# *City of Pasadena*
# *Department of Water and Power*

## ADDENDUM NO. 2
## to

### Specifications LD-13-14
### for
### PROVIDING LABOR AND MATERIALS FOR
### GLENARM REPOWERING BALANCE OF PLANT DESIGN AND CONSTRUCTION

This addendum is issued to correct and clarify the above Specifications. All addenda will be issued electronically. This addendum shall be considered in the bid proposal and become a part of any contract made pursuant thereto:

1. Replace the following documents within Attachment A.2 of the Specification. See Enclosure 1.
    - Ammonia System P&ID, Dwgs SKM1-8 Rev A & SKM1-9 Rev A with the drawing SKM1-8 Rev B & SKM1-9 Rev B accordingly.
    - General Arrangement, Dwg M1-1-1 Rev K with M1-1-1 Rev L.
    - PDC Layout, Dwg E1-2 Rev D with E1-2 Rev E in Section 260533 (Non Segregated-Phase Bus and Section 261200-2 (Medium Voltage Auxiliary Transformers).
    - Electrical One-Line, Dwg E1-1A Rev E with E1-1A Rev G in Section 260533 (Non Segregated-Phase Bus and .Section 261200-2 (Medium Voltage Auxiliary Transformers).
    - Tie Points, Dwg M1-1-6 Rev D with M1-1-6 Rev E.

2. Enclosure 2 is not used.

3. Add the following documents to the Attachment A.3 of the Specification. See Enclosure 3.

- Topographic Survey Dwgs TP-1, TP-2, & TP-3.
- Shin Nippon Steam Turbine Steam Quality Requirements
- IST Engineering Specification – Feedwater Quality Requirements for Superheated Steam Applications – Specification No ES-1000 Rev 9.
- IST Jumper Tube Installation Proposal – P12079-00 Jumper Tubes.
- Prolec GSU Transformer Preliminary Proposal Dwg 221732C1.
- Prolec GSU Transformer Technical Proposal Information Form 3.2.1-D Rev.0.
- SPX Cooling Technologies Preliminary Dwg No. JV4688445 – Schematic View.
- SPX Cooling Technologies Preliminary Dwg No.JV468844B – Basin Plan View.
- SPX Cooling Technologies Preliminary Dwg No. JV468844D – Basin Section & Details.
- Holtec Steam Surface Condenser Dwg SK-8371-0 Rev 0.
- Shin Nippon Steam Turbine Foundation Dwg Sheets 1of4 and 2of4.
- Shin Nippon Steam Turbine Layout Dwg 11415-0002-10 Rev 6.
- Shin Nippon Steam Turbine Foundation Loading Data.
- Hyundai IDEAL Steam Turbine Generator Outline Dwg 5065A0-23 Rev F.
- Hyundai IDEAL Aftermarket Service Bulletin Dated 03-01-08.

4. Add the following documents from the January 8, 2014 Pre-Bid Meeting and Job Walk as part of the Specifications. See Enclosure 4.

- BOP Contractor Pre-Bid Meeting Introduction
- BOP RFP Pre-Bid Presentation
- BOP Contractor Pre-Bid Meeting Outreach
- IST Glenarm Repowering Project OTSG Erection
- GE Power Island Equipment Review
- GE LM 6000 Package Evolution.
- Pre-Bid Meeting Sign Up Sheet

5. Add the following City of Pasadena Department of Public Works Permit Requirement Documents as part of the Specifications. See Enclosure 5.

- Construction Staging and Traffic Management Plan – Template.
- Construction Staging & Traffic Management Plan – Truck Routes.
- Contracts/Purchase Orders/Permits Insurance Requirements.
- City of Pasadena Dept of Public Works Permit Location and Working Hours.
- Moving Permit Application – For Wide Load & Heavy Equipment.
- City of Pasadena Application For a Permit to Conduct an Activity within the Public Right-of-Way.
- City of Pasadena Proposed Storage Container Guideline – Street Occupation.

- City of Pasadena – Department of Public Works Application for a Permit to Place a Storage Container in Public Right of Way.
- City of Pasadena FY 2014 Adopted General Fee Schedule Part 2.

6. Replace Attachments A.2 Document List and A.3 Reference Document List of the Specification with the versions included in Enclosure 6.

7. Add the Q & A Table Rev 0 as part of the Specifications. See Enclosure 7.

8. CAD files for the General Arrangement, Site Plan, and Grading Plan were sent to the following individuals

**Abeinsa**
Philip Schwarz – philip.schwarz@abeinsabd.abengoa.com
Thomas Cavalcante – thomas.k.cavalcante@sargentlundy.com

**ARB**
Wayne Truchan – wtruchan@arbinc.com
Bob Anders – bob.anders@worleyparsons.com

**I + icon Energy**
Geoff Murken – gmurken@iiconenergy.com
Erik McElwain – mcelwaine@zhi.com

**WoodGroup**
John Smith – jk.smith@woodgroup.com
Ray Stankowski – stankowski@pbworld.com

9. IST's drawing ED-002 "Generic Flowsheet Dual Pressure OTSG w/ Burner, SCR, CO) is included within various IST documents such as their presentation at the Pre-Bid meeting. This drawing is included for illustrative purposes only and the specific IST drawing for this project should be used. To clarify further, this project utilizes a single pressure OTSG with no duct burning.

Dan Angeles

Date: 1/16/14

Dan Angeles
Principal Engineer
City of Pasadena Water and Power Department

Enclosures: Enclosure 1
Enclosure 2
Enclosure 3
Enclosure 4
Enclosure 5
Enclosure 6
Enclosure 7

**RECEIPT OF ADDENDUM NO. 2**

**Specifications LD-13-14**

**for**
**PROVIDING LABOR AND MATERIALS FOR**
**GLENARM REPOWERING BALANCE OF PLANT DESIGN AND CONSTRUCTION**
**FOR**
**PASADENA WATER & POWER**
**PASADENA, CALIFORNIA**

**This Receipt must be signed and returned with your bid. Failure to include signed acknowledgements of all addenda will cause the bid to be deemed incomplete and nonresponsive.**

I hereby acknowledge receipt of Addendum No. 2 for Specifications LD-13-14 for Providing Labor and Materials for Glenarm Repowering Balance of Plant Design and Construction.

---

_____
Date

_____
Company Name

_____
Authorized Signature

# Enclosure 1

VENT/VAP RECOVERY
TANK FILL
SCR SUPPLY
LINE EVACUATION
FILL & VAP RECOVERY LOW POINT DRAIN COLLECTION
AIR SUPPLY

AIR SUPPLY
FI
SS TUBING EC2Y
1/2"
1/2"
NH3 AE
SCS AI
DETAIL "1"
TYP. DOUBLE WALL PIPING LEAK DETECTION MONITOR

TO SCR AMMONIA INJ. SKID 3-64
3-001
AE-3-984
3-AM9005-1"-EC2Y
AG EC2Q
UG EC2Y
TO SCR AMMONIA INJ. SKID 4-64
4-001
AE-4-984
4-AM9005-1"-EC2Y
AG EC2Q
UG EC2Y

EC2Y EC2Q
FI-984/985
AM9005-1"-EC2Y
UG AG
NOTE 2
PT 986
1/2"
3/4"
LOW POINT
AM9015-3/4"-EC2Q

EC2Q EC2Y
FI-970
PIPE CULVERT
NOTE 2
EC2Y EC2Q
AE-970

HS 970 | XS 971 | XS 972 | PSL 973
HS 980 | XS 981 | XS 982 | PSL 983
HS 990 | XS 991 | XS 992 | PSL 993
SCS

SCS AI 957
NH3 AE 957
PIPE CULVERT

SHELTER (NOTE 4)
GLENARM PLANT
BROADWAY PLANT
FUTURE AMMONIA FORWARDING PUMP SKID
(FOR GTG 1 & 2)
NH3 AE 956
SCS AI 956
LOCATE NEAR AMMONIA FWD PUMP SKID

BY VENDOR
66
AMMONIA FORWARDING PUMP SKID
NOTE 1
1" B
1" D
1" C
1" A
3/4" E
JB
FUTURE CONNECTION
1 1/2"x1"
FUTURE CONNECTION
CURBED AREA AMMONIA FORWARDING PUMPS

AM9003-1"-EC2Q
AM9004-1"-EC2Q
AM9001-3"-EC2Q
AM9002-1 1/2"-EC2Q

SOV 952
AS
XV 952
FC
BD9008-1 1/2"-EC2Q
3/4"
LOCATE NEAR PLATFORM
NH3 AE 958
SCS AI 958
1 1/2" 2"x1 1/2"
CSO
PSV 965
3"
CSO 2"FP
VRV 966
2"x1 1/2"
1"x3/4"
1" 3" 2" 2" 2" 2" 2" 2" 2"
7 1 3 6 8 9 10
PI 953
TI 954
12 1"
13 1 1/2"
65
19% AMMONIA STORAGE TANK
12,000 GAL. CAPACITY
NOTE 1
(REF. TEXAS SYSTEMS DWG. XXXXX)
1 1/2" 1 1/2" 2" 2"
2 5 4 11
1 1/2"x1" 1 1/2"
1 1/2"x1" 1 1/2"
AM9021-2"-EC2Q
LOCATE @ TANK 65
XI 951
XAH 951
LSHH 951
LSH 951
LIT 950
LG 967
SCS
LI 950
DIKED AREA AMMONIA TANK

S9001
VAPOR RETURN 19% AMMONIA LOADING STATION
2"
2"x1 1/2"
AM9002-1 1/2"-EC2Q
AG UG
UG AG
3/4"
LOW POINT

S9001
S9002
19% AMMONIA LOADING STATION
2" 2" 2" 3"x2"
1"
AM9001-3"-EC2Q
AE-975
FI-975
AG EC2Q
UG EC2Y
AG EC2Q
LOW POINT
AM9016-3/4"-EC2Q
3/4"

EC2Q EC2Y
FI-973
FI-972
NOTE 2 PIPE CULVERT
EC2Y EC2Q
AE-973
AE-972
AM9018-3/4"-EC2Q
PIPE CULVERT NOTE 2
NH3 AE
SCS AI (981) (982) (983)

TEMPORARY GT-5 PUMP LOCATION

XAH 951/960
LI 950-1
HORN & FLASHING LIGHT @ LOADING STATION
XI 951/960
LI 962-1

FI-971
NOTE 2 PIPE CULVERT
AE-971
AM9012-3/4"-EC2Q
EC2Q EC2Y
EC2Y EC2Q

XI 960
XAH 960
LOCATE @ EXISTING TANK
SOV 961
AS
T 11 EXIST. NEW
AM9020-2"-EC2Q
SHUT DOWN
LSHH 960
ALARM
LSH 960
LIT 962
LG 968

ABANDON IN PLACE
CUT & CAP VENT LINE
VAPOR RETURN 29% AMMONIA LOADING STATION (NOTE 3)
2" 2"x1 1/2"
AM9008-1 1/2"-EC2Q
AG UG
UG AG
3/4"
LOW POINT
FG 963A
FG 963B
3/4" 3/4" 3/4" 3/4"

FI-974
TO GT-5
EC2Q EC2Y
PIPE CULVERT
EC2Y EC2Q
AE-974
PIPE CULVERT NOTE 2
XV 961
FC
T 6
T 7
2"x1 1/2"
3"x2"
NEW EXIST
EXISTING 29% AMMONIA TANK

(NOTE 3)
CURBED AREA AMMONIA LOADING

AM9010-3/4"-EC2Q
AM9013-3/4"-EC2Q
AM9009-3/4"-EC2Q
AM9019-3/4"-EC2Q
AM9014-3/4"-EC2Q
ATM
68A AMMONIA RETURN PUMP
68B AMMONIA RETURN PUMP
12"DIAx3'L
12"DIAx3'L
NOTE 5
NOTE 5

TO B-3 SCR
B-3 PUMP SKID
T 12 EXIST. NEW
LI 962
SCS

AIR SUPPLY TO LEAK DETECTION FI'S PER DETAIL "1"
BY INSTR.
BY PIPING
1/2" TYP.
2"x1 1/2"
AM9011-3/4"-EC2Q
AM9017-3/4"-EC2Q
IA6016-1 1/2"-EC2Q
IA6016A-3/4"-EC2Q
IA6016B-3/4"-EC2Q
060

PIT ON WEST END OF PIPE CULVERT

# INTERIM/TEMPORARY CONDITION

USERNAME $$$$$$$SYSTIME$$$$$

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| B | ISSUE FOR INFORMATION ONLY | 12/18/13 | NJN | * | * | * |
| A | ISSUE FOR INFORMATION ONLY | 12/4/13 | NJN | * | * | * |

DSGN * *
DRN * *
CKD * *
SCALE: *
FOR 22x34 DWG ONLY

CITY OF PASADENA INCORPORATED JUNE 1886

POWER ENGINEERS www.powereng.com

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
INTERIM / TEMPORARY CONFIGURATION

JOB NUMBER 123374
REV B
DRAWING NUMBER SKM1-8

VENT/VAP RECOVERY
TANK FILL
SCR SUPPLY
LINE EVACUATION
FILL & VAP RECOVERY LOW POINT DRAIN COLLECTION
AIR SUPPLY

AIR SUPPLY
FI
SS TUBING EC2Y
1/2"
1/2"
NH3 AE
SCS AI
DETAIL "1" TYP. DOUBLE WALL PIPING LEAK DETECTION MONITOR

SHELTER (NOTE 4)
GLENARM PLANT
BROADWAY PLANT
FUTURE AMMONIA FORWARDING PUMP SKID (FOR GTG 1 & 2)
NH3 AE 956
SCS AI 956
LOCATE NEAR AMMONIA FWD PUMP SKID

TO SCR AMMONIA INJ. SKID 3-64
3-001
AE-3-984
3-AM9005-1"-EC2Y
AG UG
EC2Q EC2Y
TO SCR AMMONIA INJ. SKID 4-64
4-001
AE-4-984
4-AM9005-1"-EC2Y
AG UG
EC2Q EC2Y
EC2Y, EC2Q
FI-984/985
AM9005-1"-EC2Y
UG AG
NOTE 2
PT 986
1/2"
3/4"
LOW POINT
AM9015-3/4"-EC2Q
EC2Q EC2Y
FI-970
PIPE CULVERT
NOTE 2
EC2Y, EC2Q
AE-970
HS 970 | XS 971 | XS 972 | PSL 973
HS 980 | XS 981 | XS 982 | PSL 983
HS 990 | XS 991 | XS 992 | PSL 993
SCS
1" B
JB
BY VENDOR
66
AMMONIA FORWARDING PUMP SKID
NOTE 1
1" D
1" C
1" A
3/4" E
CURBED AREA AMMONIA FORWARDING PUMPS
FUTURE CONNECTION
1 1/2"x1"
FUTURE CONNECTION
SCS AI 957
NH3 AE 957
PIPE CULVERT

S9001
VAPOR RETURN 19% AMMONIA LOADING STATION
2"
2"x1 1/2"
AM9002-1 1/2"-EC2Q
AG UG
UG AG
3/4"
LOW POINT
PIPE CULVERT
S9001
S9002
19% AMMONIA LOADING STATION
2"
2"
2"
3"x2"
1"
AE-975
FI-975
AM9001-3"-EC2Q
AG UG AG
EC2Q EC2Y EC2Q
LOW POINT
AM9016-3/4"-EC2Q
3/4"
EC2Q EC2Y
FI-973
FI-972
NOTE 2
PIPE CULVERT
EC2Y, EC2Q
AE-973
AE-972
AM9018-3/4"-EC2Q
PIPE CULVERT
NOTE 2
NH3 AE
SCS AI (981) (982) (983)
AM9003-1"-EC2Q
AM9004-1"-EC2Q
AM9001-3"-EC2Q
AM9002-1 1/2"-EC2Q
3/4"
3/4"
3/4"
3/4"
XV 952
SOV 952
AS
FC
BD9008-1 1/2"-EC2Q
3/4"
1 1/2" 2"x1 1/2"
CSO
LOCATE NEAR PLATFORM
NH3 AE 958
SCS AI 958
PSV 965
3"
CSO 2"FP
VRV 966
2"
AM9021-2"-EC2Q
1"x3/4"
1"
3"
2"x1 1/2"
7 1" | 1 3" | 3 2" | 6 2" | 8 2" | 9 2" | 10 2"
2"
PI 953
TI 954
12 1"
13 1 1/2"
65
19% AMMONIA STORAGE TANK
12,000 GAL. CAPACITY
NOTE 1
(REF. TEXAS SYSTEMS DWG. XXXXX)
LG 967
LSHH 951
LSH 951
LIT 950
2 1 1/2" | 5 1 1/2" | 4 2" | 11 2"
1 1/2"x1" 1 1/2"
1 1/2"x1" 1 1/2"
2"
2"
DIKED AREA AMMONIA TANK
LOCATE TANK 65
XI 951
XAH 951
LI 950
SCS

XAH 951/960
LI 950-1
HORN & FLASHING LIGHT LOADING STATION
XI 951/960
LI 962-1
FI-971
AM9012-3/4"-EC2Q
EC2Q EC2Y
NOTE 2
PIPE CULVERT
AE-971
EC2Y EC2Q
XI 960
XAH 960
LOCATE EXISTING TANK
SOV 961
AS
T 11
EXIST. NEW
AM9020-2"-EC2Q
2"
SHUT DOWN
LSHH 960
ALARM
LSH 960
LIT 962
LG 968
T 6
T 7
2"x1 1/2"
2"
3"x2"
NEW EXIST
EXISTING 29% AMMONIA TANK
XV 961
FC
3/4"
3/4"
3/4"
3/4"
3/4"
3/4"
3/4"
3/4"
3/4"
3/4"
3/4"
3/4"
VAPOR RETURN 29% AMMONIA LOADING STATION (NOTE 3)
2"
2"x1 1/2"
AM9008-1 1/2"-EC2Q
AG UG
UG AG
3/4"
LOW POINT
FG 963A
FG 963B
FI-974
TO GT-5
EC2Q EC2Y
PIPE CULVERT
NOTE 2
EC2Y, EC2Q
AE-974
PIPE CULVERT
(NOTE 3)
CURBED AREA AMMONIA LOADING
AM9010-3/4"-EC2Q
AM9013-3/4"-EC2Q
AM9009-3/4"-EC2Q
AM9014-3/4"-EC2Q
AM9019-3/4"-EC2Q
68A AMMONIA RETURN PUMP
68B AMMONIA RETURN PUMP
ATM
ATM
12"DIAx3'L
12"DIAx3'L
AIR SUPPLY TO LEAK DETECTION FI'S PER DETAIL "1"
BY INSTR.
BY PIPING
1/2" TYP.
2"x1 1/2"
060
IA6016-1 1/2"-EC2Q
IA6016A-3/4"-EC2Q
IA6016B-3/4"-EC2Q
AM9011-3/4"-EC2Q
AM9017-3/4"-EC2Q
NOTE 5
NOTE 5
PIT ON WEST END OF PIPE CULVERT
EXISTING 29% AMMONIA TANK
GT-5 PUMP SKID
LI 962
SCS

PROPOSED FINAL

USERNAME $$$$$$$$SYSTIME$$$$$

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| B | RE-ISSUE FOR INFORMATION ONLY | 12/18/13 | NJN | * | * | * |
| A | ISSUE FOR INFORMATION ONLY | 12/4/13 | NJN | * | * | * |

| | | |
|---|---|---|
| DSGN | * | * |
| DRN | * | * |
| CKD | * | * |

SCALE: *
FOR 22x34 DWG ONLY

CITY OF PASADENA INCORPORATED JUNE 1886

POWER ENGINEERS www.powereng.com

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
FINAL CONFIGURATION

JOB NUMBER 123374
REV B
DRAWING NUMBER SKM1-9

GLENARM BUILDING

GRID NORTH
TRUE NORTH

α = -00°05'08"

GT - 1

GT - 2

GT - 3

GT - 4

PACIFIC ELECTRIC BUILDING

R.O.W. & P.L.

R.O.W. & P.L.

0 10 20 40 60 FEET

1" = 20'

## LEGEND

1. GAS TURBINE GENERATOR (GTG)
2. ONCE THROUGH STEAM GENERATOR (OTSG)
3. STEAM TURBINE GENERATOR (STG)
4. SURFACE CONDENSER
5. OTSG STACK
6. POWER DISTRIBUTION CENTER (PDC) / CONTROL ROOM
7. 13.8KV -4.16KV AUX. TRANSFORMER
8. 4160V -480V AUX. TRANSFORMER
9. 17.2KV -4.16KV AUX. TRANSFORMER
10. INLET AIR CHILLER
11. GSU TRANSFORMER
12. COOLING TOWER
13. FUEL GAS COMPRESSOR SKID
14. CIRCULATING WATER PUMPS
15. OTSG CHEMICAL FEED SKID
16. AMMONIA FLOW CONTROL UNIT
17. BOILER FEEDWATER PUMPS
18. GTG CO2 BOTTLES
19. CEMS SKID
20. DEMINERALIZED WATER TANK/PUMPS
21. GTG AUXILIARY SKID
22. CONDENSATE POLISHER
23. CONDENSATE STORAGE TANK
24. CONDENSATE PUMPS
25. INLET AIR HEAT EXCHANGER
26. FUEL GAS COMPRESSOR DRAINS TANK
27. AIR COMPRESSOR AND RECEIVER
28. CONDENSATE MAKE-UP PUMPS
29. INLET AIR PRE-COOLER
30. GTG FUEL GAS FINAL FILTER SKID
31. WASTE WATER TANK/PUMPS
32. GENERATOR/GEARBOX LUBE OIL SKID
33. GTG LUBE OIL COOLER SKID
34. STEAM TURBINE ENCLOSURE
35. BEARING COOLING WATER PUMPS
36. AUXILIARY COOLING WATER PUMPS
37. AUXILIARY COOLING WATER HEAT EXCHANGER
38. DEMINERALIZED WATER FORWARDING PUMPS
39. WASTE WATER LIFT STATION
40. GLENARM WEIR (EXISTING)
41. COOLING TOWER CHEMICAL TREATMENT
42. GT 3 & 4 OILY WATER SEPARATOR (EXISTING)
43. GLENARM BROADWAY TUNNEL (EXISTING)
44. GT 3 & 4 DEMIN TANK (EXISTING)
45. STEAM & WATER SAMPLING PANEL
46. POTABLE WATER RECIRCULATION SKID
47. ATMOSPHERIC FLASH TANK/TRANSFER PUMPS
48. COIL CONDENSATE SUMP
49. GTG WATER WASH DRAINS TANK (IN OPEN VAULT)
50. CONTROL BUILDING
51. PURGE/TEMPERING AIR FANS
52. WATER LAB BUILDING
53. SPRINT SKID

## NOTES

1. CONCEPTUAL

kcourson 01/06/2014 07:02 AM \\boifs1\projects\123374\OD\CAD\dwg\mech\55pam1-1-1.dgn

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| L | RE-ISSUED FOR BID | 01/06/2014 | KAC | KAC | TRC | GTH |
| K | RE-ISSUED FOR BID | 12/06/2013 | VBD | KAC | TRC | GTH |
| J | RE-ISSUED FOR BID | 10/15/2013 | VBD | KAC | TRC | GTH |
| I | RE-ISSUED FOR BID | 09/27/2013 | VBD | KAC | ADD | SLH |
| H | RE-ISSUED FOR REVIEW | 07/18/2013 | VBD | KAC | ADD | SLH |

| | | | |
|---|---|---|---|
| DSGN | DPB | 04/12/2011 |
| DRN | DPB | 04/12/2011 |
| CKD | RVK | 04/12/2011 |

SCALE: 1" = 20'-0"

FOR 22x34 DWG ONLY

POWER ENGINEERS
www.powereng.com

PASADENA WATER & POWER

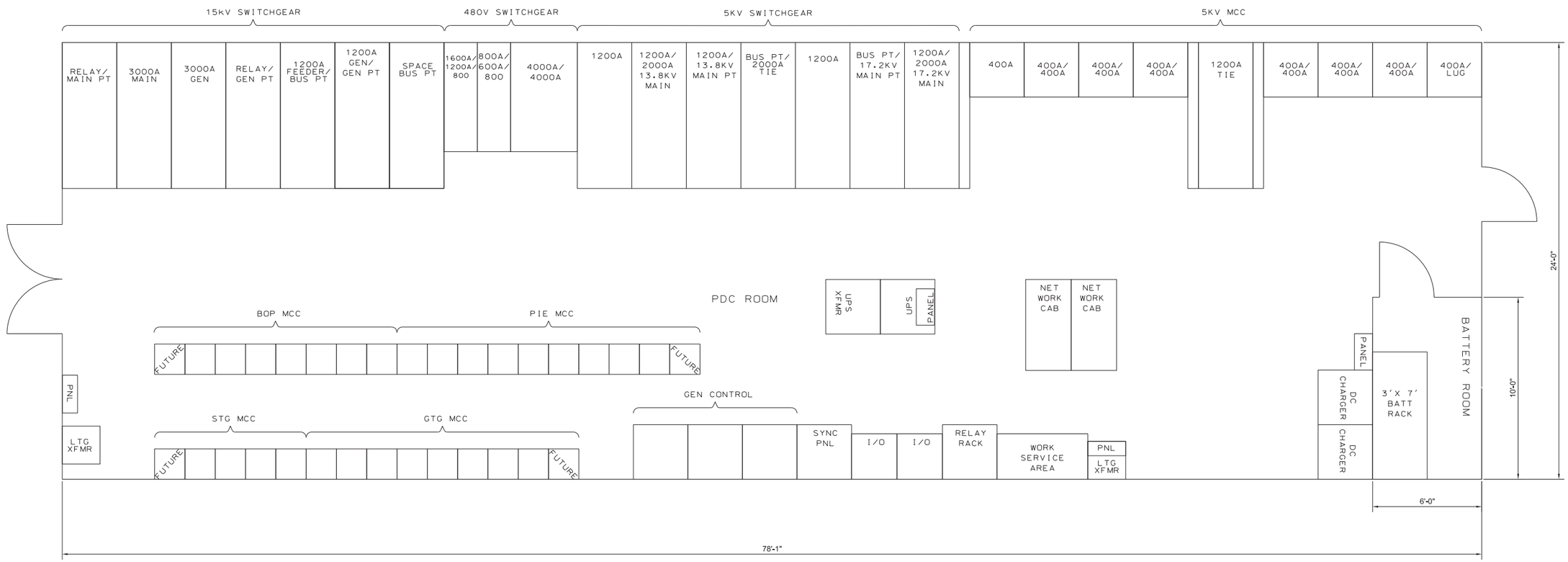
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)

GENERAL ARRANGEMENT
GAS TURBINE/AXIAL EXHAUST

JOB NUMBER 123374

REV L

DRAWING NUMBER M1-1-1




0 1 2 3 4 5 10 FEET

1/4"= 1'- 0"

tmartichusK2/09/2013 03:45 PM W:*123374*DD*CAD*dwg*elec*54paseE1.2.dgn

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| E | RE-ISSUED FOR BID | 12/10/13 | TLM | FD | RL | GH |
| D | ISSUED FOR BID | 09/06/13 | RLA | FD | RL | GH |
| C | RE-ISSUED FOR REVIEW | 07/18/13 | TLM | FD | RL | GH |
| B | RE-ISSUED FOR REVIEW | 06/21/13 | RLA | RL | RL | GH |
| A | ISSUED FOR REVIEW | 01/18/13 | RDQ | FD | CH | GH |

| | | |
|---|---|---|
| DSGN | FD | 09/04/12 |
| DRN | MD | 09/04/12 |
| CKD | JR | 09/07/12 |

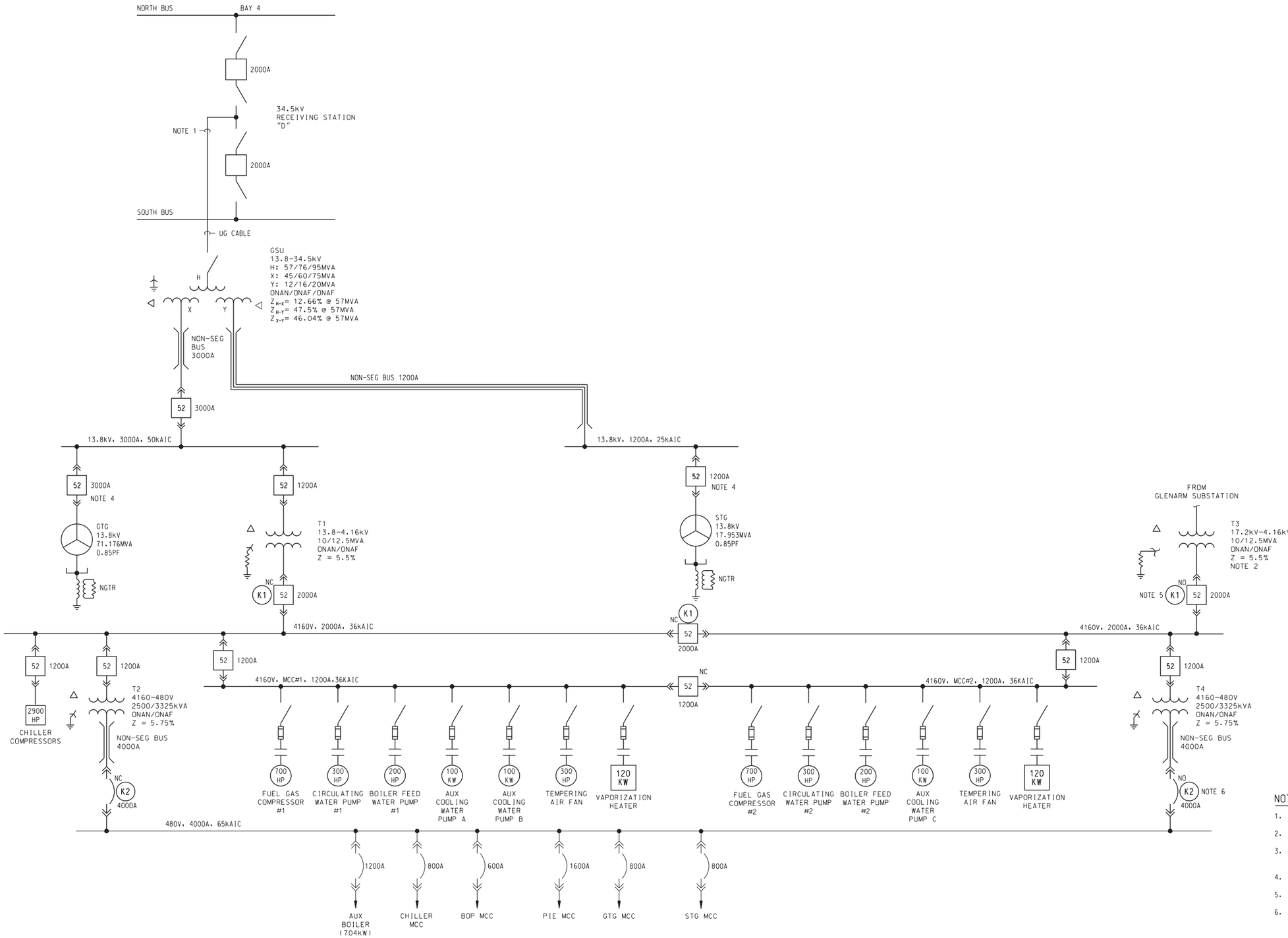
SCALE: * *
FOR 22x34 DWG ONLY

CITY OF PASADENA INCORPORATED JUNE 1886

POWER ENGINEERS

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
ELECTRICAL OVERALL CONCEPTUAL
PDC BUILDING LAYOUT

JOB NUMBER 123374
REV E
DRAWING NUMBER E1-2




## NOTES

1. REPLACES EXISTING FEED TO B3.
2. TRANSFORMER TO PROVIDE A 60° PHASE SHIFT VIA Dzn2 PHASE RELATIONSHIP.
3. ALL EQUIPMENT RATINGS TO BE CONFIRMED BY BOP CONTRACTOR DURING BID AND/OR DETAILED DESIGN.
4. GENERATOR BREAKERS NEED TO BE RATED FOR GENERATOR BREAKER SERVICE.
5. 2-KEY, 3-LOCK INTERLOCK SYSTEM TO BE INSTALLED.
6. 1-KEY, 2-LOCK INTERLOCK SYSTEM TO BE INSTALLED.

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

| INTER-DISCIPLINE REVIEW | | | | | | | |
|---|---|---|---|---|---|---|---|
| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
| DATE | - | - | - | - | - | - | - |
| INIT | - | - | - | - | - | - | - |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| G | RE-ISSUED FOR BID | 01/07/14 | TLM | FD | RL | GH |
| F | RE-ISSUED FOR BID | 12/10/13 | TLM | FD | RL | GH |
| E | ISSUED FOR BID | 09/06/13 | RLA | FD | RL | GH |
| D | RE-ISSUED FOR REVIEW | 07/18/13 | TLM | FD | RL | GH |
| C | RE-ISSUED FOR REVIEW | 10/17/12 | RDQ | FD | CH | GH |

| | | |
|---|---|---|
| DSGN | CH | 05/13/11 |
| DRN | RDQ | 05/16/11 |
| CKD | BT | 05/17/11 |

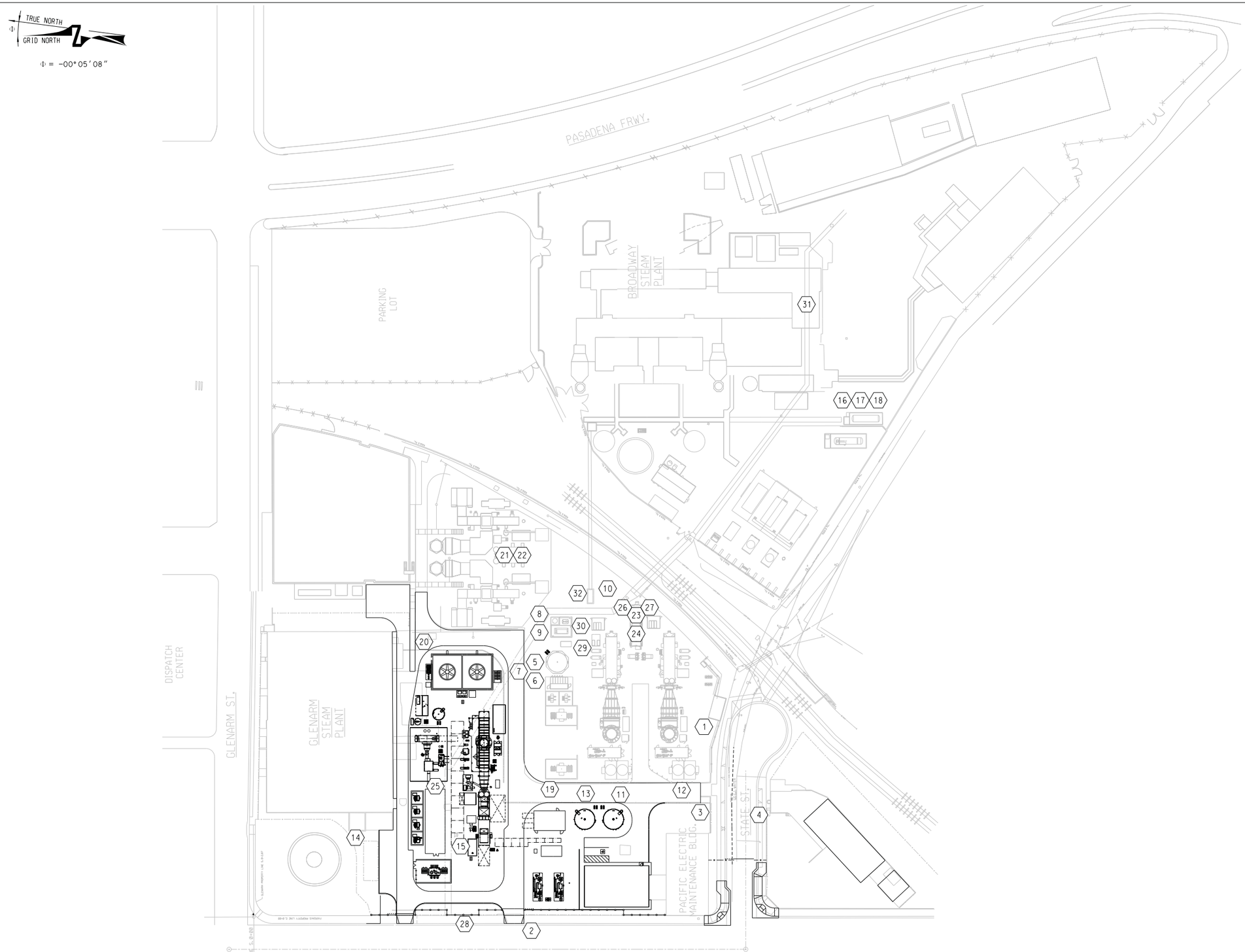
SCALE: NONE
FOR 22x34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
ELECTRICAL OVERALL CONCEPTUAL ONE-LINE DIAGRAM (LM 6000)

JOB NUMBER 123374
REV G
DRAWING NUMBER E1-1A

tmartichus601/06/2014 02:40 PM W:\123374\DD\CAD\dwg\elec\54posE1_1A.dgn




## LEGEND

1. – FUEL GAS SUPPLY
2. – CITY WATER CONNECTION – POTABLE/SERVICE WATER
3. – CITY WATER CONNECTION – FIRE WATER LOOP
4. – CITY WATER CONNECTION – MAINTENANCE BLDG
5. – DEMINERALIZED WATER FROM TANK 157B
6. – DEMINERALIZED WATER RECIRCULATION TO TANK 157B
7. – DEMINERALIZED WATER FROM TANK 157A
8. – EQUIPMENT DRAIN SUMP TO OWS
9. – OWS EFFLUENT TO WASTEWATER STORAGE TANK
10. – GT-5 WASTEWATER TO EXISTING DISCHARGE PIPE
11. – CT 3 BLOWDOWN
12. – CT 4 BLOWDOWN
13. – WASTEWATER STORAGE TANK TO DISCHARGE PIPE
14. – FOUNTAIN DRAIN
15. – GTG WASH WATER DRAINS TANK PUMP-OUT
16. – AQUEOUS AMMONIA SUPPLY
17. – AQUEOUS AMMONIA PUMP MINIMUM FLOW
18. – AQUEOUS AMMONIA PUMP SKID RECIRCULATION
19. – 34.5 KV
20. – 17 KV
21. – GT1 CONTROL SYSTEM
22. – GT2 CONTROL SYSTEM
23. – GT3 CONTROL SYSTEM
24. – GT4 CONTROL SYSTEM
25. – 34.5 KV RELAY PANEL
26. – PHONE
27. – INTERNET
28. – SANITARY SEWER
29. – INTRUMENT AIR
30. – OWS LEVEL INSTRUMENT
31. – EXISTING B3 CONTROL ROOM
32. – NEW AMMONIA FEED CONNECTION

NOTES:
1. REFER TO DRAWING M9-10 TIE IN POINT INDEX FOR FURTHER DETAILS.
2. TIE POINT LOCATIONS SHOWN ARE APPROXIMATE. BOP CONTRACTOR TO FIELD LOCATE.

0 30 60 120 180 FEET
1"= 60'

kcourson 01/06/2014 06:59 AM \\doifs1\projects\123374\DD\CAD\dwg\mech\55parm1-1-6.dgn

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| E | ISSUED FOR BID | 01/03/14 | KAC | KAC | TRC | TRC |
| D | ISSUED FOR BID | 12/09/2013 | VBD | SEG | TRC | TRC |
| C | ISSUED FOR BID | 10/15/2013 | VBD | SEG | TRC | TRC |
| B | ISSUED FOR BID | 09/27/2013 | VBD | SEG | TRC | TRC |
| A | ISSUED FOR REVIEW | 12/07/2012 | DPB | SEG | ADD | TRC |

| | | | |
|---|---|---|---|
| DSGN | DPB | 12/05/2012 |
| DRN | DPB | 12/05/2012 |
| CKD | SEG | 12/05/2012 |

SCALE: 1" = 60'-0"
FOR 22x34 DWG ONLY

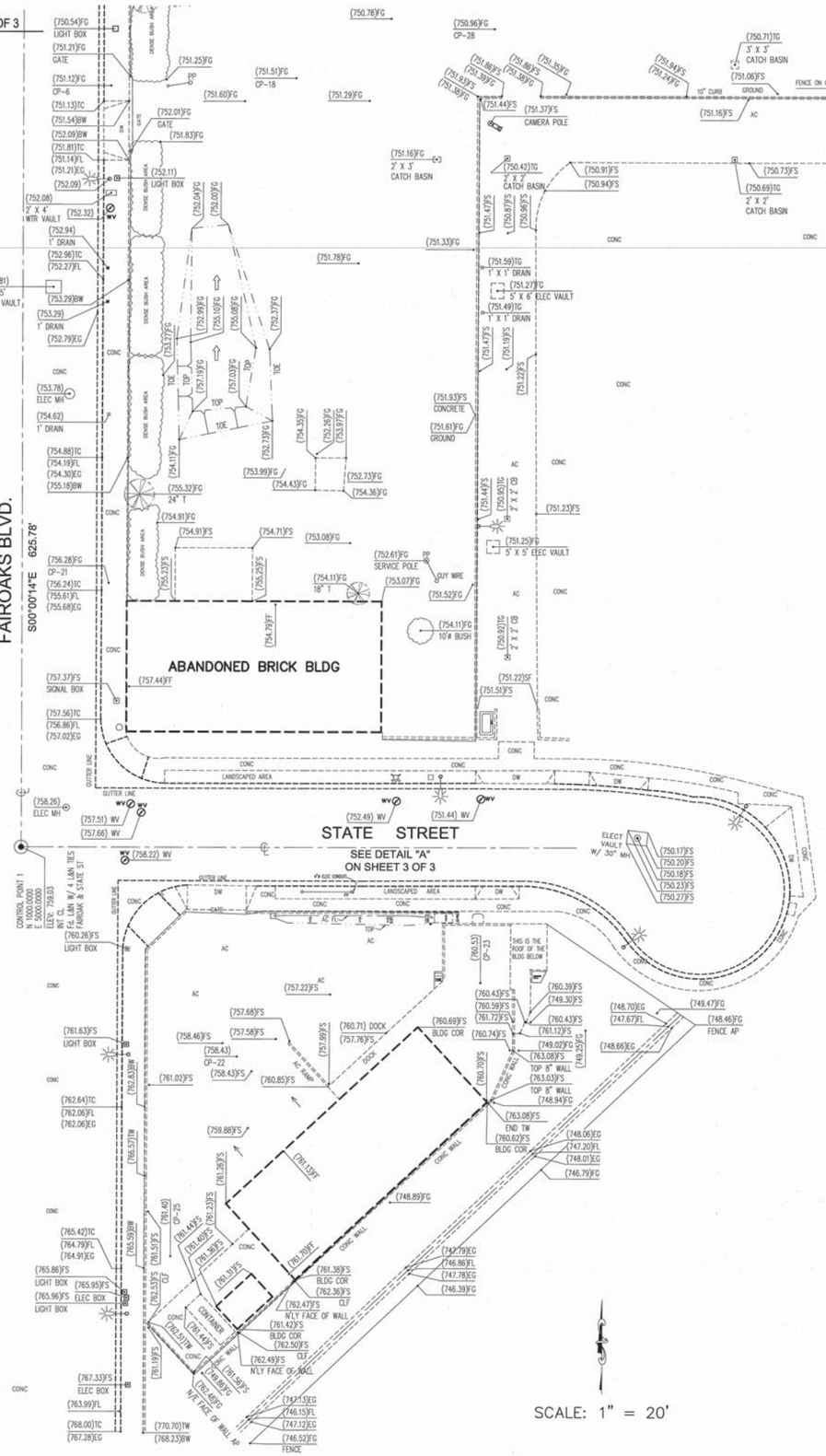
POWER ENGINEERS
www.powereng.com

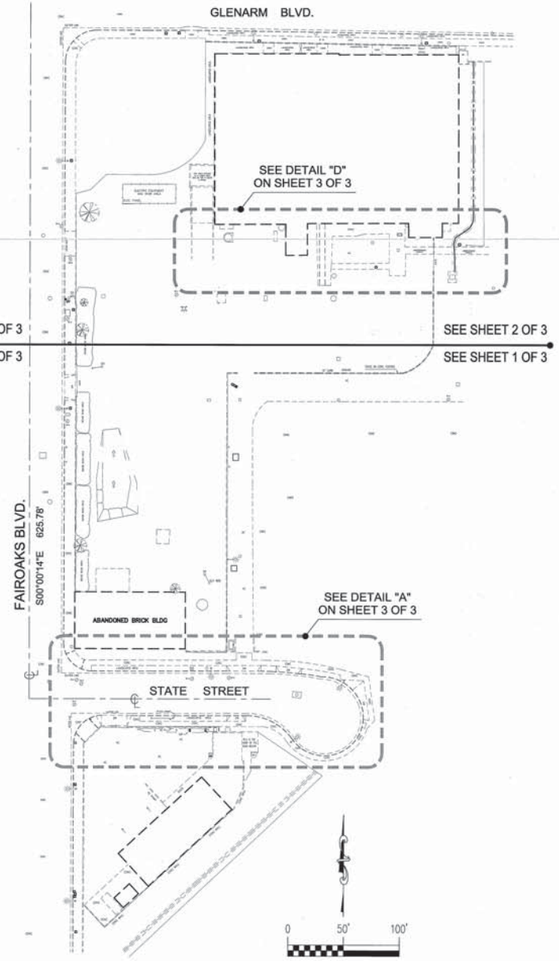
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
TIE POINT DRAWING
GAS TURBINE/AXIAL EXHAUST

JOB NUMBER 123374
REV E
DRAWING NUMBER M1-1-6

# Enclosure 2
# (Not Used)

# Enclosure 3




KEY MAP
SCALE: 1" = 50'

## ABBREVIATIONS

| | |
|---|---|
| AB | = AGGREGATE BASE |
| AC | = ASPHALTIC CONCRETE |
| ACP | = ASBESTOS CEMENT DUCT |
| AP | = ANGLE POINT |
| BC | = BEGINNING CURVE |
| BFP | = BACKFLOW PREVENTER |
| BLDG | = BUILDING |
| BLK | = BLOCK |
| BM | = BENCH MARK |
| BS | = BUS STOP |
| BW | = BACK OF WALK |
| CAB | = CRUSHED AGGREGATE BASE |
| CB | = CATCH BASIN |
| CC | = CONCRETE CURB |
| CF | = CONCRETE |
| C&G | = CURB & GUTTER |
| CI | = CAST IRON |
| CL | = CENTER LINE |
| CLF | = CHAIN LINK FENCE |
| CLR | = CLEAR |
| CMB | = CRUSHED MISCELLANEOUS BASE |
| CO | = CLEAN OUT |
| COL | = COLUMN |
| CONC | = CONCRETE |
| CP | = CONTROL POINT |
| CPCP | = CONCRETE PIPE |
| DC | = DETECTOR CHECK |
| DCL | = DOUBLE CHECK LINED |
| DI | = DUCTILE IRON |
| DWY | = DRIVEWAY |
| E | = ELECTRICAL |
| EC | = END CURVE |
| EG | = EDGE OF GUTTER |
| ELEC | = ELECTRIC |
| EMH | = ELECTRICAL MANHOLE |
| E/O | = EAST OF |
| EP | = EDGE OF PAVEMENT |
| EV | = ELECTRICAL VAULT |
| EX | = EXISTING |
| FAPB | = FIRE ALARM PULL BOX |
| F/E | = FOUND |
| FF | = FINISH FLOOR |
| FG | = FINISH GROUND |
| FH | = FIRE HYDRANT |
| FL | = FLOW LINE |
| FS | = FINISH SURFACE |
| GB | = GRADE BREAK |
| GM | = GAS METER |
| GP | = GUY WIRE SPK. |
| GV | = GAS VALVE |
| HB | = HOSE BIBB |
| HC | = HANDICAP |
| HI | = HIGH |
| HP | = HIGH POINT |
| HVPB | = HIGH VOLTAGE PANEL BOX |
| HVV | = HIGH VOLTAGE CONTROL VALVE |
| INV | = INVERT ELEVATION |
| IP | = IRON PIPE |
| IRM | = IRRIGATION WATER METER |
| LP | = LOW POINT |
| LT. STD. | = LIGHT STANDARD |
| L&R | = LEAD AND RAIL |
| L&T | = LEAD AND TAG |
| MH | = MANH |
| MO | = MOBIL OIL |
| MP | = METAL POST |
| NG | = NATURAL GROUND ELEVATION |
| N/O | = NORTH OF |
| O.H. | = OVERHEAD |
| OHT | = OVERHEAD TELEPHONE LINE |
| OHU | = OVERHEAD UTILITIES (POWER, CABLE, TELEPHONE, ETC) |
| OLC | = ORNAMENTAL LIGHTING CONDUIT |
| PB | = PULL BOX |
| PED. | = PEDESTAL |
| PL | = PROPERTY LINE |
| PM | = PARKING METER POST |
| POB | = POINT OF BEGINNING |
| POC | = POINT OF CONNECTION |
| PCC | = POINT OF COMPOUND CURVE |
| PP | = POWER POLE |
| PS | = PEDESTRIAN SIGNAL |
| PWR | = POWER |
| R | = RIDGE |
| RCE | = REGISTERED CIVIL ENGINEER |
| RCP | = REINFORCED CONCRETE PIPE |
| RCV | = REMOTE CONTROL VALVE |
| R/W | = RIGHT-OF-WAY |
| SCG | = SOUTHERN CALIF. GAS |
| SDMH | = STORM DRAIN MANHOLE |
| SL | = STREET LIGHT |
| SMH | = SEWER MANHOLE |
| SS | = SANITARY SEWER |
| SSS | = UNDERGROUND SEWER LINE |
| ST | = STREET |
| STLT | = STREET LIGHT |
| STA. | = STATION |
| STC | = SEPTIC TANK COVER |
| STD | = STANDARD |
| SWK | = SIDEWALK |
| TBM | = TEMPORARY BENCH MARK |
| TC | = TOP OF CURB |
| TCB | = TOP OF CATCH BASIN |
| TE | = TRASH ENCLOSURE |
| TEL | = TELEPHONE |
| TH | = TOP OF FIRE HYDRANT |
| TG | = TOP OF GRATE ELEVATION |
| TMH | = TELEPHONE MANHOLE |
| TP | = TELEPHONE POLE |
| TS | = TRAFFIC SIGN |
| TSPB | = TRAFFIC SIGNAL PULL BOX |
| TSIG | = TRAFFIC SIGNAL |
| TW | = TOP OF WALL |
| VB | = VENTILATION BOX |
| VCP | = VITRIFIED CLAY PIPE |
| W | = UNDERGROUND WATER LINE |
| WI | = WROUGHT IRON |
| WM | = WATER METER |
| WM | = WATER METER |
| WMH | = WATER MAIN HOLE |
| W/O | = WEST OF |
| WS | = WHEEL STOP |
| WV | = WATER VALVE |
| YD | = YARD |
| YD. LT. | = YARD LIGHT |
| (000.00) | = EXISTING ELEVATION |
| 000.00 | = PROPOSED ELEVATION |
| (000) | = PROPOSED CONTOUR |
| E | = ELECTRICAL |
| FW | = FIRE LINE "WATER" |
| G | = GAS |
| GB | = GRADE BREAK |
| R | = RIDGE |
| RW | = RECLAIMED WATER |
| S | = SEWER |
| SD | = STORM DRAIN |
| T | = TELEPHONE |
| W | = WATER |
| X | = CHAIN LINK FENCE |
| R/W | = RIGHT-OF-WAY |
| P/L | = PROPERTY LINE |
| C/L | = CENTER LINE |
| RW | = REDWOOD HEADER |
| | = BLOCK WALL |

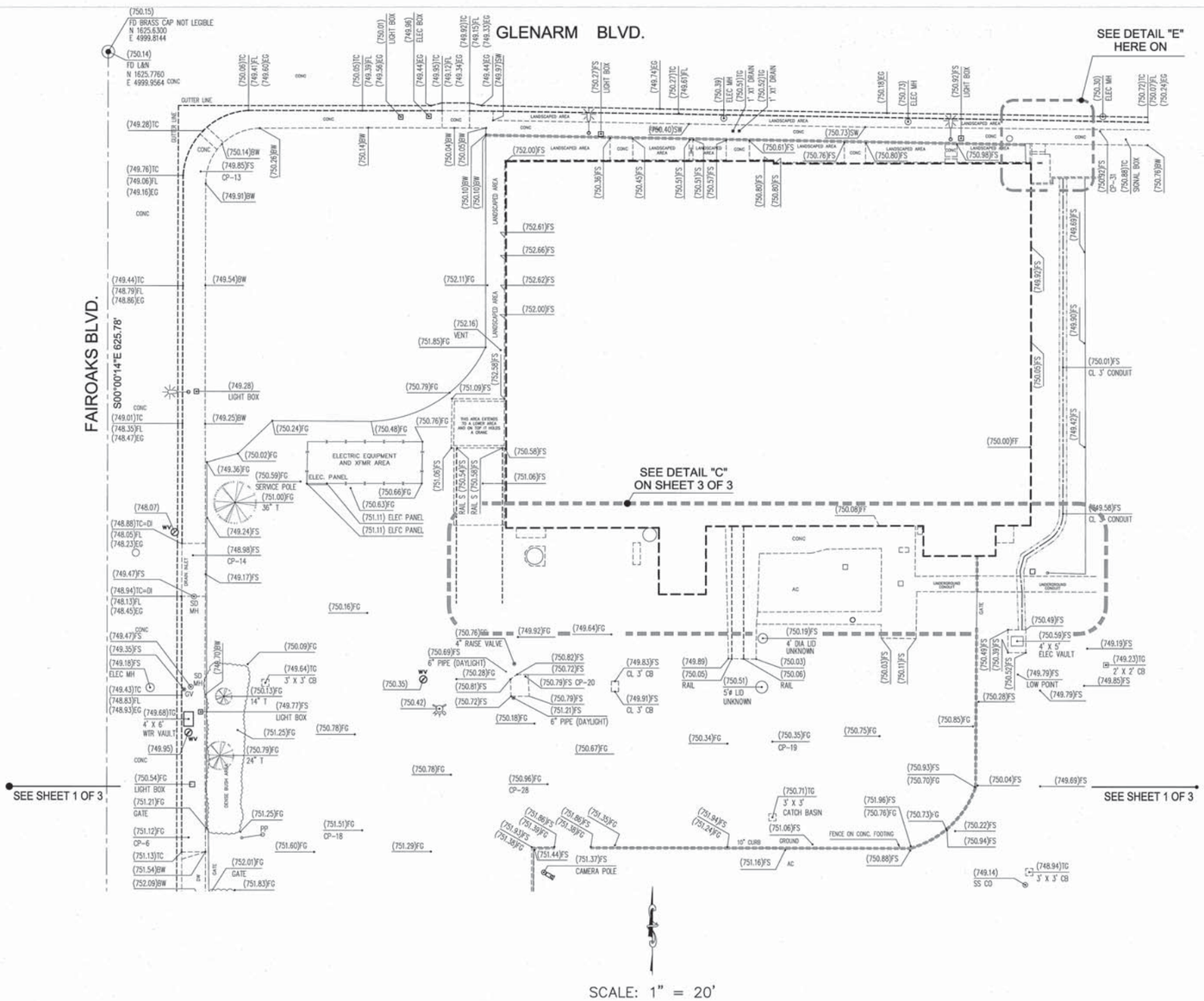
CIVIL ENGINEERING & LAND SURVEYING
COORY ENGINEERING
TEL: (714) 202-8700 FAX: (714) 202-8701
1718 N. NEVILLE STREET, ORANGE, CA 92865

| REVISIONS | | | |
|---|---|---|---|
| NO | DESCRIPTION | BY | APPROVED | DATE |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

# TOPOGRAPHIC SURVEY
## PASADENA GLENARM FACILITY

PASADENA, CA

| | | | |
|---|---|---|---|
| PREPARED FOR: | PASADENA WATER AND POWER | | |
| DRAWN BY: SAS | SCALE: 1" = 20' | SHEET: 1 OF 3 | TP-1 |
| CHECKED BY: SMK | JOB NO: 505-101 | | |
| DISREGARD PRINTS BEARING EARLIER REVISION DATES → | 04-04-11 | | |



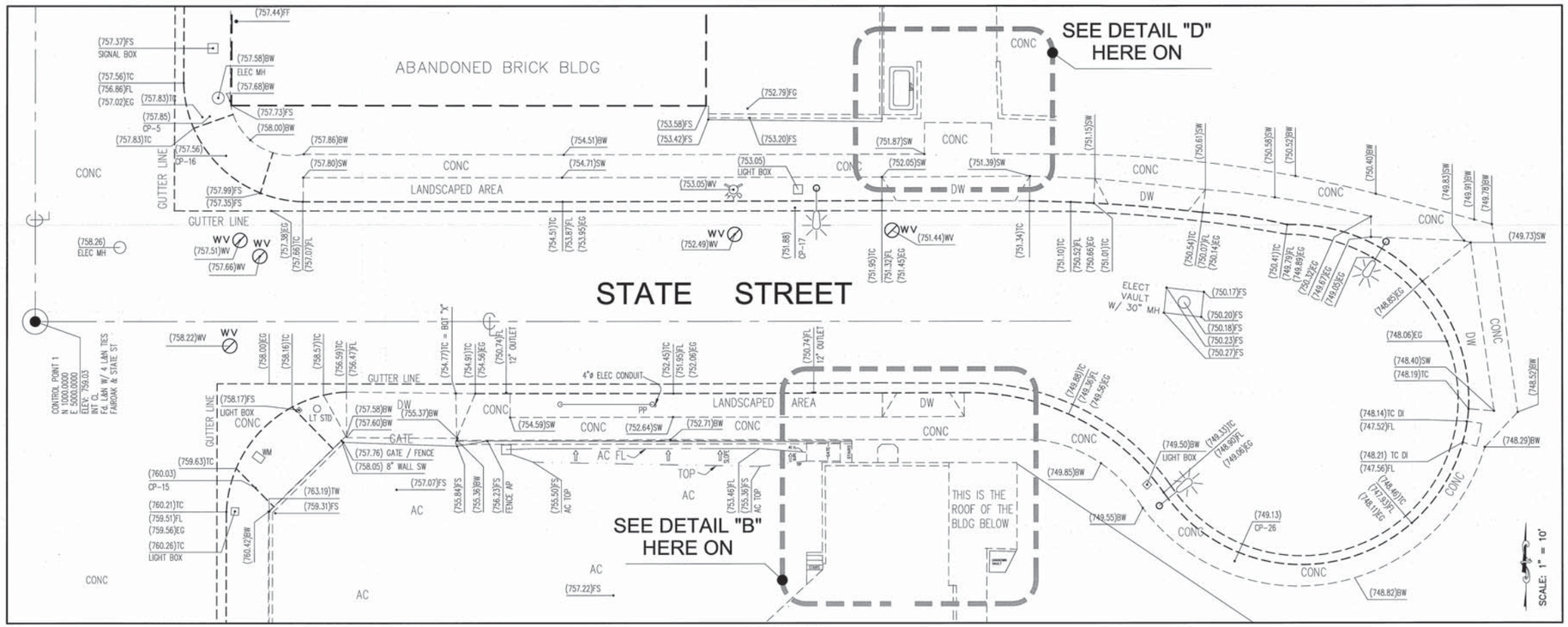

CIVIL ENGINEERING & LAND SURVEYING
COORY ENGINEERING
TEL: (714) 202-8700 FAX: (714) 202-8701
1718 N. NEVILLE STREET, ORANGE, CA 92865

| REVISIONS | | | | |
|---|---|---|---|---|
| NO | DESCRIPTION | BY | APPROVED | DATE |
| | | | | |

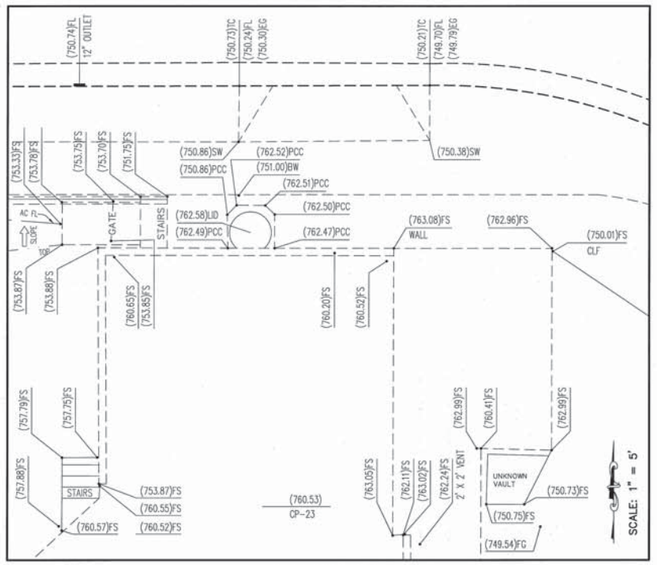
# TOPOGRAPHIC SURVEY
## PASADENA GLENARM FACILITY

PASADENA, CA

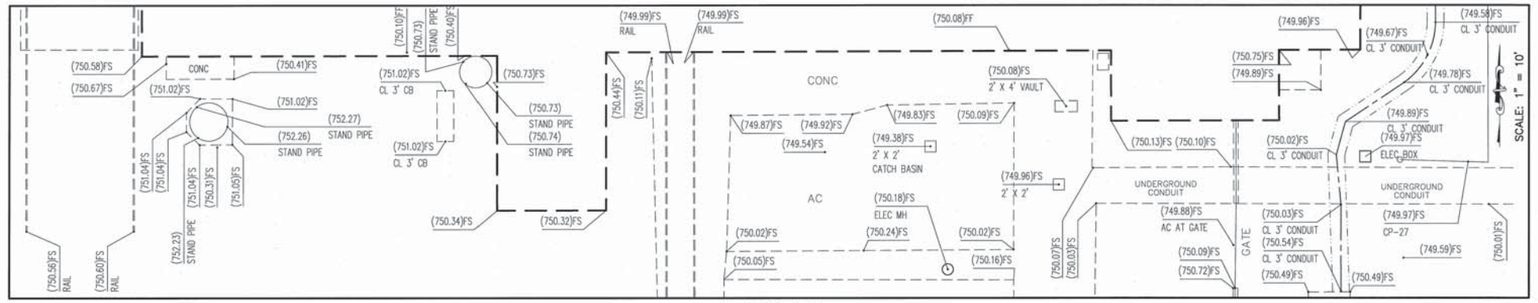
| | | | |
|---|---|---|---|
| PREPARED FOR: | PASADENA WATER AND POWER | | |
| DRAWN BY: SAS | SCALE: 1" = 20' | SHEET: 2 OF 3 | TP-2 |
| CHECKED BY: SMK | JOB NO: 505-101 | | |
| DISREGARD PRINTS BEARING EARLIER REVISION DATES → | 04-04-11 | | |



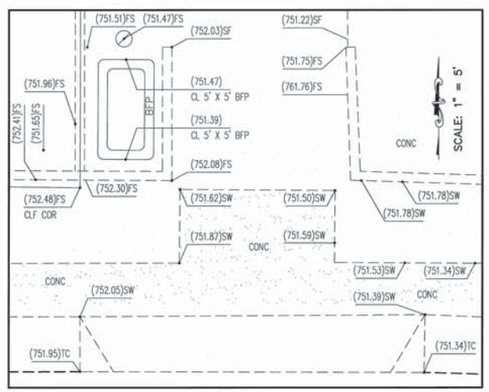

DETAIL "A"
SCALE: 1" = 10'



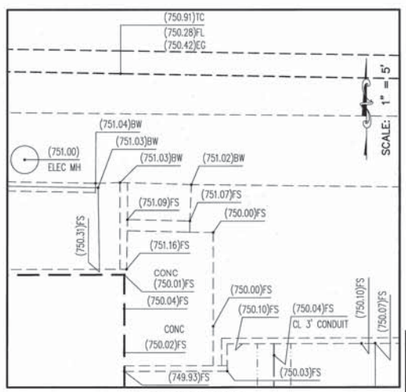

DETAIL "B"
SCALE: 1" = 5'




DETAIL "C"
SCALE: 1" = 10'




DETAIL "D"
SCALE: 1" = 5'




DETAIL "E"
SCALE: 1" = 5'

| REVISIONS | | | | |
|---|---|---|---|---|
| NO | DESCRIPTION | BY | APPROVED | DATE |
| | | | | |

CIVIL ENGINEERING & LAND SURVEYING
COORY ENGINEERING
TEL: (714) 202-8700 FAX: (714) 202-8701
1718 N. NEVILLE STREET, ORANGE, CA 92865

# TOPOGRAPHIC SURVEY
## PASADENA GLENARM FACILITY

PASADENA, CA

| | | | |
|---|---|---|---|
| PREPARED FOR: | PASADENA WATER AND POWER | | |
| DRAWN BY: SAS | SCALE: 1" = 10' | SHEET: 3 OF 3 | TP-3 |
| CHECKED BY: SMK | JOB NO: 505-101 | | |
| DISREGARD PRINTS BEARING EARLIER REVISION DATES → | 04-04-11 | | |

A

## 14. STEAM QUALITY

Deposits on the turbine blading due to steam contamination may bring about thermodynamical and mechanical disturbances. Moreover, if chlorides are involved under certain circumstances blade fractures might occur.
Corrosion depending strain, caused by aggressive deposites, affects above all in the state of commencing steam wetness the alternating bending strength of the blade material.

These recommendations concerning the steam quality are in line with the guide lines for continuous turbine operation issued by the VGB(Vereinigung der Groβkesselbetreiber in Deutschland).

On principle the guide lines should be complied with as far as practicable. The expenses for the relevant water treatment are to be seen in comparison with possible repair and stoppage costs if the turbine suffers damage from contaminated steam.

To avoid misunderstandings we point out that even full compliance with the guide lines does not guarantee absolutely safe a depositfree turbine.
The steam contaminations and their portion of mixture represent the most essential factor as to precipitation, however, this problem is not fully solved up to now. If there is a chance to improve the steam cleanliness in comparison with the guide lines, make use of it.

Guide Lines for inlet steam condensate

| Testing as to | Unit | Guide Lines | |
|---|---|---|---|
| | | Continuous Operation +) | Start-up Operation ++) |
| Conductivity at 25℃ for $CO_2$-free waters | μS/cm | ≦ 0.2 | < 0.5 |
| Silica ($SiO_2$) | p.p.m | < 0.02 | < 0.05 |
| Total-iron (Fe) | p.p.m | < 0.02 | < 0.05 |
| Copper (Cu) | p.p.m | < 0.003 | < 0.01 |
| Sodium + Potassium (Na) (K) | p.p.m | < 0.01 | < 0.02 |

+) The values are in line with the VGB-guide lines, edition April 1972. As to further details and descriptions see also there.

++) A falling tendency must be noticeable. On commissioning of new plants the values for continuous operation must be achieved after two days and the values for for start-up operation after two hours. Routine commissioning requires full compliance with the start-up values at the point of roll-off whereas the continuous operation values must be attained after 2 hours.

Supervision

Continuous monitoring of the water/steam system by means of recording instruments is recommended for the electrical conductivity at 25℃ and for the Silica content. The monitoring instruments should be provided on the inlet steam or on the exhaust steam side.

# ENGINEERING SPECIFICATION

## Feedwater Quality Requirements for Superheated Steam Applications

SPECIFICATION NO. ES-1000 REVISION 09

simply generates more profit

Innovative Steam Technologies
549 Conestoga Blvd.
Cambridge, ON
Canada N1R 7P4

An AECON Company

P: +1.519.740.0036
F: +1.519.740.2051
www.otsg.com

# Revision Page

| Revision Number | Description of Revision | Developed By | Approved By | Approval Date |
|---|---|---|---|---|
| 01 | General Revision | -------- | -------- | Sept 11/96 |
| 02 | General Revision | -------- | -------- | Sept 23/96 |
| 03 | Updated address to Conestoga Blvd | -------- | -------- | Nov 13/00 |
| 04 | Revision of entire specification | -------- | -------- | April 3/02 |
| 05 | Revision of oxygen levels<br>Added Notes to Table 1 and Table 2 | -------- | -------- | Sept 17/02 |
| 06 | Added note (7) following cycle chemistry limits regarding pH values | -------- | -------- | Nov 20/02 |
| 07 | Table 1.0, 2.0, Note (3) for Tables 1.0 and 2.0, Section 2.2 | AB | JM | Aug 8/03 |
| 08 | Format change update to new logo/font | SV | | March 5/07 |
| 09 | Removed specific conductivity | JM | CK | July 22/11 |
| | | | | |

# Table of Contents

1.0 INTRODUCTION ..... 2
1.1 BACKGROUND ..... 2
1.2 TREATMENT OPTIONS ..... 2
1.3 MAKEUP AND CONDENSATE RETURN TREATMENT ..... 3
1.4 DEMINERALIZER AND POLISHER ..... 3
1.5 ORGANIC COMPOUNDS ..... 3
1.6 CONTROL PARAMETERS ..... 3
1.7 CHEMICAL FEED POINTS ..... 4
1.8 SAMPLE POINTS ..... 4
2.0 CONTROL PARAMETERS AND LIMITS ..... 4
2.1 CYCLE CHEMISTRY LIMITS ..... 4
2.2 ACTION LEVELS ..... 8
2.3 CORRECTIVE ACTIONS ..... 8

# 1.0 INTRODUCTION

## 1.1 Background

This specification details the requirements of feedwater quality for Innovative Steam Technologies Once Through Steam Generators (OTSG's) producing superheated steam. Deviations from the limits and requirements must have specific written approval from Innovative Steam Technologies.

This specification addresses the following:
- all-volatile treatment (AVT) for applications with and without copper alloys in the pre-boiler and steam user systems
- oxygenated treatment for applications with all ferrous (no copper) pre-boiler systems

The technical criteria for formulating these guidelines includes:
- Avoidance of scale formation in the OTSG. Solids (dissolved or suspended) which are carried into the OTSG are either deposited in the tubing or carried through as a solid or vapour into the dry out zone where deposition may occur. Deposits may restrict flow as well as heat transfer and potentially act as corrosion sites.
- Suspended solids could end up plugging the stabilization orifices, which would restrict the flow to individual circuits.
- Prevention of corrosion and deposition in the OTSG. If necessary, more stringent limits can be used based on the requirements for other components in the system, which may be more sensitive to impurities.
- Generation of high purity steam

This specification is not a substitute for complete cycle chemistry guidelines, which should include monitoring of additional cycle streams as required. Successful implementation of this specification requires proper training of operators and is the responsibility of the owner.

## 1.2 Treatment Options

In once-through boilers, there are only two available options for water treatment, all volatile treatment (AVT) and oxygenated treatment (OT). Both treatments are feedwater treatments.

If copper alloys are used, OT cannot be used because the presence of oxygen accelerates copper alloy corrosion. If polishers are not to be used, or copper is present in the pre-boiler cycle, then AVT is the only option. With polishers and all ferrous pre-boiler metallurgy, either AVT or OT can be used.

Some of the chemicals referred to in this specification are hazardous to human health and/or environment and should be handled with care.

All-Volatile Treatment (AVT) is used to minimize corrosion and erosion corrosion in the pre-boiler system by using deaerated high purity water with an elevated pH. The pH elevation is achieved by the addition of ammonia. The target range for pH depends upon the metallurgy of the pre-boiler system (all-ferrous or Fe-Cu mixed). The oxygen concentration in the feedwater is reduced using an oxygen scavenger, such as hydrazine or carbohydrazide. The result of AVT treatment is a layer of magnetite ($Fe_3O_4$) on all steel surfaces which protects the metal from corrosion.

Oxygenated Treatment (OT) uses oxygenated high purity water to minimize corrosion and erosion-corrosion in the pre-boiler system. Oxygen, hydrogen peroxide, or air is injected into the feedwater to achieve an oxidizing environment. The pH is adjusted using ammonia, but the target pH range is lower than in AVT. IST has no operating experience to date with oxygenated treatment and as such IST has not

provided recommended feedwater limits for OT.

1.3 Makeup and Condensate Return Treatment

Raw water used for makeup contains impurities that must be removed before the water enters the OTSG. The extent of makeup water purification is system dependent (dependent on makeup rate) and site specific (dependent on raw water quality).

Condensate return water may contain impurities that must be removed before the water enters the OTSG. The extent of purification is system dependent (dependent on where steam is being used and how it is being contaminated).

1.4 Demineralizer and Polisher

The production of good quality feedwater is usually a function of a makeup demineralizer and a condensate polisher, although depending on system requirements, one of these items can sometimes be eliminated. Where demineralizer or polisher requirements are minimal, replacement resin bottles can minimize system capital and operating costs. This can eliminate the need for onsite acid and caustic facilities used for regeneration.

1.5 Organic Compounds

Precautions must be taken to eliminate organics prior to the water reaching the boiler since they can break down to acid type compounds at boiler operating temperatures. These acids can be harmful to the tubing of the OTSG and may have a negative affect on the feedwater treatment system resins.

Corrosion and flow-accelerated corrosion effects and removal of harmful decomposition products must be considered when selecting the type of feedwater treatment and the water treatment chemicals. Use of organic feedwater treatment chemicals (amines and oxygen scavengers) needs to be thoroughly evaluated concerning their decomposition, monitoring, analytical interferences, and toxicity.

Amines are not recommended for control of feedwater pH. They thermally decompose in the boiler and the steam circuits, forming organic acids, carbon dioxide, ammonia, and other decomposition products. This also happens to oxygen scavengers other than hydrazine. The harmful effects of some of the decomposition products may be reduced when condensate polishers are used. Hydrazine or carbohydrazide can be used for oxygen scavenging. Hydrazine is preferred since carbohydrazide decomposes forming acid species making it difficult to meet cation conductivity limits.

1.6 Control Parameters

The most important control parameter for the IST OTSG proper is feedwater cation conductivity. Dissolved oxygen and pH are to be continuously monitored to control corrosion in the pre-boiler system. Conductivity measurement is recommended because there is a direct correlation between dissolved solids and conductivity. The purpose of the cation conductivity measurement is to remove the masking effect of the ammonia/amines and its derivatives, in the water. Specific conductivity is not recommended and is not addressed in this specification.

ORP (oxidation reduction potential) is a method of grading a solution as oxidizing or reducing. The ORP value is a direct reading of the activity of the oxidizing and reducing agents in the water as they correspond to oxidation-reduction reactions. The oxidation-reduction reaction is an electrochemical process in which metal atoms are oxidized to form positive ions (cations) while other chemical species ($O_2$, $H_2O$, H+ and other cations) are reduced. This results in a flow of electrons from one site on the metal surface to another. For example, if the ORP is negative, a reducing environment exists that can reduce or eliminate a protective layer of magnetite.

Steam and feedwater conductivity measurements are both required to alert the operator of any components breaking down in the OTSG.

### 1.7 Chemical Feed Points

The chemical feed points for ammonia and the oxygen scavenger should be after the condensate polishers, since these compounds can be removed by the polisher. However, if the polishers are operated in the ammonia form, the ammonia addition can be at the exit of the condensate pumps. If there is a deaerator in the pre-boiler system, the best location to add the oxygen scavenger is into the drop leg of the deaerator. This allows a greater residence time of the scavenger in the feedwater, increasing its effectiveness.

### 1.8 Sample Points

To monitor the OTSG, it is recommended that sample points be located on the feedwater piping at the OTSG inlet and on the steam piping at the exit of the OTSG, after attemperating sprays (if installed). In cycles with reheat, hot reheat steam can be monitored instead.

It has been shown that for sampling of superheated steam, an isokinetic sampling nozzle is needed. Multi-port nozzles which are installed in the superheated steam piping are not isokinetic and do not give a representative sample. The same isokinetic sampling is needed when sampling feedwater for suspended oxides (Fe, Cu oxides) to ensure a representative sample.

When sampling cation conductivity a calibration check of the measuring instrument should be made using a standard solution of known value. If the reading is high, the measurement probe may need replacing.

## 2.0 CONTROL PARAMETERS AND LIMITS

### 2.1 Cycle Chemistry Limits

The rationale for determination of the cycle chemistry limits for these guidelines is based on the requirements for the OTSG. If necessary, more stringent limits can be used based on the requirements for other components in the system, which may be more sensitive to impurities.

The control limits to be used during normal operation are shown in Tables 1 and 2 for units on AVT. Oxygenated treatment (OT) is presently under investigation and limits have not been provided. These tables also include recommended monitoring frequencies and action levels, which allow exceeding the normal limits for short durations.

| Parameter | | Monitoring Frequency | Target Value | Action Level 1 | Action Level 2 | Action Level 3 | Action Level 4 |
|---|---|---|---|---|---|---|---|
| pH (see Note 7) | All ferrous | C | 9.3 to 9.6 | <9.3 or >9.6 | - | - | - |
| | All stainless | C | 8.0 to 8.5 | <8.0 or >8.5 | - | - | - |
| | Mixed Fe-Cu | C | 8.8 to 9.1 | <8.8 or >9.1 | - | - | - |
| Water Cation Conductivity (µS/cm) | | C | < 0.25 | 0.25 to 0.45 | >0.45 to 0.85 | >0.85 to 1.0 | > 1.0 |
| Steam Cation Conductivity (µS/cm) | | W | < 0.25 | 0.25 to 0.45 | >0.45 to 0.85 | >0.85 to 1.0 | >1.0 |
| ORP (mV) | All ferrous | T | 0 to +100 | - | - | - | - |
| | Mixed Fe-Cu | T | -350 to -300 | - | - | - | - |
| Hydrazine (ppb) | All ferrous | T | 0 to 10 | > 10 | - | - | - |
| | Mixed Fe-Cu | T | < 20 | > 20 | - | - | - |
| Dissolved Oxygen (ppb) (see Notes 5 and 6) | All ferrous | C | < 7 | > 7 | - | - | - |
| | All stainless (Water Temp ≤ 50 C)<br>(Water Temp ≤ 100 C) | C<br>C | < 800<br>< 300 | > 800<br>> 300 | -<br>- | -<br>- | -<br>- |
| | Mixed Fe-Cu | C | < 5 | > 5 | - | - | - |
| Sodium (ppb) | | W | < 6 | 6 to 12 | >12 to 24 | > 24 to 30 | > 30 |
| Chloride (Organic and inorganic) (ppb) | | T | < 6 | 6 to 12 | >12 to 24 | > 24 to 30 | > 30 |
| Sulfate (Organic and Inorganic) (ppb) | | T | < 6 | 6 to 12 | >12 to 24 | > 24 to 30 | > 30 |
| Silica (ppb) | | D | < 20 | 20 to 40 | >40 to 80 | > 80 to 100 | > 100 |
| Iron (ppb) | | W | < 10 | 10 – 20 | >20 to 40 | > 40 to 50 | > 50 |
| Copper (ppb) | | W | < 2 | 2 to 4 | >4 to 8 | > 8 to 10 | > 10 |
| Total Organic Carbon (TOC) (ppb) | | W | < 100 | > 100 | - | - | - |
| Hardness (ppb) | | T | < 1 | > 1 | - | - | - |
| Suspended Solids (ppb) (see Note 4) | | T | Not detectable | - | - | - | - |

* Nomenclature and notes follow Table 2. Action levels are given in Section 2.2.

Table 1.0 - All volatile Treatment (AVT) without Reheat

| Parameter | Monitoring Frequency | Target Value | Action Level 1 | Action Level 2 | Action Level 3 | Action Level 4 |
|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| pH (see Note 7) | All ferrous | C | 9.3 to 9.6 | <9.3 or > 9.6 | - | - | - |
| | All stainless | C | 8.0 to 8.5 | <8.0 or >8.5 | - | - | - |
| | Mixed Fe-Cu | C | 8.8 to 9.1 | <8.8 or >9.1 | - | - | - |
| Water Cation Conductivity (µS/cm) | | C | < 0.15 | 0.15 to 0.25 | 0.25 to 0.45 | >0.45 to 0.5 | >0.5 |
| Steam Cation Conductivity (µS/cm) | | W | < 0.15 | 0.15 to 0.25 | 0.25 to 0.45 | >0.45 to 0.5 | >0.5 |
| ORP (mV) | All ferrous | T | 0 to +100 | - | - | - | - |
| | Mixed Fe-Cu | T | -350 to -300 | - | - | - | - |
| Hydrazine (ppb) | All ferrous | T | 0 to 10 | > 10 | - | - | - |
| | Mixed Fe-Cu | T | < 20 | > 20 | - | - | - |
| Dissolved Oxygen (ppb) (see Notes 5 and 6) | All ferrous | C | < 7 | > 7 | - | - | - |
| | All stainless (Water Temp ≤ 50 C) | C | < 800 | > 800 | - | - | - |
| | (Water Temp ≤ 100 C) | C | < 300 | > 300 | - | - | - |
| | Mixed Fe-Cu | C | < 5 | > 5 | - | - | - |
| Sodium (ppb) | | W | < 3 | 3 to 6 | 6 to 12 | > 12 to 15 | >15 |
| Chloride (organic and inorganic) (ppb) | | T | < 3 | 3 to 6 | 6 to 12 | > 12 to 15 | >15 |
| Sulfate (organic and inorganic) (ppb) | | T | < 3 | 3 to 6 | 6 to 12 | > 12 to 15 | >15 |
| Silica (ppb) | | D | < 10 | 10 to 20 | 20 to 40 | > 40 to 50 | >50 |
| Iron (ppb) | | W | < 10 | 10 to 20 | 20 to 40 | > 40 to 50 | >50 |
| Copper (ppb) | | W | < 2 | 2 to 4 | 4 to 8 | > 8 to 10 | >10 |
| Total Organic Carbon (TOC) (ppb) | | W | < 100 | > 100 | - | - | - |
| Hardness (ppb) | | T | < 1 | > 1 | - | - | - |
| Suspended Solids (see Note 4) | | T | Not detectable | -- | - | - | - |

* Nomenclature and notes follow Table 2. Action levels are given in Section 2.2.

Table 2.0 - All-volatile Treatment (AVT) with Reheat

Nomenclature:

C = continuous
D = grab sample, once per day
W = grab sample, once per week
T = troubleshooting and commissioning

Notes (Table 1 and Table 2):

1) Conductivity and pH measured at 25°C.
2) Grab samples are to be more frequent during startup. Grab samples should be once per day until benchmark levels are obtained.
3) In start-up situations feedwater must be circulated to reduce the dissolved material and suspended particles and should not be introduced into the OTSG until the cation conductivity is below 1.0 µS/cm (or 0.27 µS/cm for specific conductivity)
4) Suspended solids must be prevented to avoid clogging of feedwater orifices. Suspended solids is commonly measured by examining the undissolved material trapped on a 0.45 micrometer filter after filtration. Material that passes through is referred to as dissolved solids.
5) IST can review the allowable oxygen levels for feedwater temperatures less than 50°C.
6) IST can review the allowable oxygen levels for systems with feedwater piping fabricated from stabilized stainless steel material (i.e. 347SS, 321SS etc.).
7) The recommended pH value for all stainless metallurgy is based on achieving improved condensate polisher performance. The pH values recommended for all ferrous metallurgy (i.e. 9.3 to 9.6) are also acceptable for all stainless metallurgy. The pH values recommended for all ferrous metallurgy (i.e. 9.3 to 9.6) should be used for a system with both ferrous and stainless metallurgy.

## 2.2 Action Levels

Operation at the lowest achievable impurity levels, with the shortest and least frequent excursions, is the most desirable mode of operation. The probability of corrosion damage and deposit formation grows significantly with increasing impurity concentration, and the damage is proportional to the exposure time. When corrosive impurities concentrate on metal surfaces, the breakdown of passivity (damage to the protective oxide layer) occurs within a few minutes to several hours.

To give more flexibility in the water and steam chemistry control, particularly during startups, three action levels are recommended. The target values for Action Levels 1, 2, and 3 were established to allow for and provide guidance during transient or abnormal operating conditions. If the problem is not corrected within the time allotted to each action level, the next higher action level takes effect.

Normal - Values are consistent with long-term system reliability. A safety margin has been provided to avoid concentration of contaminants at surfaces.

Action Level 1 - There is potential for the accumulation of contaminants and corrosion. Normal Limit can be exceeded for one week with the total yearly accumulation of two weeks. If the time allotted is exceeded an orderly shutdown should occur.

Action Level 2 - The accumulation of impurities and corrosion will occur. Operation is limited to 24 hours with the total yearly accumulation of 48 hours. If the time allotted is exceeded an orderly shutdown should occur.

Action Level 3 - The accumulation of impurities and corrosion will occur very quickly. Operation is limited to 4 hours maximum with the total yearly accumulation of 8 hours. Damage to the OTSG can occur when operating in this condition and immediate action is required to return the feedwater to the target value.

During excursions, when the impurity concentration increases sharply, the accumulation of impurities in the cycle occurs quickly, but the subsequent cleanup upon return to good chemistry may take weeks. Therefore, yearly time accumulations were also established as a guide. If the unit is shutdown due to water or steam chemistry (i.e. a major condenser leak), it should be an orderly shutdown, not a trip.

Action Level 4 – Impurity levels are too high and severe damage may occur to the OTSG. Immediate orderly shutdown of the OTSG is recommended.

## 2.3 Corrective Actions

Typical corrective actions to respond to out-of-specification steam and/or water chemistry conditions are listed in this Section. These corrective actions are not meant to be all-inclusive or universally applicable. Each utility and/or plant should establish plant-specific corrective actions that consider plant design features and other plant-specific concerns. Successful implementation of this specification requires proper training of operators and is the responsibility of the owner. ONLY AFTER DETERMINING THE ROOT CAUSES OF AN EXCURSION CAN A PERMANENT SOLUTION BE SELECTED.

The action to be taken to confirm and correct water and the time to confirm and correct a water chemistry upset depends on the severity of the chemical excursion. On-line and grab sample analysis data must be used to determine the source(s) of ingress of various impurities. Possible causes of feedwater chemistry excursions are described below. Corrective actions for each monitored parameter are listed below

# Jumper Tube Installation Proposal

| | |
|---|---|
| Date: | November 27, 2013 |
| Customer Reference: | Glenarm Repowering – Jumper tube installation |
| IST Reference: | P12079-00 Jumper Tubes |

To the BOP contractor bidding the construction of the Glenarm Repowering Project:

The following estimate is based on working a 6 x 10-hr/dy workweek Monday through Saturday, with Sunday as a scheduled off-day. Two (2) travel days (one in & one out) have also been included for all three (3) IST personnel. If additional weekend work or overtime is required, additional charges will be invoiced per the IST standard rate sheet, based on the approved signed time sheets from site. No stat-holiday period work time has been accounted for in this quotation. Any unforeseeable circumstances beyond our control causing delays will be charged based on the standard rate sheet, in accordance with the signed timesheets.

No allowance has been given for time on site for hydrostatic testing after the jumper tube welding is completed, as the external pipe welding to each unit cannot commence until after the tube welding is completed. Therefore it is presumed that this testing will be performed at a later date. IST representation for the witness of the final Sect-1 hydrostatic test that includes the boiler external piping is presumed to be performed at a later visit (which is not included in this pricing). Test plugs for steam and feedwater headers can be made available for shipment with the tools, and a pneumatic test can be performed on the site jumper welds prior to IST personnel's departure from site.



Innovative Steam Technologies
549 Conestoga Blvd.
Cambridge, ON
Canada N1R 7P4

An AECON Company

P: +1.519.740.0036
F: +1.519.740.2051
www.otsg.com

IST field service scope included in this proposal:

- Removal and reinstatement (if required) of any restraint assemblies, end-seal floors, or other OTSG components necessary to provide access to the press-part working area.
- Installation and welding of (41) jumper tube assemblies per OTSG Unit, totaling 123 x 1.25"-diameter welds, and 41 x ½"-diameter welds per boiler. All tube welding will be performed using an automatic 'tig' orbital welding process.
- Installation of 41-each per boiler, packing-gland seal bushings at the lower SCR catalyst rear floor jumper-tube penetrations.
- Engineering and administration time for the implementation of the above scope.
- All IST personnel travel & labour time, air & ground transportation costs, and subsistence for two weeks.
- Packing and shipment (return) of tools and equipment to implement the installation.
- Consumables, excluding argon gas.
- Preparation of job Quality Package including ASME Section I Data Report Forms, for submission and review by the local Authorized Inspector in the jurisdiction.

IST personnel will come prepared with all the tools necessary to execute the internal jumper tube pressure-part work, but will require some logistical support from the customer and their contractor personnel during the execution. To clarify responsibilities required by the customer / contractor for support provisions, please note the following:

Customer's Scope:

In order to accomplish the necessary tasks it will be necessary for the customer to provide the following:

1. Provision of electric power for IST portable transformers requiring 480V, 30 Amp service to support operation of orbital welding units and electric tools.
2. Electrician for initial hook up and disconnect. (3 hrs total est'd)
3. Provision of compressed air for use of hand operated pneumatic milling tools.
4. Provision of argon gas; estimated requirement is (1) x 12 bottle - manifold pack, plus four (4) individual loose bottles of 2300 psi argon per boiler.
5. Availability of a propane tank (if req'd), in the event feedwater header lines require to be tag torched dry, if evidence of moisture is apparent.
6. Site safety induction of IST personnel.
7. Designated dry laydown area for IST tool crate in close proximity to the OTSG's (preferably beneath the inlet plenum).
8. Disposal container for miscellaneous refuse (if req'd).
9. Provision of air quality testing for confined space prior to access into unit.
10. Provision of safety door watch personnel throughout the work period.
11. Provision of (2) x supplemental workers (boilermaker or similar trades designation) for support setting-up equipment and providing mechanical/trades support throughout the job as the need dictates.
12. Access to lunchroom and toilette facilities for on-site personnel.
13. Provision of off-loading capabilities for equipment arriving at site.
14. Provision of scaffolding/platforms as required for access to all internal working area levels where orbital welding is to be completed.
15. Provision of external scaffolding access at feedwater inlet box if platform access is not in place. This is required to access the HP feedwater inlet header and flex tubes.
16. All rear internal joint kits in the proximity of the jumper tube installation must be in place prior to the welding technicians arrival on site.
17. Provision of on-site permits and safe lock-out of any relevant equipment.

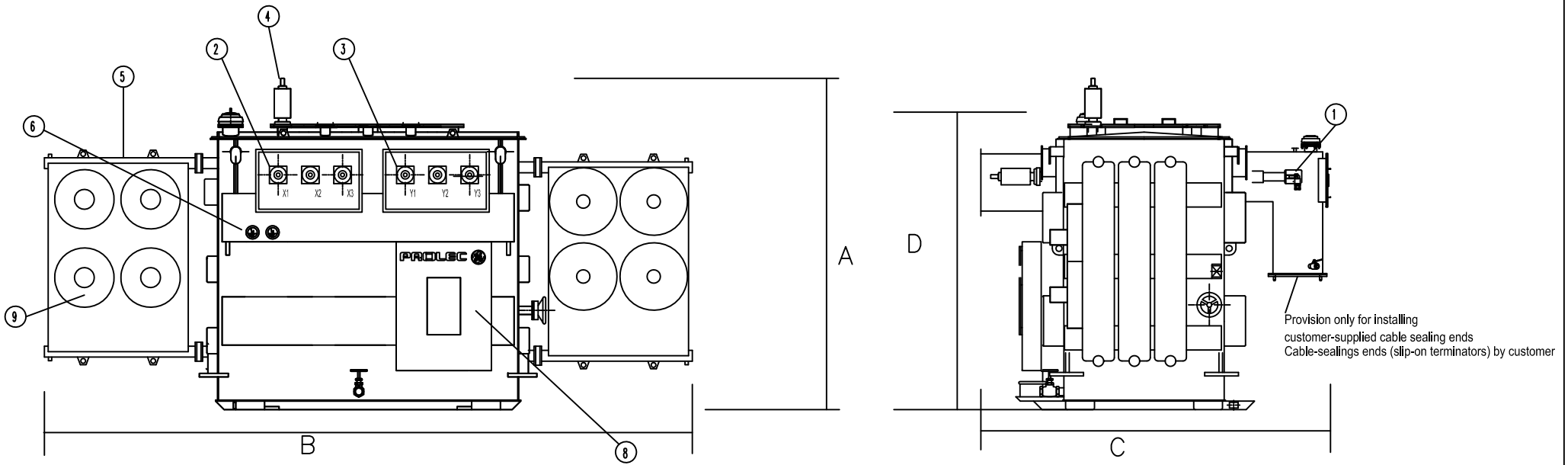
For hydrostatic testing activities at a later point in time, and not included in this price, following the completion of jumper-tube welding and boiler external piping, the customer / contractor will be responsible for the following:

a) Supply of ample demineralized water and pressurizing equipment to perform a hydrostatic test of the steam generator(s) once installation is complete.
b) Any temporary boiler internal propane heating (if req'd-seasonal), to raise feedwater and tubing temperature to the acceptable code level of 21°C.
c) Coordination with and contracting of local AI in the jurisdiction.

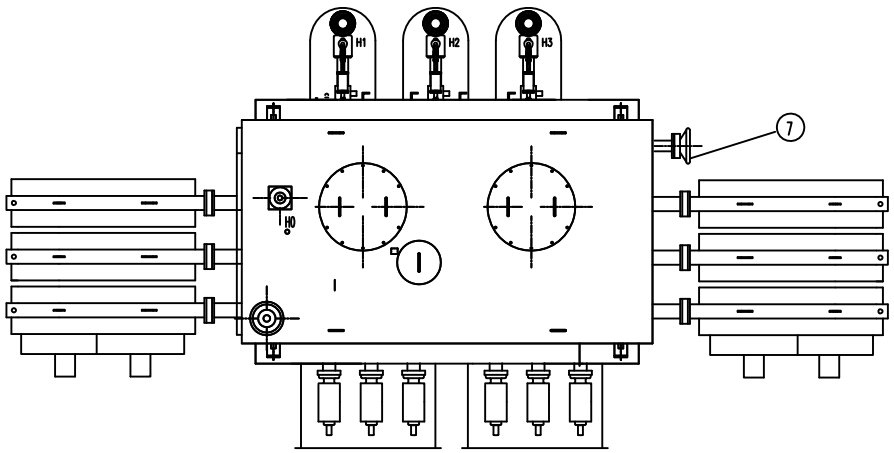
**Estimated cost for the above work is $75,000 CAD**

Best Regards,

Richard Welk,
Field Service Technical Advisor




1.- H. V. BUSHINGS "H"
2.- L. V. BUSHINGS "X"
3.- L. V. BUSHINGS "Y"
4.- NEUTRAL BUSHING
5.- RADIATORS
6.- INSTRUMENTS
7.- NO LOAD TAP CHANGER
8.- CONTROL CABINET
9.- FANS (IF SUPPLY)




NOTE: THIS DRAWING IS A PRELIMINARY PROPOSAL AND DOES NOT INDICATE THE EXACT DETAILS OF CONSTRUCTION, ARRANGEMENT OF ACCESSORIES OR THE FINAL DIMENSIONS OF THE TRANSFORMER. THIS INFORMATION SHOULD NOT BE USED FOR FINAL CONSTRUCTION ARRANGEMENTS OR FOR THE FOUNDATION UNLESS SPECIFICALLY APPROVED BY THE FACTORY. ALL DIMENSIONS AND WEIGHTS ARE APPROXIMATE

PROLEC

Drawing:
No. 221732C1

PROLEC *ISO 9001 CERTIFIED*

Form 3.2.1-D Rev. 0

## TECHNICAL PROPOSAL INFORMATION

Customer: ***GE AERO*** Date: **08/20/13**

Proposal No: **131-03751** Spec No: **SECTION 261200** Item No: **2217321/D**

| RATING | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | Transformer | Class | H Winding | | X Winding | | Y Winding | |
| Phase | 3 | | 34.5 Wye | kV | 13.8 Delta | kV | 13.8 Delta | kV |
| Hertz | 60 | KNAN | 57,000 | KVA | 45,000 | KVA | 12,000 | KVA |
| Temp Rise | 65 °C | KNAF | 76,000 | KVA | 60,000 | KVA | 16,000 | KVA |
| Insul Liquid | FR-3 | KNAF | 95,000 | KVA | 75,000 | KVA | 20,000 | KVA |
| | | - | - | KVA | - | KVA | - | KVA |

| ADDITIONAL TAP VOLTAGES | | |
|---|---|---|
| H Winding (Kv) | - | DETC |
| X Winding (Kv) | - | - |
| Y Winding (Kv) | - | |

| CONNECTIONS FOR OPERATION | | | | | | |
|---|---|---|---|---|---|---|
| Transformers in Bank | To Transformer From | Phase | Connected | To Transformer To | Phase | Connected |
| - | - | - | - | - | - | - |

| PERFORMANCE BASED ON A LOADING OF | | | | | DIELECTRIC TESTS | | | | INSULATION LEVELS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | ITEMS | Basic Lightning Impulse (kV) | |
| | | | | | | | | | | Winding | Bushing |
| H Winding | 34.5 | kV | 57.0 | MVA | Applied Voltage | H Winding | 50 | kV | H Line | 200 | 200 |
| X Winding | 13.8 | kV | 45.0 | MVA | (To other wind- | X Winding | 34 | kV | H neutral | 150 | 150 |
| Y Winding | 13.8 | kV | 12.0 | MVA | ing and ground) | Y Winding | 34 | kV | X line | 110 | 110 |
| - | - | - | - | - | Induced | 7200 cycles | 69 | kV | Y line | 110 | 110 |
| - | - | - | - | - | Voltage | - | - | kV | - | - | - |

PERFORMANCE DATA, Based on **85** °C Reference Temperature, **57** MVA Altitude: **1000** Mts.

| Losses and Exciting Current | | | | Regulation Approximate | |
|---|---|---|---|---|---|
| Excitation | % Ex | No Load Kw (20°C) | Total Loss Kw | Power Factor | % Regulation |
| 100% | 0.355 | 36 | 253 | 0.80 | 8.387 |
| 110% | 0.512 | 47 * | 264 * | 1.0 | 1.181 |
| - | - | * Not Guaranteed | | - | - |

| AUXILIARY (COOLING) LOSSES | | | |
|---|---|---|---|
| Transformer KVA | | Class | KWatts Loss |
| 57,000 | - | KNAN | 0.0 |
| 76,000 | - | KNAF | 2.5 |
| 95,000 | - | KNAF | 5.0 |
| - | - | - | - |
| - | - | - | - |
| Average Sound Level | | 76/78/79 dB | ONAN/ONAF/ONAF |

| PERCENT IMPEDANCE VOLTS | | | | | |
|---|---|---|---|---|---|
| % IZ | Between Windings | At kVA | % IZ Zero | Between Windings | At kVA |
| 12.66 | H-X | 57,000 | - | - | - |
| 47.5* | H-Y | 57,000 | - | - | - |
| 35.1* | X-Y | 57,000 | - | - | - |

* APPROXIMATE ONLY, NOT GUARANTEED

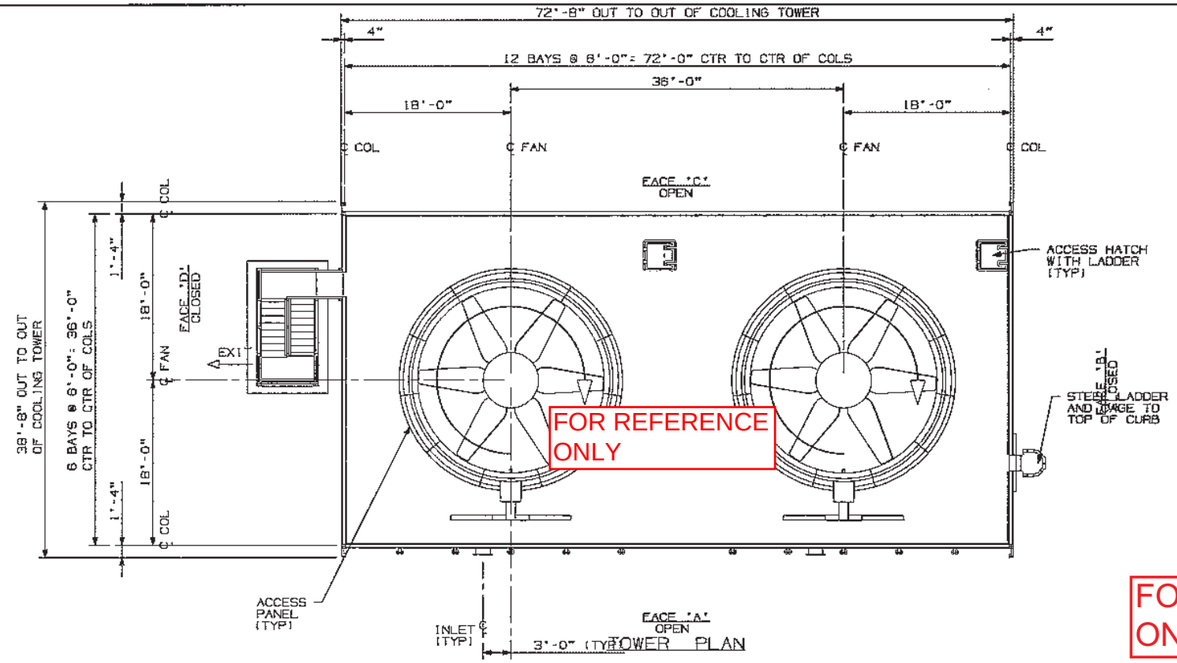
| EFFICIENCIES ( p.f = 1 ) AT 57 MVA | | | | |
|---|---|---|---|---|
| Load | Full Load | 3/4 Load | 1/2 Load | 1/4 Load |
| % | 99.558 | 99.632 | 99.684 | 99.653 |

## MECHANICAL DATA
### Not for Construction Purposes

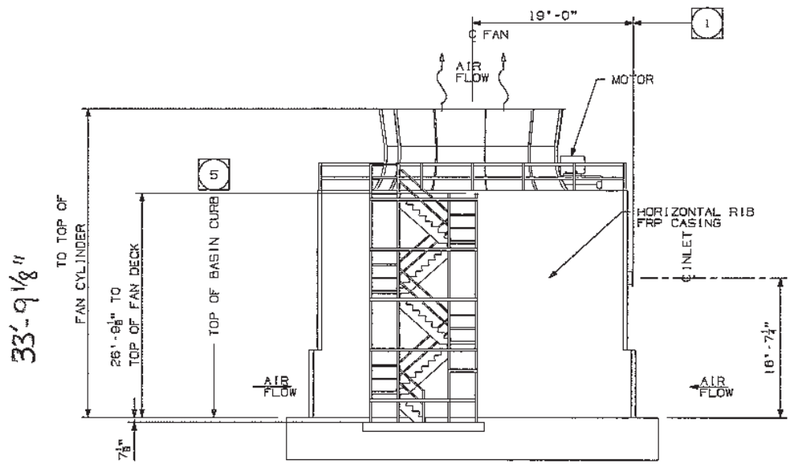
Outline Dwg No: 221732D1

| **Dimensions** (Approximate) | | Ft. (Mts.) |
|---|---|---|
| Height | (A) | 17.5 (5.32) |
| Width | (B) | 31.7 (9.65) |
| Depth | (C) | 16.5 (5.02) |
| Height over Cover | (D) | 14.0 (4.27) |
| Untanking (Plus slings) | (E) | 25.0 (7.61) |
| **Shipping** Dimensions:Ft | WxDxH | 21.6 x 12.0 x 14.1 |
| **Masses** (Approximate) | | pounds (Kg) |
| Core and Coils | | 143,360 (65,030) |
| Tank and Fittings | | 63,210 (28,680) |
| Liquid 11,580 | Gal | 89,180 (40,450) |
| **Total Mass** | | 295,750 (134,160) |
| **Shipping** without OIL | | 189,840 (86,110) |
| **Shipping** with OIL | | - |

3D CAD MASTER PART NAME:




FOR REFERENCE ONLY




TOWER ELEVATION
FACE 'D'

REFER TO GENERAL NOTE

| | |
|---|---|
| FAN DIAMETER | 216 |
| # FAN BLADES | 9 |
| MOTOR SIZE | 100 HP |
| INLET DIAMETER | 18" |
| AIR INLET ELEV | 8.0' |

## GENERAL NOTES

1. INLET INFORMATION: SPX CT PIPING STOPS AT THE FACE OF A 18 in. DIAMETER, 25 PSI, FLAT-FACED RTR FLANGE WHICH IS 15/16 in. (+1/2 in.,-1/8 in.) THICK. THERE ARE 18 - 1 1/4 in. DIAMETER BOLT HOLES ON A 22 3/4 in. DIAMETER BOLT CIRCLE. BOLT HOLES STRADDLE THE PIPE CENTERLINES. PURCHASER IS TO FURNISH ALL CONNECTING HARDWARE INCLUDING STANDARD CUT WASHERS FOR THE RTR FLANGE. FLANGE DRILLING CONFORMS TO CLASS 150 ASME B16.5 SPECIFICATIONS. THE FLANGE GASKET IS 3/8 in. THICK FULL-FACE SOFT NEOPRENE OF SHORE DUROMETER 50 +/-5 (FURNISHED BY SPX CT).

2. CAUTION: SPX CT PIPE SUPPORTS ARE DESIGNED TO SUPPORT ONLY THE WEIGHT OF THE PIPE AND WATER WITHIN THE LIMITS OF THE INLET FLANGE. CARE MUST BE TAKEN WHEN INSTALLING THE CONNECTING PIPING TO AVOID OVERLOADING OR DAMAGING THE TOWER STRUCTURE.

3. INSTALLER NOTE: CONNECTING PIPING MUST BE PROPERLY ALIGNED AT INSTALLATION TO AVOID DAMAGING OR MOVING THE RTR PIPE WHEN TIGHTENING THE FLANGE BOLTS.

4. BYPASS SYSTEM: REDUCED WATER FLOW OVER A COOLING TOWER IN COLD CLIMATES CAN RESULT IN ICE FORMATION IN THE FILL. IF THE PURCHASER'S APPLICATION REQUIRES A BYPASS SYSTEM, ITS DESIGN MUST BE REVIEWED BY SPX CT ENGINEERING.

5. CURB REFERENCE: TOP OF BASIN CURB REFERENCE IS TO BE THE HIGHEST POINT OF THE BASIN CURB WALL. FAILURE TO NOTE THIS COULD RESULT IN A MISALIGNMENT OF THE RISER TO INLET CONNECTION(S), AN INCORRECT STAIRPAD ELEVATION, AND A DECREASE IN THE AIR INLET ELEVATION THUS DECREASING COOLING TOWER PERFORMANCE.

FOR REFERENCE ONLY

Preliminary Drawing

Information only for preparatory consideration and discussion.

SPX COOLING TECHNOLOGIES

© AS OF DATE(S) IN TITLE BLOCK SPX COOLING TECHNOLOGIES, INC. UNPUBLISHED-ALL RIGHTS RESERVED UNDER COPYRIGHT LAWS.

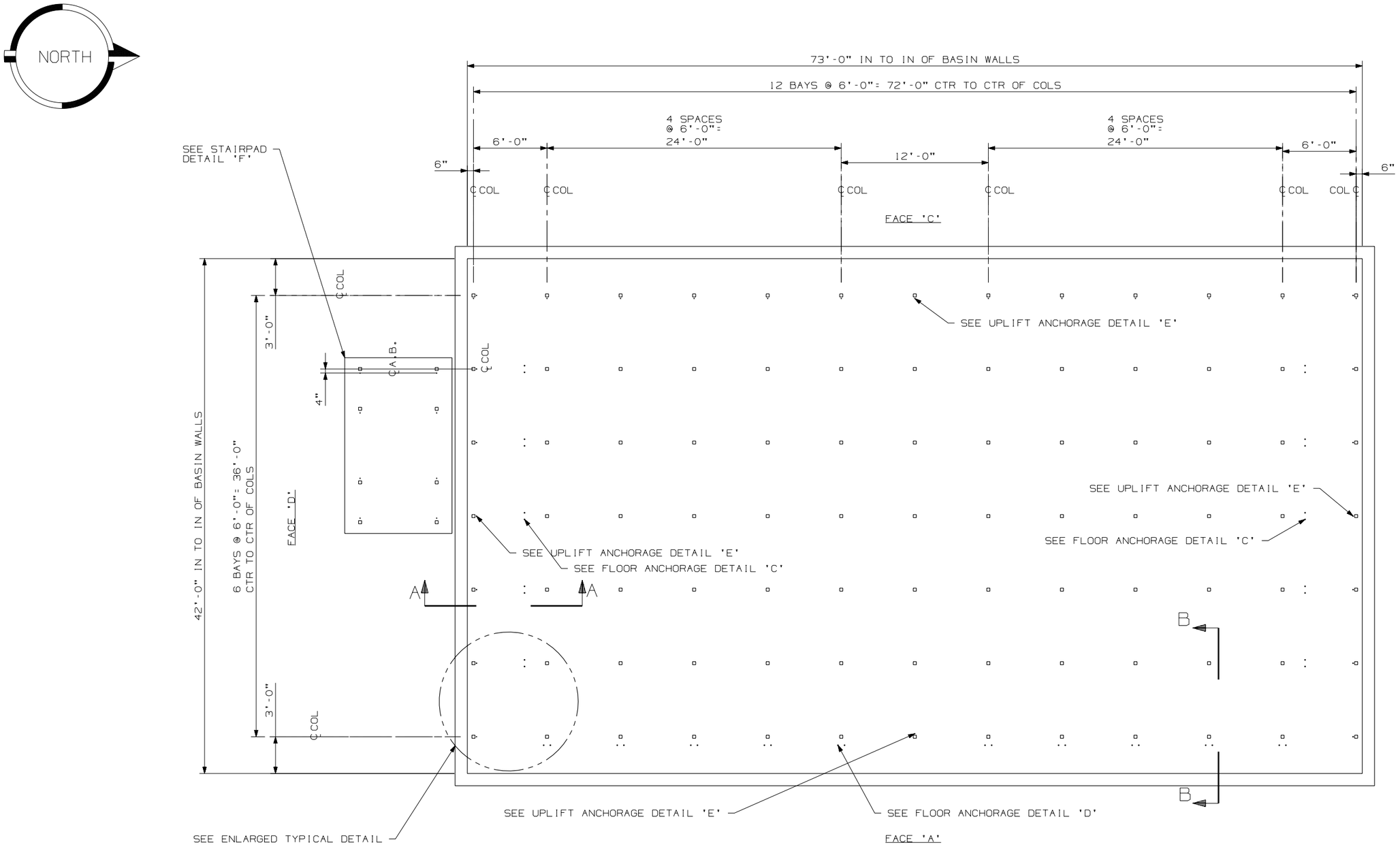
GE - Glenarm Repowering
LOS ANGELES, CA, United States

SCHEMATIC VIEWS
F436A36A5.302A COUNTERFLOW TOWER

SPX COOLING TECHNOLOGIES

| ECO NUMBER | REV. BY | CHECKED | REV. DATE | DRAWN BY | DATE | CHECKED | APPROVED | CHOK NUMBER | PLOT | DRAWING NUMBER | REV. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | OTC | 10/22/12 | | | 154213807 | 1=160 | JX4888445 | - |

3D CAD MASTER PART NAME:




BASIN PLAN VIEW

FOR BASIN SECTIONS, DETAILS AND GENERAL NOTES SEE DRAWING JV468844D

*Preliminary Drawing*

Information only for preparatory consideration and discussion.

SPX COOLING TECHNOLOGIES

© AS OF DATE(S) IN TITLE BLOCK SPX COOLING TECHNOLOGIES, INC. UNPUBLISHED-ALL RIGHTS RESERVED UNDER COPYRIGHT LAWS.

GE - Glenarm Repowering
LOS ANGELES, CA, United States

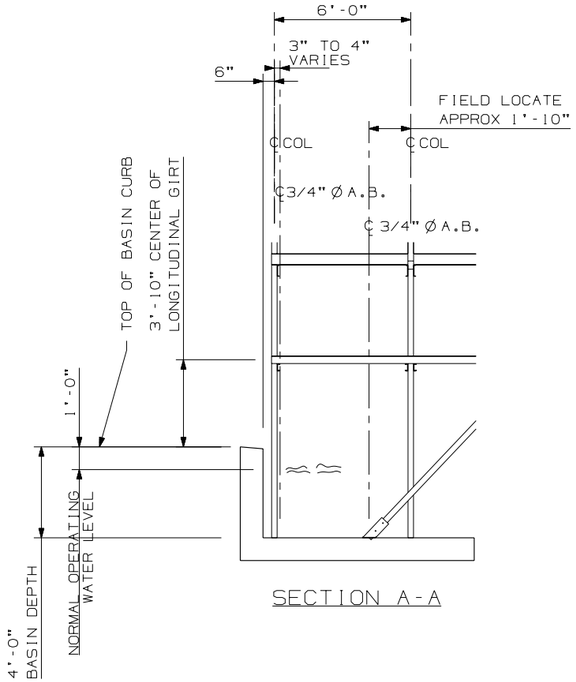
| ECO NUMBER | REV. BY | CHECKED | REV. DATE |
|---|---|---|---|

BASIN PLAN VIEW
F436A36A5.302A COUNTERFLOW TOWER

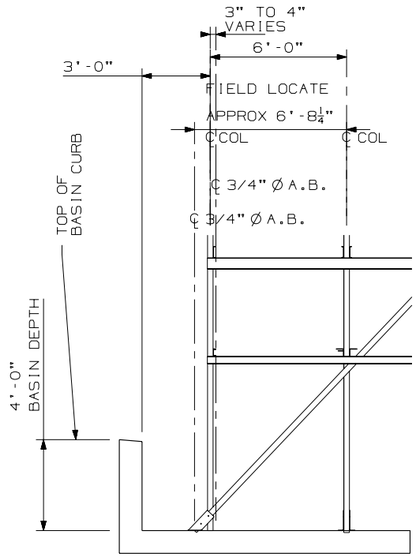
SPX COOLING TECHNOLOGIES

| DRAWN BY | DATE | CHECKED | APPROVED | ORDER NUMBER | PLOT | DRAWING NUMBER | REV. |
|---|---|---|---|---|---|---|---|
| OTC | 10/22/12 | | | 154213807 | 1=101 | JV468844B | - |

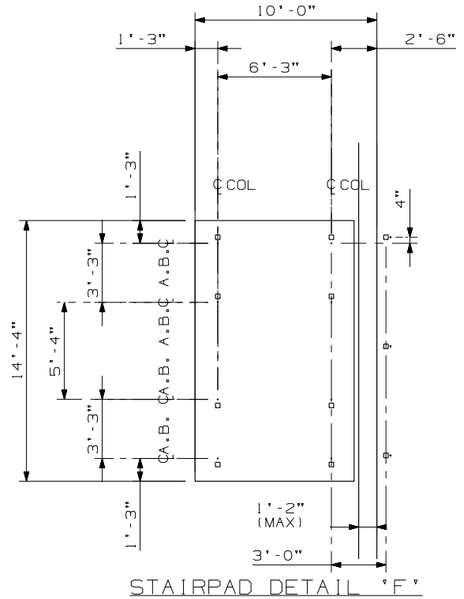
3D CAD MASTER PART NAME:



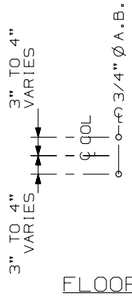

SECTION A-A




SECTION B-B

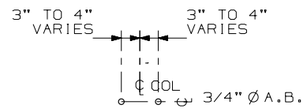



STAIRPAD DETAIL 'F'



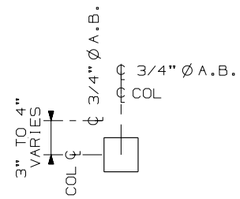

FLOOR ANCHORAGE DETAIL 'C'

(REQUIRED AT 10 PLACES)



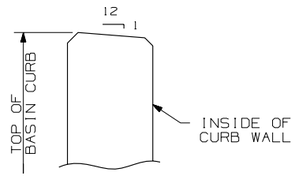

FLOOR ANCHORAGE DETAIL 'D'

(REQUIRED AT 10 PLACES)

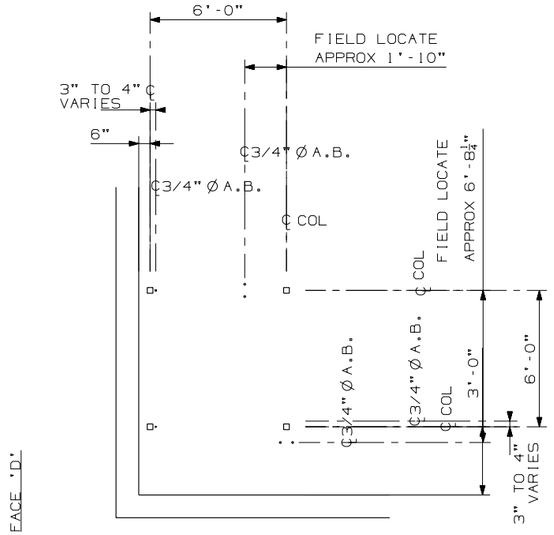



UPLIFT ANCHORAGE DETAIL 'E'

(REQUIRED AT 28 PLACES)




TOP OF CURB WALL DETAIL




FACE 'A'

ENLARGED TYPICAL DETAIL

## GENERAL NOTES

1. BASIN CONSTRUCTION: PURCHASER TO DESIGN, CONSTRUCT, AND FURNISH THE COOLING TOWER FOUNDATION TO SUIT THE DIMENSIONS OF THESE DRAWINGS. THE BASIN DESIGNER SHOULD REFER TO THE SCHEMATIC DRAWING AND AVOID LOCATION OF SUMP SCREENS, PUMPS AND ADJACENT EQUIPMENT THAT WILL INTERFERE WITH THE STAIRWAY, LADDER, OR OTHER TOWER EQUIPMENT.

2. PURCHASER TO DESIGN, LOCATE, AND FURNISH THE SUMP TO SUIT THE JOB REQUIREMENTS.

3. CONCRETE FINISH: CONCRETE SURFACES AT THE TOWER ANCHORAGE POINTS MUST BE TROWELLED TO A SMOOTH FINISH BY PURCHASER. THIS WORK MUST BE COMPLETED BEFORE TOWER CONSTRUCTION BEGINS. TOWER COLUMNS ARE FIELD CUT TO FIT THE BASIN FLOOR A MAXIMUM OF 4'-0 INCH BELOW THE TOP OF THE BASIN CURB.

4. BASIN FLOOR TO BE FLAT.

5. ANCHOR BOLTS: TOWER AND STAIR ANCHOR BOLTS ARE 3/4 INCH DIAMETER (76 REQUIRED) ALL THREAD WITH 6 5/8 INCHES MINIMUM EMBEDMENT AND 2 INCHES MINIMUM PROJECTION 1/8 INCH ABOVE THE FINISHED CONCRETE.

6. UPLIFT ANCHORAGE ON PERIMETER TOWER COLUMNS CAN BE INSTALLED ON ANY FACE OF THE COLUMN PROVIDED IT DOES NOT INTERFERE WITH THE DIAGONAL ANCHORAGE AND IS LOCATED WITH THE ANCHOR BOLT A MINIMUM OF 6 INCHES FROM ANY CONCRETE EDGE.

7. SPX CT TO FURNISH AND INSTALL ALL ADHESIVE ANCHORS COMPLETE WITH NUT AND WASHER AT TIME OF TOWER ERECTION.

8. FOR ANCHOR BOLT DESIGN, THE MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH IS TO BE 4,000 PSI. DESIGN IS BASED ON UNCRACKED CONCRETE.

9. CURB REFERENCE: TOP OF BASIN CURB REFERENCE IS TO BE THE HIGHEST POINT OF THE BASIN CURB WALL. FAILURE TO NOTE THIS COULD RESULT IN A MISALIGNMENT OF THE RISER TO INLET CONNECTION(S), AN INCORRECT STAIRPAD ELEVATION, AND A DECREASE IN THE AIR INLET ELEVATION THUS DECREASING COOLING TOWER PERFORMANCE.

10. DIFFERENTIAL SETTLEMENT CRITERIA: THE MAXIMUM SETTLEMENT THAT THE COOLING TOWER CAN ABSORB IS 1/8 INCH IN 6 FEET-0 INCHES, UP TO 1/2 INCH MAXIMUM IN TOWER WIDTH AND 1 INCH MAXIMUM IN TOWER LENGTH.

11. BASIN DESIGNER REBAR NOTE: LOCATE REINFORCING STEEL TO PREVENT INTERFERENCE WITH ANCHOR BOLTS. ANCHOR BOLT DIMENSIONS ARE LISTED AS APPROXIMATE TO ACCOUNT FOR MINOR IMPERFECTIONS IN BASIN LEVELNESS. LOCATE REINFORCING STEEL TO ALLOW 3 INCHES MINIMUM CLEARANCE TO ANCHOR BOLTS.

## STAIRPAD NOTES

REFER TO BASIN PLAN FOR STAIRPAD ORIENTATION.
TOP OF STAIRPAD TO BE 7 1/8 BELOW TOP OF BASIN CURB.
MAXIMUM DEAD LOAD ON ANY STAIR COLUMN IS 1250 POUNDS.

*Preliminary Drawing*

Information only for preparatory consideration and discussion.

SPX COOLING TECHNOLOGIES

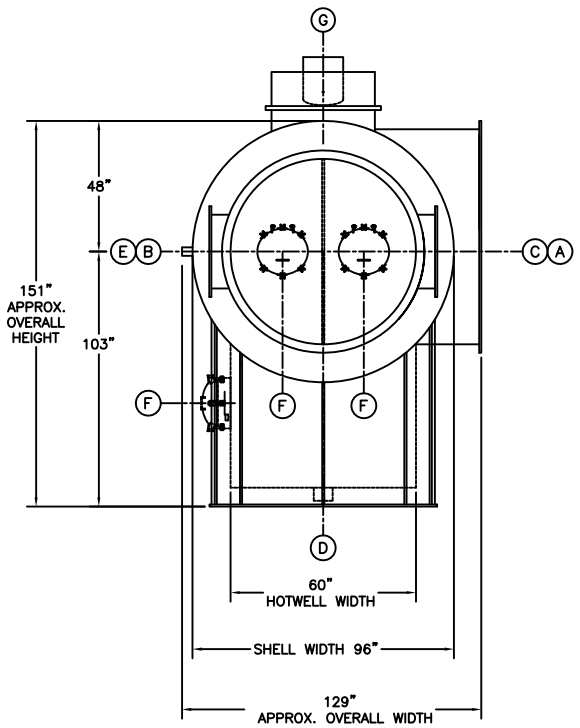
© AS OF DATE(S) IN TITLE BLOCK SPX COOLING TECHNOLOGIES, INC. UNPUBLISHED-ALL RIGHTS RESERVED UNDER COPYRIGHT LAWS.

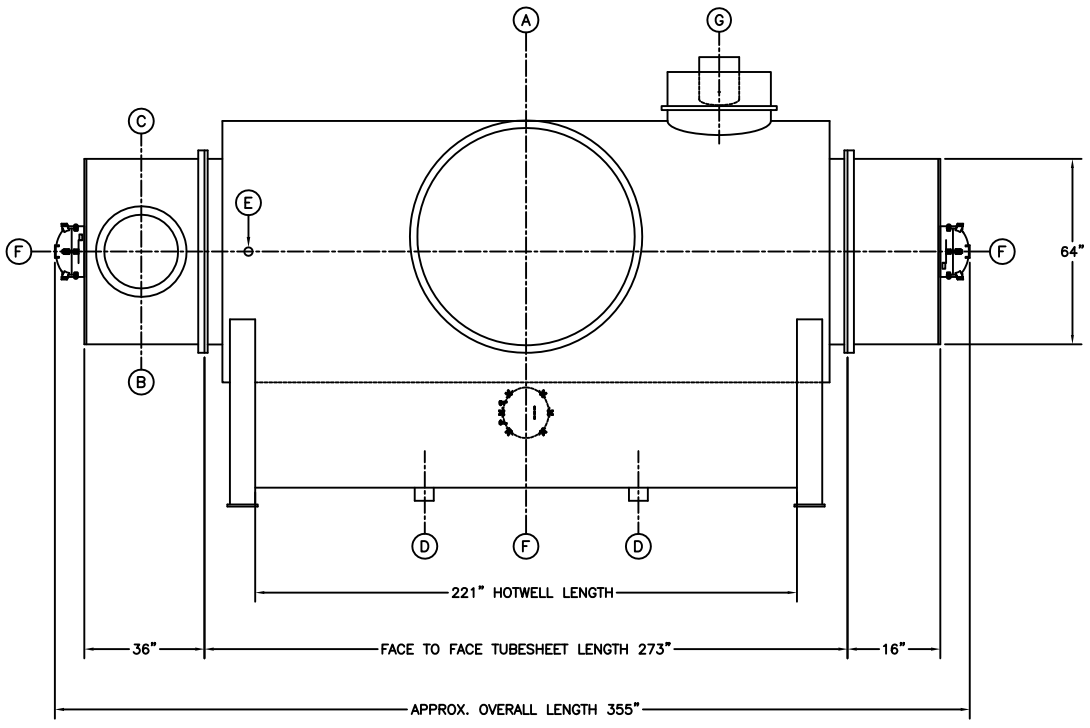
GE - Glenarm Repowering
LOS ANGELES, CA, United States

BASIN SECTIONS & DETAILS
F436A36A5.302A COUNTERFLOW TOWER

SPX COOLING TECHNOLOGIES

| ECO NUMBER | REV. BY | CHECKED | REV. DATE | DRAWN BY | DATE | CHECKED | APPROVED | ORDER NUMBER | PLOT | DRAWING NUMBER | REV. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | OTC | 10/22/12 | | | 154213807 | VARIES | JV468844D | - |




| MARK | SIZE | RATING | PURPOSE |
|---|---|---|---|
| A | 70" | FLANGED | STEAM INLET |
| B | 24" | 125# FFSO | C.W. INLET |
| C | 24" | 125# FFSO | C.W. OUTLET |
| D | 6" | B.W. | CONDENSATE OUTLET |
| E | 6" | B.W. | AIR OUTLET |
| F | 24" | 75# | MANWAY |
| G | 14" | B.W. | BYPASS INLET |

FOR REFERENCE ONLY

GENERAL NOTES:
(1) – DRAWING IS NOT TO SCALE.
(2) – ALL DIMENSIONS ARE IN INCHES.
(3) – ANY DEVIATIONS FROM THIS DRAWING MUST BE APPROVED BY HOLTEC INTERNATIONAL PRIOR TO FABRICATION.

THIS DRAWING IS THE INTELLECTUAL PROPERTY OF HOLTEC INTERNATIONAL. IT IS PROVIDED TO THE RECIPIENT UNDER THE EXPLICIT CONDITION THAT IT WILL NOT BE DUPLICATED IN WHOLE OR PART, OR GIVEN TO OTHERS WITHOUT WRITTEN CONSENT OF HOLTEC INTERNATIONAL.

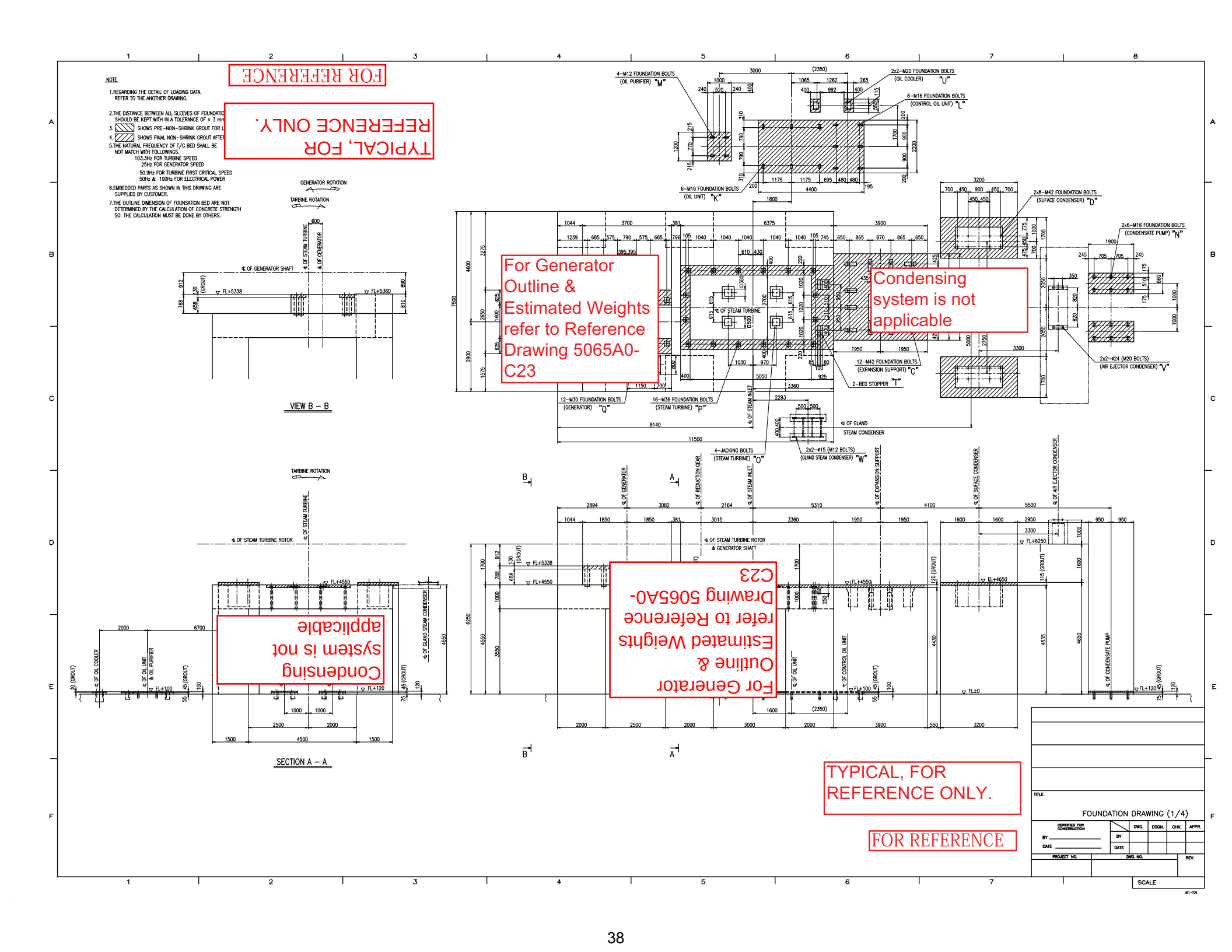
HOLTEC INTERNATIONAL
Power Plant Components Division
Holtec International
555 Lincoln Drive West
Marlton, New Jersey 08053 (USA)
Phn: 856-797-0900
Fax: 856-797-1931
www.holtecinternational.com

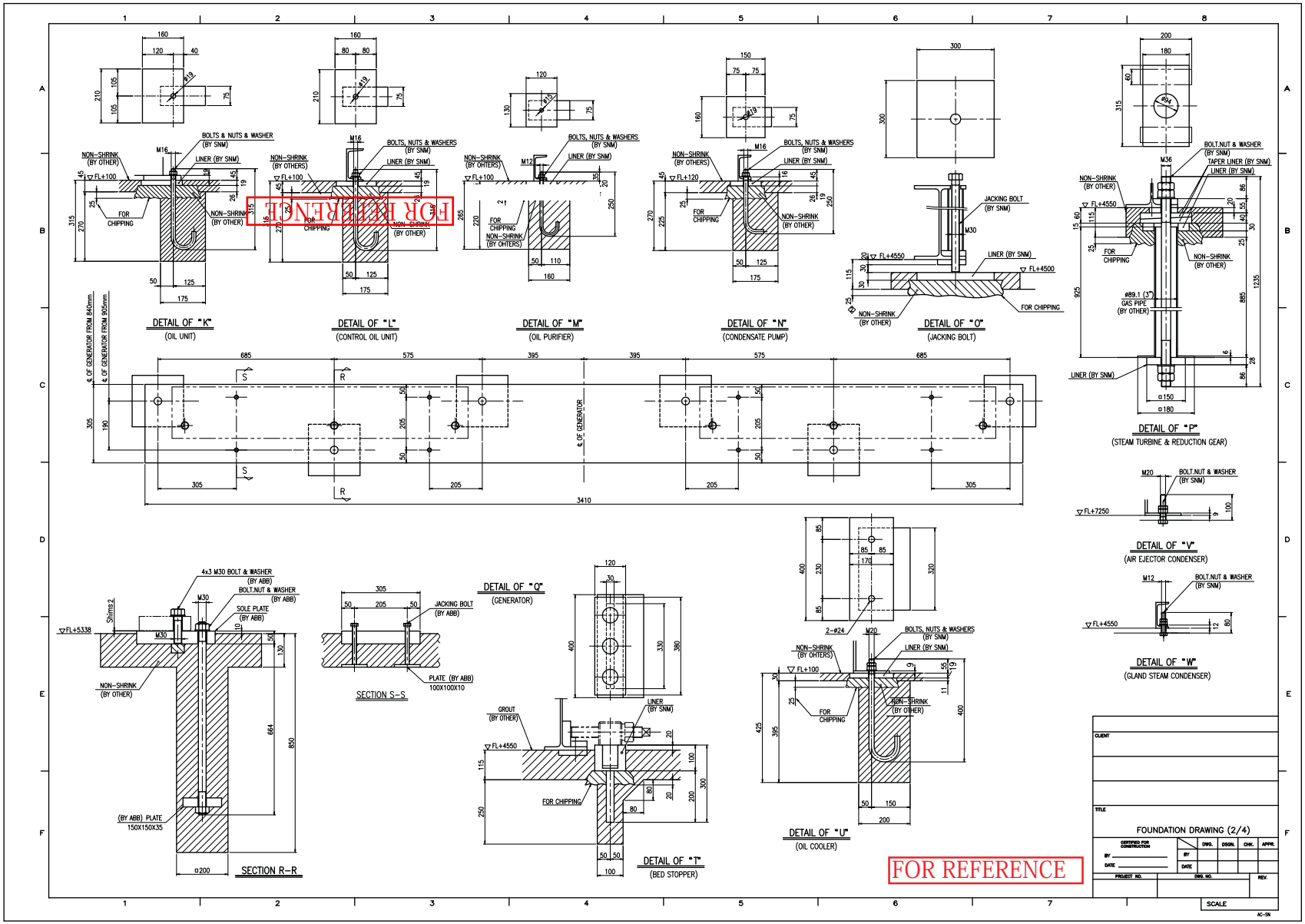
DESCRIPTION: STEAM SURFACE CONDENSER
GLENARM REPOWERING PROJECT
PASADENA, CA

FOR: GE POWER & WATER
SCHENECTADY, NY

| PROPOSAL NO.: | DRAWING NO. | REV. |
|---|---|---|
| H-8371.HX | SK-8371-0 | 0 |

Page 6 of 8


FOR REFERENCE
TYPICAL, FOR REFERENCE ONLY.
NOTE
1.REGARDING THE DETAIL OF LOADING DATA. REFER TO THE ANOTHER DRAWING.
2.THE DISTANCE BETWEEN ALL SLEEVES OF FOUNDATIO SHOULD BE KEPT WITH IN A TOLERANCE OF ± 3 mm
3. SHOWS PRE-NON-SHRINK GROUT FOR L
4. SHOWS FINAL NON-SHRINK GROUT AFTEI
5.THE NATURAL FREQUENCY OF T/G BED SHALL BE NOT MATCH WITH FOLLOWINGS.
103.3Hz FOR TURBINE SPEED
25Hz FOR GENERATOR SPEED
50.9Hz FOR TURBINE FIRST CRITICAL SPEED
50Hz & 100Hz FOR ELECTRICAL POWER
6.EMBEDDED PARTS AS SHOWN IN THIS DRAWING ARE SUPPLIED BY CUSTOMER.
7.THE OUTLINE DIMENSION OF FOUNSATION BED ARE NOT DETERMINED BY THE CALCULATION OF CONCRETE STRENGTH SO. THE CALCULATION MUST BE DONE BY OTHERS.
GENERATOR ROTATION
TARBINE ROTATION
VIEW B – B
TARBINE ROTATION
SECTION A – A
For Generator Outline & Estimated Weights refer to Reference Drawing 5065A0-C23
Condensing system is not applicable
Condensing system is not applicable
For Generator Outline & Estimated Weights refer to Reference Drawing 5065A0-C23
TYPICAL, FOR REFERENCE ONLY.
FOR REFERENCE
TITLE
FOUNDATION DRAWING (1/4)
CERTIFIED FOR CONSTRUCTION
BY
DATE
DWG.
DSGN.
CHK.
APPR.
PROJECT NO.
DWG. NO.
REV.
SCALE
AC-SN


DETAIL OF "K"
(OIL UNIT)
DETAIL OF "L"
(CONTROL OIL UNIT)
DETAIL OF "M"
(OIL PURIFIER)
DETAIL OF "N"
(CONDENSATE PUMP)
DETAIL OF "O"
(JACKING BOLT)
DETAIL OF "P"
(STEAM TURBINE & REDUCTION GEAR)
DETAIL OF "V"
(AIR EJECTOR CONDENSER)
DETAIL OF "W"
(GLAND STEAM CONDENSER)
DETAIL OF "Q"
(GENERATOR)
DETAIL OF "T"
(BED STOPPER)
DETAIL OF "U"
(OIL COOLER)
SECTION R–R
SECTION S–S
FOR REFERENCE
FOR REFERENCE
FOUNDATION DRAWING (2/4)

FOR REFERENCE

TYPICAL, FOR REFERENCE ONLY.

The Foundation height is depended on condensing system arrangement, the minimum height for the STG is 1,500mm.

CONDENSING SYSTEM IS NOT APPLICABLE

For Generator Outline & Estimated Weights refer to Reference Drawing 5065A0-C23

CONDENSING SYSTEM IS NOT APPLICABLE

For Generator Outline & Estimated Weights refer to Reference Drawing 5065A0-C23

CONDENSING SYSTEM IS NOT APPLICABLE

The Foundation height is depended on condensing system arrangement, the minimum height for the STG is 1,500mm.

SECTION A–A

LAY OUT

SNM. DRAWING NO. 11

## Loading Data [kN]

| Name | Position | Static Load | Dynamic Load(+/-)* | | | Vacuum Load |
|---|---|---|---|---|---|---|
| | | | Vertical | Horizontal | Axial | Axial |
| Steam turbine and Reduction gear with base plate | A1 | 15.86 | 23.79 | 3.97 | 1.59 | +/- 16.12 |
| | A2 | 15.86 | 23.79 | 3.97 | 1.59 | +/- 16.12 |
| | A3 | 43.70 | 65.55 | 10.93 | 4.37 | +/- 16.12 |
| | A4 | 43.70 | 65.55 | 10.93 | 4.37 | +/- 16.12 |
| | A5 | 31.85 | 47.78 | 7.96 | 3.19 | +/- 16.12 |
| | A6 | 31.85 | 47.78 | 7.96 | 3.19 | +/- 16.12 |
| | A7 | 31.85 | 47.78 | 7.96 | 3.19 | +/- 16.12 |
| | A8 | 31.85 | 47.78 | 7.96 | 3.19 | +/- 16.12 |
| | A9 | 31.85 | 47.78 | 7.96 | 3.19 | +/- 16.12 |
| | A10 | 31.85 | 47.78 | 7.96 | 3.19 | +/- 16.12 |
| | A11 | 43.70 | 65.55 | 10.93 | 4.37 | +/- 16.12 |
| | A12 | 43.70 | 65.55 | 10.93 | 4.37 | +/- 16.12 |
| | A13 | 15.86 | 23.79 | 3.97 | 1.59 | +/- 16.12 |
| | A14 | 15.86 | 23.79 | 3.97 | 1.59 | +/- 16.12 |
| | A15 | 15.86 | 23.79 | 3.97 | 1.59 | +/- 16.12 |
| | A16 | 15.86 | 23.79 | 3.97 | 1.59 | +/- 16.12 |
| Generator | B1 | 28.60 | - | 28.60 | N/A | - |
| | B2 | 28.60 | 12.20 | 40.80 | N/A | 101 |
| | B3 | 28.60 | 12.20 | 40.80 | N/A | 101 |
| | B4 | 28.60 | 12.20 | 40.80 | N/A | 101 |
| | B5 | 28.60 | 12.20 | 40.80 | N/A | 101 |
| | B6 | 28.60 | - | 28.60 | N/A | - |
| | B7 | 28.60 | - | 28.60 | N/A | - |
| | B8 | 28.60 | -12.20 | 16.40 | N/A | 101 |
| | B9 | 28.60 | -12.20 | 16.40 | N/A | 101 |
| | B10 | 28.60 | -12.20 | 16.40 | N/A | 101 |
| | B11 | 28.60 | -12.20 | 16.40 | N/A | 101 |
| | B12 | 28.60 | - | 28.60 | N/A | - |
| Connection piece | C1 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C2 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C3 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C4 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C5 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C6 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C7 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C8 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C9 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C10 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C11 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| | C12 | 17.58 | 17.58 | 0.74 | 1.07 | N/A |
| Surface Condenser | D1 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D2 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D3 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D4 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D5 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D6 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D7 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D8 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D9 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D10 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D11 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D12 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D13 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D14 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D15 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |
| | D16 | 31.88 | Full(app.) 67.43 | N/A | N/A | -/+ 16.12 |

AT RATED TORQUE

TOTAL(TO OPERATION)

Short Circuit Load (+/-)

## Loading Data [kN]

| Name | Position | Static Load | Dynamic Load(+/-)* | | | Vacuum Load |
|---|---|---|---|---|---|---|
| | | | Vertical | Horizontal | Axial | Axial |
| Oil unit | E1 | Dry(app.) 8.01 | Working(app.) 12.67 | N/A | N/A | N/A |
| | E2 | Dry(app.) 8.01 | Working(app.) 12.67 | N/A | N/A | N/A |
| | E3 | Dry(app.) 8.01 | Working(app.) 12.67 | N/A | N/A | N/A |
| | E4 | Dry(app.) 8.01 | Working(app.) 12.67 | N/A | N/A | N/A |
| | E5 | Dry(app.) 8.01 | Working(app.) 12.67 | N/A | N/A | N/A |
| | E6 | Dry(app.) 8.01 | Working(app.) 12.67 | N/A | N/A | N/A |
| Control oil pump unit | F1 | Dry(app.) 1.15 | Working(app.) 1.23 | N/A | N/A | N/A |
| | F2 | Dry(app.) 1.15 | Working(app.) 1.23 | N/A | N/A | N/A |
| | F3 | Dry(app.) 1.15 | Working(app.) 1.23 | N/A | N/A | N/A |
| | F4 | Dry(app.) 1.15 | Working(app.) 1.23 | N/A | N/A | N/A |
| | F5 | Dry(app.) 1.15 | Working(app.) 1.23 | N/A | N/A | N/A |
| | F6 | Dry(app.) 1.15 | Working(app.) 1.23 | N/A | N/A | N/A |
| Oil purifier | G1 | Dry(app.) 0.99 | Working(app.) 1.28 | N/A | N/A | N/A |
| | G2 | Dry(app.) 0.99 | Working(app.) 1.28 | N/A | N/A | N/A |
| | G3 | Dry(app.) 0.99 | Working(app.) 1.28 | N/A | N/A | N/A |
| | G4 | Dry(app.) 0.99 | Working(app.) 1.28 | N/A | N/A | N/A |
| Condensate Pump | H1 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H2 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H3 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H4 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H5 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H6 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H7 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H8 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H9 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H10 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H11 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| | H12 | 1.38 | 2.07 | 0.35 | 0.14 | N/A |
| Gland condenser | I1 | 2.70 | Full(app.) 3.44 | N/A | N/A | N/A |
| | I2 | 2.70 | Full(app.) 3.44 | N/A | N/A | N/A |
| | I3 | 2.70 | Full(app.) 3.44 | N/A | N/A | N/A |
| | I4 | 2.70 | Full(app.) 3.44 | N/A | N/A | N/A |
| Ejector condenser | J1 | Later | | N/A | N/A | N/A |
| | J2 | | | N/A | N/A | N/A |
| | J3 | | | N/A | N/A | N/A |
| | J4 | | | N/A | N/A | N/A |

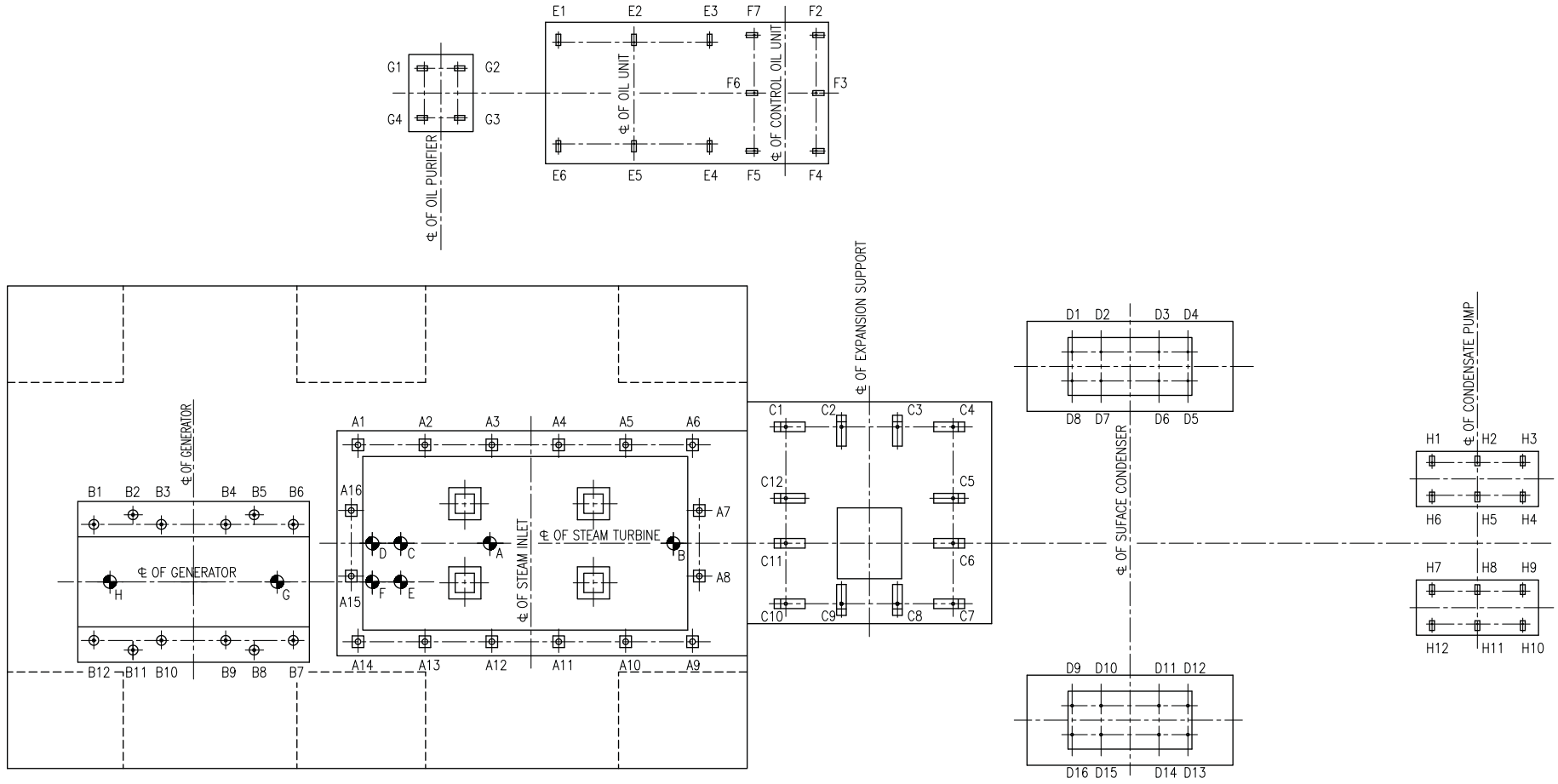
Note; * This Load is included within e.g. piping force and any other conditions not mentioned in this load data.

## Unbalance load [kN]

| Name | Position | | Rotating Weight on Bearing | Unbalance Load |
|---|---|---|---|---|
| Steam turbine and Reduction gear with base plate | A | Turbine front side | 11.88 | 2.02 |
| | B | Turbine rear side | 12.37 | 2.10 |
| | C | Reduction gear pinion turbine side | 1.96 | 0.34 |
| | D | Reduction gear pinion generator side | 1.96 | 0.34 |
| | E | Reduction gear wheel turbine side | 14.21 | 0.59 |
| | F | Reduction gear wheel generator side | 14.21 | 0.59 |
| Generator | G | Generator front side | 60.27 | 2.45 |
| | H | Generator rear side | 60.27 | 2.45 |

**Note;**
**We have not considered weight of Turbine enclosure and Generator roof.**
**When you design strength calculation of foundation,**

FOR REFERENCE



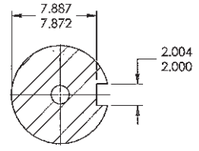

FOR REFERENCE

SCALE N/A

AC-SN

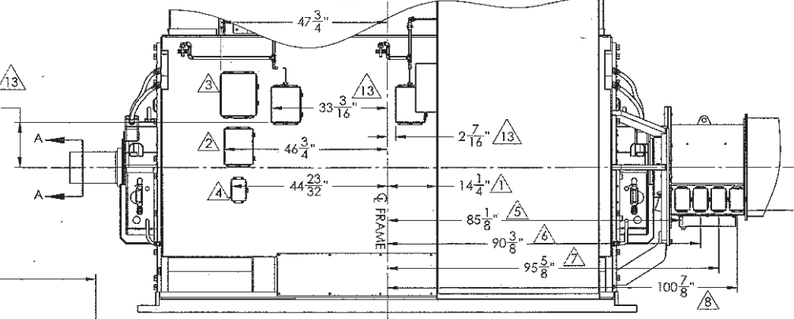
| REVISIONS | | | | | | |
|---|---|---|---|---|---|---|
| REV. | ECN | ZONE | CHANGED BY | DESCRIPTION | APPROVED BY | DATE |
| C | E12-0153 | | DBJ | UPDATED ICLC TO BOTTOM ENTRY PER C.O. #6 | DMD | 3/20/2012 |
| D | E12-0247 | | JDT | CHANGED JACKING PORT LOCATION PER RENK | DMD | 5/2/2012 |
| E | E13-0146 | | JDT | COUNTERCLOCKWISE WAS CLOCKWISE | DMD | 2/19/2013 |
| F | E13-0340 | | JDT | HYDROSTATIC LIFT MODIFICATION | DMD | 5/6/2013 |

REFERENCE ONLY




SECTION A-A

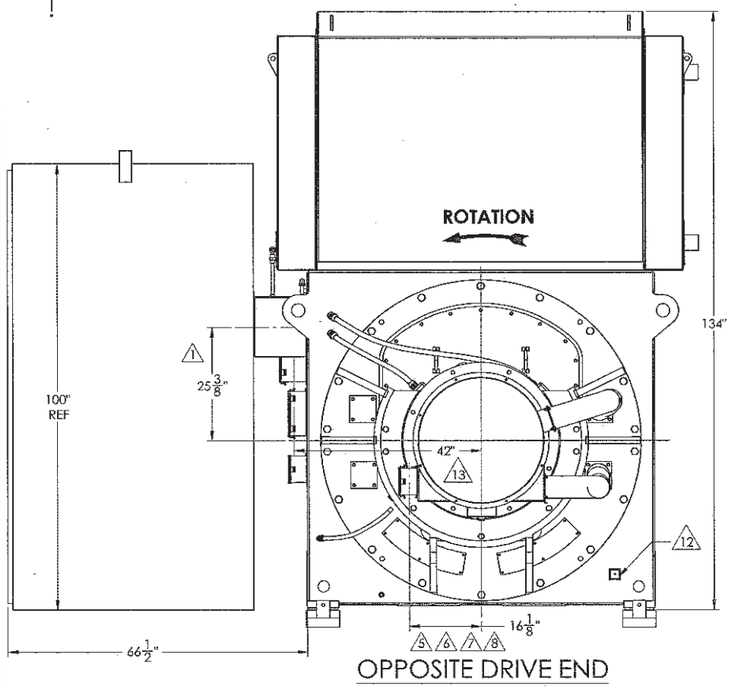
SHAFT END DETAIL



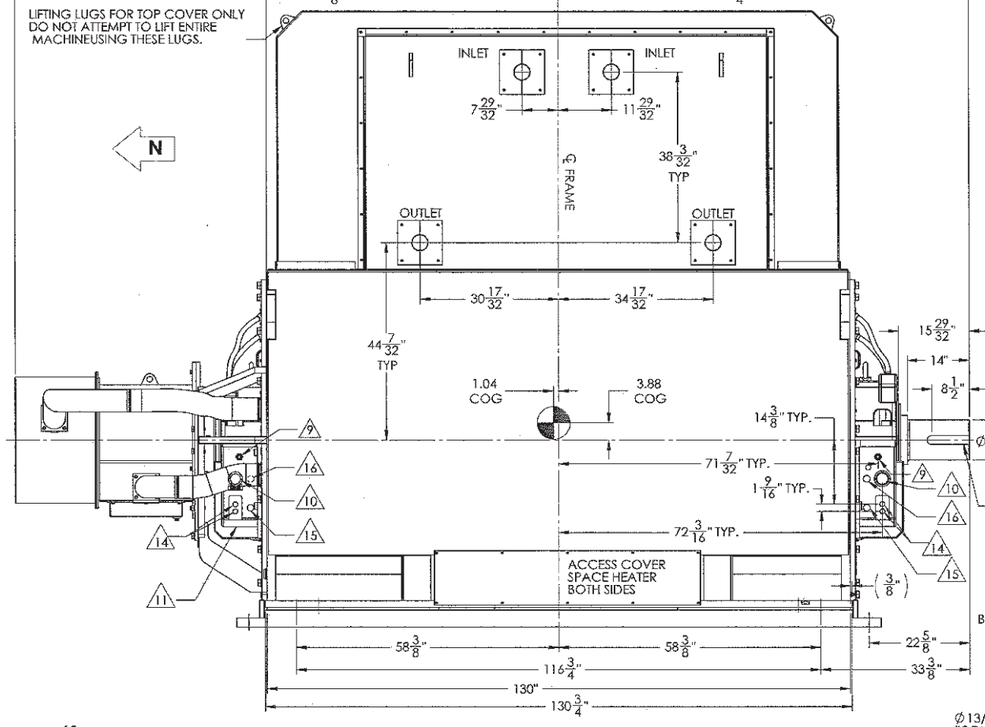

REFERENCE ONLY

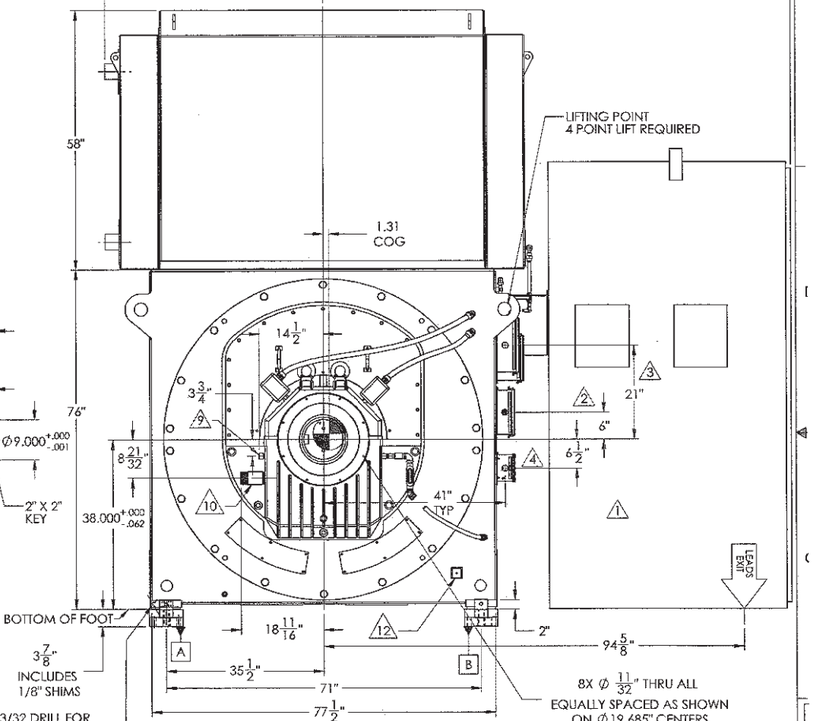
212"

DISTANCE REQUIRED TO REMOVE ROTOR ASSEMBLY AFTER REMOVAL OF RECTIFIER COVER, EXCITER FRAME AND BRACKET, OPPOSITE DRIVE END BEARING, HOUSING, CAP AND BRACKET.

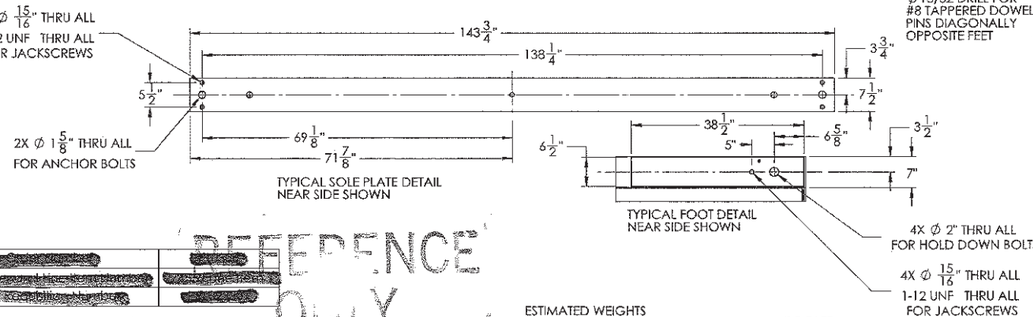



OPPOSITE DRIVE END




DRIVE END




| FOOT LOADS ± 10% | | | |
|---|---|---|---|
| PAD | STATIC LOAD | FULL LOAD TORQUE | SHORT CIRCUIT LOAD |
| A | 38,319 ▼ | 28,998 ▼ | 39,884 ▼<br>116,521 ▲ |
| B | 38,319 ▼ | 47,639 ▼ | 39,884 ▼<br>116,521 ▲ |

1. CONDUIT BOX FOR STATOR LEADS, SEE INCOMING LINE CUBICLE DRAWING 14DSB-2623.
2. ONE HOLE FOR 1" CONDUIT FOR STATOR AND BEARING TEMPERATURE DETECTOR LEADS.
3. ONE HOLE FOR 1" CONDUIT FOR VIBRATION PROXIMITORS, 2 PER BEARING, KEY PHASOR.
4. ONE HOLE FOR 1" CONDUIT FOR GENERATOR SPACE HEATER LEADS.
5. ONE HOLE FOR 1" CONDUIT FOR PERMANENT MAGNETIC ALTERNATOR LEADS.
6. ONE HOLE FOR 1" CONDUIT FOR EXCITER SPACE HEATER LEADS.
7. ONE HOLE FOR 1" CONDUIT FOR GENERATOR EXCITER FIELD LEADS.
8. ONE HOLE FOR 1" CONDUIT FOR ROTOR GROUND DETECTION LEADS.
9. OIL INLET CONNECTION IS 3/4" NPT FEMALE CONNECTION.
10. OIL RETURN CONNECTION IS 3" NPT MALE CONNECTION.
11. THIS BEARING IS ELECTRICALLY INSULATED FROM GROUND INTERNALLY AT THE BEARING HOUSING, NO CUSTOMER CONNECTIONS SHOULD BE MADE TO THE INTERNAL BEARING SHELL TO PRESERVE THE INTEGRITY OF THE INSULATION.
12. TWO GROUNDING PADS WITH 5/16-18 x 3/4" DEEP TAPPED HOLES LOCATED DIAGONALLY OPPOSITE OF EACH OTHER.
13. ONE HOLE FOR 1" CONDUIT FOR LEAK DETECTOR LEADS.
14. HYDROSTATIC JACKING PORTS, 1/4" NPT, TWO LINES PER BEARING REQUIRED.
15. (F) HYDROSTATIC JACKING SUCTION PORT 3/4" NPT
16. (F) PLUGGED PRESSURE RELIEF PORT

[redacted]

REFERENCE ONLY

CERTIFICATION FOR: [redacted] D.O. OT [redacted] CUST. NO 274559

[redacted]

TYPE "SAB" HORIZONTAL BRUSHLESS SYNCHRONOUS GENERATOR RATED AS FOLLOWS.

[redacted]

PRODUCES NEMA STANDARD PHASE SEQUENCE 1(A),3(C),2(B) FOR COUNTERCLOCKWISE SHAFT ROTATION FACING OPPOSITE DRIVE END.

ESTIMATED WEIGHTS

| | |
|---|---|
| ICLC BOX | 2,500 LBS |
| ROTOR | 22,960 LBS |
| STATOR | 45,877 LBS |
| TOP COVER | 3,000 LBS |
| COOLERS | 4,800 LBS |
| TOTAL | 79,137 LBS (± 10%) |
| SOLE PLATES | 2,354 LBS |

AIR REQUIREMENT: 24,500 CFM

VERTICAL THERMAL GROWTH IS 2.9 MILS

COOLER

CONNECTIONS ARE 3" NPT

WATER REQUIREMENTS:

125 USGM OF 90° F. MAX. OF CLEAN FILTERED WATER AT 150 PSIG

WATER PRESSURE DROP THRU COOLER IS 4.3 PSI

WATER TEMPERATURE OUT OF COOLER IS 106° F.

BEARING OIL REQUIREMENTS OPPOSITE DRIVE END

VISCOSITY ..... ISO VG 32
PRESSURE..... 8-12 PSI (15 PSI MAX.)
FLOW..... 4.0 GPM
LOSSES..... 34,151 BTU/HR

BEARING OIL REQUIREMENTS DRIVE END

VISCOSITY ..... ISO VG 32
PRESSURE..... 8-12 PSI (15 PSI MAX.)
FLOW..... 4.0 GPM
LOSSES..... 34,151 BTU/HR

THIS UNIT IS EQUIPPED WITH SLEEVE BEARINGS ALLOWING A NOMINAL 1/2 INCH TOTAL END FLOAT. MAXIMUM TOTAL COUPLING END FLOAT MUST BE 0.19 INCHES PER MG1-2003 20.29.2

WORKING TOLERANCES, UNLESS OTHERWISE SPECIFIED

| MACHINING | FABRICATION | FINISH |
|---|---|---|
| ± .01 THRU 2.00"<br>± .015 OVER 2.00 THRU 10.00"<br>± .03 OVER 10.00"<br>ANGLE ±0.5° | ± .12 THRU 24.00"<br>± .24 OVER 24.00" | 125 MICRO √ INCHES |

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
ALL THREADS TO BE CLASS 2 UNIFIED

"THIS DRAWING IS THE PROPERTY OF HYUNDAI IDEAL ELECTRIC CO AND MAY IT IS LOANED SUBJECT TO ITS TERMS UPON WHICH IT AND ALL INFORMATION THEREON IS TO BE HELD CONFIDENTIAL AND MUST NOT BE MADE PUBLIC AND IS NOT TO BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO OUR INTERESTS."

FILE NO. 15-01 | LIBRARY A0-65 | REF NO. -

FIRST USED ON [redacted]
HIEC ORDER No. [redacted]

| BY | DATE |
|---|---|
| DR. JDT | 8/23/2011 |
| CK. DMD | 8/25/2011 |
| APP. DMD | 8/25/2011 |
| APP. | |

HYUNDAI IDEAL ELECTRIC CO. MANSFIELD OPERATION 1200 EAST FIRST STREET MANSFIELD, OHIO 44902-7706

TEWAC 21520-4-55 / BE15-3 / PMA15-3

OUTLINE

RENK 28-250 SLEEVE BEARINGS

SIZE D | DRG NO. 5065A0-C23 | WEIGHT - | SHEET 1 OF 1 | REVISION F

HYUNDAI IDEAL
ELECTRIC CO.

MANSFIELD OPERATION
330 East First Street
Mansfield, Ohio 44902
Phone: (419) 520-3245
Fax: (419) 522-8427
www.idealelectricco.com

# AFTERMARKET SERVICE BULLETIN

## GENERAL INSTRUCTIONS FOR ROTOR REMOVAL ( SKID PAN METHOD)

**Motor or Generator Rotor removal**

1. Prepare Site for set up for any associated rigging, timbers, crane and/or gantry as necessary to complete this job.

2. Disconnect and/or lockout all electrical service to the motor. Ensure DE and ODE oil is drained out of the bearing housing. Uncouple the DE from any other unit.

3. Remove the entire exciter assembly from the shaft.

4. Remove the DE and ODE upper and lower bearing bracket covers, if applicable ensure to remove all vibration probe and connections that are mounted on the inner bearing brackets.

5. Remove the DE and ODE upper half bearing brackets. Ensure to remember that the ODE bearing bracket may be insulated from the bearing housing.

6. Remove DE and ODE fan baffles.

7. Remove the DE and ODE upper bearing housing along with the upper bearing half. Inspect the bearing half's for any damage.

8. Remove DE and ODE Bearing temperature probes from the bearing housing.

9. Lift and support the ODE rotor until the lower bearing can be removed from the lower bearing housing. During this process ensure not to lift no more the .010 – .020 inch to allow the bearing to roll. After the lower bearing have has been removed, place G10 blocks spaced apart at 135 degree and 225 degree between the rotor bars and the stator winding iron core (G10 blocks are to be place on the iron core and not the windings) to support the weight of the ODE rotor.

10. Lift and support the DE rotor until the lower bearing can be removed from the lower bearing housing. During this process ensure not to lift no more the .010 – .020 inch to allow the bearing to roll. After the lower bearing have has been removed, place G10 blocks spaced apart at 135 degree and 225 degree between the rotor bars and the stator winding iron core (G10 blocks are to be place on the iron core and not the windings) to support the weight of the DE rotor.

11. Remove ODE and DE lower half bearing bracket.

MANSFIELD OPERATION
330 East First Street
Mansfield, Ohio 44902
Phone: (419) 520-3245
Fax: (419) 522-8427
www.idealelectricco.com

12. Build the necessary cribbing timber up to the bottom of the ODE stator winding iron core. Ensure to place cribbing timber in the ODE stator inboard for skidpan support.

13. Prepare inside surface of skidpan by brushing melted paraffin over entire area.

14. Hoist the ODE rotor up not to exceed the top of the rotor to mesh the top of the stator winding iron core. Remove the G10 block from the ODE, place the skidpan on to the cribbing and slide the skidpan in between the rotor bars and the stator winding iron core until. Let the rotor down to set on the skidpan and repeat the same process for the G10 blocks on the DE.

15. Secure pan with cables and clevises to prevent axial movement

16. Attach a ratchet hoist between the exciter end of the rotor and a substantial anchor point; begin removing rotor out of stator.

17. If lifting means is available, utilize to relieve weight as rotor is removed out of stator.

18. Reassembly is basically the reverse of the above procedure.

**Job Notes:**

1. Do not substitute other lubricants in place of paraffin.

2. Keep rotor level when removing or reassembling to prevent fan damage.

3. Do not allow skidpan to move in stator.

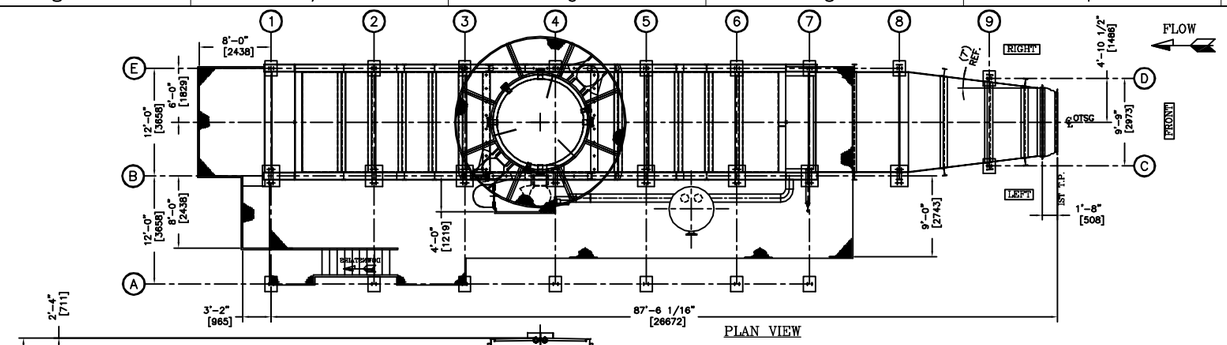
4. After removing bearings protect journals.

5. Do not lift or pull on journals or other fit surfaces.

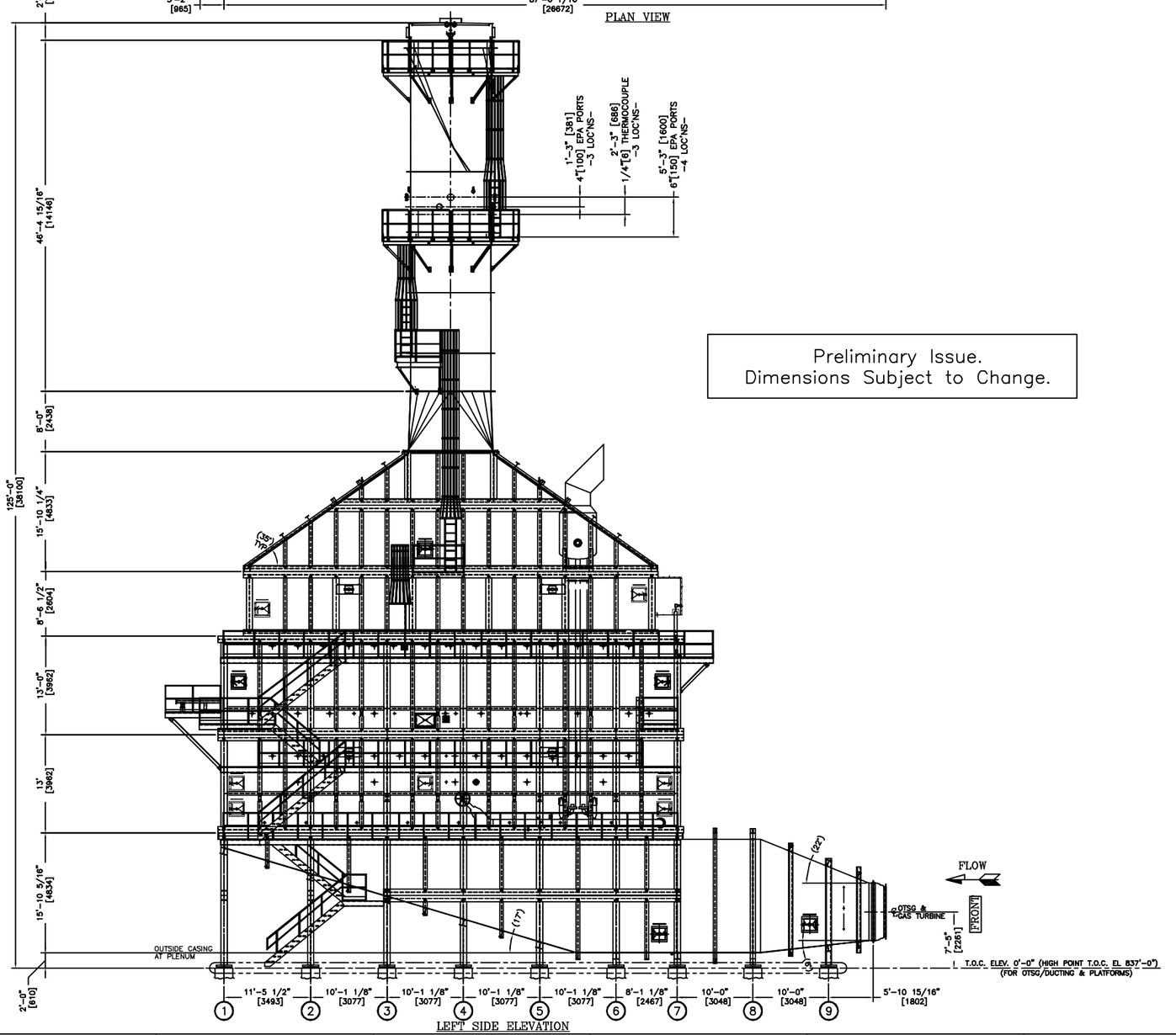
6. Before disassembling, for ease of reassembly, establish a reference for shaft extension to determine the approximate axial position of the rotor during assembly.

03-01-08

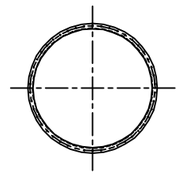
| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECR | DESCRIPTION | BY | APP | DATE |
| P | N/A | PRELIMINARY ISSUE. DIMENSIONS ARE SUBJECT TO CHANGE. | JH | JH | 11/01/13 |
| P.1 | N/A | PRELIMINARY ISSUE. DIMENSIONS ARE SUBJECT TO CHANGE. | JH | JH | 12/20/13 |




PLAN VIEW




LEFT SIDE ELEVATION



Preliminary Issue.
Dimensions Subject to Change.

REFERENCE DRAWINGS
FOUNDATION LOADINGS.....11303-0002
BASEPLATE LAYOUT ASSEMBLY.....11303-0003
FEEDWATER & STEAM FLOWSHEET....11303-0004

NOTES:
1. HEADERS LOCATED ON SAME END AS GAS INLET.
2. STEAM OUTLET WILL BE ON THE LEFT WHEN FACING HEADER END OF UNIT.
3. TYP. 12.00[305] CLEARANCE FOR EXTERNAL STIFFENING MUST BE NOTED AND ADHERED TO BY OTHERS.
4. ALL PRIMARY DIMENSIONS & ELEVATIONS ARE IN FEET & INCHES. ALL SECONDARY DIMENSIONS ARE IN mm.
5. IST T.P. DESIGNATES IST TERMINAL POINT.
6. ALL EXTERNAL PIPING WELDS TO BE IN ACCORDANCE WITH ASME B31.1 2007 EDITION.
7. A 28.00[712] SWING CLEARANCE IS REQUIRED AT ALL ACCESS DOORS.
8. STRUCTURAL STEEL DESIGN TO COMPLY WITH IBC 2010, AISC 13TH ED, AND CALIFORNIA BUILDING STANDARDS CODE 2010 EDITION (CCR TITLE 24).
9. PLATFORM GRATINGS TO HAVE FULL EDGE BANDING, INCLUDING CUT-OUTS. GRATING SERRATED TYPE.
10. ALL PLATFORM GRATING AND STAIR TREADS ARE TO BE GALVANIZED.
11. ALL LADDERS AND PLATFORMS TO CONFORM TO US OSHA AND CAL/OSHA STANDARDS (CCR TITLE 8).
12. SEE PIPING ASSEMBLY DRAWINGS FOR TERMINAL POINT DETAILS, MAXIMUM THERMAL DISPLACEMENTS AND ALLOWABLE LOADS ON PIPING.
13. ALL PAINTING TO COMPLY WITH IST STANDARD 11303-0450.

QUANTITIES SHOWN ARE FOR (1) ONE UNIT ONLY.

| QTY. | U/M | ITEM | PART NO. | PART NAME | DESCRIPTION | MATERIAL | ZONE |
|---|---|---|---|---|---|---|---|
| 1 | EA | 20 | 11303-300 | EQUIPMENT | EQUIPMENT LIST | | |
| 1 | EA | 19 | 11303-200 | VALVES | VALVE ASSEMBLY LIST | | |
| 1 | EA | 18 | 11303-100 | INSTRUMENTS | INSTRUMENT ASSEMBLY LIST | | |
| 1 | EA | 17 | 11303-0024 | PLATFORM ERECTION | PLATFORM ERECTION ASEMBLY AND DETAILS | | |
| 1 | EA | 16 | 11303-0023 | OTSG/DUCTING ERECTION | OTSG/DUCTING ERECTION DIAGRAM AND DETAILS | | |
| 1 | EA | 15 | 11303-0022 | PIPING ASSEMBLY | HP VENT STACK PIPING ASSY | | |
| 1 | EA | 14 | 11303-0021 | PIPING ASSEMBLY | HP STEAM PIPING ASSEMBLY | | |
| 1 | EA | 13 | 11303-0020 | PIPING ASSEMBLY | HP FEEDWATER PIPING ASSEMBLY | | |
| 1 | EA | 12 | 11303-0019 | EXHAUST STACK | EXHAUST STACK ASSEMBLY | | |
| 1 | EA | 11 | 11303-0018 | STACK ADAPTER | EXHAUST STACK ADAPTER | | |
| 1 | EA | 10 | 11303-0017 | U. EXHAUST HOOD | UPPER EXHAUST HOOD ASSEMBLY | | |
| 1 | EA | 09 | 11303-0016 | L. EXHAUST HOOD | LOWER EXHAUST HOOD ASSEMBLY | | |
| 1 | EA | 08 | 11303-0009 | UPPER MODULE | UPPER MODULE ASSEMBLY | | |
| 1 | EA | 07 | 11303-XXXX | SCR MODULE | SCR MODULE ASSEMBLY | | |
| 1 | EA | 06 | 11303-0006 | LOWER MODULE | LOWER/CO/AIG MODULE ASSEMBLY | | |
| 1 | EA | 05 | 11303-0015 | UPPER INLET PLENUM | UPPER INLET PLENUM ASSEMBLY | | |
| 1 | EA | 04 | 11303-0014 | LOWER INLET PLENUM | LOWER INLET PLENUM ASSEMBLY | | |
| 1 | EA | 03 | 11303-0013 | AIR DILUTION DUCT | AIR DILUTION DUCT ASSEMBLY | | |
| 1 | EA | 02 | 11303-0012 | INLET TRANS. DUCT | INLET TRANSITION DUCT ASSEMBLY | | |
| 1 | EA | 01 | 11303-0003 | BASE PLATE LAYOUT | BASE PLATE LAYOUT/ASSEMBLY | | |

BILL OF MATERIAL AND PARTS LIST

TOLERANCES
UNLESS OTHERWISE SPECIFIED
LINEAR DIMENSIONS ARE IN INCHES[mm]
METRIC UNDER 10 +/-
TOL OF 1 PLACE DECIMAL ± 0.100"
TOL OF 2 PLACE DECIMALS ± 0.030"
TOL OF 3 PLACE DECIMALS ± 0.030"
ANGULAR TOLERANCE +/- 0.5°

THIRD ANGLE PROJECTION

THIS IS A PROPRIETARY DESIGN OF INNOVATIVE STEAM TECHNOLOGIES, INC. (IST). ITS DISCLOSURE, REPRODUCTION, SUBMISSION OR ANY UNAUTHORIZED USE OF THE USE OF THE DESIGN OF ANY SUCH ASSEMBLY, SUBASSEMBLY OR PART IS NOT PERMITTED UNLESS EXPRESSLY AUTHORIZED IN WRITING BY INNOVATIVE STEAM TECHNOLOGIES.

| | | | |
|---|---|---|---|
| QUALITY | N/A | DATE: N/A | CUSTOMER: GLENARM |
| MFR. | N/A | DATE: N/A | |
| ENGINEER | J. TONG | DATE: 11/01/13 | TITLE: GENERAL ARRANGEMENT LM6000 PC OTSG |
| CHK. | J. HUNTER | DATE: 11/01/13 | |
| APPR. | J. HUNTER | DATE: 11/01/13 | |
| U.N.O. | VARIABLE | SCALE/MODEL: LM6000 PG | PREPARED: C12079 |
| DWGS LO: P:\C12079\11303-0001 | | | DWG. NO. 11303-0001 SIZE E REV. P1 |
| | | | SCALE: 1 : 64 SHEET NO. 01 OF 01 |

# Enclosure 4

PASADENA

Pasadena Water and Power

# INTRODUCTION

## GLENARM POWER PLANT REPOWERING

## BOP Contractor Pre-Bid Meeting

January 8, 2014

# Today's Agenda

Pasadena Water and Power

- Introduction
- Project Overview by POWER Engineers
- City of Pasadena and Local Participation
- PIE Overview by General Electric
- OTSG Overview by Innovative Steam Technologies
- Site Conditions
- Lunch
- Meet & Greet
- Site Visit

# Questions

Pasadena Water and Power

- We want to hear your questions and concerns
- We will respond to questions as time allows
- Please submit questions on 5x7 cards
- Responses to questions and all slides from today's meeting will be made available via an Addendum

# Some Key Points

Pasadena Water and Power

- Four bidders were qualified

| Prime Bidder | Engineering Sub |
|---|---|
| Abeinsa | Sargent & Lundy |
| ARB | WorleyParsons |
| i+iconEnergy | Zachary Engineering |
| Wood Group | PB Power |

- Only bids from four Primes will be accepted
- Interested contractors must team with a Prime
- Bid selection based on lowest priced conforming proposal

PASADENA

# Subcontractors

Pasadena Water and Power

- If Prime identified a panel for the primary major subcontractors – civil, mechanical, and electrical – Prime's bid must identify the final team.
- Changes to Prime's team will not be allowed after bid submission
- Prime's bid must identify all subcontractors whose value is >½% of total bid value
- Failure to define subcontractors as required will make the bid non-responsive

PASADENA

# Some Key Updates

Pasadena Water and Power

- Inlet Air Heating system has been deleted
  - > Mechanical chiller and plate heat exchanger retained
  - > Main steam supply to inlet air heating system and associated equipment has been deleted
  - > Performance guarantees remain unchanged
- Addendum #1 has been issued
- Addendum #2 is forthcoming, likely this week
- Addendum #3 is forthcoming, likely next week
- Further addendums as needed for Q&A

PASADENA

# Availability of Electronic Files

Pasadena Water and Power

- General Arrangement, Site Plan, and Grading Plan will be made available as live files
- Schematic drawings were developed using a database approach – not easily convertible to CAD
- POWER Engineers documents were developed to support project conceptual design, cost estimates, and bidding documents. They are not design level documents.

PASADENA

# Local Participation: Local Hiring

Pasadena Water and Power

- BOP Contractor must make best efforts to:
  - > Hire 25% (of certified payroll) from the City of Pasadena
  - > 15% of Contracting and Procurement with Pasadena businesses
- Opportunity Fair for Pasadena businesses
  - > January 8 1:00-2:30 PM
  - > January 22 1:00-2:30 PM
- Failure to make good faith outreach efforts may cause bid to be deemed non-responsive

PASADENA

# Meet & Greet

Pasadena Water and Power

- Located downstairs in the Training Room
- 25-30 local firms attending
- Tent Cards and Name Tags available for your use
- January 22nd Meet & Greet will utilize the same location and format

PASADENA

# Site Visit

Pasadena Water and Power

- Meet at Parking lot at Glenarm and Arroyo
- Four tour groups

| Prime Bidder | Tour Guide |
|---|---|
| Abeinsa | Gregg Harwood |
| ARB | Dick Fine |
| i+iconENERGY | Tony Clark |
| Wood Group | Dan Angeles |

- Don’t forget question cards

PASADENA

Pasadena Water and Power

# GT-5 GLENARM POWER PLANT REPOWERING

## BOP RFP Pre-Bid Presentation

January 8, 2014

# BOP RFP Pre-Bid Overview

Pasadena Water and Power

- Bid Package Summary
- Site Plan
- Tie Point List and Drawings
- Waste Water Configuration
- Ammonia Modifications
- Demolition Overlay and Existing Drawings
- Civil Scope / Storm Drain Reroute
- Architectural / Building Packages
- Pipe Rack Layout / STG Building Coordination

PASADENA

# BOP RFP Pre-Bid Overview

Pasadena Water and Power

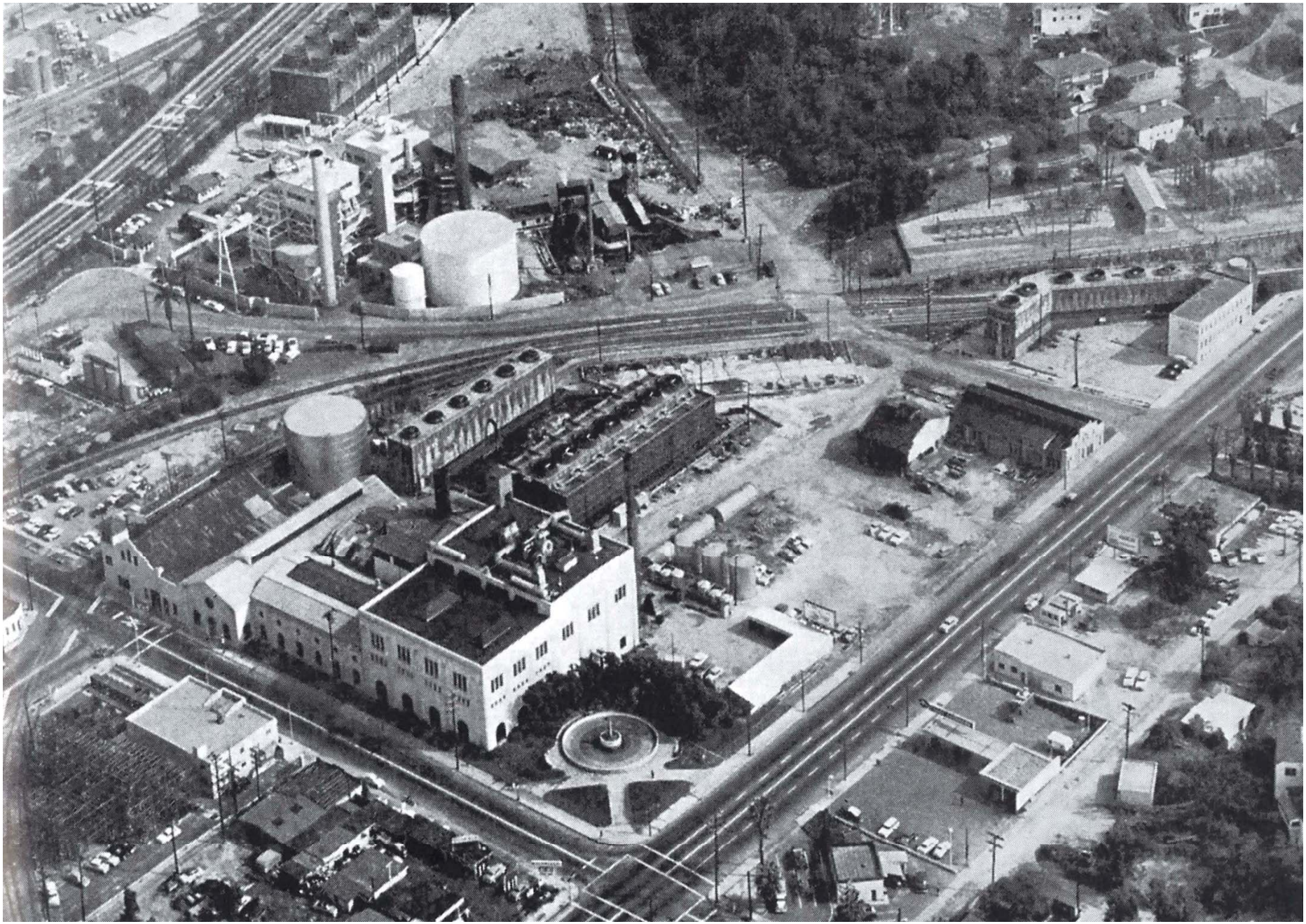
- P&IDs
- Fire Protection
- BOP Contractor Supplied Equipment
- GE Performance Information
- Control System Requirements
- High Voltage Scope
- PDC Scope, TCP Coordination, Critical Path Activity
- Engineering Deliverables
- Visual Simulations

# BID Package Summary

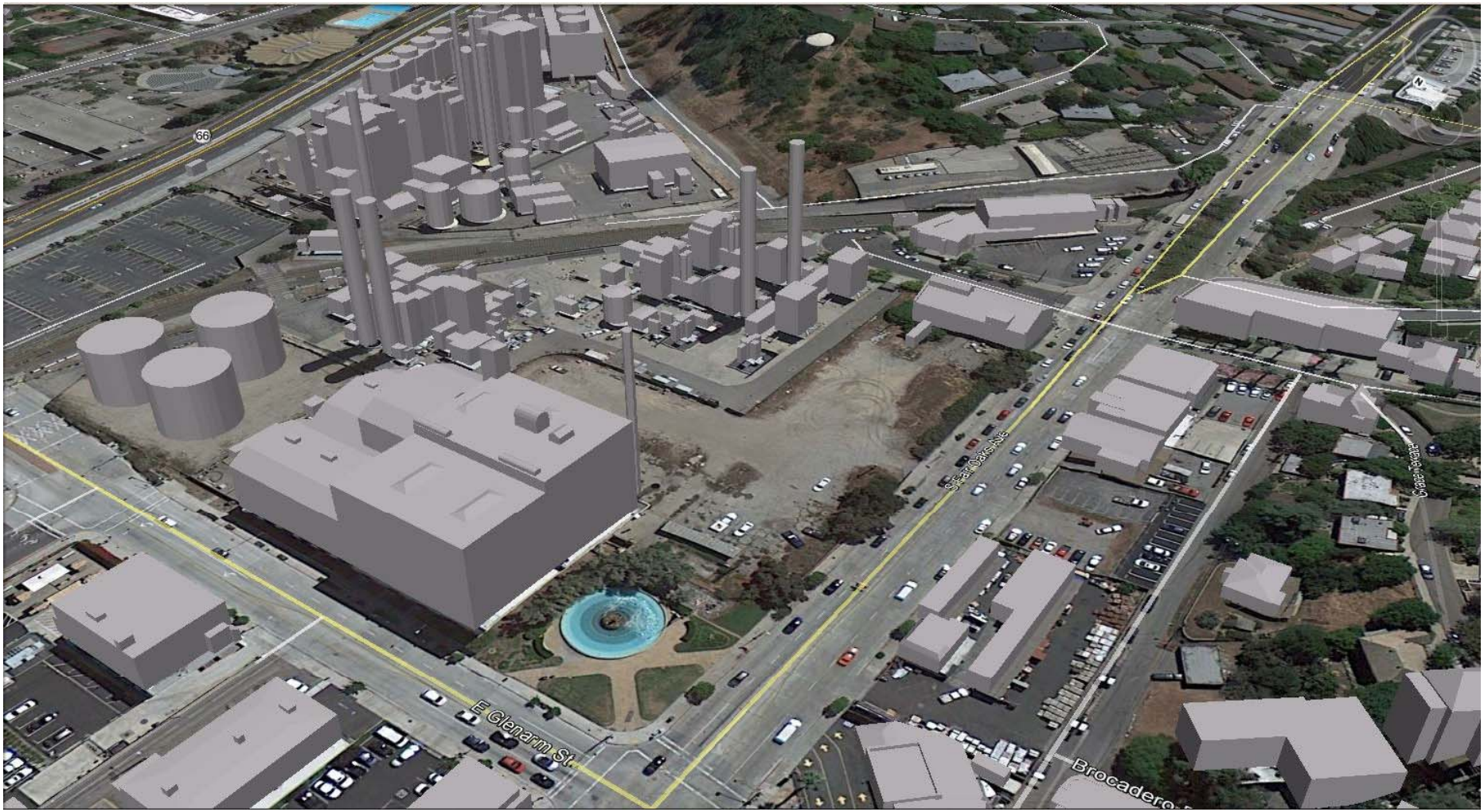
Pasadena Water and Power

- A.1 Project Scope of Work Document
- A.2 GT-5 Preliminary Design Drawings/Specs, BOP Furnished Equipment Specs, Equipment List, etc.
- A.3 Existing Drawings, Demo Scope, Permits, Owner Supplied Equipment Drawings and Specs, Geotech Reports, DOR

PASADENA

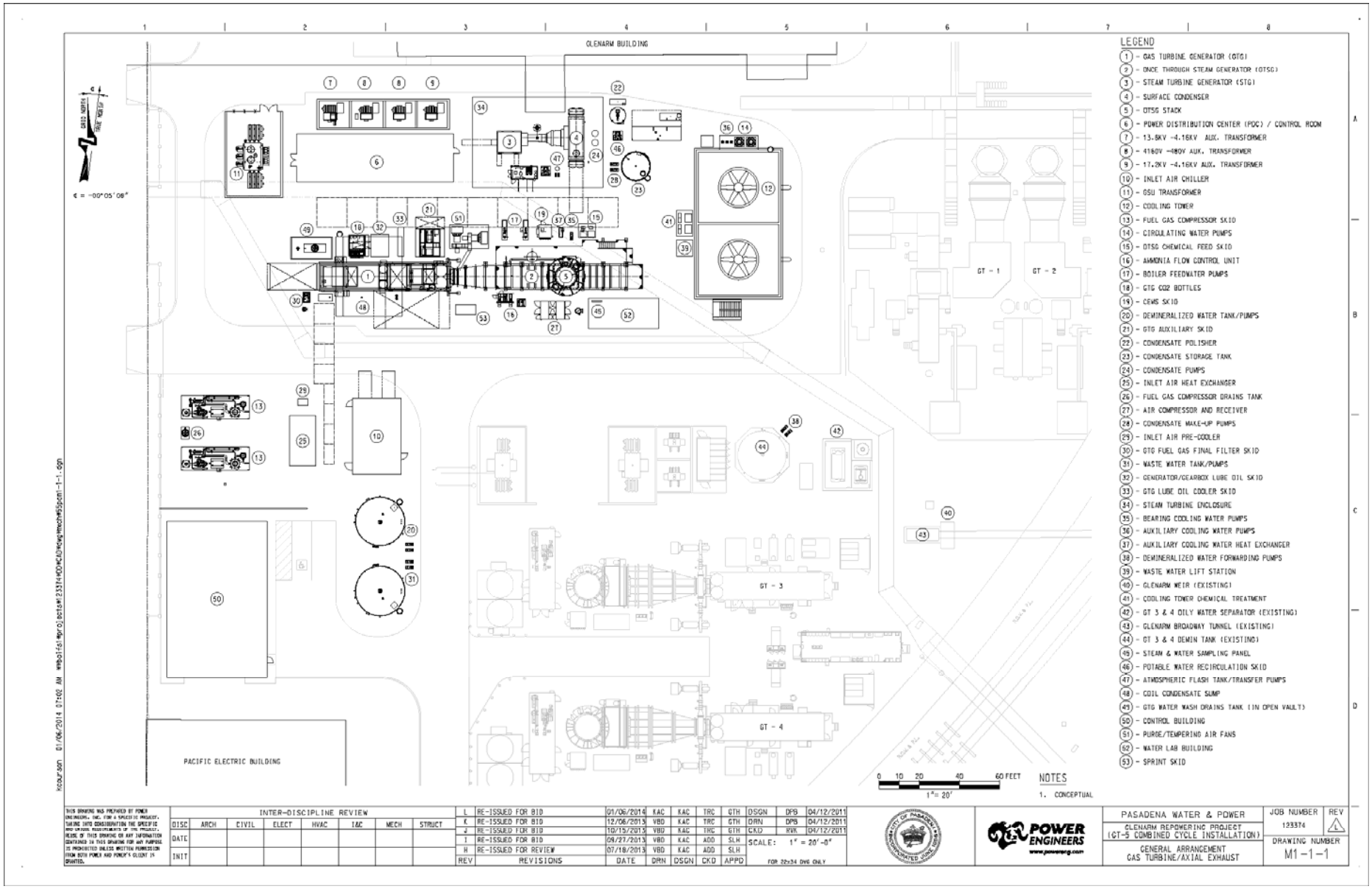


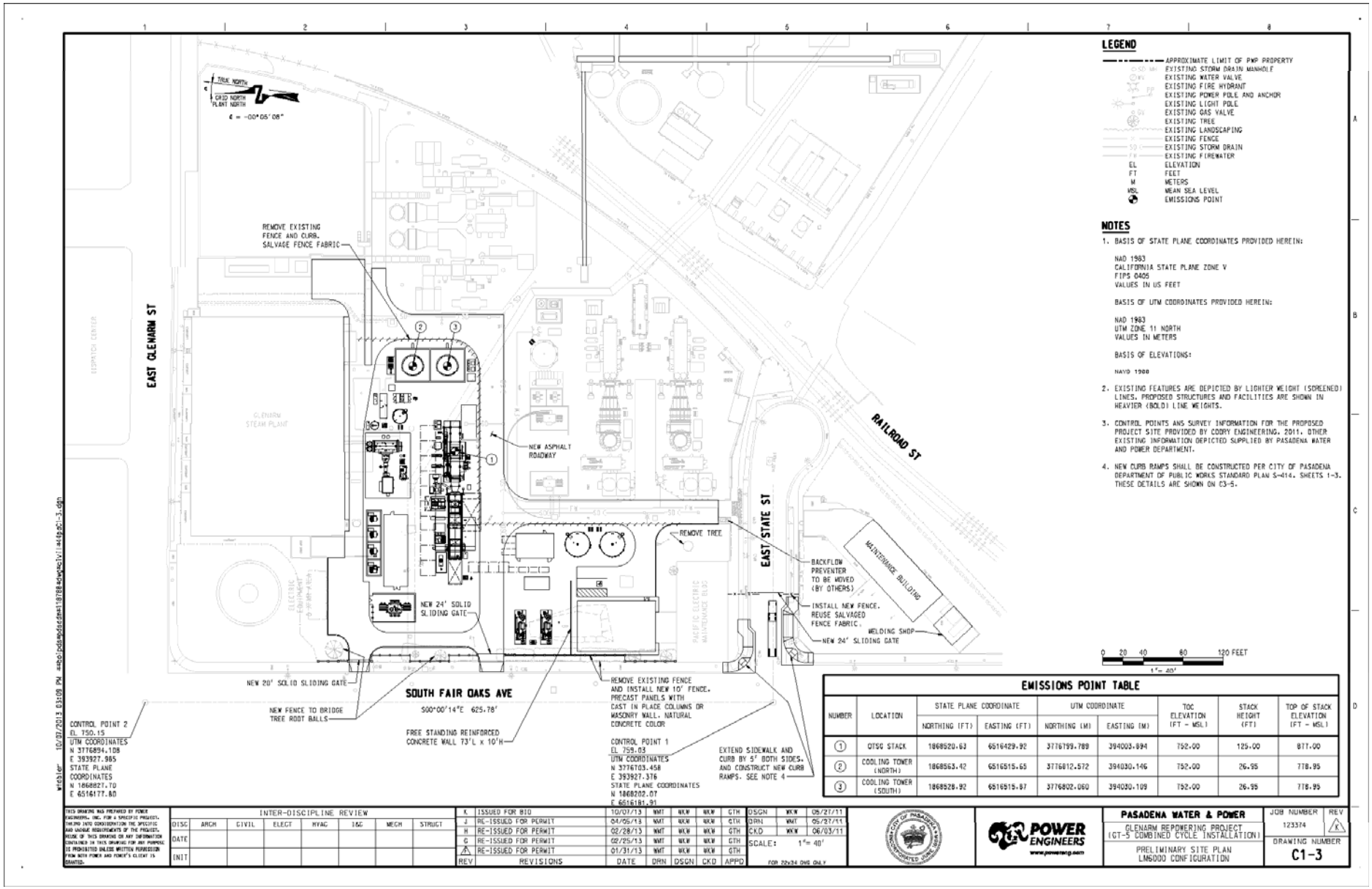
5




6

# Site Plan & General Arrangement


GLENARM BUILDING
PACIFIC ELECTRIC BUILDING
GT - 1
GT - 2
GT - 3
GT - 4
LEGEND
(1) - GAS TURBINE GENERATOR (GTG)
(2) - ONCE THROUGH STEAM GENERATOR (OTSG)
(3) - STEAM TURBINE GENERATOR (STG)
(4) - SURFACE CONDENSER
(5) - OTSG STACK
(6) - POWER DISTRIBUTION CENTER (PDC) / CONTROL ROOM
(7) - 13.8KV -4.16KV AUX. TRANSFORMER
(8) - 416OV -480V AUX. TRANSFORMER
(9) - 17.2KV -4.16KV AUX. TRANSFORMER
(10) - INLET AIR CHILLER
(11) - GSU TRANSFORMER
(12) - COOLING TOWER
(13) - FUEL GAS COMPRESSOR SKID
(14) - CIRCULATING WATER PUMPS
(15) - OTSG CHEMICAL FEED SKID
(16) - AMMONIA FLOW CONTROL UNIT
(17) - BOILER FEEDWATER PUMPS
(18) - GTG CO2 BOTTLES
(19) - CEMS SKID
(20) - DEMINERALIZED WATER TANK/PUMPS
(21) - GTG AUXILIARY SKID
(22) - CONDENSATE POLISHER
(23) - CONDENSATE STORAGE TANK
(24) - CONDENSATE PUMPS
(25) - INLET AIR HEAT EXCHANGER
(26) - FUEL GAS COMPRESSOR DRAINS TANK
(27) - AIR COMPRESSOR AND RECEIVER
(28) - CONDENSATE MAKE-UP PUMPS
(29) - INLET AIR PRE-COOLER
(30) - GTG FUEL GAS FINAL FILTER SKID
(31) - WASTE WATER TANK/PUMPS
(32) - GENERATOR/GEARBOX LUBE OIL SKID
(33) - GTG LUBE OIL COOLER SKID
(34) - STEAM TURBINE ENCLOSURE
(35) - BEARING COOLING WATER PUMPS
(36) - AUXILIARY COOLING WATER PUMPS
(37) - AUXILIARY COOLING WATER HEAT EXCHANGER
(38) - DEMINERALIZED WATER FORWARDING PUMPS
(39) - WASTE WATER LIFT STATION
(40) - GLENARM WEIR (EXISTING)
(41) - COOLING TOWER CHEMICAL TREATMENT
(42) - GT 3 & 4 OILY WATER SEPARATOR (EXISTING)
(43) - GLENARM BROADWAY TUNNEL (EXISTING)
(44) - GT 3 & 4 DEMIN TANK (EXISTING)
(45) - STEAM & WATER SAMPLING PANEL
(46) - POTABLE WATER RECIRCULATION SKID
(47) - ATMOSPHERIC FLASH TANK/TRANSFER PUMPS
(48) - COIL CONDENSATE SUMP
(49) - GTG WATER WASH DRAINS TANK (IN OPEN VAULT)
(50) - CONTROL BUILDING
(51) - PURGE/TEMPERING AIR FANS
(52) - WATER LAB BUILDING
(53) - SPRINT SKID
0 10 20 40 60 FEET
1"= 20'
NOTES
1. CONCEPTUAL
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE
INIT
L RE-ISSUED FOR BID 01/06/2014 KAC KAC TRC GTH DSGN DPB 04/12/2011
K RE-ISSUED FOR BID 12/06/2013 VBD KAC TRC GTH DRN DPB 04/12/2011
J RE-ISSUED FOR BID 10/15/2013 VBD KAC TRC GTH CKD RVK 04/12/2011
I RE-ISSUED FOR BID 09/27/2013 VBD KAC ADD SLH
H RE-ISSUED FOR REVIEW 07/18/2013 VBD KAC ADD SLH
REV REVISIONS DATE DRN DSGN CKD APPD
SCALE: 1" = 20'-0"
FOR 22x34 DWG ONLY
POWER ENGINEERS
www.powereng.com
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
GENERAL ARRANGEMENT
GAS TURBINE/AXIAL EXHAUST
JOB NUMBER 133374
REV 1
DRAWING NUMBER M1-1-1




**EMISSIONS POINT TABLE**

| NUMBER | LOCATION | STATE PLANE COORDINATE | | UTM COORDINATE | | TOC ELEVATION (FT - MSL) | STACK HEIGHT (FT) | TOP OF STACK ELEVATION (FT - MSL) |
|---|---|---|---|---|---|---|---|---|
| | | NORTHING (FT) | EASTING (FT) | NORTHING (M) | EASTING (M) | | | |
| ① | OTSG STACK | 1868520.63 | 6516429.92 | 3776799.789 | 394003.894 | 752.00 | 125.00 | 877.00 |
| ② | COOLING TOWER (NORTH) | 1868563.42 | 6516515.65 | 3776812.572 | 394030.146 | 752.00 | 26.95 | 778.95 |
| ③ | COOLING TOWER (SOUTH) | 1868528.92 | 6516515.87 | 3776802.060 | 394030.109 | 752.00 | 26.95 | 778.95 |

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFICS AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| K | ISSUED FOR BID | 10/07/13 | WMT | WKW | WKW | GTH |
| J | RE-ISSUED FOR PERMIT | 04/05/13 | WMT | WKW | WKW | GTH |
| H | RE-ISSUED FOR PERMIT | 02/28/13 | WMT | WKW | WKW | GTH |
| G | RE-ISSUED FOR PERMIT | 02/25/13 | WMT | WKW | WKW | GTH |
| F | RE-ISSUED FOR PERMIT | 01/31/13 | WMT | WKW | WKW | GTH |

DSGN WKW 05/27/11
DRN WMT 05/27/11
CKD WKW 06/03/11
SCALE: 1"= 40'
FOR 22x34 ONS ONLY

POWER ENGINEERS
www.powereng.com

**PASADENA WATER & POWER**
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
PRELIMINARY SITE PLAN
LM6000 CONFIGURATION

JOB NUMBER 123374
REV K
DRAWING NUMBER C1-3

# Tie In Points

# TIE-IN INDEX

| Unit 5 | | Size (in) | Material | Connection Type | Pressure | Temperature | Estimated Flow Rate | Fluid | Description | PWP | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tie Pt | P&ID | | | | | | | | | P&ID | Line # | |
| 1 | M3-18-1 | 6 | CS | 600# RF | 180-200 psig | 60°F | 24,250 lb/hr | Fuel Gas | Fuel Gas Supply | - | - | To tie into existing Glenarm city gas line. |
| 2 | M3-22-1 | 4 | DI | 250# MJ | 60-65 psig | TBD | 425 gpm | Potable/Service Water | City Potable Water Connection | - | - | Control Building, Cooling Tower Make-Up, Quench Spray, Potable Water System, Demineralized Water Treatment Trailer |
| 3 | M3-21-1 | 8 | DI | 250# MJ | 60-65 psig | TBD | TBD | Firewater | City Fire Water Connection | | | Location TBD by BOP Contractor; supply for Fire Water Loop |
| 4 | M3-21-1 | 8 | DI | 250# MJ | 60-65 psig | TBD | TBD | Firewater | City Fire Water Connection | - | - | Location TBD by BOP Contractor; supply for Maintenance Building |
| 5 | M3-23-2 | 4 | SS | 150# RF | 25 psia | 97°F | 98 gpm | Demineralized Water | Demineralized Water Supply from Tank 157B to new Demin Water Tank | 20001-040, Rev 2 | Tank 157B Spare Nozzle | Existing Tank 157B (Glenarm); new forwarding pumps. BOP Contractor to coordinate with PWP to determine location of available nozzle |
| 6 | M3-23-2 | 2 | SS | 150# RF | 25 psia | 97°F | 98 gpm | Demineralized Water | Demineralized Water Forwarding Pump Recirculation to Tank 157B | 20001-040, Rev 2 | Tank 157B Spare Nozzle | Existing Tank 157B (Glenarm); new forwarding pumps. BOP Contractor to coordinate with PWP to determine location of available nozzle |
| 7 | M3-23-2 | 4 | SS | 150# RF | 25 psia | 97°F | 250 gpm | Demineralized Water | Demineralized Water Supply from Tank 157A to new Demin Water Tank | 20001-040, Rev 2 | DW4004-4"-GC2Q | Existing forwarding pumps (158A) and Tank 157A (Broadway) |
| 8 | M3-26-1 | 4 (TBD) | CS | 150# RF | TBD | 80°F | 2-31 gpm | Potentially Oily Drains | Discharge from Equipment Drains Sump to OWS | 20001-071, Rev 0 | OW7004-6"-AB2B | Existing drain header is 6" |
| 9 | M3-26-1 | 4 | CS | 150# RF | 32 psia | 97°F | 100 gpm | Wastewater | OWS effluent to Glenarm Wastewater Storage Tank | 20001-071, Rev 0 | WT7001-4"-AB2B | |
| 10 | M3-26-1 | 4 (TBD) | CS | 150# RF | 50 psia | 97°F | 65 gpm | Wastewater | GT-5 Wastewater connection to existing wastewater discharge pipe | - | - | 75,190 gpd limit on Glenarm weir discharge |
| 11 | M3-26-1 | 4 (TBD) | CS | 150# FF | 50 psia | 140°F | 26 gpm | Wastewater | CT 3 Blowdown | 20001-3-050, Rev 2 | 3-BD9004-4"-AB2B | Diameter of Tie-in connection to be verified by BOP Contractor. |
| 12 | M3-26-1 | 4 (TBD) | CS | 150# FF | 50 psia | 140°F | 26 gpm | Wastewater | CT 4 Blowdown | 20001-4-050, Rev 2 | 4-BD9004-4"-AB2B | Diameter of Tie-in connection to be verified by BOP Contractor. |

| REV | REVISIONS | DATE | DSG | CHK | APP | REFERENCE DRAWINGS | | DSGN | SEG | 12.06.12 |
|---|---|---|---|---|---|---|---|---|---|---|
| D | ISSUE FOR BID | 11.20.13 | SEG | TRC | GTH | | | DRN | SEG | 12.06.12 |
| C | ISSUE FOR BID | 10.15.13 | SEG | TRC | GTH | | | CHK | ADD | 12.06.12 |
| B | ISSUE FOR BID | 9.27.13 | SEG | TRC | GTH | M1-1-6 | TIE POINT DRAWING | SCALE | NONE | |

POWER ENGINEERS

PASADENA WATER AND POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)

TIE POINT INDEX

JOB NUMBER 123374
DRAWING # M9-10
SHEET 1 OF 2

REV D

THIS DOCUMENT WAS PREPARED BY POWER ENGINEERS, INC. FOR SPECIFIC PROJECTS, AND UNIQUE REQUIREMENTS OF THE PROJECTS. REUSE OF THIS DOCUMENT OR ANY INFORMATION CONTAINED IN THIS DOCUMENT FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

| Unit 5 | | Size (in) | Material | Connection Type | Pressure | Temperature | Estimated Flow Rate | Fluid | Description | PWP | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tie Pt | P&ID | | | | | | | | | P&ID | Line # | |
| 13 | M3-26-1 | 4 (TBD) | CS | TBD | 50 psia | 97°F | 191 gpm | Wastewater | Glenarm Wastewater Storage Tank connection to existing wastewater disharge pipe | - | - | Diameter of Tie-in connection to be verified by BOP Contractor. |
| 14 | M3-13-1 | TBD | CS | TBD | TBD | 97°F | TBD | Process Water | Fountain Drain | - | - | To be emptied quarterly. Connection and means of pumping to the cooling tower TBD by BOP Contractor. |
| 15 | M3-2-1 | TBD | CS | Hose Connect | 5 psig | 97°F | TBD | Wash Water Drains | GTG Wash Water Drains Tank Pump-out | - | - | To be pumped out along with GT-3/4 wash water |
| 16 | M3-17-1 | 2 | SS Double Wall | 150# RF | 50 psig | 80°F | 23 lb/hr | 19% Aqueous Ammonia | Aqueous Ammonia Supply | 20001-090, Rev 1 | TBD | Existing 29% Ammonia Tank to be retrofitted for 19% Aqueous Ammonia |
| 17 | M3-17-1 | 1 (TBD) | SS | 150# RF | 50 psig | 80°F | TBD | 19% Aqueous Ammonia | Aqueous Ammonia Pump Minimum Flow | 20001-090, Rev 1 | TBD | Minimum Flow for Aqueous Ammonia Forwarding Pumps |
| 18 | M3-17-1 | 1 (TBD) | SS | 150# RF | 50 psig | 80°F | TBD | 19% Aqueous Ammonia | Aqueous Ammonia Pump Skid Recirculation | 20001-090, Rev 1 | TBD | Recirculation for 19% Ammonia forwarding skid |
| 19 | NA | NA | NA | NA | NA | NA | NA | | 34.5 kV | - | - | |
| 20 | NA | NA | NA | NA | NA | NA | NA | | 17 kV | - | - | |
| 21 | NA | NA | NA | NA | NA | NA | NA | | GT1 Control System | - | - | |
| 22 | NA | NA | NA | NA | NA | NA | NA | | GT2 Control System | - | - | |
| 23 | NA | NA | NA | NA | NA | NA | NA | | GT3 Control System | - | - | |
| 24 | NA | NA | NA | NA | NA | NA | NA | | GT4 Control System | - | - | |
| 25 | NA | NA | NA | NA | NA | NA | NA | | 34.5 kV Relay Panel | - | - | LOCATION ON HOLD |
| 26 | NA | NA | NA | NA | NA | NA | NA | | Phone | - | - | LOCATION ON HOLD |
| 27 | NA | NA | NA | NA | NA | NA | NA | | Internet | - | - | LOCATION ON HOLD |
| 28 | NA | TBD | CS | TBD | TBD | TBD | TBD | Sanitary Waste | Sanitary Sewer | - | - | LOCATION ON HOLD |
| 29 | M3-20-1 | TBD | SS | 150# RF | TBD | 97°F | TBD | Compressed Dry Air | Service/Instrument Air | | | Cross-tie to GT-3 and GT-4 Air System |
| 30 | M3-26-1 | TBD | CS | TBD | TBD | 97°F | NA | Potentially Oily Drains | OWS Level Instrument | - | - | |
| 31 | NA | NA | NA | NA | NA | NA | NA | | Existing B3 Control Room | - | - | |
| 32 | M3-3-1 | 3 | SS Double Wall | WE | 50 psig | 80°F | 23 lb/hr | 19% Aqueous Ammonia | New Ammonia Feed Connection | 20001-090-SK2 | - | Existing double containment pipe currently used for B-3. |

| REV | REVISIONS | DATE | DSG | CHK | APP | REFERENCE DRAWINGS |
|---|---|---|---|---|---|---|
| D | ISSUE FOR BID | 11.20.13 | SEG | TRC | GTH | |
| C | ISSUE FOR BID | 10.15.13 | SEG | TRC | GTH | |
| B | ISSUE FOR BID | 9.27.13 | SEG | TRC | GTH | M1-1-6 TIE POINT DRAWING |

| | | |
|---|---|---|
| DSGN | SEG | 12.06.12 |
| DRN | SEG | 12.06.12 |
| CHK | ADD | 12.06.12 |
| SCALE | NONE | |

POWER ENGINEERS

PASADENA WATER AND POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)

TIE POINT INDEX

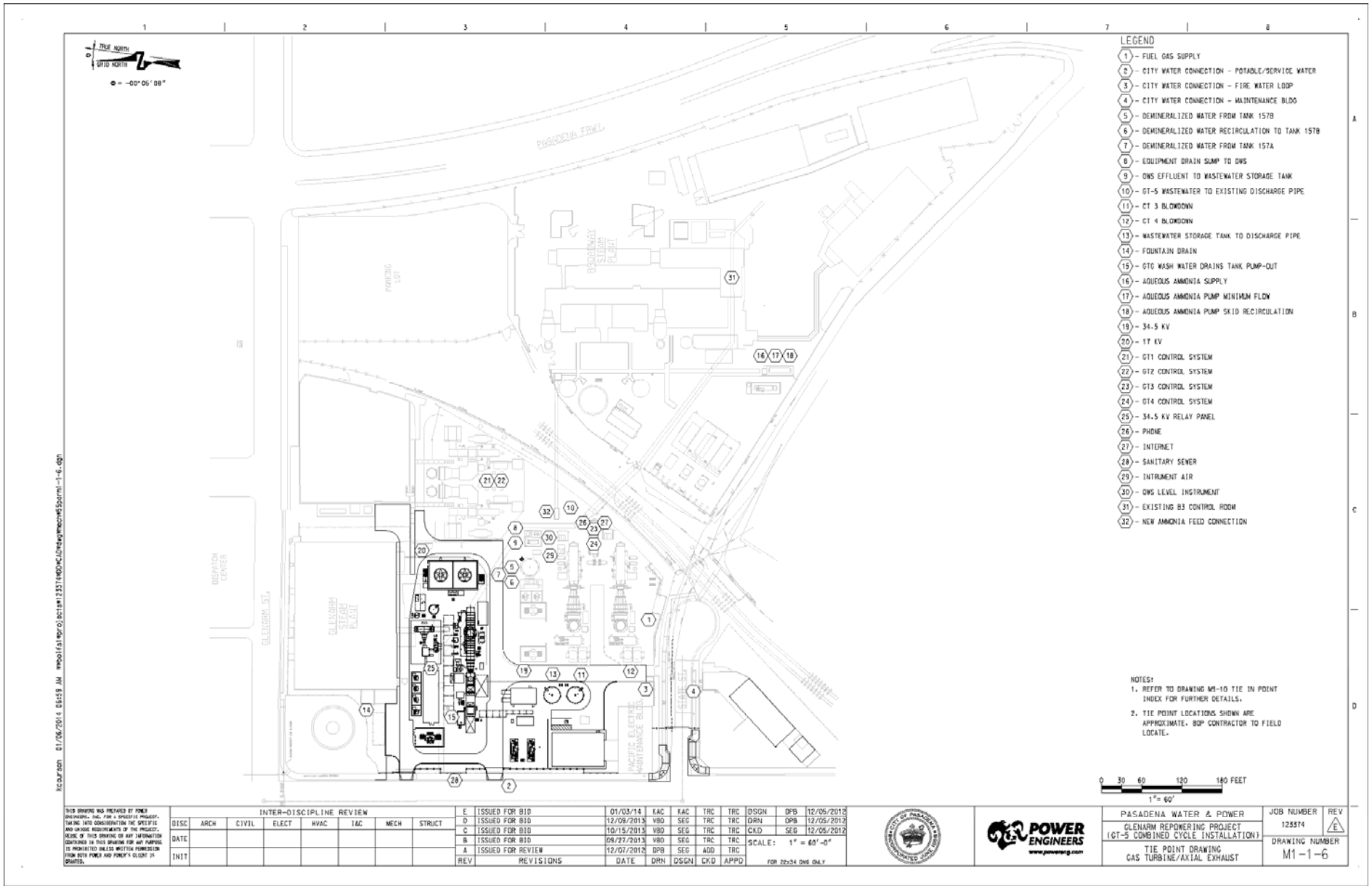
JOB NUMBER 123374

DRAWING # M9-10

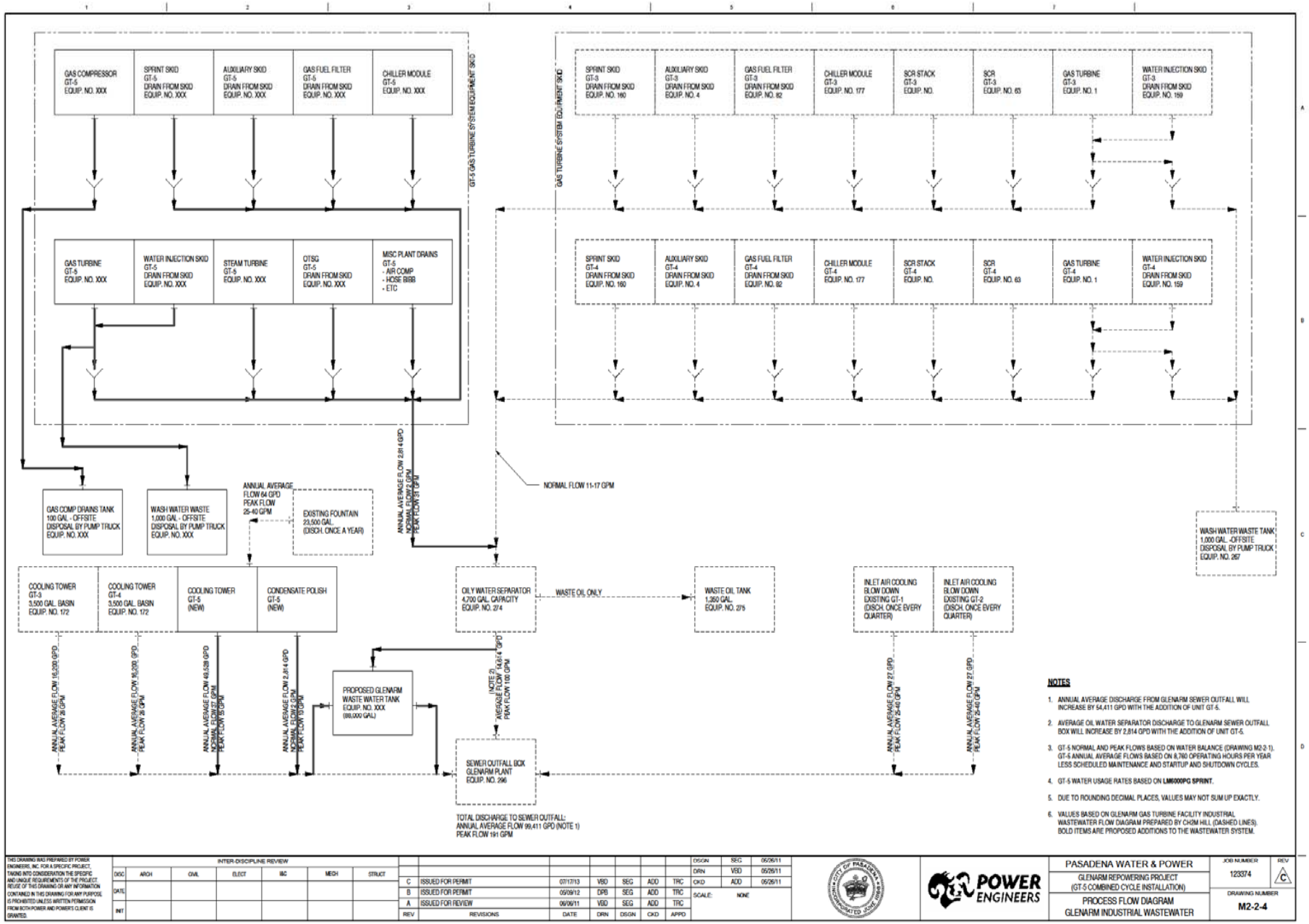
SHEET 2 OF 2

REV D

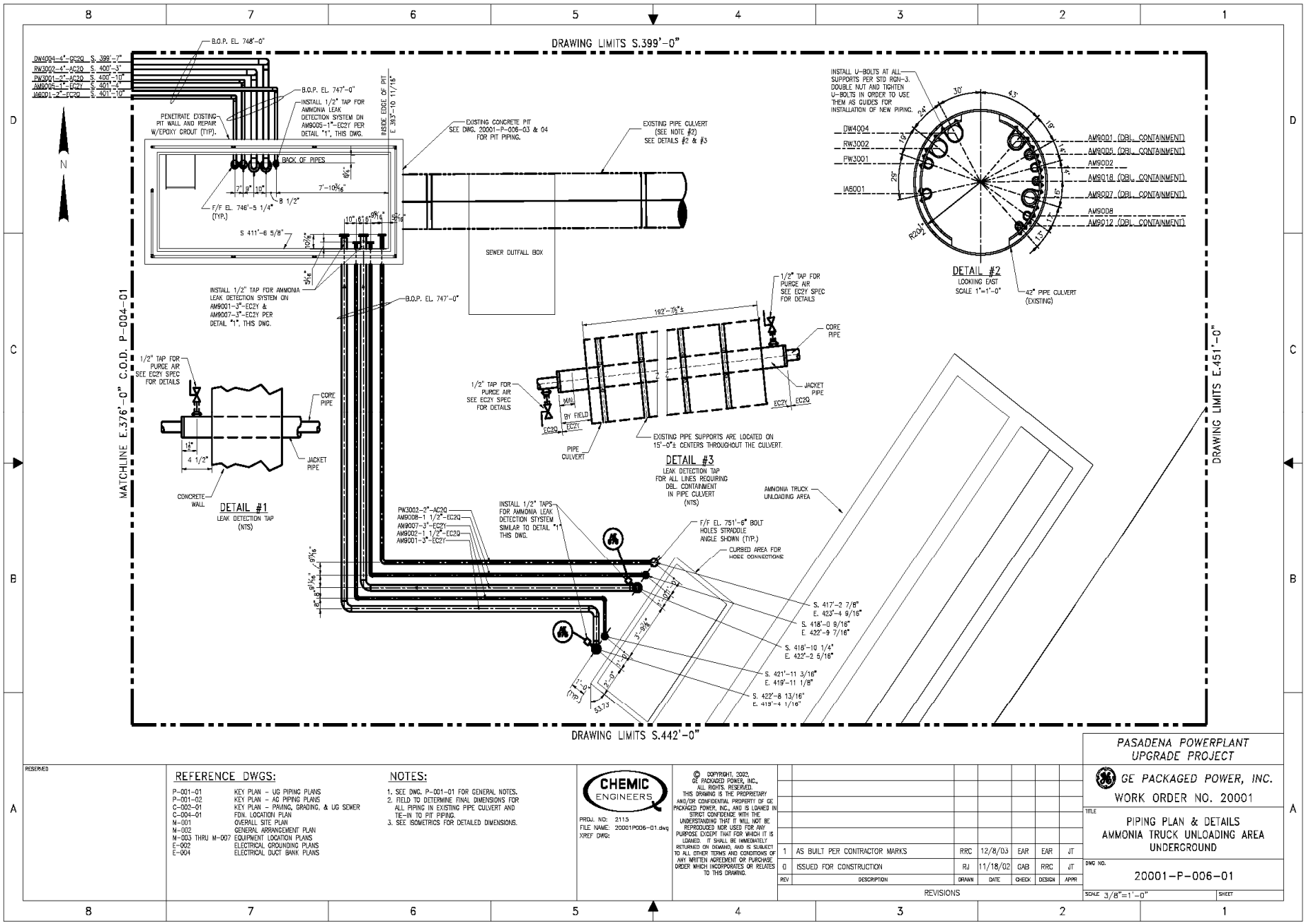
THIS DOCUMENT WAS PREPARED BY POWER ENGINEERS, INC. FOR SPECIFIC PROJECTS, AND UNIQUE REQUIREMENTS OF THE PROJECTS. REUSE OF THIS DOCUMENT OR ANY INFORMATION CONTAINED IN THIS DOCUMENT FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.


TRUE NORTH
GRID NORTH
Φ = -00° 05' 08"
PASADENA FWY.
BROADWAY STEAM PLANT
PARKING LOT
DISPATCH CENTER
GLENARM ST.
GLENARM STEAM PLANT
PACIFIC ELECTRIC MAINTENANCE BLDG.
LEGEND
1 - FUEL GAS SUPPLY
2 - CITY WATER CONNECTION - POTABLE/SERVICE WATER
3 - CITY WATER CONNECTION - FIRE WATER LOOP
4 - CITY WATER CONNECTION - MAINTENANCE BLDG
5 - DEMINERALIZED WATER FROM TANK 157B
6 - DEMINERALIZED WATER RECIRCULATION TO TANK 157B
7 - DEMINERALIZED WATER FROM TANK 157A
8 - EQUIPMENT DRAIN SUMP TO OWS
9 - OWS EFFLUENT TO WASTEWATER STORAGE TANK
10 - GT-5 WASTEWATER TO EXISTING DISCHARGE PIPE
11 - CT 3 BLOWDOWN
12 - CT 4 BLOWDOWN
13 - WASTEWATER STORAGE TANK TO DISCHARGE PIPE
14 - FOUNTAIN DRAIN
15 - GTG WASH WATER DRAINS TANK PUMP-OUT
16 - AQUEOUS AMMONIA SUPPLY
17 - AQUEOUS AMMONIA PUMP MINIMUM FLOW
18 - AQUEOUS AMMONIA PUMP SKID RECIRCULATION
19 - 34.5 KV
20 - 17 KV
21 - GT1 CONTROL SYSTEM
22 - GT2 CONTROL SYSTEM
23 - GT3 CONTROL SYSTEM
24 - GT4 CONTROL SYSTEM
25 - 34.5 KV RELAY PANEL
26 - PHONE
27 - INTERNET
28 - SANITARY SEWER
29 - INTRUMENT AIR
30 - OWS LEVEL INSTRUMENT
31 - EXISTING B3 CONTROL ROOM
32 - NEW AMMONIA FEED CONNECTION
NOTES:
1. REFER TO DRAWING M9-10 TIE IN POINT INDEX FOR FURTHER DETAILS.
2. TIE POINT LOCATIONS SHOWN ARE APPROXIMATE. BOP CONTRACTOR TO FIELD LOCATE.
0 30 60 120 180 FEET
1" = 60'
kcourson 01/06/2014 08:59 AM \\mpolifs1\Work\Projects\125374\MDOCS\Engineering\M1S\pam1-1-6.dgn
THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.
INTER-DISCIPLINE REVIEW
DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT
DATE
INIT
REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD
E | ISSUED FOR BID | 01/03/14 | KAC | KAC | TRC | TRC
D | ISSUED FOR BID | 12/09/2013 | VBD | SEG | TRC | TRC
C | ISSUED FOR BID | 10/15/2013 | VBD | SEG | TRC | TRC
B | ISSUED FOR BID | 09/27/2013 | VBD | SEG | TRC | TRC
A | ISSUED FOR REVIEW | 12/07/2012 | DPB | SEG | ADD | TRC
DSGN DPB 12/05/2013
DRN DPB 12/05/2012
CKD SEG 12/05/2012
SCALE: 1" = 60'-0"
FOR 22x34 DWG ONLY
POWER ENGINEERS
www.powereng.com
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
TIE POINT DRAWING GAS TURBINE/AXIAL EXHAUST
JOB NUMBER 125374
REV E
DRAWING NUMBER M1-1-6

# Waste Water Configuration


GAS COMPRESSOR GT-5 EQUIP. NO. XXX
SPRINT SKID GT-5 DRAIN FROM SKID EQUIP. NO. XXX
AUXILIARY SKID GT-5 DRAIN FROM SKID EQUIP. NO. XXX
GAS FUEL FILTER GT-5 DRAIN FROM SKID EQUIP. NO. XXX
CHILLER MODULE GT-5 EQUIP. NO. XXX
GT-5 GAS TURBINE SYSTEM EQUIPMENT SKID
GAS TURBINE GT-5 EQUIP. NO. XXX
WATER INJECTION SKID GT-5 DRAIN FROM SKID EQUIP. NO. XXX
STEAM TURBINE GT-5 EQUIP. NO. XXX
OTSG GT-5 DRAIN FROM SKID EQUIP. NO. XXX
MISC PLANT DRAINS GT-5 - AIR COMP - HOSE BIBB - ETC
GAS TURBINE SYSTEM EQUIPMENT SKID
SPRINT SKID GT-3 DRAIN FROM SKID EQUIP. NO. 160
AUXILIARY SKID GT-3 DRAIN FROM SKID EQUIP. NO. 4
GAS FUEL FILTER GT-3 DRAIN FROM SKID EQUIP. NO. 82
CHILLER MODULE GT-3 EQUIP. NO. 177
SCR STACK GT-3 EQUIP. NO.
SCR GT-3 EQUIP. NO. 63
GAS TURBINE GT-3 EQUIP. NO. 1
WATER INJECTION SKID GT-3 DRAIN FROM SKID EQUIP. NO. 159
SPRINT SKID GT-4 DRAIN FROM SKID EQUIP. NO. 160
AUXILIARY SKID GT-4 DRAIN FROM SKID EQUIP. NO. 4
GAS FUEL FILTER GT-4 DRAIN FROM SKID EQUIP. NO. 82
CHILLER MODULE GT-4 EQUIP. NO. 177
SCR STACK GT-4 EQUIP. NO.
SCR GT-4 EQUIP. NO. 63
GAS TURBINE GT-4 EQUIP. NO. 1
WATER INJECTION SKID GT-4 DRAIN FROM SKID EQUIP. NO. 159
GAS COMP DRAINS TANK 100 GAL - OFFSITE DISPOSAL BY PUMP TRUCK EQUIP. NO. XXX
WASH WATER WASTE 1,000 GAL - OFFSITE DISPOSAL BY PUMP TRUCK EQUIP. NO. XXX
ANNUAL AVERAGE FLOW 64 GPD PEAK FLOW 25-40 GPM
EXISTING FOUNTAIN 23,500 GAL. (DISCH. ONCE A YEAR)
ANNUAL AVERAGE FLOW 2,814 GPD NORMAL FLOW 2 GPM PEAK FLOW 97 GPM
NORMAL FLOW 11-17 GPM
WASH WATER WASTE TANK 1,000 GAL -OFFSITE DISPOSAL BY PUMP TRUCK EQUIP. NO. 267
COOLING TOWER GT-3 3,500 GAL. BASIN EQUIP. NO. 172
COOLING TOWER GT-4 3,500 GAL. BASIN EQUIP. NO. 172
COOLING TOWER GT-5 (NEW)
CONDENSATE POLISH GT-5 (NEW)
OILY WATER SEPARATOR 4,700 GAL. CAPACITY EQUIP. NO. 274
WASTE OIL ONLY
WASTE OIL TANK 1,350 GAL. EQUIP. NO. 275
INLET AIR COOLING BLOW DOWN EXISTING GT-1 (DISCH. ONCE EVERY QUARTER)
INLET AIR COOLING BLOW DOWN EXISTING GT-2 (DISCH. ONCE EVERY QUARTER)
ANNUAL AVERAGE FLOW 16,200 GPD PEAK FLOW 26 GPM
ANNUAL AVERAGE FLOW 16,200 GPD PEAK FLOW 26 GPM
ANNUAL AVERAGE FLOW 49,328 GPD NORMAL FLOW 7 GPM PEAK FLOW 55 GPM
ANNUAL AVERAGE FLOW 2,814 GPD NORMAL FLOW 2 GPM PEAK FLOW 10 GPM
PROPOSED GLENARM WASTE WATER TANK EQUIP. NO. XXX (88,000 GAL)
NOTE 2 ANNUAL AVERAGE FLOW 14,464 GPD PEAK FLOW 100 GPM
ANNUAL AVERAGE FLOW 27 GPD PEAK FLOW 25-40 GPM
ANNUAL AVERAGE FLOW 27 GPD PEAK FLOW 25-40 GPM
SEWER OUTFALL BOX GLENARM PLANT EQUIP. NO. 296
TOTAL DISCHARGE TO SEWER OUTFALL: ANNUAL AVERAGE FLOW 99,411 GPD (NOTE 1) PEAK FLOW 191 GPM
NOTES
1. ANNUAL AVERAGE DISCHARGE FROM GLENARM SEWER OUTFALL WILL INCREASE BY 54,411 GPD WITH THE ADDITION OF UNIT GT-5.
2. AVERAGE OIL WATER SEPARATOR DISCHARGE TO GLENARM SEWER OUTFALL BOX WILL INCREASE BY 2,814 GPD WITH THE ADDITION OF UNIT GT-5.
3. GT-5 NORMAL AND PEAK FLOWS BASED ON WATER BALANCE (DRAWING M2-2-1). GT-5 ANNUAL AVERAGE FLOWS BASED ON 8,760 OPERATING HOURS PER YEAR LESS SCHEDULED MAINTENANCE AND STARTUP AND SHUTDOWN CYCLES.
4. GT-5 WATER USAGE RATES BASED ON LM6000PG SPRINT.
5. DUE TO ROUNDING DECIMAL PLACES, VALUES MAY NOT SUM UP EXACTLY.
6. VALUES BASED ON GLENARM GAS TURBINE FACILITY INDUSTRIAL WASTEWATER FLOW DIAGRAM PREPARED BY CH2M HILL (DASHED LINES). BOLD ITEMS ARE PROPOSED ADDITIONS TO THE WASTEWATER SYSTEM.
THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE, IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT I&C MECH STRUCT
DATE
INT
C ISSUED FOR PERMIT 07/17/13 VED SEG ADD TRC
B ISSUED FOR PERMIT 05/09/12 DPB SEG ADD TRC
A ISSUED FOR REVIEW 06/06/11 VED SEG ADD TRC
REV REVISIONS DATE DRN DSGN CKD APPD
DSGN SEG 05/26/11
DRN VED 05/26/11
CKD ADD 05/26/11
SCALE: NONE
POWER ENGINEERS
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
PROCESS FLOW DIAGRAM GLENARM INDUSTRIAL WASTEWATER
JOB NUMBER 123374
REV C
DRAWING NUMBER M2-2-4

# Ammonia Modifications




RESERVED

## REFERENCE DWGS:

| | |
|---|---|
| P-001-01 | KEY PLAN – UG PIPING PLANS |
| P-001-02 | KEY PLAN – AG PIPING PLANS |
| C-002-01 | KEY PLAN – PAVING, GRADING, & UG SEWER |
| C-004-01 | FDN. LOCATION PLAN |
| M-001 | OVERALL SITE PLAN |
| M-002 | GENERAL ARRANGEMENT PLAN |
| M-003 THRU M-007 | EQUIPMENT LOCATION PLANS |
| E-002 | ELECTRICAL GROUNDING PLANS |
| E-004 | ELECTRICAL DUCT BANK PLANS |

## NOTES:

1. SEE DWG. P-001-01 FOR GENERAL NOTES.
2. FIELD TO DETERMINE FINAL DIMENSIONS FOR ALL PIPING IN EXISTING PIPE CULVERT AND TIE-IN TO PIT PIPING.
3. SEE ISOMETRICS FOR DETAILED DIMENSIONS.

CHEMIC ENGINEERS

PROJ. NO: 2115
FILE NAME: 20001P006-01.dwg
XREF DWG:

© COPYRIGHT, 2002, GE PACKAGED POWER, INC., ALL RIGHTS RESERVED. THIS DRAWING IS THE PROPRIETARY AND/OR CONFIDENTIAL PROPERTY OF GE PACKAGED POWER, INC., AND IS LOANED IN STRICT CONFIDENCE WITH THE UNDERSTANDING THAT IT WILL NOT BE REPRODUCED NOR USED FOR ANY PURPOSE EXCEPT THAT FOR WHICH IT IS LOANED. IT SHALL BE IMMEDIATELY RETURNED ON DEMAND, AND IS SUBJECT TO ALL OTHER TERMS AND CONDITIONS OF ANY WRITTEN AGREEMENT OR PURCHASE ORDER WHICH INCORPORATES OR RELATES TO THIS DRAWING.

| REV | DESCRIPTION | DRAWN | DATE | CHECK | DESIGN | APPR |
|---|---|---|---|---|---|---|
| 1 | AS BUILT PER CONTRACTOR MARKS | RRC | 12/8/03 | EAR | EAR | JT |
| 0 | ISSUED FOR CONSTRUCTION | RJ | 11/18/02 | GAB | RRC | JT |

REVISIONS

PASADENA POWERPLANT UPGRADE PROJECT

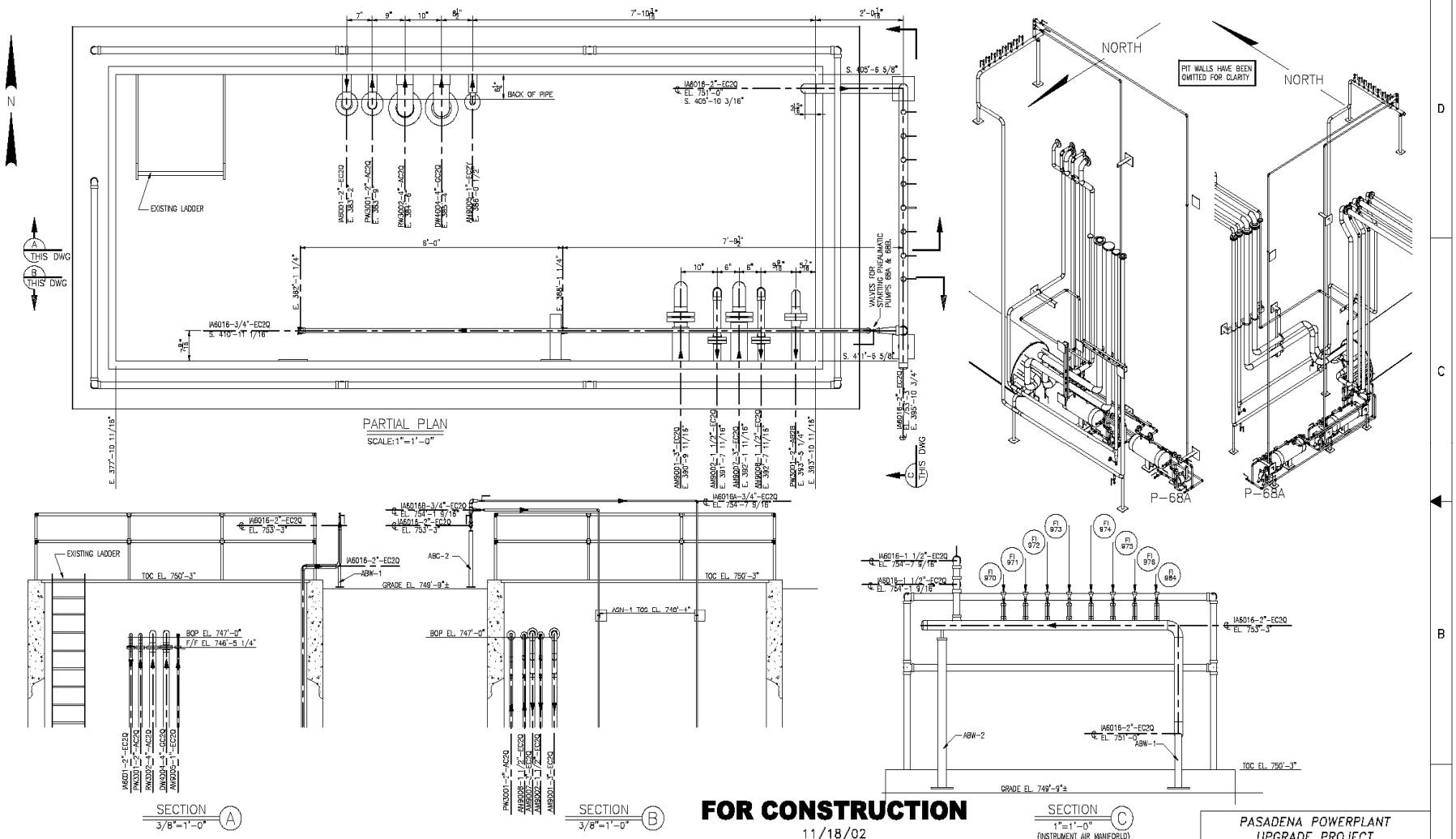
GE PACKAGED POWER, INC.

WORK ORDER NO. 20001

TITLE: PIPING PLAN & DETAILS AMMONIA TRUCK UNLOADING AREA UNDERGROUND

DWG NO. 20001-P-006-01

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




RESERVED

## REFERENCE DWGS:

| | |
|---|---|
| P-001-01 | KEY PLAN – UG PIPING PLANS |
| P-001-02 | KEY PLAN – AG PIPING PLANS |
| C-002-01 | KEY PLAN – PAVING, GRADING, & UG SEWER |
| C-004-01 | FDN. LOCATION PLAN |
| M-001 | OVERALL SITE PLAN |
| M-002 | GENERAL ARRANGEMENT PLAN |
| M-003 THRU M-007 | EQUIPMENT LOCATION PLANS |
| E-002 | ELECTRICAL GROUNDING PLANS |
| E-004 | ELECTRICAL DUCT BANK PLANS |

## NOTES:

1. SEE DWG. P-001-01 FOR GENERAL NOTES.
2. SEE DWG. P-006-01 FOR LOCATION OF WEST END CULVERT.
3. SEE ISOMETRICS FOR DETAILED DIMENSIONS.

CHEMIC ENGINEERS

PROJ. NO: 2115
FILE NAME: 20001P006-03.DWG
XREF DWG:

© COPYRIGHT, 2002, GE PACKAGED POWER, INC., ALL RIGHTS RESERVED. THIS DRAWING IS THE PROPRIETARY AND/OR CONFIDENTIAL PROPERTY OF GE PACKAGED POWER, INC., AND IS LOANED IN STRICT CONFIDENCE WITH THE UNDERSTANDING THAT IT WILL NOT BE REPRODUCED NOR USED FOR ANY PURPOSE EXCEPT THAT FOR WHICH IT IS LOANED. IT SHALL BE IMMEDIATELY RETURNED ON DEMAND, AND IS SUBJECT TO ALL OTHER TERMS AND CONDITIONS OF ANY WRITTEN AGREEMENT OR PURCHASE ORDER WHICH INCORPORATES OR RELATES TO THIS DRAWING.

| REV | DESCRIPTION | DRAWN | DATE | CHECK | DESIGN | APPR |
|---|---|---|---|---|---|---|
| 0 | ISSUED FOR CONSTRUCTION | RCJ | 11/18/02 | GAB | RRC | JT |

REVISIONS

PASADENA POWERPLANT UPGRADE PROJECT

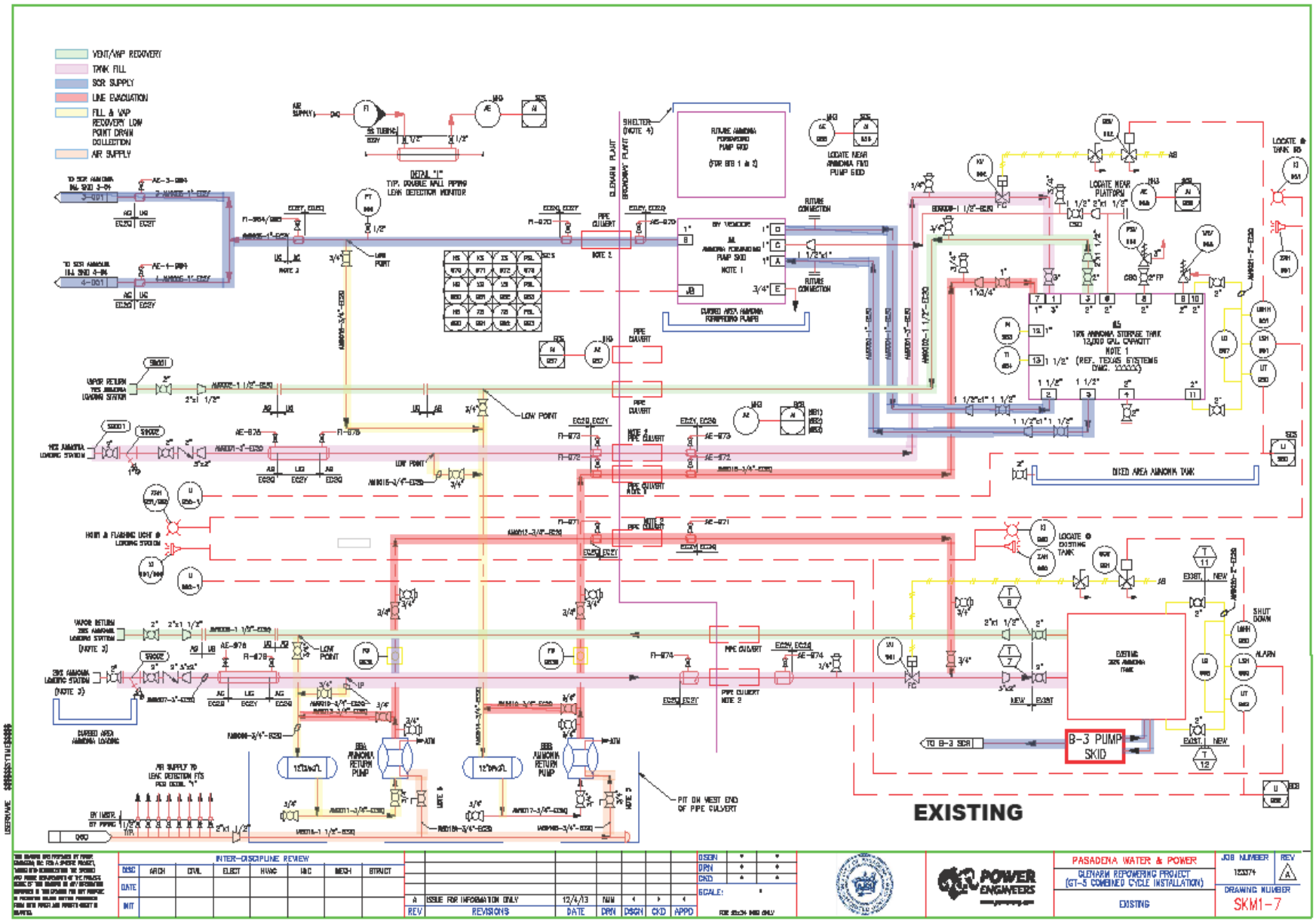
GE PACKAGED POWER, INC.

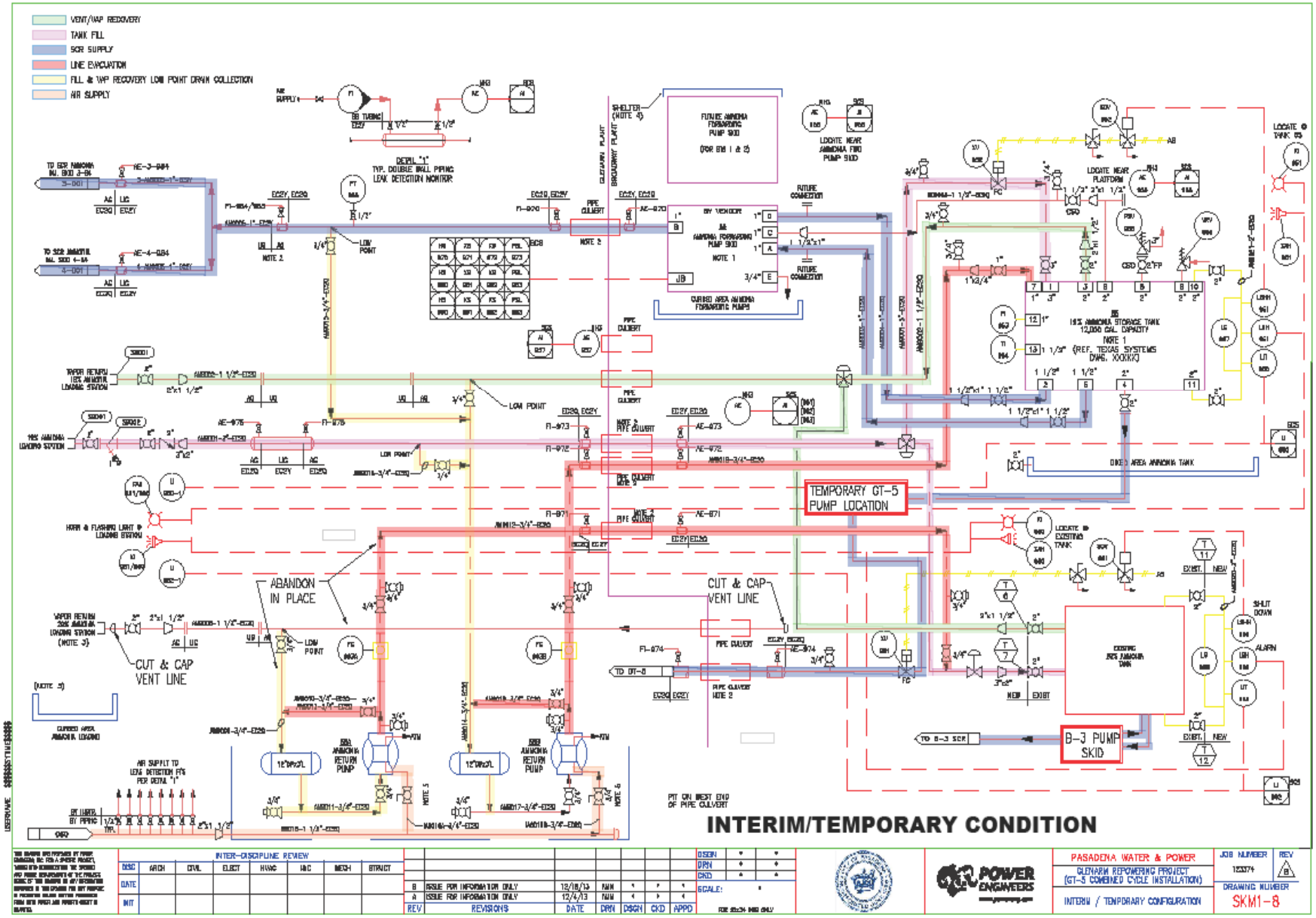
WORK ORDER NO. 20001

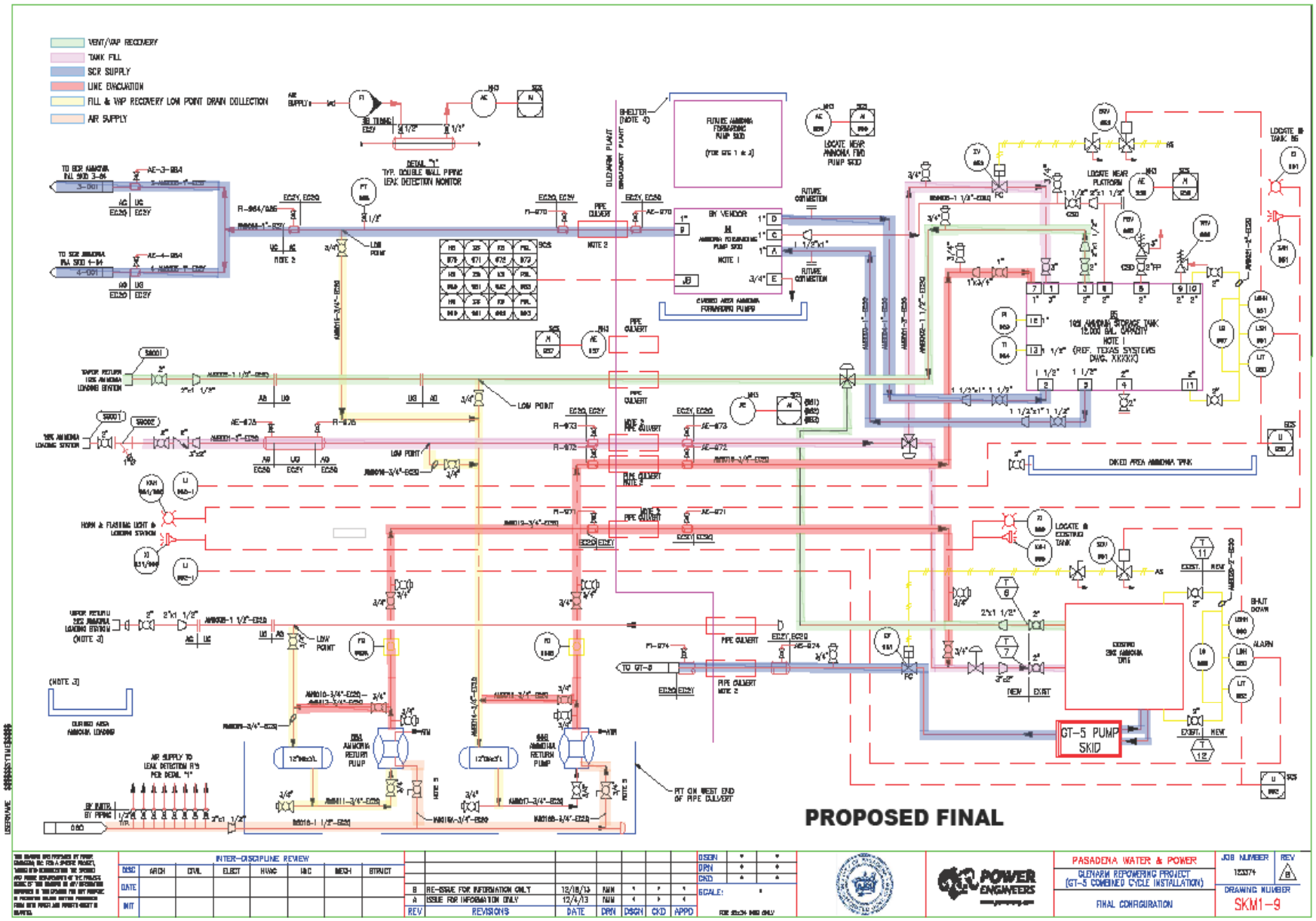
TITLE: PIPING PLAN & DETAILS PIPE CULVERT WEST END EL. 742'-0" AND ABOVE

DWG NO. 20001-P-006-03

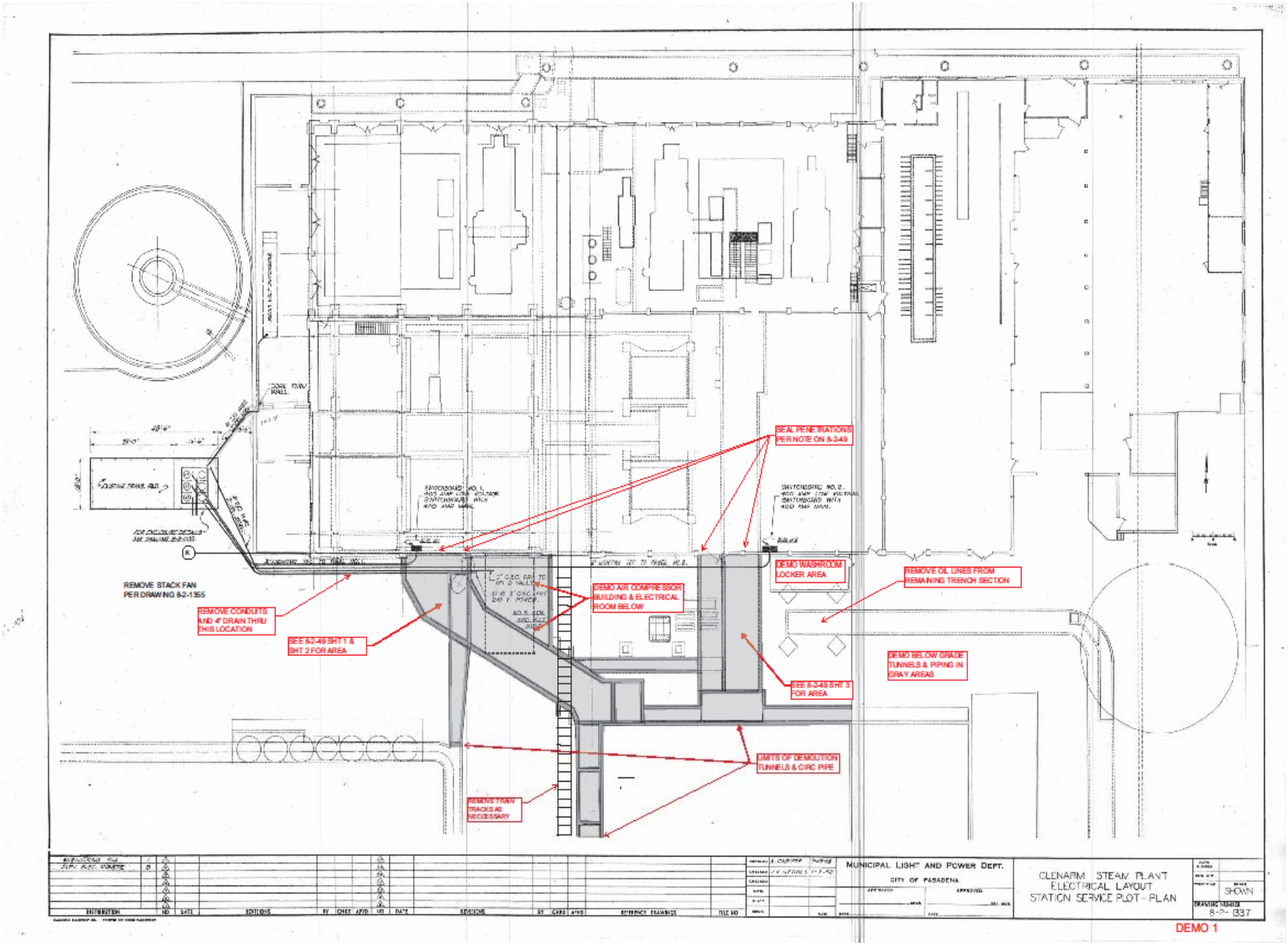
SCALE: AS NOTED SHEET

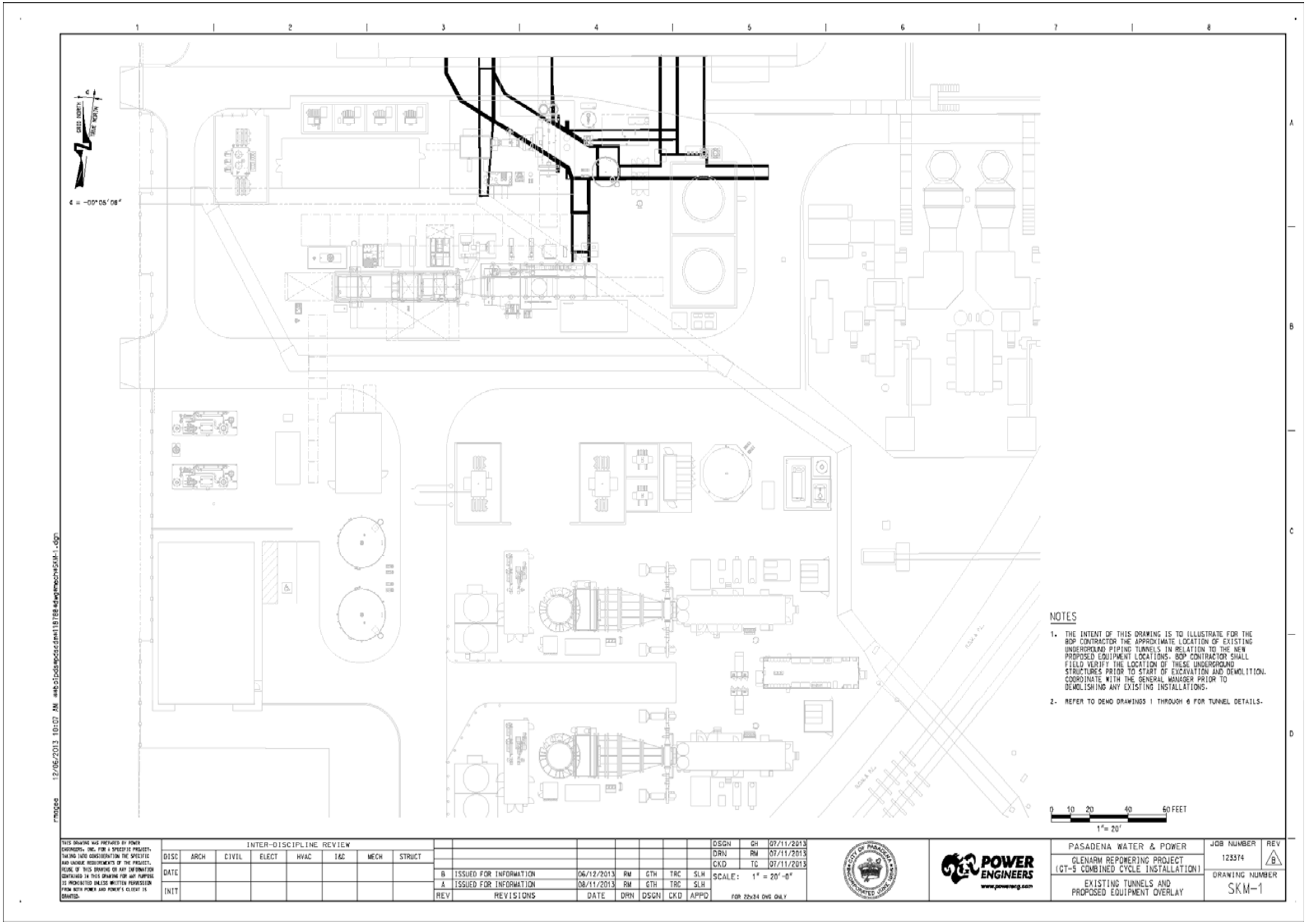

VENT/AMP RECOVERY
TANK FILL
SCR SUPPLY
LINE EVACUATION
FILL & VAP RECOVERY LOW POINT DRAIN COLLECTION
AIR SUPPLY
EXISTING
B-3 PUMP SKID
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
EXISTING
SKM1-7


VENT/VAP RECOVERY
TANK FILL
SCR SUPPLY
LINE EVACUATION
FILL & VAP RECOVERY LOW POINT DRAIN COLLECTION
AIR SUPPLY
TEMPORARY GT-5 PUMP LOCATION
B-3 PUMP SKID
ABANDON IN PLACE
CUT & CAP VENT LINE
CUT & CAP VENT LINE
INTERIM/TEMPORARY CONDITION
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
INTERIM / TEMPORARY CONFIGURATION
SKM1-8
POWER ENGINEERS


VENT/VAP RECOVERY
TANK FILL
SCR SUPPLY
LINE EVACUATION
FILL & VAP RECOVERY LOW POINT DRAIN COLLECTION
AIR SUPPLY
PROPOSED FINAL
GT-5 PUMP SKID
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
FINAL CONFIGURATION
DRAWING NUMBER
SKM1-9

# Demolition Overlay and Existing Drawings


SEAL PENETRATIONS PER NOTE ON 8-2-49
DEMO WASHROOM LOCKER AREA
REMOVE OIL LINES FROM REMAINING TRENCH SECTION
DEMO AIR COMPRESSOR BUILDING & ELECTRICAL ROOM BELOW
REMOVE STACK FAN PER DRAWING 82-1355
REMOVE CONDUITS AND 4" DRAIN THRU THIS LOCATION
SEE 82-49 SHT 1 & SHT 2 FOR AREA
DEMO BELOW GRADE TUNNELS & PIPING IN GRAY AREAS
SEE 8-2-49 SHT 3 FOR AREA
LIMITS OF DEMOLITION TUNNELS & CIRC PIPE
REMOVE TRAIN TRACKS AS NECESSARY
MUNICIPAL LIGHT AND POWER DEPT.
CITY OF PASADENA
CLEARM STEAM PLANT
ELECTRICAL LAYOUT
STATION SERVICE PLOT - PLAN
SHOWN
8-2-837
DEMO 1




THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| B | ISSUED FOR INFORMATION | 06/12/2013 | RM | GTH | TRC | SLH |
| A | ISSUED FOR INFORMATION | 08/11/2013 | RM | GTH | TRC | SLH |

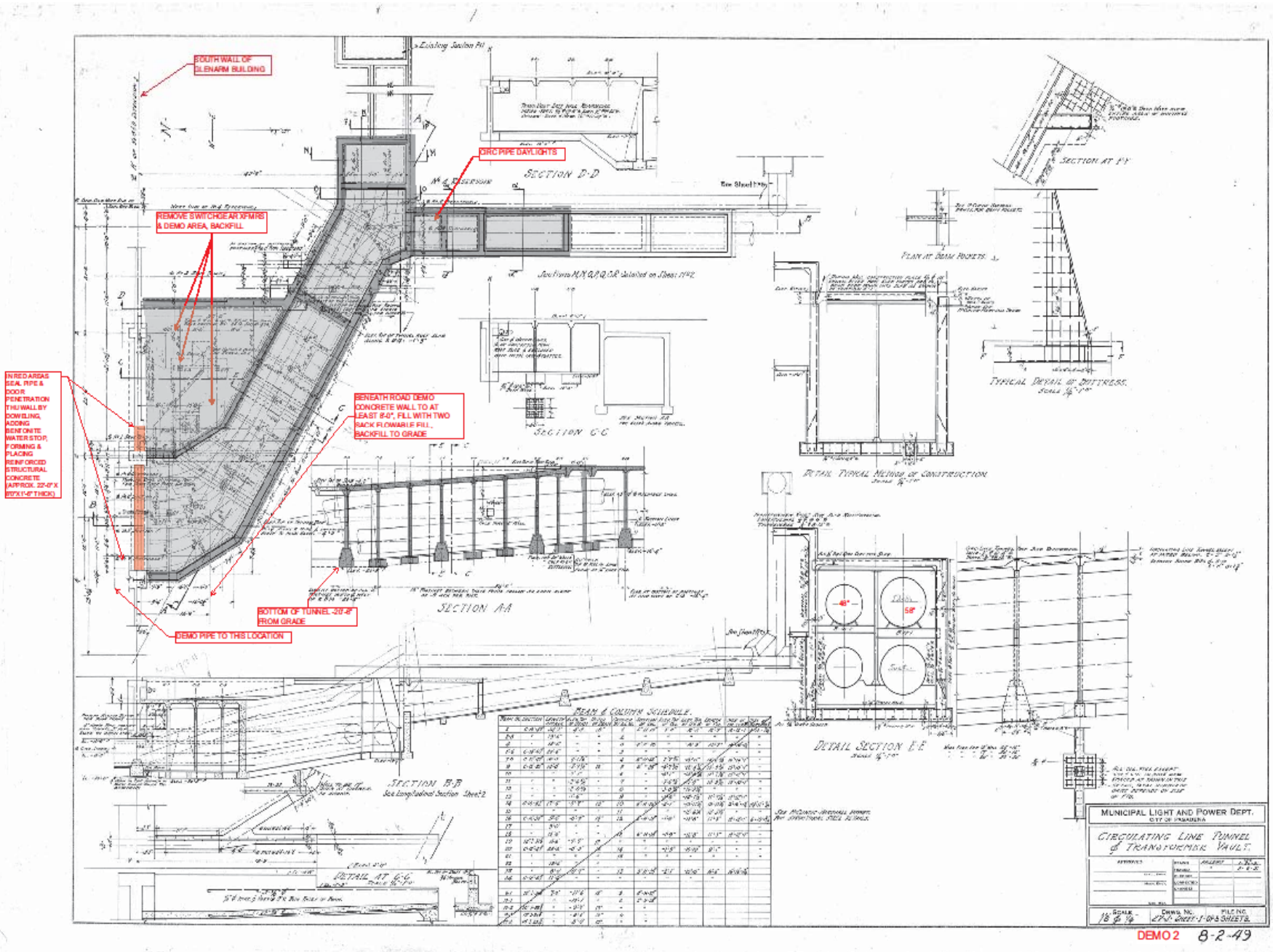
| | | |
|---|---|---|
| DSGN | GH | 07/11/2013 |
| DRN | RM | 07/11/2013 |
| CKD | TC | 07/11/2013 |

SCALE: 1" = 20'-0"
FOR 22x34 DWG ONLY

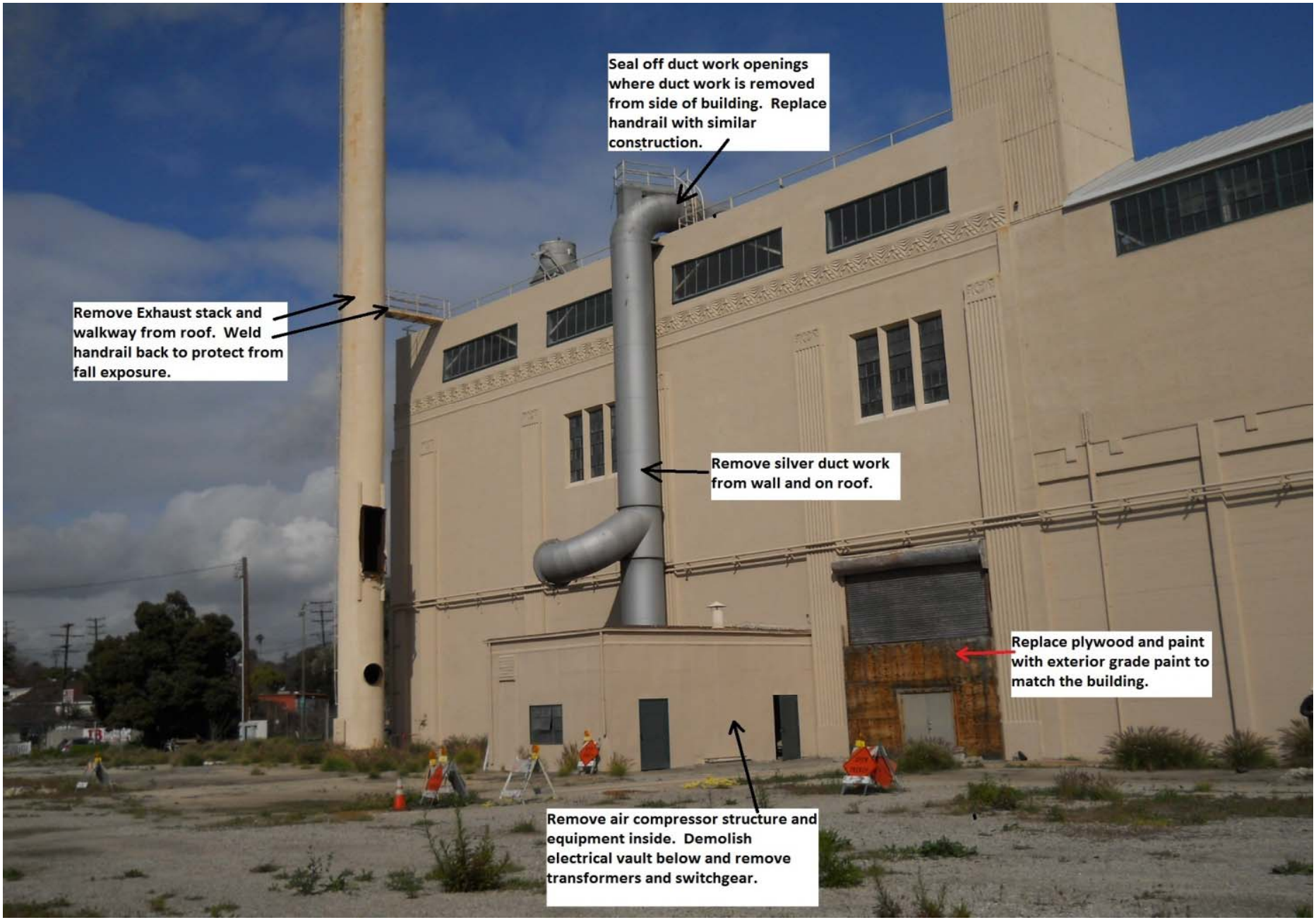
POWER ENGINEERS
www.powereng.com

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
EXISTING TUNNELS AND PROPOSED EQUIPMENT OVERLAY

JOB NUMBER 123574
REV B
DRAWING NUMBER SKM-1


SOUTH WALL OF SLENARM BUILDING
REMOVE SWITCHGEAR XFMRS & DEMO AREA, BACKFILL
CIRC PIPE DAYLIGHTS
IN RED AREAS SEAL PIPE & DOOR PENETRATION THU WALL BY DOWELING, ADDING BENTONITE WATER STOP, FORMING & PLACING REINFORCED STRUCTURAL CONCRETE (APPROX. 22'-0" X 8'0"X1'-0" THICK)
BENEATH ROAD DEMO CONCRETE WALL TO AT LEAST 8'-0", FILL WITH TWO SACK FLOWABLE FILL, BACKFILL TO GRADE
BOTTOM OF TUNNEL -20'-8" FROM GRADE
DEMO PIPE TO THIS LOCATION
SECTION D-D
SECTION C-C
SECTION A-A
SECTION B-B
DETAIL AT G-G
DETAIL SECTION E-E
DETAIL TYPICAL METHOD OF CONSTRUCTION
TYPICAL DETAIL OF BUTTRESS
BEAM & COLUMN SCHEDULE
MUNICIPAL LIGHT AND POWER DEPT.
CITY OF PASADENA
CIRCULATING LINE TUNNEL & TRANSFORMER VAULT
DEMO 2 8-2-49

SITE AREA
S Fair Oaks Ave
W State St
Broadway
110
Arroyo Seco Pkwy
© 2013 Google
Google earth
Tour Guide
Imagery Date: 3/7/2011 34°07'35.40" N 118°08'55.69" W elev 753 ft eye alt 1518 ft

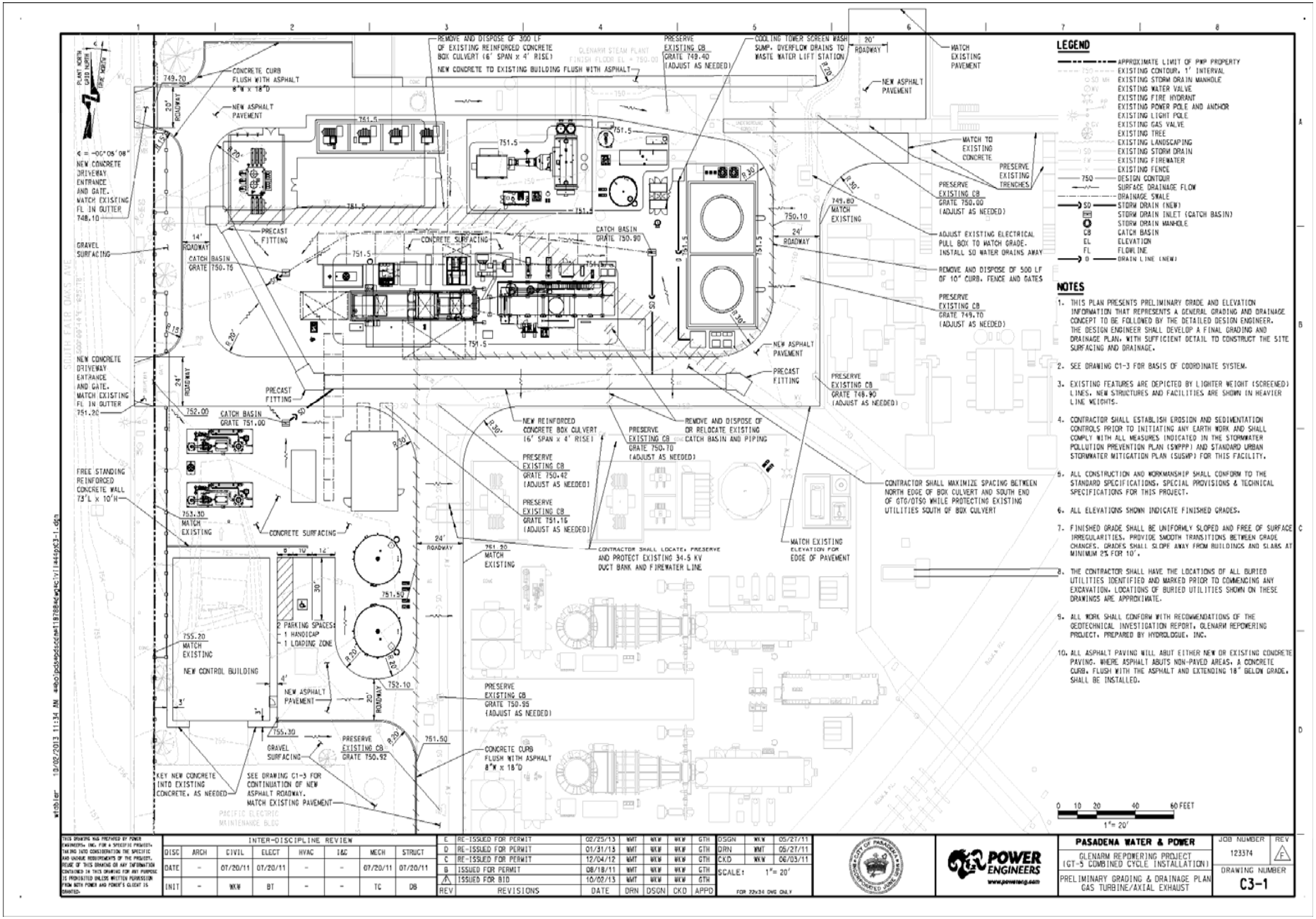

Seal off duct work openings where duct work is removed from side of building. Replace handrail with similar construction.
Remove Exhaust stack and walkway from roof. Weld handrail back to protect from fall exposure.
Remove silver duct work from wall and on roof.
Replace plywood and paint with exterior grade paint to match the building.
Remove air compressor structure and equipment inside. Demolish electrical vault below and remove transformers and switchgear.

27

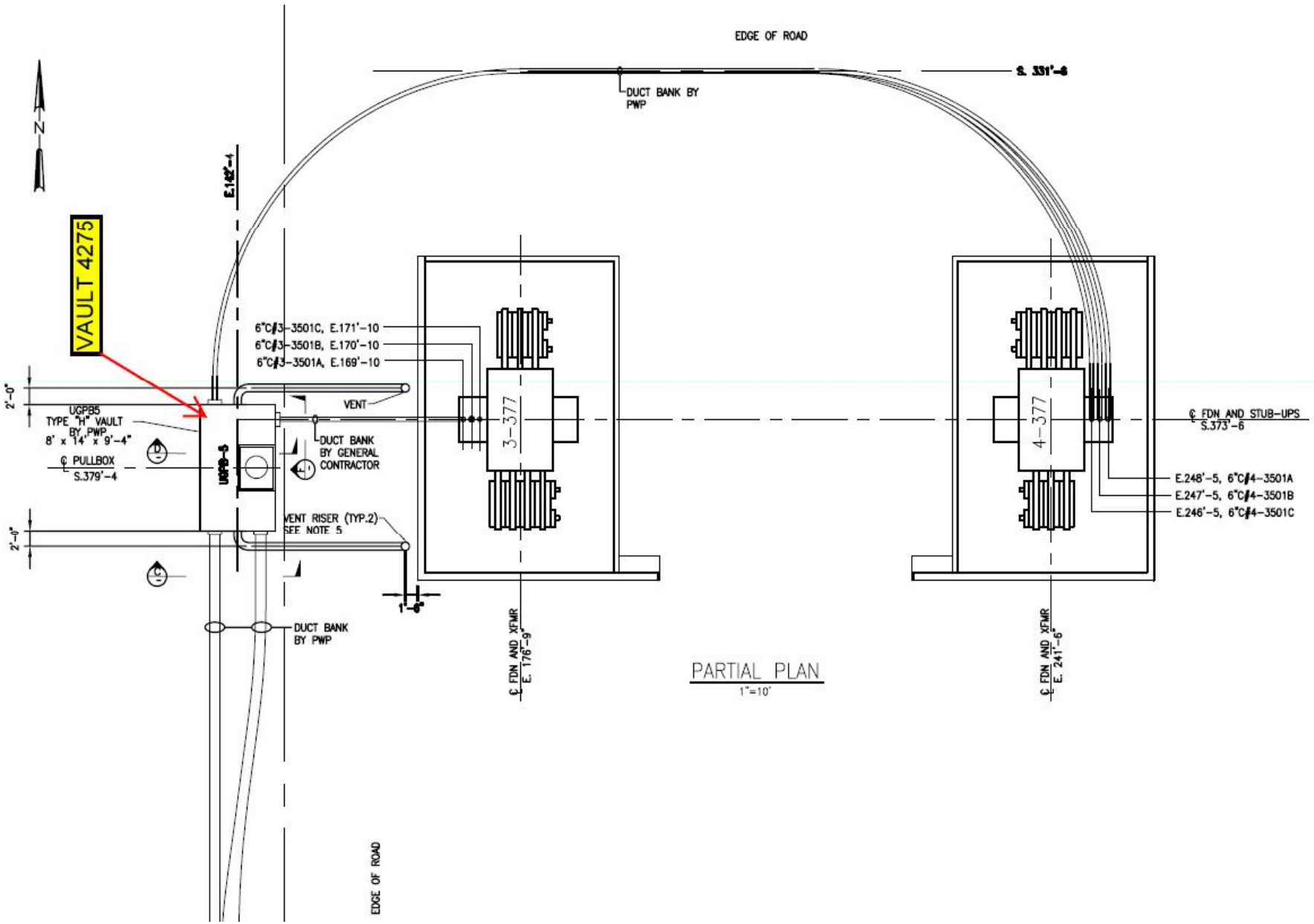
Demo restroom and air compressor rooms.
Piping to be relocated to western property line, near new wall by PWP. U/G line to building to be demoed by BOP.

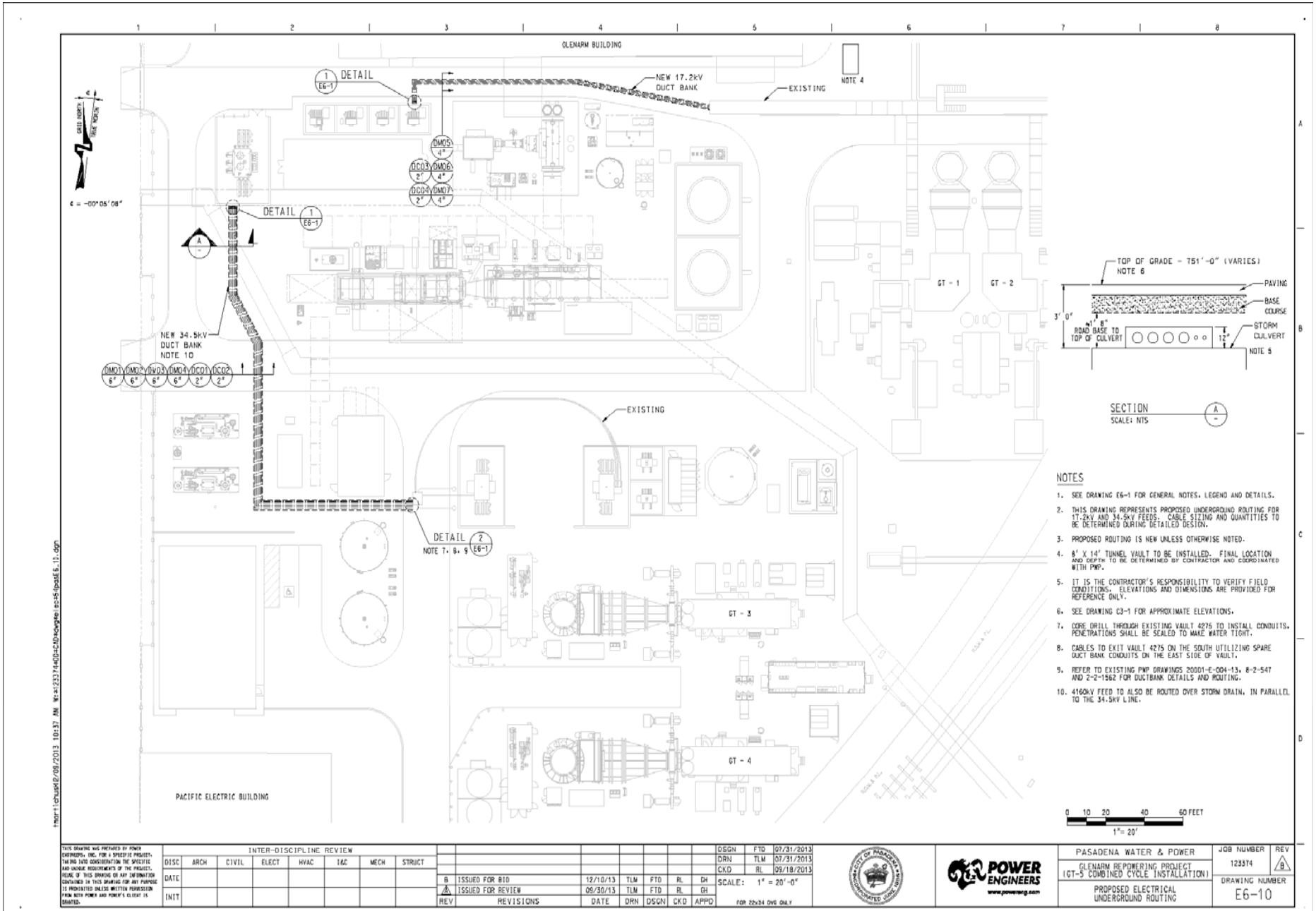
28

# Civil Scope / Storm Drain Reroute


LEGEND
APPROXIMATE LIMIT OF PWP PROPERTY
EXISTING CONTOUR, 1' INTERVAL
EXISTING STORM DRAIN MANHOLE
EXISTING WATER VALVE
EXISTING FIRE HYDRANT
EXISTING POWER POLE AND ANCHOR
EXISTING LIGHT POLE
EXISTING GAS VALVE
EXISTING TREE
EXISTING LANDSCAPING
EXISTING STORM DRAIN
EXISTING FIREWATER
EXISTING FENCE
DESIGN CONTOUR
SURFACE DRAINAGE FLOW
DRAINAGE SWALE
STORM DRAIN (NEW)
STORM DRAIN INLET (CATCH BASIN)
STORM DRAIN MANHOLE
CATCH BASIN
ELEVATION
FLOWLINE
DRAIN LINE (NEW)
NOTES
1. THIS PLAN PRESENTS PRELIMINARY GRADE AND ELEVATION INFORMATION THAT REPRESENTS A GENERAL GRADING AND DRAINAGE CONCEPT TO BE FOLLOWED BY THE DETAILED DESIGN ENGINEER. THE DESIGN ENGINEER SHALL DEVELOP A FINAL GRADING AND DRAINAGE PLAN, WITH SUFFICIENT DETAIL TO CONSTRUCT THE SITE SURFACING AND DRAINAGE.
2. SEE DRAWING C1-3 FOR BASIS OF COORDINATE SYSTEM.
3. EXISTING FEATURES ARE DEPICTED BY LIGHTER WEIGHT (SCREENED) LINES. NEW STRUCTURES AND FACILITIES ARE SHOWN IN HEAVIER LINE WEIGHTS.
4. CONTRACTOR SHALL ESTABLISH EROSION AND SEDIMENTATION CONTROLS PRIOR TO INITIATING ANY EARTH WORK AND SHALL COMPLY WITH ALL MEASURES INDICATED IN THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP) FOR THIS FACILITY.
5. ALL CONSTRUCTION AND WORKMANSHIP SHALL CONFORM TO THE STANDARD SPECIFICATIONS, SPECIAL PROVISIONS & TECHNICAL SPECIFICATIONS FOR THIS PROJECT.
6. ALL ELEVATIONS SHOWN INDICATE FINISHED GRADES.
7. FINISHED GRADE SHALL BE UNIFORMLY SLOPED AND FREE OF SURFACE IRREGULARITIES. PROVIDE SMOOTH TRANSITIONS BETWEEN GRADE CHANGES. GRADES SHALL SLOPE AWAY FROM BUILDINGS AND SLABS AT MINIMUM 2% FOR 10'.
8. THE CONTRACTOR SHALL HAVE THE LOCATIONS OF ALL BURIED UTILITIES IDENTIFIED AND MARKED PRIOR TO COMMENCING ANY EXCAVATION. LOCATIONS OF BURIED UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE.
9. ALL WORK SHALL CONFORM WITH RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION REPORT, GLENARM REPOWERING PROJECT, PREPARED BY HYDROLOGUE, INC.
10. ALL ASPHALT PAVING WILL ABUT EITHER NEW OR EXISTING CONCRETE PAVING. WHERE ASPHALT ABUTS NON-PAVED AREAS, A CONCRETE CURB, FLUSH WITH THE ASPHALT AND EXTENDING 18" BELOW GRADE, SHALL BE INSTALLED.
0 10 20 40 60 FEET
1"= 20'
REMOVE AND DISPOSE OF 300 LF OF EXISTING REINFORCED CONCRETE BOX CULVERT (16' SPAN x 4' RISE)
NEW CONCRETE TO EXISTING BUILDING FLUSH WITH ASPHALT
PRESERVE EXISTING CB GRATE 749.40 (ADJUST AS NEEDED)
COOLING TOWER SCREEN WASH SUMP, OVERFLOW DRAINS TO WASTE WATER LIFT STATION
MATCH EXISTING PAVEMENT
NEW ASPHALT PAVEMENT
MATCH TO EXISTING CONCRETE
PRESERVE EXISTING TRENCHES
PRESERVE EXISTING CB GRATE 750.00 (ADJUST AS NEEDED)
ADJUST EXISTING ELECTRICAL PULL BOX TO MATCH GRADE. INSTALL SD WATER DRAINS AWAY
REMOVE AND DISPOSE OF 500 LF OF 10" CURB, FENCE AND GATES
PRESERVE EXISTING CB GRATE 749.70 (ADJUST AS NEEDED)
PRESERVE EXISTING CB GRATE 748.90 (ADJUST AS NEEDED)
CONCRETE CURB FLUSH WITH ASPHALT 8"W x 18"D
NEW CONCRETE DRIVEWAY ENTRANCE AND GATE. MATCH EXISTING FL IN GUTTER 748.10
GRAVEL SURFACING
CATCH BASIN GRATE 750.75
PRECAST FITTING
CONCRETE SURFACING
CATCH BASIN GRATE 750.90
NEW CONCRETE DRIVEWAY ENTRANCE AND GATE. MATCH EXISTING FL IN GUTTER 751.20
CATCH BASIN GRATE 751.00
FREE STANDING REINFORCED CONCRETE WALL 73'L x 10'H
MATCH EXISTING
NEW REINFORCED CONCRETE BOX CULVERT (16' SPAN x 4' RISE)
PRESERVE EXISTING CB GRATE 750.42 (ADJUST AS NEEDED)
PRESERVE EXISTING CB GRATE 751.15 (ADJUST AS NEEDED)
PRESERVE EXISTING CB GRATE 750.70 (ADJUST AS NEEDED)
REMOVE AND DISPOSE OF OR RELOCATE EXISTING CATCH BASIN AND PIPING
CONTRACTOR SHALL MAXIMIZE SPACING BETWEEN NORTH EDGE OF BOX CULVERT AND SOUTH END OF GT6/DTS6 WHILE PROTECTING EXISTING UTILITIES SOUTH OF BOX CULVERT
CONTRACTOR SHALL LOCATE, PRESERVE AND PROTECT EXISTING 34.5 KV DUCT BANK AND FIREWATER LINE
MATCH EXISTING ELEVATION FOR EDGE OF PAVEMENT
2 PARKING SPACES 1 HANDICAP 1 LOADING ZONE
NEW CONTROL BUILDING
755.20 MATCH EXISTING
NEW ASPHALT PAVEMENT
GRAVEL SURFACING
PRESERVE EXISTING CB GRATE 750.92
PRESERVE EXISTING CB GRATE 750.95 (ADJUST AS NEEDED)
CONCRETE CURB FLUSH WITH ASPHALT 8"W x 18"D
KEY NEW CONCRETE INTO EXISTING CONCRETE, AS NEEDED
SEE DRAWING C1-5 FOR CONTINUATION OF NEW ASPHALT ROADWAY. MATCH EXISTING PAVEMENT
PACIFIC ELECTRIC MAINTENANCE BLDG
GLENARM STEAM PLANT
FINISH FLOOR EL = 750.00
PLANT NORTH
CATO NORTH
FIRE NORTH
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE - 07/20/11 07/20/11 - - 07/20/11 07/20/11
INIT - WKW BT - - TC DB
E RE-ISSUED FOR PERMIT 02/25/13 WMT WKW WKW GTH
D RE-ISSUED FOR PERMIT 01/31/13 WMT WKW WKW GTH
C RE-ISSUED FOR PERMIT 12/04/12 WMT WKW WKW GTH
B ISSUED FOR PERMIT 08/18/11 WMT WKW WKW GTH
A ISSUED FOR BID 10/02/13 WMT WKW WKW GTH
REV REVISIONS DATE DRN DSGN CKD APPD
DSGN WKW 05/27/11
DRN WMT 05/27/11
CKD WKW 06/03/11
SCALE: 1"= 20'
FOR 22x34 DWG ONLY
POWER ENGINEERS www.powereng.com
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
PRELIMINARY GRADING & DRAINAGE PLAN GAS TURBINE/AXIAL EXHAUST
JOB NUMBER 123374
REV E
DRAWING NUMBER C3-1

31


EDGE OF ROAD
S. 331'-6
DUCT BANK BY PWP
N
E.142'-1
VAULT 4275
6"C#3-3501C, E.171'-10
6"C#3-3501B, E.170'-10
6"C#3-3501A, E.169'-10
VENT
2'-0"
UGPB5
TYPE "H" VAULT
BY PWP
8' x 14' x 9'-4"
℄ PULLBOX
S.379'-4
DUCT BANK
BY GENERAL
CONTRACTOR
VENT RISER (TYP.2)
SEE NOTE 5
2'-0"
1'-6"
DUCT BANK
BY PWP
3-377
4-377
℄ FDN AND STUB-UPS
S.373'-6
E.248'-5, 6"C#4-3501A
E.247'-5, 6"C#4-3501B
E.246'-5, 6"C#4-3501C
℄ FDN AND XFMR
E. 176'-9"
℄ FDN AND XFMR
E. 241'-6"
EDGE OF ROAD
PARTIAL PLAN
1"=10'




## NOTES

1. SEE DRAWING E6-1 FOR GENERAL NOTES, LEGEND AND DETAILS.
2. THIS DRAWING REPRESENTS PROPOSED UNDERGROUND ROUTING FOR 17.2kV AND 34.5kV FEEDS. CABLE SIZING AND QUANTITIES TO BE DETERMINED DURING DETAILED DESIGN.
3. PROPOSED ROUTING IS NEW UNLESS OTHERWISE NOTED.
4. 8' X 14' TUNNEL VAULT TO BE INSTALLED. FINAL LOCATION AND DEPTH TO BE DETERMINED BY CONTRACTOR AND COORDINATED WITH PWP.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY FIELD CONDITIONS. ELEVATIONS AND DIMENSIONS ARE PROVIDED FOR REFERENCE ONLY.
6. SEE DRAWING C3-1 FOR APPROXIMATE ELEVATIONS.
7. CORE DRILL THROUGH EXISTING VAULT 4275 TO INSTALL CONDUITS. PENETRATIONS SHALL BE SEALED TO MAKE WATER TIGHT.
8. CABLES TO EXIT VAULT 4275 ON THE SOUTH UTILIZING SPARE DUCT BANK CONDUITS ON THE EAST SIDE OF VAULT.
9. REFER TO EXISTING PWP DRAWINGS 20001-E-004-13, 8-2-547 AND 2-2-1562 FOR DUCTBANK DETAILS AND ROUTING.
10. 4160kV FEED TO ALSO BE ROUTED OVER STORM DRAIN, IN PARALLEL TO THE 34.5kV LINE.

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

| INTER-DISCIPLINE REVIEW | | | | | | | |
|---|---|---|---|---|---|---|---|
| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| B | ISSUED FOR BID | 12/10/13 | TLM | FTD | RL | GH |
| A | ISSUED FOR REVIEW | 09/30/13 | TLM | FTD | RL | GH |

| | | |
|---|---|---|
| DSGN | FTD | 07/31/2013 |
| DRN | TLM | 07/31/2013 |
| CKD | RL | 09/18/2013 |

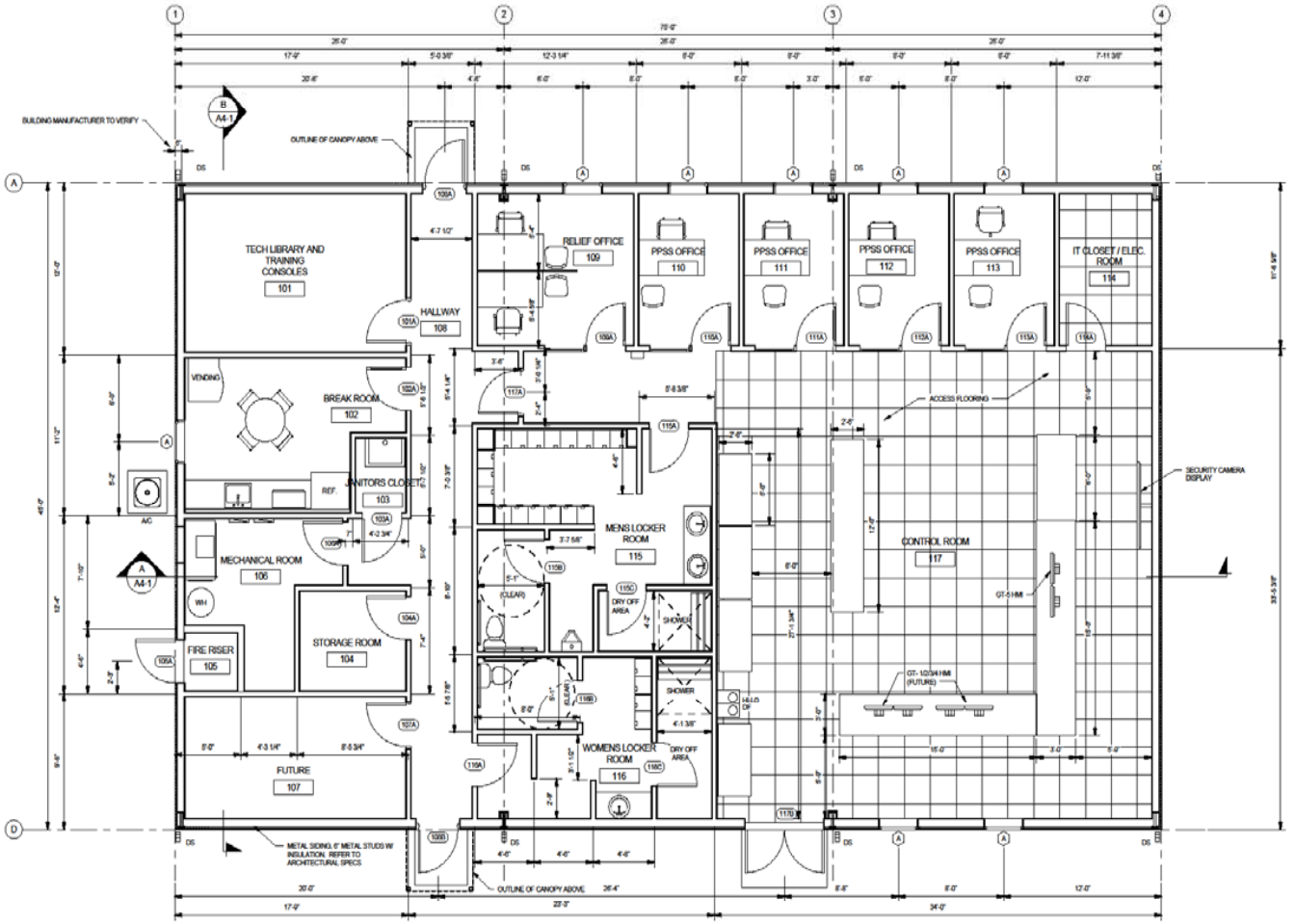
SCALE: 1" = 20'-0"
FOR 22x34 DWG ONLY

POWER ENGINEERS www.powereng.com

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
PROPOSED ELECTRICAL UNDERGROUND ROUTING

JOB NUMBER 123574 | REV B
DRAWING NUMBER E6-10

# Architectural / Building Packages




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

## GENERAL NOTES

STEEL STUDS IN WALLS:
STEEL STUD SIZE AND GUAGE TO BE DETERMINED BY THE STRUCTURAL ENGINEER.

**PRELIMINARY BID SET: NOT FOR CONSTRUCTION**

0 1 2 3 4 5 10 FEET
1/4" = 1'-0"

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIRMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

10/10/2013 4:48:24 PM

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| D | ISSUED FOR BID | 10/10/13 | SAC | SDS | GH | |
| C | ISSUED FOR BID | 09/27/13 | SAC | SDS | GH | |
| B | ISSUED FOR REVIEW | 03/27/13 | SAC | SDS | GH | |
| A | ISSUED FOR REVIEW | 03/07/13 | SAC | SDS | GH | — |

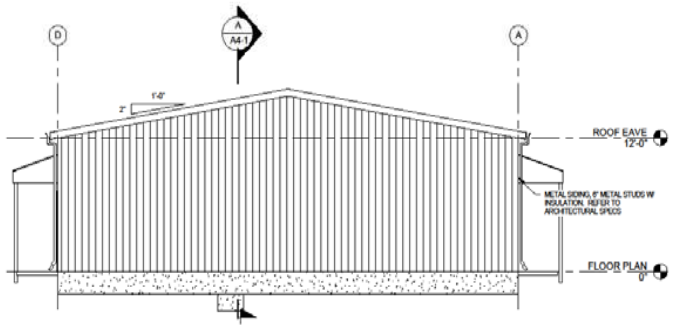
REFERENCE DRAWINGS

| | | |
|---|---|---|
| DSGN | SDS | 03/25/13 |
| DRN | SAC | 03/26/13 |
| CKD | GH | 08/03/13 |
| SCALE: | 1/4" = 1'-0" | |
| FOR 22X34 DWG ONLY | | |

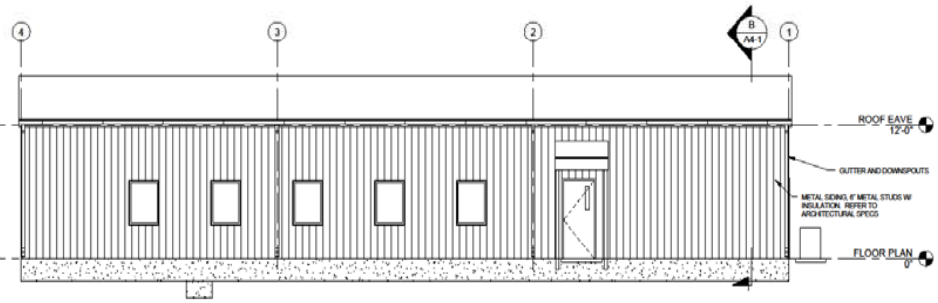
POWER ENGINEERS

PASADENA WATER & POWER
CONTROL BUILDING
MAIN FLOOR PLAN

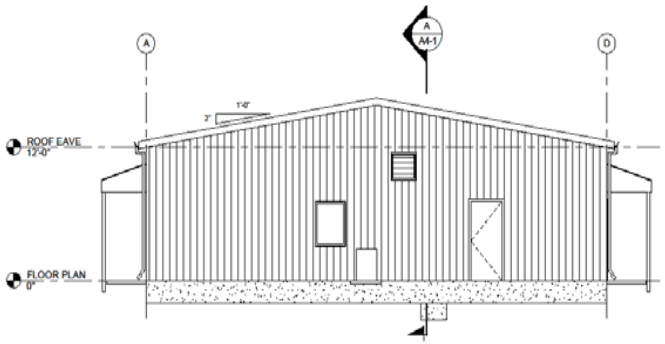
JOB NUMBER 123374
REV D
DRAWING NUMBER A1-2-1



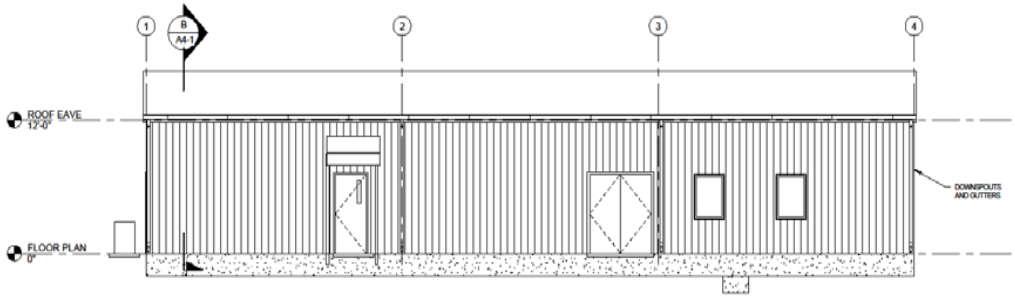

NORTH ELEVATION (LOOKING SOUTH)
SCALE 3/16" = 1'-0"




WEST ELEVATION (LOOKING EAST)
SCALE 3/16" = 1'-0"




SOUTH ELEVATION (LOOKING NORTH)
SCALE 3/16" = 1'-0"




EAST ELEVATION (LOOKING WEST)
SCALE 3/16" = 1'-0"

PRELIMINARY BID SET: NOT FOR CONSTRUCTION

0 2 4 8 12 FEET
3/16" = 1'-0"

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIRMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

10/10/2013 4:48:57 PM

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| D | ISSUED FOR BID | 10/10/13 | SAC | SDS | GH | |
| C | ISSUED FOR BID | 09/27/13 | SAC | SDS | GH | |
| B | ISSUED FOR REVIEW | 03/27/13 | SAC | SDS | GH | |
| A | ISSUED FOR REVIEW | 03/07/13 | SAC | SDS | GH | -- |

REFERENCE DRAWINGS

| | | |
|---|---|---|
| DSGN | SDS | 03/29/13 |
| DRN | SAC | 03/29/13 |
| CKD | HSD | |

SCALE: 3/16" = 1'-0"
FOR 22X34 DWG ONLY

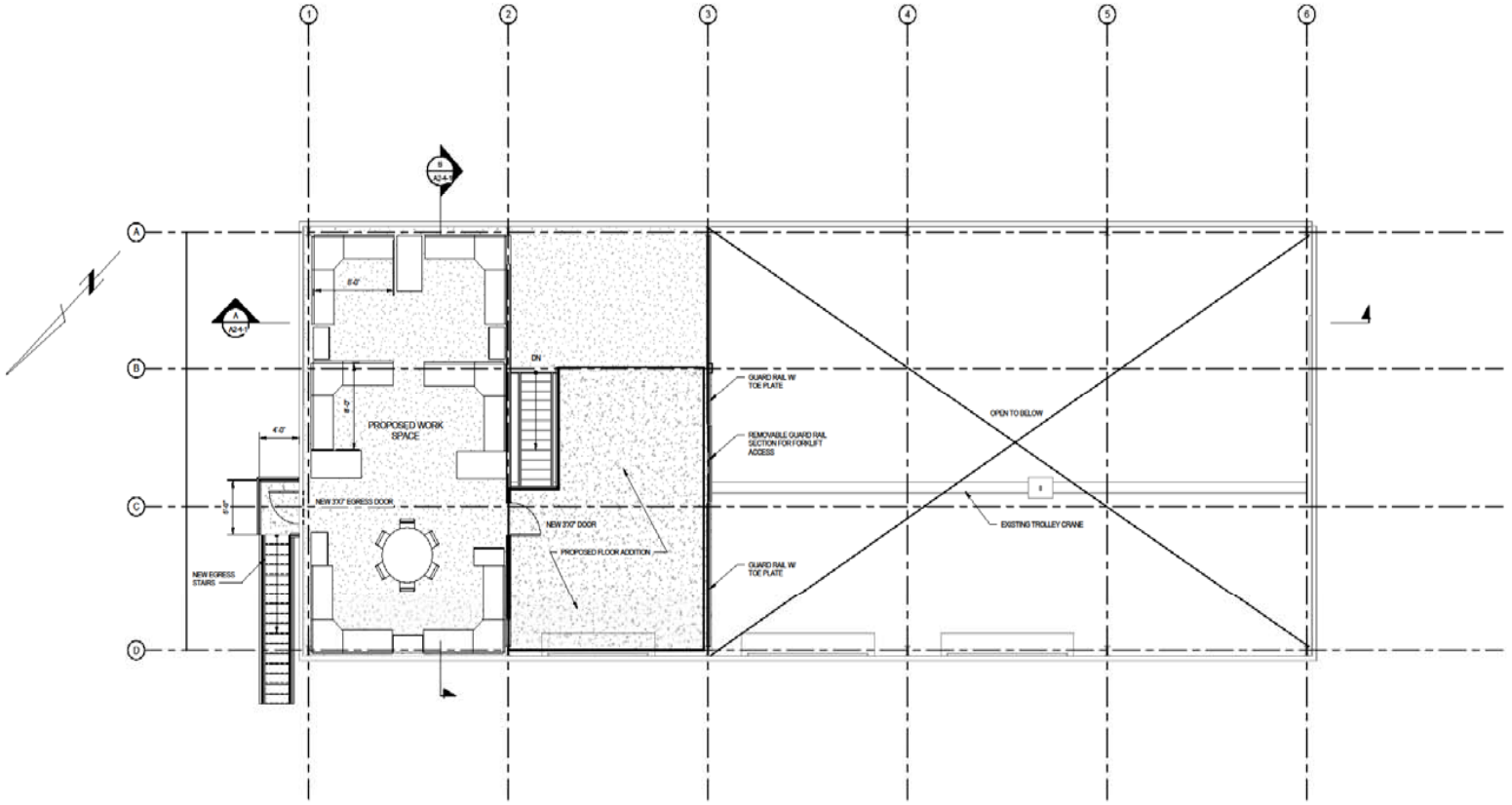
POWER ENGINEERS

PASADENA WATER & POWER
CONTROL BUILDING
EXTERIOR ELEVATIONS

JOB NUMBER 123374
REV D
DRAWING NUMBER A1-3-1

West State Street
Exit Street View
Gate
11
4
STATE
© 2012 Google

38




MEZZANINE PLAN
SCALE 3/16" = 1'-0"

PRELIMINARY : NOT FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIRMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| C | ISSUED FOR BID | 09/24/13 | SAC | SDS | GH | |
| B | ISSUED FOR REVIEW | 03/27/13 | SAC | SDS | GH | |
| A | ISSUED FOR REVIEW | 03/07/13 | SAC | SDS | GH | — |

REFERENCE DRAWINGS

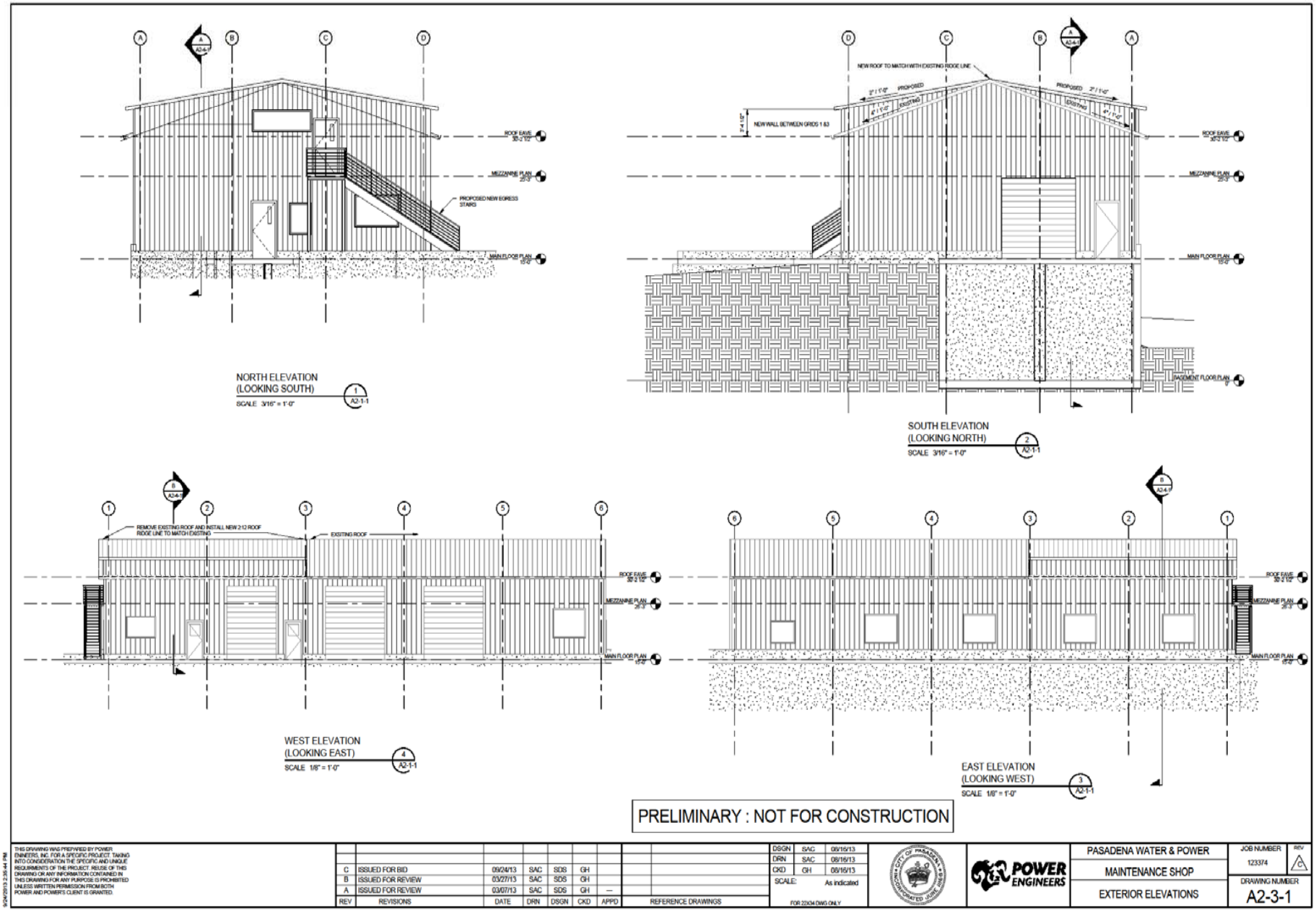
| | | |
|---|---|---|
| DSGN | SAC | 07/16/13 |
| DRN | SAC | 07/16/13 |
| CKD | GH | 09/20/13 |

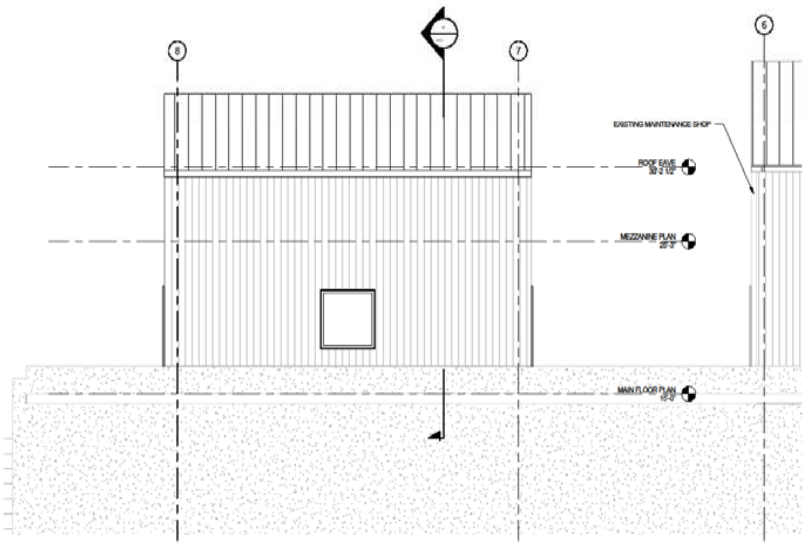
SCALE: 3/16" = 1'-0"
FOR 22X34 DWG ONLY

POWER ENGINEERS

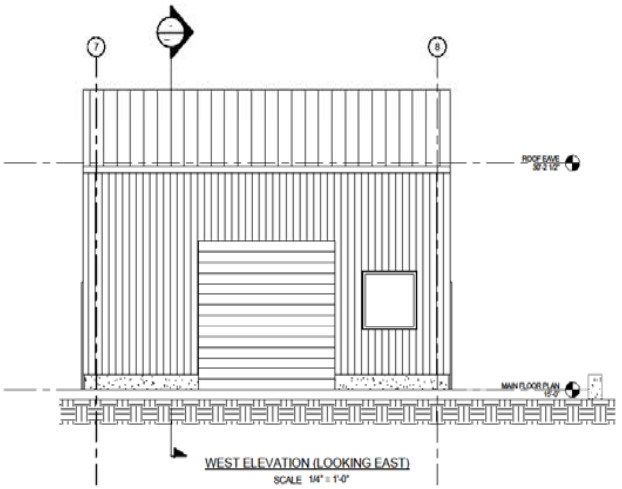
PASADENA WATER & POWER
MAINTENANCE SHOP
MEZZANINE

JOB NUMBER 123374
REV C
DRAWING NUMBER A2-2-2

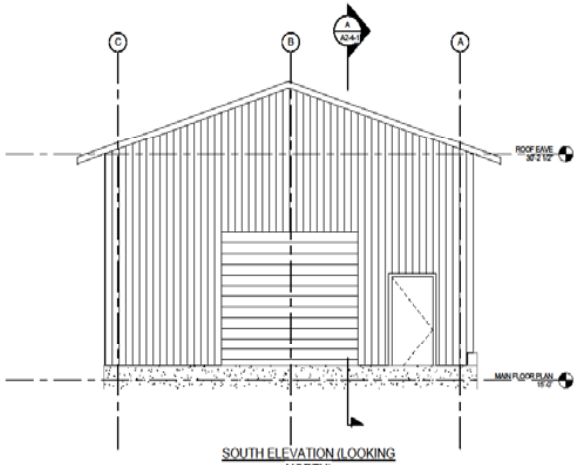

NORTH ELEVATION
(LOOKING SOUTH)
SCALE 3/16" = 1'-0"
SOUTH ELEVATION
(LOOKING NORTH)
SCALE 3/16" = 1'-0"
WEST ELEVATION
(LOOKING EAST)
SCALE 1/8" = 1'-0"
EAST ELEVATION
(LOOKING WEST)
SCALE 1/8" = 1'-0"
PRELIMINARY : NOT FOR CONSTRUCTION
PASADENA WATER & POWER
MAINTENANCE SHOP
EXTERIOR ELEVATIONS
JOB NUMBER 123374
DRAWING NUMBER A2-3-1



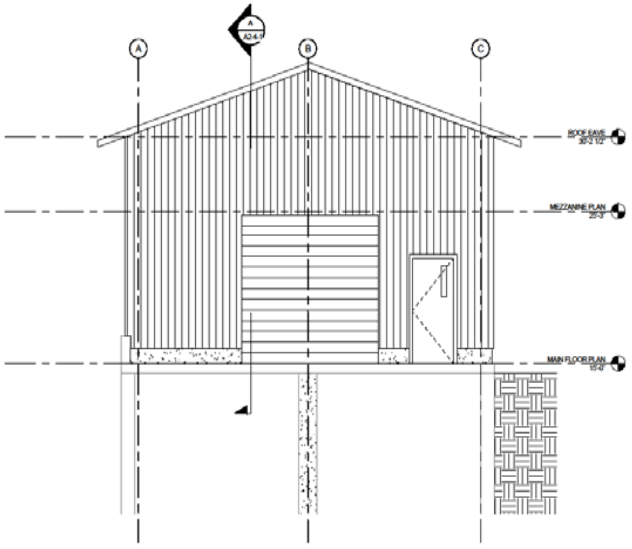

EAST ELEVATION (LOOKING WEST)
SCALE 1/4" = 1'-0"




WEST ELEVATION (LOOKING EAST)
SCALE 1/4" = 1'-0"




SOUTH ELEVATION (LOOKING NORTH)
SCALE 1/4" = 1'-0"




NORTH ELEVATION (LOOKING SOUTH)
SCALE 1/4" = 1'-0"

PRELIMINARY : NOT FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIRMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| C | ISSUED FOR BID | 09/24/13 | SAC | SDS | GH | |
| B | ISSUED FOR REVIEW | 03/27/13 | SAC | SDS | GH | |
| A | ISSUED FOR REVIEW | 03/07/13 | SAC | SDS | GH | — |

REFERENCE DRAWINGS

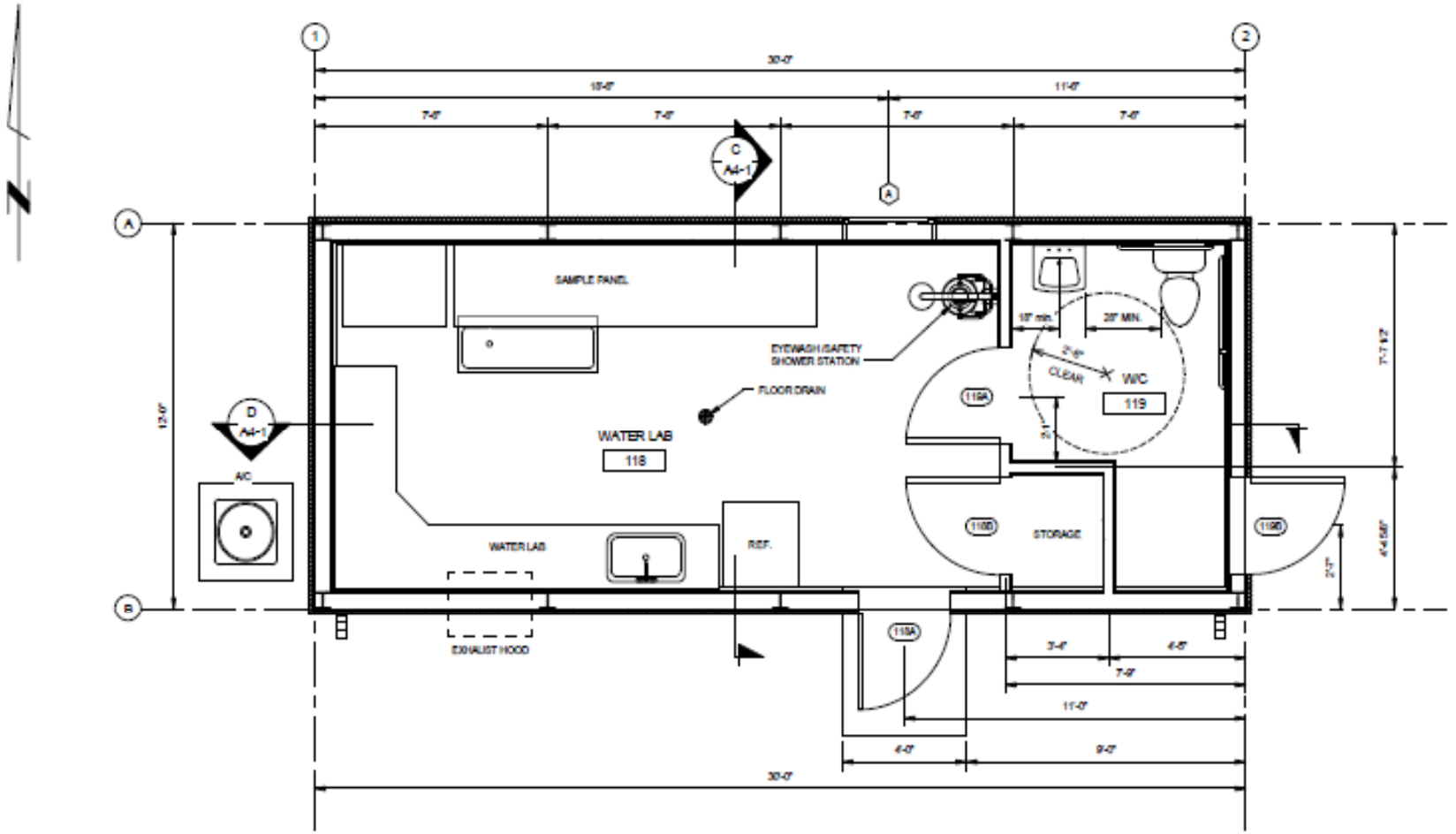
| | | |
|---|---|---|
| DSGN | SAC | 07/16/13 |
| DRN | SAC | 07/16/13 |
| CKD | GH | 09/23/13 |

SCALE: 1/4" = 1'-0"
FOR 22X34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER
WELDING SHOP
EXTERIOR ELEVATIONS

JOB NUMBER 123374
REV C
DRAWING NUMBER A3-3-1

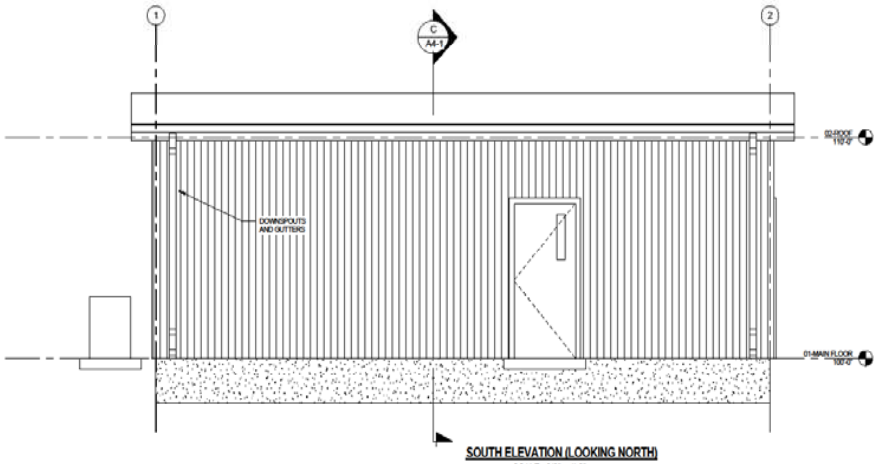



**FLOOR PLAN**

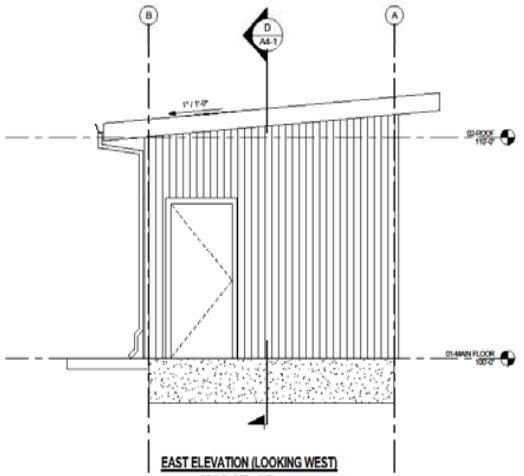
SCALE: 3/8" = 1'-0"

## GENERAL NOTES

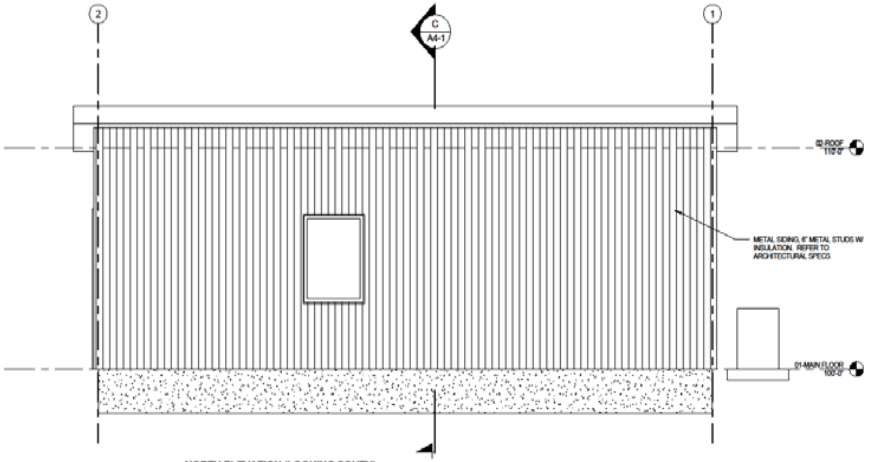
STEEL STUDS IN WALLS:
STEEL STUD SIZE AND GUAGE TO BE DETERMINED BY THE STRUCTURAL ENGINEER.



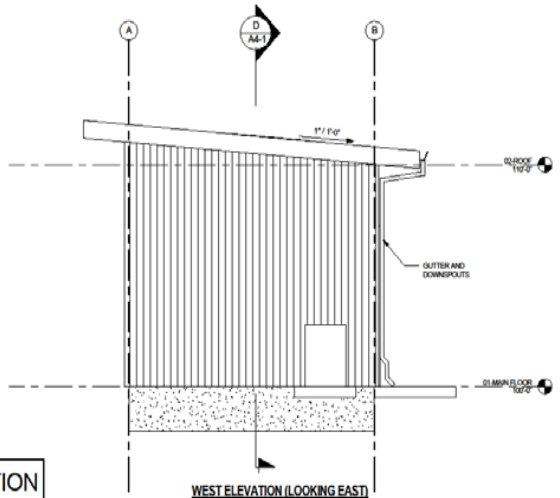

SOUTH ELEVATION (LOOKING NORTH)
SCALE 3/8" = 1'-0"




EAST ELEVATION (LOOKING WEST)
SCALE 3/8" = 1'-0"




NORTH ELEVATION (LOOKING SOUTH)
SCALE 3/8" = 1'-0"




WEST ELEVATION (LOOKING EAST)
SCALE 3/8" = 1'-0"

PRELIMINARY BID SET: NOT FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

9/24/2013 2:26:17 PM

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| C | ISSUED FOR BID | 09/24/13 | SAC | SDS | GH | |
| B | ISSUED FOR REVIEW | 03/27/13 | SAC | SDS | GH | |
| A | ISSUED FOR REVIEW | 03/07/13 | SAC | SDS | GH | — |

REFERENCE DRAWINGS

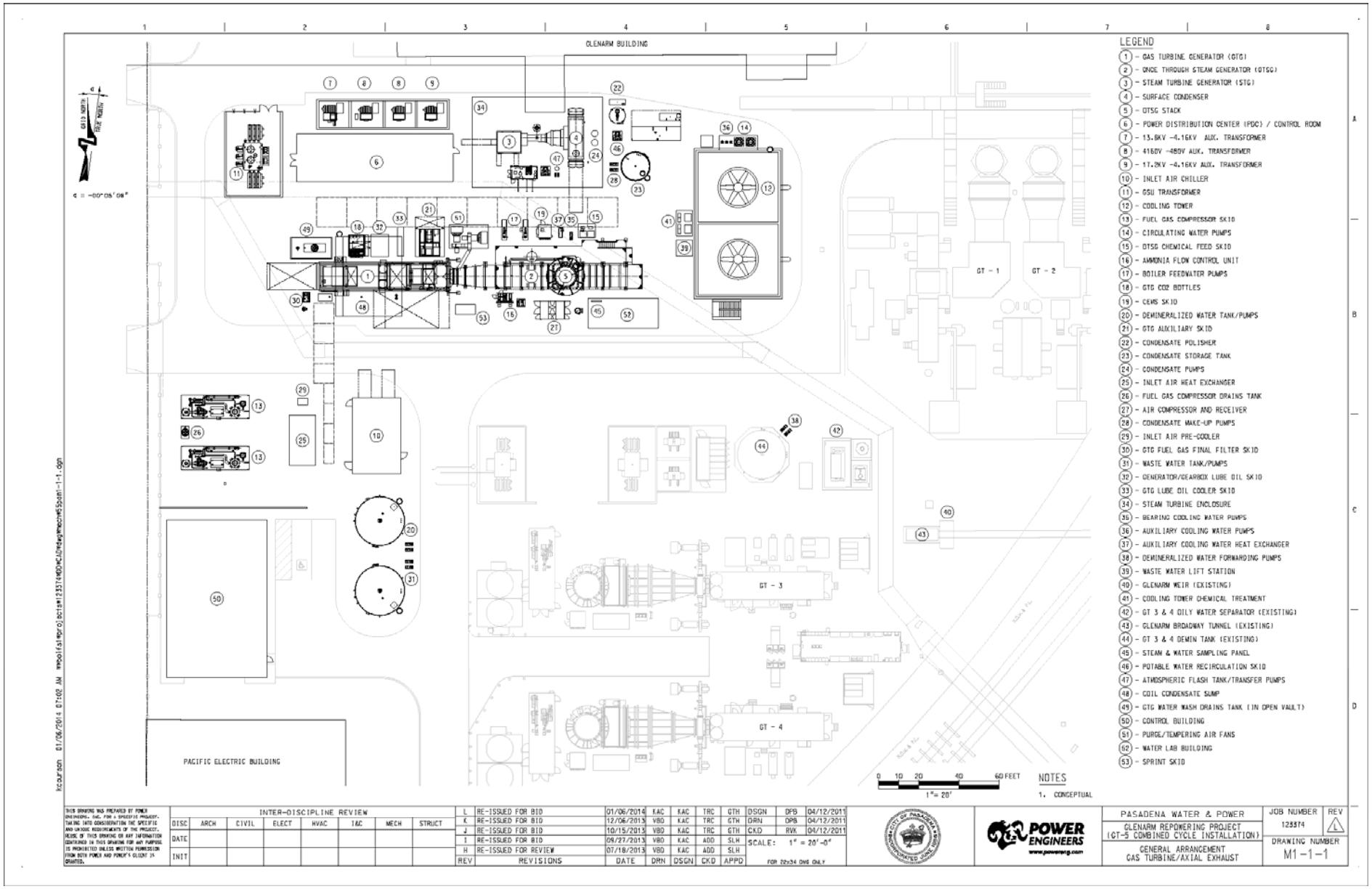
DSGN Designer
DRN Author
CKD Checker
SCALE: 3/8" = 1'-0"
FOR 22X34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER
WATER LABORATORY
EXTERIOR ELEVATIONS

JOB NUMBER 123374
REV C
DRAWING NUMBER A4-3-1

# Pipe Rack Layout / STG Building Coordination


GLENARM BUILDING
PACIFIC ELECTRIC BUILDING
GT - 1
GT - 2
GT - 3
GT - 4
LEGEND
1 - GAS TURBINE GENERATOR (GTG)
2 - ONCE THROUGH STEAM GENERATOR (OTSG)
3 - STEAM TURBINE GENERATOR (STG)
4 - SURFACE CONDENSER
5 - OTSG STACK
6 - POWER DISTRIBUTION CENTER (PDC) / CONTROL ROOM
7 - 13.8KV -4.16KV AUX. TRANSFORMER
8 - 416DV -480V AUX. TRANSFORMER
9 - 17.2KV -4.16KV AUX. TRANSFORMER
10 - INLET AIR CHILLER
11 - GSU TRANSFORMER
12 - COOLING TOWER
13 - FUEL GAS COMPRESSOR SKID
14 - CIRCULATING WATER PUMPS
15 - OTSG CHEMICAL FEED SKID
16 - AMMONIA FLOW CONTROL UNIT
17 - BOILER FEEDWATER PUMPS
18 - GTG CO2 BOTTLES
19 - CEMS SKID
20 - DEMINERALIZED WATER TANK/PUMPS
21 - GTG AUXILIARY SKID
22 - CONDENSATE POLISHER
23 - CONDENSATE STORAGE TANK
24 - CONDENSATE PUMPS
25 - INLET AIR HEAT EXCHANGER
26 - FUEL GAS COMPRESSOR DRAINS TANK
27 - AIR COMPRESSOR AND RECEIVER
28 - CONDENSATE MAKE-UP PUMPS
29 - INLET AIR PRE-COOLER
30 - GTG FUEL GAS FINAL FILTER SKID
31 - WASTE WATER TANK/PUMPS
32 - GENERATOR/GEARBOX LUBE OIL SKID
33 - GTG LUBE OIL COOLER SKID
34 - STEAM TURBINE ENCLOSURE
35 - BEARING COOLING WATER PUMPS
36 - AUXILIARY COOLING WATER PUMPS
37 - AUXILIARY COOLING WATER HEAT EXCHANGER
38 - DEMINERALIZED WATER FORWARDING PUMPS
39 - WASTE WATER LIFT STATION
40 - GLENARM WEIR (EXISTING)
41 - COOLING TOWER CHEMICAL TREATMENT
42 - GT 3 & 4 OILY WATER SEPARATOR (EXISTING)
43 - GLENARM BROADWAY TUNNEL (EXISTING)
44 - GT 3 & 4 DEMIN TANK (EXISTING)
45 - STEAM & WATER SAMPLING PANEL
46 - POTABLE WATER RECIRCULATION SKID
47 - ATMOSPHERIC FLASH TANK/TRANSFER PUMPS
48 - COIL CONDENSATE SUMP
49 - GTG WATER WASH DRAINS TANK (IN OPEN VAULT)
50 - CONTROL BUILDING
51 - PURGE/TEMPERING AIR FANS
52 - WATER LAB BUILDING
53 - SPRINT SKID
0 10 20 40 60 FEET
1"= 20'
NOTES
1. CONCEPTUAL
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE
INIT
L RE-ISSUED FOR BID 01/06/2014 KAC KAC TRC GTH DSGN DPB 04/12/2011
K RE-ISSUED FOR BID 12/06/2013 VBD KAC TRC GTH DRN DPB 04/12/2011
J RE-ISSUED FOR BID 10/15/2013 VBD KAC TRC GTH CKD RVK 04/12/2011
I RE-ISSUED FOR BID 09/27/2013 VBD KAC ADD SLH
H RE-ISSUED FOR REVIEW 07/18/2013 VBD KAC ADD SLH
REV REVISIONS DATE DRN DSGN CKD APPD
SCALE: 1" = 20'-0"
FOR 22x34 DWG ONLY
POWER ENGINEERS
www.powereng.com
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
GENERAL ARRANGEMENT GAS TURBINE/AXIAL EXHAUST
JOB NUMBER 125374
REV 1
DRAWING NUMBER M1-1-1
kcourson 01/06/2014 07:02 AM \\pooldfs1\Work\Projects\125374\MECH\CAD\M1\dwg\mech-M1-plan1-1.dgn

# P&IDs

| NUMBERS | |
|---|---|
| M3-1-0 | COVER SHEET |
| M3-1-1 | SYMBOLS AND LEGEND |
| M3-1-2 | SYMBOLS AND LEGEND |
| M3-1-3 | SYMBOLS AND LEGEND |
| M3-3-1 | GAS TURBINE INTERCONNECTIONS |
| M3-3-1 | OTSG INTERCONNECTIONS (EXHAUST GAS) |
| M3-3-2 | OTSG INTERCONNECTIONS (STEAM) |
| M3-4-1 | BOILER FEEDWATER SYSTEM |
| M3-5-1 | HIGH PRESSURE STEAM |
| M3-6-1 | STEAM TURBINE INTERCONNECTIONS |
| M3-7-1 | STEAM DRAINS – DRAIN TANK |
| M3-8-1 | STEAM AND WATER SAMPLING |
| M3-9-1 | CYCLE CHEMICAL FEED SYSTEM |
| M3-10-1 | GLAND STEAM SYSTEM |
| M3-11-1 | CONDENSATE SYSTEM |
| M3-11-2 | CONDENSATE SYSTEM |
| M3-11-3 | CONDENSATE SYSTEM |
| M3-12-1 | CONDENSER AIR EXTRACTION |
| M3-13-1 | CIRCULATING WATER SYSTEM |
| M3-14-1 | AUXILIARY COOLING WATER SYSTEM |
| M3-15-1 | COMPONENT COOLING WATER SYSTEM |
| M3-15-2 | COMPONENT COOLING WATER SYSTEM |
| M3-15-3 | COMPONENT COOLING WATER SYSTEM |
| M3-16-1 | COOLING TOWER CHEMICAL FEED SYSTEM |
| M3-17-1 | AQUEOUS AMMONIA SYSTEM |
| M3-18-1 | FUEL GAS SYSTEM |
| M3-18-2 | FUEL GAS SYSTEM |
| M3-18-3 | FUEL GAS SYSTEM |
| M3-19-1 | SERVICE AIR SYSTEM |
| M3-20-1 | INSTRUMENT AIR SYSTEM |
| M3-21-1 | FIREWATER SYSTEM |
| M3-22-1 | SERVICE WATER SYSTEM |
| M3-23-1 | DEMINERALIZED WATER SYSTEM |
| M3-23-2 | DEMINERALIZED WATER SYSTEM |
| M3-24-1 | POTABLE WATER SYSTEM |
| M3-25-1 | CHILLED WATER SYSTEM |
| M3-25-2 | CHILLED WATER SYSTEM |
| M3-26-1 | WASTEWATER COLLECTION SYSTEM |
| M3-26-2 | WASTEWATER COLLECTION SYSTEM |
| M3-27-1 | AUXILIARY STEAM SYSTEM |

# PASADENA WATER & POWER

## GLENARM REPOWER PROJECT
## (GT-5 COMBINED CYCLE INSTALLATION)

### PIPING AND INSTRUMENTATION DIAGRAMS

**GENERAL NOTES**

1. INSTRUMENT LEGEND ON DRAWING M3-1-2 IS BASED UPON ANSI/ISA 5.1.
2. ROOT VALVES ARE SHOWN ON P&IDS.
3. ALL VENTS, DRAINS, TEST CONNECTIONS, AND INSTRUMENT ROOT VALVES ARE .75", UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL INSTALL HIGH POINT VENTS AND LOW POINT DRAINS AS REQUIRED TO MEET DETAIL DESIGN.
5. ALL TANK CONNECTIONS SHALL BE PROVIDED WITH ISOLATION VALVES.
6. PIPELINE SIZES, WHERE PROVIDED, HAVE BEEN APPROXIMATED FOR ESTIMATING PURPOSES. CONTRACTOR SHALL VERIFY INTERCONNECTING PIPING SIZES SUPPORT REQUIRED PROCESS FLOWS AND TO ASSURE LINE LOSSES WILL NOT AFFECT POWER ISLAND EQUIPMENT PERFORMANCE GUARANTEES. PLEASE REFER TO GE HEAT AND MASS BALANCE DIAGRAMS HB # CCA-17604-NG, REVISION 0 AND HB # CCA-17605-NG, REVISION 0 FOR THE POWER ISLAND CONTRACT GUARANTEED PROCESS CONDITIONS. PIPELINE SIZES SHALL NOT BE SMALLER THAN THOSE INDICATED ON THESE P&IDS WITHOUT APPROVAL FROM THE GENERAL MANAGER.

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| | ARCH | CIVIL | ELECT | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|
| DISC | | | | | | |
| DATE | | | | | | |
| INIT | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| E | ISSUED FOR REVIEW | 10/15/13 | VBD | ADD | SEG | TRC |
| D | ISSUED FOR REVIEW | 09/13/13 | VBD | ADD | SEG | TRC |
| C | ISSUED FOR REVIEW | 07/16/13 | VBD | ADD | SEG | TRC |
| B | ISSUED FOR REVIEW | 10/12/12 | VBD | ADD | SEG | TRC |
| A | ISSUED FOR REVIEW | 10/09/12 | VBD | ADD | SEG | TRC |

| | | |
|---|---|---|
| DSGN | ADD | 09/13/12 |
| DRN | VBD | 09/12/12 |
| CKD | SEG | 09/12/12 |

SCALE: NONE

POWER ENGINEERS

PASADENA WATER AND POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
PIPING & INSTRUMENTATION DIAGRAM
COVER SHEET

JOB NUMBER 123374
REV E
DRAWING NUMBER M3-1-0

# Fire Protection

4.2 FIRE SUPPRESSION AREAS

| BUILDING | AREA DESCRIPTION | FIRE SUPPRESSION TYPE |
|---|---|---|
| Gas Turbine Package | Gas Turbine and Generator compartment | On-board self contained CO2 system |
| | Mineral lube oil skid | Deluge system with air pilot line |
| | Auxiliary skid enclosure | Water mist system |
| Steam Turbine Enclosure | Acoustic enclosure | Pre-action water spray system with 180°F high temp fusible link heads at ceiling |
| | Steam turbine, generator and bearings | Pre-action water spray system with temperature rate of rise detection and fusible link heads |
| | Lube oil skid | Deluge system with air pilot line |
| Heat Recovery Boiler (OTSG) | Outdoor installation | None required |
| Fuel Gas Compression and metering areas | Four side acoustic wall, no roof | None required if not contained within a building |
| Power Distribution Center | Prefabricated electrical building on concrete piers | |
| | Switchgear and battery storage | FM200 dry agent |
| | Area underneath building with cable trays and building penetrations | Dry pipe water sprinkler system with smoke detection and fusible link heads |
| Cooling Tower | Fiberglass structure with <25 flame spread rating | Wet sprinkler system |
| Generator Step-Up Transformer | No FR3 fluid | Fire separation walls as required. No active fire suppression system. |
| Auxiliary Transformers | No FR3 fluid | Fire separation walls as required. No active fire suppression system. |
| Control Building | Administrative Office Space | Wet pipe sprinkler system, CO2 handheld extinguishers as required by code |
| | GT-5 Control Room | Smoke detection and water mist system |
| | Under floor cabling (computer floor in control room and DCS/Server Room) | Wet pipe sprinkler system |
| | DCS and Server Room | Smoke detection, water mist system |
| | DCS and Server Room under floor cabling | Wet pipe sprinkler system |
| Maintenance Building (south side of State Street) | Maintenance workshop | Wet pipe sprinkler system |
| | Basement and bunker | Wet pipe sprinkler system |
| Welding Shop (south side of State Street) | Hot work area | Wet pipe sprinkler system |
| CEMS Enclosure | Air emissions analyzer equipment | Smoke detection only |
| Water Sampling Enclosure | Water and steam analyzer equipment | Smoke detection only |

# BOP Contractor Supplied Equipment

# BOP Contractor Supplied Equipment

Pasadena Water and Power

1. The Plant Control System (PCS)
2. One Power Distribution Center
3. Two 4160V-480V auxiliary transformers
4. One 13.8kV-4160V auxiliary transformer
5. One 17.2kV-4160V auxiliary transformer
6. Lighting panels and transformers as needed for building and plant loads
7. Inlet air filter house coil condensate sump and pumps
8. One gas turbine wash water tank
9. One condensate storage tank
10. 2 x 100% Condensate Makeup pumps
11. 1 x 100% Auxiliary Cooling Water/Component Cooling Water shell and tube heat exchanger
12. 2x100% Bearing (Component) Cooling Water pumps
13. One Bearing (Component) Cooling expansion tank
14. One Atmospheric Flash Tank with vent silencer and forwarding pumps
15. Condensate Transfer pumps
16. A new ammonia forwarding pump skid to be located by the existing B-3 tank
17. The steam water analyzer / sample panel
18. Cycle chemical feed system
19. Cooling tower chemical feed system
20. 2x100% Demin water pumps
21. 2x100% Demin water forwarding pumps
22. One Demin water storage tank
23. One Fuel gas drains tank for gas compressors
24. One Fuel gas drains tank for final/last chance filter at gas turbine
25. 2x100% Process drains forwarding pumps
26. Equipment drain sump and pumps
27. One Potable water recirculation skid for eyewash stations
28. Two Air receiver tanks to be installed at GT 3 & 4
29. 2 x 100% Waste water transfer pumps
30. One Wastewater storage tank
31. One Sanitary sewer lift station
32. Weather station

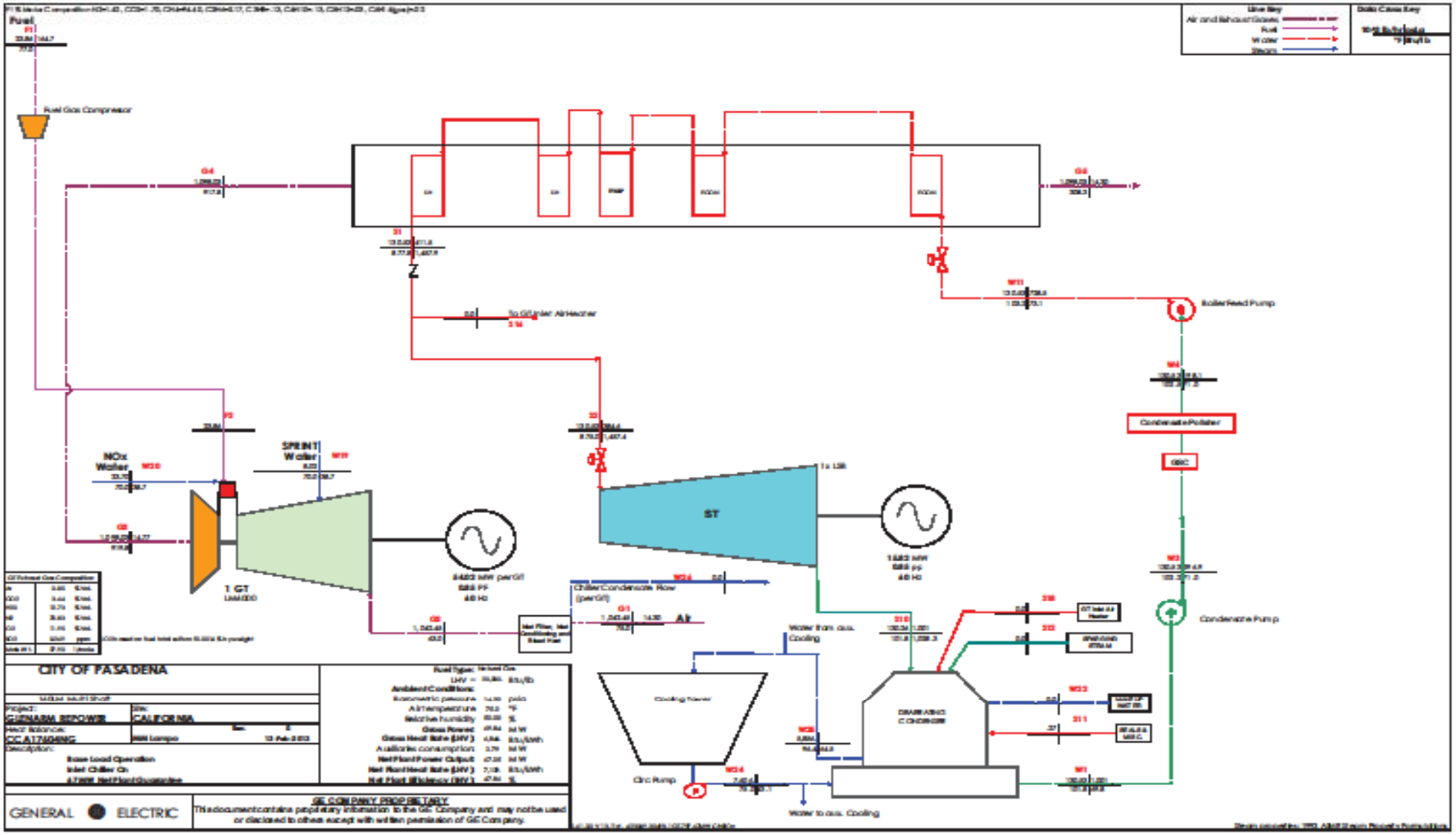
| Item Tag | Service Description | P&ID Number | Maximum Capacity | Design Pressure | Design Temp | Process Capacity | Normal Capacity | Operating Pressure | Operating Temp | Insul. Code | Insul. Thickness | Device Rating | Spec. | Supplier | Notes | Rev |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5CDS-PMP-520A | CONDENSATE PUMP A | M3-11-1 | | | | | 350gallon/min | 650 ft_of_H2O | 110F | N | 0 | | 485311.10 | BY PIE CONTRACTOR | | B |
| 5CDS-PMP-520B | CONDENSATE PUMP B | M3-11-1 | | | | | 350gallon/min | 650 ft_of_H2O | 110F | N | 0 | | 485311.10 | BY PIE CONTRACTOR | | B |
| 5CDS-PMP-540A | INLET AIR CONDENSATE PUMP A | M3-25-2 | | | | | | | | P | | | 485471 | BY PIE CONTRACTOR | | B |
| 5CDS-PMP-540B | INLET AIR CONDENSATE PUMP B | M3-25-2 | | | | | | | | P | | | 485471 | BY PIE CONTRACTOR | | B |
| 5CDS-PMP-560 | AUXILIARY BOILER FEED PUMP | M3-27-1 | | | | | | | | N | 0 | | | BY PIE CONTRACTOR | | B |
| 5CDS-TNK-010 | CONDENSATE STORAGE TANK | M3-11-2 | 5000 gallon | | | | 5000 gallon | | 117F | N | 0 | | 485173 | | | B |
| 5CDS-WTS-550 | CONDENSATE POLISHER SKID | M3-11-3 | | | | | | | | N | 0 | | 485952 | BY PIE CONTRACTOR | | B |
| 5CF6-PNL-020 | OXYGEN SCAVENGER CONTROL PANEL | M3-9-1 | | | | | | | | N | 0 | | 485952.06 | | | B |
| 5CF6-ZXX-010 | OXYGEN SCAVENGER SKID | M3-9-1 | | | | | | | | N | 0 | | 485952.06 | | | B |
| 5CF7-PNL-020 | PH CONTROL PANEL | M3-9-1 | | | | | | | | N | 0 | | 485952.06 | | | B |
| 5CF7-ZXX-010 | PH CONTROL SKID | M3-9-1 | | | | | | | | N | 0 | | 485952.06 | | | B |
| 5CFX-PNL-020 | COOLING TOWER CHEMICAL CONTROL PANEL | M3-16-1 | | | | | | | | N | 0 | | 485952.05 | | | B |
| 5CFX-ZXX-010 | COOLING TOWER CHEMICAL FEED SYSTEM | M3-16-1 | | | | | | | | N | 0 | | 485952.05 | | | B |
| 5CHW-PMP-010 | COIL CONDENSATE SUMP PUMP | M3-25-2 | | | | | 20gallon/min | | 97F | N | 0 | | 485951.63 | | | B |
| 5CHW-SMP-030 | COIL CONDENSATE SUMP | M3-25-2 | | | | | | | 97F | N | 0 | | 485951.63 | | | B |
| 5CHW-TNK-520 | POT FEEDER | M3-25-1 | | | | | | | | N | 0 | | 485471 | BY PIE CONTRACTOR | | B |
| 5CHW-ZXX-040 | WEATHER STATION | M3-25-1 | | | | | | | | N | 0 | | | | | B |
| 5CHW-ZXX-510 | CHILLER PACKAGE | M3-25-1 | | | | | | | | N | 0 | | 485471 | BY PIE CONTRACTOR | | B |
| 5CWS-CTW-510 | COOLING TOWER | M3-13-1 | | | | | 15789gallon/min | | 97F | N | 0 | | 485491 | BY PIE CONTRACTOR | | B |
| 5CWS-FAN-520A | COOLING TOWER FAN A | M3-13-1 | | | | | | | | N | 0 | | 485491 | BY PIE CONTRACTOR | | B |
| 5CWS-FAN-520B | COOLING TOWER FAN B | M3-13-1 | | | | | | | | N | 0 | | 485491 | BY PIE CONTRACTOR | | B |

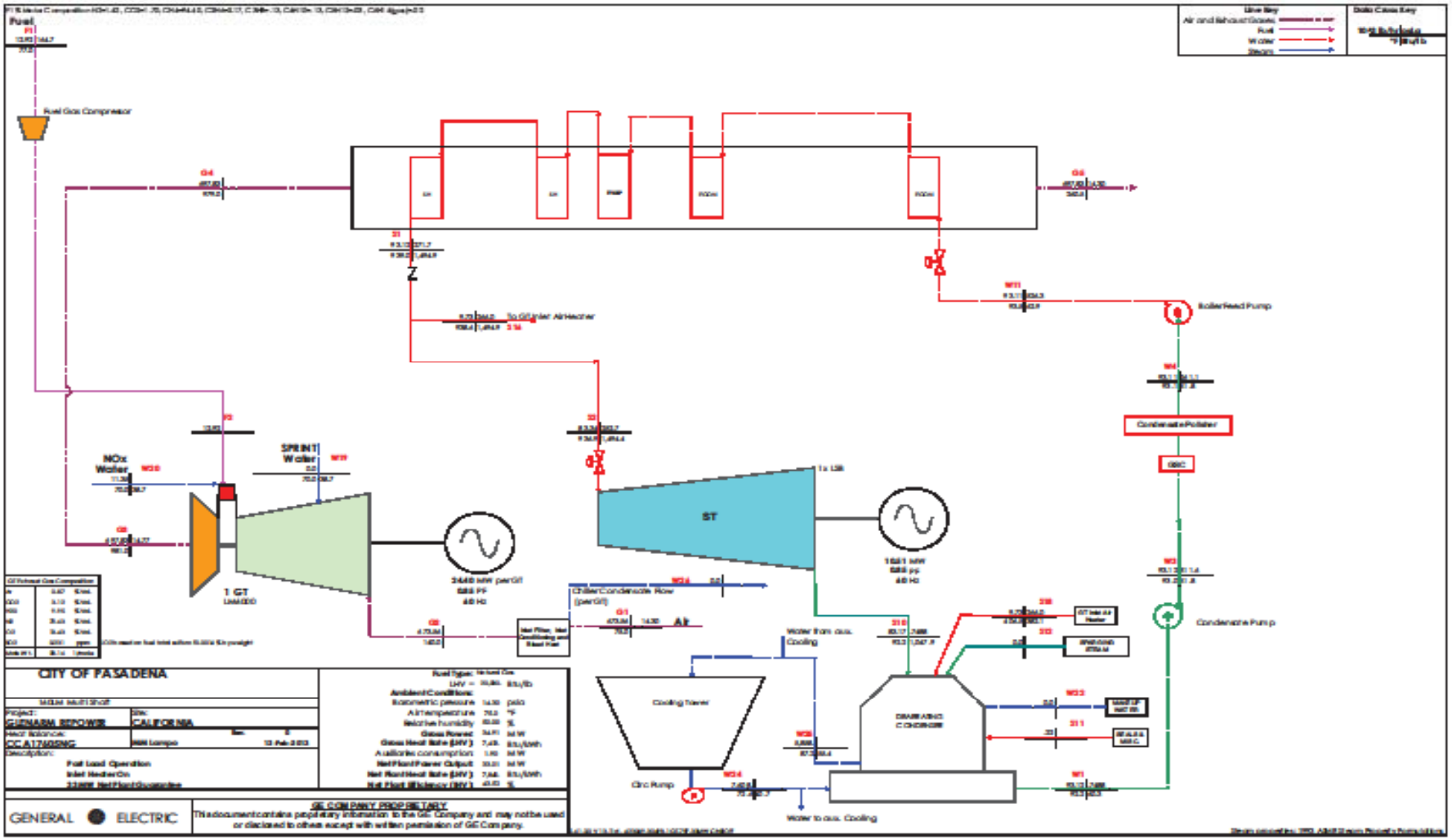
| INTER-DISCIPLINE REVIEW | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DISC | ARCH | CIVIL | ELECT | I&C | APPD | STRUCT | C | RE-ISSUED FOR BID | 12.06.13 | SEG | TRC | GTH | | | DSGN | TRC | 10.16.12 | | PASADENA WATER & POWER | |
| | | | | | | | B | ISSUE FOR BID | 10.11.13 | SEG | TRC | GTH | | | DRN | TRC | 10.16.12 | | GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION) | JOB NUMBER 122374 |
| DATE | | | | | | | A | ISSUE FOR REVIEW | 10.16.12 | TRC | SEG | GTH | M3-X | P&IDs | CHK | SEG | 10.16.12 | POWER ENGINEERS | EQUIPMENT LIST | DRAWING # M9-1 |
| INT | | | | | | | REV | REVISIONS | DATE | DSGN | CHK | APPD | REFERENCE DRAWINGS | | SCALE | NONE | | | | SHEET 3 OF 6 |

REV C

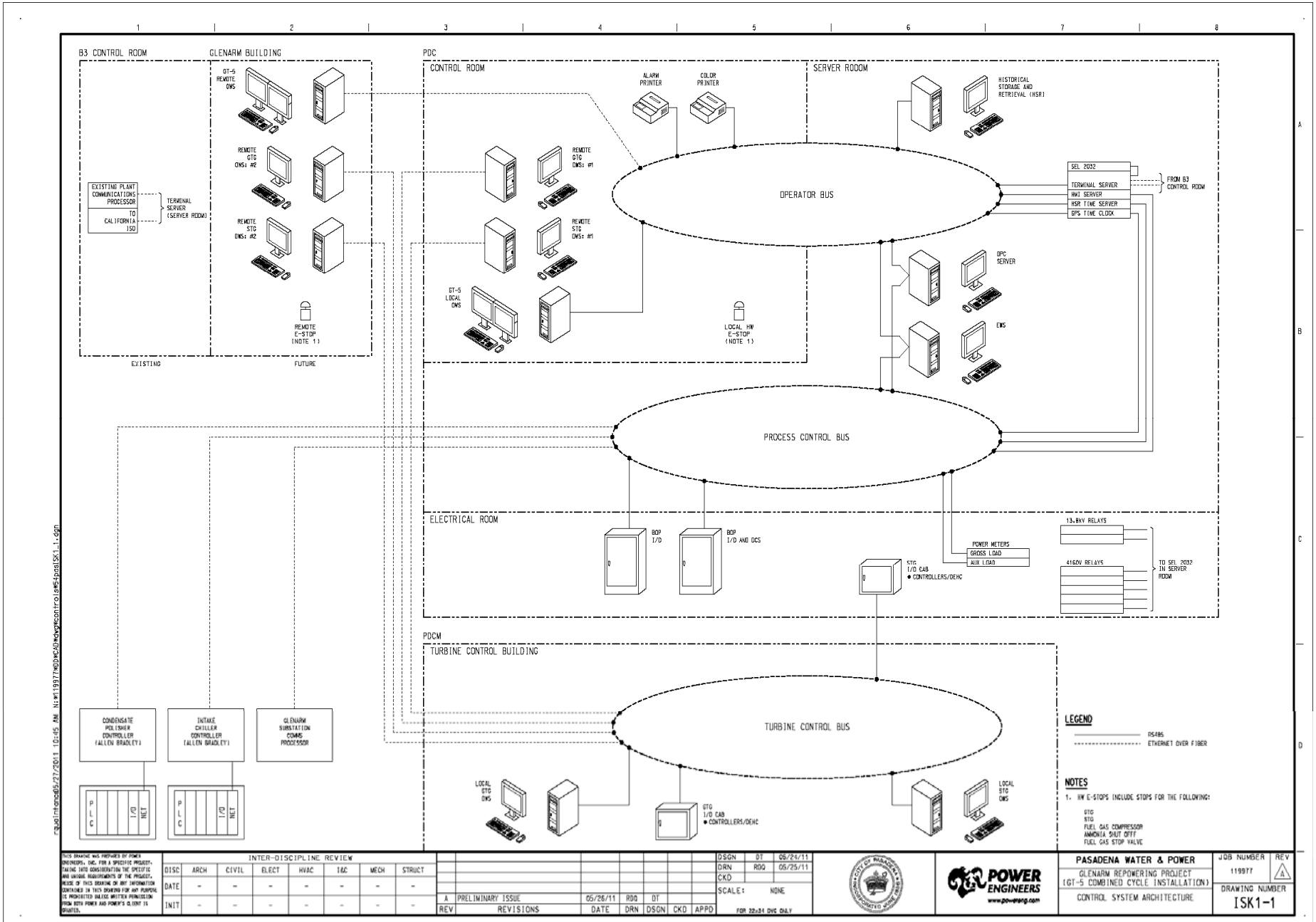
THIS DOCUMENT WAS PREPARED BY POWER ENGINEERS, INC. FOR SPECIFIC PROJECTS, AND UNIQUE REQUIREMENTS OF THE PROJECTS. REUSE OF THIS DOCUMENT OR ANY INFORMATION CONTAINED IN THIS DOCUMENT FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

# GE Performance Information

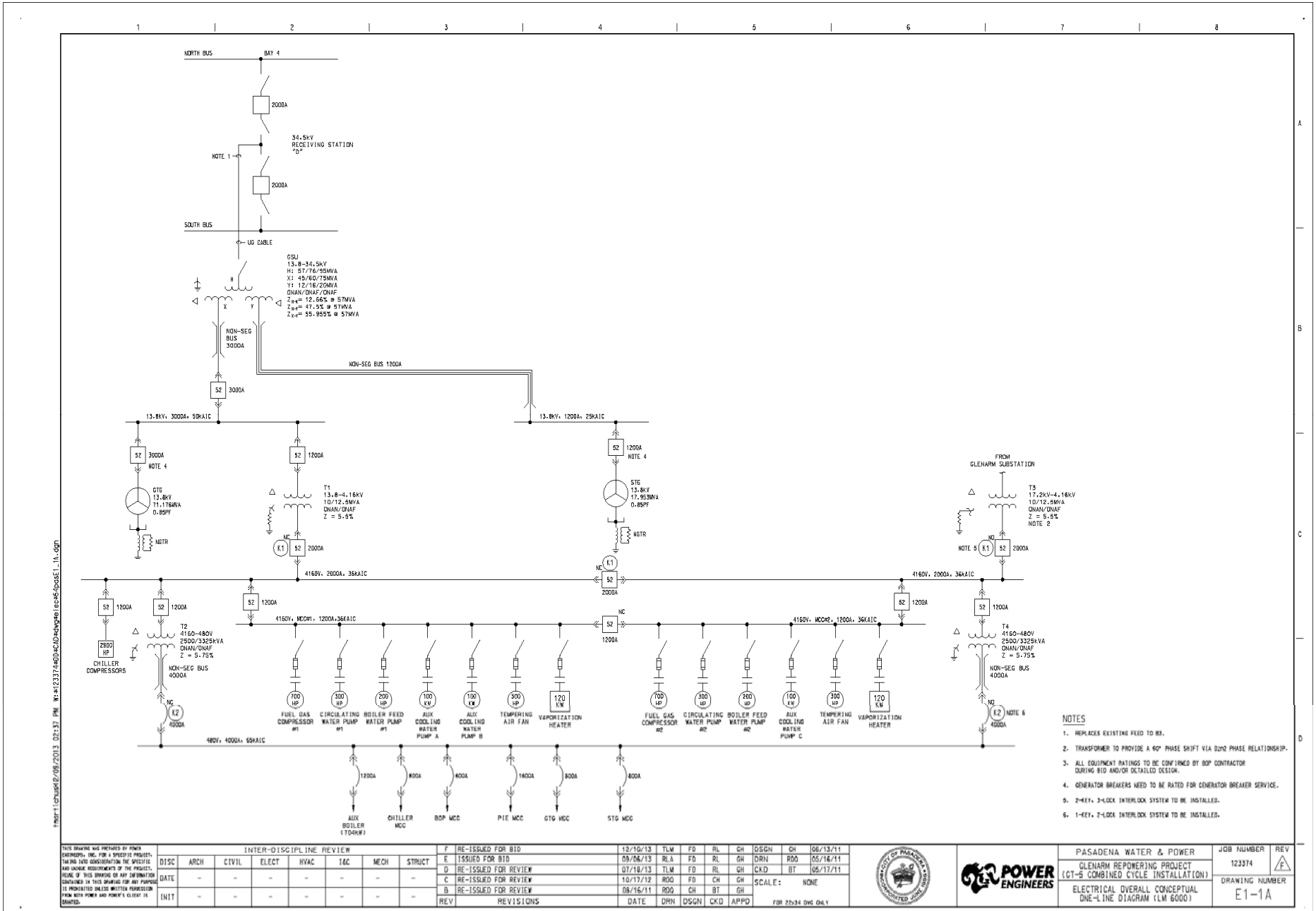

Fuel
Fuel Gas Compressor
To GT Inlet Air Heater
NOx Water
SPRINT Water
1 GT
LM6000
ST
1 x 138
Boiler Feed Pump
Condensate Polisher
Condensate Pump
Chiller Condenser Flow (per GT)
Water from aux. Cooling
Water to aux. Cooling
Circ Pump
Cooling Tower
CITY OF PASADENA
GENERAL ELECTRIC
GE COMPANY PROPRIETARY

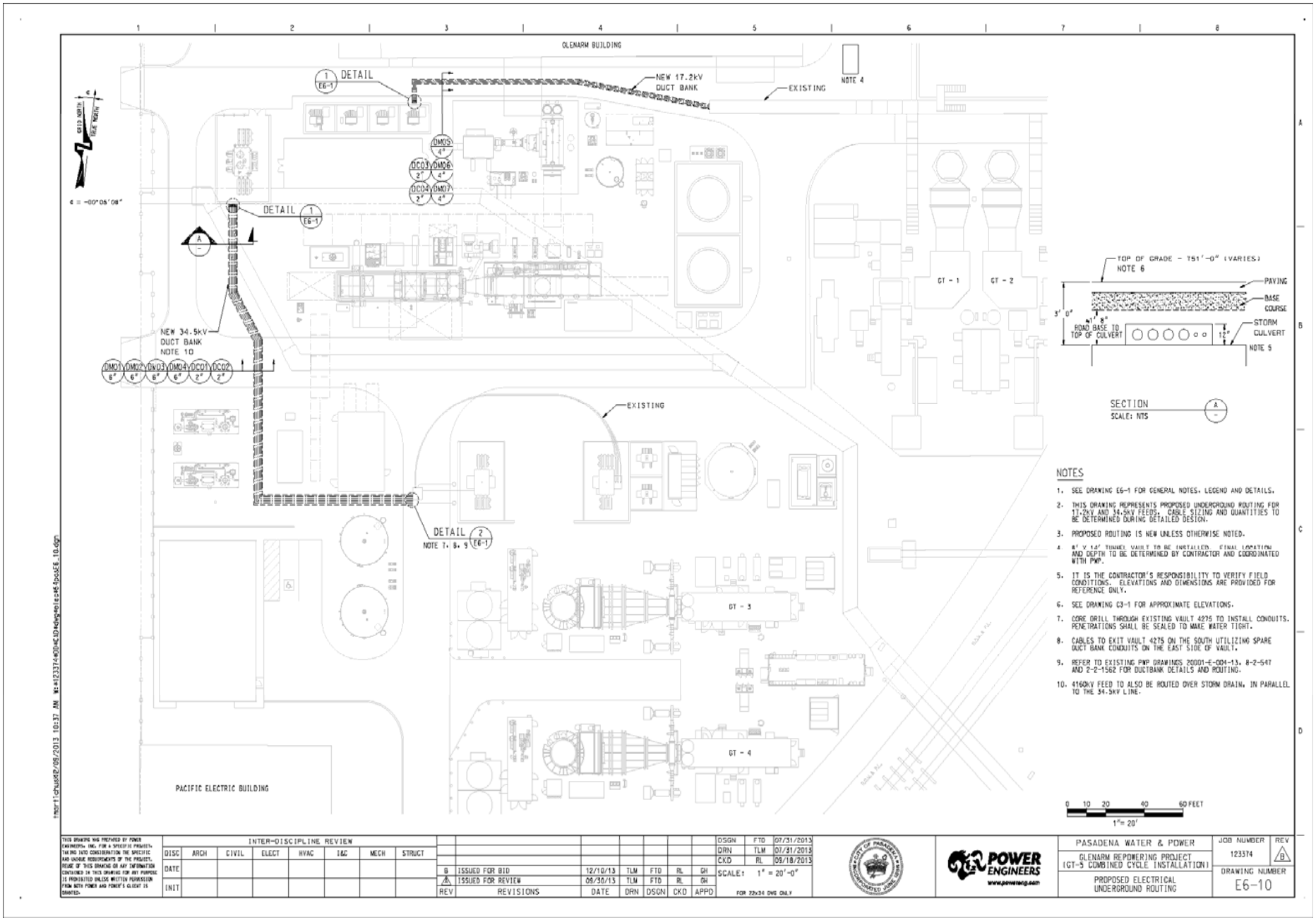

Fuel
Fuel Gas Compressor
NOx Water
SPRINT Water
1 GT
ST
To GT Inlet Air Heater
Boiler Feed Pump
Condensate Polisher
Condensate Pump
Chiller Condenser Flow (per GT)
Air
Cooling Tower
Circ Pump
Water from aux. Cooling
Water to aux. Cooling
CITY OF PASADENA
GENERAL ELECTRIC
GE COMPANY PROPRIETARY

# CONTROL SYSTEM REQUIREMENTS

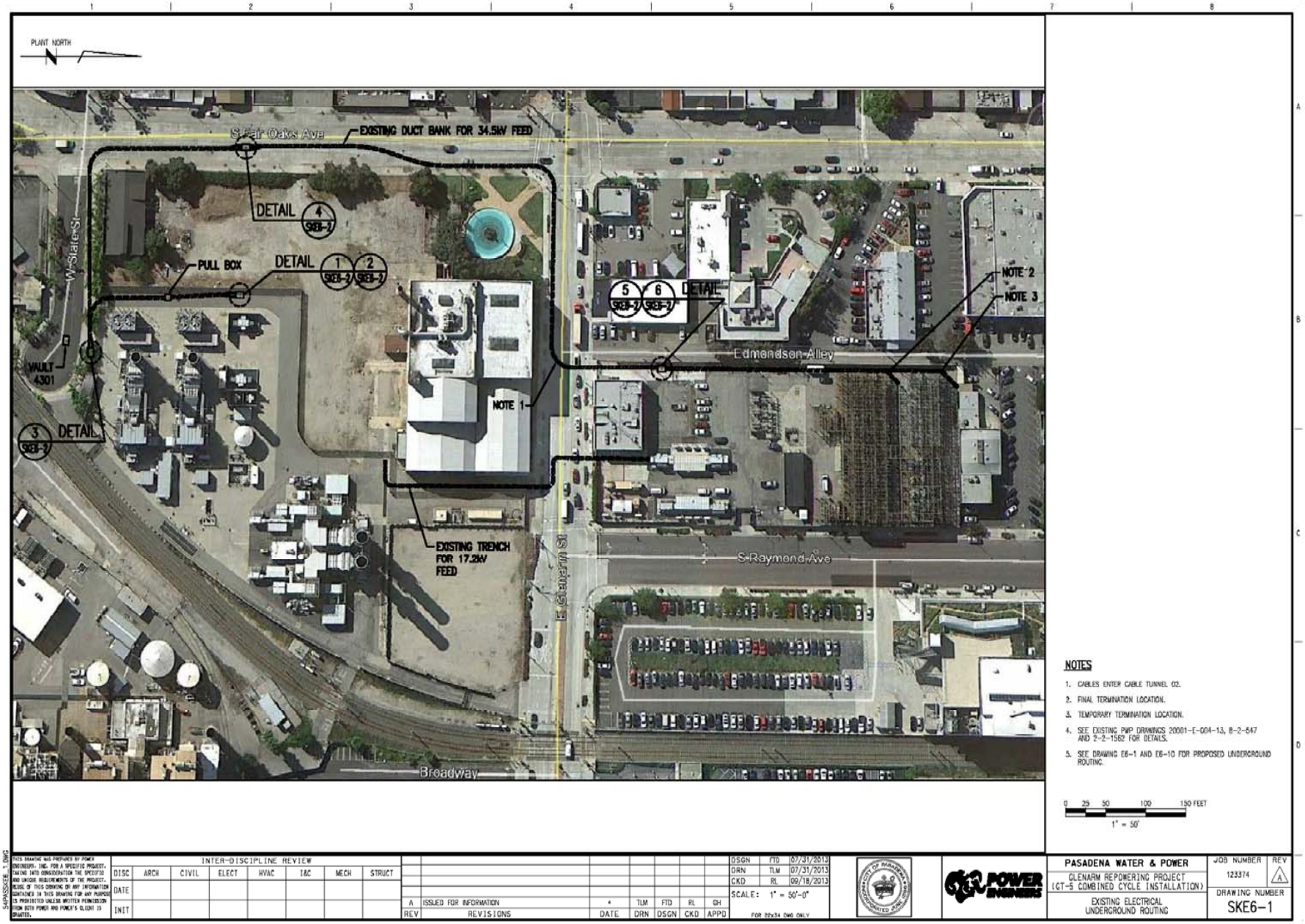

B3 CONTROL ROOM
GLENARM BUILDING
PDC
CONTROL ROOM
SERVER ROOM
ELECTRICAL ROOM
PDCM
TURBINE CONTROL BUILDING
EXISTING
FUTURE
EXISTING PLANT COMMUNICATIONS PROCESSOR
TO CALIFORNIA ISO
TERMINAL SERVER (SERVER ROOM)
GT-5 REMOTE OWS
REMOTE GTG OWS: #2
REMOTE STG OWS: #2
REMOTE E-STOP (NOTE 1)
ALARM PRINTER
COLOR PRINTER
REMOTE GTG OWS: #1
REMOTE STG OWS: #1
GT-5 LOCAL OWS
LOCAL HW E-STOP (NOTE 1)
HISTORICAL STORAGE AND RETRIEVAL (HSR)
OPERATOR BUS
SEL 2032
TERMINAL SERVER
HMI SERVER
HSR TIME SERVER
GPS TIME CLOCK
FROM B3 CONTROL ROOM
OPC SERVER
EMS
PROCESS CONTROL BUS
BOP I/O
BOP I/O AND DCS
STG I/O CAB
CONTROLLERS/DEHC
POWER METERS
GROSS LOAD
AUX LOAD
13.8KV RELAYS
4160V RELAYS
TO SEL 2032 IN SERVER ROOM
TURBINE CONTROL BUS
LOCAL STG OWS
GTG I/O CAB
CONTROLLERS/DEHC
CONDENSATE POLISHER CONTROLLER (ALLEN BRADLEY)
INTAKE CHILLER CONTROLLER (ALLEN BRADLEY)
GLENARM SUBSTATION COMMS PROCESSOR
PLC
I/O NET
LEGEND
RS485
ETHERNET OVER FIBER
NOTES
1. HW E-STOPS INCLUDE STOPS FOR THE FOLLOWING:
GTG
STG
FUEL GAS COMPRESSOR
AMMONIA SHUT OFFF
FUEL GAS STOP VALVE
INTER-DISCIPLINE REVIEW
DISC
ARCH
CIVIL
ELECT
HVAC
I&C
MECH
STRUCT
DATE
INIT
A PRELIMINARY ISSUE 05/26/11 RDQ DT
REV REVISIONS DATE DRN DSGN CKD APPD
DSGN DT 05/24/11
DRN RDQ 05/25/11
CKD
SCALE: NONE
FOR 22x34 DWG ONLY
POWER ENGINEERS
www.powereng.com
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
CONTROL SYSTEM ARCHITECTURE
JOB NUMBER 119977
REV A
DRAWING NUMBER ISK1-1

# HIGH VOLTAGE SCOPE


NORTH BUS
BAY 4
2000A
34.5kV
RECEIVING STATION
"D"
NOTE 1
2000A
SOUTH BUS
UG CABLE
GSU
13.8-34.5kV
H: 57/76/95MVA
X: 45/60/75MVA
Y: 12/16/20MVA
ONAN/ONAF/ONAF
NON-SEG BUS 3000A
NON-SEG BUS 1200A
52 3000A
13.8kV, 3000A, 50kAIC
13.8kV, 1200A, 25kAIC
52 3000A
NOTE 4
GTG
13.8kV
11.176MVA
0.85PF
NGTR
52 1200A
T1
13.8-4.16kV
10/12.5MVA
ONAN/ONAF
Z = 5.5%
NC
K1
52 2000A
52 1200A
NOTE 4
STG
13.8kV
17.953MVA
0.85PF
NGTR
K1
NC
52
2000A
FROM
GLENARM SUBSTATION
T3
17.2kV-4.16kV
10/12.5MVA
ONAN/ONAF
Z = 5.5%
NOTE 2
NOTE 5
NO
K1
52 2000A
4160V, 2000A, 36kAIC
4160V, 2000A, 36kAIC
52 1200A
52 1200A
52 1200A
52 1200A
52 1200A
52 1200A
NC
52
1200A
4160V, MCCM1, 1200A,36KAIC
4160V, MCCM2, 1200A, 36KAIC
2500 HP
CHILLER COMPRESSORS
T2
4160-480V
2500/3325kVA
ONAN/ONAF
Z = 5.75%
NON-SEG BUS
4000A
T4
4160-480V
2500/3325kVA
ONAN/ONAF
Z = 5.75%
NON-SEG BUS
4000A
NC
K2
4000A
NO
K2
NOTE 6
4000A
700 HP
FUEL GAS COMPRESSOR #1
300 HP
CIRCULATING WATER PUMP #1
200 HP
BOILER FEED WATER PUMP #1
100 KW
AUX COOLING WATER PUMP A
100 KW
AUX COOLING WATER PUMP B
300 HP
TEMPERING AIR FAN
120 KW
VAPORIZATION HEATER
700 HP
FUEL GAS COMPRESSOR #2
300 HP
CIRCULATING WATER PUMP #2
200 HP
BOILER FEED WATER PUMP #2
100 KW
AUX COOLING WATER PUMP C
300 HP
TEMPERING AIR FAN
120 KW
VAPORIZATION HEATER
480V, 4000A, 65kAIC
1200A
AUX BOILER (704kW)
800A
CHILLER MCC
400A
BOP MCC
1600A
PIE MCC
800A
GTG MCC
800A
STG MCC
NOTES
1. REPLACES EXISTING FEED TO N3.
2. TRANSFORMER TO PROVIDE A 60° PHASE SHIFT VIA Dzn2 PHASE RELATIONSHIP.
3. ALL EQUIPMENT RATINGS TO BE CONFIRMED BY BOP CONTRACTOR DURING BID AND/OR DETAILED DESIGN.
4. GENERATOR BREAKERS NEED TO BE RATED FOR GENERATOR BREAKER SERVICE.
5. 2-KEY, 3-LOCK INTERLOCK SYSTEM TO BE INSTALLED.
6. 1-KEY, 2-LOCK INTERLOCK SYSTEM TO BE INSTALLED.
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE - - - - - - -
INIT - - - - - - -
REV REVISIONS DATE DRN DSGN CKD APPD
F RE-ISSUED FOR BID 12/10/13 TLM FD RL GH
E ISSUED FOR BID 09/06/13 RLA FD RL GH
D RE-ISSUED FOR REVIEW 07/18/13 TLM FD RL GH
C RE-ISSUED FOR REVIEW 10/17/12 RDQ FD CH GH
B RE-ISSUED FOR REVIEW 08/16/11 RDQ CH BT GH
DSGN CH 06/13/11
DRN RDQ 05/16/11
CKD BT 05/17/11
SCALE: NONE
FOR 22x34 DWG ONLY
POWER ENGINEERS
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
ELECTRICAL OVERALL CONCEPTUAL ONE-LINE DIAGRAM (LM 6000)
JOB NUMBER 123574
REV F
DRAWING NUMBER E1-1A


GLENARM BUILDING
DETAIL 1 E6-1
NEW 17.2kV DUCT BANK
EXISTING
NOTE 4
DM05 4"
DC03 2"
DM06 4"
DC04 2"
DM07 4"
DETAIL 1 E6-1
NEW 34.5kV DUCT BANK NOTE 10
DM01 6"
DM02 6"
DM03 6"
DM04 6"
DC01 2"
DC02 2"
EXISTING
DETAIL 2 E6-1 NOTE 7, 8, 9
GT - 1
GT - 2
GT - 3
GT - 4
PACIFIC ELECTRIC BUILDING
TOP OF GRADE - 751'-0" (VARIES) NOTE 6
PAVING
BASE COURSE
3' 0"
4'-8" ROAD BASE TO TOP OF CULVERT
12"
STORM CULVERT
NOTE 5
SECTION
SCALE: NTS
A
NOTES
1. SEE DRAWING E6-1 FOR GENERAL NOTES, LEGEND AND DETAILS.
2. THIS DRAWING REPRESENTS PROPOSED UNDERGROUND ROUTING FOR 17.2kV AND 34.5kV FEEDS. CABLE SIZING AND QUANTITIES TO BE DETERMINED DURING DETAILED DESIGN.
3. PROPOSED ROUTING IS NEW UNLESS OTHERWISE NOTED.
4. 8' X 12' TINNEL VAULT TO BE INSTALLED. FINAL LOCATION AND DEPTH TO BE DETERMINED BY CONTRACTOR AND COORDINATED WITH PWP.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY FIELD CONDITIONS. ELEVATIONS AND DIMENSIONS ARE PROVIDED FOR REFERENCE ONLY.
6. SEE DRAWING C3-1 FOR APPROXIMATE ELEVATIONS.
7. CORE DRILL THROUGH EXISTING VAULT 4275 TO INSTALL CONDUITS. PENETRATIONS SHALL BE SEALED TO MAKE WATER TIGHT.
8. CABLES TO EXIT VAULT 4275 ON THE SOUTH UTILIZING SPARE DUCT BANK CONDUITS ON THE EAST SIDE OF VAULT.
9. REFER TO EXISTING PWP DRAWINGS 20001-E-DDM-13, 8-2-547 AND 2-2-1562 FOR DUCTBANK DETAILS AND ROUTING.
10. 416kV FEED TO ALSO BE ROUTED OVER STORM DRAIN, IN PARALLEL TO THE 34.5kV LINE.
0 10 20 40 60 FEET
1"= 20'
THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT. TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.
INTER-DISCIPLINE REVIEW
DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT
DATE
INIT
B ISSUED FOR BID 12/10/13 TLM FTD RL GH
A ISSUED FOR REVIEW 09/30/13 TLM FTD RL GH
REV REVISIONS DATE DRN DSGN CKD APPD
DSGN FTD 07/31/2013
DRN TLM 07/31/2013
CKD RL 09/18/2013
SCALE: 1" = 20'-0"
FOR 22x34 DWG ONLY
POWER ENGINEERS www.powereng.com
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
PROPOSED ELECTRICAL UNDERGROUND ROUTING
JOB NUMBER 123374
REV B
DRAWING NUMBER E6-10

34.5 Switchyard
S Fair Oaks Ave
E Glenarm St
W State St
Edmondson Alley
S Raymond Ave
Art Center College of Design
Pasadena Federal Credit Union
Enterprise Rent-A-Car
Arga Controls
Bar Bumper BBQ
1012
1008
©2010 Google - Imagery ©2010 DigitalGlobe, USDA Farm Service Agency, GeoE




S:\PASSGEE_1.DWG

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

INTER-DISCIPLINE REVIEW

| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
|---|---|---|---|---|---|---|---|
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| A | ISSUED FOR INFORMATION | * | TLM | FTD | RL | GH |

| | | |
|---|---|---|
| DSGN | FTD | 07/31/2013 |
| DRN | TLM | 07/31/2013 |
| CKD | RL | 09/18/2013 |

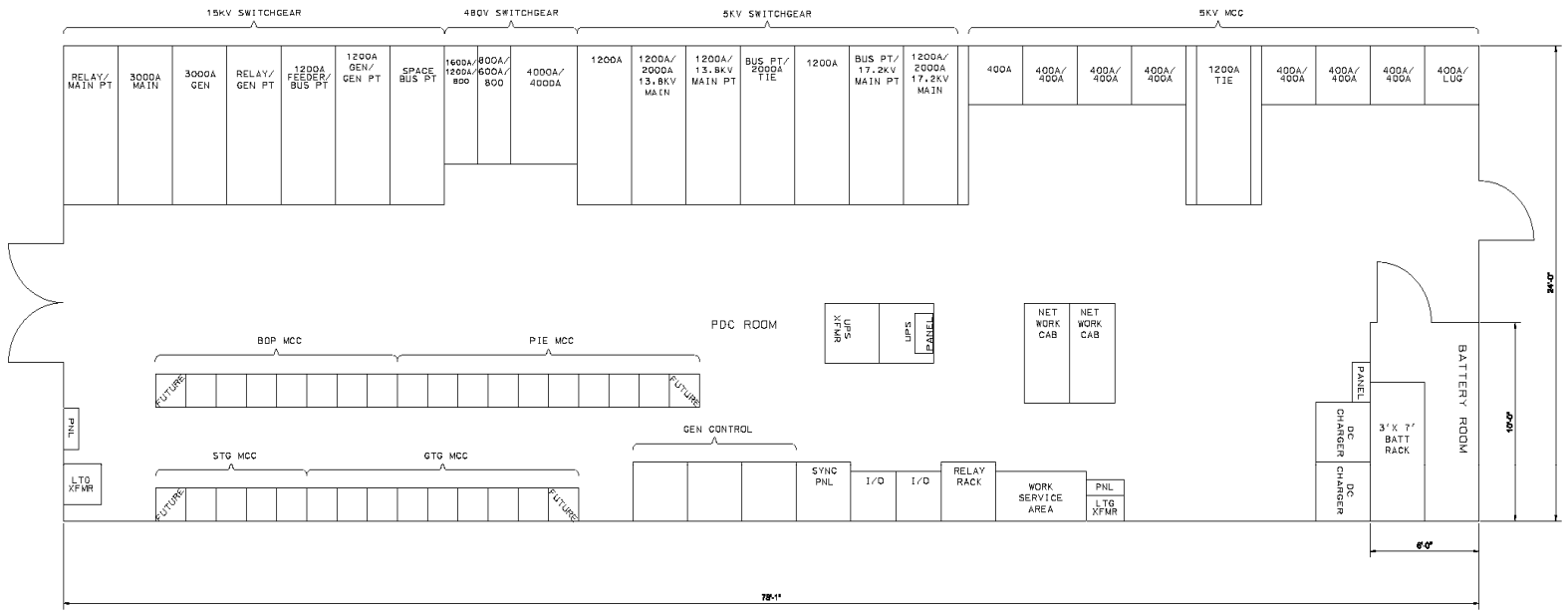
SCALE: 1" = 50'-0"
FOR 22x34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
EXISTING ELECTRICAL UNDERGROUND ROUTING

JOB NUMBER 123374
REV A
DRAWING NUMBER SKE6-1

# PDC Scope




| INTER-DISCIPLINE REVIEW | | | | | | | |
|---|---|---|---|---|---|---|---|
| DISC | ARCH | CIVIL | ELECT | HVAC | I&C | MECH | STRUCT |
| DATE | | | | | | | |
| INIT | | | | | | | |

| REV | REVISIONS | DATE | DRN | DSGN | CKD | APPD |
|---|---|---|---|---|---|---|
| E | RE-ISSUED FOR BID | 12/19/13 | TLM | FD | RL | GH |
| D | ISSUED FOR BID | 09/06/13 | RLA | FD | RL | GH |
| C | RE-ISSUED FOR REVIEW | 07/19/13 | TLM | FD | RL | GH |
| B | RE-ISSUED FOR REVIEW | 06/21/13 | RLA | RL | RL | GH |
| A | ISSUED FOR REVIEW | 01/18/13 | RDQ | FD | GH | GH |

| | | | |
|---|---|---|---|
| DSGN | FD | 09/06/12 |
| DRN | MD | 09/04/12 |
| CKD | JR | 09/07/12 |

SCALE: 1/4" = 1'-0" FOR 22x34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
ELECTRICAL OVERALL CONCEPTUAL PDC BUILDING LAYOUT

JOB NUMBER 123574
REV E
DRAWING NUMBER E1-2

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, AND HAS INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

I:\epr1\chuck\12/09/2013 03:45 PM W:\e123374\e0204c0\dwg\elec45\pase1_2.dgn

# Engineering Deliverables

# Engineering Deliverables

Pasadena Water and Power

- BOP contractor to design the project utilizing a 3D Modeling System that will be viewable/ useable by the BOP site personnel during construction
- The model shall be provided in a native editable format at the completion of the project, prior to final acceptance
- BOP Contractor shall submit a design document list within eight (8) weeks of the award.
- A complete list of the required design document in section C.5 of the Scope of Work.

PASADENA

# Visual Simulations

# Looking Northeast from Fair Oaks – GE LM6000 Option

68

# Looking West from Broadway Plant – GE LM6000 Option

PASADENA

Pasadena Water and Power

# OUTREACH

## GLENARM POWER PLANT REPOWERING

## BOP Contractor Pre-Bid Meeting

January 8, 2014

# Local Participation: Local Hiring

Pasadena Water and Power

- BOP Contractor must make best efforts to:
  - > Hire 25% (of certified payroll) from the City of Pasadena
  - > 15% of Contracting and Procurement with Pasadena businesses
- Opportunity Fair for Pasadena businesses
  - > January 8 1:00-2:30 PM
  - > January 22 1:00-2:30 PM
- Failure to make good faith outreach efforts may cause bid to be deemed non-responsive

PASADENA

# Subcontractor Solicitation Process

Pasadena Water and Power

- **15 points required to pass the Local Subcontractor Solicitation Process**
- Component One – Compile a list of Local Businesses (mandatory)
- Component Two – Advertise (5 points)
- Component Three – Solicit Local Businesses (5 points)
- Component Four – Collaborate with Local Businesses (10 points)

PASADENA

# Local Participation: Local Hiring

Pasadena Water and Power

- PLA gives priority to local workers
- City has retained Clarence Broussard as a consultant to help facilitate discussions
- Primes need to engage with unions

# Local Participation: Businesses

Pasadena Water and Power

- Meet & Greets to facilitate attracting local firms
- Primes provided a list of local firms
- Meet & Greets noticed to local firms and related agencies
- Opportunity for Primes, local firms, and resource agencies to meet and build relationships
- City Staff available to answer questions

we find a better way

# Glenarm Repowering Project
# OTSG Erection

James Tong
January 8, 2014

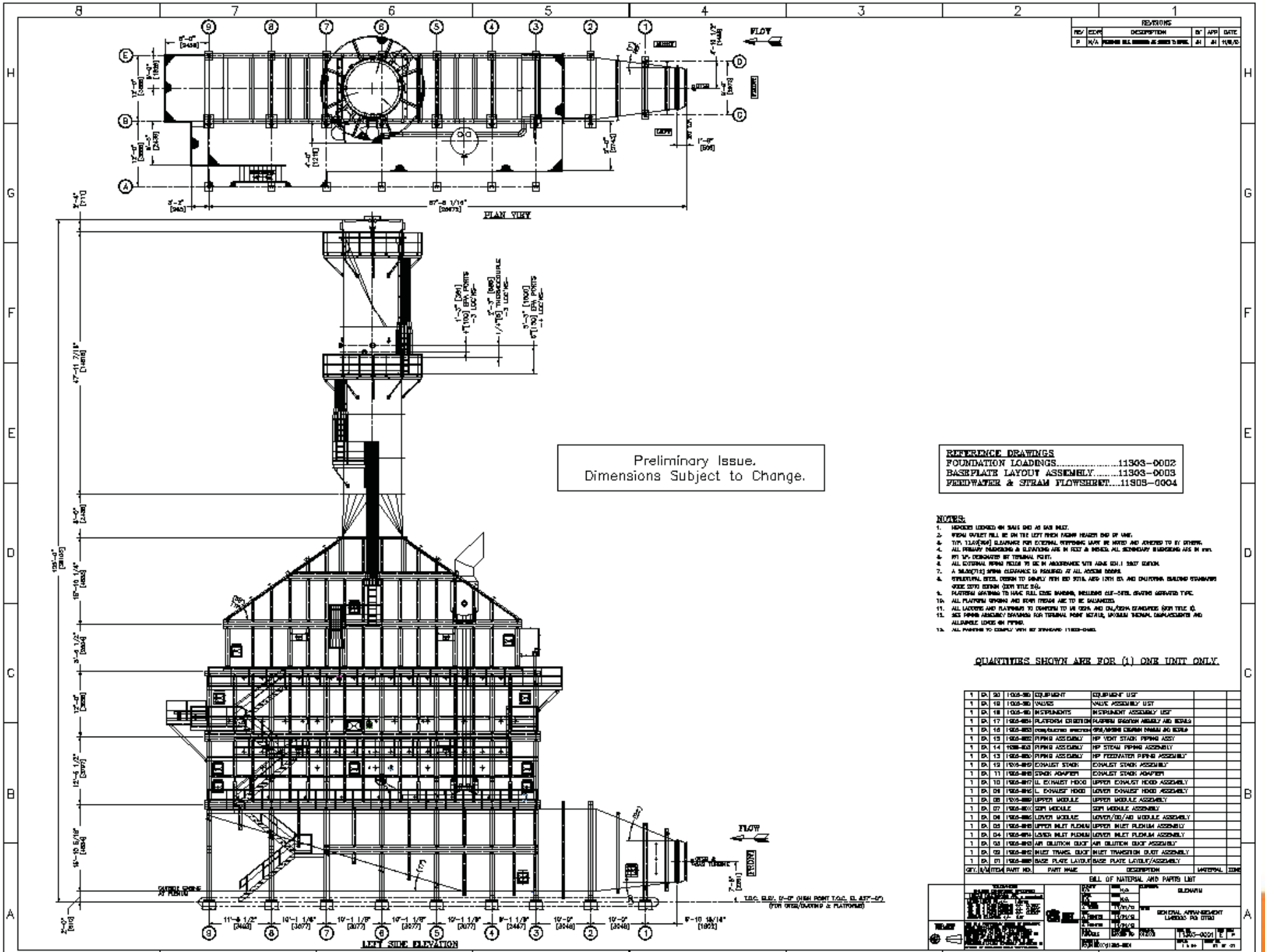
# Agenda

- General Arrangement Overview
- OTSG Module Details
- 3D View of OTSG
- Flowsheet Overview
- Erection Sequence
  - Baseplate Assemblies
  - Inlet Plenum
  - Erection Plate Installation
  - OTSG Modules
  - Exhaust Hood
  - Exhaust Stack
  - Inlet Transition Duct
  - Expansion Joint

# Agenda

- Erection Sequence (Continued)
  - Pressure Part Support (Top Support Beams)
  - Internal Joint Welding and JAK Installation
  - Internal Restraint Adjustment
  - Platform Steel and SRV Silencer Installation
  - Boiler External Piping Installation
  - “Jumper” Tube Installation
  - Instrumentation and Thermocouple Installations
- Questions / Discussions

# Preliminary General Arrangement / Shipping Pieces



# OTSG Details

**OTSG Mechanical Data: LM6000 PG**

For Information Only. May be changed during contract stage

| | | |
|---|---|---|
| Overall Length, ft | 88.60 | |
| Overall Width, ft | 12.95 | |
| Overall Height, ft | 125.00 | |
| Overall Weight, lbs | 884,149 | |
| | | |
| Number of pressure part modules per OTSG | 2 | |
| | Upper Module | Lower Module |
| OTSG Module Length, ft | 54.74 | 61.47 |
| OTSG Module Width, ft | 12.95 | 12.95 |
| OTSG Module Height, ft | 8.53 | 9.56 |
| OTSG Module Weight, lbs | 301,291 | 194,422 |
| | | |
| Effective Net Surface Area, $ft^2$ | 231,436 | |
| Number of Circuits per Module | 41 | |
| Tubes per Circuit | 38 | |
| Total Number of Tubes | 1,558 | |
| Transverse Pitch, inches | 2.75 | |
| Longitudinal Pitch, inches | 2.38 | |
| | | |
| Effective Finned Tube Length, ft | 42.73 | |
| Tube Diameter, inches | 0.75 / 1.0 / 1.25 | |
| Tube Wall Thickness, inches | As req'd | |
| | | |
| Fin Material | As req'd | |
| Fin Pitch, fins per inch | As req'd | |
| Fin Height, inches | As req'd | |
| Fin Thickness, inches | As req'd | |

**Approximate Exterior Dimensions & Weights (Please refer to attached drawing for referenced dimensions)**

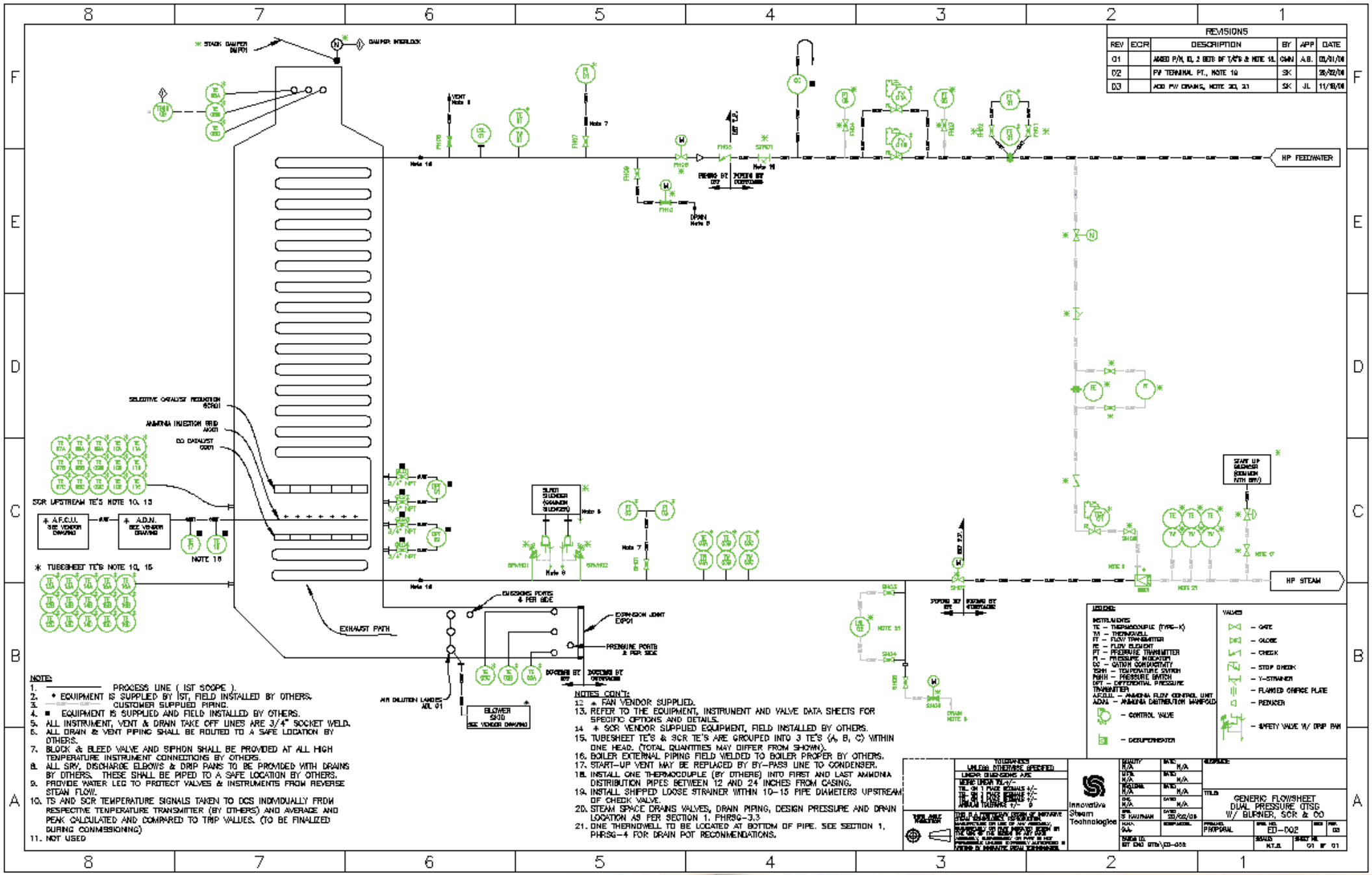
| | Length | | Width | Height | | Weight |
|---|---|---|---|---|---|---|
| Inlet Duct Inlet, ft . | | | 7.98 | 7.98 | ' A ' | |
| Inlet Duct, ft & lbs | 15.14 | ' B ' | | | | 17,755 |
| Inlet Duct Outlet, ft | | | 12.86 | 15.49 | | |
| Air Dilution Duct, ft & lbs | 10.00 | ' D ' | 12.86 | 15.49 | | 15,494 |
| Burner Duct Outlet, ft | | | 12.86 | 15.49 | | |
| Inlet Plenum, ft & lbs | 61.47 | ' E ' | 12.95 | 15.86 | ' F ' | 95,229 |
| OTSG Lower Module, ft & lbs | 61.47 | | 12.95 | 9.56 | | 194,422 |
| SCR Module, ft & lbs | 61.47 | | 12.95 | 16.50 | ' G ' | 77,617 |
| OTSG Upper Modules, ft & lbs | 54.74 | | 12.95 | 8.53 | | 301,291 |
| Exhaust Hood, ft & lbs | 54.74 | | 12.95 | 15.95 | ' H ' | 52,090 |
| Exhaust Stack, ft & lbs | 12.85 | ' K ' | 12.85 | 56.82 | ' J ' | 65,250 |
| Ladders & Platforms. lot, lbs | | | | | | 65,000 |
| | | | | Total | | **884,149** |

# 3D View of a Similar OTSG

This generic flow sheet incorrectly state the IST OTSG is dual pressure with a duct burner.

This is a single pressure OTSG without a duct burner.

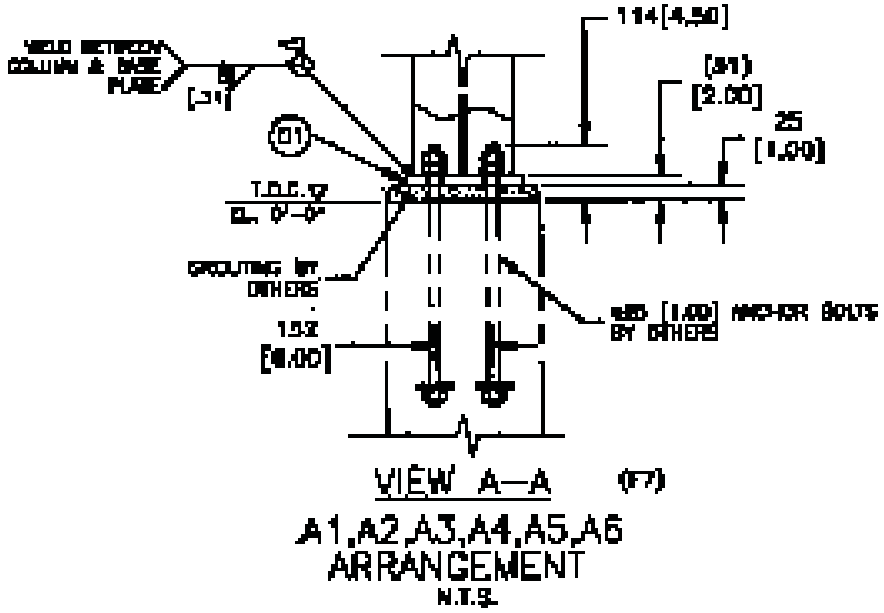
# Glenarm GE OTSG Flowsheet

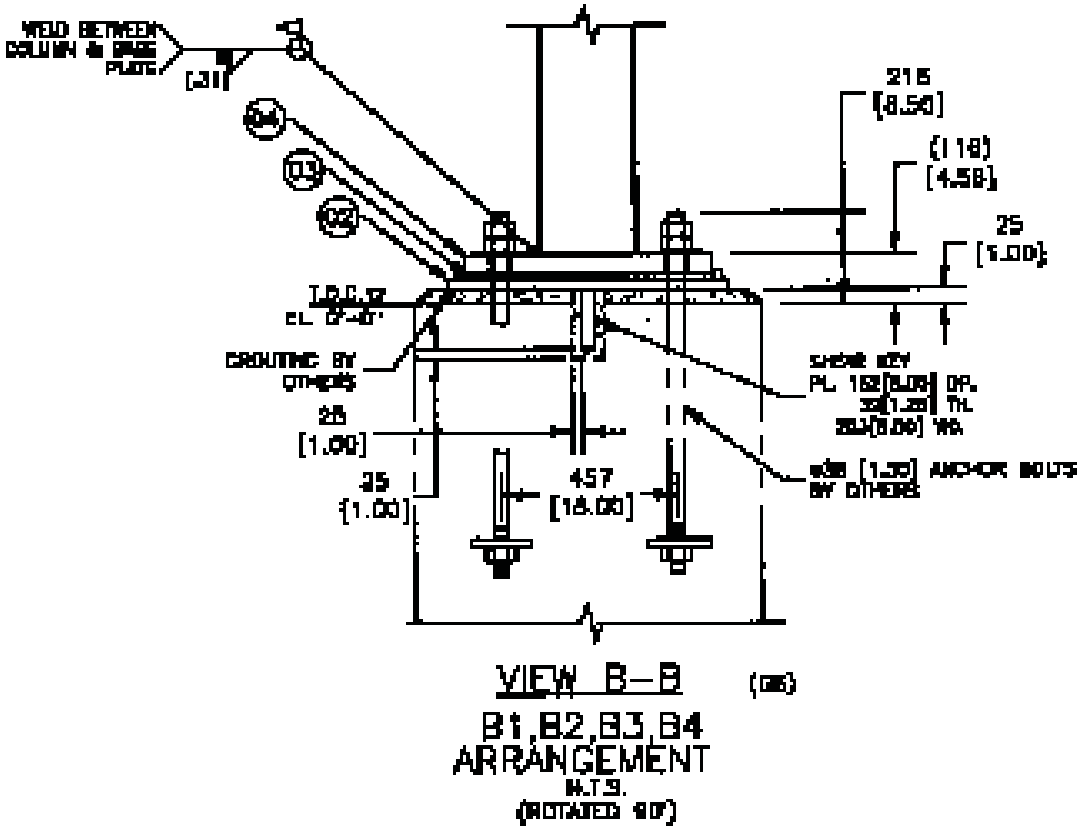


# Baseplate Assemblies

- OTSG baseplates are designed to allow thermal expansion. One baseplate location is fixed.
- Platform column baseplate assemblies are fixed and do not include soleplates nor fabreeka pads.
- Check elevations at top of concrete and check for level at each footing using a transit before installing soleplates. Avoid installing shims below soleplates.
- Verify elevations of baseplates and for level with a transit after installation.
- All OTSG anchor bolt nuts are installed snug tight.
- At fixed column locations, anchor bolt nuts are installed snug tight and tightened an additional ¼ turn and baseplate is welded to soleplate.
- Lock all anchor bolt nuts with a tack weld or jam nut.
- Grouting of sole plates must be completed prior to installation of inlet plenum.

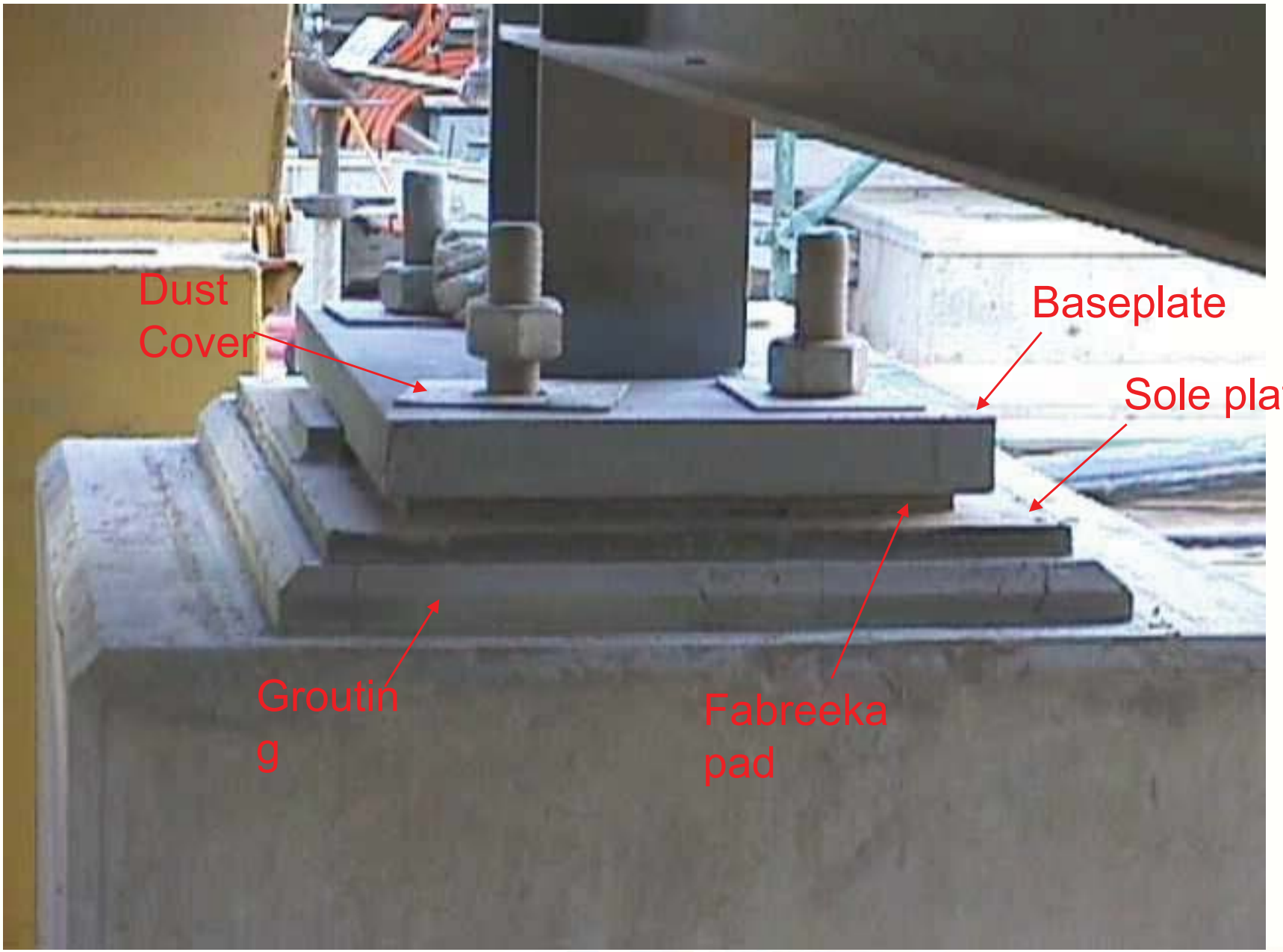
# Typical Baseplate Arrangements



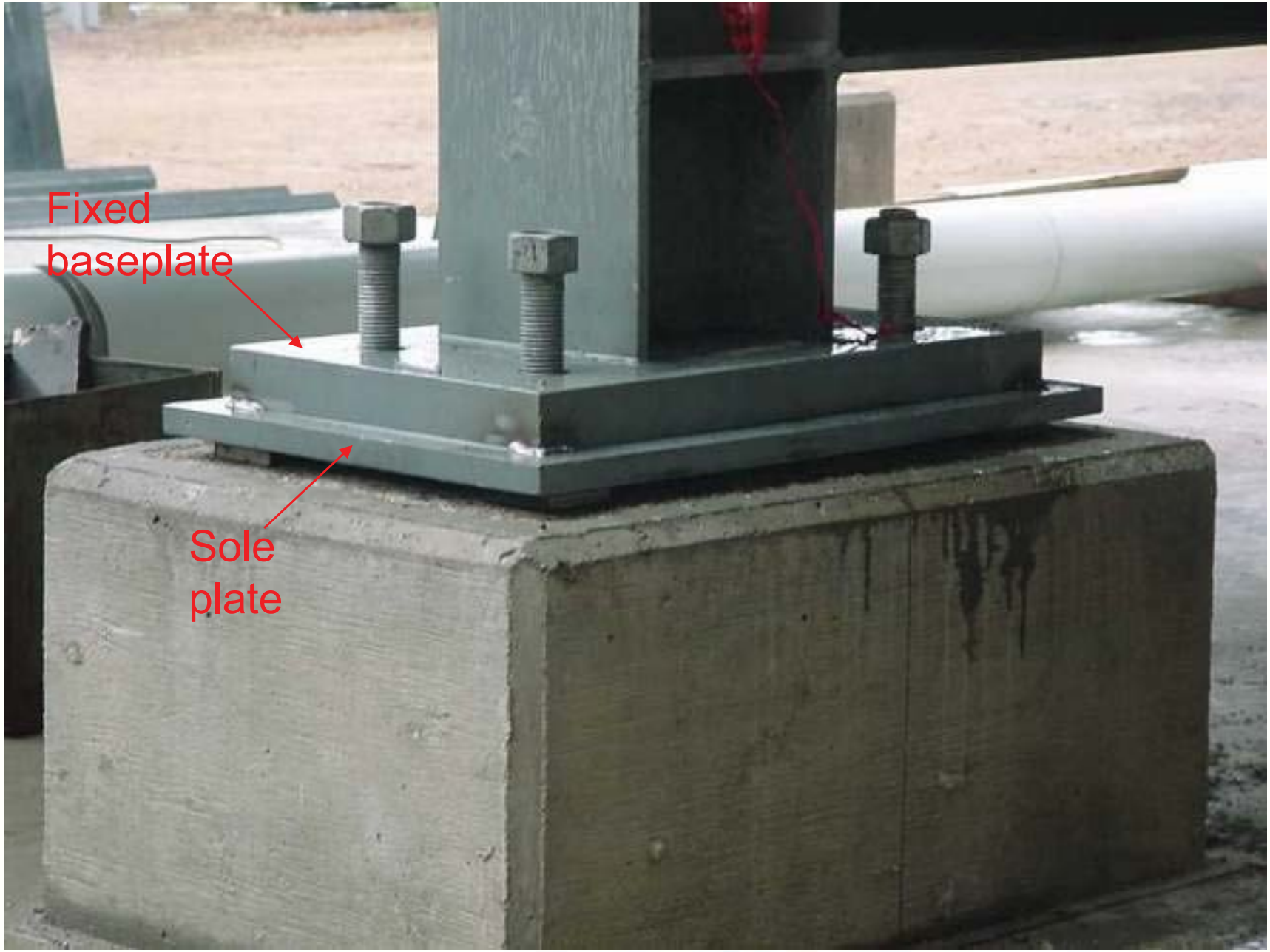



# Baseplate/Soleplate Shipments

# Sliding Baseplate Assemblies



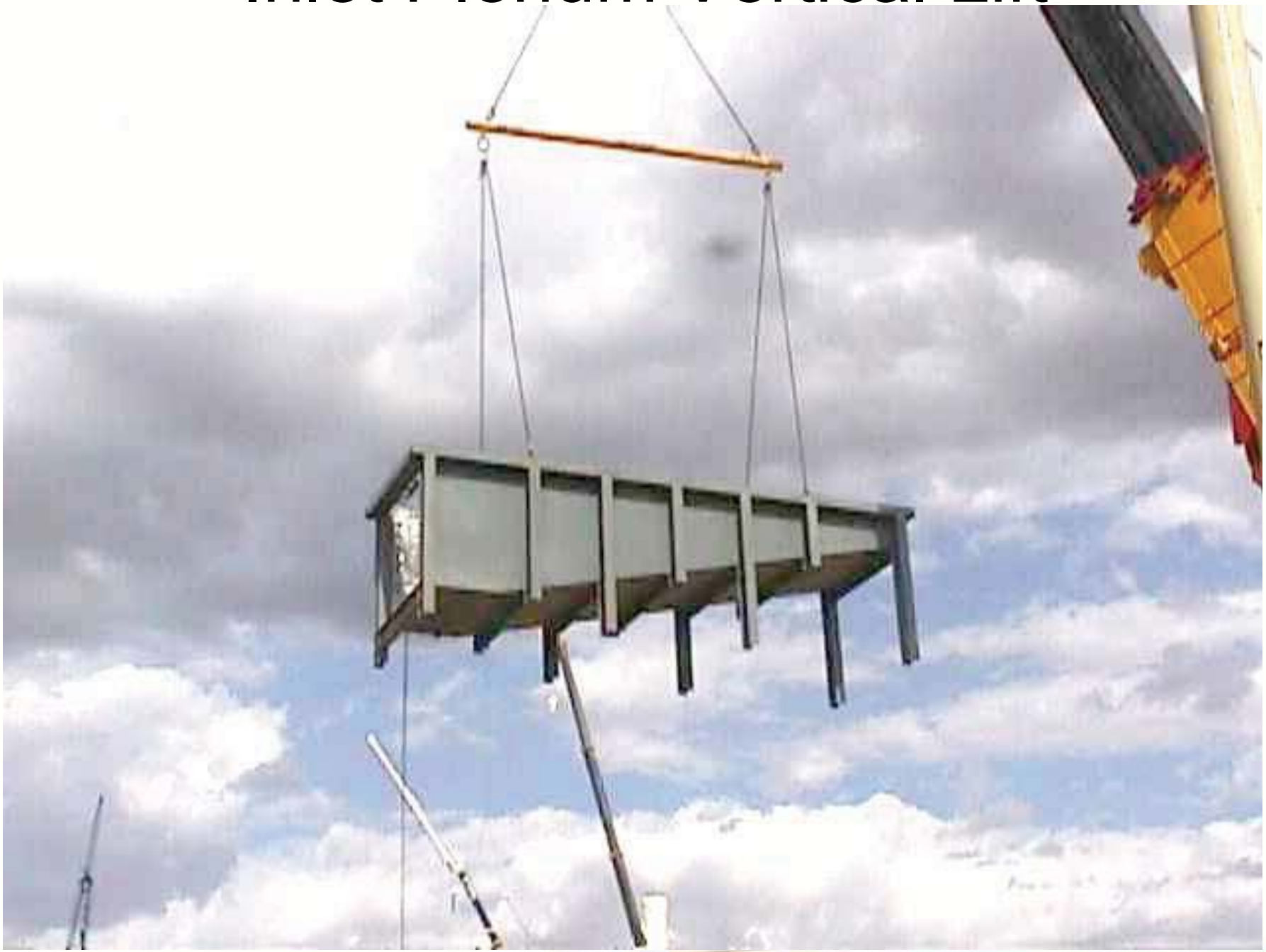
# Fixed Baseplate Assemblies



# Inlet Plenum Installation

- Two inlet plenum assemblies.
- Lift the inlet plenum into position so that each column rests centrally on its respective baseplate.
- Check the centreline distances to the gas turbine discharge to ensure fit-up dimensions are aligned and correct.
- Check the elevation dimensions at the four top corners of the inlet plenum to ensure that the plenum is level and matches the specified elevation on the drawings.
- Weld inlet plenum column to baseplates.
- Upper inlet plenums will have split rear columns that need to be bolted to the duct before being welded to their respective baseplate.

# Inlet Plenum Vertical Lift



# Inlet Plenum with External Scaffolding

# Inlet Plenum with Internal Scaffolding

# Erection Plate Installation

- Erection plates are installed at all columns and vertical stiffener locations around the perimeter.
- Bolts are installed “snug” tight to the exterior of the erection plate and tightened by an additional ¼ turn.
- Tightening shall progress systematically, from the most rigid part of the joint to its free edges.
- After erection plates are installed, weld the plate to the beam on 3 sides (top and sides).

# Erection Plate Troubleshooting

- If erection plate holes are misaligned…
  - ❖ Install all erection plates that can be installed.
  - ❖ Open up misaligned holes with a carbide burr bit.

- If side or end beams do not align…
  - ❖ Install shims or spacers to make plate flush, or
  - ❖ For minor discrepancies, just install the plate tightly by slightly bending the plate.

- If the end perimeter joint has gaps at either end…
  - ❖ Leave the erection plates unbolted until internal seal welding is complete. Follow Erection instructions on welding sequence.

# Erection Plates – Inlet Plenum to Module

# OTSG Module Installation

- The OTSG consists of three (3) primary modules
  - OTSG Lower Module
    - Pressure parts including balance headers and steam outlet header
    - CO catalyst support structure
    - AIG lances
  - SCR Module
    - SCR catalyst support structure
  - OTSG Upper Module
    - Pressure parts including feedwater inlet header

Note:

1. Removeable panel doors are located at the rear of the module for catalyst installation. It is recommended that the panel doors be kept in place during the SCR module lift.
2. CO catalyst and SCR catalyst not be installed until after OTSG burn-out procedure is completed.

# OTSG Module Installation

- Position crane (or cranes) as required in preparation for lift.
- Transfer OTSG module to the lifting location and securely place OTSG module on concrete/steel stools or dunnage in prescribed locations marked on the module.
- “Prepare” the module by removing protective tarp, placing plywood strips between top support beams to protect fin tubes, remove designated shipping beams, place JAK on plywood strips.
- Loosely install erection plates around the top of the upper inlet plenum beam and locate erection plate hardware in web of lower module bottom beam so they are readily available for installation.
- Lifting plates must be installed to hoist the module into place. Install all lower erection plates before releasing the crane.
- Remove the lifting plates, reinstall and secure the lifting pins.

# Lower Module Transferred At Site

# Dunnage Detail

# Plywood Strips for Finned Tube Protection

# Lower Module Lift – Single Crane Lift

# Lower Module Lift – Two Crane Lift

# Lower Module Lift – Two Crane Lift

# Lower Module Lift – Two Crane Lift

# Lower Module Lift – Two Crane Lift

# SCR Module Internal View

# Exhaust Hood Installation

- Exhaust Hood will be shipped in two modules.  Lower Exhaust Hood contains silencer baffles.
- Prepare the exhaust hood by installing plywood over the silencer baffles for protection, placing JAKs on plywood for future installation.
- Lower Exhaust Hood and Upper Exhaust Hood will be installed using two separate lifts.

# Exhaust Hood – Single Crane Lift

# Exhaust Stack Installation

- Properly supporting the Exhaust Stack assembly in the horizontal position, install platforms, handrails, and ladders at grade.

- Place the Stack Adaptor assembly in a vertical position on dunnage and install the Exhaust Stack Assembly at grade. Complete assembly of erection plates and all joint welds at grade. The combined assembly can be installed in a single lift.

- Once the assembly is placed on the Upper Exhaust Hood assembly, all erection plates and full penetration welds at the base of the Stack Adaptor shall be completed prior to releasing the crane.

- Stack damper can be installed immediately after the Exhaust Stack is secured in place.

- Stack damper actuator should be installed prior to the assembly being lifted to the top of stack. Rain skirt liner panels will be bolted into position after damper is secured.

# Stack Platform Installation

# Stack in Vertical Position with Platforms

# Stack Damper Placement

# Inlet Transition Duct Installation

- Install the inlet plenum flow screen prior to installing the Inlet Transition Duct.
- Place insulation and JAKS inside the Inlet Transition Duct prior to installation.
- Inlet ducting installations are slip fit connections. With the duct still on the hook of the crane, pull the inlet duct into the inlet plenum opening with come-a-longs.
- Check to ensure all ducts are centered over the baseplates in both directions. At the inlet plenum to duct interface, the edge of the duct casing should line up with the plenum column centerline.
- Check the inlet duct center alignment with the combustion turbine centerline and compare distance between the inlet duct and combustion turbine flanges at four points – top, bottom, left, and right

# Inlet Transition Duct Installation

# Inlet Transition Duct Installation

# Expansion Joint Installation

- Expansion joint is supplied in a compressed state to permit installation between combustion turbine and inlet duct flanges.

- All hardware, gasket tape, insulation, and liner plates required for joint installation are provided.

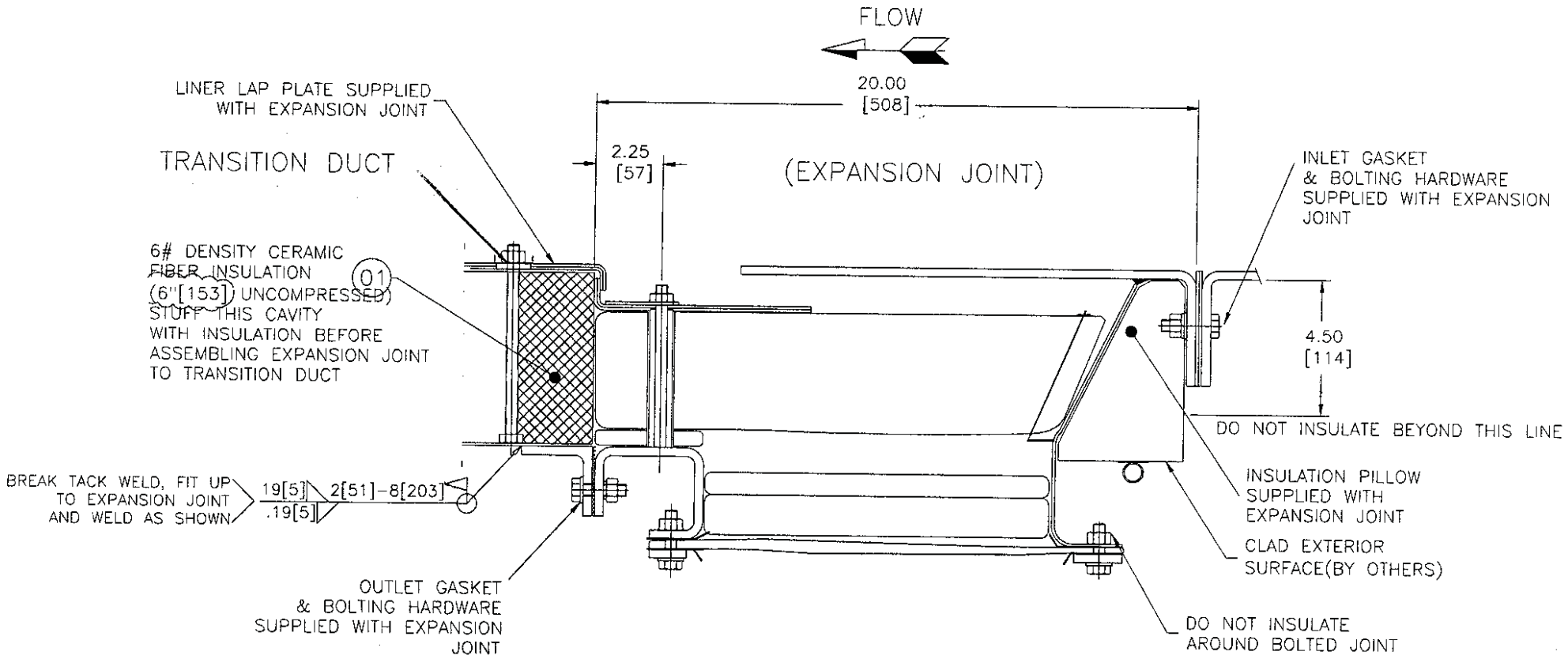
- Lift expansion joint to the combustion turbine exhaust flange and secure in place. Next, loosen the preset bars on the expansion joint and allow the joint to expand to the inlet duct flange. Securely bolt the joint to the inlet duct and then remove the preset bars.

- Fill internal void of expansion joint and transition duct with insulation and liners provided. Place these items into ducting prior to lifting the expansion joint for installation.

- An external insulation pillow for the expansion joint may be supplied for site installation. Cladding should be installed (by others) over the pillow.

# Inlet Transition Duct Installation

# Inlet Transition Duct Installation




SECTION A–A

SCALE: NTS

REFER TO SUDBURY EXPANSION JOINT DRAWING No. B24154 FOR INSTALLATION INSTRUCTIONS.

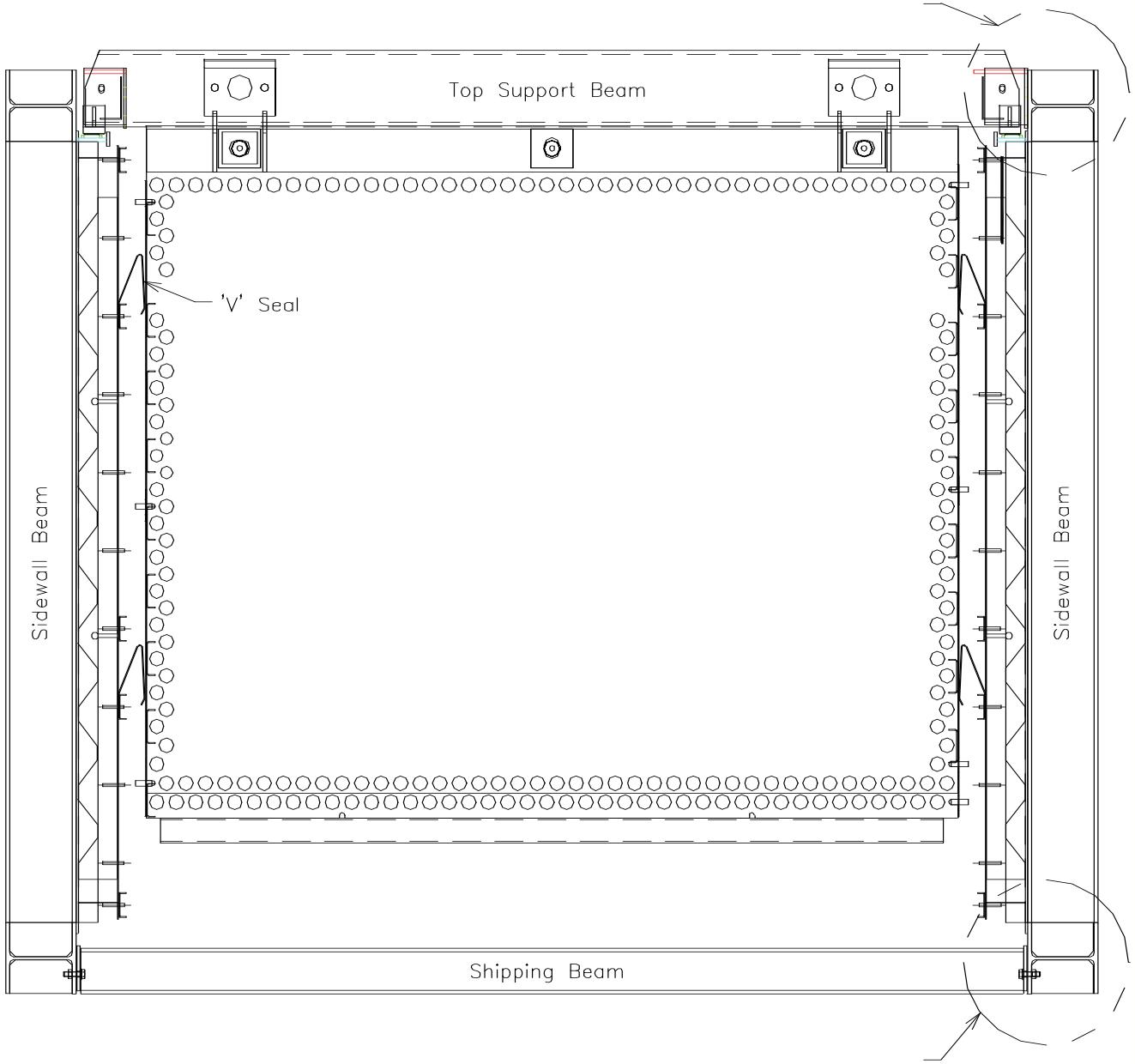
# Top Support Beams

- Remove yellow painted shipping angles from the tubesheet support beams. This will involve removing two bolts that tie into the casing and one stud that attaches into the support beam.

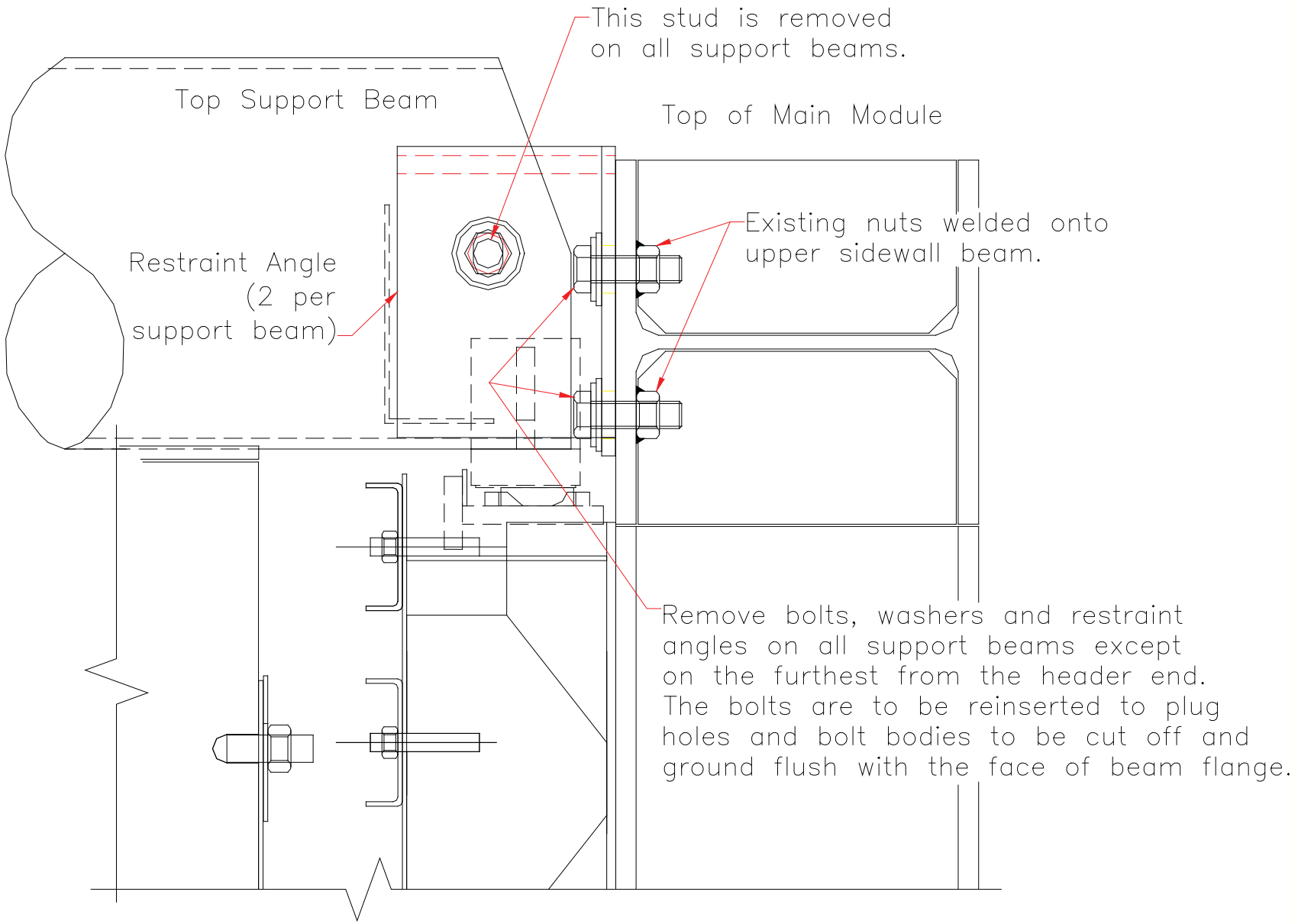
- On rear-most support beam, the angles restraining longitudinal movement are fixed and are not to be removed. The bolts tying the angle to the casing are to remain. The stud tying the angle to the support beam will be removed.

- At all locations where shipping angles have been removed, reinsert the bolts into their respective holes, cut heads off with a grinder and seal weld.

# Module Cross Section



# Top Support Beam Hardware Removal



# Top Support Beam Shipping Angles

# Internal Perimeter Joint Welding and Joint Assembly Kits

Note: These instructions are typical for all duct-to-duct joints.

Joint Assembly Kits = JAKs

- Remove all remaining shipping beams and seal weld casing bolt holes by reinstalling removed bolts and seal welding them into place.
- Seal weld internal perimeter joint between two components.
- Remove existing internal liner hardware (channel, nuts, and washers) adjacent to the joint for JAK installations.
- Install 3 layers of ceramic fiber insulation into the joint. Ensure insulation ends are tight against one another and that seams are overlapping.
- JAK liner panels must be installed in the same overlap sequence shown on the drawings to allow for unimpeded thermal expansion.
- All removed internal liner hardware are to be reinstalled. Nuts are to be installed “snug” tight and backed off ¼ turn of the wrench, then tack welded.

# Module Joint Prior to JAK Installation

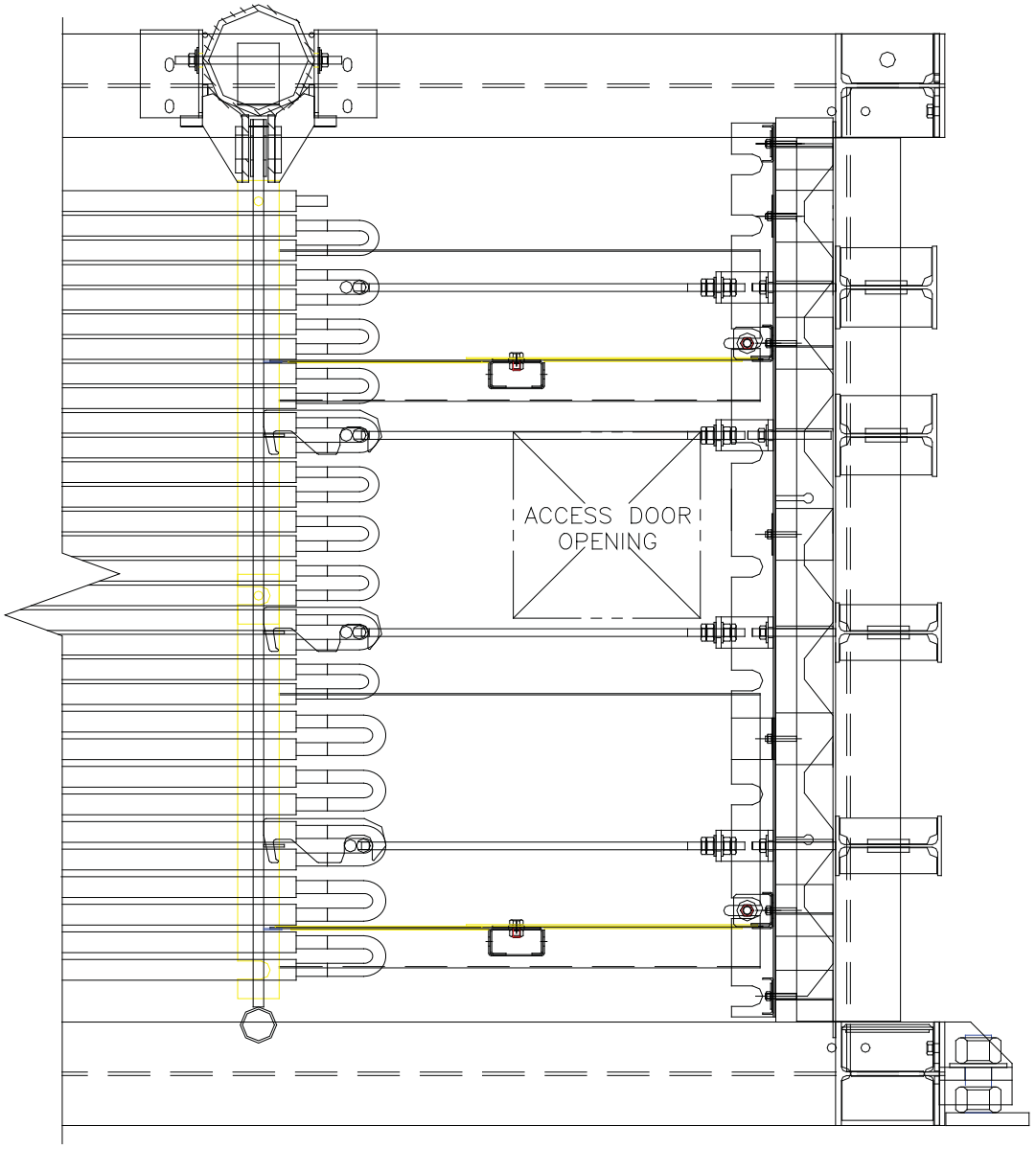
# Module Joint Insulation

# Completed Module JAK Installation

# Pressure Part Restraint Adjustment

- After internal seal welding is complete and JAKs installed, the OTSG module tube bundles have restraint hardware that require adjustment.
- Rubber pads have been installed on the inside radius of radius bends at all restraint levels for shipping protection. These rubber pads have to be removed.
- All restraint rods require adjustments after the shipping protective rubber is removed.
- It is critical not to over tighten and to maintain the required gaps between restraint rods and return bends. Refer to erection drawing for instructions.
- In order to access all levels of restraints, some endseal panels will need to be removed. Ensure all panels are reinstalled immediately after the restraint is adjusted.

# Sample Restraint Rods and End Seals



# Platform Steel and SRV Silencer Installation

- Platform steel is typically installed after major components are in place.
  - Occasionally it is installed prior to the exhaust hood and stack installation in areas with high seismic zones or high wind loads.

- Brackets are welded to the OTSG vertical beams and columns from which platform beams are bolted.

- Pre-assembly of structural steel columns and beams should commence on the ground.

- In the event that piping or conduit penetrations are required through the grating, the contractor is responsible for cutting the grating and installing additional kick plate required for protection.

- Prior to installing the SRV Silencer, confirm the distance between bolt holes on the silencer support base plate versus the platform steel. Ensure platform steel support for the silencer is completely installed and secure before placing the SRV Silencer.

- Check orientation of the SRV Silencer outlet against the erection diagram.

# Platform Steel Installation

# SRV Silencer Lift

# SRV Silencer Installation

# Boiler External Piping Installation

- OTSG Boiler External Piping is supplied in two feedwater assemblies and one steam assembly.
  - Motorized valves are shipped loose for protection and will be welded at site.
  - Drain piping off the main run will terminate at the motorized block valve (second valve), balance of piping to be designed and supplied by others.
  - SRV and SRV Silencer drain and vent piping to be supplied by others.
  - Vent and instrument lines will terminate at the first block valve. Balance of tubing to instrumentation will be designed and supplied by others.
  - Piping stress analysis will be performed by others.
  - Pipe supports will be designed and supplied by others.

- Additional valves and instruments will be shipped loose to site for installation into piping beyond the IST terminal points.

# Boiler External Piping Installation

- Check to ensure all piping assemblies, valves, and hardware are available and inspect all equipment for damage prior to installation.
- Boiler External Piping should not proceed until platform steel is in place.
- Do not remove protective end caps from piping until it is necessary.
- Ensure the safety relief valve hydrostatic test plugs have been installed prior to the hydrostatic testing.
- Check that the SRV vent pipes are secure and that sufficient clearance exists between the safety valve discharge elbow and the inside of the vent pipe to allow for thermal expansion.
- Ensure valves are installed in the correct flow direction. Motorized and pneumatic valves should be checked for proper operation. Operate the valve actuators to ensure the linkages do not bind.

# Boiler External Piping Installation

- Check that pipe orifices and/or flow devices are properly installed.
- Ensure all flange bolts are tight and proper gaskets have been installed.
- Check that all drains and vents are free of obstructions and that the lines have been properly supported.  Ensure all vent pipnig has been properly routed and is pointing safely away from access platforms.
- Ensure strainers are installed in the feedwater piping.  Strainers will prevent plugging of OTSG flow orifices and damage to control valves by foreign matter.
- Ensure all necessary post weld treatment and non-destructive examination has been completed as necessary.
- Conduct a successful hydrostatic test as requried.

# Steam Outlet Piping Installation

# “Jumper” Tube Installation

Where the complete OTSG pressure tubing is contained in two or more modules, a connection must be made between these modules to complete the tubing circuitry from the inlet header to the outlet header.  This activity is to be completed by IST orbital welding technicians using a specialized TIG welding process.

**Orbital welding process…**

- Prepare ends, on both “jumper” tubes and OTSG module tubes for welding.
- Fill the inside of the tubing circuit/bundle with argon.
- Fit-up and weld “jumper” tubes to OTSG module tubes.

# “Jumper” Tube Installation

During this process, the construction contractor will be responsible for providing the following…

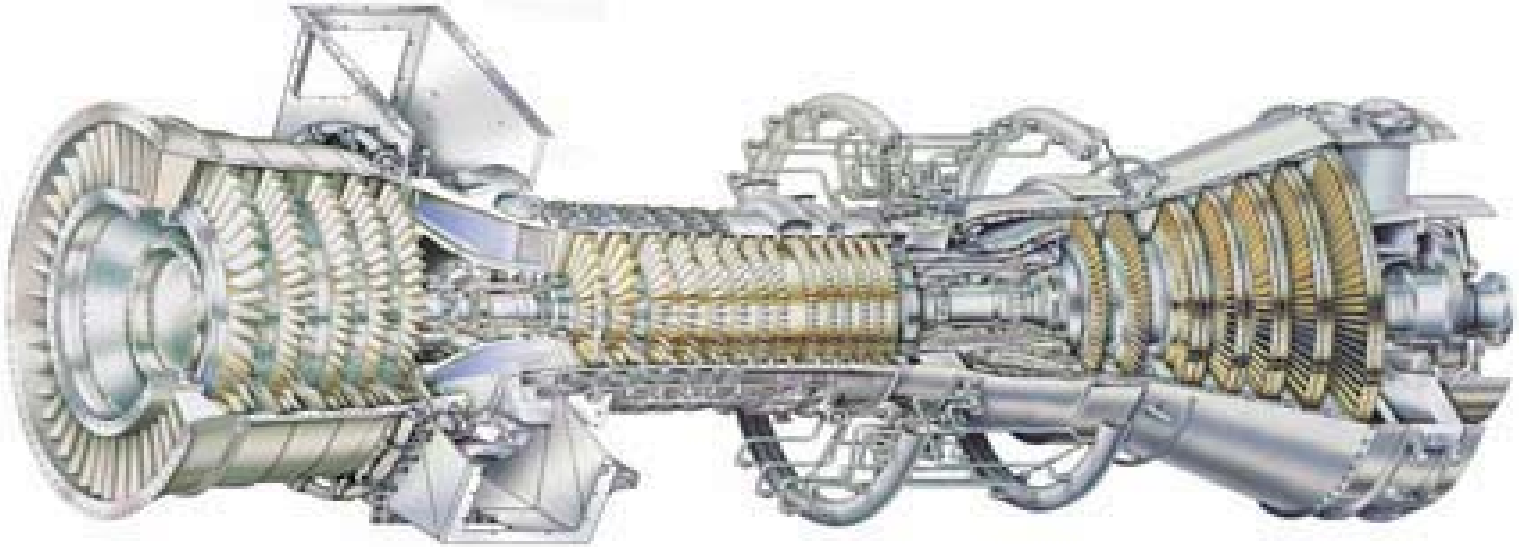
- Electrical junction and uninterrupted power source and hook-up service for IST tool crib container and transformer for orbital welding and 110V power tools.
- Designated lay-down area local to OTSG for IST tool crib container.
- Compressed air.
- Scaffolding, if platform steel and grating is not completed.
- Tarps for scaffold areas at feedwater inlet box, in case of inclement weather.
- Site safety induction of IST personnel prior to commencement of site activities.
- Provision of two personnel for assistance with general support labour duties and requirements of IST welding technicians / supervisors.
- Designated lunch, smoking area, and washroom facilities.
- Arrangement of any on site permit requirements.
- Supply of ample demineralized water and pressurizing equipment to perform a hydrostatic test of each OTSG circuit once “jumper” tube welding is complete and piping tie-ins are made.

# Instrumentation and Thermocouple Installation

- Check that all instrumentation, thermocouples, and associated components are available.  Inspect for damage prior to installation.
- During installation ensure that the correct fittings are utilized for the application.
- Check the inside of all thermowells to ensure they are void of any obstructions or deformities.
- Ensure that all gas side temperature probes install easily into the connection pipes.
- Ensure that any installed instrumentation does not interfere with platform access or walkways.
- Ensure that tubesheet thermocouples are installed per IST drawings.
- The supply of all wiring and junction boxes required for instrumentation installation will be by others.

# Questions/Discussion

# Glenarm Repowering Project
# City of Pasadena Dept. of Water & Power



## Power Island Equipment Review
## BOP Contractor Pre-Bid Meeting
## January 8, 2014

imagination at work

# GE Power Island Equipment Scope

- LM6000 Packaged GTG
- Once Through Steam Generator
- Steam Turbine Generator
- Surface Condenser
- Cooling Tower
- STG Enclosure
- Generator Step-up Transformer
- Condensate, Boiler Feed water, Circulating Water and Auxiliary Cooling Water Pumps
- Chiller/Inlet Heating Module
- Condensate Polisher
- ST Bypass Valve
- Fuel Gas Compressors
- Gas Fuel Filter Skid
- Air Compressor
- Aux Boiler and Pump
- Aux Steam Seal Super heater
- Continuous Emissions Monitoring System

# Steam Turbine Generator

**Supplier:** Shin Nippon Machinery Company/Hyundai Ideal

**Steam Turbine Design:** Horizontal axial flow, multistage condensing, non-extraction with gear reduction

- Rated output – 15.26MW
- Operating conditions – 6200/1800rpm, inlet press – 373psia, inlet temp – 849F, exhaust press – 1psia, max flow – 128,040 lbm/hr @ 1psia

**Generator Design:** TEWAC, horizontal brushless, synchronous generator

- Rated output – 15.26MW
- Operating conditions – 1800rpm, 17,952KVA, 0.85PF, 3Ph-60Hz, 13,800V, WYE conn, continuous duty

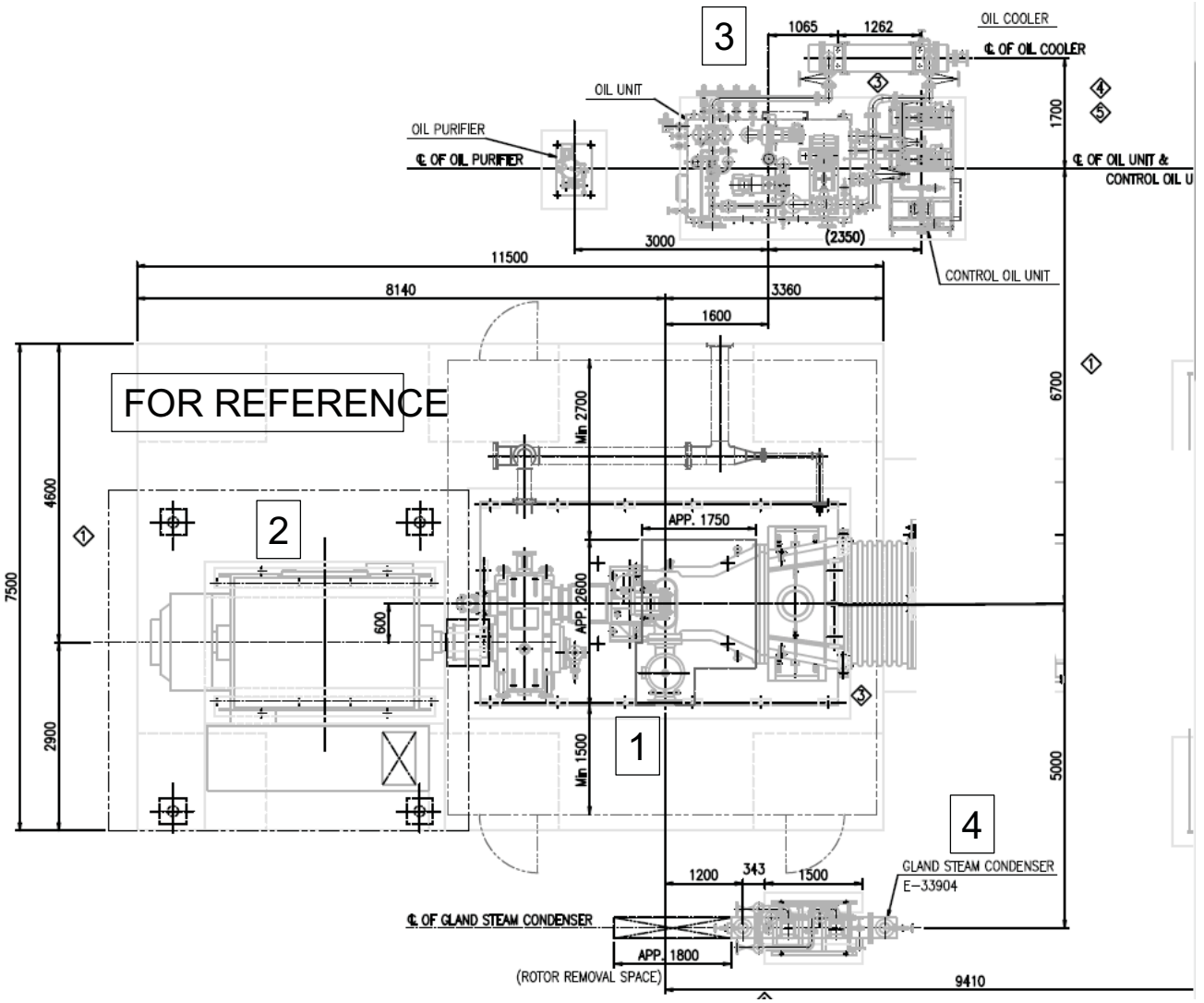
**GE Scope Also Includes:** Shims, keys, gearbox soleplate, access platform & stairs, lube oil & EHC interconnecting piping.

**Comments:** Foundation design, fire protection, drain & interconnecting piping (except lube oil & EHC), pipe supports, MCC's, motor starters, interconnecting wiring and battery system  by BOP Contractor.

# Steam Turbine Generator

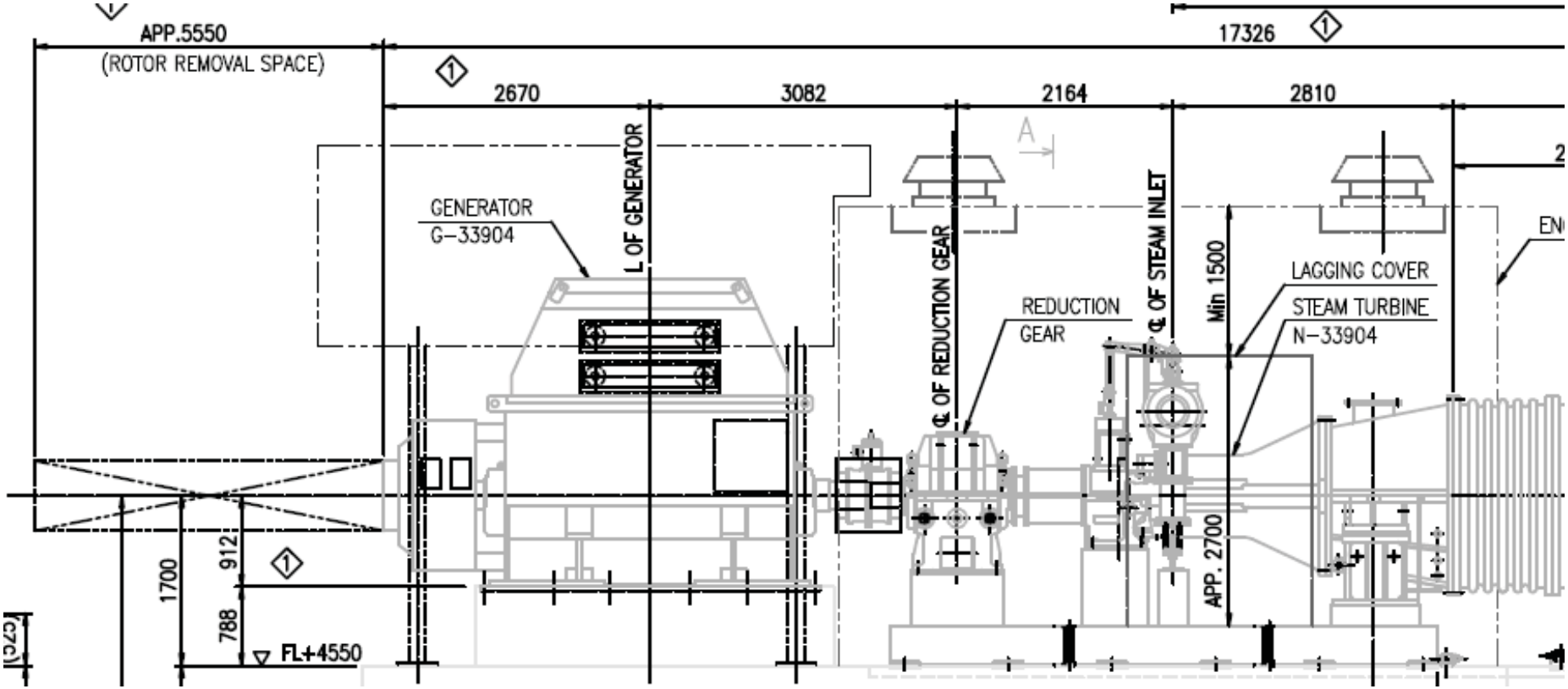
Equipment/Skids:

1) Steam turbine & gear reducer
2) Generator
3) Lube oil skid
4) Gland steam condenser
5) Turbine control panel (not shown)
6) Generator protection panel (not shown)
7) Exciter/AVR (not shown)
8) Neutral grounding equipment (not shown)




imagination at work

# Steam Turbine Generator



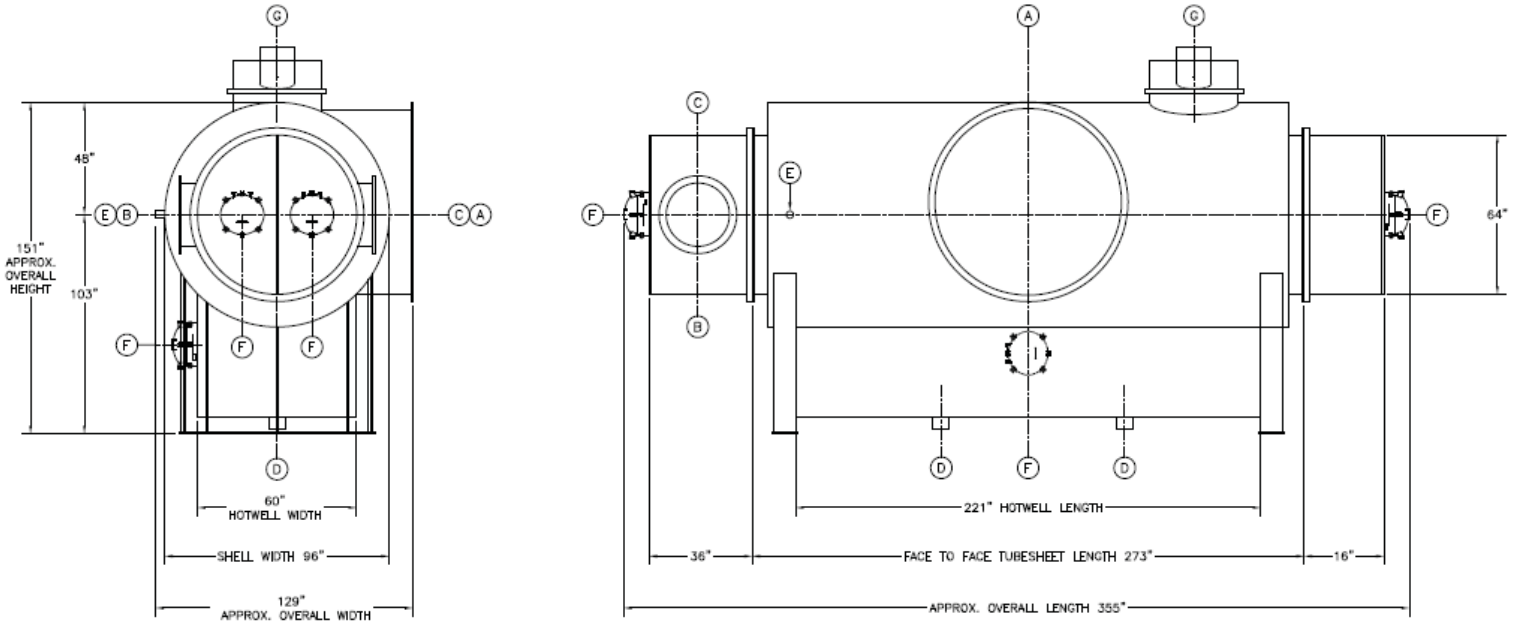

FOR REFERENCE

# Surface Condenser Overview

**Preferred Supplier:** Holtec

**Design:** 2-pass, de-aerating, water cooled, 2 x 100% liquid ring vacuum pumps with silencers, 100% bypass operation

**Comments:** Drains piping, level & pressure transmitters & level switches by BOP Contractor.




FOR REFERENCE

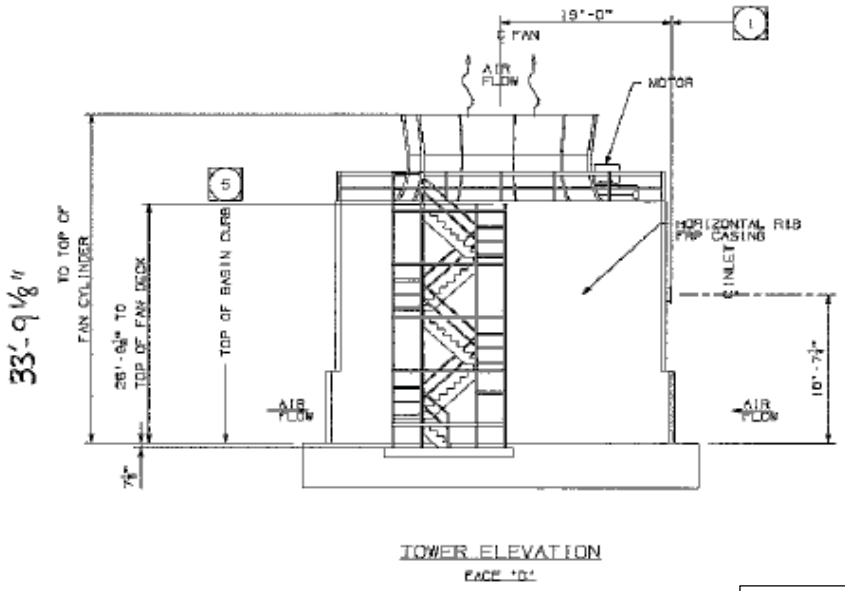
# Cooling Tower

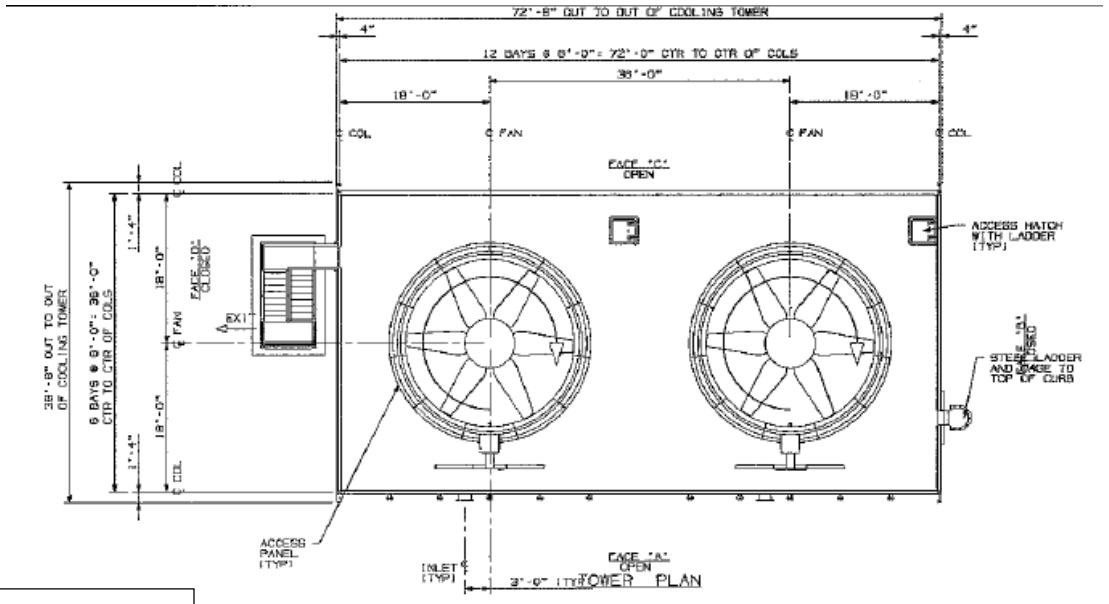
**Preferred Supplier:** SPX

**Design:** Mechanical induced draft, multi-cell counter flow design, 2 speed fans, reinforced composite construction, drift eliminators

**Access**: Fan deck accessible by stair tower and caged ladder

**Comments:** Sump basin design, fire protection, piping, lighting, lightning protection by BOP Contractor.




FOR REFERENCE

# Steam Turbine Enclosure

**Preferred Supplier:** ATCO

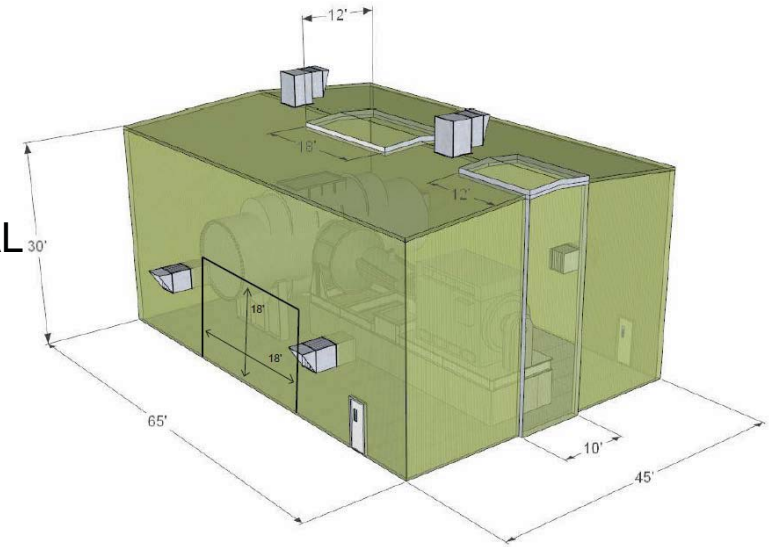
**Design:** Pre-engineered steel frame construction, roof & walls acoustic panels, ventilation included.

**GE equipment housed:** STG, lube oil skid, water cooled condenser, gland steam condenser, vacuum pumps, condensate pumps, electric aux boiler & pump, electric steam seal super-heater

**Access**: Personnel doors and removable wall and roof panels

**Comments:** Fire protection & lighting by BOP Contractor. No overhead crane or hoist to be included. Enclosure will not be designed to support BOP piping, cable tray, etc.

CONCEPTUAL




imagination at work

# Generator Step-up Transformer

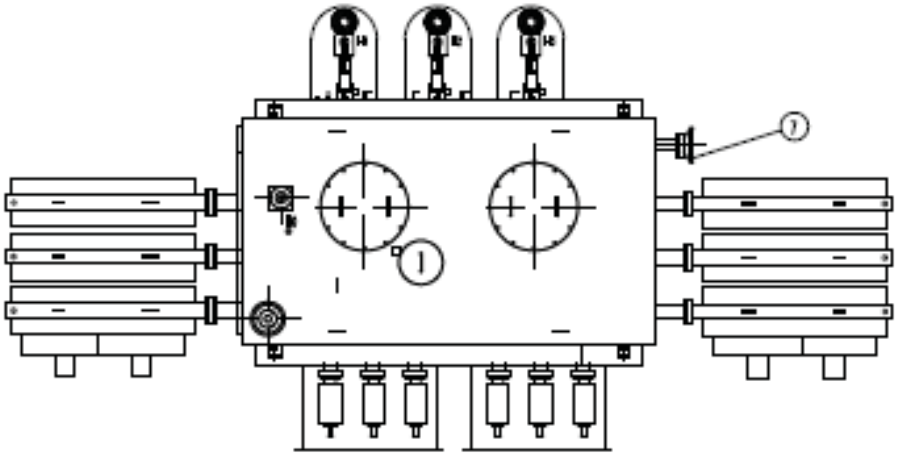
**Preferred Supplier:** Prolec

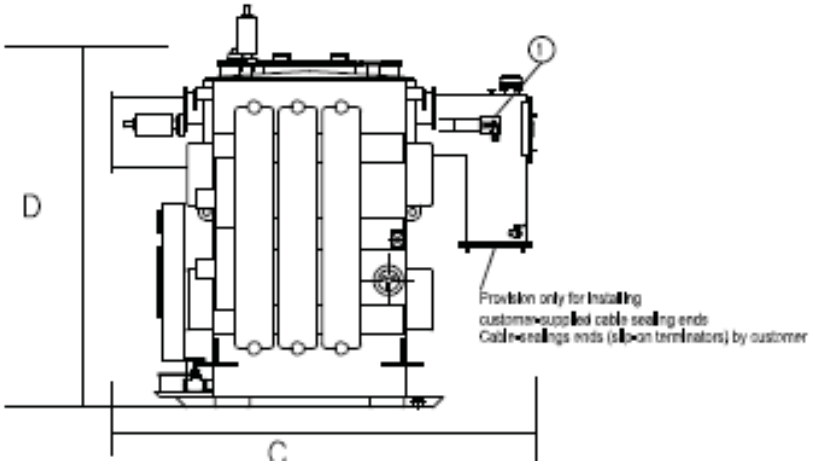
**Design:** 3 Winding, 3 phase, 60 Hz, 34.5kV(H)-13.8kV (X)- 13.8kV (Y), 95/75/20 MVA

**Estimated Shipping Dimensions:** 21.6 x 12.0 x 14.1 feet

**Estimated Shipping Weight:** 189,840 Lbs.

**Comments:** First fill of FR-3 insulating liquid included (field dress, oil fill and test by BOP Contractor).






FOR REFERENCE

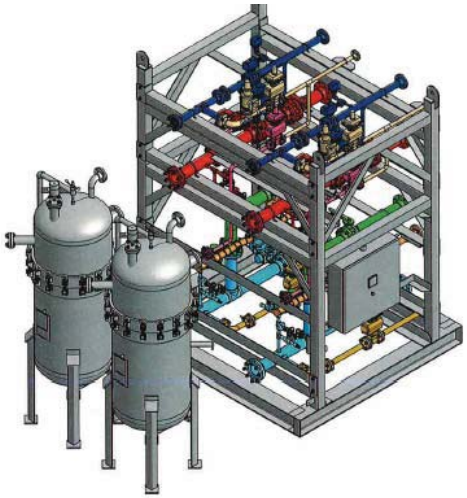
imagination at work

# Condensate Polisher

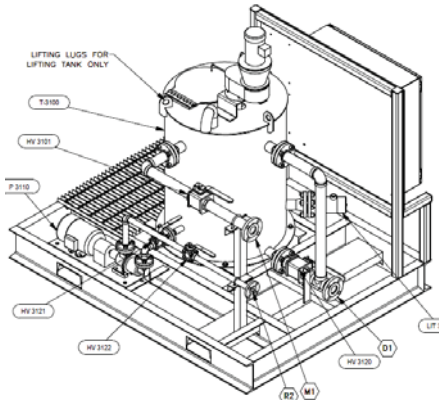
**Preferred Supplier:** Pall

**Description:** 2 x 100%, pre-coat resin, back flushable with recirculation & resin injection

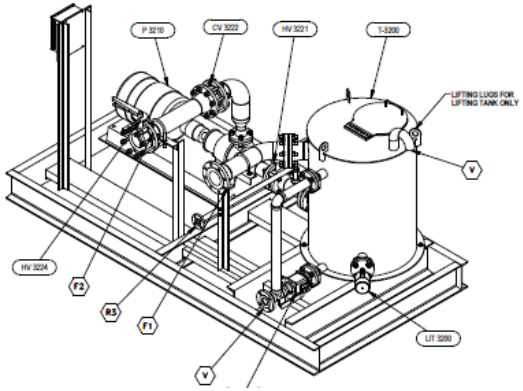
**Equipment Skids:**



(1) Valve Assembly Skid and
(2) Filter Vessels




(1) Injection Skid



(1) Recirculation Pump Skid

(1) Backwash Air Receiver

FOR REFERENCE

imagination at work

# Pumps

**Boiler Feed Pumps:** 2 x 100%, horizontal, multi-stage, ring pump, variable speed

**Condensate Pumps:** 2 x 100%, vertical can multi-stage, centrifugal pumps, constant speed

**Circulating Water Pumps:** 2 x 100%, vertical wet pit pump, fixed speed

**Auxiliary Circulating Water Pumps:** 3 x 50%, vertical wet pit pump, fixed speed

# Other Equipment

**Steam Bypass:** 1 x 100%, full flow, HP bypass

**Air Compressor:** 2 x 100% capacity air compressors with dryers & receivers, skid mounted

**Fuel Gas Compressors:** 2 x 100%, rotary screw compressors, skid mounted

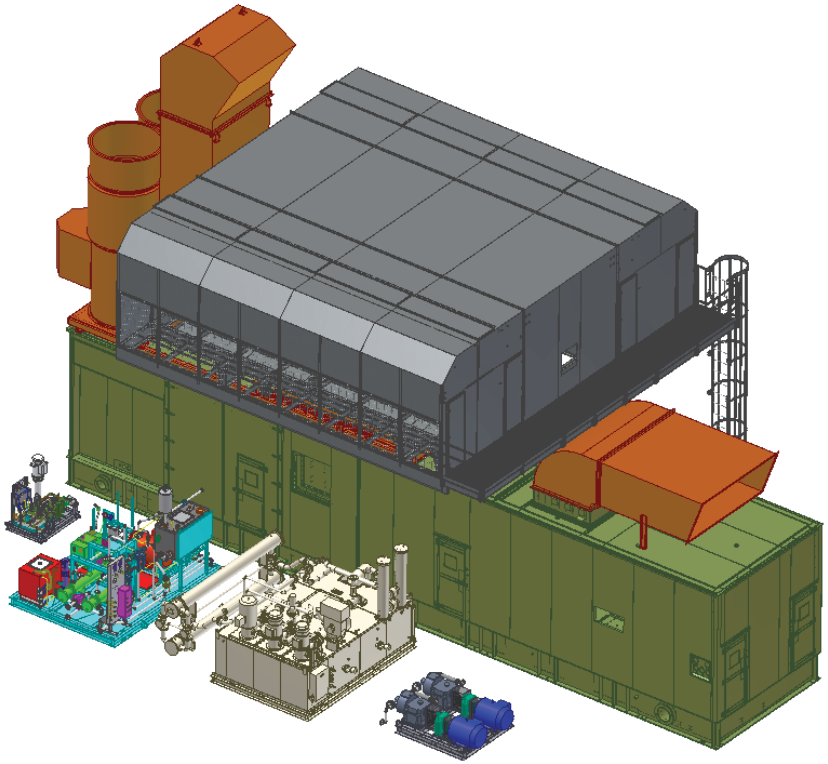
**Inlet Air Chiller:** Two (2) water cooled, centrifugal chillers, 2 x 50%

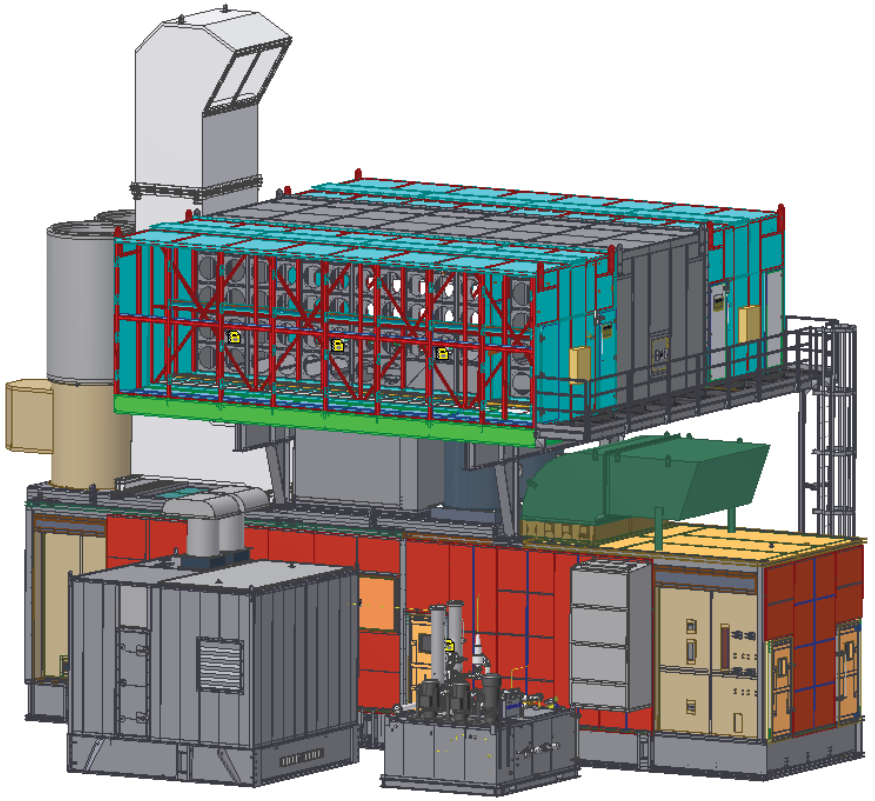
**Electric Auxiliary Boiler:** 1 x 100% steam generator for steam seals and condenser sparging

**Electric Steam Seal Super-heater:** 1 x 100%

**Continuous Emissions Monitoring System (CEMS):** Fully extractive, measuring SCR inlet NOx & stack outlet Nox, CO, Ammonia slip and $O_2$.

# LM6000 Package Evolution

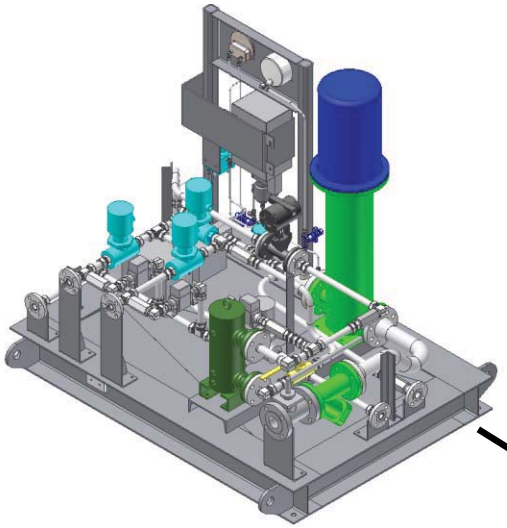




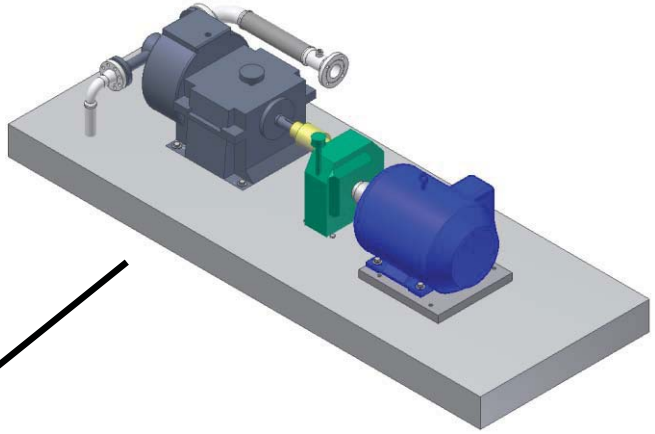
LM6000-PC/PD/PF
Separate Auxiliary Skids
Requires on-site interconnections of each skid
Mark6-90/70 & Woodward Controls

LM6000-PG/PH
Main base has Same Footprint
Universal Aux Skid reduces footprint
Minimizes field connections
Mark6e & Woodward Controls
Same inlet air filter house
Same chiller coils

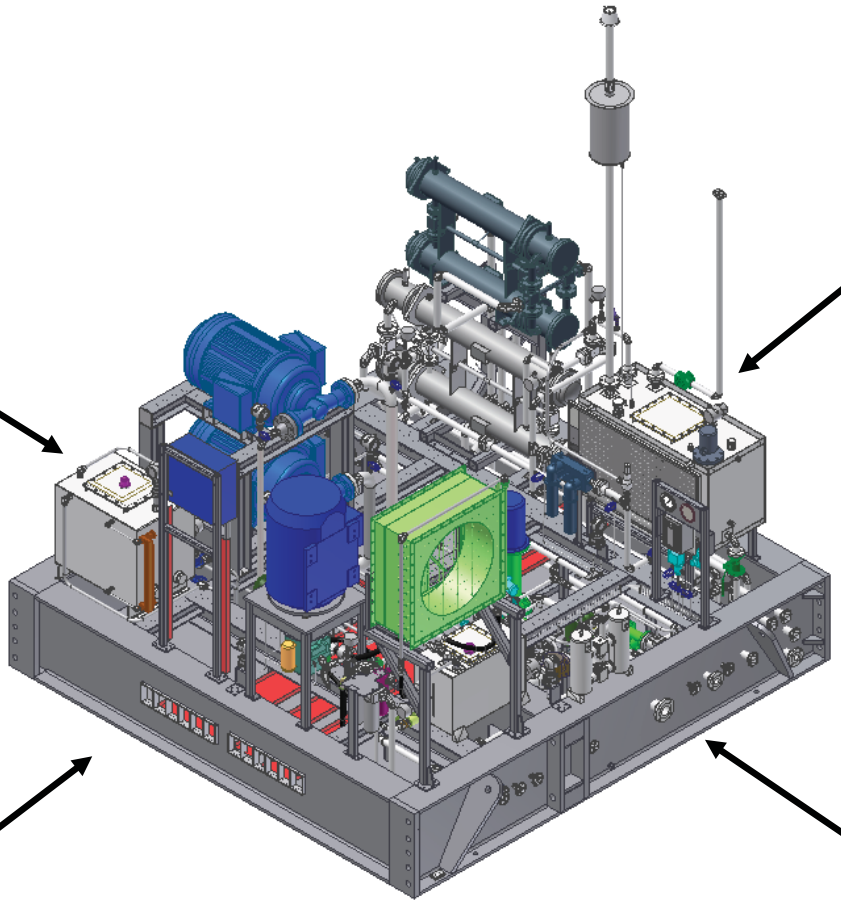
imagination at work



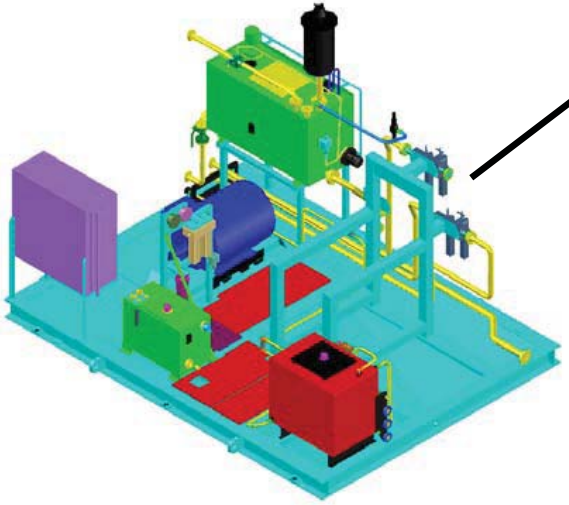
SPRINT SKID



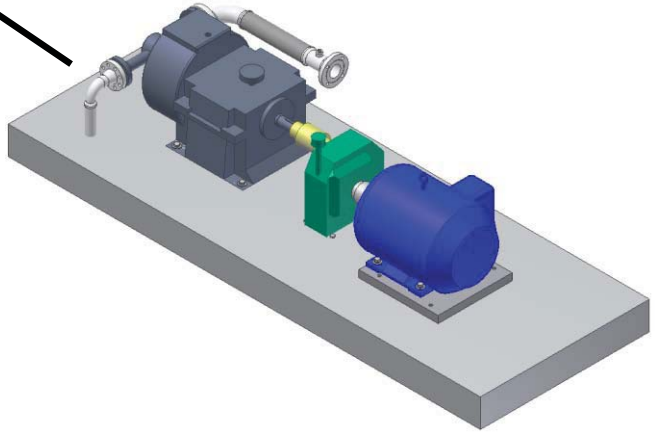
WATER INJECTION (HP)



UNIVERSAL AUX MODULE

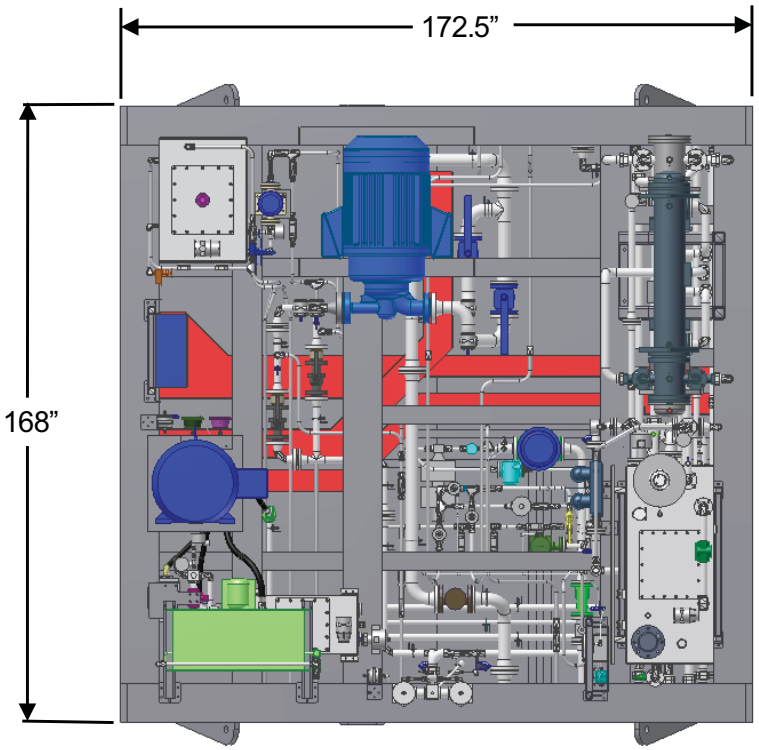


AUX SKID

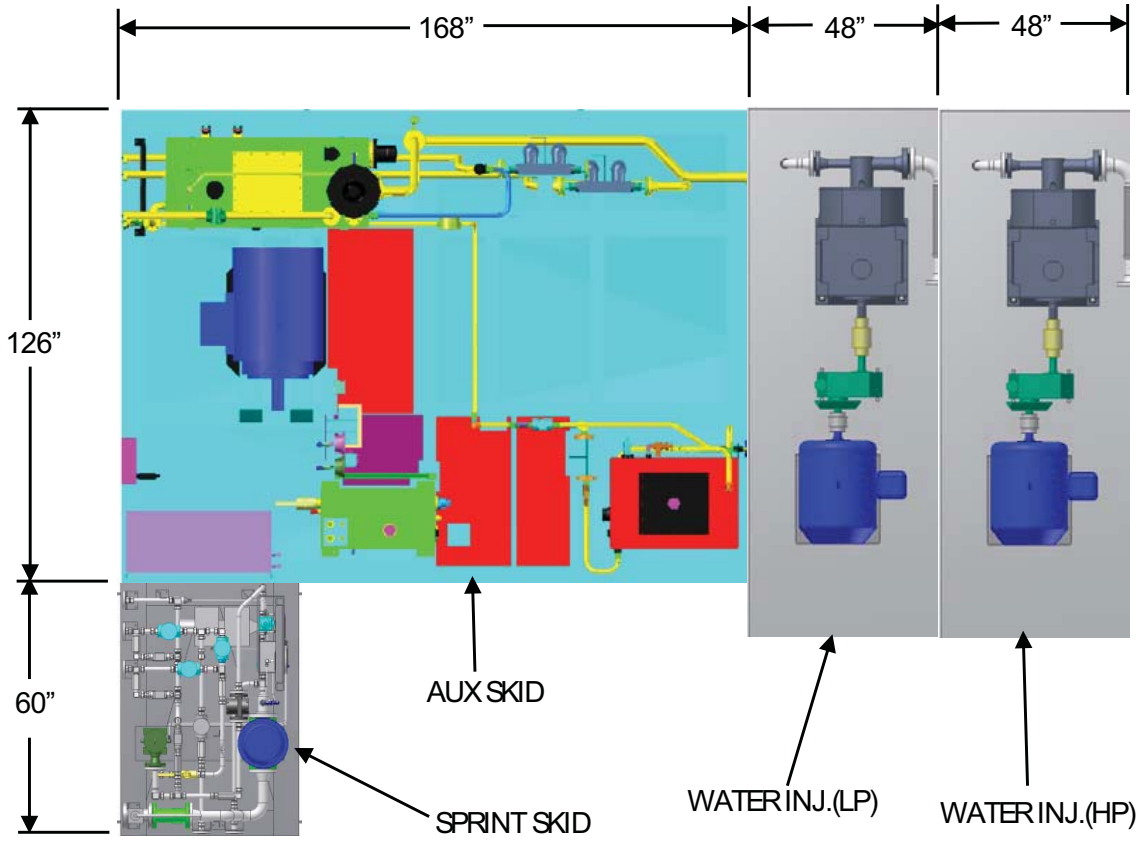


WATER INJECTION (LP)

imagination at work



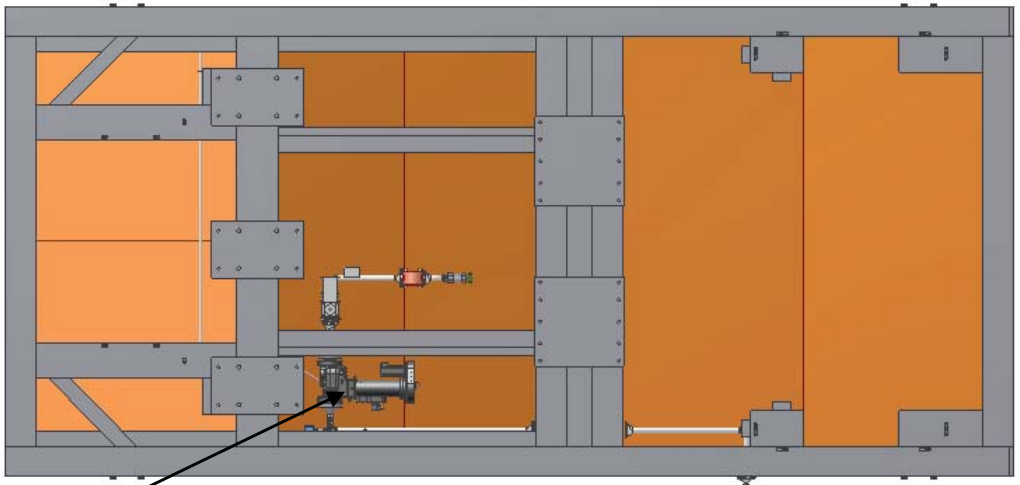

UNIVERSAL AUX MODULE
LM6000PG/PH




COMBINED SKIDS
LM6000 PC/PD/PF

# WATER INJECTION

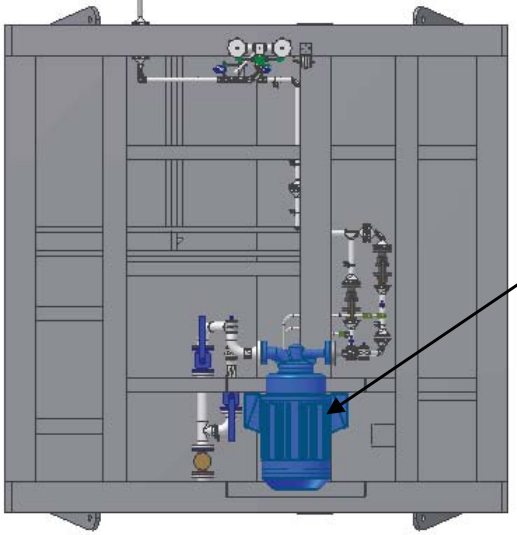
MAIN UNIT



New LMS100 type water metering valve

INTERCONNECT HOSE

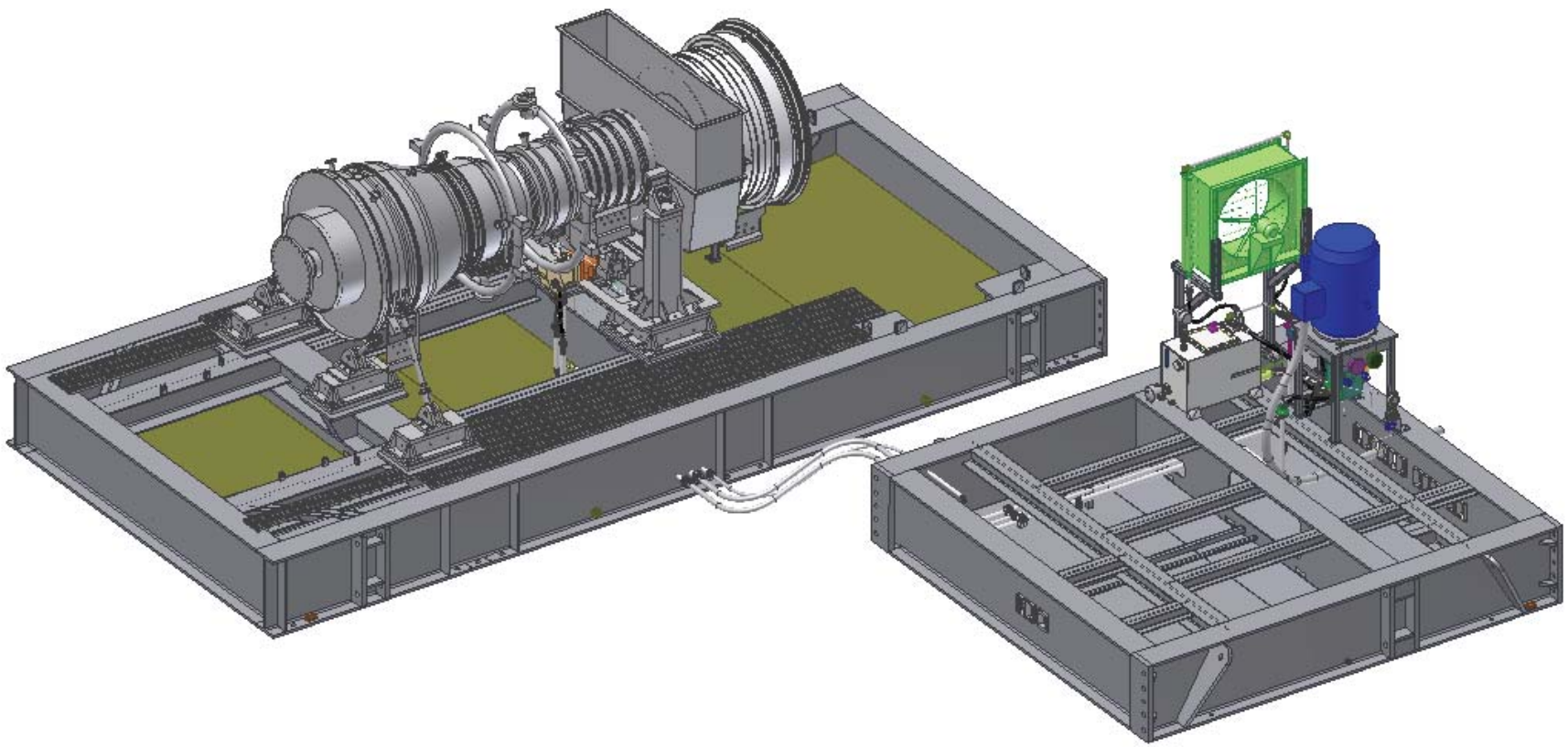
AUX MODULE



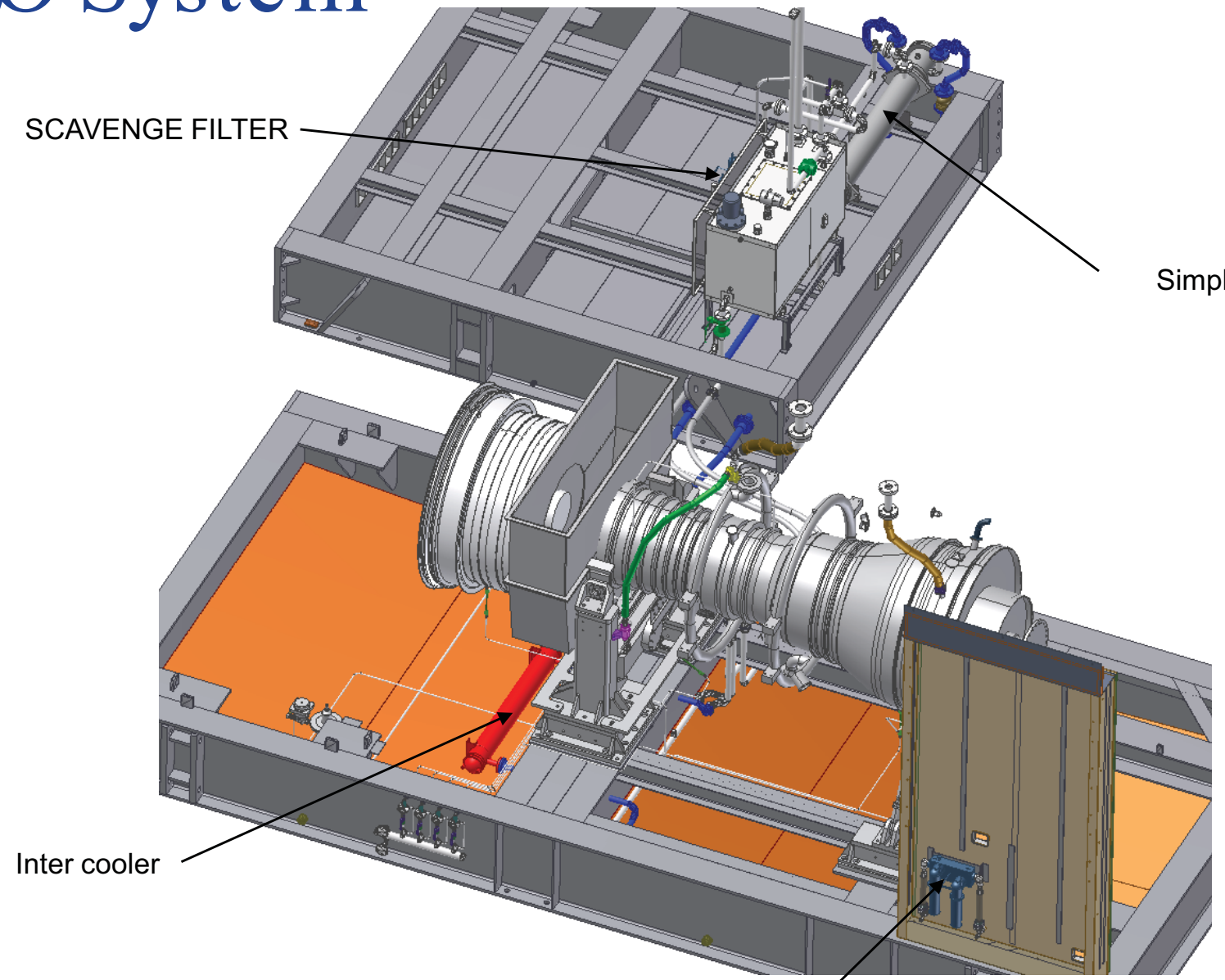
New VSR175 pump

imagination at work

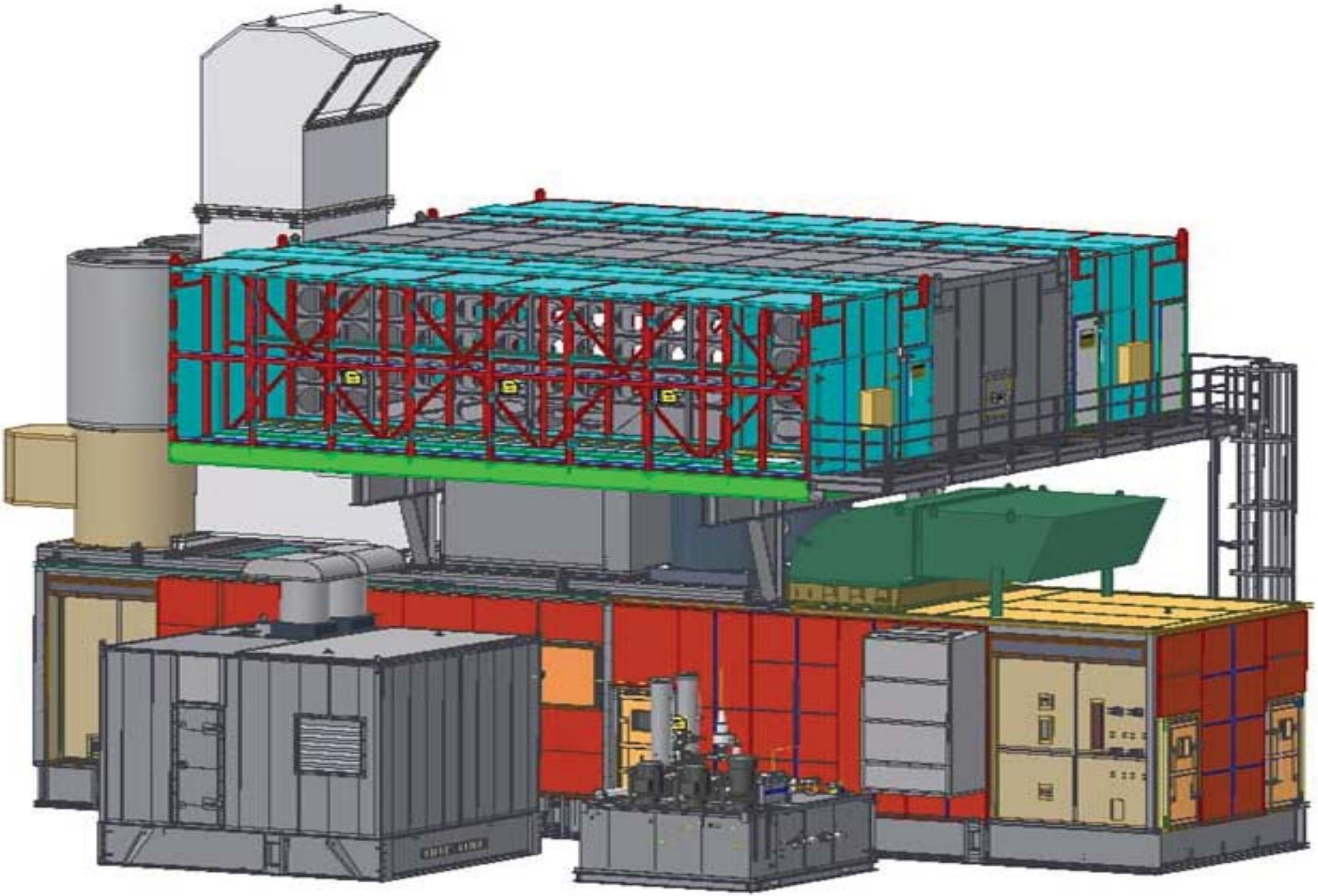
# Hyd. Start System



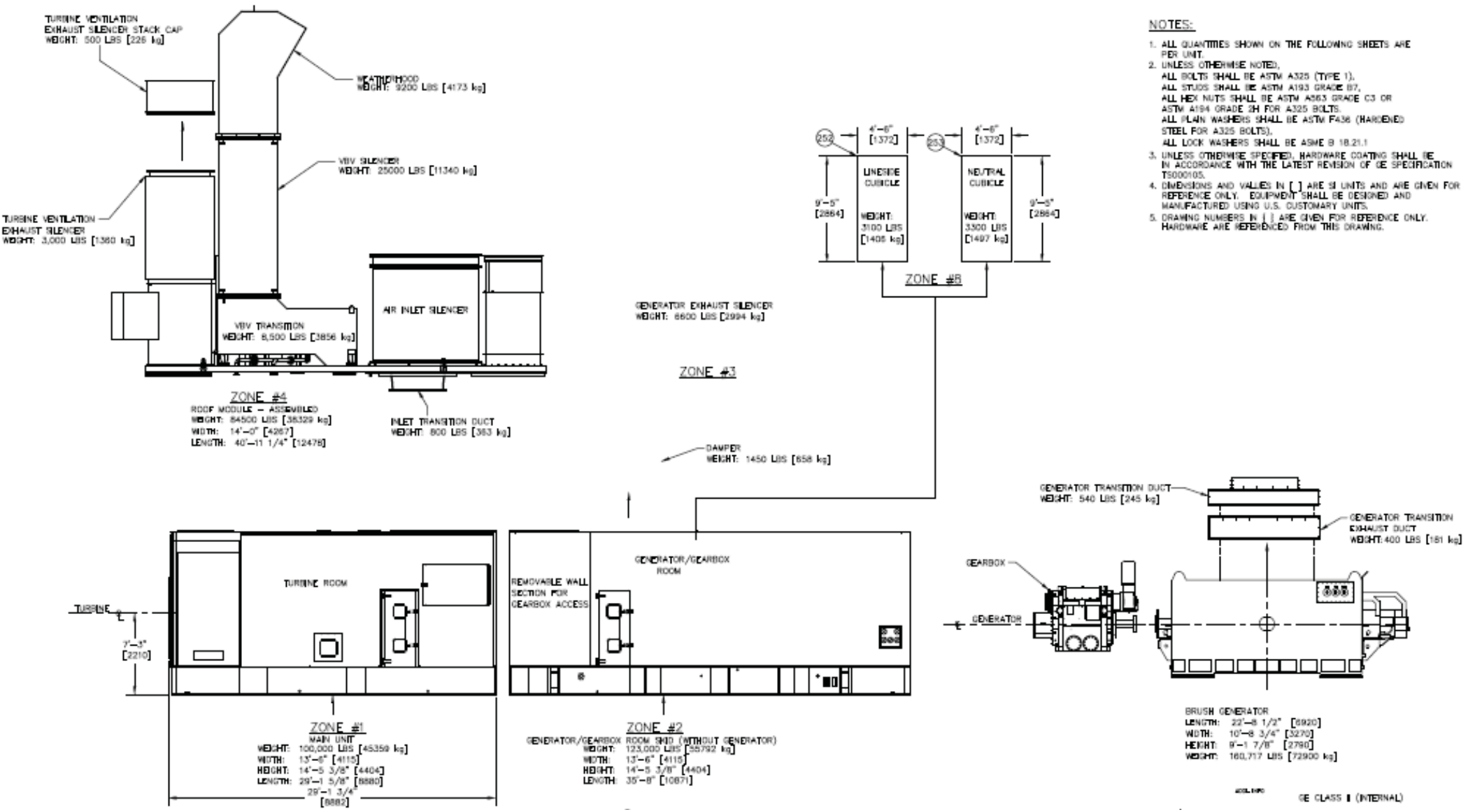
# TLO System




imagination at work



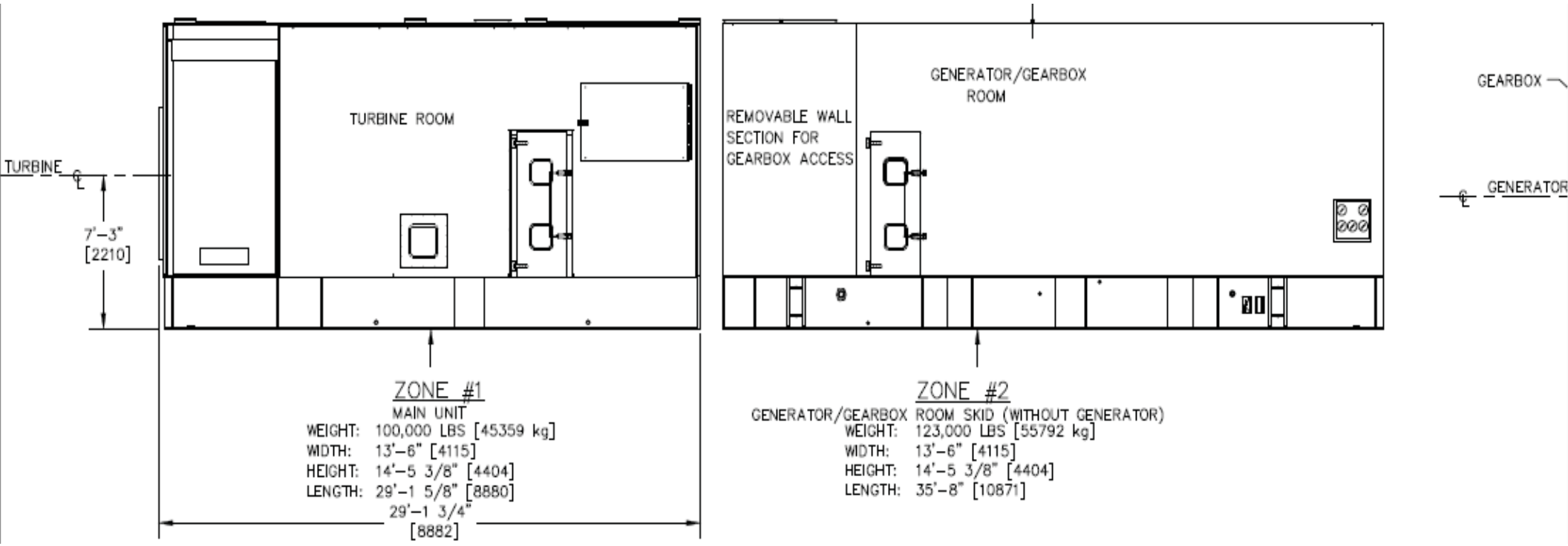
# Main Package Assembly Overview



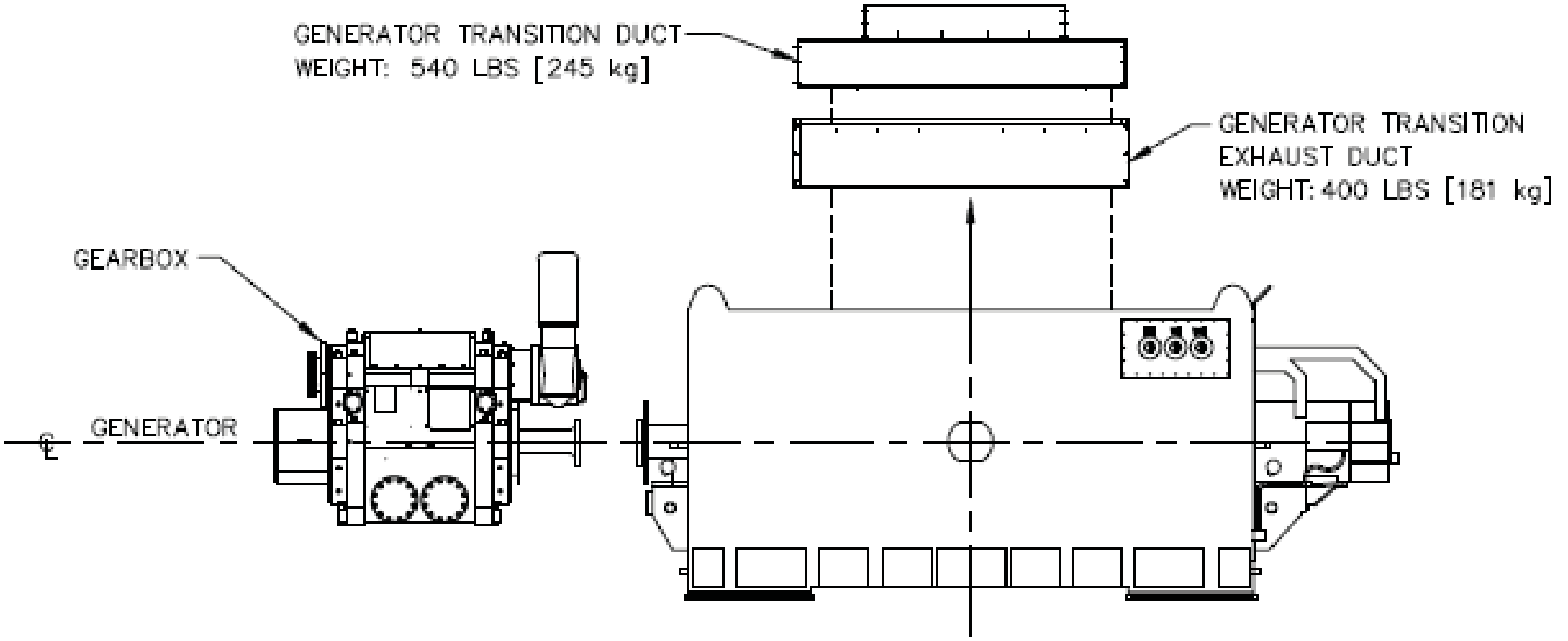

NOTES:

1. ALL QUANTITIES SHOWN ON THE FOLLOWING SHEETS ARE PER UNIT.
2. UNLESS OTHERWISE NOTED,
   ALL BOLTS SHALL BE ASTM A325 (TYPE 1).
   ALL STUDS SHALL BE ASTM A193 GRADE B7,
   ALL HEX NUTS SHALL BE ASTM A563 GRADE C3 OR ASTM A194 GRADE 2H FOR A325 BOLTS.
   ALL PLAIN WASHERS SHALL BE ASTM F436 (HARDENED STEEL FOR A325 BOLTS).
   ALL LOCK WASHERS SHALL BE ASME B 18.21.1
3. UNLESS OTHERWISE SPECIFIED, HARDWARE COATING SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF GE SPECIFICATION TS000105.
4. DIMENSIONS AND VALUES IN [ ] ARE SI UNITS AND ARE GIVEN FOR REFERENCE ONLY. EQUIPMENT SHALL BE DESIGNED AND MANUFACTURED USING U.S. CUSTOMARY UNITS.
5. DRAWING NUMBERS IN ( ) ARE GIVEN FOR REFERENCE ONLY. HARDWARE ARE REFERENCED FROM THIS DRAWING.

# Turbine and Generator Main Base Assembly

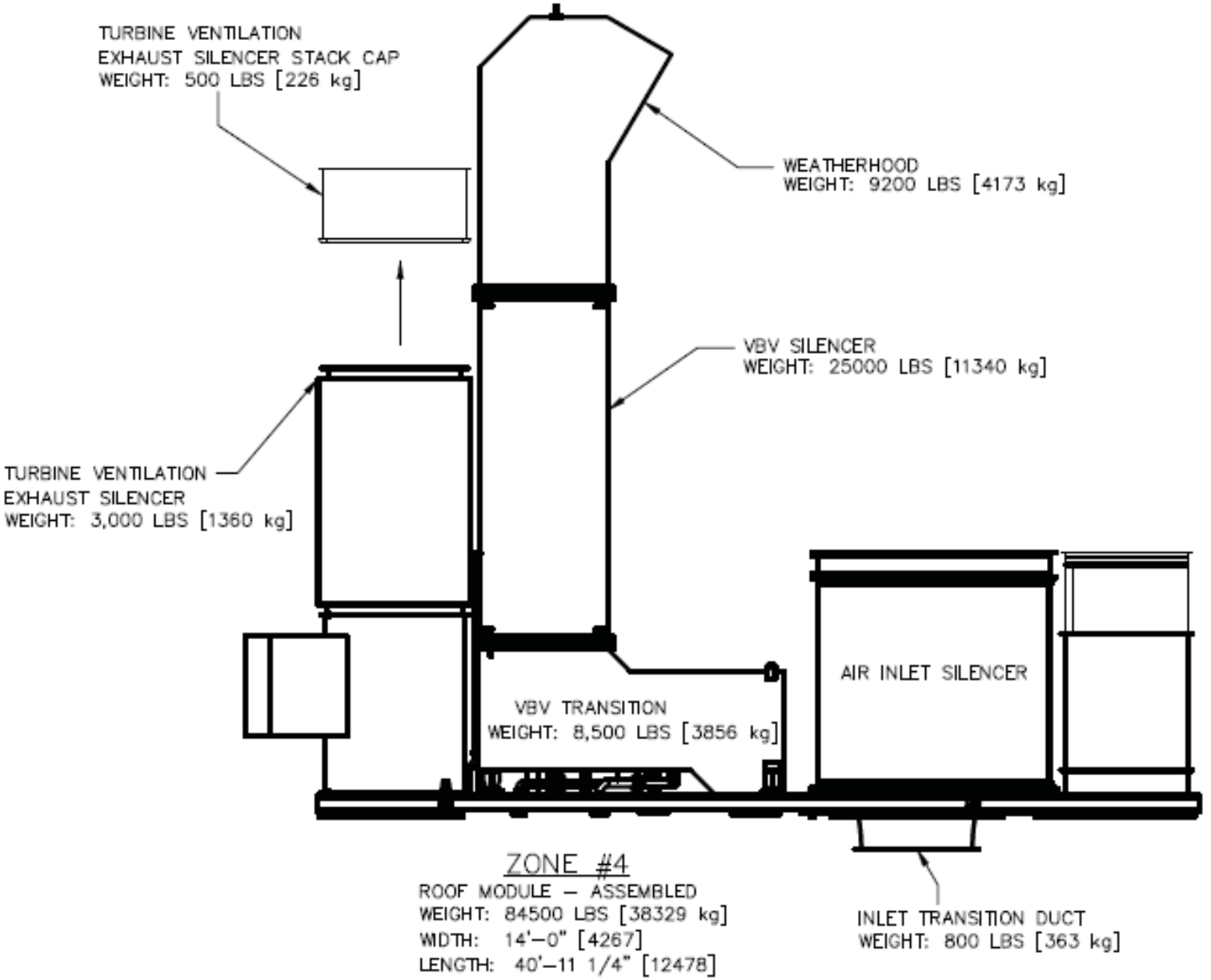


# Gearbox and Generator Assembly

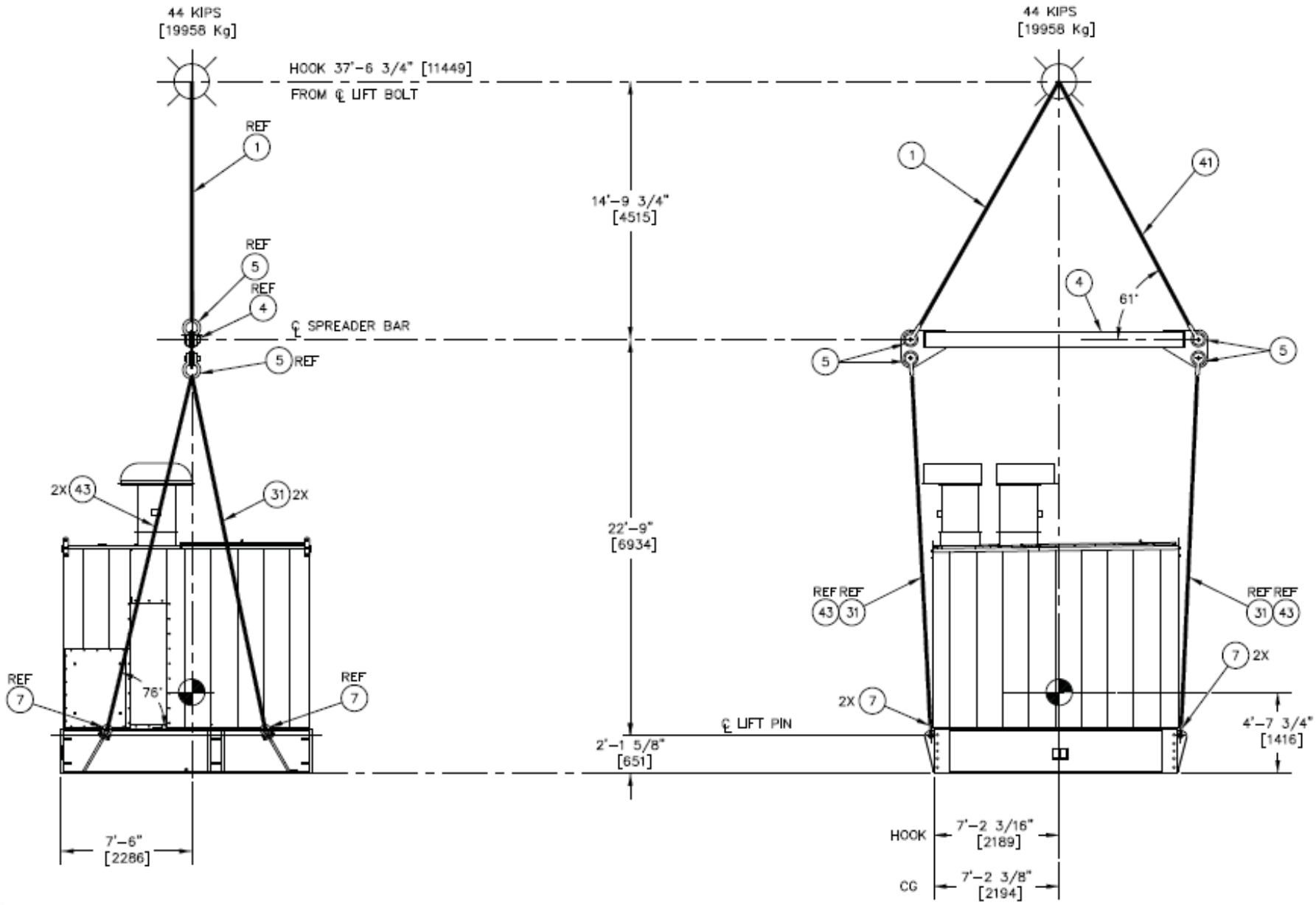



BRUSH GENERATOR
LENGTH: 22'–8 1/2" [6920]
WIDTH: 10'–8 3/4" [3270]
HEIGHT: 9'–1 7/8" [2790]
WEIGHT: 160,717 LBS [72900 kg]

# Package Roof Skid Assembly

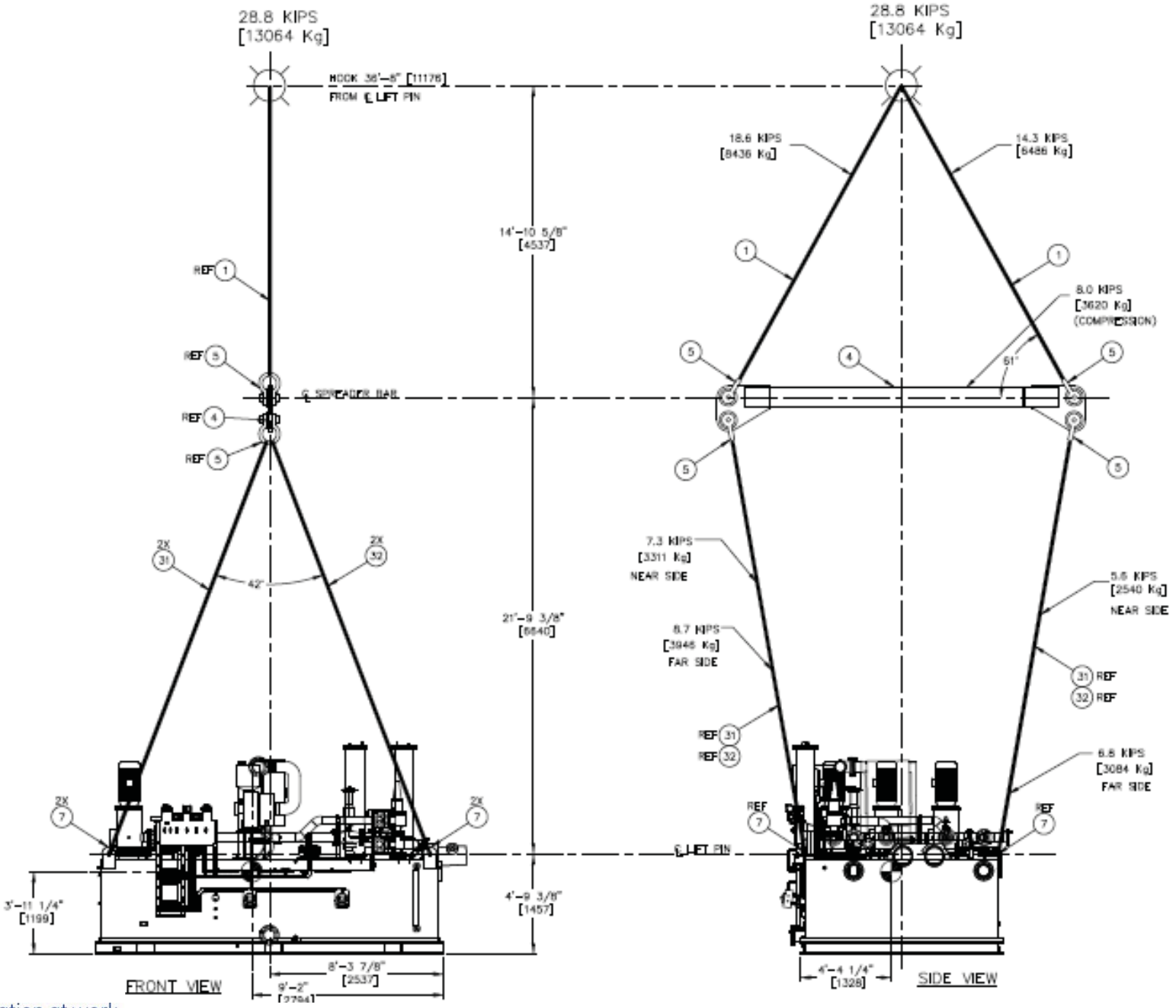


# PG Package Auxiliary Skid Lift Plan



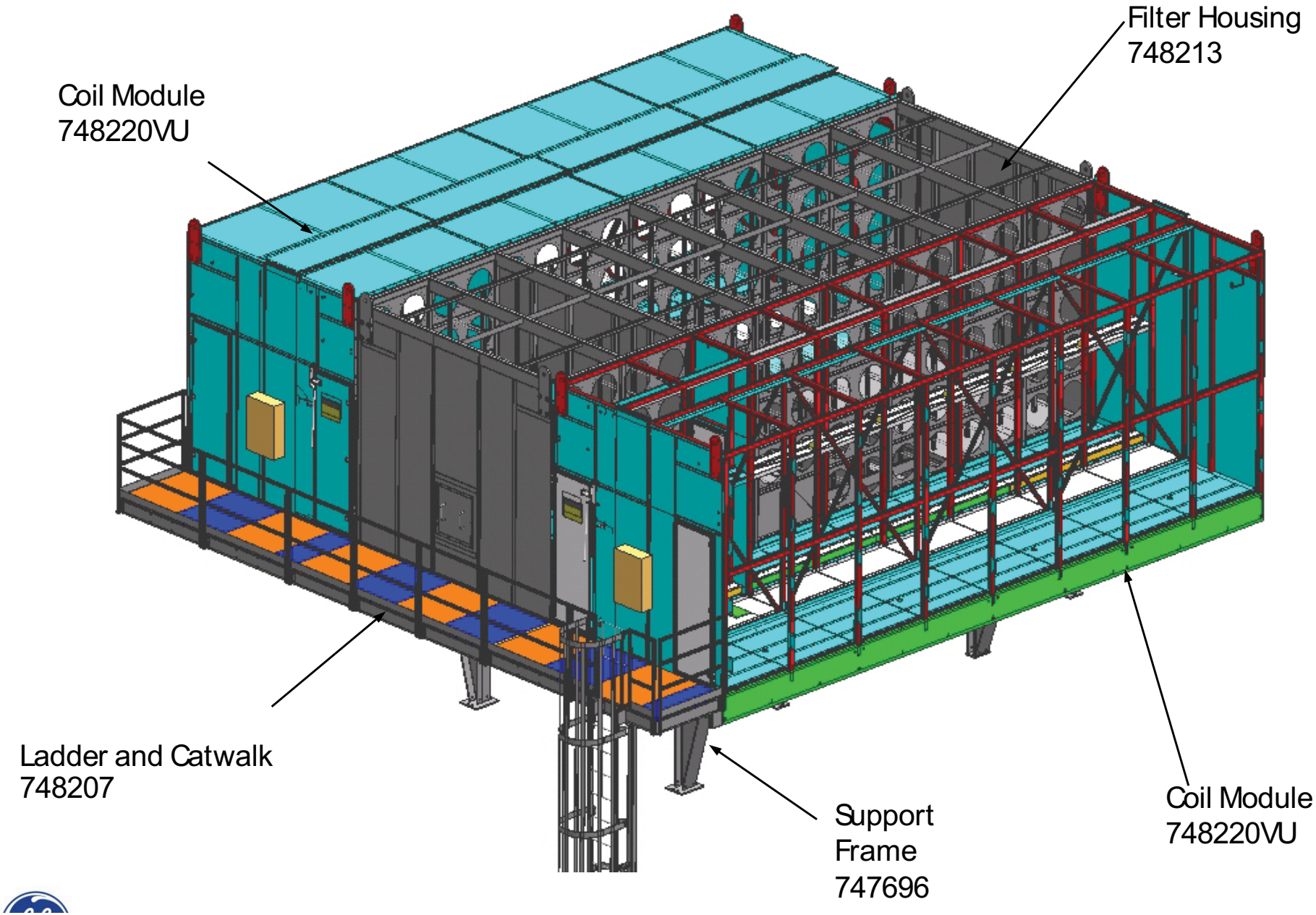

imagination at work

# PG Package Mineral Lube Oil Skid Lift Plan



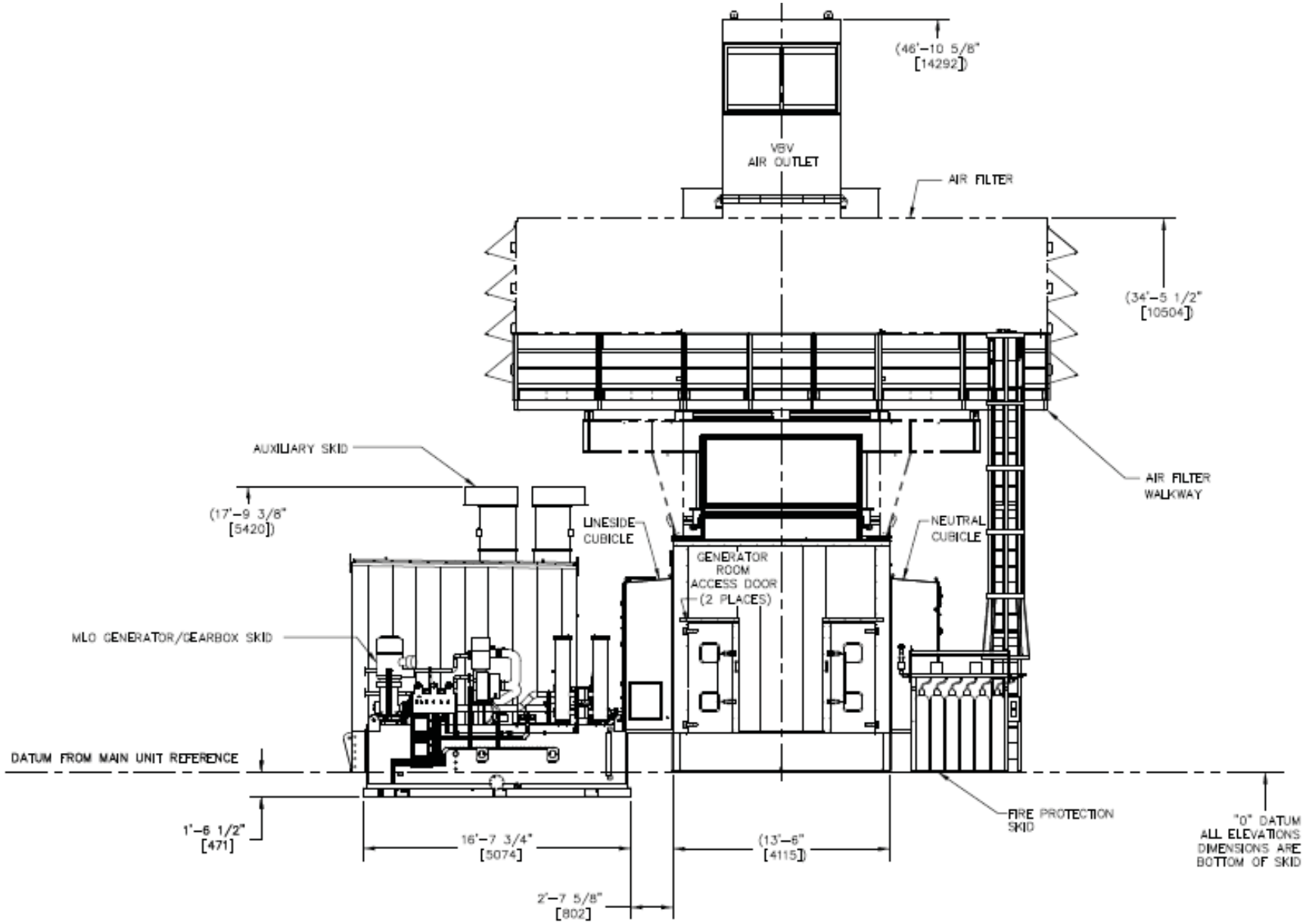

imagination at work

# ISO View – Air Filter



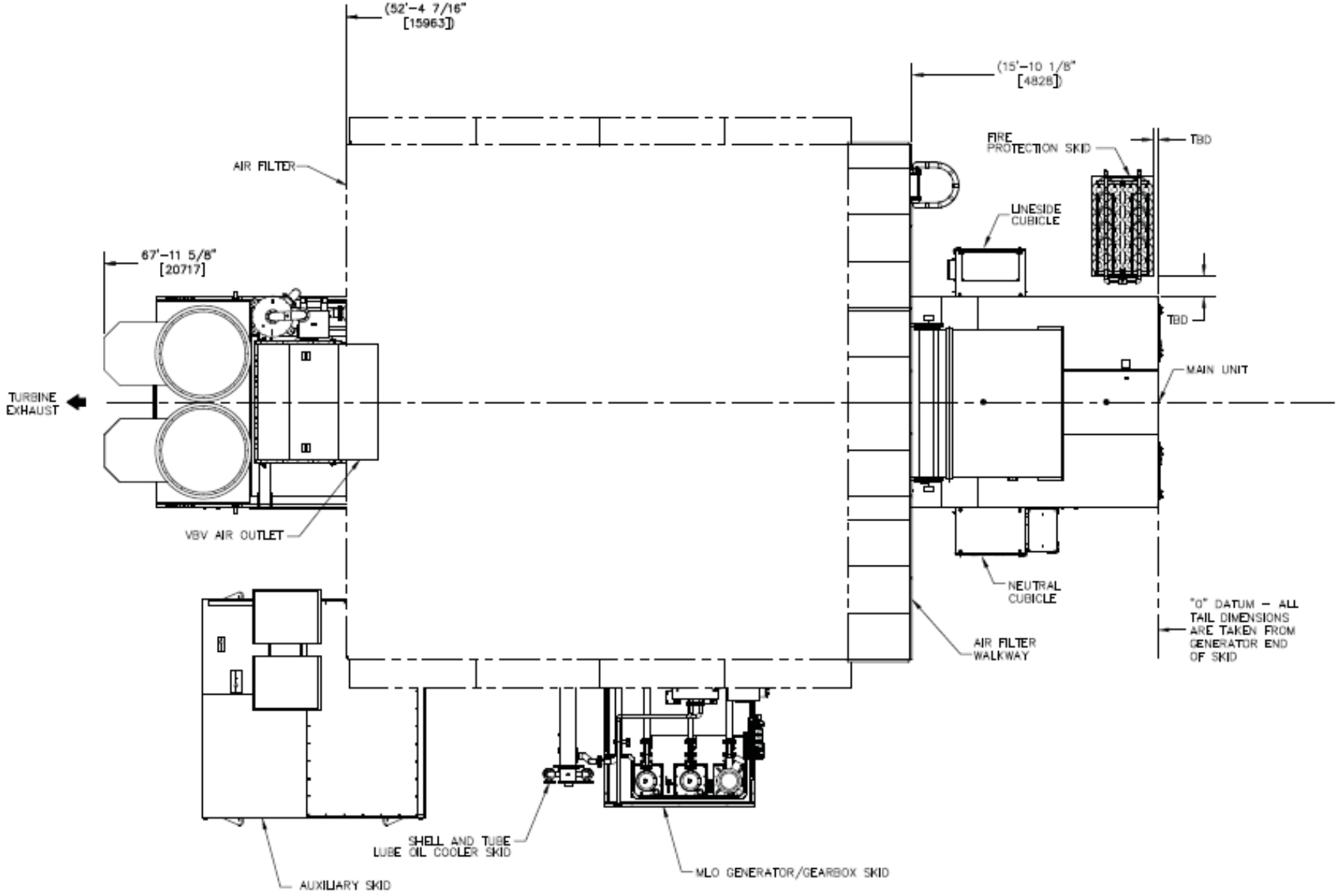

imagination at work

# Package Assembly Generator End View



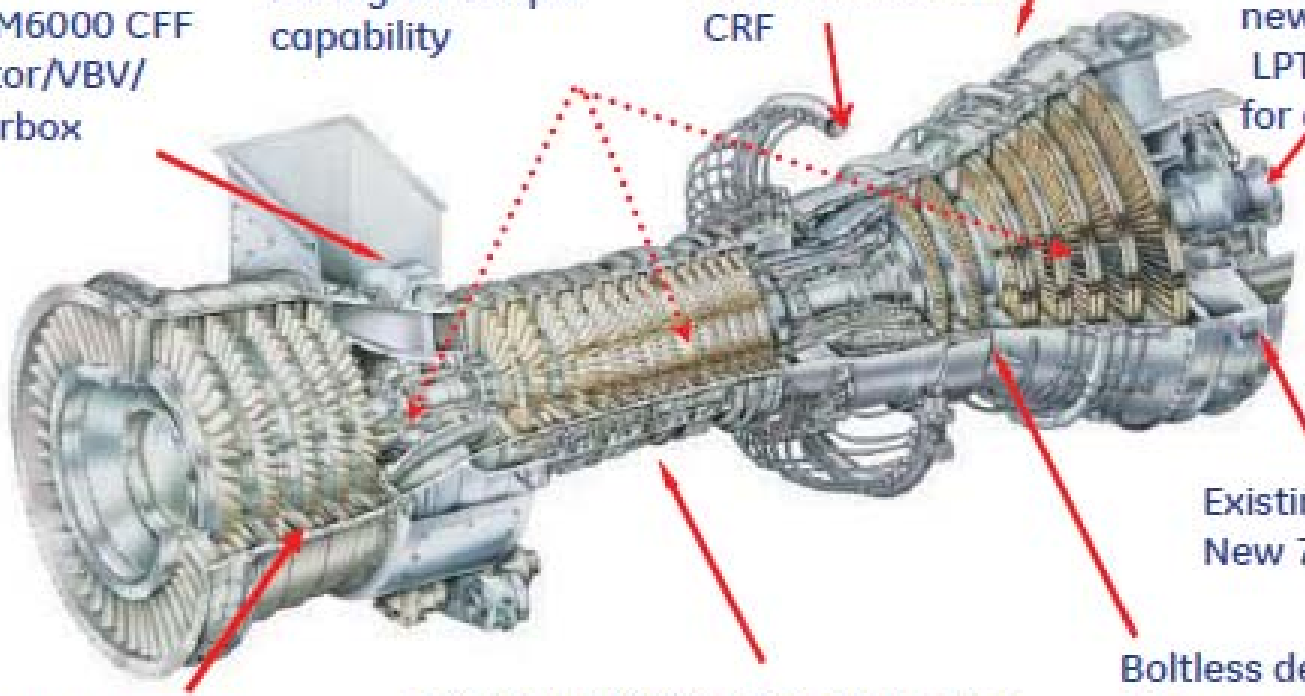

GENERATOR END VIEW

# Package Assembly Plan View




PLAN VIEW

# PG engine modifications



Improved LM6000 stator
Mew case material
LPT airfoils optimized
for efficiency

LP shaft
spline improvements
for higher torque
capability

Improved
SAC combustor &
CRF

Improved LM6000 rotor
new disk material
LPT airfoils optimized
for efficiency

Existing LM6000 CFF
/collector/VBV/
gearbox

Existing LM6000 TRF
New 7R bearing

Boltless design HPT (CF6-80E)
Disks and interstage seal
New airfoils

Existing LM6000 booster
@ 3930RPM
Premium material disks/shafts

Existing LM6000 HPC blades and
vanes
S11 from CF6-80E
New spool/disk and seal materials
Case bleed modifications

imagination at work

5

© 2013 General Electric Company. All rights reserved. Subject to restrictions on cover page.

City of Pasadena
Water and Power Department

**Pre-bid Conference for BOP**
**Glenarm Repowering Project**

**8:00 a.m. January 8, 2014**

Company: ARB INC
Name & Title: PHIL REED
Ph: (949) 454 7129 Fax: (949) 595 5525 Email: PREED@ARBINC.COM

Company: WORLEY PARSONS
Name & Title: MARC PELLETIER PROJECT MANAGER
Ph: 916 817 3932 Fax: Email: marc.pelletier@worleyparsons.com

Company: WORLEY PARSONS
Name & Title: JOHN ARMER CIVIL/STRUCTURAL ENGINEER
Ph: 916-817-3950 Fax: Email: john.armer@worleyparsons.com

Company: WORLEY PARSONS
Name & Title: BOB ANDERS PROJECT MANAGER
Ph: 916 204 0002 Fax: Email: ROBERT.ANDERS@WORLEYPARSONS.co

Company: MORROW-MEADOWS
Name & Title: RICK LANE VICE PRESIDENT
Ph: 909 598 7700 Fax: 909 598 3970 Email: RLANE@MORROWMEADOWS.COM

Company: Mayfield Enterprises Inc
Name & Title: Jim Mayfield
Ph: 5624342115 Fax: 562 439 7578 Email: jimmayfield2003@yahoo.com

Company: Crew Inc.
Name & Title: David Lalonde -
Ph: (310) 608-6860 Fax: (310) 608-6865 Email: David@Crewgrading.com

Company: Waste By Rail, Inc
Name & Title: John S. Lindsey - President
Ph: 949-673-1247 Fax: 949-673-0846 Email: john@wbrinc.com

**Company:** ZACHRY ENGINEERING CORP
**Name & Title:** MARY GRAHAM, PROJECT MANAGER
**Ph:** 303-928-4393 **Fax:** _____ **Email:** grahamm@zhi.com

**Company:** ZACHRY ENGINEERING CORPORATION
**Name & Title:** MIKE MORRIS, VICE PRESIDENT
**Ph:** 303.928.4675 **Fax:** _____ **Email:** MORRISM@ZHI.COM

**Company:** Zachry Engineering Corp
**Name & Title:** Erik McElwain, Project Manager
**Ph:** 303-928-4394 **Fax:** _____ **Email:** McElwainE@ZHI.com

**Company:** AZCO
**Name & Title:** Robert Brockington, VP of Estimating
**Ph:** ~~920-366-5636~~ 920-734-5791 **Fax:** 920-734-7432 **Email:** rbrockington@azco-inc.com

**Company:** AZCO
**Name & Title:** David Tank, Estimator
**Ph:** 920-734-5791 **Fax:** 920-734-7432 **Email:** dtank@AZCO-inc.com

**Company:** National Demolition Contractors
**Name & Title:** Jorge Rodriguez - Project Manager
**Ph:** 310-483-2034 **Fax:** 310-832-4989 **Email:** jorge@nationaldemolition.com

**Company:** Abeinsa
**Name & Title:** David Clark Proposal Manager
**Ph:** (314)541-4593 **Fax:** _____ **Email:** david.clark@abeinsabd.abengoa.com

**Company:** ABENGSA
**Name & Title:** PHILIP SCHWARZ - BUSINESS DEVELOPMENT MANAGER
**Ph:** 314-605-9762 **Fax:** _____ **Email:** PHILIP.SCHWARZ@ABEINSABD.ABENGOA.COM

**Company:** ABE INSA
**Name & Title:** Burcin Akkaya Civil Engineer
**Ph:** 636-519-2691 **Fax:** _____ **Email:** burcin.akkaya@abeinsabd.abengoa.com

**Company:** SARGENT & LUNDY
**Name & Title:** THOMAS CAVALCANTE ENGINEERING MANAGER
**Ph:** 312-269-2589 **Fax:** _____ **Email:** thomas.k.cavalcante@sargentlundy.com

Company: CBA, Inc.
Name & Title: Clarence A. Brainard II, President
Ph: 626-305-1281 Fax: 626-305-1582 Email: CBA1585@aol.com

Company: Sargent & Lundy LLC
Name & Title: Adam Taylor - Director Construction Management + Commissioning Division
Ph: 312-269-3912 Fax: Email: ataylor@sargentlundy.com

Company: PERFORMANCE MECHANICAL INC (PMI)
Name & Title: STEVE KLAUS - GENERAL MANAGER
Ph: 562-484-8030 Fax: Email: SKLAUS@PERFMECH.COM

Company: PERFORMANCE MECHANICAL INC (PMI)
Name & Title: DENNIS BROOCK ESTIMATOR
Ph: 562-972-6803 Fax: Email: DBROOCK@PERFMECH.COM

Company: LGM CONSTRUCTION CO., INC. DVBE, SBE
Name & Title: LARRY G. MURRAY - PRESIDENT
Ph: 951-371-9000 Fax: 951-371-9009 Email: LARRY@LGMCONSTRUCTIONCO.COM

Company: City of Pasadena
Name & Title: Antonio Watson
Ph: Fax: Email: AWATSON@cityofpasadena.net

Company: Pasadena W&P
Name & Title: DAN ANGELES
Ph: 626-744-6248 Fax: Email: dangeles@cityofpasadena.net

Company: Pasadena PWP
Name & Title: STACY JACOBSON
Ph: (626) 744-4414 Fax: Email: sjacobson@cityofpasadena.net

Company: PWP
Name & Title: Wes Stenger, Assoc. Engineer
Ph: 626 744 6273 Fax: Email: WStenger@cityofpasadena.net

Company: PUBLIC WORKS
Name & Title: BOB SULISTIO, ASSOC ENGR
Ph: 744-7 4265 Fax: Email: BSULISTIO@CITYOFPASADENA.NET

Company: Pasadena Fire Dept
Name & Title: James Weckerle, HazMat Specialist
Ph: 626-744-4288 Fax: 626 396 7217 Email: jweckerle@cityofpasadena.net

Company: WoodGroup PS
Name & Title: DAN PARKER P.M.
Ph: 405-317-5311 Fax: Email: DAN.PARKER@WOODGROUP.COM

Company: Wood Group
Name & Title: Jessica Richardson Proposal Coordinator
Ph: 931-722-4876 Fax: Email: Jessica.Richardson@Woodgroup.com

Company: Woods Group Power Solutions
Name & Title: JOHN K. SMITH - DIRECTOR PROJECT DEVELOPMENT
Ph: 281 776 5820 Fax: 281 776 5877 Email: jk.smith@woodgroup.com

Company: Wood Group
Name & Title: Iris Holloway - Project Manager
Ph: 281 776 5840 Fax: 281 776 5877 Email: iris.holloway@woodgroup.com

Company: PARSONS BRINKERHOFF
Name & Title: JON M. LANGHIRT CHIEF ELECT. ENGR.
Ph: 415 243 4792 Fax: 415 281 2707 Email: langhirt@pbworld.com

Company: PARSONS BRINCKERHOFF
Name & Title: RAY STANKOWSKI - PROJECT MANAGER
Ph: 415-243-4625 Fax: 415-281-2707 Email: stankowski@pbworld.com

Company: PB Power - WoodGroup
Name & Title: WARREN DAVIS - BD MGR
Ph: 510 693-0385 Fax: 530 587-1842 Email: daviswe@pbworld.com

Company: GE Control Solutions - DCS
Name & Title: Paul Abernathy - Plant Controls Sales Director
Ph: 713 397 9078 Fax: Email: paul.abernathy@ge.com

Company: GE Distributed Power
Name & Title: Rebecca Malish Deputy Project Engineer
Ph: 518-258-6890 Fax: Email: Malish@GE.com

Company: GE
Name & Title: Jeff Farrow - SR. PROJECT ENGINEER
Ph: 678-245-6296 Fax: Email: jeffrey.farrow@ge.com

Company: Milco Constructors, Inc.
Name & Title: Karen Miller, Business Development
Ph: (562) 756-4144 Fax: (562) 424-2347 Email: karenm@milcoconstructors.com

Company: PARSONS BRINCKERHOFF
Name & Title: DAVID CANEER, SR. SUPERVISING CIVIL ENGINEER
Ph: 415-243 4751 Fax: 415-243-9501 Email: caneerdf@pbworld.com

Company: IST
Name & Title: JAMES TONG PROJECT ENGINEERING
Ph: 519-740-0757 x283 Fax: Email: jtong@atsg.com

Company: IST
Name & Title: PETER HECIMOVIC, PROJECT MANAGER
Ph: 519-740-0757 x222 Fax: Email: phecimovic@atsg.com

Company: GE
Name & Title: Eli Branscum I&C Site Manager
Ph: 281.455.6334 Fax: Email: eli.branscum@ge.com

Company: GE
Name & Title: DIANE DONOVAN, PM
Ph: 713 206 1027 Fax: Email: diane.donovan@ge.com

Company: GE
Name & Title: Amol Mody - Region Sales Manager
Ph: 518 925 8329 Fax: Email: amol.mody@ge.com

Company: Process Unlimited
Name & Title: GARY ROSE Electrical/commissioning consultant
Ph: 951-505-021 Fax: 909-860-4133 Email: GTRPTE@CS.COM

Company: PROCESSES UNLIMITED
Name & Title: CARL HAASE - CIVIL ENGINEER
Ph: 661-478-3400 Fax: Email: chaase@prou.com
cdhaase@att.net

Company: AMJ CONSTRUCTION MANAGEMENT
Name & Title: JACK WICKERSHAM / VICE PRESIDENT
Ph: 213·392.0972 Fax: — Email: JMWICKERSHAM@AMJCM.COM

Company: AMJ CONSTRUCTION MANAGEMENT
Name & Title: MATTHEW WICKERSHAM / PROJECT MANAGER
Ph: 818.807.7085 Fax: — Email: mjwickersham@amjcm.com

Company: ~~DAVI~~ CLEAN POWER CONSULTING PARTNERS
Name & Title: DAVE TATEOSIAN PRINCIPAL
Ph: 925-519-2180 Fax: — Email: DAVET@CPSQRD.COM

Company: Power Engineers
Name & Title: Tony Clark Mechanical Engineer
Ph: 208-288-6483 Fax: 208-288-6199 Email: tony.clark@powereng.com

Company: Pasadena Water & Power
Name & Title: GURCHARAN BAWA, AGM (Power Supply)
Ph: 626-744-7598 Fax: Email: gbawa@cityofpasadena.net

Company: Power ENGINEERS
Name & Title: Gregg Harwood PM
Ph: 208 288 6360 Fax: Email: gregg.harwood@powereng.com

Company: HRF III ENTERPRISES, INC
Name & Title: HENRY (DICK) FINE CONSTRUCTION MANAGER
Ph: 321-626-2568 Fax: Email: HFINE0@GMAIL.COM

Company: i+i CON ENERGY
Name & Title: GEOFFREY MURKEN President
Ph: 412-334-8155 Fax: 412-471-4202 Email: gmurken@iiconenergy.com

Company: i+i con Energy
Name & Title: Kevin Cameron Operations Director
Ph: 412-471-4202 Fax: Email: Kcameron@iiconenergy.com

Company: ARB, INC.
Name & Title: WAYNE TRUCHAN VICE PRESIDENT - PROPOSALS & ESTIMATING
Ph: 949 454 7146 Fax: Email: wtruchan@arbinc.com

Company:

Name & Title: MARK M. CROWN TECHNICAL SYSTEMS / BUSINESS DEVELOPMENT.
Ph: (951) 332-4170 x120 Fax: _____ Email: MMARTINEZ@CROWNTECHNICALSYSTEMS.COM

Company: MEGA POWER SYSTEMS, INC.
Name & Title: ROBERT DE LA MORA, SALES & MARKETING MANAGER
Ph: 909-548-4169 Fax: 909-548-4212 Email: rdelamora@megapowersystems.com

Company: PWP
Name & Title: Tunji Adedeji, Utility Rate Manager
Ph: 626 744 4143 Fax: _____ Email: tadedeji@cityofpasadena.net

Company: Sargent & Lundy
Name & Title: Steve Warren - Project Manager
Ph: 312-269-6200 Fax: _____ Email: steven.warren@sargentlundy.com

Company: _____
Name & Title: _____
Ph: _____ Fax: _____ Email: _____

Company: _____
Name & Title: _____
Ph: _____ Fax: _____ Email: _____

Company: _____
Name & Title: _____
Ph: _____ Fax: _____ Email: _____

Company: _____
Name & Title: _____
Ph: _____ Fax: _____ Email: _____

Company: _____
Name & Title: _____
Ph: _____ Fax: _____ Email: _____

Company: _____
Name & Title: _____
Ph: _____ Fax: _____ Email: _____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Name & Title:_____
Ph:_____ Fax:_____ Email:_____

Company:_____
Name & Title:_____
Ph:_____ Fax:_____ Email:_____

# Enclosure 5

# CONSTRUCTION STAGING
AND
# TRAFFIC MANAGEMENT PLAN
FOR

*PROJECT NAME*
*PROJECT ADDRESS*

*DATE*

## I. PROJECT

*Briefly describe your project*

## II. Demolition Work

*Contractor:*
*Address:*
*City, State, Zip:*
*Telephone Number:*
*Fax Number:*

*Estimated Start Date:*
*Estimated Completion Date:*
*Working Hours:*

*Name of on-site superintendent:*
*Cell Phone Number:*

*Contract Responsibilities:*
*Describe how and what will be demolished; include equipment to be used*

*Truck Route:*
*Describe the route that will be used by trucks on City of Pasadena streets;(please see attached drawing entitled "City of Pasadena – Truck Routes) include the number of trucks and staging location.*

*Material Storage Location*
*Describe the location for material storage (if needed)*

*Construction Trailer*
*Will a construction trailer be used? If so where will it be located?*

*Traffic Control*
*Will this operation require the occupation of any traffic lanes, parking lanes, parkways or any other public right-of way? If yes, than closures shall be per the Manual of Uniform Traffic Control Devices (MUTCD). If the right-of-way occupation requires a diagram that is not part of the MUTCD manual a separate traffic control plan must be submitted as part of this staging plan. Please note that a Public Works & Transportation Department Occupation Permit must be obtained prior to public right-of-way use.*

*Parking*
*Indicate the number of workers and the areas where their vehicles will be parked through the duration of this phase of the project*

*Clean-up*
*Describe the measures that will be taken to ensure that the work site and public right-of-way will be maintained (including dust control)*

## III. Excavation and Grading

*Contractor:*
*Address:*
*City, State, Zip:*
*Telephone Number:*
*Fax Number:*

*Estimated Start Date:*
*Estimated Completion Date:*
*Working Hours:*

*Name of on-site superintendent:*
*Cell Phone Number:*

*Contract Responsibilities:*

*Describe excavation and grading activities; including the approximate depth of excavation, and quantity of dirt that will be removed (yd³): will piles, soldier beams and/or tiebacks be necessary? Include any other pertinent information*

*Truck Route:*

*Describe the route that will be used by trucks on City of Pasadena streets;(please see attached drawing entitled "City of Pasadena – Truck Route) include the number of trucks and staging location.*

*Material Storage Location*

*Describe the location for material storage (if needed)*

*Construction Trailer*

*Will a construction trailer be used? If so where will it be located?*

*Traffic Control*

*Will this operation require the occupation of any traffic lanes, parking lanes, parkways or any other public right-of way? If yes, than closures shall be per the Manual of Uniform Traffic Control Devices (MUTCD). If the right-of-way occupation requires a diagram that is not part of the MUTCD manual a separate traffic control plan must be submitted as part of this staging plan. Please note that a Public Works & Transportation Department Occupation Permit must be obtained prior to public right-of-way use.*

*Parking*

*Indicate the number of workers and the areas where their vehicles will be parked through the duration of this phase of the project*

*Clean-up*

*Describe the measures that will be taken to ensure that the work site and public right-of-way will be maintained (including dust control)*

## IV. Concrete Placement Work

*Contractor:*
*Address:*
*City, State, Zip:*
*Telephone Number:*
*Fax Number:*

*Estimated Start Date:*
*Estimated Completion Date:*
*Working Hours:*

*Name of on-site Superintendent:*
*Cell Phone Number:*

*Contract Responsibilities:*

*Describe concrete placement activities and/or other pertinent information, such as the use of pumps and their locations*

*Truck Route:*

*Describe the route that will be used by trucks on City of Pasadena streets;(please see attached drawing entitled "City of Pasadena – Truck Routes) include the number of trucks and staging location.*

*Material Storage Location*

*Describe the location for material storage (if needed)*

*Construction Trailer*

*Will a construction trailer be used? If so where will it be located?*

*Traffic Control*

*Will this operation require the occupation of any traffic lanes, parking lanes, parkways or any other public right-of way? If yes, than closures shall be per the Manual of Uniform Traffic Control Devices (MUTCD). If the right-of-way occupation requires a diagram that is not part of the MUTCD manual a separate traffic control plan must be submitted as part of this staging plan. Please note that a Public Works & Transportation Department Occupation Permit must be obtained prior to public right-of-way use.*

*Parking*

*Indicate the number of workers and the areas where their vehicles will be parked through the duration of this phase of the project*

*Clean-up*

*Describe the measures that will be taken to ensure that the work site and public right-of-way will be maintained (including dust control)*

## V. Wood Framing Work

*Contractor:*
*Address:*
*City, State, Zip:*
*Telephone Number:*
*Fax Number:*

*Estimated Start Date:*
*Estimated Completion Date:*
*Working Hours:*

*Name of on-site superintendent:*
*Cell Phone Number:*

*Contract Responsibilities:*

*Describe framing activities; include all pertinent information*

*Truck Route:*

*Describe the route that will be used by trucks on City of Pasadena streets;(please see attached drawing entitled "City of Pasadena – Truck Routes) include the number of trucks and staging location.*

*Material Storage Location*

*Describe the location for material storage (if needed)*

*Construction Trailer*

*Will a construction trailer be used? If so where will it be located?*

*Traffic Control*

*Will this operation require the occupation of any traffic lanes, parking lanes, parkways or any other public right-of way? If yes, than closures shall be per the Manual of Uniform Traffic Control Devices (MUTCD). If the right-of-way occupation requires a diagram that is not part of the MUTCD manual a separate traffic control plan must be submitted as part of this staging plan. Please note that a Public Works & Transportation Department Occupation Permit must be obtained prior to public right-of-way use.*

*Parking*

*Indicate the number of workers and the areas where their vehicles will be parked through the duration of this phase of the project*

*Clean-up*

*Describe the measures that will be taken to ensure that the work site and public right-of-way will be maintained (including dust control)*

## VI. Other

*Contractor:*
*Address:*
*City, State, Zip:*
*Telephone Number:*
*Fax Number:*

*Estimated Start Date:*
*Estimated Completion Date:*
*Working Hours:*

*Name of on-site foreman:*
*Cell Phone Number:*

*Contract Responsibilities:*

*Describe any other major activity including roof installation, painting, stucco, window installation, landscaping etc.*

*Truck Route:*

*Describe the route that will be used by trucks on City of Pasadena streets;(please see attached drawing entitled "City of Pasadena – Truck Routes) include the number of trucks and staging location.*

*Material Storage Location*

*Describe the location for material storage (if needed)*

*Construction Trailer*

*Will a construction trailer be used? If so where will it be located?*

*Traffic Control*

*Will this operation require the occupation of any traffic lanes, parking lanes, parkways or any other public right-of way? If yes, than closures shall be per the Manual of Uniform Traffic Control Devices (MUTCD). If the right-of-way occupation requires a diagram that is not part of the MUTCD manual a separate traffic control plan must be submitted as part of this staging plan. Please note that a Public Works & Transportation Department Occupation Permit must be obtained prior to public right-of-way use.*

*Parking*

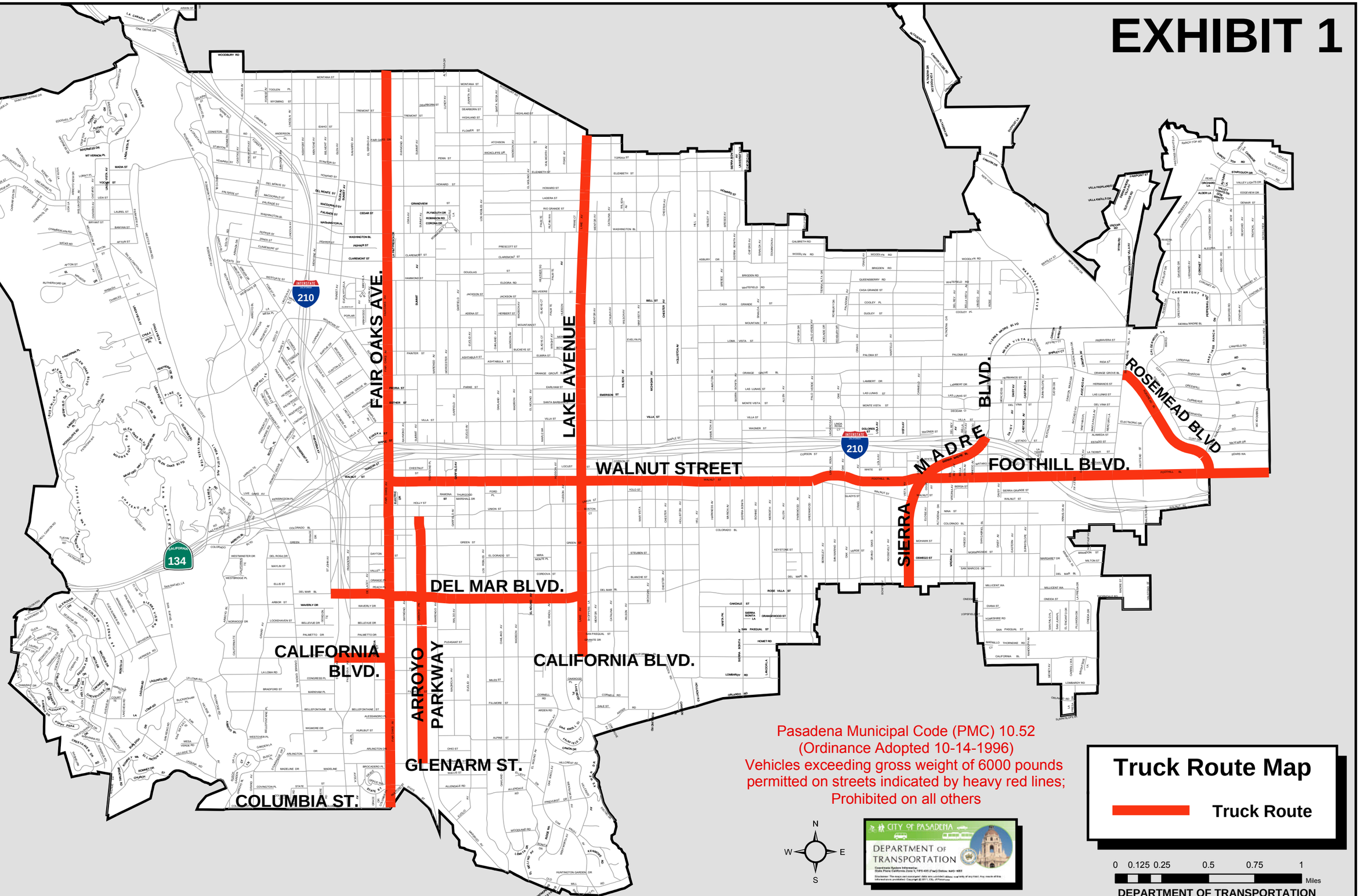
*Indicate the number of workers and the areas where their vehicles will be parked through the duration of this phase of the project*

*Clean-up*

*Describe the measures that will be taken to ensure that the work site and public right-of-way will be maintained (including dust control)*

*TRUCK ROUTE*

# EXHIBIT 1


FAIR OAKS AVE.
LAKE AVENUE
WALNUT STREET
MADRE BLVD.
FOOTHILL BLVD.
ROSEMEAD BLVD
SIERRA MADRE BLVD
DEL MAR BLVD.
CALIFORNIA BLVD.
ARROYO PARKWAY
GLENARM ST.
COLUMBIA ST.
INTERSTATE 210
CALIFORNIA 134
CALIFORNIA BLVD.
Pasadena Municipal Code (PMC) 10.52
(Ordinance Adopted 10-14-1996)
Vehicles exceeding gross weight of 6000 pounds
permitted on streets indicated by heavy red lines;
Prohibited on all others
N
W
E
S
CITY OF PASADENA
DEPARTMENT OF TRANSPORTATION
Truck Route Map
Truck Route
0 0.125 0.25 0.5 0.75 1
Miles
DEPARTMENT OF TRANSPORTATION
UPDATED: JUNE 22, 2011 - CAD90070A.MXD

# City of Pasadena INSURANCE

**Name of Company:**_____

**Project Location:**_____

**Job Description:** _____

_____

**1. PLEASE PROVIDE THE BELOW LISTED DOCUMENTS TO YOUR PROJECT MANAGER.**
**2. PLEASE SUBMIT THESE IN ONE (1) PACKAGE OR EMAIL WHEN YOU HAVE ALL DOCUMENTS IN HAND, ALONG WITH THIS CHECK LIST, BECAUSE THEY WILL BE FORWARDED OVER AS A GROUP TO OUR RISK MANAGER FOR APPROVAL:**

**Include on one or two Acord forms with the coverage limits, policy numbers, and dates for:**

A. ☐ ***General Liability*:** Combined Single Limit of $1,000,000 per occurrence.
- ☐ ***A*dditional Insured Endorsement form(s)** Naming as Additional Insured ("City of Pasadena, its Council Members, Commissioners, officers, employees and agents.")
  Please provide either this form: ☐ CG 20 12;

  or **both** of these forms ☐ CG 20 10 XX XX (for *ongoing* operations) **AND**
  ☐ CG 20 37 XX XX (for *completed* operations).

- ☐ ***Endorsement Waiver of the Right of Subrogation for General Liability*** against the City of Pasadena.

B. ☐ ***Auto Liability*:** $100,000 combined single limits unless vehicles are not involved.

C. ☐ ***Worker's Comp and Employer's Liability*** in statutory amounts. A separate certificate may be submitted. The City need not be named as additional insured.
- ☐ ***Endorsement Waiver of the Right of Subrogation for Worker's Comp*** against the City of Pasadena.

D. ☐ There is a 24-48 hour turn around approval time for insurance before Permits can be issued

Note: The Specification or Request for Insurance may be amended by the City, to require less or greater requirements depending on the potential risk involved.

Submit fax documents to 626-396-8999 or
Email to pw-permits@cityofpasadena.net
. Include the permit job location and description of work.

**OTHER CRITICAL INCLUSIONS:**

1. The City of Pasadena shall be given 30 days written notice of cancellation or material change. The certificate submitted will not be approved if it contains "best effort" modifiers or if it relieves the insurer from responsibility for failure to give notice.

10/31/13

# SAMPLE

***for A*dditional Insured Endorsement form**

Note: This sample is for reference purpose only.
Endorsement pages with different formats are acceptable.

**THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.**

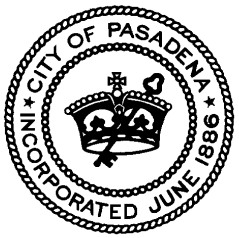
## ADDITIONAL INSURED – DESIGNATED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

**SCHEDULE**

| **Name Of Additional Insured Person(s) Or Organization(s)** |
| --- |
| City of Pasadena<br>Office of the City Attorney<br>Liability Claims |
| Information required to complete this Schedule, if not shown above, will be shown in the Declarations. |




City of Pasadena
Department of Public Works
Permit Counter
175 N. Garfield Ave.
Pasadena, CA 91101

---- PUBLIC COUNTER HOURS ----

Monday - Thursday 8:00 a.m. - 5:00 p.m.

Fridays 8:00 a.m. - 12 Noon

---- TELEPHONE HOURS ----

Monday - Thursday 7:30 a.m. - 5:30 p.m.

Fridays 7:30 a.m. - 4:30 p.m.

Telephone: 626-744-4195
Fax: 626-396-8999
Email: pw-permits@cityofpasadena.net

The City of Pasadena observes eleven public holidays each year during which non-essential City services are suspended. For more information on holidays and closed Fridays, please visit: http://www.cityofpasadena.net/

# Department of Public Works
## MOVING PERMIT APPLICATION
## (For Wide Load / Heavy Equipment)

Moving permit applications will be accepted through one of the following methods:

- Permit Counter at 175 N Garfield Ave during normal business hours
- Telephone at 626-744-4195 (An advance deposit of $100 is required for all call-in services)
- Fax at 626-396-8999 or Email to pw-permits@cityofpasadena.net
  (An advance deposit of $100 is required for all fax-in services)

The following information will be required for the issuance of a moving permit:

- Type of Moving Equipment
- Height
- Width
- Length
- Weight (tons)
- From (address)
- To (address)
- Route to be used - preferably Truck Route as designated in the City website.
- Date and hours of operation
- Applicant's Company name, address, and telephone number

All moving permits shall comply with the City of Pasadena Ordinance. In addition, the applicant shall provide the City with updated insurance information, which is subject to the City's general insurance requirements. Please allow a minimum of two (2) working days for insurance approval. Thank you.

P&P Special Event # (If applicable):_____

# CITY OF PASADENA

## APPLICATION FOR A PERMIT TO CONDUCT AN ACTIVITY WITHIN THE PUBLIC RIGHT-OF-WAY

## EVENT INFORMATION

Type of Event:

☐ RUN/WALK ☐ BIKE RACE ☐ PARADE ☐ STREET FAIR
☐ NEIGHBORHOOD BLOCK PARTY ☐ NEIGHBORHOOD WATCH – POLICE
☐ OTHER (be specific): _____

EVENT TITLE:_____

EVENT DATE(S):_____ TOTAL ANTICIPATED ATTENDANCE:_____
Month – Date(s) –Year Participants _____Spectators _____

LOCATION - Choose one of the Approved Street Closure Drawings listed below. No alterations to the approved drawings will be accepted.

☐ Centennial Square - Option "A" ☐ Centennial Square – Option "C"
☐ Centennial Square - Option "B" ☐ Rose Bowl Street Closure
☐ Other - Must Provide a Detailed Drawing if not using "Typical Street Closure" drawing.
☐ Full Street Closure ☐ Lane Closure ☐ Sidewalk Occupancy

Street Name:_____From:_____To:_____
(street name) (street name)

Staging Area (If different from above – typically for parades, runs, or walks):
Street Name:_____From:_____To:_____
(street name) (street name)

Disbanding Area (If different from above – typically for parades, runs, or walks):
Street Name:_____From:_____To:_____
(street name) (street name)

ACTUAL Event Hours: _____AM/PM - _____AM/PM

Barricade SET-UP Date:_____Start Time:_____AM/PM

Barricade BREAK-DOWN Date:_____Completion Time:_____AM/PM

Barricades to be delivered/picked up by ☐ City Staff ? ☐ OR, by applicant?
(If by City Staff, the application is subject to a flat fee of $420.99 - FY13 City's General Fee Schedule)

IS VALET PARKING BEING PROPOSED? ☐ YES ☐ NO
If "YES", please submit Valet Sponsor's Permit Application.

## APPLICANT INFORMATION

☐ NON-PROFIT (Attach IRS 501C)

APPLICANT:_____

ADDRESS:_____
STREET, CITY, STATE, ZIP CODE

CONTACT PERSON:_____

Daytime Phone: (_____)_____Evening Phone: (_____)_____FAX #:(_____)_____

Contact Person **"On Site"** Day of Event:_____Pager/Cellular #:_____

**Application must be submitted to the Department of Public Works at 175 North Garfield Avenue; or faxed to 626-396-8999; or emailed to pw-permits@cityofpasadena.net, at least thirty (30) working days prior to the date of the event or the date proposed to begin advertising the event. Please call 626-744-4195 if there are any questions.**

Revised 12/19/12

# CITY OF PASADENA – DEPARTMENT OF PUBLIC WORKS

## APPLICATION FOR A PERMIT TO PLACE A STORAGE CONTAINER IN PUBLIC RIGHT OF WAY

## APPLICANT INFORMATION

Applicant:_____
(The applicant shall be the current or prospective occupant(s), or his representative(s), of the subject property fronting the storage container)

Address:_____

Contact Person:_____ Email:_____

Daytime Phone: _____ Evening Phone: _____

FAX:_____ Cell:_____

Storage Container Company Name:_____

Address:_____ Phone:_____

Proposed start date:_____ Proposed end date:_____

Diagram: (Show street, property, driveways, trees, hydrants, and north arrow)

**General requirements for storage container placement**

The storage container shall:

1. **not** exceed the 10 day maximum duration unless approved by the City Engineer or designee.
2. require a pre-inspection to determine viability of permit issuance.
3. **not** be allowed on streets narrower than 30 feet wide (curb to curb).
4. **not** encroach onto an adjacent travel lane.
5. **not** create a traffic hazard, community inconvenience or nuisance. A minimum 20 foot clear zone is required for fire access at all times.
6. be reflectorized and have type 2 barricades with flashers at both ends. Additional traffic control may be required based on actual conditions.
7. have a flag person present when the container is occupied while on public right of way.
8. **not** interfere with storm water flows in the gutter.
9. be placed so as to minimize the sight visibility issues at intersections and adjacent driveways.
10. **not** be placed on parkways or near the drip line of trees.

I declare under penalty or perjury, that I have provided the city with the required insurance; paid associated fees; and read, understand, and agree to comply with the requirements noted above.

_____ _____

Signature of Applicant Date

Office Location: 175 N. Garfield Ave, Pasadena, CA 91101
Phone: (626) 744-4195 ** Fax: (626) 396-8999** Email: pw-permits@cityofpasadena.net

Revised 7/1/13

# Proposed Storage Container Guidelines – Street Occupation

**Instructions**
To place a storage container temporarily in the public right-of-way, a permit MUST be obtained from the Engineering Division of the Public Works Department. The permit application that begins the process can be obtained at the Engineering Services Section public counter at 175 N Garfield Ave.

**General Information**
A storage container must have reflectorization in accordance with City standards which may include the placement of type 2 barricades with flashers. Caution must be taken to safeguard the traveling public. Applicant will be held responsible for any accidents resulting from the location of this equipment, as well as for damage to public streets, curbs, sidewalks and other public property.

**Rules and Regulations of Storage Container**

1) Each application shall require:

   a) The name and address of the applicant, showing legal identity (individual, partnership, or corporation, etc.) as applicable. The applicant must be the person residing in the home or the person operating the business in front of which the storage container is to be placed;

   b) The purpose in requesting the permit.

   c) The business location and owner of the storage container;

   d) The duration the storage container would be stored on public right-of-way (10 day maximum);

   e) All other information reasonably required by the City Engineer to fulfill the intent of the application;

   f) As a part of the application, the applicant agrees to absolve the City of any claims or any liabilities in connection with the placing of storage container.

2) The City Engineer, or designee, may inspect the site to ascertain a possible alternative to placing the storage container on the street.

3) If no such alternative exists, the City Engineer, or designee, may inspect the proposed street location to determine if a traffic hazard, community inconvenience, or nuisance will be created.

4) If storage container must be placed in the public street, the City Engineer, or designee, may approve the location by pre-inspection where the proposed storage container is to be placed, taking into consideration such factors as distance from intersection, proximity of neighboring driveways, visibility offered to drivers, etc.

5) The City Engineer, or designee, shall determine the maximum length of time the bin shall be allowed to remain on the City street, (NOT more than ten (10) days except in extraordinary circumstances at the sole discretion of the City Engineer or designee).

6) The completed application and recommendation shall be considered by the City Engineer, or designee, for approval/disapproval.

7) The applicant shall be notified of approval/disapproval.

8) If approved, the applicant shall furnish the necessary insurance and pay the associated fees based per city fee schedule based on duration of described permit.

**Fee Payment**

Storage Containers – Estimate for Public Works Street Occupancy Permit

| **Per City Fee Schedule (FY13)** | **1-3 Days** | **4-10 Days** |
|---|---|---|
| **Processing Fee** | $41.75 | $41.75 |
| **Inspection per week** | $88.02 | $88.02 |
| **Rental** | $47.29 | $85.83 |
| **Total** | **$177.06** | **$215.60** |

Fees are based on 500 square feet or less

Contact information as follows:

Department of Public Works
Engineering Services Section
175 N. Garfield Avenue
Pasadena, CA 91101
Phone (626) 744-4195
Fax (626) 396-8999
Email: pw-permits@cityofpasadena.net

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| | Special Notes: Unless otherwise noted, whenever a Deposit amount is listed, applicant pays processing fee plus deposit; a portion of these charges may be refunded if actual cost is less than processing/deposit fees collected. | | | | |
| | | | | | |
| | **Barricades Installation Fees - Delivery/Pick-up by City Staff** | | | | |
| 972 | Delivery and/or Pick-up by City Staff, Small Events (one City block) | | $420.99 | | $430.33 |
| 973 | Delivery and/or Pick-up by City Staff, Large Events (more than one City block) | | $691.28 | | $706.62 |
| | | | | | |
| | **Barricades Rental Fee** | | | | |
| 974 | Non-Profit Rental and Neighborhood Block Parties | | No Charge | | No charge |
| 975 | All Others | | $148.56 | | $151.86 |
| | | | | | |
| 976 | Basic Nonrefundable Administrative Processing Fee | | $40.85 | | $41.75 |
| | | | | | |
| | **City Hall Courtyard and Rotunda Rental** | | | | |
| | **Residential/Local Hourly Rental Rates (4 Hour Minimum Required)** | | | | |
| 977 | Nonprofit Group | | $310.18 | | $317.06 |
| 978 | Private Individual | | $310.18 | | $317.06 |
| 979 | Commercial Group | | $623.50 | | $637.33 |
| | **Non-Resident/Non-Local Hourly Rental Rates (4 hour Minimum Required)** | | | | |
| 980 | Nonprofit Group | | $466.84 | | $477.20 |
| 981 | Private Individual | | $623.50 | | $637.33 |
| 982 | Commercial Group | | $946.21 | | $967.21 |
| | **Resident/Local - Hourly Set Up/Clean Up Rate** | | | | |
| 983 | Nonprofit Group | | $130.55 | | $133.44 |
| 984 | Private Individual | | $130.55 | | $133.44 |
| 985 | Commercial Group | | $130.55 | | $133.44 |
| | **Non-Resident/Non-Local - Hourly Set Up/Clean Up Rate** | | | | |
| 986 | Nonprofit Group | | $196.34 | | $200.70 |
| 987 | Private Individual | | $196.34 | | $200.70 |
| 988 | Commercial Group | | $196.34 | | $200.70 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 989 | Rest Rooms Clean-up and restocking fee | | $215.35 | | $220.13 |
| 990 | Security Guard, Up to 4 hours (when restrooms are in use only) | | Contract | | Contract |
| 991 | Security Guard, Each Addtnl Hr, over 4hrs (when restrooms are in use only) | | Contract | | Contract |
| 992 | Fountain | | $186.27 | | $190.40 |
| *993* | *Cleaning/Security Deposit, Refundable* | *$783.29* | | $800.67 | |
| 994 | Event/Sound Monitor Permit Fee, per hour | | $42.25 | | $43.18 |
| 995 | Electrician Fee | | $121.15 | | $123.83 |
| 996 | Trash & Recycle Fees | | $292.43 | | $298.91 |
| | | | | | |
| | **City Property - Damage reimbursement** | | | | |
| | **Street Light & Traffic Signal Knockdown** | | | | |
| 997 | Knockdown located on State Highway | | At Cost | | At Cost |
| 998 | Knockdown located - other | | At Cost | | At Cost |
| 999 | Miscellaneous Accident Damage | | At Cost | | At Cost |
| | | | | | |
| | **Condominium Conversions** | | | | |
| 1000 | *Review and Processing* | *$1,702.34* | At Cost | $1,000.00 | At Cost |
| | | | | | |
| | **Construction and Demolition** | | | | |
| | **Administrative Review Fee** | | | | |
| *1001* | *Refundable Performance Security Deposit* | *Whichever is less, 3% of Project Valuation or $30,000* | | *Whichever is less, 3% of Project Valuation or $30,000* | |
| 1002 | Commercial and City of Pasadena Projects New Construction | | $307.04/5,000sq ft or portion thereof | | $313.85/5,000sq ft or portion thereof |
| 1003 | Multifamily Residential New Construction (per unit) | | $268.41 | | $274.36 |
| 1004 | Single Family Residential New Construction (per unit) | | $178.59 | | $182.55 |
| 1005 | Tenant Improvements (includes residential additions) (per unit) | | $61.61 | | $62.98 |
| | | | | | |
| | | | | | |
| *1006* | *Construction Staging Plan Review And Monitoring* | *$543.08* | At Cost | *$555.13* | At Cost |
| | | | | | |
| | **Easement Application** | | | | |
| *1007* | *Standard Easement* | *$1,378.58* | At Cost | *$1,409.18* | At Cost |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| *1008* | *Quitclain of Easement* | *$2,109.65* | At Cost | *$2,156.48* | At Cost |
| | | | | | |
| | **Engineering Plan Review** | | | | |
| | **Civil Design** | | | | |
| *1009* | *Per Sheet Up to 10 Sheets* | *$1,514.35* | At Cost | *$1,547.97* | At Cost |
| *1010* | *Per Sheet More than 10 Sheets* | *$1,020.90* | At Cost | *$1,043.56* | At Cost |
| | | | | | |
| | **Street Light & Traffic Signal Design** | | | | |
| *1011* | *Street Light Plan Check (per sheet)* | *$1,002.61* | *At Cost* | *$1,024.86* | At Cost |
| *1012* | *Traffic Signal Plan Check (per sheet)* | *$2,464.74* | *At Cost* | *$2,519.45* | At Cost |
| *1013* | *Street Light Design (per sheet)* | *$4,616.16* | *At Cost* | *$4,718.64* | At Cost |
| *1014* | *Traffic Signal Design (per sheet)* | *$4,334.18* | *At Cost* | *$4,430.39* | At Cost |
| *1015* | *Street Light Installation (per pole). Cost of pole is separate.* | *$2,892.93* | *At Cost* | *$2,957.15* | At Cost |
| *1016* | *Street Light and Traffic Signal Relocation (per pole)* | *$6,443.83* | *At Cost* | *$6,586.88* | At Cost |
| | | | | | |
| *1017* | *Miscellaneous Street Light and Traffic Signal Relocation (per item)* | *$4,386.40* | *At Cost* | *$4,483.77* | At Cost |
| | | | | | |
| | **Final Parcel Map Review** | | | | |
| *1018* | *Review and Processing* | *$2,046.99* | *At Cost* | *$2,092.42* | At Cost |
| | | | | | |
| | **Final Tract Map Review** | | | | |
| *1019* | *Review and Processing* | *$2,402.08* | *At Cost* | *$2,455.40* | At Cost |
| | | | | | |
| | **License Agreement Processing Fee [P.M.C. Sec. 3.24.030]** | | | | |
| *1020* | *License Agreement Processing Fee* | *$3,331.57* | At Cost | *$3,405.53* | At Cost |
| 1021 | Application Fee | | $290.72 | | $297.17 |
| | **News rack Permit - Non-Refundable Administrative Processing Fee Applied to each Permit** | | | | |
| 1022 | Initial Application, per news rack | | $44.54 | | $45.53 |
| 1023 | Initial Application - Accelerated Implementation Program, per news rack | | 50% of Initial Application fee | | 50% of Initial Application fee |
| 1024 | Annual Permit, per news rack | | $11.12 | | $11.36 |
| 1025 | News rack Collection and Storage Fee, per news rack | | $111.44 | | $113.90 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| | | | | | |
| 1026 | Plans And Specifications Mailing Fee (based on size) | | At Cost | | At Cost |
| | | | | | |
| | **Public Improvement Permit** | | | | |
| 1027 | Non-Refundable Administrative Processing Fee Applied to Each Permit | | $40.45 | | $41.34 |
| 1028 | Drive Approach Repairs Or Widening | | $145.33 | | $148.55 |
| | | | | | |
| | **Drive Approach Installation or Replacement** | | | | |
| 1029 | Residential | | $228.25 | | $233.31 |
| 1030 | Commercial | | $316.55 | | $323.57 |
| 1031 | Temporary Drive Approaches | | $121.67 | | $124.37 |
| | | | | | |
| | **Sidewalk Repair, Installation or Replacement** | | | | |
| 1032 | 0-100 Square Feet | | $110.86 | | $113.32 |
| 1033 | 101-250 Square Feet | | $222.87 | | $227.81 |
| 1034 | 251-500 Square Feet | | $333.78 | | $341.19 |
| 1035 | >500 Square Feet - Amount Per Square Fee | | $1.00 | | $1.02 |
| | | | | | |
| | **Curb and/or Gutter, Installation or Replacement** | | | | |
| 1036 | Up to 10 Lineal Feet | | $110.86 | | $113.32 |
| 1037 | 11-25 Lineal Feet | | $222.87 | | $227.81 |
| 1038 | 26-50 Lineal Feet | | $333.78 | | $341.19 |
| 1039 | 51-100 Lineal Feet | | $556.65 | | $569.01 |
| 1040 | >100 Lineal Feet - Amount per Lineal Ft | | $5.20 | | $5.31 |
| 1041 | Roof Drains, Installation or Replacement | | $145.33 | | $148.55 |
| | | | | | |
| | **Storm Drains, Installation, Repair or Removal of Catch Basins, Culverts, Sewer Mains & Laterals** | | | | |
| 1042 | Up-25 Square Feet | | $217.49 | | $222.32 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1043 | 26-100 Square Feet | | $343.44 | | $351.06 |
| 1044 | 101-500 Square Feet | | $498.54 | | $509.60 |
| 1045 | >500 Square Feet - Amount per square feet | | $0.90 | | $0.91 |
| 1046 | Saddle Charge (for Sewer Laterals) | | $77.32 | | $79.03 |
| 1047 | Wheelchair Ramp | | $311.17 | | $318.08 |
| 1048 | Manholes | | $321.93 | | $329.07 |
| 1049 | Manholes (each additional) | | $43.03 | | $43.98 |
| | | | | | |
| | **Boreholes** | | | | |
| 1050 | 1 To 5 | | $217.49 | | $222.32 |
| 1051 | 6 To 10 | | $255.19 | | $260.85 |
| 1052 | 11 To 20 | | $291.80 | | $298.27 |
| 1053 | 21 To 30 | | $327.31 | | $334.57 |
| 1054 | 31 To 40 | | $363.91 | | $371.99 |
| 1055 | 41 To 50 | | $400.52 | | $409.41 |
| 1056 | 51 To 60 | | $437.13 | | $446.82 |
| 1057 | 61 To 70 | | $473.73 | | $484.24 |
| | | | | | |
| | **Sidewalk Dining Occupancy Permit** | | | | |
| 1058 | Application (Occupancy) | | $189.50 | | $193.70 |
| 1059 | Annual Renewal Processing Fee | | $78.33 | | $200.00 |
| | Occupancy Fee (annual fee; based on Square Foot (SF) of area occupied & the land value of adjacent property) | | | | |
| 1060 | Non-Refundable Administrative Processing Fee Applied to Each Permit | | $40.85 | | $41.75 |
| | | | | | |
| | **Street Rental Location** | | | | |
| 1061 | Colorado Boulevard - Pasadena Avenue to Arroyo Parkway | | $13.89 | | $14.19 |
| 1062 | Green Street - Pasadena Avenue to Arroyo Parkway | | $10.97 | | $11.20 |
| 1063 | Union Street - Pasadena Avenue to Arroyo Parkway | | $11.49 | | $11.74 |
| 1064 | Holly Street - Fair Oaks Avenue to Arroyo Parkway | | $10.97 | | $11.20 |
| 1065 | Pasadena Avenue - Green Street to Union Street | | $11.49 | | $11.74 |
| 1066 | De Lacey Avenue - Green Street to Union Street | | $11.49 | | $11.74 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1067 | Fair Oaks Avenue - Green Street to Holly Street | | $12.85 | | $13.13 |
| 1068 | Raymond Avenue - Green Street to Holly Street | | $11.49 | | $11.74 |
| 1069 | Arroyo Parkway - Green Street to Holly Street | | $12.85 | | $13.13 |
| 1070 | Los Robles Avenue - Union Street to Colorado Boulevard | | $12.85 | | $13.13 |
| 1071 | Marengo Avenue - Colorado Boulevard to Green Street | | $11.49 | | $11.74 |
| 1072 | Lake Avenue - Colorado Boulevard to California Boulevard | | $12.85 | | $13.13 |
| 1073 | California Boulevard - Lake Avenue to Pasadena Avenue | | $11.07 | | $11.31 |
| 1074 | Colorado Boulevard - Lake Avenue to Catalina Avenue | | $7.62 | | $7.79 |
| 1075 | Colorado Boulevard - Hudson Avenue to Lake Avenue | | $6.37 | | $6.51 |
| 1076 | Cordova Street - Hudson Avenue to Mentor Ave | | $5.33 | | $5.44 |
| 1077 | Green Street - Hudson Avenue to Mentor Avenue | | $5.33 | | $5.44 |
| 1078 | Del Mar Boulevard - Hudson Avenue to Mentor Avenue | | $5.33 | | $5.44 |
| 1079 | McCormick Alley | | $9.40 | | $9.60 |
| 1080 | Mercantile Place | | $9.40 | | $9.60 |
| 1081 | Mills Place | | $9.40 | | $9.60 |
| 1082 | Green Street - Mentor Avenue to Wilson Avenue | | $4.70 | | $4.80 |
| 1083 | Harkness Avenue - Colorado Boulevard to Walnut Street | | $3.55 | | $3.62 |
| 1084 | El Molino Avenue - Colorado Boulevard to Green Street | | $3.55 | | $3.62 |
| 1085 | Lake Avenue - Union Street to Colorado Boulevard | | $8.67 | | $8.86 |
| 1086 | Madison Avenue - Colorado Boulevard to Green Street | | $3.55 | | $3.62 |
| 1087 | Colorado Boulevard - Catalina Avenue to Hill Avenue | | $7.62 | | $7.79 |
| 1088 | Colorado Boulevard - Arroyo Parkway to Los Robles Avenue | | $12.32 | | $12.59 |
| 1089 | Colorado Boulevard - Sierra Madre Boulevard to Altadena Drive | | $6.16 | | $6.29 |
| 1090 | Chester Avenue - Colorado Boulevard to Walnut Street | | $2.82 | | $2.88 |
| 1091 | Fair Oaks Avenue - Green Street to California Boulevard | | $9.50 | | $9.71 |
| 1092 | Mentor Avenue - Colorado Boulevard to Union Street | | $3.55 | | $3.63 |
| 1093 | Allen Avenue - Casa Grande Street to Brigden Road | | $4.07 | | $4.16 |
| 1094 | Colorado Boulevard - Oakland Avenue to Hudson Avenue | | $7.62 | | $7.79 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1095 | Colorado Boulevard - Hill Avenue to Allen Avenue | | $8.56 | | $8.75 |
| 1096 | Colorado Boulevard - Los Robles Avenue to Oakland Avenue | | $10.13 | | $10.35 |
| 1097 | Dayton Street - De Lacey Avenue to Fair Oaks Avenue | | $8.04 | | $8.22 |
| 1098 | MTA Right-of-Way: Between Holly Street and Union Street, Between Union Street and Colorado Boulevard, and between Colorado Boulevard and Green Street | | $9.40 | | $9.61 |
| | **Refuse Storage Permit** | | | | |
| 1099 | Annual permit | | $91.61 | | $93.64 |
| *1100* | *Guarantee Deposit* | *$2,046.00* | | *$2,091.00* | |
| | | | | | |
| 1101 | **Solid Waste Non-Exclusive Franchise Fee (Percent of Gross Monthly Receipts)** | | 23.066% | | 23.066% |
| 1102 | Solid Waste Franchise Application Fee | | $254.21 | | $259.85 |
| | | | | | |
| | **RBOC Special Events Refuse Rates** | | | | |
| 1103 | Additional 30 bins dumped | | NEW | | $635.36 |
| 1104 | Events ***over*** 25,000 | | NEW | | $2,958.96 |
| 1105 | Events ***under*** 25,000 | | NEW | | $1,726.58 |
| 1106 | UCLA games | | NEW | | $2,958.96 |
| 1107 | Flea Market refuse rate | | NEW | | $1,244.83 |
| | | | | | |
| | **Refuse Collection Fees** | | | | |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1108 | 100 Gallon Mixed Waste | | $40.99 | | $40.99 |
| 1109 | 100 Gallon Mixed Waste - Commercial | | $50.44 | | $51.55 |
| 1110 | 100 Gallon Mixed Waste - City | | $50.44 | | $51.55 |
| 1111 | 32 Gallon Mixed Waste | | $16.29 | | $16.29 |
| 1112 | 32 Gallon Mixed Waste - Commercial | | $20.05 | | $20.49 |
| 1113 | 60 Gallon Mixed Waste | | $26.44 | | $26.44 |
| 1114 | 60 Gallon Mixed Waste - Commercial | | $32.54 | | $33.26 |
| 1115 | 60 Gallon Mixed Waste - City | | $32.65 | | $33.26 |
| 1116 | Admin/Refuse | | $11.78 | | $11.78 |
| 1117 | 100 Gallon Mixed Waste Additional | | $34.70 | | $34.70 |
| 1118 | 100 Gallon Mixed Waste Additional - Commercial | | $42.70 | | $43.64 |
| 1119 | 100 Gallon Mixed Waste Additional - City | | $42.70 | | $43.64 |
| 1120 | 32 Gallon Mixed Waste Additional | | $13.44 | | $13.44 |
| 1121 | 32 Gallon Mixed Waste Additional - Commercial | | $16.97 | | $17.34 |
| 1122 | 60 Gallon Mixed Waste Additional | | $22.11 | | $22.11 |
| 1123 | 60 Gallon Mixed Waste Additional - Commercial | | $27.55 | | $28.16 |
| 1124 | TRUCK Roll out w/ MANUAL Rollout CHARGE | | $23.63 | | $23.63 |
| 1125 | Truck Rollout | | $27.98 | | $27.98 |
| 1126 | Backyard-1 House on lot | | $43.39 | | $43.39 |
| 1127 | Special Curb Backyard-1 House on lot | | $43.39 | | $43.39 |
| 1128 | 60 mixed waste-15 UNIT MONTHLY | | $572.72 | | $585.43 |
| 1129 | Truck Rollout Additional | | $6.99 | | $6.99 |
| 1130 | Manual Rollout | | $23.63 | | $23.63 |
| 1131 | Manual Rollout - Commercial | | $54.57 | | $55.78 |
| 1132 | Manual Rollout Additional | | $11.12 | | $11.12 |
| 1133 | Manual Rollout Additional - Commercial | | $23.14 | | $23.65 |
| 1134 | Truck Rollout Commercial | | $39.80 | | $40.68 |
| 1135 | Truck Rollout 2nd Mix Waste - Commercial | | $8.35 | | $8.53 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1136 | Lockable Recycling | | $1.40 | | $1.40 |
| | **Refuse Collection Municipal Bins** | | | | |
| 1137 | 1 BIN-1 pick-up per week CITY account | | $157.34 | | $160.83 |
| 1138 | 2 BINS-1 pick-up per week CITY account | | $226.68 | | $231.71 |
| 1139 | 2 BINS 2 pick-ups per week CITY account | | $399.56 | | $408.43 |
| 1140 | 2 BINS-3 pick-ups per week CITY account | | $572.44 | | $585.14 |
| 1141 | 2 BINS-5 Pick-ups per week CITY account | | $918.20 | | $938.58 |
| 1142 | 3 BINS-1 pick-up per week CITY account | | $296.02 | | $302.59 |
| 1143 | 3 BINS-2 pick-ups per week CITY account | | $538.24 | | $550.18 |
| 1144 | 3 BINS-3 pick-ups per week CITY account | | $780.46 | | $797.78 |
| 1145 | 3 BINS-5 pick-ups per week CITY account | | $1,264.91 | | $1,292.99 |
| 1146 | 4 BINS-1 pick-up per week CITY account | | $365.36 | | $373.47 |
| 1147 | 4 BINS-2 pick-ups per week CITY account | | $676.93 | | $691.95 |
| 1148 | 4 BINS-3 pick-ups per week CITY account | | $988.49 | | $1,010.43 |
| 1149 | 5 BINS-1 pick-up per week CITY account | | $434.70 | | $444.35 |
| 1150 | 5 BINS-3 pick-ups per week CITY account | | $1,196.51 | | $1,223.07 |
| 1151 | 6 BINS-2 pick-ups per week CITY account | | $954.29 | | $975.47 |
| 1152 | 2 BINS-5 pick-ups per week CITY account 40% | | $367.28 | | $375.43 |
| 1153 | 2 BINS-5 pick-ups per week CITY account 60% | | $550.92 | | $563.15 |
| 1154 | 8 BINS-2 pick-ups per week CITY account | | $1,231.66 | | $1,259.00 |
| 1155 | 30 BINS-1 pick-up per week CITY account | | $2,168.25 | | $2,216.38 |
| 1156 | 9 BINS-2 pick-ups per week CITY account 35% | | $479.62 | | $490.26 |
| 1157 | 9 BINS-2 pick-ups per week CITY account 65% | | $890.72 | | $910.49 |
| 1158 | Lifeline 60 MW | | $27.36 | | $27.36 |
| 1159 | 14 BINS-3 pick-ups per week CITY account | | $3,068.74 | | $3,136.86 |
| 1160 | 5 BINS-4 pick-ups per week CITY account | | $1,577.42 | | $1,612.43 |
| 1161 | Temporary BIN Service | | $92.95 | | $92.95 |
| 1162 | Additional BIN CITY account | | $69.34 | | $87.21 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1163 | Temporary BIN CITY account | | $92.95 | | $116.91 |
| 1164 | Additional Temporary BIN CITY account | | $92.95 | | $116.91 |
| 1165 | Bulky Item Pick Up Charge, after 2 free pick ups have been exhausted - 1/4 ton | | $49.39 | | $49.39 |
| 1166 | Bulky Item Pick Up Charge, after 2 free pick ups have been exhausted - 1/2 parkway | | $81.67 | | $81.67 |
| 1167 | Bulky Item Pick Up Charge, after 2 free pick ups have been exhausted - full parkway | | $103.72 | | $103.72 |
| 1168 | Change Out - Residential | | $35.81 | | $35.81 |
| 1169 | Yard Waste Contamination | | $19.71 | | $19.71 |
| 1170 | Damaged Container - Residential | | $76.73 | | $76.73 |
| 1171 | Mixed Waste Overfill 1st Notice | | $8.10 | | $8.10 |
| 1172 | Mixed Waste Overfill 2nd Notice | | $13.21 | | $13.21 |
| 1173 | Compost BIN | | Actual Cost | | At Cost |
| 1174 | Compost BIN Delivery | | $25.09 | | $25.64 |
| 1175 | Additional Container Pickup - Residential | | NEW | | $13.21 |
| 1176 | Additional Container Pickup - Commercial | | NEW | | $16.60 |
| | **Bin Collection Service - Residential** | | | | |
| 1177 | 1 Bin - 1 Pick-up per week - Residential | | $124.70 | | $124.70 |
| 1178 | 1 Bin - 2 Pick-ups per week - Residential | | $202.36 | | $202.36 |
| 1179 | 2 Bin - 1 Pick-up per week - Residential | | $171.91 | | $171.91 |
| 1180 | 2 Bin - 2 Pick-ups per week - Residential | | $264.17 | | $264.17 |
| 1181 | Additional Bin Pick Up - Residential | | NEW | | $69.34 |
| | **Bin Collection Service - Commercial** | | | | |
| 1182 | 1 BIN-1 Pick-up per week-Commercial | | $157.34 | | $160.83 |
| 1183 | 1 BIN-2 Pick-ups per week-Commercial | | $260.87 | | $266.66 |
| 1184 | 1 BIN-3 Pick-ups per week-Commercial | | $364.41 | | $372.49 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1185 | 1 BIN-4 Pick-ups per week-Commercial | | $467.95 | | $478.33 |
| 1186 | 1 BIN-5 Pick-ups per week-Commercial | | $571.49 | | $584.17 |
| 1187 | 2 BINS-1 Pick-up per week-Commercial | | $226.68 | | $231.71 |
| 1188 | 2 BINS 2 Pick-ups per week-Commercial | | $399.56 | | $408.43 |
| 1189 | 2 BINS-3 Pick-ups per week-Commercial | | $572.44 | | $585.14 |
| 1190 | 2 BINS-5 Pick-up per week-Commercial | | $918.20 | | $938.58 |
| 1191 | 3 BINS-1 Pick-up per week-Commercial | | $296.02 | | $302.59 |
| 1192 | 3 BINS-2 Pick-ups per week-Commercial | | $538.24 | | $550.18 |
| 1193 | 3 BINS-3 Pick-ups per week-Commercial | | $780.48 | | $797.80 |
| 1194 | 3 BINS-5 Pick-ups per week-Commercial | | $1,264.91 | | $1,292.99 |
| 1195 | 4 BINS-1 Pick-up per week-Commercial | | $365.36 | | $373.47 |
| 1196 | 4 BINS-2 Pick-ups per week-Commercial | | $676.93 | | $691.95 |
| 1197 | 4 BINS-3 Pick-ups per week-Commercial | | $988.49 | | $1,010.43 |
| 1198 | 4 BINS-4 Pick-ups per week-Commercial | | $1,300.05 | | $1,328.91 |
| 1199 | 5 BINS-1 Pick-up per week-Commercial | | $434.70 | | $444.35 |
| 1200 | 5 BINS-2 Pick-ups per week-Commercial | | $815.61 | | $833.71 |
| 1201 | 6 BINS-3 Pick-ups per week-Commercial | | $1,404.54 | | $1,435.72 |
| 1202 | 7 BINS-2 Pick-ups per week-Commercial | | $1,092.98 | | $1,117.24 |
| 1203 | 6 BINS-2 Pick-ups per week-Commercial | | $954.29 | | $975.47 |
| 1204 | Additional BIN Pickup - Commercial | | $69.34 | | $87.21 |
| 1205 | Change Out - Commercial | | $35.81 | | $45.04 |
| 1206 | Damaged BIN - Commercial | | $78.33 | | $98.52 |
| 1207 | Confiscation charge commercial bin | | $45.51 + tipping and storage fee | | $46.52 + tipping and storage fee |
| 1208 | Confiscation charge roll off | | $85.08 + tipping and storage fee | | $86.96 + tipping and storage fee |
| 1209 | 10 yard roll off box - up to 5 tons | | $350.93 | | $358.72 |
| 1210 | 40 yard roll off box MSW - up to 5 tons | | $357.98 | | $365.92 |
| 1211 | 40 yard roll off box C&D - up to 5 tons | | $392.32 | | $401.02 |
| 1212 | Delivery charge of roll-off | | $75.97 | | $77.65 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1213 | Utility cart | | Actual Cost | | At Cost |
| | **Recycling Event** | | | | |
| 1214 | Classic Car Show Entrance Fee | | $21.62 | | $22.09 |
| | | | | | |
| | **Graffiti Removal - Restitution** | | **Will establish a restitution amount owed for prosecuted cases** | | |
| 1215 | Graffiti Removal for areas up to 100 square feet | | $152.96 | | $156.35 |
| 1216 | Graffiti Removal for areas greater than 100 square feet | | Actual Cost | | At Cost |
| | | | | | |
| | | | | | |
| | | | | | |
| | **Street Light Inspection** | | | | |
| *1217* | *Street Light Inspection* | *$772.84* | At Cost | *$2,500.00* | At Cost |
| | | | | | |
| | **Street and/or Sidewalk Occupancy** | | | | |
| 1218 | Non-Refundable Administrative Processing Fee Applied to Each Permit | | $40.85 | | $41.75 |
| | | | | | |
| | **General Occupancy** | | | | |
| | **Duration (Areas of occupancy 1-500 Square Feet)** | | | | |
| 1219 | Sidewalk/Parkway Occupancy Inspection per month or portion there of | | $71.07 | | $72.64 |
| 1220 | Per Each Additional Square Foot over 500 Square Feet of Sidewalk/Parkway Occupied - Amount per square foot | | $0.03 | | $0.03 |
| 1221 | Street Occupancy Inspection Per Week or portion thereof | | $86.11 | | $88.02 |
| 1222 | Per Each Additional Square Foot over 500 Square Feet of Street Occupied - Amount per Square Foot | | $0.0460 | | $0.04 |
| | | | | | |
| | **Rental (occupancy of the public right of way)** | | | | |
| 1223 | 1-3 Days | | $46.27 | | $47.29 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| 1224 | 4-7 Days | | $83.97 | | $85.83 |
| 1225 | 8-30 Days | | $335.93 | | $343.38 |
| 1226 | 31-60 Days | | $666.47 | | $681.26 |
| 1227 | 61-90 Days | | $1,001.35 | | $1,023.58 |
| 1228 | 91-180 Days | | $2,001.66 | | $2,046.09 |
| 1229 | 181 Days - 1 Year | | $4,050.73 | | $4,140.66 |
| 1230 | Per Each Additional Square Foot over 500 Square Feet - Amount per square Foot per day | | $0.02 | | $0.02 |
| | | | | | |
| | **Film Occupancy** | | | | |
| 1231 | Processing | | $47.36 | | $48.41 |
| 1232 | Inspection (per location) | | $69.97 | | $71.52 |
| | | | | | |
| | **Street Vacation, Summary Vacation, and Closing a Street Without Vacation** | | | | |
| *1233* | *Per Request* | *$5,413.63* | | *$5,533.81* | |
| 1234 | Application Fee | | $454.36 | | $464.44 |
| | | | | | |
| | **Temporary Street Closure/Special Events** | | | | |
| 1235 | Neighborhood block parties | | No Charge | | No Charge |
| 1236 | Non profit organizations | | 50% of Permit | | 50% of Permit |
| 1237 | Permit | | $85.06 | | $86.95 |
| | **Tree Removal** | | | | |
| 1238 | Tree Removal - Amount set by Public Works Dept - subject to refund or additional billing. | | $222.87 | | At Cost |
| 1239 | Tree Assessed Value of Removed Tree | | TBD by City Crews based on ISA guide | | TBD by City Crews based on ISA guide |
| 1240 | Tree Trimming - Admin. Charge in addition to pass-thru | | $116.92 | | $119.51 |
| | | | | | |
| | **Trees planted by City Crews (Development)** | | | | |
| 1241 | 24" Box (not including tree and materials) | | $1,114.41 | | $1,139.14 |
| 1242 | 36" Box (not including tree and materials) | | $1,491.27 | | $1,524.37 |

| Fee # | Description | Revised FY 2013 Deposit | Revised FY 2013 Processing | Adopted FY 2014 DEPOSIT | Adopted FY 2014 PROCESSING |
|---|---|---|---|---|---|
| | **PUBLIC WORKS DEPARTMENT** | | | | |
| | | | | | |
| | **Trees planted by City Crews (Residential)** | | | | |
| 1243 | 24" Box (not included tree and materials) | | NEW | | $265.00 |
| 1244 | 36" Box (not including tree and materials) | | NEW | | $647.25 |
| | | | | | |
| *1245* | *Parks/Forestry Inspection* | *$564.67* | At Cost | *Deposit subject to work required* | At Cost |
| 1246 | Hazard Assessment Private Tree Inspection | | $82.87 | | $84.71 |
| | | | | | |
| | **Utility Excavation Permit** | | | | |
| | **Utility Cut Type and Area** | | | | |
| 1247 | Non-Refundable Administrative Processing Fee Applied to Each Permit | | $40.85 | | $41.75 |
| | **Earth Cuts** | | | | |
| 1248 | 0-50 Square Feet | | $178.75 | | $182.71 |
| 1249 | 51-100 Square Feet | | $264.85 | | $270.73 |
| 1250 | >101 Square Feet (each add'l 100 Square Feet or portion thereof) | | $86.11 | | $88.02 |
| | | | | | |
| | **Pavement Cuts** | | | | |
| 1251 | 0-50 Square Feet | | $232.58 | | $237.74 |
| 1252 | 51-100 Square Feet | | $403.76 | | $412.72 |
| 1253 | >101 Square Feet (each add'l 100 Square Feet or portion thereof) | | $185.17 | | $189.27 |
| 1254 | USA (Underground Service Alert)** | | $55.98 | | $57.22 |
| 1255 | Street Cut in Moratorium Street** | | $117.34 | | $119.94 |
| | **In certain cases, these special fees will be charged in addition to Excavation Inspection & Permit Processing fees listed above. | | | | |
| | | | | | |

# Enclosure 6

# 123374 Pasadena OE

# Project Deliverables List

**Report Date** *January 15, 2014*

| Document No. | Engineering Discipline | Document Title | Current Rev. Date | Current Rev. No. | Released |
|---|---|---|---|---|---|
| 081113 | ARCHITECTURAL | HOLLOW METAL DOORS AND FRAMES | 10-Oct-13 | A | RFP |
| 083323 | ARCHITECTURAL | OVERHEAD COILING DOORS | 10-Oct-13 | A | RFP |
| 087100 | ARCHITECTURAL | DOOR HARDWARE | 10-Oct-13 | A | RFP |
| 092900 | ARCHITECTURAL | GYPSUM BOARD | 10-Oct-13 | A | RFP |
| 093100 | ARCHITECTURAL | CERAMIC TILE | 10-Oct-13 | A | RFP |
| 095113 | ARCHITECTURAL | ACOUSTICAL PANEL CEILINGS | 10-Oct-13 | A | RFP |
| 096513 | ARCHITECTURAL | RESILIENT BASE AND ACCESSORIES | 10-Oct-13 | A | RFP |
| 096519 | ARCHITECTURAL | RESILIENT TILE FLOORING | 10-Oct-13 | A | RFP |
| 096723 | ARCHITECTURAL | RESINOUS FLOOR COATING | 10-Oct-13 | A | RFP |
| 096900 | ARCHITECTURAL | ACCESS FLOORING | 10-Oct-13 | A | RFP |
| 099123 | ARCHITECTURAL | INTERIOR PAINTING | 10-Oct-13 | A | RFP |
| 102113 | ARCHITECTURAL | TOILET COMPARTMENTS | 10-Oct-13 | A | RFP |
| 102800 | ARCHITECTURAL | TOILET ACCESSORIES | 10-Oct-13 | A | RFP |
| 105113 | ARCHITECTURAL | METAL LOCKERS | 10-Oct-13 | A | RFP |
| 123200 | ARCHITECTURAL | MANUFACTURED WOOD CASEWORK | 10-Oct-13 | A | RFP |
| 123553 | ARCHITECTURAL | LABORATORY CASEWORK | 10-Oct-13 | A | RFP |
| 133419 | ARCHITECTURAL | METAL BLDG SYS SINGLE METAL PANELS WALLS AND ROOF | 10-Oct-13 | A | RFP |
| 260000 | ELECTRICAL | ELECTRICAL-MECHANICAL EQUIPMENT | 10-Sep-13 | D | RFP |
| 260533 | ELECTRICAL | NON-SEG BUS SPECIFICATION | 9-Sep-13 | A | RFP |
| 261200.2 | ELECTRICAL | MEDIUM VOLTAGE AUXILIARY TRANSFORMERS SPECIFICATION | 9-Sep-13 | B | RFP |
| 262050 | ELECTRICAL | LOW VOLTAGE MOTORS | 10-Sep-13 | C | RFP |
| 262600 | ELECTRICAL | PDC SPECIFICATION | 9-Sep-13 | B | RFP |
| 263323.1 | ELECTRICAL | 125VDC BATTERY SYSTEM SPECIFICATION | 9-Sep-13 | B | RFP |
| 262323.2 | ELECTRICAL | 24VDC BATTERY SYSTEM SPECIFICATION | 6-Sep-13 | A | RFP |
| 480020 | ALL | PASADENA SITE CONDITIONS | 10-Sep-13 | I | RFP |
| 480033 | ALL | NOISE CONTROL PERFORMANCE | 10-Dec-13 | B | RFP |
| 480032.1 | - | BALANCE OF PLANT CONTRACTOR PERFORMANCE TESTING | 21-Oct-13 | A | RFP |
| 485072 | MECHANICAL | COATING OF PIPING AND TANKS | 9-Sep-13 | A | RFP |
| 485080 | MECHANICAL | PIPING AND EQUIP INSULATION | 18-Sep-13 | A | RFP |
| 485090 | MECHANICAL | CATHODIC PROTECTION | 9-Sep-13 | A | RFP |
| 485121 | MECHANICAL | GENERAL SERVICE CONTROL VALVES | 15-Jul-13 | A | RFP |
| 485172 | MECHANICAL | FIELD FABRICATED TANKS - STEEL SPECIFICATION | 15-Jul-13 | A | RFP |
| 485173 | MECHANICAL | SHOP FABRICATED TANKS SPECIFICATION | 10-Dec-13 | C | RFP |
| 485311.10 | MECHANICAL | HORIZONTAL CENTRIFUGAL PUMPS – GENERAL SERVICE SPECIFICATION | 10-Dec-13 | C | RFP |
| 485325.11 | MECHANICAL | AMMONIA FORWARDING PUMP SKID SPECIFICATION | 26-Jul-13 | A | RFP |
| 485422 | MECHANICAL | SHELL AND TUBE HEAT EXCHANGER | 9-Dec-13 | B | RFP |
| 485951.96 | MECHANICAL | POTABLE WATER SYSTEM PUMP SKID | 9-Dec-13 | B | RFP |
| 485952.05 | MECHANICAL | CHEMICAL FEED SYSTEM - COOLING TOWER | 14-Oct-13 | B | RFP |
| 485952.06 | MECHANICAL | CHEMICAL FEED SYSTEMS - STEAM GENERATOR | 14-Oct-13 | B | RFP |
| 485956 | MECHANICAL | FIRE PREVENTION AND PROTECTION SYSTEM | 29-Aug-13 | A | RFP |
| 485956.10 | MECHANICAL | FIRE ALARM AND SIGNALING SYSTEMS | 29-Aug-13 | A | RFP |
| 485956.30 | MECHANICAL | FIRE WATER SPRINKLER SYSTEM | 14-Oct-13 | B | RFP |
| 037-1758 | ALL | SOIL EXCAVATION VOLUMES | 18-Aug-11 | A | RFP |
| 037-5033 | ALL | PASADENA GT-5 DESIGN CRITERIA | 17-Dec-13 | D | SPEC |
| 037-4780 | CONTROLS | PCS/CONTROL SYSTEM SPECIFICATION | 10-Dec-13 | B | SPEC |
| 037-5056 | ARCHITECTURAL | ARCHITECTURAL SCOPE OF WORK | 23-Oct-13 | B | SPEC |
| 261300-1 | ELECTRICAL | 15KV SWITCHGEAR SPECIFICATION | 10-Oct-13 | B | SPEC |
| 261300-2 | ELECTRICAL | 5KV SWITCHGEAR SPECIFICATION | 10-Oct-13 | B | SPEC |
| 263323-2 | ELECTRICAL | 24VDC BATTERY SYSTEM SPECIFICATION | 9-Sep-13 | A | SPEC |
| A1-2-1 | ARCHITECTURAL | CONTROL BUILDING MAIN FLOOR PLAN | 10-Oct-13 | D | SPEC |
| A1-3-1 | ARCHITECTURAL | CONTROL BUILDING EXTERIOR ELEVATIONS | 10-Oct-13 | D | SPEC |
| A1-9-1 | ARCHITECTURAL | CONTROL BUILDING & WATER LAB ROOM FINISH, DOOR AND WINDOW SCHEDULES | 10-Oct-13 | D | SPEC |
| A1-9-2 | ARCHITECTURAL | CONTROL BUILDING & WATER LAB DOOR AND WINDOW DETAILS | 10-Oct-13 | D | SPEC |
| A2-1-1 | ARCHITECTURAL | ROOF DEMOLITION PLAN | 24-Sep-13 | C | SPEC |

# 123374 Pasadena OE

# Project Deliverables List

**Report Date** *January 15, 2014*

| Document No. | Engineering Discipline | Document Title | Current Rev. Date | Current Rev. No. | Released |
|---|---|---|---|---|---|
| A2-1A | ARCHITECTURAL | WELDING SHOP FLOOR PLAN | 16-Jul-13 | A | SPEC |
| A2-2-1 | ARCHITECTURAL | MAINTENANCE SHOP MAIN FLOOR PLAN | 10-Oct-13 | D | SPEC |
| A2-2-2 | ARCHITECTURAL | MAINTENANCE SHOP MEZZANINE | 24-Sep-13 | C | SPEC |
| A2-3-1 | ARCHITECTURAL | MAINTENANCE SHOP EXTERIOR ELEVATIONS | 24-Sep-13 | C | SPEC |
| A2-4-1 | ARCHITECTURAL | MAINTENANCE SHOP SECTIONS | 10-Oct-13 | D | SPEC |
| A2-5-1 | ARCHITECTURAL | MAINTENANCE SHOP DETAILED PLANS | 10-Oct-13 | D | SPEC |
| A2-9-1 | ARCHITECTURAL | ROOM DOOR FINISH SCHEDULES | 10-Oct-13 | D | SPEC |
| A3-1 | ARCHITECTURAL | CONTROL BUILDING EXTERIOR ELEVATIONS | 27-Mar-13 | B | SPEC |
| A3-2-1 | ARCHITECTURAL | WELDING SHOP FLOOR PLAN | 24-Sep-13 | C | SPEC |
| A3-3-1 | ARCHITECTURAL | WELDING SHOP EXTERIOR ELEVATIONS | 24-Sep-13 | C | SPEC |
| A4-1 | ARCHITECTURAL | CONTROL BUILDING & WATER LAB BUILDING SECTIONS | 10-Oct-13 | D | SPEC |
| A4-2-1 | ARCHITECTURAL | WATER LABORATORY FLOOR PLAN | 10-Oct-13 | D | SPEC |
| A4-3-1 | ARCHITECTURAL | WATER LABORATORY EXTERIOR ELEVATIONS | 24-Sep-13 | C | SPEC |
| C1-3 | CIVIL | PRELIMINARY SITE PLAN LM6000 CONFIGURATION | 2-Oct-13 | K | SPEC |
| C3-1 | CIVIL | PRELIMINARY GRADING & DRAINAGE PLAN GAS TURBINE/AXIAL EXHAUST | 2-Oct-13 | F | SPEC |
| C3-3 | CIVIL | PRELIMINARY SITE SURFACING PLAN GAS TURBINE/AXIAL EXHAUST | 2-Oct-13 | A | SPEC |
| C3-4 | CIVIL | CONSTRUCTION PARKING, LAYDOWN, STAGING AND ACCESS PLAN | 2-Oct-13 | A | SPEC |
| C3-5 | CIVIL | PRELIMINARY SITE DETAILS GAS TURBINE/AXIAL EXHAUST | 7-Oct-13 | A | SPEC |
| CSK-1 | CIVIL | BOREHOLE LOCATION PLAN | 29-Apr-11 | B | SPEC |
| E1-1A | ELECTRICAL | ELECTRICAL OVERALL CONCEPTUAL ONE-LINE DIAGRAM (LM 6000) | 7-Jan-14 | G | ADD 2 |
| E1-2 | ELECTRICAL | ELECTRICAL OVERALL CONCEPTUAL PDC BUILDING LAYOUT | 10-Dec-13 | E | ADD 2 |
| E6-1 | ELECTRICAL | ELECTRICAL UNDERGROUND NOTES AND LEGEND | 4-Oct-13 | A | SPEC |
| E6-10 | ELECTRICAL | PROPOSED ELECTRICAL UNDERGROUND ROUTING | 7-Jan-14 | C | ADD 2 |
| I1-1 | CONTROLS | PLANT CONTROL SYSTEM ARCHITECTURE | 30-Aug-13 | A | SPEC |
| I1-2 | CONTROLS | CONTROL ROOM WORKSTATIONS | 30-Aug-13 | A | SPEC |
| ISK1-1 | CONTROLS | CONTROL SYSTEM ARCHITECTURE | 26-May-11 | A | SPEC |
| M1-1-1 | MECHANICAL | GENERAL ARRANGEMENT GAS TURBINE/AXIAL EXHAUST | 3-Jan-14 | L | ADD 2 |
| M1-1-6 | MECHANICAL | TIE POINT DRAWING GAS TURBINE/AXIAL EXHAUST | 3-Jan-14 | E | ADD 2 |
| M2-2-1 | MECHANICAL | PROCESS FLOW DIAGRAM WATER BALANCE (W/ INLET CHILLING) | 28-Feb-12 | D | SPEC |
| M2-2-4 | MECHANICAL | GLENARM INDUSTRIAL WASTEWATER | 17-Jul-13 | C | SPEC |
| M3-1-0 | MECHANICAL | P&ID-COVER SHEET | 15-Oct-13 | E | SPEC |
| M3-10-1 | MECHANICAL | P&ID-GLAND STEAM SYSTEM | 6-Dec-13 | E | SPEC |
| M3-1-1 | MECHANICAL | P&ID - SYMBOLS AND LEGEND | 15-Oct-13 | C | SPEC |
| M3-11-1 | MECHANICAL | P&ID-CONDENSATE SYSTEM | 6-Dec-13 | G | SPEC |
| M3-11-2 | MECHANICAL | P&ID-CONDENSATE SYSTEM | 6-Dec-13 | G | SPEC |
| M3-11-3 | MECHANICAL | P&ID-CONDENSATE SYSTEM | 6-Dec-13 | G | SPEC |
| M3-1-2 | MECHANICAL | P&ID - SYMBOLS AND LEGEND | 8-Oct-12 | A | SPEC |
| M3-12-1 | MECHANICAL | P&ID-CONDENSER AIR EXTRACTION | 29-Nov-13 | F | SPEC |
| M3-1-3 | MECHANICAL | P&ID - SYMBOLS AND LEGEND | 15-Oct-13 | B | SPEC |
| M3-13-1 | MECHANICAL | P&ID-CIRCULATING WATER SYSTEM | 6-Dec-13 | G | SPEC |
| M3-14-1 | MECHANICAL | P&ID-AUXILIARY COOLING WATER SYSTEM | 6-Dec-13 | F | SPEC |
| M3-15-1 | MECHANICAL | P&ID-COMPONENT COOLING WATER SYSTEM | 15-Oct-13 | D | SPEC |
| M3-15-2 | MECHANICAL | P&ID-COMPONENT COOLING WATER SYSTEM | 15-Oct-13 | D | SPEC |
| M3-15-3 | MECHANICAL | P&ID-COMPONENT COOLING WATER SYSTEM | 15-Oct-13 | E | SPEC |
| M3-16-1 | MECHANICAL | P&ID-COOLING TOWER CHEMICAL FEED SYSTEM | 13-Sep-13 | D | SPEC |
| M3-17-1 | MECHANICAL | P&ID-AQUEOUS AMMONIA SYSTEM | 6-Dec-13 | G | SPEC |
| M3-18-1 | MECHANICAL | P&ID-FUEL GAS SYSTEM | 6-Dec-13 | G | SPEC |
| M3-18-2 | MECHANICAL | P&ID-FUEL GAS SYSTEM | 6-Dec-13 | G | SPEC |
| M3-18-3 | MECHANICAL | P&ID-FUEL GAS SYSTEM | 13-Sep-13 | A | SPEC |
| M3-19-1 | MECHANICAL | P&ID-SERVICE AIR SYSTEM | 15-Oct-13 | E | SPEC |
| M3-20-1 | MECHANICAL | P&ID-INSTRUMENT AIR SYSTEM | 13-Sep-13 | D | SPEC |
| M3-2-1 | MECHANICAL | P&ID-GAS TURBINE INTERCONNECTIONS | 15-Oct-13 | E | SPEC |
| M3-21-1 | MECHANICAL | P&ID-FIREWATER SYSTEM | 15-Oct-13 | D | SPEC |
| M3-22-1 | MECHANICAL | P&ID-SERVICE WATER SYSTEM | 15-Oct-13 | E | SPEC |
| M3-23-1 | MECHANICAL | P&ID-DEMINERALIZED WATER SYSTEM | 15-Oct-13 | E | SPEC |
| M3-23-2 | MECHANICAL | P&ID-DEMINERALIZED WATER SYSTEM | 15-Oct-13 | C | SPEC |

# 123374 Pasadena OE

# Project Deliverables List

**Report Date** *January 15, 2014*

| Document No. | Engineering Discipline | Document Title | Current Rev. Date | Current Rev. No. | Released |
|---|---|---|---|---|---|
| M3-24-1 | MECHANICAL | P&ID-POTABLE WATER SYSTEM | 15-Oct-13 | E | SPEC |
| M3-25-1 | MECHANICAL | P&ID-CHILLED WATER SYSTEM | 6-Dec-13 | F | SPEC |
| M3-26-1 | MECHANICAL | P&ID-WASTEWATER COLLECTION SYSTEM | 15-Oct-13 | E | SPEC |
| M3-26-2 | MECHANICAL | P&ID-WASTEWATER COLLECTION SYSTEM | 15-Oct-13 | D | SPEC |
| M3-27-1 | MECHANICAL | P&ID-AUXILIARY STEAM SYSTEM | 15-Oct-13 | C | SPEC |
| M3-3-1 | MECHANICAL | P&ID-OTSG INTERCONNECTIONS (EXHAUST GAS) | 6-Dec-13 | G | SPEC |
| M3-3-2 | MECHANICAL | P&ID-OTSG INTERCONNECTIONS (STEAM) | 6-Dec-13 | G | SPEC |
| M3-4-1 | MECHANICAL | P&ID-BOILER FEEDWATER SYSTEM | 6-Dec-13 | G | SPEC |
| M3-5-1 | MECHANICAL | P&ID-HIGH PRESSURE STEAM | 6-Dec-13 | E | SPEC |
| M3-6-1 | MECHANICAL | P&ID-STEAM TURBINE INTERCONNECTIONS | 6-Dec-13 | F | SPEC |
| M3-7-1 | MECHANICAL | P&ID-STEAM DRAINS ￢ﾀﾓ DRAIN TANK | 10-Dec-13 | G | SPEC |
| M3-8-1 | MECHANICAL | P&ID-STEAM AND WATER SAMPLING | 15-Oct-13 | D | SPEC |
| M3-9-1 | MECHANICAL | P&ID-CYCLE CHEMICAL FEED SYSTEM | 13-Sep-13 | D | SPEC |
| M9-1 | MECHANICAL | EQUIPMENT LIST | 6-Dec-13 | C | SPEC |
| M9-10 | MECHANICAL | TIE-IN LIST | 20-Nov-13 | D | SPEC |
| M9-2 | MECHANICAL | SERVICE INDEX | 22-Nov-13 | C | SPEC |
| SKE6-1 | ELECTRICAL | EXISTING ELECTRICAL UNDERGROUND ROUTING | 4-Oct-13 | A | SPEC |
| SKE6-2 | ELECTRICAL | EXISTING ELECTRICAL UNDERGROUND ROUTING | 4-Oct-13 | A | SPEC |
| SKM1-7 | MECHANICAL | AMMONIA (EXISTING) | 4-Dec-13 | A | SPEC |
| SKM1-8 | MECHANICAL | INTERIM/TEMPORARY CONFIGURATION | 18-Dec-13 | B | ADD 2 |
| SKM1-9 | MECHANICAL | FINAL CONFIGURATION | 18-Dec-13 | B | ADD 2 |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| Air Compressor | Typical Drawing | 10/06/08 | 1 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Air Compressor |
| 260000 | Elec-Mech Equip | 09/10/13 | D | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 261050 | MV Motors | 09/10/13 | C | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 261200 | GSU Transformer | 09/10/13 | G | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 262050 | LV Motors | 09/10/13 | C | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 409413.22 | CEMS | 09/10/13 | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 480020 | Site Conditions | 09/10/13 | I | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 480031 | Noise Control Perf | 09/10/13 | I | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 480032 | Power Island Perf | 09/10/13 | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 481100 | Combined Cycle PIE | 09/10/13 | N | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485122.11 | Steam Bypass Valves | 09/10/13 | E | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485221 | ST and TEWAC Generator | 09/10/13 | G | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485222 | GTG Aeroderivative | 09/10/13 | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485311.10 | Condensate Pumps | 09/10/13 | F | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485311.20 | Boiler Feedwater Pumps | 09/10/13 | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485312 | Circ Water & Aux Cooling Water Pumps | 09/10/13 | F | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485374.21 | Compressed Air System | 09/10/13 | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485374.22 | Fuel Gas Compressor | 09/10/13 | E | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485413 | OTSG Spec | 09/10/13 | I | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485432 | Surface Condenser | 09/10/13 | G | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485471 | Inlet Air Chiller | 09/10/13 | E | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485491 | Cooling Tower | 09/10/13 | F | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Att 24 Specs |
| 485952 | Condensate Polisher | 08/24/12 | F | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| ElectricBoiler brochure | ElectricBoiler brochure | - | 11/10 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Aux Boiler Specs |
| ElectricBoiler Specifications | ElectricBoiler Specifications | - | 11/10 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Aux Boiler Specs |
| ElectricBoilers Boiler Book | ElectricBoilers Boiler Book | - | 11/10 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Aux Boiler Specs |
| CEMS | CEMS System Overview (Typical layout with optional equipment) | - | C | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\CEMS |
| PASADENA CHILLER GA | Chiller Module General Arrangement | 09/12/12 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Chiller |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| 969031 | One Line Diagram | - | F | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Electrical Drawings |
| Attachment 4 | Attachment 4 Scheduled Major Component RTS and Delivery Dates_GE_13Dec4 | - | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Equip Delivery Sched |
| Gas Compressor1 | Machinery Arrangement Feed Gas Compressor System | 11/20/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Gas Compressor |
| Att 10.1 MID-TD-0000-1 | Fuel Gases for Combustion in Aeroderivative Gas Turbines Sept 2009 | 9/2009 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs |
| Att 10.2 MID-TD-0000-3 | Water and Steam Purity for Injection in Aero Derivative Gas Turbines June 2010 | 6/2010 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs |
| Att 10.3 MID-TD-0000-4 | Compressor Cleaning for GE Aircraft Derivative Gas Turbines June 2010 | 6/2010 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs |
| Att 10.4 MID-TD-0000-5. | Liquid Detergent for GE Aircraft Aero Derivative Gas Turbines June 2010 | 6/2010 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs |
| Att 10.5 MID-TD-0000-6 | Lubricating Oil Specification for GE Aircraft Aero Derivative Gas Turbines June 2010 | 6/2010 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GE MID TD Specs |
| 7253049-969014 | Plan & Elevation Turbine Control Panel | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969741 | Instrument Loop Diagram Hydraulic Start System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969742 | Instrument Loop Diagram Ventilation & Combustion Air System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969743 | Instrument Loop Diagram Mineral Lube Oil System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969744 | Instrument Loop Diagram Turbine Lube Oil System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969746 | Instrument Loop Diagram Fire & Gas Protection System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969750 | Instrument Loop Diagram Nox Water Injections System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969751 | Instrument Loop Diagram Fuel System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969753 | Instrument Loop Diagram Water Wash System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969755 | Instrument Loop Diagram Auxiliary Systems | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969758 | Instrument Loop Diagram Sprint System | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| Pasadena CKOM -GTG Controls | LM6000 GE Aeroderivative Package | 11/19/13 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Controls |
| 7253049-969005 | Electrical Symbols Abbreviations and Reference Data | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969006 | Interconnect Plan Electrical | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969007 | Interconnect Wiring Diagram Customer | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969009 | Interconnect Cable Schedule | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969021 | Plan & Elevation Generator Lineside Cubicle Cable Entry Top/Bottom | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969023 | Plan & Elevation Generator Neutral Cubicle | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969031 | One Line Diagram | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969032 | Three Line Diagram Generator Metering | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| 7253049-969035 | Schedule Motor Control Center | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969037 | System Schematic Generator Excitation | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969041 | Schematic Diagram Circuit Breaker Control | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969044 | Schematic Diagram Motor Control Centers | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969690 | Area Classification Drawing Main Unit | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969767 | Schematic Diagram DC Power Distribution | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969768 | Schematic Diagram Critical Shutdown Path | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969769 | Schematic Diagram Miscellaneous | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969930 | Schematic Diagram Lighting & Distribution | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 7253049-969934 | Schematic Diagram Communication | 10/09/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| Brush_GTG_Curves | Electrical Data Sheet | 10/23/13 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Electrical |
| 969224 | Installation Footprint Anchor Bolt and Shear Lug Location | - | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 120E4746 | General Arrangement | 10/18/12 | G | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 7253049-969201 | General Arrangement Main Unit - LH | 11/12/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 7253049-969204 | General Arrangement Air Filter | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 7253049-969219 | General Arrangement Auxiliary Skid Left Hand | 11/11/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 7253049-969221 | General Arrangement Generator / Gearbox Mineral Lube Oil Skid | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 7253049-969224 | Installation Footprint Anchor Bolt and Shear Lug Location | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 7253049-969293 | Piping Penetrations Option LH | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| CD19671 | Air Filter GE-AEP_GSX LM6000 with Chiller Coil | 02/10/12 | 0 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| ElectricBoiler Dimensions and ratings | ElectricBoiler Dimensions and ratings | - | 11-10 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| GA 69200 | GA 9  Main Unit - RH | - | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| GA 969209 | GA Sprint Skid | - | D | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| GA 969218 | GA Auxiliary Skid Right Hand | - | H | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| GA 969221 | GA Generator_Gearbox Mineral Lube Oil Skid | - | F | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| GA A0 321638800 | GA Generator | 07/17/12 | C | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| Sample 00 | ElectricBoiler sample drawing S-302-700kW @ 480V | 06/08/10 | 00 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| SK-01 | GE_STG_Sk1 - PWP Comments | 11/15/12 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Arrangement Drawings |
| 7253049-969232 | Flow & Instrument Diagram Hydraulic Start System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969239 | Flow & Instrument Diagram Ventilation & Combustion Air System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969244 | Flow & Instrument Diagram Turbine Lube Oil System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969247 | Flow & Instrument Diagram Turbine Hydraulic System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969248 | Flow & Instrument Diagram Mineral Lube Oil System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969254 | Flow & Instrument Diagram Fire & Gas Protection System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969260 | Flow & Instrument Diagram Fuel System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969262 | Flow & Instrument Diagram Water Wash System | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969268 | Flow & Instrument Diagram Sprint System Main Unit | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969269 | Flow & Instrument Diagram Water Injection Pump | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969270 | Flow & Instrument Diagram Sprint System Sprint Skid | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969272 | Flow & Instrument Diagram Auxiliary Systems | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| Inlet Air Chilling_Heating Conceptual Design_R3 add pre-cooler | Inlet Air Chilling_Heating Conceptual Design_R3 add pre-cooler | 10/08/13 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M005_(RG)_120E4746_SEP-12-2013 | General Arrangement | 09/12/13 | G | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M101_(RB)_230F5536_AUG-23-2013 | Flow Diagram Steam System | 08/23/13 | B | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M105 230F5512 | Feedwater System | 11/07/12 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M106 203D7522 sheet 2 | Condenser Terminal Points On Waterboxes | 08/23/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| M106_(RA)_203D7522_AUG-23-2013 | Condenser Terminal Points | 08/23/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M107_(RB)_120E4791_AUG-23-2013 | Flow Diagram Circulating Water | 08/23/13 | B | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M109 230F5537 | Auxiliary Cooling Water System | 01/28/13 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M112_(RA)_230F5538_AUG-23-2013 | Steam Drains System | 08/23/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M119 120E4734 Sheet 2 | Flow Diagram Steam Turbine | 08/23/13 | C | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M119_(RC)_120E4734_AUG-23-2013 | Flow Diagram Steam Turbine | 08/23/13 | C | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M125_(RA)_230F5539_AUG-23-2013 | Condenser Air Removal System | 08/23/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M190_(RD)_230F5504_AUG-23-2013 | Combined Cycle system Overview Diagram | 08/23/13 | D | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M195 230F5496 sheet 2 | Ammonia Dilution Heating Flow Diagram | 02/07/13 | B | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| M195_(RD)_230F5496_AUG-23-2013 | Flow Diagram OSTG-1 Pressure | 08/23/13 | D | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\F&IDs and Flow Diagrams |
| 7253049-969225 | Lift Arrangement | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Lift and Shipping Info |
| 7253049-969226 | Shipping Data | 10/16/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Lift and Shipping Info |
| PWP_Estimated Heaviest Lifts_Equipment Weights | PWP_Estimated Heaviest Lifts_Equipment Weights | - | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical\Lift and Shipping Info |
| 7253049-000231 | Flow & Equipment Symbols Mechanical | 10/31/13 | A | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Mechanical |
| Chart Only SNM Start up | Chart Only SNM Start up | 04/02/12 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Performance Data |
| Pasadena CKOM - GT Inlet Air Conditioning | Turbine inlet Air Temperature Conditioning System | - | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\GTG\Performance Data |
| Attachment 12 | Mechanical Completion Certificate | - | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Mechanical Completion |
| C12079-EI RevP | ONCE THROUGH STEAM GENERATOR ERECTION & INSTALLATION INSTRUCTIONS | 09/13/13 | 0 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\OTSG |
| IST Start-Up Curve | OTSG Start-Up Curve | - | - | SPEC | Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG |
| OTSG Erection Training - SCR-CO - Revised | OTSG INSTALLATION AND ERECTION TRAINING PRESENTATION | 03/01/13 | - | SPEC | Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG |
| Pasadena CKOM - OTSG (IST) | Glenarm Repowering Project OTSG Design | 11/15/13 | - | SPEC | Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG |
| 11303-001 | General Arrangement LM6000 PG OSTG | 11/01/13 | P1 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Typical OTSG Erection Drawings | Typical OTSG Erection Drawings | - | - | SPEC | Attachment A3-Reference Information \A.3.A City-Supplied Power Island Equipment Info\OTSG |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| Attachment 6 | Performance Guarantees | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Performance Data |
| Attachment 22 | LM6000PG Degradation | 02/01/13 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Performance Data |
| GE Guarantee Heat Balances | GE Guarantee Heat Balances | 02/12/13 | 0 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Performance Data |
| Attachment 1.1 | Scope of Supply GTG | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents |
| Attachment 1.2 | Scope of Supply OTSG | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents |
| Attachment 1.3 | Scope of Supply CEMS | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents |
| Attachment 1.4 | Scope of Supply Mechanical and Fluid | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents |
| Attachment 1.5 | Scope of Supply Terminal Points | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents |
| Attachment 1.7 | Scope of Supply Engineering Design | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents |
| Attachment 1.8 | Scope of Supply Commissioning and Startup | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Scope of Supply Documents |
| Pasadena CKOM - GE BOP Mechanical | Steam Turbine & Generator Overview | 11/19/13 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\STG |
| STG Layout For Information Only | Steam Turbine Layout (For Information Only) | - | 0 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\STG |
| STG_Generator Curves for Information Only | REACTIVE CAPABILITY CURVE, EFFICIENCY CURVES, SATURATION CURVES | - | 0 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\STG |
| Attachment 23 | Obligations of Site Representatives | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Technical Advisors |
| Attachment 5.1 | Typical Site Test Measurement Procedures-Test Philosophy | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Testing Documents |
| Attachment 5.2 | Typical Site Test Measurement Procedures-Standard Field Testing Procedure for Emission Compliance<br>Based on US EPA, ISO and EN Methodology | 10/2011 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Testing Documents |
| Attachment 5.3 | Typical Site Test Measurement Procedures-SPECIFICATION FOR GAS TURBINE GENERATOR PERFORMANCE TEST MEASUREMENT (SGTGPTM) LM6000 PC / PG SAC, NATURAL GAS FUEL | - | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Testing Documents |
| Attachment 14.1 | GTG Training Descriptions | - | 2 | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Training |
| Attachment 14.2 | Training Program | 2013 | - | SPEC | Attachment A3-Reference Information\A.3.A City-Supplied Power Island Equipment Info\Training |
| mitigation summary | Mitigation Summary | - | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Air Permit |
| South Coast Facility Permit to Construct and Operate | South Coast Facility Permit to Construct and Operate | 08/15/13 | 26 | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Air Permit |
| Title V Facility Significant Permit Revision | Title V Facility Significant Permit Revision | 08/15/13 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Air Permit |
| 0 TOC | Environmental Impact Report-Table Of Contents | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| 0 TOC_Revised | Environmental Impact Report-TOC Revised | 3/2013 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 0 Executive Summary | Environmental Impact Report-Executive Summary | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 1.0 Introduction | Environmental Impact Report-Introduction | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 1.0 Introduction_Revised | Environmental Impact Report-Introduction_Revised | 3/2013 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 2.0 Project Description | Environmental Impact Report-Project Description | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 2.0 Comments and Responses on DEIR_Revised | Environmental Impact Report-Comments and Responses on DEIR_Revised | 3/2013 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 3.0 Environmental Setting | Environmental Impact Report-Environmental Setting | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 3.0 Corrections and Additions_Revised_Revised | Environmental Impact Report-Corrections and Additions_Revised_Revised | 3/2013 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.0 Mitigation Monitoring and Reporting Program | Environmental Impact Report-Mitigation Monitoring and Reporting Program | 3/2013 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.A Aesthetics | Environmental Impact Report-Aesthetics | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.B Air Quality | Environmental Impact Report-Air Quality | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.C Cultural Resources | Environmental Impact Report-Cultural Resources | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.D Greenhouse Gases | Environmental Impact Report-Greenhouse Gases | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.E Hazards | Environmental Impact Report-Hazards | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.F Land Use and Planning | Environmental Impact Report-Land Use and Planning | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.G Noise | Environmental Impact Report-Noise | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 4.H Water Supply | Environmental Impact Report-Water Supply | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 5.0 Alternatives | Environmental Impact Report-Alternatives | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 6.0 Other Environmental Considerations | Environmental Impact Report-Other Environmental Considerations | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 7.0 Persons and Organizations | Environmental Impact Report-Persons and Organizations | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| 8.0 References | Environmental Impact Report-References | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix_Table_of_Contents | Environmental Impact Report-Appendix Table of Contents | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix A_Revised | Environmental Impact Report-Appendix Table of Contents_Revised | 04/15/10 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix-A_NOP-IS-Scoping Meeting Materials | Environmental Impact Report-NOP-IS-Scoping Meeting Materials | 09/16/11 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix-B_Air Quality Assessment Files | Environmental Impact Report-Air Quality Assessment Files | 11/2012 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| Appendix-C_Greenhouse Gas Impact Assessment | Environmental Impact Report-Greenhouse Gas Impact Assessment | 06/15/12 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix-D.1_Figures 1-13 | Environmental Impact Report-Figures 1-13 | - | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix-D_Hazardous Materials | Environmental Impact Report-Hazardous Materials | 07/29/11 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix-E_Noise | Environmental Impact Report-Noise | 01 | 12/2011 | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| Appendix-F_Water Supply Documentation | Environmental Impact Report-Water Supply Documentation | 05/23/12 | 2 | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\EIR CEQA |
| GT 3&4 SWPPP (Draft) | GT 3&4 SWPPP (Draft) | 01/31/03 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\SUSMP & SWPPP |
| PWP SUSMP | Stormwater Treatment Certification | 02/03/03 | - | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\SUSMP & SWPPP |
| Broadway Wastewater Permit Rev B | Broadway Wastewater Permit Rev B | 07/31/12 | B | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Waste Water |
| Glenarm Wastewater Permit Rev C | Glenarm Wastewater Permit Rev C | 07/18/13 | C | SPEC | Attachment A3-Reference Information\A.3.B City-Supplied Permitting Information\Waste Water |
| 20001-C-004-06 4-06 | GSU foundation plan | 12/08/03 | 2 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural |
| 8-2-2368 | Electrical Shop Plot Plan | 10/16/69 | 4 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2369 | Electrical Shop Plan & Elevations | 12/08/60 | 3 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2370 | Electrical Shop Mezzanine Floor Plan & Details | 09/21/60 | 3 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2371 | Electrical Shop Floor Plan Anchor Bolt Setting Plan | 06/21/20 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2372 | Electrical Shop Partial Deck Plan & Longitudinal Sect. | 03/03/60 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2373 | Electrical Shop Basement Plan Sections & Details | 02/17/69 | 2 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2374 | Electrical Shop North & Partial East Elevations & Roof Slab Over Room B1 | 06/21/60 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2375 | Electrical Shop Foundation Plan for New Deck Slab Basement Ramp & Room B1 Floor Slab | 02/17/69 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2376 | Electrical Shop Reinforcing Details for Beams, Girders, Floor Slab & Ramp | 06/21/60 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2381 | Electrical Shop Architectural Floor Plan & Room Elevations | 02/17/69 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2382 | Electrical Shop Architectural Room Elevations | 09/16/60 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2383 | Electrical Shop Miscellaneous Architectural Details | 09/20/60 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |
| 8-2-2384 | Electrical Construction Shop Electrical Layout | 09/15/60 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Architectural and Structural\Pump Building Existing |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| 8-2-49 | Circ Pipe Tunnels Demo 2 | 08/02/49 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope |
| 8-2-49B | Circ Pipe Tunnels Demo 3 | 08/02/49 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope |
| 8-2-49C | Circ Pipe Tunnels Demo 4 | 04/27/49 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope |
| 8-2-1337 | Overall Tunnel Demo 1 | 01/02/58 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope |
| 8-2-1355 | Stack Foundation Demo 5 | 11/01/56 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope |
| 8-2-1670 | Plot Plan Crane Rail Demo 6 | 02/26/62 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope |
| SKM-1 | Existing Tunnels and Proposed Equipment Overlay | 06/12/13 | B | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Demolition Scope |
| 2-2-1562 | Underground Fair Oaks ave. | 04/22/03 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 8-2-547 | Receiving Stations and Dispatching Center Electrical Plot Plan | 01/30/95 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 8-2-575 | Powerhouse to Receiving Station Section A Interconnecting Tunnel Ground System | 10/14/48 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 8-2-1341 | General Arrangement of Existing Structures and Foundations | 03/27/58 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 20001E004-01 | Overall conduit routing plan & sect | 04/10/03 | 4 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 20001E004-02 | Overall conduit routing plan & sect | 12/08/03 | 4 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 20001E004-03 | Overall conduit routing plan & sect | 12/08/03 | 4 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 20001E004-05 | Conduit ductbank sect & misc sect | 12/08/03 | 4 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 20001E004-13 004-13 | Conduit ductbank details-GSU hv lines | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 8-2-6643, 6507, 6606, 6510, 6603, 6613 & 6602 | Existing Trench and Sanitary Sewer East of Glenarm Building | - | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| Storm Drain and Conduit Trench Drawing | Storm Drain and Conduit Trench Drawing | 04/10/03 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| V-228 | UG Vault Standards | 06/27/07 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Electrical |
| 8-2-300 | Fountain Drawing | 09/02/38 | | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| 20001-071R0 | Waste Water F & ID | 11/08/02 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| 20001-090 | Flow & Instrument Diagram Ammonia System | 05/19/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| 20001M001 | Overall Site Plan GT 3 & 4 | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| 20001P001-02 | Key plan above ground and trenches | 12/08/03 | 2 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| 20001P026-01 | 29% NH3 tank area above ground piping | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| 20001P026-02 | 29% NH3 tank area above ground piping | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| 20001-P-011-01 | Piping and Plan Details Existing OWS | 11/18/02 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| Existing Oil-Water Separator | Existing Oil-Water Separator Manufacturer's Information | 01/23/03 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Mechanical |
| Glenarm Parcel Map | Glenarm Parcel Map | 08/09/04 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Survey Info |
| Glenarm Parcel Plan | Glenarm Parcel Plan | 09/28/04 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Survey Info |
| Pasadena Glenarm Facility | Pasadena Glenarm Facility | - | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Survey Info |
| 8-2-1002 | General Location Plan | 03/29/73 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past |
| 8-2-1477 | Piping Arrangement | 11/25/60 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past |
| 8-2-1669 | Gas Equipment Building Miscellaneous Sections & Details | 02/26/62 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past |
| 8-2-1670 | Gas Equipment Building Plot Plan Paving & Yard Details | 02/26/62 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past |
| Site Water Utility Information | Site Water Utility Information | - | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Arrangement Dwgs Existing or Past |
| 8-2-1355 | Sootblowing Stack & Precipitator Support Foundations | 11/05/56 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |
| 20001c002-01 | Civil Key Plan Paving / Grading & U.G. Sewer PDF | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |
| 20001c002-01 | Civil Key Plan Paving / Grading & U.G. Sewer CAD | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |
| 20001c002-03 | Area 2 paving grading sewer | 12/23/03 | 2 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |
| 20001c002-04 | Area 3 paving grading sewer | 12/23/03 | 2 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |
| 20001c006-04 | Oily Water Separator foundation sections and details | 03/06/03 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |
| 20001-c003-05 | Civil Sections & Details | 01/24/03 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |
| 8-2-6643, 6507, 6606, 6510, 6608, 6613 & 6602 | Existing Trench and Sanitary Sewer East of Glenarm Building | 6/1987 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Civil |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| 8-2-49 | Circ Pipe Tunnels | 02/06/31 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 8-2-49B | Circ Pipe Tunnels | 08/14/31 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 8-2-49C | Circ Pipe Tunnels | 08/05/31 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 8-2-49D | Circ Pipe Tunnels | 05/22/31 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 8-2-598 | Circ Pipe Tunnels | 10/03/50 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 8-2-949 | Broadway to Glenarm Pipe Tunnel | 12/22/65 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 8-2-1337 | Station Service Plot Plan | 01/02/58 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 20001P006-03 | West end culvert piping | 11/18/02 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 20001P006-04 | West end  culvert piping | 05/19/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 20001P027-01 | Pipe trench between culvert & NH3 tanks | 12/16/02 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 20001P028-01 | Demin Water Pump 158A & Pipe Trench | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 20001P028-02 | East end culvert & trench piping details | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 20001P00601 | Ammonia truck unloading and culvert piping | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Mechanical Tunnels |
| 33W | Location of power plant water services | 08/29/40 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 3716 | Utility Drawings in Public ROW - Fair Oaks Ave - Glenarm to State St | 03/27/87 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001-274-M | Oil Water Separator Flo Trend Systems | 01/16/03 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001E011-04 | Cathodic protection pipe pit area | 02/24/03 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001P001-01 | Key plan underground piping A | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001P003-01 | GT 3&4 equipment drains underground | 12/08/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001P004-01 | GT3 area underground piping | 12/17/03 | 1 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001P005-01 | GT4 area underground piping | 12/17/03 | 2 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001P009-01 | NH3 tank area underground piping | 12/16/02 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| 20001P011-01 | Oily water separator pit piping | 11/18/02 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 20001-P-011-01 | Piping Plan & Details Oily Water Separator Pit | 11/18/02 | 0 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| Glenarm Plant Fire Protection Drawing | Glenarm Plant Fire Protection Drawing | 06/30/03 | 3 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| GT1 GT2 UG GAS DWG | Piping Area III | 04/30/75 | 4 | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| k350 OWS flow diagram | k350 oil water separator flow diagram | 10/11/02 | A | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| Storm Drain and Conduit Trench Drawing | Storm Drain and Conduit Trench Drawing | 04/10/03 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Existing PWP Dwgs\Underground\Underground Utilities |
| 3626-04-02 | GT-5 FIRSTPCRCorrectionEnvironmental Investigation | 07/29/11 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR |
| 3626-04-02 | GT-5 Environmental Investigation - 1 of 4 txt only | 07/29/11 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Enviro |
| 3626-03 | Geophysical Investigation | 04/15/10 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Geotech |
| 3626-04-01 | GT5 Geotechnical Investigation | 08/01/11 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Geotech |
| 11195Hydrologue_ThermalResistivity_01 | Soil Thermal Resistivity Tests | 09/16/11 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Soil Resistivity |
| geovisionthermal Resistivity | Soil Thermal Resistivity Tests | 08/10/11 | - | SPEC | Attachment A3-Reference Information\A.3.C Existing Site and Reference Drawings\Geotech Report and GPR\Soil Resistivity |
| Attachment 1.6 Scope of Supply DOR | Attachment 1.6 Scope of Supply DOR | - | - | SPEC | Attachment A3-Reference Information\A.3.D Division of Responsibility |
| Completion Turnover Start-Up | GLENARM REPOWERING PROJECT SCOPE OF RESPONSIBILITY MATRIX | 10/11/13 | A | SPEC | Attachment A3-Reference Information\A.3.D Division of Responsibility |
| 14-ST Steam Quality | Steam Quality | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 2014-01-08 GT5 Pre-Bid Meeting Introduction | 2014-01-08 GT5 Pre-Bid Meeting Introduction | 01/08/14 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 2014-01-08 GT5 Pre-Bid Meeting Local Participation | 2014-01-08 GT5 Pre-Bid Meeting Local Participation | 01/08/14 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 2014-01-08 GT5 Pre-Bid Meeting Working with Pasadena | 2014-01-08 GT5 Pre-Bid Meeting Working with Pasadena | 01/08/14 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 505-101 Sheet 01 | Topographic Survey Pasadena Glenarm Facility | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 505-101 Sheet 02 | Topographic Survey Pasadena Glenarm Facility | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 505-101 Sheet 03 | Topographic Survey Pasadena Glenarm Facility | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 5065A0-C23 | Generator outline dwg for reference | 08/23/13 | F | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| BOP RFP Pre-Bid Presentation 010814-updated | BOP RFP Pre-Bid Presentation 010814-updated | 01/08/14 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| C8 foundation dwg | STG Foundatoin Drawing | | | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| C8 Layout STG | Layout | 04/30/08 | 2 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 8 Loading data STG Foundatio | Loading Data [kN] | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Construction Staging and Traffic Management Plan | Construction Staging and Traffic Management Plan | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Contracts_Purchase Orders_Permits Insurance Requirements | Contracts Purchase Orders Permits Insurance Requirements | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| ES-1000 Rev 9 | Feedwater Quality Requirements for Superheated Steam Applications | 07/22/11 | 9 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Exhibit A - DW_221732D01 | Drawing 221732C1 | - | 0 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Exhibit B - HA_221732D01 | Form 3.2.1-D | - | 0 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| FY 2014 Adopted General Fee Schedule Part 2 | FY 2014 Adopted General Fee Schedule Part 2 | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| JV468844D | SPX Cooling Technologies Prelim Dwg - Basin Section & Details | 10/22/12 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| JV4688445 | SPX Cooling Technologies Prelim Dwg - Schematic View | 10/22/12 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Jv468844B | SPX Cooling Technologies Prelim Dwg - Basin Section & Details | 10/22/12 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Location and Working Hours | Location and Working Hours | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Moving Permit Application - For Wide Load and Heavy Equipment | Moving Permit Application - For Wide Load and Heavy Equipment | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| P12079-00 Jumper Tubes | Jumper Installation Proposal - IST | 11/27/13 | 0 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Public Right-of-Way Permit | Public Right-of-Way Permit | 12/19/12 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Rotor removal instructions _skid pan_ | Rotor removal instructions skid pan | - | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| SK-8371-0 | Condenser Outline Proposal Level (Proposal No. H-8371.HX) | - | 0 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Storage Container - Application | Storage Container - Application | 07/01/13 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Truck Route | Truck Route Map Exhibit 1 | 06/22/11 | CAD90070A.MXD | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| 11302-0004 | Generic Flowsheet Dual Pressure OTSG W/ Burner, SCR & CO | 02/20/06 | P1 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| COP BOP Pre-Bid GE BOP Equipment_14Jan02 | COP BOP Pre-Bid GE BOP Equipment | 01/08/14 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| IST Presentation 20140108 (NXPowerLite) | IST Presentation 20140108 (NXPowerLite) | 01/08/14 | - | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |

# 123374 Pasadena OE

# Attachment A3-Reference Information Documents

*January 16, 2014*

| Document No./ Filename | Document Title | Current Rev. Date | Current Rev. No. | Released | Location |
|---|---|---|---|---|---|
| LM6000_Package_Layout_Evolution1.5.14r1 | LM6000 Package Layout Evolution | - | | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |
| Bidder's Questions 2013-01-15 Rev 0 | Bidder's Questions | 01/15/14 | 0 | ADD 2 | EMAT\Procurement\Packages\BOP Contractor Scope\Addenda\Addendum 2 |

# Enclosure 7

# City of Pasadena - Glenarm GT5
# Pre-Bid Meeting Questions
# Revision 0

Last Updated January 15, 2014

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 1 | Drawing E3-10 shows a vault identified under note 4 and located at the east end of the Glenarm building. The scope document indicates that this vault is for the 17.2 kV feed form the dispatch center. Given it's location it would appear that it is intended to be inserted in the existing 17.2kV trench on the east of the building as shown on sketch 6-1. Please clarify the intended use and location of this vault. | Location to be determined by the BOP with the intention of feeding through this vault for 17.2Kv feed to the PDC. | CLOSED | |
| 2 | The fire marshal (FM) has dictated that the auxiliary lube oil skids/containers be misted/sprinkled. We heard this at the bid meeting on 1/8/14. What does PW&P expect for containment of the oil & water. Depending on the spray volume, this could be a significant quantity and flow of oil & water. | For indoors, the containment would be expected to hold the contents of the largest single container of material, plus 20 minutes of fire flow. For outdoors, the containment would be expected to contain the same, plus the volume of 24 hours of rainfall from a 25 year storm unless it's protected from rainfall. Drainage from the containment area should be sized for the amount of fire flow and rainfall, as applicable. | CLOSED | |
| 3 | The scope requires a soil resistivity test after soil removal & recompaction. Presumably this is for grounding design. Is the engineer required to wait to complete a grounding design until after this is complete? | Resistivity values provided can be used to initiate design. Post-backfilling tests should be performed to confirm values. | CLOSED | |
| 4 | The containment area fill for future lay down appears to be at a different elevation than the surrounding roads/asphalt. Please confirm elevations to determine if we need to dedicate space in the area for ramping. | The lay down area is approximately 12" higher than the surrounding asphalt. The BOP Contractor will need to plan how to deal with the change in elevation. | CLOSED | |
| 5 | Confirm whether a licensed structural engineer is required for the project. i.e. is a licensed civil engineer is acceptable for design of structures for this project. | PWP requires a licensed structural engineer. | CLOSED | |
| 6 | Clarify how ADA requirements apply for the site. i.e. what buildings are required to be ADA? | ADA requirements apply to the control and maintenance buildings. | CLOSED | |
| 7 | Does the new fence/wall along Fair Oaks need to be built first, or can it be built near the end of the project? | The decision lies with the BOP contractor. | CLOSED | |
| 8 | Clarify if a firewall or blast wall is required between gas compressors and control building. | It is a protection wall and yes it is required. | CLOSED | |
| 9 | Section 262600 (Power Distribution Center) Section 2.9-B-1 requires a 5' clearance under the PDC and Section 5.5 states 8' clearance; please clarify | Actual clearance is to be 6' to bottom of steel. | CLOSED | |
| 10 | Specification LD-13-14, 7.2 states water use cost by contractor and scope of work page 140 states water use cost by City of Pasadena; please clarify. | Point of water connection provided by city; cost of water usage by BOP | CLOSED | |

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 11 | Is any epoxy grout required for the GE supplied equipment? | Assume none for bid purposes.<br><br>Grout specifications (in accordance with project design specifications) grout shall be non-shrinkable, at all ages, when tested in accordance with American Society for Testing and Materials (ASTM) C-827. Effective bearing area shall not be less than 95% in hardened state when tested in accordance with ASTM C-827. If using an epoxy grout for use around turbine and generator skid and anchor bolt, grout must meet requirements of Corps of Engineers CRD C-621 and ASTM C-1107. Peak exotherm of a cylinder of grout material 2 inches in diameter and 4 inches high shall not exceed 95 °F (35 °C), when tested at material and laboratory temperatures of 75 °F (24 °C). Working life of grout shall be 60 minutes minimum at 75 °F (24 °C). | CLOSED | |
| 12 | Can testing water be supplied? | Yes at metered cost to the BOP Contractor | CLOSED | |
| 13 | Can 70F testing water be supplied for Section 1 hydros? | Assume a package boiler may be required. | CLOSED | |
| 14 | Is the onsite resident engineer requirement of scope of work Section C.4.1.2 for a full time requirement? | It is the responsibility of the BOP Contractor to provide engineers as needed. | CLOSED | |
| 15 | Attachment 4 of GE document (schedule major component, TES and delivery dates) based on GE provided NTP of September 27, 2013. Was NTP provided on September 27, 2013? | | OPEN | Dave Tateosian |
| 16 | Section 485312 (circulating water pumps) section 1.2-A-2 states one speed drive motors and Section 1.7-A-8 states two speed motors; please clarify. | The circulating water pump motors are single speed | CLOSED | |
| 17 | Section 480031-2 (noise control performance) section 2.2 refers to attachment 6 - performance guarantees and part 3 refers to contract liquidated damages. Can not located liquidated damages in contract. | The BOP contractor does not need the GE Liquidated Damages as they do not apply to the BOP | CLOSED | |
| 18 | When will design information be received for the PIE equipment? | | OPEN | Dave Tateosian |
| 19 | Are there permit requirements tied to construction of the wall along Fair Oaks? | There are permit requirements tied to the construction of the wall. | CLOSED | |
| 20 | IST is a mandatory subcontractor that is not local. The welding could be self-performed. How will the IST subcontract be considered towards the local content criteria? | The orbital welding on the IST equipment is proprietary in both equipment and procedure and the BOP Contractor must subcontract with IST. As IST is not local to Pasadena, this subcontract does not count towards the 15% goal. | CLOSED | |
| 21 | In the RFP documents, there are two references mentioned for seismic design criteria. One is based on 2013 CA Building Code (CBC), the other is based on ASCE 7-05 which is 2010 CBC. Which version of CBC is to be used for project design? | CBC 2013 is required. | CLOSED | |
| 22 | Have you had conversations with the building trades on how they could support the 25% local hire requirements considering their collective bargaining provisions? | Yes and the building trades feel confident that the 25% requirement can be achieved. | CLOSED | |

# City of Pasadena - Glenarm GT5
## Pre-Bid Meeting Questions
## Revision 0

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 23 | GE BOP equipment lists 'preferred suppliers' as opposed to chosen suppliers. Are these suppliers fixed or subject to change? | General Electric should have all of their suppliers defined by mid-February. At this time the OTSG is by IST, the STG by Shin Nippon, the steam turbine enclosure by ATCO, and the fuel gas compressors by Kobelco. As pieces of equipment is finalized by GE, we will notify the bidders by Addendum. | CLOSED | |
| 24 | Will a water analysis data sheet be provided for the BOP to design and procure the chemical feed system? | Yes. Refer to condensate polisher spec. A3 | CLOSED | |
| 25 | Are start up and commissioning chemicals to be provided by BOP as well as initial 'fills' | Yes. | CLOSED | |
| 26 | Does the BOP contractor work with GE and/or ATCO (the steam turbine enclosure provider) directly during proposal development for load requirement of piping and cable trays? | The steam turbine enclosure will only be used to support the fire sprinkler piping. | CLOSED | |
| 27 | For what equipment will GE supply 3D models? GTG? STG? OTSG? | | OPEN | Diane Donovan |
| 28 | BOP contractor required to contract with cooling tower manufacturer for field erection; provide cooling tower vendor information. | | OPEN | Diane Donovan |
| 29 | Please confirm material requirement for feed water & condensate piping, or if carbon steel A106 is suitable | Please refer to P&IDs. Given the need for high purity water for the OTSG, all condensate & BFW piping is stainless steel. | CLOSED | |
| 30 | Is hazard assessment surrey reports on all asbestos containing areas available? | | OPEN | Dan Angeles |
| 31 | Is a list of hazardous waste sites available? | | OPEN | Dan Angeles |
| 32 | What permits and inspections are required for historical structures? | | OPEN | Dan Angeles |
| 33 | Should fire protection system for control be water mist or FM200? | The control room will have water mist pre-action system. | CLOSED | |
| 34 | Please specifically state that the STG fire protection by the BOP Contractor shall be pre-action fire water and deluge if required for STG bearings and lube/hydraulic oil systems. No clean agent gasses are planned. | The STG fire protection requirements are defined in the Specification. No clean agent is required. STG roof preaction, STG bearings preaction with rate of rise detections, and STG lube oil deluge are all required. | CLOSED | |
| 35 | Please confirm aircraft warning lights are supplied if required by local codes for the exhaust stack. | No aircraft warning lights are required | CLOSED | |
| 36 | Please confirm all IST pressure/temperature instruments are provided and rack mounted and that the BOP Contractor is responsible only for junction boxes, tubing, and wiring. | Refer to M195 in A.3 owner supplied equipment. Items shown with an asterisk are supplied by IST. TEs will be supplied by IST. All other instruments by BOP. | CLOSED | |
| 37 | In the RFP documents seismic design values based on CBC 2010 have been provided. During pre-bid meeting, it has been cleared that 2013 version of CBC will be used. Can you provide us with the new seismic design values based on CBC, 2013 version | The seismic design values did not change from 2010 to 2013. However it is up to the Bidder to select the proper values as they will be the responsible engineer for the project. The values provided in the Specification are to be used as general guidance only. | CLOSED | |
| 38 | Clarify/confirm/identify what drawings/calculations are required to be submitted to city for review | | OPEN | Dave Tateosian |

# City of Pasadena - Glenarm GT5
## Pre-Bid Meeting Questions
## Revision 0

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 39 | Hyrdologue Inc. representative stated during the pre-bid meeting that additional soil samples have been taken for soil contamination determination. Hyrdologue also stated that no critical contamination levels are anticipated for the project site. Will it be possible for us to get the new soil contamination results as they are available? | | OPEN | Hyrdologue |
| 40 | Please define all GE loads & utilities after an emergency shutdown as well as duration, voltage phase, etc. Relevant to safe & proper shutdown of GT & STG & other BOP equipment within GE/IST scope of supply. | | OPEN | Diane Donovan |
| 41 | Please define length and diameter of P91/P11/P21 alloy piping materials for interconnecting piping to silencer and/or any other known equipment interconnects to IST/GE equipment | | OPEN | Diane Donovan |
| 42 | Please confirm if SS liner is required by GE/IS for any de-superheater or bypass piping interconnections or if P91/P11/P21 is required. | | OPEN | Diane Donovan |
| 43 | Equipment doors on west side open into firewall behind GSU XFMR. What is concept for truck access for equipment removal? | The platforms provided by BOP will need to allow for equipment removal | CLOSED | |
| 44 | Are the GE provided panels that are shown on E1-2 shown correctly? TCP Mark VIE panels for CTG and STG often are 6-10 units. Including GPP for 2 units, exciter/AVR for STG, etc., is the allocated space sufficient? | | OPEN | Diane Donovan |
| 45 | Is battery room required for QEL-CEL battery stacks? If required, is space shown sufficient for 125v battery and 24v battery? | Battery room is basis of bid and is required. | CLOSED | |
| 46 | In regards to local business participation obtaining 15% local procurement and subcontracting; do team members count as self-perform? | People performing work that are employees of the BOP Contractor count for self-performed work. Work performed by the any of the BOP Contractor's sub-contractors does not count as self-performed. | CLOSED | |
| 47 | In regards to local business participation obtaining 15% local procurement and subcontracting; how do you satisfy 15% requirement at bid time if 7% is material procurement from local Pasadena business? | | OPEN | Antonio Watson |
| 48 | Will the prime receive credit towards the 15% local business, for transactions generated by our subcontractor? | Yes, the goal is that 15% of the BOP Contractor's subcontracted work be spent with local Pasadena businesses. | CLOSED | |

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 49 | Local participation of 15% is required. It is understood this requirement pertains to subcontractor and procuring content combined. In other words if our price for subcontracted work is $10,000,000 and our price for procurement is $10,000,000 the aggregate is $20,000,000 therefore we would need to spend 15% of $20,000,000 ($3,000,000) on local Pasadena subcontractors and/or vendors. Please confirm this is correct | That is correct. | CLOSED | |
| 50 | When calculating total subcontractor and procurement dollars are we to include other costs such as sales tax, bonds, markup in the calculation? Example: If procuring dollars are $10,000,000 exclusive of sales taxes and say sales taxes are 9% total procurement cost would be $10,900,000. If subcontractor content is $10,000,000 exclusive of bonds and bond cost are an additional 1% sub-value would then be $10,100,000. In summary, do we shoot for 15% of $20,000,000 or do we shoot for 15% of $10,900,000 plus $10,100,000 which totals $21,000,000? | | OPEN | Antonio Watson |
| 51 | Does procuring for project apply only to permanent plant materials or could it include items such as small tools and consumables as well? | Small tools, equipment, and consumables count towards the 15%. | CLOSED | |
| 52 | Clarify the 15% local requirement. I.E. 15% applies to total subcontracted plus total procurement. Confirm if this includes taxes/fees, etc. | See responses to items 49 and 50. | CLOSED | |
| 53 | What is the evaluation criteria for the local preference point system? I.E., advertising is worth 5 points. What determines if the bidder receives full points at 5/5 versus partial points? | | OPEN | Antonio Watson |
| 54 | GE is supplying the STG enclosure (building). Is GE responsible for building official/building permit requirements? If BOP contractor is responsible, who is responsible if the building official requires changes/additions? | General Electric is responsible for providing the design of the steam turbine enclosure. The BOP Contractor is responsible for working with the City's Building Department. If changes to GE suppied equipment are needed, those will be worked through the City's GT5 Project Team. | CLOSED | |
| 55 | On page 12 of scope of work, it is stated that "SWPPP and SUSMP permits will need to be obtained by the BOP contractor". On page 49 of the same document, under section G.11 it is mentioned "… development of SWPPP meeting all state and EPA regulators and supporting PWP in updating their SUSMP permit." Please clarify the scope of this SUSMP (standard urban storm water mitigation plan) on the BOP contractor side. | | OPEN | Dan Angeles |
| 56 | What are the options of locations for hazardous material disposal? | | OPEN | Dan Angeles |

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 57 | What are the technical specs for flowable fill; if used? | This is the responsibility of the BOP Contractor since they are performing the construction.<br><br>Flowable fill mixtures are usually specified to meet either a compressive strength or unit weight requirement. The compressive strength is typically measured by testing a 4 x 8 inch cylindrical test specimen in compression. The National Ready Mixed Concrete Association defines an "excavatable" flowable fill mixture as one with a compressive strength not exceeding 150 pounds per square inch.<br><br>We do not have a formal technical spec for flowable fill. Standard criteria are:<br>* Unit weight: 20#/CF to 145#/CF<br>* Compressive Strength: 150psi max (any more than this will not allow for future ease of excavation)<br>A typical mix uses approx. 100# cement, 250-300# fly ash, and the rest clean sand, water and selected admixtures…on a per cubic yard basis. | CLOSED | |
| 58 | On page 34 of scope of work there is a statement, "organics removed from the site will most likely be reduced this soil, if cleared organic material, can be used for fill on site per the geotech report." For proposal preparation, should we assume 1.3000cy is accurate and price accordingly? | You should base your bid upon the quantities provided. | CLOSED | |
| 59 | What are the safety training requirements for workers at the site? (how many hours?) | | OPEN | Dan Angeles |
| 60 | Are drawings of maintenance shop available? | The Maintenance Building has been removed from the scope of the project. | CLOSED | |
| 61 | Are extended hours allowed for monolithic pours on the center-line foundation? | You should assume that the monolithic pours must be completed within the standard allowed work hours. | CLOSED | |
| 62 | Are there any extended time curing requirements? | Per ACI mass concrete requirements | CLOSED | |
| 63 | Will plant operations be allowed on Sunday? | Operations: yes Construction: no | CLOSED | |
| 64 | Will any historic building inspections be required? | | OPEN | Dan Angeles |
| 65 | Will we utilize the plant's EPA processes for hazardous material? | Yes | CLOSED | |
| 66 | Will there be any CBO involvement? | There will not be a CBO in the sense of a California Energy Commission jurisdictional project. However the Pasadena Building Department does expect to review the project design as well as field inspections. | CLOSED | |
| 67 | Does the 15% requirement apply to the aggregate of subcontracting and procurement? | See responses to items 49 and 50. | CLOSED | |
| 68 | If we use a company that the city of Pasadena uses, but is not located within the city of Pasadena, does it count towards the 15%? | No | CLOSED | |
| 69 | Is the list of Pasadena firms classified by business type? | No, business type is not the criteria, location within the City of Pasadena is the critical criterion. | CLOSED | |
| 70 | Are there extraction points for the gear box? | There is a removeable panel on the GTG per the GE presentation. The STG gear box should be accessible through the roof. | CLOSED | |
| 71 | Is the generator rotor located out of the back? | The generator rotor for both the STG and the GTG will be to the west. Removeable panels will be provided by GE for both. | CLOSED | |
| 72 | Does the steam turbine include a removable roof? | Sections of the roof are removable. | CLOSED | |

# City of Pasadena - Glenarm GT5
## Pre-Bid Meeting Questions
## Revision 0

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 73 | Will GE define the requirements for the chemical feed systems? | They are included in the issued specifications | CLOSED | |
| 74 | Will GE be treating the boiler feed pumps for acoustics? | Yes, If necessary to meet their noise guarantee. | CLOSED | |
| 75 | Will the slides from GE's presentation be included in the addendum? | They are being distributed as part of Addendum #2. | CLOSED | |
| 76 | Is GE's equipment data current? | Yes | CLOSED | |
| 77 | Are the GE preferred vendors confirmed or yet to be determined? | See response to item 23. | CLOSED | |
| 78 | When will the bidders know GE's final equipment selections? | See response to item 23. | CLOSED | |
| 79 | It was noted that the steam turbine included shims, but are they also included with the gas turbine? | Shear lugs only for gas turbine | CLOSED | |
| 80 | Are the generator protective panels included with all devices? | Yes; the BOP is to have them installed in the PDC furnished by the BOP Contractor. | CLOSED | |
| 81 | Are the power requirements after shutdown defined? | See response to Item 40. | CLOSED | |
| 82 | Is the steam turbine grout or epoxy? | See response to Item 11. | CLOSED | |
| 83 | Are the erection plates designed for seismic activity? | Yes | CLOSED | |
| 84 | Will the erection plates be bolted and welded? | Yes | CLOSED | |
| 85 | Do the modules come prime or painted? | They will be delivered in a primed condition. It is the BOP contractor's responsibility to do touch ups | CLOSED | |
| 86 | Is there a recommended traffic-rated cover to protect pipes onsite? | It is the BOP Contractor's responsibility to provide adequate protection. | CLOSED | |
| 87 | Are the soil resistivity levels defined? | See response to Item 3. | CLOSED | |
| 88 | Are there any requirements for soil remediation in the lay-down yard following use? | The BOP Contractor must restore the laydown area to its as found condition | CLOSED | |
| 89 | Are there any architectural details for the 10' protection wall? | There are no architectural requirements. | CLOSED | |
| 90 | Is the PDC considered a habitable structure with ADA requirements? | No, there are no ADA requirements for the PDC. | CLOSED | |
| 91 | Can additional site visits be requested? | Yes, if scheduled in advance with at least one week's notice. | CLOSED | |
| 92 | Which version of the building code will be used on the project? | See response to Item 21. | CLOSED | |
| 93 | Are there any requirements to have external condensate storage during drain down of IST's equipment? | The plant design includes a 5,000 gal. Condensate Storage Tank | CLOSED | |
| 94 | Are gas blows allowed on the project? | No, natural gas blows are not allowed. | CLOSED | |
| 95 | Will the erection procedures for the LM6000 and OTSG be included in the bid package? | Yes, to the extend shown at the pre-bid meeting. | CLOSED | |
| 96 | Will the sign-in sheet be made available? | They are being distributed as part of Addendum #2. | CLOSED | |
| 97 | Does the CEMS package include the umbilical? | Yes | CLOSED | |
| 98 | Will the project primarily be using Donaldson filter houses? | Yes | CLOSED | |
| 99 | Does the existing 6’ x 4’ storm drain culvert lie within an easement? If so, please provide the recorded easement document with legal description and any encroachment restrictions. | | OPEN | Dan Angeles |

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 100 | Since the boilers and burners in the Glenarm Building are not being removed and there is no "seismic retrofitting" of the Glenarm Building, are "demolition" & "protection" plans and a "Historic American Building Survey (HABS) Level III recordation" required prior to any demolition within the Glenarm Building (see Mitigation Monitoring and Reporting Program (MMRP) Mitigation Measures CULT-1, -2 & -3), or for any other existing structure? And is an "interpretive architectural exhibit" required per MMRP Mitigation Measure CULT-2? | | OPEN | Dan Angeles |
| 101 | Has PWP submitted "comprehensive pre-demolition asbestos" and "lead-based paint" surveys "for all existing buildings located on the project site" and a "soils management plan" for "excavation and grading activities on the project site" to the City of Pasadena Fire Department per MMRP Mitigation Measures HAZ-1, -2 & -5? If so, please provide the surveys and plan. If not, please let us know when they will be submitted and their expected approval. | The GT5 Repower EIR Mitigation Measure indicated that an asbestos/lead survey and soil management plan shall be submitted to Pasadena Fire prior to demo. The Mitigation Measure and reporting Program (MMRP) from the EIR is in the BOP Contractor Specification. As the City will not be occupying the Glenarm Building as part of this project, the asbestos and lead abatement will be limited to the structures that will be removed on the south side of the building (i.e., smoke stack, air compressor building, restroom, and piping in the tunnels outside the building that will be removed). There will be organic & lead contaminated dirt remediation. There are electrical transformers that contain < 2 ppm PCB based on PWP's latest sampling and analysis and there are old fuel oil lines in the tunnels that will be removed.<br><br>The BOP Contractor could handle this as one work plan for everything or several separate ones. They'll need work plans for the following:<br>- Lead/asbestos abatement on structures<br>- Electrical transformer removal (assuming they are not just being sent as hazardous waste)<br>- Cleaning and removal of fuel oil piping (assuming they are not just being sent as hazardous waste)<br>- Soil remediation<br><br>The work plans will need to demonstrate that the proposed contractor(s) is suitably qualified and licensed for the work, document the procedures used to remove and manage the hazardous materials from generation through disposal, and propose cleanup levels and sampling criteria based upon current regulatory standards. Pasadena Fire will charge $202/hour for review of submittals and reports, as well as required inspections. This rate is subject to escalation each fiscal yaer. Lead and asbestos work may also require additional submittals and/or permits from CalOSHA and/or AQMD. | CLOSED | |
| 102 | Can we design flexible & rigid pavement sections per the Soils Engineering Investigation's R-value tests of "60 and 67" (page 22) instead of per the paving thickness designs "outlined in section 9.0 Paving of the Soils Investigation Report" based on "an assumed R value of 35" (section 9.2, page 43) | | OPEN | Gregg Harwood/Keith Waller |
| 103 | Is the reinforced concrete paving covering the "operating areas" to be designed for "heavy truck drives" (2nd to last paragraph in SOW, page 46)? | The intent is to have all concrete H-20 rated, with thickened areas for crane loading on the west side of the GTG and then also south of the cooling tower. | CLOSED | |

| Question # | Question | Answer | Status | Responsible Party |
|---|---|---|---|---|
| 104 | Please clarify the conflicting statements in the 3rd paragraph of SOW, page 49, regarding spill containment areas:<br>"The containments shall be provided with sumps to pump out rain water or contaminated water."<br>and<br>"All spill containment areas shall be set to gravity drain to grade . . ." | | OPEN | Dan Angeles |
| 105 | Is the existing on-site AC roadway running N. – S. between East State St. and the new plant proper to be removed and replaced, or can it be left in place to connect with the proposed new roadways on its west and north ends? | | OPEN | Dan Angeles |
| 106 | What volume of "residual fuel oil" in the "asbestos insulated fuel oil piping" and "asbestos containing materials (ACM)" needs to be removed, remediated, and properly disposed (SOW sections A.7.1.i., page 6, and G.2, page 39)? | | OPEN | Dan Angeles |
| 107 | Per SOW, paragraph 2, pages 5 & 6, of Addendum No. 1, can Hyrdologue serve as both the "geotechnical firm . . . present for all excavation and backfill activities on site" and the "third party geotechnical firm . . . required to be on site for all inspections, testing and reporting including compaction, soil testing, etc.? | | OPEN | Dan Angeles |
| 108 | Please confirm that the contractor-provided "unit rates" for the "Quantities of soil to be excavated and recompacted, organic materials and lead contaminated soils to be removed from the site and concrete volumes to be demolished" will be used as both an extra to "account for additional material to be handled/removed" and as a "credit for materials not handled and removed" (SOW, section G.1, 3rd paragraph). | Yes, the unit rates that were requested are to be used to adjust up or down the BOP Contractor's cost based on actual volumes. | CLOSED | |
| 109 | Where is the Ground Penetrating Radar report in the RFP bid documents? If missing, please provide. | The GPR report is in the document 3626-03 Geophysical Investigation found in A.3.C/Reference & Preliminary Design Scoping/ Geotech Report and GPR / Geotech | CLOSED | |
| 110 | Does the 10 minute start requirement apply to the BOP Contractor? | The plant must meet a 10 minute start. The plant control system, plant design, and any equipment supplied by the BOP Contractor must work with the GE supplied equipment to achieve the 10 minute start. | CLOSED | |
| 111 | | | | |