CONCEPT NARRATIVE

For

ON-SITE HEATING PLANT

GRADY MEMORIAL HOSPITAL, ATLANTA, GA

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ENGINEER

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CONCEPTUAL PRICING NARRATIVE

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1. Introduction

Grady's existing remote boiler plant, which serves the Grady hospital including the Main Grady original building, A and B towers and the Clinics Building as well as the Children's Hospital and other free standing campus buildings has reached the end of its useful life and must be replaced. As an alternative to a direct replacement of the existing remote plant, Oakwell recommends that Grady construct an onsite plant which would consist of a separate condensing hot water boiler plant and a smaller medium pressure steam boiler plant all located within the penthouse of the Clinics Building. This option will improve efficiency, lower operating costs, eliminate the need to build a new central plant building, reserve open land and begin to move the hospital away from fossil fuel dependence.

2. General Scope of Work

A. Oakwell, engineer of record and project administrator, will develop full mechanical and electrical plans and specifications in collaboration with the selected mechanical contractor. Existing conditions will be scanned and a detailed 3-D model of existing conditions and new work will be developed for pricing and construction. Grady and Oakwell will select a mechanical contractor during the early design phase so that the design can be developed in collaboration with the mechanical contractor.

B. Under a Transparent Project Delivery (TPD) delivery method, Oakwell and its mechanical contractor partner will provide all work (design, general construction, mechanical and electrical) required for the construction of a new hot water and medium pressure steam boiler plant as described herein.

C. Construct a new medium pressure steam boiler plant within the existing Clinics Building 8th floor machine room. Demolish existing paint shop and relocate existing mechanical/electrical components as needed to make room for the new plant.

D. Construct new condensing hot water boiler plant within the existing Clinics Building 8th floor machine room. Replace existing steam to domestic hot water instantaneous heaters and demolish abandoned inertia base. In addition, raise the height of existing steam main and PRV stations within Clinics 8 to make room for new condensing HW boilers.

E. Install a new intermediate pressure (5 psi) natural gas service and riser to the Main Grady hospital building to serve the new dual fuel hot water boilers and steam boilers

F. Install a new 33,000 gallon direct buried fuel oil tank for the storage of back up fuel for the new HW and steam boilers. The new tank shall be installed near the existing direct buried generator fuel tank located on the Pratt Street side of the hospital. In addition, provide new dual transfer fuel oil pumps and fuel oil pipe risers to convey backup fuel to the new HW boilers and steam boilers. Oakwell has engaged the services of an Atlanta based civil engineer to assist in siting and designing the new tank.

G. Provide emergency electric power from equipment branch switchboards for boiler and related auxiliary power. Electrical power design is underway by Oakwell.

3. Medium Pressure Steam Boiler Plant

A. Furnish and install three (3) new dual fuel medium pressure steam boilers. New boilers shall be equal to Cleaver Brooks FLX-1850 with economizers. Boilers shall be factory built and ASME certified to produce 70 psig steam. Boilers shall include dual fuel modulating burners, electronic controls, gas train designed for 5 psig inlet natural gas, and exhaust gas economizers.

B. Provide a new Cleaver Brooks deaerator equipped with stainless steel tank, heating tube with steam regulator, feedwater controls, dual pumps with VFD speed control, electronic control package and skid to support all components.

C. Provide a new Cleaver Brooks condensate surge tank equipped with stainless steel tank, makeup water connection with level controls, dual pumps with VFD speed control, electronic control package and skid to support all components.

D. Provide new 24″ double wall stainless steel exhaust gas stacks for each boiler. Stack shall terminate 5′ above existing parapet. Provide penetration, flashing and guy wires.

E. Provide new medium pressure steam header piping, boiler steam connections and steam piping main between new header and existing hospital steam risers. Intercept risers on floor 6a. All new steam piping shall be schedule 40 steel with welded connections. Insulate with 3″ fiberglass pipe insulation and cover in ASJ.

F. Reestablish piping connection between the existing 8″ buried steam main which conveys steam to other campus buildings to the steam piping in the basement of Main Grady. This will allow temporary supply of steam to the remote buildings from the new Clinics steam plant.

G. Pipe all gas train and steam relief valves up through roof.

H. Provide new pumped steam condensate riser to convey condensate from the existing Grady basement steam room to the new medium pressure steam boiler plant condensate surge tank. Insulate riser with 2″ fiberglass pipe insulation. Provide anchoring and expansions loops/joints within shaft. Piping shall be Schedule 80 steel with welded joints.

I. Provide new pumped condensate Schedule 80 piping within new boiler room to interconnect surge tank, deaerator, boilers, etc. Insulate piping as required.

J. Provide blow down separator plant and all blowdown interconnect schedule 80 piping. Provide three new 4″ floor drains in space connected to existing sanitary piping system.

K. Provide a new flash tank, traps and piping to accept medium pressure condensate from drip traps in the plant.

L. Provide new water softener, chemical feed system and conductivity sensor for medium pressure boiler plant.

M. Provide new 3″ non-potable city water service for the boiler room.

N. Modify six existing outside air intake louvers in penthouse wall for combustion air and exhaust service. Provide new insulated sheet metal plenums and high and low automatic control dampers.

O. Provide two new 25,000 CFM ventilation fans with mixing boxes for boiler room ventilation. New fans and intake hoods shall be roof mounted. Unit shall be equal to Cook Model MRSE-D.

P. Provide two new hot water unit heaters for boiler room heating. Each heater shall be capable of producing 600 MBH of heat.

Q. Provide new natural gas intermediate pressure service and riser within existing Main Grady shaftway. New service piping shall be schedule 40 steel with welded fittings. Paint piping yellow.

R. Provide new natural gas horizontal piping between riser and new boilers.

S. Provide a new 33,000 gallon double wall fiberglass direct buried fuel oil tank on the Pratt Street side of the Main Grady Hospital complex. Provide double wall welded containment piping connecting new tank to a new fuel oil transfer pump system located in Main Grady basement. Each new transfer pump shall be capable of pumping 21 GPM at 100 psi of head. Install a new fuel oil supply riser, return riser all within welded containment piping within an existing Main Grady shaft. Extend double wall containment piping from riser to new boilers. New fuel oil supply piping shall be 2-1/2" and return line shall be 3". Provide a new fuel oil storage management system and leak detection system. Interconnect with building management system. Power new fuel oil transfer pumps from equipment branch emergency power panel.

T. Provide new 4" housekeeping pads for all new boiler plant equipment.

U. Provide a Delta Controls digital control system as an extension of the existing hospitals Delta control system to monitor and stage boilers and it's auxiliary equipment and combustion air systems. Provide Bacnet interface to new boiler controllers.

V. All required manufacturer's start-up and testing, system testing/balancing, and commissioning.

W. Provide emergency equipment branch electric power service derived from the Clinics Building emergency power system to power boilers, feedwater systems, combustion air systems and room lighting.

X. Provide a new boiler room lighting and fire protection systems. Extend fire protection coverage from the existing building wet system.

Y. Provide fire alarm heat detectors in room and integrate to existing fire alarm system.

4. Hot Water Boiler Plant

A. Furnish and install three (3) new dual fuel condensing hot water boilers to directly heat the hot water reheat loops within Main Grady and the Clinics Building. The existing steam to hot water reheat heat exchangers are located in Main Grady 7th floor and Clinics Building 8th floor. New boilers shall be equal to Cleaver Brooks Switch Fire SFC-12000. Boilers shall include dual fuel modulating burners, electronic controls, gas train designed for 5 psig inlet natural gas, and ducting to outdoors for closed combustion.

B. Provide three new primary hot water pumps equipped with variable frequence drive. Mount pumps upon inertial bases and provide pump piping accessories. Each new pump shall be rated for 1,575 GPM at 60′ of head with a 40 HP motor and variable frequency drive. Power pumps from an equipment branch emergency power feed.

C. Provide new welded schedule 40 steel hot water distribution piping to interconnect new boilers to the existing hot water reheat systems located within Main Grady 7 and Clinics 8. Insulate piping with 2.5″ fiberglass insulation and ASJ.

D. Provide new double wall stainless steel exhaust stack per boiler that extends up through roof of mechanical room. Provide penetration, thimble, flashing, and guy wires. Terminate stack 10′ above roof.

E. Provide two ventilation fans with mixing dampers for room ventilation. Each fan shall be rated for 15,000 CFM. Fan shall be equal to Cook Model MRSE-D.

F. Extend natural gas and fuel oil piping to the new HW boilers from the new risers.

G. Provide new 4″ housekeeping pads for all new boiler plant equipment.

H. Provide a Delta Controls digital control system as an extension of the existing hospital's Delta control system to monitor and stage boilers and it's auxiliary equipment and combustion air systems. Provide Bacnet interface to new boiler controllers.

I. All required manufacturer's start-up and testing, system testing/balancing, and commissioning.

J. Provide emergency equipment branch electric power service derived from the Clinics Building emergency power system to power boilers, HW pumps, combustion air systems and room lighting.

K. Provide a new boiler room lighting and fire protection systems. Extend fire protection coverage from the existing building wet system.

L. Provide fire alarm heat detectors in room and integrate to existing fire alarm system.

5. Code, Laws and Standards for Mechanical, Electrical and Plumbing

1. GENERAL REQUIREMENTS FOR ALL TRADES

   a. Applicable sections of the most current edition of the Georgia State Building Code and all referenced codes and standards shall be adhered to. Contractors shall be responsible for providing and filing all plans, pay all fees and secure all permits, inspections and approvals for legal installation and operation of the system and/or equipment furnished. All work shall be performed per applicable national, state and local codes, laws, and ordinances, latest issue in effect at time of bidding or as stated. The following is a list of applicable industry standard organizations that all work shall adhere to:

      i. Air Movement and Control Association (AMCA)

      ii. American National Standards Institute (ANSI)

      iii. American Society of Heating, Refrigerating & Air Conditioning Engineers (ASHRAE)

      iv. Air Conditioning and Refrigeration Institute (ARI)

      v. American Society of Mechanical Engineers (ASME)

      vi. American Society for Testing and Materials (ASTM)

      vii. City of Atlanta Inspectional Services Department requirements

      viii. City of Atlanta Fire Department requirements

      ix. City of Atlanta Water Department requirements

      x. CDC Guides for control and maintenance of aseptic practices for mechanical systems in Health Care Occupancy.

      xi. Environmental Protection Agency (EPA)

      xii. Factory Mutual (FM)

      xiii. International Codes (Plumbing, Fire Protection, Mechanical, Electrical Energy Conservation, & Seismic Restraint)

      xiv. Institute of Electrical and Electronic Engineers (IEEE)

      xv. Georgia State Building Code, latest edition

      xvi. Georgia State Plumbing and Fuel Gas Code

      xvii. National Electrical Code (NEC)

      xviii. National Electrical Manufacturer's Association (NEMA)

      xix. National Electrical Testing Association (NETA)

xx. National Grid Standards and Requirements

xxi. National Fire Protection Association Codes, NFPA 13 – Installation of Sprinkler Systems; NFPA 24 – Installation of Private Fire Service Mains; NFPA 25 – Inspection, Testing and Maintenance of Water Based Fire Protection Systems, and other appropriate sections.

xxii. NICET – National Institute of Certified Engineering Technology

xxiii. Occupational Safety and Health Act (OSHA)

xxiv. Owners Insurance Company

xxv. Grady HealthCare Systems mechanical standards.

xxvi. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

PIPING LEGEND

	LPS EXISTING PIPING
	MPS EXISTING PIPING
	HPS EXISTING PIPING
	IPNG NEW PIPING
	MPS NEW PIPING
	HWS NEW PIPING
	HWR NEW PIPING
	PC NEW PIPING
	BALANCING VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE W/ 2-POSITION ACTUATOR
	BUTTERFLY VALVE W/ MODULATING ACTUATOR
	GATE VALVE
	DIRECTION OF FLOW

EQUIPMENT LEGEND

	EXISTING EQUIPMENT
	NEW EQUIPMENT
	IN-LINE PUMP EXISTING
VFD	VARIABLE FREQUENCY DRIVE EXISTING
	IN-LINE PUMP NEW
VFD	VARIABLE FREQUENCY DRIVE NEW

STEAM BOILER SCHEDULE

UNIT NO.	LOCATION	OUTPUT CAPACITY (BOILER HP)	GAS INPUT (CFH)	AVAILABLE GAS PRESSURE (PSIG)	OIL FIRING RATE (GPH)	DESIGN STEAM PRESSURE (PSIG)	OPERATING STEAM PRESSURE (PSIG)	BREECHING CONNECTION (IN.)	COMBUSTION AIR FAN MOTOR HP	AIR COMPRESSOR HP	OIL PUMP HP	SHIPPING WEIGHT (LBS)	OPERATING WEIGHT (LBS)	V/Ph/HZ	MANUFACTURER MODEL NO.	REMARKS
B-4	CLINICS 8TH FLOOR	450	18,598	5	132	125	70	24	–	–	–	–	28,750	480/3/60	CLEAVER BROOKS FLX-1850	
B-5	CLINICS 8TH FLOOR	450	18,598	5	132	125	70	24	–	–	–	–	28,750	480/3/60	CLEAVER BROOKS FLX-1850	
B-6	CLINICS 8TH FLOOR	450	18,598	5	132	125	70	24	–	–	–	–	28,750	480/3/60	CLEAVER BROOKS FLX-1850	

NOTES:
1. PROVIDE WITH PLC BURNER CONTROLS (BACNET INTERFACE), COMBUSTION FAN VFD, O2 TRIM PARALLEL POSITIONING, GRAPHIC INTERFACE AND PLATFORM WITH LADDERS (NOT REQUIRED FOR B-4 & B-5). FUEL OIL PUMPS (B-1, 2 & 3 ONLY) SHALL BE FACTORY MOUNTED & WIRED. O2 SENSOR SHALL BE FURNISHED BY FACTORY TO BE FIELD INSTALLED BY MC. DRAFT CONTROLS FOR B-1, 2, 3 SHALL BE FURNISHED BY FACTORY AND FIELD INSTALLED BY MC. ALL BOILERS PROVIDED WITH SINGLE POINT POWER CONNECTION.

HOT WATER BOILER SCHEDULE

UNIT NO.	SERVICE	LOCATION	TYPE	OUTPUT CAPACITY (MBH)	NATURAL GAS		BURNER ELECTRICAL		OPERATING PRESSURE (PSIG)	WATER			MANUFACTURERS MODEL NO.	REMARKS
					INPUT CAPACITY (MBH)	MINIMUM INLET PRESSURE (IN. W.C.)	FLA	V/Ø/Hz		ENT. (°F)	LVG. (°F)	GPM		
B-1	HW	CLINICS 8TH FLOOR	CONDENSING	10,500	12,000	5	–	480/3/60	150	160	180	1,050	CLEAVER BROOKS SFC-12000	
B-2	HW	CLINICS 8TH FLOOR	CONDENSING	10,500	12,000	5	–	480/3/60	150	160	180	1,050	CLEAVER BROOKS SFC-12000	
B-3	HW	CLINICS 8TH FLOOR	CONDENSING	10,500	12,000	5	–	480/3/60	150	160	180	1,050	CLEAVER BROOKS SFC-12000	

NOTES

STEAM CONDENSATE SURGE TANK SCHEDULE

UNIT NO.	LOCATION	VOLUME (GAL.)	NO. OF PUMPS	TRANSFER PUMP							MAKE-UP WATER %	LOW TEMP. PUMPED CONDENSATE %	MANUFACTURER MODEL NO.	REMARKS
				GPM	PRESS. PSI	NPSH	V	ø	HZ	HP	RPM				
CR-1	CLINICS 8	900	2	250	15	–	480	–	–	–	–	25	–	CLEAVER BROOKS CB-900	

NOTE:
1. EQUIPMENT PROVIDED WITH SINGLE POINT POWER CONNECTION.

DEAERATOR SCHEDULE

UNIT NUMBER	SERVICE	LOCATION	CAPACITY #/HR	STORAGE CAPACITY		BOILER FEED PUMPS									OPERATING PRESSURE (PSIG)	% MAKE-UP WATER	% LOW PRESSURE RETURNS	MANUFACTURER MODEL NO.	REMARKS
				MINS	GALLONS	NO.	GPM	PRESS. PSI	NPSH	V	ø	HZ	HP	RPM					
DA-1	LPS	CLINICS 8	38,000		840	3	55	90	–	480	–	–	–	–	12	–	–	CLEAVER BROOKS DA-45-840	

NOTE:
1. EQUIPMENT PROVIDED WITH SINGLE POINT POWER CONNECTION.

ABBREVIATIONS

AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ARCH.	ARCHITECT
ATC	AUTOMATIC TEMPERATURE CONTROL
BHP	BRAKE HORSEPOWER
BLDG.	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
CC	COOLING COIL
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CO	CLEAN-OUT
COL.	COLUMN
COND.	CONDENSATE
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME/CONTROL VALVE
D	DRAIN
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DDCFP	DIRECT DIGITAL CONTROL FIELD PANEL
DIA.	DIAMETER
DIM.	DIMENSION
DIV.	DIVISION
DN	DOWN
DOV	DRAIN OFF VALVE
DX	DIRECT EXPANSION
EA.	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EFF.	EFFICIENCY
EF	EXHAUST FAN
ELEV.	ELEVATION
EMS	ENERGY MANAGEMENT SYSTEM
ER	EXHAUST REGISTER
ES	END SWITCH
ET	EXPANSION TANK
E.T.R.	EXISTING TO REMAIN
EWT	ENTERING WATER TEMPERATURE
EXH.	EXHAUST
EXP.	EXPANSION
F	FAN
FA	FRESH AIR
FAHU	FRESH AIR HANDLING UNIT
FAI	FRESH AIR INTAKE
FCU	FAN COIL UNIT
FLEX.	FLEXIBLE CONNECTION
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FURN.	FURNISHED
FVNR	FULL VOLTAGE NON-REVERSING
GA.	GAUGE
GAL.	GALLONS
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
H	HUMIDIFIER
HC	HEATING COIL
HGT.	HEIGHT
HPC	HIGH PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM
Hz	HERTZ
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
KW	KILOWATT
LxWxH	LENGTH x WIDTH x HEIGHT
LAT	LEAVING AIR TEMPERATURE
LF	LINEAR FEET
LPC	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH.	MECHANICAL
MEZZ.	MEZZANINE
MFR.	MANUFACTURER
MIN.	MINIMUM OR MINUTES
MPC	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM
MUW	MAKE-UP WATER
N/A	NOT APPLICABLE OR NOT AVAILABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NO.	NUMBER
NPCW	NON-POTABLE CITY WATER
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
P	PUMP
PC	PUMPED CONDENSATE
PD	PRESSURE DROP
PHC	PREHEAT COIL
PLBG	PLUMBING
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
RA	RETURN AIR
RET.	RETURN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RL	REFRIGERANT LIQUID
RM.	ROOM
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
RV	PRESSURE RELIEF VALVE
SA	SUPPLY AIR
SATT	SOUND ATTENUATOR
SCH.	SCHEDULE
SF	SQUARE FEET
SP	STATIC PRESSURE
SPH	STATIC PRESSURE HIGH LIMIT
SPL	STATIC PRESSURE LOW LIMIT
SS	STAINLESS STEEL
TEMP.	TEMPERATURE
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TYP.	TYPICAL
UH	UNIT HEATER
V	VENT
VAV	VARIABLE AIR VOLUME BOX
W/	WITH
WB	WET-BULB TEMPERATURE
WMS	WIRE MESH SCREEN
XMTR	EMS TRANSMITTER

CALL-OUT SYMBOL LEGEND

	POINT OF CONNECTION– NEW TO EXISTING
	START/ENDPOINT OF DEMOLITION
	KEY NOTE
# / M#	DETAIL DESIGNATION SHEET NUMBER
S/R #	SUPPLY/RETURN RISER DESIGNATION
A-A / M#	SECTION DESIGNATION SHEET NUMBER
#	REVISION NUMBER
XX CFM	AIR DEVICE ID TAG CFM RATING
XXXX XXXX	EQUIPMENT ID TAG
XXXX XXXX XXXX	EQUIPMENT ID TAG
	CALLED NORTH

GENERAL NOTES

1. GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO ALL M SERIES DRAWINGS. SOME SYMBOLS OR ABBREVIATIONS MAY NOT BE APPLICABLE.
2. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS AS SPECIFIED.
3. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
4. THE MC SHALL BE REQUIRED TO READ THE SPECIFICATIONS AND REVIEW THE DRAWINGS FOR ALL DIVISIONS OF WORK. THE MC SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE WORK OF THIS SECTION AND THE WORK OF ALL OTHER DIVISIONS OF WORK ASSOCIATED WITH THE PROJECT.
5. ALL TESTING SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT, DUCTWORK OR PIPING INSULATION IS APPLIED.
6. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS PRIOR TO FABRICATION.
7. ALL CONTROL WIRE SHALL COMPLY THE THE NATIONAL ELECTRIC CODE AND DIVISION SPECIFICATIONS.
8. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION. DO NOT SCALE THE DRAWINGS.
9. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION.
10. LOCATIONS AND SIZES OF ALL FLOOR AND WALL OPENINGS SHALL BE COORDINATED WITH ALL TRADES INVOLVED.
11. UNLESS OTHERWISE NOTED, ALL HOT WATER BRANCH RUNOUTS TO EQUIPMENT SHALL BE 3/4" IN SIZE.
12. PROVIDE AN AIR VENT AT THE HIGH POINT AND DRAIN AT LOW POINT FOR ALL WATER SERVICES. ALL PIPING SHALL PITCH TO LOW POINTS.
13. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
14. ALL BALANCING VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS). ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE FINAL CONNECTIONS TO EQUIPMENT AND CONTROLS.
15. ISOLATION VALVES IN PIPING SYSTEMS ARE NOT SHOWN ON PLANS (FOR CLARITY) BUT ARE REQUIRED AT ALL PIPING BRANCHES AND CONNECTIONS TO EQUIPMENT.
16. PROVIDE AT LEAST THREE-ELBOW SWING FOR PIPE TAKEOFFS TO TERMINAL EQUIPMENT.
17. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE FINAL CONNECTIONS TO EQUIPMENT AND CONTROLS.
18. PITCH STEAM PIPING DOWNWARD IN THE DIRECTION OF FLOW 1/4" IN 10 FEET (1" IN 40 FEET) MINIMUM. PITCH ALL LOW PRESSURE STEAM CONDENSATE LINES DOWNWARD IN THE DIRECTION OF FLOW 1/2" IN 10 FEET (1" IN 10 FEET) MINIMUM.
19. PITCH UP ALL STEAM AND CONDENSATE BRANCH RUNOUTS TO RISERS AND EQUIPMENT 1/2" PER FOOT, WHERE THIS PITCH CANNOT BE OBTAINED, RUNOUTS SHALL BE ONE SIZE LARGER THAN INDICATED ON PLAN.
20. TAP ALL BRANCH RUNOUTS FROM TOP OF STEAM MAINS (45° PREFERRED, 90° ACCEPTABLE).
21. PROVIDE LINE SIZE STRAINER UPSTREAM OF EACH AUTOMATIC CONTROL VALVE. PROVIDE SHUTOFF VALVE ON EACH SIDE OF STRAINER.
22. PROVIDE AN END OF MAIN DRIP AT EACH RISE IN THE STEAM MAIN. PROVIDE CONDENSATE DRIPS AT THE BOTTOM OF ALL STEAM RISERS; DOWNFED BRANCH RUNOUTS TO EQUIPMENT, ETC.; AT END OF MAINS AND LOW POINTS; AND AHEAD OF ALL PRESSURE REGULATORS AND CONTROL VALVES. STEAM TRAPS SHALL BE MINIMUM 3/4" IN SIZE.
23. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.
24. ALL DUCTWORK AND PIPING WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTWORK AND PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
25. VOLUME DAMPERS IN DUCT SYSTEMS ARE NOT SHOWN IN EVERY INSTANCE ON PLANS (FOR CLARITY) BUT ARE REQUIRED AT ALL LOW PRESSURE DUCT BRANCHES TO INDIVIDUAL REGISTERS, GRILLES, DIFFUSERS, AND WMS OUTLETS. VOLUME DAMPERS INSTALLED ABOVE HARD CEILINGS SHALL BE EQUIPPED WITH REMOTE CONTROLLED OPERATORS. VOLUME DAMPERS SHALL BE LOCATED AT BRANCH DUCT CONNECTIONS TO DUCT MAINS, AND AS FAR FROM AIR OUTLETS AS POSSIBLE.
26. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC. ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY AT A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENT OF SUCH ITEMS.
27. ALL DUCTWORK DIMENSIONS AS SHOWN ON THE DRAWINGS ARE INTERNAL CLEAR DIMENSIONS.
28. PROVIDE ALL 90 DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE NOTED. ELBOWS IN ALL OTHER LOCATIONS SHALL BE SMOOTH UNVANED RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1-1/2 TIMES THE WIDTH OF THE DUCT.
29. COORDINATE EXACT REGISTER, GRILLE AND DIFFUSER LOCATIONS WITH THE ARCHITECTURAL CEILING PLAN.
30. LOCATE ALL MECHANICAL EQUIPMENT (VAVS) FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS AND VALVING.
31. PROVIDE FLEXIBLE DUCT CONNECTIONS IN ALL DUCTWORK SYSTEMS CONNECTED TO FANS, AND OTHER EQUIPMENT REQUIRING VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT.
32. UNLESS OTHERWISE NOTED, ALL DUCTWORK SHALL BE INSTALLED OVERHEAD TIGHT TO UNDERSIDE OF STRUCTURE WITH SPACE FOR INSULATION AS REQUIRED.
33. PROVIDE THERMALLY INSULATED DUCT MOUNTED ACCESS DOORS FOR ALL FIRE DAMPERS, MOTORIZED DAMPERS, ETC. REQUIRING PERIODIC INSPECTION. CONTRACTOR SHALL DEMONSTRATE PROPER ACCESS AT EACH ACCESS DOOR TO ADEQUATELY SERVICE SYSTEM COMPONENTS.
34. IN AREAS OF WORK WHERE EXISTING ACT IS TO REMAIN, MC SHALL BE RESPONSIBLE FOR REMOVING AND REINSTALLING EXISTING ACT, DAMAGED ACT OR GRID SHALL BE REPLACED WITH NEW TO MATCH EXISTING.
35. OWNER SHALL BE RESPONSIBLE FOR ACM TESTING AND REMOVAL IN ALL AREAS OF WORK, IN COMPLIANCE WITH OSHA.
36. PROVIDE FIRE DAMPERS OR SMOKE/FIRE DAMPERS AND ASSOCIATED ACCESS PANELS WHERE SHOWN ON DRAWINGS, WHERE REQUIRED BY NFPA 90A, AND WHERE THE ARCHITECTURAL DRAWINGS INDICATE 2 HOUR FIRE RATED CONSTRUCTION. DUCTS THAT PENETRATE FIRE WALLS, FLOORS, OR RATED CONSTRUCTION SHALL HAVE SLEEVES WHERE PENETRATIONS ARE NOT PERPENDICULAR TO SURFACE PENETRATED. ENCLOSE DAMPERS IN 10 GAUGE STEEL SLEEVE.
37. ALL HVAC UNITS, DISTRIBUTION EQUIPMENT AND ASSEMBLIES SHALL BE FACTORY WARRANTED FOR PARTS AND LABOR FOR A PERIOD OF ONE (1) YEAR AFTER SUBSTANTIAL COMPLETION. ALL WARRANTIES FOR HVAC EQUIPMENT AND COMPONENTS SHALL BE TRANSFERRED TO THE OWNER.
38. ALL DUCT TAKEOFFS SHALL BE FLARED.
39. ALL THERMOSTAT/HUMIDISTAT MOUNTING LOCATIONS, TYPE AND HEIGHTS SHALL BE APPROVED BY THE OWNER PRIOR TO INSTALLATION.
40. ALL WORK IN OCCUPIED AREAS SHALL BE CLOSELY COORDINATED WITH OWNER AND MUST BE CONDUCTED DURING NIGHTS AND WEEKENDS.
41. SPACE ABOVE CEILINGS ARE EXTREMELY TIGHT IN MOST AREAS AND REQUIRES COORDINATION WITH ALL TRADES AND CEILING HEIGHTS. USE PLENUM BOXES AS NECESSARY FOR GRILLE/DIFFUSER CONNECTIONS. REFER TO SHEET M602 FOR PLENUM BOX DETAIL.
42. DO NOT ROUTE DUCTWORK/PIPING OVER ELECTRICAL PANELS. COORDINATE WITH ELECTRICAL CONTRACTOR.
43. DO NOT LOCATE ANY DAMPERS ABOVE PATIENT TOILET ROOMS.
44. WHERE PNEUMATIC DEVICES ARE REMOVED, THIS CONTRACTOR SHALL REMOVE ALL PNEUMATIC PIPING BACK TO NEAREST AIR MAIN AND PLUG FOR NO AIR LEAKAGE.
45. ALL SYSTEM SHUTDOWN SHALL BE SCHEDULED WITH THE FACILITIES ENGINEER A MINIMUM OF 96 HOURS IN ADVANCE. CONFIRM TIME WITH FACILITIES ENGINEER.
46. MECHANICAL CONTRACTOR SHALL CLEAN UP CONSTRUCTION DEBRIS DURING AND AFTER MECHANICAL EQUIPMENT DEMOLITION.
47. MECHANICAL CONTRACTOR SHALL DISPOSE OF DEMOLISHED MECHANICAL EQUIPMENT AND COORDINATE WITH THE CONSTRUCTION MANAGER.
48. PRIOR TO START OF DEMOLITION WORK, MECHANICAL CONTRACTOR SHALL VERIFY WITH ELECTRICAL CONTRACTOR THAT POWER FEEDS AND CONTROL WIRING HAVE BEEN DISCONNECTED AND LOCKED OUT FROM MECHANICAL EQUIPMENT WHICH IS TO BE REMOVED.
49. MECHANICAL CONTRACTOR SHALL REPAIR OR REPLACE ANY DUCT OR PIPING INSULATION DAMAGED DURING DEMOLITION WORK.
50. WHERE DUCTWORK OR PIPING IS REMOVED TO A MAIN, CAP AT MAIN AIRTIGHT. FIELD VERIFY EXACT CONDITIONS. PROVIDE ALL MATERIALS AS REQUIRED. PROVIDE NEW/I VALVES AT MAINS AS REQUIRED TO ALLOW FOR WORK.
51. MECHANICAL CONTRACTOR TO COORDINATE HW/S/R PIPE ROUTING TO ALLOW FOR ADEQUATE MAINTENANCE ACCESS TO TERMINAL BOXES.

EACH BLOCK REPRESENTS ONE FOOT IN THE SCALE INDICATED

REV.	DESCRIPTION	DATE

OAKWELL

TITLE: CONCEPT MECHANICAL LEGENDS, SCHEDULES AND GENERAL NOTES

CLIENT: GRADY HOSPITAL ATLANTA, GA

PROJECT: MAIN CAMPUS ON-SITE BOILER PLANT

CONCEPT

SCALE:	NTS
DATE:	7/9/2025
DRAWN BY:	LJH
REVIEWED BY:	JN
JOB NUMBER:	

DRAWING NO. M1

OPEN SHAFT SPACE FOR NEW RISERS

EXISTING MAIN GRADY HEAT EXCHANGERS LOCATED IN 7TH FLOOR MER BENEATH COOLING TOWERS (TYP)

NEW 8" MPS BETWEEN CLINICS AND MAIN GRADY

10" HWS/R BETWEEN CLINICS & MAIN GRADY

RAISE EXISTING STEAM MAIN & PRV LOCATED HERE TO MAKE ROOM FOR NEW BOILERS

HW PUMP PER NARRATIVE (TYP. 3)

EXISTING DOMESTIC WATER HEATERS TO BE REPLACED LOCATED HERE CURRENTLY

EXISTING CLINICS STEAM TO HW HEAT EXCHANGERS TO BE REMOVED

MODIFY LOUVER PER NARRATIVE (TYP. 6)

REPLACE LOUVERS IN THE OUTSIDE AIR PLENUM

KEY NOTES
1) ALL NEW EQUIPMENT SHALL BE MOUNTED UPON NEW 4" HOUSEKEEPING PADS

EIGHTH FLOOR KEYPLAN

EACH BLOCK REPRESENTS ONE FOOT IN THE SCALE INDICATED

REV.	DESCRIPTION	DATE

OAKWELL

TITLE: ON-SITE BOILER PLANT 8TH FLOOR CONCEPT PLAN

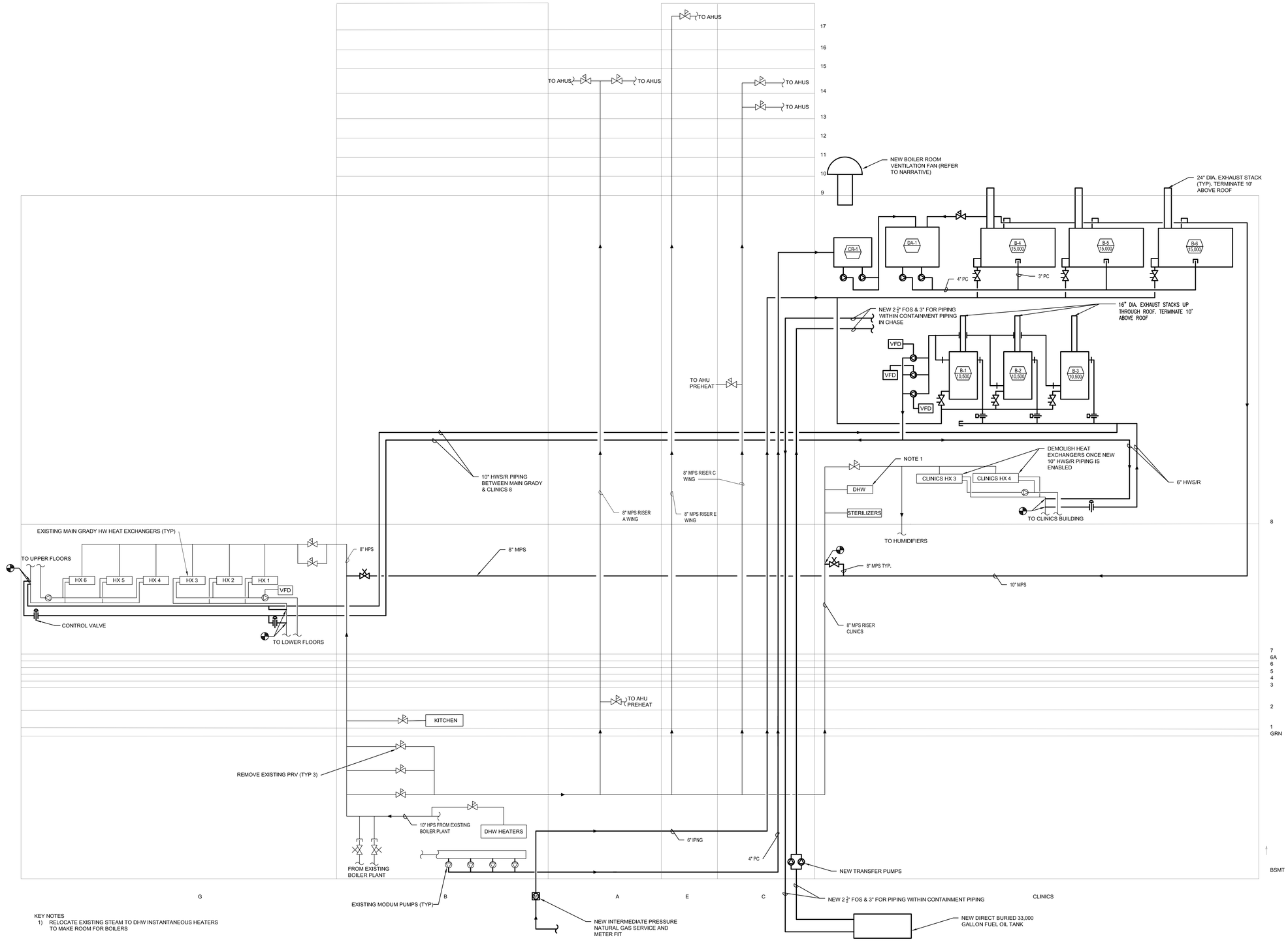
CLIENT: GRADY HOSPITAL ATLANTA, GA

PROJECT: MAIN CAMPUS ON-SITE BOILER PLANT

CONCEPT

SCALE:	3/32"=1'
DATE:	7/9/2025
DRAWN BY:	LJH
REVIEWED BY:	JN
JOB NUMBER:	

DRAWING NO. M2



KEY NOTES
1) RELOCATE EXISTING STEAM TO DHW INSTANTANEOUS HEATERS TO MAKE ROOM FOR BOILERS

EACH BLOCK REPRESENTS ONE FOOT IN THE SCALE INDICATED

REV.	DESCRIPTION	DATE

OAKWELL

TITLE: STEAM, HOT WATER & NATURAL GAS CONCEPT RISER DIAGRAM

CLIENT: GRADY HOSPITAL ATLANTA, GA

PROJECT: MAIN CAMPUS ON-SITE BOILER PLANT

CONCEPT

SCALE:	1/4"=1'-0"
DATE:	7/9/2025
DRAWN BY:	LJH
REVIEWED BY:	JN
JOB NUMBER:	

DRAWING NO.

M3