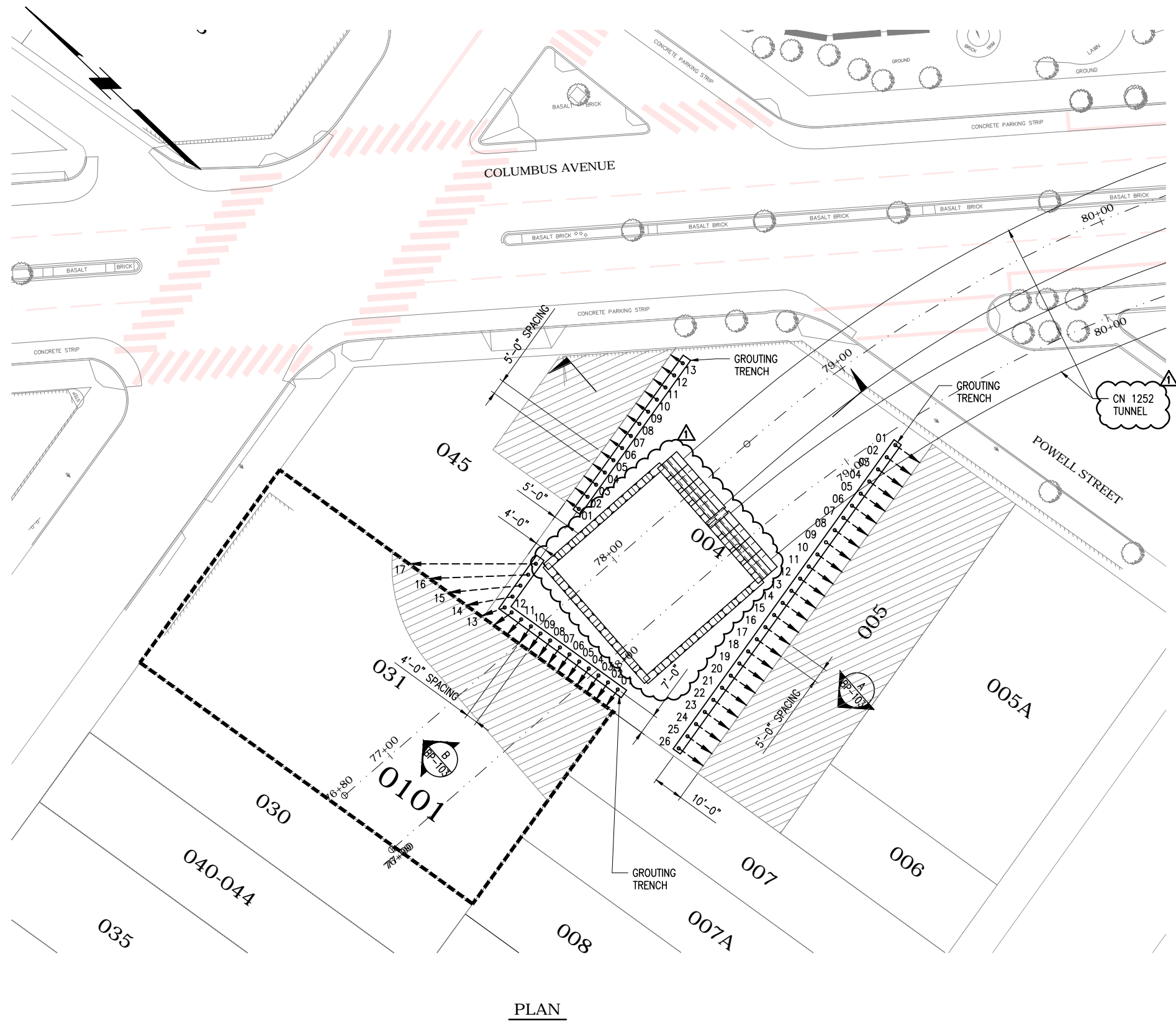
THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

**BUILDING PROTECTION  
 INSTRUMENTATION PLAN**

CONTRACT NO.	1278
SFMTA CONTROL NO.	CL-24638
DRAWING NO.	BP-101
SHEET NO.	32
REVISION	1

BORDER REVISED 03/25/2011

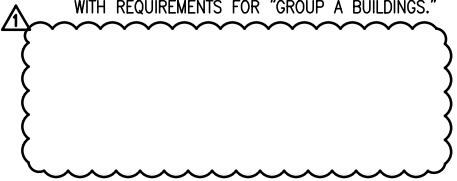
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PLAN

FOR ORIGINAL SIGNATURES, SEE CL-24639, REV. 0

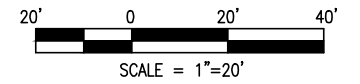
- NOTES:**
- GROUP A BUILDINGS SHALL BE SUBJECT TO COMPENSATION GROUTING OPERATION REQUIREMENTS SPECIFIED IN THE SPECIFICATION SECTION 31 43 14.
  - CONTRACTOR SHALL PERFORM PRE-CONSTRUCTION SURVEY OF THE EXISTING BUILDINGS AND UTILITIES IN ACCORDANCE WITH SPECIFICATION SECTION 31 09 13 AND SECTION 31 09 15.
  - SETTLEMENT AND ANGULAR DISTORTION OF BUILDINGS SHALL BE LIMITED TO THE REQUIREMENTS SPECIFIED IN THE SPECIFICATION SECTION 31 09 15. STRUCTURAL INSTRUMENTATION AND MONITORING.
    - A. FOR MITIGATION REQUIRED BUILDINGS, COMPLY WITH REQUIREMENTS FOR "GROUP A BUILDINGS."



- LEGEND:**
- MINIMUM BUILDING FOOTPRINT TO BE STABILIZED WITH COMPENSATION GROUTING
  - HISTORIC BUILDING
  - HORIZONTAL SURFACE
    - PLUNGE ANGLE
    - SUBVERTICAL TUBE-A-MANCHETTE (TAM) PIPE

COMPENSATION GROUTING ARRAY SCHEDULE

HOLE ID	DIRECTION	PLUNGE ANGLE (DEGREE)	PIPE LENGTH (FT)
005-01 TO 005-04	PERPENDICULAR TO PROPERTY LINE	71	28
005-05 TO 005-26		72.5	30.5
031-01 TO 031-11	AS INDICATED ON THIS DRAWING	81	40
031-12		81	40
031-13		81	40
031-14		64	34
031-15		51.5	37
031-16		39	42
031-17		33	46.5
045-01 TO 045-07	PERPENDICULAR TO PROPERTY LINE	85	52
045-08 TO 045-13		82.5	34.5



DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
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**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

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 DATE: 05/31/2013

CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
 PHASE 2 - CENTRAL SUBWAY  
 TEMPORARY TBM RETRIEVAL SHAFT

**BUILDING PROTECTION  
 COMPENSATION GROUTING  
 SHEET 1 OF 2**

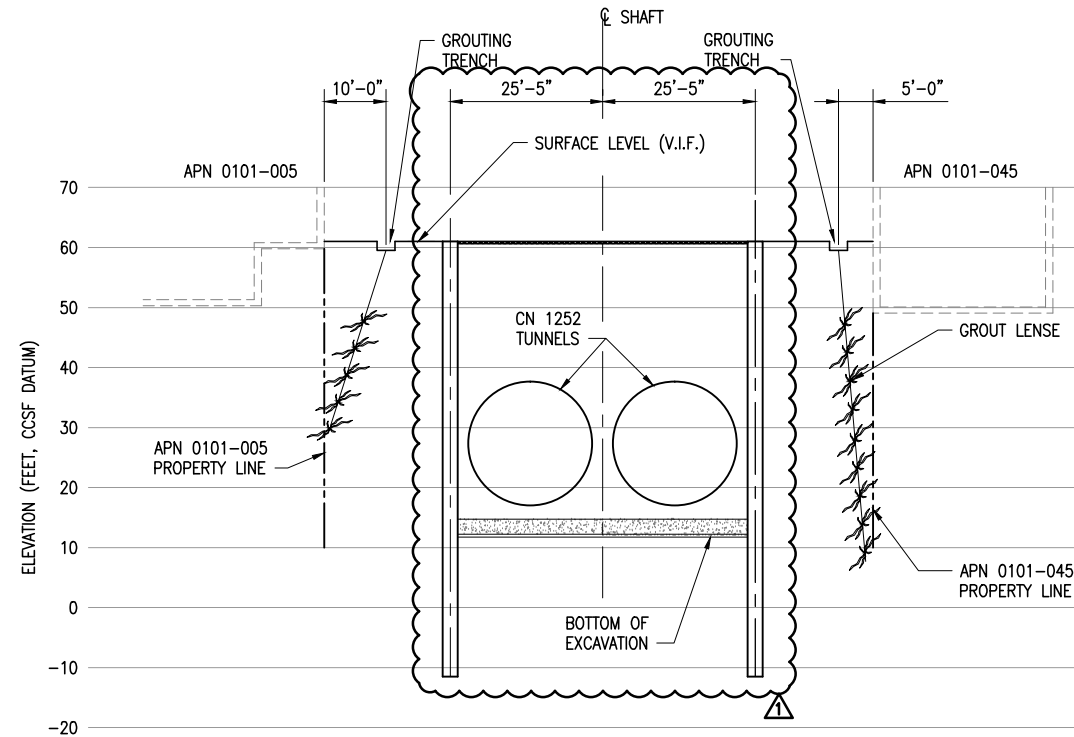
CONTRACT NO. <b>1278</b>	REVISION <b>1</b>
SFMTA CONTROL NO. <b>CL-24639</b>	
DRAWING NO. <b>BP-102</b>	
SHEET NO. <b>33</b>	

BORDER REVISED 03/25/2011

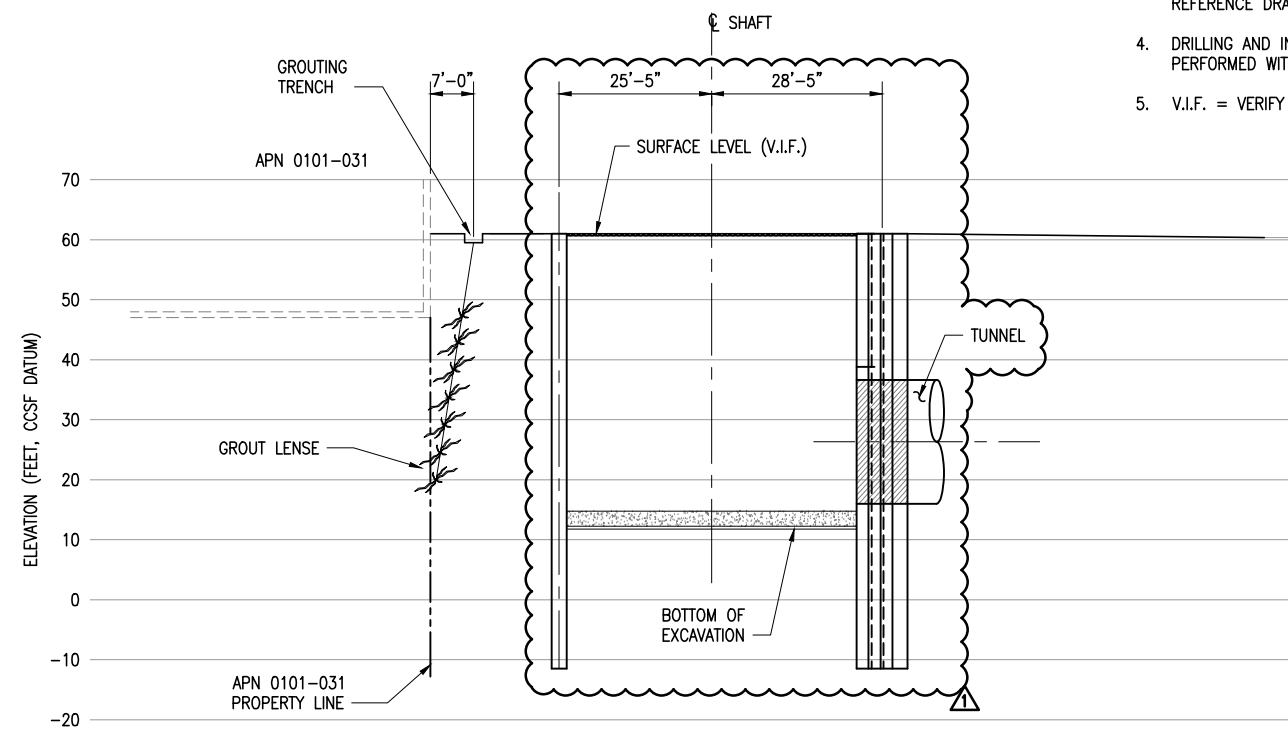
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**NOTES:**

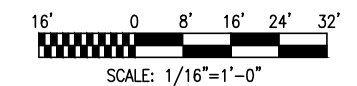
1. INDICATED GROUT LENSE SHAPE AND EXTENT ARE FOR ILLUSTRATION PURPOSES ONLY. CONTRACTOR SHALL DETERMINE PRESSURES AND FLOW RATES TO ACHIEVE REQUIRED VOID FILLING AND SETTLEMENT CONTROL.
2. LIMITS AND EXTENTS OF EXISTING BUILDINGS ARE APPROXIMATE AND DO NOT REFLECT THE ACTUAL POSITION. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS OF BUILDINGS PRIOR TO COMPENSATION GROUTING.
3. CONTRACTOR TO BUILD GROUTING TRENCHES SO THAT GROUT INJECTION PIPE END IS BELOW WORKING SURFACE. TRENCH SHALL BE RECTANGULAR WITH NEAT SIDES. PLACE STEEL PLATE OVER TRENCH WHEN NOT IN USE. SIZE OF TRENCH SHALL BE DETERMINED BY CONTRACTOR. CUT AND REMOVE PARTS OF EXISTING BASEMENT SLAB AND FOUNDATION AS REQUIRED FOR TRENCHING AND DRILLING. SEE REFERENCE DRAWINGS.
4. DRILLING AND INSTALLATION OF TAM PIPE SHALL BE PERFORMED WITHIN PROJECT SITE LIMIT.
5. V.I.F. = VERIFY IN THE FIELD.



**A SECTION**  
BP-102



**B SECTION**  
BP-102



FOR ORIGINAL SIGNATURES, SEE CL-24640, REV. 0

DATE	DESCRIPTION	REV. NO.	BY	CHECKED	APPROVED
07/12/2013	ISSUED FOR CONTRACT 1252 CMOD 18	1			
05/31/2013	ISSUED FOR BID	0			

**PB TELAMON**

**PB PARSONS BRINCKERHOFF**

DESIGNED S. KIM
DRAWN O. KURNOVSKAYA
CHECKED K. JOHNSON
REVIEWED D. ABRAHAMS
RECOMMENDED M. FOWLER
APPROVED R. EDWARDS
DATE 05/31/2013



CITY AND COUNTY OF SAN FRANCISCO  
**MUNICIPAL TRANSPORTATION AGENCY**

APPROVED

DIRECTOR OF TRANSPORTATION

THIRD STREET LIGHT RAIL PROGRAM  
PHASE 2 - CENTRAL SUBWAY  
TEMPORARY TBM RETRIEVAL SHAFT

**BUILDING PROTECTION  
COMPENSATION GROUTING  
SHEET 2 OF 2**

CONTRACT NO. <b>1278</b>
SFMTA CONTROL NO. <b>CL-24640</b>
DRAWING NO. <b>BP-103</b>
SHEET NO. <b>34</b>
REVISION <b>1</b>