

ADDENDUM NO.: THREE

DATE OF ADDENDUM: January 12, 2016

**NEW MANUFACTURING TECHNOLOGY CENTER
ASNUNTUCK COMMUNITY COLLEGE
170 ELM STREET
ENFIELD, CT
BI-CTC-488**

Original Bid Due Date / Time:

January 20, 2016

1:00 PM

Previous Addenda: Addendum #2 dated 12/23/2015, Addendum #1 dated 12/16/2015

TO: Prospective Bid Proposers:

This Addendum forms part of the "Contract Documents" and modifies or clarifies the original "Contract Documents" for this Project dated October 28, 2015. Prospective Bid Proposers shall acknowledge receipt of the total number of the Addenda issued for this Project on the space provided on Section 00 41 00 Bid Proposal Form. Failure to do may subject Bid Proposers to disqualification.

The following clarifications are applicable to drawings and specifications for the project referenced above.

GENERAL

Sign-In Sheet: Refer to CT DAS Form 6020 "Bid Phase Meeting Attendance Log" for BI-CTC-488 New Manufacturing Technology Center dated January 6, 2015 (sic) consisting of 8 pages attached to this Addendum.

PREVIOUSLY ISSUED ADDENDA

Item 1

ADDENDUM NO. TWO, ITEM NUMBER 1

DELETE Item 1 in its entirety without substitution.

SPECIFICATIONS

Item 2

In Section 01 11 00 "Summary of Work," Article 1.5 WORK SEQUENCE, DELETE Paragraph C in its entirety.

SUBSTITUTE new Paragraph C to read as follows:

"C. The entire Project shall be constructed in One Phase as follows:

1. Work of this Project shall be complete such that **the building** shall be ready for Owner to receive Owner-furnished equipment for installation in the building at the jobsite, and for Owner and his forces to commence installation and hookup and commissioning of Owner-furnished equipment within **350** Calendar Days of Commencement of the Work.
2. Work of this Project shall be substantially complete, ready for Owner occupancy and intended use by the Owner of **the Building** within **365** Calendar Days of commencement of the Work (the "Contract Time") with the exception of the landscaping, site improvements, and final bituminous paving.
3. Work of the **entire Project** including landscaping, site improvements, and final bituminous paving shall be complete, ready for occupancy and use by the Owner within **390** Calendar Days of Commencement of the Work."

Item 3

SECTION 012000 - CONTRACT CONSIDERATIONS

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At Article 1.5 UNIT PRICE SCHEDULES, Paragraph E, subparagraph 2 UNIT PRICE SCHEDULE - MISCELLANEOUS, DIVISION 5 METALS sub-subparagraph a. Steel L Frames, under Allowance **DELETE** text that reads

"Include 2 frames in base bid"

SUBSTITUTE text to read

"Include 5 frames in base bid"

Item 4

SECTION 03 45 00 - ARCHITECTURAL PRECAST CONCRETE

At Article 2.5 MANUFACTURERS, Paragraph A, **ADD** new subparagraph 5 to read

- "5. Any architectural precast manufacturer in the United States or Canada that complies with Quality Assurance requirements specified in this Section."

Item 5

SECTION 06 23 13 - INTERIOR FINISH CARPENTRY

At Article 2.3 STANDING AND RUNNING WOOD TRIM, Paragraph A, **DELETE** "White Maple" and **REPLACE** with "White Oak."

Item 6

SECTION 06 23 13 - INTERIOR FINISH CARPENTRY

At Article 2.3 STANDING AND RUNNING WOOD TRIM, Paragraph A, **DELETE** subparagraph 5 and **REPLACE** with subparagraph 5 to read:

- "5. Base: 10 inches high x 3/4 inch thick with 3/8 x 3/8 inch chamfer. Finish to match adjacent wood floor."

Item 7

SECTION 06 23 13 - INTERIOR FINISH CARPENTRY

At Article 2.3 STANDING AND RUNNING WOOD TRIM, **DELETE** Paragraph B in its entirety without substitution.

Item 8

SECTION 009 91 00 - PAINTING

At Article 3.8 EXTERIOR PAINT SCHEDULE, Paragraph A subparagraph 1 **DELETE** High Performance acrylic enamel and **REPLACE** with pigmented polyurethane topcoat over intermediate polyurethane body coat over primer recommended by manufacturer at AESS Steel fabrications.

Item 9

SECTION 10 14 00 - SIGNS

1. At Article 1.2 SUMMARY Paragraph A **DELETE** subparagraph 2 in its entirety without substitution.
2. At Article 1.3 SUBMITTALS Paragraph E **DELETE** subparagraph 2 in its entirety without substitution.
3. **DELETE** Article 2.2 DIMENSIONAL CHARACTERS in its entirety without substitution.
4. At Article 3.2 INSTALLATION, **DELETE** Paragraph C in its entirety without substitution.
5. At Article 3.2 INSTALLATION Paragraph D **DELETE** subparagraph 1 in its entirety without substitution.

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6. At Article 3.2 INSTALLATION Paragraph D subparagraph 2 **DELETE** text that reads "into wall surface" and **REPLACE** with text to read "into blocking to be provided in wall".

Item 10

SECTION 10 14 00 - SIGNS

7. At Article 1.2 SUMMARY Paragraph A **DELETE** subparagraph 2 in its entirety without substitution.

Item 11

SECTION 10 22 13 - WIRE MESH PARTITIONS

1. At Article 2.3 Paragraph K subparagraph 1 **DELETE** text that reads "manufacturer's full range" and **REPLACE** with text to read: "full range of custom colors."

Item 12

SECTION 10 28 13 - TOILET AND BATH ACCESSORIES

1. At Article 3.1 INSTALLATION **ADD** new Paragraph D to read:
"D. Provide cutouts and recesses where required for recessed accessories."
2. At Article 3.3 TOILET AND BATH ACCESSORY SCHEDULE **DELETE** text that read B-354 and **REPLACE** with B-254.

Item 13

SECTION 10 51 13 - METAL LOCKERS

1. At Article 2.3 KNOCKED DOWN QUIET METAL LOCKERS Paragraph A.1 **ADD** new subparagraph d. to read:
"d. Penco Products Inc."
2. At Article 2.3 KNOCKED DOWN QUIET METAL LOCKERS Paragraph C **DELETE** "12" wide x 18" deep x 30" high" and **REPLACE** with "12" wide x 12" deep x 30" high".

Item 14

SECTION 111300 - LOADING DOCK EQUIPMENT

1. At Article 1.5 COORDINATION, Article 2.1 TRUCK RESTRAINTS and Article 3.3 INSTALLATION Paragraph B: Contractor **NOTE** that truck restraints are furnished by Owner and shall be installed by Contractor as part of the Base Bid without exclusions; obtain mounting and installation requirements for truck restraints from Owner and coordinate the Work such that installation shall occur without delay or additional expense to the Project.
2. At Article 2.2 DOCK BUMPERS **DELETE** Paragraphs A and B and associated subparagraphs.

At Article 2.2 DOCK BUMPERS **SUBSTITUTE** new Paragraph A and B and subparagraphs to read as follows:

- A. Product - Laminated-Tread Dock Bumper: Subject to compliance with requirements, provide one of the following:

1. Chalfant Dock Equipment: B612-24.
2. Durable Corporation: B612-24.
3. Pioneer Loading Dock Equipment: P6H1224.
4. Rite Hite Corporation: RH6 12-24.
5. SPX Dock Products - Kelley: 612-24.

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- B. Laminated-Tread Dock Bumper: Fabricated from multiple, uniformly thick plies cut from fabric-reinforced rubber tires. Laminate plies under pressure on not less than two 3/4-inch- diameter, steel supporting rods that are welded at one end to 1/4-inch- thick, structural-steel end angle and secured with a nut and angle at the other end. Fabricate angles with predrilled anchor holes and sized to provide not less than 1 inch of tread plies extending beyond the face of closure angles.
1. Thickness: 6 inches.
 2. Horizontal Style: 12 inches high x 24 inches length.

Item 15

SPECIFICATION SECTION 23 05 00 – COMMON WORK RESULTS FOR HVAC: CHANGE: **DELETE** Article 1.18 TEMPORARY HEAT in its entirety and **REPLACE** with new Article 1.18 TEMPORARY HEAT to read as follows:

- A. New Air distribution systems **shall not** be used for temporary heating, cooling or ventilation **EXCEPT** equipment associated with providing HVAC to Manufacturing Lab 128 and Additive Manufacturing Lab 120. This equipment shall be used for temporary indoor environmental control for the new manufacturing equipment that will be placed in the space prior to substantial completion. Prior to the placement of the manufacturing equipment, temporary heating, cooling and ventilation shall be provided by other means to this space.
- B. The General Contractor is responsible to "take ownership" of a clean HVAC system and shall be proactive in implementing procedures that achieve that end result. When utilizing the permanent HVAC equipment for temporary heating/cooling, the following procedures at a minimum shall take place to ensure that system will be clean upon Substantial Completion:
1. A pre-startup meeting will be held between the General Contractor, Construction Administrator and Engineer in which expectations and procedures to prevent dust infiltration will be discussed and confirmed.
 2. The General Contractor will provide temporary thermostatic control of all the equipment required to provide temporary environmental control.
 3. The General Contractor will furnish and install two (2) layers of temporary filter media on all return registers and outside air return grilles. The first layer preventing dust infiltration during the change of the second (outermost) layer. The General Contractor shall change the filter media on return registers every five (5) calendar days or sooner depending on the condition of the filter media. The Construction Administrator's decision on condition will prevail in any difference of opinion and shall be considered final. No Change Order Requests for changing filter media will be entertained. Failure to change the filter media within twenty-four (24) hours after receiving verbal or written direction to do so will result in the Construction Administrator making the change with all costs back-charged to the General Contractor.
 4. This Subcontractor will furnish and install temporary HVAC unit air filters and they shall be changed every ten (10) calendar days or sooner depending on the condition of the unit air filter. The Construction Administrator's decision on condition will prevail in any difference of opinion and shall be considered final. No Change Order Requests for changing temporary HVAC unit air filters will be entertained. Failure to change the temporary HVAC unit air filters within twenty-four (24) hours after receiving written direction to do so will result in the Construction Administrator making the change with all costs back-charged to the General Contractor.
 5. The General Contractor will submit catalog cut sheets and other manufacturer's information on all proposed temporary filters and filter media for approval.
 6. The General Contractor will be responsible for developing a log sheet in which all filter and filter media changes are to be recorded. All changes must be witnessed and initialed by the Construction Administrator and the log must be submitted to the Construction Administrator periodically.
 7. The General Contractor will be responsible to ensure that all ductwork returns not in use for temporary heating, cooling and ventilation remain sealed.
 8. Prior to Substantial Completion, the General Contractor will be responsible for a complete professional cleaning of air distribution systems utilized and provide certification for this procedure for record.
 9. The General Contractor shall include all extended warranties/guarantees associated with early start-up of AHU-1, AHU-3 and related equipment. The startup of this equipment early does not constitute beneficial use.

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Item 16

SPECIFICATION SECTION 23 09 93 – SEQUENCE OF OPERATION FOR HVAC CONTROLS: **ADD** Entire section with attached Section 23 09 93 SEQUENCE OF OPERATION FOR HVAC CONTROLS consisting of 18 pages to the specifications.

Item 17

SPECIFICATION SECTION 23 31 13– METAL DUCTS: **ADD:** Paragraph 2.17 DUST COLLECTOR DC-1.

Item 18

SECTION 32 17 13 - PARKING BUMPERS: **ADD** new Section 32 17 13 PARKING BUMPERS consisting of 2 pages attached to and issued with this Addendum to the Specifications immediately following Section 32 16 14 CURBING.

DRAWINGS

Item 19

DRAWING INFO - INFORMATION

REVISE as shown by sketch AD3-SK-INFO.1 entitled SAMPLE PANEL dated 1/11/2016 attached to and issued with this Addendum.

Item 20

DRAWING CP-101 – SITE PREPARATION PLAN: **REVISE** plan to show correct existing southern light pole to be reused and add trench for new connecting conduit as shown by attached sketch AD3-SK-CP-101-1 titled "REVISED LIGHTING POLE TO BE REUSED AND CONDUIT TRENCH".

Item 21

DRAWING CP-101 – SITE PREPARATION PLAN: **REVISE** plan to require removal of the existing stone dust track material as shown by attached sketch AD3-SK-CP-101-2 titled "REVISED STONE DUST TRACK REMOVAL".

Item 22

DRAWING CS-101 – SITE PAVEMENT AND SIGNAGE PLAN: **REVISE** plan to show correct location of blue phone as shown by attached sketch AD3-SK-CS-101-1 titled "REVISED BLUE PHONE LOCATION".

Item 23

DRAWING CS-101 – SITE PAVEMENT AND SIGNAGE PLAN: **REVISE** plan to show correct location of accessible parking spaces as shown by attached sketch AD3-SK-CS-101-2 titled "REVISED ACCESSIBLE PARKING SPACES".

Item 24

DRAWING CU-101 – SITE UTILITY PLAN: **REVISE** plan to show call-outs and dimension in inset as shown by attached sketch AD3-SK-CU-101-1 titled "REVISED WATER LINE CONNECTION INSET".

Item 25

DRAWING CU-101 – SITE UTILITY PLAN: **REVISE** plan to show correct location of blue phone as shown by attached sketch AD3-SK-CU-101-2 titled "REVISED BLUE PHONE LOCATION".

Item 26

DRAWING CU-101 – SITE UTILITY PLAN: **REVISE** plan to show telecom boxes and conduits as shown by attached sketch AD3-SK-CU-101-3 titled "REVISED TELECOM BOXES AND CONDUIT".

Item 27

DRAWING CU-101 – SITE UTILITY PLAN: **REVISE** plan to show primary and secondary electrical service conduits as shown by attached sketch AD3-SK-CU-101-4 titled "REVISED ELECTRICAL SERVICE CONDUITS".

Item 28

DRAWING CU-101 – SITE UTILITY PLAN: **REVISE** plan to remove call-out to reuse existing conduit to existing southern light pole as shown by attached sketch AD3-SK-CU-101-5 titled "REVISED CONDUIT TO EXISTING SOUTHERN LIGHT POLE".

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DRAWING SL1 - SITE LOGISTICS PLAN

REVISE as shown by sketch AD3-SKSL-1 entitled ELECTRICAL PRIMARY INSTALLATION LOGISTICS dated 1/11/2016 attached to and issued with this Addendum.

Item 30

DRAWING L1.0 – SITE ILLUSTRATIVE PLAN: REVISE plan to relocate two (2) HC Accessible Parking Spaces as shown by attached sketch AD3-SK-L1.0-1 titled "RELOCATED HC PARKING SPACES" dated 01/11/2016.

Item 31

DRAWING L1.0 – SITE ILLUSTRATIVE PLAN: DELETE one (1) tree as shown by attached sketch AD3-SK-L1.0-2 titled "DELETED TREE" dated 01/11/2016.

Item 32

DRAWING L1.1 – SITE LAYOUT PLAN: REVISE plan to relocate two (2) HC Accessible Parking Spaces and associated dimensions as shown by attached sketch AD3-SK-L1.1-1 titled "RELOCATED HC PARKING SPACES" dated 01/11/2016.

Item 33

DRAWING L1.1 – SITE LAYOUT PLAN: REVISE plan to adjust size of east entrance frost pads and associated dimensions as shown by the attached sketch AD3-SK-L1.1-2 titled "FROST PAD DIMENSIONS REVISED" dated 01/11/2016.

Item 34

DRAWING L1.2 – SITE IMPROVEMENTS PLAN: REVISE plan to relocate two (2) HC Accessible Parking Spaces and associated material call outs as shown by attached sketch AD3-SK-L1.2-1 titled "RELOCATED HC PARKING SPACES" dated 01/11/2016.

Item 35

DRAWING L1.2 – SITE IMPROVEMENTS PLAN: ADD Note 5 as follows:
"5. EXPANSION AND TOOL JOINT LOCATIONS SHOWN ON THIS SHEET AND SHEET L2.2 ARE RELATED TO THE CANOPY COLUMN LINES, SITE FEATURES AND SITE FURNISHINGS AS ILLUSTRATED."

Item 36

DRAWING L1.2 – SITE IMPROVEMENTS PLAN: ADD Note 6 as follows:
"6. EXPANSION AND TOOL JOINT LOCATIONS NOT SHOWN ON THIS SHEET OR SHEET L2.2 SHOULD FOLLOW TYPICAL JOINT PLACEMENT IN CONCRETE AS INDICATED IN DETAIL 9 ON SHEET L3.2 AND CONCRETE JOINT AS INDICATED IN DETAIL 10 ON SHEET L3.2 ."

Item 37

DRAWING L1.3 – SITE GRADING PLAN: REVISE plan to relocate two (2) HC Accessible Parking Spaces and associated spot elevations as shown by attached sketch AD3-SK-L1.3-1 titled "RELOCATED HC PARKING SPACES" dated 01/11/2016.

Item 38

DRAWING L1.3 – SITE GRADING PLAN: DELETE Note 6 text in its entirety and replace with the following text: "ALL HANDICAPPED RAMPS SHALL CONFORM TO ICC/ANSI A117.1-2003 AND ADA REQUIREMENTS, WITH A MAXIMUM LONGITUDINAL SLOPE OF 8.33%".

Item 39

DRAWING L1.4 – SITE PLANTING PLAN: DELETE one (1) ASL tree as shown by attached sketch AD3-SK-L1.4-1 titled "DELETED TREE" dated 01/11/2016.

Item 40

DRAWING L1.4 – SITE PLANTING PLAN: DELETE ASL quantity of "9" from the PLANT SCHEDULE and replace with a new ASL quantity of "8".

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DRAWING L3.4 – SITE DETAILS: DETAIL 4 – CHAIN LINK FENCE W/PRIVACY SLATS DELETE call out to DETAIL 2 DUMPSTER PAD on SHEET L-3.4 and REPLACE with call out to DETAIL TYPICAL EQUIPMENT AND DUMPSTER PAD DETAIL on SHEET S6.1 as shown by attached sketch AD3-SK-L3.4-1 titled "CHAIN LINK FENCE W/PRIVACY SLATS" dated 01/11/2016.

Item 42

DRAWING A1.1 - FIRST FLOOR PLAN

1. **ADD NEW** General Note No. 10 to read as follows:

"AT WALL TYPES 2B, 2C, 4, 4A, 4B, 5 AND 6B EXTEND GWB AND SOUND ATTENUATION BATTS WHERE WHOWN FULL HEIGHT OF PARTITION OR WALL ASSEMBLY."

2. At Wall Type 4A **ADD** note to read:

HIGH ABUSE GWB UP TO 10'-0" A.F.F."

Item 43

DRAWING A2.1 - BUILDING ELEVATIONS: At SOUTH ELEVATION 2/A2.1 at loading dock **ADD** note to read:

"TRUCK RESTRAINTS (NOT SHOWN) FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR."

Item 44

DRAWING A3.2 - WALL SECTIONS

1. At Section 5/A3.2 **ADD** suspended gypsum ceiling at 14'-0" A.F.F. as shown by Reflected Ceiling Plan on Sheet A1.3 and as specified.
2. **DELETE** Section 1
3. At Section 8/A3.2 at loading dock **ADD** note to read:

"TRUCK RESTRAINTS (NOT SHOWN) FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR."

Item 45

DRAWING A3.3 - WALL SECTIONS

1. **DELETE** Section 13/A3.3 and **REPLACE** with new Section 13/A3.3 as shown by attached sketch AD3-SK-A3.3.1 dated 1/11/2016.
2. **DELETE** Section 13A/A3.3 and **REPLACE** with new Section 13A/A3.3 as shown by attached sketch AD3-SK-A3.3.2 dated 1/11/2016.

Item 46

DRAWING A3.4 - CANOPY SECTION, DETAILS: At Detail 1/A3.4 and Detail 3/A3.4 **ADD** note to read as follows:

NOTE: PROVIDE AESS FINISH AT ALL EXPOSED STRUCTURAL AND EXPOSED MISCELLANEOUS STEEL INCLUDING CONNECTIONS.

Item 47

DRAWING A3.6 - WALL SECTIONS

REVISE as shown by sketch AD3-SK-A3.6.1 entitled SUN SCREEN FRAME PLAN dated 1/11/2016 attached to and issued with this Addendum.

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DRAWING A3.6 - WALL SECTIONS: At Detail 2/A3.6, Detail 2A/A3.6, Detail 2B/A3.6, Section 4/A3.6, Detail 4B/A3.6 and Elevation 4C/A3.6 **DELETE** note that reads:

NOTE: PROVIDE AESS FINISH AT ALL WELDED STEEL CONNECTIONS.

And **REPLACE** with note to read as follows:

NOTE: PROVIDE AESS FINISH AT ALL EXPOSED EXTERIOR STRUCTURAL AND EXPOSED EXTERIOR MISCELLANEOUS STEEL INCLUDING CONNECTIONS.

Item 49

DRAWING A4.0 - FINISH SCHEDULE: At Finish Schedule **ADD** note to read:

ALL WALLS WITHIN MANUFACTURING LAB 128: PROVIDE 2 DIFFERENT PAINT COLORS; ONE COLOR ABOVE AND THE OTHER COLOR BELOW DATUM LINE AT 14'-8" A.F.F.

ALL WALLS WITHIN ADDITIVE MANUFACTURING LAB 120: PROVIDE 2 DIFFERENT PAINT COLORS; ONE COLOR ABOVE AND THE OTHER COLOR BELOW DATUM LINE AT 12'-0" A.F.F.

Item 50

DRAWINGS A7.2 - INTERIOR ELEVATIONS, A7.3 - INTERIOR ELEVATIONS; A7.4 - INTERIOR ELEVATIONS: **ADD** note to read:

ALL WALLS WITHIN MANUFACTURING LAB 128: PROVIDE 2 DIFFERENT PAINT COLORS; ONE COLOR ABOVE AND THE OTHER COLOR BELOW DATUM LINE AT 14'-8" A.F.F.

ALL WALLS WITHIN ADDITIVE MANUFACTURING LAB 120: PROVIDE 2 DIFFERENT PAINT COLORS; ONE COLOR ABOVE AND THE OTHER COLOR BELOW DATUM LINE AT 12'-0" A.F.F.

Item 51

DRAWING EQ2. - EQUIPMENT SCHEDULE AND ENLARGED PLANS.

REVISE ADDITIVE MANUFACTURING LAB EQUIPMENT SCHEDULE as shown by sketch AD3-SK-EQ.2. entitled ADDITIVE MANUFACTURING LAB EQUIPMENT SCHEDULE dated 1/11/2016 attached to and issued with this Addendum.

Item 52

DRAWING S1.3 – CANOPY FOUNDATION AND FRAMING PLANS

ADD a note adjacent to column line L in the canopy foundation plan to read as follows:

"ALL PIERS ARE TO BE REINFORCED WITH (14) NO. 7 BARS AND #4 STIRRUPS @ 6" O.C. TWO HOOP STIRRUPS SHALL BE PROVIDED AT EACH ROW. TYPICAL FOR 12 PIERS."

Item 53

DRAWING S1.3 – CANOPY FOUNDATION AND FRAMING PLANS

CHANGE note at canopy foundation plan adjacent to the existing building to read as follows:

"NEW 5" CONCRETE SLAB ON GRADE. DOWEL INTO EXISTING WITH NO. 4 DOWELS AT 12" O.C. TYP 3 SIDES."

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Item 54

DRAWING S1.3 – CANOPY FOUNDATION AND FRAMING PLANS

CHANGE Section mark indicated at the existing building on both the canopy foundation and framing plans from 2/S3.4 to 1/S3.4.

Item 55

DRAWING S1.3 – CANOPY FOUNDATION AND FRAMING PLANS

CHANGE Section mark indicated at the canopy framing plans between column lines 5.2 & 6 from 3/S3.4 to 1/S3.3 Sim.

Item 56

DRAWING S1.3 – CANOPY FOUNDATION AND FRAMING PLANS

CHANGE Section mark indicated at the canopy framing plans between column lines 3.6 & 3.9 from 1/S3.4 to 3/S3.3 Sim.

Item 57

DRAWING S2.2 - FOUNDATION SECTIONS

Section 1/S2.2: **DELETE** 6'-0" dimension indicated above the exterior frost pad and replace with note to read as follows:

"COORDINATE FROST PAD LENGTH AND WIDTH WITH LANDSCAPE DRAWINGS."

Item 58

DRAWING S3.1 - FRAMING SECTIONS

1. Detail 1/S3.1 and Section 2/S3.1: Assume (2) clips per panel.
2. Section 2/S3.1: **ADD** note at the joist bottom chord extension to read as follows:

"JOIST BOTTOM CHORDS EXTENSIONS TO BE DESIGNED FOR A MINIMUM 3 KIP WIND LOAD."

Item 59

DRAWING S3.3 - FRAMING SECTIONS

Section 1/S3.3: **DELETE** Section mark 1/S3.4 indicated between column lines 3.6 & 3.9.

DRAWING P1.0 – UNDERGROUND PLUMBING PLAN: CHANGE 10" Storm Drain Invert Elevation shall be 48" below finished floor elevation.

Item 60

DRAWING P1.0 – UNDERGROUND PLUMBING PLAN: CHANGE: 6" Sanitary Drain Invert Elevation shall be 72" below finished floor elevation.

Item 61

DRAWING P1.1 – FIRST FLOOR PLUMBING PLAN: ADD: 1" compressed air pipe for Item 47, EOS 110, in Additive Manufacturing Lab 120. Refer to AD-3-SK1-PL1-1.

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DRAWING P1.1 – FIRST FLOOR PLUMBING PLAN: CHANGE: 2” gas pipe for the emergency power generator shall run underground from the wall to the generator. Underground gas pipe shall be protected against corrosion.

Item 63

DRAWING P1.1 – FIRST FLOOR PLUMBING PLAN: ADD: Pipe sizes for the CW pipe to Drench Shower. Refer to AD-3-SK2-PL1-1.

Item 64

DRAWING P1.2 – PLUMBING ROOF: OMMITT 4”VTR between AHU-1 and AHU-2.

Item 65

DRAWING P2.1 – PLUMBING DETAILS – PIPING INSTALLATION AT HOT WATER HEATER: OMMITT: Recirculating Pump RP-2.

Item 66

DRAWING P2.2 – PLUMBING DETAILS – COMPRESSED AIR LINE DROP DETAIL: CHANGE: galvanized drop shall be 1”.

Item 67

DRAWING M1.1 – FIRST FLOOR HVAC PLAN: CHANGE: Duct sizes; refer to AD-3-SK1-M1-1 and AD3-SK2-M1-1.

Item 68

DRAWING M1.1 – FIRST FLOOR HVAC PLAN: ADD: Dust Collector DC-2 shall be Jet model 414700, 1 1/2hp, 115/230V, 1ph, capable of circulating 490CFM.

Item 69

DRAWING M1.2 – FIRST FLOOR HYDRONIC PIPING PLAN – OMMITT: Humidistat located on the west wall in the Loading Area 129.

Item 70

DRAWING M1.2– FIRST FLOOR HYDRONIC PIPING PLAN – CHANGE: VAV boxes in the Manufacturing Lab 128 shall be controlled by Temperature Sensors only. Provide (3) three separate wall mounted CO2 detectors to monitor CO2 levels in the space.

Item 71

DRAWING M1.2– FIRST FLOOR HYDRONIC PIPING PLAN – CHANGE: Temperature sensor controlling the Cabinet Unit Heater in Vestibule 100A shall be located on the South wall opposite from where the unit is located.

Item 72

DRAWING M1.2– FIRST FLOOR HYDRONIC PIPING PLAN – CHANGE: Temperature sensor controlling the Cabinet Unit Heater in Vestibule 103A shall be located on the South wall opposite from where the unit is located.

Item 73

DRAWING M1.2– FIRST FLOOR HYDRONIC PIPING PLAN – ADD: By-pass at the end of the hydronic loop. Refer to AD3-SK1- M1.2.

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DRAWING M2.1 – MECHANICAL SCHEDULES - SINGLE DUCT SCHEDULE – HOT WATER HEAT: CHANGE Maximum Primary air flow for VAV-18 shall be 2060CFM.

Item 75

DRAWING M2.1 – MECHANICAL SCHEDULES – AIR HANDLING UNIT SCHEDULE: ADD: Note 17 for all (3) three units – Unit manufacturer shall provide Air Flow Measuring Station.

Item 76

DRAWING M2.1 – MECHANICAL SCHEDULES – AIR HANDLING UNIT SCHEDULE: ADD: Note 17 for all (3) three units – Unit manufacturer shall provide Air Flow Measuring Station.

Item 77

DRAWING M2.1 – MECHANICAL SCHEDULES – EXHAUST FAN SCHEDULE: ADD: Note 4 for Exhaust Fan EF-3 – Mechanical contractor shall provide low leak motorized damper.

Item 78

DRAWING M4.1 – MECHANICAL DETAILS – TYPICAL AHU HOT WATER COIL PIPING DIAGRAM: CHANGE: Supply and return Hot Water pipes to AHU-2 shall be 2”.

Item 79

DRAWING M5.1 – TEMPERATURE CONTROLS – TYPICAL CABINET UNIT HEATER CONTROL DIAGRAM: CHANGE: Provide wall mounted Temperature Sensor to control the unit.

Item 80

DRAWING M5.1 – TEMPERATURE CONTROLS – BATHROOM EXHAUST FAN W/ SUPPLY AIR VAV FLOW DIAGRAM: CHANGE: Refer to AD-3-SK1-M5.1.

Item 81

DRAWING M5.1 – TEMPERATURE CONTROLS – AHU-1 CONTROL FLOW DIAGRAM: OMMITT Filter and Differential Pressure Transducer in the return duct.

Item 82

DRAWING M5.1 – TEMPERATURE CONTROLS – AHU-1 CONTROL FLOW DIAGRAM: CHANGE: Duct Mounted Smoke Detectors are furnished, wired and powered by Div. 26. Duct Mounted Smoke Detectors are installed by Div.23.

Item 83

DRAWING M5.2 – TEMPERATURE CONTROLS – AHU-2 CONTROL FLOW DIAGRAM: CHANGE: Duct Mounted Smoke Detectors are furnished, wired and powered by Div. 26. Duct Mounted Smoke Detectors are installed by Div.23.

Item 84

DRAWING M5.2 – TEMPERATURE CONTROLS – AHU-3 CONTROL FLOW DIAGRAM: CHANGE: Duct Mounted Smoke Detectors are furnished, wired and powered by Div. 26. Duct Mounted Smoke Detectors are installed by Div.23.

Item 85

DRAWING M5.2 – TEMPERATURE CONTROLS – AHU-3 CONTROL FLOW DIAGRAM: OMMITT: Duct Mounted Smoke Detector located in the return duct.

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Item 86

DRAWING M5.2 – TEMPERATURE CONTROLS – AHU-3 CONTROL FLOW DIAGRAM: CHANGE: Unit is Constant air flow. Provide fan control and status.

Item 87

DRAWING M5.2 – TOILET ROOM AND LOCKER ROOM VENTILATION SYSTEM – REVISE; controls for TOILET ROOM AND LOCKER ROOM VENTILATION SYSTEM. Refer to AD-3-SK1-M-5.2.

Item 88

DRAWING M5.2 – TEMPERATURE CONTROLS – ADD; controls for ductless split systems. Refer to AD-3-SK2-M-5.2.

Item 89

DRAWING SE.1 – Refer to Addendum #3 sketch AD3-SK1-SE1.1 for CHANGE to wiring serving existing site lighting standard.

Item 90

DRAWING SE.1 – Refer to Addendum #3 sketch AD3-SK2-SE1.1 for existing fire alarm control panel location.

Item 91

DRAWING EL1.1 – Refer to Addendum #3 sketch AD3-SK1-EL1.1 for ADDITIONAL type P light fixtures in Conference Room #126.

Item 92

DRAWING EL1.1 – Refer to Addendum #3 sketch AD3-SK2-EL1.1 for lighting relay panel LRP location and for CHANGES to light fixtures in Additive Room 121 and Storage 121A.

Item 93

DRAWING EL1.1 – The type Q and Q1 light fixtures this drawing are furnished with remote LED drivers. The Electrical Contractor shall provide plenum rated boxes for the drivers, shall wall mount the drivers above the ceilings adjacent to each fixture, and shall provide wiring to the drivers and from each driver to its respective light fixture as required.

Item 94

DRAWING EL2.0 – Refer to Addendum #3 sketch AD3-SK1-EL2.0 for CHANGE to type D light fixture.

Item 95

DRAWING EP1.1 – Refer to Addendum #3 sketch AD3-SK1-EP1.1 for ADDED branch circuits, lighting relay panel LRP location, and ADDED disconnect switch at recirculation pump.

Item 96

DRAWING EP1.1 – Refer to Addendum #3 sketch AD3-SK2-EP1.1 for ADDED fire protection electric alarm bell branch circuit.

Item 97

DRAWING EP1.1 – Refer to Addendum #3 sketch AD3-SK3-EP1.1 for CHANGES to heat tracing branch circuits.

Item 98

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DRAWING EP1.3 – Refer to Addendum #3 sketch AD3-SK1-EP1.3 for ADDED item #47 branch circuit, ADDED duplex data outlets, and REVISION to Additive Manufacturing Lab Equipment Schedule.

Item 99

DRAWING EP2.4 – Refer to Addendum #3 sketch AD3-SK1-EP2.4 for panelboard REVISIONS.

Item 100

DRAWING EP2.5 – Refer to Addendum #3 sketch AD3-SK1-EP2.5 for panelboard REVISIONS.

Item 101

DRAWING EP2.5 – Refer to Addendum #3 sketch AD3-SK2-EP2.5,for panelboard REVISIONS.

Item 102

DRAWING ES1.1 – Refer to Addendum #3 sketch AD3-SK1-ES1.1 for fire alarm REVISIONS.

Item 103

DRAWING ES1.1 – Refer to Addendum #3 sketch AD3-SK2-ES1.1 for fire alarm REVISIONS.

Item 104

DRAWING T2.1 - TECHNOLOGY PARTIAL PLANS AND ELEVATIONS

ADD mounting heights for LCD panels as shown by sketch AD3-SK-T2.1 dated 1/11/2016 and entitled MOUNTING HEIGHTS FOR LCD PANELS attached to and issued with this Addendum.

BIDDER QUESTIONS AND ANSWERS

- 1 Question: When is the anticipated start date of construction?
Answer: May 1, 2016, approximately.
- 2 Question: Automatic doors are listed in the table of Contents of the Specs but there is no technical specification for these doors.
Answer: There are no automatic doors; **DELETE** Section 087113 AUTOMATIC DOOR OPERATORS from the Specifications Table of Contents.
- 3 Question: Specification Section 101400 SIGNS lists exterior signage and cast plaque. Neither of them are shown on the Drawings. Are they required?
Answer: There are no dimensional characters or logos on the building. Building identification signage is shown by Addendum 2. Provide cast metal plaque as specified by Section 101400 SIGNS at location to be determined by Architect; provide blocking in wall for support.
- 4 Question: We are having difficulty getting responses from some of the listed precast manufacturers; some may not be bidding the job.
Answer: Refer to Item 4 above in this Addendum.
- 5 Question: Are any permits required for the job?
Answer: Yes. As follows:
 1. As this is a State-owned building, Municipal Building Permits (Plumbing/Electrical, etc) such as those for the Town of Enfield would not be required.
 2. Construction Phase Stormwater Permits are required.
 3. State Education fee is required.
 4. Other permits as required by Statute or Code must be included.

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- 6 Question: Please provide specification for wheel stops shown by Drawing L1.2.
Answer: Provide wheel stops per requirements shown by Detail 7/CD501 WHEEL STOPS REINFORCED PRECAST CONCRETE and Section 321713 PARKING BUMPERS attached to this Addendum.
- 7 Question: Please clarify dumpster pad construction shown by Drawing L3.4.
Answer: Construct dumpster pad as shown by Sketch AD3-SK-L3.4-1 attached to this Addendum and TYPICAL EQUIPMENT AND DUMPSTER PAD DETAIL on Sheet S6.1 - GENERAL NOTES AND TYPICAL DETAILS as issued for bids.
- 8 Question: Quantity of metal shelving specified by Section 109000 SPECIALTIES is not indicated; please clarify.
Answer: None required; in Section 109000 SPECIALTIES ~~DELETE~~ Article 2.3 STEEL SHELVING in its entirety without substitution.
- 9 Question: Quantity of flat screen mounts is not indicated; please clarify.
Answer: Provide flat screen mounts at locations indicated by Drawing AV1.1 - FIRST FLOOR PLAN AUDIO/VISUAL LAYOUT as issued for Bids.
- 10 Question: Clarify whether feeders from the MSB to the remote panels and transformers in the electric room be installed in schedule 40 PVC conduit below the slab with rigid steel stub ups..
Answer: Specification Section 26 05 00, 3.2, Q governs and does not permit under slab conduit/wiring unless specifically indicated so on the drawings, or unless there is no other way to feed the outlet, device, or equipment.
- 11 Question: Clarify locations of solid surface types.
Answer: SS-1 Work Room counter and integral backsplash- details 2, 3 and 4 on drawing A4.0.
SS-2 Mens and Womens bathroom lavatory counter, front and valance- detail 5/A4.0.
Note Detail of backsplash at detail 5/A4.0.
- 12 Question: Clarify material for window sills.
Answer: Provide stone window stools as shown by Drawings as issued for Bids, and as specified by Section 042000 UNIT MASONRY ASSEMBLIES Article 2.10 Paragraph B as issued for Bids.
- 13 Question: What is the ceiling height in Vestibule 103A?
Answer: Ceiling height is 12'-0".
- 14 Question: Is the Ceiling in Additive Room 121 GWB at 14'-0" as per Reflected Ceiling Plan or is it exposed structure at 23'-8" as shown by Detail 5/A3.2?
Answer: Ceiling is suspended GWB installed at 14'-0" A.F.F..
- 15 Question: Who is responsible for sealing the two concrete floors at TC6 130 and Electrical Room 131?
Answer: Contractor's means and methods; Contractor is responsible for assigning this Work.
- 16 Question: Does the wood base in Conference Room 126 need to be field painted or will it be factory finished?
Answer: Wood Base and finish: see Items 6 and 7 of this Addendum.
- 17 Question: Clarify scope of epoxy paint.
Answer: Provide epoxy paint at walls of Janitor 123.
- 18 Question: Plans call for PNT-5 at exposed ceilings but there is no direction regarding exposed overhead utilities. Will overhead utilities be painted to match the structure or are multiple colors required?
Answer: All utilities will be painted to match structure except galvanized steel ductwork will remain unpainted.
Multiple colors are not required.
- 19 Question: Does any of the framing associated with the roof equipment screen wall need to be field painted?
Answer: No; framing is galvanized and will not be painted.
- 20 Question: Is there any roof dunnage to be field painted?
Answer: No.

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- 21 Question: Is there any exterior plywood to be painted?
Answer: No.
- 22 Question: Please clarify scope of field painting at the canopies.
Answer: Exposed steel at the glass skylight is field painted.
- 23 Question: All flat lock wall tile manufacturers require the zinc tiles to be fastened to a solid substrate (preferably plywood). Reference details 43 and 4/A3.5: these details only show 7/8 inch furring. Please advise if we should include plywood.
Answer: No. More than one manufacturer of zinc flat lock metal panels, including the basis of design manufacturer of zinc panels specified for this project, allow installation of their zinc flat lock wall panels on furring as an acceptable means of installation. Install zinc panels on furring; installation of zinc flat lock wall panels over plywood or OSB will not be accepted for this project.
- 24 Question: Please confirm that the SBE and MBE requirement are on the overall project and that the full percentages are not required by each trade.
Answer: The General Contractor on the project shall be required to award not less than the percentages stated in the Invitation to Bid to contractors that are State certified SBE and MBE contractors. Refer to Specs. Section - 00 41 00 - Bid Proposal Form - Paragraph 4.6, Specs. Section - 00 73 27 – Set-Aside Contractor Schedule, Specs. Section 00 73 38 – CHRO Contract Compliance Regulations and other Specs. Sections that may apply to this subject for all contractors.
- 25 Question: When do you anticipate steel erection to begin?
Answer: "The General Contractor is responsible for providing a CPM schedule after notice to proceed in accordance with the bid documents showing completion of the project within the specified calendar days.
- 26 Question: Section 051223 Quality Assurance references AISC specifications but makes no reference to certifications whereas Article 3.1 Paragraph D fabricator to be AISC certified. Please clarify.
Answer: AISC certification required.
- 27 Question: Drawing S1.3 refers to details 2 and 3 on Sheet S3.4; details do not exist. Please clarify.
Answer: Details 2 and 3 S3.4 do not exist; please refer to structural drawing items of this Addendum.
- 28 Question: Republic Lockers is out of business; can PENCO lockers be supplied instead?
Answer: Republic Lockers is being manufactured as a division of Lyon Lockers and will remain in the specifications; comparable lockers manufactured by Penco Products Inc. may be supplied in conformance with specified requirements.
- 29 Question: Confirm whether recessed sanitary napkin disposal, Bobrick B-354 is the correct item.
Answer: No; provide Bobrick B-254 surface mounted sanitary napkin disposal in lieu of Bobrick B-354.
- 30 Question: Room finish schedule shows electrical room and TC6 to be sealed concrete. First Floor Plan shows these rooms to be polished concrete; please clarify.
Answer: Provide sealed concrete as shown by Room Finish Schedule.
- 31 Question: Please clarify the size of the angle iron attaching the equipment screen to the roof as shown by Sheet Sk3.2.
Answer: L 4 x 4 x 3/8".
- 32 Question: Please confirm that the 5 sets of (2) - L 4 x 4 x 3/8 shown at the partition support between column lines E and F connect horizontally from the beam to the joist. This size angle is not shown in Section 5/S3.1.
Answer: That is correct.
- 33 Question: Electrical Drawing EP2.2 - POWER RISER DIAGRAM shows eleven RCS-1 thru 11. The floor plans do not show the locations of RCS-1 thru 11. Please show locations on the plans.
Answer: . Refer to note on Drawing EP2.2 that directs installer to locate switches high on walls in Room 128A.

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- 34 Question: The drawings call for Egress Wall Tape but I did not spec section for this product. Please provide.
Answer: Refer to fixture type F on the Light Fixture Schedule on Drawing EL2.0.

End of Addendum Three



Mellanee Walton, Associate Fiscal Administrative Officer
Department of Administrative Services
On Behalf of the Division of Construction Services

DCS Project No.:	BI-CTC-488 New Manufacturing Technology Center	Meeting Purpose:
Date:	January 6, 2015	<input checked="" type="checkbox"/> Pre-Bid Meeting
Meeting Start Time:	10:00 am	<input type="checkbox"/> Post Bid Review Meeting
Meeting Location:	Asnuntuck Community College	<input type="checkbox"/> Other:

Name:	JEFF ANDERSON	Title:	ASST. DIR. OF OPS.
Company/Department:	DOWNES CONSTRUCTION	E-mail:	janderson@dawnco.com
Street:	200 STANLEY STREET	Phone:	860-229-3755
City/State/Zip:	NEW BRITAIN, CT 06050	FAX:	860-225-3617

Name:	MATT POTTS	Title:	ESTIMATOR
Company/Department:	PAC GROUP LLC	E-mail:	MPOTTS@PACGROUPLLC.COM
Street:	126 S. MAIN ST	Phone:	860-485-9363
City/State/Zip:	TORRINGTON, CT	FAX:	860-485-9404

Name:	Roel Legaspi	Title:	Estimator
Company/Department:	Nosal Builders	E-mail:	roel@nosalbuilders.com
Street:	51 Ozick Drive, Suite 100	Phone:	860-349-5674
City/State/Zip:	Durham, CT 06422	FAX:	860-349-5675

Name:	Ollie D'Amario	Title:	Estimator
Company/Department:	FUSCO CORP.	E-mail:	odamario@Fusco.com
Street:	555 Long Wharf Drive	Phone:	203-777-7451
City/State/Zip:	New Haven, CT 06511	FAX:	203-772-4568

Name:	PAUL STACY	Title:	SENIOR PROJ. MGR
Company/Department:	MILLENNIUM BUILDERS INC	E-mail:	pstacy@mbkt.com
Street:	50 INWOOD ROAD	Phone:	860.571.0555
City/State/Zip	ROCKY HILL, CT 06007	FAX:	860.571.0550

Name:	JONATHAN ADAMS	Title:	SENIOR ESTIMATOR
Company/Department:	ORLANDO ANNULI & SONS	E-mail:	JON@ANNULI.COM
Street:	147 HALE ROAD	Phone:	860.644.2427
City/State/Zip	MANCHESTER, CT 06042	FAX:	860.644.6505

Name:	GEORGE BARON	Title:	PROJ. MGR.
Company/Department:	MERCURY CABLING SYSTEMS	E-mail:	george.baron@mercury-group.com
Street:	300 AVON ST.	Phone:	203.650.0499
City/State/Zip	STRAFORD CT. CT	FAX:	203.375.9222

Name:	JAMES URYASE	Title:	ESTIMATOR
Company/Department:	LAROSA BUILDING GROUP	E-mail:	JURYASE@larosabg.com
Street:	163 RESEARCH PKWY	Phone:	203.235.1770
City/State/Zip	MERIDEN, CT 06450	FAX:	203.630.1998

Name: Richard Gabdon	Title: Sr Supervisor
Company/Department: Cutter Enterprises LLC	E-mail: richard@cutterenterprises.com
Street: 105 Industrial Park Rd Vernon, Ct	Phone: 860-871-2839
City/State/Zip: Vernon, CT 06066	FAX: 860-871-3058

Name: Rich Miller	Title: ESTIMATOR
Company/Department: MONTANO CONST	E-mail: RMILLER@MONTANO.COM
Street: 75 PROGRESS AVE	Phone: 203 597-9014
City/State/Zip: WATERBURY CT	FAX:

Name: Kent Scott	Title: BDM
Company/Department: Wayne T. Griffin Electric	E-mail: KScott@wigei.com
Street: 116 Hopping Brook	Phone: 508-306-5234
City/State/Zip: Holliston MA	FAX:

Name: Chris Cyr	Title: Estimator
Company/Department: Associated Const.	E-mail: CLC@accge.com
Street: 1010 Wetness Field ave	Phone: 860-296-4114
City/State/Zip: Hartford CT	FAX: 4469

Name:	Morgan Donohue	Title:	PE
Company/Department:	Barton Construction	E-mail:	m.donohue@bartonconstruction.com
Street:	339 Washington Ave	Phone:	203-274-2753
City/State/Zip:	North Haven, CT	FAX:	203-274-0010

Name:	Joe Miller	Title:	
Company/Department:	ACE	E-mail:	JMiller@Ace.com
Street:	170 Elm St	Phone:	860 253-3055
City/State/Zip:	EDFIELD, CT	FAX:	

Name:	Mike Garneau	Title:	Project manager
Company/Department:	WJ mantford	E-mail:	mgarneau@wjmantford.com
Street:	170 Commerce Way	Phone:	860 291 9448
City/State/Zip:	S. Windsor CT 06074	FAX:	860 291 9448

Name:	Peter Grenier	Title:	Electrical Estimator
Company/Department:	E.S. Boulos	E-mail:	Pgrenier@ESBoulos.com
Street:	11-A Old Winton Rd	Phone:	860 899 1968 #8903
City/State/Zip:	Bloomfield CT	FAX:	

Name:	Title:
Jermain Thompson	
Company/Department:	E-mail:
Kleanup Restoration	
Street:	Phone:
219 Indian ave	203-331-0353
City/State/Zip	FAX:
BPT CT. 06606	

Name:	Title:
Joseph Petronella	Estimator
Company/Department:	E-mail:
Enfield Builders, Inc.	sbutler@enfieldbuilders.com
Street:	Phone:
1654 King ST	860-627-6870
City/State/Zip	FAX:
Enfield, CT 06082	860-627-8017

Name:	Title:
JIM BONA	
Company/Department:	E-mail:
ELECTRICAL CONTRACTORS INC.	JIMB@ECINCORPORATED.COM
Street:	Phone:
3510 MAIN ST.	860-549-2822
City/State/Zip	FAX:
HARTFORD CT. 06120	

Name:	Title:
Nick D Angelo	
Company/Department:	E-mail:
Enterprise Builders Inc	ndangelo@enterbuilders.com
Street:	Phone:
46 SHEPHERD DR	860-466-5188
City/State/Zip	FAX:
Newington CT 06111	860-466-4119

Name:	KIM SYMMONDS	Title:	ELECT. ENGINEER
Company/Department:	BEMIC ASSOCIATES	E-mail:	KIM@BEMICASSOCIATES.COM
Street:	MAIN ST.	Phone:	
City/State/Zip	FARMINGTON, CT	FAX:	✓

Name:	JOE DEVINE	Title:	CIVIL ENGINEER
Company/Department:	FUSS & O'NEILL	E-mail:	jdevine@fando.com
Street:	146 HARTFORD RD.	Phone:	
City/State/Zip	MANCHESTER, CT	FAX:	

Name:	MICHAEL PUCHY	Title:	STRUCT. ENGR
Company/Department:	Macchi Engineers	E-mail:	MPUCHY@MACCHIENGINEERS.COM
Street:	44 Gillett St	Phone:	
City/State/Zip	Hartford, CT	FAX:	

Name:	GARY GUMMOND	Title:	LANDSCAPE ARCHITECT
Company/Department:	RICHTERZ & CEAN INC.	E-mail:	ggummond@richterzegan.com
Street:		Phone:	
City/State/Zip		FAX:	

KYLE BOUSAUCT

ESTIMATOR

M. L. SCHMITT ELECTRIC

KYLE B @ MLSCHMITT ELECTRIC.COM

SPRINGFIELD MA

413 733 7868

Name:	LUCIAN DRAGULSKI	Title:	MEET ENG -
Company/Department:	BEMIS ASSOCIATES	E-mail:	lucian@bemisassociates.com
Street:	185 MAIN STREET	Phone:	860 667 9233
City/State/Zip	FARMINGTON	FAX:	

Name:	MARK SCHWEITZER	Title:	PM
Company/Department:	MORGANTI GROUP	E-mail:	mschweitzer@morganti.com
Street:	100 MILL PLAIN ROAD	Phone:	203 830-3358
City/State/Zip	DANBURY CT 06811	FAX:	

Name:	Lisa Humble	Title:	DAS/DCS Project Manager
Company/Department:	DAS/DIVISION OF CONSTRUCTION SERVICES	E-mail:	lisa.humble@ct.gov
Street:	105 Capitol Ave	Phone:	860 713-5823
City/State/Zip	Hartford, CT 06106	FAX:	

Name:	FRANK D. GULLANI	Title:	Director
Company/Department:	ASAC/FULLER CC	E-mail:	fgullani@acc.commuter.edu
Street:	170 ELM ST	Phone:	(860)253-3190
City/State/Zip	ENFIELT, CT 06082	FAX:	860 253-3166

Name:	Yolanda Hacia	Title:	Project Manager
Company/Department:	Board of Regents	E-mail:	Thacia@commnet.edu
Street:	61 Woodland St.	Phone:	860-723-0723
City/State/Zip	Hartford, CT. 06060	FAX:	

Name:		Title:	
Company/Department:		E-mail:	
Street:		Phone:	
City/State/Zip		FAX:	

Name:		Title:	
Company/Department:		E-mail:	
Street:		Phone:	
City/State/Zip		FAX:	

Name:		Title:	
Company/Department:		E-mail:	
Street:		Phone:	
City/State/Zip		FAX:	

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
- B. The General Requirements in Sections 20 00 50 shall also govern the work under this Section.
- C. Examine all drawings and data and coordinate the work of the Section with all related and adjoining work.
- D. Refer to section 01 81 00, Commissioning of Integrated Automation requirements for work related to this section.

1.2 SUMMARY

- A. This Section includes control sequences for HVAC systems, subsystems, and equipment.
- B. Related Sections include the following:
 - 1. Division 23, Section 23 09 13 "Instrumentation and Controls for HVAC" for control equipment and devices and for submittal requirements.

1.3 DEFINITIONS

- A. DDC: Direct Digital Control
- B. VAV: Variable Air Volume

1.4 HOT WATER SYSTEM CONTROL

- A. Hot Water Boiler and Circulating Water Pumps control:
 - 1. Whenever OA is below or equal 65°F (adjustable) and there is a call for heat at one of the AHU heating coils or other two (2) heating terminal units (adjustable), the DDC system shall index the system in heating mode. The three way control valves shall position for hot water flow through the boilers. System start the lead circulating pump and shall enable the boiler package control panel which shall fully open the lead boiler isolation valve and lead boiler shall be enabled. If the lead boiler cannot maintain hot water supply temperature at set point, the lag boiler's isolation valve shall fully open and lag boiler will be enabled then both boilers shall modulate their firing rates to maintain hot water supply temperature at set point. After the set point is satisfied, the lag boiler shall be disabled, the lag boiler isolation valve shall fully close and the lead boiler shall remain on line with its isolation valve fully open. The boiler controls furnished as part as the boiler control package shall alternate the boilers for equal running time, open/close isolation valves, reset hot water supply (HWS) temperature based on OA temperature via BAS input and generate alarms. Wiring of the boiler control panel and its control components are the responsibility of the

control contractor. The control contractor will interface all available control points and alarms from the boiler control panel into the DDC system through Modbus. It is the boiler manufacturer responsibility to supply a control panel capable of sending this information to the control system via Modbus. HWS temperature shall be reset based on outside air temperature as follows:

- a. OA = 65°F (adjustable) then HWS = 120°F (adjustable).
- b. OA = 45°F (adjustable) then HWS = 140°F (adjustable).

The BAS shall generate alarms at operator's workstation for the following:

- a. Lead boiler isolation valve failed to open/close.
- b. Lag boiler isolation valve failed to open/close.
- c. Hot water supply temperature is not at set point for 60 minutes (adjustable) and both boilers are enabled and at full fire.

2. Building Circulating Water Pump Control:

Whenever the outside air temperature is 65°F or below, and/or there is a call for heat at one of the AHU heating coils or other two (2) heating terminal units (adjustable), the heating hot water system shall be enabled and the BAS shall signal the lead pump to start. Isolation control valve at lead boiler shall fully open prior to lead pump start.

The lead pump's variable frequency drive (VFD) shall modulate the lead pump's motor speed to maintain the higher of two (2) differential pressure (DP) set point as sensed by the differential pressure sensors. Differential pressure set point shall be determined by balancing contractor, typical of 2. Whenever the lead pump is at 80% (adjustable) speed and differential pressure sensors set point is not at set point then the BAS shall start lag pump and gradually increase lag pump's speed and run both pumps to maintain the differential pressure at set point. When differential pressure is at set point for twenty (20) minutes (adjustable) then the BAS shall gradually slow down lag pump's speed to 30% and shut down lag pump or pump with higher number of running hours if DP is at set point. If any of two (2) differential pressure sensors fails then the BAS shall generate an alarm at operator work station, control pump(s) based on functional differential pressure sensor and "memory" of failed sensor in the last five (5) minutes (adjustable) prior to its failure and limit pump(s) speed to 60% (adjustable). Differential pressure set point shall be reset based on the zone requiring the most pressure; i.e. the set point is reset lower to keep zone control valve with the most demand open in range of 92-96% (adjustable). If control valve with the most demand exceeds 96% open then DP set point shall increase small amount. If control valve with the most demand drops below 92% open then DP set point shall decrease small amount. Hot water and chilled water differential pressure set points serving chilled beams shall be the same. The hot water pump shall operate continuously during occupied mode of operation, shall cycle during unoccupied mode of operation whenever there is a call for heating at one of the AHU's coils or heat recover unit or other three (3) heating terminal units (adjustable).

The BAS shall alternate the lead / lag position of the pumps every 200 hours (adjustable). Upon change over from an operating lead pump to an idle lag pump, the idle lag pump shall be started and its operation proven prior to the stopping of the operating lead pump. If the lead or lag pump fails to establish and/or maintain flow, as determined by the differential pressure sensor across the pump or current switch, the lag or lead pump shall be started and an alarm shall be

issued.

Coordinate and direct the installation of the differential pressure sensors in the piping with the Mechanical Contractor. Locate the pressure controller approximately 2/3 the longest hydraulic distance from the discharge of the pumps. Refer to piping plans. Review and coordinate sensor location with the Agency and Engineer.

1.5 CHILLED WATER SYSTEM CONTROL

1. The BAS system shall enable/disable chilled water system consisting of: chiller with the Chiller package control panel and compressors, variable flow circulating water pumps and chilled water control valves. The chilled water system shall be enabled whenever the outside air temperature is 67°F or above (adjustable), or there is a call for cooling at one of the AHU's coils or other two (2) cooling terminal (adjustable). The chilled water system shall be disabled whenever the outside air temperature is below 66°F (adjustable).

Wiring of the Chiller control panel and its control components is the responsibility of the control contractor. The control contractor will interface all available control points and alarms from the chiller control panel into the DDC system through BACnet. It is the chiller manufacturer responsibility to supply a control panel capable of sending this information to the control system via BACnet.

The chiller shall be enabled/disabled to operate through the DDC system and shall be controlled by factory mounted and wired controls to maintain chilled water supply temperature at set point of 44°F (adjustable).

The three way control valves shall position for chilled water flow through the chiller. Two way (2-way) chilled water bypass control valve shall modulate to maintain the required minimum chilled water flow through the chiller at all time and as calculated via chilled water differential pressure sensor at chiller. Whenever the minimum chilled water flow through chiller is below set point and loss of chilled water flows exist through chiller, then the BAS shall stop the chiller and generate alarms at operator's workstation.

The DDC system shall provide a reset signal to the chiller control panel to reset the chilled water supply temperature as follows:

- a. $OA \leq 75^{\circ}F$ (adjustable) then CHWS = 46°F (adjustable).
- b. $OA > 75^{\circ}F$ (adjustable) then CHWS = 44°F (adjustable).

Upon signal from refrigerant sensor the BAS shall disable chiller and shut down chilled water pumps, condenser water pumps, condenser water side stream filtration (CTFP-1) pump, and cooling tower.

2. Building Circulating Water Pump Control (serving air handling units):
Whenever the outside air temperature is 67°F or above (adj.), and there is a call for cooling at one of the AHU's coils, the chilled water system shall be enabled and the BAS shall signal the lead circulating water pump to start. Failure to detect pump operation 30 seconds (adj.) after a pump has been commanded to run by the BAS, or failure to maintain pump operation, shall initiate an alarm at the operator's workstation and the BAS shall start standby pump. If standby pump fails to start or to run the BAS shall initiate an alarm at the operator's

workstation. The BAS shall alternate the lead / standby position of the pumps every 200 hours (adjustable). Upon change over from an operating lead pump to an idle standby pump, the idle standby pump shall be started and its operation proven prior to the stopping of the operating lead pump.

The lead pump's variable frequency drive (VFD) shall modulate the lead pump's motor speed to maintain the differential pressure set point as determined by balancing contractor and as sensed by the differential pressure sensors. If any of two (2) differential pressure sensors fails then the BAS shall generate an alarm at operator work station, control pump based on functional differential pressure sensor and "memory" of failed sensor in the last five (5) minutes (adjustable) prior to its failure and limit pump speed to 60% (adjustable). Differential pressure set point shall be reset based on the AHU/zone requiring the most pressure; i.e. the set point is reset lower to keep AHU/zone control valve with the most demand open in range of 92-96% (adjustable). If control valve with the most demand exceeds 96% open then DP set point shall increase small amount. If control valve with the most demand drops below 92% open then DP set point shall decrease small amount.

The chilled water pump shall operate continuously during occupied mode of operation, shall cycle during unoccupied mode of operation whenever there is a call for cooling at one of the AHU's coils or heat recover unit and shall run continuously whenever chilled beam chilled water pump is running. Whenever the chilled water system is disabled the pumps shall be shut down.

Coordinate and direct the installation of the differential pressure sensor in the piping with the Mechanical Contractor. Locate the pressure controller approximately 2/3 the longest hydraulic distance from the discharge of the pumps. Refer to piping plans. Review and coordinate sensors location with the Agency and Engineer.

1.6 VARIABLE VOLUME AIR HANDLING UNIT – MANUFACTURING LAB (AHU-1)

A. Optimal Start Mode

1. The AHU-1 DDC controller will calculate how long it will take the AHU-1 to return from its unoccupied state to its occupied state to maintain occupied temperature setpoint in each zone based on the heating or cooling capacity of AHU-1 and the outside air temperature. The AHU-1 DDC controller will then adjust supply air temperature setpoint for the time necessary to ensure the occupied temperature in each zone is maintain 10-minutes (adjustable) prior to full occupancy.
2. The system will not start more than 4 one (1) hours before a scheduled occupancy.

B. Morning Warm Up Mode:

Whenever temperatures in any zone is 2°F (adjustable) below occupied heating temperature set points of 70°F (adjustable) then the supply and return fans are commanded on. The fans shall operate on 100% return air, the heating coil control valve shall modulate and the freeze protection pump shall start if not running to maintain SA

temperature at 90°F (adjustable) to maintain each zone at occupied heating temperature set point. Run fans as needed to have all zones at occupied heating set point prior full occupancy. During morning warm up supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) equal supply air (SA) flow. If the supply or return fans fails to start and/or run in any mode of operation, as determined by the current sensor, an alarm shall be indicated at the head end computer and fans shall be commanded off.

1. Freeze protection pump control: Whenever the outside air (OA) is below 45°F (adjustable), SF and RF are running or the AHU-1 mixed air temperature is 38°F (adjustable) when fans are shut down then the freeze protection pump shall operate continuously. The freeze protection pump shall cycle whenever $45^{\circ}\text{F} > \text{OA} \leq 65^{\circ}\text{F}$, SF and RF are running and supply air temperature is not at set point. If freeze protection pump fails to start and/or run in any mode of operation, as determined by the current sensor, an alarm shall be indicated at the head end computer and freeze protection pump shall be commanded off, fans shall stop and outside air dampers shall close.

C. Morning Cool Down Mode:

Whenever temperatures in any zones is 2°F (adjustable) above occupied cooling temperature set points of 75°F (adjustable) then the supply and return fans are commanded on. The heating valve shall close, the circulating pump shall stop, if it was running, when outside air temperature permits, the AHU-1 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air (SA=OA) temperature is 2°F cooler than the average calculated zones temperature and the outside air enthalpy is less than average calculated zones enthalpy. When the economizer can no longer maintain these conditions then dampers shall modulate to their unoccupied mode positions or economizer cannot maintain each zone at occupied cooling temperature set point then the cooling coil valve shall modulate to maintain SA temperature at 55°F (adjustable) to maintain each zone at occupied cooling temperature set point (cooling coil control valve shall modulate only if cooling is available). Run fans as needed to have all zones at occupied cooling set point prior full occupancy. During morning cool down mode supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide exhaust air (EA) during full economizer or return air (RA) whenever the economizer is disabled to be equal supply air (SA) flow.

D. Occupied Heating Mode of Operation:

The supply and return fans shall continuously to run. The dampers open to their occupied mode positions (OA at minimum position as determined by balancing contractor, RA fully open, and EA fully closed) prior to fans start, the freeze protection pump shall start/run and heating coil control valve shall modulate as required to maintain supply air temperature at 65°F (adjustable) whenever average calculated space temperature is 70°F (adjustable) or whenever average calculated space temperature is 65°F (adjustable). During occupied heating mode of operation of AHU-1 the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) $\text{RA} = \text{SA} - \text{OFFSET}$. A low temperature protection thermostat/freezestat located in the heating coil discharge

shall shut down the unit fans, close the outside and exhaust dampers, open the heating coil valve full to the coil, start freeze protection pump if not running and stop freeze protection pump when AHU-1 mixed air temperature is above 40°F (adjustable), and indicate an alarm at the head end computer upon sensing a temperature below its set point of 36°F (adjustable).

E. Occupied Cooling:

The supply and return fans shall continuously run and the dampers shall open to their occupied mode positions (OA at minimum position, RA fully open, and EA fully closed) prior to fans start.

Whenever average calculated zones temperature is in range of 72-75°F then SA temperature shall reset from 65°F to 55°F (when average calculated zones temperature is 75°F) then the heating valve shall close, the circulating pump shall stop if was running, the AHU-3 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air temperature is 2°F cooler than the average calculated zones temperature and the outside air enthalpy is less than average calculated zones enthalpy. When the economizer can no longer maintain these conditions then dampers shall modulate to their occupied mode positions or economizer cannot maintain reset SA temperature at set point then the cooling coil control valve shall modulate to maintain reset SA temperature at set point. During occupied cooling mode of operation of AHU-1 the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) RA=SA-OFFSET.

F. Demand ventilation control:

During the occupied mode of operation of AHU-1, if average calculated zones CO2 level is 690 PPM above OA CO2 (adjustable, 400 PPM OA CO2, typical), over a period of 10 minutes (adjustable) then the AHU-1 controller shall override current positions of OA dampers, modulate OA damper open for 10%, hold OA damper at position for 10 minutes (adjustable), if after 10 minutes (adjustable) average calculated CO2 level is not at set point then the OA damper shall modulate open for additional 10%, hold OA damper at position for 10 minutes (adjustable), if after 10 additional minutes (adjustable) average calculated CO2 level is not at set point then the OA damper shall continue to modulate open up to its maximum OA position listed in the schedule and as determined by balancing contractor, and subject to a mixed air limit sensor. Whenever OA damper is at its maximum OA position for demand ventilation control then the AHU-1 controller shall override position of RA and EA dampers and modulate them to provide maximum specified OA flow for demand ventilation control, hold dampers in their position until average calculated zones CO2 drops below 690 PPM for 10 minutes (adjustable), then modulate all dampers to their occupied mode operation. The CO2 concentration shall be the difference between calculated indoor and outdoor air concentration.

G. Unoccupied Heating:

Whenever temperatures in any zone is 2°F (adjustable) below unoccupied heating temperature set points of 60°F (adjustable) then the supply and return fans are commanded on. The fans shall operate on 100% return air, the heating coil control valve shall modulate and the freeze protection pump shall start to maintain SA temperature at 90°F (adjustable). When all zones are at unoccupied temperature set point for 10 minutes (adjustable) then fans shall slow down to their minimum speed of 30% and shut down.

During unoccupied heating mode of operation the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) equal supply air (SA) flow.

H. Unoccupied Cooling:

Whenever temperatures in any zone is 2°F (adjustable) above unoccupied cooling temperature set points of 85°F (adjustable) then the supply and return fans are commanded on. The heating valve shall close, the circulating pump shall shut down if was running, the AHU-1 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air (SA=OA) temperature is 2°F cooler than the average calculated zones temperature and the outside air enthalpy is less than average calculated zones enthalpy. When the economizer can no longer maintain these conditions then dampers shall modulate to their unoccupied mode positions or economizer cannot maintain each zone at unoccupied cooling temperature set point then, the cooling coil control valve will modulate to maintain SA temperature at 55°F (adjustable). When all zones are at unoccupied cooling temperature set point for 10 minutes (adjustable) then fans shall slow down to their minimum speed of 30% and shut down and close OA and EA dampers if not already closed. During unoccupied cooling mode of operation the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide exhaust air (EA) during full economizer or return air (RA) whenever the economizer is disabled to be equal supply air (SA) flow.

I. Smoke Detectors

This contractor shall monitor duct mounted smoke detectors furnished and installed under a different section. This contractor shall hard wire smoke detectors to shut down all fans then close dampers and send an alarm to the front end computer upon detecting products of combustion.

J. Duct Static Pressure Sensor

Duct static pressure set point shall be reset based on the zone requiring the most pressure; i.e. the set point is reset lower to keep zone VAV box damper with the most demand open in range of 92-96% (adjustable). If zone VAV box damper with the most demand exceeds 96% open then duct static pressure set point shall increase small amount. If zone VAV box damper with the most demand drops below 92% open then DP set point shall decrease small amount.

K. High Limit Static Pressure Sensor

The AHU-1 DDC controller shall shut down supply and return fans, close OA and EA dampers three (3) minutes (adjustable) after the fans shut down, and send an alarm to the front end computer whenever high limit static pressure sensor is at set point as determined by balancing contractor. AHU-1 shall return to mode of operation prior to activation of high limit static pressure sensor upon manual reset of that sensor. Coordinate duct static pressure classification, total AHU-1 static pressure with mechanical and balancing contractors prior to AHU-1 start.

L. Base bid

The specified sequence of operations for AHU-1 shall be provided and tested under base bid then disabled for future use. Under base bid the AHU-1 shall operate in unoccupied heating and unoccupied cooling mode of operations.

- M. Occupancy override: an indication of override condition is provided via push button led on the wall temperature sensor. The AHU-1 control is in the normal occupied mode. The AHU-1 control returns to the unoccupied mode after an elapsed time set point (three hours, adjustable). During occupancy override mode of operation of AHU-1 the AHU-1 shall run continuously with supply and OA air flows as specified for occupied mode of operation(s) to maintain zone temperature setpoint. When the Manufacturing Lab becomes unoccupied, shut down AHU-1 and revert to unoccupied mode of operation.

1.7 VARIABLE VOLUME AIR HANDLING UNIT – CLASSROOMS AND ADMEN (AHU-2)

A. Optimal Start Mode

1. The AHU-2 DDC controller will calculate how long it will take the AHU-2 to return from its unoccupied state to its occupied state to maintain occupied temperature setpoint in each zone based on the heating or cooling capacity of AHU-2 and the outside air temperature. The AHU-2 DDC controller will then adjust supply air temperature setpoint for the time necessary to ensure the occupied temperature in each zone is maintain 10-minutes (adjustable) prior to full occupancy.
2. The system will not start more than 4 one (1) hours before a scheduled occupancy.

B. Morning Warm Up Mode:

Whenever temperatures in any zone is 2°F (adjustable) below occupied heating temperature set points of 70°F (adjustable) then the supply and return fans are commanded on. The fans shall operate on 100% return air, the heating coil control valve shall modulate and the freeze protection pump shall start if not running to maintain SA temperature at 90°F (adjustable) to maintain each zone at occupied heating temperature set point. Run fans as needed to have all zones at occupied heating set point prior full occupancy. During morning warm up supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) equal supply air (SA) flow. If the supply or return fans fails to start and/or run in any mode of operation, as determined by the current sensor, an alarm shall be indicated at the head end computer and fans shall be commanded off.

2. Freeze protection pump control: Whenever the outside air (OA) is below 45°F (adjustable), SF and RF are running or the AHU-1 mixed air temperature is 38°F (adjustable) when fans are shut down then the freeze protection pump shall operate continuously. The freeze protection pump shall cycle whenever $45^{\circ}\text{F} > \text{OA} \leq 65^{\circ}\text{F}$, SF

and RF are running and supply air temperature is not at set point. If freeze protection pump fails to start and/or run in any mode of operation, as determined by the current sensor, an alarm shall be indicated at the head end computer and freeze protection pump shall be commanded off, fans shall stop and outside air dampers shall close.

C. Morning Cool Down Mode:

Whenever temperatures in any zones is 2°F (adjustable) above occupied cooling temperature set points of 75°F (adjustable) then the supply and return fans are commanded on. The heating valve shall close, the circulating pump shall stop, if it was running, when outside air temperature permits, the AHU-1 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air (SA=OA) temperature is 2°F cooler than the average calculated zones temperature and the outside air enthalpy is less than average calculated zones enthalpy. When the economizer can no longer maintain these conditions then dampers shall modulate to their unoccupied mode positions or economizer cannot maintain each zone at occupied cooling temperature set point then the cooling coil valve shall modulate to maintain SA temperature at 55°F (adjustable) to maintain each zone at occupied cooling temperature set point (cooling coil control valve shall modulate only if cooling is available). Run fans as needed to have all zones at occupied cooling set point prior full occupancy. During morning cool down mode supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide exhaust air (EA) during full economizer or return air (RA) whenever the economizer is disabled to be equal supply air (SA) flow.

D. Occupied Heating Mode of Operation:

The supply and return fans shall continuously to run. The dampers open to their occupied mode positions (OA at minimum position as determined by balancing contractor, RA fully open, and EA fully closed) prior to fans start, the freeze protection pump shall start/run and heating coil control valve shall modulate as required to maintain supply air temperature at 65°F (adjustable) whenever average calculated space temperature is 70°F (adjustable) or whenever average calculated space temperature is 65°F (adjustable). During occupied heating mode of operation of AHU-1 the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) RA=SA-OFFSET. A low temperature protection thermostat/freezestat located in the heating coil discharge shall shut down the unit fans, close the outside and exhaust dampers, open the heating coil valve full to the coil, start freeze protection pump if not running and stop freeze protection pump when AHU-2 mixed air temperature is above 40°F (adjustable), and indicate an alarm at the head end computer upon sensing a temperature below its set point of 36°F (adjustable).

E. Occupied Cooling:

The supply and return fans shall continuously to run and the dampers shall open to their occupied mode positions (OA at minimum position, RA fully open, and EA fully closed) prior to fans start.

Whenever average calculated zones temperature is in range of 72-75°F then SA temperature shall reset from 65°F to 55°F (when average calculated zones temperature is

75°F) then the heating valve shall close, the circulating pump shall stop if was running, the AHU-3 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air temperature is 2°F cooler than the average calculated zones temperature and the outside air enthalpy is less than average calculated zones enthalpy. When the economizer can no longer maintain these conditions then dampers shall modulate to their occupied mode positions or economizer cannot maintain reset SA temperature at set point then the cooling coil control valve shall modulate to maintain reset SA temperature at set point. During occupied cooling mode of operation of AHU-1 the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) RA=SA-OFFSET.

F. Demand ventilation control:

During the occupied mode of operation of AHU-2, if average calculated zones CO2 level is 690 PPM above OA CO2 (adjustable, 400 PPM OA CO2, typical), over a period of 10 minutes (adjustable) then the AHU-2 controller shall override current positions of OA dampers, modulate OA damper open for 10%, hold OA damper at position for 10 minutes (adjustable), if after 10 minutes (adjustable) average calculated CO2 level is not at set point then the OA damper shall modulate open for additional 10%, hold OA damper at position for 10 minutes (adjustable), if after 10 additional minutes (adjustable) average calculated CO2 level is not at set point then the OA damper shall continue to modulate open up to the its maximum OA position listed in the schedule and as determined by balancing contractor, and subject to a mixed air limit sensor. Whenever OA damper is at its maximum OA position for demand ventilation control then the AHU-1 controller shall override position of RA and EA dampers and modulate them to provide maximum specified OA flow for demand ventilation control, hold dampers in their position until average calculated zones CO2 drops below 690 PPM for 10 minutes (adjustable), then modulate all dampers to their occupied mode operation. The CO2 concentration shall be the difference between calculated indoor and outdoor air concentration.

G. Unoccupied Heating:

Whenever temperatures in any zone is 2°F (adjustable) below unoccupied heating temperature set points of 60°F (adjustable) then the supply and return fans are commanded on. The fans shall operate on 100% return air, the heating coil control valve shall modulate and the freeze protection pump shall start to maintain SA temperature at 90F (adjustable). When all zones are at unoccupied temperature set point for 10 minutes (adjustable) then fans shall slow down to their minimum speed of 30% and shut down. During unoccupied heating mode of operation the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide return air (RA) equal supply air (SA) flow.

H. Unoccupied Cooling:

Whenever temperatures in any zone is 2°F (adjustable) above unoccupied cooling temperature set points of 85°F (adjustable) then the supply and return fans are commanded on. The heating valve shall close, the circulating pump shall shut down if was running, the AHU-2 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air (SA=OA) temperature is 2°F cooler than the average calculated zones

temperature and the outside air enthalpy is less than average calculated zones enthalpy. When the economizer can no longer maintain these conditions then dampers shall modulate to their unoccupied mode positions or economizer cannot maintain each zone at unoccupied cooling temperature set point then, the cooling coil control valve will modulate to maintain SA temperature at 55°F (adjustable). When all zones are at unoccupied cooling temperature set point for 10 minutes (adjustable) then fans shall slow down to their minimum speed of 30% and shut down and close OA and EA dampers if not already closed. During unoccupied cooling mode of operation the supply fan (SF) speed shall modulate to maintain duct static pressure sensor at set point and return fan (RF) speed shall modulate/track supply fan speed to provide exhaust air (EA) during full economizer or return air (RA) whenever the economizer is disabled to be equal supply air (SA) flow.

I. Smoke Detectors

This contractor shall monitor duct mounted smoke detectors furnished and installed under a different section. This contractor shall hard wire smoke detectors to shut down all fans then close dampers and send an alarm to the front end computer upon detecting products of combustion.

J. Duct Static Pressure Sensor

Duct static pressure set point shall be reset based on the zone requiring the most pressure; i.e. the set point is reset lower to keep zone VAV box damper with the most demand open in range of 92-96% (adjustable). If zone VAV box damper with the most demand exceeds 96% open then duct static pressure set point shall increase small amount. If zone VAV box damper with the most demand drops below 92% open then DP set point shall decrease small amount.

K. High Limit Static Pressure Sensor

The AHU-2 DDC controller shall shut down supply and return fans, close OA and EA dampers three (3) minutes (adjustable) after the fans shut down, and send an alarm to the front end computer whenever high limit static pressure sensor is at set point as determined by balancing contractor. AHU-2 shall return to mode of operation prior to activation of high limit static pressure sensor upon manual reset of that sensor. Coordinate duct static pressure classification, total AHU-2 static pressure with mechanical and balancing contractors prior to AHU-2 start.

L. Base bid

The specified sequence of operations for AHU-2 shall be provided and tested under base bid then disabled for future use. Under base bid the AHU-2 shall operate in unoccupied heating and unoccupied cooling mode of operations.

1.8 CONSTANT VOLUME AIR HANDLING UNIT – METROLOGY LAB (AHU-3)

A. Optimal Start Mode

1. The AHU-3 DDC controller will calculate how long it will take the AHU-3 to

return from its unoccupied state to its occupied state to maintain occupied temperature setpoint in each zone based on the heating or cooling capacity of AHU-3 and the outside air temperature. The AHU-3 DDC controller will then adjust supply air temperature setpoint for the time necessary to ensure the occupied temperature in each zone is maintain 10-minutes (adjustable) prior to full occupancy.

2. The system will not start more than 4 one (1) hours before a scheduled occupancy.

B. Morning Warm Up Mode:

Whenever temperatures in in the space is 2°F (adjustable) below occupied heating temperature set points of 70°F (adjustable) then the supply fan is commanded on. The fan shall operate on 100% return air, the heating coil control valve shall modulate and the freeze protection pump shall start if not running to maintain SA temperature at 90°F (adjustable) to maintain each zone at occupied heating temperature set point. Run fan as needed to have space at occupied heating set point prior to full occupancy. If the supply fan fails to start and/or run in any mode of operation, as determined by the current sensor, an alarm shall be indicated at the head end computer and fan shall be commanded off.

1. Freeze protection pump control: Whenever the outside air (OA) is below 45°F (adjustable), SF is running or the AHU-3 mixed air temperature is 38°F (adjustable) when fan is shut down then the freeze protection pump shall operate continuously. The freeze protection pump shall cycle whenever $45^{\circ}\text{F} > \text{OA} \leq 65^{\circ}\text{F}$, SF is running and supply air temperature is not at set point. If freeze protection pump fails to start and/or run in any mode of operation, as determined by the current sensor, an alarm shall be indicated at the head end computer and freeze protection pump shall be commanded off.

C. Morning Cool Down Mode:

Whenever temperatures in the space is 2°F (adjustable) above occupied cooling temperature set points of 75°F (adjustable) then the supply fan is commanded on. The heating valve shall close, the circulating pump shall stop if was running, when outside air temperature permits, the AHU-3 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air (SA=OA) temperature is 2°F cooler than the average calculated zones temperature and the outside air enthalpy is less than average calculated zones enthalpy. Space mounted pressure sensors shall modulate the motorized insulated low leak motorized damper to maintain pressure in the space. When the economizer can no longer maintain these conditions then dampers shall modulate to their unoccupied mode positions or economizer cannot maintain space at occupied cooling temperature set point then the cooling coil valve shall be modulated to maintain SA temperature at 55°F (adjustable) to maintain space at occupied cooling temperature set point (cooling coil control valve shall modulate only if cooling is available). Run fan as needed to have space at occupied cooling set point prior to full occupancy.

D. Occupied Heating Mode of Operation:

The supply fan shall run continuously. The dampers open to their occupied mode positions (OA at minimum position as determined by balancing contractor, RA fully open, and EA fully closed) prior to fan start, the freeze protection pump shall start/run and heating coil control valve shall modulate as required to maintain supply air temperature at 65°F (adjustable) whenever average calculated space temperature is 70°F (adjustable) or 70°F (adjustable) whenever average calculated space temperature is 65°F (adjustable).

A low temperature protection thermostat/freezestat located in the heating coil discharge shall shut down the unit fan, close the outside and exhaust dampers, open the heating coil valve full to the coil, start freeze protection pump if not running and stop freeze protection pump when AHU-3 mixed air temperature is above 40°F (adjustable), and indicate an alarm at the head end computer upon sensing a temperature below its setpoint of 36°F (adjustable).

E. Occupied Cooling:

The supply fan shall continuously to run and the dampers shall open to their occupied mode positions (OA at minimum position, RA fully open, and EA fully closed) prior to fan start.

Whenever average calculated zones temperature is in range of 72-75°F then SA temperature shall reset from 65°F to 55°F (when average calculated zones temperature is 75°F) then the heating valve shall close, the circulating pump shall stop if was running, the AHU-3 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air temperature is 2°F cooler than the space temperature and the outside air enthalpy is less than average calculated zones enthalpy. Space mounted pressure sensors shall modulate the motorized insulated low leak motorized damper to maintain pressure in the space. When the economizer can no longer maintain these conditions then dampers shall modulate to their occupied mode positions or economizer cannot maintain reset SA temperature at set point then the cooling coil control valve shall modulate to maintain reset SA temperature at set point.

F. Demand ventilation control:

During the occupied mode of operation of AHU-3, if average calculated zones CO2 level is 690 PPM above OA CO2 (adjustable, 400 PPM OA CO2, typical), over a period of 10 minutes (adjustable) then the AHU-3 controller shall override current positions of OA dampers, modulate OA damper open for 10%, hold OA damper at position for 10 minutes (adjustable), if after 10 minutes (adjustable) average calculated CO2 level is not at set point then the OA damper shall modulate open for additional 10%, hold OA damper at position for 10 minutes (adjustable), if after 10 additional minutes (adjustable) average calculated CO2 level is not at set point then the OA damper shall continue to modulate open up to the its maximum OA position listed in the schedule and as determined by balancing contractor, and subject to a mixed air limit sensor. Whenever OA damper is at its maximum OA position for demand ventilation control then the AHU-3 controller shall override position of RA and EA dampers and modulate them to provide maximum specified OA flow for demand ventilation control, hold dampers in their position until average calculated zones CO2 drops below 690 PPM for 10 minutes (adjustable), then

modulate all dampers to their occupied mode operation.-The CO2 concentration shall be the difference between calculated indoor and outdoor air concentration.

G. Unoccupied Heating:

Whenever temperatures in the space is 2°F (adjustable) below unoccupied heating temperature set points of 60°F (adjustable) then the supply fan is commanded on. The fan shall operate on 100% return air, the heating coil control valve shall modulate and the freeze protection pump shall start to maintain SA temperature at 90F (adjustable). When space is at unoccupied temperature set point for 10 minutes (adjustable) then fan shall shut down.

H. Unoccupied Cooling:

Whenever temperatures in the space is 2°F (adjustable) above unoccupied cooling temperature set points of 85°F (adjustable) then the supply fan is commanded on. The heating valve shall close, the circulating pump shall shut down if it was running, the AHU-3 DDC controller will first utilize the economizer for free cooling (OA damper fully open, RA damper fully closed and EA damper fully open), as long as the supply air (SA=OA) temperature is 2°F cooler than the average calculated zones temperature and the outside air enthalpy is less than calculated space enthalpy. Space mounted pressure sensors shall modulate the motorized insulated low leak motorized damper to maintain pressure in the space. When the economizer can no longer maintain these conditions then dampers shall modulate to their unoccupied mode positions or economizer cannot maintain each zone at unoccupied cooling temperature set point then, the cooling coil control valve will modulate open to maintain SA temperature at 55°F (adjustable). When all zones are at unoccupied cooling temperature set point for 10 minutes (adjustable) then fans shall slow down to their minimum speed of 30% and shut down and close OA and EA dampers if not already closed. Smoke Detectors

This contractor shall monitor duct mounted smoke detectors furnished and installed under a different section. This contractor shall hard wire smoke detectors to shut down all fans then close dampers and send an alarm to the front end computer upon detecting products of combustion.

1.9 TYPICAL VARIABLE AIR VOLUME BOX SEQUENCE OF OPERATION

- A. Morning warm-up: If space temperature is 2°F (adjustable) below occupied heating set point of 70°F (adjustable) then VAV box damper shall modulate down to scheduled minimum airflow setpoint if not at this position, then modulating reheat coil control valve to maintain a maximum scheduled discharge air temperature, then increasing air flow to scheduled heating cfm setpoint as the last stage of heating in order to maintain each zone at heating setpoint of 70°F (adjustable). In zones with VAV boxes and hot water radiation elements the DDC system shall modulate hot water control valves to maintain zones temperature at setpoints. In zones with VAV boxes and hot water radiant panels the DDC system shall modulate hot water control valves at VAV boxes and open/close hot water control valves at hot water radiant panels to maintain zones temperature at setpoints. When

occupied space temperature set point is reached, damper at VAV box and hot water reheat control valve shall go to their occupied positions.

- B. Morning cool-down: If space temperature is 2°F (adjustable) above occupied cooling set point of 73°F (adjustable) (75°F in storage rooms and corridors) then the VAV box damper shall modulate between minimum and maximum cfm set points and hot water reheat coil control valve shall fully close at VAV box to maintain each zone at cooling setpoint of 73°F (adjustable) (75°F in storage rooms and corridors). When occupied space temperature set point is reached, damper at VAV box and hot water reheat control valve shall go to their occupied positions.
- C. Cooling: VAV box damper shall modulate between minimum and maximum airflow setpoints in order to maintain each zone at cooling setpoint of 75°F (adjustable +/-2 °F at thermostat, day-unoccupied 77°F) during occupied mode of operation, and 85°F (adjustable) during unoccupied mode of operation.
- D. Heating (where is applicable): VAV box damper shall modulate down to scheduled minimum airflow setpoint if it is not at that setpoint, then modulating hot water reheat coil control valve to maintain a maximum scheduled discharge air temperature, then increasing air flow to scheduled heating cfm setpoint as the last stage of heating in order to maintain each zone at heating setpoint of 70°F (adjustable +/- 2°F at thermostat, day unoccupied 68°F) during occupied mode of operation, and 60°F (adjustable) during unoccupied mode of operation
- E. Ventilation rate control: VAV box serving room with specified CO2 sensor shall modulate to maintain space CO2 level at setpoint. Whenever space CO2 level is 500 PPM (adjustable) above OA CO2 level (400 PPM OA CO2) the DDC system shall override current position of VAV box damper to gradually increase air flow for 10% (adjustable) then hold VAV box damper at that position for 10 minutes (adjustable) in order to maintain CO2 level at setpoint. If after 10 minutes (adjustable) the space CO2 level is not at setpoint then the DDC system shall repeat this sequence every 10 minutes (adjustable) in order to maintain space CO2 level at setpoint. Whenever space CO2 level is at setpoint then the VAV box damper shall be subject to temperature control loop. If VAV box damper provides maximum cooling or heating air flow or during its modulations space temperature drops below heating setpoint the DDC system shall override current position of AHU outdoor air damper to increase outdoor air flow to maintain CO2 level at setpoint and VAV box damper shall modulate to maintain space temperature at setpoint.
- F. Occupancy sensor (refer to electrical drawings for occupancy sensors location): Upon a signal from occupancy sensor, the zone space temperature shall revert to "stand-by" mode. Unique stand-by software set points for cooling, plus 2°F (adjustable) above space cooling set point, and heating, minus 2°F (adjustable) below space heating set point shall be provided for each zone except corridor. If the occupancy sensor detects that any room becomes occupied for minimum 15 minutes (adjustable) served by VAV box, then the room day occupied temperature setpoints are restored and VAV box shall operate in heating or cooling mode of

operation. When all rooms become unoccupied then the DDC system shall revert VAV box operation to "stand-by" mode.

G. Alarms:

1. A VAV box has been at max flow for more than 6 hours (adjustable)
2. VAV box does not reach commanded CFM.
3. There is no supply air temperature rise with VAV box hot water reheat coil control valve fully open.

H. Refer to air handling unit sequence of operations for additional controls requirement for VAV boxes.

1.10 RADIANT PANEL CONTROL

- A. A space sensor shall cycle the low voltage 2-position spring return, normally open, radiation valve in order to maintain it's occupied and unoccupied setpoint.

1.11 EXHAUST FANS CONTROLLED BY DDC

- A. The exhaust fans shall operate during the occupied period and remain off during the unoccupied period. The exhaust fan damper shall be open prior to starting the exhaust fans. If the fan status is not verified by the current sensor then an alarm will be indicated at the head end computer.

1.12 EXHAUST FANS CONTROLLED BY TEMPERATURE SENSOR

- A. Electrical room exhaust fans shall be control by a space sensor. When the room space temperature rises above setpoint, the outside air damper shall open and the exhaust fan shall start. If the fan status is not verified by the current sensor then an alarm will be indicated at the head end computer.

1.13 CABINET & UNIT HEATERS

- A. A space sensor shall cycle the cabinet/unit heater control valve as need to maintain the space temperature. A strap-on aquastat shall prevent fan operation the if hot return temperature fall below 85 degrees F.

1.14 WARRANTY

- A. The entire building control system shall be warranted for a period as specified in Section 01 78 30 "Warranty and Bonds". Any manufacturing defects arising during this period shall be corrected without cost to the Agency. This warranty commences on Date of Substantial Completion. Please refer to Section 01 78 30 for additional warranty

requirements.

PART 2 - PRODUCTS

None

PART 3 - EXECUTION

3.1 INSTRUCTION AND ADJUSTMENTS

- A. Upon completion of the project, the Temperature Control Contractor shall: Check, validate, and calibrate, where required, all controllers, controlled devices, valves, actuators, auxiliary devices, relays, etc. provided under this section.

3.2 COORDINATION

- A. Coordinate the controls furnished under this section with the controls furnished with the boilers and chillers resulting in a complete system properly interfaced.

3.3 SYSTEM TURN OVER

- A. Upon completion of the installation, the Control Contractor shall start-up the system and perform all necessary testing and run diagnostics to ensure proper operation. An acceptance test in the presence of the Agency's Representative, the Architect, or the Engineer shall be performed. The acceptance test shall consist of a point-to-point check-out within each terminal unit controller to insure proper operation of all system components.
- B. When the system is deemed satisfactory as a whole or in parts by these observers, the system as a whole or in parts will be accepted for use. Warranty commences on the latter of date accepted for use by Agency or Date of Substantial Completion, but in any case will not commence until entire system as a whole is accepted for use by Agency.
- C. Problems which occur within approved and installed hardware or software comprising this system during warranty period shall be promptly corrected in an appropriate fashion under warranty to Agency's satisfaction. Any such occurrence shall not void previous approval; however, the Control Contractor shall be responsible to attend to, and remedy, such items arising within the Warranty Period. Appropriate logs, schedules, and reports shall be maintained to reflect these items and their redress.

3.4 TRAINING/AGENCY'S INSTRUCTION

- A. The Control Contractor shall provide two (2) CD copies of an operator's manual describing all operating and routine maintenance service procedures to be used with the system. The Control Contractor shall instruct the Agency's designated representative in these procedures during the start-up and test period. The duration of the instruction are to be conducted during normal working hours and shall be no less than sixteen (16) hours.

END OF SECTION 23 09 93

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Concrete wheel stops.
- B. Related Sections include the following:
 - 1. Division 32 Section "Bituminous Paving" for underlying bituminous concrete paving.

1.3 SUBMITTALS

- A. Shop Drawings: For concrete wheel stops including installation details for approval.
- B. Product Data: Submit manufacturer's product data for wheel stops and epoxy adhesive for approval.

PART 2 - PRODUCTS

2.1 PARKING BUMPERS

- A. Concrete Wheel Stops: Precast, steel-reinforced, air-entrained concrete, 3,000-psi minimum compressive strength with fiber mesh reinforcement, with nominal dimensions 6 inches high by 10 inches wide by 72 inches long. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed or -drilled vertical holes through wheel stop for anchoring to substrate.
- B. Surface Appearance: Free of pockets, sand streaks, honeycombs, and other obvious defects. Corners shall be uniform, straight, and sharp.
- C. Mounting Hardware: Epoxy-coated No. 5 rebar, 24-inch minimum length.
- D. Adhesive: Epoxy type manufactured for the purpose.

PART 3 - EXECUTION

3.1 EXAMINATION

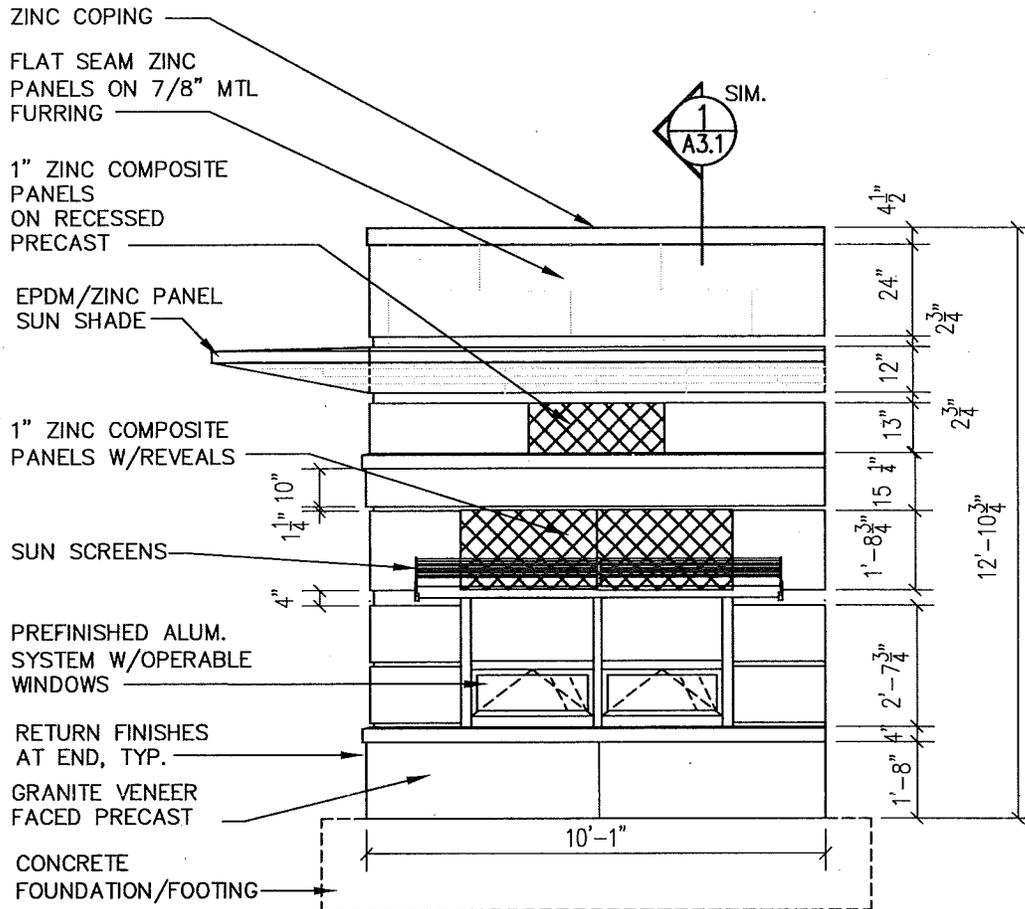
- A. Do not install parking bumpers until pavements are thoroughly cured.

- B. Verify that pavement is clean and free of debris and is in suitable condition to begin installation according to manufacturer's written instructions.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install wheel stops in accordance with the manufacturer's written instructions.
- B. Install one wheel stop per parking space where indicated.
- C. Each wheel stop shall be uniformly spaced, accurately aligned, and securely adhered.
- D. Exposed surfaces shall be clean and free from chips, cracks, stains, discoloration, and other defects and damage.
- E. Secure each wheel stop to paving surfaces with mounting hardware installed in each preformed vertical hole in the wheel stop and drilled into the underlying paving surface. Recess head of hardware beneath top of wheel stop.
- F. Securely bond mounting hardware to the wheel stop and underlying pavement with adhesive.
- G. Install wheel stops in bed of adhesive before anchoring.

END OF SECTION 32 17 13



NOTES:

1. CONSTRUCT SAMPLE WALL PANEL PER CONSTRUCTION DOCUMENTS, WITH 12" PRECAST INSULATED ARCH. PANEL WITH GRANITE FACE, PREFINISHED ALUMIN. CURTAIN WALL, OPERABLE VENTS, SUNSCREEN, ZINC COMPOSITE PANEL, ZINC PANEL SUN SHADE, ZINC COMPOSITE PANELS ON MTL FURRING AND ZINC COPING.
2. RETURN ALL FINISHES 12" AT CORNER, ONE END
3. SAMPLE PANEL CONSTRUCTION SHALL BE ENTRIELY SELF SUPPORTING PER OSHA REQUIREMENTS WITH OUT EXTERNAL BRACING.
4. LOCATION OF SAMPLE PANEL SHALL BE CORRORDINATED W/ARCH.



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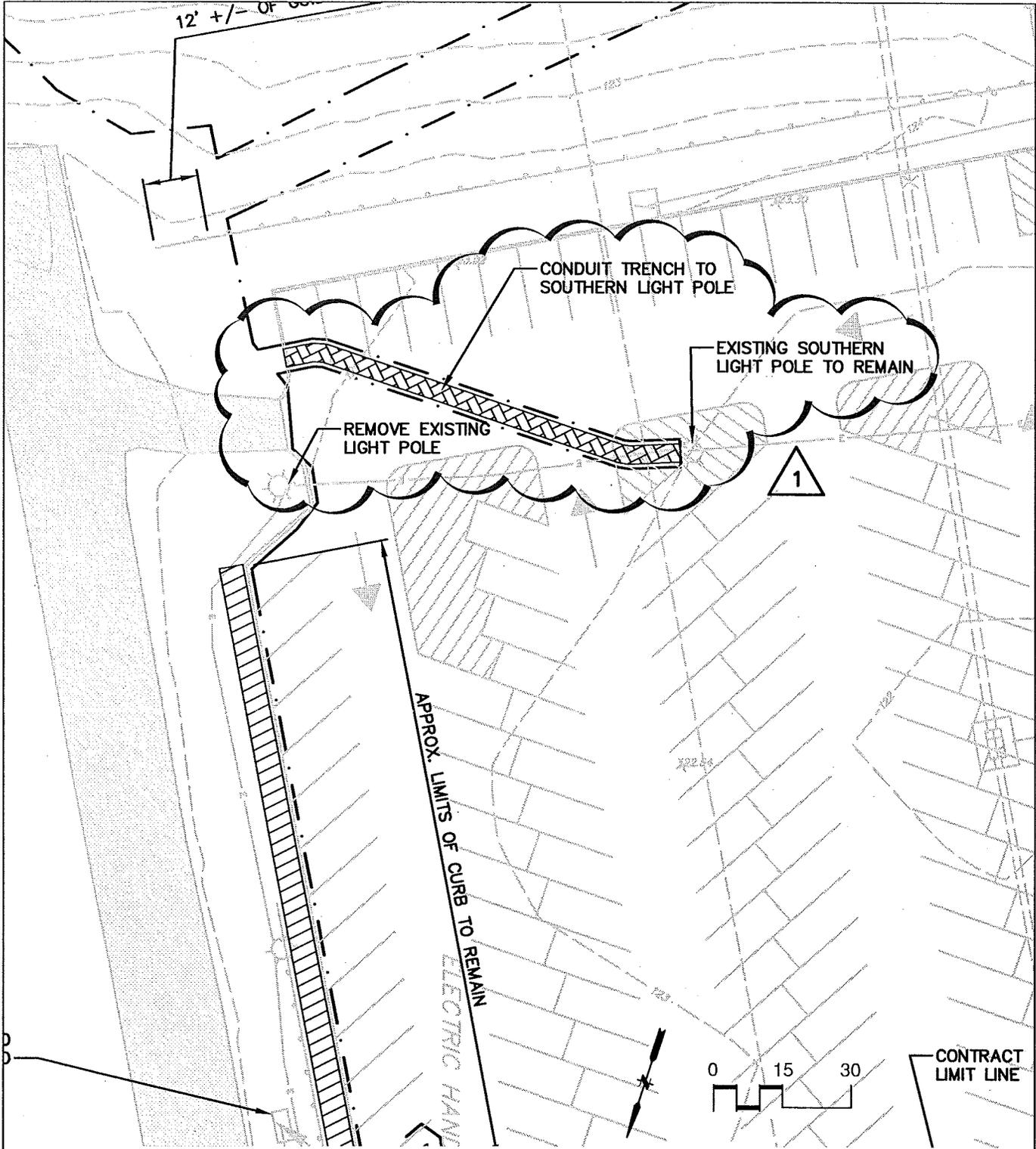
SKETCH TITLE SAMPLE PANEL

DATE 1/11/2016

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SCALE: N.T.S.

SKETCH NO.
 AD3-SK-INFO.1



FUSS & O'NEILL

146 HARTFORD RD
 MANCHESTER, CT 06040
 860.646.2469
 www.fando.com

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SKETCH TITLE REVISED LIGHTING POLE TO BE

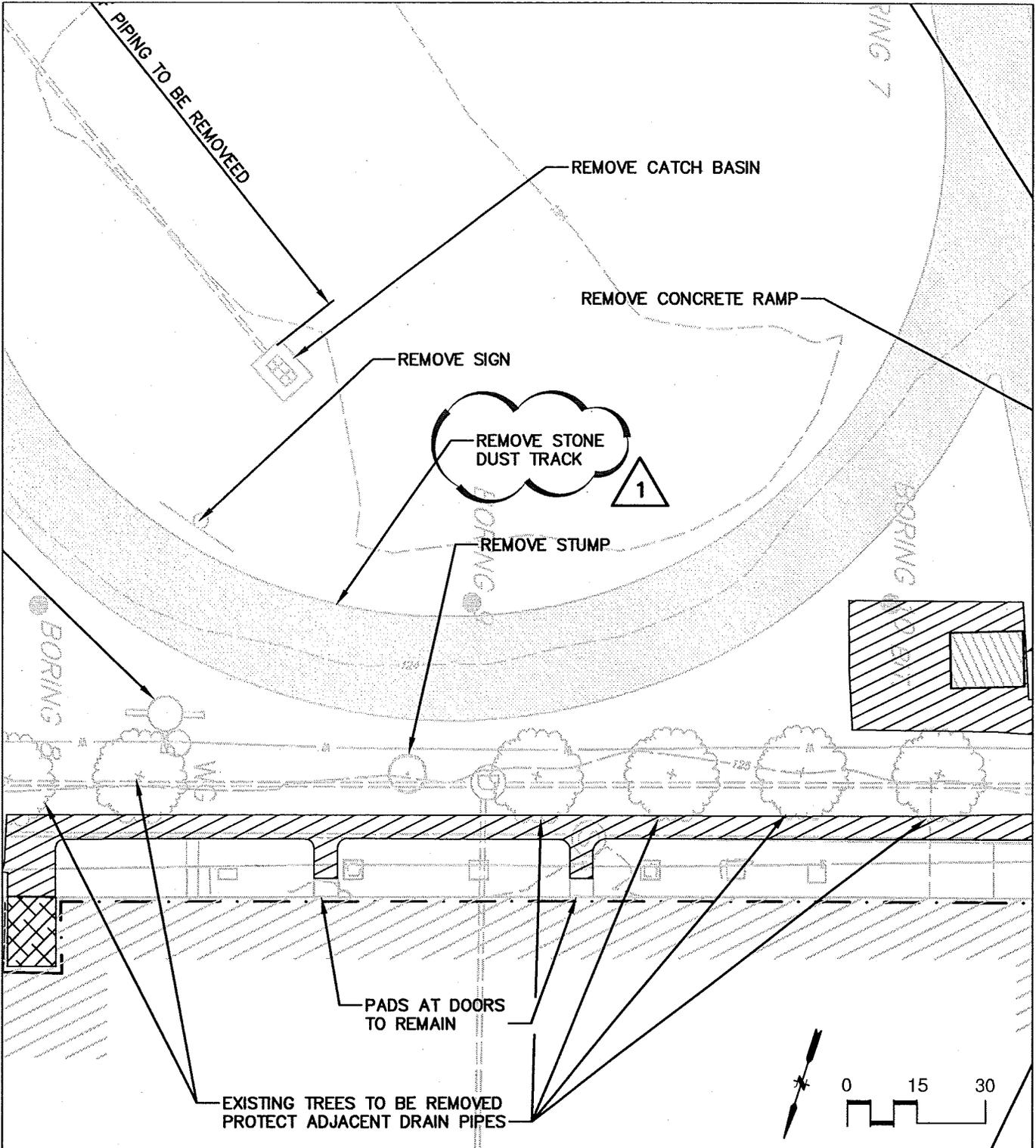
REMOVED AND CONDUIT TRENCH

DATE 1/11/2016

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SCALE: 1"=30'

SKETCH NO.
 AD3-SK-CP-101-1



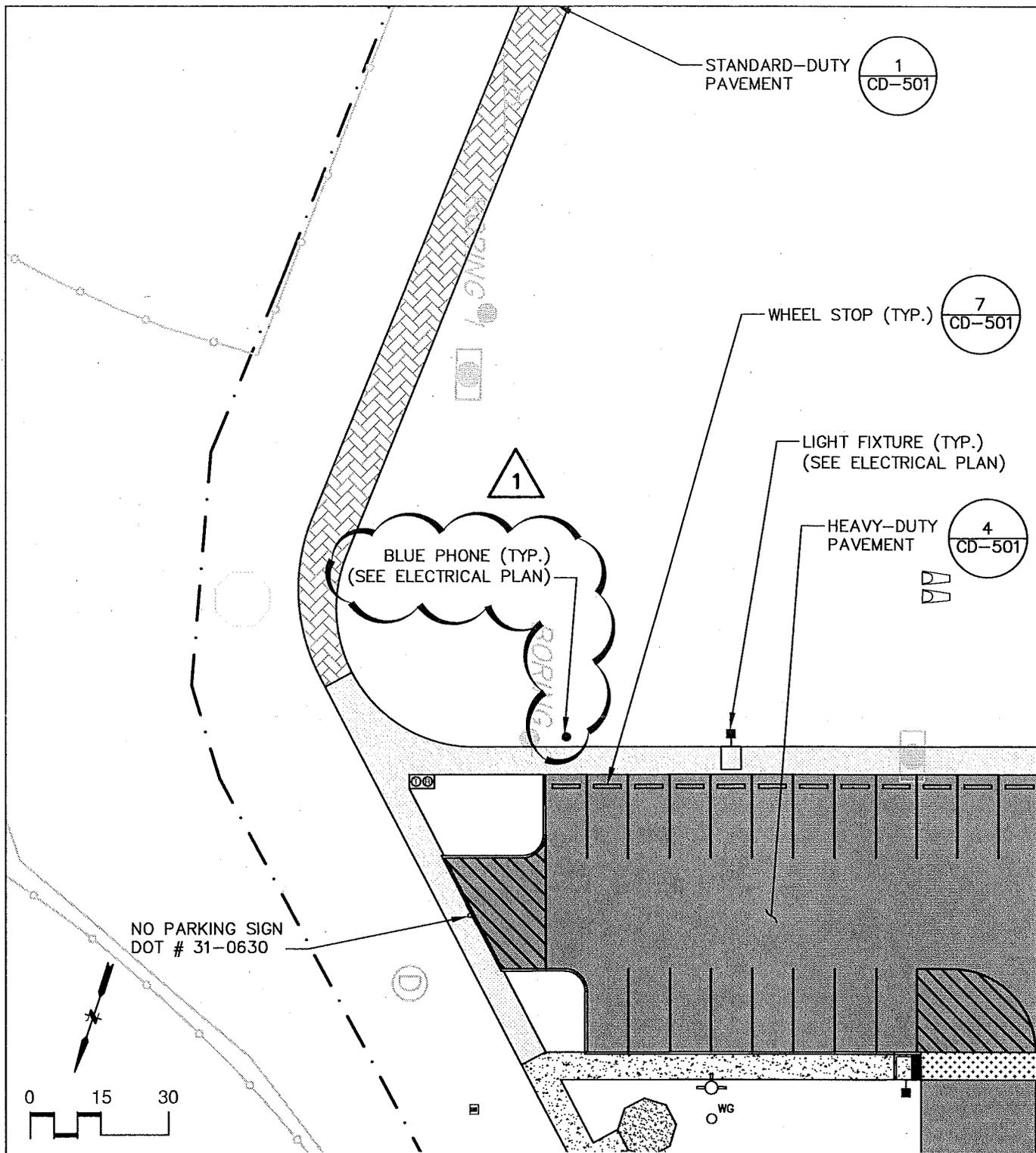
PROJECT TITLE Asnuntuck Community College
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SKETCH TITLE REVISED STONE DUST TRACK REMOVAL

DATE 1/11/2016
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SCALE: 1"=30'

SKETCH NO.
AD3-SK-CP-101-2



1
CD-501

7
CD-501

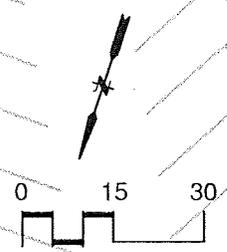
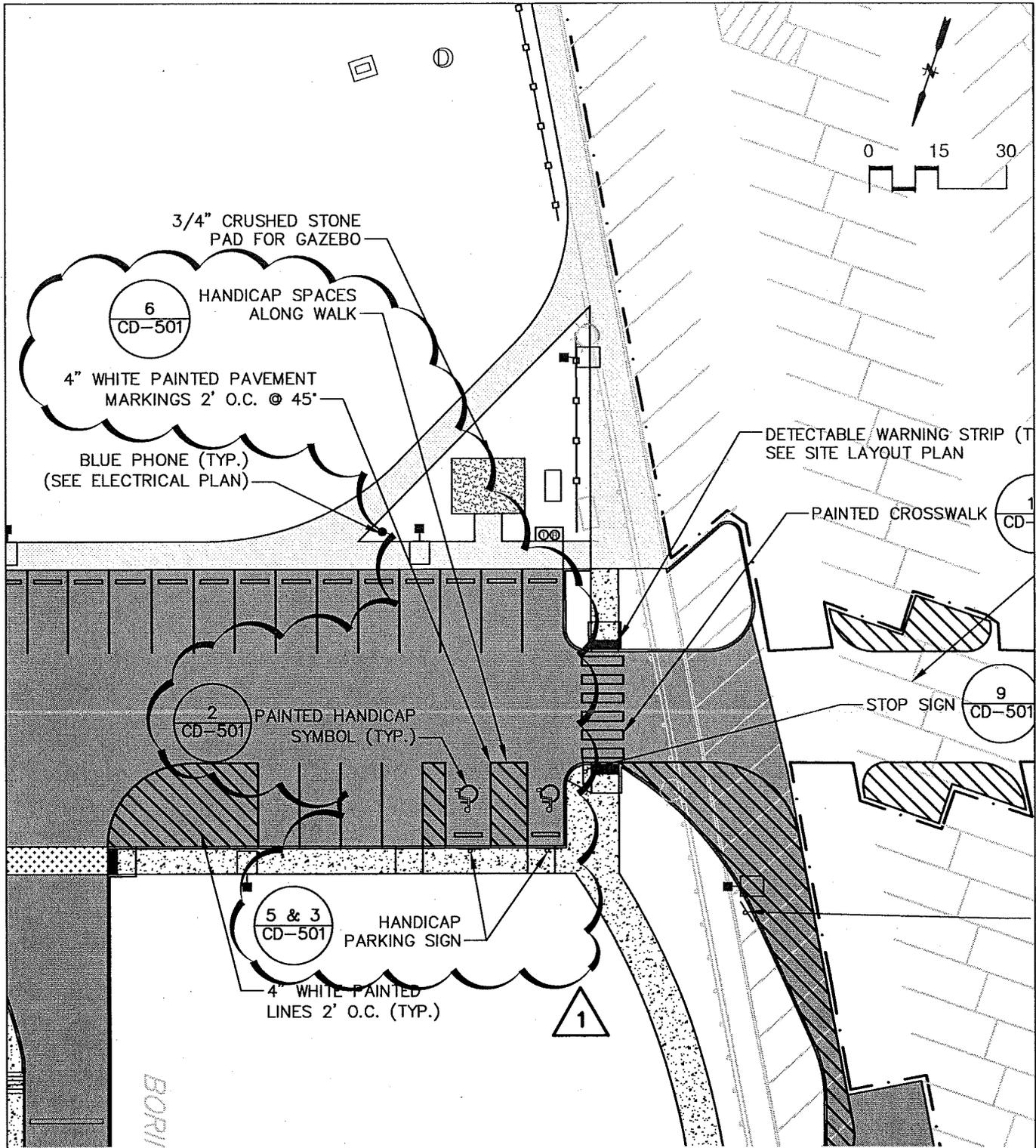
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CD-501



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SKETCH TITLE
REVISED BLUE PHONE LOCATION

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SKETCH NO. AD3-SK-CS-101-1



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SKETCH TITLE REVISED ACCESSIBLE PARKING SPACES

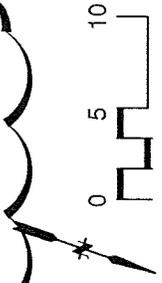
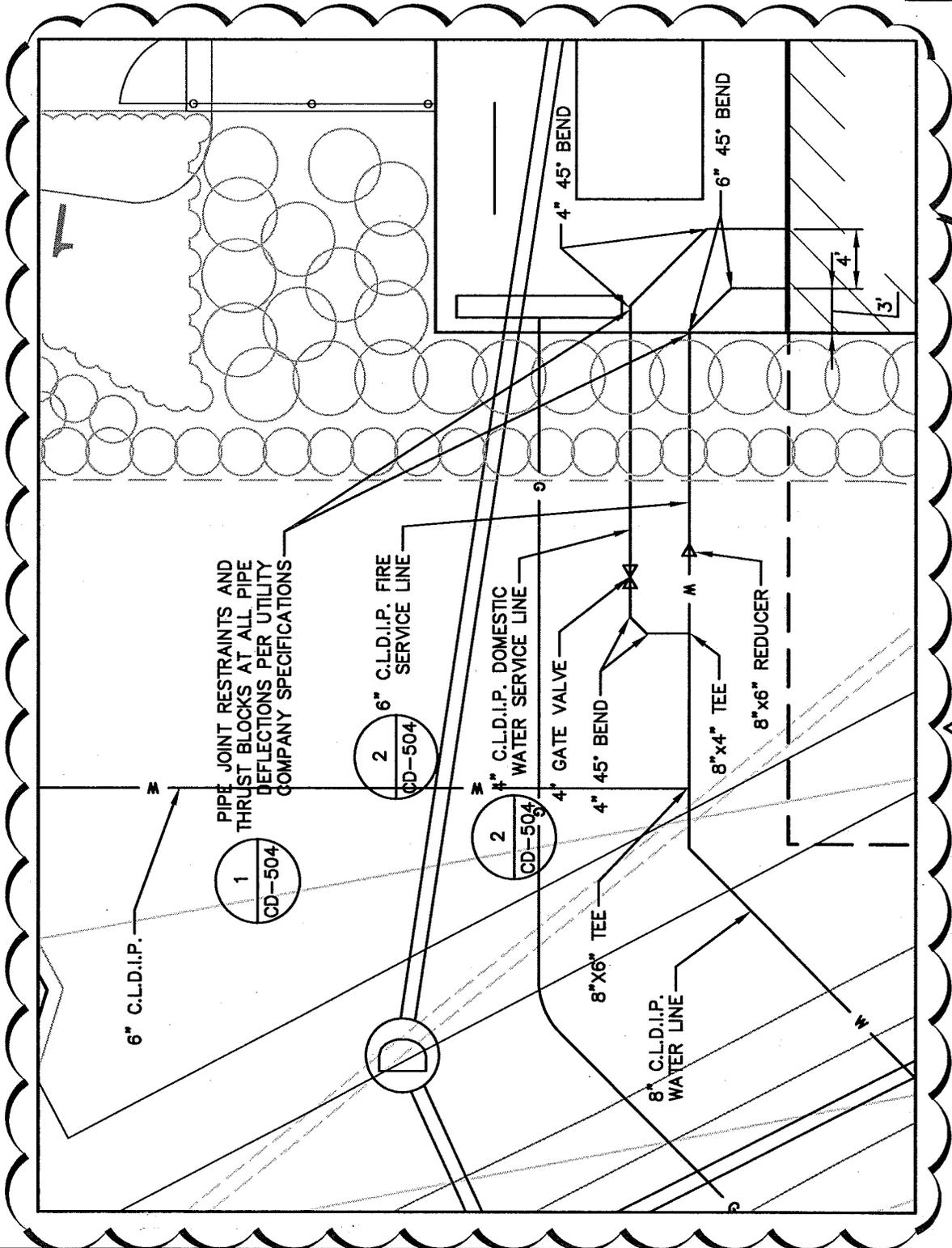
DATE 1/11/2016
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 SCALE: 1"=30'
 SKETCH NO. AD3-SK-CS-101-2



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SKETCH TITLE: REVISED WATER LINE CONNECTION INSET

DATE: 1/11/2016
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 SCALE: 1"=10'
 SKETCH NO. AD1-SK-C-101-1



PIPE JOINT RESTRAINTS AND THRUST BLOCKS AT ALL PIPE DEFLECTIONS PER UTILITY COMPANY SPECIFICATIONS

6" C.L.D.I.P.

1
CD-504

2
CD-504

2
CD-504

8" C.L.D.I.P. WATER LINE

8" x 6" TEE

4" 45° BEND

4" GATE VALVE

4" C.L.D.I.P. DOMESTIC WATER SERVICE LINE

2 6" C.L.D.I.P. FIRE SERVICE LINE

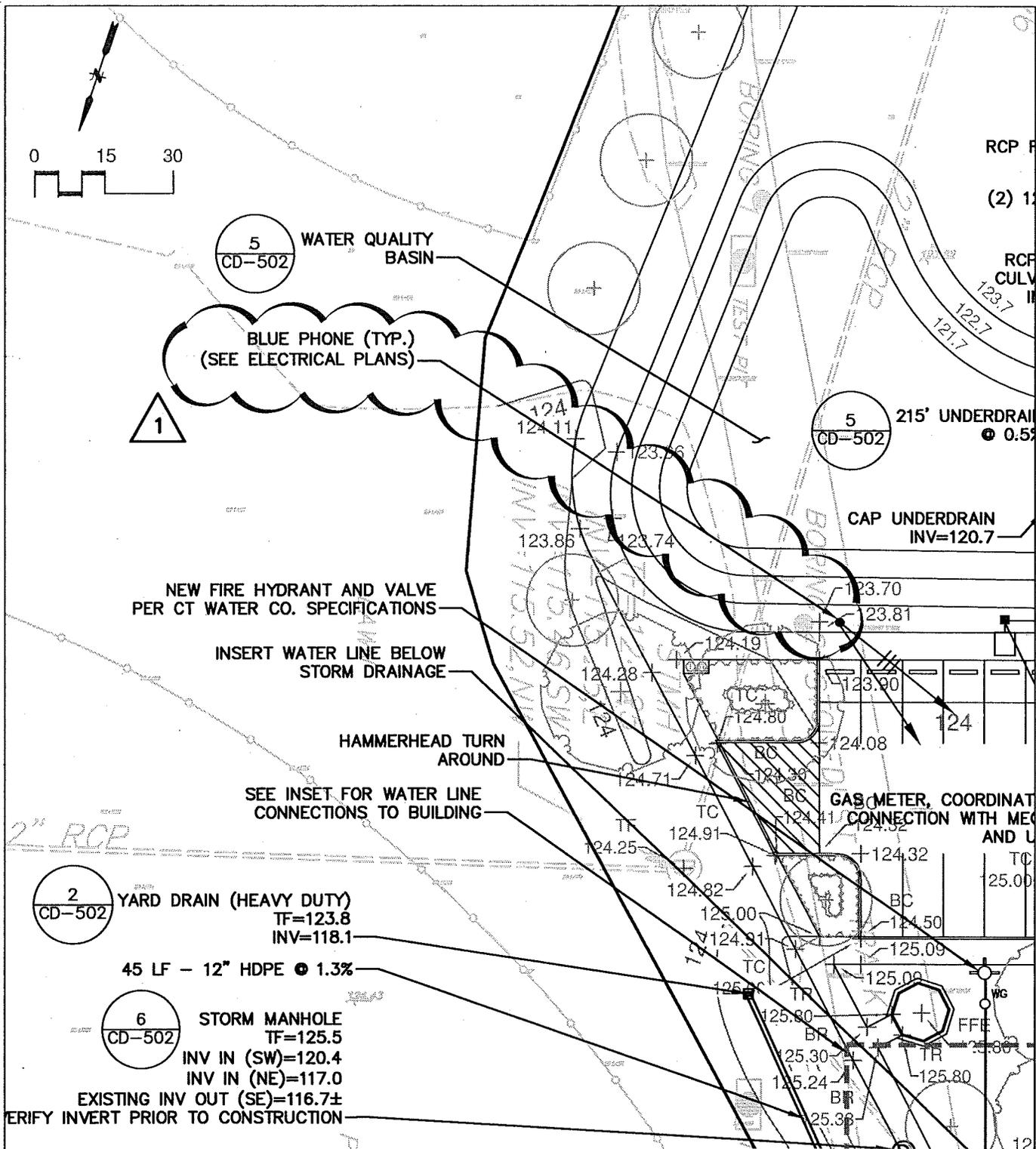
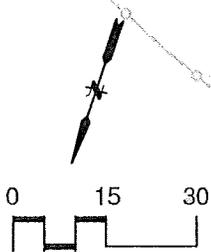
8" x 4" TEE

8" x 6" REDUCER

6" 45° BEND

4" 45° BEND

1



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SKETCH TITLE REVISED BLUE PHONE LOCATION

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SKETCH NO. AD1-SK-C-101-2

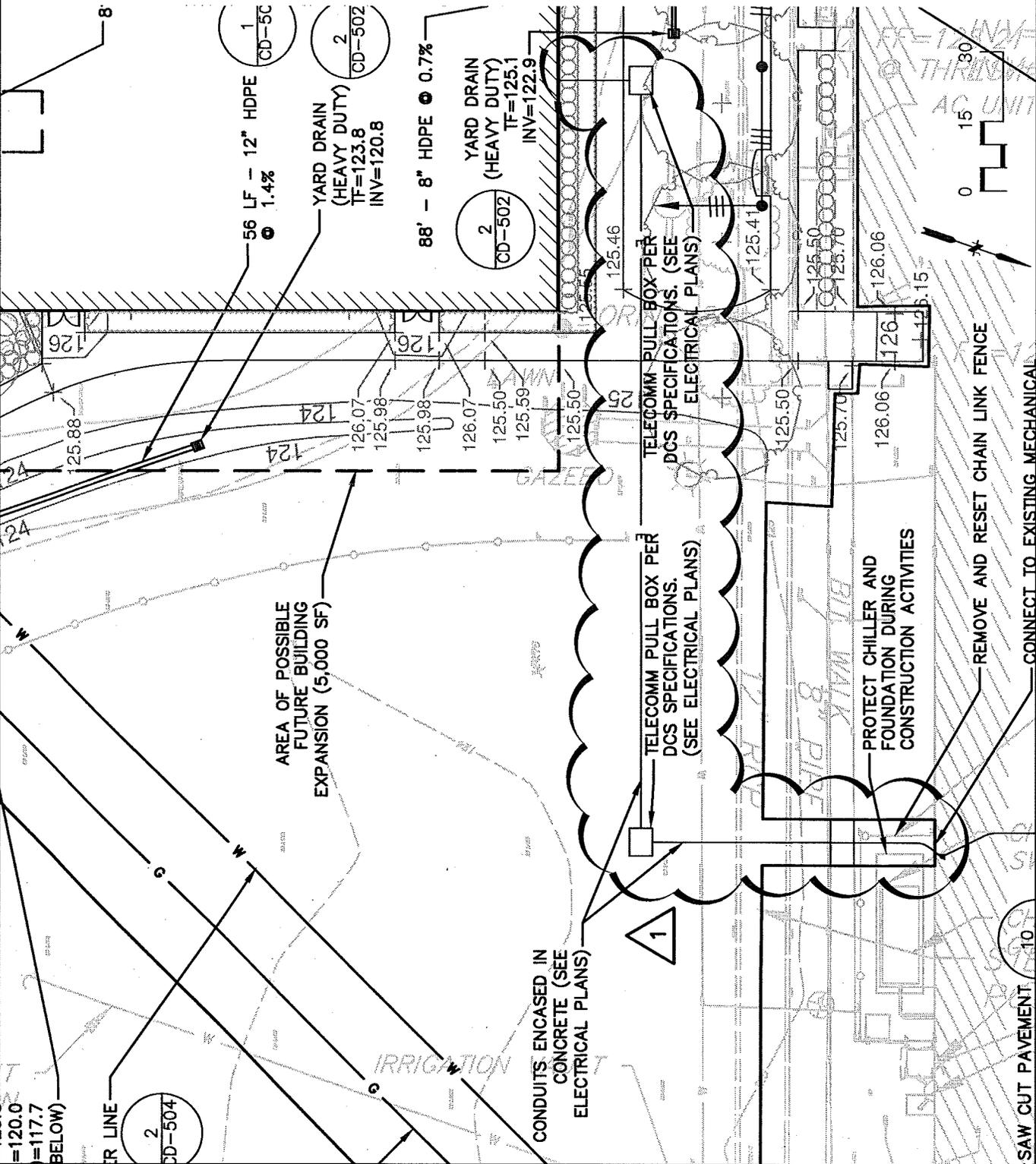


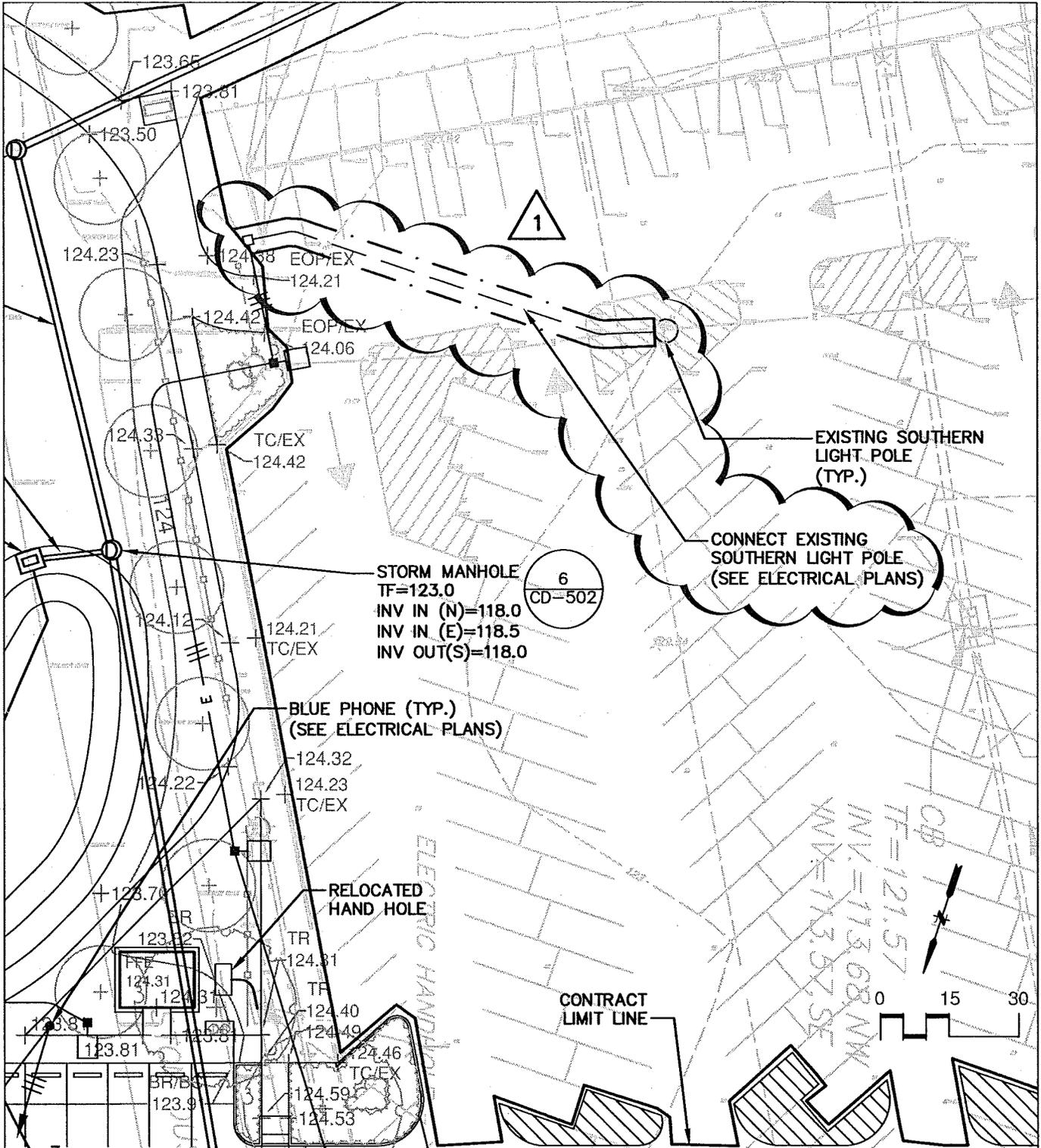
PROJECT TITLE
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SKETCH TITLE
REVISED TELECOM BOSES AND CONDUIT

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 SKETCH NO. AD1-SK-C-101-3





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SKETCH TITLE REVISED CONDIT TO EXISTING
SOUTHERN LIGHT POLE

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SCALE: 1"=30'

SKETCH NO.
AD1-SK-C-101-5

CONSULTANT LOGO

**moser
pilon
nelson**
architects
37 JORDAN LANE
MIDDLETOWN, CT 06450
860 343 9744

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SKETCH TITLE _____

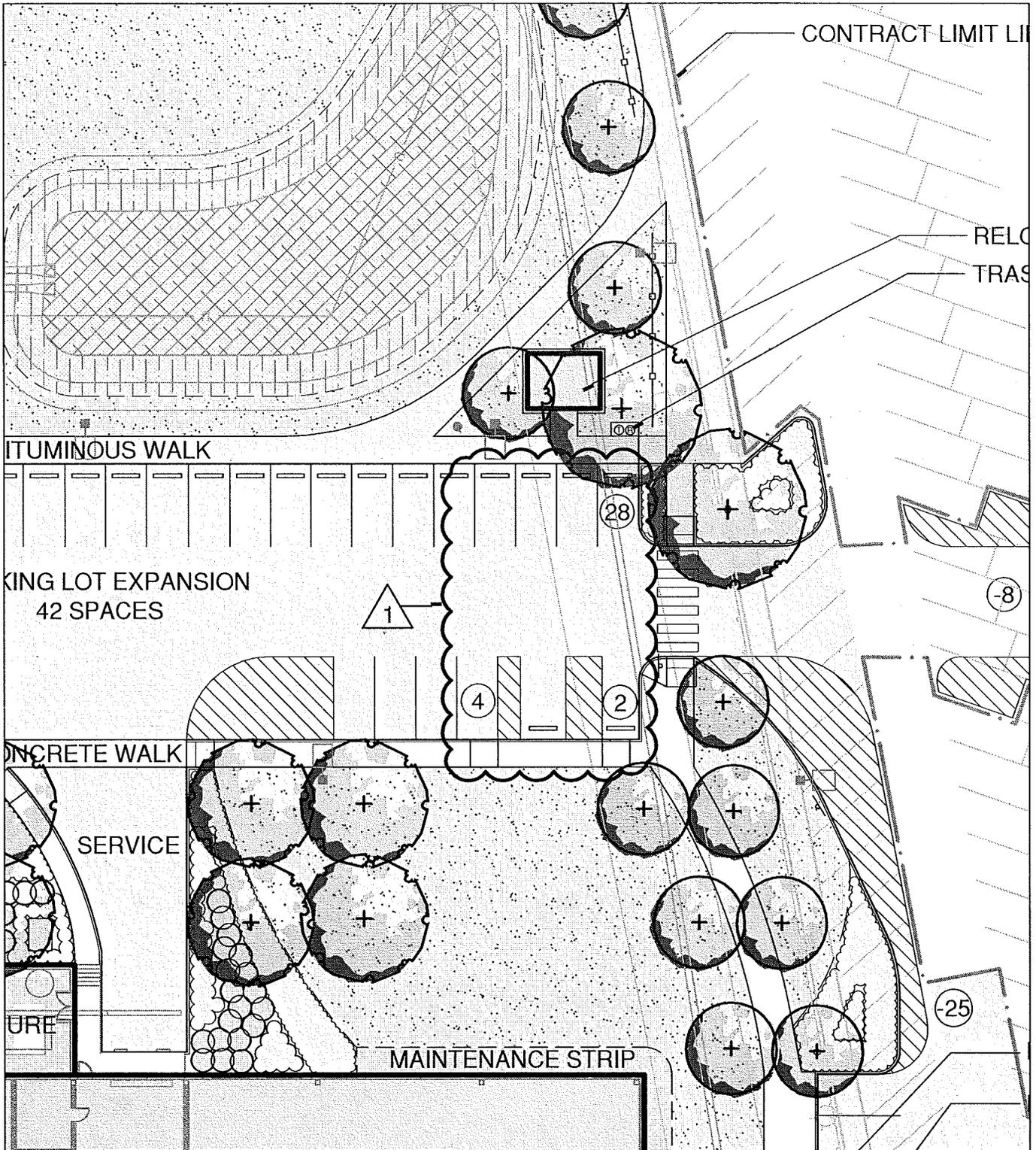
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AD3-SK-A□.□□

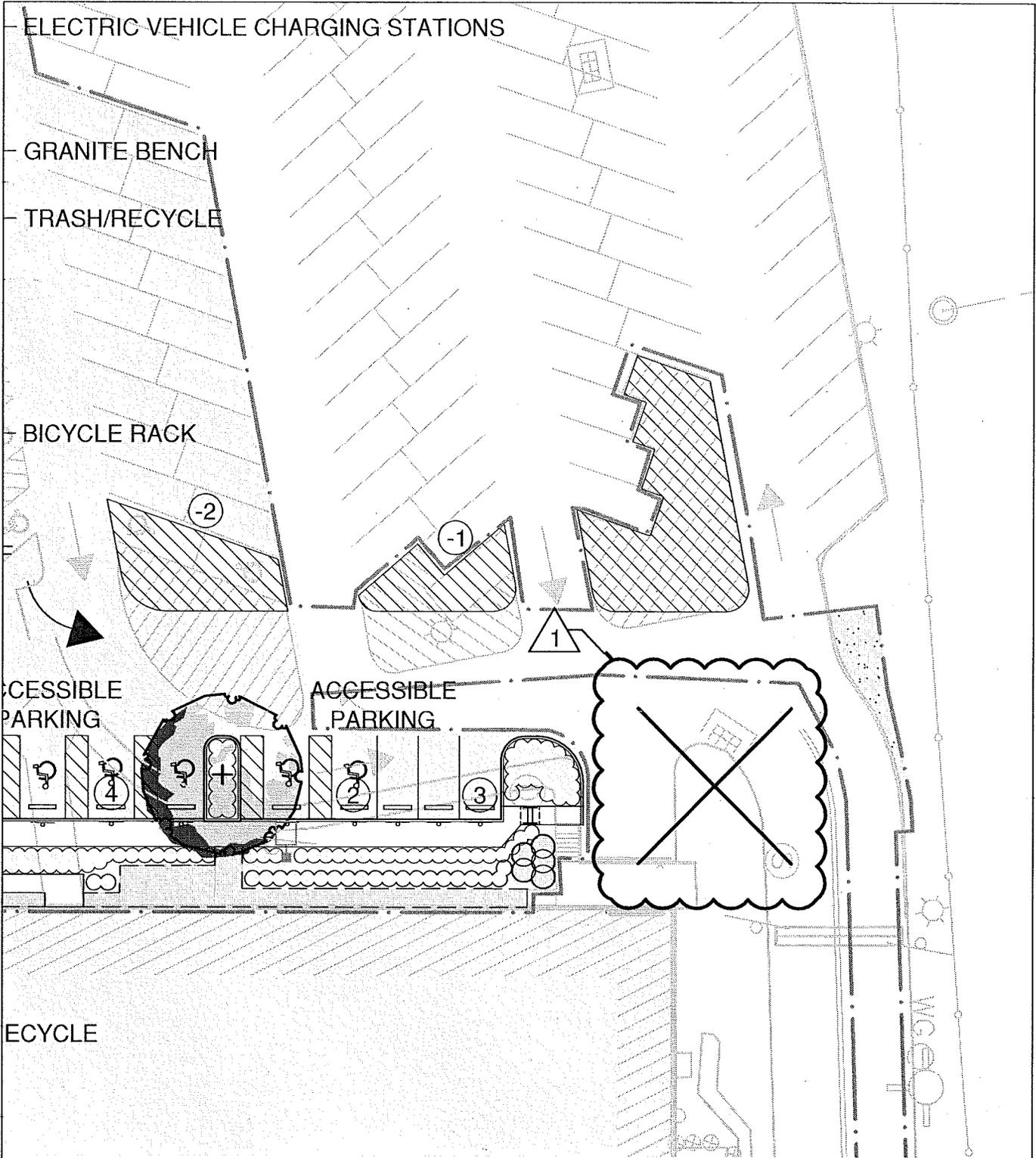


PROJECT TITLE Asnuntuck Community College
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SKETCH TITLE RELOCATED HC PARKING SPACES

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 SCALE: 1"=30'-0"
 SKETCH NO. AD3-SK-L1.0-1

LANDSCAPE ARCHITECT
Richter & Cogan Inc.
 48 CANAL COURT
 P.O. BOX 567
 AVON, CT 06001
 PHONE: 860-678-0669

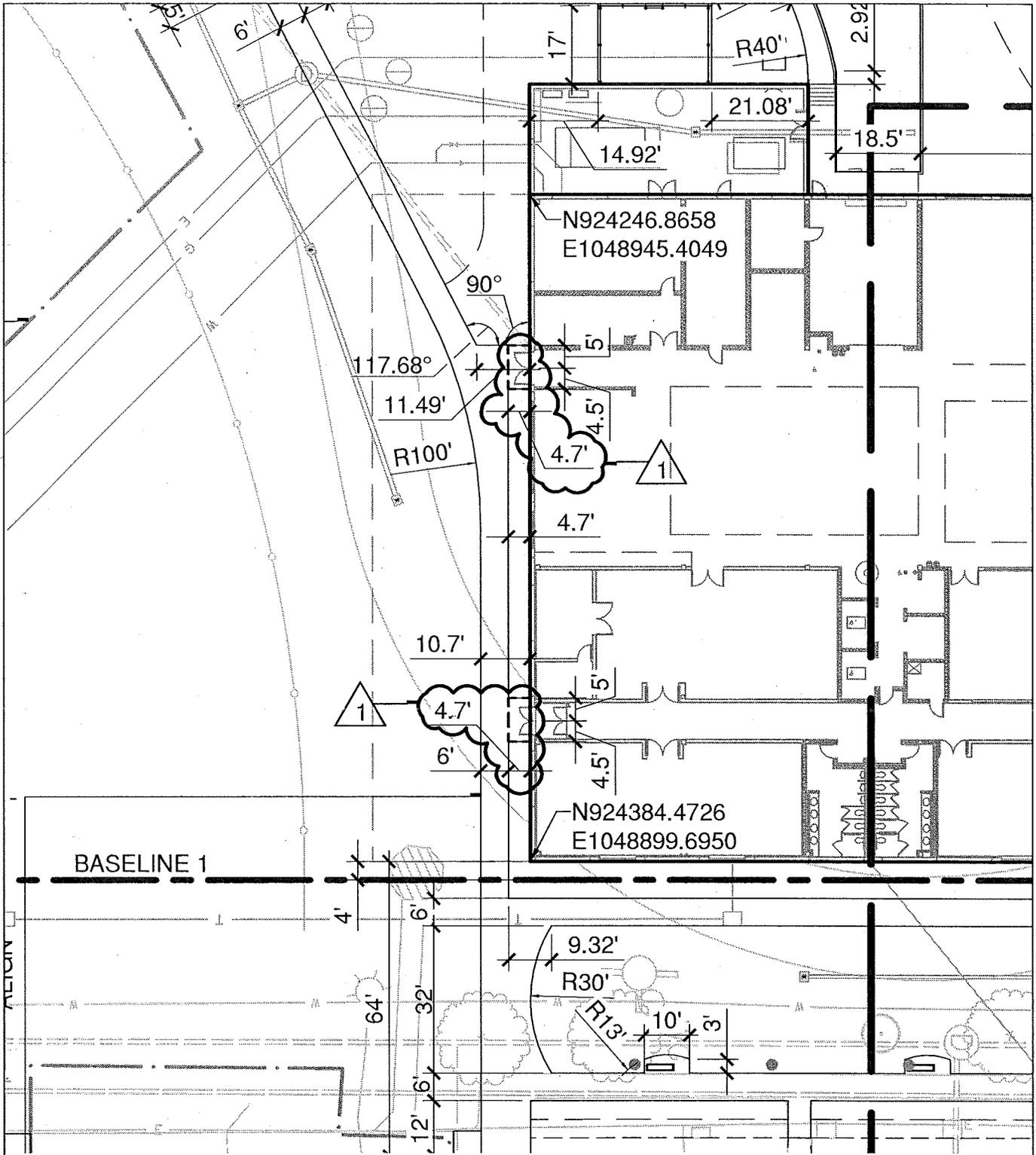


LANDSCAPE ARCHITECT
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 88 CANAL COURT
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PROJECT TITLE Asnuntuck Community College
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SKETCH TITLE DELETED TREE

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 SKETCH NO. AD3-SK-L1.0-2



PROJECT TITLE **Asnuntuck Community College
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SKETCH TITLE **FROST PAD DIMENSIONS REVISED**

DATE 01/11/2016

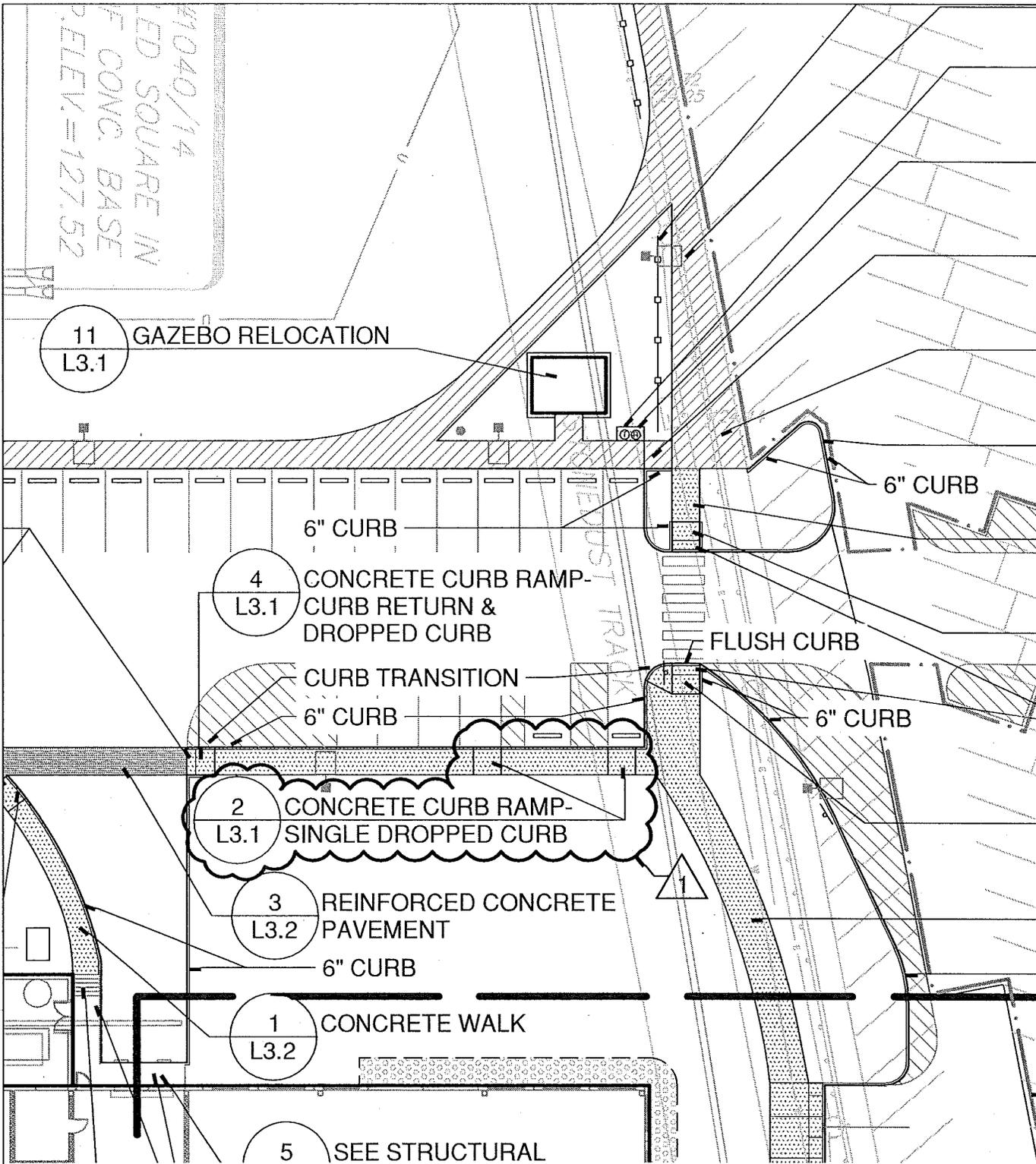
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SCALE: 1"=30'-0"

SKETCH NO.
AD3-SK-L1.1-2

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 PHONE: 860-678-0669

41040/14
 ED SQUARE IN
 F CONC. BASE
 ELEV. = 127.52

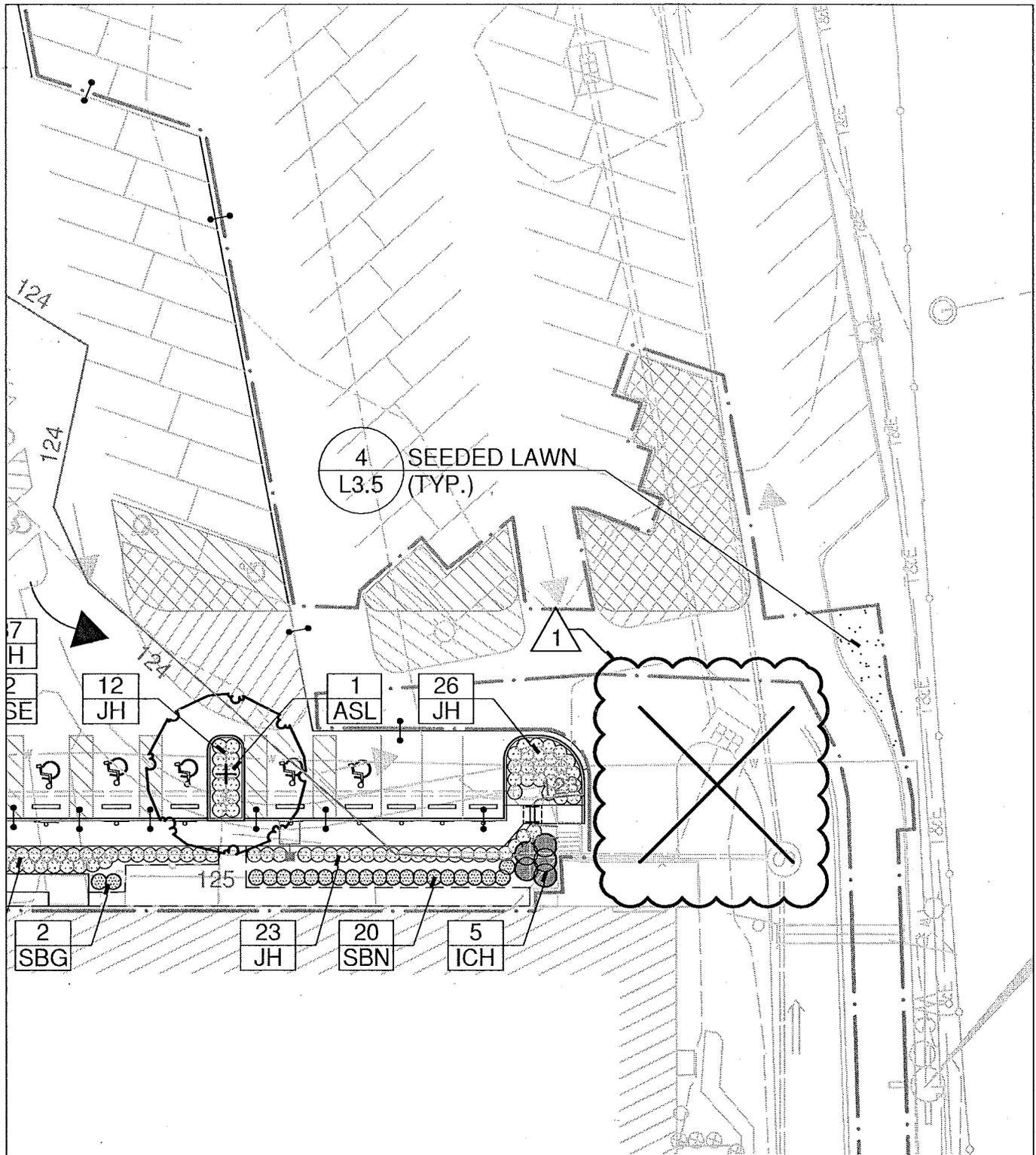


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PROJECT TITLE **Asnuntuck Community College
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SKETCH TITLE
RELOCATED HC PARKING SPACES

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SKETCH TITLE
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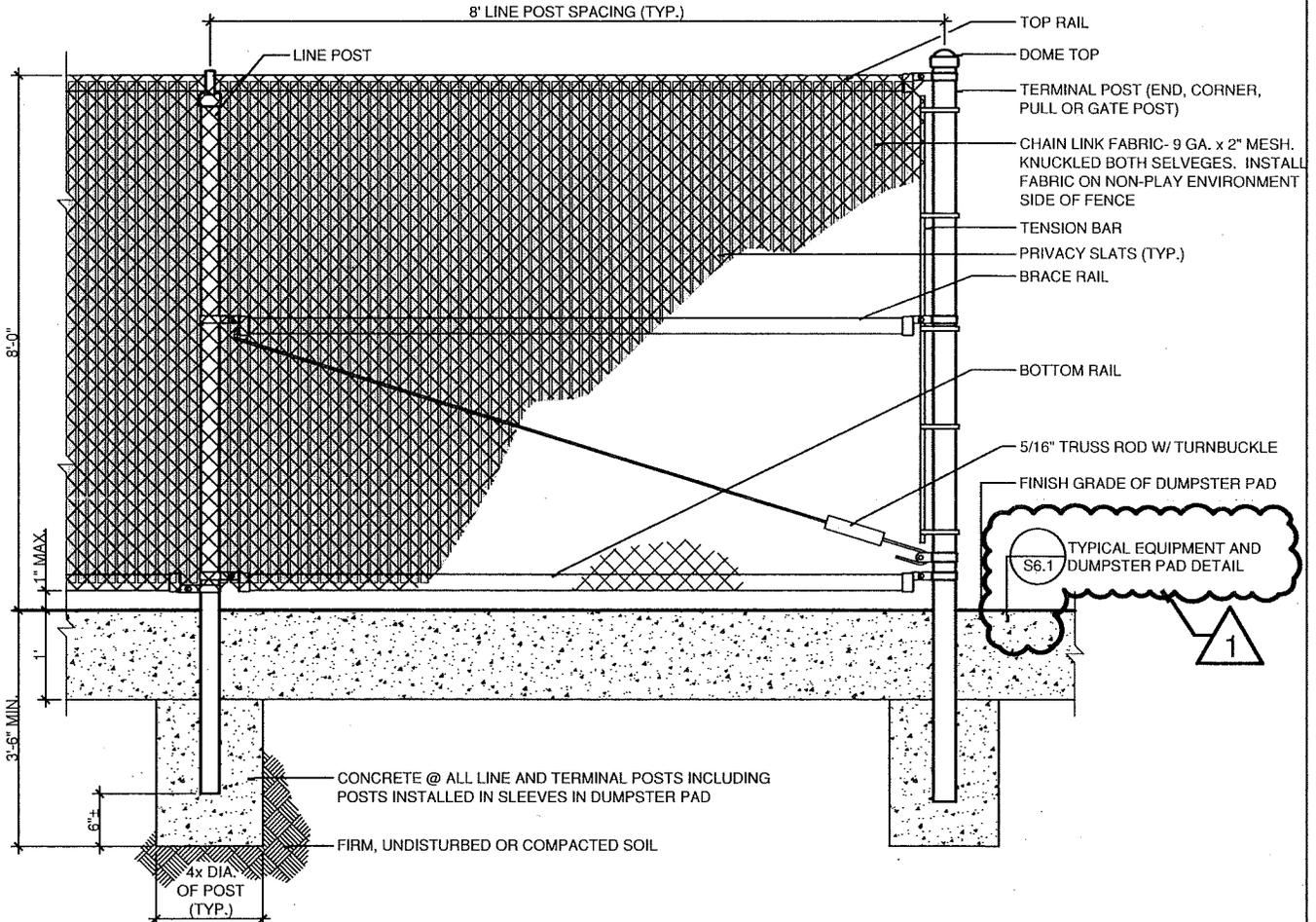
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SCALE: 1"=30'-0"

SKETCH NO.
AD3-SK-L1.4-1

DIMENSIONS				
	FENCE HEIGHT	O.D.	NOM. WEIGHT (LBS/FT)	
			TYPE I	TYPE II
RAILS		1.66"	2.27	1.83
LINE POSTS	8'	2.375"	3.65	3.12
TERMINAL POSTS	8'	2.875"	5.79	4.64
GATE FRAMES	8'	1.66"	2.27	1.83
GATE POSTS	8'	2.875"	5.79	4.64

NOTE:
PROVIDE SLEEVES FOR INSTALLATION
BY DUMPSTER PAD INSTALLER



4 CHAIN LINK FENCE W/ PRIVACY SLATS
N.T.S.

323113-A.DWG



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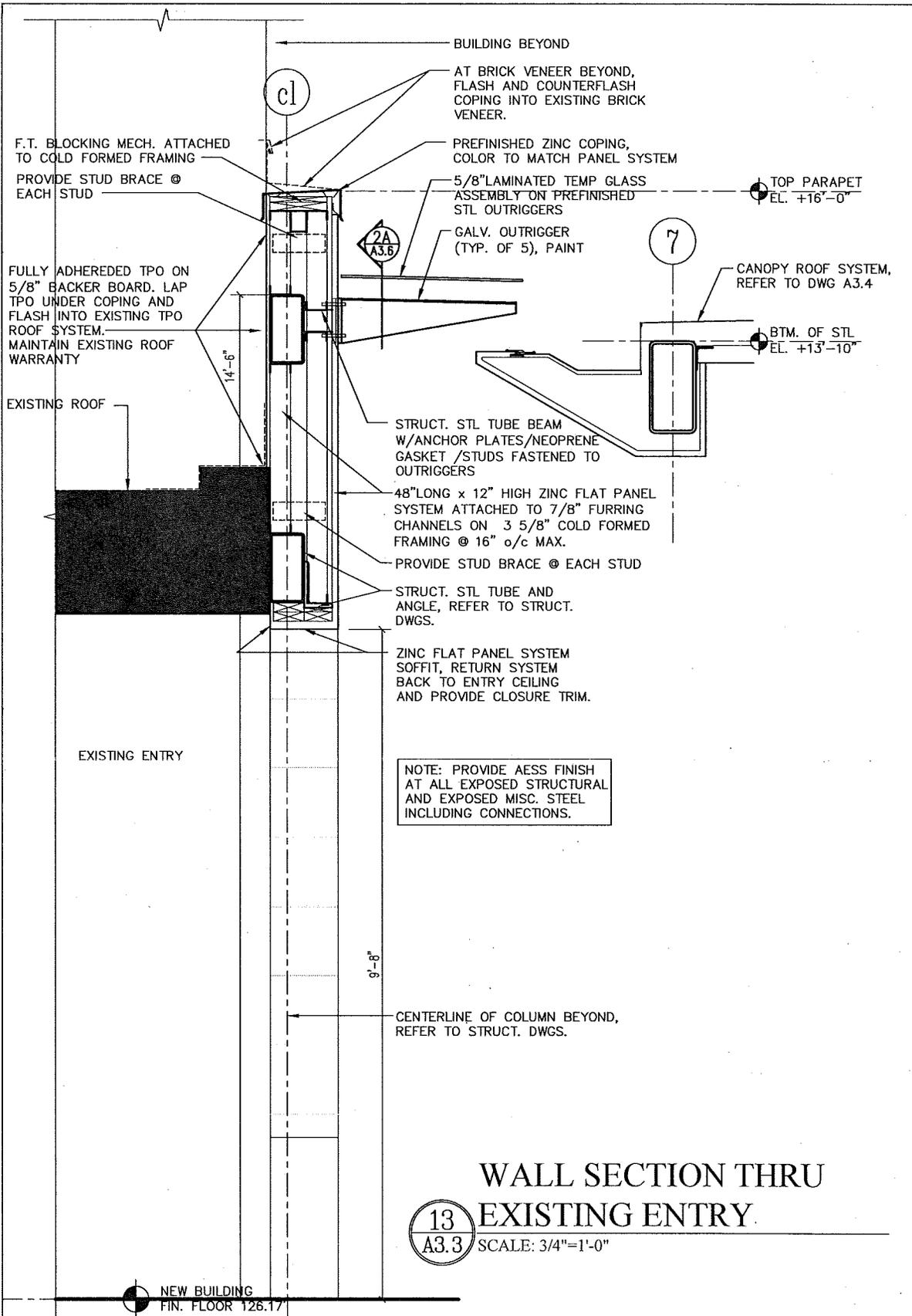
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SKETCH TITLE

SCALE: N.T.S.

CHAIN LINK FENCE W/PRIVACY SLATS

SKETCH NO.
AD3-SK-L3.4-1



NOTE: PROVIDE AESS FINISH AT ALL EXPOSED STRUCTURAL AND EXPOSED MISC. STEEL INCLUDING CONNECTIONS.

WALL SECTION THRU EXISTING ENTRY.

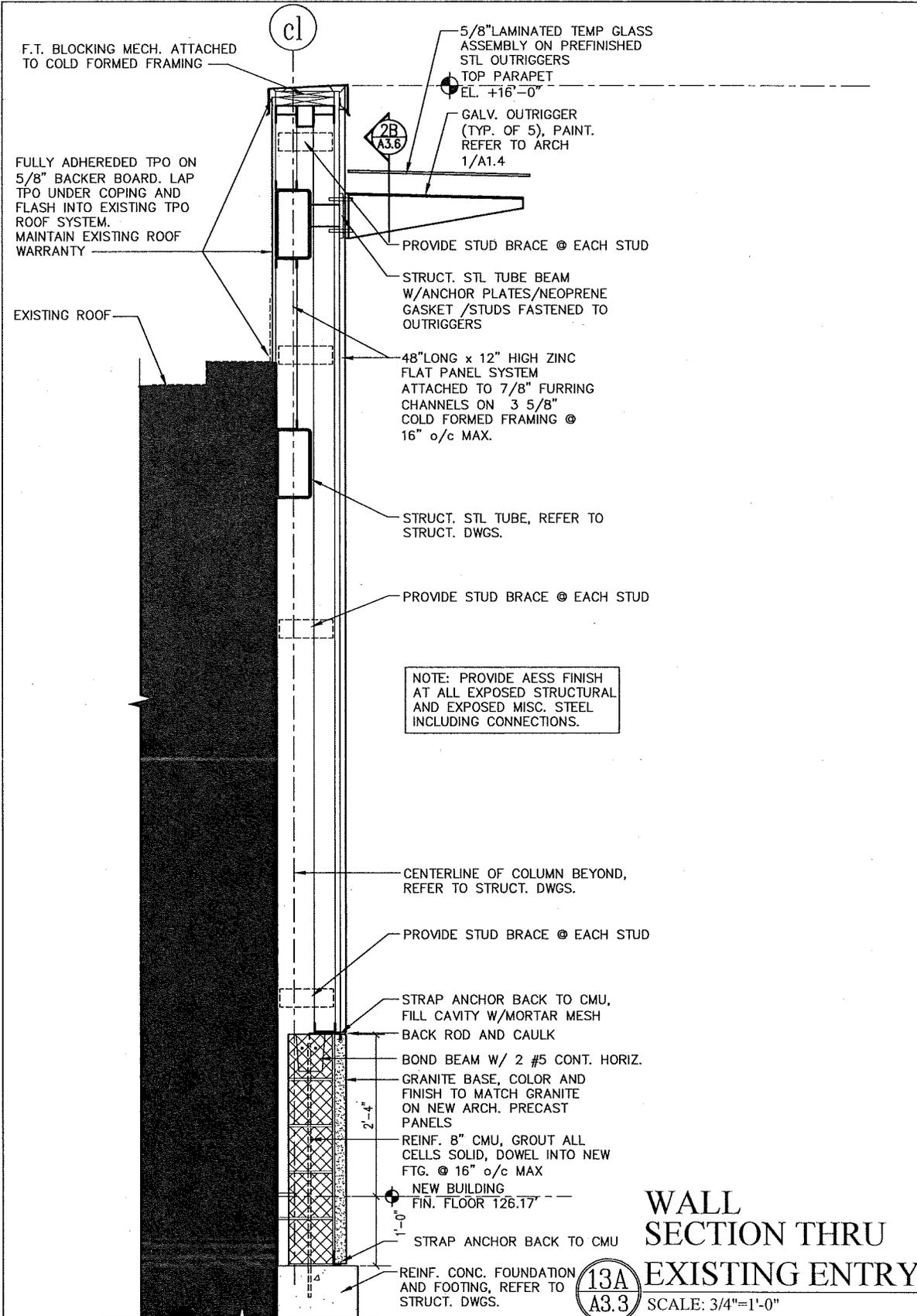
13
A3.3 SCALE: 3/4"=1'-0"



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SKETCH TITLE
WALL SECTION THRU EXISTING ENTRY

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SCALE: 3/4"=1'-0"
SKETCH NO.
AD3-SK-A3.3.1



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WALL SECTION THRU EXISTING ENTRY

13A
A3.3

SCALE: 3/4"=1'-0"



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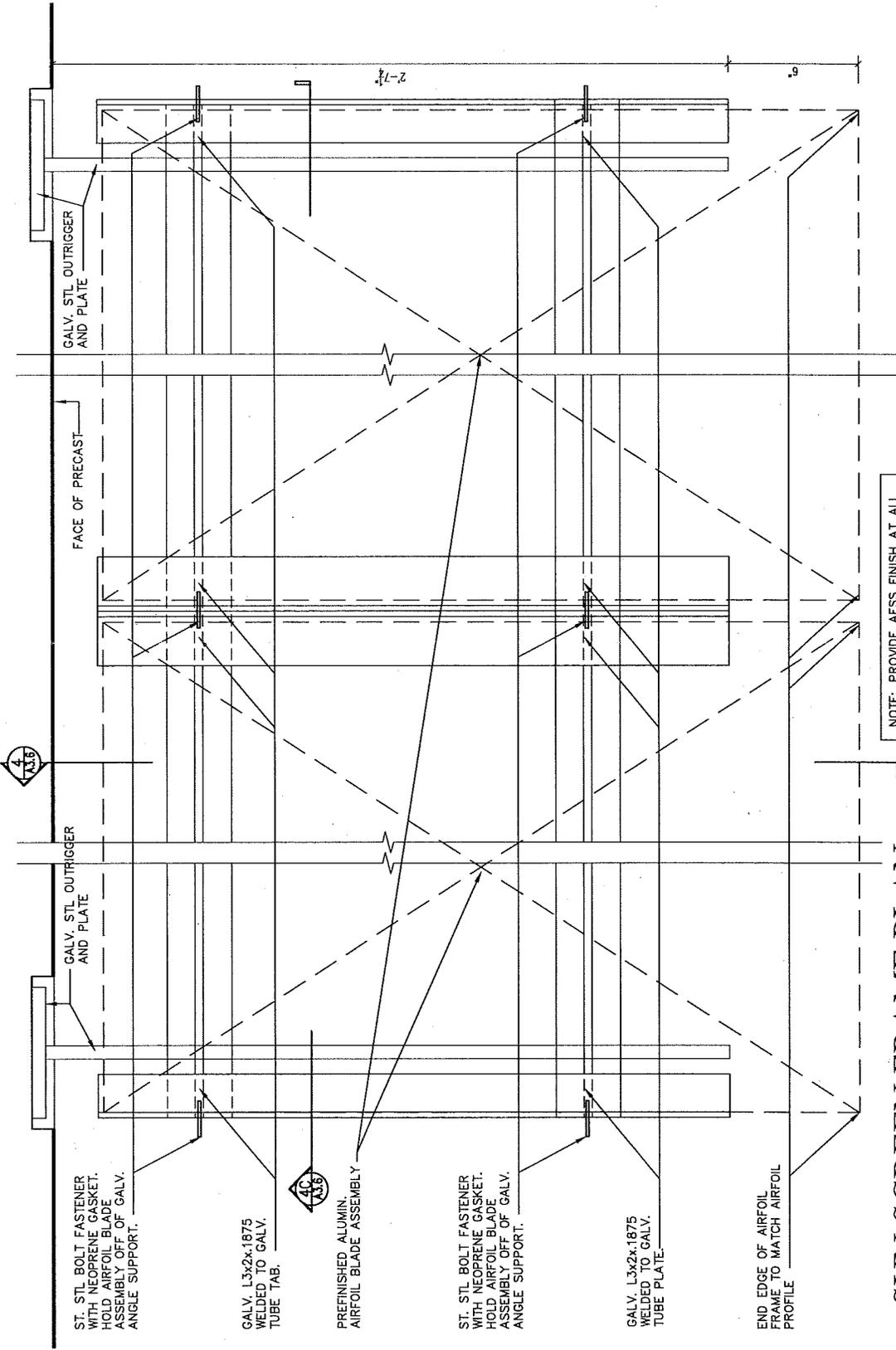
SKETCH TITLE WALL SECTION THRU EXISTING ENTRY

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 SKETCH NO.
 AD3-SK-A3.3.2



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 SKETCH NO. AD3-SK-A3.6.1



NOTE: PROVIDE AESS FINISH AT ALL EXPOSED STRUCTURAL AND EXPOSED MISC. STEEL INCLUDING CONNECTIONS.

SUN SCREEN FRAME PLAN
 SCALE: N.T.S.





ADDITIVE MANUFACTURING LAB EQUIPMENT SCHEDULE

PROJECT TITLE: Asnuntuck Community College
 New Manufacturing Technology Center
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SKETCH TITLE: ADDITIVE MANUFACTURING LAB EQUIPMENT SCHEDULE

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 SCALE: N.T.S.
 SKETCH NO. AD3-SK-E-02

ITEM#QTY.	DESCRIPTION	EXISTING	NEW	FINAL CONNECTION	BY OWNER	FURNISHED/INSTALLED BY OWNER, DROPS AND FEEDS BY CONTRACTOR	EXISTING RELOCATED BY OWNER	UTIL.			POWER				NOTES	
								AIR	DATA	VOLTAGE	PHASE	FLA	HORSE POWER	CORD & PLUG		HARDWIRED
40	1 EOS EOSINT M290 LASER POWDER BED		•	•	•	•		•	2	480	3	15.5				
41	1 FORTUS 450MC		•	•	•	•		•	2	208	3	18				
42	NOT USED															
43	5 MAKERBOT REPLICATOR 5TH GEN.		•	•	•	•				120	1					DESKTOP
44	5 MAKERBOT REPLICATOR Z18		•	•	•	•				120	1					DESKTOP
45	5 MAKERBOT DIGITIZER		•	•	•	•				120	1					DESKTOP
46	1 290 BLAST CABINET		•	•	•	•				208	3	19.0				CONNECTS TO ITEM 40
47	1 EOS 110		•	•	•	•			2	208	3	19.0				
48	1 DIMENSION SST 768	•							2	208	3	19.0				DATA IS LOCAL, NOT NETWORKED

GENERAL EQUIPMENT NOTES:

1. G.C. TO BRING ALL UTILITY DROPS FROM OVERHEAD TO WITHIN 24" OF MACHINE CONNECTION POINTS. DROPS SHALL NOT BE MADE UNTIL EQUIPMENT HAS BEEN SET IN PLACE BY THE OWNER'S RIGGER. COORDINATE WITH DOWNE'S CONTRACTOR.
2. FINAL CONNECTION OF UTILITIES AT ALL MACHINES IS BY THE OWNER'S FORCES.

GENERAL NOTES:

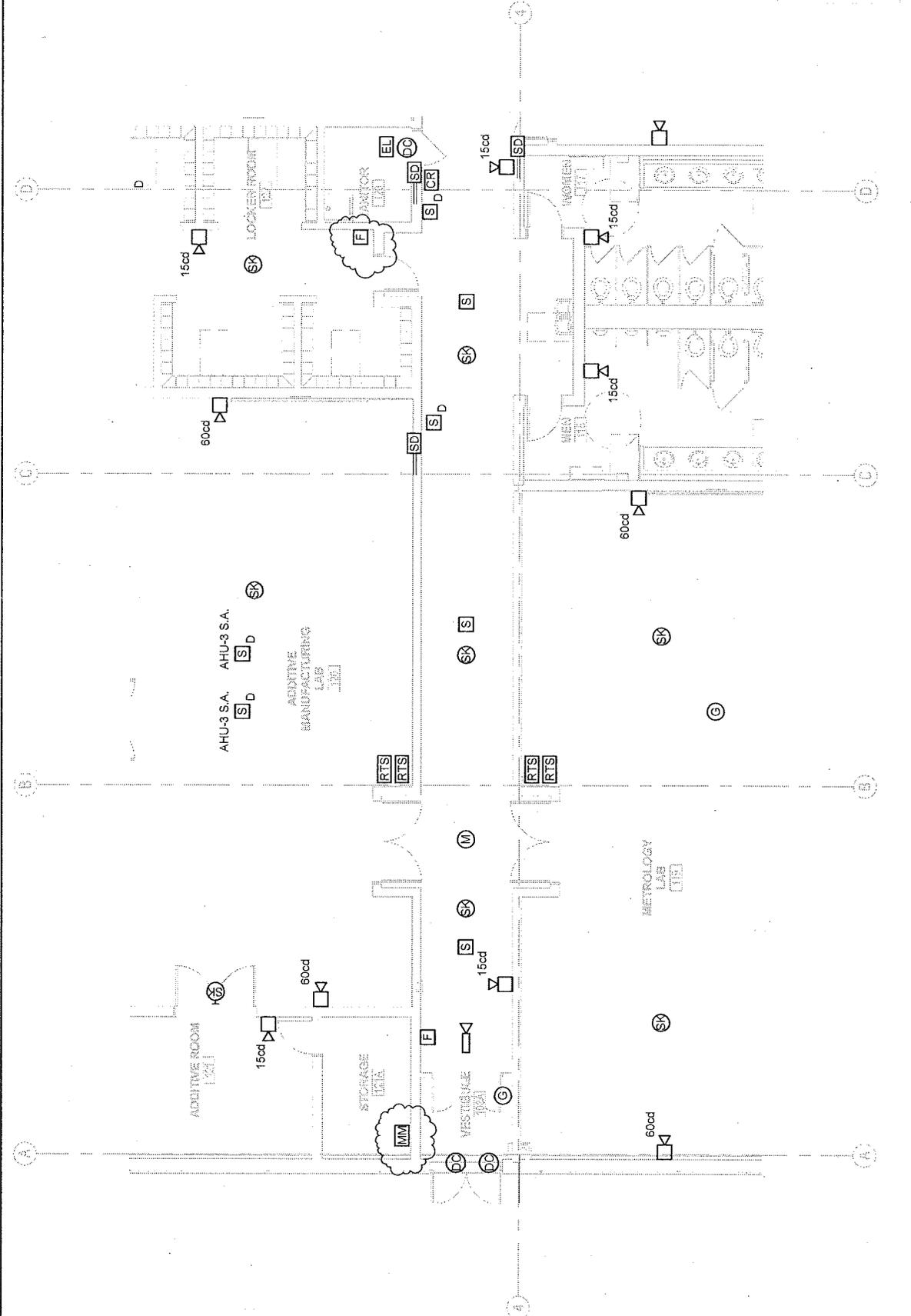
1. COORDINATE WITH MEP DRAWINGS ALL FIXED AND MOVABLE EQUIPMENT UTILITIES, ATTACHMENTS AND SERVICE CLEARANCES.
2. PROVIDE 3" WIDE SAFETY YELLOW STRIPING LENGTHWISE AND ENTIRE LENGTH OF WALKWAY WITH 3" WIDE SAFETY YELLOW DIAGONAL STRIPING @ 12°/c. LAYOUT AS SHOWN ON PLAN.



FIRST FLOOR SPECIAL SYSTEMS PLAN

AD3-SK1-ES1
SKETCH NO.
SCALE: 1/8" = 1'-0"
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BLCTC-488
SKETCH TITLE





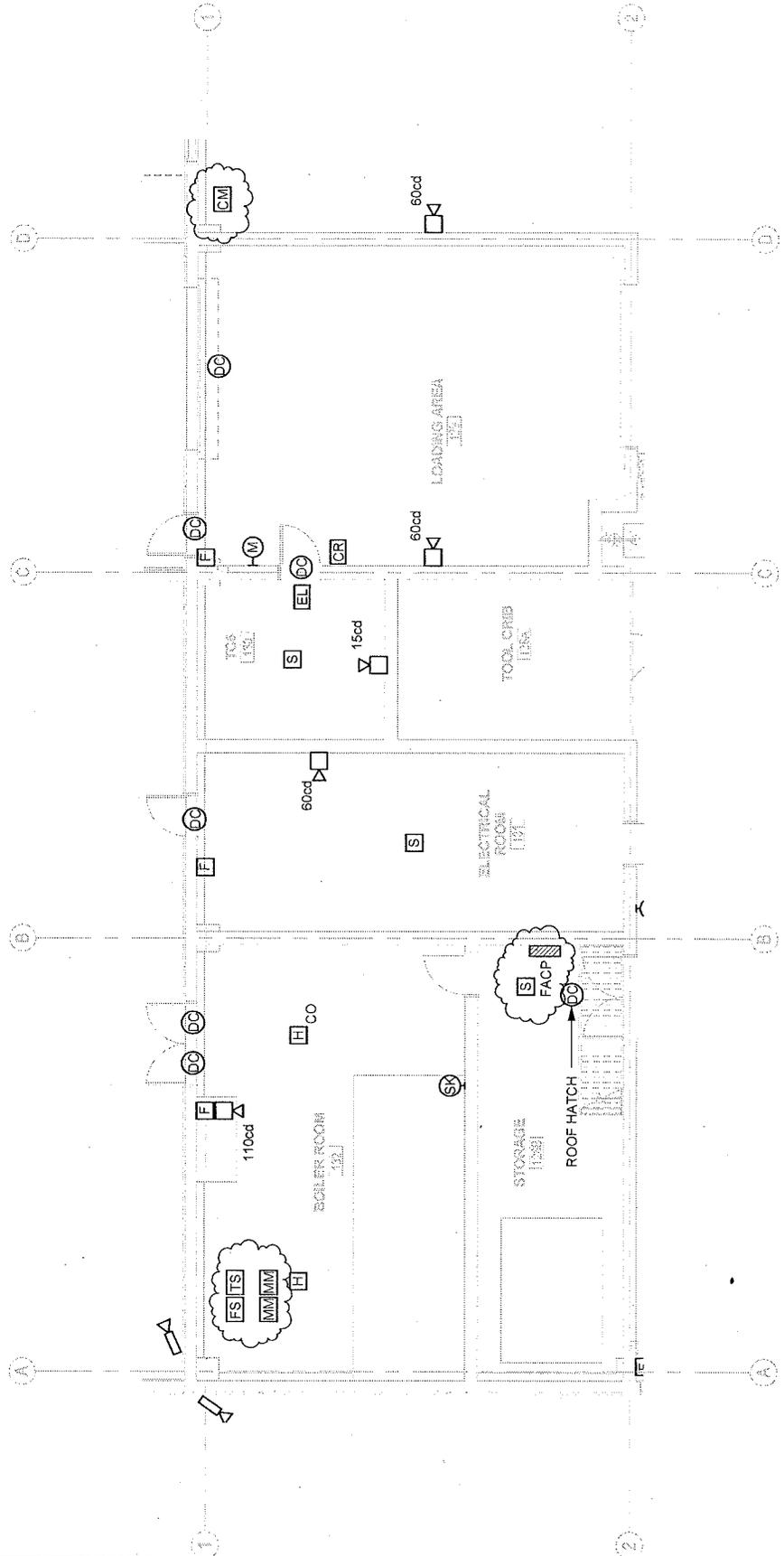
FIRST FLOOR SPECIAL SYSTEMS PLAN

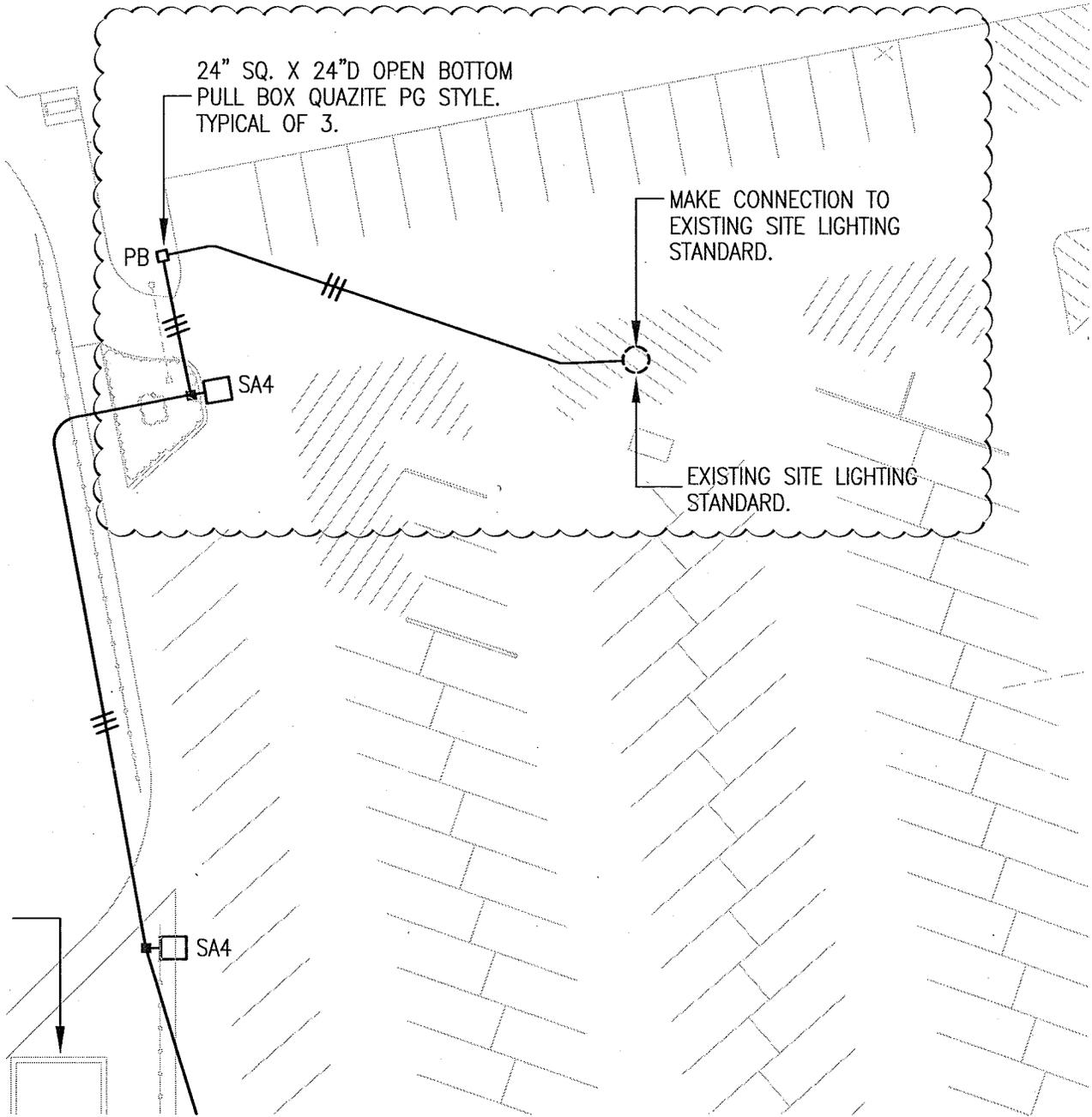
SKETCH NO. AD3-SK2-ES1.1

SCALE: 1/8" = 1'-0"
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BI-CTC-488

PROJECT TITLE
Asnuntuck Community College
New Manufacturing Technology Center

SKETCH TITLE





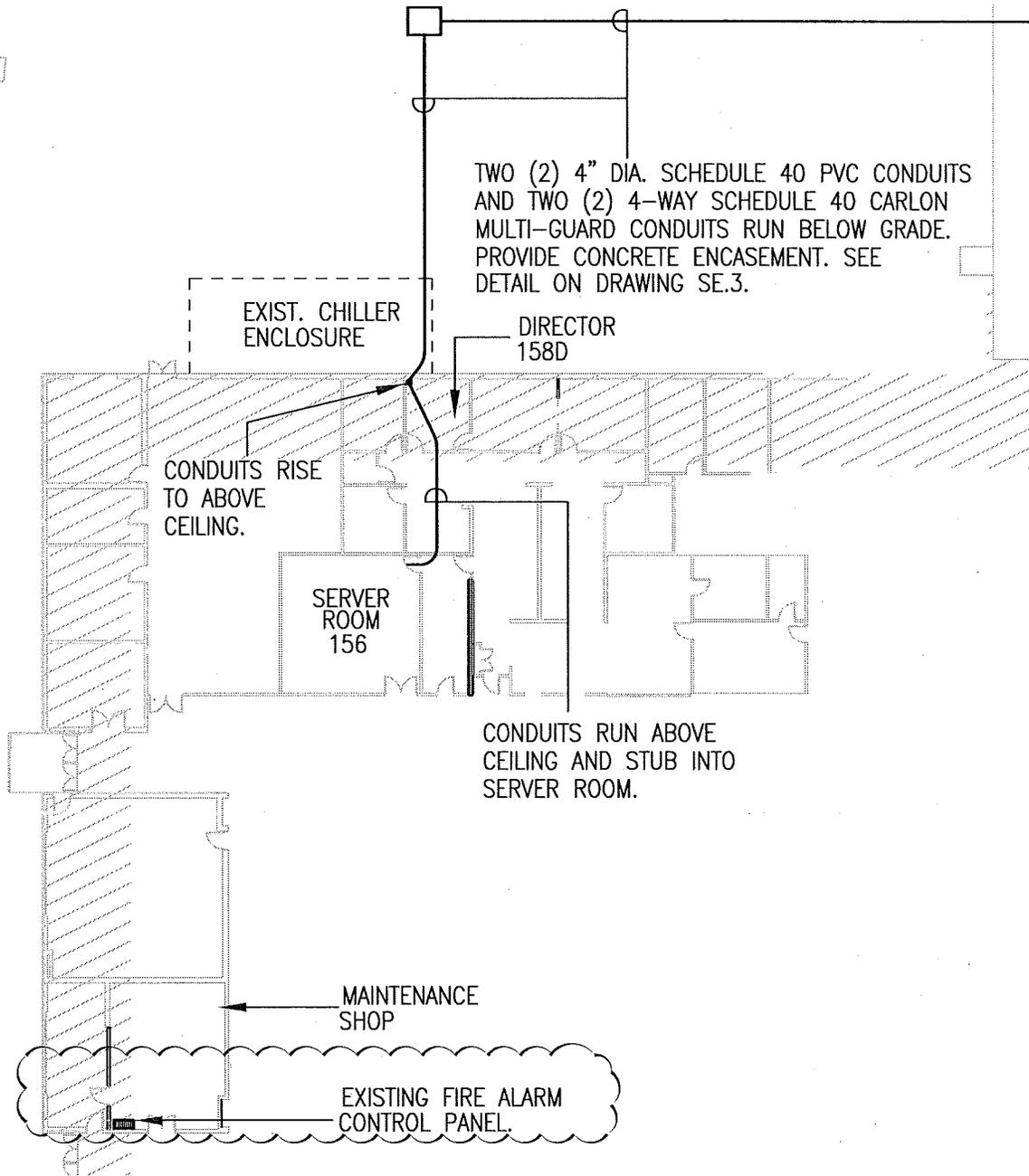
PROJECT TITLE Asnuntuck Community College
New Manufacturing Technology Center
 170 Elm Street, Enfield, Connecticut
 BI-CTC-488

SKETCH TITLE SITE ELECTRICAL PLAN

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SKETCH NO.
AD3-SK1-SE.1



BEMIS ASSOCIATES, LLC

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SKETCH TITLE

SITE ELECTRICAL PLAN

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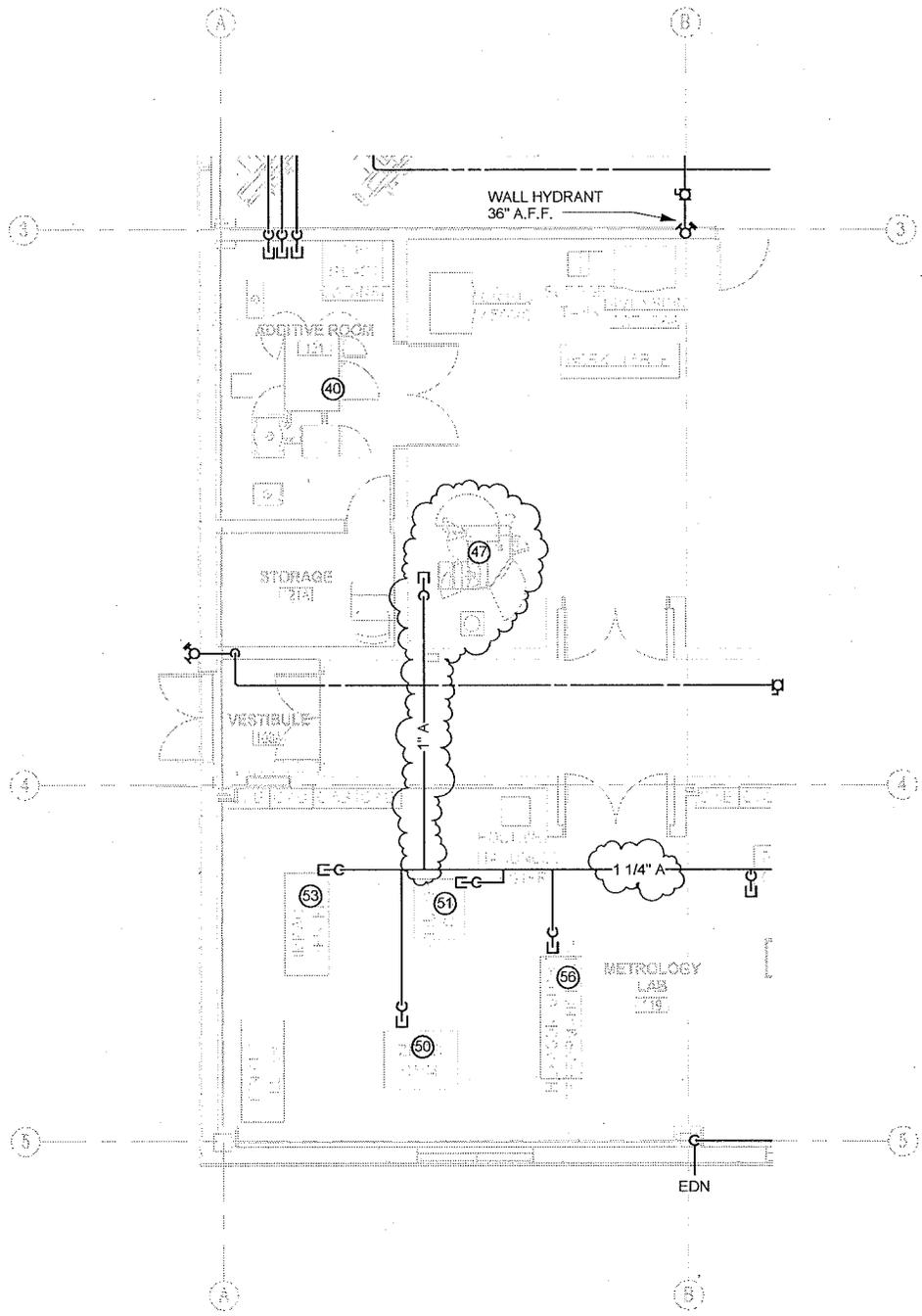
SCALE: AS NOTED

SKETCH NO.
AD3-SK2-SE.1

LABORATORY & SHOP EQUIPMENT SCHEDULE

ITEM#	QTY.	DESCRIPTION
?		
47	1	EOS 110

• AIR 1



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New Manufacturing Technology Center
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BI-CTC-488

SKETCH TITLE FIRST FLOOR PLUMBING PLAN

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 SCALE: 1/8" = 1'-0"
 SKETCH NO.
AD3-SK1-P1.1

C	2" W X 2" L X 3 7/8" H RECESSED LED FIXTURE WITH 20 GAUGE DIE FORMED COLD ROLLED STEEL HOUSING (WHITE FINISH), 22 GAUGE DIE FORMED COLD ROLLED STEEL REFLECTORS (WHITE FINISH), SPOTLESS CLEAR ACRYLIC LENS, AND DIMMING LED DRIVER (120/277V). AXIS #DAYLED-22-B3-4000-35-S0-W-UNV-D-1-TB9.	LED'S, 4000 LUMENS, 3500° K, 80 CRI	42.5	FOCAL POINT #FEQ122-WP-4000LH-35K-1C-UNV-LD1-LEDALITE #4122-02-ST-LBB-D-S-1-X-DM
D	2" W X 4" L X 4 1/4" D RECESSED LED FIXTURE WITH DIE-FORMED CODE GAUGE COLD-ROLLED STEEL HOUSING (WHITE FINISH), PATTERN 19 FROSTED ACRYLIC .156" LENS, AND LED DRIVER (120/277V). HUBBELL LIGHTING #LIT24-35HLC-FSA19F-E-U-FK24.	LED'S, 5500 LUMENS, 3500° K, 82 CRI	45.0	LITHONIA #27L460L FW A19 EZ1 LP835 DGA24 PHILIPS #SP S 24 G FS KA 43A 40 U LAG-FK92X4
E	7 1/2" H X 13" W WALL MOUNT SINGLE FACE EDGE LT LED EXIT SIGN FIXTURE WITH EXTRUDED ALUMINUM LAMP HOUSING AND CANOPY (WHITE FINISH), ACRYLIC GRAPHIC LENS WITH RED LETTERS AND MIRROR BACKGROUND, NI-CAD BATTERY, AND ISOLATED DIGITAL TYPE POWER SUPPLY AND CHARGER (120/277V). SIGNTEX #CRSBB-1RMW-NA-TM.	LED'S	1.5	NO ARROWS. PROVIDE 4" SQ. X 2 1/8" DEEP J-BOX WITH 1 1/2" EXTENSION. ISOLITE #ELT-EM-R-XM-BA EVENLITE #FRES (BA H5G)
E1	7 1/2" H X 21" W CEILING MOUNT SINGLE FACE EDGE LT LED "HANDICAP ACCESSIBLE" EXIT FIXTURE WITH EXTRUDED ALUMINUM LAMP HOUSING AND CANOPY (WHITE FINISH), ACRYLIC GRAPHIC LENS WITH RED LETTERS AND THE INTERNATIONAL SIGN OF ACCESSIBILITY, MIRROR BACKGROUND, NI-CAD BATTERY, AND ISOLATED DIGITAL TYPE POWER SUPPLY AND CHARGER (120/277V). SIGNTEX #CAEBB-1RMW-NA-TM.	LED'S	1.5	NO ARROWS. PROVIDE 4" SQ. X 2 1/8" DEEP J-BOX WITH 1 1/2" EXTENSION. ISOLITE #ELT-EM-R-XM-BA-sw EVENLITE #FRES (BA H5G)

LIGHT FIXTURE SCHEDULE

SKETCH TITLE

170 Elm Street, Enfield, Connecticut
BI-CTC-488
Asnuntuck Community College Center
New Manufacturing Technology Center

PROJECT TITLE



AD3-SK-1-M1.1

SKETCH NO.

SCALE: 1/8" = 1'-0"

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FIRST FLOOR HVAC PLAN

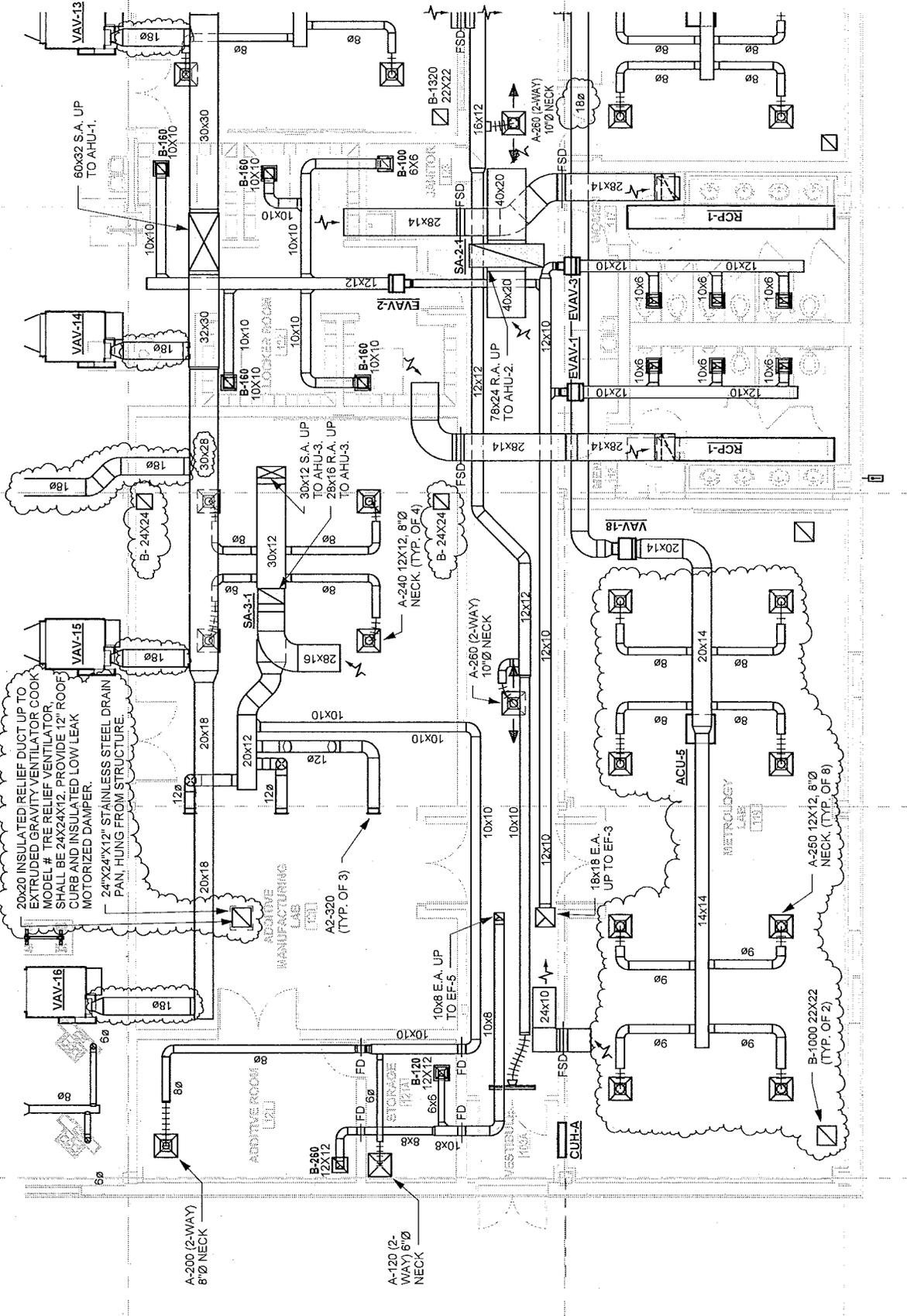
SKETCH TITLE

BL-CTC-488

170 Elm Street, Enfield, Connecticut

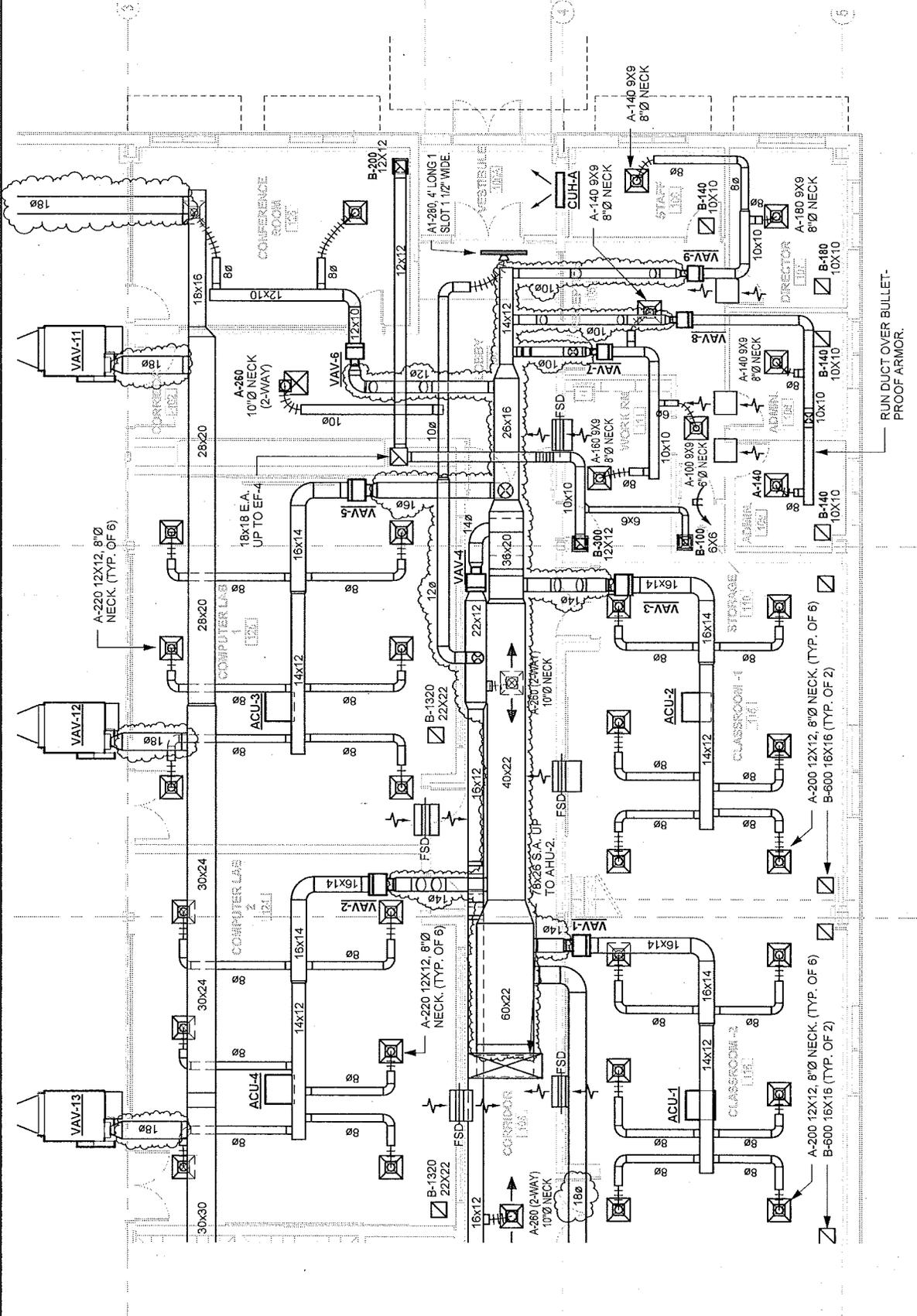
Asnuntuck Community College
New Manufacturing Technology Center

PROJECT TITLE



AD3-SK2-M1.1
 SKETCH NO.
 SCALE: 1/8" = 1'-0"
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 ARCHITECTURAL ENGINEERS

PROJECT TITLE
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 170 Elm Street, Enfield, Connecticut
 B-C-T-C-488
 SKETCH TITLE
 FIRST FLOOR HVAC PLAN



RUN DUCT OVER BULLET-
 PROOF ARMOR.

3 4 5

AD3-SK1-M1.2

SKETCH NO.

SCALE: 1/8" = 1'-0"

DATE: 1/11/2016

PROJECT TITLE

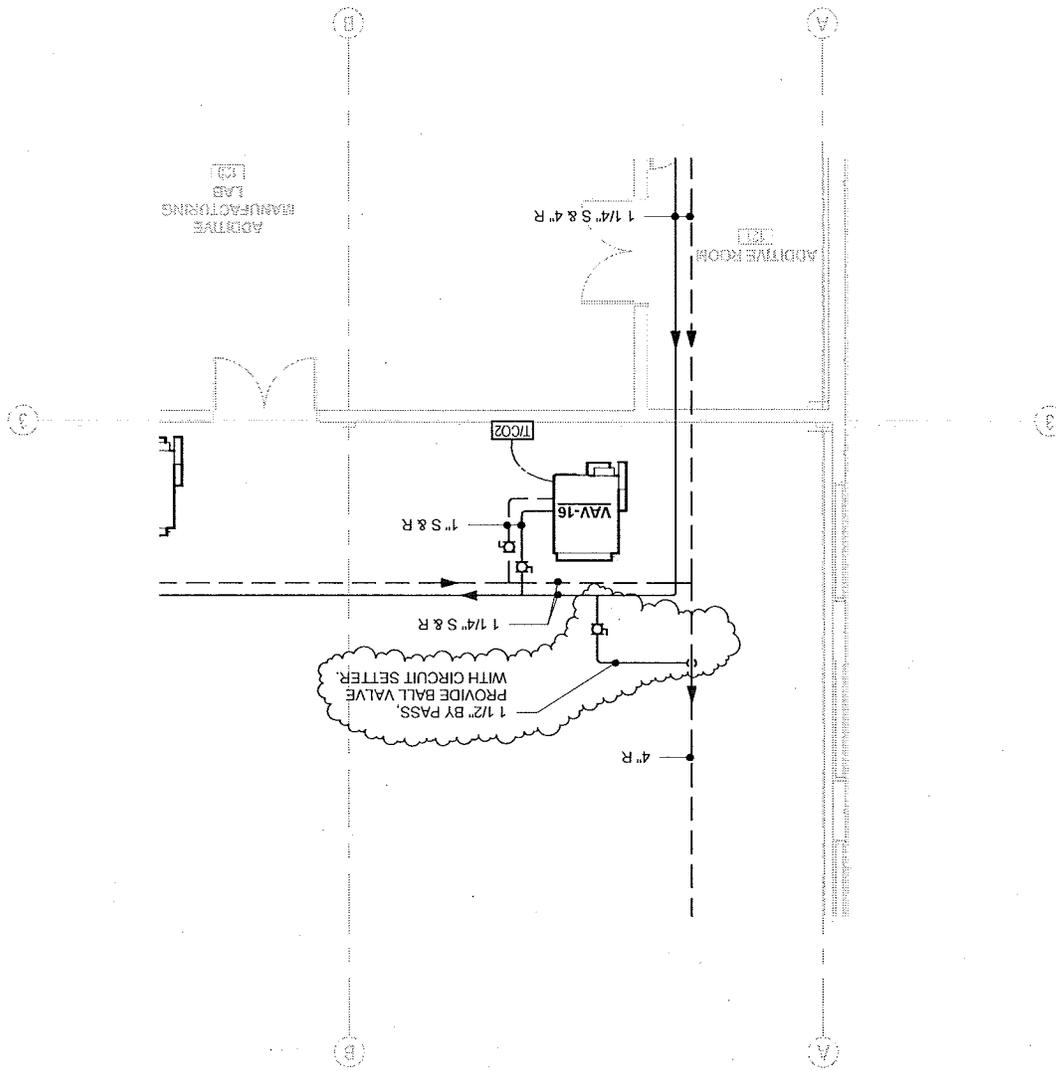
170 Elm Street, Enfield, Connecticut

BL-CTC-488

FIRST FLOOR HYDRONIC PIPING PLAN

PROJECT TITLE

Asnuntuck Community College
New Manufacturing Technology Center



ADDITIVE LAB
MANUFACTURING

ADDITIVE ROOM

1 1/2" BY PASS
WITH CIRCUIT SETTER
AND BALL VALVE

VAV-16

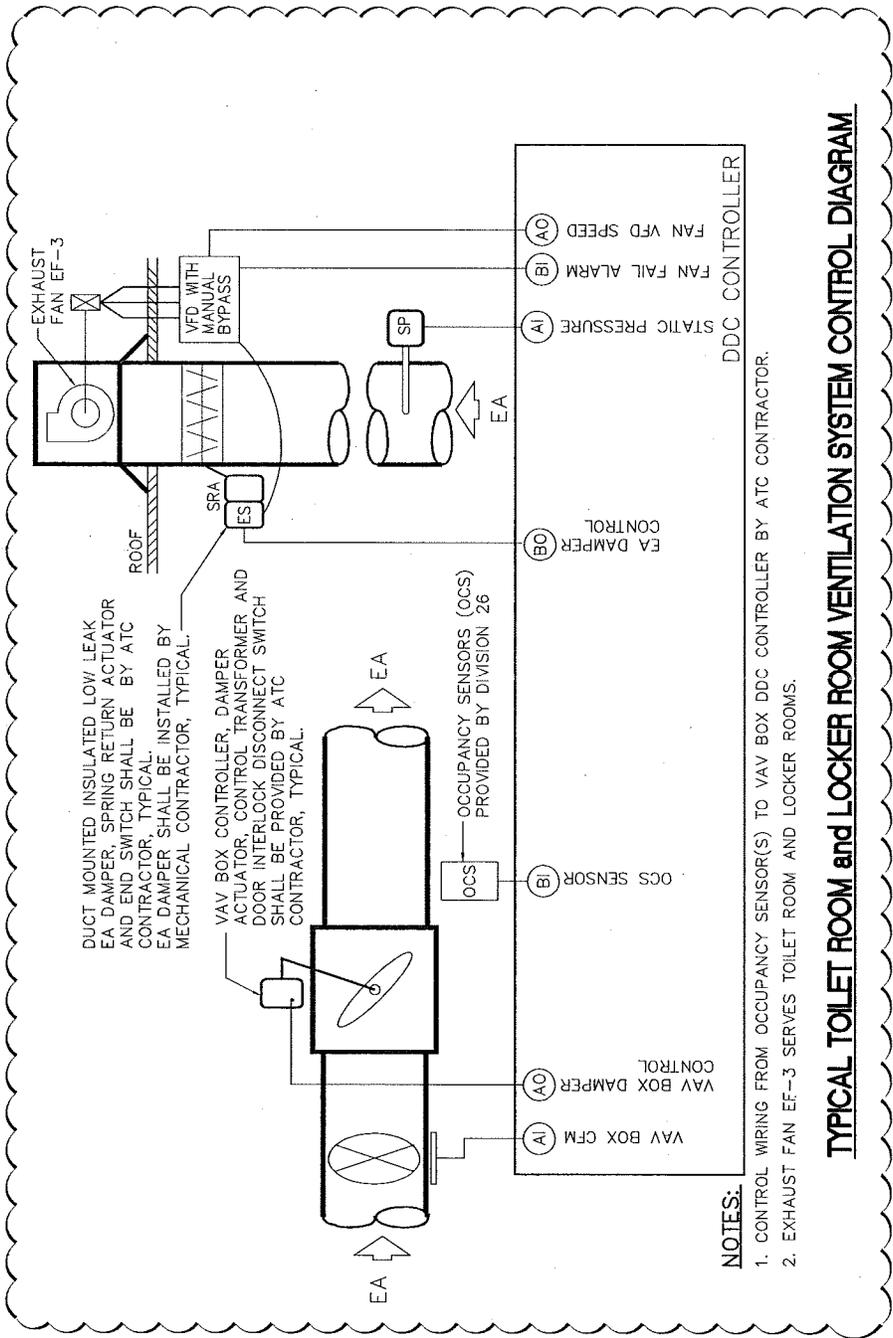
T1002

1" S & R

1 1/4" S & R

1 1/4" S & R

4" R

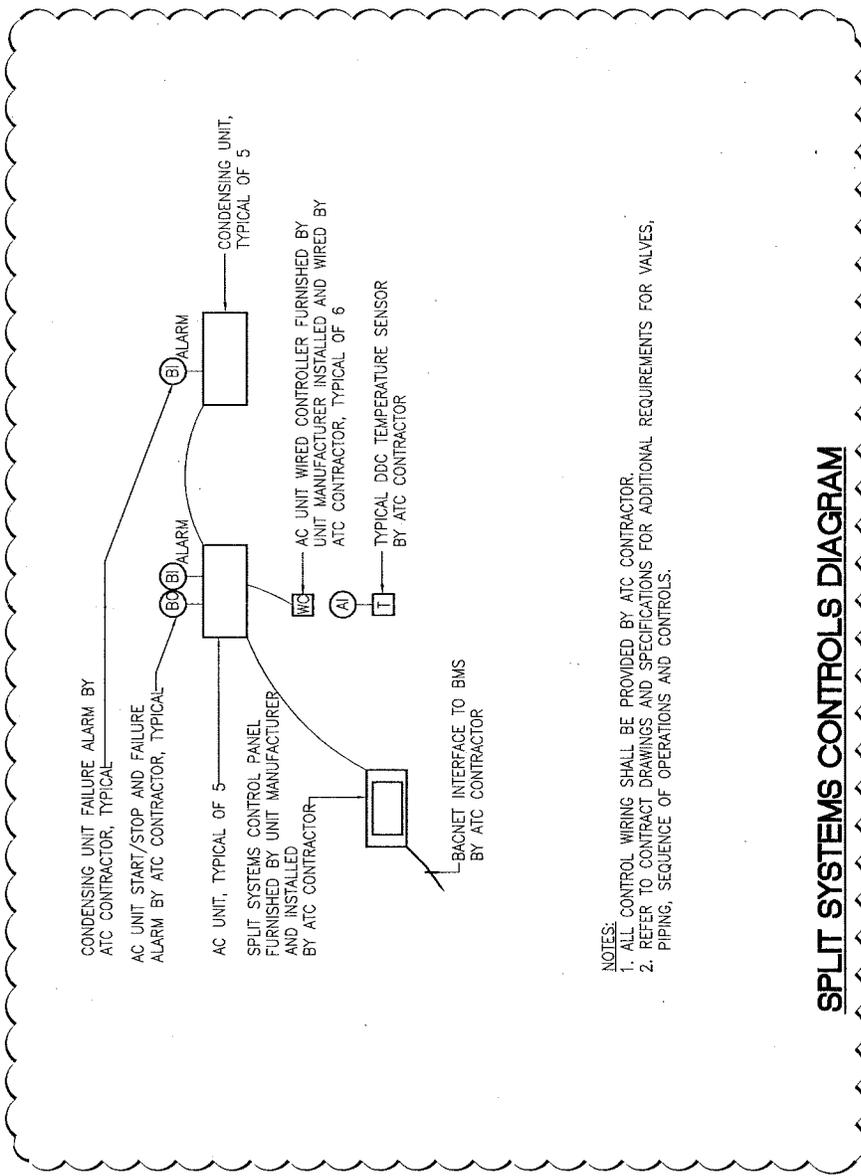


TYPICAL TOILET ROOM and LOCKER ROOM VENTILATION SYSTEM CONTROL DIAGRAM

SPLIT SYSTEMS CONTROLS DIAGRAM

PROJECT TITLE
 Asnuntuck Community College
 New Manufacturing Technology Center
 170 Elm Street, Enfield, Connecticut
 BL-CTC-488

SKETCH TITLE



- NOTES:
1. ALL CONTROL WIRING SHALL BE PROVIDED BY ATC CONTRACTOR.
 2. REFER TO CONTRACT DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR VALVES, PIPING, SEQUENCE OF OPERATIONS AND CONTROLS.

SPLIT SYSTEMS CONTROLS DIAGRAM

AD3-SK1-EP1.1
SKETCH NO.

SCALE: 1/8" = 1'-0"

DATE 1/11/2016

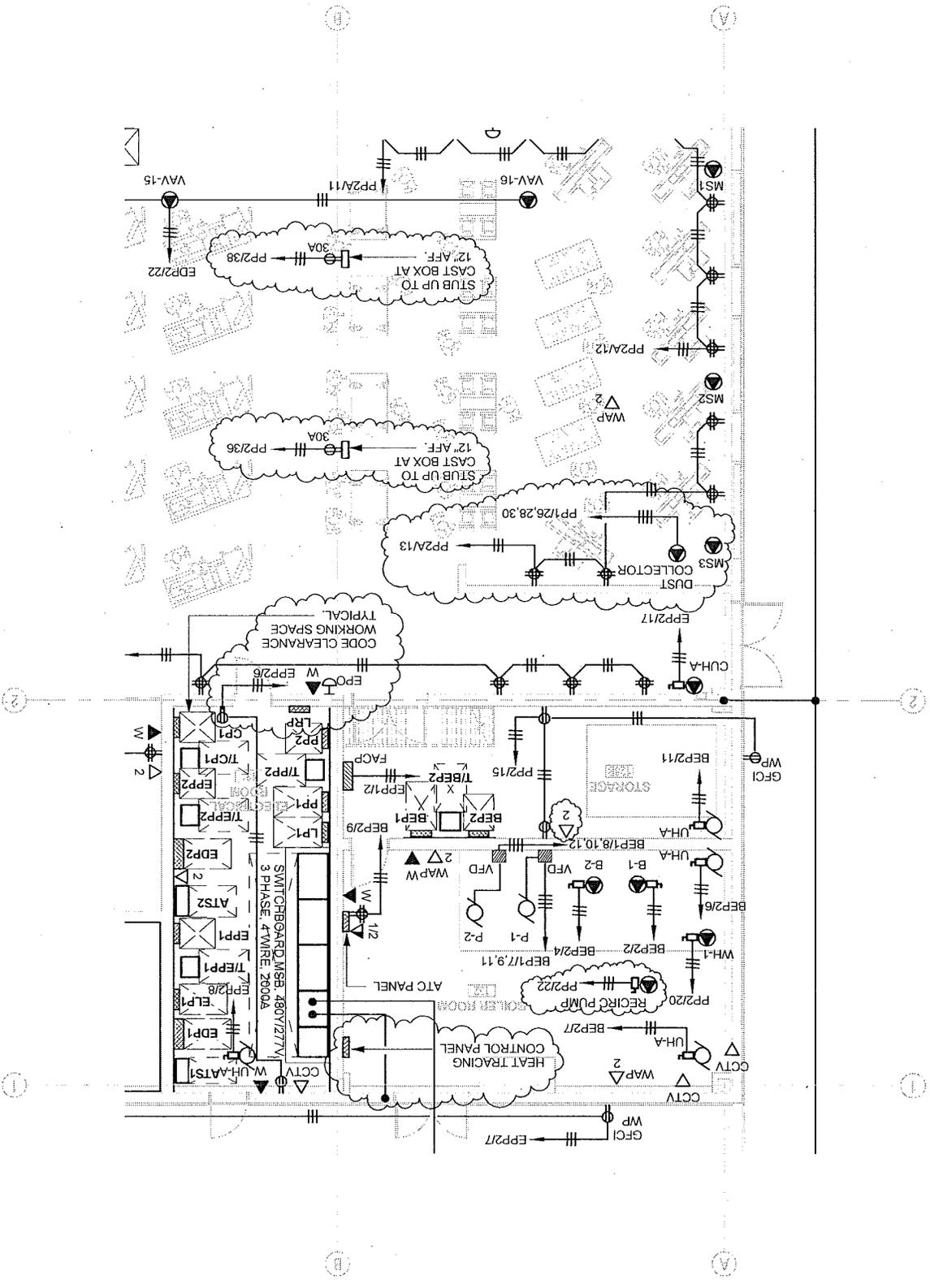
DATE 1/11/2016

DATE 1/11/2016

FIRST FLOOR POWER PLAN

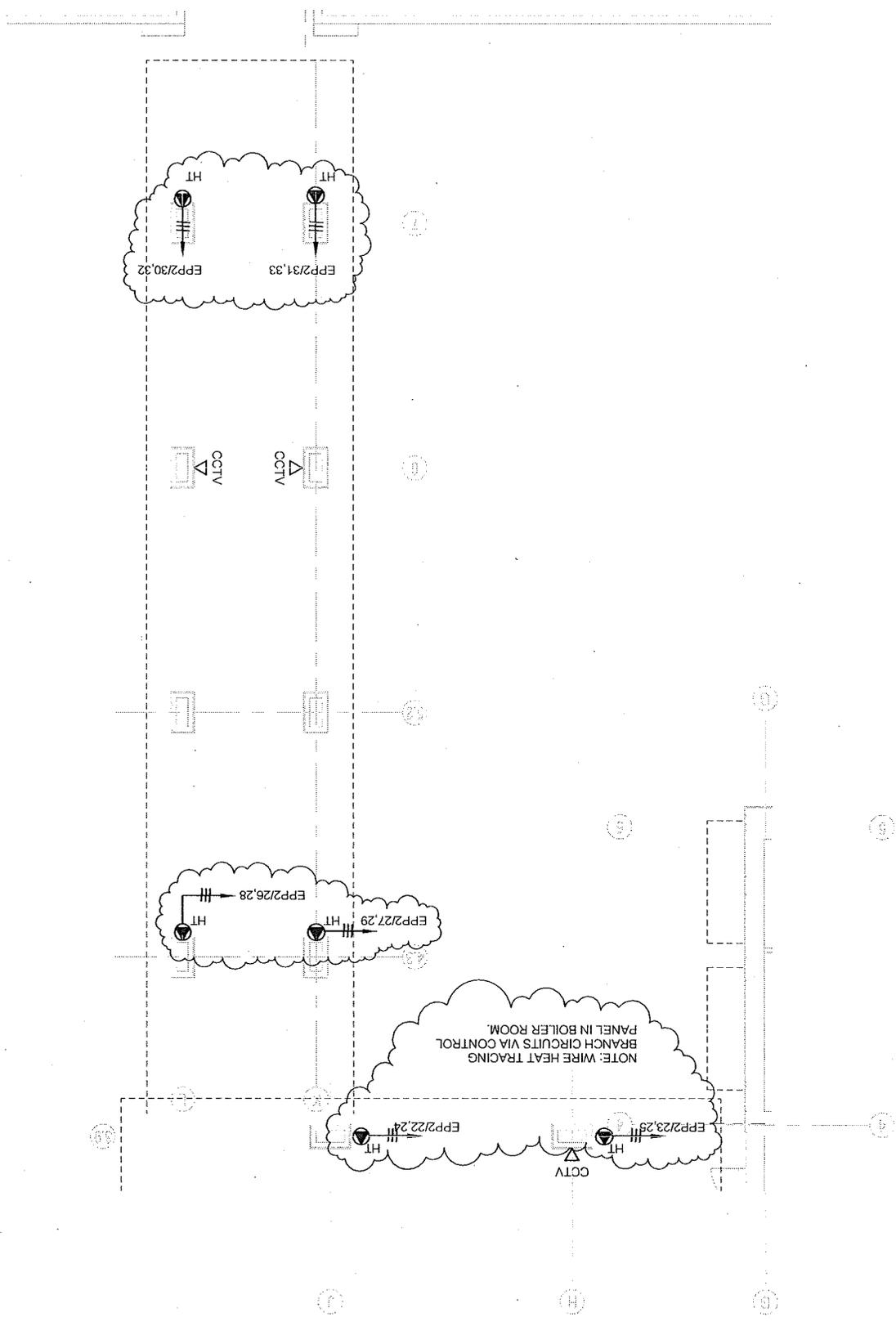
PROJECT TITLE

Asnuntuck Community College
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170 Elm Street, Enfield, Connecticut
BL-CTC-488



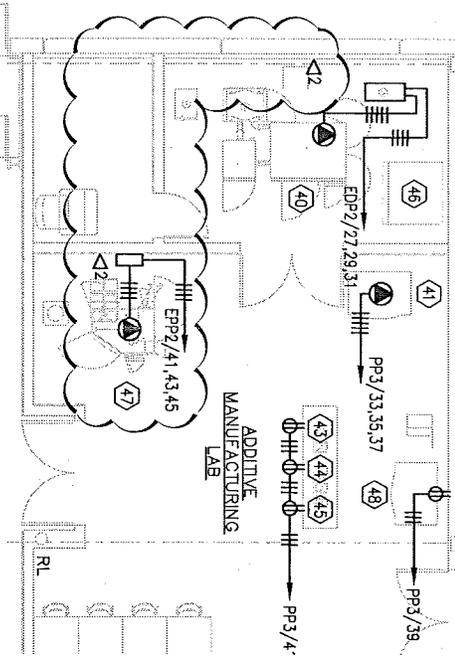
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 DATE: 1/11/2016
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PROJECT TITLE
 Asnutuck Community College
 New Manufacturing Technology Center
 170 Elm Street, Fairfield, Connecticut
 BLCTC-488
 SKETCH TITLE
 FIRST FLOOR POWER PLAN



FIRST FLOOR PLAN

SCALE: 1/8"=1'-0"



ADDITIVE MANUFACTURING LAB EQUIPMENT SCHEDULE

ITEM#	QTY	DESCRIPTION	EXISTING	NEW	FINAL CONNECTION BY OWNER	FURNISHED/INSTALLED BY OWNER. DROPS AND FEEDS BY CONTRACTOR	EXISTING RELOCATED BY OWNER	UTIL.		POWER					NOTES	
								AIR	DATA	VOLTAGE	PHASE	FLA	HORSE POWER	CORD & PLUG		HARDWIRED
40	1	EOS EOSINT M290 LASER POWDER BED														
41	1	FORTUS 450MC														
42		NOT USED														
43	5	MAKERBOT REPLICATOR 5TH GEN.														DESKTOP
44	5	MAKERBOT REPLICATOR Z18														DESKTOP
45	5	MAKERBOT DIGITIZER														DESKTOP
46	1	290 BLAST CABINET														CONNECTS TO ITEM 40
47	1	EOS 110														
48	1	DIMENSION SST 788														DATA IS LOGIC, NOT NETWORKED

GENERAL EQUIPMENT NOTES:

1. G.C. TO BRING ALL UTILITY DROPS FROM OVERHEAD TO WITHIN 24" OF MACHINE CONNECTION POINTS. DROPS SHALL NOT BE MADE UNTIL EQUIPMENT HAS BEEN SET IN PLACE BY THE OWNER'S RIGGER. COORDINATE WITH DOWNE'S CONTRACTOR.
2. FINAL CONNECTION OF UTILITIES AT ALL MACHINES IS BY THE OWNER'S FORCES.



MOSER PILON NELSON ARCHITECTS
170 ELM STREET, ENFIELD, CONNECTICUT 06024
TEL: 860-271-1111 FAX: 860-271-1112

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 BI-CTC-488

SKETCH TITLE FIRST FLOOR EQUIPMENT POWER PLAN

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 SCALE: AS NOTED
 SKETCH NO. **AD3-SK1-EP1.3**

PANEL: PP1					MANUFACTURE & MODEL: CUTLER-HAMMER TYPE PRL3a								
MOUNTING: SURFACE					VOLTAGE CLASSIFICATION: 480Y/277V, 3 PHASE, 4 WIRE								
MAINS RATING: 600 AMP MAIN LUGS					SCR (FULLY RATED): 42K A.I.C. MIN.								
200% NEUTRAL: NO					SPD: NO								
BREAKER			PHASE LOAD - KW						BREAKER				
#	TRIP RATING	POLE	LOAD DESCRIPTION	LOAD KW	A	B	C	LOAD KW	LOAD DESCRIPTION	TRIP RATING	POLE	#	
1	300	3	T/PP2	45.94	45.95			0.01	KWH/DEMAND METER	20	3	2	
3	-	-	-	38.25		38.26		0.01	-	-	-	4	
5	-	-	-	31.64			31.65	0.01	-	-	-	6	
7	100	3	AIR COMPRESSOR	16.60	17.43			0.83	B+S 618 GRINDER	20	3	8	
9	-	-	-	16.60		17.43		0.83	-	-	-	10	
11	-	-	-	16.60			17.43	0.83	-	-	-	12	
13	20	3	VERTICAL LIFT	2.74	6.48			3.74	GF WIRE EDM	20	3	14	
15	-	-	-	2.74		6.48		3.74	-	-	-	16	
17	-	-	-	2.74			6.48	3.74	-	-	-	18	
19	20	3	TORMAX 13-5 LATHE	2.14	4.28			2.14	TORMAX 13-5 LATHE	20	3	20	
21	-	-	-	2.14		4.28		2.14	-	-	-	22	
23	-	-	-	2.14			4.28	2.14	-	-	-	24	
25	20	3	TORMAX 13-5 LATHE	2.14	6.02			3.88	DUST COLLECTOR	25	3	26	
27	-	-	-	2.14		6.02		3.88	-	-	-	28	
29	-	-	-	2.14			6.02	3.88	-	-	-	30	
31	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	32	
33	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	34	
35	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	36	
37	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	38	
39	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	40	
41	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	42	
TOTAL LOAD PER PHASE:					80.16	72.47	65.86	TOTAL LOAD ON PANEL:			218.49	KW	
											262.81	AMPS	

NOTES:

PANEL: PP2					MANUFACTURE & MODEL: CUTLER-HAMMER TYPE PRL3a								
MOUNTING: SURFACE					VOLTAGE CLASSIFICATION: 208Y/120V, 3 PHASE, 4 WIRE								
MAINS RATING: 500AMP MAIN C/B					SCR (FULLY RATED): 10K A.I.C. MIN.								
200% NEUTRAL: NO					SPD: NO								
BREAKER			PHASE LOAD - KW						BREAKER				
#	TRIP RATING	POLE	LOAD DESCRIPTION	LOAD KW	A	B	C	LOAD KW	LOAD DESCRIPTION	TRIP RATING	POLE	#	
1	225	3	PANEL PP3	18.13	23.07			4.94	PANEL PP4	100	3	2	
3	-	-	-	16.04		19.04		3.00	-	-	-	4	
5	-	-	-	14.47			17.91	3.44	-	-	-	6	
7	15	3	KWH/DEMAND METER	0.01	0.21			0.20	RECEPTACLES	20	1	8	
9	-	-	-	0.01		0.71		0.70	RECEPTACLES	20	1	10	
11	-	-	-	0.01			0.31	0.30	UH-A	20	1	12	
13	20	1	RECEPTACLES	0.20	0.70			0.50	RECEPTACLES	20	1	14	
15	20	1	RECEPTACLES	0.50		0.90		0.40	RECEPTACLES	20	1	16	
17	20	1	EWC	0.50			1.00	0.50	EWC	20	1	18	
19	225	3	PANEL PP2A	12.40	13.20			0.80	WATER HEATER	20	1	20	
21	-	-	-	9.70		10.00		0.30	RECIRC. PUMP	20	1	22	
23	-	-	-	9.20			9.90	0.70	RECEPTACLES	20	1	24	
25	40	2	E.V. CHARGING STATION	3.12	6.24			3.12	E.V. CHARGING STATION	40	2	26	
27	-	-	-	3.12		6.24		3.12	-	-	-	28	
29	20	1	MECHO SHADES	0.36			0.72	0.36	MECHO SHADES	20	1	30	
31	20	1	MECHO SHADES	0.36	0.72			0.36	MECHO SHADES	20	1	32	
33	20	1	MECHO SHADES	0.36		1.36		1.00	COILING DOOR	20	1	34	
35	20	2	SPARE	0.00			1.80	1.80	RECEPTACLE	30	1	36	
37	-	-	-	0.00	1.80			1.80	RECEPTACLE	30	1	38	
39	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	40	
41	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	42	
43	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	44	
45	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	46	
47	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	48	
49	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	50	
51	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	52	
53	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	54	
55	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	56	
57	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	58	
59	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	60	
TOTAL LOAD PER PHASE:					45.94	38.25	31.64	TOTAL LOAD ON PANEL:			115.83	KW	
											321.52	AMPS	



PROJECT TITLE Asnuntuck Community College
 New Manufacturing Technology Center
 170 Elm Street, Enfield, Connecticut
 BI-CTC-488

SKETCH TITLE
 PANELBOARD SCHEDULES

DATE 01/11/2016
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 SCALE: NONE
 SKETCH NO. AD3-SK1-EP2.4

PANEL: EDP2					MANUFACTURE & MODEL: CUTLER-HAMMER TYPE PRL3a								
MOUNTING: SURFACE					VOLTAGE CLASSIFICATION: 480Y/277V, 3 PHASE, 4 WIRE								
MAINS RATING: 400 AMP MAIN LUGS					SCR (FULLY RATED): 42K A.I.C. MIN.								
200% NEUTRAL: NO					SPD: 200KA/PHASE								
BREAKER			PHASE LOAD - KW						BREAKER				
#	TRIP RATING	POLE	LOAD DESCRIPTION	LOAD KW	A	B	C	LOAD KW	LOAD DESCRIPTION	TRIP RATING	POLE	#	
1	150	3	PANEL BEP1	12.92	30.25			17.33	T/EPP2	150	3	2	
3	-	-	-	13.92		33.75		19.83	-	-	-	4	
5	-	-	-	12.92			32.35	19.43	-	-	-	6	
7	15	3	KWH/DEMAND METER	0.01	8.91			8.90	UPS	40	3	8	
9	-	-	-	0.01		8.91		8.90	-	-	-	10	
11	-	-	-	0.01			8.91	8.90	-	-	-	12	
13	40	3	AHU-2	6.20	24.70			18.50	AHU-1	125	3	14	
15	-	-	-	6.20		24.70		18.50	-	-	-	16	
17	-	-	-	6.20			24.70	18.50	-	-	-	18	
19	15	3	AHU-3	1.20	1.30			0.10	VAV BOXES	20	1	20	
21	-	-	-	1.20		1.50		0.30	VAV BOXES	20	1	22	
23	-	-	-	1.20			1.40	0.20	VAV BOXES	20	1	24	
25	20	1	VAV BOXES	0.20	0.45			0.15	VAV BOXES	20	1	26	
27	30	3	M290 LASER	4.30		4.30		0.00	SPARE	20	1	28	
29	-	-	-	4.30			4.30	0.00	SPARE	20	1	30	
31	-	-	-	4.30	4.30			0.00	SPARE	20	1	32	
33	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	34	
35	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	36	
37	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	38	
39	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	40	
41	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	42	
TOTAL LOAD PER PHASE:					69.91	73.16	71.66	TOTAL LOAD ON PANEL:			214.73		KW
											258.29		AMPS

NOTES:

PANEL: EPP2					MANUFACTURE & MODEL: CUTLER-HAMMER TYPE PRL3a								
MOUNTING: SURFACE					VOLTAGE CLASSIFICATION: 208Y/120V, 3 PHASE, 4 WIRE								
MAINS RATING: 250 AMP MAIN C/B					SCR (FULLY RATED): 10K A.I.C. MIN.								
200% NEUTRAL: NO					SPD: NO								
BREAKER			PHASE LOAD - KW						BREAKER				
#	TRIP RATING	POLE	LOAD DESCRIPTION	LOAD KW	A	B	C	LOAD KW	LOAD DESCRIPTION	TRIP RATING	POLE	#	
1	15	3	KWH/DEMAND METER	0.01	1.11			1.10	GENSET ACCESSORIES	30	2	2	
3	-	-	-	0.01		1.11		1.10	-	-	-	4	
5	-	-	-	0.01			0.41	0.40	RECEPTACLES	20	1	6	
7	20	1	RECEPTACLES	0.50	0.80			0.30	UH-A	20	1	8	
9	40	2	CU-6	2.60		2.90		0.30	CUH-A	20	1	10	
11	-	-	-	2.60			2.90	0.30	CUH-A	20	1	12	
13	20	1	CP-1	0.30	0.60			0.30	CP-2	20	1	14	
15	20	1	CP-3	0.30		8.60		0.30	EF-2	20	1	16	
17	20	1	CUH-A	0.30			1.30	1.00	HEAT TRACING	20	2	18	
19	20	2	HEAT TRACING	1.00	1.00			0.00	-	-	-	20	
21	-	-	-	0.00		1.00		1.00	HEAT TRACING	20	2	22	
23	20	2	HEAT TRACING	1.00			1.00	0.00	-	-	-	24	
25	-	-	-	0.00	1.00			1.00	HEAT TRACING	20	2	26	
27	20	2	HEAT TRACING	1.00		1.00		0.00	-	-	-	28	
29	-	-	-	0.00			1.00	1.00	HEAT TRACING	20	2	30	
31	20	2	HEAT TRACING	1.00	1.00			0.00	-	-	-	32	
33	-	-	-	0.00		1.00		1.00	HEAT TRACING	20	2	34	
35	20	2	HEAT TRACING	1.00			1.00	0.00	-	-	-	36	
37	-	-	-	0.00	9.90			9.90	MAZAK 5 AXIS MILL	100	3	38	
39	20	1	RECEPTACLES	0.40		10.30		9.90	-	-	-	40	
41	25	3	EOS 110	1.92			11.82	9.90	-	-	-	42	
43	-	-	-	1.92	1.92			0.00	SPARE	20	1	44	
45	-	-	-	1.92		1.92		0.00	SPARE	20	1	46	
47	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	48	
49	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	50	
51	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	52	
53	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	54	
55	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	56	
57	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	58	
59	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	60	
TOTAL LOAD PER PHASE:					17.33	19.83	19.43	TOTAL LOAD ON PANEL:			56.59		KW
											157.08		AMPS



PROJECT TITLE Asnuntuck Community College
 New Manufacturing Technology Center
 170 Elm Street, Enfield, Connecticut
 BI-CTC-488

SKETCH TITLE
 PANELBOARD SCHEDULES

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 SCALE: NONE

SKETCH NO.
 AD3-SK1-EP2.5

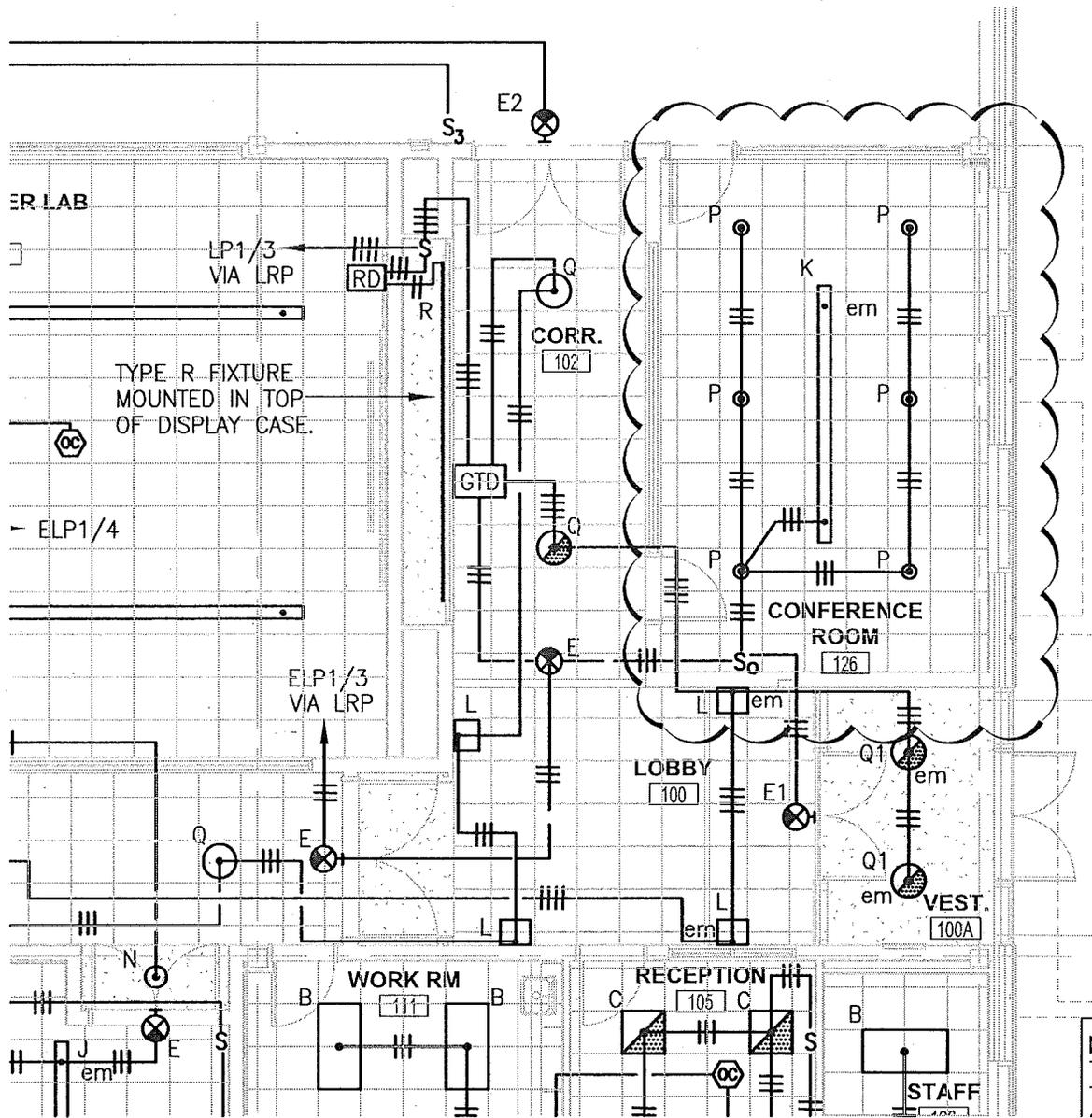
PANEL: EPP1					MANUFACTURE & MODEL: CUTLER-HAMMER TYPE PRL1a							
MOUNTING: SURFACE					VOLTAGE CLASSIFICATION: 208Y/120V, 3 PHASE, 4 WIRE							
MAINS RATING: 50 AMP MAIN C/B					SCR (FULLY RATED): 10K A.I.C. MIN.							
200% NEUTRAL: NO					SPD: NO							
BREAKER			PHASE LOAD - KW						BREAKER			
#	TRIP RATING	POLE	LOAD DESCRIPTION	LOAD KW	A	B	C	LOAD KW	LOAD DESCRIPTION	TRIP RATING	POLE	#
1	15	3	KWH/DEMAND METER	0.01	1.51			1.50	FACP	20	1	2
3	-	-		0.01		0.41		0.40	SMOKE DAMPERS	20	1	4
5	-	-		0.01			0.41	0.40	SMOKE DAMPERS	20	1	4
7	20	1	FM 200 PANEL	1.20	1.20			0.00	ALARM BELL	20	1	8
9	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	10
11	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	12
13	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	14
15	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	16
17	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	18
19	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	20
21	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	22
23	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	24
25	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	26
27	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	28
29	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	30
31	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	32
33	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	34
35	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	36
37	20	1	SPARE	0.00	0.00			0.00	SPARE	20	1	38
39	20	1	SPARE	0.00		0.00		0.00	SPARE	20	1	40
41	20	1	SPARE	0.00			0.00	0.00	SPARE	20	1	42
TOTAL LOAD PER PHASE:					2.71	0.41	0.41	TOTAL LOAD ON PANEL:		3.53	KW	
										9.80	AMPS	
NOTES:												



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 New Manufacturing Technology Center
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 PANELBOARD SCHEDULES

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DENIS ASSOCIATES, INC.
 1000 Park Street
 Enfield, CT 06033
 (860) 254-1111

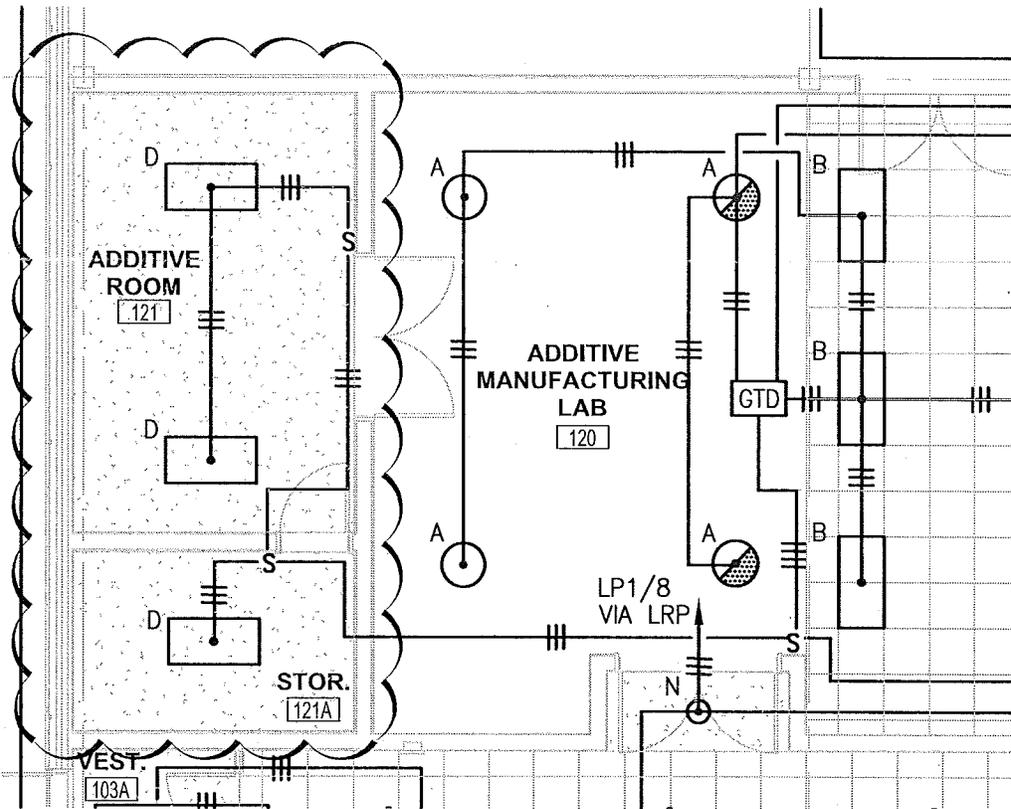
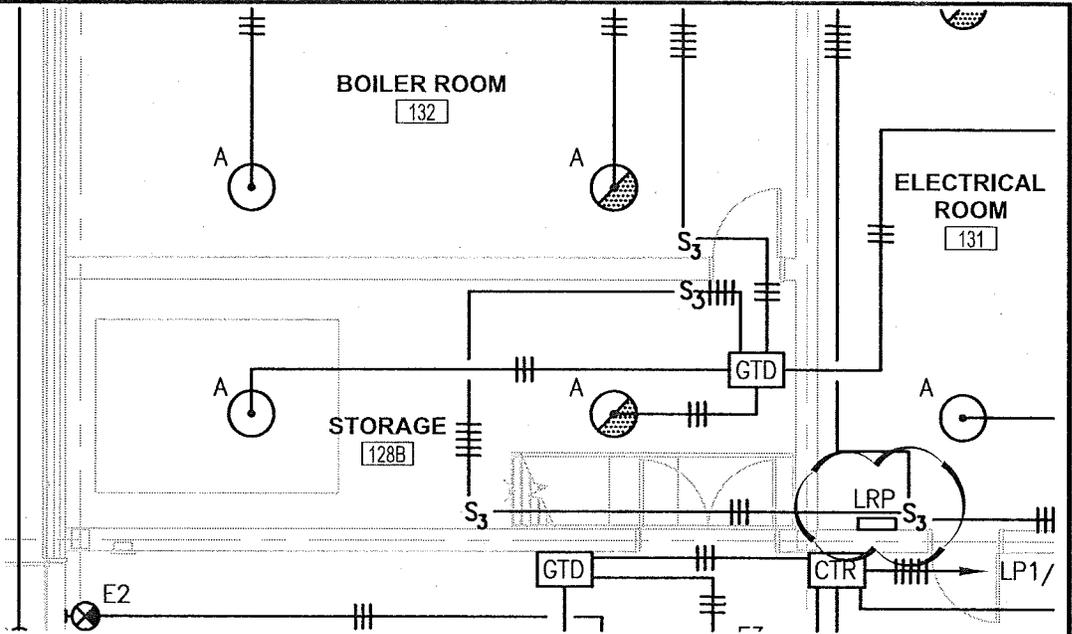
PROJECT TITLE Asnuntuck Community College
New Manufacturing Technology Center
 170 Elm Street, Enfield, Connecticut
 BI-CTC-488

SKETCH TITLE _____
FIRST FLOOR LIGHTING PLAN

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SCALE: 1/8"=1'-0"

SKETCH NO.
AD3-SK1-EL1.1



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SKETCH TITLE
FIRST FLOOR LIGHTING PLAN

SCALE: 1/8"=1'-0"
SKETCH NO.
AD3-SK2-EL1.1

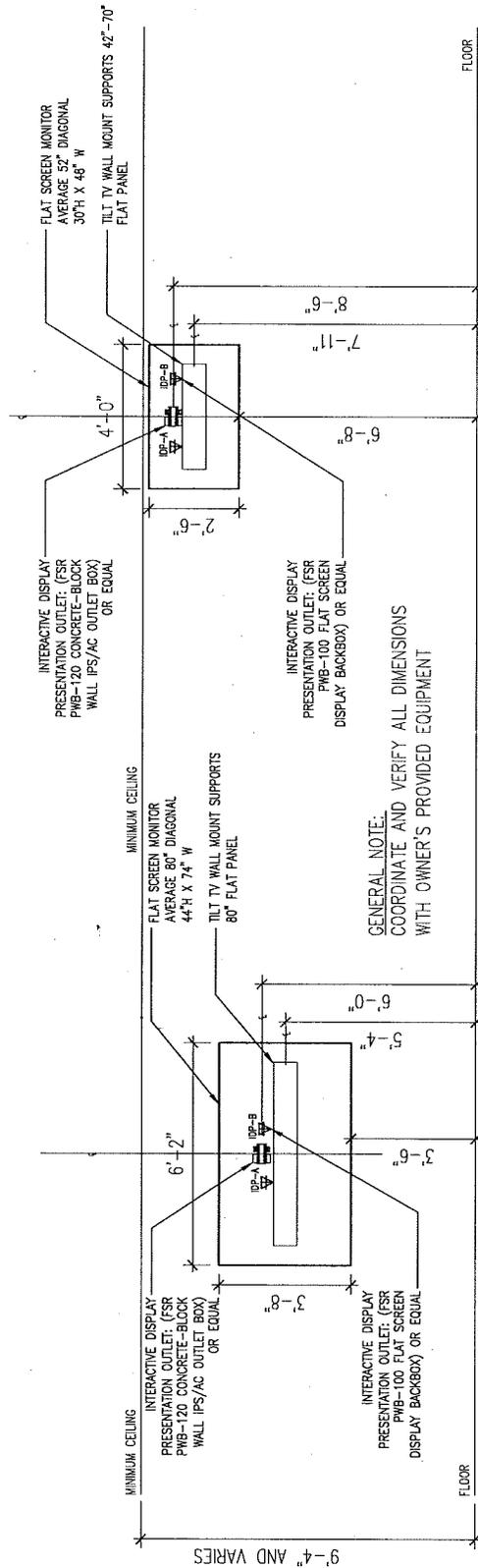
C	2'W X 2'L X 3' 7/8" RECESSED LED FIXTURE WITH 20 GAUGE DIE FORMED COLD ROLLED STEEL HOUSING (WHITE FINISH), 22 GAUGE DIE FORMED COLD ROLLED STEEL REFLECTORS (WHITE FINISH), SPOTLESS CLEAR ACRYLIC LENS, AND DIMMING LED DRIVER (120/277V). MIS #DAVLE0-22-83-4000-35-S0-W-UNV-D-1-1B99	LED'S, 4000 LUMENS, 3500° K, 80 CRI	42.5	-	FOCAL POINT #FEQL22-WP-4000UH-35K-10-UNV-L01-LEDALITE #4122-D2-ST-LBB-D-S-1-X-DIM
D	2'W X 4'L X 4' 1/4" RECESSED LED FIXTURE WITH DIE-FORMED CODE GAUGE COLD-ROLLED STEEL HOUSING (WHITE FINISH), PATTERN 19 FROSTED ACRYLIC .156" LENS, AND LED DRIVER (120/277V). HUBBELL LIGHTING #LIT24-35HG-FSA19F-E-U-FK24	LED'S, 5600 LUMENS, 3500° K, 82 CRI	45.0	-	LITHONIA #2TL460L FW A19 EZ1 LP835 DGA24 PHILIPS #SP S 24 G FS KA 43A 40 U LAG-FK92X4
E	7 1/2" X 13" WALL MOUNT SINGLE FACE EDGE LIT LED EXIT SIGN FIXTURE WITH EXTRUDED ALUMINUM LAMP HOUSING AND CANOPY (WHITE FINISH), ACRYLIC GRAPHIC LENS WITH RED LETTERS AND MIRROR BACKGROUND, NI-CAD BATTERY, AND ISOLATED DIGITAL TYPE POWER SUPPLY AND CHARGER (120/277V). SIGNTEX #KNS98-FRW-NM-TW	LED'S	1.5	NO ARROWS, PROVIDE 4" SQ. X 2 1/8" DEEP J-BOX WITH 1 1/2" EXTENSION.	ISOLITE #LIT-EM-R-XM-BA-EVNLITE #TRE6 (BA HSG)
E1	7 1/2" X 21" GELING MOUNT SINGLE FACE EDGE LIT LED "HANDICAP ACCESSIBLE" EXIT FIXTURE WITH EXTRUDED ALUMINUM LAMP HOUSING AND CANOPY (WHITE FINISH), ACRYLIC GRAPHIC LENS WITH RED LETTERS AND THE INTERNATIONAL SIGN OF ACCESSIBILITY, MIRROR BACKGROUND, NI-CAD BATTERY, AND ISOLATED DIGITAL TYPE POWER SUPPLY AND CHARGER (120/277V). SIGNTEX #CAEBB-FRW-NM-TW	LED'S	1.5	NO ARROWS, PROVIDE 4" SQ. X 2 1/8" DEEP J-BOX WITH 1 1/2" EXTENSION.	ISOLITE #LIT-EM-R-XM-BA-SW-EVNLITE #TRE6 (BA HSG)

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SKETCH TITLE
LIGHT FIXTURE SCHEDULE

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CLASSROOMS AND CONFERENCE ROOM

ENTRANCE AND PUBLIC CORRIDORS

9'-4" AND VARIES