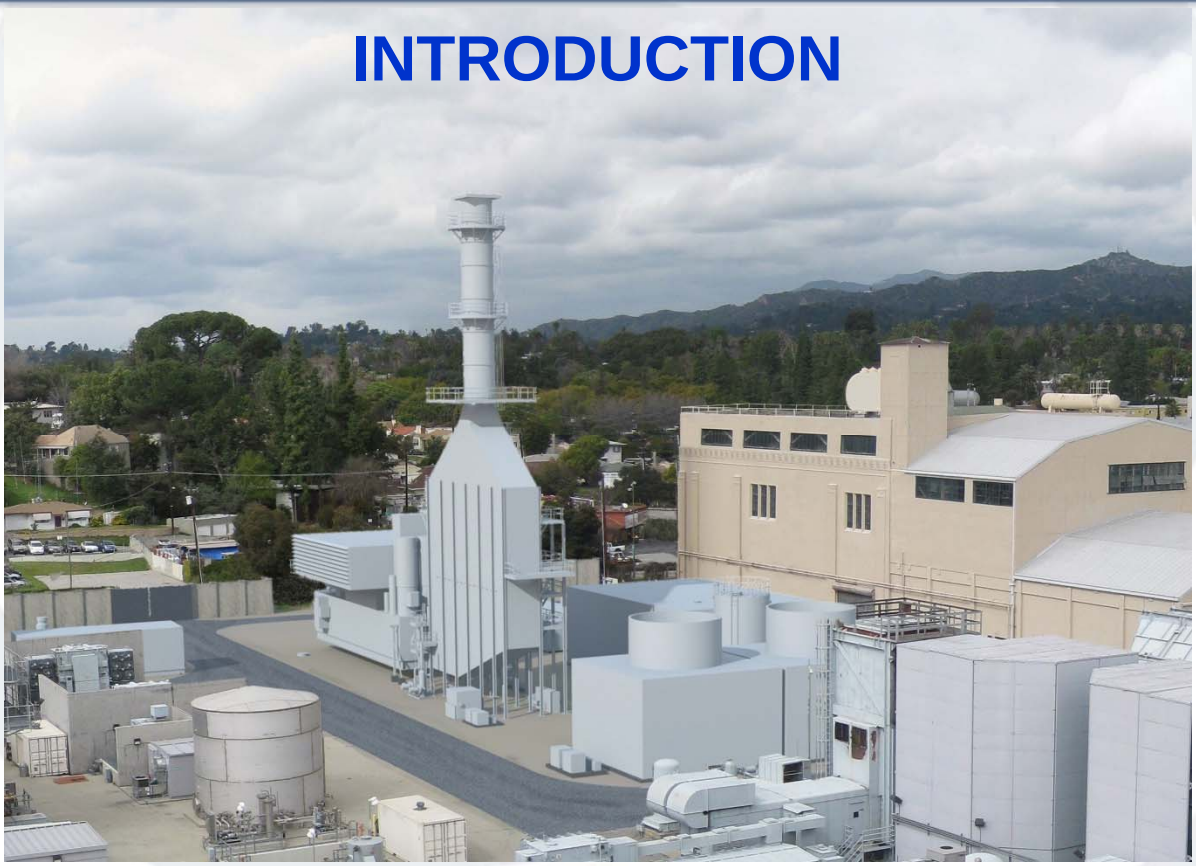
Enclosure 4

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

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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

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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

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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

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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.

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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

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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

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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

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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

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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

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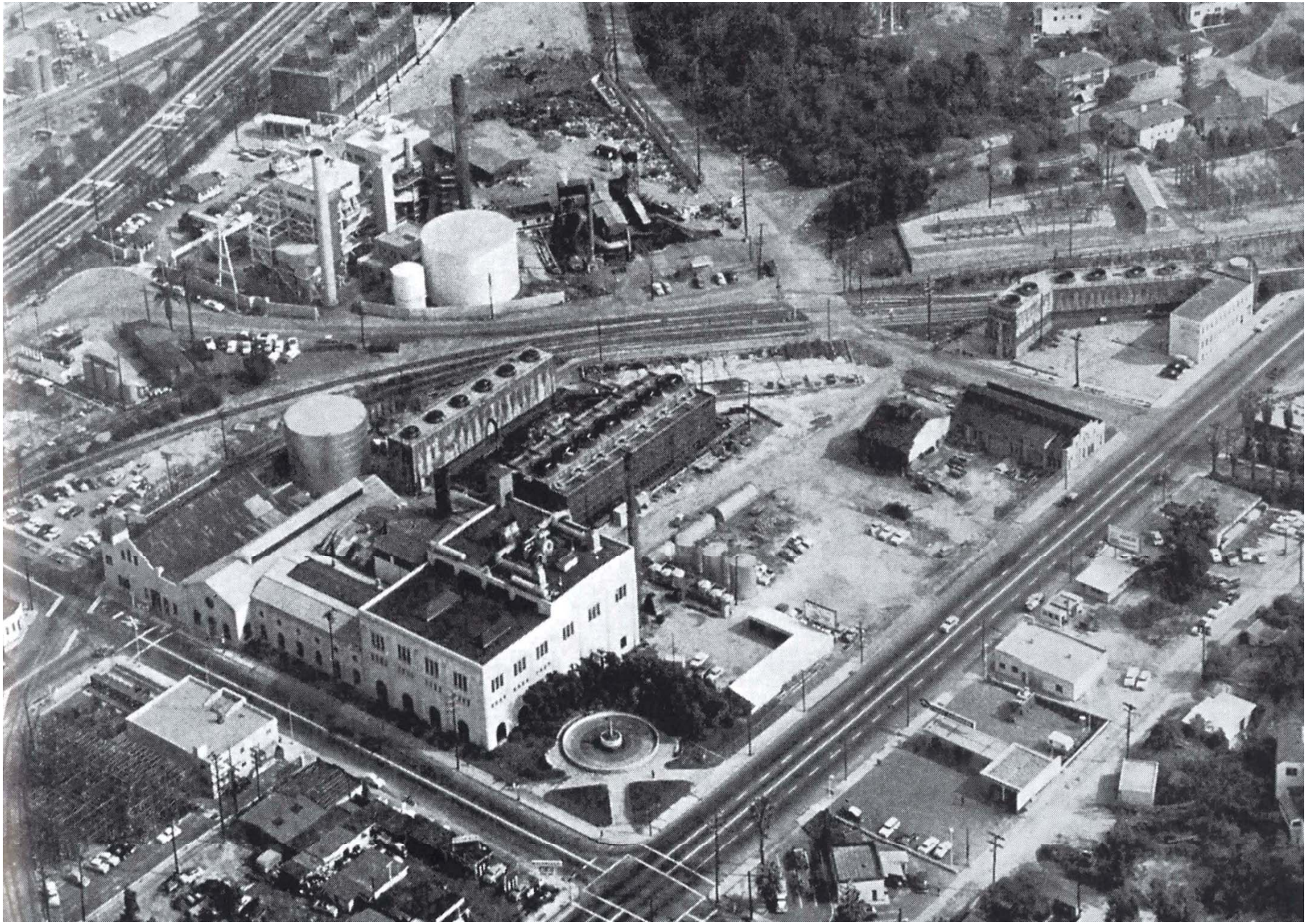
BID Package Summary

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



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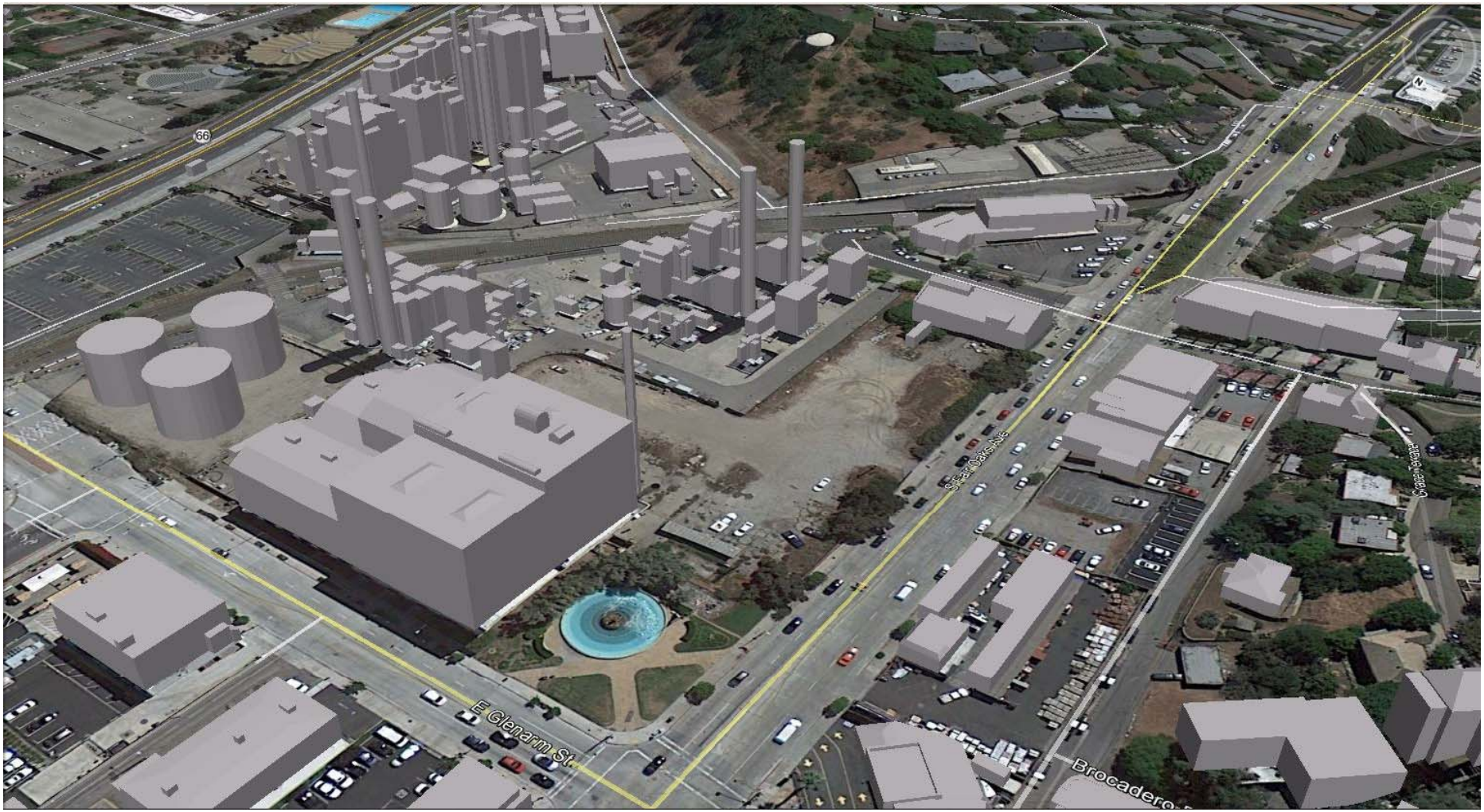

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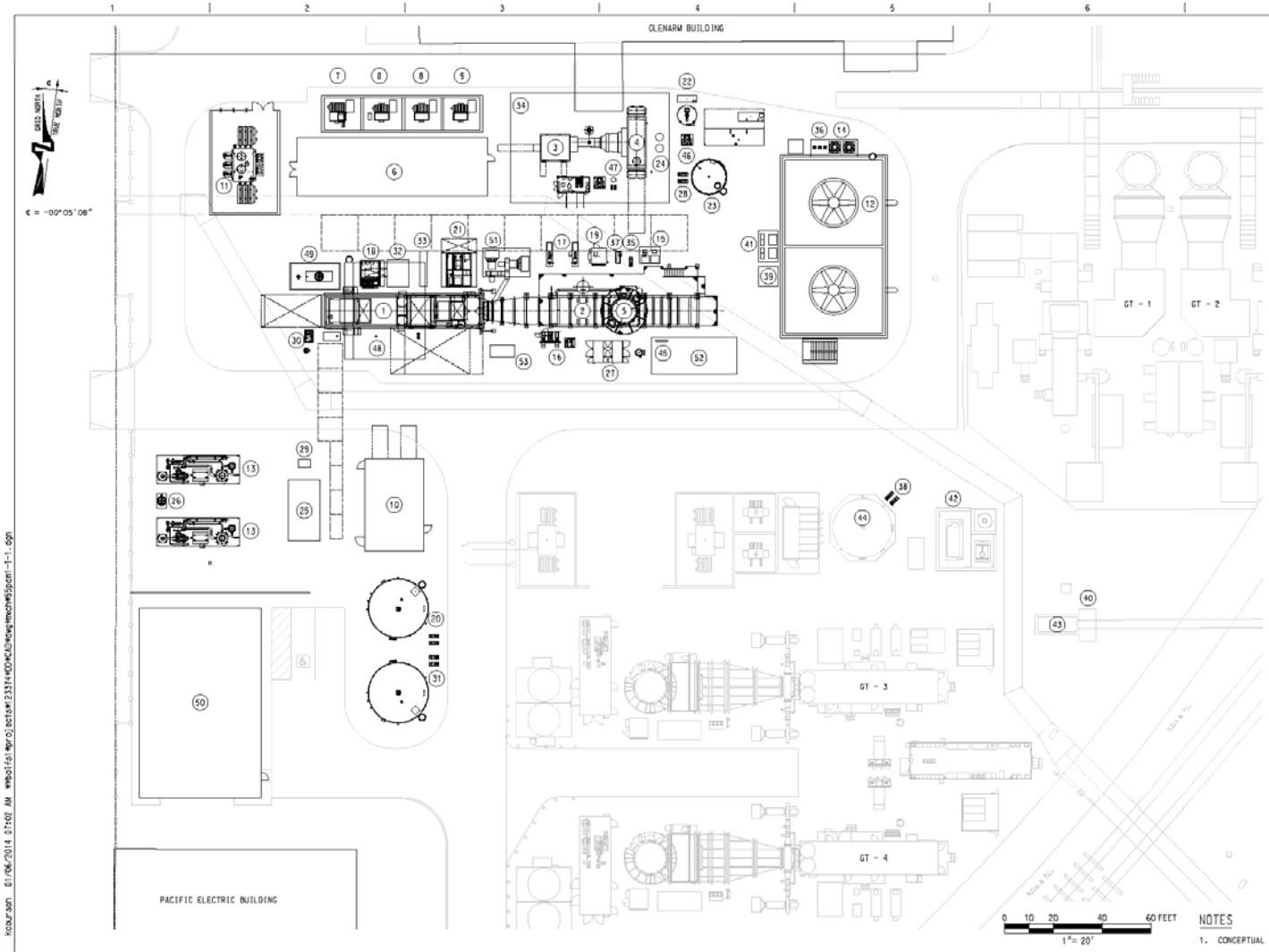
Site Plan & General Arrangement



NOTES

1. CONCEPTUAL

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

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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

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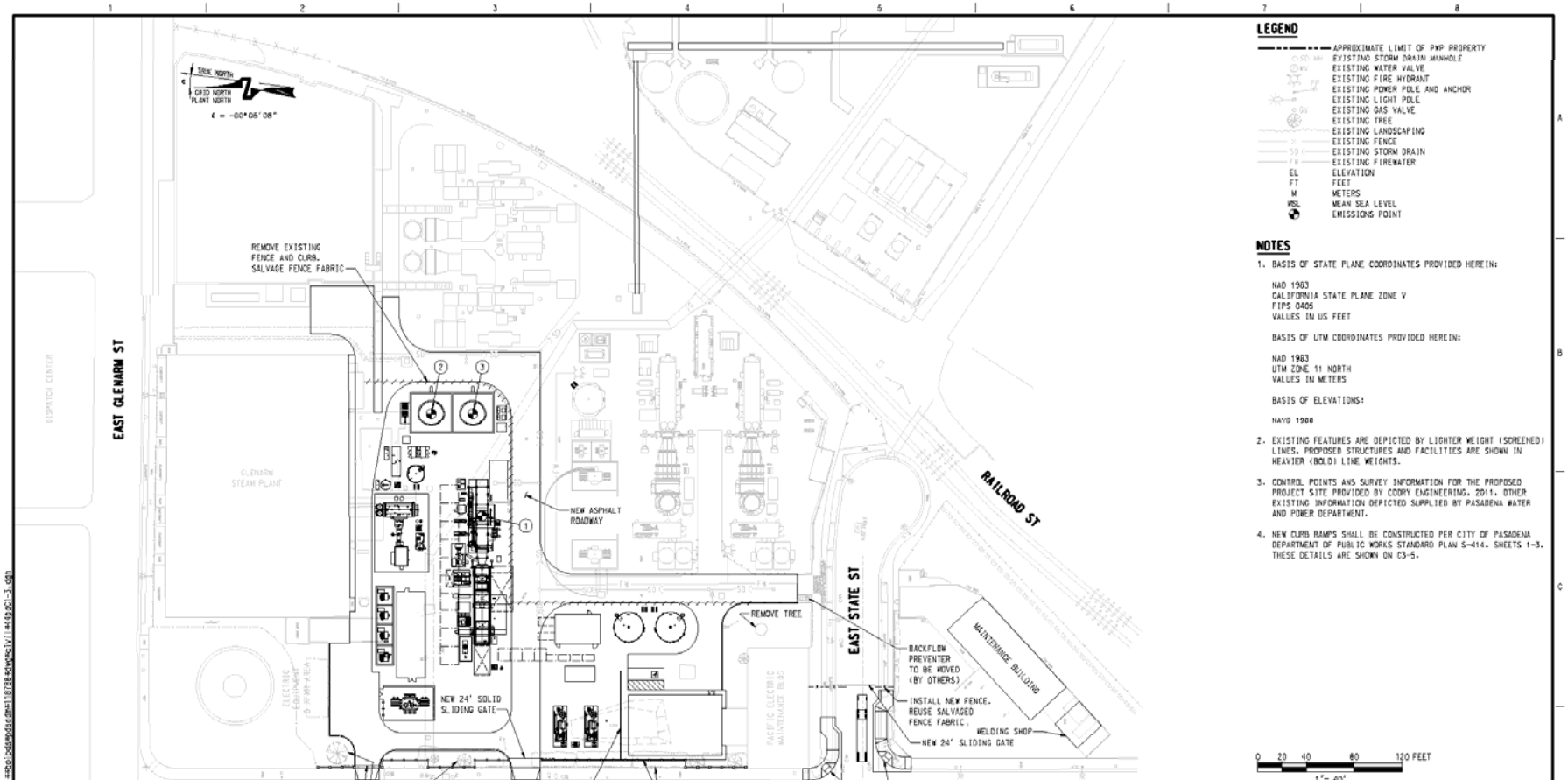
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
GENERAL ARRANGEMENT
GAS TURBINE/AXIAL EXHAUST

JOB NUMBER 133374
REV 1
DRAWING NUMBER M1-1-1

8



LEGEND

- APPROXIMATE LIMIT OF PWP PROPERTY
- 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 FENCE
- EXISTING STORM DRAIN
- EXISTING FIREWATER
- EL — ELEVATION
- FT — FEET
- M — METERS
- MSL — MEAN SEA LEVEL
- EMISSIONS POINT

NOTES

1. BASIS OF STATE PLANE COORDINATES PROVIDED HEREIN:

   NAD 1983
   CALIFORNIA STATE PLANE ZONE V
   FIPS 0405
   VALUES IN US FEET

   BASIS OF UTM COORDINATES PROVIDED HEREIN:

   NAD 1983
   UTM ZONE 11 NORTH
   VALUES IN METERS

   BASIS OF ELEVATIONS:

   NAVD 1988

2. EXISTING FEATURES ARE DEPICTED BY LIGHTER WEIGHT (SCREENED) LINES. PROPOSED STRUCTURES AND FACILITIES ARE SHOWN IN HEAVIER (BOLD) LINE WEIGHTS.

3. CONTROL POINTS ANS SURVEY INFORMATION FOR THE PROPOSED PROJECT SITE PROVIDED BY COORY ENGINEERING, 2011. OTHER EXISTING INFORMATION DEPICTED SUPPLIED BY PASADENA WATER AND POWER DEPARTMENT.

4. NEW CURB RAMPS SHALL BE CONSTRUCTED PER CITY OF PASADENA DEPARTMENT OF PUBLIC WORKS STANDARD PLAN S-414. SHEETS 1-3. THESE DETAILS ARE SHOWN ON C3-5.

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	CTSG 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

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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 DWG ONLY

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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		SCALE	NONE
D	ISSUE FOR BID	11.20.13	SEG	TRC	GTH			DSGN SEG	12.06.12
C	ISSUE FOR BID	10.15.13	SEG	TRC	GTH			DRN SEG	12.06.12
B	ISSUE FOR BID	9.27.13	SEG	TRC	GTH	M1-1-6	TIE POINT DRAWING	CHK ADD	12.06.12

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

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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

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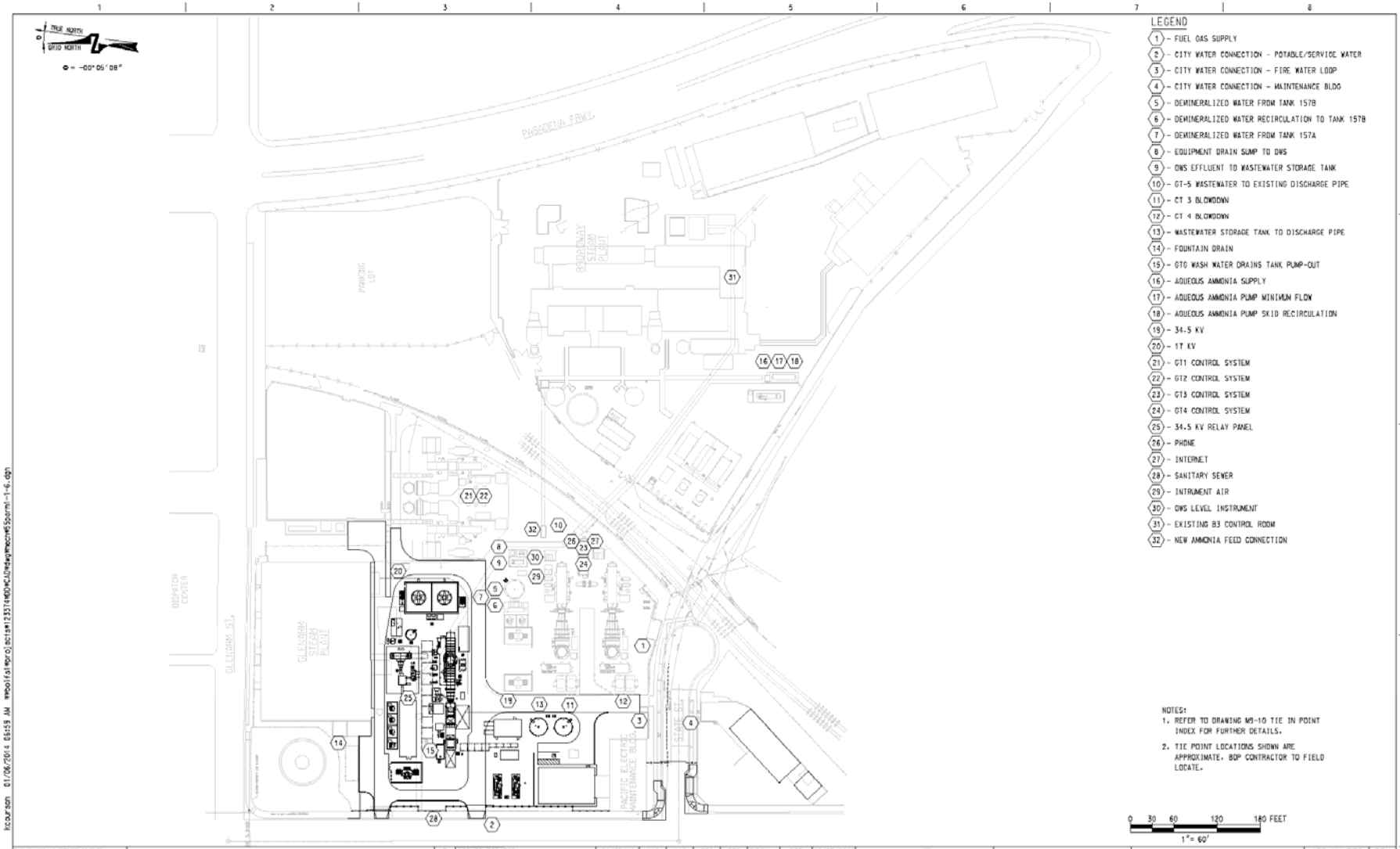
TRUE NORTH
GRID NORTH
Φ = -00°05'08"
PASADENA FRWY.
PARKING LOT
BROADWAY STEAM PLANT
DISPATCH CENTER
GLENARM STEAM PLANT
GLENARM ST.
PACIFIC ELECTRIC MAINTENANCE BLDG.
LEGEND
1 - FUEL GAS SUPPLY
2 - CITY WATER CONNECTION - POTABLE/SERVICE WATER
3 - CITY WATER CONNECTION - FIRE WATER LOOP
4 - CITY WATER 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'
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INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE
INIT
E ISSUED FOR BID 01/03/14 KAC KAC TRC TRC DSGN DPB 12/05/2013
D ISSUED FOR BID 12/09/2013 VBO SEG TRC TRC DRN DPB 12/05/2012
C ISSUED FOR BID 10/15/2013 VBO SEG TRC TRC CKD SEG 12/05/2012
B ISSUED FOR BID 09/27/2013 VBO SEG TRC TRC
A ISSUED FOR REVIEW 12/07/2012 DPB SEG ADD TRC
REV REVISIONS DATE DRN DSGN CKD APPD
SCALE: 1" = 60'-0"
FOR 22x34 DWG ONLY
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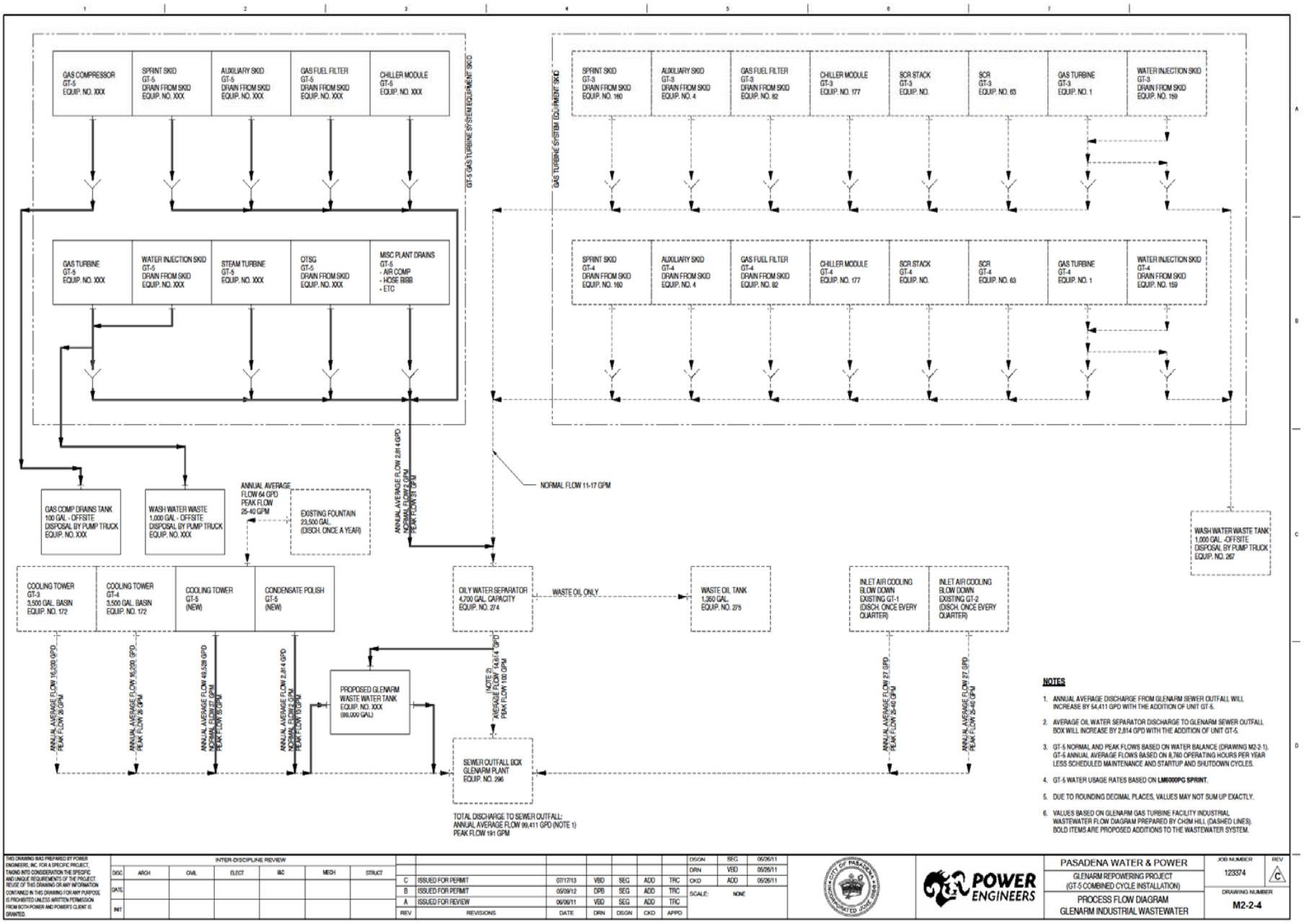
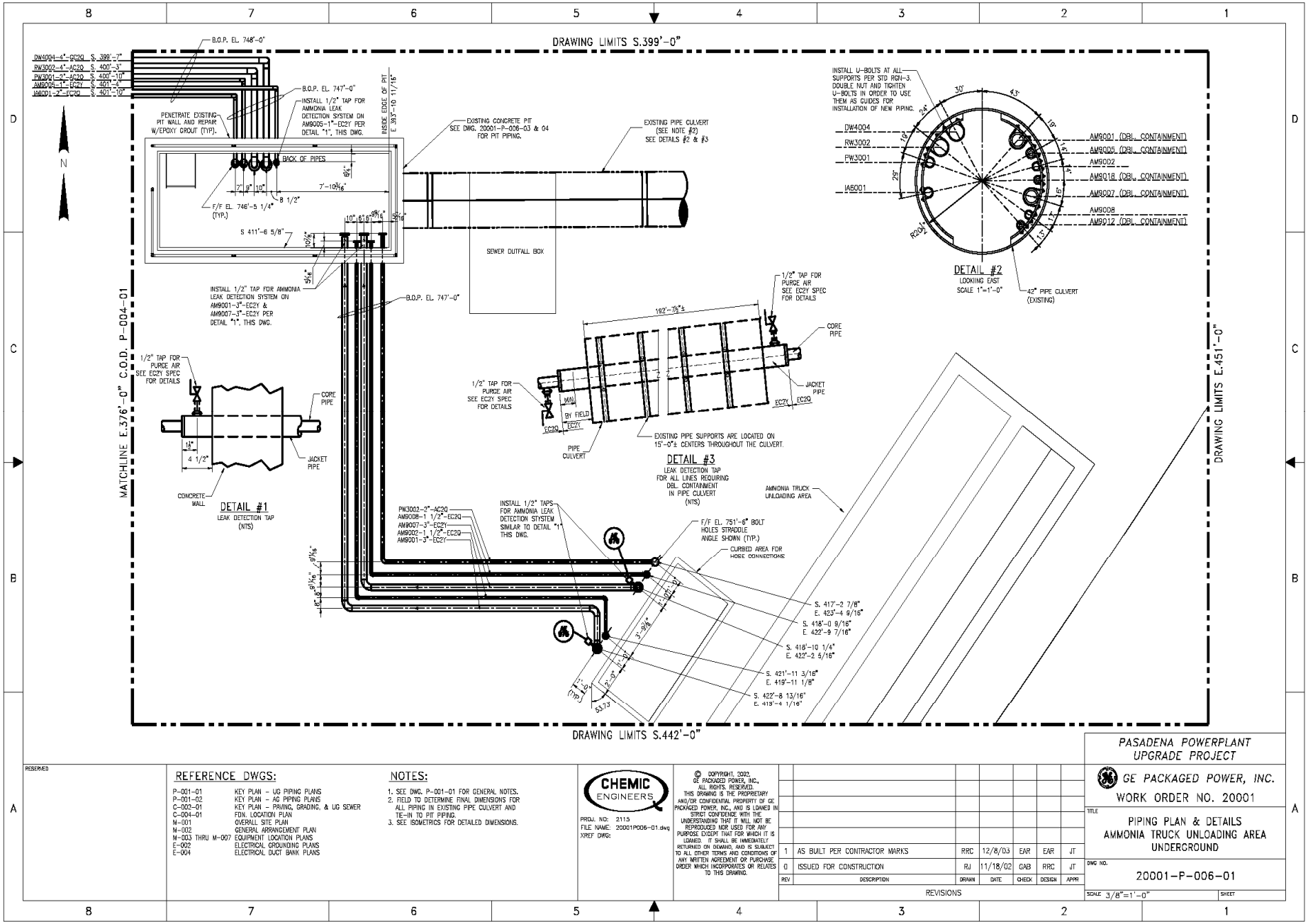
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
TIE POINT DRAWING GAS TURBINE/AXIAL EXHAUST
JOB NUMBER 123374
REV E
DRAWING NUMBER M1-1-6

13

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 91 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 28 GPM
ANNUAL AVERAGE FLOW 16,200 GPD PEAK FLOW 28 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 19 GPM
PROPOSED GLENARM WASTE WATER TANK EQUIP. NO. XXX (88,000 GAL)
NOTE 2 ANNUAL AVERAGE FLOW 14,614 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
INIT
C ISSUED FOR PERMIT 07/17/13 VBD SEG ADD TRC
B ISSUED FOR PERMIT 05/09/12 DPB SEG ADD TRC
A ISSUED FOR REVIEW 06/06/11 VBD SEG ADD TRC
REV REVISIONS DATE DRN DSGN CKD APPD
DSGN SEG 05/26/11
DRN VBD 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: 20001PD06-01.dwg
XREF DWG:

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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

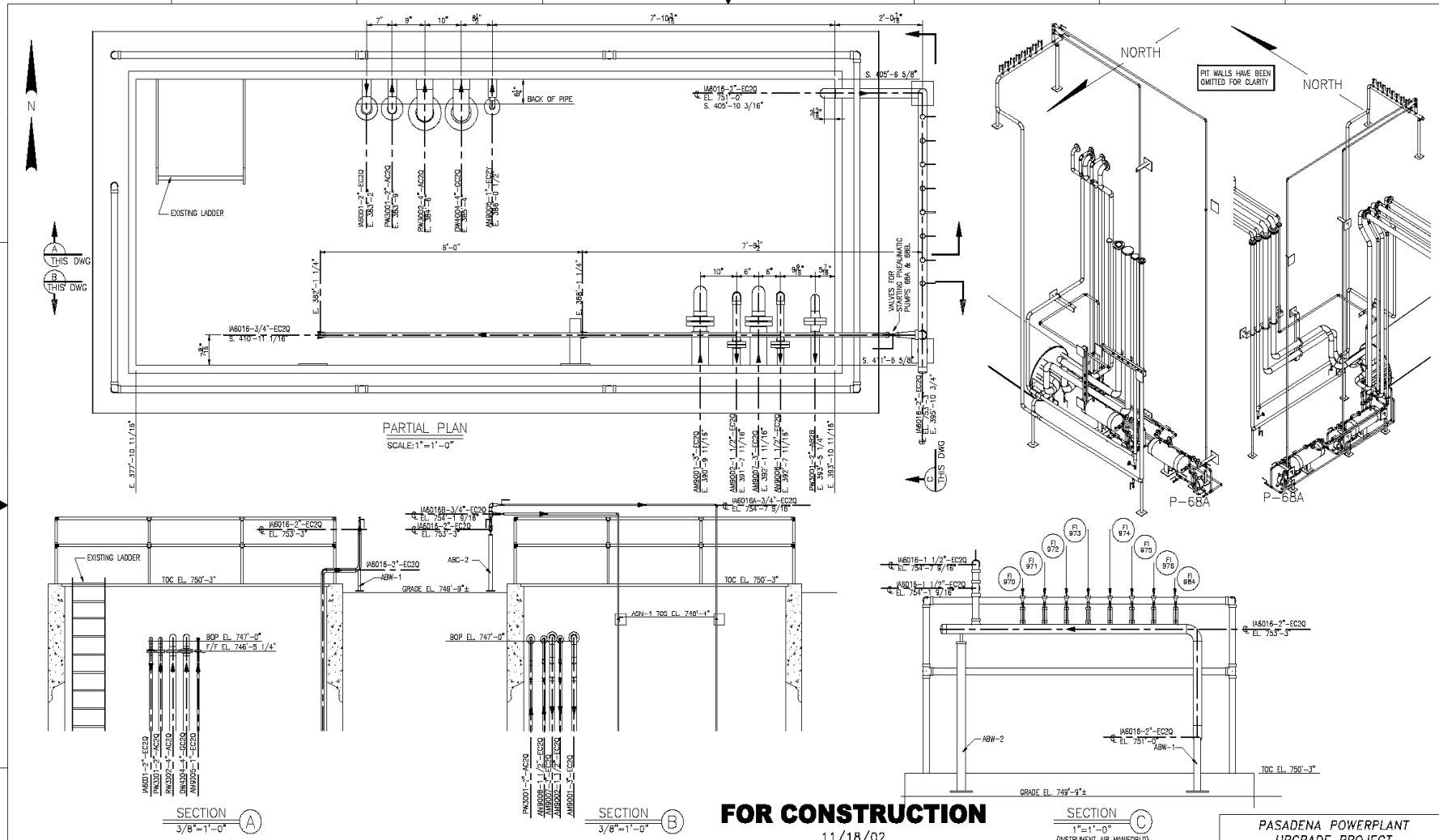
GE PACKAGED POWER, INC.

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



FOR CONSTRUCTION

11/18/02

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:

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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.

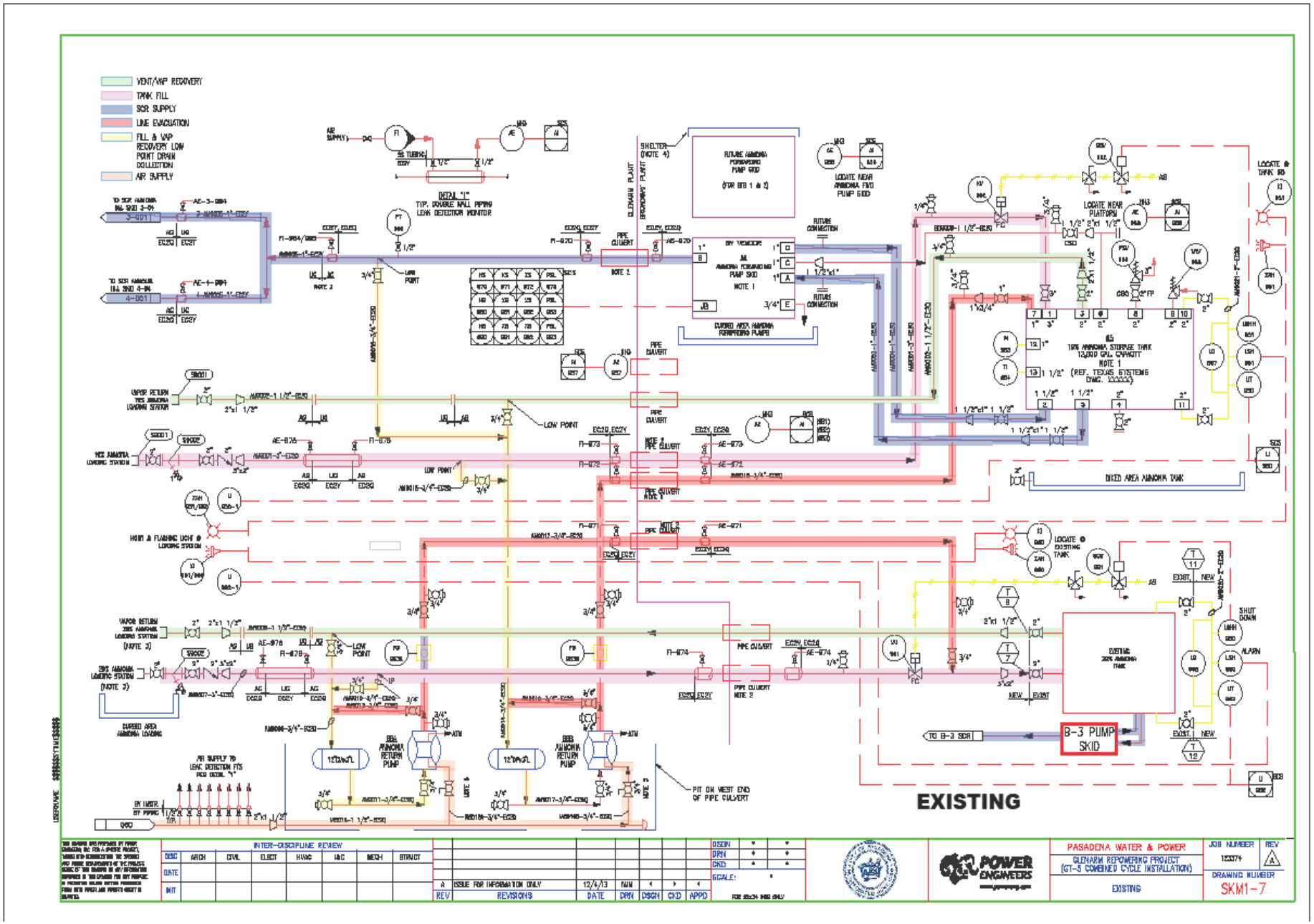
WORK ORDER NO. 20001

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

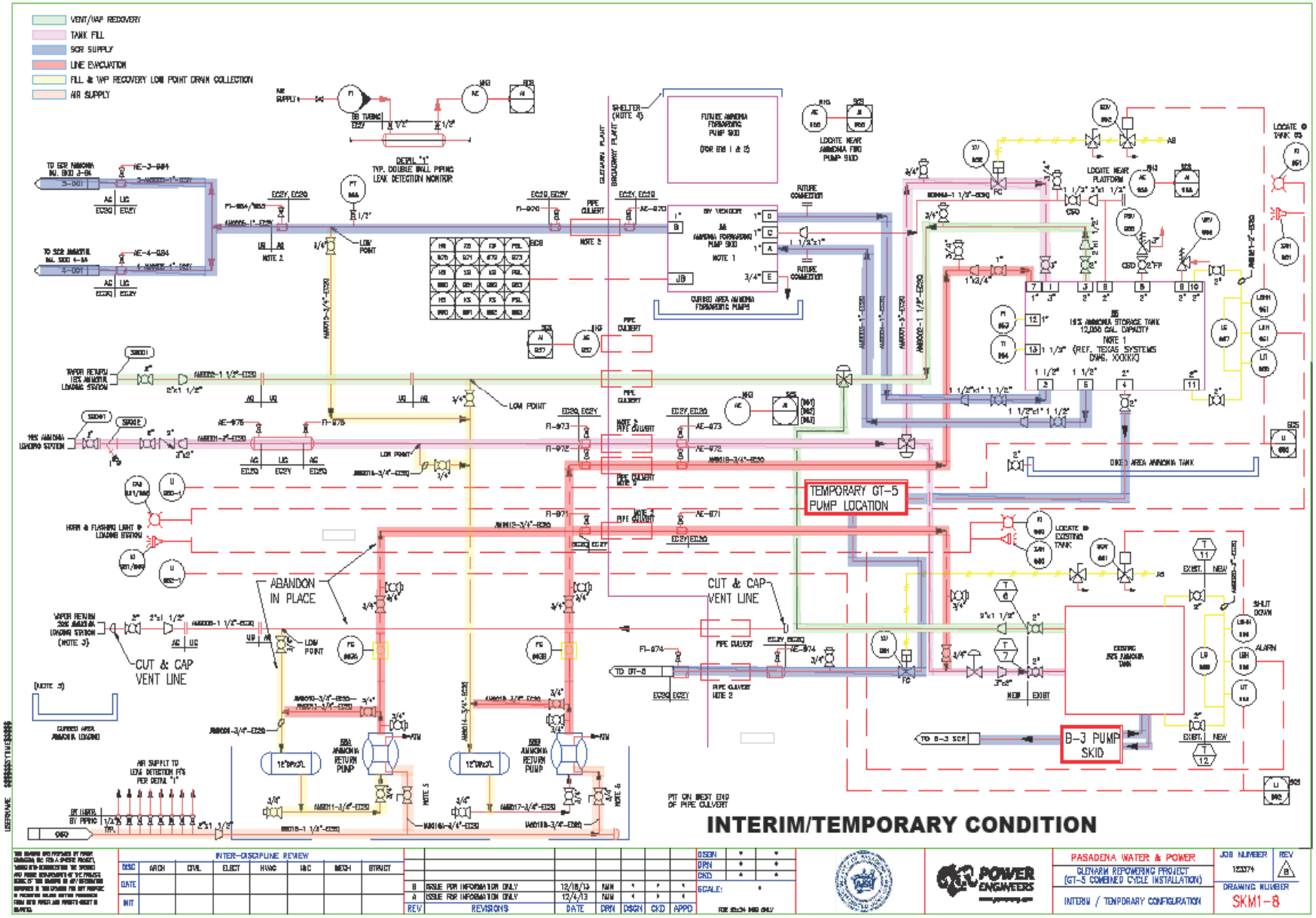
DWG NO. 20001-P-006-03

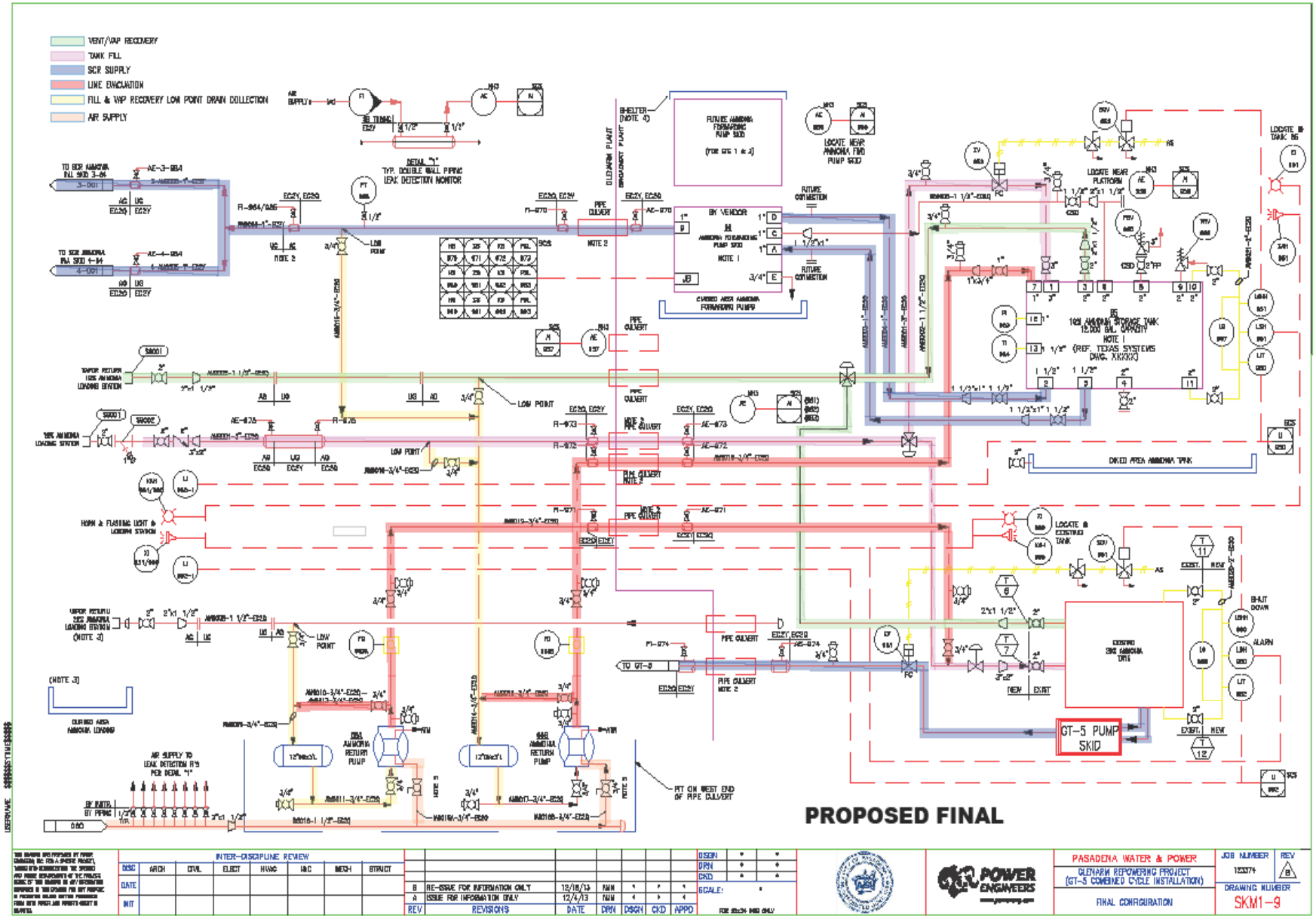
SCALE AS NOTED

SHEET

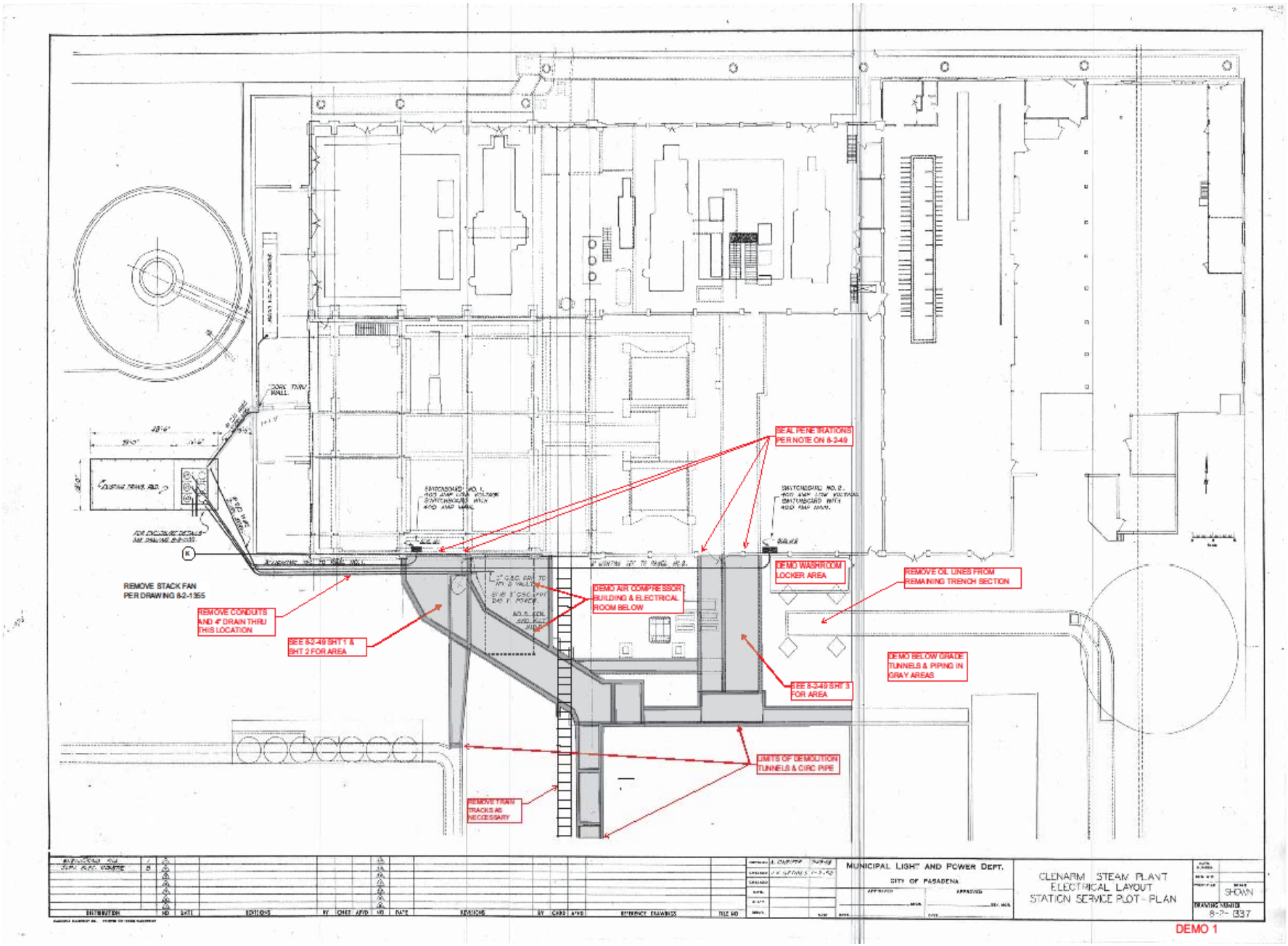

VENT/VAP RECOVERY
TANK FILL
SCR SUPPLY
LINE EVACUATION
FILL & VAP RECOVERY LOW POINT DRAIN COLLECTION
AIR SUPPLY
DETAIL "I"
TYP. DOUBLE WALL PIPING LEAK DETECTION MONITOR
SHELTER (NOTE 4)
FUTURE AMMONIA FORWARDING PUMP SKID
(FOR BFB 1 & 2)
LOCATE NEAR AMMONIA FWD PUMP SKID
LOCATE NEAR PLATFORM
LOCATE @ TANK #5
BY VENDOR
AM AMMONIA FORWARDING PUMP SKID
NOTE 1
FUTURE CONNECTION
DIKED AREA AMMONIA FORWARDING PUMPS
PIPE CULVERT
LOW POINT
VAPOR RETURN TO AMMONIA LOADING STATION
TO AMMONIA LOADING STATION
HORN & FLASHING LIGHT @ LOADING STATION
DIKED AREA AMMONIA LOADING
DIKED AREA AMMONIA TANK
LOCATE @ EXISTING TANK
EXISTING 20% AMMONIA TANK
SHUT DOWN
ALARM
EXIST.
NEW
B-3 PUMP SKID
TO B-3 SCR
BBA AMMONIA RETURN PUMP
AIR SUPPLY TO LEAK DETECTION PTS
PIT ON WEST END OF PIPE CULVERT
EXISTING
INTER-DISCIPLINE REVIEW
ARCH
CIVIL
ELECT
HVAC
I&C
MECH
STRUCT
DSGN
DRN
CKD
DATE
INIT
REV
REVISIONS
ISSUE FOR INFORMATION ONLY
12/4/13
DATE
DRN
DSGN
CKD
APPD
SCALE:
POWER ENGINEERS
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
EXISTING
JOB NUMBER
123374
REV
A
DRAWING NUMBER
SKM1-7

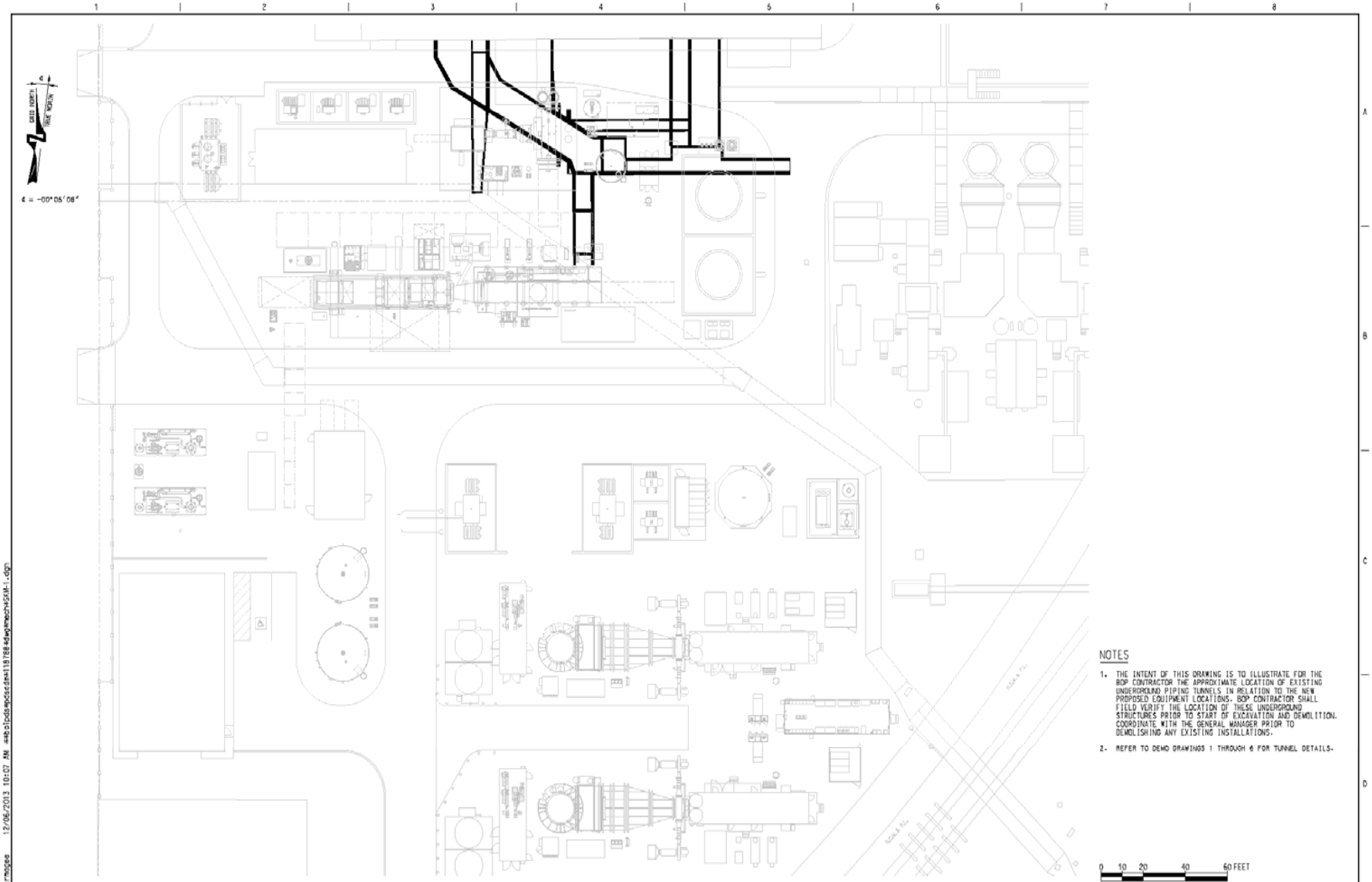
19


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


VENT/VAP RECOVERY
TANK FILL
SCR SUPPLY
LINE EVACUATION
FILL & VAP RECOVERY LOW POINT DRAIN COLLECTION
AIR SUPPLY
DETAIL "1"
TYP. DOUBLE WALL PIPING
LEAK DETECTION MONITOR
FUTURE AMMONIA FORWARDING PUMP SKID
(FOR GTG 1 & 2)
LOCATE NEAR AMMONIA FWD PUMP SKID
BY VENDOR
AMMONIA FORWARDING PUMP SKID
NOTE 1
DIKED AREA AMMONIA FORWARDING PUMP
FUTURE CONNECTION
LOCATE NEAR PLATFORM
16M AMMONIA STORAGE TANK
15,000 GAL. CAPACITY
NOTE 1
(REF. TEXAS SYSTEMS DWG. XXXXX)
DIKED AREA AMMONIA TANK
LOCATE @ TANK 55
VAPOR RETURN 12M AMMONIA LOADING STATION
12M AMMONIA LOADING STATION
HORN & FLASHING LIGHT @ LOADING STATION
LOW POINT
PIPE CULVERT
NOTE 2
TO GT-9
LOCATE @ EXISTING TANK
EXISTING 30M AMMONIA TANK
GT-5 PUMP SKID
SHUT DOWN
ALARM
(NOTE 3)
DIKED AREA AMMONIA LOADING
AMMONIA RETURN PUMP
AIR SUPPLY TO LEAK DETECTION RTS PER DETAIL "1"
BY OWNER
BY PIPING
PIT ON WEST END OF PIPE CULVERT
PROPOSED FINAL
INTER-DISCIPLINE REVIEW
ARCH
CIVIL
ELECT
HVAC
I&C
MECH
STRUCT
RE-ISSUE FOR INFORMATION ONLY
ISSUE FOR INFORMATION ONLY
REVISIONS
DATE
DRN
DSGN
CKD
APPD
POWER ENGINEERS
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT
(GT-5 COMBINED CYCLE INSTALLATION)
FINAL CONFIGURATION
JOB NUMBER
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
REMOVE STACK FAN PER DRAWING 8-2-1355
REMOVE CONDUITS AND 4" DRAIN THRU THIS LOCATION
DEMO AIR COMPRESSOR BUILDING & ELECTRICAL ROOM BELOW
SEE 8-2-49 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
GLENARM STEAM PLANT
ELECTRICAL LAYOUT
STATION SERVICE PLOT - PLAN
SHOWN
8-2-1337
DEMO 1


GRID NORTH
TRUE NORTH
ε = -00°05'08"
NOTES
1. THE INTENT OF THIS DRAWING IS TO ILLUSTRATE FOR THE BOP CONTRACTOR THE APPROXIMATE LOCATION OF EXISTING UNDERGROUND PIPING TUNNELS IN RELATION TO THE NEW PROPOSED EQUIPMENT LOCATIONS. BOP CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THESE UNDERGROUND STRUCTURES PRIOR TO START OF EXCAVATION AND DEMOLITION. COORDINATE WITH THE GENERAL MANAGER PRIOR TO DEMOLISHING ANY EXISTING INSTALLATIONS.
2. REFER TO DEMO DRAWINGS 1 THROUGH 6 FOR TUNNEL DETAILS.
0 10 20 40 60 FEET
1"= 20'
12/06/2013 10:07 AM
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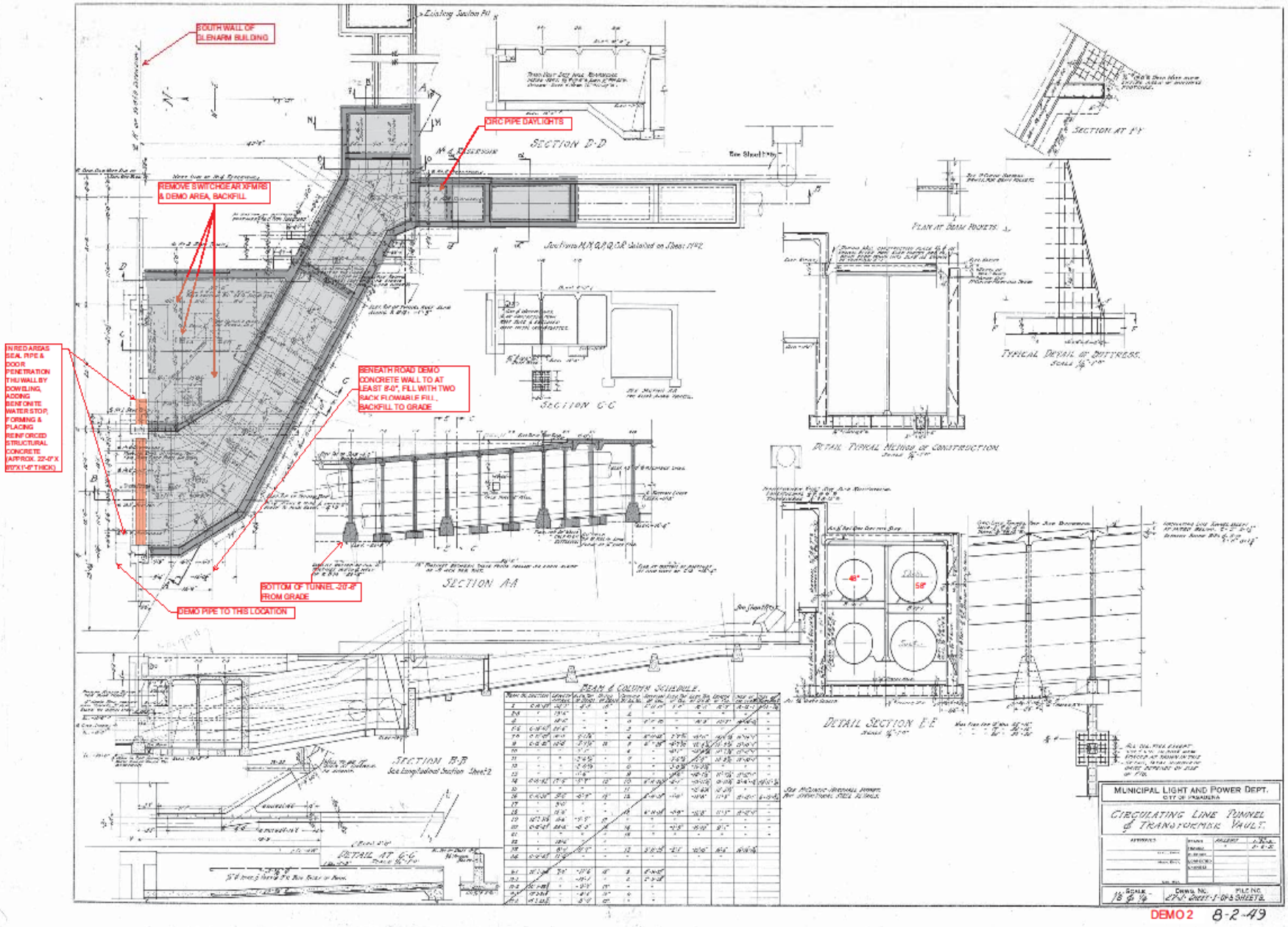
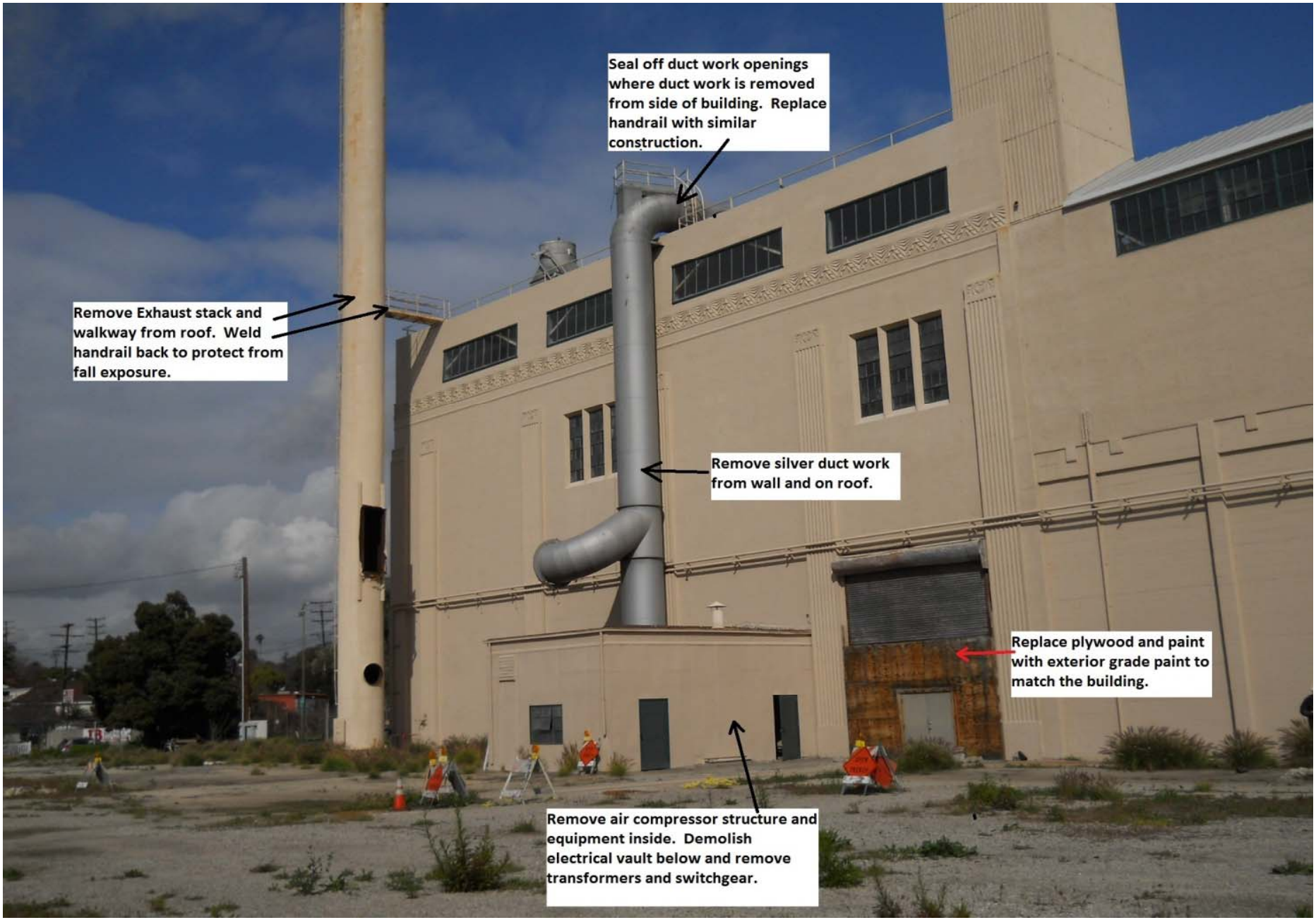
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE
INIT
REV REVISIONS DATE DRN DSGN CKD APPD
B ISSUED FOR INFORMATION 06/12/2013 RM GTH TRC SLH
A ISSUED FOR INFORMATION 08/11/2013 RM GTH TRC SLH
DSGN GH 07/11/2013
DRN RM 07/11/2013
CKD TC 07/11/2013
SCALE: 1" = 20'-0"
FOR 22x34 DWG 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 GLENARM BUILDING
CIRC PIPE DAYLIGHTS
REMOVE SWITCHGEAR XFMRS & DEMO AREA, BACKFILL
IN RED AREAS SEAL PIPE & DOOR PENETRATION THU WALL BY DOWELING, ADDING BENTONITE WATER STOP, FORMING & PLACING REINFORCED STRUCTURAL CONCRETE (APPROX. 22'-0" X 10'0"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
See Longitudinal Section Sheet 2
DETAIL AT G-G
PLAN AT BEAM POCKETS
SECTION AT F-F
TYPICAL DETAIL AT BUTTRESS
DETAIL TYPICAL METHOD OF CONSTRUCTION
DETAIL SECTION E-E
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
Arroyo Seco Pkwy
110
© 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

26


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

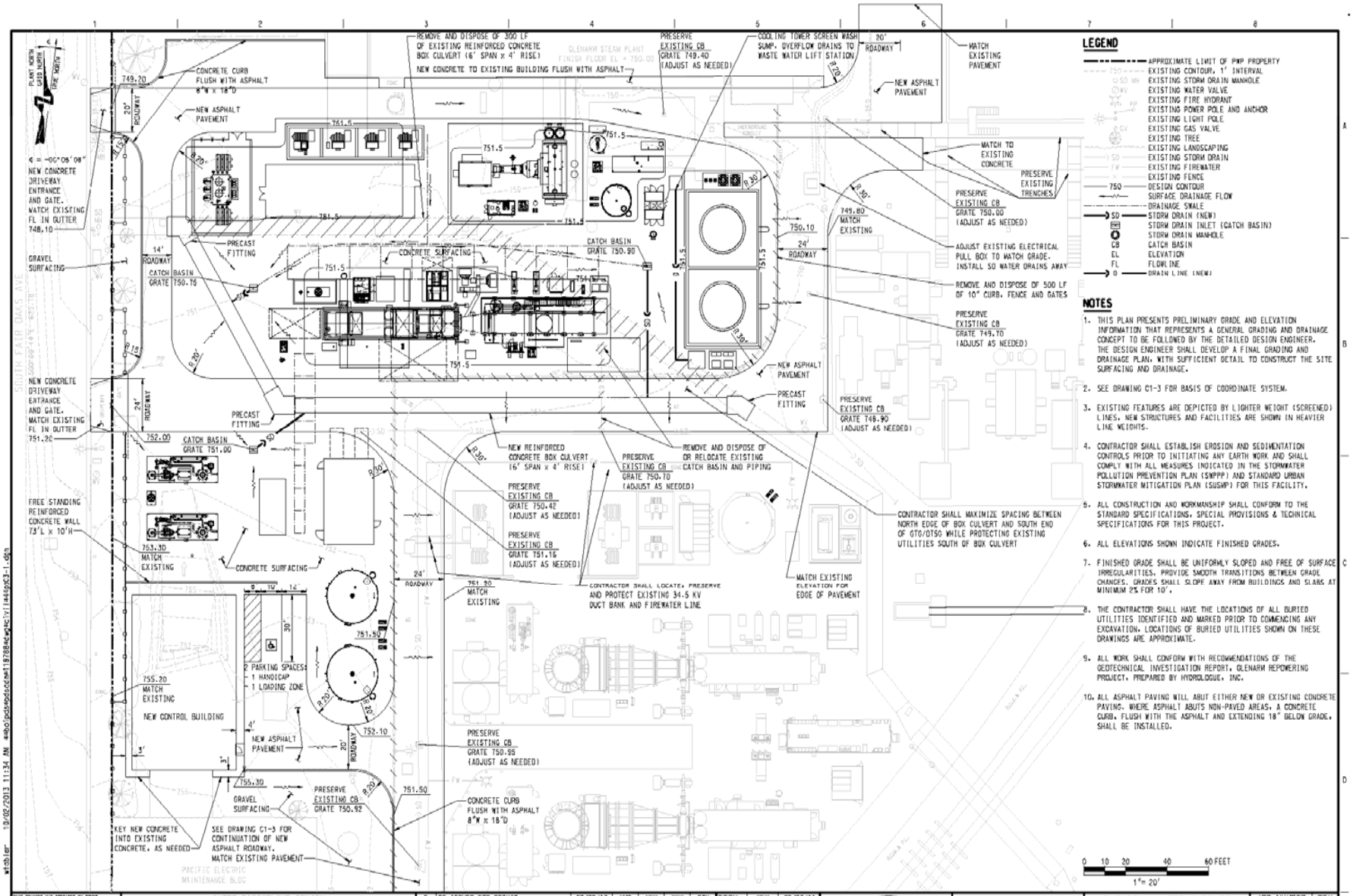
Demo restroom and air compressor rooms.
Piping to be relocated to western property line, near new wall by PWP. U/G line to building to be demoed by BOP.

28

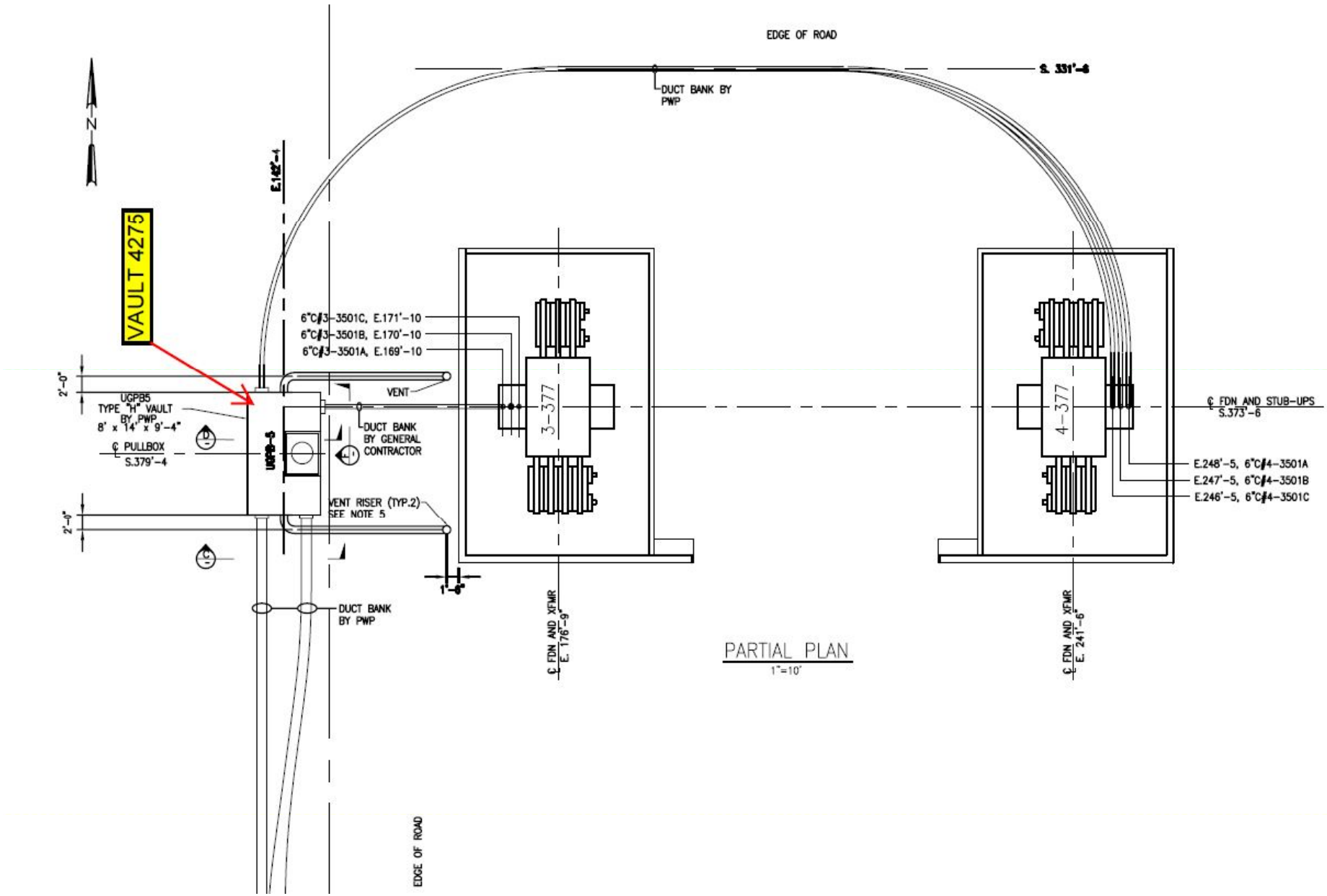
PASADENA

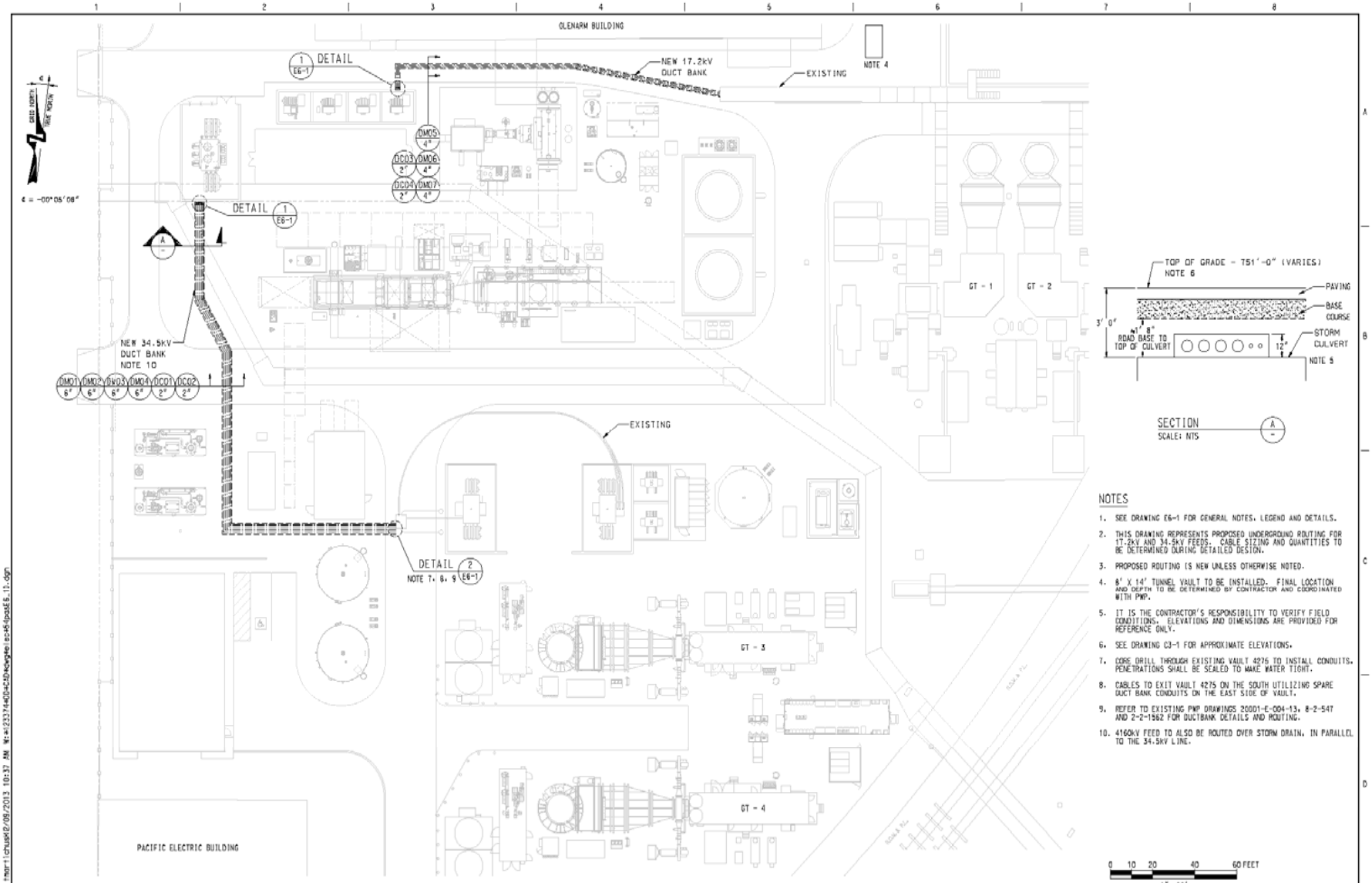
Pasadena Water and Power

Civil Scope / Storm Drain Reroute

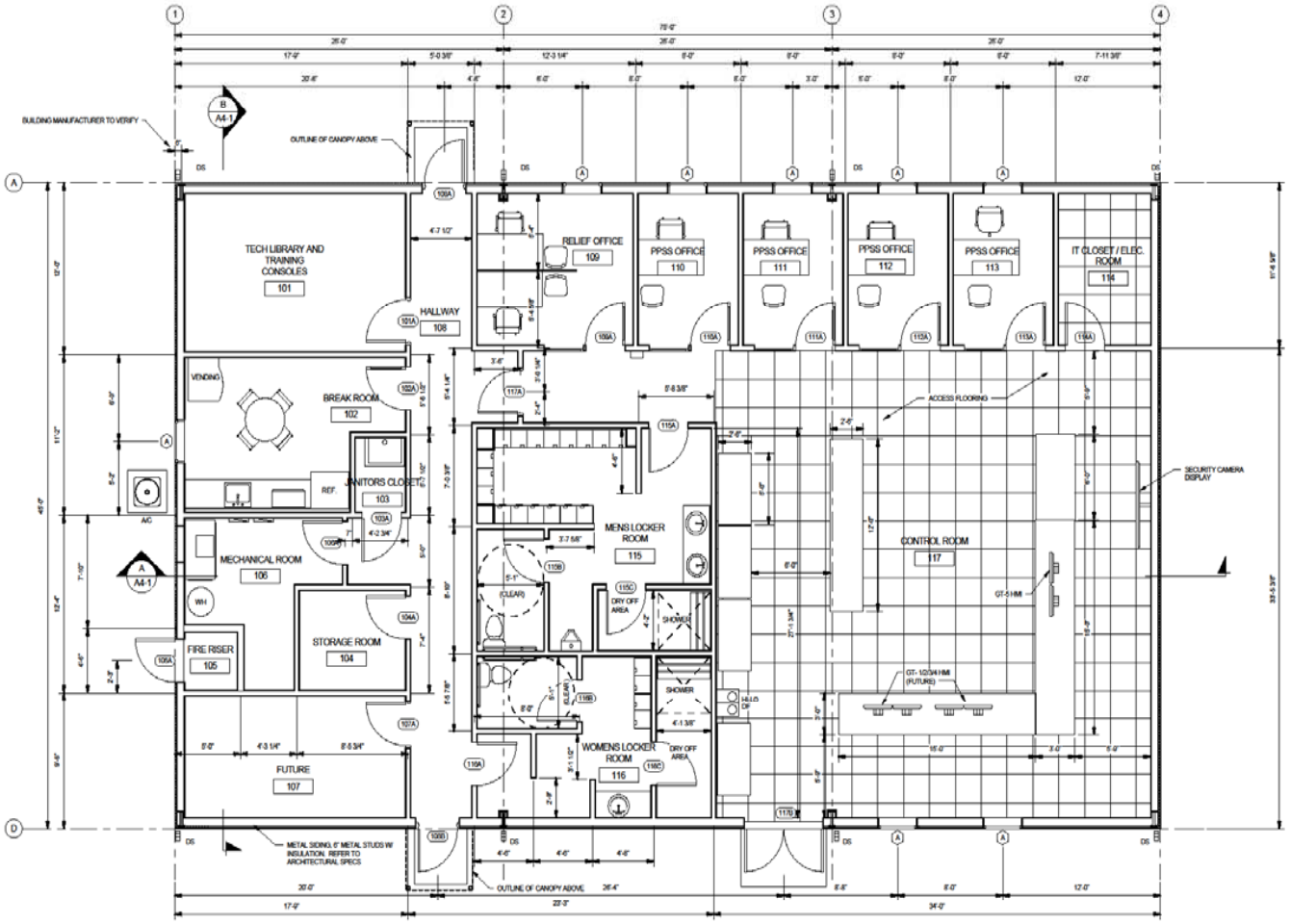

LEGEND
APPROXIMATE LIMIT OF PWP PROPERTY
EXISTING CONTOUR, 1' INTERVAL
EXISTING STORM DRAIN MANHOLE
EXISTING WATER VALVE
EXISTING FIRE HYDRANT
EXISTING POWER POLE AND ANCHOR
EXISTING LIGHT POLE
EXISTING GAS VALVE
EXISTING TREE
EXISTING LANDSCAPING
EXISTING STORM DRAIN
EXISTING FIREWATER
EXISTING FENCE
750 DESIGN CONTOUR
SURFACE DRAINAGE FLOW
DRAINAGE SWALE
SD STORM DRAIN (NEW)
STORM DRAIN INLET (CATCH BASIN)
STORM DRAIN MANHOLE
CB CATCH BASIN
EL ELEVATION
FL 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'
NEW CONTROL BUILDING
GLENARM STEAM PLANT
PACIFIC ELECTRIC MAINTENANCE BLDG
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
REV REVISIONS DATE DRN DSGN CKD APPD
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
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
2'-0"
UGPB5
TYPE "H" VAULT BY PWP
8' x 14' x 9'-4"
℄ PULLBOX S.379'-4
VENT
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"
PARTIAL PLAN
1"=10'
EDGE OF ROAD


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"
1' 8"
ROAD BASE TO TOP OF CULVERT
12"
STORM CULVERT
NOTE 9
SECTION A
SCALE: NTS
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.
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
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

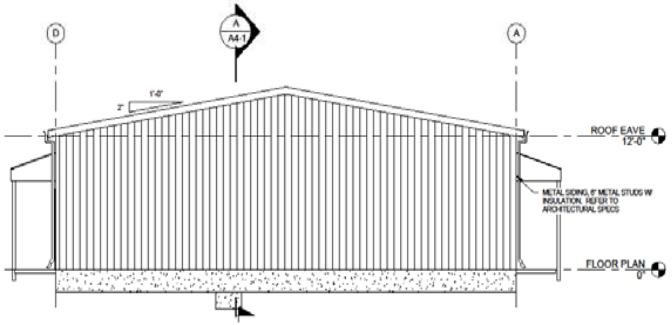
DSGN	SDS	03/26/13
DRN	SAC	03/26/13
CKD	GH	06/03/13
SCALE:	1/4" = 1'-0"	

FOR 22X34 DWG ONLY

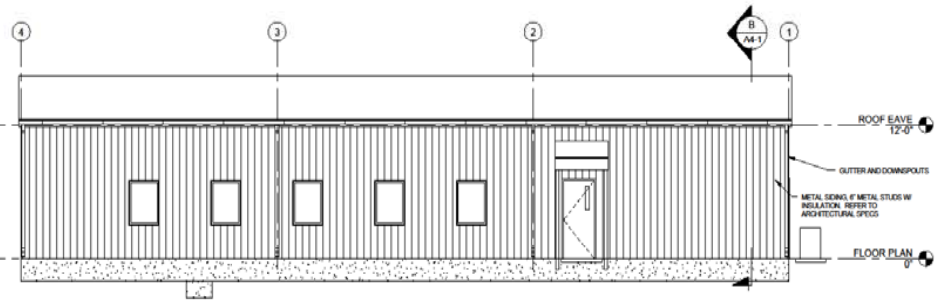
POWER ENGINEERS

PASADENA WATER & POWER
CONTROL BUILDING
MAIN FLOOR PLAN

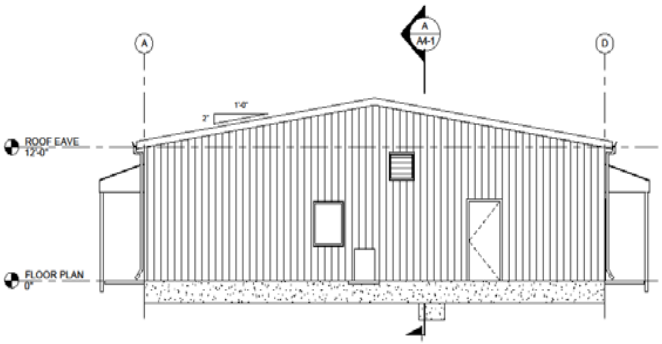
JOB NUMBER 123374
REV D
DRAWING NUMBER A1-2-1



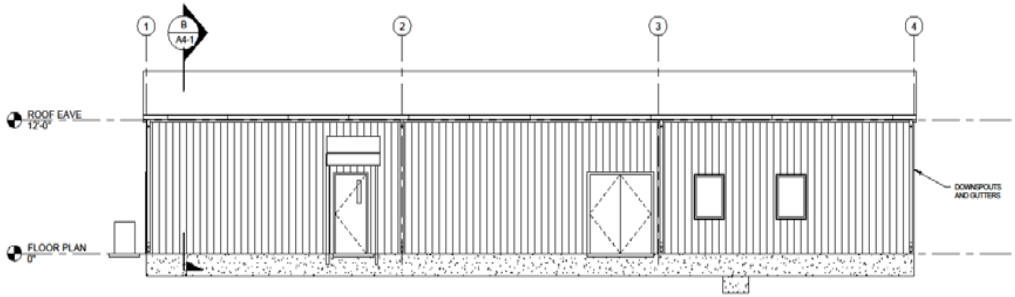
NORTH ELEVATION (LOOKING SOUTH)
SCALE 3/16" = 1'-0"



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"

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10/10/2013 4:48:37 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

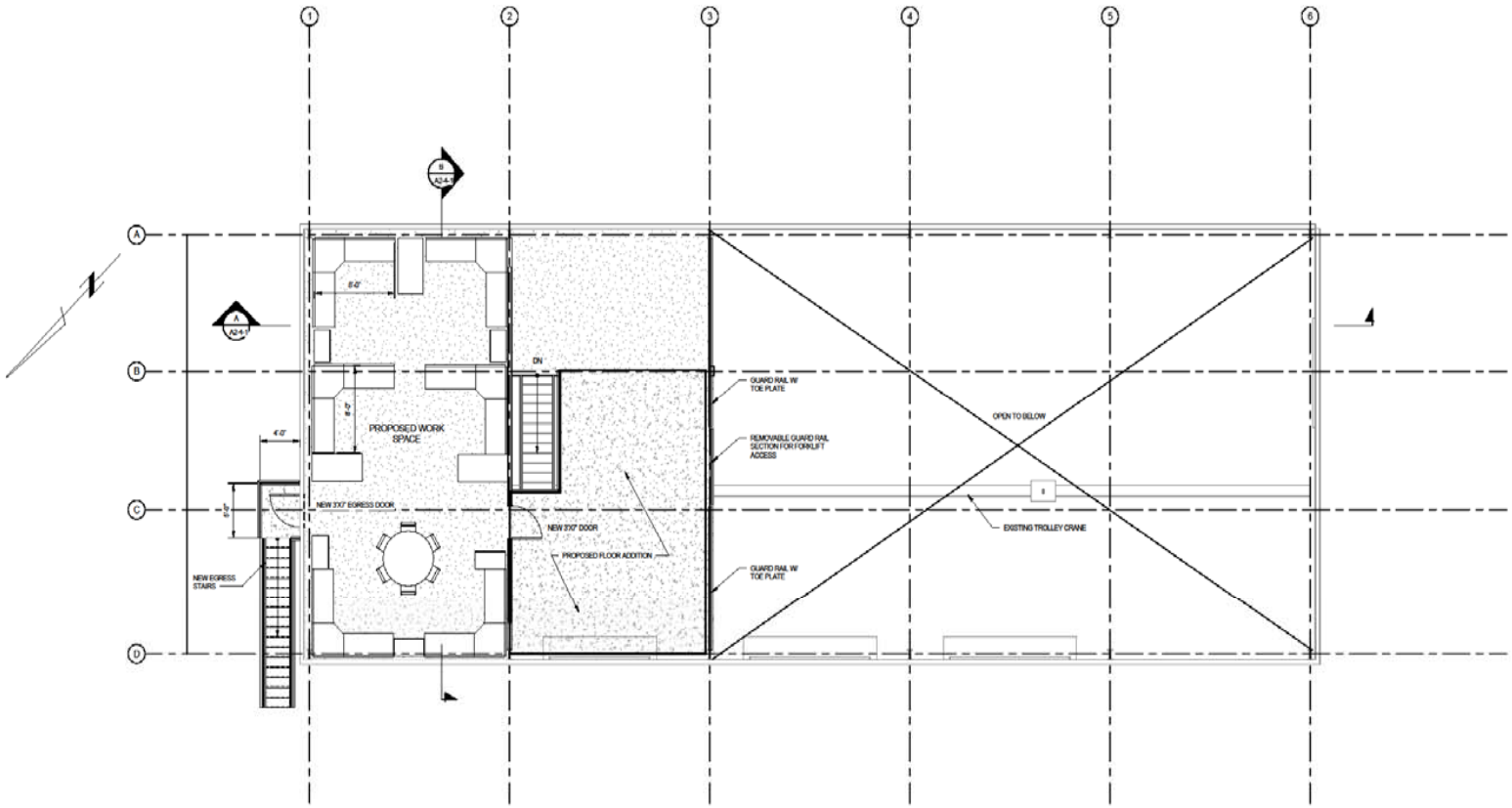
PASADENA WATER & POWER
CONTROL BUILDING
EXTERIOR ELEVATIONS

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

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

37

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.

9/24/2013 2:35:42 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	SAC	07/15/13
DRN	SAC	07/16/13
CKD	GH	09/20/13

SCALE: 3/16" = 1'-0"

FOR 22X34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER

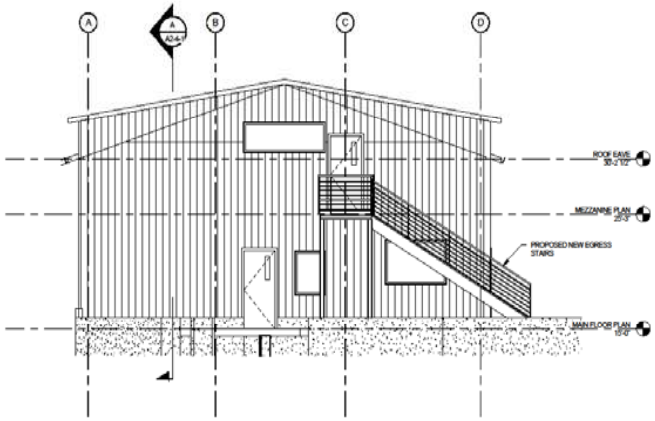
MAINTENANCE SHOP

MEZZANINE

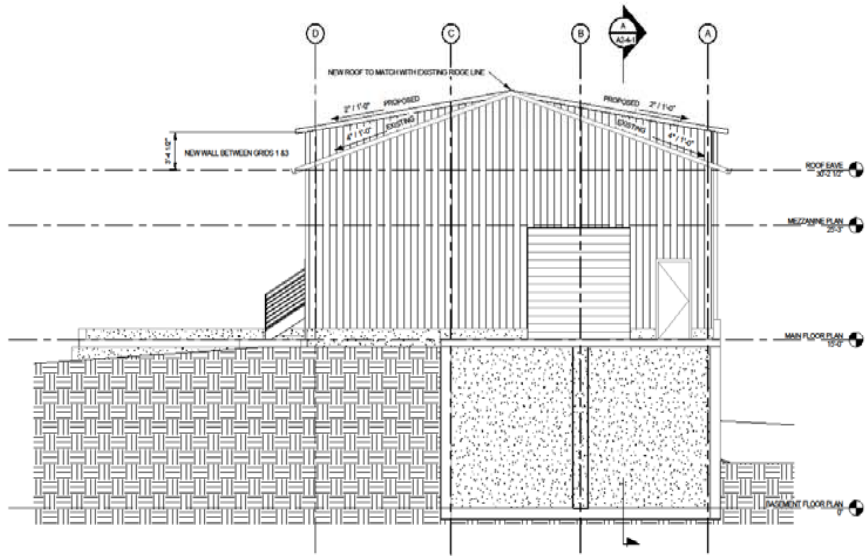
JOB NUMBER 123374

REV C

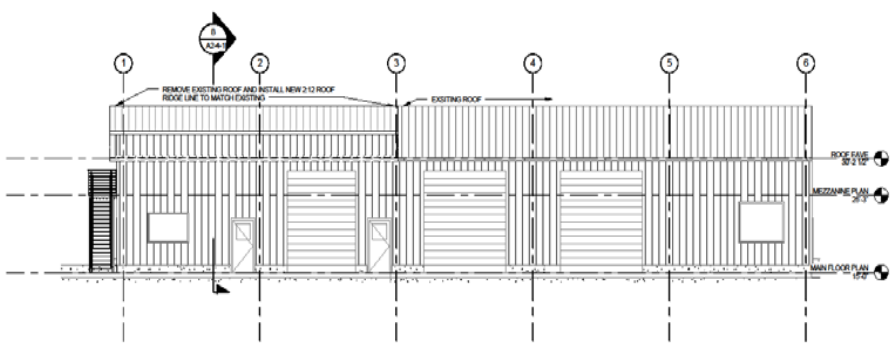
DRAWING NUMBER A2-2-2



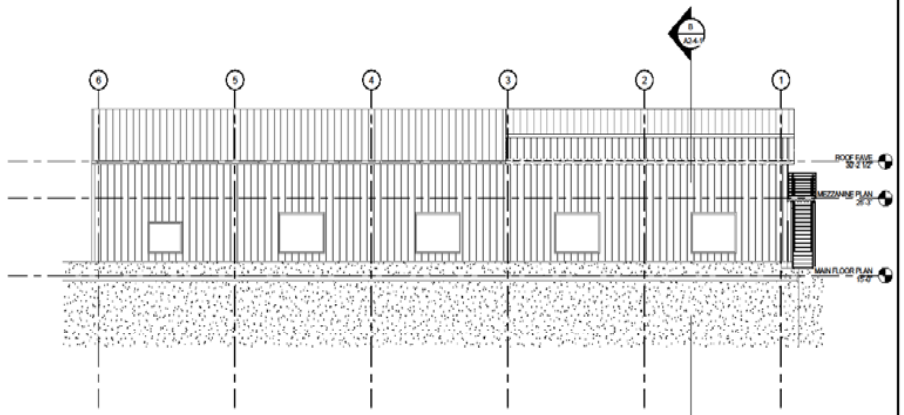
NORTH ELEVATION
(LOOKING SOUTH)
SCALE 3/16" = 1'-0"
1 A2-1-1



SOUTH ELEVATION
(LOOKING NORTH)
SCALE 3/16" = 1'-0"
2 A2-1-1



WEST ELEVATION
(LOOKING EAST)
SCALE 1/8" = 1'-0"
4 A2-1-1



EAST ELEVATION
(LOOKING WEST)
SCALE 1/8" = 1'-0"
3 A2-1-1

PRELIMINARY : NOT FOR CONSTRUCTION

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9/24/2013 2:35:44 PM

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B	ISSUED FOR REVIEW	03/27/13	SAC	SDS	GH	
A	ISSUED FOR REVIEW	03/07/13	SAC	SDS	GH	—

REFERENCE DRAWINGS

DSGN	SAC	08/16/13
DRN	SAC	08/16/13
CKD	GH	08/16/13

SCALE: As indicated

FOR 22X34 DWG ONLY

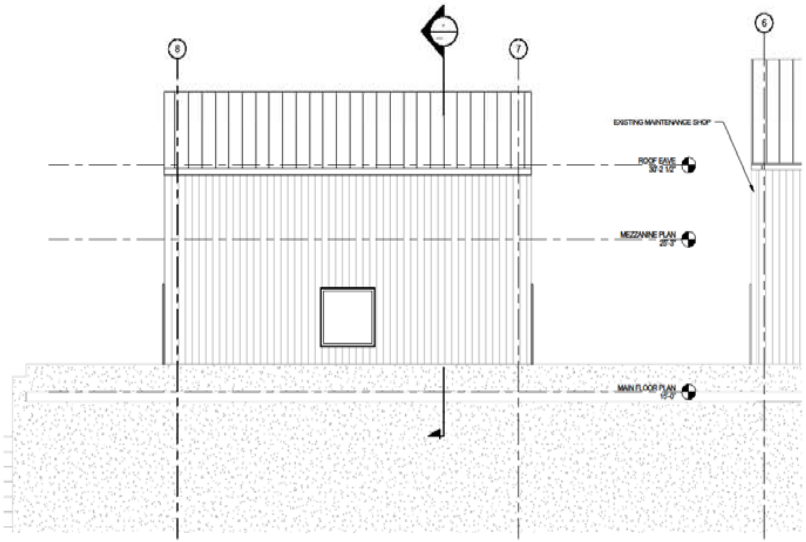
POWER ENGINEERS

PASADENA WATER & POWER
MAINTENANCE SHOP
EXTERIOR ELEVATIONS

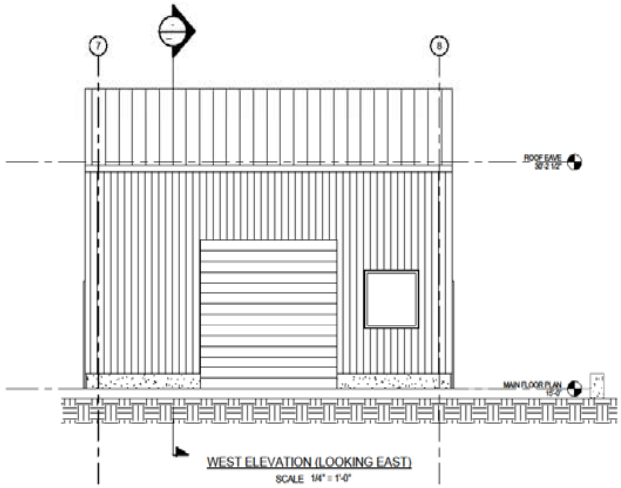
JOB NUMBER 123374

REV C

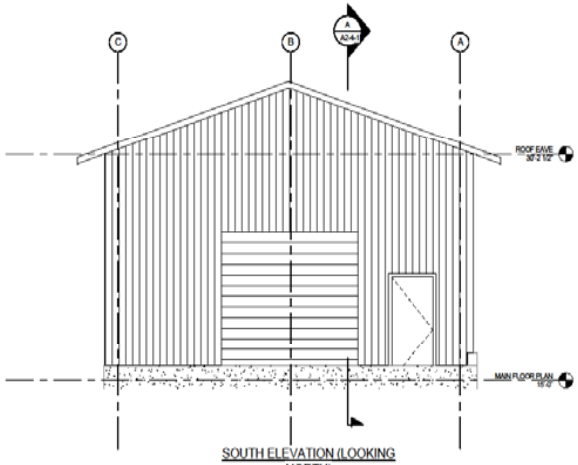
DRAWING NUMBER A2-3-1



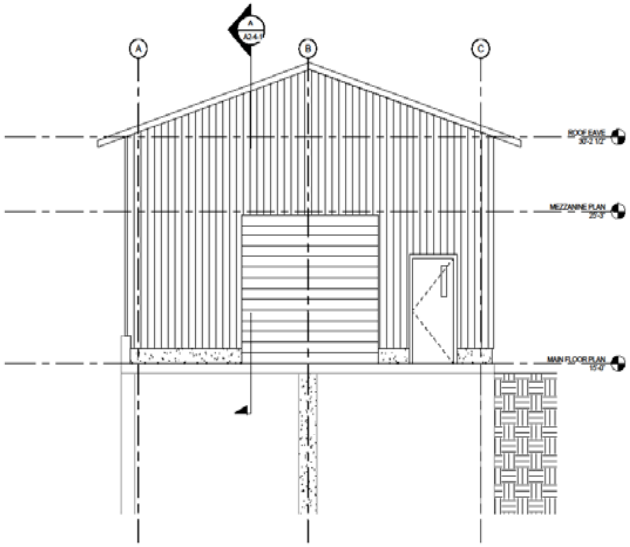
EAST ELEVATION (LOOKING WEST)
SCALE 1/4" = 1'-0"



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

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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	07/15/13
DRN	SAC	07/16/13
CKD	GH	09/23/13
SCALE:	1/4" = 1'-0"	

FOR 22X34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER

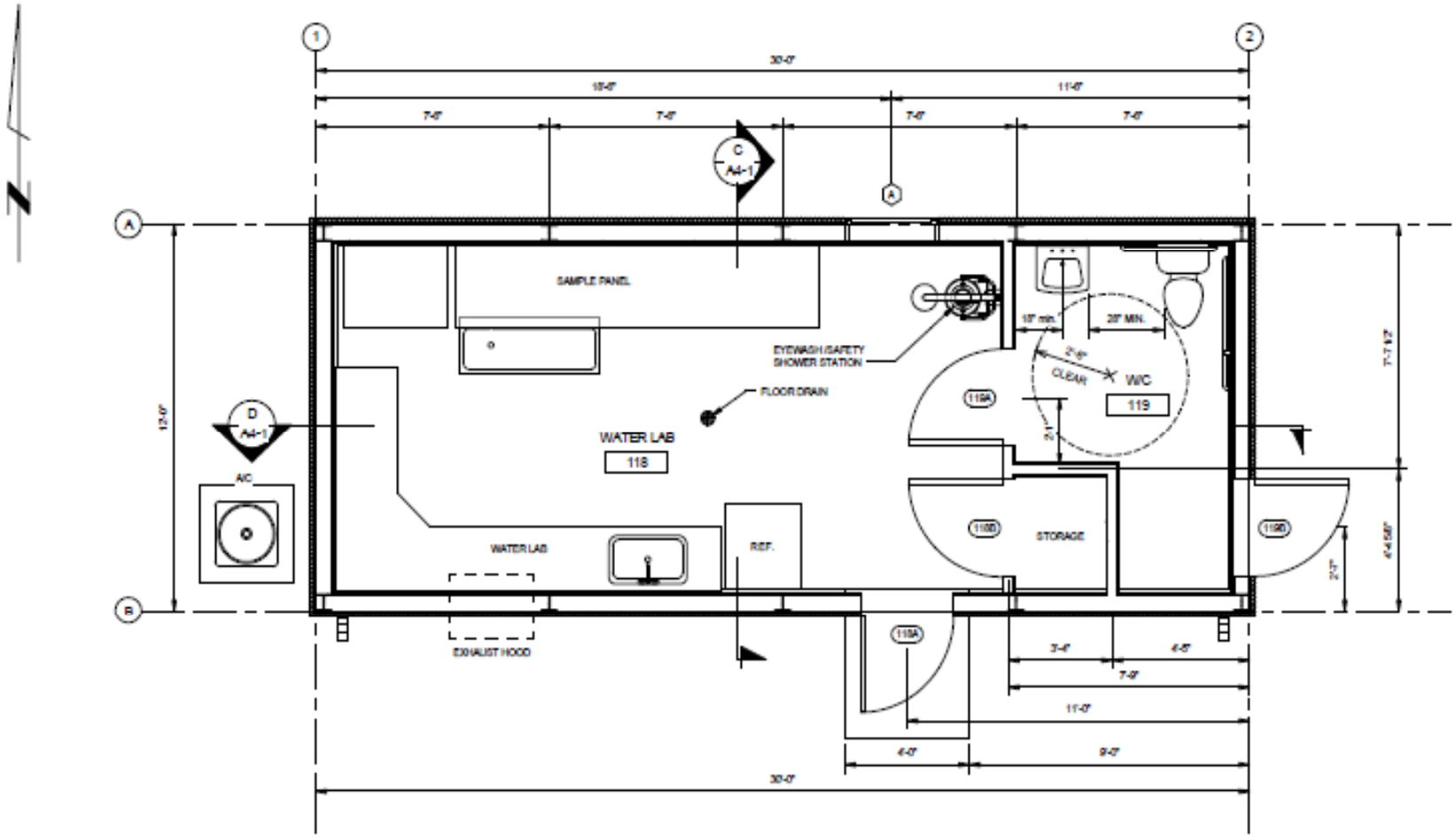
WELDING SHOP

EXTERIOR ELEVATIONS

JOB NUMBER 123374

REV C

DRAWING NUMBER A3-3-1

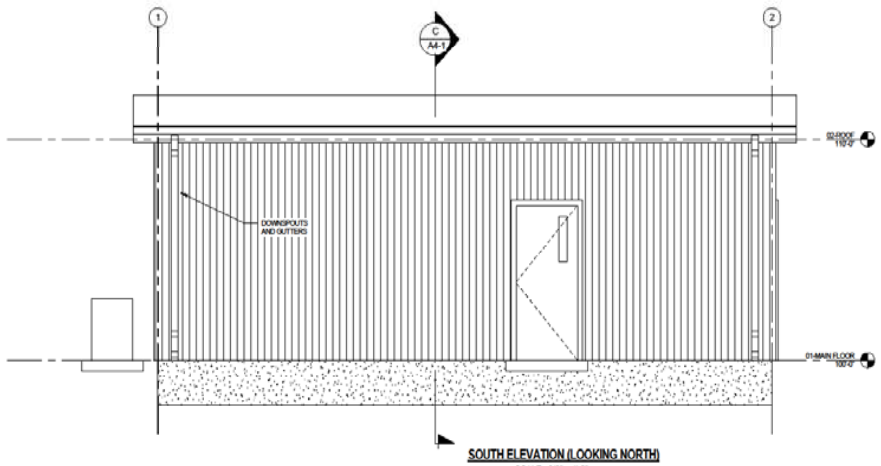


FLOOR PLAN

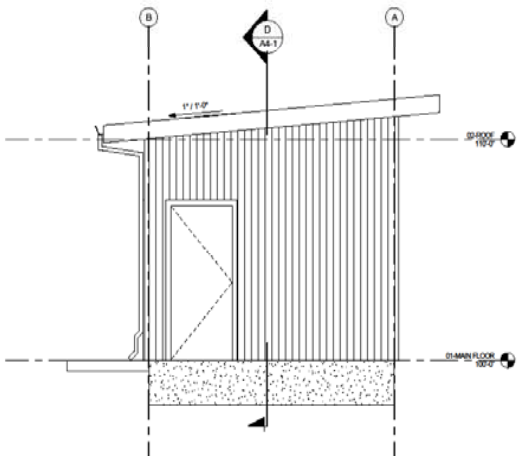
SCALE 3/8" = 1'-0"

GENERAL NOTES

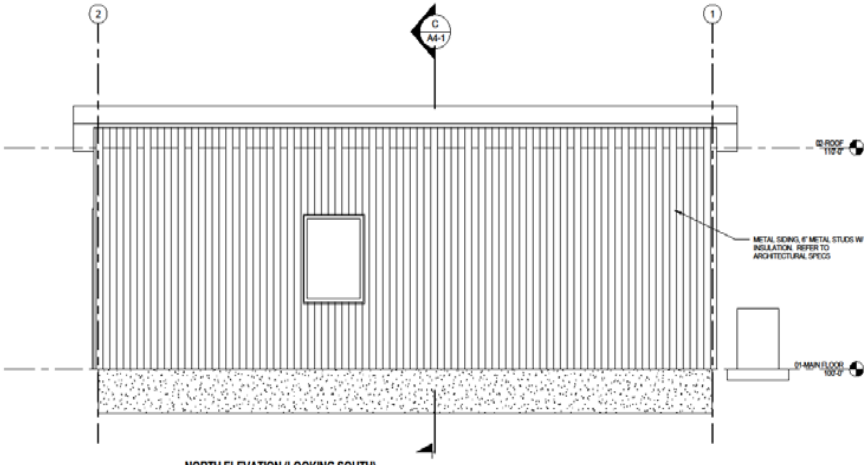
STEEL STUDS IN WALLS:
STEEL STUD SIZE AND GUAGE TO BE DETERMINED BY THE STRUCTURAL ENGINEER.



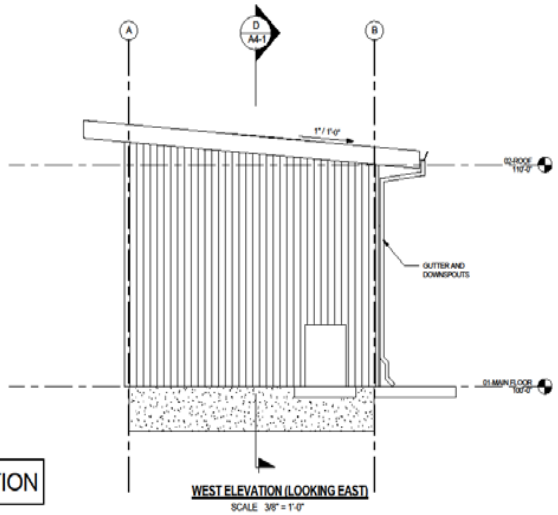
SOUTH ELEVATION (LOOKING NORTH)
SCALE 3/8" = 1'-0"



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 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

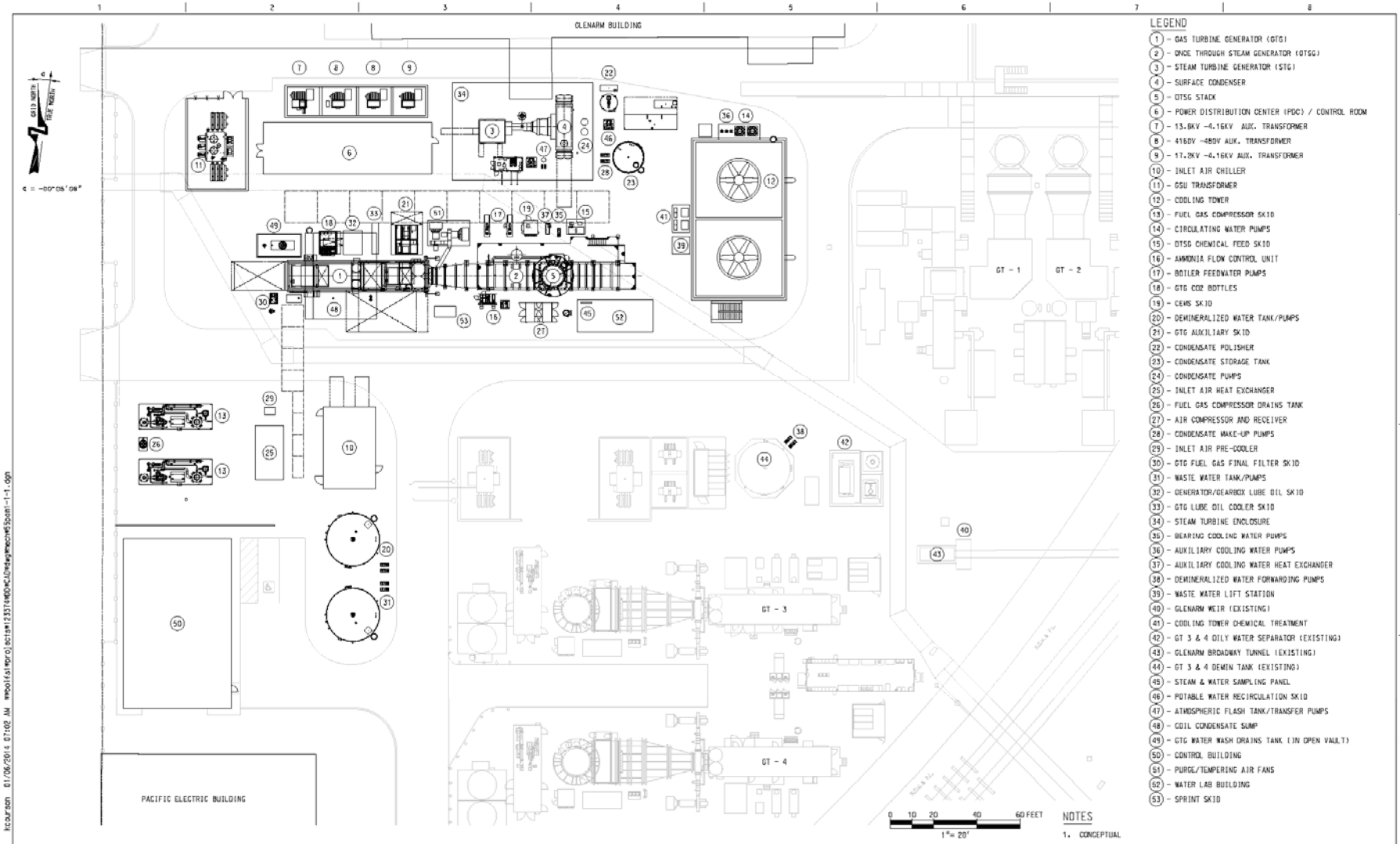
DSGN Designer
DRN Author
CKD Checker
SCALE: 3/8" = 1'-0"
FOR 22X34 DWG ONLY

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
GT - 1
GT - 2
GT - 3
GT - 4
PACIFIC ELECTRIC BUILDING
0 10 20 40 60 FEET
1" = 20'
NOTES
1. CONCEPTUAL
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
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
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

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.

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INTER-DISCIPLINE REVIEW						
DISC	ARCH	CIVIL	ELECT	I&C	MECH	STRUCT
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

PASADENA

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
DATE						
INT						

REV	REVISIONS	DATE	DSGN	CHK	APPD
C	RE-ISSUED FOR BID	12.06.13	SEG	TRC	GTH
B	ISSUE FOR BID	10.11.13	SEG	TRC	GTH
A	ISSUE FOR REVIEW	10.16.12	TRC	SEG	GTH

REFERENCE DRAWINGS	
M3-X	P&IDs

DSGN	TRC	10.16.12
DRN	TRC	10.16.12
CHK	SEG	10.16.12
SCALE	NONE	

POWER ENGINEERS

PASADENA WATER & POWER

GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)

EQUIPMENT LIST

JOB NUMBER 122374

DRAWING # M9-1

SHEET 3 OF 6

REV C

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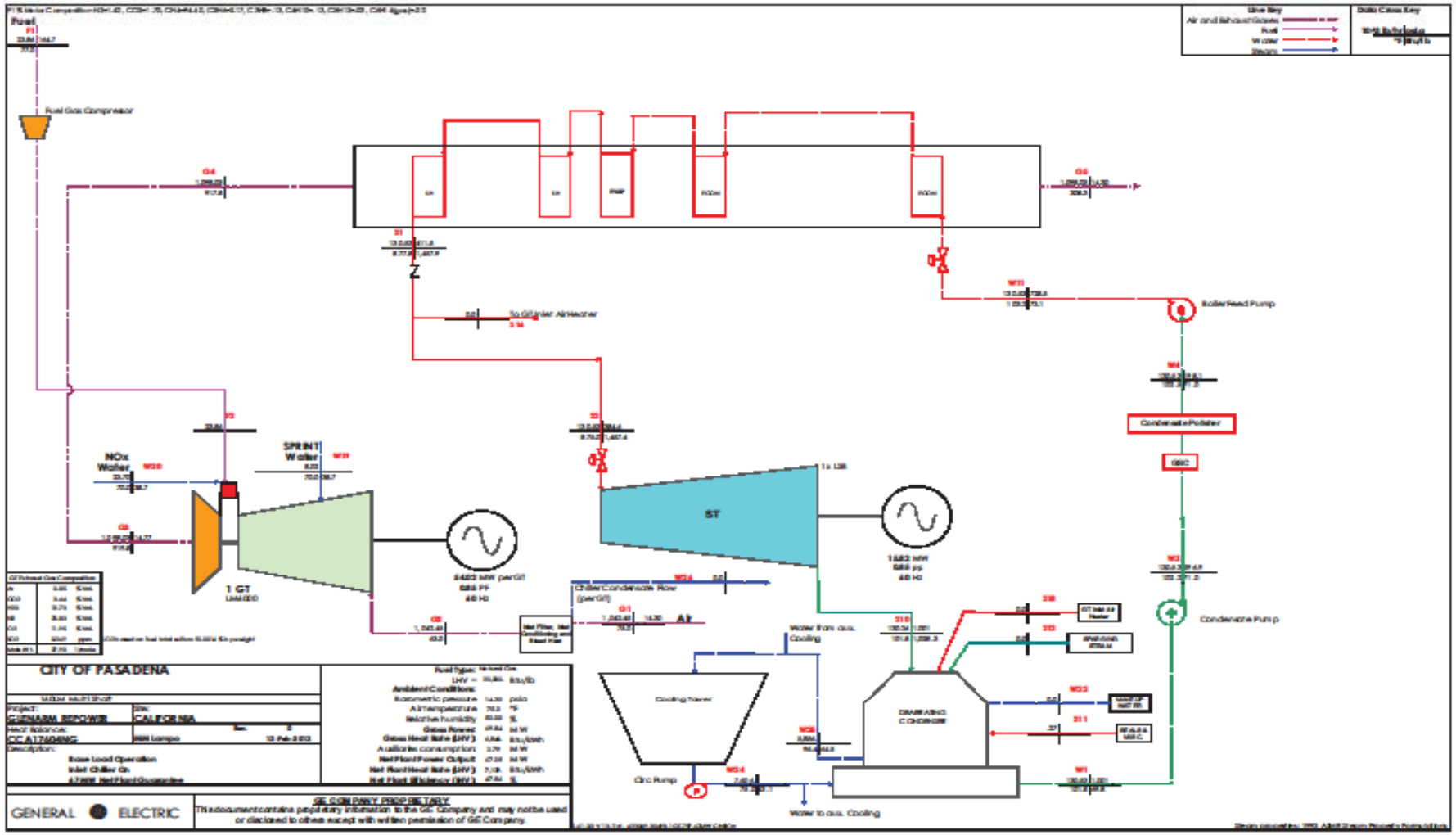
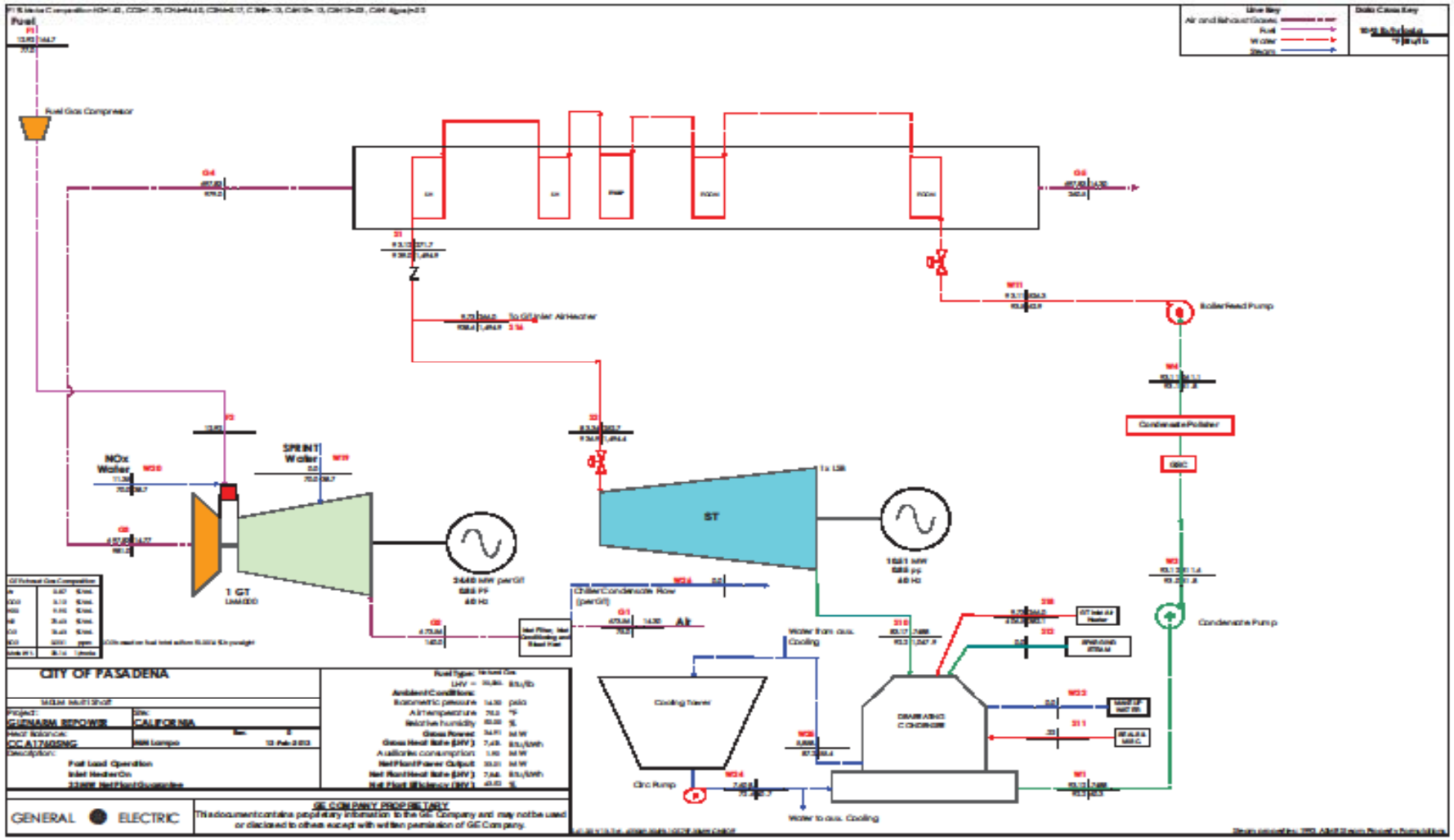
GE Performance Information

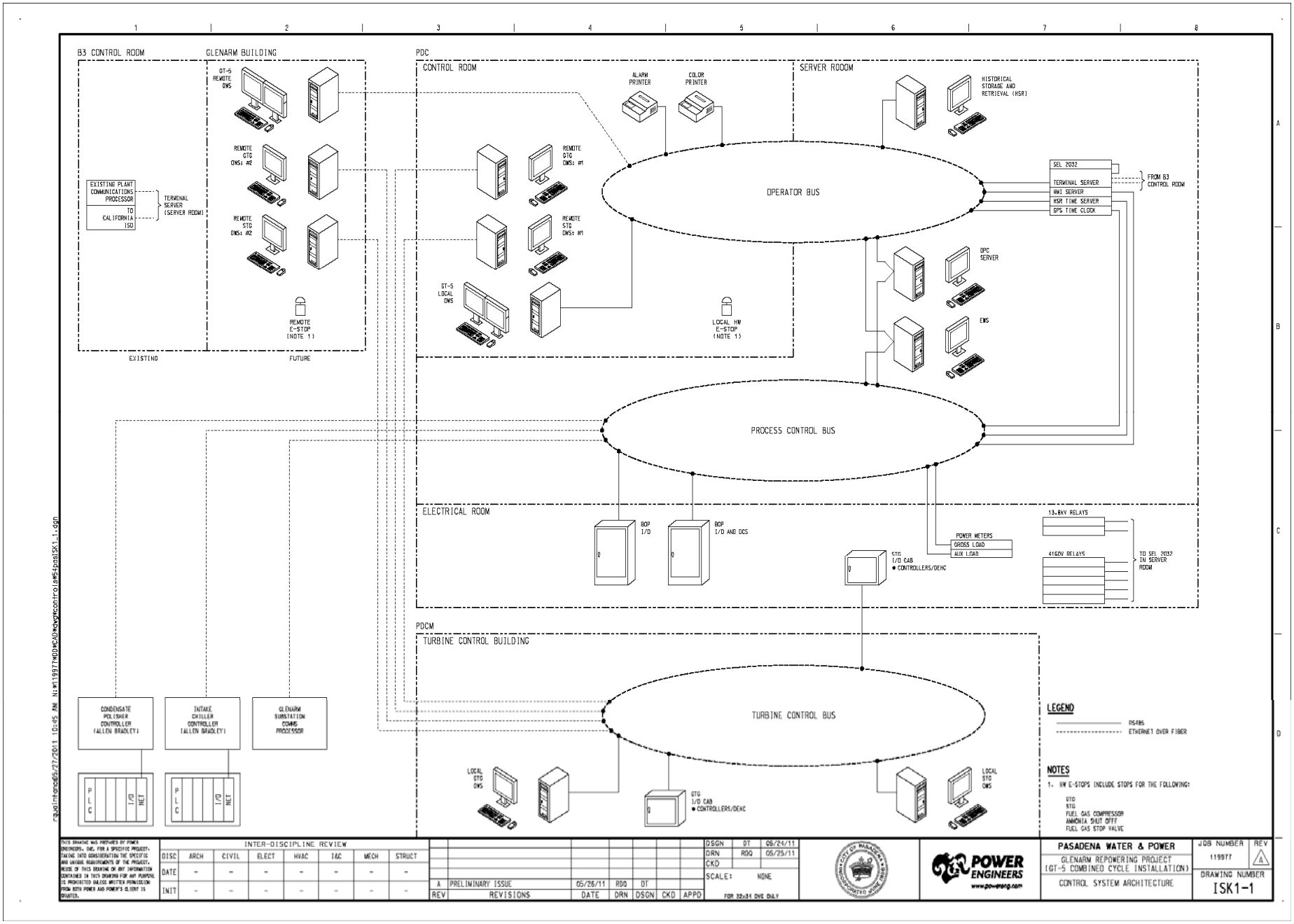

Fuel
Fuel Gas Compressor
NOx Water
SPRINT Water
T GT
ST
Boiler Feed Pump
Condensate Polisher
Condensate Pump
Cooling Tower
Circ Pump
DRAIN AND CONDENSE
CITY OF PASADENA
GENERAL ELECTRIC


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

PASADENA

Pasadena Water and Power

CONTROL SYSTEM REQUIREMENTS


B3 CONTROL ROOM
GLENARM BUILDING
PDC
CONTROL ROOM
SERVER ROOM
ALARM PRINTER
COLOR PRINTER
HISTORICAL STORAGE AND RETRIEVAL (HSR)
GT-5 REMOTE OWS
REMOTE GTG OWS: #2
REMOTE STG OWS: #2
REMOTE GTG OWS: #1
REMOTE STG OWS: #1
EXISTING PLANT COMMUNICATIONS PROCESSOR
TO CALIFORNIA ISO
TERMINAL SERVER (SERVER ROOM)
OPERATOR BUS
SEL 2032
TERMINAL SERVER
HMI SERVER
HSR TIME SERVER
GPS TIME CLOCK
FROM B3 CONTROL ROOM
OPC SERVER
EMS
GT-5 LOCAL OWS
REMOTE E-STOP (NOTE 1)
LOCAL HW E-STOP (NOTE 1)
EXISTING
FUTURE
PROCESS CONTROL BUS
ELECTRICAL ROOM
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
PDCM
TURBINE CONTROL BUILDING
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 OFFT
FUEL GAS STOP VALVE
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE
INIT
A PRELIMINARY ISSUE 05/26/11 RDG DT
REV REVISIONS DATE DRN DSGN CKD APPD
DSGN DT 05/24/11
DRN RDG 05/25/11
CKD
SCALE: NONE
FOR 22x34 DWG ONLY
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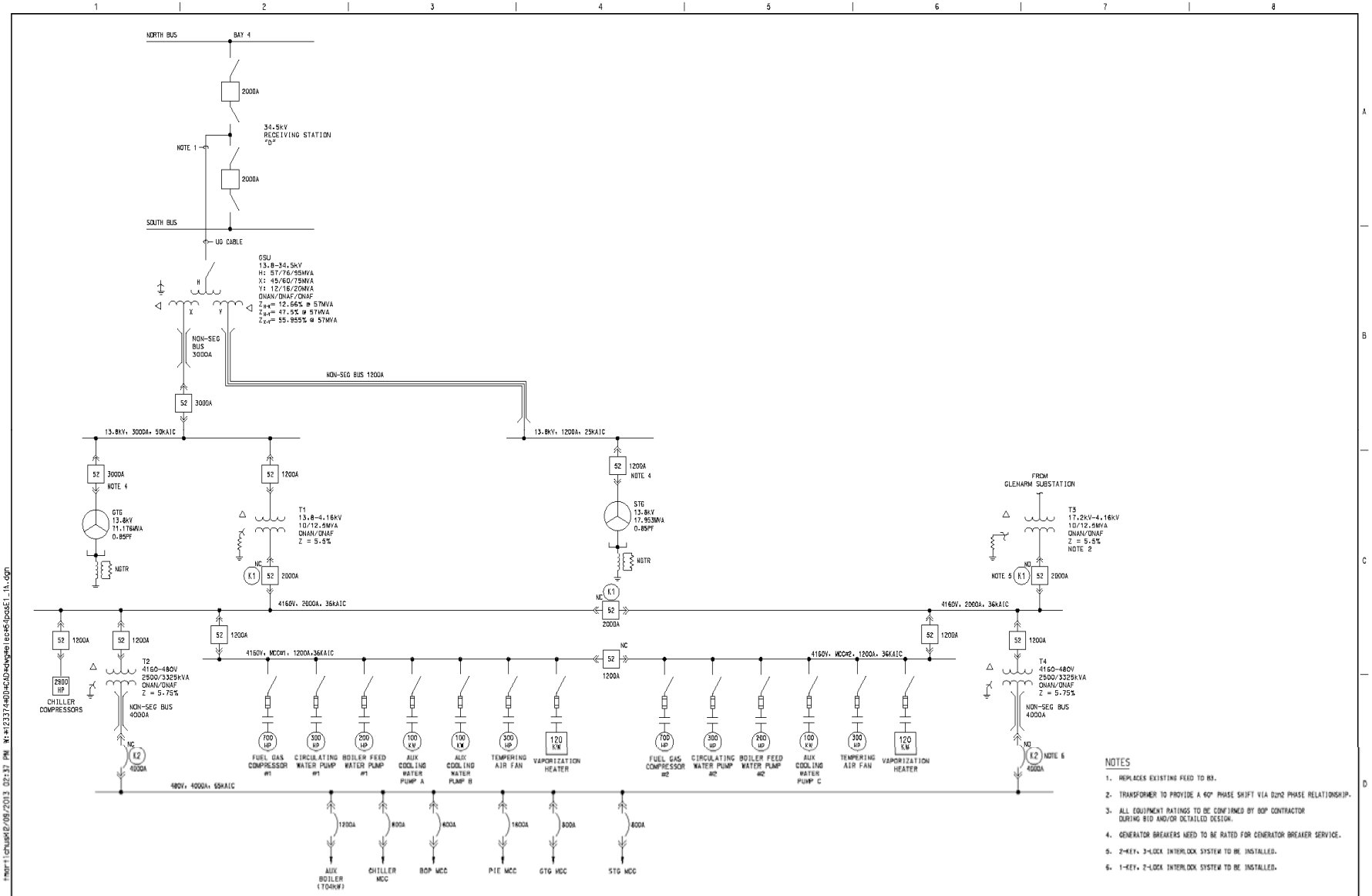
PASADENA WATER & POWER
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)
CONTROL SYSTEM ARCHITECTURE
JOB NUMBER 119977
REV A
DRAWING NUMBER ISK1-1

HIGH VOLTAGE SCOPE



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.

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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	07/10/13	TLM	FD	RL	GH
C	RE-ISSUED FOR REVIEW	10/17/12	RDO	FD	CH	GH
B	RE-ISSUED FOR REVIEW	08/16/11	RDO	CH	BT	GH

DSGN	CH	06/13/11
DRN	RDO	05/16/11
CKD	BT	05/17/11

SCALE: NONE

FOR 22x34 DWG ONLY

POWER ENGINEERS

PASADENA WATER & POWER

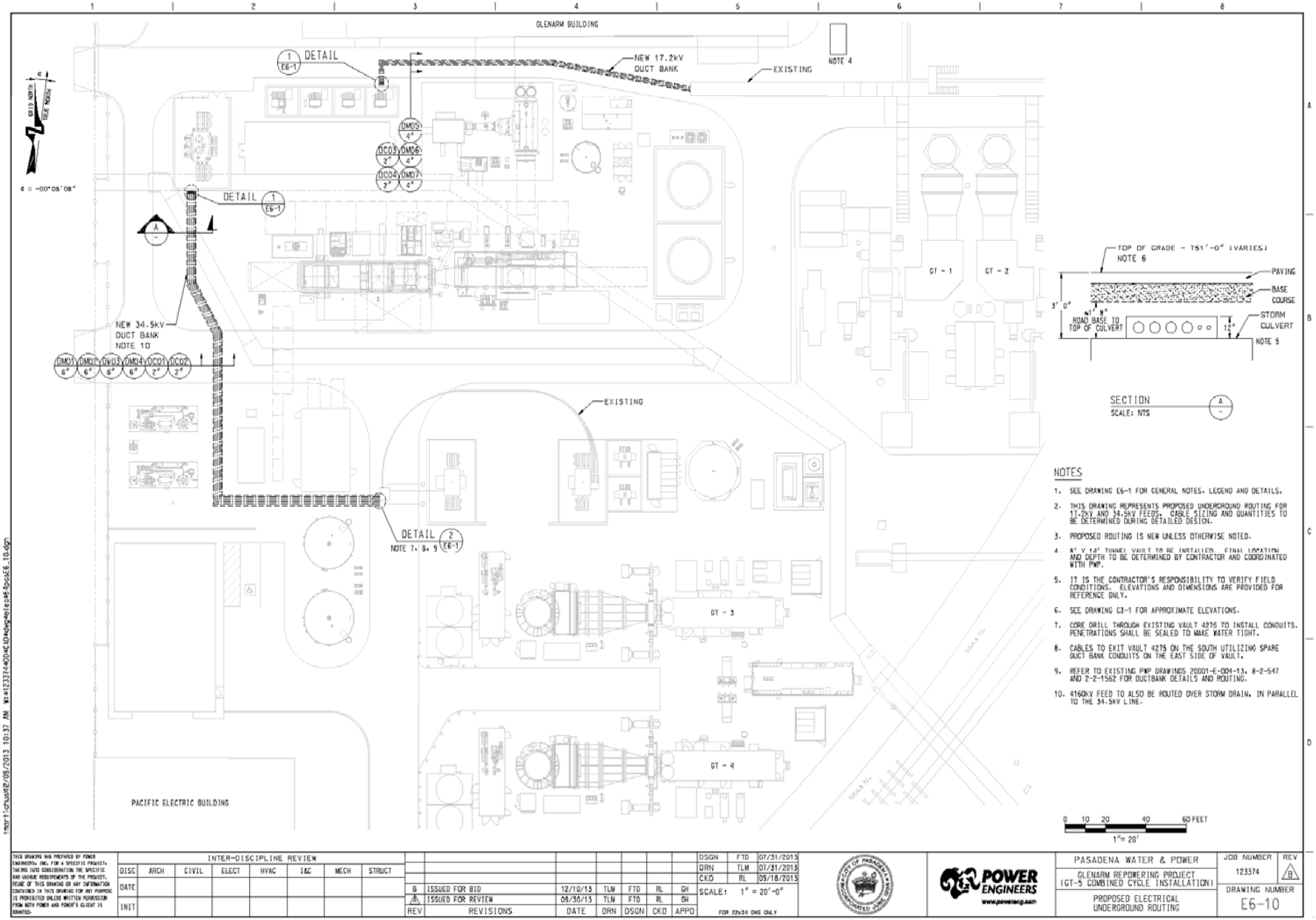
GLENARM REPOWERING PROJECT (GT-5 COMBINED CYCLE INSTALLATION)

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
GRID NORTH
TRUE NORTH
C = -00°05'08"
DM05 4"
DC03 2" DM06 4"
DC04 2" DM07 4"
DETAIL 1 E6-1
A
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 A
SCALE: NTS
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' 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 G3-1 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-ODM-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.
0 10 20 40 60 FEET
1" = 20'
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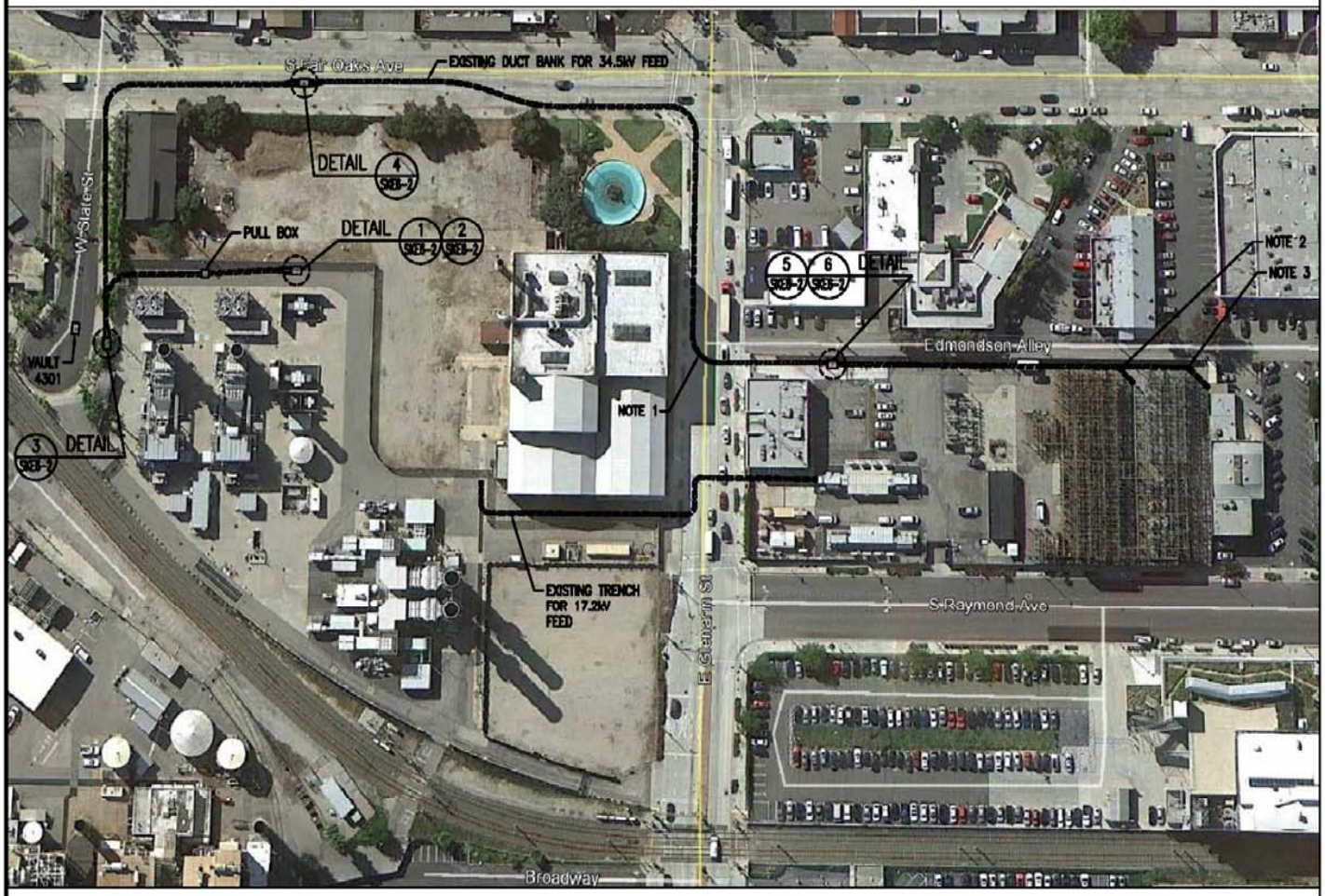
INTER-DISCIPLINE REVIEW
DISC ARCH CIVIL ELECT HVAC I&C MECH STRUCT
DATE
INIT
B ISSUED FOR BID 12/10/13 TLM FTD RL GH
A ISSUED FOR REVIEW 09/30/13 TLM FTD RL GH
REV REVISIONS DATE DRN DSGN CKD APPD
DSGN FTD 07/31/2013
DRN TLM 07/31/2013
CKD RL 09/18/2013
SCALE: 1" = 20'-0"
FOR 22x34 DWG ONLY
POWER ENGINEERS
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

60

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



NOTES

1. CABLES ENTER CABLE TUNNEL 02.
2. FINAL TERMINATION LOCATION.
3. TEMPORARY TERMINATION LOCATION.
4. SEE EXISTING PWP DRAWINGS 20001-E-004-13, 8-2-547 AND 2-2-1562 FOR DETAILS.
5. SEE DRAWING E6-1 AND E6-10 FOR PROPOSED UNDERGROUND ROUTING.

0 25 50 100 150 FEET
1" = 50'

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

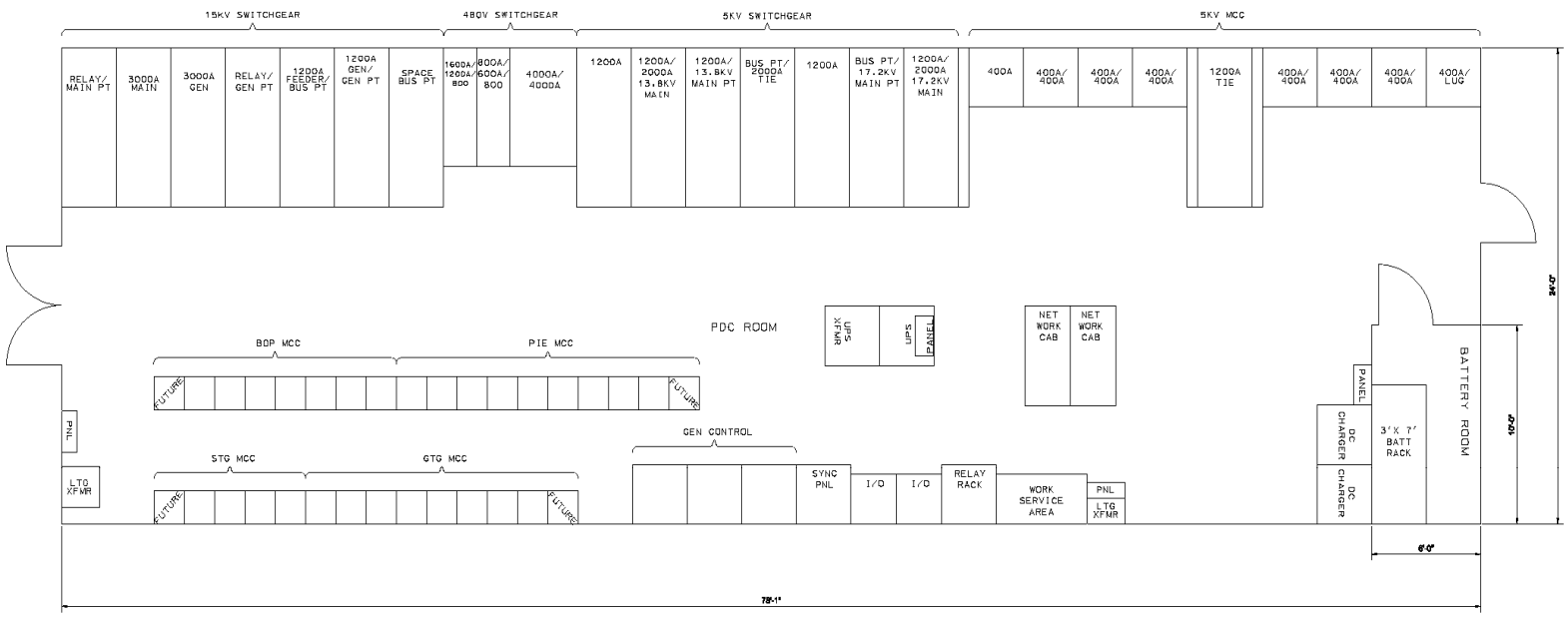
POWER ENGINEERS

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

JOB NUMBER 123374
REV A
DRAWING NUMBER SKE6-1

S:\PASSCEE_1.DWG

PDC Scope



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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	GH	GH

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

SCALE: * * 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

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

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

PASADENA

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

PASADENA