



National Aeronautics and Space Administration

ARMSTRONG FLIGHT RESEARCH CENTER

PROJECT TITLE:

REVITALIZE RADAR AND TELEMETRY TRACKING FACILITIES

100% FINAL DESIGN

PROJECT TEAM

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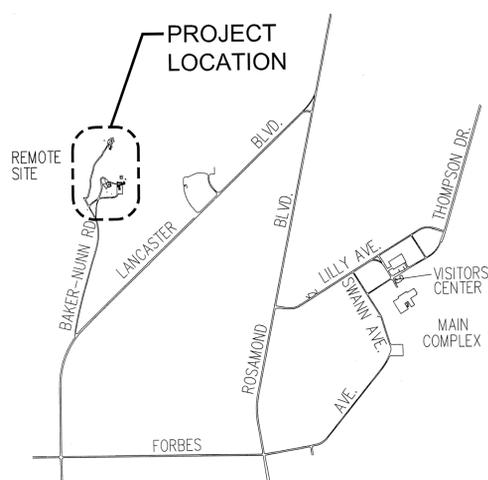
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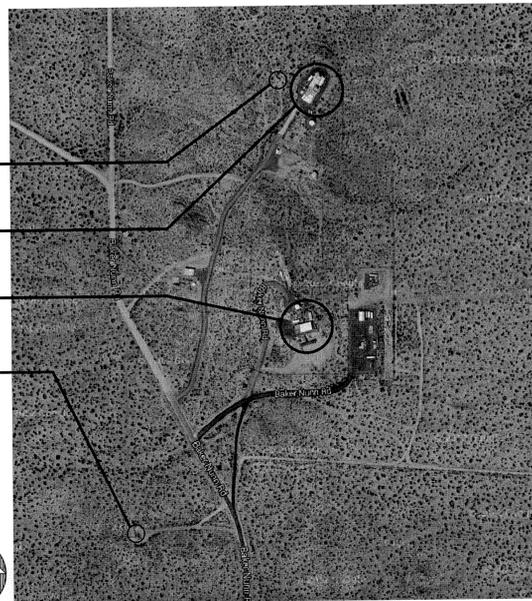
AREA PLAN
NOT TO SCALE



PROJECT LOCATIONS

- PUMP HOUSE - BUILDING 4983
SEE SHEET A10
- ATF BUILDING 4982
SEE SHEET A2
- ATF BUILDING 4720
SEE SHEET A5
- BORE SITE - BUILDING 4983
SEE SHEET A10

SITE PHOTO
NOT TO SCALE



PROJECT LOCATIONS

- BUILDING 4983
PUMP HOUSE
SEE SHEET A10
- ATF BUILDING 4982
SEE SHEET A2
- ATF BUILDING 4720
SEE SHEET A5
- BUILDING 4983
PUMP HOUSE
SEE SHEET A10

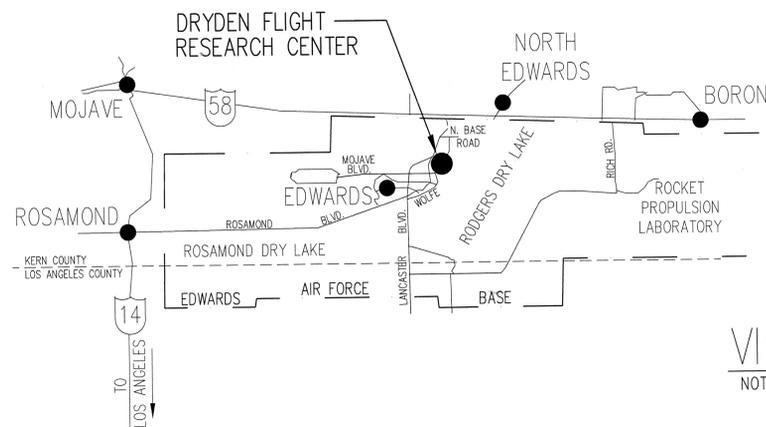
REMOTE SITE PLAN
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ARMSTRONG FLIGHT RESEARCH CENTER EDWARDS, CA		APPROVALS DATE 7-10-15 2-10-15 1-27-15 1-28-15 1-27-15 3 Feb 15
DRAWING TITLE		TITLE AND INDEX SHEET
PROJECT TITLE		REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE
DATE STARTD	DATE PRINTD	5/9/14
DRAWN BY	DRM	EDM-1728
SCALE	AS NOTED	TRADE SH. No.
FILE NAME	T1	SHEET No. 1 of 48



VICINITY MAP
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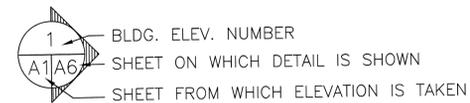


ABBREVIATIONS

ACT	ACOUSTIC TILE
ACP	ACCESS PANEL
ACT	ASBESTOS COMPOSITION TILE
AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
BD	BOARD
BLDG	BUILDING
CPT	CARPET
CEM	CEMENT
CH	CEILING HEIGHT
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CPOI	CONTRACTOR PROVIDED OWNER INSTALLED
CT	CERAMIC TILE
DWP	DRYWALL PAINTED
DR	DOOR
(E)	EXISTING
EM	ELASTOMERIC MEMBRANE
EN	ENAMEL
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EC	EXPOSED CONSTRUCTION
ECP	EXPOSED CONSTRUCTION PAINTED
EXTR	EXTRUDED
EXT	EXTERIOR
FBI	FEDERAL BUREAU OF INVESTIGATION
FC	FINISH CEILING
FD	FLOOR DRAIN
FF	FINISHED FLOOR
FIN	FINISH(ED)
FEC	FIRE EXTINGUISHER CABINET
FL	FLOOR
FW	FACE OF WALL
GALV	GALVANIZED
GL	GLASS
GWB	GYPSON WALL BOARD
GYP	GYPSON
HC	HOLLOW CORE
HDW	HARDWARE
HM	HOLLOW METAL
HR	HOUR
HT	HEIGHT
HWD	HARDWOOD
INS	INSULATION
INT	INTERIOR
LAM	LAMINATE
MFR	MANUFACTURER
MFT	MINERAL FISSURED TILE
MIN	MINIMUM
MWP	MEMBRANE WATERPROOFING
NAT	NATURAL
(N)	NEW
NIC	NOT IN CONTRACT
OH	OVERHANG
OPCI	OWNER PROVIDED, CONTRACTOR INSTALLED
OPOI	OWNER PROVIDED, OWNER INSTALLED
PERF	PERFORATED
PL	PLASTER
P-LAM	PLASTIC LAMINATE
PNL	PANEL
PT	PAINT
PTN	PARTITION
PWD	PLYWOOD
QT	QUARRY TILE
RB	RUBBER BASE
RE	REFER TO
REIN	REINFORCING
RM	ROOM
SC	SOLID CORE
SIM	SIMILAR
ST	STEEL
SS	STAINLESS STEEL
SSD	SEE STRUCTURAL DRAWINGS
STRUCT	STRUCTURAL
SUSP	SUSPENDED
TBD	TO BE DETERMINED
TEL	TELEPHONE
THLD	THRESHOLD
TOS	TOP OF SLAB
UBC	UNIFORM BUILDING CODE
UG	UNDERGROUND UTILITY
TYP	TYPICAL
UC	UNDER CUT
UON	UNLESS OTHERWISE NOTED
VCT	VINYL COMPOSITION TILE
VIF	VERIFY IN FIELD
VWC	VINYL WALL COVERING
VYN	VINYL
WCO	WALL CLEAN OUT
WD	WOOD
WP	WEATHER PROOF
WR	WATER RESISTANT
WWF	WOVEN WIRE FABRIC

SYMBOL LEGEND

EXTERIOR ELEVATION REFERENCES



DETAIL REFERENCE

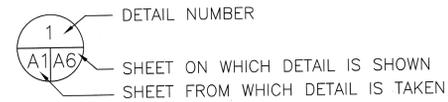
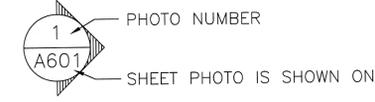


PHOTO REFERENCE



GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES HAVING JURISDICTION.
- INSTALL ALL MANUFACTURED ITEMS, MATERIALS AND EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
- CONTRACTOR IS RESPONSIBLE FOR EXAMINING ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND CONFIRMING THAT WORK MAY BE CONSTRUCTED AS SHOWN BEFORE PROCEEDING WITH CONSTRUCTION. IF THERE ARE ANY QUESTIONS REGARDING THESE OR OTHER COORDINATION QUESTIONS, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE CONTRACTING OFFICER BEFORE PROCEEDING WITH WORK IN QUESTION.
- ALL WORK NOTED "N.I.C." OR "NOT IN CONTRACT" IS TO BE ACCOMPLISHED BY A CONTRACTOR OTHER THAN THE GENERAL CONTRACTOR AND IS NOT TO BE PART OF THE CONSTRUCTION AGREEMENT. THE GENERAL CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS AS REQUIRED.
- "TYPICAL" AS USED IN THESE DOCUMENTS SHALL MEAN THAT THE CONDITION IS THE SAME OR REPRESENTATIVE FOR ALL SIMILAR CONDITIONS THROUGHOUT, UNLESS OTHERWISE NOTED.
- CONTRACTOR IS TO ERECT AND MAINTAIN TEMPORARY BRACING, BARRICADES, SIGNS, AND OTHER MEASURES AS NECESSARY TO PROTECT THE PUBLIC, WORKERS, OTHER PERSONS, AND ADJOINING PROPERTY FROM DAMAGE FROM DEMOLITION WORK, ALL IN ACCORDANCE WITH THE APPLICABLE CODES AND REGULATIONS. CONTRACTOR IS TO PROVIDE NOISE AND DUST ABATEMENT AS REQUIRED TO PREVENT DISTURBANCE AND NUISANCE TO ADJACENT PREMISES AND SURROUNDING AREAS. DEMOLITION AND REMOVAL WORK SHALL BE DONE IN A MANNER WHICH WILL MINIMIZE THE SPREAD OF DUST AND FLYING PARTICLES. REMOVED MATERIALS AND DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF BASE IN A LEGAL MANNER.

USE OF DUST SUPPRESSION DEVICES SUCH AS HEPA VACUUM WITH SHROUD ATTACHMENTS, VACUUMS THAT USE A CYCLONIC SEPARATOR, AND WET SUPPRESSION FOR ALL SAW CUTS IS MANDATORY, AND SHALL BE INCLUDED IN THE ACTIVITY HAZARD ANALYSIS. DRY-SWEEPING IS PROHIBITED. OPERATIONS ADJACENT TO AIR HANDLERS OR WITH THE POSSIBILITY OF CONTAMINATION WILL REQUIRE COORDINATION TO SHUT DOWN AND SEAL UNITS WITH THE CONTRACTING OFFICER.
- CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE PRIOR TO BIDDING AND START OF CONSTRUCTION. IF ANY DISCREPANCIES ARE FOUND, CONTRACTING OFFICER SHALL BE NOTIFIED FOR CLARIFICATION.
- THE CONTRACTOR IS RESPONSIBLE TO VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS SHOWN ON THE CONSTRUCTION DOCUMENTS BEFORE MANUFACTURING AND/OR FABRICATION OF ALL WORK. ANY WORK PROVIDED AND INSTALLED IN CONFLICT WITH THE CONSTRUCTION DOCUMENTS SHALL BE CORRECTED BY EACH CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACTING AGENCY.
- ALL SYMBOLS AND ABBREVIATIONS ARE CONSIDERED TO BE CONSTRUCTION STANDARDS. IF ANY CONTRACTOR HAS A QUESTION OR NEEDS CLARIFICATION, CONTRACTING AGENCY IS TO BE CONTACTED BEFORE WORK, MANUFACTURING AND/OR FABRICATION COMMENCES.
- DO NOT SCALE DRAWINGS; WRITTEN DIMENSIONS TAKE PRECEDENCE. LARGE SCALE DETAILS GOVERN OVER SMALL SCALE DETAILS.
- CONTRACTOR IS REQUIRED TO GET PERMITS FROM NASA SAFETY OFFICE AND PROVIDE CURRENT TRAINING CERTIFICATIONS PRIOR TO:
 - EXCAVATION AND DIGGING
 - OPEN FLAMES AND HOT WORK
 - CONFINED SPACE ENTRY
 - UTILITY OUTAGES/FACILITY CLOSURES
 - CRANE OPERATIONS
 SEE SPECIFICATION SECTION 01 35 14.11 40

GENERAL NOTES (CONT.)

- SUBSTITUTIONS OF ANY ITEM, MATERIAL OR PRODUCT, INCLUDING ITEMS NOTED FOR SUBSTITUTION OF AN "APPROVED EQUAL", SHALL ONLY BE MADE WITH THE WRITTEN APPROVAL OF THE CONTRACTING OFFICER.
- THE PROJECT AREAS SHALL BE CLEARLY MARKED AT THE OUTER BOUNDARIES TO DEFINE THE WORK AREA. ALL WORKERS SHALL BE INSTRUCTED THAT THEIR ACTIVITIES MUST BE CONFINED TO LOCATIONS WITHIN THE FENCED, FLAGGED OR MARKED AREAS.
- PROTECTION OF BIOLOGICAL RESOURCES:

OPEN EXCAVATIONS OF ANY KIND CREATED DURING THE PROJECT ACTIVITIES SHALL BE SECURED AT THE END OF EACH DAY BY BACKFILLING, PLACING A COVER OVER THE EXCAVATION, INSTALLING A TEMPORARY DESERT TORTOISE FENCE APPROVED BY THE NASA DRYDEN SAFETY OFFICE (CODE SH), AND/OR RAMPING EXCAVATIONS AT A 3:1 SLOPE.

EXCAVATIONS LEFT UNSECURED DURING THE WORKDAY SHALL BE CHECKED THREE TIMES PER DAY (MORNING, MIDDAY, AND LATE AFTERNOON) FOR TRAPPED ANIMALS. IF ANY ANIMALS ARE FOUND IN AN EXCAVATION, IMMEDIATELY NOTIFY CODE SH AT EXTENSION 3863 OR 3976. ALL PROJECT PERSONNEL SHALL IMMEDIATELY REPORT SIGHTINGS OF DESERT TORTOISES OR DESERT TORTOISE BURROWS FOUND WITHIN THE PROJECT AREA TO 95 ABW/EM AT (661)277-1401.

PROJECT PERSONNEL SHALL USE EXISTING ACCESS ROADS AND STAGING AREAS, AND FOLLOW FLAGGED ACCESS ROUTES THAT HAVE BEEN SURVEYED OR CLEARED OF DESERT TORTOISES.

HABITAT DISTURBANCE SHALL BE CONTAINED TO PRE-DISTURBED AREAS AS MUCH AS POSSIBLE.

ANY PIPES STORED WITHIN THE AREA SHALL BE CAPPED ON OPEN ENDS OR ELEVATED AT LEAST 12" ABOVE THE GROUND TO PREVENT ENTRY BY DESERT TORTOISES OR OTHER WILDLIFE.

SPEED LIMITS ON DIRT ROADS WITHIN THE PROJECT AREA SHALL BE LESS THAN 20 MPH UNLESS OTHERWISE POSTED.

ALL TRASH SHALL BE CONTAINED WITHIN RAVEN-PROOF (COVERED) CONTAINERS AND REMOVED FROM THE PROJECT SITE.

NO PETS OR FIREARMS SHALL BE ALLOWED ON THE PROJECT SITE.

BIRDS: IF POSSIBLE, DEMOLITION OF STRUCTURES SHOULD OCCUR OUTSIDE OF THE BIRD NESTING SEASON (FEBRUARY TO AUGUST). IF DEMOLITION OF STRUCTURES CANNOT OCCUR OUTSIDE OF THE NESTING SEASON AND AN ACTIVE NEST IS PRESENT, A DEPREDATION PERMIT FROM THE UNITED STATES FISH AND WILDLIFE SERVICE MUST BE OBTAINED PRIOR TO COMMENCEMENT OF ACTIVITIES. CONTACT THE CONTRACTING OFFICER IF AN ACTIVE BIRD NEST (NEST WITH EGGS, UNFLEDGED BIRDS, OR ADULT BIRDS OBSERVED IN THE NEST) IS FOUND WITHIN THE PROJECT AREA AND CANNOT BE AVOIDED.
- ALL UTILITY OUTAGES MUST BE SCHEDULED A MINIMUM OF 14 DAYS IN ADVANCE WITH THE CONTRACTING OFFICER. OUTAGES MUST BE SCHEDULED FOR AFTER NORMAL OPERATING HOURS, WEEKENDS, OR HOLIDAYS.

CODE REFERENCES

- INTERNATIONAL BUILDING CODE (2012)
- NASA STANDARD 8719.1 (2008)
- NFPA 1 UNIFORM FIRE CODE (2012)
- NFPA 101 LIFE SAFETY CODE (2002)
- NFPA 70 NATIONAL ELECTRICAL CODE (2011)

CONSTRUCTION SCOPE

THE PROJECT SHALL CONSIST OF:

REPLACEMENT OF ELECTRICAL DISTRIBUTION SYSTEMS, INCLUDING GENERATOR AND UPS SYSTEMS, AND INSTALLATION OF RELATED INFRASTRUCTURE AND EQUIPMENT ENCLOSURES AND PADS TO ENHANCE POWER RELIABILITY AT B4982 AND B4720.

REPLACEMENT AND PARTIAL RELOCATION OF BUILDING HVAC EQUIPMENT AT B4982 AND B4720, INCLUDING CRAC UNITS, AND PROVIDING DDC CONTROLS TO TIE INTO CAMPUS ENERGY MANAGEMENT SYSTEM.

PROVIDE MISCELLANEOUS INTERIOR IMPROVEMENTS ASSOCIATED WITH THE INSTALLATION OF ELECTRICAL AND MECHANICAL EQUIPMENT, INCLUDING SELECTIVE DEMOLITION, REPAIRS, PAINT, ROOFING, GRID CEILINGS AND INSULATION, AND OTHER WORK AS SHOWN IN THESE DRAWINGS.

CONSTRUCTION OPTIONS

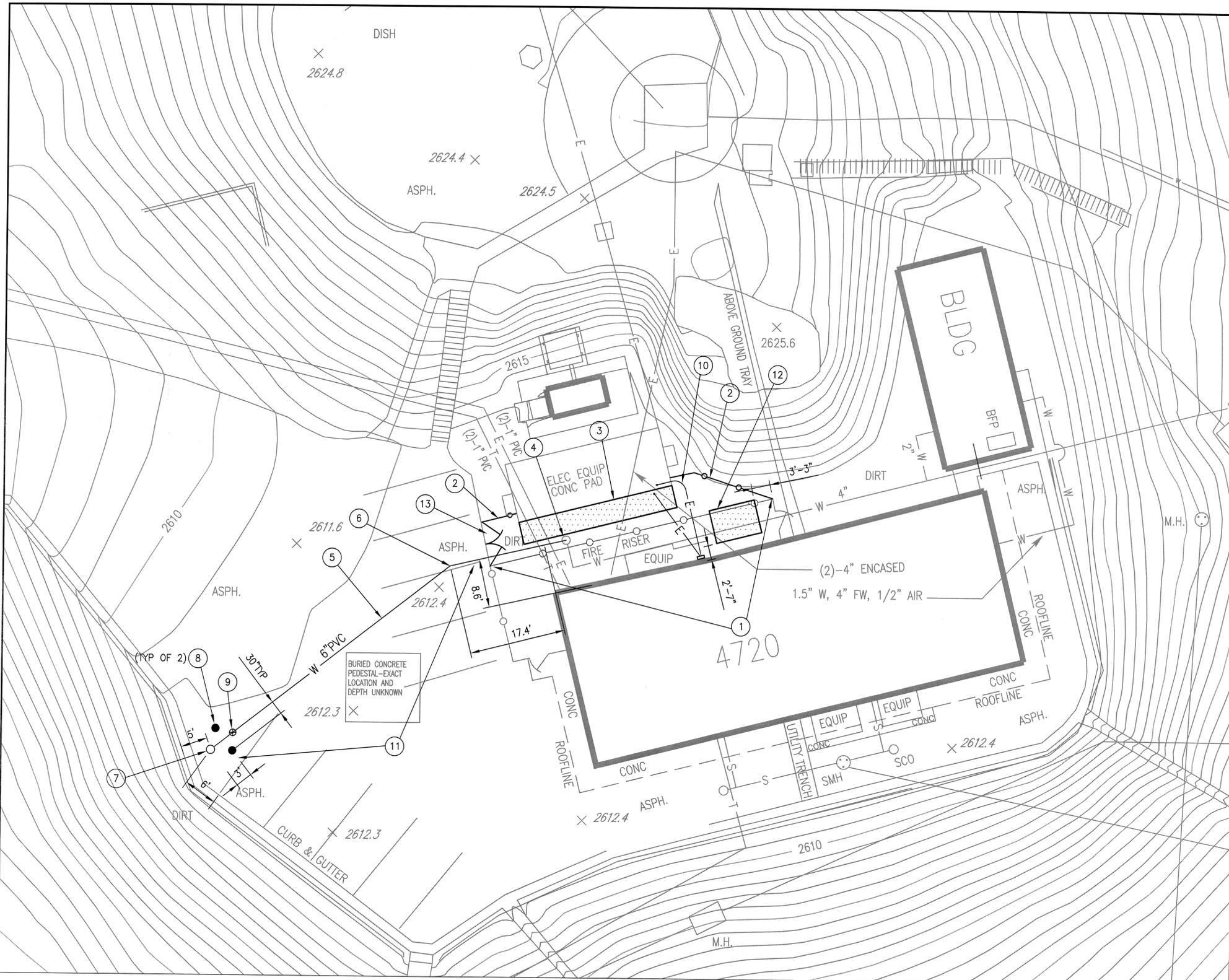
- THE CONTRACTOR SHALL ISSUE THE BID WITH THE FOLLOWING ITEMS INCLUDED AS DISTINCT, SEPARATE BID OPTIONS. NO OTHER SEPARATION OF OPTIONS OR ALLOWANCE ITEMS IS TO BE INCLUDED IN THE BID. SEE ENTIRE SET FOR LOCATION AND DESCRIPTION OF BID OPTIONS.
- OPTION 1 - REPLACE ROOF AT BUILDING 4982, SEE SHEET A4
 - OPTION 2 - REPLACE BORE SITE BUILDING WITH NEW PREFABRICATED METAL BUILDING, SEE DETAILS 2 AND 4 ON SHEET A10
 - OPTION 3 - REMOVE AND REPLACE (E) TANK IN PUMP BUILDING AT BUILDING 4720, REMOVE AND REPLACE ROOF TO FACILITATE TANK REPLACEMENT SEE SHEETS A5, A6 AND P6
 - OPTION 4A - UPGRADE TWO 100 KVA UPS UNITS AT B4892 FROM 35 MINUTES TO 55 MINUTES, SEE SHEET E5
 - OPTION 4B - UPGRADE THREE 30 KVA UPS UNITS AT B4720 FROM 36 MINUTES TO 53 MINUTES AND ONE 50 KVA UNIT FROM 18 TO 28 MINUTES. SEE SHEET E8
 - OPTION 5 - REPLACE (E) FLUORESCENT LIGHTS WITH LED LIGHTING IN BUILDING 4720 AND BUILDING 4982 SEE SHEETS A3, A6, E4 AND E9
 - OPTION 6 - REPLACE (E) PUMP, TANK, AND EQUIPMENT ENCLOSURE AT B4983, SEE DETAILS 1 & 3 ON SHEET A10, SHEET P5 AND E12
 - OPTION 7 - REMOVE AND REPLACE (E) TANK AT BUILDING 4982 - SEE SHEETS A2, A3 AND P3



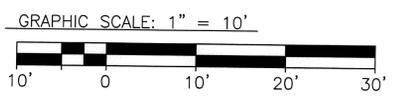
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SCALE	AS NOTED	TRADE SH. No.	T2
FILE NAME		SHEET No. 2 of 48	



- (XX) NOTES:
- 1) REMOVE AND DISPOSE OF 6-FOOT TALL CHAIN LINK FENCING, HARDWARE MESH, TENSION WIRE, BRACING, POSTS, AND CONCRETE FOUNDATIONS.
 - 2) INSTALL NEW CHAIN LINK FENCING, SEE DETAIL 1
C-5
 - 3) INSTALL NEW EXPANDED CONCRETE EQUIPMENT PAD, SEE DETAIL 1
C-4
 - 4) REMOVE AND DISPOSE OF PIPE RISER AND SINGLE PORT FIRE HYDRANT. INSTALL NEW 4" 90° DI BEND, 4"x6" DI PIPE REDUCER AND THRUST BLOCK, SEE DETAIL 2
C-4
 - 5) INSTALL NEW 6" PVC WATER PIPE, SEE UTILITY TRENCH DETAIL 3
C-4
 - 6) INSTALL NEW 6" 22.5" DI PIPE BEND AND CONCRETE THRUST BLOCK, SEE DETAIL 2
C-4
 - 7) INSTALL NEW FIRE HYDRANT, SEE DETAIL 5
C-4
 - 8) INSTALL NEW 4" GUARD POST, SEE DETAIL 4
C-4
 - 9) INSTALL NEW 6" GATE VALVE, SEE DETAIL 5
C-4
 - 10) INSTALL NEW ELECTRICAL CONDUIT (TYP), SEE DETAIL 6
C-5
 - 11) SAWCUT, REMOVE, DISPOSE, AND REPLACE ASPHALT CONCRETE PAVEMENT, SEE DETAIL 3
C-4
 - 12) INSTALL NEW CONCRETE EQUIPMENT PAD, SEE DETAIL 2
C-5
 - 13) INSTALL 8' WIDE CHAIN LINK GATE, SEE DETAIL 5
C-5



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 EDWARDS, CA

DRAWING TITLE
 CIVIL SITE PLAN - BLDG 4720

PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

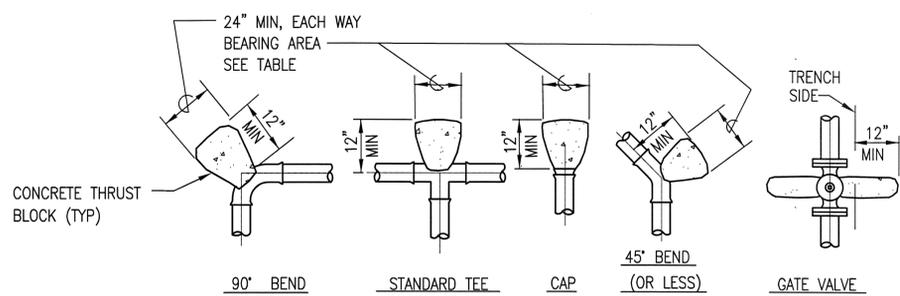
APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office <i>Don Gwoley</i>		7-10-15
Project Registrar/Custodian <i>A. J. Dehner</i>		2-10-15
Facilities Project Manager <i>Stacy Miller</i>		1-27-15
Chief, Office of Protective Services <i>M. J. [Signature]</i>		1-28-15
Chief, Safety, Health and Environmental Office <i>[Signature]</i>		1-27-15
Chief, Information Office <i>[Signature]</i>		3-10-15
DATE START	DATE PRINT	5/9/14
DRAWN BY	JFB	EDM-1728
SCALE	AS NOTED	TRADE SH. NO.
FILE NAME	C-2	SHEET No. 4 of 48

EPOXY ANCHORS NOTES

- EPOXY FOR EPOXY ANCHORS SHALL BE SET-XP EPOXY BY "SIMPSON STRONG-TIE" (ICC ER ESR-2508)
- ANCHORS USED FOR EPOXY ANCHORS SHALL BE CARBON STEEL CONFORMING TO ASTM A-307 THREADED RODS U.N.O. SIZE AND EMBEDMENT SHALL BE AS INDICATED ON PLANS.
- ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE EPOXY MANUFACTURER'S RECOMMENDATIONS AND THE CURRENT ICBO REPORT.
- DRILLED HOLES SHALL BE CLEANED OF DUST AND ANY DEBRIS USING NYLON BRUSH AND COMPRESSED AIR. OIL, SCALE, AND RUST SHALL BE REMOVED FROM THREADED RODS PRIOR TO INSTALLATION.
- UNLESS NOTED OTHERWISE IN THE PLANS, EPOXY ANCHORS SHALL HAVE THE FOLLOWING MINIMUM EMBEDMENT

BAR SIZE	MINIMUM EMBEDMENT *
#3	3 1/2"
#4 OR 1/2"φ	4 1/4"
#5 OR 5/8"φ	5 1/2"
#6 OR 3/4"φ	6 3/4"

* UNLESS NOTED OR DETAILED

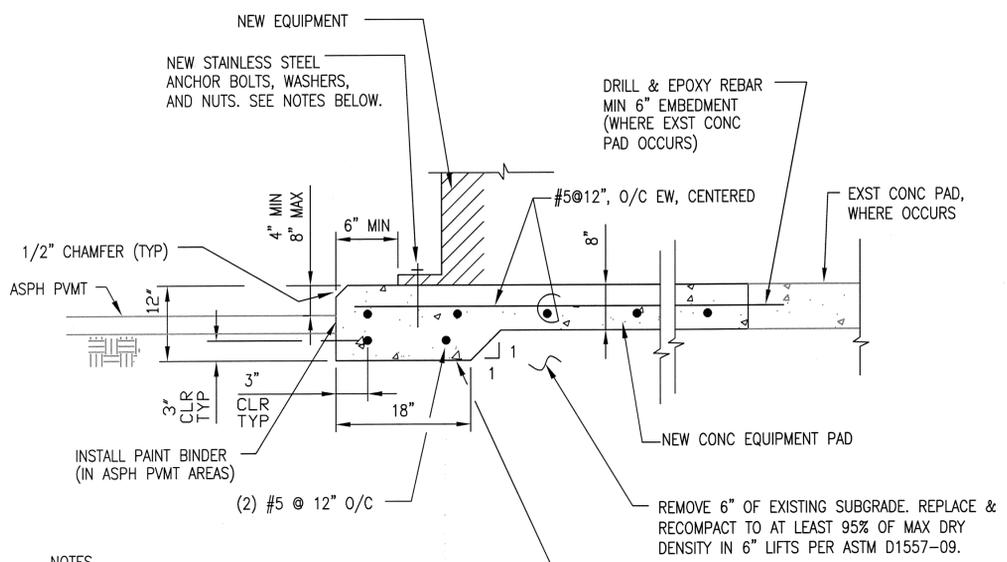


PIPE SIZE	FITTINGS					BEARING AREA (SQ. FEET)
	90°	45°	22 1/2'	11 1/4'	TEE, CAP & GV	
4"	3.5	2.0	1.0	0.5	2.5	
6"	7.9	4.5	2.3	1.1	5.7	

- NOTES:
- MAX. ALLOWABLE SOIL PRESSURE (MASP) = 1000 PSF
 - DESIGN OPERATING PRESSURE (DOP) = 120 PSI
 - DESIGN TEST PRESSURE (DTP) = 200 PSI
 - CONCRETE THRUST BLOCKS SHALL NOT INFRINGE ON VALVE OPERATORS, BOLTS, ETC.
 - ALL THRUST BLOCK BEARING AREAS SHALL BE CARRIED TO UNDISTURBED SOIL.

HORIZONTAL BEND THRUST BLOCK TABLE AND DETAILS

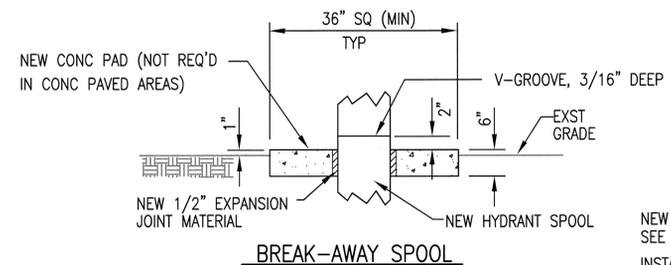
DETAIL 2
NO SCALE C-4



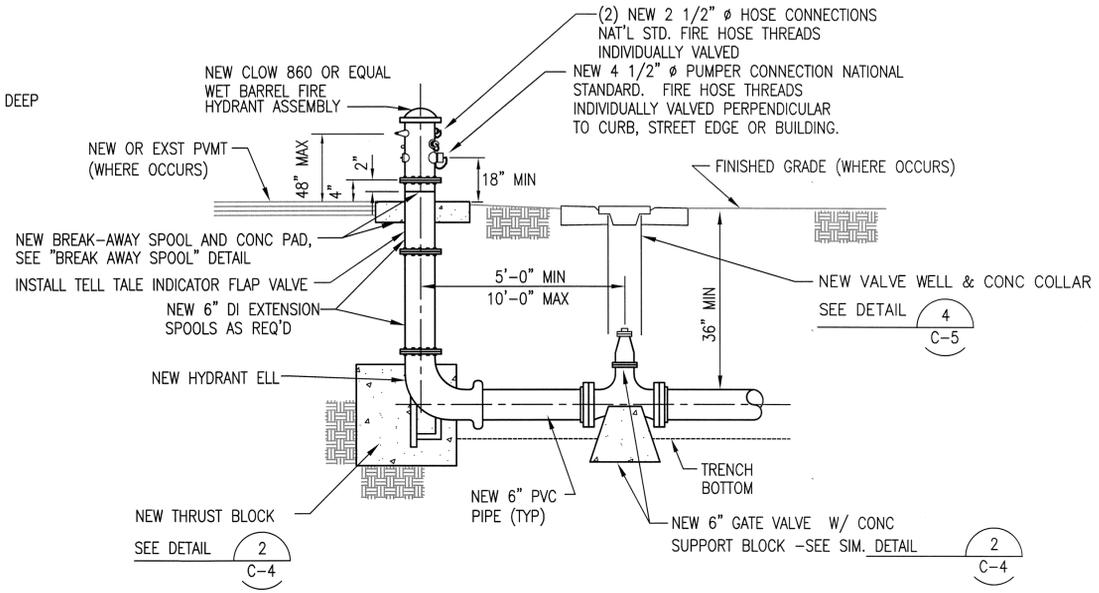
- NOTES:
- CONTRACTOR HAS THE OPTION TO DRILL & EPOXY OR EMBED THE ANCHOR BOLTS. SEE EPOXY ANCHOR NOTES.
 - CONTRACTOR SHALL PROVIDE SEISMIC ANCHOR BOLT STRUCTURAL CALCULATIONS, STAMPED BY A REGISTERED PROFESSIONAL STRUCTURAL ENGINEER, TO CONTRACTING OFFICER.

EXPANDED EQUIPMENT PAD

DETAIL 1
NO SCALE C-4

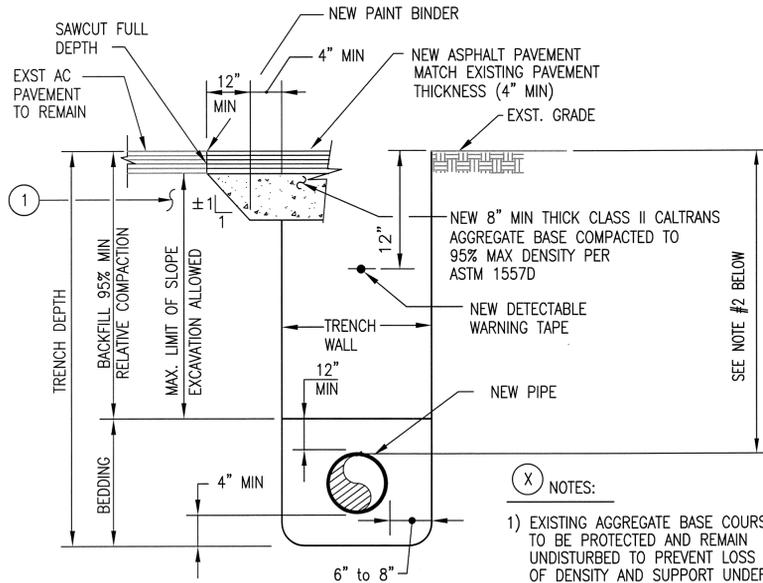


BREAK-AWAY SPOOL



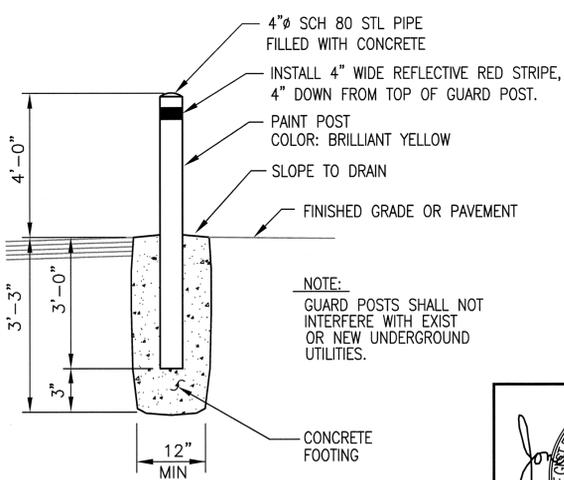
NEW FIRE HYDRANT ASSEMBLY

DETAIL 5
NO SCALE C-4



TYPICAL WATER UTILITY TRENCH

DETAIL 3
NO SCALE C-4



GUARD POST

DETAIL 4
NO SCALE C-4

Professional Engineer Seal for Jonathan B. Barlow, No. 60229, Exp. 6/30/14, Civil. License State of California.

JBY #1306-4

JB YOUNG & ASSOCIATES
CONSULTANT ENGINEERS
11440 RIVERSIDE DRIVE, SUITE M
LAKEVIEW, CA 92040
619-448-9424

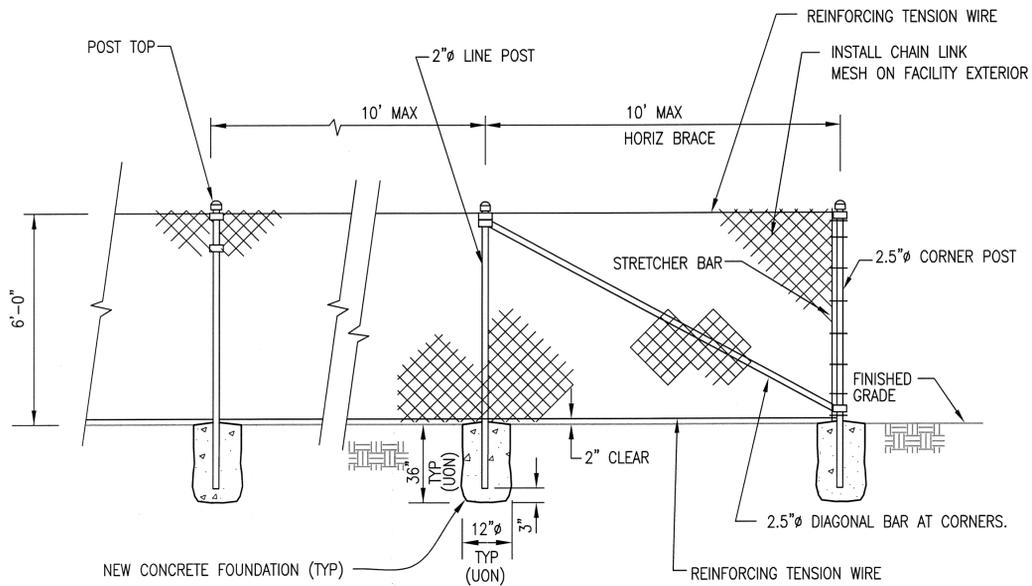
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5/9/14	E	FINAL DESIGN	
2/24/14	D	100% FINAL DESIGN	
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6/21/13	B	30% PRELIMINARY DESIGN	
12/21/12	A	15% CONCEPT DESIGN	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ARMSTRONG FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE: CIVIL DETAILS
PROJECT TITLE: REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS	DATE
Chief, Facilities Engineering & Asset Mgmt. Office	7-10-15
Project Regulator/Customer	2-10-15
Facilities Project Manager	1-27-15
Chief, Office of Protective Services	1-28-15
Chief, Safety, Health and Environmental Office	1-27-15
Chief, Information Officer	3-16-15

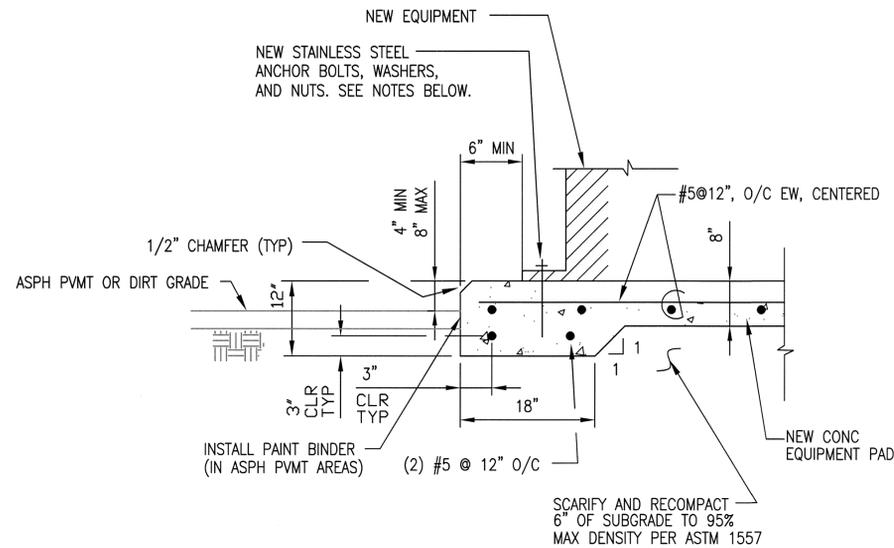
DATE PRINTED: 5/9/14
DRAWN BY: JFB
SCALE: AS NOTED
FILE NAME: C-4
EDM-1728
SHEET No. 6 of 48



- NOTE:**
- 1) USE CLASS I GALV STEEL PIPE GRADE A OR B FOR POSTS, TOP RAILS, AND BRACES.
 - 2) USE TYPE I ZINC COATED STEEL 9 GAGE WIRE SIZE WITH 2" MESH SIZE FOR CHAIN LINK MESH.
 - 3) ALL PIPE DIAMETERS SHOWN ARE OUTSIDE DIAMETER.
 - 4) NEW FENCE POSTS SHALL BE A MINIMUM OF 18" CLEAR OF EXISTING OR NEW UTILITIES.

CHAIN LINK FENCING

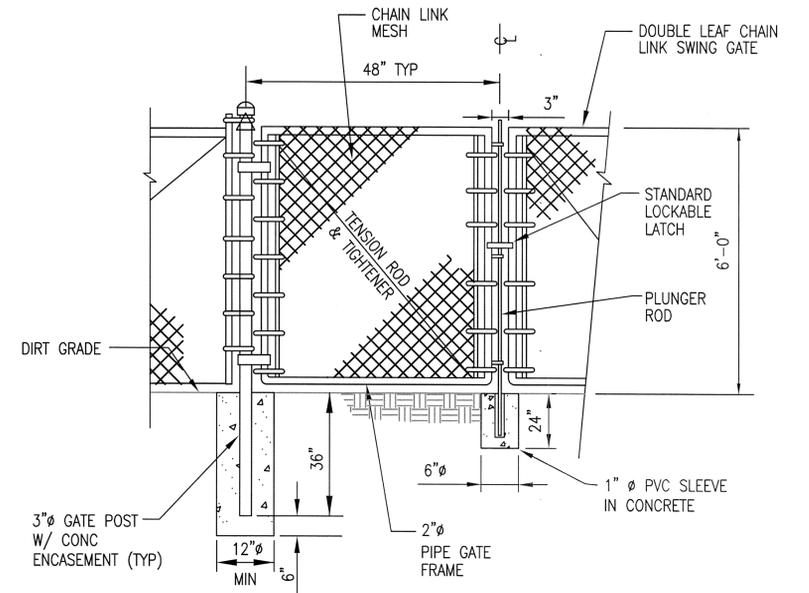
DETAIL 1
NO SCALE C-5



- NOTES:**
- 1) CONTRACTOR HAS THE OPTION TO DRILL & EPOXY OR EMBED THE ANCHOR BOLTS. SEE EPOXY ANCHOR NOTES.
 - 2) CONTRACTOR SHALL PROVIDE SEISMIC ANCHOR BOLT STRUCTURAL CALCULATIONS, STAMPED BY A REGISTERED PROFESSIONAL STRUCTURAL ENGINEER, TO CONTRACTING OFFICER.
 - 3) SEE EPOXY ANCHOR NOTES ON C-4.

EQUIPMENT PAD

DETAIL 2
NO SCALE C-5

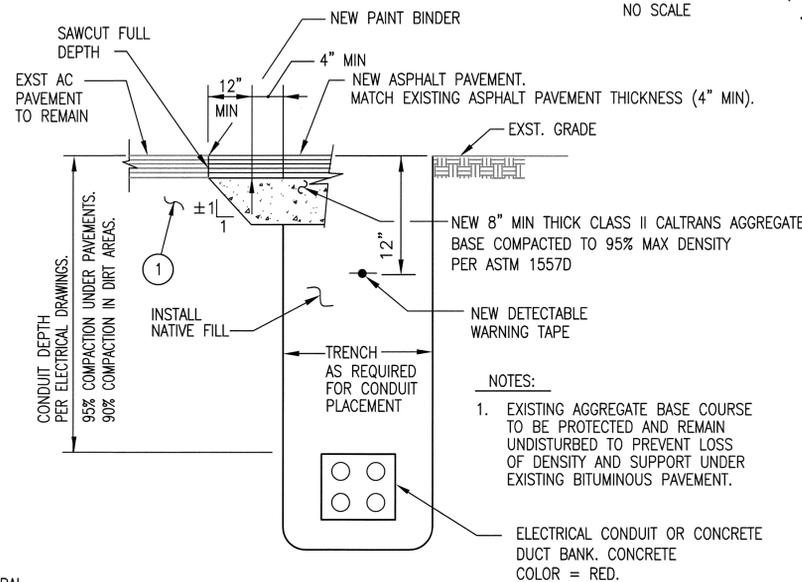


- NOTE:**
- 1) USE CLASS I GALV STEEL PIPE GRADE A OR B FOR POSTS, AND BRACES.
 - 2) USE TYPE I ZINC COATED STEEL 9 GAGE WIRE SIZE WITH 2" MESH SIZE FOR CHAIN LINK MESH.
 - 3) ALL PIPE DIAMETERS SHOWN ARE OUTSIDE DIAMETER.
 - 4) NEW FENCE POSTS SHALL BE A MINIMUM OF 18" CLEAR OF EXISTING OR NEW UTILITIES.
 - 5) INSTALL "HOLD OPEN" CLAMP, CHAIN, AND HOOK ON ALL NEW SWING GATE WINGS.

ELEVATION

CHAIN LINK DOUBLE LEAF SWING GATE

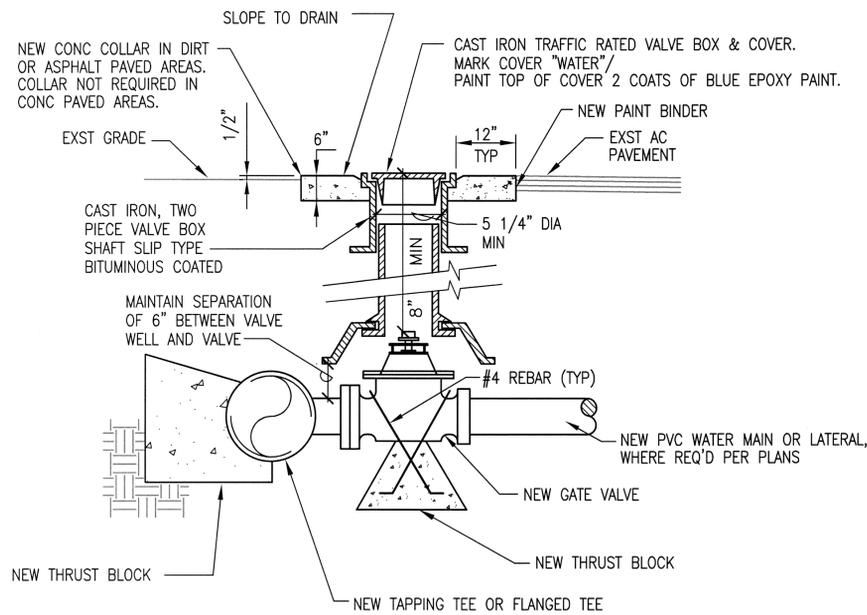
DETAIL 5
NO SCALE C-5



- NOTES:**
1. EXISTING AGGREGATE BASE COURSE TO BE PROTECTED AND REMAIN UNDISTURBED TO PREVENT LOSS OF DENSITY AND SUPPORT UNDER EXISTING BITUMINOUS PAVEMENT.

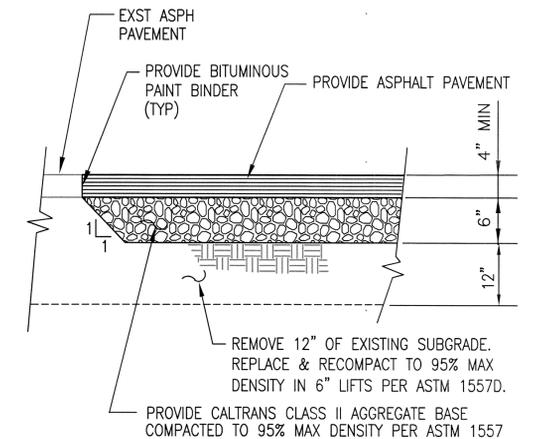
TYPICAL ELECTRICAL UTILITY TRENCH

DETAIL 6
NO SCALE C-5



WATER VALVE

DETAIL 4
NO SCALE C-5



REPAIR ASPHALT PAVEMENT

DETAIL 3
NO SCALE C-5

Professional Engineer Seal:
JBY #1306-4
NO. 60229
EXP. 6/30/14
CIVIL
STATE OF CALIFORNIA

JB YOUNG & ASSOCIATES
CONSULTANT ENGINEERS
11440 RIVERSIDE DRIVE, SUITE M
LAKESIDE, CA 92040
619-448-9424

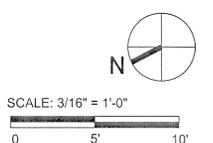
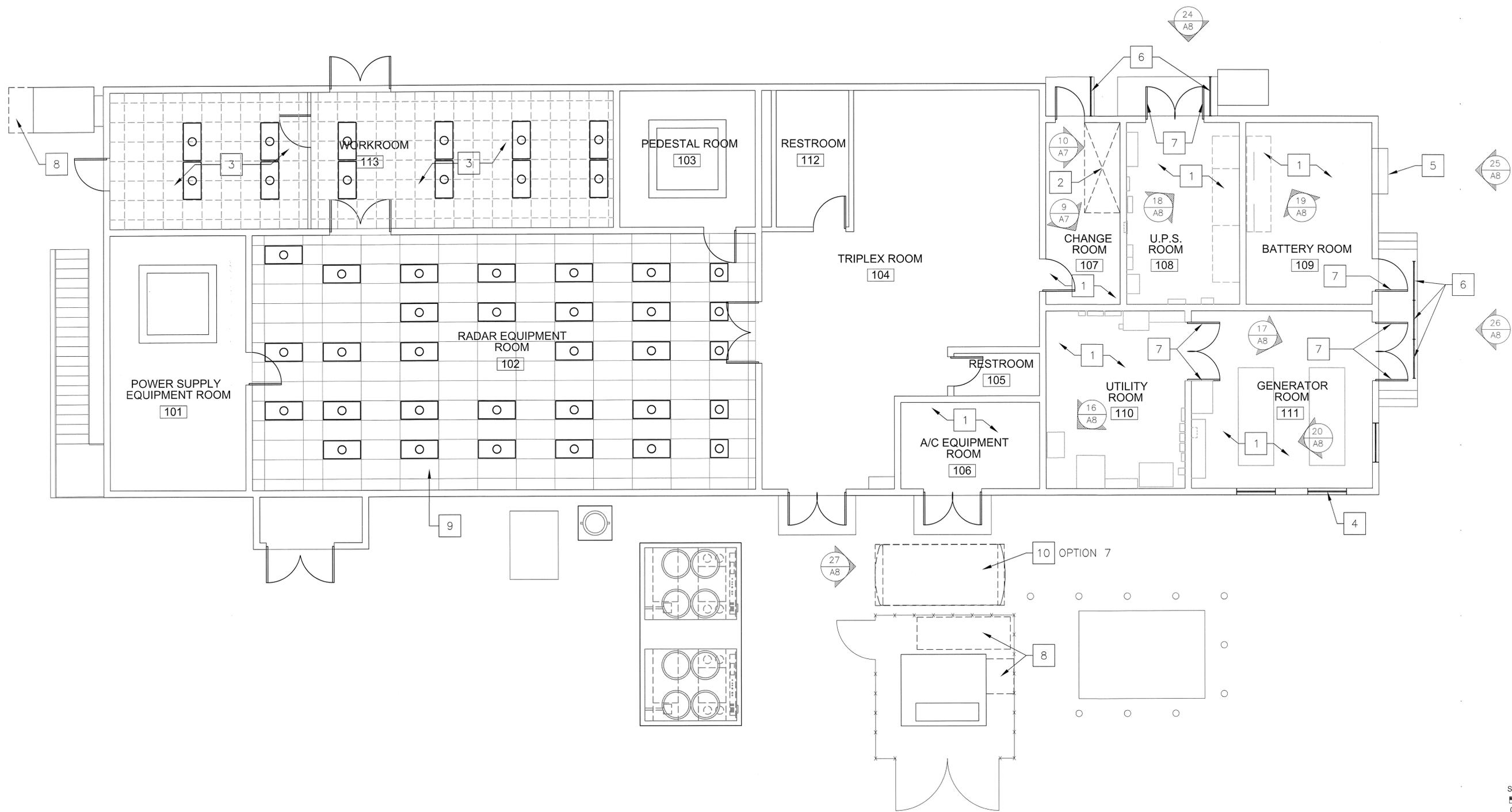
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ARMSTRONG FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE: CIVIL DETAILS
PROJECT TITLE: REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS	DATE
Chief, Facilities Engineering & Asset Mgmt. Office	7-10-15
Project Technical Controller	2-10-15
Facilities Project Manager	1-27-15
Chief, Office of Protective Services	1-28-15
Chief - Safety, Health and Environmental Office	1-27-15
SEPP/Chief Information Officer	3 Feb 15

DATE STRD: JFB DATE PRD: 5/9/14
DRAWN BY: JFB
SCALE: AS NOTED TRADE SH. No.: EDM-1728
FILE NAME: C-5 SHEET No. 7 of 48



KEYNOTES

- | | | |
|---|--|--|
| <p>1 REMOVE MECHANICAL, PLUMBING OR ELECTRICAL EQUIPMENT AS INDICATED ON SHEETS M4, P2 AND E2.</p> <p>2 REMOVE SHOWER ENCLOSURE AND WATER HEATER IN ROOM 107. SEE P2</p> <p>3 2 X 2 GRID CEILING TO BE REMOVED AND DISPOSED OF FOR REPLACEMENT OF DUCTWORK.</p> | <p>4 DEMOLISH SHEET METAL BARRIER IN (E) MASONRY OPENING AND PREP FOR (N) LOUVER</p> <p>5 DEMOLISH HVAC DUCT HOOD AT EXTERIOR WALL APPROX. 54" X 16" V.I.F.</p> <p>6 REMOVE (E) PLYWOOD PANEL FROM (E) METAL FRAME</p> <p>7 REMOVE (E) DOOR HARDWARE FOR REPLACEMENT</p> | <p>8 REMOVE AC PAVEMENT AND PREPARE FOR (N) EQUIPMENT SLAB. SEE CIVIL DRAWINGS.</p> <p>9 EXISTING CEILING CONFIGURATION SHOWN IN ROOM 102. SEE SHEETS E2 AND E4 FOR WORK IN THIS AREA.</p> <p>10 REMOVE (E) 2000 GALLON TANK - SEE SHEET P2 (TANK REMOVAL AND REPLACEMENT IS BID OPTION 7)</p> |
|---|--|--|

DEMOLITION PLAN 4982

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



DEVELOPMENT ONE, INC.
 1611 East Fourth Street, Suite 250
 Santa Ana, California 92701
 J. Bruce Camino, Architect, AIA, NCARB
 (714) 689-0298
 (714) 648-0197 FAX

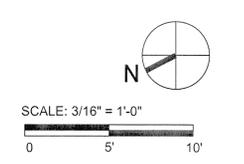
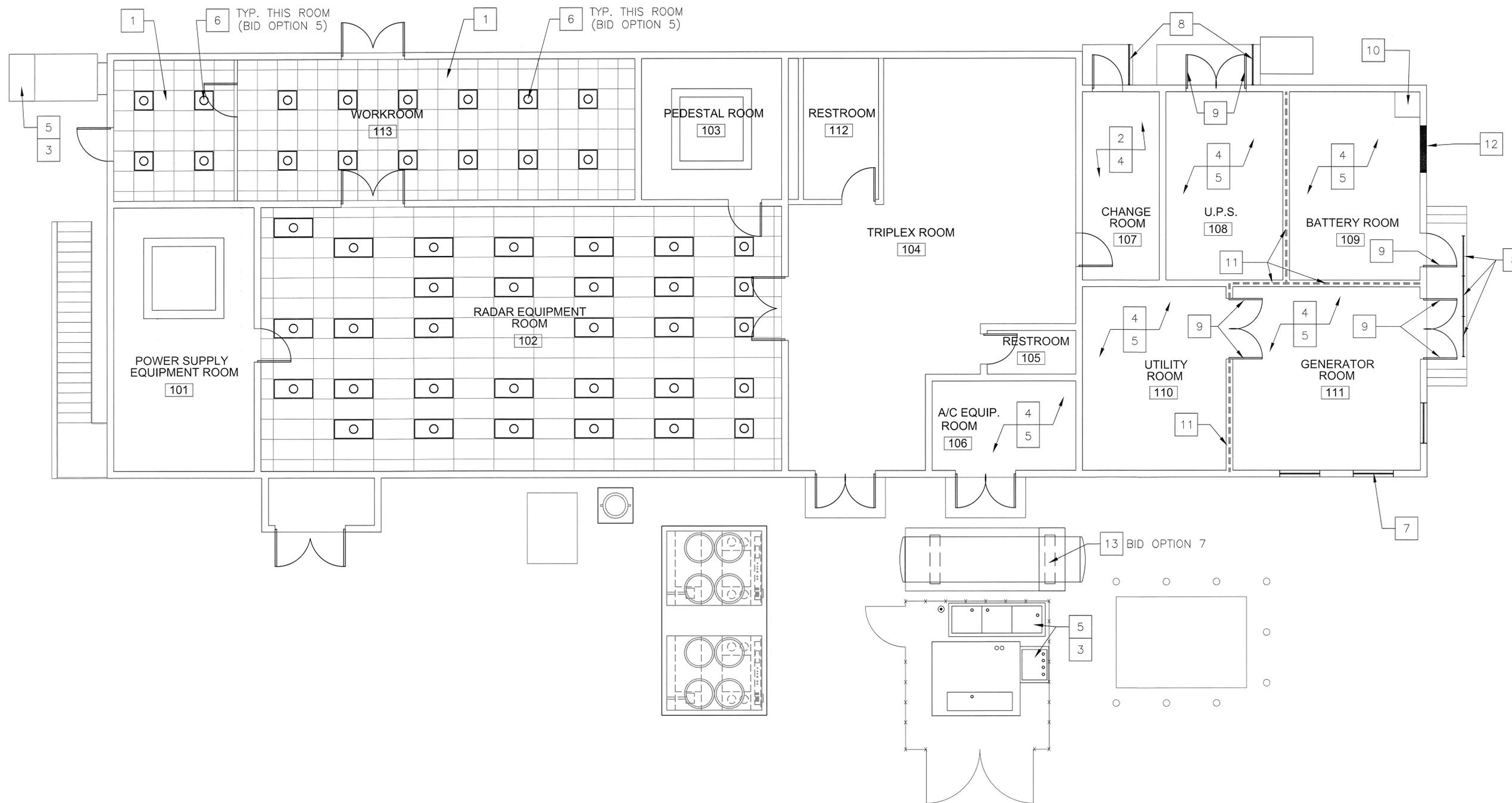
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6/21/13	B	30% PRELIMINARY DESIGN	
12/21/12	A	15% CONCEPT DESIGN	
DATE	SYM	REVISION	BY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 ARMSTRONG FLIGHT RESEARCH CENTER
 EDWARDS, CA

DRAWING TITLE
 BUILDING 4982 DEMOLITION PLAN

PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS	DATE
<i>[Signature]</i> Chief, Facilities Engineering & Asset Mgmt. Office	7-10-15
<i>[Signature]</i> Project Regulator/Control	2-10-15
<i>[Signature]</i> Facilities Project Manager	1-27-15
<i>[Signature]</i> Chief, Office of Protective Services	1-28-15
<i>[Signature]</i> Chief - Safety, Health and Environmental Office	1-27-15
<i>[Signature]</i> Lead Chief Information Officer	3-27-15
DATE STRD:	DATE PRINTD: 5/9/14
DRAWN BY: DRM	EDM-1728
SCALE: AS NOTED	TRADE: A2
FILE NAME:	SHEET No. 8 of 48



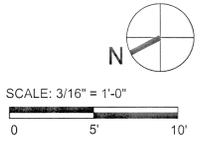
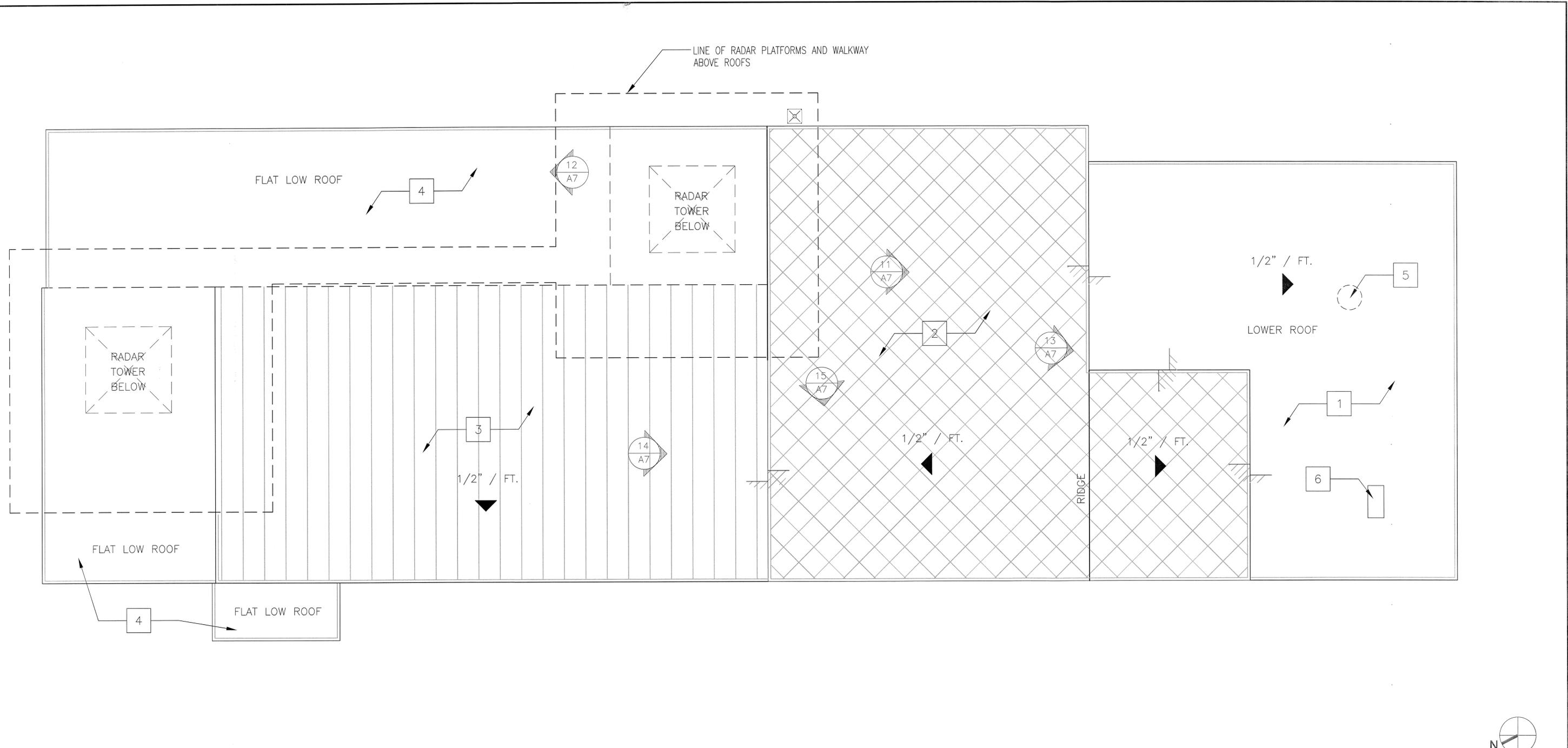
KEYNOTES

- 1 PROVIDE NEW 2X2 GRID CEILING ACOUSTIC TILES, AT ALL AREAS WHERE CEILING IS REMOVED TO REPLACE DUCTWORK. SEE DETAIL 3/A9.
- 2 PATCH AND REPAIR AREA WHERE SHOWER AND EQUIPMENT HAVE BEEN REMOVED TO MATCH EXISTING WALLS. PAINT ROOM, COMPLETE.
- 3 NEW EQUIPMENT PAD FOR ELECTRICAL OR MECHANICAL EQUIPMENT. SEE SHEET C-3.
- 4 APPLY NEW EPOXY RESIN FLOORING TO (E) CONCRETE SLAB FLOOR AND PAINT (E) WALLS
- 5 INSTALL NEW ELECTRICAL, MECHANICAL OR PLUMBING EQUIPMENT - SEE SHEETS M5, P3, AND E4
- 6 REINSTALL (E) LIGHTS IN (N) GRID. (REPLACEMENT OF (E) LIGHTS W/ (N) L.E.D. LIGHTS IS BID OPTION 5. SEE ELECTRICAL DRAWINGS.)
- 7 INSTALL (N) METAL LOUVER IN (E) MASONRY OPENING, APPROX. 4' X 8' V.I.F. SEE DETAIL 12/A9
- 8 INSTALL (N) PLYWOOD (3/4" X 4' X 8' V.I.F.) WIND SCREEN IN (E) METAL FRAME. PAINT PLYWOOD AND FRAME.
- 9 INSTALL (N) SURFACE-MOUNTED VERTICAL ROD PUSH-BAR DOOR HARDWARE TO MATCH (E). PAINT (E) DOORS BOTH SIDES.
- 10 SEAL (E) 30" X 30" FLOOR DRAIN AND FILL WITH CONCRETE TO LEVEL WITH (E) FLOOR.
- 11 PROVIDE FIRE SAFING FILL AND FLASHING ABOVE (E) MASONRY WALLS TO ROOF DECK TO MAINTAIN RATED SEPARATION AT TOP OF WALL. SEE DETAIL 14/A9
- 12 CONSTRUCT CMU INFILL AT (E) OPENING WHERE DUCT HOOD IS REMOVED, APPROX. 54" X 16" V.I.F. SEAL WEATHER TIGHT AND PAINT TO MATCH (E) WALL
- 13 PROVIDE NEW WATER TANK AND FOOTINGS - SEE SHEET P3 FOR TANK. SUBMIT FOOTING DESIGN BASED ON SPECIFIC TANK PROVIDED. FOOTING DESIGN MUST BE PREPARED AND STAMPED BY A CALIFORNIA LICENSED STRUCTURAL ENGINEER. SEE SHEET A11 FOR DESIGN CRITERIA. (TANK REPLACEMENT IS BID OPTION 7)

RENOVATION PLAN 4982 SCALE: 3/16" = 1'-0" **1**

<p>DEVELOPMENT ONE, INC. 1611 East Fourth Street, Suite 250 Santa Ana, California 92701 J. Bruce Camillo, Architect, AIA, NCARB (714) 689-0298 (714) 648-0197 FAX</p>		<p>NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ARMSTRONG FLIGHT RESEARCH CENTER EDWARDS, CA</p>	<p>APPROVALS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DATE</th> <th>DATE</th> </tr> <tr> <td style="text-align: center;">7-10-15</td> <td style="text-align: center;">2-10-15</td> </tr> <tr> <td style="text-align: center;">1-27-15</td> <td style="text-align: center;">1-28-15</td> </tr> <tr> <td style="text-align: center;">1-27-15</td> <td style="text-align: center;">3 Feb 15</td> </tr> </table>	DATE	DATE	7-10-15	2-10-15	1-27-15	1-28-15	1-27-15	3 Feb 15	
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1-27-15	3 Feb 15											
<p>DRAWING TITLE</p> <p>BUILDING 4982 RENOVATION PLAN</p>	<p>PROJECT TITLE</p> <p>REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DATE STRTD</td> <td>DATE PRINTD</td> </tr> <tr> <td>5/9/14</td> <td>5/9/14</td> </tr> <tr> <td>DRAWN BY</td> <td>DRW</td> </tr> <tr> <td>SCALE</td> <td>AS NOTED</td> </tr> <tr> <td>FILE NAME</td> <td>A3</td> </tr> </table>	DATE STRTD	DATE PRINTD	5/9/14	5/9/14	DRAWN BY	DRW	SCALE	AS NOTED	FILE NAME	A3
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KEYNOTES

- 1** ROOF AREA 1 - REMOVE EXISTING INSULATED PANEL ROOF AND SHEATHING. INSTALL NEW SHEATHING, INSULATION (R-30) AND TPO MEMBRANE ROOF. PROVIDE NEW ACCESSORIES AND FLASHING. (BID OPTION 1)

2 ROOF AREA 2 - REMOVE BUILT-UP ROOF AND INSULATION OVER CONCRETE DECK. INSTALL NEW INSULATION (R-30) AND TPO MEMBRANE ROOF. PROVIDE NEW ACCESSORIES AND FLASHING. (BID OPTION 1)

3 ROOF AREA 3 - INSTALL NEW INSULATION (R-30) AND TPO MEMBRANE ROOF OVER EXISTING INSULATED METAL PANEL ROOF. PROVIDE NEW ACCESSORIES AND FLASHING. (BID OPTION 1)
- 4** MISCELLANEOUS FLAT ROOF AREAS - REMOVE EXISTING ROOF AND SHEATHING. INSTALL NEW SHEATHING AND INSULATION (R-30) AND NEW MEMBRANE ROOF. (BID OPTION 1)

5 IF BID OPTION 1 IS NOT EXERCISED, PATCH (E) ROOF WHERE EXHAUST DUCT IS REMOVED. MATCH EXISTING ROOF CONSTRUCTION

6 INSTALL (N) EXHAUST MUFFLER FOR (N) GENERATOR. SHOW MUFFLER ON GENERATOR SYSTEM SHOP DRAWINGS, INCLUDING ANCHORAGE AND ROOF PENETRATION. SEE SHEETS M5 AND E4 FOR GENERATOR.

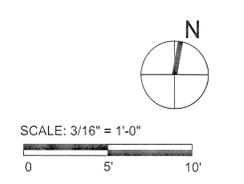
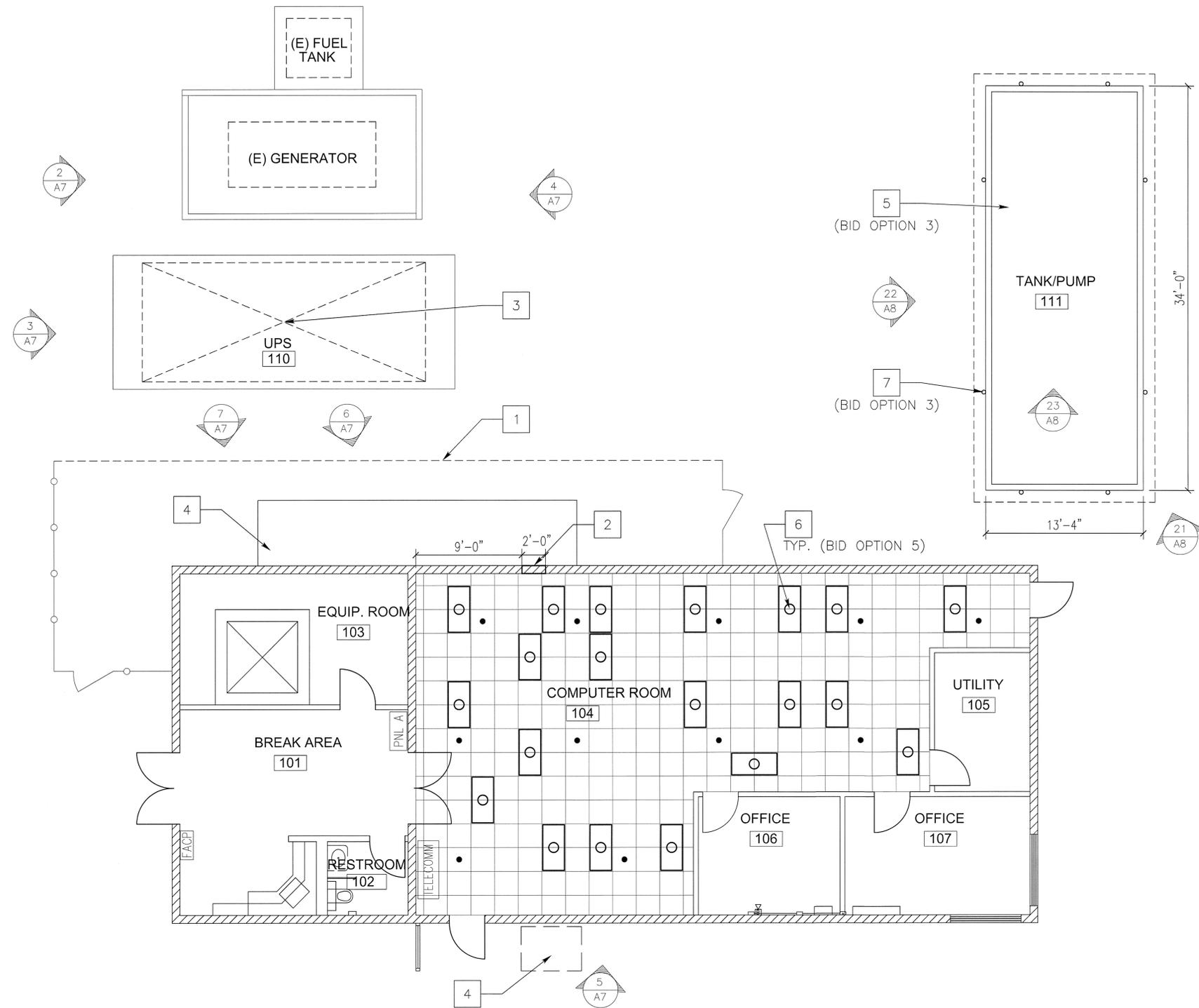
NOTE: BID OPTION 1 ROOF REPLACEMENT IS A DEFERRED DESIGN SUBMITTAL. BASIS OF DESIGN ROOFING IS CONTINUOUS POLYVINYL-CHLORIDE (PVC) MEMBRANE ROOF OVER 5" (R-30) CONTINUOUS RIGID INSULATION BOARD AND 1/2" ROOF PROTECTION BOARD. ROOFING SHALL BE CONTINUOUS UNDER (E) WALKWAY.

AS PART OF BID, CONTRACTOR SHALL DESIGN A SINGLE, COMPLETE ROOF SYSTEM FOR USE ON THE PROJECT INCLUDING THE FOLLOWING CRITERIA: SINGLE POINT OF CONTACT 20 YEAR WARRANTY, 120 MPH, EXPOSURE 'D' WIND RESISTANCE, MECHANICALLY FASTENED, SHOP DRAWINGS, CALCULATIONS, TECHNICAL DATA, AND DETAILS FOR EACH TRANSITION, PENETRATION AND EDGE CONDITION IN PROJECT.

SHOP DRAWINGS MUST BE APPROVED BY CONTRACTING OFFICER PRIOR TO DEMOLITION, PROCUREMENT OR ANY ROOF WORK.

NOTE: SEE DETAILS 5, 8, 10 & 13 ON SHEET A9 FOR TYPICAL ROOF CONDITIONS

ROOF PLAN 4982		SCALE: 3/16" = 1'-0"	1																								
 DEVELOPMENT ONE, INC. 1611 East Fourth Street, Suite 250 Santa Ana, California 92701 J. Bruce Camino, Architect, AIA, NCARB (714) 689-0298 (714) 648-0197 FAX	 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ARMSTRONG FLIGHT RESEARCH CENTER EDWARDS, CA	APPROVALS																									
	DRAWING TITLE BUILDING 4982 ROOF PLAN		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DATE</th> <th>DATE PRINTED</th> </tr> <tr> <td>7-10-15</td> <td>5/9/14</td> </tr> <tr> <td>2-10-15</td> <td></td> </tr> <tr> <td>1-28-15</td> <td></td> </tr> <tr> <td>1-27-15</td> <td></td> </tr> <tr> <td>3 Feb 15</td> <td></td> </tr> </table>		DATE	DATE PRINTED	7-10-15	5/9/14	2-10-15		1-28-15		1-27-15		3 Feb 15												
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DATE	SCALE	TRADE	SH. No.																								
	AS NOTED	A4	EDM-1728																								



DEMOLITION PLAN B4720 SCALE: 3/16" = 1'-0" 1

KEYNOTES

- | | | |
|--|--|---|
| <p>1 REMOVE SECTION OF (E) FENCE TO ACCOMMODATE (N) EQUIPMENT PAD. SEE SHEET C-2.</p> <p>2 (N) 24" X 18" OPENING IN MASONRY (E) WALL FOR (N) MECHANICAL DUCT. BOTTOM OF OPENING AT 10'-8" A.F.F.</p> <p>3 DEMOLISH AND REMOVE (E) UPS BUILDING</p> | <p>4 REMOVE MECHANICAL, PLUMBING OR ELECTRICAL EQUIPMENT AS INDICATED ON SHEETS M2, P6 AND E6.</p> <p>5 REMOVE (E) ROOF AND TANK AT ACCESSORY BUILDING AT B4720 SITE FOR REPLACEMENT OF TANK SEE SHEET P6. SEE DETAIL 24/A8 (BID OPTION 3)</p> <p>6 REMOVE (E) FLUORESCENT LIGHT FIXTURES FOR REPLACEMENT WITH LED FIXTURES (BID OPTION 5)</p> | <p>7 DETACH AND PROTECT ALL ANTENNAS AND ROOF ACCESSORIES FOR RE-INSTALLATION FOLLOWING ROOF REPLACEMENT (BID OPTION 3)</p> |
|--|--|---|

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 Santa Ana, California 92701
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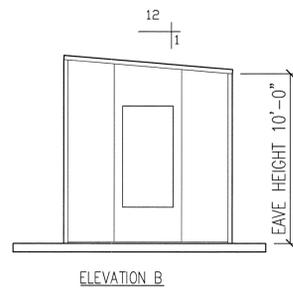
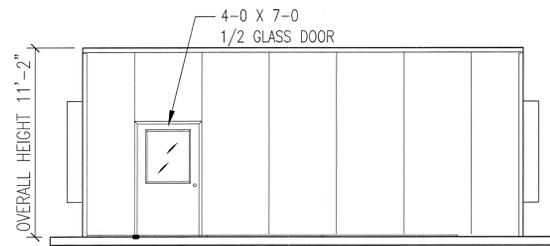
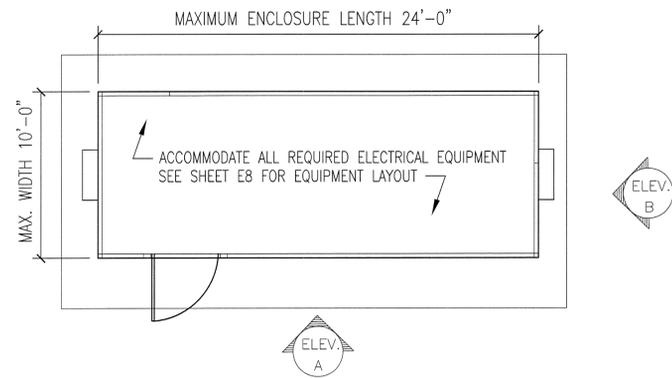
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 ARMSTRONG FLIGHT RESEARCH CENTER
 EDWARDS, CA

DRAWING TITLE
BUILDING 4720 DEMOLITION PLAN

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office <i>De Gasty</i>		7-10-15
Project Registrar/Contractor <i>J. Deheret</i>		2-10-15
Facilities Project Manager <i>Stoyard Jackson</i>		1-27-15
Chief, Office of Protection Services <i>K. [Signature]</i>		1-28-15
Chief - Safety, Health and Environmental Office <i>[Signature]</i>		1-27-15
USMC Chief Information Officer <i>[Signature]</i>		3 Feb 15

DATE STRD	DATE PRINTD	5/9/14
DRAWN BY	DRM	EDM-1728
SCALE	AS NOTED	
FILE NAME	TRADE SH. No.	A5
	SHEET No.	11 of 48



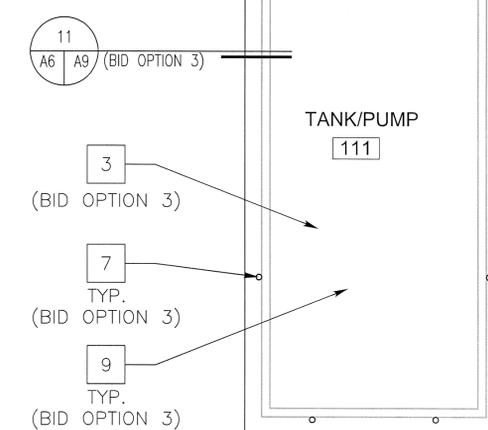
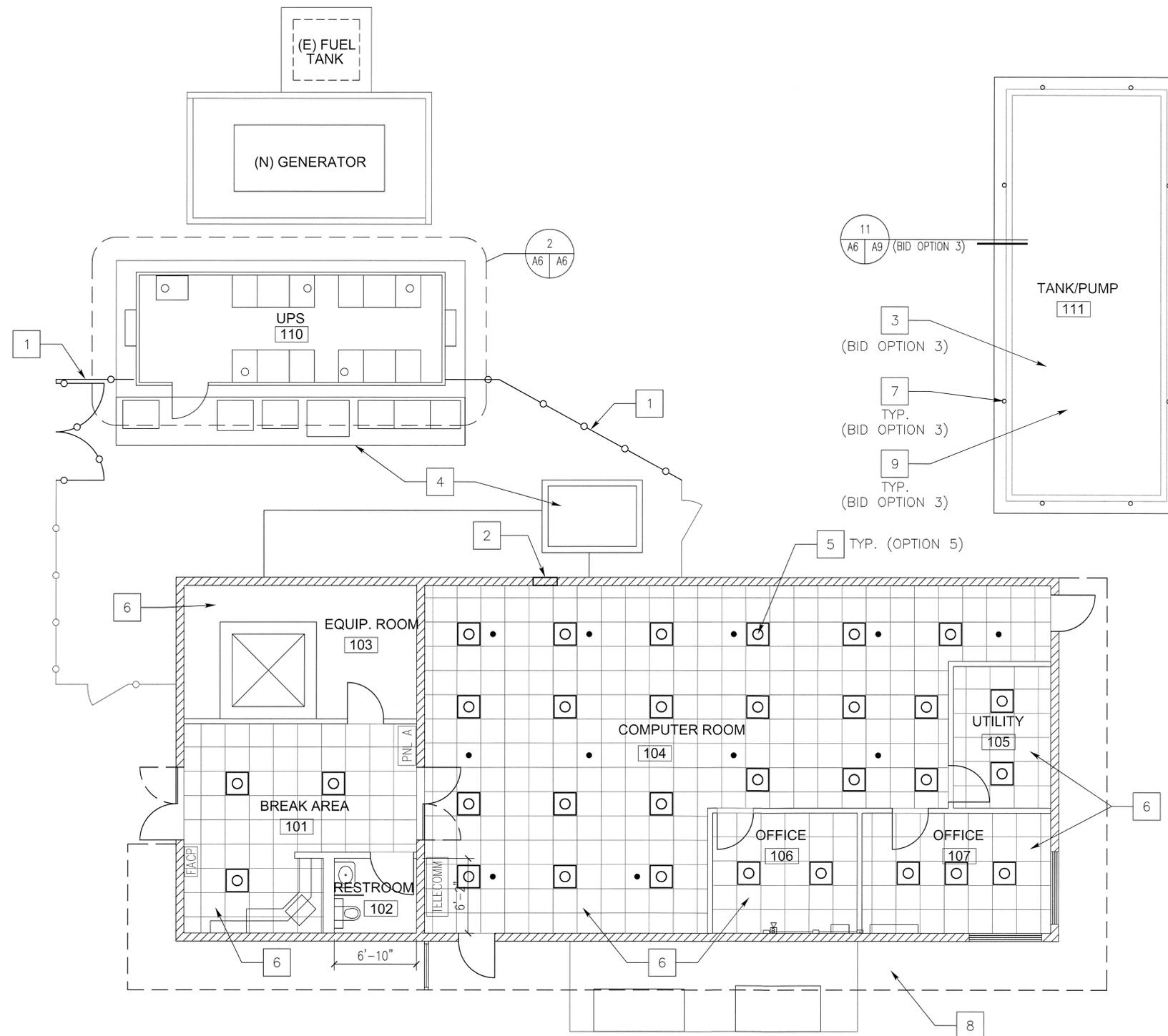
PROVIDE (N) ENCLOSURE FOR ELECTRICAL EQUIPMENT. ENCLOSURE SHALL BE SKID-MOUNTED WITH INSULATED FLOOR, WALL AND CEILING PANELS. EXTERIOR SURFACE SHALL BE MIN. 22 GAUGE STEEL WITH FACTORY-APPLIED FINISH.

ENCLOSURE SHALL INCLUDE DUAL 5-TON A/C UNITS FACTORY-INSTALLED AND WARRANTED BY ENCLOSURE MANUFACTURER. ENCLOSURE INSULATION VALUE SHALL BE R-30 AT WALLS AND R-30 AT ROOF, MINIMUM.

ENCLOSURE SHALL BE DESIGNED FOR A WIND LOAD OF 90 MPH, EXPOSURE 'D', AND FOR THE WEIGHT OF THE SPECIFIC ELECTRICAL EQUIPMENT TO BE INSTALLED.

ENCLOSURE SHALL INCLUDE INTERIOR LIGHTING, POWER CONNECTIONS FOR THE EQUIPMENT TO BE INSTALLED AND ONE ADDITIONAL CONVENIENCE ELECTRICAL OUTLET. SHOW ALL ELECTRICAL ITEMS IN SHOP DRAWINGS.

CONTRACTOR SHALL PROVIDE COORDINATION DRAWINGS SHOWING EQUIPMENT TO BE INSTALLED AND REQUIRED CLEARANCES. CONTRACTOR SHALL PROVIDE DETAILS FOR ANCHORING ENCLOSURE TO EXISTING CONCRETE PAD. ANCHORAGE DETAILS SHALL BE STAMPED BY CALIFORNIA LICENSED STRUCTURAL ENGINEER.



ELECTRICAL ENCLOSURE

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

2

RENOVATION PLAN B4720

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

1

KEYNOTES

- 1 INSTALL (N) FENCE - SEE SHEET C-2
- 2 INSTALL REINFORCING STEEL AT MASONRY OPENING, SEAL DUCT PENETRATION AT EXTERIOR WALL. SEE DETAIL 1/A11
- 3 REMOVE AND REPLACE ROOF, INCLUDING RAFTERS AT PUMP BUILDING TO ALLOW REPLACEMENT OF TANK. SEE DETAIL 11/A9 (OPTION 3)
- 4 PROVIDE CONCRETE PADS FOR ELECTRICAL AND MECHANICAL EQUIPMENT SEE SHEETS C2 AND E8.
- 5 REPLACE EXISTING FLUORESCENT LIGHT FIXTURES WITH NEW LED LIGHT FIXTURES. SEE SHEET E9. (OPTION 5)
- 6 INSTALL R-30 SCRIM-FACED BATT INSULATION AT UNDERSIDE OF (E) ROOF IN ALL AREAS. (E) CEILING GRID TO REMAIN.
- 7 RE-INSTALL ALL ANTENNAS AND ROOF ACCESSORIES FOLLOWING ROOF REPLACEMENT (BID OPTION 3)
- 8 DETACH AND RESET (E) METAL PANELS AT BUILDING SOFFIT FOR HVAC REPLACEMENT
- 9 PROVIDE NEW WATER TANK AND FOOTINGS - SEE SHEET P5 FOR TANK. SUBMIT FOOTING DESIGN BASED ON SPECIFIC TANK PROVIDED. FOOTING DESIGN MUST BE PREPARED AND STAMPED BY A CALIFORNIA LICENSED STRUCTURAL ENGINEER. SEE SHEET A11 FOR STRUCTURAL CRITERIA. (TANK REPLACEMENT IS BID OPTION 3)



DEVELOPMENT ONE, INC.
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DATE	SYM	REVISION	BY	A'PD
5/9/14	E	FINAL DESIGN		
2/24/14	D	100% DESIGN		
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6/21/13	B	30% PRELIMINARY DESIGN		
12/21/12	A	15% CONCEPT DESIGN		



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EDWARDS, CA

DRAWING TITLE

BUILDING 4720 RENOVATION

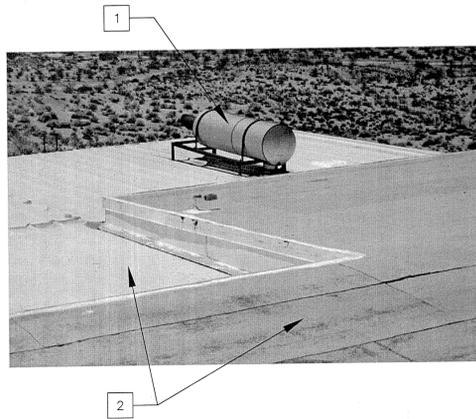
PROJECT TITLE

REVITALIZE RADAR AND TELEMETRY
TRACKING INFRASTRUCTURE

APPROVALS

NAME	DATE
David Woolley	7-10-15
John Dehner	7-10-15
Stephanie Dickson	1-27-15
Kimberly...	1-28-15
...	1-27-15
...	3 Feb 15

DATE STRTD	DATE PRINTD	5/8/14
DRAWN BY	DRW	EDM-1728
SCALE	AS NOTED	SH. No.
FILE NAME	A6	SHEET No. 12 of 48



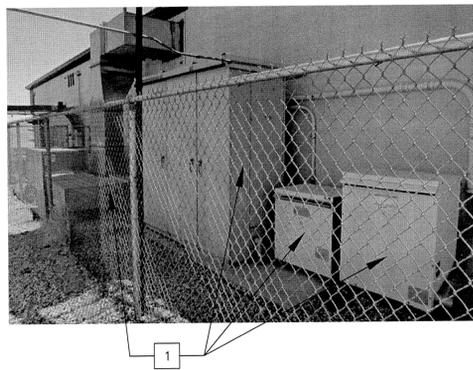
SOUTH ROOF - B4982

13



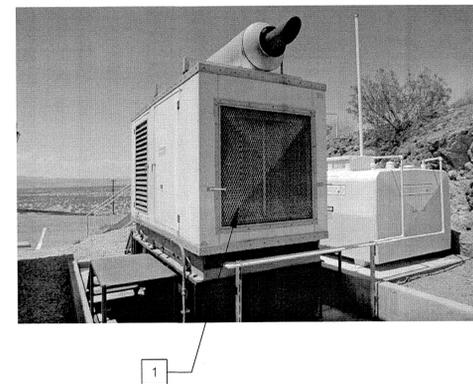
SHOWER AND WATER HEATER - B4982

10



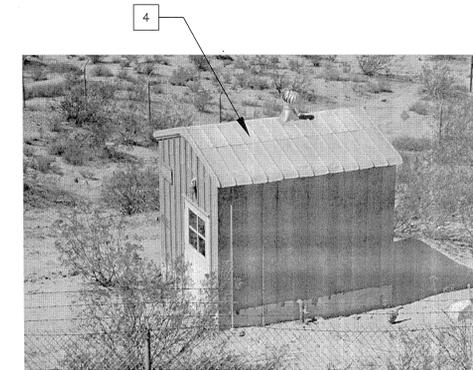
HVAC - B4720

7



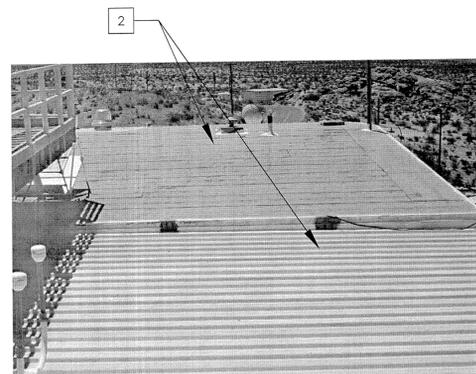
GENERATOR AND FUEL TANK - B4720

4



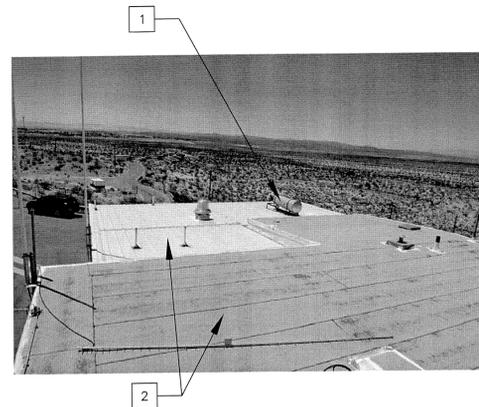
PUMP HOUSE B4983

1



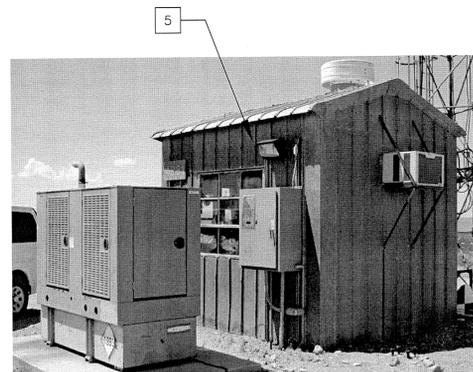
SOUTH ROOF - B4982

14



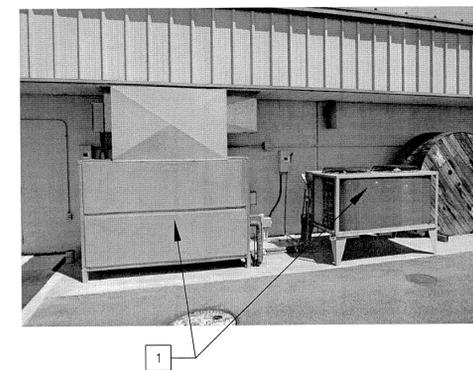
SOUTH ROOF - B4982

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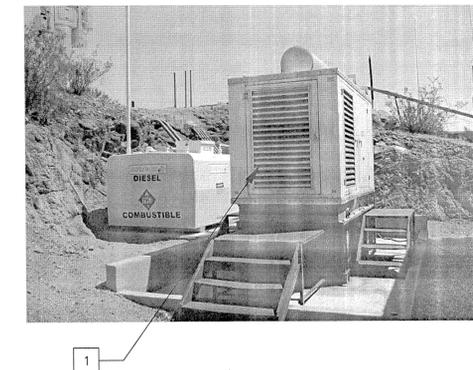
BORE SITE B4981

8



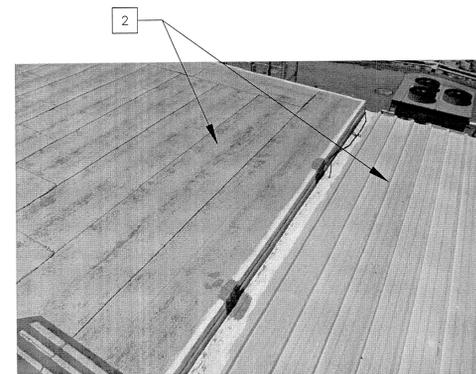
MECHANICAL EQUIPMENT - B4720

5



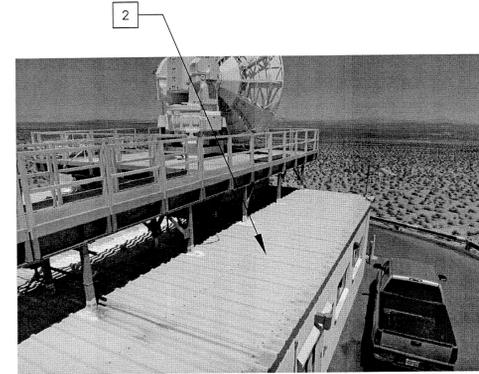
GENERATOR AND FUEL TANK - B4720

2



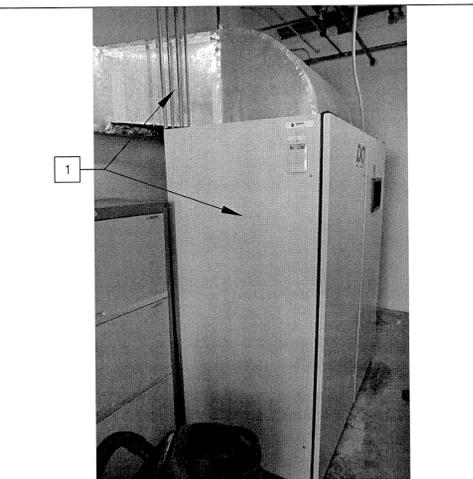
WEST ROOF - B4982

15



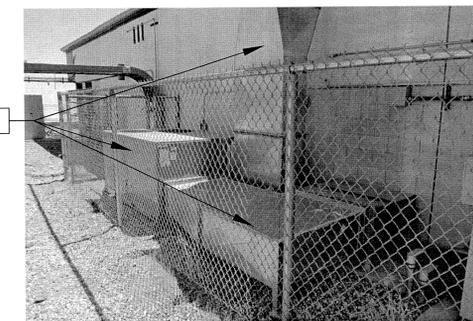
NORTH ROOF - B4982

12



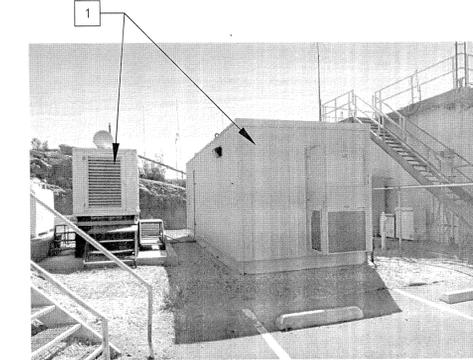
MECH EQUIPMENT - B4982

9



HVAC UNIT - B4720

6



UPS ENCLOSURE - B4720

3

KEYNOTES

- 1 REMOVE MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AS INDICATED - SEE SHEETS M2, M4, P2, E2 & E6
- 2 DEMOLISH ROOFING AND SHEATHING, PREPARE SURFACE FOR NEW INSULATION/ROOF - SEE SHEET A4 (BID OPTION 1)
- 3 NOT USED
- 4 (E) PUMP HOUSE TO BE DEMOLISHED AND REPLACED. SEE DETAIL 1/A10 (BID OPTION 6)

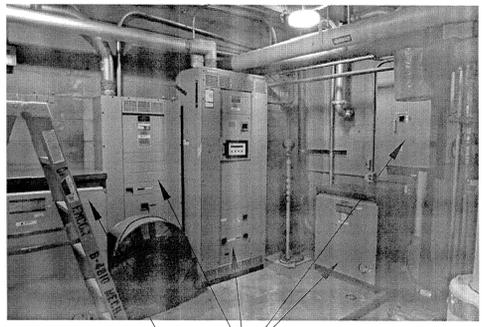
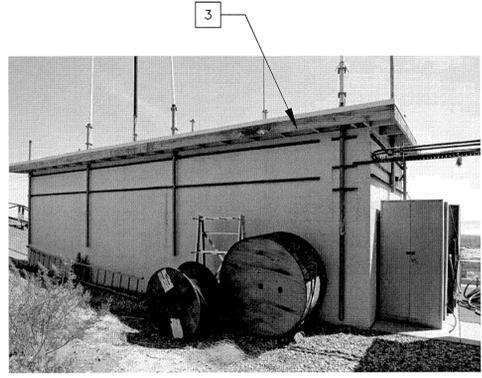
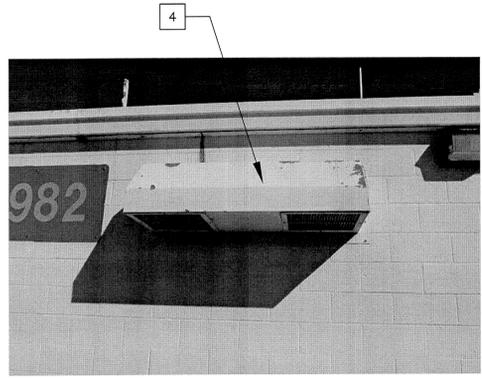
- 5 BORE SITE BUILDING TO BE DEMOLISHED AND REPLACED. SEE SHEET DETAIL 2/A10 (OPTION 2)



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Santa Ana, California 92701
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DATE	SYM	REVISION	BY	A'PD
5/9/14	E	FINAL DESIGN		
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6/21/13	B	30% PRELIMINARY DESIGN		
12/21/12	A	15% CONCEPT DESIGN		

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ARMSTRONG FLIGHT RESEARCH CENTER EDWARDS, CA		APPROVALS Chief, Facilities Engineering & Asset Mgmt. Office <i>Da. Howdy</i> 7-10-15 Project Requester/Customer <i>St. Deheret</i> 2-10-15 Facilities Project Manager <i>Stanford Beckton</i> 1-27-15 Chief, Office of Protection Services <i>[Signature]</i> 1-28-15 Chief - Safety, Health and Environmental Office <i>[Signature]</i> 1-27-15 Public and Information Officer <i>[Signature]</i> 3 Feb 15	
DRAWING TITLE		DATE PRINTED: 5/9/14	
PROJECT TITLE		SCALE: AS NOTED	
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE		TRADE: EDM-1728	
FILE NAME		SHEET No. 13 of 18	



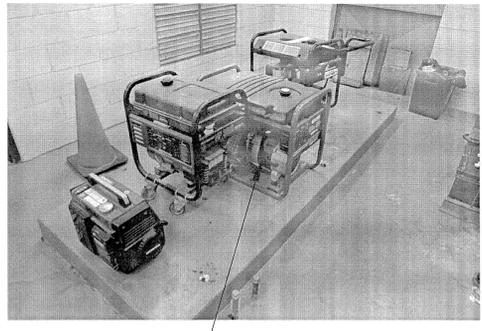
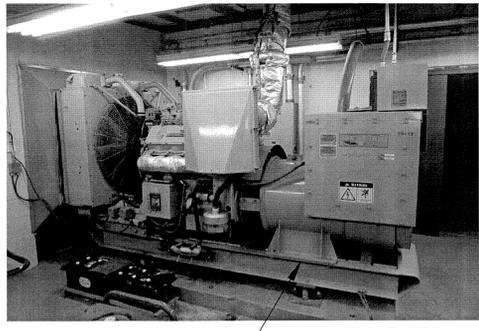
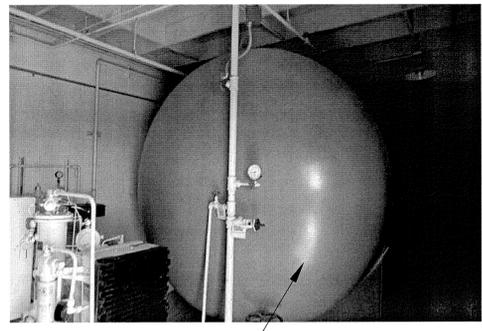
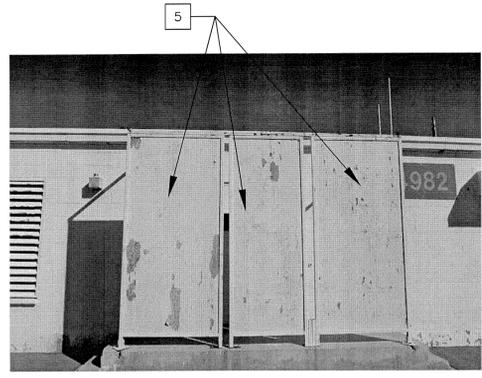
NOT USED 28

HVAC HOOD 25

TANK/PUMP BUILDING - B4720 22

UPS/BATTERIES - B4982 19

ELECTRICAL EQUIPMENT - B4982 16



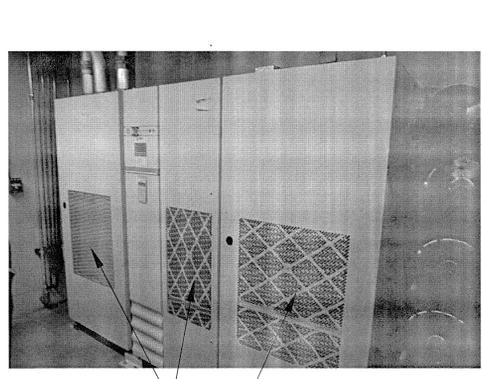
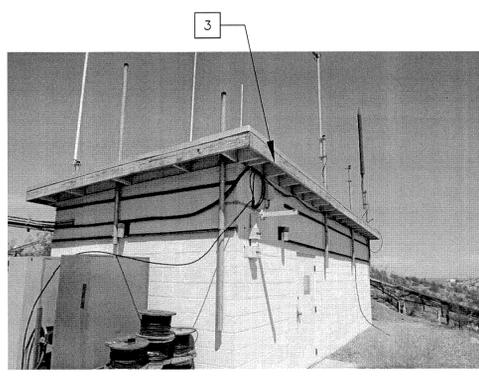
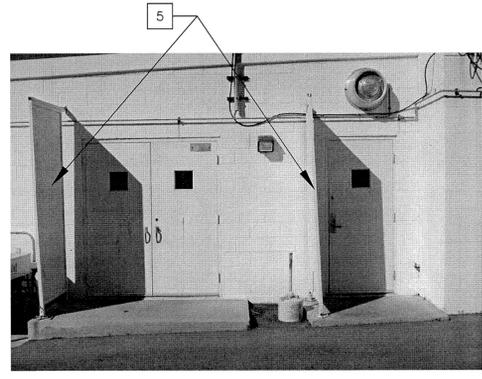
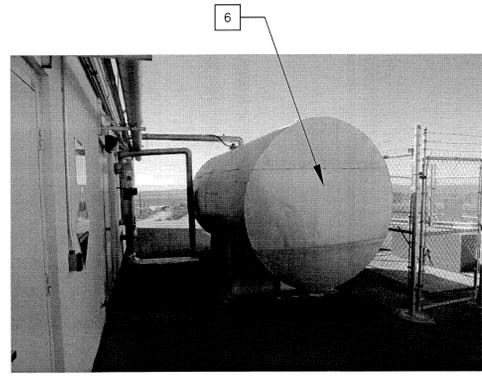
NOT USED 29

PLYWOOD WIND GUARDS 26

TANK/PUMP BUILDING - B4720 23

(E) GENERATOR - B4982 20

EQUIPMENT PAD - B4982 17



NOT USED 30

FIRE WATER TANK 27

PLYWOOD WIND GUARDS 24

TANK/PUMP BUILDING - B4720 21

UPS/BATTERIES - B4982 18

KEYNOTES

1 REMOVE MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AS INDICATED - SEE SHEETS M2, M4, P2, E2 & E6

2 RE-USE EXISTING CONCRETE PAD FOR (N) ENGINE GENERATOR - SEE SHEET A4. PORTABLE GENERATORS SHOWN TO BE REMOVED BY GOVERNMENT PRIOR TO CONSTRUCTION.

3 REMOVE (E) ROOF AND TANK AT ACCESSORY BUILDING AT B4720 SITE FOR REPLACEMENT OF TANK SEE SHEETS A5 AND P6. PROVIDE NEW WATER TANK AND FOOTINGS - SEE SHEET P5 FOR TANK. SUBMIT FOOTING DESIGN BASED ON SPECIFIC TANK PROVIDED. FOOTING DESIGN MUST BE PREPARED AND STAMPED BY A CALIFORNIA LICENSED STRUCTURAL ENGINEER. SEE SHEET A11 FOR STRUCTURAL CRITERIA. (TANK REPLACEMENT IS BID OPTION 3)

4 DEMOLISH HVAC DUCT HOOD AT EXTERIOR WALL APPROX. 54" X 16" V.I.F.

5 DEMOLISH (E) PLYWOOD PANEL IN (E) METAL FRAME.

6 REMOVE AND REPLACE 2000 GALLON TANK - SEE SHEETS P2 AND P3 (BID OPTION 7)

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DATE	SYM	REVISION	BY	A/DPD
5/9/14	E	FINAL DESIGN		
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12/21/12	A	15% CONCEPT DESIGN		

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 EDWARDS, CA

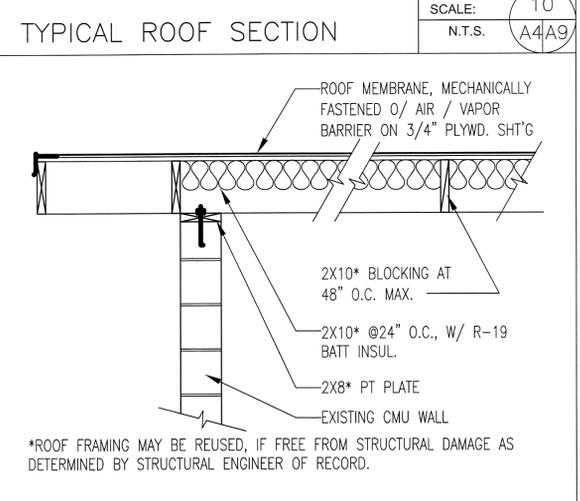
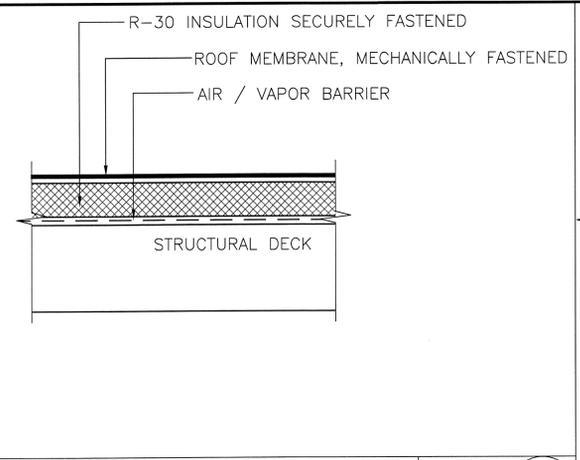
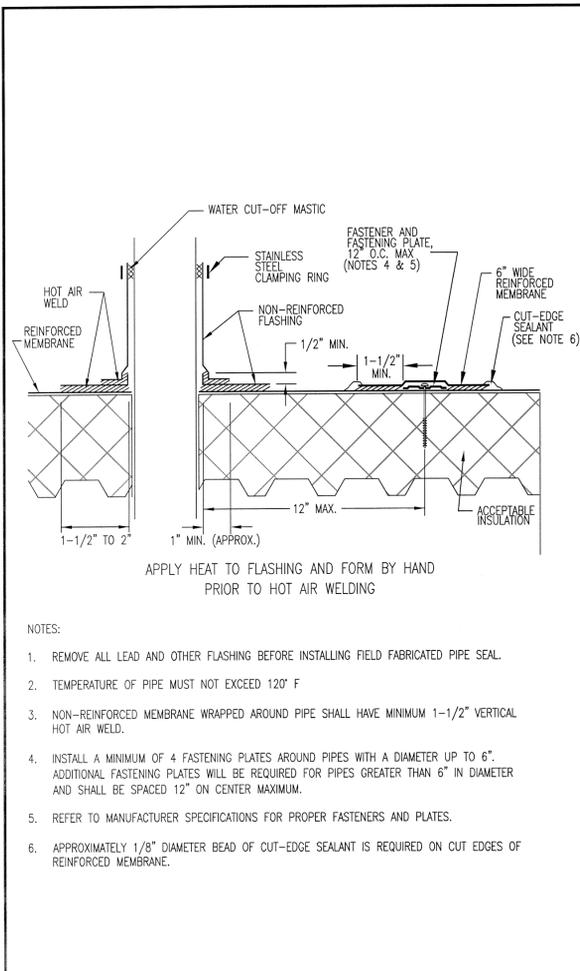
APPROVALS

APPROVALS	DATE
Chief, Facilities Engineering & Maint Mgmt. Office	7-10-15
Project Regulator/Contractor	2-10-15
Facilities Project Manager	1-27-15
Chief, Office of Acquisitive Services	1-28-15
Chief - Safety, Health and Environmental Office	1-27-15
Office of Information Officer	3 Feb 15

DRAWING TITLE
 PHOTO DETAILS

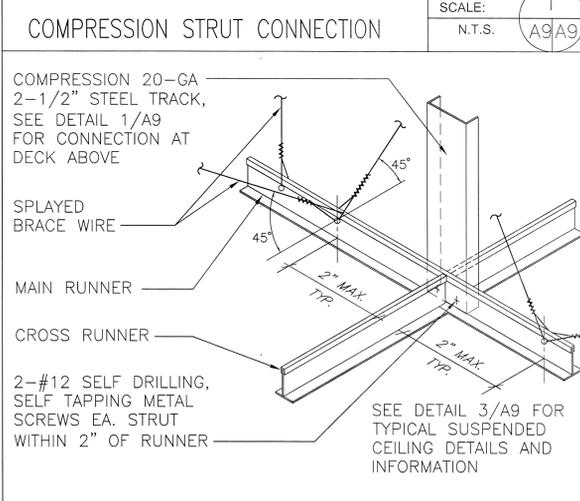
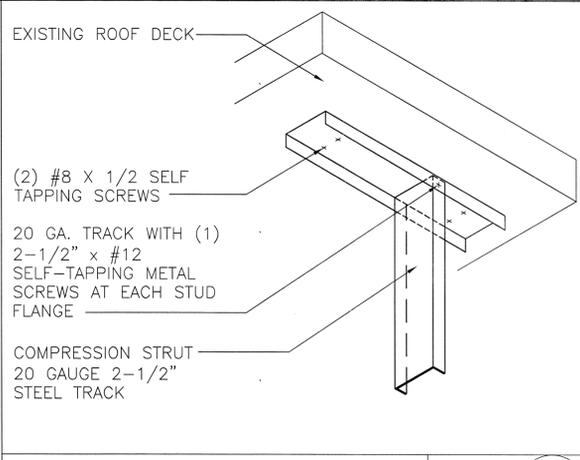
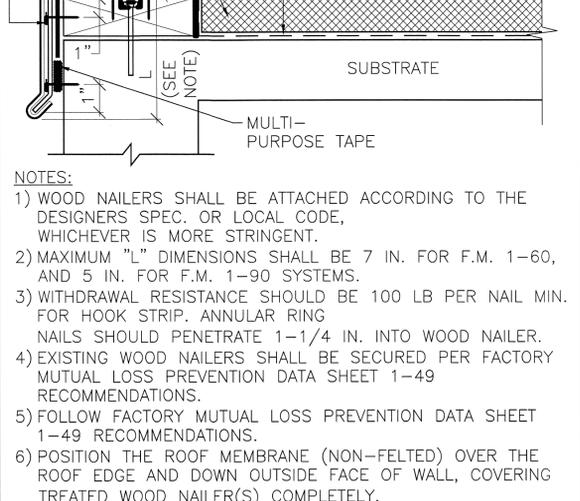
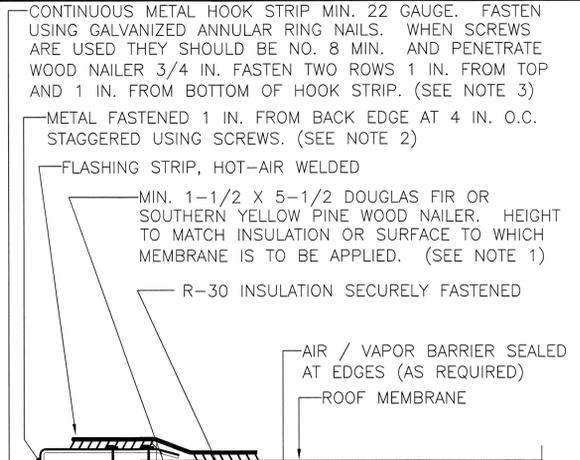
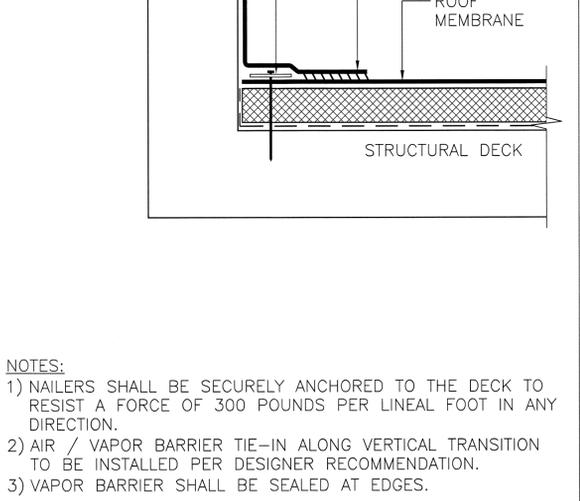
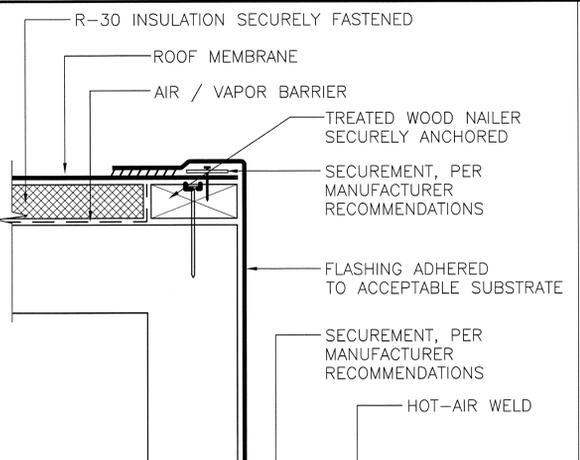
PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

DATE STRTD: 5/9/14 DATE PRINTD: 5/9/14
 DRAWN BY: DIM TRADE: EDM-1728
 SCALE: AS NOTED SHE. No. 14 of 48
 FILE NAME: A8



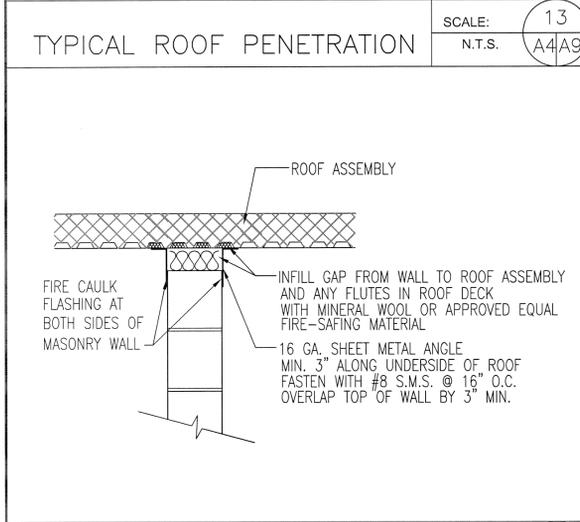
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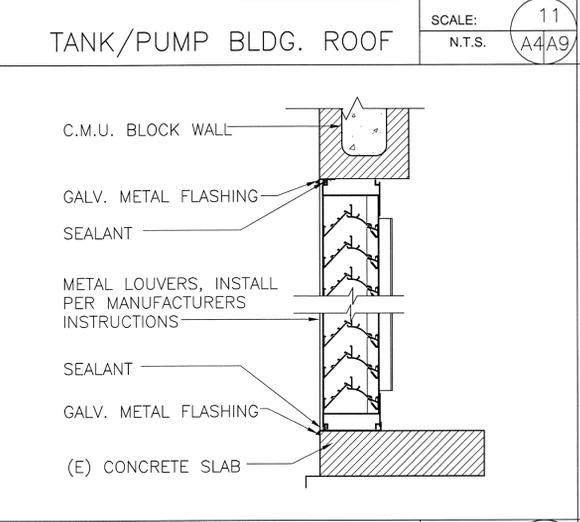
COMPRESSION STRUT CONNECTION

SCALE: 1
N.T.S. A9/A9



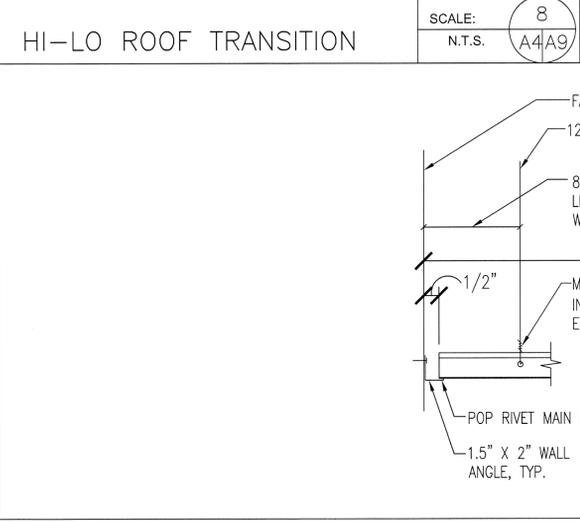
TYPICAL ROOF PENETRATION

SCALE: 13
N.T.S. A4/A9



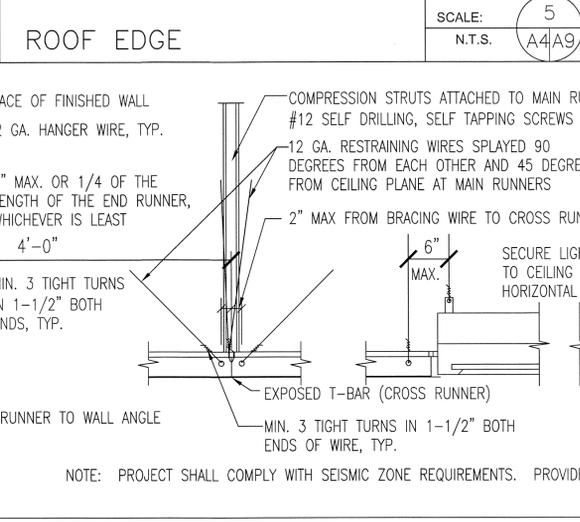
TANK/PUMP BLDG. ROOF

SCALE: 11
N.T.S. A4/A9



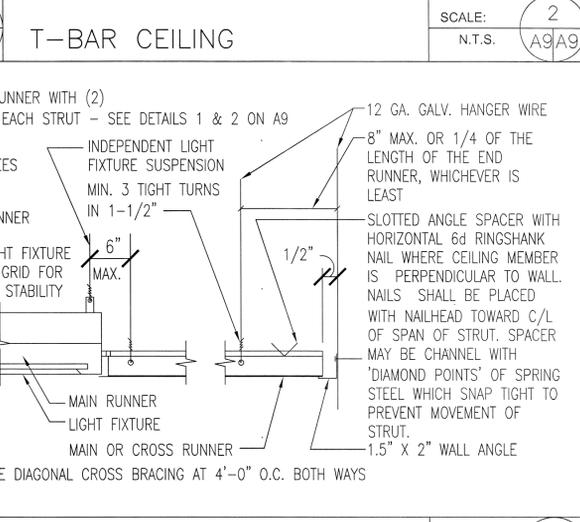
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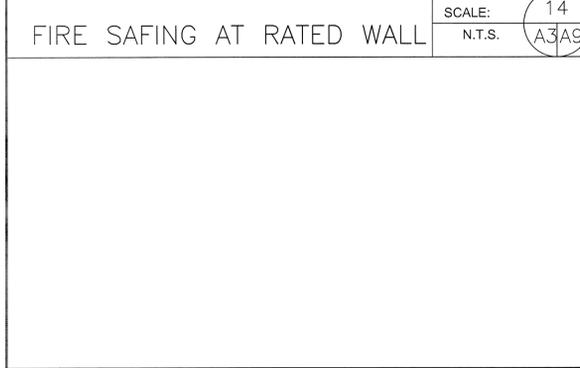
ROOF EDGE

SCALE: 5
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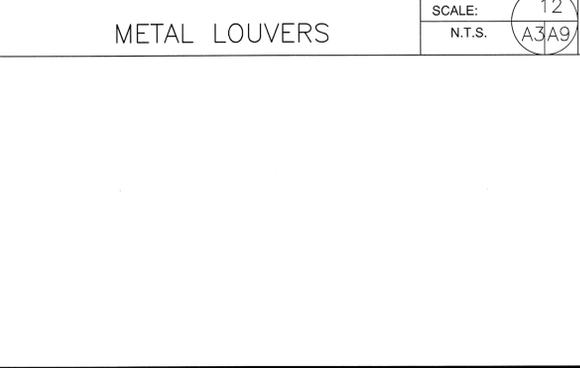
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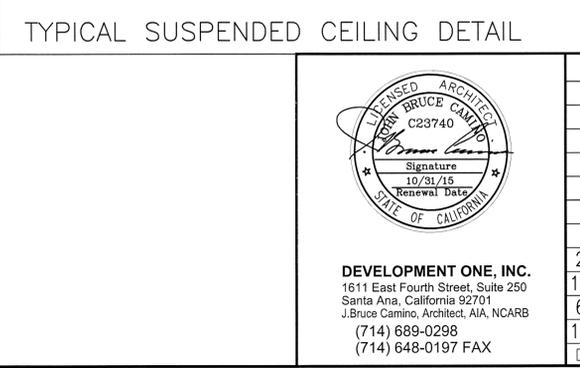
FIRE SAFING AT RATED WALL

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N.T.S. A3/A9



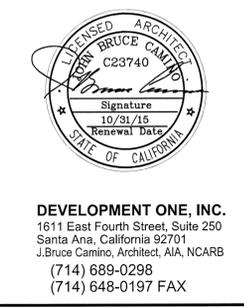
METAL LOUVERS

SCALE: 12
N.T.S. A3/A9



TYPICAL SUSPENDED CEILING DETAIL

SCALE: 3
N.T.S. A3/A9



5/9/14	E	FINAL DESIGN			
2/24/14	D	100% DESIGN			
10/27/13	C	60% DEVELOPED DESIGN			
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12/21/12	A	15% CONCEPT DESIGN			
DATE	SYM	REVISION	BY	A'PD	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ARMSTRONG FLIGHT RESEARCH CENTER
EDWARDS, CA

APPROVALS

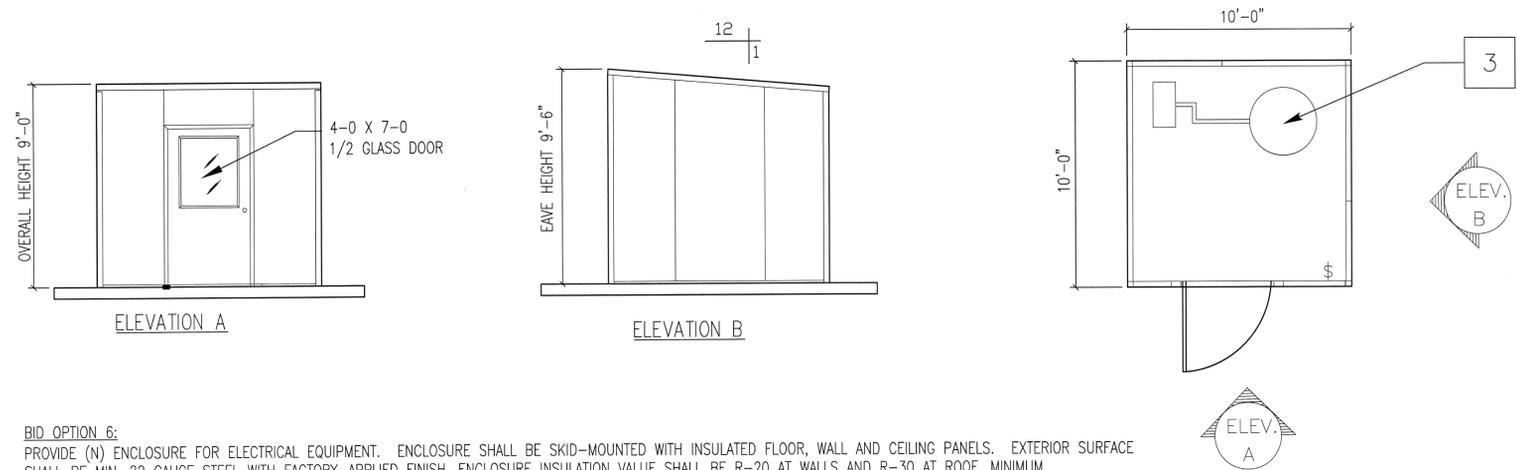
Chief, Facilities Engineering & Asset Mgmt. Office	DATE
<i>[Signature]</i>	7-10-15
Project Manager/Designer	
<i>[Signature]</i>	2-10-15
Facilities Project Manager	
<i>[Signature]</i>	1-27-15
Chief, Office of Protective Services	
<i>[Signature]</i>	1-28-15
Chief - Safety, Health and Environmental Office	
<i>[Signature]</i>	1-27-15
OP&E Chief Information Officer	
<i>[Signature]</i>	3Feb15

DRAWING TITLE
DETAILS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

DATE STRD: 5/8/14
DATE PRINTD: 5/8/14
DRAWN BY: DRW
SCALE: AS NOTED
FILE NAME: A9
SHEET No. 15 of 48

DEVELOPMENT ONE, INC.
1611 East Fourth Street, Suite 250
Santa Ana, California 92701
J. Bruce Camino, Architect, AIA, NCARB
(714) 689-0298
(714) 648-0197 FAX



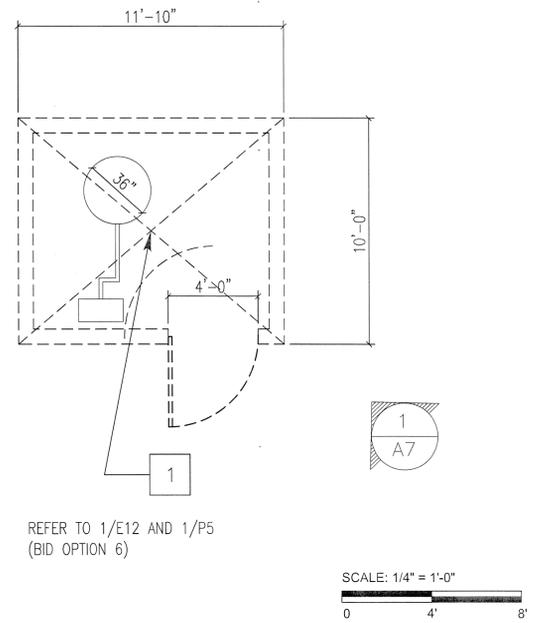
BID OPTION 6:
 PROVIDE (N) ENCLOSURE FOR ELECTRICAL EQUIPMENT. ENCLOSURE SHALL BE SKID-MOUNTED WITH INSULATED FLOOR, WALL AND CEILING PANELS. EXTERIOR SURFACE SHALL BE MIN. 22 GAUGE STEEL WITH FACTORY-APPLIED FINISH. ENCLOSURE INSULATION VALUE SHALL BE R-20 AT WALLS AND R-30 AT ROOF, MINIMUM.

ENCLOSURE SHALL BE DESIGNED FOR A WIND LOAD OF 90 MPH, EXPOSURE 'D', AND FOR THE WEIGHT OF THE SPECIFIC ELECTRICAL EQUIPMENT TO BE INSTALLED.

ENCLOSURE SHALL INCLUDE INTERIOR LIGHTING, POWER CONNECTIONS FOR THE EQUIPMENT TO BE INSTALLED AND ONE ADDITIONAL CONVENIENCE ELECTRICAL OUTLET. SHOW ALL ELECTRICAL ITEMS IN SHOP DRAWINGS.

CONTRACTOR SHALL PROVIDE COORDINATION DRAWINGS SHOWING EQUIPMENT TO BE INSTALLED AND REQUIRED CLEARANCES. CONTRACTOR SHALL PROVIDE DETAILS FOR ANCHORING ENCLOSURE TO EXISTING CONCRETE PAD. ANCHORAGE DETAILS SHALL BE STAMPED BY CALIFORNIA LICENSED STRUCTURAL ENGINEER.

NOTE: SEE DETAILS 3/E12 AND 2/P5 FOR EQUIPMENT REQUIREMENTS.



PUMP HOUSE B4983

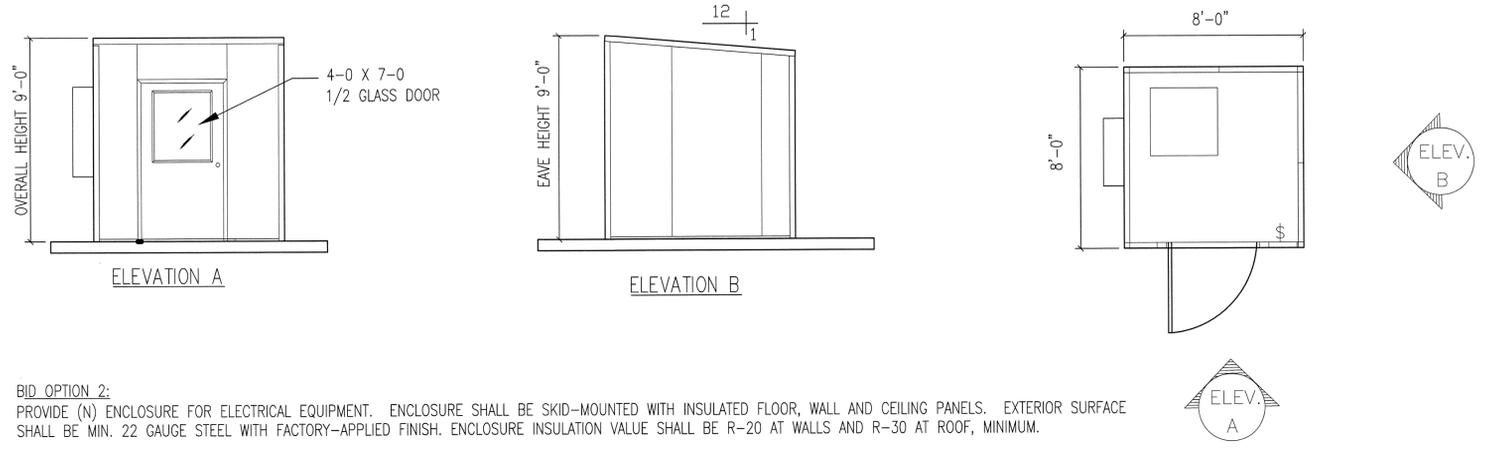
SCALE:
1/4" = 1'-0"

3

PUMP HOUSE B4983 DEMOLITION

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

1



BID OPTION 2:
 PROVIDE (N) ENCLOSURE FOR ELECTRICAL EQUIPMENT. ENCLOSURE SHALL BE SKID-MOUNTED WITH INSULATED FLOOR, WALL AND CEILING PANELS. EXTERIOR SURFACE SHALL BE MIN. 22 GAUGE STEEL WITH FACTORY-APPLIED FINISH. ENCLOSURE INSULATION VALUE SHALL BE R-20 AT WALLS AND R-30 AT ROOF, MINIMUM.

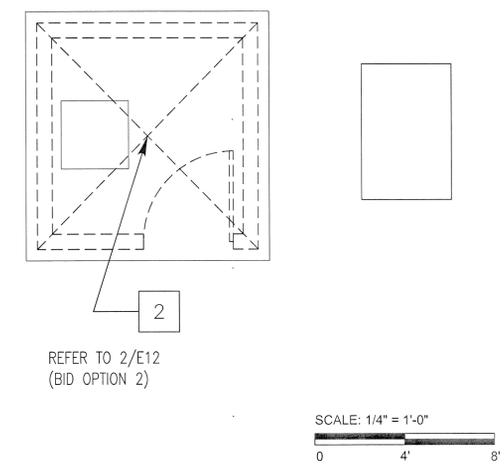
ENCLOSURE SHALL INCLUDE DUAL 1-TON A/C UNIT FACTORY-INSTALLED AND WARRANTED BY ENCLOSURE MANUFACTURER.

ENCLOSURE SHALL BE DESIGNED FOR A WIND LOAD OF 90 MPH, EXPOSURE 'D', AND FOR THE WEIGHT OF THE SPECIFIC ELECTRICAL EQUIPMENT TO BE INSTALLED.

ENCLOSURE SHALL INCLUDE INTERIOR LIGHTING, POWER CONNECTIONS FOR THE EQUIPMENT TO BE INSTALLED AND ONE ADDITIONAL CONVENIENCE ELECTRICAL OUTLET. SHOW ALL ELECTRICAL ITEMS IN SHOP DRAWINGS.

CONTRACTOR SHALL PROVIDE COORDINATION DRAWINGS SHOWING EQUIPMENT TO BE INSTALLED AND REQUIRED CLEARANCES. CONTRACTOR SHALL PROVIDE DETAILS FOR ANCHORING ENCLOSURE TO EXISTING CONCRETE PAD. ANCHORAGE DETAILS SHALL BE STAMPED BY CALIFORNIA LICENSED STRUCTURAL ENGINEER.

NOTE: REFER TO DETAIL 4/E12 FOR ELECTRICAL EQUIPMENT REQUIREMENTS.



BORE SITE B4981

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

4

BORE SITE B4981 DEMOLITION

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

2

KEYNOTES

- 1 DEMOLISH (E) PUMP HOUSE AND CLEAR AREA FOR NEW SKID MOUNTED PUMP AND ENCLOSURE - SEE DETAIL 3 FOR PUMP ENCLOSURE AND P5 FOR PUMP AND TANK REQUIREMENTS. PUMP HOUSE REPLACEMENT SCOPE IS BID OPTION 6.
- 2 DEMOLISH (E) BORE SITE BUILDING TO CONCRETE PAD .- SEE DETAIL 4 FOR EQUIPMENT ENCLOSURE. RELOCATE (E) ELECTRICAL EQUIPMENT TO (N) ENCLOSURE. BORE SITE BUILDING REPLACEMENT SCOPE IS BID OPTION 2.
- 3 PROVIDE NEW WATER TANK AND FOOTINGS - SEE SHEET P5 FOR TANK. SUBMIT FOOTING DESIGN BASED ON SPECIFIC TANK PROVIDED. FOOTING DESIGN MUST BE PREPARED AND STAMPED BY A CALIFORNIA LICENSED STRUCTURAL ENGINEER. SEE SHEET A11 FOR STRUCTURAL CRITERIA. (TANK REPLACEMENT IS BID OPTION 6)



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DATE	SYM	REVISION	BY	A/PD
5/9/14	E	FINAL DESIGN		
2/24/14	D	100% DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
6/21/13	B	30% PRELIMINARY DESIGN		
12/21/12	A	15% CONCEPT DESIGN		

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 ARMSTRONG FLIGHT RESEARCH CENTER
 EDWARDS, CA

DRAWING TITLE
 BORE SITE AND PUMP HOUSE

PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS	DATE
Chief, Facilities Engineering & Asset Mgmt. Office <i>Don Howry</i>	7-10-15
Project Requestor/Customer <i>J.A. Acheret</i>	2-10-15
Facilities Project Manager <i>Stacy Jackson</i>	1-27-15
Chief, Office of Infrastructure Services <i>[Signature]</i>	1-28-15
Chief - Safety, Health and Environmental Office <i>[Signature]</i>	1-27-15
Space Flight International Officer <i>[Signature]</i>	3Feb15

DATE STRICD: [] DATE PRINTD: 5/9/14

DRAWN BY: [] DRW: EDM-1728

SCALE: AS NOTED TRADE SH. No. []

FILE NAME: A10 SHEET No. 16 of 48

GENERAL

- THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE, AND SHALL BE RESPONSIBLE FOR CONDITIONS OF ALL WORK AND MATERIALS INCLUDING THOSE FURNISHED BY SUB-CONTRACTORS. STRUCTURAL ENGINEER OF RECORD SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
- ALL MATERIALS AND WORKMANSHIP SHALL BE PERFORMED IN ACCORDANCE WITH 2013 CALIFORNIA BUILDING CODE.
- ALL DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE SHOWN ON PLANS, SECTIONS AND DETAILS.
- NOTES AND DETAILS ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
- WHERE NO DETAILS SHOWN OR NOTED ON THE DRAWINGS, THE DETAILS SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
- OPENINGS, POCKETS, SLEEVES, ETC., SHALL NOT BE PLACED IN SLABS, BEAMS, WALLS, COLUMNS AND FOOTINGS UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS.
- THIS SET OF DRAWINGS REPRESENT THE FINISHED STRUCTURE, METHOD OF CONSTRUCTION NOT NECESSARY INDICATED, THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE, WORKERS AND OTHER PERSONS DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE BUT NOT BE LIMITED TO BRACING, SHORING, SCAFFOLDING, ETC.

FOUNDATION

- THE SOILS BEARING PRESSURE = 1,500 p.s.f.
- SUBGRADE SHALL BE 2" SAND OVER AND BELOW POLYETHYLENE FILM VAPOR BARRIER.
- SIDE OF FOUNDATION MAY BE POURED AGAINST STABLE EARTH UNLESS SHOWN OR NOTED OTHERWISE.
- CONTRACTOR SHALL PROVIDE TEMPORARY AND PERMANENT DEWATERING FOR EITHER SURFACE WATER, GROUND WATER OR SEEPAGE WATER.

CONCRETE

- ALL CONCRETE SHALL BE NORMAL WEIGHT CONFORMING TO THE FOLLOWING:

LOCATION	28-DAY MIN. COMPRESSIVE STRENGTH	MAXIMUM AGGREGATE SIZE (IN.)	MIX DESIGN SLUMP (INCHES)
A. ALL CONC. WORKS	4000 psi	1	3 (4" MAX)
- ALL CONCRETE MIX DESIGN SHALL BE REVIEWED BY THE ENGINEER PRIOR TO CONSTRUCTION.
- PORTLAND CEMENT SHALL CONFORM TO ASTM C-150, TYPE V CEMENT WITH WATER-CEMENT RATIO OF 0.45
- AGGREGATE SHALL CONFORM TO ASTM C-33.
- WATER SHALL BE CLEAN, FREE FROM DELETERIOUS AMOUNTS OF ACIDS, ALKALIS OR ORGANIC MATERIALS, OILS, SALTS AS PER ACI 318.
- NOT USED.
- UNLESS SHOWN OR NOTED OTHERWISE, CONCRETE COVERAGE FOR REINFORCING BAR TO FACE OF BAR SHALL BE AS FOLLOWS:

A. CONCRETE IN CONTACT WITH EARTH, UNFORMED	3"
B. CONCRETE IN CONTACT WITH EARTH, FORMED	2"
C. WALLS	1.5"
D. BEAMS, GIRDERS & COLUMNS (TO TIES OR STIRRUPS)	1.5"
- CONDUIT PLACED IN A CONCRETE SLAB SHALL NOT EXCEED 1/3 OF THE THICKNESS OF THE SLAB AND SHALL BE PLACED BETWEEN THE TOP AND BOTTOM REINFORCING STEEL. MINIMUM CLEAR DISTANCE BETWEEN CONDUITS SHALL BE 6".
- CONSTRUCTION JOINTS: THE SURFACES OF ALL CONSTRUCTION JOINTS SHALL BE CLEAN, FREE FROM LOOSE DEBRIS. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.
- CONCRETE SHALL BE CURED IN ACCORDANCE WITH SECT 1905.11 OF 2013 C.B.C.
- REMOVAL OF CONCRETE FORMS AND SHORES SHALL BE IN ACCORDANCE WITH SECTION 1906.2 OF 2013 C.B.C.
- CONDUITS AND PIPES EMBEDDED IN CONCRETE SHALL COMPLY WITH THE PROVISION OF SECTION 1906.3 OF 2013 C.B.C.
- DESIGN AND CONSTRUCTION OF CONCRETE FORMWORK SHALL CONFORM TO ACI 347 "RECOMMENDED PRACTICE FOR CONCRETE FORMWORK".
- ALL SAW CUTS IN SLAB ON GRADE SHALL BE MADE NOT LATER THAN 24 HOURS AFTER PLACING CONCRETE.

REINFORCING STEEL

- ALL REINFORCING BARS SHALL BE ASTM A-615 GRADE 60 DEFORMED BILLET STEEL BARS, EXCEPT NOTED BELOW:
 - WELDED SMOOTH WIRE FABRIC SHALL CONFORM TO ASTM A-185.
- GRADE 60 BARS SHALL BE MARKED SO ITS IDENTIFICATION CAN BE MADE WHEN THE FINAL IN PLACE INSPECTION IS MADE.
- THE TIE WIRE USED SHALL BE BLACK ANNEALED WIRE, 16 GA. OR HEAVIER.
- BAR SUPPORTS SHALL CONFORM TO THE BAR SUPPORT SPECIFICATIONS CONTAINED IN THE "MANUAL OF STANDARD PRACTICE" BY ACI.
- A CERTIFIED COPY OF MILL TEST ON EACH HEAT OF REINFORCING STEEL DELIVERED SHOWING PHYSICAL AND CHEMICAL ANALYSIS SHALL BE PROVIDED UPON REQUEST AT THE TIME OF SHIPMENT.
- ALL REQUIREMENT OF CONCRETE REINFORCEMENT NOT COVERED ON THE DRAWINGS SHALL BE IN ACCORDANCE WITH ACI "MANUAL OF STANDARD PRACTICE".
- REINFORCING STEEL AT THE TIME OF THE CONCRETE IS PLACED SHALL BE FREE FROM MUD, OIL, OR OTHER NON METALLIC COATINGS THAT ADVERSELY AFFECT BONDING CAPACITY.
- ALL HOOKS SHALL CONFORM TO THE BEND DIMENSION PER ACI "STANDARD HOOK" UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
- REINFORCING BARS SHALL NOT BE BENT OR STRAIGHTENED IN A MANNER THAT WILL INJURE THE MATERIAL.
- REINFORCING BARS SHALL CONFORM ACCURATELY TO THE DIMENSIONS SHOWN ON THE DRAWINGS WITH THE FABRICATING TOLERANCES PER ACI "MANUAL OF STANDARD PRACTICE."
- BARS SHALL BE SECURELY TIED TO PREVENT DISPLACEMENT DURING THE CONCRETE OPERATION AND ALL DOWELS SHALL BE WIRED IN PLACE BEFORE DEPOSITING CONCRETE.
- SPLICES OF REINFORCEMENT SHALL HAVE 42 BAR DIAMETER LAP OR 2'-0" LAP MINIMUM.
- DOWELS BETWEEN FOOTINGS AND WALLS OR COLUMNS SHALL HAVE SAME SIZE AS THE VERTICAL REINFORCEMENT, EMBEDMENT OF DOWELS SHALL BE 36 BAR DIAMETER OR 2'-0" MINIMUM UNLESS OTHERWISE SHOWN.
- MINIMUM LAP OF MESH SHALL BE NOT LESS THAN THE SPACING OF THE CROSS WIRE PLUS TWO INCHES OR 60 DIA. OR 8 IN. WHICHEVER IS GREATER.

EPOXY ANCHORS

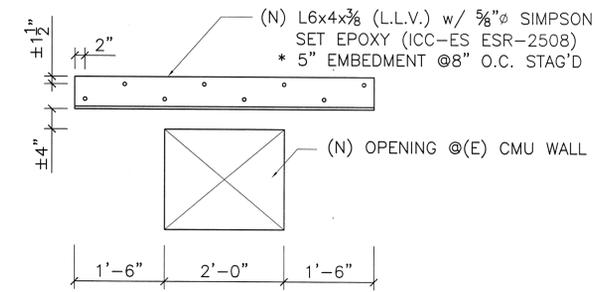
- EPOXY FOR EPOXY ANCHORS SHALL BE SET-XP EPOXY BY "SIMPSON STRONG-TIE" (ICC ER ESR-2508)
- ANCHORS USED FOR EPOXY ANCHORS SHALL BE CARBON STEEL CONFORMING TO ASTM A-307 THREADED RODS UNO. SIZE AND EMBEDMENT SHALL BE AS INDICATED ON PLANS.
- ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE EPOXY MANUFACTURER'S RECOMMENDATIONS AND THE CURRENT ICBO REPORT.
- SPECIAL INSPECTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 1704.13 OF THE IBC AND IN ACCORDANCE WITH THE SPECIFIC SPECIAL INSPECTION REQUIREMENTS SET FORTH IN THE CORRESPONDING ICC REPORT.
- DRILLED HOLES SHALL BE CLEANED OF DUST AND ANY DEBRIS USING NYLON BRUSH AND COMPRESSED AIR. OIL, SCALE, AND RUST SHALL BE REMOVED FROM THREADED RODS PRIOR TO INSTALLATION.
- UNLESS NOTED OTHERWISE IN THE PLANS, EPOXY ANCHORS SHALL HAVE THE FOLLOWING MINIMUM EMBEDMENT

BAR SIZE	MINIMUM EMBEDMENT*	REMARKS
#3	3 1/2"	
#4 OR 1/2"Ø	4 1/4"	
#5 OR 5/8"Ø	5 1/2"	
#6 OR 3/4"Ø	6 3/4"	

* UNLESS NOTED OR DETAILED

WELDING

- ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS QUALIFIED AND CERTIFIED IN ACCORDANCE WITH THE QUALIFICATION PROCEDURE OF AWS.
- ALL WELDING SHALL BE ACCOMPLISHED USING THE SHIELDED METAL ARC WELDING PROCESS (SMAW) WITH E70XX ELECTRODES OR THE SUBMERGED ARC WELDING PROCESS (SAW) WITH E7X-E8XX ELECTRODES OR THE FLUX-CORED ARC WELDING PROCESS (FCAW) WITH E71T-B ELECTRODES (E70T-4 ELECTRODES ALLOWED FOR SHOP WELDING ONLY). LOW HYDROGEN ELECTRODES SHALL BE USED AND KEPT DRY, AND PARENT METALS SHALL BE PREHEATED IN ACCORDANCE WITH AWS STANDARDS.
- ALL WELDING SHALL BE UNDER CONTINUOUS SPECIAL INSPECTION BY A REGISTERED SPECIAL INSPECTOR, EXCEPT WELDING DONE IN A BUILDING DEPARTMENT APPROVED FABRICATOR'S SHOP IN ACCORDANCE WITH 2010 CBC. WELDING INSPECTION MAY BE PERIODIC WHERE ALLOWED BY 2010 CBC. WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS. WELDERS SHALL HAVE LIGHT GAUGE STEEL CERTIFICATION WHEN WELDING LIGHT GAUGE STEEL.
- FULL PENETRATION WELDED CONNECTIONS (100%) AT MOMENT FRAMES, BRACED FRAMES, AND ALL FULL PENETRATION FIELD WELDS SHALL HAVE ULTRASONIC TESTING FOR COMPLIANCE WITH CBC 2010, OF THE UNIFORM BUILDING CODE. ULTRASONIC TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING AGENCY THAT HAS BEEN INSPECTED BY THE NATIONAL STANDARDS. TESTING INSPECTIONS SHALL BE QUALIFIED BY ASNT BUREAU OF RECOMMENDED PRACTICE SNT-TC-A1. PROVIDE SURFACE PREPARATION AND BACKUP PLATES AS REQUIRED PER AISC AND AWS.
- WELDING OF REINFORCING BARS SHALL BE DONE USING E 90XX ELECTRODES AND SHALL BE DONE ON A 706 REINFORCING STEEL ONLY. THE A 706 TYPE REINFORCING BARS SHALL BE IDENTIFIED BY THE SPECIAL INSPECTOR PRIOR TO WELDING IN THE FIELD. WELDING OF REINFORCING BARS SHALL CONFORM WITH AWS D1.4.
- WELD MATERIAL SHOULD BE ABLE TO ABSORB 20 "FOOT POUNDS" OF IMPACT AT MINUS TWENTY DEGREES FAHRENHEIT. FILLER METAL SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
 - SMAW - AWS A5.1 & A5.5
 - SAW - AWS A5.17 & A5.23
 - FCAW - AWS A5.29
- ALL EXPOSED WELDS SHALL BE FILLED AND GROUND SMOOTH WHERE METAL COULD COME IN CONTACT WITH THE PUBLIC.
- ALL WELDS SHOWN AS FULL PENETRATION (F.P.) SHALL BE FULLY DETAILED ON THE SHOP DRAWINGS.
- WELDING PROCEDURES, WELDER QUALIFICATION REQUIREMENTS AND WELDING ELECTRODES FOR STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF 2010 CBC.
- STEEL USED IN WELDING STRUCTURES SHALL CONFORM TO THE LIMITATIONS ON CHEMICAL PROPERTIES SPECIFIED IN THE LATEST EDITIONS OF AWS D1.1 AND D1.3 OF THE STRUCTURAL WELDING CODE - STEEL. PUBLISHED BY THE AMERICAN WELDING SOCIETY. NO WELDED SPLICES SHALL BE MADE EXCEPT THOSE SHOWN ON APPROVED PLAN.
- THE WELDING OF REINFORCING STEEL, METAL, INSERTS AND CONNECTIONS IN REINFORCED CONCRETE CONSTRUCTION SHALL CONFORM TO CBC STANDARD NO. 19-1.



MASONRY OPENING REINFORCEMENT

SCALE: 1/8" = 1'-0"
N.T.S. A6A1

PROJECT DESIGN CRITERIA

- DESIGN BASED ON 2010 EDITION OF CALIFORNIA BUILDING CODE (CBC).
- SEISMIC DESIGN PARAMETERS (CBC,2010)

CATEGORIZATION/COEFFICIENT	DESIGN VALUE
SITE CLASS	D
SEISMIC DESIGN CATEGORY	D
MAPPED 0.2 SECOND SPECTRAL RESPONSE ACCELERATION S _s	0.990 g
MAPPED ONE SECOND SPECTRAL RESPONSE ACCELERATION S ₁	0.428g
SITE COEFFICIENT FROM TABLE 1613A5.3(1), F _s	0.9
SITE COEFFICIENT FROM TABLE 1613A5.3(2), F _v	1.4
MAX. DESIGN SPECTRAL RESPONSE ACCELERATION FOR SHORT PERIOD, S _{ms}	1.093g
MAX. DESIGN SPECTRAL RESPONSE ACCELERATION FOR ONE-SECOND PERIOD, S _{m1}	0.673 g
DESIGN (5% DAMPED) SPECTRAL RESPONSE ACCELERATION FOR SHORT PERIOD, S _{ds}	0.729g
DESIGN (5% DAMPED) SPECTRAL RESPONSE ACCELERATION FOR ONE-SECOND PERIOD, S _{d1}	0.449g

- BASIC WIND SPEED = 110 MPH
EXPOSURE = C
IMPORTANT FACTOR I = 1.0

<p>DEVELOPMENT ONE, INC. 1611 East Fourth Street, Suite 250 Santa Ana, California 92701 J.Bruce.Campino, Architect, AIA, NCAARB (714) 689-0298 (714) 648-0197 FAX</p>	<table border="1"> <tr><td>5/9/14</td><td>E</td><td>FINAL DESIGN</td></tr> <tr><td>2/24/14</td><td>D</td><td>100% DESIGN</td></tr> <tr><td>10/27/13</td><td>C</td><td>60% DEVELOPED DESIGN</td></tr> <tr><td>6/21/13</td><td>B</td><td>30% PRELIMINARY DESIGN</td></tr> <tr><td>12/21/12</td><td>A</td><td>15% CONCEPT DESIGN</td></tr> <tr><td>DATE</td><td>SYM</td><td>REVISION</td><td>BY</td><td>A'PD</td></tr> </table>	5/9/14	E	FINAL DESIGN	2/24/14	D	100% DESIGN	10/27/13	C	60% DEVELOPED DESIGN	6/21/13	B	30% PRELIMINARY DESIGN	12/21/12	A	15% CONCEPT DESIGN	DATE	SYM	REVISION	BY	A'PD	<p>NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ARMSTRONG FLIGHT RESEARCH CENTER EDWARDS, CA</p>	<p>APPROVALS</p> <table border="1"> <tr><td>Chief, Facilities Engineering & Asset Mgmt. Office</td><td>7-10-15</td></tr> <tr><td>Project Registrar/Engineer</td><td>2-10-15</td></tr> <tr><td>Facilities Project Manager</td><td>1-27-15</td></tr> <tr><td>Chief, Office of Protective Services</td><td>1-28-15</td></tr> <tr><td>Chief - Safety, Health and Environmental Office</td><td>1-27-15</td></tr> <tr><td>ASST. Chief Information Officer</td><td>3 Feb 15</td></tr> </table>	Chief, Facilities Engineering & Asset Mgmt. Office	7-10-15	Project Registrar/Engineer	2-10-15	Facilities Project Manager	1-27-15	Chief, Office of Protective Services	1-28-15	Chief - Safety, Health and Environmental Office	1-27-15	ASST. Chief Information Officer	3 Feb 15	<p>DATE PRINTED: 5/9/14</p>
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		<p>DRAWING TITLE STRUCTURAL NOTES</p>	<p>PROJECT TITLE REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE</p>	<p>EDM-1728 SHEET No. 17 of 48</p>																																

ABBREVIATIONS

NOTE: ABBREVIATIONS LISTED ARE FOR GENERAL USE. DISREGARD THOSE WHICH ARE NOT USED ON DRAWING.

ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION
ACCH	AIR COOLED CHILLER	LF	LINEAR FEET
ACCU	AIR COOLED CONDENSING UNIT	LRA	LOOKED ROTOR AMPS
AF	AIR FOIL	LWB	LEAVING WET BULB
AFC	ABOVE FINISHED CEILING	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MBH	1000 BTU PER HOUR
AFG	ABOVE FINISHED GRADE	MCA	MINIMUM CIRCUIT AMPACITY
AHU	AIR HANDLING UNIT	MD	MOTORIZED DAMPER
AMPS	AMPERES	MFR	MANUFACTURER
APD	AIR PRESSURE DROP	MIN	MINIMUM
BD	BACKDRAFT DAMPER	(N)	NEW
BFF	BELOW FINISHED FLOOR	NTS	NOT TO SCALE
BLDG	BUILDING	OA	OUTSIDE AIR
BOD	BOTTOM OF DUCT	OBD	OPPOSED BLADE DAMPER
BTU	BRITISH THERMAL UNIT	ODD	OUTSIDE DIAMETER
CD	CONDENSATE DRAIN	P.D	PRESSURE DROP
CFH	CUBIC FEET PER HOUR	POC	POINT OF CONNECTION
CFM	CUBIC FEET PER MINUTE	PSI	POUNDS PER SQUARE INCH
CFSD	COMBINATION FIRE/SMOKE DAMPER	QTY	QUANTITY
CW	COLD WATER	RA	RETURN AIR
DB	DRY BULB	RCP	REFLECTED CEILING PLAN, REINFORCED CONCRETE PIPE
dB	DECIBEL	REQD	REQUIRED
DC	DIRECT CURRENT	RH	RELATIVE HUMIDITY
DEG	DEGREES	RHG	REFRIGERANT HOT GAS
DIA	DIAMETER	RL	REFRIGERANT LIQUID
DIM	DIMENSION	RLA	RUNNING LOAD AMPS
DISC	DISCONNECT	RPM M	REVOLUTIONS PER MINUTE MOTOR
DN	DOWN	RPM F	REVOLUTIONS PER MINUTE FAN
DWG(S)	DRAWING(S)	RTU	ROOF TOP UNIT
DX	DIRECT EXPANSION	SA	SUPPLY AIR
EA	EXHAUST AIR, EACH	SF	SQUARE FEET / SUPPLY FAN
EAT	ENTERING AIR TEMPERATURE	SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION
EDB	ENTERING DRY BULB	SP	STATIC PRESSURE
EF	EXHAUST FAN	SPEC	SPECIFICATION
EFF	EFFICIENCY	SO	SQUARE
ESP	EXTERNAL STATIC PRESSURE	SS	STAINLESS STEEL, SANITARY SEWER, SERVICE SINK
EMB	ENTERING WET BULB	T	TEMPERATURE, THERMOSTAT
EXH	EXHAUST	TDH	TOTAL DYNAMIC HEAD
EXIST. (E)	EXISTING	TG	TRANSFER GRILLE
FC	FAN COIL	THRU	THROUGH
FD	FIRE DAMPER	TSP	TOTAL STATIC PRESSURE
FPI	FINS PER INCH	TYP	TYPICAL
FT	FOOT, FEET	U/C	UNDERCUT
F	DEGREES FAHRENHEIT	V	VOLT
GC	GENERAL CONTRACTOR	VA	VOLT-AMPERE
GPM	GALLONS PER MINUTE	VD	VOLUME DAMPER
HD	HEAD, HUB DRAIN	W	WATT, WIDTH
HP	HORSEPOWER, HEAT PUMP	W/O	WITHOUT
HTG	HEATING	WB	WET BULB
HZ	HERTZ	WC	WATER COLUMN
ID	INSIDE DIAMETER	XFR	TRANSFORMER
IN	INCH		
IN WG	INCHES WATER GAUGE		
IN WC	INCHES OF WATER COLUMN		
L	LENGTH		
LAT	LEAVING AIR TEMPERATURE		
LB(S),#	POUND(S)		
LDB	LEAVING DRY BULB		

GENERAL & PIPING LEGEND

NOTE: SYMBOLS LISTED ARE FOR GENERAL USE. DISREGARD THOSE WHICH ARE NOT USED ON DRAWING.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	EXISTING TO REMAIN		BALL VALVE
	EXISTING TO BE DEMOLISHED		BUTTERFLY VALVE
	EXISTING BELOW ROOF		GLOBE VALVE
	NEW		GATE VALVE
	NEW BELOW ROOF		DRAIN VALVE
	MOTOR OPERATED		MANUAL AIR VENT
	PUMP		AUTO AIR VENT
	CHILLED WATER SUPPLY		FLOW CONTROL VALVE
	CHILLED WATER RETURN		THREE-WAY CONTROL VALVE
	CONDENSING WATER SUPPLY		TWO-WAY CONTROL VALVE
	CONDENSING WATER RETURN		MOTORIZED BUTTERFLY VALVE
	HEATING HOT WATER SUPPLY		TRIPLE DUTY VALVE
	HEATING HOT WATER RETURN		CHECK VALVE
	MALE HOSE CONNECTOR		CALIBRATED BALANCING VALVE
	PIPING REDUCER		UNION
	PIPE ANCHOR		GAUGE VALVE
	REFRIGERANT SUCTION		BLIND FLANGE
	PIPE EXPANSION LOOP		GAS COCK
	EXPANSION JOINT		GAS PRESSURE REGULATOR
	FLOW ARROW		GAS SOLENOID VALVE W/H-LO FIRE
	EMS TEMPERATURE SENSOR W/ WELL		RELIEF VALVE
	EMS FLOW METER W/ WELL		UNION
	EMS DIFF. PRESS. SENSOR W WELL		FLOW ARROW
	PADDLE FLOW SWITCH		THERMOMETER W/ WELL
	PRESSURE REDUCING VALVE		DIFFERENTIAL PRESSURE SENSOR
	COMBINATION SMOKE/FIRE DAMPER		PRESSURE GAUGE
	POINT OF CONNECTION		AIR COMPRESSOR
	POINT OF DISCONNECTION		AIR DRYER
	C02 CARBON DIOXIDE SENSOR		ACTUATOR ELECTRIC
	SWS SIDEWALL SUPPLY		APOGEE ETHERNET MICROSERVER
	SWR/SWE SIDEWALL RETURN/EXHAUST		AIR FLOW STATION
	SUPPLY AIR DUCT UP		ANALOG OUTPUT, PNEUMATIC
	RETURN AIR DUCT UP		ACTUATOR PNEUMATIC
	SUPPLY AIR DUCT DOWN		AUX. POWER SUPPLY
	RETURN AIR DUCT DOWN		AUTOMATIC TRAP
	EXHAUST AIR DUCT DOWN		AUTO TANK DRAIN
	SUPPLY AIR DIFFUSER (NEW)		ACTUATOR TEC
	RETURN AIR DIFFUSER (NEW)		AUTOZERO MODULE
	SUPPLY AIR DIFFUSER (EXISTING)		BELL
	RETURN AIR DIFFUSER (EXISTING)		BUS INTERFACE MODULE
	EXHAUST AIR DIFFUSER (EXISTING)		BOILER
	EXHAUST AIR DIFFUSER (EXISTING)		CABLES
	EXHAUST AIR DIFFUSER (EXISTING)		CHECK VALVE
	EXHAUST AIR DIFFUSER (EXISTING)		CONSTRUCTION MATERIALS
	EXHAUST AIR DIFFUSER (EXISTING)		COMPONENT PANEL
	EXHAUST AIR DIFFUSER (EXISTING)		CENTRAL PROCESSING UNIT
	EXHAUST AIR DIFFUSER (EXISTING)		CATHODE RAY TUBE
	EXHAUST AIR DIFFUSER (EXISTING)		CURRENT SWITCH
	EXHAUST AIR DIFFUSER (EXISTING)		CURRENT TRANSDUCER
	EXHAUST AIR DIFFUSER (EXISTING)		C02 TEMP TRANSMITTER ELEC
	EXHAUST AIR DIFFUSER (EXISTING)		CONSTANT VOLUME CONTROLLER DAMPER
	EXHAUST AIR DIFFUSER (EXISTING)		DUAL DUCT CONTROLLER
	EXHAUST AIR DIFFUSER (EXISTING)		DEMAND ENERGY MONITOR
	EXHAUST AIR DIFFUSER (EXISTING)		DEW POINT TRANSMITTER
	EXHAUST AIR DIFFUSER (EXISTING)		DIFFERENTIAL PRESS. REGULATOR
	EXHAUST AIR DIFFUSER (EXISTING)		DIFFERENTIAL PRESSURE SWITCH
	EXHAUST AIR DIFFUSER (EXISTING)		DIFF. PRESS. TRANSMITTER ELEC.
	EXHAUST AIR DIFFUSER (EXISTING)		DIFFERENTIAL PRESSURE PNEUMATIC
	EXHAUST AIR DIFFUSER (EXISTING)		DIGITAL POINT UNIT
	EXHAUST AIR DIFFUSER (EXISTING)		ENTHALPY COMPARTOR
	EXHAUST AIR DIFFUSER (EXISTING)		ELECTRO-PNEUMATIC VALVE
	EXHAUST AIR DIFFUSER (EXISTING)		END SWITCH
	EXHAUST AIR DIFFUSER (EXISTING)		ENTHALPY TRANSMITTER
	EXHAUST AIR DIFFUSER (EXISTING)		EXPANSION PANEL
	EXHAUST AIR DIFFUSER (EXISTING)		FAN
	EXHAUST AIR DIFFUSER (EXISTING)		FUME HOOD CONTROLLER
	EXHAUST AIR DIFFUSER (EXISTING)		FLOW MTR. (FLOW METER STATION)
	EXHAUST AIR DIFFUSER (EXISTING)		FIRE MGMT. SYSTEM
	EXHAUST AIR DIFFUSER (EXISTING)		FLOW SWITCH
	EXHAUST AIR DIFFUSER (EXISTING)		FLOW TRANSMITTER PNEU. GAUGE
	EXHAUST AIR DIFFUSER (EXISTING)		GAUGE
	EXHAUST AIR DIFFUSER (EXISTING)		DDC ELECTRICAL POINT
	EXHAUST AIR DIFFUSER (EXISTING)		DDC PNEUMATIC POINT
	EXHAUST AIR DIFFUSER (EXISTING)		ELECTRICAL TERMINATION
	EXHAUST AIR DIFFUSER (EXISTING)		PNEUMATIC TERMINATION
	EXHAUST AIR DIFFUSER (EXISTING)		STANDARD DDC TERMINATION
	EXHAUST AIR DIFFUSER (EXISTING)		NOTE OR REVISION
	EXHAUST AIR DIFFUSER (EXISTING)		PAGE REFERENCE

GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE, NATIONAL, AND LOCAL BUILDING CODES AND STANDARD, IBC AND UMC.
- PRIOR TO BIDDING, OBTAIN A FULL COPY OF THE PLANS SPECIFICATIONS.
- THESE DRAWINGS ARE DIAGRAMATIC. ACTUAL FIELD CONDITIONS MAY VARY AND MUST BE FIELD VALIDATED AND COORDINATED WITH OTHER TRADES PRIOR TO FABRICATION AND CONSTRUCTION.
- COORDINATE INSTALLATION WITH THE WORK OF OTHER TRADES PRIOR TO STARTING. IN EVENT THAT CONFLICTS ARE FOUND WITH THE WORK OF OTHER TRADES, BRING SUCH CONFLICTS TO THE GOVERNMENT ATTENTION FOR RESOLUTION PRIOR TO PROCEEDING WITH THE WORK IN THAT AREA.
- PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL SUBMIT DETAILED SHOP AND VENDOR DRAWINGS IN ADEQUATE DETAIL, ORGANIZED AND MARKED FOR REVIEW BY CONTRACTING OFFICER.
- CONTRACTOR IS RESPONSIBLE FOR PATCHING AND REPAIRING AREAS, PIPING, DUCTWORK, ETC., EXISTING OR NEW, THAT ARE DAMAGED AS A RESULT OF THE WORK. REPAIR TO MATCH EXISTING CONDITIONS.
- CUTTING OR PENETRATION OF STRUCTURAL MEMBERS IS PROHIBITED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD AND THE PROJECT ARCHITECT/CONTRACTING OFFICER.
- UNIONS SHALL BE PROVIDED AND INSTALLED PRIOR TO EQUIPMENT CONNECTIONS. PROVIDE DIELECTRIC UNIONS, GASKETS AND FASTENERS AT DISSIMILAR METAL CONNECTIONS OR CONTACT POINTS.
- EQUIPMENT SHALL BE INSTALLED, DUCTED AND/OR PIPED IN ACCORDANCE APPLICABLE CODES AND MANUFACTURERS RECOMMENDATIONS.
- ACCURATE "AS-BUILT" DRAWINGS SHALL BE MAINTAINED DURING CONSTRUCTION AND SUBMITTED FOR APPROVAL UPON COMPLETION OF INSTALLATION.
- MECHANICAL SYSTEMS SHALL BE TESTED, BALANCED AND OPERATED TO DEMONSTRATE TO THE OWNER OR DESIGNATED REPRESENTATIVE THAT THE INSTALLATION AND PERFORMANCE OF THE SYSTEMS CONFORM TO THE DESIGN INTENT. ALL TESTING AND BALANCING SHALL BE PERFORMED BY A QUALIFIED INDEPENDENT AGENCY CERTIFIED BY THE ASSOCIATION AIR BALANCE COUNCIL (AABC). TEST RESULTS SHALL BE DOCUMENTED AND SUBMITTED FOR APPROVAL.
- CONTROL SCHEMATICS ARE INTENDED TO CONVEY OPERATING PRINCIPLES AND INTER-RELATIONSHIPS ONLY. ACTUAL SIZING, LOCATION, AND COMPONENTS AND WIRING SHALL BE PER THE MANUFACTURERS RECOMMENDATION AND ALL CODE REQUIREMENTS.

SEISMIC NOTES

EQUIPMENT ANCHORAGE NOTES

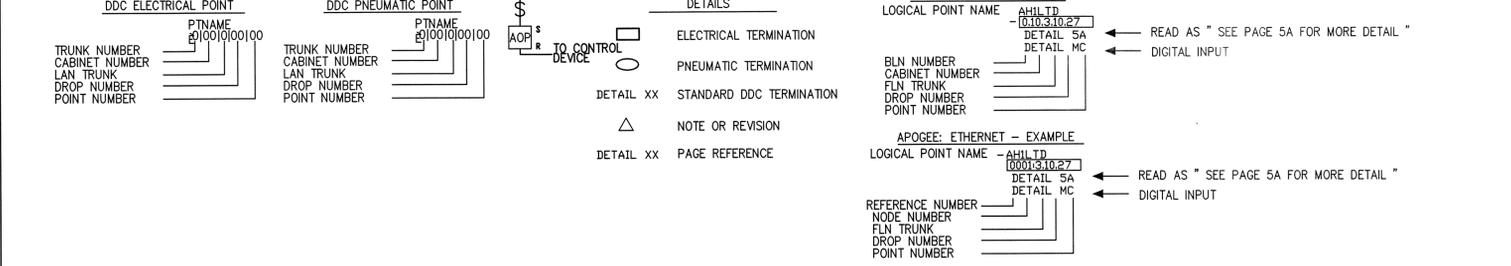
- ANCHORAGE AND/OR SEISMIC RESTRAINTS SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CALIFORNIA.
- THE ANCHORAGE AND/OR SEISMIC RESTRAINT OF PERMANENT EQUIPMENT AND ASSOCIATED SYSTEMS LISTED SHALL BE DESIGNED TO RESIST THE TOTAL DESIGN SEISMIC FORCES PRESCRIBED IN SECTION 1613 OF THE 2013 INTERNATIONAL BUILDING CODE AND CHAPTER 13 OF ASCE 7-05.
- SEISMIC RESTRAINTS ARE REQUIRED FOR THE FOLLOWING INSTALLATIONS. REFER TO SMACNA GUIDELINES FOR SEISMIC RESTRAINTS FOR ADDITIONAL REQUIREMENTS:
 - FLOOR OR ROOF MOUNTED EQUIPMENT WEIGHING 400 LBS. OR GREATER.
 - SUSPENDED OR WALL MOUNTED EQUIPMENT WEIGHING 20 LBS. OR GREATER.
 - VIBRATION ISOLATION EQUIPMENT WEIGHING 20 LBS. OR GREATER.
 - PIPING 1-1/4 INCHES NOMINAL DIAMETER AND LARGER LOCATED IN BOILER, MECHANICAL EQUIPMENT AND REFRIGERATION MECHANICAL ROOMS.
 - PIPING 2-1/2 INCHES NOMINAL DIAMETER AND LARGER.
 - PIPES SUPPORTED BY A TRAPEZE WHERE NONE OF THOSE ELEMENTS WOULD INDIVIDUALLY REQUIRE BRACING NEED NOT BE BRACED IF CONNECTIONS TO THE PIPE/DUCT OR DIRECTIONAL CHANGES DO NOT RESTRICT MOVEMENT OF THE TRAPEZE. IF THIS FLEXIBILITY IS NOT PROVIDED, BRACING IS REQUIRED WHEN THE COMBINED OPERATING WEIGHT OF ALL ELEMENTS SUPPORTED BY THE TRAPEZE IS 10 LBS/FT OR GREATER.

DRAWING/DETAIL REFERENCE KEY

SYMBOL	DESCRIPTION
	PLAN REFERENCE / KEY NOTE
	PHOTO REFERENCE / PHOTO DIRECTION
	REVISION
	AIR DEVICE CALLOUT
	BID OPTION
	POINT OF CONNECTION
	POINT OF DISCONNECTION/DEMOLITION
	REFER TO DRAWING/DETAIL NUMBER
	SHEET NUMBER OF DRAWING/DETAIL
	EQUIPMENT TAG
	SHEET SHOWN
	SHEET REFERENCED TO
	DENOTES AIR DISTRIBUTION TYPE
	DENOTES AIR QUANTITY (CFM)
	REFERENCED PHOTO NO.
	SHEET REFERENCED TO

CONTROLS LEGEND AND ABBREVIATIONS

CONTROL SYMBOL	CONTROL SYMBOL DESCRIPTION	CONTROL SYMBOL	CONTROL SYMBOL DESCRIPTION	CONTROL SYMBOL	CONTROL SYMBOL DESCRIPTION
AC	AIR COMPRESSOR	GD	GAS DETECTOR	PXC	PXC-MODULAR CONTROLLER
AD	AIR DRYER	HE	HUMIDIFIER ELECTRIC	RBC	REMOTE BUILDING CONTROLLER
AE	ACTUATOR ELECTRIC	H	HYGROSTATS	RCU	RECEIVER CONTROLLER
AEM	APOGEE ETHERNET MICROSERVER	HHC	HAND-HELD OPERATOR'S TERMINAL	RE	REMOTE CONTROL UNIT
AF	AIR FILTER	HL	HIGH LIMIT	RE	RELAY ELECTRIC
AFS	AIR FLOW STATION	HOA	HAND-OFF-AUTO SWITCH	RP	RELAY PNEUMATIC
AOP	ANALOG OUTPUT, PNEUMATIC	HORN	HORN	RS	RESTRICTOR
AP	ACTUATOR PNEUMATIC	HPC	HEAT PUMP CONTROLLER	RV	RELIEF VALVE
APS	AUX. POWER SUPPLY	HTD	HIGH TEMPERATURE DETECTOR	S/W	SOFTWARE
AT	AUTOMATIC TRAP	HTE	HUMIDITY TRANSMITTER ELECTRIC	SC	STEP CONTROLLER
ATD	AUTO TANK DRAIN	HTP	HUMIDITY TRANSMITTER PNEUMATIC	SCU	STAND ALONE CONTROL UNIT
ATEC	ACTUATOR TEC	INT	INTERCOM	SD	SMOKE DETECTOR
AZM	AUTOZERO MODULE	KWM	ELECTRIC KILOWATT METER	SE	SWITCH ELECTRIC
BELL	BELL	LC	LIMIT CONTROLLER (LIMIT)	SEPKR	SPEAKER
BIM	BUS INTERFACE MODULE	LLS	LIQUID LEVEL SWITCH	SPP	STATIC PRESSURE PROBE
BOIL	BOILER	LLT	LIQUID LEVEL TRANS.	SPR	STATIC PRESSURE REGULATOR
CBU	CABLES	LPR	POWER SUPPLY 24VAC/24VDC	SV	SOLENOID VALVE
CKV	CHECK VALVE	LDPE	LOW TEMP. DETECTOR ELECTRIC	SW	SWITCH PNEUMATIC
CM	CONSTRUCTION MATERIALS	LTOP	LOCAL USER INTERFACE	SW	SWITCH THERMOSTAT, PNEUMATIC
CP	COMPONENT PANEL	LUI	LOCAL USER INTERFACE	TBC	TERMINAL BOX CONTROLLER
CPU	CENTRAL PROCESSING UNIT	MBC	MODULAR BUILDING CONTROLLER	TCC	TEMPERATURE CONTROLLER(S200)
CRT	CATHODE RAY TUBE	MDM	MODEM	TCU	TERMINAL CONTROL UNIT
CS	CURRENT SWITCH	ME	ELECTRONIC ACTUATOR	TDR	TIME DELAY RELAY
CT	CURRENT TRANSDUCER	MEC	MODULAR EQUIPMENT CONTROLLER	TEC	THERMOSTAT, ELECTRIC
CTTE	C02 TEMP TRANSMITTER ELEC	MG	MAGNETIC GAUGE	TEC	TERMINAL EQUIPMENT CONTROLLER
CVC	CONSTANT VOLUME CONTROLLER DAMPER	MPU	MULTI-POINT UNIT	TH	THERMOMETER
DDC	DUAL DUCT CONTROLLER	OBS	OBSOLETE	TI	TRUNK INTERFACE
DEM	DEMAND ENERGY MONITOR	ODP	OPERATOR DATA PANEL	TIE	TRUNK ISOLATOR EXTENDER
DP	DEW POINT TRANSMITTER	P	PUMP	TIU	TELECOM INTERFACE UNIT
DPR	DIFFERENTIAL PRESS. REGULATOR	PA	PULSE ACCUMULATOR	TMR	TIMER, TIME CLOCK
DPS	DIFFERENTIAL PRESSURE SWITCH	PCT	PROGRAMMABLE CLOCK TIMER	ITE	TEMPERATURE TRANSMITTER ELECTRIC
DPTE	DIFF. PRESS. TRANSMITTER ELEC.	PE	PRESSURE ELECTRIC SWITCH	ITP	TEMPERATURE TRANSMITTER PNEUMATIC
DPTP	DIFFERENTIAL PRESSURE PNEUMATIC	PL	PLOT LIGHT	TX-10	TX-10 FAMILY CONTROLLER MODULES
DPU	DIGITAL POINT UNIT	PM	POWER MONITOR	UC	UNITARY CONTROLLER
EC	ENTHALPY COMPARTOR	PNL	PANEL	UCC	UNIT CONDITIONER CONTROLLER
EP	ELECTRO-PNEUMATIC VALVE	PPM	POINT PICKUP MODULE	UVC	UNIT VENT CONTROLLER
ES	END SWITCH	PRC	PRESSURE REG. CONTROLLER	V	VALVE
ET	ENTHALPY TRANSMITTER	PRV	PRESSURE REDUCING VALVE	V*	VALVE SERVICE PARTS
EXP	EXPANSION PANEL	PS	POSITIONING SWITCH	VA	TEC VALVE ACTUATOR
FAN	FAN	PSE	POSITION SENSOR ELECTRIC	VAC	VIBRATION ISOLATOR
FHC	FUME HOOD CONTROLLER	PST	PULL STATION	VB	VARIABLE AIR VOLUME CONTROLLER
FM	FLOW MTR. (FLOW METER STATION)	PT	PITOT TUBE	VTE	VELOCITY TRANSMITTER ELECTRICAL
FMS	FIRE MGMT. SYSTEM	PTE	PRESSURE TRANSMITTER ELECTRIC	W	WELL
FS	FLOW SWITCH	PTP	PRESSURE TRANSMITTER PNEUMATIC	XDR	TRANSDUCER
FTP	FLOW TRANSMITTER PNEU. GAUGE	PTR	PRINTER	XFRM	TRANSFORMER
G	GAUGE	PV	PLOT VALVE		
		PXCC	PX COMPACT CONTROLLER		



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DATE	SYM	REVISION	BY
5/9/14	E	FINAL DESIGN	
2/24/14	D	100% FINAL DESIGN	
10/27/13	C	60% DEVELOPED DESIGN	
6/21/13	B	30% DEVELOPED DESIGN	
12/21/12	A	15% CONCEPT DESIGN	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DRYDEN FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE
MECHANICAL LEGEND, NOTES, SYMBOLS
LISTS, AND ABBREVIATIONS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY
TRACKING INFRASTRUCTURE

APPROVALS	DATE
Chief, Facilities Engineering & Asset Mgmt. Office	7-10-15
Project Administrator	2-10-15
Facilities Project Manager	1-27-15
Chief, Office of Protective Services	1-28-15
Chief - Safety Health and Environmental Office	1-27-15
Chief of Information Office	3Feb15

DATE START: 5/9/14 DATE PRINT: 5/9/14
DRAWN BY: ANH, MT, WAS
SCALE: AS NOTED
FILE NAME: MO
SHEET No. 18 of 48

AIR HANDLING UNIT SCHEDULE

SYMBOL	SUPPLY FAN							COOLING COIL										FILTER	OPERATING WEIGHT (LBS.)	REMARKS							
	CFM	EXT S.P.	NO. OF FANS	DRIVE	RPM	BHP PER FAN	ELECTRICAL			MIN. OSA (CFM)	MAX. FACE VELOCITY (FPM)	ROWS	FPI	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	ENT. AIR TEMP. (°F)					LVG. AIR TEMP. (°F)		CHILLED WATER TEMP. (°F)		FLOW RATE GPM	AIR PRESSURE DROP (IN WG)	WATER PRESSURE DROP
							MOTOR TOTAL HP	VOLT	PHASE							DB	WB				DB	WB	ENT	LVG.			
AH 1	3300	1.5	1	BELT	1612	1.817	2	460-60	3ø	120	450	6	14	77.87	66.48	79.00	65.20	58.2	57.8	45	55	15.3	.35	.59	4" PLEATED MEDIA-MERV 13	1450	- WITH 20KW DUCT HEATER, 460V-3ø-60, 2-STAGE. PROVIDE SA DUCT SMOKE DETECTOR.
AH 2	3300	1.5	1	BELT	1277	2.05	2	460-60	3ø	175	450	6	14	77.0	68.77	78.70	65.20	58.3	57.8	45	55	15.40	.463	.94	2" PLEATED MEDIA-MERV 13	550	- WITH 10KW DUCT HEATER, 460V-3ø-60, 2-STAGE. PROVIDE SA DUCT SMOKE DETECTOR.

PACKAGED HEAT PUMP SCHEDULE

SYMBOL	DESCRIPTION	LOCATION	AREA SERVED	NOMINAL TONNAGE	COOLING (BTUH)			HEATING (BTUH)			ELECTRICAL AT 60Hz				SUPPLY FAN		MIN. OSA (CFM)	REFRIGERANT TYPE	OPERATING WEIGHT (LBS)	REMARKS
					TOTAL	SENSIBLE	SEER/EER	INPUT	OUTPUT	COP / HSPF	MCA	MOCP	VOLT	PHASE	CFM	ESP (INCHES)				
HP 1	SINGLE PACKAGE AC UNIT	BUILDING 4982	WORK ROOM	3	34,000	27,100	15.60	19,540	17,620	8.0	28	30	460	3	1,200	.75	120	R-410A	535	- WITH INTEGRATED 10.6KW HEATER, LOW AMBIENT KIT, BAROMETRIC RELIEF. OA HOOD

CHILLED WATER PUMP UNIT SCHEDULE

SYMBOL	DESCRIPTION	TYPE	SERVICE	LOCATION	GPM	HEAD IN FT.	ELECTRICAL AT 60Hz			RPM	ISOLATION TYPE	OPERATING WEIGHT (LBS)	REMARKS
							HP	VOLT	PHASE				
CHW 1	CHW PUMP	END SUCTION	CHILLED WATER	BUILDING 4982	106	110	10	460	3	1,770	FRAME MOUNTED	336	- REUSE EXISTING ISOLATION CURB.
CHW 2	CHW PUMP	END SUCTION	CHILLED WATER	BUILDING 4982	106	110	10	460	3	1,770	FRAME MOUNTED	336	- REUSE EXISTING ISOLATION CURB.

PACKAGED COOLING ONLY A/C UNIT SCHEDULE

SYMBOL	DESCRIPTION	LOCATION	AREA SERVED	NOMINAL TONNAGE	COOLING (BTUH)			ELECTRICAL AT 60Hz				SUPPLY FAN		MIN. OSA (CFM)	REFRIGERANT (LBS)	OPERATING WEIGHT (LBS)	REMARKS	
					TOTAL	SENSIBLE	EER	MCA	MOCP	VOLT	PHASE	CFM	ESP (INCHES)					HP
AC 1	SINGLE PACKAGE AC UNIT	BUILDING 4720	COMPUTER ROOM	7.5	87,130	69,690	12.20	18.0	20	460	3	3,000	1.0	2	120	R-410A	881	- WITH ECONOMIZER AND BAROMETRIC RELIEF. - WITH LOW AMBIENT KIT. - PROVIDE DUCT SMOKE DETECTOR.

SPLIT SYSTEM HEAT PUMP SCHEDULE

OUTDOOR CONDENSING UNIT															FAN COIL UNIT														
SYMBOL	DESCRIPTION	LOCATION	AREA SERVED	NOMINAL TONNAGE	COOLING (BTUH)			HEATING (BTUH)			ELECTRICAL AT 60 HZ				REFRIGERANT TYPE	OPERATING WEIGHT (LBS)	REMARKS	SYMBOL	DESCRIPTION	LOCATION	AREA SERVED	SUPPLY FAN		MIN. OSA (CFM)	ELECTRICAL AT 60 HZ			OPERATIONAL WEIGHT (LBS)	REMARKS
					TOTAL	SENSIBLE	SEER/EER	INPUT	OUTPUT	COP HSPF	MCA	MOCP	VOLT	PHASE								CFM	ESP (INCHES)		HP	CFM	ESP (INCHES)		
CU 3	AIR COOLED CONDENSING UNIT	BUILDING 4720	COMPUTER ROOM, OFFICE, BREAK ROOM	15.0	168,000	136,000	10.6	89,600	82,100	3.4	30	40	460	3	R410A	770	- WITH LOW AMBIENT KIT.	FC 2	FAN COIL	BUILDING 4720	COMPUTER ROOM, OFFICE, BREAK ROOM	6,000	1.0	300	3.7	460	3	720	WITH INTEGRATED 20KW HEATER. 100% SLOPED ECONOMIZER (MODULATING) BAROMETRIC RELIEF PROVIDE DUCT SMOKE DETECTOR. 6" SUB-BASE. SEE NOTES BELOW

NOTES:

- PROVIDE SLOPED ROOF ON THE UNIT.
- CAULK AROUND ALL PANELS, EXCEPT THE PANEL WHERE ELECTRICAL AND REFRIGERANT CONNECTIONS ARE MADE AND ADD DRIP ACCESSORY.
- BONDED WASHERS SHALL BE INSTALLED ON ALL SCREWS.
- COAT THE UNIT TO PROTECT THE EXTERIOR FROM THE ELEMENTS.

AIR DISTRIBUTION SCHEDULE

SYMBOL	MODULE SIZE	NECK SIZE	CFM RANGE	REMARKS
CD-1 FOR LAY-IN CEILING, MODULAR CORE	24"x24"	6"	60-160	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		8"	110-210	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		10"	180-400	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		12"	240-550	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		14"	350-750	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		16"	450-800	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		18"	801-1000	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
CD-2 FOR SURFACE MOUNTED	12"x12"	6"	80-200	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		8"	150-350	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		10"	220-550	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		12"	320-700	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		14"	450-850	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		16"	500-950	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		16"	500-950	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.

AIR DISTRIBUTION SCHEDULE

SYMBOL	MODULE SIZE	NECK SIZE	CFM RANGE	REMARKS
CD-3 FOR LAY-IN CEILING, MODULAR CORE	24"x24"	6"x6"	60-100	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		8"x8"	101-200	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		10"x10"	201-300	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		12"x12"	301-450	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		14"x14"	451-600	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		16"x16"	601-800	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
		18"x18"	801-1000	- 4-WAY THROW, UNLESS NOTED ON OTHERWISE ON PLANS.
CG-1 FOR LAY-IN AND SURFACE MOUNTED	-	6"x6"	60-100	- SURFACE MOUNTED. FIXED DEFLECTION RETURN. 3/4" SPACING, 35° DEFLECTION
		8"x8"	101-200	- SURFACE MOUNTED. FIXED DEFLECTION RETURN. 3/4" SPACING, 35° DEFLECTION
		10"x10"	201-300	- SURFACE MOUNTED. FIXED DEFLECTION RETURN. 3/4" SPACING, 35° DEFLECTION
		12"x12"	301-450	- SURFACE MOUNTED. FIXED DEFLECTION RETURN. 3/4" SPACING, 35° DEFLECTION
		14"x14"	451-600	- SURFACE MOUNTED. FIXED DEFLECTION RETURN. 3/4" SPACING, 35° DEFLECTION
		16"x16"	601-800	- SURFACE MOUNTED. FIXED DEFLECTION RETURN. 3/4" SPACING, 35° DEFLECTION
		18"x18"	801-1000	- SURFACE MOUNTED. FIXED DEFLECTION RETURN.
SWS	-	-	-	- SURFACE MOUNTED. DOUBLE DEFLECTION. 3/4" SPACING. - SEE PLANS FOR SIZE AND CFM.

AIR DISTRIBUTION SCHEDULE

SYMBOL	MODULE SIZE	NECK SIZE	CFM RANGE	REMARKS
SWR	-	-	-	- SURFACE MOUNTED. 3/4" SPACING, 35° DEFLECTION. - SEE PLANS FOR SIZE AND CFM.
EG-1 TITUS "350RL" OR APPROVED EQUAL.	-	6"x6"	60-100	- SURFACE MOUNTED. FIXED DEFLECTION EXHAUST.
		8"x8"	101-200	- SURFACE MOUNTED. FIXED DEFLECTION EXHAUST.
		10"x10"	201-300	- SURFACE MOUNTED. FIXED DEFLECTION EXHAUST.
		12"x12"	301-450	- SURFACE MOUNTED. FIXED DEFLECTION EXHAUST.
		14"x14"	451-600	- SURFACE MOUNTED. FIXED DEFLECTION EXHAUST.
		16"x16"	601-800	- SURFACE MOUNTED. FIXED DEFLECTION EXHAUST.
EG-2 TITUS "350 RL" OR APPROVED EQUAL.	12"x12"	-	0-120	- SURFACE MOUNTED
SWE TITUS "350 RL" OR APPROVED EQUAL.	SEE PLANS FOR SIZE	-	-	- SIDEWALL EXHAUST GRILLE.

AIR SEPARATOR SCHEDULE

SYMBOL	DESCRIPTION	LOCATION	SERVICE	MAX. FLOW RATE AT 6 FPS (GPM)	PIPE SIZE (IN)	MAX. WORKING PRESSURE (PSI)	OPERATING WEIGHT (LBS)	REMARKS
AS 1	CHILLED WATER AIR SEPARATOR	BUILDING 4982 UTILITY ROOM	CHILLED WATER	90	2-1/2"	150	65	- ASME AIR SEPARATOR LESS STRAINER

BLADDER TANK SCHEDULE

SYMBOL	DESCRIPTION	LOCATION	SERVICE	CAPACITY (GAL)	MAX. WORKING PRESSURE (PSI)	OPERATING WEIGHT (LBS)	REMARKS
BT 1	CHILLED WATER BLADDER TANK	BUILDING 4982 UTILITY ROOM	CHILLED WATER	22	150	120	

CHEMICAL POT FEEDER SCHEDULE

SYMBOL	DESCRIPTION	LOCATION	SERVICE	CAPACITY (GAL)	MAX. WORKING PRESSURE (PSI)	MAX. TEMP. (°F)	OPERATING WEIGHT (LBS)	REMARKS
CPF 1	CHEMICAL POT FEEDER	BUILDING 4982 UTILITY ROOM	CHILLED WATER	2	150	212	45	WITH FLOW INDICATOR DRAIN COCK.

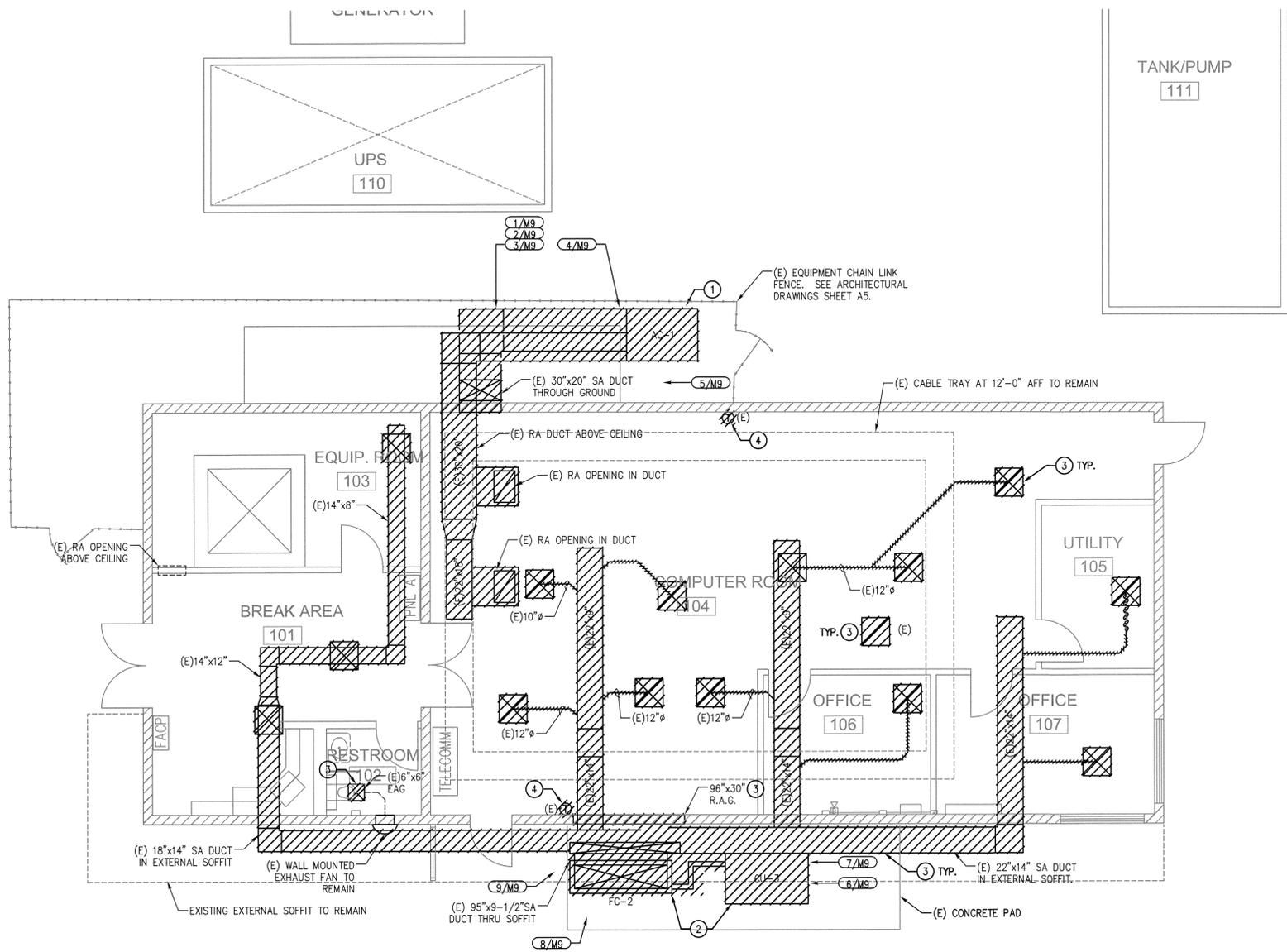

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2/24/14	D	100% FINAL DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
6/21/13	B	30% DEVELOPED DESIGN		
12/21/12	A	15% CONCEPT DESIGN		


NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 DRYDEN FLIGHT RESEARCH CENTER
 EDWARDS, CA
 DRAWING TITLE
MECHANICAL SCHEDULES
 BLDGS 4720 AND 4982
 PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Maint. Mgmt. Office	<i>[Signature]</i>	7-10-15
Project Registrar/Customs	<i>[Signature]</i>	2-10-15
Facilities Project Manager	<i>[Signature]</i>	1-27-15
Chief, Office of Protective Services	<i>[Signature]</i>	1-28-15
Chief - Safety, Health and Environmental Office	<i>[Signature]</i>	1-27-15
Spec. Shop/Integration Office	<i>[Signature]</i>	3 Feb 15
STATE STRID	DATE PRINTED	5/9/14
DRAWN BY	AWH, MT, WAS	EDM-1728
SCALE	AS NOTED	TRADE SH. No.
FILE NAME	M1	SHEET No. 19 of 48

DWG: P112088 NASA ATF Dwg M12088 M2.dwg USER: Alex Hernandez DATE: Sep 09, 2014 9:09am XREFS: A:TELOCK-D Base Plan RM-2 IMAGES: BLOB 4720 BASE-Demo



BUILDING 4720 – AERONAUTICAL TRACKING FACILITY (ATF 2)

SCALE: 3/16" 1'-0

REFERENCE NOTES:

- ① EXISTING AC-1 SERVES COMPUTER ROOM TO BE REMOVED AND DISPOSED OF.
- ② EXISTING FC-2 AND CU-3 (SPLIT SYSTEM) SERVES BREAK AREA, COMPUTER ROOM, OFFICES AND UTILITY ROOM TO BE REMOVED AND DISPOSED OF INCLUDING ELECTRICAL DUCT HEATER, SMOKE DETECTION, REFRIGERANT PIPING AND OTHER APPURTENANCES.
- ③ EXISTING DUCTS, DIFFUSERS, GRILLES TO BE REMOVED AND DISPOSED OF.
- ④ EXISTING THERMOSTAT TO BE REMOVED AND DISPOSED OF.



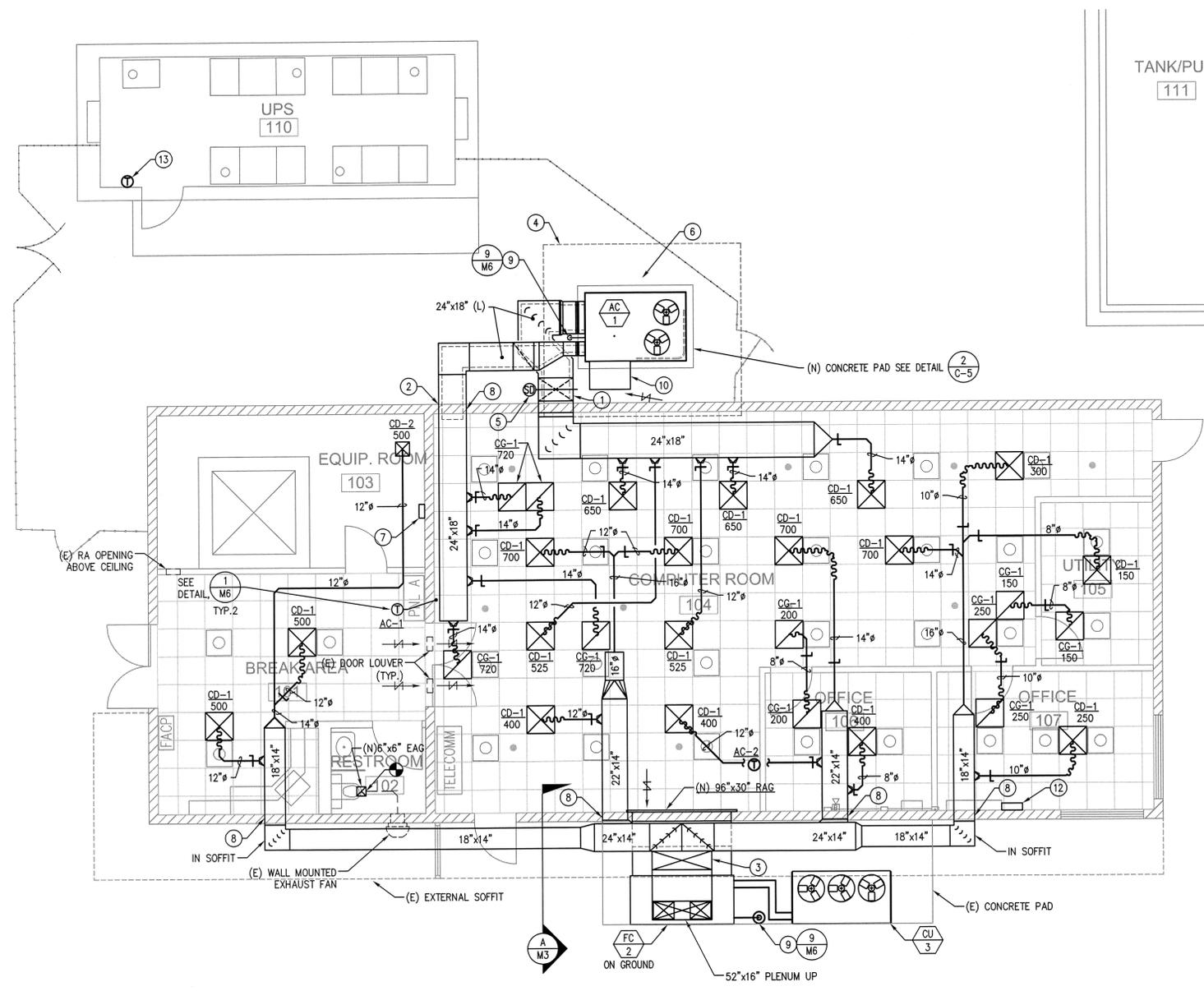
DONN C. GILMORE & ASSOC.
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 Consulting Mechanical and Electrical Engineers
 5000 E. Spring St., 8th Floor 591 Camino De La Reina, Ste. 1107
 Long Beach, CA 90815 San Diego, CA 92108
 Ph: 562.497.2999 Ph: 619.618.2347

DATE	SYM	REVISION	BY	A'PD
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10/27/13	C	60% DEVELOPED DESIGN		
6/21/13	B	30% DEVELOPED DESIGN		
12/21/12	A	15% CONCEPT DESIGN		

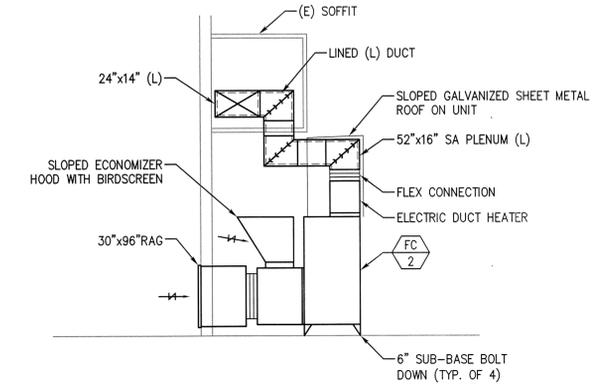
 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION DRYDEN FLIGHT RESEARCH CENTER EDWARDS, CA	
DRAWING TITLE	
MECHANICAL DEMOLITION – BUILDING 4720	
PROJECT TITLE	
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE	

APPROVALS	DATE
Chief, Facilities Engineering & Asset Mgmt. Office <i>Don Lowry</i>	7-10-15
Project Reviewer/Author <i>J. A. DeWitt</i>	2-10-15
Facilities Project Manager <i>Stacy DeWitt</i>	1-27-15
Chief, Office of Protective Services <i>M. A. ...</i>	1-28-15
Chief, Safety, Health and Environmental Office <i>...</i>	1-27-15
DRP O&M Information Officer <i>...</i>	3 Feb 15

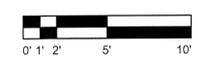
DATE START	DATE PRINTD	5/9/14
DRAWN BY	ANL, MT, WAS	EDM-1728
SCALE	AS NOTED	TRADE
FILE NAME	MZ	SHEET No. 20 of 48



- GENERAL NOTES:**
- REPLACE EXISTING CONTROLS WITH NEW DIRECT DIGITAL CONTROLS (DDC) AND TIED INTO THE CAMPUS WIDE EMS SYSTEM. REFER TO SHEET M7.
- REFERENCE NOTES:**
- (N) 24"x18"(L) SAD PLENUM UP AND THRU WALL ABOVE CEILING.
 - (N) 24"x18(L) RAD THRU WALL ABOVE CEILING.
 - 52"x16"(L) SAD THRU EXTERNAL SOFFIT.
 - MINIMUM SERVICE CLEARANCE PER MANUFACTURER'S RECOMMENDATION.
 - PROVIDE SA DUCT SMOKE DETECTOR. ALARM SHALL BE COMPATIBLE WITH EXISTING SIMPLEX SYSTEM.
 - PROVIDE SERVICE ACCESS TO AC UNIT.
 - PROPOSED DDC CONTROL PANEL LOCATION.
 - REUSE EXISTING WALL PENETRATION FOR NEW DUCTWORK. MODIFY EXISTING WALL OPENING AS REQUIRED, PATCH AND SEAL AIR TIGHT.
 - (N) 3/4" CONDENSATE DRAIN TO DRYWELL.
 - HORIZONTAL ECONOMIZER.
 - INSULATED REFRIGERANT LINES.
 - PROPOSED ANNUNCIATOR PANEL. PROVIDE WIRED ROOM TEMPERATURE SENSOR AND ALARM PANEL FOR UPS EQUIPMENT SHELTER #110. TEMPERATURE RANGE ADJUSTABLE TO 95 DEGREES F. WIRED ANNUNCIATOR PANEL TO BE LOCATED IN BUILDING MANNED OFFICE, WITH 90dB ALARM SOUNDING FOR 45 SECONDS (MINIMUM) TEMPERATURE MONITOR INTERVALS TO BE 60 SECONDS (MAXIMUM) AND ACCURATE TO PLUS OR MINUS 3 DEGREES F.
 - PROPOSED TEMPERATURE SENSOR LOCATION.



BUILDING 4720 - AERONAUTICAL TRACKING FACILITY (ATF 2)
 SCALE: 3/16" 1'-0"



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DATE	SYM	REVISION	BY
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2/24/14	D	100% FINAL DESIGN	
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6/21/13	B	30% DEVELOPED DESIGN	
12/21/12	A	15% CONCEPT DESIGN	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 DRYDEN FLIGHT RESEARCH CENTER
 EDWARDS, CA

DRAWING TITLE
 MECHANICAL REMODEL - BUILDING 4720

PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS

DATE

7-10-15

2-10-15

1-28-15

1-27-15

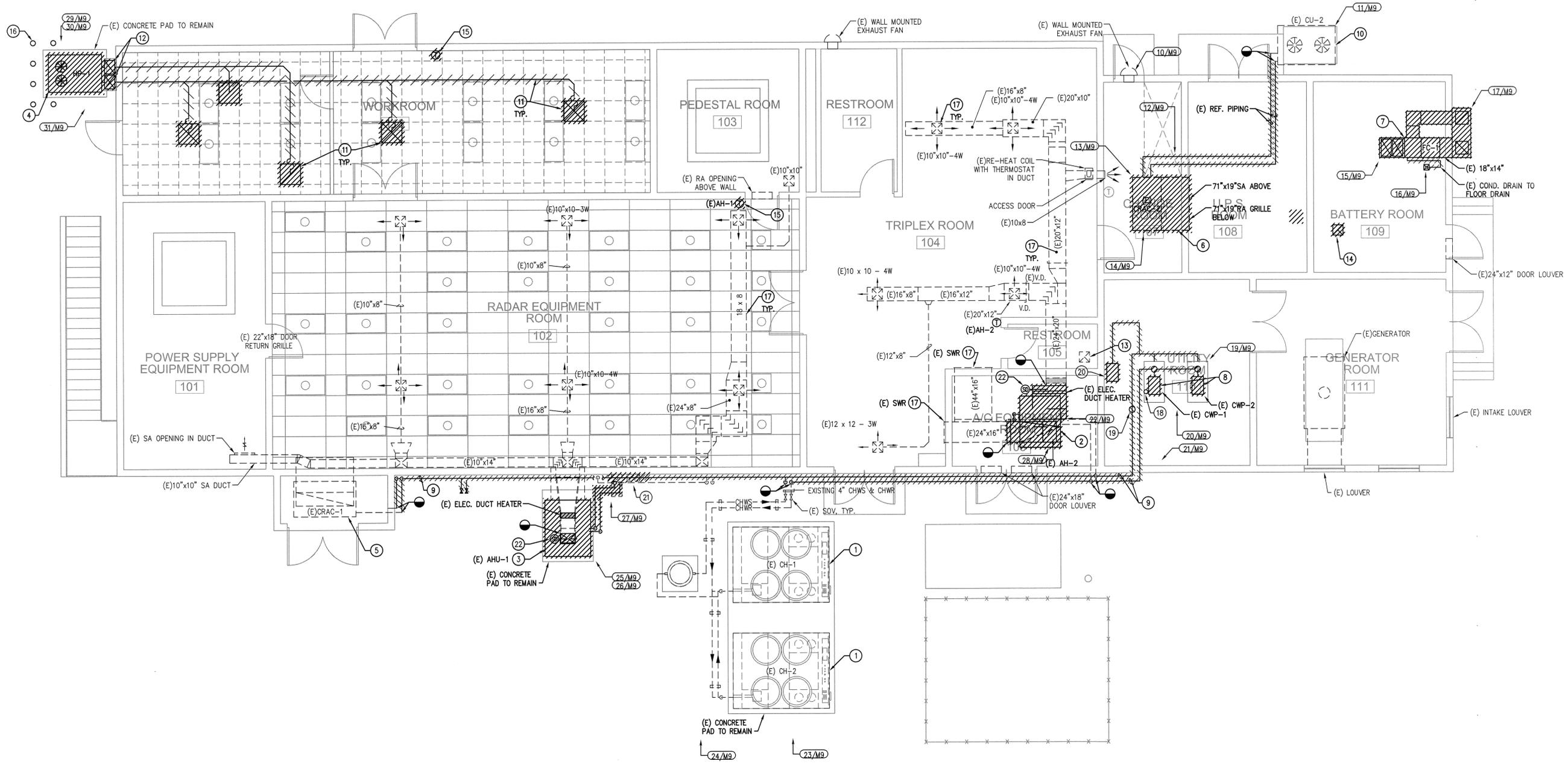
3 Feb 15

DATE STRTD: DATE PRNTD: 5/9/14

DRAWN BY: ANH, MT, WAS
 SCALE: AS NOTED
 FILE NAME: M3

EDM-1728
 SHEET No. 21 of 48

DWG: P112088 NASA ATF1DwM12088 M3.dwg USER: Alex Hernandez DATE: Sep 09 2014 9:12am XREFS: A-BLOCK-D BLOB 4720 BASE-New IMAGES:



BUILDING 4982 - AERONAUTICAL TRACKING FACILITY 1 (ATF 1)
 SCALE: 3/16" 1'-0"

TEMPORARY COOLING
 PROVIDE TEMPORARY COOLING IN EQUIPMENT ROOMS 101 AND 102 AND POWER GENERATION FOR UTILITY CONNECTION DURING OUTAGES.



REFERENCE NOTES:

- | | |
|---|--|
| <ul style="list-style-type: none"> ① EXISTING CHILLERS (CH-1 & 2) TO REMAIN. ② EXISTING AH-2 AND ELECTRIC DUCT HEATER SERVING TRIPLEX ROOM, TO BE REMOVED AND DISPOSED OF. ③ EXISTING AH-1 AND ELECTRIC DUCT HEATER SERVING RADAR EQUIPMENT ROOM / POWER SUPPLY EQUIPMENT ROOM, TO BE REMOVED AND DISPOSED OF. ④ EXISTING HP-1 SERVING WORK ROOM, TO BE REMOVED AND DISPOSED OF. ⑤ EXISTING CRAC-1 SERVING RADAR EQUIPMENTS, UNDER FLOOR AIR DISTRIBUTION, TO REMAIN. ⑥ EXISTING CRAC-2 SERVING UPS ROOM THRU WALL TO BE RELOCATED, INCLUDING DUCTWORK, DIFFUSERS/GRILLES, REFRIGERANT PIPING AND OTHER APPURTENANCES. SEE REMODEL PLAN FOR EXACT LOCATION. ⑦ EXISTING SELF CONTAINED AC UNIT (FC-1) SERVING BATTERY ROOM INCLUDING DUCTWORK, PIPING AND OTHER APPURTENANCES TO BE REMOVED AND DISPOSED OF. ⑧ EXISTING CHILLED WATER PUMPS CWP-1/CWP-2 SERVING CH-1/CH-2, TO BE REPLACED. EXISTING CONCRETE PAD TO REMAIN AND BE REUSED. ⑨ EXISTING 2-1/2" CHILLED WATER PIPES TO BE REMOVED TO CRAC-1 ENCLOSURE. ⑩ EXISTING OUTDOOR CONDENSER UNIT (CU-2) SERVING CRAC-2, TO REMAIN. | <ul style="list-style-type: none"> ⑪ EXISTING DUCT, DIFFUSERS, AND GRILLES TO BE REMOVED AND DISPOSED OF. ⑫ EXISTING 16"x12" SA AND RA DUCT UP AND THROUGH THE WALL. TO BE REMOVED AND DISPOSED OF. ⑬ EXISTING CEILING MOUNTED EXHAUST FAN TO REMAIN. ⑭ EXISTING EXHAUST/RELIEF DUCT TO BE REMOVED AND DISPOSED OF. ⑮ EXISTING THERMOSTAT TO BE REMOVED AND DISPOSED OF. ⑯ EXISTING BOLLARDS REFER TO CIVIL DRAWINGS. ⑰ EXISTING DUCTS, DIFFUSERS AND GRILLES TO REMAIN, CLEAN AND SEAL AIRTIGHT. ⑱ EXISTING CHEMICAL POT FEEDER TO BE REPLACED WITH NEW. ⑲ EXISTING AIR SEPARATOR TO BE REPLACED WITH NEW. ⑳ EXISTING EXPANSION BLADDER TANK TO BE REPLACED WITH NEW. ㉑ EXISTING HUMIDIFIER, PIPING AND HUMIDIFIER CONTROL TO BE REMOVED AND DISPOSED OF. ㉒ EXISTING DUCT SMOKE DETECTOR TO BE REMOVED AND DISPOSED OF. |
|---|--|

PROFESSIONAL SEAL
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 Exp. 9-30-15
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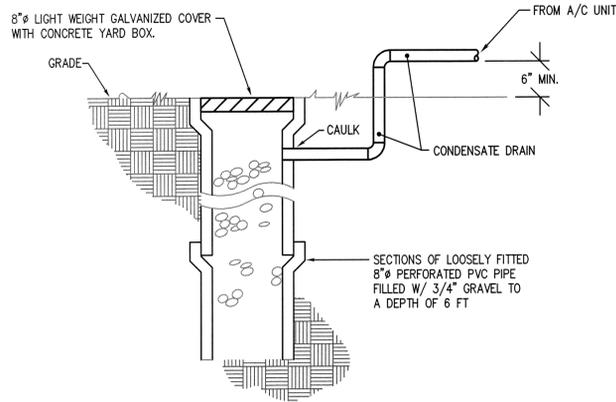
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 DRYDEN FLIGHT RESEARCH CENTER
 EDWARDS, CA

DRAWING TITLE
 MECHANICAL DEMOLITION
 - BUILDING 4982

PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY
 TRACKING INFRASTRUCTURE

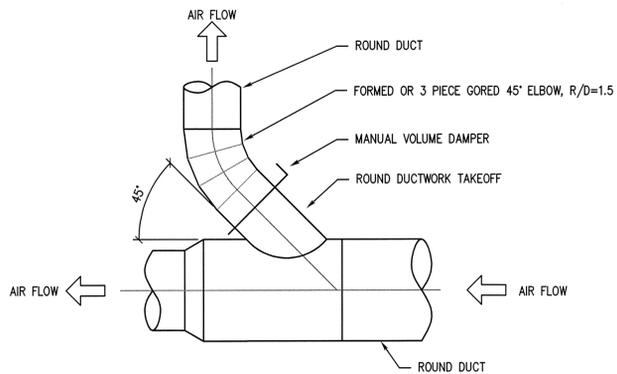
APPROVALS	DATE
Chief, Facilities Engineering & Asset Mgmt. Office <i>Don Woody</i>	7-10-15
Project Registrar/Customer <i>J.P. Acheret</i>	2-10-15
Facilities Project Manager <i>Stacy DeLeon</i>	1-27-15
Chief, Office of Protective Services <i>Kristen</i>	1-28-15
Chief - Safety, Health and Environmental Office <i>John</i>	1-27-15
SAFC Chief Information Officer <i>John</i>	3-4-15
DATE STRTD	DATE PRINTD
DRAWN BY ANH, MT, WAS	EDM-1728
SCALE AS NOTED	TRADE SH. No.
FILE NAME	M4 SHEET No. 22 of 48

DWG: P112088 NASA ATF Dwg M12088 M4.dwg USER: Alex Hernandez MD-4982 IMAGES:
 DATE: Sep 09, 2014 9:13am XREFS: A:TELOCK.D -A:ATF-4982-Demo



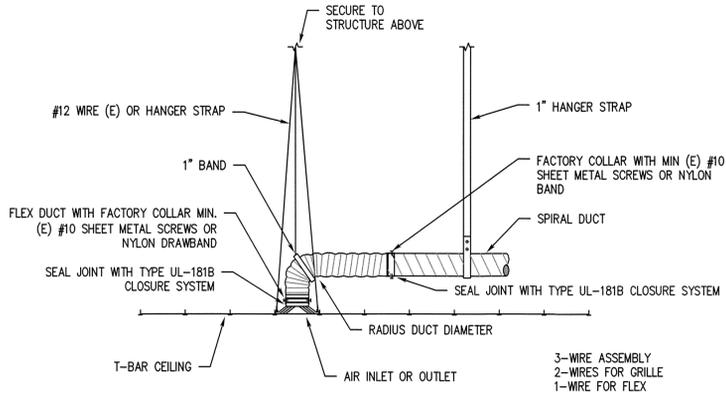
DRYWELL DETAIL

SCALE: NTS **9**



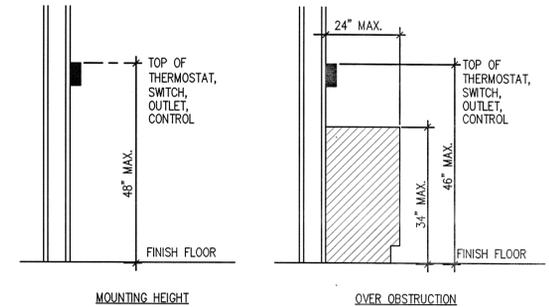
SUPPLY BRANCH-ROUND TO ROUND DETAIL

SCALE: NTS **7**



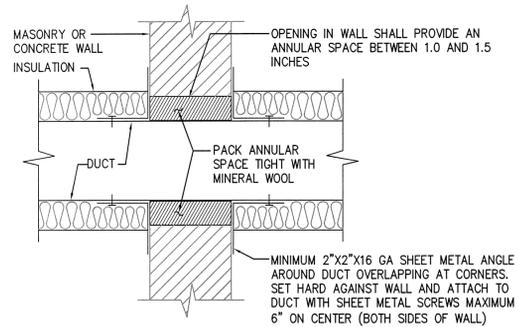
FLEX DUCT CONNECTION TO SUPPLY DIFFUSER

SCALE: NTS **4**



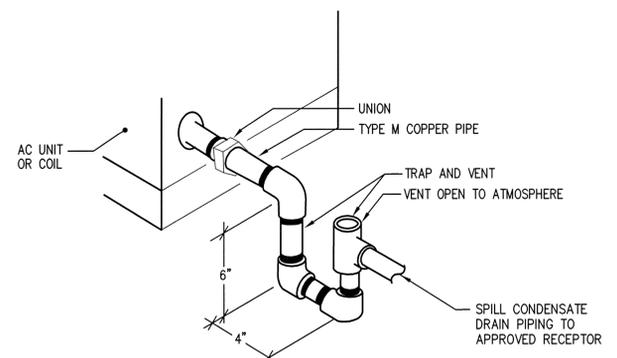
THERMOSTAT MOUNTING DETAIL

SCALE: NTS **1**



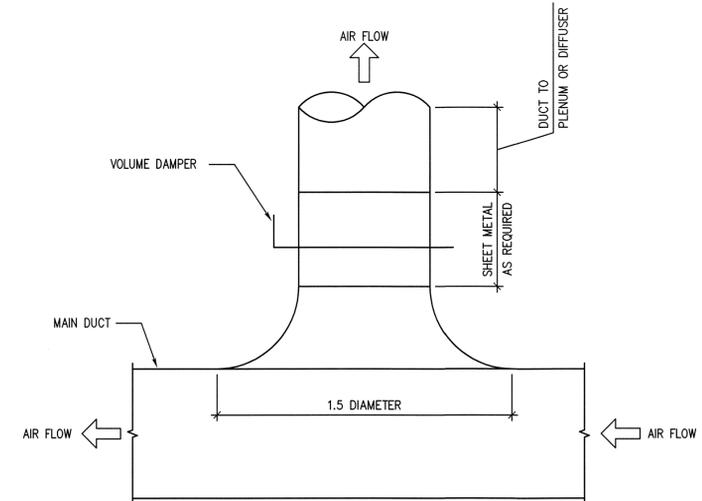
DUCT THRU WALL DETAIL

SCALE: NTS **10**



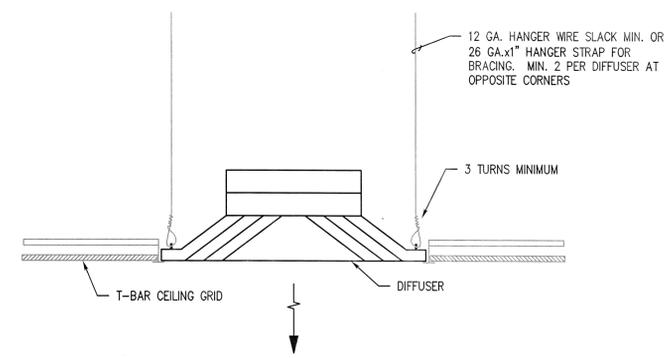
A/C UNIT CONDENSATE DRAIN DETAIL

SCALE: NTS **8**



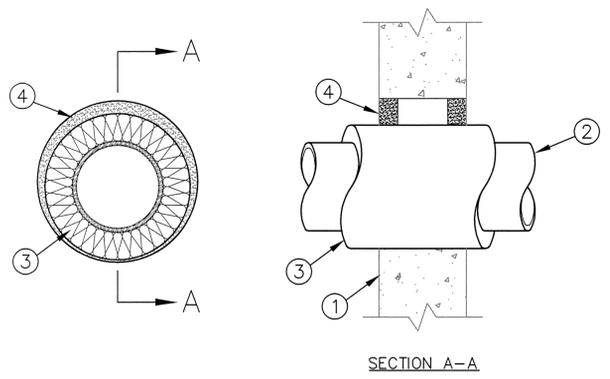
ROUND SUPPLY DUCT BRANCH CONN. DETAIL

SCALE: NTS **5**



REGISTER/DIFFUSER IN LAY IN CEILING

SCALE: NTS **2**

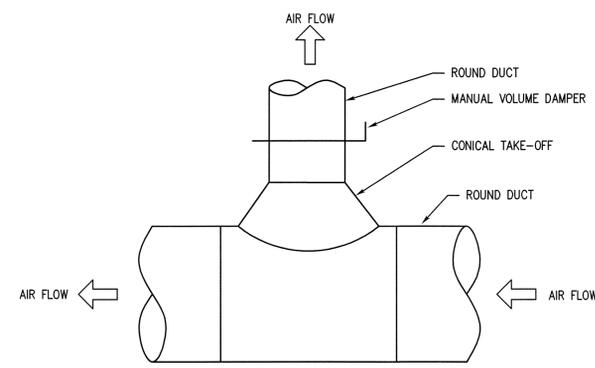


PIPE PENETRATION DETAIL

SCALE: NTS **11**

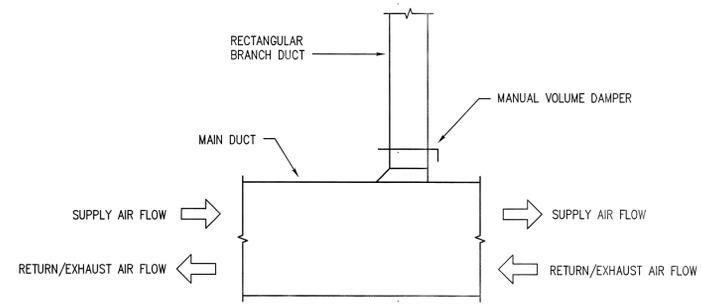
- WALL ASSEMBLY - MIN 6 IN. (152 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600 - 2400 KG/M³) CONCRETE WALL. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. OPENING SHALL BE SIZED TO BE NOM. 2 IN. (51 MM) LARGER THAN OUTSIDE DIAMETER OF PIPE COVERING (ITEM 3).
SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- THROUGH PENETRANTS - ONE METALLIC PIPE OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
 - STEEL PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL PIPE.
 - IRON PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
 - COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
 - COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
- PIPE COVERING* - NOM. 3 IN. (76 MM) THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT. THE ANNULAR SPACING BETWEEN PIPE COVERING AND STEEL SLEEVE SHALL BE MIN. 0 IN. (POINT CONTACT) TO MAX. 2 IN. (51 MM).
- FILL, VOID OR CAVITY MATERIAL* - SEALANT - MIN 1-1/4 IN. (32 MM) THICKNESS OF SEALANT APPLIED WITHIN THE GYPSUM BOARD ANNULUS, FLUSH WITH THE FINISHED SIDE OF THE WALL. MIN 1/2 IN. (13 MM) DIAMETER BEAD OF SEALANT APPLIED TO THE PENETRANT/GYPSUM BOARD INTERFACE AT THE POINT CONTACT LOCATION ON THE FINISHED SIDE OF THE WALL.

*BEARING THE UL CLASSIFICATION MARK



SUPPLY BRANCH-CONICAL DETAIL

SCALE: NTS **6**



RECTANGULAR DUCT BRANCH CONN. DETAIL

SCALE: NTS **3**



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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DRYDEN FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE
MECHANICAL DETAILS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS

NAME	DATE
<i>Don Gault</i>	7-10-15
<i>J.P. DeRobertis</i>	2-10-15
<i>Stacy Aikens</i>	1-27-15
<i>John Aikens</i>	1-28-15
<i>John Aikens</i>	1-27-15
<i>John Aikens</i>	3-18-15

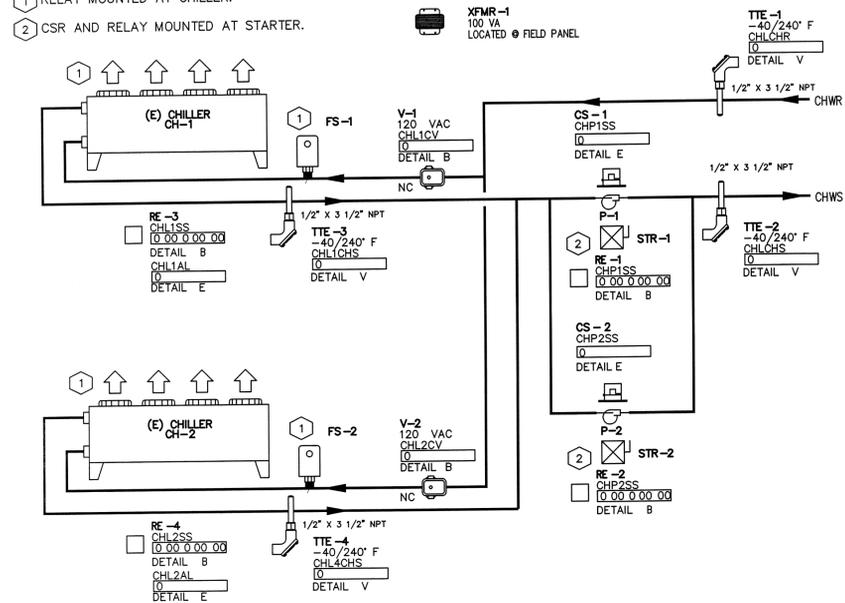
DATE 5/9/14

DRAWN BY ANH, MT, WAS
SCALE AS NOTED
FILE NAME M6

DATE PRINTED 5/9/14
TRADE SW. No. EDM-1728
SHEET No. 24 of 48

INSTALLATION NOTES:

- 1 RELAY MOUNTED AT CHILLER.
- 2 CSR AND RELAY MOUNTED AT STARTER.



BUILDING 4982 - CHILLED WATER PIPING SYSTEM CONTROLS

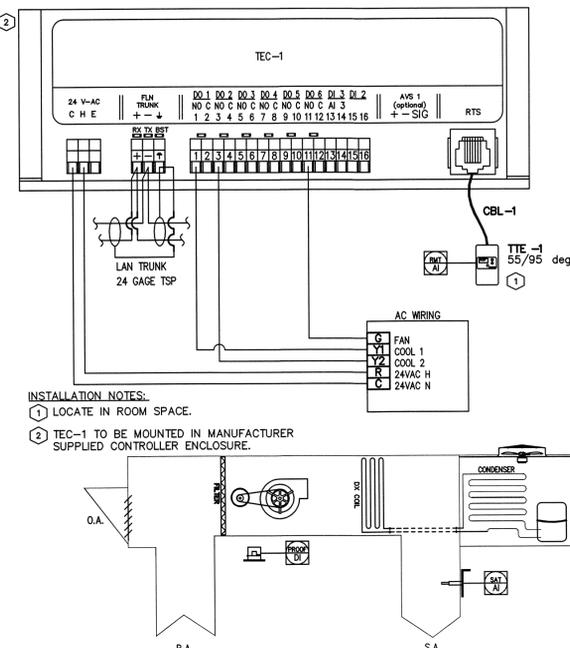
SCALE: NTS

6

CHILLED WATER PUMPS BUILDING 4982 (TYP. FOR CHWP-1 AND 2)

SCALE: NTS

4



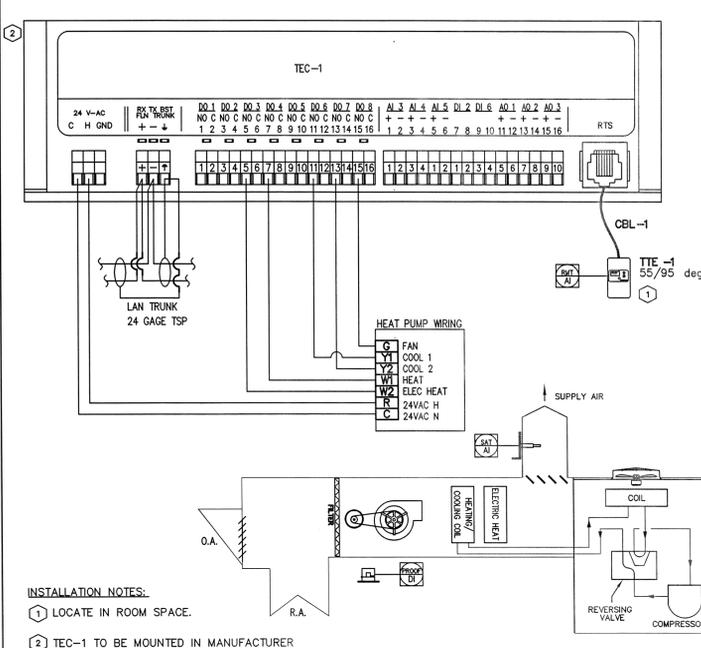
INSTALLATION NOTES:

- 1 LOCATE IN ROOM SPACE.
- 2 TEC-1 TO BE MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.

BUILDING 4720 - PACKAGED COOLING ONLY UNIT (AC-1 ONLY)

SCALE: NTS

3



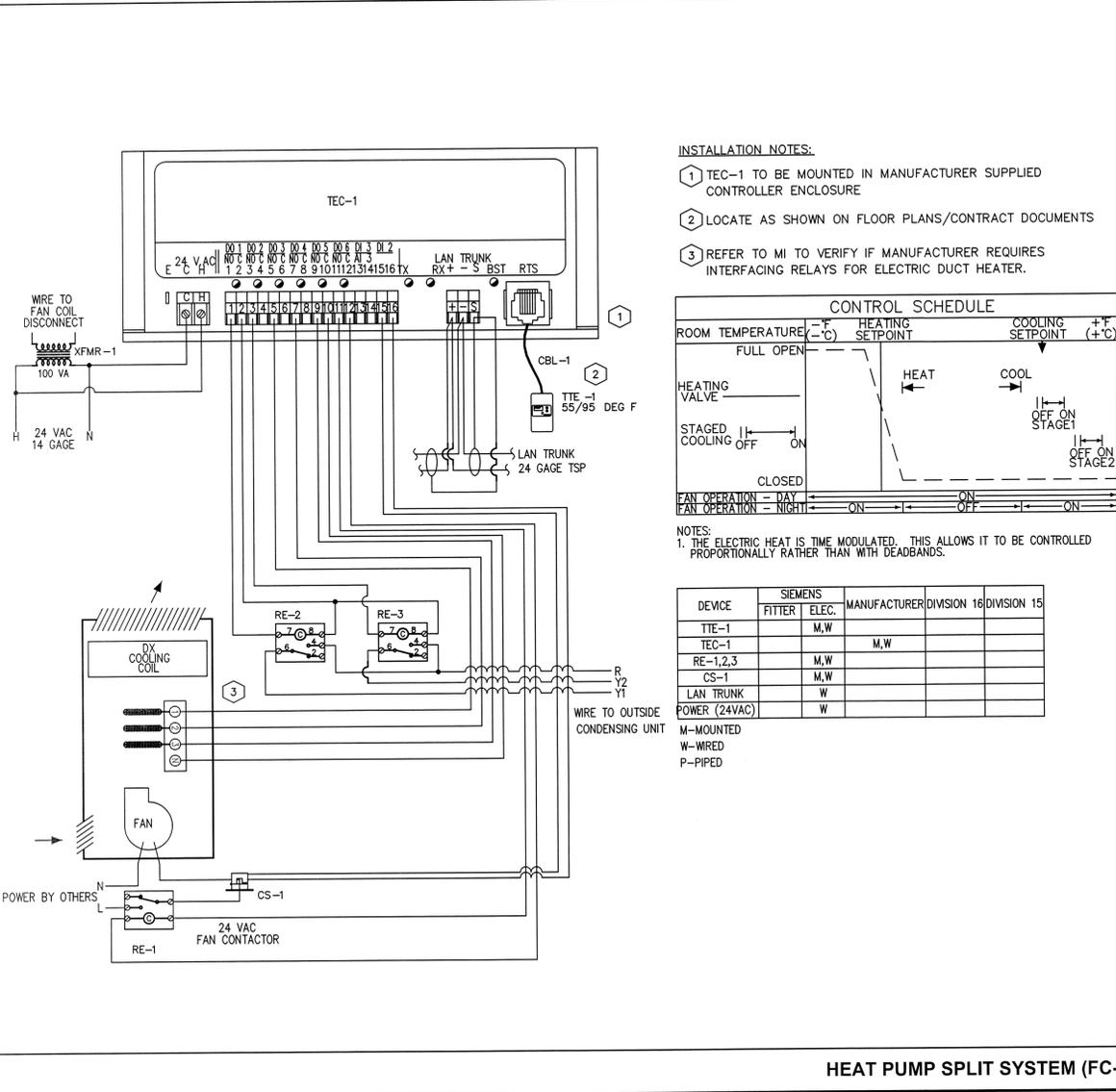
INSTALLATION NOTES:

- 1 LOCATE IN ROOM SPACE.
- 2 TEC-1 TO BE MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.

HEAT PUMP CONTROL (FOR HP-1 BUILDING 4982)

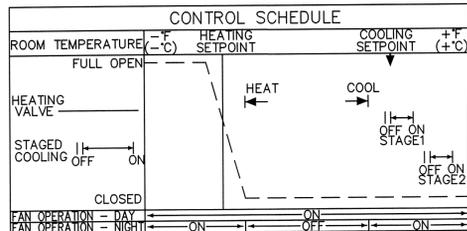
SCALE: NTS

2



INSTALLATION NOTES:

- 1 TEC-1 TO BE MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE
- 2 LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS
- 3 REFER TO MI TO VERIFY IF MANUFACTURER REQUIRES INTERFACING RELAYS FOR ELECTRIC DUCT HEATER.



NOTES:
1. THE ELECTRIC HEAT IS TIME MODULATED. THIS ALLOWS IT TO BE CONTROLLED PROPORTIONALLY RATHER THAN WITH DEADBANDS.

DEVICE	SIEMENS FITTER	ELEC.	MANUFACTURER	DIVISION 16	DIVISION 15
TTE-1		M,W			
TEC-1		M,W			
RE-1,2,3		M,W			
CS-1		M,W			
LAN TRUNK		W			
POWER (24VAC)		W			

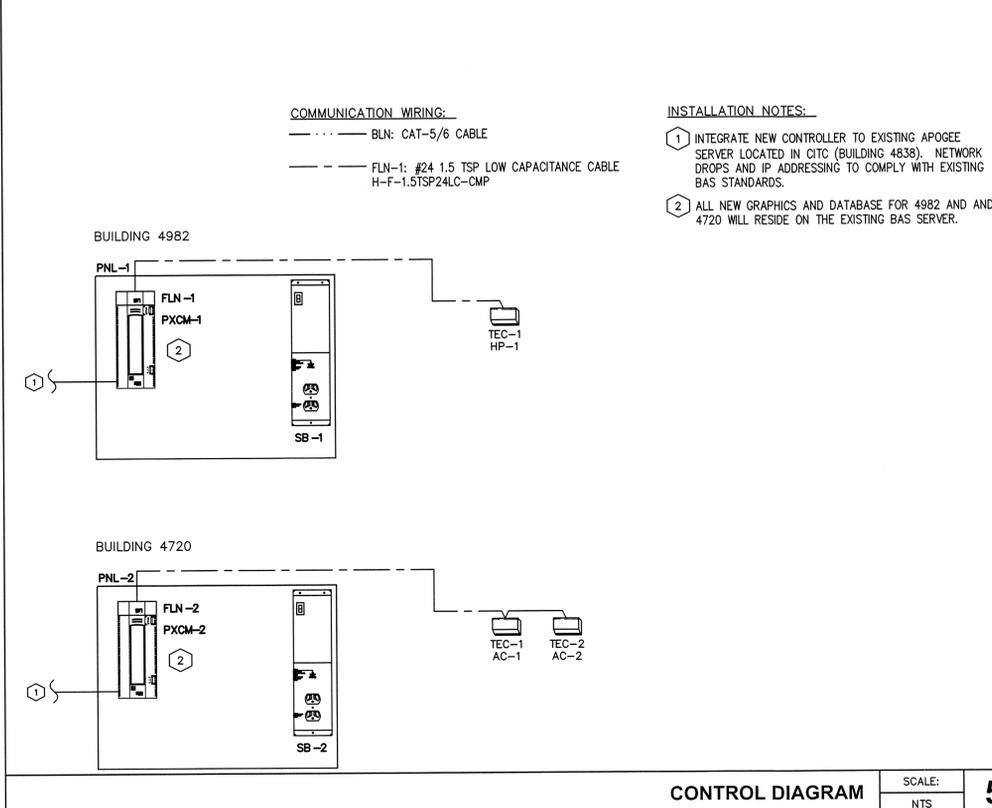
WIRE TO OUTSIDE CONDENSING UNIT
M-MOUNTED
W-WIRED
P-PIPED

COMMUNICATION WIRING:

- BLN: CAT-5/6 CABLE
- FLN-1: #24 1.5 TSP LOW CAPACITANCE CABLE
- H-F-1.5TSP24LC-CMP

INSTALLATION NOTES:

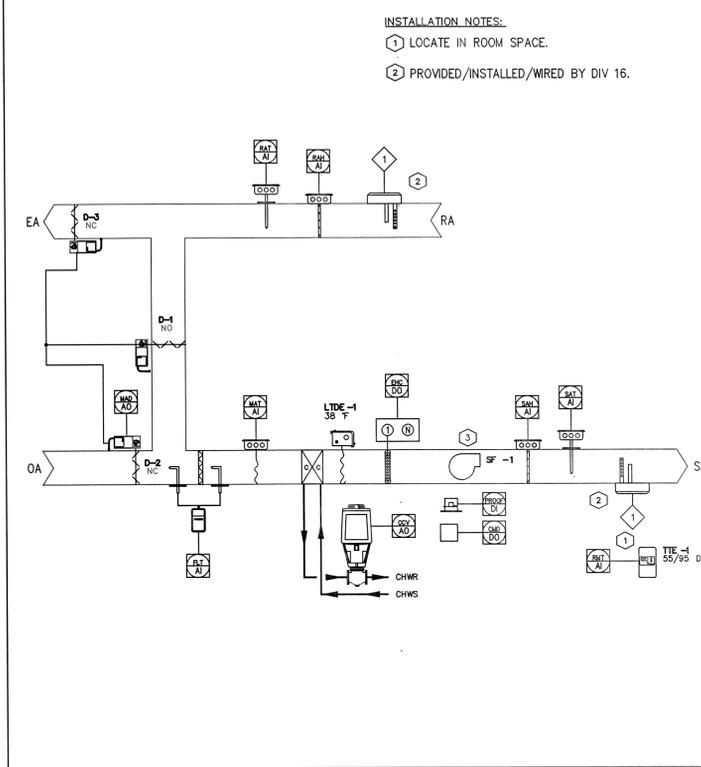
- 1 INTEGRATE NEW CONTROLLER TO EXISTING APOGEE SERVER LOCATED IN CITC (BUILDING 4838). NETWORK DROPS AND IP ADDRESSING TO COMPLY WITH EXISTING BAS STANDARDS.
- 2 ALL NEW GRAPHICS AND DATABASE FOR 4982 AND AND 4720 WILL RESIDE ON THE EXISTING BAS SERVER.



CONTROL DIAGRAM

SCALE: NTS

5



INSTALLATION NOTES:

- 1 LOCATE IN ROOM SPACE.
- 2 PROVIDED/INSTALLED/WIRED BY DIV 16.

BUILDING 4982 - AHU WITH CHW (TYP. FOR AHU-1 AND 2)

SCALE: NTS

1

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION		APPROVALS		DATE
DRYDEN FLIGHT RESEARCH CENTER EDWARDS, CA		Chief, Facilities Engineering & Asset Mgmt. Office	<i>Don Gowdy</i>	7-10-15
		Project Inspector/Assistant	<i>John Albrecht</i>	2-10-15
		Facilities Project Manager	<i>Stephen A. Ben</i>	1-20-15
		Chief, Office of Projective Services	<i>K. R. ...</i>	1-28-15
		Chief - Safety, Health and Environmental Mgmt.	<i>...</i>	1-27-15
		ETIC - Quality Assurance Officer	<i>...</i>	3 Feb 15
DATE STRTD	DATE PRNTD	5/9/14		
DRAWN BY	ANH, MT, WAS	TRADE	EDM-1728	
SCALE	AS NOTED	SHEET	M7	
FILE NAME		SHEET No. 25 of 48		

MECHANICAL CONTROL DIAGRAMS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

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HEAT PUMP SPLIT SYSTEM (FC-2/CU-3)

SCALE: NTS

7

DWG: P112088 NASA ATEFD001M12088 M7.dwg USER: Alex Hernandez DATE: Sep 09, 2014 9:17am XREFS: A-BLOCK-0 IMAGES:

NEW PXCM PANEL, SEE PLAN FOR LOCATION						
DESCRIPTION	POINT TYPE					NOTES
	DO	DI	AO	AI	S/W	
AHU-1 AND AHU-2 (TYPICAL)						
OA/RA/EA ECONOMIZER DAMPERS			X			DAMPERS FURNISHED WITH UNIT, ACTUATORS/CONTROLS BY SIEMENS
MIXED AIR TEMP				X		
CHW COOLING COIL			X			VALVE FURNISHED BY SIEMENS, INSTALLED BY PIPING CONTRACTOR
FREEZE STAT						HARD-WIRED FOR FAN SHUTDOWN - NOT A DISCRETE INPUT TO DDC
ELECTRIC HEATING	X					SINGLE STAGE OUTPUT
SFAN START/STOP	X					
SFAN STATUS		X				
SUPPLY TEMP				X		
SUPPLY RH				X		
ZONE TEMP				X		
RETURN TEMP				X		
RETURN RH				X		
HP-1 AND FC-2 / CU-3						
UNIT ENABLE	X					
UNIT STATUS		X				
HEAT ENABLE	X					
COOLING STAGE 1	X					
COOLING STAGE 2	X					
ZONE TEMP				X		
AIR COOLED CHILLERS (X2)						
CHILLER ENABLE	X					
CHILLER STATUS		X				
CHILLER ALARM		X				
CHWS TEMP				X		
CHWR TEMP				X		
CHW PUMP START/STOP	X					
CHW PUMP STATUS		X				
AC-1						
UNIT ENABLE	X					
UNIT STATUS		X				
COOLING STAGE 1	X					
COOLING STAGE 2	X					
ZONE TEMP				X		
MISC						
CRAC ZONE TEMP				X		
CRAC RUN STATUS		X				
* REQUIRES 120V POWER						
ELECTRICAL NOTES						
1. ELECTRICAL INSTALLATION OF THE DDC SYSTEM SHALL BE IN ACCORDANCE WITH NASA STANDARDS						
2. INCLUDE MOUNTING NEW PANEL & DEVICES, WIRE, CONDUIT, FIELD AND PANEL TERMINATIONS AND OTHER MISC. LABOR AND MATERIALS RELATED TO THE INSTALLATION OF THE ABOVE POINTS.						

AHU W/ CHW - AH-1 & AH-2

THE CONSTANT VOLUME AIR HANDLING UNIT CONSISTS OF A MIXED AIR SECTION WITH OUTDOOR AIR AND RETURN AIR DAMPERS, PRE-FILTER, CHILLED WATER COOLING COIL AND SUPPLY FAN WITH STARTER. THE UNIT IS DDC CONTROLLED USING ELECTRIC ACTUATION.

THE AIR HANDLING UNIT IS SCHEDULED FOR AUTOMATIC OPERATION ON A TIME OF DAY BASIS FOR OCCUPIED AND UNOCCUPIED MODES. WITHIN THE OCCUPIED MODE, THE SYSTEM CAN ENTER THE COOL-DOWN MODE WHEN THE SPACE TEMPERATURE IS ABOVE SET POINT. THE SYSTEM STAYS IN THE COOL-DOWN MODE UNTIL THE MODE SET POINT IS SATISFIED. WITHIN THE UNOCCUPIED MODE, NIGHT COOLING IS AVAILABLE WHEN THE SPACE TEMPERATURE RISES ABOVE 78 DEGREES F (29 DEGREES C). THE LATEST START TIME IS THE SCHEDULED OCCUPANCY FOR THE SPACE.

THE AIR HANDLING UNIT OPERATES IN COOL-DOWN, OCCUPIED, UNOCCUPIED, NIGHT COOLING AND SAFETY MODES AS FOLLOWS (ALL SUGGESTED SET POINTS AND SETTINGS ARE ADJUSTABLE.):

COOL-DOWN

THE SUPPLY FAN STARTS. THE COOLING COIL VALVE AND THE MIXING DAMPERS MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT. WHEN THE OUTDOOR AIR DRY BULB TEMPERATURE IS ABOVE THE ECONOMIZER CHANGEOVER VALUE, THE MIXING DAMPERS ARE POSITIONED FOR 100% RETURN AIR. IF TIME REACHES THE LATEST START TIME DURING THE COOL-DOWN MODE, THE OUTDOOR AIR DAMPER OPENS TO ITS MINIMUM POSITION OR IS CONTROLLED IN ECONOMIZER OPERATION. THE SYSTEM IS PREVENTED FROM ENTERING THE COOL-DOWN MODE MORE THAN ONCE PER DAY.

OCCUPIED

THE FAN STARTS OR CONTINUES TO RUN AND THE UNIT IS CONTROLLED AS FOLLOWS:

WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS BELOW THE ECONOMIZER CHANGEOVER VALUE, THE COOLING COIL VALVE AND MIXED AIR DAMPERS MODULATE IN SEQUENCE WITHOUT OVERLAP TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT WITH A LOW LIMIT OF 48 DEGREES F (9 DEGREES C) AT THE MIXED AIR SENSOR. THE MIXING DAMPERS RAMP OPEN SLOWLY TO MINIMIZE OVERSHOOTING.

WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS ABOVE THE ECONOMIZER CHANGEOVER VALUE, THE MIXING DAMPERS ARE PLACED IN THE MINIMUM OUTDOOR AIR POSITION. THE COOLING COIL VALVE MODULATES TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT.

UNOCCUPIED (NORMAL OFF)

THE SUPPLY FAN IS OFF, THE COOLING COIL VALVE CLOSES AND MIXING DAMPERS CLOSE TO THE OUTDOOR AIR.

NIGHT COOLING

THE SUPPLY FAN STARTS WITH THE COOLING COIL VALVE AND MIXING DAMPERS MODULATING TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT FOR A MAXIMUM SPACE TEMPERATURE OF 78 DEGREES F (29 DEGREES C). WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS ABOVE THE ECONOMIZER CHANGEOVER VALUE, THE MIXING DAMPERS ARE CLOSED TO THE OUTSIDE AIR.

SAFETY

SMOKE DETECTORS IN THE SUPPLY AIR STREAMS DE-ENERGIZE THE SUPPLY FAN UPON ACTIVATION. ALL DAMPERS AND VALVES POSITION TO THEIR NORMAL POSITION AFTER THE FAN IS DE-ENERGIZED.

A LOW TEMPERATURE DETECTOR IN THE MIXED AIR STREAM DE-ENERGIZES THE SUPPLY FAN WHEN TEMPERATURES BELOW 38 DEGREES F (3 DEGREES C) ARE SENSED. THE COOLING COIL VALVE OPENS. ALL OTHER DAMPERS AND VALVES POSITION TO THEIR NORMAL POSITION AFTER THE FAN IS DE-ENERGIZED.

A CURRENT SWITCH IS INSTALLED AT SUPPLY FAN. THE DDC SYSTEM USES THIS SWITCH TO CONFIRM THE FAN IS IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL AND THE SYSTEM GOES TO NORMAL OFF MODE.

HEAT PUMP HP-1 & FC-2/CU-3

THE HEAT PUMP SYSTEM HAS COMPRESSORS BY AN APPLICATION SPECIFIC DDC CONTROLLER USING ELECTRIC ACTUATION. THE SPACE SERVED BY THE HEAT PUMP IS CONTROLLED IN OCCUPIED AND UNOCCUPIED MODES AS FOLLOWS:

OCCUPIED

THE UNIT FAN IS ON. THE CONTROLLER MODULATES THE STAGES OF THE COMPRESSORS IN SEQUENCE TO MAINTAIN THE ROOM TEMPERATURE AT SET POINT.

UNOCCUPIED

THE HEAT PUMP IS CONTROLLED USING THE UNOCCUPIED SPACE TEMPERATURE SET POINT. THE UNIT FAN IS OFF WHEN THE SPACE TEMPERATURE IS BETWEEN THE HEATING AND COOLING UNOCCUPIED SET POINT. THE CONTROLLER MAY RESET TO THE OCCUPIED MODE FOR A PREDETERMINED TIME PERIOD UPON A SIGNAL FROM THE CONTROL SYSTEM OR MANUALLY AT THE ROOM SENSOR.

PACKAGED UNIT COOLING ONLY AC-1

AN APPLICATION SPECIFIC DDC CONTROLLER USING ELECTRIC ACTUATION CONTROLS THE AIR CONDITIONING UNIT. THE SPACE SERVED BY THE AC UNIT IS CONTROLLED IN OCCUPIED AND UNOCCUPIED MODES AS FOLLOWS:

OCCUPIED

THE AC UNIT FAN OPERATES CONTINUOUSLY. THE CONTROLLER MONITORS THE ROOM TEMPERATURE SENSOR AND STAGES THE DX COOLING AND TIME MODULATES THE ELECTRIC HEATING COIL IN SEQUENCE TO MAINTAIN THE SPACE TEMPERATURE AT SET POINT.

UNOCCUPIED

THE AC UNIT IS CONTROLLED USING THE UNOCCUPIED SPACE TEMPERATURE SET POINT. THE AC UNIT FAN IS OFF WHEN THE SPACE IS SATISFIED. THE CONTROLLER MAY RESET TO THE OCCUPIED MODE FOR A PREDETERMINED TIME PERIOD UPON A SIGNAL FROM THE CONTROL SYSTEM OR MANUALLY FROM A SWITCH AT THE ROOM SENSOR.

THE DDC SYSTEM USES A CURRENT SWITCH TO MONITOR THE AC FAN STATUS.

CRAC-1 AND 2

THE BAS WILL MONITOR THE OPERATIONAL/ALARM STATUS OF CRAC UNITS. UPON ACTIVATION OF THE ALARM CONTACTS, THE BAS WILL SEND ALARM NOTIFICATION TO THE EXISTING CENTRAL MONITORING STATION. IN ADDITION THE BAS WILL MONITOR ROOM TEMP FOR AREAS SERVED BY CRAC UNITS. UPON A RISE IN TEMP ABOVE THE ALARM LIMIT, THE BAS WILL INITIATE ALARM NOTIFICATION TO THE EXISTING CENTRAL MONITORING STATION.

CHILLER 1 AND 2

THE CHILLED WATER SYSTEM CONSISTS OF A 2 PACKAGED AIR-COOLED CHILLERS WITH PRIMARY AND BACK-UP CHILLED WATER PUMPS. THE SYSTEM IS DDC CONTROLLED WITH ELECTRIC ACTUATION.

THE SYSTEM OPERATES AS FOLLOWS (ALL SUGGESTED SET POINTS AND SETTINGS ARE ADJUSTABLE.):

PUMP ALTERNATION

PUMPS ALTERNATE TO EQUALIZE RUNTIME. SELECTION OF THE LEAD PUMP IS EVALUATED ON A WEEKLY BASIS. THE PUMP WITH THE LEAST RUNTIME IS THE LEAD PUMP.

CHILLER CONTROL

CHILLERS ALTERNATE TO EQUALIZE RUNTIME. SELECTION OF THE LEAD CHILLER IS EVALUATED ON A WEEKLY BASIS. THE CHILLER WITH THE LEAST RUNTIME IS THE LEAD CHILLER.

THE CHILLED WATER SYSTEM ENABLE POINT IS CONTROLLED EITHER MANUALLY BY THE OPERATOR OR BY A PROGRAM FUNCTION (I.E., TIME-OF-DAY). IF THE CHILLED WATER SYSTEM ENABLE POINT IS ON AND THERE IS A CALL FOR COOLING, AND THE OUTSIDE AIR TEMPERATURE IS ABOVE 55 DEGREES F (13 DEGREES C) THE CHILLER AND LEAD PUMP ARE STARTED.

AFTER FLOW IS PROVEN, THE CHILLER OPERATES UNDER ITS OPERATING AND SAFETY CONTROLS.

THE CHILLED WATER SYSTEM CONTINUES TO OPERATE UNTIL EITHER THE CHILLED WATER SYSTEM ENABLE POINT IS OFF OR COOLING IS NO LONGER REQUIRED. WHEN THE CHILLED WATER SYSTEM SHUTS DOWN, THE CHILLER AND PUMP GO THROUGH A CHILLER STOP SEQUENCE.

THE CHILLER STOP SEQUENCE FIRST STOPS THE CHILLER. AFTER TIME DELAY, THE CHILLED WATER PUMPS ARE STOPPED.

THE DDC SYSTEM USES CURRENT SWITCHES TO CONFIRM THE PUMPS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL. IF THE LEAD PUMP GOES INTO ALARM, THE SECOND PUMP STARTS.

THE DDC SYSTEM MONITORS THE CHILLER ALARM POINT. UPON RECEIPT OF A CHILLER ALARM THE CHILLER AND PUMP GO THROUGH A CHILLER STOP SEQUENCE.

THE OPERATING STATUS OF THE CHILLER IS DETERMINED BY MONITORING THE START/STOP POINT, CHILLER ALARM POINT AND THE CHILLED WATER SUPPLY TEMPERATURE.

SEQUENCE OF OPERATION

SCALE: NTS 1

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2/24/14	D	100% FINAL DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
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12/21/12	A	15% CONCEPT DESIGN		

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DRAWING TITLE
MECHANICAL CONTROL DIAGRAMS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

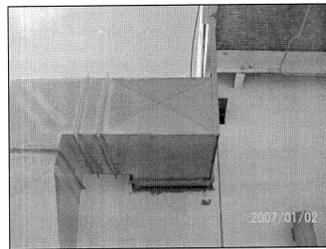
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5/9/14	

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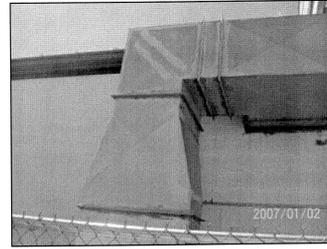
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CONTROLS POINTS LIST

SCALE: NTS 2



1



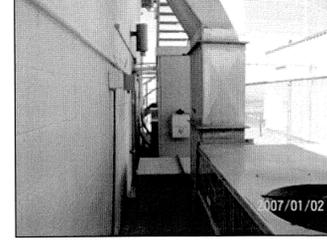
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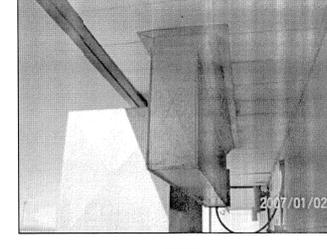
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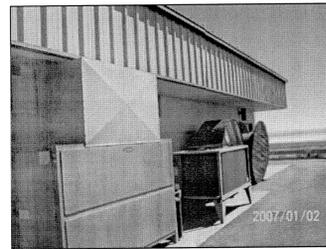
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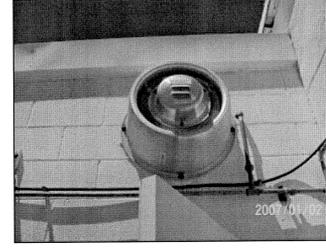
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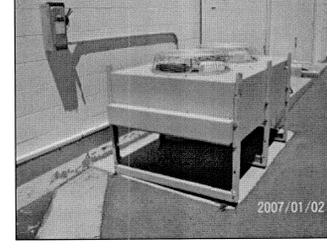
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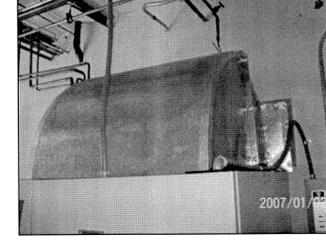
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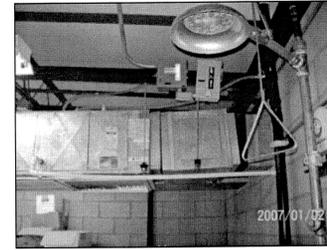
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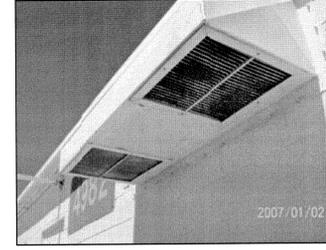
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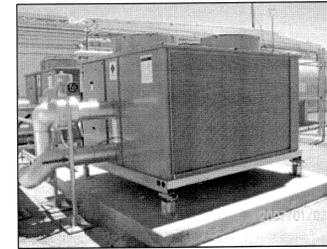
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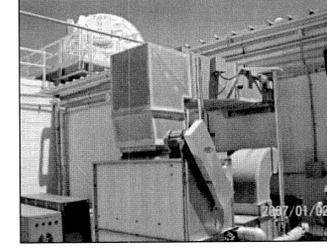
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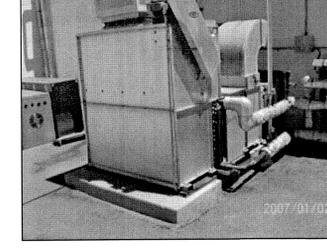
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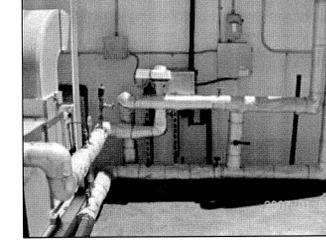
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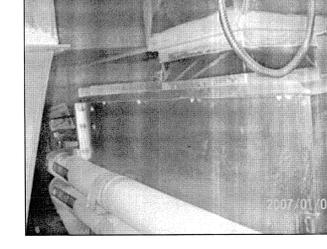
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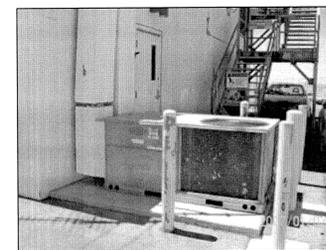
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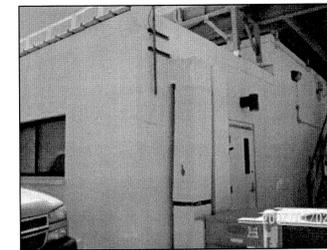
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28



29



30



31

PROFESSIONAL ENGINEER
MECHANICAL
 No. 16641
 Exp. 9-30-15
 STATE OF CALIFORNIA

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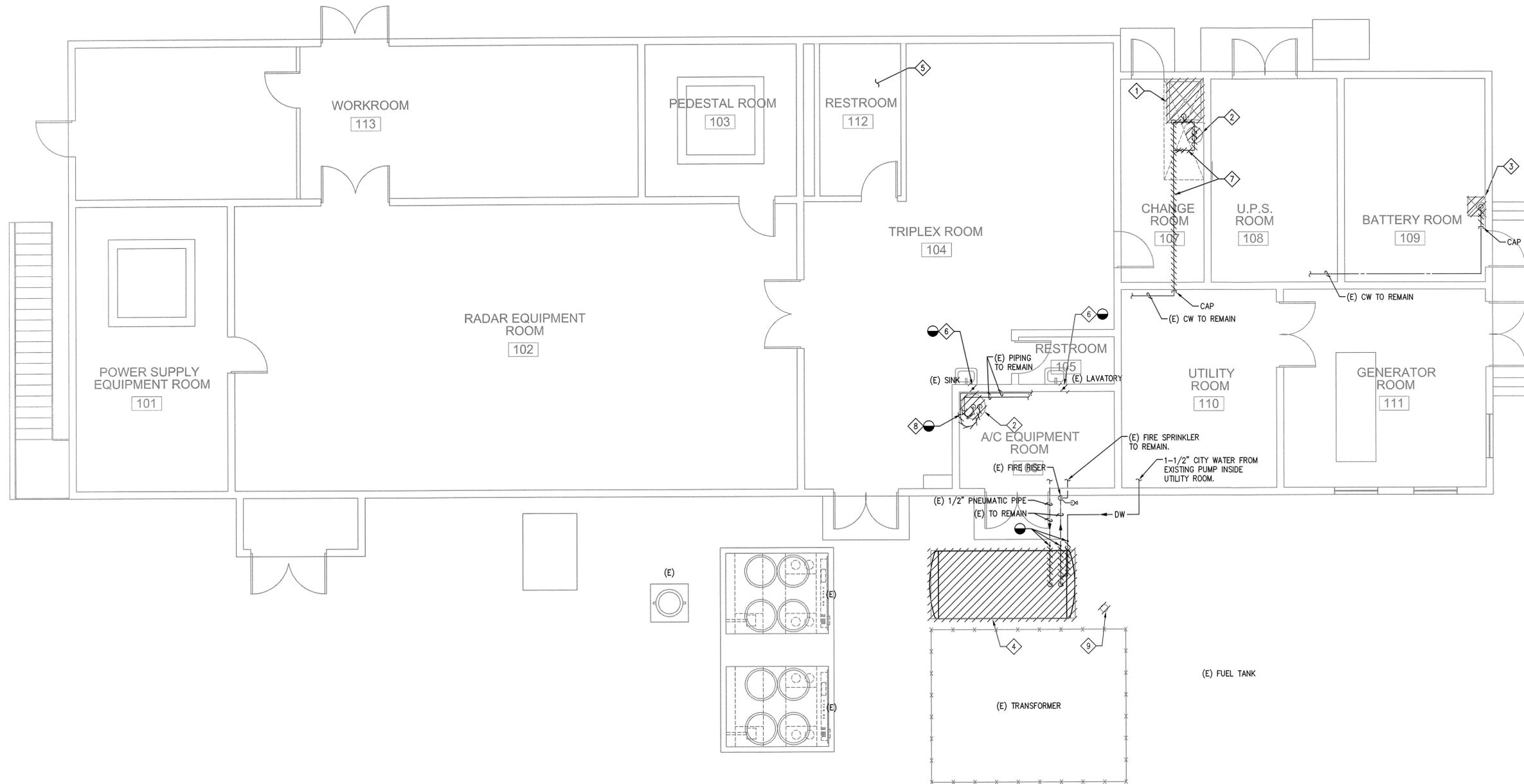
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5/9/14	E	FINAL DESIGN		
2/24/14	D	100% FINAL DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
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 EDWARDS, CA

DRAWING TITLE
 EXISTING MECHANICAL PHOTOS

PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office	<i>[Signature]</i>	7-10-15
Project Registrar/Customer	<i>[Signature]</i>	8-10-15
Facilities Project Manager	<i>[Signature]</i>	1-27-15
Chief, Office of Professional Services	<i>[Signature]</i>	1-28-15
Chief - Safety, Health and Environmental Office	<i>[Signature]</i>	1-27-15
CRD: CDD Information Office	<i>[Signature]</i>	3 Feb 15
DATE STRID	DATE PRINTD	5/9/14
DRAWN BY	ANH, MT, WAS	EDM-1728
SCALE	AS NOTED	
FILE NAME	M9	SHEET No. 22 of 48

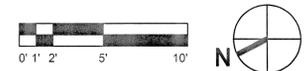


BUILDING 4982 – AERONAUTICAL TRACKING FACILITY 1 (ATF 1)

SCALE: 3/16" 1'-0"
TOTAL: 5067 SF

DEMOLITION NOTES:

- 1 REMOVE EXISTING SHOWER CUT AND CAP EXISTING SERVICES BELOW FLOOR AND ABOVE CEILING. HOT AND COLD WATER SHALL BE CUT AND CAPPED AT MAIN BRANCH.
- 2 REMOVE EXISTING WATER HEATER, ASSOCIATED PIPING AND APPURTENANCES. WATER SHALL BE CUT AND CAPPED AT MAIN BRANCH.
- 3 REMOVE EXISTING EMERGENCY EYE WASH. CUT AND CAP EXISTING SERVICE BELOW FLOOR AND ABOVE CEILING. WATER SHALL BE CUT AND CAPPED AT MAIN BRANCH.
- 4 BID OPTION #7: REMOVE EXISTING FIRE WATER TANK. LEAVE READY FOR RECONNECTION OF NEW FIRE WATER TANK.
- 5 EXISTING WATER CLOSET, URINAL, LAVATORY AND INSTANTANEOUS ELECTRIC WATER HEATER TO REMAIN.
- 6 REMOVE EXISTING HOT WATER TO LAVATORY/SINK. CAP HOT WATER IN WALL.
- 7 REMOVE EXISTING DOMESTIC WATER SUPPLY TO EXISTING SHOWER AND WATER HEATER.
- 8 DISCONNECT AND CAP WATER SUPPLY TO WATER HEATER. PROVIDE SOV FOR FUTURE.
- 9 REMOVE AND DISPOSE OF EXISTING BOLLARD TO ACCOMMODATE NEW FIRE PROTECTION TANK.



PROFESSIONAL SEAL
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No. 11641
Exp. 9-30-15
STATE OF CALIFORNIA

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6/21/13	B	30% DEVELOPED DESIGN	
12/21/12	A	15% CONCEPT DESIGN	
DATE	SYM	REVISION	BY

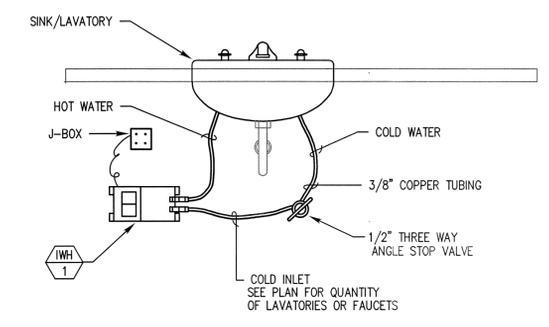
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DRAWING TITLE
BUILDING 4982
PLUMBING DEMOLITION
FLOOR PLAN

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY
TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office	<i>Da Wooly</i>	2-10-15
Project Registrar/Customer	<i>J. Deheret</i>	2-10-15
Facilities Project Manager	<i>Stanford Nelson</i>	1-27-15
Chief, Office of Protective Services	<i>K. [Signature]</i>	1-28-15
Chief - Safety, Health and Environmental Office	<i>[Signature]</i>	1-27-15
DRYDEN Chief Information Officer	<i>[Signature]</i>	3 Feb 15
DATE STRID	DATE PRINTD	5/9/14
DRAWN BY	ANM, MT, WAS	EDM-1728
SCALE	AS NOTED	TRADE SR. No.
FILE NAME	P2	SHEET No. 29 of 48

DWG: P112088 NASA ATF 1.dwg USER: Alex Hernandez DATE: Sep 09, 2014 9:22am XREFS: A-TF-4982-Demo IMAGES:



ELECTRICAL WATER HEATER DETAIL

SCALE: 1
NONE

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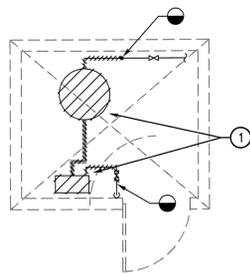
DRAWING TITLE
PLUMBING DETAILS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS	DATE
Chief, Facilities Engineering & Asset Mgmt. Office <i>Da Cowg</i>	7-10-15
Project Registrar/Customer <i>J. S. Clebert</i>	7-10-15
Facilities Project Manager <i>Stacyal Nelson</i>	1-20-15
Chief, Office of Protective Services <i>K. J. ...</i>	1-28-15
Chief - Safety, Health and Environmental Office <i>...</i>	1-27-15
DIRSO Chief Information Officer <i>...</i>	3 Feb 15

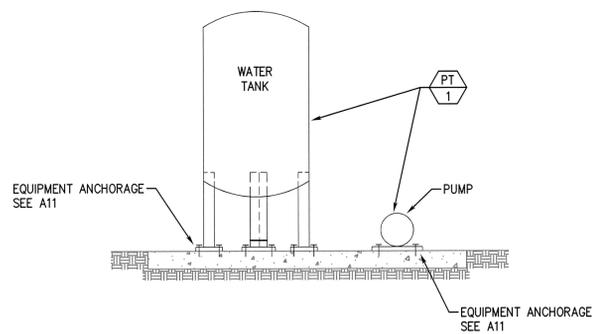
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DRAWN BY	ANHL, MT, WAS	EDM-1728
SCALE	AS NOTED	
FILE NAME	TRADE SHEET No. P4	SHEET No. 31 of 48

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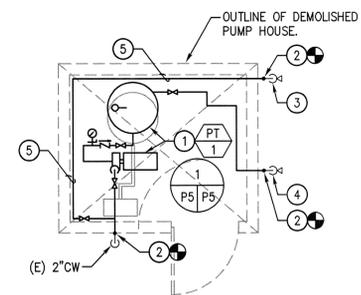


REFERENCE NOTES:

- ① REMOVE EXISTING WATER PUMP AND STORAGE TANK AND RELATED PIPING.



DETAIL 1
SCALE: NTS

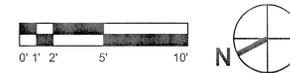


NOTES:

- PROVIDE INSULATION WITH JACKET TO NEW TANK, PUMP, VALVES AND PIPING.
- ALL ABOVE GROUND PIPING SHALL BE PROVIDED WITH HEAT TRACING.

REFERENCE NOTES:

- ① INSTALL NEW SKID MOUNTED PUMP AND WATER TANK.
- ② POINT OF CONNECTION TO EXISTING.
- ③ EXISTING INSULATED WATER VALVE.
- ④ EXISTING INSULATED WATER SUPPLY PIPE TO BELOW GRADE.
- ⑤ NEW 2" CW.



DEMOLITION - PUMP HOUSE B4983

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

REMODEL - PUMP HOUSE B4983

SCALE: 3/16"=1'-0" 2

DWG: P:\12088 NASA AFTD\DWG\P12088 P5.dwg USER: Alex Hernandez DATE: Sep 09, 2014 9:24am XREFS: A:\BLOCK-D BLDG 4720 BASE-Demo IMAGES:

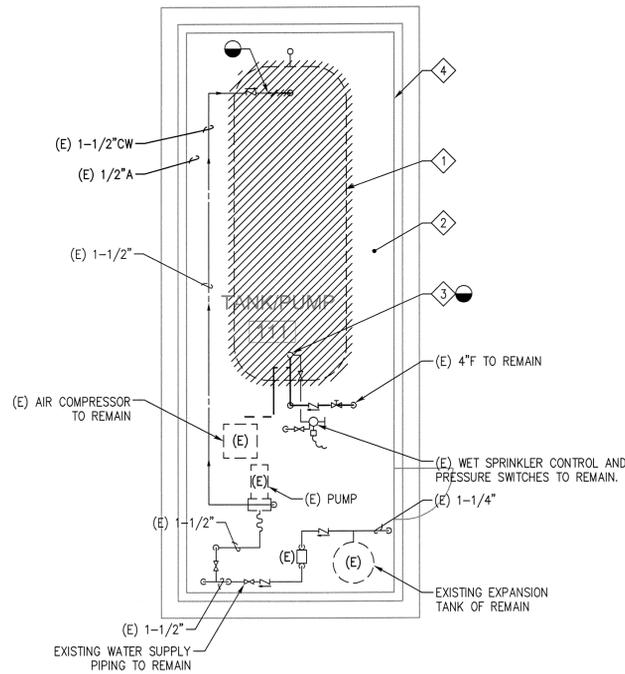
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Consulting Mechanical and Electrical Engineers
5000 E. Spring St., 8th Floor Long Beach, CA 90815
591 Camino De La Reina, Ste. 1107 San Diego, CA 92108
Ph.: 562.497.2999 Ph.: 619.616.2347

DATE	SYM	REVISION	BY	A'PD
5/9/14	E	FINAL DESIGN		
2/24/14	D	100% FINAL DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
6/21/13	B	30% DEVELOPED DESIGN		
12/21/12	A	15% CONCEPT DESIGN		

<p>NATIONAL AERONAUTICS AND SPACE ADMINISTRATION DRYDEN FLIGHT RESEARCH CENTER EDWARDS, CA</p>	<p>APPROVALS</p> <p>Chief, Facilities Engineering & Assgmt. Office <i>Don Lowry</i> 7-10-15</p> <p>Project Manager/Customer <i>J. J. Acheret</i> 2-10-15</p> <p>Facilities Project Manager <i>Stefan Nelson</i> 1-27-15</p> <p>Chief, Office of Protective Services <i>K. S. ...</i> 1-28-15</p> <p>Chief - Safety, Health and Environmental Office <i>...</i> 1-27-15</p> <p>DRBC Chief Information Officer <i>...</i> 3 Feb 15</p>		DATE
	<p>DRAWING TITLE</p> <p>BUILDING 4983 PLUMBING FLOOR PLAN</p>		
<p>PROJECT TITLE</p> <p>REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE</p>		DATE STRTD	DATE PRNTD
<p>DRAWN BY: ANH, MT, WAS</p> <p>SCALE: AS NOTED</p> <p>FILE NAME: P5</p>		TRADE SH. No.	DATE
		EDM-1728	5/9/14
		P5	SHEET No. 32 of 48

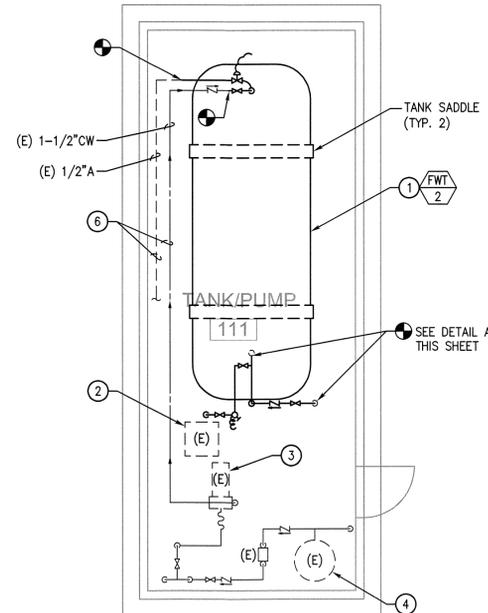
DEMOLITION NOTES

- 1 REMOVE EXISTING ABOVE GROUND WATER STORAGE TANK. EXISTING WATER SUPPLY CONNECTION FOR FUTURE NEW TANK TO REMAIN.
- 2 TEMPORARILY REMOVE EXISTING WET PIPE SPRINKLER SUPPLY AND PIPING IN THIS AREA.
- 3 DISCONNECT TANK WATER OUTLET. PRESERVE PIPING FOR FUTURE TANK CONNECTION.
- 4 EXISTING ROOF SHALL BE REMOVED TO PROVIDE ACCESS OF EXISTING TANK REMOVAL. SEE ARCHITECTURAL DRAWING FOR DIRECTION.

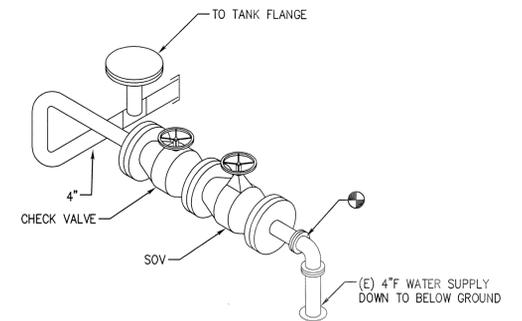


REMODEL NOTES

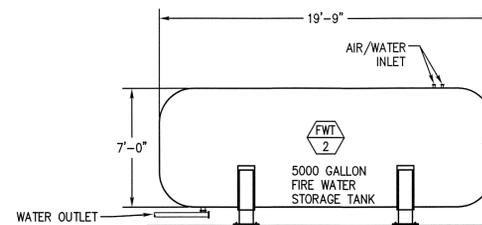
- 1 BID OPTION #3: NEW ABOVE GROUND 5000 GALLON, GLASS LINED WATER STORAGE TANK. CONNECT WATER INLET AND OUTLET CONNECTIONS TO EXISTING WATER SUPPLIES.
- 2 EXISTING AIR COMPRESSOR TO REMAIN.
- 3 EXISTING WATER PUMP TO REMAIN.
- 4 EXISTING EXPANSION TANK TO REMAIN.
- 5 EXISTING 4\"/>



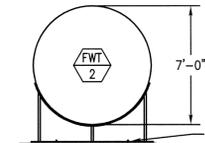
PLAN VIEW
SCALE: 3/16" = 1'-0"



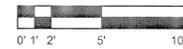
DETAIL A
SCALE: NTS



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



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



DEMOLITION - AERONAUTICAL TRACKING FACILITY (ATF 2) B4720

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

REMODEL - AERONAUTICAL TRACKING FACILITY (ATF 2) B4720

SCALE:
AS NOTED 2

DWG: P12088 NASA ATF2.dwg PR.dwg USER: Alex Hernandez DATE: Sep 09, 2014 9:27am XREFS: A:\B\LOCK-D BLDs\4720 BASE-New IMAGES:

DONN C. GILMORE & ASSOC.
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 591 Camino De La Reina, Ste. 1107 San Diego, CA 92108 Ph.: 619.618.2347

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 DRYDEN FLIGHT RESEARCH CENTER
 EDWARDS, CA

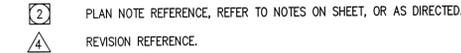
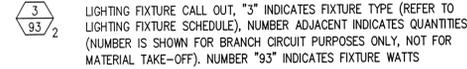
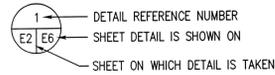
DRAWING TITLE
 BUILDING 4720
 DEMOLITION AND REMODEL PLANS

PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY
 TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office	<i>[Signature]</i>	7-10-15
Project Manager/Contractor	<i>[Signature]</i>	2-10-15
Facilities Project Manager	<i>[Signature]</i>	1-27-15
Chief, Office of Protective Services	<i>[Signature]</i>	1-28-15
Chief - Safety, Health and Environment Office	<i>[Signature]</i>	1-27-15
ERDC Chief Information Officer	<i>[Signature]</i>	3 Feb 15

DATE STRTD	DATE PRNTD	5/9/14
DRAWN BY	ANL, MT, WAS	EDM-1728
SCALE	AS NOTED	
FILE NAME	P6	SHEET No. 33 of 48

ANNOTATIONS



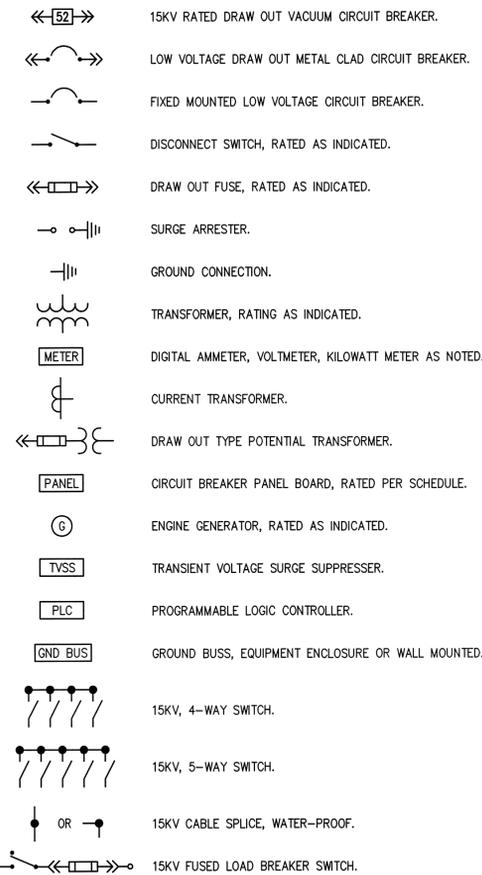
ABBREVIATIONS

A/C	AIR CONDITIONING
ADA	AMERICAN WITH DISABILITIES ACT
A.F.F.	ABOVE FINISH FLOOR
A.F.G.	ABOVE FINISH GRADE
AWG	AMERICAN WIRE GAUGE
AMP, A	AMPERE
A.I.C.	AMPERES INTERRUPTING CAPACITY (SYMMETRICAL)
AF/AT	AMP FRAME, AMP TRIP
AS/AF	AMP SWITCH, AMP FUSE
ATS	AUTOMATIC TRANSFER SWITCH
CIRC., CKT.	CIRCUIT
CB	CIRCUIT BREAKER
C	CONDUIT
CM	CENTIMETER
C.O.	CONDUIT ONLY, COMPLETE WITH PULL STRING
CONN	CONNECTED
CPT	CONTROL POWER TRANSFORMER
CLCB	CURRENT LIMITING CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
CT	CURRENT TRANSFORMER
DIA	DIAMETER
E.C.	ELECTRICAL CONTRACTOR
EMS	ENERGY MANAGEMENT CONTROL SYSTEM
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRICAL NON-METALLIC TUBING
EWC	ELECTRIC WATER COOLER
E-O-L	END-OF-LINE CIRCUIT TERMINATOR
EF	EXHAUST FAN
E/G	EQUIPMENT GROUND (GREEN)
E	EXISTING EQUIPMENT
EP	EXPLOSION PROOF
FA	FIRE ALARM
FLA	FULL LOAD AMPS
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRD	GROUND
HOA	HAND-OFF-AUTO
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
H,W,D,L	HEIGHT, WIDTH, DEPTH, LENGTH
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
I/G	ISOLATED GROUND
JBOX	JUNCTION BOX
K	DEGREE KELVIN
KVA	KILOVOLT AMPERES
KW	KILOWATT
LCL	LONG CONTINUOUS LOAD
L.F.	LINEAR FEET
LTS, LTS	LIGHTING
LPS	LOW PRESSURE SODIUM
MAX	MAXIMUM
MCP	MAINTENANCE BYPASS
MCB	MAIN CIRCUIT BREAKER
MIN.	MINIMUM
MLO	MAIN LUGS ONLY
MM	MILLIMETER
MV	MERCURY VAPOR
MH	METAL HALIDE
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MFR.	MANUFACTURER
MTD	MOUNTED
MW	MICROWAVE
N	NEW EQUIPMENT
NEC	NATIONAL ELECTRICAL CODE
NC	NORMALLY CLOSED
NO	NORMALLY OPENED
NF	NON-FUSED
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO, or #	NUMBER
OFCL	OWNER FURNISHED, CONTRACTOR INSTALLED.
P	POLE
PC	PHOTOCELL
PRIMARY	OVER 600 VOLTS
PH, or P	PHASE
PROVIDE	FURNISH, INSTALL AND CONNECT.
PT	POTENTIAL TRANSFORMER
PA	PUBLIC ADDRESS
REC, RECEIPT	RECEPTACLE
REF	REFRIGERATOR
RGS	RIGID GALVANIZED STEEL
SECONDARY	600 VOLTS AND LESS
SQ.	SQUARE
TC	TIME CLOCK
TEL./DATA	TELEPHONE AND DATA
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLT AMPERES
WP	WEATHERPROOF
W	WIRE
XFMR	TRANSFORMER

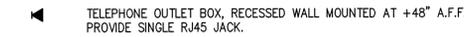
GENERAL NOTES:

- CONDUIT SIZES CALLED OUT ON DRAWINGS ARE NOT NECESSARILY BASED ON THE MINIMUM SIZE ALLOWED BY THE NATIONAL ELECTRICAL CODE AND MAY BE PURPOSELY OVERSIZED FOR EASE OF CONDUCTOR PULLING OR TO AVOID EXCESS CONDUIT HEATING. IN NO CASE SHALL CONDUIT SIZE BE SMALLER THAN IS REQUIRED BY THE NATIONAL ELECTRICAL CODE.
- THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL JUNCTION AND PULL BOXES REQUIRED FOR THE INSTALLATION OF ELECTRICAL DEVICES AND EQUIPMENT, WHETHER OR NOT SPECIFICALLY INDICATED ON THE PLANS. SIZE OF THESE BOXES SHALL BE PER THE NATIONAL ELECTRICAL CODE.
- THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT FOR TEMPORARY CONSTRUCTION POWER AS REQUIRED.
- ALL PENETRATIONS THROUGH FIRE BARRIERS SHALL BE FIRE STOPPED TO MAINTAIN THE INTEGRITY OF THE FIRE BARRIER. FIRE STOPPING MATERIAL SHALL BE U.L. LISTED.
- THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE CONTRACTING OFFICER BEFORE DRILLING ANY PENETRATION THROUGH STRUCTURAL MEMBERS OR FIRE RATED WALLS AND SLABS.
- SHOULD PROJECT CONDITIONS REQUIRE REARRANGEMENT OF WORK, THE CONTRACTOR SHALL MARK SUCH CHANGES ON THE AS-BUILT DRAWINGS. IF THESE CHANGES REQUIRE ALTERNATE METHODS TO THOSE SPECIFIED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING THE PROPOSED ALTERNATE METHODS TO THE CONTRACTING OFFICER. THE CONTRACTOR SHALL NOT PROCEED UNTIL APPROVAL IS OBTAINED. REARRANGEMENT OF WORK FOR THE PURPOSE OF COORDINATION SHALL NOT BE CONSIDERED AN ITEM FOR EXTRA COST.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. TESTING SHALL BE DONE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. SUBMIT A COPY OF SHOP DRAWINGS TO THE CONTRACTING OFFICER FOR INFORMATION.
- PROVIDE TESTING BY OPERATING THE INSTALLATION AND RUNNING TESTS TO DEMONSTRATE ITS OPERATIONS AND COMPLIANCE WITH THE EQUIPMENT SPECIFICATIONS TEST ALL WIRING AND EQUIPMENT TO INSURE PROPER OPERATION ACCORDING TO FUNCTIONS SPECIFIED HEREIN AND ON THE DRAWINGS.
WARRANTY:
ALL WORK IN THIS SECTION SHALL BE UNDER WARRANTY FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE WORK AS A WHOLE BY THE CONTRACTING OFFICER. SHOULD ANY EQUIPMENT OR MATERIAL FAIL WITHIN THIS PERIOD, THE CONTRACTOR SHALL REPLACE OR REPAIR THAT ITEM AT NO COST FOR MATERIAL AND/OR SERVICES IF SUCH IS DUE TO FAULTY WORKMANSHIP OR QUALITY OF MATERIAL FURNISHED.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE TO ANY PART OF THE PREMISES CAUSED BY FAILURE IN THE EQUIPMENT FURNISHED AS PART OF THE CONTRACT DRAWINGS FOR A PERIOD OF ONE YEAR AFTER THE FINAL ACCEPTANCE OF THE WORK AS A WHOLE.
- ALL MECHANICAL CONTROL SYSTEMS EQUIPMENT SHALL BE PROVIDED, INSTALLED AND WRED BY THE MECHANICAL CONTRACTOR PER THE CONTRACT DOCUMENTS. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUITS ONLY FOR CONTROL WIRING.
ELECTRICAL POWER FOR THE MECHANICAL CONTROL SYSTEM EQUIPMENT SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. THIS INCLUDES THE POWER WIRING, AND CONNECTION TO THE MECHANICAL CONTROL SYSTEMS EQUIPMENT.
- ALL EQUIPMENT SHALL BE DESIGNED AND INSTALLED FOR USE IN A SEISMIC ZONE 4 AREA. ALL SEISMIC DESIGN SHALL BE STAMPED AND SIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF CALIFORNIA.
- POT HOLE, TEST, AND LOCATE ALL UTILITY LINES WITHIN THE PROJECT AREA PRIOR TO START OF EXCAVATION IN ORDER TO AVOID DAMAGE TO EXISTING UNDERGROUND UTILITIES. REPAIR ALL DAMAGES TO EXISTING UTILITIES AT NO COST TO OWNER.
- PATCH AND PAINT ALL EXPOSED ELECTRICAL MATERIAL, INCLUDING CONDUIT, SURFACE METAL RACEWAYS, JUNCTION BOXES, PANELS, AND DEVICES TO MATCH THE ADJACENT SURFACES IN TEXTURE AND COLOR.
- REPAIR ANY DAMAGE TO EXISTING CONSTRUCTION RESULTING FROM THE INSTALLATION OF ELECTRICAL ITEMS. THE AREAS REPAIRED SHALL MATCH THE ADJACENT SURFACES IN TEXTURE AND COLOR.
- PROVIDE DEWATERING EFFORT FOR NEW BELOW GRADE EXCAVATION/TRENCHING IF GROUND WATER IS ENCOUNTERED. THE CONTRACTOR SHALL OBTAIN A DIGGING PERMIT BEFORE ANY EXCAVATION OR TRENCHING.
- ALL ELECTRICAL SPLICES SHALL BE WATERPROOF.
- ALL MOUNTING HARDWARE, CHANNELS AND FASTENING DEVICES IN EXTERIOR LOCATIONS SHALL BE 316 STAINLESS STEEL UNLESS NOTED.
- PROVIDE A COMPLETE AND OPERATING ELECTRICAL SYSTEM. PROVIDE SHALL MEAN "FURNISH AND INSTALL". WORK INCLUDES INSTALLATION OF ALL ELECTRICAL EQUIPMENT AND SYSTEMS, INCLUDING ANY FURNISHED BY OWNER OR OTHER TRADES, COMPLETE AND OPERATIONAL TO THE SATISFACTION OF THE CONTRACTING OFFICER, AS LIMITED BY THE INTENT OF THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL COMPLY WITH THE CONSTRUCTION PRACTICES AND REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NFPA 70), NATIONAL ELECTRICAL SAFETY CODE, AMERICAN ELECTRICIANS HANDBOOK BY OROFT EDISON ELECTRIC INSTITUTE, AMERICANS WITH DISABILITIES ACT, APPLICABLE INSTRUCTIONS OF MANUFACTURERS OF EQUIPMENT AND MATERIALS SUPPLIED FOR THE PROJECT, AND ALL ORDINANCES, RULES AND POLICIES OF THE STATE AND COUNTY IN WHICH THE WORK IS TO BE PERFORMED.
- ALL CIRCUITS SHALL INCLUDE AN INSULATED GREEN GROUNDING CONDUCTOR, SIZED PER THE NATIONAL ELECTRICAL CODE. THIS CONDUCTOR SHALL BE CARRIED IN ALL RACEWAYS INCLUDING THOSE INSTALLED FOR SWITCH LEGS AND SHALL BE ATTACHED TO THE DEVICE OR EQUIPMENT HOUSING USING A SUITABLE GROUNDING LUG.
- AT COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL PROVIDE A COPY OF AS-BUILT DRAWINGS IN CD-ROM TO THE CONTRACTING OFFICER.
- SAWCUT EXISTING AC PAVEMENT/SIDEWALK FOR NEW UNDERGROUND DUCTLINE INSTALLATIONS. PATCH AND REPAIR AC PAVEMENT/SIDEWALK TO MATCH EXISTING ADJACENT SURFACES. AT NON-PAVED AREAS, RESTORE SURFACES TO MATCH EXISTING ADJACENT SURFACES. REFER TO 013300 FOR DRAWING FORMAT.
- ALL OUTAGES SHALL BE COORDINATED AND SCHEDULED WITH THE CONTRACTING OFFICER AT LEAST (3) WEEKS IN ADVANCE OF REQUESTED OUTAGE IN WRITING. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING GENERATOR SUPPORT FOR SCHEDULED ELECTRICAL OUTAGE DUE TO CONSTRUCTION CONTRACT WORK.
- ALL NEW PRIMARY ELECTRICAL DUCTS AND TELECOMMUNICATION AND CATV DUCTS SHALL BE CONCRETE ENCASED. REFER TO TYPICAL DETAIL ON DWG. E-7.
- ALL SITE 15KV DISTRIBUTION CONDUITS SHALL INCLUDE #4/0 AWG BARE COPPER GROUND CONDUCTOR.
- PROVIDE GROUND BOND OF SWITCHGEAR SECTIONS TO SUBSTATION GRID USING #4/0 AWG BARE COPPER WIRE AND BOLTED CONNECTIONS.
- ALL ELECTRICAL CONDUCTORS FOR DISTRIBUTION AT 480 VOLTS AND BELOW SHALL BE THHN, 90°C INSULATION EXCEPT WHERE SPECIFIED ON SINGLE LINE DIAGRAM TO INSTALL DOL TYPE RHH/RHW-2 90°C CONDUCTORS.
- MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG FOR BOTH POWER AND CONTROL CIRCUITS.
- OBTAIN CONFINED SPACE PERMIT FROM NASA PRIOR TO ENTRY OF UNDER GROUND MANHOLES AND VAULTS.
- GOVERNMENT RESERVES THE RIGHT TO WITNESS FACTORY TESTING. NOTIFY GOVERNMENT 30 CALENDAR DAYS PRIOR TO EQUIPMENT FACTORY TESTS FOR GOVERNMENT REPRESENTATIVE ATTENDANCE.

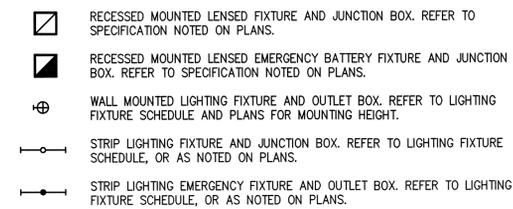
ONE LINE DIAGRAM



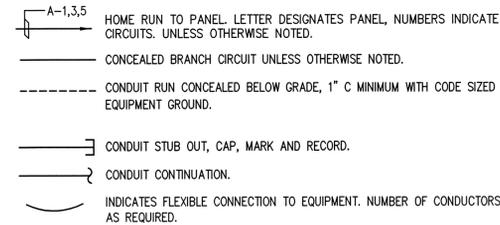
TELEPHONE/DATA SYMBOLS



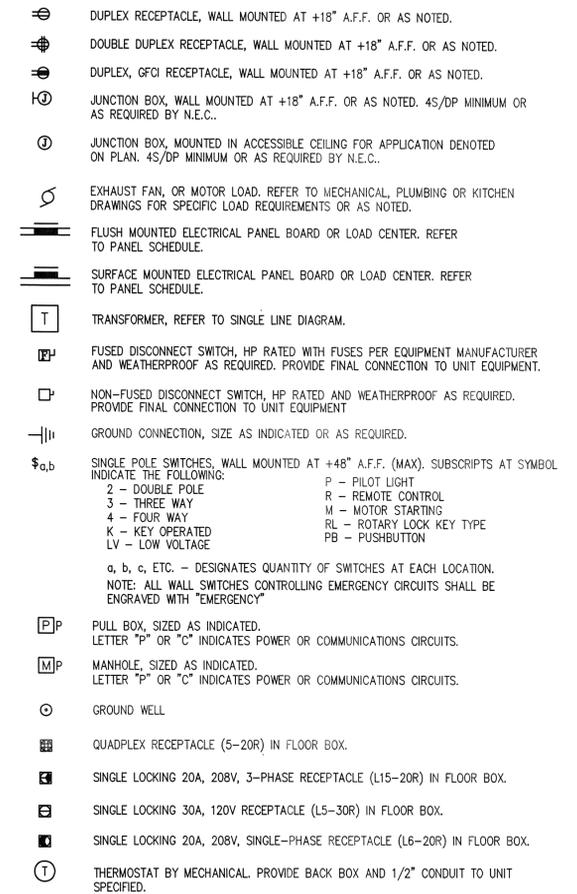
LIGHTING SYMBOLS



BRANCH CIRCUIT SYMBOLS



POWER SYMBOLS



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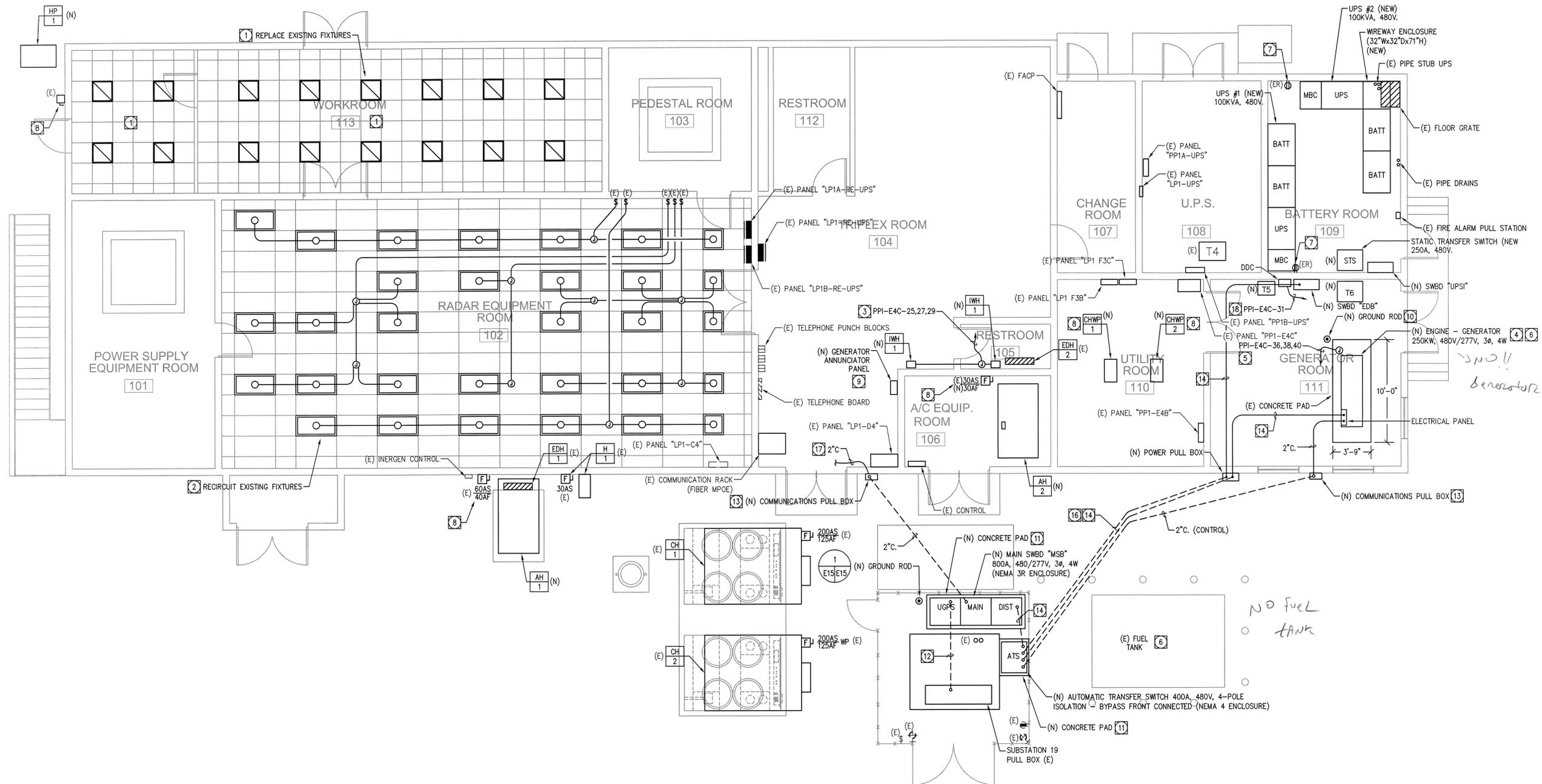
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

DRYDEN FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE
ELECTRICAL SYMBOLS, NOTES AND ABBREVIATIONS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office	<i>[Signature]</i>	7-10-15
Project Manager/Engineer	<i>[Signature]</i>	2-10-15
Facilities Project Manager	<i>[Signature]</i>	1-27-15
Chief, Office of Protective Services	<i>[Signature]</i>	1-28-15
Chief - Safety, Health and Environmental Office	<i>[Signature]</i>	1-27-15
OPIC Chief Information Officer	<i>[Signature]</i>	3 Feb 15
DATE STRTD	DATE PRNTD	5/9/14
DRAWN BY	ANL, MT, WAS	EDM-1728
SCALE	AS NOTED	
FILE NAME	E1	SHEET No. 34 of 48



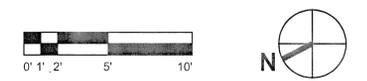
BUILDING 4982 - AERONAUTICAL TRACKING FACILITY 1 (ATF 1) - REMODEL

SCALE: 3/16" = 1'-0"
TOTAL: 5067 SF

SHEET SPECIFIC NOTES:

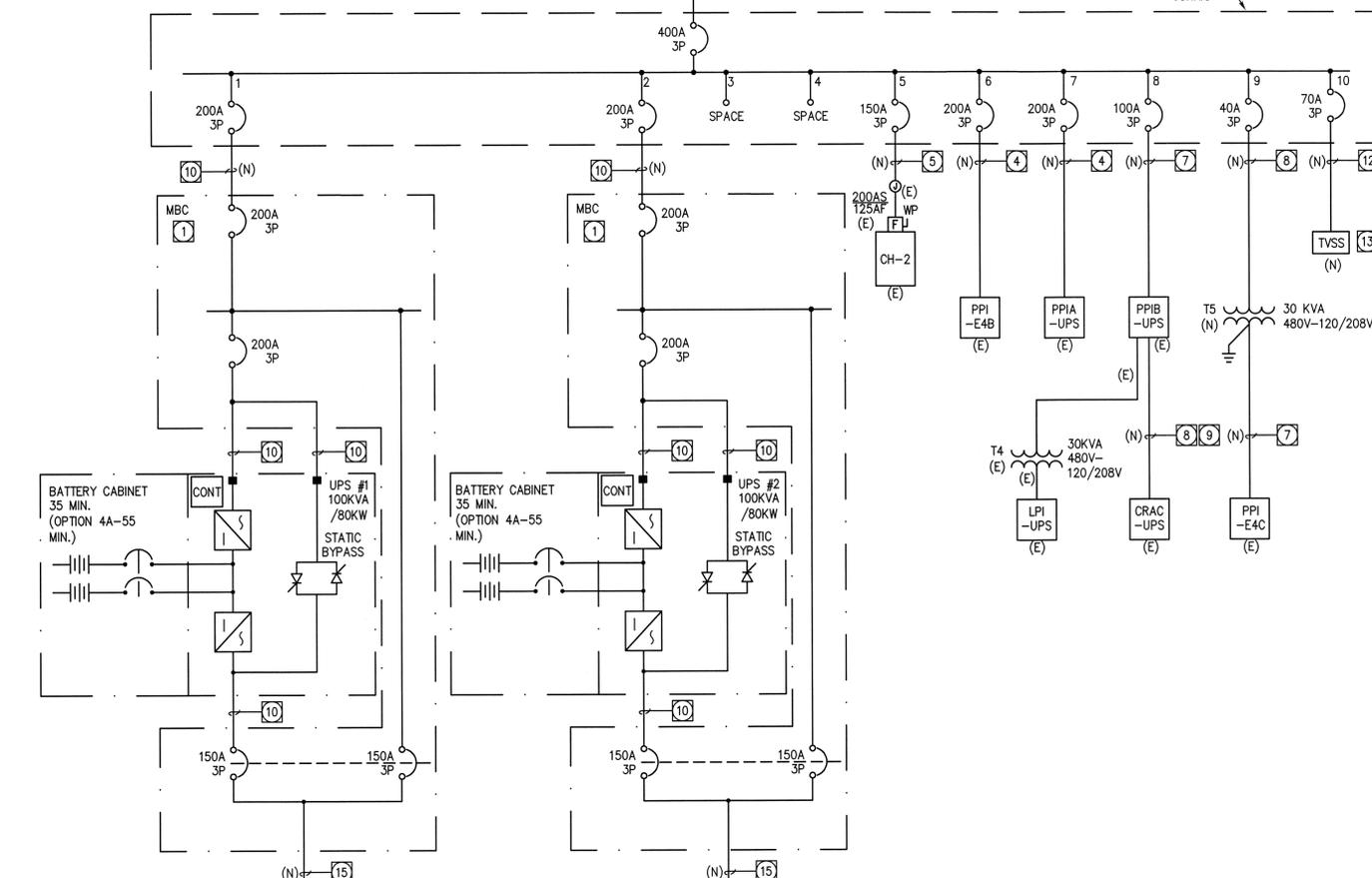
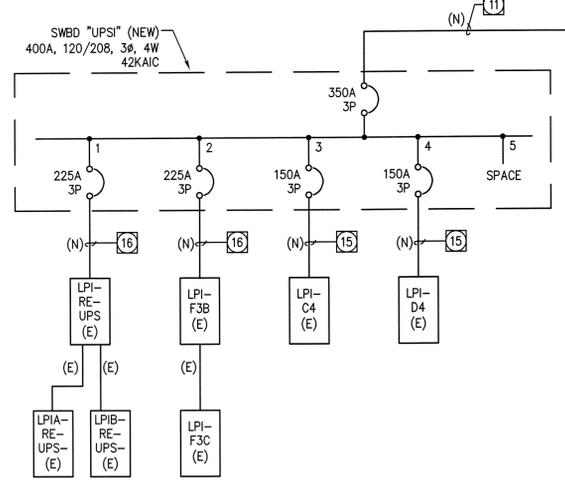
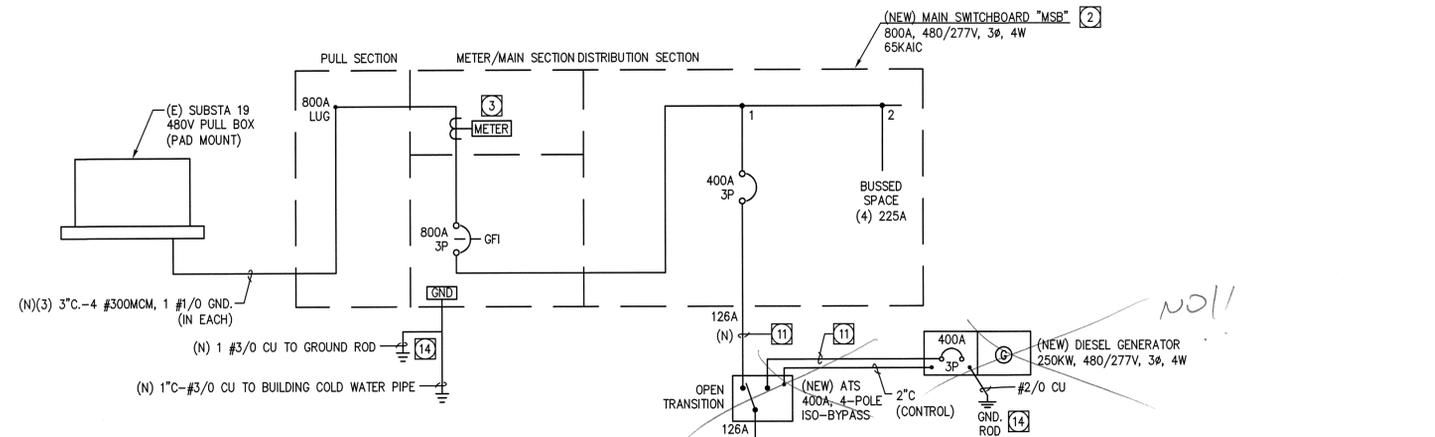
- 1 OPTION 5: PROVIDE NEW 2"x2" RECESSED LED LIGHT FIXTURES IN ROOM 113. PROVIDE CONNECTION TO EXISTING SWITCH CIRCUITS, RETAINED FROM DEMOLITION. PROVIDE FIXTURES RATED 40W, 3500K, WITH MINIMUM 3540 LUMEN OUTPUT AND CRI VALUE OF 82.
- 2 PROVIDE NEW SWITCH LEG CIRCUITRY FOR EXISTING LIGHT FIXTURES, IN ROOM 102, AS SHOWN. CLEAN AND RE-LAMP EXISTING FIXTURES. WIRE TO EXISTING LIGHT SWITCHES. PROVIDE SWITCH LEG WIRING WITH #12 AWG LINE, NEUTRAL, AND GROUND CONDUCTORS IN 3/4" CONDUIT. CONDUIT AND JUNCTION BOX SYSTEM PROVIDED AS A GUIDELINE. FIELD DEVELOP WITH ROUTING AND JUNCTION BOX QUANTITY AS REQUIRED.
- 3 PROVIDE 3/4"C-3 #10, 1 #10 GROUND TO NEW 30A, 3-POLE CIRCUIT BREAKER. PROVIDE BRANCH CIRCUIT CONTINUATION IN CONDUIT, THROUGH JUNCTION BOX, TO WATER HEATER TERMINATION, PER MANUFACTURER'S INSTRUCTIONS. BREAKER TYPE AND AIC RATING TO MATCH EXISTING.
- 4 PROVIDE ENGINE-GENERATOR MOUNTED ON EXISTING EQUIPMENT PAD, WITH VIBRATION ISOLATORS. PROVIDE CEILING/ROOF PENETRATION FOR INSULATED EXHAUST STACK PIPE, WITH WATER-PROOF SEALANT. PROVIDE RADIATOR FAN EXHAUST DUCT, WITH COUPLING, TO EXISTING WALL LOUVER. PROVIDE MUFFLER MOUNTED ON ROOF, WITH STAND FOR STRUCTURAL BRACING AND ANCHORAGE.
- 5 PROVIDE BATTERY CHARGER AND WATER JACKET HEATER SUPPLY CIRCUIT AS 3/4"C-4 #10, 1 #10 GND. ON NEW 30A, 3-POLE CIRCUIT BREAKER. TYPE AND AIC RATING TO MATCH EXISTING.
- 6 PROVIDE FUEL TRANSFER PIPING FOR SUPPLY AND RETURN BETWEEN EXTERIOR TANK AND ENGINE FRAME MOUNTED PUMPS.
- 7 RELOCATE EXISTING RECEPTACLE TO EAST WALL IN APPROXIMATE LOCATION SHOWN.
- 8 PROVIDE RECONNECTION OF EXISTING SAFETY SWITCH TO UNIT TERMINATION, WITH FEEDER IN FLEXIBLE SEALTIGHT STEEL CONDUIT.
- 9 PROVIDE 1" CONDUIT TO GENERATOR CONTROL PANEL, WITH WIRING PER MANUFACTURER'S INSTRUCTIONS.

- 10 PROVIDE NEW GROUND ROD (3/4" DIAMETER x 10' LENGTH), AS COPPER-CLAD STEEL, WITH EXOTHERMIC WELD CONNECTION TO GROUNDING ELECTRODE CONDUCTOR. PROVIDE FALL OF POTENTIAL GROUND TEST (3-POINT) FOR VERIFICATION OF EARTH GROUND RESISTANCE LESS THAN 25 OHMS. PROVIDE ADDITIONAL GROUND ROD (IF REQUIRED) AT MINIMUM 10' SEPARATION DISTANCE.
- 11 SEE CIVIL PLANS FOR CONCRETE PAD SIZE AND CONSTRUCTION.
- 12 PROVIDE (3) 3"C-4 #300MCM, 1 #1/0 GND. (IN EACH).
- 13 PROVIDE COMMUNICATIONS PULL BOX (18x18"x6"D), RATED NEMA TYPE 3R, ON EXTERIOR WALL AT +48" ABOVE FINISHED GRADE.
- 14 PROVIDE (2) 2"C-4 #3/0, 1 #3 GND. (IN EACH).
- 15 PROVIDE POWER PULL BOX (24x24"x6"D), RATED NEMA TYPE 3R, ON EXTERIOR WALL AT +48" ABOVE FINISHED GRADE.
- 16 PROVIDE WRAPPED RGS CONDUIT ON STUB-UP IN GRADE TO PULL BOX.
- 17 PROVIDE SEALED EXTERIOR WALL PENETRATION AND CONDUIT STUB INTO INTERIOR CEILING SPACE.
- 18 PROVIDE 3/4"C-2 #12, 1 #12 GND.

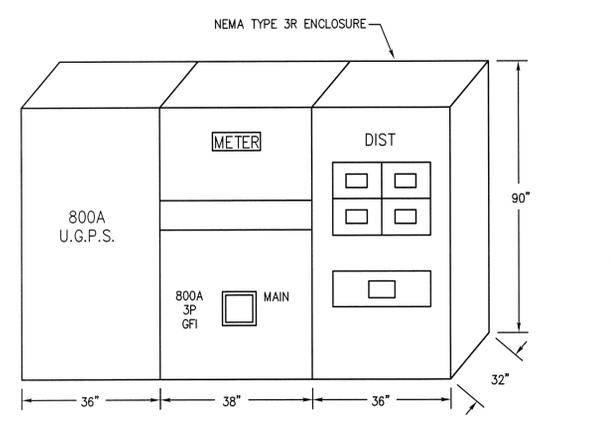


<p>DONN C. GILMORE & ASSOC. FOUNDED 1959 Consulting Mechanical and Electrical Engineers 5000 E. Spring St., 8th Floor Long Beach, CA 90815 591 Camino De La Reina, Ste. 1107 San Diego, CA 92108 Ph: 562.497.2999</p>	<table border="1"> <tr><th>DATE</th><th>SYM</th><th>REVISION</th><th>BY</th></tr> <tr><td>5/9/14</td><td>E</td><td>FINAL DESIGN</td><td></td></tr> <tr><td>2/24/14</td><td>D</td><td>100% FINAL DESIGN</td><td></td></tr> <tr><td>10/27/13</td><td>C</td><td>60% DEVELOPED DESIGN</td><td></td></tr> <tr><td>6/21/13</td><td>B</td><td>30% DEVELOPED DESIGN</td><td></td></tr> <tr><td>12/21/12</td><td>A</td><td>15% CONCEPT DESIGN</td><td></td></tr> </table>	DATE	SYM	REVISION	BY	5/9/14	E	FINAL DESIGN		2/24/14	D	100% FINAL DESIGN		10/27/13	C	60% DEVELOPED DESIGN		6/21/13	B	30% DEVELOPED DESIGN		12/21/12	A	15% CONCEPT DESIGN		<p>NATIONAL AERONAUTICS AND SPACE ADMINISTRATION DRYDEN FLIGHT RESEARCH CENTER EDWARDS, CA</p> <p>DRAWING TITLE BUILDING 4982 REMODEL PLAN</p> <p>PROJECT TITLE REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE</p>	<table border="1"> <tr><th>APPROVALS</th><th>DATE</th></tr> <tr><td><i>Don Gilmore</i></td><td>7-10-15</td></tr> <tr><td><i>J.P. Oberhel</i></td><td>2-10-16</td></tr> <tr><td><i>Stacy Wilson</i></td><td>1-27-15</td></tr> <tr><td><i>K. Wilson</i></td><td>1-28-15</td></tr> <tr><td><i>John Wilson</i></td><td>1/27/15</td></tr> <tr><td><i>John Wilson</i></td><td>3/2/15</td></tr> </table>	APPROVALS	DATE	<i>Don Gilmore</i>	7-10-15	<i>J.P. Oberhel</i>	2-10-16	<i>Stacy Wilson</i>	1-27-15	<i>K. Wilson</i>	1-28-15	<i>John Wilson</i>	1/27/15	<i>John Wilson</i>	3/2/15
	DATE	SYM	REVISION	BY																																					
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<p>DATE: 5/9/14 DRAWN BY: ANH, MT, WAS SCALE: AS NOTED FILE NAME: E4</p>	<p>DATE PRINTED: 5/9/14 TRADE: EDM-1728 SHEET No. 32 of 48</p>																																								

DWG: P:\12088 NASA ATF\DWG\4982 Remodel.dwg USER: Alex Hernandez DATE: Sep 09, 2014 8:53am XREFS: A:\BLOC\4 - ATF Base Plan (Elect) A:\ATF 4982-Rem



- SINGLE LINE DIAGRAM SPECIFIC NOTES:**
- 1 PROVIDE MAINTENANCE BYPASS SWITCH WITH ELECTRICALLY INTERLOCKED CIRCUIT BREAKERS FOR SIMULTANEOUS CLOSURE ONLY WHEN UPS IS IN STATIC BYPASS MODE.
 - 2 PROVIDE METER SWITCHBOARD IN AN EQUIPMENT SHELTER MOUNTED ON BUILDING EXTERIOR. SEE REMODEL PLAN (E4) AND DETAIL #1, ON THIS SHEET.
 - 3 PROVIDE NETWORKED 3-PHASE DIGITAL MULT-FUNCTION POWER MONITOR, WITH MODBUS RTU. POWER MEASUREMENTS SHALL INCLUDE VOLTS, AMPS, KW, KVA, KWH, FREQ. AND PF. INTEGRATED MEMORY SHALL STORE MAXIMUM KW DEMAND, AND TOTALIZED KWH READINGS.
 - 4 PROVIDE 2\"/>



BUILDING 4982 - REMODEL SINGLE LINE DIAGRAM

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DATE	SYM	REVISION	BY
5/9/14	E	FINAL DESIGN	
2/24/14	D	100% FINAL DESIGN	
10/27/13	C	60% DEVELOPED DESIGN	
6/21/13	B	30% DEVELOPED DESIGN	
12/21/12	A	15% CONCEPT DESIGN	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DRYDEN FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE
BUILDING 4982 REMODEL
SINGLE LINE DIAGRAM

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY
TRACKING INFRASTRUCTURE

APPROVALS

Signature	DATE
<i>[Signature]</i>	7-10-13
<i>[Signature]</i>	2-10-15
<i>[Signature]</i>	2-27-15
<i>[Signature]</i>	1-28-15
<i>[Signature]</i>	1/27/15
<i>[Signature]</i>	3 Feb 15

DATE STRTD 5/9/14 **DATE PRINTD** 5/9/14

DRAWN BY ANH, MT, WAS **TRACED** EDM-1728

SCALE AS NOTED **SR. No.** E5

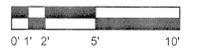
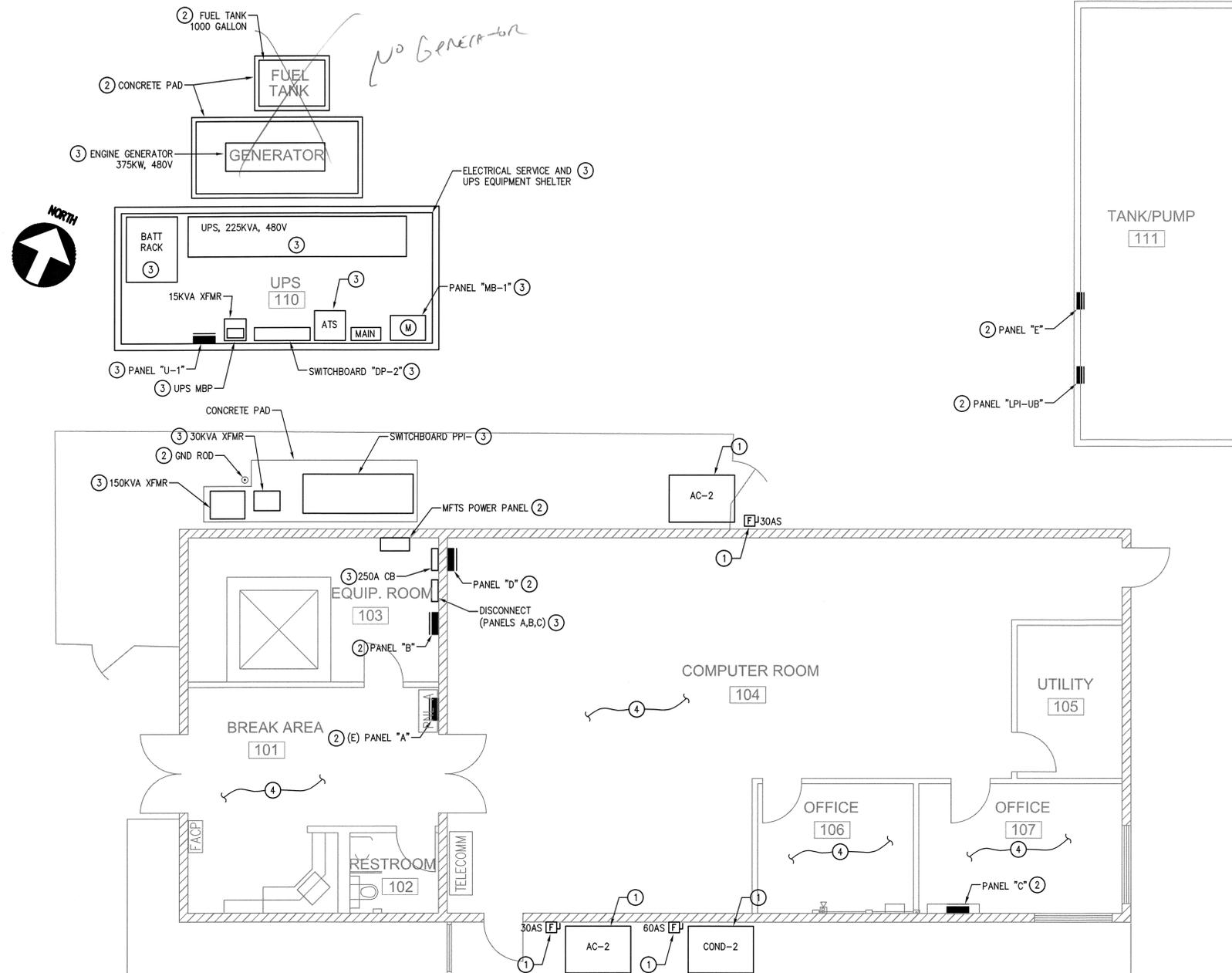
FILE NAME SHEET No. 38 of 48

DWG: P112088 NASA ATF/Dwp/E12088 E5.dwg USER: Alex Hernandez
 DATE: Sep 09, 2014 8:53am XREFS: A-TBLOCKD IMAGES:

MAIN SWITCHBOARD "MSB" ELEVATION

DEMOLITION SHEET NOTES:

- ① DISCONNECT AND REMOVE ELECTRICAL WIRING AND CONDUIT FROM MECHANICAL UNIT, SCHEDULED FOR DEMOLITION. REMOVE DISCONNECT SWITCH AND FEEDER CONDUCTORS/CONDUIT BACK TO SERVICE SWITCHBOARD.
- ② EXISTING EQUIPMENT TO REMAIN.
- ③ DISCONNECT AND REMOVE ELECTRICAL EQUIPMENT. REMOVE FEEDER CONDUCTORS AND CONDUIT BACK TO SUPPLY PANEL.
- ④ DISCONNECT AND REMOVE EXISTING LIGHT FIXTURES. REMOVE SWITCH CIRCUIT AND ASSOCIATED CONDUIT IN CEILING SPACE TO LOCAL JUNCTION BOX. INSULATE WIRING IN PREPARATION FOR REUSE PER REMODEL PLAN.
- ⑤ TO BE DEMOLISHED.



BUILDING 4720 – AERONAUTICAL TRACKING FACILITY (ATF 2) – DEMOLITION
 SCALE: 3/16" 1'- 0" (TOTAL SQUARE FEET = 2200)
 TOTAL: 5067 SF

PROFESSIONAL ENGINEER
 No. E016151
 Exp. 6-30-16
ELECTRICAL
 STATE OF CALIFORNIA

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 Ph.: 562.497.2999 Ph.: 619.618.2347

DATE	SYM	REVISION	BY	A'PD
5/9/14	E	FINAL DESIGN		
2/24/14	D	100% FINAL DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
6/21/13	B	30% DEVELOPED DESIGN		
12/21/12	A	15% CONCEPT DESIGN		

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 DRYDEN FLIGHT RESEARCH CENTER
 EDWARDS, CA

DRAWING TITLE
 BUILDING 4720
 DEMOLITION PLAN

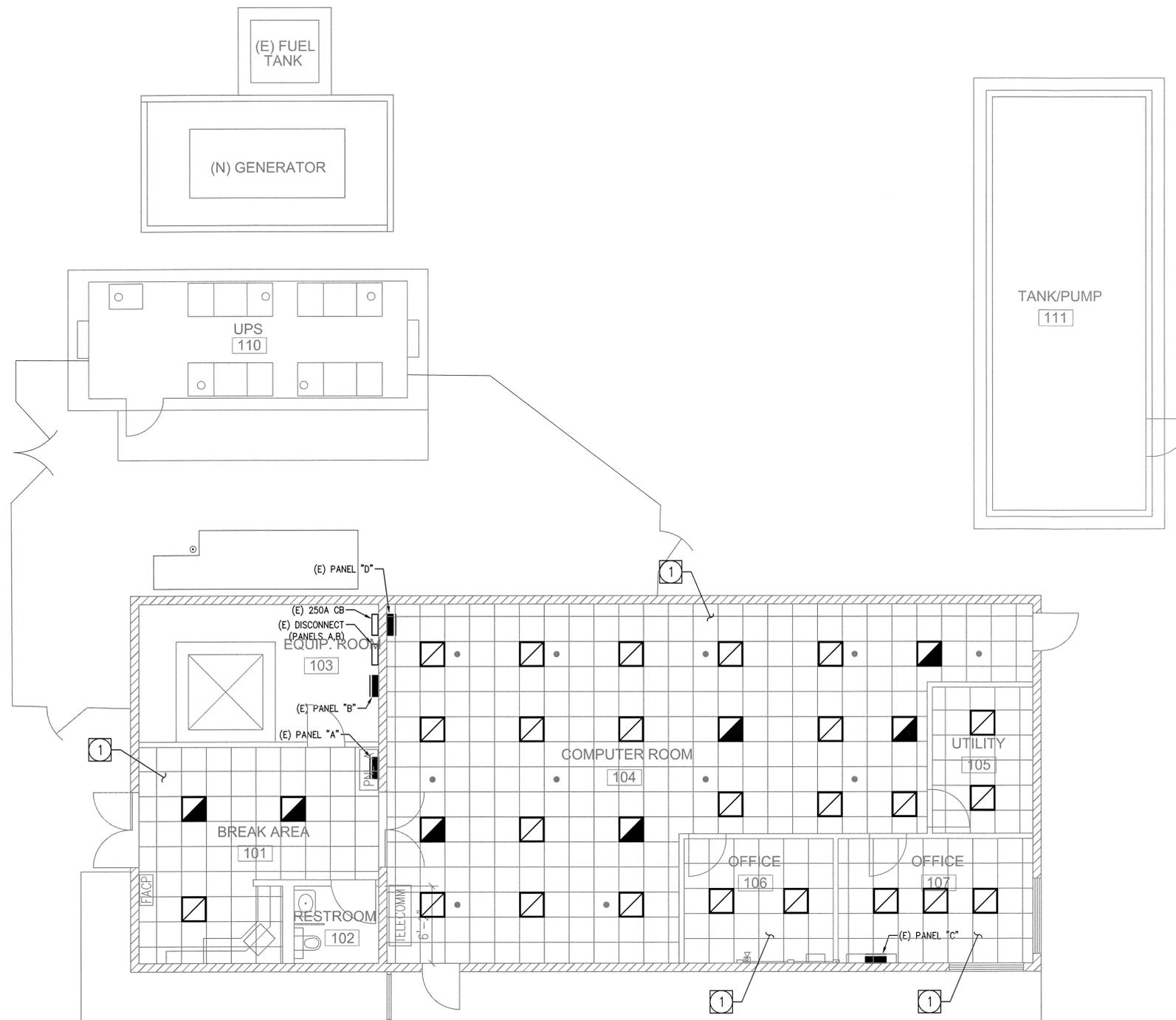
PROJECT TITLE
 REVITALIZE RADAR AND TELEMETRY
 TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office	<i>[Signature]</i>	7-10-15
Project Registrar/Designer	<i>[Signature]</i>	2-10-15
Facilities Project Manager	<i>[Signature]</i>	1-27-15
Chief, Office of Protective Services	<i>[Signature]</i>	1-28-15
Chief – Safety, Health and Environmental Office	<i>[Signature]</i>	1/27/15
ORCA Chief Information Officer	<i>[Signature]</i>	3 Feb 15
DATE STRTD	DATE PRINTD	5/9/14
DRAWN BY	ANH, MT, WAS	EDM-1728
SCALE	AS NOTED	TRADE
FILE NAME	E6	SHEET No. 39 of 48

DWG: P:\12088 NASA ATF\DWG\12088\ER.dwg USER: Alex Hernandez
 DATE: Sep 09, 2014 8:54am XREFS: A71BLDCK-D BLD8.4720 BASE-Demo IMAGES:

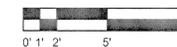
SHEET SPECIFIC NOTES:

- 1 OPTION 5: PROVIDE NEW 2'x2' RECESSED LED LIGHT FIXTURES IN ROOM. PROVIDE CONNECTION TO EXISTING LIGHTING CIRCUITS. PROVIDE NEW SWITCH CIRCUITRY CONNECTIONS TO ALLOW SEPARATE SWITCHING FOR EAST AND WEST SIDES OF ROOM 104. PROVIDE FIXTURES RATED 40W, 3500K, WITH MINIMUM 3540 LUMEN OUTPUT AND CRI VALUE OF 82.



BUILDING 4720 – AERONAUTICAL TRACKING FACILITY (ATF 2) – LIGHTING REMODEL

SCALE: 3/16" = 1'-0" (TOTAL SQUARE FEET = 2200)
TOTAL: 5067 SF



DWG: P:\12088 NASA ATF\dwg\12088EB.dwg USER: Alex Hernandez DATE: Sep 09, 2014 8:58am XREFS: ATFL000-D BLDG 4720 BASE-New IMAGES:



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DATE	SYM	REVISION	BY	A'PD
5/9/14	E	FINAL DESIGN		
2/24/14	D	100% FINAL DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
6/21/13	B	30% DEVELOPED DESIGN		
12/21/12	A	15% CONCEPT DESIGN		

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION DRYDEN FLIGHT RESEARCH CENTER EDWARDS, CA		APPROVALS Chief, Facilities Engineering & Asset Mgmt. Office <i>[Signature]</i> 7-10-15 Project Regulator/Customer <i>[Signature]</i> 2-10-15 Facilities Project Manager <i>[Signature]</i> 1-27-15 Chief, Office of Protective Services <i>[Signature]</i> 1-28-15 Chief - Safety, Health, and Environmental Office <i>[Signature]</i> 1-27-15 CRIC Civil Information Officer <i>[Signature]</i> 3 Feb 15	DATE 7-10-15 2-10-15 1-27-15 1-28-15 1-27-15 3 Feb 15
DRAWING TITLE BUILDING 4720 REMODEL LIGHTING PLAN			
PROJECT TITLE REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE			
DATE STRTD	DATE PRNTD	5/9/14	
DRAWN BY	ANH, MT, WAS	EDM-1728	
SCALE	AS NOTED	TRADE	SP. No.
FILE NAME	E9	SHEET No. 42 of 48	

VOLTS: 120/208 PHASE: 3PH, 4W MTG: SURFACE										PANELBOARD: UPS1 (NEW) LOCATION: RM 104										MAIN: 125A BUS: 125A AIC: 22KA									
CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION	BUS ABC	CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION											
	A	B	C								A	B	C																
1	180			R	20/1	1	RECEP. 1	A	2	800			R	20/3	1	RECEP. 33													
3		180		R	20/1	1	RECEP. 1	B	4		600		R	20/3	1	RECEP. 41													
5			180	R	20/1	1	RECEP. 5	C	6		600																		
7	180			R	20/1	1	RECEP. 5	A	8	600																			
9		180		R	20/1	1	RECEP. 9	B	10																				
11			180	R	20/1	1	RECEP. 9	C	12																				
13	180			R	20/1	1	RECEP. 13	A	14																				
15		180		R	20/1	1	RECEP. 13	B	16																				
17			180	R	20/1	1	RECEP. 17	C	18																				
19	180			R	20/1	1	RECEP. 17	A	20																				
21		180		R	20/1	1	RECEP. 17	B	22																				
23			180	R	20/1	1	RECEP. 21	C	24																				
25	180			R	20/1	1	RECEP. 25	A	26																				
27		180		R	20/1	1	RECEP. 25	B	28																				
29			180	R	20/1	1	RECEP. 29	C	30																				
31	180			R	20/1	1	RECEP. 34	A	32																				
33		180		R	20/1	1	RECEP. 34	B	34																				
35			180	R	20/1	1	RECEP. 34	C	36																				
37				R	20/1		SPARE	A	38																				
39				R	20/1		SPARE	B	40																				
41				R	20/1		SPARE	C	42																				

CONNECTED:	VA	AMPS	L.C.L. @ 125% = 0	LOAD TYPE:
PHASE A = 2480	21		RECEPT. (> 10 kVA @ 50%) = 4460	G - GENERAL (100%)
PHASE B = 1500	13		KITCHEN @ 65% = 0	M - MOTOR (100%)
PHASE C = 1680	14		OTHER LOAD @ 100% = 1200	L - L.C.L. (125%)
TOTAL = 5660	16		TOTAL VA = 5660	R - RECEPTACLE (50%)
			TOTAL AMPS = 16	(10 kVA @ 100%)
				X1 - X-RAY (50%)
				K - KITCHEN (65%)

VOLTS: 120/208 PHASE: 3PH, 4W MTG: SURFACE										PANELBOARD: UPS2 (NEW) LOCATION: RM 104										MAIN: 125A BUS: 125A AIC: 22KA									
CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION	BUS ABC	CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION											
	A	B	C								A	B	C																
1	180			R	20/1	1	RECEP. 2	A	2	600			R	20/3	1	RECEP. 38													
3		180		R	20/1	1	RECEP. 2	B	4		600																		
5			180	R	20/1	1	RECEP. 6	C	6		600																		
7	180			R	20/1	1	RECEP. 6	A	8	600																			
9		180		R	20/1	1	RECEP. 10	B	10		600																		
11			180	R	20/1	1	RECEP. 10	C	12		600																		
13	180			R	20/1	1	RECEP. 14	A	14																				
15		180		R	20/1	1	RECEP. 14	B	16																				
17			180	R	20/1	1	RECEP. 18	C	18																				
19	180			R	20/1	1	RECEP. 18	A	20																				
21		180		R	20/1	1	RECEP. 22	B	22																				
23			180	R	20/1	1	RECEP. 22	C	24																				
25	180			R	20/1	1	RECEP. 26	A	26																				
27		180		R	20/1	1	RECEP. 26	B	28																				
29			180	R	20/1	1	RECEP. 30	C	30																				
31	180			R	20/1	1	RECEP. 30	A	32																				
33		180		R	20/1	1	RECEP. 35	B	34																				
35			180	R	20/1	1	RECEP. 35	C	36																				
37				R	20/1		SPARE	A	38																				
39				R	20/1		SPARE	B	40																				
41				R	20/1		SPARE	C	42																				

CONNECTED:	VA	AMPS	L.C.L. @ 125% = 0	LOAD TYPE:
PHASE A = 2280	19		RECEPT. (> 10 kVA @ 50%) = 3660	G - GENERAL (100%)
PHASE B = 2100	18		KITCHEN @ 65% = 0	M - MOTOR (100%)
PHASE C = 2280	19		OTHER LOAD @ 100% = 3000	L - L.C.L. (125%)
TOTAL = 6660	18		TOTAL VA = 6660	R - RECEPTACLE (50%)
			TOTAL AMPS = 18	(10 kVA @ 100%)
				X1 - X-RAY (50%)
				K - KITCHEN (65%)

VOLTS: 120/208 PHASE: 3PH, 4W MTG: SURFACE										PANELBOARD: UPS4 (NEW) LOCATION: RM 104										MAIN: 175A BUS: 225A AIC: 22KA									
CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION	BUS ABC	CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION											
	A	B	C								A	B	C																
1	180			R	20/1	1	RECEP. 4	A	2	600			R	20/2	1	RECEP. 40													
3		180		R	20/1	1	RECEP. 8	B	4		600																		
5			180	R	20/1	1	RECEP. 8	C	6		600																		
7	180			R	20/1	1	RECEP. 12	A	8	600																			
9		180		R	20/1	1	RECEP. 12	B	10		600																		
11			180	R	20/1	1	RECEP. 16	C	12		4200																		
13	180			R	20/1	1	RECEP. 16	A	14	4200																			
15		180		R	20/1	1	RECEP. 16	B	16		4200																		
17			180	R	20/1	1	RECEP. 20	C	18		1200																		
19	180			R	20/1	1	RECEP. 20	A	20	1200																			
21		180		R	20/1	1	RECEP. 24	B	22		100																		
23			180	R	20/1	1	RECEP. 24	C	24																				
25	180			R	20/1	1	RECEP. 28	A	26																				
27		180		R	20/1	1	RECEP. 28	B	28																				
29			180	R	20/1	1	RECEP. 32	C	30																				
31	180			R	20/1	1	RECEP. 32	A	32																				
33		180		R	20/1	1	RECEP. 37	B	34																				
35			180	R	20/1	1	RECEP. 37	C	36																				
37				R	20/1		SPARE	A	38																				
39				R	20/1		SPARE	B	40																				
41				R	20/1		SPARE	C	42																				

CONNECTED:	VA	AMPS	L.C.L. @ 125% = 0	LOAD TYPE:
PHASE A = 7680	64		RECEPT. (> 10 kVA @ 50%) = 4260	G - GENERAL (100%)
PHASE B = 6400	53		KITCHEN @ 65% = 0	M - MOTOR (100%)
PHASE C = 7080	59		OTHER LOAD @ 100% = 16900	L - L.C.L. (125%)
TOTAL = 21160	59		TOTAL VA = 21160	R - RECEPTACLE (50%)
			TOTAL AMPS = 59	(10 kVA @ 100%)
				X1 - X-RAY (50%)
				K - KITCHEN (65%)

VOLTS: 120/208 PHASE: 3PH, 4W MTG: SURFACE										PANELBOARD: UPS3 (NEW) LOCATION: RM 104										MAIN: 125A BUS: 125A AIC: 22KA									
CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION	BUS ABC	CKT #	←← LOAD (VA) →→			LOAD TYPE	BKR	QUAN	OUTLET	DESCRIPTION											
	A	B	C								A	B	C																
1	180			R	20/1	1	RECEP. 3	A	2	600			R	20/3	1	RECEP. 39													
3		180		R	20/1	1	RECEP. 3	B	4		600																		
5			180	R	20/1	1	RECEP. 7	C	6		600																		
7	180			R	20/1	1	RECEP. 7	A	8	600																			
9		180		R	20/1	1	RECEP. 11	B	10		600																		
11			180	R	20/1	1	RECEP. 11	C	12		600																		
13	180			R	20/1	1	RECEP. 15	A	14																				
15		180		R	20/1	1	RECEP. 15	B	16																				
17			180	R	20/1	1	RECEP. 19	C	18																				
19	180			R	20/1	1	RECEP. 19	A	20																				
21		180		R	20/1	1	RECEP. 23	B	22																				
23			180	R	20/1	1	RECEP. 23	C	24																				
25	180			R	20/1	1	RECEP. 27	A	26																				
27		180		R	20/1	1	RECEP. 27	B	28																				
29			180	R	20/1	1	RECEP. 31	C	30																				
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33		180		R	20/1	1	RECEP. 36	B	34																				
35			180	R	20/1	1	RECEP. 36	C	36																				
37				R	20/1		SPARE	A	38																				
39				R	20/1		SPARE	B	40																				
41				R	20/1		SPARE	C	42																				

CONNECTED:	VA	AMPS	L.C.L. @ 125% = 0	LOAD TYPE:
PHASE A = 2280	19		RECEPT. (> 10 kVA @ 50%) = 4260	G - GENERAL (100%)
PHASE B = 2100	18		KITCHEN @ 65% = 0	M - MOTOR (100%)
PHASE C = 2280	19		OTHER LOAD @ 100% = 2400	L - L.C.L. (125%)
TOTAL = 6660	18		TOTAL VA = 6660	R - RECEPTACLE (50%)
			TOTAL AMPS = 18	(10 kVA @ 100%)
				X1 - X-RAY (50%)
				K - KITCHEN (65%)

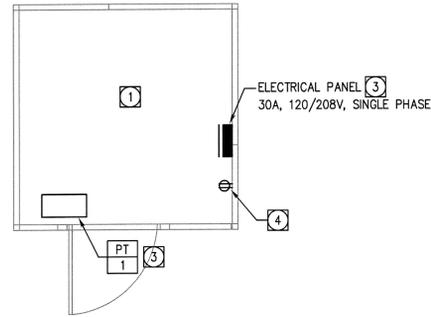
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 DATE: Sep 09 2014 9:05am XREFS: A-TBLOCK.d D IMAGES:

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DATE	SYM	REVISION
5/9/14	E	FINAL DESIGN
2/24/14	D	100% FINAL DESIGN
10/27/13	C	60% DEVELOPED DESIGN
6		

REMODEL NOTES:

- ① PREFABRICATED SHELTER FURNISHED WITH INTERIOR AND EXTERIOR LIGHTING, WITH WALL SWITCH. PROVIDE ELECTRICAL CONNECTION FROM 20A, SINGLE-PHASE BREAKER AT REINSTALLED CIRCUIT BREAKER PANEL. PROVIDE 3/4"C-2 #12, 1 #12 GROUND.
- ② INSTALL ELECTRICAL CIRCUIT BREAKER PANEL, RETAINED FROM DEMOLITION.
- ③ INSTALL HOA STARTER SWITCH, RETAINED FROM DEMOLITION, AND PUMP MOTOR SUPPLY WIRING IN CONDUIT.
- ④ PROVIDE MAINTENANCE RECEPTACLE ON SUPPLY CIRCUIT FROM ELECTRICAL PANEL USING EXISTING 20A, 1-POLE CIRCUIT BREAKER AND 3/4"C-2 #12, 1 #12 GROUND.

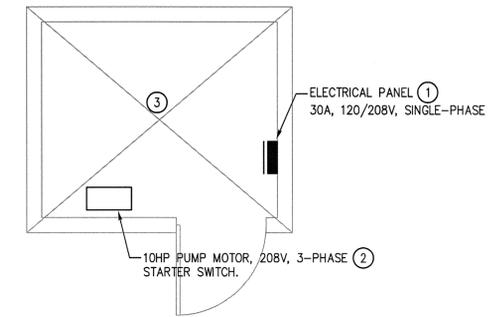


OPTION 6 - ELECTRICAL PUMP HOUSE B4983 REMODEL

SCALE: 1/4"=1'-0" 3

DEMOLITION NOTES:

- ① DISCONNECT AND REMOVE. RETAIN FOR INSTALLATION IN NEW BUILDING. NOTE LINE AND LOAD SIDE CONDUCTORS AND CONDUIT RATINGS FOR REPLACEMENT IN NEW BUILDING REMODEL.
- ② DISCONNECT ELECTRICAL SUPPLY CONDUCTORS AND CONDUIT FROM PUMP MOTOR. RETAIN STARTER SWITCH.
- ③ DISCONNECT AND REMOVE GENERAL ELECTRICAL RECEPTACLES, LIGHT FIXTURES, AND SWITCH.

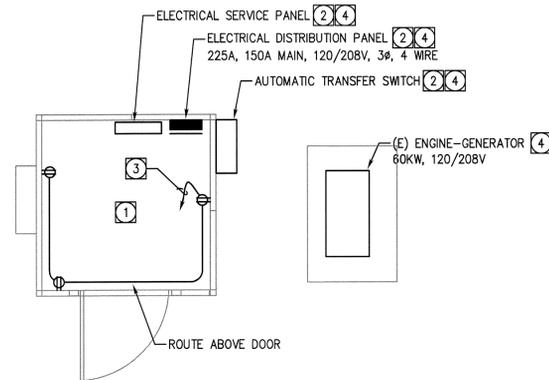


OPTION 6 - ELECTRICAL PUMP HOUSE B4983 DEMOLITION

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

REMODEL NOTES:

- ① PREFABRICATED SHELTER FURNISHED WITH INTERIOR/EXTERIOR LIGHTING, WALL SWITCH, AND AIR CONDITIONING UNIT. PROVIDE WIRING IN CONDUIT TO DESIGNATED EQUIPMENT TERMINATION, FROM REINSTALLED ELECTRICAL CIRCUIT BREAKER PANEL.
- ② INSTALL ELECTRICAL EQUIPMENT, RETAINED FROM DEMOLITION.
- ③ PROVIDE 3/4"C-2 #12, 1 #12 GROUND TO 20A, 1-POLE CIRCUIT BREAKER IN ELECTRICAL PANEL.
- ④ PROVIDE REINSTALLATION OF SERVICE FEEDER AND DISTRIBUTION FEEDERS, FROM UTILITY SERVICE AND GENERATOR, THROUGH AUTOMATIC TRANSFER SWITCH, TO DISTRIBUTION, IN CODE SIZED CONDUIT.

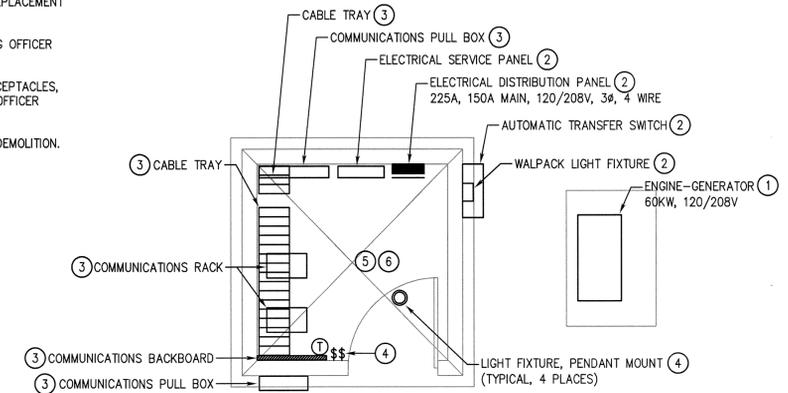


OPTION 2 - ELECTRICAL BORE SITE B4981 REMODEL

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

DEMOLITION NOTES:

- ① EXISTING EQUIPMENT TO REMAIN.
- ② DISCONNECT AND REMOVE. RETAIN FOR INSTALLATION IN NEW BUILDING. NOTE LINE AND LOAD SIDE CONDUCTORS AND CONDUIT RATINGS FOR REPLACEMENT IN NEW BUILDING REMODEL.
- ③ SEE CONTRACTING OFFICER FOR DEMOLITION AND REPLACEMENT INSTRUCTIONS.
- ④ DISCONNECT AND REMOVE. STORE PER CONTRACTING OFFICER INSTRUCTIONS.
- ⑤ DISCONNECT AND REMOVE GENERAL ELECTRICAL RECEPTACLES, SWITCHES AND DEVICES. STORE PER CONTRACTING OFFICER INSTRUCTIONS.
- ⑥ SEE SHEET E13 FOR PHOTO REFERENCE OF B4981 DEMOLITION.



OPTION 2 - ELECTRICAL BORE SITE B4981 DEMOLITION

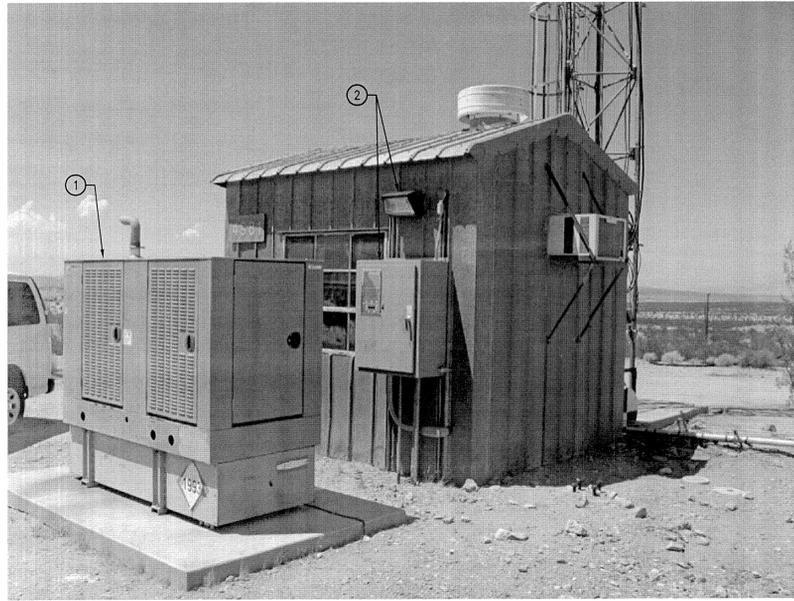
SCALE: 1/4"=1'-0" 2

DWG: P:\12088 NASA AFTR\DWG\12088 E12.dwg USER: Alex Homandor DATE: Sep 09, 2014 9:05am XREFS: A-TBLOCK.d A-B4983 and Bore Site IMAGES:

DONN C. GILMORE & ASSOC.
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591 Camino De La Reina, Ste. 1107 San Diego, CA 92108 Ph.: 619.618.2347

DATE	SYM	REVISION	BY	A'PD
5/9/14	E	FINAL DESIGN		
2/24/14	D	100% FINAL DESIGN		
10/27/13	C	60% DEVELOPED DESIGN		
6/21/13	B	30% DEVELOPED DESIGN		
12/21/12	A	15% CONCEPT DESIGN		

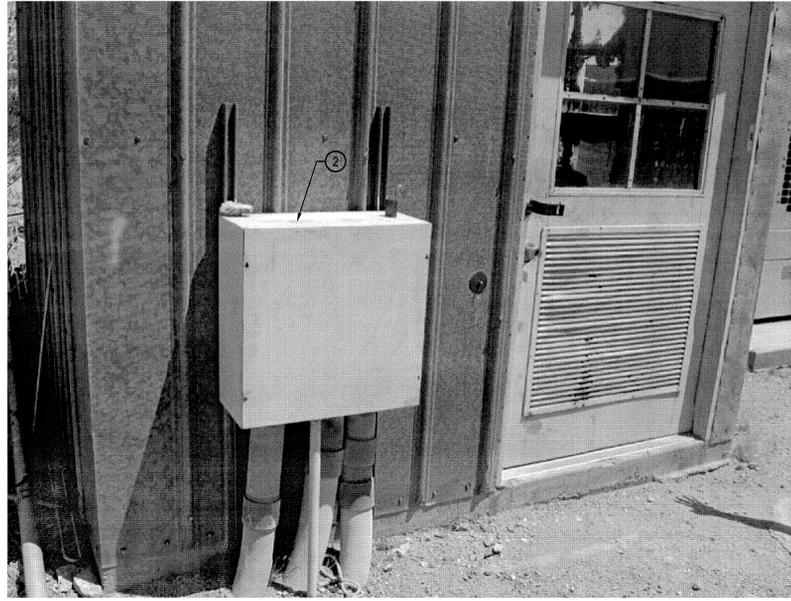
<p>NATIONAL AERONAUTICS AND SPACE ADMINISTRATION DRYDEN FLIGHT RESEARCH CENTER EDWARDS, CA</p>		<p>APPROVALS</p> <p>Chief, Facilities Engineering & Asset Mgmt. Office <i>Da Gault</i> 7-10-15</p> <p>Project Manager/Customer <i>J.K. Oberst</i> 2-10-15</p> <p>Facilities Project Manager <i>Forrest Dickson</i> 1-27-15</p> <p>Chief, Office of Protective Services <i>WMS</i> 1-28-15</p> <p>Chief - Safety, Health and Environmental Office <i>CM</i> 1-27-15</p> <p>DFRC Chief Information Officer <i>La Goff</i> 3Feb15</p>	
		<p>DATE STRD: DATE PRINTD: 5/9/14</p> <p>DRAWN BY: ANH, MT, WAS</p> <p>SCALE: AS NOTED</p> <p>FILE NAME: E12</p>	
<p>DRAWING TITLE BUILDING B4981 AND B4983</p>		<p>PROJECT TITLE REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE</p>	
<p>DATE: 5/9/14</p>		<p>TRADE: EDM-1728</p> <p>SHEET No. 45 of 48</p>	



BUILDING 4981 EXTERIOR/SITE

SCALE:
N.T.S.

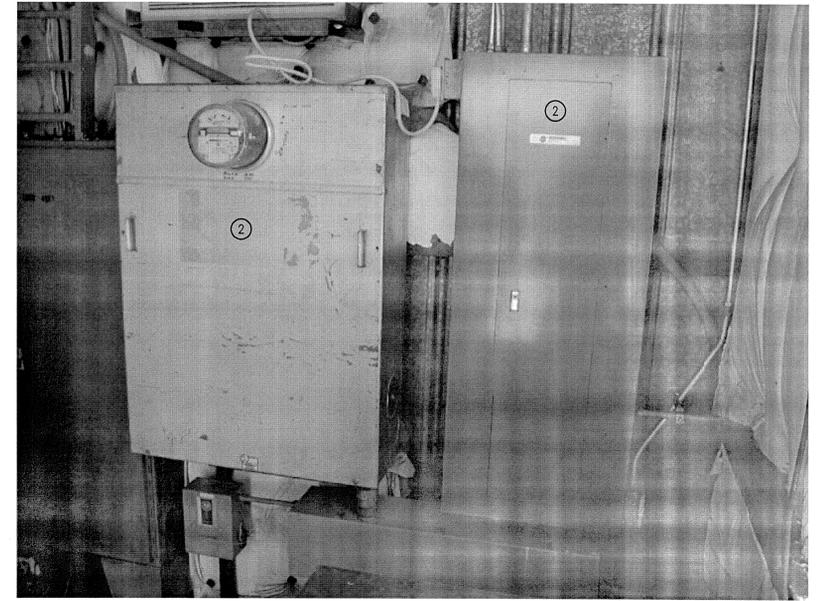
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BUILDING 4981 EXTERIOR

SCALE:
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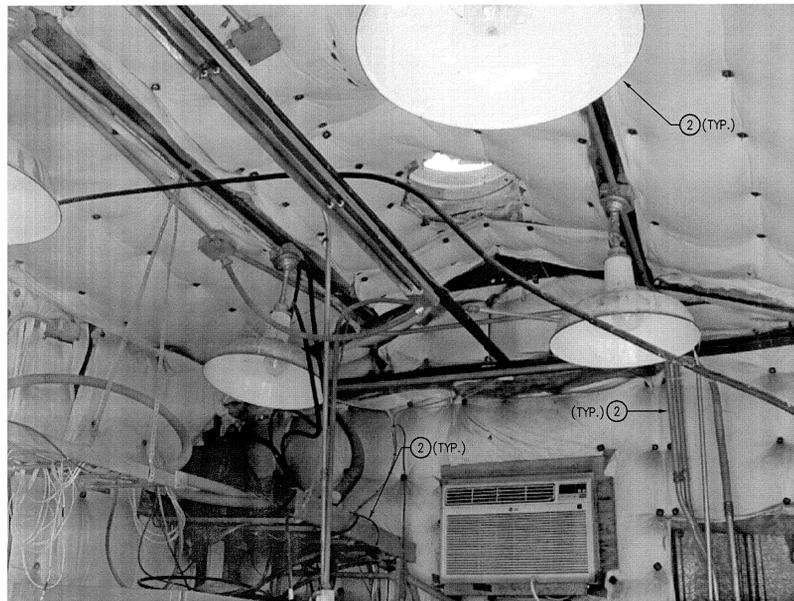
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BUILDING 4981 INTERIOR

SCALE:
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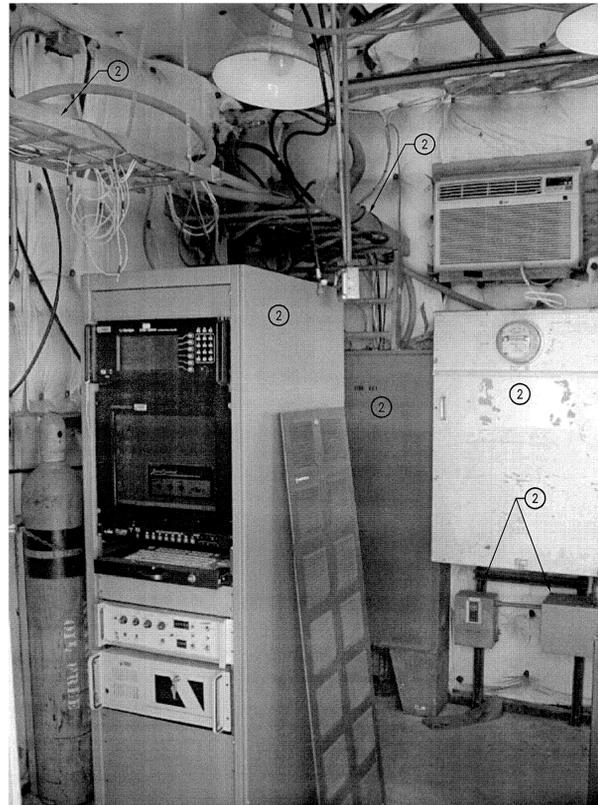
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BUILDING 4981 INTERIOR

SCALE:
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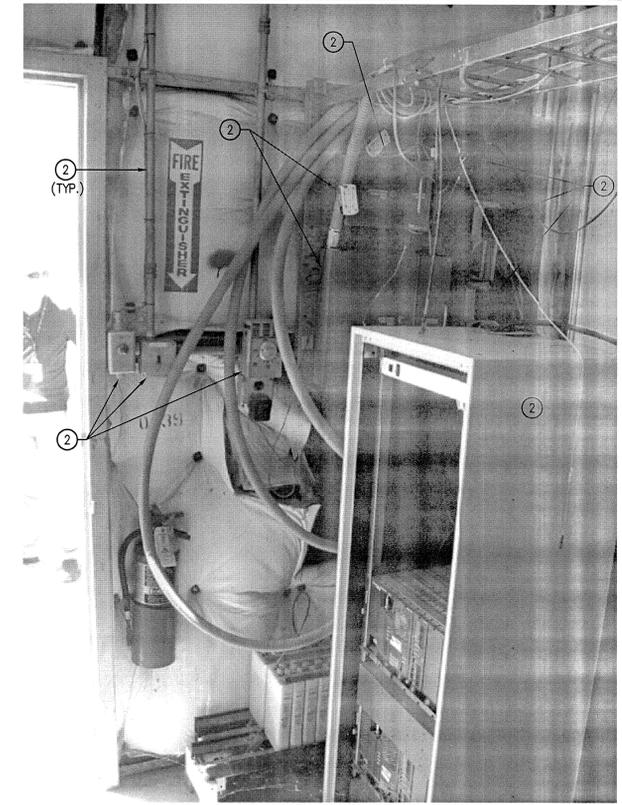
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BUILDING 4981 INTERIOR

SCALE:
N.T.S.

5



BUILDING 4981 INTERIOR

SCALE:
N.T.S.

4

NOTES:

- ① EQUIPMENT TO REMAIN.
- ② DISCONNECT AND REMOVE PER DEMOLITION PLAN INSTRUCTIONS. SEE SHEET E12.



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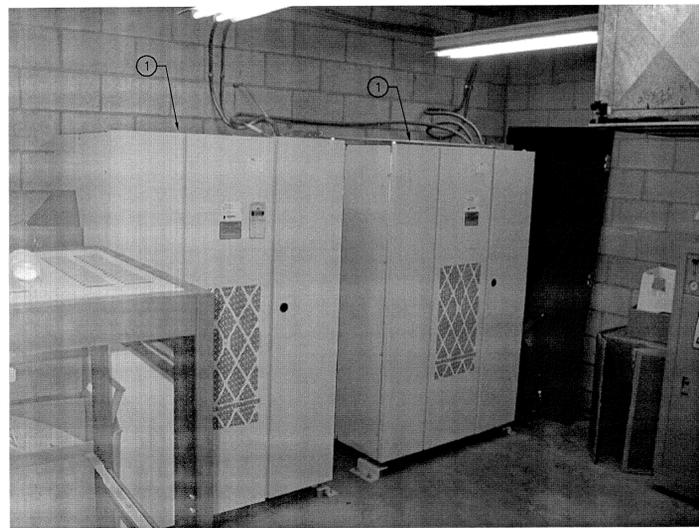
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DRYDEN FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE
BUILDING B4981
DEMOLITION PHOTO DETAILS

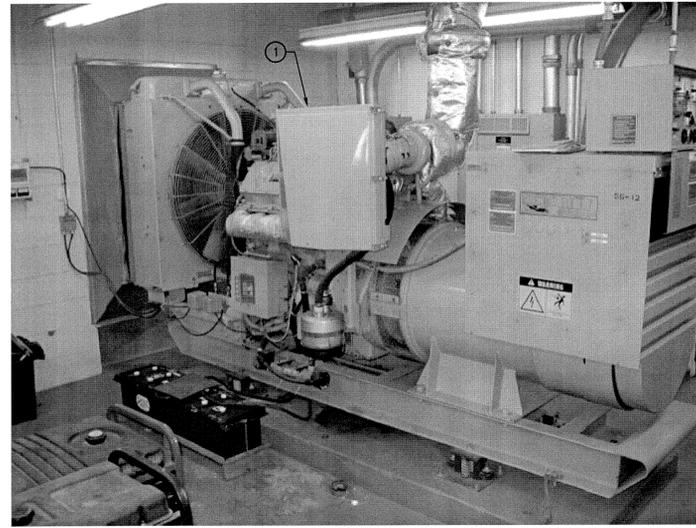
PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY
TRACKING INFRASTRUCTURE

APPROVALS	DATE
Chief, Facility Engineering & Asset Mgmt. Office <i>Van Lowry</i>	7-10-15
Project Inspector/Customer <i>J.P. Dehner</i>	2-10-15
Facilities Project Manager <i>Stanford Jackson</i>	1-27-15
Chief, Office of Protective Services <i>RW</i>	1-28-15
Chief - Safety, Health and Environmental Office <i>La Cy</i>	1-27-15
DRYDEN Information Officer <i>La Cy</i>	3 Feb 15

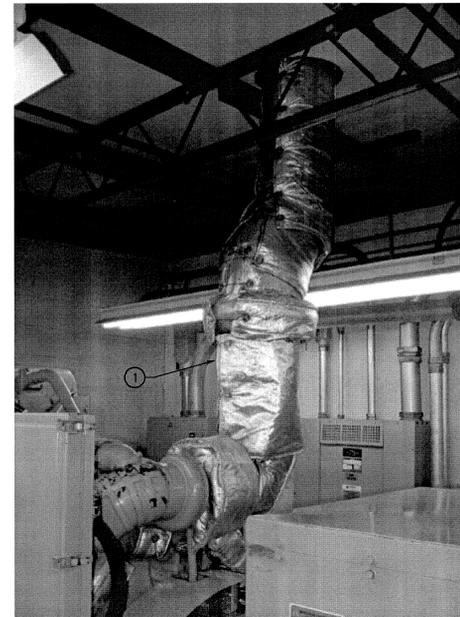
DATE STRD: 5/9/14
DATE PRINTD: 5/9/14
DRAWN BY: ANH, MT, WAS
SCALE: AS NOTED
FILE NAME: E13
SHEET No. 46 of 48



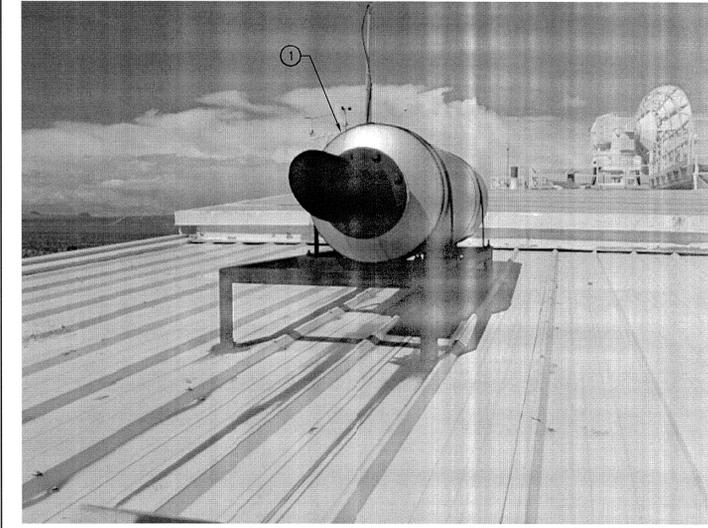
BUILDING 4982 UPS MODULES SCALE: N.T.S. 4



B4982 GENERATOR SCALE: N.T.S. 3



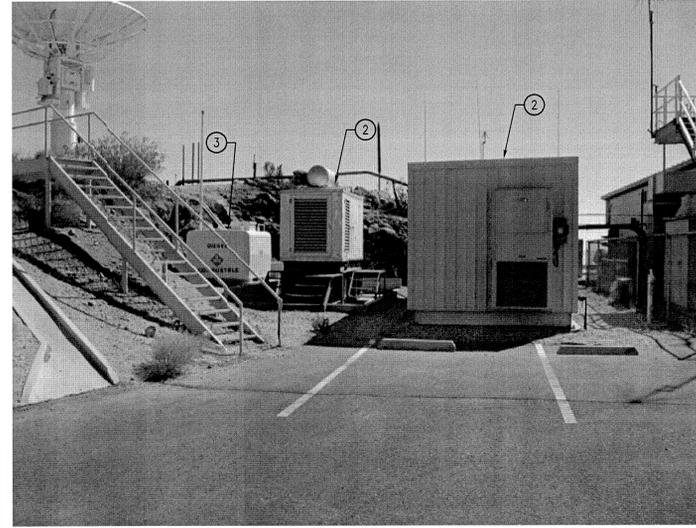
B4982 GENERATOR EXHAUST SCALE: N.T.S. 2



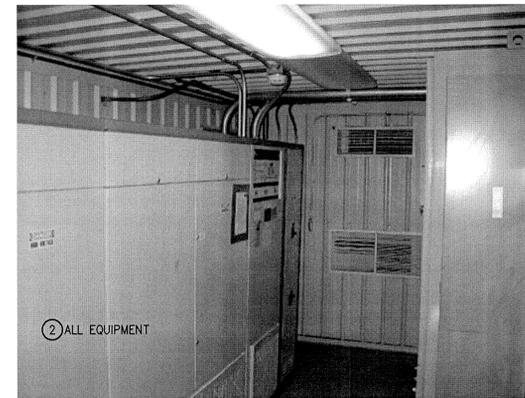
B4982 GENERATOR MUFFLER SCALE: N.T.S. 1



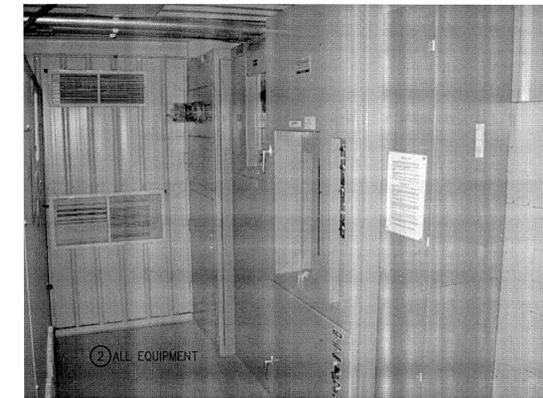
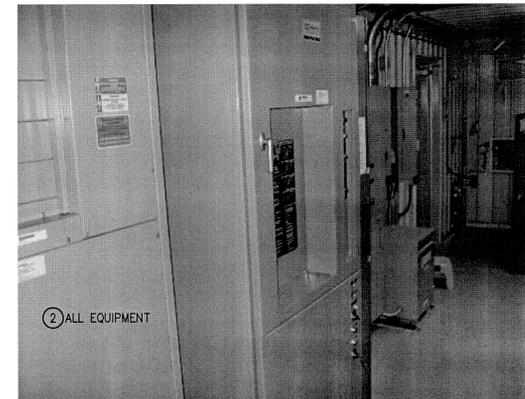
B4720 ELECTRICAL SERVICE EQUIPMENT SCALE: N.T.S. 8



B4720 GENERATOR/UPS SHELTER SCALE: N.T.S. 7



B4720 UPS SHELTER INTERIOR SCALE: N.T.S. 6



B4720 UPS SHELTER INTERIOR SCALE: N.T.S. 5



NOTES:

- ① DISCONNECT AND REMOVE PER DEMOLITION PLAN INSTRUCTIONS. SEE SHEET E2.
- ② DISCONNECT AND REMOVE PER DEMOLITION PLAN INSTRUCTIONS. SEE SHEET E6.
- ③ EQUIPMENT TO REMAIN.

*Instead of Reflow
Generators, WTS
Add the Final "LED"
wiring to complete
the Electrical
Loop @ the CENTER*

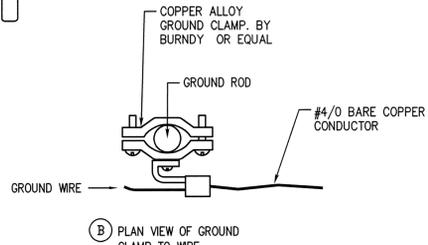
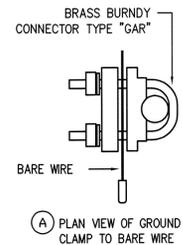
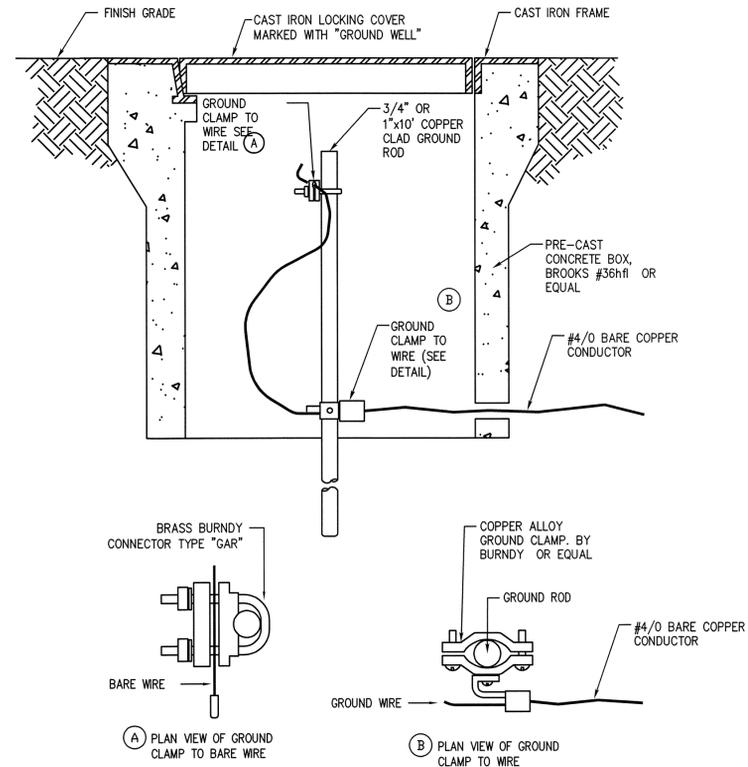


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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION DRYDEN FLIGHT RESEARCH CENTER EDWARDS, CA		APPROVALS DATE 7-10-15 2-10-15 1-28-15 1/27/15 3/7/15
DRAWING TITLE BUILDING 4982/4720 DEMOLITION PHOTO DETAILS		Project Registrar/Customer Facility Project Manager Chief, Office of Protective Services Chief - Safety, Health and Environmental Office GARC Chief Information Officer
PROJECT TITLE REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE		DATE PRINTED: 5/9/14 DRAWN BY: ANH, MT, WAS SCALE: AS NOTED FILE NAME: E14 SHEET No. 47 of 48

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SCALE: 2
NTS

GROUND WELL DETAIL

SCALE: 1
NTS E15/E15

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DRYDEN FLIGHT RESEARCH CENTER
EDWARDS, CA

DRAWING TITLE
ELECTRICAL DETAILS

PROJECT TITLE
REVITALIZE RADAR AND TELEMETRY TRACKING INFRASTRUCTURE

APPROVALS		DATE
Chief, Facilities Engineering & Asset Mgmt. Office	<i>W. Cooley</i>	7-10-15
Project Requestor/Customer	<i>J. P. Oberhet</i>	7-10-15
Facilities Project Manager	<i>Stanford Gibson</i>	1-20-15
Chief, Office of Protective Services	<i>K.M.</i>	1-28-15
Chief - Safety, Health and Environmental Office	<i>[Signature]</i>	1/27/15
DRM/CR Information Officer	<i>[Signature]</i>	3-Feb-15
DATE STRTD	DATE PRNTD	5/9/14
DRAWN BY	ANHL, MT, WAS	EDM-1728
SCALE	AS NOTED	TRADE
FILE NAME	E15	SHEET No. 48 of 48