

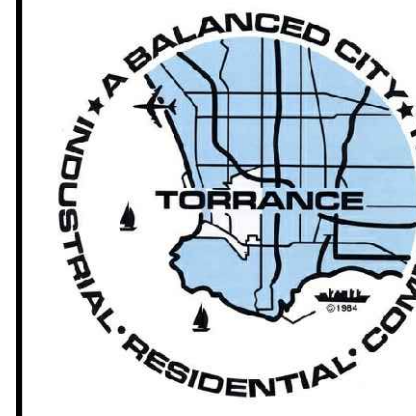
CITY OF TORRANCE

JIM FUENTES, SUPERVISOR, HVAC AND ELECTRICAL - GENERAL SERVICE DEPARTMENT

FIRE STATION #4 HVAC ROOF TOP UNIT REPLACEMENT

5205 CALLE MAYOR
TORRANCE, CA. 90501

TORRANCE CITY COUNCIL



- PATRICK J. FUREY,** MAYOR
- HEIDI ANN ASHCRAFT,** COUNCIL MEMBER
- TIM GOODRICH,** COUNCIL MEMBER
- MIKE GRIFFITHS,** COUNCIL MEMBER
- MILTON S. HERRING, I,** COUNCIL MEMBER
- GEOFF RIZZO,** COUNCIL MEMBER
- KURT WEIDEMAN,** COUNCIL MEMBER

CONTACT INFORMATION

CITY OF TORRANCE
HVAC AND ELECTRICAL - GENERAL SERVICE DEPARTMENT
3031 Torrance Boulevard
Project Supervisor: Jim Fuentes
Phone: (310) 625-7931

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) NOTES

1. IN CASE OF EMERGENCY, CALL_JIM FUENTES AT WORK PHONE #-310-625-7931.
2. SEDIMENT FROM AREAS DISTURBED BY CONSTRUCTION SHALL BE RETAINED ON SITE USING STRUCTURAL CONTROLS TO THE MAXIMUM EXTENT PRACTICABLE.
3. STOCKPILES OF SOIL SHALL BE PROPERLY CONTAINED TO MINIMIZE SEDIMENT TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES OR ADJACENT PROPERTIES VIA RUNOFF, VEHICLE TACKING, OR WIND.
4. APPROPRIATE BMP'S FOR CONSTRUCTION-RELATED MATERIALS, WASTES, SPILLS SHALL BE IMPLEMENTED TO MINIMIZE TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES, OR ADJOINING PROPERTIES BY WIND OR RUNOFF.
5. RUNOFF FROM EQUIPMENT AND VEHICLE WASHING SHALL BE CONTAINED AT CONSTRUCTION SITES UNLESS TREATED TO REDUCE OR REMOVE SEDIMENT AND OTHER POLLUTANTS.
6. ALL CONSTRUCTION CONTRACTOR AND SUBCONTRACTOR PERSONNEL SHALL BE MADE AWARE OF THE REQUIRED BEST MANAGEMENT PRACTICES AND GOOD HOUSEKEEPING MEASURES FOR THE PROJECT SITE AND ANY ASSOCIATED CONSTRUCTION STAGING AREAS.
7. AT THE END OF EACH DAY OF CONSTRUCTION ACTIVITY ALL CONSTRUCTION DEBRIS AND WASTE MATERIALS SHALL BE COLLECTED AND PROPERLY DISPOSED IN TRASH OR RECYCLE BINS.
8. CONSTRUCTION SITES SHALL BE MAINTAINED IN SUCH A CONDITION THAT AN ANTICIPATED STORM DOES NOT CARRY WASTES OR POLLUTANTS OFF THE SITE. DISCHARGES OF MATERIAL OTHER THAN STORM WATER ONLY WHEN NECESSARY FOR PERFORMANCE AND COMPLETION OF CONSTRUCTION PRACTICES AND WHERE THEY DO NOT: CAUSE OR CONTRIBUTE TO A VIOLATION OF ANY WATER QUALITY STANDARD; CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR NUISANCE; OR CONTAIN A HAZARDOUS SUBSTANCE IN A QUANTITY REPORTABLE UNDER FEDERAL REGULATIONS 40 CFR PARTS 117 AND 302.
9. POTENTIAL POLLUTANTS INCLUDE BUT ARE NOT LIMITED TO: SOLID OR LIQUID CHEMICAL SPILLS; WASTES FROM PAINTS, STAINS, SEALANTS, GLUES, LIMES, PESTICIDES, HERBICIDES, WOOD PRESERVATIVES AND SOLVENTS; ASBESTOS FIBERS, PAINT FLAKES OR STUCCO FRAGMENTS; FUELS, OILS, LUBRICANTS, AND HYDRAULIC, RADIATOR OR BATTERY FLUIDS; FERTILIZERS, VEHICLE/EQUIPMENT WASH WATER AND CONCRETE WASH WATER; CONCRETE, DETERGENT OR FLOATABLE WASTES; WASTES FROM ANY ENGINE/EQUIPMENT STEAM CLEANING OR CHEMICAL DEGREASING AND SUPERCHLORINATED POTABLE WATER LINE FLUSHING.
- DURING CONSTRUCTION, PERMITTEE SHALL DISPOSE OF SUCH MATERIALS IN A SPECIFIED AND CONTROLLED TEMPORARY AREA ON-SITE, PHYSICALLY SEPARATED FROM POTENTIAL STORM WATER RUNOFF, WITH ULTIMATE DISPOSAL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS.
10. DEWATERING OF CONTAMINATED GROUNDWATER, OR DISCHARGING CONTAMINATED SOILS VIA SURFACE EROSION IS PROHIBITED. DEWATERING OF NON-CONTAMINATED GROUNDWATER REQUIRES A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FROM THE RESPECTIVE STATE REGIONAL WATER QUALITY CONTROL BOARD.
11. GRADED AREAS ON THE PERMITTED AREA PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPES AT THE CONCLUSION OF EACH WORKING DAY. DRAINAGE SHALL BE DIRECTED TOWARD DESILTING FACILITIES.
12. THE PERMITTEE AND CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATER CREATES A HAZARDOUS CONDITION.
13. THE PERMITTEE AND CONTRACTOR SHALL INSPECT THE EROSION CONTROL WORK AND INSURE THAT THE WORK IS IN ACCORDANCE WITH THE APPROVED PLANS.
14. THE PERMITTEE SHALL NOTIFY ALL GENERAL CONTRACTORS, SUBCONTRACTORS, MATERIAL SUPPLIERS, LESSEES, AND PROPERTY OWNERS: THAT DUMPING OF CHEMICALS INTO THE STORM DRAIN SYSTEM OR THE WATERSHED IS PROHIBITED.
15. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
16. ALL REMOVABLE EROSION PROTECTIVE DEVICES SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE 5-DAY RAIN PROBABILITY FORECAST EXCEEDS 40%.
17. SEDIMENTS FROM AREAS DISTURBED BY CONSTRUCTION SHALL BE RETAINED ON SITE USING AN EFFECTIVE COMBINATION OF EROSION AND SEDIMENT CONTROLS TO THE MAXIMUM EXTENT PRACTICABLE, AND STOCKPILES OF SOIL SHALL BE PROPERLY CONTAINED TO MINIMIZE SEDIMENT TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES OF ADJACENT PROPERTIES VIA RUNOFF, VEHICLE TRACKING, OR WIND.
18. APPROPRIATE BMP'S FOR CONSTRUCTION-RELATED MATERIALS, WASTES, SPILLS OR RESIDUES SHALL BE IMPLEMENTED AND RETAINED ON SITE TO MINIMIZE TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES, OR ADJOINING PROPERTY BY WIND OR RUNOFF.

GENERAL NOTES

1. PROVIDE SHOP DRAWINGS AND EQUIPMENT SUBMITTALS TO THE OWNER'S REPRESENTATIVE FOR REVIEW PRIOR TO BEING SUBMITTED TO THE PROJECT ENGINEER.
2. PROVIDE COMPLETE AND PROPERLY FUNCTIONING CONTROL SYSTEM FOR THIS PROJECT.
3. COORDINATE THE INSTALLATION OF THE WORK OF ALL REQUIRED TRADES. IF DURING THE COURSE OF THE WORK, THE CONTRACTOR EXPERIENCES A PROBLEM RELATIVE TO THE DOCUMENTS, THE LOCAL APPLICABLE CODES AND GOVERNING DOCUMENTS, OR THE WORK CANNOT BE INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS FOR ANY REASON, NOTIFY ENGINEER FOR DIRECTION PRIOR TO EXECUTION OF THIS WORK. THE CONTRACTOR MAY BE RESPONSIBLE FOR REMOVING, AT NO ADDITIONAL COMPENSATION, ANY WORK INSTALLED, PRIOR TO RECEIVING DIRECTION FROM THE OWNER'S REPRESENTATIVE, IN VIOLATION OF THE CONTRACT DOCUMENTS OR APPLICABLE CODES.
4. SYMBOLS SHOWN ON THE DRAWINGS AND IN THE SCHEDULES INDICATE THE TYPE OF EQUIPMENT ONLY. REVIEW DRAWINGS TO DETERMINE THE EXACT QUANTITIES REQUIRED FOR EACH EQUIPMENT TYPE.
5. CONTRACTOR SHALL EMPLOY "CLEAN CONSTRUCTION" METHODS TO KEEP THE WORK AREA AND SYSTEMS FREE OF DUST, DIRT AND DEBRIS. DUCT OPENINGS, DIFFUSERS, GRILLES AND REGISTERS SHALL BE SEALED WITH VISQUEE IN ANY AREA OF THE PROJECT WHERE DUST GENERATING CONSTRUCTION ACTIVITIES OCCUR, INCLUDING THE PREPARATION OF WALL BOARD, PREPARATION, GRINDING OR FINISHING OF CONCRETE WORK OR ANY OTHER SIMILAR ACTIVITY. IF SIMILAR REWORK OF A PREVIOUSLY FINISHED AREA IS REQUIRED, AIR HANDLING UNITS AND FAN COILS SERVING THAT AREA SHALL BE SHUT DOWN, AND ALL GRILLES, REGISTERS, DIFFUSERS AND DUCT OPENINGS IN THAT AREA, WHETHER ABOVE OR BELOW THE CEILING, SHALL BE SEALED WITH VISQUEE TO PREVENT INFILTRATION OF DUST, DIRT AND DEBRIS INTO THE AIR DISTRIBUTION SYSTEM.
6. PROVIDE ALL CORING, TRENCHING, CUTTING AND PATCHING AS REQUIRED TO PERFORM THE WORK FOR THIS PROJECT.
7. COORDINATE LOCATIONS OF SENSORS AND OTHER DEVICES WITH ENGINEER AND OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
8. PROVIDE SUPPORT STEEL, HANGERS AND ACCESSORIES REQUIRED TO INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. DO NOT SUPPORT DEVICES FROM DUCTWORK, PIPES, OR ELECTRICAL CONDUIT, UNLESS OTHERWISE NOTED. DO NOT ALLOW PIPES OR CONDUIT TO DIRECTLY CONTACT THE BUILDING STRUCTURE, CEILING SYSTEM, LIGHT FIXTURES, ANY OTHER BUILDING SYSTEM COMPONENT, OR EACH OTHER.
9. PERFORM WORK IN ACCORDANCE WITH ALL CURRENT AND APPLICABLE LOCAL CODES AND REGULATIONS AND AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ).
10. PROVIDE CODE APPROVED FIRE STOPPING AT PENETRATIONS THROUGH BUILDING CONSTRUCTION TO ACHIEVE FIRE, SMOKE, AND SOUND RATINGS AS REQUIRED.
11. REPAIR ANY DAMAGE TO FIREPROOFING DUE TO INSTALLATION OF THIS WORK.
12. INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
13. PROVIDE EQUIPMENT SUITABLE FOR THE INTENDED PURPOSE.
14. PERFORM SYSTEM COMMISSIONING, CLEANING, SERVICING, BALANCING, TESTING, AND CERTIFICATION REQUIRED BY THE DOCUMENTS, CODE, LOCAL AUTHORITY HAVING JURISDICTION, AND AS RECOMMENDED BY THE EQUIPMENT MANUFACTURERS, PRIOR TO OCCUPANCY.
15. UPON COMPLETION OF TESTING, OPERATE EQUIPMENT TO VERIFY THAT ALL SYSTEMS FUNCTION PROPERLY. AFTER VERIFYING THE PROPER OPERATION, DEMONSTRATE THE OPERATION OF SYSTEMS AND EQUIPMENT TO THE OWNERS REPRESENTATIVES. PROVIDE 48 HOURS NOTICE AND SCHEDULE THE DEMONSTRATION WITH THE OWNER.
16. PROVIDE O & M MANUALS AS DESCRIBED IN SPECIFICATIONS.
17. PROVIDE TRAINING FOR OWNER'S MAINTENANCE AND ENGINEERING STAFF AS DESCRIBED IN SPECIFICATIONS.

SCOPE OF WORK

- A. REPLACE EXISTING ROOF TOP UNIT WITH ONE OF SIMILAR CAPACITY
- B. RECONNECT THE EXISTING GAS AND CONDENSATE LINES TO NEW ROOF TOP UNIT. MODIFY THE EXISTING LINES AND POINT OF CONNECTIONS AS NEEDED.
- C. RECONNECT POWER TO NEW EQUIPMENT. MODIFY EXISTING ELECTRICAL AS NEEDED.
- D. START UP AND COMMISSION HVAC SYSTEM FOR SMOOTH OPERATION.

APPLICABLE CODE

- AS APPLICABLE TO THE SCOPE OF WORK, NEW WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWINGS:
- 2016 CALIFORNIA BUILDING CODE, VOLUMES 1 AND 2
 - 2016 CALIFORNIA ELECTRICAL CODE
 - 2016 CALIFORNIA MECHANICAL CODE
 - 2016 CALIFORNIA PLUMBING CODE
 - 2016 CALIFORNIA EXISTING BUILDING CODE
 - 2016 CALIFORNIA REFERENCED STANDARDS CODE
 - 2016 CALIFORNIA FIRE CODE
 - 2016 CALIFORNIA ENERGY CODE

DRAWING INDEX

SHEET INDEX	
SHEET NUMBERS	SHEET TITLE
T-1	TITLE SHEET
M0.1	MECHANICAL LEGENDS, ABBREVIATIONS, AND SCHEDULES
M0.2	MECHANICAL SPECIFICATIONS
M0.3	MECHANICAL SPECIFICATIONS
M0.4	MECHANICAL SCHEDULES
M2.1	MECHANICAL ROOF DEMOLITION PLAN
M3.1	MECHANICAL ROOF RENOVATION PLAN
M4.1	MECHANICAL DETAILS
E0.1	ELECTRICAL NOTES, LEGEND, ABBREVIATION AND SHEET INDEX
E0.2	SINGLE LINE DIAGRAM & PANEL SCHEDULE
E2.0	ELECTRICAL ROOF RENOVATION PLAN

CONSULTANTS

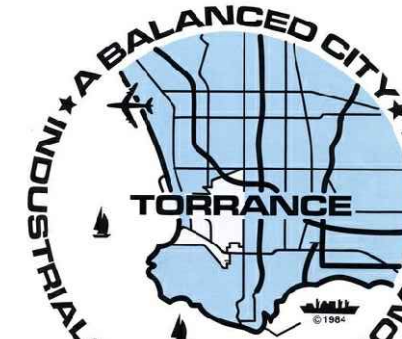
IDS MECHANICAL ENGINEERS, INC
1 PETERS CANYON ROAD, STE 130
IRVINE, CA. 92606
PHONE: 949-387-8500
FAX: 949-502-7640
ENGINEER OF RECORD:
MECHANICAL: MAYSOON SHEABAAN, P.E.
X432
ELECTRICAL: ROB O'NEIL, P.E. X 425
PROJECT MANAGER: MAYSOON SHEABAAN, P.E.
X432

VICINITY MAP



**FIRE STATION #4
5205 CALLE MAYOR TORRANCE, CALIFORNIA**

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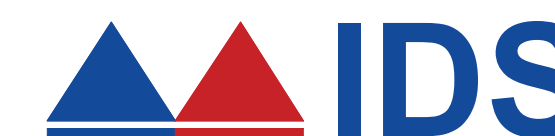


CITY OF TORRANCE
3031 TORRANCE BLVD.
TORRANCE, CA 90503

PROJECT NAME

**FIRE STATION #4
ROOF TOP UNIT
REPLACEMENT**
5205 CALLE MAYOR
TORRANCE, CA 90501

CONSULTANT



IDS GROUP
1 PETERS CANYON ROAD, SUITE 130
IRVINE, CA. 92606
TEL: 949-387-8500, FAX: 949-387-0800

Project # 17X036.00

STAMP

NOT FOR CONSTRUCTION

Date

STAMP



ISSUE

REV.	DESCRIPTION	DATE
	CITY SUBMITTAL	03/05/2018

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

ABBREVIATIONS

ABBR. / SYMBOL	DESCRIPTION	ABBR. / SYMBOL	DESCRIPTION
AD	ACCESS DOOR	LVG	LEAVING
AFF	ABOVE FINISHED FLOOR	LWB	LEAVING WB TEMPERATURE
AI	ANALOG INPUT	MA	MAKEUP AIR
AO	ANALOG OUTPUT	MAT	MIXED AIR TEMPERATURE
AMB	AMBIENT	MAX	MAXIMUM
AP	ACCESS PANEL	MCC	MOTOR CONTROL CENTER
ARCH	ARCHITECTURAL	MIN	MINIMUM
BAS	BUILDING AUTOMATION SYSTEM	NC	NORMALLY CLOSED
BDD	BACK DRAFT DAMPER	NO	NORMALLY OPEN
BHP	BRAKE HORSEPOWER	SS	STAINLESS STEEL
BTUH	BTU PER HOUR	CV	CONSTANT VOLUME
CC	COOLING COIL	GV	GRAVITY VENTILATOR
CD	CEILING DIFFUSER	(N)	NEW
CFM	CUBIC FEET PER MINUTE	NO.	NUMBER
CWS/R	COOLING WATER SUPPLY AND RETURN	O & M	OPERATION AND MAINTENANCE
CTWS/R	COOLING TOWER WATER SUPPLY AND RETURN	OAD	OUTSIDE AIR DAMPER
CG	CEILING GRILLE	OPER WT	OPERATING WEIGHT
CNTRL	CONTROL	OPNG	OPENING
CONN	CONNECTION	OSA	OUTSIDE AIR
CONT	CONTINUATION	OV	OUTLET VELOCITY
CR	CEILING REGISTER	PD	PRESSURE DROP
CSF	COMBINATION FIRE/SMOKE DAMPER	POC	POINT OF CONNECTION
DDC	DISTRIBUTED DIGITAL CONTROL	POD	POINT OF DEMOLITION
DI	DIGITAL INPUT	(R)	RELOCATE
DO	DIGITAL OUTPUT	RA	RETURN AIR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	RAT	RETURN AIR TEMP.
Ø	(DIA) DIAMETER	RG	RETURN GRILLE
D	CONDENSATE DRAIN, DRAIN	RH	RELATIVE HUMIDITY
(E)	EXISTING	RM	REFRIGERANT MONITOR SENSING POINT
dP	PRESSURE DROP	RPB	REVERSE PRESSURE BACKFLOW
EA	EXHAUST AIR	RPM	REVOLUTIONS PER MINUTE
EAT	ENTERING AIR TEMPERATURE	SA	SUPPLY AIR
EWT	ENTERING WATER TEMPERATURE	SAT	SUPPLY AIR TEMPERATURE
EDB	ENTERING DB TEMPERATURE	SD	SMOKE DETECTOR
EWB	ENTERING WB TEMPERATURE	SF	SUPPLY FAN
EMS	ENERGY MANAGEMENT SYSTEM	SG	SUPPLY GRILLE
EF	EXHAUST FAN	SP	STATIC PRESSURE
EXH.	EXHAUST	SPEC	SPECIFICATION
FM	FLOW METER	SQ FT	SQUARE FOOT
FS	FLOW SWITCH	S/S	START/ STOP
ENT	ENTERING	ST	SOUND TRAP
ESP	EXTERNAL STATIC PRESSURE	T	THROAT
°F	DEGREES FAHRENHEIT	TS	TEMPERATURE SENSOR
FC	FLEXIBLE CONNECTION	TT	TEMPERATURE TRANSMITTER
FD	FIRE DAMPER	TSP	TOTAL STATIC PRESSURE
FLA	FULL LOAD AMPS	TDH	TOTAL DYNAMIC HEAD
FPM	FEET PER MINUTE	T OR TEMP	TEMPERATURE
GPM	GALLONS PER MINUTE	TYP	TYPICAL
HP	HORSEPOWER	UI	UNIVERSAL INPUT
HWS/R	HEATING HOT WATER SUPPLY AND RETURN	VD	VOLUME DAMPER
HZ	HERTZ	VAV	VARIABLE AIR VOLUME
IN	INCHES	VFD	VARIABLE FREQUENCY DRIVE
ICW	INDUSTRIAL COLD WATER	VRF	VARIABLE REFRIGERANT FLOW
KW	KILOWATT	WB	WET BULB
(L)	LINED DUCTWORK	WC	WATER COLUMN
LB	POUND	WG	WATER GAUGE
LAT	LEAVING AIR TEMPERATURE	WM	WATER METER
LWT	LEAVING WATER TEMPERATURE		

MECHANICAL LEGEND

ABBR. / SYMBOL	DESCRIPTION	ABBR. / SYMBOL	DESCRIPTION
	SQUARE OR RECTANGULAR DUCT	—CWS—	CONDENSING WATER SUPPLY
	ROUND DUCT	—CWR—	CONDENSING WATER RETURN
	FIRE DAMPER		REDUCER
	COMBINATION FIRE/SMOKE DAMPER		CONDENSATE DRAIN, DRAIN
	DUCT WITH MANUAL VOLUME DAMPER		FLOW INDICATOR, FLOW METER
	DUCT WITH ACOUSTICAL LINER. SIZE IS O.D. "X" IS LINER THICKNESS		FLEXIBLE PIPE CONNECTOR
	INCLINE RISE OR DROP IN DIRECTION OF AIR FLOW		GATE VALVE
	FLEXIBLE DUCT - DOUBLE LINE		BALANCING VALVE
	FLEXIBLE DUCT - SINGLE LINE		PLUG VALVE
	DIRECTION OF FLOW		CHECK VALVE
	TRANSITION		PRESSURE RELIEF VALVE, TEMPERATURE & PRESSURE RELIEF VALVE
	VAV (VAV-NO.)		AUTOMATIC AIR VENT
	SIDEWALL REGISTER		BALL VALVE
	DUCT DOWN		BUTTERFLY VALVE
	DUCT UP		PRESSURE GAGE, PRESSURE INDICATOR
	UP AND DOWN		THERMOMETER, TEMPERATURE INDICATOR
	CEILING REGISTER		2-WAY CONTROL VALVE
	EXHAUST REGISTER		3-WAY CONTROL VALVE
	CEILING DIFFUSER		PRESSURE REDUCING VALVE
	SUPPLY DUCT		BLIND FLANGE
	RETURN DUCT		TEMPERATURE/PRESSURE TEST PORT
	EXHAUST DUCT		OCCUPANCY SENSOR
	CEILING ACCESS PANEL		LIGHTING CONTROL SWITCH
	DUCT WITH TURNING VANES		LIGHTING CONTROLLER
	VOLUME DAMPER		TIME SWITCH
	EQUIPMENT DESIGNATION & NUMBER		DAYLIGHT SENSOR
	ROOM THERMOSTAT		DIMMER
	SMOKE DETECTOR		LIGHTING CONTROL RELAY
	POINT OF CONNECTION		CARBON DIOXIDE SENSOR
	UNDERCUT DOOR		POWER SUPPLY, "X" IS VOLTAGE
	DOOR LOUVER	—CWS—	COOLING WATER SUPPLY
	NEW CONSTRUCTION KEYNOTE DESIGNATION	—CWR—	COOLING WATER RETURN
	DEMOLITION KEYNOTE DESIGNATION	—HHWS—	HEATING WATER SUPPLY
	ROOM HUMIDISTAT	—HHWR—	HEATING WATER RETURN
	INTERLOCK	—CTWS—	COOLING TOWER WATER SUPPLY
	PARALLEL BLADE DAMPER	—CTWR—	COOLING TOWER WATER RETURN
	OPPOSED BLADE DAMPER		
	MOTORIZED DAMPER OR VALVE		
	BACKDRAFT DAMPER		
	PIPE UNION		

ANCHORAGE & BRACING NOTES

THE SEISMIC ANCHORAGE OF MECHANICAL EQUIPMENT SHALL CONFORM TO ASCE 7-10 SECTION 13.3.1 AND TABLE 13.6-1, CCR TITLE 24, 2016 CBC SECTION 1613. ANCHORAGE DETAILS FOR ROOF/FLOOR MOUNTED EQUIPMENT SHALL BE AS SHOWN ON PLANS.

ALL MECHANICAL EQUIPMENT SHALL BE BRACED OR ANCHORED TO RESIST A HORIZONTAL FORCE ACTING IN ANY DIRECTION. REFER TO CCR TITLE 24 PART II, 2016 CBC PART 2 FOR EXACT REQUIREMENTS. THE ATTACHMENT OF THE FOLLOWING ITEMS SHALL BE DESIGNED TO RESIST THE FORCES DESCRIBED ABOVE, BUT NEED NOT BE DETAILED ON THE PLANS, AND THE PROJECT INSPECTOR WILL VERIFY THAT THESE ITEMS (EQUIPMENT) HAVE BEEN ANCHORED:

A. EQUIPMENT WEIGHING LESS THAN 400 POUNDS SUPPORTED DIRECTLY ON THE FLOOR OR ROOF.
 B. FURNITURE REQUIRED TO BE ATTACHED IN ACCORDANCE WITH ASCE 7-10, SECTION 13.5.
 C. TEMPORARY OR MOVABLE EQUIPMENT WITH FLEXIBLE CONNECTION TO POWER OR UTILITIES.
 D. EQUIPMENT WEIGHING LESS THAN 20 POUNDS SUPPORTED BY VIBRATION ISOLATORS.
 E. EQUIPMENT WEIGHING LESS THAN 20 POUNDS SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE MECHANICAL/ELECTRICAL ENGINEER.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE:

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO RESIST THE FORCES DESCRIBED IN ASCE 7-10 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.8, 13.6.7 AND 13.6.5.5, ITEM 6, RESPECTIVELY.

A COPY OF THE LATEST EDITION SMACNA MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF HANGING AND BRACING OF THE PIPE, DUCTWORK, AND ELECT. DISTRIBUTION SYSTEMS.

THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES

WHERE BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER

A COPY OF THE GUIDELINES PUBLISHED BY SMACNA SHALL BE PROVIDED BY THE CONTRACTOR AND KEPT AT THE JOB SITE AT ALL TIMES.

GENERAL NOTES

- PROVIDE SHOP DRAWINGS AND EQUIPMENT SUBMITTALS TO THE OWNER'S REPRESENTATIVE FOR REVIEW PRIOR TO BEING SUBMITTED TO THE PROJECT ENGINEER.
- PROVIDE COMPLETE AND PROPERLY FUNCTIONING CONTROL SYSTEM FOR THIS PROJECT.
- COORDINATE THE INSTALLATION OF THE WORK OF ALL REQUIRED TRADES. IF DURING THE COURSE OF THE WORK, THE CONTRACTOR EXPERIENCES A PROBLEM RELATIVE TO THE DOCUMENTS, THE LOCAL APPLICABLE CODES AND GOVERNING DOCUMENTS, OR THE WORK CANNOT BE INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS FOR ANY REASON, NOTIFY ENGINEER FOR DIRECTION PRIOR TO EXECUTION OF THIS WORK. THE CONTRACTOR MAY BE RESPONSIBLE FOR REMOVING, AT NO ADDITIONAL COMPENSATION, ANY WORK INSTALLED, PRIOR TO RECEIVING DIRECTION FROM THE OWNER'S REPRESENTATIVE, IN VIOLATION OF THE CONTRACT DOCUMENTS OR APPLICABLE CODES.
- SYMBOLS SHOWN ON THE DRAWINGS AND IN THE SCHEDULES INDICATE THE TYPE OF EQUIPMENT ONLY. REVIEW DRAWINGS TO DETERMINE THE EXACT QUANTITIES REQUIRED FOR EACH EQUIPMENT TYPE.
- CONTRACTOR SHALL EMPLOY "CLEAN CONSTRUCTION" METHODS TO KEEP THE WORK AREA AND SYSTEMS FREE OF DUST, DIRT AND DEBRIS. DUCT OPENINGS, DIFFUSERS, GRILLES AND REGISTERS SHALL BE SEALED WITH VISQUINE IN ANY AREA OF THE PROJECT WHERE DUST GENERATING CONSTRUCTION ACTIVITIES OCCUR, INCLUDING THE PREPARATION OF WALL BOARD, PREPARATION, GRINDING OR FINISHING OF CONCRETE WORK OR ANY OTHER SIMILAR ACTIVITY. IF SIMILAR REWORK OF A PREVIOUSLY FINISHED AREA IS REQUIRED, AIR HANDLING UNITS AND FAN COILS SERVING THAT AREA SHALL BE SHUT DOWN, AND ALL GRILLES, REGISTERS, DIFFUSERS AND DUCT OPENINGS IN THAT AREA, WHETHER ABOVE OR BELOW THE CEILING, SHALL BE SEALED WITH VISQUINE TO PREVENT INFILTRATION OF DUST, DIRT AND DEBRIS INTO THE AIR DISTRIBUTION SYSTEM.
- PROVIDE ALL CORING, TRENCHING, CUTTING AND PATCHING AS REQUIRED TO PERFORM THE WORK FOR THIS PROJECT.
- CUTTING, BORING, SAWCUTTING, OR DRILLING THROUGH NEW OR EXISTING STRUCTURAL ELEMENTS TO BE DONE ONLY WHEN SO DETAILED IN THE DRAWINGS OR ACCEPTED BY THE ARCHITECT AND STRUCTURAL ENGINEER.
- COORDINATE LOCATIONS OF SENSORS, THERMOSTATS AND OTHER DEVICES WITH ENGINEER AND OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. TEMPERATURE SENSORS MOUNTED ON EXTERIOR WALLS SHALL HAVE INSULATED BACKS. AVOID LOCATIONS NEAR EXTERIOR DOORS OR IN DIRECT SUNLIGHT. MOUNTING HEIGHT PER ADA. IN FINISHED AREAS WHERE DEVICES ARE REMOVED, PATCH AND FINISH TO MATCH EXISTING SURROUNDING MATERIALS AND COLORS.
- COORDINATE THE CEILING TYPES AND DO NOT INSTALL WORK THAT REQUIRES ACCESS (JUNCTION BOXES, VALVES, DEVICES, ETC.) ABOVE INACCESSIBLE CEILINGS. IF IT IS NECESSARY TO INSTALL SUCH WORK ABOVE AN INACCESSIBLE CEILING, PROVIDE ACCESS PANELS AS REQUIRED TO PERMIT ACCESS. COORDINATE ACCESS PANEL LOCATIONS WITH THE ASSOCIATED EQUIPMENT LOCATIONS. SHOW ACCESS PANELS ON SHOP DRAWINGS. INSTALL ACCESS PANELS IN WALLS OR CEILINGS AS SHOWN ON ARCHITECTURAL PLANS OR AS DIRECTED BY THE ARCHITECT.
- PROVIDE 1" DIAMETER COLORED STICKER ON CEILINGS TO INDICATE LOCATIONS OF CONTROLLERS, FIRE DAMPERS AND BALANCING DAMPERS ABOVE CEILINGS. SHOP DRAWINGS SHALL INCLUDE A LEGEND FOR COLOR CODE.
- PROVIDE SUPPORT STEEL, HANGERS, VIBRATION ISOLATION, AND ACCESSORIES REQUIRED TO INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. DO NOT SUPPORT CEILINGS, LIGHTING FIXTURES, OR ANY OTHER DEVICES FROM DUCTWORK, PIPES, OR ELECTRICAL CONDUIT. UNLESS OTHERWISE NOTED, DO NOT ALLOW DUCTWORK, PIPES, OR CONDUIT TO DIRECTLY CONTACT THE BUILDING STRUCTURE, CEILING SYSTEM, LIGHT FIXTURES, ANY OTHER BUILDING SYSTEM COMPONENT, OR EACH OTHER. APPLIANCES DESIGNED TO BE FIXED IN POSITION SHALL BE SECURELY FASTENED IN PLACE PER BUILDING CODE REQUIREMENTS.
- PERFORM WORK IN ACCORDANCE WITH ALL CURRENT AND APPLICABLE LOCAL CODES AND REGULATIONS AND AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
- VERIFY THAT EQUIPMENT AND MATERIAL TO BE INSTALLED IN THE RETURN AIR PATH IS RATED FOR USE IN THE RETURN AIR PATH AND MEETS REQUIREMENTS OF THE APPLICABLE CODES AND REGULATIONS. SUPPLY AND RETURN AIR PLENUMS SHALL BE OF NON-COMBUSTIBLE CONSTRUCTION, SEALED AIRTIGHT, AND CONFORM TO ALL APPLICABLE CODE REQUIREMENTS. MATERIALS SHALL HAVE A MOLD, HUMIDITY, AND EROSION RESISTANT FACE THAT MEETS THE REQUIREMENTS OF UL181. COMBUSTIBLE MATERIALS EXPOSED WITHIN THE PLENUM MUST HAVE A FLAME-SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED RATING OF NOT MORE THAN 50.
- SUPPLY AIR, RETURN AIR, AND OUTSIDE AIR FOR HEATING, COOLING OR EVAPORATIVE COOLINGS SHALL BE CONDUCTED THROUGH DUCT SYSTEMS CONSTRUCTED OF METAL AS SET FORTH IN THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS. METAL AND FLEXIBLE, OR ANOTHER APPROVED DUCT CONSTRUCTION STANDARD.
- PROVIDE CODE APPROVED FIRE STOPPING AT PENETRATIONS THROUGH BUILDING CONSTRUCTION TO ACHIEVE FIRE, SMOKE, AND SOUND RATINGS AS REQUIRED.
- REPAIR ANY DAMAGE TO FIREPROOFING DUE TO INSTALLATION OF THIS WORK.
- INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
- PROVIDE EQUIPMENT SUITABLE FOR THE INTENDED PURPOSE.
- PERFORM SYSTEM COMMISSIONING, CLEANING, SERVICING, BALANCING, TESTING, AND CERTIFICATION REQUIRED BY THE DOCUMENTS, CODE, LOCAL AUTHORITY HAVING JURISDICTION, AND AS RECOMMENDED BY THE EQUIPMENT MANUFACTURERS, PRIOR TO OCCUPANCY.
- UPON COMPLETION OF TESTING, OPERATE EQUIPMENT TO VERIFY THAT ALL SYSTEMS FUNCTION PROPERLY. AFTER VERIFYING THE PROPER OPERATION, DEMONSTRATE THE OPERATION OF SYSTEMS AND EQUIPMENT TO THE OWNERS REPRESENTATIVES. PROVIDE 48 HOURS NOTICE AND SCHEDULE THE DEMONSTRATION WITH THE OWNER.
- PRIOR TO PERMIT BEING FINALIZED, A COMPLETE REPORT OF THE TESTING AND ADJUSTING SHALL BE PROVIDED TO THE OWNER/OWNER'S REPRESENTATIVE AND TO THE INSPECTOR (CGS.713.10.4)
- PROVIDE O & M MANUALS AS DESCRIBED IN SPECIFICATIONS.
- PROVIDE TRAINING FOR OWNER'S MAINTENANCE AND ENGINEERING STAFF AS DESCRIBED IN SPECIFICATIONS.
- SURFACE MOUNTED CONDUIT NOT PERMITTED IN OCCUPIED AREAS.
- CONTROL WIRING NOTES
 - PROVIDE CONTROL, SIGNAL AND COMMUNICATION WIRING AND CONDUIT.
 - COORDINATE WITH ELECTRICAL CONTRACTOR FOR 120 VAC POWER REQUIRED FOR CONTROL DEVICES.
 - WIRING DIAGRAMS ARE SHOWN FOR CONTROL SEQUENCE AND FUNCTION ONLY. IT REMAINS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO INSURE THAT THE ELECTRICAL PORTION OF THIS WORK IS INSTALLED PER CODE.
- REGARDLESS INDICATED ON PLAN OR NOT, CONTRACTOR TO PROVIDE BALANCING DAMPER FOR ALL SUPPLY, RETURN AND EXHAUST DUCTWORK AT BRANCH TAKEOFF.
- CONTRACTOR TO ENSURE THAT THE MECHANICAL SCREEN AND PARAPET WALL SHALL BE HIGHER THAN THE NEW UNITS. UPGRADE THE EXISTING ONES TO APPROACH CITY REQUIREMENTS.

SCOPE OF WORK

THE MECHANICAL SCOPE OF WORK FOR THIS PROJECT IS AS FOLLOWS:

- REPLACE PACKAGED ROOF TOP UNIT, HORIZONTAL TAGGED AC-1. NEW UNIT SHALL BE OF SIMILAR CAPACITY.
- DISCONNECT AND RECONNECT NEW UNIT WITH EXISTING AIR DUCT BY DUCT FLEXIBLE CONNECTION, CANVAS. MATERIAL & FABRICATION SHALL COMPLY WITH SMACNA.
- DISCONNECT AND RECONNECT GAS LINE TO NEW UNIT. DISCONNECT AND RECONNECT CONDENSATE PIPE TRAPS FOR NEW UNIT TO EXISTING MAIN CONDENSATE LINE ON ROOF. DISCONNECT AND RECONNECT ELECTRICAL POWER. TO BE MODIFIED AS NEEDED.
- REMOVE EXISTING THERMOSTAT AND PROVIDE NEW WIRED THERMOSTAT TO NEW UNIT. LOCATION SHALL BE COORDINATED WITH ARCHITECT AND TENANT.

DESIGN CONDITION

OUTDOOR DESIGN CONDITION:
 SUMMER: 93 DEGREE FDB, 68 DEGREE FWB
 WINTER: 33 DEGREE F

INDOOR DESIGN CONDITION:
 FLOW AREAS: 75 DEGREE F SUMMER
 68 DEGREE F WINTER
 NO HUMIDITY CONTROL

LUNCH ROOM: 75 DEGREE F SUMMER
 68 DEGREE F WINTER
 NO HUMIDITY CONTROL

REST ROOM: 12 AC EXHAUST

TITLE 24 NOTE:

- NO ADDITIONAL COOLING/HEATING LOADS ARE BEING ADDED TO THE BUILDING HVAC SYSTEMS.
- NO CHANGES ARE BEING MADE TO THE BUILDING ENVELOPE.
- NEW DUCTWORK SHALL COMPLY WITH SECTION 149(b) 1D. STANDARDS.

MECHANICAL SHEET INDEX

SHEET NO.	SHEET TITLE
M0.1	MECHANICAL GENERAL NOTES, ABBREVIATIONS AND LEGENDS
M0.2	MECHANICAL SPECIFICATIONS
M0.3	MECHANICAL SPECIFICATIONS
M0.4	MECHANICAL SCHEDULES
M2.1	MECHANICAL DEMOLITION & RENOVATION FLOOR PLANS
M3.1	MECHANICAL ROOF DEMOLITION PLAN
M3.2	MECHANICAL ROOF RENOVATION PLAN
M4.1	MECHANICAL DETAILS

APPLICABLE CODES & STANDARD

AS APPLICABLE TO THE SCOPE OF WORK, NEW WORK TO BE PERFORMED IN ACCORDANCE WITH THE FOLLOWINGS:

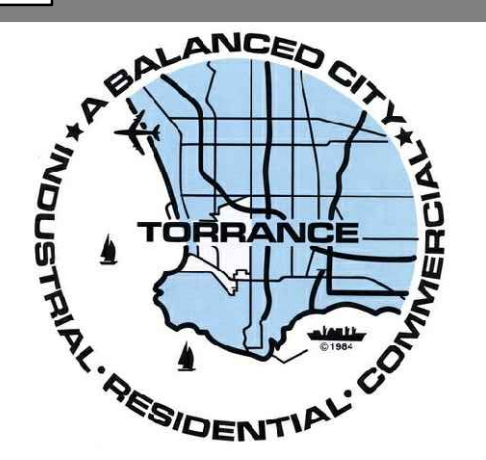
- 2016 CALIFORNIA BUILDING CODE, VOLUMES 1 AND 2
- 2016 CALIFORNIA ELECTRICAL CODE
- 2016 CALIFORNIA MECHANICAL CODE
- 2016 CALIFORNIA PLUMBING CODE
- 2016 CALIFORNIA EXISTING BUILDING CODE
- 2016 CALIFORNIA REFERENCED STANDARDS CODE
- 2016 CALIFORNIA FIRE CODE
- 2016 CALIFORNIA ENERGY CODE

GREEN BUILDING STANDARD NOTES

- MINIMUM OF 50% OF NON HAZARDOUS CONSTRUCTION WASTE SHALL BE RECYCLED. CGC 5.713.8.1.
- TESTING AND ADJUSTING OF NEW SYSTEMS SHALL COMPLY AS OUTLINED IN CGC SECTION 5.713.10.4.2.
- OPERATIONS AND MAINTENANCE SCHEDULE (O&M) AS LISTED IN CGC SECTION 5.713.10.4.5 SHALL BE DELIVERED TO THE BUILDING OWNER OR REPRESENTATIVE AND THE FACILITIES OPERATOR.
- DURING CONSTRUCTION, ENDS OF DUCT OPENING SHALL BE SEALED, AND MECHANICAL EQUIPMENT SHALL BE COVERED. CGC 5.714.4.3.
- VOC'S MUST COMPLY WITH THE LIMITATIONS LISTED IN SECTION 5.504.4 AND TABLES 4.504.1, 5.504.4.1, 5.504.4.2, 5.504.4.3 AND 5.504.4.5 FOR: ADHESIVES, SEALANTS, PAINTS, AND COATINGS, CARPET AND COMPOSITION WOOD PRODUCTS. CGC 5.714.4.4.
- PRIOR TO FINAL APPROVAL OF THE BUILDING THE LICENSED CONTRACTOR, ARCHITECT OR ENGINEER IN RESPONSIBLE CHARGE OF THE OVERALL CONSTRUCTION MUST COMPLETE AND SIGN THE CITY APPROVED GREEN BUILDING STANDARDS CERTIFICATION FORM OR OTHER DOCUMENTATION REQUIRED BY THE CITY AND GIVEN TO THE BUILDING DEPARTMENT OFFICIAL PRIOR TO RECEIVING FINAL APPROVAL TO BE FILED WITH THE APPROVED PLANS.


BUILDING NAME AND ADDRESS

FIRE STATION #4 CITY OF TORRANCE
 5205 CALLE MAYOR TORRANCE, CA 90501



CITY OF TORRANCE
 3031 TORRANCE BLVD.
 TORRANCE, CA 90503

PROJECT NAME
**FIRE STATION #4
 ROOF TOP UNIT
 REPLACEMENT**
 5205 CALLE MAYOR
 TORRANCE, CA 90501

CONSULTANT

IDS GROUP
 1 PETERS CANYON ROAD, SUITE 130
 IRVINE, CA. 92606
 TEL: 949-387-8500, FAX: 949-387-0800

Project # 17X036.00

STAMP
 NOT FOR CONSTRUCTION
 Date

STAMP

ISSUE

REV.	DESCRIPTION	DATE
	CITY SUBMITTAL	03/05/2018

SHEET TITLE
**MECHANICAL
 GENERAL NOTES
 ABBREVIATION
 AND LEGENDS**

SHEET NUMBER
M0.1

SPECIFICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION:

DIVISION 1 APPLIES TO THIS SECTION. PROVIDE HEATING, VENTILATING AND AIR CONDITIONING AS INDICATED, SPECIFIED AND REQUIRED FOR OPTIMAL SYSTEM OPERATION.

A. WORK IN THIS SECTION SHALL INCLUDE:

- AIR CONDITIONING SHALL CONSIST OF MAIN DUCTS, AIR DISTRIBUTION EQUIPMENT AND CONTROLS.
- AIR CONDITIONING FOR ALL AREAS IN SCOPE OF WORK SHOWN ON PLANS COMPLETE WITH ALL AIR CONDITIONING EQUIPMENT, AIR DISTRIBUTION DUCTWORK, PIPING AND CONTROLS.

B. RELATED WORK IN THIS SECTION SHALL INCLUDE:

- FURNISHING ELECTRICAL DEVICES NECESSARY FOR MECHANICAL WORK WITH THE EXCEPTION OF DISCONNECTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- LINE AND LOW VOLTAGE WIRING AND CONDUIT FOR LINE AND LOW VOLTAGE WIRING FOR MECHANICAL CONTROLS INCLUDING FINAL CONNECTIONS AS INDICATED ON WIRING DIAGRAMS.
- RESPONSIBILITY FOR OBTAINING CLARIFICATION FROM ARCHITECT/OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES THAT EXIST BETWEEN MECHANICAL AND ELECTRICAL WORK PRIOR TO PROCEEDING WITH THE WORK
- RESPONSIBILITY FOR CORRECT AND PROPER OPERATION OF AUTOMATIC ELECTRIC CONTROLS AND ASSOCIATED MECHANICAL EQUIPMENT AND ALL ELECTRIC POWER DRIVEN EQUIPMENT FURNISHED UNDER THIS SECTION.

C. RELATED WORK IN OTHER SECTIONS:

- ALL EXPOSED PIPING, DUCTWORK AND UNFINISHED PORTIONS OF FIXTURES AND EQUIPMENT SHALL BE PAINTED WITH WEATHERPROOF COATING APPROVED BY ARCHITECT.
- CONCRETE WORK ASSOCIATED AND INCLUSIVE OF MISCELLANEOUS METAL IN CONNECTION WITH PITS, TRENCHES AND CATCH BASINS WITH FOUNDATIONS OR CONCRETE PADS LOCATED UNDER BOILERS, PUMPS, AND ALL OTHER MECHANICAL EQUIPMENT, FURNISHING TEMPLATES FOR SPACING AND SIZES OF CONCRETE PADS AND ANCHOR BOLTS UNDER THIS SECTION.
- MISCELLANEOUS EQUIPMENT PROVIDED BY OWNER OR UNDER OTHER SECTIONS WITH THE EXCEPTION OF EXHAUST AND VENTILATION CONNECTIONS FOR THE EQUIPMENT SHALL BE MADE UNDER THIS SECTION.
- ELECTRICAL WORK AS SPECIFIED WILL BE PROVIDED UNDER ELECTRICAL SPECIFICATIONS:
 - CONDUIT FOR LINE WIRING FOR EQUIPMENT AND DEVICES AS INDICATED OR SPECIFIED EXCEPT CONDUIT FOR LINE AND LOW VOLTAGE WIRING FOR MECHANICAL EQUIPMENT CONTROLS AS SPECIFIED UNDER MECHANICAL SPECIFICATIONS.
 - LINE WIRING FOR EQUIPMENT AND DEVICES AS INDICATED OR SPECIFIED HEREIN EXCEPT LINE AND LOW VOLTAGE WIRING FOR MECHANICAL EQUIPMENT CONTROLS AS SPECIFIED UNDER MECHANICAL SPECIFICATIONS.
 - PROVIDING DISCONNECT SWITCHES.
 - FURNISHING AND INSTALLING ELECTRICAL DEVICES SUCH AS STARTERS AND DISCONNECTS, WHERE INDICATED.

1.02 QUALITY ASSURANCE:

- GUARANTEES: IN ADDITION TO EQUIPMENT WARRANTIES, PROVIDE A WRITTEN GUARANTEE FORM REQUIRED AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR ONE YEAR. GUARANTEE SHALL BE INCLUSIVE OF REPAIR OF DAMAGE TO OR REPLACEMENT OF ANY PORTION OF EQUIPMENT OR PREMISES CAUSED BY LEAKS OR BREAKS IN PIPE OR EQUIPMENT PROVIDED UNDER THIS SECTION.

1.03 SUBMITTALS:

A. SHOP DRAWINGS:

- SHOW ALL DETAILS OF ALL DUCTWORK, DUCT SUPPORTS, PIPING SUPPORTS, MECHANICAL EQUIPMENT PADS AND SUPPORTS AND ANY RELEVANT ELECTRICAL WIRING OR CONTROL WIRING DIAGRAMS.

B. PRODUCT DATA:

- WITHIN 35 DAYS AFTER AWARD OF CONTRACT AND PRIOR TO DELIVERY TO THE JOB SITE OF ANY MATERIALS OF THIS SECTION, CONTRACTOR SHALL SUBMIT SEVEN COMPLETE BROCHURES OF ALL MATERIALS AND EQUIPMENT, IN CONJUNCTION WITH ALL PRODUCT DATA SUBMITTALS.
- PRODUCT DATA SHALL INCLUDE ALL AIR CONDITIONING EQUIPMENT, HANGERS, FANS, DUCTWORK CONSTRUCTION ELECTRICAL WIRING AND CONTROL WIRING DIAGRAMS AND OTHER ASSOCIATED STANDARD ITEMS AS REQUIRED TO COMPLEMENT SHOP DRAWINGS.
- MANUFACTURERS AND SUPPLIERS OF EQUIPMENT SHALL PROVIDE ALL NECESSARY DATA TO COMPLY WITH THE STATE OF CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS. COMPLIANCE CERTIFICATION FOR ALL EQUIPMENT SHALL BE INCLUDED IN EQUIPMENT SUBMITTALS

C. RECORD DRAWINGS: PROJECT RECORD DRAWINGS SHALL BE MAINTAINED THROUGH THE PROGRESS OF THE WORK AND SUBMITTED TO THE ARCHITECT FOR APPROVAL

D. OPERATING AND MAINTENANCE MANUALS:

- SUBMIT THREE COPIES OF ALL OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS.
- FULLY INSTRUCT OWNER'S OPERATING PERSONNEL AND DEMONSTRATE ALL ASPECTS OF EQUIPMENT PERFORMANCE, OPERATION AND MAINTENANCE. AMOUNT OF TIME ALLOCATED FOR SAID INSTRUCTION AND DEMONSTRATIONS OF EQUIPMENT AND SYSTEMS SHALL BE INCORPORATED IN THESE OBLIGATIONS. SUBMIT A LETTER TO ARCHITECT SIGNED BY OWNER'S REPRESENTATIVE WHO WILL OPERATE SYSTEMS STATING THAT HE/SHE HAS BEEN FULLY INSTRUCTED BY CONTRACTOR CONCERNING OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEM.
- SUBMIT ONE ADDITIONAL SET OF APPROVED INSTRUCTIONS AND ONE ADDITIONAL SET OF APPROVED CONTROL DIAGRAM SUITABLY FRAMED BEHIND GLASS FOR MOUNTING AS INSTRUCTED.

1.04 PRODUCT HANDLING:

A. PROTECTION: ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PROTECT THE MATERIALS OF THIS SECTION BEFORE, DURING, AND AFTER INSTALLATION.

B. REPLACEMENTS: ANY OCCURRENCE OF DAMAGE, SHALL TRIGGER IMMEDIATE REPAIR OF ALL DAMAGED AND DEFECTIVE WORK TO THE APPROVAL OF THE ARCHITECT AT NO ADDITIONAL COST TO OWNER.

1.05 MISCELLANEOUS:

A. PERMITS AND FEES: CONTRACTOR SHALL ARRANGE, APPLY AND PAY FOR ALL NECESSARY PERMITS, INSPECTIONS, EXAMINATIONS, FEES AND CHARGES REQUIRED BY PUBLIC AUTHORITIES HAVING JURISDICTION.

B. LOCATIONS AND ACCESSIBILITY: CONTRACTOR SHALL BE COMPLETELY INFORMED REGARDING ANY PECULIARITIES AND LIMITATIONS OF SPACES AVAILABLE FOR INSTALLATION OF WORK UNDER THIS SECTION. VALVES, MOTOR CONTROLS AND ALL OTHER DEVICES REQUIRING SERVICE, MAINTENANCE AND ADJUSTMENT SHALL BE LOCATED IN POSITIONS OF FULL ACCESS. ACCESS DOORS SHALL BE PROVIDED WHERE NECESSARY IN DUCTWORK OR CONSTRUCTION WHETHER SPECIALLY DETAILED OR NOT, AND RENDER ALL SUCH DEVICES ACCESSIBLE.

C. SCAFFOLDING: PROVIDE ALL SCAFFOLDING, RIGGING AND HOISTING AS REQUIRED FOR THE PROPER EXECUTION OF THE WORK.

D. DRAWINGS: DRAWINGS SHOW DESIRED LOCATION AND ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT AND OTHER ITEMS, AND SHOULD BE ADHERED TO AS CLOSE AS POSSIBLE. CONTRACTOR SHALL ASSUME THE RESPONSIBILITY FOR COORDINATING THE WORK WITH ALL OTHER TRADES. WORK SPECIFIED WHICH IS NOT CLEARLY DEFINED BY THE DRAWINGS SHALL BE INSTALLED AND ARRANGED TO THE SATISFACTION OF THE ARCHITECT. IF CHANGES IN INDICATED LOCATIONS AND ARRANGEMENTS ARE DEEMED NECESSARY BY ARCHITECT, THEY SHALL BE COMPLETED BY CONTRACTOR WITHOUT ADDITIONAL CHARGES PROVIDED THE CHANGE IS ORDERED BEFORE WORK IS INSTALLED.

PART 2 - PRODUCTS

2.01 PACKAGED ROOFTOP UNITS:

A. GENERAL

- ROOFTOP UNIT SHALL BE SPECIFICALLY FOR OUTDOOR APPLICATION WITH A FULLY WEATHERPROOF CABINET, FULLY FLASHED ON 4 SIDES; SHIPPED AS ONE PIECE. (ROOF CURB CAN BE SHIPPED OR SUPPLIED SEPARATELY.)

B. MANUFACTURER SHALL PERFORM ALL OF THE FOLLOWING AT THE FACTORY:

- ASSEMBLE UNITS
- WIRE AND PIPE UNITS
- INSTALL UNIT CONTROLLER
- RUN TEST UNITS BEFORE SHIPPING

C. INFORMATION PLATES:

- OUTSIDE NAME PLATE
 - UNIT(S) SHALL HAVE INSTALLATION AND MAINTENANCE MANUALS SUPPLIED WITH EACH UNIT IN THE CONTROL ACCESS SECTION.
 - UNIT(S) SHALL BE PROVIDED WITH A DURABLE AND WEATHER RESISTANT WIRING DIAGRAM MOUNTED TO THE CONTROL COMPARTMENT DOOR.
- PLASTIC OR RUBBER BUSHINGS OR TOOLED OPENINGS TO PREVENT WIRE ABRASION WHEREVER WIRING RUNS THROUGH SHEET METAL.
- RTU's TO INCLUDE THE FOLLOWING EQUIPMENT:
 - CABINET: FORMED AND REINFORCED INSULATED PANELS, HINGED TO ALLOW ACCESS TO INTERNAL PARTS AND COMPONENTS, WITH JOINTS BETWEEN SECTIONS SEALED.
 - ENCLOSURE SHALL INCLUDE ANTI-CORROSION COATING AND SHALL BE CAPABLE OF WITHSTANDING ASTM B117 750 HOUR SALT SPRAY TEST.
 - BASE RAILS:
 - FULL PERIMETER
 - TO HAVE RIGGING HOLES FOR LIFTING
 - SHALL HAVE FORKLIFT SLOTS
 - ACCESS DOORS AND PANELS:
 - PROVIDE HINGED ACCESS DOORS AND REMOVABLE PANELS TO ALLOW FOR REMOVAL, REPLACEMENT OR REPAIR OF ALL INTERNAL COMPONENTS. ALL DOORS AND REMOVABLE PANELS SHALL BE GASKETED.
 - INCLUDE AIR/WATER SEALS FOR PANELS/DOORS SEPARATING CONDITIONED FROM UNCONDITIONED AIR.
 - FACTORY SUPPLIED LATCHING HANDLES
 - PROVIDE ACCESS TO:
 - ECONOMIZER SECTION
 - FILTER SECTION
 - BLOWER SECTION
 - COMPRESSORS/CONTROL/HEAT SECTIONS(S)
 - CONDENSER SECTION
 - CONDENSER ACCESS PANEL:
 - ONE SQUARE FOOT MINIMUM PANEL SIZE
 - OPENINGS:
 - UNIT BASE ACCESS FOR ELECTRICAL
 - HORIZONTAL ACCESS KNOCKOUTS FOR ELECTRICAL AND DOUBLE GAS LINES
 - 1/2" RAISED EDGES AROUND DUCT AND POWER ENTRY OPENINGS IN THE BASE PAN
 - BASE PAN:
 - PROVIDE OPENINGS WITH NONMETALLIC GROMMETS FOR THE FOLLOWING:
 - UNIT POWER
 - 120 V CONVENIENCE NETWORK RECEPTACLE WIRING
 - LOW VOLTAGE NETWORK OR EXTERNAL DEVICE WIRING
 - INSULATION:
 - CABINET SHALL BE THERMALLY AND ACOUSTICALLY INSULATED.
 - UNIT BASE FULLY INSULATED TO SERVE AS AIR SEAL TO THE ROOF CURB.
 - ALL PANELS ADJACENT TO CONDITIONED AIR INCLUDING THE BASE SHALL BE FULLY INSULATED WITH A MINIMUM OF R=1.0 (HIGHER R VALUE IS PREFERRED) FIBERGLASS INSULATION TO PREVENT CONDENSATION AND MINIMIZE SOUND TRANSMISSION.
 - DOOR LINERS, TOP PANELS, DIVIDER PANELS AND MULLIONS SHALL BE FULLY INSULATED TO MEET AN R VALUE OF 1.0 (HIGHER R VALUE IS PREFERRED)
 - CASING INSULATION AND ADHESIVE: COMPLY WITH NFPA 90A.
 - OUTDOOR-AND RETURN-AIR MIXING DAMPERS:
 - DAMPER LEAKAGE RATE NO GREATER THAN THE RATE DESCRIBED IN ASHRAE/IESNA 90.1 TABLE 6.4.3.4.4.
 - DAMPER MOTOR: DIRECT-COUPLED, MODULATING WITH ADJUSTABLE MINIMUM POSITION, PLUG CONNECTIONS.
 - GEAR DRIVEN PREFERRED. USE OF ROD AND LINKAGES IS ACCEPTABLE
 - OUTDOOR AIR HOOD FURNISHED WITH CLEANABLE ALUMINUM MESH OUTDOOR AIR FILTERS.
 - RELIEF-AIR DAMPER: MOTORIZED (DIRECT COUPLED), GEAR DRIVEN PREFERRED, USE OF ROD AND LINKAGES ACCEPTABLE) OR BACKDRAFT GRAVITY (NONMOTORIZED), AS REQUIRED BY ASHRAE/IESNA 90.1, WITH BIRD SCREEN AND HOOD.
 - AIRSTREAM SURFACES: SURFACES IN CONTACT WITH THE AIR STREAM SHALL BE PROTECTED AGAINST EROSION AND MEET NFPA 90 FLAME RETARDANCE REQUIREMENTS (PREFERABLY INTERIOR PANEL, BUT FOIL FACED CLEANABLE INSULATION ENCAPSULATED WITH PANEL DESIGN OR TAPE EDGES SECURING FIR IT ACCEPTABLE).

2.02 DIFFUSERS, REGISTERS AND GRILLES:

PROVIDE AIR DISTRIBUTION EQUIPMENT OF THE INDICATED SIZES AND CAPACITIES.

A. COLORS: PROVIDE AND INSTALL AIR DISTRIBUTION EQUIPMENT WITH FACTORY FINISHED ENAMEL OF COLOR TO MATCH TILE AS SELECTED. SUBMIT PAINT SAMPLES FOR APPROVAL BY ARCHITECT.

B. SQUARE CEILING DIFFUSERS: PROVIDE TITUS PERFORATED FACE WITH CORES ALLOWING ONE, TWO, THREE AND FOUR WAY THROW PATTERNS, OF SIZE AND CAPACITY INDICATED. DIFFUSER INSTALLATION SHALL BE ADAPTED TO CEILING SUSPENSION SYSTEM AND PERFORATED FACE SHALL BE HINGED AND REMOVABLE.

- SUPPLY AIR SHALL ENTER INTO CONDITIONED SPACE IN SUCH A MANNER THAT CONDITIONED AIR AND ROOM AIR IS IMMEDIATELY AND EVENLY MIXED, RESULTING IN EQUALIZATION OF TEMPERATURE WITHOUT CAUSING ANY AIR DISTRIBUTION DRAFTS THROUGHOUT ZONES OF OCCUPANCY WITH TEMPERATURE DIFFERENTIALS UP TO 25 DEGREE F FOR BOTH COOLING AND HEATING. AIR QUANTITIES AND THROWS SHALL BE AS SPECIFIED ON DRAWINGS.
- MOVING AIR VELOCITY BELOW 5' LEVEL, DURING COOLING CYCLE, SHALL NOT EXCEED LIMITS OF EITHER 90 FPM AT 1.5 DEGREE F BELOW MEAN ROOM TEMPERATURE OR 70 FPM AT 1 DEGREE F BELOW MEAN ROOM TEMPERATURE. DURING HEATING CYCLE, MOVING AIR VELOCITY BELOW 5' LEVEL SHALL NOT BE LESS THAN 10 FPM. TEMPERATURE DIFFERENCE AT OR BELOW THE 5' LEVEL SHALL NOT EXCEED THE FOLLOWING: 2 DEGREE F BELOW MEAN ROOM TEMPERATURE AT 50 FPM, 1 DEGREE F BELOW MEAN ROOM TEMPERATURE AT 70 FPM. SOUND PRESSURE LEVEL IN ALL OCTAVE BANDS FOR EACH DIFFUSER SHALL NOT EXCEED NC 30 NOISE CRITERIA CURVE AT TASK LEVEL WHEN DIFFUSERS OPERATE AT SPECIFIED CAPACITIES.

2.03 DUCTS AND SHEET METAL WORK:

A. PROVIDE AND INSTALL DUCTS, PLENUMS, ACCESS DOORS, FRESH AIR INTAKES, AND EXHAUST AIR OUTLETS AS INDICATED AND REQUIRED. ALL DUCTWORK SHALL BE CONSTRUCTED, ERECTED AND TESTED TO COMPLY WITH THE MOST RESTRICTIVE OF LOCAL CODES AND REGULATIONS, IN ADDITION DUCTWORK SHALL COMPLY WITH PROCEDURES DETAILED IN THE ASHRAE HANDBOOK OF FUNDAMENTALS OR THE APPLICABLE STANDARDS ADOPTED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION. RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED STEEL AND PREFABRICATED SPIRAL LOCKSEAM DUCTS AND FITTINGS.

B. CEILING DIFFUSERS SHALL HAVE FINAL CONNECTION MADE WITH FLEXIBLE GLASS FIBER DUCT, (CASCO SILENT FLEX-II). FLEXIBLE DUCT CONNECTION TO ROUND DUCTS SHALL BE MADE WITH 1/2" WIDE POSITIVE LOCKING STEEL STRAPS.

C. ALL BRANCH DUCT CONNECTIONS TO MAIN SUPPLY DUCTS SHALL BE MADE WITH LOW LOSS FITTINGS.

D. ALL FLAT DUCT SURFACES SHALL BE DIAGONALLY CRIMPED REGARDLESS OF SIZE. LONGITUDINAL JOINTS IN ALL DUCT SIZES MAY BE FLAT-LOCK JOINTS. TRANSVERSE JOINTS AND INTERMEDIATE BRACING SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL OR GALVANIZED STRUCTURAL ANGLES IN COMPLIANCE WITH REQUIREMENTS OF THE ASHRAE GUIDE AND LOCAL AUTHORITIES HAVING JURISDICTION.

E. TRANSVERSE JOINTS ON SUPPLY DUCTS SHALL BE SEALED WITH MASTIC OR TAPE. LOW PRESSURE SUPPLY DUCTS WITH INTERNAL STATIC PRESSURE IN EXCESS OF .075" OF WATER PRESSURE SHALL HAVE LONGITUDINAL JOINTS SEALED WITH MASTIC OR TAPE.

G. LOCK JOINTS SHALL BE HAMMERED TO ENSURE THEY ARE AIRTIGHT. INSIDE OF DUCT SHALL PRESENT A SMOOTH SURFACE TO FLOW OF AIR.

H. CHANGES IN SIZE OF DUCTS SHALL INCREASE GRADUALLY WITH A SLOPE OF NOT MORE THAN 1:5 RATIO WHERE POSSIBLE, BUT NO GREATER THAN 1:3 RATIO IN ANY EVENT.

URNS SHALL BE CONSTRUCTED WITH A THROAT RADIUS OF NOT LESS THAN THE DUCT WIDTH. HORIZONTAL DUCTWORK SHALL BE STRONGLY SUPPORTED WITH GALVANIZED HANGERS TO COMPLY WITH THE REQUIREMENTS OF THE ASHRAE, SMACNA GUIDELINES AND LOCAL AUTHORITIES HAVING JURISDICTION. FLEXIBLE DUCTWORK SHALL BE SUPPORTED WITH A 4" WIDE SHEET METAL SUPPORT STRAP TO PREVENT PINCHING OF DUCTWORK AND SPACED AS PER ASHRAE, SMACNA GUIDELINES AND LOCAL AUTHORITIES HAVING JURISDICTION.

K. PLENUMS SHALL BE CONSTRUCTED OF 18 GAUGE GALVANIZED SHEET STEEL. PLENUM HORIZONTAL REINFORCING SHALL BE MAXIMUM OF 48 INCH CENTERS BY 1-1/2" x 1-1/4" x 1-1/8" GALVANIZED ANGLES AND REINFORCED VERTICALLY BY 1-1/2" STANDING SEAMS.

FLEXIBLE CONNECTIONS FOR SUPPLY AND RETURN AIR DUCTS SHALL BE 16 OZ. AIRTIGHT "VENTGLAS" NONCOMBUSTIBLE FABRIC WITH A COATING OF FIRE RETARDANT NEOPRENE ON OUTSIDE. FLEXIBLE CONNECTION SHALL BE ATTACHED TO DUCTWORK BY LOCK SEAM AND SHALL BE NO LONGER THAN 6". PROVIDE AT ALL DUCT CONNECTIONS TO MECHANICAL EQUIPMENT.

L. TAPE TRANSVERSE JOINTS ON MAIN COLD SUPPLY AIR DUCTS WITH 4" WIDE 4 OZ. CANVAS SATURATED WITH ARABOL. ADDITIONAL COATS OF ARABOL SHALL BE APPLIED TO ENSURE DUCTWORK IS COMPLETELY AIRTIGHT.

2.04 TURNING VANES:

A. BOTH DUCT DIMENSIONS (HEIGHT AND WIDTH) LESS THAN 48" USE: BARBER-COLEMAN AIR TURNS WITHOUT SPLICING OR APPROVED DOUBLE THICKNESS AIRFOIL VANES.

B. EITHER DUCT DIMENSION (HEIGHT AND WIDTH) GREATER THAN 48" USE: DOUBLE THICKNESS AIRFOIL VANES OF APPROVED PATTERN.

C. RECTANGULAR DUCT SMOOTH RADIUS ELBOWS USE - MULTIPLE SPLITTER VANES.

L.

2.05 DAMPERS AND LOUVERS:

A. BALANCING VOLUME DAMPERS SHALL BE INSTALLED IN EACH BRANCH DUCT AND IN EACH MAIN DUCT TO ENSURE FOR COMPLETE AIR BALANCING. FURNISH EACH MANUAL VOLUME DAMPER WITH BEARINGS AND AN ADJUSTING DEVICE HAVING A LOCKING MECHANISM. PROVIDE ACCESS PANELS TO VOLUME DAMPERS IF CONCEALED OR INACCESSIBLE THROUGH CEILING OR WALL.

B. BALANCING DAMPERS WHERE NEITHER DUCT DIMENSION EXCEEDS 17" SHALL BE BUTTERFLY TYPE CONSISTING OF A BLADE CONSTRUCTED OF 18 GAUGE GALVANIZED STEEL SECURELY RIVETED OR WELDED AT ITS CENTER AXIS TO A SQUARE OPERATING ROD OR SHALL HAVE AIR BALANCE AC-111 OR AC-112 BUTTERFLY TYPE INSTALLED.

C. BALANCING DAMPERS WHERE EITHER DUCT DIMENSION EXCEEDS 18" SHALL HAVE AIR BALANCE AB-2, OPPOSED BLADE TYPE INSTALLED.

D. FIRE DAMPERS: FUSIBLE LINK OUT OF AIRSTREAM TYPE MANUFACTURED TO COMPLY WITH REQUIREMENTS OF STATE FIRE MARSHALL AND LOCAL AUTHORITIES HAVING JURISDICTION, WITH PERMANENT LABELING IDENTIFICATION. PROVIDE ACCESS PANELS TO FIRE DAMPERS IF CONCEALED OR INACCESSIBLE THROUGH CEILING OR WALL.

2.06 REFRIGERANT PIPING:

INSTALLED REFRIGERANT PIPING SHALL BE COPPER ACR REFRIGERANT PIPING WITH SOLDERED WROUGHT COPPER FITTINGS.

2.07 PIPE HANGERS:

HANGERS SHALL BE COMPLETE WITH THREADED STEEL RODS AND VIBRATION ISOLATORS. SOUND AND ELECTROLYSIS ISOLATORS AS REQUIRED AND SPECIFIED FOR CORRECT OPERATION. CONCRETE INSERTS SHALL BE FURNISHED AND INSTALLED UNDER THIS SECTION.

A. 2-1/2" AND UNDER: GRINNELL 104 OR APPROVED EQUAL.

B. 3" AND LARGER: GRINNELL 280.

C. CONCRETE INSERTS: GRINNELL 280.

2.08 INSULATION:

ALL INSULATION SHALL COMPLY WITH THE STATE OF CALIFORNIA ENERGY EFFICIENCY STANDARDS. INSTALL PIPE INSULATION AFTER PIPING IS INSTALLED, TESTED AND APPROVED, AND IS IN CLEAN DRY CONDITION. FIRMLY BUTT INSULATION JOINTS.

A. REFRIGERANT PIPING: INSULATE PIPING WITH ARMACELL PIPE INSULATION 1" THK API/ARMAFLEX, SS (SELF SEALING) PIPE INSULATION. INSULATION SHALL HAVE A 25/50 RATED FLEXIBLE ELASTOMETRIC THERMAL INSULATION WITH FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS.

B. THERMAL DUCT INSULATION: INSULATE ALL CONCEALED AND EXPOSED SUPPLY AIR DUCTS AND PLENUMS UNLESS OTHERWISE SPECIFIED, WITH J-M MICROPOLITE FIBERGLASS DUCT INSULATION, FOIL FACED, 3/4 LB. DENSITY, 1-1/2" THICK. INSULATION SHALL BE WRAPPED ENTIRELY AROUND DUCT WITH JOINTS LAPPED AT LEAST 2" AND SECURED WITH 16 GAUGE GALVANIZED WIRE ON 12" CENTERS. INSULATION SHALL COVER ALL SURFACES INCLUDING STANDING SEAMS.

C. EXPOSED COLD AND HOT SUPPLY AIR PLENUM FROM AC UNITS: SHALL BE LINED WITH J-M LINACUSTIC, 1" THICK, 1-1/2 LB. DENSITY COATED FIBERGLASS DUCT LINER IN ACCORDANCE

D. WITH NFPA 90-A REQUIREMENTS. THE CUT LINER SHALL NOT HAVE AN AIR FRICTION CORRECTION FACTOR GREATER THAN 1.1 AT A VELOCITY OF 3000 FPM. INSULATION SHALL BE APPLIED TO THE INSIDE OF DUCTS WITH AN APPROVED FIRE RETARDANT ADHESIVE TO PROVIDE 100% COVERAGE AND A SMOOTH SURFACE. IN DUCTS WITH ONE SIDE GREATER THAN 12", SECURE INSULATION WITH MECHANICAL FASTENERS IN ADDITION TO ADHESIVE, SPACED AT 14" CENTERS IN BOTH DIRECTIONS.

A. MECHANICAL FASTENERS SHALL BE FLUSH WITH THE LINER SURFACE AND SHALL BEGIN WITHIN 2" OF THE LEADING EDGE OF EACH SECTION AND WITHIN 3" OF THE LEADING EDGE OF ALL CROSS JOINTS WITHIN THE DUCT SECTION. ALL EXPOSED EDGES AND THE LEADING EDGE OF ALL CROSS JOINTS OF THE LINER SHALL BE HEAVILY COATED WITH AN APPROVED FIRE RESISTANT ADHESIVE. THE DUCT LINER SHALL BE CUT TO ASSURE SNUG CLOSING CORNER JOINTS. THE BLACK SURFACE OF THE LINER SHALL FACE THE AIR STREAM. TRANSVERSE JOINTS SHALL BE NEATLY BUTTED AND ALL DAMAGED AREAS SHALL BE HEAVILY COATED WITH AN APPROVED FIRE RESISTANT ADHESIVE.

SOUND DUCT INSULATION: WHERE SHOWN, SOUND INSULATE AIR DUCTS AS SPECIFIED FOR EXPOSED COLD SUPPLY AIR DUCTS.

ALL DUCT INSULATION SHALL HAVE A MINIMUM THERMAL RESISTANCE OF 4.2 EXCLUSIVE OF FILM RESISTANCE AND FULLY COMPLY WITH 2016 CALIFORNIA MECHANICAL CODE.

2.09 TEMPERATURE CONTROL:

FURNISH EQUIPMENT AND SERVICES NECESSARY FOR PROPER INSTALLATION OF A COMPLETE AUTOMATIC TEMPERATURE CONTROL SYSTEM AS SPECIFIED. SUBMIT CONTROL DIAGRAM, SHOP DRAWINGS OF PROPOSED EQUIPMENT AND A SEQUENCE OF OPERATION WITHIN 35 DAYS AFTER AWARD OF CONTRACT. CONTRACTOR SHALL PROVIDE ANY SERVICE REQUIRED FOR PROPER OPERATION FOR ONE YEAR AFTER COMPLETION AND ACCEPTANCE OF ENTIRE WORK.

SUBCONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS OF ALL AUTOMATIC ELECTRIC CONTROL EQUIPMENT INSTALLED.

C. ALL MATERIALS AND EQUIPMENT PROVIDED SHALL BE STANDARD COMPONENTS, REGULARLY MANUFACTURED FOR THIS AND/OR OTHER SYSTEMS AND NOT SPECIFICALLY CUSTOM DESIGNED FOR THIS PROJECT. ALL SYSTEMS AND COMPONENTS SHALL HAVE BEEN THOROUGHLY AND COMPLETELY TESTED AND PROVEN IN ACTUAL USE FOR A MINIMUM OF TWO YEARS.

D. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL

- BAS AND TEMPERATURE CONTROL WIRING FOR A COMPLETE AND OPERABLE SYSTEM. ALL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH ALL LOCAL/NATIONAL CODES. ALL EXPOSED LOW VOLTAGE CONTROL WIRING LOCATED THROUGHOUT THE BUILDING SHALL BE RUN IN CONDUIT. ALL LOW VOLTAGE ELECTRICAL WIRING LOCATED ABOVE THE CEILING MAY BE RUN IN PLENUM CABLE. ROOM SENSOR CABLES HIDDEN BEHIND WALLS SHALL BE RUN IN CONDUIT. WITH ROOM SENSOR CONDUIT EXTENDING ABOVE WALL INTO ACCESSIBLE CEILING. ALL CABLE SHALL BE SUPPORTED OFF BUILDING STRUCTURE AND SHALL NOT BE SUPPORTED OFF DUCTWORK, PIPE RACKS, ETC.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS:

A. INSPECTION:

- BEFORE COMMENCING WORK REQUIRED BY THIS SECTION, THE WORK OF OTHER TRADES SHALL BE INSPECTED AND VERIFIED SUCH THAT WORK HAS BEEN PROPERLY COMPLETED AND INSTALLED TO FACILITATE FOR PROPER INSTALLATION OF ALL MATERIALS AND METHODS REQUIRED OF THIS SECTION. ALL HEATING, VENTILATION AND AIR CONDITIONING SHALL BE INSTALLED TO COMPLY WITH THE REQUIREMENTS OF ALL LOCAL GOVERNING AUTHORITIES, THE ORIGINAL DESIGN, AND THE REFERENCED STANDARDS.
- DISCREPANCIES:
 - IN THE EVENT OF DISCREPANCY, THE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY.
 - DO NOT PROCEED WITH INSTALLATION IN AREAS OF DISCREPANCY UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED BY THE ARCHITECT OR ENGINEER.

3.02 EQUIPMENT IDENTIFICATION:

ALL MAJOR EQUIPMENT SHALL DISPLAY FIRMLY ATTACHED METAL NAMEPLATES WHICH STATE NAME OF MANUFACTURER, MODEL NUMBER AND ELECTRICAL DATA. AN ADDITIONAL PERMANENT LABEL SHALL BE ATTACHED TO EACH PIECE OF EQUIPMENT WHICH WILL CLEARLY INDICATE BY NUMBER WHICH OPERATING AND MAINTENANCE MANUAL EXPLAINS MAINTENANCE REQUIREMENT IN DETAIL.

3.03 SAFETY PROVISIONS:

EQUIPMENT AND PIPING WITH TEMPERATURES ABOVE 140 DEGREE F OR BELOW 25 DEGREE F, LOCATED IN A POSITION TO INFLECT DANGER TO PERSONNEL OR CREATE A FIRE HAZARD, SHALL BE PROPERLY GUARDED OR COVERED WITH INSULATION OF TYPE SPECIFIED. BOLTS, GEARS, CHAINS, PULLEYS, COUPLINGS, PROJECTING SET SCREWS, KEYS AND OTHER ROTATING OR RECIPROCATING PARTS SHALL BE COVERED OR PROPERLY GUARDED. PROVIDE GUARD RAILS, ETC., TO ENSURE SAFE OPERATION AND MAINTENANCE OF EQUIPMENT.

3.04 INITIAL LUBRICATION:

PRIOR TO OPERATING ANY MECHANICAL SYSTEMS, EQUIPMENT BEARINGS SHALL BE LUBRICATED AND BOLTS, PULLEYS, AND OTHER MOVING PARTS CHECKED FOR ALIGNMENT AND TOLERANCES SO AS TO COMPLY WITH MANUFACTURER'S OPERATING INSTRUCTION. PIPING AND LIQUID SYSTEMS SHALL BE FLUSHED OUT AND FILLED WITH OPERATING FLUIDS. AFTER TESTS, VALVES AND OTHER PARTS OF WORK SHALL BE ADJUSTED TO ENSURE QUIET OPERATION. STRAINERS SHALL BE CLEANED OUT BY REMOVING AND WASHING BASKET OR SCREEN, PRIOR TO START-UP AND COMPRESSORS SHALL HAVE LUBRICATING OIL CHANGED BEFORE START-UP. VIBRATION AND NOISE SHALL BE SUPPRESSED.

3.05 CLEANING OF EQUIPMENT, MATERIALS AND PREMISES:

ALL EQUIPMENT AND MATERIALS SHALL BE CLEANED THOROUGHLY. LEAVE SURFACES SUITABLE FOR PAINTING, SMOOTH, CLEAN, AND READY FOR PAINTERS. LEAVE ENTIRE PREMISE CLEAN, REMOVING UNUSED MATERIALS, RUBBISH, DEBRIS, GREASE SPOTS AND DIRT LEFT BY SUBCONTRACTORS REMOVE, CLEAN AND REPLACE PIPELINE STRAINERS AFTER SYSTEMS HAVE BEEN OPERATIONAL FOR A PERIOD OF 30 CALENDAR DAYS.

3.06 HANGERS AND SUPPORTS:

A. INSTALL HORIZONTAL PIPE RUNS FIRMLY IN PLACE USING APPROVED STEEL AND IRON HANGERS, SUPPORTS, AND/OR PIPE RESTS, UNLESS OTHERWISE INDICATED. HANGER RODS SHALL BE SUSPENDED FROM CONCRETE INSERTS OR FROM APPROVED BRACKETS, CLAMPS OR CLIPS. HANG PIPES INDIVIDUALLY OR IN GROUPS ONLY IF SUPPORTING STRUCTURE IS ADEQUATE TO SUPPORT WEIGHT OF PIPING AND FLUID. EXCEPT FOR BURIED PIPING, HANG PIPE SUPPORT RUNS SO THEY HAVE THE CAPABILITY TO EXPAND OR CONTRACT FREELY WITHOUT STRAIN TO PIPE OR EQUIPMENT.

B. HORIZONTAL STEEL PIPING: PROVIDE HANGERS OR SUPPORTS SPACED EVERY 10 FEET. PROVIDE HANGERS OR SUPPORTS SPACED EVERY 8' FOR PIPING UNDER 1" IN DIAMETER, UNLESS OTHERWISE SPECIFIED.

C. HORIZONTAL COPPER TUBING: PROVIDE HANGERS OR SUPPORTS SPACED EVERY 10' FOR 2" DIAMETER AND OVER. PROVIDE HANGERS OR SUPPORTS EVERY 6' FOR 1-1/2" DIAMETER AND SMALLER.

D. VERTICAL PIPING: SHALL BE SUPPORTED AT EVERY FLOOR WITH WROUGHT IRON PIPE CLAMPS.

E. BRANCHES: PROVIDE SEPARATE HANGERS OR SUPPORTS FOR BRANCH LINES 6 FEET OR MORE IN LENGTH FROM MAIN PIPE RUN.

3.07 EQUIPMENT AND MATERIALS:

INSTALL ALL EQUIPMENT AND MATERIALS AS PER MANUFACTURER'S RECOMMENDATIONS.

3.08 ACCESSIBILITY:

INSTALLATION OF WORK SHALL BE READILY ACCESSIBLE FOR NORMAL OPERATION, READING OF INSTRUMENTS, ADJUSTMENT, SERVICE, INSPECTION AND REPAIR. PROVIDE ACCESS PANELS WHERE INDICATED AND REQUIRED. ACCESS PANELS SHALL BE THE RESPONSIBILITY OF THE RESPECTIVE SUBCONTRACTOR.

3.09 SYSTEM BALANCING:

A. SUBMITTED BALANCING DATA SHALL SHOW AIR FLOW AT EACH OUTLET, OUTSIDE AIR, RETURN AIR, TOTAL SUPPLY AIR, FAN RPM, FAN PRESSURE AND TEMPERATURES AND ANY OTHER DATA DEEMED NECESSARY TO SHOW THAT PROPER ADJUSTMENTS HAVE BEEN MADE BY AIR INDEPENDENT BALANCING COMPANY. ALL ADDITIONAL COSTS FOR THIS SERVICE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

B. TESTS SHALL BE WITNESSED BY OWNER'S REPRESENTATIVE AND SUBMITTAL DATA SIGNED BY OWNER'S REPRESENTATIVE PRIOR TO FINAL INSPECTION.

C. AIR BALANCE SUBCONTRACTOR SHALL VERIFY THAT VOLUME DAMPERS HAVE BEEN INSTALLED FOR ADEQUATE AIR BALANCING AND THAT AIR LOSS IN DUCTWORK IS NON EXISTENT. ALL LEAKS IN DUCT JOINTS SHALL BE REPAIRED BY CONTRACTOR.

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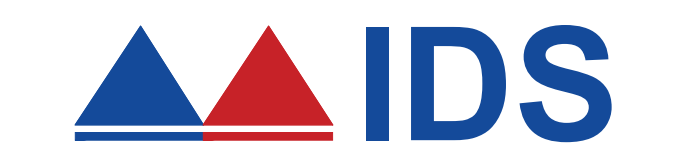


CITY OF TORRANCE
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PROJECT NAME

**FIRE STATION #4
ROOF TOP UNIT
REPLACEMENT**
5205 CALLE MAYOR
TORRANCE, CA 90501

CONSULTANT



IDS GROUP
1 PETERS CANYON ROAD, SUITE 130
IRVINE, CA. 92606
TEL: 949-387-8500, FAX: 949-387-0800

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SHEET TITLE

**MECHANICAL
SPECIFICATIONS**

SHEET NUMBER

M0.2

SPECIFICATIONS

- D. BALANCING WORK INCLUDED:
1. CONDUCT COMPLETE AND COMPREHENSIVE TESTING AND BALANCING OF ALL SYSTEMS, DISTRIBUTION PIPING, AIR TESTING AND BALANCING OF ALL EXHAUST SYSTEMS, AIR HANDLING UNITS, AND AIR DISTRIBUTION EQUIPMENT COMPLETE AS HEREIN SPECIFIED.
 2. ALL SYSTEM BALANCING SHALL BE CONDUCTED BY INDEPENDENT AGENCY CERTIFIED BY AABC. PROOF OF QUALIFICATIONS SHALL BE SUBMITTED TO ARCHITECT FROM EACH SPECIALTY CONTRACTOR CERTIFIED TO PERFORM SUCH SERVICES.
 3. ALL BALANCING SHALL BE COMPLETED TO THE SATISFACTION OF THE ARCHITECT, MECHANICAL ENGINEER, OR OWNERS REPRESENTATIVE. SHOULD THE CONTRACTOR REFUSE OR NEGLECT TO BALANCE THE SYSTEM TO THE ARCHITECT'S SATISFACTION, SUCH BALANCING SHALL BE PERFORMED BY AN INDEPENDENT AGENCY AT THE CONTRACTOR'S EXPENSE.
 4. THE CONTRACTOR SHALL MAKE DRIVE CHANGES, INSTALL ADDITIONAL DAMPERS, VANES, GRILLE BAFFLES, OR OTHER ITEMS, AS MAY BE REQUIRED ON THE JOB, TO ACHIEVE THE OBJECTIVE OF BALANCING BALANCING THE SYSTEM TO THE ARCHITECT'S SATISFACTION.
- E. VERIFICATION OF CONDITIONS: PRIOR TO CONDUCTING ANY TESTING AND BALANCING, INSPECT EQUIPMENT AND MATERIALS AND ARRANGE WITH CONTRACTOR FOR SATISFACTORY CORRECTION OF ALL DEFECTS IN WORKMANSHIP AND/OR MATERIAL THAT COULD DISAFFECT THE WORK SPECIFIED HEREIN.
- F. PROTECTION: AS SPECIFIED HEREINBEFORE.
- G. AGENCY: BALANCING OF ALL SYSTEMS SHALL BE SUPERVISED BY AN INDEPENDENT AGENCY WHICH SPECIALIZES IN BALANCING AND TESTING OF MECHANICAL SYSTEMS, HEREINAFTER REFERRED TO AS THE AGENCY.
- H. SYSTEM OPERATION: CONTRACTOR SHALL PUT ALL COMPONENTS OF SYSTEMS IN FULL OPERATION AND SHALL CONTINUE THE OPERATION OF SAME DURING EACH WORKING DAY OF TESTING AND BALANCING.
- I. SUBMITTALS: WITHIN 90 DAYS AFTER THE START OF CONSTRUCTION CONTRACTOR SHALL SUBMIT A COMPLETE TESTING AND BALANCING PROCEDURE DETAILING ALL TEST EQUIPMENT THAT WILL BE USED, TESTING PROCEDURES, TEST DATA SHEETS, SYSTEMS SCHEMATICS, AND POINT OF TESTING.
1. TEST DATA: SUBMIT 8 COPIES OF TEST DATA TO ARCHITECT UPON COMPLETION OF WORK UNDER THIS SECTION.
 2. CERTIFICATE: AGENCY SHALL PROVIDE CERTIFICATION IN WRITING THAT SYSTEM HAS BEEN ADJUSTED AND BALANCED AND DESIGN CONDITIONS HAVE BEEN ACHIEVED IN ALL AREAS OF BUILDING.
- J. INSTRUMENTS: INSTRUMENTS USED BY BALANCING COMPANY SHALL BE ACCURATELY CALIBRATED AND MAINTAINED IN GOOD OPERATIONAL ORDER. INSTRUMENTS SHALL BE CERTIFIED BY THE MANUFACTURER, OR AN APPROVED TEST LABORATORY WITHIN ONE YEAR OF THE TESTING DATE. SUBMIT THIS CERTIFICATE TO ARCHITECT. TEST INSTRUMENTS PROVIDED BY CONTRACTOR FOR DELIVERY TO OWNER MAY BE USED TO PERFORM PART OF THE SYSTEM BALANCING.
- K. AIR DISTRIBUTION TESTING AND BALANCING:
1. MAKE PITOT TUBE TRANSVERSE OF MAIN SUPPLY DUCTS AND OBTAIN DESIGN CFM AT FANS AT SIMULATED FULL LOAD CONDITIONS.
 2. TEST AND ADJUST SYSTEM FOR DESIGN RETURN AND EXHAUST AIR CFM.
 3. TEST AND ADJUST SYSTEM FOR OUTSIDE AIR DESIGN CFM.
 4. ADJUST ALL MAIN SUPPLY AND RETURN AIR DUCT TO PROPER DESIGN CFM.
 5. ADJUST ALL ZONES TO PROPER STATIC PRESSURE, DESIGN MINIMUM AND MAXIMUM CFM AND AIR TEMPERATURE.
 6. TEST AND ADJUST EACH DIFFUSER, GRILLE AND REGISTER TO WITHIN +/- 10% OF SPECIFIED DESIGN REQUIREMENT.
 7. EACH GRILLE, DIFFUSERS, AND REGISTER SHALL BE IDENTIFIED AS TO LOCATION AND AREA.
 8. SIZE, TYPE AND MANUFACTURER OF DIFFUSERS, GRILLES, REGISTERS AND ALL TESTING EQUIPMENT SHALL BE IDENTIFIED AND LISTED. MANUFACTURER'S RATINGS ON ALL EQUIPMENT SHALL BE USED TO
 9. READINGS AND TESTS OF DIFFUSERS, GRILLES AND REGISTERS SHALL INCLUDE THE REQUIRED FPM VELOCITY AND TEST RESULT VELOCITY AFTER ADJUSTMENT, REQUIRED CFM, AND TEST RESULT CFM AFTER ADJUSTMENT.
 10. IN COOPERATION WITH THE CONTROL MANUFACTURER'S REPRESENTATIVE, SETTINGS SHALL BE ADJUSTED OF AUTOMATICALLY OPERATED CONTROLS TO OPERATE AS SPECIFIED, INDICATED AND/OR NOTED.
 11. ALL DIFFUSERS, REGISTERS AND GRILLES AND ALL EQUIPMENT SHALL BE ADJUSTED TO MAINTAIN THE DESIGN CONDITIONS AT DESIGN LOADS.
- L. COORDINATE TESTS WITH THE MANUFACTURER OF EACH PIECE OF MECH EQUIPMENT.
- M. WITNESS: NOTIFY ARCHITECT IN WRITING TWO WEEKS PRIOR TO TESTING AND BALANCING OF ALL MAJOR EQUIPMENT IN ORDER TO ARRANGE THAT ARCHITECT'S REPRESENTATIVES TO WITNESS THE TESTS.
- 3.10 AIR DISTRIBUTION EQUIPMENT LOCATIONS:
AIR DISTRIBUTION EQUIPMENT FINAL LOCATIONS SHALL COORDINATED WITH ARCH DWGS.
- 3.11 TURNING VANES:
TURNING VANES SHALL BE INSTALLED IN ALL RIGHT ANGLE SHARP TURNS IN DUCTS.
- 3.12 SOUND INSULATION:
WHERE INDICATED, SPECIFIED DUCT DIMENSIONS ARE NET CLEAR DIMENSIONS, I.E., CLEAR DIMENSIONS, AFTER SOUND INSULATION HAS BEEN INSTALLED.
- 3.13 FIRE DAMPERS:
FIRE DAMPERS IN SUPPLY AIR DUCTS AND RETURN AIR DUCTS SHALL HAVE FUSIBLE LINKS WITH MELTING TEMPERATURE 50 DEGREES F ABOVE MAXIMUM NORMAL OPERATING TEMPERATURE (MINIMUM IS 165 F). FIRE DAMPERS SHALL BE PROVIDE WITH ADEQUATE ACCESS PANELS BY CONTRACTOR. WHERE FIRE DAMPERS ARE INSTALLED DIRECTLY BEHIND WALL REGISTERS OR GRILLES, THE REGISTER OR GRILLE SHALL BE OVERSIZED TO ALLOW FOR THE FIRE DAMPER CURTAIN.
- 3.14 DUCTWORK:
DUCTWORK CONNECTED TO LOUVERED OPENINGS SHALL BE TRANSITIONAL TO SIZE OF THESE OPENINGS.
- 3.15 CONNECTIONS:
PHYSICAL CONNECTIONS BETWEEN TWO DISSIMILAR METAL PIPES SHALL BE MADE WITH DIELECTRIC UNIONS.
- 3.16 OPERATION:
MECHANICAL SYSTEM SHALL OPERATE QUIETLY AND WITHOUT VIBRATION OR NOISE AND SHALL BE REGULATED OR ADJUSTED TO ARCHITECT'S SATISFACTION.

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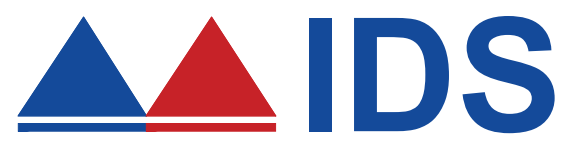


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CONSULTANT



1 PETERS CANYON ROAD, SUITE 130
IRVINE, CA. 92606
TEL: 949-387-8500, FAX: 949-387-0800

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**MECHANICAL
SPECIFICATIONS**

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M0.3

DEMOLITION EXISTING PACKAGED AIR CONDITIONING UNIT SCHEDULE

MARK	MANUFACTURER	TYPE	LOCATION	MODEL	CFM	SUPPLY FAN.		SEER	REFRIG.	COOLING CAPACITY.				GAS HEATING CAP. (MBH)		ELECTRICAL DATA					AMB. TEMP. (°F)	OPER. WEIGHT (LBS.)	UNIT SIZE LxWxH	REMARKS
						ESP (IN. WG.)	HP.			TOTAL (MBH)	SENSIBLE (MBH)	EDB	LDB	EWB	LWB	INPUT	OUTPUT	MCA	MOCP	VOLT				
AC 1 (D)	TRANE OR EQUIVALENT	HORIZONTAL	ROOF	YCC018F1MOBF P424JL11H	722	0.4			22	18.000	14.00			50	40	33	50	208/230	1	60	93	341	53x34x46	SERIAL NO.: P424JL11H UNIT TO BE DEMOLISHED.

NOTE:
(D) TO BE DEMOLISHED

NEW PACKAGED AIR CONDITIONING UNIT SCHEDULE (ELECTRICAL COOLING / GAS HEATING)

MARK	MANUFACTURER	TYPE	LOCATION	MODEL	CFM	OSA CFM	SUPPLY FAN.		SEER	REFRIG.	COOLING CAPACITY.				GAS HEATING CAP. (MBH)		ELECTRICAL DATA					AMB. TEMP. (°F)	OPER. WEIGHT (LBS.)	UNIT SIZE LxWxH	REMARKS
							ESP (IN. WG.)	HP.			TOTAL (MBH)	SENSIBLE (MBH)	EDB	LDB	EWB	LWB	INPUT	OUTPUT	MCA	MOCP	VOLT				
AC 1 (N)	TRANE	HORIZONTAL	ROOF	4YCY5024A1060A	850	100	0.4	1/2	15	410A	23.8	18	80	58.4	60	48	34	50	208/230	1	60	93	425	52X 45X46	① ② ③ ④ ⑤ ⑥ ⑦

REMARKS:

- ① PROVIDE ROOF TOP PACKAGED UNIT ELECTRICAL COOLING / GAS HEATING.
- ② LOW NOX, MEDIUM GAS HEAT, STAINLESS STEEL HEAT EXCHANGER.
- ③ PROVIDE UNIT WITH ENCLOSED MOTOR, ECM MOTOR, MOTOR SHALL BE PROVIDED WITH PERMANENTLY LUBRICATED BEARING.
- ④ CONDENSER COILS SHALL BE COATED WITH EPOXY PHENOLIC COATING
- ⑤ PROVIDE UNIT WITH NEW CURB AS PER MANUFACTURER'S RECOMMENDATIONS . SEE STRUCTURAL PLAN FOR ATTACHMENT.
- ⑥ PROVIDE UNIT WITH DDC CONTROLLED THERMOSTAT AS PER 2016 TITLE 24 SECTION 120.2 (J). THERMOSTAT SHALL COMPLY WITH SECTION 120.2(B). PROVIDE THERMOSTAT WITH SHUT-OFF AND RESET CONTROL CAPABILITIES AS PER SECTION 120.2(E).

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TEL: 949-387-8500, FAX: 949-387-0800

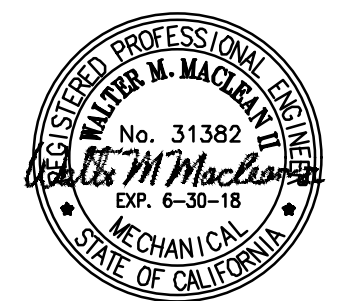
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**MECHANICAL
SCHEDULES**

SHEET NUMBER

M0.4



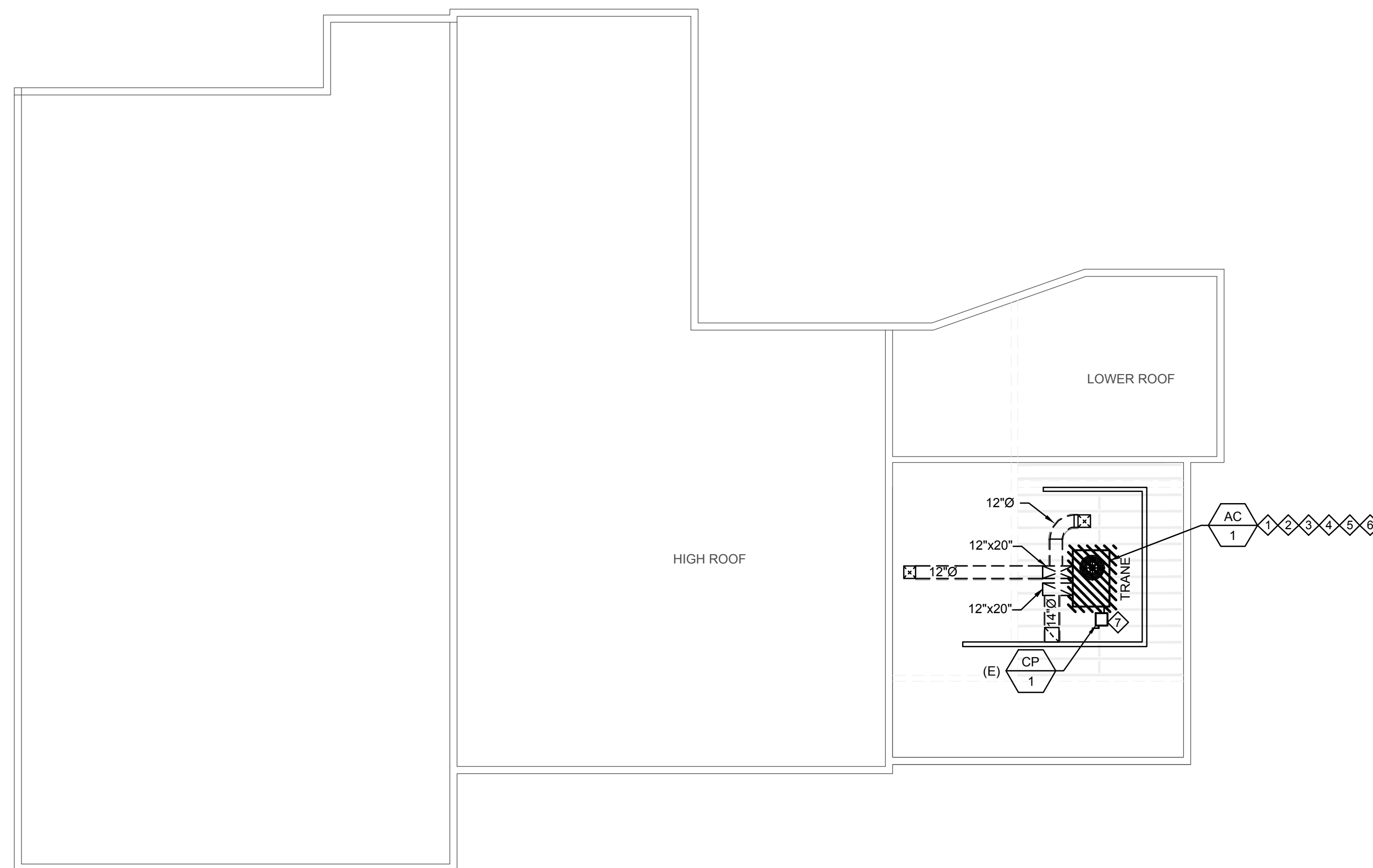
EXISTING UNIT AC-1 TO BE REPLACED NO SCALE 4



EXISTING UNIT AC-1 TO BE REPLACED NO SCALE 3



EXISTING UNIT AC-1 TO BE REPLACED NO SCALE 2



GENERAL NOTES

1. KEEP SITE CLEAN DURING CONSTRUCTION.
2. PROTECT AIR DUCTS FROM DIRT.

DEMOLITION KEY NOTES

- ◇ ROOF TOP UNIT SHALL BE DEMOLISHED AND REPLACED WITH NEW. TEMPORARILY CAP (E) DUCTWORK. VERIFY (E) DUCT WORK IN FIELD AND REPAIR AS NEEDED.
- ◇ (E) AIR DUCT WORK ON ROOF TO REMAIN. VERIFY EXACT LOCATION IN FIELD.
- ◇ EXISTING ROOF CURB SHALL BE DEMOLISHED. NEW ROOF CURB SHALL BE PROVIDED AND INSTALLED. CAP EXISTING ROOF CURB OPENING DURING CONSTRUCTION.
- ◇ CUT AND CAP EXISTING PRIMARY CONDENSATE DRAIN PIPE. VERIFY EXACT PIPE LOCATION IN FIELD AND PROTECT DURING CONSTRUCTION.
- ◇ SHUT-OFF GAS VALVE AND DISCONNECT GAS LINE FROM (E) UNIT. CAP GAS LINE AND PROTECT DURING CONSTRUCTION.
- ◇ DEMOLISH FLEXIBLE CONNECTION.

CLIENT



CITY OF TORRANCE
3031 TORRANCE BLVD.
TORRANCE, CA 90503

PROJECT NAME

**FIRE STATION #4
ROOF TOP UNIT
REPLACEMENT**
5205 CALLE MAYOR
TORRANCE, CA 90501

CONSULTANT



IDS GROUP
1 PETERS CANYON ROAD, SUITE 130
IRVINE, CA. 92606
TEL: 949-387-8500, FAX: 949-387-0800

Project # 17X036.00

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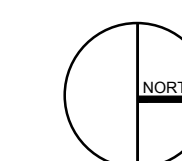
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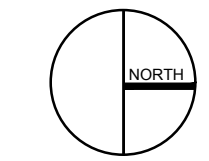
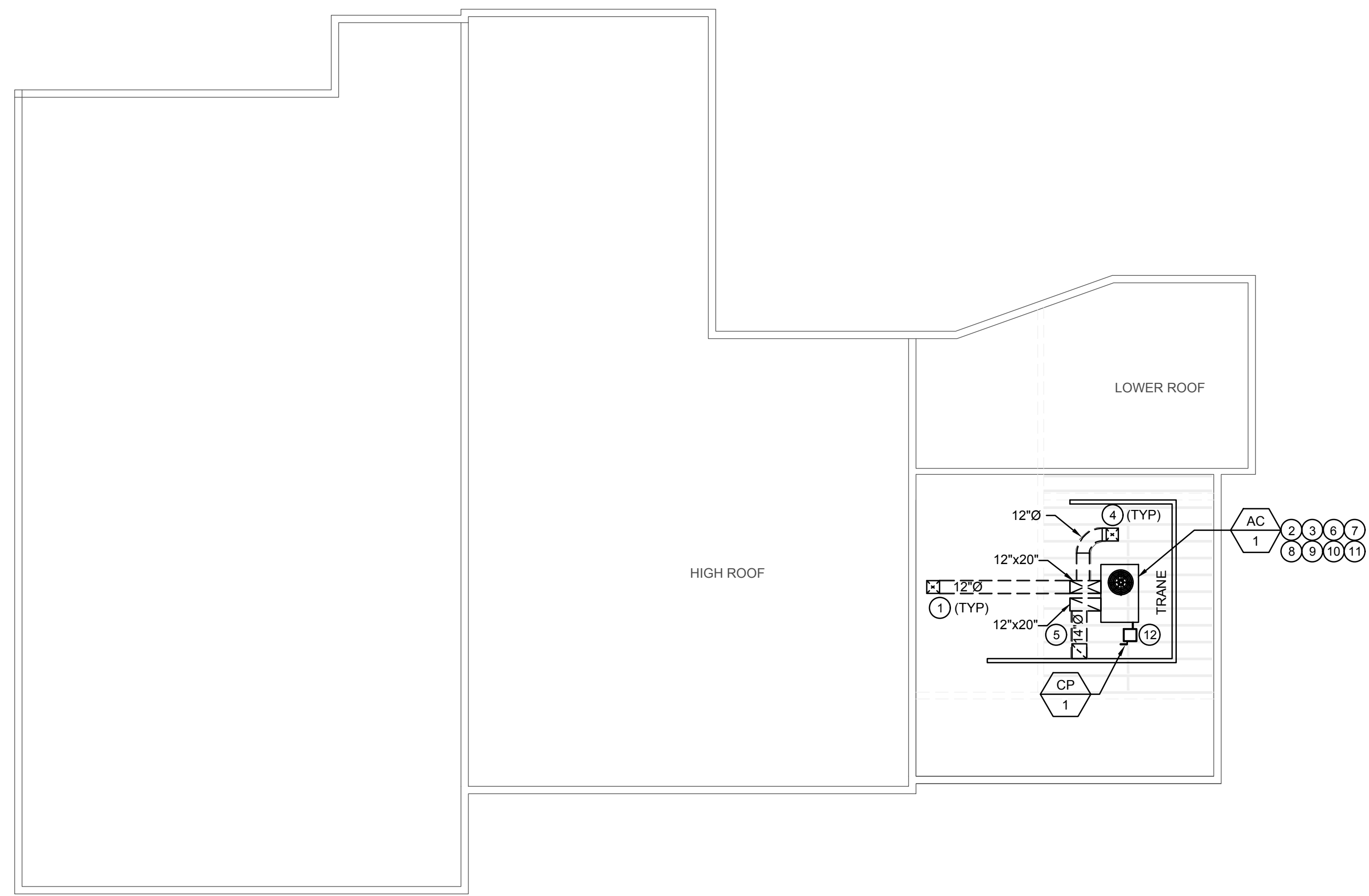
SHEET TITLE

**MECHANICAL ROOF
DEMOLITION PLAN**

SHEET NUMBER

M2.1





GENERAL NOTES

1. KEEP SITE CLEAN DURING CONSTRUCTION.
2. PROTECT AIR DUCTS FROM DIRT.
3. FIELD VERIFY EXISTING LOCATIONS AND SIZES OF ALL AIR DUCT-WORK AND HVAC SYSTEM AND ENSURE COMPLETE AND SAFE OPERATION OF THE WHOLE SYSTEM AFTER CONSTRUCTION. NO ADDITIONAL CHANGE ORDERS WILL BE GRANTED TO CONTRACTORS RELATED TO EXISTING CONDITIONS THAT ARE DIFFERENT THAN WHAT IS REFLECTED IN DESIGN PLANS.
4. IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO FURNISH, REINSTALL AND COMMISSION THE WHOLE HVAC SYSTEM FOR SMOOTH AND SAFE OPERATION WITH NO EXTRA CHARGE ON OWNER.
5. ALL MATERIALS EXPOSED IN A RETURN AIR PLENUM OR CEILING SHALL BE NON-COMBUSTIBLE, PLENUM RATED OR HAVE FLAME SPREAD INDEX NO GREATER THAN 25 AND A SMOKE DEVELOPED INDEX NO GREATER THAN 50. CMC SEC. 602.2.
6. THE VENTILATION MUST BE MAINTAINED THAT WILL RESULT IN A CONCENTRATION OF CO2 AT OR BELOW 600 PPM ABOVE AMBIENT LEVEL.
7. ENSURE THE NEW ROOF CURB IS STRUCTURALLY SOUND AND SEALED TO BE WATER TIGHT BEFORE ANY INSTALLATION. BRING TO ARCHITECT AND ENGINEER ATTENTION IF ABOVE CONDITION ARE NOT MET.
8. EXISTING CURB TO BE REPLACED WITH NEW FACTORY ONE. SEE STRUCTURAL PLANS FOP ATTACHMENT.

RENOVATION KEY NOTES

1. INSTALL AIR DUCT WORK AS PER CMC 603.1, 603.2 AND SMACNA.
2. COORDINATE THERMOSTAT LOCATION WITH ARCHITECT AND OWNER. THERMOSTAT SHALL BE PROVIDED WITH SECURE COVER. FOR INSTALLATION SEE DETAIL NO.2 ON SHEET M4.1.
3. NOT USED.
4. EXISTING HORIZONTAL SUPPLY AIR DUCT ROUTE ON ROOF TO REMAIN.
5. EXISTING HORIZONTAL RETURN AIR DUCT ROUTE DOWN FROM ROOF TO REMAIN.
6. EXISTING SUPPLY AND RETURN AIR DUCT SHALL REMAIN. REPLACED ANY CORRODED SECTIONS.
7. CONNECT GAS LINE TO UNIT. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATIONS.
8. CONNECT (E) CONDENSATE DRAIN LINE TO UNIT. FOLLOW MANUFACTURER'S RECOMMENDATIONS AND CPC 2016 SEC 803.1.
9. REPLACE ANY PUNCTURED (E) CONDENSATE PIPES OR ONES THAT SHOW SIGNS OF LEAKAGE.
10. FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MAINTAIN UNIT CLEARANCES. SEE DETAIL NO.7 ON SHEET M4.1.
11. SEE ELECTRICAL PLANS FOR ELECTRICAL CIRCUIT BREAKER CUT-OFF.
12. NEW CONDENSATE PUMP. PUMP SHALL BE SIMILAR THE EXISTING AND WEATHERPROOF PROTECTION.

CLIENT



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TORRANCE, CA 90501

CONSULTANT



1 PETERS CANYON ROAD, SUITE 130
IRVINE, CA. 92606
TEL: 949-387-8500, FAX: 949-387-0800

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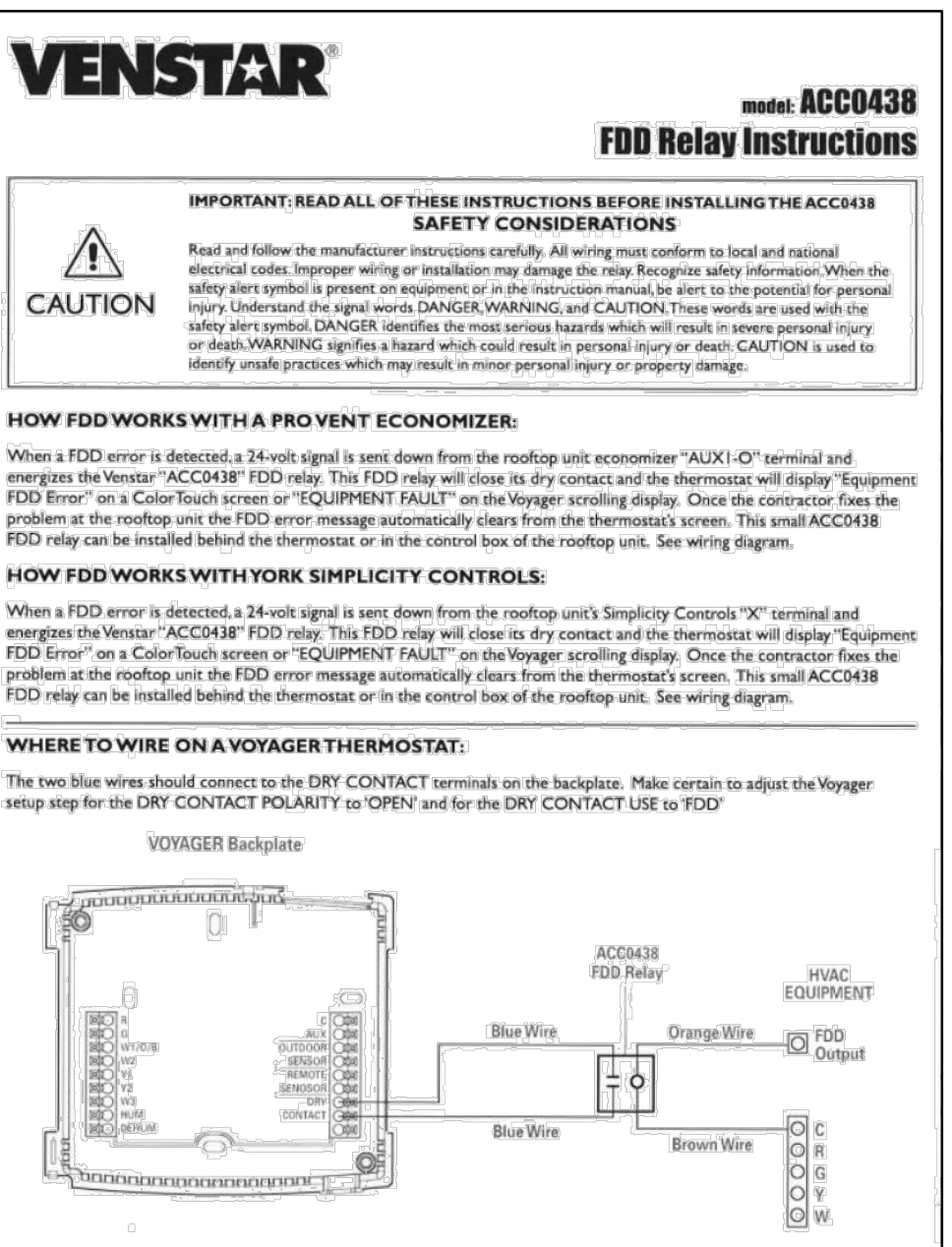
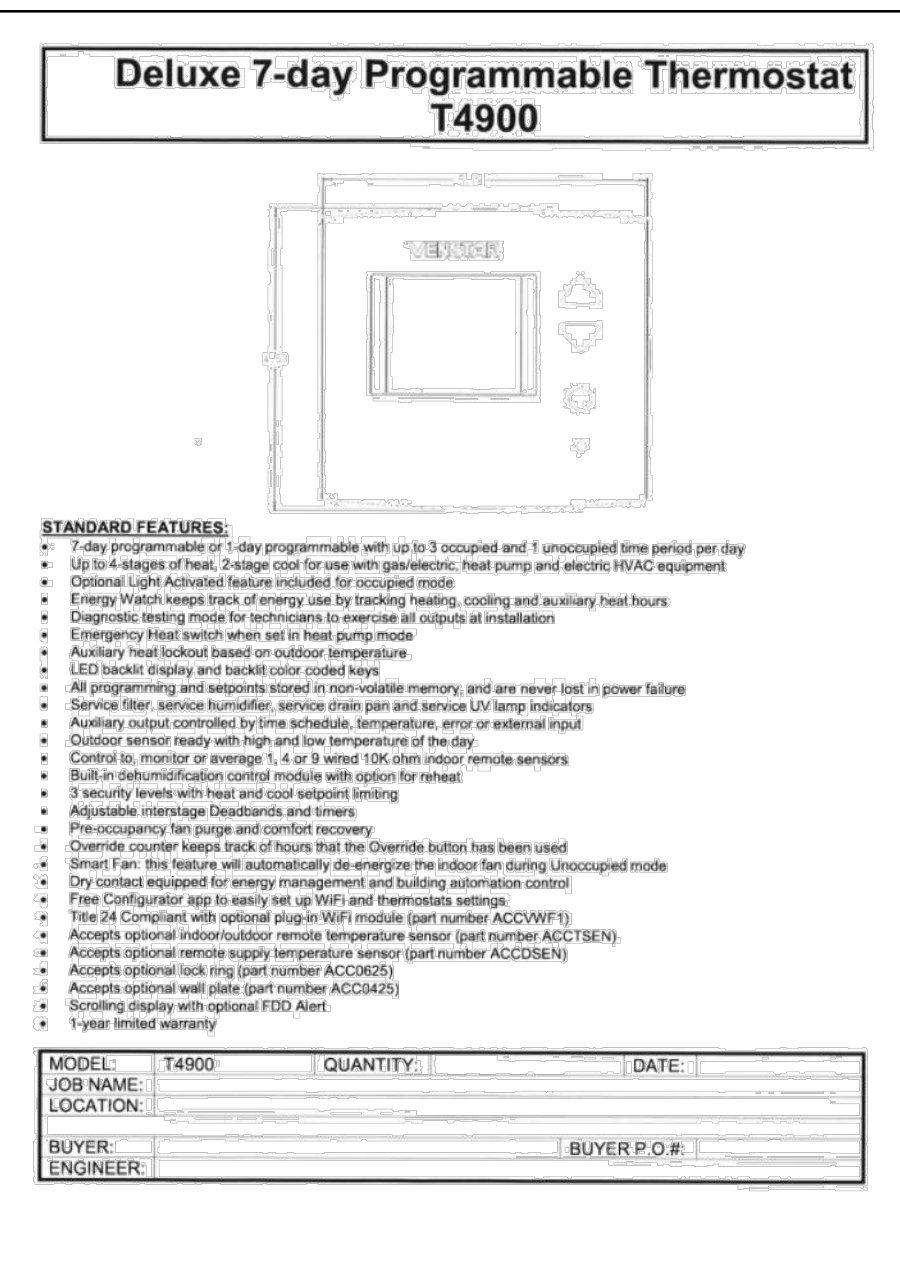
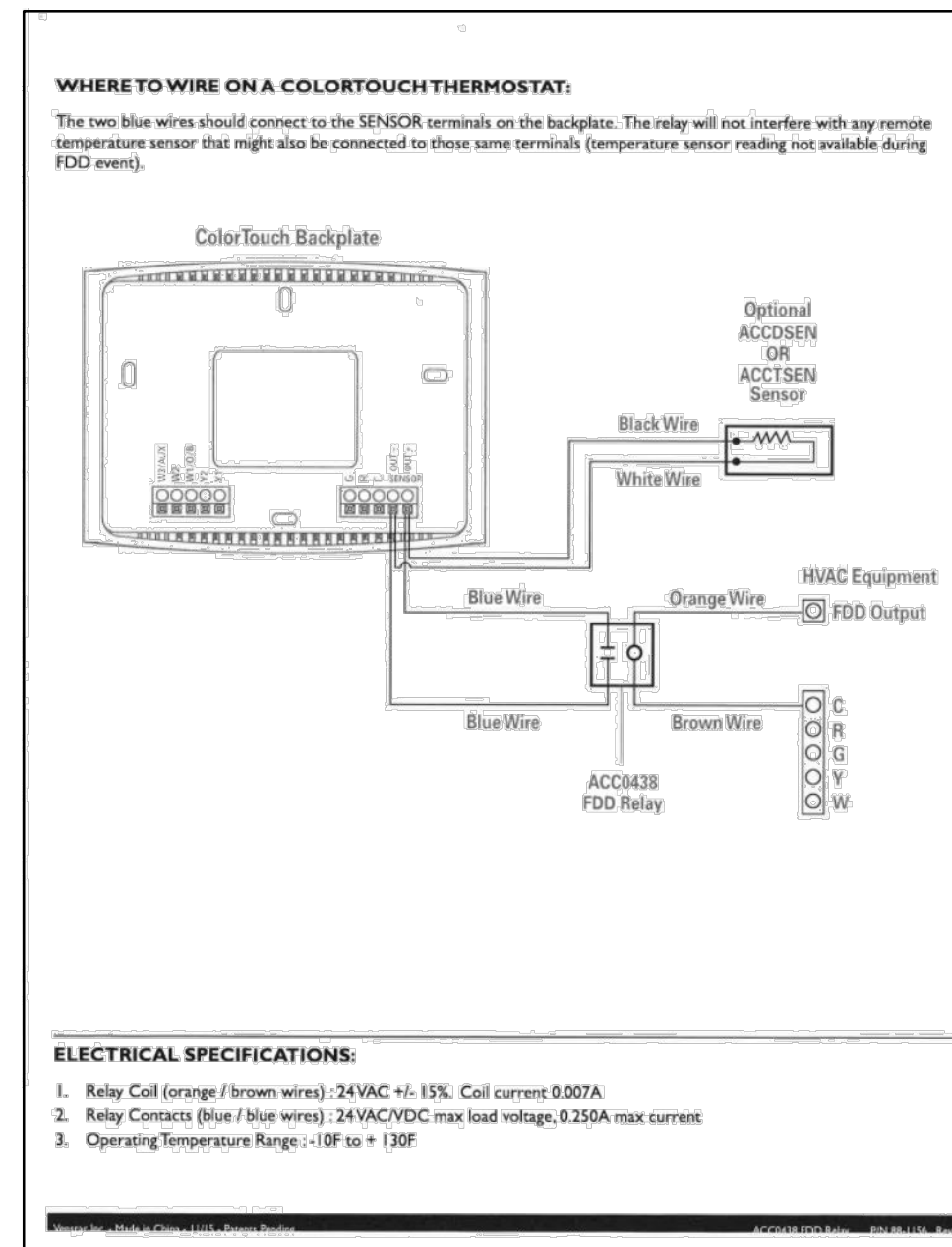
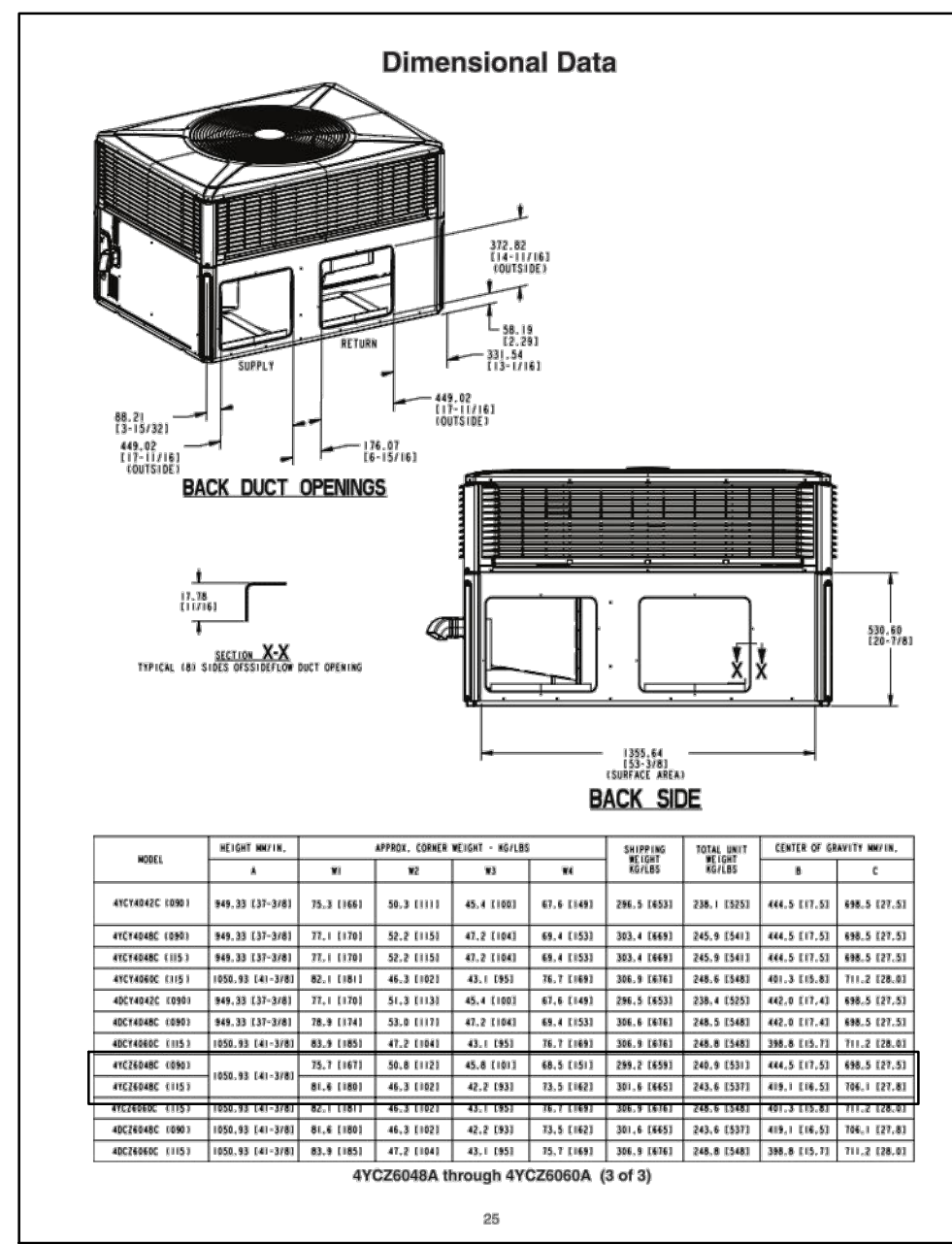
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SHEET TITLE

**MECHANICAL ROOF
RENOVATION PLAN**

SHEET NUMBER

M3.1



CLIENT

CITY OF TORRANCE
3031 TORRANCE BLVD.
TORRANCE, CA 90503

PROJECT NAME

**FIRE STATION #4
ROOF TOP UNIT
REPLACEMENT**
5205 CALLE MAYOR
TORRANCE, CA 90501

CONSULTANT

IDS GROUP
1 PETERS CANYON ROAD, SUITE 130
IRVINE, CA. 92606
TEL: 949-387-8500, FAX: 949-387-0800

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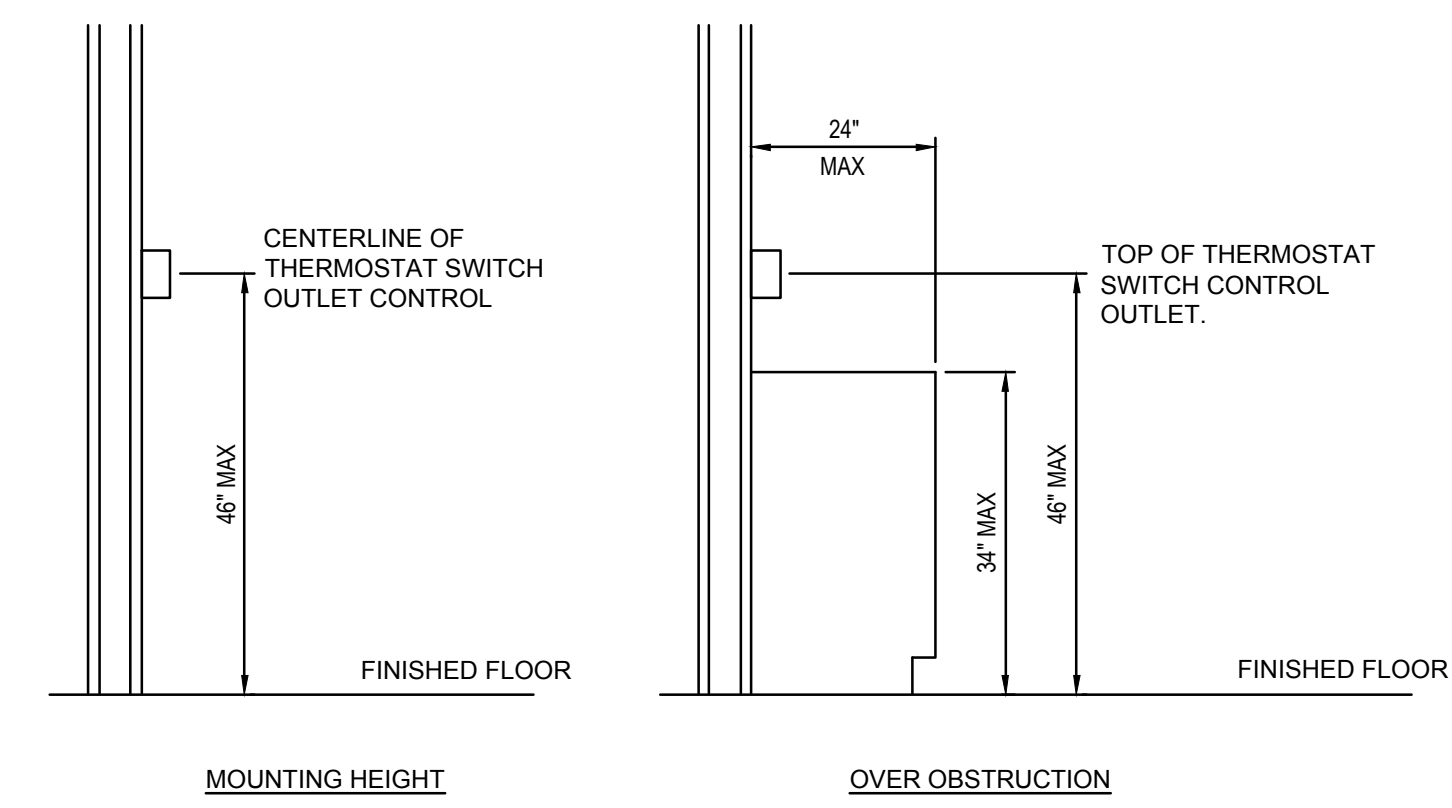
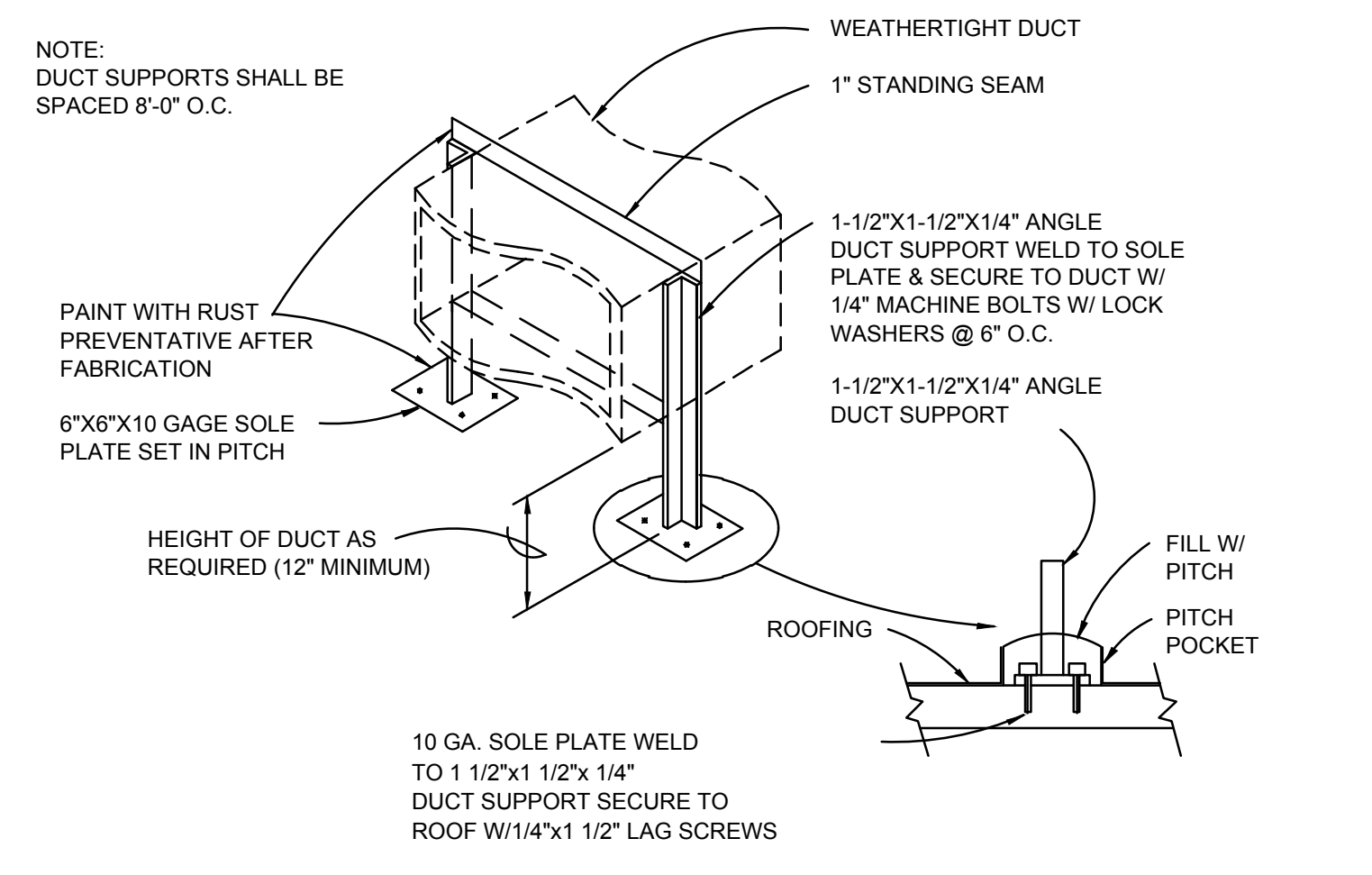
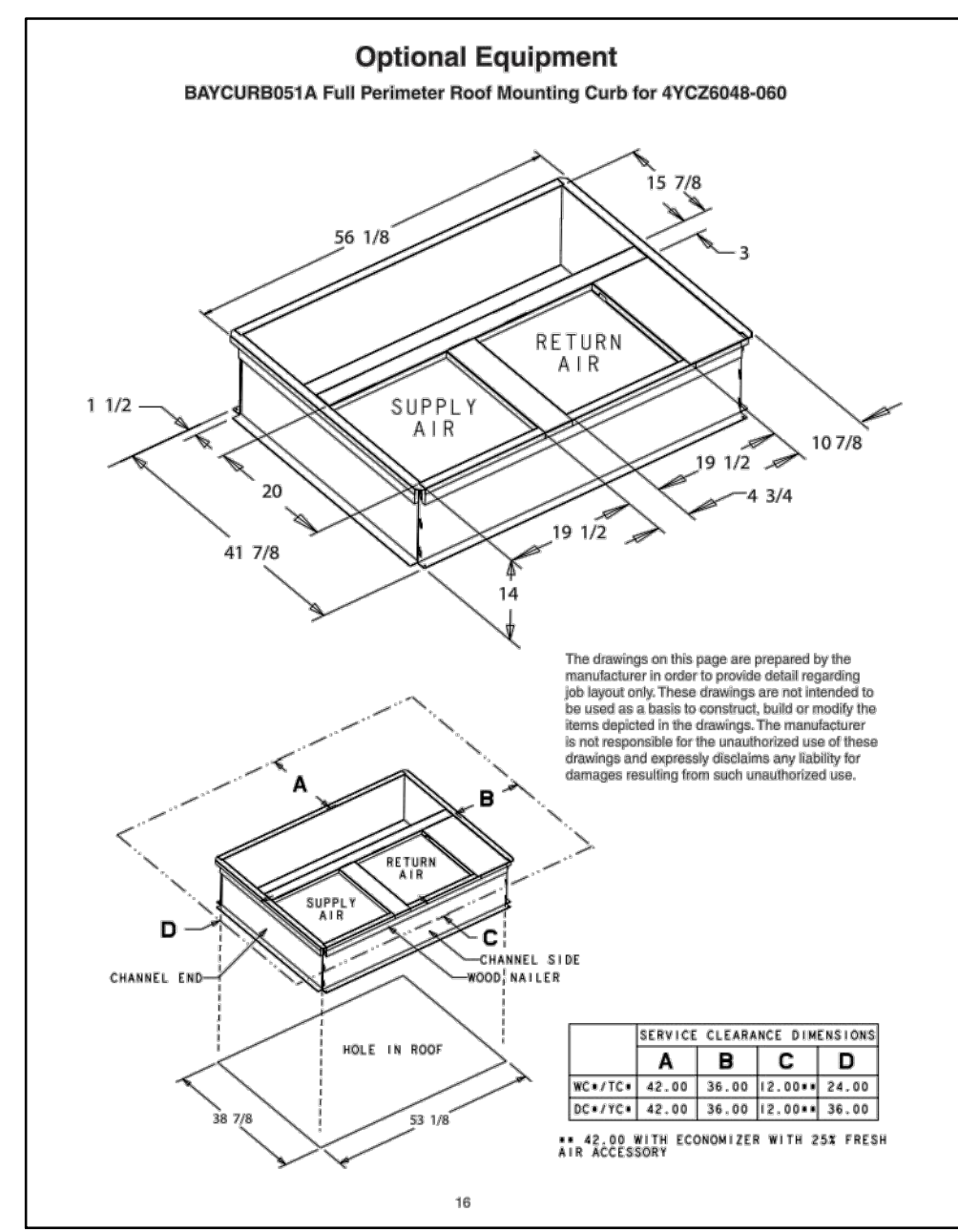
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NEW TRANE UNIT AC-1 NO SCALE 8

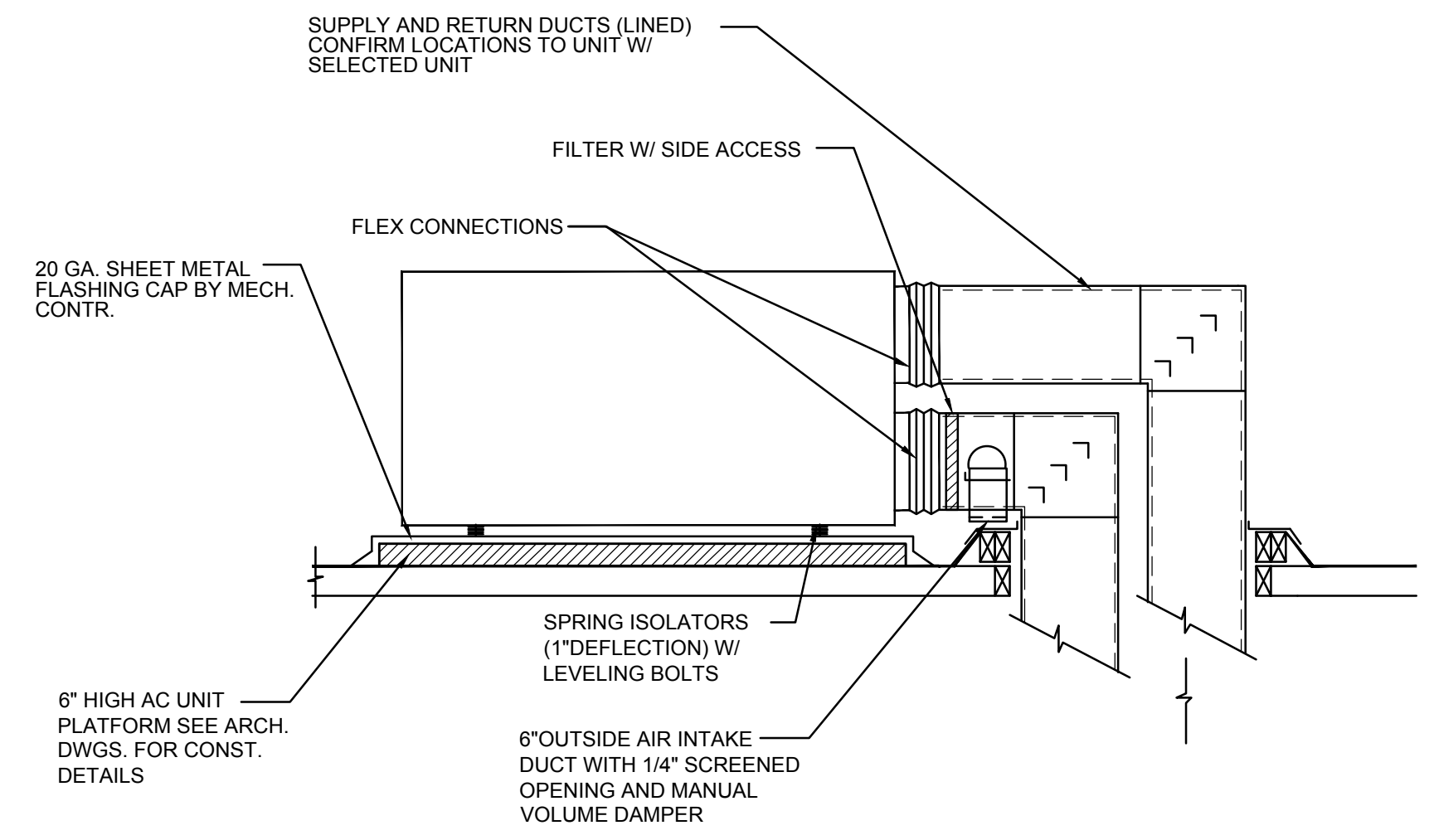
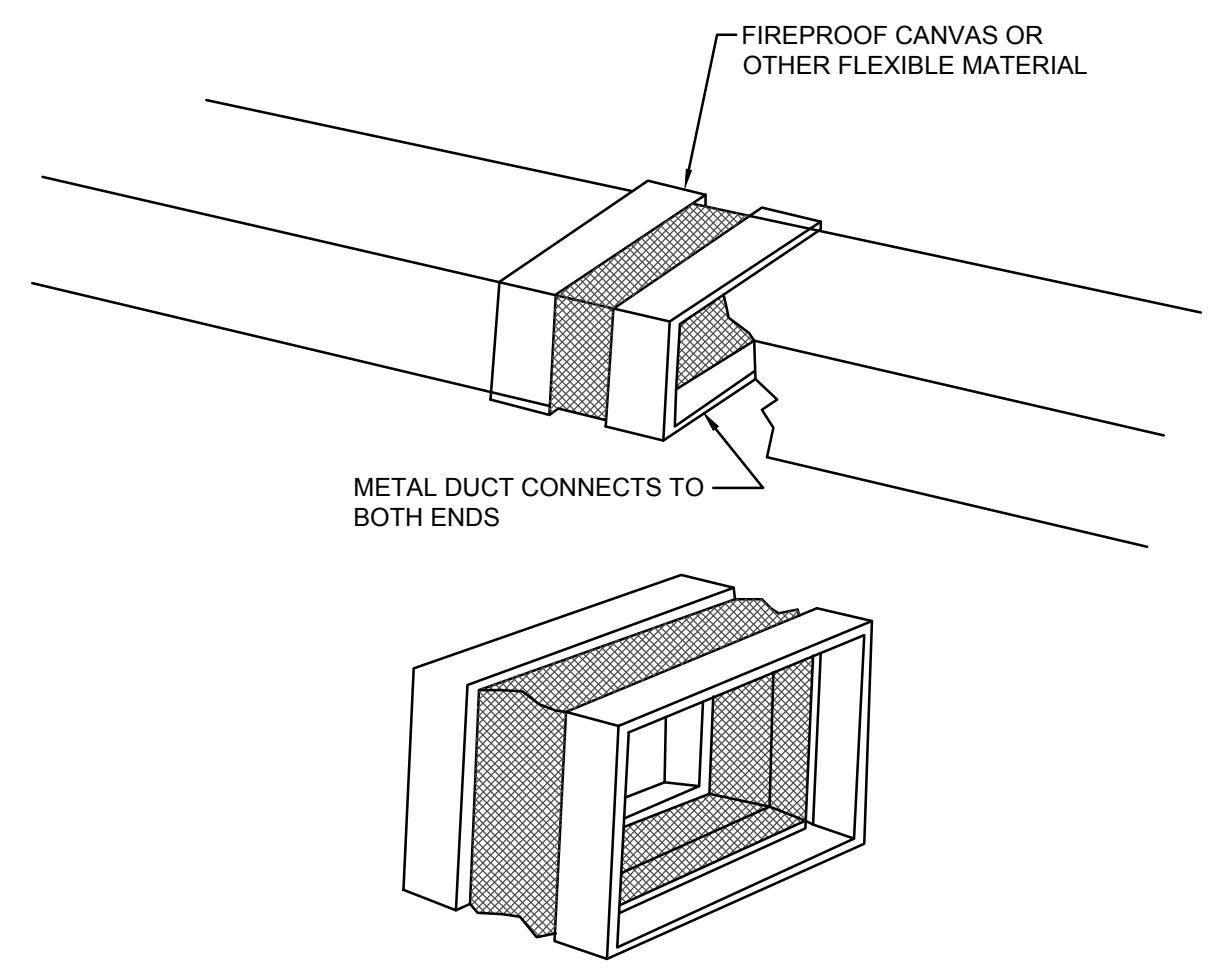
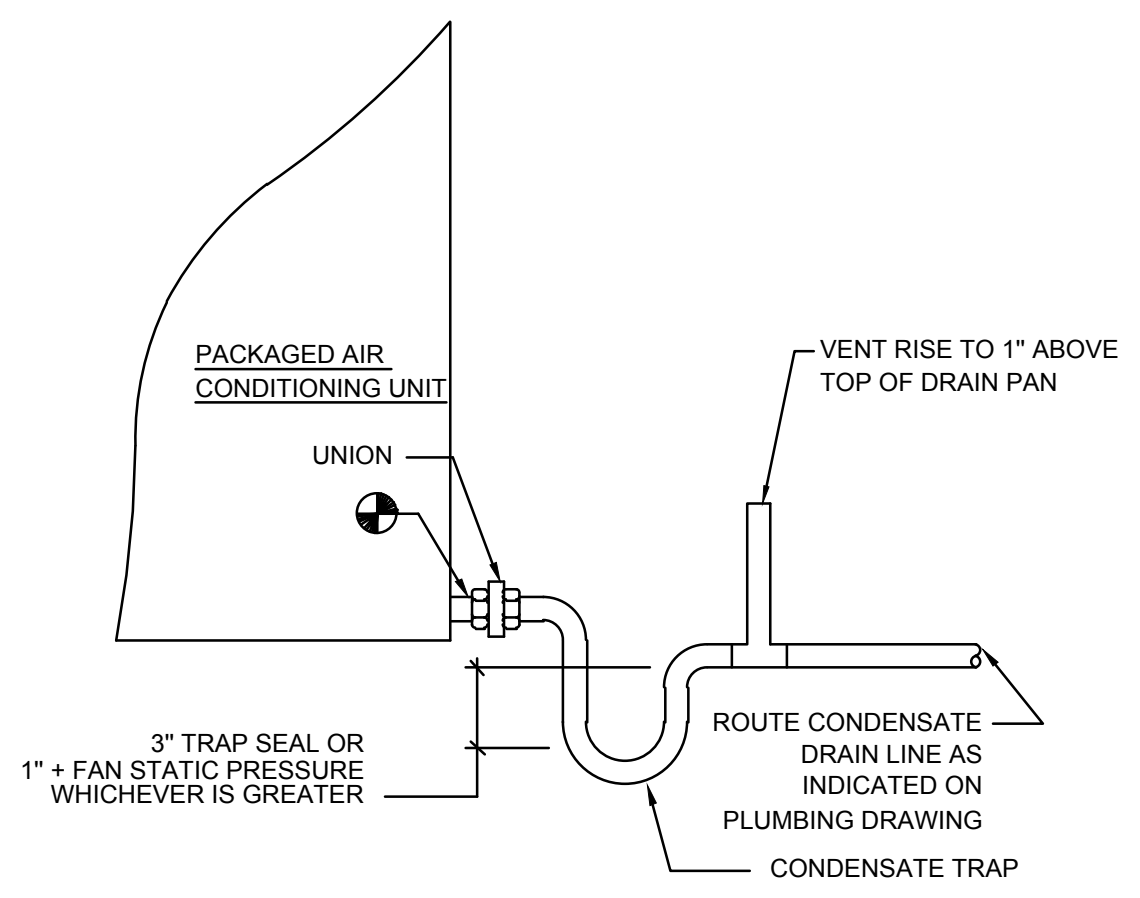
THERMOSTAT CUT SHEETS NO SCALE 3



NEW UNIT MAINTENANCE CLEARANCE NO SCALE 7

DUCT SUPPORT DETAIL NO SCALE 5

THERMOSTAT MOUNTING NO SCALE 2



CONDENSATE DRAIN DETAIL AC/1-AC/9 NO SCALE 6

FLEXIBLE DUCT CONNECTOR NO SCALE 4

ROOF-TOP PACKAGE UNIT MOUNTING DETAIL NO SCALE 1

ISSUE

REV.	DESCRIPTION	DATE
	CITY SUBMITTAL	03/05/2018

SHEET TITLE

MECHANICAL DETAILS

SHEET NUMBER

M4.1