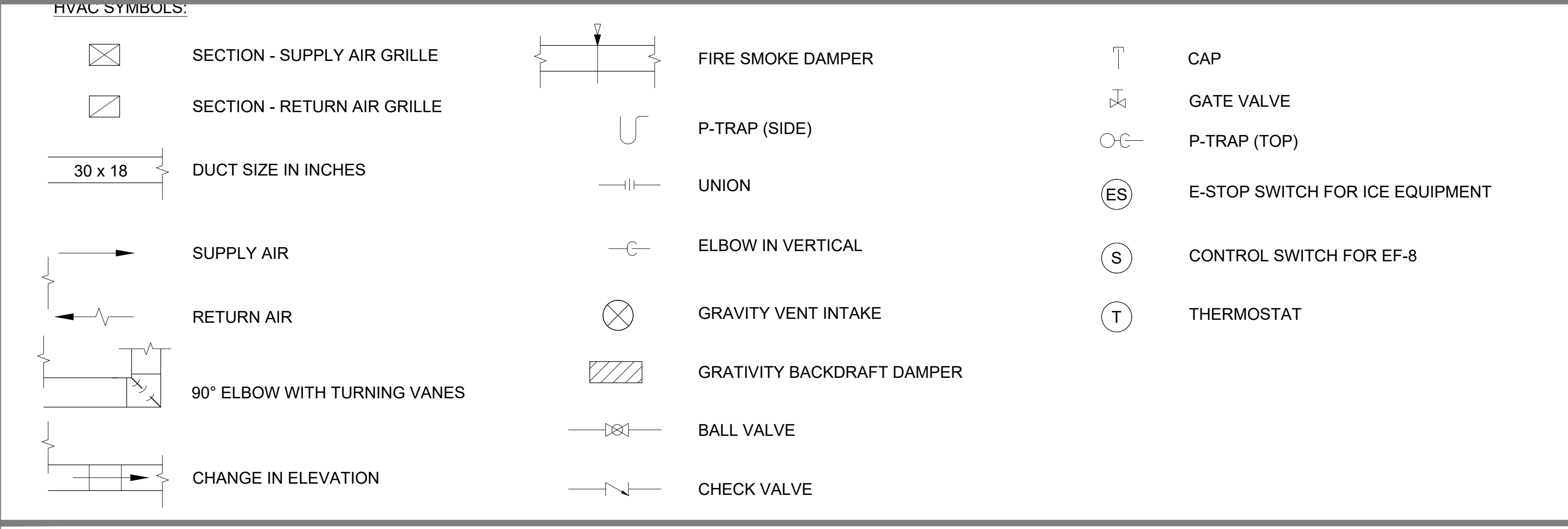


MECHANICAL NOTES:

- 1. CONTRACTOR SHALL FURNISH AND INSTALL COMPLETE AND FULLY OPERATIONAL HVAC SYSTEMS, INCLUDING ALL LABOR AND MATERIALS NECESSARY. ALL EQUIPMENT AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF APPLICABLE CODES AND STANDARDS, AND IN ACCORDANCE WITH CITY OF LOS ANGELES REQUIREMENTS AND 2020 LAMC.
2. PER CA MECHANICAL CODE, CONTRACTOR SHALL PROVIDE SHUTOFF FOR SMOKE CONTROL FOR ALL AIR MOVING SYSTEMS SUPPLYING OVER 2,000 CFM TO BUILDING SPACES. AUTOMATIC SHUTOFF SHALL BE ACCOMPLISHED BY INTERRUPTING THE POWER SOURCE OF THE AIR MOVING EQUIPMENT ON DETECTION OF SMOKE IN RELATED MAIN SUPPLY DUCT. SMOKE DETECTORS SHALL BE SELECTED TO DETECT PRODUCTS OF COMBUSTION, AND FOR COMPATIBILITY WITH AIR TEMPERATURES, VELOCITIES, HUMIDITY, AND PRESSURES. SMOKE DETECTORS SHALL COMPLY WITH CBC, BE UL LABELLED FOR USE IN AIR-DUCTS, INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS, AND WIRED TO ACTIVATE THE FIRE ALARM SYSTEM.
3. MATERIALS OF CONSTRUCTION
a. CONDENSATE DRAIN PIPING SHALL BE 1" DIA GALV. STEEL, AND ROUTED TO NEAREST FLOOR DRAINS. COORDINATE WITH PLUMBING CONTRACTOR.
b. DUCT FABRICATION AND INSTALLATION SHALL CONFORM TO THE "HVAC DUCT CONSTRUCTION STANDARDS" AS PUBLISHED BY S.M.A.C.N.A. 2006 OR UL 181. ALL DUCTWORK (ASTM A525, A526, A527, A528), ACCESSORIES, AND SUPPORT COMPONENTS SHALL COMPLY WITH THE UNIFORM MECHANICAL CODE (CHAPTER 6 DUCT SYSTEMS) AND SHALL BE GALVANIZED STEEL CONSTRUCTED AND SUPPORTED FOR 2 INCHES OF WATER COLUMN, MINIMUM 18 GAUGE. ALL SUPPORT COMPONENTS SHALL BE GALVANIZED STEEL. FLEXIBLE DUCTS, IF ANY, SHALL NOT BE LONGER THAN 5 FT. ALL DUCT JOINTS AND SEAMS SHALL BE SEALED. PAINT ALL EXPOSED PIPING, DUCTWORK AND SUPPORTS WHITE. APPLY PAINT IN ACCORDANCE WITH MFG RECOMMENDATIONS:
- ONE COAT AMERLOCK (2 MIN. 5 MIL DFT)
- ONE COAT AMERSHIELD (170 MIN. 5 MIL DFT)
- PAINT SYSTEM BY AMERON, TNEMEC, OR EQUAL.
c. ALL SA DUCTWORK SHALL BE INSULATED. INSULATION SHALL BE U.L. AND STATE FIRE MARSHAL APPROVED. INSULATION SHALL HAVE A FLAME SPREAD OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NOT MORE THAN 50 WHEN TESTED AS A COMPOSITE INSTALLATION INCLUDING INSULATION FACING MATERIALS, TAPES AND ADHESIVE. INSULATION MATERIALS SHALL MEET THE CALIFORNIA QUALITY STANDARD PER SECTION 118 E.E.S. - LATEST EDITION. ALL PIPING AND DUCTWORK INSULATION SHALL BE CONSISTENT WITH THE REQUIREMENTS OF SECTIONS 118, 123, 124 TITLE 24 ENERGY STANDARDS AND TABLE 6-6A AND 6-6B OF CMC.
d. ANCHORAGE OF PIPING, DUCTWORK AND EQUIPMENT SHALL BE IN ACCORDANCE WITH LATEST EDITIONS OF SMACNA AND CALIFORNIA BUILDING CODE, SECTION 16. ALL DUCTWORK SHALL BE SUPPORTED AT INTERVALS NOT TO EXCEED 8 FEET WITH 1-5/8" UNISTRUT (HOT DIPPED GALVANIZED), HILTI KWIK BOLT II ANCHORS, AND GALVANIZED STEEL BOLTS AND STRAPS.
e. ALL MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL BE BRACED AND ANCHORED TO RESIST A HORIZONTAL FORCE ACTING IN ANY DIRECTION AS DESIGNED/ SIGNED/ SEALED BY CONTRACTOR'S CIVIL OR STRUCTURAL ENGINEER.
4. CONTRACT DRAWINGS INDICATE LOCATION OF DUCTWORK AND EQUIPMENT APPROXIMATELY. EXACT LOCATIONS OF SAME SHALL BE DETERMINED BY THE CONTRACTOR BASED ON COORDINATION WITH OTHER TRADES. CONTRACTOR SHALL IDENTIFY ANY CONFLICTS BETWEEN OTHER TRADES AND REQUIREMENTS SHOWN ON THE DRAWINGS, PRIOR TO SUBMITTAL OF SHOP DRAWINGS. CONTRACTOR SHOP DRAWINGS SHALL INCLUDE RESULTS OF THIS COORDINATION, WITH PROPOSED RESOLUTION OF ANY CONFLICTS IDENTIFIED.
5. COORDINATE DUCT LAYOUT WITH OTHER DISCIPLINES AND SUBMIT DUCT COORDINATION DRAWINGS PRIOR TO INSTALLATION.
6. ENSURE THAT ALL EQUIPMENT WILL FIT IN THE AVAILABLE SPACE. MAKE FIELD MEASUREMENTS TO DETERMINE SPACE REQUIREMENTS, INCLUDING FOR CONNECTIONS, AND PROVIDE ARCHITECT WITH SCALED INSTALLATION AND COORDINATION DRAWINGS. INSTALL EQUIPMENT IN ACCESSIBLE LOCATIONS AND PROVIDE ADEQUATE SERVICE CLEARANCE FOR NORMAL MAINTENANCE WITHOUT REMOVING ARCHITECTURAL, STRUCTURAL OR ELECTRICAL ELEMENTS.
7. PROVIDE ACCESS DOORS IN DUCTWORK FOR EASY ACCESS TO DAMPERS, DUCT-MOUNTED COILS, DUCT SMOKE DETECTORS, AND OTHER DEVICES. ACCESS DOOR SIZES SHALL MATCH DUCT SIZE UP TO 18"x18" MAXIMUM SIZE.
8. ALL ELBOWS IN DUCTWORK SHALL BE 1.5 X RADIUS ELBOWS UNLESS NOTED OTHERWISE. WHERE RECTANGULAR ELBOWS ARE INDICATED, PROVIDE DOUBLE-WIDTH TURNING VANES.
9. PROVIDE SECURITY BARS ON ALL EXHAUST FAN OPENINGS AND GRAVITY VENT OPENINGS THROUGH ROOF THAT ARE LARGER THAN 16"x16". PROVIDE BIRD AND INSECT SCREENS ON ALL LOUVERS AND VENT OPENINGS.
10. PROVIDE CORROSION-RESISTANT SHEET METAL WEATHER HOOD COVER FOR ALL DAMPER ACTUATORS, SMOKE DETECTORS, AND MOTORS LOCATED OUTDOORS.
11. WHERE DUCTWORK CONNECTS TO EXTERIOR LOUVERS, DUCTWORK SHALL BE PRIMED AND PAINTED BLACK TO PREVENT DUCTWORK FROM BEING VISIBLE THROUGH THE LOUVER.
12. PROVIDE ALL ELECTRICAL AND CONTROL CONNECTIONS FOR THE EQUIPMENT PROVIDED. COORDINATE WITH ELECTRICAL SUBCONTRACTOR FOR LOCATION OF JUNCTION BOXES, DISCONNECTS, AND CIRCUIT BREAKERS (PANEL BOARDS).
13. CONDENSATE OVERFLOW DRAINS SHALL BE IN ACCORDANCE WITH ONE OF THE METHODS OUTLINED IN SECTION 301.2 (LAMC 602.1)

HVAC SEQUENCE OF OPERATION:

- 1. SINGLE-ZONE PACKAGE HEAT PUMP (ACU-1)
A. GENERAL: HEAT PUMP SUPPLY FAN SHALL BE STARTED AND STOPPED BASED ON SPACE TEMPERATURE, OCCUPANCY SENSORS, OR SIGNAL FROM FACP. EACH OF THE OPERATING MODES SHALL BE TURNED ON AND OFF (ENABLED OR DISABLED) INDEPENDENTLY AT THE CONTROLLER. THE HEAT PUMP WILL BE 100% OUTSIDE AIR, TO SERVE RESTROOMS AND LOCKER ROOMS. OPERATION OF ROOF-MOUNTED EXHAUST FANS, EACH SERVING SEPARATE SPACES, WILL BE INITIATED WHEN SUPPLY AIR FAN STARTS. SETBACK THERMOSTAT SHALL BE PROVIDED TO REDUCE HEATING, AND ELIMINATE COOLING, WHEN THE FACILITY IS UNOCCUPIED. EACH RESTROOM AND LOCKER ROOM WILL BE EQUIPPED WITH OCCUPANCY SENSOR WIRED TO HEAT PUMP CONTROLLER LOCATED IN MECHANICAL ROOM.
B. OPERATING MODES:
- OCCUPIED MODE: HEAT PUMP SYSTEM WILL RUN CONTINUOUSLY TO MAINTAIN SETPOINT TEMPERATURE AND CONSTANT VENTILATION RATES TO ALL SPACES WHEN ANY OF THE SPACES ARE OCCUPIED. THERMOSTAT WILL BE LOCATED IN CENTRALLY-LOCATED ROOM REPRESENTATIVE OF OTHER SPACES.
- UNOCCUPIED MODE: HEAT PUMP SYSTEM WILL RUN AS-NEEDED TO MAINTAIN SPACE TEMPERATURE WITHIN SETPOINT.
- TIME-CLOCK MODE: SET-BACK THERMOSTAT WITH TIME CLOCK WILL BE PROGRAMMABLE TO OVERRIDE UNOCCUPIED MODE, ALLOWING FOR SCHEDULE PROGRAMMING OF HVAC CONTROL.
C. COOLING MODE:
- WHEN SPACE TEMPERATURE RISES ABOVE SETPOINT, HEAT PUMP WILL OPERATE IN COOLING MODE TO CONTROL SPACE SETPOINT TEMPERATURE.
- COOLING CAPACITY SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE DOWN TO AN ADJUSTABLE MINIMUM BELOW SPACE SETPOINT.
- THE SEQUENCE SHALL UNWIND IN REVERSE.
D. HEATING MODE:
- WHEN SPACE TEMPERATURE FALLS BELOW SETPOINT, HEAT PUMP WILL OPERATE IN HEATING MODE TO CONTROL SPACE SETPOINT TEMPERATURE.
- HEATING CAPACITY SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE UP TO A MAXIMUM OF 85 DEG. F OR 20 DEG. F ABOVE SPACE SETPOINT.
- THE SEQUENCE SHALL UNWIND IN REVERSE.
E. VENTILATION-ONLY MODE:
- WHEN SPACE TEMPERATURE IS WITHIN SETPOINT, SUPPLY AIR FAN SHALL BE STARTED AND STOPPED BASED ON OCCUPANCY SENSORS IN EACH OF THE OCCUPIED SPACES (VENTILATION ONLY).
- VENTILATION ONLY MODE SHALL BE INDEPENDENT FROM HEATING AND COOLING MODES, AND WHEN ENABLED, HEATING AND COOLING MODES SHALL OVERRIDE VENTILATION ONLY MODE.
F. DUCT-MOUNTED SMOKE DETECTORS. SYSTEM OPERATION WILL SHUT DOWN AND ALARM TO FACP ON DETECTION OF SMOKE IN EXHAUST FAN DUCTS.
2. ICE ROOM VENTILATION.
A. NORMAL OPERATION: ROOF-MOUNTED ICE ROOM EXHAUST FAN (EF-2) WILL OPERATE CONTINUOUSLY, AT LOW SPEED WITH FRESH AIR ADMITTED TO ICE ROOM THROUGH LOUVERED DOORS.
B. REFRIGERANT LEAK OPERATION: ICE ROOM WILL BE EQUIPPED WITH REFRIGERANT LEAK DETECTION INSTRUMENT (FF&E SCOPE), AND ON DETECTION OF LEAK, EF-8 WILL SWITCH ON TO EVACUATE AIR FROM ICE ROOM AND EF-2 WILL BE STOPPED. REFRIGERANT LEAK ALARM SIGNAL WILL BE WIRED TO FACP, AND WILL INITIATE AUDIBLE AND VISUAL ALARMS INSIDE ICE ROOM.
C. EF-8 SHALL ALSO BE EQUIPPED WITH CONTROL SWITCH LOCATED OUTSIDE ICE ROOM FOR MANUAL START/STOP OF FAN. MANUAL SWITCH WILL OVERRIDE AUTOMATIC FAN OPERATION.
3. ELECTRICAL ROOM VENTILATION FAN (EF-3). ROOF-MOUNTED EXHAUST FAN WILL OPERATE BASED ON ROOM OCCUPANCY SENSORS. HVAC CONTROLS WILL BE PROVIDED TO ALLOW OVERRIDE OF OCCUPANCY SENSORS AND CONTINUOUS/MANUAL FAN OPERATION.
4. ICE RINK VENTILATION AND DEHUMIDIFICATION SYSTEM (FF&E SCOPE).
A. GENERAL: ICE RINK VENTILATION AND DEHUMIDIFICATION (DHU) SYSTEM SHALL PROVIDE REQUIRED FRESH AIR AND VENTILATION TO ICE RINK AREA, WHILE MAINTAINING RELATIVE HUMIDITY (DEW POINT TEMPERATURE) AND ADJUSTING OUTSIDE AIR FOR INDOOR AIR QUALITY. DHU SHALL BE CLIMATE BY DESIGN MODEL DH-142-5.8-ESOTSLOMCM, OR EQUAL. DHU SYSTEM SHALL INCLUDE:
- DEHUMIFIER WITH CONTROLLABLE OUTSIDE AIR (OA) DAMPER, AND 100 LB/HR MOISTURE REMOVAL CAPACITY.
- SUPPLY AIR FAN (SAF), 5,800 CFM CAPACITY WITH ADJUSTABLE SPEED DRIVE.
- HEATING COIL FOR DESSICANT REGENERATION, 48,000 BTU/HR CAPACITY.
- DHU PROGRAMMABLE CONTROLLER, WITH NEMA 4X ENCLOSURE, LOCATED IN MECHANICAL ROOM.
- ICE AREA EXTERIOR WALLS (NORTH AND SOUTH) SHALL EACH BE EQUIPPED WITH ONE WEIGHTED RELIEF DAMPER TO MAINTAIN ICE AREA POSITIVE STATIC PRESSURE BELOW 0.04".
- SYSTEM BALANCING AND TESTING SHALL ADJUST DHU CONTROLS AND OPERATION TO MAINTAIN ICE AREA STATIC PRESSURE WITHIN RANGE OF 0.01" AND 0.04" WITHOUT RELIEF DAMPERS OPENING UNDER NORMAL RANGE OF OPERATING CONDITIONS. RELIEF DAMPERS SHALL ONLY OPEN DURING EVENT MODE OR UPSET CONDITIONS.
- SUPPLY AND RETURN AIR DUCTWORK SHALL BE EQUIPPED WITH DUCT-MOUNTED SMOKE DETECTORS WIRED TO FACP, WHICH WILL SHUT DOWN THE DHU SYSTEM AND ALARM ON DETECTION OF SMOKE. DHU WILL ALSO ACCEPT ALARM SHUTDOWN SIGNAL FROM FACP IN THE EVENT OF FIRE DETECTION OR SPRINKLER SYSTEM ALARM.
- ICE AREA WILL BE EQUIPPED WITH DP SENSOR WIRED TO DHU CONTROL SYSTEM TO MAINTAIN ICE AREA RELATIVE HUMIDITY (RH) WITHIN ADJUSTABLE SETPOINTS (E.G. 55% - 65% RH).
- ICE AREA WILL BE EQUIPPED WITH CO, CO2 AND N GAS DETECTION DEVICES WIRED TO VENTILATION CONTROL SYSTEM TO BOOST OUTSIDE AIR VENTILATION RATE ON DETECTION OF ALARM CONCENTRATIONS ABOVE SETPOINTS. GAS DETECTION ALARMS WILL BE WIRED FOR ALARM TO FACP.
B. UNOCCUPIED MODE: WHEN ICE AREA AMBIENT CONDITIONS (DP AND CO2) ARE WITHIN SETPOINTS, AND SPACE IS UNOCCUPIED, DHU WILL EITHER BE OFF OR OPERATED WITHOUT OUTSIDE AIR, TO MAINTAIN A MINIMUM RECIRCULATING AIR VENTILATION RATE. DHU WILL OPERATE AS NEEDED TO MAINTAIN DP SETPOINT.
C. OCCUPIED MODE: WHEN ICE AREA AMBIENT CONDITIONS ARE WITHIN SETPOINTS AND ICE AREA IS OCCUPIED, DHU WILL OPERATE WITH ADJUSTABLE OUTSIDE AIR FOR VENTILATION AND DEHUMIDIFICATION. OA DAMPER WILL OPEN TO ALLOW AN ADJUSTABLE MINIMUM FRESH AIR (E.G. 0%-20% OUTSIDE AIR) TO BE MIXED WITH RA.
D. AIR QUALITY (AQ) EVENT MODE. ON DETECTION OF AQ ALARM CONDITIONS, DHU WILL BE OPERATED WITH 100% OUTSIDE AIR, AND RELIEF DAMPERS WILL OPEN TO EVACUATE AIR FROM THE ICE AREA.



ABBREVIATIONS:

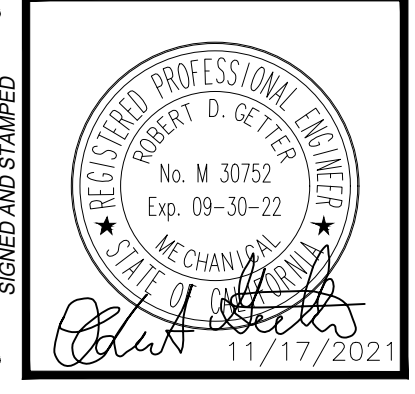
Table with 2 columns: Abbreviation and Full Name. Includes AABC, AFF, ACU, ASTM, BTU, CDU, CFC, CFM, CMC, COP, DFT, DHU, DP, EAR, E.E.R., E.E.S., EF, FF&E, HVAC, LAMC, MERV, MFG, NEBB, OEL, RA, RH, SA, SAR, S.M.A.C.N.A., SS, U.L, WT, ASSOCIATED AIR BALANCE COUNCIL, ABOVE FINISHED FLOOR, AIR CONDITIONING UNIT, AMERICAN SOCIETY FOR TESTING MATERIALS, BRITISH THERMAL UNIT, CONDENSING UNIT, CHLOROFLUOROCARBON, CUBIC FEET PER MINUTE, CALIFORNIA MECHANICAL CODE, COEFFICIENT OF PERFORMANCE, DRY FILM THICKNESS, DEHUMIDIFICATION UNIT, DEW POINT, EXHAUST AIR REGISTER, ENERGY EFFICIENCY RATIO, ENERGY EFFICIENCY STANDARDS, EXHAUST FAN, FACILITY FURNISHINGS AND EQUIPMENT, HEATING, VENTILATION, AND AIR CONDITIONING CITY OF LA MECHANICAL CODE, MINIMUM EFFICIENCY REPORTING VALUE, MANUFACTURER, NATIONAL ENVIRONMENTAL BALANCING BUREAU, OCCUPATIONAL EXPOSURE LIMIT, RETURN AIR, RELATIVE HUMIDITY, SUPPLY AIR, SUPPLY AIR REGISTER, SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION, STAINLESS STEEL, UNDERWRITERS LABORATORIES, WEIGHT.

PROVIDE DHU AND AC UNITS WITH:

- A. HINGED ACCESS PANELS W/ MERV 13 FILTERS FOR OUTSIDE AND RETURN AIR.
B. EPOXY-COATED CONDENSER COILS.
C. UNIT-MOUNTED DISCONNECT.
D. CONVENIENCE OUTLET.
E. MICROPROCESSOR CONTROL WITH ALARMS FOR CLOGGED FILTER, FAN FAILURE, HIGH TEMPERATURE, AND DRAIN PAN OVERFLOW. TOUCHSCREEN PROGRAMMABLE THERMOSTAT.
F. STAINLESS STEEL CONDENSATE DRAIN PAN WITH PRIMARY AND SECONDARY DRAINS AND LEVEL ALARMS.
G. MAX 65 dBA AT 3 FT.
H. PROVIDE DUCT-MOUNTED SMOKE DETECTORS IN BOTH SUPPLY AND RETURN DUCTS OF DHU. PROVIDE CONTROL WIRING TO SHUT DOWN DHU AND AC UNITS ON DETECTION OF SMOKE.
I. OUTSIDE AIR AND EXHAUST DAMPER CONTROL.

Table titled 'NEW PACKAGE HEAT PUMP EQUIPMENT SCHEDULE'. Columns: EQUIPMENT TAG #, LOCATION, AREAS SERVED, MANUFACTURER & MODEL NO., V/PH/HZ, COOLING CAPACITY (BTU/H), HEATING CAPACITY (BTU/H), CFM, EFFICIENCY RATINGS, WEIGHT (LB), REMARKS. Row 1: ACU-1, ROOF MOUNTED, RESTROOMS, LOCKER ROOMS, DAIKIN DPS005A OR EQUAL (SEE NOTE 2), 208/3/60, 82,000, 49,000, 1800, 12.3 EER, 1309 LB, 100% OUTSIDE AIR MICROTECH III CONTROLS.

NOTES: 1. ACU CONDENSATE DRAIN SHALL BE PROVIDED WITH LEVEL DETECTION DEVICE THAT WILL SHUT DOWN THE ACU AND ALARM IF PRIMARY DRAIN IS BLOCKED. 2. LOCAL REP FOR DAIKIN UNIT IS NSWC (CONTACT ERIC YANG 714-321-6612). 3. PROVIDE ACU-1 WITH MERV 13 FILTERS AS REQUIRED.

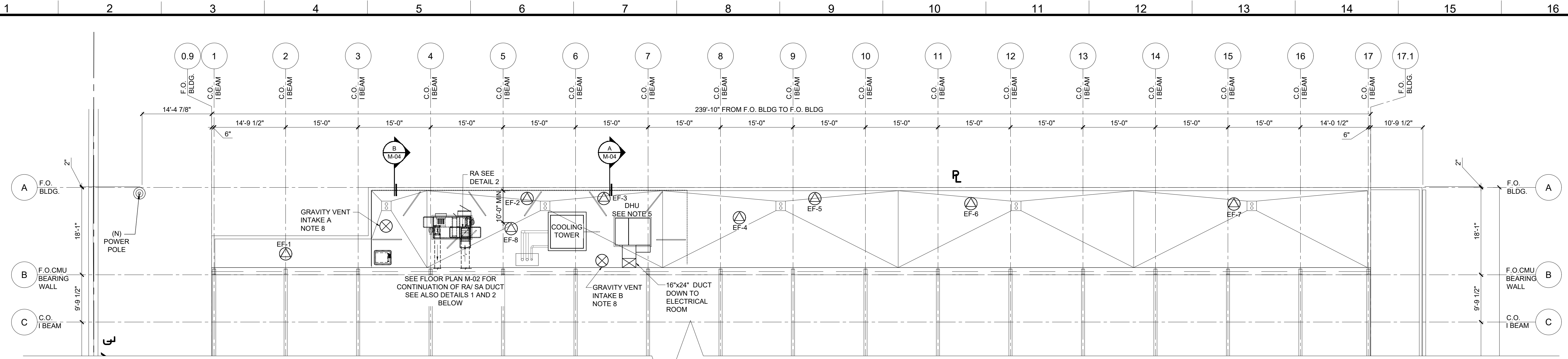


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MECHANICAL NOTES & LEGEND
RESEDA SKATE FACILITY
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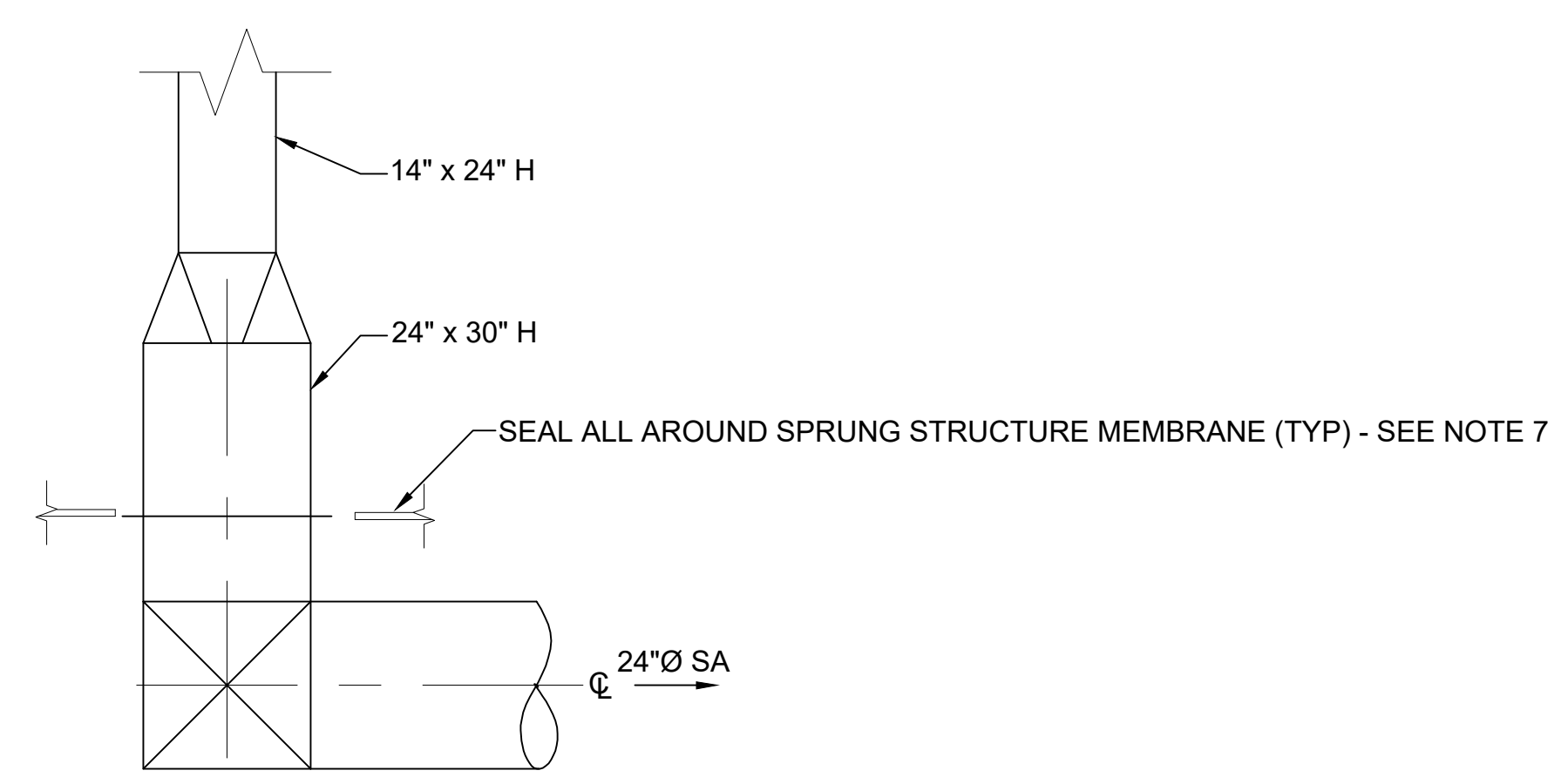
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APPROVED BY: XX

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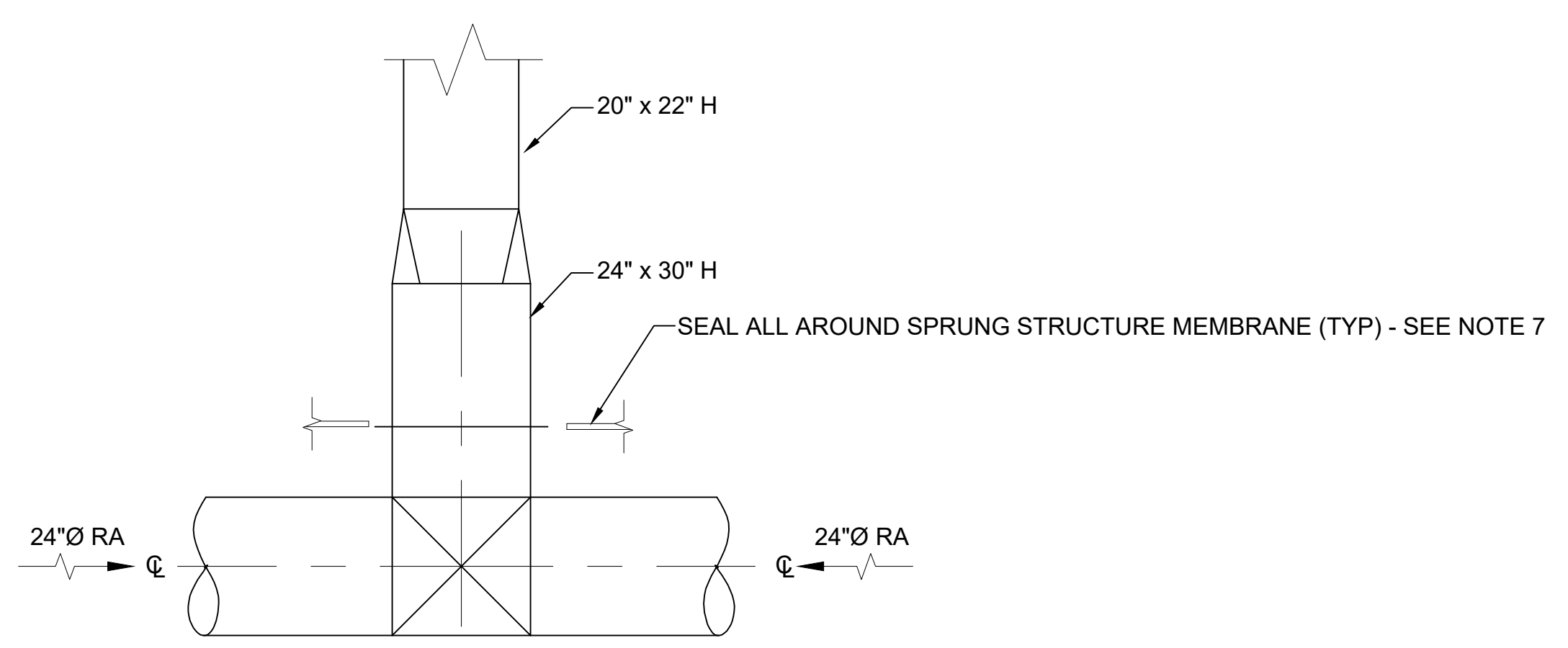
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HVAC ROOF PLAN
SCALE: 3/32" = 1'-0"



DETAIL 1:
SUPPLY AIR DUCT
SCALE: 1/2" = 1'-0"



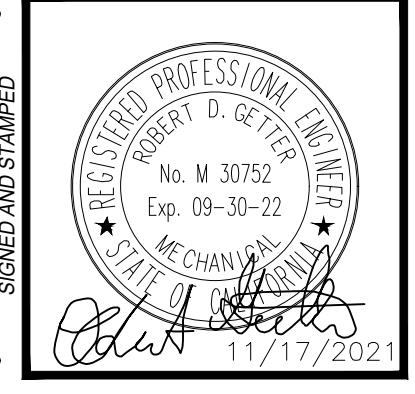
DETAIL 2:
RETURN AIR DUCT
SCALE: 1/2" = 1'-0"

FAN SCHEDULE									
FAN #	TYPE	CFM	SP	HP	VOLTAGE	PHASE	MODEL	WEIGHT	AREA SERVED
EF-1	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.30 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-097-VG	100 LB	PUBLIC RESTROOMS
EF-2	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.30 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-095-VG	100 LB	ICE ROOM
EF-3	DIRECT DRIVE CENTRIFUGAL ROOF	215	0.30 IN. WG	1/10	115V	1Ø	GREENHECK MODEL G-080-VG	100 LB	ELECTRICAL ROOM
EF-4	DIRECT DRIVE CENTRIFUGAL ROOF	101	0.26 IN. WG	1/15	115V	1Ø	GREENHECK MODEL G-060-VG	100 LB	REFEREE ROOM
EF-5	DIRECT DRIVE CENTRIFUGAL ROOF	115	0.26 IN. WG	1/15	115V	1Ø	GREENHECK MODEL G-060-VG	100 LB	GIRL'S ROOM
EF-6	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.3 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-095-VG	100 LB	LOCKER ROOM A/B
EF-7	DIRECT DRIVE CENTRIFUGAL ROOF	500	0.3 IN. WG	1/6	115V	1Ø	GREENHECK MODEL G-095-VG	100 LB	LOCKER ROOM C/D
EF-8	DIRECT DRIVE CENTRIFUGAL ROOF	3,500	0.3 IN. WG	2	208V	3Ø	GREENHECK MODEL G-200-VG	200 LB	ICE ROOM - PURGE AIR FOR REFRIGERANT GAS DETECTION

- NOTES:
- FANS SHALL BE GREENHECK MODEL LISTED ABOVE, OR EQUAL. GREENHECK REP: NSWC (CONTACT: ERIC YANG 714-321-6612).
 - PROVIDE FANS WITH MOTORS, BACKDRAFT DAMPERS, AND GPI FAN CURBS.
 - ADJUST FAN MOTOR SPEED IN FIELD TO MATCH DESIRED CFM.
 - SEE STRUCTURAL DRAWINGS FOR CEILING AND ROOF MEMBRANES.
 - DHU UNIT WILL BE PROVIDED AS FF&E SCOPE. DHU SHALL BE MODEL DH-142 OR EQUAL:
 - 5800 CFM @2" WC
 - 4 x 32 KW HEATERS
 - MAX REACTIV. MBH = 436.7
 - FOR EQUIPMENT WEIGHTS, SEE M-09
 - GRAVITY INTAKE VENTS SHALL BE GREENHECK MODEL GRISI, OR EQUAL. PROVIDE WITH ROOF CURB AND BIRD SCREEN.
 - PROVIDE INSULATED, FRAMED OPENING ASSEMBLIES FOR DHU DUCT PENETRATIONS THROUGH BUILDING ENVELOPE INSULATED MEMBRANE. OPENING ASSEMBLIES SHALL BE COORDINATED WITH MEMBRANE STRUCTURE SUPPLIER. PROVIDE FLASHING, SEAL AND INSULATION BETWEEN FRAMED OPENINGS AND DUCTS/DAMPERS.
 - GRAVITY VENT INTAKES:
 - A: 3500 cfm @ 0.20" WG MAX PRESSURE DROP. GREEHECK GRISI-24 OR EQUAL
 - B: 250 cfm @ 0.10" WG MAX PRESSURE DROP. GREEHECK GRISI-8 OR EQUAL
 - INSTALL BACKDRAFT DAMPERS IN MAKEUP AIR INTAKES
 - EXHAUST VENTILATION SHALL TERMINATE OUTSIDE ACCORDING TO THE FOLLOWING REQUIREMENTS: FOR REFRIGERANTS HAVING FLAMMABILITY CLASSIFICATION OF 1 (A1, B1) NOT LESS THAN 10 FEET FROM PROPERTY LINE, 3 FEET FROM EXTERIOR WALLS OR ROOFS, 10 FEET FROM OPENINGS INTO THE BUILDING, AND 10 FEET ABOVE ADJOINING GRADE (LAMC 502.2.2; 1106.2.3; 1106.2.4; 1106.2.5)

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HORIZONTAL CONTROL: _____

SHEET TITLE: HVAC ROOF LAYOUT PLAN AND DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

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NO.	REVISIONS

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INDEX NO. _____

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP
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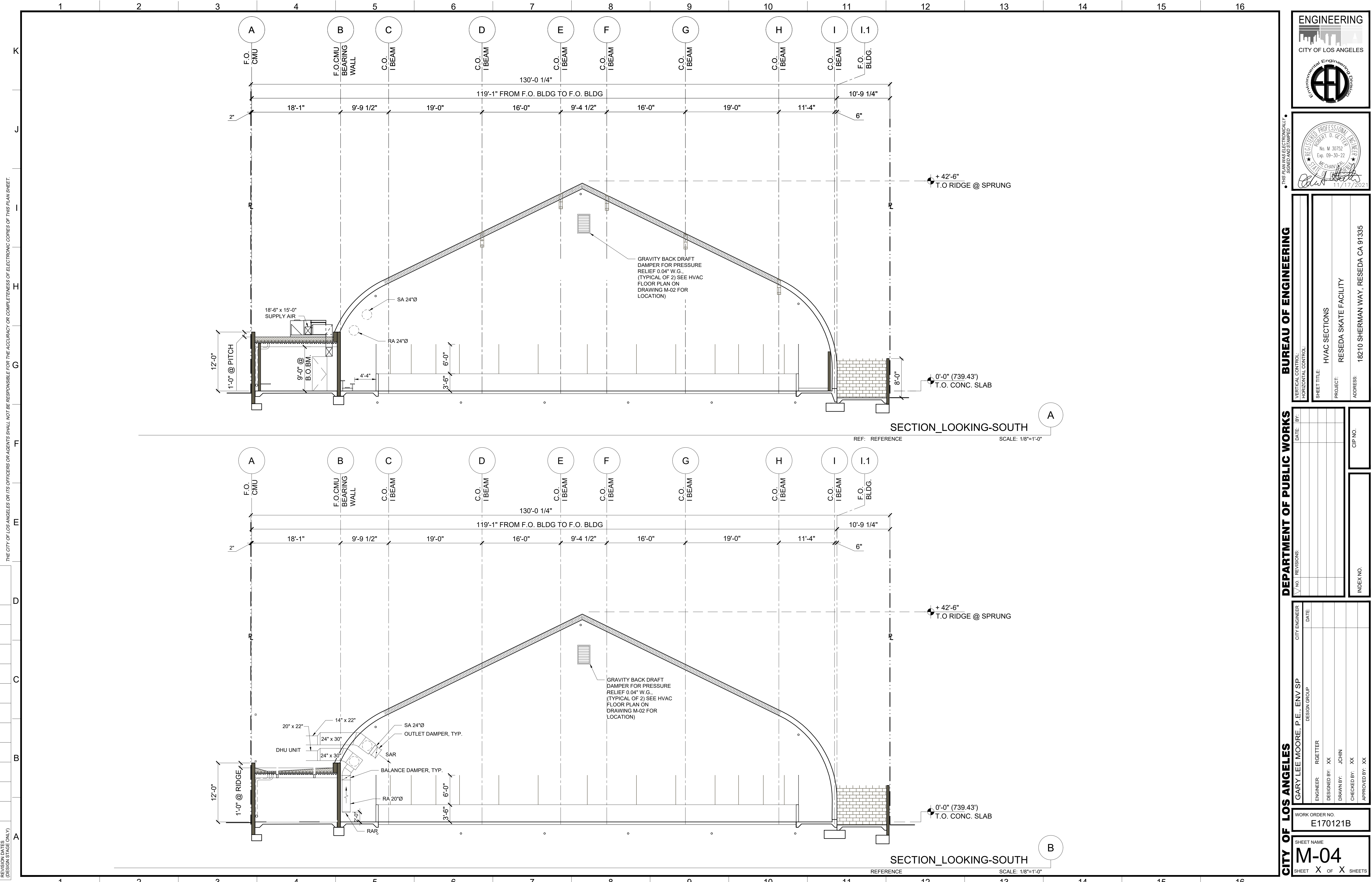
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ROBERT D. GETTLER
No. M 30753
Exp. 09-30-22
STATE OF CALIFORNIA
11/17/2021

BUREAU OF ENGINEERING

VERTICAL CONTROL: _____
HORIZONTAL CONTROL: _____

SHEET TITLE: HVAC SECTIONS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS

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INDEX NO. _____

CITY OF LOS ANGELES

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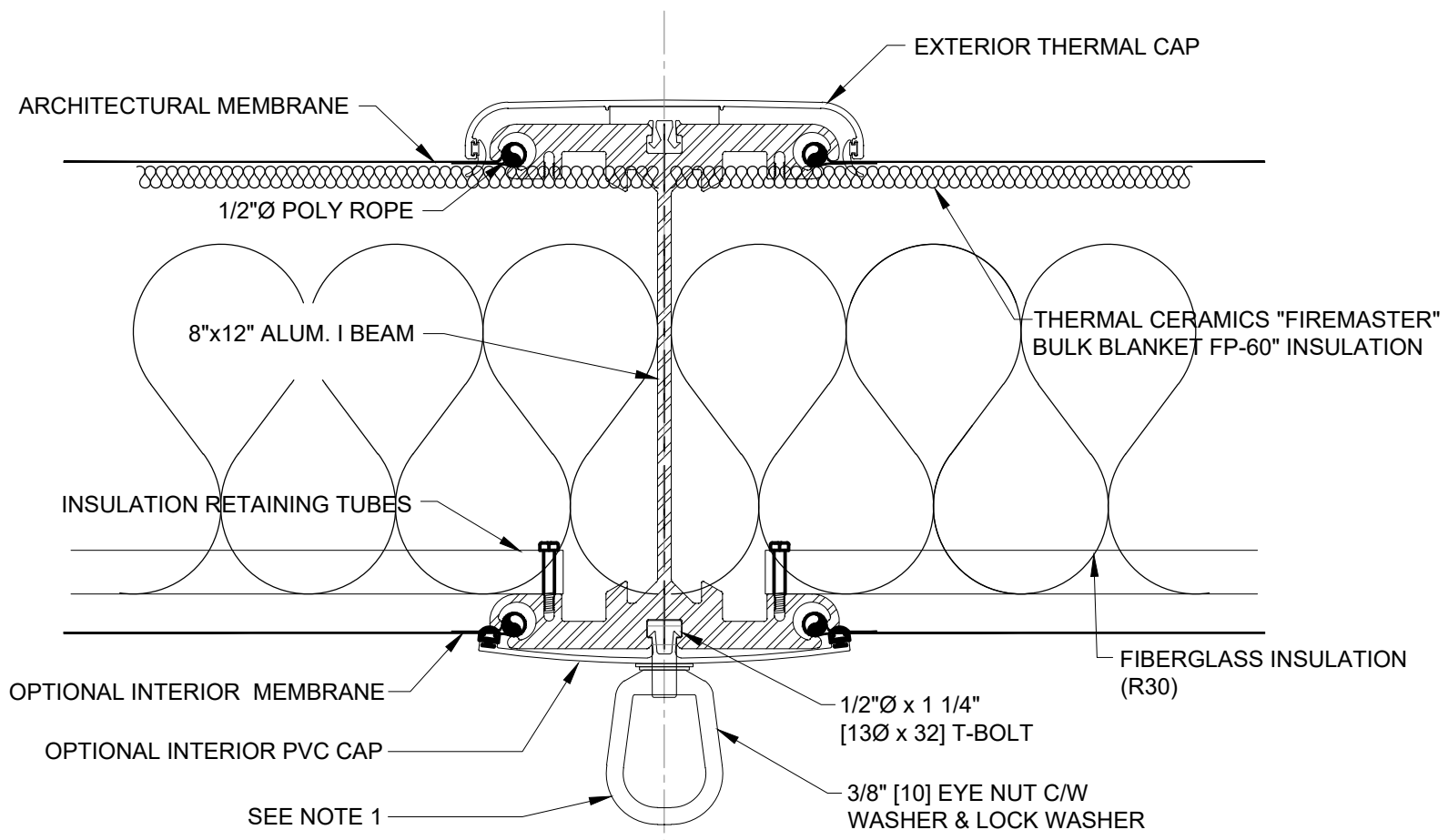
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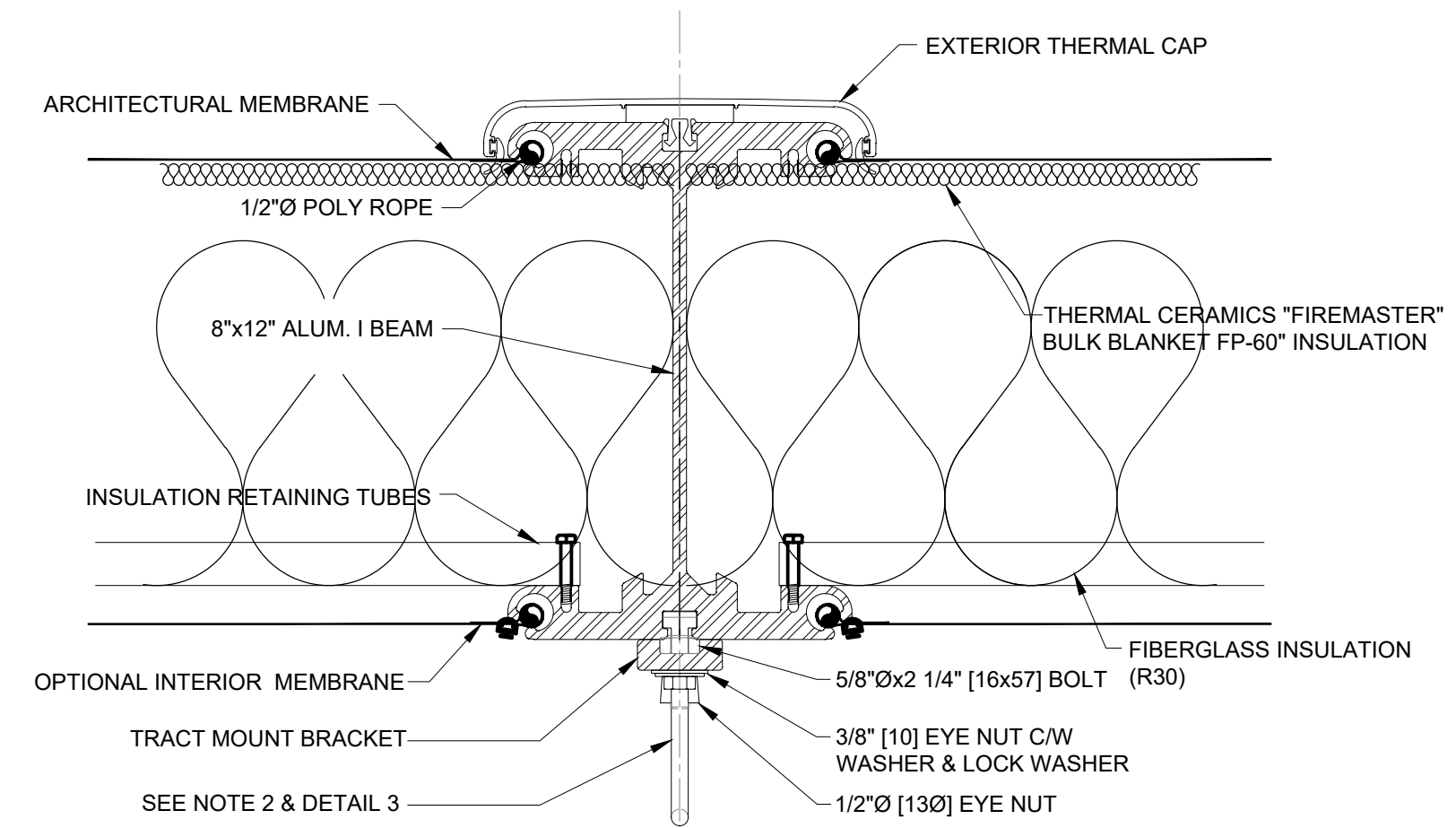
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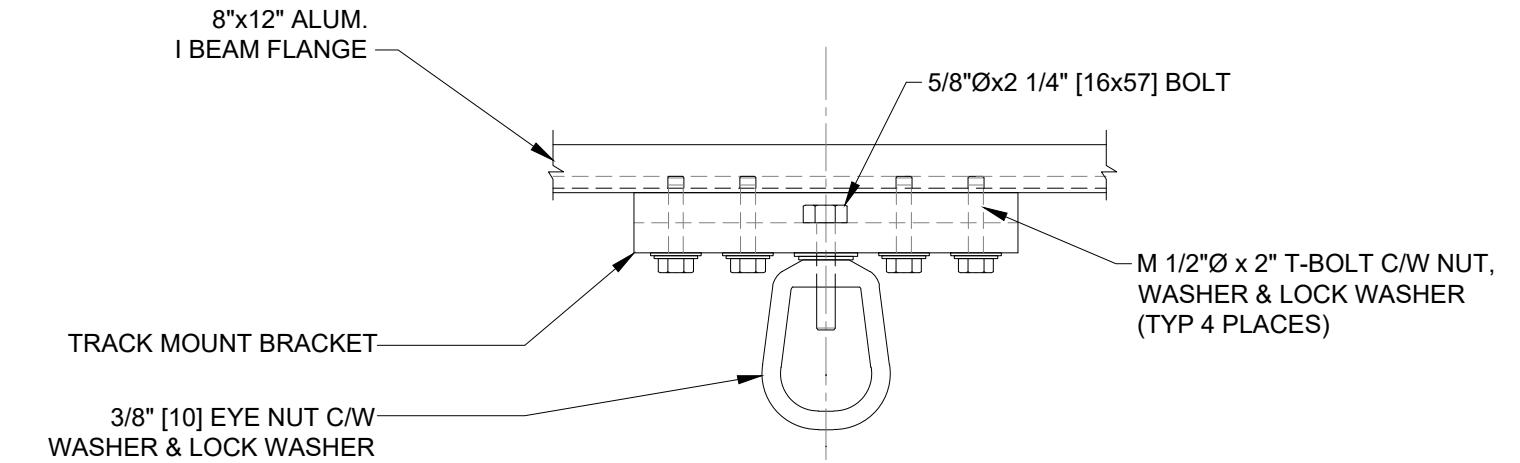
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BEAM HANGER - BOLT CHASE
M-04 SCALE: 3"=1'



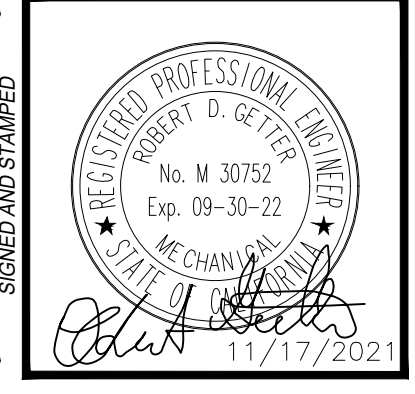
BEAM HANGING BRACKET
M-04 SCALE: 3"=1'



TRACK MOUNT BRACKET
SCALE: 3"=1'

1. FASTENER CAPACITY 75 POUNDS. QUANTITY AND LOCATION PROPOSED BY CONTRACTOR TO SUPPORT MOUNTING OF DEVICES, AND SUBMITTED TO CITY TO BE VERIFIED BY ENGINEER.
2. FASTENER CAPACITY 300 POUNDS. QUANTITY AND LOCATION PROPOSED BY CONTRACTOR TO SUPPORT MOUNTING OF DEVICES, AND SUBMITTED TO CITY TO BE VERIFIED BY ENGINEER.
3. CONTRACTOR SHALL USE APPROVED RODS HANGERS AND DUCT CLAMPS.

THIS SHEET FOR REFERENCE ONLY



BUREAU OF ENGINEERING

DEPARTMENT OF PUBLIC WORKS

CITY OF LOS ANGELES

VERTICAL CONTROL: _____

HORIZONTAL CONTROL: _____

SHEET TITLE: HANGERS DETAILS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DATE: _____

BY: _____

REVISIONS:

NO.	REVISIONS	DATE	BY

CIP NO. _____

INDEX NO. _____

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP

DESIGNER: RGETTER

DESIGNED BY: XX

DRAWN BY: JCHN

CHECKED BY: RHUBATCH

APPROVED BY: XX

DATE: _____

WORK ORDER NO. E170121B

SHEET NAME: M-05

SHEET X OF X SHEETS

REVISION DATE (DESIGN STAGE ONLY)
K
J
I
H
G
F
E
D
C
B
A
THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
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STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E (Created 09/2020)		CALIFORNIA ENERGY COMMISSION NRCC-MCH-E							
CERTIFICATE OF COMPLIANCE This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.		Report Page: Page 1 of 11	Date Prepared: 2021-04-07						
Project Name: Reseda Skate Facility Project Address: 18210 Sherman Way									
A. GENERAL INFORMATION									
01	Project Location (city)	Reseda	04 Total Conditioned Floor Area	2,350					
02	Climate Zone	3	05 Total Unconditioned Floor Area	25,650					
Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)		1				
<input checked="" type="checkbox"/> Office (B)		<input type="checkbox"/> Retail (M)		<input type="checkbox"/> Non-refrigerated Warehouse (S)					
<input type="checkbox"/> Hotel/Motel Guest Rooms (R-1)		<input type="checkbox"/> School (E)		<input type="checkbox"/> Healthcare Facility (I)					
<input type="checkbox"/> High-Rise Residential (R-2/R-3)		<input type="checkbox"/> Relocatable Class Bldg (E)		<input checked="" type="checkbox"/> Other (Write In):					
<small>*FOOTNOTES: Climate zone can be determined on the California Energy Commission's website at http://www.energy.ca.gov/maps/renewable/building_climate_zones.html</small>									
B. PROJECT SCOPE									
Table Instructions: Include any mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.									
My project consists of (check all that apply)									
01 Air System(s)		02 Wet System Components		03 Dry System Components					
<input checked="" type="checkbox"/> Heating Air System		<input type="checkbox"/> Water Economizer		<input type="checkbox"/> Air Economizer					
<input checked="" type="checkbox"/> Cooling Air System		<input type="checkbox"/> Pumps		<input type="checkbox"/> Electric Resistance Heat					
<input type="checkbox"/> Mechanical Controls		<input type="checkbox"/> Hydronic System Piping		<input checked="" type="checkbox"/> Fan Systems					
<input type="checkbox"/> Mechanical Controls (existing to remain, altered or new)		<input type="checkbox"/> Cooling Towers		<input checked="" type="checkbox"/> Ductwork (existing to remain, altered or new)					
<input type="checkbox"/> Boilers		<input type="checkbox"/> Chillers		<input checked="" type="checkbox"/> Ventilation					
<input type="checkbox"/> Zonal Systems/ Terminal Boxes		<input type="checkbox"/> Zone Systems/ Terminal Boxes							
C. COMPLIANCE RESULTS									
Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D, for guidance.									
01	System Summary §110.1, §110.2, §140.4 (See Table F)	02 AND Pumps §140.4(k) (See Table G)	03 AND Fans/Economizers §140.4(c), §140.4(e) (See Table H)	04 AND System Controls §110.2, §120.2, §140.4(f) (See Table I)	05 AND Ventilation §120.1 (See Table J)	06 AND Terminal Box Controls §140.4(d) (See Table K)	07 AND Distribution §120.3, §140.4(i) (See Table L)	08 AND Cooling Towers §120.2(e)2 (See Table M)	09 Compliance Results
Yes	AND	AND	No	AND	Yes	AND	No	AND	DOES NOT COMPLY
Mandatory Measures Compliance (See Table Q for Details)				AND	Yes	AND	Yes	AND	DOES NOT COMPLY
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/				September 2020					

STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E (Created 09/2020)		CALIFORNIA ENERGY COMMISSION NRCC-MCH-E							
CERTIFICATE OF COMPLIANCE Project Name: Reseda Skate Facility Project Address: 18210 Sherman Way		Report Page: Page 4 of 11	Date Prepared: 2021-04-07						
I. SYSTEM CONTROLS									
Table Instructions: Complete the following Table to demonstrate compliance with mandatory controls in §110.2 and §120.2 and prescriptive controls in §140.4(f) and (n) or requirements in §141.0(b)2E for altered space conditioning systems.									
01	System Name	02 System Zoning	03 Conditioned Floor Area Being Served (ft²)	04 Thermostats §110.2(b) & (c)1, §120.2(a) or §141.0(b)2E	05 Shut-Off Controls §120.2(e)	06 Isolation Zone Controls §120.2(g)	07 Demand Response §110.12 and §120.2(b)	08 Supply Temp. Reset §140.4(f)	09 Window Interlocks per §140.4(n)
ACU-1	single zone	≤ 25,000 ft²	Setback Thermostat	Occ. Sensor	NA: Continuous Heat/Cool	NA: PTAC, PTHP, Rm AC, HP	NA: Single Zone	NA: No operable windows	
<small>*FOOTNOTES: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves are not required to have setback thermostats. **NOTES: Controls with a * require a note in the space below explaining how compliance is achieved. EX: System 1: SA Temp Reset: Exempt because zones compliant with §140.4(d); EXCEPTION 1 to §140.4(f)</small>									
J. VENTILATION AND INDOOR AIR QUALITY									
Table Instructions: Complete the following Table to demonstrate compliance with mandatory ventilation requirements in §120.1 and §120.2(e)3B for all nonresidential, high-rise residential and hotel/motel occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflow may be shown on the plans or the calculations can be presented in a spreadsheet.									
01	<input type="checkbox"/> Check the box if the project is showing ventilation calculations on the plans, or attaching the calculations instead of completing this table.								
02	<input type="checkbox"/> Check the box if the project includes Nonresidential or Hotel/Motel spaces								
	<input type="checkbox"/> Check this box if the project includes new or altered high-rise residential dwelling units								
03	<input type="checkbox"/> Check the box if the project is using natural ventilation in any spaces to meet required ventilation rates per §120.1(c)2.								
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/									
September 2020									

STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E (Created 09/2020)		CALIFORNIA ENERGY COMMISSION NRCC-MCH-E														
CERTIFICATE OF COMPLIANCE Project Name: Reseda Skate Facility Project Address: 18210 Sherman Way		Report Page: Page 2 of 11	Date Prepared: 2021-04-07													
D. EXCEPTIONAL CONDITIONS																
This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.																
Table H indicates a Fan Power System Index that exceeds the maximum allowed per §140.4(c). Please revise to demonstrate compliance. Please review Table J for compliance: all fields which are not grey must be completed; either column O1 must indicate that ventilation calculations are attached to the permit application or each system must demonstrate that Outside Airflow + Transfer Air > Required Min. Outside Airflow. Selections made in Table O have been changed by the permit applicant. See Table E. Additional Remarks for permit applicant's explanation.																
E. ADDITIONAL REMARKS																
This table includes remarks made by the permit applicant to the Authority Having Jurisdiction. HVAC systems include single-zone 1800 cfm, 6-ton, 100% outside air heat pump serving restrooms, showers and locker rooms. Ice rink and ancillary spaces are ventilation-only.																
F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)																
Table Instructions: Complete the following equipment schedules to show compliance with mandatory requirements found in §110.1 and §110.2(a) and prescriptive requirements found in §140.4(a), §140.4(b) and §140.4(i) or §141.0(b)2 for alterations.																
Dry System Equipment Summary (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters)																
01	02	03	04	05	06	07	08	09	10	11						
Name or Item Tag	Equipment Category per Tables 110.2	Equipment Type per Tables 110.2 & Table 20	Smallest Size Available ¹ §140.4(a)	Equipment Sizing per Mechanical Schedule (kBTU/h) §140.4(a)&(b)			Load Calculations ⁴									
				Heating Output ^{3,5}		Cooling Output ^{3,5}		Total Heating Load (kBTU/h)		Total Cooling Load (kBTU/h)						
ACU-1	Unitary heat pumps	Air cooled, package roof-top (3 phase)	Yes	Per Design (kBTU/h)	49	Rated (kBTU/h)	80	Supp. Heating Output (kBTU/h)	Sensible Per Design (kBTU/h)	82	Rated (kBTU/h)	82	Total Heating Load (kBTU/h)	49	Total Cooling Load (kBTU/h)	82
<small>*FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per §140.4(a). Healthcare facilities are exempt. **It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables. ** If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank. * Authority Having Jurisdiction may ask for load calculations used for compliance per §140.4(b). Table Continued</small>																
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/				September 2020												

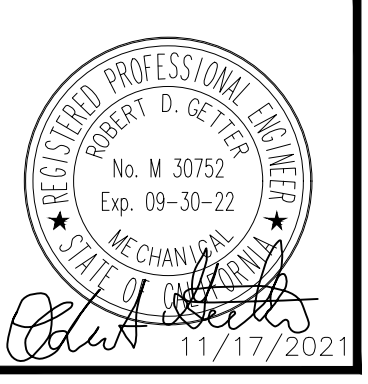
STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E (Created 09/2020)		CALIFORNIA ENERGY COMMISSION NRCC-MCH-E														
CERTIFICATE OF COMPLIANCE Project Name: Reseda Skate Facility Project Address: 18210 Sherman Way		Report Page: Page 2 of 11	Date Prepared: 2021-04-07													
E. ADDITIONAL REMARKS																
This table includes remarks made by the permit applicant to the Authority Having Jurisdiction. HVAC systems include single-zone 1800 cfm, 6-ton, 100% outside air heat pump serving restrooms, showers and locker rooms. Ice rink and ancillary spaces are ventilation-only.																
F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)																
Table Instructions: Complete the following equipment schedules to show compliance with mandatory requirements found in §110.1 and §110.2(a) and prescriptive requirements found in §140.4(a), §140.4(b) and §140.4(i) or §141.0(b)2 for alterations.																
Dry System Equipment Summary (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters)																
01	02	03	04	05	06	07	08	09	10	11						
Name or Item Tag	Equipment Category per Tables 110.2	Equipment Type per Tables 110.2 & Table 20	Smallest Size Available ¹ §140.4(a)	Equipment Sizing per Mechanical Schedule (kBTU/h) §140.4(a)&(b)			Load Calculations ⁴									
				Heating Output ^{3,5}		Cooling Output ^{3,5}		Total Heating Load (kBTU/h)		Total Cooling Load (kBTU/h)						
ACU-1	Unitary heat pumps	Air cooled, package roof-top (3 phase)	Yes	Per Design (kBTU/h)	49	Rated (kBTU/h)	80	Supp. Heating Output (kBTU/h)	Sensible Per Design (kBTU/h)	82	Rated (kBTU/h)	82	Total Heating Load (kBTU/h)	49	Total Cooling Load (kBTU/h)	82
<small>*FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per §140.4(a). Healthcare facilities are exempt. **It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables. ** If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank. * Authority Having Jurisdiction may ask for load calculations used for compliance per §140.4(b). Table Continued</small>																
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/				September 2020												

Air cooled, split (3 phase)

STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E (Created 09/2020)		CALIFORNIA ENERGY COMMISSION NRCC-MCH-E			
CERTIFICATE OF COMPLIANCE Project Name: Reseda Skate Facility Project Address: 18210 Sherman Way		Report Page: Page 5 of 11	Date Prepared: 2021-04-07		
K. TERMINAL BOX CONTROLS					
This Section Does Not Apply					
L. DISTRIBUTION (DUCTWORK AND PIPING)					
Table Instructions: Complete the following table to show compliance with mandatory pipe insulation requirements found in §120.3 and prescriptive requirements found in §140.4(i) for duct leakage testing.					
Duct Leakage Sealing					
The answers to the questions below apply to the following duct system(s):		Duct leakage testing triggered for these systems?		No	
11	No	The scope of the project includes only duct systems serving healthcare facilities.			
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.			
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.			
14	No	The combined surface area of the ducts in the following locations is more than 25% of the total surface area of the entire duct system: <input type="checkbox"/> Outdoors <input type="checkbox"/> In a space directly under a roof that has a U-factor greater than the U-factor of the ceiling, or if the roof does not meet the requirements of §140.3(a)1B or if the roof has fixed vents or openings to the outside/unconditioned spaces <input type="checkbox"/> In an unconditioned crawlspace <input type="checkbox"/> In other unconditioned spaces			
15	No	The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.			
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.			
Table Continued					
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/				September 2020	

STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E (Created 09/2020)		CALIFORNIA ENERGY COMMISSION NRCC-MCH-E						
CERTIFICATE OF COMPLIANCE Project Name: Reseda Skate Facility Project Address: 18210 Sherman Way		Report Page: Page 3 of 11	Date Prepared: 2021-04-07					
Dry System Equipment Efficiency (other than Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP))								
01	02	03	04	05	06	07	08	09
Name or Item Tag	Size Category (Btu/h)	Rating Condition (°F)	Efficiency Unit	Min Efficiency Required per Tables 110.2/ Title 20	Design Efficiency	Efficiency Unit	Cooling Mode	
							Min Efficiency Required per Tables 110.2/ Title 20	Design Efficiency
ACU-1	≥65,000 and <135,000	47°Fdb/43°Fwb OSA	COP	3.3	4.05	EER	11	13.5
						IEER	12.2	25.3
G. PUMPS								
This Section Does Not Apply								
H. FAN SYSTEMS & AIR ECONOMIZERS								
Table Instructions: Complete the following Table for fan systems to demonstrate compliance with prescriptive requirements found in §140.4(c), §140.4(e) and §140.4(m). First document the system details, then add fans within that system to document compliance with fan power requirements. Fan systems serving only process loads are exempt from these requirements and do not need to be included in Table H.								
System Name:		AHU-1	Economizer ¹	04	Economizer Controls:	System Fan Type:		Constant Volume
01	02	03	04	05	06	07	08	09
Fan Name or Item Tag	Fan Function	Qty	Maximum Design Supply Airflow (CFM)	HP Unit ²	Design HP	Fan Power Pressure Drop Adjustment - Table 140.4-B		
						Device	Design Airflow through Device (CFM)	
ACU-1	Supply	1	1,800	Nameplate HP	0.5	Calculated Adjustment (in H ₂ O)		
Total System Design Supply Airflow (CFM):		1,800		Total System Design [BHP]:		0.5		Maximum System Fan Power [BHP]:
<small>*FOOTNOTE: Computer room economizers must meet requirements of §140.9(a) and will be documented on the NRCC-PRC-E document. ** The unit used for HP must be consistent for all fans within a system.</small>								
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/				September 2020				

STATE OF CALIFORNIA Mechanical Systems NRCC-MCH-E (Created 09/2020)		CALIFORNIA ENERGY COMMISSION NRCC-MCH-E			
CERTIFICATE OF COMPLIANCE Project Name: Reseda Skate Facility Project Address: 18210 Sherman Way		Report Page: Page 6 of 11	Date Prepared: 2021-04-07		
Table Continued					
17	Duct system shall be sealed in accordance with the California Mechanical Code.				
M. COOLING TOWERS					
This Section Does Not Apply					
N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION					
Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCC/					
YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-01-E - Must be submitted for all buildings.	<input type="checkbox"/>	Pass	Fail
CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/				September 2020	



DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

SHEET TITLE
MECHANICAL SYSTEMS - TITLE 24 1 OF 2
PROJECT:
RESEDA SKATE FACILITY
ADDRESS:
18210 SHERMAN WAY, RESEDA, CA 91335

DATE: BY:
REVISIONS:
CITY ENGINEER
GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP
ENGINEER
RGETTER
DESIGNED BY: XX
DRAWN BY: JCHN
CHECKED BY: RHUBATCH
APPROVED BY: XX

DATE:
INDEX NO.

WORK ORDER NO.
E170121B

SHEET NAME
M-06
SHEET X OF X SHEETS

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REVISION DATE (DESIGN STAGE ONLY)
Sheet Version 4.0

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 7 of 11
Project Address: 18210 Sherman Way Date Prepared: 2021-04-07

Q. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE
Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector	
				Pass	Fail
<input checked="" type="radio"/>	<input type="radio"/>	NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-03-A Constant Volume Single Zone HVAC. NOTE: This form does not automatically move to "Yes". If Constant Volume Single Zone HVAC Systems are included in the scope, permit applicant should move this form to "Yes".		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-04-A Air Distribution Duct Leakage		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-05-A Air Economizer Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-06-A Demand Control Ventilation Systems Acceptance must be submitted for all systems required to employ demand controlled ventilation (refer to §120.1(c)(3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO2) concentration setpoints.		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-07-A Supply Fan Variable Flow Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-08-A Valve Leakage Test		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-09-A Supply Water Temperature Reset Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-10-A Hydronic System Variable Flow Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-11-A Automatic Demand Shed Controls		<input type="checkbox"/>	<input type="checkbox"/>

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> September 2020

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 8 of 11
Project Address: 18210 Sherman Way Date Prepared: 2021-04-07

<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-12-A FDD for Packaged Direct Expansion Units		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-14-A Distributed Energy Storage DX AC Systems Acceptance. NOTE: This form does not automatically move to "Yes". If Chilled Water Storage, Ice-on-Coil Internal Melt, Ice-on-Coil External Melt, Ice Harvester, Brine, Ice-Slurry, Eutectic Salt, Clothrate Hydrate Slurry (CHS), Cryogenic or Encapsulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to "Yes".		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-15-A Thermal Energy Storage (TES) System Acceptance. NOTE: This form does not automatically move to "Yes". If Chilled Water Storage, Ice-on-Coil Internal Melt, Ice-on-Coil External Melt, Ice Harvester, Brine, Ice-Slurry, Eutectic Salt, Clothrate Hydrate Slurry (CHS), Cryogenic or Encapsulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to "Yes".		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-16-A Supply Air Temperature Reset Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-17-A Condenser Water Temperature Reset Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-18 Energy Management Control Systems		<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="radio"/>	<input type="radio"/>	NRCA-MCH-19 Occupancy Sensor Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-20 Multi-Family Ventilation		<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCA-MCH-21 Multi-Family Envelope Leakage		<input type="checkbox"/>	<input type="checkbox"/>

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> September 2020

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 9 of 11
Project Address: 18210 Sherman Way Date Prepared: 2021-04-07

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION
Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be completed by a HERS Rater and provided to the building inspector during construction. The final documents must be created by a HERS Providers registry, but drafts can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCV/

YES	NO	Form/Title	Field Inspector	
			Pass	Fail
<input type="radio"/>	<input checked="" type="radio"/>	NRCV-MCH-04-H Duct Leakage Test. NOTE: Must be completed by a HERS Rater	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCV-MCH-24 Enclosure Air Leakage Worksheet. NOTE: Must be completed by a HERS Rater	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCV-MCH-27 High-rise Residential. NOTE: Must be completed by a HERS Rater	<input type="checkbox"/>	<input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCV-MCH-32 Local Mechanical Exhaust. NOTE: Must be completed by a HERS Rater	<input type="checkbox"/>	<input type="checkbox"/>

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> September 2020

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 10 of 11
Project Address: 18210 Sherman Way Date Prepared: 2021-04-07

Q. MANDATORY MEASURES DOCUMENTATION LOCATION
Table Instructions: Indicate where mandatory measures are documented in the plan set or construction documentation. For any mandatory measures that do not apply, mark the plan sheet or construction document location as "N/A", any active cells that are left blank will result in non-compliance in Table C.

01	02
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block:	Plan sheet or construction document location

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> September 2020

STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 11 of 11
Project Address: 18210 Sherman Way Date Prepared: 2021-04-07

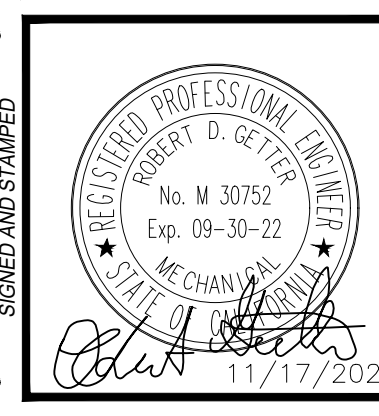
DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Robert Getter, P.E. Documentation Author Signature: Robert Getter
Company: ProjectLine Signature Date: 11/5/21
Address: 2900 Bristol, D-103 CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Costa Mesa, CA 92626 Phone: 949-351-9718

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Robert Getter, P.E. Responsible Designer Signature: Robert Getter
Company: ProjectLine Date Signed: 11/5/21
Address: 2900 Bristol, D-103 License: M30752
City/State/Zip: Costa Mesa, CA 92626 Phone: 949-351-9718

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards>



BUREAU OF ENGINEERING

VERTICAL CONTROL: _____
HORIZONTAL CONTROL: _____

SHEET TITLE: MECHANICAL SYSTEMS - TITLE 24 2 OF 2
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS

DATE: _____ BY: _____
REVISIONS: _____
CIP NO. _____
INDEX NO. _____

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP

ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHN
CHECKED BY: RHUBATCH
APPROVED BY: XX

CITY ENGINEER DATE: _____

WORK ORDER NO. E170121B
SHEET NAME M-07
SHEET X OF X SHEETS

REVISION DATE (SEE REVISIONS) (DESIGN STAGE ONLY)

K
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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) CALIFORNIA ENERGY COMMISSION NRCC-PLB-E

CERTIFICATE OF COMPLIANCE
This document is used to demonstrate compliance for nonresidential occupancies with requirements in §110.1, §110.3, §120.3, and §140.5, and with requirements in §141.0 for additions and alterations, for domestic water heating scopes using the prescriptive path. For high-rise residential and hotel/motel occupancies, compliance is demonstrated with requirements in §110.1, §110.3, §120.3, §150.0 and §150.1(c)(8), and with requirements in §150.2 for additions and alterations.

Project Name: Reseda Skate Facility Report Page: Page 1 of 5
Project Address: 18210 Sherman Way Date Prepared: 2021-04-08

A. GENERAL INFORMATION

01 Project Location (city) Reseda 02 Climate Zone 3
03 Occupancy Types Within Project (select all that apply):
 Nonresidential High-Rise Residential Hotel/ Motel
 State Building Healthcare Facility Other (Write In):

B. PROJECT SCOPE

Table Instructions: Include any domestic water heating systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive paths outlined in §140.5, §150.1(c)(8), and §141.0(a), or §141.0(b)(2) for additions or alterations. Solar water heating systems should be documented on the NRCC-SRA compliance document. Combined hydronic water heating systems should be documented on the NRCC-MCH compliance document.

01 02 03
My project consists of (check all that apply): System Type² System Components
 New System (DHW system being installed for the first time in newly constructed building) Individual System (serving nonresidential spaces)¹ Equipment Distribution Controls
 System Alteration (equipment, distribution or controls) Equipment Distribution Controls

¹ FOOTNOTE: Point of use water heaters, or other non-central systems used to serve nonresidential spaces, are considered individual systems.
² Dwelling units refers to hotel/ motel guest rooms and units in a high-rise residential occupancy.

C. COMPLIANCE RESULTS

Table Instructions: Table C will indicate if the project data input into the compliance document is compliant with water heating requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D, or the table indicated as not compliant for guidance.

01	02	03	04	
Domestic Hot Water Equipment	Distribution Systems	Controls		Compliance Results
(See Table F)	(See Table G)	(See Table H)		
Yes	Yes	Yes		COMPLIES

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> October 2020

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) CALIFORNIA ENERGY COMMISSION NRCC-PLB-E

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 2 of 5
Project Address: 18210 Sherman Way Date Prepared: 2021-04-08

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.
No exceptional conditions apply to this project.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.
See water heater literature for equipment rating and efficiency data (Item F).

F. DOMESTIC HOT WATER EQUIPMENT

Table Instructions: Complete the following table to demonstrate compliance with mandatory equipment requirements in §110.1 and §110.3. For high-rise residential and hotel/motel occupancies, compliance with prescriptive requirements in §150.1(c)(8) must also be demonstrated and with §150.2 for addition and alteration scopes.

Equipment Schedule: Individual Systems

01	02	03	04	05	06
Name or Item Tag	Equipment Type	Volume (gal)	Max GPM/ First Hour Rating (FHR)	Rated Uniform Energy Factor (UEF)	Minimum Required Uniform Energy Factor (UEF) ¹
EWH-1	Electric Storage	>75	0 ≤ FHR < 18	2.36	1.84

¹ FOOTNOTE: Compliant equipment may be found in the Modernized Appliance Efficiency Database System (MAEDBS) on the Energy Commission website: <https://caertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx>

Water Heating Equipment All Occupancies

	Yes	No	Not Applicable	Requirement
18	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unfired storage tank insulation shall have internal + External ≥ R-16 OR External ≥ R-12. Label required per §110.3(c)(3)
19	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	New state buildings 60% of energy for service water heating from site solar energy or recovered energy per §110.3(c)(5)
20	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Isolation valves for instantaneous water heater with input rating > 6.8 kBTHU or 2 kW has been specified per §110.3(c)(8)

G. DOMESTIC HOT WATER DISTRIBUTION SYSTEM

Table Instructions: Complete the following table to demonstrate compliance for nonresidential occupancies with distribution requirements in §120.3 and §140.5. For high-rise residential and hotel/motel occupancies, compliance is demonstrated with requirements in §110.3(c), §120.3, §150.0, §150.1.

Table Continued

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> October 2020

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) CALIFORNIA ENERGY COMMISSION NRCC-PLB-E

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 3 of 5
Project Address: 18210 Sherman Way Date Prepared: 2021-04-08

Table Continued

Mandatory Pipe Insulation All Occupancies

12 For systems serving nonresidential spaces, pipe insulation for the following applications is specified to comply with Table 120.3-A (see below) per §120.3:
 - Recirculating system piping, including supply and return piping of the water heater
 - The first 8 ft of hot and cold outlet piping for a nonrecirculating storage system
 - Pipes that are externally heated

13 Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service per §120.3(b) and §150.0(i)(3)

TABLE 120.3-A PIPE INSULATION THICKNESS

Fluid Temperature Range (°F)	Conductivity Range (Btu-in per hour per ft ² per °F)	Insulation Mean Rating Temp (°F)	Nominal Pipe Diameter (in)		
			<1	1 to < 1.5	1.5 to < 4
105-140	0.22-0.28	100	Minimum Insulation Required		
			1.0 in or R-7	1.5 in or R-12.5	1.5 in or R-11

H. DOMESTIC HOT WATER SYSTEM CONTROLS

Table Instructions: Complete the following table to demonstrate compliance with controls requirements in §110.3 for all occupancies. For high-rise residential and hotel/motel occupancies, compliance is demonstrated with requirements in §150.1(c)(8).

	Yes	No	Not Applicable	Requirement
01	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Construction documents require manufacturer certification that service water-heating systems are equipped with automatic temperature controls capable of adjusting temperature settings per §110.3(a)
02	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Systems with capacity > 167,000 BTUH equipped with outlet temperature controls per §110.3(c)(1) unless covered by California Plumbing Code Section 613.0.
03	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Controls for circulating pumps or electrical heat trace systems are capable of automatically turning off the system per §110.3(c)(2) unless system serves healthcare facility.
04	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	For recirculation systems serving multiple dwelling units, design includes automatic pump controls per §150.1(c)(8)(ii), or §150.2 for additions or alterations.
05	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	For recirculation systems serving individual dwelling units, design includes manual on/off controls as specified in Reference Appendix RA 4.4.9 per §150.1(c)(8).
06	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	For replacement single heat pump water heaters serving individual dwelling units in climate zones 1-15, design includes communication interface that meets demand responsive control requirements of §110.12(a) per §150.2(b)(1)(iii).

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> October 2020

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) CALIFORNIA ENERGY COMMISSION NRCC-PLB-E

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 4 of 5
Project Address: 18210 Sherman Way Date Prepared: 2021-04-08

I. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Field Inspector
<input checked="" type="radio"/>	<input type="radio"/>	NRCC-PLB-01-E - Must be submitted for all buildings	Pass <input type="checkbox"/> Fail <input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCC-PLB-02-E - Must be submitted for high-rise residential and hotel/ motel central hot water distribution systems to be recognized for compliance.	Pass <input type="checkbox"/> Fail <input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCC-PLB-03-E - Must be submitted for high-rise residential and hotel/ motel single dwelling unit hot water distribution systems to be recognized for compliance.	Pass <input type="checkbox"/> Fail <input type="checkbox"/>

J. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no Certificates of Acceptance applicable to service water heating requirements.

K. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be completed by a HERS Rater and provided to the building inspector during construction. The final documents must be created by a HERS Providers registry, but drafts can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCV/

YES	NO	Form/Title	Field Inspector
<input type="radio"/>	<input checked="" type="radio"/>	NRCV-PLB-21-H High-rise Residential Central Hot Water Distribution HERS Verification	Pass <input type="checkbox"/> Fail <input type="checkbox"/>
<input type="radio"/>	<input checked="" type="radio"/>	NRCV-PLB-22-H High-rise Residential Individual Dwelling Unit Hot Water Distribution HERS Verification	Pass <input type="checkbox"/> Fail <input type="checkbox"/>

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> October 2020

STATE OF CALIFORNIA
Domestic Water Heating System
NRCC-PLB-E (Created 10/20) CALIFORNIA ENERGY COMMISSION NRCC-PLB-E

CERTIFICATE OF COMPLIANCE
Project Name: Reseda Skate Facility Report Page: Page 5 of 5
Project Address: 18210 Sherman Way Date Prepared: 2021-04-08

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete

Documentation Author Name: Robert Getter Documentation Author Signature: Robert Getter
 Company: ProjectLine Signature Date: 11/5/21
 Address: 2900 Bristol, D-103 CEA/ HERS Certification Identification (if applicable):
 City/State/Zip: Costa Mesa, CA 92626 Phone: 949-351-9718

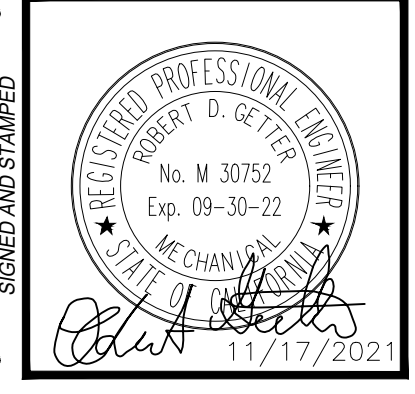
RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Compliance is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
- The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
- The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
- I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Robert Getter, P.E. Responsible Designer Signature: Robert Getter
 Company: ProjectLine Date Signed: 11/5/21
 Address: 2900 Bristol, D-103 License: M30752
 City/State/Zip: Costa Mesa, CA 92626 Phone: 949-351-9718

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> October 2020

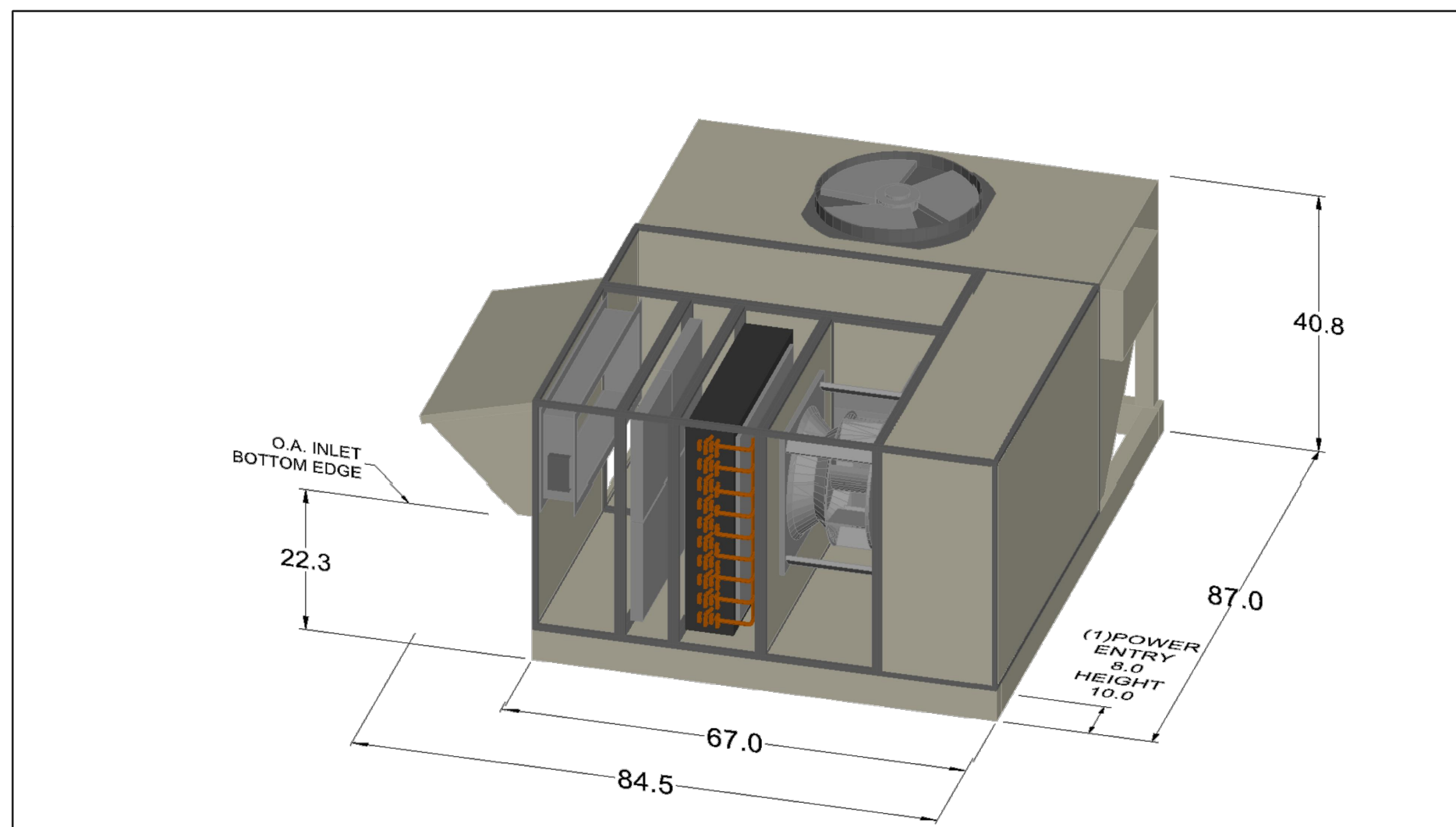


VERTICAL CONTROL: BUREAU OF ENGINEERING
 HORIZONTAL CONTROL: DOMESTIC WATER HEATING SYSTEM - TITLE 24
 SHEET TITLE: RESEDA SKATE FACILITY
 PROJECT: 18210 SHERMAN WAY, RESEDA, CA 91335
 ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DATE: BY: REVISIONS:
 NO. REVISIONS: CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP: RGETTER
 ENGINEER: RGETTER
 DESIGNED BY: XX
 DRAWN BY: JCHN
 CHECKED BY: RHUBATCH
 APPROVED BY: XX

WORK ORDER NO. E170121B
 SHEET NAME: M-08
 SHEET X OF X SHEETS

REVISION DATE (DESIGN STAGE ONLY) THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

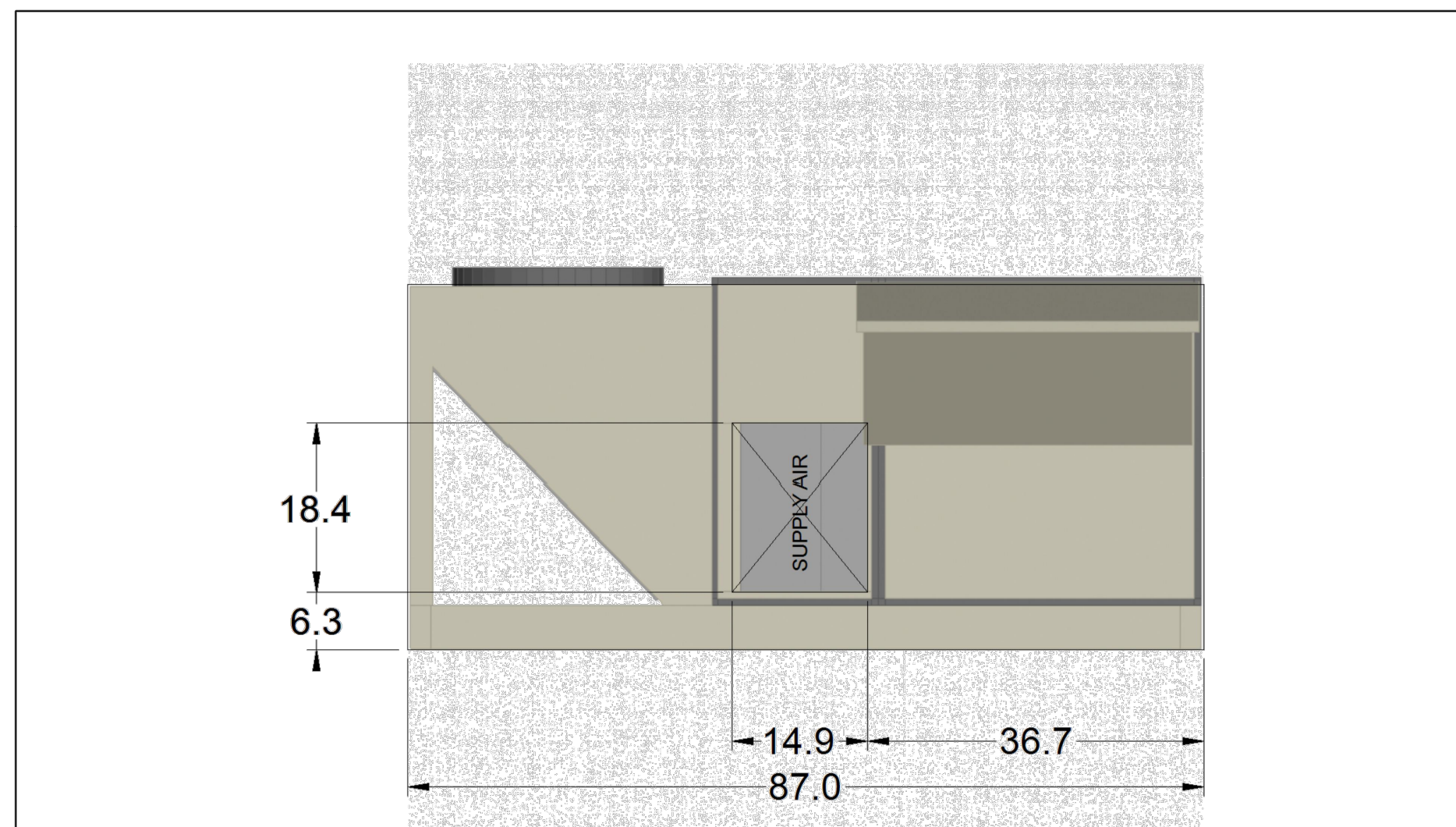


Notes:
(1) Recommended location for optional field cut side power connection.

Product Drawing	Unit Tag: Rebel 001	Sales Office: Norman S. Wright-Climatec Mechl Equip
Product: DP5005A	Project Name: Reseda Skate Facility	Sales Engineer:
Model: DP5005A	Apr. 29, 2021 Ver/Rev: Sheet: 1 of 1	Scale: NTS Tolerance: +/- 0.25" Dwg Units: in [mm]

13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.

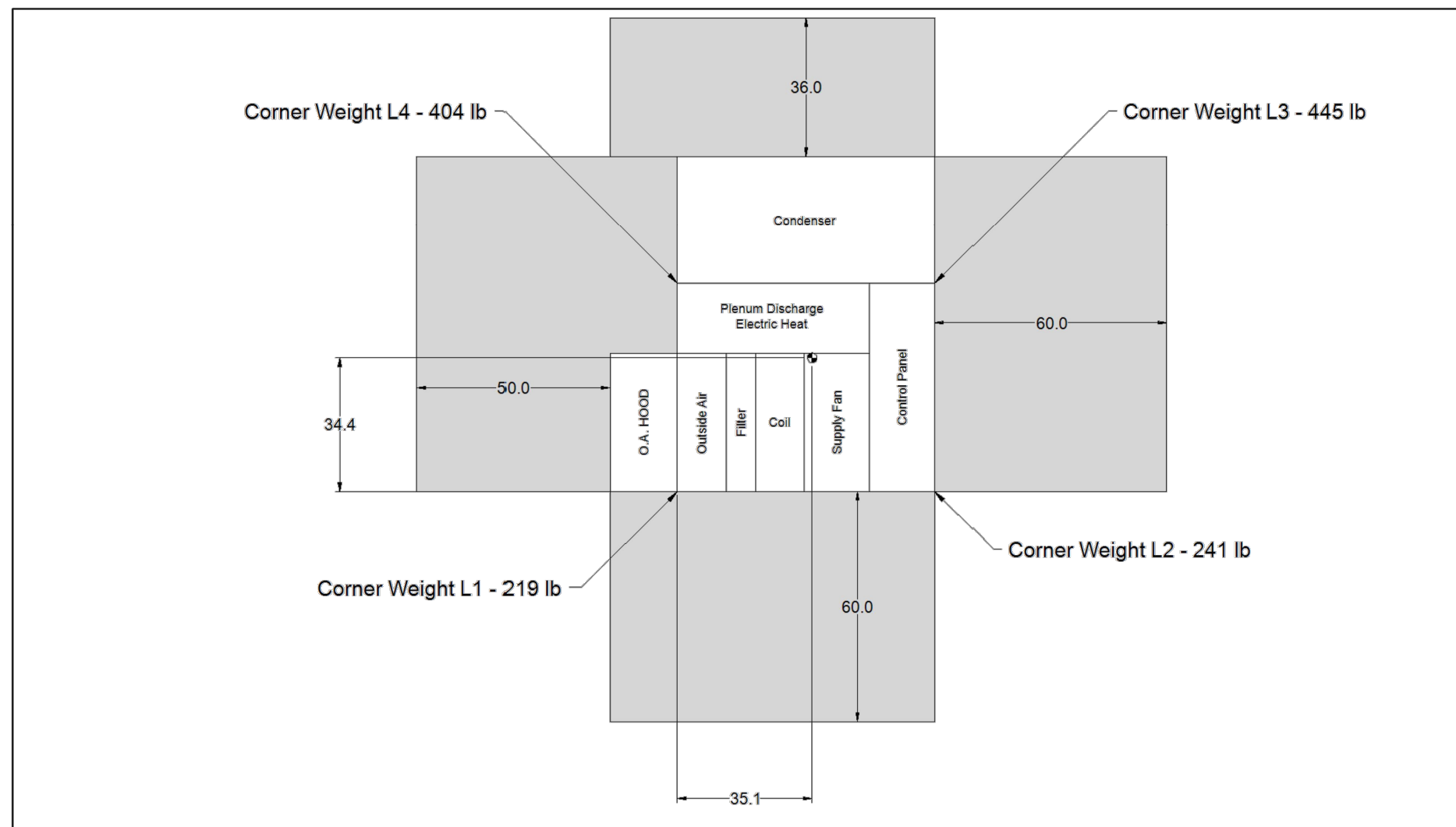


Product Drawing Unit Tag: Rebel 001

Product: DP5005A	Project Name: Reseda Skate Facility	Sales Office: Norman S. Wright-Climatec Mechl Equip
Model: DP5005A	Apr. 29, 2021 Ver/Rev: Sheet: 1 of 1	Sales Engineer:
	Scale: NTS Tolerance: +/- 0.25" Dwg Units: in [mm]	

13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

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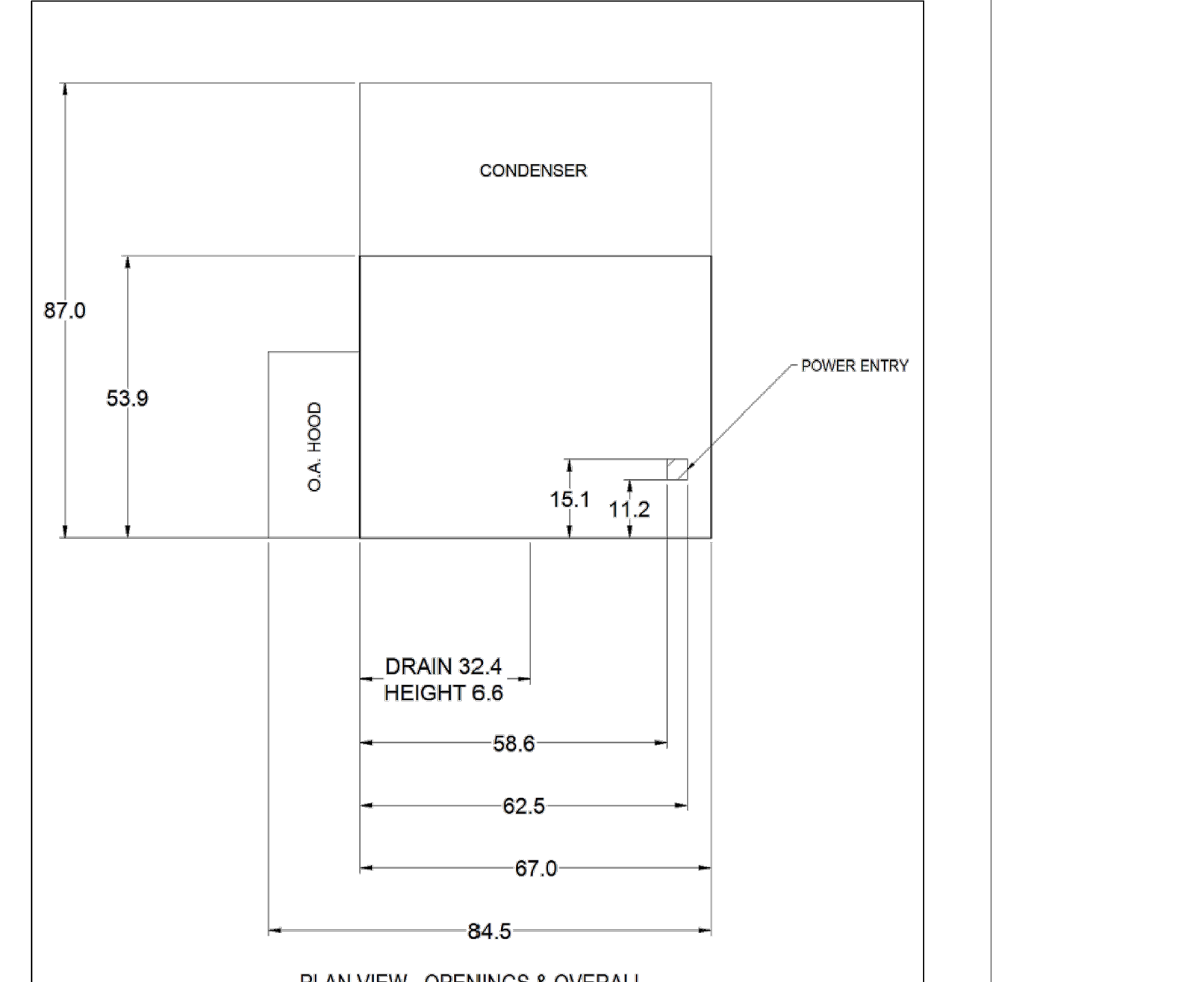


Notes:
(1) Center of Gravity Height = 20.5
(2) Total Weight = 1308 lb

Product Drawing	Unit Tag: Rebel 001	Sales Office: Norman S. Wright-Climatec Mechl Equip
Product: DP5005A	Project Name: Reseda Skate Facility	Sales Engineer:
Model: DP5005A	Apr. 29, 2021 Ver/Rev: Sheet: 1 of 1	Scale: NTS Tolerance: +/- 0.25" Dwg Units: in [mm]

13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

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Product Drawing Unit Tag: Rebel 001

Product: DP5005A	Project Name: Reseda Skate Facility	Sales Office: Norman S. Wright-Climatec Mechl Equip
Model: DP5005A	Apr. 29, 2021 Ver/Rev: Sheet: 1 of 1	Sales Engineer:
	Scale: NTS Tolerance: +/- 0.25" Dwg Units: in [mm]	

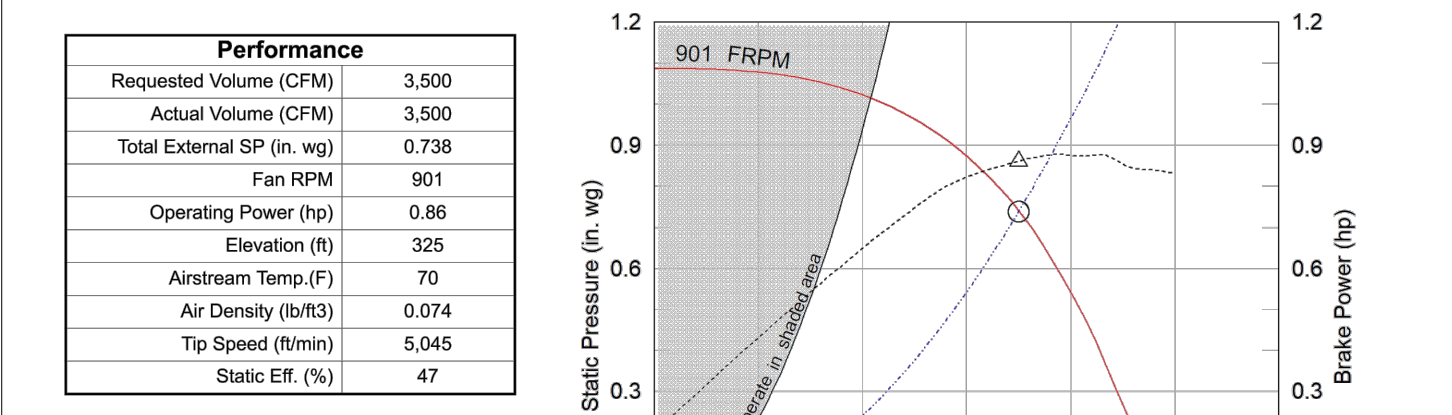
13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 08.90

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.

GREENHECK Building Value In Air.
Printed Date: 04/28/2021
Job: ProjectLine_Reseda Skate Facility
Mark: EF-8
Model: G-200-VG

Model: G-200-VG
Direct Drive Centrifugal Roof Exhaust Fan
Previously: G-203-VG

Dimensional	
Quantity	1
Weight w/ Acc's (lb)	151
Weight w/ Acc's (kg)	157
Weight w/ Acc's and Curb (lb)	196
Standard Curb Cap Size (in.)	30 x 30
Optional Damper (in.)	18 x 18
Roof Opening (in.)	20.5 x 20.5



Performance	
Requested Volume (CFM)	3,500
Actual Volume (CFM)	3,500
Total External SP (in. wg)	0.738
Fan RPM	901
Operating Power (hp)	0.86
Elevation (ft)	325
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	5,045
Static Eff. (%)	47

Motor	
Motor Mounted	Yes
Size (hp)	2
Voltage/Cycle/Phase	208/60/3
Enclosure	TEFC
Motor RPM	1200
Efficiency Rating	High
Windings	1
FLA (Amps)	9.7

Notes:
All dimensions shown are in units of in.
Please consult factory for actual motor amp draw.
LWA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.8 dB
attenuation per octave band at 5 ft. dBA levels are not
listed by AMCA International.
Scores - calculated using ANSI/AMCA 301 at 5 ft

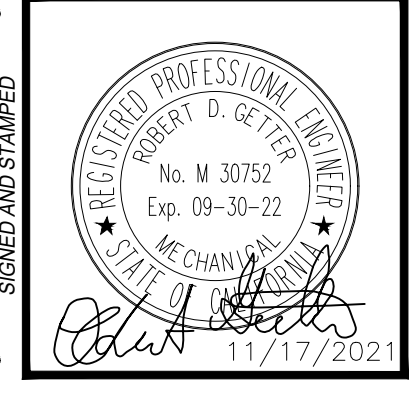
Sound Power by Octave Band											
Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Scores
Inlet	79	80	77	72	63	63	60	54	74	62	12.0

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Generated by: eyang@rsnwclia.com
Page 29 of 36

GREENHECK Building Value In Air.
Printed Date: 04/28/2021
Job: ProjectLine_Reseda Skate Facility
Mark: EF-8
Model: G-200-VG

Model: G-200-VG
Direct Drive Centrifugal Roof Exhaust Fan
Standard Construction Features:
- Aluminum housing - Backward inclined composite (sizes 90-95) or aluminum (sizes 97-300) wheel - Aluminum curb cap with prepunched mounting holes - Birdscreen - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - Motor isolated on shock mounts - Corrosion resistant features.
Selected Options & Accessories:
Motor - Vari-Green EC motor
Control - Dial for balancing
Standard Curb Cap Size - 30 in. Square
UL/ULCUL 705 Listed - "Power Ventilators"
Switch - NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Damper Shipped Loose, W/D-100-PB-18X18, Gravity Operated, Not Coated
Birdscreen: Galvanized, nom. 54% Free Area
Unit Warranty: 1 Yr (Standard)
Selected Sub Marks
See individual submittals for full details
GPI-30-G12

CAPS 4.35.918	F:\Caps\Jobseyang\ProjectLine_Reseda Skate Facility.gfx Generated by: eyang@rsnwclia.com	Page 30 of 36
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BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE: OUTDOOR HEAT PUMP AND FAN CUT SHEET
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

DATE:	BY:
REVISIONS:	
NO.	DESCRIPTION

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP: RGETTER
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO. E170121B

SHEET NAME: M-09
SHEET X OF X SHEETS

THIS SHEET FOR REFERENCE ONLY

REVISION DATES (DESIGN STAGE ONLY) SHEET NO. 10 OF 10 SHEETS THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Rebel® Packaged Rooftop System



Job Information Technical Data Sheet
Job Name: Reseda Skate Facility
Date: 4/29/2021
Submitted By: Eric Yang
Software Version: 08.90
Unit Tag: Rebel 001

Unit Overview
Model Number: DPS005A
Voltage: 208/60/3
Design Cooling Capacity: 68576
EER@95/75 EAT & 200 CFM/ton: 12.3
ASHRAE 90.1 compliant

Unit
Model Number: DPS005A
Model Type: Heat Pump
Heat Type: Electric
Hot Gas Reheat: MHGRH with Combination Space Temperature and Humidity Sensor
Energy Recovery: None
Application: Variable Air Volume, Single Zone (Mixed Air or 100% OA)
Controls: Microtech III
Outside Air: 100% Outside Air
Altitude: 0 ft
Approval: cETLus

Physical
Dimensions and Weight
Length: 67.0 in, Height: 40.8 in, Width: 87.0 in, Weight: 1308 lb
Corner Weights: L1: 219 lb, L2: 241 lb, L3: 445 lb, L4: 404 lb
Construction: Exterior: Painted Galvanized Steel, Insulation and Liners: 1" Injected Foam, R-7, Galvanized Steel Liner, Air Opening Location: Return: None, Supply: Horizontal

Electrical
Unit FLA: 52.2 A, MCA: 63.5 A, MROPD: 70 A, SCRR: 5 KAIC
Note: Use only copper supply wires with ampacity based on 75° C conductor rating. Connections to terminals must be made with copper lugs and copper wire.

Return/Outside/Exhaust Air
Type: None, Damper Pressure Drop: 0.09 inH2O, Exhaust Air Type: None

Rebel® Packaged Rooftop System



Electric Heat Section
Physical: Airflow: 1500 CFM, Size: 12 kW, Control: SCR control, FLA: 33.3
Performance: Capacity: 40956 Btu/hr, Entering Air Temperature: 40.6 F, Leaving Air Temperature: 65.8 F, Air Pressure Drop: 0.22 inH2O

Unit Discharge Conditions
Air Temperature: Motor Heat: 2871 Btu/hr, Moisture Removal: 0.0 lb/h, Unit Leaving Dry Bulb: 56.7 F, Unit Leaving Wet Bulb: 51.9 F, Unit Leaving Dewpoint: 48.5 F

Condensing Section
Compressor: Inverter Scroll, 1, 19.7, 3.41 kW, Mod Control with Inverter Compressors, Rubber in Shear
Compressor Amps: 11.9 A
Condenser Coil: Copper Tube, 23, Aluminum
Condenser Fan Motors: 1, 2.0 A

Internal Pressure Drop Calculation
External Static Pressure: 1.50 inH2O
Filters: 0.11 inH2O
Outside Air: 0.09 inH2O
DX Coil: 0.18 inH2O
Hot Gas Reheat: 0.04 inH2O
Electric Heat: 0.22 inH2O
Total Static Pressure: 2.14 inH2O

Sound
Sound Power (dB)
Frequency: 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz
Inlet: 71, 70, 78, 73, 75, 74, 69, 64
Discharge: 71, 73, 81, 78, 81, 80, 77, 72
Radiated: 82, 82, 78, 75, 73, 68, 61, 54

Options
Field Connection: Power Block

Rebel® Packaged Rooftop System



Filter Section
Type: 2" MERV 8 & 4" MERV 14 Filters
Quantity / Size: 4 / 16 in x 16 in x 2 in & 4 / 16 in x 16 in x 4 in
Face Area: 7.1 ft²
Face Velocity: 211.3 ft/min
Air Pressure Drop: 0.11

DX Cooling Coil
Coil Type: Cu Tube/Al Fin
Refrigerant Type: R410A
Fins per Inch: 14
Rows: 4
Face Area: 6.0 ft²
Face Velocity: 248.3 ft/min
Air Pressure Drop: 0.18 inH2O
Drain Pan Material: Stainless Steel

Cooling Performance
Capacity: Total 68576 Btu/hr, Sensible 68576 Btu/hr, Moisture Removal 0.0 lb/h
Indoor Air Temperature: Entering Wet Bulb 96.7 F, Wet Bulb 66.8 F, Dry Bulb 54.9 F
Leaving Wet Bulb 51.3 F, Dewpoint 48.5 F
Ambient Air Temperature: 96.7 F

Heating Performance
Total Capacity: 56659 Btu/hr
Refrigerant Type: R410A
Indoor Air Temperature: Entering 45.0 F, Leaving 79.5 F
Ambient Air Temperature: 40.6 F

Hot Gas Reheat Coil Section
Type: Aluminum Tube Micro-Channel
Face Area: 5.5 ft²
Air Pressure Drop: 0.04 inH2O
Total Capacity: 24589 Btu/hr
Leaving Air Temperature: Dry Bulb 70.0 F, Wet Bulb 57.3 F

Fan Section
Type: SWSI AF
Fan Wheel Diameter: 14 in
Fan Isolation: None
Performance: Airflow: 1500 CFM, Total Static Pressure: 2.1 inH2O, Fan Speed: 1973 rpm, Brake Horsepower: 0.90 HP, Altitude: 0 ft
Motor: ECM Motor, 2.3, Efficiency: Premium, FLA: 5.0 A, Type: Direct Drive

Rebel® Packaged Rooftop System



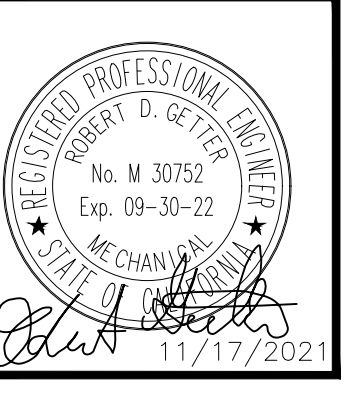
Factory Installed Sensors
Leaving Coil/Entering Fan Temperature Sensor
Duct High Limit Switch
Discharge Air Temperature sensor - Wired in unit, mounted in supply duct
Outside Air Temperature Sensor
Dirty Filter On/Off Switch
Supply Fan Air Proving Via Modbus

Warranty
Parts: Standard One Year
Compressor: Standard One Year

Notes

Accessories
Mandatory: Part Number 910191961, Description: Combo Digital Temp and Humidity Sensor w/Adj setpoint and tenent override

THIS SHEET FOR REFERENCE ONLY



THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING
DAIKEN (ROOFTOP SYSTEM) CUT SHEET
RESEDA SKATE FACILITY
18210 SHERMAN WAY, RESEDA, CA 91335

REVISIONS table with columns for No., Description, Date, By

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
ENGINEER: RGETTER
DESIGNED BY: XX
DRAWN BY: JCHN
CHECKED BY: RHUBATCH
APPROVED BY: XX

WORK ORDER NO. E170121B

SHEET NAME: M-10
SHEET X OF X SHEETS

REVISION DATE (DESIGN STAGE ONLY) THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

PRELIMINARY DRAWING

All Dimensions and specifications are preliminary and may change. Please consult factory for final dimensions and specifications.

Unit Information

CFM @ ESP	5,800 @ 2.0 W.C.
BHP / RPM	8.39 / 3,510
FAN MODEL	16" BA, CLS 3.75B
MOTOR HP / RPM	10 / 3,600
MOTOR TYPE	NEMA PREM. TEC
MOTOR FLA	11.5
FILTER SFG/FTQ	1) 29x29x2 (3) 6x29x2
FILTER TYPE	MERV 8
CFM @ ESP	3,500 @ 0.0 W.C.
BHP / RPM	2.42 / 3,495
FAN MODEL	16" BA, CLS 3.37A
MOTOR HP / RPM	3.5 / 3,600
MOTOR TYPE	NEMA PREM. TEC
MOTOR FLA	3.53
FILTER SFG/FTQ	1) 24x24x2
FILTER TYPE	MERV 8

Electrical Information

HEATER TYPE	40 30 KW HEATERS
REACT. KW / AMPS	128 KW / 180.9 AMPS
MAX. REACT. MBH	436.7

Electrical Information

SUPPLY VOLTAGE	480V 3PHASE 60Hz
UNIT FLA	178.2
UNIT MCA	183
UNIT MOP	200
LOCK	5,000
ELECTRICAL DWG. NO.	

2100 Park Drive NW
Owatonna, MN 55040
phone: 507.451.2198
fax: 507.451.1177
www.cdihvac.com

Climate by Design INTERNATIONAL
Reseda Ice Skating Facility
DH-1
DH-142-S-8-ES01SLOCM
P-015038-001

ARID-Ice
by Climate by Design INTERNATIONAL

PRELIMINARY DRAWING

All Dimensions and specifications are preliminary and may change. Please consult factory for final dimensions and specifications.

Service Clearances:
Side (RH) = 42.00"
Side (LH) = 44.00"
End (RH) = 43.00"
End (Discharge) = 49.00"

Access Door Sizes:
Pre-Filter Door = 20" x 50"
DH Door (Large) = 30" x 50"
DH Door (Small) = 12" x 48"
Electrical Cabinet Door = 30" x 50"

Discharge End View

Top View

Intake End View

Bottom View (looking down from top)

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Climate by Design INTERNATIONAL
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Spun Aluminum Model GRSI/GRSR/GRSF

GREENHECK
Building Value in Air

Construction Features

When you buy a Greenheck gravity ventilator, you receive a ventilator with the industry's best performance and durability for intake (model GRSI) or relief (model GRSR) for natural gravity or positive pressure systems. Exceptional low silhouette design and construction features make this unit a rugged, efficient, and economical air inlet or outlet.

- All aluminum exterior for corrosion-resistant construction
- Integral birdscreen to prevent the entry of birds and/or small objects
- Built-in curb cap with pre-punched holes for easy attachment to roof curbs
- Optional built-in flashing flange (model GRSF) with pre-punched holes for quick and easy installations without a roof curb.

Use the GRS with the following accessories:
Gravity or motorized dampers to ensure weather tightness.
Prefab curbs to reduce installation time.
Protective coatings to extend the life of the unit or blend its color with other equipment.

Dimensions

Model Size	A	B	C	D	E	F	Damper	Shroud	Unit Weight	
8	19	20 1/2	7 1/2	1 1/2	20 1/2	8 1/2	8 x 8	0.051	0.051	3
10	22	23 1/2	8 1/2	2	23 1/2	10 1/2	10 x 10	0.051	0.051	5
12	25	26 1/2	9 1/2	2 1/2	26 1/2	12 1/2	12 x 12	0.064	0.064	10
14	28	29 1/2	10 1/2	3 1/2	29 1/2	14 1/2	14 x 14	0.064	0.064	13
16	31	32 1/2	11 1/2	4 1/2	32 1/2	16 1/2	16 x 16	0.064	0.064	19
18	34	35 1/2	12 1/2	5 1/2	35 1/2	18 1/2	18 x 18	0.064	0.064	24
20	37	38 1/2	13 1/2	6 1/2	38 1/2	20 1/2	20 x 20	0.064	0.064	31
24	43	44 1/2	15 1/2	8 1/2	44 1/2	24 1/2	24 x 24	0.064	0.064	45
30	53	54 1/2	19 1/2	11 1/2	54 1/2	30 1/2	30 x 30	0.064	0.064	60
36	63	64 1/2	23 1/2	14 1/2	64 1/2	36 1/2	36 x 36	0.064	0.064	80
42	73	74 1/2	27 1/2	17 1/2	74 1/2	42 1/2	42 x 42	0.064	0.064	100
48	83	84 1/2	31 1/2	21 1/2	84 1/2	48 1/2	48 x 48	0.064	0.064	120

Model GRSI Intake Performance

GRSI Size	Throat Area (ft²)	Total Pressure Drop (in. wg)										Recommended Maximum Intake Capacities	
		0.04	0.06	0.08	0.10	0.15	0.20	0.25	0.30	0.35	Intake Area (ft²)	Max. CFM Intake	
8	0.37	178	218	252	282	345	398	445	488	527	1.30	780	
10	0.57	279	342	395	442	541	624	698	765	826	1.72	1032	
12	0.82	400	490	566	633	775	895	1001	1097	1184	2.52	1512	
14	1.12	553	677	782	874	1071	1237	1383	1515	1635	3.57	2142	
16	1.45	742	908	1049	1173	1438	1658	1854	2031	2194	5.02	2912	
18	1.83	901	1104	1274	1425	1745	2015	2253	2469	2665	3.42	2052	
20	2.25	1096	1343	1550	1733	2123	2452	2741	3002	3243	4.43	2658	
24	3.24	1542	1888	2180	2438	2985	3447	3884	4222	4560	4.95	2970	
30	5.03	2013	2485	2847	3193	3988	4501	5052	5512	5954	7.49	4494	
36	7.29	2821	3577	4150	4618	5656	6301	7001	7659	8209	10.2	6111	
42	9.77	3811	4781	5532	6195	7574	8746	9779	10712	11570	12.0	7159	
48	12.8	5139	6294	7268	8126	9952	11491	12849	14074	15021	15.5	9296	

Model GRSR Relief Performance

GRSR Size	Throat Area (ft²)	Total Pressure Drop (in. wg)									
		0.04	0.06	0.08	0.10	0.15	0.20	0.25	0.30	0.35	
8	0.37	231	282	326	365	446	516	576	631	682	
10	0.57	331	406	468	524	641	741	828	907	980	
12	0.82	468	573	662	740	907	1047	1171	1282	1385	
14	1.12	663	811	927	1046	1283	1481	1666	1814	1960	
16	1.45	870	1065	1230	1375	1688	1945	2175	2382	2573	
18	1.83	1090	1298	1496	1676	2052	2370	2649	2902	3135	
20	2.25	1294	1572	1815	2029	2496	2870	3209	3515	3797	
24	3.24	1879	2301	2657	2971	3638	4201	4697	5145	5558	
30	5.03	2381	2794	3226	3607	4418	5101	5703	6247	6748	
36	7.29	3279	4016	4637	5184	6349	7331	8157	8979	9699	
42	9.77	4672	5722	6627	7387	9047	10447	11680	12796	13800	
48	12.8	6211	7607	8793	9820	12027	13888	15527	17009	18372	

Spun Aluminum Model GRSI/GRSR

GREENHECK
Building Value in Air

Performance

Performance data for these units was obtained through actual testing. The information is presented in capacity versus total pressure drop through the GRS. Total pressure drop includes the static and velocity pressure drops. To find the static drop alone, use the following equations.

Throat Velocity = $\frac{CFM}{Throat Area}$

Static Pressure = $\frac{Total Pressure}{Pressure} - \frac{Velocity Pressure}{Pressure}$

Velocity Pressure = $\frac{Throat Velocity^2}{4008.6}$

*1 inch wg = 2.49 Pa

The data is presented for both discharge and intake units. The intake velocity of the intake unit should not exceed 600 feet per minute. Above this velocity, airborne particles may be carried into the building. The table below displays the maximum recommended values for the respective intake units. In areas where snow depths may be a problem, 12 inch (305 mm) or higher curbs are recommended.

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES

Professional Engineer
Robert D. Gettler
No. M. 30752
Exp. 09-30-22

BUREAU OF ENGINEERING

DEPARTMENT OF PUBLIC WORKS

GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP

ROOF EQUIPMENT - SHEET (1 of 2)
RESEDA SKATE FACILITY
18210 SHERMAN WAY, RESEDA, CA 91335

WORK ORDER NO.
E170121B

SHEET NAME
M-11

DESIGNED BY: XX
DRAWN BY: JOHN
CHECKED BY: RHUBATCH
APPROVED BY: XX

INDEX NO.

CITY ENGINEER
DATE:

CBD6

Counterbalanced Backdraft Damper



APPLICATION

The CBD6 counterbalanced backdraft damper will relieve at extremely low pressures (approximately .02" w.g.). It also features heavy duty aluminum construction, with the ability to handle large air flows and has maximum spot velocities up to 3,500 fpm. To maintain quiet operation synthetic corrosion resistant bearings are used. The CBD6 also offers excellent weather resistance for relief air applications in exterior walls.

STANDARD CONSTRUCTION

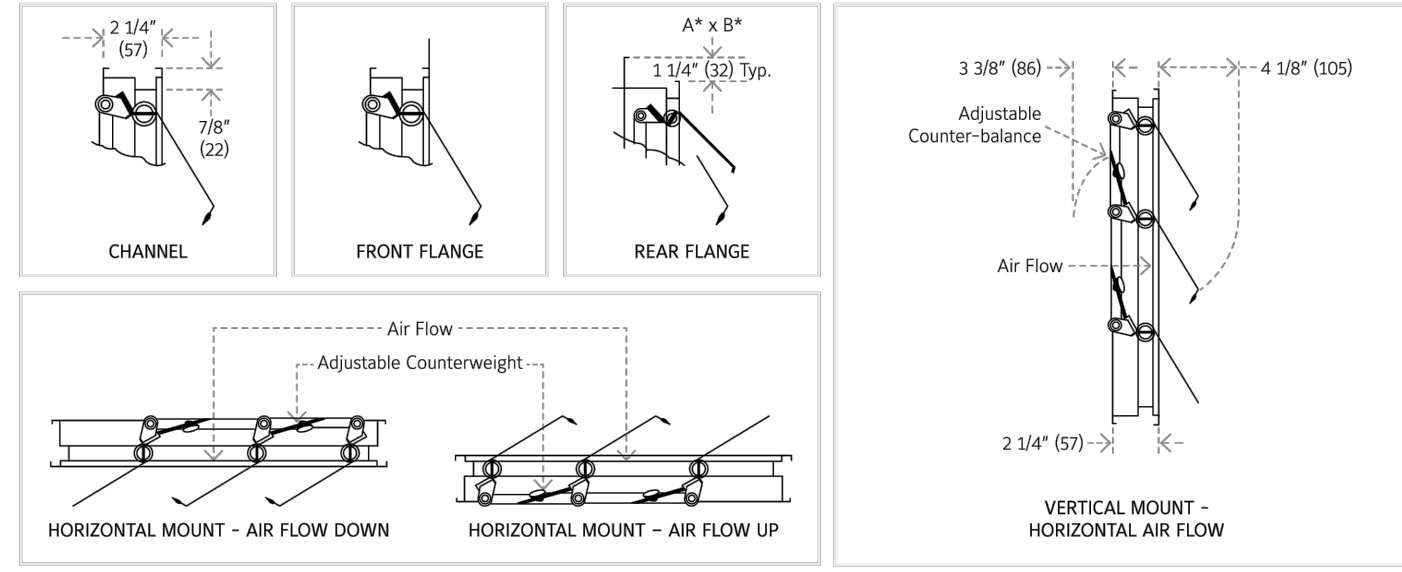
Frame	6063T6 extruded aluminum .125" (3.2) wall thickness
Blades	6063T6 extruded aluminum .070" (1.8) wall thickness with extruded vinyl edge seals
Bearings	Zytel
Linkage	1/8" x 1/2" x (3 x 13) aluminum tiebars
Counterbalance	Zinc plated bar on blades (except top blade). Adjustable for final "on the job" setting
Finish	Mill
Maximum Size	Single section - 48" w x 52" h (1219 x 1321). Assembly of sections - unlimited
Minimum Size	6" w x 10" h (152 x 254)
Temperature Limits	-40°F (-40°C) minimum and +200°F (93°C) maximum



VARIATIONS

- The following variations to the CBD6 are available at additional cost:
- Special finishes
- Bird or insect screens

FRAME CONSTRUCTION



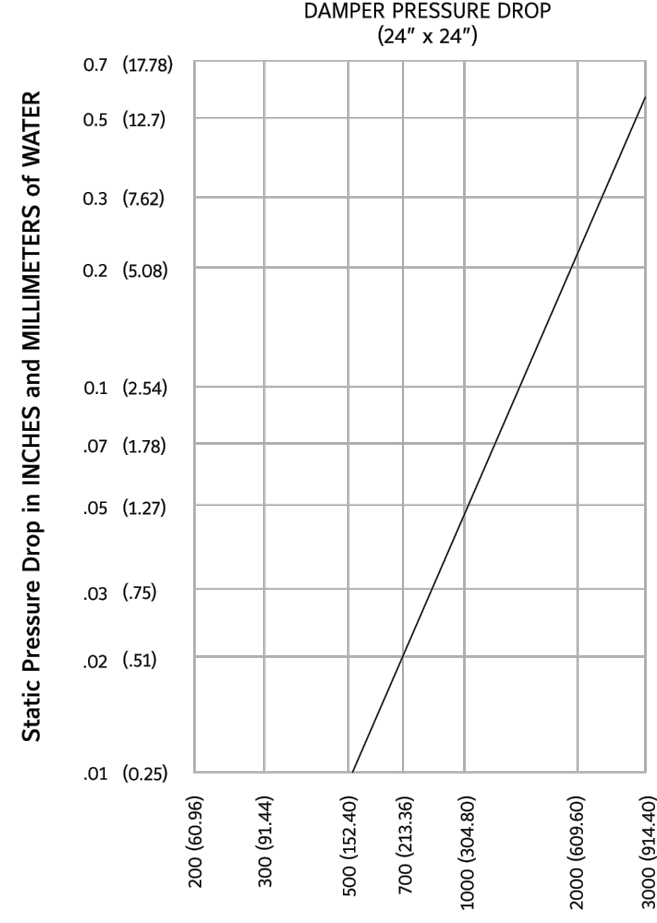
Note:
- Unit furnished approx. 1/4" (6) smaller than given opening dimensions.
- Dimensions shown in parentheses () indicate millimeters.

Spec CBD6-0520/Replaces CBD6-005 ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION. © Ruskin May 2020

PERFORMANCE DATA

Damper Width	Maximum Back Pressure	Maximum System Velocity	Leakage*		Blades Start To Open	Blades Fully Open
			% Of Max. Flow	CFM/Sq. Ft.		
48" (1219)	4.0" w.g.	2500 FPM	0.6%	15	0.01" w.g.	0.05" w.g.
36" (914)	8.0" w.g.	2500 FPM	0.6%	15		
24" (610)	12.0" w.g.	2500 FPM	0.7%	17.5		
12" (305)	16.0" w.g.	2500 FPM	1%	25		

*Leakage information based on pressure differential of 1" w.g. tested per AMCA Std. 500.



Air Velocity in FEET and METERS per minute through FACE AREA. Tested per AMCA Std. 500, Fig. 5.3, ductwork upstream and downstream.

Spec CBD6-0520/Replaces CBD6-005 ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION. © Ruskin May 2020

INSTALLATION

- When used in fan discharge applications, damper should be located at least one-half the fan diameter away from the fan.
- For proper operation, damper must be installed square and free from racking.
- Bracing of multiple section assemblies: The CBD6 is intended to be self supporting only in the largest single section size. Multiple section damper assemblies may require bracing to support the weight of the assembly and to hold against system pressure. Ruskin recommends appropriate bracing to support the damper horizontally at least once for every 8 feet of damper width. Vertical assemblies and higher system pressures may require more bracing.

SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans or in accordance with schedules, heavy duty backdraft dampers that meet the following minimum construction standards: Frame shall be .125" (3.2) wall thickness 6063T6 extruded aluminum with 12 gauge (2.8) galvanized steel structural brace at each corner. Blades shall be .070" (1.8) wall thickness 6063T6 extruded aluminum with extruded vinyl blade edge seals mechanically locked into blade edge. Adhesive or clip on type seals are unacceptable. Bearings shall be corrosion resistant, long life synthetic type for quiet operation. Linkage shall be 1/2" (13) wide tiebar connected to stainless steel pivot pins. Dampers shall be designed for maximum 3500 fpm spot velocities and minimum 4 inches w.g. back pressure depending on damper size. Dampers shall be in all respects equivalent to Ruskin model CBD6.

LINKS TO IMPORTANT DOCUMENTS

Document Title
Limited Warranty Document



3900 Doctor Greaves Road
Grandview, MO 64030
Website: www.ruskin.com
Phone: (816) 761-7476

Spec CBD6-0520/Replaces CBD6-005 ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION. © Ruskin May 2020

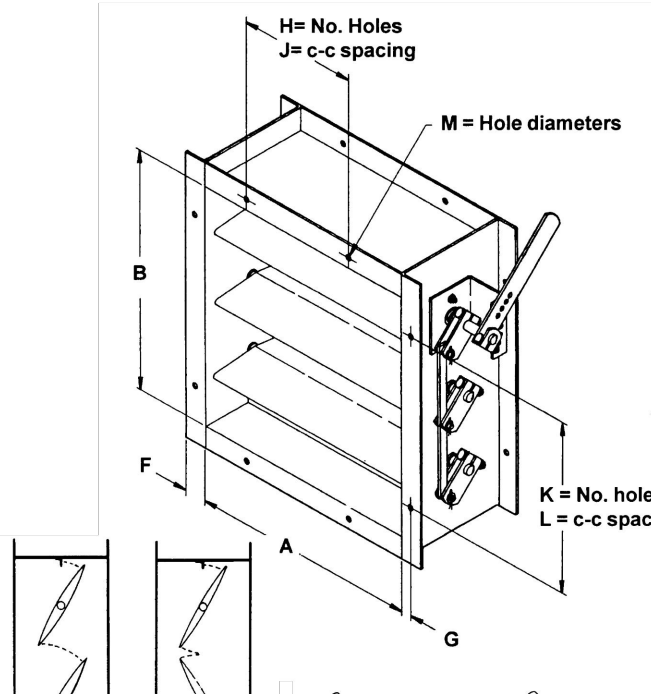
RUSKIN®

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

CD102 CONTROL DAMPER OD102 FAN OUTLET DAMPER Aluminum Airfoil Blades

STANDARD CONSTRUCTION

- FRAME**
8" x 2" x 12 gauge (203 x 51 x 2.8) steel channel.
- BLADES**
7/16" (197) wide, .080 (2) thick, 6063T5 extruded aluminum airfoil blade.
- AXLES**
3/4" (19) diameter plated steel.
- BEARINGS**
CD102 - Stainless steel sleeve pressed into frame.
OD102 - Stainless steel bolted to frame.
- LINKAGE**
Side linkage out of airstream; 10 gauge (3.5) galvanized steel clevis-type arms, 3/16" x 3/8" (4.8 x 9.5) plated steel tie bars and 3/8" diameter (9.5) stainless steel pivot pins with lock-type retainers.
- OPERATING LEVER**
Hand Quadrant for manual operation. A crank lever for motor operation is available at no extra cost.
- FINISH**
Mill galvanized frame with mill finish blades.
- MAXIMUM TEMPERATURE**
300°F (149°C) maximum.
- MINIMUM SIZE**
Single blade damper - 6" w x 6" h (152 x 152).
Multiple blade damper - 6" w x 14" h (152 x 355).
- MAXIMUM SIZE**
60" w x 96" h (1524 x 2438).



VARIATIONS

- The CD/OD102 can be furnished with a number of variations to meet special requirements. These variations, available at additional cost include:
- 10" (254) deep frame.
- Special finishes.
- Electric and pneumatic actuators.
- Other frame materials.

NOTE: Dimensions in parentheses () indicate millimeters.

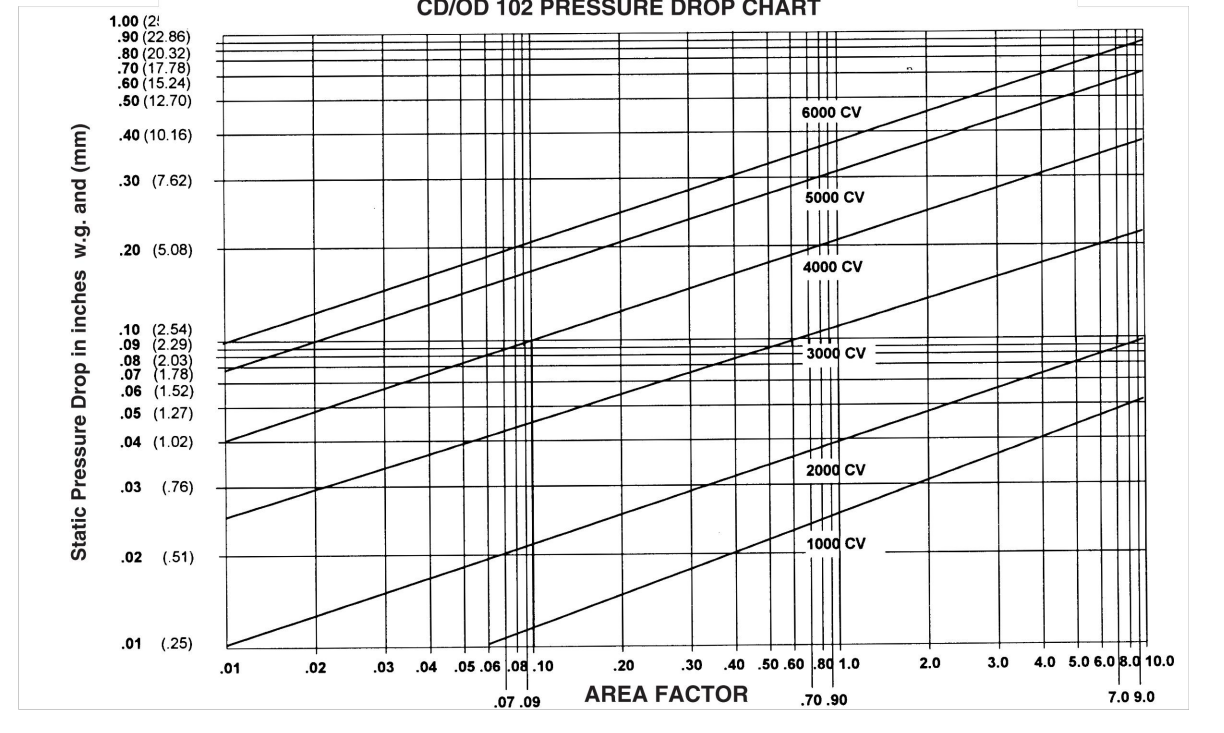
FRAME	BLADES	AXLES	BEARINGS	LINKAGE	SEALS (OPT)	ACCESSORIES
6" x 2" (152 x 51) GALVANIZED STEEL	7/16" (197) WIDE PLATED STEEL	3/4" (19) DIA. PLATED STEEL	ZYTEL	10 GAUGE (3.5) GALVANIZED STEEL	EXTRUDED VINYL	HAND QUADRANT (HQ) CRANK LEVER (CL) ELECTRIC ACTUATOR (EACT) PNEUMATIC ACTUATOR (PACT) ELECTRIC ACTUATOR (EACT) PNEUMATIC ACTUATOR (PACT)

Spec CD/OD102-1165/Replaces Spec CD/OD-493 ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION. © Ruskin 2020

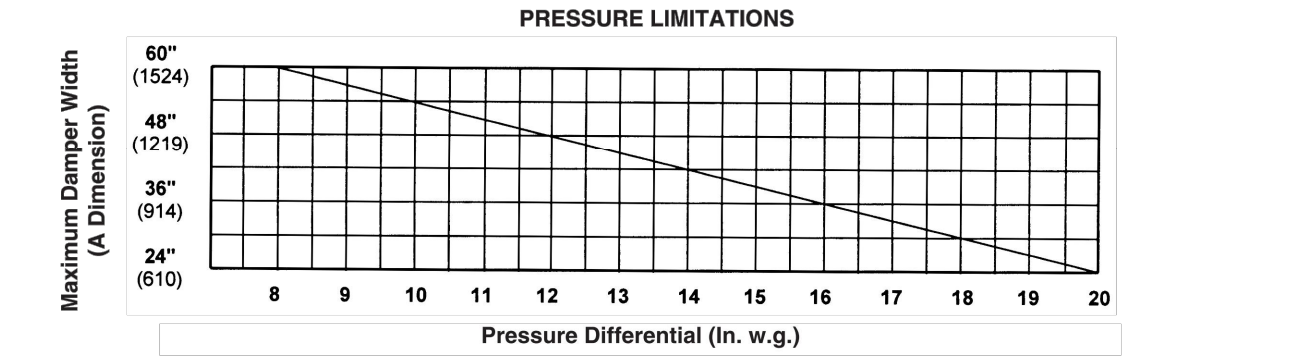
PRESSURE DROP INFORMATION AREA FACTOR TABLE

B Dimension Height in Inches (mm)	A Dimension—Width in Inches (mm)																			
	6"	9"	12"	15"	18"	21"	24"	27"	30"	33"	36"	39"	42"	45"	48"	51"	54"	57"	60"	
6" (152)	6.65	4.43	3.33	2.66	2.22	1.90	1.68	1.48	1.33	1.21	1.11	1.02	95	89	83	85	80	76	72	
9" (229)	3.93	2.62	1.96	1.57	1.31	1.12	98	87	79	71	65	60	56	52	49	46	46	43	41	
12" (305)	2.75	1.84	1.38	1.10	0.92	0.79	69	61	55	50	46	42	39	37	34	34	33	31	29	
15" (381)	2.05	1.37	1.02	0.82	0.68	0.59	51	46	41	37	34	32	29	26	25	24	23	21	21	
18" (457)	1.74	1.16	0.87	0.69	0.58	0.50	43	39	35	32	29	27	25	22	22	22	20	19	18	
24" (610)	1.27	0.85	0.63	0.51	0.42	0.36	32	28	25	23	21	20	18	17	16	16	15	14	13	
30" (762)	0.96	0.64	0.48	0.39	0.32	0.28	24	21	19	18	16	15	14	13	12	12	11	11	10	
36" (914)	0.80	0.53	0.40	0.32	0.27	0.23	20	18	16	15	13	12	11	11	10	10	09	09	08	
42" (1067)	0.68	0.46	0.34	0.27	0.23	0.20	17	15	14	12	11	11	10	09	09	08	08	08	07	
48" (1219)	0.60	0.40	0.30	0.24	0.20	0.17	15	13	12	11	10	09	09	08	07	07	07	07	06	
54" (1372)	0.53	0.35	0.26	0.21	0.18	0.15	13	12	11	10	09	08	08	07	07	07	06	06	06	
60" (1524)	0.47	0.31	0.23	0.19	0.16	0.13	12	10	09	08	08	07	07	06	06	06	05	05	05	
66" (1676)	0.42	0.28	0.21	0.17	0.14	0.12	11	09	08	08	07	07	06	06	05	05	05	05	04	
72" (1829)	0.39	0.26	0.19	0.16	0.13	0.11	10	09	08	07	06	06	05	05	05	05	04	04	04	
78" (1981)	0.36	0.24	0.18	0.14	0.12	0.10	09	08	07	06	06	05	05	04	04	04	04	04	04	
84" (2134)	0.33	0.22	0.17	0.13	0.11	0.09	07	07	06	06	05	05	04	04	04	04	04	04	03	
90" (2286)	0.31	0.21	0.16	0.12	0.10	0.08	07	06	06	05	05	04	04	04	04	04	04	03	03	
96" (2438)	0.29	0.19	0.14	0.12	0.10	0.08	07	06	06	05	05	04	04	04	04	04	03	03	03	

- DETERMINING PRESSURE DROP**
Use the Area Factor Table and Pressure Drop Chart to determine pressure drop through Ruskin CD/OD102 Dampers.
- Determine area factor for damper by entering the Area Factor Table through duct width and height.
 - Find the conversion velocity (CV) by multiplying the selected size damper's area factor by the flow rate in CFM.
 - Enter the Pressure Drop Chart at the determined area factor and proceed up to appropriate conversion velocity (CV) line. Then, read across to static pressure drop at left side of chart.
- Example:**
1. Find the pressure drop across an 18" wide x 18" high Model CD/OD102 Damper handling 8570 CFM. From the Area Factor Table, area factor is determined to be 38.
2. Therefore, CV (Conversion Velocity) = 8570 CFM x .58 = 5000. Use the Pressure Drop Chart, pressure drop = 28 inches water gage.
- NOTES:**
1. Ratings are based on AMCA Standard 500 using Test Setup Apparatus Figure 5.3 (damper is installed with duct upstream and downstream).
2. Static Pressure and Conversion Velocities are corrected to .075 lb./cu. ft. air density.



CD/OD102 PERFORMANCE DATA



The OD102 damper can be mounted in any position for fan discharge. Ideal for medium to heavy duty commercial or industrial applications, the OD102 can be used to control or modulate the volume of air delivered by the fan, to shut off fan air flow and to balance the system.

The graph shows the maximum allowable pressure differentials across a closed CD/OD102 damper. Dampers with a 60" (1524) width (A dimension) can withstand 9 in. w.g. Dampers with smaller widths (A dimension) can withstand higher pressures. For example, a 48" (1219) A dimension damper can withstand a maximum of 12 in. w.g. and a 36" (914) A dimension damper can withstand a maximum of 16" w.g.

Note that CD/OD102 dampers are not recommended for use in abrasive or high temperature atmospheres due to the aluminum blade construction. Consult your Ruskin representative for a listing of Ruskin models suited to abrasive environments.

TOTAL CFM LEAKAGE AT ONE INCH WATER GAGE STATIC PRESSURE DIFFERENTIAL (For Damper Equipped with Optional Seals)

DAMPER WIDTH	DAMPER HEIGHT															
	12"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	
12" (305)	15	23	30	38	45	53	60	68	75	83	90	98	105	113	120	
24" (610)	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	
36" (914)	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	
48" (1219)	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	
60" (1524)	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	

LEAKAGE CORRECTION FACTOR

Static Pressure (in. w.g.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Correction Factor	1.0	1.4	1.7	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.1	4.2	4.4	4.5

- DETERMINING LEAKAGE**
To determine leakage at static pressure differentials higher than one inch water gage, multiply leakage at one inch (determined from table) by correction factor for higher static pressure (determined from the Leakage Correction Factor Table).
- Example:**
Find leakage for a 36" wide x 24" high damper at 3 inches water gage. 48 CFM x 1.7 = 81.6 CFM leakage at 3 inches water gage.
- Leakage ratings are based on AMCA Standard 500 using Test Setup Apparatus Figure 5.3. Torque applied holding damper closed at 10 in. lbs. per sq. ft. of damper with minimum of 20 in. lbs.
- INSTALLATION**
For proper operation, damper must be installed square and free from racking. Opposed blade dampers must be operated from a power blade or drive axle.
- Dampers are designed for operation with blades running horizontally. Dampers to be installed with vertical blades require thrust collars be added at time of damper manufacture and at additional cost. Some standard features are not available with vertical bladed dampers.

CD102 SUGGESTED SPECIFICATION

Furnish and install, at locations shown in plans or in accordance with schedules, industrial grade control dampers meeting the following construction standards: Frames shall be minimum 8" deep x 2" flanged 12 gauge steel channel (203 x 51 x 2.8). The blades shall be maximum 7/16" (197) wide, minimum .080" (2) thick, 6063T5 extruded aluminum airfoil shaped with integral structural reinforcing tube running full length of each blade. Axles shall be minimum 3/4" (19) diameter with machined edge to provide positive locking connection to blades and linkage. Full round axles are not acceptable. Bearings shall be stainless steel sleeve pressed into frame. Linkage shall be located in jamb out of airstream and constructed of 10 gauge (3.5) galvanized steel clevis type arms, 3/16" x 3/8" (4.7 x 9.5) diameter stainless steel pivot pins with lock-type retainers.

Submittal must include leakage, pressure drop and maximum pressure data based on AMCA Publication 500 testing. Damper shall be Ruskin model CD102 Control Damper.

ADD TO SPECIFICATION IF REQUIRED:
Dampers shall be equipped with blade and jamb seals for low leakage application. Blade seals shall be extruded silicone rubber mechanically locked into extruded blade slots. Adhesive type seals are not acceptable. Jamb seals shall be flexible stainless steel located between blade edge and jamb for maximum sealing compression. Wind stop type seals are not acceptable.

OD102 SUGGESTED SPECIFICATION

Furnish and install, at locations shown in plans or in accordance with schedules, fan outlet dampers meeting the following construction standards: Frames shall be minimum 8" deep x 2" flanged 12 gauge steel channel (203 x 51 x 2.8). The blades shall be maximum 7/16" (197) wide, minimum .080" (2) thick, 6063T5 extruded aluminum airfoil shaped with integral structural reinforcing tube running full length of each blade. Axles shall be minimum 3/4" (19) diameter with machined edge to provide positive locking connection to blades and linkage. Full round axles are not acceptable. Bearings shall be stainless steel sleeve bolted to frame. Bearings pressed into frame are not acceptable. Linkage shall be located in jamb out of airstream and constructed of 10 gauge (3.5) galvanized steel clevis type arms, 3/16" x 3/8" (4.7 x 9.5) diameter stainless steel pivot pins with lock-type retainers.

Submittal must include leakage, pressure drop and maximum pressure data based on AMCA Publication 500 testing. Damper shall be capable of being mounted in any position for fan discharge and shall be capable of controlling or modulating the volume of air delivered by the fan, to shut off fan air flow and to balance the system. Damper shall be Ruskin model OD102 Control Damper.

ADD TO SPECIFICATION IF REQUIRED:
Dampers shall be equipped with blade and jamb seals for low leakage application. Blade seals shall be extruded silicone rubber mechanically locked into extruded blade slots. Adhesive type seals are not acceptable. Jamb seals shall be flexible stainless steel located between blade edge and jamb for maximum sealing compression. Wind stop type seals are not acceptable.

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FAX (816) 765-8955
www.ruskin.com

RUSKIN®

THIS SHEET FOR REFERENCE ONLY

ENGINEERING
CITY OF LOS ANGELES
Professional Engineer
Robert D. Gettler
No. M 30759
Exp. 09-30-22

BUREAU OF ENGINEERING
VERTICAL CONTROL SHEET TITLE
HORIZONTAL CONTROL SHEET TITLE
RUSKIN CBD6 BACKDRAFT DAMPER CUT SHEETS
RESEDA SKATE FACILITY
PROJECT: 18210 SHERMAN WAY, RESEDA, CA 91335
ADDRESS:

NO. REVISIONS

NO.	DATE	BY

CITY ENGINEER: GARY LEE MOORE, P. E.; ENV SP
DESIGN GROUP: RGETTER
ENGINEER: RGETTER
DESIGNED BY: JCHN
DRAWN BY: RHUBATCH
CHECKED BY: RHUBATCH
APPROVED BY: JCHN

CIP NO. INDEX NO.

CITY OF LOS ANGELES
WORK ORDER NO. E170121B

SHEET NAME: M-12
SHEET X OF X SHEETS



MODEL PBX

Heat Pump Water Heater

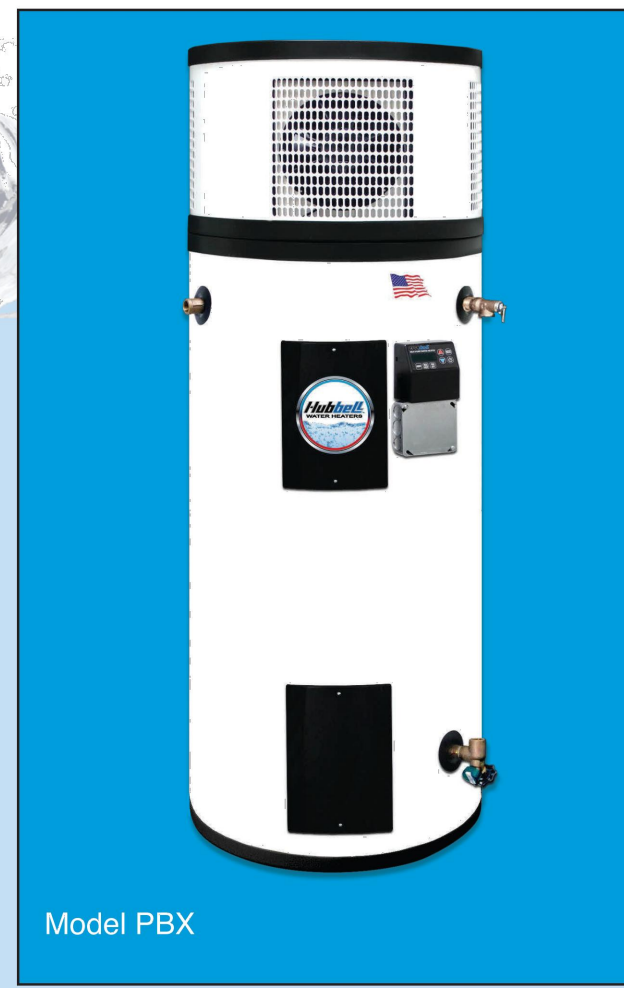
Fully Integrated Heat Pump Water Heater (HPWH)
40-119 Gallon Capacity

Features

- Highest Efficiency**
 - Heat Pump transfers heat from surrounding air into the hot water tank
 - Industry leading efficiency
 - Insulated with 3" thick CFC free polyurethane foam insulation to minimize stand-by heat loss
- Long Life**
 - Hydrastone Cement lining ensures long tank life
 - Proven Heat Pump technology
 - Incoloy Sheathed back-up electric heaters resist corrosion and mineral build up
- Simple Operation**
 - Fully Integrated water heater easily replaces a standard electric water heater
 - User friendly electronic controller simplifies operation, maintenance, and trouble shooting
 - Low maintenance design
 - Designed for simple installation and service by a professional plumber

APPLICATIONS

- Residential
- Restaurants
- Schools
- Office Buildings



A Long Lasting and Reliable Heat Pump Water Heater

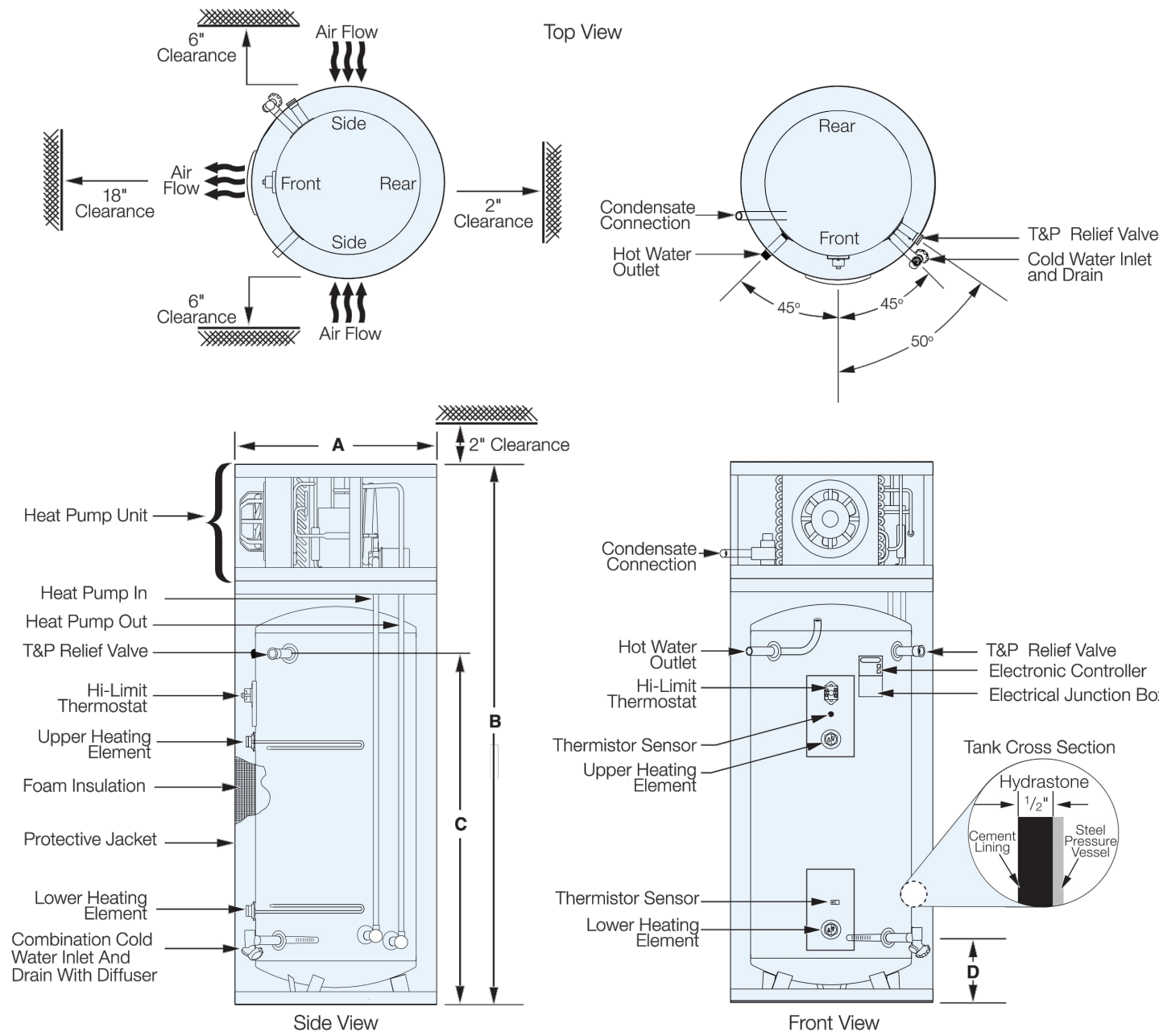
The Hubbell Model PBX water heater incorporates a number of features not found in other conventional heaters which makes it better suited to resist the highly corrosive effects of hot water. The heart of a Hubbell water heater is a superior storage vessel which utilizes a specially formulated Hydrastone cement lining, solid copper-silicon

threaded tank openings and a built-in heat trap device, all of which ensure a longer lasting and energy efficient water heater. When you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a long lasting, trouble-free water heater.



A High Efficiency Long Lasting Water Heater

Outline Dimensions



Dimensional Data

Storage Capacity (Gallons)	Base Model Number	Dimensions (Inches)				Shipping Weight (Lbs.)
		Overall Diameter "A"	Overall Height "B"	Floor to T&P and HW Outlet "C"	Floor to CW Inlet "D"	
40	PBX40SL	28	49	26	8	450
50	PBX50SL	25	66	43	8	500
65	PBX65SL	28	83	46	8	540
80	PBX80SL	28	73.5	50	8	615
119	PBX120SL	30	84	61	8	695



Cement Lined Tanks Provide Longer Service Life

Q? What is the most common reason why a water heater fails?

A! Failure of a tank's protective lining allows water to come into direct contact with the steel tank causing it to corrode and leak. Therefore, the type of protective lining is the single most important feature when determining the quality of any water heater. The ability of a lining to protect the steel tank is primarily based upon its thickness and complete coverage of all steel surfaces.

Two common internal tank linings are **Glass & Cement**.

Glass

Glass lining is approximately 5 mils (.005") thick & does not cover all internal surfaces. To compensate, all glass lined tanks require a sacrificial anode rod which must be periodically inspected and replaced.

Cement

Hydrastone cement lining is a minimum of 1/2" thick (100 times thicker than glass lining) and is guaranteed to uniformly cover 100% of all internal tank surfaces. The result is a significantly longer lasting tank which does not require a sacrificial anode.

Threaded tapping material is critical for tank longevity.

Glass lined tanks are constructed with regular steel tappings which are continuously attacked by corrosive hot water due to the lack of glass lining on the internal threads. The Hubbell Model PBX water heater tank is constructed with solid non-ferrous copper-silicon tank tappings which are impervious to the corrosive effects of hot water.

The Hubbell Model PBX is a longer lasting water heater based upon the construction features found in the Hydrastone cement lined storage tank and the result is that when you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a trouble-free and long lasting water heater.

Thickness

Each Hubbell Model PBX storage tank is lined with a minimum of 1/2" thick Hydrastone cement to ensure protection of the steel tank.

Coverage

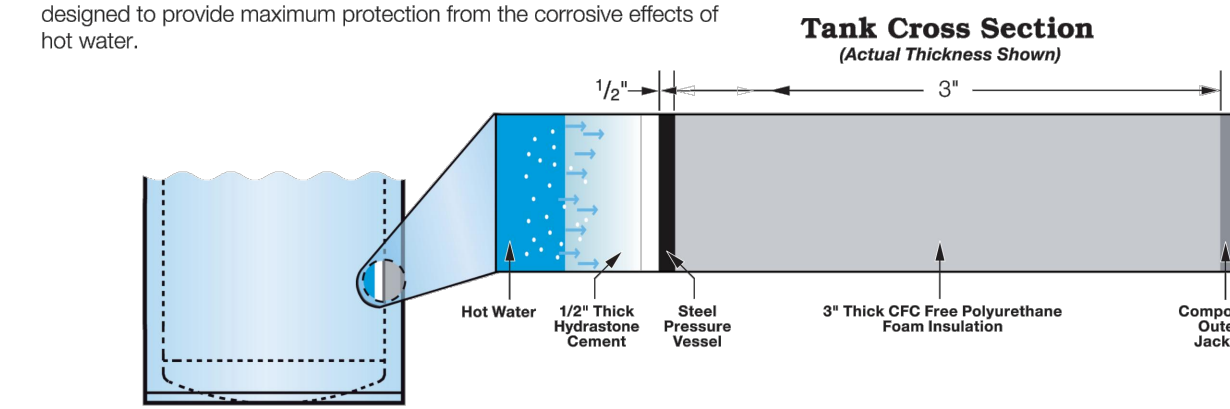
The Hydrastone cement lining covers a guaranteed 100% of all interior tank surfaces and is free from flaws or imperfections. Full coverage is achieved by injecting the precise amount of Hydrastone cement into each tank and then centrifugally spinning it at 250 RPM to ensure complete and uniform coverage of the lining on all interior surfaces.

Corrosion Resistance

Hydrastone cement is a specifically formulated high density lining designed to provide maximum protection from the corrosive effects of hot water.

Reduced Operating Costs

The Hubbell Model PBX water heater significantly reduces the total ownership cost of a water heater due to the longer life and maintenance-free benefits derived from a Hydrastone cement lined tank. Longer tank life is directly attributable to the unmatched tank protection provided by the Hydrastone cement lining and copper-silicon tappings. Additionally, the Model PBX reduces operating expenses by eliminating the periodic inspection and replacement costs associated with maintaining a sacrificial anode in a glass lined tank.



How the Hubbell Heat Pump Water Heater Works

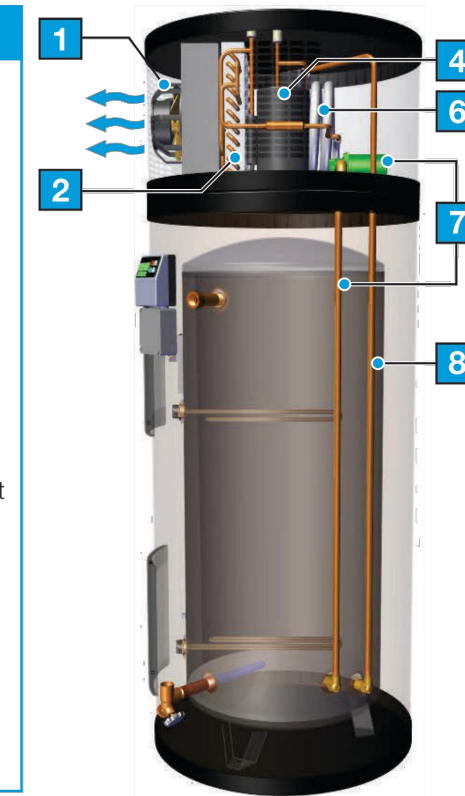
The Hubbell Model PBX Heat Pump Water Heater uses a small amount of electricity to transfer heat from the air to water. In comparison, traditional electric water heaters use resistive heating elements to directly heat water. The Hubbell Model PBX is significantly more energy efficient compared to a conventional electric water heater because less electricity is required for a heat pump water heater to produce the same amount of hot water as a traditional electric water heater.

Quite simply, a heat pump works like a refrigerator in reverse. A refrigerator moves heat from inside the refrigerator (making things cold) and transfers that heat energy to the surrounding room. A heat pump water heater on the other hand pulls free and essentially unlimited heat from the surrounding air and transfers that heat to the hot water stored in the tank.

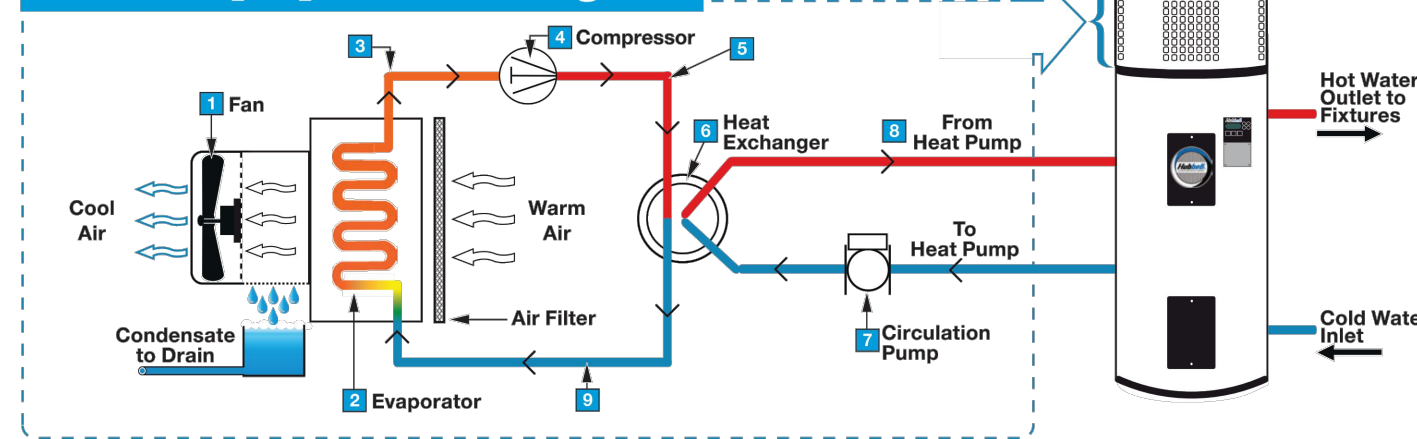
The Hubbell Model PBX Heat Pump Water Heater can pull heat out of air as cool as 40°F, and if it cannot provide enough heating capacity to meet demand, the water heater includes back-up resistive heating elements to ensure the unit provides sufficient hot water. The heat pump process of removing heat from the air and transferring it to the water results in the exhaust of cooler dryer air, with as much as 0.4 gallons per hour of "free" dehumidification provided by the heat pump when the unit is heating water.

Heat Pump Functions

- The built in fan draws room air into the water heater heat pump compartment and across an evaporator coil, and exhausts cooler and slightly dryer (dehumidified) air.
- The evaporator coil captures heat energy in the air and transfers that energy to a specially formulated CFC free refrigerant contained within the evaporator.
- The refrigerant changes from a liquid to a gas as it gets warmer.
- The refrigerant, now as a warm gas, exits the evaporator and passes into a compressor.
- The warm gas is compressed, causing it to become a superheated hot gas and then flows to the heat exchanger.
- The heat exchanger transfers heat energy from the superheated hot gas to the cold water from the tank.
- The pump circulates cold water from the tank through the heat exchanger resulting in a continuous transfer of heat energy from the superheated gas to the water.
- Hot water exits the heat exchanger and is stored in the tank.
- The superheated gas condenses back to a liquid and awaits to repeat the process.



Heat Pump Operational Diagram



Model PBX Water Heater Specifications

Tank: Hydrastone Cement Lined Steel	Hi-Limit: 190°F Manual Reset
Storage: 40, 50, 65, 80, 119 Gallons	Pressure Rating: 150 psi WP; 300 psi TP
Orientation: Vertical	First Hour Rating: (Gallons)
Volts: 208-240 Volt	PBX40SL: 46
Phase: 1-Ø	PBX50SL: 61
Frequency: 60 Hz	PBX65SL: 70
Inlet Size: 3/4" Female NPT	PBX80SL: 82
Outlet Size: 3/4" Male NPT	PBX120SL: 120
Drain Size: 3/4" GHT	Standby Heat Loss: (°F/hr)
Condensate Size: 1/2" Tube	PBX40SL: 0.45
Relief Valve Size: 3/4" Female NPT	PBX50SL: 0.38
Relief Valve Type: T&P, 210°F, 150 psi	PBX65SL: 0.35
Heat Pump: Refrigerant: R426A (CFC Free)	PBX80SL: 0.28
COP: 0	PBX120SL: 0.28
GWP: 1349	Energy Factor: 2.33
Over Pressure Safety: Manual Reset	COP: 2.36
Field Chargeable: No	Average Power Consumption:
Ambient Air: Air Flow (High Fan): 450 CFM	High Fan: 690 Watts
Air Flow (Low Fan): 250 CFM	Low Fan: 614 Watts
Air Filtration: Washable/Removable	Electric Elements: Incoloy Sheathed 3800 W @ 240V
Temperature Range: 40-110°F	Insulation: 3" Polyurethane Foam
Thermostat Range: 50-160°F (°F or °C) ± 3°F	Sound Level: 62db Average @ 3 Feet
Error Indication: Visual and Audible	Warranty: Tank: 10 Years
Demand Response Capable: Yes	Parts: 6 Years
Child Lock Capable: Yes	Approvals: cULus
	Jacket: High Impact Composite
	Color: White with Black Trim

Selectable Operating Modes

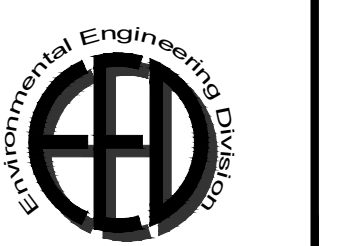
- Economy** This mode controls the heater such that the heat pump provides essentially all of the heating capacity. This is typically the lowest operating cost mode.
- Hybrid** This mode controls the heater in a way to optimize its efficiency and user experience and is the default setting. This mode operates the water heater such that the heat pump provides the vast majority of heating capacity and automatically switches to electric resistance heater mode only when necessary to meet high demand or to optimize efficiency.
- Electric** This mode controls the heater such that it only heats using the electric resistance heaters and operates as a traditional electric water heater. The heat pump will not operate in this mode.
- Super** This mode controls the heater such that both the heat pump and the electric resistance elements can operate simultaneously. This mode provides the fastest recovery option possible by providing heating capacity from both the heat pump and the electric resistance heaters at the same time.
- Vacation** This mode prevents the heater from heating (regardless of what mode it is in) as a way to improve efficiency during long periods of no usage (i.e. vacation). In this mode the only time the heater will heat is if the unit is in danger of freezing. The user sets the number of days to be in vacation mode (adjustable from 2 to 99 days or Off), and the unit resumes its previous mode of operation at the end of this period.

Temporary Modes

- Max Heat** Simply pressing one button maximizes heating capacity by temporarily putting the heater into super mode.
- Fan Off** Simply pressing one button temporarily lowers the fan speed which reduces the airflow and minimizes operating noise. Pressing the button twice turns the fan off for a user adjustable time period.



ENGINEERING



10/31/2021
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BUREAU OF ENGINEERING
 HEAT PUMP WATER HEATER CUT SHEET
 RESEDA SKATE FACILITY
 18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS
 GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP

WORK ORDER NO. E170121B
 SHEET NAME M-12
 SHEET X OF X SHEETS

REVISION DATE (SEE REVISION TABLE) (DESIGN STAGE ONLY)
 THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
 SHEET VERSION 4.0

Hubbell™ MODEL PBX Heat Pump Water Heater

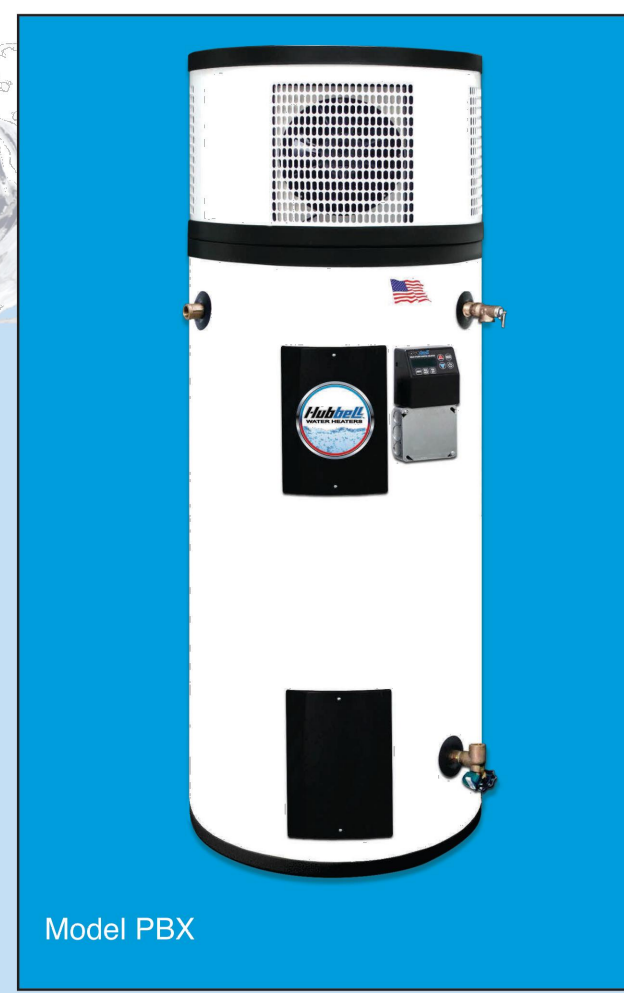
Fully Integrated Heat Pump Water Heater (HPWH) 40-119 Gallon Capacity

Features

- Highest Efficiency**
 - Heat Pump transfers heat from surrounding air into the hot water tank
 - Industry leading efficiency
 - Insulated with 3" thick CFC free polyurethane foam insulation to minimize stand-by heat loss
- Long Life**
 - Hydrastone Cement lining ensures long tank life
 - Proven Heat Pump technology
 - Incoloy Sheathed back-up electric heaters resist corrosion and mineral build up
- Simple Operation**
 - Fully integrated water heater easily replaces a standard electric water heater
 - User friendly electronic controller simplifies operation, maintenance, and trouble shooting
 - Low maintenance design
 - Designed for simple installation and service by a professional plumber

APPLICATIONS

- Residential
- Restaurants
- Schools
- Office Buildings



Model PBX



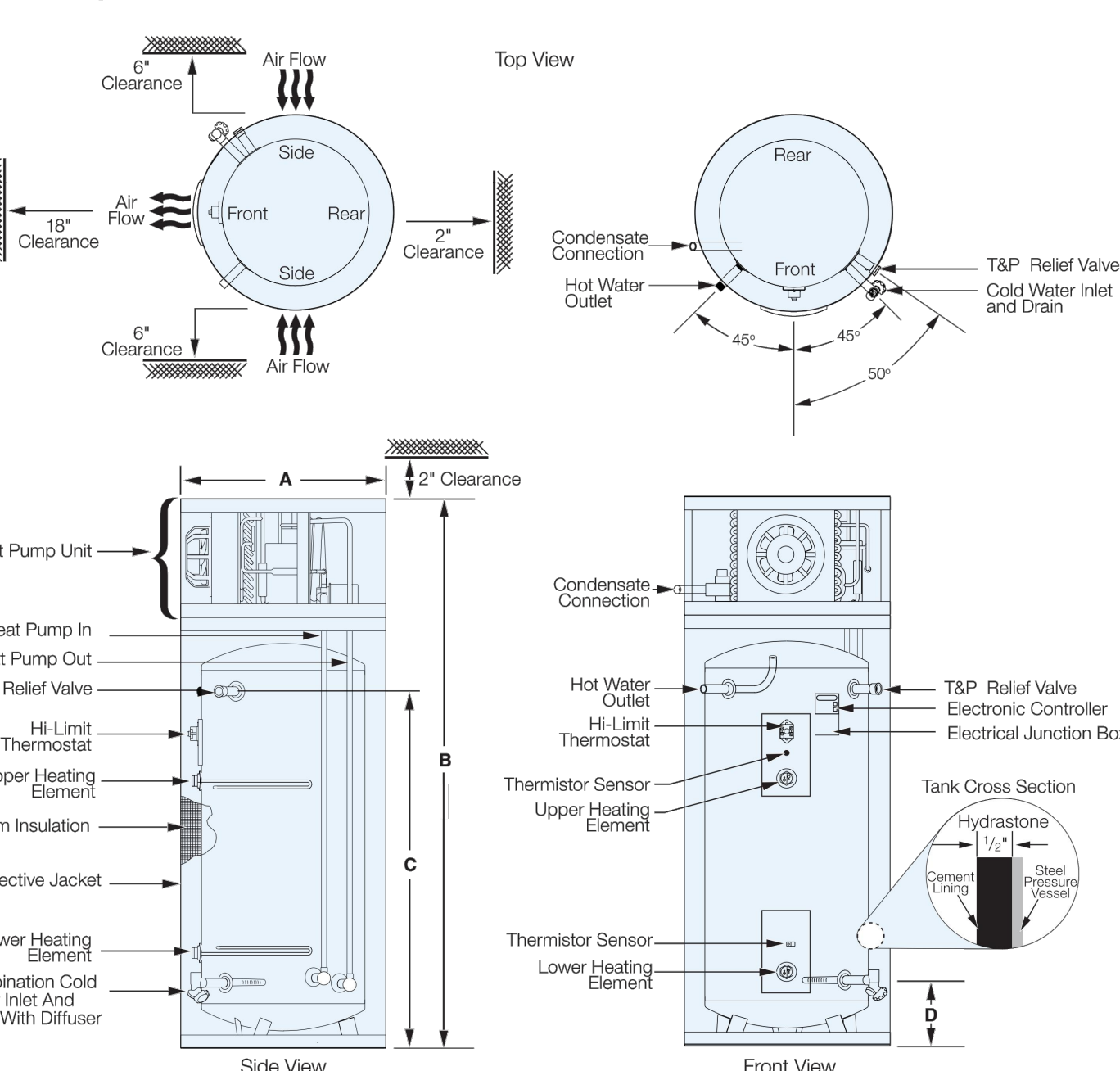
A Long Lasting and Reliable Heat Pump Water Heater

The Hubbell Model PBX water heater incorporates a number of features not found in other conventional heaters which makes it better suited to resist the highly corrosive effects of hot water. The heart of a Hubbell water heater is a superior storage vessel which utilizes a specially formulated Hydrastone cement lining, solid copper-silicon threaded tank openings and a built-in heat trap device, all of which ensure a longer lasting and energy efficient water heater.

When you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a long lasting, trouble-free water heater.

Hubbell™ A High Efficiency Long Lasting Water Heater

Outline Dimensions



Dimensional Data

Storage Capacity (Gallons)	Base Model Number	Dimensions (Inches)			Shipping Weight (lbs.)
		Overall Diameter "A"	Overall Height "B"	Floor to T&P and RW Outlet "C"	
40	PBX40SL	28	49	26	450
50	PBX50SL	28	66	43	500
65	PBX65SL	28	83	40	540
80	PBX80SL	28	73.5	50	615
119	PBX120SL	30	84	61	695

Cement Lined Tanks Provide Longer Service Life

Q What is the most common reason why a water heater fails?

A Failure of a tank's protective lining allows water to come into direct contact with the steel tank causing it to corrode and leak.

Therefore, the type of protective lining is the single most important feature when determining the quality of any water heater. The ability of a lining to protect the steel tank is primarily based upon its thickness and complete coverage of all steel surfaces.

Two common internal tank linings are Glass & Cement.

Glass Glass lining is approximately 5 mils (.005") thick & does not cover all internal surfaces. To compensate, all glass lined tanks require a sacrificial anode rod which must be periodically inspected and replaced.

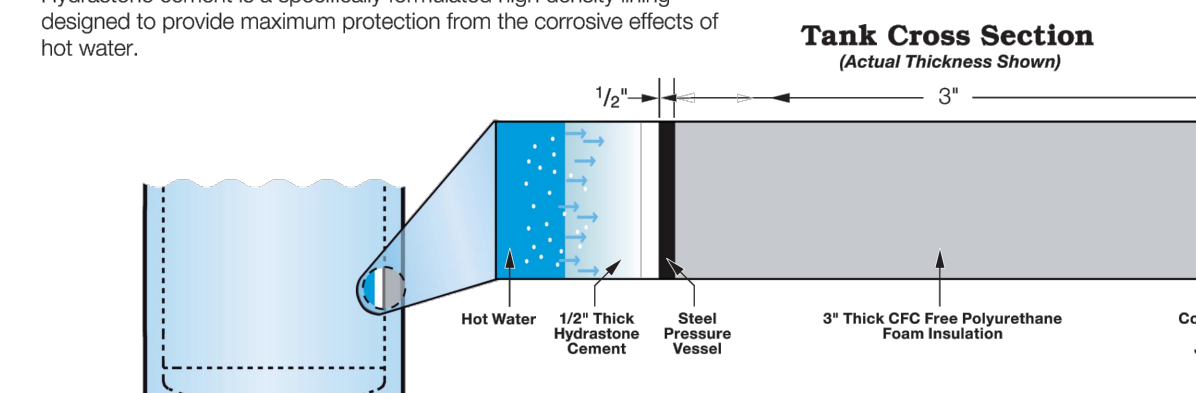
Cement Hydrastone cement lining is a minimum of 1/2" thick (100 times thicker than glass lining) and is guaranteed to uniformly cover 100% of all internal tank surfaces. The result is a significantly longer lasting tank which does not require a sacrificial anode.

Threaded tapping material is critical for tank longevity.

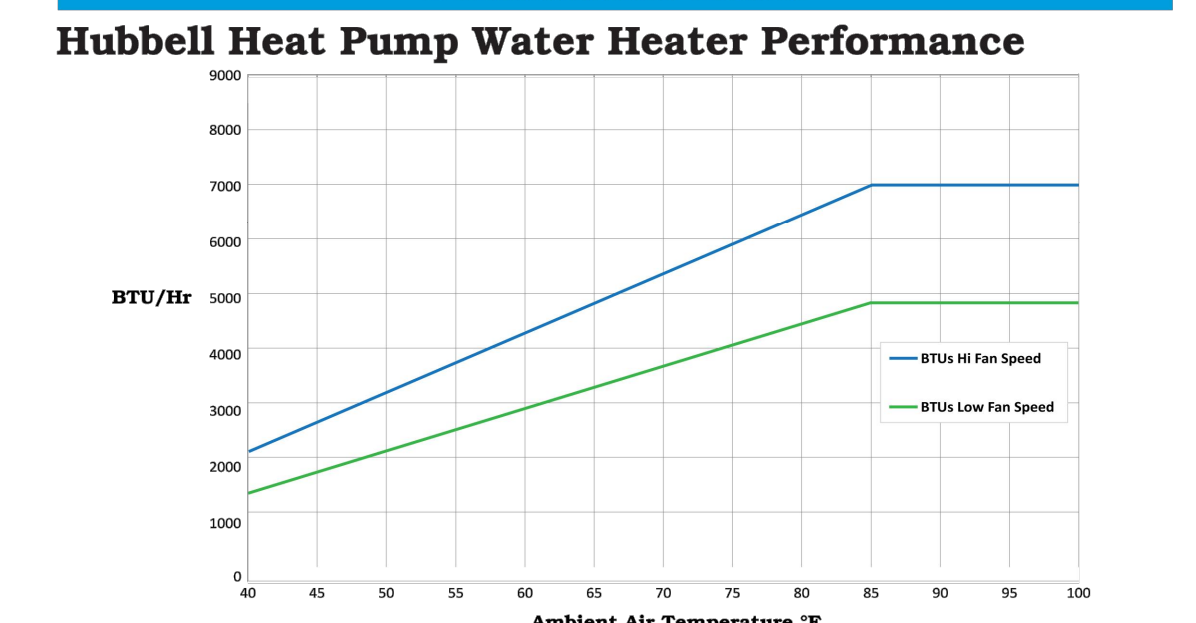
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The Hubbell Model PBX is a longer lasting water heater based upon the construction features found in the Hydrastone cement lined storage tank and the result is that when you specify and install a Hubbell Model PBX, you will have confidence in knowing that the owner will be provided with a trouble-free and long lasting water heater.

- Thickness** Each Hubbell Model PBX storage tank is lined with a minimum of 1/2" thick Hydrastone cement to ensure protection of the steel tank.
- Coverage** The Hydrastone cement lining covers a guaranteed 100% of all interior tank surfaces and is free from flaws or imperfections. Full coverage is achieved by injecting the precise amount of Hydrastone cement into each tank and then centrifugally spinning it at 250 RPM to ensure complete and uniform coverage of the lining on all interior surfaces.
- Corrosion Resistance** Hydrastone cement is a specially formulated high density lining designed to provide maximum protection from the corrosive effects of hot water.
- Reduced Operating Costs** The Hubbell Model PBX water heater significantly reduces the total ownership cost of a water heater due to the longer life and maintenance-free benefits derived from a Hydrastone cement lined tank. Longer tank life is directly attributable to the unmatched tank protection provided by the Hydrastone cement lining and copper-silicon tappings. Additionally, the Model PBX reduces operating expenses by eliminating the periodic inspection and replacement costs associated with maintaining a sacrificial anode in a glass lined tank.



Performance Chart



Energy Consumption Chart

Ambient Air Temperature	Energy Factor (EF)	Coefficient of Performance (COP)	Annual Energy Consumption and Operating Cost in Various Operating Modes							
			Economy	Hybrid	Electric	Super				
50°F	1.39	1.42	3159	\$336	3159	\$336	4671	\$497	4368	\$465
70°F	2.33	2.36	1884	\$201	1884	\$201	4671	\$497	3851	\$410
90°F	3.07	3.07	1430	\$152	1430	\$152	4671	\$497	3527	\$376

Energy Factor and Average Annual Operating Costs based on 2007 D.O.E. (Department of Energy) test procedures. D.O.E. national average fuel rate electricity 10.65¢/KWH. Energy Factor (EF) based upon heater operating in Hybrid mode.

Recovery Rating Chart

Ambient Air Temp	Continuous Recovery Rating (GPH) in Various Operating Modes										
	Economy	Hybrid	Electric	Super	Economy	Hybrid	Electric	Super			
50°F	6.5	5.6	4.9	25.9	22.2	19.4	25.9	22.2	19.4	27.8	24.3
70°F	10.9	9.4	8.2	25.9	22.2	19.4	25.9	22.2	19.4	36.8	31.6
90°F	14.2	12.2	10.6	25.9	22.2	19.4	25.9	22.2	19.4	40.1	34.4

Continuous Recovery rating based upon 240V power supplied to heater and fan operating in high speed mode. ΔT represents the °F temperature rise for hot water.

Heating Chart

Ambient Air Temp	BTU/Hr Rating in Various Operating Modes			
	Economy	Hybrid	Electric	Super
50°F	3,240	12,965	12,965	16,205
70°F	5,400	12,965	12,965	18,365
90°F	7,020	12,965	12,965	19,985

Heating Capacity based on 240V power to heater and fan operating in high speed mode.

How the Hubbell Heat Pump Water Heater Works

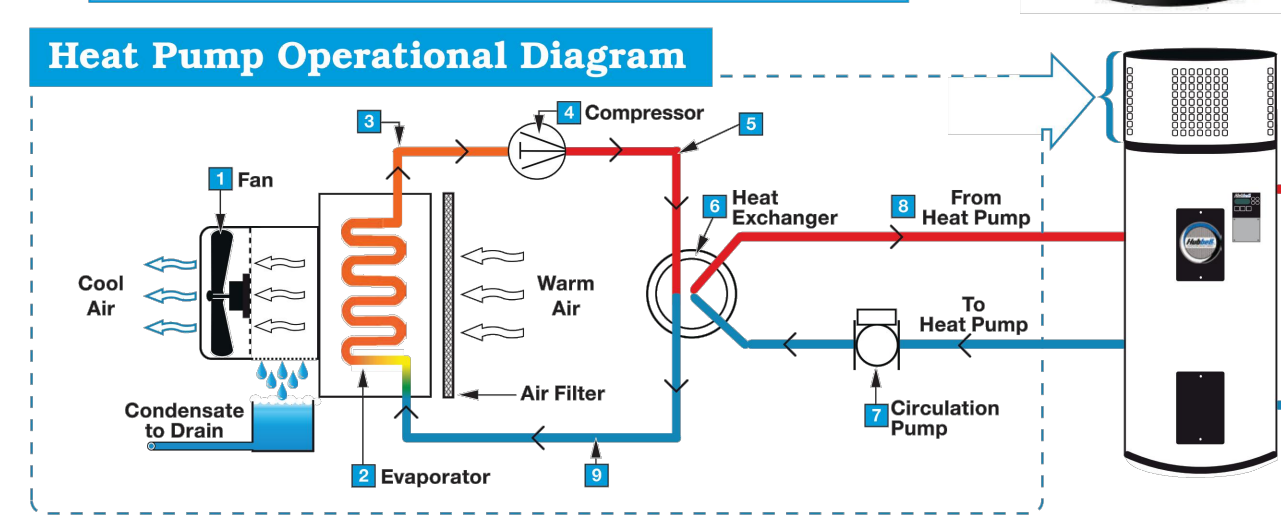
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Quite simply, a heat pump works like a refrigerator in reverse. A refrigerator moves heat from inside the refrigerator (making things cold) and transfers that heat energy to the surrounding room. A heat pump water heater on the other hand pulls free and essentially unlimited heat from the surrounding air and transfers that heat to the hot water stored in the tank.

The Hubbell Model PBX Heat Pump Water Heater can pull heat out of air as cool as 40°F, and if it cannot provide enough heating capacity to meet demand, the water heater includes back-up resistive heating elements to ensure the unit provides sufficient hot water. The heat pump process of removing heat from the air and transferring it to the water results in the exhaust of cooler dryer air, with as much as 0.4 gallons per hour of "free" dehumidification provided by the heat pump when the unit is heating water.

Heat Pump Functions

- The built in fan draws room air into the water heater heat pump compartment and across an evaporator coil, and exhausts cooler and slightly dryer (dehumidified) air.
- The evaporator coil captures heat energy in the air and transfers that energy to a specially formulated CFC free refrigerant contained within the evaporator.
- The refrigerant changes from a liquid to a gas as it gets warmer.
- The refrigerant, now as a warm gas, exits the evaporator and passes into a compressor.
- The warm gas is compressed, causing it to become a superheated hot gas and then flows to the heat exchanger.
- The heat exchanger transfers heat energy from the superheated hot gas to the cold water from the tank.
- The pump circulates cold water from the tank through the heat exchanger resulting in a continuous transfer of heat energy from the superheated gas to the water.
- Hot water exits the heat exchanger and is stored in the tank.
- The superheated gas condenses back to a liquid and awaits to repeat the process.



Amperage Chart

Supply Voltage	Total Maximum AMP Draw in Various Operating Modes			
	Economy	Hybrid	Electric	Super
240V	2.6	15.8	15.8 (3850 Watts)	18.4
220V	2.8	14.5	14.5 (3200 Watts)	17.3
208V	3.0	13.7	13.7 (2850 Watts)	16.7

Over current circuit protection rated minimum 25 amp required, reference all local, state and national codes.

VARIABLES TO SOLVE FOR:

- Solve for the unknown using the formulas stated below.
- BTU/Hr Requirement:** $GPH \times \Delta T \times 8.33 = BTU/Hr$
 - Temperature Rise:** $BTU/Hr \div 8.33 \div GPH = \Delta T$
 - Flow Rate:** $BTU/Hr \div 8.33 \div \Delta T = GPH$

ELECTRICAL

Watts = Amps 1 Φ Watts = Amps 3 Φ

Installation Requirements

Installed location must be at least a 10' x 10' x 7' room (700 cubic feet of air space). If smaller, there must be lower installed to provide sufficient airflow.

Installed room location must not be cooler than 40°F.

Installed locations with warmer ambient air temperature (i.e. furnace room) provides abundant "free" heat and is advantageous.

The heat pump dehumidifies the air and as a result produces condensate which must be piped to drain or outdoors.

The washable air filter requires periodic cleaning. Frequency depends upon environmental conditions.

OPTIONAL EQUIPMENT

- 1 1/2" Male NPT inlet and outlet water connections
- 2 Solid (Copper-Alloy, Type 304L, Type 316L stainless steel) storage tank for maximum life
- 3 Tank installed heat exchanger for use with solar or radiant heating systems
- 4 ASME tank construction
- 5 Alternate voltages (1 or 3 phase), alternate wattages or 50 Hz available. Please consult factory
- 6 Condensate removal pump (120V plug-in) to remove and lift condensate to drain

Please note: optional equipment may impact overall dimensions and weight. Please request additional drawing from factory.

Metric Conversions

Liters x 0.2641 = Gallons	*F = (°C x 1.8) + 32	kPa x 0.1456 = psi
Gallons x 3.79 = Liters	*C = (°F - 32) x 0.556	Lbs x 0.4536 = Kg
Gallons x 0.003785 = m³	psi x 0.06896 = Bar	Kg x 2.2 = Lbs
m³ x 264.2 = Gallons	Bar x 14.5 = psi	BTU/Hr + 3412 = kW-Hr
1°C ΔT = 1.8°F ΔT	psi x 6.86 = kPa	kW-Hr x 3412 = BTU/Hr

Model PBX Water Heater Specifications

Tank: Hydrastone Cement Lined Steel	HI-Limit: 190°F Manual Reset
Storage: 40, 50, 65, 80, 119 Gallons	Pressure Rating: 150 psi WP, 300 psi TP
Orientation: Vertical	First Hour Rating: (Gallons)
Phases: 208-240 Volt	PBX40SL: 45
Frequency: 60 Hz	PBX50SL: 61
Inlet Size: 3/4" Male NPT	PBX65SL: 70
Outlet Size: 3/4" Male NPT	PBX80SL: 82
Drain Size: 3/4" GHT	PBX120SL: 120
Condensate Size: 1/2" Tube	Standby Heat Loss: (°F/hr)
Relief Valve Size: 3/4" Female NPT	PBX40SL: 0.45
Relief Valve Type: T&P, 210°F, 150 psi	PBX50SL: 0.36
Heat Pump: Refrigerant: R426A (CFC Free)	PBX65SL: 0.35
COP: 0	PBX80SL: 0.28
Over Pressure Safety: Manual Reset	PBX120SL: 0.28
Field Chargeable: No	Energy Factor: 2.33
Ambient Air: Air Flow (High Fan): 450 CFM	COP: 2.36
Air Flow (Low Fan): 250 CFM	Average Power Consumption:
Air Filtration: Washable/Removable	High Fan: 690 Watts
Temperature Range: 40-110°F	Low Fan: 614 Watts
Thermostat Range: 50-100°F (F or °C) ± 3°F	Electric Elements: Incoloy Sheathed 3800 W @ 240V
Error Indication: Visual and Audible	Insulation: 3" Polyurethane Foam
Demand Response Capable: Yes	Sound Level: 62db Average @ 3 Feet
Child Lock Capable: Yes	Warranty:
	Tank: 10 Years
	Parts: 6 Years
	Approvals: cULus
	Jacket: High Impact Composite
	Color: White with Black Trim

Selectable Operating Modes

- Economy** This mode controls the heater such that the heat pump provides essentially all of the heating capacity. This is typically the lowest operating cost mode.
- Hybrid** This mode controls the heater in a way to optimize its efficiency and user experience and is the default setting. This mode operates the water heater such that the heat pump provides the vast majority of heating capacity and automatically switches to electric resistance heater mode only when necessary to meet high demand or to optimize efficiency.
- Electric** This mode controls the heater such that it only heats using the electric resistance heaters and operates as a traditional electric water heater. The heat pump will not operate in this mode.
- Super** This mode controls the heater such that both the heat pump and the electric resistance elements can operate simultaneously. This mode provides the fastest recovery option possible by providing heating capacity from both the heat pump and the electric resistance heaters at the same time.
- Vacation** This mode prevents the heater from heating (regardless of what mode it is in) as a way to improve efficiency during long periods of no usage (i.e. vacation). In this mode the only time the heater will heat is if the unit is in danger of freezing. The user sets the number of days to be in vacation mode (adjustable from 2 to 99 days or Off), and the unit resumes its previous mode of operation at the end of this period.

Temporary Modes

- Max Heat** Simply pressing one button maximizes heating capacity by temporarily putting the heater into super mode.
- Fan Off** Simply pressing one button temporarily lowers the fan speed which reduces the airflow and minimizes operating noise. Pressing the button twice turns the fan off for a user adjustable time period.

Master Specification: Model PBX

JOB NAME _____	ENGINEER / ARCHITECT _____
REPRESENTATIVE _____	CONTRACTOR _____

GENERAL

Provide a quantity of _____ high efficiency heat pump electric water heater(s) Model No. _____ as manufactured by HUBBELL Electric Heater Co., Stratford, CT. The entire unit is to be complete with all operating controls and require only plumbing and electrical service connections. The tank shall be all welded steel commercial construction designed for 150 psi working pressure and contain (40, 50, 65, 80, 119) gallons of storage. The tank is to be lined with seamless Hydrastone cement to a minimum thickness of 1/2" on 100% of all interior tank surfaces and does not require any type of sacrificial anode. The tank shall be designed and fabricated with non-ferrous copper-silicon threaded tappings and non-ferrous inlet and outlet piping for maximum corrosion resistance. Steel tank tappings will not be acceptable. The entire tank is to be insulated with a minimum of 3" thick CFC free polyurethane foam insulation that exceeds the latest ASHRAE standard for stand-by heat loss. The complete heater shall be supplied with a high impact colored composite protective jacket which cannot rust or corrode and does not require painting. The unit shall bear the cULus listing mark certifying the entire water heater.

The cold water inlet shall be 3/4" Female NPT (Optional Specification: 1 1/2" Male NPT) and include a non-corrosive strata-flow diffuser which prevents incoming cold water from mixing too rapidly with hot water in the tank. A 3/4" hose connection drain is supplied. The hot water outlet shall be 3/4" Male NPT (Optional Specification: 1 1/2" Male NPT) and shall include a factory installed built-in heat trap to prevent water from radiating through the piping during stand-by periods. A 3/4" tube condensate connection shall be provided for connection to suitable drain. A separate 3/4" Female NPT tapping is to be provided for relief valve installation. An ASME/CSA rated automatic reseating combination temperature and pressure safety relief valve set at 150 psi and 210°F shall be factory supplied.

HEATING CAPABILITY

The water heater shall be factory integrated with a built in air to water heat pump module rated to provide up to 7000 BTU/Hr heating capacity. The heat pump shall be capable of operating in ambient air temperature as low as 40°F and must be installed in a 10' x 10' x 7' room (700 FT³), or if smaller, lovers shall be provided sufficiently sized to allow 450 CFM air flow. The fan shall be two speed type in order to optimize efficiency and minimize airflow when desired. The refrigerant shall be CFC free environmentally friendly R426A. The heat exchanger shall be non ferrous construction rated for 150psi WP. Two incoloy sheathed immersion electric resistance heating elements rated 3800 watts each at 240 volt 1 phase (Optional Specification: Watts, Volts, Phase, Hz) shall be installed in the storage tank to provide back up heating capability. An integrated electronic controller with digital display shall provide the user interface and shall display operating and service information.

In addition, the water heater shall be supplied with the following optional features:

- Option _____
- Option _____
- Option _____

Hubbell shall warranty all electrical components against defects in workmanship and material for a period of one (1) year from date of start-up, all heat pump components for six (6) years and the pressure vessel for ten (10) years from date of start-up, provided that the unit is started within three (3) months of date of shipment and installed and operated within the scope of the tank design and operating capacity. Each water heater shall be shipped with a complete set of installation and operating instructions including spare parts list and approved drawings.



The Electric Heater Company • P.O. Box 288 • Stratford, CT 06615-0288 • Phone: 203-378-2659 • Fax: 203-378-3593 info@hubbellheaters.com • www.hubbellheaters.com

Rev. E

ENGINEERING
CITY OF LOS ANGELES

Professional Engineering Seal
ROBERT D. GETTY
No. M 30752
Exp. 09-30-22
11/17/2021

BUREAU OF ENGINEERING
HEAT PUMP WATER HEATER CUT SHEET
RESEDA SKATE FACILITY
18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS
DATE: BY:
REVISIONS:
CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
ENGINEER: RGETTER
DESIGNED BY: JX
DRAWN BY: JCHN
CHECKED BY: RHUBATCH
APPROVED BY: JX

CITY OF LOS ANGELES
SHEET NAME: M-13
SHEET X OF X SHEETS

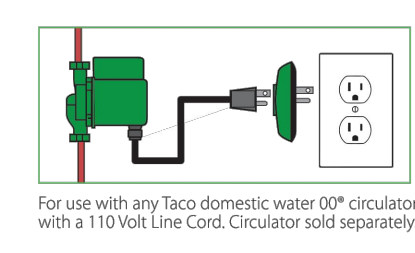
REVISION DATE (SEE REVISIONS) (DESIGN STAGE ONLY) A B C D E F G H I J K

Plumbing Application & Benefits

SmartPlug Instant Hot Water Control® — SP115-1
The patented SmartPlug lets you upgrade any hot water recirculation pump with a power cord to "Smart" operation.



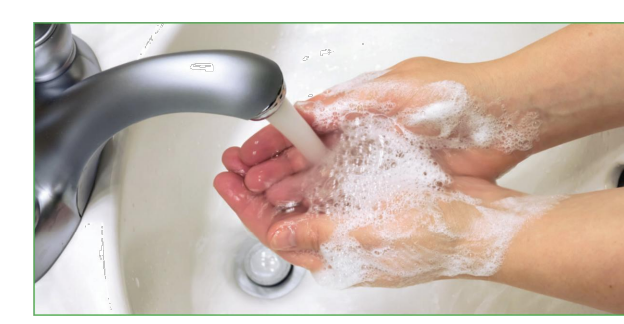
U.S. Pat# 8,594,853 and 9,207,682



For use with any Taco domestic water DP circulator with a 110Volt Line Cord. Circulator sold separately.



Effective Date: 12/21/16 Printed in USA



Application: The Taco SmartPlug is designed to upgrade any hot water recirculation system. SmartPlug replaces inefficient timers and aquastats typically used in recirculation systems.

- Benefits:
• Easy to install: Upgrades any recirculation pump to "Smart" operation.
• Water conservation: The average residence can save up to 12,000 gallons* of water per year by eliminating the wait for hot water to arrive at fixtures and taps.
• Comfort and convenience: Hot water is available in seconds. No timers or programming required.
• Efficiency: "Smart" setting maximizes hot water comfort and energy savings.
• Reliability: The SmartPlug, when combined with a Taco domestic hot water circulator, provides whisper quiet operation and industry leading electronics for proven performance and dependability.

SmartPlug Control Options / Features:
"Smart" Mode: When set to "Smart" mode, the SmartPlug monitors and records the home's hot water usage pattern over a 7 day period.

"Pulse" Mode: When set to "Pulse" mode, the SmartPlug will continuously cycle the circulator ON for 5 minutes, then OFF for 10 minutes to maintain hot water at all fixtures.

Vacation Mode: After 36 hours of no hot water usage, the SmartPlug will automatically turn the circulator OFF and remain off until hot water usage is detected.

Exercise Function: While in vacation mode the SmartPlug will cycle the circulator for 10 seconds every 7 days to prevent any corrosion or scale build up.

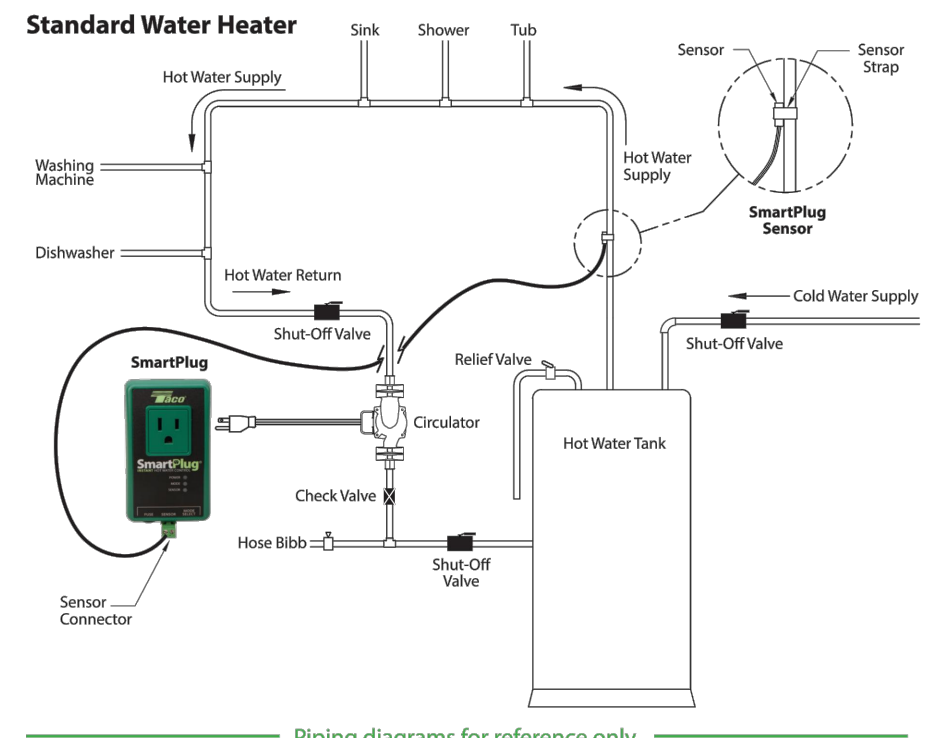


LED Indicator lights: Green: Power Yellow: Mode Setting Red: Error code diagnostics

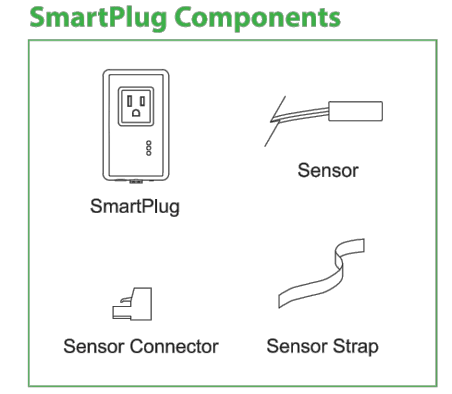
* Source: Department of Energy study

Submittal Data #101-179 Supersedes: 10/14/16 Effective: 12/21/16

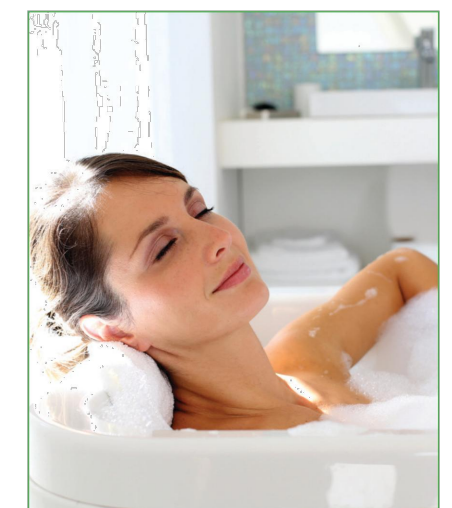
Submittal Data Information SmartPlug Instant Hot Water Control®



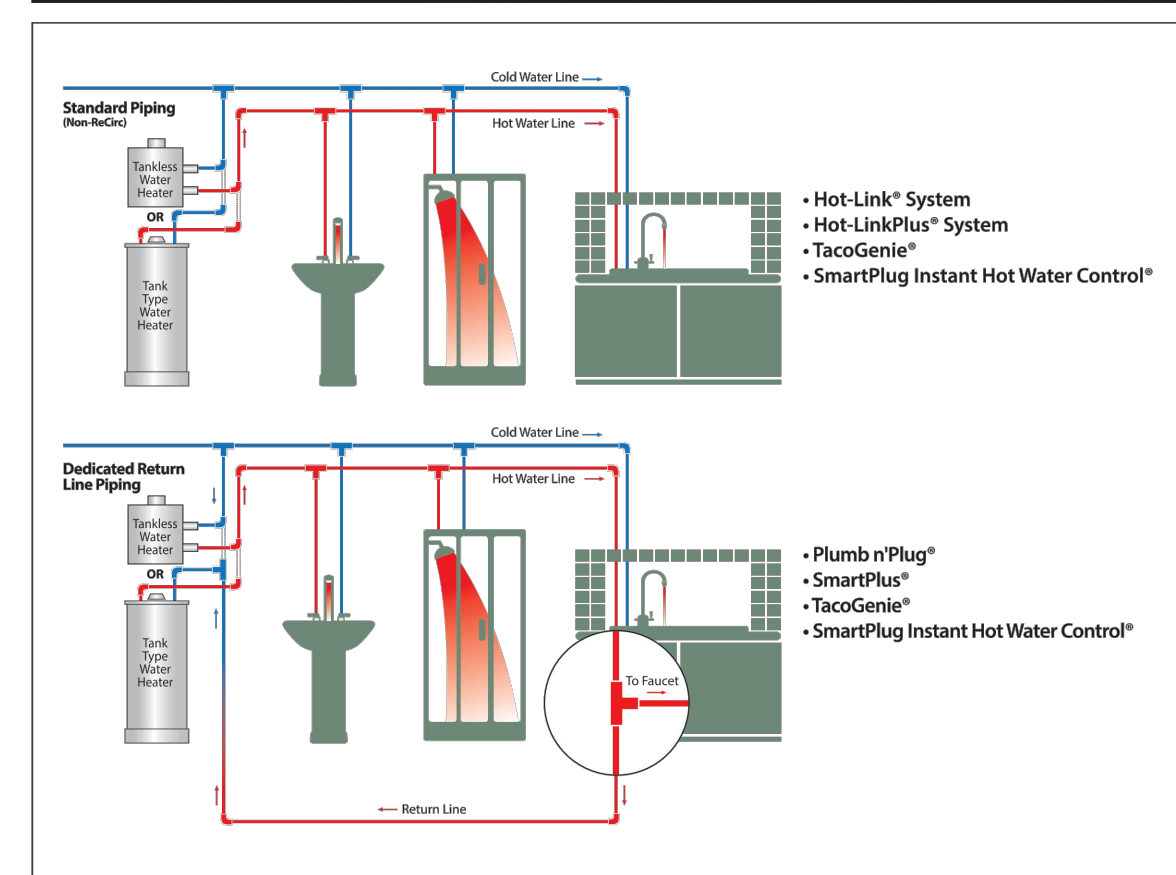
- Specifications:
• Input: 120VAC, 50/60HZ, single phase, 6A
• Output: 120VAC, 50/60HZ, Single phase, 1/2 hp (limited to 6 FLA, 36LRA)
• Sensor: NTC Thermistor, 10K ohm @ 77°F, B= 3392
• Fuse: 125V, 6A, Medium Acting 5x20 mm glass, Littelfuse® p/n 0233006 mxp
• Ambient Operating Temp: 50-104°F, 10-40°C



UL US FOR INDOOR USE ONLY



Taco offers a full line of Hot Water Recirculation Products



Taco Inc., 1160 Cranston Street, Cranston, RI 02920 / (401) 942-8000 / Fax (401) 942-2360

FlowCo™ Specifications Electric Tankless Water Heater

- Applications:
• Handwashing
• Kitchen/bar/utility sinks
• Fixed-flow
• Designed for a single sensor faucet or meter faucet



- Performance Features:
• Self-diagnostics
• Intelligent controls
• InfoCue - visible LED indicator
• SafeStart™ technology
• Mounts in any orientation
• Compact size
• Only one cold water line needed for installation
• No T&P relief valve needed (check local codes)
• Integral 3/8" compression fittings
• Control system activates heater only on demand
• Bare wire technology
• High temperature limit switch (ECO - automatic energy cut-off)
• Low activation flow starting at 0.25 GPM turn on (model dependent)
• Warranty, five (5) years limited on leaks, one (1) year parts

Note: For optimum performance, mounting location should be within 2 feet of fixture.

- Benefits:
• Endless hot water - no storage capacity to run out
• Fits almost anywhere; suitable for ADA compliant facilities
• Save water and time by installing unit at point-of-use to eliminate long pipe runs
• Reduces installation cost and materials
• Cut energy waste (no standby heat loss)
• No venting
• Purge technology engages upon start-up to avoid dry-fire occurrence
• Easy, flexible installation
• Ready out of the box
• Over temperature protection
• Real-time response to flow
• Operation feedback via an intuitive LED indicator
• Blinking patterns indicate system status

Special Design Service: Inquiries for units for unique applications are welcome. Call our Technical Service department at 1-800-543-6163.

Suggested Specification: Replace suggested spec text on PDF w/ the following: Tankless water heater shall be an Eemax model number SPEX...

System Specifications: Dimensions: 10.5" H x 5.25" W x 3" D Product Weight (model dependent): 2.75 lb/3 lb Cover: ABS UL 94 V0A Color: White Minimum Operating Pressure: 30 PSI Maximum Operating Pressure: 150 PSI Element: Replaceable nichrome cartridge insert Fittings: 3/8" compression fittings U.S. Patent Pending Technology

Eemax 400 Captain Neville Drive, Waterbury, CT 06705 (800) 543-6163 | info@eemaxinc.com | www.eemax.com

FlowCo™ Specifications Electric Tankless Water Heater

Table with columns: MODEL NUMBER, MW, AMPS, WIRE SIZE, TURN ON GPM, TEMPERATURE RISE °F, and various flow rate/temperature rise data points.

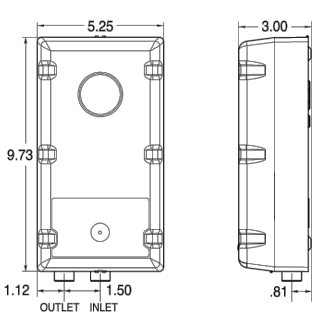


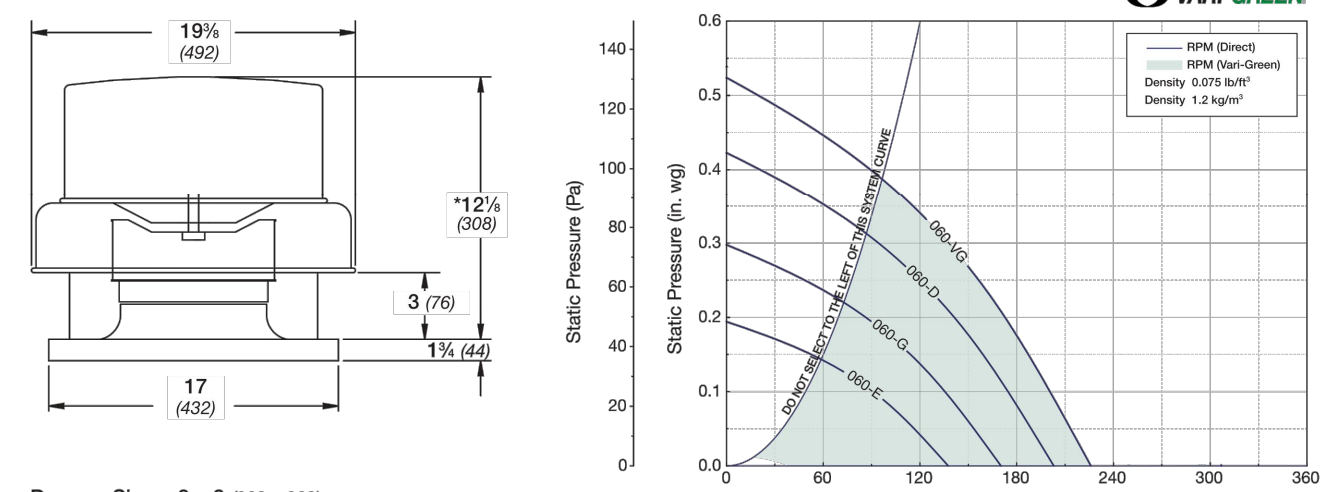
Table with columns: MODEL NUMBER, MW, AMPS, WIRE SIZE, TURN ON GPM, TEMPERATURE RISE °F, and various flow rate/temperature rise data points.

Eemax 400 Captain Neville Drive, Waterbury, CT 06705 (800) 543-6163 | info@eemaxinc.com | www.eemax.com

THIS SHEET FOR REFERENCE ONLY

Engineering stamps and project information including: ENGINEERING CITY OF LOS ANGELES, BUREAU OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS, CITY ENGINEER GARY LEE MOORE, P.E., ENV SP DESIGN GROUP, WORK ORDER NO. E170121B, SHEET M-14 OF X SHEETS.

Roof Downblast Exhaust Size-060: G

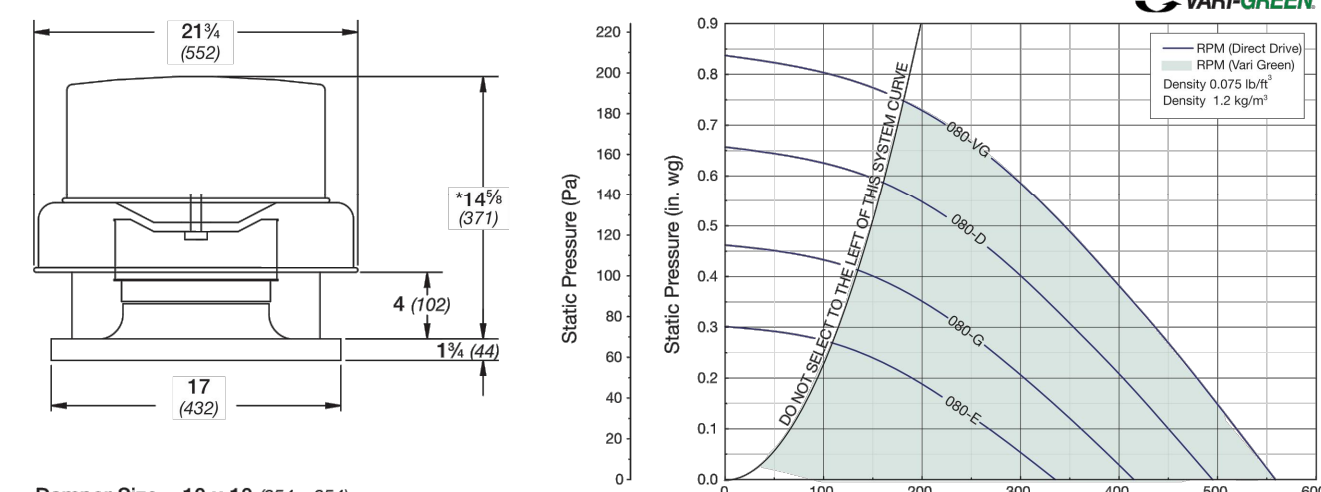


Damper Size = 8 x 8 (203 x 203)
Roof Opening = 10 1/2 x 10 1/2 (267 x 267)
Shroud Thickness = 0.064 (1.6)
Motor Cover Thickness = 0.040 (1.0)
Curb Cap Thickness = 0.064 (1.6)
Approximate Unit Weight = 15 lbs. (7 kg)
All dimensions in inches (millimeters). *May be greater depending on motor.
*Weight shown is largest cataloged Open Drip-Proof motor.

Table with columns: Direct Drive HP, Motor RPM, Fan RPM, Static Pressure in Inches wg (0 to 0.4), and CFM/BHP/Sones for various motor models.

Performance certified for installation type A: Free inlet, free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a backdraft. The sound ratings shown are loudness values in hemispherical zones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical zone levels.

Roof Downblast Exhaust Size-080: G

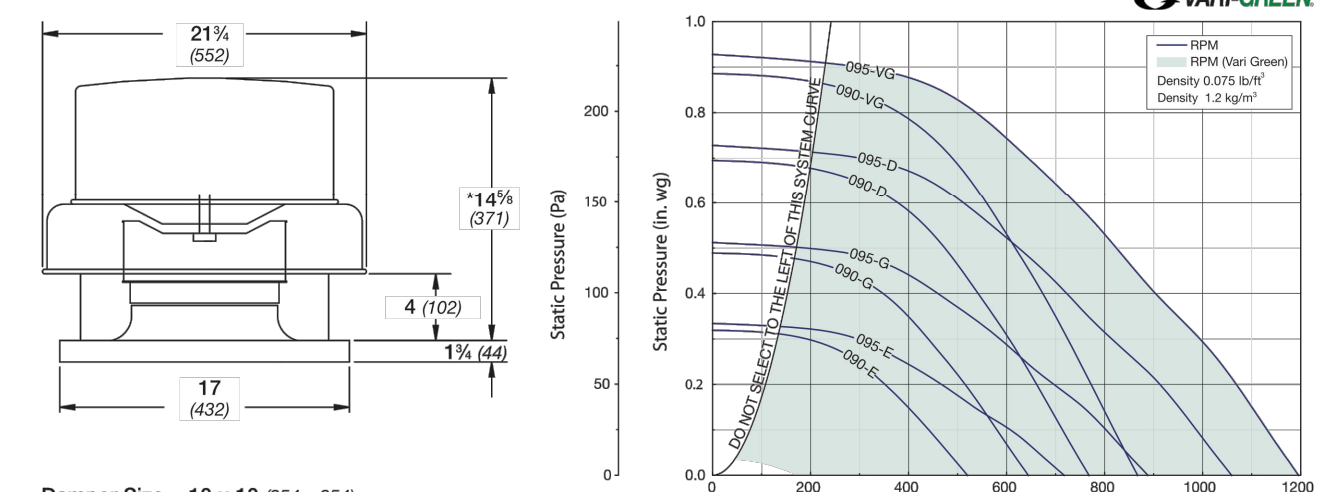


Damper Size = 10 x 10 (254 x 254)
Roof Opening = 12 1/2 x 12 1/2 (318 x 318)
Shroud Thickness = 0.064 (1.6)
Motor Cover Thickness = 0.040 (1.0)
Curb Cap Thickness = 0.064 (1.6)
Approximate Unit Weight = 19 lbs. (9 kg)
All dimensions in inches (millimeters). *May be greater depending on motor.
*Weight shown is largest cataloged Open Drip-Proof motor.

Table with columns: Direct Drive HP, Motor RPM, Fan RPM, Static Pressure in Inches wg (0 to 0.625), and CFM/BHP/Sones for various motor models.

Performance certified for installation type A: Free inlet, free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a backdraft. The sound ratings shown are loudness values in hemispherical zones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical zone levels.

Roof Downblast Exhaust Sizes-090 • 095: G

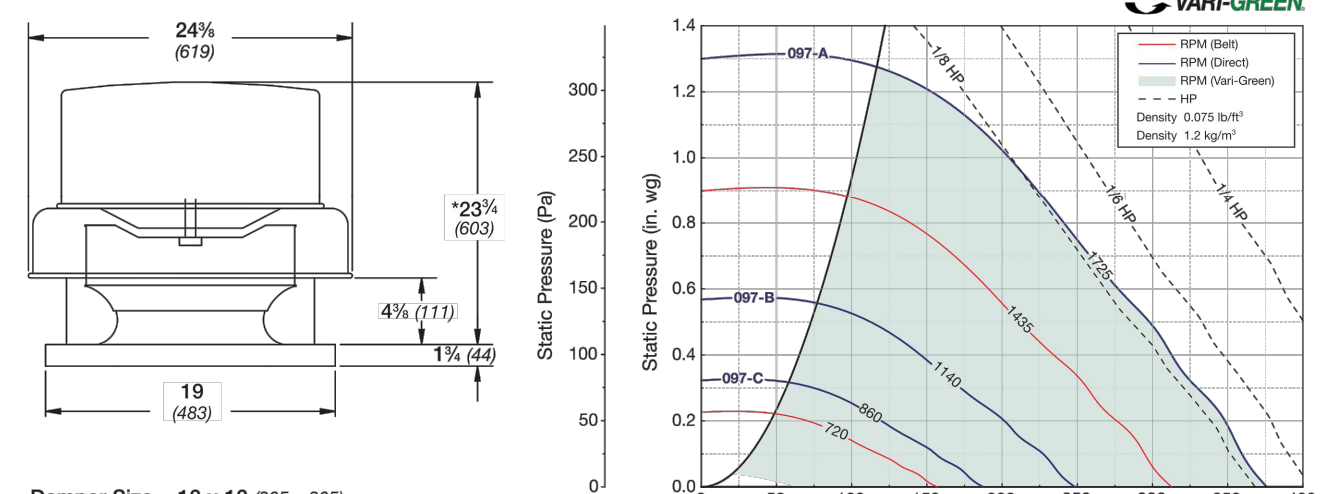


Damper Size = 10 x 10 (254 x 254)
Roof Opening = 12 1/2 x 12 1/2 (318 x 318)
Shroud Thickness = 0.064 (1.6)
Motor Cover Thickness = 0.040 (1.0)
Curb Cap Thickness = 0.064 (1.6)
Approximate Unit Weight = 22 lbs. (10 kg)
All dimensions in inches (millimeters). *May be greater depending on motor.
*Weight shown is largest cataloged Open Drip-Proof motor.

Table with columns: Direct Drive HP, Motor RPM, Fan RPM, Static Pressure in Inches wg (0 to 0.625), and CFM/BHP/Sones for various motor models.

Performance certified for installation type A: Free inlet, free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a backdraft. The sound ratings shown are loudness values in hemispherical zones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical zone levels.

Roof Downblast Exhaust Size-097: GB • G
Previously Size- GB-071

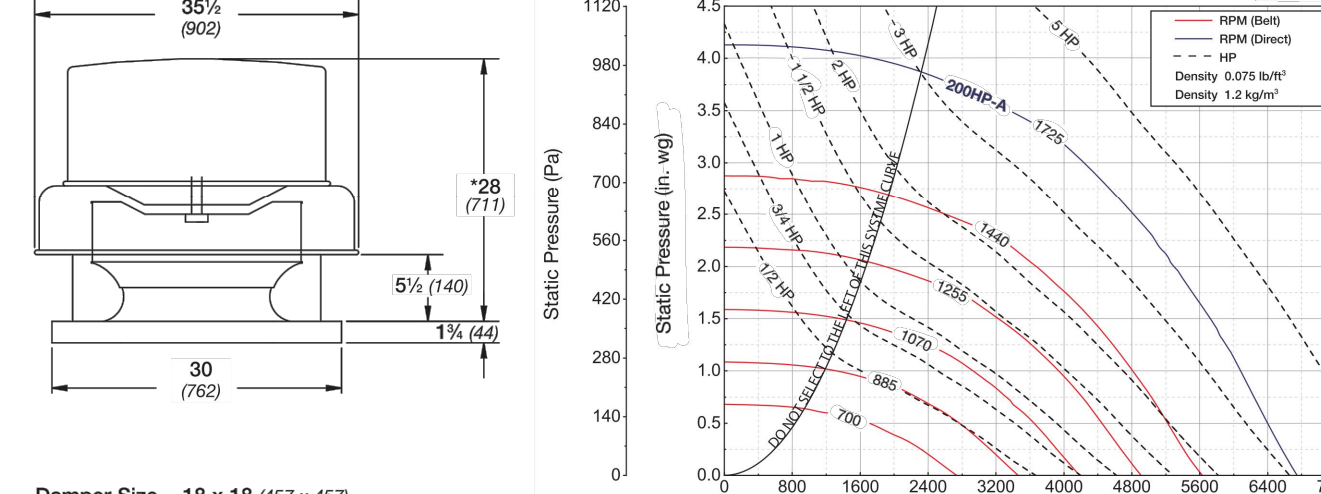


Damper Size = 12 x 12 (305 x 305)
Roof Opening = 14 1/2 x 14 1/2 (368 x 368)
Shroud Thickness = 0.061 (1.5)
Motor Cover Thickness = 0.040 (1.0)
Curb Cap Thickness = 0.064 (1.6)
Approximate Unit Weight = 54/60 lbs. (24/27 kg)
All dimensions in inches (millimeters). *May be greater depending on motor.
*Weight shown is largest cataloged Open Drip-Proof motor.

Table with columns: Motor HP (Belt/Direct), Fan RPM, Static Pressure in Inches wg (0 to 1.125), and CFM/BHP/Sones for various motor models.

Performance certified for installation type A: Free inlet, free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a backdraft. The sound ratings shown are loudness values in hemispherical zones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical zone levels.

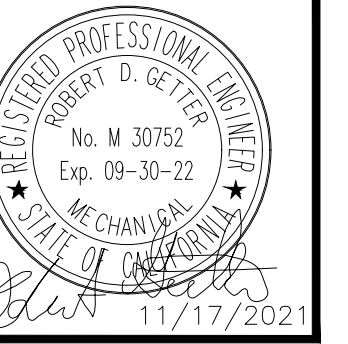
Roof Downblast Exhaust Size-200HP: GB • G



Damper Size = 18 x 18 (457 x 457)
Roof Opening = 20 1/2 x 20 1/2 (521 x 521)
Shroud Thickness = 0.064 (1.6)
Motor Cover Thickness = 0.040 (1.0)
Curb Cap Thickness = 0.064 (1.6)
Approximate Unit Weight = 166 lbs. (75 kg)
All dimensions in inches (millimeters). *May be greater depending on motor.
*Weight shown is largest cataloged Open Drip-Proof motor.

Table with columns: Motor HP (Belt/Direct), Fan RPM, Static Pressure in Inches wg (0.5 to 3.25), and CFM/BHP/Sones for various motor models.

Performance certified for installation type A: Free inlet, free outlet. Power rating (BHP) does not include transmission losses. Performance ratings include the effects of a backdraft. The sound ratings shown are loudness values in hemispherical zones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical zone levels.



BUREAU OF ENGINEERING
ROOF EXHAUST FAN CUT SHEETS
RESEDA SKATE FACILITY
18210 SHERMAN WAY, RESEDA, CA 91335

Table for REVISIONS with columns: NO., REVISIONS, DATE, BY.

CITY ENGINEER: GARY LEE MOORE, P. E., ENV SP
DESIGN GROUP: RGETTER
ENGINEER: RGETTER
DESIGNED BY: JCHN
DRAWN BY: JCHN
CHECKED BY: RHUBATCH
APPROVED BY: JCHN

WORK ORDER NO. E170121B

SHEET NAME M-15
SHEET X OF X SHEETS

THIS SHEET FOR REFERENCE ONLY

PLUMBING GENERAL NOTES:

- 1. PRIOR TO THE BID THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS, POINTS OF CONNECTIONS AND CHARACTERISTICS OF ALL UTILITY PIPING AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.
2. EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES SHALL BE OBTAINED FROM ARCHITECTURAL DRAWINGS.
3. SEE ARCHITECTURAL DRAWINGS FOR ALL DISABLED ACCESS FIXTURE LOCATIONS AND MOUNTING HEIGHTS. INSULATE ALL EXPOSED EDGES, INCLUDING WATER SUPPLY PIPING, LOOSE KEY STOPS AND DRAIN PIPING BELOW DISABLED ACCESS FIXTURES. ALL DESIGNATED FIXTURES SHALL BE ACCESSIBLE TO INDIVIDUALS WITH DISABILITIES IN ACCORDANCE WITH THE "AMERICANS WITH DISABILITIES ACT FIXTURES AND THEIR INSTALLATION ANSI A117.1"
4. ALL PLUMBING WORK SHALL BE INSTALLED SO AS TO AVOID INTERFERENCE WITH OTHER TRADES.
5. CLEANOUTS SHALL BE PROVIDED AS REQUIRED BY CODE AND SHALL BE READILY ACCESSIBLE. THE CONTRACTOR SHALL COORDINATE ALL LOCATIONS WITH EQUIPMENT, CABINETS, ETC., WITH THE ARCHITECT PRIOR TO ANY INSTALLATION. ALL CLEANOUTS SHALL BE SIZED PER CODE.
6. EQUIPMENT ANCHORAGE: ANCHORAGE DETAILS FOR EQUIPMENT ARE SUBJECT TO APPROVAL OF THE STRUCTURAL ENGINEER PRIOR TO INSTALLATION AND INSPECTION, UNLESS SPECIFICALLY SHOWN ON THESE PLANS. NO STRUCTURAL MEMBERS SHALL BE CUT OR DRILLED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM STRUCTURAL OR ENGINEER.
7. ALL PLUMBING FIXTURES, EQUIPMENT, TRIM AND FITTINGS SHALL COMPLY WITH LOCAL, STATE, AND FEDERAL REGULATIONS AND CODES, INCLUDING, BUT NOT LIMITED TO WATER AND ENERGY CONSERVATION CODES. THE SCHEDULED AND/OR SPECIFIED PLUMBING FIXTURES AND EQUIPMENT REPRESENT THE MINIMUM CRITERIA.
8. ALL WASTE PIPING SHALL SLOPE AT 1% MIN. UNLESS OTHERWISE INDICATED OR REQUIRED DUE TO STRUCTURAL CONDITIONS.
9. PROVIDE DIELECTRIC ISOLATION FITTINGS AT POINT OF CONNECTION OF ALL COPPER TUBING AND ANY DISSIMILAR METALS.
10. ALL NEW PIPING, INCLUDING WATER, WASTE, ROOF DRAINS SHALL BE TESTED IN ACCORDANCE WITH THE CALIFORNIA PLUMBING CODE.
11. ALL HOT WATER PIPING SHALL BE INSULATED WITH MINIMUM THERMAL RESISTANCE OF R=4.0 PER INCH. THE INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND SMOKE DEVELOPED RATING OF NOT MORE THAN 50, TYPE AND THICKNESS PER SPECIFICATIONS.
12. PROVIDE LOOSE CHROME PLATED KEY STOPS AT ALL FIXTURES.
13. EACH PLUMBING VENT SHALL TERMINATE NOT LESS THAN TEN (10) FEET FROM TO THREE (3) FEET ABOVE ANY WINDOW, DOOR, AIR INTAKE, OR VENT SHAFT, AND SHALL HAVE A VANDAL RESISTANT VENT CAP.
14. ALL HOSE BIBBS SHALL HAVE A NON-REMOVABLE VACUUM BREAKER.
15. CONTRACTOR SHALL PAY ALL FEES REQUIRED TO COMPLETELY INSTALL ALL EQUIPMENT, MATERIALS AND PIPING INDICATED IN CONTRACT DRAWINGS.
16. PROVIDE TRAPS AND AUTOMATIC TRAP PRIMERS FOR ALL FLOOR DRAINS.
17. PROVIDE WATER HAMMER ARRESTORS, THREADED OR SOLDERED, UPSTREAM OF LAST FIXTURE WATER SUPPLY PIPING, PER PDI & TD WH-201.
18. ALL BURRED ENDS OF WATER PIPING AND TUBING SHALL BE REAMED TO THE FULL BORE OF THE PIPE OR TUBE AND ALL CHIPS SHALL BE REMOVED (SEE CALIFORNIA PLUMBING CODE, 2016 EDITION, SECTION 310.3). ADDITIONALLY, TOOLS USED IN CUTTING OR REAMING SHALL BE KEPT FREE FROM OIL OR GREASE AND WHERE SUCH CONTAMINATION HAS OCCURRED, THE ITEMS AFFECTED SHALL BE REWORKED AND RINSED.
19. FOR PIPE PENETRATIONS THROUGH FIRE RATED FLOOR, WALL AND PARTITIONS, PROVIDE FIRE STOP DEVICES AND PACKING IN COMPLIANCE WITH U.L. FIRE RESISTANCE DIRECTORY FOR THROUGH-PENETRATION FIRE STOPS DEVICES (XHCR), SYSTEMS WL1001, WL1002, WL5001, WL5002 OR CAJ1001, CAJ5001, CAJ5002, CAJ5003 AS APPLICABLE.
20. SEAL ALL PENETRATIONS THROUGH FIRE RESISTIVE CONSTRUCTION WITH APPROVED MATERIALS PER SECTION 714, CBC.
21. PER CODE ALL SINKS AND URINALS SHALL HAVE WALL CLEAN-OUTS.
22. CONTRACTOR SHALL COMPLY WITH LOW-LEAD ORDINANCE AB-1953.
23. COORDINATE ACCESS PANEL LOCATIONS WITH ARCHITECTURAL SHEETS.
24. ALL PLUMBING FIXTURES & PLUMBING FITTINGS SHALL COMPLY WITH MAXIMUM FLOW RATE VALUES OF SECTION 5.303.2. AND SECTION 5.303.3. OF CALIFORNIA GREEN BUILDING CODE.
25. NEW OR REPAIRED POTABLE WATER SYSTEM SHALL BE DISINFECTED PRIOR TO USE ACCORDING TO METHOD SET IN SECTION 609.9 OF CALIFORNIA PLUMBING CODE.
26. ALL FIXTURES, EQUIPMENT, PIPING, AND MATERIALS SHALL BE LISTED. (LAPC103.2.1;LAPC3012)
27. ALL PLUMBING FIXTURES SHALL MEET THE FLOW REQUIREMENTS SPECIFIED IN THE LOS ANGELES PLUMBING CODE. (LAPC401.3)
28. ALL FAUCETS IN PUBLIC RESTROOMS SHALL BE SELF-CLOSING OR SELF-CLOSING METERING FAUCETS. (LAPC407.2.2)
29. PUBLIC LAVATORIES SHALL HAVE CONTROLS TO LIMIT THE WATER TEMPERATURE TO 100°F. (TITLE 24, PART 6 110.3(c)3)
30. WATER PIPE AND FITTINGS WITH A LEAD CONTENT WHICH EXCEED 0.25% SHALL BE PROHIBITED IN SYSTEMS CONVEYING POTABLE WATER. (LAPC604.2; HEALTH & SAFETY CODE 116875)
31. PROVIDE REDUCED-PRESSURE BACK FLOW PRVENTERS FOR ALL DOMESTIC WATER CONNECTIONS TO MECHANICAL EQUIPMENT, WATTS SERIES 009, OR EQUAL.

Table with 2 columns: CODE, DESCRIPTION. Lists applicable codes such as CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R., CALIFORNIA BUILDING CODE, PART 2, TITLE 24 C.C.R., (2009 INTERNATIONAL BUILDING CODE), CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24 C.C.R. (2008 NATIONAL ELECTRICAL CODE), CALIFORNIA MECHNAICAL CODE, PART 4, TITEL 24 C.C.R. (2009 UNIFORM MECHANICAL CODE), CALIFORNIA PLUMBING CODE, PART 5, TITLE 24 C.C.R. (2009 UNIFORM PLUMBING CODE), CALIFORNIA ENERGY CODE, PART 6, TITLE 24 C.C.R., CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R. (2009 INTERNATIONAL FIRE CODE), CALIFORNIA GREEN BUILDING STANDARD CODE, TITLE 24, PART II C.C.R., CALIFORNIA REFERENCE STANDARDS CODE, PART 12, TITLE 24 C.C.R.

Table with 2 columns: ITEM, DESCRIPTION. SEISMIC BRACING OF PLUMBING SYSTEMS. 1. GENERAL CONTRACTOR SHALL ENGINEER, PROVIDE AND INSTALL GRAVITY SUPPORTS (HANGERS, STANDS, ETC.) AND SEISMIC RESTRAINTS (CABLE BRACING, ANGLE BRACING, ETC.) INCLUDING THEIR CONNECTIONS TO THE STRUCTURE. FOR ALL EQUIPMENT AND DISTRIBUTION SYSTEMS (PIPING, DUCTWORK, CONDUIT, ETC.) GRAVITY SUPPORTS AND SEISMIC RESTRAINTS SHALL MEET THE REQUIREMENTS SET FORTH IN THE CALIFORNIA BUILDING CODE, IT'S REFERENCE STANDARD ASCE 7-10 (CHAPTER 13), AND ALL OTHER APPLICABLE CODES. 2. GENERAL CONTRACTOR SHALL SUBMIT THE ENGINEERED DESIGN OF THE SEISMIC RESTRAINTS, STAMPED AND SIGNED BY CALIFORNIA LICENSED CIVIL OR STRUCTURAL ENGINEER, TO THE AHJ REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. 3. SEISMIC BRACING SHALL CONSISTS OF ENGINEERED SYSTEMS (SUCH AS ISAT, TOLCO, OR ERICO) CARRYING AN OSHPD OPM CERTIFICATION UNDER THE 2013-CBC OR 2016-CBC. 4. GRAVITY SUPPORTS AND SEISMIC RESTRAINTS SHALL BE LAID OUT AS TO AVOID INDUCING TORSION ON STRUCTURAL STEEL MEMBERS.

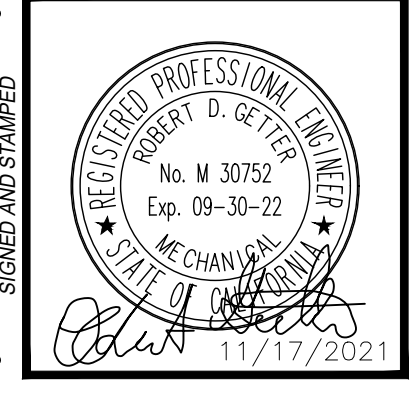
Table with 3 columns: UTILITY, ABOVE GRADE, BELOW GRADE. PIPE MATERIAL. SANITARY SOIL, WASTE, VENT, STORM & OVERFLOW DRAIN: NO-HUB CAST IRON & COUPLINGS W/ STAINLESS STEEL BAND FITTINGS. DOMESTIC & INDUSTRIAL WATER: TYPE "L" COPPER W/WROUGHT COPPER SOLDERED JOINT FITTINGS. PROVIDE FIBERGLASS INSULATION ON HW PIPING. CONDENSATE DRAIN: TYPE "M" COPPER W/WROUGHT COPPER SOLDERED JOINT FITTINGS. PROVIDE ARMAFLEX 1" THICK INSULATION. FIRE WATER/ SPRINKLER: SCHEDULE 40 BLACK STEEL ASTM A53 GRADE B WITH ASME B16.9 STEEL BUTT WELD FITTINGS OR LIGHT WALL AS LISTED IN NFPA 13, 2016 EDITION. ACID WASTE: CPVC CHEM DRAIN, SCHEDULE 40 PIPING.

PLUMBING ABBREVIATIONS

- & AND
(E) EXISTING
@ AT
ABV ABOVE
AD AREA DRAIN
ADA AMERICAN WITH DISABILITY ACT
AFF ABOVE FINISH FLOOR
AHU AIR HANDLING UNIT
AP ACCESS PANEL
ARCH ARCHITECT/ARCHITECTURAL
BEH BEHIND
BEL BELOW
BLDG BUILDING
CO CLEANOUT
CFH CUBIC FEET PER HOUR
CFM CUBIC FEET PER MINUTE
CLG CEILING
CONC CONCRETE
CONN CONNECT/CONNECTION
CONT CONTINUED/CONTINUATION
CP CIRCULATING PUMP
DCW DOMESTIC COLD WATER
DF DRINKING FOUNTAIN
DIA DIAMETER
DN DOWN
DS DOWNSPOUT
DW DOMESTIC WATER (POTABLE WATER)
DWG(S) DRAWINGS(S)
EA EACH
EWH ELECTRIC WATER HEATER
EQUIP EQUIPMENT
FC FAN COIL UNIT
FD FLOOR DRAIN
FDC FIRE DEPARTMENT CONNECTION
FFE FINISH FLOOR ELEVATION
FIN FINISH
FLR FLOOR
FP FIRE PROTECTION WATER
FR FROM
FS FLOOR SINK
FTG(S) FITTINGS
GAL GALLONS
GPF GALLONS PER FLUSH
GPH GALLONS PER HOUR
GPM GALLONS PER MINUTE
GRD GRADE
HB HOSE BIBB
HDR HEADER
HP HORSE POWER
HTR HEATER
HW HOT WATER
HWC CIRCULATING HOT WATER
HWCP HOT WATER RECIRCULATION PUMP
IE INVERT ELEVATION
IWR INDIRECT WASTE RECEPTOR
L LAVATORY
MAX MAXIMUM
MECH MECHANICAL
MIN MINIMUM
OD OVERFLOW DRAIN
PP POLYPROPYLENE
PRESS PRESSURE
PRV PRESSURE REDUCING VALVE
PSI POUNDS PER SQUARE INCH
PVC POLYVINYL CHLORIDE
R REFRIGERATOR
RD ROOF DRAIN
RED REDUCER
RI & C ROUGH-IN AND CONNECT
RL RAIN LEADER
SD STORM DRAIN
SH SHOWER
SS SANITARY SEWER
SHT SHEET
T TANK
TEMP TEMPERATURE
THRU THROUGH
TP TRAP PRIMER
TYP TYPICAL
UL UNDERWRITERS LABORATORY
UR URINAL
VTR VENT THRU ROOF
W/ WITH
WC WATER CLOSET
WH WATER HEATER

Table with 3 columns: SYMBOL, ABBREV, DESCRIPTION. PIPING LEGEND. Symbols for sewer/waste, vent, condensate, pumped condensate, domestic cold water, hot water, circulation hot water, storm drain, overflow drain, gray water, industrial cold water, trap primer, floor drain, roof drain, floor sink, floor cleanout, cleanout in yard box, wall cleanout, indirect waste receptor, cleanout, trap primer line, shut-off valve, shut-off valve (butterfly type), hose bibb, union, check valve, pressure gauge, thermo meter, direction of flow, cap or plug, water hammer arrestor, keynote, detail number, drawing number, point of connection.

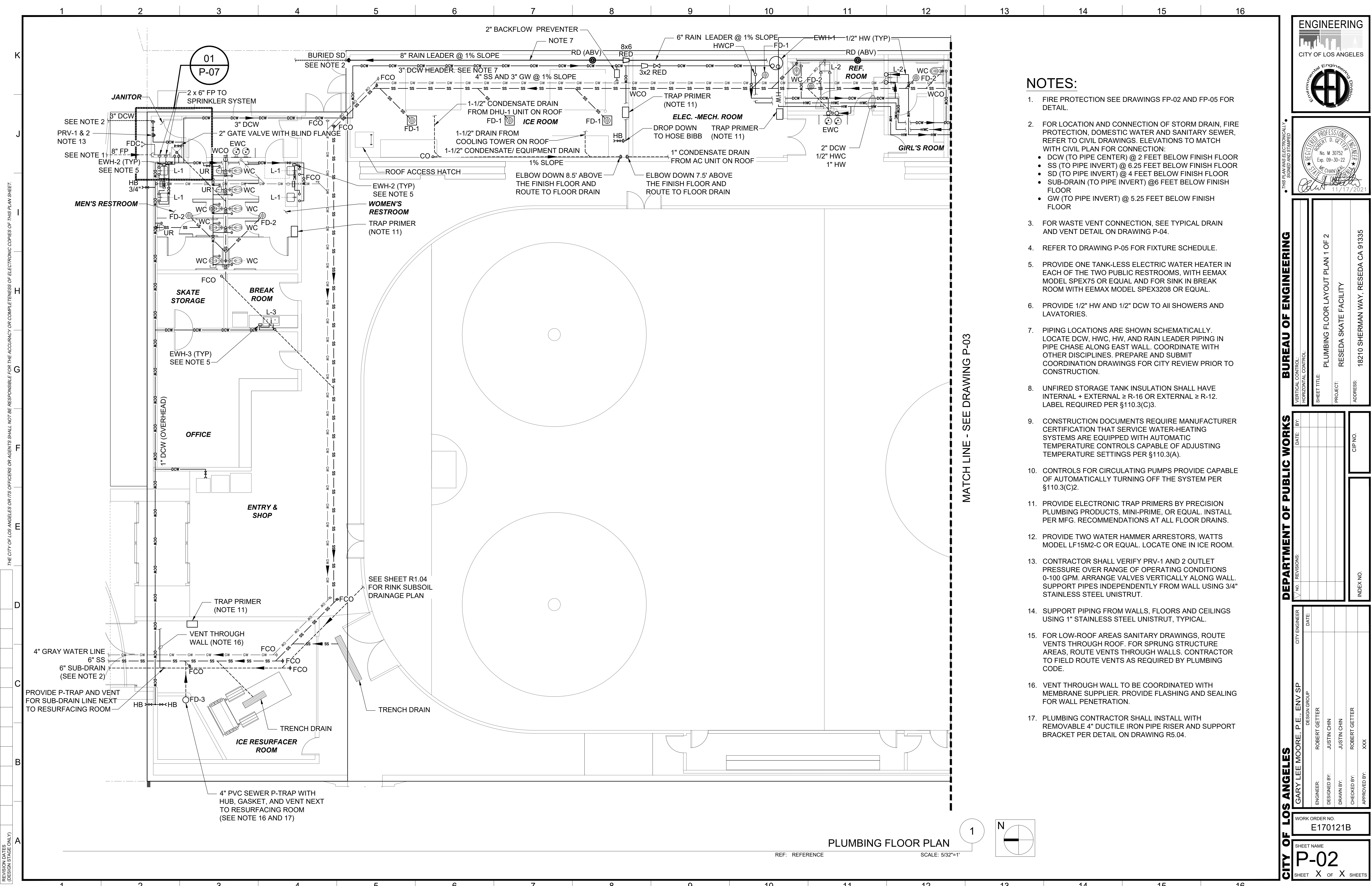
REVISION DATE (DESIGN STAGE ONLY) SHEET NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16



BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
SHEET TITLE: PLUMBING GENERAL NOTES AND LEGEND
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS
CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP: ROBERT GETTER
ENGINEER: ROBERT GETTER
DESIGNED BY: JUSTIN CHIN
DRAWN BY: JUSTIN CHIN
CHECKED BY: ROBERT GETTER
APPROVED BY: XXX
DATE:
INDEX NO.

CITY OF LOS ANGELES
WORK ORDER NO. E170121B
SHEET NAME: P-01
SHEET X OF X SHEETS



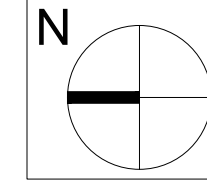
NOTES:

1. FIRE PROTECTION SEE DRAWINGS FP-02 AND FP-05 FOR DETAIL.
2. FOR LOCATION AND CONNECTION OF STORM DRAIN, FIRE PROTECTION, DOMESTIC WATER AND SANITARY SEWER, REFER TO CIVIL DRAWINGS. ELEVATIONS TO MATCH WITH CIVIL PLAN FOR CONNECTION:
 - DCW (TO PIPE CENTER) @ 2 FEET BELOW FINISH FLOOR
 - SS (TO PIPE INVERT) @ 6.25 FEET BELOW FINISH FLOOR
 - SD (TO PIPE INVERT) @ 4 FEET BELOW FINISH FLOOR
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3. FOR WASTE VENT CONNECTION, SEE TYPICAL DRAIN AND VENT DETAIL ON DRAWING P-04.
4. REFER TO DRAWING P-05 FOR FIXTURE SCHEDULE.
5. PROVIDE ONE TANK-LESS ELECTRIC WATER HEATER IN EACH OF THE TWO PUBLIC RESTROOMS, WITH EEMAX MODEL SPEX75 OR EQUAL AND FOR SINK IN BREAK ROOM WITH EEMAX MODEL SPEX3208 OR EQUAL.
6. PROVIDE 1/2" HW AND 1/2" DCW TO ALL SHOWERS AND LAVATORIES.
7. PIPING LOCATIONS ARE SHOWN SCHEMATICALLY. LOCATE DCW, HWC, HW, AND RAIN LEADER PIPING IN PIPE CHASE ALONG EAST WALL. COORDINATE WITH OTHER DISCIPLINES. PREPARE AND SUBMIT COORDINATION DRAWINGS FOR CITY REVIEW PRIOR TO CONSTRUCTION.
8. UNFIRED STORAGE TANK INSULATION SHALL HAVE INTERNAL + EXTERNAL ≥ R-16 OR EXTERNAL ≥ R-12. LABEL REQUIRED PER §110.3(C)3.
9. CONSTRUCTION DOCUMENTS REQUIRE MANUFACTURER CERTIFICATION THAT SERVICE WATER-HEATING SYSTEMS ARE EQUIPPED WITH AUTOMATIC TEMPERATURE CONTROLS CAPABLE OF ADJUSTING TEMPERATURE SETTINGS PER §110.3(A).
10. CONTROLS FOR CIRCULATING PUMPS PROVIDE CAPABLE OF AUTOMATICALLY TURNING OFF THE SYSTEM PER §110.3(C)2.
11. PROVIDE ELECTRONIC TRAP PRIMERS BY PRECISION PLUMBING PRODUCTS, MINI-PRIME, OR EQUAL. INSTALL PER MFG. RECOMMENDATIONS AT ALL FLOOR DRAINS.
12. PROVIDE TWO WATER HAMMER ARRESTORS, WATTS MODEL LF15M2-C OR EQUAL. LOCATE ONE IN ICE ROOM.
13. CONTRACTOR SHALL VERIFY PRV-1 AND 2 OUTLET PRESSURE OVER RANGE OF OPERATING CONDITIONS 0-100 GPM. ARRANGE VALVES VERTICALLY ALONG WALL. SUPPORT PIPES INDEPENDENTLY FROM WALL USING 3/4" STAINLESS STEEL UNISTRUT.
14. SUPPORT PIPING FROM WALLS, FLOORS AND CEILINGS USING 1" STAINLESS STEEL UNISTRUT, TYPICAL.
15. FOR LOW-ROOF AREAS SANITARY DRAWINGS, ROUTE VENTS THROUGH ROOF. FOR SPRUNG STRUCTURE AREAS, ROUTE VENTS THROUGH WALLS. CONTRACTOR TO FIELD ROUTE VENTS AS REQUIRED BY PLUMBING CODE.
16. VENT THROUGH WALL TO BE COORDINATED WITH MEMBRANE SUPPLIER. PROVIDE FLASHING AND SEALING FOR WALL PENETRATION.
17. PLUMBING CONTRACTOR SHALL INSTALL WITH REMOVABLE 4" DUCTILE IRON PIPE RISER AND SUPPORT BRACKET PER DETAIL ON DRAWING R5.04.

MATCH LINE - SEE DRAWING P-03

PLUMBING FLOOR PLAN

REF: REFERENCE SCALE: 5/32"=1'

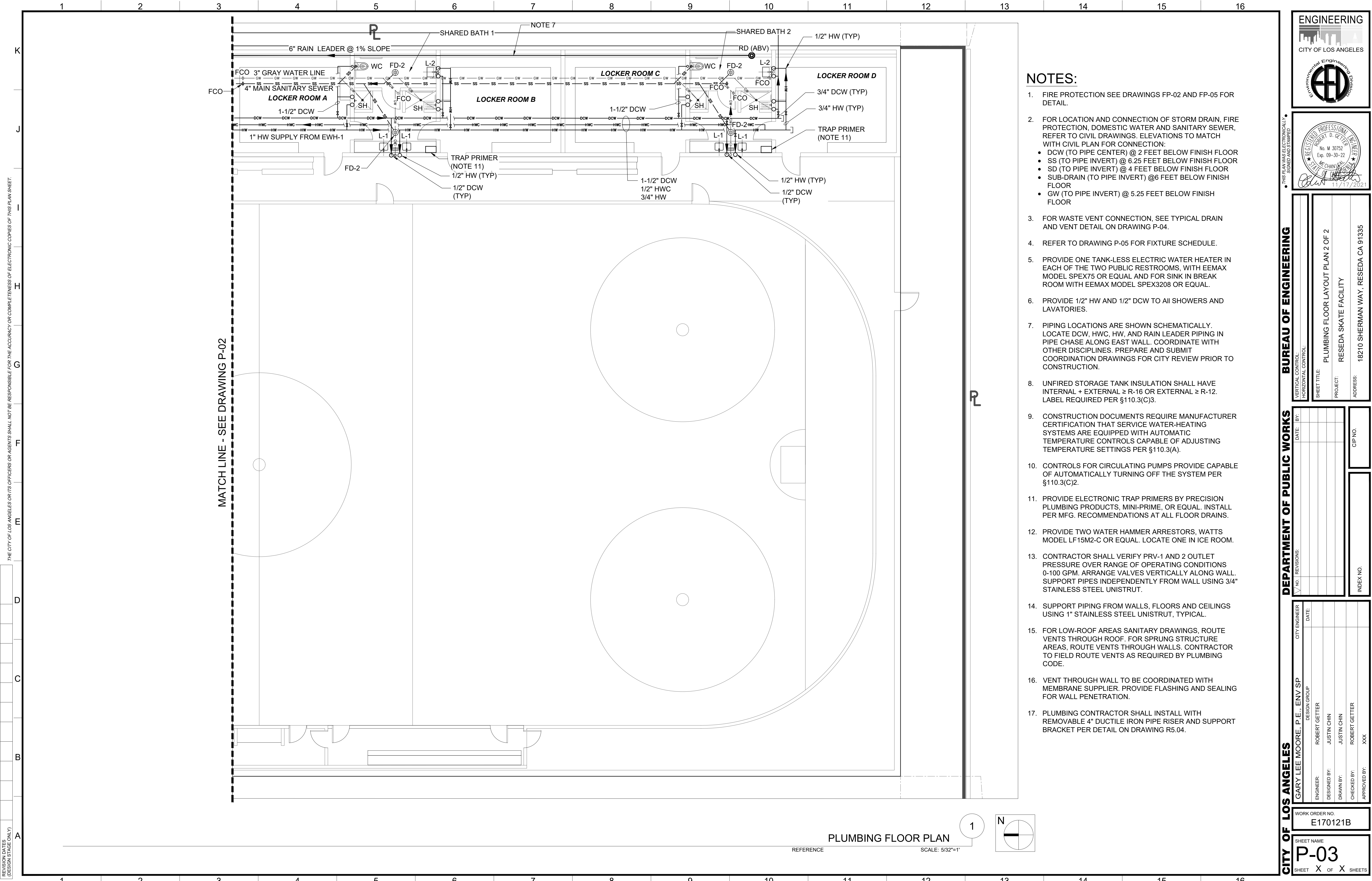


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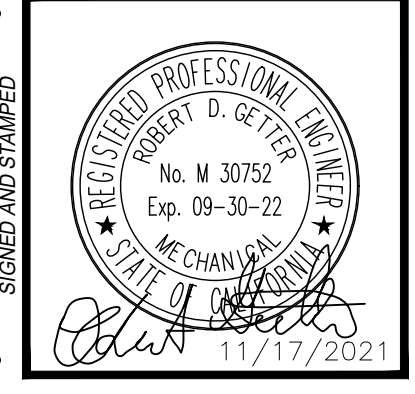
ENGINEERING	
CITY OF LOS ANGELES	
VERTICAL CONTROL: HORIZONTAL CONTROL:	BUREAU OF ENGINEERING
SHEET TITLE: PROJECT: ADDRESS:	PLUMBING FLOOR LAYOUT PLAN 1 OF 2 RESEDA SKATE FACILITY 18210 SHERMAN WAY, RESEDA, CA 91335
DATE: BY:	INDEX NO.
CITY ENGINEER: DESIGN GROUP:	WORK ORDER NO.
ENGINEER: DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:	E170121B SHEET P-02 OF X SHEETS

REVISION DATE (DESIGN STAGE ONLY) SHEET NO. THE CITY OF LOS ANGELES OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.



NOTES:

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BUREAU OF ENGINEERING

VERTICAL CONTROL: _____

HORIZONTAL CONTROL: _____

SHEET TITLE: PLUMBING FLOOR LAYOUT PLAN 2 OF 2

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS

DATE: _____

BY: _____

INDEX NO. _____

CIP NO. _____

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP

DESIGN GROUP: _____

ENGINEER: ROBERT GETTER

DESIGNED BY: JUSTIN CHIN

DRAWN BY: JUSTIN CHIN

CHECKED BY: ROBERT GETTER

APPROVED BY: XXX

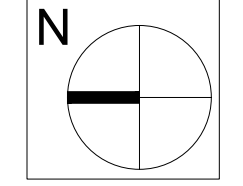
WORK ORDER NO. E170121B

SHEET NAME: P-03

SHEET X OF X SHEETS

PLUMBING FLOOR PLAN

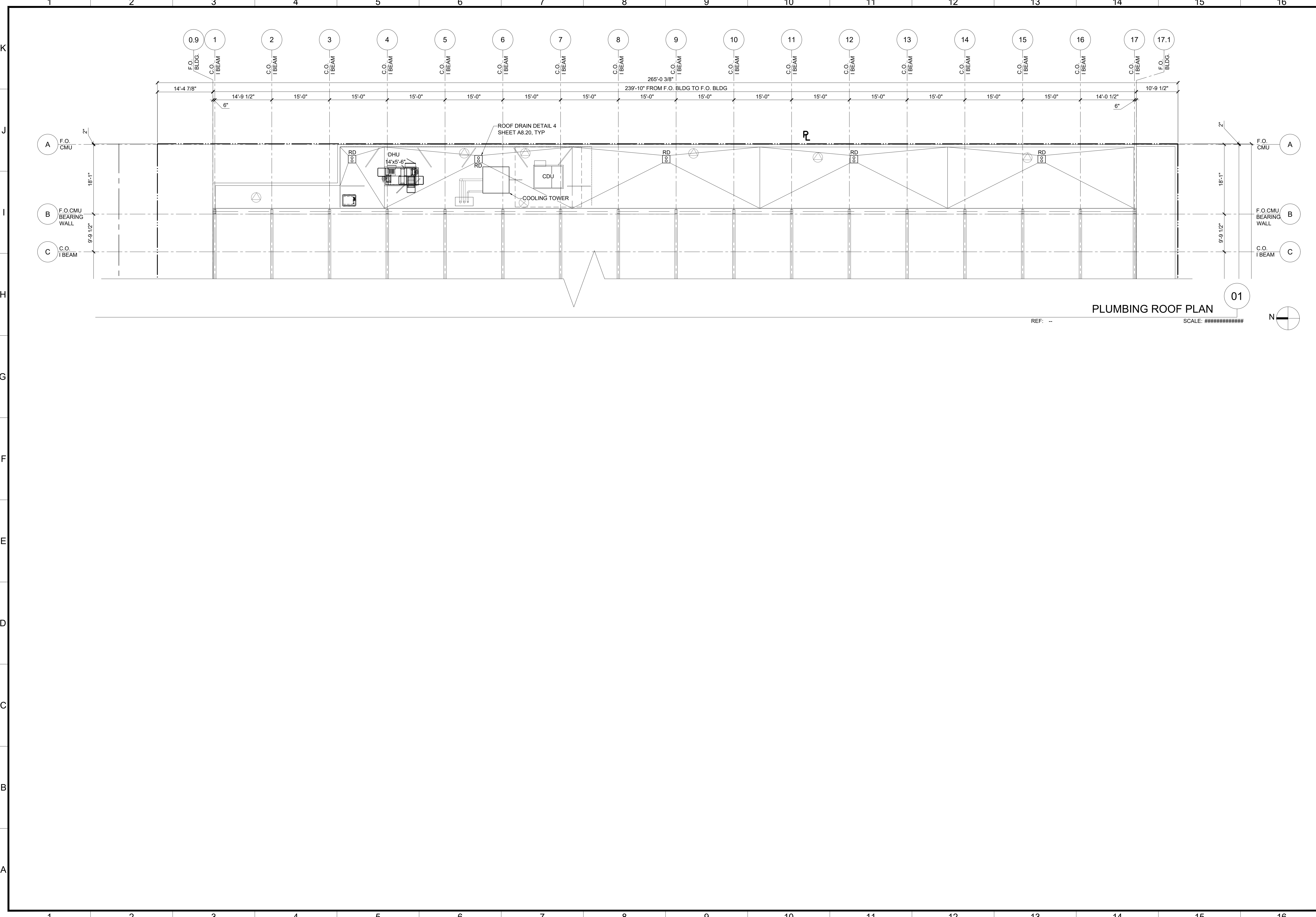
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REVISION DATES (DESIGN STAGE ONLY)

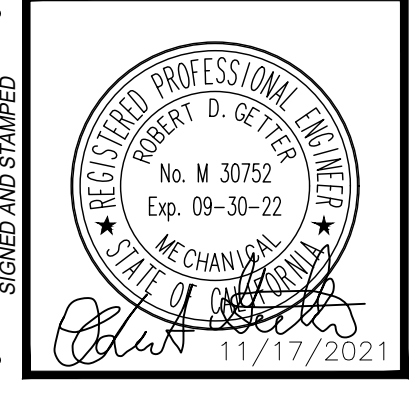
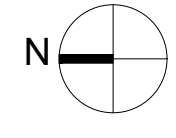
Sheet Version 4.0



PLUMBING ROOF PLAN

REF: -- SCALE: #####

01



BUREAU OF ENGINEERING

VERTICAL CONTROL: _____

HORIZONTAL CONTROL: _____

SHEET TITLE: PLUMBING ROOF LAYOUT PLAN

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS	DATE	BY

INDEX NO. _____

CIP NO. _____

CITY OF LOS ANGELES

GARY LEE MOORE, P.E., ENV SP

DESIGN GROUP: _____

ENGINEER: ROBERT GETTER

DESIGNED BY: JUSTIN CHIN

DRAWN BY: JUSTIN CHIN

CHECKED BY: ROBERT GETTER

APPROVED BY: XXX

WORK ORDER NO. E170121B

SHEET NAME: P-04

SHEET X OF X SHEETS

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PLUMBING FIXTURE SCHEDULE

- FD-1 FLOOR DRAIN ZURN MODEL NO. ZN415B DURA-COATED CAST IRON DRAIN WITH BOTTOM OUTLET, COMBINATION INVERTABLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH SEEPAGE SLOTS, "TYPE B" POLISHED NICKEL BRONZE LIGHT-DUTY STRAINER.
FD-2 FLOOR DRAIN WITH RUBBER FLOORING ZURN MODEL NO. Z415H, STRAINER CLAMPING DEVICE, DRAIN BODY IS SECURED TO THE PIPE WITH FOUR CONNECTIONS, THREADED, NO HUB CONNECTOR, LEAD CAULK OR ZURN NEO-LOC GASKET.
FS-1 FLOOR SINK AND SERVICE FAUCET ADVANCE TABCO MODEL 9-OP-40F, 18.5"X25"X16" STAINLESS STEEL FLOOR MOUNTED MOP SINK WITH SERVICE FAUCET MODEL K-240.
TD-1 TRENCH DRAIN (12" WIDE x 8' LONG) ZURN, NO. ZN-665-Y D.C. SUMP BODY WITH BOTTOM OUTLET, INTEGRAL SEEPAGE PAN D.C. SEDIMENT BUCKET AND 12"x 96" NICKEL BRONZE LOOSE SLOTTED GRATE.
TD-2 TRENCH DRAIN (12" WIDE x 4' LONG) ZURN, NO. ZN-665-Y D.C. SUMP BODY WITH BOTTOM OUTLET, INTEGRAL SEEPAGE PAN D.C. SEDIMENT BUCKET AND 12"x 48" NICKEL BRONZE LOOSE SLOTTED GRATE.
HB HOSE BIBB - LOOSE KEY PRIER "SKU NO. C-255CP-75" ANTI-SIPHON BACKFLOW CHECK VALVE, CAST BRASS WITH POLISHED CHROME FINISH, LOOSE KEY ON LANYARD, FULL-FLOW INLINE VACUUM BREAKER AND HOSE THREAD OUTLET, AND WALL FLANGE
FCO CLEANOUT - FLOOR ZURN MODEL NO. ZN1400-BP WITH NICKEL BRONZE TOP AND BRONZE PLUG, PROVIDE -CM CARPET CLEANOUT MARKER WHERE ON CARPET
BFP-1 BACKFLOW PREVENTER 3" WATTS NO. LF909-S-QT-FDA REDUCED PRESSURE ZONE BACKFLOW PREVENTER WITH EPOXY COATED STRAINER AND QUARTER TURN BALL VALVES, UNIT SHALL MEET AND BE LABELED WITH ASSE 1013 AND FCCCHR OR USC STANDARDS AND SPECIFICATIONS, PROVIDE AIR GAP WATTS 909AG-C
BFP-2 BACKFLOW PREVENTER 2" WATTS NO. LF909M1QT-S REDUCED PRESSURE ZONE BACKFLOW PREVENTER WITH EPOXY COATED STRAINER AND QUARTER TURN BALL VALVES, UNIT SHALL MEET AND BE LABELED WITH ASSE 1013 AND FCCCHR OR USC STANDARDS AND SPECIFICATIONS, PROVIDE AIR GAP WATTS 909AG-F
MV-1 MIXING VALVE BRADLEY MODEL NO. S59-3130 THERMOSTATIC MIXING VALVE, CAST BRASS BODY, CHECK STRAINERS ON INLETS, ROUGH CHROME FINISH WITH 1-1/4" INLETS AND 1-1/2" OUTLET. PROVIDE QUARTER-TURN BALL VALVES ON INLETS AND OUTLET, PROVIDE TEMPERATURE GAUGE ON OUTLET
RD ROOF DRAIN JAY R. SMITH DRAWING FIGURE NUMBER 1800, DUCO CAST IRON BODIES WITH COMBINED FLASHING CLAMP AND GRAVEL STOP FOR ROOF DRAIN, COMBINED FLASHING CLAMP, GRAVEL STOP WITH HIGH INTERNAL WATER DAM STANDPIPE FOR OVERFLOW DRAIN WITH VANDAL PROOF DOME.
WC WATER CLOSET (ACCESSIBLE) AMERICAN STANDARD, MADERA MODEL NO. 3461528.020, COMPLETE HIGH EFFICIENCY TOILET SYSTEM WITH FLOOR MOUNTED, BOTTOM OUTLET, TOP SPUD, VITREOUS CHINA, HIGH EFFICIENCY TOILET WITH ELONGATED BOWL, 1.28 GPF FLUSHOMETER TOILET SYSTEM (SELECTRONIC MODEL NO. 6063.101.002), ADA COMPLIANT. AMERICAN STANDARD #5905.100 EXTRA HEAVY DUTY OPEN FRONT LESS COVER.
L-1 LAVATORY (SHARE BATH 1 & 2) HI-MACS, SINGLE SINK, MODEL NO. 1715, WALL HUNG, 17"W X 15"L X 5"D LAVATORY, ARCTIC WHITE, WITH FAUCET (MOMENTS MODEL NO. 250B.105, CHROME COLOR FINISH, HARDWIRED AC, ADA COMPLIANT.
L-2 LAVATORY AMERICAN STANDARD, DECORUM MODEL NO. 9024.011EC, WALL HUNG, 20"W x 18-1/4"L x 5"D LAVATORY, WHITE COLOR, WITH FAUCET (MOMENTS MODEL NO. 250B.105, CHROME COLOR FINISH, HARDWIRED AC, ADA COMPLIANT.
L-3 KITCHEN SINK SINK MANUFACTURER KOHLER, MODEL VAULT K-3996-1, SINK FAUCET MANUFACTURER DELTA, B1310LF WITH CHROME FINISH.
SH SHOWER BRADLEY MODEL NO. WS-1WCA-ADA-TTPA WITH TWO 1.5 GPM SHOWER HEADS WITH VANDAL-PROOF LOCKABLE SPRAY ADJUSTMENT AND CAST BRASS HEAVY DUTY INSTITUTIONAL TYPE HEAD BRACKET FOR VANDAL-RESISTANT RIGIDITY, A DIVERTER VALVE, AND A PUSH-BUTTON ACTUATOR WITH AUTOMATIC SHUT-OFF. VALVE SHALL HAVE COMPLETE WORKING PARTS ENCLOSED WITHIN THE CARTRIDGE AND AN INTEGRAL STOP WITH VOLUME CONTROL ADJUSTED TO MAXIMUM FLOW LENGTH (APPX. ONE MINUTE). ALL PARTS SHALL BE MOUNTED ON/WITHIN A STAINLESS STEEL PIPE COVER WITH INTEGRAL SOAP DISH. MOUNT USING VANDAL-PROOF SCREWS. PROVIDE ADDITIONAL VERTICAL STAINLESS STEEL PIPE COVER AS NEEDED TO COVER EXPOSED PIPING TO FLOOR.
EWC ELECTRIC WATER COOLER (ACCESSIBLE) OASIS MODEL NO. PGF8EBFSL, LEAD & BARRIER-FREE SPLIT-LEVEL COOLER W/ TOP MOUNTED VERSAFILLER SPORTS BOTTLE FILLER WITH INDEPENDENT ACTIVATION. COOLER SHALL HAVE SOFT-TOUCH, SELF-CLOSING, VANDAL RESISTANT PUSH-BUTTON AND STAINLESS STEEL ANTI-SPLASH TOP DESIGN, UNIT SHALL HAVE OPTIONAL CHROM-PLATED BRASS, TAMPER-RESISTANT BUBBLER BOTTLE FILLER SHALL HAVE STAINLESS STEEL ANTIMICROBIAL FINISH. PROVIDE OPTIONAL APRON FOR UPPER BOWL OF UNIT. PROVIDE JAY R. SMITH CARRIER NO. 0834 TO SUIT INSTALLATION. WHERE CARRIER CANNOT BE USED, SECURE FIXTURE RIGIDLY TO THE WALL WITH TOGGLE BOLTS OR RAM-SET ON BLOCK WALLS, OR PROVIDE WOOD OR STEEL BLOCKING IN GYPSUM BOARD WALLS. PROVIDE MCGUIRE NO.8912C P-TRAP AND BALL VALVE IN COLD WATER LINE WITHIN CABINET. PROVIDE TWO (2) SPARE FILTERS FOR OWNER'S STOCK

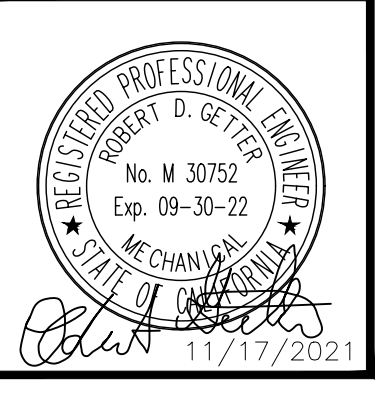
- EW-1 HEAT PUMP WATER HEATER HUBBELL, MODEL NO. PBX120SL. THE ENTIRE TANK IS TO BE INSULATED WITH A MINIMUM OF 3" THICK CFC FREE POLYURETHANE FOAM INSULATION THAT EXCEEDS THE LATEST ASHRAE STANDARD FOR STAND-BY HEAT LOSS. HEATER TO BE SET AT 110°F. TACO MODEL WATER CIRCULATION PUMP (MODEL 006-1FC), FLOW RANGE: 0-9 GPM, HEAD RANGE: 0-8.5 FEET, 120/1/60, 1/4 HP, 1/2", 3/4" STAINLESS STEEL WITH UNION CONNECTIONS WITH SMART PLUG INSTANT HOT WATER CONTROL MODEL SP115-1.
EW-2 TANKLESS WATER HEATER EEMAX, MODEL NO. SPEX75. HIGH TEMPERATURE LIMIT SWITCH WITH AUTOMATIC RESET, FLOW RESTRICTING AERATOR, COMPLIANT WITH ADA PHYSICAL INSTALLATION.
EW-3 TANKLESS WATER HEATER EEMAX, MODEL NO. SPEX75. HIGH TEMPERATURE LIMIT SWITCH WITH AUTOMATIC RESET, FLOW RESTRICTING AERATOR, COMPLIANT WITH ADA PHYSICAL INSTALLATION.
SEE ARCHITECTURAL SHEET A-700 FOR OTHER FIXTURES AND ACCESSORY SCHEDULE.

DOMESTIC WATER PIPE SIZING:

- WATER PRESSURE 83-93 PSI PER LADWP WEST VALLEY (213-367-1250)
PRV-1 OUTLET OF 50 PSI, WATTS MODEL LFN223-2.5"
PRV-2 OUTLET OF 55 PSI, WATTS MODEL LF223-2".
BACKFLOW PREVENTOR: WATTS LF90905Y.

PIPC 2014-009 SIMPLE SIZING FORM FOR DOMESTIC WATER SYSTEMS. This is a very simplified form and should not be used for complex design as design by branches, systems with booster pumps, down-feed systems, etc. JOB ADDRESS: LADWP West Valley. WATER INFORMATION FROM DWP: MAX PRESS. 91 psi, MIN PRESS. 83 psi, 739 ft. GIVEN BY: LADWP West Valley, DATE: 11/15/2021. METER SIZE: 3 in. DEVELOPED LENGTH: 240 ft. EQUIVALENT LENGTH (Developed length + 25%): 300 ft. WATER CLOSETS AND URINALS table with columns for With Tank, W/Flush Valve, MAKE, MODEL. SYSTEM COMPONENTS table with columns for PIPING MATERIAL, PRESSURE REDUCING VALVE, BACKFLOW PREVENTION DEVICE. HYDRAULIC CALCULATIONS table with rows A through K.

PIPC 2014-009 FIXTURE UNIT COUNT and PIPE SIZE SCHEDULE. TABLES showing fixture unit counts for Kitchen Sinks, Dishwashers, Bar Sinks, Mop or Service Sinks, Clothes Washers, Lavatories, Bathtub, Showers, Water Closets, Urinals, First Hose Bibb, Additional Hose Bibbs, Drinking Fountain. PIPE SIZE SCHEDULE table showing PRESS. LOSS and ALLOWED F. U. for various pipe sizes and materials. Additional flow of approximately 100 gpm will be required for filling ice rink, however, this will be an infrequent process water demand, which will occur when facility is not in use, so this has not been included in above hydraulic calculations.



THIS PLAN WAS ELECTRONICALLY SIGNED AND STAMPED

BUREAU OF ENGINEERING

DEPARTMENT OF PUBLIC WORKS

CITY ENGINEER GARY LEE MOORE, P.E., ENV SP

WORK ORDER NO. E170121B SHEET NAME P-05 SHEET X OF X SHEETS

VERTICAL CONTROL: PLUMBING FIXTURE SCHEDULE RESEDA SKATE FACILITY ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DATE: BY: INDEX NO. CIP NO.

DESIGNER: ROBERT GETTER DESIGNED BY: JUSTIN CHIN DRAWN BY: JUSTIN CHIN CHECKED BY: ROBERT GETTER APPROVED BY: XXX

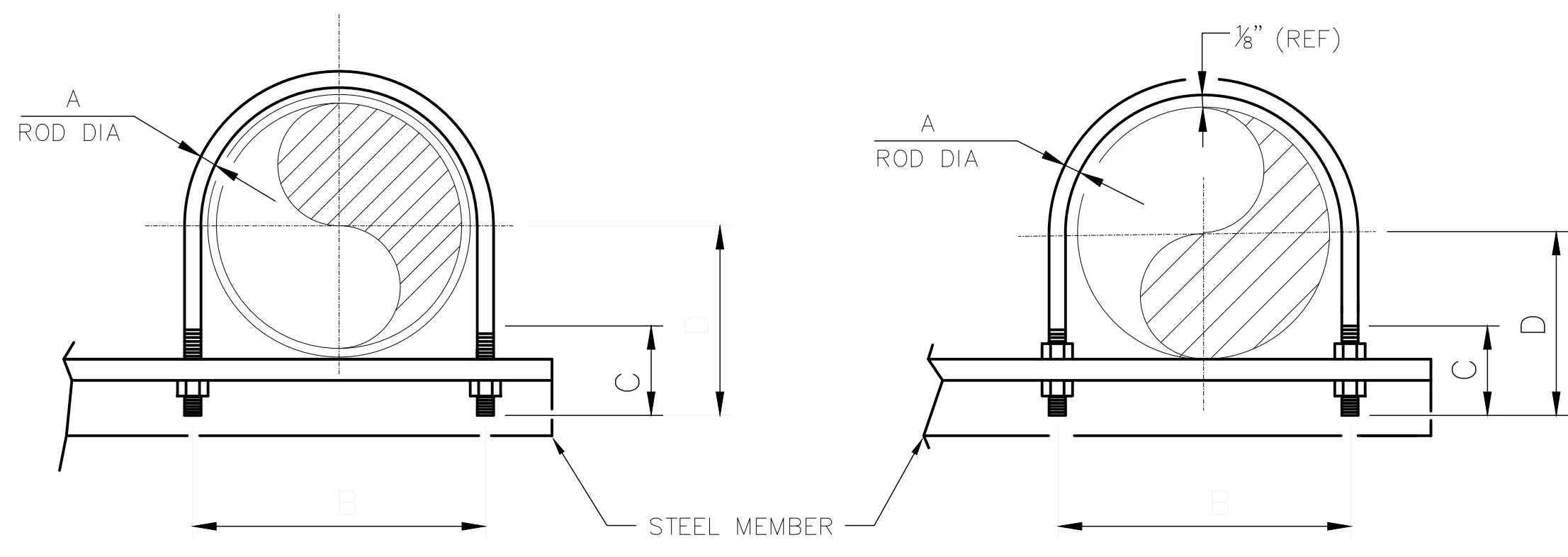


FIG 1
ANCHOR

FIG 2
GUIDE

PIPE SIZE (IN)	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18
"A" ROD DIA (IN)	1/4	3/8	3/8	3/8	3/8	1/2	1/2	1/2	5/8	5/8	3/4	7/8	7/8	7/8	1
"B" (IN)	1 3/16	1 1/2	1 3/4	2 3/8	2 13/16	3 7/16	4 1/8	5 1/8	7 3/8	9 3/8	11 3/8	13 3/4	15	17	19 1/2
"C" THRD (IN)	2 3/8	2 3/8	2 3/8	2 1/2	2 1/2	2 5/16	3	3	3 3/4	3 3/4	4	4 1/4	4 1/4	4 1/4	4 3/4
"D" TANG. (IN)	2 3/4	2 3/4	2 3/4	3	3 1/4	3 3/4	4	4 1/2	6 1/8	7 1/8	8 3/8	9 3/8	10 1/4	11 1/4	12 3/8
# OF SUPPORTS	32	10	10	5	197	-	-	64	70	35	54	-	-	-	-

"U" BOLT W/HEX NUTS

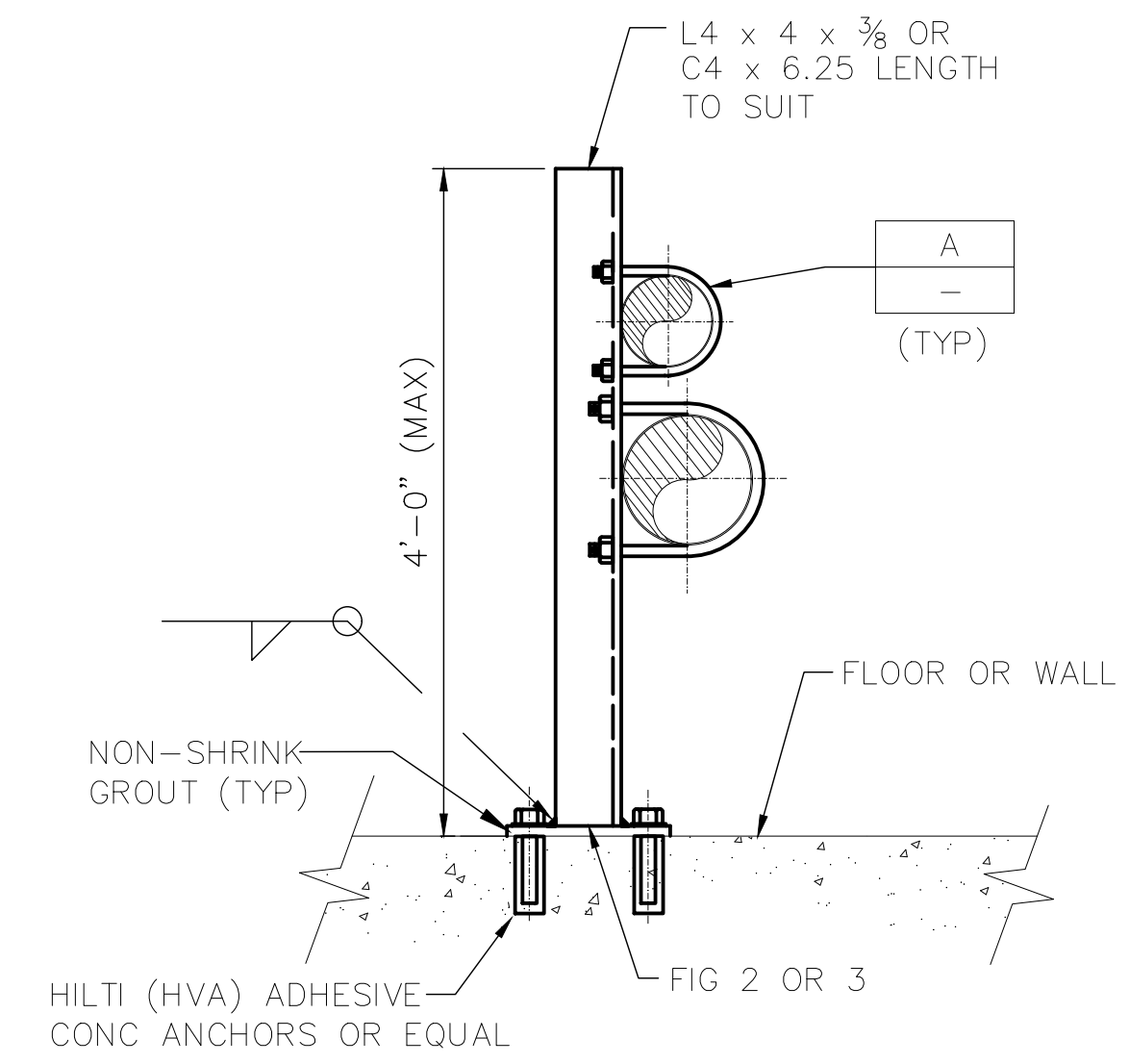


FIG 1
FLOOR OR OVERHEAD MOUNTED

SCHEDULE

L6 x 4 x 3/8 FOR PIPES 14" - 18"
 L5 x 3 1/2 x 3/8 FOR PIPES 8" - 12"
 L4 x 4 x 3/8 FOR PIPES 6" & BELOW

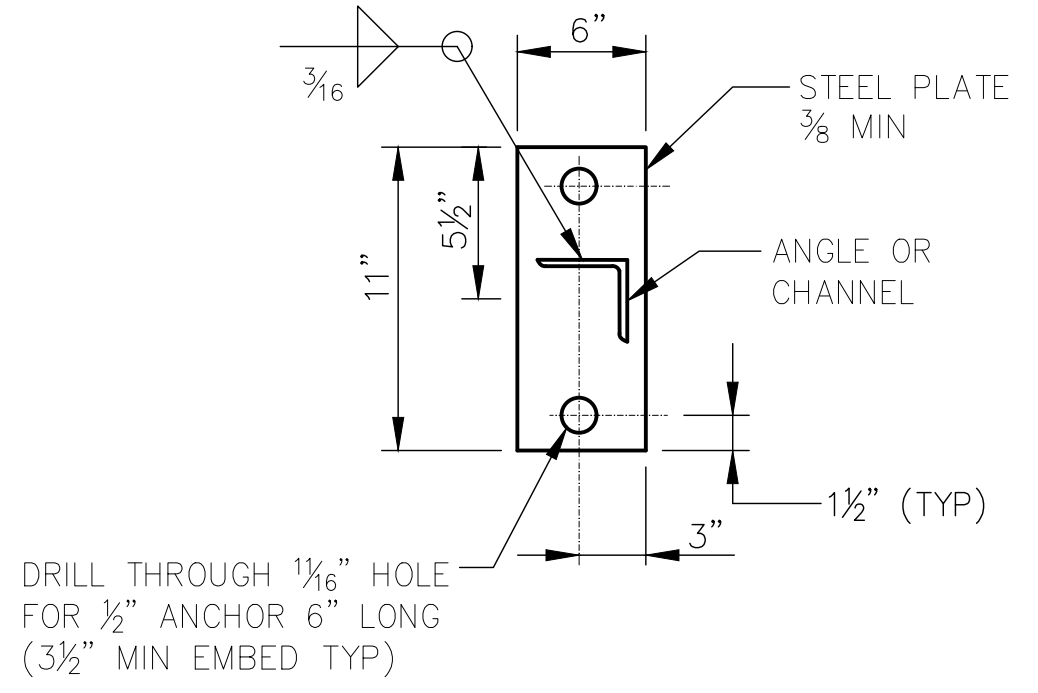


FIG 2
BOLTED

PSG1:
 BOLT SUPPORT TO EXISTING STRUCTURAL STEEL FRAME. DRILL 11/16" HOLES IN STEEL FRAME AND PROVIDE NUTS AND BOLTS FOR ATTACHMENT.

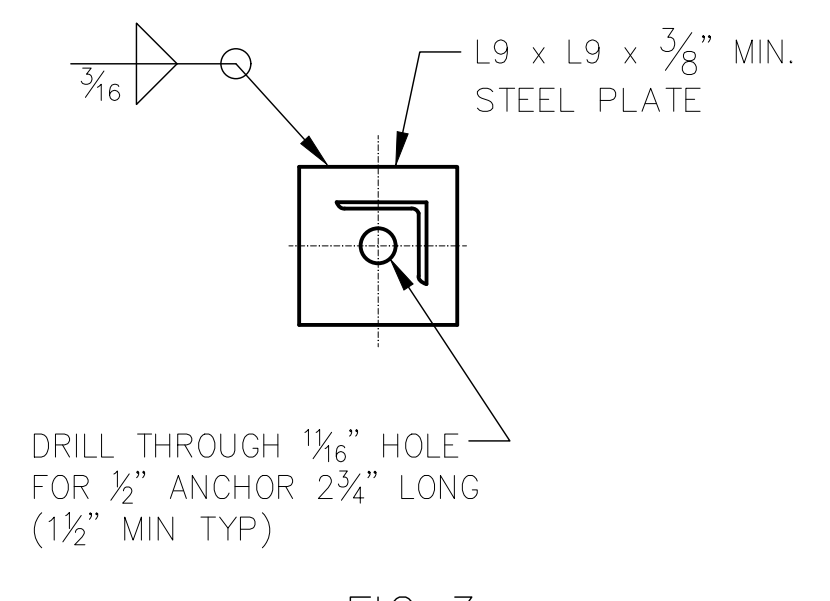


FIG 3
BOLTED

USE FOR PIPE SIZE BELOW 4"

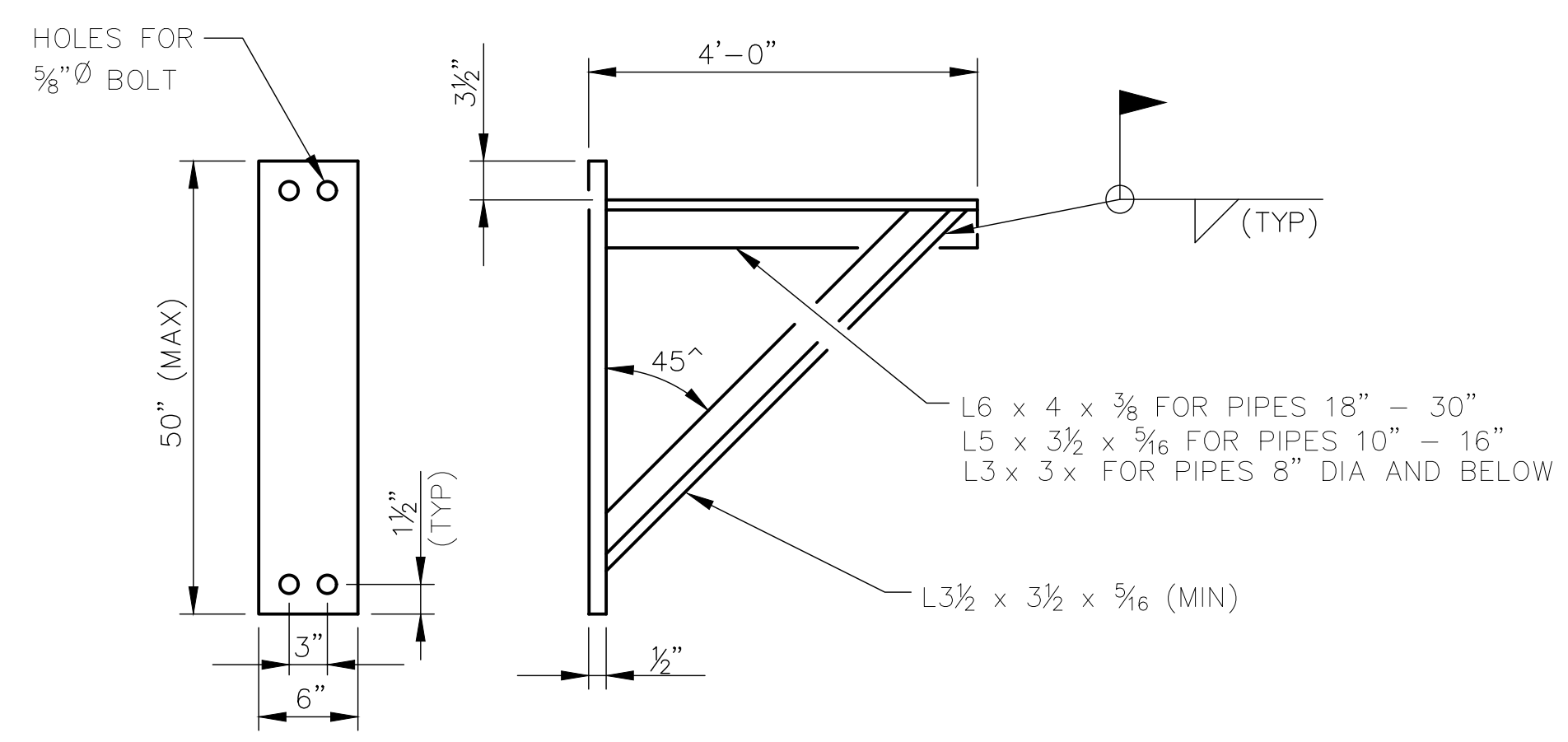
PIPE SIZE (IN)	0.5	1	1.5	2	3	4
# OF PSG SUPPORTS	10	20	12	72	15	18
OVERALL LENGTH OF SUPPORTS (FT)	40	50	30	200	60	70
# OF PSG1 SUPPORTS	30	20	4	40	-	4
OVERALL LENGTH OF SUPPORTS (FT)	90	60	12	100	-	12

PIPE SUPPORT TYPE A DETAIL

SCALE: N.T.S.

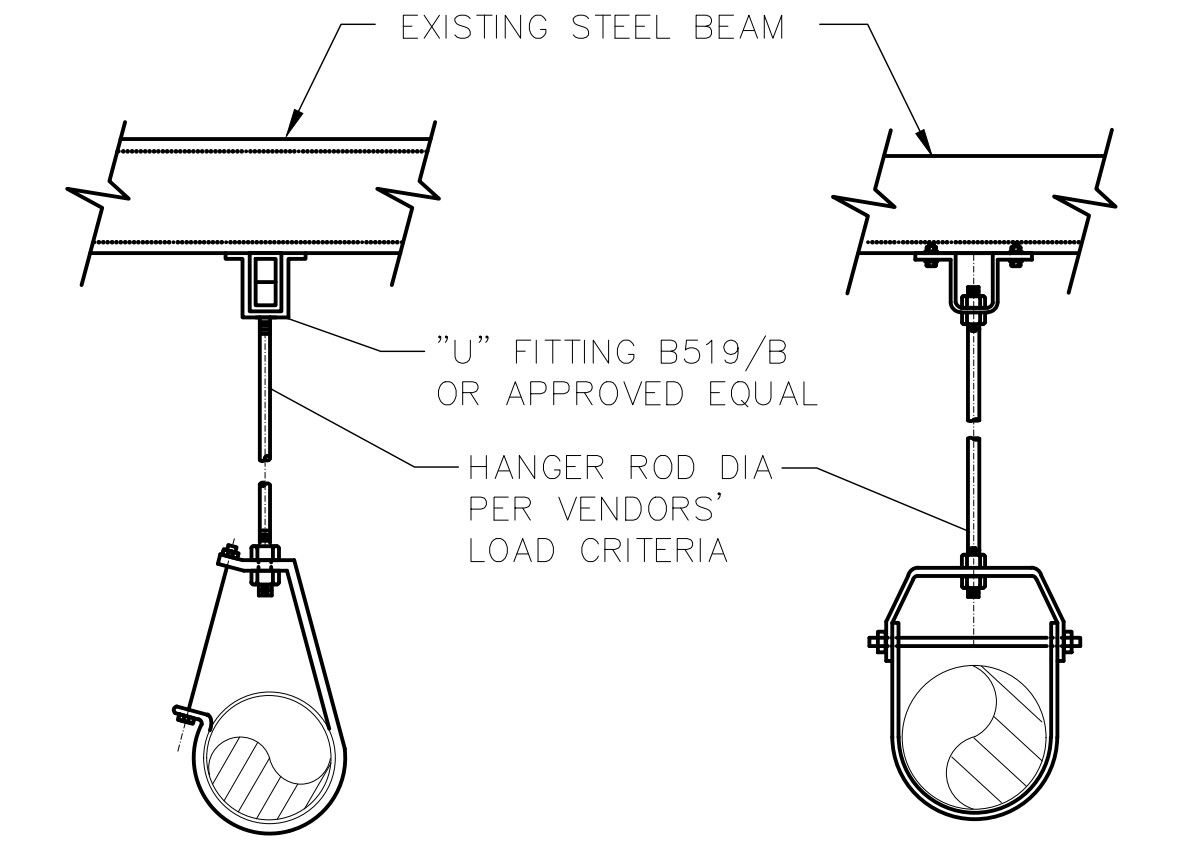
PIPE SUPPORT TYPE B DETAIL

SCALE: N.T.S.



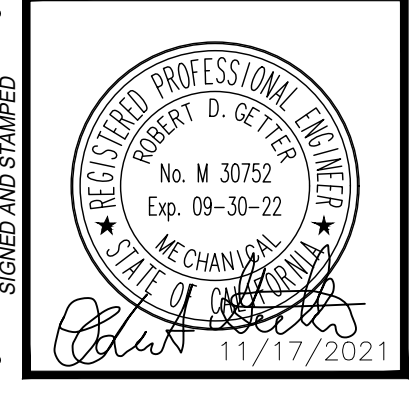
PIPE SUPPORT TYPE C DETAIL

SCALE: N.T.S.



PIPE SUPPORT TYPE D DETAIL

SCALE: N.T.S.



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 VERTICAL CONTROL:
 HORIZONTAL CONTROL:
 SHEET TITLE: PIPE SUPPORT DETAILS
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

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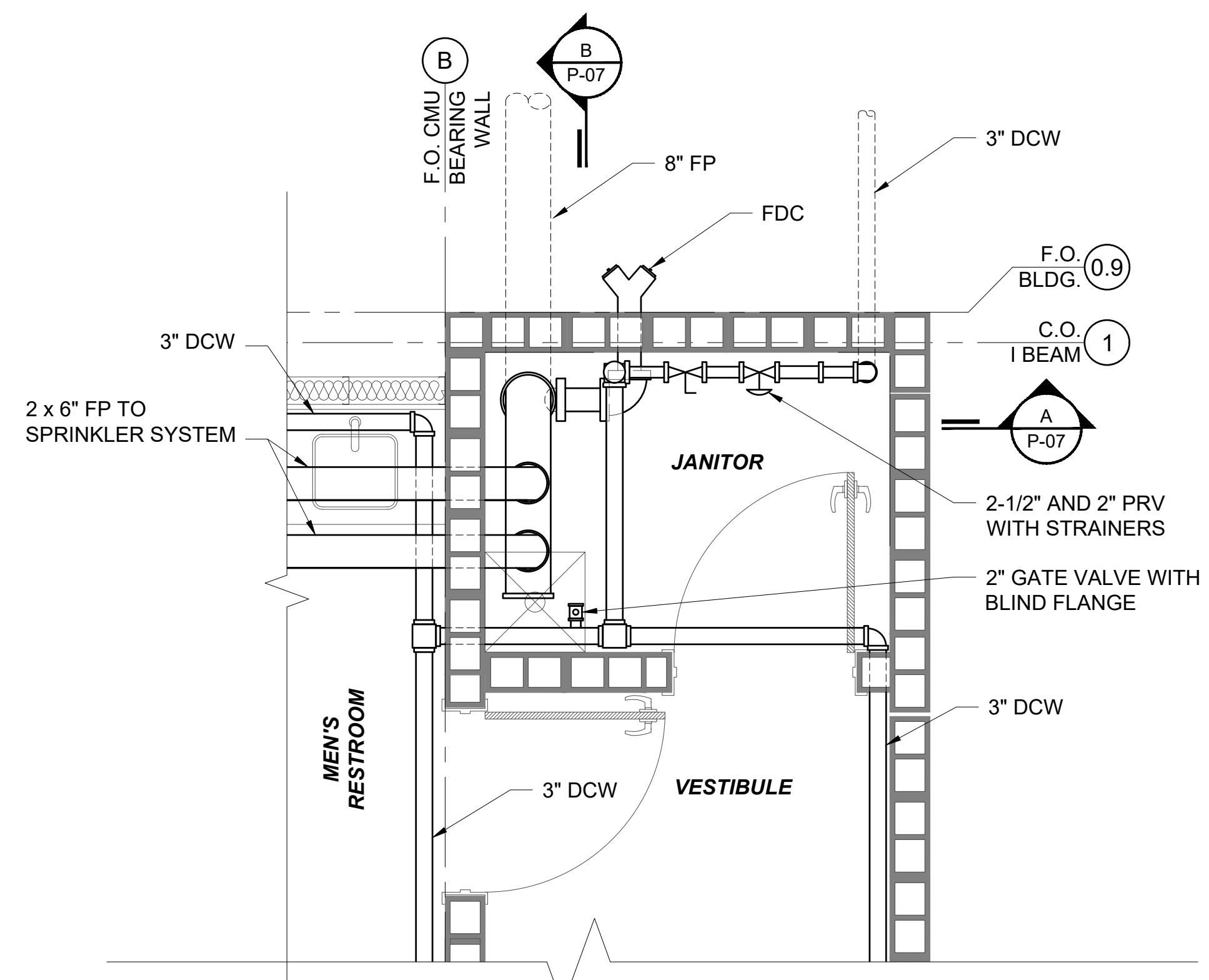
CITY OF LOS ANGELES
 CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP:
 ENGINEER: ROBERT GETTLER
 DESIGNED BY: JUSTIN CHIN
 DRAWN BY: JUSTIN CHIN
 CHECKED BY: ROBERT GETTLER
 APPROVED BY: XXX

WORK ORDER NO.
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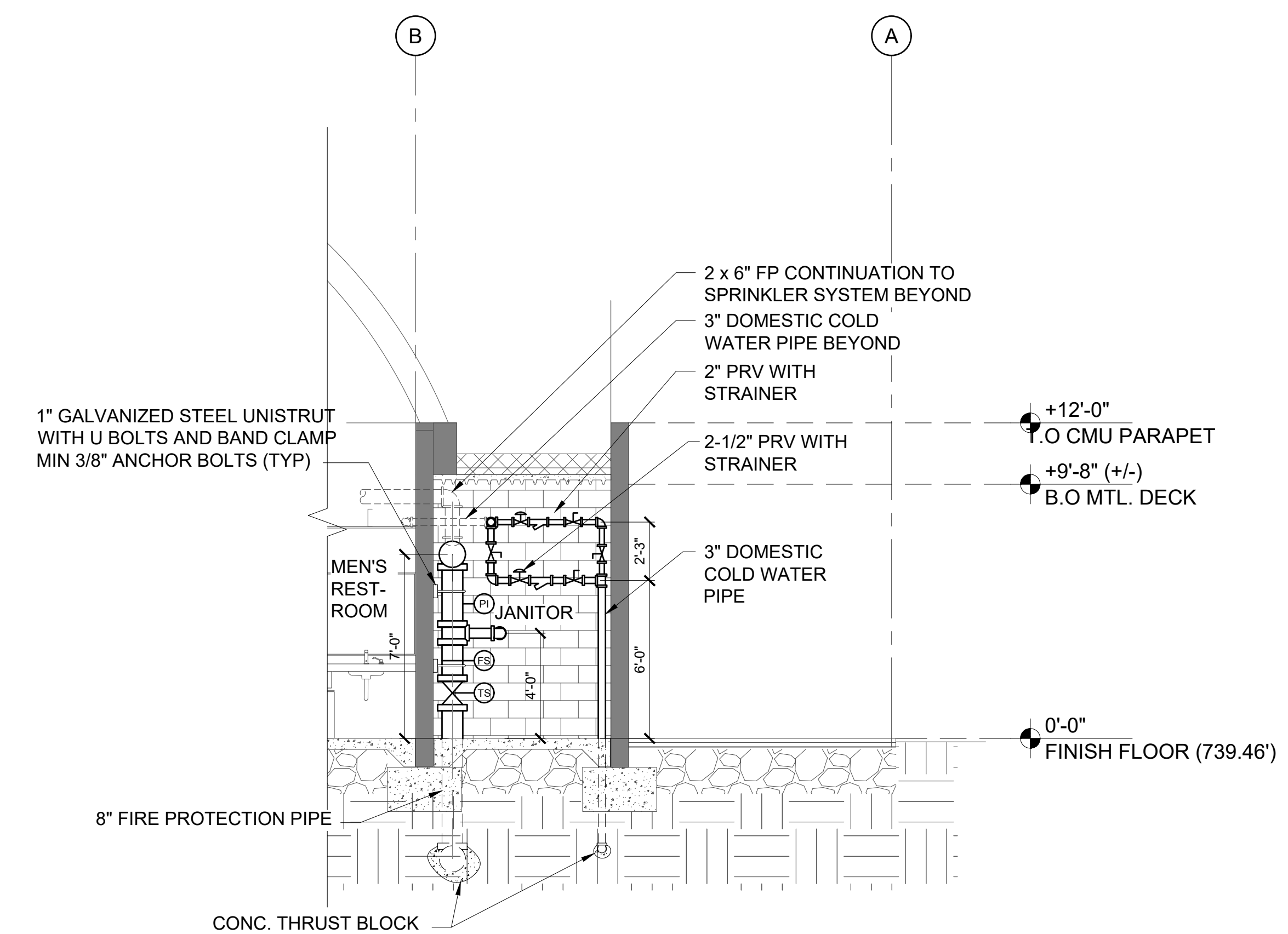
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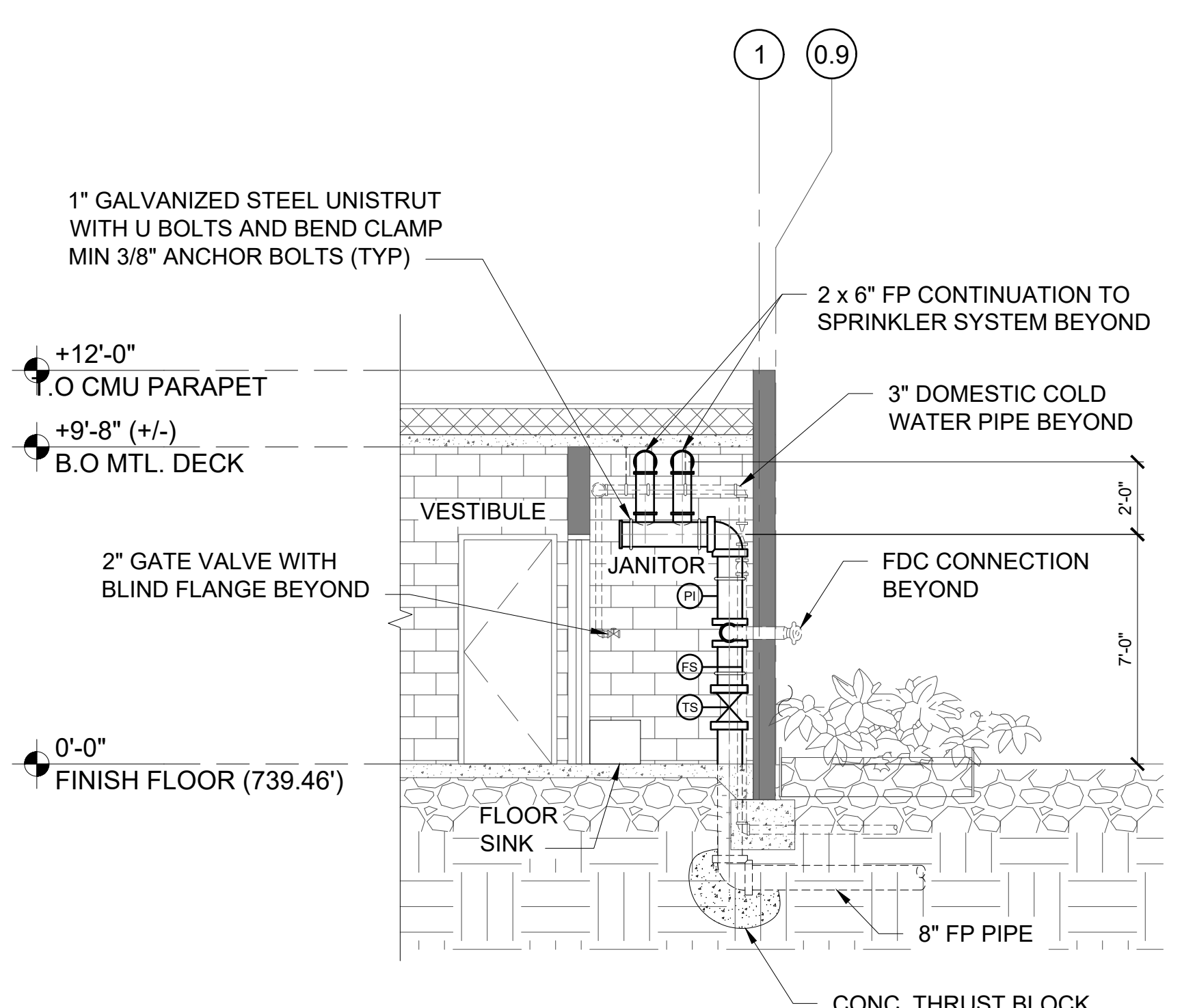
REVISION DATES (DESIGN STAGE ONLY)



JANITOR CLOSET ENLARGE PLAN
 REF: P-02 SCALE: 1/2" = 1'-0"

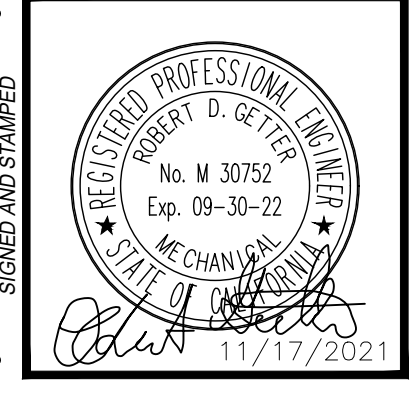


SECTION @ JANITOR NORTH WALL
 REF: P-02 SCALE: 1/4" = 1'-0"



SECTION @ JANITOR WEST WALL
 REF: P-02 SCALE: 1/4" = 1'-0"

REVISION DATE(S) (DESIGN STAGE ONLY) SHEET NUMBER CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS BUREAU OF ENGINEERING



VERTICAL CONTROL:	BUREAU OF ENGINEERING
HORIZONTAL CONTROL:	PIPING DETAIL PLAN AND SECTIONS
SHEET TITLE:	RESEDA SKATE FACILITY
PROJECT:	18210 SHERMAN WAY, RESEDA, CA 91335
ADDRESS:	

NO.	REVISIONS	DATE	BY

CITY ENGINEER	GARY LEE MOORE, P.E., ENV SP	DATE:	
DESIGN GROUP	ROBERT GETTER		
ENGINEER	ROBERT GETTER		
DESIGNED BY:	JUSTIN CHIN		
DRAWN BY:	JUSTIN CHIN		
CHECKED BY:	ROBERT GETTER		
APPROVED BY:	XXX		

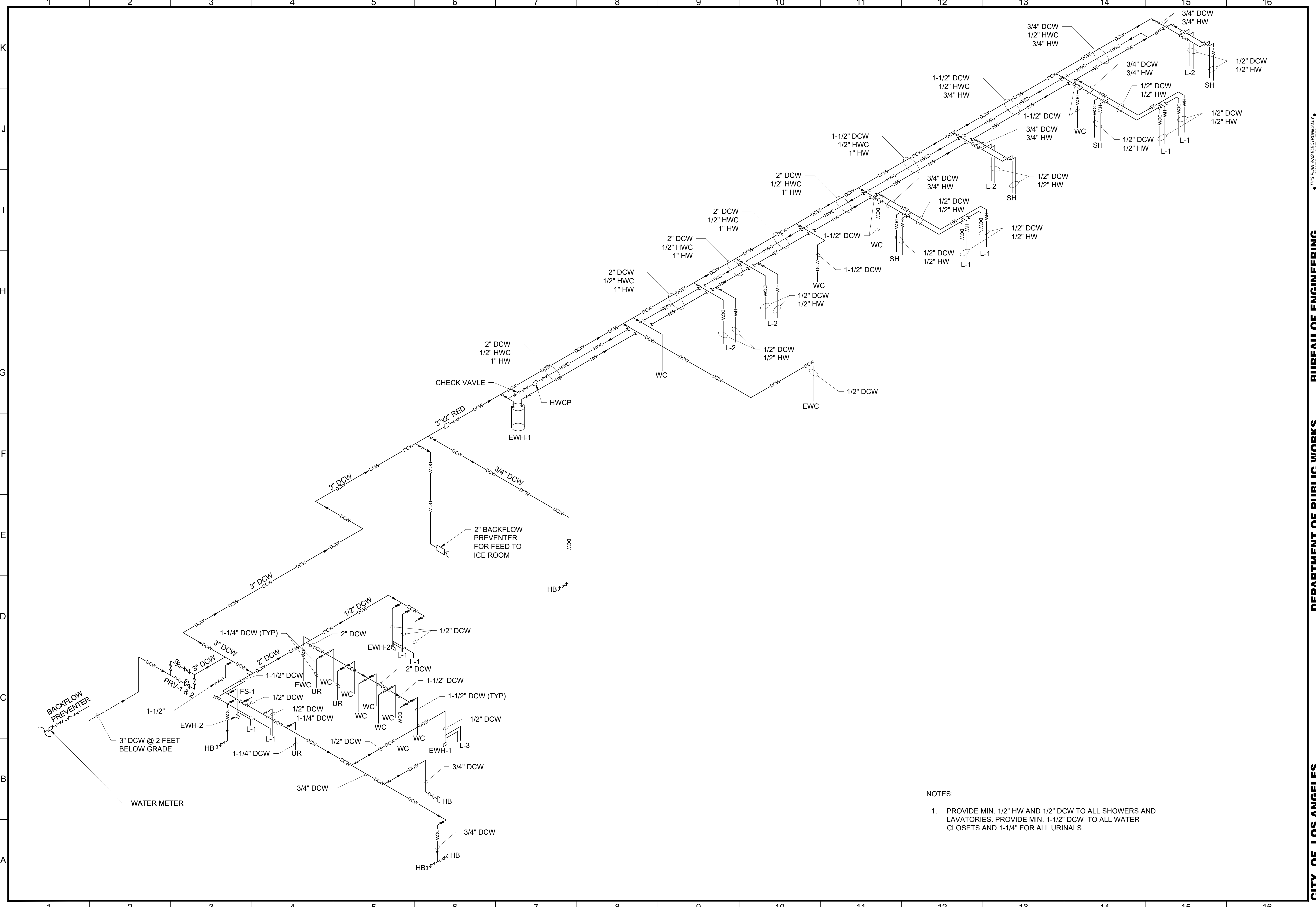
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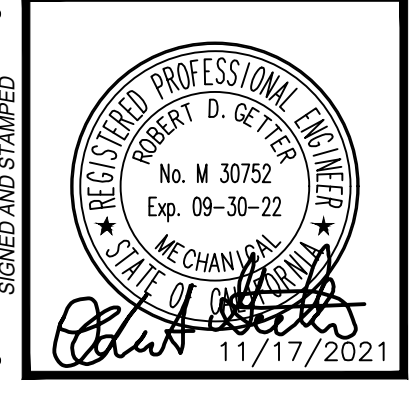
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- NOTES:
1. PROVIDE MIN. 1/2" HW AND 1/2" DCW TO ALL SHOWERS AND LAVATORIES. PROVIDE MIN. 1-1/2" DCW TO ALL WATER CLOSETS AND 1-1/4" FOR ALL URINALS.



VERTICAL CONTROL:	BUREAU OF ENGINEERING
HORIZONTAL CONTROL:	
SHEET TITLE:	WATER SUPPLY PLUMBING DIAGRAM
PROJECT:	RESEDA SKATE FACILITY
ADDRESS:	18210 SHERMAN WAY, RESEDA, CA 91335

DATE:	BY:
REVISIONS:	
CITY ENGINEER:	
DESIGN GROUP:	
ENGINEER:	
DESIGNED BY:	
DRAWN BY:	
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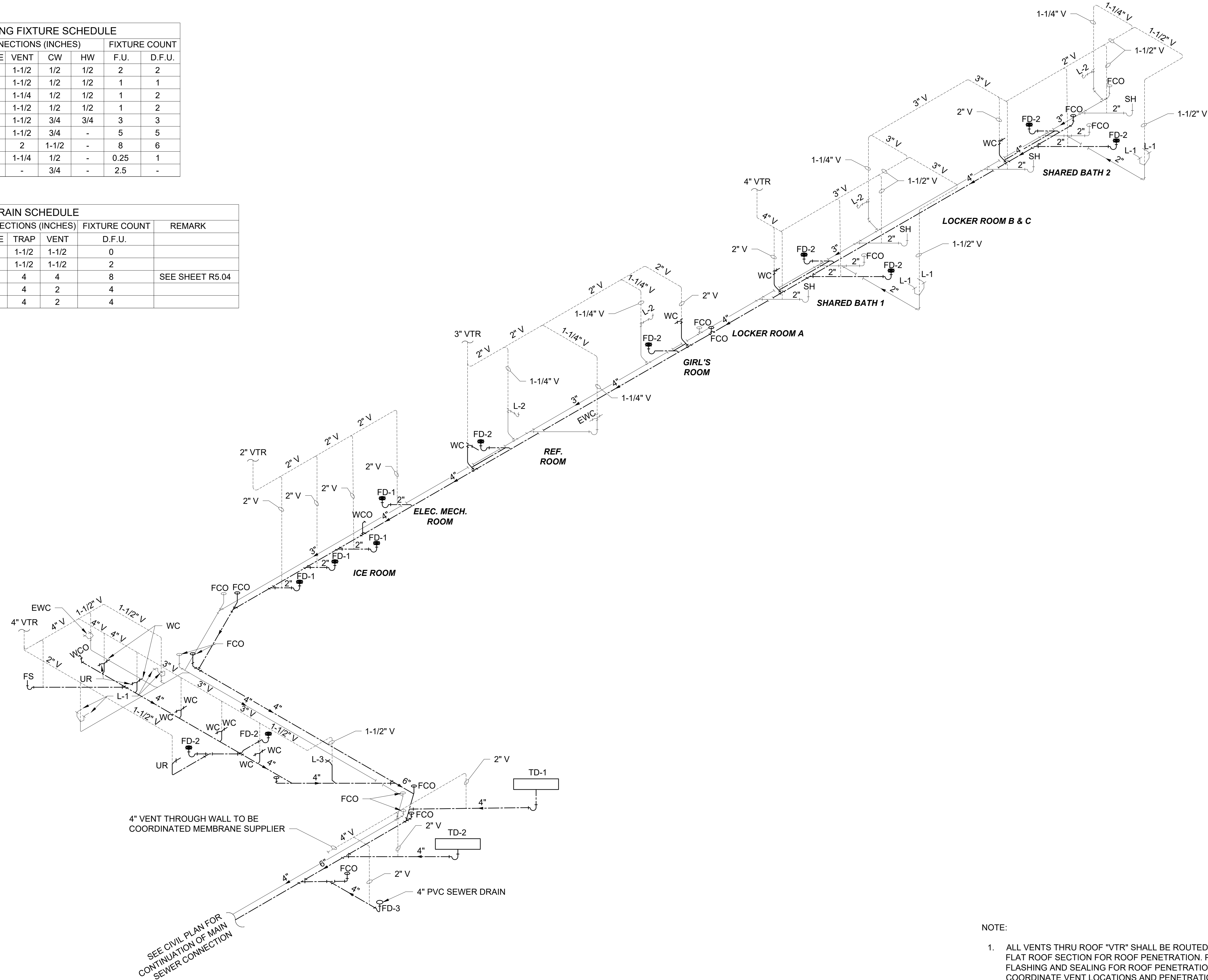
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JUSTIN CHIN	
JUSTIN CHIN	
ROBERT GETTER	
XXX	

WORK ORDER NO. E170121B

SHEET NAME: P-08
SHEET X OF X SHEETS

PLUMBING FIXTURE SCHEDULE								
MARK	DESCRIPTION	CONNECTIONS (INCHES)					FIXTURE COUNT	
		WASTE	VENT	CW	HW	F.U.	D.F.U.	
SH	SHOWER	2	1-1/2	1/2	1/2	2	2	
L-1	LAVATORY	2	1-1/2	1/2	1/2	1	1	
L-2	LAVATORY	1-1/2	1-1/4	1/2	1/2	1	2	
L-3	KITCHEN SINK	2	1-1/2	1/2	1/2	1	2	
FS-1	FLOOR SINK	2	1-1/2	3/4	3/4	3	3	
UR	URINAL	2	1-1/2	3/4	-	5	5	
WC	WATER CLOSET	3	2	1-1/2	-	8	6	
EWC	WATER COOLER	1-1/4	1-1/4	1/2	-	0.25	1	
HB	HOSE BIBB	-	-	3/4	-	2.5	-	

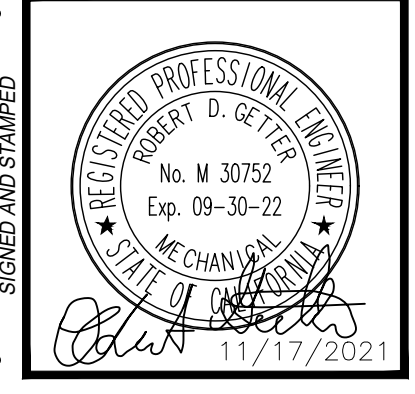
FLOOR DRAIN SCHEDULE						
MARK	DESCRIPTION	CONNECTIONS (INCHES)			FIXTURE COUNT	REMARK
		WASTE	TRAP	VENT		
FD-1	FLOOR DRAIN	2	1-1/2	1-1/2	0	
FD-2	FLOOR DRAIN	2	1-1/2	1-1/2	2	
FD-3	FLOOR DRAIN	4	4	4	8	SEE SHEET R5.04
TD-1	TRENCH DRAIN	4	4	2	4	
TD-2	TRENCH DRAIN	4	4	2	4	



NOTE:
 1. ALL VENTS THRU ROOF "VTR" SHALL BE ROUTED TO LOW FLAT ROOF SECTION FOR ROOF PENETRATION. PROVIDE FLASHING AND SEALING FOR ROOF PENETRATIONS. COORDINATE VENT LOCATIONS AND PENETRATION DETAILS WITH GENERAL CONTRACTOR AND ROOFING SUBCONTRACTOR

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 HORIZONTAL CONTROL:
 SHEET TITLE: WASTE AND VENT PLUMBING DIAGRAM
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

NO.	REVISIONS	DATE	BY

CITY OF LOS ANGELES
 GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP
 ENGINEER: ROBERT GETTER
 DESIGNED BY: JUSTIN CHIN
 DRAWN BY: JUSTIN CHIN
 CHECKED BY: ROBERT GETTER
 APPROVED BY: XXX

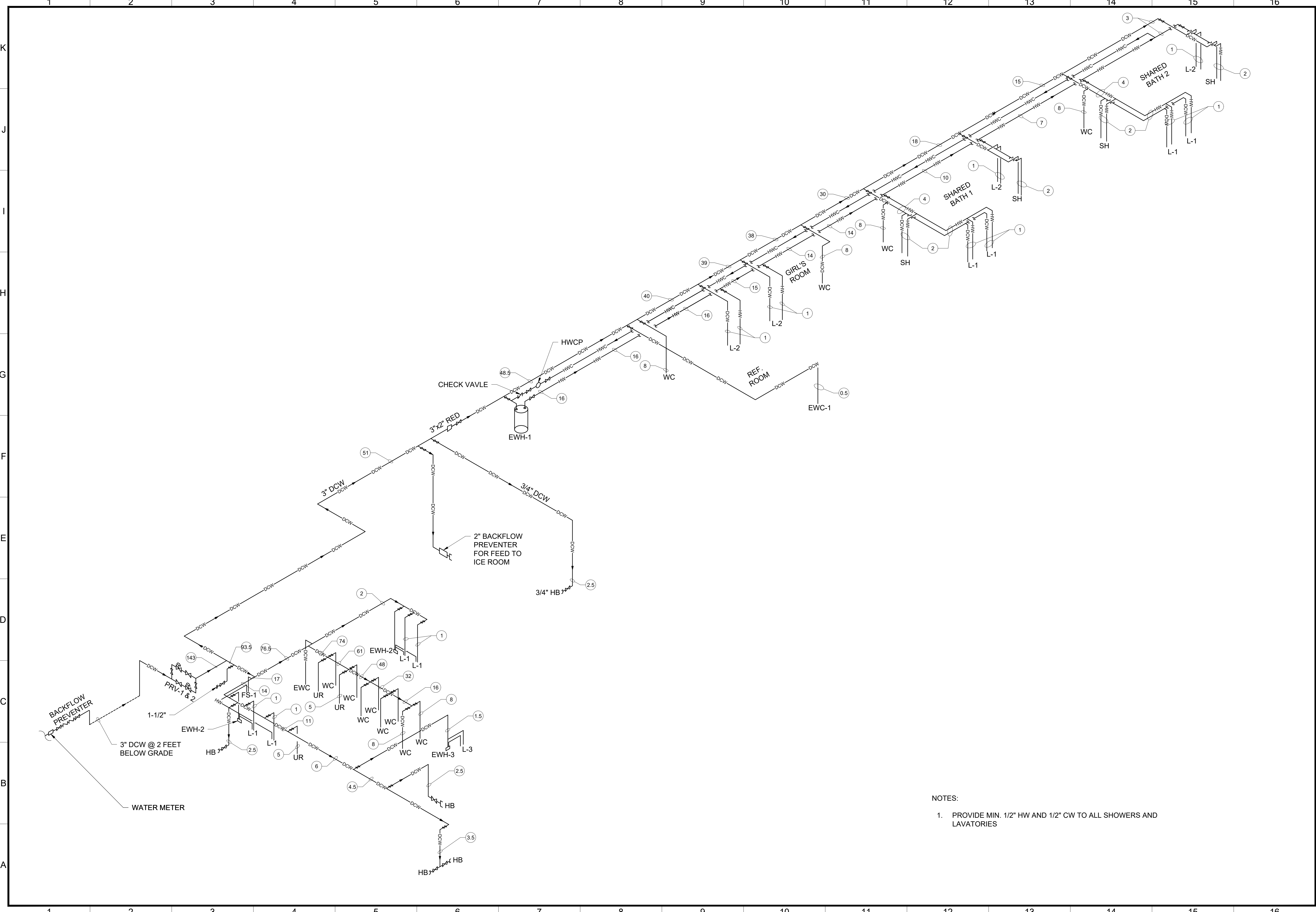
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 E170121B

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P-09
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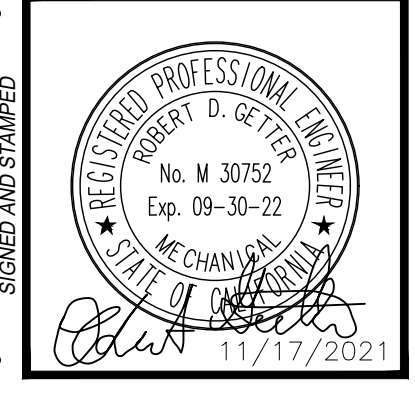
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- NOTES:
1. PROVIDE MIN. 1/2" HW AND 1/2" CW TO ALL SHOWERS AND LAVATORIES



VERTICAL CONTROL:	BUREAU OF ENGINEERING
HORIZONTAL CONTROL:	WATER SUPPLY FIXTURE COUNT DIAGRAM
SHEET TITLE:	RESEDA SKATE FACILITY
PROJECT:	18210 SHERMAN WAY, RESEDA, CA 91335
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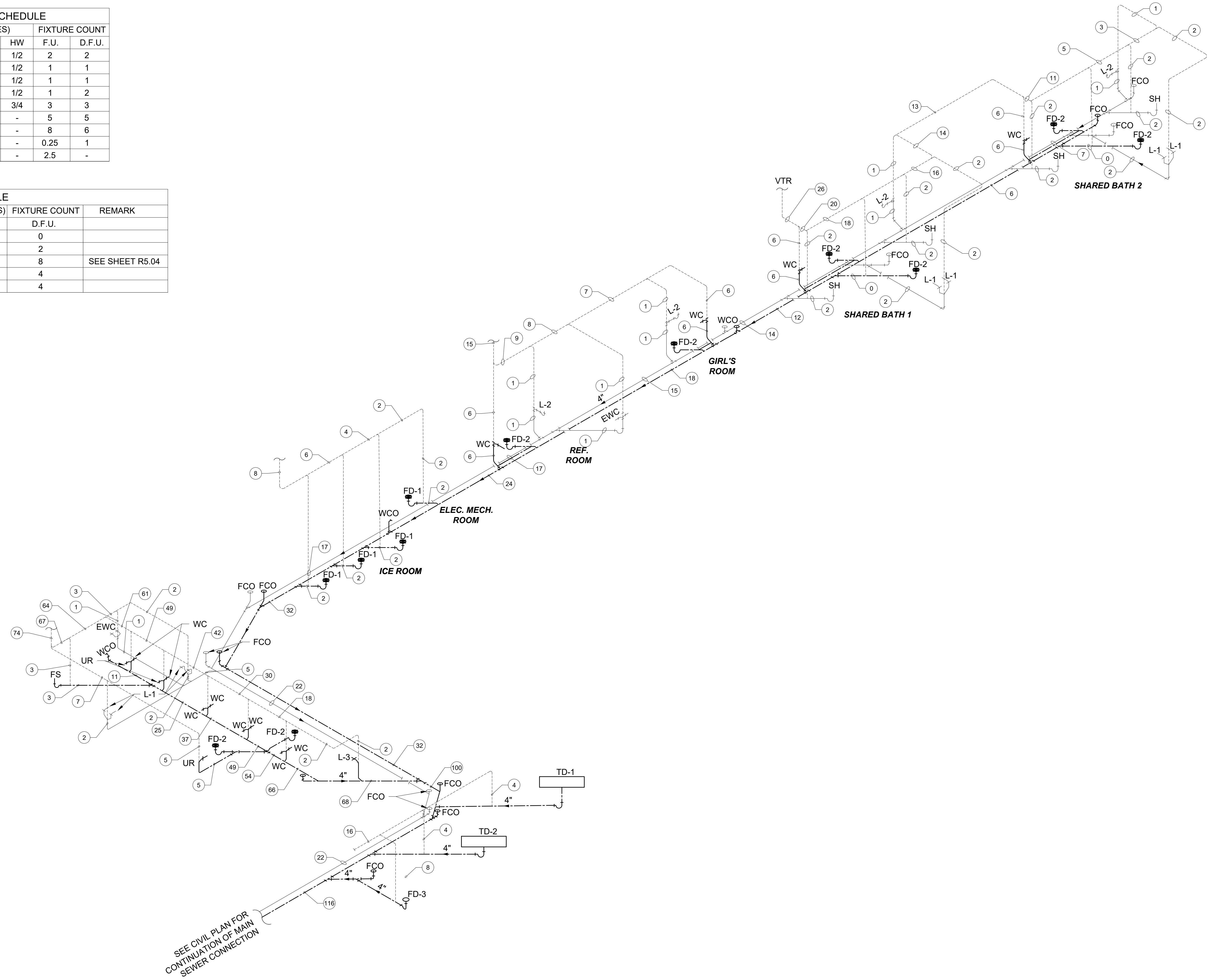
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DESIGN GROUP:	
ENGINEER:	ROBERT GETTER
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WORK ORDER NO. E170121B

SHEET NAME: P-10
SHEET X OF X SHEETS

PLUMBING FIXTURE SCHEDULE								
MARK	DESCRIPTION	CONNECTIONS (INCHES)					FIXTURE COUNT	
		WASTE	VENT	CW	HW	F.U.	D.F.U.	
SH	SHOWER	2	1-1/2	1/2	1/2	2	2	
L-1	LAVATORY	1-1/2	1-1/4	1/2	1/2	1	1	
L-2	LAVATORY	1-1/2	1-1/4	1/2	1/2	1	1	
L-3	KITCHEN SINK	2	1-1/2	1/2	1/2	1	2	
FS-1	FLOOR SINK	2	1-1/2	3/4	3/4	3	3	
UR	URINAL	2	1-1/2	3/4	-	5	5	
WC	WATER CLOSET	3	2	1-1/2	-	8	6	
EWC	WATER COOLER	1-1/4	1-1/4	1/2	-	0.25	1	
HB	HOSE BIBB	-	-	3/4	-	2.5	-	

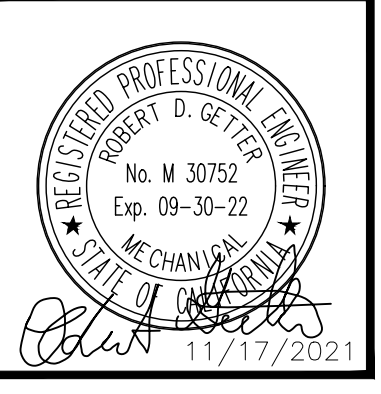
FLOOR DRAIN SCHEDULE						
MARK	DESCRIPTION	CONNECTIONS (INCHES)			FIXTURE COUNT	REMARK
		WASTE	TRAP	VENT		
FD-1	FLOOR DRAIN	2	1-1/2	1-1/2	0	
FD-2	FLOOR DRAIN	2	1-1/2	1-1/2	2	
FD-3	FLOOR DRAIN	4	4	4	8	SEE SHEET R5.04
TD-1	TRENCH DRAIN	4	4	2	4	
TD-2	TRENCH DRAIN	4	4	2	4	



SEE CIVIL PLAN FOR CONTINUATION OF MAIN SEWER CONNECTION

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 VERTICAL CONTROL:
 HORIZONTAL CONTROL:
 SHEET TITLE: WASTE AND VENT FIXTURE COUNT DIAGRAM
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

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DATE:	BY:
REVISIONS:	
CIP NO.	INDEX NO.

CITY ENGINEER	DESIGN GROUP	DATE:
GARY LEE MOORE, P.E., ENV SP	ROBERT GETTER	
ENGINEER	DESIGNED BY:	
	JUSTIN CHIN	
	DRAWN BY:	
	JUSTIN CHIN	
	CHECKED BY:	
	ROBERT GETTER	
	APPROVED BY:	
	XXX	

WORK ORDER NO. E170121B
 SHEET NAME P-11
 SHEET X OF X SHEETS

RESEDA SKATE FACILITY - RINK DRAWINGS

SHEET INDEX:

R0.01	RINK COVER SHEET
R1.01	RINK LAYOUT
R1.02	RINK EQUIPMENT ROOM
R1.03	RINK ROOF-TOP CONDENSOR
R1.04	RINK SUBSOIL DRAINAGE PLAN
R1.05	RINK SUBSOIL & SNOWMELT HEATING PLAN
R5.01	RINK DETAILS
R5.02	RINK DETAILS
R5.03	RINK DETAILS
R5.04	RINK DETAILS
R6.01	RINK DETAILS
R6.02	RINK DETAILS
R6.03	RINK DETAILS

Summary of Reseda Ice Skating Facility Ice Systems

General

Refrigeration System for the ice-skating rink provides a total of 140 tons of cooling to the ice rink floor through two Trane RTHD 120 chiller packages. Each chiller provides 70 tons of cooling from twin screw compressors using refrigerant R513A as the primary refrigerant and a 40% ethylene glycol fluid for the secondary refrigerant. Secondary refrigerant circulates through the rink floor cooling pipe using primary and secondary (100% backup) Grundfos cold floor pumps. A waste heat recovery system captures refrigerant waste heat with a waste heat condenser and circulates a solution of 40% ethylene glycol warmed from waste heat to both warm the subsoils beneath the rink and provide heating for the snowmelt pit. The subsoils require heating to prevent frost from developing under the rink floor due to continuous operation of the refrigerated ice rink and the snowmelt pit requires heating to melt ice shavings generated from the ice grooming operation of the ice resurfacers. A Korytko, Model KDJ-0606A-7.5-1, cooling tower is located on the roof of the ice refrigeration mechanical room for condensing the hot gasses and exhausting any excess heat from the refrigeration cooling process. All refrigeration equipment and pumps are identified on the Refrigeration Equipment Schedule located on Sheet R-603 of the Refrigeration Drawings.

The refrigeration floor is detailed on the drawings and includes a subsoil drainage piping system located beneath the cooling floor and at the base of the granular fill that provides a frost-free base to the cooling floor. The drainage system evacuates any stray water from the ice resurfacing equipment, surface and subsurface rainwater that may migrate into the rink floor subsoils preventing any accidental freezing of these soils that could cause the ice floor to heave. Additional freeze protection is provided under the rink floor from the subsoil waste heat system described above which is located just beneath the ice rink insulation layer located immediately below the ice rink refrigerated floor. All these systems are designed to protect the rink floor subsoils from freezing which would heave the rink floor upward causing damage to the ice rink floor.

The ice rink contractor will be responsible for coordinating and installing all the ice rink floor systems shown on the R (Rink) drawings.

Ice Rink Floor Systems include:

1. Subsoil drainage piping under the rink floor.
2. Granular fill under the rink floor.
3. Subsoil heat headers and piping under the rink floor.
4. Insulation and vapor barriers under the rink floor.
5. The refrigeration floor which includes rink floor headers and cooling pipe, granular sand fill surrounding and covering the rink floor cooling pipe, and the rink perimeter expansion joint.
6. Insulated refrigeration floor transmission pipe to and from the refrigeration room and ice rink floor.
7. Subsoil heating transmission pipe to and from the refrigeration room and ice rink floor subsoil heating headers and piping.
8. Transmission piping for the snowmelt pit to and from the ice refrigeration room and the snowmelt pit.
9. The snowmelt pit and drain will be constructed by the building contractor, but the snowmelt pit heating coil will be provided and installed by the ice rink contractor.

Other rink systems shown on the R (Rink) drawings, coordinated, and installed by the ice rink contractor include:

1. The refrigeration plant, including all equipment, piping, pumping, valves, wiring, and controls.
2. The refrigeration plant motor control panel.
3. The refrigeration leak detection system, including all wiring, sensors, controls, sound/strobe light alarms, emergency shutdowns and required fire department monitoring panelboards and signage.
4. All equipment, pumps, piping, wiring and controls for the condensing system.
5. All equipment, pumps, piping, wiring, and controls for the waste heat reclamation system.
6. All dasher boards and boxes including spectator shielding, team box rubber floor, benches, gates, and safety netting and accessories.

The ice rink contractor will have a project manager on site during all critical construction associated around the installation of the ice rink systems outlined above and will coordinate their systems installation with the general building systems construction.

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REVISION DATES (DESIGN STAGE ONLY)

Sheet Version 4.0



BUREAU OF ENGINEERING	
VERTICAL CONTROL	
HORIZONTAL CONTROL	
SHEET TITLE	RINK COVER SHEET
PROJECT	RESEDA SKATE FACILITY
ADDRESS	18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS	
DATE	BY
INDEX NO.	
CIP NO.	

CITY OF LOS ANGELES	
ENGINEER	GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP	
ENGINEER	JAMES R. MALAND
DESIGNED BY	JAMES R. MALAND
DRAWN BY	S. DUNLEAVY
CHECKED BY	JAMES R. MALAND
APPROVED BY	JAMES R. MALAND

WORK ORDER NO.	E170121B
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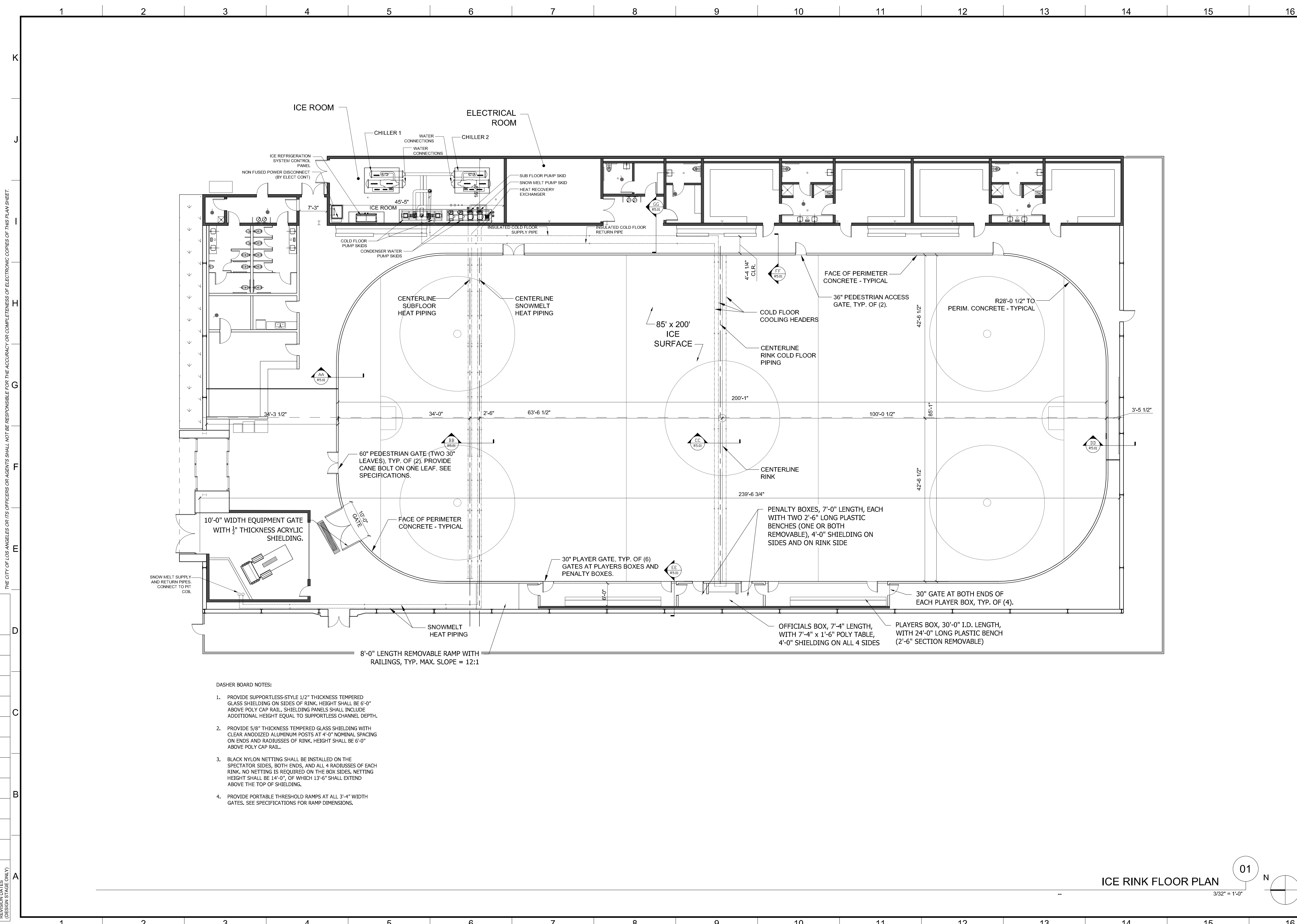
SHEET NAME	R0.01
SHEET	X OF X SHEETS

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BUREAU OF ENGINEERING

DEPARTMENT OF PUBLIC WORKS

CITY OF LOS ANGELES



- DASHER BOARD NOTES:
1. PROVIDE SUPPORTLESS-STYLE 1/2" THICKNESS TEMPERED GLASS SHIELDING ON SIDES OF RINK. HEIGHT SHALL BE 6'-0" ABOVE POLY CAP RAIL. SHIELDING PANELS SHALL INCLUDE ADDITIONAL HEIGHT EQUAL TO SUPPORTLESS CHANNEL DEPTH.
 2. PROVIDE 5/8" THICKNESS TEMPERED GLASS SHIELDING WITH CLEAR ANODIZED ALUMINUM POSTS AT 4'-0" NOMINAL SPACING ON ENDS AND RADIIUSES OF RINK. HEIGHT SHALL BE 6'-0" ABOVE POLY CAP RAIL.
 3. BLACK NYLON NETTING SHALL BE INSTALLED ON THE SPECTATOR SIDES, BOTH ENDS, AND ALL 4 RADIIUSES OF EACH RINK. NO NETTING IS REQUIRED ON THE BOX SIDES. NETTING HEIGHT SHALL BE 14'-0", OF WHICH 13'-6" SHALL EXTEND ABOVE THE TOP OF SHIELDING.
 4. PROVIDE PORTABLE THRESHOLD RAMPS AT ALL 3'-4" WIDTH GATES. SEE SPECIFICATIONS FOR RAMP DIMENSIONS.

ICE RINK FLOOR PLAN
 3/32" = 1'-0"
 01
 N

REVISION DATES (DESIGN STAGE ONLY)

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CITY OF LOS ANGELES

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BUREAU OF ENGINEERING

ENGINEERING CITY OF LOS ANGELES

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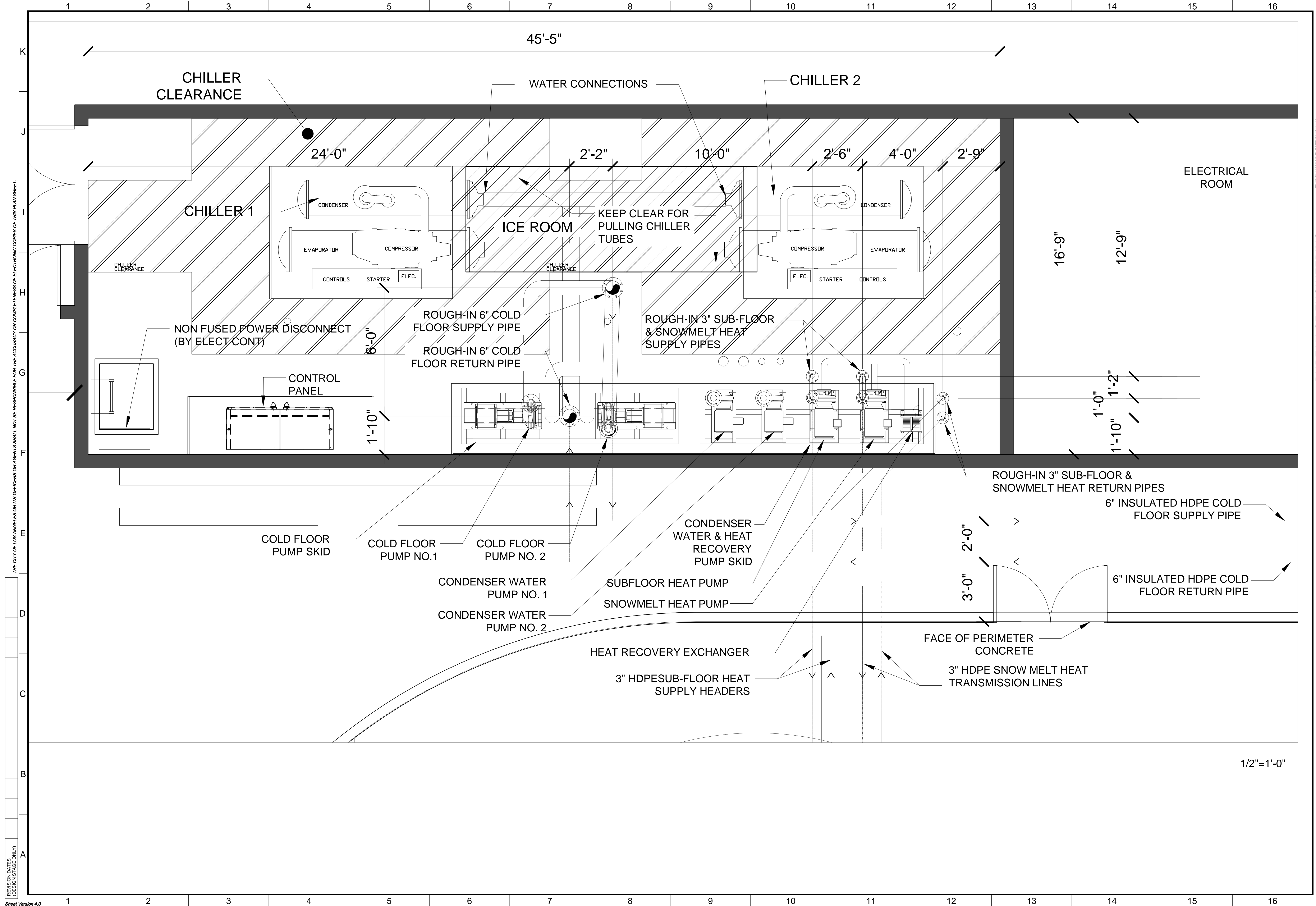
VERTICAL CONTROL	DATE	BY
HORIZONTAL CONTROL		
SHEET TITLE	RINK LAYOUT	
PROJECT	RESEDA SKATE FACILITY	
ADDRESS	18210 SHERMAN WAY, RESEDA CA 91335	

CITY ENGINEER	DATE
GARY LEE MOORE, P.E., ENV SP	
DESIGN GROUP	
ENGINEER	JAMES R. MALAND
DESIGNED BY	JAMES R. MALAND
DRAWN BY	S. DUNLEAVY
CHECKED BY	JAMES R. MALAND
APPROVED BY	JAMES R. MALAND

WORK ORDER NO.	E170121B
SHEET NAME	R1.01
SHEET	X OF X SHEETS

INDEX NO.

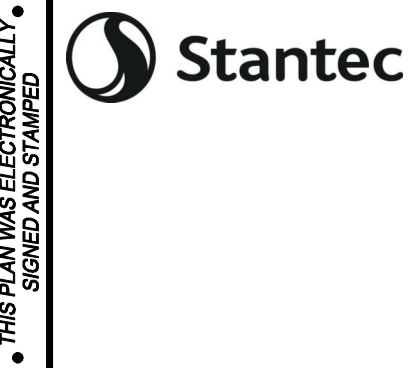
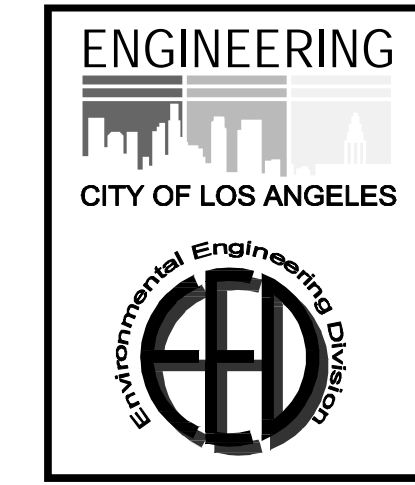
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Sheet Version 4.0



BUREAU OF ENGINEERING

VERTICAL CONTROL: _____
 HORIZONTAL CONTROL: _____
 SHEET TITLE: RINK EQUIPMENT ROOM
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS	DATE	BY

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 ENGINEER: JAMES R. MALAND
 DESIGNED BY: JAMES R. MALAND
 DRAWN BY: S. DUNLEAVY
 CHECKED BY: JAMES R. MALAND
 APPROVED BY: JAMES R. MALAND

CIP NO. _____
 INDEX NO. _____

CITY OF LOS ANGELES

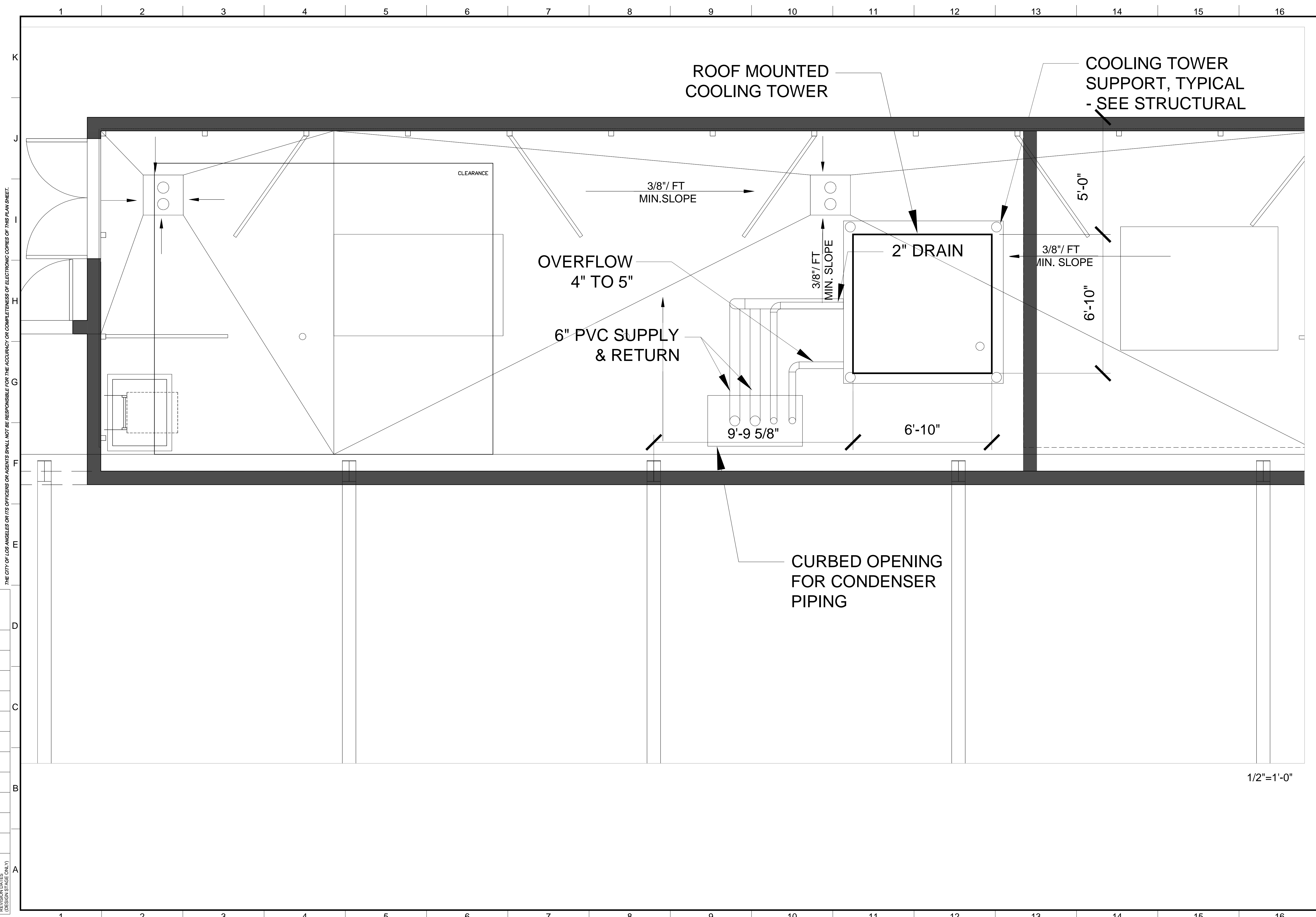
GARY LEE MOORE, P.E., ENV SP

DESIGN GROUP: _____
 ENGINEER: JAMES R. MALAND
 DESIGNED BY: JAMES R. MALAND
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 CHECKED BY: JAMES R. MALAND
 APPROVED BY: JAMES R. MALAND

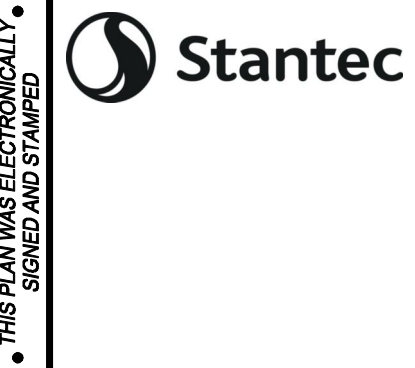
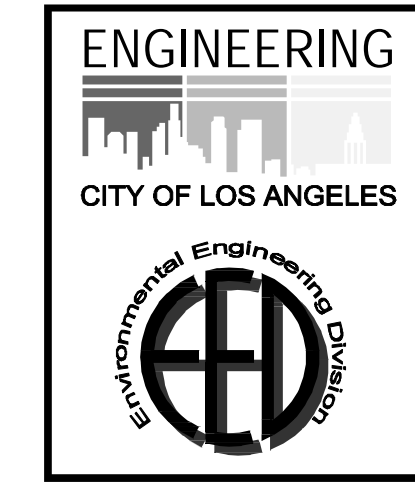
WORK ORDER NO. E170121B

SHEET NAME R1.02

SHEET X OF X SHEETS



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 SHEET VERSION 4.0



BUREAU OF ENGINEERING
 VERTICAL CONTROL:
 HORIZONTAL CONTROL:
 SHEET TITLE: RINK ROOF-TOP CONDENSER
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

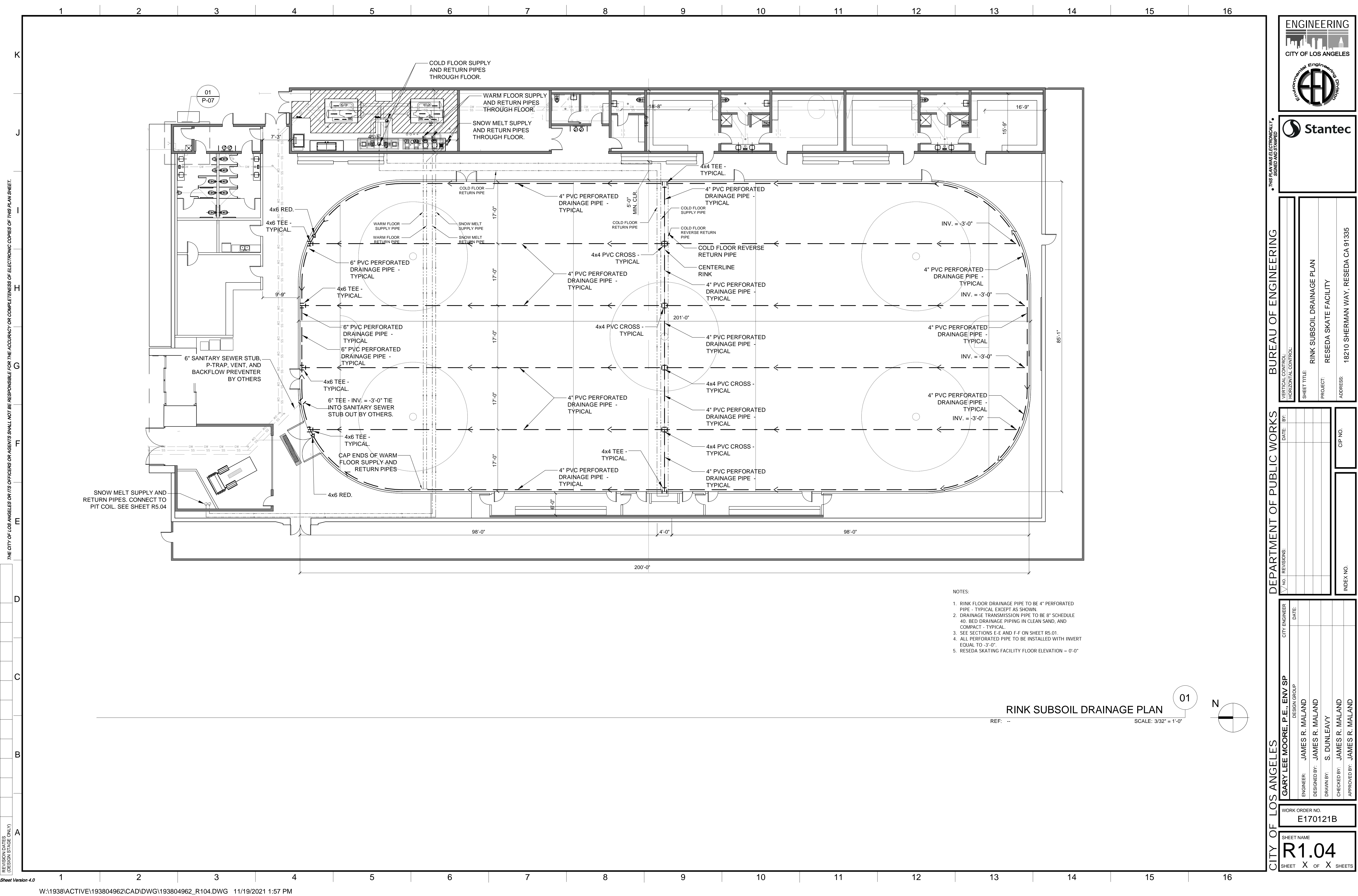
NO.	REVISIONS	DATE	BY

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GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP:
 ENGINEER: JAMES R. MALAND
 DESIGNED BY: JAMES R. MALAND
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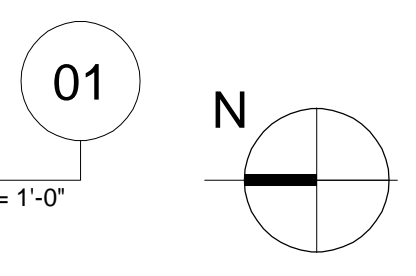
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E170121B

SHEET NAME
R1.03
 SHEET X OF X SHEETS



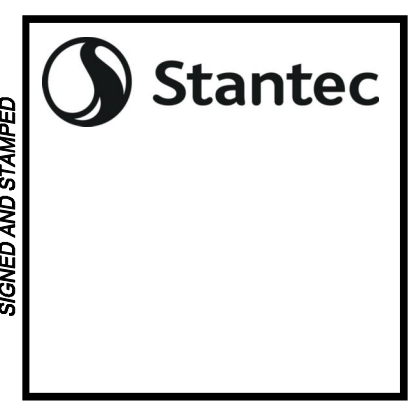
- NOTES:
1. RINK FLOOR DRAINAGE PIPE TO BE 4" PERFORATED PIPE - TYPICAL EXCEPT AS SHOWN.
 2. DRAINAGE TRANSMISSION PIPE TO BE 8" SCHEDULE 40. BED DRAINAGE PIPING IN CLEAN SAND, AND COMPACT - TYPICAL.
 3. SEE SECTIONS E-E AND F-F ON SHEET R5.01.
 4. ALL PERFORATED PIPE TO BE INSTALLED WITH INVERT EQUAL TO -3'-0".
 5. RESEDA SKATING FACILITY FLOOR ELEVATION = 0'-0".

RINK SUBSOIL DRAINAGE PLAN
 REF: --
 SCALE: 3/32" = 1'-0"



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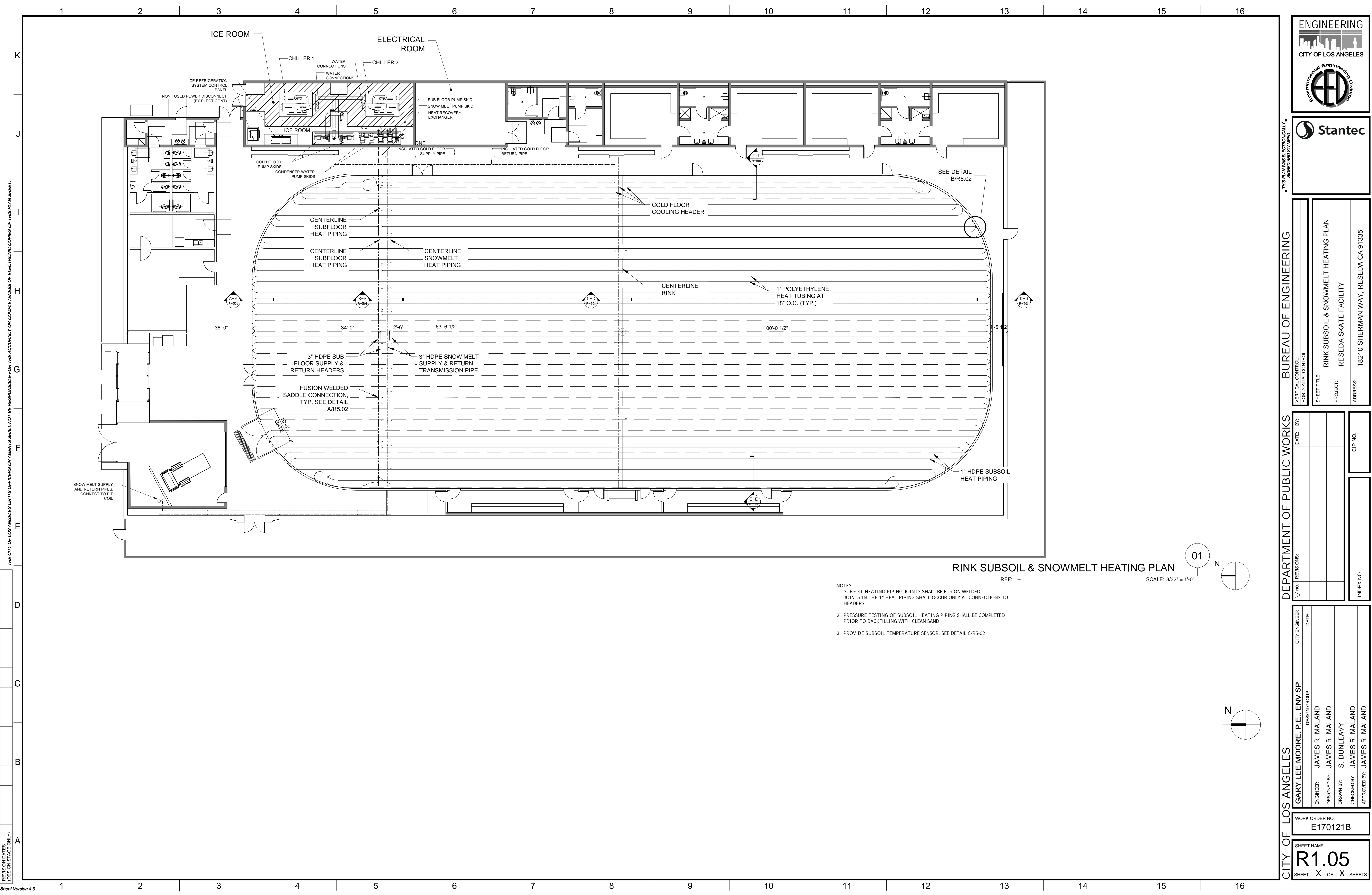
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 VERTICAL CONTROL:
 HORIZONTAL CONTROL:
 SHEET TITLE: RINK SUBSOIL DRAINAGE PLAN
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

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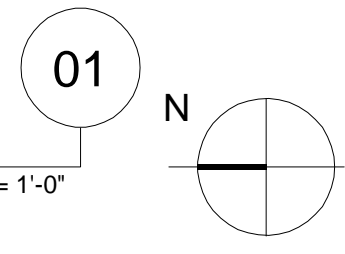
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CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
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 ENGINEER: JAMES R. MALAND
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 CHECKED BY: JAMES R. MALAND
 APPROVED BY: JAMES R. MALAND

WORK ORDER NO. E170121B
 SHEET NAME: R1.04
 SHEET X OF X SHEETS



RINK SUBSOIL & SNOWMELT HEATING PLAN



- NOTES:
- SUBSOIL HEATING PIPING JOINTS SHALL BE FUSION WELDED. JOINTS IN THE 1" HEAT PIPING SHALL OCCUR ONLY AT CONNECTIONS TO HEADERS.
 - PRESSURE TESTING OF SUBSOIL HEATING PIPING SHALL BE COMPLETED PRIOR TO BACKFILLING WITH CLEAN SAND.
 - PROVIDE SUBSOIL TEMPERATURE SENSOR. SEE DETAIL C/R5-02

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VERTICAL CONTROL: _____
 HORIZONTAL CONTROL: _____

SHEET TITLE: RINK SUBSOIL & SNOWMELT HEATING PLAN
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS	DATE	BY

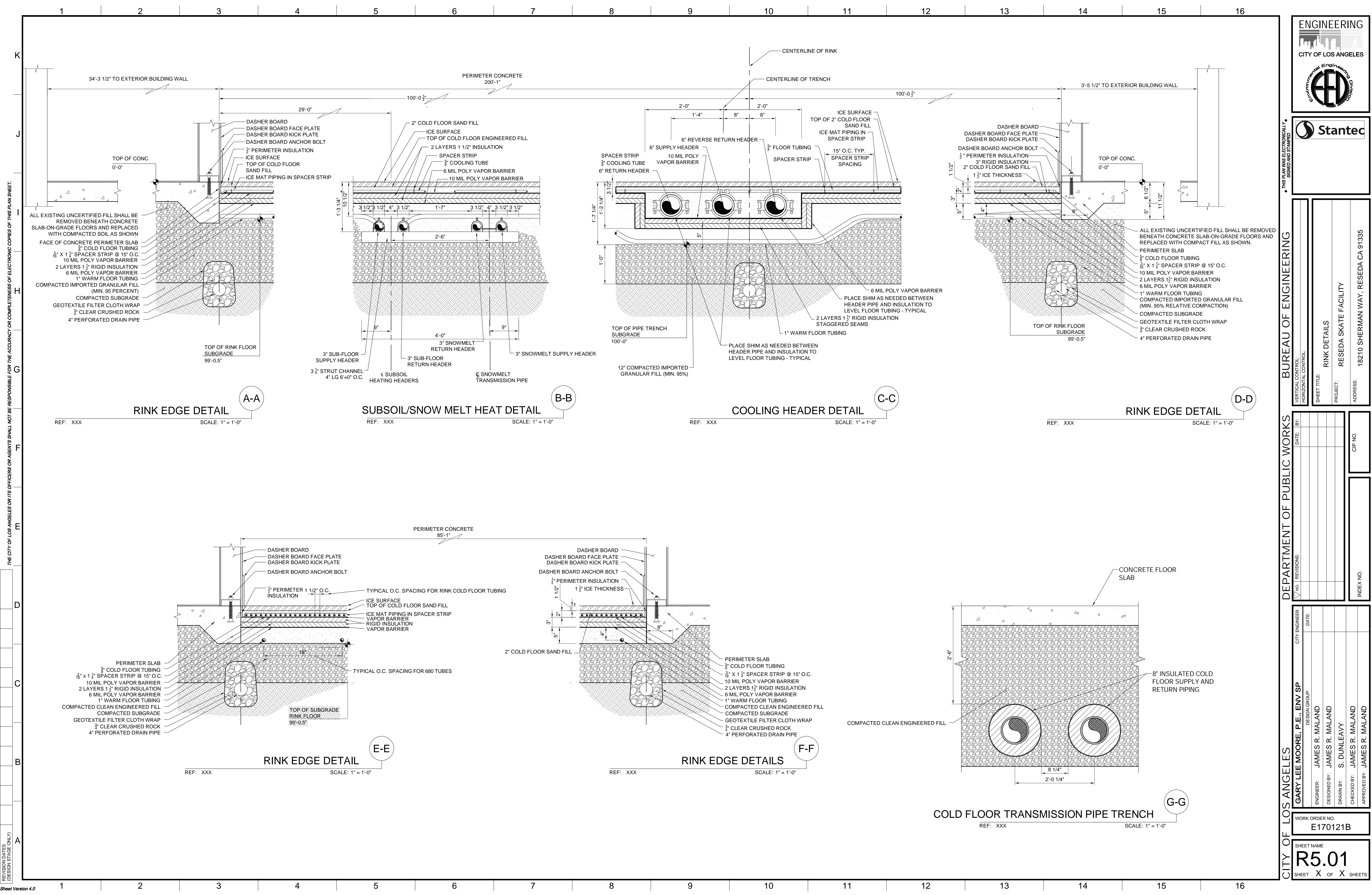
INDEX NO. _____

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CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP: _____
 ENGINEER: JAMES R. MALAND
 DESIGNED BY: JAMES R. MALAND
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 APPROVED BY: JAMES R. MALAND

WORK ORDER NO. E170121B

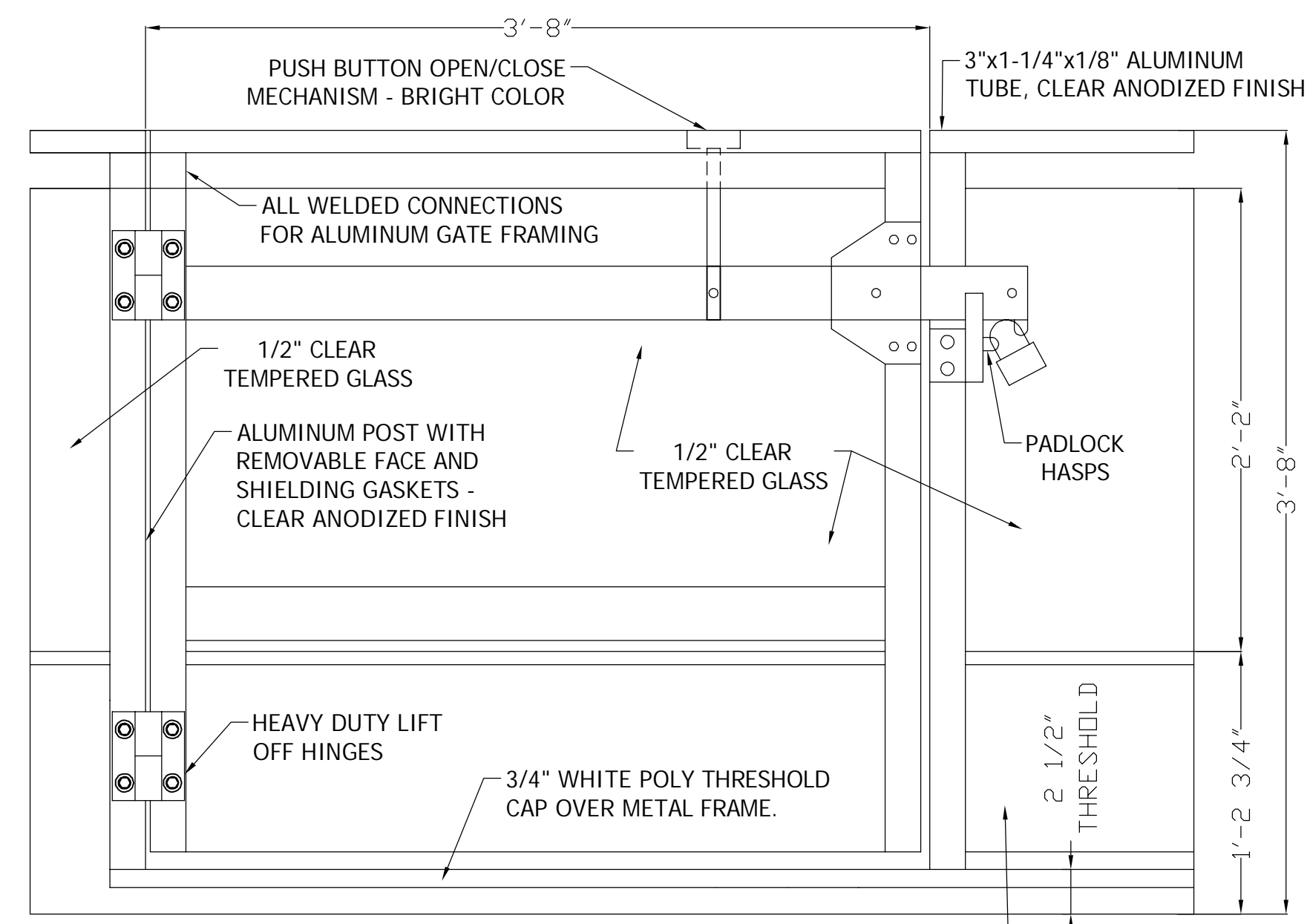
SHEET NAME: R1.05
 SHEET X OF X SHEETS



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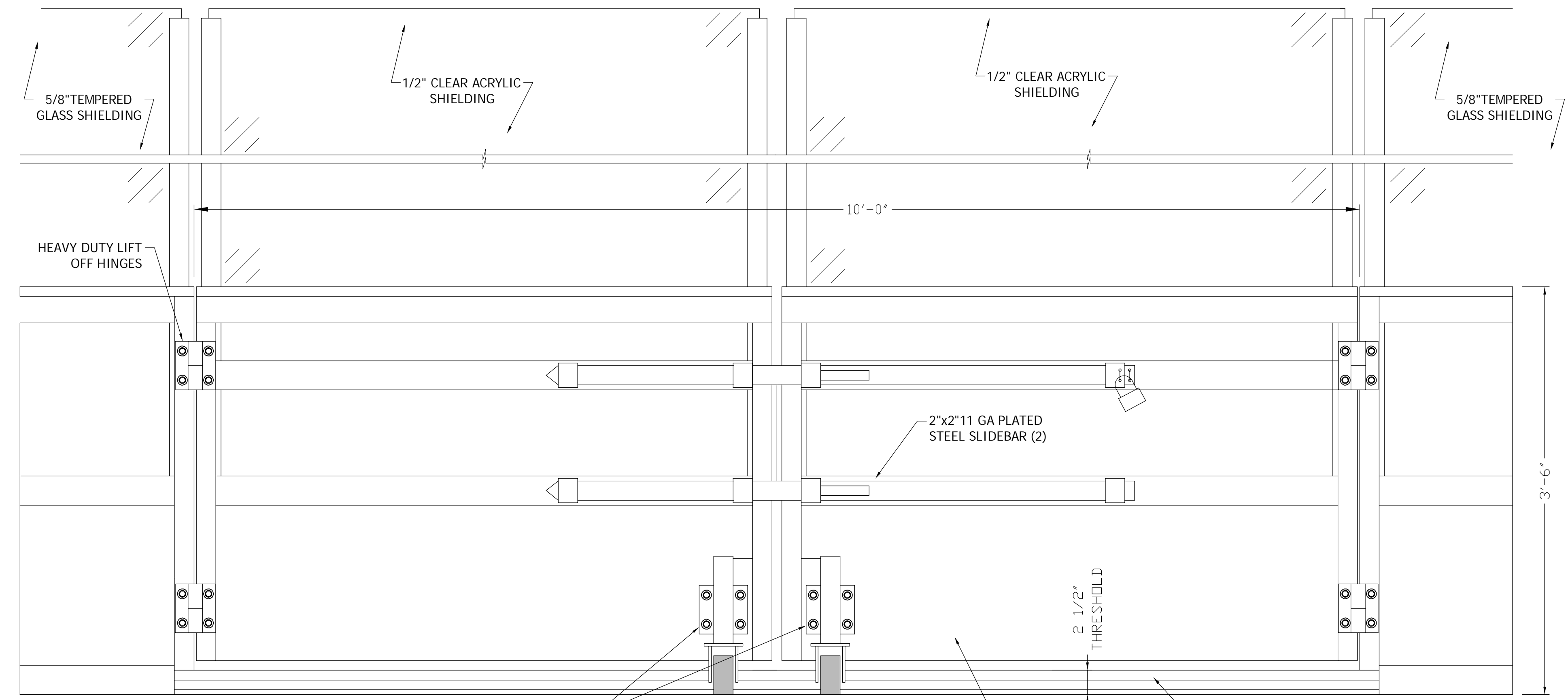
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A PLAYER GATE ELEVATION (NO GLASS)

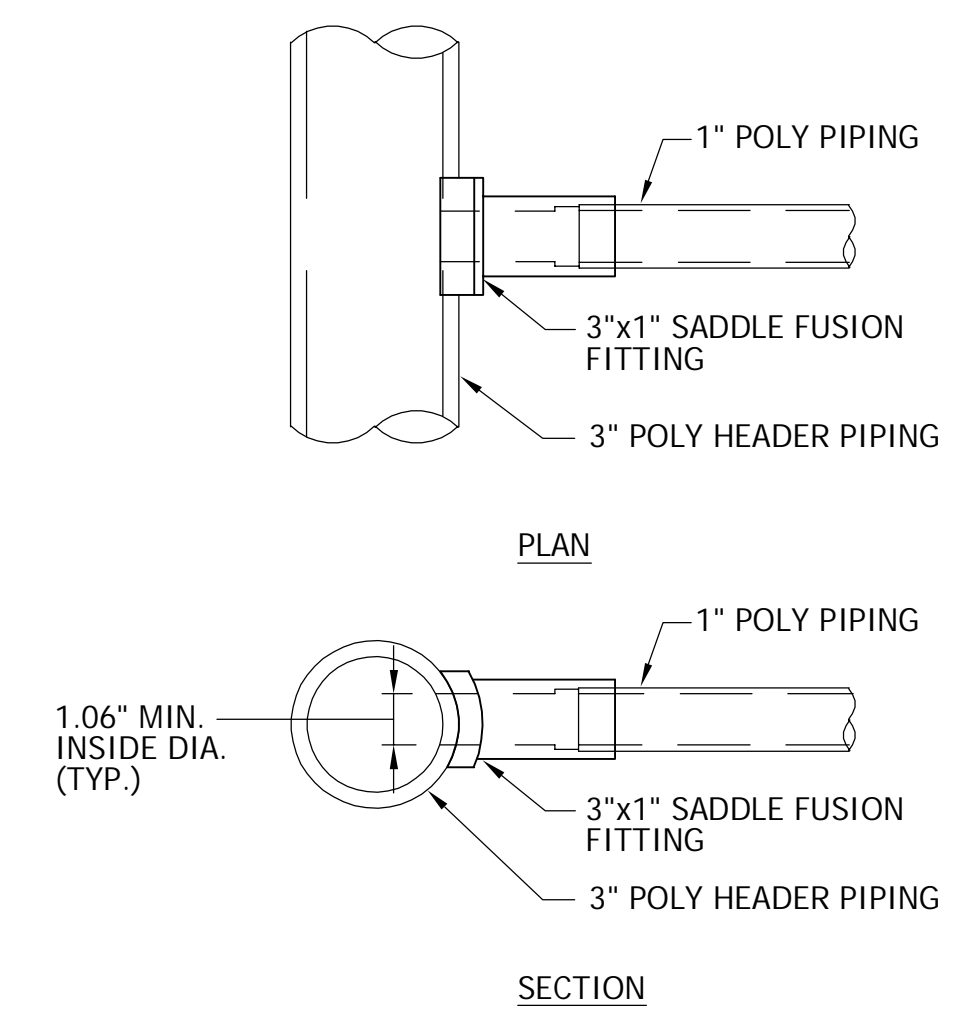
0 4" 8" 1'-4"



B EQUIPMENT GATE ELEVATION

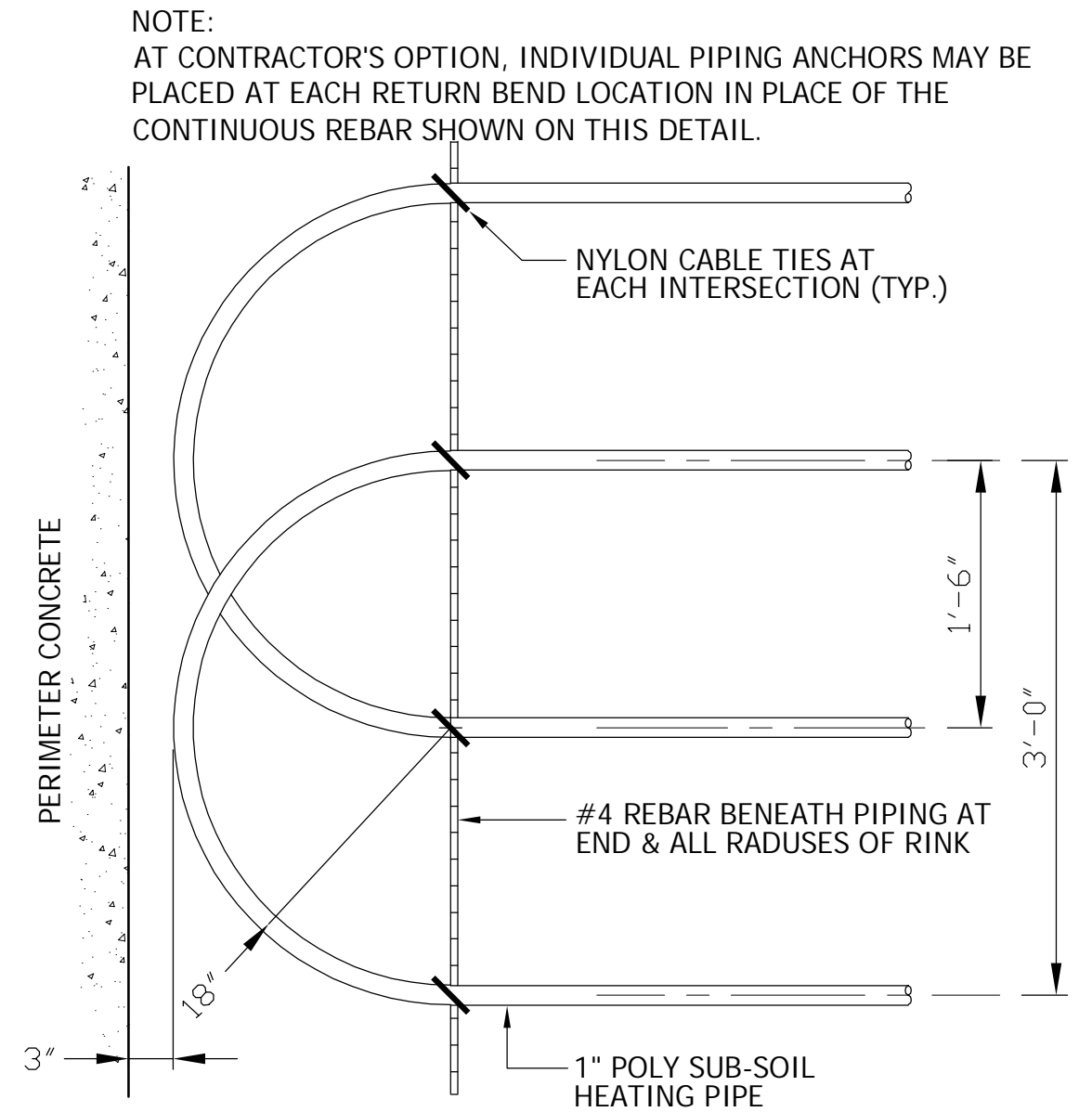
0 4" 8" 1'-4"

NOTE:
1. SEE SPECIFICATIONS FOR DASHER BOARD CONSTRUCTION SPECIFICS.



C SADDLE FUSION FITTING

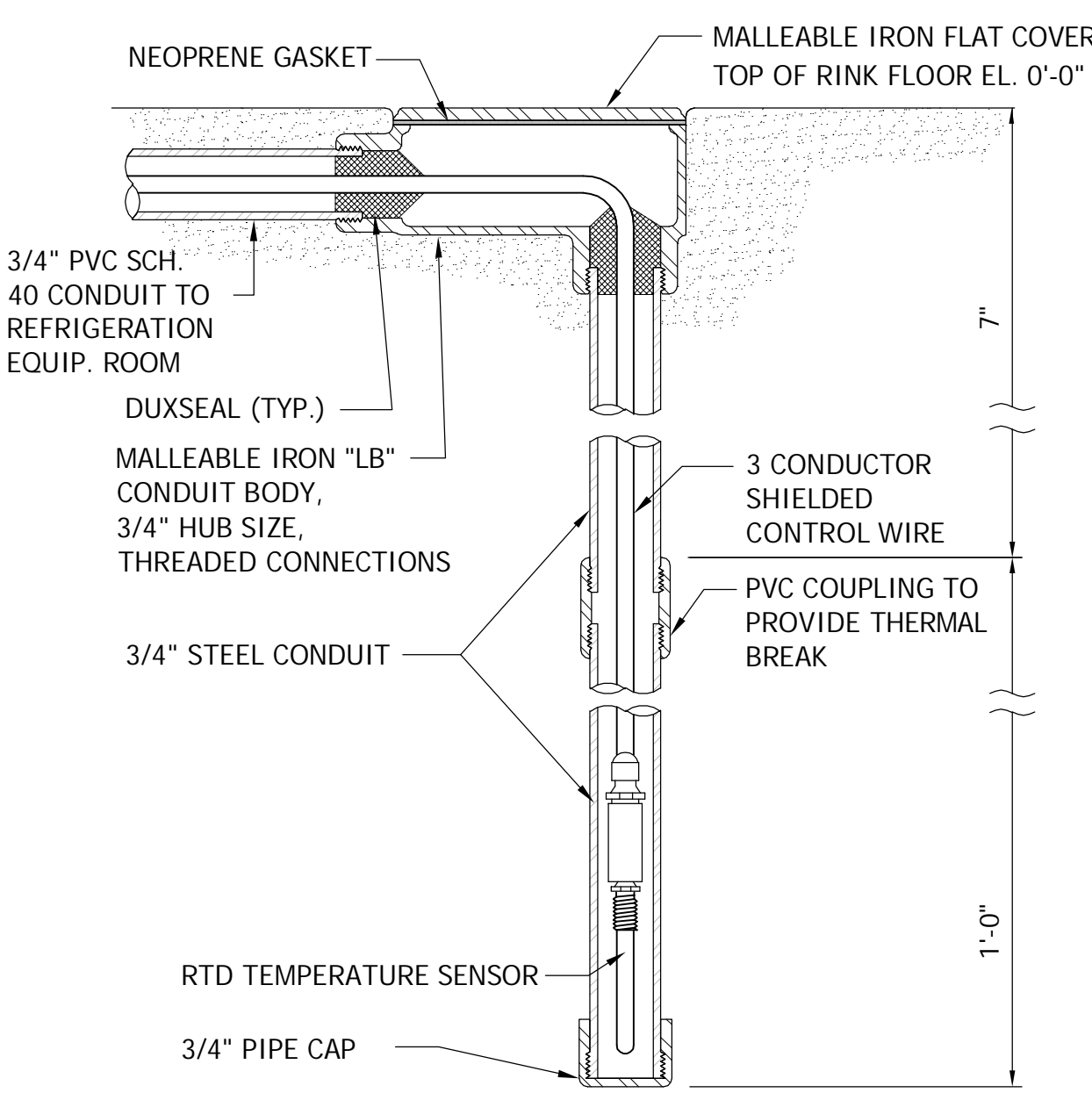
0 2" 4" 8"



D DETAIL

0 6" 1' 2'

NOTE:
AT CONTRACTOR'S OPTION, INDIVIDUAL PIPING ANCHORS MAY BE PLACED AT EACH RETURN BEND LOCATION IN PLACE OF THE CONTINUOUS REBAR SHOWN ON THIS DETAIL.



E SUB-SOIL TEMPERATURE SENSOR
NO SCALE



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VERTICAL CONTROL	
HORIZONTAL CONTROL	
SHEET TITLE	RINK DETAILS
PROJECT	RESEDA SKATE FACILITY
ADDRESS	18210 SHERMAN WAY, RESEDA CA 91335

DATE	BY
REVISIONS	
INDEX NO.	
CIP NO.	

CITY ENGINEER	GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP	
ENGINEER	JAMES R. MALAND
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DRAWN BY	S. DUNLEAVY
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APPROVED BY	JAMES R. MALAND

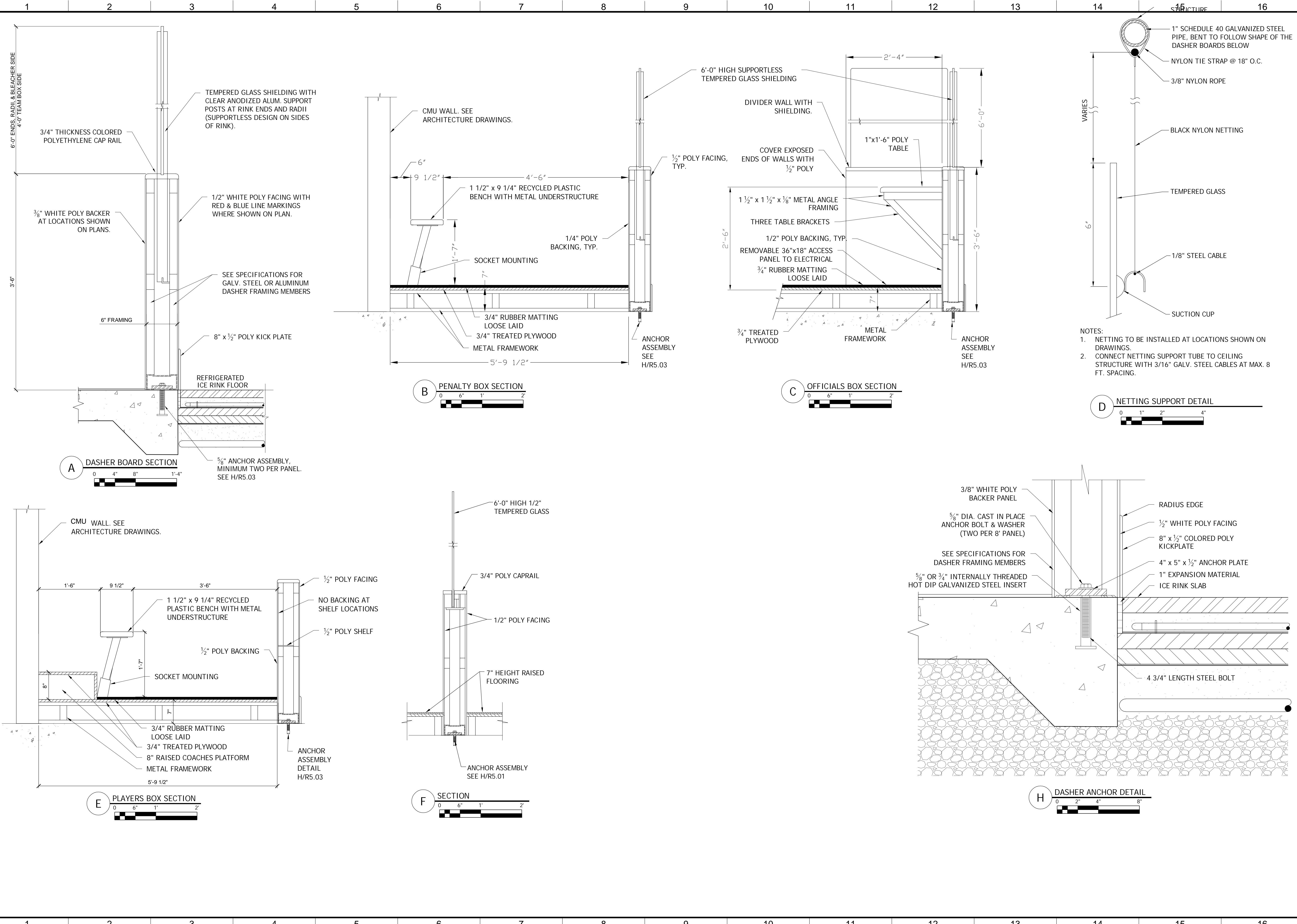
WORK ORDER NO.
E170121B

SHEET NAME
R5.02
SHEET X OF X SHEETS

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- NOTES:
- NETTING TO BE INSTALLED AT LOCATIONS SHOWN ON DRAWINGS.
 - CONNECT NETTING SUPPORT TUBE TO CEILING STRUCTURE WITH 3/16" GALV. STEEL CABLES AT MAX. 8 FT. SPACING.

ENGINEERING
 CITY OF LOS ANGELES
 Environmental Engineering Division

Stantec

BUREAU OF ENGINEERING

VERTICAL CONTROL: _____
 HORIZONTAL CONTROL: _____

SHEET TITLE: RINK DETAILS
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DATE: _____ BY: _____
 REVISIONS: _____

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
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 ENGINEER: JAMES R. MALAND
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WORK ORDER NO. E170121B
 SHEET NAME: R5.03
 SHEET X OF X SHEETS

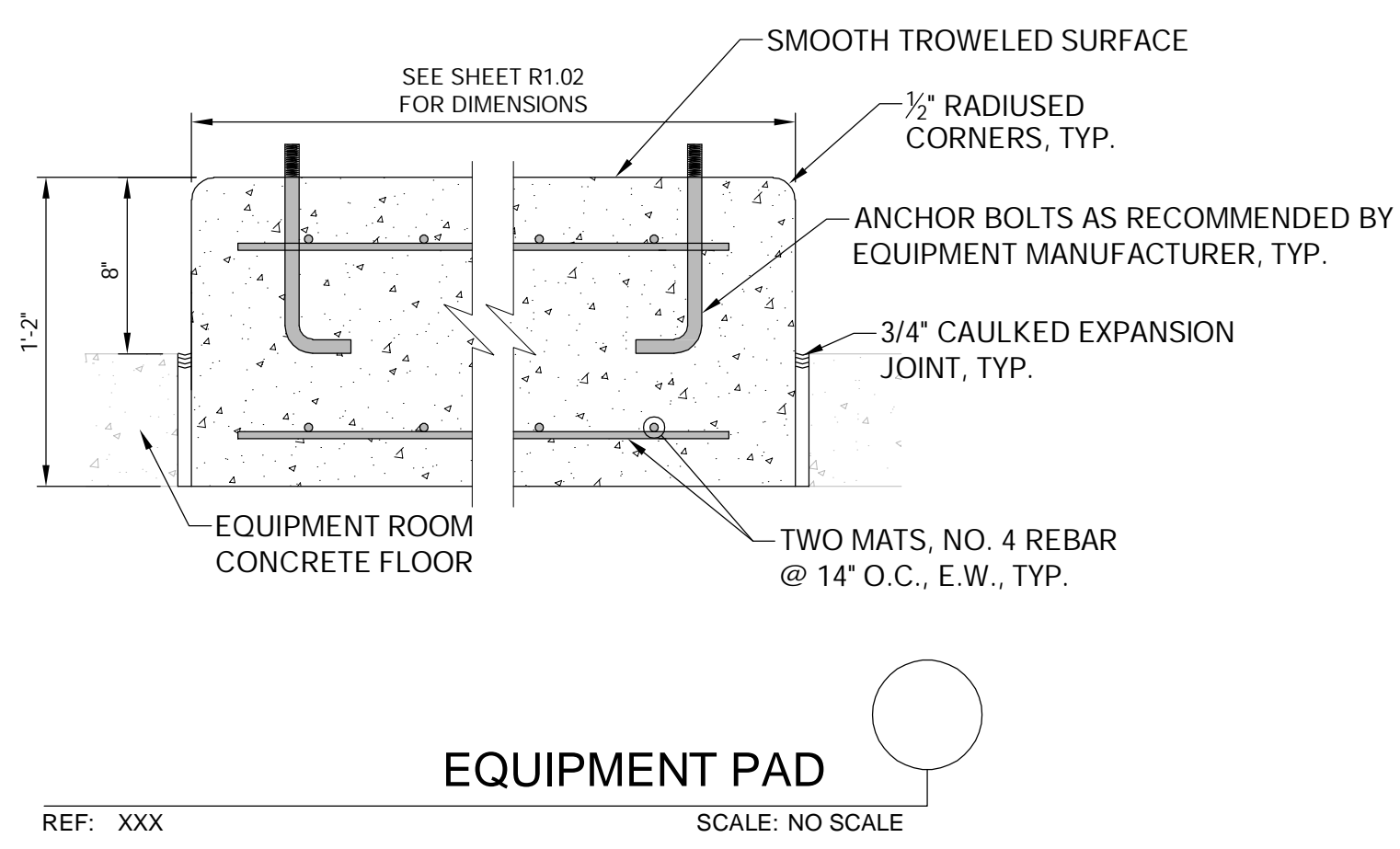
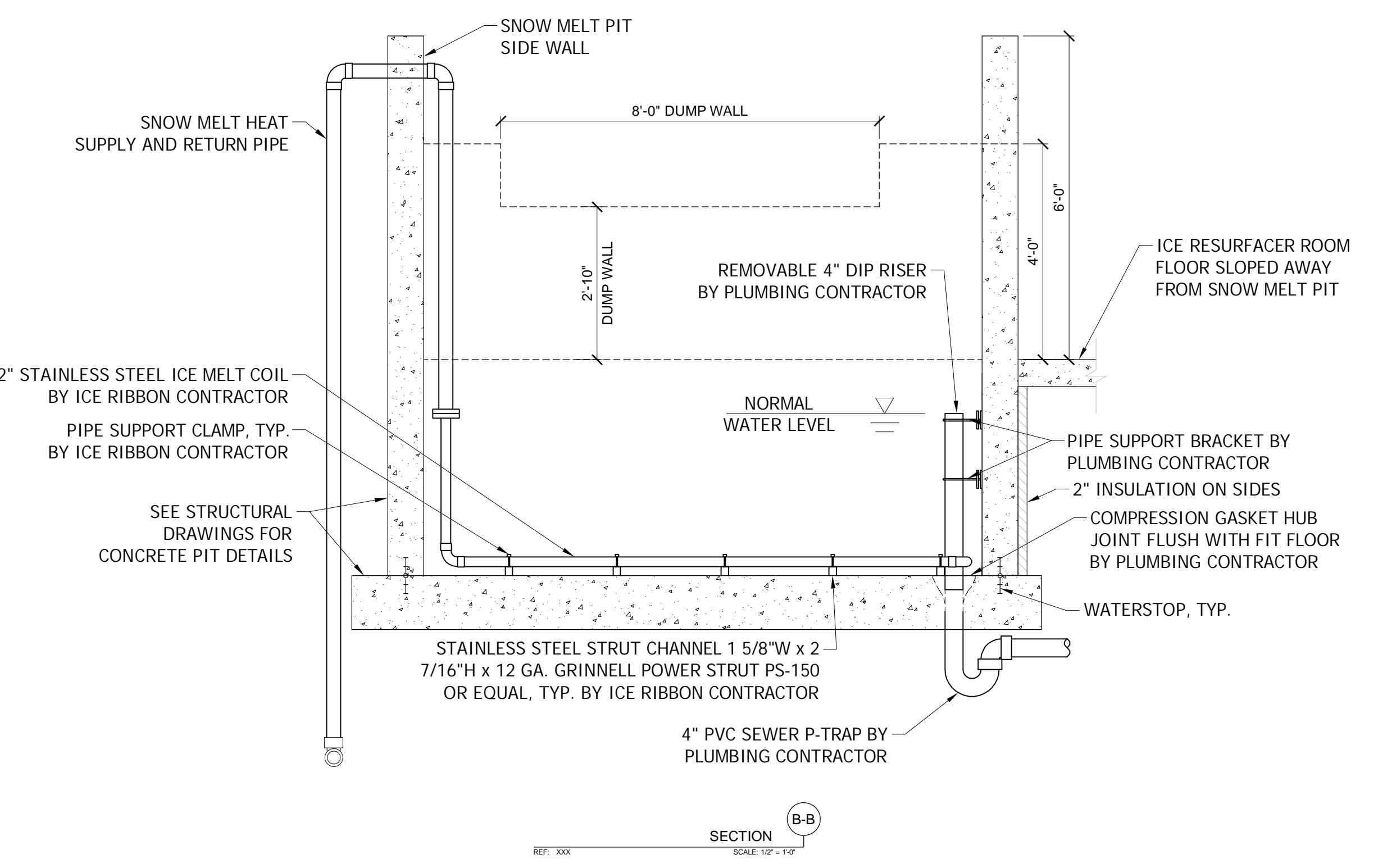
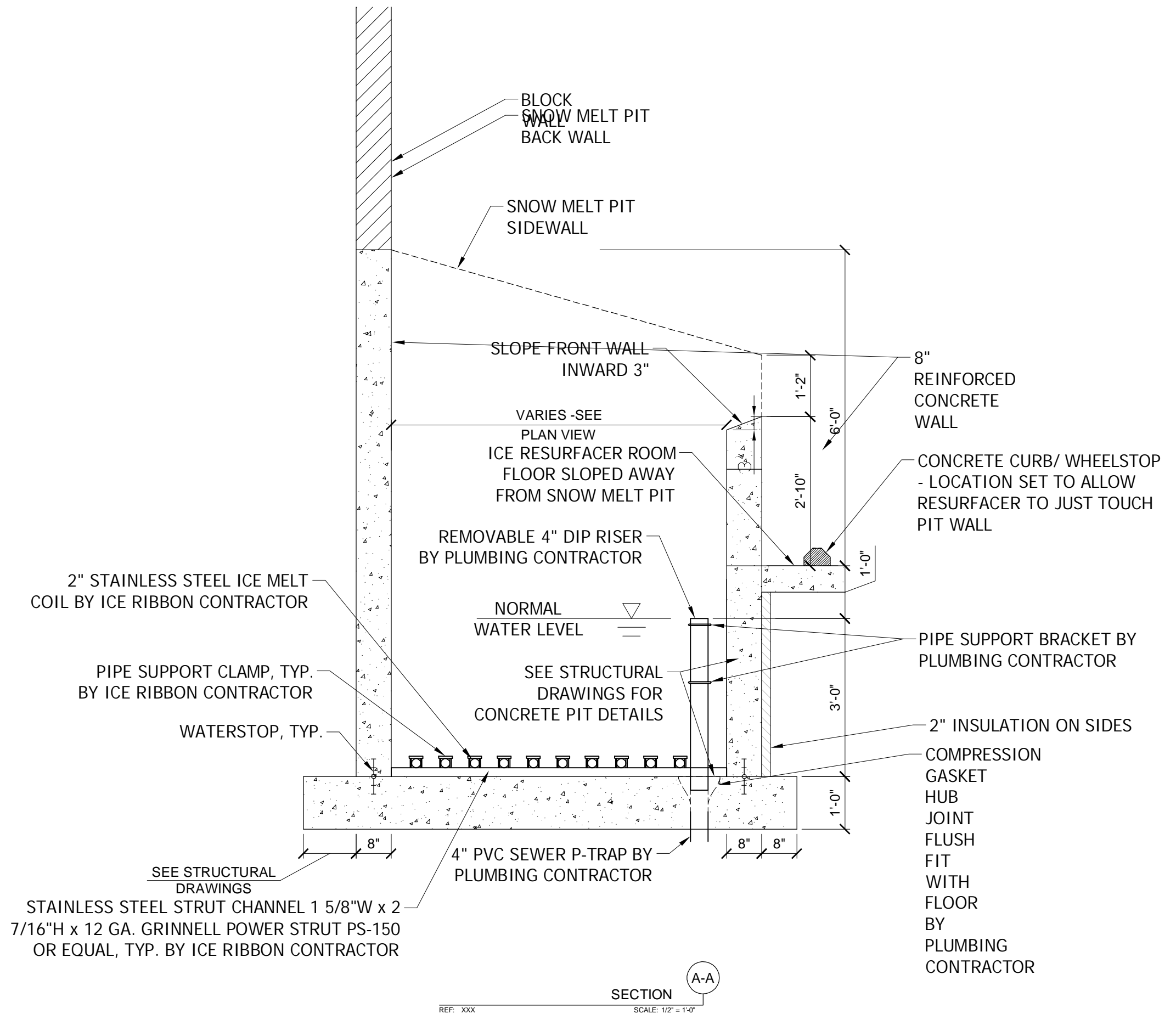
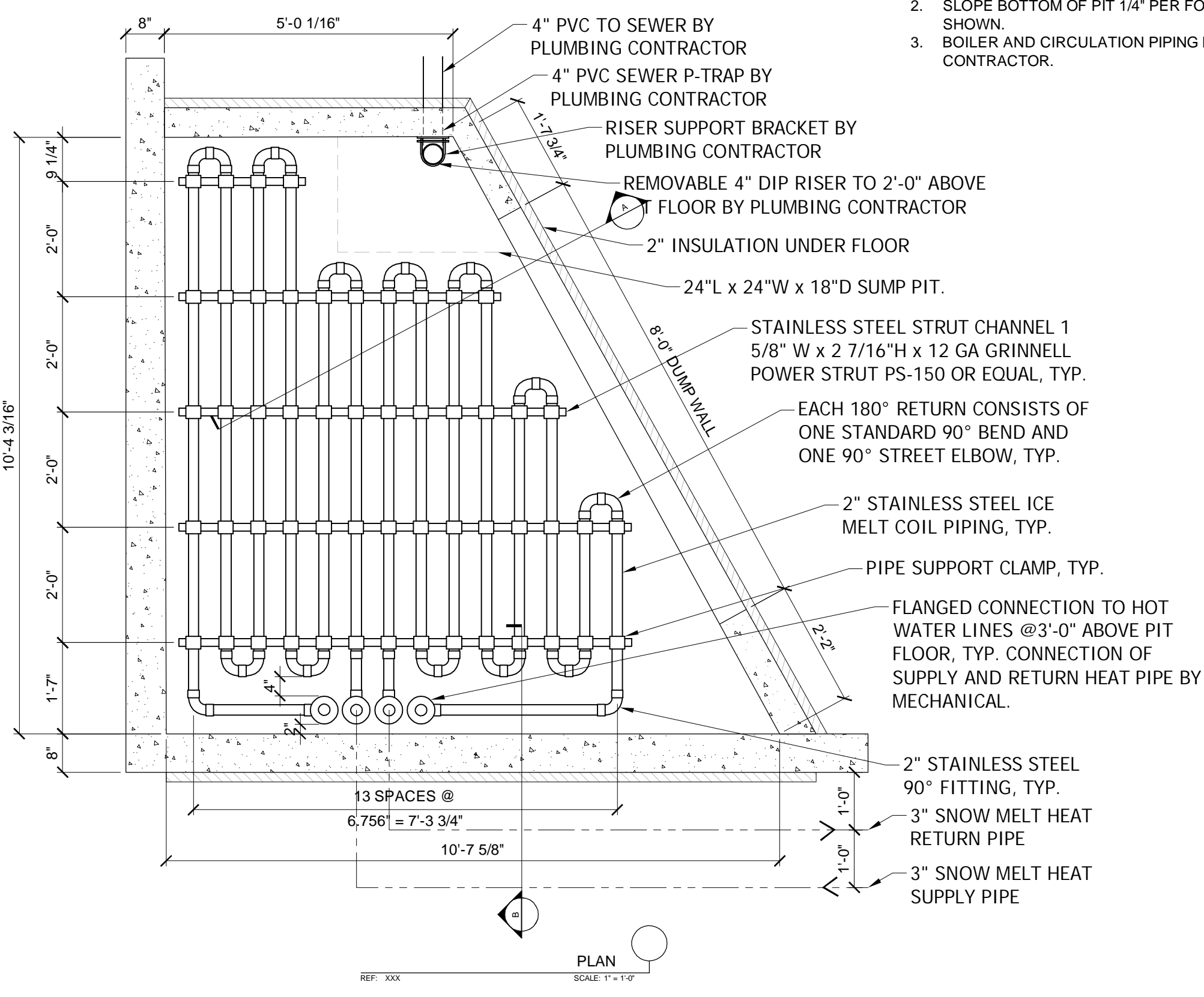
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- NOTES:
 1. SERPENTINE HEATING COIL BY ICE RIBBON CONTRACTOR.
 2. SLOPE BOTTOM OF PIT 1/4" PER FOOT TOWARDS DRAIN AS SHOWN.
 3. BOILER AND CIRCULATION PIPING BY MECHANICAL CONTRACTOR.



BUREAU OF ENGINEERING

VERTICAL CONTROL	
HORIZONTAL CONTROL	
SHEET TITLE	RINK DETAILS
PROJECT	RESEDA SKATE FACILITY
ADDRESS	18210 SHERMAN WAY, RESEDA CA 91335

DEPARTMENT OF PUBLIC WORKS

NO. REVISIONS	DATE	BY
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INDEX NO.		

CITY OF LOS ANGELES

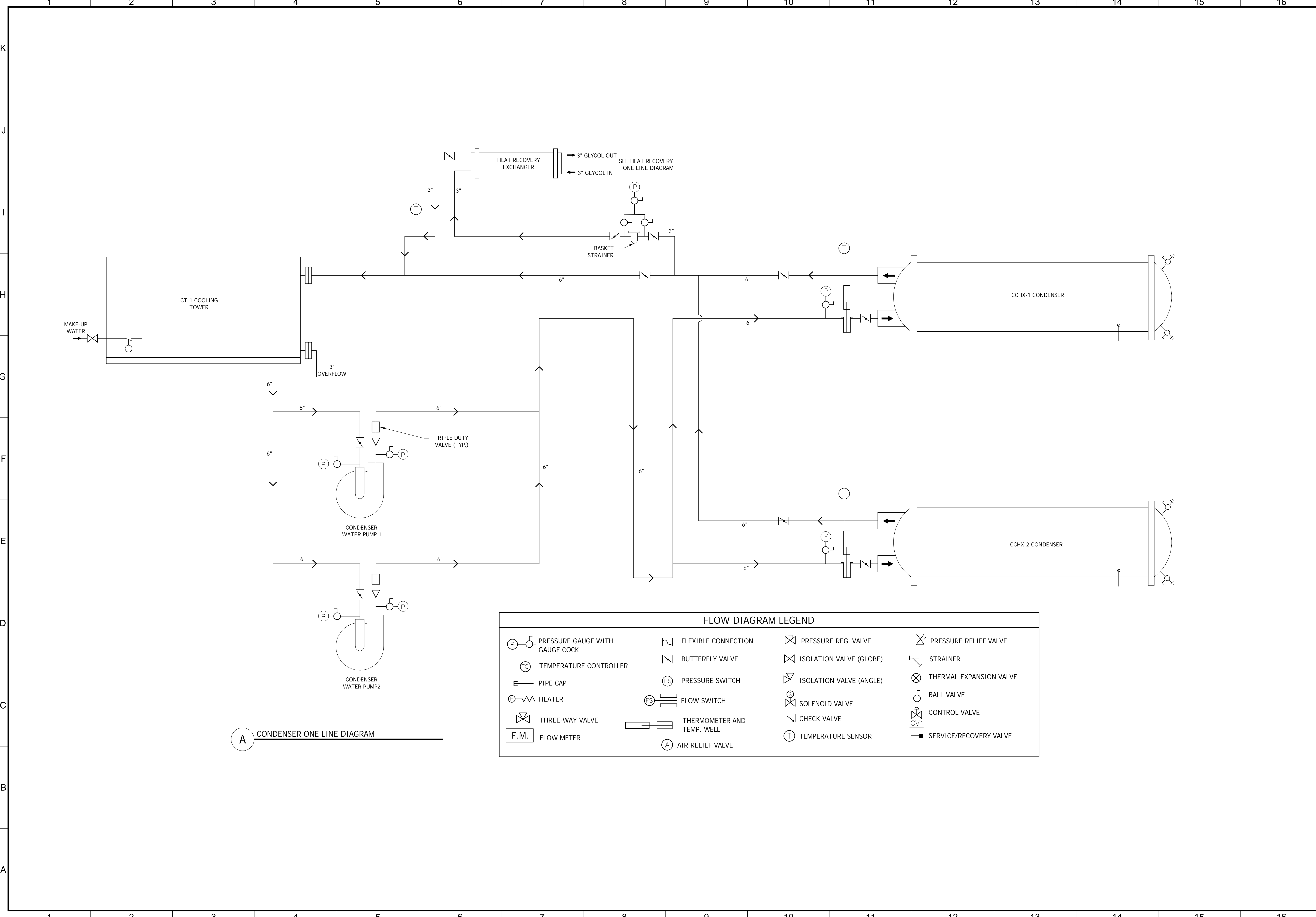
CITY ENGINEER	DATE
GARY LEE MOORE, P.E., ENV SP	
DESIGN GROUP	
ENGINEER	JAMES R. MALAND
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SHEET NAME R5.04
SHEET X OF X SHEETS

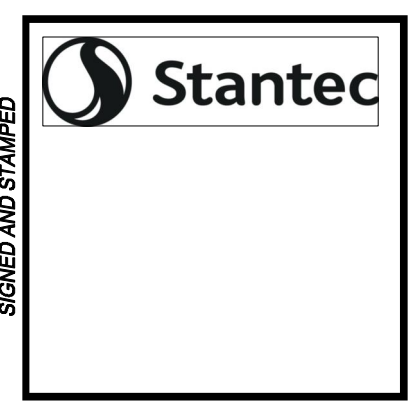
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REVISION DATES (DESIGN STAGE ONLY)



A CONDENSER ONE LINE DIAGRAM

FLOW DIAGRAM LEGEND			
PRESSURE GAUGE WITH GAUGE COCK	FLEXIBLE CONNECTION	PRESSURE REG. VALVE	PRESSURE RELIEF VALVE
TEMPERATURE CONTROLLER	BUTTERFLY VALVE	ISOLATION VALVE (GLOBE)	STRAINER
PIPE CAP	PRESSURE SWITCH	ISOLATION VALVE (ANGLE)	THERMAL EXPANSION VALVE
HEATER	FLOW SWITCH	SOLENOID VALVE	BALL VALVE
THREE-WAY VALVE	THERMOMETER AND TEMP. WELL	CHECK VALVE	CONTROL VALVE
F.M. FLOW METER	AIR RELIEF VALVE	TEMPERATURE SENSOR	SERVICE/RECOVERY VALVE



BUREAU OF ENGINEERING	
VERTICAL CONTROL:	
HORIZONTAL CONTROL:	
SHEET TITLE:	RINK DETAILS
PROJECT:	RESEDA SKATE FACILITY
ADDRESS:	18210 SHERMAN WAY, RESEDA, CA 91335

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CITY ENGINEER:	GARY LEE MOORE, P.E., ENV SP
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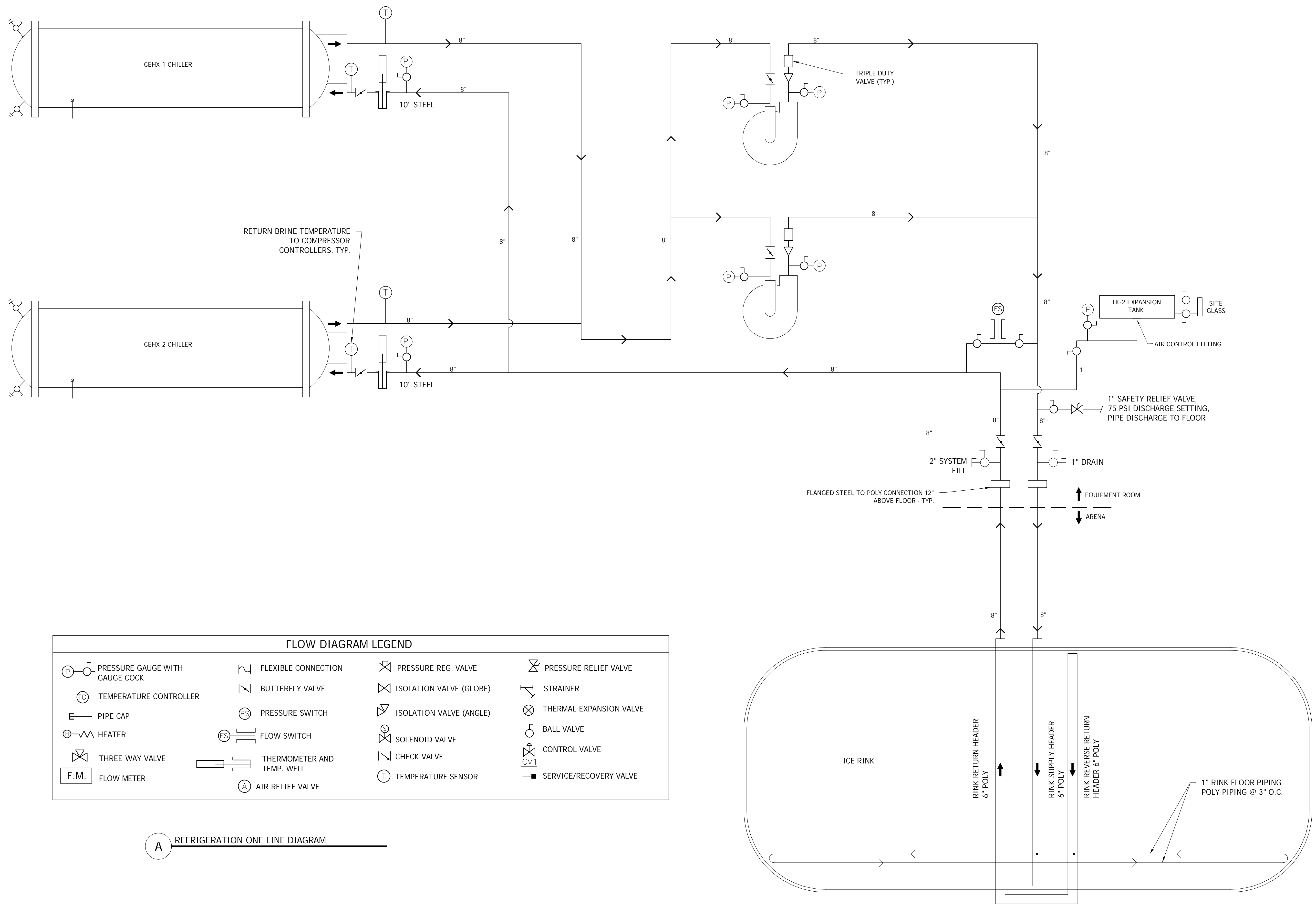
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R6.01
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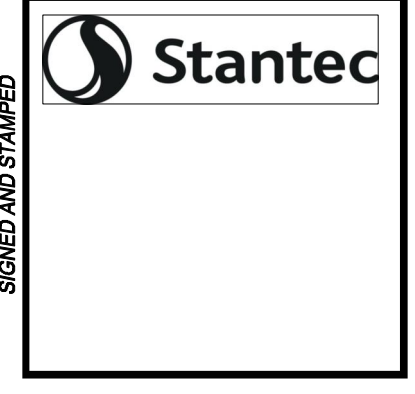
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FLOW DIAGRAM LEGEND			
PRESSURE GAUGE WITH GAUGE COCK	FLEXIBLE CONNECTION	PRESSURE REG. VALVE	PRESSURE RELIEF VALVE
TEMPERATURE CONTROLLER	BUTTERFLY VALVE	ISOLATION VALVE (GLOBE)	STRAINER
PIPE CAP	PRESSURE SWITCH	ISOLATION VALVE (ANGLE)	THERMAL EXPANSION VALVE
HEATER	FLOW SWITCH	SOLENOID VALVE	BALL VALVE
THREE-WAY VALVE	THERMOMETER AND TEMP. WELL	CHECK VALVE	CONTROL VALVE
F.M. FLOW METER	AIR RELIEF VALVE	TEMPERATURE SENSOR	SERVICE/RECOVERY VALVE

A REFRIGERATION ONE LINE DIAGRAM



BUREAU OF ENGINEERING

VERTICAL CONTROL: _____
HORIZONTAL CONTROL: _____

SHEET TITLE: RINK DETAILS
PROJECT: RESEDA SKATE FACILITY
ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

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APPROVED BY: JAMES R. MALAND

WORK ORDER NO. E170121B

SHEET NAME R6.02
SHEET X OF X SHEETS

ICE SYSTEM PUMPS

NO.	DESCRIPTION	MANUFACTURER	MODEL	GPM	TDH (FT)	MOTOR	RPM	VOLT/PH/FREQ.	FLUID	COMMENTS
P1	COLD FLOOR PUMP	GRUNDFOSS	LF-40707 5"x4"	1283	83	40 HP	3550	460/3/60	40% ETHYLENE GLYCOL	VAR. SPEED
P2	COLD FLOOR PUMP	GRUNDFOSS	LF-40707 5"x4"	1283	83	40 HP	3550	460/3/60	40% ETHYLENE GLYCOL	VAR. SPEED
P3	CONDENSER WATER PUMP	GRUNDFOSS	LC-40707 5"x4"	464	40	7.5 HP	1755	460/3/60	WATER	VAR. SPEED
P4	CONDENSER WATER PUMP	GRUNDFOSS	LC-40707 5"x4"	464	40	7.5 HP	1755	460/3/60	WATER	VAR. SPEED
P5	WARM FLOOR PUMP	GRUNDFOSS PACO	IO-20709-130008-1562P 2.5"x2"	150	35	2 HP	1800	460/3/60	40% ETHYLENE GLYCOL	
P6	SNOW MELT PUMP	GRUNDFOSS	LC-12709 1.5"x1.25"	90	35	1.5 HP	1765	460/3/60	40% ETHYLENE GLYCOL	

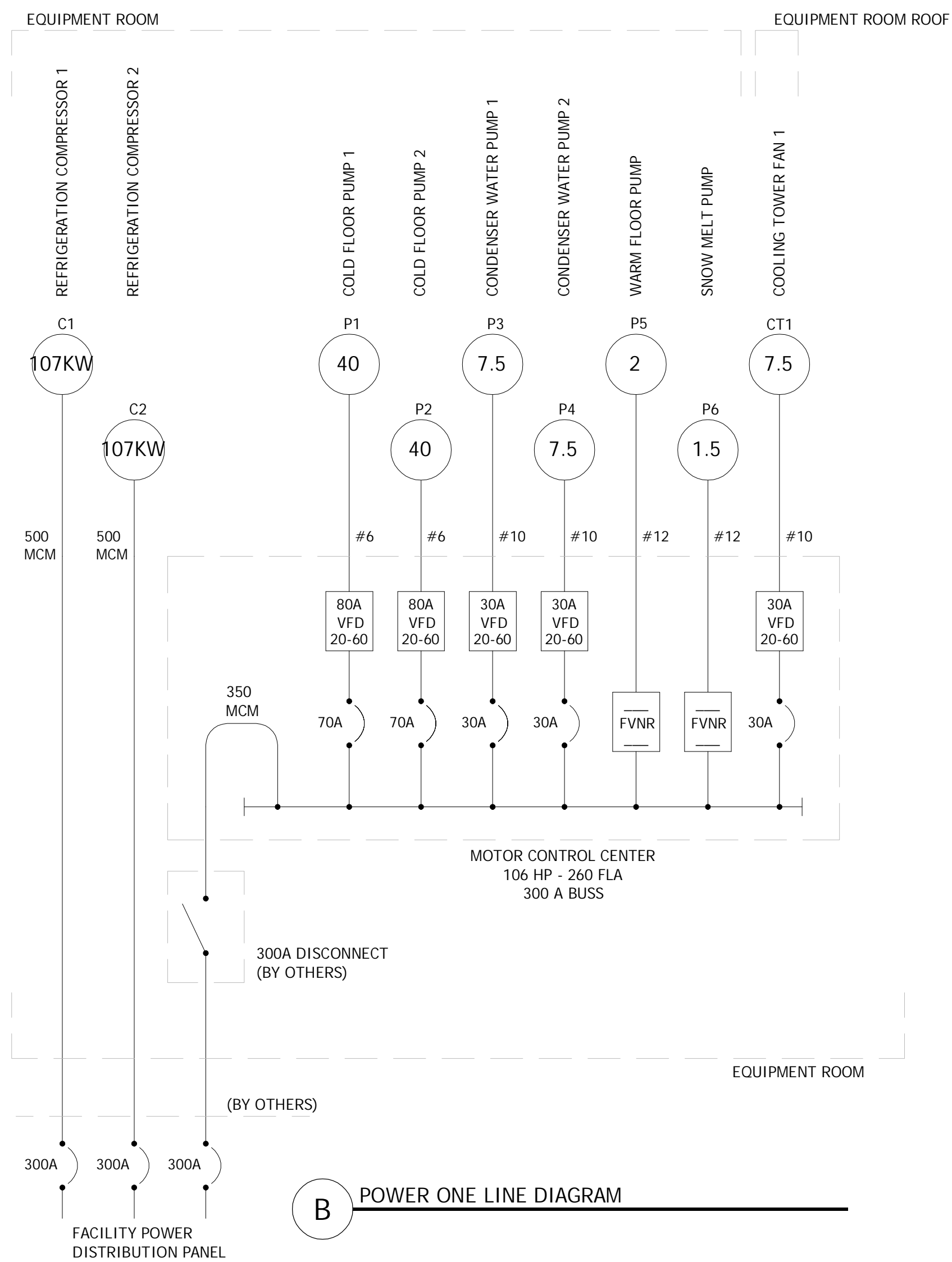
PACKAGED CHILLERS

NO.	TYPE	MANUFACTURER	MODEL	NUMBER OF CIRCUITS	REFRIGERANT	CAPACITY TONS	EVAPORATOR LEAVING TEMP	EVAPORATOR ENTERING TEMP	EVAPORATOR FLOW (GPM)	CONDENSER LEAVING TEMP	CONDENSER ENTERING TEMP	CONDENSER FLOW (GPM)	VOLT/PH/FREQ.	ELECTRICAL MCA -MOCIP AMPERAGE
C1	SCREW	TRANE	RTHD 120	1	R513A	70	15 °F	18 °F	641.5	95 °F	240 °F	641.5	460/3/60	183-300
C2	SCREW	TRANE	RTHD 120	1	R513A	70	15 °F	18 °F	641.5	95 °F	240 °F	641.5	460/3/60	183-300

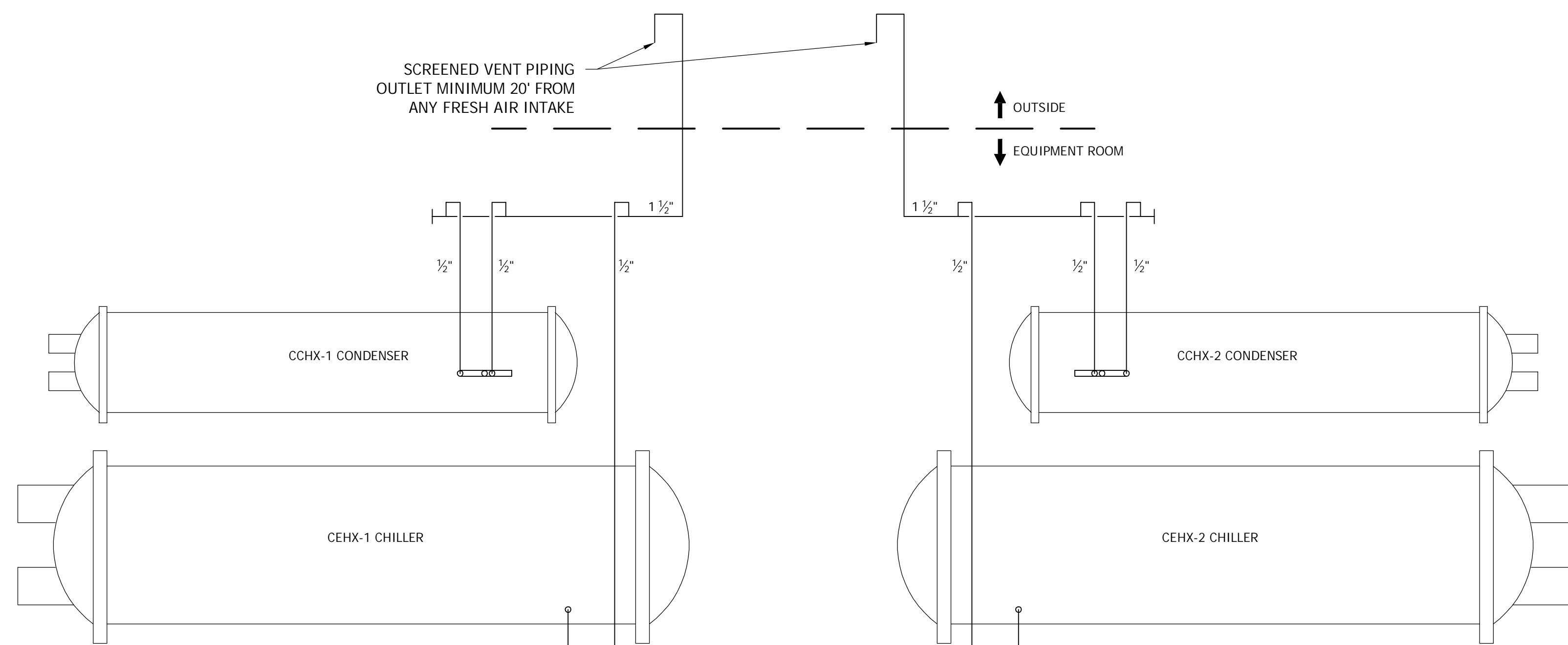
COOLING TOWER

NO.	MANUFACTURER	MODEL	EWT	LWT	WET BULB	SPRAY WATER FLOW	FAN MOTOR	VFD	AIR FLOW	COMMENTS
CT1	KORYTKO	KDI-0606A-7.5-1	95.0 °F	85.0 °F	72.0 °F	464 GPM	7.5HP	YES	25,200 CFM	

A REFRIGERATION EQUIPMENT SCHEDULE

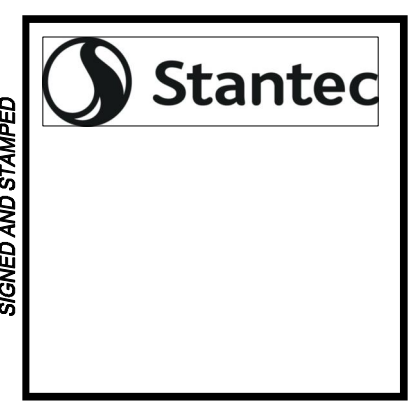


B POWER ONE LINE DIAGRAM



C SAFETY RELIEF ONE LINE DIAGRAM

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BUREAU OF ENGINEERING
 VERTICAL CONTROL: _____
 HORIZONTAL CONTROL: _____
 SHEET TITLE: RINK DETAILS
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS	DATE	BY

INDEX NO. _____ CIP NO. _____

CITY OF LOS ANGELES
 CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP: _____
 ENGINEER: JAMES R. MALAND
 DESIGNED BY: JAMES R. MALAND
 DRAWN BY: S. DUNLEAVY
 CHECKED BY: JAMES R. MALAND
 APPROVED BY: JAMES R. MALAND

WORK ORDER NO. E170121B

SHEET NAME: **R6.03**
 SHEET X OF X SHEETS

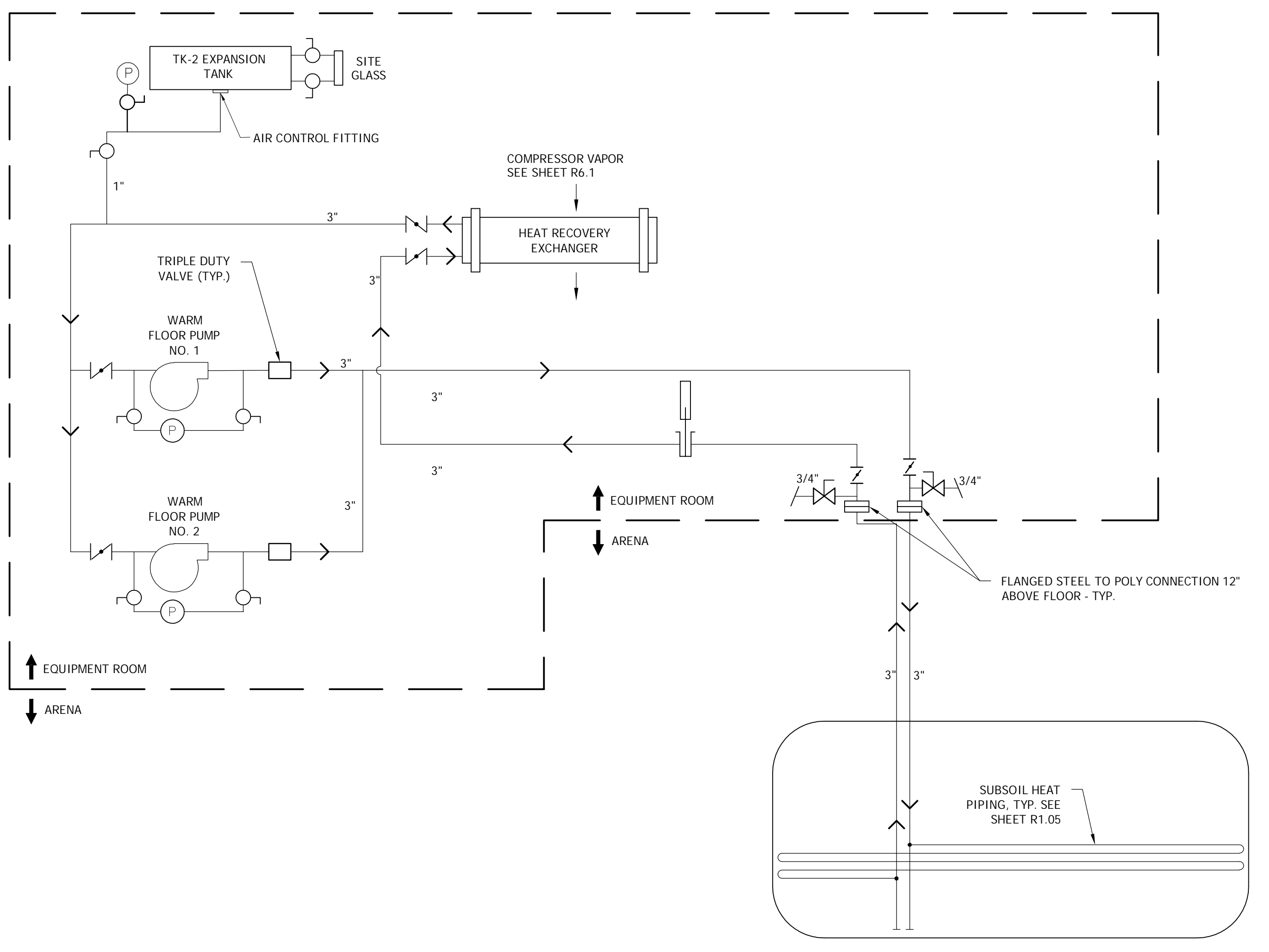
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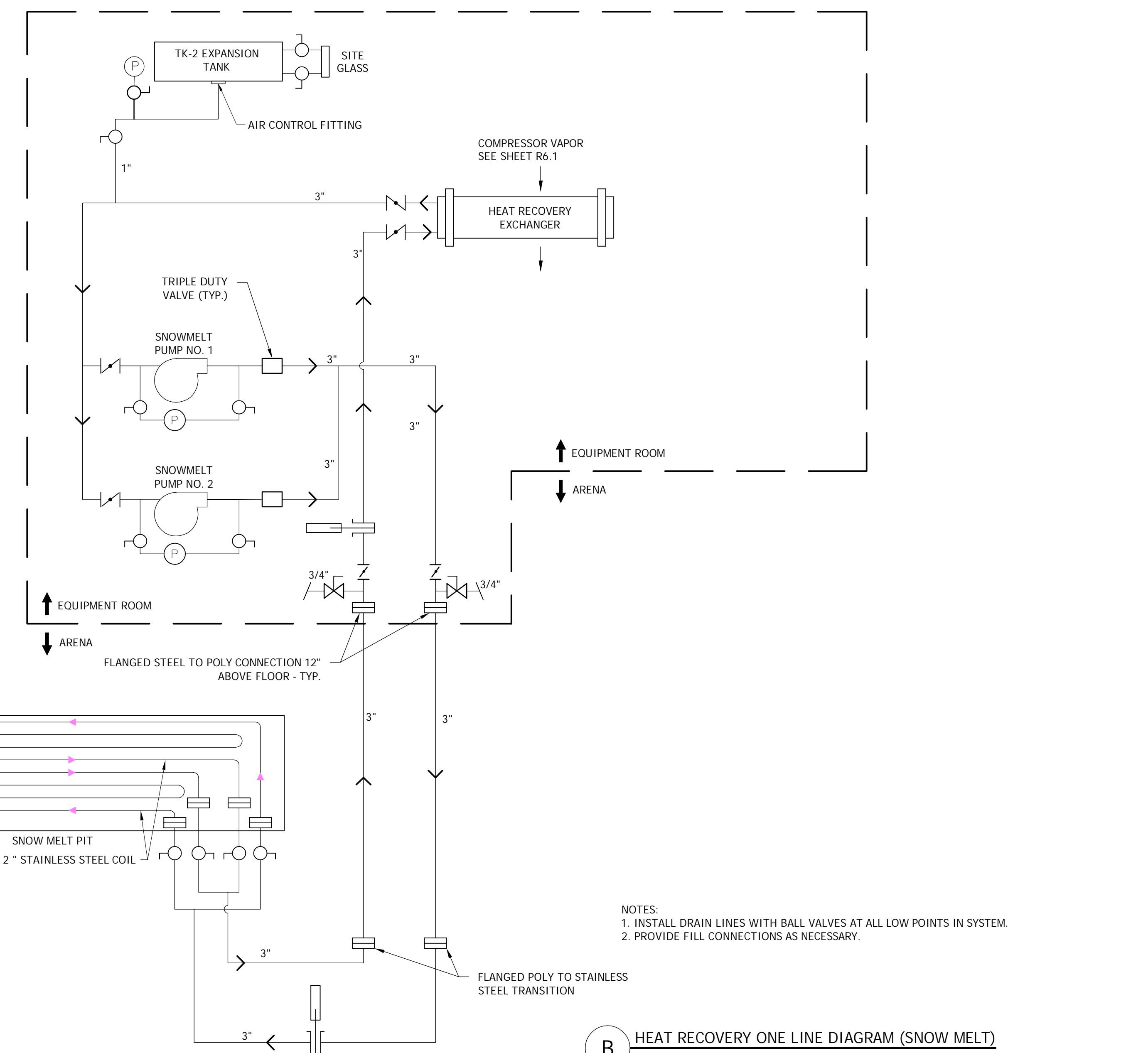
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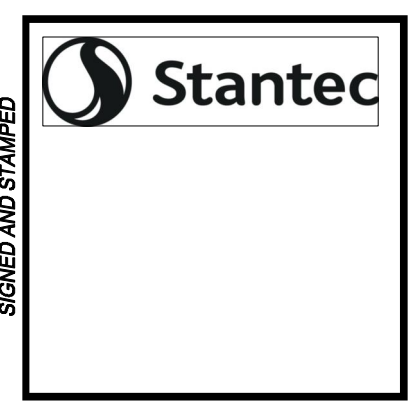
NOTES:
 1. INSTALL DRAIN LINES WITH BALL VALVES AT ALL LOW POINTS IN SYSTEM.
 2. PROVIDE FILL CONNECTIONS AS NECESSARY.

A HEAT RECOVERY ONE LINE DIAGRAM (SUBSOIL HEAT)



NOTES:
 1. INSTALL DRAIN LINES WITH BALL VALVES AT ALL LOW POINTS IN SYSTEM.
 2. PROVIDE FILL CONNECTIONS AS NECESSARY.

B HEAT RECOVERY ONE LINE DIAGRAM (SNOW MELT)



BUREAU OF ENGINEERING

VERTICAL CONTROL: _____
 HORIZONTAL CONTROL: _____

SHEET TITLE: RINK DETAILS
 PROJECT: RESEDA SKATE FACILITY
 ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS:	DATE:	BY:

INDEX NO. _____
 CIP NO. _____

CITY OF LOS ANGELES

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
 DESIGN GROUP: _____
 ENGINEER: JAMES R. MALAND
 DESIGNED BY: JAMES R. MALAND
 DRAWN BY: S. DUNLEAVY
 CHECKED BY: JAMES R. MALAND
 APPROVED BY: JAMES R. MALAND

WORK ORDER NO. E170121B

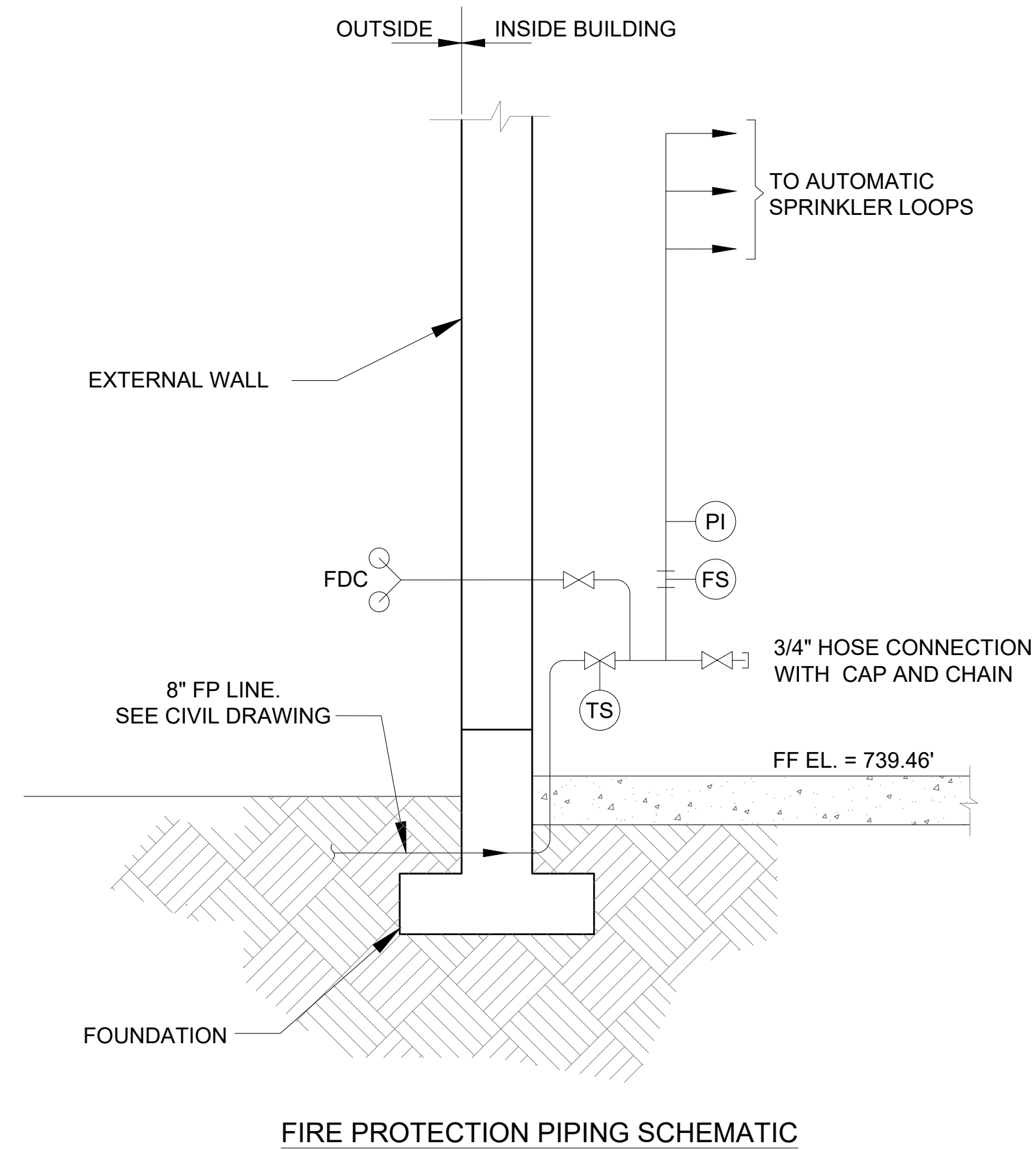
SHEET NAME: R6.04
 SHEET X OF X SHEETS

FIRE PROTECTION NOTES:

- 1. PROVIDE FIRE WATER SERVICE, FIRE SPRINKLERS, INSTALLATION, TESTING AND RELATED DOCUMENTATION IN ACCORDANCE WITH THE LATEST APPLICABLE EDITION OF NFPA 13 AND STATE AND CITY OF LOS ANGELES REQUIREMENTS. PER NFPA TABLE B105.1 MINIMUM REQUIRED FIRE FLOW FOR 28,000 SF TYPE IIB CONSTRUCTION =
 - ORDINARY HAZARD GROUP 1
QO = 1945 SF x 0.14 GPM/SF
=272 GPM
 - LIGHT HAZARD
QL = 26,055 SF x 0.075 GPM/SF
=1954 GPM
QT = 2226 GPM SPRINKLER FLOW
- BUILDING SHALL BE FULLY SPRINKLERED. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CITY OF LOS ANGELES DEPARTMENT OF BUILDING AND SAFETY (DBS) APPROVAL AS A DEFERRED SUBMITTAL. CONTRACTOR SHALL SUBCONTRACT FIRE PROTECTION SYSTEM TO QUALIFIED FIRE PROTECTION SYSTEM SUBCONTRACTOR AND SUBMIT:
 - SUBCONTRACTOR QUALIFICATIONS AND LICENSE, AND RESPONSIBLE INDIVIDUAL'S QUALIFICATIONS.
 - DRAWINGS AND CALCULATIONS FOR SPRINKLER INSTALLATION, INCLUDING PIPE SUPPORTS, WALL AND CEILING PENETRATIONS, CONTROLS, ETC.
 - DRAWINGS AND DETAILS FOR FIRE DEPARTMENT CONNECTION, INSPECTOR'S TEST VALVES, DRAINS, FLOW SWITCH, TAMPER SWITCHES, HOSE CONNECTIONS, ETC.
 - CATALOG CUTS FOR ALL EQUIPMENT AND MATERIALS TO BE INSTALLED.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE CONTRACT DRAWINGS AND COORDINATE THE FIRE PROTECTION SYSTEM INSTALLATION WITH CIVIL, STRUCTURAL, MECHANICAL AND ELECTRICAL DESIGNS.
 - COORDINATE LOCATION OF SPRINKLER HEADS AND PIPING WITH CEILING PLANS, ELECTRICAL, PLUMBING AND HVAC TO AVOID CONFLICTS (E.G. WITH LIGHTS AND VENTILATION SYSTEMS).
 - COORDINATE WITH ELECTRICAL AND FIRE ALARM SUBCONTRACTORS FOR WIRING OF ALARM SIGNALS TO FIRE ALARM CONTROL PANEL.
 - COORDINATE WITH BURIED UTILITIES FOR CONNECTION OF FIRE WATER SUPPLY PIPING AND TO AVOID BURIED UTILITY CONFLICTS.
 - ALL SPRINKLER HEADS ABOVE AND ADJACENT TO THE ICE RINK SHALL BE INSTALLED A MINIMUM OF 20 FT ABOVE THE FINISHED FLOOR, AND INCLUDE HEAD GUARD CAGES.
 - SPRINKLER WATER SUPPLY PIPING THROUGHOUT LOCKER ROOMS AND RESTROOMS SHALL BE ROUTED IN SHARED PIPE CHASE ALONG EAST EXTERIOR WALL.
 - DRAINS SHALL BE ROUTED TO FLOOR DRAINS OR EXTERIOR OF BUILDING.
 - MINIMUM MATERIAL REQUIREMENTS:
 - WET SPRINKLER SYSTEM PIPING SHALL BE BLACK STEEL PIPE, ASTM A53 SCHEDULE 40, WITH THREADED OR GROOVED JOINTS.
 - SPRINKLER HEADS IN SHOWER AREAS, BATHROOMS, LOCKER ROOMS, ICE ROOM, AND MECHANICAL ROOM SHALL BE CORROSION RESISTANT TYPE.
 - ALL SPRINKLER PIPING SERVING INDIVIDUAL SPRINKLER HEADS SHALL BE 1-INCH SCHEDULE 40 BLACK STEEL PIPE.
 - COORDINATE WITH CIVIL FOR MATERIALS CONNECTING TO FIRE PROTECTION SUPPLY PIPING. PROVIDE DUCTILE IRON OR LINED STEEL FOR FIRE PROTECTION SUPPLY PIPING.

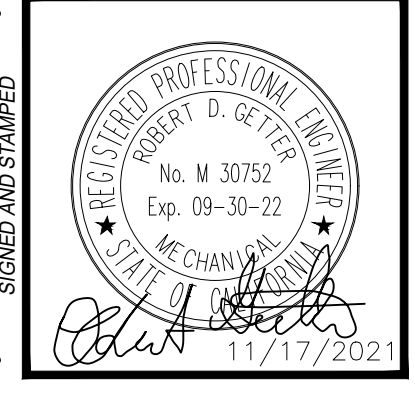
SAFETY PLAN LEGEND:

	FH	FIRE HYDRANT		ALARM STROBE
	PIV	POST INDICATOR VALVE		ESTOP
	TS	TAMPER SWITCH		FACP
	FS	FLOW SWITCH		FDC
		SPRINKLER AREA ORDINARY HAZARD		H
		SPRINKLER AREA LIGHT HAZARD		FA



FIRE PROTECTION PIPING SCHEMATIC

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BUREAU OF ENGINEERING

VERTICAL CONTROL: _____

HORIZONTAL CONTROL: _____

SHEET TITLE: FIRE PROTECTION NOTES, LEGEND, SINGLE LINE

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA CA 91335

NO.	REVISIONS	DATE	BY

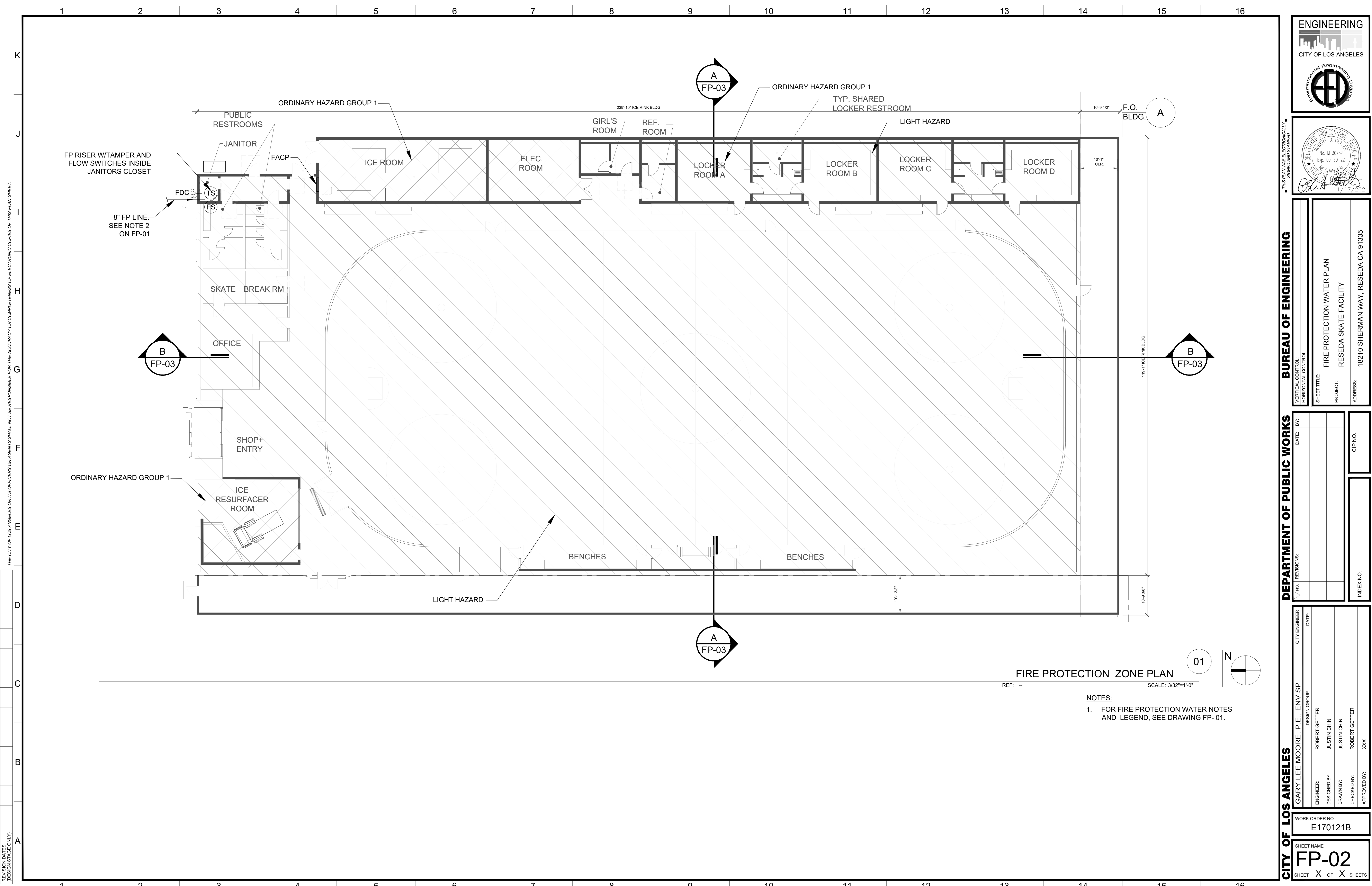
CIP NO. _____

INDEX NO. _____

CITY ENGINEER	GARY LEE MOORE, P.E., ENV SP	DATE:	
DESIGN GROUP	ROBERT GETTER	ENGINEER	ROBERT GETTER
DESIGNED BY:	JUSTIN CHIN	DRAWN BY:	JUSTIN CHIN
CHECKED BY:	ROBERT GETTER	APPROVED BY:	XXX

WORK ORDER NO. E170121B

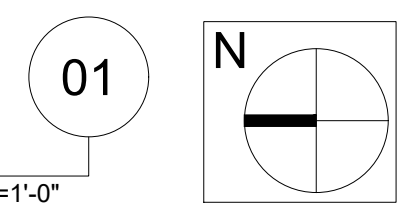
SHEET NAME **FP-01**
SHEET X OF X SHEETS



FIRE PROTECTION ZONE PLAN

REF: -- SCALE: 3/32"=1'-0"

- NOTES:**
- FOR FIRE PROTECTION WATER NOTES AND LEGEND, SEE DRAWING FP-01.



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ENGINEERING
CITY OF LOS ANGELES

BUREAU OF ENGINEERING

VERTICAL CONTROL:
HORIZONTAL CONTROL:

SHEET TITLE:
PROJECT:
ADDRESS:

DEPARTMENT OF PUBLIC WORKS

DATE: BY:

NO. REVISIONS:

CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP

DESIGN GROUP: ROBERT GETTIER

ENGINEER: ROBERT GETTIER

DESIGNED BY: JUSTIN CHIN

DRAWN BY: JUSTIN CHIN

CHECKED BY: ROBERT GETTIER

APPROVED BY: XXX

INDEX NO.:

CIP NO.:

WORK ORDER NO. E170121B

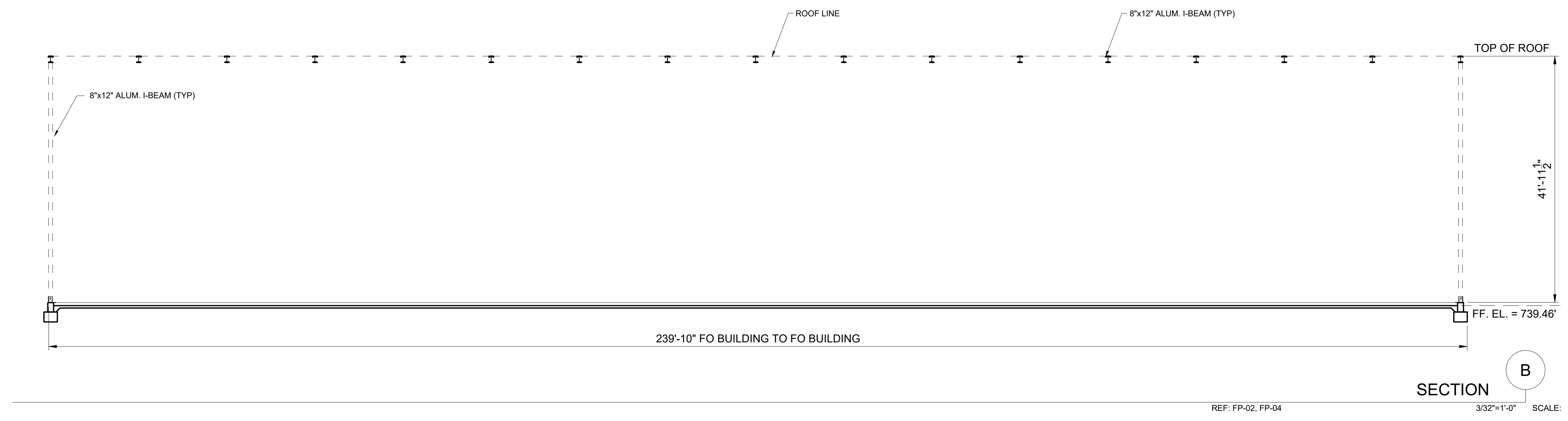
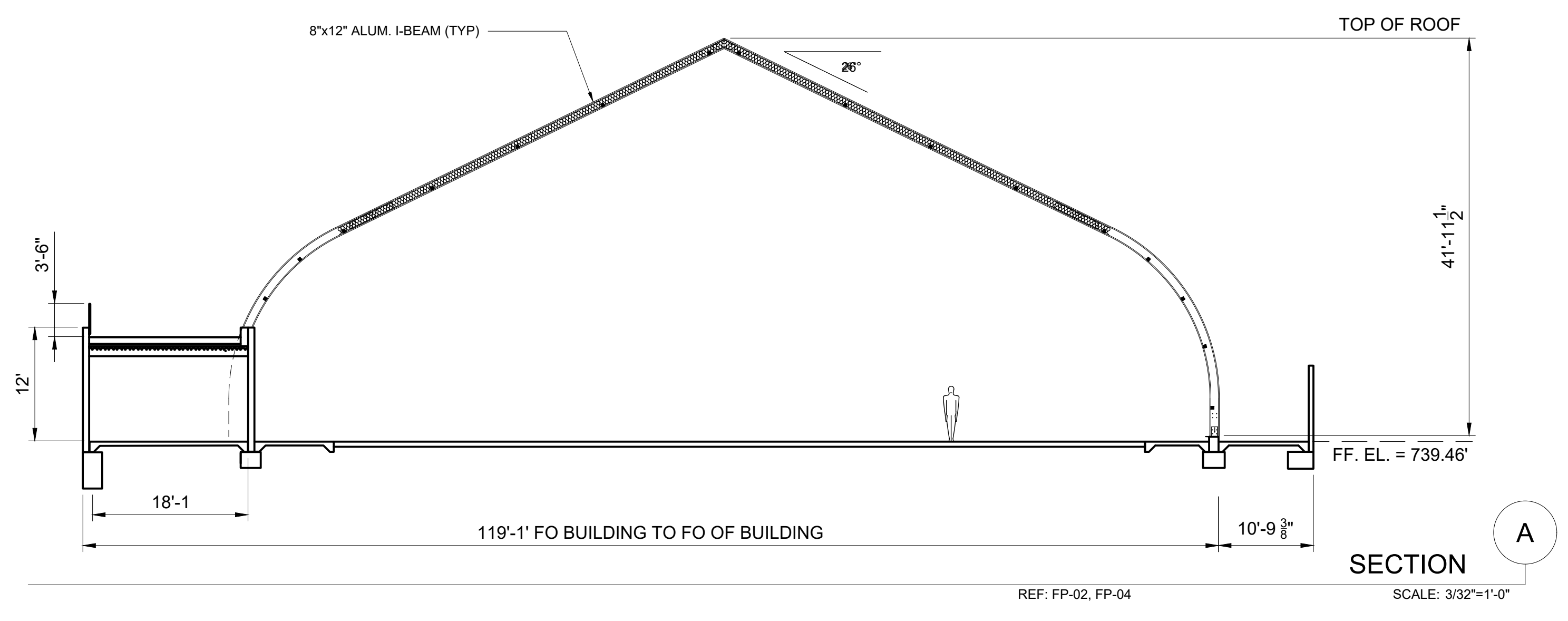
SHEET NAME: **FP-02**

SHEET X OF X SHEETS

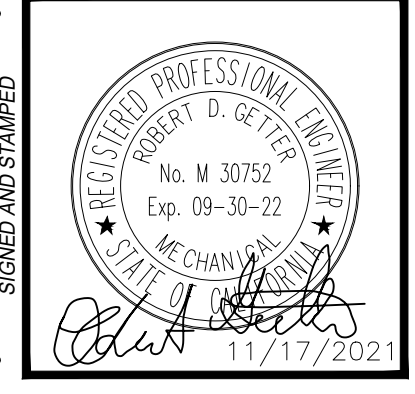
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- NOTE:
- FOR DETAILS ON ROOF, SEE STRUCTURAL DRAWINGS.



BUREAU OF ENGINEERING

VERTICAL CONTROL: _____

HORIZONTAL CONTROL: _____

SHEET TITLE: FIRE PROTECTION AND ALARM SECTIONS

PROJECT: RESEDA SKATE FACILITY

ADDRESS: 18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS	DATE	BY

INDEX NO. _____

CIP NO. _____

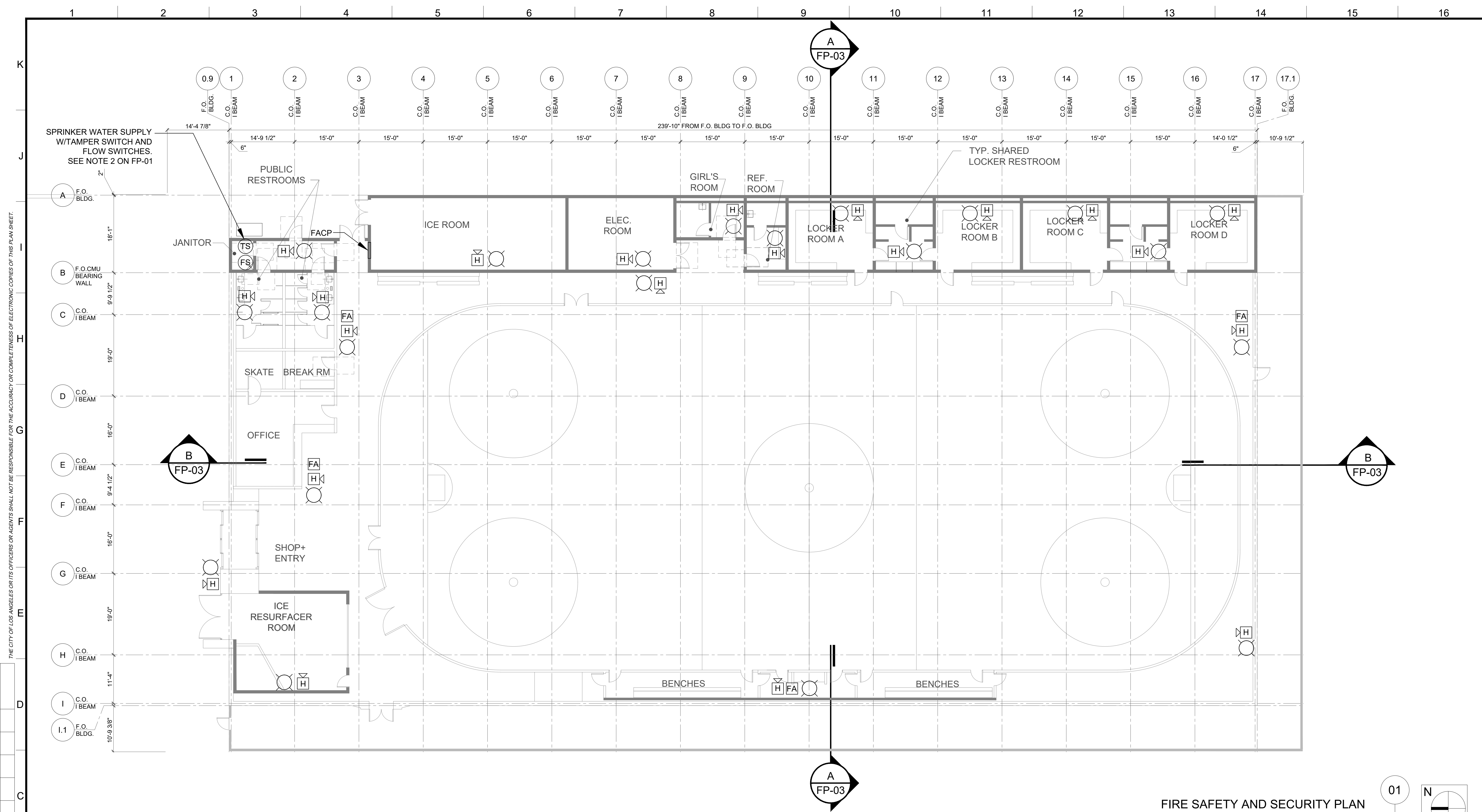
CITY OF LOS ANGELES

CITY ENGINEER	GARY LEE MOORE, P.E., ENV SP	DATE	
DESIGN GROUP	ROBERT GETTER		
ENGINEER	ROBERT GETTER		
DESIGNED BY	JUSTIN CHIN		
DRAWN BY	JUSTIN CHIN		
CHECKED BY	ROBERT GETTER		
APPROVED BY	XXX		

WORK ORDER NO. E170121B

SHEET NAME: **FP-03**

SHEET X OF X SHEETS



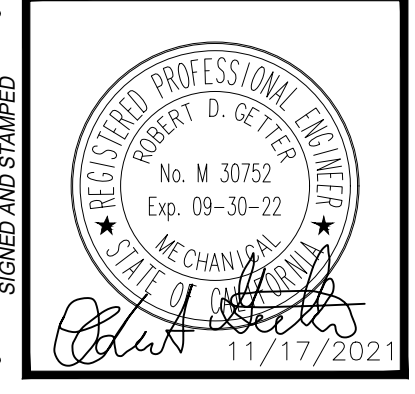
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FIRE ALARM AND SAFETY PLAN NOTES:

1. PROVIDE COMPLETE FIRE ALARM AND SAFETY SYSTEM INSTALLATION DRAWINGS FOR APPROVAL BY CITY OF LOS ANGELES DBS AS A DEFERRED SUBMITTAL. SYSTEMS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA AND DBS REQUIREMENTS BY QUALIFIED INSTALLATION TECHNICIANS IN ACCORDANCE WITH EQUIPMENT MANUFACTURERS' RECOMMENDATIONS.
2. FIRE ALARM SYSTEMS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
 - a. FACP (EDWARDS MODEL EST4 SERIES, OR EQUAL). FACP AND ALARM DEVICES SHALL BE POWERED FROM A DEDICATED CIRCUIT, AND PROVIDED WITH EMERGENCY BACKUP POWER. CIRCUIT BREAKER SHALL BE LOCKED IN ON POSITION WITH APPROVED MECHANICAL CLIP, AND SHALL BE IDENTIFIED AS "FIRE ALARM SYSTEM".
 - b. SMOKE DETECTION DEVICES THROUGHOUT THE FACILITY, AND RELAY CONTACTS FROM FACP FOR HVAC AND DHU SHUTDOWN. COORDINATE ALARM SIGNAL WIRING WITH HVAC AND DHU CONTROLS.
 - c. FIRE ALARM AUDIBLE ALARMS. AUDIBLE ALARMS SHALL BE NOT LESS THAN 15 DBA ABOVE AMBIENT AND NOT LESS THAN 75 DBA THROUGHOUT THE FACILITY.
 - d. FIRE ALARM STROBES. AREAS HAVING MORE THAN 2 STROBES IN FIELD OF VIEW SHALL BE SYNCHRONIZED. WALL-MOUNTED STROBES SHALL BE MOUNTED NOT LESS THAN 80 INCHES, AND NOT MORE THAN 96 INCHES, ABOVE FINISHED FLOOR.
 - e. MANUAL FIRE ALARM PULL STATIONS THROUGHOUT THE FACILITY. MANUAL PULL STATIONS SHALL BE DUAL-ACTION TYPE.
 - f. SPRINKLER SYSTEM FLOW AND TAMPERS SWITCHES, COORDINATED WITH FIRE WATER SUPPLY AND SPRINKLER SYSTEM INSTALLATION.
 - g. ELECTRICAL WIRING SUITABLE FOR THE LOCATIONS AND IN ACCORDANCE WITH NFPA. ALL WIRING SHALL BE PROVIDED IN CONDUIT AND/OR APPROVED CABLE.
3. PROVIDE WALL-MOUNTED EMERGENCY EVACUATION SIGNAGE INDICATING LOCATIONS AND DIRECTION TO EXITS. SIGNS SHALL BE PROVIDED NOT LESS THAN EVERY 75 FT AT PERIMETER OF THE ICE RINK.
4. PROVIDE TEN (10) CLASS A FIRE EXTINGUISHERS IN SECURE ENCLOSURES THROUGHOUT THE FACILITY, AND ONE (1) CLASS C FIRE EXTINGUISHER IN ELECTRICAL ROOM.
5. DEDICATED TELEPHONE LINES SHALL BE PROVIDED BY OWNER, WITH ONE LINE DEDICATED FOR FA MONITORING.
6. CO, CO2 AND NO2 AIR QUALITY MONITORING INSTRUMENTS WILL BE PROVIDED BY DEHUMIDIFIER EQUIPMENT PACKAGE. AIR QUALITY ALARMS WILL FORCE DHU AND HVAC SYSTEMS TO EVENT MODE, WITH 100% OUTSIDE AIR. FACP SHALL ACCEPT EVENT MODE ALARM SIGNAL FROM DEHUMIDIFIER CONTROL PANEL.
7. IT IS CONTRACTOR'S RESPONSIBILITY TO PREPARE AND SUBMIT DRAWINGS AND SPECIFICATIONS FOR FIRE DETECTION AND ALARM SYSTEMS TO LA DBS AS A DEFERRED PLAN CHECK SUBMITTAL. CONTRACTOR SHALL PREPARE PLAN CHECK SUBMITTAL IN ACCORDANCE WITH CONTRACT SPECIFICATIONS, CODE AND CITY DBS REQUIREMENTS, AND OBTAIN CITY FIRE MARSHALL APPROVAL. FIRE DETECTION AND ALARM SYSTEMS SHALL BE IN ACCORDANCE WITH THE LATEST APPLICABLE EDITION OF CCR PART 2, TITLE 24, CHAPTER 9, SECTION 907, CBC, AND SHALL CONFORM TO CCR PART 3, TITLE 24, ARTICLE 760, CEC. FIRE DETECTION AND ALARM SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT WITHIN 14 CALENDAR DAYS AFTER NOTICE TO PROCEED. FIRE ALARM AND DETECTION WORK SHALL NOT BE STARTED UNTIL SUBMITTALS HAVE BEEN APPROVED BY THE ARCHITECT, DBS, AND CITY FIRE MARSHALL. CONTRACTOR SUBMITTALS SHALL INCLUDE:
 1. TYPE OF FIRE ALARM AND DETECTION SYSTEMS PROPOSED.
 2. CATALOG DATA, CSFM LISTING NUMBERS, AND MODEL NUMBERS FOR ALL SYSTEM COMPONENTS.
 3. ELECTRICAL SINGLE LINE DIAGRAM, RISER DIAGRAMS, AND POINT-TO-POINT WIRING DIAGRAMS.
8. EMERGENCY WARNING SYSTEMS WITH VISUAL STROBES DEVICES AS REQUIRED FOR HEARING IMPAIRED, CCR PART 9, TITLE 24, CHAPTER 9, SECTIONS 9907.6.2.3.1 THROUGH 907.6.2.3.5, CFC.
9. CONDUIT SIZES, QUANTITY AND TYPE OF CONDUCTORS, AND WHETHER THE SYSTEM IS POWER LIMITED OR NON-POWER LIMITED.
10. BATTERY CALCULATIONS FOR THE ENTIRE SYSTEM (24-HOUR STANDBY, 5 MINUTE ALARM TIME).
11. FLOOR PLANS SHOWING LOCATIONS OF ALL FIRE ALARM EQUIPMENT, INTERCONNECTING WIRING, REMOTE POWER SUPPLIES, AND ANNUNCIATORS.
12. VOLTAGE DROP CALCULATIONS FOR THE LONGEST RUN AND FOR CIRCUITS WITH THE LARGEST LOAD REQUIRED FOR BOTH INITIATION AND SIGNAL CIRCUITS.
13. FIRE DETECTION AND ALARM DEVICES INDICATED AND SPECIFIED HEREIN ARE MINIMUM REQUIREMENTS, AND CONTRACTOR SHALL PROVIDE ADDITIONAL DEVICES, CONDUITS AND WIRING AS REQUIRED BY CODE, AND AT NO ADDED COST TO THE CITY.
14. CONTRACTOR SHALL COORDINATE WITH CITY RAP AND BOE DEPARTMENTS FOR CONNECTION AND REPORTING OF ALARMS TO A SUPERVISED LOCATION AS REQUIRED BY CODE.

FIRE SAFETY AND SECURITY PLAN
REF: -- SCALE: 3/32"=1'-0"
01 N



BUREAU OF ENGINEERING
VERTICAL CONTROL:
HORIZONTAL CONTROL:
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PROJECT:
ADDRESS:

FIRE ALARM AND SAFETY PLAN
RESEDA SKATE FACILITY
18210 SHERMAN WAY, RESEDA, CA 91335

DEPARTMENT OF PUBLIC WORKS
DATE: BY:
REVISIONS:
INDEX NO.

CITY OF LOS ANGELES
CITY ENGINEER: GARY LEE MOORE, P.E., ENV SP
DESIGN GROUP:
ENGINEER: ROBERT GETTER
DESIGNED BY: JUSTIN CHIN
DRAWN BY: JUSTIN CHIN
CHECKED BY: ROBERT GETTER
APPROVED BY: XXX
WORK ORDER NO.: E170121B
SHEET NAME: FP-04
SHEET X OF X SHEETS