

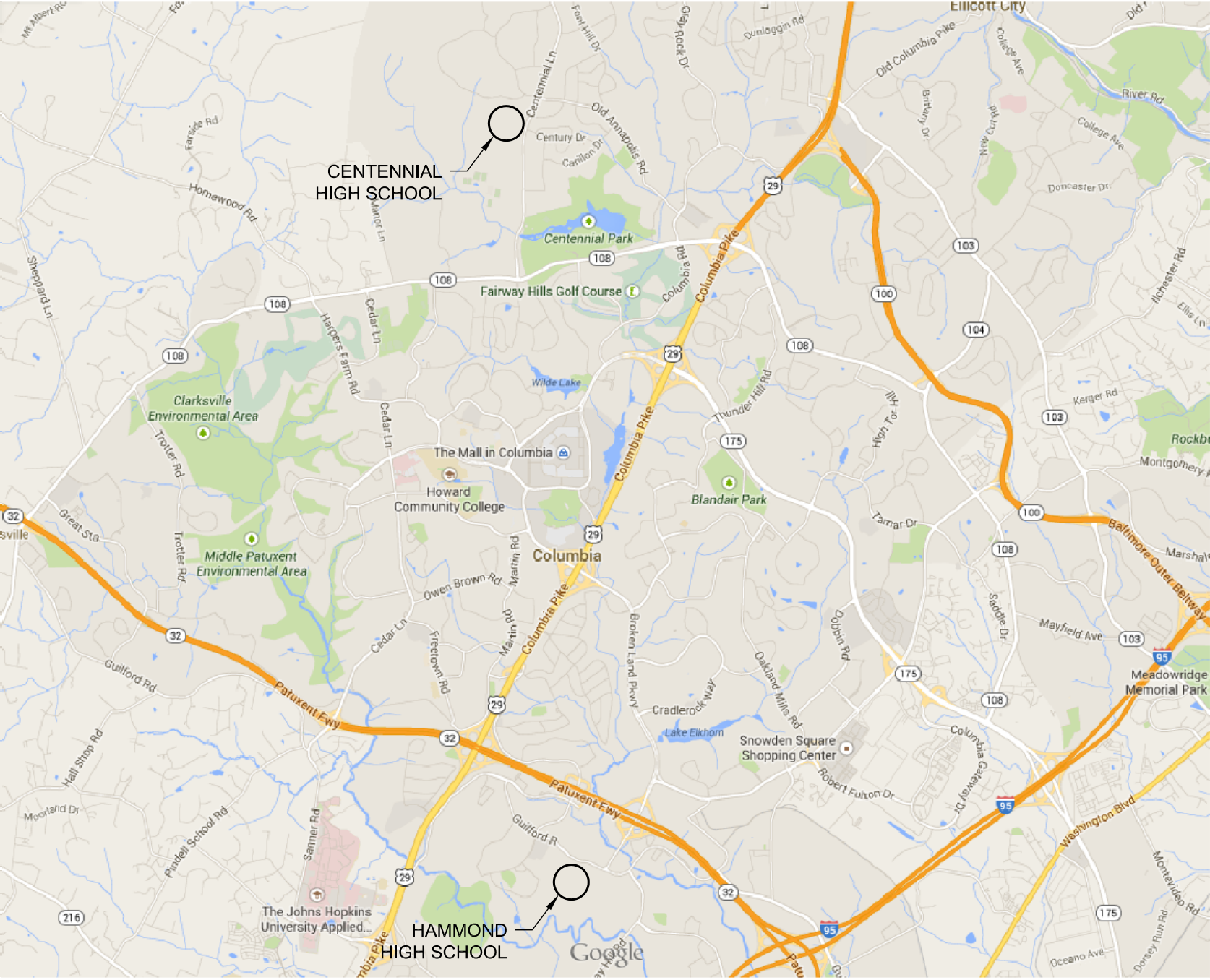
CENTENNIAL & HAMMOND HIGH SCHOOLS DOMESTIC WATER HEATER AND KITCHEN MAKE-UP AIR UNIT REPLACEMENTS

Centennial High School

4300 Centennial Lane
Ellicott City, MD 21042

Hammond High School

8800 Guilford Road
Columbia, MD 21046



Vicinity Map

Construction Documents July 14, 2014

Owner

Howard County Public School System
8045 Harriet Tubman Lane
Columbia, MD 21044

Drawing List

GENERAL

CS-1 COVER SHEET

PLUMBING

P-1 CHS DOMESTIC HOT WATER PLUMBING DEMOLITION AND NEW WORK PLANS
P-2 HHS DOMESTIC HOT WATER PLUMBING DEMOLITION AND NEW WORK PLANS
P-3 DOMESTIC HOT WATER SCHEMATIC DIAGRAM, DETAILS, AND SCHEDULES

MECHANICAL

M-1 KITCHEN MAKE-UP AIR UNIT DEMOLITION AND NEW WORK PLANS, DETAILS, AND SCHEDULES

ELECTRICAL

E-1 CHS DOMESTIC HOT WATER ELECTRICAL DEMOLITION AND NEW WORK PLANS
E-2 HHS DOMESTIC HOT WATER ELECTRICAL DEMOLITION AND NEW WORK PLANS
E-3 KITCHEN MAKE-UP AIR UNIT DEMOLITION AND NEW WORK PLANS

STRUCTURAL

S-1 CHS/HHS PARTIAL ROOF PLANS, GENERAL NOTES, AND DETAILS

MEP Engineer

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8029 Somerville Lane
Elkridge, Maryland 21075
(410) 799-1080

Structural Engineer

Columbia Engineering, Inc.
6210 Old Dobbin Lane, Suite 150
Columbia, MD 21045
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PROJECT

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KEY PLAN

01	CONSTRUCTION DOCUMENTS	07/14/14
NO.	DESCRIPTION	DATE

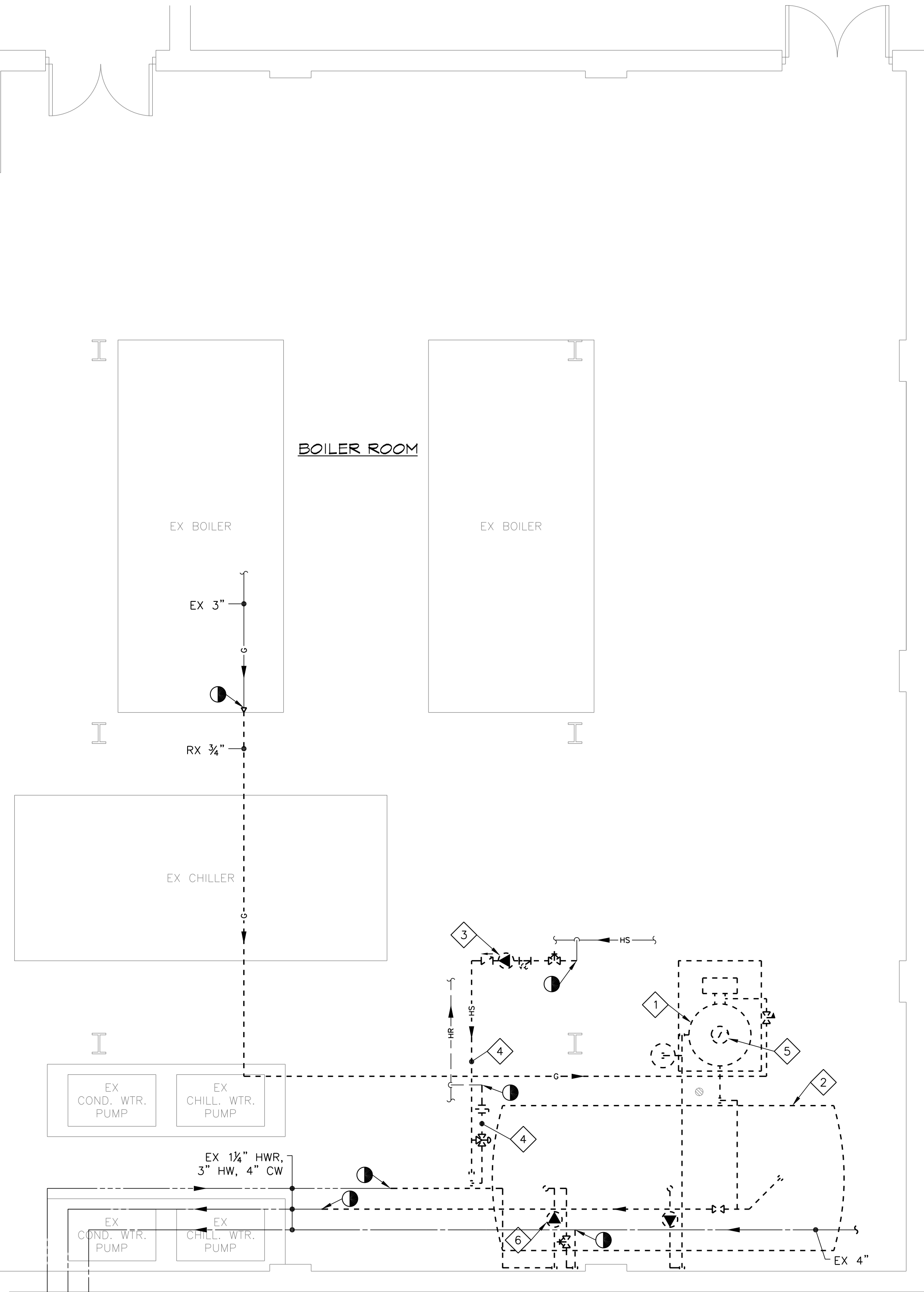
DRAWING

COVER SHEET

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PROJECT NO.	14014
SCALE	NONE
SHEET	

CS-1

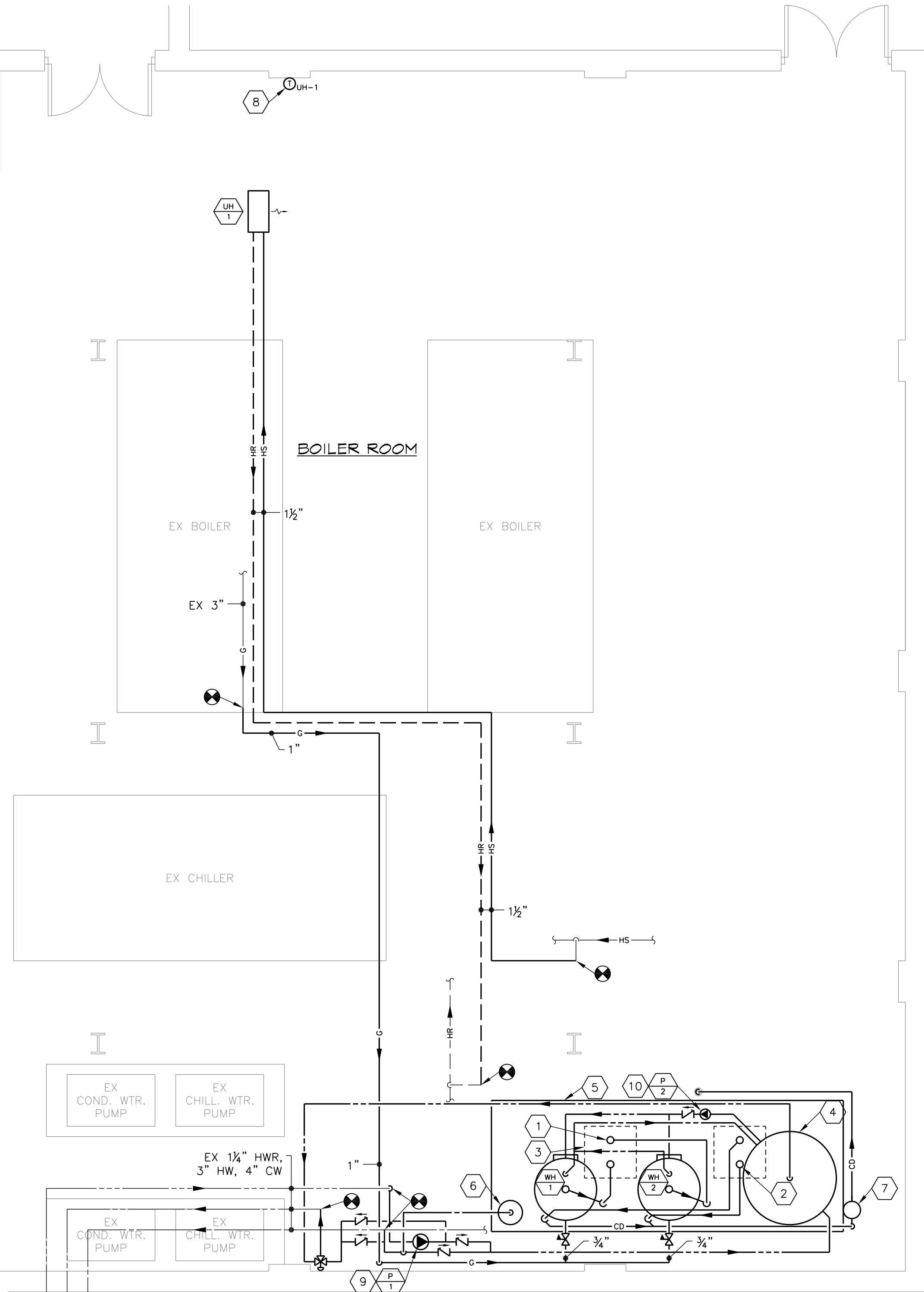
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1 PLUMBING DEMOLITION PLAN
SCALE: 1/4"=1'-0"

DEMOLITION KEY NOTES

- REMOVE EXISTING WATER HEATER AND ASSOCIATED GAS, AND DOMESTIC COLD, HOT, AND HOT WATER RECIRCULATING PIPING TO POINTS INDICATED. REMOVE EXISTING CONCRETE HOUSEKEEPING PAD. PATCH FLOOR TO MATCH EXISTING.
- REMOVE EXISTING 16'-0"L x 7'-0"W DOMESTIC HOT WATER STORAGE TANK, TANK SADDLES, AND CONCRETE SUPPORTS.
- REMOVE EXISTING HEATING WATER PUMP AND ACCESSORIES.
- REMOVE EXISTING HEATING WATER PIPING TO POINTS INDICATED.
- REMOVE EXISTING 8" FLUE UP THROUGH ROOF. PATCH ROOF WITH METAL DECK, INSULATION, AND ROOFING TO MATCH EXISTING. REFER TO STRUCTURAL DRAWINGS FOR DETAIL.
- DISCONNECT EXISTING CONTROL WIRING FOR HOT WATER RECIRCULATING PUMP. WIRING AND CONDUIT MAY REMAIN TO THE EXTENT THAT IT IS SUITABLE FOR REUSE.

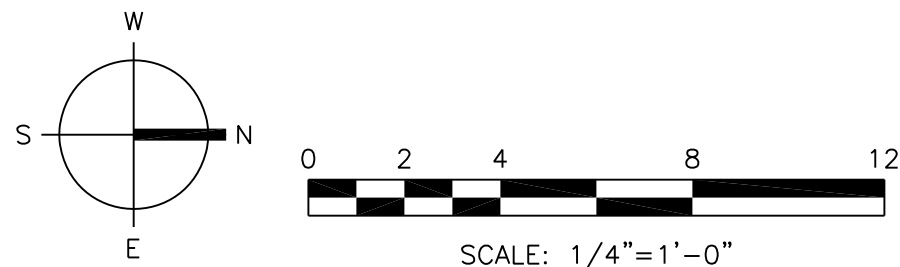


2 PLUMBING NEW WORK PLAN
SCALE: 1/4"=1'-0"

NEW WORK KEY NOTES

- 6" PVC EXHAUST PIPE UP THROUGH ROOF CURB (TYPICAL OF 2).
- 6" PVC INTAKE PIPE UP THROUGH ROOF CURB (TYPICAL OF 2).
- 30"x30" ROOF CURB ABOVE (TYPICAL OF 2).
- 500 GALLON VERTICAL STORAGE TANK.
- 17'-0"L x 6'-4"W x 8"H CONCRETE HOUSEKEEPING PAD REINFORCED WITH 6"x6"-W1.4xW1.4 W.W.F.
- DIAPHRAGM EXPANSION TANK.
- 5 GALLON ACID NEUTRALIZING TANK WITH LIMESTONE CHIPS.
- THERMOSTAT SHALL BE EQUAL TO HONEYWELL MODEL NO. TH-522. PROVIDE 24 VAC CONTROL TRANSFORMER AND CONTROL WIRING IN ELECTRICAL METALLIC TUBING.
- EXTEND CONTROL WIRING FOR HOT WATER RECIRCULATING PUMP FROM STRAP-ON AQUASTAT TO PUMP STARTER.
- EXTEND CONTROL WIRING FOR HOT WATER STORAGE CIRCULATING PUMP FROM IMMERSION AQUASTAT IN HOT WATER STORAGE TANK TO PUMP STARTER.

NOTE
REFER TO SCHEMATIC DIAGRAM 1/P-3 FOR COMPLETE DETAILS AND PIPE SIZES.



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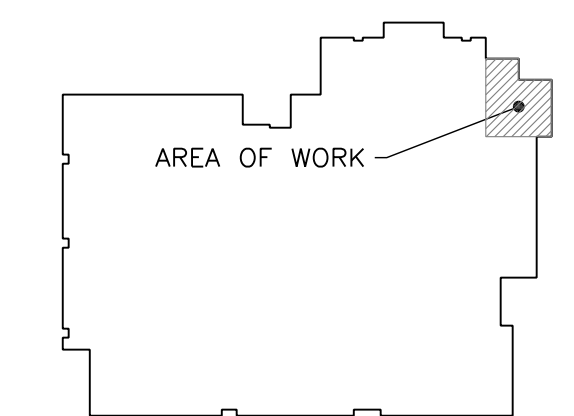
Howard County Public School System
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PROJECT

**CENTENNIAL & HAMMOND HIGH SCHOOLS
DOMESTIC WATER HEATER AND
KITCHEN MAKE-UP AIR UNIT REPLACEMENTS**

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4500 Centennial Lane
Ellicott City, MD 21042

KEY PLAN



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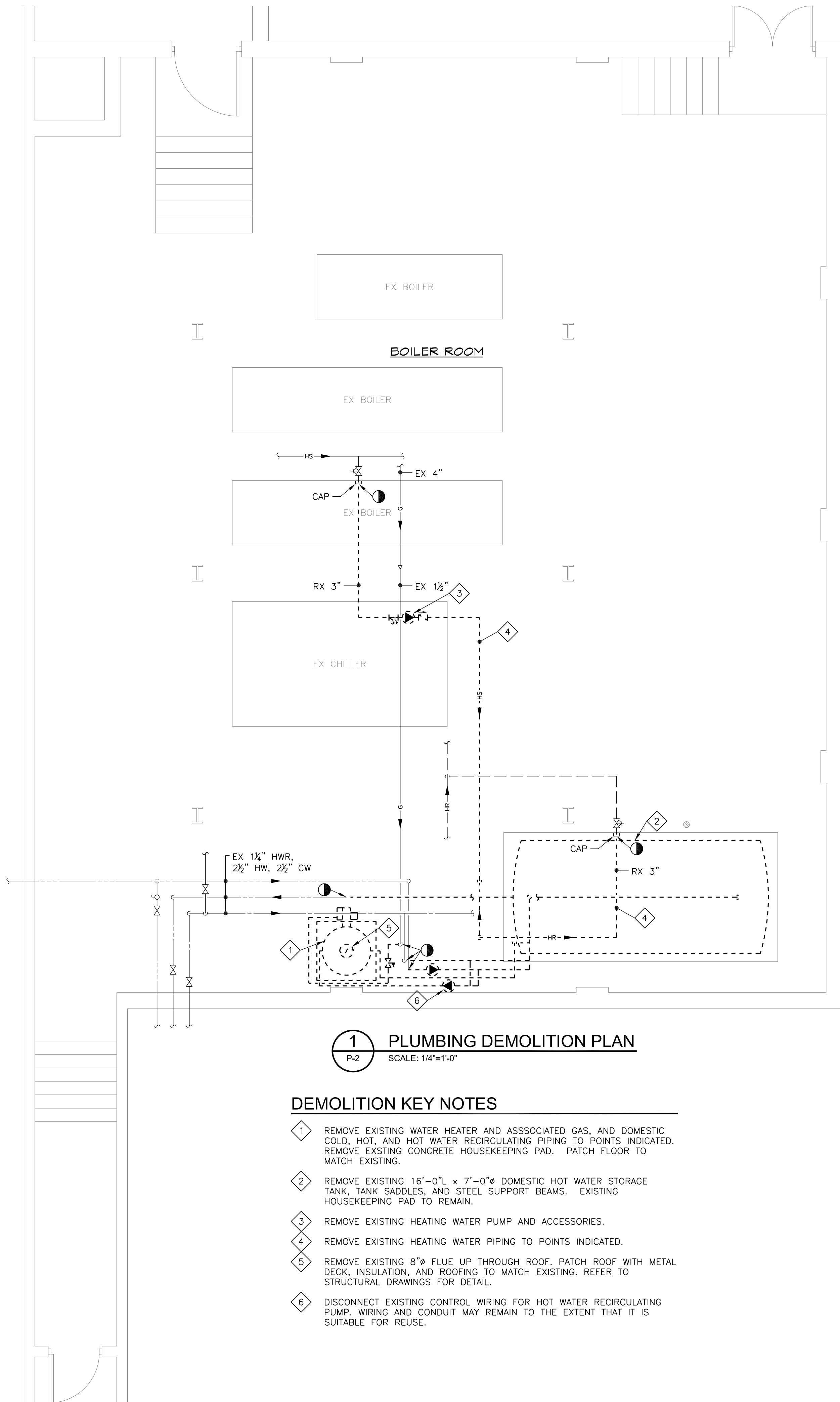
DRAWING

CHS DOMESTIC HOT WATER
PLUMBING DEMOLITION
AND NEW WORK PLANS

DRAWN BY	WLA
CHECKED BY	WLA
PROJECT NO.	14014
SCALE	AS SHOWN
SHEET	

P-1

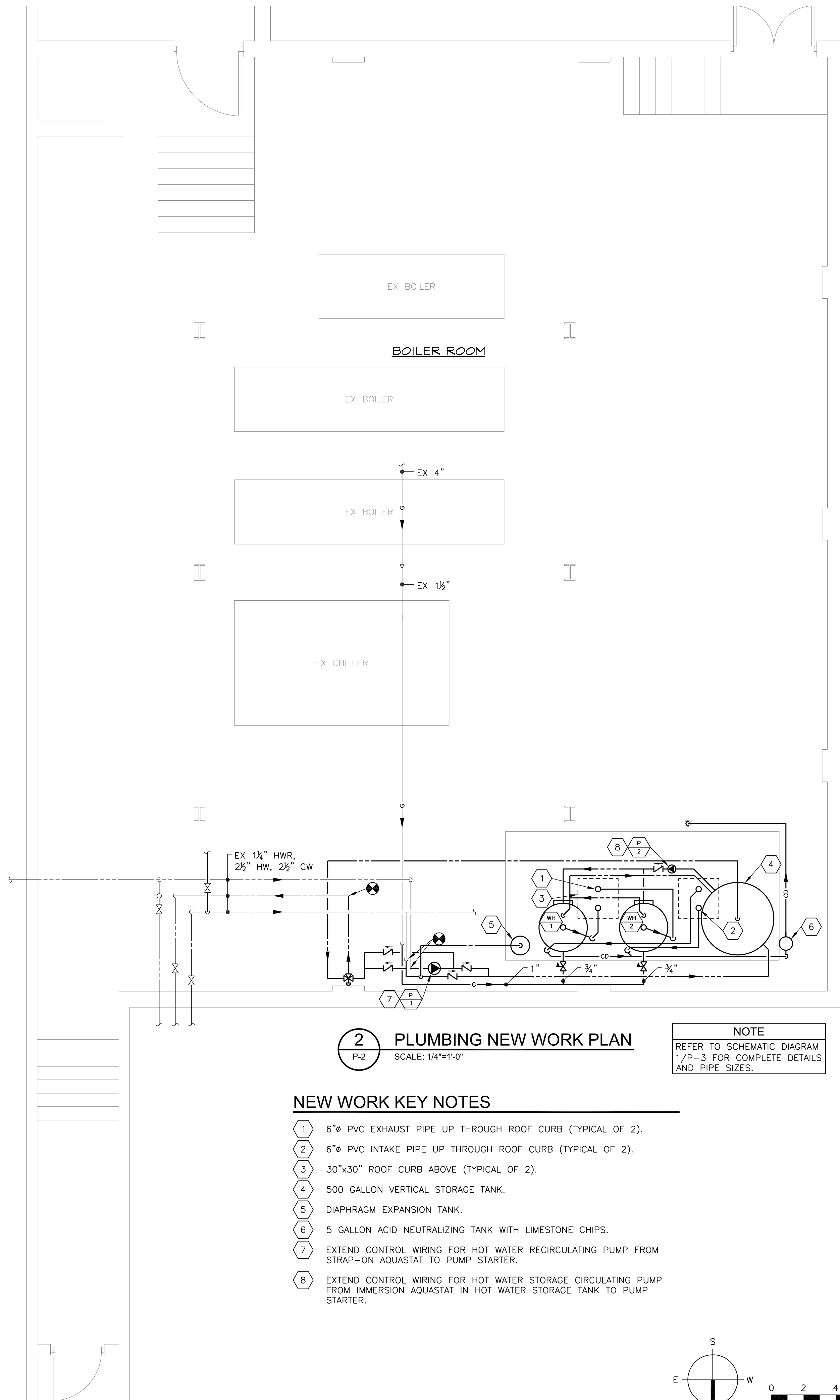
FILE NAME: C:\WORK\GBEE\Projects\14014_OIS & HHS WH & MUA Unit Rep\2_Dwg\14014_OIS & HHS WH & MUA Unit Rep\2.dwg PLOTTED: Mon, Jul 14, 2014 @ 8:17am



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- REMOVE EXISTING HEATING WATER PUMP AND ACCESSORIES.
- REMOVE EXISTING HEATING WATER PIPING TO POINTS INDICATED.
- REMOVE EXISTING 8" FLUE UP THROUGH ROOF. PATCH ROOF WITH METAL DECK, INSULATION, AND ROOFING TO MATCH EXISTING. REFER TO STRUCTURAL DRAWINGS FOR DETAIL.
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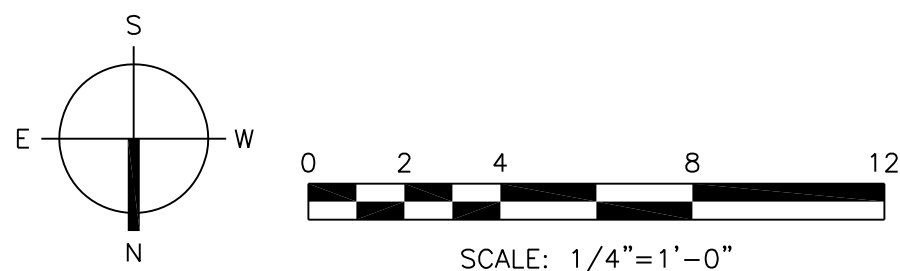


2 PLUMBING NEW WORK PLAN
SCALE: 1/4"=1'-0"

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- 30"x30" ROOF CURB ABOVE (TYPICAL OF 2).
- 500 GALLON VERTICAL STORAGE TANK.
- DIAPHRAGM EXPANSION TANK.
- 5 GALLON ACID NEUTRALIZING TANK WITH LIMESTONE CHIPS.
- EXTEND CONTROL WIRING FOR HOT WATER RECIRCULATING PUMP FROM STRAP-ON AQUASTAT TO PUMP STARTER.
- EXTEND CONTROL WIRING FOR HOT WATER STORAGE CIRCULATING PUMP FROM IMMERSION AQUASTAT IN HOT WATER STORAGE TANK TO PUMP STARTER.

NOTE
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SEAL

2

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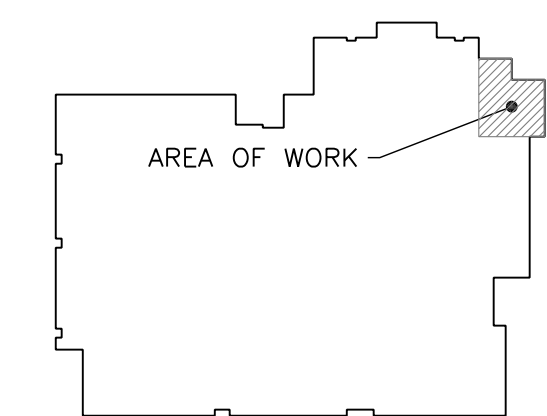
PROJECT

**CENTENNIAL & HAMMOND HIGH SCHOOLS
DOMESTIC WATER HEATER AND
KITCHEN MAKE-UP AIR UNIT REPLACEMENTS**

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KEY PLAN



7

NO.	DESCRIPTION	DATE
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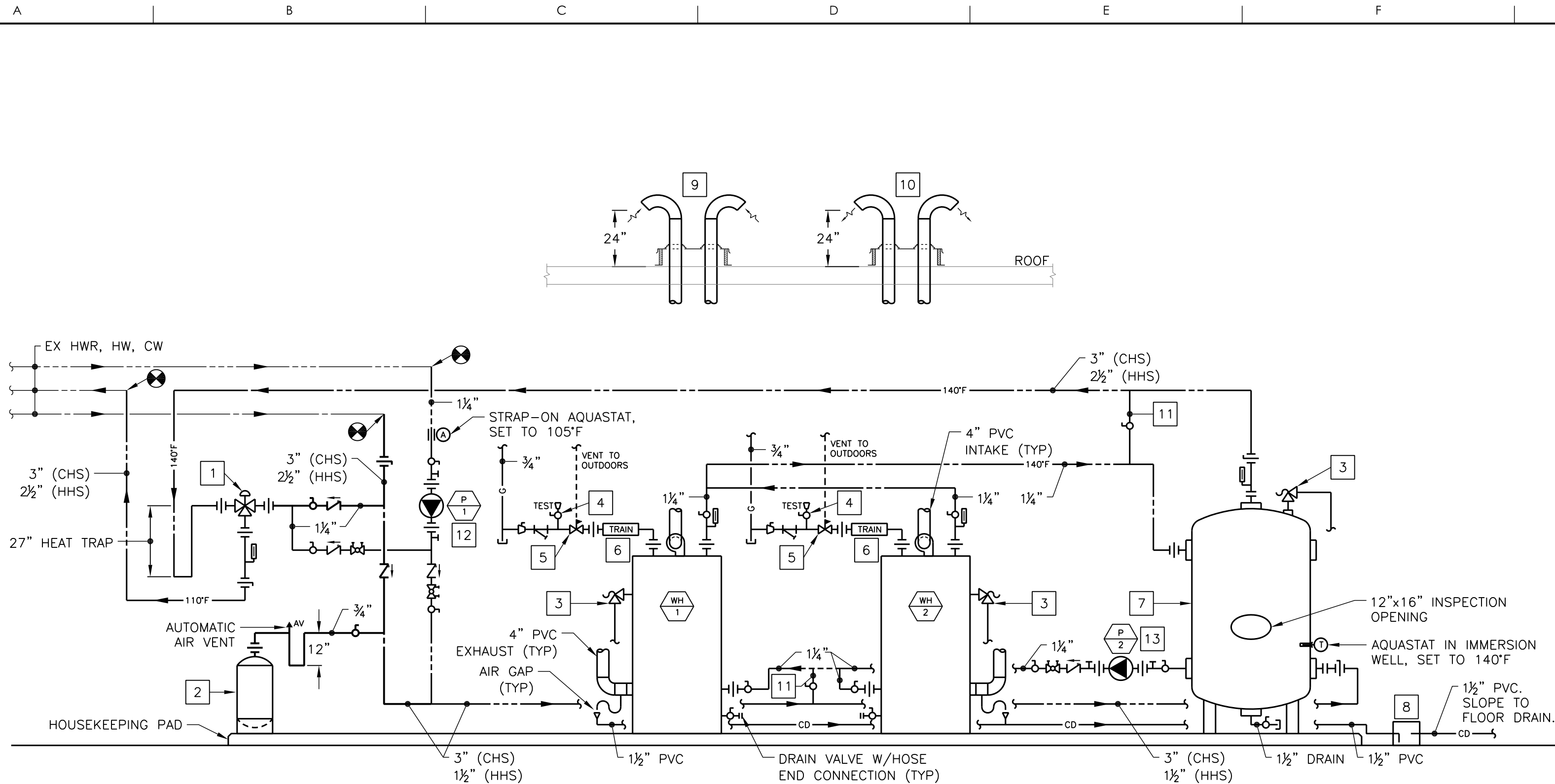
DRAWING

**HHS DOMESTIC HOT WATER
PLUMBING DEMOLITION
AND NEW WORK PLANS**

DRAWN BY	WLA
CHECKED BY	WLA
PROJECT NO.	14014
SCALE	AS SHOWN
SHEET	

P-2

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1 DOMESTIC HOT WATER SCHEMATIC DIAGRAM
P-3 NO SCALE

KEY NOTES

- 1 THERMOSTATIC MIXING VALVE, EQUAL TO LAWLER MODEL 802.
- 2 150 PSI ASME RATED DIAPHRAGM EXPANSION TANK, EQUAL TO BELL & GOSSETT MODEL NO. PTA-42V.
- 3 COMBINATION TEMPERATURE AND PRESSURE RELIEF VALVE. EXTEND DISCHARGE FULL SIZE TO FLOOR DRAIN.
- 4 BALL VALVE AND PLUG.
- 5 LINE PRESSURE REGULATOR, 10 PSIG TO 9" W.C., EQUAL TO MAXITROL 210D. PROVIDE VENT PIPING TO A POINT OUTDOORS AND TERMINATE WITH RAIN CAP.
- 6 CSD-1 GAS TRAIN FURNISHED WITH WATER HEATER.
- 7 500 GALLON VERTICAL STORAGE TANK, ASME 150 PSI RATED, GLASS-LINED, EQUAL TO A.O. SMITH MODEL NO. TUV-500. TANK SHALL HAVE (4)-3", (1)-1", AND (1)-3/4" SIDE TAPPINGS, (2)-3" TOP TAPPINGS, 1/2" DRAIN, (2)-2" ANODE TAPPINGS, AND (1)-12"x16" INSPECTION OPENING.

KEY NOTES (CONT.)

- 8 5 GALLON ACID NEUTRALIZING TANK, EQUAL TO AXIOM INDUSTRIES MODEL NO. NT20, WITH LIMESTONE CHIPS.
- 9 4" PVC INTAKE PIPES THROUGH ROOF. ROUTE PIPING THROUGH 30"x30" ROOF CURB WITH PIPING BOOTS. PROVIDE FLASHING AND PATCH ROOF TO MAINTAIN WARRANTY. TERMINATE PIPES 18" ABOVE TOP OF ROOF CURB WITH 45° ELBOWS AND BIRD SCREENS OVER OPENINGS.
- 10 4" PVC EXHAUST PIPES THROUGH ROOF. ROUTE PIPING THROUGH 30"x30" ROOF CURB WITH PIPING BOOTS. PROVIDE FLASHING AND PATCH ROOF TO MAINTAIN WARRANTY. TERMINATE PIPES 18" ABOVE TOP OF ROOF CURB WITH 45° ELBOWS AND BIRD SCREENS OVER OPENINGS.
- 11 1/4" BYPASS PIPE WITH BALL VALVE.
- 12 OPERATION OF PUMP P-1 SHALL BE CONTROLLED BY STRAP-ON AQUASTAT ON HOT WATER RECIRCULATING PIPE.
- 13 OPERATION OF PUMP P-2 SHALL BE CONTROLLED BY IMMERSION AQUASTAT IN HOT WATER STORAGE TANK.

GAS-FIRED WATER HEATER SCHEDULE

DESIG.	STORAGE (GAL.)	RECOVERY		INPUT (BTUH)	THERMAL EFFICIENCY	INTAKE (DIA.)	VENT (DIA.)	ELEC. (VOLT./PH)	BASIS OF DESIGN	NOTES
		GPH	TEMP. RISE (°F)							
WH-1	130	466	100	399,900	96%	4"	4"	120/1	A.O. SMITH BTH-400A	1
WH-2	130	466	100	399,900	96%	4"	4"	120/1	A.O. SMITH BTH-400A	1

NOTES:

1. ASME TANK.

PUMP SCHEDULE

DESIG.	SERVICE	TYPE	FLUID	FLOW (GPM)	HEAD (FT. W.C.)	SPEED (RPM)	IMPELLER DIA (IN.)	MOTOR (HP)	ELEC. (VOLT./PH)	BASIS OF DESIGN	NOTES
P-1	HOT WATER RECIRC.	IN-LINE	WATER	20	45	1,750	6.50	1.5	480/3	BELL & GOSSETT 60-STOCK-617	1
P-2	STORAGE CIRCULATOR	IN-LINE	WATER	20	10	3,300	2.00	1/6	120/1	BELL & GOSSETT BOOSTER PL-50	1

NOTES:

1. ALL BRONZE CONSTRUCTION.

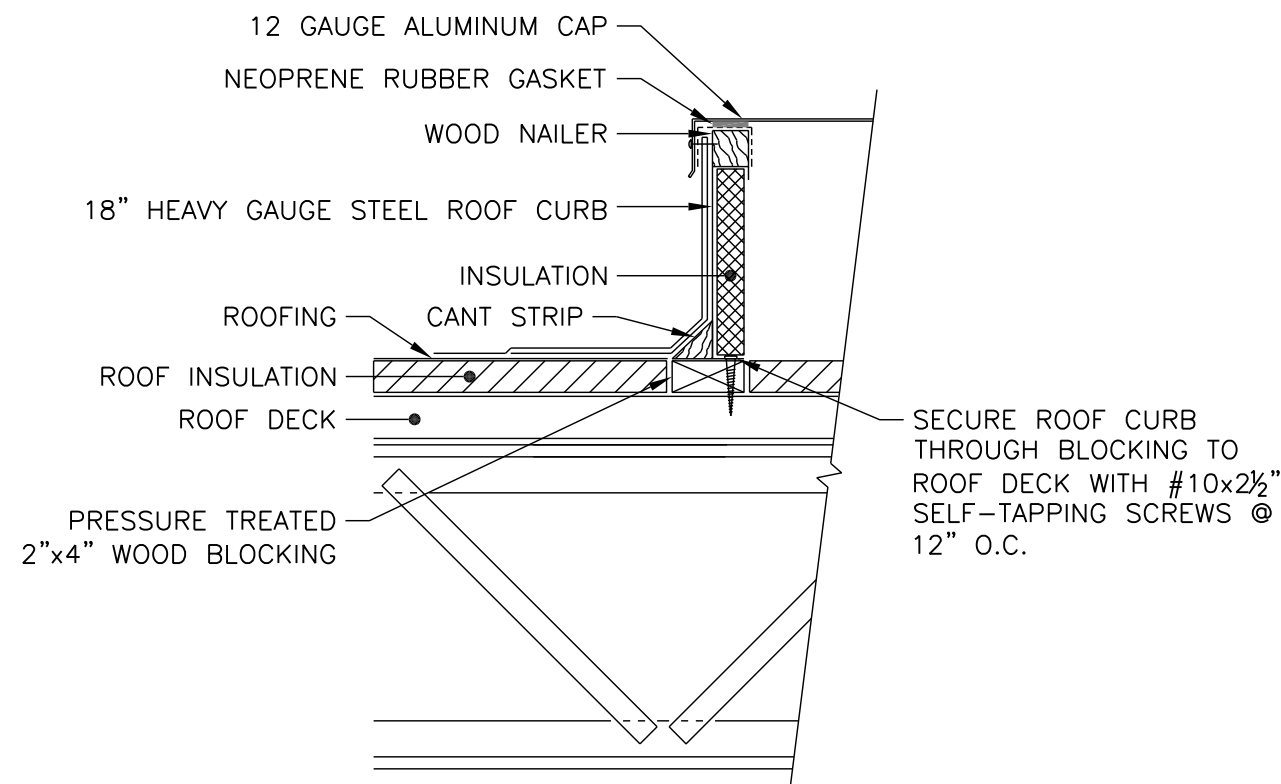
HOT WATER UNIT HEATER SCHEDULE

DESIG.	SERVICE	TYPE	CAPACITY (BTUH)*	FLOW (GPM)	WPD (FT. W.C.)	AIRFLOW (CFM)	MOTOR (HP)	ELEC. (VOLT./PH)	BASIS OF DESIGN	NOTES
UH-1	BOILER ROOM	VERTICAL	205,400	20.0	2.68	4,200	1/2	480/3	TRANE MODEL NO. UHP-280-6-T-A-1-1	1,2

* CAPACITY BASED ON 200°F EWT, 60°F EAT, 20°F TD.

NOTES:

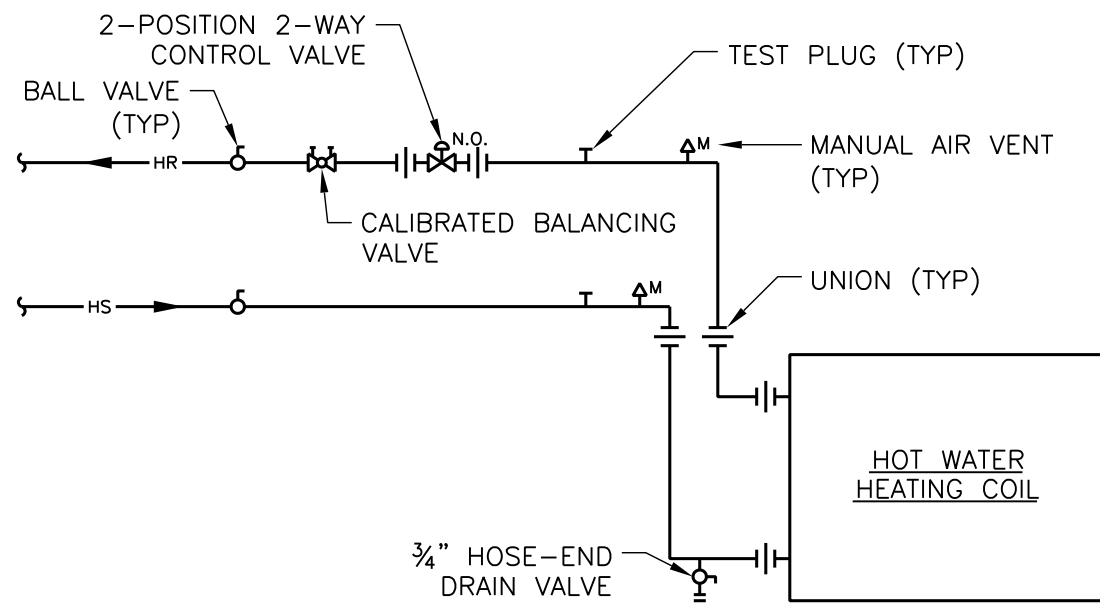
1. PROVIDE FACTORY-INSTALLED OSHA FAN GUARD.
2. FIELD INSTALL FACTORY-FURNISHED UNFUSED DISCONNECT SWITCH.



2 ROOF CURB DETAIL
P-3 NO SCALE

NOTES:

1. PROVIDE ALL FLASHING, PATCHING, AND SEALANT AS REQUIRED FOR A WATER TIGHT INSTALLATION.
2. ALL ROOFING WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE EXISTING ROOFING WARRANTY.



3 UNIT HEATER COIL CONNECTION DETAIL
P-3 NO SCALE

LEGEND AND ABBREVIATIONS

	CONNECT TO EXISTING		NATURAL GAS
	EXTENT OF DEMOLITION		THERMOSTATIC MIXING VALVE
	DEMOLITION WORK		BALL VALVE
	EXISTING TO REMAIN		CHECK VALVE
	NEW WORK		HOSE-END DRAIN VALVE
	DIRECTION OF FLOW		FLOOR DRAIN
	PIPE DOWN		GAS COCK
	PIPE UP		GATE VALVE
	PIPE TEE (BOTTOM TAKEOFF)		PRESSURE REGULATING VALVE
	CONDENSATE DRAIN		PRESSURE RELIEF VALVE
	DOMESTIC COLD WATER		PUMP
	DOMESTIC HOT WATER		STRAINER
	DOMESTIC HOT WATER RECIRCULATING		THERMOMETER
	HEATING WATER RETURN		UNION
	HEATING WATER SUPPLY		MOTOR OPERATED DAMPER
			SUPPLY/OUTDOOR AIR DUCT UP, DOWN

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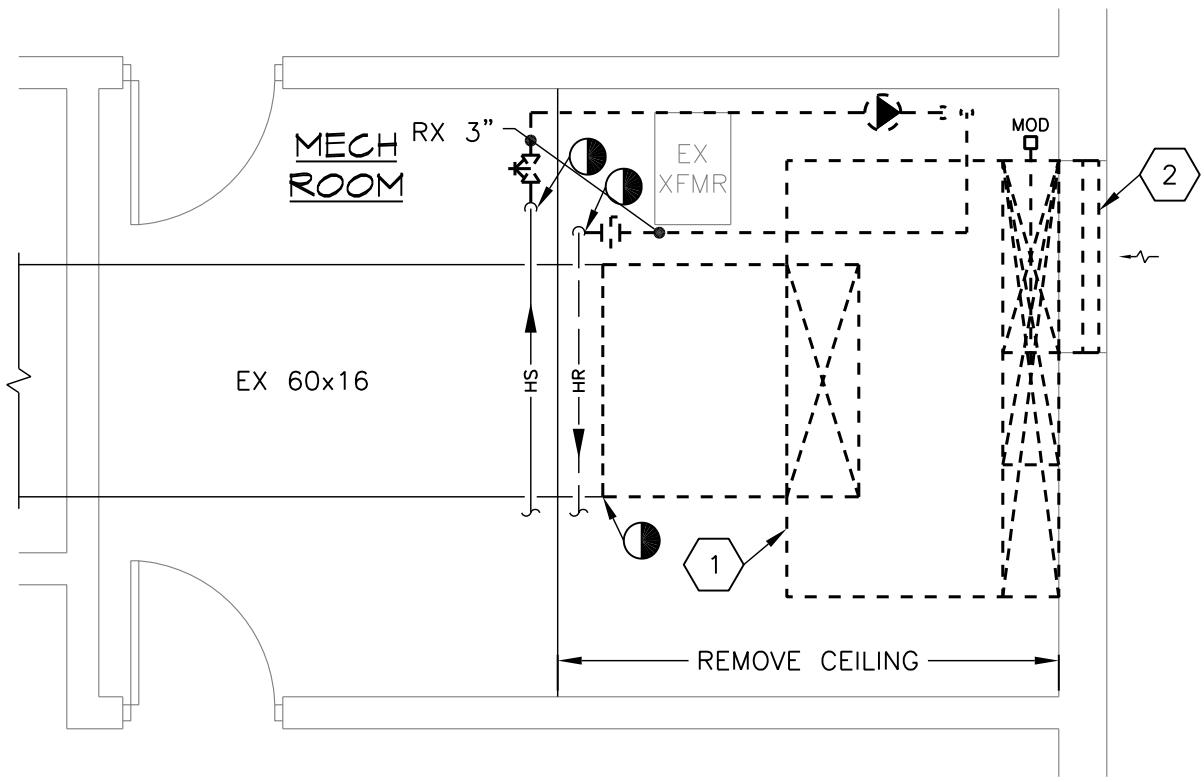
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DRAWING

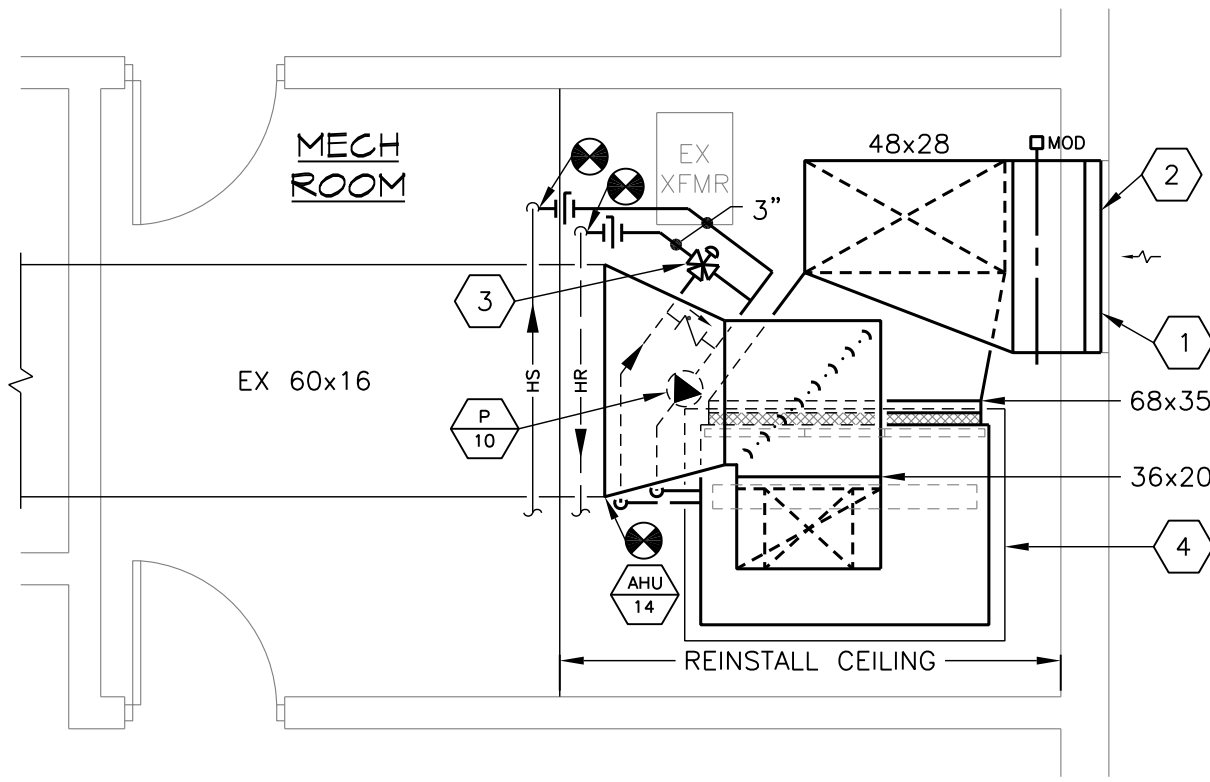
DOMESTIC HOT WATER
SCHEMATIC DIAGRAM,
DETAILS, AND SCHEDULES

DRAWN BY	WLA
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SHEET	

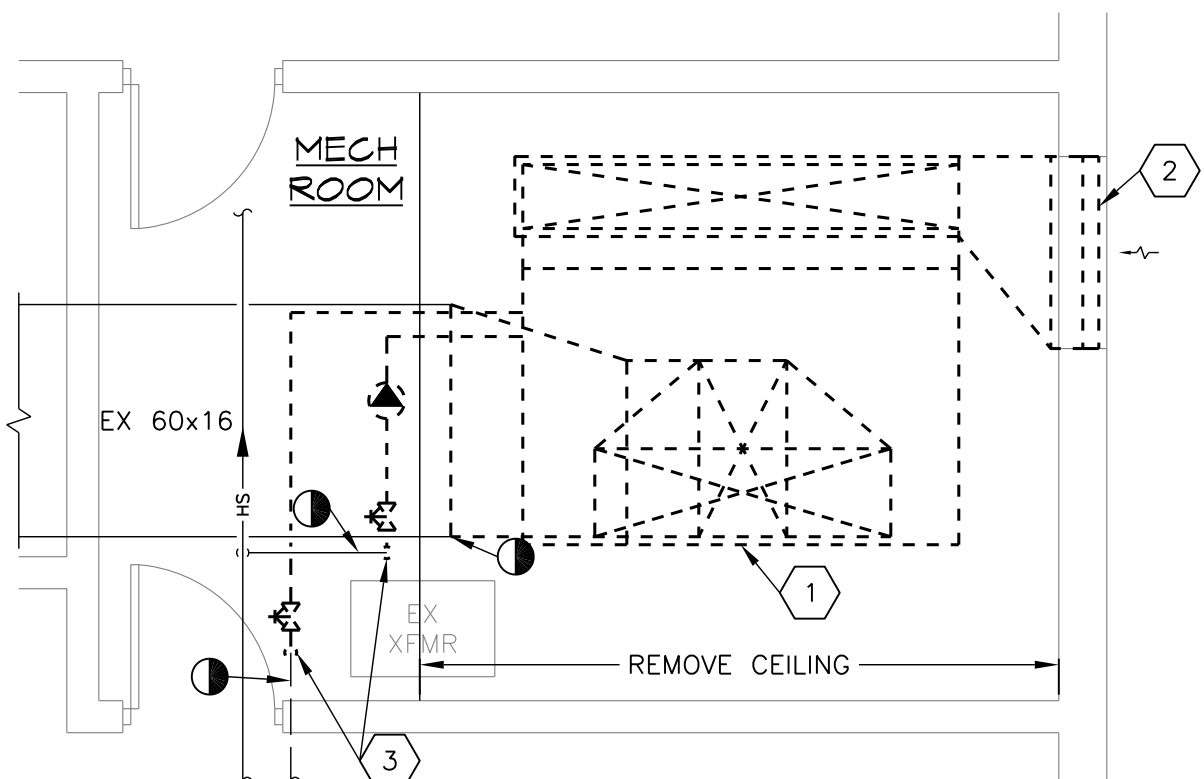
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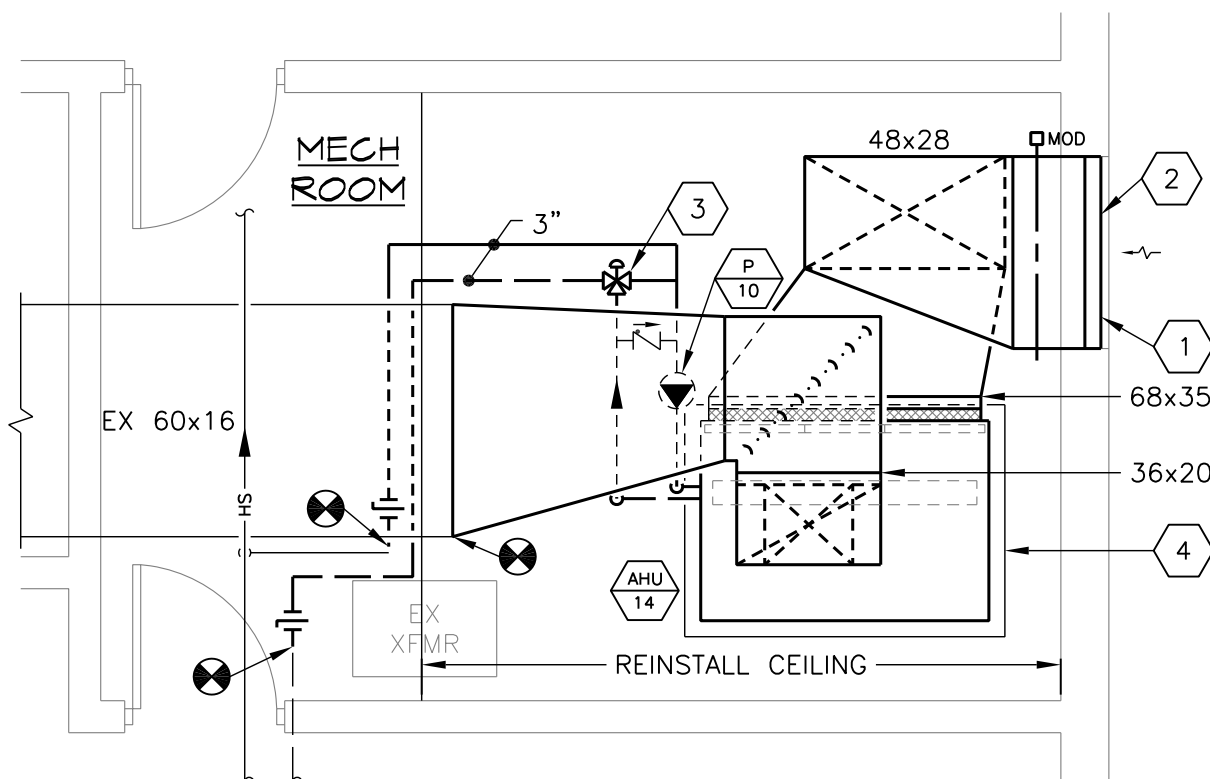
1 CHS - HVAC DEMOLITION PLAN
SCALE: 1/4"=1'-0"



2 CHS - HVAC NEW WORK PLAN
SCALE: 1/4"=1'-0"



4 HHS - HVAC DEMOLITION PLAN
SCALE: 1/4"=1'-0"



5 HHS - HVAC NEW WORK PLAN
SCALE: 1/4"=1'-0"

DEMOLITION KEY NOTES

- REMOVE EXISTING AIR HANDLING UNIT, SUPPLY AND OUTDOOR AIR DUCTWORK, HEATING WATER PUMP, HEATING WATER SUPPLY AND RETURN PIPING, AND SHUTOFF VALVES TO POINTS INDICATED.
- REMOVE EXISTING 48"x48" OUTDOOR AIR LOUVER AND STORE FOR REINSTALLATION.
- REMOVE EXISTING VERTICAL PIPING TO A POINT 9'-4" ABOVE FINISHED FLOOR.

NEW WORK KEY NOTES

- RIG REPLACEMENT AIR HANDLING UNIT IN SECTIONS THROUGH EXISTING OUTDOOR AIR LOUVER OPENING IN WALL.
- REINSTALL EXISTING 48"x48" OUTDOOR AIR LOUVER. PROVIDE NEW PNEUMATIC ACTUATOR.
- PROVIDE NEW 3-WAY MODULATING CONTROL VALVE AND PNEUMATIC ACTUATOR.
- MOUNT AIR HANDLING UNIT ON 4" HOUSEKEEPING PAD.

PUMP SCHEDULE

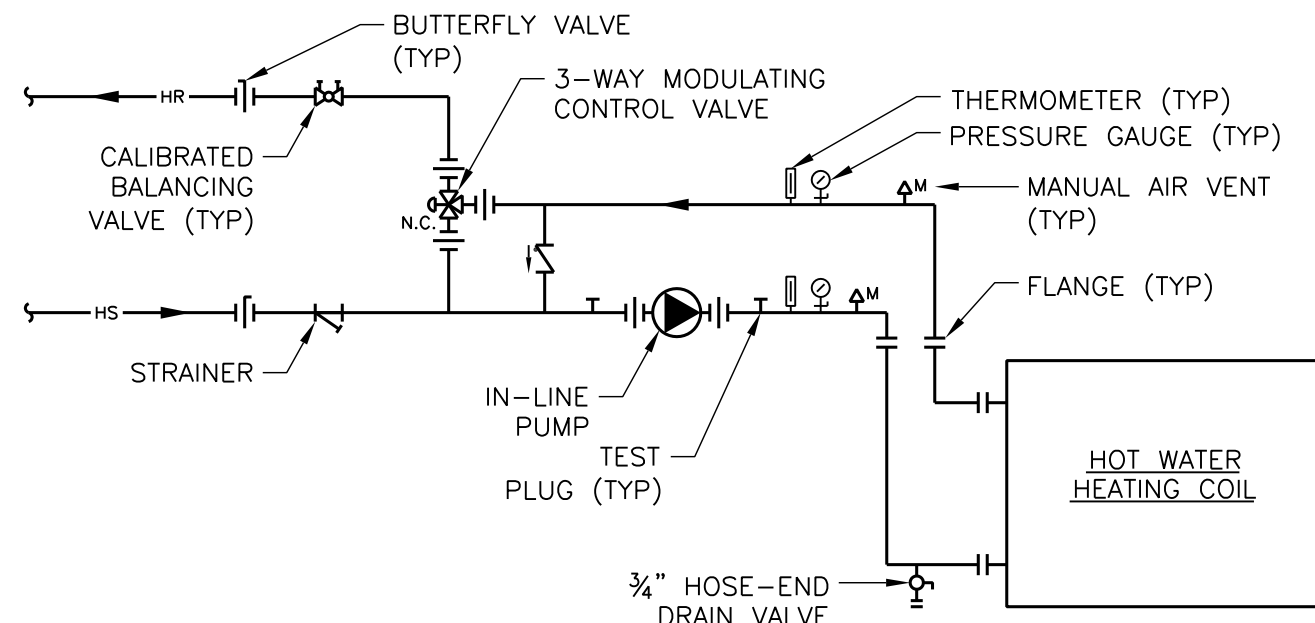
DESIG.	SERVICE	TYPE	FLUID	FLOW (GPM)	HEAD (FT. W.C.)	SPEED (RPM)	IMPELLER DIA (IN.)	MOTOR (HP)	ELEC. (VOLT./PH)	BASIS OF DESIGN
P-10	AHU-14 HEATING COIL	IN-LINE	WATER	86	27	1,750	5.25	1	480/3	BELL & GOSSETT 60-STOCK-612

AIR HANDLING UNIT SCHEDULE

DESIG.	SERVICE	SUPPLY FAN					HOT WATER HEATING COIL												FILTERS			ELEC. (VOLT./PH)	DIMENSIONS (L x W x H)	WEIGHT (LBS)	BASIS OF DESIGN	NOTES	
		SUPPLY AIR (CFM)	OUTDOOR AIR (CFM)	ESP (IN. W.C.)	TSP (IN. W.C.)	MOTOR (HP)	AIRFLOW (CFM)	CAPACITY (MBH)	FACE VEL (FPM)	EAT (°F)	LAT (°F)	APD (IN. W.C.)	ROWS	FPI	FLUID	FLOW (GPM)	EWT (°F)	LWT (°F)	WPD (FT W.C.)	THICKNESS	TYPE						EFFICIENCY
AHU-14	KITCHEN MAKE-UP AIR	8,400	8,400	1.00	2.04	7.5	8,400	861.8	672	0.0	95.0	0.36	2	12	WATER	86.2	180	160	4.1	2"	PLEATED	MERV 8	480/3	50" x 72" x 83"	1,445	TRANE CLIMATE CHANGER SIZE 14	1-5
NOTES: 1. UNIT SHALL HAVE FLAT FILTER SECTION, HOT WATER HEATING COIL SECTION, AND FAN SECTION. 2. FAN SECTION SHALL BE STACKED ON TOP OF COIL SECTION WITH UPBLAST FAN. 3. FAN ROTATION SHALL COUNTER CLOCKWISE WHEN VIEWING THE UNIT FROM THE LEFT SIDE (AIR BLOWING IN THE FACE). 4. COIL CONNECTIONS SHALL BE ON THE LEFT SIDE (AIR BLOWING IN THE FACE). 5. SHIP UNIT IN SECTIONS FOR FIELD ASSEMBLY.																											

ADD ALTERNATE PRICING

- THE PRICE FOR ALL WORK ASSOCIATED WITH THE REPLACEMENT OF THE KITCHEN MAKE-UP AIR UNIT FOR EACH SCHOOL SHOWN ON DRAWINGS M-1 AND E-3 SHALL BE IDENTIFIED ON THE BID FORM AS THE ADD ALTERNATE NO. 1 PRICE FOR EACH SCHOOL.



3 HEATING WATER COIL CONNECTION DETAIL
NO SCALE

NOTES:

- ARRANGE COIL PIPING CONNECTIONS TO FACILITATE REMOVAL OF COIL FROM EQUIPMENT WITH A MINIMUM DISTURBANCE TO PIPING.

ATC DEMOLITION WORK

- DISCONNECT ALL EXISTING AUTOMATIC TEMPERATURE CONTROLS (ATC) COMPONENTS ASSOCIATED WITH AIR HANDLING UNIT AHU-14 AND HEATING WATER PUMP P-10. EXISTING ATC COMPONENTS INCLUDE:
 - AHU-14 SUPPLY FAN START/STOP.
 - 3-WAY MODULATING CONTROL VALVE.
 - LOW LIMIT TEMPERATURE SENSOR.
 - OUTDOOR AIR DAMPER OPEN/CLOSE.
 - PUMP P-10 START/STOP.
- REMOVE EXISTING OUTDOOR AIR MOTOR OPERATED DAMPER ACTUATOR AND HEATING WATER CONTROL VALVE ACTUATOR.
- EXISTING ATC WIRING AND PNEUMATIC TUBING SHALL REMAIN FOR CONNECTION TO REPLACEMENT AIR HANDLING UNIT AND HEATING WATER PUMP.

ATC NEW WORK

- PROVIDE NEW OUTDOOR AIR MOTOR OPERATED DAMPER ACTUATOR AND HEATING WATER CONTROL VALVE ACTUATOR.
- RECONNECT ALL AUTOMATIC TEMPERATURE CONTROLS (ATC) COMPONENTS ASSOCIATED WITH AIR HANDLING UNIT AHU-14 AND HEATING WATER PUMP P-10. ATC COMPONENTS INCLUDE:
 - AHU-14 SUPPLY FAN START/STOP.
 - 3-WAY MODULATING CONTROL VALVE.
 - LOW LIMIT TEMPERATURE SENSOR.
 - OUTDOOR AIR DAMPER OPEN/CLOSE.
 - PUMP P-10 START/STOP.
- RECONNECT ALL ATC WIRING AND PNEUMATIC ASSOCIATED WITH AIR HANDLING UNIT AND HEATING WATER PUMP.
- PROVIDE ALL NECESSARY ATC COMPONENTS, WIRING, AND CONDUIT TO INTERLOCK THE OPERATION OF AHU-14 WITH THE EXISTING KITCHEN RANGE HOOD EXHAUST FAN.
- VERIFY PROPER OPERATION OF ALL ATC COMPONENTS.



GBEE

GREEN BUILDING ENERGY ENGINEERS, LLC

MECHANICAL - ELECTRICAL - PLUMBING

8029 Sumnerville Lane
Elkridge, MD 21075
TEL: 410-796-1080
FAX: 410-796-1081
www.GreenBuildingEnergyEngineers.com

SUBCONSULTANT

Columbia Engineering, Inc.
6210 Old Dobbin Lane, Suite 150
Columbia, MD 21045

SEAL

2

Professional Certification. I certify that these documents were prepared or approved by me, and that I am a duly licensed engineer under the laws of the State of Maryland, License Number 20533, expiration date 8/5/2016.

OWNER

Howard County Public School System
8045 Harriet Tubman Lane
Columbia, MD 21044

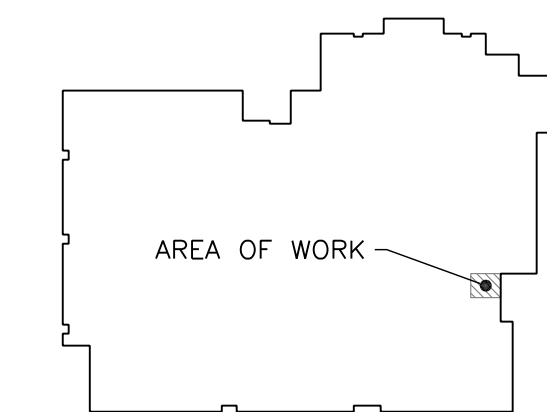
PROJECT

CENTENNIAL & HAMMOND HIGH SCHOOLS
DOMESTIC WATER HEATER AND
KITCHEN MAKE-UP AIR UNIT REPLACEMENTS

Hammond High School
8800 Guilford Road
Columbia, MD 21046

Centennial High School
4300 Centennial Lane
Ellicott City, MD 21042

KEY PLAN



01	CONSTRUCTION DOCUMENTS	07/14/14
NO.	DESCRIPTION	DATE

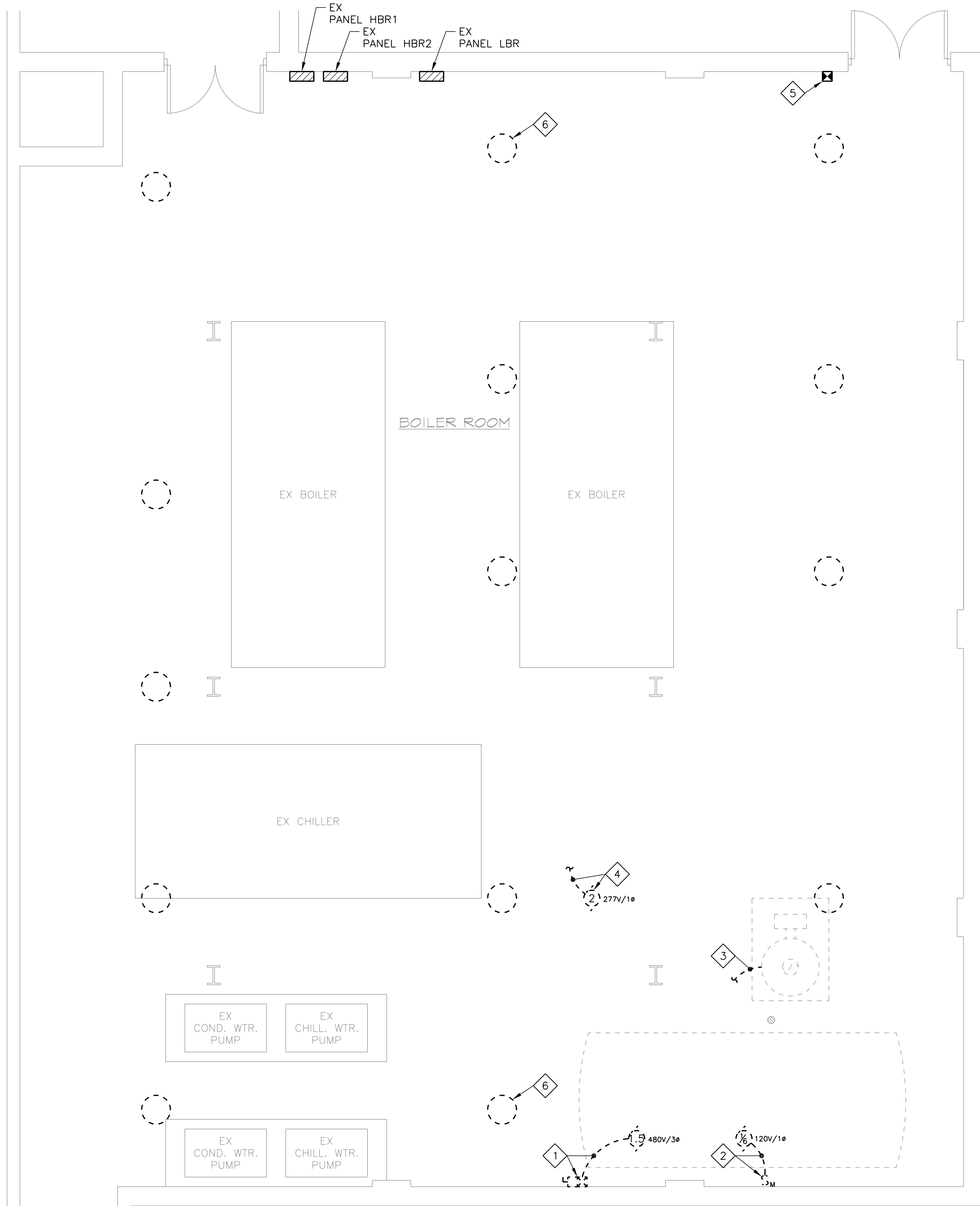
DRAWING

KITCHEN MAKE-UP AIR UNIT
DEMO & NEW WORK PLANS,
DETAILS, AND SCHEDULES

DRAWN BY	WLA
CHECKED BY	WLA
PROJECT NO.	14014
SCALE	AS SHOWN
SHEET	

M-1

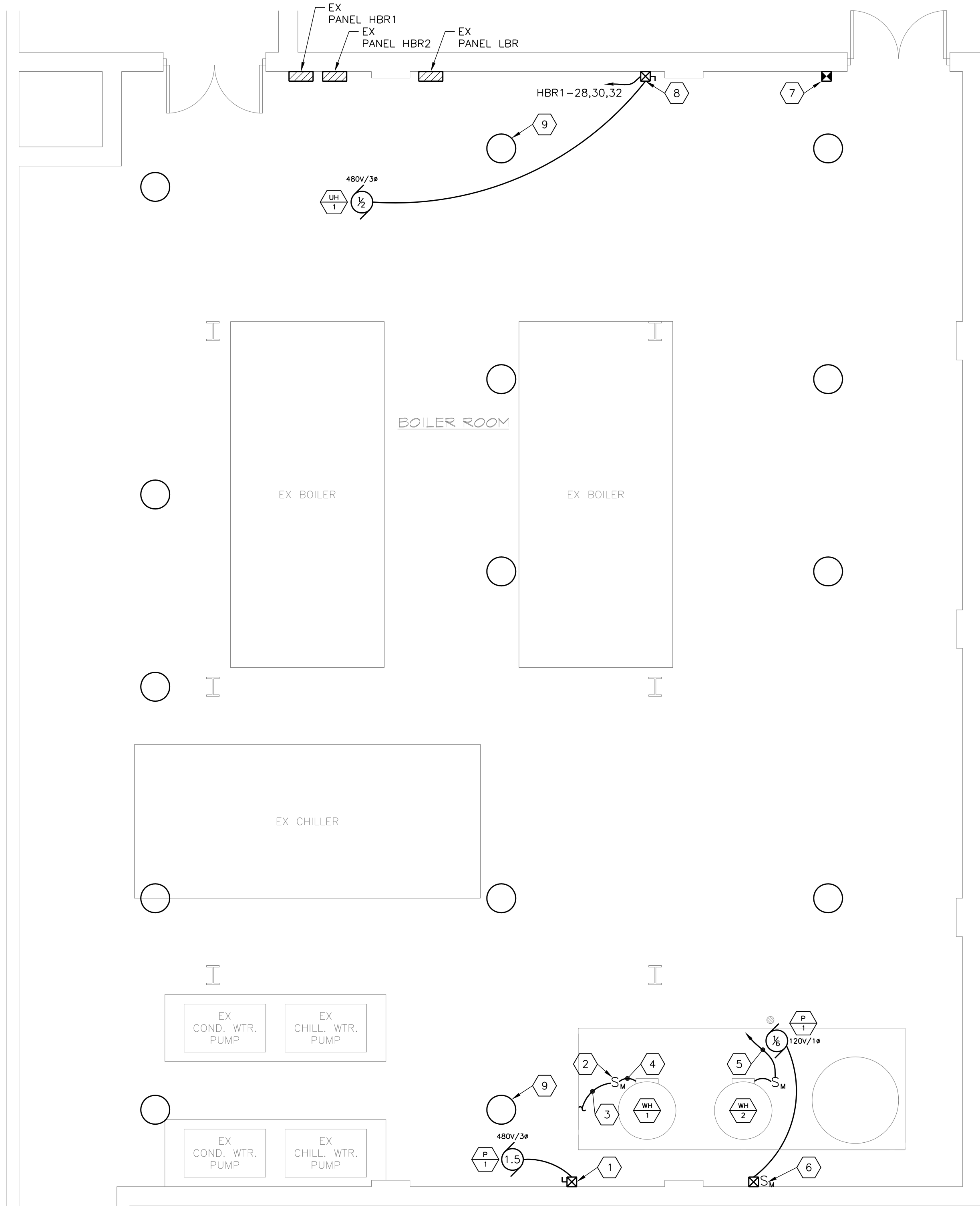
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1
E-1
ELECTRICAL DEMOLITION PLAN
SCALE: 1/4"=1'-0"

DEMOLITION KEY NOTES

- 1 REMOVE EXISTING SAFETY SWITCH AND MAGNETIC MOTOR STARTER AND CONNECTION TO HOT WATER RECIRCULATING PUMP. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).
- 2 REMOVE EXISTING SAFETY SWITCH AND CONNECTION TO HOT WATER STORAGE CIRCULATOR. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).
- 3 REMOVE EXISTING CONNECTION TO WATER HEATER AND WIRING AND CONDUIT BACK TO NEAREST JUNCTION BOX. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).
- 4 REMOVE EXISTING CONNECTION TO HEATING WATER PUMP AND ALL ASSOCIATED WIRING AND CONDUIT BACK TO PANELBOARD HBR2. UPDATE PANELBOARD DIRECTORY TO IDENTIFY EXISTING 20A/1P CIRCUIT BREAKER AS "SPARE".
- 5 EXISTING EMERGENCY POWER OFF SWITCH TO REMAIN.
- 6 REMOVE EXISTING METAL HALIDE LIGHTING FIXTURE (TYPICAL OF 14). EXISTING PENDANT AND WIRING TO REMAIN FOR CONNECTION TO REPLACEMENT LIGHTING FIXTURE (REFER TO NEW WORK PLAN).



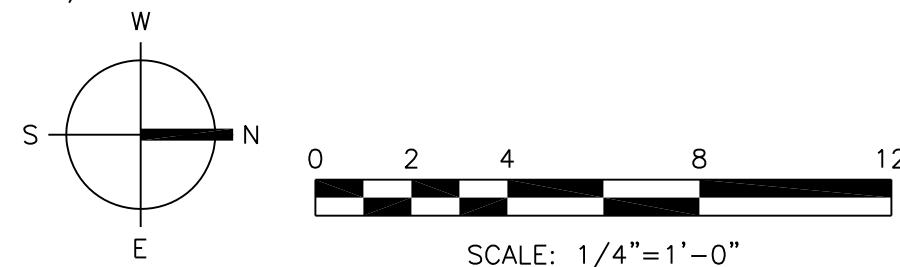
2
E-1
ELECTRICAL NEW WORK PLAN
SCALE: 1/4"=1'-0"

NEW WORK KEY NOTES

- 1 3P, 600V COMBINATION MAGNETIC MOTOR STARTER WITH NON-FUSED SAFETY SWITCH, NEMA SIZE 0 STARTER, AND H AND/OFF/AUTO SWITCH IN NEMA 1 ENCLOSURE. CONNECT TO EXISTING BRANCH CIRCUIT WIRING. EXTEND 2#12 + #12 GROUND IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT AND MAKE CONNECTION TO PUMP P-1.
- 2 LOCKABLE 30A/2P, 240V MOTOR RATED SWITCH IN NEMA 1 ENCLOSURE. PROVIDE UNISTRUT FRAME TO MOUNT SAFETY SWITCH NEAR WATER HEATER (TYPICAL OF 2).
- 3 CONNECT 2#12 + #12 GROUND IN 3/4" CONDUIT TO EXISTING BRANCH CIRCUIT WIRING THAT WAS DISCONNECTED UNDER DEMOLITION.
- 4 EXTEND 2#12 + #12 GROUND IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT AND MAKE CONNECTION TO WATER HEATER (TYPICAL OF 2).
- 5 EXTEND 2#12 + #12 GROUND IN 3/4" CONDUIT TO PANEL LBR AND PROVIDE 20A/1P SHUNT TRIP CIRCUIT BREAKER TO MATCH EXISTING EQUIPMENT. UPDATE PANELBOARD DIRECTORY.

NEW WORK KEY NOTES (CONT.)

- 6 30A/2P, 240V MOTOR RATED SWITCH AND SIZE 0 MAGNETIC MOTOR STARTER WITH HAND/OFF/AUTO SWITCH IN NEMA 1 ENCLOSURES. CONNECT TO EXISTING BRANCH CIRCUIT WIRING. EXTEND 2#12 + #12 GROUND IN 3/4" CONDUIT AND MAKE CONNECTION TO PUMP P-2.
- 7 PROVIDE ALL WIRING AND CONDUIT NECESSARY TO ADD EMERGENCY POWER SHUT OFF OF WATER HEATER WH-2 THROUGH THE SHUNT TRIP CIRCUIT BREAKER PROTECTING THE WATER HEATER CIRCUIT WHEN THE EMERGENCY POWER OFF SWITCH IS DEPRESSED.
- 8 3P, 600V COMBINATION MAGNETIC MOTOR STARTER WITH NON-FUSED SAFETY SWITCH, NEMA SIZE 0 STARTER, AND HAND/OFF/AUTO SWITCH IN NEMA 1 ENCLOSURE. EXTEND 3#12 + #12 GROUND IN 3/4" CONDUIT TO UNIT HEATER UH-1 AND TO PANEL HBR1. CONNECT TO EXISTING SPARE CIRCUIT BREAKER IN PANEL HBR1.
- 9 PROVIDE REPLACEMENT LED HIGH BAY LIGHTING FIXTURE, 78W, 4000K COLOR TEMPERATURE, EQUAL TO BAYLED78NW. CONNECT TO EXISTING PENDANT AND 277V/1Ø WIRING.



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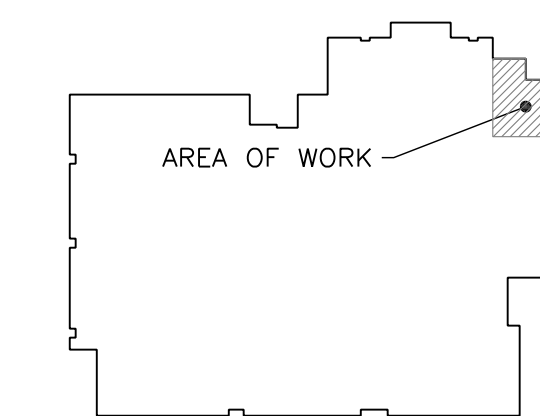
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KEY PLAN



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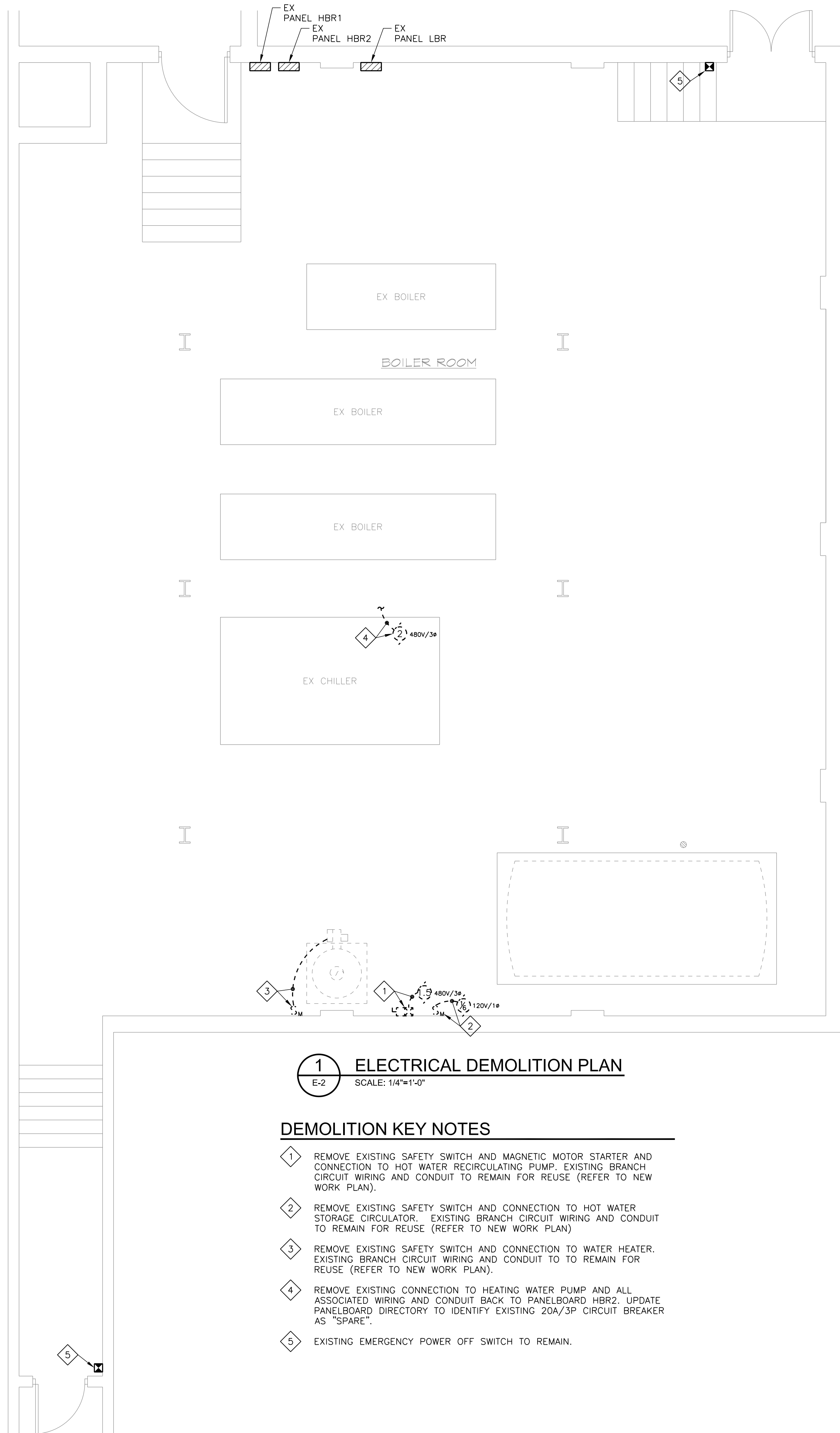
DRAWING

**CHS DOMESTIC HOT WATER
ELECTRICAL DEMOLITION
AND NEW WORK PLANS**

DRAWN BY	WLA
CHECKED BY	WLA
PROJECT NO.	14014
SCALE	AS SHOWN
SHEET	

E-1

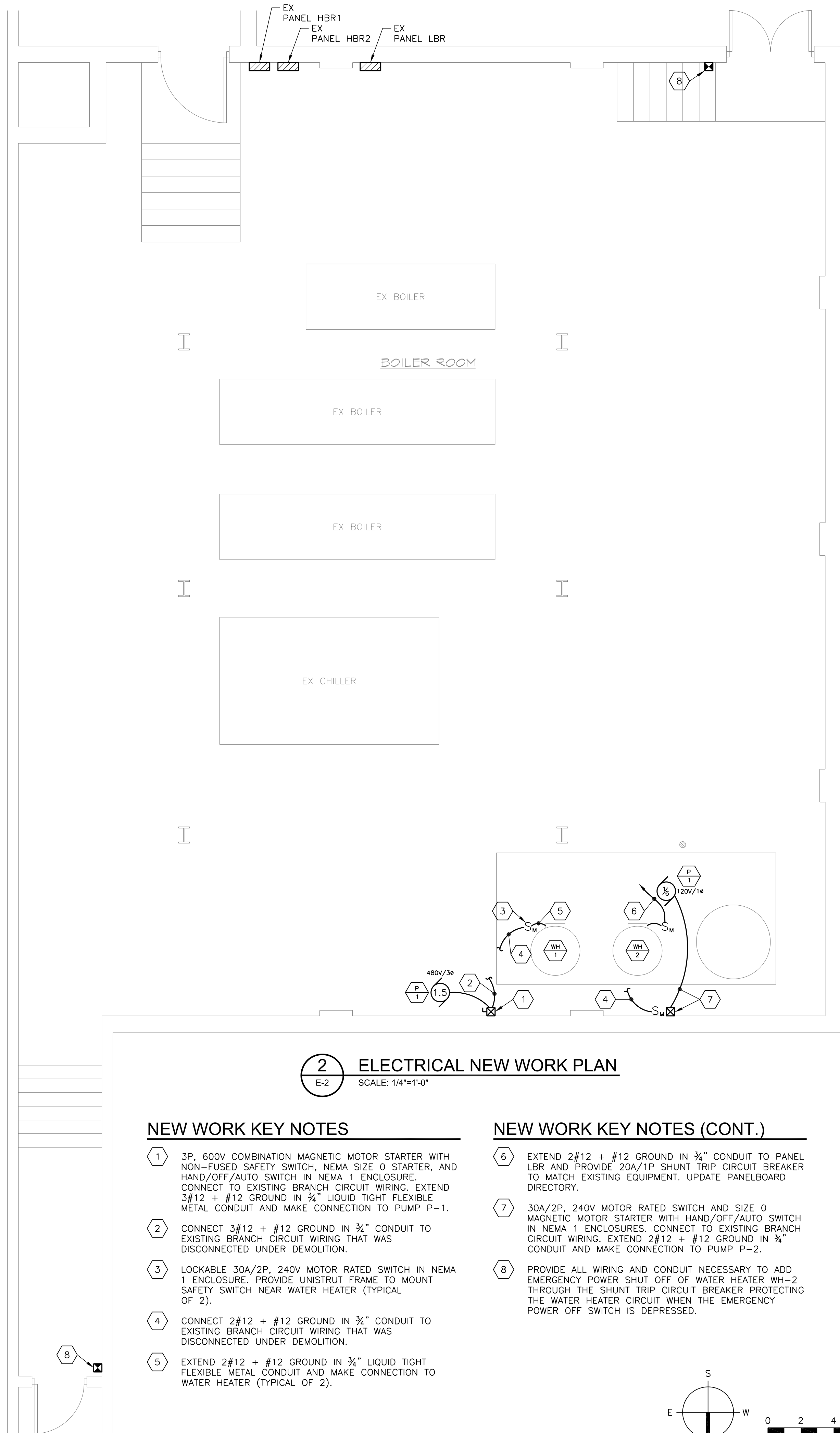
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1 ELECTRICAL DEMOLITION PLAN
E-2 SCALE: 1/4"=1'-0"

DEMOLITION KEY NOTES

- 1 REMOVE EXISTING SAFETY SWITCH AND MAGNETIC MOTOR STARTER AND CONNECTION TO HOT WATER RECIRCULATING PUMP. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).
- 2 REMOVE EXISTING SAFETY SWITCH AND CONNECTION TO HOT WATER STORAGE CIRCULATOR. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).
- 3 REMOVE EXISTING SAFETY SWITCH AND CONNECTION TO WATER HEATER. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).
- 4 REMOVE EXISTING CONNECTION TO HEATING WATER PUMP AND ALL ASSOCIATED WIRING AND CONDUIT BACK TO PANELBOARD HBR2. UPDATE PANELBOARD DIRECTORY TO IDENTIFY EXISTING 20A/3P CIRCUIT BREAKER AS "SPARE".
- 5 EXISTING EMERGENCY POWER OFF SWITCH TO REMAIN.



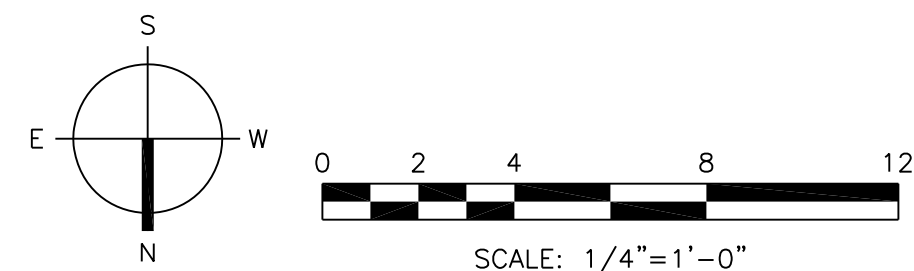
2 ELECTRICAL NEW WORK PLAN
E-2 SCALE: 1/4"=1'-0"

NEW WORK KEY NOTES

- 1 3P, 600V COMBINATION MAGNETIC MOTOR STARTER WITH NON-FUSED SAFETY SWITCH, NEMA SIZE 0 STARTER, AND HAND/OFF/AUTO SWITCH IN NEMA 1 ENCLOSURE. CONNECT TO EXISTING BRANCH CIRCUIT WIRING. EXTEND 3#12 + #12 GROUND IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT AND MAKE CONNECTION TO PUMP P-1.
- 2 CONNECT 3#12 + #12 GROUND IN 3/4" CONDUIT TO EXISTING BRANCH CIRCUIT WIRING THAT WAS DISCONNECTED UNDER DEMOLITION.
- 3 LOCKABLE 30A/2P, 240V MOTOR RATED SWITCH IN NEMA 1 ENCLOSURE. PROVIDE UNISTRUT FRAME TO MOUNT SAFETY SWITCH NEAR WATER HEATER (TYPICAL OF 2).
- 4 CONNECT 2#12 + #12 GROUND IN 3/4" CONDUIT TO EXISTING BRANCH CIRCUIT WIRING THAT WAS DISCONNECTED UNDER DEMOLITION.
- 5 EXTEND 2#12 + #12 GROUND IN 3/4" LIQUID TIGHT FLEXIBLE METAL CONDUIT AND MAKE CONNECTION TO WATER HEATER (TYPICAL OF 2).

NEW WORK KEY NOTES (CONT.)

- 6 EXTEND 2#12 + #12 GROUND IN 3/4" CONDUIT TO PANEL LBR AND PROVIDE 20A/1P SHUNT TRIP CIRCUIT BREAKER TO MATCH EXISTING EQUIPMENT. UPDATE PANELBOARD DIRECTORY.
- 7 30A/2P, 240V MOTOR RATED SWITCH AND SIZE 0 MAGNETIC MOTOR STARTER WITH HAND/OFF/AUTO SWITCH IN NEMA 1 ENCLOSURES. CONNECT TO EXISTING BRANCH CIRCUIT WIRING. EXTEND 2#12 + #12 GROUND IN 3/4" CONDUIT AND MAKE CONNECTION TO PUMP P-2.
- 8 PROVIDE ALL WIRING AND CONDUIT NECESSARY TO ADD EMERGENCY POWER SHUT OFF OF WATER HEATER WH-2 THROUGH THE SHUNT TRIP CIRCUIT BREAKER PROTECTING THE WATER HEATER CIRCUIT WHEN THE EMERGENCY POWER OFF SWITCH IS DEPRESSED.



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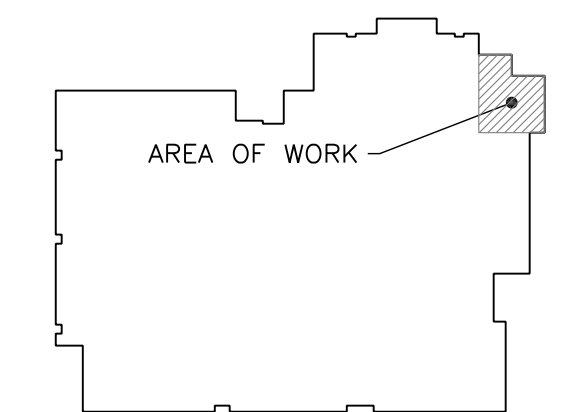
PROJECT

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KEY PLAN



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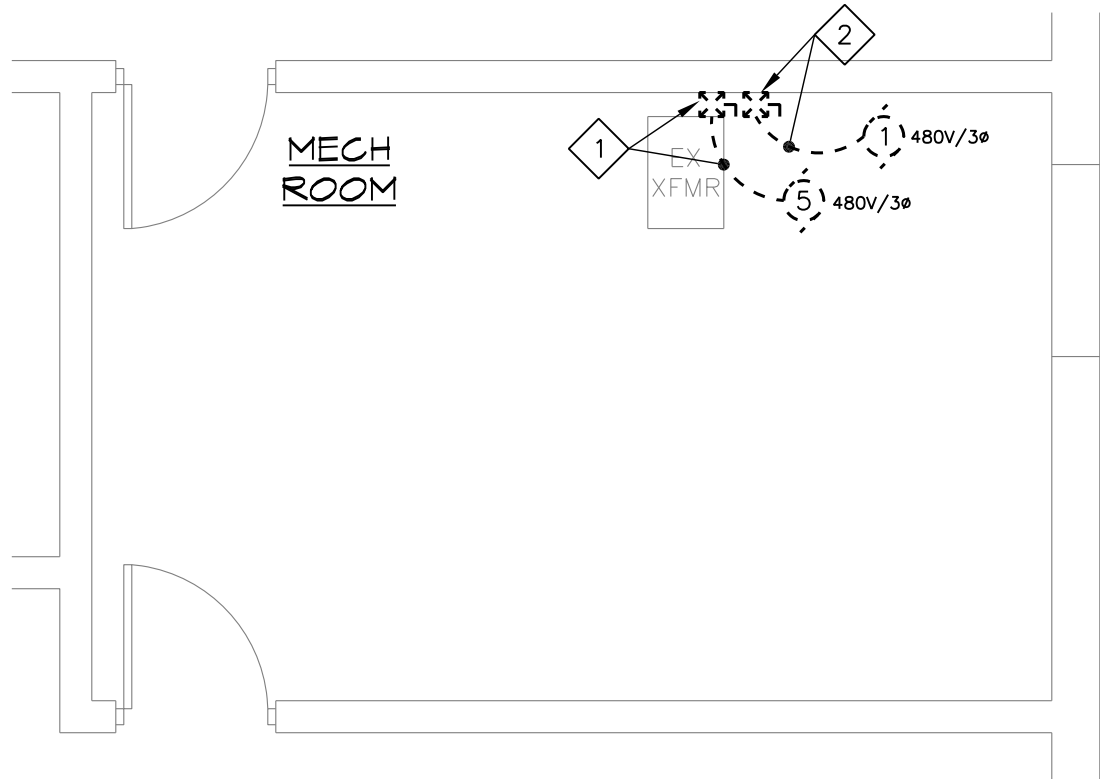
DRAWING

**HHS DOMESTIC HOT WATER
ELECTRICAL DEMOLITION
AND NEW WORK PLANS**

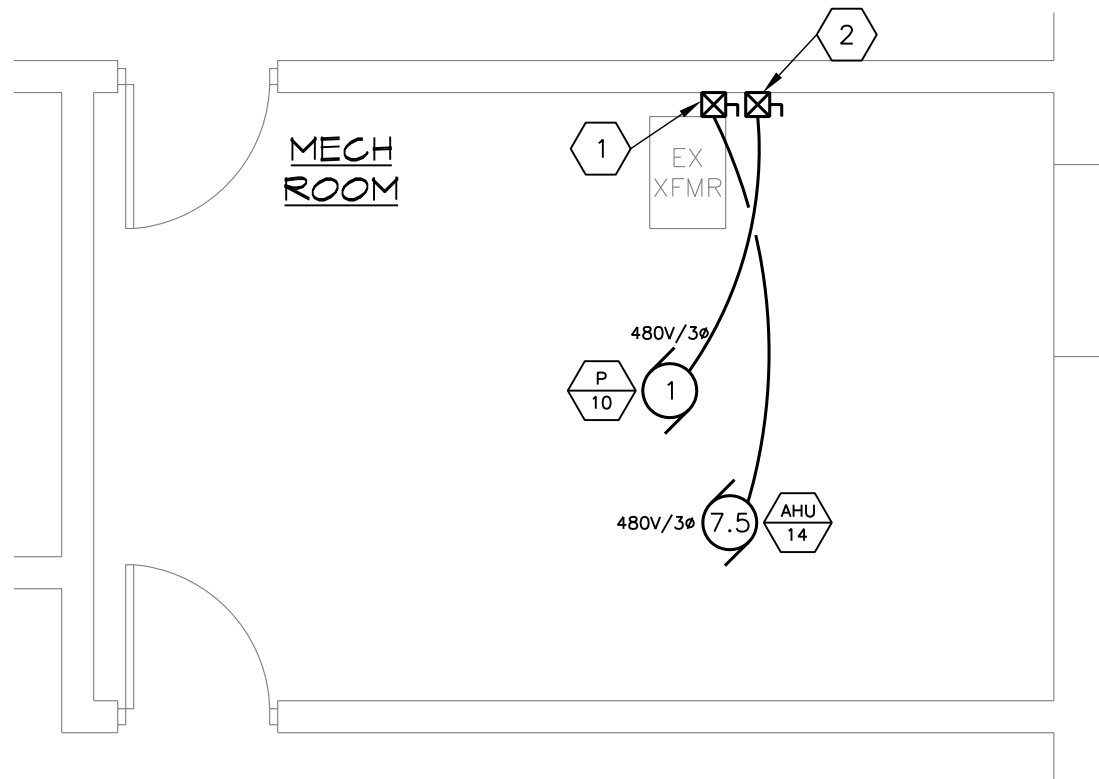
DRAWN BY	WLA
CHECKED BY	WLA
PROJECT NO.	14014
SCALE	AS SHOWN
SHEET	

E-2

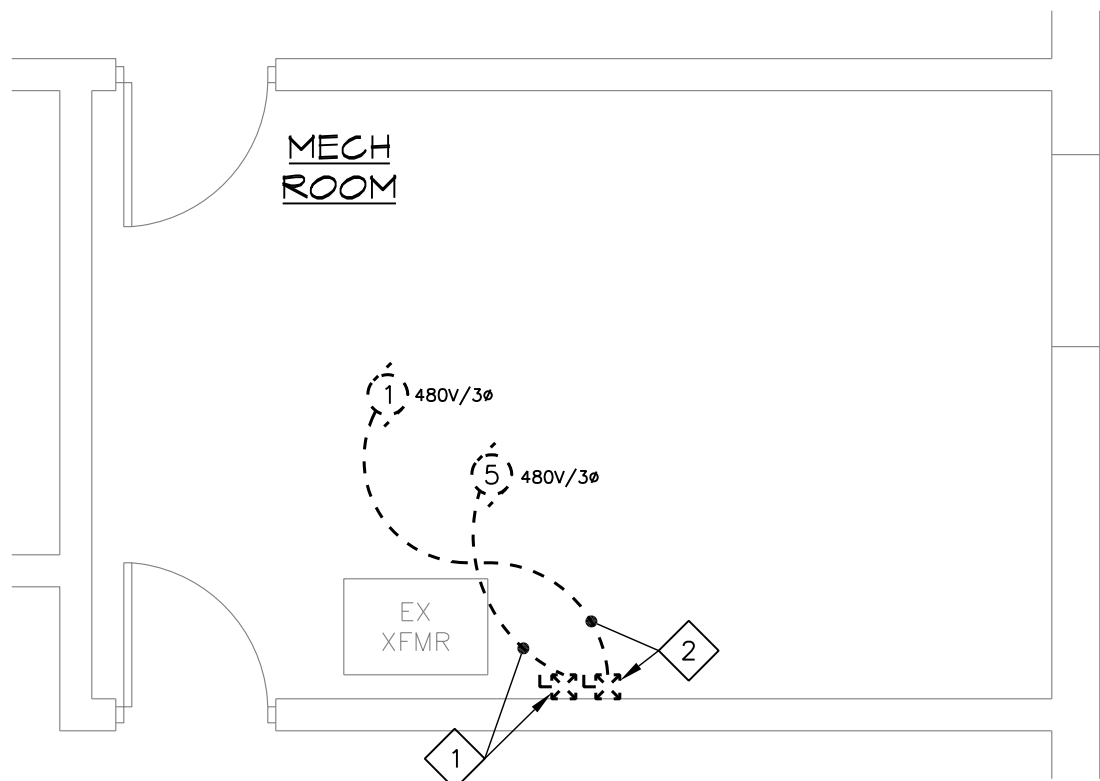
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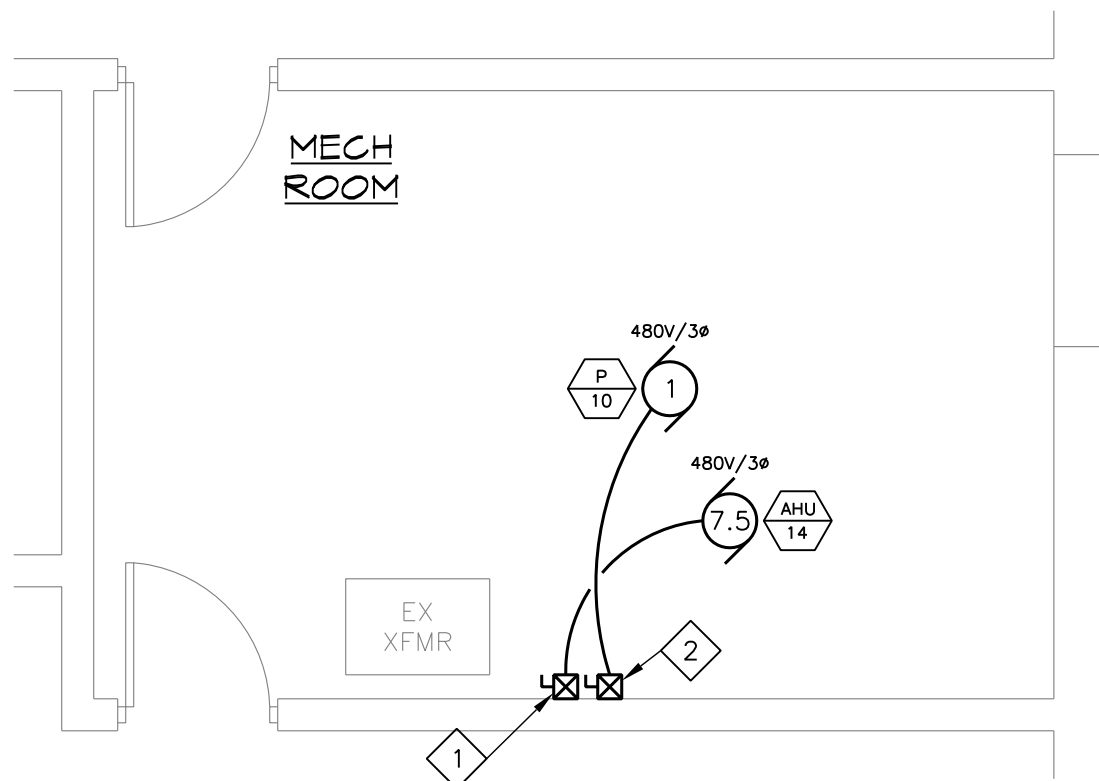
1
CHS - ELECTRICAL DEMOLITION PLAN
E-3
SCALE: 1/4"=1'-0"



2
CHS - ELECTRICAL NEW WORK PLAN
E-3
SCALE: 1/4"=1'-0"



3
HHS - ELECTRICAL DEMOLITION PLAN
E-3
SCALE: 1/4"=1'-0"



4
HHS - ELECTRICAL NEW WORK PLAN
E-3
SCALE: 1/4"=1'-0"

DEMOLITION KEY NOTES

- 1 REMOVE EXISTING SAFETY SWITCH AND MAGNETIC MOTOR STARTER AND CONNECTION TO AIR HANDLING UNIT. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).
- 2 REMOVE EXISTING SAFETY SWITCH AND MAGNETIC MOTOR STARTER AND CONNECTION TO HEATING WATER PUMP. EXISTING BRANCH CIRCUIT WIRING AND CONDUIT TO REMAIN FOR REUSE (REFER TO NEW WORK PLAN).

NEW WORK KEY NOTES

- 1 3P, 600V COMBINATION MAGNETIC MOTOR STARTER WITH NON-FUSED SAFETY SWITCH, NEMA SIZE 1 STARTER, AND HAND/OFF/AUTO SWITCH IN NEMA 1 ENCLOSURE. CONNECT TO EXISTING BRANCH CIRCUIT WIRING. EXTEND 3#12 + #12 GROUND IN 3/4" CONDUIT AND MAKE CONNECTION TO AIR HANDLING UNIT AHU-14.
- 2 3P, 600V COMBINATION MAGNETIC MOTOR STARTER WITH NON-FUSED SAFETY SWITCH, NEMA SIZE 0 STARTER, AND HAND/OFF/AUTO SWITCH IN NEMA 1 ENCLOSURE. CONNECT TO EXISTING BRANCH CIRCUIT WIRING. EXTEND 3#12 + #12 GROUND IN 3/4" CONDUIT AND MAKE CONNECTION TO PUMP P-10.

ADD ALTERNATE PRICING

1. THE PRICE FOR ALL WORK ASSOCIATED WITH THE REPLACEMENT OF THE KITCHEN MAKE-UP AIR UNIT FOR EACH SCHOOL SHOWN ON DRAWINGS M-1 AND E-3 SHALL BE IDENTIFIED ON THE BID FORM AS THE ADD ALTERNATE NO. 1 PRICE FOR EACH SCHOOL.

LEGEND AND ABBREVIATIONS			
-----	DEMOLITION WORK	☒	EMERGENCY POWER OFF SWITCH
_____	EXISTING TO REMAIN	☐	NONFUSED SAFETY SWITCH
_____	NEW WORK	☒	COMBINATION MAGNETIC MOTOR STARTER/DISCONNECT WITH HOA SWITCH
1 E-1	PLAN/DETAIL DESIGNATION	S _u	MOTOR RATED SWITCH
▨	PANELBOARD - EXISTING	1	MOTOR - HORSEPOWER AS NOTED
PP-1	HOMERUN TO PANELBOARD. LETTER AND NUMBER INDICATE PANEL AND BRANCH CIRCUIT NUMBER. WIRING SHALL BE 2#12 + #12G IN 3/4" CONDUIT UNLESS NOTED OTHERWISE.	Φ	RECEPTACLE
		A	AMPERES
		P	POLE
		V	VOLTS



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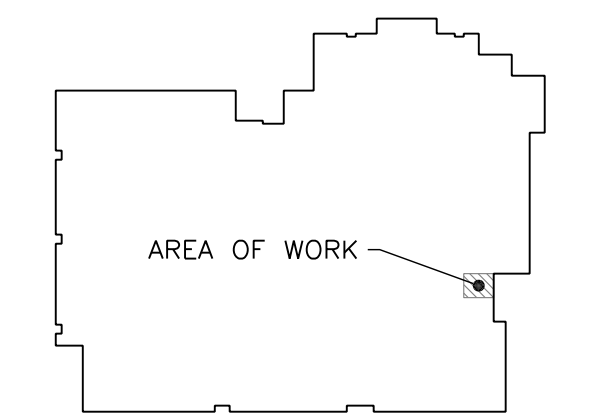
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KEY PLAN



NO.	DESCRIPTION	DATE
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DRAWING

KITCHEN MAKE-UP AIR UNIT
DEMO & NEW WORK PLANS

DRAWN BY	WLA
CHECKED BY	WLA
PROJECT NO.	14014
SCALE	AS SHOWN
SHEET	

E-3

GENERAL NOTES

METAL DECK:

NOTE: 1
ROOF DECK SHALL BE MADE OF STEEL CONFORMING TO ASTM A653 SS GRADE 33. GALVANIZED DECK SHALL HAVE COATING DESIGNATION G60.

NOTE: 2
METAL DECK SHALL HAVE THE FOLLOWING MINIMUM SECTION PROPERTIES:
•ROOF DECK ----- I = 0.155 in⁴, S = 0.186 in³

NOTE: 3
ALL METAL DECK HAS BEEN DESIGNED TO BE CONTINUOUS OVER 3 SPANS MINIMUM AND SHALL BEAR AT LEAST 2" ON STEEL SUPPORTS. FOR ONE OR TWO SPAN CONDITIONS, THE CONTRACTOR SHALL PROVIDE SHORING OR FURNISH HEAVIER GAGE DECK AS REQUIRED TO SUPPORT ALL THE APPLICABLE LOADS. THE CONTRACTOR SHALL SUBMIT THE ALTERNATE LAYOUT FOR APPROVAL.

NOTE: 4
DECK SHALL BE ATTACHED TO SUPPORTING STEEL AT ENDS AS NOTED ON PLANS.

EXISTING CONSTRUCTION:

NOTE: 1
COLUMBIA ENGINEERING INC. HAS PREPARED THESE PLANS BASED ON A LIMITED AMOUNT OF FIELD EXPLORATION AND ON THE STRUCTURAL INFORMATION SHOWN IN DRAWING S-10 PREPARED BY DUNCAN GRAY STRUCTURAL ENGINEER DATED MAY 1975. THE EXISTING MEMBER SIZES ARE NOTED (E) AND ARE SHOWN IN THE PLANS. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING MEMBERS SHOWN IN THE PLANS MATCH EXISTING AS BUILT CONDITIONS. IF THE AS BUILT CONDITIONS DO NOT CONFORM TO THE INFORMATION SHOWN IN THE PLANS, OR IF ANY STRUCTURAL MEMBER IS FOUND TO BE IN POOR CONDITION, THE CONTRACTOR SHALL INFORM COLUMBIA ENGINEERING INC. OF THE ACTUAL SIZES AND/OR CONDITION. RE-DESIGN AND ADDITIONAL FRAMING MAY BE REQUIRED IN THAT CASE.

NOTE: 2
ALL NEW PENETRATIONS THROUGH THE EXISTING ROOFS SHALL BE ACCURATELY LOCATED BY THE CONTRACTOR. THE CONTRACTOR SHALL PREPARE SHOP DRAWINGS SHOWING ALL PROPOSED OPENINGS AND SHALL SUBMIT THESE FOR REVIEW AND APPROVAL PRIOR TO CUTTING ANY OPENINGS.

NOTE: 3
NEW PENETRATIONS SHOWN IN THE STRUCTURAL DRAWINGS ARE PRINCIPAL OPENINGS. THE CONTRACTOR SHALL COORDINATE WITH THE ARCHITECTURAL, MEP AND TELECOMMUNICATION DRAWINGS FOR ALL PENETRATIONS.

NOTE: 4
ALL NEW PIPE SHALL BE LOCATED BY THE CONTRACTOR TO AVOID SUPPORTING MEMBERS UNDER THE ROOF. THE CONTRACTOR SHALL NOT CUT ANY MEMBER WITHOUT THE PRIOR APPROVAL OF COLUMBIA ENGINEERING, INC.

NOTE: 5
NEW PENETRATION THROUGH THE ROOF DECK SHALL BE CORE DRILLED.

MISCELLANEOUS:

NOTE: 1
THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER OF ANY DISCREPANCIES BETWEEN THE STRUCTURAL DOCUMENTS AND ANY OTHER DOCUMENTS OR EXISTING CONDITIONS FOR RESOLUTION PRIOR TO PROCEEDING WITH FABRICATION OR CONSTRUCTION.

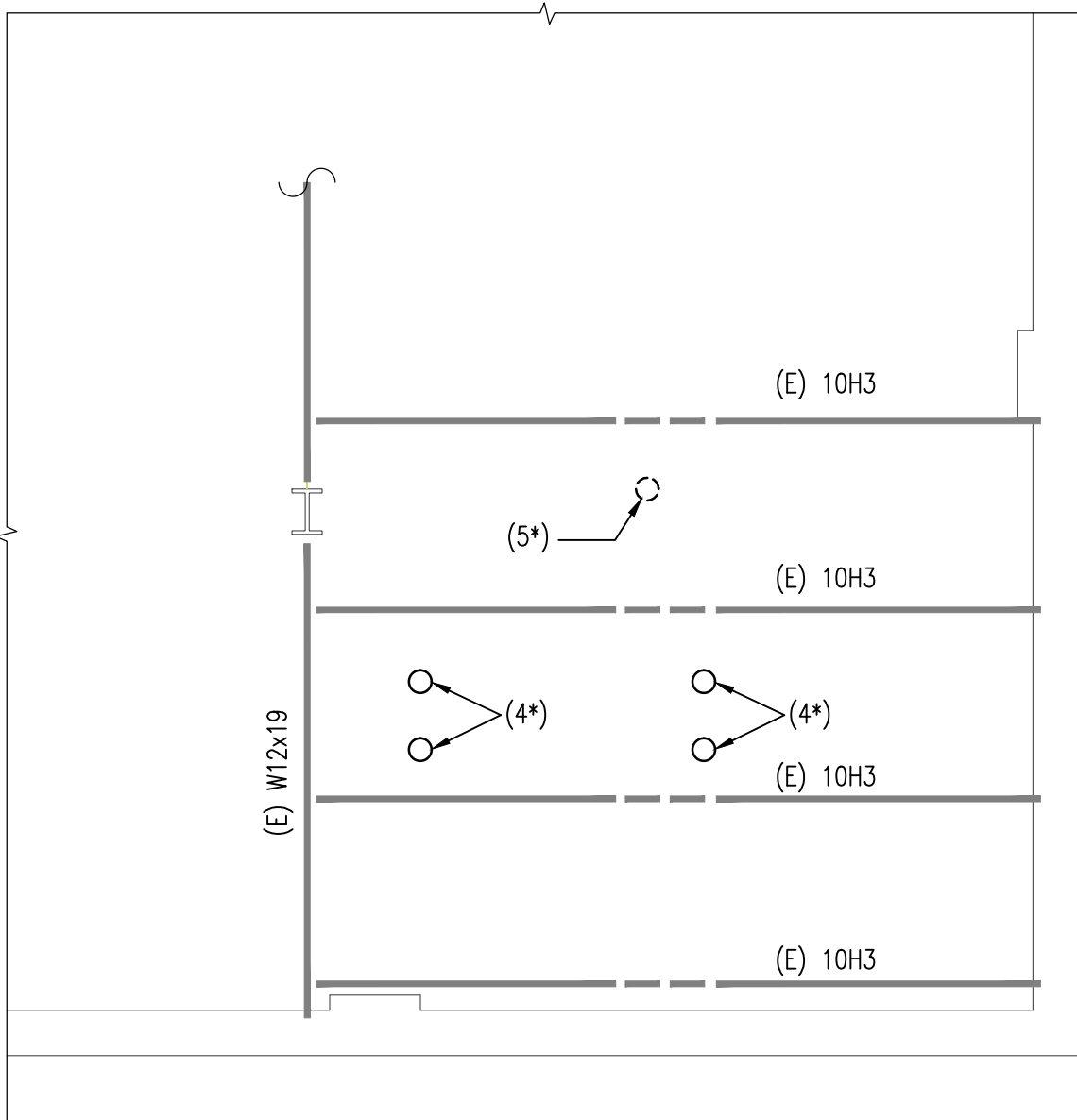
NOTE: 2
SHOP DRAWINGS FOR ALL STRUCTURAL ITEMS MUST BE SUBMITTED BY THE CONTRACTOR. IF A CONTRACTOR OR OWNER FAILS TO SUBMIT THE SHOP DRAWINGS, THE FIRM COLUMBIA ENGINEERING, INC., WILL NOT BE RESPONSIBLE FOR THE STRUCTURAL CERTIFICATION AND/OR THE DESIGN OF THE PROJECT.

DESIGN CODES:

1. INTERNATIONAL BUILDING CODE:
2012

DESIGN LOADS:

ROOF LOADS:
1. LIVE LOAD ----- 30 PSF
2. GROUND SNOW LOAD, pg ----- 30 PSF
3. FLAT ROOF SNOW LOAD, pf ----- 23 PSF
4. SNOW EXPOSURE FACTOR, Ce ----- 1.0
5. SNOW LOAD IMPORTANCE FACTOR, Is ----- 1.1
6. THERMAL FACTOR, Ct ----- 1.0

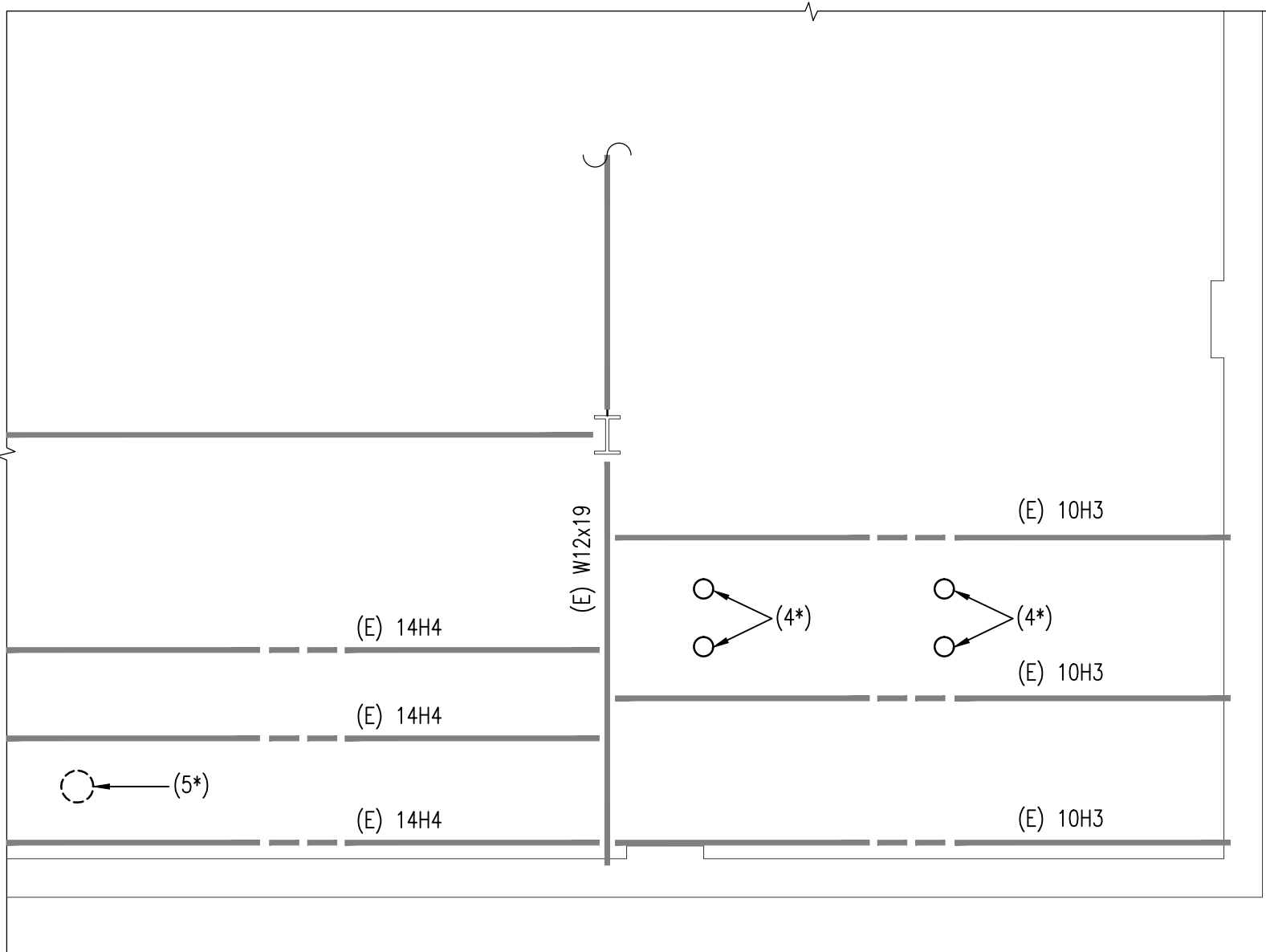


CHS -PARTIAL EXISTING ROOF PLAN - NEW WORK

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

NOTES:

- 1.) (E) DENOTES EXISTING.
- 2.) ALL NEW CONSTRUCTION SHOWN BOLD.
- 3.) EXISTING ROOF DECK IS 1 1/2", 22 GAGE METAL DECK.
- 4.) (4*) DENOTES NEW 6" DIAMETER HOLE. ACCURATELY LOCATE THE HOLE AND CAREFULLY CORE DRILL THROUGH THE METAL DECK.
- 5.) (5*) DENOTES EXISTING HOLE TO BE INFILLED. SEE DETAIL A/S-1 OR B/S-1.
- 6.) SEE MECHANICAL DRAWINGS FOR CURB.

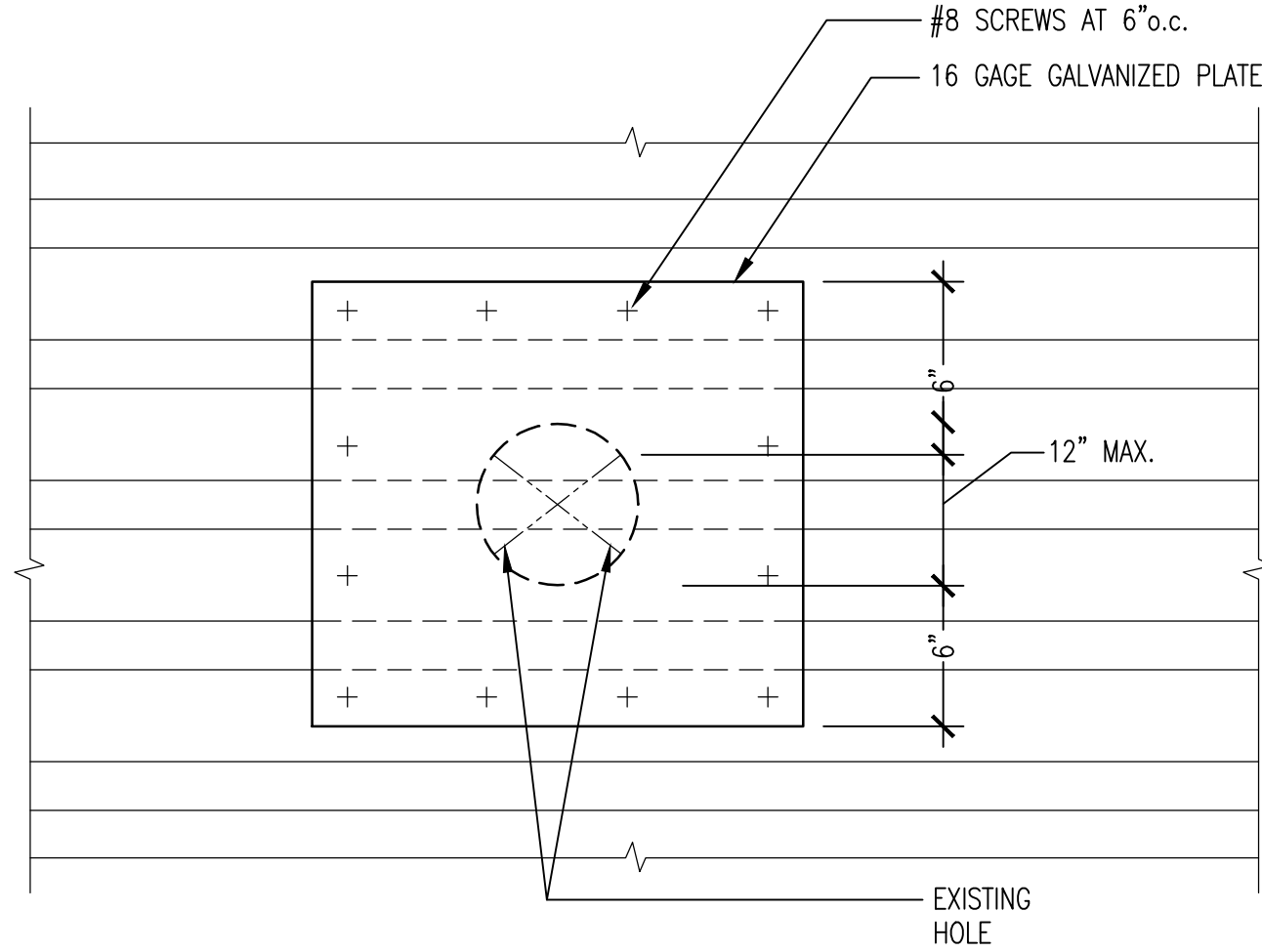
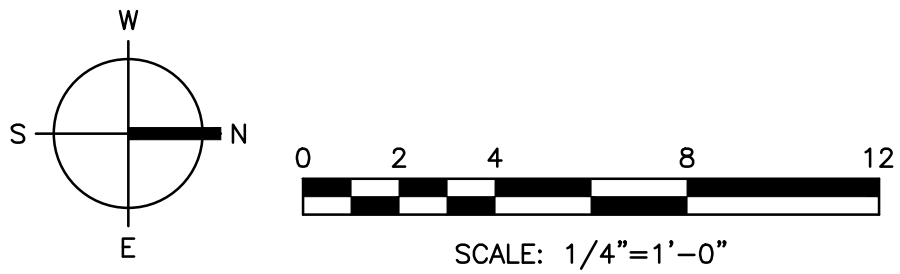


HHS -PARTIAL EXISTING ROOF PLAN - NEW WORK

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NOTES:

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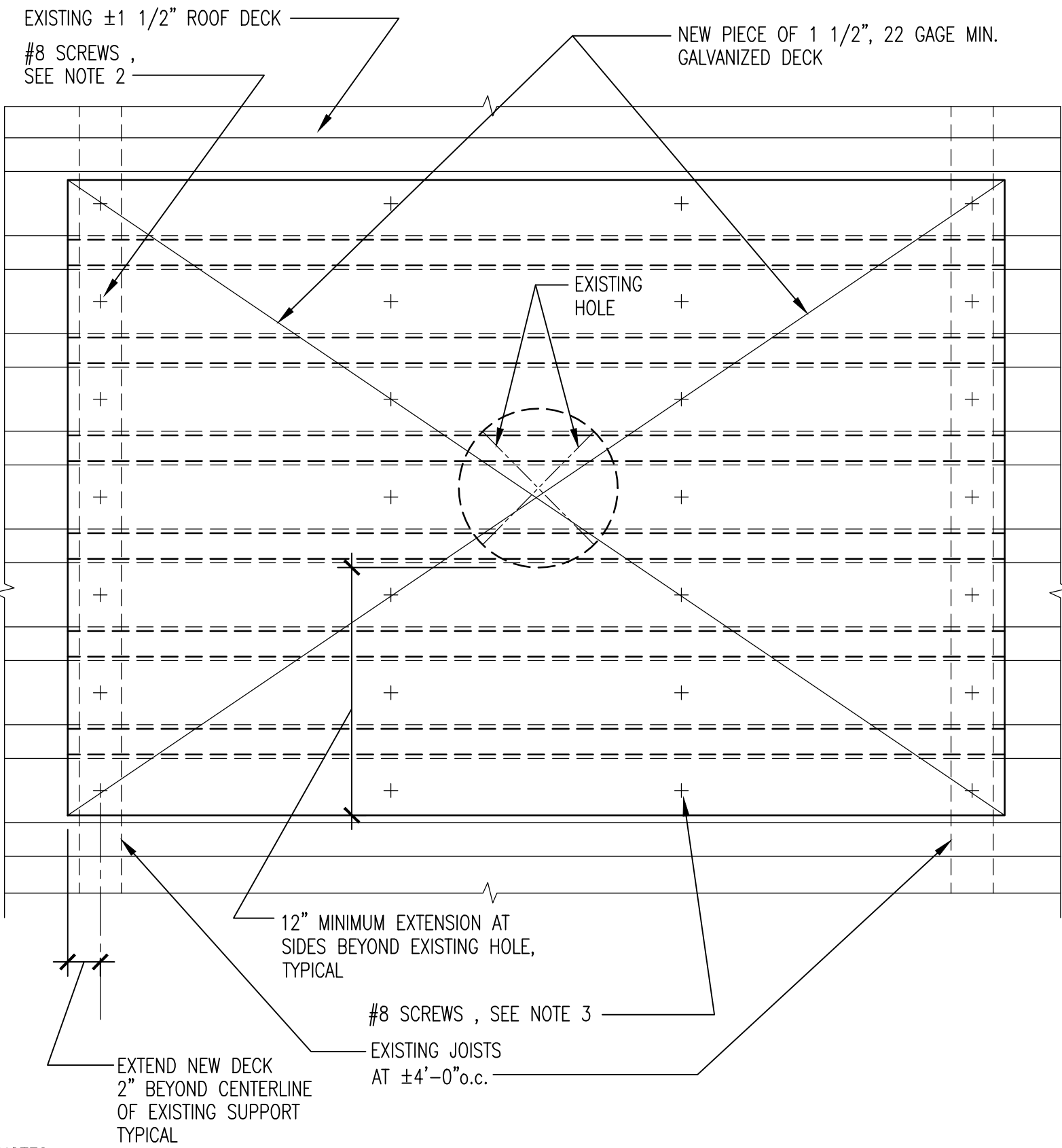
- 1.) IF HOLE DIAMETER EXCEEDS 12", INFILL PER B/S-1.

DECK PATCH DETAIL

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

A

S-1



NOTES:

- 1.) ADD NEW SECTION OF DECK AS SHOWN OVER THE EXISTING HOLE.
- 2.) SCREW NEW DECK TO EXISTING SUPPORTS AT 6" o.c.
- 3.) SCREW NEW DECK TO EXISTING DECK AT 18" o.c. MAX.

DECK PATCH DETAIL

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

B

S-1



Green Building Energy Engineers, LLC
Mechanical - Electrical - Plumbing

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rchacon@columbiaengineering.com

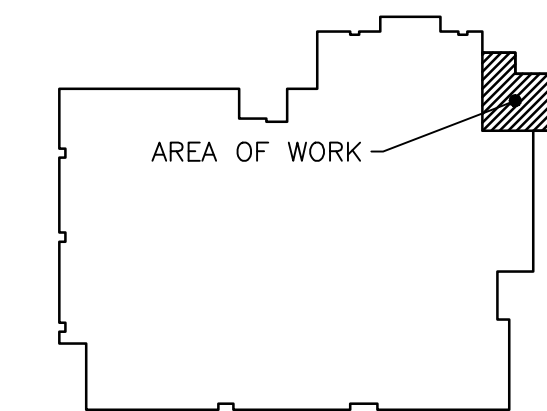
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Elliott City, MD 21042

KEY PLAN



01	CONSTRUCTION DOCUMENTS	07/11/14
NO.	DESCRIPTION	DATE

DRAWING

CHS/HHS PARTIAL
ROOF PLANS,
GENERAL NOTES, AND
DETAILS

DRAWN BY	MT
CHECKED BY	RC
PROJECT NO.	14014
SCALE	AS SHOWN
SHEET	

S-1

CEI#14091