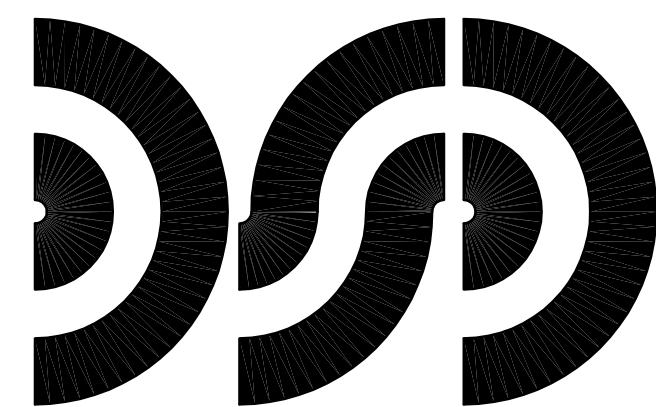


CITY OF ANN ARBOR

LARCOM SECONDARY CHILLER PROJECT ITB 4318

301 E. HURON STREET

ANN ARBOR, MICHIGAN 48104



DICLEMENTE SIEGEL DESIGN INC.

28105 GREENFIELD ROAD
SOUTHFIELD, MICHIGAN 48076-3046
DSD PROJECT No. 13-1310

ENGINEERING AND ARCHITECTURE

GENERAL SHEET INDEX

SHEET	DESCRIPTION
G-1	TITLE SHEET

ARCHITECTURAL SHEET INDEX

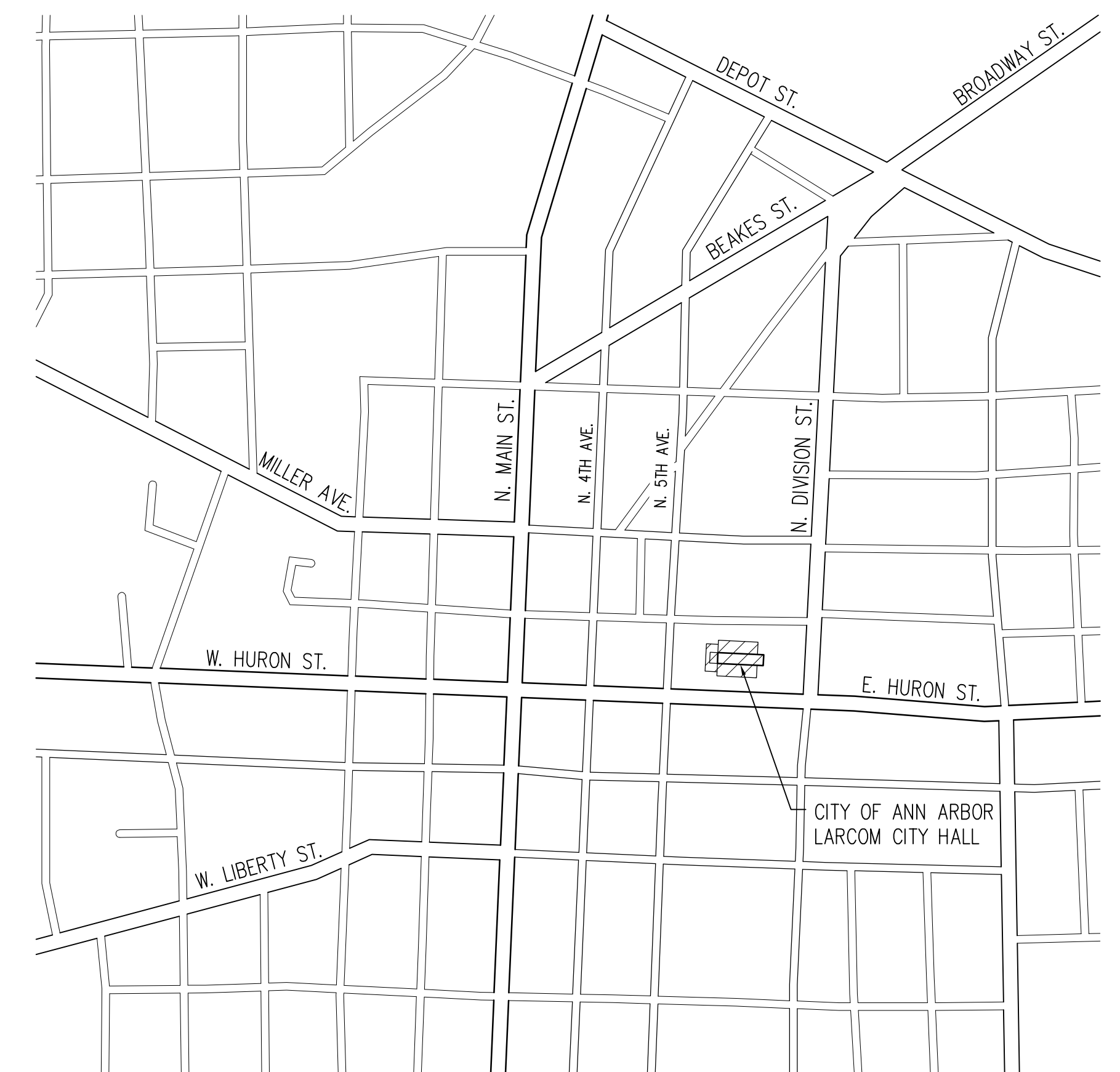
SHEET	DESCRIPTION
A-1	ARCHITECTURAL GENERAL INFORMATION
A-2	PENTHOUSE FLOOR & ROOF PLANS
A-3	ROOF FRAMING PLAN & DETAILS
A-4	SECTIONS & PLAN DETAILS
A-5	SPECIFICATIONS
A-6	SPECIFICATIONS
A-7	SPECIFICATIONS

MECHANICAL SHEET INDEX

SHEET	DESCRIPTION
M-1	MECHANICAL GENERAL INFORMATION
M-2	PENTHOUSE FLOOR & ROOF PLANS

ELECTRICAL SHEET INDEX

SHEET	DESCRIPTION
E-1	GENERAL ELECTRICAL INFORMATION
E-2	UPPER AND LOWER PENTHOUSE FLOOR PLANS - ELECTRICAL



SHEET:
ACAD FILE:
ISSUED FOR:
DATE:

G-1
13-1310-G-1
BIDS
01/10/14

PLAN LEGEND	
SYMBOL	DESCRIPTION
////	LINE FOR ITEM TO BE REMOVED
=====	WALL TO REMAIN
=====	NEW OR RELOCATED ITEM
=====	EXISTING ITEM
=====	1 HR. FIRE RATED SEPARATION
=====	2 HR. FIRE RATED SEPARATION

GENERAL SYMBOLS	
SYMBOL	DESCRIPTION
XX	NEW COLUMN NUMBER IDENTIFICATION AND GRID
XX	EXISTING COLUMN NUMBER IDENTIFICATION AND GRID
X X	SECTION IDENTIFIER
X X	DETAIL DESIGNATOR
1 A-3 2	ELEVATION DESIGNATOR
◆	WORK POINT / ELEVATION ABOVE FINISHED FLOOR OR GRADE
---	MATCH LINE
---	BREAK LINE
XXX	ROOM NUMBER IDENTIFIER
XXX	DOOR NUMBER IDENTIFIER
WXXX	WINDOW NUMBER IDENTIFIER
A XXX	ADDENDUM NUMBER IDENTIFIER
BXXX	BULLETIN NUMBER IDENTIFIER

ABBREVIATIONS			
A.F.F.	ABOVE FINISHED FLOOR	N.I.C.	NOT IN CONTRACT
ALUM.	ALUMINUM	NON. COMB.	NON COMBUSTIBLE
ARCH.	ARCHITECTURAL	N.T.S.	NOT TO SCALE
ASSY.	ASSEMBLY	O.C.	ON CENTER
BD.	BOARD	O.H.	OVERHEAD
B.F.	BARRIER FREE	OP'NG.	OPENING
B.O.S.	BOTTOM OF STEEL	OPP.	OPPOSITE
BOT.	BOTTOM	PL.	PLATE
BRG.	BEARING	P.LAM.	PLASTIC LAMINATE
C.J.	CONTROL JOINT	PT.	PAINT
CLG.	CEILING	PTD.	PAINTED
CLR.	CLEAR	PR.	PAIR
CLOS.	CLOSET	R.	RADIUS
C.M.U.	CONCRETE MASONRY UNIT	R.A.	RETURN AIR
C.O.	CLEAN OUT	R.B.	RUBBER BASE
COMM.	COMMUNICATION	REINF.	REINFORCED/REINFORCING
COMP.	COMPACTED	REQ'D.	REQUIRED
CONC.	CONCRETE	RM.	ROOM
CONSTR.	CONSTRUCTION	R.O.	ROUGH OPENING
CONT.	CONTINUOUS	S.C.	SOLID CORE
CONTR.	CONTRACTOR	S.F.	SQUARE FEET
CPT.	CARPET	SHT.	SHEET
C.T.	CERAMIC TILE	SIM.	SIMILAR
DET.	DETAIL	S.S.	STAINLESS STEEL
DIA.	DIAMETER	ST.	STONE
D.O.	DOOR OPENING	STL.	STEEL
DR.	DOOR	STRUCT.	STRUCTURAL
DWG.	DRAWING	SUSP.	SUSPENDED
E.J.	EXPANSION JOINT	THK.	THICK
ELECT.	ELECTRICAL	THRU	THROUGH
EL. OR ELEV.	ELEVATION	T.O.	TOP OF
ENG.	ENGINEER	T.O.C.	TOP OF CURB
EQ.	EQUAL	T.O. CONC.	TOP OF CONCRETE
EQUIP.	EQUIPMENT	T&G	TONGUE AND GROOVE
E.W.C.	ELECTRIC WATER COOLER	T.S.	TUBE STEEL
EX.	EXISTING	T.O.S.	TOP OF STEEL
EXP.	EXPANSION	TYP.	TYPICAL
EXT.	EXTERIOR	UNEXCAV.	UNEXCAVATED
FIN.	FINISH	U.O.N.	UNLESS OTHERWISE NOTED
FL. OR FLR.	FLOOR	V.C.T.	VINYL COMPOSITION TILE
GALV.	GALVANIZED	VERT.	VERTICAL
GA.	GAUGE	VEST.	VESTIBULE
G.C.	GENERAL CONTRACTOR	V.I.F.	VERIFY IN FIELD
GL.	GLASS OR GLAZING	W/	WITH
GYP.	GYPSPUM	WD.	WOOD
HWDR.	HARDWARE	W.P.	WORK POINT
H.D.G.	HOT-DIPPED GALVANIZED		
H.M.	HOLLOW METAL		
HORIZ.	HORIZONTAL		
H.P.	HIGH POINT		
HT.	HEIGHT		
INSUL.	INSULATION		
INT.	INTERIOR		
JAN.	JANITOR		
JST.	JOIST		
LAM.	LAMINATE		
LAV.	LAVATORY		
L.P.	LOW POINT		
MANUF.	MANUFACTURER		
MAS.	MASONRY		
MAX.	MAXIMUM		
MECH.	MECHANICAL		
MET. OR MTL.	METAL		
MIN.	MINIMUM		
MTD.	MOUNTED		
M.O.	MASONRY OPENING		

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A-6	SPECIFICATIONS
A-7	SPECIFICATIONS

OVERVIEW OF ARCHITECTURAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ARCHITECTURAL

1. PROVIDE SHIP LADDER AT THE PENTHOUSE TO THE PENTHOUSE ROOF. **NOT IN SCOPE**
2. PROVIDE ROOF HATCH AT PENTHOUSE ROOF. **NOT IN SCOPE**
3. PROVIDE STEEL REINFORCING AT PENTHOUSE ROOF.
4. PROVIDE FLASHING AND OR ROOM MEMBRANE AT ROOF CURBS FOR NEW ROOF TOP UNITS.

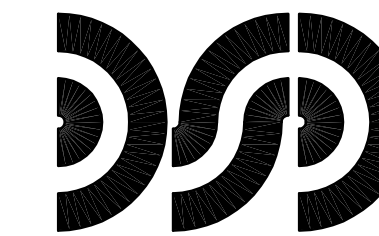
PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

- 2011 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2011 MICHIGAN ELECTRICAL CODE RULES, PART 8
- NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)
- MICHIGAN ENERGY CODE--ASHRAE 90.1-2007
- 2009 INTERNATIONAL FIRE CODE (AS REFERENCED)
- 2009 MICHIGAN BUILDING CODE
- 2012 MICHIGAN MECHANICAL CODE
- 2009 MICHIGAN PLUMBING CODE
- 2009 INTERNATIONAL FUEL GAS CODE

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE CONTRACTOR SHALL BEAR ALL ADDITIONAL COSTS ASSOCIATED WITH USING EQUIPMENT AND/OR SYSTEMS BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT AND/OR SYSTEMS INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ARCHITECT THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.



**DiClemente
Siegel
Design
Inc.**
Engineering and Architecture

28105 Greenfield Rd Southfield, MI 48075-3046
Voice: 248.568.1430 Fax: 248.568.0098
Email: mtg@dsonline.com
Website: http://www.dsonline.com

**CITY OF ANN ARBOR
LARCOM SECONDARY
CHILLER PROJECT
ANN ARBOR, MI**

**ARCHITECTURAL
GENERAL
INFORMATION**

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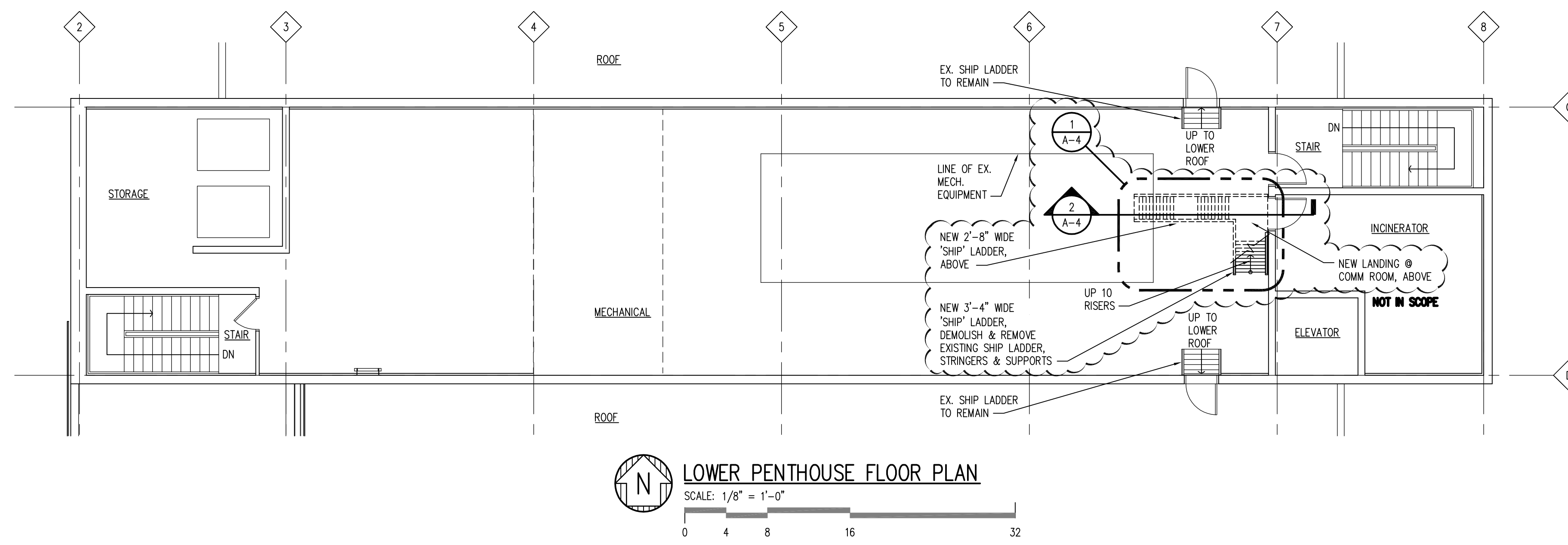
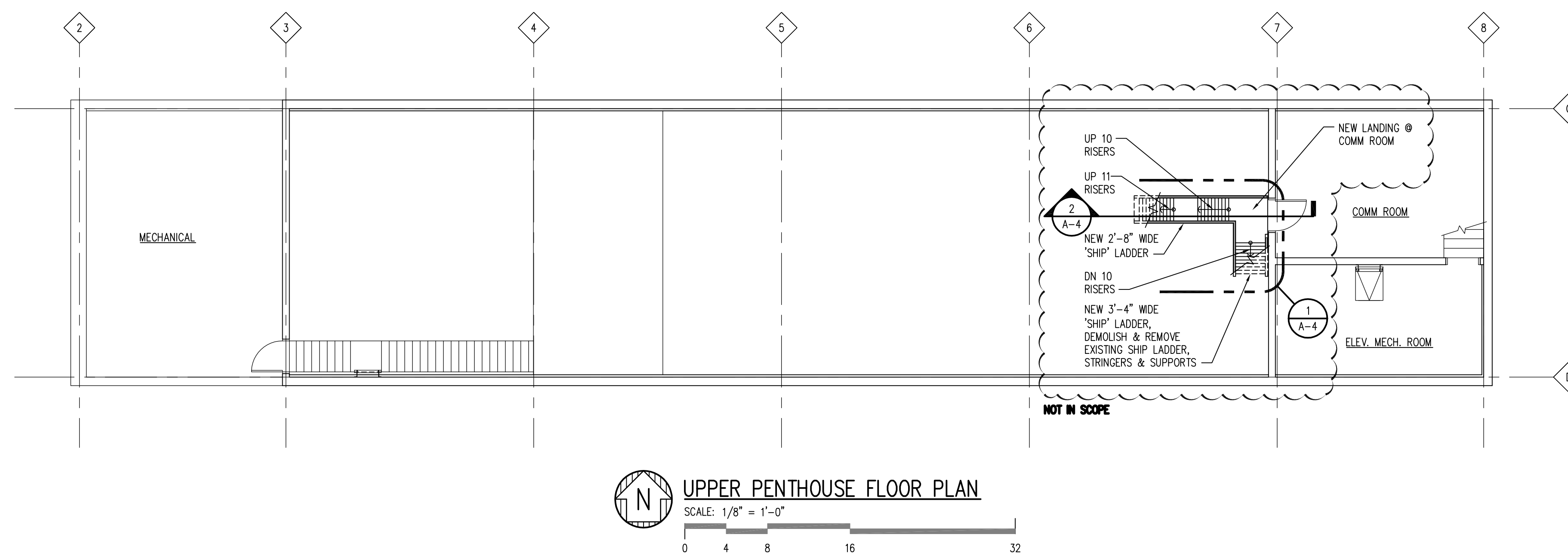
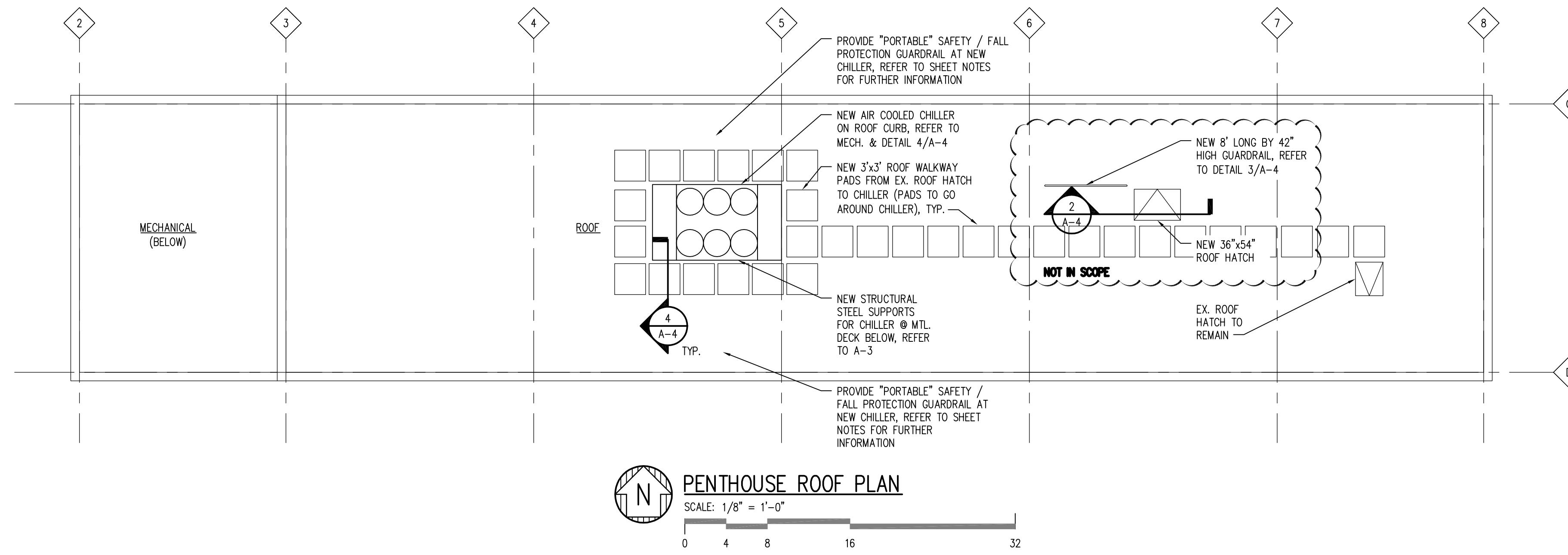
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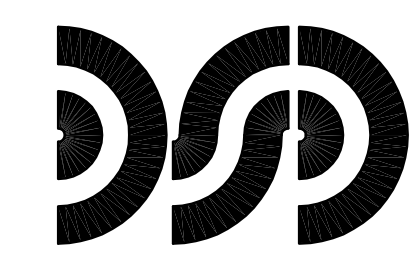
ISSUED FOR	DATE
OWNER REVIEW	10/18/13
BIDS	11/13/13
BIDS	01/10/14

DESIGNER:	CLF
DRAWN:	CLF
PM / PIC:	JSR/LAT
CHECKED:	GDC
ACADFILE:	13-130-A-1
PROJECT No.	13-1310

A-1



- SHEET NOTES:**
- FOR MECHANICAL AND ELECTRICAL DEMOLITION AND NEW WORK, REFER TO MECHANICAL AND ELECTRICAL DRAWINGS
 - AS REQ'D. PATCH, REPAIR AND OR PAINT / REPLACE ADJACENT SURFACES TO MATCH ORIGINAL CONDITIONS WHERE PROPOSED ARCH. & M.E.P. WORK DISTURBED EXISTING CONDITIONS
 - ALL SPACES ARE TO BE CLEANED AND ANY DAMAGE CAUSED BY THE CONTRACTOR IS TO BE PATCHED, REPAIRED AND OR PAINTED / REPLACED TO MATCH ORIGINAL CONDITIONS ONCE WORK IS COMPLETED
 - THE ROOF IS UNDER WARRANTY AND WILL BE INSPECTED BOTH BEFORE THE CONTRACTOR MOBILIZES AND AFTER DEMOBILIZATION TO CONFIRM THAT THERE ARE NOT DAMAGES CAUSED BY CONSTRUCTION ACTIVITIES OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF THE ROOF DURING THEIR CONSTRUCTION ACTIVITIES AND MUST SUPPLY AT A MINIMUM RIGID FOAM BOARD COVERED BY 3/4" PLYWOOD TO PROTECT THE ROOF WHERE WORK IS TO OCCUR. CONTRACTOR TO ARRANGE BOTH PRE-CONSTRUCTION AND POST-CONSTRUCTION CONFERENCES / INSPECTIONS. CONTACT FOR ANY ROOFING PENETRATIONS OR REPAIRS IS CEI, MICHIGAN OUT OF HOWELL, MI (517-548-0039). THE ROOF WAS A PRODUCT OF FIRESTONE ROOFING SYSTEMS (800-830-5612)
 - CONTRACTOR TO PROVIDE (3) 10 FOOT (MIN.) SECTIONS OF "PORTABLE" SAFETY / FALL PROTECTION GUARDRAIL W/ MULTIDIRECTIONAL BASE FOR EACH POST AT NEW ROOF CHILLER. GUARDRAILS TO BE 42" MIN. HEIGHT AND DESIGNED WITH INTERMEDIATE RAILS SO AS A 21" SPHERE WILL NOT BE ABLE TO PASS THRU THE RAILS / OPENINGS. GUARDRAIL SYSTEM MUST BE ABLE TO WITHSTAND 200 POUND FORCE WITHIN 2" OF THE TOP EDGE. SYSTEM TO MATCH EXISTING GARLOCK EQUIPMENT COMPANY, RAILGUARD 200 #161021. OWNER TO ASSURE GUARDRAIL SYSTEM IS IN PLACE WHEN PERSONNEL ARE WORKING ON ROOF CHILLER
 - SHIP LADDER STRINGERS, TREADS, LANDINGS AND STEEL TUBE GUARDRAILS, RAILINGS SHALL BE PAINTED SAFETY YELLOW
 - ALL MECHANICAL AND ELECTRICAL PENETRATIONS THRU PENTHOUSE ROOF DECK TO BE 2 HOUR MIN. FIRE STOPPED



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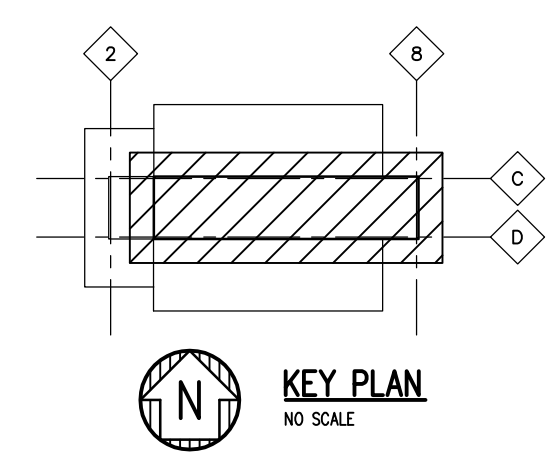
**CITY OF ANN ARBOR
LARCOM SECONDARY CHILLER PROJECT
ANN ARBOR, MI**

PENTHOUSE FLOOR & ROOF PLANS
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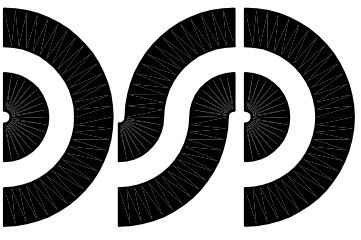
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CHECKED:	GDC
ACADFILE:	13-130-A-2
PROJECT No.	13-1310

A-2

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CITY OF ANN ARBOR
LARCOM SECONDARY CHILLER PROJECT
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ROOF FRAMING PLAN & DETAILS

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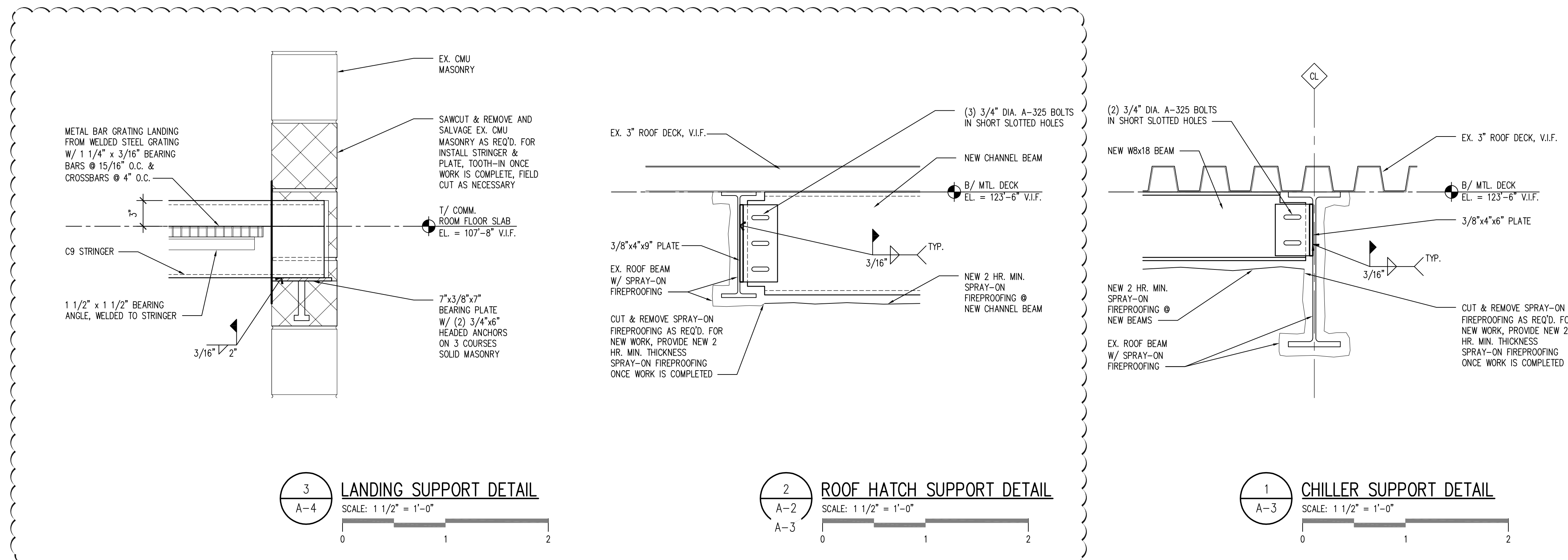
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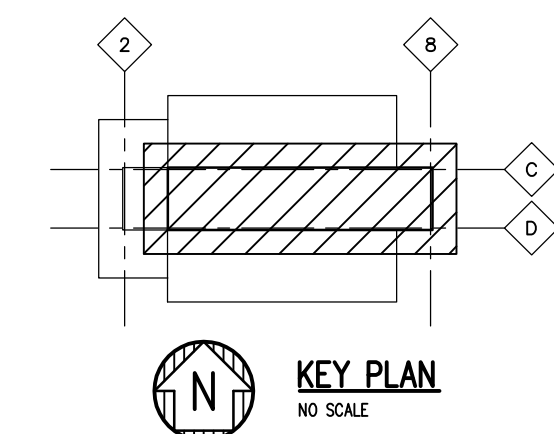
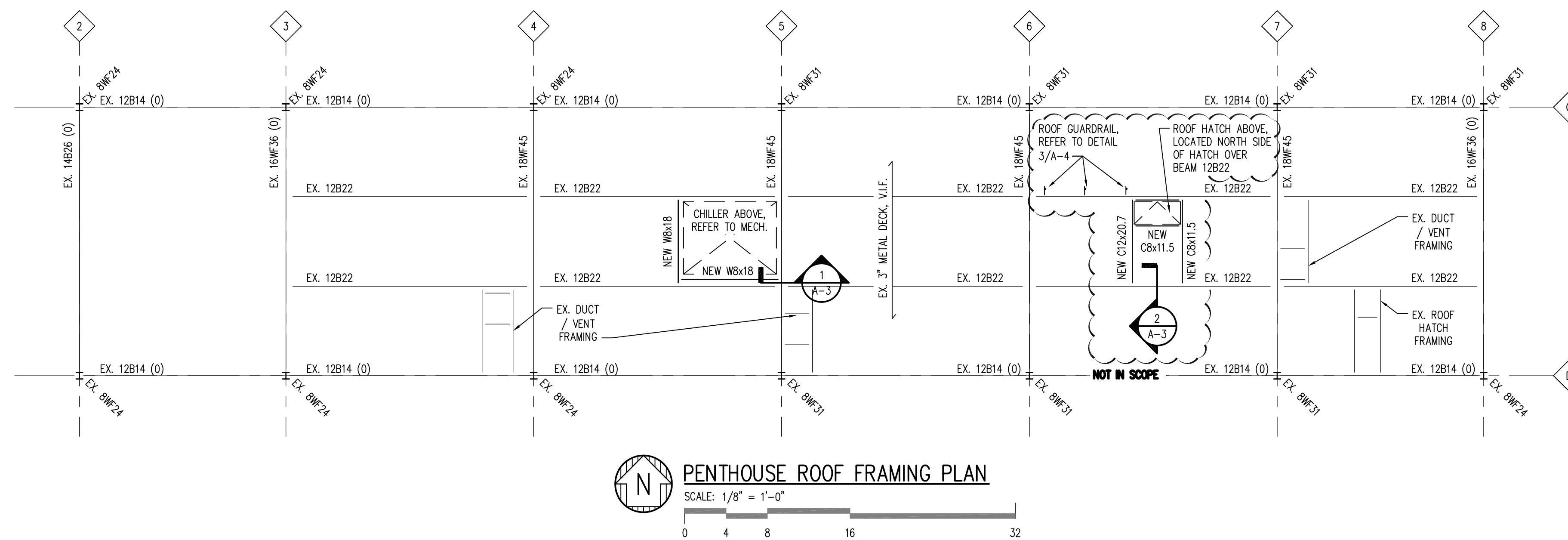
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ACADFILE:	13-130-A-3
PROJECT No.	13-1310

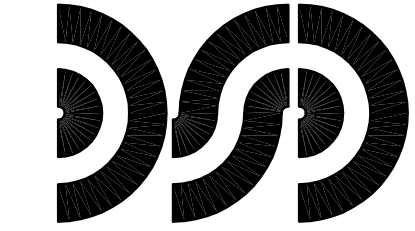
A-3



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**CITY OF ANN ARBOR
LARCOM SECONDARY
CHILLER PROJECT
ANN ARBOR, MI**

**SECTIONS & PLAN
DETAILS**
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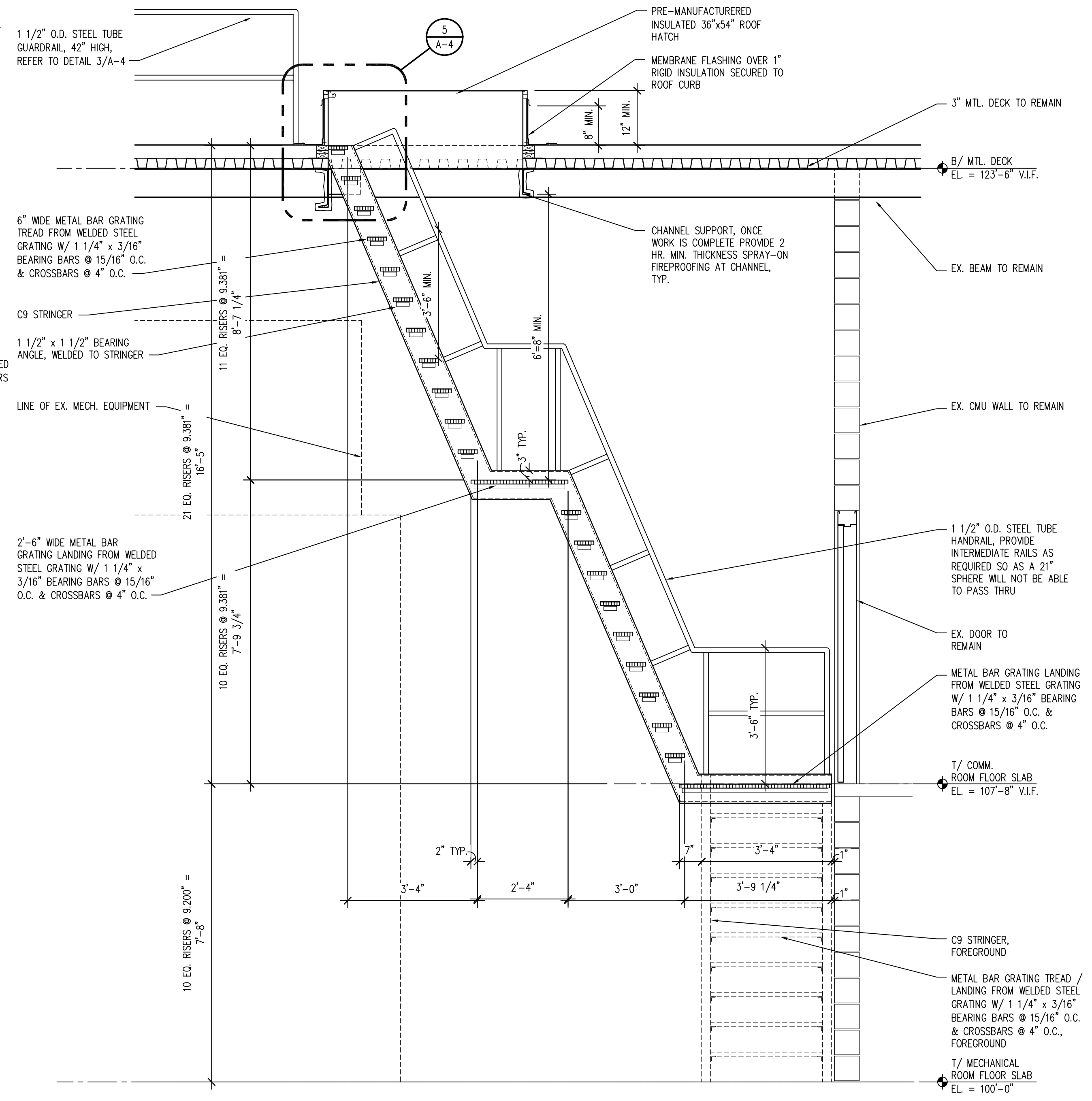
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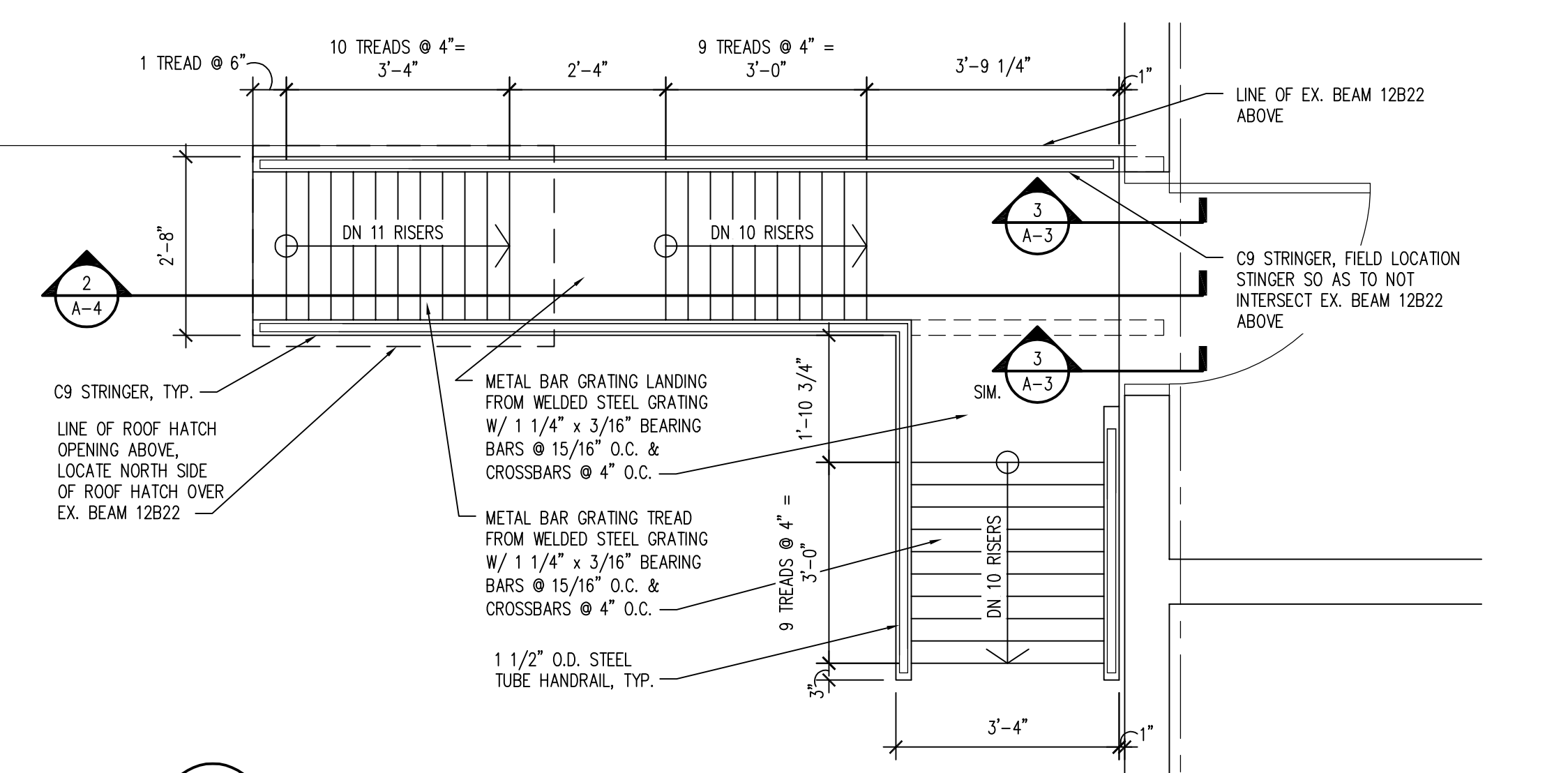
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PM / PIC:	JSR/LAT
CHECKED:	GDC
ACADFILE:	13-130-A-4
PROJECT No.	13-1310

A-4

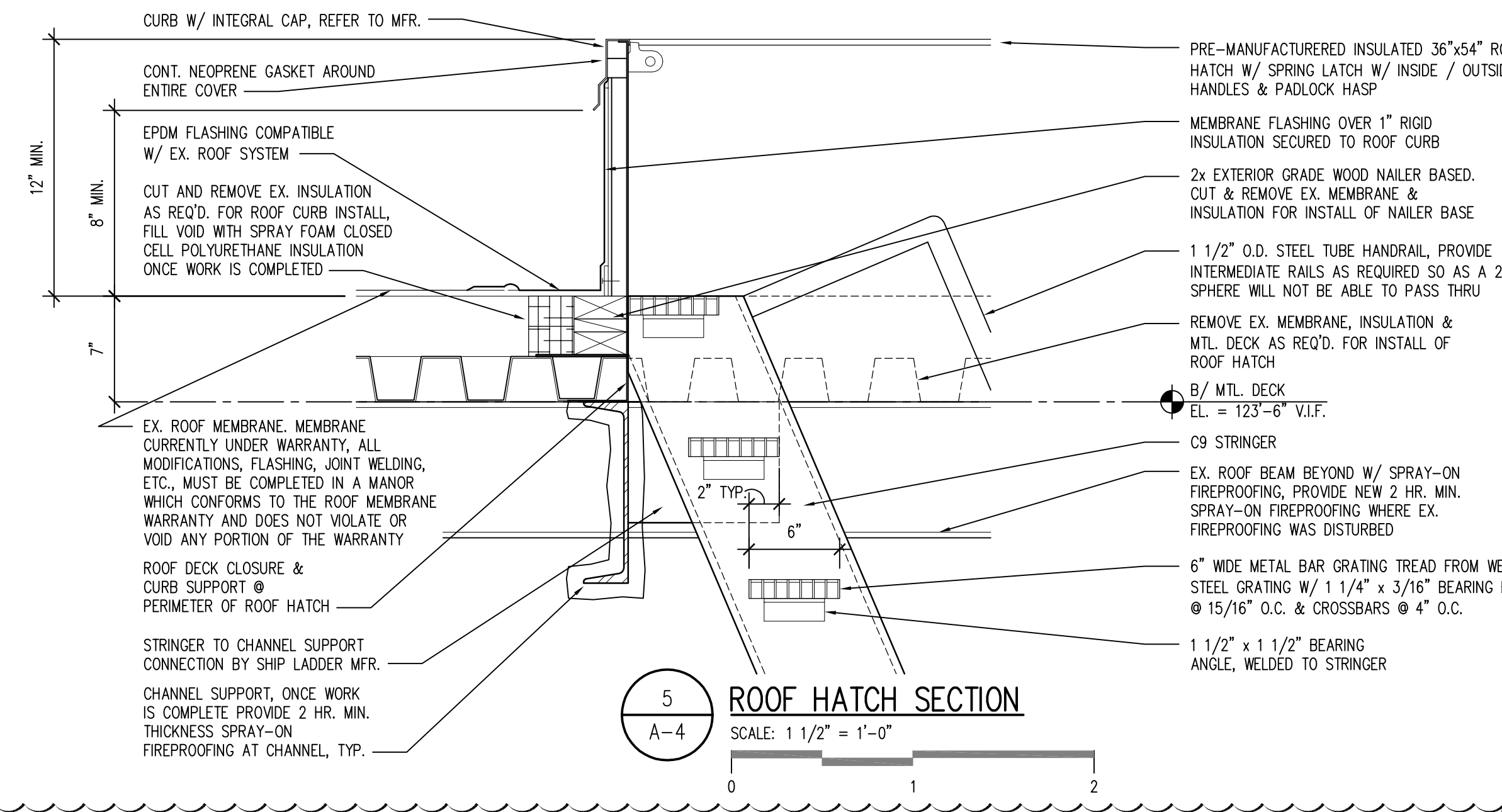
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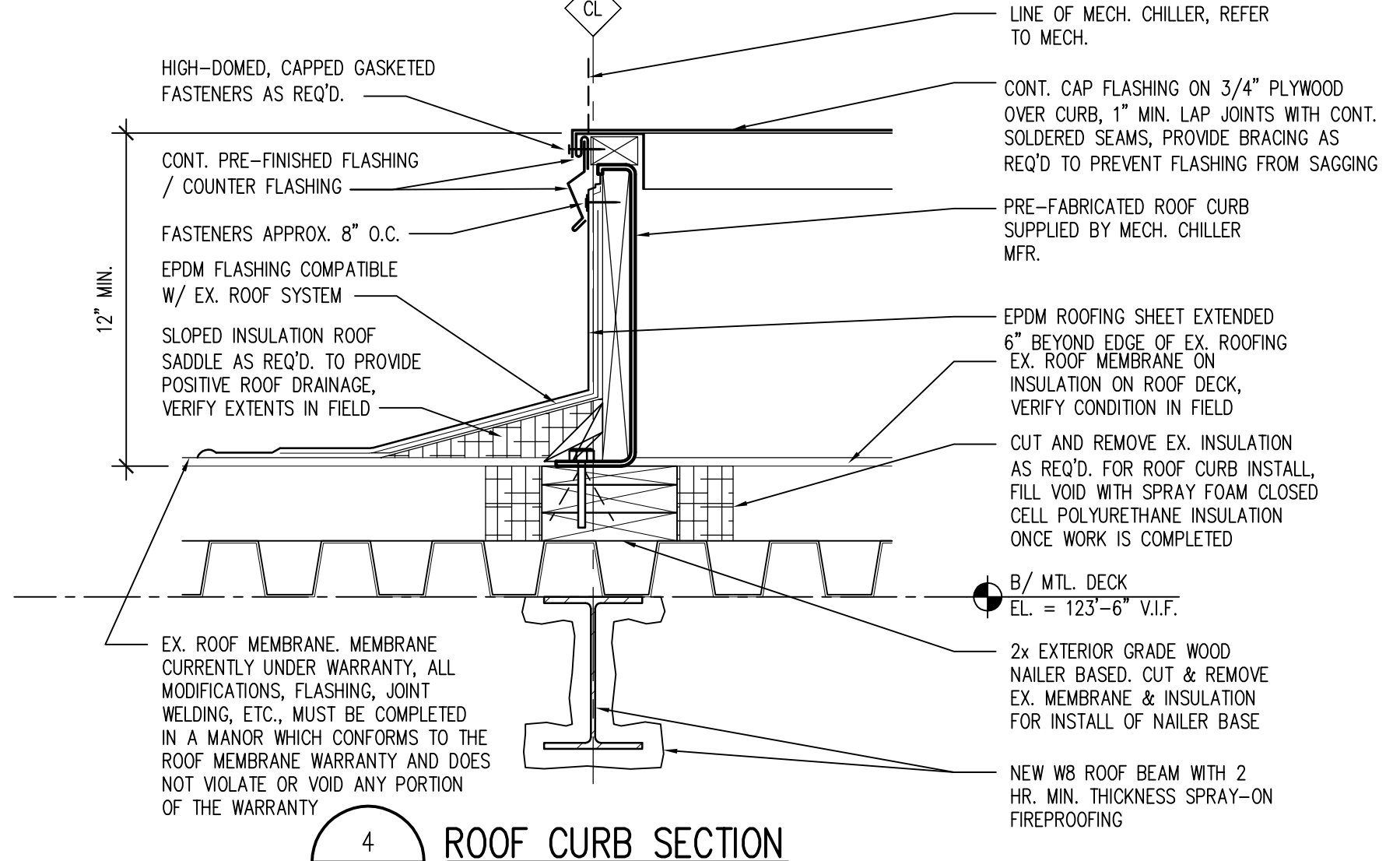
2 STAIR SECTION
SCALE: 1/2" = 1'-0"



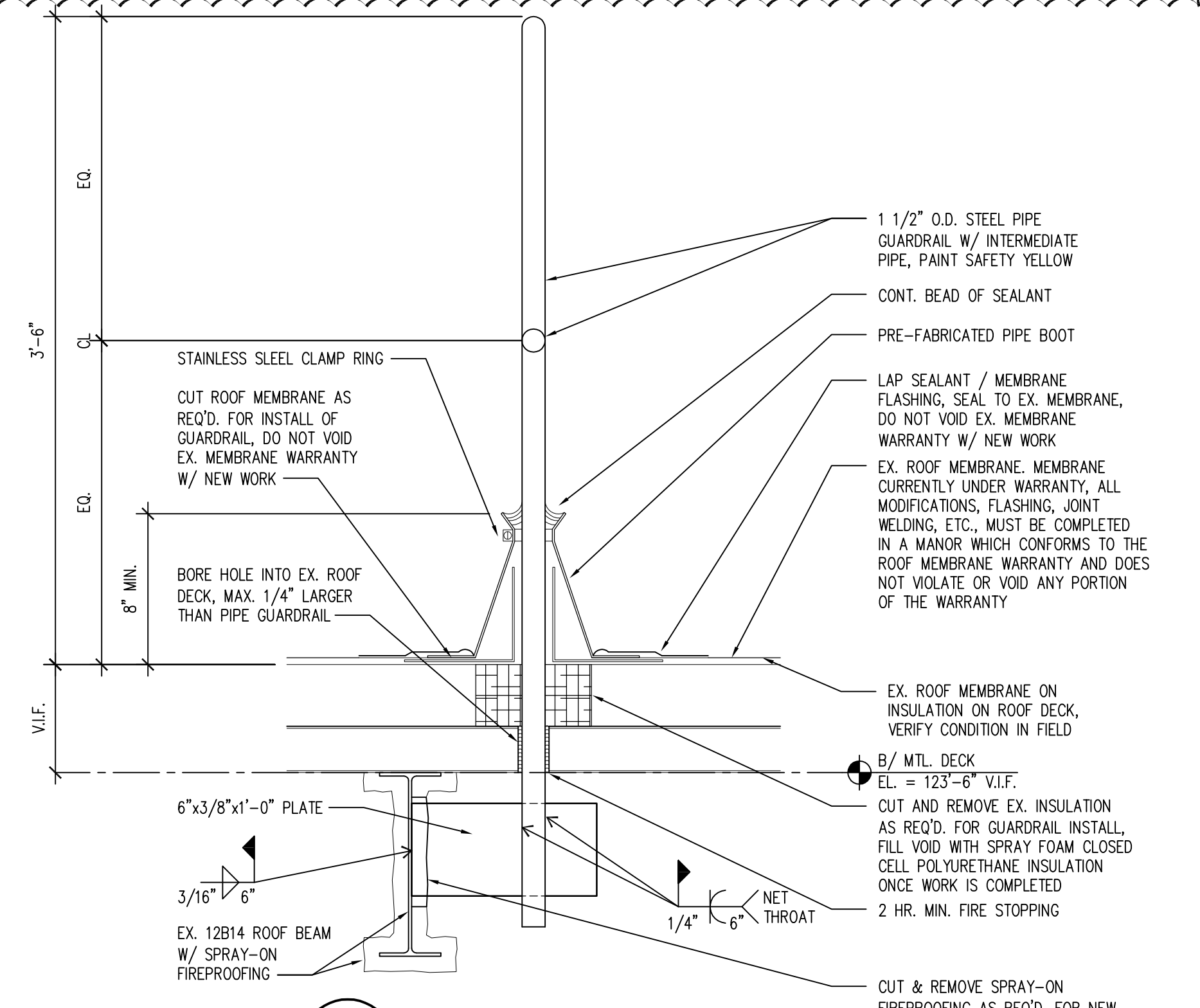
1 ENLARGED STAIR PLAN
SCALE: 1/2" = 1'-0"



5 ROOF HATCH SECTION
SCALE: 1 1/2" = 1'-0"



4 ROOF CURB SECTION
SCALE: 1 1/2" = 1'-0"



3 GUARDRAIL SECTION
SCALE: 1 1/2" = 1'-0"

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NOT IN SCOPE

CHILLER PUMPS SYSTEM POINT LIST		
SYSTEM POINT DESCRIPTION	TYPE	COMMAND
CHILLER 1 (C-1)	-	ENABLE / DISABLE
CHILLER 3 (C-3)	-	ENABLE / DISABLE
CHLR1-ISOLATION VALVES	-	OPEN / CLOSE
CHLR3-ISOLATION VALVES	-	OPEN / CLOSE
CHW PUMP 3 VFD	-	CHLR1 OP/ CHLR3 OP
CHW PUMP 4 VFD	-	CHLR1 OP/ CHLR3 OP
CMP 1 STATUS	-	ON
CWP-2 STATUS	-	OFF
CHWP-3 STATUS	-	OFF
CHWP-4 STATUS	-	ON
CW PUMP REQUEST	-	STOP
CHW PUMP STATUS	-	STOP
CW PUMP 1	-	STOP
CW PUMP 2	-	STOP
CHW PUMP 3	-	STOP
CHW PUMP 4	-	STOP

LOW VOLTAGE WIRING IS BY CONTROL CONTRACTOR. FOR ADDITIONAL POINTS AND PROGRAMMING OF THE EXISTING CONTROLS (AUTOMATIC LOGIC) GENERAL CONTRACTOR TO CONTRACT METRO CONTROL INC. (586) 790-2500. FREQUENCY DRIVES ARE BY MECHANICAL CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR.

SYMBOL LEGEND		
TWO LINE SYMBOLS	SCHEMATIC SYMBOLS	DESCRIPTION
		EXISTING TO REMAIN
		EXISTING TO BE REMOVED
		NEW WORK
		NEW CONNECTION TO EXISTING
		PIPING ELBOW
		PIPING ELBOW UP
		PIPING ELBOW DOWN
		PIPING TEE
		PIPING TEE UP
		PIPING TEE DOWN
		DIELECTRIC UNION OR FLANGE CONNECTION
		ISOLATION VALVE
		GATE VALVE
		CHECK VALVE
		BUTTERFLY VALVE
		MOTORIZED DEVICE
		SOLENOID VALVE
		BALL VALVE
		GLOBE VALVE
		LUBRICATED PLUG VALVE
		BALANCE VALVE
		CONTROL VALVE - 2 WAY
		CONTROL VALVE - 3 WAY
		BACKWATER VALVE
		STRAINER
		THERMOMETER
		PRESSURE GAUGE WITH BALL VALVE
		CIRCUIT SETTER
		FLOW METER
		PIPE ANCHOR
		PIPE GUIDE
		FLOW ARROW
		CONCENTRIC REDUCER (PIPE OR DUCT)
		ECCENTRIC REDUCER (PIPE OR DUCT)

ABBREVIATIONS	
SYMBOL	DESCRIPTION
ABV	ABOVE
A.F.F.	ABOVE FINISHED FLOOR
A.H.U.	AIR HANDLING UNIT
B.O.D.	BOTTOM OF DUCT
B.O.P.	BOTTOM OF PIPE
CHWP	CHILLED WATER PUMP
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
DN	DOWN
EXH.	EXHAUST
F.D.	FLOOR DRAIN
FLR.	FLOOR
I.E.	INVERT ELEVATION
M.B.H.	THOUSAND BTU/HR (BRITISH THERMAL UNITS PER HOUR)
N.I.C.	NOT IN CONTRACT
P.R.V.	PRESSURE REDUCING VALVE
P.T.	PLUGGED TEE
R.A.	RETURN AIR
R.A.F.	RETURN AIR FAN
S.A.	SUPPLY AIR
SAN	SANITARY PIPE
TP.	TYPICAL
V	VENT
V.T.R.	VENT THROUGH ROOF

PIPING LEGEND	
SYMBOL	DESCRIPTION
	CHILLED WATER RETURN
	CHILLED WATER SUPPLY

MECHANICAL SHEET INDEX	
SHEET	DESCRIPTION
M-1	MECHANICAL GENERAL INFORMATION
M-2	PENTHOUSE FLOOR & ROOF PLANS

OVERVIEW OF MECHANICAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

MECHANICAL:

1. PROVIDE AIR COOLED CHILLER AS SCHEDULED AND SHOWN ON THE DRAWINGS.
2. PROVIDE CHILLED WATER PIPING AND CONNECT TO EXISTING AS SHOWN ON DRAWINGS.
3. REPLACE MOTORS ON EXISTING CHILLED WATER PUMPS.
4. REMOVE EXISTING MEZZANINE PUMP.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

- 2009 MICHIGAN BUILDING CODE
- 2012 MICHIGAN MECHANICAL CODE
- 2009 MICHIGAN PLUMBING CODE
- 2009 INTERNATIONAL FIRE CODE (AS REFERENCED)
- 2009 INTERNATIONAL FUEL GAS CODE
- NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)
- MICHIGAN ENERGY CODE-ASHRAE 90.1-2007

- 2011 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2011 MICHIGAN ELECTRICAL CODE RULES, PART 8.
- 2009 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE MECHANICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

AIR COOLED CHILLER SCHEDULE																							
MARK	LOCATION	SYSTEM SERVED	NOMINAL CAPACITY (TONS)	EVAPORATOR						CONDENSER					COMPRESSOR				UNIT POWER			BASIS OF DESIGN MODEL NUMBER	REMARKS
				E.W.T. F	L.W.T. F	NO. OF PASSES	GPM	MAX. PRESS. DROP (F.T.)	FLUID	FOULING FACTOR	AMBIENT F	NO. OF FANS	HP EACH	NO.	STEPS UNLOADING %	TYPE	REFRIGERANT	NUMBER OF INDEPENDENT REFRIGERANT CIRCUITS	KW	VOLTAGE	PHASE		
C-3	PENTHOUSE ROOF	HVAC	70	55	45	1	163	14.7	35% PROPYLENE GLYCOL	0.0001	95	6	1.5	4	25-50-75-100	SCROLL	410A	2	80.8	460	3	TRANE CGAM070F2	WITH DISCONNECT, ENHANCED CHILLER ACOUSTICAL INSULATION, SEVEN BLADE CONDENSER FANS WITH TOTALLY ENCLOSED AIR OVER MOTORS.

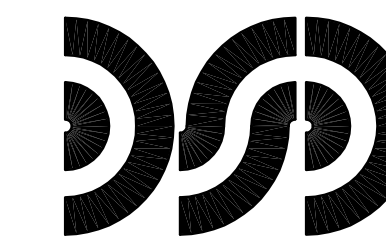
ARCHITECTURAL - MECHANICAL - ELECTRICAL COORDINATION SCHEDULE											
MARK	LOCATION	HP	KW	MCA	ELECTRICAL		DISCONNECT		STARTER		REMARKS
					VOLTAGE	PHASE	FURN.	INST.	FURN.	INST.	
C-3	PENTHOUSE ROOF	-	-	148A	460	3	S	S	S	S	-
CP-3 MOTOR	PENTHOUSE	15			460	3	M	E	M	E	VFD - PROVIDED BY MECHANICAL, INSTALLED BY ELECTRICAL
CP-4 MOTOR	PENTHOUSE	15			460	3	M	E	M	E	VFD - PROVIDED BY MECHANICAL, INSTALLED BY ELECTRICAL

LEGEND

- S = SUPPLIER (MANUFACTURER)*
- M = MECHANICAL
- E = ELECTRICAL
- VFD = VARIABLE FREQUENCY DRIVE

- C = CHILLER
- CP = CHILLED WATER PUMP

* - ITEMS INDICATED AS SUPPLIER SHALL BE PROVIDED WITH THE ITEM/ EQUIPMENT OR BY THE CONTRACTOR PURCHASING THE ITEM/EQUIPMENT



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**CITY OF ANN ARBOR
LARCOM SECONDARY
CHILLER PROJECT
ANN ARBOR, MI**

**MECHANICAL
GENERAL
INFORMATION**

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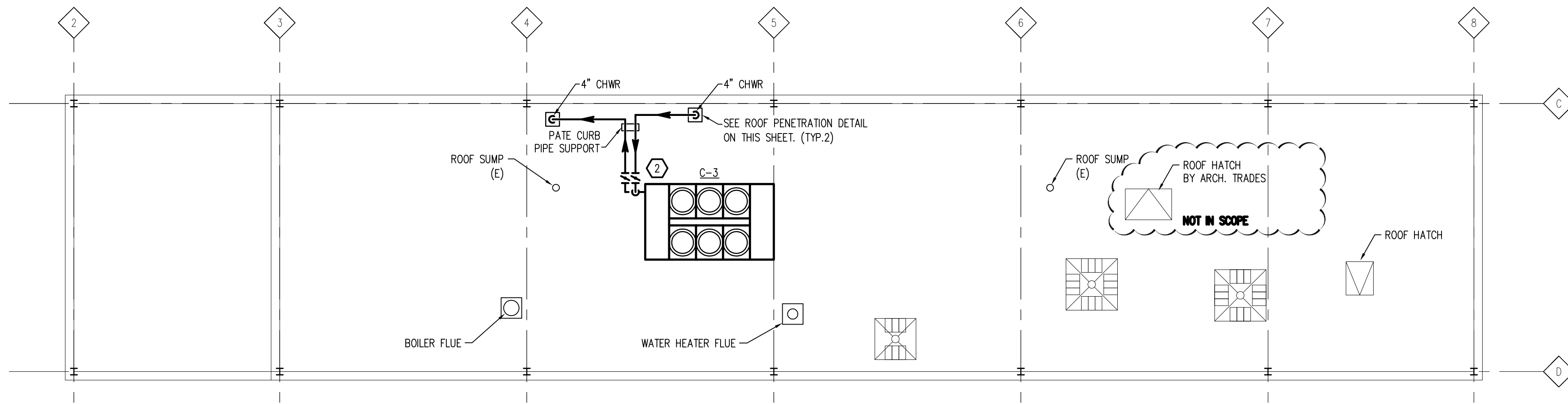
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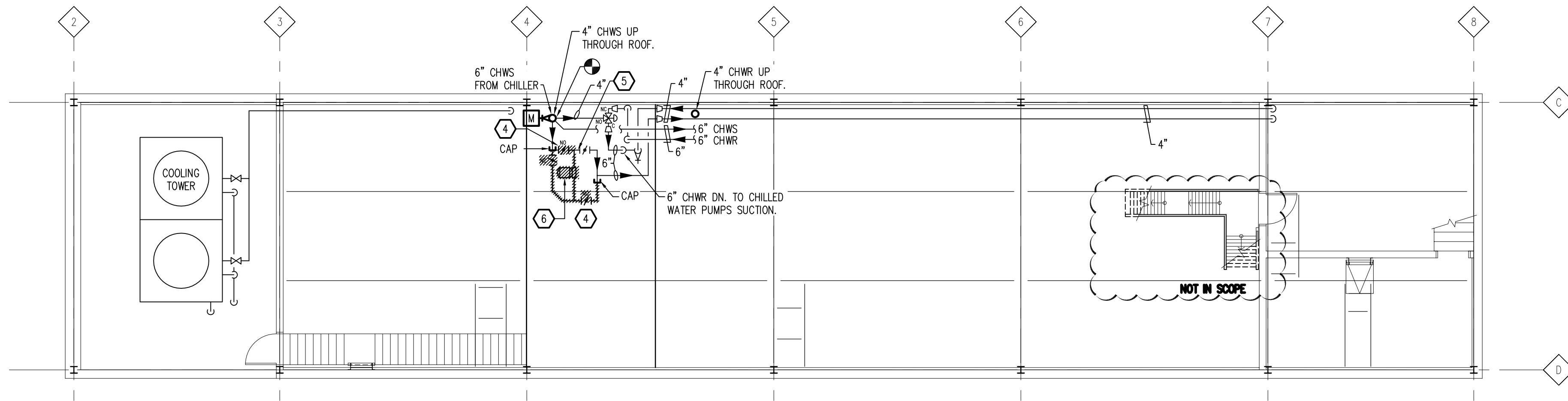
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ADDENDUM 1	11/25/13
BIDS	01/10/14

DESIGNER:	SDM
DRAWN:	RJF
PM / PIC:	JSR/LAT
CHECKED:	GDC
ACADFILE:	13-130-M-1
PROJECT No.	13-1310

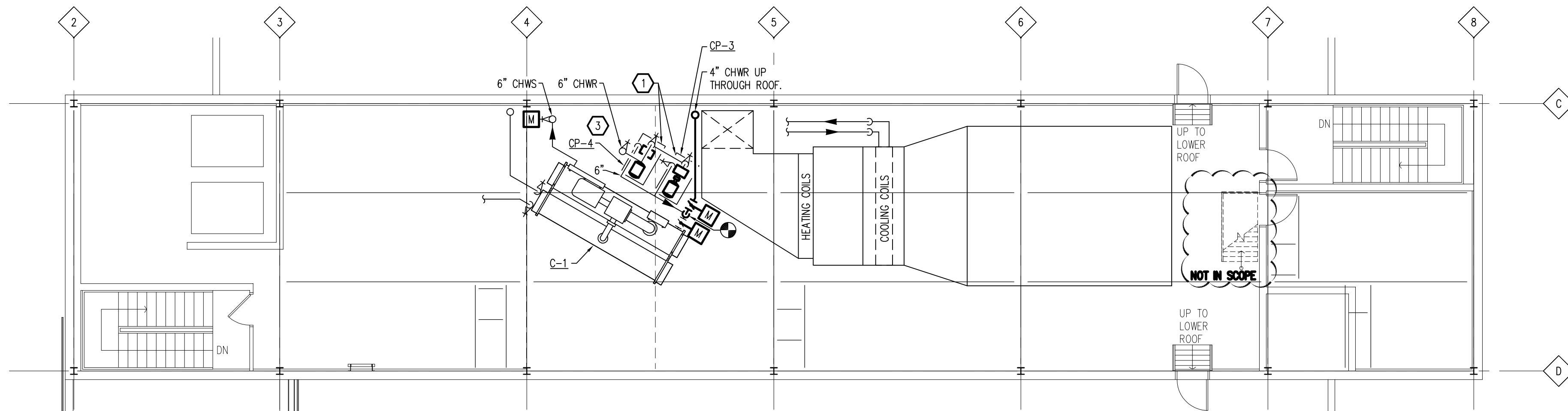
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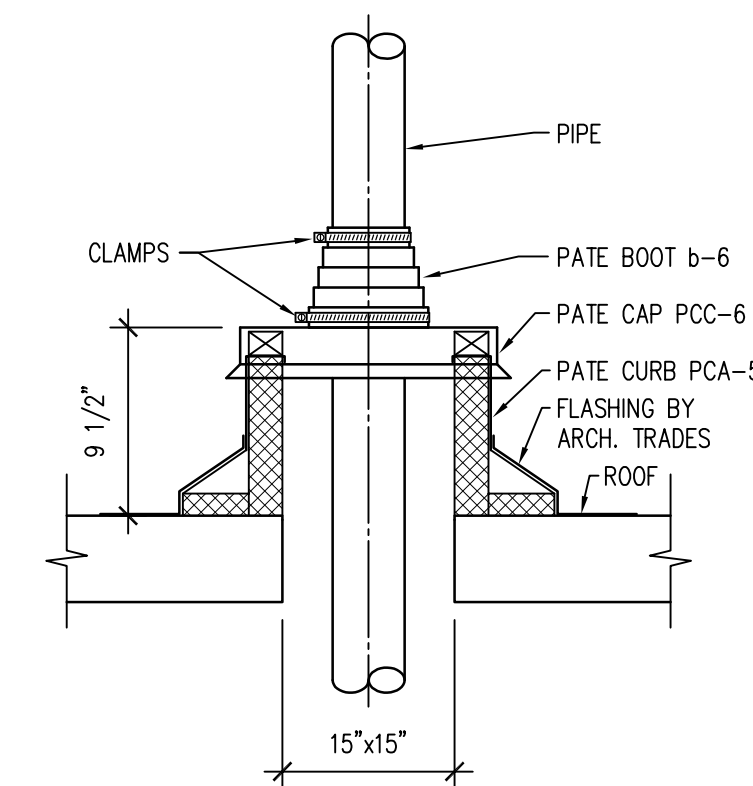
PENTHOUSE ROOF PLAN - NEW WORK
 SCALE: 1/8" = 1'-0"
 0 4 8 16 32



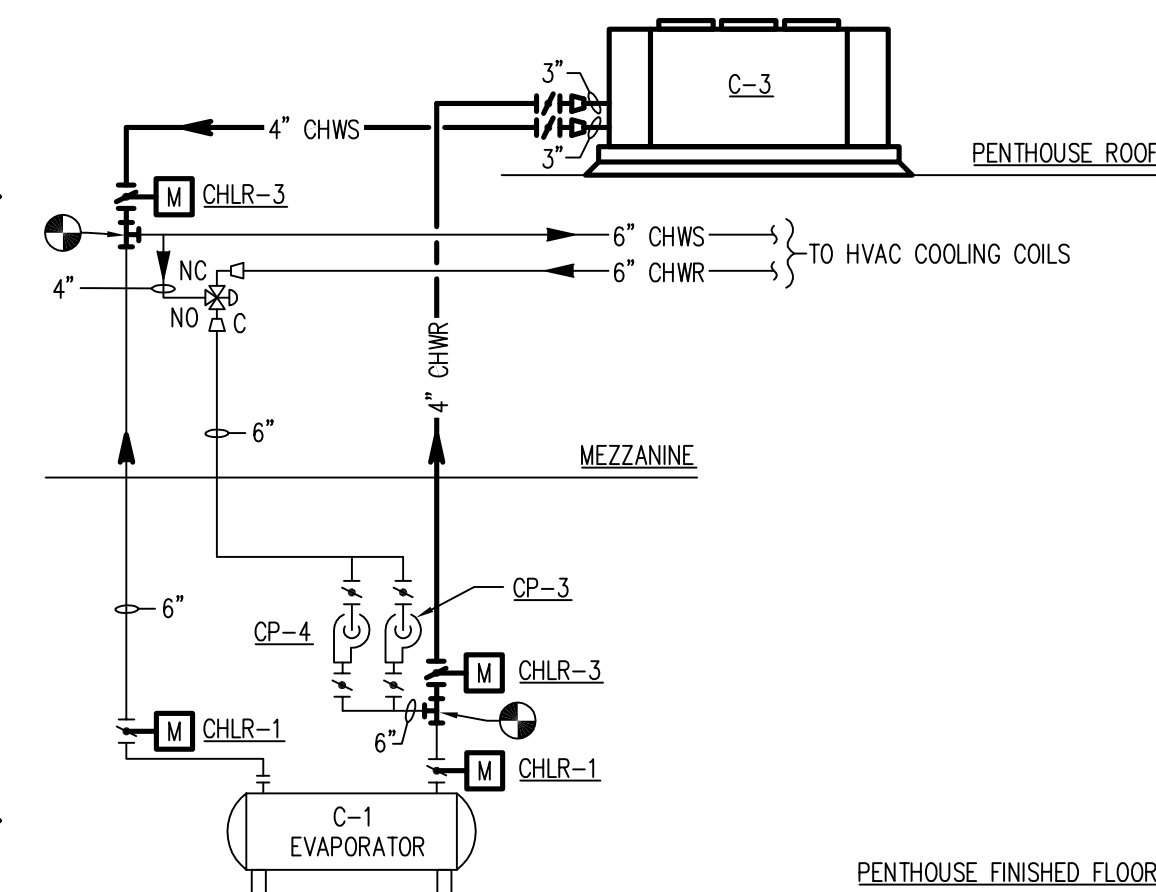
UPPER PENTHOUSE FLOOR PLAN - NEW WORK
 SCALE: 1/8" = 1'-0"
 0 4 8 16 32



LOWER PENTHOUSE FLOOR PLAN - NEW WORK
 SCALE: 1/8" = 1'-0"
 0 4 8 16 32



PIPE ROOF PENETRATION DETAIL
 NO SCALE



CHILLED WATER PIPING DIAGRAM
 NO SCALE

KEYED NOTES:
 (APPLICABLE THIS SHEET ONLY)

- 1 REPLACE EXISTING PUMP CP-3 AND CP-4 MOTORS WITH 15HP, 1,750 RPM WEG INVERTED DUTY RATED (ODP NEMA MOTOR WITH AEGIS BEARING PROTECTION RING, MODEL #015180T3E254T-G) OR EQUIVALENT.
- 2 CONTRACTOR TO INSTALL FLOW SWITCH AND CHWS TEMPERATURE SENSOR FURNISHED WITH CHILLER.
- 3 CHILLED WATER SYSTEM TO HAVE 35% PROPYLENE GLYCOL.
- 4 REMOVE PIPING AND VALVES, RETURN VALVES TO OWNER.
- 5 INSTALL 6" SPOOL PIECE IN PLACE OF REMOVED VALVE.
- 6 REMOVE EXISTING PUMP.

MECHANICAL SPECIFICATIONS:

BUTTERFLY VALVE: FULL LUG, HIGH PERFORMANCE TYPE, CARBON STEEL BODY, 316 STAINLESS STEEL DISC, STAINLESS STEEL SHAFT AND BEARING, TEFLOM STEM PACKING, PTEE SEAT. RATED FOR 150 PSI, 450 DEGREES F. MANUFACTURER: DEZURIK BHP, GRINNELL GHP.

PIPING: SHALL BE BLACK STEEL, SCHEDULE 40, ASTM A 53, ERW OR SEAMLESS GRADE B. FITTINGS STANDARD WEIGHT, BUTT WELDED, BLACK STEEL, ASTM A 234. JOINT WELDING NECK FORGED STEEL FLANGE AT VALVES AND EQUIPMENT, ASTM A 181, 150#.

PIPING INSULATION: INDOOR SHALL BE FIBERGLASS WITH FACTORY-APPLIED VAPOR BARRIER JACKET WITH SELF-SEALING LAPS, 1" THICK, ASTM C547, CLASS 1. MANUFACTURER: JOHNSON-MANVILLE MICRO-LOK 650 AP-T; OWENS/CORNING FIBERGLAS ASJ/SSLII.

OUTDOOR SAME AS ABOVE EXCEPT 1-1/2" THICK AND WITH PVC WATERPROOF INSULATION JACKETING. MANUFACTURER: ZESTON; CEECO; PROTO.

VARIABLE FREQUENCY DRIVE CP-3 AND CP-4: VFD SHALL HAVE ENCLOSURES RATED NEMA 1. ALL RELAYS SHALL BE PLUG-IN STYLE BASE. ALL FUSES SHALL BE MOUNTED IN FUSE BLOCKS WITH INSULATED COVERS. COVERS SHALL SHIELD FUSE ENDS AND WIRE TERMINATIONS. THE VFD SHALL BE MARKED WITH ITS SHORT CIRCUIT CURRENT RATING IN COMPLIANCE WITH UL.

THE UNIT, INCLUDING ALL SPECIFIED ACCESSORIES, SHALL HAVE A MINIMUM EFFICIENCY OF 85% AT ANY SPEED FROM 50 TO 100%. THE UNIT SHALL HAVE A POWER FACTOR OF 0.9 OR HIGHER WHEN OPERATING AT ANY SPEED FROM 50 TO 100%.

THE VFD SHALL BE VARIABLE TORQUE TYPE AND SHALL PROVIDE FULL MOTOR TORQUE AT ANY OPERATING SPEED FROM 40% TO 100%. THE VFD SHALL PROVIDE VARIABLE TORQUE V/Hz CONTROL WHEN OPERATING AT SPEEDS LESS THAN 100%.

PROVIDE THE DRIVE WITH A MAIN INPUT DISCONNECT SWITCH, ACCESSIBLE WITHOUT OPENING THE DRIVE CABINET, EQUIPPED WITH CURRENT LIMITING FUSES AND FUSE REJECTION CLIPS, OR CIRCUIT BREAKERS.

THE UNIT SHALL INCLUDE SELF-DIAGNOSTICS WITH A DIGITAL DISPLAY THAT IDENTIFIES FAULT CONDITIONS AND SIMPLIFIES TROUBLE SHOOTING. FAULT INDICATION SHALL BE RETAINED EVEN AFTER A POWER OUTAGE OR AN INPUT OVER-CURRENT PROTECTIVE DEVICE TRIP. UNIT SHALL BE UL, CSA OR ETL LABELED. VFD SHALL INCLUDE CURRENT SENSORS ON ALL THREE OUTPUT PHASES TO ACCURATELY MEASURE MOTOR CURRENT.

PROVIDE FACTORY MOUNTED AND WIRED 115V, 1 PHASE, AND 60 HZ CONTROL POWER TRANSFORMER SIZED FOR HANDLING AN ADDITIONAL 30 VA INDUCTIVE LOAD. LIMIT FUSE SIZE FOR THE CONTROL TRANSFORMER TO 3 AMPS MAXIMUM. THE VFD INPUT AND OUTPUT SHALL BE RATED AT 480V, 3 PHASE.

PROVIDE A FACTORY MOUNTED AND WIRED MANUAL BYPASS DEVICE AS SCHEDULED. THE BYPASS DEVICE SHALL ALLOW THE LOAD TO RUN ACROSS-THE-LINE WHILE ELECTRICALLY ISOLATING THE VFD SO THAT MAINTENANCE CAN BE PERFORMED ON THE DRIVE COMPONENTS.

CONTROL FEATURES:
 THE VFD SHALL BE PROVIDED WITH THE FOLLOWING CONTROL FEATURES:

1. FACTORY MOUNTED AND WIRED HAND-OFF-AUTO SELECTOR SWITCH THAT STARTING OR STOPPING OF THE DRIVE.
2. FACTORY MOUNTED AND WIRED LOCAL SPEED CONTROL SWITCH THAT ALLOWS CONTROL OF THE DRIVE SPEED. KEY PAD BUTTONS ARE ALSO ACCEPTABLE PROVIDED THAT PERMANENTLY LABELED, DEDICATED BUTTONS ARE PROVIDED FOR THE LOCAL SPEED CONTROL FUNCTIONS.
3. MAIN INPUT DISCONNECT SWITCH.
4. MANUAL SPEED POTENTIOMETER OR KEYPAD CONTROL, FOR LOCAL SPEED CONTROL.

AIR-COOLED CHILLER:

THE UNIT SHALL HAVE HERMETIC, DIRECT-DRIVE, 3600 RPM 60 HZ SUCTION GAS-COOLED SCROLL COMPRESSORS. THE COMPRESSOR INCLUDES: CENTRIFUGAL OIL PUMP, OIL LEVEL SIGHT GLASS AND OIL CHARGING VALVE. EACH COMPRESSOR WILL HAVE COMPRESSOR HEATERS INSTALLED AND PROPERLY SIZED TO MINIMIZE THE AMOUNT OF LIQUID REFRIGERANT PRESENT IN THE OIL SUMP DURING OFF CYCLES. COMPRESSORS SHALL HAVE WEATHERPROOF ENCLOSURE TO REDUCE COMPRESSOR SOUND LEVEL.

THIS UNIT SHALL HAVE AN ACROSS-THE-LINE CONFIGURATION STARTER, FACTORY-MOUNTED, AND FULLY PRE-WIRED TO THE COMPRESSOR MOTOR AND CONTROL PANEL.

A FACTORY-INSTALLED, FACTORY-WIRED 120 VA CONTROL POWER TRANSFORMER PROVIDES ALL UNIT CONTROL POWER (120 VAC SECONDARY) AND MODULE POWER (24 VAC SECONDARY).

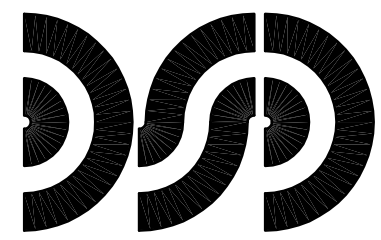
A MOLDED CASE HIGH INTERRUPTING CAPACITY CIRCUIT BREAKER, FACTORY PRE-WIRED WITH TERMINAL BLOCK POWER CONNECTIONS AND EQUIPPED WITH A LOCKABLE EXTERNAL OPERATOR HANDLE TO DISCONNECT THE CHILLER FROM MAIN POWER.

BRAZE PLATE EVAPORATOR TO BE MADE OF STAINLESS STEEL WITH COPPER AS THE BRAZE MATERIAL, DESIGNED TO WITHSTAND A REFRIGERANT SIDE WORKING PRESSURE OF 430 PSIG AND A WATERSIDE WORKING PRESSURE OF 150 PSIG.

AIR-COOLED CONDENSER COILS TO HAVE LANCED ALUMINUM FINS MECHANICALLY BONDED TO INTERNALLY-FINISHED COPPER TUBING.

THE CONDENSER COIL TO BE AN INTEGRAL SUBCOOLING CIRCUIT. THE MAXIMUM ALLOWABLE WORKING PRESSURE OF THE CONDENSER IS 650 PSIG.

ELECTRICAL TRADES WILL PROVIDE THREE PHASE POWER FOR MOTORS AND 120V POWER FOR HEATERS.



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**PENTHOUSE FLOOR
 & ROOF PLANS**

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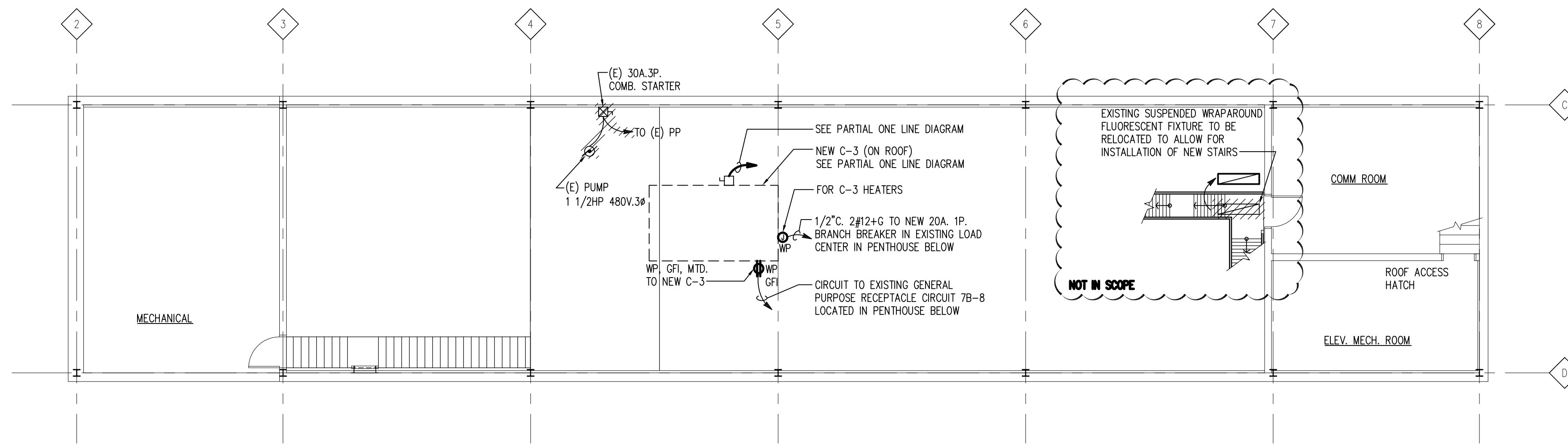
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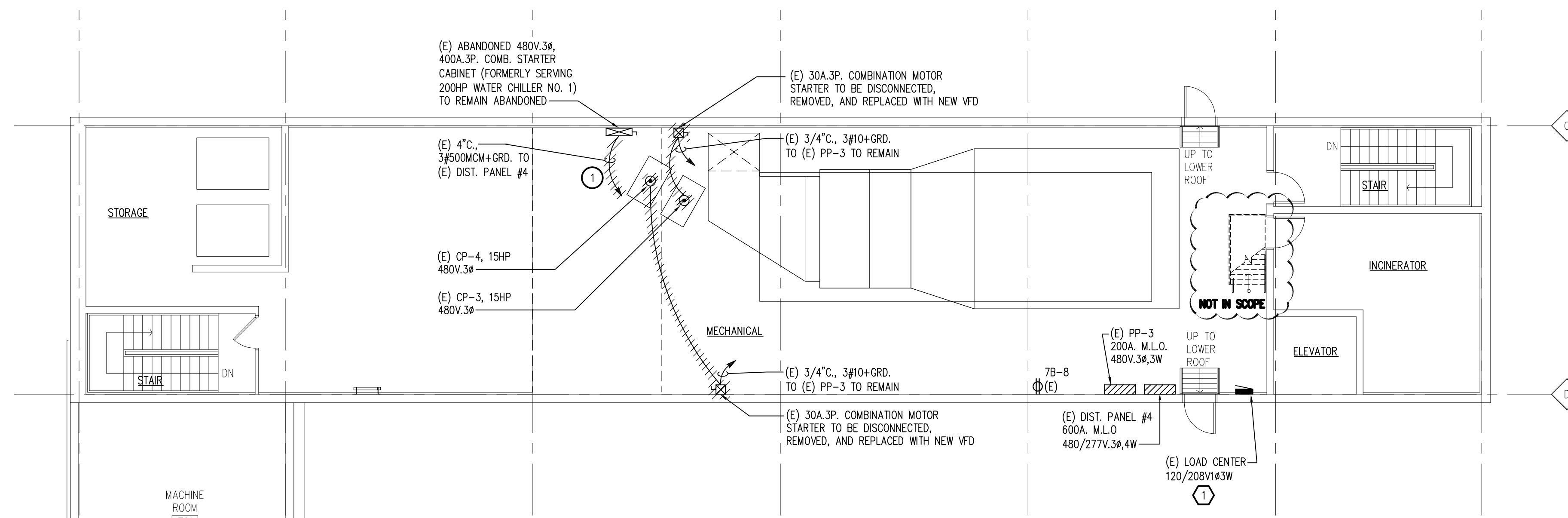
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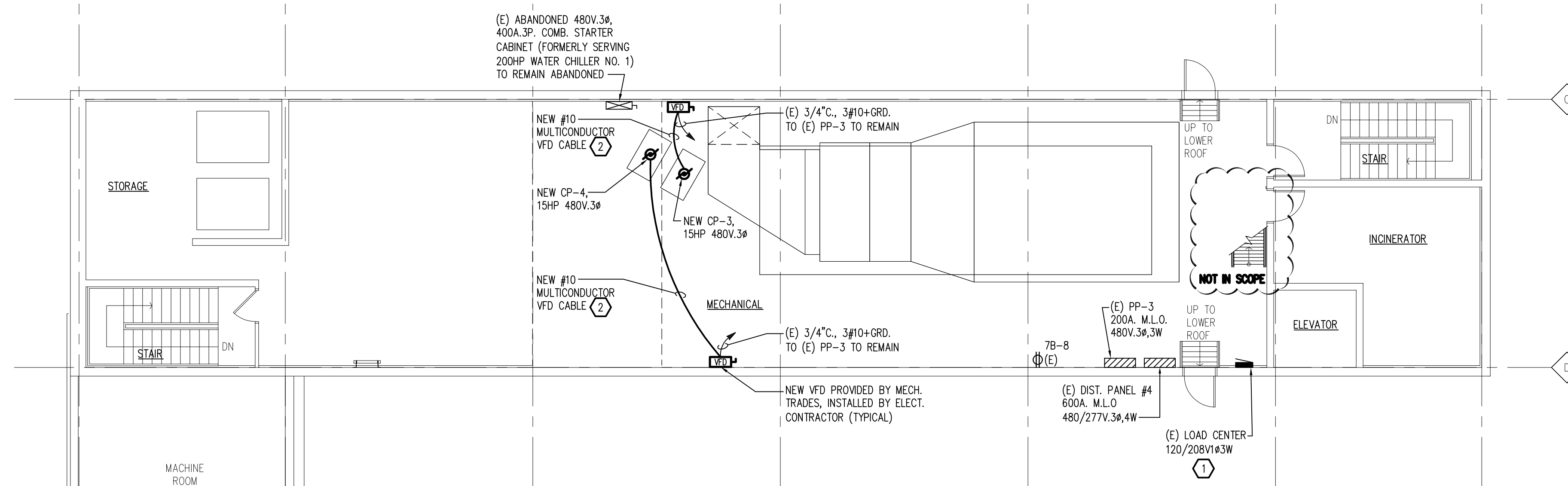
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UPPER PENTHOUSE FLOOR PLAN – ELECTRICAL DEMOLITION AND NEW WORK
 SCALE: 1/8" = 1'-0"
 0 4 8 16 32



LOWER PENTHOUSE FLOOR PLAN – ELECTRICAL DEMOLITION
 SCALE: 1/8" = 1'-0"
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LOWER PENTHOUSE FLOOR PLAN – ELECTRICAL NEW WORK
 SCALE: 1/8" = 1'-0"
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DEMOLITION KEY NOTES:

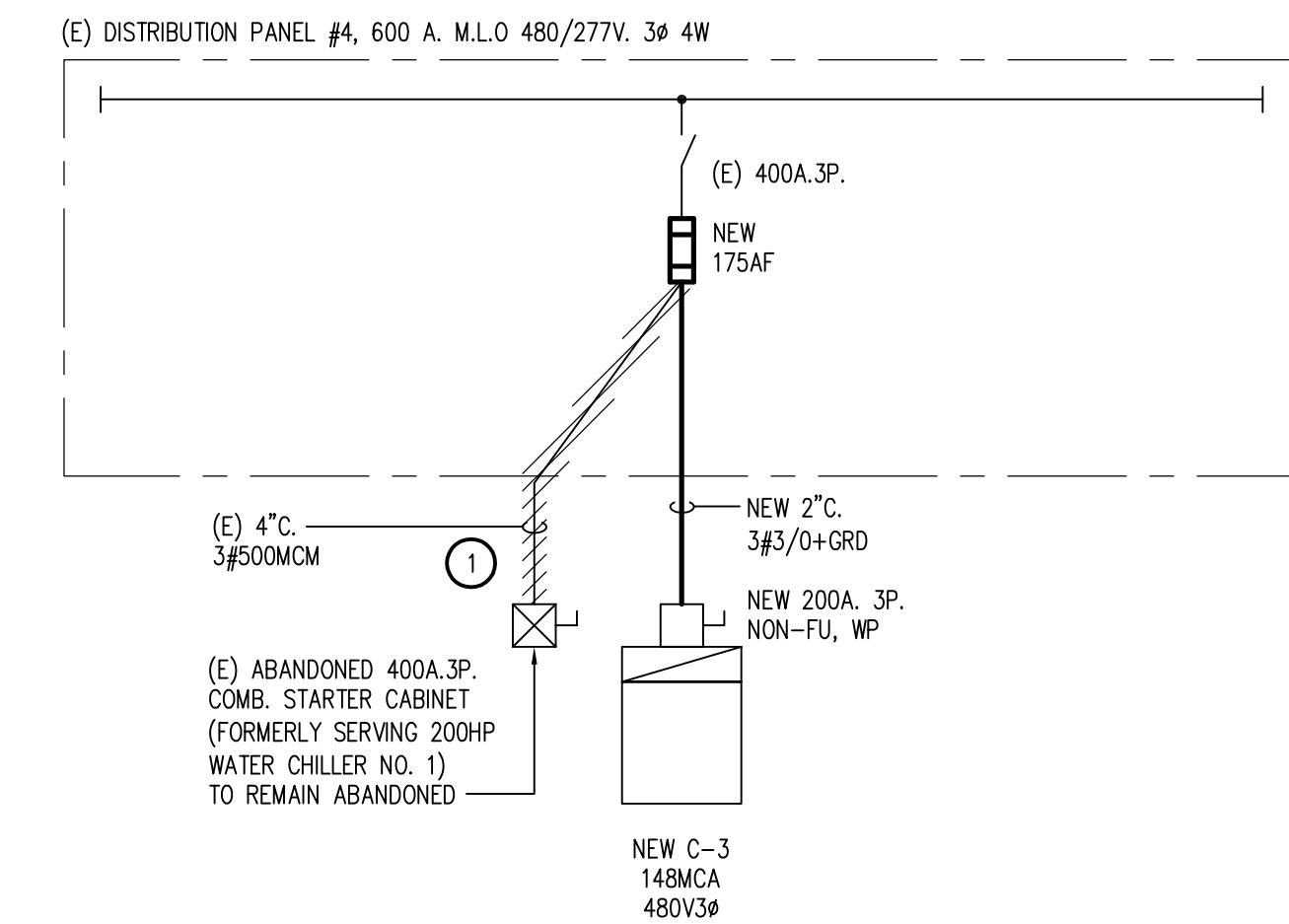
(APPLICABLE THIS SHEET ONLY)

- 1 DISCONNECT, REMOVE, AND PROPERLY DISPOSE OF EXISTING CONDUCTORS FROM ABANDONED 400A 3P COMBINATION STARTER CABINET TO EXISTING 400A 3P SWITCH IN EXISTING DISTRIBUTION PANEL #4. EXISTING CONDUIT TO REMAIN.

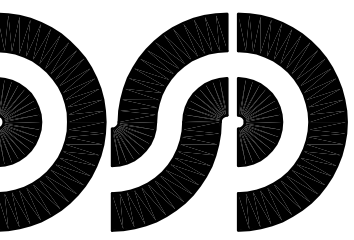
NEW WORK KEY NOTES:

(APPLICABLE THIS SHEET ONLY)

- 1 PROVIDE NEW 20A-1P BRANCH BREAKER IN EXISTING LOAD CENTER FOR NEW C-3 HEATERS.
- 2 PROVIDE NEW PVC JACKETED #10AWG MULTICONDUCTOR VFD CABLE, 600V, WITH 3#10 CIRCUIT CONDUCTORS AND 3#14 GROUND CONDUCTORS, VFD CONNECTORS AND TERMINATION KIT, SERVICE WIRE CO. #ASDP/CONASD/TERRASD SERIES OR EQUAL BY BELDEN.



PARTIAL ONE LINE DIAGRAM
 NO SCALE



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**UPPER AND LOWER
 PENTHOUSE FLOOR
 PLANS - ELECTRICAL**
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