

PARTIAL ELECTRICAL SINGLE LINE DIAGRAM  
NOT TO SCALE

**SHEET NOTES**

- 1 ALL NEW EQUIPMENT CIRCUIT BREAKERS SHALL HAVE ATTACHMENTS TO ALLOW FOR PADLOCK OFF DEVICE.
- 2 EMERGENCY SHUT DDOWN SHALL STOP COMPRESSORS. SHUT DOWN BUTTON SHALL BE SIMILAR TO ALLEN-BRADLEY BULLETIN 800H FOR CLASS 1 DIV 1 LOCATIONS. MUSHROOM PUSHBUTTON HAVE 2-N.C. AND 2-N.O. CONTACTS SHALL BE RATED 120V, 4 AMPS. COORDINATE WITH COMPRESSOR DRAWINGS.
- 3 3-POLE NON-FUSIBLE SERVICE DISCONNECT CLASS 1, DIV 2 ENCLOSURE. HUBBELL XEDS-100AA.
- 4 DISCONNECT AND REMOVE EXISTING CONDUCTORS FROM ELECTRICAL ROOM TO COMPRESSOR AREA. REROUTE EXISTING CONDUIT AS NEEDED AND PROVIDE NEW RIGID STEEL RISER AT NEW PULL NEW CONDUCTORS AS SHOWN.
- 5 PROVIDE AND INSTALL NEW ESD PUSHBUTTONS AND FLAMABLE GAS DETECTORS AS SHOWN ON DRAWING P-2. TIE ALL PUSH BUTTONS AND GAS DETECTOR ALARM OUTPUTS INTO ESD CIRCUIT OF NEW CNG COMPRESSOR TO SHUT DOWN COMPRESSOR SHUT DOWN POWER TO DISPENSER, AND STOP FLOW OF GAS TO DISPENSERS AND TIMEFILL STATIONS UPON ACTIVATION OF ESD. TIE NEW GAS DETECTORS INTO EXISTING 120V CIRCUIT FEEDING EXISTING DETECTORS.
- 6 PROVIDE AND INSTALL 3/4"x10" GROUND ROD IN COMPRESSOR AREA FOR EQUIPMENT GROUND. TIE COMPRESSOR, AND DRYER TO GROUND ROD WITH #2 INSULATED GROUND CONDUCTOR.
- 7 ROUTE SPARE CONDUITS FROM NEW COMPRESSOR TO ELECT ROOM FOR FUTURE PHONE AND SIGNAL WIRING.
- 8 MAX FILL FOR CONDUIT SEAL-OFF FITTINGS EQUALS 25% (40% ALLOWED FOR CONDUIT). ADJUST SIZE ACORDINGLY.
- 9 REFER TO DRAWING P-2 AND CHAPTER 500 OF NEC FOR EXTENT OF CLASSIFIED AREAS

**LOAD SUMMARY**

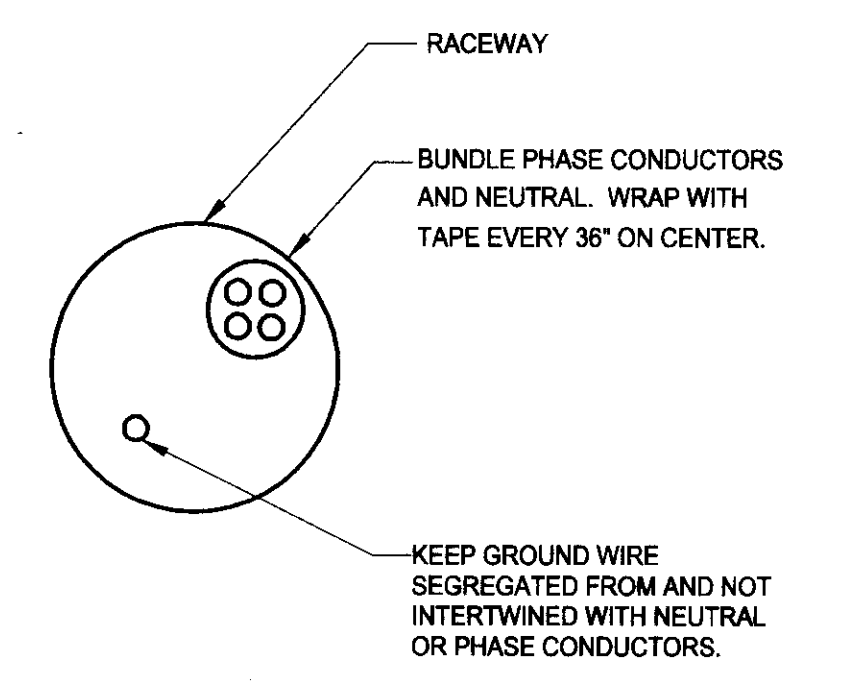
COMPRESSOR C-1 (52 FLA)	=	43 KVA
COMPRESSOR CONTROL	=	3KVA
GAS DRYER	=	1KVA
LARGEST MOTOR X 25%	=	11 HP
58KVA = 70AMP AT 480V, 3PH 100 AMP CIRCUIT OKAY		

**GENERAL NOTES**

1. AT ALL TIMES THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITION OF JOB SITE, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY AND FOR ALL NECESSARY INDEPENDENT ENGINEERING REVIEWS OF THESE CONDITIONS. THE ENGINEERS JOB SITE REVIEW IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTORS SAFETY MEASURES.
2. THE CONTRACTOR SHALL MAKE AN EXAMINATION OF THE SITE. HE SHALL COMPARE THE SITE WITH THE DRAWINGS AND SPECIFICATIONS AND SATISFY HIMSELF AS TO CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED. HE SHALL ASCERTAIN AND CHECK THE LOCATIONS OF ANY EXISTING STRUCTURES OR EQUIPMENT WHICH MAY AFFECT THIS WORK. NO ALLOWANCE SHALL SUBSEQUENTLY BE MADE IN HIS BEHALF FOR ANY EXPENSE TO WHICH HE MAY BE PUT DUE TO FAILURE OR NEGLECT ON HIS PART TO MAKE SUCH EXAMINATION.
3. ALL WORK SHALL BE COORDINATED WITH THE OWNER TO MAINTAIN CONTINUITY OF SERVICE AND MAXIMUM UTILIZATION OF THE OWNERS FACILITY. ALL WORK SHALL BE BID ON A 'NORMAL TIME' BASIS WITH PREMIUM TIME IN ADDITION ONLY AS AUTHORIZED FOR CORE BORING OR OTHER WORK WHICH WILL BE NOISY, DIRTY OR OTHERWISE OBSTRUCT THE WORK PROCESS.
4. THE CURRENT ISSUE OF ALL NFPA, CEC, CBC, UBC, UFC, ANSI, OSHA, ASTM, NEMA, AND OTHER NATIONALLY PUBLISHED CODES OR STANDARDS SHALL APPLY TO THIS WORK WHETHER ADOPTED BY LOCAL AGENCIES OR NOT. THE MOST STRINGENT CODE SHALL APPLY.
5. NOTHING IN THE DRAWING OR SPECIFICATIONS INTENDED TO ALLOW A VIOLATION OF ELECTRICAL WORKING SPACE AROUND ELECTRICAL EQUIPMENT. A 30"W MIN x 48"D x 8'6"H SPACE SHALL BE CLEAR TO THE FLOOR IN FRONT OF ALL ELECTRICAL PANELS, CONTROLS OR ITEMS THAT REQUIRE MAINTENANCE OR ACCESS WHILE ENERGIZED. ANY DEVIATION FROM THIS MINIMUM SHALL BE APPROVED, IN WRITING.
6. ALL CONDUITS SHALL RUN TIGHT TO SLAB AND BEAMS. WHERE DUCTWORK IS INSTALLED TIGHT TO SLAB, RUN CONDUIT BELOW DUCTS AS TIGHT TO DUCTS AS POSSIBLE.
7. DO NOT SUPPORT CONDUITS FROM DUCTS, MECHANICAL SUPPORTS OR EQUIPMENT OF ANY KIND.
8. ALL CABLES, CONDUITS, PIPING OR EQUIPMENT LOCATIONS AND ELEVATIONS ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR FIELD CHECKING AND MAKING ALL NECESSARY OFFSETS, AS REQUIRED, TO AVOID EXISTING INTERFERENCES AND COORDINATE WITH OTHER TRADES.
9. IDENTIFY EACH CONDUCTOR BY SHRINK-ON INDELIBLY MARKED BRADY-TAGS AND EACH ELECTRICAL ITEM BY BLACK - WHITE - BLACK ENGRAVED SCREW - ON PLASTIC NAMEPLATE, LEGEND PER DRAWING.
10. ALL GROUND WIRES SHALL BE SEGREGATED FROM PHASE CONDUCTORS IN CONDUITS TO MINIMIZE GROUND LOOPS.
11. ELECTRICAL DESIGN BASED UPON TYPICAL VENDOR EQUIPMENT. COORDINATE FINAL INSTALLATION WITH ACTUAL EQUIPMENT FURNISHED.
12. THE CONTRACTOR SHALL PROVIDE ALL FUSES REQUIRED FOR PROJECT POWER INCLUDING ANY FUSES BLOWN DURING INITIAL TESTING.
13. BONDING JUMPERS SHALL BE INSTALLED TO INSURE CONTINUITY WHERE CONDUIT CONNECTIONS AT CONCENTRIC KNOCKOUTS ARE TO SERVE AS A GROUND.
14. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO ALL WALLS, FLOORS AND PAVING. IF DAMAGE OCCURS DURING CONSTRUCTION, THEY SHALL COORDINATE WITH OWNER TO PATCH, PAINT AND REPAIR TO MATCH EXISTING CONDITIONS.

**SYMBOL LIST**

(A)	RECESSED FLUORESCENT FIXTURE TYPE A - SEE FIXTURE SCHEDULE
(B)	FLUORESCENT FIXTURE TYPE B MOUNTED ON WALL AT +90" ABOVE FLOOR - SEE FIXTURE SCHEDULE
S	1PST LIGHT SWITCH, 20A, 125/277V RATED, +48", LETTER DENOTES OUTLETS CONTROLLED
S <sup>M</sup>	MANUAL MOTOR STARTING SWITCH, HORSE POWER RATED WITH OVERLOADS
□	JUNCTION BOX - SIZE PER CODE
⊖	20A, 125V, 3W, SPECIFICATION GRADE, GROUNDED DUPLEX RECEPTACLE, +24" U.O.N.
⊖	20A, 125V, 3W, SPECIFICATION GRADE, GROUNDED DUPLEX RECEPTACLE, +48", GFI TYPE
⊖	20A, 125V, 3W, SPECIFICATION GRADE, GROUNDED DOUBLE DUPLEX RECEPTACLE, +24" U.O.N.
⊖	WELDER OUTLET, 480V 3-1, 3W, 60A WITH INTERLOCKED DISCONNECT SWITCH. SEE SPECIFICATIONS
⊖	4"SQ X 2-1/8"D TELEPHONE/DATA J-BOX, +18" WITH 1" CONDUIT UP TO TRUSS SPACE
⊖	MOTOR OUTLET, HORSEPOWER NOTED, COMPLETE WITH CONNECTIONS AND FLEX
⊖	TRANSFORMER, KVA AND VOLTAGE AS SHOWN IN CONNECTION DETAILS
⊖	NON-FUSED DISCONNECT SWITCH, 30A, 3 POLE, 480 VOLT NEMA 3R, OR AMP RATING NOTED
⊖	FUSED DISCONNECT SWITCH, 30A, 3 POLE, 480 VOLT NEMA 3R OR AMP RATING NOTED
⊖	COMBINATION FUSIBLE SWITCH MOTOR STARTER, NEMA SIZE 1 OR AS NOTED. ENCLOSURE SHALL BE NEMA 12 WITH H-O-A SELECTOR SWITCH AND 120 VOLT 100VA CONTROL TRANSFORMER
⊖	FUEL SYSTEM 'EMERGENCY SHUT DOWN'. DEVICE SHALL BE LISTED FOR CLASS 1, DIV 1
⊖	FUSED SWITCH - SIZE /POLE/FUSE NOTED
⊖	CIRCUIT BREAKER - TRIP/POLE/FRAMED NOTED
⊖	EXISTING CONDUIT
⊖	CONDUIT EXPOSED ON WALL OR IN CEILING
⊖	HOMERUN TO PANEL BOARD OR OTHER TERMINATION POINT
⊖	ANY BRANCH CIRCUIT CONDUIT SHALL BE MINIMUM 3/4" - 2#12 UNLESS OTHERWISE NOTED OR INDICATED. FOR A GREATER NUMBER OF #12 WIRES: (---) = 3/4" - 3#12 ETC. FOR WIRE SIZES OTHER THAN #12: (---) = 3#12 IN CODE SIZE CONDUIT) ETC.
⊖	HOT WIRES
⊖	NEUTRAL
⊖	ISOLATED GROUND
⊖	CONDUIT SEAL
BC	BARE COPPER
C	CONDUIT
(E)	EXISTING
(X)	REMOVE ITEM NOTED
(R)	RELOCATED AND RECONNECTED DEVICE
U.O.N.	UNLESS OTHERWISE NOTED
WP	WEATHERPROOF
EP	EXPLOSION PROOF FITTING
ESD	EMERGENCY SHUT DOWN
⊖	SHEET NOTE
⊖	DETAIL 1 SHEET WHERE DETAIL IS DRAWN
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
⊖	GROUNDING ROD



**SEGREGATED GROUND WIRE INSTALLATION DETAIL**

NOT TO SCALE

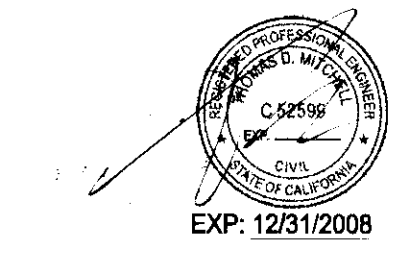
COUNTY OF SAN JOAQUIN  
Submitted ,2008

THOMAS RYAN FLINN  
DIRECTOR OF PUBLIC WORKS

1	ADDED PRIORITY PANEL	TM	3/08
0	PRELIMINARY FOR CLIENT REVIEW	TM	
REV.	DESCRIPTION	BY	DATE
SAN JOAQUIN COUNTY - PUBLIC WORKS STOCKTON, CA			
T. MITCHELL ENGINEERS DANFORD CALIFORNIA			
SCALE	AS NOTED	FOR	CNG SYSTEM UPGRADE DOWNTOWN GARAGE
DATE	12/18/07	DRWN	TM
CHECKED	TM	TITLE	ELECTRICAL - SYMBOLS, NOTES, DIAGRAM & DETAILS
APPROVED		JOB	0521
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**RECORD DRAWING**

Checked by: *[Signature]*  
No Change By: *[Signature]*  
Date: 12-18-07  
Any person using this drawing shall void all information by inspecting the Site Of Work



SU 4442

**DESIGN CONDITIONS**

A. This CNG fueling station has been designed with the following pressure and temperature parameters:

Operating Pressure: 3600 psig  
 Design Pressure: 4500 psig  
 Design Temperature: 20 to 110 degrees F  
 Pneumatic Test Pressure: 4950 psig (for CNG piping)  
 Materials: All Piping and tubing shall be seamless

**PIPE SPECIFICATIONS**

A. Natural Gas (G) Abovegrade  
 1. Carbon Steel (CS): ASTM 106 Grade B Schedule 40 black.

- a. Fittings: ASTM A234/A234M.
- b. Joints: ASME B31.9.
- c. Jacket: None

d. Plug Valves: Refer to PG&E standards.

- i. 2 inches and smaller: MSS SP 78, 200psi WOG, threaded ends, semi-steel construction, and full pipe area.
- ii. 2-1/2" and larger: MSS SP 78, 200psi WOG, Flanged ends, semi-steel construction, full pipe area. Furnish with worm gear operator.

e. Check valves: Tom Wheatley figure 55 or KF valve series 35 per PG&E STD K-15.

B. Natural Gas (G) buried  
 NOT USED

C. Compressed Natural Gas (CNG)

- 1. Carbon Steel - Heavy Walled (CS2) Schedule 160 ASTM A106 grade B.
- a. Fittings: 6000psi forged steel socket weld - ASME SA 105 (if buried), ASME SA 350LF2 (if above ground)

2. Tubing (SST) - Seamless, fully annealed tube for general service conforming to the requirements of ASTM A 213 for Grades TP 304 or TP 316 material having a minimum ultimate tensile strength of 75,000 psi. Tubing shall be cold finished and free of scratches. All tubing is sized according to the maximum expected flow rate and must be installed per the drawings. No tubing with other than the minimum wall thickness required is to be used without approval of the owner. The internal and external surfaces of the tubing shall be provided with adequate protection from corrosion and abrasion during normal handling and storage. The manufacturer of vendor shall be prepared to certify that all tubing conforms to the requirements of this specification and shall provide formal Mill Certificates for each lot.

Above ground tubing shall be of rigid straight lengths. All bends above grade must be made with tubing benders and should be 90 degrees whenever possible. All lengths of tubing shall be anchored per code to prevent excessive vibration. All tubing shall run true to the vertical and horizontal axis of the equipment and shall be anchored to prevent injury.

All underground tubing shall be continuous with no intermediate joints fittings or unions that are inaccessible and shall be installed inside a buried plastic pipe or PVC conduit sleeve. Underground tubing shall be continuous with no intermediate joints, valves or fittings that are buried or inaccessible.

Minimum Tube Wall Thickness (Inches):

See Schedule

**Tube Fittings:**

1/4" TO 1/2" Swagelok or equal 316 stainless steel, double ferrule type fittings. 5000 psi minimum working pressure.  
 3/4" Not Used

**Ball Valves:**

1/4 to 1/2 Hoke series 71, 316 ss w/TFE seats & seals

**Needle Valves:**

1/4 to 1/2 Hoke, 316 ss w/TFE seals

Sleeve (for buried tubing): Not Used

Bleed Valves: Hoke series 6600, 316 ss bleed valve with integral tube ends. 6000 psi maximum working pressure.

**Back Pressure Regulators:**

Aqua Environmental

**TESTING AND INSPECTION**

A. When assembly of a welded gas piping or tubing assembly is complete, a pneumatic pressure test shall be performed in accordance with ASME/ANSI B31.3. All pressure sensitive devices (regulators, relief valves, etc.) shall be removed or isolated from the system prior to testing. The leak test pressure shall be as follows:

Pipe	Pressure
CNG Piping and Tubing (CNG)	4800 psig
Natural Gas Piping (G)	75 psig
Vent piping (V)	N/A

1. A source of high-pressure gas (nitrogen) shall be connected to one end of the system.
2. The pressure shall be gradually increased, in 500 psig increments and held for 15 minutes (at which time all connections shall be soap tested to check for leaks), until maximum pressure is reached. Document testing.
3. After all connections are proved to be leak free, record final pressure and allow to set for one hour. After one hour, compare test pressure to recorded pressure. If pressures are the same, bleed off the gas in a controlled and safe manner. If the test pressure is lower than the recorded pressure, or if a leak is found while soap testing, find and repair the leak and repeat the test procedure.
4. Upon completion of the pneumatic pressure test, all pressure sensitive devices shall be reinstalled in the system and soap tested for leaks at operating pressure.

B. Contractor shall use an approved soap and water solution to test all pipe fittings and connections during testing and at start-up.

**PURGING AND PRESSURIZING**

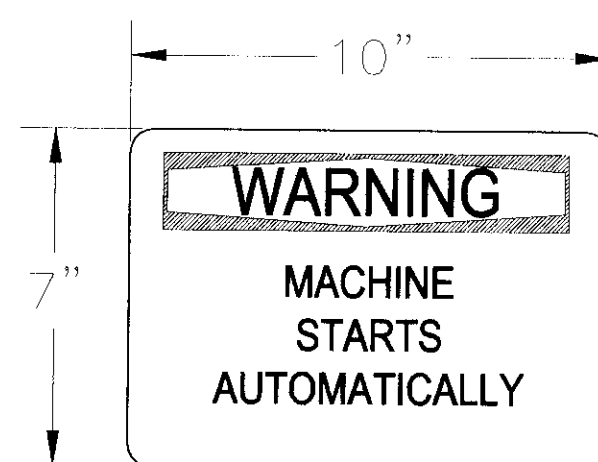
- A. All purging and pressurizing shall be done by Contractor and observed by the Owner or designated representative.
- B. Prior to pressurizing the system with natural gas, the ESD system must be operational. Natural gas shall not be introduced into the system without prior authorization from the Owner. All air shall be purged from the entire system to the satisfaction of the Owner and in accordance with the manufacturers instructions prior to pressurizing the system.
- C. Prior to Natural gas being introduced into any piping system, all fabrication, testing, and work requiring flame or sparging devices shall be complete. After natural gas has been introduced, the Owner shall do welding or other work, which could ignite natural gas vapors, only upon authorization.
- D. Once the system is pressurized (to full operating pressure) all valves, welds, joints and fittings shall be leak tested and signed off by the Owner.

**SIGN SCHEDULE**

TYPE	DESCRIPTION	QTY.	SIZE	MATERIAL (NOTE 7)	BACKGROUND	TEXT	LOCATION
①	WARNING - FLAMMABLE GAS	6	10"x14"	0.04 ALUMINUM	ORANGE/WHITE	BLACK	COMPRESSOR AND FUELING AREA (SEE P-2 FOR LOCATION)
②	IN CASE OF FIRE	6	10"x14"	0.04 ALUMINUM	WHITE	BLACK	COMPRESSOR AND FUELING AREA (SEE P-2 FOR LOCATION)
③	EMERGENCY FUEL SHUT-OFF	6	7"x10"	0.04 ALUMINUM	WHITE	RED	ABOVE ESD (E) SWITCH (REFER TO P-2)
④	MACHINE STARTS AUTOMATICALLY	1	7"x10"	0.04 ALUMINUM	ORANGE	BLACK	COMPRESSOR AREA
⑤	HAZARD DIAMOND (NPFA 704)	4	10"x10"	0.125 FRP	HAZ DIAMOND	BLACK	LOCATE NEAR ENTRANCE(S) FASTEN WITH SCREWS OR TIES

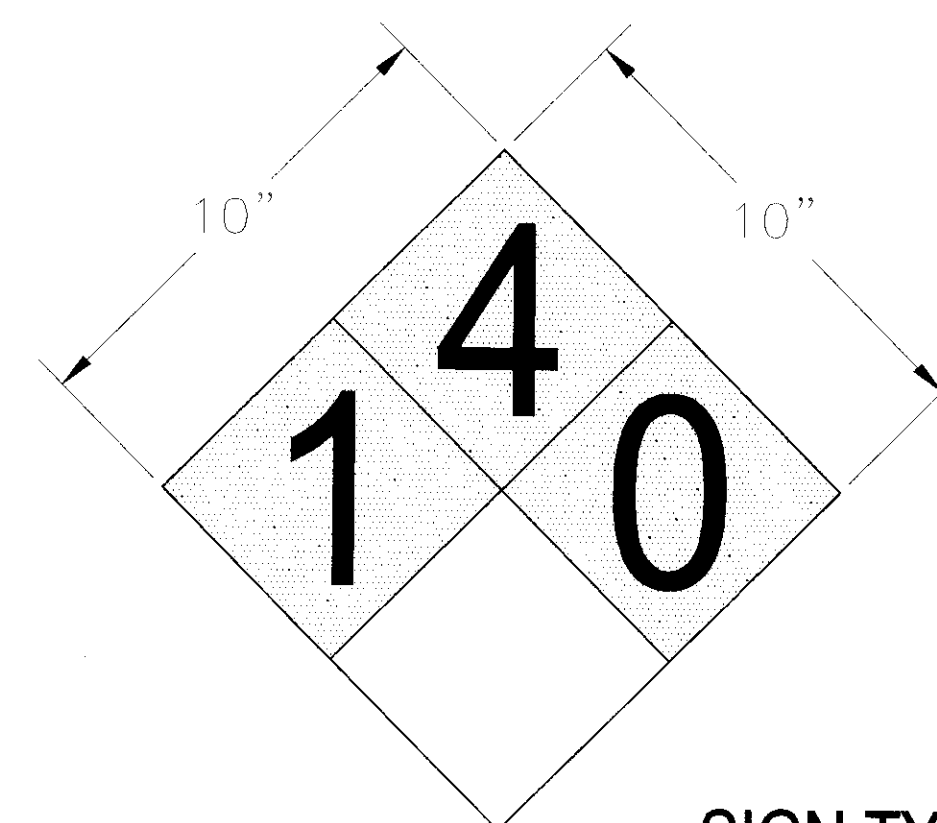
**SIGNAGE NOTES:**

1. ALL SIGNS SHALL BE IN ACCORDANCE WITH OSHA SPECIFICATIONS 1910.145 AND ANSI SPECIFICATIONS Z535.
2. ALL SIGNS SHALL BE SUITABLE FOR OUTDOOR USE.
3. SIGNS SHALL BE MADE OF 0.40 INCH THICK ALUMINUM WITH BAKED WHITE ENAMEL BACKGROUND U.N.O.. LETTERS SHALL BE 3M WEATHERIZED VINYL - SIZE, COLOR AND FONT AS NOTED.
4. VENDORS LISTED ARE ONLY FOR ESTABLISHING STANDARDS OF QUALITY AND PERFORMANCE. OTHER MANUFACTURES MAY BE SUBSTITUTED IF APPROVED.
5. CONTRACTOR SHALL PROVIDE AND INSTALL SIGNAGE AS SHOWN ON DRAWINGS. IN ADDITION, CONTRACTOR SHALL TAG ALL EQUIPMENT AND VALVES AND SHALL LABEL ALL LINES IN ACCORDANCE WITH ANSI A13.1-1987.
6. SIGNS SHALL BE PROVIDED AND INSTALLED WITH NECESSARY BRACKETS, SUPPORTS AND HARDWARE. BRACKETS, SUPPORTS AND HARDWARE SHALL BE GALVANIZED. ALL HARDWARE SHALL BE VANDAL AND TAMPER RESISTANT.
7. WHERE SIGNAGE IS TO BE ATTACHED TO EXTERIOR SURFACE OF EQUIPMENT, SUCH AS COMPRESSOR ENCLOSURE OR DISPENSER FRONT PANEL, SIGN MATERIAL SHALL BE SELF ADHESIVE VINYL.
8. SIGNS SHALL BE LOCATED FOR EASY VISIBILITY FROM ALL SIDES.



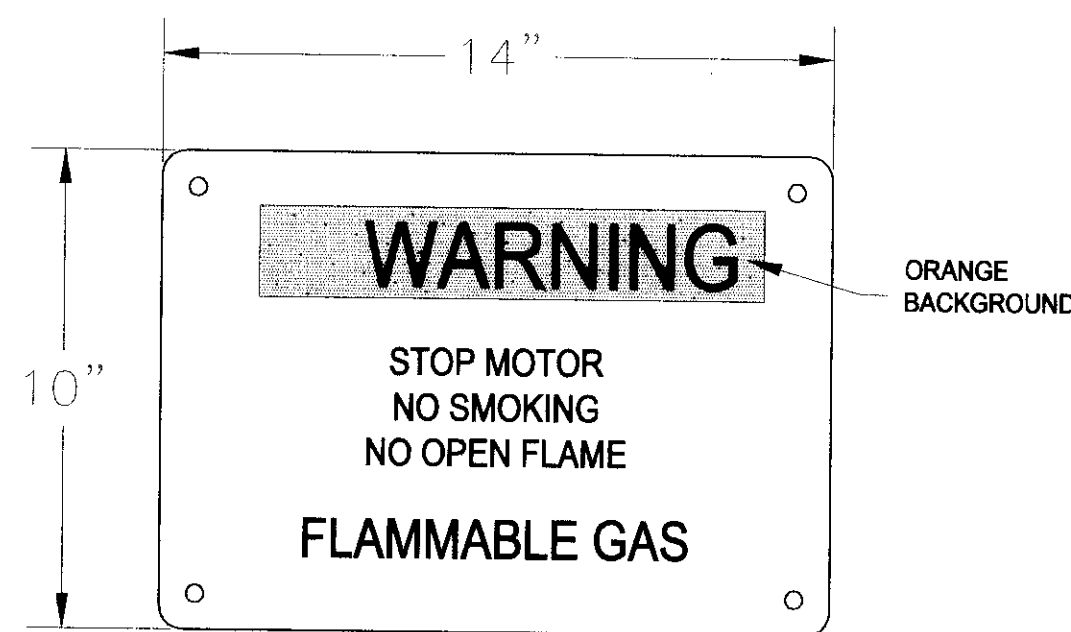
**SIGN TYPE "4"**

SCALE: 3"=1'-0"



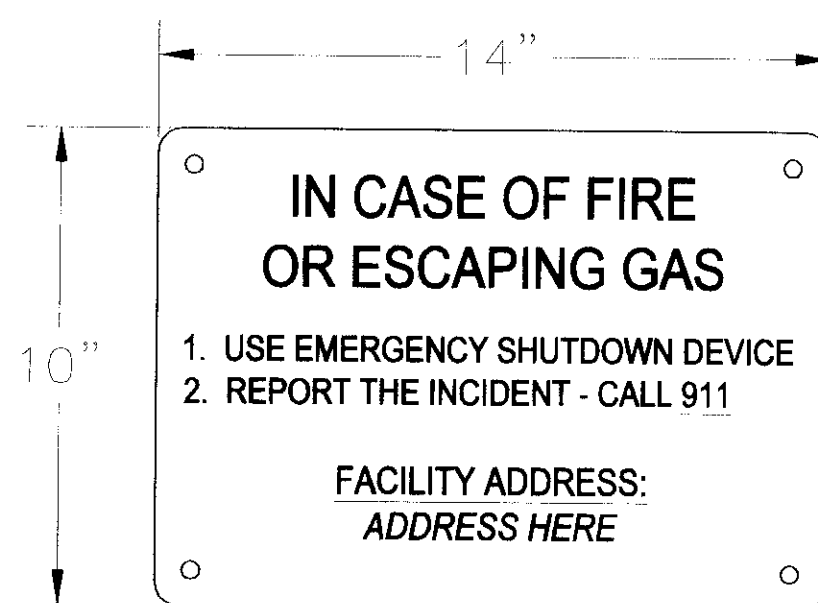
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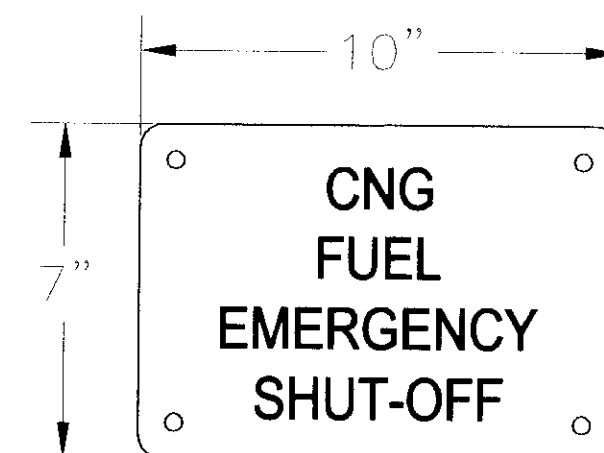
**SIGN TYPE "1"**

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**SIGN TYPE "2"**

SCALE: 3"=1'-0"



**SIGN TYPE "3"**

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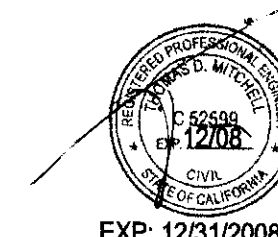
COUNTY OF SAN JOAQUIN  
 Submitted ,2008

THOMAS RYAN FLINN  
 DIRECTOR OF PUBLIC WORKS

SAN JOAQUIN COUNTY - PUBLIC WORKS STOCKTON, CA			
T. MITCHELL ENGINEERS OAKLAND CALIFORNIA			
SCALE AS NOTED	FOR	CNG SYSTEM UPGRADE DOWNTOWN GARAGE	
DATE: 05/06	DRWN: TM	CHECKED: TM	TITLE: SIGNAGE AND NOTES
APPROVED:	APPROVED:	JOB: 0521	DWG. NO.: P3
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**RECORD DRAWING**

Corrected By: \_\_\_\_\_  
 Date: 5-07-09  
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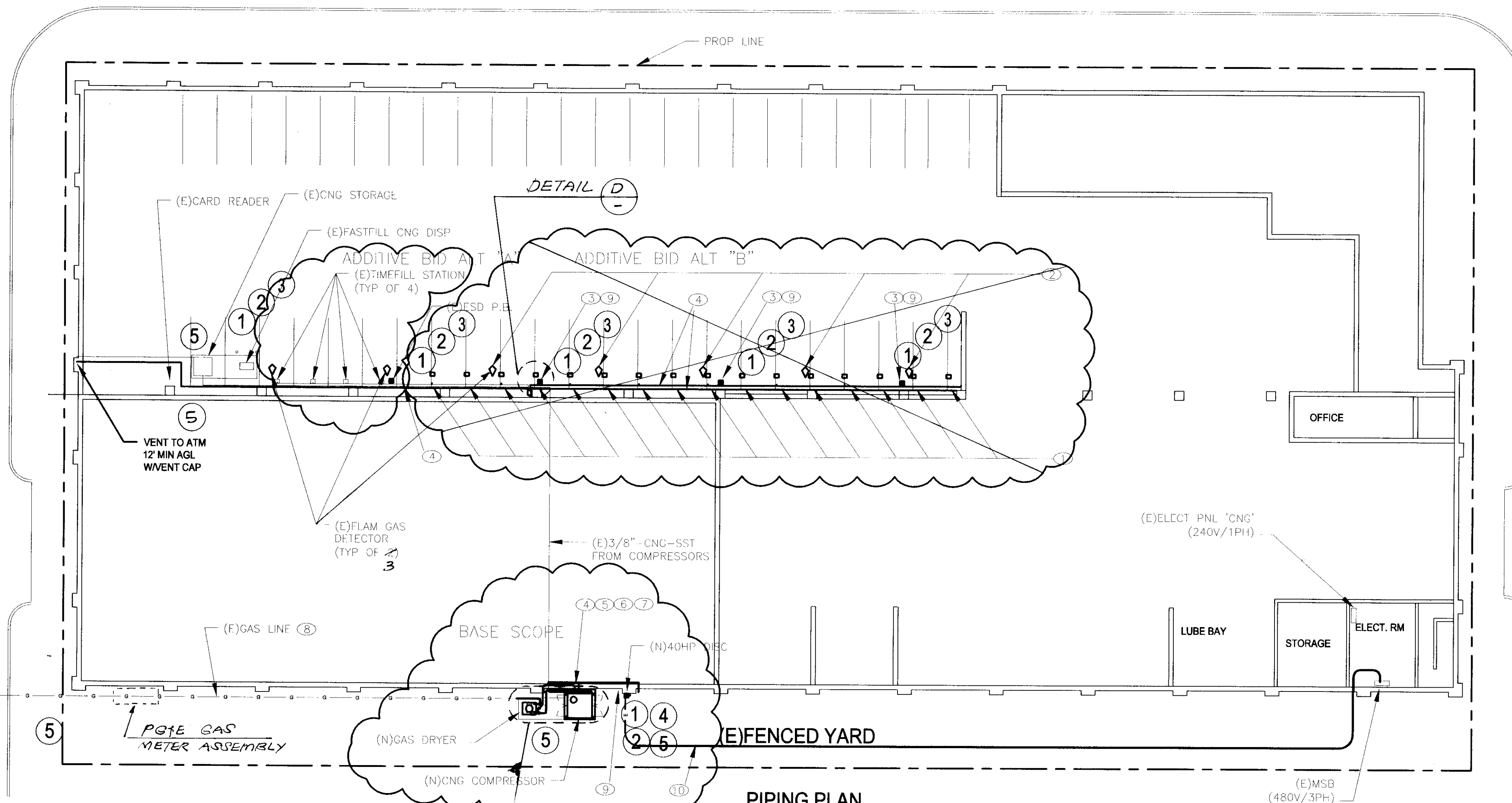


SU 4443

MARKET STREET

HUNTER STREET

SAN JOAQUIN STREET



PIPING PLAN

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

GENERAL NOTES:

- COORDINATE EQUIPMENT INSTALLATION AND PIPE ROUTING WITH OTHER WORK INCLUDING CONCRETE AND ELECTRICAL.
- NOT USED.
- VERIFY LOCATION OF EXISTING UTILITIES AND UNDERGROUND CONDUITS PRIOR TO CONSTRUCTION.
- NOT USED.
- LOCATIONS OF EQUIPMENT SHOWN ON DRAWINGS IS APPROXIMATE. CONFIRM FINAL LOCATIONS WITH OWNER PRIOR TO INSTALLATION.
- INSTALLATION SHALL MEET PACIFIC GAS & ELECTRIC STANDARDS INCLUDING PG&E STANDARD H-15. COPY AVAILABLE UPON REQUEST.
- PROVIDE FULL DEPTH PVC PIPE SLEEVE AROUND ALL PRIMARY PIPING OR TUBING PASSING THROUGH CONCRETE. SEAL VOID BETWEEN PIPING AND SLEEVE WITH WEATHER RESISTANT SEALANT.
- UPGRADE EXISTING SAFETY SIGNAGE TO MEET REQUIREMENTS OF UFC ARTICLE 5201 AND 5204, AND NFPA 52 AS NEEDED.
- REFER TO AS-BUILT DESIGN DRAWINGS FOR ORIGINAL SYSTEM - DRAWING C-1 REV 4 BY TAITE & ASSOCIATES DATED 06/03/02 - FOR ADDITIONAL INFORMATION REGARDING EXISTING CONDITIONS.
- SEE DRAWING P-3 FOR SIGNAGE DETAILS (X)

SHEET NOTES:

- CONTRACTOR SHALL PROVIDE AND INSTALL UP TO SIXTEEN (16) SINGLE HOSE CEILING MOUNTED TIMEFILL STATIONS COMPLETE WITH HOSES, NOZZLES AND BREAKAWAYS FOR 3600PSI FILLS, HOSE RETRACTORS, AND MOUNTING BRACKET. CONFIRM FINAL LOCATIONS WITH OWNER PRIOR TO INSTALLATION.
- CONTRACTOR SHALL PROVIDE AND INSTALL FIVE ADDITIONAL GAS DETECTORS AND TIE THEM INTO EXISTING POWER AND EMERGENCY SHUT-DOWN (ESD) SYSTEM. (SEE ELECTRICAL).
- CONTRACTOR SHALL PROVIDE AND INSTALL THREE ADDITIONAL ESD PUSH-BUTTON STATIONS (ESD P.B.). NEW ESD P.B.'S TO MATCH EXISTING. TIE INTO EXISTING ESD CIRCUIT.
- CONTRACTOR SHALL PROVIDE AND INSTALL NEW CNG, GAS, AND VENT PIPING TO SERVE NEW EQUIPMENT. SEE DRAWING P-1 FOR ADDITIONAL DETAIL.
- CONTRACTOR SHALL CONSTRUCT NEW CONCRETE COMPRESSOR PAD. SEE CIVIL.
- CONTRACTOR SHALL PROVIDE AND INSTALL NEW INLET GAS DRYER AND 50 CFM CNG COMPRESSOR.
- CONTRACTOR SHALL REMOVE EXISTING INLET GAS DRYER, REFUELING APPLIANCES AND ASSOCIATED PLUMBING AND ELECTRICAL WITHIN COMPRESSOR AREA.
- CONTRACTOR SHALL COORDINATE WITH PG&E TO UPGRADE EXISTING CNG SYSTEM GAS SERVICE TO ACCOMMODATE NEW EQUIPMENT.
- FURNISH AND INSTALL 20 B.C PORTABLE FIRE EXTINGUISHER(S) AND CABINET(S) WITH GLASS FRONT AND SIGNAGE IN FUELING AREA AND COMPRESSOR AREA.
- REROUTE (E) CONDUIT AND PULL NEW WIRE FROM ELECTRIC ROOM TO NEW EQUIPMENT. PROVIDE NEW 480V/3PH BREAKER. SEE ELECTRICAL.

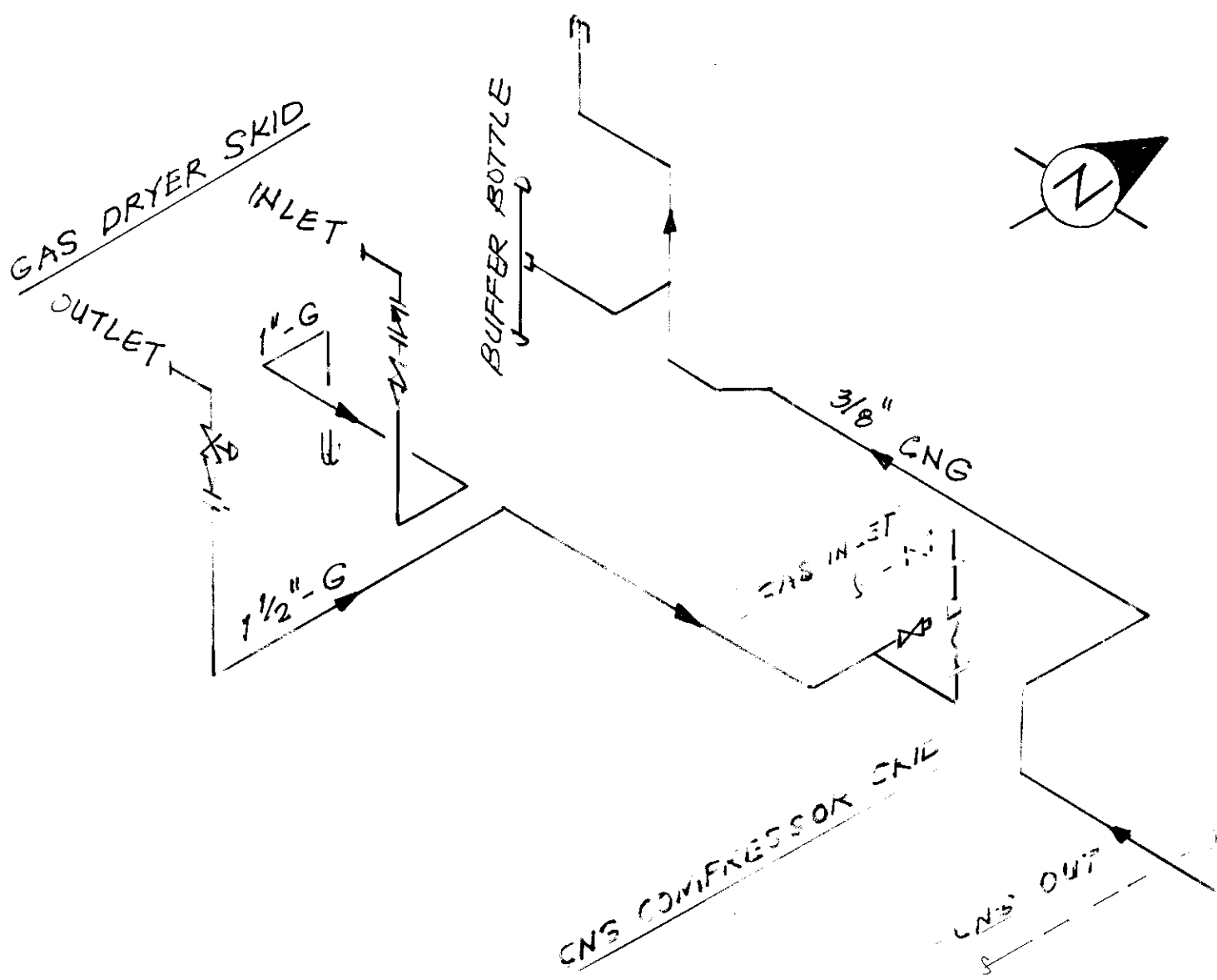
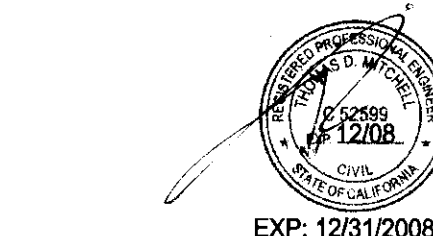
COUNTY OF SAN JOAQUIN  
Submitted ,2008

THOMAS RYAN FLINN  
DIRECTOR OF PUBLIC WORKS

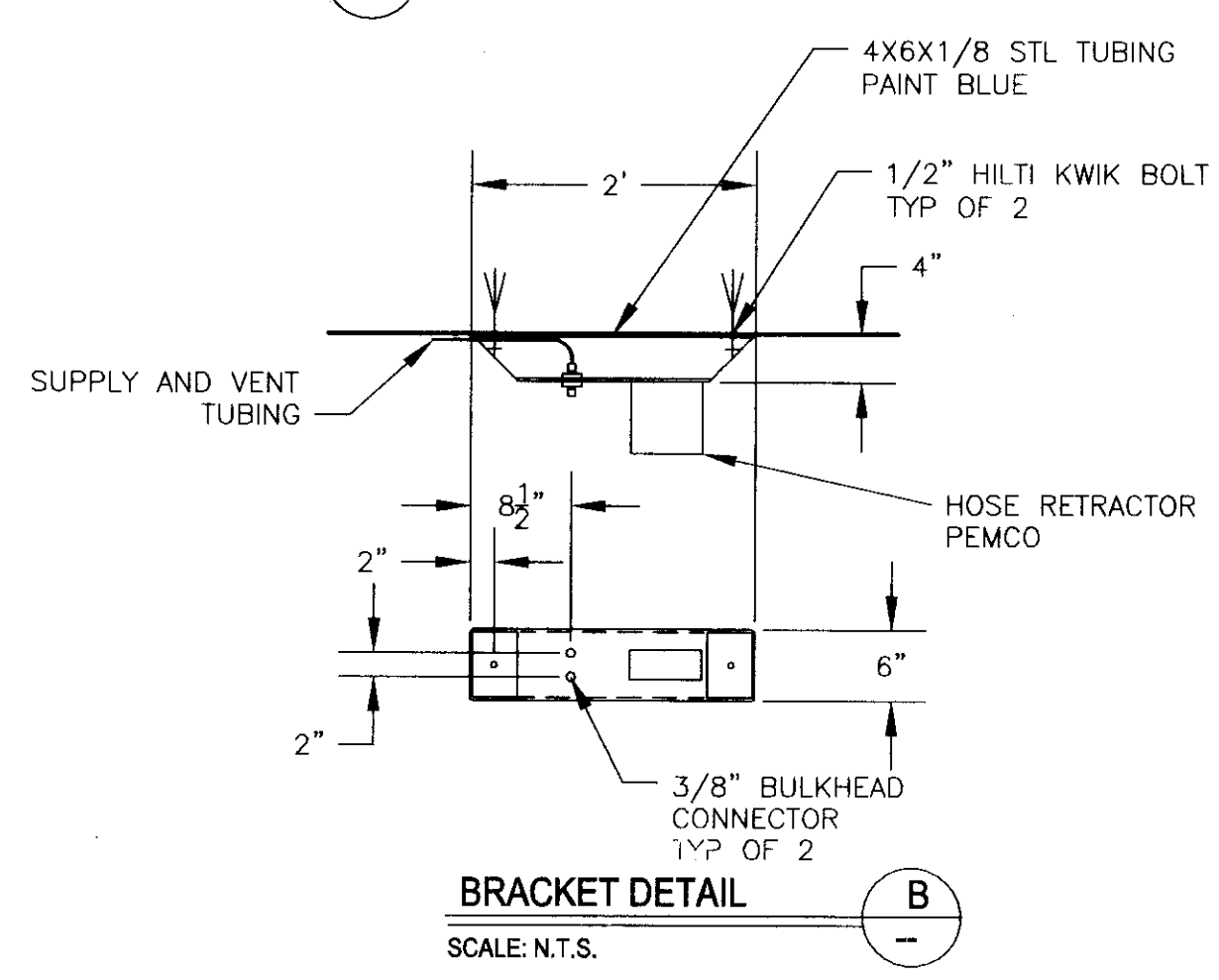
REV	DESCRIPTION	BY	DATE
2	MINOR REVISION	TM	03/08
1	REVISED COMPRESSOR AREA	TM	07/07
0	PRELIMINARY FOR CLIENT REVIEW	TM	

SAN JOAQUIN COUNTY - PUBLIC WORKS  
STOCKTON, CA  
T. MITCHELL ENGINEERS  
OAKLAND, CALIFORNIA

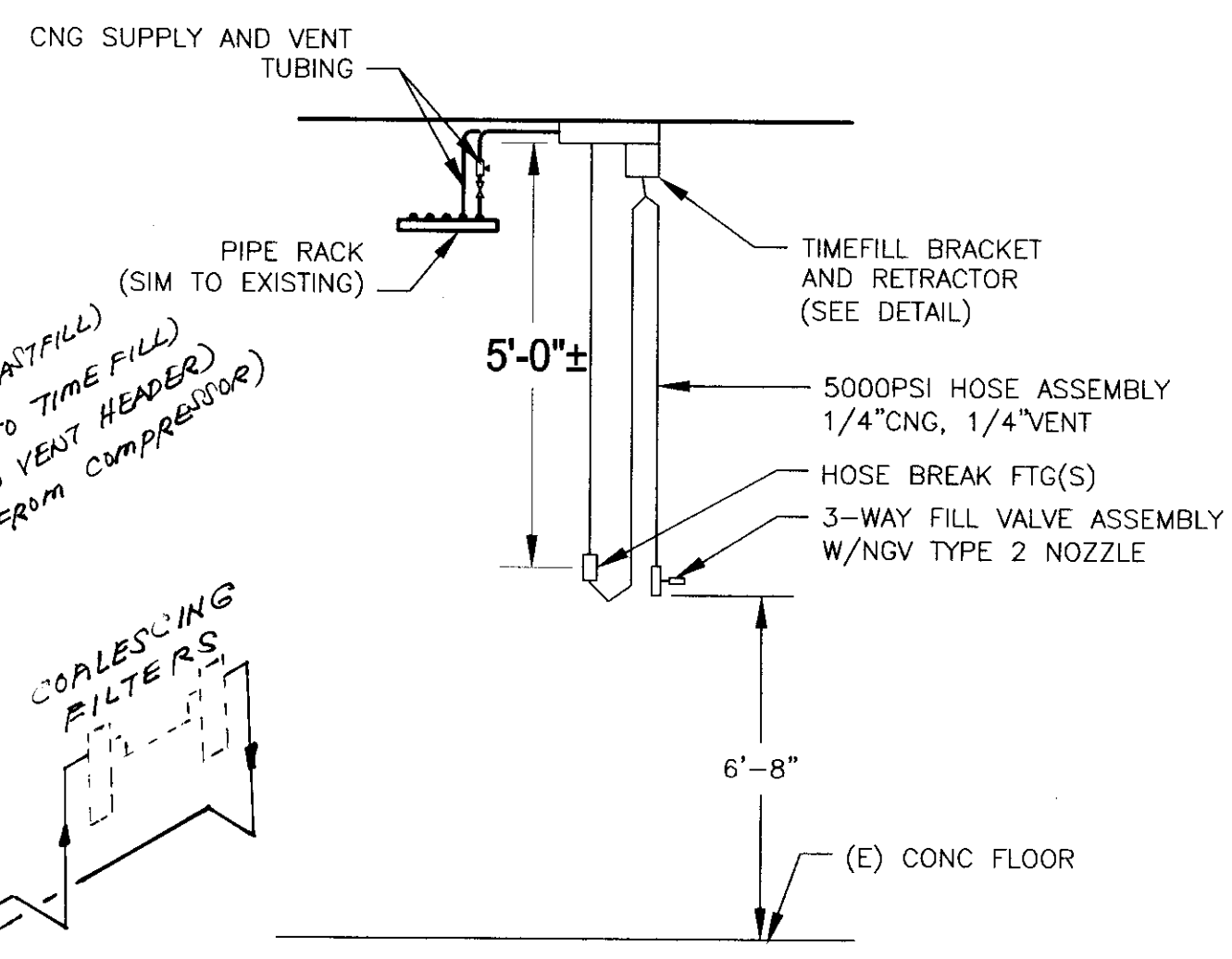
SCALE	AS NOTED	FOR	CNG SYSTEM UPGRADE DOWNTOWN GARAGE
DATE	05/06	CHECKED	TM
DRWN	TM	APPROVED	
JOB	0521	DWG. NO.	P2



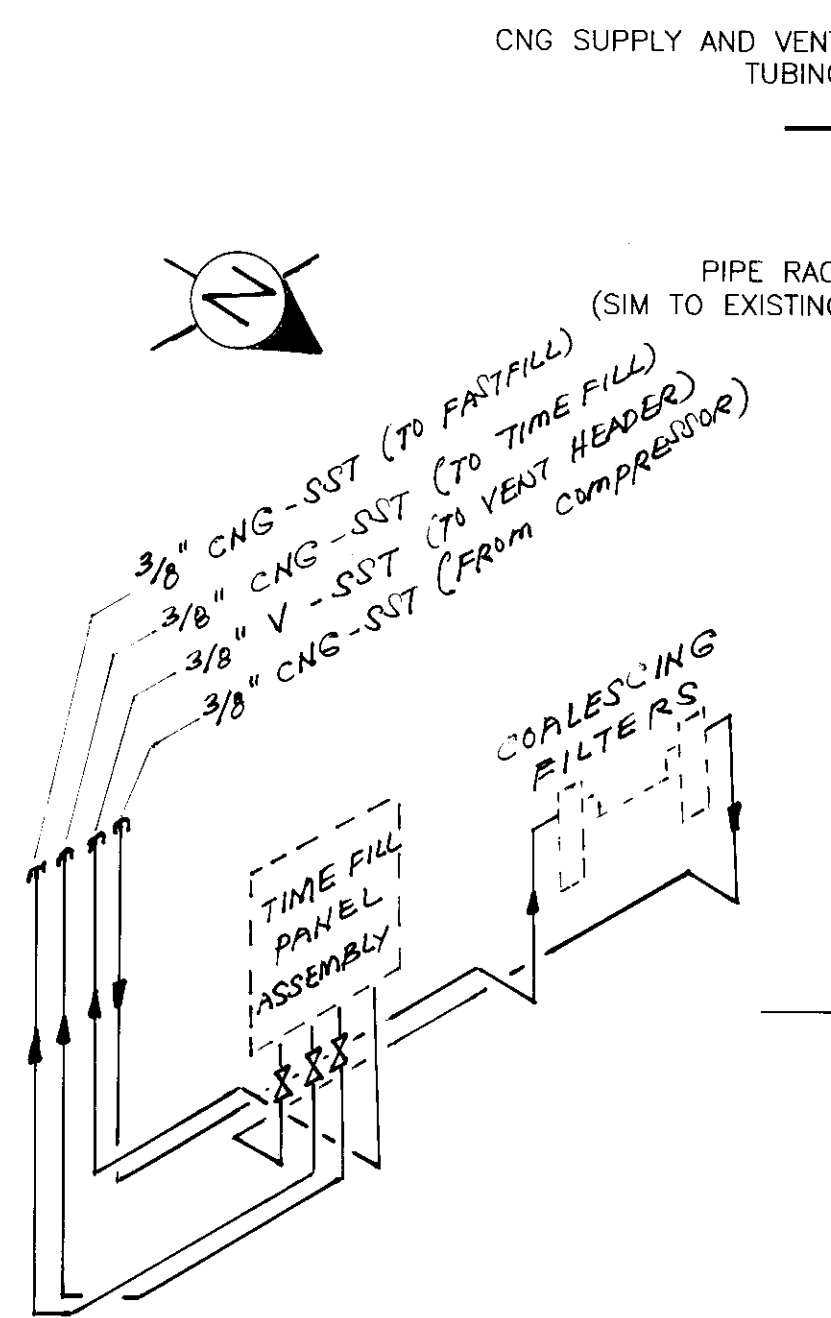
DRYER/COMPRESSOR PIPING/TUBING DETAIL (C)



BRACKET DETAIL (B)  
SCALE: N.T.S.



TYPICAL FILL STATION (A)  
SCALE: N.T.S.



TIME FILL PANEL TUBING DETAIL (D)

RECORD DRAWING  
Checked By: [Signature]  
Date: 5-6-09  
All Persons Using This Drawing Shall Verify Information by Inspecting The Site Work

SU 4444



**GENERAL INSTALLATION NOTES:**

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETELY FAMILIARIZE HIMSELF WITH EXISTING SITE CONDITIONS AND ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS, CODES AND REGULATIONS. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THESE REGULATIONS. NO ALLOWANCE WILL BE MADE FOR HIS FAILURE TO DO SO. IF THERE IS A CONFLICT WITHIN THESE DOCUMENTS OR BETWEEN THESE DOCUMENTS AND SITE CONDITIONS AND/OR APPLICABLE LAWS, CODES, OR REGULATIONS, THE CONTRACTOR IS RESPONSIBLE TO INFORM THE APPROPRIATE PARTY PRIOR TO BID OR DURING CONSTRUCTION, IN WRITING, WITHIN 24 HRS OF DISCOVERY. NO ALLOWANCES WILL BE MADE FOR HIS FAILURE TO DO SO.
- CONTRACTOR TO FURNISH ALL LABOR EQUIPMENT AND SECURE PERMITS TO PERFORM THE WORK AS INDICATED ON THESE SHEETS. CONTRACTOR TO VISIT THE SITE TO VERIFY ALL CONDITIONS THAT MAY AFFECT THIS PROJECT. ALL WORK IS TO BE DONE IN ACCORDANCE WITH FEDERAL, STATE & LOCAL CODES AND PER MFG., RECOMMENDATIONS & REQUIREMENTS
- CONTRACTOR IS RESPONSIBLE FOR BLUE STAKING THE EXCAVATION AREAS AND LOCATING ANY UNDERGROUND UTILITIES. REROUTE ANY EXISTING UNDERGROUND UTILITY LINES AROUND NEW WORK IF CONFLICT EXISTS.
- ALL METAL PIPING IN CONTACT WITH THE GROUND SHALL BE COATED AND WRAPPED IN ACCORDANCE WITH APPLICABLE STANDARDS. (INCLUDING GALVANIZED PIPING)
- CONTRACTOR SHALL PROVIDE PVC PIPE SLEEVES FOR ALL PIPING PENETRATIONS THROUGH CONCRETE.
- PIPE UNIONS OR THREADED FITTINGS SHALL NOT BE BURIED NOR INACCESSIBLE.
- ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS. ALL PIPING ABOVE GRADE MUST BE LABELED WITH THE NAME OF THE MATERIALS CONVEYED AND WITH DIRECTIONAL FLOW ARROWS. LABELS MUST BE PROVIDED AT EVERY VALVE, CHANGE OF DIRECTION, WALL OR CEILING PENETRATION, AND AT EVERY 20FT. OF STRAIGHT PIPE RUN. LABELS AND LABEL LOCATIONS TO BE APPROVED BY OWNER PRIOR TO INSTALLATION.
- ALL EXPOSED STEEL PIPING SHALL BE PRIMED AND PAINTED. BE SELECTED BY OWNER.
- ALL UNDERGROUND PIPING SHALL BE PRESSURE TESTED AND INSPECTED PRIOR TO BURIAL. ALL PIPING SHALL BE TESTED AND INSPECTED IN ACCORDANCE WITH ANSI B31.3 PRIOR TO START-UP.
- ALL PIPE WELDING SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE NATIONAL FUEL GAS CODE AND ANSI B31.3 AND SHALL BE PERFORMED BY CERTIFIED PIPE WELDERS. PROVIDE PROOF OF CERTIFICATION AND WELDING PROCEDURES FOR REVIEW PRIOR TO COMMENCEMENT OF WORK.
- SEE DWG P-3 AND WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

TUBING SCHEDULE			
DIAMETER (INCH)	DESIGN PRESSURE (PSI)	MINIMUM WALL THICKNESS (INCH)	FITTINGS
1/4	4000	0.049	SWAGelok OR HOKE GYROLOK
3/8	4000	0.063	SWAGelok OR HOKE GYROLOK
1/2	4000	0.083	SWAGelok OR HOKE GYROLOK

1. ALL STAINLESS STEEL TUBING SHALL BE TYPE 316 SEAMLESS AND BRIGHT ANNEALED MAX HARDNESS: ROCKWELL 80 ASTM SA-213.

**PIPING LEGEND**

LINE SIZE: 3-G-PLP

PRODUCT: CNG - COMPRESSED NATURAL GAS, G - NATURAL GAS, V - VENT

MATERIAL: CS - CARBON STEEL (SCH. 40), CSG - CARBON STEEL (SCH. 40) GALVANIZED, CS2 - CARBON STEEL (SCH. 80), SST - STAINLESS STEEL TUBING (SEE SCHEDULE), PLP - PLASTIC PIPE (POLYETHYLENE SDR11.1 PSI)

<p>NEW PIPING</p> <p>EXISTING PIPING</p> <p>SOLENOID VALVE</p> <p>NEEDLE VALVE (N.C.)</p> <p>BALL VALVE (N.O.)</p> <p>BALL VALVE (N.C.)</p> <p>PRESSURE RELIEF (PRV)</p> <p>PIPE UNION</p> <p>CHECK VALVE</p> <p>PIPE FLANGE</p> <p>CONCENTRIC REDUCER</p> <p>3-WAY BALL VALVE</p> <p>FLEXIBLE HOSE</p>	<p>AIR PIPING</p> <p>PIPING TO BE REMOVED</p> <p>ELECTRICAL/SIGNAL WIRING</p> <p>PRESSURE REGULATOR</p> <p>FILTER</p> <p>FLEX CONNECTOR (WIRE REINFORCED)</p> <p>CAP</p> <p>HOSE COUPLING</p> <p>PRESSURE INDICATOR (0 TO 5000 PSIG)</p> <p>PLUG VALVE</p> <p>THREADED PLUG</p> <p>(E) EXISTING</p> <p>N.O. NORMALLY OPEN</p> <p>N.C. NORMALLY CLOSED</p>
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**SHEET NOTES:**

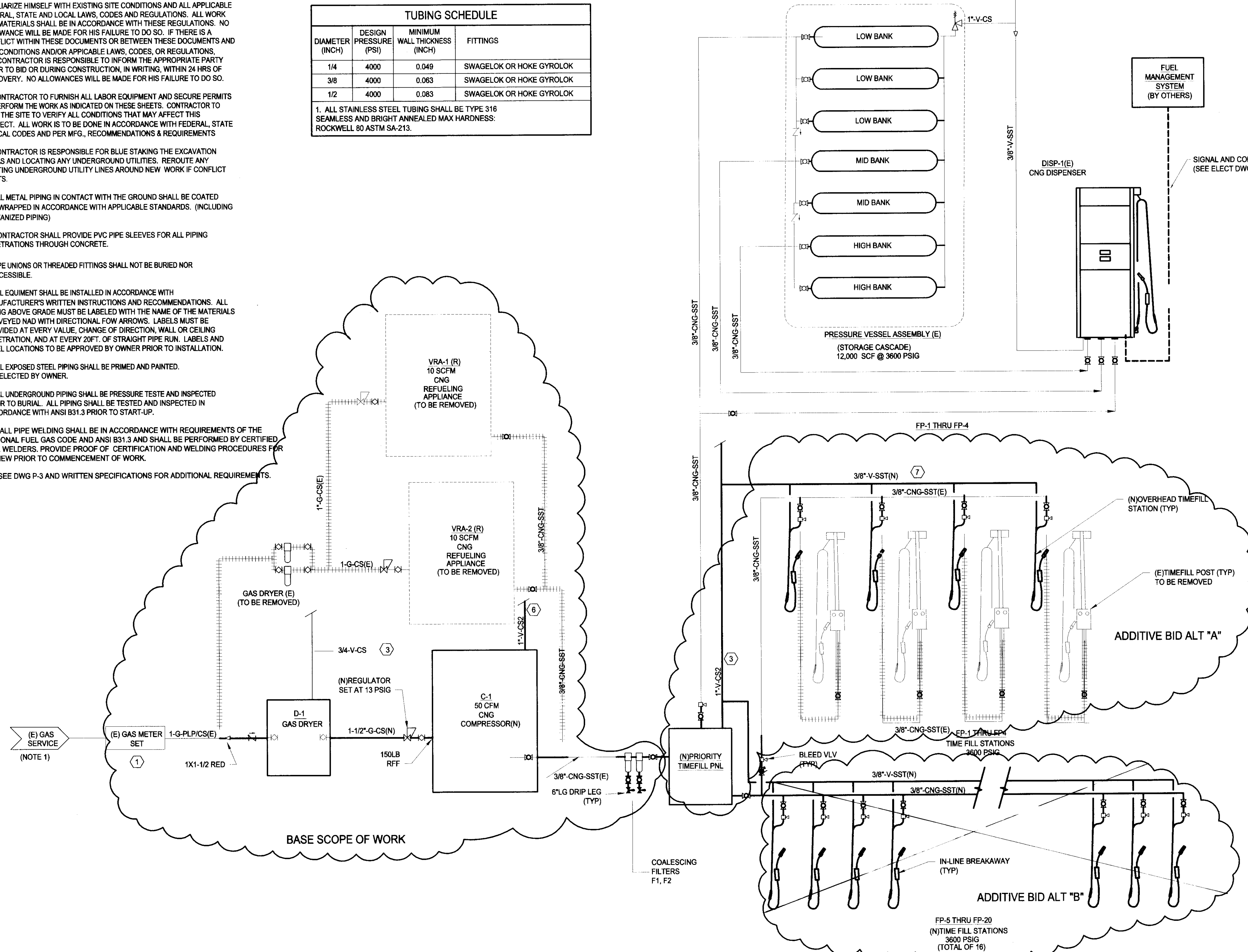
- COORDINATE UPGRADE OF EXISTING GAS SERVICE TO HANDLE ANTICIPATED ADDITIONAL LOAD AND PRESSURE WITH LOCAL UTILITY.
- UNDERGROUND NATURAL GAS HOUSE LINES SHALL BE PG&E APPROVED POLYETHYLENE PIPE WITH PRE-BENT ANODELESS RISERS. ABOVEGROUND SHALL BE CARBON STEEL - PRIMED AND PAINTED PG&E GREY.
- INTERIOR CROSSSECTIONAL AREA OF ALL NEW VENT PIPING SHALL EQUAL OR EXCEED CROSSSECTIONAL AREA OF SUM OF ALL PRESSURE RELIEF VALVES SERVED PRIME AND PAINT CARBON STEEL VENT LINES BLACK.

**MAJOR EQUIPMENT**

- THE FOLLOWING EQUIPMENT WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- GAS DRYER: DESICCANT TYPE LOW PRESSURE GAS DRYER RATED FOR 120SCFM AT 15 TO 20 PSIG, 2000HRS BETWEEN REGENERATIONS ASSUMING 7LBMMCF. AUTODEW AUTOMATIC DEW POINT MONITOR, INLET AND OUTLET FILTERS, ISOLATION VALVES, BYPASS, AND CONTROLS. TAG D-1.
  - CNG COMPRESSOR: FULLY SELF-CONTAINED ELECTRICALLY DRIVEN CNG COMPRESSOR W/AUTOMATIC CONTROL AND SHUTDOWN SYSTEM. 50 SCFM (NOMINAL) AT 15 PSIG INLET AND 4500 PSIG DISCHARGE. TAG C-1
  - PRIORITY TIME FILL PANEL: ELECTRONIC TYPE PRIORITY TIME FILL PANEL W/SEAL VALVING FIELD ADJUSTABLE SET POINTS FOR PRIORITY CONTROL. TO FASTFILL, TIMEFILL AND STORAGE NEMA 3R ENCLOSURE SUITABLE FOR OUTDOOR INSTALLATION. CLASS 1, DIV 2, GROUP D.
  - COALESCING FILTERS: HIGH PRESSURE (5000 PSIG) COMPRESSED GAS FILTER SUITABLE FOR CNG. DUCTILE IRON OR CARBON STEEL. FLUOROCARBON SEALS FILTER MEDIA TO REMOVE 99.995% LIQUID AEROSOLS IN 0.3 TO 0.6 MICRON RANGE. PROVIDE MANUAL DRAIN BALL VALVE AND NEEDLE VALVE. PARKER FINITE. JASL-4CWCI-035 OR EQUAL. TAG: F-1 AND F-2.

COUNTY OF SAN JOAQUIN  
Submitted ,2008

THOMAS RYAN FLINN  
DIRECTOR OF PUBLIC WORKS



BASE SCOPE OF WORK

ADDITIVE BID ALT "B"

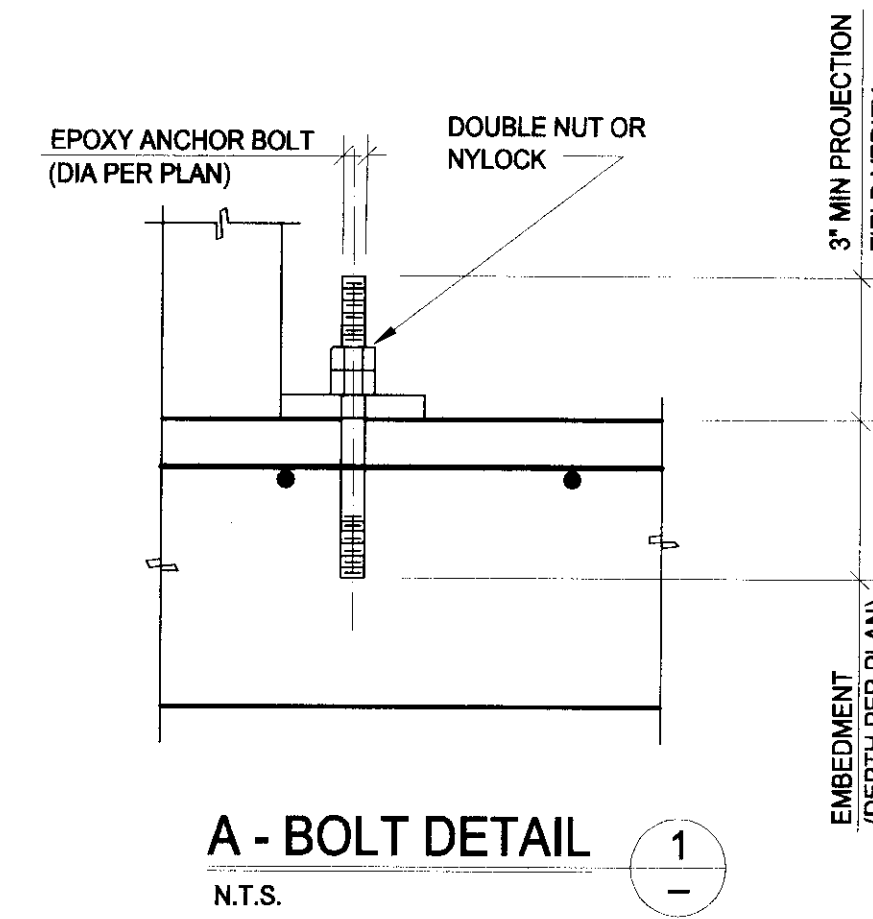
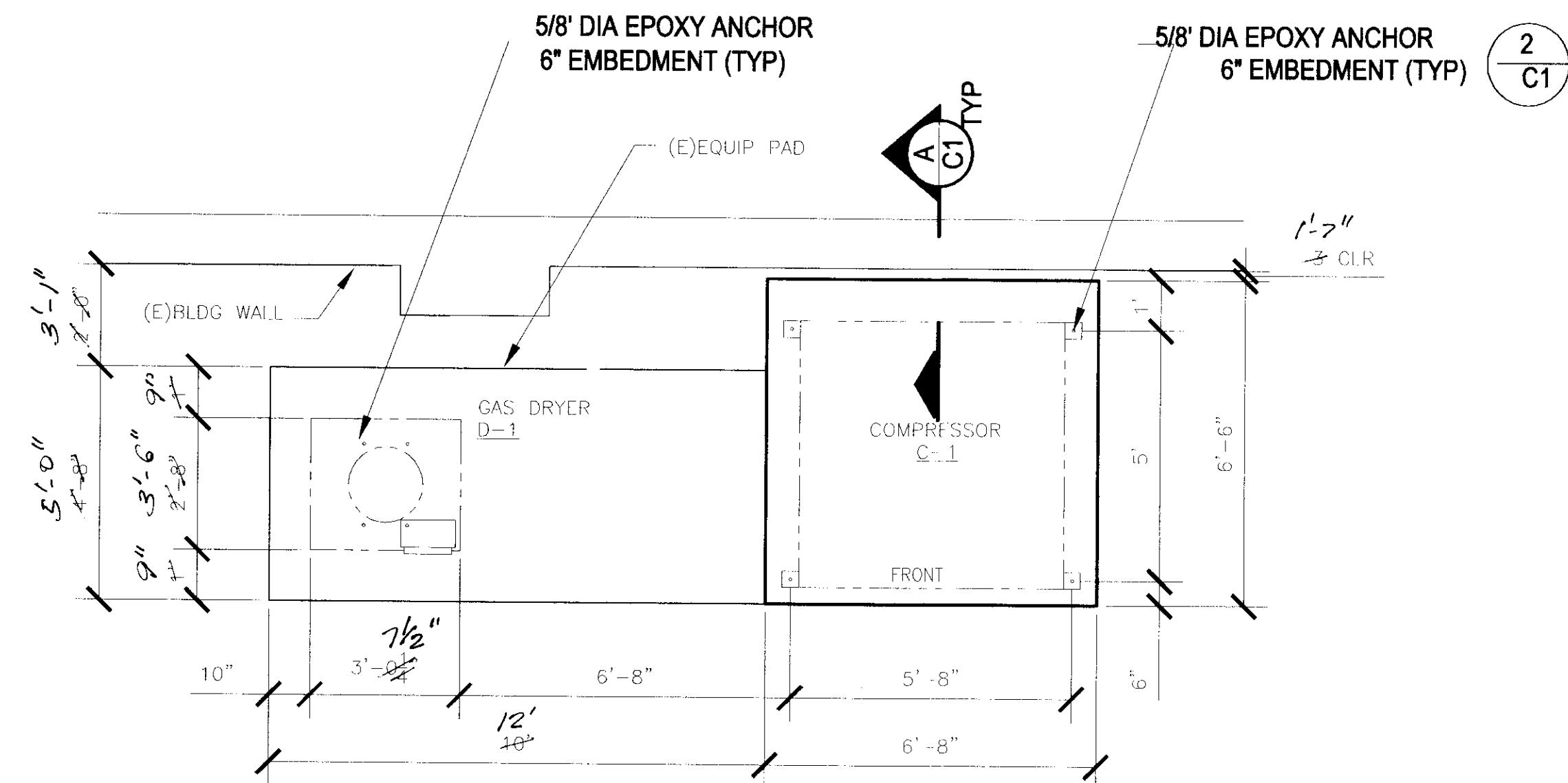
ADDITIVE BID ALT "A"

4445  
St

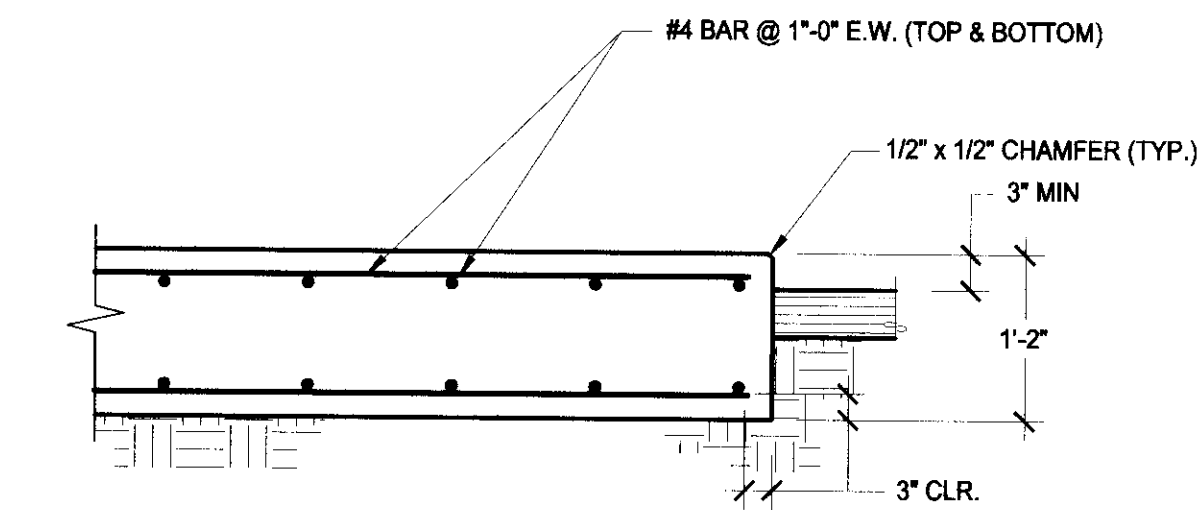
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2	CLEARIFIED OPTIONAL WORK	TM	03/08
1	MAJOR REVISION	TM	07/07
0	PRELIMINARY FOR CLIENT REVIEW	TM	
REV.	DESCRIPTION	BY	DATE
SAN JOAQUIN COUNTY - PUBLIC WORKS STOCKTON, CA			
T. MITCHELL ENGINEERS OAKLAND CALIFORNIA			
SCALE	AS NOTED	FOR	CNG SYSTEM UPGRADE DOWNTOWN GARAGE
DATE	05/06	DRWN	TM
CHECKED		TITLE	PIPING SCHEMATIC
APPROVED		JOB	0521
		DWG. NO.	P1



**CNG COMPRESSOR AREA PLAN**  
SCALE: 3/8"=1'-0"



**TYPICAL CONCRETE PAD SECTION**  
SCALE: 3/4" = 1'-0"

**GENERAL NOTES:**

- 1.0 GENERAL
  - 1.1 THE CONSTRUCTION SHALL CONFORM TO THE 2006 CALIFORNIA BUILDING CODE (CBC) AND LOCAL REGULATORY AGENCIES' REQUIREMENTS.
  - 1.2 THE CONTRACTOR SHALL VERIFY ALL PERTINENT DIMENSIONS PRIOR TO BEGINNING CONSTRUCTION.
  - 1.3 CHANGES FROM THE CONTRACT DRAWINGS SHALL BE MADE ONLY WITH THE APPROVAL OF THE ENGINEER AND SAN JOAQUIN COUNTY.
  - 1.4 CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. ANY UNDERGROUND UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
  - 1.5 EQUIPMENT DOES NOT REQUIRE GROUTING IN PLACE PER ANCI INTERNATIONAL.
- 2.0 FOUNDATIONS
  - 2.1 THE FOUNDATIONS SHALL BE OF A SPREAD FOOTING TYPE.
  - 2.2 SOIL DESIGN BEARING PRESSURE 1,000 psf MAX.
- 3.0 MATERIALS
  - 3.1 CONCRETE: HARDROCK, WITH MINIMUM 28 DAY COMPRESSIVE STRENGTH EQUAL TO 2,500 psi. USE DENSE GRADED, 3/4" MAX. AGGREGATE, MAXIMUM SLUMP 4".
  - 3.2 REINFORCING STEEL: ASTM A615, GRADE 60
  - 3.3 THREADED RODS: ASTM A307, ASTM A36 OR AISI 1040 COLD DRAWN.
  - 3.4 ANCHOR BOLTS: HILTI KWIK BOLT III, CARBON STEEL
- 4.0 CONCRETE CONSTRUCTION:
  - 4.1 BENDS AND HOOK REBAR SHALL CONFORM TO UBC AND ACI REQUIREMENTS REGARDING BEND RADIUS AND EXTENSION.
  - 4.2 PROVIDE MINIMUM CONCRETE COVER OF REINFORCEMENT 3" TO EARTH, 2" TO SKY.
- 5.0 SPECIAL INSPECTIONS:
  - 5.1 NONE REQUIRED.

COUNTY OF SAN JOAQUIN  
Submitted ,2008

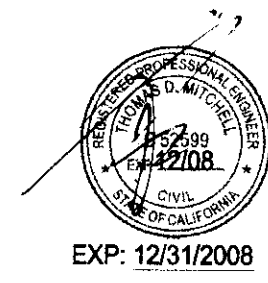
THOMAS RYAN FLINN  
DIRECTOR OF PUBLIC WORKS

REV.	DESCRIPTION	BY	DATE
2	MINOR REVISION	TM	03/08
1	REVISED COMPRESSOR AREA	TM	07/07
0	PRELIMINARY FOR CLIENT REVIEW	TM	

SAN JOAQUIN COUNTY - PUBLIC WORKS  
STOCKTON, CA

T. MITCHELL ENGINEERS  
OAKLAND, CALIFORNIA

SCALE	AS NOTED	FOR	
DATE	10/18/06		CNG SYSTEM UPGRADE DOWNTOWN GARAGE
DRWN	TDW		
CHECKED	T. MITCHELL	TITLE	COMPRESSOR PAD
APPROVED			
JOB	0521	DWG. NO.	C-1



RECEIVED DRAWING  
N. Chan  
5-02-09  
All in accordance with the City of Stockton

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SU 4446

# SAN JOAQUIN COUNTY – DOWNTOWN GARAGE

## COMPRESSED NATURAL GAS (CNG) FUELING SYSTEM UPGRADE

121 SOUTH SAN JOAQUIN STREET  
STOCKTON, CALIFORNIA

### DESCRIPTION OF WORK

BASE SCOPE: REMOVE TWO EXISTING COMPRESSED NATURAL GAS (CNG) REFUELING APPLIANCES AND ASSOCIATED INLET GAS DRYER AND REPLACE WITH NEW CNG COMPRESSOR AND DRYER, AND ASSOCIATED PIPING, ELECTRICAL AND CONTROLS. UPGRADE EXISTING SAFETY SIGNAGE IN COMPRESSOR AREA AS NEEDED.

ADDITIVE BID ALT "A" REMOVE FOUR (4) EXISTING TIMEFILL POSTS, TIMEFILL CONTROL SYSTEM, AND ASSOCIATED PIPING, BOLLARDS, AND ELECTRICAL SYSTEMS. REPLACE WITH NEW OVERHEAD TIMEFILL STATIONS. REPLACE EXISTING TIMEFILL CONTROL WITH NEW TIMEFILL CONTROL SYSTEM TO BETTER CONTROL GAS FLOW BETWEEN COMPRESSOR AND BOTH TIME AND FASTFILL SYSTEMS.

ADDITIVE BID ALT "B": PROVIDE AND INSTALL UP TO 16 ADDITIONAL OVERHEAD TIMEFILL STATIONS, AND ASSOCIATED FLAMABLE GAS DETECTOR, EMERGENCY SHUTDOWN PUSH BUTTON, FIRE EXTINGUISHER, AND NECESSARY SAFETY SIGNAGE. EXTEND EXISTING PIPING AND ELECTRICAL SYSTEMS AS NECESSARY.

### GENERAL NOTES TO BUILDING OFFICIALS & CONTRACTORS

NOTE: The term "contractor" or "contractors" as used in these General Notes shall refer to the general contractor and all sub-contractors.

1. This set of construction documents covers the exterior improvements only.

2. CALIFORNIA TITLE 24 ENERGY COMPLIANCE - California Title 24 Building Envelope compliance requirements do not apply to this project. The improvements shown on these plans do not alter the building envelope or site lighting in any way from previously approved building permits.

3. The contractors shall preserve and maintain access to existing exits during construction.

4. The contractors shall be responsible for verifying that all materials, labor, installation, fabrication, etc. shall conform to all codes and regulations of applicable governing agencies.

5. The General Contractor and all other Contractors shall verify dimensions and site conditions prior to commencing any work. The General Contractor and all other Contractors shall immediately notify the Engineer of any discrepancy contained within these construction documents which are related to the contractor's scope of work. Should an error appear in these construction documents or related work performed by other Contractors affecting the contractor's scope of work, the General Contractor and all other Contractors shall notify the Engineer at once for instructions as to the procedure for continuation of work. Should the contractor proceed with work after identifying such a conflict without obtaining instructions from the Engineer, the contractor shall assume the full responsibility for all remedial work necessary to satisfy the requirements of these construction documents and the applicable building codes.

6. The contractors shall verify existing conditions with those shown on the drawings and promptly report any discrepancies to the Engineer. Verify existing conditions within the work area and review modifications required to suit existing conditions prior to fabrication and installation of new work or modifications to existing conditions.

7. Contractors shall maintain the job site in a clean, orderly condition, free of debris and litter. Each contractor shall, immediately upon completion of each phase of his work, remove all trash and debris that results from the performance of his work.

8. Construction materials stored on the site shall be properly stacked and protected to prevent damage and deterioration until used. Failure to protect materials may be cause for rejection of work.

9. Contractors shall protect new and existing finishes and construction from damage that may occur during construction. Damage to new and/or existing finishes and construction shall be repaired or replaced (the Owner's decision) with identical material at the Contractor's expense.

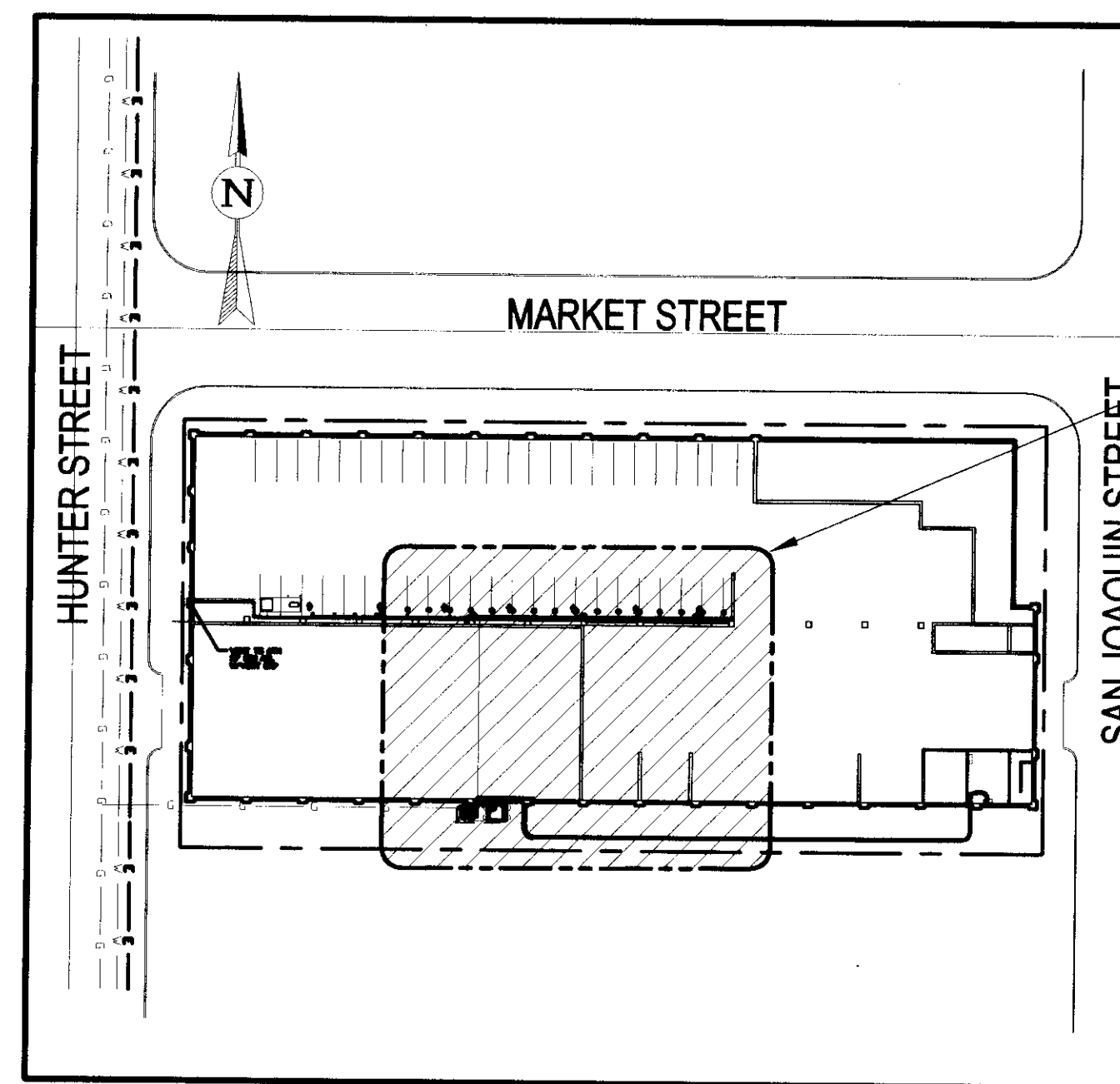
10. The General Contractor and all contractors shall be responsible for providing the Owner with accurate "As-Built" record drawings at the completion of construction.

11. The notation "Typical" or "Typ." shall mean to repeat at all locations where the described or detailed condition occurs.

12. The notation "Similar" or "Sim." shall mean to repeat and modify the described or detailed condition as required to suit the condition in the location in which it occurs.

13. The notation "<E>" or "Exist." shall mean existing improvements.

14. The notation "<N>" shall mean new improvements to be installed as part of this work. All work shown on these drawings shall be construed as being new work and part of this contract unless noted being existing or otherwise.

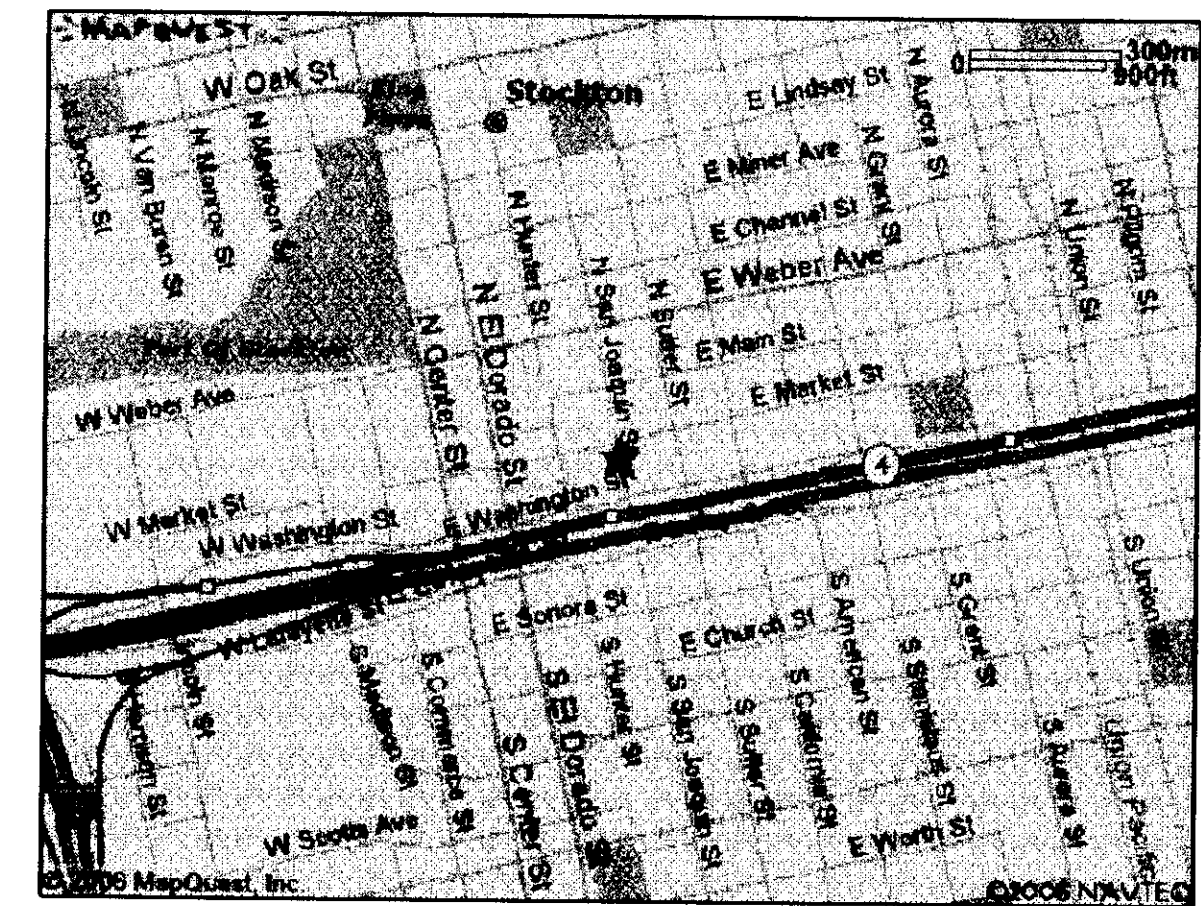


SITE PLAN

SCALE: N.T.S.

### DRAWING LIST

- C-1 COMPRESSOR PAD
- P-1 CNG SYSTEM - PIPING SCHEMATIC
- P-2 CNG SYSTEM - PIPING PLAN AND SECTIONS
- P-3 CNG SYSTEM - SIGNAGE AND NOTES
- E-1 ELECTRICAL NOTES AND DETAILS



VICINITY MAP

NOT TO SCALE

### CONSTRUCTION SHALL CONFORM TO THE FOLLOWING CODES AND STANDARDS

- CALIFORNIA BUILDING CODE (CBC) 2007
- CALIFORNIA FIRE CODE (CFC) 2007
- CALIFORNIA ELECTRIC CODE (CEC) 2007
- NFPA 52 - CNG VEHICULAR FUEL SYSTEMS CODE 2006
- CCR TITLE 8 UNFIREED PRESSURE VESSELS

### OWNER:

SAN JOAQUIN COUNTY  
444 SOUTH WILSON WAY  
STOCKTON, CA 95305  
DAN MCCANN  
(209)468-3106

### ENGINEERING CONSULTANT:

T. MITCHELL ENGINEERS  
5737 THORNHILL DR. SUITE 207  
OAKLAND, CA 94611  
(510) 338-0520

### CNG SPECIALTY CONTRACTOR:

TO BE DETERMINED

RECORD DRAWING

DATE: 5-22-08  
BY: [Signature]

COUNTY OF SAN JOAQUIN  
Submitted 21 April 2008

[Signature]  
THOMAS RYAN FLINN  
DIRECTOR OF PUBLIC WORKS



EXP: 12/31/2008