GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE 2007 CALIFORNIA ELECTRICAL CODE AND THE MUNICIPAL CODES. ELECTRICAL EQUIPMENT SHALL BE LISTED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY OR APPROVED BY THE DEPARTMENT.
2. CONTROL WIRING FOR HVAC SYSTEM SHALL BE COPPER TYPE THHN.
3. ALL RELAYS, TIMECLOCKS, ETC. SHALL BE MOUNTED IN A HINGED, LOCKABLE CABINET ADJACENT TO RESPECTIVE PANEL.
4. ALL JUNCTION BOXES SHALL BE LABELED WITH RESPECTIVE CIRCUIT NUMBERS.
5. ALL EQUIPMENT SHALL BE LISTED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY.
6. PROVIDE CABLE SUPPORTS ON ALL VERTICAL RUNS.
7. ALL WIRING SHALL BE COPPER TYPE THHN AND/OR THWN UNLESS OTHERWISE NOTED AND SHALL BE INSTALLED IN EMT CONDUIT.
8. ALL FUSES SHALL BE CURRENT LIMITING TYPE RATED FOR A MINIMUM OF 200,000 A.I.C. AND SHALL BE CLASS RK1 UP TO 600 AMPERES.
9. ALL ELECTRICAL DEVICES OUTSIDE SHALL BE WEATHERPROOF.
10. ALL EMPTY CONDUITS SHALL HAVE PULL STRINGS INSTALLED.
11. ELECTRICAL CONTRACTOR SHALL VISIT SITE AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS PRIOR TO BIDDING.
12. ALL WORK SHALL BE NEW UNLESS OTHERWISE INDICATED.
13. SITE SHALL BE LEFT CLEAN, FREE FROM DEBRIS AND ACCEPTABLE TO THE OWNER.
14. ALL WORK SHALL BE GUARANTEED FOR ONE YEAR.
15. E.C. SHALL OBTAIN AND PAY FOR ALL PERMITS NECESSARY TO COMPLETE THE WORK.
16. CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY. EXACT LOCATIONS AND ROUTING TO BE DETERMINED IN THE FIELD TO SUIT FIELD CONDITIONS.
17. ALL VERIFICATIONS SHALL BE PRIOR TO SUBMITTING BID.
18. INSTALL GROUND CONDUCTOR IN ALL P.V.C. CONDUITS.
19. THE ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS AND MAKE REQUIRED CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS.
20. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ROUGH-IN AND FINISH WORK WITH THE OTHER TRADES.
21. A SET OF MARKED-UP PRINTS SHALL BE PREPARED SHOWING ALL CHANGES MADE DURING CONSTRUCTION AND TURN IT OVER TO THE ARCHITECT AT THE END OF THE JOB. ALL CHANGES MUST HAVE ARCHITECT'S APPROVAL.
22. ANY DISCREPANCY BETWEEN MATERIAL, DESCRIPTION AND/OR CATALOG NUMBERS SHALL BE BROUGHT TO THE ENGINEER'S OR OWNER'S ATTENTION IMMEDIATELY.
23. FURNISH AND INSTALL THE REQUIRED SUPPORT FOR INSTALLATION OF EQUIPMENT.
24. IT IS THE INTENT OF THESE DRAWINGS THAT THIS BE A COMPLETE ELECTRICAL JOB. ANY ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BIDDING THE JOB.
25. PROVIDE TEMPORARY POWER AND LIGHTING AS REQUIRED TO PERFORM WORK.
26. ALL DISCONNECTS SHALL BE FUSED, UNLESS OTHERWISE NOTED.
27. ALL CONDUCTORS USED IN EXTERIOR WIRING SHALL BE RATED FOR WET LOCATIONS.
28. ALL ELECTRICAL TERMINATIONS SHALL BE 75 DEGREES C. RATED.

SPECIAL NOTES

1. PROVIDE FACTORY "START-UP-AND-TEST" WITH CUMMINS.
2. COORDINATE COMPLETION AND SUBMISSION OF AQMD APPLICATIONS BY CUMMINS FOR CITY.
3. PROVIDE "ADD ALTERNATE" FOR ONAN "STAGE 3" WEATHERPROOF ENCLOSURE.
4. PROVIDE CONCRETE GENERATOR PAD PER STRUCTURAL DETAIL.
5. PROVIDE ALL TRENCHING, BACKFILLING, COMPACTION, AND RESURFACING FOR NEW CONDUITS. MINIMUM COVER TO TOP OF CONDUIT SHALL BE 24".
6. CONTRACTOR SHALL PROVIDE IN THE BASE BID A DETAILED WRITTEN SEQUENCING SCHEDULE DESCRIBING THE PROPOSED DURATION OF OUTAGES NECESSARY FOR INSTALLATION. CONTRACTOR SHALL PROVIDE TEMPORARY POWER (VIA PORTABLE GENERATORS) AND MINIMIZE DURATION OF OUTAGE.
7. ALL SWEEPS AND RISERS FROM BELOW GRADE TO ABOVE GRADE SHALL BE RIGID "COATED" STEEL GALVANIZED. ALL EXPOSED CONDUIT BELOW 7'-6" SHALL BE RIGID STEEL GALVANIZED.
8. OBTAIN PLANNING DEPT. AND FIRE DEPT. APPROVALS OF PLANS.
9. PROVIDE MINIMUM 15 FEET SEPARATION DISTANCE OF THE GENERATOR TO THE PROPANE TANKS AND PROVIDE THE ACCESS TO AND AROUND THE PROPANE TANKS AS REQUIRED BY THE FIRE DEPT.

DEMOLITION NOTES

1. ALL CONDUCTORS WHICH WILL NOT REMAIN IN SERVICE SHALL BE DISCONNECTED AND REMOVED BACK TO THE NEAREST DEVICE TO REMAIN IN SERVICE OR TO THE PANELBOARD. CONDUCTORS REMOVED BACK TO PANELBOARDS SHALL HAVE THEIR APPROPRIATE CIRCUIT BREAKER RELABELED "SPARE".
2. ALL CONDUITS SERVING DEVICES WHICH WILL NOT REMAIN IN SERVICE SHALL BE DEMOLISHED BACK TO A POINT WHERE THE NEW CONSTRUCTION WILL PROVIDE TOTAL CONCEALMENT.
3. BRANCH CIRCUITRY TO DEVICES WHICH WILL REMAIN IN SERVICE THAT IS DISRUPTED DURING DEMOLITION SHALL BE RESTORED BY THE CONTRACTOR. ALL WIRING SHALL BE COPPER TYPE THHN/THWN AND ALL JUNCTION BOXES SHALL BE LABELED WITH RESPECTIVE CIRCUIT NUMBERS.
4. EXTREME CARE SHALL BE TAKEN DURING DEMOLITION TO PRESERVE ITEMS WHICH WILL REMAIN IN SERVICE.
5. PROVIDE TEMPORARY POWER AND LIGHTING AS REQUIRED TO PERFORM WORK AND MAINTAIN SERVICE.
6. VISIT THE SITE AND VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING THE BID.
7. SEE TECHNICAL PROVISIONS PART 1 ITEM 5 FOR THE REMOVAL OF EXISTING GENERATOR & LPG TANK.

ADDITIONAL ITEMS

2

ADDITIONAL SCOPE UNDER THIS CONTRACT:

- 500 GALLON ABOVE GROUND PROPANE TANK. LOW LEVEL SWITCH, PIPING AND CONNECTION TO GENERATOR, PERMITS AND TESTING.
- FOUNDATION/PAD FOR GENERATOR AND PROPANE SYSTEM INCLUDING DESIGN/PERMIT, GRADING, RETAINING WALLS, CONCRETE WORK, AND BARRIER POSTS. INCLUDE SPECS. AND ANCHORING.
- EXPANSION OF EQUIPMENT YARD INCLUDING NEW FENCING (TO MATCH EXISTING) FOR PVIC. COMPLETELY NEW FENCED EQUIPMENT YARD FOR HESSE PARK (FENCING/GATE TO MATCH PVIC).
- OBTAIN FIRE DEPARTMENT APPROVAL OF PLANS. VERIFY AND PROVIDE REQUIRED ACCESS TO AND AROUND PROPANE TANKS WITH FIRE DEPARTMENT.
- PROVIDE GEOTECHNICAL REPORT FOR THE PROPANE TANK FOUNDATION DESIGN OR OBTAIN WAIVER FROM CITY SOILS CONSULTANT.

SHEET INDEX

E1	NOTES
E2	PVIC SINGLE LINE DIAGRAM
E3	PVIC ELECTRICAL PLAN
E4	HESSE PARK SINGLE LINE DIAGRAM
E5	HESSE PARK ELECTRICAL PLAN

REV.	DESCRIPTION	DATE
2	GENERAL REVISIONS	7/19/10

Project

PVIC AND HESSE PARK EMERGENCY GENERATORS

PVIC
31501 PALOS VERDES DRIVE WEST
RANCHO PALOS VERDES, CA 90275

HESSE PARK
29301 HAWTHORNE BLVD.
RANCHO PALOS VERDES, CA 90275

NIKOLAKOPULOS and ASSOC., INC.
CONSULTING ELECTRICAL ENGINEERS

2780 SKYPARK DRIVE, SUITE #280
TORRANCE, CA 90505
310/530-7277 FAX: 310/530-7283

Sheet Title

NOTES

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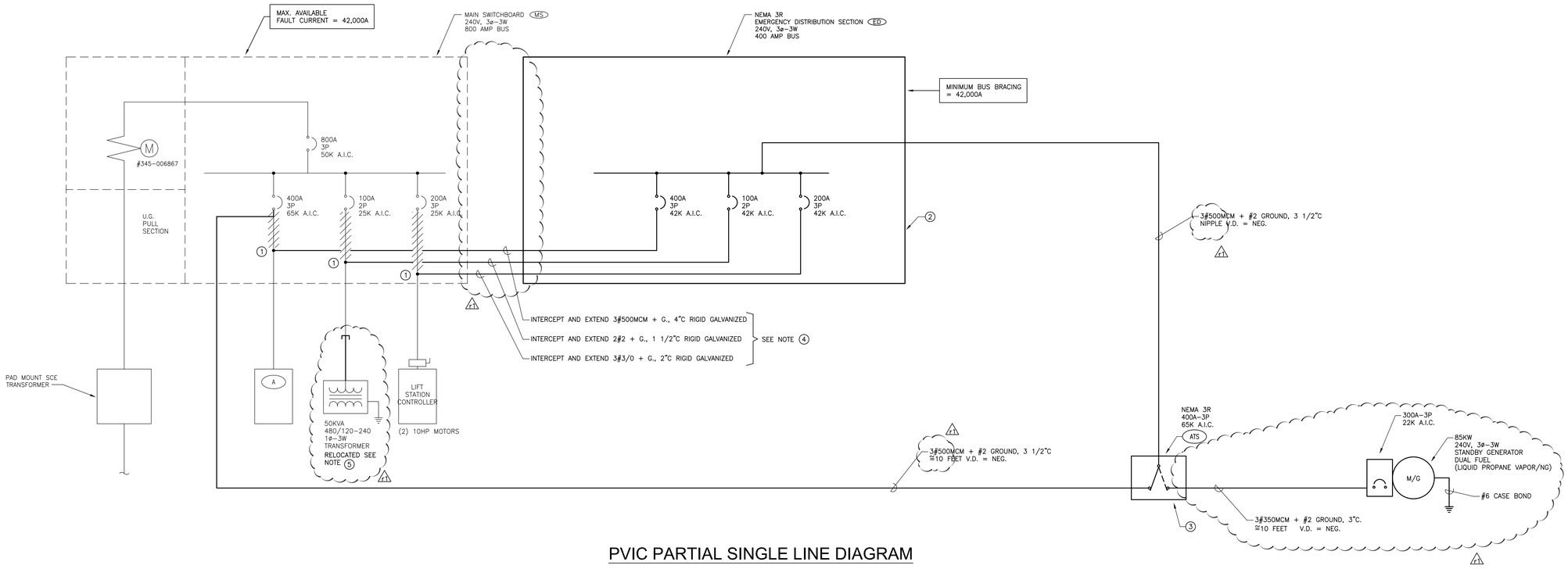
Date 4/15/09

CAD File

Project Number

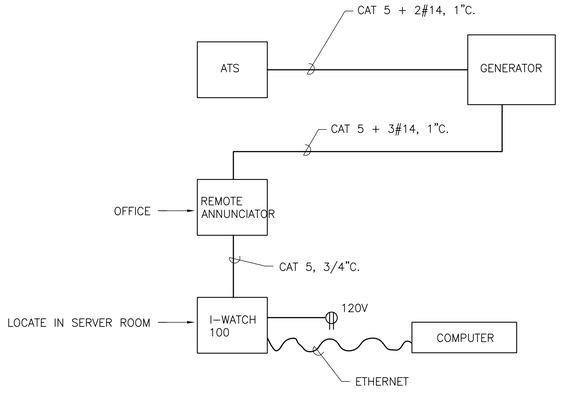
Sheet Number

E1r2



PVIC PARTIAL SINGLE LINE DIAGRAM

- LIGHT LINE WORK = EXISTING
- DARK LINE WORK = NEW



GENERATOR CONTROL DIAGRAM

GENERATOR/TRANSFER SWITCH DESCRIPTION

- DUAL FUEL (LIQUID PROPANE VAPOR/NG) 85KW GENERATOR 240V, 3ø-3W WITH WEATHERPROOF STAGE 2 COASTAL ALUMINUM HOUSING ONAN #85GGHF (OR EQUAL). PROVIDE: 1500W 120 VOLT HEATER, FT-10 IN "POWER COMMAND" FOR NETWORK MONITORING. PROVIDE GENERAL CONVENIENCE DUPLEX RECEPTACLE.
- TRANSFER SWITCH
  400A-3P NEMA 3R 240V, 3ø-3W MOUNTED ON UNISTRUT ONAN #OTTC400 (OR EQUAL).
  PROVIDE: INTEGRAL EXERCISER CLOCK, CHARGER, "I WATCH 100" FOR REMOTE MONITORING NETWORK.

GENERATOR FUEL SUPPLY DURATION

AT 100% LOADING WITH A 500 GALLON PROPANE SUPPLY.

DURATION =

$$\frac{500 \text{ GALLONS}}{12.046 \text{ GALLONS PER HOUR}} = 41.5 \text{ HOURS}$$

NOTES

1. CONDUCTORS ARE LONG ENOUGH TO EXTEND INTO (ED); PROVIDE EXTENSION OF CONDUITS INTO (ED) FROM (MS) TO PROVIDE NEC CODE REQUIRED "BARRIER".
2. MATCH EXISTING EATON POWRLINE C SWITCHGEAR. PROVIDE EXTENSION OF CONCRETE PAD.
3. ATS TO BE MOUNTED ON GENERATOR SKID.
4. PROVIDE FIRE BARRIER WRAPPING OF CONDUITS EQUAL TO "3M" INTERAM. CONDUIT TO BE CONTINUOUSLY "THROUGH" SWITCHGEAR (NO EXPOSED CABLE WITHIN EXISTING "MS" TO MAINTAIN SEPARATION).
5. TRANSFORMER IS BEING RELOCATED; INTERCEPT AND EXTEND EXISTING CONDUIT AND PULL IN NEW CONDUCTORS (3#2 + G.) IF NECESSARY.

LOAD SCHEDULE

EXISTING PEAK DEMAND FROM MINIMUM ONE WEEK LOAD TEST ON EACH PHASE	=	110 AMPS
ADDITIONAL 25% REQUIRED BY N.E.C.	=	27.5 AMPS
	=	137.5 AMPS
TOTAL 137.5 AMPS X 240 VOLTS X $\sqrt{3}$	=	57.2 KW

REV.	DESCRIPTION	DATE
1	GENERAL REVISIONS	7/19/10

Project

PVIC EMERGENCY GENERATORS

31501 PALOS VERDES DRIVE WEST
RANCHO PALOS VERDES, CA 90275

NIKOLAKOPULOS and ASSOC., INC.
CONSULTING ELECTRICAL ENGINEERS

2780 SKYPARK DRIVE, SUITE #280
TORRANCE, CA 90505
310/530-7277 FAX: 310/530-7283

Sheet Title

PVIC SINGLE LINE DIAGRAM

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Date 4/15/09

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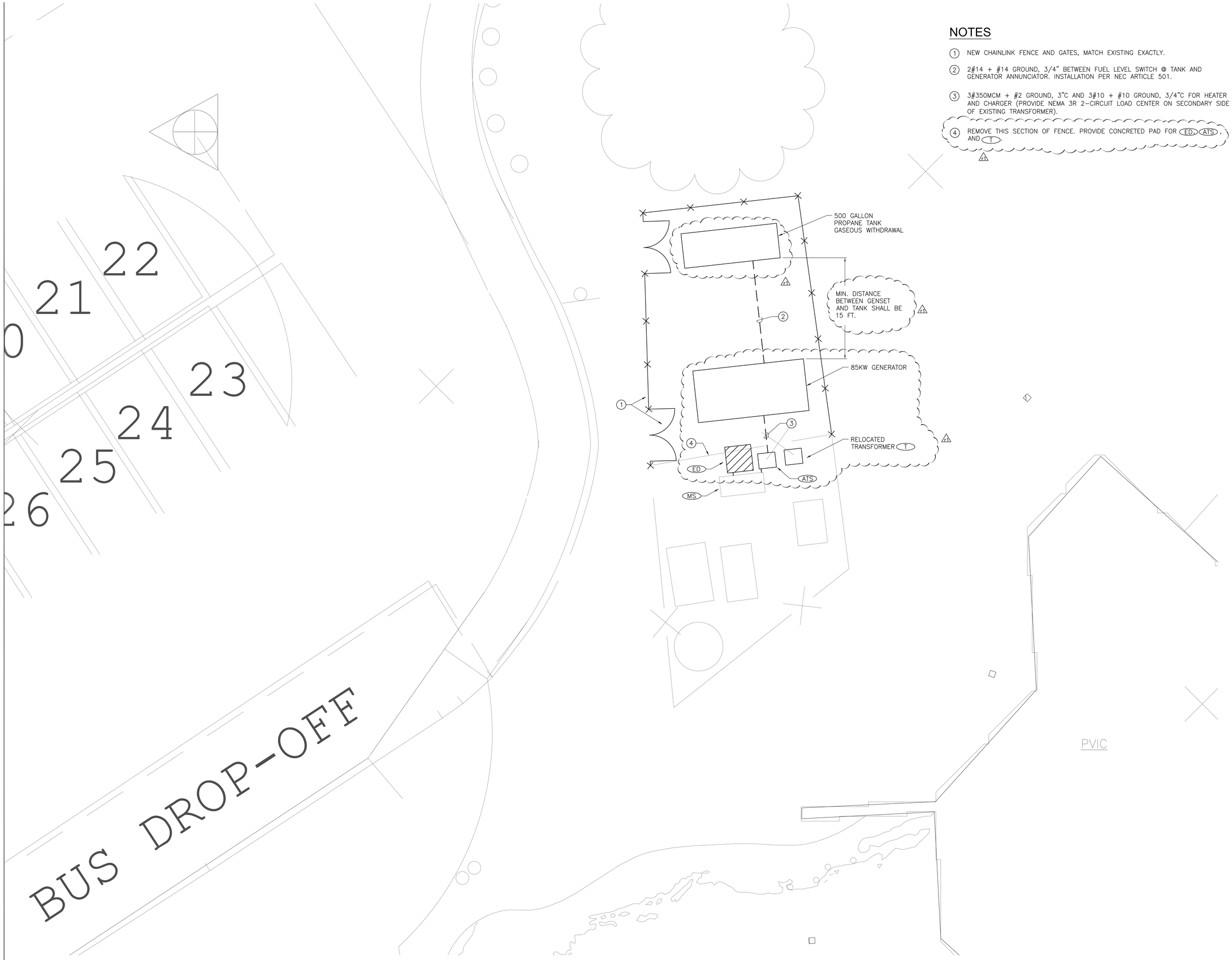
E2r1

NOTES

1. NEW CHAINLINK FENCE AND GATES, MATCH EXISTING EXACTLY.
2. 2#14 + #14 GROUND, 3/4" BETWEEN FUEL LEVEL SWITCH @ TANK AND GENERATOR ANNUNCIATOR. INSTALLATION PER NEC ARTICLE 501.
3. 3#350MCM + #2 GROUND, 3"C AND 3#10 + #10 GROUND, 3/4"C FOR HEATER AND CHARGER (PROVIDE NEMA 3R 2-CIRCUIT LOAD CENTER ON SECONDARY SIDE OF EXISTING TRANSFORMER).
4. REMOVE THIS SECTION OF FENCE. PROVIDE CONCRETED PAD FOR (ED), (ATS), AND (T). 1



PARTIAL ELECTRICAL SITE PLAN
SCALE: 1/4" = 1'-0"

REV.	DESCRIPTION	DATE
1	GENERAL REVISIONS	7/19/10

Project

PVIC
EMERGENCY GENERATORS
31501 PALOS VERDES DRIVE WEST
RANCHO PALOS VERDES, CA 90275

NIKOLAKOPULOS and ASSOC., INC.
CONSULTING ELECTRICAL ENGINEERS

2780 SKYPARK DRIVE, SUITE #280
TORRANCE, CA 90505
310/530-7277 FAX: 310/530-7283

Sheet Title

PVIC ELECTRICAL PLAN

Scale: AS SHOWN

Date 4/15/09

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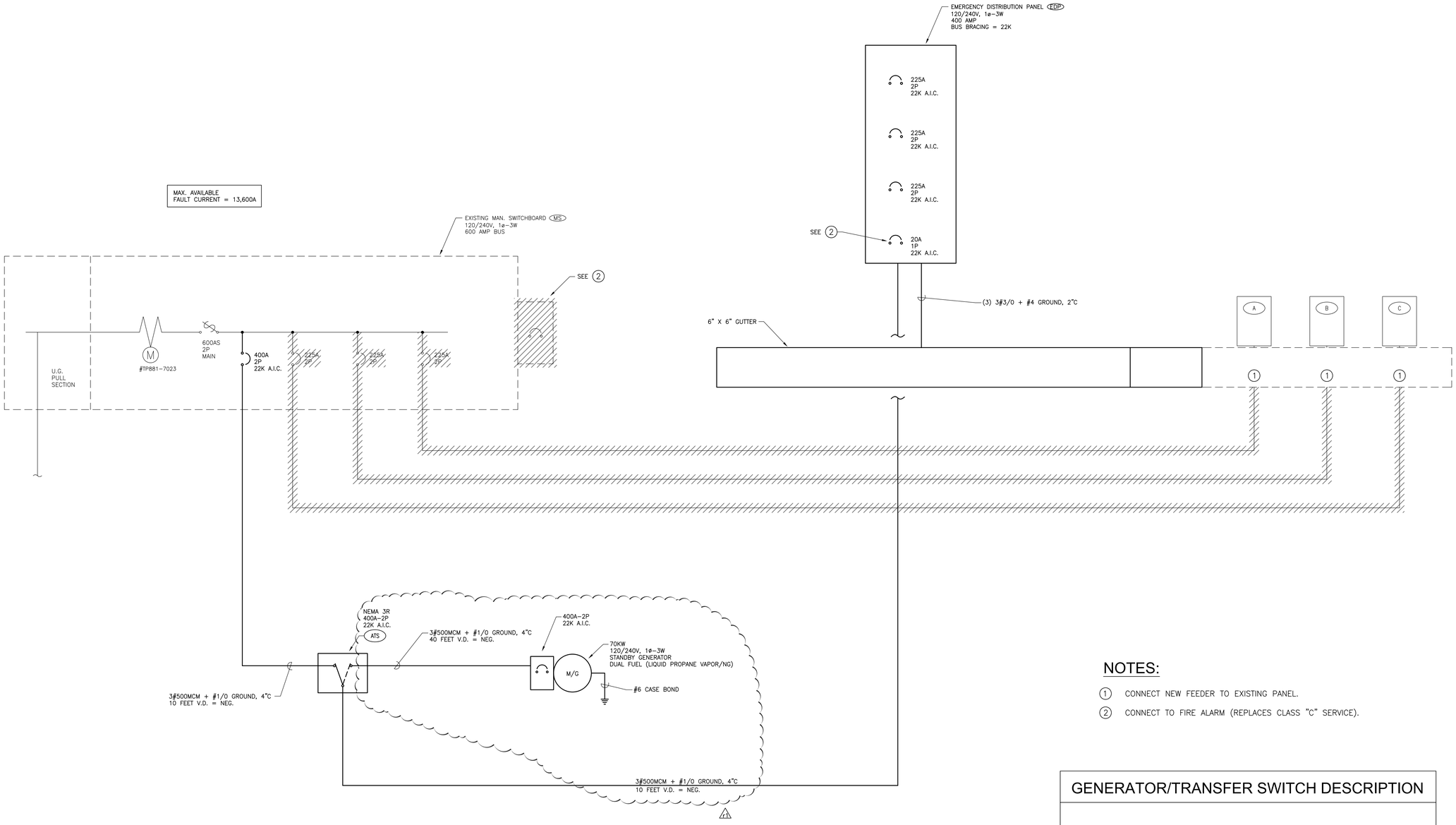
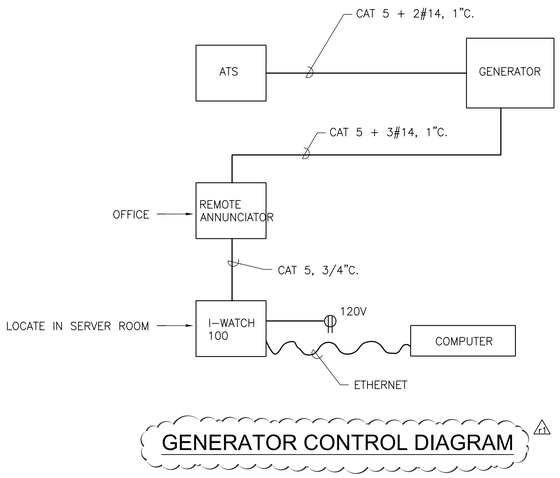
Sheet Number

E3r1



HESSE PARK PARTIAL SINGLE LINE DIAGRAM



GENERATOR CONTROL DIAGRAM

NOTES:

1. CONNECT NEW FEEDER TO EXISTING PANEL.
2. CONNECT TO FIRE ALARM (REPLACES CLASS "C" SERVICE).

GENERATOR/TRANSFER SWITCH DESCRIPTION

- DUAL FUEL (LIQUID PROPANE VAPOR/NG) 70KW GENERATOR 120/240V, 1ø-3W WITH WEATHERPROOF STAGE 2 COASTAL ALUMINUM HOUSING ONAN #70GGHF (OR EQUAL).
  PROVIDE: 1500W 120 VOLT HEATER, FT-10 IN "POWER COMMAND" FOR WIRELESS MONITORING. PROVIDE GENERAL CONVENIENCE DUPLEX RECEPTACLE.
- TRANSFER SWITCH
  400A-2P NEMA 3R 120/240V, 1ø-3W MOUNTED ON GENERATOR SKID ONAN #~~70TC400~~ (OR EQUAL).
  PROVIDE: INTEGRAL EXERCISER CLOCK, CHARGER, "EYE WATCH MODULE" FOR WIRELESS MONITORING.

GENERATOR FUEL SUPPLY DURATION

AT 100% LOADING WITH A 500 GALLON PROPANE SUPPLY.

DURATION =

500 GALLONS / 10.4 GALLONS PER HOUR = 48 HOURS

LOAD SCHEDULE

EXISTING PEAK DEMAND FROM MINIMUM ONE WEEK LOAD TEST ON EACH PHASE	= 190 AMPS
ADDITIONAL 25% REQUIRED BY N.E.C.	= 47.5 AMPS
	= 237.5 AMPS
TOTAL 237.5 AMPS X 240 VOLTS	= 57.0 KW

SPECIAL NOTE

PROVIDE ALTERNATE PRICING FOR LOCATING NEMA 1 ATS INSIDE OF ELECTRICAL ROOM INSTEAD OF NEMA 3R ATS ON GENERATOR SKID. INCLUDE COST FOR MODIFYING EXISTING STORAGE TO MAKE ROOM FOR ATS IN ELECTRICAL ROOM AND PROVIDE PLAN OF THE LOCATION & CLEARANCES.

REV.	DESCRIPTION	DATE
1	GENERAL REVISIONS	7/19/10

Project

HESSE PARK
EMERGENCY GENERATORS

29301 HAWTHORNE BLVD.
RANCHO PALOS VERDES, CA 90275

NIKOLAKOPULOS and ASSOC., INC.
CONSULTING ELECTRICAL ENGINEERS
2780 SKYPARK DRIVE, SUITE #280
TORRANCE, CA 90505
310/530-7277 FAX: 310/530-7283

Sheet Title

HESSE PARK SINGLE LINE DIAGRAM

Scale: NOT TO SCALE

Date 4/15/09

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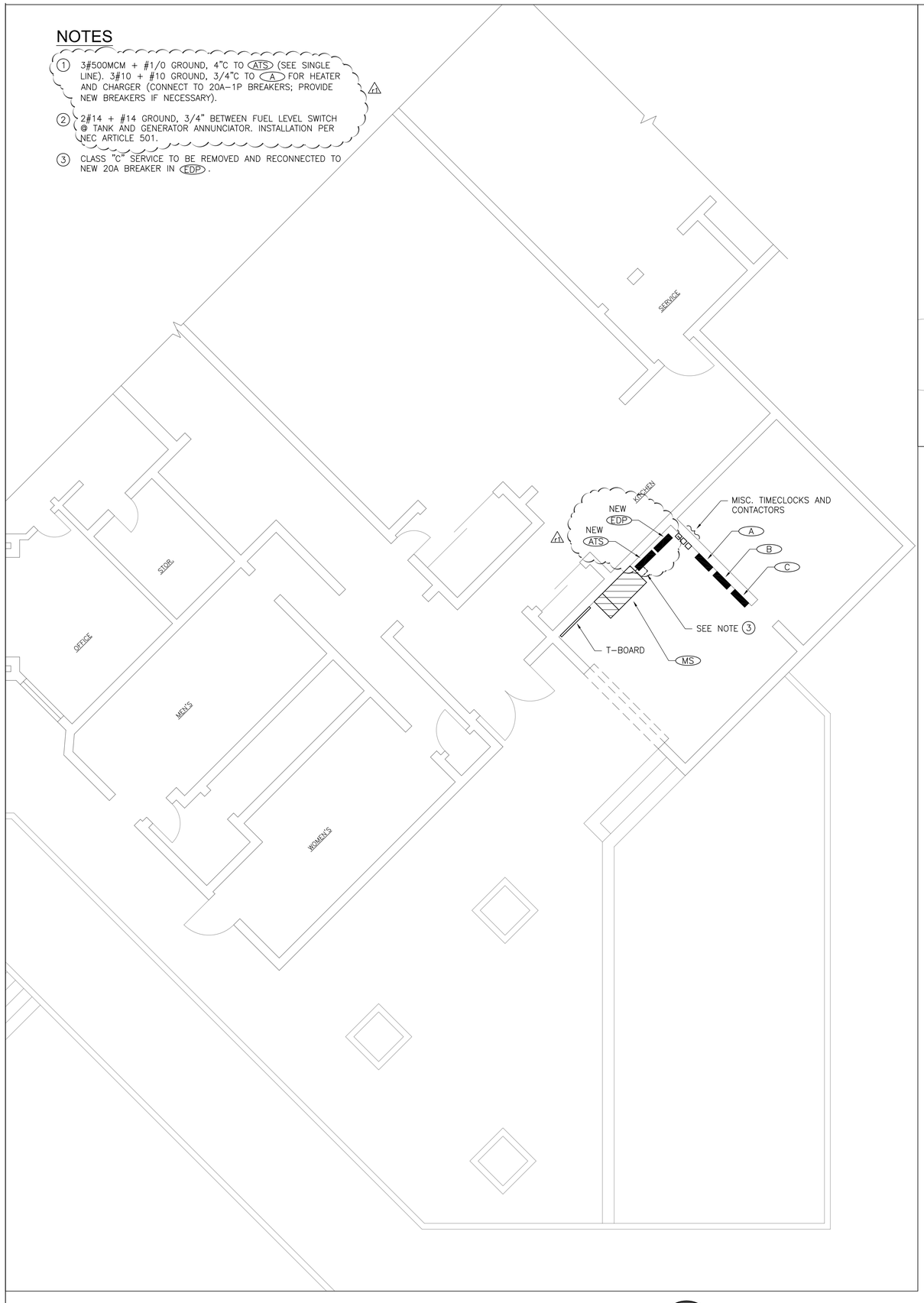
E4r1

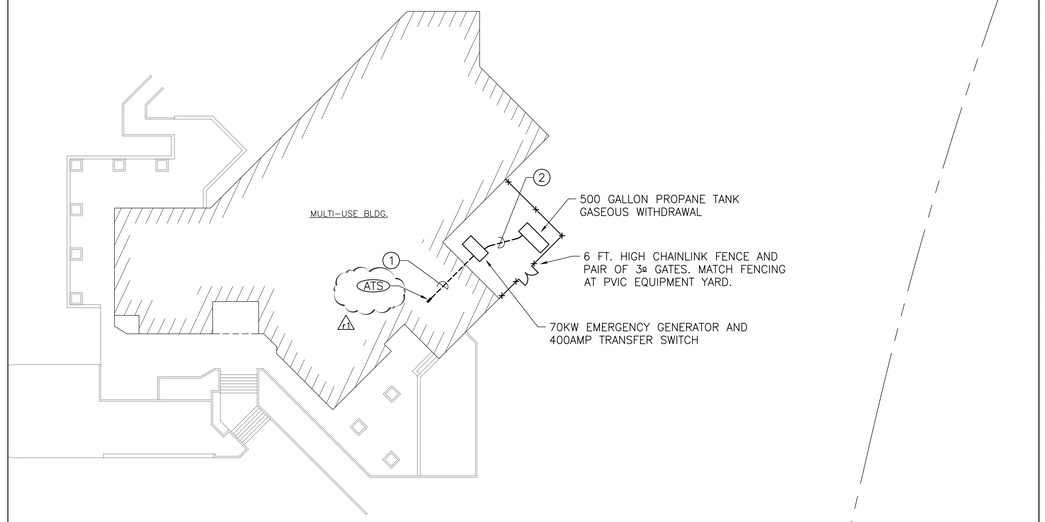
NOTES

1. 3#500MCM + #1/0 GROUND, 4"C TO (ATS) (SEE SINGLE LINE). 3#10 + #10 GROUND, 3/4"C TO (A) FOR HEATER AND CHARGER (CONNECT TO 20A–1P BREAKERS; PROVIDE NEW BREAKERS IF NECESSARY). 1
2. 2#14 + #14 GROUND, 3/4" BETWEEN FUEL LEVEL SWITCH @ TANK AND GENERATOR ANNUNCIATOR. INSTALLATION PER NEC ARTICLE 501.
3. CLASS "C" SERVICE TO BE REMOVED AND RECONNECTED TO NEW 20A BREAKER IN (EDP).



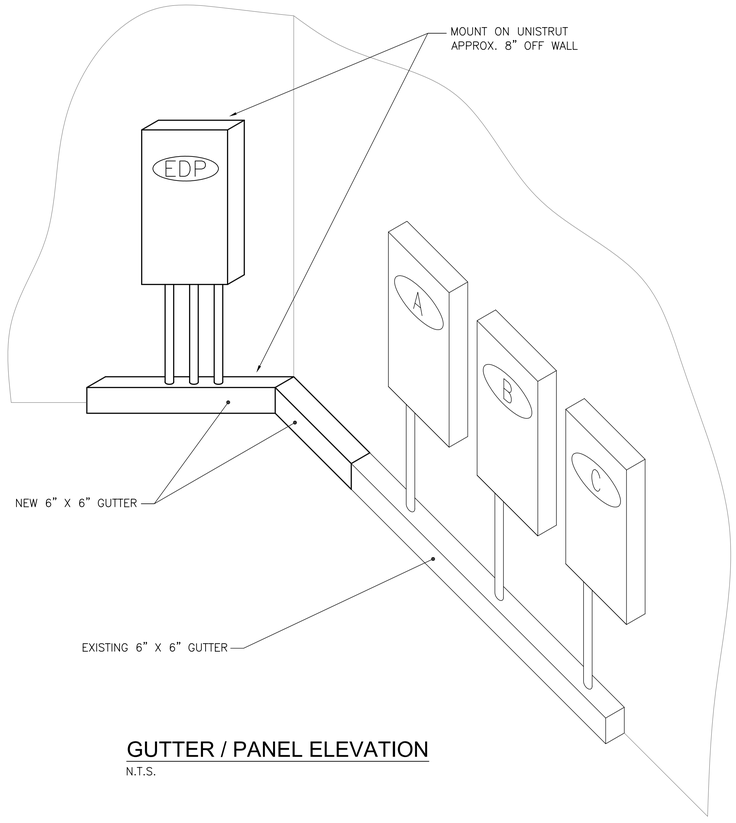
PARTIAL ELECTRICAL BLDG. PLAN

SCALE: 1/4" = 1'–0"



SITE ELECTRICAL PLAN

SCALE: 1" = 20'



GUTTER / PANEL ELEVATION

N.T.S.

REV.	DESCRIPTION	DATE
1	GENERAL REVISIONS	7/19/10

Project

HESSE PARK
EMERGENCY GENERATORS

29301 HAWTHORNE BLVD.
RANCHO PALOS VERDES, CA 90275

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CONSULTING ELECTRICAL ENGINEERS

2780 SKYPARK DRIVE, SUITE #280
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310/530-7277 FAX: 310/530-7283

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HESSE PARK ELECTRICAL PLAN

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E5r1