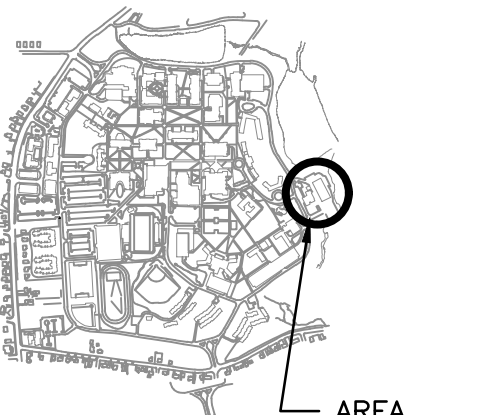


THE COLLEGE OF NEW JERSEY

EWING, NJ

COGENERATION PLANT HEAT RECOVERY STEAM GENERATOR RENEWAL ISSUED FOR BID - MAY 31, 2019

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No. Date Revision

Burns
Burns Engineering, Inc. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

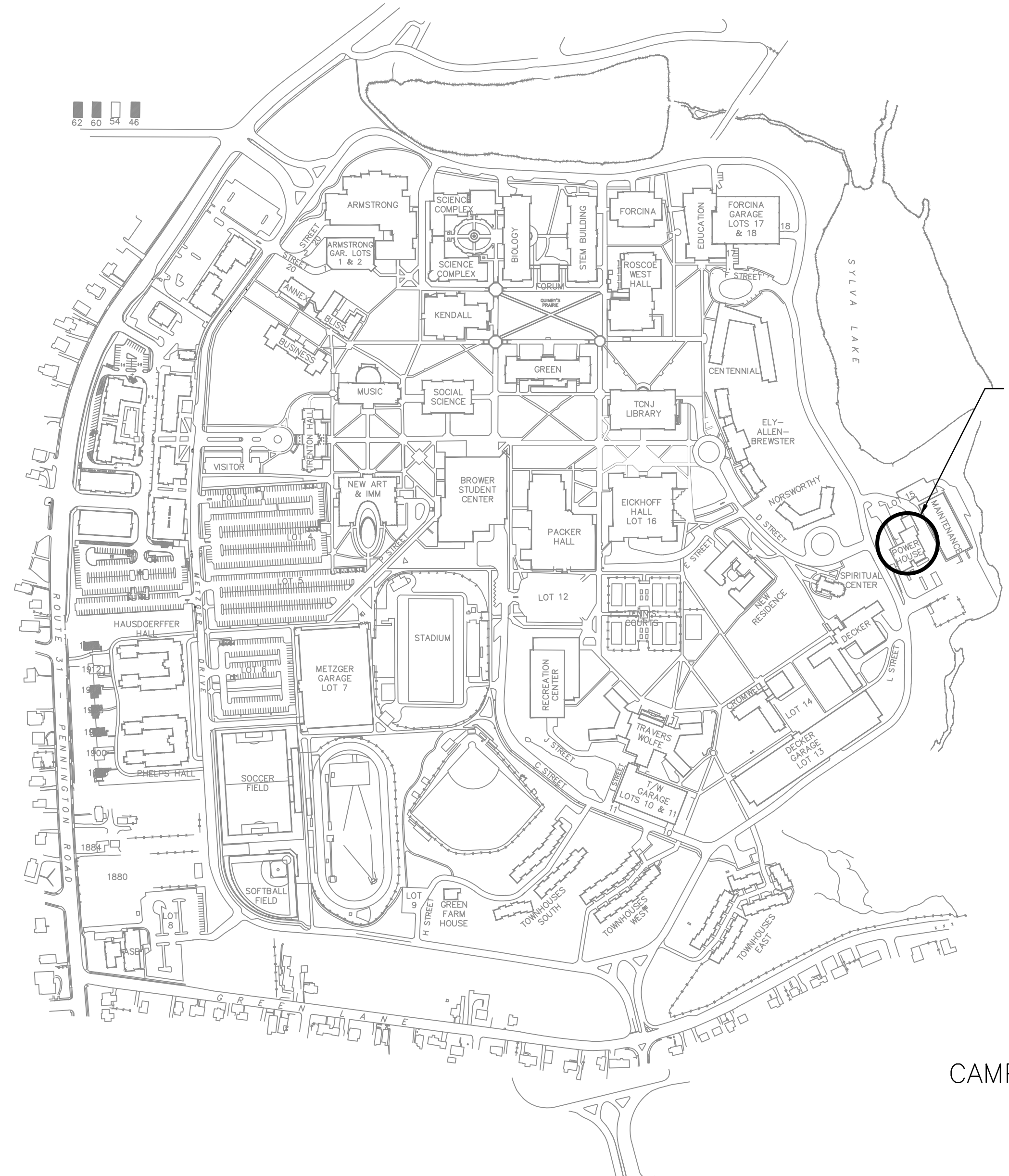
Drawing Title:
COVER SHEET

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

CS-001

ISSUED FOR BID

DRAWING LIST							
Sheet Title	Sheet Description	BASE	ALT. 1 (NOT USED)	ALT. 2 (ADD)	ALT. 3 (ADD)	ALT. 4 (ADD)	ALT. 5 (NOT USED)
GENERAL							
CS-001	COVER SHEET	X		X	X	X	
G-001	GENERAL NOTES	X		X	X	X	
ARCHITECTURAL							
A-001	ROOFING GENERAL NOTES	X		X	X		
A-101	ROOF PLAN – DEMOLITION	X		X	X		
A-102	ROOF PLAN – NEW WORK	X		X	X		
A-501	ROOFING DETAILS	X		X	X		
STRUCTURAL							
S-001	GENERAL STRUCTURAL NOTES	X		X	X	X	
S-101	ROOF PLAN – DEMOLITION AND NEW WORK	X		X	X		
S-102	OPERATING FLOOR PLAN – NEW WORK	X		X		X	
S-501	STRUCTURAL DETAILS	X		X	X	X	
MECHANICAL							
M-001	MECHANICAL NOTES, ABBREVIATIONS & SYMBOLS	X		X	X	X	
M-101	PIPING & INSTRUMENTATION DIAGRAMS – DEMOLITION –1–	X					
M-102	PIPING & INSTRUMENTATION DIAGRAMS – DEMOLITION –2–	X					
M-103	PIPING & INSTRUMENTATION DIAGRAMS – DEMOLITION –3–			X			
M-104	PIPING & INSTRUMENTATION DIAGRAMS – DEMOLITION –4–					X	
M-105	PIPING & INSTRUMENTATION DIAGRAMS – NEW WORK –1–	X					
M-106	PIPING & INSTRUMENTATION DIAGRAMS – NEW WORK –2–	X		X			
M-107	PIPING & INSTRUMENTATION DIAGRAMS – NEW WORK –3–			X			
M-108	PIPING & INSTRUMENTATION DIAGRAMS – NEW WORK –4–			X			
M-109	PIPING & INSTRUMENTATION DIAGRAMS – NEW WORK –5–						X
M-201	GENERAL ARRANGEMENT – DEMOLITION	X		X		X	
M-202	GENERAL ARRANGEMENT – NEW WORK	X		X		X	
M-203	OPERATING FLOOR PLAN – LOWER LEVEL – DEMOLITION	X		X		X	
M-204	OPERATING FLOOR PLAN – UPPER LEVEL – DEMOLITION	X		X		X	
M-205	OPERATING FLOOR PLAN – LOWER LEVEL – NEW WORK	X		X		X	
M-206	OPERATING FLOOR PLAN – UPPER LEVEL – NEW WORK	X		X		X	
M-207	ROOF PLAN – DEMOLITION				X		
M-208	ROOF PLAN – NEW WORK				X		
M-401	SECTIONS –1–	X					
M-402	SECTIONS –2–	X					
M-403	SECTIONS –3–	X					
M-501	DETAILS			X		X	
M-601	MECHANICAL EQUIPMENT SCHEDULES	X		X	X	X	
INSTRUMENTATION							
I-101	CONTROL SYSTEM ARCHITECTURE & INTERCONNECTION DIAGRAM	X		X			
I-102	GENERAL ARRANGEMENT – NEW WORK	X		X			
I-103	SECTIONS	X					
FIRE PROTECTION							
FP-001	GENERAL NOTES, ABBREVIATIONS AND LEGEND	X		X			
FP-101	OPERATING FLOOR PLAN – DEMOLITION	X		X			
FP-102	OPERATING FLOOR PLAN – NEW WORK	X		X			
ELECTRICAL							
E-001	ELECTRICAL ABBREVIATIONS, LEGEND AND NOTES	X		X	X	X	
E-100	ROOF PLAN – DEMOLITION AND NEW WORK	X			X		
E-101	OPERATING FLOOR PLAN – DEMOLITION	X		X		X	
E-201	OPERATING FLOOR PLAN – NEW WORK	X		X		X	
E-301	SINGLE LINE DIAGRAMS	X		X	X		



AREA OF WORK
(POWERHOUSE OFF METZGER DRIVE ON TCNJ CAMPUS
LOCATED AT 2000 PENNINGTON ROAD, EWING NJ 08628)

TCNJ
CAMPUS MAP

KEY PLAN

GENERAL NOTES

- 1. PROJECT SCHEDULE
1.1. THIS PROJECT IS TO BE PERFORMED WITH A DOUBLE SHIFT (REGULAR SHIFT AND SECOND SHIFT).
2. ALTERNATE PRICING
2.1. ALTERNATE No. 1 - NOT USED:
2.2. ALTERNATE NO. 2 - ADD:
2.3. ALTERNATE NO. 3 - ADD:
2.4. ALTERNATE NO. 4 - ADD:
2.5. ALTERNATE NO. 5 - NOT USED:
3. GENERAL
3.1. PROVIDE DEMOLITION, RELOCATION, AND ALTERATION OF THE MECHANICAL FACILITIES AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN.
3.2. WORK TO BE DONE UNDER THIS CONTRACT IS SHOWN BY HEAVY LINES AND/OR IDENTIFIED BY NOTES ON THE CONTRACT DRAWINGS AND SPECIFIED IN CONTRACT SPECIFICATIONS.
3.3. WORK RELATED TO THE BASE SCOPE OF THIS PROJECT SHALL INCLUDE FURNISHING AND INSTALLATION OF BUT NOT BE LIMITED TO THE FOLLOWING:
3.3.1. NEW HEAT RECOVERY STEAM GENERATOR (HRSG)
3.3.2. NEW ECONOMIZER
3.3.3. NEW TURBINE EXHAUST DUCT
3.3.4. NEW CONTINUOUS BLOWDOWN TANK PACKAGE
3.4. VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD PRIOR TO PERFORMING WORK AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES AND CHANGES.
3.5. PERFORM TESTING ASSOCIATED WITH ALL EQUIPMENT AND PIPING INSTALLED UNDER THIS CONTRACT AS REQUIRED BY THE CONTRACT DOCUMENTS AND THE AHJ.
3.6. UNLESS SPECIFICALLY REQUIRED OTHERWISE, CONFORM TO THE MANUFACTURER'S STANDARDS AND RECOMMENDATIONS IN INSTALLING EQUIPMENT AND MATERIALS AND AS APPROVED BY THE ENGINEER.
3.7. COORDINATE WITH ALL TRADES FOR REMOVALS AND INSTALLATIONS.
3.8. THE CONTRACTOR SHALL APPLY FOR AND OBTAIN ALL REQUIRED PERMITS FOR THE CONSTRUCTION. CERTAIN PERMITS WILL NOT BE REQUIRED DUE TO THE OWNER'S CLASSIFICATION; COORDINATE WITH OWNERS' PROJECT MANAGER. THE OWNER (TCNJ) SHALL PAY FOR ALL PERMIT FEES.
3.9. IF THE CONTRACTOR IS UNSURE AS TO THE DISPOSITION OF ANY PORTION OF THE DEMOLITION, THE CONTRACTOR SHALL REQUEST CLARIFICATION IN WRITING, FROM OWNER(S) PROJECT MANAGER OR ENGINEER PRIOR TO REMOVAL. IN THE EVENT THAT THE CONTRACTOR REMOVES MATERIAL AND/OR EQUIPMENT NOT INTENDED FOR REMOVAL, THIS CONTRACTOR SHALL REPLACE THOSE MATERIAL AND/OR EQUIPMENT AT HIS EXPENSE.
3.10. WHERE EXISTING PIPING, WIRING, INSULATION OR EQUIPMENT TO REMAIN IS INADVERTENTLY DAMAGED OR DISTURBED, THE DAMAGED SECTION SHALL BE CUT, REMOVED AND REPLACED. THE NEW SECTION SHALL BE OF EQUAL CAPACITY AND QUALITY.
3.11. MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. MAINTAIN FIRE-PROTECTION FACILITIES IN SERVICE DURING DEMOLITION OPERATIONS. COORDINATE WITH THE OWNER(S) PROJECT MANAGER.
3.12. THE CONTRACTOR SHALL PERFORM ALL TORCH CUTTING IN ACCORDANCE WITH THE REQUIREMENTS OF OWNER(S) PROJECT MANAGER AND ITS INSURANCE UNDERWRITER. HOT WORK PERMITS ARE REQUIRED. COORDINATE WITH THE LOCAL FIRE MARSHALL.
3.12.1. ALL HOT WORK SHALL COMPLY WITH CHAPTER 35 (WELDING AND OTHER HOT WORK) OF THE INTERNATIONAL FIRE CODE (IFC-2015). ALL HOT WORK SHALL COMPLY WITH, BUT NOT BE LIMITED TO, THE FOLLOWING REQUIREMENTS:
3.12.1.1. HOT WORK EQUIPMENT SHALL BE IN GOOD WORKING ORDER.
3.12.1.2. HOT WORK SITE SHALL BE CLEAR OF COMBUSTIBLES OR COMBUSTIBLES SHALL BE PROTECTED.
3.12.1.3. SLAGS AND SPARKS SHALL BE CONTROLLED/MINIMIZED.
3.12.1.4. FLOORS SHALL BE KEPT CLEAN.
3.12.1.5. NO EXPOSED COMBUSTIBLES SHALL BE LOCATED ON THE OPPOSITE SIDE OF WALLS, PARTITIONS, CEILINGS, OR THE FLOOR BELOW.
3.12.1.6. FIRE WATCHES, WHERE REQUIRED, SHALL BE ASSIGNED.
3.12.1.7. APPROVED ACTIONS SHALL BE TAKEN TO PREVENT ACCIDENTAL ACTIVATION OF SUPPRESSION AND DETECTION EQUIPMENT.
3.12.1.8. FIRE EXTINGUISHERS, WITH VALID INSPECTIONS, SHALL BE PROVIDED BY THE CONTRACTOR AND BE ON LOCATION NEAR THE HOT WORK AREA.
3.13. CLEAN UP: ALL DEBRIS TO BE REMOVED AT END OF EACH WORK DAY. SITE SHALL BE MAINTAINED WITH GOOD WORK PRACTICES AS DEFINED BY OWNER OR ENGINEER. LEGALLY AND PROPERLY DISPOSE OF DEMOLISHED EQUIPMENT AND SPOILS.
3.14. STAGE SHUTDOWNS IN SUCH A MANNER THAT INTERRUPTIONS ARE KEPT TO A MINIMUM AND GIVE AT LEAST TEN BUSINESS DAYS ADVANCE NOTICE TO OWNER(S) PROJECT MANAGER PRIOR TO SHUTDOWNS. FURNISH AND INSTALL SIGNAGE TO NOTIFY BUILDING PERSONNEL OF SHUTDOWNS.
3.15. IF SHUTDOWNS OF ANY SYSTEM EXCEEDS EIGHT HOURS, TEMPORARY PIPING ARRANGEMENTS SHALL BE MADE TO ENSURE ALL SYSTEMS ARE OPERATIONAL AT THE END OF EACH WORK PERIOD.
3.16. ALL PIPING AND ACCESSORIES THAT IS EXISTING TO BE REMOVED SHALL BE REMOVED. ABANDONING IN PLACE IS AT THE SOLE DIRECTION OF OWNER(S) PROJECT MANAGER.
3.17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING AND SUBMITTING TO THE OWNER(S) PROJECT MANAGER AN OVERALL PROJECT CONSTRUCTION SCHEDULE AND PHASING PLAN. SUBMIT PLAN AT LEAST TWO WEEKS IN ADVANCE FOR REVIEW, COORDINATION AND APPROVAL. NO WORK SHALL BEGIN UNTIL AUTHORIZATION HAS BEEN RECEIVED IN WRITING.
3.18. SUBMIT WORK SCHEDULE FOR APPROVAL TEN BUSINESS DAYS IN ADVANCE TO THE ENGINEER BEFORE COMMENCING WORK AT THE NEXT LOCATION.
3.19. ALL CONTRACTOR EMPLOYEES SHALL BE 30 HOUR OSHA SAFETY TRAINED. IDENTIFICATION SHALL BE REQUIRED AND IS TO BE WORN EXPOSED AT ALL TIMES WHEN ON THE PROPERTY.
3.20. COGENERATION ROOM OPERATING FLOOR SHALL HAVE CODE REQUIRED FLOOR DRAINS, EGRESS DOOR(S), FIRE PROTECTION, LIGHTING, EMERGENCY FUEL CUT-OFF, ETC.
3.21. FURNISH AND INSTALL HOUSEKEEPING PADS, PENETRATION SLEEVES, FIREPROOFING, FIRE CAULKING AND APPURTENANCES FOR ALL INSTALLATIONS. REFER TO DRAWING DETAILS FOR REQUIREMENTS.
3.22. CONTRACTOR SHALL NOT BLOCK ANY MONITORING WELLS LOCATED ON SITE. DO NOT STORE OR STAGE ON TOP OF THE WELLS OR THEIR PADS.
3.23. CONTRACTOR SHALL MAINTAIN A CLEAN AND ORDERLY WORK SITE. THE OWNER'S (TCNJ) OPERATIONS STAFF OCCUPY THE BUILDING AND OPERATE THE EXISTING EQUIPMENT 24/7. SAFE ACCESS TO EXISTING EQUIPMENT SHALL BE MAINTAINED THROUGHOUT THE PROJECT.
4. ENVIRONMENTAL
4.1. THE OWNER IS RESPONSIBLE FOR THE TESTING OF AND LEAD. THE OWNER IS TO UTILIZE A SEPARATE PROJECT TO ADDRESS ANY ABATEMENT CONCERNS IN THE AREAS OF THE PROPOSED WORK PRIOR TO THE START OF CONSTRUCTION.
4.2. THE AREA SURROUNDING THE COGENERATION PLANT CONTAINS MONITORING WELLS. ACCESS TO THESE WELLS SHALL BE MAINTAINED THROUGHOUT THE PROJECT TO FACILITATE MONTHLY INSPECTIONS OF THE WELLS. WELL AREAS SHOULD BE AVOIDED TO PREVENT DAMAGE. THE CONTRACTOR SHALL PROTECT THESE EXISTING WELLS THROUGH THE USE OF PLATING, ETC., AS REQUIRED, TO PROTECT THE WELLS AND THEIR PADS DURING RIGGING, DELIVERIES, STORAGE OF EQUIPMENT, ETC. MATERIALS AND/OR EQUIPMENT SHALL NOT BE STORED ON THESE WELLS OR THEIR PADS.
4.3. THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL HAZARDOUS WASTE.

PROVIDE TESTING FOR ANY EQUIPMENT/MATERIAL THAT COULD REQUIRE HAZARDOUS WASTE PROCEDURES INCLUDING BUT NOT LIMITED TO THE EXISTING WATER TREATMENT SKID.

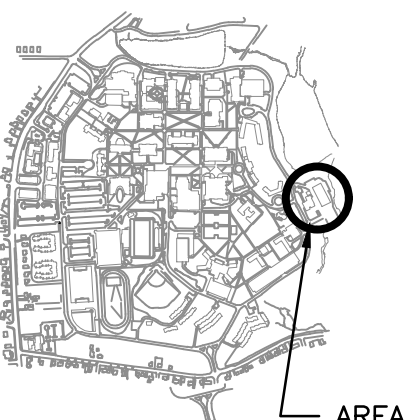
- 4.4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ONLY APPROPRIATE WASTEWATER ENTERS THE EXISTING SEWER SYSTEM DURING ALL CLEANING PROCEDURES, EQUIPMENT BLOWDOWNS, ETC. NO CHEMICALS SHALL BE RELEASED TO THE STORMWATER SYSTEM PER THE OWNER'S (TCNJ) EXISTING STORMWATER PERMIT.
4.1. CONFINED SPACE
4.1.1. PRIOR TO ENTERING ANY CONFINED SPACE, WHETHER A PERMIT REQUIRED CONFINED SPACE (PRCS) OR NON-PERMIT CONFINED SPACE, NOTIFY THE OWNER(S) PROJECT MANAGER FOR COORDINATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL APPROVAL OF ENTRY TO THE SPACE BY ANY PERSONNEL.
4.1.2. DO NOT ENTER ANY CONFINED SPACE (WHETHER PRCS OR NON-PERMIT CONFINED SPACE) WITHOUT AIR MONITORING. CONDUCT AIR MONITORING PRIOR TO ENTRY, AND CONTINUOUSLY UNTIL COMPLETION OF WORK IN THE CONFINED SPACE.
4.1.3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER (TCNJ) OF ANY CHANGES TO THE SPACE(S) AS A RESULT OF ANY NEW WORK.
4.1.4. CONTRACTOR SHALL BE RESPONSIBLE FOR TRAINING, PERMIT, AND ENTRY EQUIPMENT. CONTRACTOR SHALL CONTACT LOCAL EMERGENCY RESPONSE PERSONNEL PRIOR TO ENTRY, AS REQUIRED FOR COORDINATION.
5. RIGGING
5.1. THE CONTRACTOR SHALL PROVIDE ALL RIGGING IN ACCORDANCE WITH APPLICABLE SECTIONS OF 29 CFR 1910, "OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR GENERAL INDUSTRY", AND 29 CFR 1926, "OCCUPATIONAL SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION", AND ANSI/ASME.
5.2. THE CONTRACTOR SHALL PROVIDE A COMPLETE RIGGING PLAN AND PROCEDURES TO BE USED FOR THE DURATION OF THE PROJECT FOR REMOVALS AND INSTALLATIONS. PROVIDE AT LEAST TEN BUSINESS DAYS NOTICE TO THE OWNER(S) PROJECT MANAGER WITH THE RIGGING PLAN PRIOR TO MOBILIZATION OF THE EQUIPMENT.
5.3. THE CONTRACTOR SHALL PROVIDE QUALIFIED OPERATORS AND RIGGERS TO PERFORM ALL ASPECTS OF THE DEMOLITION AND NEW WORK. THE CONTRACTOR SHALL PROVIDE QUALIFICATIONS OF EACH RIGGER AND OPERATOR UPON REQUEST BY THE OWNER(S) PROJECT MANAGER OR THE ENGINEER. QUALIFICATIONS SHALL SUBSTANTIATE THE PERSONS KNOWLEDGE, TRAINING AND EXPERIENCE AND SHALL DEMONSTRATE THEIR COMPETENCE FOR THE POSITION.
5.4. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY ALL FEES REQUIRED TO OBTAIN PERMITS TO PERFORM THE RIGGING IN ACCORDANCE WITH THE LOCAL AUTHORITY HAVING JURISDICTION OR ANY NJ STATE AND FEDERAL PERMIT REQUIREMENT.
5.5. THE CONTRACTOR SHALL PERFORM ALL RIGGING WORK TO ACCOMMODATE THE OWNER(S) OPERATIONAL CONSTRAINTS. RIGGING SHALL BE PERFORMED ON WEEKENDS OR AS APPROVED BY THE OWNER(S) PROJECT MANAGER.
5.6. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CONTROLS AND SAFETY EQUIPMENT AND SAFETY PERSONNEL DURING THE RIGGING WORK TO MAKE THE SITE SAFE AND PROTECT THE PUBLIC, OWNER PERSONNEL AND THEIR REPRESENTATIVES.
5.7. CONTRACTOR SHALL OBTAIN PERMISSION OF THE OWNERS PROJECT MANAGER AND TCNJ'S OFFICE OF OCCUPATIONAL SAFETY AND ENVIRONMENTAL SERVICES PRIOR TO START OF WORK.
6. COORDINATION
6.1. CONTRACTOR SHALL REMAIN RESPONSIBLE FOR COORDINATION OF ANY SYSTEM SHUTDOWN WITH THE OWNER(S) PROJECT MANAGER. WRITTEN NOTIFICATION SHALL BE SUBMITTED TO PROJECT MANAGER, ENGINEER AT LEAST TEN BUSINESS DAYS PRIOR TO REQUESTED DATE. PROVIDE DATE(S), TIME(S), LOCATION(S) AFFECTED, LIST ALL UTILITIES TO BE SHUT OFF, AND REASON(S) FOR OUTAGE. PROVIDE ALL APPLICABLE COMPANY AND PERSONNEL CONTACT INFORMATION.
6.2. CONTRACTOR SHALL REMAIN RESPONSIBLE FOR COORDINATION WITH ALL TRADES, AND FOR COORDINATION OF ALL VALVES, FLOW SENSORS, ETC. CONFORMING TO PIPING DIAGRAMS, SCHEDULES, DETAILS, FLOOR PLANS, SPECIFICATION AND MANUFACTURERS REQUIREMENTS. CONTRACTOR TO COORDINATE SIZING WITH FINAL PURCHASED EQUIPMENT.
6.3. ALL CONDUIT AND POWER WIRING TO MECHANICAL EQUIPMENT, MOTOR CONTROLLERS AND CONTROL PANELS SHALL BE PROVIDED UNDER THIS CONTRACT.
6.4. ALL NON-FACTORY FURNISHED VFD'S, STARTERS AND DISCONNECTS SHALL BE PROVIDED BY UNDER THIS CONTRACT. FINALIZE RATINGS AND LOCATIONS WITH FINAL PURCHASED EQUIPMENT.
6.5. MECHANICAL AND ELECTRICAL TESTING AND BALANCING SHALL BE PROVIDED UNDER THIS CONTRACT. TAB CONTRACTOR SHALL BE PRE-APPROVED BY THE OWNER(S).
6.6. THE OWNER'S (TCNJ) IMPAIRMENT COORDINATOR MUST BE NOTIFIED 2 DAYS PRIOR TO ANY SYSTEM IMPAIRMENT ASSOCIATED WITH THE FIRE ALARM AND/OR FIRE SUPPRESSION SYSTEMS.
6.7. ALL WORK ASSOCIATED WITH SHUTDOWNS AND/OR MODIFIED OPERATIONS OF EXISTING EQUIPMENT SHALL BE COORDINATED WITH THE OWNER'S (TCNJ) OPERATIONS STAFF.
6.8. ALL WORK WHICH COULD IMPACT NORMAL ACCESS, EMERGENCY ACCESS, AND/OR PERSONNEL FLOW INTO AND OUT OF THE BUILDING SHALL BE APPROVED BY AND COORDINATED WITH THE OWNER'S PM AND OPERATIONS STAFF A MINIMUM OF TWO (2) WEEKS IN ADVANCE. SAFE ACCESS TO/FROM THE BUILDING SHALL BE MAINTAINED FOR THE OPERATIONS STAFF ON SITE 24/7.
7. EXAMINATION
7.1. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS TO VERIFY THAT THEY ARE COMPLETE AND THAT TESTING, CLEANING, ADJUSTING, AND COMMISSIONING HAVE BEEN PERFORMED.
7.2. EXAMINE EQUIPMENT INSTALLATION TO VERIFY THAT INDICATED PIPING AND SPECIALTIES AND FITTINGS ARE PROPERLY INSTALLED AND THAT THEIR LOCATIONS ARE ACCESSIBLE AND APPROPRIATE FOR EFFECTIVE BALANCING AND FOR EFFICIENT SYSTEM AND EQUIPMENT OPERATION.
7.3. EXAMINE SYSTEMS FOR FUNCTIONAL DEFICIENCIES THAT CANNOT BE CORRECTED BY ADJUSTING AND BALANCING.
7.4. EXAMINE EQUIPMENT FOR INSTALLATION AND FOR PROPERLY OPERATING SAFETY INTERLOCKS AND CONTROLS.
8. FINAL PROJECT DOCUMENTATION
8.1. PRIOR TO ACCEPTANCE OF WORK, CONTRACTOR SHALL PRESENT ENGINEER AND OWNER(S) WITH AS-BUILT MARK-UPS FOR INCORPORATION BY THE ENGINEER INTO THE RECORD DRAWING SET. THE SCOPE SHALL INCLUDE ALL MECHANICAL, ELECTRICAL, AND CONTROLS WORK INTO THE RECORD DRAWING SET.
8.2. THE FOLLOWING SHALL BE INCLUDED AT MINIMUM:
8.2.1. TAB AND START-UP REPORT(S)
8.2.2. AS-BUILT DRAWING MARK-UPS
8.2.3. OPERATIONS AND MAINTENANCE MANUAL FOR ALL EQUIPMENT; INCLUDE ONLY APPLICABLE INFORMATION. EXAMPLE: IF MULTIPLE SIZES ARE LISTED, CROSS OUT AND INDICATE INSTALLED EQUIPMENT/SIZES.
8.2.4. ITEMIZED LIST OF FINAL PURCHASED EQUIPMENT
8.2.5. SEPARATE MAINTENANCE MATERIALS LIST - INCLUDE: TYPE, SIZE, AND QUANTITY FOR EACH UNIT.
8.3. ALL WARRANTIES; SHALL BEGIN FROM DATE OF ACCEPTANCE.

APPLICABLE CODES & STANDARDS

THE FOLLOWING IS A SUMMARY OF APPLICABLE CODES AND REGULATIONS FOR THIS PROJECT. THIS LIST MAY NOT BE ALL ENCOMPASSING AND DOES NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH OTHER CODES AND REGULATIONS. ALL REFERENCES SHALL BE LATEST EDITION UNLESS NOTED OTHERWISE.

- 1. AMERICANS WITH DISABILITIES ACT (ADA)
2. AMERICAN WELDING SOCIETY (AWS)
3. COPPER DEVELOPMENT ASSOCIATION (CDA)
4. FACTORY MUTUAL (FM) GLOBAL
5. ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA)
6. MANUFACTURERS STANDARDIZATION SOCIETY OF VALVE AND FITTING INDUSTRY (MSS)
7. SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA)
8. UNDERWRITER LABORATORY (UL)
9. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
10. AMERICAN GAS ASSOCIATION (AGA)
11. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
12. OSHA 29 CFR 1926 - OCCUPATION SAFETY AND HEALTH REGULATION FOR CONSTRUCTION
13. OSHA 29 CFR 1910 - OCCUPATION SAFETY AND HEALTH STANDARDS FOR GENERAL INDUSTRY (CONFINED SPACES)
14. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
14.1. ANSI/ASME A13.1 PIPE LABELING
14.2. ANSI Z358.1 EMERGENCY EYEWASH AND SHOWER EQUIPMENT
15. AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS (ASHRAE)
15.1. STANDARD 90.1-2013
16. AMERICAN PETROLEUM INSTITUTE (API)
16.1. API-510-1995 PRESSURE VESSEL INSPECTION CODE
17. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
17.1. B31.1 POWER PIPING CODE
17.2. BOILER AND PRESSURE VESSEL CODE V2013
17.3. GSD-1-2012 CONTROLS AND SAFETY DEVICES FOR AUTOMATICALLY FIRED BOILERS
18. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
18.1. (3) COMMISSIONING OF FIRE PROTECTION AND LIFE SAFETY SYSTEMS
18.2. (13) INSTALLATION OF SPRINKLER SYSTEMS
18.3. (25) INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS
18.4. (37) STANDARD FOR THE INSTALLATION AND USE OF STATIONARY COMBUSTION ENGINES AND GAS TURBINES
18.5. (54) 2012 NATIONAL FUEL GAS CODE
18.6. (70) 2014 NATIONAL ELECTRIC CODE
18.7. (85) BOILER AND COMBUSTION SYSTEMS HAZARD CODE
18.8. (101) LIFE SAFETY CODE
19. NJ UCC STATE CODES (NJCC 5:53)
19.1. 1993 BOCA NATIONAL MECHANICAL CODE
19.2. 2015 NATIONAL STANDARD PLUMBING CODE (NSPC)
19.3. 2015 EDITION OF THE INTERNATIONAL CODE COUNCIL (ICC)
19.3.1. INTERNATIONAL BUILDING CODE (IBC-2015) W/ NJ EDITS FROM 3.14
19.3.2. INTERNATIONAL MECHANICAL CODE (IMC-2015)
19.3.3. INTERNATIONAL ENERGY CONSERVATION CODE (IECC-2015)
19.3.4. INTERNATIONAL FIRE CODE (IFC-2015)
19.3.5. INTERNATIONAL FUEL GAS CODE (IFGC-2015)
19.4. NJ BUREAU OF BOILER AND PRESSURE VESSEL COMPLIANCE
20. AMERICAN CONCRETE INSTITUTE (ACI)
20.1. ACI 318 REQUIREMENTS FOR STRUCTURAL CONCRETE
21. UNDERWRITER'S LABORATORIES, INC. (UL)

TCNJ THE COLLEGE OF NEW JERSEY



KEY PLAN AREA OF WORK

Table with 3 columns: No., Date, Revision. Row 0: 5/31/19 ISSUED FOR BID.

Burns ENGINEERING, INC. | 215 979-7700 TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600 PHILADELPHIA, PA 19103

Project Title: TCNJ - COGENERATION PLANT HRSG RENEWAL

Drawing Title: GENERAL NOTES

Table with 2 columns: Field, Value. Fields include Date (05/31/2019), Scale (AS NOTED), Drawn (ADR), Checked (DB), Job No (2016-193), Drawing No (G-001).

ISSUED FOR BID

GENERAL ROOFING NOTES

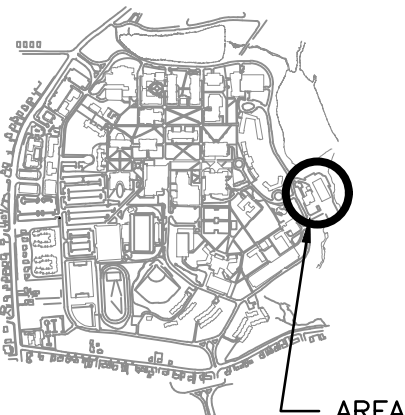
1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH FEDERAL, STATE AND CITY REGULATIONS AND THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL AMENDMENTS THERETO. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE CODE OF FEDERAL REGULATIONS, 29CFR, 40 CFR AND EQUIVALENT STATE REGULATIONS.
2. ALL ELEVATIONS AND DIMENSIONS INDICATED ON DRAWINGS ARE APPROXIMATE AND FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE THIS WORK WITH WORK PERFORMED BY OTHERS AND SHALL FIELD VERIFY CONDITIONS PRIOR TO FABRICATION AND INSTALLATION. EXISTING CONDITIONS ARE SHOWN AS NEARLY AS POSSIBLE TO THE KNOWN ARRANGEMENTS. CONTRACTOR SHALL PROVIDE ALL WORK REQUIRED FOR TEMPORARY OR PERMANENT RELOCATION OF THEIR WORK AS A RESULT OF INTERFERENCES WITH OTHER WORK OR INFRASTRUCTURE WHICH IS REQUIRED TO REMAIN IN SERVICE.
3. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR INSTALLATION OF WORK.
4. LIMIT USE OF THE PREMISES TO WORK IN AREAS INDICATED. THE CONTRACTOR SHALL NOT DISTURB PORTIONS OF THE SITE BEYOND THE AREAS IN WHICH THE WORK IS INDICATED.
5. CONTRACTOR SHALL NOT EXCEED STAGING AREA DESIGNATED BY OWNER. REQUESTS FOR TEMPORARY ADDITIONAL SPACE MUST BE SUBMITTED IN WRITING TO OWNER A MINIMUM OF TWO WEEKS PRIOR TO NEED. DO NOT PROCEED WITHOUT OWNER APPROVAL.
6. CONTRACTOR SHALL MAINTAIN A CLEAN AND ORDERLY STAGING AREA. WASTE STORAGE CONTAINERS SHALL BE EMPTIED DAILY AND IN A CLEAN FASHION, AND AS DIRECTED BY THE PROJECT MANAGER.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR FIRE PREVENTION OF ALL EXISTING BUILDING ELEMENTS DUE TO ANY HOT WORK PROJECTS SUCH AS WELDING. PROVIDE THE NECESSARY FIRE WATCH AS REQUIRED BY CODE, WHENEVER WELDING OR ANY OTHER WORK THAT MIGHT CAUSE FIRE IS BEING DONE.
8. FOR COMPLETE ROOFING INFORMATION REFER TO SPECIFICATIONS SECTION 07512.
9. NO WORK SHALL BE PERFORMED ON DAYS WHERE WEATHER CONDITIONS WOULD COMPROMISE INTEGRITY OF NEW ROOF. NO EXPOSED PORTION OF ROOF SHALL BE LEFT UNCOVERED OVER NIGHT. CONTRACTOR SHALL PROVIDE STOP BARRIER BETWEEN NEW AND EXISTING WORK AND TEMPORARY COVER OVER BARRIER FOR PROTECTION AGAINST UNFAVORABLE CONDITIONS.
10. KEEP BUILDING WATERTIGHT AND WATERPROOF AT ALL TIMES. PERFORM WORK AT TIME PERIODS AS DIRECTED AND APPROVED BY OWNER. CONTRACTOR TO PROVIDE ROOF MANUFACTURER'S REPRESENTATIVE CERTIFIED INSPECTOR TO PERFORM DAILY INSPECTIONS AND REQUIRED TESTS. ANY PROBLEMS MUST BE RELAYED TO OWNER'S PROJECT MANAGER.
11. DRAWINGS ARE INTENDED TO SHOW MAJORITY OF WORK AND OVERALL CONCEPT. TYPICAL DETAILS SHALL BE USED AT INSTANCES WHERE WORK IS NOT SPECIFICALLY CALLED OUT ON DRAWINGS. CONTRACTOR SHALL PROVIDE COMPLETE, WATERPROOF ROOFING SYSTEM AT COMPLETION OF PROJECT.
12. CONTRACTOR SHALL REMOVE ALL ABANDONED SUPPORTS (INCLUDING BUT NOT LIMITED TO ABANDONED GUY WIRE ANCHORS, PITCH POCKETS AND EQUIPMENT SUPPORT CURBS), NOT BEING USED UNLESS NOTED OTHERWISE. CONTRACTOR SHALL REPAIR ROOFING AS REQUIRED.
13. MAINTAIN POSITIVE WATER FLOW TO EXISTING ROOF DRAIN. ADD CRICKETS AS NEEDED.

SEQUENCE OF OPERATIONS:

THIS IS ONLY A SUGGESTED DAILY SEQUENCE OF WORK. CONTRACTOR SHALL SUBMIT A SEQUENCE OF OPERATIONS IN WRITING FOR REVIEW BY OWNER ACCORDING TO REQUIREMENTS IN THE SPECIFICATIONS:

1. SET UP TEMPORARY ENCLOSURES FOR WASTE DISPOSAL UNITS AND STAGING AREA.
2. SETUP WASTE DISPOSAL UNIT AND NECESSARY EQUIPMENT TO PERFORM DAILY DEMOLITION AND INSTALLATION OPERATIONS PER SPECIFICATIONS AND INDUSTRY STANDARDS.
3. PREPARE AREAS WITH ROOF TOP EQUIPMENT BY DISCONNECTING UNIT. TEMPORARILY RELOCATING UNITS ONLY IF ABSOLUTELY NECESSARY FOR PROPER ROOFING INSTALLATION.
4. DEMOLISH EXISTING ROOFING MATERIALS TAKING CARE NOT TO DAMAGE ANY EXISTING EQUIPMENT, EQUIPMENT CURBS AND ROOF DECK THAT REMAINS.
5. INSTALL INSULATION REQUIRED TO REPLACE AREA OF DAILY DEMOLITION OPERATIONS. INSTALL INSULATION AS TO PROVIDE PROPER DRAINAGE.
6. INSTALL RECOVERY BOARD AS PER MANUFACTURER'S RECOMMENDATIONS.
7. INSTALL 2-PLY ROOFING SYSTEM IN COLD ADHEASIVE. PER MANUFACTURER'S RECOMMENDATIONS. PERFORM REQUIRED TESTING FOR ALL INSTALLED MATERIALS IN THE ROOFING SYSTEM.
8. INSTALL FLASHING AND COUNTER FLASHING AT ALL LOCATIONS DISTURBED BY DAILY DEMOLITION.
9. INSTALL WALKWAY PAVERS AS SHOWN ON DRAWINGS AND AS REQUIRED.
10. REPAIR AND/OR REPLACE ANY DAMAGED EQUIPMENT PER OWNER PROJECT MANAGER'S RECOMMENDATIONS.
11. CLEAN UP AND REMOVE ALL DEBRIS.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns

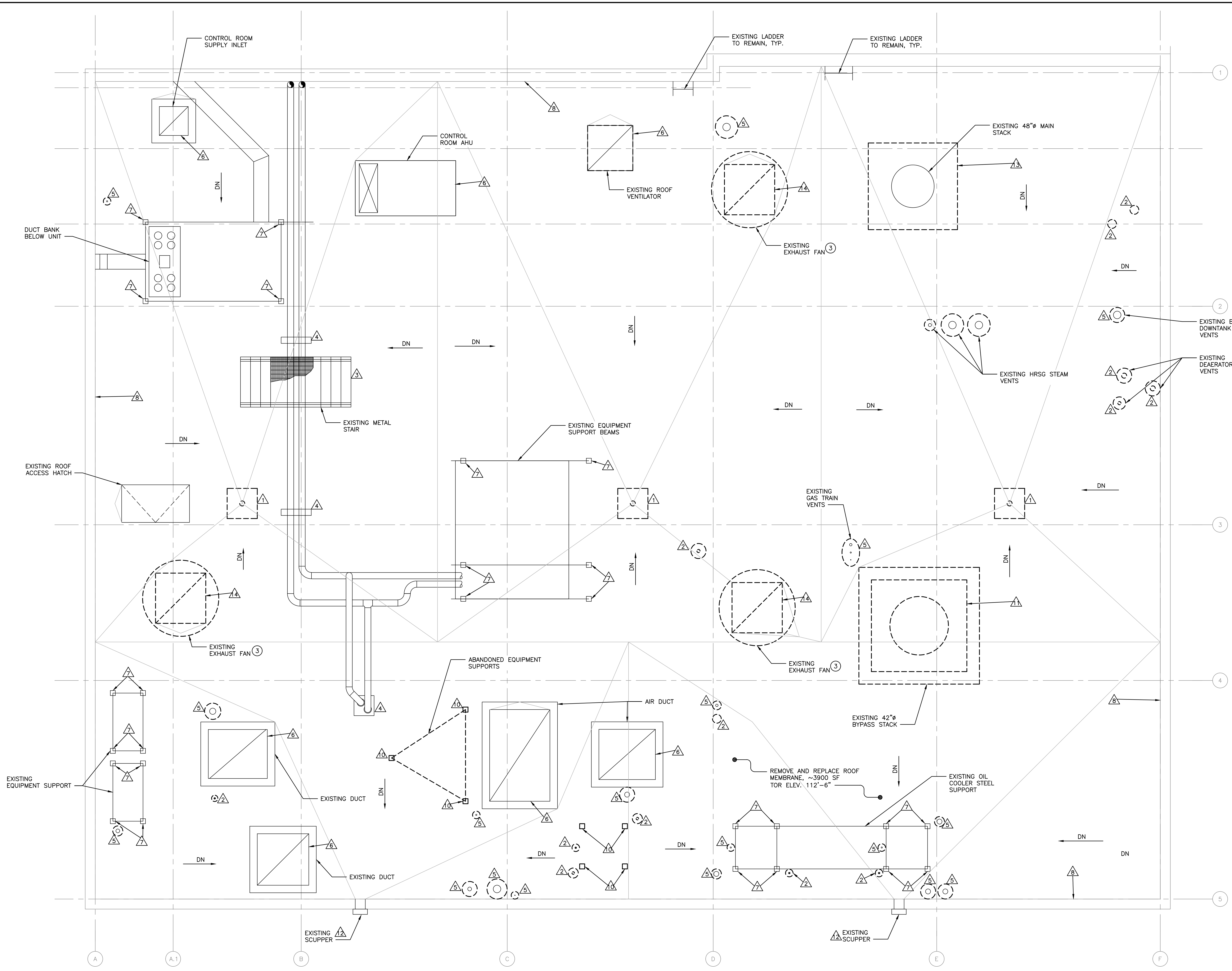
BURNS ENGINEERING, INC. | 215 979-7300
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
ROOFING
GENERAL NOTES

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: A-001

ISSUED FOR BID



GENERAL NOTES

1. REFER TO A-001 FOR ADDITIONAL NOTES.
2. THE LOCATION, SIZE, NUMBER AND TYPES OF EXISTING ROOF SYSTEMS, PENETRATIONS AND EQUIPMENT HAVE BEEN DEFINED SCHEMATICALLY AND ARE APPROXIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING A DETAILED INVENTORY OF ALL ROOF SYSTEM DIMENSIONS, FEATURES AND EQUIPMENT, TO ESTABLISH PRECISE SIZE, LOCATION, NUMBER AND TYPES. ANY PREVIOUSLY UNDEFINED CONDITIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE PROJECT MANAGER.
3. CONTRACTOR SHALL REMOVE EXISTING ROOFING DOWN TO ORIGINAL DECKING.
4. CLEAN AND PREPARE EXISTING TO REMAIN VENT PIPES FOR NEW FLASHING AS PER ROOF MANUFACTURER'S INSTRUCTIONS.
5. ALL DRAINS SHALL BE PLUGGED TO PREVENT CLOGGING AND RESTORED TO WORKING ORDER AT THE END OF EACH WORK DAY.
6. REMOVE FLASHING AND ALL ATTACHMENTS UP TO AND INCLUDING THE EXISTING ROOF DRAINS. CLEAN ALL DRAIN PIPES OUT TO THE MAIN. INSTALL NEW ROOF DRAINS PER DRAIN MANUFACTURER'S INSTRUCTIONS.
7. ALL EXISTING ROOF CURBS TO REMAIN UNLESS NOTED OTHERWISE.
8. ALL EXISTING PITCH POCKET SHALL BE REMOVED AND REPLACED WITH NEW FOR NEW OR EXISTING PIPE/CONDUIT PENETRATIONS.
9. ALL EXISTING WOOD BLOCKING SHALL BE REMOVED AND REPLACED AS REQUIRED BY ROOFING MANUFACTURER AND SHOWN ON CONSTRUCTION DETAILS.
10. EXISTING LIGHTING PROTECTION TO REMAIN. PROVIDE NEW ROOFING FLASHING AS NEEDED. REPAIR CONNECTIONS AS NEEDED SO CONTINUITY OF THE LIGHTING PROTECTION IS NOT DAMAGED.
11. CONTRACTOR SHALL DEMOLISH ONLY WHAT CAN BE REPLACED IN THAT SAME DAY. ALL DEMOLITION MUST BE REPLACED ON A DAILY BASIS.
12. ALL DEBRIS AND OTHER DISCARDED MATERIAL SHALL BE REMOVED FROM ROOF AREAS BY THE USE OF CHUTES TO DUMPSTER.
13. REFER TO MECHANICAL, ELECTRICAL AND STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION.

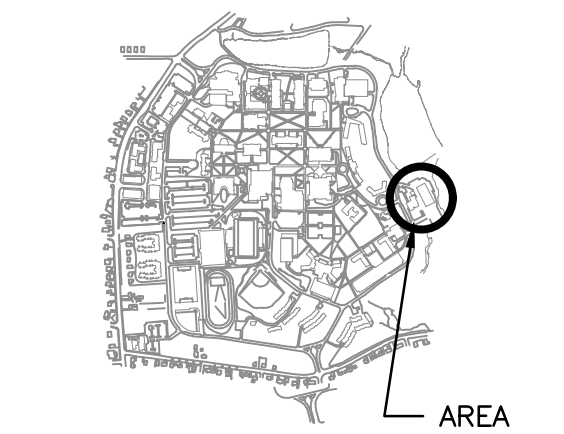
DEMOLITION NOTES

- △ REMOVE AND REPLACE ROOF DRAIN SEE DETAIL 7/A-501
- △ REMOVE EXISTING ABANDON CONDUITS/PIPES PITCH POCKET DOWN TO EXISTING DECK. PREPARE DECK TO RECEIVE NEW ROOFING SYSTEM. PATCH DECK OPENING LARGER THAN 4" DIAMETER PER DETAIL 5/S-501.
- △ REMOVE AND REINSTALL EXISTING STAIRS WITH RAILING. CLEAN, PRIME AND PAINT PRIOR TO REINSTALLATION.
- △ REMOVE AND REPLACE PIPE SUPPORT CURB FLASHING. TEMPORARILY SUPPORT PIPES. PIPE STRUT AND ROLLERS TO REMAIN.
- △ REMOVE AND REPLACE PITCH POCKET, SEE DETAIL 6/A-501.
- △ EXISTING EQUIPMENT/DUCT CURB TO REMAIN. REMOVE AND REPLACE EXISTING ROOF FLASHING.
- △ EXISTING EQUIPMENT POST TO REMAIN. REMOVE AND REPLACE POST ROOF FLASHING.
- △ REMOVE AND REPLACE WALL COUNTERFLASHING AND ROOFING FLASHING. SEE DETAIL 3/A-501.
- △ TEMPORARILY REMOVE EXISTING ROOF HATCH FLASHING AND DOOR FOR INSTALLATION OF NEW ROOF FLASHING ONTO EXISTING HATCH CURB. REINSTALL HATCH AND METAL FLASHING.
- △ EXISTING ABANDON EQUIPMENT POST SUPPORTS, CUT FLASH WITH DECK. PREPARE DECK FOR NEW ROOFING. IF EXISTING DECK OPENING IS LARGER THAN 4" REPAIR DECK PER DETAIL 5/S-501.
- △ REMOVE EXISTING 42" BYPASS STACK AND STACK EQUIPMENT FLASHING.
- △ REMOVE AND REPLACE SCUPPER FLASHING.
- △ TEMPORARILY REMOVE EXISTING HRSG STACK AND ALL ASSOCIATED PLATFORM AND RAILING INCLUDING EQUIPMENT FLASHING AND CURB FOR NEW EQUIPMENT FLASHING AND CURB FOR NEW EQUIPMENT FLASHING. REFER TO S-101 FOR ADDITIONAL INFORMATION.
- △ REMOVE AND REPLACE WITH NEW, EXISTING EXHAUST FAN, EQUIPMENT FLASHING AND EQUIPMENT CURB. REFER TO MECHANICAL DWG'S FOR ADDITIONAL INFORMATION

SCOPE NOTES

- ② ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
- ③ ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING EXHAUST FANS (EF-1, EF-2 AND EF-3) AND INSTALLATION OF NEW EXHAUST FANS (EF-1, EF-2, EF-3 AND EF-4) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 3.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

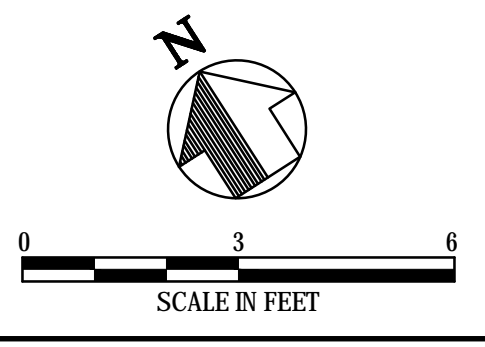
Burns
Burns Engineering, Inc. | 215-979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

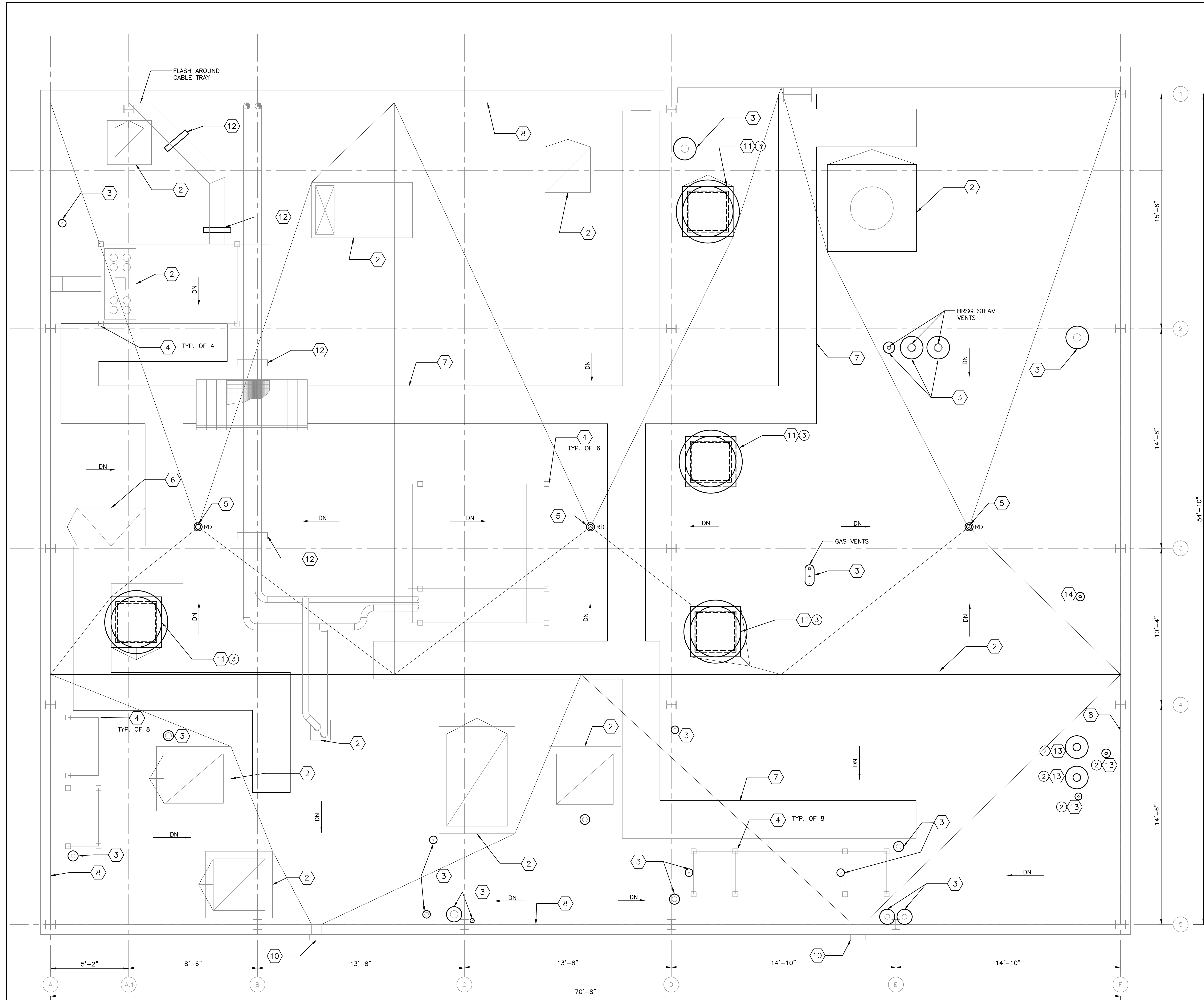
Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
ROOF PLAN – DEMOLITION

Date: 05/31/2019
Scale: AS NOTED
Drawn: ABT
Checked: DB
Job No: 2016-193
Drawing No: A-101

1 ROOF PLAN - DEMOLITION
A-101 3/8" = 1'-0"





GENERAL NOTES:

1. REFER TO A-001 FOR ADDITIONAL NOTES.
2. REFER TO A-101 FOR DEMOLITION WORK.
3. INSTALL 2 PLY BUILT UP COAL TAR PITCH ROOFING MEMBRANE SET IN COLD APPLIED ADHESIVE.
4. INSTALL 2" MINIMUM POLYISOCYANURATE BOARD INSULATION. PROVIDE TAPERED INSULATION AND CRICKETS FOR POSITIVE DRAINAGE TO ROOF DRAINS AND SCUPPERS. TAPERED INSULATION MINIMUM SLOPE SHALL BE 1/8"=1'-0".
5. INSULATION SLOPE AND CRICKETS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL SUBMIT A ROOF INSULATION LAYOUT PLAN FOR REVIEW AND APPROVAL.
6. COORDINATE WITH STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.

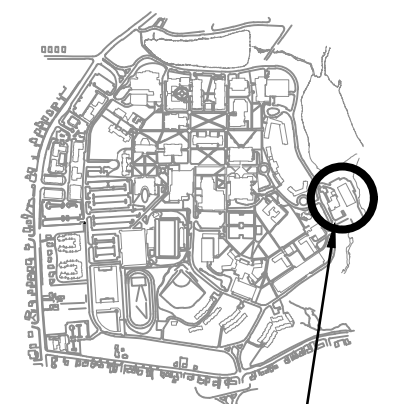
CONSTRUCTION NOTES

- 1 FURNISH AND INSTALL EQUIPMENT CURB FLASHING, DETAIL 2/A-501
- 2 FURNISH AND INSTALL DUCT FLASHING AND NEW EQUIPMENT CURB
- 3 FURNISH AND INSTALL PITCH POCKET 6/A-501
- 4 FURNISH AND INSTALL EQUIPMENT/DUNNAGE POST FLASHING 10/A-501.
- 5 FURNISH AND INSTALL ROOF DRAIN, 7/A-501
- 6 TEMPORARILY REMOVE ROOF HATCH FLASHING AND DOOR FOR INSTALLATION OF PROPOSED ROOF FLASHING ONTO EXISTING HATCH CURB. REINSTALL HATCH AND METAL FLASHING.
- 7 FURNISH AND INSTALL 30" WIDE x 1/2" THICK TRAFFIC PAD
- 8 INSTALL PARAPET WALL FLASHING AND COUNTER FLASHING SEE DETAIL 3/A-501.
- 9 REINSTALL PIPE CROSSOVER STAIRS. PRIOR TO INSTALLATION PRIME AND PAINT STAIRS AND RAILING. PROVIDE PADS BELOW STAIRS LEGS.
- 10 INSTALL NEW SCUPPER SEE DETAIL 8/A-501.
- 11 FURNISH AND INSTALL NEW EXHAUST FAN CURB AND CURB FLASHING. REFER TO DETAIL 2/S-501
- 12 FURNISH AND INSTALL PIPE SUPPORT CURB FLASHING 9/A-501.
- 13 NEW PIPE ROOF PENETRATION (DEAERATOR HOT VENTS). SEE DETAIL 6/A-501. COORDINATE W/MANUFACTURER FOR OPENING SIZE
- 14 NEW PIPE ROOF PENETRATION (BLOWDOWN TANK STEAM VENT). SEE DETAIL 6/A-501. COORDINATE W/MANUFACTURER FOR OPENING SIZE.

SCOPE NOTES

- 2 ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
- 3 ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING EXHAUST FANS (EF-1, EF-2 AND EF-3) AND INSTALLATION OF NEW EXHAUST FANS (EF-1, EF-2, EF-3 AND EF-4) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 3.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
Burns Engineering, Inc. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

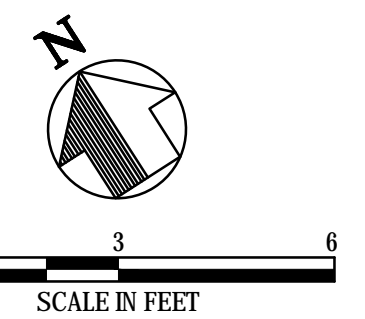
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
ROOF PLAN –
NEW WORK

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	ABT
Checked:	DB
Job No:	2016-193
Drawing No:	A-102

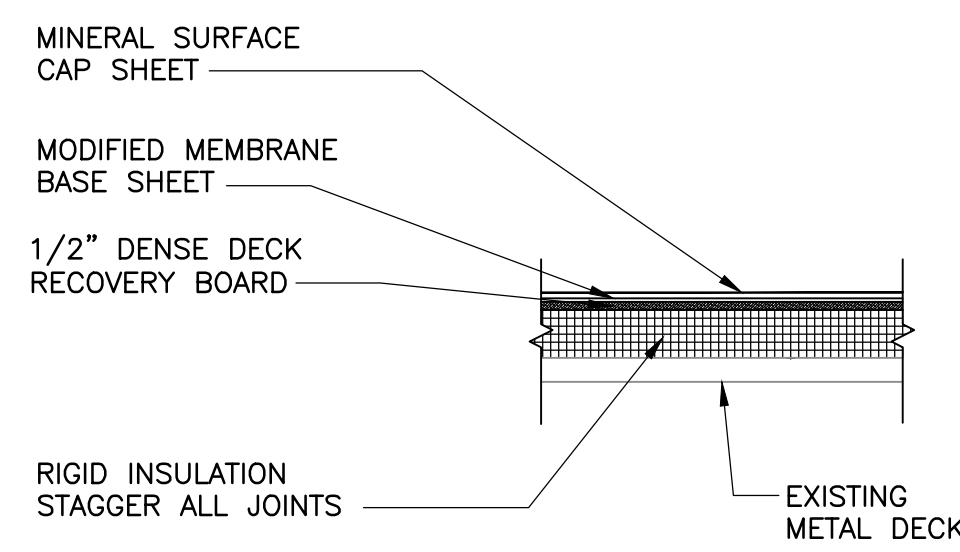
1 ROOF PLAN
A-102 3/8" = 1'-0"

Burns Engineering, Inc., Philadelphia, Pennsylvania

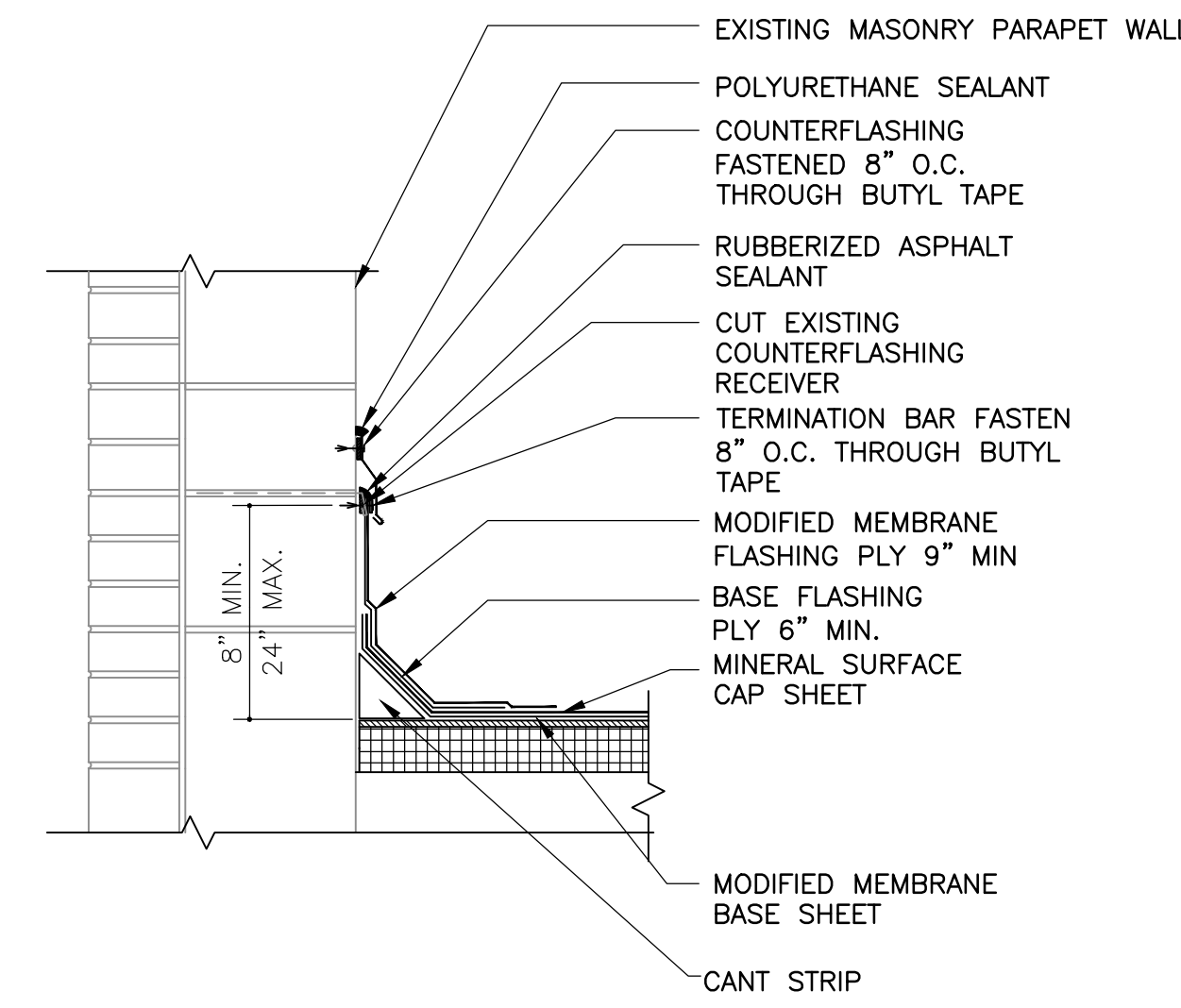
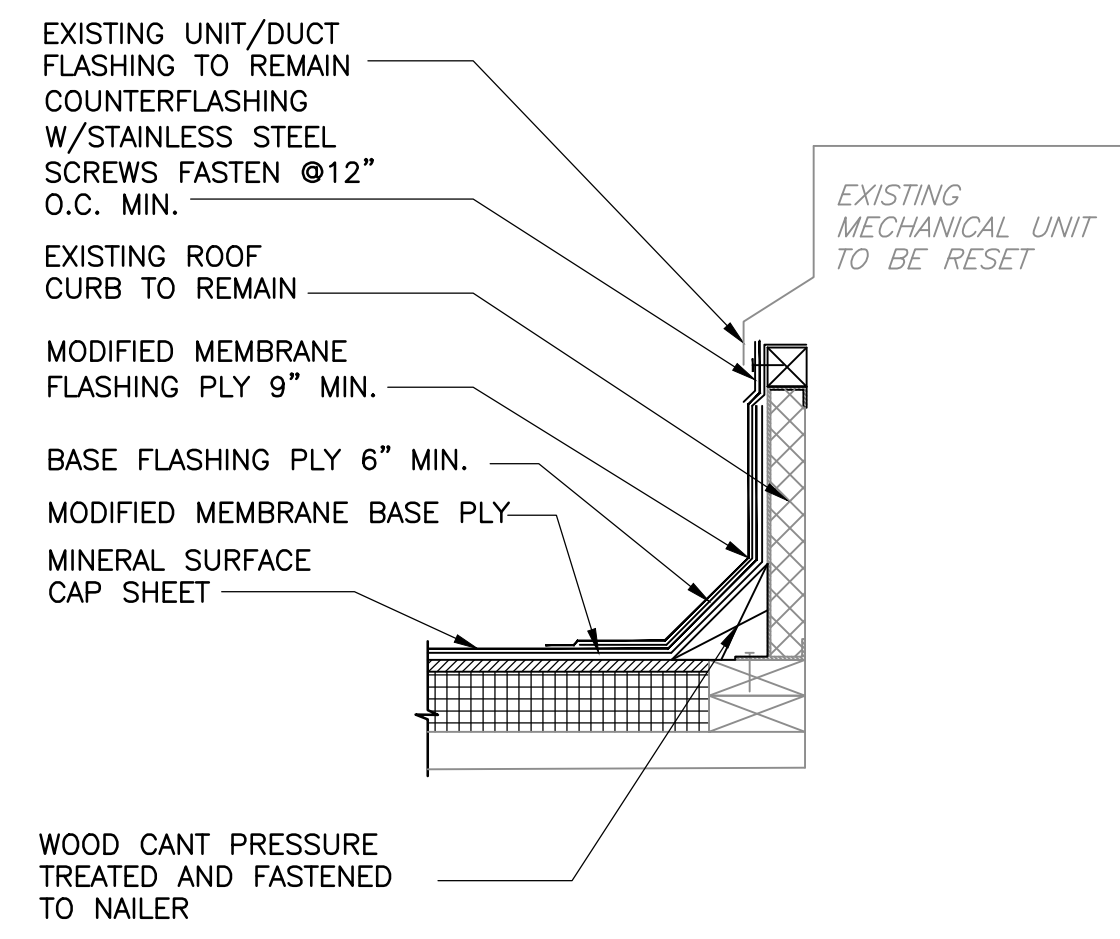


SCOPE NOTES

1. REMOVAL/RE-INSTALLATION OF MAIN STACK AS WELL AS THE REMOVAL AND PATCHING OF BYPASS STACK SHALL BE INCLUDED AS PART OF BASE-BID. ALL OTHER WORK INDICATED ON THIS DRAWING SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 1.



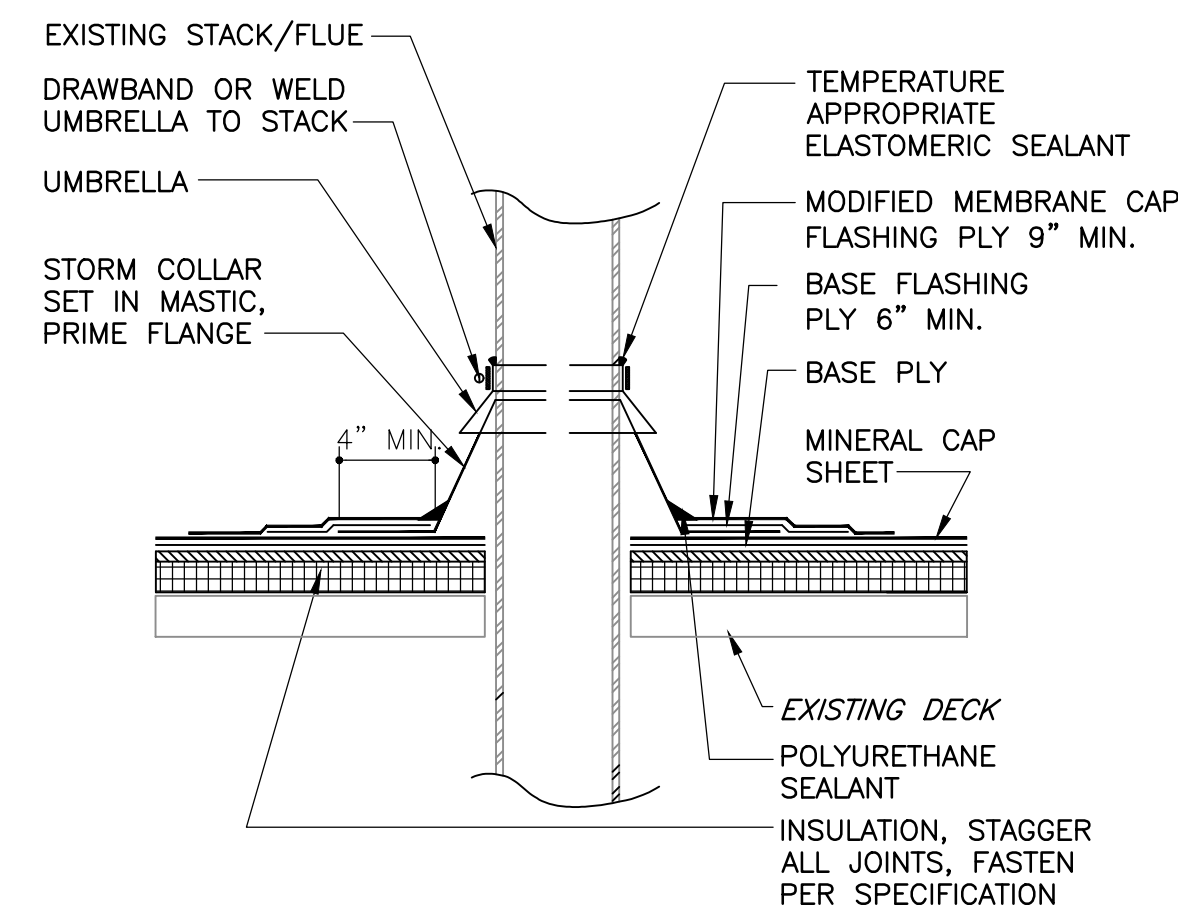
NOTE: ROOFING SHALL BE 2 PLY BUILT-UP COAL TAR PITCH ROOFING SET IN COLD ADHESIVE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION



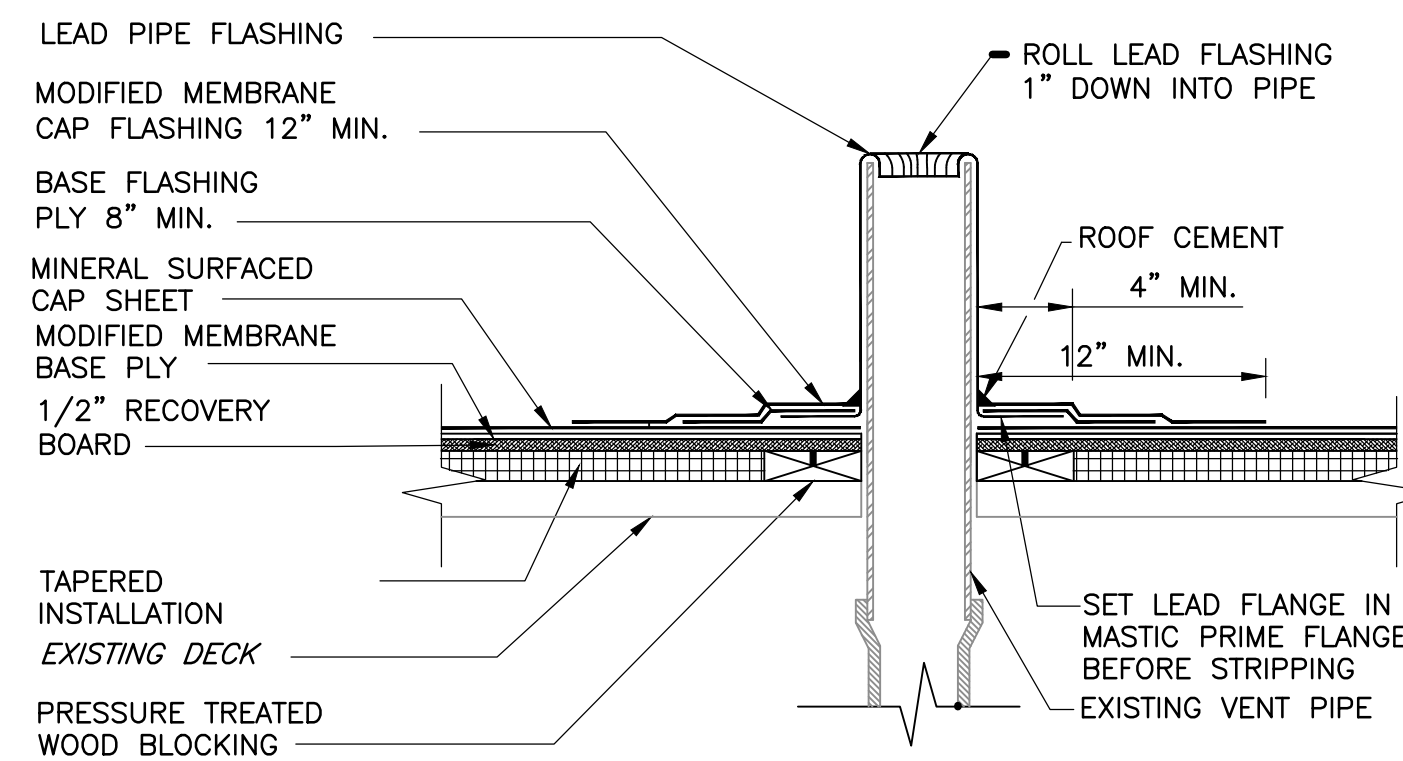
1 ROOFING TYPICAL DETAIL
A-501 N.T.S.

2 EQUIPMENT CURB DETAIL
A-501 N.T.S.

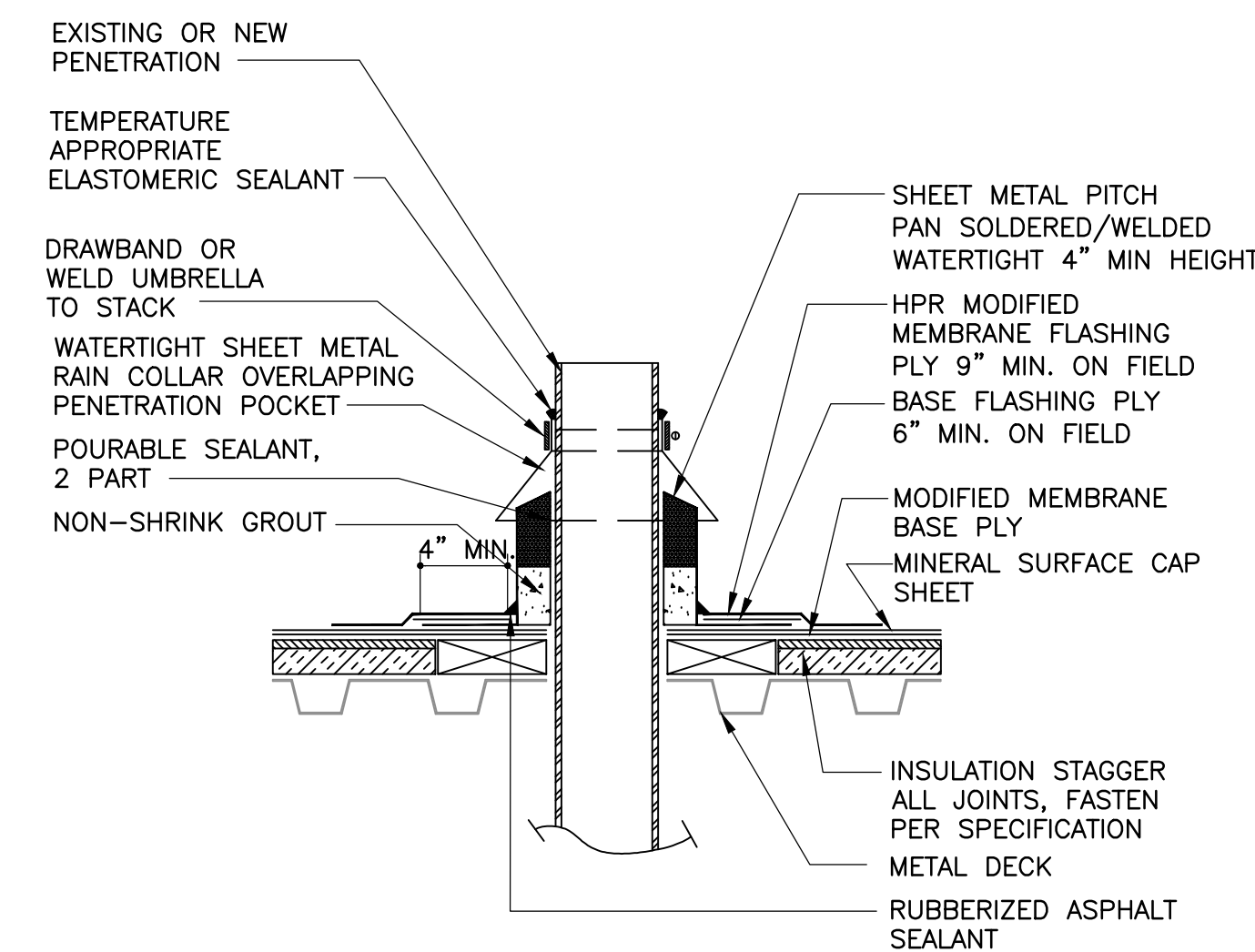
3 PARAPET WALL FLASHING DETAIL
A-501 N.T.S.



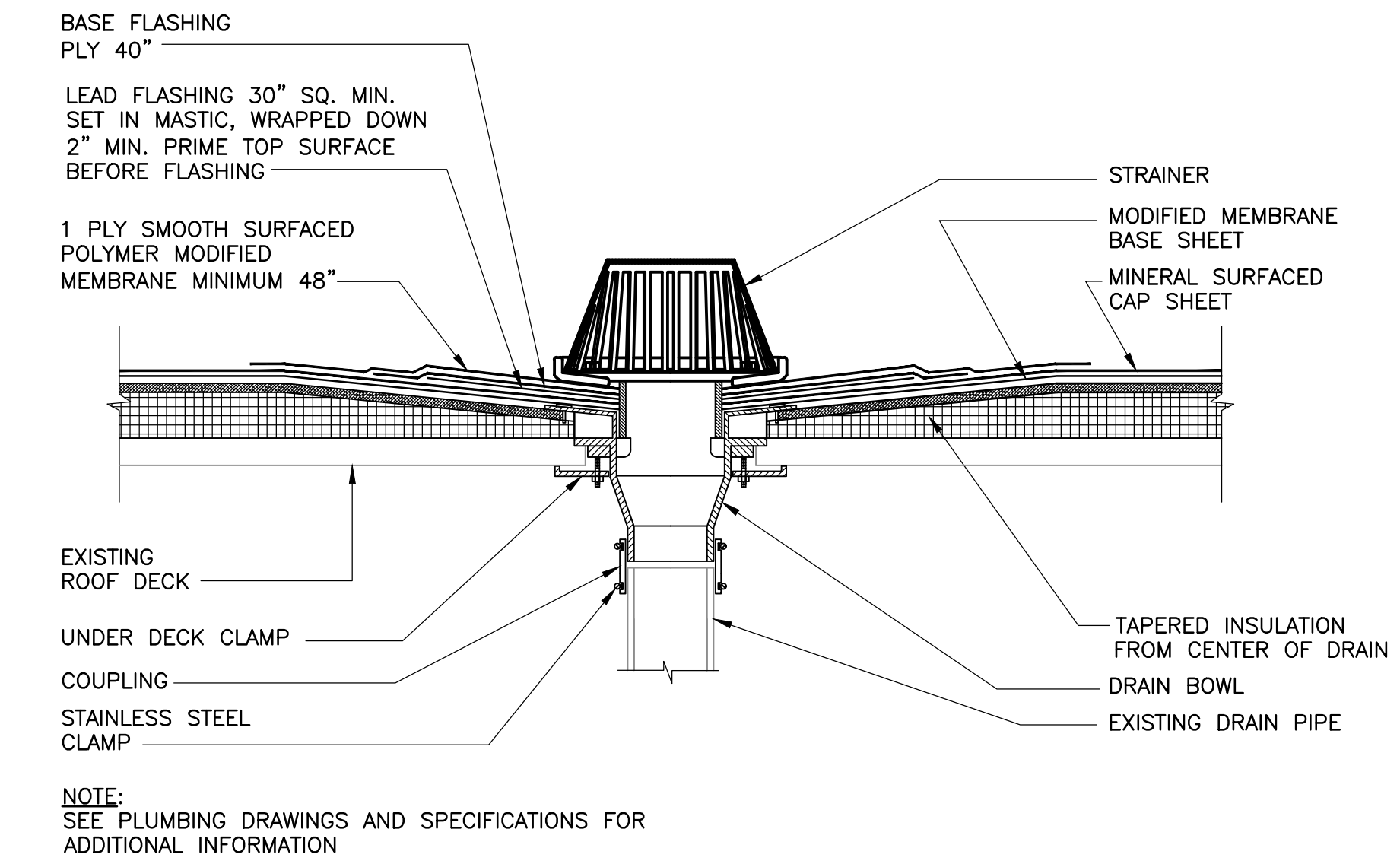
4 FLUE DETAIL
A-501 N.T.S.



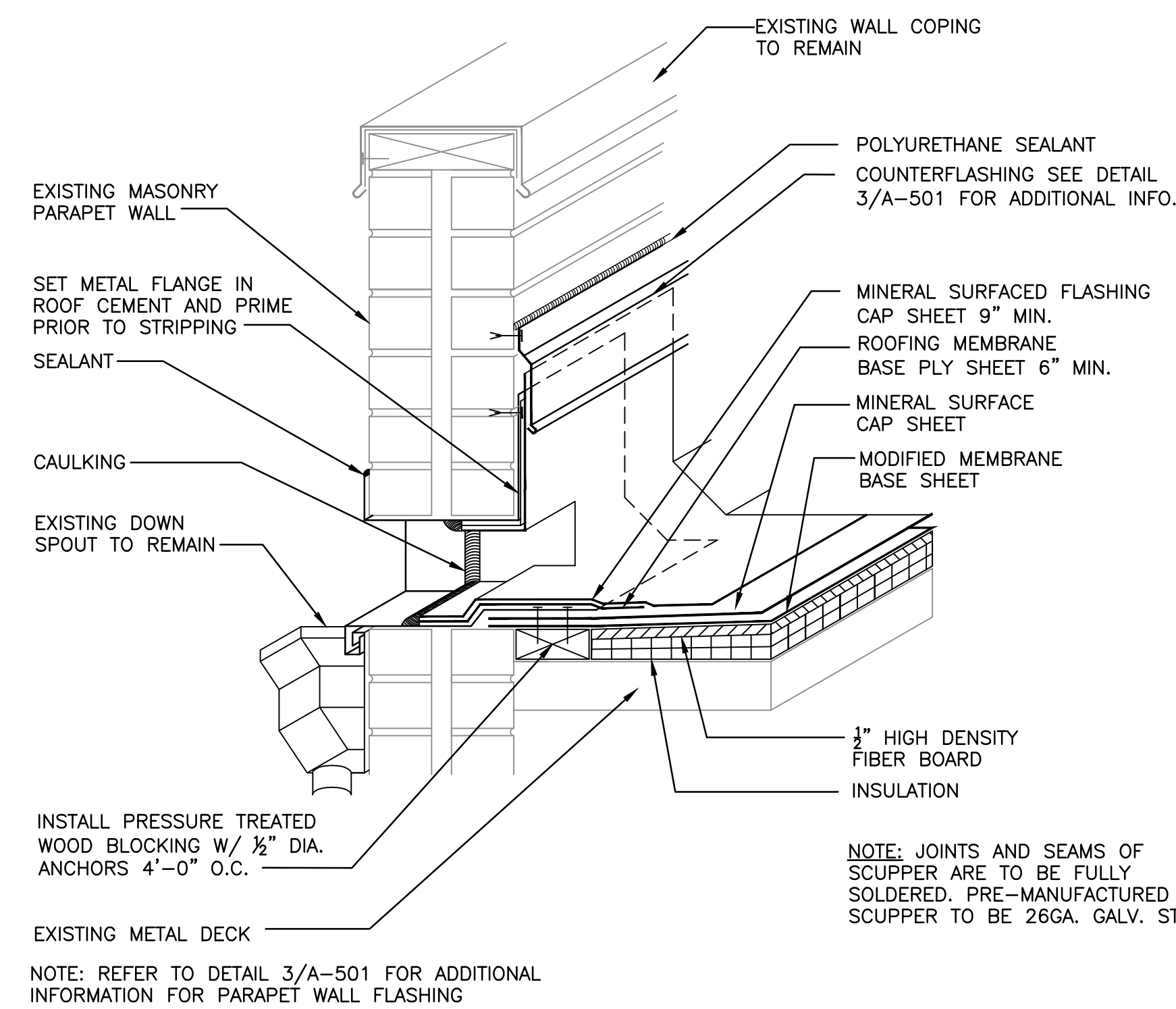
5 VENT DETAIL
A-501 N.T.S.



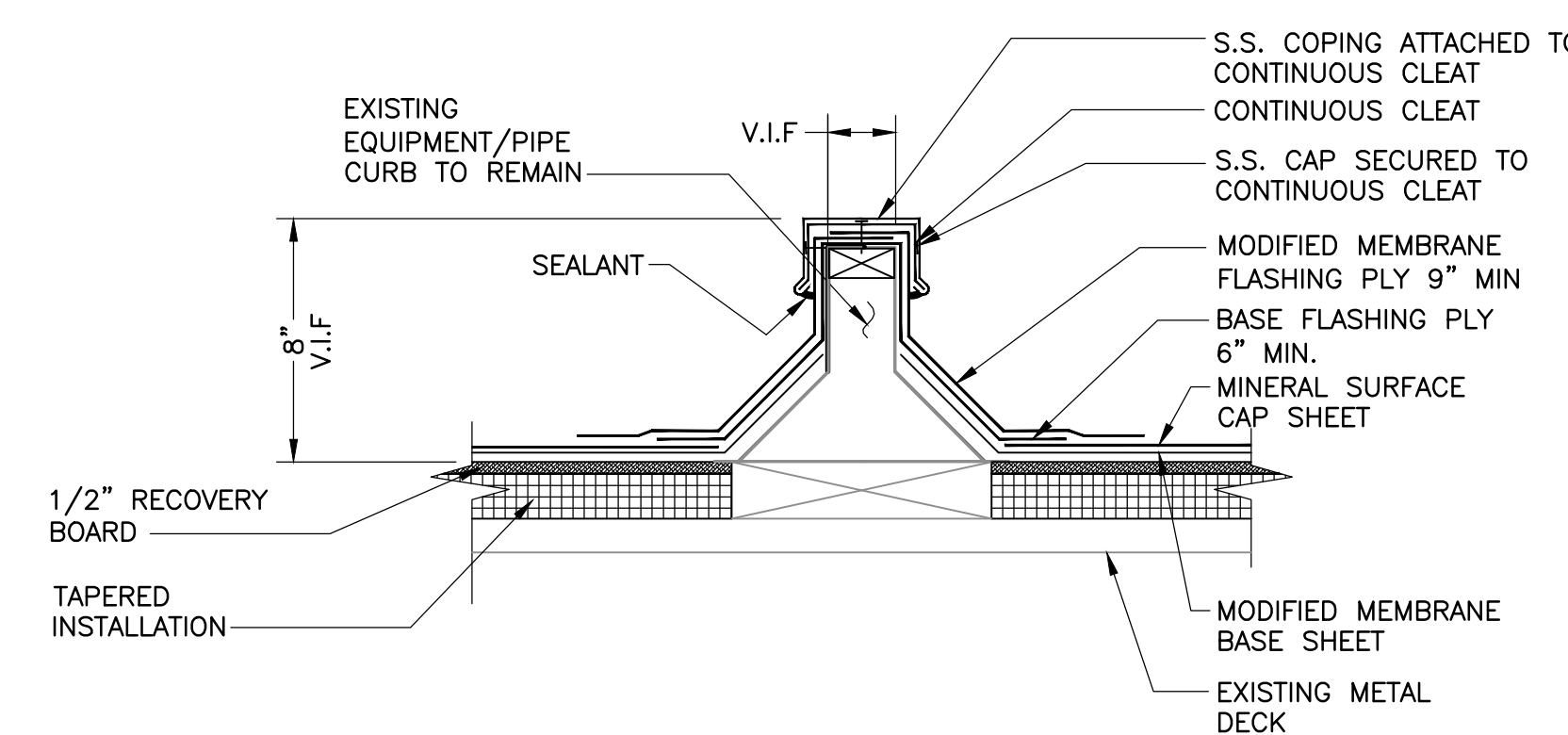
6 PITCH POCKET WITH UMBRELLA DETAIL
HOT PIPE PENETRATION
A-501 N.T.S.



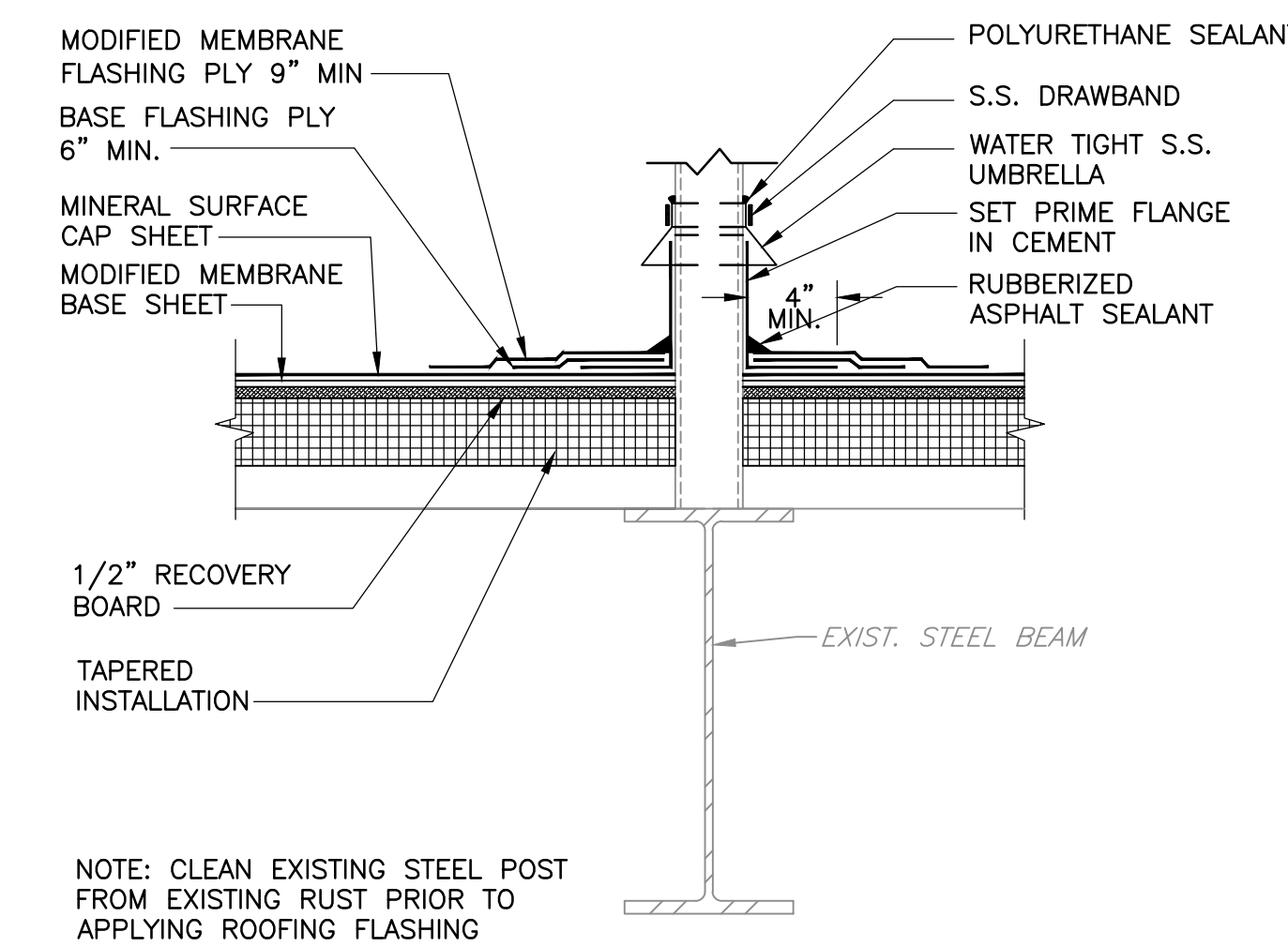
7 ROOF DRAIN DETAIL
A-501 N.T.S.



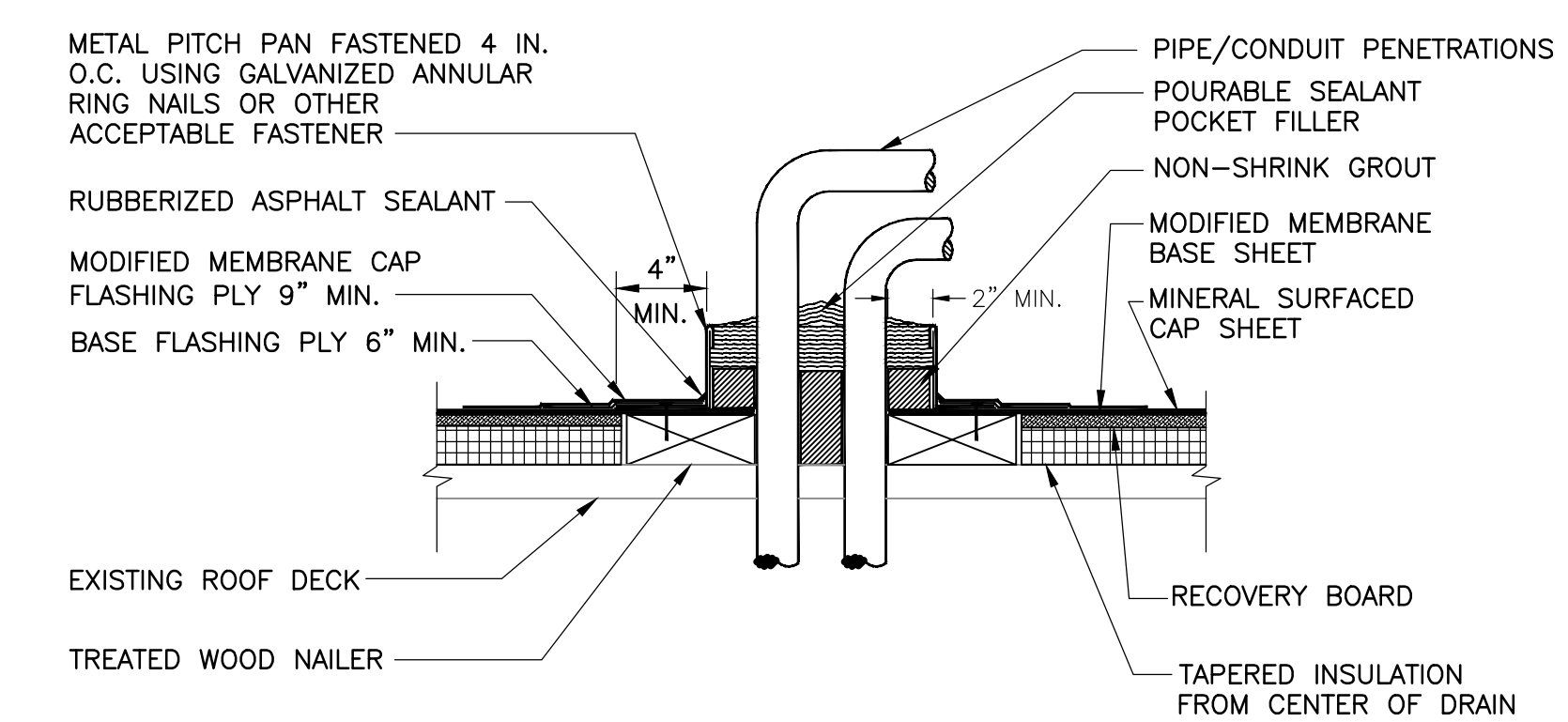
8 THROUGH WALL SCUPPER DETAIL
A-501 N.T.S.



9 EQUIPMENT OR PIPE CURB SUPPORT
A-501 N.T.S.

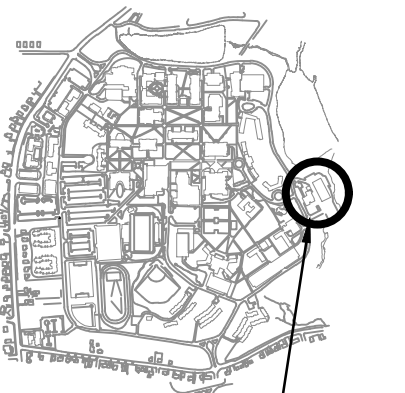


10 EQUIPMENT POST SUPPORT
A-501 N.T.S.



11 PITCH POCKET (MULTIPLE PENETRATIONS)
A-501 N.T.S.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN
AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
ENGINEERING, INC. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
ROOFING DETAILS

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	ADR
Checked:	DB
Job No:	2016-193
Drawing No:	A-501

ISSUED FOR BID

GENERAL STRUCTURAL NOTES

THE FOLLOWING GENERAL STRUCTURAL NOTES ARE APPLICABLE TO THE STRUCTURAL DRAWINGS. THESE NOTES ARE SUPPLEMENTAL TO THE SPECIFICATIONS. IN THE EVENT OF DISCREPANCIES BETWEEN GENERAL NOTES AND SPECIFICATIONS, THE MORE STRINGENT SHALL GOVERN.

GENERAL

1. TYPICAL SECTIONS AND DETAILS – ALL SECTIONS, DETAILS AND NOTES ARE INTENDED TO BE TYPICAL UNLESS OTHERWISE DETAILED. SHOP AND ERECTION DRAWINGS SUBMITTED BY THE CONTRACTOR SHALL SHOW APPLICATION OF TYPICAL SECTIONS AND DETAILS FOR SIMILAR SITUATIONS.
2. EXAMINE AND FIELD VERIFY ALL EXISTING AND GIVEN DIMENSIONS AND CONDITIONS PRIOR TO COMMENCEMENT OF THE WORK AND FABRICATION OF CONSTRUCTION MATERIALS. REPORT VARIANCES FROM THE DRAWINGS AND SPECIFICATIONS AND POTENTIAL INTERFERENCES PROMPTLY TO OWNER'S PROJECT MANAGER. INCORPORATE ACTUAL FIELD CONDITIONS AND DIMENSIONS IN THE WORK AND INDICATE CHANGES AND ADJUSTMENTS ON DRAWINGS SUBMITTED FOR APPROVAL.
3. ASSUME AN ABSOLUTE OBLIGATION TO PROTECT EXISTING STRUCTURES AND EQUIPMENT, NEW WORK AND ALL FACILITY EMPLOYEES FROM DAMAGE, LOSS OR INJURY RESULTING FROM THE CONTRACTOR'S OPERATIONS. IN THE EVENT OF SUCH DAMAGE OR LOSS, PROMPTLY REPLACE OR RESTORE THE WORK TO AN EQUIVALENT QUALITY TO THE SATISFACTION OF THE PROJECT MANAGER AND AT NO EXPENSE TO OWNER.
4. OPENINGS AND EMBEDDED ITEMS – ALL CURBED AND OTHER OPENINGS, EQUIPMENT BASES, DEPRESSIONS, FRAMES, CASTINGS, PIPE SLEEVES, CONDUITS, INSERTS, EDGE PROTECTION, ANCHOR BOLTS AND SIMILAR ITEMS SHALL BE PROVIDED, LOCATED AND INSTALLED AS SHOWN ON APPROVED SHOP DRAWINGS FOR MANUFACTURED ITEMS AND OTHER TRADES.
5. THE CONTRACTOR SHALL COORDINATE NEW EQUIPMENT STRUCTURES SHOWN ON THE CONTRACT DRAWINGS WITH MANUFACTURER'S APPROVED SHOP DRAWINGS. ALL DIMENSIONS, DETAILS AND STRUCTURAL DESIGN REVISIONS REQUIRED TO ACCOMMODATE APPROVED EQUIPMENT SHALL BE MADE BY THE CONTRACTOR AT NO COST TO OWNER. STEEL SHOP DRAWINGS SHALL REFLECTS ALL CHANGES.
6. JOB SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

STRUCTURAL DESIGN CRITERIA

1. DESIGNED IN CONFORMANCE WITH THE FOLLOWING CODES AND STANDARDS:
 - a. INTERNATIONAL BUILDING CODE 2015, NEW JERSEY EDITION WITH AMENDMENTS
 - b. AISC MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, 13TH EDITION.
 - c. AWS STRUCTURAL WELDING CODES – D1.4–2011.
 - d. APPLICABLE STATUTES AND REGULATIONS OF FEDERAL, STATE AND LOCAL JURISDICTIONS.
2. DESIGN LOADS:
 - A. LIVE LOAD:
 - ROOF.....20 PSF.
 - B. SNOW LOAD:
 - GROUND SNOW (Pg).....30 PSF + DRIFTING
 - SNOW EXPOSURE Co.....1.0
 - SNOW LOAD IMPORTANCE FACTOR Is.....1.1
 - THERMAL FACTOR, Ct.....1.0
 - C. WIND LOAD
 - BASIC WIND SPEED, V.....120 MPH (3 SECOND GUST)
 - OCCUPANCY CATEGORY.....III
 - EXPOSURE CATEGORY.....C
 - IMPORTANCE FACTOR, Iw.....1.0
 - D. SEISMIC LOAD:
 - SITE CLASS.....D
 - SPECTRAL RESPONSE ACCELERATION:
 - Ss.....0.225
 - S1.....0.064
 - IMPORTANCE FACTOR, Iw.....1.25
 - SEISMIC DESIGN CATEGORY.....B
3. DESIGN ALLOWABLE BEARING CAPACITY IS 1500 PSF.

MATERIALS OF CONSTRUCTION

STRUCTURAL STEEL:

1. WIDE FLANGE SHAPES: ASTM A992; ASTM A572, GRADE 50.
2. ALL OTHER ROLLED SHAPES AND PLATES TO BE A36.
3. STRUCTURAL STEEL TUBING: ASTM A500, GRADE B (Fy = 46ksi).
4. STEEL PIPE: ASTM A53, TYPE S, GRADE B, EXTRA STRONG, BLACK UNLESS NOTED OTHERWISE.
5. DO NOT PAINT STEEL SURFACES WHICH ARE TO BE WELDED OR FIELD BOLTED OR ARE TO BE ENCASED IN CONCRETE OR RECEIVE CEMENTITIOUS FIREPROOFING.
6. SHOP CONNECTIONS MAY BE BOLTED OR WELDED; FIELD CONNECTIONS SHALL BE BOLTED UNLESS DETAILED OR NOTED OTHERWISE ON THE DRAWINGS.

CAST-IN-PLACE CONCRETE:

1. ALL CONCRETE SHALL BE NORMAL WEIGHT AGGREGATE UNLESS NOTED OTHERWISE.
2. CONCRETE SHALL CONFORM TO THE FOLLOWING TABLE:

USAGE	28-DAY STRENGTH (PSI)	MAX WATER/ CEMENT RATIO	CONCRETE SPECIFICATION
MISCELLANEOUS PADS AND CONCRETE REPAIRS	4000	0.45	NORMAL WT.

3. WORKABILITY ADMIXTURES MAY BE UTILIZED, PROVIDED THAT BATCH PROPORTIONS ARE DETERMINED IN THE MANNER DESCRIBED IN THE SPECIFICATIONS.
4. USE OF ACCELERATING OR SET-RETARDING ADMIXTURES REQUIRES PRIOR APPROVAL OF THE PROJECT MANAGER. USE OF CALCIUM CHLORIDE WILL NOT BE PERMITTED.
5. ALL CEMENT SHALL BE PORTLAND TYPE I OR II.
6. CHAMFER EXPOSED CONCRETE EDGES 1"x1".

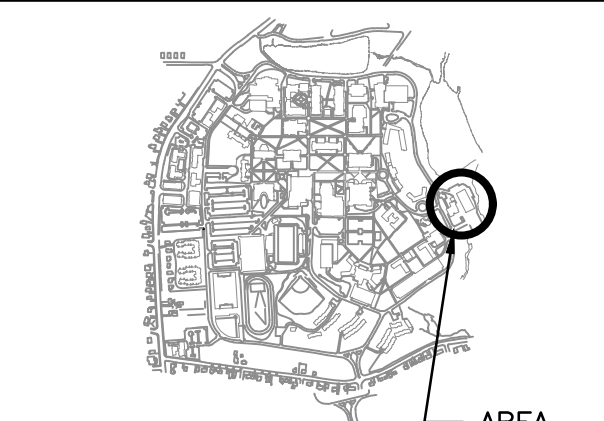
CONCRETE REINFORCEMENT:

1. REINFORCING BARS – ASTM A615, GRADE 60, EPOXY COATED FINISH, UNLESS OTHERWISE NOTED.
 2. WELDED WIRE FABRIC – ASTM A185, DEFORMED EPOXY COATED FINISH UNLESS OTHERWISE NOTED.
 3. DETAIL AND FABRICATE REINFORCEMENT IN ACCORDANCE WITH ACI 315 DETAILING MANUAL.
 4. ALL REINFORCEMENT SHALL BE ADEQUATELY SECURED IN POSITION PRIOR TO CONCRETE PLACEMENT.
 5. REINFORCING BARS AND ACCESSORIES SHALL NOT BE IN CONTACT WITH ANY METAL PIPE, PIPE FLANGE, METAL CONDUIT OR OTHER METAL PARTS EMBEDDED IN CONCRETE. A MINIMUM CLEARANCE OF 2 INCHES SHALL BE PROVIDED.
- WELDING:**
1. WELDING ELECTRODES: E70XX (AWS A5.1 OR A5.5). USE LOW HYDROGEN ELECTRODES FOR FIELD WELDING.
 2. ALL GROOVE AND BUTT WELDS SHALL BE FULL PENETRATION.
 3. FILLET WELD SIZES SHALL BE THE MINIMUM SIZE REQUIRED BY AISC CODE FOR PLATE SIZES TO BE CONNECTED AND SHALL BE APPLIED TO THE ENTIRE JOINT CONTACT LENGTH, BUT NOT LESS THAN 3/16".

STRUCTURAL FASTENERS:

1. HIGH STRENGTH BOLTS: ASTM A325, MINIMUM 3/4", GALVANIZED UNLESS NOTED OTHERWISE.
2. ANCHOR RODS: ASTM F1554, GRADE 55, NONHEADED, HOT-DIPPED GALVANIZED.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
BURNS ENGINEERING, INC. | 215 979-7290
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

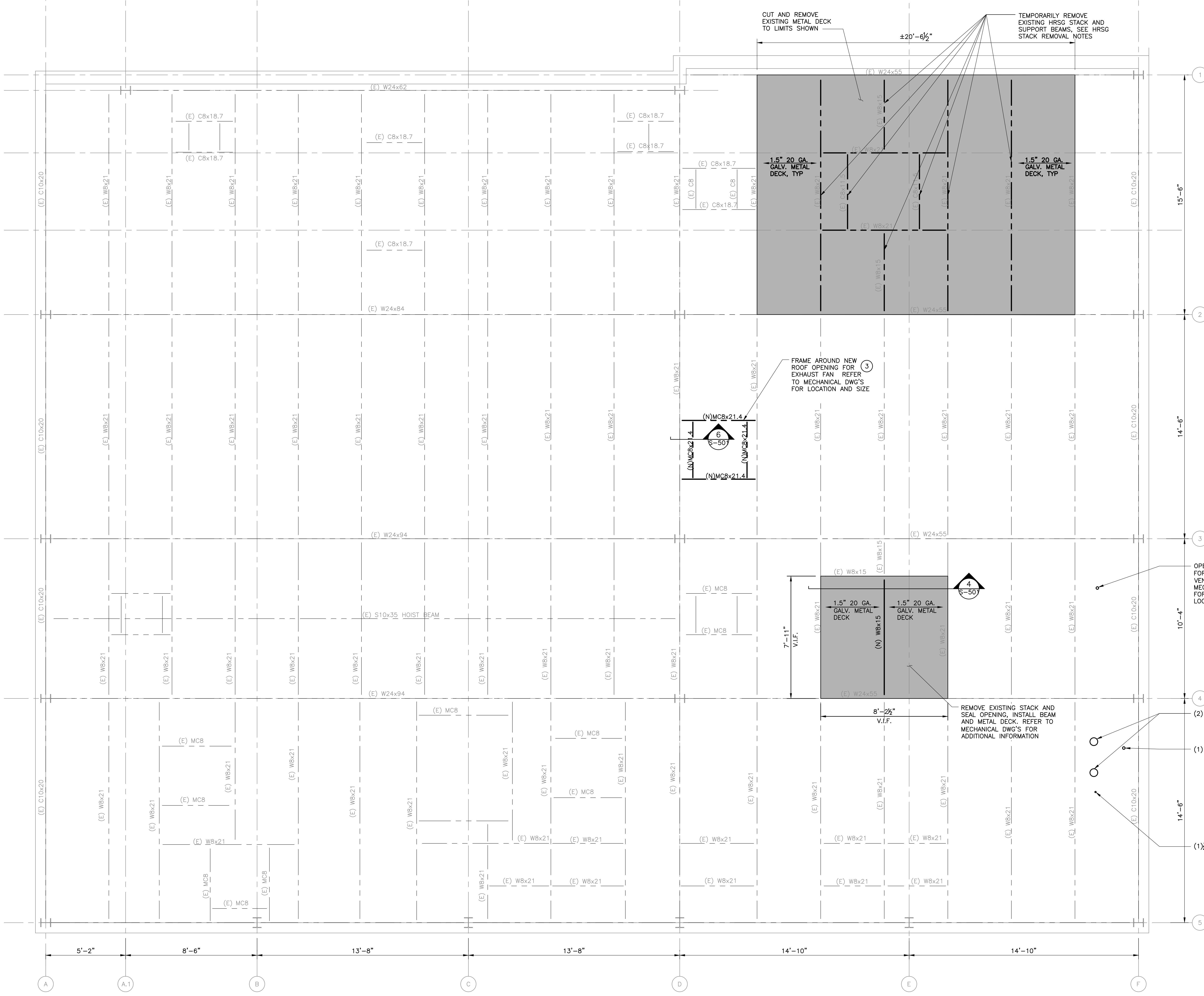
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
GENERAL
STRUCTURAL
NOTES

Date: 05/31/2019
Scale: AS NOTED
Drawn: ABT
Checked: DB
Job No: 2016-193
Drawing No:

S-001

ISSUED FOR BID



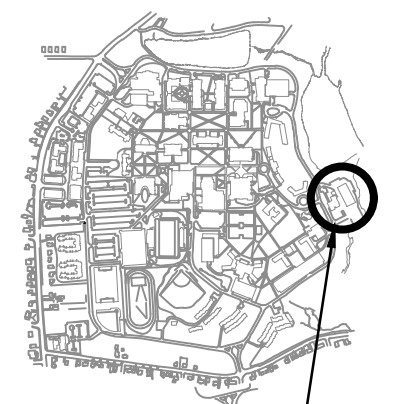
HRSG STACK TEMPORARY REMOVAL NOTES:

- CONTRACTOR SHALL TEMPORARILY REMOVE EXISTING HRSG STACK, INCLUDING ALL ASSOCIATED STEEL SUPPORTS, LADDER AND PLATFORMS.
- UNBOLT AND REMOVE EXISTING ROOF FRAME STEEL BEAMS AND METAL DECK TO LIMITS SHOWN.
 - ONCE ALL THE EQUIPMENT IS DELIVERED CONTRACTOR SHALL REINSTALL EXISTING BEAMS. PROVIDE NEW HIGH STRENGTH BOLTS, MATCH EXISTING SIZE.
 - INSTALL NEW METAL DECK. DECK SHALL MATCH EXISTING IN SIZE AND GAGE. METAL DECK SHALL BE GALVANIZED.
- CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORTS AS NEEDED.
- CONTRACTOR SHALL COORDINATE EQUIPMENT DELIVERY THROUGH ROOF OPENING WITH ROOFING REPLACEMENT WORK.
 - SEAL OPENING EVERY DAY TO PROVIDE WATERTIGHT CONDITIONS UNTIL OPENING IS CLOSED OFF AND NEW ROOFING MEMBRANE IS INSTALLED.
- CONTRACTOR SHALL REMOVE ALL EXISTING EXHAUST DUCT AND BYPASS STACK SUPPORTING STEEL AND ASSOCIATED MEMBERS. COORDINATE WITH MECHANICAL DRAWINGS.

SCOPE NOTES

- ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
- ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING EXHAUST FANS (EF-1, EF-2 AND EF-3) AND INSTALLATION OF NEW EXHAUST FANS (EF-1, EF-2, EF-3 AND EF-4) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 3.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
BURNS ENGINEERING, INC. | 215 979-7290
TWO COMMERCE SQUARE, 201 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

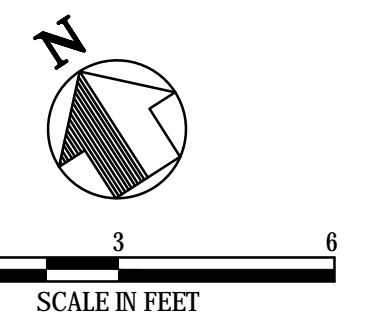
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

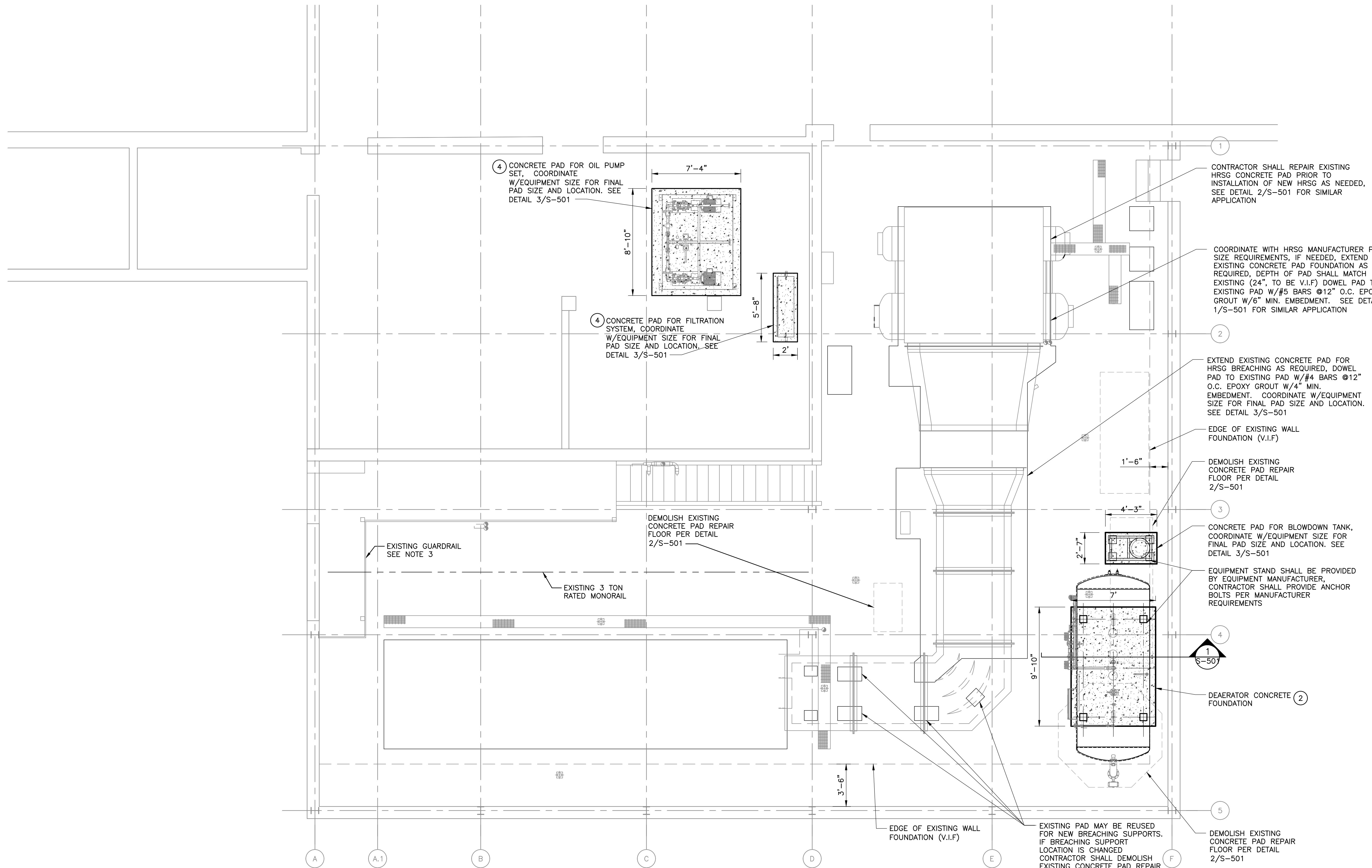
Drawing Title:
ROOF PLAN –
DEMOLITION AND
NEW WORK

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	ABT
Checked:	DB
Job No:	2016-193
Drawing No:	S-101

1 ROOF FRAMING PLAN
S-101 3/8" = 1'-0"

Burns Engineering, Inc., Philadelphia, Pennsylvania





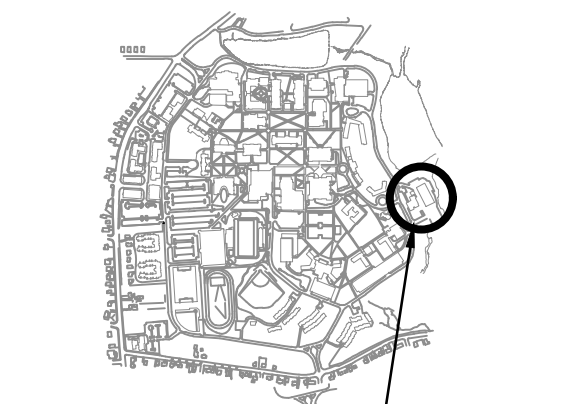
GENERAL NOTES:

1. REFER TO S-001 FOR ADDITIONAL NOTES.
2. COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION ON DEMOLITION AND NEW WORK.
3. THE LOCATION AND SIZE OF EXISTING FEATURES ARE APPROXIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR EXISTING CONDITIONS SURVEY. NOTIFY PROJECT MANAGER IMMEDIATELY IF ANY DISCREPANCIES OR CONFLICTS ARE FOUND.
3. CONTRACTOR MAY REMOVE EXISTING PLATFORM GUARD RAIL, IF REQUIRED, FOR RIGGING IN EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-INSTALLATION OF GUARD RAIL AT THE END OF WORK. REPAIR GUARD RAIL IF NEEDED AT NO COST TO OWNER. PROVIDE TEMPORARY FALL PROTECTION WHEN RIGGING IS NOT TAKING PLACE.
4. COORDINATE SIZE AND LOCATION OF CONCRETE PADS WITH FINAL EQUIPMENT SELECTION.
5. CONTRACTOR SHALL REMOVE ALL EXISTING EXHAUST BREECHING AND BYPASS STACK SUPPORTING STEEL AND ASSOCIATED MEMBERS. PRIOR TO DEMOLITION, CONTRACTOR SHALL REVIEW WITH OWNER'S PROJECT MANAGER WHICH MEMBERS ARE TO BE REMOVED. COORDINATE WITH MECHANICAL DRAWINGS. PROVIDE TEMPORARY SUPPORTS FOR CONDUITS AND PIPES WHERE NEEDED.
6. REFER TO MECHANICAL DRAWINGS FOR REQUIRED CLEARANCE AROUND EQUIPMENT.

SCOPE NOTES

- 2 ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
- 4 ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No. Date Revision

Burns
BURNS ENGINEERING, INC. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

1 LOWER LEVEL FLOOR PLAN - NEW WORK
S-102 1/4" = 1'-0"

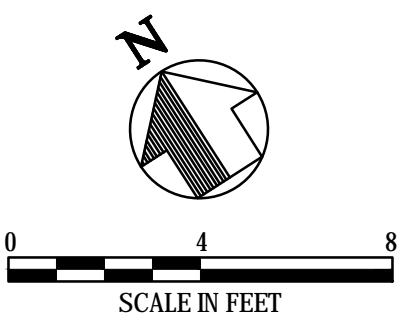
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

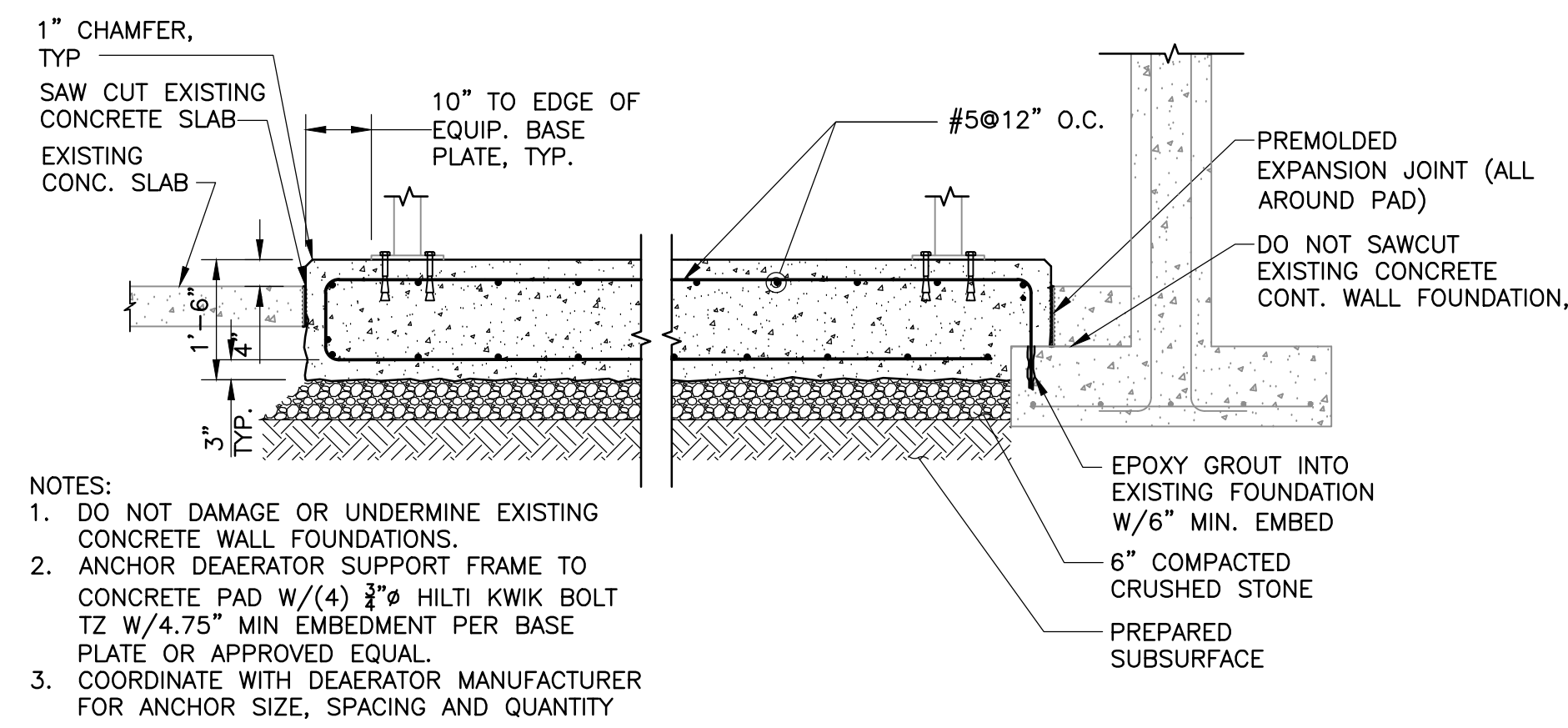
Drawing Title:
OPERATING
FLOOR PLAN –
NEW WORK

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

S-102

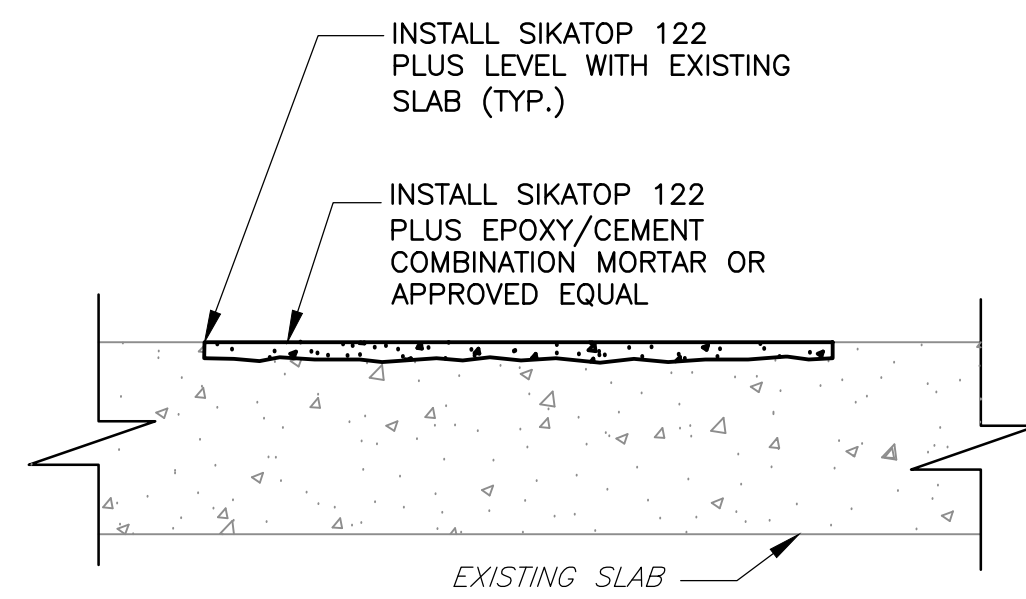
ISSUED FOR BID





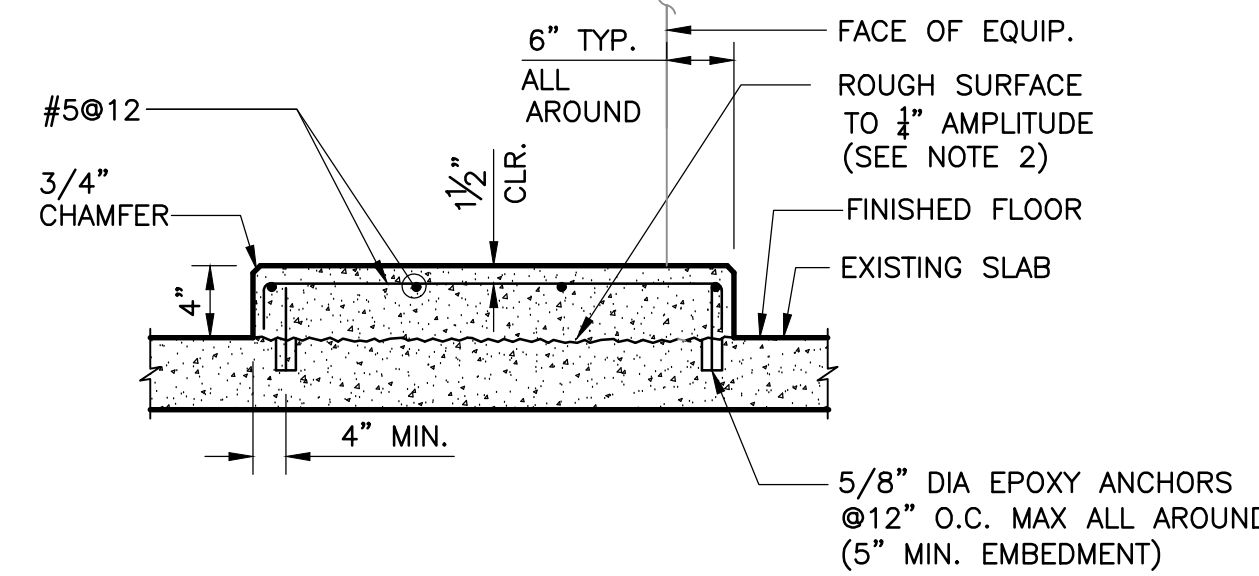
- NOTES:
- DO NOT DAMAGE OR UNDERMINE EXISTING CONCRETE WALL FOUNDATIONS.
 - ANCHOR DEAERATOR SUPPORT FRAME TO CONCRETE PAD W/(4) 3/8" HILTI KWIK BOLT TZ W/4.75" MIN EMBEDMENT PER BASE PLATE OR APPROVED EQUAL.
 - COORDINATE WITH DEAERATOR MANUFACTURER FOR ANCHOR SIZE, SPACING AND QUANTITY

1 DEAERATOR CONCRETE PAD ②
S-501 1/2"=1'-0"



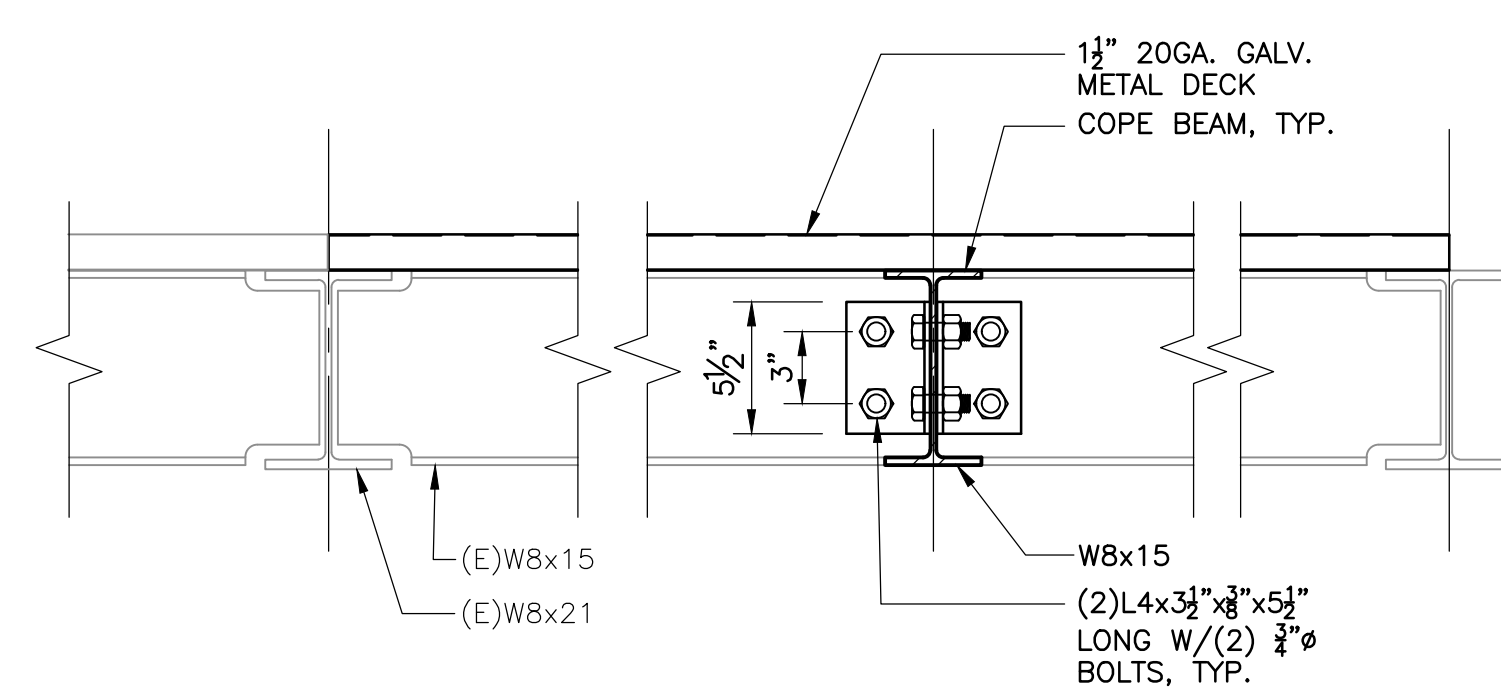
- NOTES:
- AT ALL LOCATIONS WHERE EXISTING CONCRETE EQUIPMENT PADS OR EQUIPMENT ARE DEMO.
 - CONTRACTOR SHALL APPLY SIKATOP 122 PLUS (OR APPROVED EQUAL) PER MANUFACTURER RECOMMENDATIONS. APPLY PRIMER TO SURFACE AS REQUIRED.
 - IF REINFORCING STEEL IS EXPOSED, CONTRACTOR SHALL CLEAN AND REMOVE ALL TRACES OF RUST AND PRIME WITH SIKA ARMATEC 110 EPOCEM OR APPROVED EQUAL.

2 FLOOR REPAIR DETAIL
S-501 N.T.S.

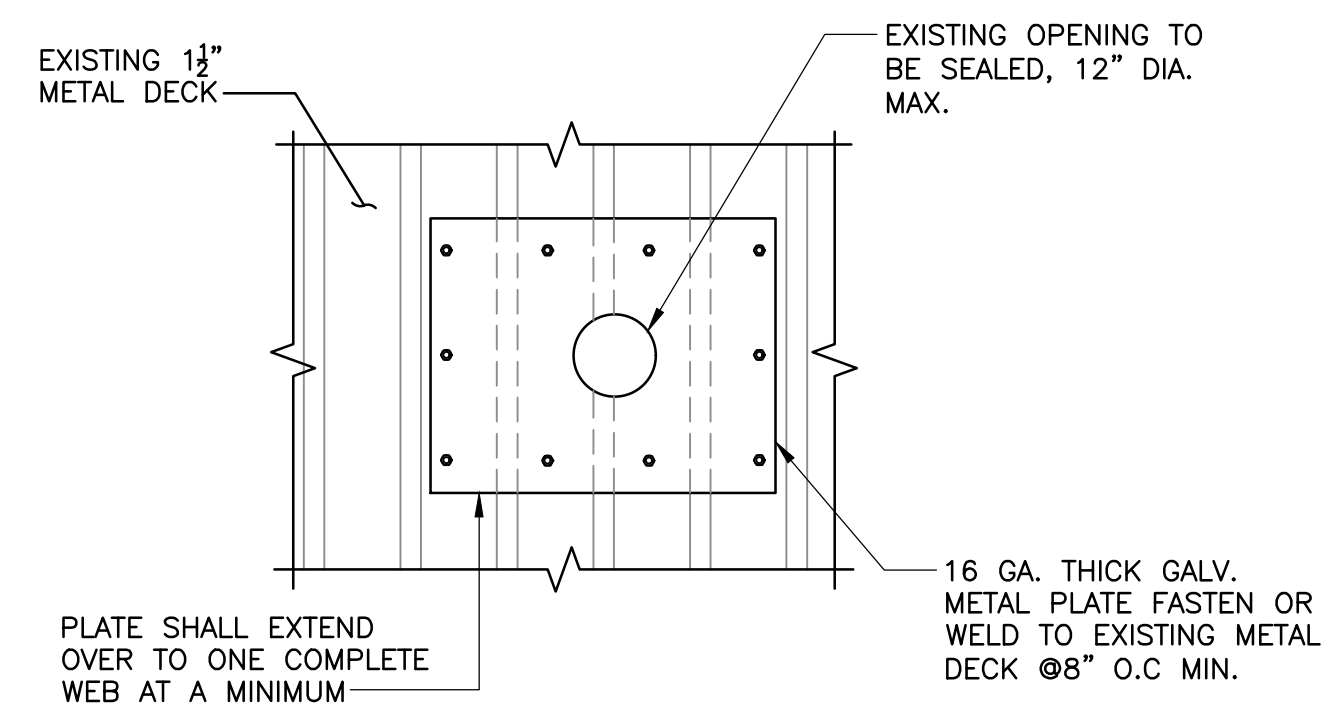


- NOTES:
- PROVIDE EPOXY ANCHORS WITH #5 REINFORCEMENT BAR INTO EXISTING SLABS. DO NOT DRILL THROUGH EXISTING SLAB REINFORCEMENT.
 - CLEAN JOINT BEFORE PLACING CONCRETE FOR EQUIPMENT PAD.
 - COORDINATE SIZE AND THICKNESS OF PAD WITH PLAN SHEETS.
 - DETERMINE SIZE AND LOCATION AFTER FINAL SELECTION OF EQUIPMENT AND IN ACCORDANCE WITH APPROVED WORKING DRAWINGS.

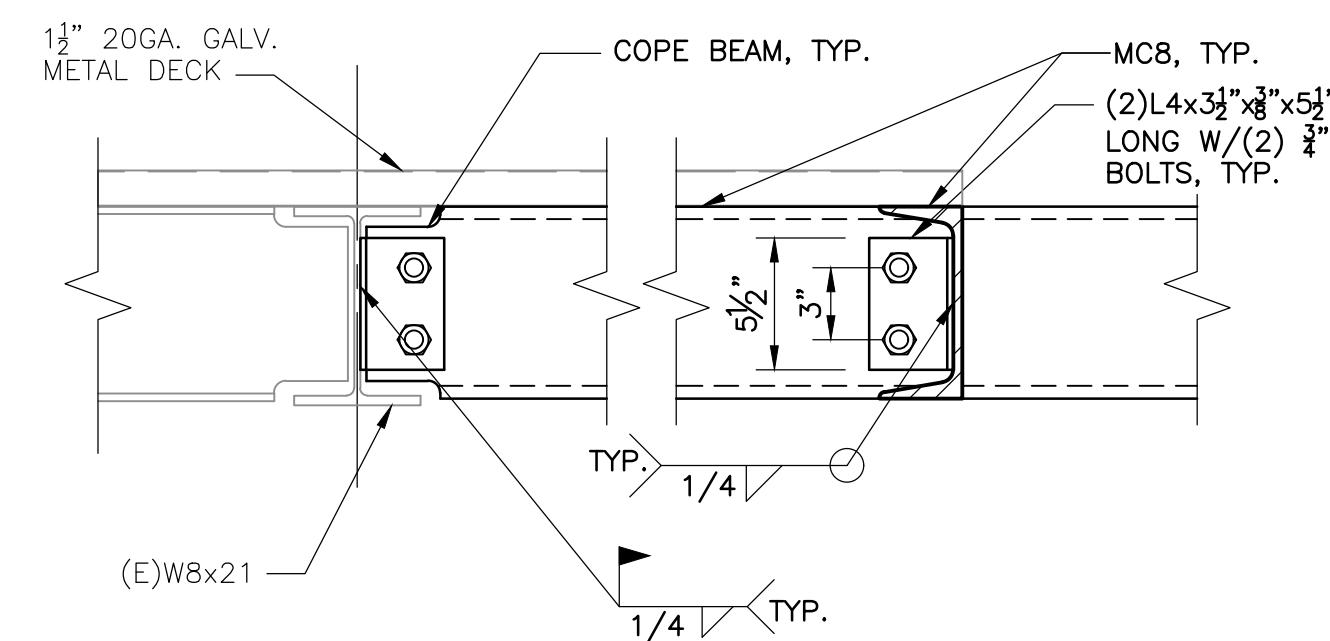
3 EQUIPMENT PAD DETAIL
S-501 N.T.S.



4 REPAIR STACK ROOF OPENING - SECTION
S-501 1 1/2"=1'-0"



5 DECK REPAIR DETAIL
S-501 N.T.S.

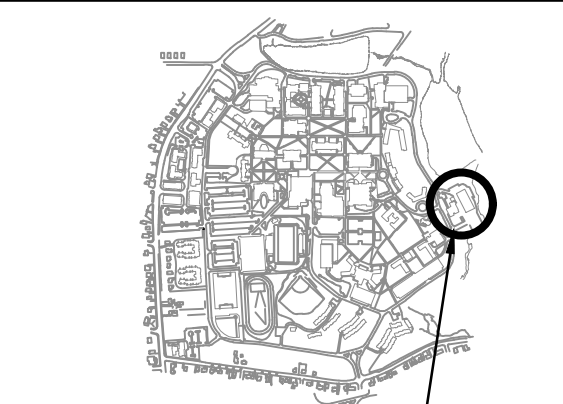


6 OPENING IN EXISTING ROOF
S-501 1 1/2"=1'-0"

SCOPE NOTES

- ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
BURNS ENGINEERING, INC. | 215.979.7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

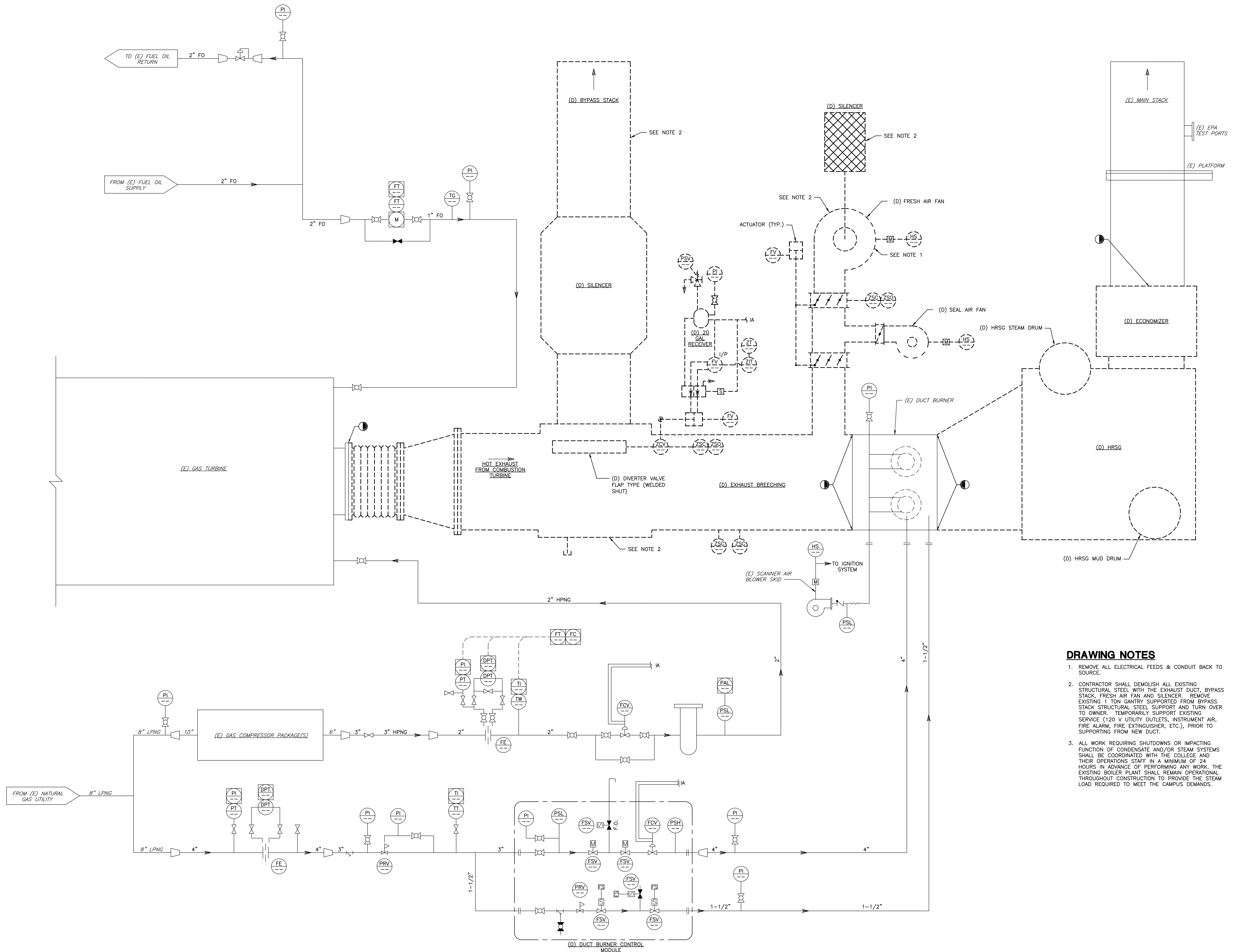
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
STRUCTURAL
DETAILS

Date: 05/31/2019
Scale: AS NOTED
Drawn: ABT
Checked: DB
Job No: 2016-193
Drawing No:

S-501

ISSUED FOR BID

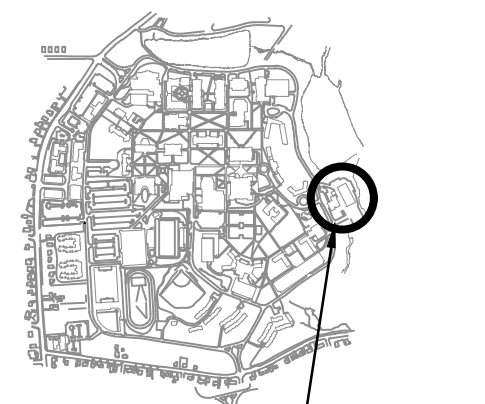


1 FUEL OIL AND NATURAL GAS - DEMOTION
M-101 N.T.S.

DRAWING NOTES

1. REMOVE ALL ELECTRICAL FEEDS & CONDUIT BACK TO SOURCE.
2. CONTRACTOR SHALL DEMOLISH ALL EXISTING STRUCTURAL STEEL WITH THE EXHAUST DUCT, BYPASS STACK, FRESH AIR FAN AND SILENCER. REMOVE EXISTING 1 TON GANTRY SUPPORTED FROM BYPASS STACK STRUCTURAL STEEL SUPPORT AND TURN OVER TO OWNER. TEMPORARILY SUPPORT EXISTING SERVICE (120 V UTILITY OUTLETS, INSTRUMENT AIR, FIRE ALARM, FIRE EXTINGUISHER, ETC.), PRIOR TO SUPPORTING FROM NEW DUCT.
3. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN
AREA OF WORK

0 5/31/19 ISSUED FOR BID

No.	Date	Revision

Burns
BURNS ENGINEERING, INC. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

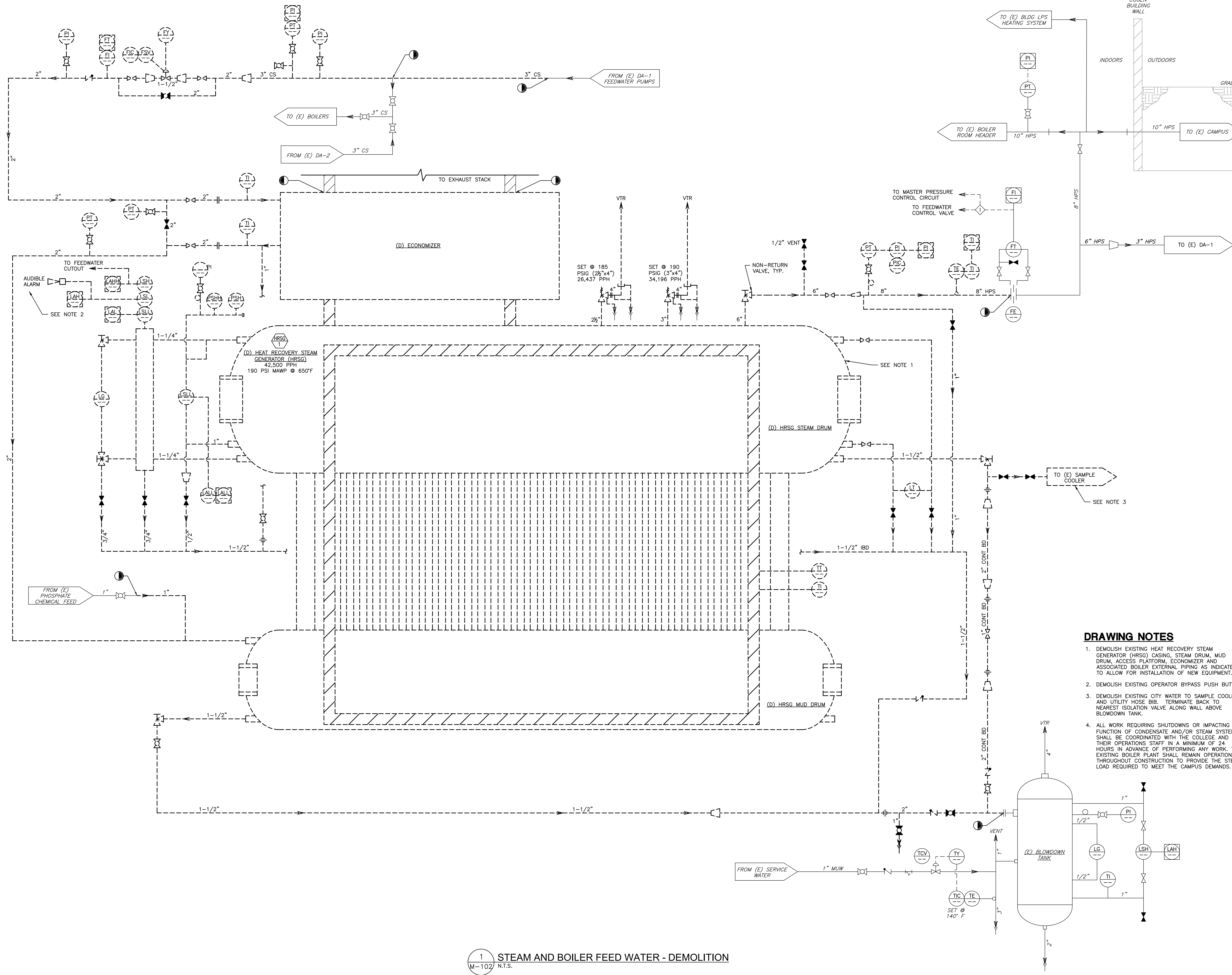
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
PIPING &
INSTRUMENTATION
DIAGRAMS –
DEMOLITION –1–

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

M-101

ISSUED FOR BID

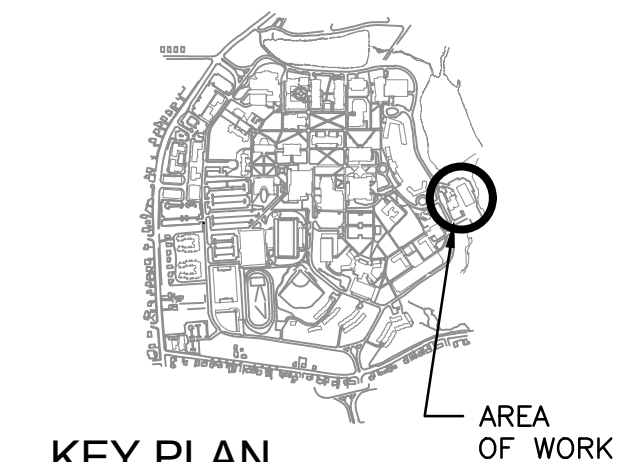


DRAWING NOTES

1. DEMOLISH EXISTING HEAT RECOVERY STEAM GENERATOR (HRSG) CASING, STEAM DRUM, MUD DRUM, ACCESS PLATFORM, ECONOMIZER AND ASSOCIATED BOILER EXTERNAL PIPING AS INDICATED TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT.
2. DEMOLISH EXISTING OPERATOR BYPASS PUSH BUTTON.
3. DEMOLISH EXISTING CITY WATER TO SAMPLE COOLER AND UTILITY HOSE BIB. TERMINATE BACK TO NEAREST ISOLATION VALVE ALONG WALL ABOVE BLOWDOWN TANK.
4. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.

1 STEAM AND BOILER FEED WATER - DEMOLITION
M-102 N.T.S.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
Burns Engineering, Inc. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
PIPING & INSTRUMENTATION DIAGRAMS – DEMOLITION – 2 –

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-102

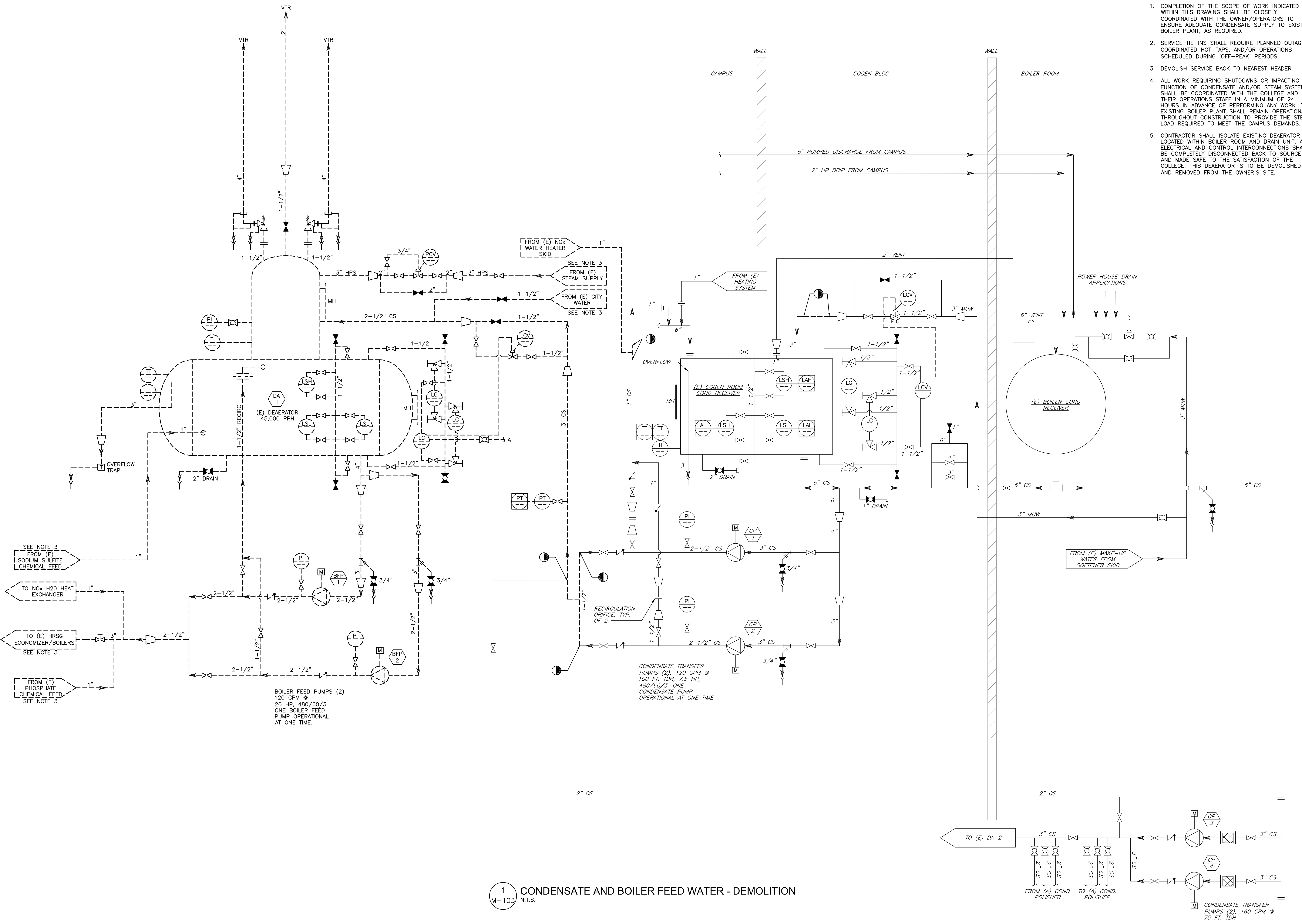
ISSUED FOR BID

SCOPE NOTES

1. ALL WORK INDICATED ON THIS DRAWING SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.

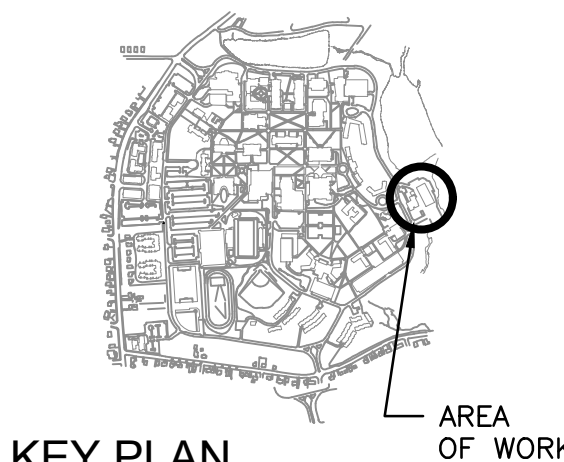
DRAWING NOTES

1. COMPLETION OF THE SCOPE OF WORK INDICATED WITHIN THIS DRAWING SHALL BE CLOSELY COORDINATED WITH THE OWNER/OPERATORS TO ENSURE ADEQUATE CONDENSATE SUPPLY TO EXISTING BOILER PLANT, AS REQUIRED.
2. SERVICE TIE-INS SHALL REQUIRE PLANNED OUTAGES, COORDINATED HOT-TAPS, AND/OR OPERATIONS SCHEDULED DURING 'OFF-PEAK' PERIODS.
3. DEMOLISH SERVICE BACK TO NEAREST HEADER.
4. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.
5. CONTRACTOR SHALL ISOLATE EXISTING DEAERATOR LOCATED WITHIN BOILER ROOM AND DRAIN UNIT. ALL ELECTRICAL AND CONTROL INTERCONNECTIONS SHALL BE COMPLETELY DISCONNECTED BACK TO SOURCE AND MADE SAFE TO THE SATISFACTION OF THE COLLEGE. THIS DEAERATOR IS TO BE DEMOLISHED AND REMOVED FROM THE OWNER'S SITE.



1 CONDENSATE AND BOILER FEED WATER - DEMOLITION
M-103 N.T.S.

TCNJ
THE COLLEGE OF
NEW JERSEY



0 5/31/19 ISSUED FOR BID
No. Date Revision

Burns
Burns Engineering, Inc. | 215-979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

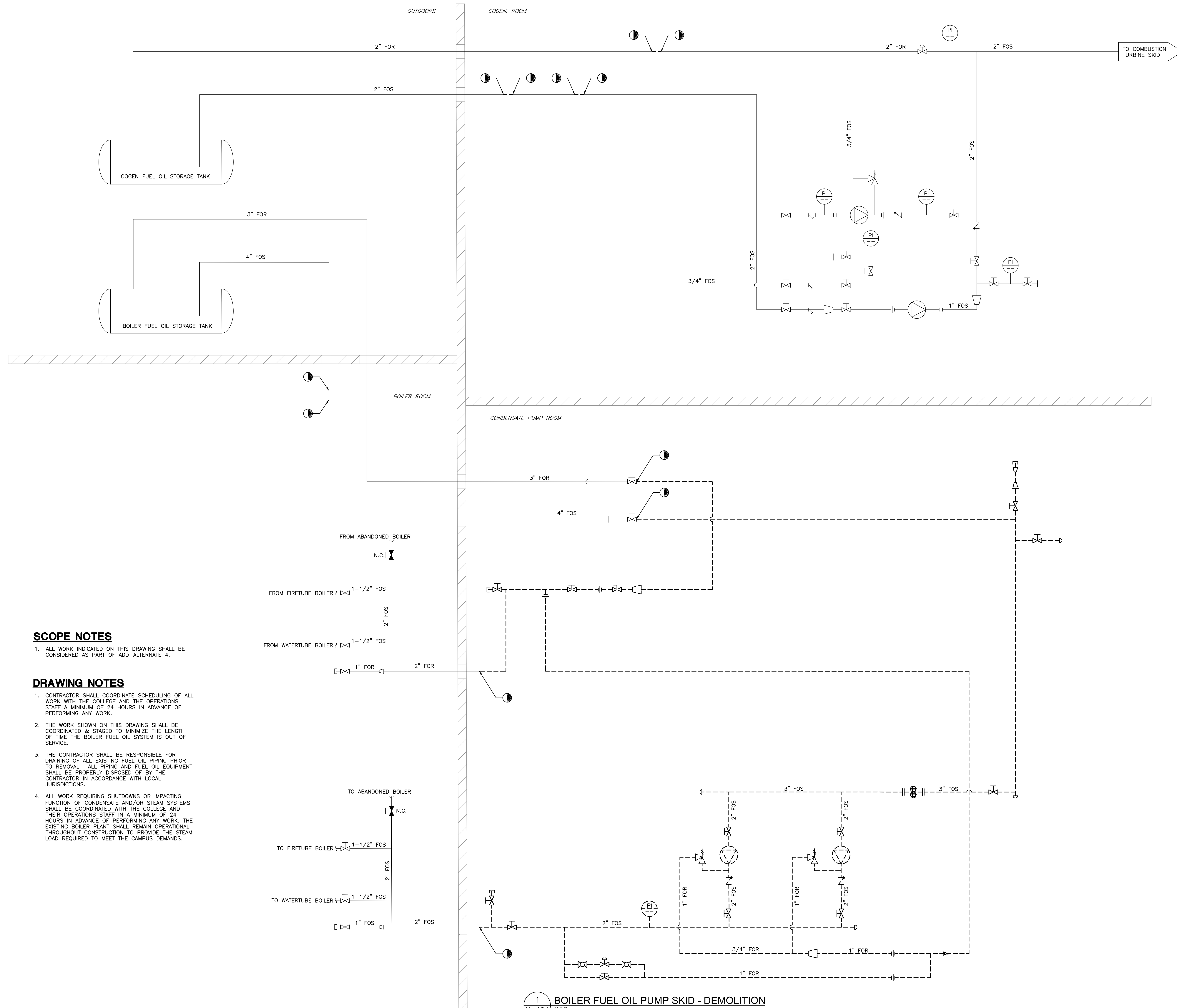
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
PIPING &
INSTRUMENTATION
DIAGRAMS –
DEMOLITION – 3 –

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

M-103

ISSUED FOR BID



SCOPE NOTES

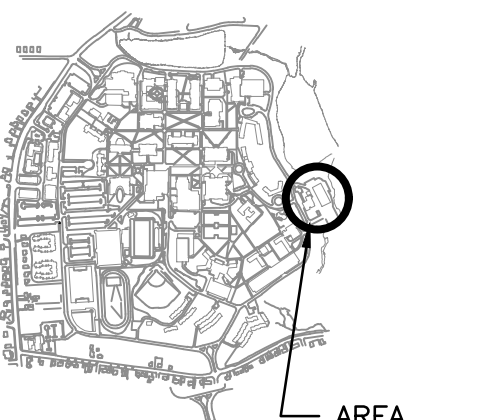
1. ALL WORK INDICATED ON THIS DRAWING SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.

DRAWING NOTES

1. CONTRACTOR SHALL COORDINATE SCHEDULING OF ALL WORK WITH THE COLLEGE AND THE OPERATIONS STAFF A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK.
2. THE WORK SHOWN ON THIS DRAWING SHALL BE COORDINATED & STAGED TO MINIMIZE THE LENGTH OF TIME THE BOILER FUEL OIL SYSTEM IS OUT OF SERVICE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING OF ALL EXISTING FUEL OIL PIPING PRIOR TO REMOVAL. ALL PIPING AND FUEL OIL EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH LOCAL JURISDICTIONS.
4. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.

1 BOILER FUEL OIL PUMP SKID - DEMOLITION
M-104/ N.T.S.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No.	Date	Revision

Burns

BURNS ENGINEERING, INC. | 215-979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
PIPING &
INSTRUMENTATION
DIAGRAMS –
DEMOLITION – 4 –

Date: 05/31/2019

Scale: AS NOTED

Drawn: ADR

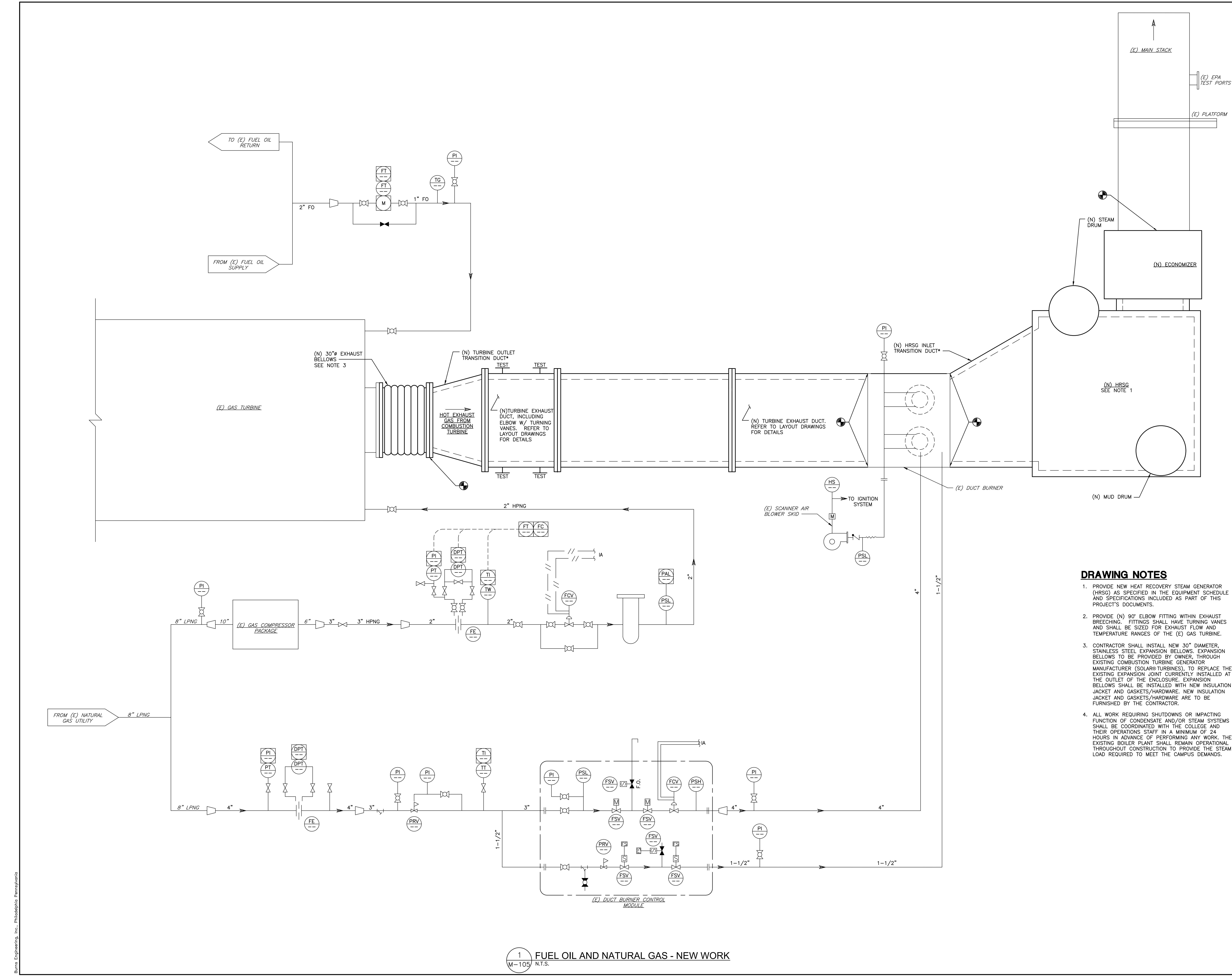
Checked: DB

Job No: 2016-193

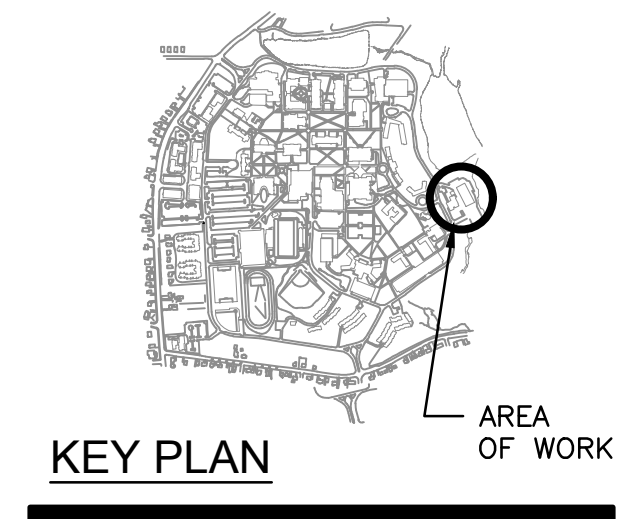
Drawing No:

M-104

ISSUED FOR BID



TCNJ
THE COLLEGE OF
NEW JERSEY



No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
Burns Engineering, Inc. | 215-979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

- DRAWING NOTES**
1. PROVIDE NEW HEAT RECOVERY STEAM GENERATOR (HRSG) AS SPECIFIED IN THE EQUIPMENT SCHEDULE AND SPECIFICATIONS INCLUDED AS PART OF THIS PROJECT'S DOCUMENTS.
 2. PROVIDE (N) 90° ELBOW FITTING WITHIN EXHAUST BREECHING. FITTINGS SHALL HAVE TURNING VANES AND SHALL BE SIZED FOR EXHAUST FLOW AND TEMPERATURE RANGES OF THE (E) GAS TURBINE.
 3. CONTRACTOR SHALL INSTALL NEW 30" DIAMETER, STAINLESS STEEL EXPANSION BELLOWS. EXPANSION BELLOWS TO BE PROVIDED BY OWNER, THROUGH EXISTING COMBUSTION TURBINE GENERATOR MANUFACTURER (SOLAR® TURBINES), TO REPLACE THE EXISTING EXPANSION JOINT CURRENTLY INSTALLED AT THE OUTLET OF THE ENCLOSURE. EXPANSION BELLOWS SHALL BE INSTALLED WITH NEW INSULATION JACKET AND GASKETS/HARDWARE. NEW INSULATION JACKET AND GASKETS/HARDWARE ARE TO BE FURNISHED BY THE CONTRACTOR.
 4. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.

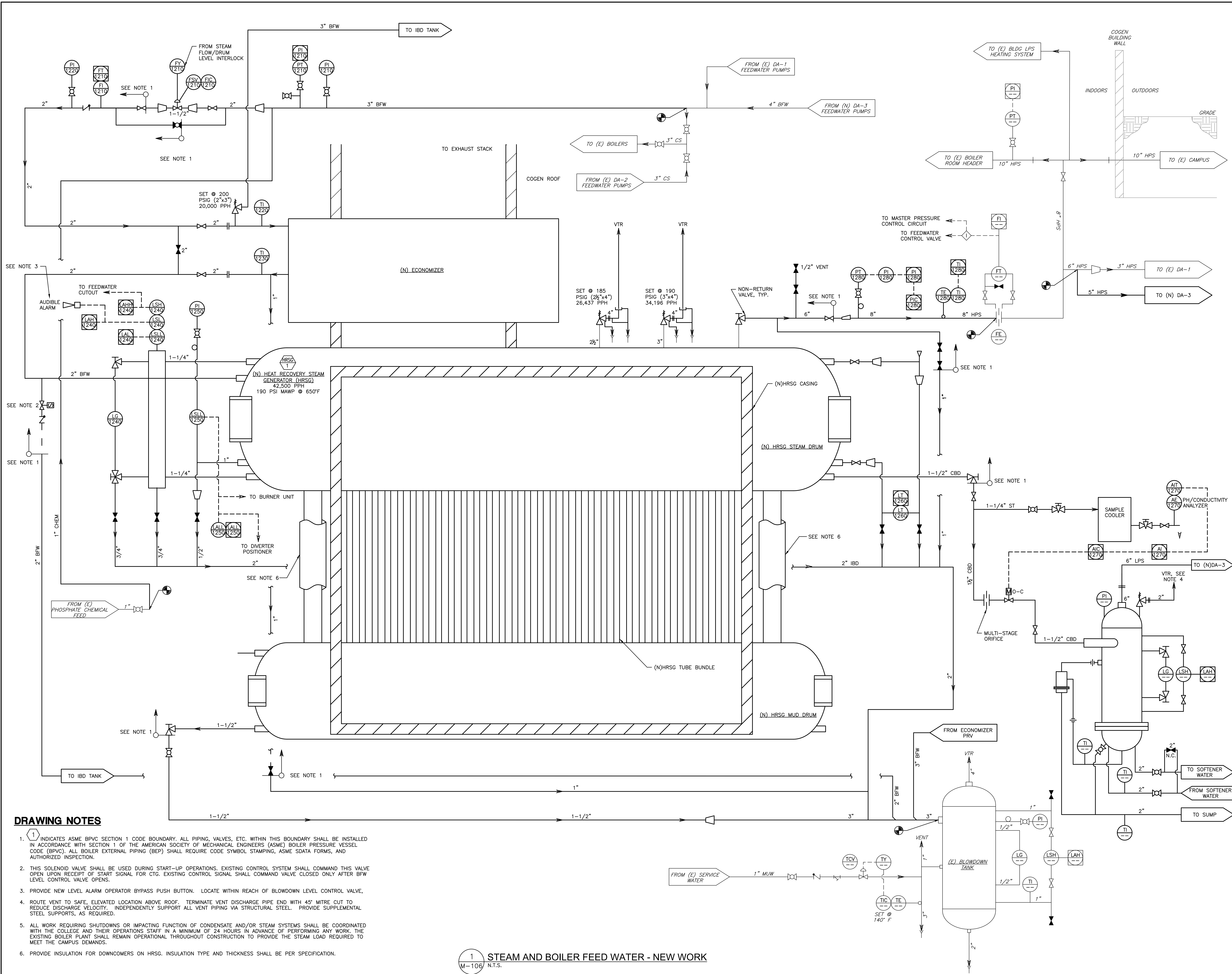
1 FUEL OIL AND NATURAL GAS - NEW WORK
M-105 N.T.S.

Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
PIPING & INSTRUMENTATION DIAGRAMS – NEW WORK – 1 –

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-105

ISSUED FOR BID

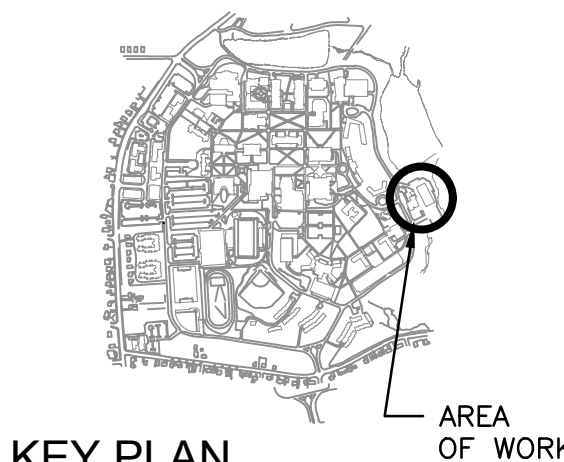


DRAWING NOTES

- 1 INDICATES ASME BPVC SECTION 1 CODE BOUNDARY. ALL PIPING, VALVES, ETC. WITHIN THIS BOUNDARY SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 1 OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) BOILER PRESSURE VESSEL CODE (BPVC). ALL BOILER EXTERNAL PIPING (BEP) SHALL REQUIRE CODE SYMBOL STAMPING, ASME SDATA FORMS, AND AUTHORIZED INSPECTION.
- THIS SOLENOID VALVE SHALL BE USED DURING START-UP OPERATIONS. EXISTING CONTROL SYSTEM SHALL COMMAND THIS VALVE OPEN UPON RECEIPT OF START SIGNAL FOR CTG. EXISTING CONTROL SIGNAL SHALL COMMAND VALVE CLOSED ONLY AFTER BFW LEVEL CONTROL VALVE OPENS.
- PROVIDE NEW LEVEL ALARM OPERATOR BYPASS PUSH BUTTON. LOCATE WITHIN REACH OF BLOWDOWN LEVEL CONTROL VALVE.
- ROUTE VENT TO SAFE, ELEVATED LOCATION ABOVE ROOF. TERMINATE VENT DISCHARGE PIPE END WITH 45° MITRE CUT TO REDUCE DISCHARGE VELOCITY. INDEPENDENTLY SUPPORT ALL VENT PIPING VIA STRUCTURAL STEEL. PROVIDE SUPPLEMENTAL STEEL SUPPORTS, AS REQUIRED.
- ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.
- PROVIDE INSULATION FOR DOWNCOMERS ON HRSG. INSULATION TYPE AND THICKNESS SHALL BE PER SPECIFICATION.

1 STEAM AND BOILER FEED WATER - NEW WORK
M-106 N.T.S.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN
AREA OF WORK

0 5/31/19 ISSUED FOR BID
No. Date Revision

Burns
Burns Engineering, Inc. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ - COGENERATION PLANT HRSG RENEWAL

Drawing Title:
PIPING & INSTRUMENTATION DIAGRAMS - NEW WORK -2-

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-106

ISSUED FOR BID

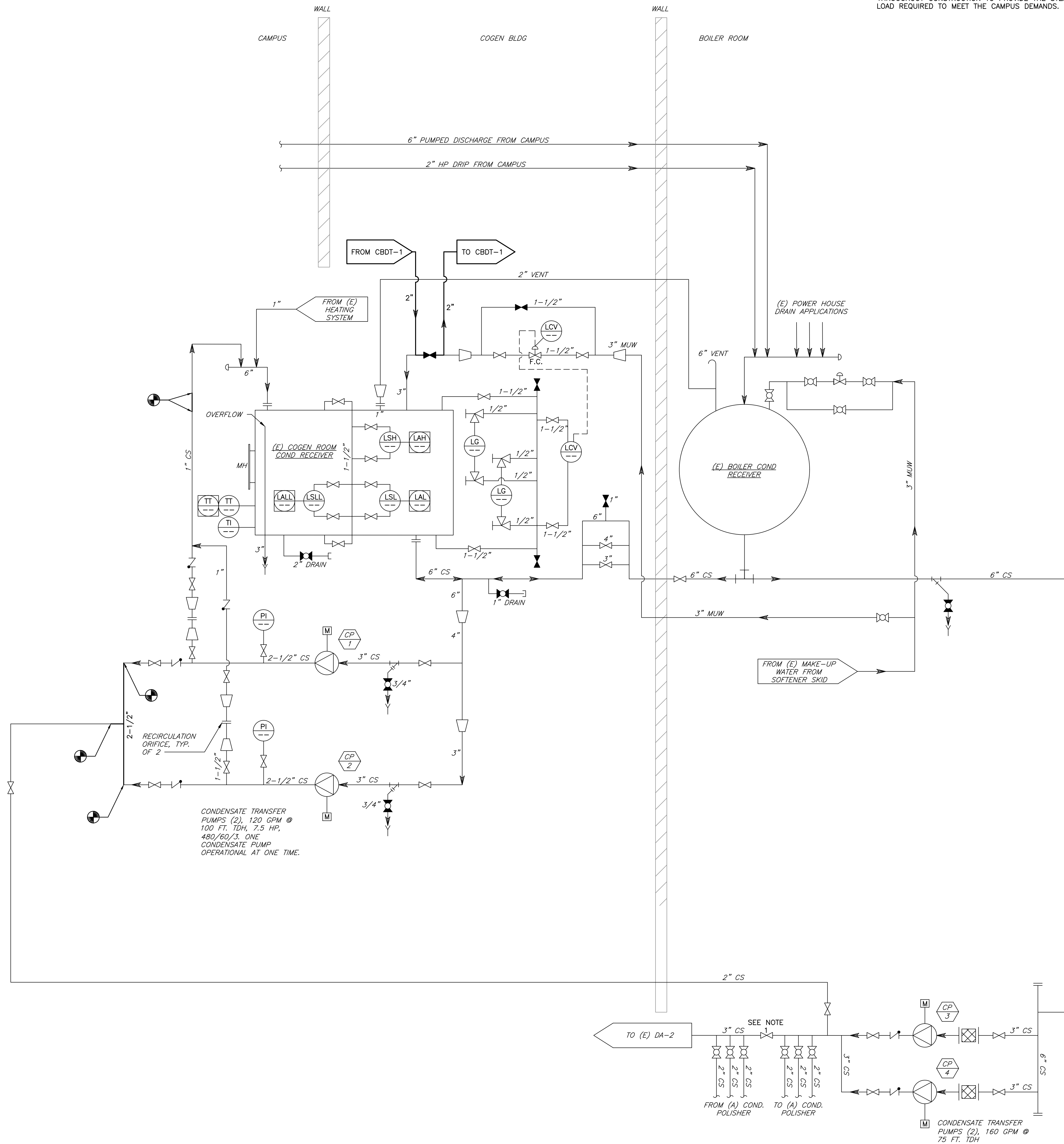
Burns Engineering, Inc., Philadelphia, Pennsylvania

SCOPE NOTES

1. ALL WORK INDICATED ON THIS DRAWING SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.

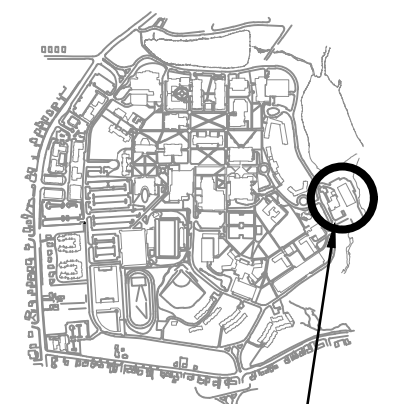
DRAWING NOTES

1. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.



1 CONDENSATE AND BOILER FEED WATER - NEW WORK
M-107 1'-0" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
BURNS ENGINEERING, INC. | 215 979-7200
TWO COMMERCE SQUARE, 201 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

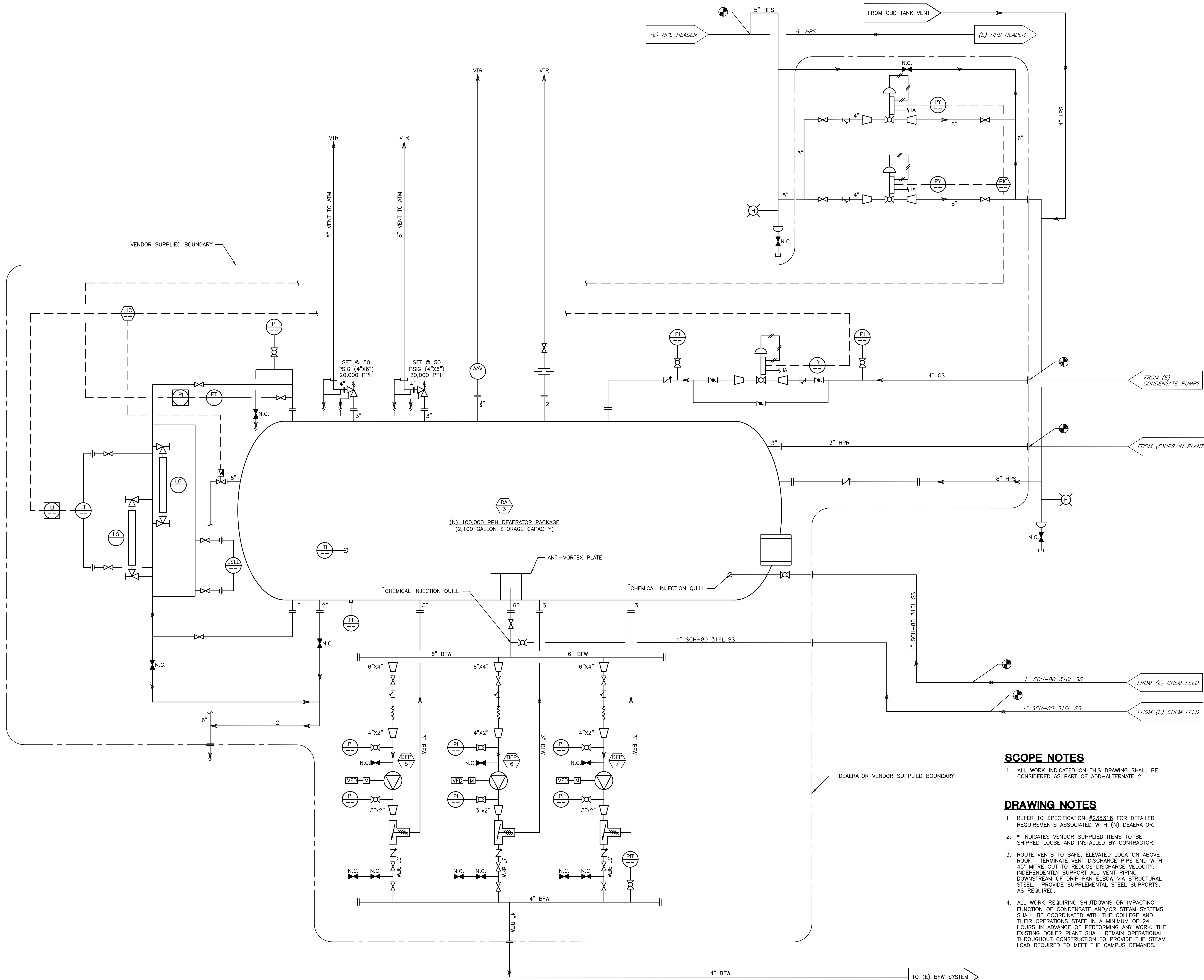
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
PIPING &
INSTRUMENTATION
DIAGRAMS –
NEW WORK –3–

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

M-107

ISSUED FOR BID



1 DEAERATOR - NEW WORK
M-108 N.T.S.

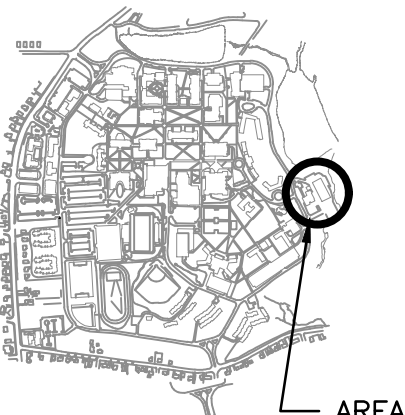
SCOPE NOTES

1. ALL WORK INDICATED ON THIS DRAWING SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.

DRAWING NOTES

1. REFER TO SPECIFICATION #235316 FOR DETAILED REQUIREMENTS ASSOCIATED WITH (N) DEAERATOR.
2. * INDICATES VENDOR SUPPLIED ITEMS TO BE SHIPPED LOOSE AND INSTALLED BY CONTRACTOR.
3. ROUTE VENTS TO SAFE, ELEVATED LOCATION ABOVE ROOF. TERMINATE VENT DISCHARGE PIPE END WITH 45° MITRE CUT TO REDUCE DISCHARGE VELOCITY. INDEPENDENTLY SUPPORT ALL VENT PIPING DOWNSTREAM OF DRIP PAN ELBOW VIA STRUCTURAL STEEL. PROVIDE SUPPLEMENTAL STEEL SUPPORTS, AS REQUIRED.
4. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

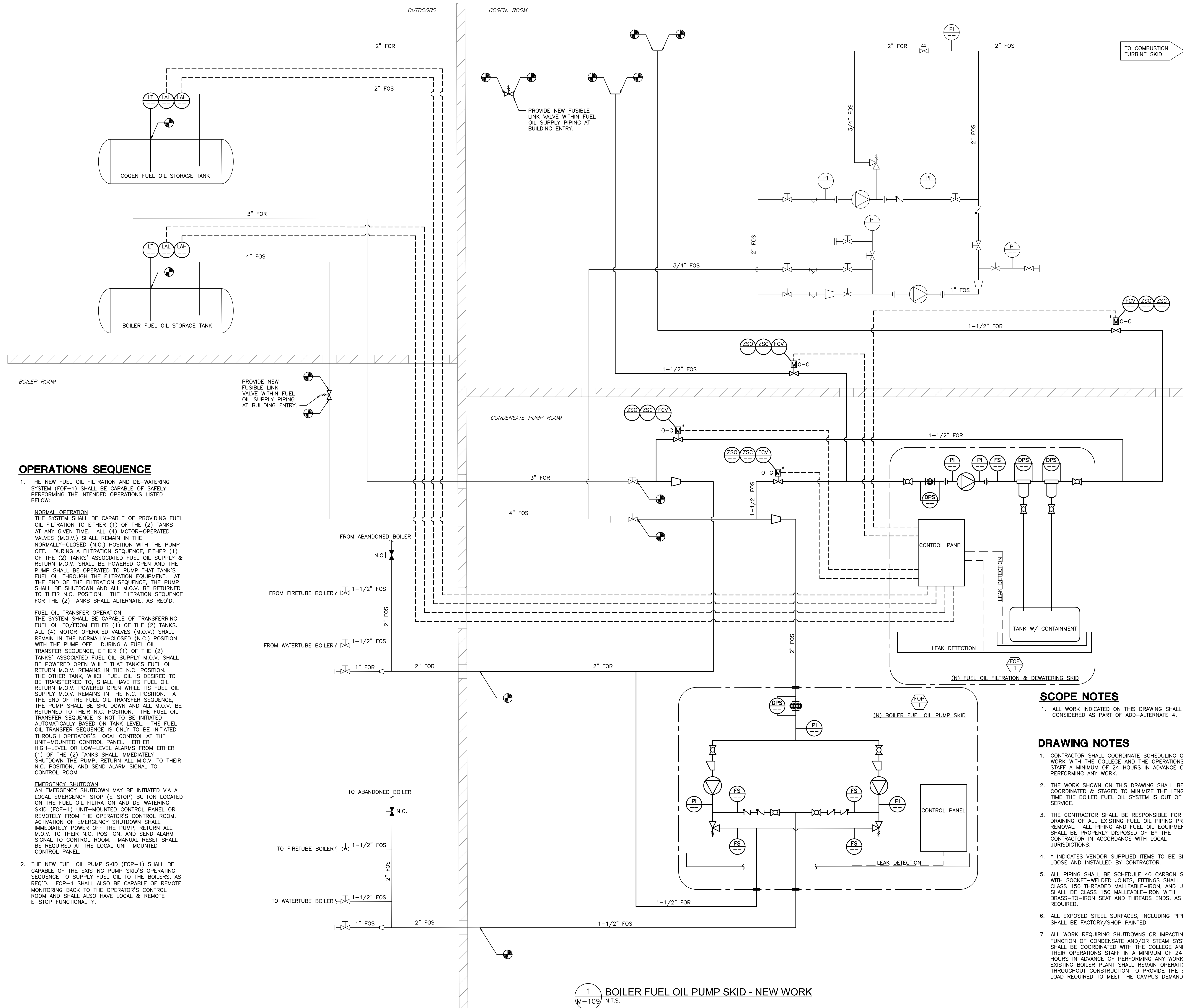
Burns
BURNS ENGINEERING, INC. | 215 979-7290
TWO COMMERCIAL SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
PIPING &
INSTRUMENTATION
DIAGRAMS –
NEW WORK –4–

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	ADR
Checked:	DB
Job No:	2016-193
Drawing No:	M-108

ISSUED FOR BID



OPERATIONS SEQUENCE

1. THE NEW FUEL OIL FILTRATION AND DE-WATERING SYSTEM (FOP-1) SHALL BE CAPABLE OF SAFELY PERFORMING THE INTENDED OPERATIONS LISTED BELOW.

NORMAL OPERATION

THE SYSTEM SHALL BE CAPABLE OF PROVIDING FUEL OIL FILTRATION TO EITHER (1) OF THE (2) TANKS AT ANY GIVEN TIME. ALL (4) MOTOR-OPERATED VALVES (M.O.V.) SHALL REMAIN IN THE NORMALLY-CLOSED (N.C.) POSITION WITH THE PUMP OFF. DURING A FILTRATION SEQUENCE, EITHER (1) OF THE (2) TANKS' ASSOCIATED FUEL OIL SUPPLY & RETURN M.O.V. SHALL BE POWERED OPEN AND THE PUMP SHALL BE OPERATED TO PUMP THAT TANK'S FUEL OIL THROUGH THE FILTRATION EQUIPMENT. AT THE END OF THE FILTRATION SEQUENCE, THE PUMP SHALL BE SHUTDOWN AND ALL M.O.V. BE RETURNED TO THEIR N.C. POSITION. THE FILTRATION SEQUENCE FOR THE (2) TANKS SHALL ALTERNATE, AS REQ'D.

FUEL OIL TRANSFER OPERATION

THE SYSTEM SHALL BE CAPABLE OF TRANSFERRING FUEL OIL TO/FROM EITHER (1) OF THE (2) TANKS. ALL (4) MOTOR-OPERATED VALVES (M.O.V.) SHALL REMAIN IN THE NORMALLY-CLOSED (N.C.) POSITION WITH THE PUMP OFF. DURING A FUEL OIL TRANSFER SEQUENCE, EITHER (1) OF THE (2) TANKS' ASSOCIATED FUEL OIL SUPPLY M.O.V. SHALL BE POWERED OPEN WHILE THAT TANK'S FUEL OIL RETURN M.O.V. REMAINS IN THE N.C. POSITION. THE OTHER TANK, WHICH FUEL OIL IS DESIRED TO BE TRANSFERRED TO, SHALL HAVE ITS FUEL OIL RETURN M.O.V. POWERED OPEN WHILE ITS FUEL OIL SUPPLY M.O.V. REMAINS IN THE N.C. POSITION. AT THE END OF THE FUEL OIL TRANSFER SEQUENCE, THE PUMP SHALL BE SHUTDOWN AND ALL M.O.V. BE RETURNED TO THEIR N.C. POSITION. THE FUEL OIL TRANSFER SEQUENCE IS NOT TO BE INITIATED AUTOMATICALLY BASED ON TANK LEVEL. THE FUEL OIL TRANSFER SEQUENCE IS ONLY TO BE INITIATED THROUGH OPERATOR'S LOCAL CONTROL AT THE UNIT-MOUNTED CONTROL PANEL EITHER HIGH-LEVEL OR LOW-LEVEL ALARMS FROM EITHER (1) OF THE (2) TANKS SHALL IMMEDIATELY SHUTDOWN THE PUMP, RETURN ALL M.O.V. TO THEIR N.C. POSITION, AND SEND ALARM SIGNAL TO CONTROL ROOM. MANUAL RESET SHALL BE REQUIRED AT THE LOCAL UNIT-MOUNTED CONTROL PANEL.

EMERGENCY SHUTDOWN

AN EMERGENCY SHUTDOWN MAY BE INITIATED VIA A LOCAL EMERGENCY-STOP (E-STOP) BUTTON LOCATED ON THE FUEL OIL FILTRATION AND DE-WATERING SKID (FOP-1) UNIT-MOUNTED CONTROL PANEL OR REMOTELY FROM THE OPERATOR'S CONTROL ROOM. ACTIVATION OF EMERGENCY SHUTDOWN SHALL IMMEDIATELY POWER OFF THE PUMP, RETURN ALL M.O.V. TO THEIR N.C. POSITION, AND SEND ALARM SIGNAL TO CONTROL ROOM. MANUAL RESET SHALL BE REQUIRED AT THE LOCAL UNIT-MOUNTED CONTROL PANEL.

2. THE NEW FUEL OIL PUMP SKID (FOP-1) SHALL BE CAPABLE OF THE EXISTING PUMP SKID'S OPERATING SEQUENCE TO SUPPLY FUEL OIL TO THE BOILERS, AS REQ'D. FOP-1 SHALL ALSO BE CAPABLE OF REMOTE MONITORING BACK TO THE OPERATOR'S CONTROL ROOM AND SHALL ALSO HAVE LOCAL & REMOTE E-STOP FUNCTIONALITY.

SCOPE NOTES

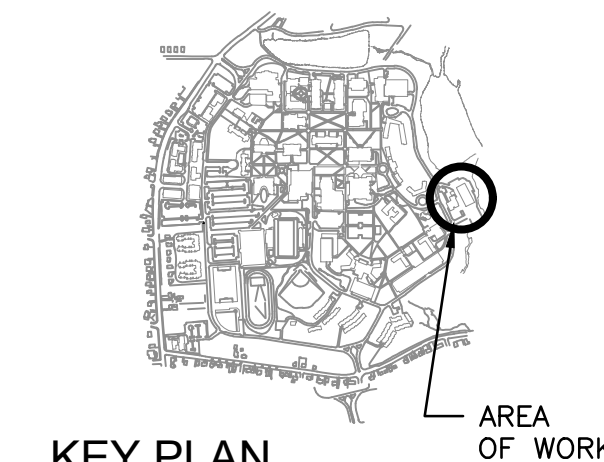
1. ALL WORK INDICATED ON THIS DRAWING SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.

DRAWING NOTES

1. CONTRACTOR SHALL COORDINATE SCHEDULING OF ALL WORK WITH THE COLLEGE AND THE OPERATIONS STAFF A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK.
2. THE WORK SHOWN ON THIS DRAWING SHALL BE COORDINATED & STAGED TO MINIMIZE THE LENGTH OF TIME THE BOILER FUEL OIL SYSTEM IS OUT OF SERVICE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING OF ALL EXISTING FUEL OIL PIPING PRIOR TO REMOVAL. ALL PIPING AND FUEL OIL EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH LOCAL JURISDICTIONS.
4. * INDICATES VENDOR SUPPLIED ITEMS TO BE SHIPPED LOOSE AND INSTALLED BY CONTRACTOR.
5. ALL PIPING SHALL BE SCHEDULE 40 CARBON STEEL WITH SOCKET-WELDED JOINTS. FITTINGS SHALL BE CLASS 150 THREADED MALLEABLE-IRON, AND UNIONS SHALL BE CLASS 150 MALLEABLE-IRON WITH BRASS-TO-IRON SEAT AND THREADS ENDS, AS REQUIRED.
6. ALL EXPOSED STEEL SURFACES, INCLUDING PIPING, SHALL BE FACTORY/SHOP PAINTED.
7. ALL WORK REQUIRING SHUTDOWNS OR IMPACTING FUNCTION OF CONDENSATE AND/OR STEAM SYSTEMS SHALL BE COORDINATED WITH THE COLLEGE AND THEIR OPERATIONS STAFF IN A MINIMUM OF 24 HOURS IN ADVANCE OF PERFORMING ANY WORK. THE EXISTING BOILER PLANT SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION TO PROVIDE THE STEAM LOAD REQUIRED TO MEET THE CAMPUS DEMANDS.

1 M-109 N.T.S. BOILER FUEL OIL PUMP SKID - NEW WORK

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No. Date Revision

Burns
Burns Engineering, Inc. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ - COGENERATION PLANT HRSG RENEWAL

Drawing Title:
PIPING & INSTRUMENTATION DIAGRAMS - NEW WORK -5-

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-109

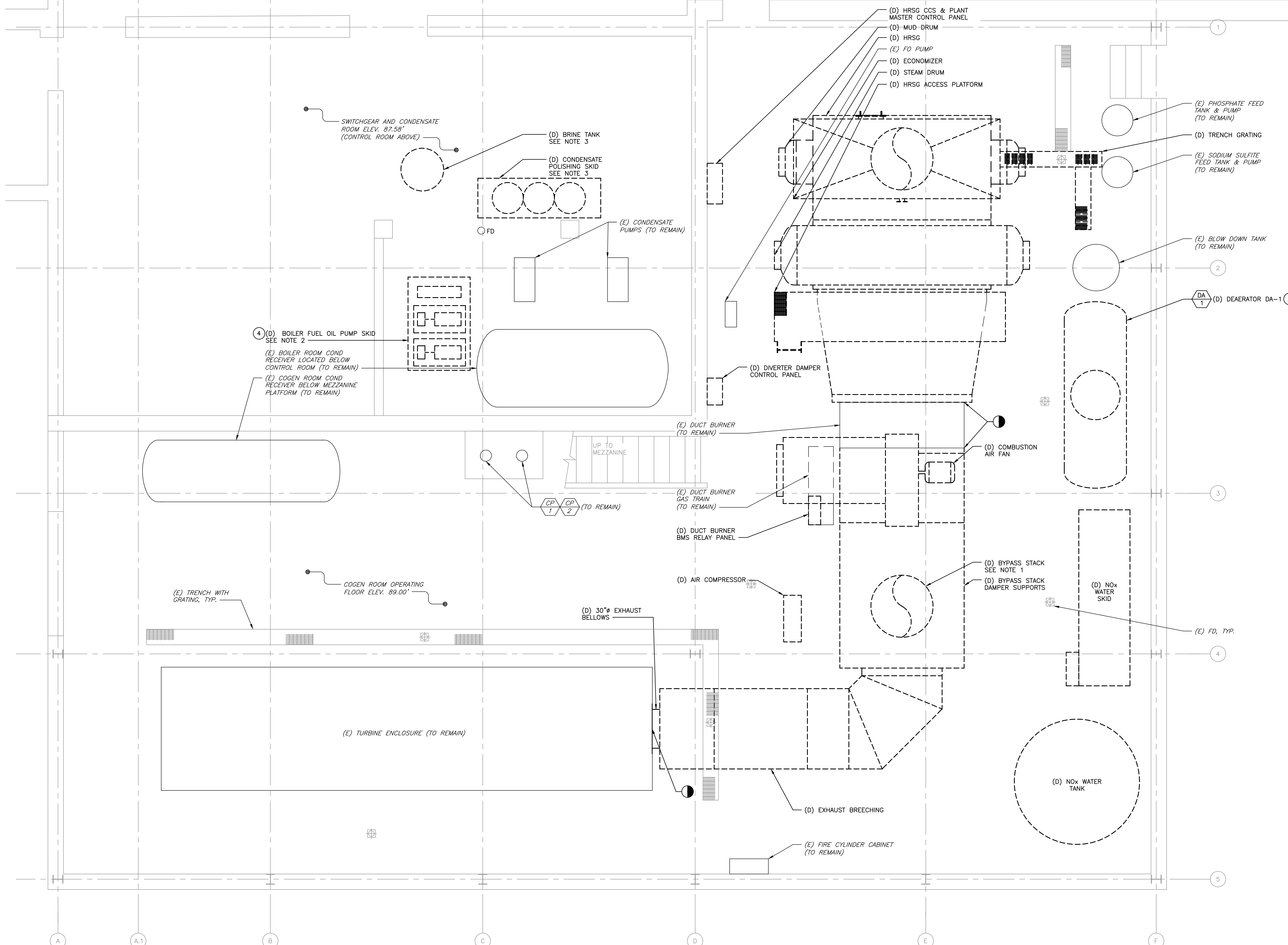
ISSUED FOR BID

DRAWING NOTES

1. REMOVE (E) BYPASS STACK AND ASSOCIATED SUPPORTS.
2. REFER TO P&ID M-108 FOR DEMOLITION SCOPE RELATED TO EXISTING BOILER FUEL OIL PUMP SKID.
3. EXISTING CONDENSATE POLISHING SKID & BRINE TANK SHALL BE DEMOLISHED AND PROPERLY DISPOSED OF BY THE CONTRACTOR, IN ACCORDANCE WITH LOCAL JURISDICTIONS.

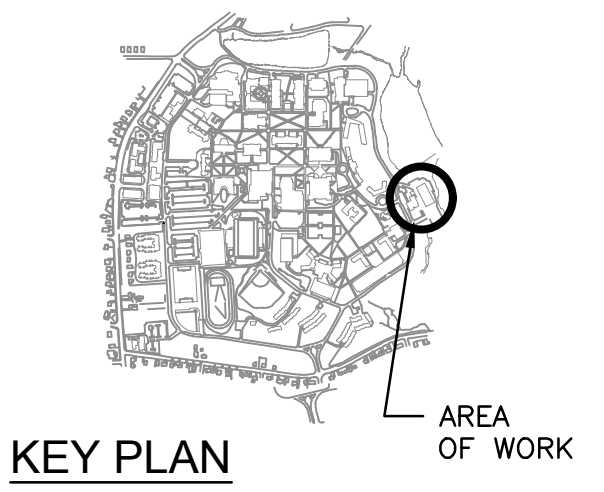
SCOPE NOTES

2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.



1 OPERATING FLOOR PLAN - DEMOLITION
M-201 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



0 5/31/19 ISSUED FOR BID
No. Date Revision

Burns
BURNS ENGINEERING, INC. | 215.979.7200
TWO COMMERCE SQUARE, 201 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL
Drawing Title:
GENERAL
ARRANGEMENT –
DEMOLITION

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

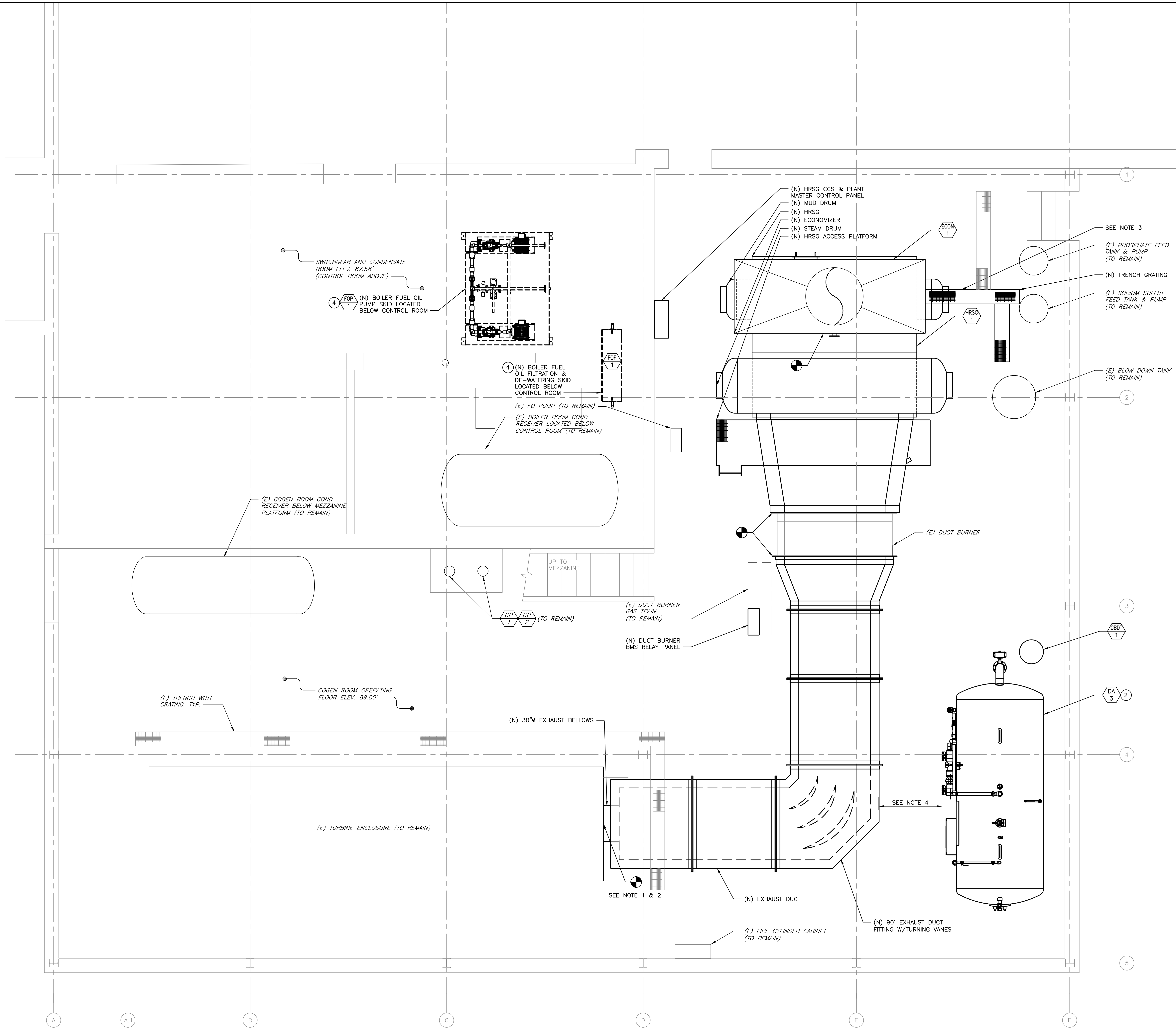
M-201
ISSUED FOR BID

DRAWING NOTES

1. NEW 30" EXHAUST BELLOWS AND NEW EXHAUST BREECING SHALL FLANGE TO EXISTING CTG SKID OUTLET FLANGE TO FORM GAS TIGHT SEAL. NEW EXHAUST BREECING SHALL BE DESIGNED/INSTALLED TO PREVENT EXTERNAL LOADS IN EXCESS OF THE MANUFACTURER'S MAXIMUM RATED LOADS FROM BEING APPLIED TO THE EXHAUST BELLOWS FLANGE, PER THE MANUFACTURER'S REQUIREMENT. DETAILS OF EXISTING EXHAUST BELLOWS ARE INCLUDED WITHIN APPENDIX A OF SPECIFICATION 235840. NOTE, NEW BELLOWS SHALL BE EXTERNALLY INSULATED (WITH "HOT" FLANGES ON BOTH ENDS).
2. REFER TO APPENDIX B OF SPECIFICATION 235840 FOR CENTERLINE ELEVATION OF EXHAUST CONNECTION. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.
3. FURNISH AND INSTALL NEW TRENCH GRATING IN THIS AREA. MATERIAL, DEPTH AND WIDTH SHALL MATCH EXISTING.
4. MAINTAIN CODE REQUIRED EGRESS PATH CLEARANCE OF 36" BETWEEN DEAEATOR AND HRSG/HRSG EQUIPMENT PAD (NOT SHOWN).
5. REFER TO SEPARATE SKETCH FOR UPDATED LAYOUT AND COMMENTS.

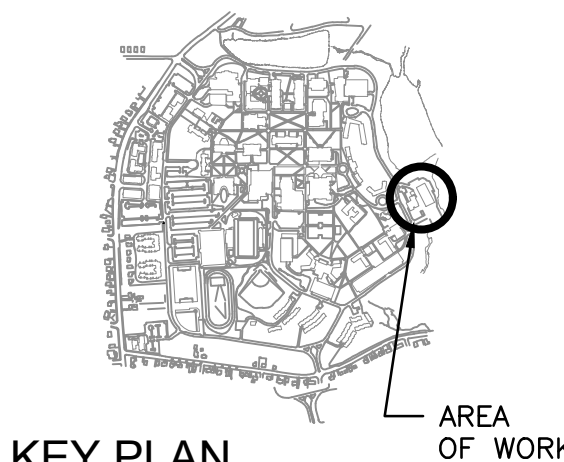
SCOPE NOTES

2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAEATOR (DA-1) AND INSTALLATION OF NEW DEAEATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.



1 OPERATING FLOOR PLAN - NEW WORK
M-202 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



0 5/31/19 ISSUED FOR BID

Burns
BURNS ENGINEERING, INC. | 215-979-7200
TWO COMMERCE SQUARE, 201 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
GENERAL ARRANGEMENT – NEW WORK

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-202

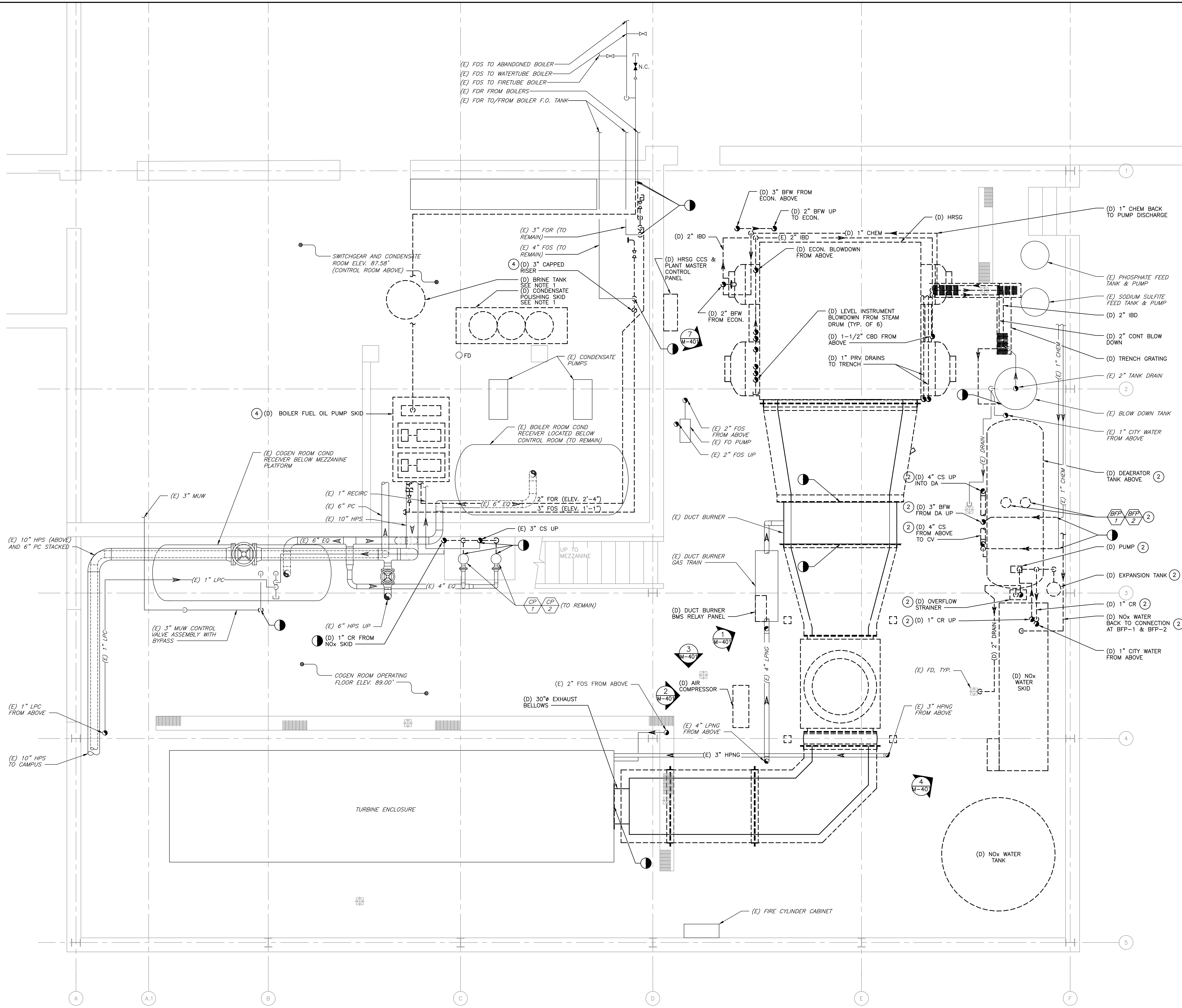
ISSUED FOR BID

DRAWING NOTES

1. EXISTING CONDENSATE POLISHER SKID & BRINE TANK SHALL BE DEMOLISHED AND PROPERLY DISPOSED OF BY THE CONTRACTOR, IN ACCORDANCE WITH LOCAL JURISDICTIONS.

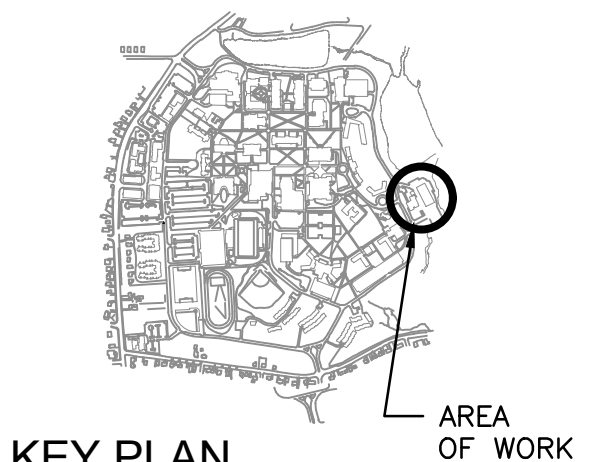
SCOPE NOTES

- 2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
- 4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.



1 LOWER LEVEL PLAN (EL. 89.0')
M-203 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
Burns Engineering, Inc. | 215.979.7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
OPERATING
FLOOR PLAN –
LOWER LEVEL –
DEMOLITION

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-203

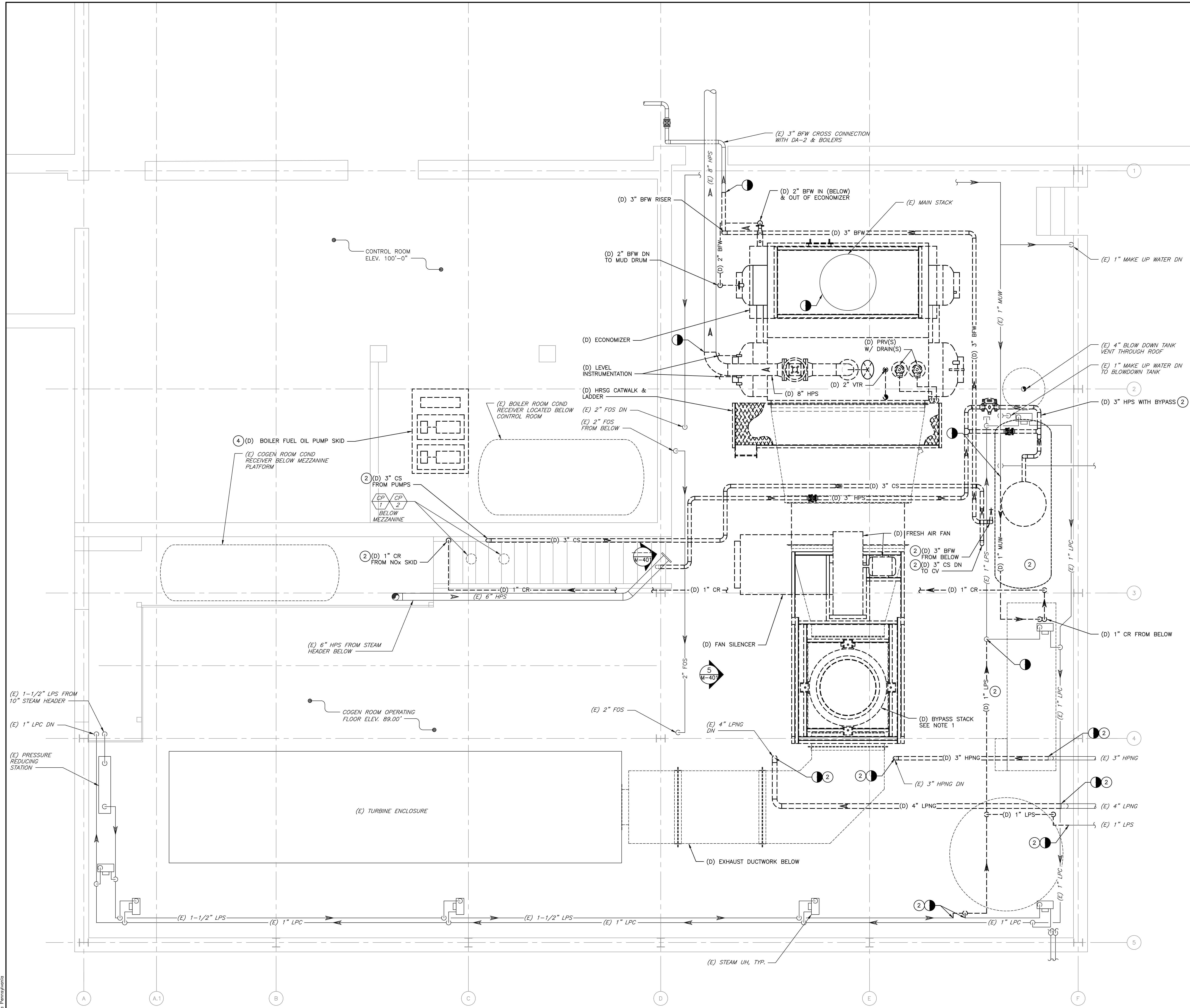
ISSUED FOR BID

DRAWING NOTES

1. REMOVE EXISTING BYPASS STACK AND ASSOCIATED SUPPORTS.

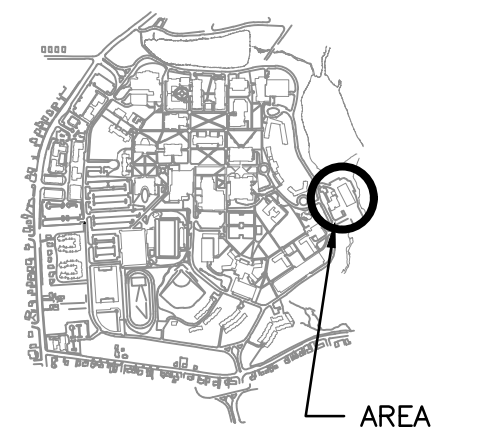
SCOPE NOTES

- 2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
- 4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.



1 UPPER LEVEL PLAN (EL. 99.0')
M-204 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN
AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

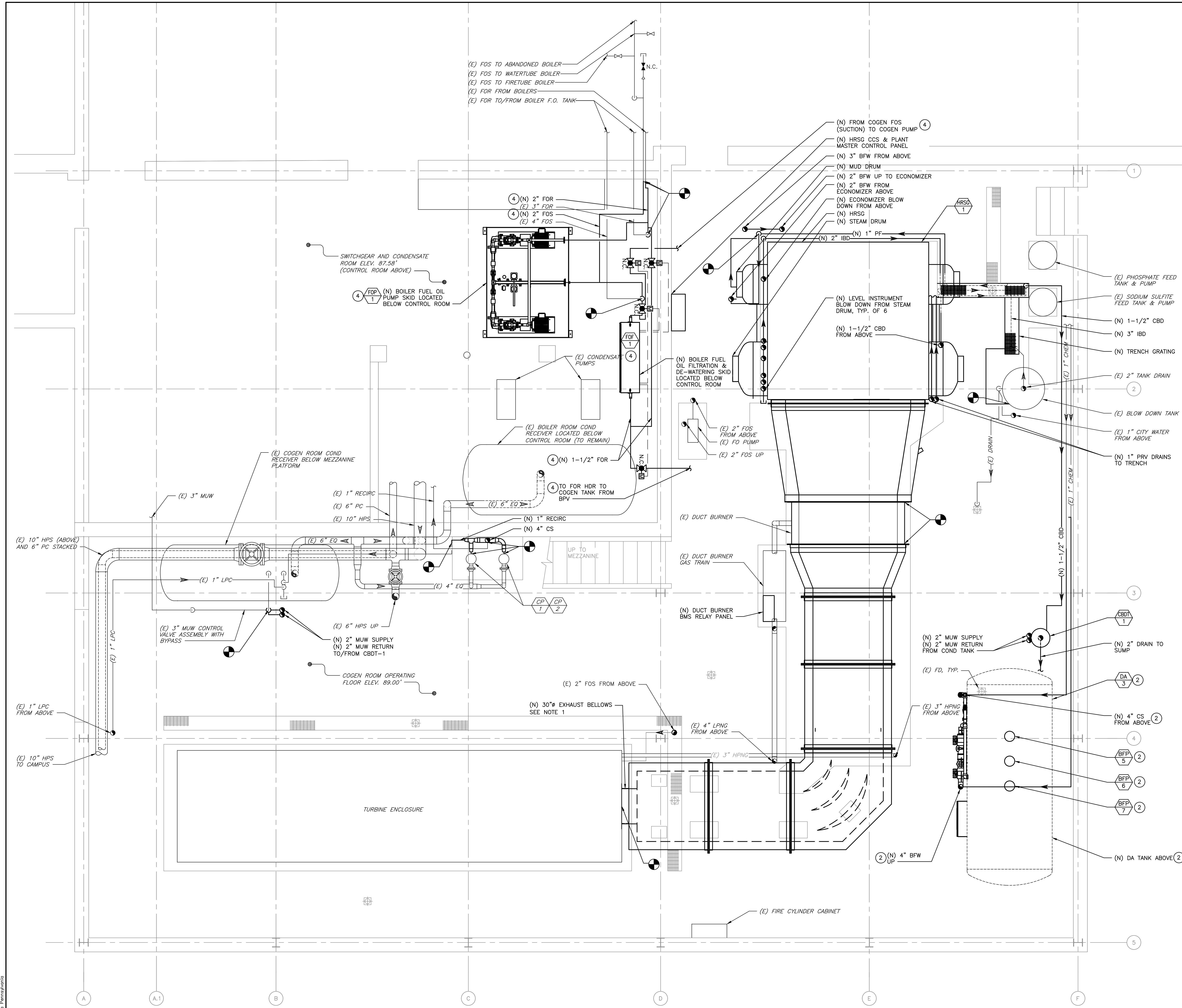
Burns
Burns Engineering, Inc. | 215.979.7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
OPERATING
FLOOR PLAN –
UPPER LEVEL –
DEMOLITION

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	ADR
Checked:	DB
Job No.:	2016-193
Drawing No.:	M-204

ISSUED FOR BID



DRAWING NOTES

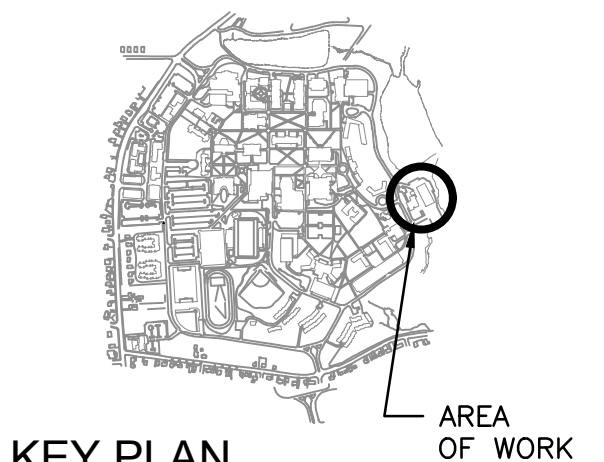
1. CONTRACTOR SHALL INSTALL NEW 30" DIAMETER, STAINLESS STEEL EXPANSION BELLOWS, EXPANSION BELLOWS TO BE PROVIDED BY OWNER, THROUGH EXISTING COMBUSTION TURBINE GENERATOR MANUFACTURER (SOLARB TURBINES), TO REPLACE THE EXISTING EXPANSION JOINT CURRENTLY INSTALLED AT THE OUTLET OF THE ENCLOSURE. EXPANSION BELLOWS SHALL BE INSTALLED WITH NEW INSULATION JACKET AND GASKETS/HARDWARE. NEW INSULATION JACKET AND GASKETS/HARDWARE ARE TO BE FURNISHED BY THE CONTRACTOR.

SCOPE NOTES

2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.

4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.

TCNJ
THE COLLEGE OF
NEW JERSEY



0 5/31/19 ISSUED FOR BID

No.	Date	Revision

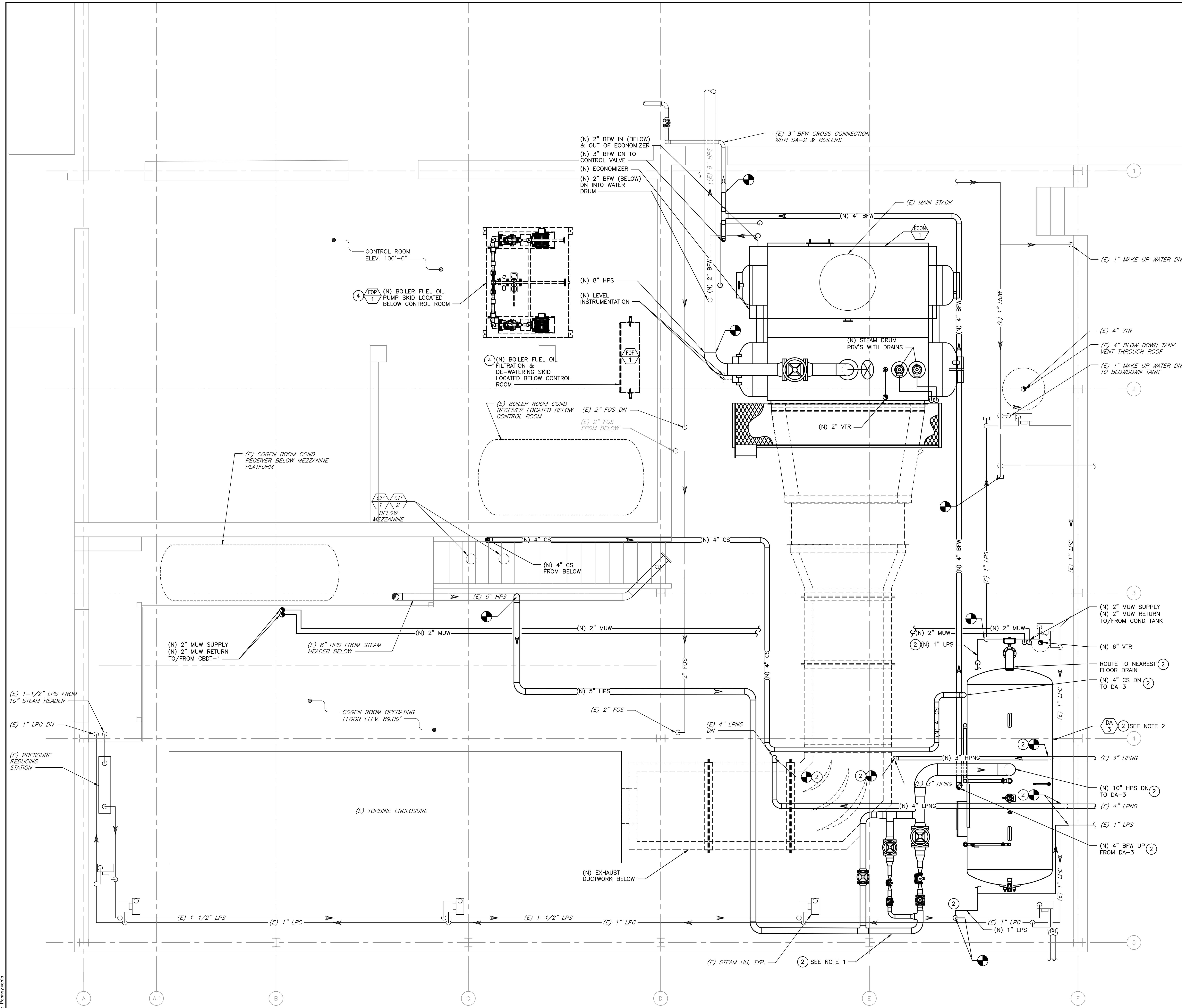
Burns
ENGINEERING, INC. | 215.979.7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
OPERATING FLOOR PLAN – LOWER LEVEL – NEW WORK

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-205

1 LOWER LEVEL PLAN (EL. 89.0')
M-205 3/8" = 1'-0"



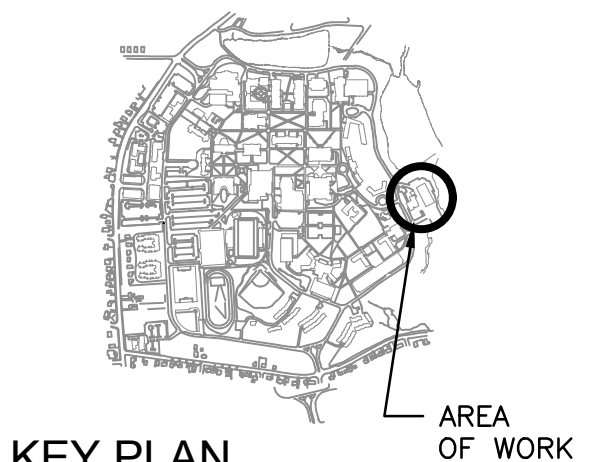
DRAWING NOTES

1. THE DEAERATOR'S 1/3, 2/3 STEAM CONTROL VALVE ASSEMBLY HAS BEEN SHOWN IN THE HORIZONTAL FOR CLARITY PURPOSES. VALVE ASSEMBLY SHALL BE INSTALLED IN THE VERTICAL (STACKED) ORIENTATION. ALL VALVES/ACTUATORS SHALL BE ACCESSIBLE FROM DEAERATOR ACCESS PLATFORM.
2. NEW DEAERATOR (DA-3) SHALL BE INSULATED IN THE FIELD BY THE CONTRACTOR. INSULATION SHALL BE OF THE MINERAL WOOL, INSULATING BLANKET TYPE AND SHALL BE PROVIDED IN NO LESS THAN TWO LAYERS WITH STAGGERED JOINTS. MINIMUM INSULATION THICKNESS SHALL BE 4" THICK AND RESULT IN AN EXTERNAL TEMPERATURE OF LESS THAN 140°F. ALL INSULATION SHALL BE ADEQUATELY COVERED WITH ALUMINUM JACKETING. REFER TO SPECIFICATION 235316 FOR ADDITIONAL REQUIREMENTS.

SCOPE NOTES

2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.

TCNJ
THE COLLEGE OF
NEW JERSEY



No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
Burns Engineering, Inc. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

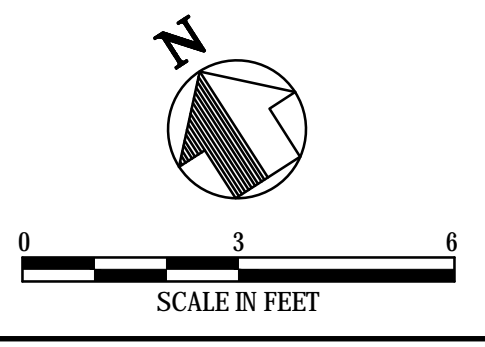
Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
OPERATING FLOOR PLAN – UPPER LEVEL – NEW WORK

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No: M-206

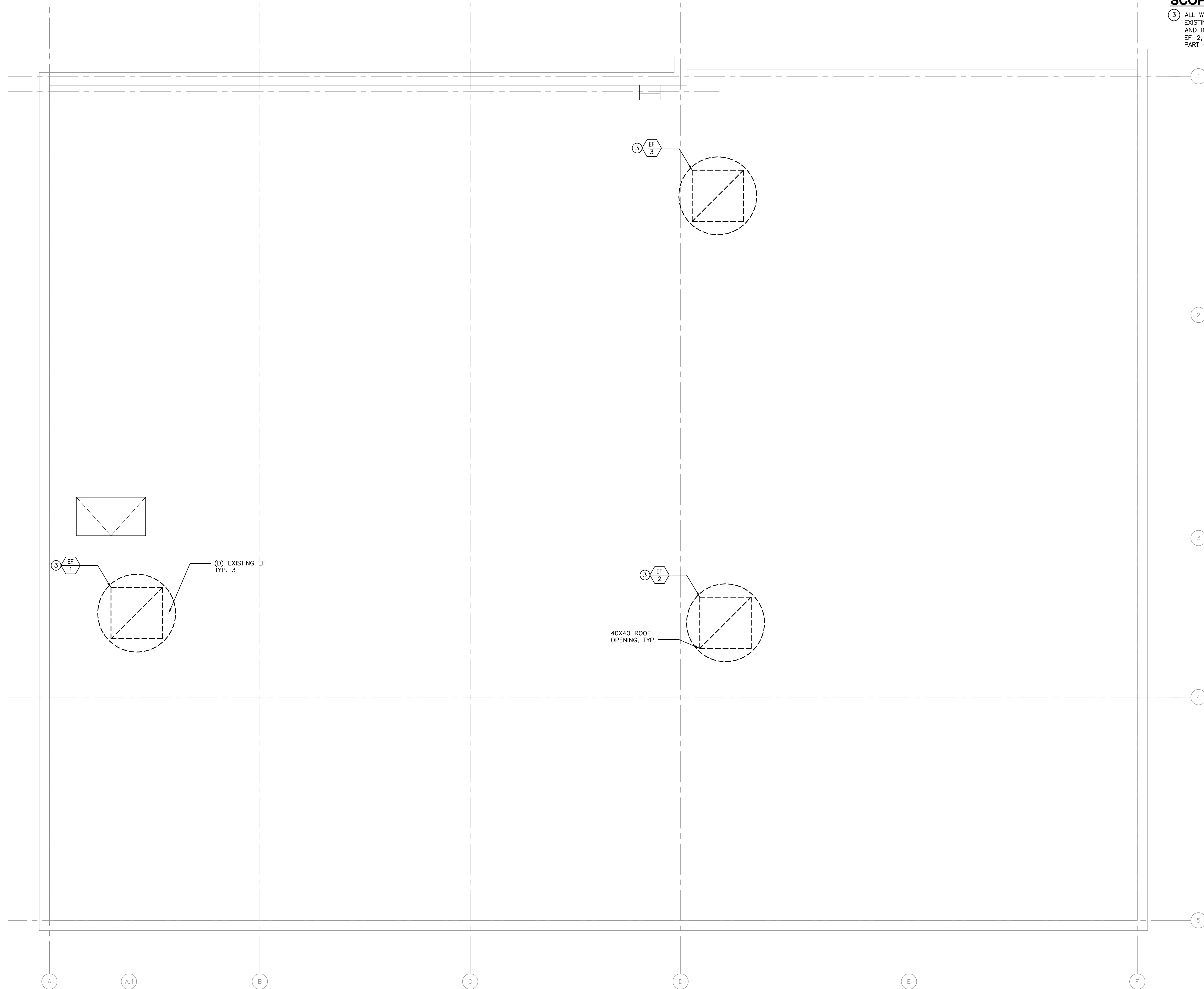
1 UPPER LEVEL PLAN (EL. 99.0')
M-206 3/8" = 1'-0"

Burns Engineering, Inc., Philadelphia, Pennsylvania



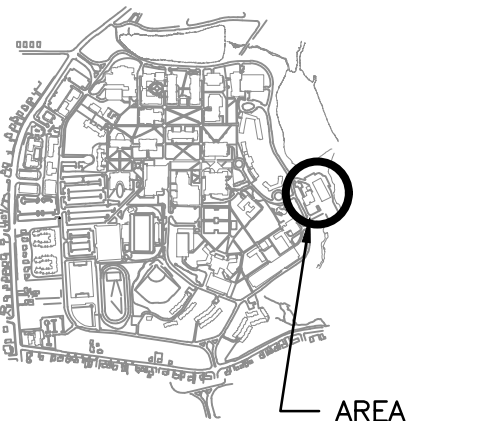
SCOPE NOTES

③ ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING EXHAUST FANS (EF-1, EF-2 AND EF-3) AND INSTALLATION OF NEW EXHAUST FANS (EF-1, EF-2, EF-3 AND EF-4) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 3.



1 ROOF PLAN - DEMOLITION
M-207 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No.	Date	Revision

Burns

BURNS ENGINEERING, INC. | 215 979-7200
TWO COMMERCIAL SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
ROOF PLAN –
DEMOLITION

Date: 05/31/2019

Scale: AS NOTED

Drawn: ADR

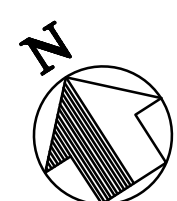
Checked: DB

Job No: 2016-193

Drawing No:

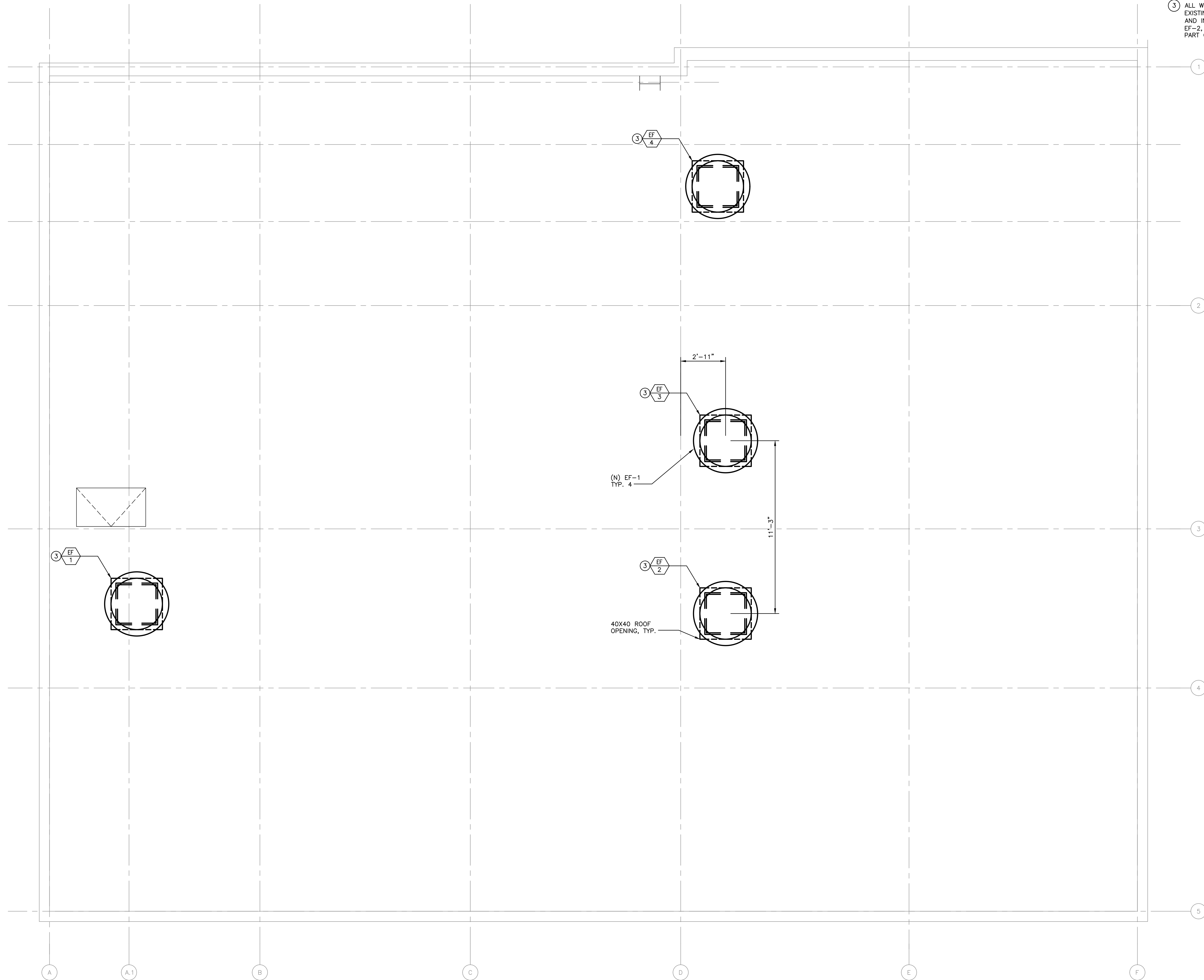
M-207

ISSUED FOR BID



SCOPE NOTES

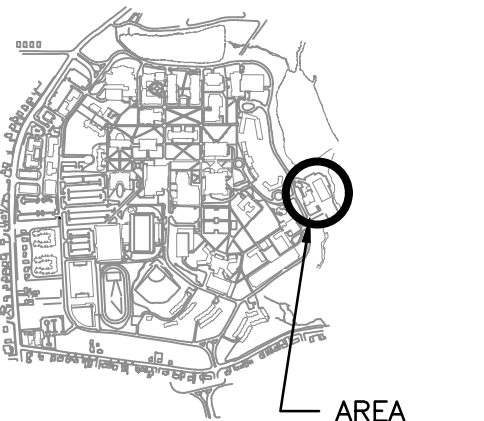
③ ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING EXHAUST FANS (EF-1, EF-2 AND EF-3) AND INSTALLATION OF NEW EXHAUST FANS (EF-1, EF-2, EF-3 AND EF-4) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 3.



1 ROOF PLAN - NEW WORK
M-208 3/8" = 1'-0"

VENTILATION SCHEDULE					
TAG	ROOM NAME	AREA (SQ. FT.)	CODE (CFM/ SQ. FT.)	MIN. VENTILATION REQ'D (CFM)	DESIGN VENTILATION (CFM)
EF-1,2,3,4	COGENERATION ROOM	2,750	0.12	330	44,000

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No. Date Revision

Burns

BURNS ENGINEERING, INC. | 215 979-7290
TWO COMMERCE SQUARE, 201 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
ROOF PLAN –
NEW WORK

Date: 05/31/2019

Scale: AS NOTED

Drawn: ADR

Checked: DB

Job No: 2016-193

Drawing No:

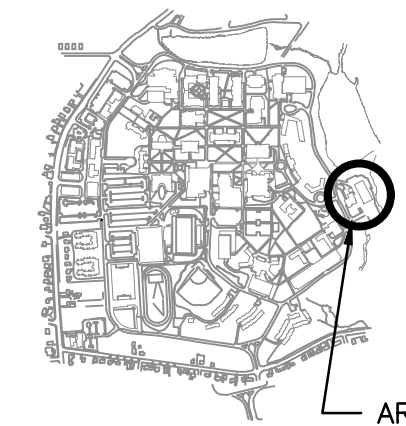
M-208

ISSUED FOR BID

GENERAL NOTES:

1. SECTIONS DO NOT ENCOMPASS ENTIRE SCOPE OF DEMOLITION. REFER TO PLANS AND SPECIFICATIONS FOR ITEMS NOT SHOWN OR EXPLICITLY CALLED OUT.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN
AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

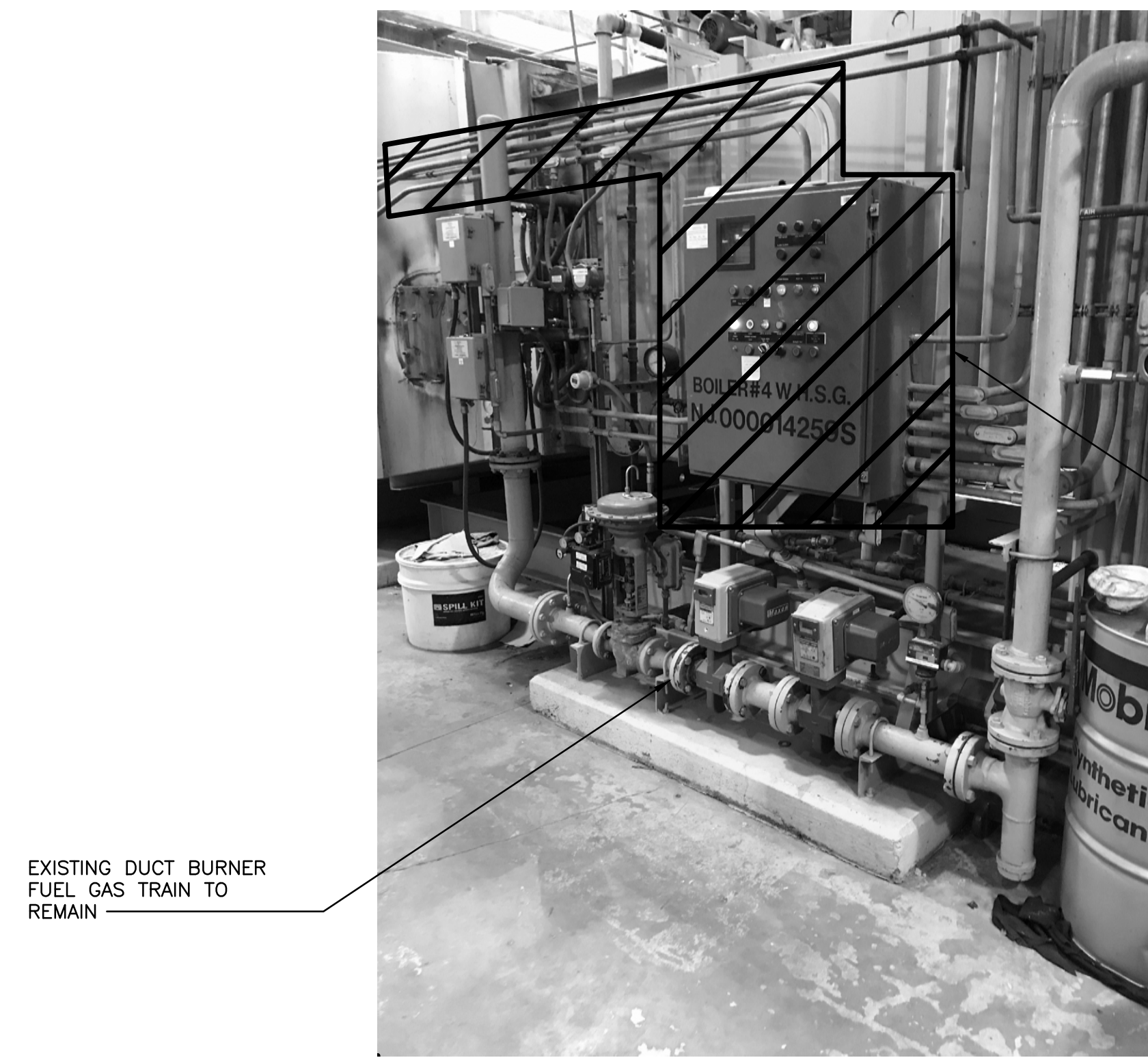
Burns
BURNS ENGINEERING, INC. | 215 979-7700
TWO CONRAD SQUARE, 300 MARKET ST, SUITE 600
PHILADELPHIA, PA 19106

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL
Drawing Title:
SECTIONS –1–

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193

Drawing No: M-401

ISSUED FOR BID



EXISTING DUCT BURNER FUEL GAS TRAIN TO REMAIN

1 SECTION -1-
M-401 N.T.S.

REMOVE/REPLACE EXISTING DUCT BURNER BMS CONTROL(S)/PANEL

REMOVE EXISTING BYPASS STACK SUPPORTS IN ITS ENTIRETY

REMOVE EXISTING DIVERTER, ACTUATOR AND INSTRUMENT AIR TUBING IN THEIR ENTIRETY



4" LPNG TO REMAIN

REFER TO DETAIL 5/M-401 FOR BYPASS STACK DEMO SCOPE

REMOVE EXISTING AIR COMPRESSOR, INSTRUMENTATION AND INSTRUMENT AIR TUBING IN THEIR ENTIRETY

REMOVE EXISTING AIR COMPRESSOR IN ITS ENTIRETY

2 SECTION -2-
M-401 N.T.S.



REMOVE EXISTING AIR COMPRESSOR

3 SECTION -3-
M-401 N.T.S.

REMOVE EXISTING PIPING AS SHOWN ON PLANS

(D) EXISTING DA



REMOVE EXISTING Nox SKID IN ITS ENTIRETY

REMOVE EXISTING DIVERTER, BYPASS STACK AND SUPPORTS IN THEIR ENTIRETY

REMOVE EXISTING Nox WATER TANK IN ITS ENTIRETY

4 SECTION -4-
M-401 N.T.S.



REMOVE EXISTING FRESH-AIR FAN, SILENCER AND SUPPORT STEEL IN THEIR ENTIRETY

TO REMAIN

5 SECTION -5-
M-401 N.T.S.



(D) HPS BACK TO HEADER

REMOVE EXISTING VENTS THROUGH ROOF

REMOVE HRSG AND ACCESS PLATFORM

REMOVE EXISTING CS PIPING AS SHOWN ON PLANS

REMOVE EXISTING BFW PIPING IN ITS ENTIRETY

REMOVE EXISTING SEAL AIR FAN IN ITS ENTIRETY

UPPER LEVEL(2)
M-401 N.T.S.



REMOVE HRSG

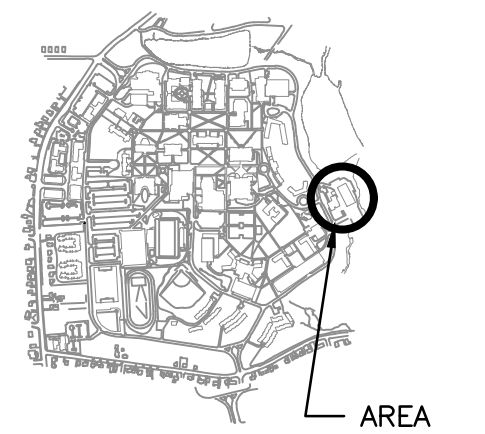
REMOVE EXISTING INSTRUMENTATION BLOWDOWN PIPING IN ITS ENTIRETY

7 SECTION -7-
M-401 N.T.S.

DRAWING NOTES

1. PIPING ROTATED FOR CLARITY PURPOSES ONLY. REFER TO PLAN VIEW FOR ROUTING.
2. REMOVE ALL PNEUMATIC TUBING/CONTROLS BACK TO NEAREST EXISTING MAIN/SOURCE.
3. CONTRACTOR SHALL DEMOLISH ALL EXISTING STRUCTURAL STEEL WITH THE EXHAUST BREECHING, BYPASS STACK, FRESH AIR FAN AND SILENCER. REMOVE EXISTING 1 TON GANTRY SUPPORTED FROM BYPASS STACK STRUCTURAL STEEL SUPPORT AND TURN OVER TO OWNER. TEMPORARILY SUPPORT EXISTING SERVICE (120 V UTILITY OUTLETS, INSTRUMENT AIR, FIRE ALARM, FIRE EXTINGUISHER, ETC.), PRIOR TO SUPPORTING FROM NEW BREECHING.
4. ALL DIMENSIONS AND ELEVATIONS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF WORK AND/OR COORDINATION WITH EQUIPMENT MANUFACTURER.
5. CONTRACTOR SHALL REMOVE EXISTING MAIN STACK FOR REUSE UPON INSTALLATION OF NEW HRSG EQUIPMENT AND STACK ECONOMIZER. MAIN STACK, ACCESS PLATFORM, GEMS SAMPLE TUBING, AND ALL ASSOCIATED COMPONENTS SHALL BE SAFELY STORED BY THE CONTRACTOR UNTIL RE-INSTALLATION.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

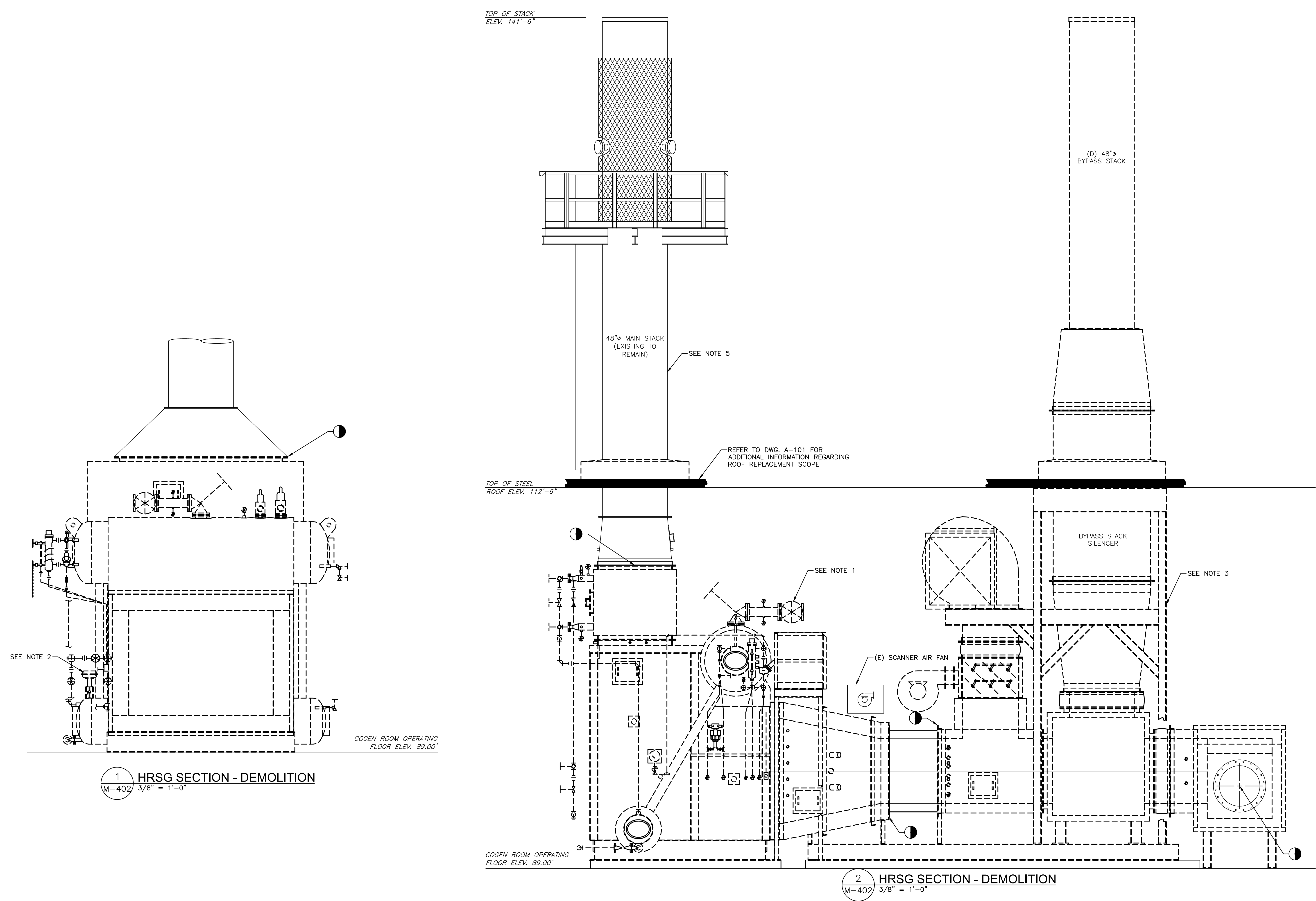
No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
BURNS ENGINEERING, INC. | 215-979-7200
TWO COMMERCIAL SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
SECTIONS – 2 –

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	ADR
Checked:	DB
Job No:	2016-193
Drawing No:	M-402

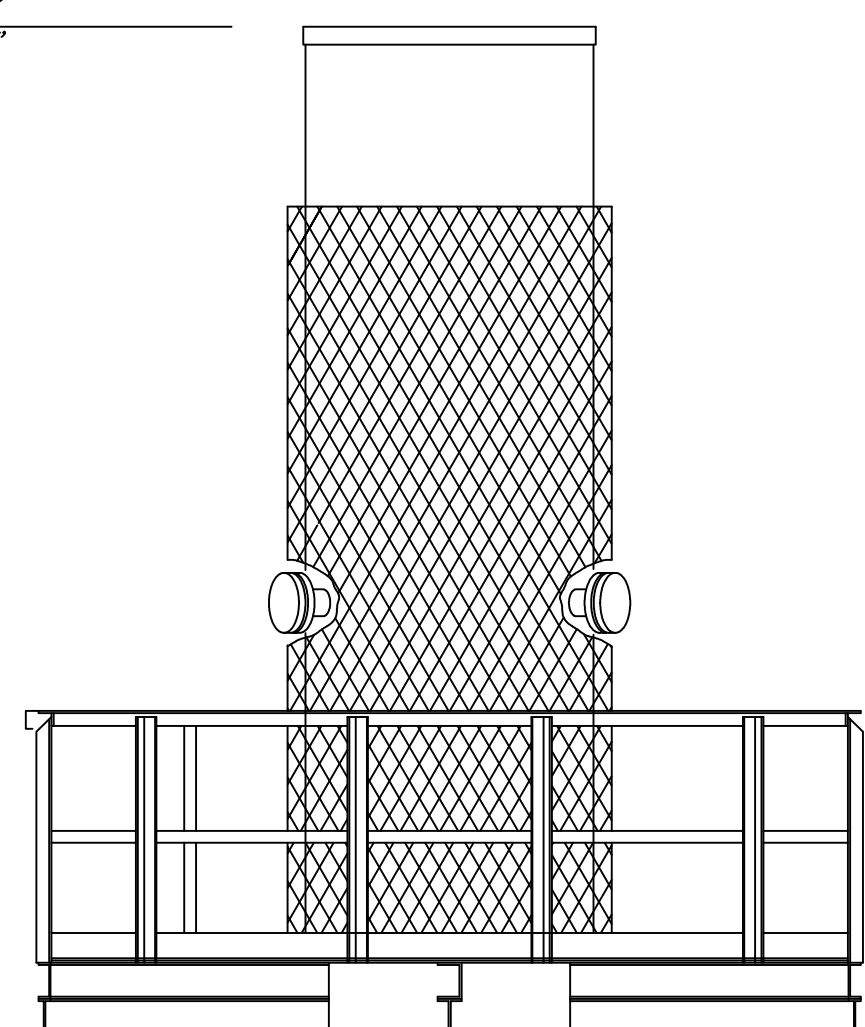


Burns Engineering, Inc., Philadelphia, Pennsylvania

DRAWING NOTES

1. ALL DIMENSIONS AND ELEVATIONS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF WORK AND/OR COORDINATION WITH EQUIPMENT MANUFACTURER.
2. PIPING ROTATED FOR CLARITY PURPOSES ONLY. REFER TO PLAN VIEW FOR ROUTING.
3. CONTRACTOR SHALL TEMPORARILY RELOCATE SCANNER AIR BLOWER SKID DURING DEMOLITION OF TRANSITION DUCT BETWEEN DUCT BURNER AND HRSG. THIS EQUIPMENT IS TO BE STORED PER MANUFACTURER'S REQUIREMENTS AND RE-INSTALLED IN SIMILAR LOCATION AFTER INSTALLATION OF NEW TRANSITION DUCT.
4. CONTRACTOR SHALL REMOVE EXISTING MAIN STACK FOR REUSE UPON INSTALLATION OF NEW HRSG EQUIPMENT AND STACK ECONOMIZER. MAIN STACK, ACCESS PLATFORM, CEMS SAMPLE TUBING, AND ALL ASSOCIATED COMPONENTS SHALL BE SAFELY STORED BY THE CONTRACTOR UNTIL RE-INSTALLATION.

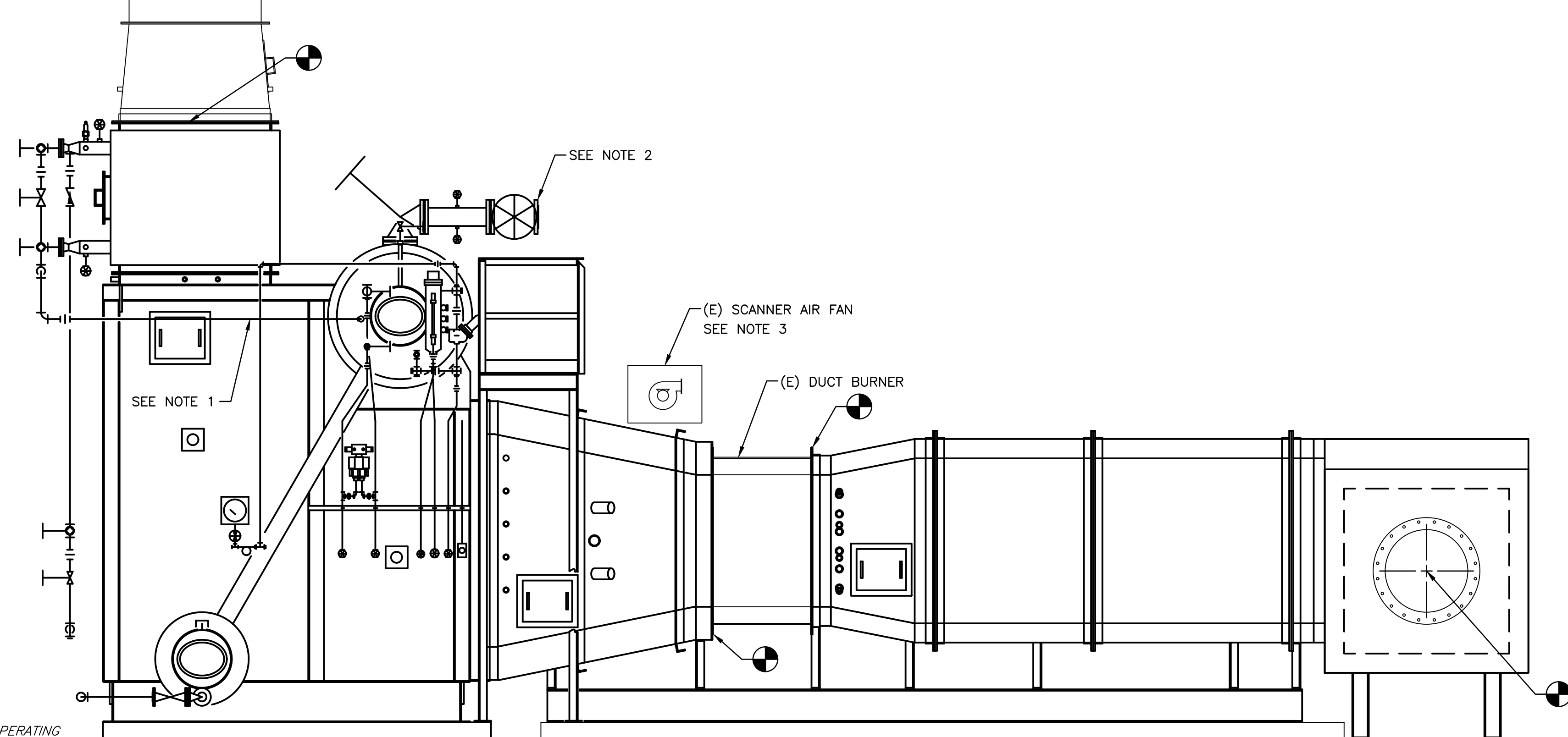
TOP OF STACK
ELEV. 141'-6"



48"Ø MAIN STACK
(EXISTING TO REMAIN)
SEE NOTE 4

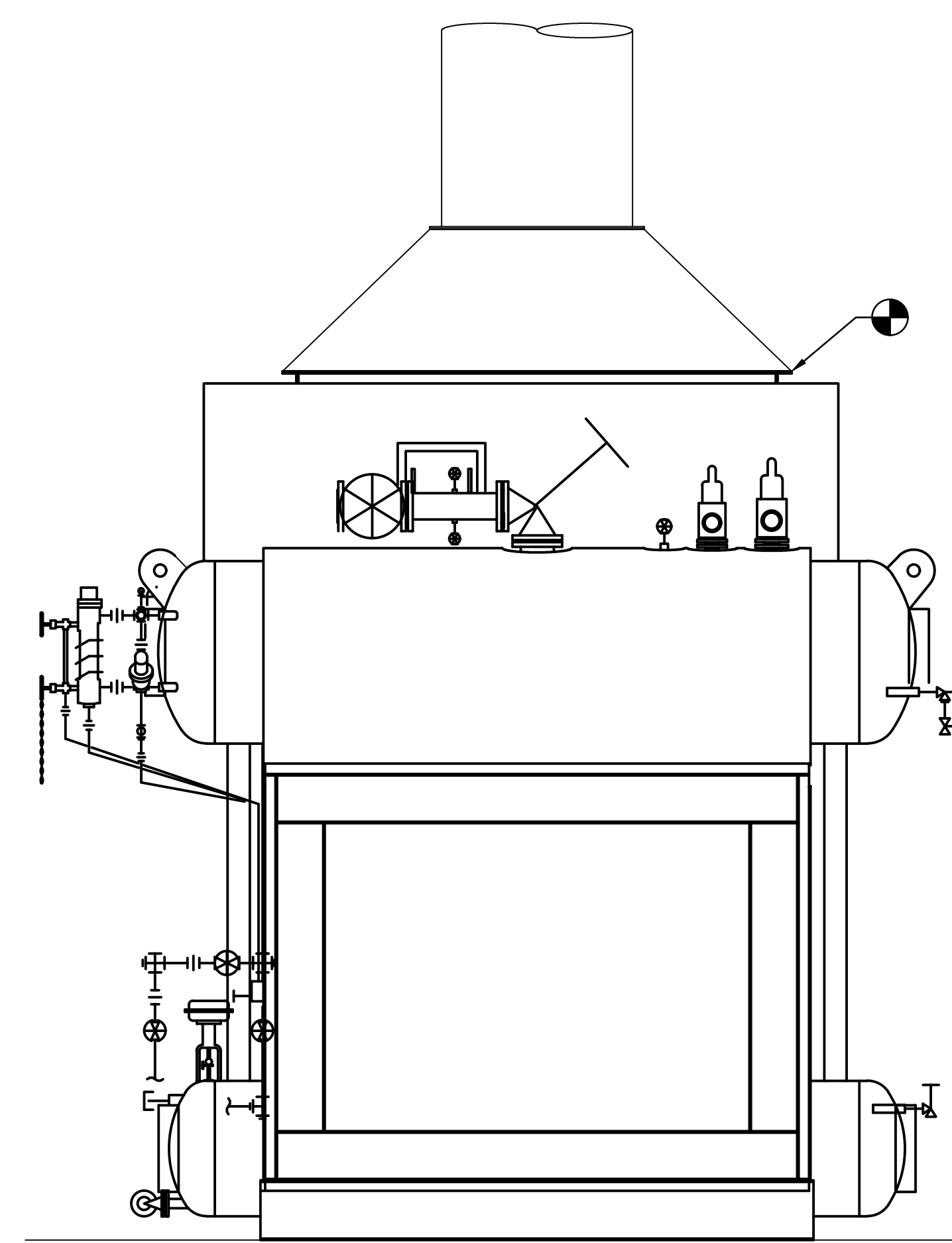
REFER TO DWG. A-101 FOR
ADDITIONAL INFORMATION REGARDING
ROOF REPLACEMENT SCOPE

TOP OF STEEL
ROOF ELEV. 112'-6"



COGEN ROOM OPERATING
FLOOR ELEV. 89.00'

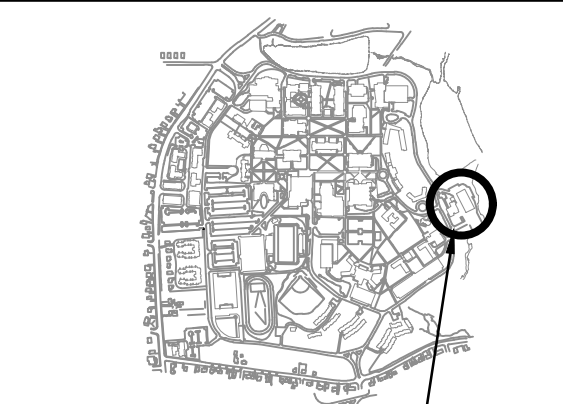
1 HRSG SECTION - NEW WORK
M-403 3/8" = 1'-0"



COGEN ROOM OPERATING
FLOOR ELEV. 89.00'

2 HRSG SECTION - NEW WORK
M-403 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
BURNS ENGINEERING, INC. | 215.979.7290
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

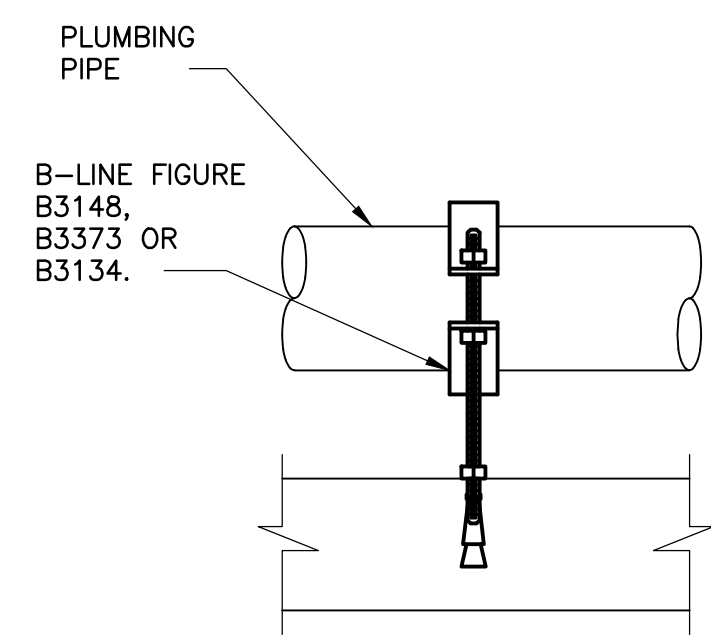
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
SECTIONS – 3–

Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

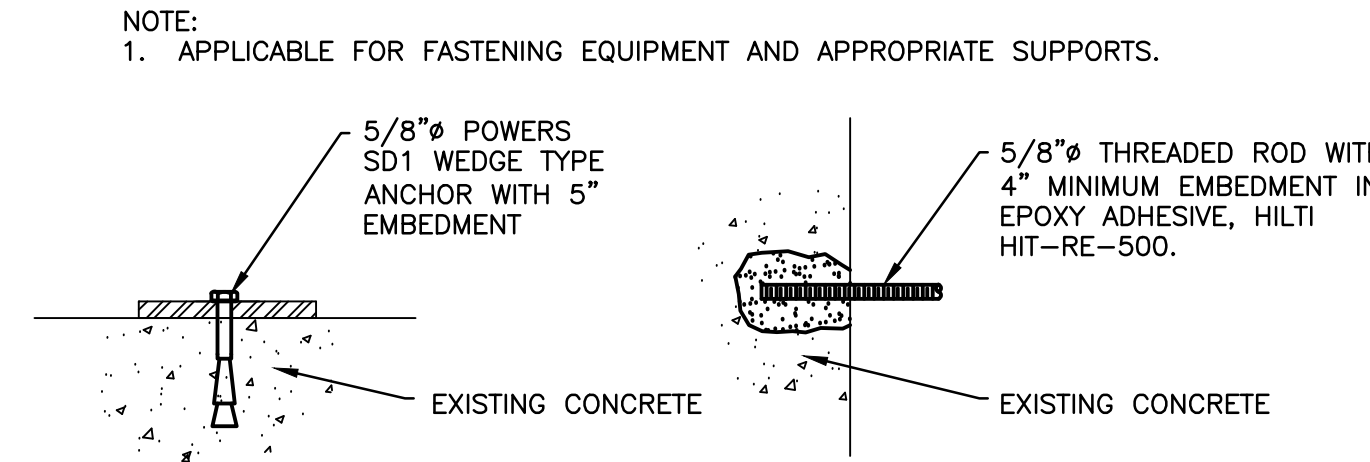
M-403

ISSUED FOR BID



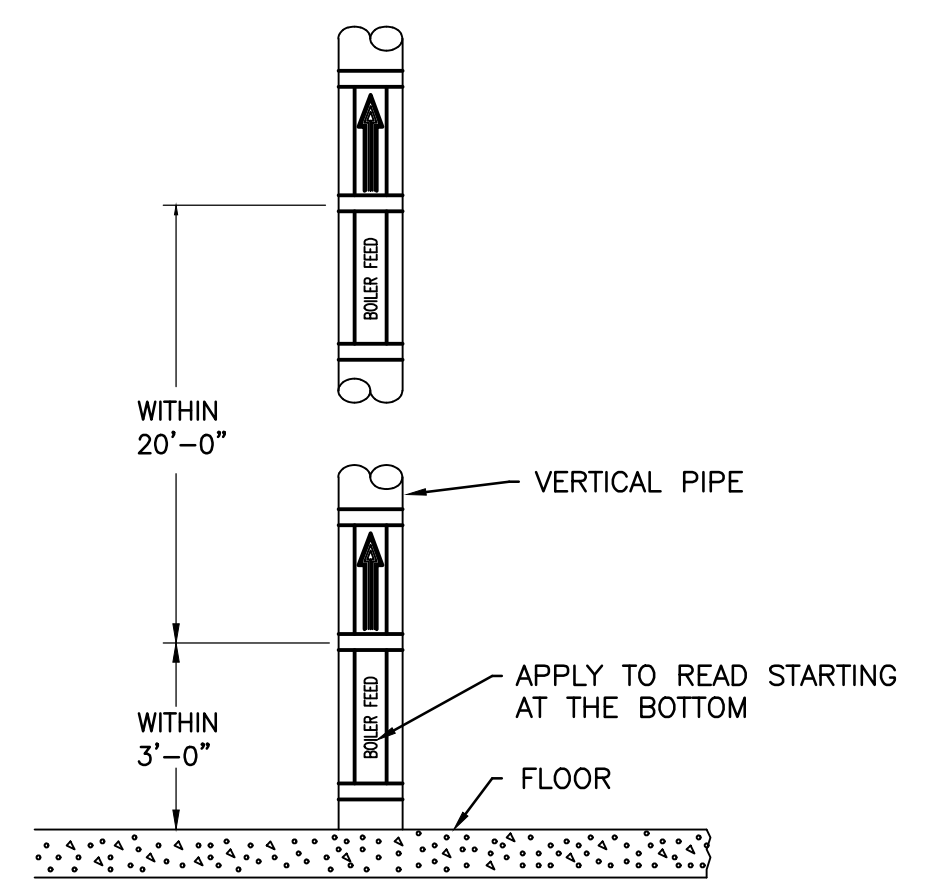
NOTES:
 1. FURNISH AND INSTALL MINIMUM OF TWO SUPPORTS PER PIPE SECTION.
 2. WHERE CLEARANCE BETWEEN PIPE INVERT AND FLOOR SLAB PERMITS, INSTALL B-LINE FIGURE B3148. WHEN CLEARANCE IS NOT AVAILABLE, USE B-LINE FIGURE B3373 OR FIGURE B3134 WITH THREADED ROD SUPPORTS.

1 HORIZONTAL DRAIN PIPING ALONG FLOOR DETAIL
 M-501 N.T.S.

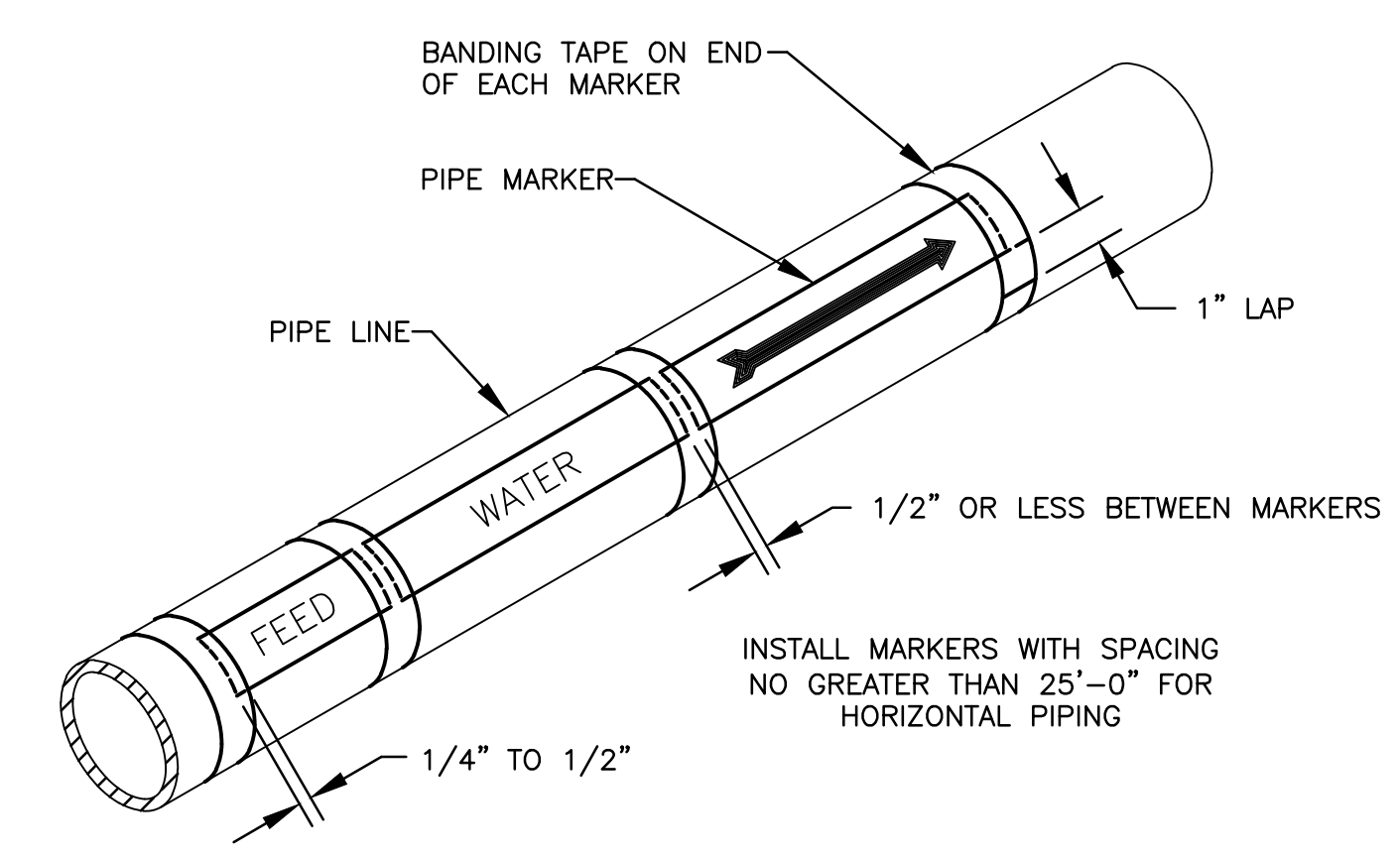


NOTE:
 1. APPLICABLE FOR FASTENING EQUIPMENT AND APPROPRIATE SUPPORTS.

2 PAD CONNECTION DETAIL
 M-501 1'-0" = 1'-0"

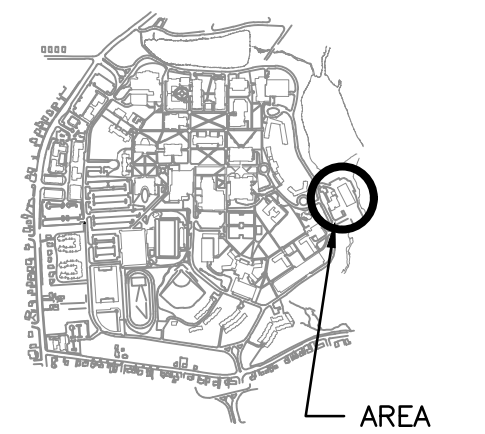


3 PIPE LABELING DETAIL
 M-501 N.T.S.



4 STEAM DRIP PAN ELBOW DETAIL
 M-501 N.T.S.

TCNJ
 THE COLLEGE OF
 NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID
 No. Date Revision

Burns
 BURNS ENGINEERING, INC. | 215-979-7200
 TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
 PHILADELPHIA, PA 19103

Project Title:
 TCNJ –
 COGENERATION
 PLANT
 HRSG RENEWAL

Drawing Title:
 DETAILS

Date: 05/31/2019
 Scale: AS NOTED
 Drawn: ADR
 Checked: DB
 Job No: 2016-193
 Drawing No: M-501

ISSUED FOR BID

Safety Relief Valve Schedule table with columns: TAG, BODY SIZE (INCHES), SERVICE, RELIEF SETTING (PSIG), % ACCUMULATED OVER PRESSURE (PSIG), CAPACITY (LBS/HR), VENT SIZE (INCHES), BASIS OF DESIGN, NOTES.

NOTES: 1. PROVIDE DRIP-PAN ELBOWS AT DISCHARGE OF SAFETY RELIEF VALVE. ROUTE ALL DRAINS TO NEAREST FLOOR DRAIN. 2. PROVIDE SUPPLEMENTAL STEEL TO SUPPORT VENT PIPING DOWNSTREAM OF DRIP-PAN ELBOW AS REQUIRED. 3. TERMINATE ALL VENTS AT A SAFE LOCATION...

Heat Recovery Steam Generator Schedule table with columns: TAG, TYPE, UNFIRED PERFORMANCE DATA, FULL FIRED PERFORMANCE DATA, EXHAUST GAS, MANUFACTURER/ MODEL, VESSEL DESIGN PRESSURE (PSIG), REMARKS.

NOTES: 1. CONSTRUCTION TO BE STAMPED AS ASME SECTION 1. 2. REFER TO SPECIFICATION #235233 FOR ADDITIONAL REQUIREMENTS.

Economizer Schedule table with columns: TAG, DESIGN PRESSURE (PSIG), DESIGN TEMPERATURE (°F), FLUE GAS FLOW, FLOW TYPE, TUBE ARRANGEMENT, MATERIALS, FINIS/INCH, NOTES.

NOTES: 1. ECONOMIZER SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM TO ASME BPV CODE SECTION 1. 2. PROVIDE 16" X 16" ACCESS DOOR.

(1/2" to 1-1/2") STEAM SERVICE table with columns: TYPE, BODY, ENDS, BASIS OF DESIGN MFR, OAE, REMARKS.

NOTES: 1. F&I REMOVABLE THERMAXX INSULATION COVER(S) OAE, FOR ALL VALVES, AND SERVICEABLE DEVICES. 2. COMPLY WITH ALL OSHA REQUIREMENTS...

PIPE INSULATION SCHEDULE (ASHRAE 90.1 / IECC) table with columns: INSULATION APPLICATION, SERVICE, INSULATION TYPE, INSULATE HORIZONTAL, INSULATE VERTICAL, INSULATE REMOVABLE COVERS, etc.

NOTES: 1. COMPLY WITH ALL OSHA REQUIREMENTS, EXTERIOR TOUCH TEMPERATURE SHALL BE LESS THAN 120°F. 2. COMPLY WITH ANSI COLOR LABELING OF SYSTEMS...

(1/2" to 1-1/2") CONDENSATE RETURN SERVICE table with columns: SERVICE, TYPE, ENDS, BASIS OF DESIGN MFR, OAE, REMARKS.

NOTES: 1. F&I REMOVABLE THERMAXX INSULATION COVER(S) OAE, FOR ALL VALVES, AND SERVICEABLE DEVICES. 2. COMPLY WITH ALL OSHA REQUIREMENTS...

BLOW DOWN TANK SCHEDULE table with columns: TAG, SYSTEM SERVED, LOCATION, DIMENSIONS, TANK PRESSURE (PSIG), HEAT EXCHANGER, BASIS OF DESIGN, MATERIALS, NOTES.

NOTES: 1. TANK SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM TO ASME BPV CODE SECTION VIII, DIV. 1. 2. PROVIDE STAINLESS STEEL COIL HEAT EXCHANGER, TEMPERATURE GAUGE PANEL WITH INDICATING THERMOMETERS...

PUMP SCHEDULE (ALTERNATE 2) table with columns: TAG, DESCRIPTION, MANUFACTURER, FLOW RATE (GPM), TDH (FT), HORSEPOWER, RPM, ELECTRICAL REQUIREMENTS, MOTOR STARTER, NOTES.

NOTES: 1. PROVIDE PREMIUM EFFICIENCY MOTOR RATED FOR VFD USE. 2. PROVIDE VFD WITH BYPASS.

FAN SCHEDULE (ALTERNATE 3) table with columns: EQUIP. TAG, SERVICE, CFM, ESP (IN. W.G.), FAN RPM, FAN TYPE, DRIVE, MOTOR DATA, OPERATING HP, MANUFACTURER, MODEL NO., NOTES.

NOTES: 1. PROVIDE ROOF CURB BY FAN MANUFACTURER. 2. PROVIDE GRAVITY DAMPER AT FAN INLET. 3. PROVIDE LOCAL THERMOSTAT FOR ON/OFF CONTROL OF THIS EXHAUST FAN.

DEAERATOR SCHEDULE (ALTERNATE 2) table with columns: TAG, TYPE, MAXIMUM CAPACITY (LBS/HR), MINIMUM TURNDOWN, STEAM DATA, STORAGE DATA, MAKE-UP WATER DATA, BASIS OF DESIGN, NOTES.

NOTES: 1. TANK SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM TO ASME BPV CODE SECTION VIII. 2. PROVIDE UNIT MOUNTED CONTROL PANEL FOR BFP-5, BFP-6 AND BFP-7'S VFD CONTROL (VIA DISCHARGE HEADER PRESSURE)...

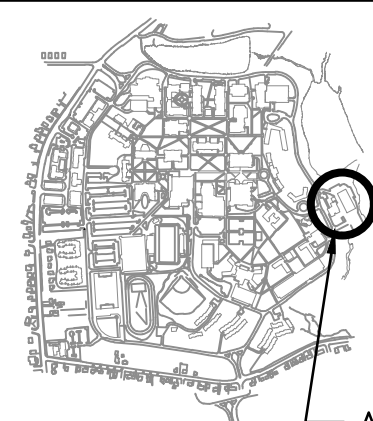
FUEL OIL PUMP SKID SCHEDULE (ALTERNATE 4) table with columns: TAG, DESCRIPTION, SERVICE, SYSTEM SERVED, PUMP, MOTOR, STRAINER, BASIS OF DESIGN, NOTES.

NOTES: 1. ALL PIPING SHALL BE SCHEDULE 40 CARBON STEEL WITH SOCKET-WELDED JOINTS, FITTINGS SHALL BE CLASS 150 THREADED MALLEABLE-IRON... 3. FUEL OIL SKID SHALL BE FURNISHED WITH UNIT-MOUNTED CONTROL PANEL CAPABLE OF LOCAL CONTROL & REMOTE MONITORING WITH REMOTE SHUTDOWN FUNCTIONALITY.

FUEL OIL FILTRATION & DE-WATERING SKID SCHEDULE (ALTERNATE 4) table with columns: TAG, DESCRIPTION, SERVICE, SYSTEM SERVED, PUMP, MOTOR, STRAINER, FILTER, BASIS OF DESIGN, NOTES.

NOTES: 1. ALL PIPING SHALL BE SCHEDULE 40 CARBON STEEL WITH SOCKET-WELDED JOINTS, FITTINGS SHALL BE CLASS 150 THREADED MALLEABLE-IRON... 5. FUEL OIL SKID SHALL BE FURNISHED WITH (2) FUEL OIL TANK LEVEL GAUGES SHIPPED-LOOSE FOR INSTALLATION BY THE CONTRACTOR...

TCNJ THE COLLEGE OF NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No. Date Revision

Burns ENGINEERING, INC. | 215-979-7390 TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600 PHILADELPHIA, PA 19103

Project Title: TCNJ - COGENERATION PLANT HRSG RENEWAL

Mechanical Equipment Schedules

Date: 05/31/2019

Scale: AS NOTED

Drawing: ADR

Checked: DB

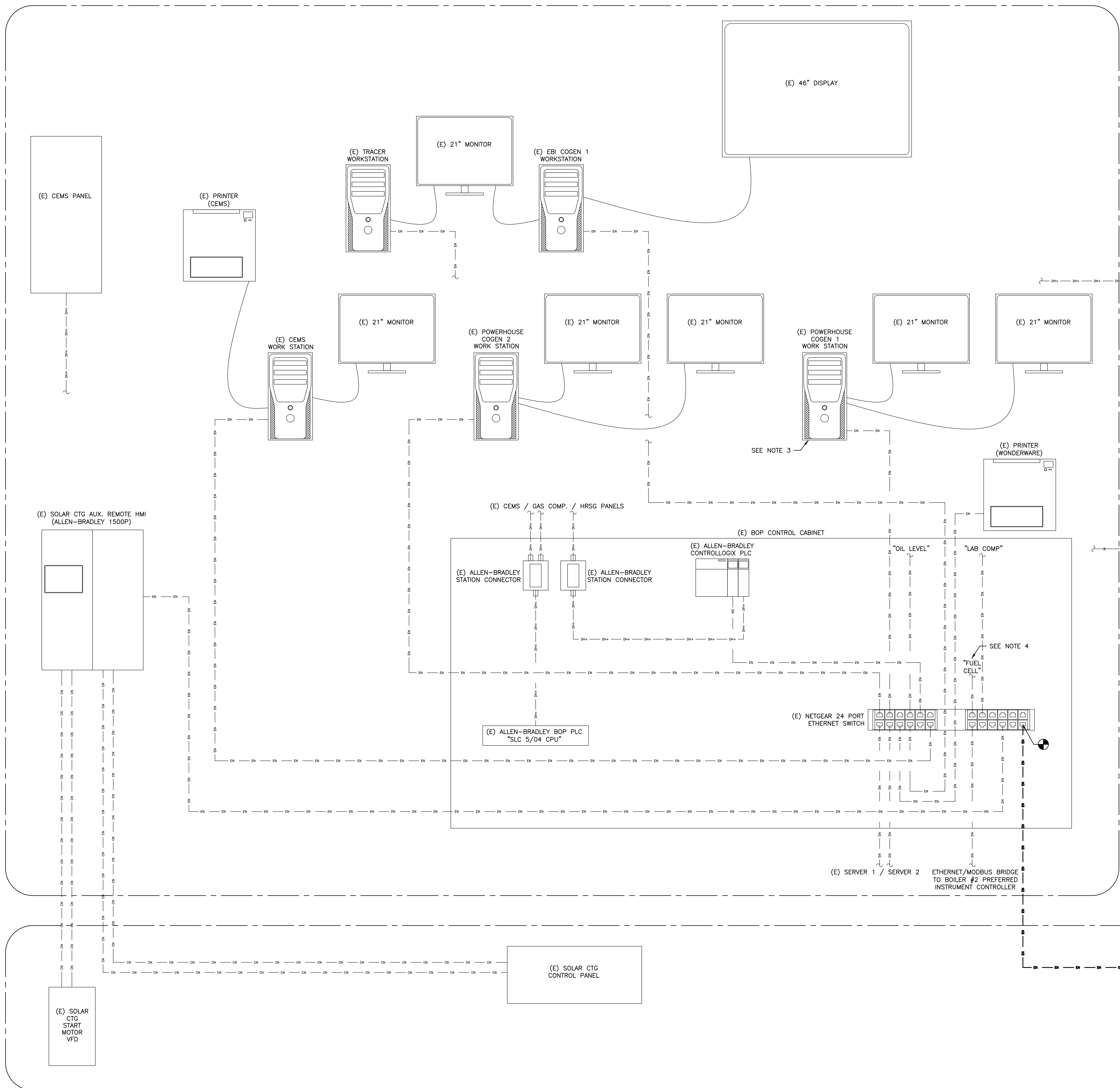
Job No: 2016-193

Drawing No: M-601

ISSUED FOR BID

Burns Engineering, Inc., Philadelphia, Pennsylvania

COGENERATION PLANT CONTROL ROOM



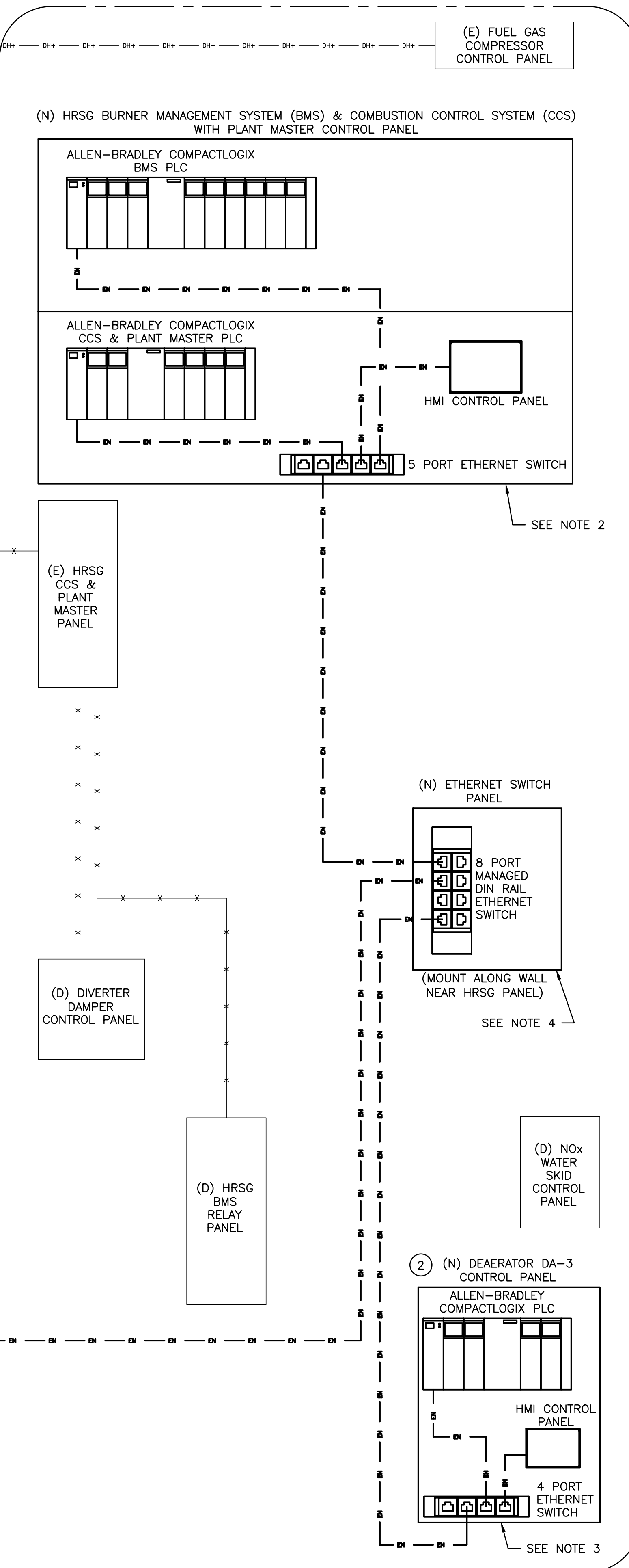
DRAWING NOTES

1. CONTROLS INTEGRATOR SHALL COORDINATE WITH OWNER TO UPDATE EXISTING (APPROX. 10) CONTROL SCREENS WITHIN THE EXISTING WONDERWARE SYSTEM TO INCLUDE DISPLAY OF NEW INSTRUMENTATION, REPORTING OF REQUIRED FLOWS, ETC., DISPLAY & ACKNOWLEDGMENT OF ALARMS, RECORDING OF NEW POINTS TO HISTORIAN, ETC. TO PROVIDE THE OWNER WITH THE SAME EXISTING MONITORING/CONTROL/REPORTING CAPABILITIES, AS REQUIRED PER THE EXISTING AIR PERMIT, ETC. THESE SAME (APPROX. 10) SCREENS SHALL ALSO BE UPDATED TO REFLECT THE NEW EQUIPMENT INSTALLED AND EXISTING EQUIPMENT REMOVED/DEMOLISHED AS PART OF THIS PROJECT INCLUDING, BUT NOT LIMITED TO, REMOVAL OF BYPASS DAMPER, REMOVAL OF BYPASS STACK, INSTALLATION OF NEW DEAERATOR (DA-3), ETC.
2. CONTROL PANEL SHALL BE FURNISHED BY HRSG MANUFACTURER. PANEL SHALL BE INSTALLED BY CONTRACTOR.
3. CONTROL PANEL SHALL BE FURNISHED BY DEAERATOR MANUFACTURER. PANEL SHALL BE INSTALLED BY CONTRACTOR.
4. CONTROL PANEL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR/CONTROLS INTEGRATOR. ETHERNET SWITCH SHALL BE HIRSCHMANN, 8 PORT, DIN RAIL TYPE, OR APPROVED EQUAL. PANEL SHALL BE NEMA 4.
5. EXISTING DATA HIGHWAY PLUS (DH+) CONTROL WIRING DAISY-CHAIN CONNECTION TERMINAL BOXES LOCATED WITHIN PANELS TO BE REMOVED/DEMOLISHED SHALL BE RELOCATED, AS REQUIRED TO MAINTAIN FUNCTIONALITY OF EXISTING CONTROL PANELS.
6. (E) POWERHOUSE COGEN 1 WORKSTATION CURRENTLY OUT OF SERVICE (TEMPORARILY).
7. FUEL CELL SYSTEM OUT OF SERVICE (PERMANENTLY).

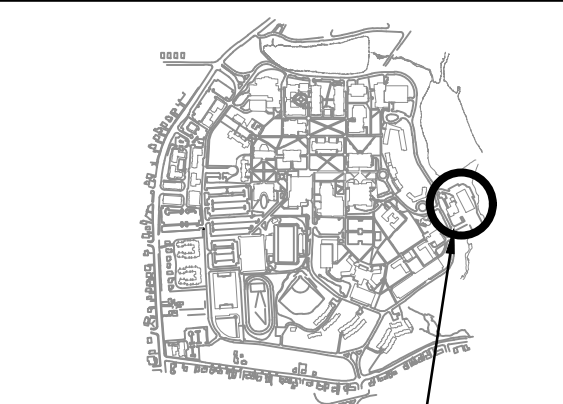
SCOPE NOTES

- 2 ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.

COGENERATION PLANT OPERATING FLOOR



TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN
AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
ENGINEERING, INC. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ - COGENERATION PLANT HRSG RENEWAL

Drawing Title:
CONTROL SYSTEM ARCHITECTURE & INTERCONNECTION DIAGRAM

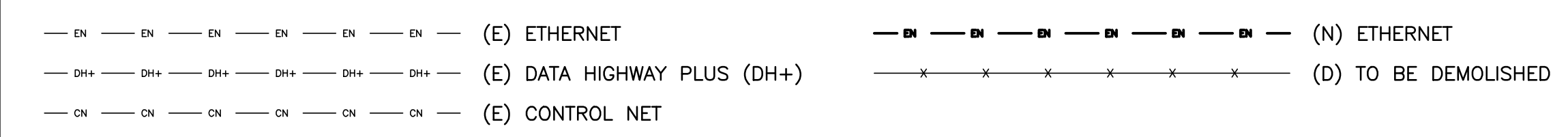
Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

I-101

ISSUED FOR BID

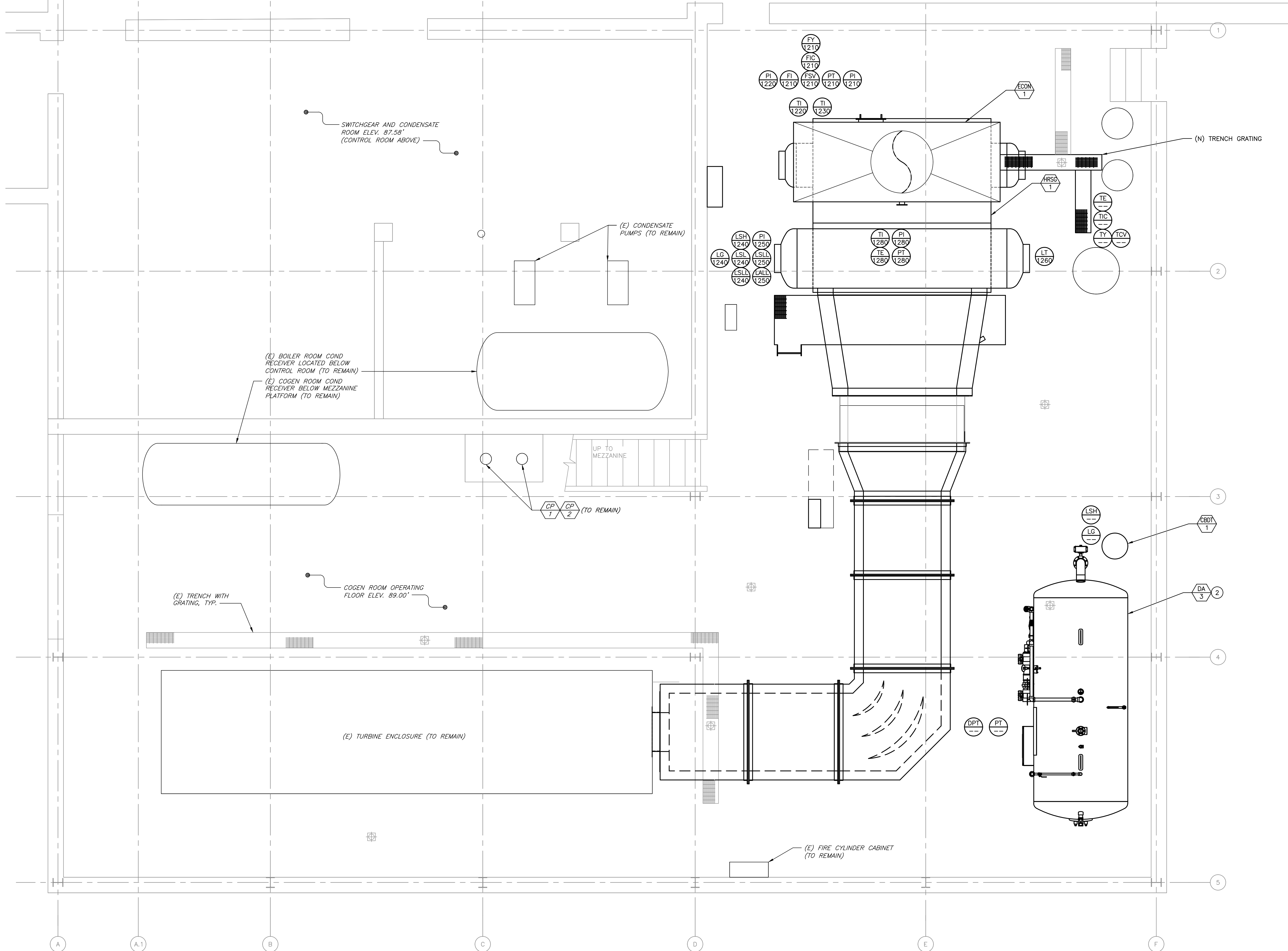
1 CONTROL SYSTEM ARCHITECTURE & INTERCONNECTION DIAGRAM
I-101 N.T.S.

LEGEND



SCOPE NOTES

- ② ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.



SWITCHGEAR AND CONDENSATE ROOM ELEV. 87.58" (CONTROL ROOM ABOVE)

(E) CONDENSATE PUMPS (TO REMAIN)

(E) BOILER ROOM COND RECEIVER LOCATED BELOW CONTROL ROOM (TO REMAIN)
(E) COGEN ROOM COND RECEIVER BELOW MEZZANINE PLATFORM (TO REMAIN)

UP TO MEZZANINE

CP 1 CP 2 (TO REMAIN)

(E) TRENCH WITH GRATING, TYP.

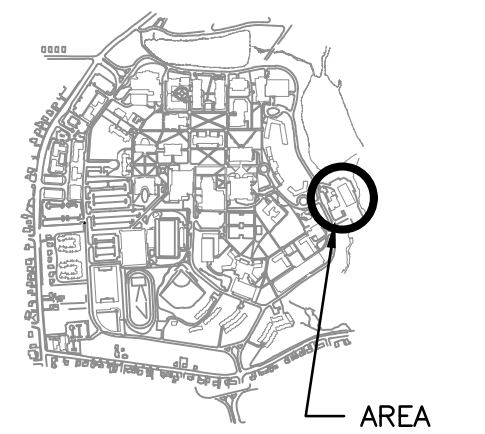
COGEN ROOM OPERATING FLOOR ELEV. 89.00"

(E) TURBINE ENCLOSURE (TO REMAIN)

(E) FIRE CYLINDER CABINET (TO REMAIN)

1 OPERATING FLOOR PLAN - NEW WORK
1-102 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID
No. Date Revision

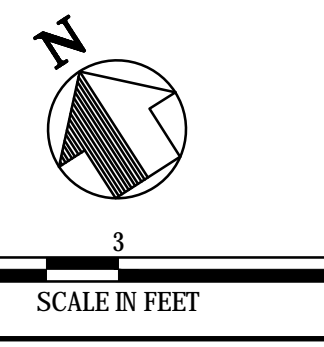
Burns
BURNS ENGINEERING, INC. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL
Drawing Title:
GENERAL ARRANGEMENT – NEW WORK

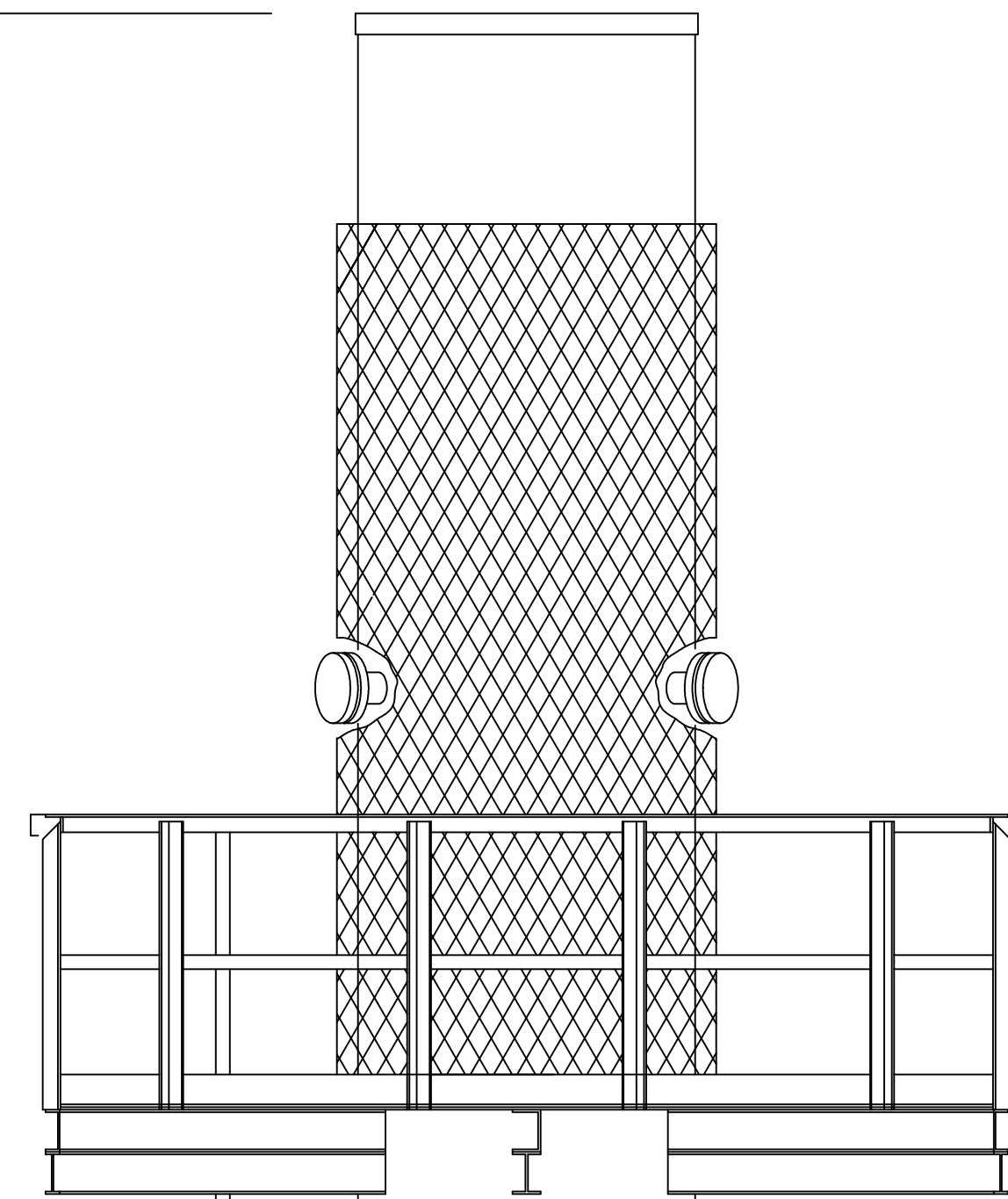
Date: 05/31/2019
Scale: AS NOTED
Drawn: ADR
Checked: DB
Job No: 2016-193
Drawing No:

I-102

ISSUED FOR BID

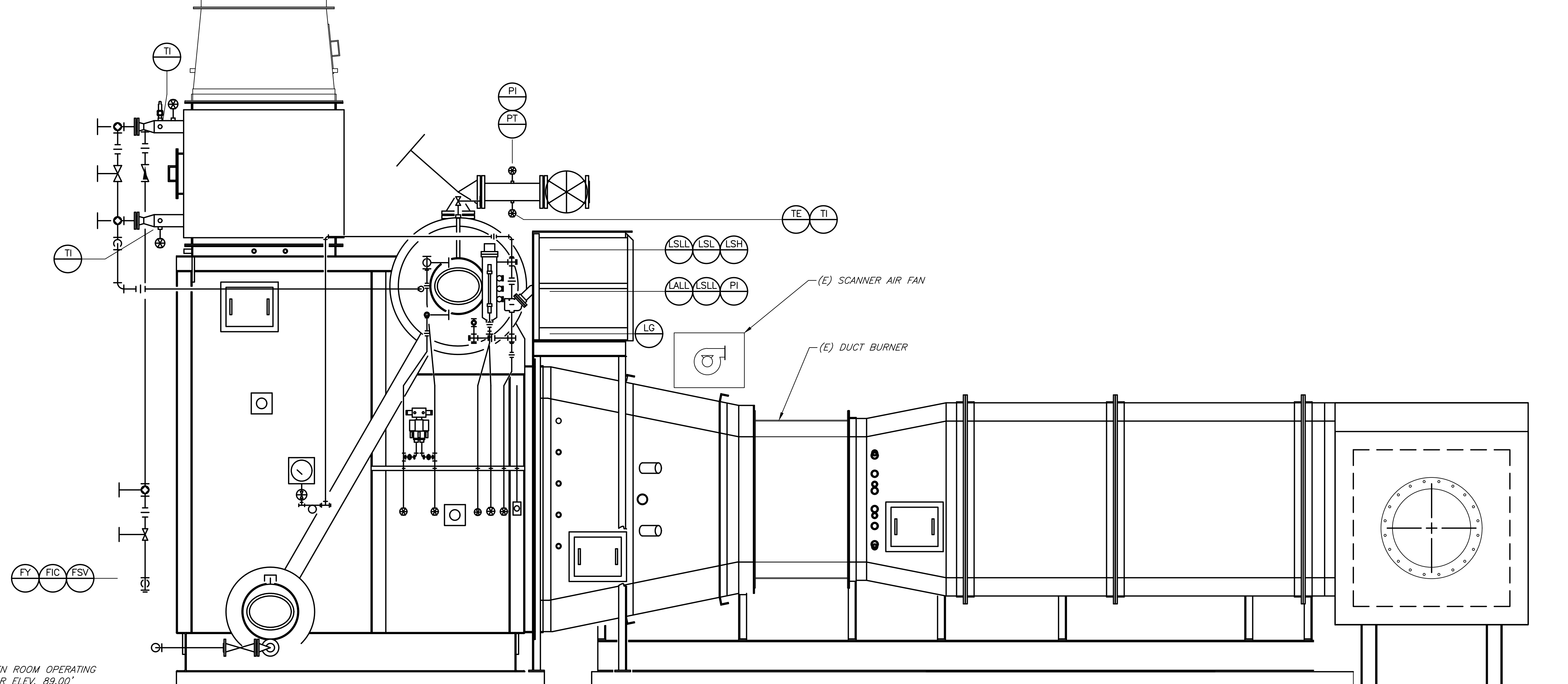


TOP OF STACK
ELEV. 141'-6"



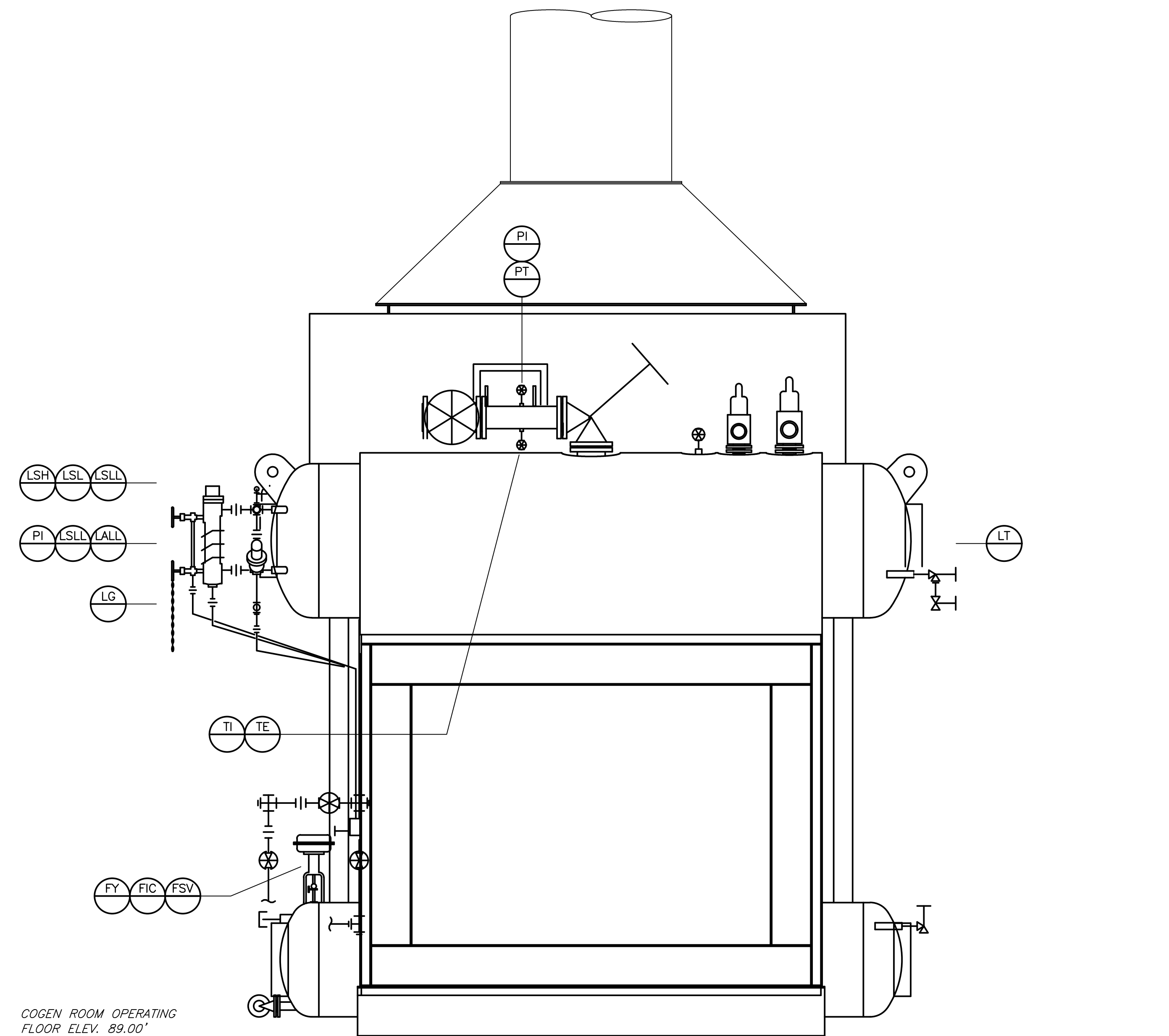
48" Ø MAIN STACK

TOP OF STEEL
ROOF ELEV. 112'-6"



COGEN ROOM OPERATING
FLOOR ELEV. 89.00'

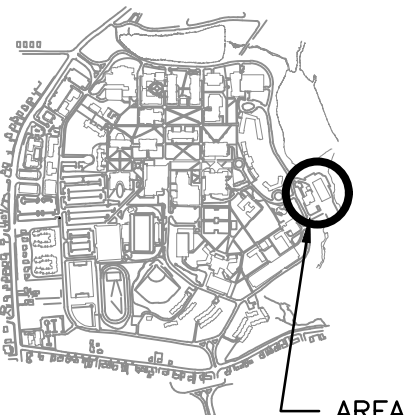
1 HRSG SECTION - NEW WORK
1-103 N.T.S.



COGEN ROOM OPERATING
FLOOR ELEV. 89.00'

2 HRSG SECTION - NEW WORK
1-103 N.T.S.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No. Date Revision

Burns

BURNS ENGINEERING, INC. | 215 979-7200
TWO COMMERCIAL SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
SECTIONS

Date: 05/31/2019

Scale: AS NOTED

Drawn: ADR

Checked: DB

Job No: 2016-193

Drawing No:

1-103

ISSUED FOR BID

FIRE PROTECTION NOTES

1. TEST, FLUSH AND MAINTAIN FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS INCLUDING, BUT NOT LIMITED TO, NFPA STANDARDS, STATE OF NJ, DCA AND FM GLOBAL REQUIREMENTS.
2. CONTRACTOR TO PROVIDE FIRE PROTECTION SHOP DRAWINGS AND HYDRAULIC CALCULATIONS TO THE DCA FOR PLAN REVIEW.
3. A FINAL ACCEPTANCE TEST OF THE SPRINKLER AND STANDPIPE MUST BE CONDUCTED BY A CONTRACTOR LICENSED AND CERTIFIED BY THE STATE OF NJ. DCA, TCNJ FIRE AND EMERGENCY SERVICES MUST BE PRESENT AT ALL SYSTEM TESTING.
4. ALL PRODUCTS AND EQUIPMENT SHALL BE UL LISTED AND/OR FM GLOBAL APPROVED FOR USE AS A PART OF A FIRE SUPPRESSION SYSTEM.
5. PROVIDE AS-BUILT DOCUMENTATION IN BOTH DIGITAL AND PRINT FORM.
6. TEST ALL FIRE PROTECTION PIPING AND MODIFICATIONS PER NFPA CODES AND STANDARDS.





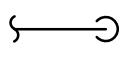
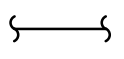
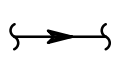
FIRE PROTECTION SPECIFICATIONS

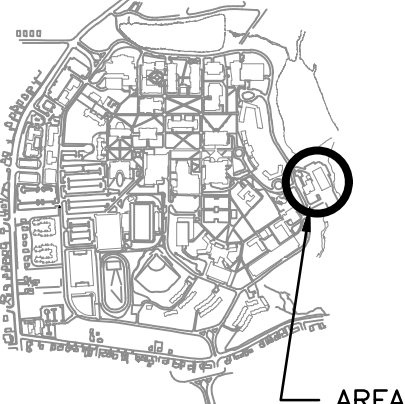
1. FIRE PROTECTION PIPING
 - 1.1. PIPE: BLACK STEEL PIPE, SCHEDULE 40, ASTM 53 GRADE A
 - 1.2. FITTINGS: THREADED OR VICTAULIC GROOVED FITTINGS
2. SPRINKLER HEADS
 - 2.1. LISTED IN UL'S "FIRE PROTECTION EQUIPMENT DIRECTORY" OR FM GLOBAL'S "APPROVAL GUIDE."
 - 2.2. PRESSURE RATING FOR AUTOMATIC SPRINKLERS: 175-PSIG MINIMUM.
 - 2.3. AUTOMATIC SPRINKLERS WITH HEAT-RESPONSIVE ELEMENT, NONRESIDENTIAL APPLICATIONS: UL 199
 - 2.4. CHARACTERISTICS: NOMINAL DISCHARGE COEFFICIENT K OF 8.0, TEMPERATURE RATING: 165° F OR 286° F, REFER TO PLANS.
 - 2.4.1. BRASS PENDANT SPRINKLER HEAD FOR TEMPERATURE RATING OF 165° F.
 - 2.4.2. BRASS UPRIGHT SPRINKLER HEAD FOR TEMPERATURE RATING OF 286° F.
 - 2.5. SPRINKLER FINISHES: CHROME PLATED

FIRE PROTECTION ABBREVIATIONS

*F DEGREES (FAHRENHEIT)
 (E) EXISTING TO REMAIN
 ELEV ELEVATION
 FP FIRE PROTECTION
 GPM GALLONS PER MINUTE
 SF SQUARE FEET
 SPR SPRINKLER

FIRE PROTECTION LEGEND

-  NEW WORK
-  EXISTING
-  POINT OF CONNECTION BETWEEN NEW AND EXISTING
-  POINT OF DISCONNECT BETWEEN DEMOLITION AND EXISTING
-  PIPE DROP
-  PIPE BREAK
-  FLOW ARROW



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID



Project Title:
 TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
 GENERAL NOTES, ABBREVIATIONS AND LEGEND

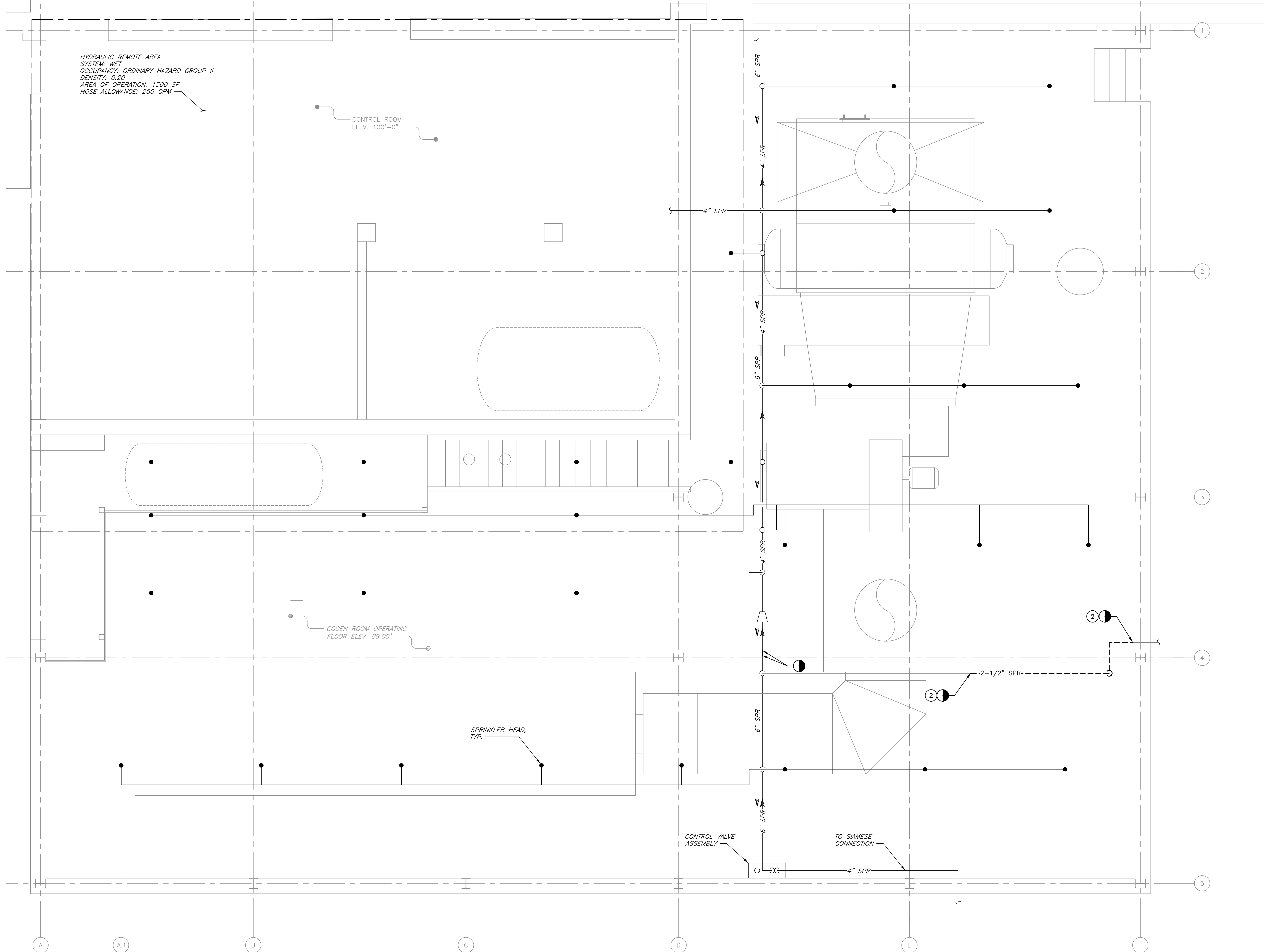
Date: 05/31/2019
 Scale: AS NOTED
 Drawn: ADR
 Checked: DB
 Job No: 2016-193
 Drawing No:

FP-001

ISSUED FOR BID

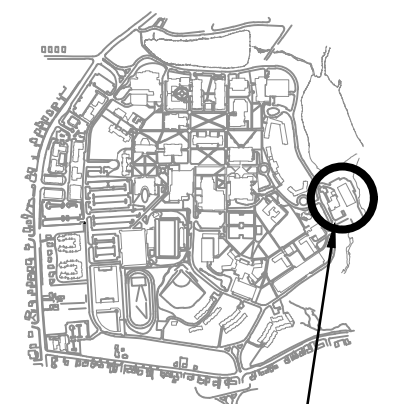
SCOPE NOTES

- ② ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.



① OPERATING FLOOR PLAN - DEMOLITION
FP-101 3/8" = 1'-0"

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No. Date Revision

Burns
BURNS ENGINEERING, INC. | 215.979.7290
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
OPERATING
FLOOR PLAN –
DEMOLITION

Date: 05/31/2019

Scale: AS NOTED

Drawn: ADR

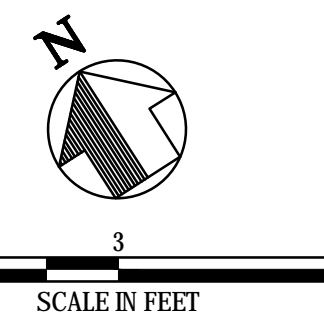
Checked: DB

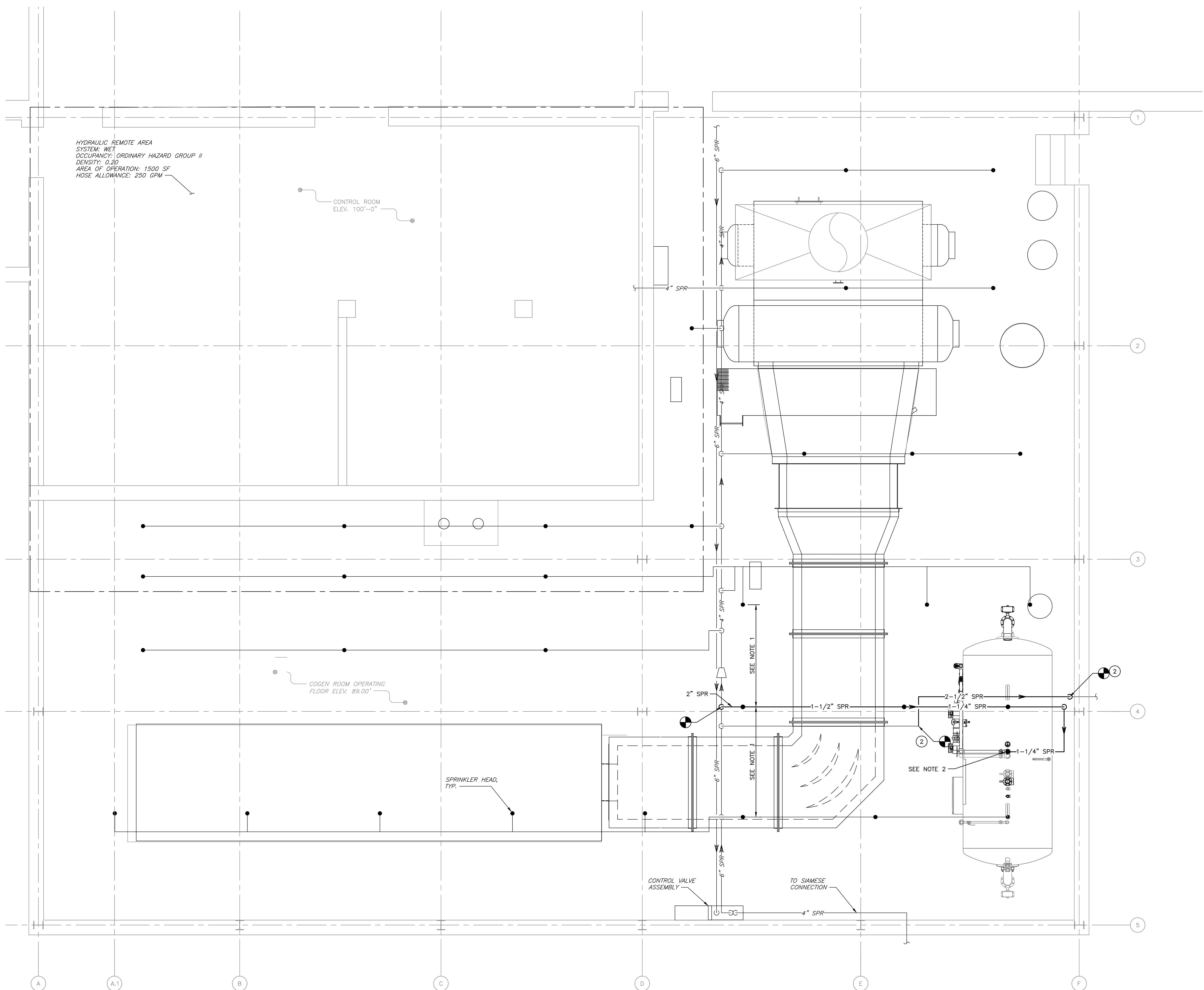
Job No: 2016-193

Drawing No:

FP-101

ISSUED FOR BID





HYDRAULIC REMOTE AREA
 SYSTEM: WET
 OCCUPANCY: ORDINARY HAZARD GROUP II
 DENSITY: 0.20
 AREA OF OPERATION: 1500 SF
 HOSE ALLOWANCE: 250 GPM

CONTROL ROOM
 ELEV. 100'-0"

COGEN ROOM OPERATING
 FLOOR ELEV. 89.00'

SPRINKLER HEAD,
 TYP.

CONTROL VALVE
 ASSEMBLY

TO SIAMESE
 CONNECTION

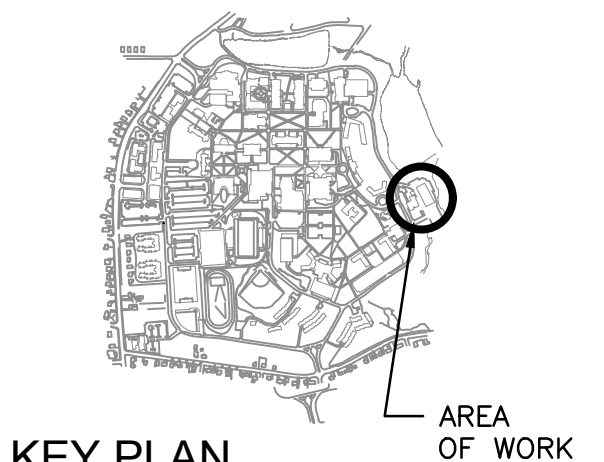
DRAWING NOTES

- HEADS SHALL NOT BE SPACED CLOSER THAN 6'-0". VERIFY EXISTING SPRINKLER HEAD PLACEMENT PRIOR TO BEGINNING WORK. RELOCATE SPRINKLERS AS REQUIRED. HEADS INSTALLED HIGH IN CEILING SHALL HAVE TEMPERATURE RATING OF 286°F.
- FURNISH AND INSTALL SPRINKLER HEAD UNDER DA-3. SPRINKLER HEAD TEMPERATURE RATING: 165°F.
- CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY REMOVAL/REINSTALLATION OF FIRE PROTECTION SYSTEM WITHIN THE AREA ABOVE THE HEAT RECOVERY STEAM GENERATOR (HRSG-1) TO SUPPORT RIGGING PROCEDURES FOR THE REPLACEMENT OF HRSG-1, AS REQUIRED. REFER TO NOTE 6.6 ON DRAWING G-001. CONTRACTOR SHALL PROVIDE COORDINATED FIRE WATCH WHILE THIS PORTION OF THE SYSTEM IS NOT IN SERVICE.

SCOPE NOTES

- ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.

TCNJ
 THE COLLEGE OF
 NEW JERSEY



No.	Date	Revision
0	5/31/19	ISSUED FOR BID

Burns
 BURNS ENGINEERING, INC. | 215.979.7290
 TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
 PHILADELPHIA, PA 19103

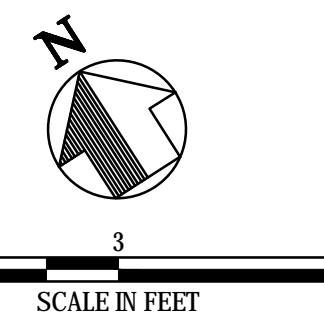
Project Title:
 TCNJ –
 COGENERATION
 PLANT
 HRSG RENEWAL

Drawing Title:
 OPERATING
 FLOOR PLAN –
 NEW WORK

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	ADR
Checked:	DB
Job No:	2016-193
Drawing No:	FP-102

1 OPERATING FLOOR PLAN - NEW WORK
 FP-102 3/8" = 1'-0"

Burns Engineering, Inc., Philadelphia, Pennsylvania



GENERAL NOTES:

1. PRIOR TO STARTING WORK, CONTRACTOR SHALL VISIT THE SITE AND CONVENE A COORDINATION MEETING WITH THE COLLEGE OF NEW JERSEY. THE CONTRACTOR SHALL PROVIDE A SCHEDULE OF ACTIVITIES WITH DURATION AND PHASING OF CONSTRUCTION FOR APPROVAL.
2. REFER TO CONTRACT DOCUMENTS FOR GENERAL REQUIREMENTS, DESCRIPTION OF WORK, MATERIALS AND EQUIPMENT. CONTRACTOR SHALL NOTIFY TCNJ OF ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS PRIOR TO PROCEEDING WITH ANY WORK.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR TO ANY EXISTING UTILITY FEATURES OR OTHER ITEMS DISTURBED OR DAMAGED BY CONSTRUCTION ACTIVITIES INDICATED FOR WORK UNDER THIS CONTRACT.
4. PROVIDE LABOR, MATERIAL, EQUIPMENT, RIGGING, INCIDENTALS, METHODS AND SERVICES REQUIRED TO INSTALL ALL WORK INDICATED ON DRAWINGS.
5. VERIFY FIELD CONDITIONS, ACCESS WAYS, DIMENSIONS, AND DETAILS IN THE FIELD PRIOR TO WORK.
6. THE COLLEGE OF NEW JERSEY WILL PAY FOR ALL PERMITS AND/OR CERTIFICATES OF INSPECTION REQUIRED IN PERFORMANCE OF THE WORK BY ALL AUTHORITIES HAVING JURISDICTION.
7. IN ADDITION TO SPECIFICS AS MAY BE DEFINED HEREINAFTER, THE CONTRACTOR SHALL PROTECT THE WORK SITE AND ALL WORK AGAINST DAMAGE FROM ANY SOURCE (INCLUDING BUT NOT LIMITED TO WATER, DUST, HEAT, FREEZING ETC.) UNTIL FINAL COMPLETION AND ACCEPTANCE BY THE OWNER.
8. CONTRACTOR SHALL, UPON COMPLETION OF THE WORK, SUBMIT A SET OF RECORD DRAWINGS SHOWING ALL CHANGES FROM THE CONTRACT DRAWING MADE IN THE INSTALLATION AND SHOWING DIMENSIONED LOCATIONS OF CONCEALED EQUIPMENT OR PARTS OF THE WORK. DRAWING SHALL BE IN AUTOCAD 2010 BASED UPON BURNS ENGINEERING LAYERING STANDARDS AND PEN TABLE.
9. NO ELECTRICAL MATERIALS OR COMPONENTS OF ANY KIND SHALL BE USED THAT HAVE NOT BEEN APPROVED AND LISTED BY THE UNDERWRITERS LABORATORIES, INC. (UL), AND EACH PIECE OF EQUIPMENT SHALL HAVE MARKED THEREON, WHERE IT CAN READILY BE OBSERVED, THE NAME OR TRADEMARK OF THE MANUFACTURER.
10. ALL FLOOR PENETRATIONS SHALL BE SAW CUT OR CORE DRILLED AND SEALED WITH AN APPROVED FIRE RATED ASSEMBLY OR SEALANT.
11. SWITCHBOARDS, SCHEDULE SHALL BE PRINTED AND PLACED ON INTERIOR OF PANELS AND PANELBOARDS. NO HAND WRITTEN SCHEDULES WILL BE ACCEPTED.
12. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS AND THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL AMENDMENTS THERETO.
13. EXISTING CIRCUITS AND CONDUITS ARE SHOWN BASED ON BEST INFORMATION AVAILABLE AND MAY NOT BE TOTALLY ACCURATE. CONTRACTOR SHALL VERIFY ALL CIRCUITS BY TESTING AND OTHER MEANS PRIOR TO WORK.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL AND PEDESTRIAN BARRIERS REQUIRED FOR CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE SIGNAGE FOR CONSTRUCTION AS NEEDED AND IN ACCORDANCE WITH OSHA AND STATE REQUIREMENTS.
16. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR INSTALLATION OF WORK.
17. CONDUIT ROUTING SHOWN ON PLANS IS DIAGRAMMATIC. CONTRACTOR SHALL DETERMINE BEST ROUTING TO AVOID OBSTRUCTIONS AND MINIMIZE LENGTH. PULL BOXES SHALL BE INSTALLED WHERE REQUIRED FOR CABLE PULLING. ALL CONDUIT RUNS MUST BE COORDINATED WITH ORIGINAL EQUIPMENT MANUFACTURER (OEM).
18. CONTRACTOR SHALL ADVISE MANUFACTURERS OF CLEARANCE AND REQUIREMENTS TO RIG EQUIPMENT INTO BUILDING AND FINAL LOCATION.
19. CONTRACTOR SHALL INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS AND THE CONTRACT DRAWINGS. ALL NECESSARY HARDWARE TO SECURE THE ASSEMBLIES IN PLACE SHALL BE PROVIDED BY THE CONTRACTOR.

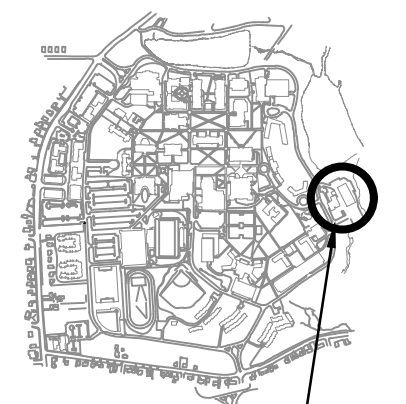
LEGEND

—————	EXISTING
-----	DEMOLITION
—————	NEW
— · — · —	CONDUIT ROUTING
XX:YY	HOME RUN TO SOURCE PANEL; 'XX' INDICATES PANEL NO. & 'YY' INDICATES CIRCUIT NO.
▭	PANELBOARD
⊕	GENERAL PURPOSE DUPLEX RECEPTACLE, 120VAC, 20A MOUNT AT 18" AFF. TO CENTERLINE, UON
⊕	GENERAL PURPOSE QUAD RECEPTACLE, 120VAC, 20A MOUNT AT 18" AFF. TO CENTERLINE, UON
⊕	DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTER, 120VAC, 20A MOUNT AT 18" AFF. TO CENTERLINE, UON
X	CIRCUIT; X DESIGNATES NUMBER
S _X	20A TOGGLE SWITCH, X INDICATES 3 OR 4 WAY
⌋	CIRCUIT BREAKER
⌋	FUSED DISCONNECT SWITCH
⌋	FUSE
⌋	TRANSFORMER
⊗	MOTOR; XX INDICATES HORSEPOWER
⊗	ENCLOSED CIRCUIT BREAKER
⊗	3P NON-FUSED DISCONNECT SWITCH XX INDICATES AMPERE RATING NEMA 1 FOR INDOOR USE, UON
⊗	3P FUSED DISCONNECT SWITCH XX INDICATES FUSE RATING NEMA 1 FOR INDOOR USE, UON
⊕	JUNCTION BOX

ABBREVIATIONS:

A	AMPERE
AC	ALTERNATING CURRENT
ACH	ABOVE COUNTER HEIGHT
ADA	AMERICAN DISABILITIES ACT
AF	AMPERE FRAME
AFC	ABOVE FINISHED CEILING
AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AMP	AMPERE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AT	AMPERE TRIP
ATC	AIR TERMINAL CHAMBER
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BAS	BUILDING AUTOMATION SYSTEM
BICSJ	BUILDING INDUSTRY CONSULTING SERVICE INTERNATIONAL, INC
BLDG	BUILDING
BLR	BOILER
BOP	BOTTOM OF PIPE
C	CONDUIT
CAT	CATEGORY
CB	CIRCUIT BREAKER
CD	CANDELA
CHW	CHILLED WATER
CKT	CIRCUIT
CLG	CEILING
CND	CONDUIT
COMM	COMMUNICATION
CONT	CONTROL
CP	CONTROL PANEL
CU	COPPER
dB	DECIBEL
DISC	DISCONNECT
DWP	DOMESTIC WATER PUMP
(E)	EXISTING TO REMAIN
EC	ELECTRICAL CONTRACTOR
EMT	ELECTRICAL METALLIC TUBING
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN
FLA	FULL LOAD AMPS
FLMC	FLEXIBLE LIQUIDTIGHT METALLIC CONDUIT
FMC	FLEXIBLE METALLIC CONDUIT
G, GND	GROUND
GA	GAUGE
GC	GENERAL CONTRACTOR
GDS	GENERATOR DISCONNECT SWITCH
GFI	GROUND FAULT CIRCUIT INTERRUPTER
HDA	HAND/OFF/AUTO
HP	HORSE POWER
I/O	INPUT/OUTPUT
JB	JUNCTION BOX
JCI	JOHNSON CONTROL INC.
KVA	KILOVOLTAMPERE
KW	KILOWATT
L.C.	LOCKED CLOSED
L.O.	LOCKED OPEN
LSI	LONG TIME/SHORT TIME/INSTANTANEOUS MANUFACTURER
MANF	MANUFACTURER
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MLO	MAIN LUGS ONLY
MOV	MOTOR OPERATED VALVE
MS	MOTOR STARTER
MTD	MOUNTED
NEC	NATIONAL ELECTRICAL CODE
O/H	OVERHEAD
OC	OVERCURRENT
OCC	OPERATION CONTROL CENTER
OPS	OPERATIONS
P	POLE
PH	PHASE
PVC	POLYVINYL CHLORIDE
(R)	REMOVE
RA	REMOTE ANNUNCIATOR
(RE)	RELOCATE EXISTING
RECP	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
RM	ROOM
SCH	SCHEDULE
SPD	SURGE PROTECTIVE DEVICE
SPEC	SPECIFICATION
STP	SHIELDED TWISTED PAIR
TEMP	TEMPORARY
TM	THERMAL MAGNETIC
TSP	TRANSIENT SURGE PROTECTION
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATT
WP	WEATHERPROOF
XFMR	TRANSFORMER

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0	5/31/19	ISSUED FOR BID
No.	Date	Revision

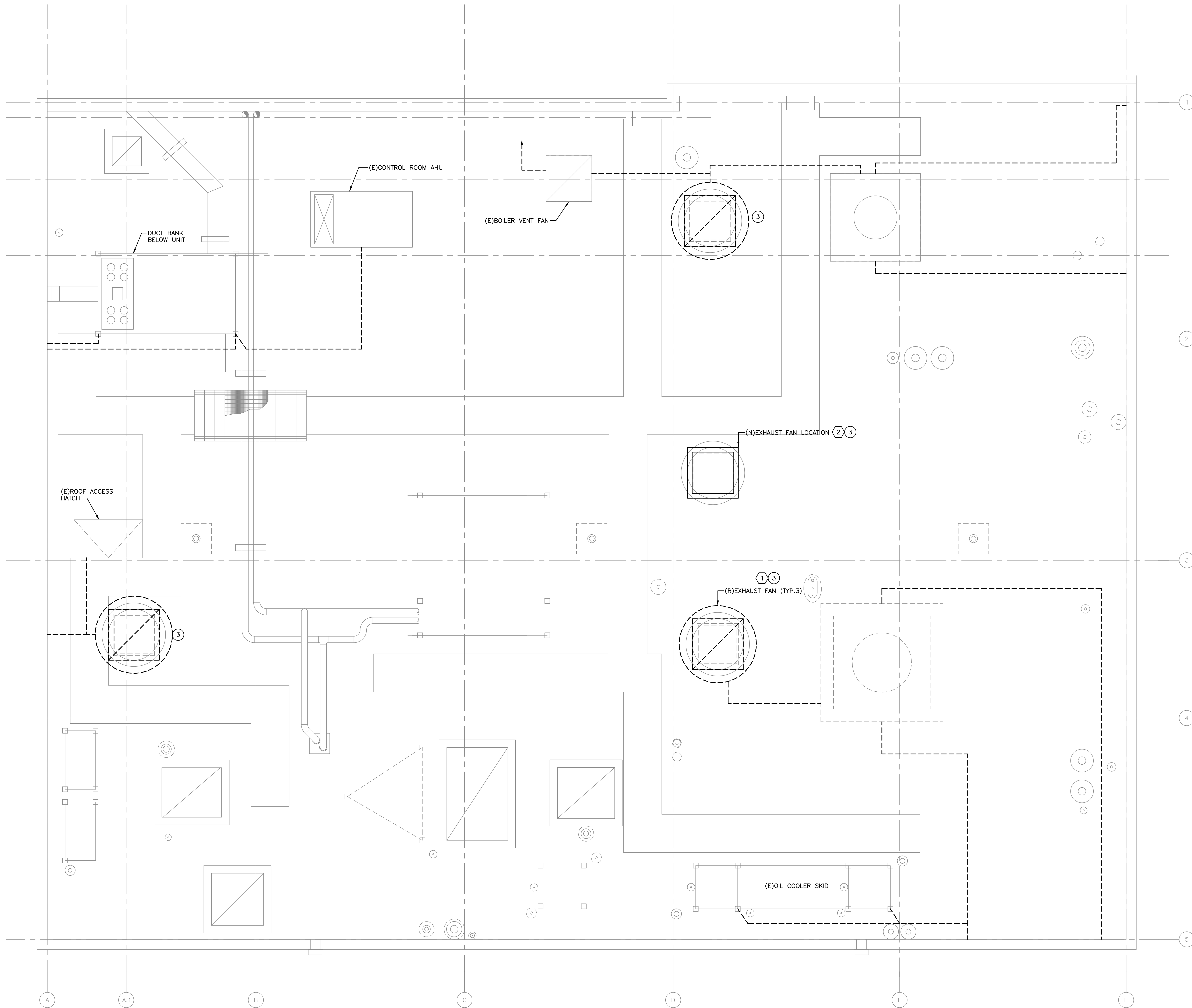
Burns
BURNS ENGINEERING, INC. | 215.979.7200
TWO COMMERCIAL SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
ELECTRICAL ABBREVIATIONS, LEGEND AND NOTES

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	CJV
Checked:	DB
Job No:	2016-193
Drawing No:	E-001

ISSUED FOR BID



GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FEATURES, SIZES AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, IN THE EVENT OF ANY DISCREPANCY BEFORE PROCEEDING WITH ANY CONSTRUCTION.
2. DISCONNECT, PROTECT AND RECONNECT ALL ROOF-TOP GROUNDING CONNECTIONS FOLLOWING ROOF REPLACEMENT. SEE ARCHITECTURAL DRAWINGS FOR FURTHER DETAILS.

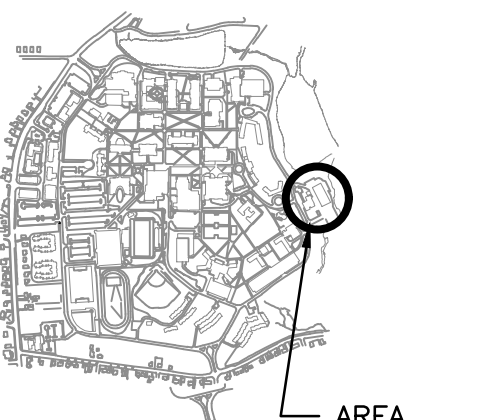
KEY NOTES:

1. REMOVE (3) EXHAUST FAN CONNECTIONS, DISCONNECT SWITCHES AND CIRCUITS BACK TO EXISTING MEZZANINE LEVEL MCC AND SOURCE ATC PANEL. EXISTING EXHAUST FAN MOTOR STARTERS TO REMAIN AND BE RE-USED FOR NEW EXHAUST FANS. SEE SINGLE LINE DIAGRAM ON E-301 FOR NEW WORK CIRCUIT SIZING AND M-207 FOR EXHAUST FAN DESIGNATIONS AND LOCATIONS. COORDINATE WITH ROOFING CONTRACTOR FOR NEW WORK ROOF PENETRATIONS.
2. NEW WORK EXHAUST FAN LOCATION. COORDINATE WITH ROOFING CONTRACTOR FOR NEW ROOF PENETRATION. SEE SINGLE LINE DIAGRAM ON E-301 FOR NEW WORK CIRCUIT/DISCONNECT SIZING AND M-207 FOR EXHAUST FAN DESIGNATIONS AND LOCATIONS.

SCOPE NOTES:

3. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING EXHAUST FANS (EF-1, EF-2 AND EF-3) AND INSTALLATION OF NEW EXHAUST FANS (EF-1, EF-2, EF-3 AND EF-4) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 3.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN AREA OF WORK

0 5/31/19 ISSUED FOR BID

No.	Date	Revision

Burns
BURNS ENGINEERING, INC. | 215.979.7290
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
ROOF PLAN –
DEMOLITION AND
NEW WORK

Date: 05/31/2019

Scale: AS NOTED

Drawn: CJV

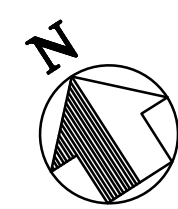
Checked: DB

Job No: 2016-193

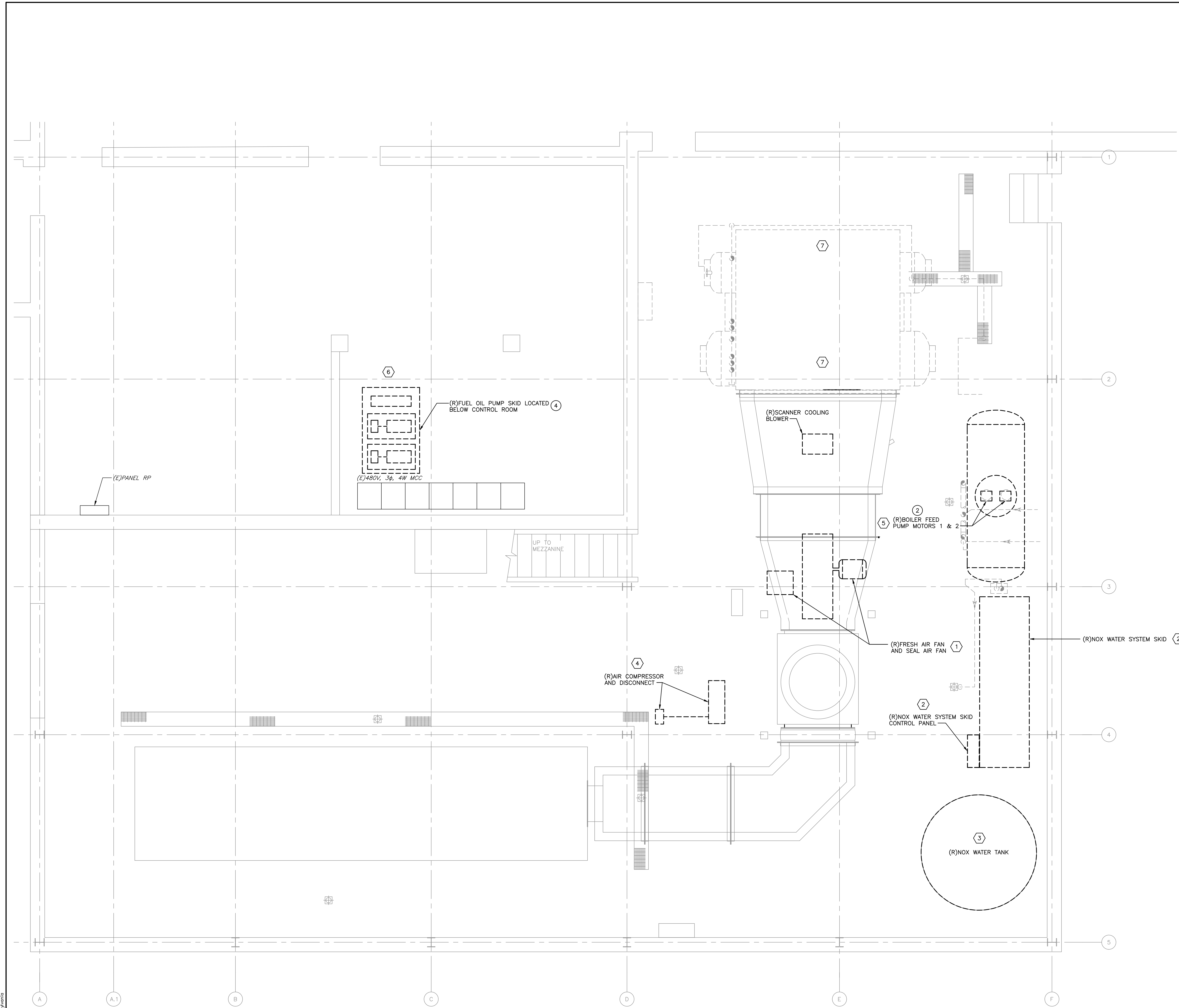
Drawing No:

E-100

1 ROOF PLAN
E-100 3/8" = 1'-0"



SCALE IN FEET



1 OPERATING LEVEL PLAN - ELECTRICAL REMOVALS
 E-101 3/8" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FEATURES, SIZES AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, IN THE EVENT OF ANY DISCREPANCY BEFORE PROCEEDING WITH ANY CONSTRUCTION.

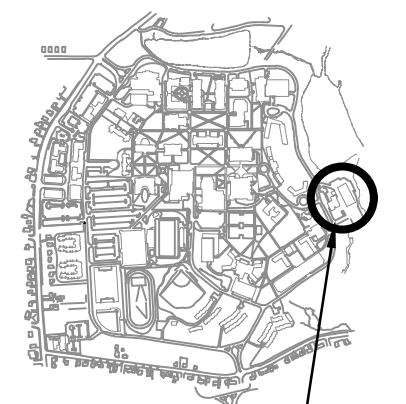
KEY NOTES:

1. SAFE OFF AND DISCONNECT MOTOR CONNECTION TO FRESH AIR FAN MOTOR. REMOVE 1-1/2" CONDUIT AND WIRE BACK TO EXISTING MCC. REMOVE EXISTING SIZE 4, 150A, FVNR STARTER IN EXISTING MCC. EXISTING CABINET VACATED BY THIS REMOVAL TO BE RE-USED FOR NEW WORK. SEE DRAWING E-201.
2. REMOVE 2/0 STRANDED, COPPER GROUND LOOP RUNNING ALONG BUILDING WALL. SAFE OFF AND DISCONNECT SINGLE POINT OF ELECTRICAL CONNECTION FROM CONTROL PANEL. REMOVE 3" CONDUIT BACK TO EXISTING 20A CIRCUIT BREAKER IN MCC. SAFE OFF AND MARK "SPARE" FOR FUTURE FACILITY USE. REMOVE 120V CONTROL PANEL CONNECTION, CONDUIT AND WIRE TO EXISTING PANEL RP. SAFE OFF AND MARK "SPARE" FOR FUTURE FACILITY USE.
3. REMOVE ALL EXISTING CONTROL POWER CONNECTIONS BACK TO NEAREST JUNCTION BOX AND SAFE OFF. REMOVE 2/0 STRANDED COPPER GROUND CONDUCTOR BACK TO 4/0 STRANDED, COPPER GROUND LOOP RUNNING ALONG BUILDING WALL.
4. EXISTING AIR COMPRESSOR, DISCONNECT SWITCH AND ASSOCIATED CIRCUIT TO BE REMOVED BACK TO SOURCE MCC. SAFE OFF AND MARK "SPARE" FOR FUTURE FACILITY USE.
5. REMOVE 2/0 STRANDED, COPPER GROUND CONDUCTOR BACK TO 4/0 STRANDED, COPPER GROUND LOOP RUNNING AROUND BUILDING WALL. REMOVE 3" CONDUIT BACK TO EXISTING 50A CIRCUIT BREAKER IN MCC. SAFE OFF AND MARK "SPARE" FOR FUTURE FACILITY USE.
6. SAFE OFF AND DISCONNECT MOTOR CONNECTION TO EXISTING FUEL OIL FILTRATION SKID. REMOVE CONDUIT AND WIRING TO NEAREST JUNCTION BOX. EXISTING CIRCUIT TO REMAIN AND BE RE-USED WITH NEW SKID.
7. COORDINATE WITH MECHANICAL CONTRACTOR TO RELOCATE THE FOLLOWING CONDUITS AND CIRCUITS TO ALLOW FOR REMOVAL AND INSTALLATION OF HRSG EQUIPMENT:
 - 7.1. (2)3" SUPPLYING GAS COMPRESSOR #1
 - 7.2. (2)3" SUPPLYING GAS COMPRESSOR #2
 - 7.3. (1)1-1/2" FOR WELDING RECEPTACLE
 - 7.4. (6)3/4" SUPPLYING BOILER FEED PUMP 1, BOILER FEED PUMP 2, SEAL AIR FAN, SCANNER BLOWER, RECIRC PUMP 1 AND 2, AND UNIT HEATERS.

SCOPE NOTES:

2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.

TCNJ
 THE COLLEGE OF
 NEW JERSEY



KEY PLAN AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

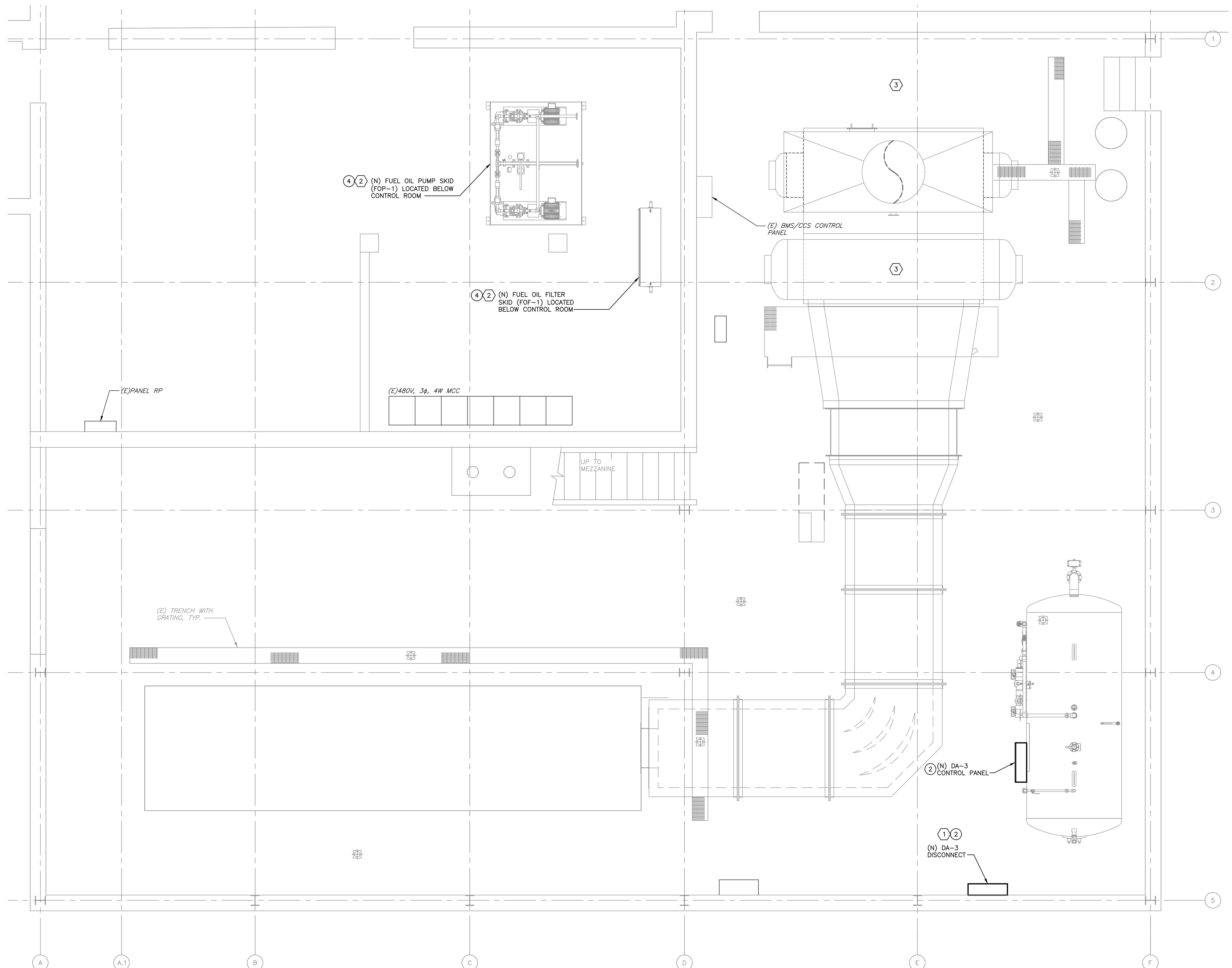
Burns
 BURNS ENGINEERING, INC. | 215.979.7200
 TWO COMMERCE SQUARE, 201 MARKET ST, SUITE 600
 PHILADELPHIA, PA 19103

Project Title:
 TCNJ –
 COGENERATION
 PLANT
 HRSG RENEWAL

Drawing Title:
 OPERATING
 FLOOR PLAN –
 DEMOLITION

Date:	05/31/2019
Scale:	AS NOTED
Drawn:	CJV
Checked:	DB
Job No:	2016-193
Drawing No:	E-101

ISSUED FOR BID



1 OPERATING LEVEL PLAN - ELECTRICAL NEW WORK
E-201 3/8" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FEATURES, SIZES AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, IN THE EVENT OF ANY DISCREPANCY BEFORE PROCEEDING WITH ANY CONSTRUCTION.
2. COORDINATE ALL REQUIRED ELECTRICAL SHUT-DOWNS WITH TCNJ PERSONNEL AT LEAST 7 DAYS PRIOR TO WORK BEING COMPLETED.

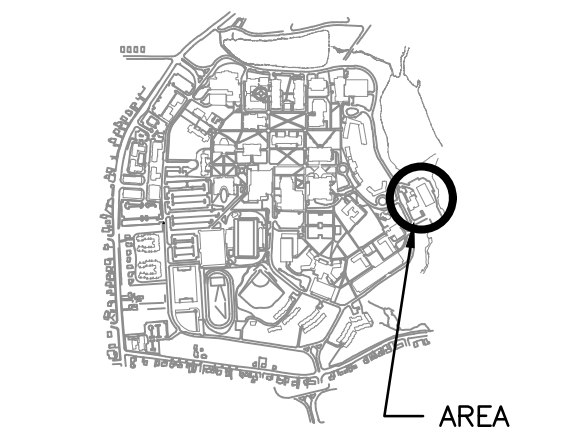
KEY NOTES:

1. FURNISH AND INSTALL 200A, NON-FUSED DISCONNECT IN NEMA 4X ENCLOSURE. COORDINATE FINAL WIRE AND CONDUIT SIZE TO CONTROL PANEL SINGLE POINT OF CONNECTION WITH FINAL SELECTED MANUFACTURER. SEE SINGLE LINE DIAGRAM ON E-301 FOR PRIMARY CIRCUIT INFORMATION. FURNISH AND INSTALL EQUIPMENT SKID GROUND, STRANDED 2/0 BARE COPPER. CONNECT TO EXISTING 4/0 STRANDED GROUND RING ON BUILDING WALL.
2. COORDINATE FINAL CONNECTION OF EXISTING CIRCUIT TO NEW FUEL OIL SKID WITH MECHANICAL CONTRACTOR. ALL CIRCUIT EXTENSIONS SHALL BE RIGID STEEL CONDUIT.
3. SEE DRAWING E-101 FOR INFORMATION ON CIRCUITS TO BE RELOCATED DURING REMOVALS AND NEW WORK PHASE OF PROJECT. EXTEND EXISTING CIRCUITS AS REQUIRED, MATCH EXISTING WIRE SIZE AND INSULATION TYPE.

SCOPE NOTES:

2. ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEAERATOR (DA-1) AND INSTALLATION OF NEW DEAERATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
4. ALL WORK ASSOCIATED WITH THE MODIFICATIONS TO THE EXISTING FUEL OIL SYSTEM SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 4.

TCNJ
THE COLLEGE OF
NEW JERSEY



KEY PLAN
AREA OF WORK

No.	Date	Revision
0	5/31/19	ISSUED FOR BID

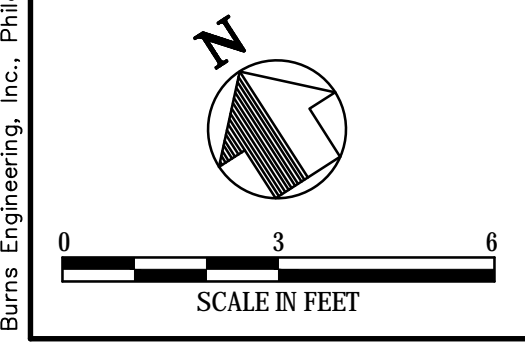
Burns
BURNS ENGINEERING, INC. | 215 979-7200
TWO COMMERCE SQUARE, 2001 MARKET ST, SUITE 600
PHILADELPHIA, PA 19103

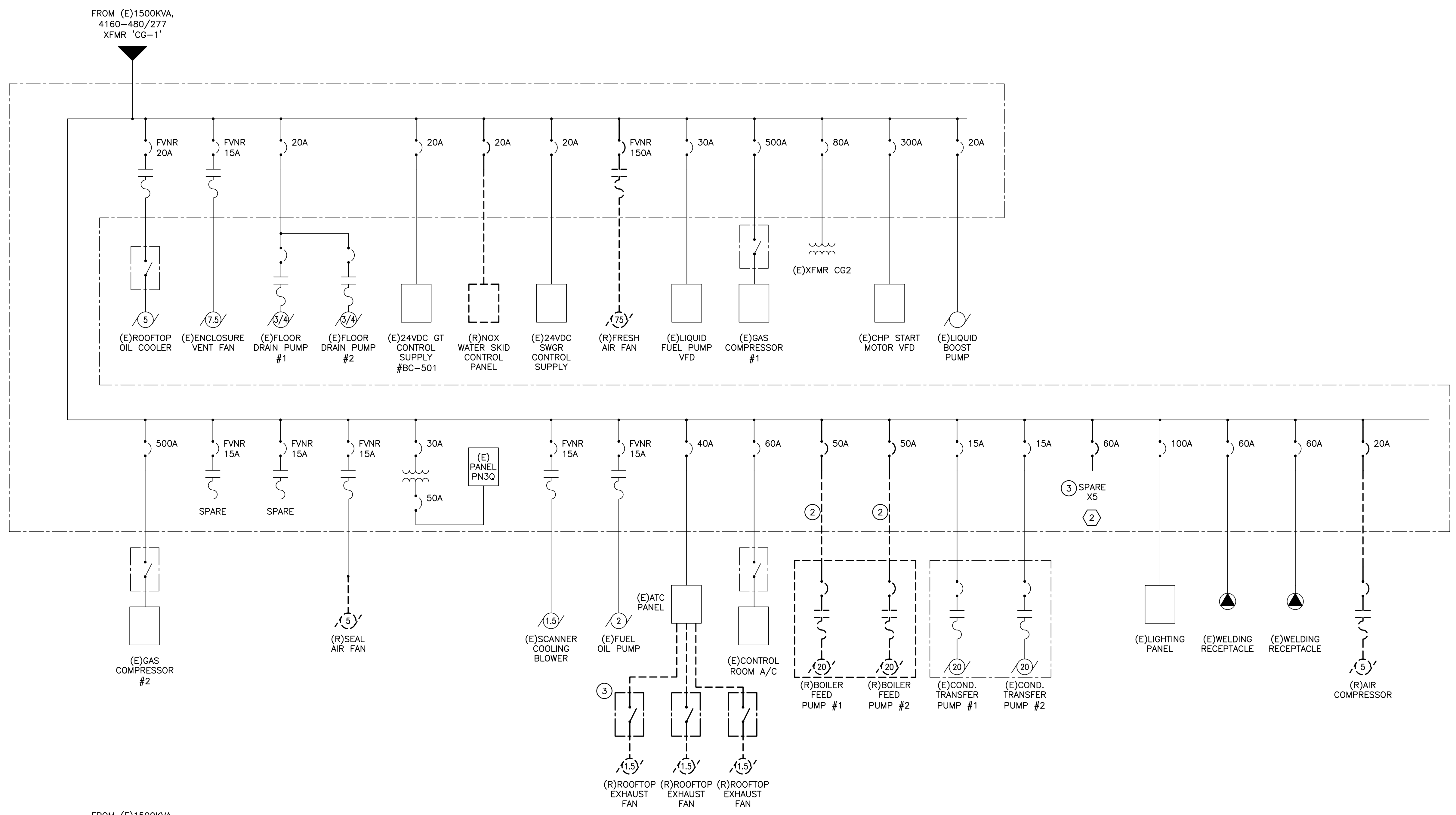
Project Title:
TCNJ –
COGENERATION
PLANT
HRSG RENEWAL

Drawing Title:
OPERATING
FLOOR PLAN –
NEW WORK

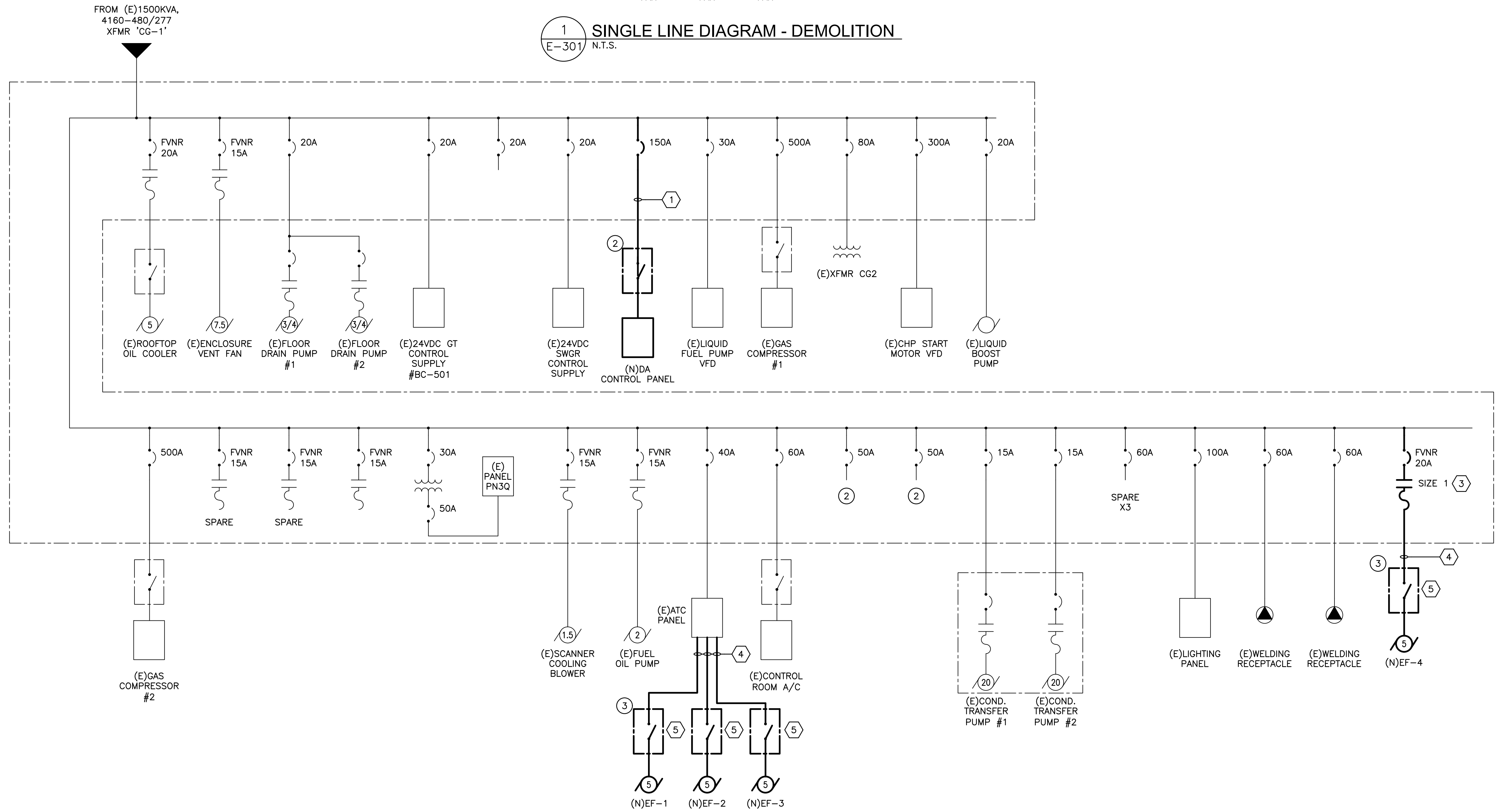
Date:	05/31/2019
Scale:	AS NOTED
Drawn:	CJV
Checked:	DB
Job No:	2016-193
Drawing No:	E-201

ISSUED FOR BID





1 SINGLE LINE DIAGRAM - DEMOLITION
E-301 N.T.S.



2 SINGLE LINE DIAGRAM - NEW WORK
E-302 N.T.S.

GENERAL NOTES:

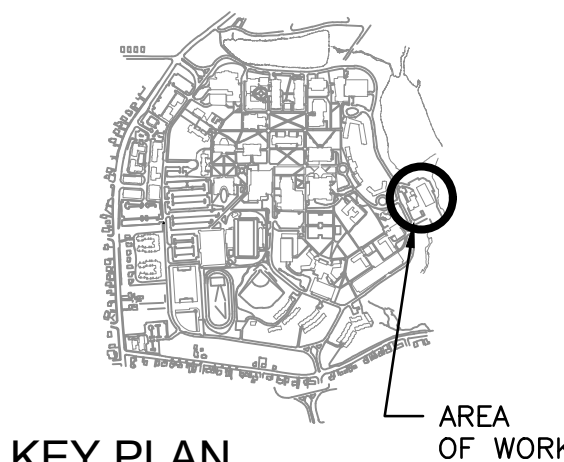
- CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FEATURES, SIZES AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, IN THE EVENT OF ANY DISCREPANCY BEFORE PROCEEDING WITH ANY CONSTRUCTION.
- COORDINATE ALL REQUIRED ELECTRICAL SHUT-DOWNS WITH TCNJ PERSONNEL AT LEAST 7 DAYS PRIOR TO WORK BEING COMPLETED.

KEY NOTES:

- 3-1/2" #1AWG & #6G IN 1-1/4" RIGID STEEL CONDUIT.
- REMOVE (2) OF THE EXISTING SPARE CIRCUIT BREAKER SPACES THAT ARE VERTICALLY ALIGNED FOR NEW EXHAUST FAN STARTER.
- FURNISH AND INSTALL NEMA SIZE 1 STARTER COMPATIBLE WITH EXISTING GENERAL ELECTRIC 8000 LINE CONTROL CENTER IN SPACE VACATED BY SPARE CIRCUIT BREAKER SPACE REMOVALS. COORDINATE THERMOSTAT CONTROL WIRING WITH MECHANICAL CONTRACTOR.
- 3-1/2" #10AWG & #10G IN 1" RIGID STEEL CONDUIT.
- FURNISH AND INSTALL 30A RATED, 3 POLE, NON-FUSED DISCONNECT IN NEMA 4X (316 STAINLESS STEEL) ENCLOSURE. COORDINATE FINAL LOCATION ON ROOF WITH MECHANICAL CONTRACTOR.

SCOPE NOTES:

- ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING DEARATOR (DA-1) AND INSTALLATION OF NEW DEARATOR (DA-3) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 2.
- ALL WORK ASSOCIATED WITH THE REMOVAL OF EXISTING EXHAUST FANS (EF-1, EF-2 AND EF-3) AND INSTALLATION OF NEW EXHAUST FANS (EF-1, EF-2, EF-3 AND EF-4) SHALL BE CONSIDERED AS PART OF ADD-ALTERNATE 3.



No.	Date	Revision
0	5/31/19	ISSUED FOR BID



Project Title:
TCNJ – COGENERATION PLANT HRSG RENEWAL

Drawing Title:
SINGLE LINE DIAGRAMS

Date: 05/31/2019
Scale: AS NOTED
Drawn: CJV
Checked: JZ
Job No: 2016-193
Drawing No: E-301

ISSUED FOR BID