



Fiber Infrastructure Upgrades Rebid

TCNJ Advertised Bid # AB220020

COVER SHEET

INVITATION TO BID

MILESTONE SCHEDULE

CONSTRUCTION BID PROPOSAL FORM

GENERAL WORK DESCRIPTION

MANDATORY DOCUMENTS

CONTRACT

GENERAL CONDITIONS

December 27, 2021



Please place the following advertisement in the Legal Section of Classified Advertising. Please ensure that the invoice for this advertisement is prepared and an affidavit forwarded to The College of New Jersey, Office of Finance and Business Services, Administrative Services Building, Room 201, P.O. Box 7718, Ewing, NJ 08628-0718.

To be published on **December 27, 2021**. Contact person regarding placement of ad is Anup Kapur (609) 771-2495.

**THE COLLEGE OF NEW JERSEY
ADVERTISEMENT FOR BIDS
BID #AB220020**

Under the provisions of the State College Contracts Law, Chapter 64 of Title 18-A, The College of New Jersey will receive sealed bids for the **Fiber Infrastructure Upgrades Rebid Project** until **2:00 P.M. on the 27th day of January, 2022** at The College's Office of Finance and Business Services, Administrative Services Building, Second Floor, Room 201, Route 31 (Pennington Road), Ewing Township, New Jersey. At 2:00 P.M. all bids will be publicly opened and read in Room 203 of the Administrative Services Building.

The project will be bid as a Single Lump Sum.

No bidder may submit more than one bid.

Bid Documents may be obtained on/after **December 27, 2021 via our website** (<https://bids.tcnj.edu/home/construction-projects/>).

A **strongly encouraged pre-bid conference/on-site inspection** is scheduled on **January 4, 2022 at 10:00 A.M.** in Room 203 of the Administrative Services Building, located on The College's Ewing Township, New Jersey campus on Route 31 (Pennington Road).

Bidders are required to comply with the requirements of P.L. 1975 c. 127 (N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27 - Affirmative Action); the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq.; N.J.S.A. 52:25-24.2, "Statement of Ownership Disclosure"; the Public Works Contractor Registration Act (N.J.S.A. 34:11-56.48 et seq.); the New Jersey Business Registration of Public Contractors provisions (N.J.S.A. 52:32-44); Executive Order 117 and P.L. 2005 Chapter 51 (N.J.S.A. 19:44a-1 et seq.) and all amendments thereto

Bidders must have a New Jersey Department of Treasury, Division of Property Management and Construction (DPMC) C120, C121 and C122 at time of bid submission. No bids will be accepted without this classification.

A bid bond is required in the amount of 10% of the total bid. Bid bond shall consist of a certified check or cashiers check to the order of The College of New Jersey, or an individual or annual bid bond issued by an insurance company or surety company authorized to do business in the State of New Jersey. The successful Bidder(s) is required to provide a Performance and Payment Bond equal to 100% of the contract. A Surety Disclosure Statement and Certification form must accompany the performance bond.

The College will award the contract to the lowest responsible bidder who satisfies the qualification criteria as set forth in the contract documents.

The College of New Jersey reserves the right to reject all bids or to waive any minor informalities in the bidding in accordance with law. No bid shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of The College of New Jersey.



Fiber Infrastructure Upgrades Rebid Fire Alarm Project

MILESTONE SCHEDULE December, 2022

Bid Documents Advertised	December 27, 2021
*Pre-bid Meeting/Site visit (ASB 203) 10:00 am	January 4, 2022
Cut off for questions	January 10, 2022
Addendum issued (if needed)	January 13, 2022
Bids Received	January 27, 2022
Notice of Intent to Award issued	January 31, 2022
End of Protest Period	February 8, 2022
Notice to proceed issued by	February 10, 2022
Pre-Construction (Submittals by)	March 10, 2022
Mobilize on site and begin fieldwork by	March 13, 2022
Substantial Completion	July 29, 2023
Project Closeout by	October 28, 2023
No Work on Campus During Commencement 2022	May 19 & 20, 2022
No Work on Campus During Special Olympics	June 10-12, 2022

*The Pre-bid meeting is not mandatory, but attendance is recommended. The meeting will be held in Administrative Services Building, **Room 203**. Parking is available at the building. We will briefly review the scope of work and take a tour of the buildings after the meeting. Q&A will be addressed in the addendum.

**THE COLLEGE OF NEW JERSEY
Construction Bid Proposal Form**

**Office of Finance & Business Services
Administrative Services Building, Rm. 201
2000 Pennington Road
Ewing, New Jersey 08628-0718**

**Bid Number: AB220020
Bid Due Date: January 27, 2022**

Project Name: Fiber Infrastructure Upgrades Rebid

BIDDER INFORMATION

Firm Name:

Telephone Number:

Contact Person:

Fax Number:

Address:

Email Address:

Federal I.D. Number:

SOLICITATION OF CONSTRUCTION BIDS

- 1. Bid proposals are solicited as follows:**
 - A. Single Bid (Lump Sum) which combines all trades.**
 - (1) The total number and types of trades are set forth in the Specifications.**
 - (2) Bidder enters the Bid Price on the line provided.**
 - (3) Pursuant to the requirements of N.J.S.A. 18A:64-76.1., bidder lists the names of the subcontractors on the Subcontractor Information page.**
- 2. The scope of work includes installing and upgrading fiber optic cables between building on campus.**
 - A. See Specifications and Drawings for Details (included in RFP package).**
 - B. The College may issue Addenda or Clarifications which may include additions to or deletions from the scope of work; changes to the Specifications, Drawings, and proposal form; and clarifications of requirements. Bidder is advised to review all Addenda and/or clarifications carefully, and shall note the receipt of same with their bid package.**

GENERAL INSTRUCTIONS AND REQUIREMENTS

1. PRICES

- A. Bidder submits prices for the Base Bid and any Alternate Proposals and Unit Prices which are listed for the contract of the bid. If there is no cost associated with the Alternate or Unit Price, bidder is required to enter “0.00” or “no change”.
- B. Prevailing wage rates apply (Mercer County).
- C. Bid is to remain good for sixty (60) days after the Bid Due Date.

2. BOND REQUIREMENTS AND SURETY STANDARDS

- A. Bidder must submit with its bid a Certified Check in the amount of ten percent (10%) of the total bid, or a Bid Bond in the amount of ten percent (10%) of the total bid.
- B. The successful bidder must submit a Performance and Payment Bond equal to 100% of the contract. A completed Surety Disclosure Statement and Certification must accompany the Performance and Payment Bond.
 - (1) The Performance and Payment Bond form and a sample Surety Disclosure Statement and Certification form are included at the end of this Construction Bid Proposal Form.
- C. All bid deposits shall be returned within three (3) days, Sunday and holidays excepted, after the awarding of the contract and the approval of the successful bidder’s performance bond, if any, the bid guaranty of the remaining bidders shall be returned to them.
- D. Should the successful bidder fail to enter into said contract after acceptance of bid by the College, then the check or security deposited by that bidder shall, at the option of the College, be retained as liquidated damages, or if Bid Bond has been supplied, principal and surety shall be liable to the amount of the Bid Bond.
- E. Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified copy of their Power of Attorney to sign said bonds.

3. LICENSES, CERTIFICATIONS, REGISTRATIONS, QUALIFICATIONS

- A. The bidder or, as applicable, its subcontractors shall at the time of bid have those required licenses, certifications, registrations, qualifications and the like (“LCRQ”) listed below and shall present satisfactory evidence thereof upon request of the College prior to the notice of intent to award.
 - (1) The electrical contractor or subcontractor as applicable shall have a valid electrical license. (An electrical license is not required when the work is below 110Volt)
 - ~~(2) The plumbing contractor or subcontractor as applicable shall have a valid plumbing license.~~
 - ~~(3) The HVACR contractor or subcontractor as applicable shall have a valid HVACR license.~~
 - ~~(4) The asbestos abatement contractor or subcontractor as applicable shall have a valid asbestos abatement license.~~

- B.** The selected bidder/contractor or, as applicable, its subcontractors shall have and shall present satisfactory evidence of all other required LCRQ noted in the Specifications after execution of contract during the submittal process and prior to the start of the applicable work, unless otherwise requested by the College or a date or event specified for that LCRQ in the Specifications.

4. SUBCONTRACTORS

- A.** Pursuant to New Jersey State Law (N.J.S.A. 18A-76.1), a Single Bid (Lump Sum) bidder discloses its subcontractors to whom the bidder intends to subcontract the work. The Subcontractor Information sheet is provided for this purpose.

- 5.** Under Executive Order 34, the College is responsible for soliciting demographic information from its vendors. The College is required to seek the following information from each firm under contract with the College:

1. Is more than fifty percent (50%) of your company minority owned? (circle one) YES NO
(African-American, Hispanic, Asian, and/or Native American)
2. Is more than fifty percent (50%) of your company woman owned? (circle one) YES NO
3. What is the ethnicity of the owner of your company: (check applicable according to 51% ownership)

- Asian American
- Multiple Ethnicities
- Non-Minority
- Hispanic American
- African American
- Caucasian American Female
- Native American
- Unspecified

The College is required to solicit the foregoing information. Your response, however, is **strictly voluntary**. Please be advised that any contracting decisions made by the College will **not** be influenced in any way by your decision to provide the above information.

EXECUTIVE ORDER #34: MINORITY AND WOMEN BUSINESS ENTERPRISES

On September 15, 2006, Governor Corzine signed Executive Order 34 establishing a Division of Minority and Women Business Development. The Division is charged with administering and monitoring policies, practices, and programs to ensure that minority and women business enterprises (MWBE) are afforded an equal opportunity to participate in New Jersey's purchasing and procurement processes.

State entities are required to report to the Division the ethnic and gender composition of the vendors with which those state entities do business.

6. Bidder completes Statement of Ownership Disclosure form and the Non-Collusion Affidavit form along with bid proposal.
7. Bidders are required to be registered with the New Jersey Department of Property Management and Construction (DPMC) and possess a DPMC C120, C121 and C122 classification at the time of bid submission. No bids will be accepted without these classifications.

8. SET ASIDE PROGRAM FOR SMALL BUSINESS ENTERPRISE (SBE) – CONSTRUCTION

In accordance to N.J.A.C., 17:14-1.2 et seq. and Executive Order 71, signed by Governor James E. McGreevey in 2003, the College requires bidders to make a good faith effort to provide opportunities for Small Business Enterprises (SBE) to participate in the performance of this contract as subcontractors consistent with the overall goals established for construction services by the New Jersey Commerce and Economic Growth Commission (NJ Commerce).

SBE subcontracting goals are not applicable if the bidder is currently registered with NJ Commerce as an SBE firm.

9. PREVAILING WAGE AND PUBLIC WORKS CONTRACTOR REGISTRATION ACTS

- The work described in this project is subject to the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq. and the Public Works Contractor Registration Act, N.J.S.A. 34:11-56.48 et seq.
- The Public Works Contractor Registration Act requires the bidder and any subcontractors listed in the bid to be registered with the New Jersey Department of Labor and Workforce Development at the time the bid is submitted. The contractor must submit registration certificates for all listed subcontractors prior to award of the contract.
- The Contractor must comply with the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 through 56.47. Workers employed by the Contractor or any subcontractor or sub-subcontractor in the performance of services directly on the project must be paid prevailing wages. As required by N.J.S.A. 34:11-56.27 and 56.28, this contract cannot become effective until the College obtains from the New Jersey Department of Labor and Workforce Development a determination of the prevailing wage rates applicable to the project as of the contract award date and attaches a copy to the contract. As required by N.J.S.A. 34:11-56.27, the Contractor or any subcontractor may be terminated if any covered worker is not paid prevailing wages on the project, and the Contractor and its surety shall be liable for any additional costs which result. The Contractor and its subcontractors must be registered with the New Jersey Department of Labor and Workforce Development (N.J.S.A. 34:11-56.51 et seq.), and the prevailing wage rates must be posted at the job site (N.J.S.A. 34:11-56.32). The Contractor and its subcontractors must prepare accurate certified records of wages paid for each worker on the project (N.J.S.A. 34:11-56.29), and copies for the period covered by each invoice must be attached to the invoice submitted under the contract. In accordance with N.J.S.A. 34:11-56.33, the Contractor's final invoice must include a statement of all amounts still then due to workers on the project. The Contractor

is also cautioned that it must use job titles and worker classifications consistent with those approved by the Department of Labor and Workforce development, and that, if it intends to pay apprentice rates, it must comply with the Department of Labor and Workforce Development regulations at N.J.A.C. 12:60.

- Please refer to http://lwd.dol.state.nj.us/labor/wagehour/wagerate/wage_rates.html for official wage rate determinations for Mercer County, NJ.

10. NEW JERSEY EQUAL PAY ACT

On April 24, 2018, Governor Phil Murphy signed into law New Jersey's Diane B. Allen Equal Pay Act (P.L. 2018, c. 9) The law provides in pertinent part that as of July 1, 2018, any employer entering into a contract with the State of New Jersey or an instrumentality of the State for "qualifying services" or "public works" must provide to the Department of Labor and Workforce Development – upon commencement of the contract – wage and demographic data for all employees who are employed in connection with the contract (for public works) and for all employees (for qualifying services). This requirement DOES NOT apply to employers who are contracting with local governments (for example: municipalities and counties). The report must contain the gender, race, ethnicity, job category, compensation, and number of hours worked by each employee.

The extent of the Department of Labor and Workforce Development's responsibilities under the Equal Pay Act is the collection of data regarding compensation, hours worked, job/occupational category, job title, gender, race, and ethnicity for State contactors and making that data available to the Division on Civil Rights (DCR), within the Department of Law and Public Safety, and upon request to certain individuals. Complaints of unlawful discrimination under the Equal Pay Act should be directed to the DCR, as should any questions regarding the filing of such a complaint.

The Department of Labor and Workforce Development has issued two forms, as required by the law, to be completed by employers. The forms should be used to report the employee's wage and demographic data and can be found on the LWD website (<http://www.nj.gov/labor/equalpayact>). **A completed copy of the forms is not required at time of bid; however, it will be required of the bidder who receives the notice to proceed from the College. Completed forms should be emailed to: equalpayact@dol.nj.gov**

11. In order for your proposal to be accepted and deemed valid, your company/firm will be required to comply with the requirements of N.J.S.A. 19:44A-1 et seq/P.L. 2005 Ch. 51 ("Chapter 51") and Executive Order 117. Enclosed are the requirements of Chapter 51 and Executive Order 117, the forms for Certification and Disclosure. The contract that will be generated based on this bid proposal cannot be awarded without approval of the Certification and Disclosure forms by the State of New Jersey, Department of Treasury. **A completed copy of your Certification form is not required at time of bid; however, it will be required from the bidder who receives the notice of intent to award from the College prior to the execution of the contract.**

- 12.** Pursuant to N.J.S.A. 52:32-44, The College of New Jersey (“Contracting Agency”) is prohibited from entering into a contract with an entity unless the bidder/proposer/contractor, and each subcontractor that is required by law to be named in a bid/proposal/contract has a valid Business Registration Certificate on file with the Division of Revenue and Enterprise Services within the Department of the Treasury.

Prior to contract award or authorization, the contractor shall provide the Contracting Agency with its proof of business registration and that of any named subcontractor(s).

Subcontractors named in a bid or other proposal shall provide proof of business registration to the bidder, who in turn, shall provide it to the Contracting Agency prior to the time a contract, purchase order, or other contracting document is awarded or authorized.

During the course of contract performance:

- (1) the contractor shall not enter into a contract with a subcontractor unless the subcontractor first provides the contractor with a valid proof of business registration.
- (2) the contractor shall maintain and submit to the Contracting Agency a list of subcontractors and their addresses that may be updated from time to time.
- (3) the contractor and any subcontractor providing goods or performing services under the contract, and each of their affiliates, shall collect and remit to the Director of the Division of Taxation in the Department of the Treasury, the use tax due pursuant to the Sales and Use Tax Act, (N.J.S.A. 54:32B-1 et seq.) on all sales of tangible personal property delivered into the State. Any questions in this regard can be directed to the Division of Taxation at (609)292-6400. Form NJ-REG can be filed online at <http://www.state.nj.us/treasury/revenue/busregcert.shtml>.

Before final payment is made under the contract, the contractor shall submit to the Contracting Agency a complete and accurate list of all subcontractors used and their addresses.

Pursuant to N.J.S.A. 54:49-4.1, a business organization that fails to provide a copy of a business registration as required, or that provides false business registration information, shall be liable for a penalty of \$25 for each day of violation, not to exceed \$50,000, for each proof of business registration not properly provided under a contract with a contracting agency.

- 13.** Record Retention: Pursuant to N.J.A.C. 17:44-2.2, the vendor shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.
- 14.** Energy Star energy efficient products: Under Executive Order #11 (Corzine), the College is required to select ENERGY STAR energy-efficient products when acquiring new energy-using products or replacing existing equipment. For

products that do not have ENERGY STAR labels, vendors shall follow guidelines established by the New Jersey Clean Energy Program.

15. QUESTIONS

- A. Direct inquiries and correspondence relating to this proposal form and questions regarding the technical specifications and requests for clarification must be submitted in writing via **email to kapura@tcnj.edu or fax (609)637-5140** and must be received **prior to 4p.m., on January 10, 2022.**
- B. Should any questions be received, a notice will be placed in the newspaper and the addendum or clarification will be available on **January 13, 2022 on the College's website at <https://bids.tcnj.edu/home/construction-projects/>. If an addendum and/or clarification is posted, it SHOULD be noted in the General Agreement section of the bidder's proposal. Failure to do so may subject Bidder to disqualification.**

16. HOW TO SUBMIT THE COMPLETED CONSTRUCTION BID PROPOSAL FORM

- A. Bidder places all pages of the completed form and the requisite additional documents in an envelope, seals the envelope, and labels it with his/her firm name, address, and "Sealed Bid Enclosed for (**Bid Number and Project Name**)".
 - B. Bidder mails or deliver by hand the sealed bid, no later than **2:00 p.m., January 27, 2022**, to The College of New Jersey, Attention: Anup Kapur for (specify the Bid Number), Office of Finance & Business Services, Room 201, 2000 Pennington Road, Ewing, New Jersey 08628-0718. **At 2 p.m., all bids will be publicly opened and read in Room 203 of the Administrative Services Building.**
 - C. Contractors are advised that the U.S. Postal Service and all express mail companies deliver to The College's Mail Room or Receiving Department, not directly to the Office of Budget & Finance. The College is not responsible for lost or misdirected bids.
17. Any bid not prepared and submitted in accordance with the provisions described herein may be rejected by the College. Any bid received after the time and date specified will not be considered. No bidder shall withdraw a bid within sixty (60) days after the date of the bid opening. Contracts shall be awarded to the lowest responsible bidder whose bid, conforming to the invitation for bids, will be the most advantageous to the State college
18. Any bidder who has defaulted on any contract with the College or any other State Agency may be considered as not responsible and their bid may be rejected. THE COLLEGE OF NEW JERSEY reserves the right to exercise this option, as the College deems proper and/or necessary in accordance with applicable law.

19. Bids shall include all costs of any nature necessary to complete the project in the manner and within the time required by the contract.
20. The College reserves the right to require bidders to provide a schedule of values of their lump sum bid price upon request.
21. The College is exempt from all taxes including Federal Excise Tax, Transportation Taxes, State Excise, Sales Tax and local taxes. Rentals of equipment for 28 days or less is not exempt from any tax under the State sales tax act.
22. Before submitting his bid, the bidder shall be familiar with the Drawings, Specifications, and other Documents that will form part of the contract and shall have visited the site of the project to confirm for themselves the character and amount of work involved.
23. No bidder shall be allowed to offer more than one price on each item even though he/she may feel that he/she has two or more types or styles that will meet specifications. Bidders must determine for themselves which to offer. This may be cause for automatic rejection of bid.
24. It is understood and agreed that all prices quoted are firm and not subject to any increase during the life of the contract.
25. Should any difference arise between the contracting parties as to the meaning or intent of these instructions or specifications, the College's decision shall be final and conclusive.
26. Should the bidder discover discrepancies in this Request for Bids, the matter shall be at once brought to the attention of the College, and the discrepancies corrected by written agreement before submission of bid. The correction will be issued by addendum.

27. ACCEPTANCE/REJECTION OF BIDS

- A. THE COLLEGE OF NEW JERSEY, pursuant to State College Contract Law, Contracts shall be awarded to the lowest responsible bidder whose bid, conforming to the invitation for bids, will be the most advantageous to the State college.
- B. The bid is irrevocable by the bidder or the bidder's representatives. The bid, and any award made to the bidder by the College, shall bind the bidder and the bidder's heirs, executors, administrators, successors or assigns.
- C. Award of contract shall be made to the lowest responsible bidder, whose bid, conforming to the invitation for bids, is the most advantageous to the College.
- D. The award of the contract or the rejection of the bids shall be made within sixty (60) days of the date of receiving bids, unless written extensions are requested by the College and accepted by the bidder(s). All bid securities shall be returned immediately if all bids are rejected. The successful bidder(s) to whom the award is to be made will be notified by receipt of a written "Intent to Award" from the College.

- E. When award of contract is made in one fiscal year with effective date in the next fiscal year, award shall be contingent upon the availability and appropriation of sufficient funds for that purpose for the year in which said contract takes effect. When a contract shall be awarded for a period in excess of one year, said contract shall be contingent upon the annual availability and appropriation of sufficient funds for that purpose for each year of the contract term.

28. WITHDRAWAL OF BIDS

- A. A written request for the withdrawal of a bid, or any part thereof, will be granted if the request is received by the College prior to the specified time of the bid opening.
- B. Should the bidder refuse to perform the work for the price provided, they will forfeit their bid security and will be held liable for the difference between their low bid and the next highest/responsive bidder.

29. OSHA COMPLIANCE:

- A. The Contractor shall guarantee that all materials, supplies and equipment to be provided under his contract shall meet all applicable requirements, Specifications and standards of the Federal Occupational Safety and Health Act (OSHA) of 1970 as amended to date of acceptance by the College, and shall also apply to Contractors Construction procedures.

30. APPLICABLE LAWS:

- A. The following list of statutes and regulations, which may be applicable in whole or in part, is provided for the benefit of the Contractor and is not meant to be all-inclusive. In the event that other laws are applicable, it shall be the responsibility and obligation of the Contractor to ascertain and comply with them.

(1) New Jersey Statutes and Regulations

N.J.S.A. 10:5-31 *et seq.* and N.J.A.C. 17:27-1 *et seq.*, Affirmative Action

Prevailing Wage Act, N.J.S.A. 34:11-56.25 *et seq.*

N.J.S.A. 52:32-44, Business Registration Certificate

N.J.S.A. 34:11-56.48 *et seq.*, Public Works Contractor Registration Act

(2) Federal Statutes

Immigration Control and Reform Act (1986) – 8 U.S.C.A. Section 1324(a) *et seq.*

Civil Rights Act of 1964 – 42 U.S.C.A. Section 1971 *et seq.*

The Americans with Disabilities Act of 1990

31. EXAMINATION OF SITE, DRAWINGS AND SPECIFICATIONS

- A. Each Bidder shall visit the site of the proposed work and fully acquaint themselves with the conditions as they exist so that they may fully understand the facilities, difficulties, and restrictions attending the execution of the work under this Contract.

- B.** Bidders shall also thoroughly examine and be familiar with the Drawings and Specifications. The failure to receive or examine any form, instrument or document, or to visit the site and acquaint himself with conditions there existing shall in no way relieve any bidder from obligation with respect to his bid. By submitting a bid, the bidder agrees and warrants that he has examined the site, the Drawings and Specifications and, that the Specifications and Drawings are adequate and the required result can be produced under the Drawings and Specifications. No claim for any extra will be allowed because of alleged impossibilities in the productions of the results specified or because of unintentional errors or conflicts in the Drawings and Specifications. No change orders will be issued for items, materials or issues that existed on or with respect to the site prior to bidding.

32. DRAWINGS AND SPECIFICATIONS

- A.** The project shall be performed in accordance with the requirements of the Drawings and Specifications, subject to modification as provided in General Conditions. The Drawings and Specifications are intended to complement and supplement each other.
- B.** Any work required by either of them and not by the other shall be performed as if denoted in both. Should any work be required which is not also denoted in the Specifications or on the Drawings because of an obvious omission, but which is, nevertheless, necessary for the proper performance of the project, such work shall be performed as fully as if it were described and delineated.

33. FORM OF AGREEMENT

- A.** Every successful bidder shall be required to sign the standard form contract, a copy of which is attached. Any proposed language or form changes which in any way modifies the contractor's responsibilities as set forth in the Contract Documents will not be acceptable and will be deemed to constitute a bid exception.

34. MULTIPLE BIDS NOT ALLOWED:

- A.** No bidder is allowed to submit more than one bid from an individual, firm, partnership, corporation or association under the same or different name. This will be cause for automatic rejection of each bid.

35. SUBSTITUTIONS:

- A.** The bidder may include in their bid substitute materials or equipment or methods in lieu of those specified in the contract documents, but they do so at their own risk. Any substitution must be equivalent in type, function and quality to the item required in the contract. The successful bidder must submit all information required within 20 days of contract award to determine if the proposed substitute is equal to the contract requirements, and any substitution must be approved by the architect and the College.

- B. The College shall have complete discretion to decide whether it will accept any substitution. No substitution shall result in any increase in the contract price or times. The successful bidder in its application for the substitution must certify in writing that the substitution is equal to what is specified in the contract documents in all material respects and will not increase the time or price of the contract work.

- C. Should the substitution be rejected, the contractor will then be required to provide the specified product, material or method at no additional cost to the College and no change in the project schedule.

36. DOCUMENTS/SUBMISSIONS THAT MUST BE PROVIDED BEFORE CONTRACT AWARD:

- **AFFIRMATIVE ACTION:** The bidder is required to complete and submit a copy of Initial Project Workforce Report (AA-201) to the College and the Division of Public Contracts Equal Employment Opportunity Compliance verifying that the bidder is operating under a federally approved or sanctioned Affirmative Action program. The bidder also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to The College and the Division.

- **CERTIFICATE OF INSURANCE:** The bidder is required to submit proof of liability insurance in accordance with The College's contract.

- **PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATES**

- **P.L. 2005, Chapter 51 / Executive Order 117 - Contractor Certification and Disclosure of Political Contributions:**

In order for your proposal to be accepted and deemed valid, your company/firm will be required to comply with the requirements of Chapter 51 and Executive Order 117. Enclosed are the requirements of Ch. 51 and EO 117, the forms for Certification and Disclosure. The contract that will be generated based on this bid cannot be awarded without approval of the Certification and Disclosure forms by the State of New Jersey, Department of Treasury.

- **New Jersey Business Registration Certificate**

- **All applicable licenses, certificates, and requirements specified in the scope of work, contract documents and specifications.**

The following Bidder's Checklist is provided as an aid to the bidder. It does not in any way relieve the bidder of its responsibility to ensure that its bid proposal is complete.

- a. _____ Bidder has completed the Bidder Information section and General Agreement section and filled out the receipt of addendum and clarifications.
- b. _____ Bidder has completed the form of proposal and indicated base bid for either Separate Bid or Single Bid (Lump Sum all trades), prices for Alternate Proposals, and Unit Prices.
- c. _____ Bidder for Single Bid (Lump Sum) has listed and has disclosed the subcontractors on the Subcontractor Information form.
- d. _____ Bidder has enclosed a certified check or bid bond for ten percent (10%) of the amount of the bid.
- e. _____ Bidder has completed and enclosed the Non-Collusion Affidavit.
- f. _____ Bidder and each disclosed subcontractor has enclosed a copy of its **registration certificate** in accordance with the requirement of the Public Works Contractor Registration Act. (NJ Dept. of Labor and Workforce Development). **A completed copy of your Certification form is not required at time of bid; however, will be required from the bidder who receives the intent to award from the College.**
- g. _____ Bidder has acknowledged the **Affirmative Action Language** in accordance with the requirements P.L. 1975 C.127. (NJAC 17:27-1.1 et seq).
- h. _____ Bidder has enclosed its MWBE information.
- i. _____ Bidder has enclosed its Electrical and Plumbing License and any other licenses, certifications, certifications, and qualifications.
- j. _____ Bidder has enclosed its Vendor Qualification Statement
- k. _____ ~~Bidder has included a copy of its latest Experience Modification Rating (EMR Safety Rating). The College requires an average rating over the last 5 years of 1.25 or less.~~
- l. _____ Bidder has included a copy of its DPMC Notice of Classification and Total Amount of Uncompleted Contracts.
- m. _____ Bidder has enclosed a copy of its Chapter 51 & EO117 Certification form. **A completed copy of your Certification form is not required at time of bid; however, will be required from the bidder who receives the intent to award from the College.**
- n. _____ Bidder has enclosed a copy of its New Jersey Business Registration Certificate in accordance with the requirements of the New Jersey Division of Revenue. **A completed copy of your Certificate is not required at time of bid; however, will be required from the bidder who receives the intent to award from the College.**

- o. _____ Bidder has completed and enclosed the Statement of Ownership Disclosure (N.J.S.A. 52:25-24.2).**
- p. _____ Disclosure of Investment Activities in Iran (N.J.S.A. 52:32-58).**

GENERAL AGREEMENT

1. Having examined the plans and specifications with related documents and the site of the proposed work and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, the undersigned hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the Contract Documents, within the time set forth therein, and at the price stated. This price covers all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

2. Bidder acknowledges receipt of the following Addendums/Clarifications:

Addendum Number _____	Date _____	Addendum Number _____	Date _____
Addendum Number _____	Date _____	Addendum Number _____	Date _____
Addendum Number _____	Date _____	Addendum Number _____	Date _____

3. Bidder acknowledges and affirms that he/she has personal knowledge of or has obtained and reviewed a copy of the valid prevailing wage rates at the time of the bid and for the duration of the contract for all trades involved in the project for the geographical location of the project as issued by the Commissioner of the Department of Labor & Workforce Development, Trenton, NJ 08625 (609) 292-2259 or visiting the Department of Labor website at (http://lwd.dol.state.nj.us/labor/wagehour/wagerate/wage_rates.html).

4. Bidder agrees that its price is good and the bid shall not be withdrawn for a period of 60 calendar days after the scheduled Bid Due Date and Time.

5. Upon conclusion of the 5 business day protest period, Bidder will execute the formal contract within 5 business days and deliver as required in the General Conditions: a Performance and Payment Bond; Surety Disclosure and Certification Statement; and certificates of insurance for general liability, automobile and worker’s compensation.

6. Bidder acknowledges work to commence on site not later than ten (10) calendar days after receipt of a Notice to Proceed.

(Seal if bid is by Corporation)

Respectfully submitted,

(Signature of Principal)

(Printed Name of Principal)

(Title of Principal)

PRICES FOR SINGLE BID (LUMP SUM): Base Bid, Alternate Proposals, and Unit Prices
FORM OF PROPOSAL

To: **The College of New Jersey**

For: Fiber Infrastructure Upgrades Rebid

Date _____

A. BID:

1. Base:

Part-A (Fiber Infrastructure): \$ _____

Part-B (Allowance): \$100,000.00

We, _____, the Undersigned, in accordance with the published advertisement inviting proposals, will furnish all labor, material, equipment and services necessary for the complete construction, as defined in the advertisement, specimen contract, specifications, addendums/clarifications/bulletins, drawings, and proposal, for the Contract amount indicated below for the **above noted project** in strict accordance with the Contract Documents and Addenda thereto for the total sum of:

Total of Part A and B (including allowance)

_____ Dollars \$ _____
(words)

General Construction (Single overall Prime Contract)

Allowance:

Contractors will include in their bids an allowance of \$100,000 to be used for unforeseen conditions. One such condition could be asbestos remediation, etc.. Selected contractor will review and survey the proposed conduit routings in each building for any environmental hazards. If any areas of asbestos are suspected and cannot be avoided, contractor shall engage an environmental consultant for testing and remediation. Contractor will bill any costs associated with the environmental remediation against the allowance amount. The cost will be accounted for via an allowance reduction form to manage the allowance.

3. Add/Deduct Alternate

Alternate #1 – New underground 4” conduit routed to provide link between Travers to the TW Garage. Existing underground conduit will be scoped as part of the base bid to determine if conduit has been compromised.

\$ _____ Dollars
_____ (words)

Alternate #2 – New underground 4” conduit will be routed to provide link between the Power House and the Maintenance building. Routing will follow the existing path from the chiller room to the pull box on the exterior of maintenance. The existing underground conduit will be scoped as part of the base bid to determine if conduit has been compromised.

\$ _____ Dollars

_____ (words)

Alternate #3 – Underground duct bank conduit quantity change. Refer to table on drawings TC005, TC006, TC007 and TC008 for duct banks included in this change.

\$ _____ Dollars

_____ (words)

B. UNIT PRICES:

We, the Undersigned, agree, if awarded the Contract to perform additional work or delete work at the Unit Prices set forth below (Unit Prices are for work that is in addition to or is deleted from the base bid work):

1. Per foot – (2) 4” conduit duct bank (include trenching, conduit, concrete encasement, backfill, surface restoration and tracer wire.

\$ _____

2. Per foot – (4) 4” conduit duct bank (include trenching, conduit, concrete encasement, backfill, surface restoration and tracer wire)

\$ _____

3. 100 linear foot – 12 single mode fiber indoor/outdoor installed in existing pathway terminated on both ends.

\$ _____

4. 100 Linear foot – 24 single mode fiber installed in existing pathway terminated on both ends

\$ _____

5. 100 Linear foot – 36 single mode fiber installed in existing pathway terminated on both ends

\$ _____

6. 100 Linear foot – 48 single mode fiber installed in existing pathway terminated on both ends

\$ _____

7. 100 Linear foot – 96 single mode fiber installed in existing pathway terminated on both ends

\$ _____

8. 100 Linear foot – 144 single mode fiber installed in existing pathway terminated on both ends.

\$ _____

9. 2 Conduit Duct bank connection to two manholes on both sides of conduit

\$ _____

10. Medium (6’x6’x8’) precast manhole provided and installed with 2 conduit duct bank connection on two sides.

\$ _____

C. AGREEMENT: We, the Undersigned, agree, if awarded the Contract, to execute an agreement for the above stated work and compensation on the Standard Form of Agreement Between Owner and Contractor.

D. SURETY: We, the Undersigned, agree, if awarded the Contract, to execute and deliver to the Owner, prior to the signing of the Contract, the Performance and Payment Bonds as required.

- Contractor shall provide a Maintenance Bond at job completion for a period of one year for 100% of the final contract price.

E. BID SECURITY: The attached bid security is to become the Property of the Owner in the event that the Contract and bond are not executed within the time set forth, as liquidated damages for the delay and additional expense (including the difference between the price provided with said bond and the next lowest responsive bidder) to the Owner caused thereby.

Certified Check	\$ _____
Bid Bond	\$ _____

F. STATEMENT:

1. We, the Undersigned, acting through its authorized officers and intending to be legally bound, agree that this bid proposal shall constitute an offer by the Undersigned to enter into a Contract with the acts and things therein provided, which offer shall be irrevocable for sixty (60) calendar days from the date of opening hereof and that the Owner may accept this offer at any time during said period by notifying the Undersigned of the acceptance of said offer.

2. We, the Undersigned, acknowledge receipt of the following Addenda/Clarifications:

Addenda Number	Dated
_____	_____
_____	_____
_____	_____

The undersigned further agrees to comply with the requirements as to conditions of employment, wage rates, and hours of labor set forth in the Contract Documents.

Dated _____

Firm Name _____ Phone Number: _____

Address _____

**If a corporation, give the State of Incorporation, using the phrase:
"A corporation organized under the laws of _____."

If a partnership, give names of the partners, using also the phrase:
"Co-partners trading and doing business under the firm name and style of

_____.
If an individual using a trade name, give individual name, also using the phrase:
"An individual doing business under the firm name and style of _____.

Dated: _____

STATE OF _____ SS.

COUNTY OF _____

_____ being duly sworn say that the several matters stated in this proposal are in all respects true, and that no member of the State or employee of the College are interested in any way in this proposal.

Sworn and subscribed before me _____ Bidder signs above line

this _____ day of _____ 20 _____

Print Name and Title

SUBCONTRACTOR INFORMATION FOR SINGLE BID (LUMP SUM)

Pursuant to the State Colleges Contract Law, N.J.S.A. 18A:64-76.1, all bids submitted shall set forth the names and license numbers of all subcontractors to whom the bidder intends to subcontract the plumbing and gas fitting work; the refrigeration, the heating and ventilating systems and equipment; the electrical work, including any electrical power plants; tele-data, fire alarm, or security systems; the structural steel and ornamental iron work (individually, the “Trade” or collectively, the “Trades”).

For each Trade listed below for which the work will be completed by a subcontractor you must list for each such subcontractor at a minimum the name and, where applicable, license number (or in lieu thereof enclose a copy of the license with this form) and preferably you will also list the subcontractor’s address, telephone number, and fax number. If the work will be self-performed by the bidder, you may indicate that by inserting the name of the bidder (next to “Name”). If work by that Trade is not required per the scope of work of the project, you may indicate that by inserting “Not required” (next to “Name”). If the name of a subcontractor is not provided on this form for any one or more of the Trades, the bidder, in submitting its bid, certifies that, for such Trades, either the work will be self-performed by the bidder, or the work is not required per the scope of work.

Failure to complete this form as required may result in your bid being disqualified.

Plumbing and Gas Fitting Work

List information for Subcontractor, if any:

Name: _____
License Number: _____
Address: _____

Telephone: _____
Fax: _____

Refrigeration, Heating and Ventilating Systems and Equipment

List information for Subcontractor, if any:

Name: _____
License Number: _____
Address: _____

Telephone: _____
Fax: _____

Electrical Work, including any Electrical Power Plants, Tele-data, Fire Alarm, or Security Systems

List information for Subcontractor, if any:

Name: _____
License Number: _____
Address: _____

Telephone: _____
Fax: _____

Structural Steel Work and Ornamental Iron Work

List information for Subcontractor, if any:

Name: _____
License Number: _____
Address: _____

Telephone: _____
Fax: _____

Bidder Name

By: _____
Signature

Printed Name of Signing Individual

Date

SMALL BUSINESS, MINORITY AND/OR FEMALE-OWNED BUSINESS REPORTING

1. Contractor and sub-contractors are requested to check all of the following that apply to their company and, if applicable, submit a copy of their certificate(s):

A. My company is certified by the NJ Department of Treasury, Division of Revenue as a:

_____ small business _____ minority-owned business _____ female-owned business

B. My company is certified by the NJ Department of Transportation as a:

_____ small business _____ minority-owned business _____ female-owned business

C. My company is a _____ small business _____ minority-owned or _____ female-owned but is not certified by either NJ Department.

C. _____ My company is not a small business, minority-owned or female-owned.

Signed

Date



PERFORMANCE BOND & PAYMENT BOND

BOND NO. _____

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____ as Principal, and _____, a corporation of the State of _____, duly authorized to do business in the State of New Jersey, having an office at _____, are hereby held and firmly bound unto The College of New Jersey in the Penal Sum of _____ DOLLARS, for payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

SIGNED this _____ day of _____, 20_____

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT, WHEREAS, the above named Principal did on the _____ day of _____, 20_____, enter into a written contract with The College of New Jersey for _____ which said contract is made a part of this bond as set forth herein;

NOW, if the said _____ shall well and faithfully do and perform the things agreed by _____ to be done and performed according to the terms of the said contract; shall pay all lawful claims of sub-contractors, materialmen, laborers, persons, forms of other suppliers or teams. fuel, oils, implements or machinery furnished, used or consumed in the carrying forward, performing, or completing of said contract, we agreeing and assenting that this undertaking shall be for the benefit of any subcontractor, materialman, laborer, person, firm or corporation having a just claim, as well as for the obligee herein; then this obligation shall be void, otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said surety hereby stipulated and agrees that no modifications, omissions, or additions in or to the terms of the said contract, or in or to the plans and specifications therefore shall in any wise effect the obligation of said surety on its bond.

This bond is given in compliance with the requirements of the statutes of the State of New Jersey including N.J.S.A. 18A:64-68 and any amendments thereof.

SIGNED, SEALED AND DELIVERED
IN THE PRESENCE OF

Witness

BY: _____

Witness as to Surety

BY: _____
ATTORNEY-IN-FACT

Countersigned

NOTE: General Power of Attorney and the current

this _____ day of _____, 20 _____

financial statement of the bonding company
must be attached to each copy (a total of three)
of the Performance Bond.

BY: _____

SURETY DISCLOSURE STATEMENT AND CERTIFICATION

_____, surety(ies) on the attached bond, hereby certifies(y) the following:

- (1) The surety meets the applicable capital and surplus requirements of R.S. 17:17-6 or R.S. 17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.
- (2) The capital (where applicable) and surplus, as determined in accordance with the applicable laws of the State of New Jersey, of the surety(ies) participating in the issuance of the attached bond is (are) in the following amount(s) as of the calendar year ending December 31, _____, (insert most recent calendar year for which capital and surplus amounts are available), which amounts have been certified as indicated by certified public accountants (indicating separately for each surety that surety's capital and surplus amounts, together with the name and address of the firm of certified public accountants that shall have certified those amounts):

- (3) (a) With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. 9305, the underwriting limitation established therein and the date as of which that limitation was effective is as follows (indicating for each surety that surety's underwriting limitation and the effective date thereof):

- (b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S. 17:18-9 as of date on which such limitation was so established, is as follows (indicating for each such surety that surety's underwriting limitation and the date on which that limitation was established):

- (4) The amount of the bond to which this statement and certification is attached is \$_____.

- (5) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3) (a) or (3) (b) above, or both, then for each such contract of reinsurance:

- (a) The name and address of each such re-insurer under that contract and the amount of that re-insurer's participation in the contract is as follows:

-
- (b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item (5) (a) satisfies the credit for reinsurance requirement established under P.L. 1993, c. 243 (C. 17:51B-1 *et seq.*) and any applicable regulations in effect as of the date on which the bond to which this statement certification is attached shall have been filed with the appropriate public agency.

CERTIFICATION

(to be completed by an authorized certifying agent for each surety on the bond)

I, _____ (name of agent), as _____ (title of agent)

for _____ (name of surety),

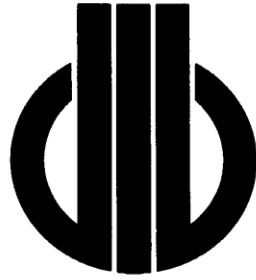
a corporation/mutual insurance company/other (indicate type of business organization by circling one) domiciled in _____ (state of domicile), DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOID and I am subject to punishment.

(Signature of certifying agent)

(Printed name of certifying agent)

(Title of certifying agent)

(Date of Certification)



**THE COLLEGE OF NEW JERSEY
CAMPUS FIRE ALARM PROJECT
EWING, NEW JERSEY**

TCNJ Project # IX124

FIBER INFRASTRUCTURE UPGRADES

SPECIFICATIONS

Issued For Bid – October 2021

**Prepared by:
DLB Associates
265 Industrial Way West
Eatontown, NJ 07724**

(DLB # 47211)

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TABLE OF CONTENTS**SECTION** **DESCRIPTION****DIVISION 01 - GENERAL REQUIREMENTS**

01010	SUMMARY OF WORK
01025	MEASUREMENT AND PAYMENT
01100	PROJECT PROCEDURES
01300	SUBMITTALS AND SUBSTITUTIONS
01310	QUALITY CONTROL
01320	TEMPORARY FACILITIES
01322	PHOTOGRAPHIC DOCUMENTATION
01330	CONTRACT CLOSEOUT
01340	PROJECT RECORD DOCUMENTS
01524	CONSTRUCTION WASTE MANAGEMENT
017836	WARRANTIES

DIVISION 03 – CONCRETE

033000	CAST IN PLACE CONCRETE
--------	------------------------

DIVISION 07 – THERMAL & MOISTURE PROTECTION

078413	PENETRATION FIRESTOPPING
--------	--------------------------

DIVISION 26 - ELECTRICAL

260519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
260529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
260533	RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
260544	SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING
260553	IDENTIFICATION FOR ELECTRICAL SYSTEMS

DIVISION 27 - COMMUNICATIONS

270526	GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS
270528	PATHWAYS FOR COMMUNICATIONS SYSTEMS
270529	HANGERS AND SUPPORTERS FOR COMMUNICATIONS SYSTEMS
270543	UNDERGROUND PATHWAYS AND STRUCTURES FOR COMMUNICATION SYSTEMS
270544	SLEEVES AND SLEEVE SEALS FOR COMMUNICATIONS PATHWAYS AND CABLING
271323	COMMUNICATIONS OPTICAL FIBER BACKBONE CABLING

DIVISION 31 - EARTHWORK

311000	SITE CLEARING
312000	EARTH MOVING

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>
<u>DIVISION 32 - EXTERIOR IMPROVEMENTS</u>	
321313	CONCRETE PAVING
321316	ASPHALT PAVING

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the specifications, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project consists of all work noted on the Contract Drawings and in these specifications for the Campus Alarm Cable Infrastructure Improvements.

- 1. Project Location: The College of New Jersey, Ewing New Jersey
- 2. Owner: The College of New Jersey, State of New Jersey

- B. SUMMARY of Work Not Intended To Be All Inclusive :

- 1. Cable Infrastructure

- a. Conduit Installations:

- 1) Install Underground Conduit Duct Banks Between Building as Identified on Drawings For Fiber Cable Routing. This Will Require A Minimum Of 2-4" PVC Conduits Run In Concrete-encased Duct Banks.
- 2) Install New Pathways Inside The Buildings In Electrical / Mechanical Rooms And Other Areas As Identified On Drawings For Routing The New Fiber.

- b. Fiber Cable Installations:

- 1) Install New Fiber Communication Infrastructure Between Buildings. Fiber Shall Be Routed Continuous (Unspliced) From MDF Room In One Building To MDF Room In Another Building. This Includes Routing Fiber In Underground Duct Banks And From Point Of Entry (POE) In The Buildings To MDF Room. These Pathways May Be A Combination Of New Conduits And Existing Spare Conduits.
- 2) Where Indicated Pull Out Existing Communication Fiber Cable Between Building And Install New Larger Fiber Cables That Would Include Fibers For Both New Fire Alarm Communication And The Replacement Fibers For Existing IT Requirements. Terminate all Fibers. Disconnection Of Jumpers On Existing Fibers Will Be By TCNJ IT Department. Installer shall develop a schedule for work in consultation with IT department to inform work progress and disruptions.

1.3 CONTRACTS

- A. The project contract is between The College of New Jersey and the single prime contractor performing the work specified.
- B. Definition of Extent of Contract Work: The contract documents, specifications, project drawings, manufacturer's installation handbooks, TCNJ form of agreement, and the contractors response to the RFP represent the extent of the construction contract.

1.4 CONTRACTORS USE OF PREMISES

- A. General: During the construction period the Contractor shall have full use of the premises for construction operations, including use of the site. The contractor's use of the premises is limited only by the Owner's right to perform work, retain other contractors on portions of associated projects, or to access the building for the occupants.
 - 1. Contractor is to coordinate their work with the activities for each work location.
 - 2. Contractor shall provide for and maintain pedestrian access flow through work areas during the fulfillment of this contract. This work shall include but is not limited to: temporary walkways, protection of open trenches and manholes, safety barriers and signage for pedestrian directions.
- B. Use of the Site: Limit use of the premises to areas required for equipment and material storage -
 - Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas immediately adjacent to the building and areas where the work is being performed.
 - 1. Owner Occupancy: Allow for Owner occupancy and use by the public.
 - 2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials unless previously approved by the owner. Schedule deliveries to minimize space and time requirements or storage of materials and equipment on -site.
 - 3. Burial of Waste Materials: Disposal of organic and hazardous materials on-site either by burial or burning, will not be permitted.
 - 4. Owner will provide designated areas near the construction site for parking for two vehicles, all other vehicles must park at the TCNJ Carlton Avenue parking lot and have the workers shuttled to the site.
- C. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect campus, buildings, contents, components, and systems and occupants during the construction period.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01010

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SECTION 01025 – MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SCHEDULE OF VALUES

- A. Each Contractor shall prepare a schedule of values in coordination with the preparation of progress schedule. Correlate line items with other administrative schedules and forms required for the work, including progress schedule, payment request form, listing of subcontractors, schedule of allowances if any, schedule of alternates if any, listing of products and principal suppliers and fabricators, and schedule of submittals. Break down principal subcontract amounts into multiple line items for each entity of work. Round off to nearest whole dollar, but with total equal to Contract Sum. Submit 4 copies of schedule of values to the Owner and Architect for review and approval.
1. Upon Owner/Architect approval, Owner will return the Schedule of Values to the Contractor for the Contractor to submit to the bonding company for their acceptance. Payments will not be made to the Contractor until the bonding company has provided a written acceptance to the Owner.
- B. The schedule of values shall be tabulated into subcontracts and trades with the Quantity, Labor, Material, and Total Cost indicated. The Schedule of Values shall include such items as bonds, insurance, allowances and alternates, punchlist/close out documents and shall enclose copies of invoices and/or cancelled checks from bonding and insurance agents.
- C. values shall be submitted on AIA Form G703 or similar form approved by the Architect and Owner.
- D. Each Contractor's monthly application for payment shall be in the same schedule form, reflecting the same items from above. Unit costs shall be realistic for their part of the Work.

1.2 CHANGES IN THE WORK

- A. When a change in the Work includes a category or categories of Work both added to and deducted from the Contract, the total quantities of added Work and of deleted Work shall be determined separately for each category and the appropriate unit price or net cost of the Work shall be applied to the difference between the two total quantities.
- B. Unit prices shall be inclusive of all costs and shall be applied to units of measure as defined in the Specifications for each category of Work.
- C. For all extra Work performed by the Contractor, the gross cost to the Owner shall include the net cost of the Work to the Contractor plus an allowance for overhead and profit not to exceed 15% of the net cost.
- D. For all extra Work performed by a Subcontractor, the gross cost to the Owner shall include the net cost of the Work to the Subcontractor plus an allowance for overhead and profit not to exceed 15% of the net cost, plus the Prime Contractor's overhead and profit not to exceed 5% of the Subcontractor's cost.

- E. Net cost of extra Work shall be the actual or pro-rated cost of:
 - 1. Labor, including foreman, at the prevailing rate of wages, contributions and taxes.
 - 2. Materials entering permanently into the Work, including delivery to the site.
 - 3. The ownership or rental cost of construction equipment and expendable tools, pro-rated for the time necessary for the Work.
 - 4. Power and consumable supplies for the operation of power equipment, pro-rated for the time necessary for the Work.
 - 5. Insurance and Bonds.
- F. Gross costs shall be net costs plus the mark up allowances described above, such mark up allowances being inclusive, of all cost of superintendence, supervision, engineering, overhead, profit, administrative and site office expenses and all other general expenses.

1.3 APPLICATIONS FOR PAYMENT

- A. Except as otherwise indicated, sequence of progress payments for the Contractor shall be regular, and each shall be consistent with previous applications and payments. It is recognized that certain applications involve extra requirements, including initial applications, applications at times of substantial completion, and final payment applications.
- B. Payment Application Forms: Use AIA Document G702 and G703 Continuation Sheets; available from Publications Distribution Div., The American Institute of Architects, 1735 New York Ave., N.W., Washington, D.C. 20006 (also available at most local AIA chapter offices).
- C. Except as otherwise indicated, complete every entry provided on the form, including notarization and execution by authorized persons. Incomplete applications will be returned by Architect and Owner without action. Entries shall match current data of schedule of values, progress schedules and reports. Listing shall include amounts of fully executed change orders issued prior to first day of the period of construction covered by application. Applications for payment shall include weekly payroll report. Contractor shall furnish to the Owner certified payroll reports for each payroll period with pay request, indicating name craft, social security number and actual hourly rate of wages paid to each workman employed on the project. A certified payroll record is defined as "a payroll record which is attested to by the employer, or corporate officer of such company, or an authorized agent of the employer." A payment request will not be paid until the Owner receives the certified payrolls.
- D. Submit one "pencil" copy of each proposed payment application to the architect and owner, for review, not less than seven days prior to formal submissions of application.
- E. Submit 4 executed copies of each payment application. Transmit with a transmittal form listing attachments, and recording appropriate information related to application.
- F. Breakdown may include a line item for General Conditions. General Conditions shall include the cost of general supervision, trailers, temporary utilities and other general expenses directly related to the project and not considered overhead. The general conditions item shall be billed on monthly progress payments on a percentage of work completed.

1.4 INITIAL PAYMENT APPLICATION

- A. The principal administrative actions and submittals which shall precede or coincide with submittal of the Contractor's first payment application can be summarized as follows, but not necessarily by way of limitation.
1. Listing of subcontractors and principal suppliers and fabricators.
 2. Schedule of values.
 3. Schedule of principal products.
 4. Schedule of submittals (preliminary if not final).
 5. Copies of acquired building permits and similar authorizations and licenses from governing authorities for current performance of the work.
 6. Data needed by Owner to secure related insurance coverages.
 7. Performance and Payment Bond.
 8. Insurance Certificates.

1.5 PROGRESS PAYMENTS

- A. Based upon application for payments submitted to the Architect and the Owner, by the Contractor, on or about the 25th day of each month for the period ending the last day of the previous second month, and Certificate of Payment issued by the Architect and the Owner, the Owner will make progress payments on account of the Contract Sum to the Contractor as follows:
1. On or after the 20th day of each month, the Contractor shall submit to the Architect and Owner a "pencil copy" indicating the previous payment and the proposed amounts for each line item for the current period. After review and approval or changes, the Contractor shall prepare the final billing for presentation to the Architect and Owner.
 - a. Whenever any contract, the total price of which exceeds \$100,000, entered into by a State college, for the construction, reconstruction, alteration or repair of any building, structure, facility or other improvement to real property, requires the withholding of payment of a percentage of the amount of the contract, the contractor may agree to the withholding of payments in the manner prescribed in the contract, or may deposit with the State college registered book bonds, entry municipal bonds, State bonds or other appropriate bonds of the State of New Jersey, or negotiable bearer bonds or notes of any political subdivision of the State, the value of which is equal to the amount necessary to satisfy the amount that otherwise would be withheld pursuant to the terms of the contract. The nature and amount of the bonds or notes to be deposited shall be subject to approval by the State college. For purposes of this section, "value" shall mean par value or current market value, whichever is lower.

If the contractor agrees to the withholding of payments, the amount withheld shall be deposited, with a banking institution or savings and loan association insured by an agency of the Federal government, in an account bearing interest at the rate currently paid by such institutions or associations on time or savings deposits. The amount withheld, or the bonds or notes deposited, and any interest

accruing on such bonds or notes, shall be returned to the contractor upon fulfillment of the terms of the contract relating to such withholding. Any interest accruing on cash payments withheld shall be credited to the State college.

- b. Any contract, the total price of which exceeds \$100,000, entered into by a State college involving the construction, reconstruction, alteration, repair or maintenance of any building, structure, facility or other improvement to real property, shall provide for partial payments to be made at least once each month as the work progresses, unless the contractor shall agree to deposit bonds with the State college pursuant to section 1.
 - c. With respect to any contract entered into by a State college pursuant to section 2 for which the contractor shall agree to the withholding of payments pursuant to section 1, 2% of the amount due on each partial payment shall be withheld by the State college pending completion of the contract.
2. Upon acceptance of the work performed pursuant to the contract for which the contractor has agreed to the withholding of payments pursuant to subsection a. of this section, all amounts being withheld by the State college shall be released and paid in full to the contractor within 45 days of the final acceptance date agreed upon by the contractor and the State college, without further withholding of any amounts for any purpose whatsoever, provided that the contract has been completed as indicated. If the State college requires maintenance security after acceptance of the work performed pursuant to the contract, such security shall be obtained in the form of a maintenance bond. The maintenance bond shall be no longer than two years and shall be no more than 100% of the project costs.
- a. This act shall take effect immediately. This bill supplements the “State College Contracts Law,” P.L.1986, c.43 (C.18A:64-52 et seq.), and applies to any State college contract for over \$100,000 which involves the construction, reconstruction, alteration or repair of any building, structure, facility or other improvement to real property. Under the provisions of this bill, whenever a contract of this type requires the withholding of payment of a percentage of the amount of the contract, the contractor would have the choice of either agreeing to a retainage deduction from each monthly progress payment, or the contractor could choose to deposit bonds in the amount necessary to satisfy the amount that otherwise would be withheld under the contract. If a contractor chooses a retainage deduction from each monthly payment, then the retainage would be limited to 2% of the amount due on each partial payment. Upon acceptance of the work performed pursuant to the contract for which the contractor has agreed to a retainage deduction, all amounts being withheld by the State college must be paid in full to the contractor within 45 days of the final acceptance date agreed upon by the contractor and the State college. The bill provides that if the State college requires maintenance security after acceptance of the work performed under the contract, the security must be obtained in the form of a maintenance bond, which is required to be no longer than two years and no more than 100% of the project costs. The provisions of this bill are similar to provisions in the “Local Public Contracts Law,” P.L.1971, c.198 (C.40A:11-1 et seq.) and the “Public School Contracts Law,” P.L.1977, c.114 (C.18A:18A-1 47 et seq.).
3. Upon substantial completion, the retainage shall, upon the Architect/Owner’s approval, remain at 2% of the value of work completed. Final release of retained monies will occur

only upon the total completion of all punch list and closeout documentation to the satisfaction of the Architect and Owner.

4. For each day's delay in the Contractor's submission of an application for payment acceptable to the Architect and Owner, the Owner may delay one day in making his progress payment.
5. Owner shall make payments within 30 days of receipt of said monthly pay requisition.

1.6 APPLICATION AT TIME OF SUBSTANTIAL COMPLETION

- A. Following issuance of certificate of substantial completion on each Contractor's work, and also in part as applicable to prior certificates on portions of completed work as designated, a "special" payment application may be prepared and submitted by Contractor. The principal administrative actions and submittals which shall precede or coincide with such special applications can be summarized as follows, but not necessarily by way of limitation:
 1. Occupancy permits and similar approvals or certifications by governing authorities and franchised services, assuring Owner's full access and use of completed work.
 2. Warranties, guarantees, maintenance agreements and similar provisions of Contract Documents.
 3. Test/adjust/balance records, maintenance instructions, meter readings, start up performance reports, and similar change over information germane to Owner's occupancy, use, operation and maintenance of completed work.
 4. Final cleaning of the work.
 5. Application for reduction (if any) of retainage, with consent of surety.
 6. Advice to Owner on coordination of shifting insurance coverages, including proof of extended coverage as required.
 7. Listing of Contractor's incomplete work, recognized as exceptions to certificate of substantial completion.

1.7 FINAL PAYMENT APPLICATION

- A. The administrative actions and submittals which shall precede or coincide with submittal of the Contractor's final payment application can be summarized as follows, but not necessarily by way of limitation.
 1. Completion of project closeout requirements.
 2. Completion of items specified for completion beyond time of substantial completion, regardless of whether special payment application was previously made.
 3. Assurance, satisfactory to Owner and Owner, that unsettled claims will be settled and that work not actually completed and accepted will be completed without undue delay.
 4. Transmittal of required project construction records to Owner via the Owner.
 5. Proof, satisfactory to Owner and Owner, that taxes, fees and similar obligations of Contractor have been paid.

6. Removal of temporary facilities, services, surplus materials, rubbish and similar elements.
7. Notarized consent of surety for final payment.

1.8 WAIVER OF LIENS

- A. Each Contractor, for himself, and for all Subcontractors and material men, agrees that no mechanic's lien or other claim shall be filed or maintained by the Contractor or by any Subcontractor, materialmen, laborer or any other person whatsoever for, or on account of any work performed or materials furnished under this Contract. This agreement shall be an independent contract, and the Contractor shall execute and deliver a separate Waiver of Liens in form and substance satisfactory to the Architect and Owner contemporaneously with the execution of the Owner-Contractor Agreement and before any work is begun at the site.
- B. In every subcontract entered into by each Contractor after execution of this Contract or in connection herewith, the Contractor shall incorporate a provision, similar to the foregoing paragraph, to the effect that neither the Subcontractor nor any party acting through or under him shall file or maintain any mechanic's lien or other claim against the Architect or Owner in connection with the Work.

END OF SECTION 01025

SECTION 01100 - PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SPECIAL REQUIREMENTS

- A. Schedule: Contractor shall provide a master schedule showing sequencing of work utilizing the CPM method. The Contractor shall supply a schedule with all subcontractor activities, relationships, and durations, utilizing the CPM method via SureTrak/Primavera, Version 3.0, or a Microsoft scheduling software to the Owner on a working version CDrom and coordinate their schedule with the Owner.
1. The Contractor is required to update at the end of each month the CPM Schedule based on the percentage completed for each activity on the approved schedule (in concert with the submission of the percentage completed in the monthly proposed schedule of values).
 2. **The contractor in their bid includes a cost of \$500.00 per month for this schedule submission, for the duration of construction (per the milestone schedule in the bidding documents). The contractors schedule of values shall include this cost, and can only be billed for upon TCNJ's successful receipt of said schedule. Should any schedule not be received at the end of any month during construction, TCNJ will issue a deduct change order in the amount of \$500.00 to the contractor.**
- B. Each Contractor shall take all necessary precautions to ensure the safety of all structural elements during all phases of all work. No materials, cranes, trucks or any other construction loads shall be placed on any part of the structure until the Contractor has determined the adequacy of that structure to carry the intended load without damage or overstress.
- C. Entrance into, or other use of the building will not be permitted except as may be necessary for the execution of the Work, and shall be subject to the restrictions and instructions of the Owner.
1. **NOTE: Any personnel working in any residence hall, including delivery personnel are to have a State Police Background check completed before entering any residence hall. Contractor is to provide the background check for all personnel at the kick off meeting, and/or prior to start of their work. Should a person not have a background check but is on site for a short period of time, said person shall be escorted by a TCNJ project manager/superintendent and /or a designated person that has provided the appropriate back ground check information. All back ground checks will be forwarded to TCNJ police for review and filing.**
 2. **NOTE: any personnel working in a residence hall must wear a badge with the name of the vendor/contractor they work for and their personal name. This badge must be worn at all times.**
- D. Routes of ingress and egress to areas where work is being performed shall be subject to the restrictions and instructions of the Owner.
- E. Materials shall be moved through the Building using rubber tired vehicles which shall be properly controlled at all times to avoid damage to existing wall, floor or ceiling surfaces.

- F. Water damage cannot be tolerated and it is incumbent upon Contractors to take any steps necessary to keep the existing premises dry at all times.
- G. Any damage to the new building from heavy equipment, striking the Building or any other damage to any part of the premises shall be repaired at the expense of the Contractors.
- H. All welding and cutting shall be performed by qualified and certified welders. Certificates shall be on file with the Contractor prior to commencement of any welding.
- I. No work shall start before 8:30am unless agreed to in advance with the College.

PART 2 - PRODUCTS
NOT APPLICABLE

PART 3 - EXECUTION

3.1 GENERAL

- A. Contractors shall perform the work on or about the premises in a careful manner with full consideration to fire protection as required by the National Fire Protection Association Standards, National Board of Fire Underwriters and State and Local Departments having jurisdiction. Fire resistant materials shall be used for temporary enclosures.
- B. Chemical extinguishers approved by the Owner shall be provided by the Contractor during the progress of the work where and as required by the Owner, the Local Fire Marshal and the National Board of Fire Underwriters.
- C. The Contractor shall maintain an active program of fire prevention to keep workmen fire conscious during the entire life of the Contract. Designate one member of the organization to execute and coordinate fire control measures of his own organization and that of all subcontractors under his jurisdiction.
- D. All sub-contractors shall cooperate with the Contractor in carrying out the above program.
- E. Storage of flammable materials will not be permitted in the Building unless written permission is obtained from the Owner. Storage of all such materials shall be the Contractors' responsibility.
- F. On-site open burning of rubbish, garbage, trade waste, leaves or plant life is prohibited.
- G. Safety Program: The Contractor shall institute a safety program in accordance with OSHA and any local, state, or federal guidelines. The contractor shall name a safety officer to monitor this program and shall submit a safety report at job meetings.
- H. Stockpiling: Stockpiling of materials on site will be allowed (but limited due to the limited space on this site). Such materials shall not impair or impede the functioning of the facility. Materials stored on site shall be secured to prevent loss from theft, damage, vandalism or fire. By stockpiling materials on site, the contractor assumes full responsibility for said materials, and shall protect them to the fullest extent possible. Specific locations for stockpiling materials shall be coordinated with the Owner.

1. NOTE: Excess soil shall be removed from the site and disposed of immediately as part of this project. The intent is to minimize the quantity of open trenches and stock piled soils at the site.
- I. Safety Barriers: The Contractor shall erect safety barriers to deter and prohibit unauthorized access to the construction site; such barriers may take the form of fences and shall be clearly marked with signage prohibiting unauthorized access. The Contractor shall be responsible for safety barriers around the site and within the buildings. The contractor shall be liable for damages to persons or property due to the construction process if adequate safety measures are not undertaken. The Owner shall review safety precautions for their adequacy but shall not be held liable for Contractors failure to maintain or provide adequate protection.
- J. Sequencing: The Contractor will work with the Sub-Contractors to sequence the work during the submission of monthly project schedules. Contractors shall endeavor to coordinate their work efforts with the Owner's requirements. Interruptions of utility services shall be coordinated with the Owner, but in no instance, shall last longer than 2 hours.
- K. Limited staging and on site parking will be provided by General Contractor. The Contractor will coordinate parking areas with all the subcontractors and TCNJ.
 1. Parking will be available at Carlton Avenue. Contractor will provide shuttle service to and from the site.
 2. Contractor will be permitted to have vehicles on site with in the construction fencing only. Contractor is to provide stone in all parking areas on site to prevent the buildup of ruts and mud, thus minimizing the amount of mud leaving the site and being left behind on TCNJ roads.
- L. Site Utilities: Electric power and water are available on site. Toilet facilities will be made available by the Contractor. These facilities shall remain clean by the Contractors throughout the course of the project. The Contractors shall repair and/or replace any damaged fixtures, partitions, etc. The Electrical Sub-Contractor shall tie in a temporary power panel (or panels as required) for all trades to use during construction. Interruption of building services shall not occur without prior consent and coordination by the Owner and Owner.
 1. Provide portable toilets for all construction personnel.
- M. Construction Lighting: The Electrical Sub-Contractor shall run sufficient strings and fixtures to maintain a 50 foot-candle/sq.ft.intensity of light throughout the project areas.
- N. Dumpster Location and Cleanup: The Owner shall coordinate the dumpster location with the Contractors. The Contractor shall be responsible for obtaining, maintaining, and disposing of dumpsters, and shall maintain clean work areas throughout the course of the project.
 1. Contractor is to provide adequate manpower during the entire course of the project to maintain the site in a clean, neat and professional manner. At a minimum the contractor is to clean the entire site twice per week (on different days) by picking up all debris in and around the site. Sweeping the areas of work inside the building is required daily. Contractor is to place garbage cans on each floor minimum 3 per floor in designated locations to assist in keeping the site clean. The owner will not tolerate a building project that is not maintained in a professional manner at all times.

3.2 PROGRESS MEETINGS

- A. Progress Meetings shall be held bi-weekly at the job site at a regular time and day mutually agreed upon. The frequency may be changed by the Engineer or Owner to reflect current conditions. The Contractors, those of his/their subcontractors concerned with current progress or with scheduling of future progress, the Engineer, and the Owner shall each be represented at these job meetings by persons familiar with the details of the work and authorized to conclude matters relative to work progress, establishment of progress schedules, etc., as may be necessary to expedite completion of the work.
- B. The Contractors and his/their subcontractors attending these meetings shall present complete and definite reports as to the status of their respective work, conditions of product and equipment manufacturer, labor availability, productivity and cooperation, shipping data, time of completion, sequence of the work, safety program, and any other information bearing upon the execution of the Contract or subcontract. For the Owner's convenience the Owner will chair the meetings.

3.3 MONTHLY REPORTS

- A. The Contractor is to provide TCNJ a brief monthly status report on the last working day of each month dividing the status of the project into the following categories (report must be complete in all respects, piece meal submissions will not be accepted):
 - 1. Project overview
 - 2. Financial status
 - 3. Updated project schedule
 - 4. Change order request log
 - 5. Submittal log
 - 6. RFI log
 - 7. Owner/Engineer issues that need immediate resolution
 - 8. Order/delivery issues
- B. The Contractor is to provide TCNJ with this monthly report, and include in their bid a cost of \$500.00 per month for all projects in excess of 2 million dollars base bid price for the duration of the construction period as noted in the bidding milestone schedule. This total cost will be listed in the contractor's schedule of values and can be billed for on a monthly basis only if said report is received in whole as noted above. Should TCNJ not receive said complete report a deduct change order will be issued to the contractor for \$500.00 for that month.

END OF SECTION 01100

SECTION 01300 – SUBMITTALS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 PROGRESS SCHEDULE / COORDINATION DRAWINGS

- A. The Contractor's schedule, shall coordinate with all trades to produce a coordinated CPM via Suretrak/Primavera version 3.0 or a Microsoft scheduling program schedule indicating the start and completion dates for each portion of the work as defined by the schedule of values, with the total time as defined by the contract time and milestone dates as set forth in these specifications. The Contractor's CPM schedule shall be submitted in electronic format (Suretrak 3.0 or a Microsoft Scheduling program) to and reviewed by the Owner and Engineer prior to first application for payment. Any revisions or additional information requested by the Owner shall be provided. (No payment shall be made to any Contractor not providing a schedule that reflects their entire work).
1. Also refer to Section 01100-1 – Project Procedures.
- B. The Contractor shall revise the progress schedule on a monthly basis as the work progresses reflecting therein any delays, including those not within the Contractor's control, or accelerations in the progress of the work. The progress schedule, as revised for any weekly period, shall be discussed at the bi-weekly job meetings with the, Owner, the Engineer, and the Contractor and the major trades in order to insure that the percentage of actual completion of any portion of the work as called for in the progress schedule for that bi-weekly period is attained. Monthly updates to the progress schedule shall be made prior to application for payment.
- C. Should any delay occur in the progress of the work or any portion thereof, the Contractor shall be required to implement all necessary measures to accelerate the construction, to meet the percentages of completion dictated by the progress schedule on the applicable dates, without additional cost to the Owner.

1.2 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. Shop drawings, product data and samples will not be processed by the Owner and/or Engineer until the list of subcontractors, material suppliers and fabricators is submitted as required under Paragraph 3.12 of the General Conditions.
1. The successful Contractor shall submit their list of proposed substitutions within 20 calendar days of the Contract Award.
2. The Engineer shall be compensated on an hourly basis for review of all shop drawings or samples that do not meet the requirements of the contract documents after two submissions. The compensation shall be deducted from the contractors contract via a deduct change order, or other means that both parties agree to.
- B. Coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittals. Allow two weeks for review/approval by the Engineer for the approval process, one additional week for TCNJ staff to review the submittal before it is returned to the contractor. Allow additional time if processing must be delayed to permit coordination with subsequent submittals with others.

1. Contractor is to provide a submittal schedule identifying the critical path submittals to assist the design team in prioritizing their review and subsequent return to the contractor prior to the first requisition for payment being processed. Every submittal is to have a required return date associated with it so the design team can schedule their reviews accordingly.
- C. Provide permanent marking on each submittal to identify Project, date, Contractor, subcontractor, submittal name, Specification section, drawing reference, and similar information to distinguish it from other submittals. Show Contractor's executed review and approval marking and provide space (5" x 7") for Engineer's Action marking and space for Owner's review marking. Package each submittal appropriately for transmittal and handling. Submittals received, which are lacking the above information, will be returned without action. Submittals, which are received from sources other than through Contractor's office, will be returned without action.
- D. Each submission shall be complete, with all options clearly marked and with all components required for the assembly fully described and detailed. Submissions missing important information will be returned unchecked.
- E. Transmittal Form: Submittals shall be accompanied by a transmittal form. Provide Contractor's certification on form, ready for execution, stating that information submitted complies with requirements of contract documents.
- F. Transmit all submittals and shop drawings to the Engineer with a copy of the transmittal to the Owner.
- G. Except as otherwise indicated in individual work sections, comply with requirements specified herein for each indicated category of submittal. Provide and process intermediate submittals, where required between initial and final, similar to initial submittals.
- H. Do not proceed with installation of materials, products or systems until final copy of applicable shop drawings, product data and samples are in possession of Installer.
- I. Provide newly prepared shop drawings, on reproducible sheets, with graphic information at accurate scale, with company name of preparer indicated. Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards, and special coordination requirements. Do not allow shop drawing copies without appropriate final Action markings by Engineer to be used in connection with the work.
 1. Initial and Intermediate Submittals: One correctable translucent reproducible print and 5 blue line or black line prints; reproducible will be returned.
 2. Final Submittal: 6 prints, plus 3 additional prints where required for maintenance manuals; 4 will be retained and remainder will be returned, one of which shall be marked up and maintained by Contractor as "Record Document".
 3. Electronic submittals are acceptable in AutoCad format only. Contractor shall be responsible for printing and distribution of multiple copies as required.
- J. Collect required product data into one submittal for each unit of work or system; and mark each copy to show which choices and options are applicable to the project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements that have been checked, and special

coordination requirements. Maintain one set of product data for each submittal at project site, available for reference by Engineer and others.

- K. Submittals will be accepted from the Contractor only. Submittals received from other entities will be returned without review or action.
1. Submittals received without a transmittal form will be returned without review or action.
 2. Transmittal form: Use a form matching the sample form attached to this section. Include the following:
 - a. List of deviations.
 - b. The Contractor's certification signature.
 3. Fill out a separate transmittal form for each submittal; also include the following:
 - a. Other relevant information.
 - b. Request for additional information.
- L. Do not submit product data, or allow its use on the project, until compliance with requirements of Contract Documents has been confirmed by Contractor. Submittal is for information and record unless otherwise indicated. Initial submittal is final submittal unless returned promptly by Engineer marked with an Action that indicates and observed noncompliance. Submit 6 copies, plus 3 additional copies, which will be returned, where required for maintenance manuals.
1. Electronic submittals are acceptable in 8 ½" x 11" format only.
- M. Upon receipt of a signed copy of the Engineers' Waiver form, electronic copies of CAD drawings of the Contract Documents will be provided by the Engineer for Contractor's use in preparing submittals.
- N. Product Selection Procedures: Procedures for product selection include the following:
1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the named product or an equivalent.
 2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product of the manufacturer or source that complies with requirements, or an equivalent.
 3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements, or an equivalent. Comply with provisions of "Product Options and Substitutions," Section 1.4 of Division 1300 of these specifications when submitting an equivalent product.
 4. Manufacturers: Where specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed, or an equivalent, that complies with requirements. Comply with provisions of "Product Options and Substitutions," Section 1.4 of Division 1300 of these specifications when submitting an equivalent product.
 5. Product Options: Where Specification paragraphs or subparagraphs refer to "Product Options and Substitutions," indicate that size, profiles, and dimensional requirements on

Drawings are based on a specific product or system; provide the specific product or system or an equivalent product or system by another manufacturer. Comply with provisions of "Product Options and Substitutions," Section 1.4 of Division 1300 of these specifications when submitting an equivalent product.

6. Basis of Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Products" introduce or refer to a list of manufacturers' names, provide either the specified product or an equivalent. Drawings and Specifications indicate sizes, profiles, dimensions and other characteristics that are based on the product names. Comply with the provisions of "Product Options and Substitutions," Section 1.4 of Division 1300 of these specifications when submitting an equivalent product.

1.3 MISCELLANEOUS SUBMITTALS

- A. Miscellaneous submittals related directly to the work include warranties, maintenance agreements, workmanship bonds, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the work and not processed as shop drawings, product data or samples.
- B. Refer to sections for specific general requirements on warranties, product/workmanship bonds, and maintenance agreements. In addition to copies desired for Contractor's use, furnish 2 executed copies, except furnish 3 additional copies where required for maintenance manuals.
- C. For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

1.4 PRODUCT OPTIONS AND SUBSTITUTIONS

A. DEFINITIONS

1. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - a. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - b. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - c. Equivalent Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance,

physical properties, appearance, and other characteristics that equal or exceed those of specified product.

2. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
3. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
4. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
5. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
6. **Buy American Requirement: the Contractor shall comply with N.J.S.A 52:32-1 and N.J.S.A. 52:33-1 et seq., which prohibits the use by the Contractor or subcontractors of materials or farm products produced and manufactured outside of the United States on any public work.**

B. General Requirements:

1. The requirements for substitutions do not apply to specified Contractor options on products and construction methods. Revisions to Contract Documents, where requested by Owner or Engineer are changes, not substitutions. Contractor's determination of and compliance with governing regulations and orders issued by governing authorities do not constitute substitutions and do not constitute a basis for change orders. Otherwise, Contractor's requests for changes in products, materials, and methods of construction required by Contract Documents are considered requests for substitutions, and are subject to requirements hereto.
2. To the greatest extent possible, provide products, materials and equipment of a singular generic kind and from a single source.
3. Where more than one choice is available as options for Contractor's selection of a product or material, select an option that is compatible with other products and materials already selected. Total compatibility among options is not assured by limitations within Contract Documents, but shall be provided by Contractor. Compatibility is a basic general requirement of product/material selections.
4. Any and all contractor substitutions that require additional work by other trades not specifically called for in the documents shall be paid for by the contractor requesting the substitution if any other trade increase is required.
5. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

- C. Submittals: Submit 6 copies, utilizing Substitution Request Form, CSI Form 13.1.A, fully identified for product or method being requested for substitution, including related specification section and drawing numbers, and fully documented to show compliance with requirements for substitutions. Include product data/drawings, description of methods, samples where applicable, Contractor's details comparison of significant qualities between specified item and proposed substitution, statement of effect on construction time and coordination with other affected work and contractors, cost information or proposal, warranty information, compatibility with other work, approval of all authorities having jurisdiction, and Contractor's statement to the effect that proposed substitution will result in overall work equal to or better than work originally indicated.
- D. Contractor's options for selecting products are limited by Contract Documents requirements, and governing regulations. Required procedures include, but are not necessarily limited to, the following for various indicated methods or specifying:
1. Single product/manufacturer name; provide product indicated or equivalent, except advise Engineer before proceeding, where known that named product is not a feasible or acceptable selection.
 2. Two or more product/manufacturer names; provide one of the named products or equivalent, at Contractor's option; but excluding products which do not comply with requirements. Advise Engineer before proceeding.
 3. Equivalent; where named products in Specifications text are accompanied by the term "or equivalent", or other language of similar effect, comply with those Contract Documents provisions concerning substitutions for obtaining Engineer's approval of equivalent product.
 4. Named, except as otherwise indicated, is defined to mean manufacturer's name for product, as recorded in published product literature, of latest issue as of date of Contract Documents. Refer requests to use products of a later or earlier model to Engineer for acceptance before proceeding.
 5. Where compliance with an imposed standard, code or regulation is required, selection from among products that comply with requirements including those standards, codes and regulations, is Contractor's option.
 6. Provide products which comply with specific performances indicated, and which are recommended by manufacturer, in published product literature or by individual certification, for application indicated. Overall performance of a product is implied where product is specified for specific performance.
 7. Provide products that have been produced in accordance with prescriptive requirements, using specified ingredients and components, and complying with specified requirements for mixing, fabricating, curing, finishing, testing and similar operations in manufacturing process.
 8. Where specified product requirements include "...as selected from manufacturer's full range of colors, patterns, textures..." or words of similar effect, the selection of manufacturer and basic product data is to comply with requirements of the Contract, and selection shall be from the full range of products within the requirements. Where specified product requirements include "... as the industry...", or words to that effect, selection of product complying with requirements, is Engineer's selection, including designation of manufacturer, where necessary to obtain desired color, pattern or texture.

- E. Substitutions may be permitted by the Engineer, if, in his opinion, the requirements of the proposed substitution comply with the requirements specified for the material, article or piece of equipment; however, the Engineer is not required to permit substitution pursuant to the case of Whitten Corporation vs. Paddock, Incorporated, United States District Court, Massachusetts, April 12, 1974, affirmed by the Federal First Circuit Court, December 14, 1974.
- F. After award of contract, the Contractor may submit substitutes to the Engineer for review, fully documented and certified, and accompanied by a proposal for a reduction in the Contract Sum.
- G. Contractor's request for substitution will be received and considered when extensive revisions to Contract Documents are not required and changes are in keeping with general intent of Contract Documents; when timely, fully documented and properly submitted; and when one or more of following conditions is satisfied, all as judged by Engineer. Otherwise, requests will be returned without action except to record noncompliance with these requirements.
 - 1. Where request is directly related to an "equivalent" clause or other language of same effect in Contract Documents.
 - 2. Where required product, material or method cannot be provided within Contract Time, but not as a result of Contractor's failure to pursue the work promptly or coordinate various activities properly.
 - 3. Where required product, material or method cannot be provided in a manner which is compatible with other materials of the work, or cannot be properly coordinated therewith, or cannot be warranted (guaranteed) as required, or cannot be used without adversely affecting Owner's insurance coverage on completed work, or will encounter other substantial noncompliances which are not possible to otherwise overcome except by making requested substitution, which Contractor thereby certifies to overcome such incompatibility, uncoordination, nonwarranty, noninsurability or other noncompliance as claimed.
 - 4. Where substantial advantage is offered Owner, in terms of cost, time or other valuable considerations, after deducting offsetting responsibilities Owner may be required to bear, including additional compensation to Engineer for redesign and evaluation services, increased cost of other work by Owner or separate Contractors, and similar considerations.
- H. Contractor's submittal of, and Engineer's acceptance of, shop drawings, product data or samples which indicate work not complying with requirements of Contract Documents, does not constitute an acceptable and valid request for, nor approval of, a substitution.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

1.6 EQUIVALENT PRODUCTS

- A. Where products or manufacturers are specified by name, Contractor must submit the following, in addition to other required submittals, to obtain approval of an unnamed product proposed as an equivalent:
1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners, if requested.
 5. Samples, if requested.

1.7 OPERATION AND MAINTENANCE INSTRUCTIONS AND EQUIPMENT WARRANTIES

- A. The Contractor shall orient and instruct the responsible maintenance personnel designated by the Owner in the Operation of all equipment and shall provide the maintenance personnel with pertinent literature and operational manuals for all equipment. Date and time of demonstrations shall be mutually agreed upon with the Owner. Provide qualified personnel for as long as necessary to fully orient and instruct the Owner. Contractor shall videotape instruction session and provide owner with completed video.
- B. The manuals shall be submitted in (quadruplicate) 3-ring loose-leaf type binders to the Engineer for approval with all additional information that the Engineer may request and considers necessary for the proper servicing and maintenance of all equipment. Manuals are to include plain paper copies of approved shop drawings and catalog cuts. The quality of the copies may be subject to approval by the Engineer. Upon completion and approval, 3 copies will be forwarded to the Owner and one copy retained by the Engineer.
- C. Manuals shall include no less than the following:
1. Maintenance Schedule: Typewritten schedule describing manufacturer's recommended schedule of maintenance and maintenance procedures.
 2. Catalog cuts and shop drawings:
 - a. Catalog cuts shall clearly indicate the exact model and type of each piece of equipment installed in the Project, including all options provided.
 - b. Catalog cuts shall fully describe equipment including physical, electrical, mechanical and other characteristics, performance characteristics and installation or erection diagrams.
 - c. Catalog cuts shall indicate spare part numbers and name, address and telephone number of local representative or service department.

3. Typewritten list of all subcontractors on the Project including name, address, telephone number and responsibility on the Project.
 4. Manuals shall be indexed with dividers indicating each system or piece of equipment.
 5. Warranties, permits, inspection stickers/approvals and Certificate of Occupancy are to be included.
- D. Required warranties shall be submitted in three copies to the Engineer.
- E. The Contractor shall video tape all instructional sessions and demonstrations and provide the Owner with a copy of the videotape at the end of all demonstrations.

PART 2 - PRODUCTS
NOT APPLICABLE

PART 3 - EXECUTION

3.1 ACTION ON SUBMITTALS

- A. One copy of all submissions will be returned to the Contractor for his files. The Contractor shall mark up other copies so as to conform with the copy returned to him and forward them to all interested Contractors, Subcontractors, and Suppliers.
- B. The Engineer will review and stamp submitted shop drawings in one of the following ways (the actual stamp may be different; below language is shown for an example only)
1. "No Exceptions Taken": Approved.
 2. "Make Corrections Noted": Approved, provided the work complies with corrections marked on the submittal.
 3. "Revise and Resubmit": Do not commence work of this submittal. Revise and resubmit or prepare a new submittal; comply with notations marked on submittal.
 4. "Rejected": Fundamentally not in compliance. Prepare a new submittal. No notations or comments made.
- C. Work shall be executed in accordance with "Approved", "Approved As Noted", or "Resubmit for Record" stamp only.
- D. Engineer's review of shop drawings/submittals will constitute checking for general arrangement only, and shall not relieve the Contractor of responsibility for complete compliance with Drawings and Specifications. Contractor shall be responsible for quantities and dimensions to assure a proper fit under field conditions.

3.2 DISTRIBUTION

- A. Provide additional distribution of submittals, not included in foregoing copy submittal requirements, to subcontractors, suppliers, fabricators, installers, governing authorities and others as necessary for proper performance of the work. Include such additional copies in transmittal to

Engineer where required to receive Action marking before final distribution. Show such distributions on transmittal forms.

3.3 COLOR SELECTIONS

- A. All colors for all finished surfaces and materials will be approved by the Owner. The color selections will be made at **one time** to provide a complete and coordinated color schedule which, upon acceptance of the Owner, will be provided to the Contractor. Any and all specific color selections for materials not noted on drawings or in specification shall be chosen by Owner after submittal of samples.
- B. The Contractors are reminded of the requirement to declare all substitutions within 20 days of execution of their Contract as specified.

END OF SECTION 01300

SECTION 01310 - QUALITY CONTROL

PART 1 - GENERAL

1.1 TRADESMEN AND WORKMANSHIP

- A. Each Contractor shall ensure that tradesmen performing work at site are skilled and knowledgeable in methods and craftsmanship needed to produce required quality levels for workmanship in completed work. Remove and replace work which does not comply with workmanship standards as specified and as recognized in the construction industry for applications indicated. Remove and replace other work damaged or deteriorated by faulty workmanship or its replacement.
- B. In certain instances, specification text requires that specific work be assigned to specialists or expert entities, who shall be engaged for performance of those units of work. These shall be recognized as special requirements over which Contractor has no choice or option. These assignments shall not be confused with, and are not intended to interfere with, normal application of regulations, union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of entire set of requirements remains with Contractor.

1.2 INSPECTION, TESTS AND REPORTS

- A. Required inspection and testing services are intended to assist in determination of probable compliances of the work with requirements, but do not relieve any Contractor of responsibility for those compliances, or for general fulfillment of requirements of Contract Documents. Specified inspections and tests are not intended to limit any Contractor's quality control program. Afford reasonable access to agencies performing tests and inspections.
- B. Contractors are responsible for all testing associated with their work (soils compaction, concrete, etc.) and shall submit the name of their proposed testing agency within 15 days of Notice-to-Proceed. Contractor is responsible to coordinate the activities of the testing agency to assure that work is tested prior to being covered up or other activities associated to the work begin.

PART 2 - PRODUCTS
NOT APPLICABLE

PART 3 - EXECUTION

3.1 REPLACEMENT OF WORK

- A. The Contractor shall, within 24 hours after rejection of Work, remove all materials and equipment so rejected and immediately replace said Work, at his cost, to the satisfaction of the Architect. Should the Work of the Owner or other Contractors be damaged by such removal or replacement,

the Contractor shall reimburse the Owner or other Contractors for all cost incurred for correcting said damage.

3.2 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
1. Before construction, verify the location and points of connection of utility services.
- B. Construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; communication and underground electrical services.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions prior to work starting: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Examine roughing-in for communication systems to verify actual locations of connections before equipment and fixture installation.
 4. Examine walls, and floors for suitable conditions where products and systems are to be installed.
 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.3 PREPARATION

- A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Owner's/Owner's written permission.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.4 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to existing conditions and dimensions. If discrepancies are discovered, notify Engineer and Owner promptly.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Only use the best quality tools and equipment with proper attenuations for the latest acceptable sound levels.

- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Allow for building movement, including thermal expansion and contraction.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

END OF SECTION 01310

SECTION 01320 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

- A. Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in General Conditions and other Contract Documents. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication that such temporary activity is not required for successful completion of the work and compliance with requirements of Contract Documents.
- B. Contractor is specifically assigned certain responsibilities for temporary facilities to be used by all Contractors, other entities at the site, the Owner's work forces and other personnel including occupants of the project, the Owner, the Engineer, test agencies, personnel of governing authorities, and similar entities and personnel authorized to be at the project site during construction. In general, the Contractor is assigned the responsibilities for installation, operation and removal of each temporary facility; and, except as otherwise indicated, is responsible for costs and use charges associated therewith, including fuel, power usage, water usage and similar usage costs.
- C. No costs or usage charges for temporary facilities are chargeable to the Owner, nor can any Contractor's cost or usage charges for temporary facilities be accepted as the basis for a change order extra. The total costs and usage charges for temporary facilities are included, collectively, in the Contract Amounts.

1.2 GENERAL REQUIREMENTS

- A. Each Contractor shall provide and operate all hoists, cranes, and furnish and erect all ladders and scaffolding required by him and his subcontractors, constructed to afford proper protection to craftsmen, their Work and other Work in progress and previously executed.

1.3 JOB CONDITIONS

- A. Each Contractor shall establish and initiate use of each temporary facility at time first reasonably required for proper performance of the total work of project. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.
- B. Contractor shall install, operate, maintain and protect temporary facilities in a manner and at locations that will be safe, nonhazardous, sanitary, protective of persons and property, and free of deleterious effects.

1.4 ENVIRONMENTAL PROTECTION

- A. Contractor shall provide facilities, establish procedures, and conduct construction activities in a manner that will ensure compliance with environmental and other regulations controlling

construction activities at project site. The Contractor shall designate one person, the Construction Superintendent or other, to enforce strict discipline on activities related to generation of wastes, pollution of air/water/soil, generation of noise, and similar harmful or deleterious effects which might violate regulations or reasonably irritate persons at or in vicinity of project site. Anti-pollution measures required by D.E.P., as applicable are to be followed.

1.5 SECURITY

- A. The Contractor shall maintain complete security on the site at all times during and outside of normal working hours to protect the Work and all field offices, and to secure the area of construction by restricting all trespassers.
 - 1. This means locking the doors and/or gates. A guard is not required.
- B. Provide a six foot chain link fence around any compounds and/or dumpsters related to this project.

1.6 TEMPORARY CONSTRUCTION FACILITIES

- A. Where mud, snow, ice or other hazardous conditions exist in the purview (Scope of Work) of any Sub Contractor, the Contractor shall remove the hazards immediately and replace with suitable material for the other contractors use. If the Owner is compelled to remove the hazards with their own forces due to inaction by the Contractor, then that Contractor will be back-charged for the work performed by the Owner.
- B. No welding, cutting by torch, or Work utilizing or causing flammable waste shall be done unless adequate fire protection is provided and maintained for the duration of the Work in the area of operations.

1.7 DEBRIS CONTROL (Refer to Section 01524 for further delineation)

- A. The Contractor shall be responsible for daily cleaning up of spillages and debris resulting from his operations and from those of his Subcontractors; and shall be responsible for complete removal and disposition of hazardous and toxic waste materials. The Contractor shall provide containers at grade, sufficient for the depositing of nonhazardous/nontoxic waste materials, and shall remove such waste materials from project site at least weekly during cold weather (daily high temperatures below 50°F) and at least twice weekly during mild and warm weather.
 - 1. Contractor is responsible to provide and pay for all dumpsters.
- B. The Contractor shall daily clean all mud, dirt and debris resulting from all trades operations from the adjacent streets, sidewalks, drives and parking areas and shall repair all damage caused by the cleaning to the satisfaction of the Owner.
- C. The Contractor is to provide and maintain appropriate means of trash disposal (i.e., chutes) to grade/dumpster. Multiple units may be required and shall be figured for in the bid.

PART 2 - EXECUTION

2.1 ENCLOSURES

- A. At earliest possible date, the Contractor shall secure project area against unauthorized entrance at times when personnel are not working. Provide secure temporary enclosure at ground floor and other locations of possible entry, with locked entrances.
- B. Where any form of demolition will expose the interior of the building to weather, demolition shall follow the erection of weatherproof walls by the Contractor installed inside the demolition line, sealed and flashed, as required, to keep all water from the building interior. Keep temporary weatherproofing in place until new construction has been completed to the stage where water will not enter the building.
- C. The Contractor shall provide constant protection against rain, wind, storms, frost or heat to maintain the work, materials, apparatus and fixtures free from damage. At the end of each day's work, cover work likely to be damaged. During cold weather, protect work from damage by freezing and provide such enclosures and heating apparatus as may be necessary diligently to prosecute the Work without stoppage for reason of unfavorable weather.
- D. Wherever a Contractor provides openings through walls or slabs, each location shall be adequately protected at the end of each working day with temporary enclosures to make these areas tight. Openings through exterior walls shall be watertight.
- E. Install an 8 foot high fence around the area of work pertaining to site work with wind screening. Provide gates as needed to properly access the area to complete the work. Remove the fence once the project is substantially completed. Fence is to have poles into the ground where the fence will be untouched per a period of time, and can have feet with sand bags in areas that the fence may have to be moved occasionally to not interfere with the work.
- F. For renovation projects: Contractor is to maintain the building in a water tight condition during all construction activities by whatever means necessary. Contractor is to never do any more removal work during any given day than that contractor can replace in the same day in order to make sure the occupants of the building will be protected from the possibility of water leakage into the building. Should any leakage occur, the contractor is to immediately make the building water tight (on a 24 hour basis) and repair any damage caused by the leakage or replace any equipment damaged by the leakage.

2.2 TEMPORARY ELECTRICITY

- A. Power is available on site.

2.3 TEMPORARY VENTILATION

- A. A trade requiring ventilation for Work shall provide fans to induce circulation of air.

2.4 TEMPORARY TELEPHONES

- A. Each Contractor is responsible for their own telephone service and for payment of all charges relating to that service.

2.5 TEMPORARY WATER

- A. Water is available on site.

2.6 TEMPORARY SANITARY FACILITIES

- A. Starting at time of start of work at project site, the Contractor shall provide and maintain self-contained toilet units of type acceptable to governing authorities, adequate, at all stages of construction, for use of personnel at project site. Provide separate facilities for male and female personnel when both sexes are working, in any capacity, at project site. Facilities shall remain in use until completion of project. Use of permanent facilities will not be permitted.

2.7 REMOVAL AND RESTORATION

- A. Prior to acceptance of the Project, each contractor shall remove temporary work for which he has been responsible.

2.8 OWNER'S RIGHTS

- A. If any Contractor fails to carry out his responsibilities in providing temporary facilities, as set forth above, the Owner shall have the right to take such action as he deems proper for the protection and conduct of the Work, and to deduct the cost thereof from the amount due the Contractor at fault.
- B. Extended work days, hours, shifts, weekend work, etc. may be allowed upon coordination and approval by Engineer, Owner at no additional cost to the Owner.
 - 1. Should the schedule begin to slip, for any reason, each contractor will be required to work additional shifts or weekends to recover the lost time. Should there be a cost to the College for this overtime work, the contractor will be required to reimburse the owner for said costs.

2.9 Parking: parking is allowed for two vehicles only. All other parking is to be at the TCNJ Carlton Avenue parking lot. The contractor is responsible to shuttle workers back and forth as needed.

END OF SECTION 01320

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. A. This Section includes administrative and procedural requirements for the following work by the Contractor:
 - 1. Preconstruction videos and photographs.
 - 2. Videos and photographs of various stages of construction.
- B. Related Sections include the following:
 - 1. All of Division 1.

1.3 SUBMITTALS

- A. Media : submit 3 copies on CD or flash drives.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name of Contractor.
 - c. Date video was recorded or photographs taken.
 - d. Description of vantage point, indicating location, direction (by encompass point), and elevation or story of construction.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital format : provided on CD or Flash drive

PART 3 - EXECUTION

3.1 CONSTRUCTION RECORDINGS AND PHOTOGRAPHS

- A. Preconstruction: Before starting demolition or construction record, record Project site, interior and exterior.
- B. Construction:
 - 1. Show protection efforts / measures put in place by the Contractor.
 - 2. Photographs: Take photographs of various stages of pre-construction and construction activities.
 - 3. Maintain full photographic and video records of construction.

END OF SECTION 01322

SECTION 01330 – CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 DEFINITION

- A. Closeout is hereby defined to include general requirements near end of Contract Time, in preparation for final acceptance, final payment, normal termination of Contract, occupancy by Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Divisions 2 through 32. Time of closeout is directly related to Substantial Completion, and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates. That time variation, if any, shall be applicable to other provisions of this section.
- B. Substantial completion shall be defined that every material item has been installed. Nothing is missing and therefore, the punch list can begin.

1.2 PREREQUISITES TO SUBSTANTIAL COMPLETION

- A. Prior to requesting the Engineer's inspection for certification of substantial completion, for either entire work or portions thereof, complete the following and list known exceptions in request:
1. In progress payment request coincident with or first following date claimed, show either 100% completion for portion of work claimed as substantially complete, or list incomplete items, value of incomplete items, and reasons for being incomplete.
 2. Include supporting documentation for completion as indicated in these Contract Documents.
 - a. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 3. Submit statement showing accounting of changes to the Contract Sum.
 4. Advise Owner of pending insurance change over requirements.
 5. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.
 6. Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including occupancy permits, operating certificates, and similar releases.
 7. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner obtaining a signed receipt of materials delivered. Refer to individual work sections for required quantities of spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units to be submitted.
 8. Discontinue, or change over, and remove from project site temporary facilities and services, along with construction tools and facilities, and similar elements.
 9. Complete final clean up requirements.

10. Touch up and otherwise repair and restore marred exposed finishes.
11. Inspection: Submit a written request for inspection for Substantial Completion to Owner. On receipt of request, Owner and Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection, the Owner will notify Contractor of items, either on Contractor's list or additional items identified by Engineer that must be completed or corrected before certificate will be issued.
 - a. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - b. Results of completed inspection will form the basis of requirements for Final Completion.
- B. Upon receipt of Contractor's request, the Owner and Engineer will proceed with substantial completion inspection. Following inspection, the Engineer will either prepare the certificate of substantial completion, or advise the Contractor of work which shall be performed prior to issuance of certificate. The work remaining to be performed shall be completed prior to the punch list for final acceptance.
- C. Upon receipt of Contractor's notice that work has been completed, including all punch list items, but excepting incomplete items delayed because of circumstances acceptable to the Owner and Engineer, the Owner and Engineer will reinspect the work. Upon completion of reinspection, the Engineer will either prepare the certificate of final acceptance or advise the Contractor of work not completed or obligations not fulfilled as required for final acceptance.
- D. In the event that the work is not completed or obligations are not fulfilled as required for final acceptance and the Owner / Engineer is required to reinspect the work more often than the two inspections described, the Contractor shall compensate the Engineer at the rate of \$900.00 for each additional site visit required for reinspections. The compensation shall be processed by change order as a deduction to the Contractor's Contract Sum, which amount will be paid to the Engineer by the Owner, through a change order as an addition to the Engineer's Contract Sum.
- E. **Substantial Completion shall be defined for this project that every element of the project/construction and the contract, based on the contract and amended drawings and specification sections, are installed and is deemed complete, less repairs and/or touch up type work that would be generally referred to as punchlist work. If any components inside the buildings, or site work associated with this contract are not installed, the project cannot be deemed substantially completed.**

1.3 PREREQUISITES TO FINAL ACCEPTANCE

- A. Prior to requesting Engineer's final inspection for certification of final acceptance and final payment, complete the following and list known exceptions, in request:
 1. Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit release of liens for all subcontractors.

3. Submit Contractor's statement that his final application, as presented, is the final bill and no other claims will be presented.
 4. Submit updated final statement, accounting for additional changes to Contract Sum including change orders and allowances.
 5. Submit certified copy of Engineer's final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by Engineer.
 6. Submit one set of record documents, bound copies of maintenance/operating manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
 7. Complete final clean up requirements.
 8. Touch up and otherwise repair and restore marred exposed finishes.
 9. Submit notarized consent of surety to final payment.
 10. Submit final liquidated damages settlement statement, if required, acceptable to the Owner.
 11. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.
 12. 10% one year Maintenance Bond.
 13. Underwriter's Certificate or Electrical Sub Code Official's Approval.
 14. Final acceptance by Engineer of record documents
- B. Except as otherwise indicated or requested by Owner/Engineer, remove temporary protection devices and facilities that were installed during course of the work to protect previously completed work during remainder of construction period.

1.4 CLEAN UP

- A. Remove waste materials from site and dispose of in a lawful manner.

PART 2 - PRODUCTS NOT APPLICABLE

PART 3 - EXECUTION

3.1 CLEANING

- A. Where extra materials of value remaining after completion of associated work have become Owner's property, dispose of these to Owner's best advantage as directed.
- B. After Substantial Completion of the Work, each Contractor shall do the final cleaning of the surfaces of his installations as may be required by the various Specification sections.

- C. After Contractor has cleaned their work, The Contractor shall engage a professional cleaning service to perform final cleaning of the work consisting of cleaning each surface or unit to normal clean condition. Comply with manufacturer's instructions for cleaning operations and chemicals. The following are examples, but not by way of limitation, of cleaning levels required:
1. Remove labels that are not required as permanent labels.
 2. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision obscuring materials. Replace broken glass and damaged transparent materials.
 3. Clean exposed exterior and interior hard surfaced finishes, to a dirt free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective conditions.
 4. Wipe surfaces of mechanical and electrical equipment clean, including elevator equipment and similar equipment; remove excess lubrication and other substances.
 5. Remove debris and surface dust from limited access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
 6. Vacuum and clean carpeted surfaces and similar soft surfaces.
 7. Clean light fixtures and lamps to function with full efficiency.
 8. Clean and wax or polish all hard floors following manufacturer's instructions.
 9. Clean all window surfaces inside and outside.
 10. Perform final cleaning in, on and around all casework, sinks, toilets fixtures, etc.
 11. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 12. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 13. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 14. Remove tools, construction equipment, machinery, and surplus material from Project site.
 15. Remove snow and ice to provide safe access to building.
 16. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 17. Sweep concrete floors broom clean.
 18. Replace parts subject to unusual operating conditions.
 19. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 20. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 21. Clean ducts, blowers, and coils if units were operated without filters during construction.

22. Leave Project clean and ready for occupancy.

- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.2 RECORD DOCUMENTS (Refer to Section 01340, project requirements for submitting Record Documents)

3.3 REMOVE TEMPORARY FACILITIES

- A. At the completion of the work prior to final payment, remove all temporary facilities entirely from site, including, but not limited to, the following: Field offices, trailers, shanties, sheds, job telephone, temporary toilets, temporary enclosures, dust barriers and other temporary protection devices.

END OF SECTION 01330

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SECTION 01340 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project record documents consisting of:
 - a. Record drawings.
 - b. Record project manual (specifications).

1.2 SUBMITTALS

A. Project Record Documents: Submit after substantial completion, but prior to final completion.

1. Record drawings: Submit in form of opaque prints.
 - a. Sets shall include all drawings, whether changed or not.
2. Other record documents: Submit originals or good quality photocopies.
3. Contractor is responsible for a complete set of record documents and record drawings.

PART 2 - PRODUCTS
(NOT USED)

PART 3 - EXECUTION

3.1 MAINTENANCE OF PROJECT RECORD DOCUMENTS

- A. Do not use record documents of any type for construction purposes.
- B. Maintain record documents in a secure location at the site while providing for access by the contractor and the architect during normal working hours; store in a fire-resistive room or container outside of normal working hours.
- C. Record information as soon as possible after it is obtained.
- D. Assign a person or persons responsible for maintaining record documents.
- E. Record the following types of information on all applicable record documents:
 1. Dimensional changes.
 2. New and revised details.

3. Revisions to electrical circuits.
4. Locations of utilities concealed in construction.
5. Particulars on concealed products which will not be easy to identify later.
6. Changes made by modifications to the contract; note identification numbers if applicable.
7. New information which may be useful to the owner, but which was not shown in either the contract documents or submittals.

3.2 RECORD DRAWINGS

- A. Maintain a complete set of opaque prints of the contract drawings, marked to show changes.
- B. Where the actual work differs from that shown on the drawings, mark this set to show the actual work.
 1. Mark location of concealed items before they are covered by other work.
 2. Mark either record contract drawings or shop drawings, whichever are best suited to show the change.
- C. When the contractor is required by a provision of a modification to prepare a new drawing, rather than to revise existing drawings, obtain instructions from the architect as to the drawing scale and information required.
- D. Keep drawings in labeled, bound sets.
 1. Mark with red pencil.
 2. Mark work of separate contracts with different colors of pencils.
 3. Incorporate new drawings into existing sets, as they are issued.
- E. Where record drawings are also required as part of operation and maintenance data submittals, copy marks to another opaque print.

3.3 RECORD PROJECT MANUAL

- A. Maintain a complete copy of the project manual, marked to show changes.
- B. Where the actual work differs from that shown in the project manual, mark the record copy to show the actual work.
 1. Include a copy of each addendum and modification to the contract.
 2. In addition to the types of information required on all record documents, record the following types of information:
 - a. Product options taken, when the specification allows more than one.
 - b. Proprietary name and model number of actual products furnished, for each product, material, and item of equipment specified.

- c. Name of the supplier and installer, for each product for which neither a product data submittal nor a maintenance data submittal was specified.

3.4 TRANSMITTAL TO OWNER (through the Engineer)

- A. Collect, organize, label, and package ready for reference.
 1. Bind print sets with durable paper covers.
 2. Label each document (and each sheet of drawings) with "PROJECT RECORD DOCUMENTS - This document has been prepared using information furnished by _____" [insert the contractor's name], and the date of preparation.
- B. Submit to the Engineer four (4) sets of Operation and Maintenance Manuals in three-ring binders, by volume, and indexed per binder (with one master index) to be transmitted to the Engineer for approval: All to be submitted at one time, not piece meal. Indexing should follow the specification section numbers.
 1. Include all inspection/approvals/certifications
 2. All approved submittals and cut sheets as well as manufacturer's operation and maintenance manuals for each section.
 3. Manuals are to be completed in volumes, three ring binders, starting with Division 1 and continuing through the last projects Division. The number of volumes is determined by the number of spec section the projects has and by the amount of paper/copies for complete sets of three ring binders.
 4. List of all contractors and vendors for the project with names, addresses and phone numbers.

END OF SECTION 01340

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SECTION 01524 – CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections include the following:
 - 1. All of Division 1 and attached specifications and drawings that make a part of this contract.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.4 SUBMITTALS

- A. Waste Management Plan: Submit 4 copies of plan within 30 days of date established for the Notice to Proceed.
- B. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

- C. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- D. Waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 1. Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, and waste reduction work plan. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 2. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

3. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
4. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with Division 1 Section "Temporary Facilities" for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 1. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Sale and Donation: Not permitted on Project site.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.

- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 3. Stockpile materials away from construction area.
 4. Store components off the ground and protect from the weather.
 5. Remove recyclable waste off Owner's property and transport to recycling receiving or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
- B. Concrete: break up and sort rebar as best as possible. Recycle all concrete.
- C. Recycle as much product as possible and provide a complete report to TCNJ to confirm the percentage recycled on the project.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Polystyrene Packaging: Separate and bag materials.
 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials on site.
- C. Burying: Do not bury waste materials on site.
- D. Disposal: Transport waste materials off Owner's property and legally dispose of them.
- E. Washing waste materials into sewers or drains is not permitted.

END OF SECTION 01524

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SECTION 017836 - WARRANTIES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. Within this Section, the term Warranty shall be used to mean warranties of various types, equipment performance certifications, and similar performance guarantees, or Service/Maintenance Agreements.
- B. Within this Section, the term Product shall be used to mean equipment, systems, products, components, and other similar aspects of the Work that have a manufacturer's or installer's warranty, or Service/Maintenance Agreements.

1.2 GENERAL WARRANTY REQUIREMENTS

- A. Basic construction warranty of work is outlined in the General Conditions of the Contract.
- B. Specific Product warranties are identified in the various Technical Specification sections.
- C. Contractor shall provide the basic construction warranty, shall provide 1-year Maintenance Bond, if required, and shall be responsible for any required Product warranties, related to the Contract.
- D. Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- E. Written warranties made to The College of New Jersey are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under law. Warranty periods shall not be interpreted as limitations on time in which The College of New Jersey can enforce such other duties, obligations, rights, or remedies as established by the Uniform Commercial Code (UCC).
- F. The College of New Jersey reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- G. Where a special warranty is required on the Work or part of the Work, The College of New Jersey reserves the right to refuse to accept the Work until the responsible entities countersign such warranty.
- H. Upon determination by The College of New Jersey that Work covered by a warranty, or Service Agreement has failed, the Contractor shall replace or rebuild the Work to an acceptable condition complying with requirements of Contract. The Contractor is responsible for the total cost of replacing or rebuilding defective Work regardless of whether The College

of New Jersey benefits from use of the Work through a portion of its anticipated useful service life.

- I. When correcting warranted Work that has failed, the Contractor shall remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- J. When Work covered by a warranty, or Service Agreement has failed and been corrected by replacement or rebuilding, the warranty, or Service Agreement shall be reinstated by the Contractor by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- K. In the event the Contractor fails to commence and diligently pursue any warranty work required, The College of New Jersey may have the work performed by others, and after completion of the work, charge the cost of the work, and any reasonable and necessary expenses associated with the work incurred by the University, to the Contractor. In the event sufficient funds are not remaining in the Contract to cover the cost and expenses incurred, The College of New Jersey will have the right to recoup expenses by other legal means.

1.3 WARRANTY PERIODS

- A. Warranties shall commence on the Substantial Completion Date, unless one of the following apply.
- B. The Certificate of Substantial Completion designates a warranty commencement date, other than the Substantial Completion Date, for certain Work or portions of Work.
- C. By separate agreement between the Contractor and The College of New Jersey, a designated and completed portion of the Work is occupied or used by The College of New Jersey during the construction period, in which case any warranty, or Service Agreement related to that Work or portions of the Work shall commence when the occupancy or use begins.

1.4 SUBMITTAL OF PRODUCT WARRANTIES

- A. Written product warranties shall be submitted to The College of New Jersey within fifteen (15) days of Substantial Completion. If another date is specified per paragraph 1.03 above, written warranties shall be submitted within fifteen (15) days of that other date.
- B. When a special warranty, or Service Agreement is required to be executed by the Contractor, or by the Contractor and a subcontractor, supplier, or manufacturer, the Contractor shall prepare a written document for execution by the required parties that contains appropriate terms and identification. A draft of the written document shall be submitted to The College of New Jersey for acceptance prior to final execution.
- C. When Operating and Maintenance Manuals are required for warranted construction, an additional copy of each required warranty shall be provided, as necessary, with each Operating and Maintenance Manual.

1.5 SUBMITTAL OF WARRANTY PLAN

- A. Contractor shall prepare and submit a Warranty Plan which outlines the responsibilities and procedures to address warranty issues arising from the Contract and the Work. Contractor's Warranty Plan shall include information relative to the Work and to product warranties related to the Contract.
- B. Prior to Substantial Completion, the Contractor shall meet with The College of New Jersey to develop a mutual understanding with respect to the requirements of the Warranty Plan. Communication procedures for notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by The College of New Jersey for the execution of the warranty shall be established and reviewed at this meeting. Based on the information provided at the meeting, the Contractor shall submit to The College of New Jersey a written Warranty Plan.
- C. The Warranty Plan shall generally include all information required to assure that The College of New Jersey receives all warranties to which it is entitled and can take action with respect to calls against the warranties. The Plan shall be in sufficient detail to render it suitable for use by future College of New Jersey operations and maintenance personnel, and tailored as appropriate for the specific Contract.
- D. The Warranty Plan shall include the following information.
1. The Plan shall identify key personnel associated with the warranty process, to include their specific roles and responsibilities, and their telephone numbers and other means of contact. Key personnel should be from within the organizations of the Contractor, subcontractors, manufacturers, and suppliers involved. The Contractor may choose to furnish the name, telephone number and address of a licensed and bonded company, other than itself, authorized to directly initiate and pursue warranty work on its behalf. Doing so does not relieve the Contractor of any of its responsibilities in connection with their responsibility for warranting the Work.
 2. The Plan shall provide a list of all product warranties and special warranties, or Service Agreement required by the Contract Documents. This list shall also provide the status of delivery of each of these warranties.
 3. The Plan shall provide a list of each warranted product. This list shall include the following:
 - a. name of item
 - b. model number
 - c. serial number
 - d. location where installed
 - e. name and phone numbers of manufacturer
 - f. name and phone numbers of installer
 - g. names, addresses, and telephone numbers of sources of spare parts

SECTION 033000 - CAST-IN-PLACE CONCRETE

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. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Submit Laboratory test reports for concrete materials and mix design test.
- C. Material certifications in lieu of material laboratory test reports when permitted by engineer. Material certificates shall be signed by manufacturer and contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturer that chloride content complies with specification requirements.
- D. Copies of Material Safety Data Sheets (MSDS) for any adhesives and other hazardous materials.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.
- E. Mockups: Cast concrete slab-on-grade and formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.
 - 1. Build panel approximately 200 sq. ft. for slab-on-grade and 100 sq. ft. for formed surface in the location indicated or, if not indicated, as directed by Owner and Engineer.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.7 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces.
 - 1. Use overlaid plywood complying with U.S. Product Standard PS-1 “A-C or B-B High Density Overlaid Concrete Form”, Class I.
 - 2. Use plywood complying with U.S. Product Standard PS-1 “B-B (Concrete Form) Plywood” Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Form Release Agent: Provide commercial formulation form release agent with a maximum of 350 g/L volatile organic compounds (VOCS) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to the plane of the exposed concrete surface.
 - 1. Provide ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.

2.2 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.
 - 2. ACI 117.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or ASTM C1157, Type LH or GU.
 - a. Use one brand of cement throughout the Project unless otherwise specified.
 - b. Do not re-use cement which has partially set or hardened.
- B. Fly Ash:
 - 1. Permitted in drilled piers, footings, pier caps, pile caps, columns, walls, grade beams only.
 - 2. ASTM C 618, Class C or F, except maximum loss on ignition: 6%. Maximum percent retained on #325 sieve: 28%. Maximum water requirement, stated as percentage of control: 100%.

3. Testing: ASTM C311.
4. Percentage of fly ash in mix design shall be by weight, not by volume. Water/cement ratio will be calculated as water/cementitious (total cement and fly ash) ratio.
5. Prohibited: Fly ash in same mix with Type IP blended cement.
6. If strength or air content varies from value specified by more than specified tolerances, Engineer or designated representative shall reject that concrete.
7. The total fly ash contained in concrete should not be more than 20% of total cementitious materials by weight
8. Submit all fly ash concrete mix designs per ACI 301.

C. Ground Granulated Blast-Furnace Slag (GG BFS):

1. ASTM C 989, Grade 100 or higher.
2. Percentage of GGBF slag in mix design shall be by weight, not by volume. Water-cement ratio shall be calculated as water-cementitious (total Portland cement + GGBF slag) ratio.
3. If strength or air content varies from value specified by more than specified tolerances, Engineer or designated representative shall reject that concrete.
4. Total fly ash and slag contained in concrete should not be more than 30% of total cementitious materials by weight.
5. Submit all GGBF slag concrete mix designs per ACI 301.

D. Aggregates:

1. Normal weight aggregates: Aggregates shall be crushed stone or gravel complying with ASTM C 33, uniform throughout the work, with fineness modulus not varying by more than 0.15 either way from approved samples; maximum size of coarse aggregate particles shall be ½ inch for slabs on grade and 1” for other concrete. Use in all foundations, slabs on grade, walls, steps, pits, mats, etc.
2. Fine aggregates: Natural sand conforming to ASTM C33.
3. Combined aggregate gradation for slabs and other designated concrete shall be 8% - 18% for large top size aggregates (1½ in.) or 8% - 22% for smaller top size aggregates (1 in. or ¾ in.) retained on each sieve below the top size and above the No. 100.

E. Water: Potable.

2.4 CONCRETE MIXING

1. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.
2. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Construct forms tight enough to prevent loss of concrete mortar.
- D. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- E. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- G. Do not chamfer exterior corners and edges of permanently exposed concrete.
- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.3 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

3.5 WATERSTOP INSTALLATION

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete" and as specified.

3.7 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view.

3.8 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Equipment Bases: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.9 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

END OF SECTION 033000

SECTION 078413 - PENETRATION FIRESTOPPING

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. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in horizontal assemblies.
 - 3. Penetrations in smoke barriers.

1.3 ALLOWANCES

- A. Penetration firestopping Work is part of an allowance.

1.4 UNIT PRICES

- A. Work of this Section is affected by unit prices.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
 - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.7 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.10 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."
 - 2) FM Global in its "Building Materials Approval Guide."

2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.
 - 2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
 - 3. W-Rating: Provide penetration firestopping systems showing no evidence of water leakage when tested according to UL 1479.
- D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479, based on testing at a positive pressure differential of 0.30-inch wg.
 - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at and no more than 50-cfm cumulative total for any 100 sq. ft. at both ambient and elevated temperatures.
- E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E 84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
 - 1. Permanent forming/damming/backing materials.
 - 2. Substrate primers.
 - 3. Collars.
 - 4. Steel sleeves.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.5 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

3.6 PENETRATION FIRESTOPPING SYSTEM SCHEDULE

- A. UL-classified systems are required, refer to system numbers in UL's "Fire Resistance Directory" under product Category XHEZ.
- B. FM Global-approved systems are required, refer to design numbers listed in FM Global's "Building Materials Approval Guide" under "Wall and Floor Penetration Fire Stops."

END OF SECTION 078413

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SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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. Section Includes:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

- A. NETA ATS: National Electrical Testing Association.
- B. NRTL: Nationally Recognized Testing Laboratory.
- C. VFC: Variable frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 QUALITY ASSURANCE

- 1. Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Alpha Wire.
2. Belden Inc.
3. Encore Wire Corporation.
4. General Cable Technologies Corporation.
5. Southwire Incorporated.
6. Superior Essex
7. The Okonite Company
8. Or Equivalent.

B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2, except for VFC cables which may be Type XHHW-2.

D. Metal Clad Cable Type MC: Aluminum or galvanized steel armor, color coded 90-deg. C THHN-THWN insulated copper conductors with full size green insulated grounding conductor.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. Ideal Industries, Inc.
4. IlSCO; a branch of Barden Corporation.
5. O-Z/Gedney; a brand of the EGS Electrical Group.
6. 3M; Electrical Markets Division.
7. Tyco Electronics.
8. Or Equivalent.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Branch Circuits, Including in Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- B. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-2-THWN-2, single conductors in raceway, Metal-clad cable, Type MC, or Mineral-insulated, metal-sheathed cable, Type MI.
- C. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-2-THWN-2, single conductors in raceway or Type XHHW-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section "Hangers and Supports for Electrical Systems."
- G. Seal around cables penetrating fire-rated elements according to Specification Section "Penetration Firestopping."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test all feeders and branch circuits for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
 - a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - b. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- C. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.

3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 260519

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SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.
 - 1. Section includes grounding and bonding systems and equipment

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

- A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
 - 1. Grounding arrangements and connections for separately derived systems and non-separately derived systems.
- B. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Burndy; Part of Hubbell Electrical Systems.
 - 2. ERICO International Corporation.
 - 3. Harger Lightning and Grounding.
 - 4. ILSCO.
 - 5. O-Z/Gedney; A Brand of the EGS Electrical Group.
 - 6. Robbins Lightning, Inc.
 - 7. Or Equivalent.

2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.
- C. CONDUCTORS
- D. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- E. Bare Copper Conductors:
 - 1. Stranded Conductors: ASTM B 8.

2.3 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: All wire shall be stranded.
- B. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.

1.2 DEFINITIONS

- A. RMC: Rigid metal conduit.

1.3 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Steel slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
 - 1. Steel slotted channel systems. Include Product Data for components.
 - 2. Equipment supports.

1.5 QUALITY ASSURANCE

- A. Comply with NFPA 70.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Provide anchor-bolt inserts into bases.

- B. Coordinate installation of, equipment supports.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Atkore International.
 - g. Wesanco, Inc.
 - 3. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.

- 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.
2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Cooper B-Line, Inc.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti, Inc.
 - 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 6. Toggle Bolts: All-steel springhead type.
 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.
- D. Conduit clips and clamp-backs shall be used for attachment of surface-mounted conduit at points below 9-feet AFF in spaces regularly used or occupied by personnel (e.g. office,

classroom, finished storage, etc.). Conduit clamps that protrude from the wall are not acceptable for attachment in this case.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
 - 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 - 7. To Light Steel: Sheet metal screws.
 - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 CONCRETE BASES

- A. Anchor equipment to concrete base.
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

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SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 MATERIALS

A. Metal Conduits, Tubing, and Fittings:

1. GRC.
2. EMT.
3. FMC: Zinc-coated steel .
4. LFMC.
5. Fittings:
 - a. EMT: Steel, setscrew or compression type.
 - b. Expansion fittings.

B. Nonmetallic Conduits, Tubing, and Fittings:

1. ENT.
2. RNC.
3. LFNC.
4. HDPE.
5. Fittings: Match conduit.

C. Metal Wireways and Auxiliary Gutters: Sheet metal with hinged covers.

D. Nonmetallic Wireways and Auxiliary Gutters: Fiberglass polyester.

E. Surface Metal Raceways: Metal, galvanized steel, with snap-on covers.

F. Surface Nonmetallic Raceways: Two- or three-piece, rigid PVC.

G. Boxes, Enclosures, and Cabinets:

1. Metal Outlet and Device Boxes: Ferrous alloy.
2. Nonmetallic outlet and device boxes.
3. Small sheet metal pull and junction boxes.
4. Cast-metal access, pull, and junction boxes.
5. Box extensions.
6. Gangable boxes are prohibited.
7. Hinged-Cover Enclosures: Metal.
8. Cabinets: Galvanized steel.

1.2 RACEWAY APPLICATION

A. Indoors:

1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 3. Exposed and Subject to Severe Damage: GRC.
 4. Exposed on existing masonry walls in finished areas: Surface Metal Raceway.
 5. Concealed: EMT.
 6. Connection to Vibrating Equipment: FMC, except LFMC in damp or wet locations.
 7. Damp or Wet Locations: GRC.
 8. Boxes and Enclosures: Type 1, except Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- B. Minimum Raceway Size: (3/4-inch) trade size.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Threaded rigid steel conduit fittings.
 2. EMT: Setscrew or compression, steel fittings.
 3. Flexible Conduit: Fittings listed for use with flexible conduit.

END OF SECTION 260533

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 MATERIALS

A. Sleeves:

1. Schedule 40 steel pipe.
2. Cast-iron pipe.
3. Galvanized-steel sheet for conduits penetrating non-fire-rated gypsum-board assemblies.
4. Schedule 40 PVC pipe.
5. Molded-PVC pipe.
6. Molded-PE or -PP pipe.
7. Galvanized-steel sheet for rectangular openings.

B. Sleeve-Seals:

1. EPDM rubber sealing elements.
2. Stainless-steel pressure plates.
3. Stainless-steel connecting bolts and nuts.

C. Hydraulic-cement grout.

D. Silicone Sealants:

1. Single-component, silicone-based, neutral-curing elastomeric sealant.
2. Multicomponent, silicone-based liquid elastomeric nonshrinking foam.

END OF SECTION 260544

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SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.2 ACTION SUBMITTALS

- ##### A. Product Data: For each electrical identification product indicated.

1.3 QUALITY ASSURANCE

- ##### A. Comply with ANSI A13.1 and IEEE C2.
- ##### B. Comply with NFPA 70.
- ##### C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- ##### D. Comply with ANSI Z535.4 for safety signs and labels.
- ##### E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.4 COORDINATION

- ##### A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- ##### B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- ##### C. Coordinate installation of identifying devices with location of access panels and doors.

- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
- B. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted or Write-on, 3-mil- thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the cable diameter such that the clear shield overlaps the entire printed legend.

2.3 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tapes not less than 3 mils thick by 1 to 2 inches wide.

2.4 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.5 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.6 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 - 3. Temperature Range: Minus 40 to plus 185 deg F.
 - 4. Color: Black except where used for color-coding.

2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape with adhesive appropriate to the location and substrate.
- G. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors,

at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

- H. Painted Identification: Comply with manufacturer requirements for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

1. Control.
2. Power.
3. Communications (coordinate with college IT department and requirements in Division 27).

- B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in pull and junction boxes, use colored conductor insulation for sizes smaller than #8AWG, and color-coding conductor tape for larger sizes.

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
 - a. Color shall be factory applied for sizes less than #8 AWG and factory or field applied for sizes #8 AWG and larger, if authorities having jurisdiction permit.
 - b. Colors for 240/120-V, Single Phase Power Circuits:
 - 1) Phase A: Red
 - 2) Phase B: Black
 - 3) Neutral: White
 - c. Colors for 208/120-V Power Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - d. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - e. Colors for 120 VAC Control Wire:
 - 1) 120 VAC Control Power (Hot): Black
 - 2) 120 VAC Control Power (Neutral): White
 - 3) 120 VAC Control Circuit: Red
 - f. Colors for 24 VDC Control Circuits:
 - 1) 24 VDC (+): Blue
 - 2) 24 VDC (common): Blue with white stripe
 - g. Control wires energized by voltage source external to enclosure: Yellow

- h. Colors for 4-20mA Signal Wire:
 - 1) 4-20mA (+): Red
 - 2) 4-20mA (-): Black
 - i. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- C. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- D. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes use, self-laminating polyester labels with the conductor or cable designation, origin, and destination.
- E. Control-Circuit Conductor Termination Identification: For identification at terminations provide self-adhesive, self-laminating polyester labels with the conductor designation.
- F. Warning Labels for Indoor, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
- 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Controls with external control power connections.
- G. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
- 1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
 - b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - c. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 - 2. Equipment to Be Labeled:

- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive, engraved, laminated acrylic or melamine label.
- b. Enclosures and electrical cabinets.
- c. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- d. Enclosed switches.
- e. Enclosed circuit breakers.
- f. Enclosed controllers.
- g. Push-button stations.
- h. Remote-controlled control devices.
- i. Monitoring and control equipment.

END OF SECTION 260553

SECTION 270526 - GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

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. Section Includes:
 - 1. Grounding conductors.
 - 2. Grounding connectors.
 - 3. Grounding rods.
 - 4. Grounding labeling.

1.3 DEFINITIONS

- A. BCT: Bonding conductor for telecommunications.
- B. EMT: Electrical metallic tubing.
- C. TGB: Telecommunications grounding busbar.
- D. TMGB: Telecommunications main grounding busbar.
- E. TBB: Telecommunication Bonding Backbone
- F. GE: Grounding Equalizer

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For communications equipment room signal reference grid. Include plans, elevations, sections, details, and attachments to other work.

1.5 INFORMATIONAL SUBMITTALS

- A. As-Built Data: Plans showing as-built locations of grounding and bonding infrastructure, including the following:
 - 1. Ground rods.
 - 2. BCT, TMGB, TGBs, and routing of their bonding conductors.

- B. Qualification Data: For Installer, installation supervisor, and field inspector.
- C. Qualification Data: For testing agency and testing agencies, field supervisor.
- D. Field quality-control reports.

PART 2 - PRODUCTS

2.1 SYSTEM COMPONENTS

- A. Comply with TIA-607-B.

2.2 CONDUCTORS

- A. Telecommunications Bonding Backbone (TBB): All TBB shall be a minimum of #4/0 AWG.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Harger Lightning and Grounding.
 - 2. Panduit Corp.
 - 3. Tyco Electronics Corp.
 - 4. Or Equivalent.
- C. Comply with UL 486A-486B.
- D. Insulated Conductors: Stranded copper wire, green or green with yellow stripe insulation, insulated for 600 V, and complying with UL 83.
 - 1. Ground wire for custom-length equipment ground jumpers shall be No. 6 AWG, 19-strand, UL-listed, Type THHN wire.
 - 2. Cable Tray Equipment Grounding Wire: No. 6 AWG.
- E. Cable Tray Grounding Jumper:
 - 1. Not smaller than No. 6 AWG 26 kmils (13.3 sq. mm) and not longer than 12 inches (300 mm). If jumper is a wire, it shall have a crimped grounding lug with two holes and long barrel for two crimps. If jumper is a flexible braid, it shall have a one-hole ferrule. Attach with grounding screw or connector provided by cable tray manufacturer.
- F. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kmils (14.2 sq. mm), 14 strands of No. 17 AWG conductor, and 1/4 inch (6.3 mm) in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

6. Bonding Jumper: Tinned-copper tape, braided conductors terminated with two-hole copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.3 COMPONENTS, KITS AND HARDWARE

- A. Provide BICSI/J-STD-607-A telecommunications grounding busbars for the TMGB.
 1. Harger GBI14412TMGBKT: TMGB Ground Bus bar, 1/4" x 4" x 12"
- B. Provide BICSI/J-STD-607-A telecommunications grounding busbars for the TGB.
 1. Harger GBI14212TGBKT: TGB Ground Bus bar, 1/4" x 2" x 12"
- C. Provide compression type two hole lugs for connecting conductors to TMGB and TGB.
 1. Harger GECLBxxx Series

2.4 CONNECTORS

- A. Irreversible connectors listed for the purpose. Listed by an NRTL as complying with NFPA 70 for specific types, sizes, and combinations of conductors and other items connected. Comply with UL 486A-486B.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Burndy; Part of Hubbell Electrical Systems.
 2. Chatsworth Products, Inc.
 3. Harger Lightning and Grounding.
 4. Panduit Corp.
 5. Tyco Electronics Corp.
 6. Or Equivalent.
- C. Compression Wire Connectors: Crimp-and-compress connectors that bond to the conductor when the connector is compressed around the conductor. Comply with UL 467.
 1. Electroplated tinned copper, C and H shaped.
- D. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.5 GROUND RODS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Harger Lightning and Grounding.
 2. Tyco Electronics Corp.
 3. Or Equivalent

- B. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet (19 mm by 3 m) in diameter.

2.6 LABELING

- A. Labeling system shall identify the terminal endpoints of each conductor segment. Coordinate labeling with Owner.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Brother International Corporation.
 - 2. HellermannTyton.
 - 3. Panduit Corp.
 - 4. Or Equivalent.
- C. Comply with TIA/EIA-606-B and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- D. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm). Overlay shall provide a weatherproof and UV-resistant seal for label.
- E. Refer to Specification 271323 for labeling products approved for use on cable systems.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Comply with TIA-607-B.

3.2 APPLICATION

- A. Conductors: Install solid conductor for No. 8 AWG and smaller and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
 - 1. The bonding conductors between the New Rack and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2 AWG minimum.
- C. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

D. Conductor Support:

1. Secure grounding and bonding conductors at intervals of not less than 36 inches (900 mm).

E. Grounding and Bonding Conductors:

1. Install in the straightest and shortest route between the origination and termination point, and no longer than required. The bend radius shall not be smaller than eight times the diameter of the conductor. No one bend may exceed 90 degrees.
2. Install without splices.
3. Support at not more than 36-inch (900-mm) intervals.
4. Install grounding and bonding conductors in 3/4-inch (21-mm) PVC conduit until conduit enters a telecommunications room. Conductors shall not be installed in EMT.

3.3 CONNECTIONS

- A. Bond metallic equipment in a telecommunications equipment room to the grounding busbar in that room, using equipment grounding conductors not smaller than No. 6 AWG.
- B. Stacking of conductors under a single bolt is not permitted when connecting to busbars.
- C. Assemble the wire connector to the conductor, complying with manufacturer's written instructions and as follows:
 1. Use crimping tool and the die specific to the connector.
 2. Pretwist the conductor.
 3. Apply an antioxidant compound to all bolted and compression connections.
- D. Telecommunications Enclosures and Equipment Racks: Bond metallic components of enclosures to the telecommunications bonding and grounding system. Coordinate attachment point with owner.

3.4 IDENTIFICATION

- A. Labels shall be preprinted or computer-printed type.
 1. Refer to Specification 271323 for labeling in communications systems.

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:

1. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
- B. Prepare test and inspection reports.

END OF SECTION 270526

SECTION 270528 - PATHWAYS FOR COMMUNICATIONS SYSTEMS

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.
- B. Building Industry Consulting Service International (BICSI) And Telecommunications Industry Associates (EIA/ TIA) Commercial Building Standards for Telecommunication Pathway Standards Shall Be Followed.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal conduits and fittings.
 - 2. Optical-fiber-cable pathways and fittings.
 - 3. Boxes, enclosures, and cabinets.

1.3 ACTION SUBMITTALS

- A. Product Data: For conduits and fittings, pathways, boxes, and enclosures.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. All Manholes And Building Points Of Entry
 - 2. All Slack Loop Locations
 - 3. Structural members in paths of pathway groups with common supports.
 - 4. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Qualification Data: For professional engineer.
- C. Seismic Qualification Certificates: For pathway racks, enclosures, cabinets, equipment racks and their mounting provisions, including those for internal components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which certification is based and their installation requirements.

4. Detailed description of conduit support devices and interconnections on which certification is based and their installation requirements.

D. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit.
3. O-Z/Gedney.
4. Southwire Company.
5. Thomas & Betts Corporation.
6. Wheatland Tube Company.
7. Or Equivalent.

B. General Requirements for Metal Conduits and Fittings:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-B.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. EMT: Comply with ANSI C80.3 and UL 797.

E. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Conduit Fittings: Comply with NFPA 70.
2. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: Compression.
3. Expansion Fittings: Steel to match conduit type, complying with UL-467, rated for environmental conditions were installed, and including flexible external bonding jumper.

2.2 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Endot Industries Inc.
2. IPEX.

3. Lamson & Sessions; Carlon Electrical Products.
 4. Or Equivalent.
- B. Basis of Design Carlon: CG4X1C-XXX 1-1/4” Corrugated Non-Metallic Tubing (ENT) With Pull Tape
- C. Installation of 4” conduit from POE to MDF shall contain 3 ENT with pull strings. The three ENT within the same conduit shall be different colors: one black, one orange, and one blue.
- D. Description: Comply with UL 2024; flexible-type pathway, approved for plenum, riser, or general-use installation as required per installation location.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Comply with TIA-569-B.

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Adalet.
 2. Cooper Technologies Company; Cooper Crouse-Hinds.
 3. EGS/Appleton Electric.
 4. Hoffman.
 5. Lamson & Sessions; Carlon Electrical Products.
 6. Milbank Manufacturing Co.
 7. Mono-Systems, Inc.
 8. O-Z/Gedney.
 9. RACO; Hubbell.
 10. Stahlin Non-Metallic Enclosures.
 11. Thomas & Betts Corporation.
 12. Wiremold / Legrand.
 13. Or Equivalent.
- B. General Requirements for Boxes, Enclosures, and Cabinets:
1. Comply with TIA-569-B.
 2. Boxes, enclosures and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- D. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- E. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

PART 3 - EXECUTION

3.1 PATHWAY APPLICATION

- A. Outdoors: Apply pathway products as specified below unless otherwise indicated:
 1. Exposed Conduit: GRC .
 2. Concealed Conduit, Aboveground: GRC
 3. Underground Conduit: RNC, Type EPC-40-PVC, Type EPC-80-PVC under roadways
 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R Type 4.
- B. Indoors: Apply pathway products as specified below unless otherwise indicated:
 1. Exposed, Not Subject to Physical Damage: EMT
 2. Exposed, Not Subject to Severe Physical Damage: EMT
 3. Concealed in Ceilings and Interior Walls and Partitions: Flexible Non Metallic Tubing (unless otherwise noted).
 4. Damp or Wet Locations: GRC.
 5. Pathways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: EMT.
 6. Pathways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: EMT.
 7. Pathways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: Plenum-type, communications-cable pathway or EMT.
 8. Boxes and Enclosures: NEMA 250 Type 1.
- C. Minimum Pathway Size: See Drawings. Follow BISCI Standard Fill Ratios Minimum Of 1-1/4 inch (27 mm).
- D. Pathway Fittings: Compatible with pathways and suitable for use and location.
 1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. EMT: Use compression connectors. Comply with NEMA FB 2.10.
- E. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

3.2 INSTALLATION

- A. Comply with NECA 1, NECA 101, and TIA-569-B for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.
- B. Keep pathways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal pathway runs above water and steam piping.

- C. Complete pathway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of two 90-degree bends in any pathway run. Support within 12 inches (300 mm) of changes in direction. Utilize long radius ells for all optical-fiber cables.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Change of direction shall not occur within pulling enclosures.
- I. Support conduit within 12 inches (300 mm) of enclosures to which attached.
- J. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT for pathways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of pathway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.
- M. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- O. Cut conduit perpendicular to the length. For conduits of 2-inch (53-mm) trade size and larger, use roll cutter or a guide to ensure cut is straight and perpendicular to the length.
- P. Install pull wires in empty pathways. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground pathways designated as spare above grade alongside pathways in use.
- Q. Pathways for Optical-Fiber and Communications Cable: Install pathways, metal, rigid and flexible, as follows:
 - 1. 3/4-Inch (21-mm) Trade Size and Smaller: Install pathways in maximum lengths of 50 feet (15 m).
 - 2. 1-Inch (27-mm) Trade Size and Larger: Install pathways in maximum lengths of 75 feet (23 m).

3. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.
 4. Changes in direction shall not occur within pull or junction boxes.
- R. Install pathway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install pathway sealing fittings according to NFPA 70.
- S. Install devices to seal pathway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all pathways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where an underground service pathway enters a building or structure.
 3. Where otherwise required by NFPA 70.
- T. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.
- U. Expansion-Joint Fittings:
1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F (17 deg C), and that has straight-run length that exceeds 25 feet (7.6 m). Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
 - d. Attics: 135 deg F (75 deg C) temperature change.
 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
 4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

- V. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 270544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling."

3.4 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.5 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage or deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 270528

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SECTION 270529 - HANGERS AND SUPPORTS FOR COMMUNICATIONS SYSTEMS

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. Section Includes:

1. Steel slotted support systems for communication raceways.
2. Aluminum slotted support systems for communication raceways.
3. Nonmetallic slotted support systems for communication raceways.
4. Conduit and cable support devices.
5. Support for conductors in vertical conduit.
6. Structural steel for fabricated supports and restraints.
7. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
8. Fabricated metal equipment support assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Slotted support systems, hardware, and accessories.
 - b. Clamps.
 - c. Hangers.
 - d. Sockets.
 - e. Eye nuts.
 - f. Fasteners.
 - g. Anchors.
 - h. Saddles.
 - i. Brackets.
2. Include rated capacities and furnished specialties and accessories.

B. Shop Drawings: For fabrication and installation details for communications hangers and support systems.

1. Trapeze hangers. Include product data for components.

2. Steel slotted-channel systems.
 3. Aluminum slotted-channel systems.
 4. Nonmetallic slotted-channel systems.
 5. Equipment supports.
 6. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
- C. Delegated-Design Submittal: For hangers and supports for communications systems.
1. Include design calculations and details of trapeze hangers.
 2. Include design calculations for seismic restraints.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Suspended ceiling components.
 2. Ductwork, piping, fittings, and supports.
 3. Structural members to which hangers and supports will be attached.
 4. Size and location of initial access modules for acoustical tile.
 5. Items penetrating finished ceiling, including the following:
 - a. Luminaires.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
 - f. Projectors.
- B. Seismic Qualification Certificates: For hangers and supports for communications equipment and systems, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M

- B. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M.
 2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design hanger and support system.
- B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7
- C. Retain "Surface-Burning Characteristics" Paragraph below for nonmetallic slotted-channel system and accessories.
- D. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame Rating: Class 1.
 2. Self-extinguishing according to ASTM D 635.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
 2. Material for Channel, Fittings, and Accessories: Galvanized steel
 3. Channel Width: 1-5/8 inches
 4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 5. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
 8. Channel Dimensions: Selected for applicable load criteria.
- B. Aluminum Slotted Support Systems: Extruded aluminum channels and angles with minimum 13/32-inch diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.

2. Channel Width: 1-5/8 inches
 3. Channel Material: 6063-T6 aluminum alloy.
 4. Fittings and Accessories Material: 5052-H32 aluminum alloy.
 5. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
 8. Channel Dimensions: Selected for applicable load criteria.
- C. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with minimum 13/32-inch diameter holes at a maximum of 8 inches o.c., in at least one surface.
1. Standard: Comply with MFMA 4.
 2. Channel Width: 1-5/8 inches
 3. Fittings and Accessories: Products provided by channel and angle manufacturer and designed for use with those items.
 4. Fitting and Accessory Materials: Same as those for channels and angles
 5. Rated Strength: Selected to suit applicable load criteria.
 6. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Conduit and Cable Support Devices: Steel clamps, hangers, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored communications conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.
- G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 2. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steelfor use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.

5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 1. NECA 1.
 2. NECA/BICSI 568.
 3. TIA-569-C.
 4. NECA 101
 5. NECA 102.
 6. NECA 105.
 7. NECA 111.
- B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Comply with requirements for pathways specified in Section 270528 "Pathways for Communications Systems."
- D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 1. Secure raceways and cables to these supports with two-bolt conduit clamps
 2. Retain paragraph below for projects where seismic design requirements do not apply. Consider retaining for light-commercial projects only.
- F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, according to NFPA 70.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten communications items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Use approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Use expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated-driven threaded studs, provided with lock washers and nuts, may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 - 6. To Light Steel: Sheet metal screws.
 - 7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor communications materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils
- B. Touchup: Comply with TCNJ requirements for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas, and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 270529

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SECTION 270543 - UNDERGROUND PATHWAYS AND STRUCTURES FOR COMMUNICATION SYSTEMS

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. Section Includes:
 - 1. Metal conduit and fittings, including GRC and PVC-coated GRC.
 - 2. Rigid nonmetallic duct.
 - 3. Duct accessories, including rigid innerduct and fabric innerduct.
 - 4. Precast manholes.
 - 5. Utility structure accessories.

1.3 DEFINITIONS

- A. Direct-Buried: Duct or a duct bank that is buried in the ground, without any additional casing materials, such as concrete.
- B. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.
- C. Duct Bank:
 - 1. Two or more ducts installed in parallel, with or without additional casing materials.
 - 2. Multiple duct banks.
- D. GRC: Galvanized rigid conduit.
- E. RNC: Rigid nonmetallic conduit.
- F. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include duct-bank materials, including spacers and miscellaneous components.
 - 2. Include duct and conduits and their accessories, including elbows, end bells, bends, fittings, duct spacers and solvent cement.

3. Include accessories for manholes and handholes
4. Include underground-line warning tape.

B. Shop Drawings:

1. Precast or Factory-Fabricated Underground Utility Structures:
 - a. Include plans, elevations, sections, details, attachments to other work, and accessories.
 - b. Include duct entry provisions, including location and duct size.
 - c. Include reinforcement details.
 - d. Include frame and cover design and manhole chimneys.
 - e. Include ladder /step details.
 - f. Include grounding details.
 - g. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
 - h. Include joint details.
2. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:
 - a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
 - b. Include duct entry provisions, including location and duct size.
 - c. Include cover design.
 - d. Include grounding details.
 - e. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.5 INFORMATIONAL SUBMITTALS

- A. Duct and Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.
 1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
 2. Shop drawing for areas where duct bank will cross an existing duct bank or utility. Details showing appropriate shoring and reinforcement shall be provided.
 3. Drawings shall be signed and sealed by a qualified professional engineer.
- B. Product Certificates: For concrete and steel used in precast concrete manholes as required by ASTM C 858.
- C. Qualification Data: For professional engineer and testing agency responsible for testing nonconcrete handholes and boxes.
- D. Source quality-control reports.
- E. Field quality-control reports.

1.6 MAINTENANCE MATERIALS SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Furnish cable-support stanchions, arms, and associated fasteners in quantities equal to 5 percent of quantity of each item installed.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

1.8 FIELD CONDITIONS

- A. Interruption of Existing Communications Service: Do not interrupt communications service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary communications service according to requirements indicated:
 - 1. Notify Engineer/ Owner no fewer than five days in advance of proposed interruption of communications service.
 - 2. Do not proceed with interruption of communications service without Engineer/ Owner written permission.
- B. Ground Water: Assume ground-water level is at grade level unless a lower water table is noted on Drawings.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

- A. GRC: Comply with ANSI C80.1 and UL 6.
- B. PVC-Coated Steel Conduit: PVC-coated GRC.
 - 1. Comply with NEMA RN 1.
 - 2. Coating Thickness: 0.040 inch, minimum.
- C. General Requirements for Metal Conduits and Fittings:
 - 1. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.
 - 2. Comply with TIA-569-C and TIA-758-C.

2.2 RIGID NONMETALLIC DUCTS

- A. Underground Plastic Utilities Duct: Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.
- B. General Requirements for Nonmetallic Ducts and Fittings:
 - 1. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.
 - 2. Comply with TIA-569-C and TIA-758-C.
- C. Solvents and Adhesives: As recommended by duct manufacturer.

2.3 DUCT ACCESSORIES

- A. Innerduct: Corrugated HDPE duct, designed for installation within an underground duct or pathway.
 - 1. Basis of Design Carlon Or Equivalent: A6D2S1JNNB Standard Wall 1-1/4” Corrugated HDPE With Pull Tape.
 - 2. Installation of 3 innerducts in each active conduit within a duct bank. The three inner ducts within the same conduit shall be different colors: one black, one orange, and one green.
 - 3. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Duct Spacers: Factory-fabricated rigid PVC interlocking spacers, sized for type and size of duct with which used, and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.
- C. Underground-Line Warning Tape: Underground-line warning tape.
- D. Traceable muletape: (Neptco DT900P) Flat woven polyester with insulated 22AWG conductor, equipped with footage markings and impregnated lubricant. 1/2" nominal width, 900-lb pulling strength.

2.4 PRECAST MANHOLES

- A. Description: One-piece units and units with interlocking mating sections, complete with accessories, hardware, and features.
- B. Standard: Comply with ASTM C 858.
- C. Structural Design Loading: Comply with requirements in "Underground Enclosure Application" Article.

- D. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct and duct banks, plus an additional 6 inches vertically and horizontally to accommodate alignment variations.
1. Splayed location.
 2. Knockout panels shall be located no less than 6 inches from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
 3. Knockout panel opening shall have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
 4. Knockout panel openings shall be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
 5. Knockout panels shall be 1-1/2 to 2 inches thick.
- E. Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
1. Type and size shall match fittings to duct or conduit to be terminated.
 2. Fittings shall align with elevations of approaching duct and be located near interior corners of manholes to facilitate racking of cable.
- F. Ground Rod Sleeve: Provide a 3-inch PVC sleeve in manhole floors 2 inches from the wall adjacent to, but not underneath, the duct routed from the facility.
- G. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

2.5 UTILITY STRUCTURE ACCESSORIES

- A. Accessories for Utility Structures: Utility equipment and accessory items used for utility structure access and utility support, listed and labeled for intended use and application.
- B. Accessory - Manhole cover and frame
1. Frames and covers shall be made of gray cast iron and a machine-finished seat shall be provided to ensure a matching joint between frame and cover. Cover shall incorporate a lip on the underside to facilitate removal with a standard manhole hook, as well as open pick holes at opposite edges. Frames and covers shall be rated for wheel loads in accordance HS-20 rating and shall comply with ASTM A 48, Class 30B, minimum. Frame shall provide for an opening minimum diameter 30", maximum 36". Frame shall include a flange suitable and equipped for fastening to the manhole structure.
 2. The cover shall be round. The phrase "COMMUNICATIONS" shall be stamped or cast into the cover.
- C. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch diameter eye, and 1-by-4-inch bolt.
- D. Working Load Embedded in 6-Inch 4000-psi Concrete: 13,000-lbf minimum tension.

- E. Pulling-In and Lifting Irons in Concrete Floors: 7/8-inch- diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.
 - 1. Ultimate Yield Strength: 40,000-lbf shear and 60,000-lbf tension.
- F. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch ID by 2-3/4 inches deep, flared to a minimum of 1-1/4 inches at base.
 - 1. Tested Ultimate Pullout Strength: 12,000 lbf minimum.
- G. Ground Rod Sleeve: 3-inch (75-mm), PVC duct sleeve in manhole floors 2 inches (50 mm) from the wall adjacent to, but not underneath, the duct entering the structure.
- H. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip, with 1/2-inch bolt, 5300-lbf rated pullout strength, and minimum 6800-lbf rated shear strength.
- I. Cable racking assemblies shall be: Hot-dip galvanized cable racks with a plastic coating over the galvanizing shall be installed in each communications manhole. Racking supports shall extend floor to ceiling of manhole, with a minimum of three supports per side distributed evenly across the wall (typical for all four walls). Provide three racking hooks per racking support; two (2) of which shall be 3” arms and one (1) shall have an 18” arm.
- J. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F. Capable of withstanding temperature of 300 deg F without slump and adhering to clean surfaces of plastic duct, metallic duct, duct coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.
- K. Cover Hooks: Heavy duty, designed for lifts 60 lbf and greater.

2.6 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate layout and installation of duct, duct bank, manholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Owner / Engineer if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.
- B. Coordinate elevations of duct and duct-bank entrances into manholes, and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other

utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Engineer.

- C. Clear and grub vegetation to be removed and protect vegetation to remain.

3.2 UNDERGROUND DUCT APPLICATION

- A. Duct for Communications: Type EPC-40-PVC RNC, in concrete-encased duct bank unless otherwise indicated.
- B. Stub-Ups for Communications: Concrete-encased RNC.

3.3 UNDERGROUND ENCLOSURE APPLICATION

- A. Manholes: Precast concrete.
 - 1. Units Located in Roadways and Other Deliberate Traffic Paths by Heavy or Medium Vehicles: H-20 structural load rating according to AASHTO HB 17.
 - 2. Units Not Located in Deliberate Traffic Paths by Heavy or Medium Vehicles: H-10 load rating according to AASHTO HB 17.

3.4 EARTHWORK

- A. Excavation and Backfill: Comply with Section 312000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.
- B. Restoration: Replace area immediately after backfilling is completed.
- C. Restore surface features at areas disturbed by excavation and re-establish original grades unless otherwise indicated.
- D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary top soiling, fertilizing, liming, seeding, sodding, sprigging, and mulching.
- E. Cut and patch existing pavement in the path of underground duct, duct bank, and utility structures.

3.5 DUCT AND DUCT-BANK INSTALLATION

- A. Where indicated on Drawings, install duct, spacers, and accessories into the duct configuration shown. Duct installation requirements in this Section also apply to duct bank.
- B. Install duct and duct bank according to NEMA TCB 2 and TIA-758-C.

- C. Slope: Pitch duct and duct bank a minimum slope of 1:100 down toward manholes and handholes and away from buildings and equipment. Slope duct and duct bank from a high point in runs between two manholes, to drain in both directions.
- D. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.
 - 1. Duct and duct banks shall have maximum of two 90-degree bends, or the total of all bends shall be no more 180 degrees between pull points.
- E. Joints: Use solvent-cemented joints in duct and fittings and make watertight according to manufacturer's written instructions. Stagger couplings, so those of adjacent ducts do not lie in same plane.
- F. Installation Adjacent to High-Temperature Steam Lines: Where duct or duct banks are installed parallel to underground steam lines, perform calculations showing the duct or duct bank will not be subject to environmental temperatures above 40 deg C. Where environmental temperatures are calculated to rise above 40 deg C, and anywhere the duct or duct bank crosses above an underground steam line, install insulation blankets listed for direct burial to isolate the duct bank from the steam line.
- G. End-Bell Entrances to Manholes: Use end bells, spaced approximately 6 inches o.c. for 4-inch duct, and vary proportionately for other duct sizes.
 - 1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct slope and without forming a trap in the line.
 - 2. Expansion and Deflection Fittings: Install an expansion and deflection fitting in each duct in the area of disturbed earth adjacent to manhole. Install an expansion fitting near the center of all straight-line direct-buried duct and duct banks, with calculated expansion of more than 3/4 inch.
 - 3. Grout end bells into structure walls from both sides to provide watertight entrances.
- H. Terminator Entrances to Manholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inches o.c. for 4-inch duct, and vary proportionately for other duct sizes.
 - 1. Begin change from regular spacing to terminator spacing 10 feet from the terminator without reducing duct slope and without forming a trap in the line.
 - 2. Expansion and Deflection Fittings: Install an expansion and deflection fitting in each duct in the area of disturbed earth adjacent to manhole. Install an expansion fitting near the center of all straight-line duct or duct bank, with calculated expansion of more than 3/4 inch.
- I. Building Wall Penetrations: Make a transition from underground duct at least 10 feet outside the building wall, without reducing duct slope away from the building or forming a trap in the duct. Install penetrations of building walls as specified in Section 270544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling."

- J. Sealing: Provide temporary closure at terminations of duct that has cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.
- K. Innerduct: Install immediately after mandreling duct. Provide three innerducts per duct
- L. Pulling Cord: Install 200-lbf- (1000-N-m) test nylon cord in empty duct and innerduct.
- M. Detectable Muletape: Install 900-lbf detectable muletape in each empty duct. Provide 25-foot slack loop on each end and secure to anchor point in manhole. Install label tag on each muletape, label text coordinated with Owner.
- N. Concrete-Encased Duct and Duct Bank:
1. Excavate trench bottom to provide firm and uniform support for duct or duct bank. Prepare trench bottoms as specified in Section 312000 "Earth Moving" for pipes less than 6 inches in nominal diameter.
 2. Width: Excavate trench 12 inches wider than duct or duct bank on each side.
 3. Depth: Install top of duct and duct bank at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
 4. Support duct and duct bank on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
 5. Minimum Space Between Duct: 3 inches between edge of duct and exterior envelope wall, 3.5 inches between ducts.
 6. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 feet of duct. Place spacers within 24 inches of duct ends. Stagger spacers approximately 6 inches between tiers. Secure spacers to earth and duct to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around duct or duct bank. Maintain clearance from conduit bank, to trench base and sides for complete concrete encasement
 7. Elbows: Use manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct run unless otherwise indicated. Extend concrete encasement throughout length of elbow.
 8. Elbows: Use manufactured PVC-coated GRC elbows for stub-ups, at building entrances.
 - a. Couple PVC-coated GRC to duct with adapters designed for this purpose and encase coupling with 3 inches of concrete.
 - b. Stub-Ups to Indoor Equipment: Extend concrete-encased PVC-coated GRC horizontally a minimum of 60 inches (1500 mm) from edge of wall. Install insulated grounding bushings on terminations at equipment.
 - 1) Stub-ups shall be minimum 4 inches above finished floor and no less than 3 inches from conduit side to edge of wall.

9. Reinforcement: Reinforce concrete-encased duct and duct bank where they cross existing utilities and infrastructure. Duct banks shall be supported independently of any existing utilities or infrastructure. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
10. Forms: Use trench walls to form side walls of duct and duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
11. Concrete Cover: Install a minimum of 3 inches of concrete cover between edge of duct to exterior envelope wall, 3.5 inches between ducts.
12. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.
 - a. Start at one end and finish at the other, allowing for expansion and contraction of duct as its temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations or use other specific measures to prevent expansion-contraction damage.
 - b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing-rod dowels extending a minimum of 18 inches into concrete on both sides of joint near corners of envelope.
13. Pouring Concrete: Comply with requirements in "Concrete Placement" Article in Section 033000 "Cast-in-Place Concrete." Place concrete carefully during pours to prevent voids under and between ducts and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto duct. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.

3.6 INSTALLATION OF CONCRETE MANHOLES

A. Precast Concrete Manhole Installation:

1. Comply with ASTM C 891 unless otherwise indicated.
2. Install units level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

B. Elevations:

1. Manhole Roof: Install with rooftop at least 15 inches below finished grade.
2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch above finished grade.
3. Manhole shall be set so that cover / associated frame is 1" above surrounding finished grade for green areas and flush for hard scape areas.

C. Manhole Access: Circular opening in manhole roof; sized to match cover size.

1. Install chimney, constructed of precast concrete collars and rings, to support cast-iron frame to connect cover with manhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for frame to chimney.
 2. Install pins or bolts to attach collars and rings to manhole top, each other, and to the frame for the cover.
- D. Waterproofing: Apply waterproofing to exterior surfaces of manholes after concrete has cured at least three days. After duct has been connected and grouted, and before backfilling, waterproof joints and connections, and touch up abrasions and scars. Waterproof exterior of manhole chimneys after mortar has cured at least three days.
- E. Hardware: Install removable hardware, including pulling eyes, cable stanchions, cable arms, as required for installation and support of cables and conductors and as indicated.
- F. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches for manholes and 2 inches for handholes, for field-installed anchor bolts installed. Use a minimum of two anchors for each cable stanchion.

3.7 GROUNDING

- A. Ground underground duct, duct bank, and utility structures according to Section 270526 "Grounding and Bonding for Communications Systems."
- B. Ground Rods
1. A ground rod shall be installed in the manholes, handholes and pullboxes. Ground rods shall be driven into the earth so that approximately 4 inches of the ground rod will extend above the manhole floor. Position the ground rod along the wall to avoid a tripping hazard.
 2. Provide copper grounding bus ring around upper perimeter of manhole, constructed of bare 4/0 copper cable. Support cable on walls with clips and anchors at intervals not to exceed 24". Bond ground conductor to ground rod using exothermic weld. Bond ground conductor to cable rack arms and ductbank ground conductor.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
 2. Conduit Mandrelling - mandrel conduit and correct issues prior to concrete encasement.
 - a. Owner to be present during manrelling for observation.
 3. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 12-inch- (300-mm-) long mandrel equal to duct size minus 1/4 inch (6 mm). If obstructions are

indicated, remove obstructions and retest. This Test Should Be Performed Before Concrete Encasement.

4. Test manhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 270526 "Grounding and Bonding for Communications Systems."

- B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.9 CLEANING

- A. Duct shall be cleaned with an assembly that consists of a flexible mandrel (¼-inch) less than inside diameter of duct, 2 wire brushes, and a rag. The cleaning assembly shall be pulled through each conduit a minimum of 2 times, or until less than a volume of 8 cubic inches of debris is expelled from the duct. Traceable mule tape and A nylon pull line with a test strength of 200 lbs. shall be installed in each conduit after cleaning.
- B. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris.
- C. Clean internal surfaces of manholes, including sump.
 1. Sweep floor, removing dirt and debris.
 2. Remove foreign material.

END OF SECTION 270543

SECTION 270544 - SLEEVES AND SLEEVE SEALS FOR COMMUNICATIONS PATHWAYS AND CABLING

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. Section Includes:

1. Sleeves for pathway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

- C. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

D. Sleeves for Rectangular Openings:

1. Material: Galvanized-steel sheet.
2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
 - f. Or Equivalent.
2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Presealed Systems.
 - b. Or Equivalent.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
 - 2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint.
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pathway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.

4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.

C. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

D. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

E. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between pathway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at pathway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 270544

SECTION 271323 - COMMUNICATIONS OPTICAL FIBER BACKBONE CABLING

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. Section Includes:
 - 1. Optical fiber cable, OS2 (9/125-micron) for OSP and indoor installation.
 - 2. Optical fiber cable, OM1 (62.5/125-micron) for indoor installation.
 - 3. Optical fiber cable termination and enclosure hardware.
 - 4. Cabling identification products.

1.3 DEFINITIONS

- A. BICSI: Building Industry Consulting Service International.
- B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- C. IDC: Insulation displacement connector.
- D. LAN: Local area network.
- E. RCDD: Registered Communications Distribution Designer.

1.4 OPTICAL FIBER BACKBONE CABLING DESCRIPTION

- A. Optical fiber backbone cabling system shall provide interconnections between Main Distribution Frame (MDF) communications equipment rooms in the telecommunications cabling system structure. Cabling system consists of backbone cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for backbone-to-backbone cross-connection.
- B. Backbone cabling cross-connects may be located in MDF communications equipment rooms.

1.5 PERFORMANCE REQUIREMENTS

- A. General Performance: Backbone cabling system shall comply with transmission standards in TIA-568-C, when tested according to test procedures of this standard.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Substitutions

1. All functions and features specified herein are to be provided by the contractor. Where specific manufacturer's names and model numbers are specified, such identification is to identify the expected performance parameters and to functionally define the specific product requirement.
2. Where a contractor intends to provide goods other than those specifically identified, such "equivalent" items must be clearly identified in the submittals. "Equivalent" items must include written certification from the manufacturer of the substitute item stating the equivalency of each and every substituted item relative to the specified items in regard to features, function, performance and future expansion capability.
3. Contractors wishing to provide "equivalent" products for specified devices may be required to demonstrate the equivalency of the proposed substitute items to the Owner, at the contractor's expense. Such proof of equivalency, in addition to the manufacturer's letter as noted above, may include the following:
 - a. An on-site, side-by-side sample demonstration of both the specified and proposed substitute items.
 - b. A formal bipartisan, laboratory test report comparing the technical performance of each and every proposed substitute, versus specified item.
 - c. Such test reports for IT System components will include a spreadsheet comparison of all critical dimensions, performance characteristics, compatibilities, etc.
 - d. The responsibility of proving the equivalency of substitute products with respect to the specified products shall lie solely with the contractor.
 - e. All costs associated with providing information or performing the above outlined tests and comparisons required to confirm the equivalency of substitute products will be at the sole expense of the contractor. Such costs may include but are not limited to:
 - 1) Independent laboratory tests
 - 2) Cost of equipment items for demonstration of specified and proposed substitute items
 - 3) Contractor incurred travel costs and miscellaneous expenses
 - 4) Professional Services Fees (architects, engineers and consultants) charged to the Owner as a result of time charged to participating in the review of proposed substitute items.
4. All requests for substitution shall be made to the Engineer, accompanied by a product data sheet submittal as outlined in the Specifications. The Engineer will distribute documentation to the Owner for review.
5. The Engineer and Owner have no obligation to consider or approve requests for substitution after award of contract.

C. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
3. Cabling administration drawings and printouts.
4. Wiring diagrams to show typical wiring schematics including the following:
 - a. Cable segments and routing.
 - b. Termination points and enclosures.
 - c. Final (field-installed) cable segment and terminal enclosure identifiers.
5. Termination points and enclosures. Detail mounting assemblies and show elevations and physical relationship between the installed components.
6. Network Diagram
 - a. Network diagram submittal as shop drawing for the campus which shall include the following information:
 - 1) Product information submittal
 - 2) System diagram (Point to point) that includes all cables, connectors, and system calculations including loss budget analysis, power budget, and loss margin calculation.
 - b. The specifications on each fiber shall also be indicated including: manufacturer, type, quantity, cable construction type, length, installation type.
 - 1) Performance requirements shall be indicated along with all relevant information (bandwidth, total fiber loss, total connector loss, other losses)
 - 2) Once calculations are completed, approved, and fiber installation completed the system shall be tested. OTDR and End to End loss of every fiber being utilized shall be completed and the calculated data shall be utilized as the criteria for the testing.
7. Shop Drawings are to be submitted on project standard full size and bound. Each shop drawing set is to include the below in the following order:
 - a. Title Sheet.
 - 1) Containing, at a minimum, a list of all drawings in the set and a symbols legend defining each symbol used in the package.
 - b. Riser Diagram.
 - 1) Show the relationship of TR's, the pathway between them, and cable connectivity to be installed.
 - c. Telecommunications Room Details.

- 1) Plan Details of infrastructure and room fittings with clearances, Elevation Details of wall fields and rack details showing the relationship of rack mounted elements inclusive of Owner provided equipment (labeled as such).
 - d. Floor Plans / Site Plans.
 - 1) Show planned location for all elements and cable routing. Drawings should be at project standard scale clearly legible. Include outlet port numbers for each outlet.
 - 2) Provide layout plans identifying proposed locations of slack loops for each cable routing. Refer to project drawings for further information.
 - e. Field quality-control reports. Submit copy of project status reporting form.
8. Submittal Data is to be submitted in pdf format. Each pdf file shall contain the below, in the following order:
- a. Cover Sheet.
 - 1) Include name of supplying contractor and project name.
 - b. Detailed Bill of Materials.
 - 1) Include a listing of: component quantities, equipment manufacturer, model number, and description of each component being supplied, and the specification paragraph or drawing sheet that corresponds to the product. Failure to provide this information will result in the rejection of submittals.
 - c. Product Data.
 - 1) Include a catalog sheet per product of equipment listed in the Detailed Bill of Materials, in the exact order as the Detailed Bill of Materials. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. The catalog sheet must also include an image of the product. Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed as long as they provide adequate clarity of both the printed word and graphics/pictures. If more than one product is shown on the catalog sheet the intended product must be denoted by either an arrow or highlight.
 - d. Installer Qualifications
 - 1) Provide the following to demonstrate adequate experience and minimum qualifications.
 - a) Corning EWP Certificate
 - 2) Installing company shall be certified by manufactures in aspects of design, installation and testing of optical premise distribution systems, be a manufactures Value Added Reseller (VAR) in good standing, with

a current, active certification that has been continuous for at least the last 24 months.

- 3) Installation Supervision: Installation shall be under the direct supervision of Level 2 Installer and manufactures certified installer, who shall be present at all times when Work of this Section is performed at Project site. One half of remainder of the crew shall be at a minimum Registered Technicians by manufacture as part of their Certified Installer Program.
- 4) Installer shall provide project information detailing a minimum of five (5) years of experience on similar Structured Cabling Systems (SCS).

e. Prequalification Warrantee.

- 1) Recently dated (within one year from submittal date) support letter from manufacturer stating that the supplying contractor is Authorized to obtain for the owner the Extended Warranty for Cabling System and the Extended Warranty for System Assurance.
- 2) Prequalification shall include demonstrating 24 months continuous active certification in the extended warranty program, from the date of the submittal.

f. Prequalification Certificate.

- 1) Copy of the installing technician(s) certificate of completion from the manufacturer's training school for the equipment being provided.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installation supervisor, and field inspector.
- B. Source quality-control reports.
 1. ISO9001 and 14001 certifications
- C. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

- A. Software and Firmware Operational Documentation:
 1. Software operating and upgrade manuals.
 2. Program Software Backup: On USB media or compact disk, complete with data files.
 3. Device address list.
 4. Printout of software application and graphic screens.
- B. Maintenance Data: For optical fiber cable, splices, and connectors to include in maintenance manuals.

- C. At the completion of the installation, but before Final Acceptance, provide for review and approval the following, in compliance with Closeout Procedures.
1. Operation and Maintenance Manuals:
 - a. Equipment manufacturer's operation and service manuals for each make and model of equipment. Submit in both hard-copy and electronic (.pdf) formats.
 2. Warranty
 - a. Provide list and dates of activation of equipment warranties
 - b. Provide original manufacturers' certificate of SCS extended warranty.
 3. As-built Drawings
 - a. Include contractor generated (mark-up of contract documents is not acceptable) digital record diagrams for all systems including, but not limited to:
 - 1) Floor Plans, including final outlet locations and identification. Refer to Article 3 of this specification for additional details.
 - 2) Cable identification spreadsheet. Provide both hard-copy (laminated) and Excel version. Include all relevant data, including cable identification, make, color, source room, destination room, termination location, etc.
 - 3) Provide laminated hard-copy of each document for each applicable Telecommunications Room.
 - 4) Provide butterflies for each manhole and building POE, showing the location and routing of each cable removed and each cable installed, with each cable's unique identifier.
 4. Testing Results
 - a. Submit hard-copy and electronic (Excel) test result data. Refer to Article 3 of this specification for additional details.
 - b. Submit copy of native tester results datafile, and copy of reader software on USB. Datafiles shall be organized by link segment, organization readily apparent through file listing.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Termination cassettes: Two of each type.

1.10 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings and Cabling Administration Drawings by an RCDD.
 2. Installation Supervision: Installation shall be under the direct supervision of Level 2 Installer and manufactures certified installer, who shall be present at all times when Work of this Section is performed at Project site. One half of remainder of the crew shall be at a minimum Registered Technicians by manufacturer as part of their Certified Installer Program.
 3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- B. Testing Agency Qualifications: Certified by BICSI.
1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 50 or less
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Have a Registered Communications Distribution Designer (RCDD) on staff.
- F. Installing company shall have demonstrated experience with Corning products specified herein and will be required to provide documentation of this experience.
- G. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-C.
- H. Administration Standard for the Telecommunications Infrastructure of Commercial Buildings, ANSI/TIA/EIA – 606
- I. Grounding: Comply with ANSI-J-STD-607-B.
- J. NFPA 70 – National Electric Code
- K. BICSI – Telecommunications Distribution Methods Manual, 13th Edition
- L. NEMA – VE-1 – Metal Cable Tray Systems, 2017
- M. NEMA – VE-2 – Metal Cable Tray Installation Guidelines, 2013
- N. Grounding: Comply with TIA-607-B.

1.11 WARRANTY

- A. Special Warranty for Cabling System: Manufactures warranty shall ensure against product defects; that approved cabling components exceed the specifications of TIA/EIA 568C and ISO/IEC IS 11801; and that the installation will exceed the loss and bandwidth requirements of TIA-568-C and ISO/IEC IS 11801 for fiber links/channels. The warranty shall apply to passive SCS components.
 - 1. Warranty Period: 25-year Cabling System from date of Substantial Completion.
 - 2. Warranties shall include certification under Corning EWP.

- B. Special Warranty for System Assurance: Manufactures warranty shall cover the failure of the cabling system to support the application which it was designed to support, as well as additional application(s) introduced in the future by recognized standards or user forums that recognize TIA/EIA 568C or ISO/IEC IS 11801 component and link/channel specifications for cabling.
 - 1. Warranty Period: 25-year Applications Assurance from date of Substantial Completion.
 - 2. Warranties shall include certification under Corning EWP

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 - 1. Test optical fiber cable to determine the continuity of the strand end to end. Use optical loss test set.
 - 2. Test each optical fiber in the cable assembly while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector, including the loss value of each. Retain test data and include the record in maintenance data.

- B. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

1.13 COORDINATION

- A. Coordinate layout and installation of communications equipment with Owner's IT department.
 - 1. Meet with Owner's IT representatives to Coordinate OFE equipment and their required connections.
 - 2. Record agreements reached in meetings and distribute them to other participants.
 - 3. Adjust arrangements and locations of equipment racks, termination cassettes, and connector housings in equipment rooms to accommodate and optimize arrangement and space requirements of equipment.

- B. Coordinate layout and installation of communication pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

- C. A labeling scheme for fiber system components shall be established in coordination with Owner's IT department. Each fiber jumper shall be labeled at each end with the approved identifier. Identifiers shall be placed on system as-build plans.
- D. Disconnection and reconnection of existing fiber jumpers is the responsibility of TCNJ IT. Coordinate schedule with TCNJ IT department for disconnection and reconnection of existing fiber jumpers. Installer shall develop a schedule for work in consideration with outage / disruption restrictions and in consultation with IT department to inform work progress. Schedule shall be reviewed and approved by TCNJ.

PART 2 - PRODUCTS

2.1 OS2 INDOOR/OUTDOOR OPTICAL FIBER CABLE. Basis of Design: Corning or Equivalent.

- A. Description: single-sheath OFNR-rated **OS2** (9/125-micrometer) gel-free waterblocked, ribbon fiber optical cable.
 - 1. 12-Fiber Cable
 - a. 012XCF-14101-D20 - 12-Fiber Ribbon Cable indoor / outdoor gel-free cable, SST-RIBBON OFNR: OS2 SMF
 - 2. 24-Fiber Cable
 - a. 024XCF-14101-D20 - 24-Fiber FREEDM indoor/outdoor gel-free cable, SST-RIBBON OFNR: OS2 SMF
 - 3. 36-Fiber Cable
 - a. 036XCF-14101-D20 - 36-Fiber FREEDM indoor/outdoor gel-free cable, SST-RIBBON OFNR: 36-fibers OS2 SMF
 - 4. 48-Fiber Cable
 - a. 048XCF-14101-D20 - 48-Fiber FREEDM indoor/outdoor gel-free cable, SST-RIBBON OFNR: 48-fibers OS2 SMF
 - 5. 96-Fiber Cable
 - a. 096XCF-14101-D20 - 96-Fiber FREEDM indoor/outdoor gel-free cable, SST-RIBBON OFNR: 96-fibers OS2 SMF
 - 6. 144-Fiber Cable
 - a. 0192XCF-14101-D20 - 144-Fiber FREEDM indoor/outdoor gel-free cable, SST-RIBBON OFNR: 144-fibers OS2 SMF
 - 7. 192-Fiber Cable

- a. 0192XCF-14101-D20 - 192-Fiber FREEDM indoor/outdoor gel-free cable, SST-RIBBON OFNR: 192-fibers OS2 SMF
8. 288-Fiber Cable
 - a. 0288XVF-14101-D20 - 288-Fiber FREEDM indoor/outdoor gel-free cable, SST-RIBBON OFNR: 288-fibers OS2 SMF
- B. Description: single-sheath OFNR-rated **OM1** (62.5/125-micrometer) gel-free waterblocked, ribbon fiber optical cable.
1. 48-Fiber Cable
 - a. 048KC7-14130-D20 - 48-Fiber Ribbon Cable indoor gel-free cable, SST-RIBBON OFNR: 48-fibers 62.5micron OM1 multimode standard
- C. OS2
1. Maximum Attenuation: 0.4dB/km at 1310 nm; 0.4dB/km at 1383 nm, 0.3dB/km at 1550 nm.
 2. Standards:
 - a. Comply with TIA-492CAAB for detailed specifications.
 - b. Comply with TIA-568-C.3 for performance specifications.
 - c. Comply with ICEA S-104-696 for mechanical properties.
- D. OM1
1. Maximum Attenuation: 3.40dB/km at 850 nm; 1.0dB/km at 1300 nm.
 2. Minimum Overfilled Modal Bandwidth-length Product: 200 MHz-km at 850 nm; 500 MHz-km at 1300 nm.
 3. Standards:
 - a. Comply with ICEA S-83-596 for mechanical properties and ANSI/ICEA S-83-696 for mechanical properties of indoor/outdoor cables.
 - b. Comply with TIA-568-C.3 for performance specifications.
 - c. Comply with TIA-492AAAA for detailed specifications.
- E. Jacket:
1. Jacket Color: OS2 – Yellow, OM1 – Orange,. Coordinate cable jacket color with college prior to ordering.
 2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA-598-D.
 3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches
 4. Outer jacket is moisture-resistant, plenum rated, fungus-resistant and UV resistant for outdoor use

- F. Comply with TIA-492AAAA for detailed specifications and TIA-492AAAA for cables with single-mode fiber.
- G. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70

2.2 OPTICAL FIBER CABLE HARDWARE

- A. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors. Basis of Design: Corning or Equivalent.
 - 1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.
 - 2. Fiber Optic enclosures shall be rack-mounted with respect to location and application.
 - a. Corning CCH-04U : 12-panel, 4U Rack-mount termination housing
 - 3. Furnish all installation components and accessories as required for a complete fiber SCS installation, including (but not limited to)
 - a. Corning UCC-001 - Universal cable clamp.
 - b. Corning CPP-SSR-KIT - Central strain-relief kit.
 - c. Corning HCF-FURC-KIT-B - Ribbon cable furcation kit.
- B. Cable Connecting Hardware:
 - 1. Comply with Optical Fiber Connector Inter-mateability Standards (FOCIS) specifications of TIA-604-2-B for Type ST connectors, TIA-604-3-B for Type SC connectors, TIA-604-10-B for Type LC connectors, TIA/EIA-604-12 for Type MT-RJ connectors, and TIA-604-5-D for Type MPO connectors. Comply with TIA-568-C.3.
 - 2. Fibers to be terminated on ribbon fiber, fusion-splice pre-terminated cassettes.
 - a. Corning CCH-CS12-59-P00RJ - CCH Pigtail Cass, 12/F SC UPC Dupx OS2 ribbon
 - b. Corning CCH-CS12-91-P00KJ - CCH Pigtail Cass, 12/F SC UPC Dupx OM1 ribbon

2.3 RACKING HARDWARE

- A. Wall-mount IT equipment Cabinets and appurtenances. Furnish and install as indicated at each site installation. Basis of Design: Chatsworth Or Equivalent.
 - 1. Chatsworth Products 12419-748 (30” Deep Wall Mount Cabinet)
 - a. Cube-IT Plus 24x30x48 Wall mount, Plexiglas door.
 - b. Chatsworth Products 12787-548 (Or Equivalent)

- 1) Cube-IT 26RU L-style mounting rail kit.
- c. Chatsworth Products 12804-701
 - 1) Fan kit 115v 100CFM
- d. Chatsworth Products 12805-201
 - 1) Filter kit, white
- e. Chatsworth Products 12803-701
 - 1) Cube-IT Light kit
- 2. Chatsworth Products 13050-723 (12" Deep Wall Mount Cabinet)
 - a. Thinline-II 36"H x 26"W x 12"D
- B. Free-standing IT equipment rack. Furnish and install as indicated at each site installation
 - 1. Chatsworth 66353-503 (Or Equivalent)
 - a. 45RMU (7') x 6"-deep channel rack, two post, clear finish

2.4 GROUNDING

- A. Comply with requirements in Section 270526 "Grounding and Bonding for Communications Systems" for grounding conductors and connectors.
- B. Comply with TIA-607-B.

2.5 IDENTIFICATION PRODUCTS

- A. Comply with TIA-606-B and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Labels Printed, Adhesive, Self-laminating for Grounding, Indoor and Outdoor Fiber and UTP Cable Sheath. Label stock color and text to provide high-contrast with cable sheath.
 - 1. Panduit PST-FO: Self laminating fiber tag
 - 2. Panduit PST-FOBLNK: Self laminating blank tag
- C. Labels, Cable Sheath, Printed, Adhesive Wrap-around, Self-laminating. Label stock color and text to provide high-contrast with cable sheath. Labeling surface shall accommodate label text printed minimum 9-point font. Label shall be water-proof and self-laminating, lamination extending minimum 0.25" past label text field when installed on cable sheath.
 - 1. BRADY XSL-31-427-YL Vinyl self-laminating, 1"Wx1.5"L (0.5") black on yellow (UTP sheaths, typ.)

2. BRADY XSL-21-427-YL Vinyl self-laminating, 1"Wx1.5"L (0.75") black on yellow (PLTC sheaths, typ.) Or approved equal .
- D. Labels, Self-laminating cable tags, Ceiling grid or equipment enclosures, Printed, Adhesive, Laminated.
1. Label stock color and text to provide high-contrast with mounting surface. Label width shall be chosen to accommodate printed text readable while standing on the ground below the labeled equipment or component.
 - a. P-TOUCH TZ-series laminated black text on white (for applying to dark-colored surfaces or self-laminating cable tags)
 - b. P-TOUCH TZ-series laminated white text on black (for applying to light-colored surfaces)
 - c. Or approved equal.
- E. A labeling scheme for fiber system components shall be established in coordination with College's IT department. Each fiber jumper shall be labeled at each end with the approved identifier. Identifiers shall be placed on system as-build plans.

2.6 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.
- B. Factory test multimode optical fiber cables according to TIA-526-14-C and TIA-568-C.3.
- C. Factory test single mode optical fiber cables according to TIA-526-7-A and TIA-568-C.3.
- D. Factory test pre-terminated optical fiber cable assemblies according to TIA-526-14-B and TIA-568-C.3.
- E. Cable will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

2.7 TRACEABLE MULETAPE AND TRACER TERMINATOR

- A. Traceable muletape: (Neptco DT900P) Flat woven polyester with insulated 22AWG conductor, equipped with footage markings and impregnated lubricant. 1/2" nominal width, 900-lb pulling strength.
- B. Terminate traceable muletape installed in parallel with fiber cable on IDC grounding terminal. Grounding terminal is connected to Telecommunications ground point.
 1. ElectricMotion 9160 : IDC connector 22,24,26 AWG locate wire (connect to grounding point; terminate tracer wire on connector)

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

- A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.

3.2 WIRING METHODS

- A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.
 - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
 - 2. Comply with requirements for pathways specified in Section 270528 "Pathways for Communications Systems."
- B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
- C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 INSTALLATION OF OPTICAL FIBER BACKBONE CABLES

- A. Comply with NECA 301.
- B. General Requirements for Cabling:
 - 1. Comply with TIA-568-C.3.
 - 2. Comply with s TIA-568-C.3 for fiber, BICSI ITSIMM, Ch. 6, "Cable Termination Practices."
 - 3. Terminate all cables; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
 - 4. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 5. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
 - 6. Bundle, lace, and train cable to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
 - 7. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.

8. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.
 9. In the communications equipment room, 30-foot service loop in service entry room, and 30-foot loop in communications equipment room. Install a 10-foot-long service loop on each end of cable.
 10. Pulling Cable: Comply with BICSI ITSIMM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
- C. Optical Fiber Cable Installation:
1. Comply with TIA-568-C.3.
 2. Cable may be terminated on connecting hardware that is rack or cabinet mounted. Refer to plans and diagrams for details.
- D. Open-Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
 2. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
- E. Group connecting hardware for cables into separate logical fields.
- F. Cable Lubricant: Cable pulling lubricant shall be utilized when pulling cable. All lubricant shall be compatible with the associated cable jackets and approved for use by the manufacturer
- G. Common installation attributes for fiber cable
1. Coordinate with Owner for location of termination enclosures and for location of terminal panels within new and existing enclosures.
 2. Mid-span access to fiber cable will be planned for and accommodated with sufficient slack placed in the terminal room.
 - a. Fiber counts that do not terminate at the access location shall remain contiguous; they will not be broken and re-spliced.
 - b. Fibers access shall accommodate future termination of the strands following the opposite direction of designated termination. These strands will be managed and protected in fiber enclosures.
 3. Re-incorporate and re-organize new termination panels with existing (to-remain) termination panels in new and existing enclosures in coordination with Owner.
 4. Any required system disruption or down-time must be coordinated and scheduled in advance with Owner; service-disrupting work shall be coordinated and disruption schedule(s) approved by Owner prior to commencing disruptive work.
 5. Labeling of terminal enclosures shall be coordinated with owner. IDs shall include Room, per-Cabinet, per-Panel information identifying endpoints and fiber counts.
 6. Label tags are installed on indoor and outdoor fiber cable at points of entry and exit from spaces, manholes, and bulkheads; coils and loops, and proximate to terminals.
- H. Inter-building backbone cable.

1. Install backbone cable between buildings via designated outside plant cable pathway.
 2. Establish slack coil(s) in manholes as required in conformance with design and best practice.
 3. Each inter-building backbone cable shall be installed parallel with a traceable mulletape. Traceable mulletape shall be maintained continuous end-to-end in order to maintain trace continuity and trace length sequence.
 4. Establish service coils in building Entrance Facility, and Communications Equipment room. Service coil location(s) shall be coordinated with Owner.
 5. Terminate new backbone cable into designated fiber equipment enclosure.
 6. Install label tags for backbone cable and traceable mulletape. Label text to be coordinated with Owner. Label tags are generally installed at both side of space bulkheads, entry and exit from spaces and pathways, prior to terminal enclosures, and on any slack or service coils.
 7. Connect traceable mulletape tracer wire to IDC grounding terminal specified for the purpose.
- I. Intra-building riser cable.
1. Install cable designated for riser interconnect between or within building spaces as required and as per design.
 2. Install riser cable via designated cable pathway.
 3. Establish service coils in building Communications Equipment room and at far-end terminal. Service coil location(s) shall be coordinated with Owner.
 4. Install label tags for rise cable. Label text to be coordinated with Owner. Label tags are generally installed at both side of space bulkheads, entry and exit from spaces and pathways, prior to terminal enclosures, and on any slack or service coils.

3.4 FIRESTOPPING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work are limited to the following:
1. Basis of design: Wiremold-Legrand (Or Equivalent).
- B. Fire Rated Cable Pathways: Wiremold-Legrand Brand device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill, the following products are acceptable:
1. Wiremold-Legrand – FlameStoppers FS2R-RED
 2. Wiremold-Legrand – FlameStoppers FS4R-RED
- C. Horizontal cable pathway locations fewer than 20 cables EMT sleeve with UL listed system for firestopping is acceptable. Caulks and sealants shall be as manufactured by STI, 3M, Nelson, or approved equivalent.
- D. Fill ratio for fire stop EMT sleeves is based on a not to exceed 40% fill capacity

3.5 IDENTIFICATION

- A. Labeling requires coordination with the Owner. This includes the labeling scheme as well as the materials and methods.
1. Labeling must be coordinated with owner.
 2. Owner will provide labeling schedule.
 3. All labels shall remain visible, e.g. Not be painted over.
 4. Identify system components, wiring, and cabling complying with TIA/EIA-606-B.
- B. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.
- C. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. **Furnish two sets (one for demolition and one for installation) of butterfly drawings for all manholes and POEs where cables are added or removed, identifying each cable with its unique identifier. Follow convention of TIA/EIA-606-B. Furnish electronic record of all drawings.**
- D. Cable and Wire Identification:
1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 2. For exposed cables residing in vertical cable trays in TRs, label each cable at intervals not exceeding 15 feet. This is in addition to labels at the connector devices and just before the terminations thereon.
 3. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
 4. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 5. Label each unit and field within distribution racks and frames.
 6. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service. Coordinate colors with Owner.
- E. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-B.
1. Cables use flexible vinyl or polyester that flex as cables are bent. When labels are applied to round objects such as cables, special attention shall be paid to ensure that the label will not unwrap itself due to stress relief.
 2. Cable and equipment labels shall be sized appropriately for the item to which it will be applied and the number of characters to be displayed. Typefaces smaller than 10-point shall not be used; for maximum legibility sans serif typefaces are preferred.

3. Labels shall be appropriately colored for maximum contrast (i.e. The background color of the label must be of a contrasting color to the ceiling support). Label nomenclature shall be protected by a permanent, water-resistant, transparent top layer. Label text will be provided in a font large enough to be read from a standing position on the finished floor.
- F. Labeling for riser, grounding, and backbone cables, within buildings and within outside plant, shall be installed using self-laminating cable tags (e.g. Panduit). Label texts shall be printed on adhesive label stock, applied to the cable tag, and sealed completely beneath the lamination. Labels shall be installed where cables enter and exit pulling points (e.g. manholes, pullboxes, etc.), on all slack or service coils, where cables pass through wall, floor, bulkhead or enclosure, penetrations, and before termination enclosures.
- G. Labeling for conduits feeding enclosed spaces shall be applied within 6” of the end of the conduit using self-laminating cable tags (e.g. Panduit), at both ends. If conduit terminates above dropped ceiling, label shall also be applied to ceiling support grid. Separate label codes shall be developed for conduit segments separated by intermediate pullboxes/enclosures in order to indicate the presence and location of such enclosures. Label code shall include terminating room numbers. Coordinate with Owner.
- H. Work area outlets and equipment enclosures located above the ceiling, such as are provided for cameras, wireless access points, or display units, will be identified by a machine printed label permanently attached to the ceiling grid.
- I. The Contractor shall apply labels as detailed on drawings and as identified on cable pull schedules to each cable, patch panel, termination block and faceplate as required
- J. Labeling for fiber patch cords shall be applied within 6" of the end of the patch cord. Label texts shall be printed on self-laminating adhesive labels. Labeling text shall indicate the loop segment this patch cord connects (e.g. Inter-building), and the endpoints of the patch cord (e.g. panel to transceiver). Indexing shall be included to differentiate multiple patch cords connecting similar elements (e.g. -1, -2, -3, etc.). Where wrap-around labels do not fit the cord (e.g. label field overlaps itself), install a label wrap mandrel on the cord to support the label. Mandrel shall be sized to maintain position on the cord without excess compression.

3.6 SOURCE QUALITY CONTROL

- A. Factory test multimode and single-mode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-C. Include 526-7 for single-mode cable.
- B. Cable will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Test all optical fiber cable for length prior to removing from spool.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Tests and Inspections:
 - 1. Visually inspect optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-C.1.
 - 2. Visually confirm cable category marking of outlets, cover plates, outlet/connectors, and patch panels.
 - 3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 - 4. Replace any cable whose cable jacket is be kinked, scored, twisted or otherwise damaged.
 - 5. Optical Fiber Cable Tests:
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-C.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 - b. Optical Fiber Cable Performance Tests: Perform optical fiber end-to-end link tests according to TIA/EIA-568-C.1. Link End-to-End Attenuation Tests:
 - c. Multimode backbone link measurements: Test at 850 and 1300 nm in 1 direction according to TIA/EIA-526-14-C, Method B, One Reference Jumper. Repeat test in reverse direction as well.
 - d. Singlemode backbone link measurements: Test at 1310 and 1550 nm in 1 direction according to TIA/EIA-526-7-A, Method B, One Reference Jumper. Repeat test in reverse direction as well.
 - 6. Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-C.1.
 - a. Provide bi-directional OTDR and OLTS testing.
 - 7. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM. Data shall also be submitted in .pdf format as well as the raw data from the testing instrument. Provide any software required to read this data to the Owner at no additional charge. Software shall include permanent licensing.
 - 8. Remove and replace cabling that is physically damaged or where test results indicate that they do not comply with specified requirements.
 - 9. End-to-end cabling will be considered defective if it does not pass tests and inspections
- E. Prepare test and inspection reports.

END OF SECTION 271323

SECTION 311000 - SITE CLEARING

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. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, removing site utilities and abandoning site utilities in place.
7. Temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.
- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.
- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or video recording.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: General Contractor to include ground penetrating radar. Notify utility locator service and college for area where Project is located before site clearing.
- C. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- D. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.

- 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- E. Do not direct vehicle or equipment exhaust towards protection zones.
- F. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- G. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain. Wrap a 1-inch (25-mm) blue vinyl tie tape flag around each tree trunk at 54 inches (1372 mm) above the ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by owner.
- B. All trees to be replaced shall be a minimum of five inches in diameter of a type approved by the owner.

3.4 EXISTING UTILITIES

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Water utilities shall only be disconnected during approved period.
 - 2. Notify Engineer not less than two weeks in advance of proposed utility interruptions.
 - 3. Do not proceed with utility interruptions without Owner's written permission.
- D. Removal of underground utilities is included in earthwork sections and with applicable communications sections.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
 - 3. Use only hand methods for grubbing within protection zones around manholes and in congested areas shown on drawings.
 - 4. Chip removed tree branches and dispose of off-site.
 - 5. All trees that are removed as part of this project shall be replaced with a tree that has a minimum trunk diameter of five inches.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm) and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6 inches (150 mm) in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil at Carlton Avenue lot away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
 - 4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

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SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating and backfilling trenches for utilities and pits for buried utility structures.

B. Related Requirements: Add Raceways and Ducts.

1.2 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

E. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

F. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

G. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct pre-excavation conference at Project site.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:
 - a. Personnel and equipment needed to make progress and avoid delays.
 - b. Coordination of Work with utility locator service.

- c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
- d. Extent of trenching by hand or with air spade.
- e. Field quality control.

1.4 INFORMATIONAL SUBMITTALS

- A. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.5 FIELD CONDITIONS

- A. Utility Locator Service: Notify 811 "One Call" and TCNJ markout for area where Project is located before beginning earth-moving operations.
- B. TCNJ markout request is also needed for Private Utility, at least two (2) weeks prior to digging

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- C. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- D. Sand: ASTM C 33/C 33M; fine aggregate.

2.2 ACCESSORIES

PART 3 - Detectable Warning Tape: Refer to section “Identification for electrical Systems”.
EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: As required for proper installation and meeting concrete encasement requirements where indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 2. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on spacers selected for the application on an undisturbed subgrade.
 3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trenches in Tree- and Plant-Protection Zones:
1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.6 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust and to protect soils from saturation.
1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 2. Stockpile only soils needed for backfilling. Remove all excess materials from campus and dispose of appropriately. Stock piling excess soils anywhere on college property is prohibited.

3.7 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for joints, fittings, and bodies of conduits.
- C. Backfill voids with satisfactory soil while removing shoring and bracing.
- D. Initial Backfill:
1. Soil Backfill: Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit, or concrete encasement where indicated.

- a. For Conduit not encased in concrete Carefully compact initial backfill evenly up on both sides and along the full length of conduit to avoid damage or displacement of conduit. Coordinate backfilling with testing.

E. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to minus 8” subgrade elevation. Top 8” is to be top soil over entire disturbed area.

3.8 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.9 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment and not more than 8 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
1. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.10 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

3.11 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.12 PROTECTION

- A. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

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. Section Includes:

- 1. Hot-mix asphalt paving.
- 2. Asphalt surface treatments.

B. Related Requirements:

- 1. Section 312000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

- 1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
 - a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
 - b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

- 1. Include technical data and tested physical and performance properties.
- 2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
- 3. Job-Mix Designs: For each job mix proposed for the Work.

B. Samples for Verification: For the following product, in manufacturer's standard sizes unless otherwise indicated:

- 1. Paving Fabric: 12 by 12 inches minimum.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and testing agency.
- B. Material Certificates: For each paving material. Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.
- C. Material Test Reports: For each paving material, by a qualified testing agency.
- D. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.
- C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the State Of New Jersey DOT for asphalt paving work.
 - 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. Prime Coat: Minimum surface temperature of 60 deg F.
 - 2. Tack Coat: Minimum surface temperature of 60 deg F.
 - 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
 - 4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 - 5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- C. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
- D. Mineral Filler: ASTM D 242/D 242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: AASHTO M 320, PG 64-22.
- B. Asphalt Cement: ASTM D 3381/D 3381M for viscosity-graded material.
- C. Cutback Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-30 or MC-70.
- D. Emulsified Asphalt Prime Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.
- E. Fog Seal: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.
- F. Water: Potable.
- G. Undersealing Asphalt: ASTM D 3141/D 3141M; pumping consistency.

2.3 AUXILIARY MATERIALS

- A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles or glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.
- B. Sand: ASTM D 1073 or AASHTO M 29, Grade No. 2 or No. 3.
- C. Paving Geotextile: AASHTO M 288 paving fabric; nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.
- D. Joint Sealant: ASTM D 6690 or AASHTO M 324, hot-applied, single-component, polymer-modified bituminous sealant.

2.4 MIXES

1. Surface Course Limit: Recycled content no more than 10 percent by weight.
- B. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and complying with the following requirements:
1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
 - 2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Cutback Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.
 - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 - 2. Protect primed substrate from damage until ready to receive paving.

3.3 PLACING HOT-MIX ASPHALT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 - 2. Spread mix at a minimum temperature of 250 deg F.
 - 3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 - 4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
 2. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints [using either "bulkhead" or "papered" method according to AIMS-22, for both "Ending a Lane" and "Resumption of Paving Operations."] [as shown on Drawings.
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927 or AASHTO T 245, but not less than 94 percent or greater than 100 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Surface Course: 1/8 inch.

3.7 SURFACE TREATMENTS

- A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. to existing asphalt pavement and allow to cure. With fine sand, lightly dust areas receiving excess fog seal.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. Asphalt Traffic-Calming Devices: Finished height of traffic-calming devices above pavement will be measured for compliance with tolerances.
- E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.
 - 1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
 - 2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

- a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than three cores taken.
 - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- F. Replace and compact hot-mix asphalt where core tests were taken.
- G. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 WASTE HANDLING

- A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

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SECTION 321313 - CONCRETE PAVING

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. Section Includes:

1. Driveways.
2. Roadways.
3. Curbs and gutters.
4. Walks.

B. Related Sections:

1. Section 033000 "Cast-in-Place Concrete for general building applications of concrete.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.
- B. WWM: Woven Wire Mesh

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
- C. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.
- D. Samples for Verification: For each type of product or exposed finish, prepared as Samples of size indicated below:
 1. Paving Bricks: EB Hartley color. Sample for confirmation.
- E. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified ready-mix concrete manufacturer.
- B. Material Certificates: For the following, from manufacturer:
 1. Cementitious materials.
 2. Steel reinforcement and reinforcement accessories.
 3. Fiber reinforcement.
 4. Admixtures.
 5. Curing compounds.
 6. Applied finish materials.
 7. Bonding agent or epoxy adhesive.
 8. Joint fillers.
- C. Material Test Reports: For each of the following:
 1. Aggregates.
- D. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").
- B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- C. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.
- D. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.
- E. Preinstallation Conference: Conduct conference at Project site.
 1. Review methods and procedures related to concrete paving, including but not limited to, the following:

- a. Concrete mixture design.
- b. Quality control of concrete materials and concrete paving construction practices.
- 2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete paving subcontractor.

1.7 PROJECT CONDITIONS

- A. Traffic Control:
 - 1. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Bridges shall be provided over existing walkways during construction.
 - 2. Installation of temporary walkways (Gravel) will be required to maintain traffic flow as best as possible during the work of each area. Keep work areas neat and organized at all times.
 - 3. All areas to be secure with proper fencing and signage to prevent physical harm to pedestrian traffic. Advanced notice as to when the work will begin and when the work will be completed are required on signage provided by this contractor.
 - 4. Movement of construction vehicles must be approved to assure safety to existing sidewalks and the college community.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F (4.4 deg C) for oil-based materials and not exceeding 95 deg F (35 deg C).

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 - 1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.
- C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.
- D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars; assembled with clips.
- E. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
- F. Deformed-Steel Wire: ASTM A 496/A 496M.
- G. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars[; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating]. Cut bars true to length with ends square and free of burrs.
- H. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- I. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- J. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
- K. Zinc Repair Material: ASTM A 780.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C 150, gray Portland cement Type I.
- B. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.
 - 1. Maximum Coarse-Aggregate Size: 1-1/2 inches (38 mm) nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: Potable and complying with ASTM C 94/C 94M.

- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 RELATED MATERIALS

- A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.5 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
 - 2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.
- B. Proportion mixtures to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28 Days): 4500 psi (31 MPa).
 - 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
 - 3. Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
 - 1. Air Content: 5-1/2 percent plus or minus 1.5 percent for 1-1/2-inch (38-mm) nominal maximum aggregate size.
 - 2. Air Content: [6] [4-1/2] [3] percent plus or minus 1.5 percent for 1-inch (25-mm) nominal maximum aggregate size.
 - 3. Air Content: [6] [5] [3-1/2] percent plus or minus 1.5 percent for 3/4-inch (19-mm) nominal maximum aggregate size.
- D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

2.6 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.
 - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For concrete batches of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For concrete batches larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Remove sidewalks as identified using equipment and machinery required to safely dislodge and remove from site.
- B. Great care must be taken to assure no damage is incurred to adjoining sidewalks, light fixtures, trees and minimal disturbance to landscaping and lawn areas. Repair all disturbed areas immediately after work of each area is done.
- C. All debris is to be hauled from the site on a daily basis.

3.2 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete pavings to identify soft pockets and areas of excess yielding.
 - 1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
 - 3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (13 mm) according to requirements in Section 312000 "Earth Moving."

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.4 GENERAL INSTALLATION

- A. All sidewalks and intersections are to contain 6" packed 3/4" clean crushed aggregate over compacted sub grade.
- B. All brick pavers in sidewalk are to utilize Unit Concrete Pavers (4x8x2), 3/4" as manufactured by EP Henry (Autumn Blend). Submit samples of proposed pavers for TCNJ approval prior to delivery to the site. Install pavers according to manufacturer's specifications.
- C. Concrete is to be 4,000 psi, rated class C and air entrained with fly ash. A 15% Class C fly ash mix is suggested, similar to a 1# fly ash to 1# cement ratio. Submit concrete mix design to TCNJ for approval and provide delivery tickets for each day's placement of concrete.
- D. 6x6 WWF Reinforcing is to be installed in low one-third of all concrete walks and concrete / brick walks (only if there is no re-bar).
- E. Expansion joints are to be placed a maximum of 20' on center utilizing preformed expansion joint material, PVC pipe for re-bar continuation, minimum 1/2" thick.
- F. Pavement slope: minimum 1/8" per foot.
- G. Create 1/2" radius along outside edge by use of an appropriate edging tool. Intermediate lines and details to match the existing prior to removal. Take pictures in order to assist in duplicating the work.
- H. Appropriate sealer to be applied to all new concrete via 1/2" smooth dowels at a minimum of 12" into the adjacent concrete and epoxy solid into the concrete, with a minimum of 12" into the new concrete.
- I. Topsoil and seed / hay (or mulch) per existing conditions all edges of new walkways immediately upon final cleanup of each area.

3.5 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.6 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.
- F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.
- G. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch (50-mm) overlap of adjacent mats.

3.7 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
 - 1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
 - 2. Provide tie bars at sides of paving strips where indicated.
 - 3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 50 feet (15.25 m) unless otherwise indicated.
 - 2. Extend joint fillers full width and depth of joint.

3. Terminate joint filler not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
- B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement and joint devices.
- H. Screed paving surface with a straightedge and strike off.
- I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

- K. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 2. Do not use frozen materials or materials containing ice or snow.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- L. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.9 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
 2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
 3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.10 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing opera-

tions. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

3.11 CONCRETE DETAILS (LARGER THAN 8 FEET WIDE)

- A. One foot concrete border to be installed on outside of brick pattern.
- B. Border to be 12" thick reinforced with #4 and #5 rebar on 24" centers and 18" centers respectively. See detail 10 on drawing M-12.
- C. Pavers to be installed on 3/4" of sand over 6 inches of concrete reinforced with #4 and #5 rebar on centers as noted above.
- D. Concrete inside brick pavers is to be minimum 8" thick reinforced with #4 and #5 rebar on centers as noted above.

3.12 CONCRETE DETAILS (LESS THAN 8 FEET WIDE)

- A. Concrete is to be 5 inches thick across entire slab.
- B. Concrete sidewalk, 4,000 psi class C air entrained with 6"x6" WWM in lower one-third of slab.
- C. 1/2" preformed joint filler expansion joints required.

3.13 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
 1. Elevation: 3/4 inch (19 mm).
 2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
 3. Surface: Gap below 10-foot- (3-m-) long, unlevelled straightedge not to exceed 1/2 inch (13 mm).
 4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches (13 mm per 300 mm) of tie bar.
 5. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
 6. Vertical Alignment of Dowels: 1/4 inch (6 mm).
 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches (6 mm per 300 mm) of dowel.
 8. Joint Spacing: 3 inches (75 mm).
 9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
 10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.14 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
 - 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 - 6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Concrete paving will be considered defective if it does not pass tests and inspections.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

- I. Prepare test and inspection reports.

3.15 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.
- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

THE COLLEGE OF NEW JERSEY FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)

2000 PENNINGTON ROAD
EWING, NJ 08618



SITE LOCATION



AERIAL IMAGE

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ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

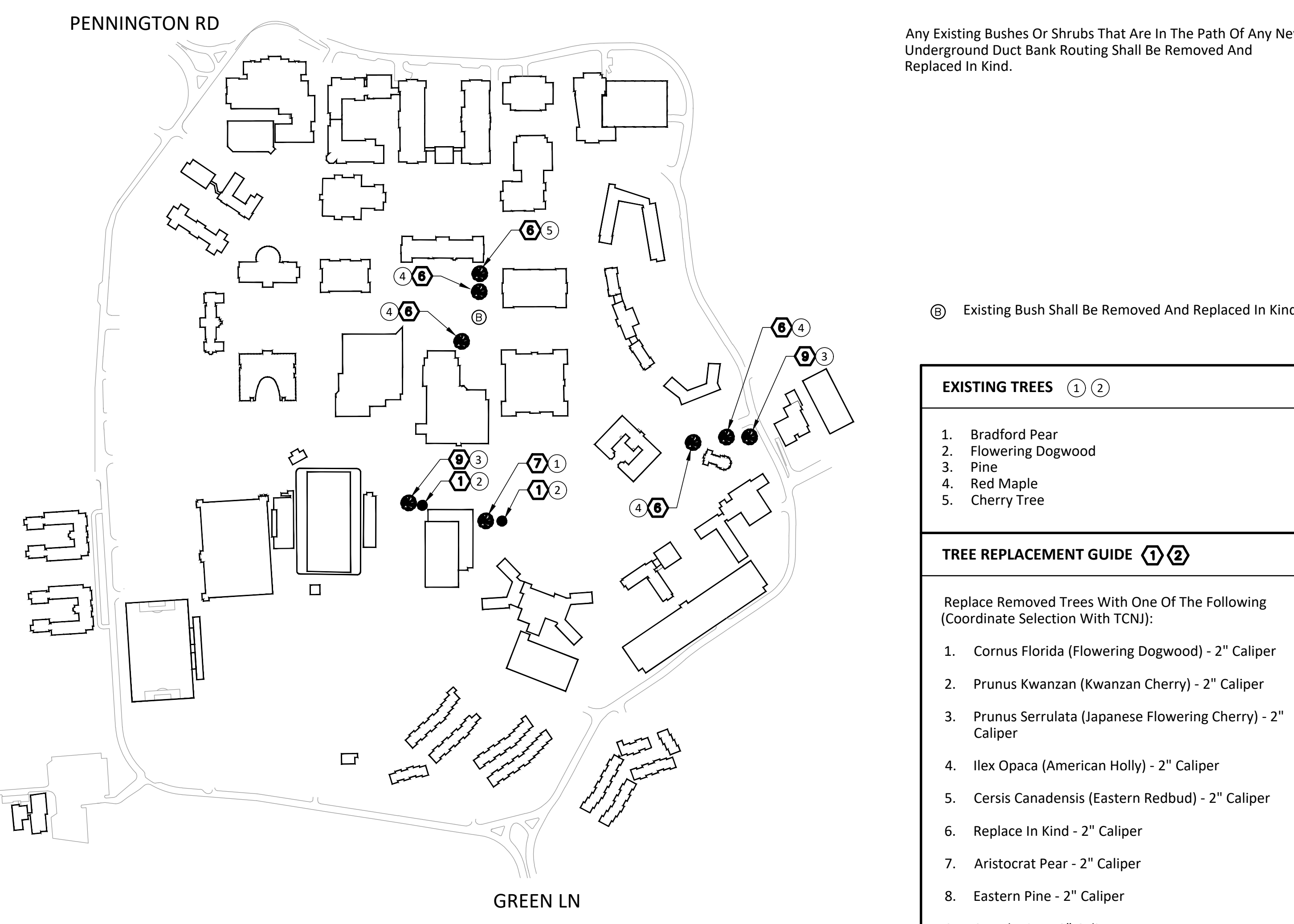



dlb associates
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Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IX124
TCNJ Project Manager: Mumtaz Makhdomi

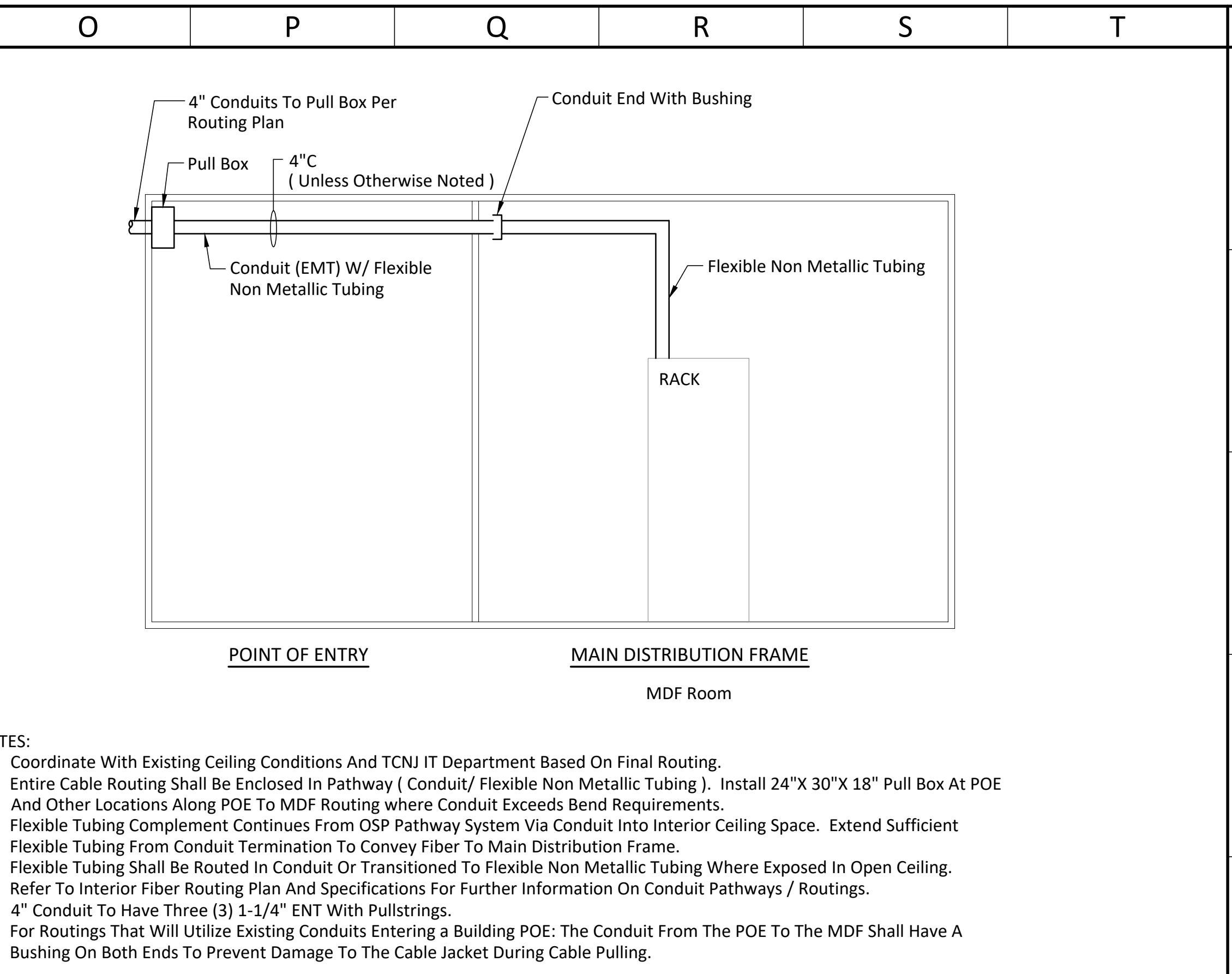
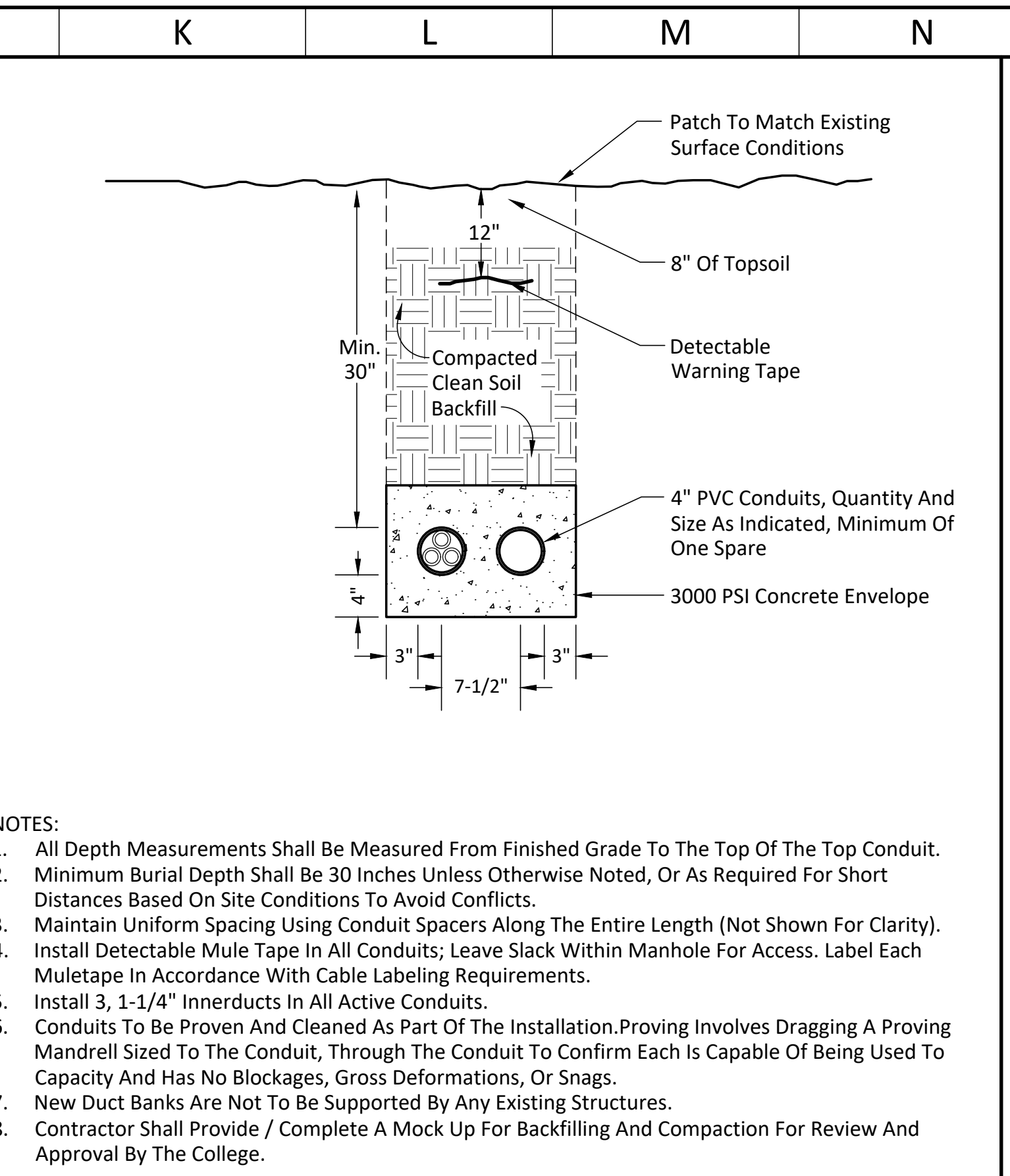
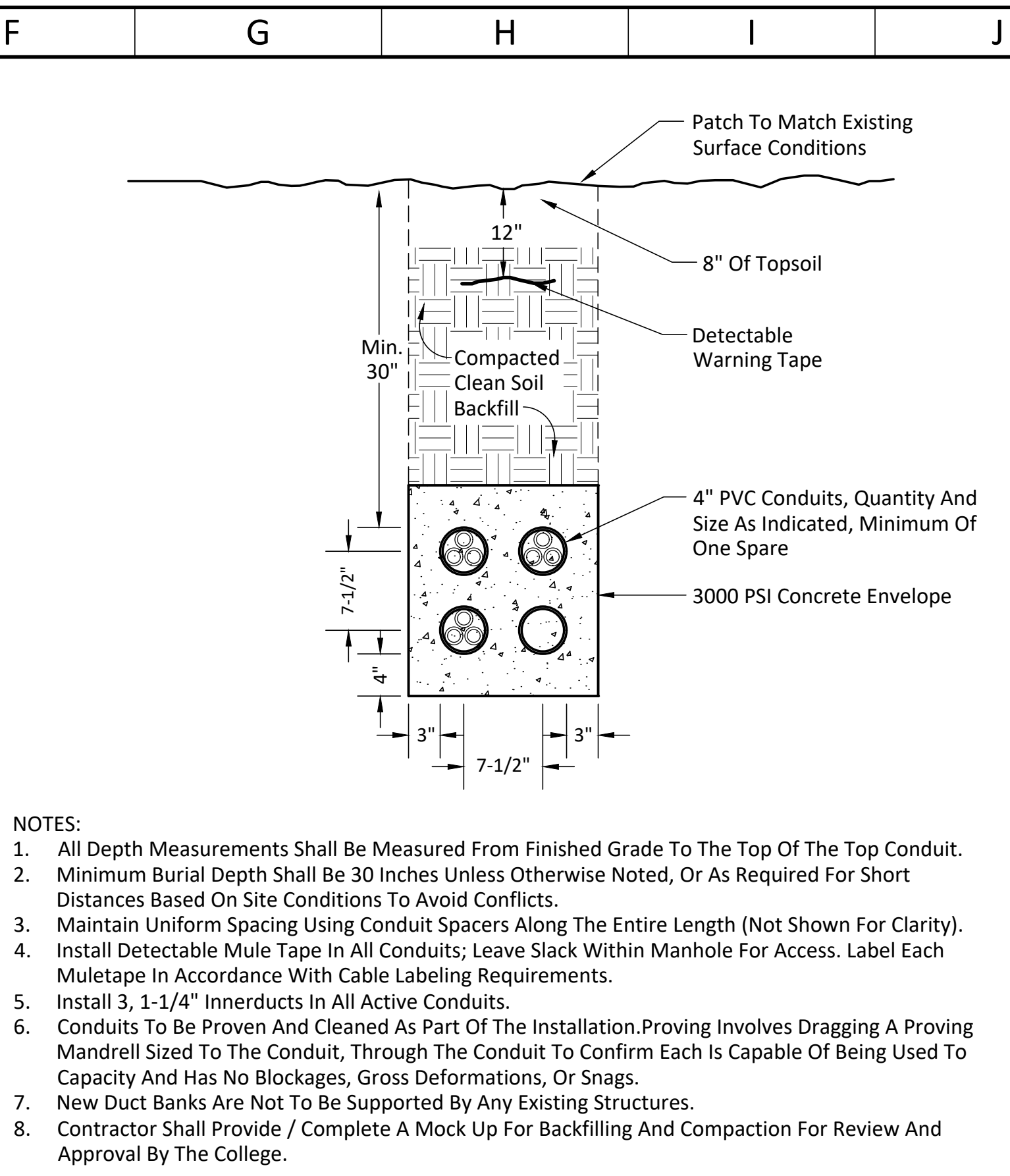
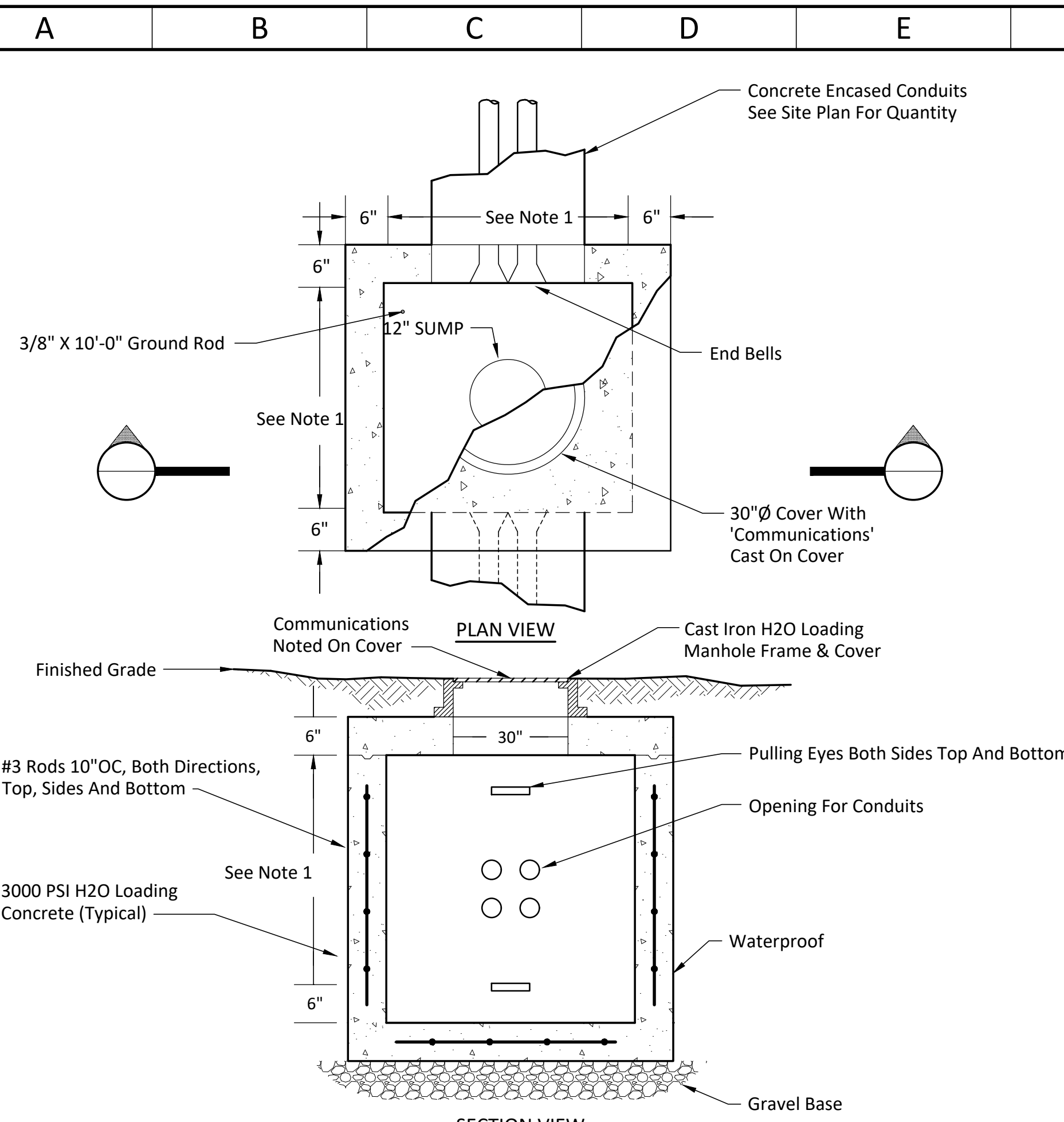
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title
COVER SHEET
scale AS SHOWN
drawn by SC
checked by SG
date 09/17/2021

dwg. no.
G000

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T																																																						
	TREE REPLACEMENT GUIDELINES					PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION					PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION (CONTINUED)					TOPSOILING (CONTINUED)																																																										
1	1. Prior To Removal, All Trees Must Be Tagged And Approved For Removal By The TCNJ Grounds Crew. 2. All Trees That Have The Root System Disturbed, But Are Not To Be Removed Shall Have An Arborist Perform Root Pruning Along The Trenched Side Of The Root System. 3. No Stockpiling Of Excavated Dirt Shall Be Stored On The Root System Within 15 Feet Of The Base Of Remaining Trees. Prior To Trenching Contact TCNJ Grounds Crew To Mark Out A Radius As A Guide For Stock Piled Dirt Along The Trench. 4. Several Excavation Areas Contain Site Lighting Near Streets And Sidewalks. In The Event That Site Lighting Fixtures, Conduit, Or Supports Are Disturbed During Construction Or Tree Removal Process The General Contractor Must Repair As Required To Maintain Existing Conditions. 5. Unless Otherwise Noted, Trees Shall Be Replaced 1 For 1 With A Tree Of The TCNJ Ground Crew's Choosing. TCNJ's Specified Replacement Guide Is Listed On This Plan For Reference. 6. General Contractor Shall Visit The Site Prior To Bidding And Notify TCNJ/DLB Of Discrepancies In An RFI During The Questions Period Of The Bid Milestone Schedule.					1. Field Exploration Should Be Made To Determine Whether Quantity And / Or Quality Of Surface Soil Justifies Stripping. 2. A 6-Inch Stripping Depth Is Typical, But May Vary Depending On The Particular Soil Structure Or Pre-Existing Use. 3. Stockpiles Should Be Located So As To Not Obstruct Natural Drainage Or Cause Off-Site Environmental Damage, And Shall Be Delineated On The Certified Soil Erosion And Sediment Control Plan And Be Constructed In Accordance With The Topsoil Stockpile Detail. 4. Stockpiles Should Be Temporarily Stabilized According To The Standards. <u>Site Preparation</u> 1. Install Erosion Control Measures And Facilities Such As Silt Fence, Diversions, Sediment Basins, And Channel Stabilization. 2. Grade As Needed And Feasible To Permit The Use Of Conventional Equipment For Seedbed Preparation, Seeding, Mulch Application, Tacking, And Maintenance. All Grading Shall Be In Accordance With Standard For Land Grading, 19-1. 3. The Contractor Responsible For Site Preparation, Seeding, And Mulching Shall Have A Minimum Of 5 Years Professional Experience. <u>Seedbed Preparation</u> 1. Topsoil Required: Minimum Depth: 6" (Unsettled) pH: 6.0 To 8.0 Organic Matter Content: 2.75% Minimum Nitrate N2: 50 Pounds Per Acre (50% Water Insoluble) Phosphorous: 100 Pounds Per Acre Potassium: 50 Pounds Per Acre 2. The Contractor Should Be Aware Of The Possibility, Depending Upon The Site Conditions, That All Topsoil May Have To Be Provided From An Off-Site Source. 3. Topsoil Should Be Handled Only When Dry Enough To Work Without Damaging Soil Structure. 4. Apply A Uniform 6 Inches (Unsettled) Of Topsoil On All Disturbed Areas. Soils With A pH Of 4.0 Or Less Or Containing Iron Sulfide Shall Be Covered With A Minimum Depth Of 12 Inches Of Soil Having A pH Of 5.0 Or More And The Top 5 Inches Shall Conform To The Topsoil Standard And Shall Be Limed According To The Specifications. 5. If The Topsoil Becomes Compacted, The Surface Must Be Scarified 6" To 12" To Provide Good Seed-To-Soil Bond. 6. Apply Limestone And Fertilizer According To Soil Test Recommendations Such As Those Offered By Rutgers University Cooperative Extension. If Soil Testing Is Not Feasible, Fertilizer (10-20-10) With 50% Water Insoluble Nitrogen Should Be Applied At The Typical Rate Of 500 Pounds Per Acre Or 11 Pounds Per 1,000 Square Feet. 7. Apply Limestone Equivalent To 50% Calcium Plus Magnesium Oxides (Pulverized Dolomitic Limestone Is Preferred For Most Soils South Of The New Brunswick - Trenton Fall Line) As Follows: <table border="1" data-bbox="982 787 1288 865"> <tr><th>SOIL TEXTURE</th><th>TONS / ACRE</th><th>LBS / 1000 SQ. FT.</th></tr> <tr><td>CLAY, CLAY LOAM, HIGH ORGANIC</td><td>3</td><td>135</td></tr> <tr><td>SANDY LOAM, LOAM, SILT LOAM</td><td>2</td><td>90</td></tr> <tr><td>LOAMY SAND, SAND</td><td>1</td><td>45</td></tr> </table> 8. Work Lime And Fertilizer Into Soil To A Depth Of 4 Inches. The Final Harrowing Or Disc Operation Should Be On The General Contour. Continue Tillage Until A Uniform, Fine Seedbed Is Prepared. 9. Remove From The Surface All Stones 2 Inches Or Larger In Any Dimension, And Other Objectionable Stones Or Debris Such As Wire, Tree Roots, Pieces Of Concrete, Clods, Lumps, Or Other Unsuitable Material. <u>Seeding</u> 1. Select A Seed Mixture Approved By The Mercer County Soils Conservation District. 2. Apply Seed Uniformly By Hand, Cyclones, Drop Seeder, Drill Cultipacker, Or Hydroseeder. The Latter May Be Justifiable For Large, Steep Areas Where Conventional Applications Are Not Feasible. Hydroseeding Shall Be A Two Step Process: Mulch Shall Not Be Mixed With The Seed; The Seed Must Be Applied First To Assure Proper Seed To Soil Contact. The Hydromulch Is Then Sprayed Over The Seeding. For Optimum Results, The Seed Should Be Incorporated Into The Soil To A Depth Of 1/4 To 1/2 Inch Depending Upon Species. 3. After Seeding, The Soil Should Be Packed With A Corrugated Roller. When Performed On The Contour, Rolling Will Minimize Sheet Erosion And Maximize Water Conservation.					SOIL TEXTURE	TONS / ACRE	LBS / 1000 SQ. FT.	CLAY, CLAY LOAM, HIGH ORGANIC	3	135	SANDY LOAM, LOAM, SILT LOAM	2	90	LOAMY SAND, SAND	1	45	1. Unrotted Straw, Hay Free Of Seeds, Or Salt Hay Is Required On All Seeding At A Rate Of 1.5 To 2 Tons Per Acre, (70 To 90 Pounds Per 1,000 Square Feet), Except Where A Crimper Is Used Instead Of A Liquid Mulch-Binder, Then The Rate Of Application Is 3 Tons Per Acre. 2. Mulch Anchoring Should Be Accomplished Immediately After Placement To Minimize Loss Due To Wind Or Water. This May Be Done According To The Following Methods: <ul style="list-style-type: none">Wood-Fiber Or Paper-Fiber Mulch At The Rate Of 1,500 Pounds Per Acre Applied By The Hydroseeder. Use Is Limited To Only The Optimum Seeding Season.Synthetic Or Organic BindersPeg And Twine, Mulch Netting, And Mechanical Crimping.Crimping Requires A Higher Mulch Rate (3 Tons Per Acre) Note 1. One Bale Of Hay Weighs 40-60 Pounds Depending On How It Was Baled. A 1,500 Tank Of Hydromulch Covers 0.5 Acres. <u>Temporary Seeding Mixes</u> 1. Mix: Early Spring / Late Summer To Early Fall 100% Perennial Ryegrass Rate: 100 Pounds Per Acre 2. Mix: Mid-Summer 40% Pearl Millet 40% Millet (German Or Hungarian) 20% Weeping Lovegrass Rate: 100 Pounds Per Acre <u>Permanent Seeding Mixes</u> 1. Optimum Seeding Dates: March 1 To May 15 And August 15 To October 15 Application Rate: 200 Pounds Per Acre 70% Turf Type Tall Fescue 20% Perennial Ryegrass 10% Kentucky Bluegrass Rate: 100 Pounds Per Acre					4. Employ Needed Erosion Control Practices Such As Diversions, Grade Stabilization Structures, Channel Stabilization Measures, Sedimentation Basins, And Waterways. <u>Applying Topsoil</u> 1. Topsoil Should Be Handled Only When It Is Dry Enough To Work Without Damaging Soil Structure; i.e., Less Than Field Capacity. 2. A Uniform Application To A Depth Of 6 Inches (Unsettled) Is Required. Soils With A pH Of 4.0 Or Less Or Containing Iron Sulfide Shall Be Covered With A Minimum Depth Of 12 Inches Of Topsoil Having A pH Of 5.0 Or More, In Accordance With The Standard For Management Of High Acid Producing Soil. 3. Topsoil Should Be Finely Graded With Low Ground Pressure Equipment Or By Hand When Practical And Feasible To Reduce The Potential For Re-Compacting The Subsoil.																																														
SOIL TEXTURE	TONS / ACRE	LBS / 1000 SQ. FT.																																																																								
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2	SOIL EROSION AND SEDIMENT CONTROL NOTES															MERCER COUNTY SOIL EROSION AND SEDIMENT CONTROL NOTES																																																										
3	Soil And Erosion Control Shall Comply With The Requirements Of The Mercer County Soil Conservation District With The Following Additional Requirements: 1. The Contractor Shall Only Excavate That Portion Of The Trench That The Contractor Can Install The Pipe, Backfill The Trench And Stabilize In A Day. 2. Where A Portion Of The Trench Is Required To Remain Open. Erosion And Sediment Control Devices (Silt Fence And Silt Sack For Inlets As Indicated) Shall Be Installed Along Level Sections Of The Project. 3. The Contractor Shall Not Commence Excavation During Periods Of Expected Poor Weather Conditions. 4. Mud And Sediment Shall Be Washed Off Of The Construction Equipment While On Site To Prevent Migration Of Sediment From The Site. 5. Stabilization Of The Backfilled Trench Shall Conform To The Requirements Of The Mercer County Soil's Requirements For Permanent Vegetative Cover For Soil Stabilization.															1. The Mercer County Soil Conservation District Shall Be Notified 48 Hours Prior To Starting Land Disturbance Activity. Notice May Be Mailed, Faxed Or Emailed To: MCSCD, 590 Hughes Drive, Hamilton Square, NJ 08690 Phone: 609-586-9603 Fax: 609-586-1117 Email: Pauls1mercer@aol.com 2. If Applicable To This Project, The Owner Should Be Aware Of His Or Her Obligation To File For A NJPDES Construction Activity Stormwater Management Plan (NJG088323) Via The NJDEP Online Permitting System (www.nj.gov/dep/online) And To Maintain The Associated Best Management Practices And Stormwater Pollution Prevention Plan Self-Inspection Logbook Onsite At All Times. This Permit Must Be Filed Prior To The Start Of Soil Disturbance. The Online Application Process Will Require Entry Of An SCD Certification Code, Which Is Provided By The Soil Conservation District Upon Certification Of The Soil Erosion And Sediment Control Plan. 3. The Mercer County Soil Conservation District Shall Be Notified Of Any Changes In Ownership. 4. Any Changes To The Certified Soil Erosion And Sediment Control Plan, Including An Increase In The Limit Of Disturbance, Will Require The Submission Of Revised Soil Erosion And Sediment Control Plans To The District For Recertification. The Revised Plans Must Meet All Current State Soil Erosion & Sediment Control Standards. 5. A Copy Of The Certified Soil Erosion And Sediment Control Plan Shall Be Maintained On Site At All Times. 6. All Soil Erosion And Sediment Control Practices Shall Be Installed Prior To Any Major Soil Disturbances, Or In Their Proper Sequence As Outlined Within The Sequence Of Construction On The Certified Soil Erosion And Sediment Control Plan, And Maintained Until Permanent Protection Is Established. 7. All Work Shall Be Done In Accordance With The Current Standards For Soil Erosion And Sediment Control In NJ. If Language Contained Within Any Other Permit For This Project Is More Restrictive Than (But Not Contradictory To) What Is Contained Within These Notes Or On The Certified Soil Erosion And Sediment Control Plan, Then The More Restrictive Permit Requirements Shall Be Followed. 8. The Standard For Stabilized Construction Access Requires The Installation Of A 1 1/2" To 2 1/2" Clean Stone Tracking Pad At All Construction Driveways Immediately After Initial Site Disturbance, Whether Identified On The Certified Plan Or Not. The Width Shall Span The Full Width Of The Driveway, And Length Shall Be 50 Ft. Or More. Depending On Site Conditions And As Required By The Standard, This Shall Include Individual Lot Access Points Within Residential Subdivisions. If The Egress Is To A County Road, Then A 20 Ft. Long Paved Transition Shall Be Provided Between The Edge Of Pavement And The Stone Access Pad. 9. A Sub-Base Course Will Be Applied Immediately Following Rough Grading And Installation Of Improvements In Order To Stabilize Streets, Roads, Driveways And Parking Areas. In Areas Where No Utilities Are Present, The Sub-Base Shall Be Installed Within 15 Days Of Preliminary Grading, Provided That All Other Requirements Related To Detention Basins, Swales And The Sequence Of Construction Have Been Met. 10. Any Disturbed Areas That Will Be Left Exposed More Than 14 Days And Not Subject To Construction Activity Will Immediately Receive Temporary Stabilization. If The Season Prevents Establishment Of A Temporary Vegetative Cover, Or If The Area Is Not Topsoiled, Then The Disturbed Areas Will Be Mulched With Straw, Or Equivalent Material, At A Rate Of Two (2) Tons Per Acre, According To State Standards. Sloped Areas In Excess Of 3H:1V Shall Be Provided With Erosion Control Blankets. Critical Areas Subject To Erosion (i.e. Steep Slopes, Roadway Embankments, Environmentally Sensitive Areas) Will Receive Temporary Stabilization Immediately After Initial Disturbance Or Rough Grading. 11. Any Steep Slopes (i.e. Slopes Greater Than 3:1) Receiving Pipeline Or Utility Installation Will Be Backfilled And Stabilized Daily, As The Installation Proceeds. 12. Permanent Vegetation Shall Be Seeded Or Sodded On All Exposed Areas Within Ten (10) Days After Final Grading And Topsoiling. All Agronomic Requirements Contained Within The Standards And On The Certified Plan Shall Be Employed. Mulch With Binder, In Accordance With The Standards, Shall Be Used On All Seeded Areas. Save All Tags And/Or Bags Used For Seed, Lime And Fertilizer, And Provide Them To The District Inspector To Verify That Mixtures And Rates Meet The Standards. 13. At The Time When The Site Preparation For Permanent Vegetative Stabilization Is Going To Be Accomplished, Any Soil That Will Not Provide A Suitable Environment To Support Adequate Vegetative Ground Cover, Shall Be Removed Or Treated In Such A Way That Will Permanently Adjust The Soil Conditions And Render It Suitable For Vegetative Ground Cover. If The Removal Or Treatment Of The Soil Will Not Provide Suitable Conditions, Then Non-Vegetative Means Of Permanent Ground Stabilization Will Have To Be Employed. 14. During The Course Of Construction, Soil Compaction May Occur Within Haul Routes, Staging Areas And Other Project Areas. In Accordance With The Standard For Topsoiling, Compacted Surfaces Should Be Scarified 6" To 12" Immediately Prior To Topsoil Application. This Will Help Ensure A Good Bond Between The Topsoil And Subsoil. This Practice Is Permissible Only Where There Is No Danger To Underground Utilities (Cables, Irrigation Systems, Etc.). 15. Prior To Seeding, Topsoil Shall Be Worked To Prepare A Proper Seedbed. This Shall Include Raking Of The Topsoil And Removal Of Debris And Stones, Along With Other Requirements Of The Standard For Permanent Vegetative Cover For Soil Stabilization. 16. In Accordance With The Standard For Management Of High Acid Producing Soils, Any Soil Having A pH Of 4.0 Or Less Or Containing Iron Sulfides Shall Be Buried With Limestone In Accordance With The Standard And Be Covered With A Minimum Of 12" Of Soil Having A pH Of 5.0 Or More Prior To Topsoil Application And Seedbed Preparation. If The Area Is To Receive Tree Or Shrub Plantings, Or Is Located On A Slope, Then The Area Shall Be Covered With A Minimum Of 24" Of Soil Having A Ph Of 5.0 Or More. 17. Mulching To The Standards Is Required For Obtaining A Conditional Report Of Compliance. Conditional ROC's Are Only Issued When The Season Prohibits Seeding. Permanent Stabilization Must Then Be Completed During The Optimum Seeding Season Immediately Following The Conditional ROC, Or The Completion Of Work In A Given Area. 18. Hydroseeding Is A Two-Step Process. The First Step Includes Seed, Fertilizer, Lime, Etc., Along With Minimal Amounts Of Mulch To Promote Consistency, Good Seed-To-Soil Contact, And Give A Visual Indication Of Coverage. Upon Completion Of The Seeding Operation, Hydromulch Should Be Applied At A Minimum Rate Of 1500 Lbs. Per Acre In Second Step. The Use Of Hydro-Mulch, As Opposed To Straw, Is Limited To Optimum Seeding Dates As Listed In The Standards. The Use Of Hydromulch On Sloped Areas Is Discouraged. 19. The Contractor Is Responsible For Keeping All Adjacent Roads Clean During Life Of The Construction Project. All Sediment Washed, Dropped, Tracked Or Spilled Onto Paved Surfaces Shall Be Immediately Removed. 20. The College Shall Be Responsible For Remediating Any Erosion Or Sediment Problems That Arise As A Result Of Ongoing Construction, And For Employing Additional Erosion And Sediment Control Measures At The Request Of The Mercer County Soil Conservation District. 21. Conduit Outlet Protection Must Be Installed At All Required Outfalls Prior To The Drainage System Becoming Operational. 22. All Detention / Retention Basins Must Be Fully Constructed (Inclusive Of All Structural Components And Liners) And Permanently Stabilized Prior To Paving Or Prior To Permanent Stabilization. Additional Stabilization Measures For Basins That Are Not Limited To: Topsoil, Seed, Straw Mulch And Binders Or Erosion Control Blankets On All Seeding. All Agronomic Requirements As Specified On The Certified Soil Erosion And Sediment Control Plan, Installation Of The Outflow Control Structures And Discharge Storm Drainage Piping, Low Flow Channels, Conduit Outlet Protection, Emergency Spillways, And Lap Ring Protection. 23. The Riding Surface Of All Utility Trenches Within Paved Areas Shall Be 3/4" Clean Stone Or Base Pavement Until Such Time As Final Pavement Has Been Installed. Temporary Soil Riding Surfaces Are Prohibited. 24. All Construction Dewatering (Trenches, Excavations, Etc.) Must Be Done Through An Inlet Or Outlet Filter In Accordance With The Standard For Dewatering Or As Depicted On The Certified Soil Erosion And Sediment Control Plan. Discharge Locations For The Dewatering Operation Must Contain Perennial Vegetation Or Similar Stable Surface. 25. All Swales Or Channels That Will Receive Runoff From Paved Surfaces Must Be Permanently Stabilized Prior To The Installation Of Pavement. If The Season Prohibits The Establishment Of Permanent Stabilization, The Swales Or Channels May Be Temporarily Stabilized In Accordance With The Standards. 26. Stockpiling Shall Not Be Permitted On Paved Driveways Or Within Paved Parking Lots. Coordinate Stockpile Location With TCNJ.																																																										
4																																																																										
5	MANAGEMENT OF HIGH ACID PRODUCING SOILS																																																																									
6	<u>General Requirements</u> 1. Limit The Excavation Area And Exposure Time When High Acid Producing Soils Are Encountered. 2. Topsoil Stripped From The Site Shall Be Stored Separately From Temporarily Stockpiled High Acid-Producing Soils. 3. Stockpiles Of High Acid-Producing Soils Should Be Located On Level Land To Minimize Its Movement, Especially When This Material Has High Clay Content. 4. Temporarily Stockpiled High Acid-Producing Soil Material To Be Stored More Than 48 Hours Should Be Covered With Properly Anchored, Heavy Grade Sheets Of Polyethylene Where Possible. If Not Possible, Stockpiles Should Be Covered With A Minimum Of 3 To 6 Inches Of Wood Chips To Minimize Erosion Of The Stockpile. Silt Fence Shall Be Installed At The Toe Of The Slope To Contain Movement Of The Stockpiled Material. Topsoil Shall Not Be Applied To The Stockpiles To Prevent Topsoil Contamination With High Acid-Producing Soil. 5. High Acid-Producing Soils With A pH Of 4.0 Or Less Or Containing Iron Sulfide (Including Borrow Cuts Or Dredged Sediment) Shall Be Ultimately Placed Or Buried With Limestone Applied At The Rate Of 10 Tons Per Acre (Or 450 Pounds Per 1,000 Square Feet Of Surface Area) And Covered With A Minimum Of 12 Inches Of Settled Soil With A pH Of 5.0 Or More Except As Follows: <ul style="list-style-type: none">Disposal Areas Shall Not Be Located Within 24 Inches Of Any Surface Of A Slope Or Bank, Such As Berms, Stream Banks, Ditches, And Others, To Prevent Potential Lateral Leaching Damages. 6. Equipment Used For Movement Of High Acid-Producing Soils Should Be Cleaned At The End Of Each Day To Prevent Spreading Of High Acid-Producing Soil Materials To Other Parts Of The Site, Into Streams Or Stormwater Conveyances, And To Protect Machinery From Accelerated Rusting. 7. Non-Vegetative Erosion Control Practices (Stone Tracking Pads, Strategically Placed Limestone Check Dam, Sediment Barrier, Wood Chips) Should Be Installed To Limit The Movement Of High Acid-Producing Soils From, Around, Or Off The Site. 8. Following Burial Or Removal Of High Acid-Producing Soil, Topsoiling And Seeding Of The Site (See Temporary Vegetative Cover For Soil Stabilization, Permanent Vegetative Cover For Soil Stabilization, And Topsoiling). Monitoring Must Continue For A Minimum Of 6 Months To Ensure There Is Adequate Stabilization And That No High Acid-Producing Soil Problems Emerge. If Problems Still Exist, The Affected Area Must Be Treated As Indicated Above To Correct The Problem.																																																																									
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	 <p>PENNINGTON RD</p> <p>GREEN LN</p> <p>CAMPUS TREE PLAN</p> <p>Scale: NTS</p> <p>Drawing: G002 Detail: 01</p> <p>EXISTING TREES ① ②</p> <ol style="list-style-type: none"> Bradford Pear Flowering Dogwood Pine Red Maple Cherry Tree <p>TREE REPLACEMENT GUIDE ① ②</p> <p>Replace Removed Trees With One Of The Following (Coordinate Selection With TCNJ):</p> <ol style="list-style-type: none"> Cornus Florida (Flowering Dogwood) - 2" Caliper Prunus Kwanzan (Kwanzan Cherry) - 2" Caliper Prunus Serrulata (Japanese Flowering Cherry) - 2" Caliper Ilex Opaca (American Holly) - 2" Caliper Cercis Canadensis (Eastern Redbud) - 2" Caliper Replace In Kind - 2" Caliper Aristocrat Pear - 2" Caliper Eastern Pine - 2" Caliper Scotch Pine - 2" Caliper <p>Any Existing Bushes Or Shrubs That Are In The Path Of Any New Underground Duct Bank Routing Shall Be Removed And Replaced In Kind.</p> <p>⓪ Existing Bush Shall Be Removed And Replaced In Kind</p>																																																																									
	<table border="1" data-bbox="44 1953 2923 2047"> <tr> <td rowspan="2">30442</td> <td colspan="15">  </td> <td colspan="3"> project TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT) 2000 PENNINGTON ROAD, EWING NJ, 08618 </td> <td colspan="3"> title GENERAL INFORMATION </td> <td colspan="3"> dwg. no. G002 </td> </tr> <tr> <td> 1 ITEM DATE ISSUE DESCRIPTION </td> <td> 10/01/2021 ISSUED FOR BID </td> <td colspan="13"></td> <td> scale AS SHOWN </td> <td> drawn by SC </td> <td> checked by SG </td> <td> date 09/17/2021 </td> </tr> </table>															30442																project TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT) 2000 PENNINGTON ROAD, EWING NJ, 08618			title GENERAL INFORMATION			dwg. no. G002			1 ITEM DATE ISSUE DESCRIPTION	10/01/2021 ISSUED FOR BID														scale AS SHOWN	drawn by SC	checked by SG	date 09/17/2021															
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	Questions For DLB Call: Anthony Laszkosky Phone: 732-829-7351 DLB Project ID: 47211 TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi																																																																									

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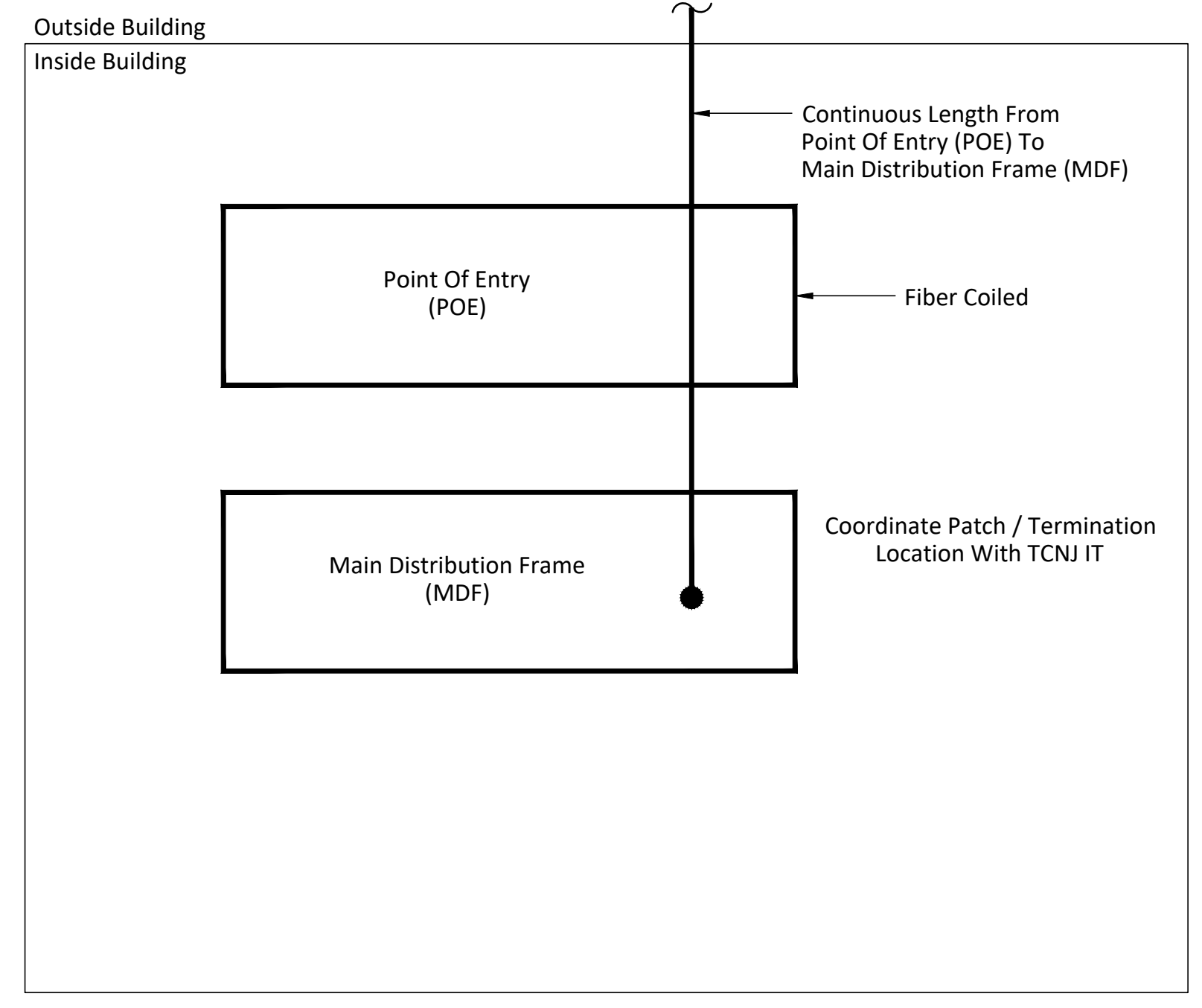
DUCT BANK DETAIL Scale: NTS Drawing: **G003** Detail: **02**

DUCT BANK DETAIL Scale: NTS Drawing: **G003** Detail: **03**

TYPICAL FIBER PATHWAY ROUTING Scale: NTS Drawing: **G003** Detail: **04**

NOTES:
 1. See Campus Plans For Manhole Locations And Size Selections:
 "X" Indicates Size Of Manhole
 Small (S) - 4' x 4' x 6' (L x W x D) Interior Dimensions
 Medium (M) - 6' x 6' x 8' (L x W x D) Interior Dimensions
 Large (L) - 8' x 8' x 8' (L x W x D) Interior Dimensions
 2. Grounding Shall Include Ground Ring "Halo" Within Manhole; 4/0 Bare Copper Secured Around The Perimeter Of The Top Of The Manhole, Cad-Weld To The Ground Rod.
 3. Cover Shall Have Rim And "Open Pick" Holes For Access.
 4. Cover Frame Shall Be Bolted To The Structure. Any Required Riser Rings Shall Be Secured To Each Other And To The Manhole Top.
 5. Cable Racking Assemblies Shall Be Hot Dipped Galvanized Cable Racks With A Plastic Coating Over The Galvanizing, Shall Be Installed In Each Communication Manhole. Racking Supports Shall Extend Floor To Ceiling Of Manhole, With A Minimum Of Three Supports Per Side. Distributed Evenly Across The Wall. Provide 3 Racking Hooks Per Racking Wall. Two Of Which Shall Have 3" Arms And 1 Shall Have 18" Arm.

COMMUNICATION CONCRETE MANHOLE DETAIL Scale: NTS Drawing: **G003** Detail: **01**



NOTES:
 1. Slack Loop To Be Provided At Manholes As Per Specifications (One In The Run), Building's Point Of Entry (POE), And Building's Main Distribution Frame (MDF). If Exterior Run Between Buildings Exceeds 400Ft., Provide A Second Slack Loop In An Additional Manhole.

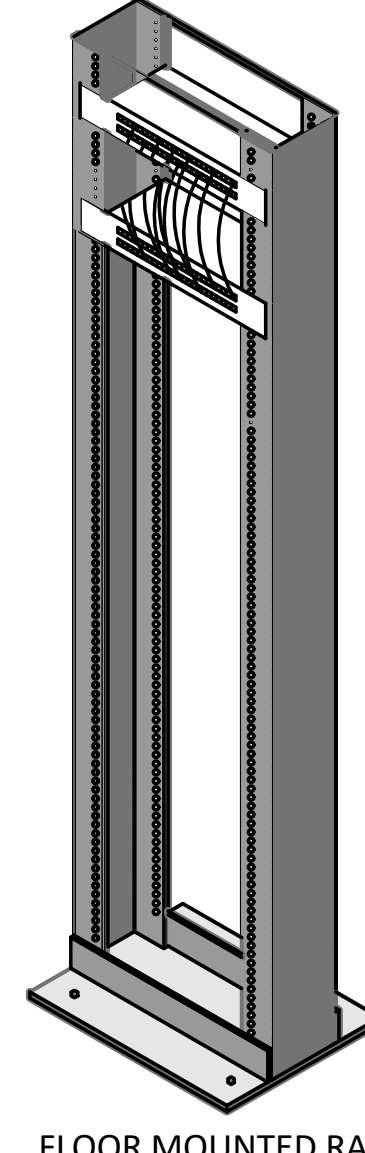
FIBER ENCLOSURE INSTALLATION BLOCK DIAGRAM Scale: NTS Drawing: **G003** Detail: **05**



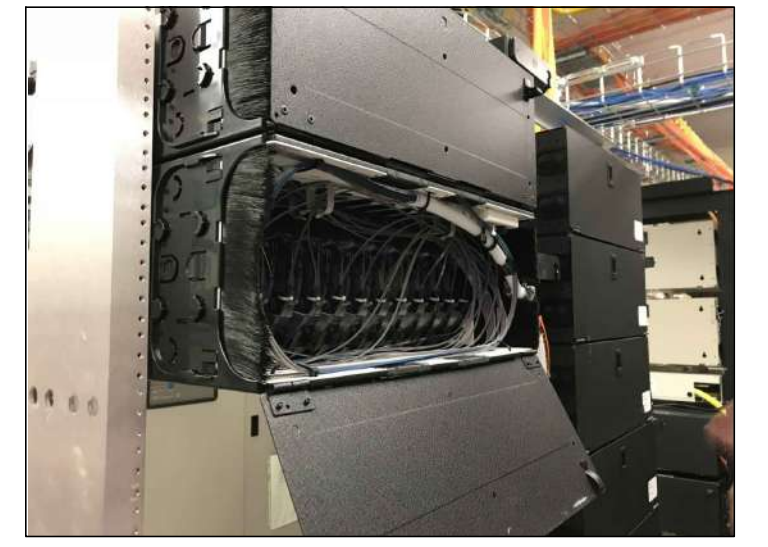
12" DEEP - WALL MOUNTED CABINET
 Similar To Chatsworth Part No. 13050-723, THINLINE-II, With Overall Dimensions 36"H X 26"W X 12"D, Black.



30" DEEP - WALL MOUNTED CABINET
 Similar To CUBE-IT Wall-Mount Cabinet; Gen 3; 48"H x 24"W x 30"D (1220 mm x 610 mm x 760 mm); 26U; #12-24 Tapped Rails; Tempered Glass Door; Black



FLOOR MOUNTED RACK (TWO POST RACK)



RACK MOUNTED CABINET

NOTES:
 1. Coordinate Specific Rack Requirements With TCNJ IT Department.
 2. Entire Cable Routing Shall Be Enclosed In Pathway. Provide Junction Boxes At Locations To Facilitate Transitioning Between Pathways. Pull Boxes Shall Also Be Provided As Required Per Routing As Per Specification.
 3. Provide All Required Quantities Of Connector Housings, Cassettes, Terminations And Labeling Based On Cable Size Indicated For Each Location For A Complete Installation.

EQUIPMENT RACK DETAIL Scale: NTS Drawing: **G003** Detail: **06**

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30x42

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

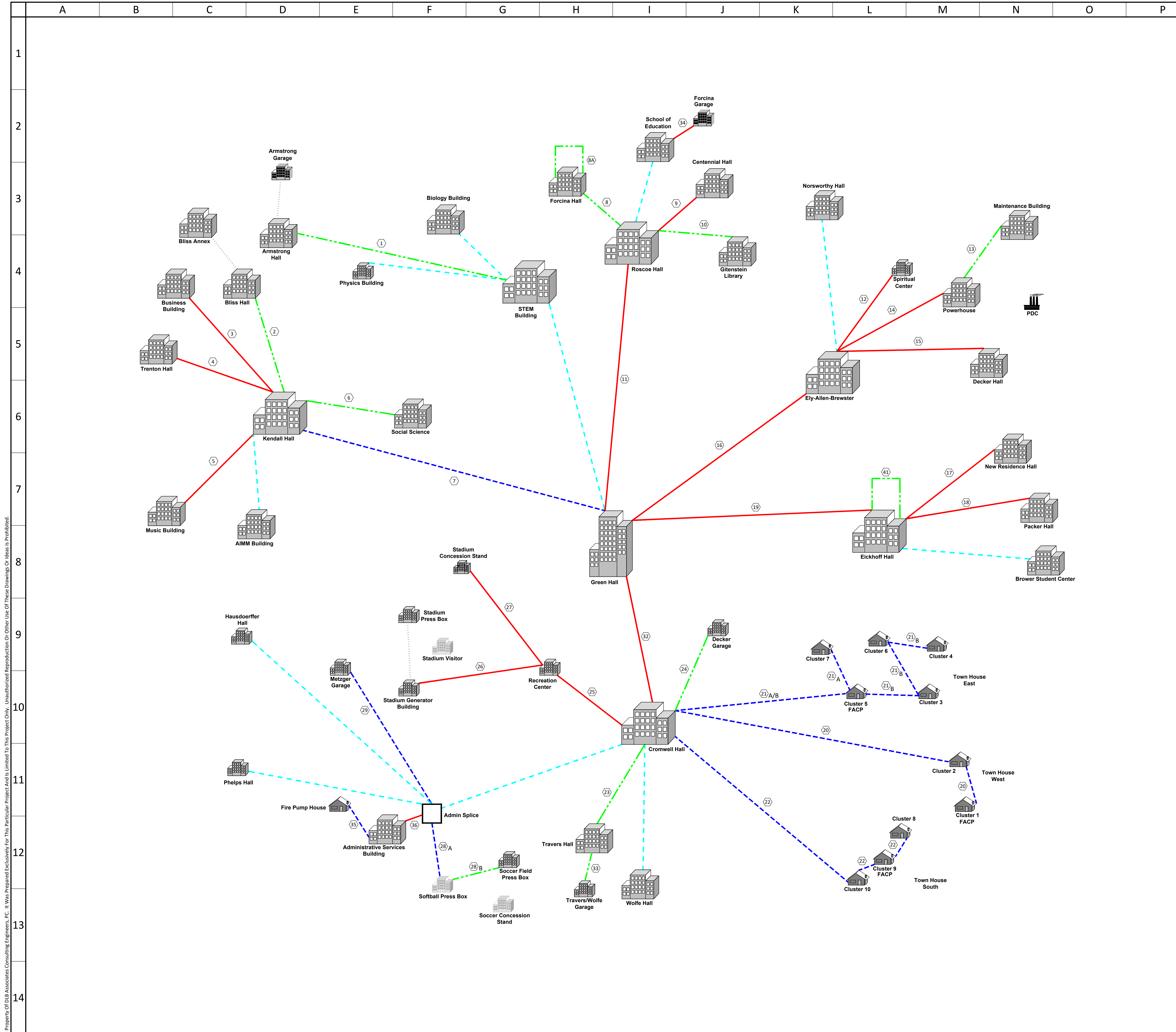
dlb associates
 CONSULTING ENGINEERS, P.C.
 265 Industrial Way West, Eatontown, N.J. 07724
 Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
 TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi

project
 TCNJ - FIBER INFRASTRUCTURE UPGRADES
 (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD,
 EWING NJ, 08618

title
 DETAILS
 scale AS SHOWN drawn by SC checked by SG date 09/17/2021

dwg. no.
G003



Fiber Routing					
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information	
				Fiber Strand Count	Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36	OS2
2	Bliss Hall	Kendall Hall	Yes	48	OS2
3	Business Building	Kendall Hall	No	24	OS2
4	Trenton Hall	Kendall Hall	No	36	OS2
5	Music Building	Kendall Hall	No	24	OS2
6	AIMM Building	Kendall Hall	N/A	0*	OS2
7	Social Science	Kendall Hall	Yes	36	OS2
8	Kendall Hall	Green Hall	Yes	144	OS2
	Chemistry Building	STEM Building	N/A	0*	
	Physics Building	STEM Building	N/A	0*	OS2
	Biology Building	STEM Building	N/A	0*	OS2
	STEM Building	Green Hall	N/A	0*	OS2
8	Forcina Hall	Roscoe Hall	Yes	24	OS2
8A	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48	OS2/OM1
	Education Building	Roscoe Hall	N/A	0*	OS2
9	Centennial Hall	Roscoe Hall	No	24	OS2
10	Gitenstein Library	Roscoe Hall	No	36	OS2
11	Roscoe Hall	Green Hall	No	96	OS2
	Norsworthy Hall	Ely-Allen-Brewster	N/A	0*	OS2
12	Spiritual Center	Ely-Allen-Brewster	No	24	OS2
13	Maintenance Building	Powerhouse	Yes	36	OS2
14	Powerhouse	Ely-Allen-Brewster	No	48	OS2
15	Decker Hall	Ely-Allen-Brewster	No	36	OS2
16	Ely-Allen-Brewster	Green Hall	Yes	192	OS2
17	New Residence Hall	Eickhoff Hall	No	24	OS2
18	Packer Hall	Eickhoff Hall	No	36	OS2
	Brower Student Center	Eickhoff Hall	N/A	0*	OS2
19	Eickhoff Hall	Green Hall	No	96	OS2
20	TH1 (Town House West)	Cromwell Hall	No	48	OS2
21	TH5 21A/B (Town House East)	Cromwell Hall	No	(2) 36	OS2
22	TH9 (Town House South)	Cromwell Hall	No	48	OS2
23	Travers Hall	Cromwell Hall	Yes	12	OS2
	Wolfe Hall	Cromwell Hall	N/A	0*	
24	Decker Garage	Cromwell Hall	Yes	24	OS2
25	Recreation Center	Cromwell Hall	No	36	OS2
26	Stadium Generator Building	Recreation Center	No	12	OS2
27	Stadium Concession Stand	Recreation Center	No	12	OS2
28	Soccer Field Press Box 28A/B	Admin Splice	No	36	OS2
29	Metzger Garage	Admin Splice	No	24	OS2
	Phelps Hall	Admin Splice	N/A	0*	OS2
	Hausdoerffer Hall	Admin Splice	N/A	0*	OS2
32	Cromwell Hall	Green Hall	No	288	OS2
33	Travers/Wolfe Garage	Travers Hall	Yes	12	OS2
34	Forcina Garage	Education Building	No	12	OS2
35	Fire Pump House	Admin Services Building	No	12	OS2
36	Admin Services Building	Admin Splice	N/A	36	OS2
41	Eickhoff Room 227**	Eickhoff Room 337	No	48/48	OS2 / OM1

NOTES

- * - Spare Capacity Is Available In Existing Fiber Located At The MDF. Existing Fiber Shall Be Tested Per General Note Below.
- ** - Routing Shall Have Both A Single Mode Fiber Cable And A Multimode Fiber Cable.
- Contractor To Terminate All Fiber Strands On Both Ends Of Cable

GENERAL NOTES

- All New Cables Shall Be Tested From MDF In One Building To MDF In Another.
- All Existing Cables For This Project Shall Be Tested. Existing Fiber Shall Be Tested According To The Specifications For Testing New Fiber. Contractor Shall Provision And Provide Testing For 12 Strands Of OS2 Fiber For Each Span Noted To Have Existing Fibers Available.
- Type Of Cable Designation Has Been Added To The Table Above For Reference And To Clarify Types To Be Utilized. All Fiber Spans Including Interior Building Routed Fiber, Connectors, Cassettes, Etc Shall Have The Performance Type Identified In The Table Above.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description
	Existing Open Fiber Strands Available
	Existing Conduit Pathway Available For New Fiber Installation
	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway
	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required
	Fire Alarm Devices Fed From Panel Located In Another Building

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1	10/01/2021	ISSUED FOR BID			

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265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky Phone: (732) 829-7351
DLB Project ID: 47211

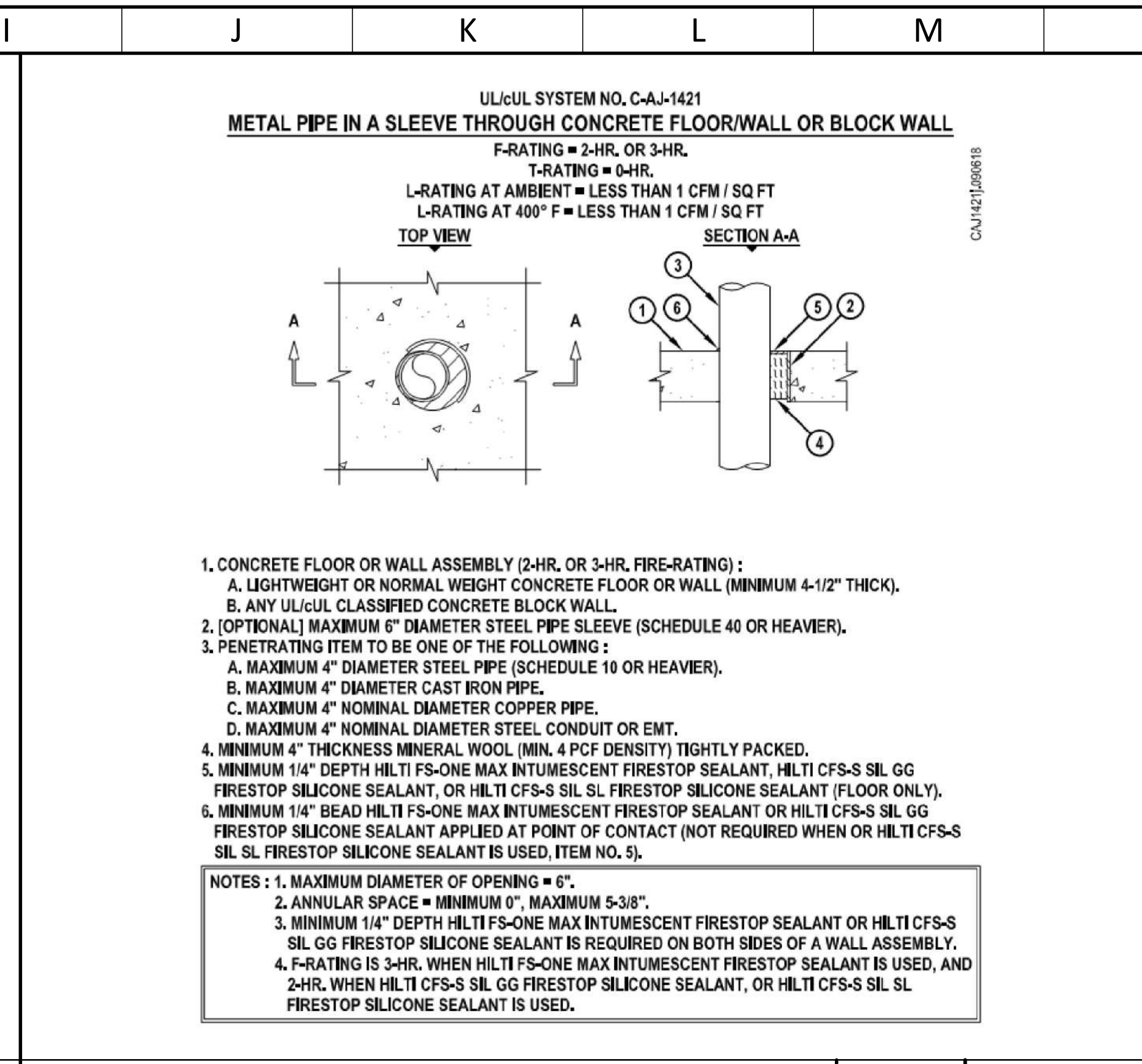
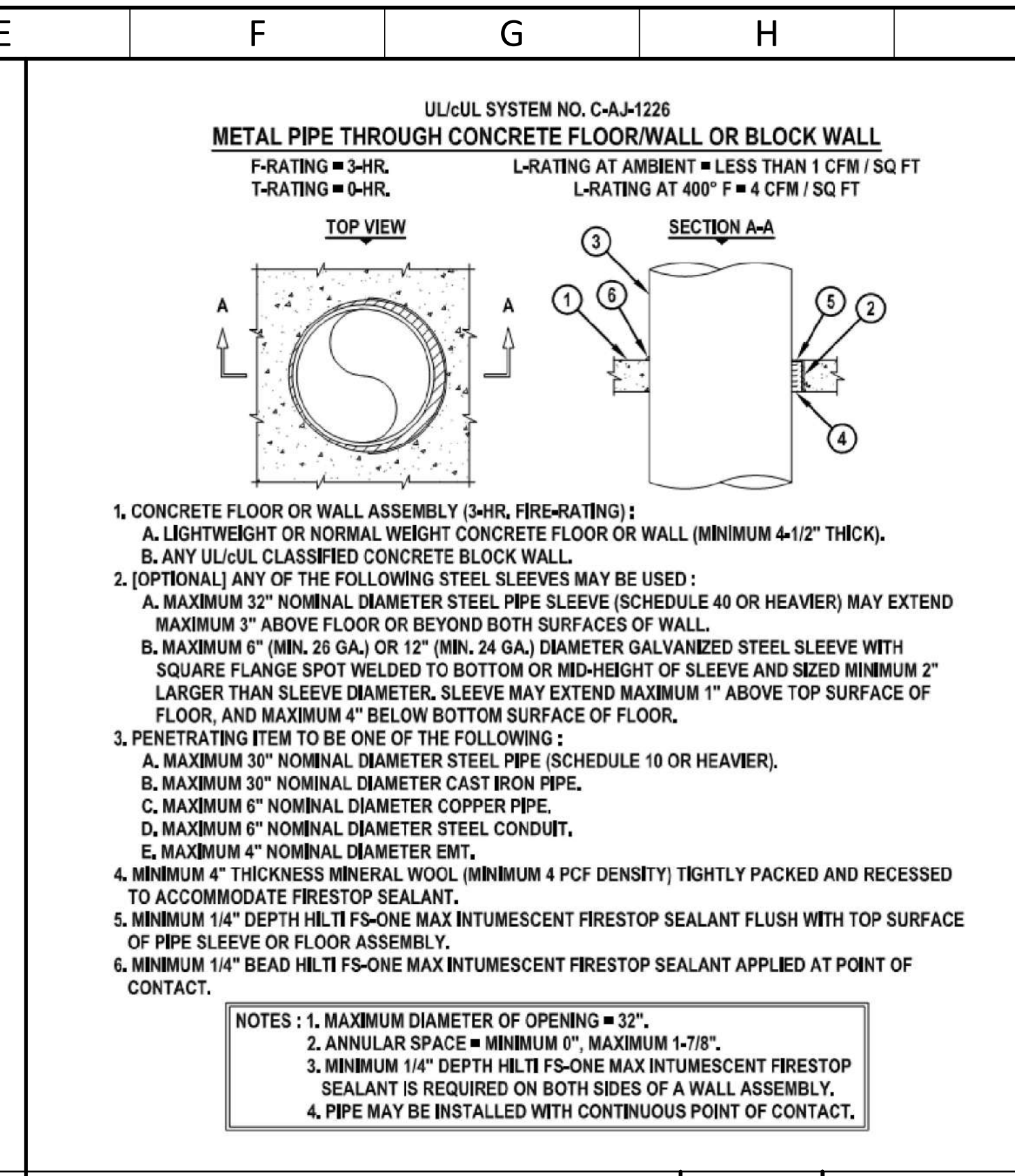
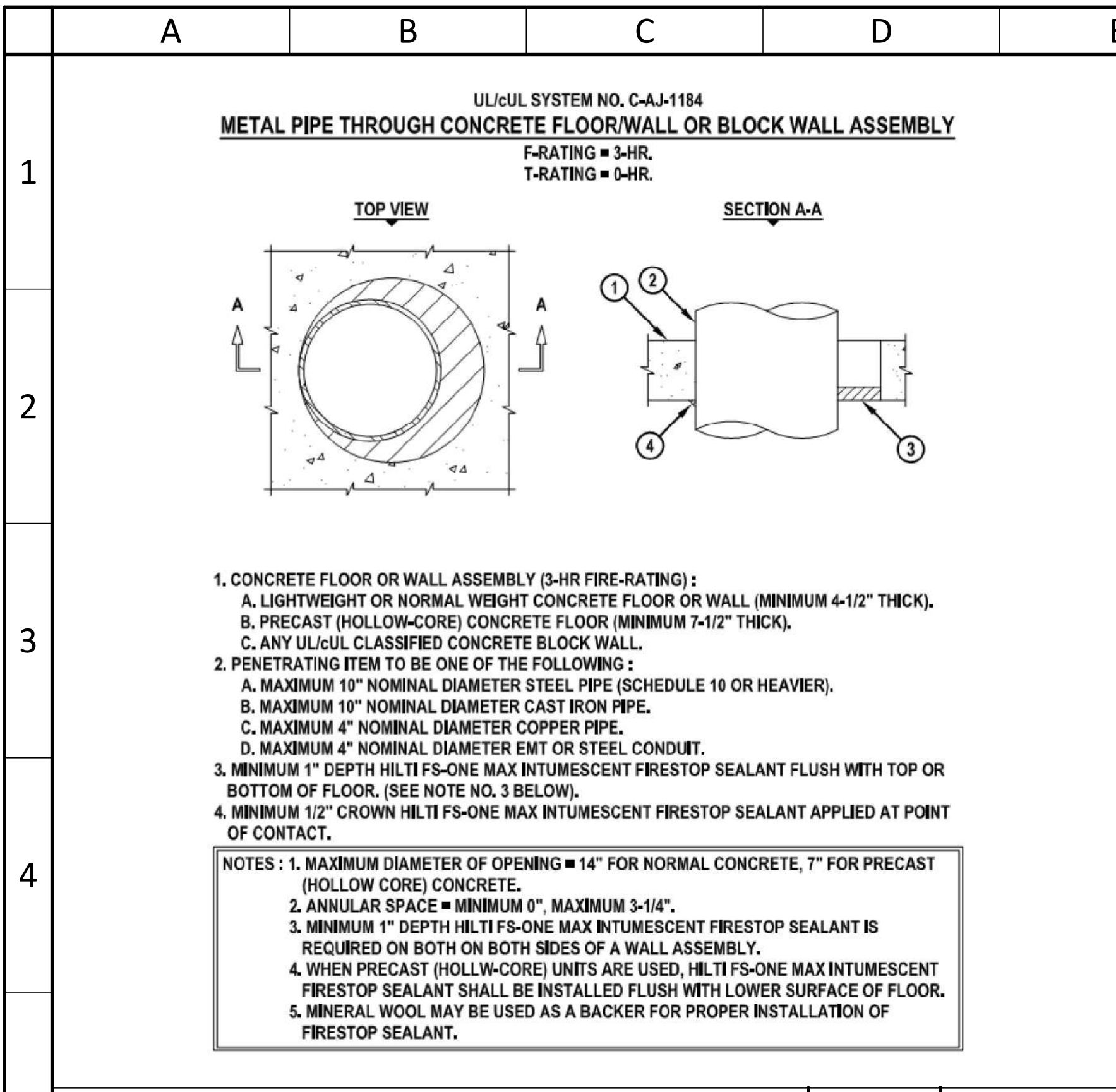
TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IK124
TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title FIBER NETWORK OVERVIEW DIAGRAM	dwg. no. G004
scale AS SHOWN	drawn by SC
checked by SG	date 09/17/2021

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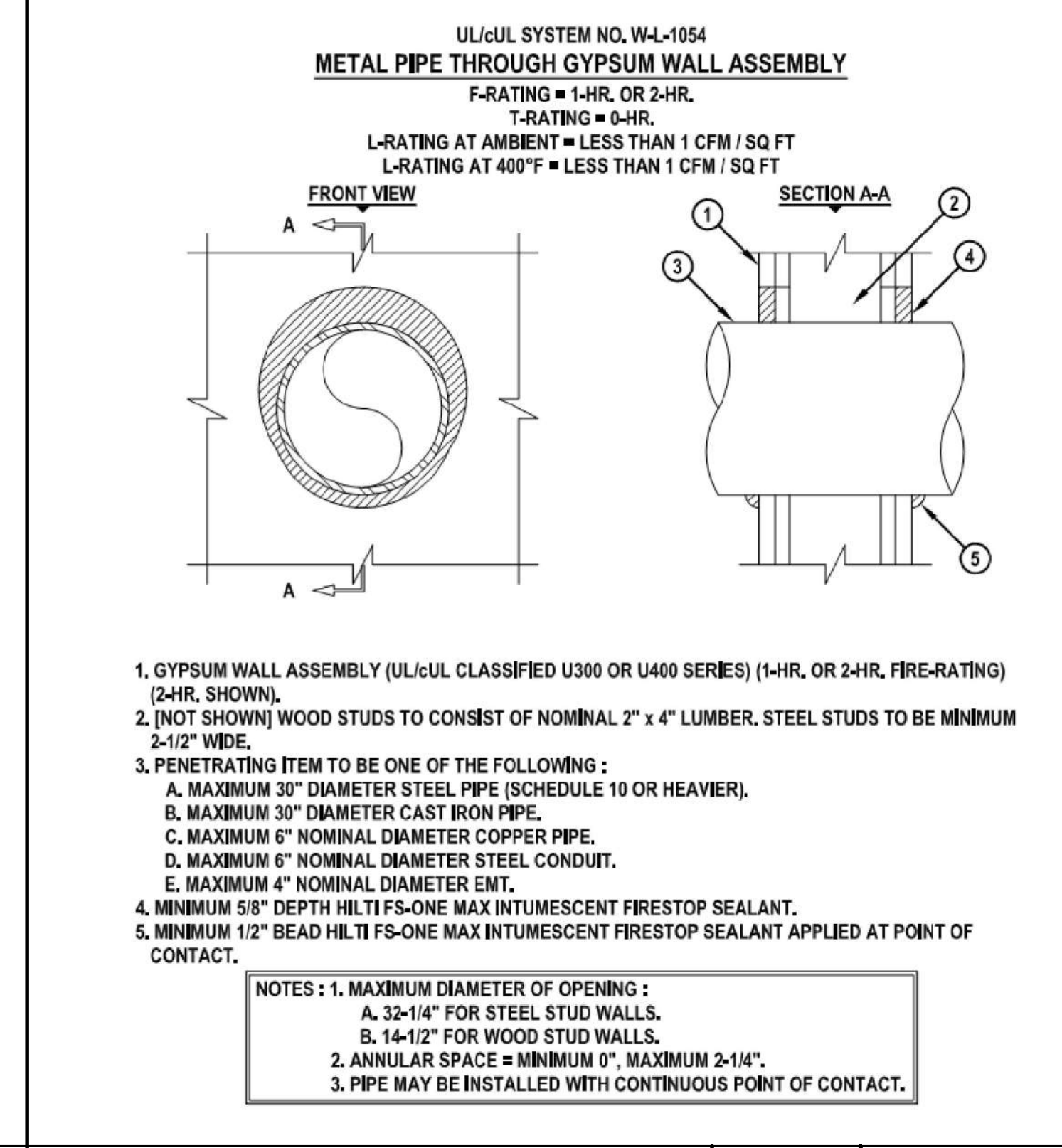
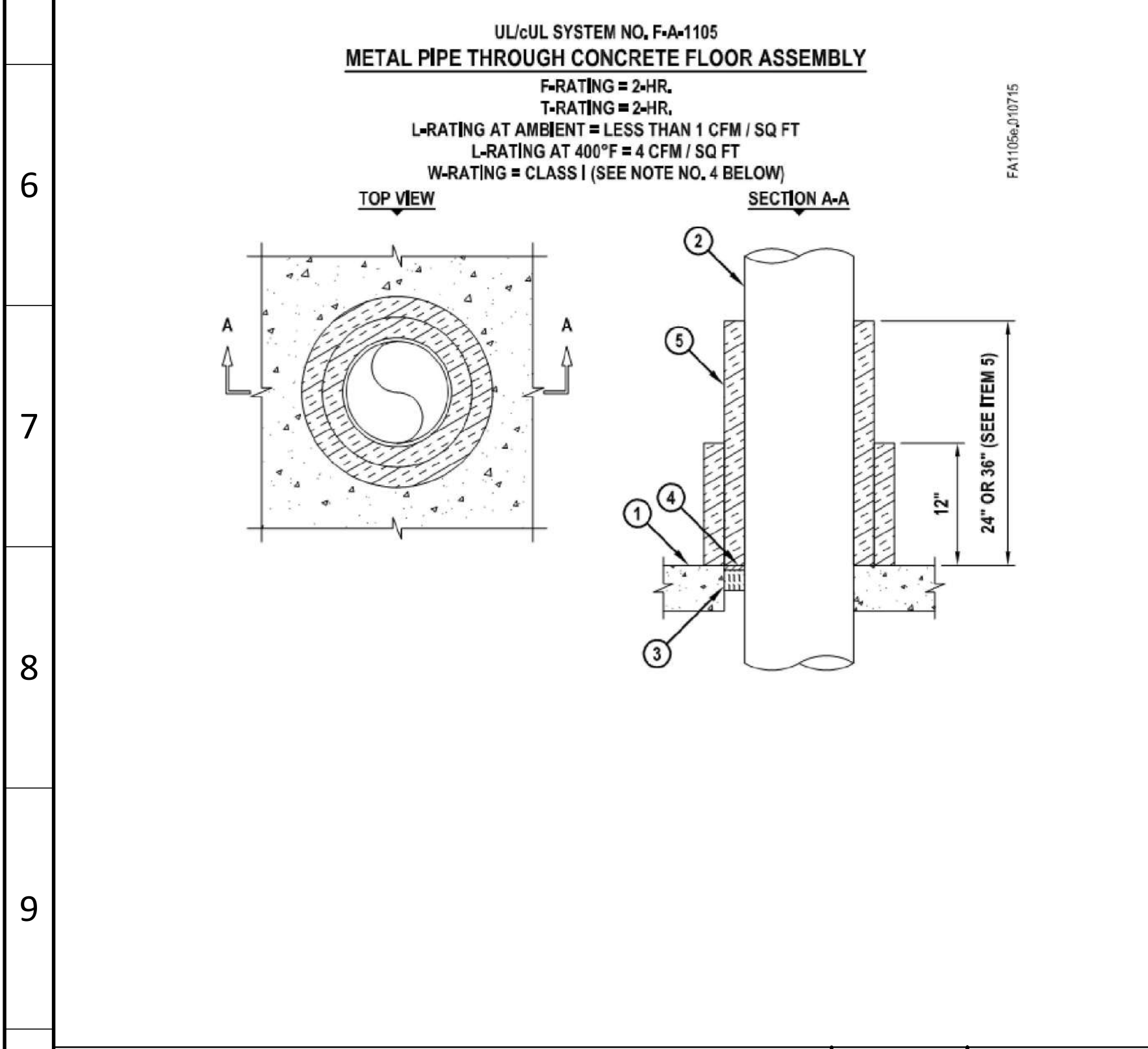


- PENETRATION FIRESTOPPING GENERAL NOTES**
- Refer to Specifications for additional information.
 - Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in joints between fire rated wall and floor assemblies.
 - Only tested firestop systems shall be used in specific locations as follows: Penetrations for the passage of conduit through fire-rated vertical barriers (walls and partitions), and horizontal barriers (floor/ceiling assemblies).
 - Test Requirements: ASTM E-814-02, "Standard Method of Fire Tests of Through Penetration Fire Stops"; Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
 - A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.
 - Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
 - Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
 - For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation.
 - REQUIRED SUBMITTALS
 - Shop Drawings: Proposed conduit routes per building with each penetration identified.
 - Product Data: Manufacturer's specifications and technical data for each material including the composition and manufacturers', documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 1300.
 - Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineer judgment must include both project name and contractor's name who will install firestop system as described in drawing.
 - Submit material safety data sheets provided with product delivered to job-site.
 - INSTALLER QUALIFICATIONS: Engage an experienced installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an installer engaged by the Contractor does not in itself confer qualification on the buyer.
 - DELIVERY, STORAGE, AND HANDLING
 - Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
 - Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
 - Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.
 - Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
 - Do not use damaged or expired materials.
 - PROJECT CONDITIONS
 - Do not use materials that contain flammable solvents.
 - Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
 - Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
 - Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.
 - During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.
 - Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
 - Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
 - MATERIALS
 - Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
 - Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
 - Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.
 - PREPARATION
 - Verification of Conditions: Prior to beginning the work, examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - Verify penetrations are properly sized and in suitable condition for application of materials.
 - Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
 - Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
 - Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
 - Do not proceed until unsatisfactory conditions have been corrected.
 - INSTALLATION
 - Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.
 - Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.
 - Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
 - Protect materials from damage on surfaces subjected to traffic.
 - FIELD QUALITY CONTROL
 - Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
 - Keep areas of work accessible until inspection by applicable code authorities.
 - Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
 - Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.
 - ADJUSTING AND CLEANING
 - Remove equipment, materials and debris, leaving area in undamaged, clean condition.
 - Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

CONCRETE PIPE THROUGH FLOOR / WALL Scale: NTS Drawing: G005 Detail: 01

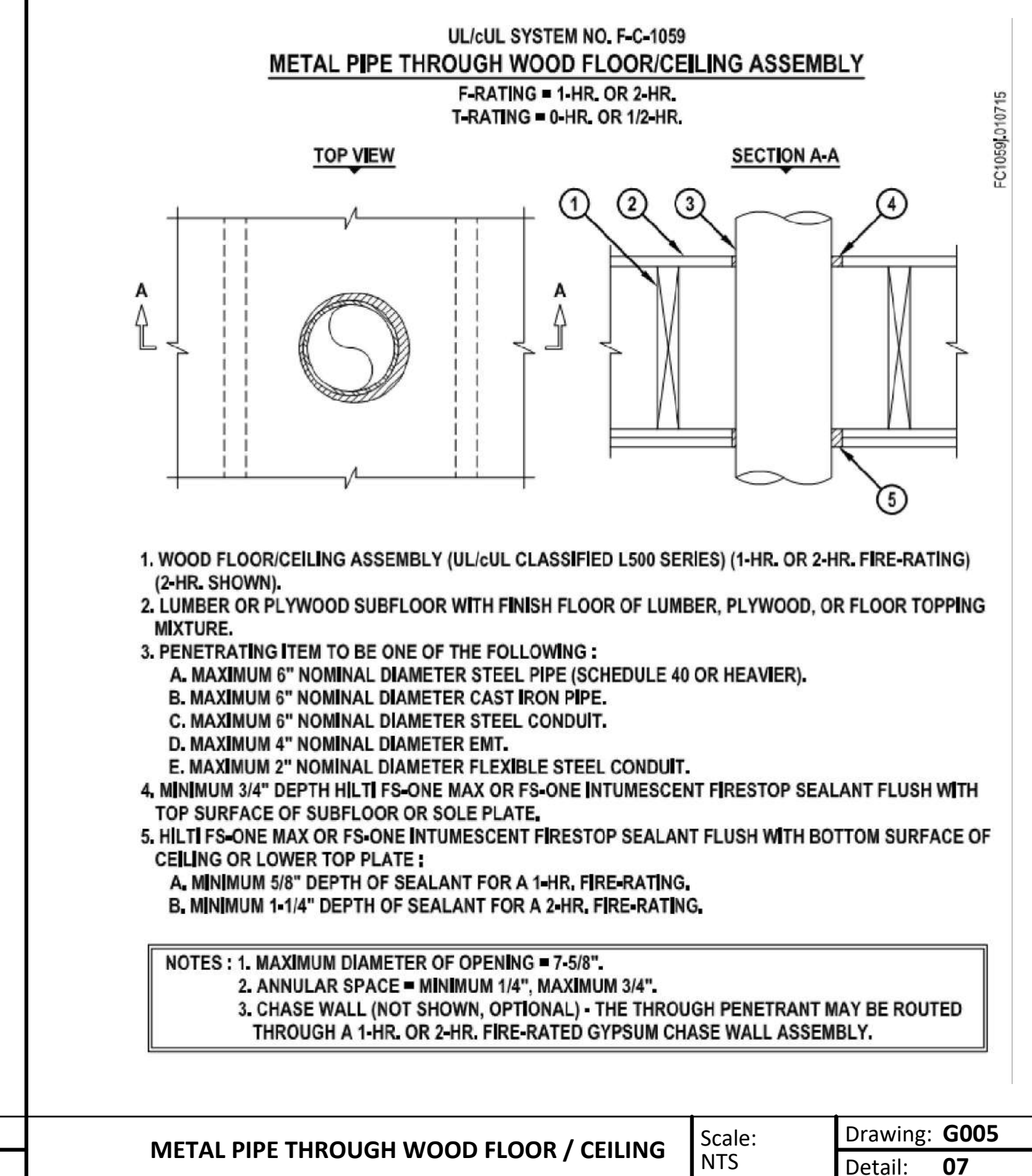
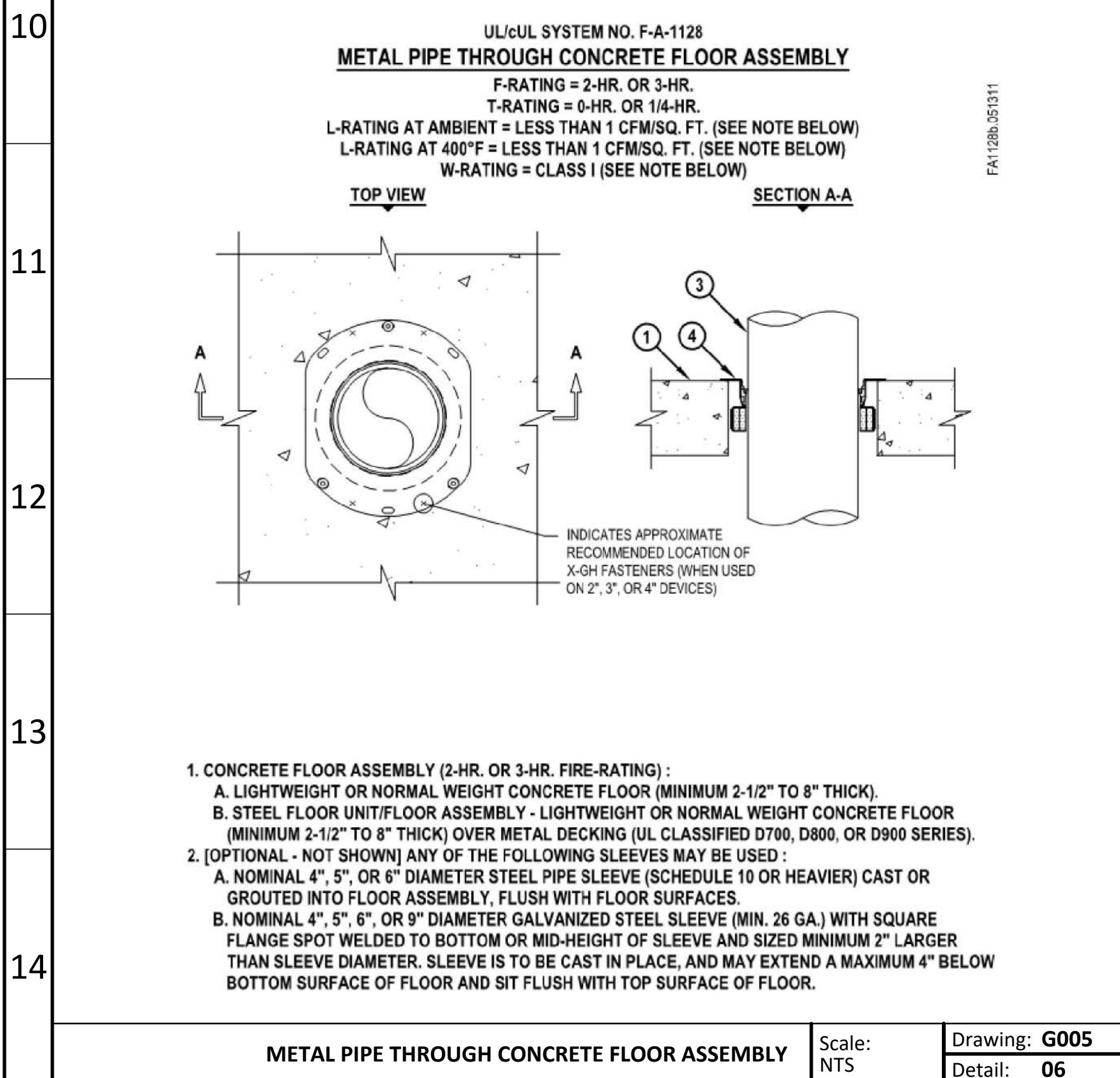
METAL PIPE THROUGH CONCRETE FLOOR / WALL Scale: NTS Drawing: G005 Detail: 02

METAL PIPE IN A SLEEVE THROUGH CONCRETE FLOOR / WALL OR BLOCK WALL Scale: NTS Drawing: G005 Detail: 03



METAL PIPE THROUGH CONCRETE FLOOR ASSEMBLY Scale: NTS Drawing: G005 Detail: 04

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY Scale: NTS Drawing: G005 Detail: 05



METAL PIPE THROUGH CONCRETE FLOOR ASSEMBLY Scale: NTS Drawing: G005 Detail: 06

METAL PIPE THROUGH WOOD FLOOR / CEILING Scale: NTS Drawing: G005 Detail: 07

SCHEDULE OF FIREPROOFING OF WALL & FLOOR / CEILING PENETRATIONS

Location	Penetrated Item	Fire Resistance Rating in Hours (min.)	Penetrating Item	Applicable UL System Detail(s)
Wall	Metal Stud and Drywall	2	1" - 4" Metal (EMT)	W-L-1054; W-L-1441
Wall	Wood Stud and Drywall	2	1" - 4" Metal (EMT)	W-L-1054; W-L-1441
Wall	Brick Masonry	2	1" - 4" Metal (EMT)	C-AJ-1184; C-AJ-1226; C-AJ-1421
Wall	CMU	2	1" - 4" Metal (EMT)	C-AJ-1184; C-AJ-1226; C-AJ-1421
Wall	Concrete	2	1" - 4" Metal (EMT)	C-AJ-1184; C-AJ-1226; C-AJ-1421
Floor / Ceiling	Wood Floor	2	1" - 4" Metal (EMT)	F-C-1059
Floor / Ceiling	Concrete Floor	2	1" - 4" Metal (EMT)	C-AJ-1184; C-AJ-1226; F-A-1105; F-A-1128; C-AJ-1421

NOTES:
1. The details listed above are for typical construction assemblies expected to be encountered on this project. They are provided for the contractor's information and may not represent all construction assemblies that will be penetrated. It is the contractor's responsibility to apply the appropriate detail to each penetration.
2. Where multiple applicable details are shown the contractor may select one based upon the existing conditions, constructability and product availability.
3. While some penetrations may not be through fire walls, in the interest of life safety and simplification of construction, all penetrations are to be firestopped as if the wall had a two hour fire-resistance rating. If during construction the contractor encounters a three hour fire-resistance rated wall and the applicable details do not offer a three hour rated option, notify the Engineer immediately for resolution.
4. The contractor is responsible for the conduit pathway routing and will identify walls, floors and ceilings to be penetrated prior to the ordering of materials. The contractor is to provide proposed conduit path drawings (may be hand-marked) for each building and system for Engineer review and approval prior to beginning the work. All penetrations are at the discretion of the contractor in the field and will be accounted for in the contractor's bid. There will be no change orders issued for number or type of penetrations to be created and firestopped.
5. The applicable details listed here and included in the drawings are based upon the use of Hilti products. The contractor is to use a single source for fireproofing materials. The same listed detail may be used from an alternate approved manufacturer at the contractor's request prior to beginning the work.

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Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: (732) 829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdoumi

project
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EWING NJ, 08618

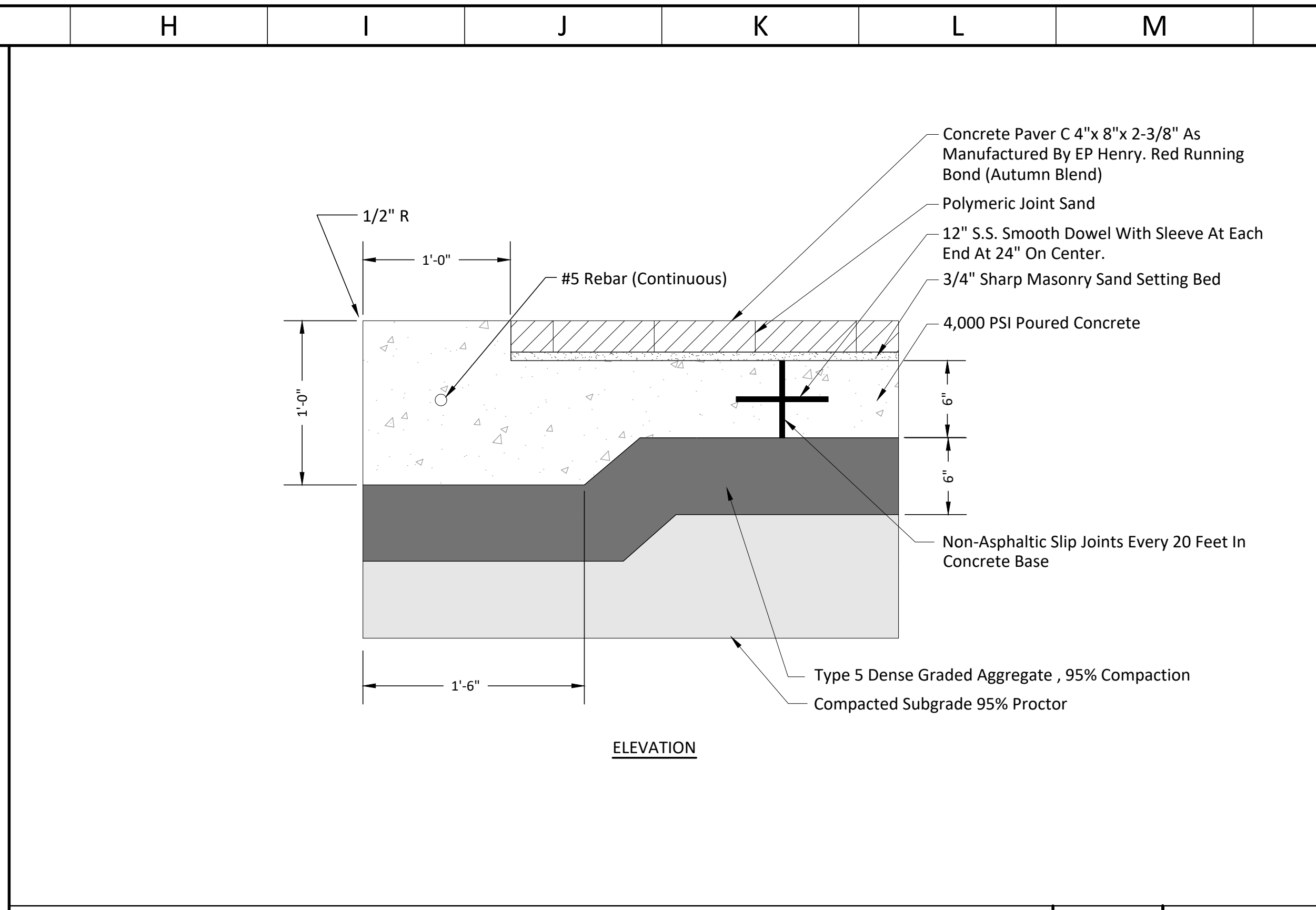
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scale AS SHOWN
drawn by CDO
checked by AL
date 09/17/2021

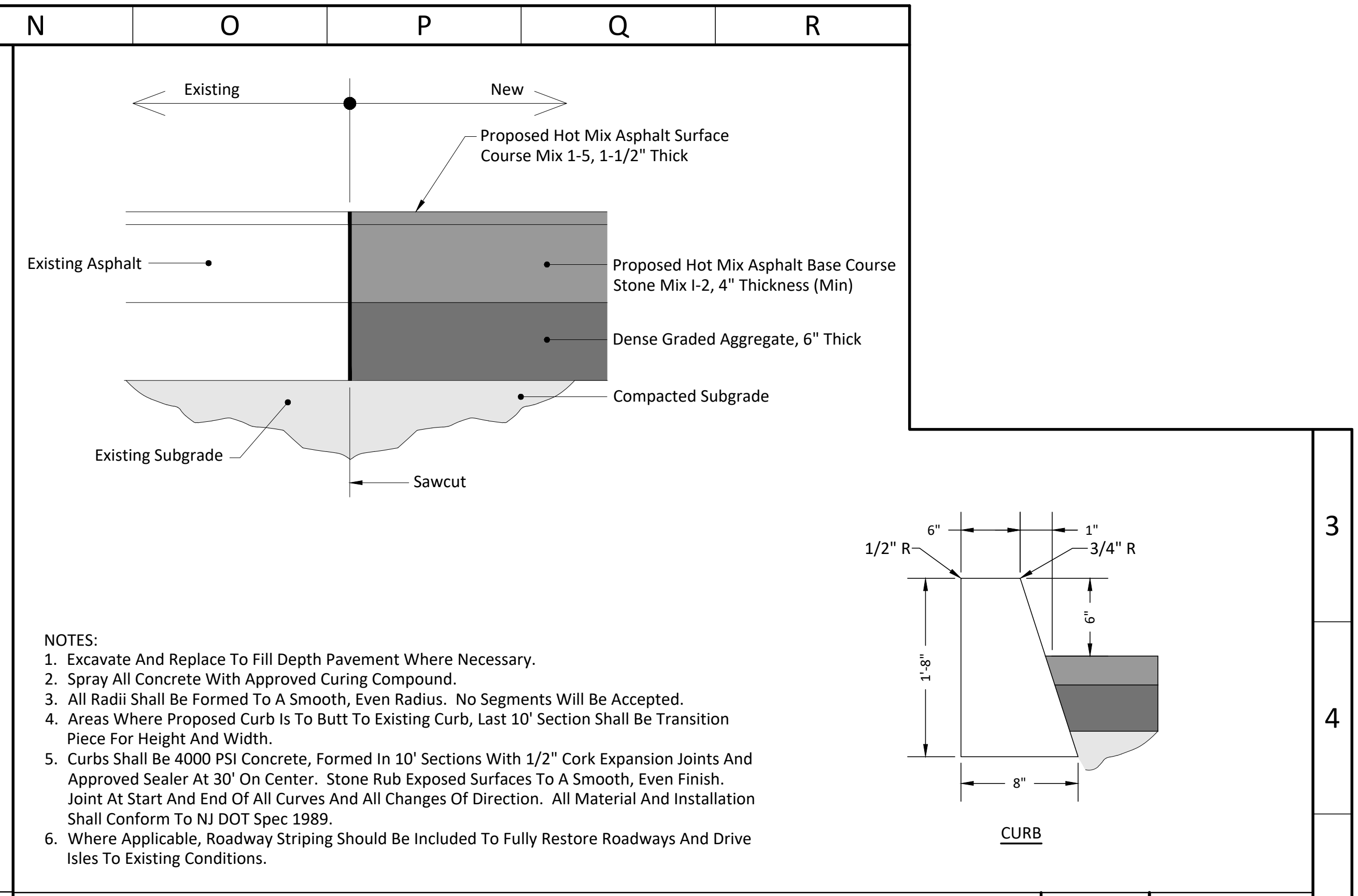
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G005

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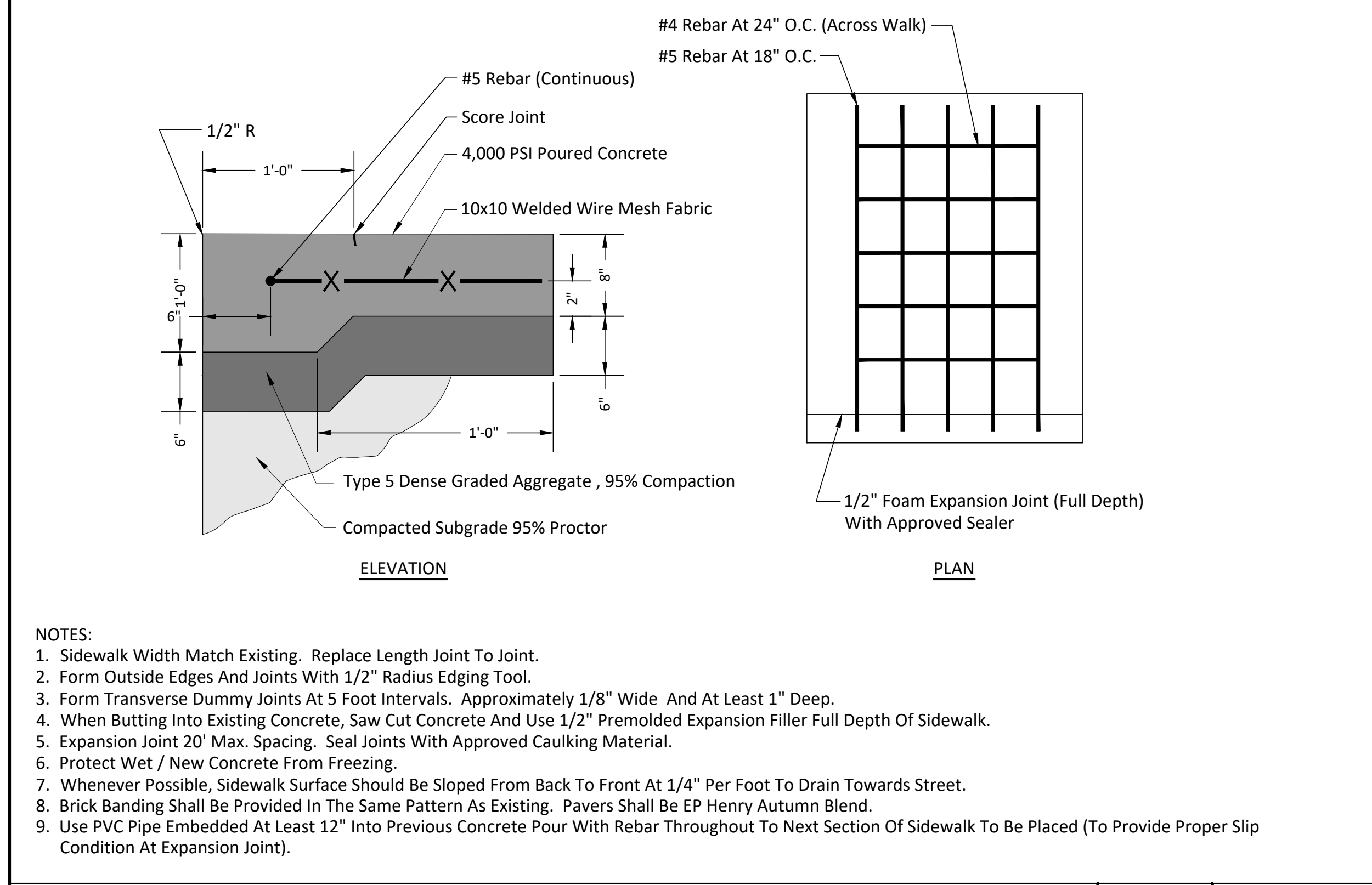
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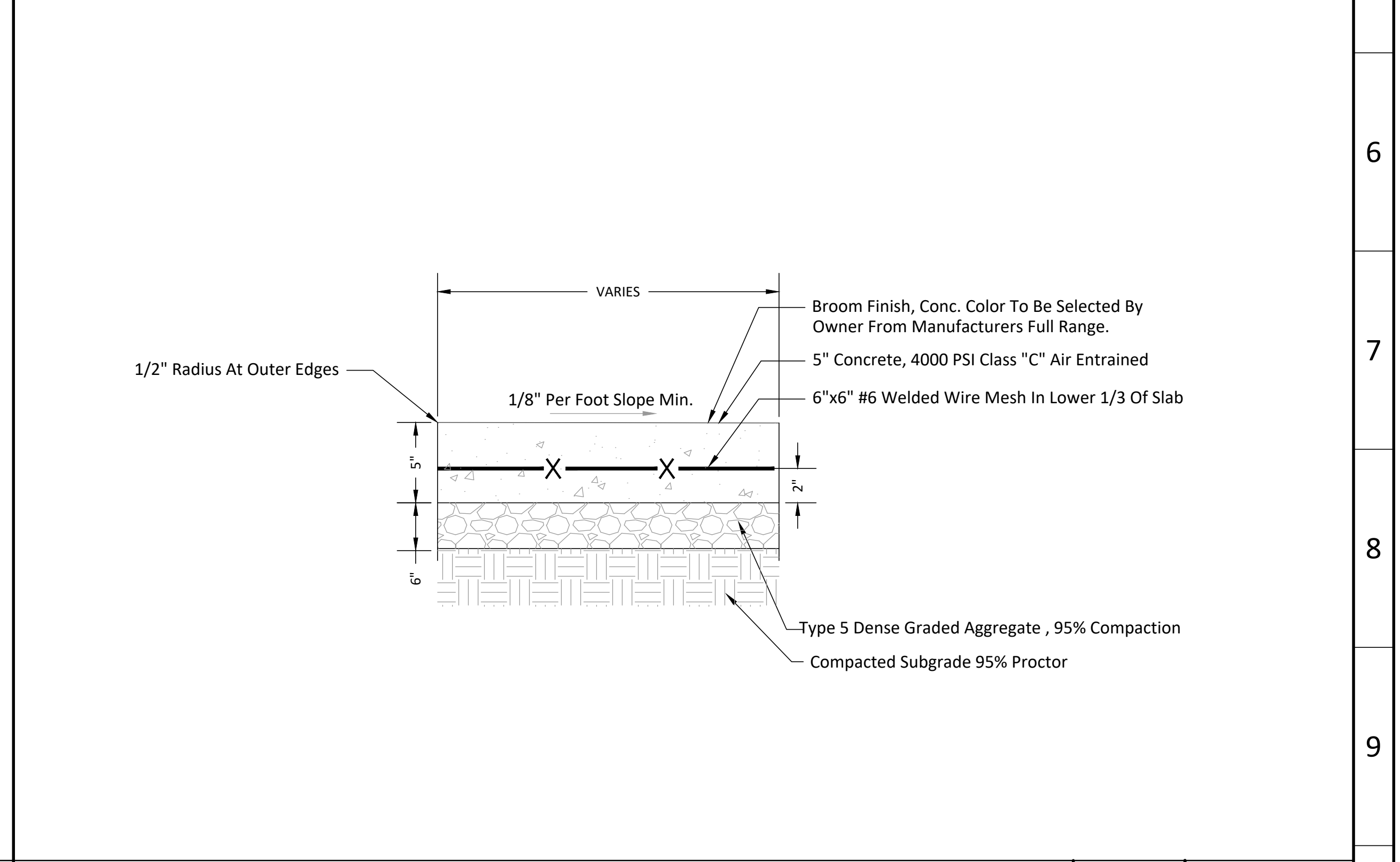
CONCRETE SIDEWALK WITH EMBEDDED PAVER REPAIR DETAIL Scale: NTS Drawing: **G006** Detail: **01**



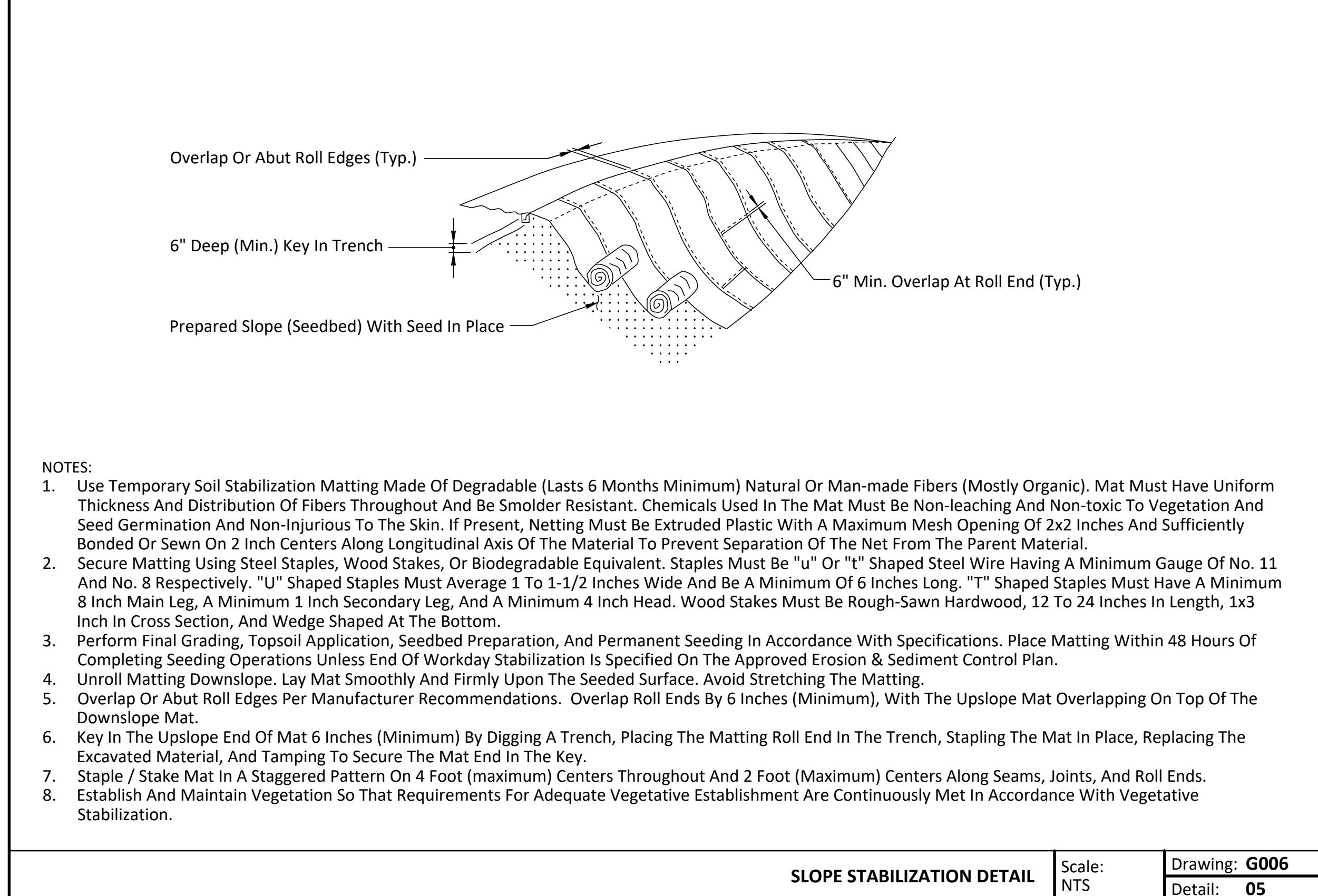
ASPHALT PAVEMENT REPAIR WITH EXISTING PAVEMENT Scale: NTS Drawing: **G006** Detail: **02**



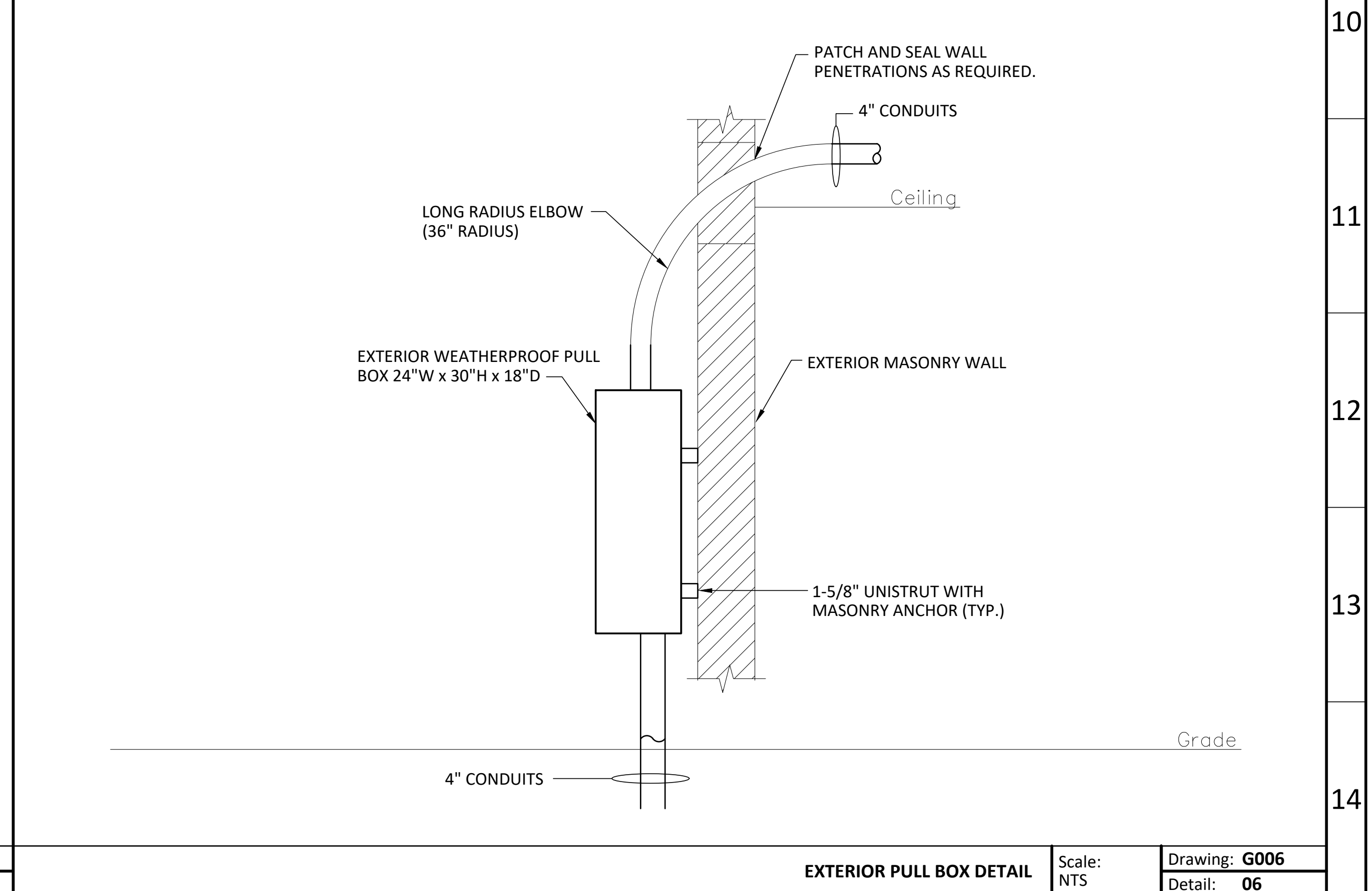
DRIVE ISLE CONCRETE SIDEWALK RESTORATION DETAIL Scale: NTS Drawing: **G006** Detail: **03**



NON-DRIVE ISLE CONCRETE SIDEWALK REPAIR DETAIL Scale: NTS Drawing: **G006** Detail: **04**



SLOPE STABILIZATION DETAIL Scale: NTS Drawing: **G006** Detail: **05**



EXTERIOR PULL BOX DETAIL Scale: NTS Drawing: **G006** Detail: **06**

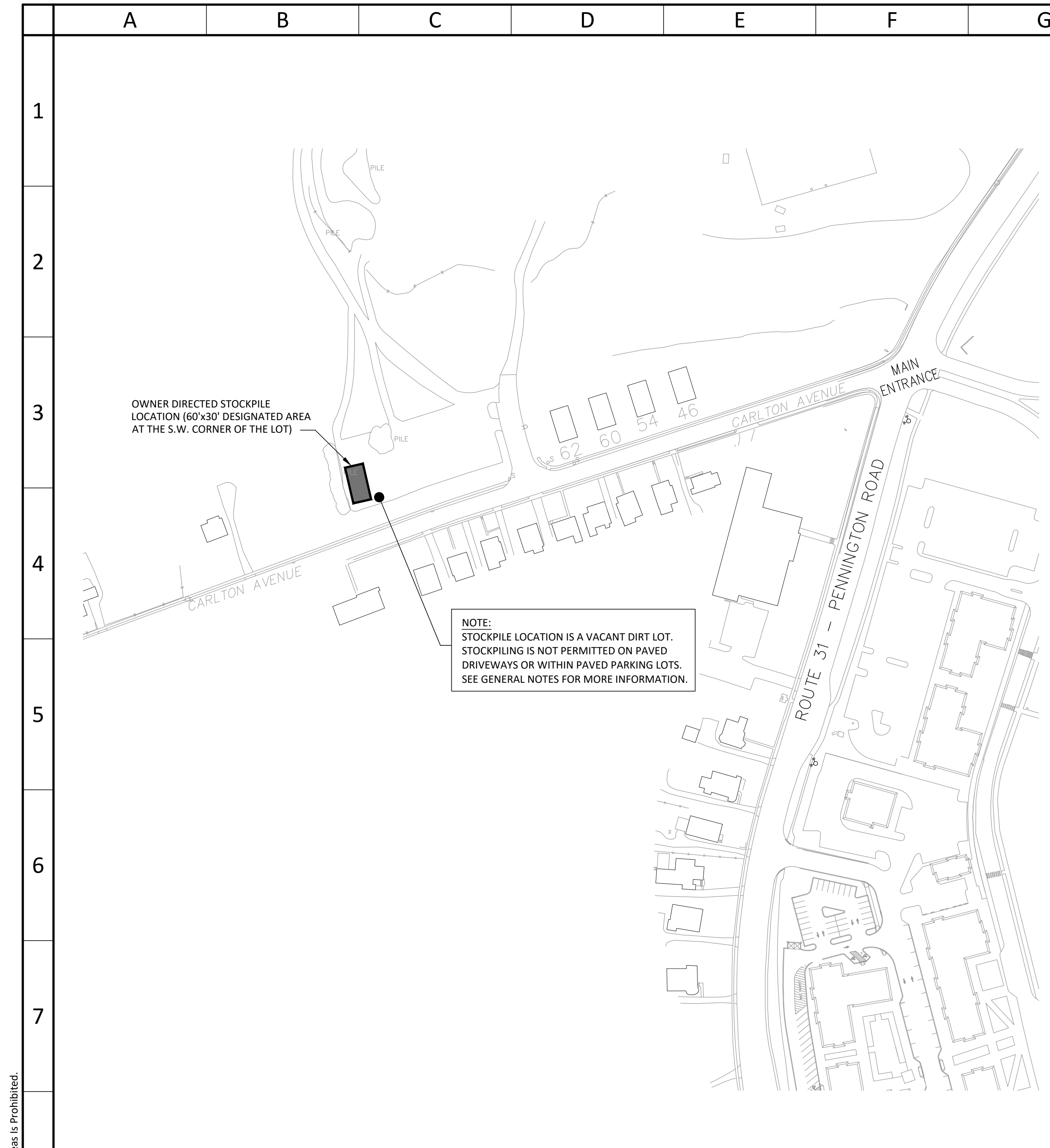
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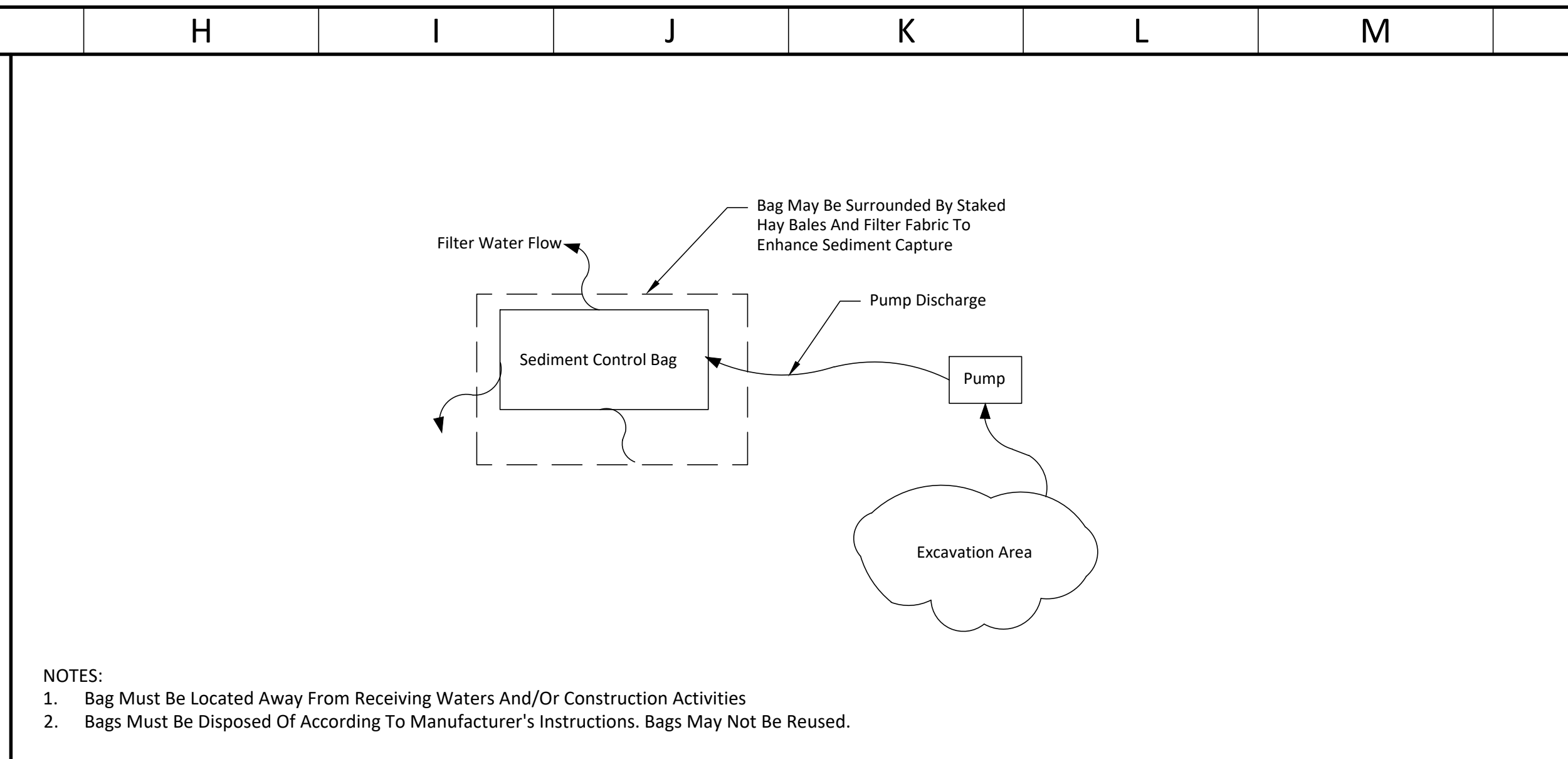
TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
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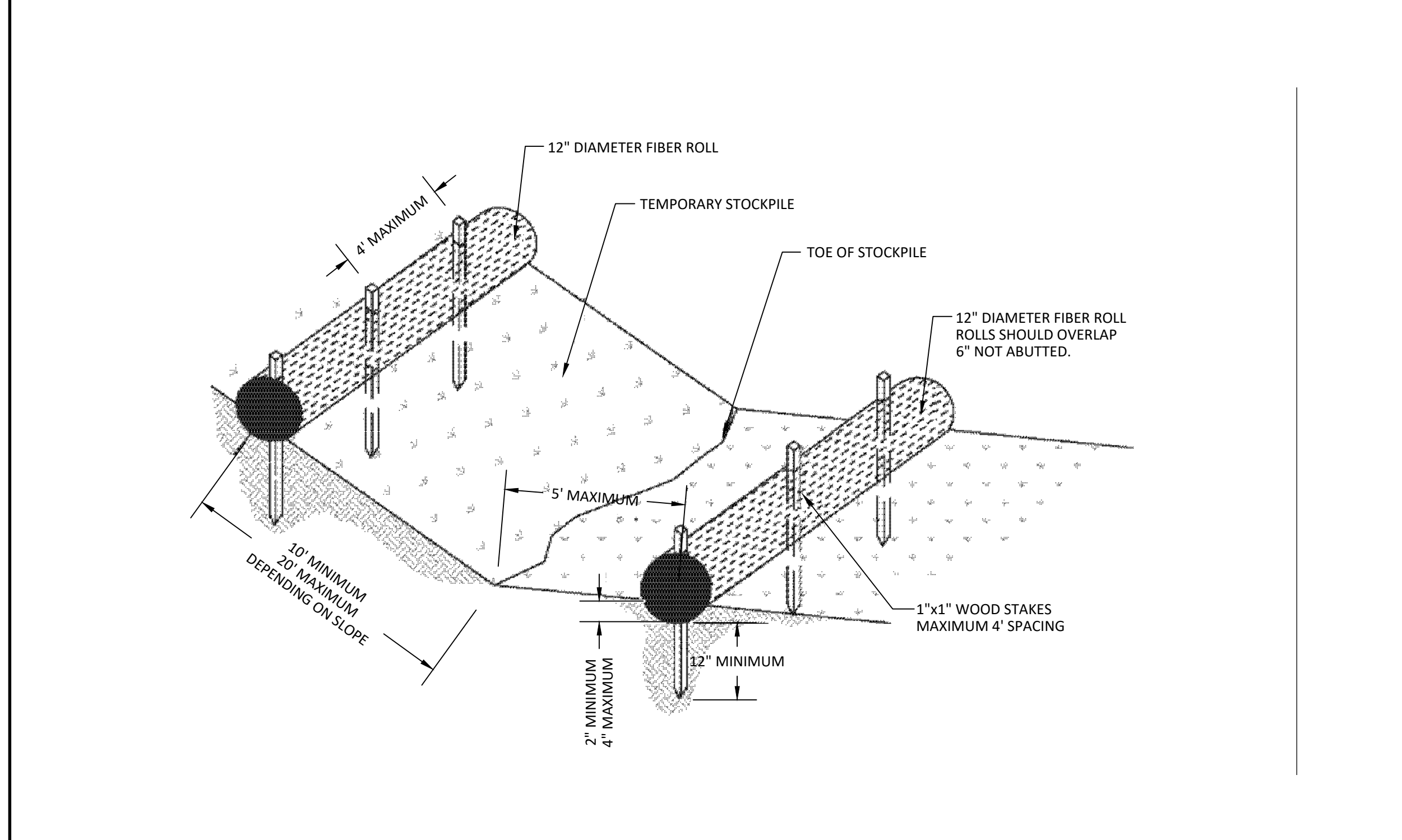
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DETAILS
scale AS SHOWN drawn by HF checked by ASL date 09/17/2021
dwg. no.
G006



PARTIAL SITE PLAN Scale: 1/128" = 1' Drawing: G007 Detail: 01



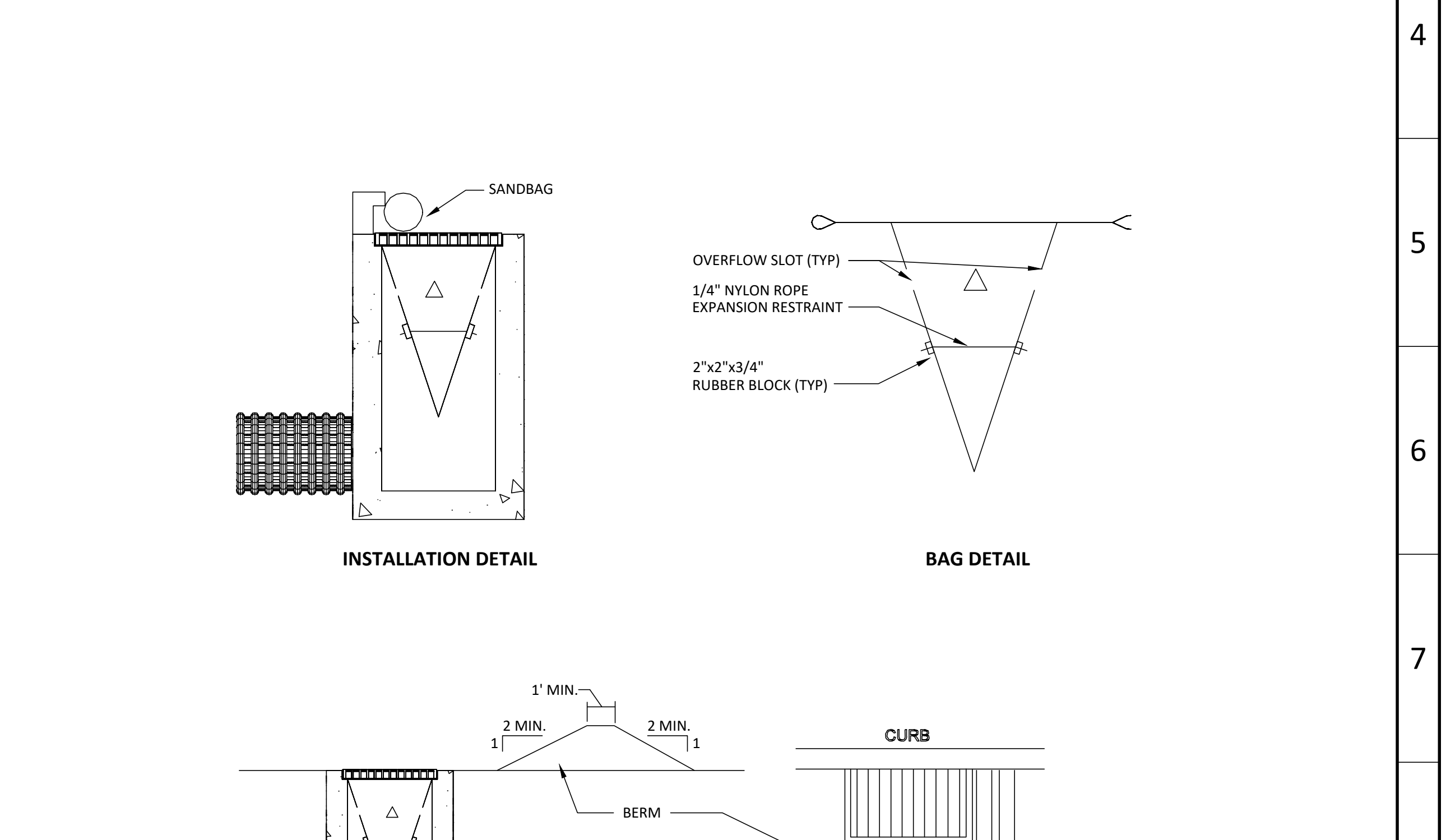
SEDIMENT CONTROL BAG FOR DEWATERING Scale: NTS Drawing: G007 Detail: 02



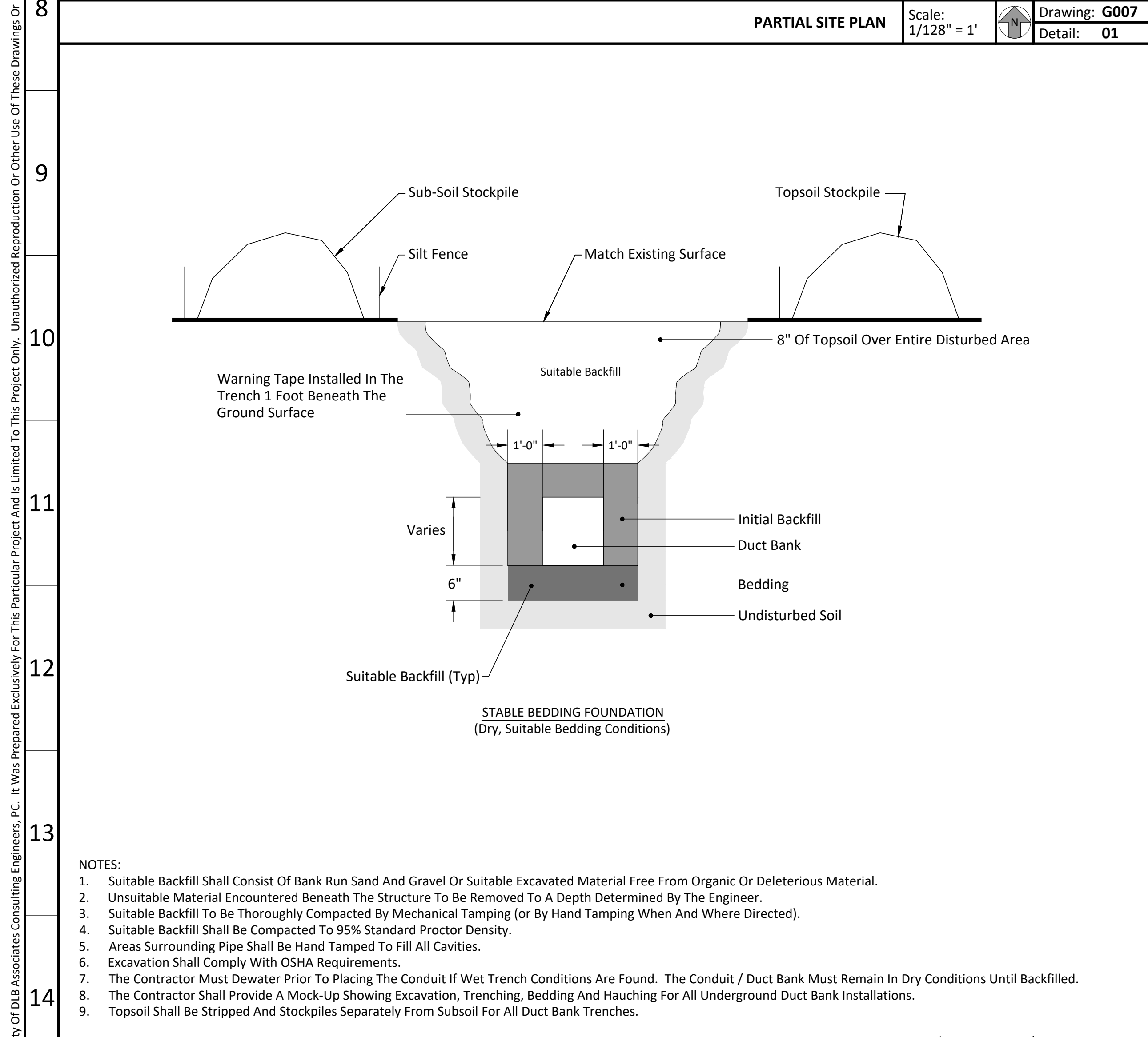
STOCKPILE PROTECTION PLAN Scale: NTS Drawing: G007 Detail: 03

- CONSTRUCTION SEQUENCE**
1. Install Silt Fence And Provide Inlet Protection - 5 Days
 2. Notify The Mercer County Soil Conservation District 48 Hours Prior To Any Disturbance
 3. Excavate Trenches Along Routings. Stockpile Topsoil Separately From Sub-Soil.
 4. Install Underground Duct Bank And Manholes
 5. Stabilize All Disturbed Areas Immediately After Conduit And Manhole Installations - (During The Duration Of Items #3 And 4)
 6. Maintain Soil Erosion And Sediment Control Measures
 7. Notify The Mercer County Soil Conservation District By Letter Requesting A Compliance Inspection
 8. Remove Inlet Protection And Silt Fence After All Disturbed Areas Have Been Stabilized - 5 Days
 9. Install Permanent Stabilization At All Areas Affected By Construction - 5 Days

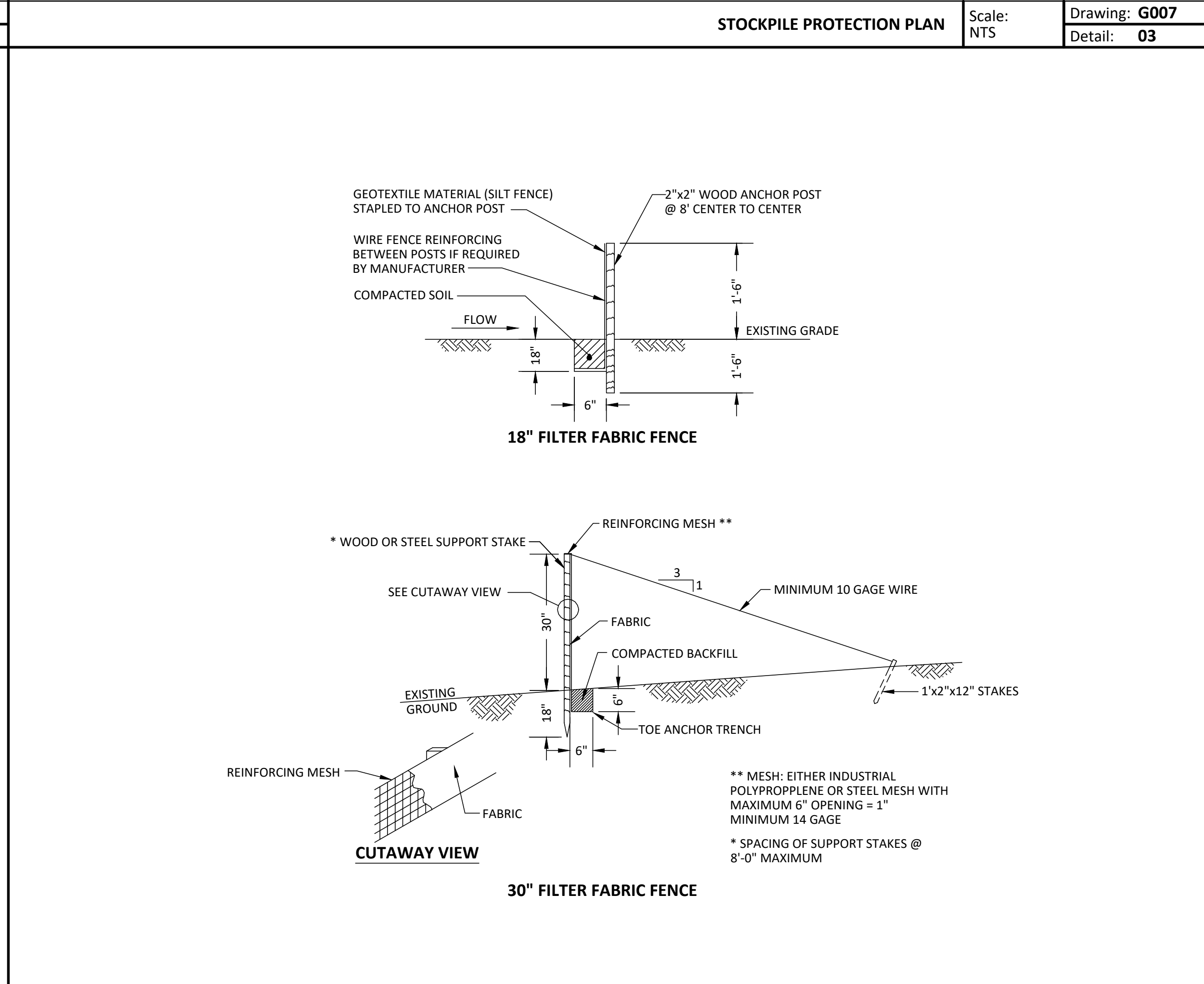
- GENERAL NOTES**
1. Unsuitable Soils Or Soils That Are Not Planned To Be Reused Shall Be Trucked Out And Dispose Of Immediately Upon Excavation. Soils Of This Category Shall NOT Be Stockpiled. Receipt For Proper Disposal Shall Be Provided To TCNJ Upon Removal.
 2. Where Practical, Soils Are Permitted To Be Stockpiled Next To The Trench As Shown In The Contract Documents. Soils Can Not Be Stockpiled Next To Trenches That Run Near Trees (Under Tree Drip Line) Or In Heavily Landscaped Areas.
 3. Upon Completion Of Excavation And Backfill, All Soils Related To The Work Performed Under This Scope Shall Be Removed From The Carlton Avenue Lot And Disposed Of In An Approved Manor. Provide Receipt Of Disposal To TCNJ For Record.
 4. The Carlton Avenue Lot Shall Be Restored To The Condition At The Time Of Bid Upon Completion Of The Project. This Includes Striping Where Damaged By Stockpiling.
 5. Prior To Use Of The Carlton Avenue Lot The Contractor Must Inspect And Provide Photo Documentation Of Existing Conditions For Restoration Purposes.
 6. Stockpile Is Only Permitted In Area Designated On This Plan. Carlton Avenue Lot Stockpile Shall Not Exceed The Noted 30'x60' Disruption Area At The South East Corner Of The Lot.
 7. Install And Maintain Silt Fence Around Stockpile And Tarp To Prevent Dirt From Getting Wet.



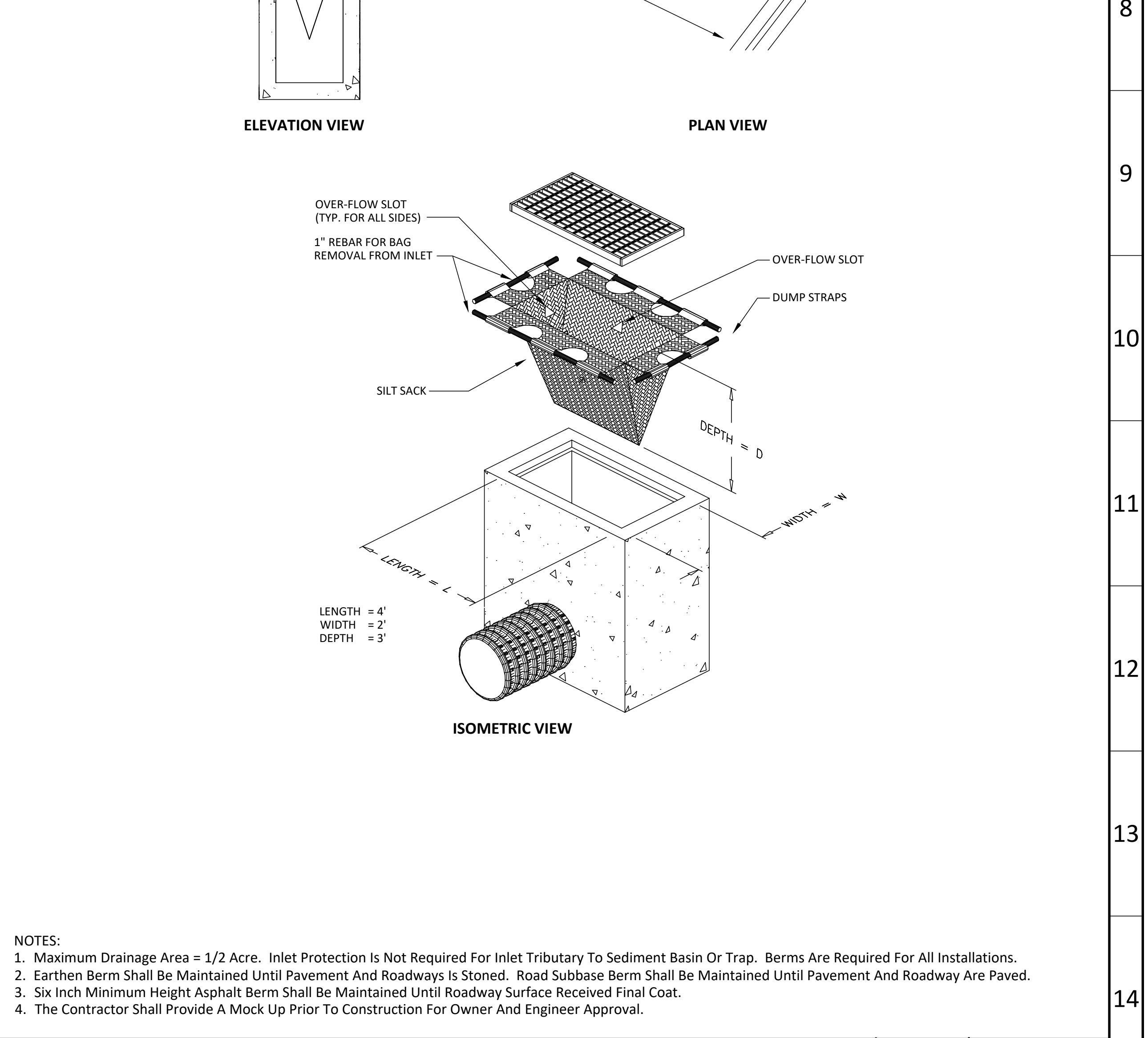
INSTALLATION DETAIL Scale: NTS Drawing: G007 Detail: 04



TRENCH STOCKPILE DETAIL Scale: NTS Drawing: G007 Detail: 04



FILTER FABRIC DETAIL Scale: NTS Drawing: G007 Detail: 05



EXISTING DRAINAGE SILK SACK DETAIL Scale: NTS Drawing: G007 Detail: 06

NOTES:

1. Suitable Backfill Shall Consist Of Bank Run Sand And Gravel Or Suitable Excavated Material Free From Organic Or Deleterious Material.
2. Unsuitable Material Encountered Beneath The Structure To Be Removed To A Depth Determined By The Engineer.
3. Suitable Backfill To Be Thoroughly Compacted By Mechanical Tamping (or By Hand Tamping When And Where Directed).
4. Suitable Backfill Shall Be Compacted To 95% Standard Proctor Density.
5. Areas Surrounding Pipe Shall Be Hand Tamped To Fill All Cavities.
6. Excavation Shall Comply With OSHA Requirements.
7. The Contractor Must Dewater Prior To Placing The Conduit If Wet Trench Conditions Are Found. The Conduit / Duct Bank Must Remain In Dry Conditions Until Backfilled.
8. The Contractor Shall Provide A Mock-Up Showing Excavation, Trenching, Bedding And Haunching For All Underground Duct Bank Installations.
9. Topsoil Shall Be Stripped And Stockpiled Separately From Subsoil For All Duct Bank Trenches.

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TCNJ THE COLLEGE OF NEW JERSEY

project: TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

title: SOIL STORAGE AND PROTECTION INFORMATION

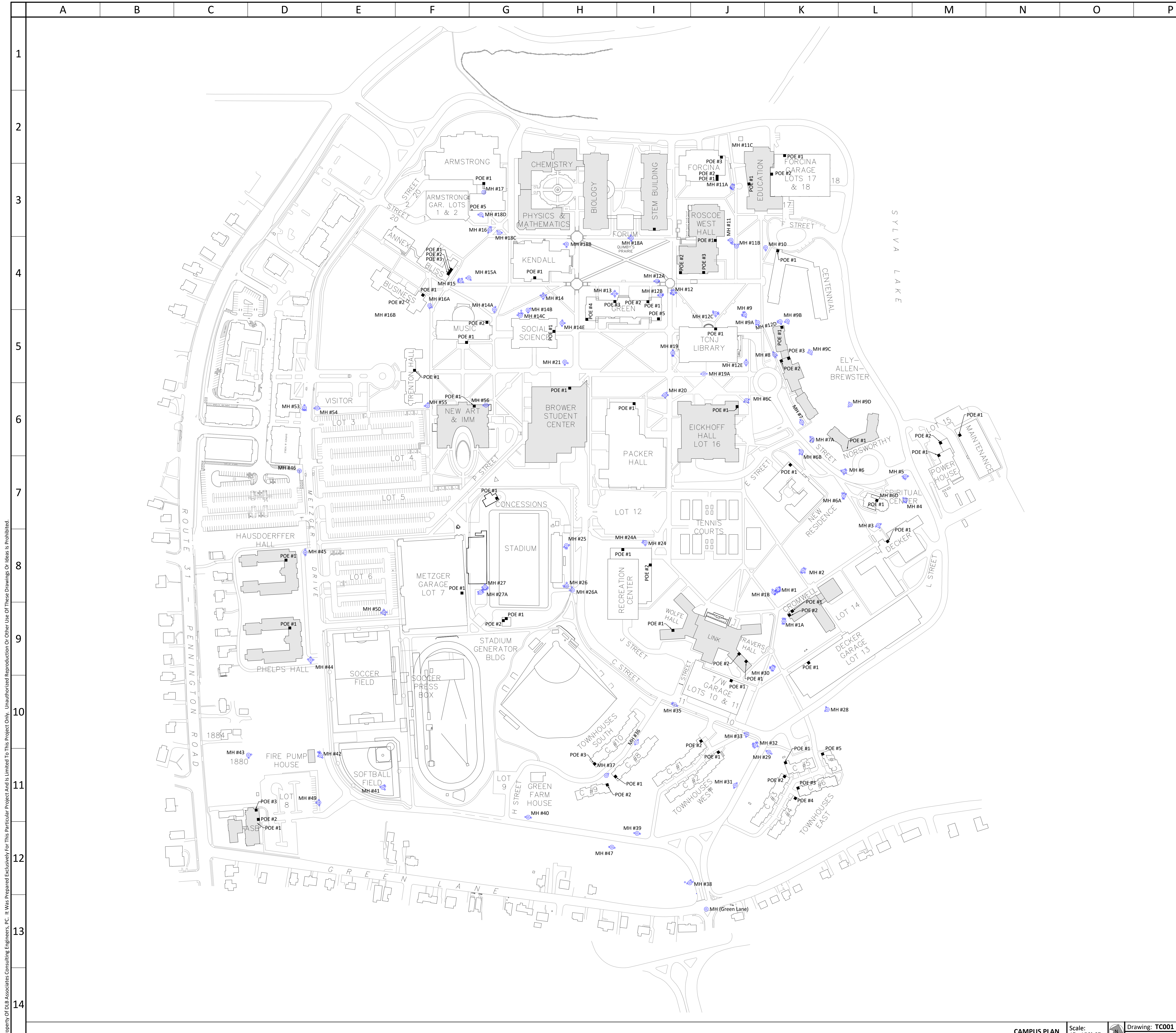
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checked by: ASL
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dwg. no. **G007**

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Fiber Routing			
Span ID	Starting Building	Ending Building	Fiber Cable (Strand Count) To Be Installed
1	Armstrong Hall	STEM Building	Yes 36
2	Bliss Hall	Kendall Hall	Yes 48
3	Business Building	Kendall Hall	No 24
4	Trenton Hall	Kendall Hall	No 36
5	Music Building	Kendall Hall	No 24
6	AIMM Building	Kendall Hall	N/A 0*
7	Social Science	Kendall Hall	Yes 36
8	Kendall Hall	Green Hall	Yes 144
9	Chemistry Building	STEM Building	N/A 0*
10	Physics Building	STEM Building	N/A 0*
11	Biology Building	STEM Building	N/A 0*
12	STEM Building	Green Hall	N/A 0*
13	Forcina Hall	Roscoe Hall	Yes 24
14	Forcina Hall Room 104 **	Forcina Hall Room 104 **	N/A 48/48
15	Education Building	Roscoe Hall	N/A 0*
16	Centennial Hall	Roscoe Hall	No 24
17	Gilstein Library	Roscoe Hall	No 36
18	Roscoe Hall	Green Hall	No 96
19	Norsworthy Hall	Ely-Allen-Brewster	N/A 0*
20	Spiritual Center	Ely-Allen-Brewster	No 24
21	Maintenance Building	Powerhouse	Yes 36
22	Powerhouse	Ely-Allen-Brewster	No 48
23	Decker Hall	Ely-Allen-Brewster	No 36
24	Ely-Allen-Brewster	Green Hall	No 192
25	New Residence Hall	Eickhoff Hall	No 24
26	Packer Hall	Eickhoff Hall	No 36
27	Brower Student Center	Eickhoff Hall	N/A 0*
28	Eickhoff Hall	Green Hall	No 96
29	TH1 (Town House West)	Cromwell Hall	No 48
30	TH2 21A/B (Town House East)	Cromwell Hall	No (2) 36
31	TH3 (Town House South)	Cromwell Hall	No 48
32	Travers Hall	Cromwell Hall	Yes 12
33	Wolfe Hall	Cromwell Hall	N/A 0*
34	Decker Garage	Cromwell Hall	Yes 24
35	Recreation Center	Cromwell Hall	No 36
36	Stadium Generator Building	Recreation Center	No 12
37	Stadium Concession Stand	Recreation Center	No 12
38	Soccer Field Press Box	Admin Splice	No 36
39	Metzger Garage	Admin Splice	No 24
40	Phelps Hall	Admin Splice	N/A 0*
41	Hausdoerffer Hall	Admin Splice	N/A 0*
42	Cromwell Hall	Green Hall	No 288
43	Travers/Wolfe Garage	Travers Hall	Yes 12
44	Forcina Garage	Education Building	No 12
45	Fire Pump House	Admin Services Building	No 12
46	Admin Services Building	Admin Splice	N/A 36
47	Eickhoff Room 227 **	Eickhoff Room 337 **	N/A 48/48

NOTES

- * - Existing Fiber Spare Capacity Available At MDF For Fire Alarm Cable.
- ** - Routing Shall Have Both A Single Mode Fiber Cable And A Multimode Fiber Cable.
- Contractor To Terminate All Fiber Strands On Both Ends Of Cable

GENERAL NOTES

- This Sheet's Purpose Is To Show An Overview Of Buildings That Have Spare Existing Fiber Capacity At The MDF For The Fire Alarm Panel. Refer To The Building Drawing Series For Scope Of Work Inside These Buildings. Those Buildings Are Identified By The Shaded Rows In The Table Above.

Identifier	Description	Identifier	Description
	Existing Manhole	MDF	Main Distribution Frame
		MH	Manhole
		MH#XX	Manhole Identification Tag
		POE	Point Of Entry
		WCH	Wall-Mounted Connector Housing

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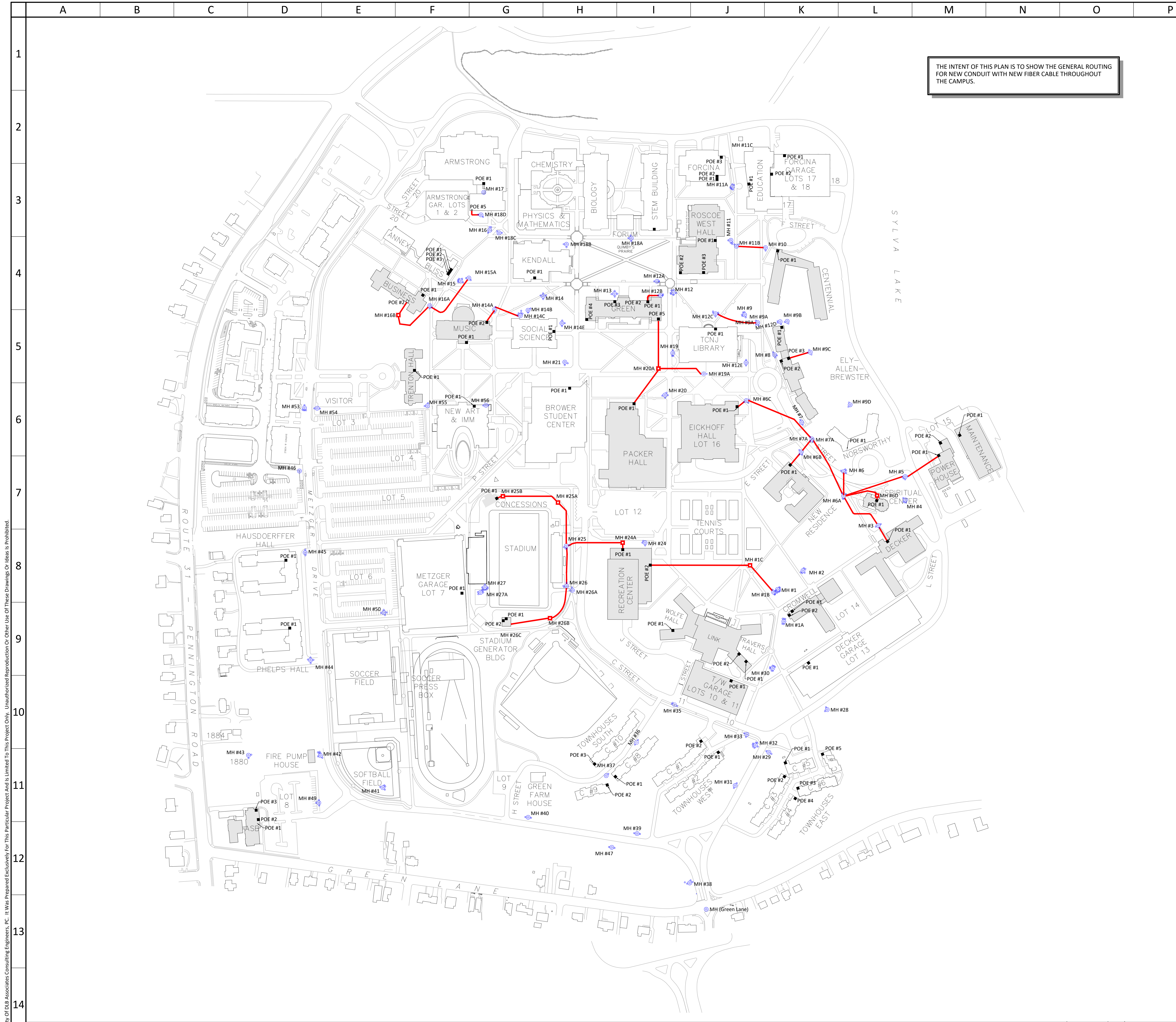
ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351
DLB Project ID: 47211

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdoum

CAMPUS PLAN Scale: 1" = 150'-0"
Drawing: TC001 Detail: 01
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title
CAMPUS OVERVIEW EXISTING FIBER
scale drawn by checked by date
SC SG 09/17/2021
dwg. no.
TC001



THE INTENT OF THIS PLAN IS TO SHOW THE GENERAL ROUTING FOR NEW CONDUIT WITH NEW FIBER CABLE THROUGHOUT THE CAMPUS.

Fiber Routing				
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable (Strand Count) To Be Installed
1	Armstrong Hall	STEM Building	Yes	36
2	Bliss Hall	Kendall Hall	Yes	48
3	Business Building	Kendall Hall	No	24
4	Trenton Hall	Kendall Hall	No	36
5	Music Building	Kendall Hall	No	24
	AIMM Building	Kendall Hall	N/A	0*
6	Social Science	Kendall Hall	Yes	36
7	Kendall Hall	Green Hall	Yes	144
	Chemistry Building	STEM Building	N/A	0*
	Physics Building	STEM Building	N/A	0*
	Biology Building	STEM Building	N/A	0*
	STEM Building	Green Hall	N/A	0*
8	Forcina Hall	Roscoe Hall	Yes	24
8A	Forcina Hall Room 104 **	Forcina Hall Room 101A	N/A	48/48
	Education Building	Roscoe Hall	N/A	0*
9	Centennial Hall	Roscoe Hall	No	24
10	Gilstein Library	Roscoe Hall	No	36
11	Roscoe Hall	Green Hall	No	96
	Norsworthy Hall	Ely-Allen-Brewster	N/A	0*
12	Spiritual Center	Ely-Allen-Brewster	No	24
13	Maintenance Building	Powerhouse	Yes	36
14	Powerhouse	Ely-Allen-Brewster	No	48
15	Decker Hall	Ely-Allen-Brewster	No	36
16	Ely-Allen-Brewster	Green Hall	No	192
17	New Residence Hall	Eickhoff Hall	No	24
18	Packer Hall	Eickhoff Hall	No	36
	Brower Student Center	Eickhoff Hall	N/A	0*
19	Eickhoff Hall	Green Hall	No	96
20	TH1 (Town House West)	Cromwell Hall	No	48
21	TH1 21A/B (Town House East)	Cromwell Hall	No	(2) 36
22	TH9 (Town House South)	Cromwell Hall	No	48
23	Travers Hall	Cromwell Hall	Yes	12
	Wolfe Hall	Cromwell Hall	N/A	0*
24	Decker Garage	Cromwell Hall	Yes	24
25	Recreation Center	Cromwell Hall	No	36
26	Stadium Generator Building	Recreation Center	No	12
27	Stadium Concession Stand	Recreation Center	No	12
28	Soccer Field Press Box	Admin Splice	No	36
29	Metzger Garage	Admin Splice	No	24
	Phelps Hall	Admin Splice	N/A	0*
	Hausdoerffer Hall	Admin Splice	N/A	0*
32	Cromwell Hall	Green Hall	No	288
33	Travers/Wolfe Garage	Travers Hall	Yes	12
34	Forcina Garage	Education Building	No	12
35	Fire Pump House	Admin Services Building	No	12
36	Admin Services Building	Admin Splice	N/A	36
41	Eickhoff Room 227 **	Eickhoff Room 337 **	N/A	48/48

- NOTES
- * - Existing Fiber Spare Capacity Available At MDF For Fire Alarm Cable.
 - ** - Routing Shall Have Both A Single Mode Fiber Cable And A Multimode Fiber Cable.
 - Contractor To Terminate All Fiber Strands On Both Ends Of Cable

- GENERAL NOTES
- This Sheet's Purpose Is To Show An Overview Of All The New Underground Conduit Duct Banks For The Campus. Those Buildings Are Identified By The Shaded Rows In The Table Above.
 - Contractor Shall Engage Private Utility Locating Service To Obtain Markout Of Existing Underground Utilities Using EM Scanning And GPR Methods. Provide TCNJ With Mapping Results Prior To Excavation.
 - Contractor Shall Open And Verify Entry Locations For New Conduit In Existing Manholes Prior To Extraction.
 - Duct Bank Routing Shown On This Plan Is Diagrammatic. Contractor Shall Be Responsible For Submitting A Routing Plan For Review. The Routing Plan Shall Include Proposed Routings For New Ducts And Entry Locations Into Buildings And Manholes. Routings Shall Be Based On GPR (Ground Penetrating Radar) And Field Conditions Conducted Prior To Excavation.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	Existing Manhole	MDF	Main Distribution Frame
	New Manhole	MH	Manhole
	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required	MH#XX	Manhole Identification Tag
	Building To Building Span Number	POE	Point Of Entry
	Building With New Conduit Connections	WCH	Wall-Mounted Connector Housing

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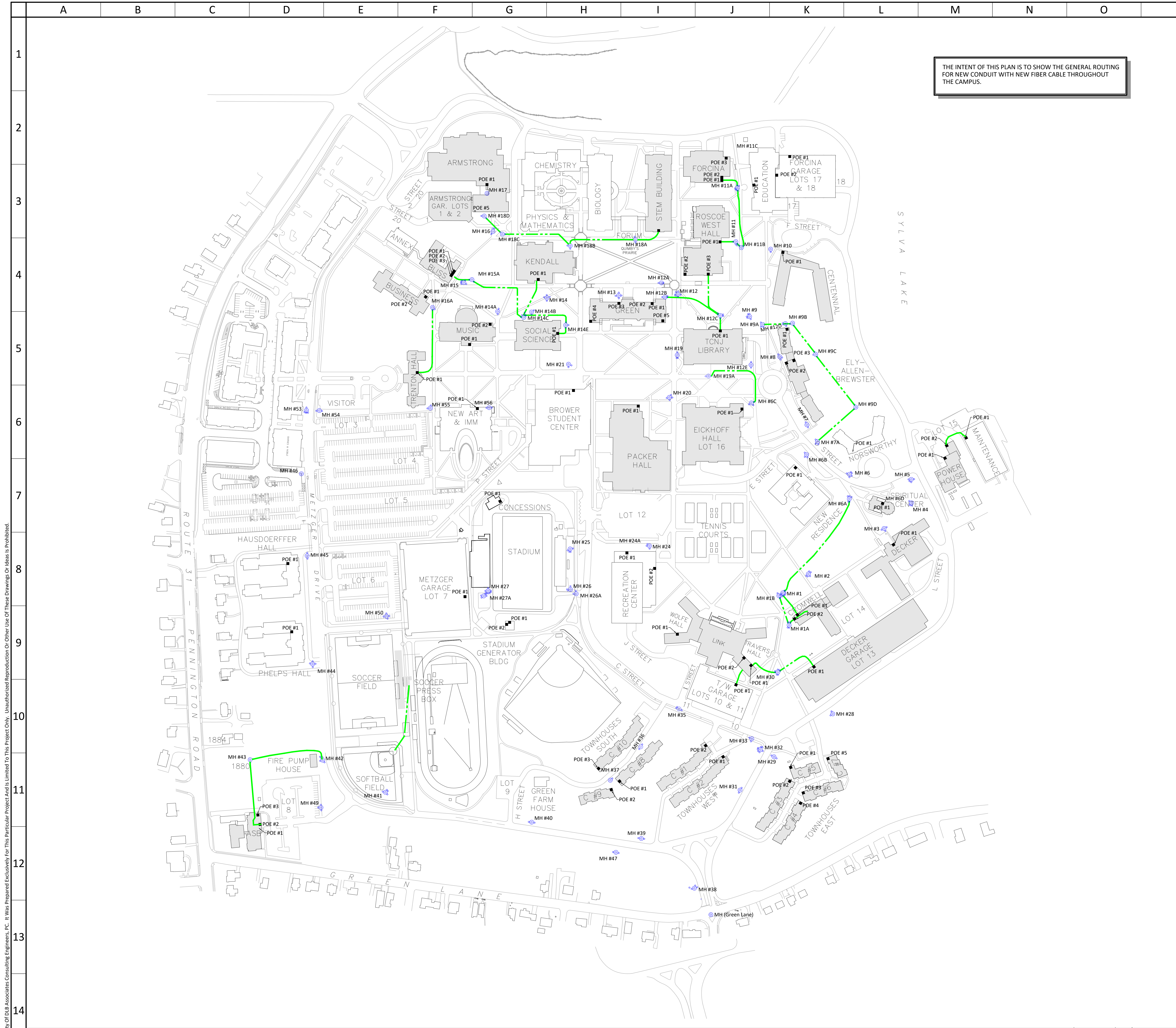
ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
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Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351
DLB Project ID: 47211

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdoum

CAMPUS PLAN Scale: 1"=150'-0"
Drawing: TC002 Detail: 01
project TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

title CAMPUS OVERVIEW NEW FIBER & NEW CONDUIT
scale AS SHOWN drawn by SC checked by SG date 09/17/2021
dwg. no. **TC002**



THE INTENT OF THIS PLAN IS TO SHOW THE GENERAL ROUTING FOR NEW CONDUIT WITH NEW FIBER CABLE THROUGHOUT THE CAMPUS.

Fiber Routing			
Span ID	Starting Building	Ending Building	Fiber Cable (Strand Count) To Be Installed
1	Armstrong Hall	STEM Building	Yes 36
2	Bliss Hall	Kendall Hall	Yes 48
3	Business Building	Kendall Hall	No 24
4	Trenton Hall	Kendall Hall	No 36
5	Music Building	Kendall Hall	No 24
6	AIMM Building	Kendall Hall	N/A 0*
7	Social Science	Kendall Hall	Yes 36
8	Kendall Hall	Green Hall	Yes 144
9	Chemistry Building	STEM Building	N/A 0*
10	Physics Building	STEM Building	N/A 0*
11	Biology Building	STEM Building	N/A 0*
12	STEM Building	Green Hall	N/A 0*
13	Forcina Hall	Roscoe Hall	Yes 24
14	Forcina Hall Room 104 **	Forcina Hall Room 104	N/A 48/48
15	Education Building	Roscoe Hall	N/A 0*
16	Centennial Hall	Roscoe Hall	No 24
17	Gilstein Library	Roscoe Hall	No 36
18	Roscoe Hall	Green Hall	No 96
19	Norsworthy Hall	Ely-Allen-Brewster	N/A 0*
20	Spiritual Center	Ely-Allen-Brewster	No 24
21	Maintenance Building	Powerhouse	Yes 36
22	Powerhouse	Ely-Allen-Brewster	No 48
23	Decker Hall	Ely-Allen-Brewster	No 36
24	Ely-Allen-Brewster	Green Hall	No 192
25	New Residence Hall	Eickhoff Hall	No 24
26	Packer Hall	Eickhoff Hall	No 36
27	Brower Student Center	Eickhoff Hall	N/A 0*
28	Eickhoff Hall	Green Hall	No 96
29	TH1 (Town House West)	Cromwell Hall	No 48
30	TH2 21A/B (Town House East)	Cromwell Hall	No (2) 36
31	TH3 (Town House South)	Cromwell Hall	No 48
32	Travers Hall	Cromwell Hall	Yes 12
33	Wolfe Hall	Cromwell Hall	N/A 0*
34	Decker Garage	Cromwell Hall	Yes 24
35	Recreation Center	Cromwell Hall	No 36
36	Stadium Generator Building	Recreation Center	No 12
37	Stadium Concession Stand	Recreation Center	No 12
38	Soccer Field Press Box	Admin Splice	No 36
39	Metzger Garage	Admin Splice	No 24
40	Pelphs Hall	Admin Splice	N/A 0*
41	Hausdoerffer Hall	Admin Splice	N/A 0*
42	Cromwell Hall	Green Hall	No 288
43	Travers/Wolfe Garage	Travers Hall	Yes 12
44	Forcina Garage	Education Building	No 12
45	Fire Pump House	Admin Services Building	No 12
46	Admin Services Building	Admin Splice	N/A 36
47	Eickhoff Room 227 **	Eickhoff Room 337 **	N/A 48/48

NOTES
 1. * - Existing Fiber Spare Capacity Available At MDF For Fire Alarm Cable.
 2. ** - Routing Shall Have Both A Single Mode Fiber Cable And A Multimode Fiber Cable.
 3. Contractor To Terminate All Fiber Strands On Both Ends Of Cable

GENERAL NOTES
 1. This Sheet's Purpose Is To Show An Overview Of The Existing Underground Conduit Duct Banks With Available Spare Conduits That Are Proposed To Be Utilized For New Fiber Cables. Those Buildings Are Identified By The Shaded Rows In The Table Above.
 2. Contractor Shall Clean The Existing Conduits Using Wire Brush Mandrill And Rubber Duct Swab Prior To Cable Installation.

Identifier	Description	Identifier	Description
	Existing Manhole	MDF	Main Distribution Frame
	New Manhole	MH	Manhole
	Existing Conduit Pathway Available For New Fiber Installation	MH#XX	Manhole Identification Tag
	Building To Building Span Number	POE	Point Of Entry
	Building With New Conduit Connections	WCH	Wall-Mounted Connector Housing

CAMPUS PLAN Scale: 1" = 150'-0" Drawing: TC003 Detail: 01

30x42

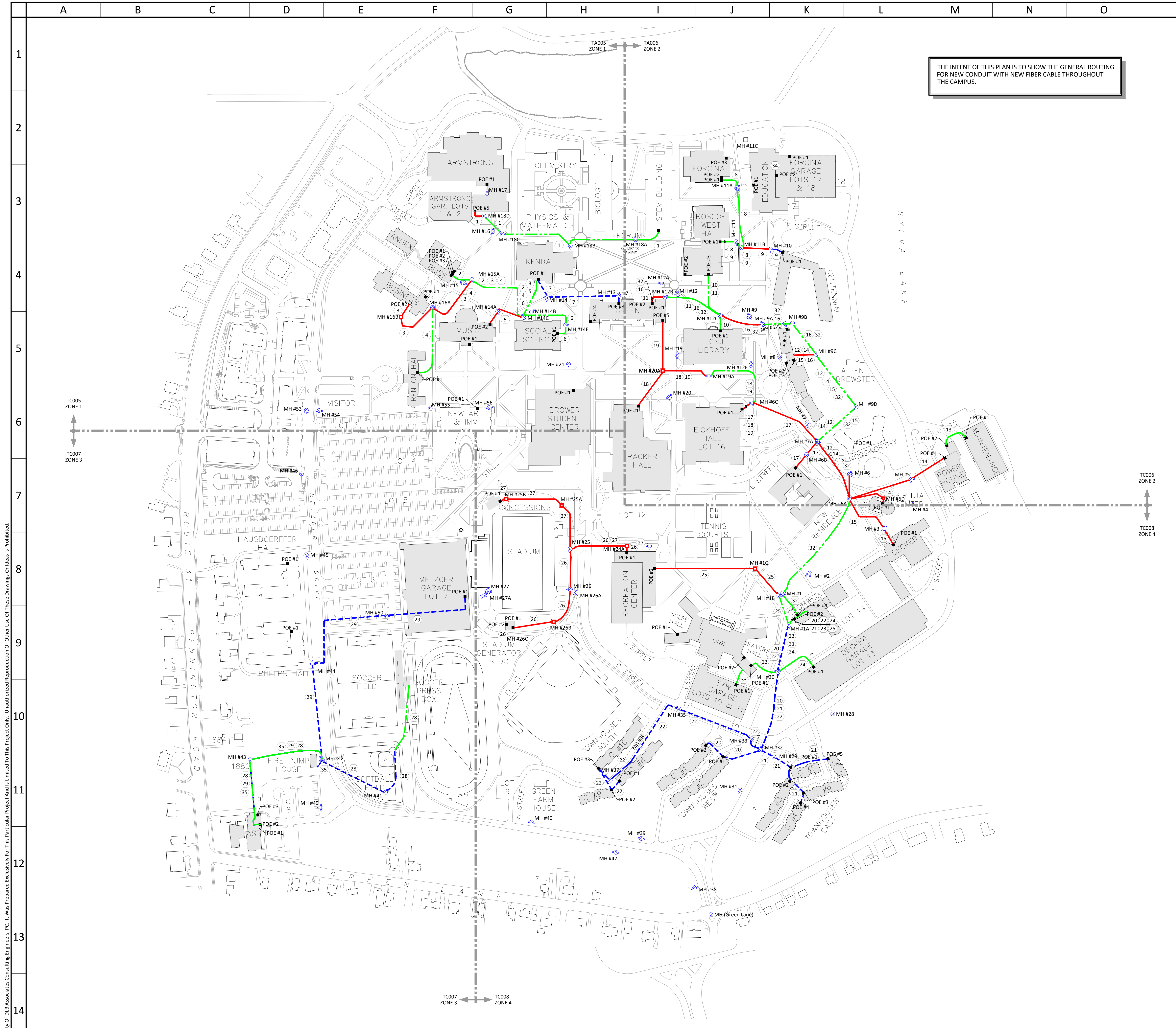
ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
 CONSULTING ENGINEERS, P.C.
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 DLB Project ID: 47211

TCNJ THE COLLEGE OF NEW JERSEY
 TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdoum

project
 TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD, EWING NJ, 08618

title
 CAMPUS OVERVIEW
 NEW FIBER IN EXISTING EMPTY CONDUIT
 scale AS SHOWN drawn by SC checked by SG date 09/17/2021
 dwg. no. **TC003**



THE INTENT OF THIS PLAN IS TO SHOW THE GENERAL ROUTING FOR NEW CONDUIT WITH NEW FIBER CABLE THROUGHOUT THE CAMPUS.

Fiber Routing				
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable (Strand Count) To Be Installed
1	Armstrong Hall	STEM Building	Yes	36
2	Bliss Hall	Kendall Hall	Yes	48
3	Business Building	Kendall Hall	No	24
4	Trenton Hall	Kendall Hall	No	36
5	Music Building	Kendall Hall	No	24
6	AIMM Building	Kendall Hall	N/A	0*
7	Social Science	Kendall Hall	Yes	36
8	Kendall Hall	Green Hall	Yes	144
9	Chemistry Building	STEM Building	N/A	0*
10	Physics Building	STEM Building	N/A	0*
11	Biology Building	STEM Building	N/A	0*
12	STEM Building	Green Hall	N/A	0*
13	Forcina Hall	Roscoe Hall	Yes	24
14	Forcina Hall Room 104 **	Forcina Hall Room 104	N/A	48/48
15	Education Building	Roscoe Hall	N/A	0*
16	Centennial Hall	Roscoe Hall	No	24
17	Gilstein Library	Roscoe Hall	No	36
18	Roscoe Hall	Green Hall	No	96
19	Norsworthy Hall	Ely-Allen-Brewster	N/A	0*
20	Spiritual Center	Ely-Allen-Brewster	No	24
21	Maintenance Building	Powerhouse	Yes	36
22	Powerhouse	Ely-Allen-Brewster	No	48
23	Decker Hall	Ely-Allen-Brewster	No	36
24	Ely-Allen-Brewster	Green Hall	No	192
25	New Residence Hall	Eickhoff Hall	No	24
26	Packer Hall	Eickhoff Hall	No	36
27	Brower Student Center	Eickhoff Hall	N/A	0*
28	Eickhoff Hall	Green Hall	No	96
29	TH1 (Town House West)	Cromwell Hall	No	48
30	TH2 21A/B (Town House East)	Cromwell Hall	No	(2) 36
31	TH3 (Town House South)	Cromwell Hall	No	48
32	Travers Hall	Cromwell Hall	Yes	12
33	Wolfe Hall	Cromwell Hall	N/A	0*
34	Decker Garage	Cromwell Hall	Yes	24
35	Recreation Center	Cromwell Hall	No	36
36	Stadium Generator Building	Recreation Center	No	12
37	Stadium Concession Stand	Recreation Center	No	12
38	Soccer Field Press Box	Admin Splice	No	36
39	Metzger Garage	Admin Splice	No	24
40	Phelps Hall	Admin Splice	N/A	0*
41	Hausdoerffer Hall	Admin Splice	N/A	0*
42	Cromwell Hall	Green Hall	No	288
43	Travers/Wolfe Garage	Travers Hall	Yes	12
44	Forcina Garage	Education Building	No	12
45	Fire Pump House	Admin Services Building	No	12
46	Admin Services Building	Admin Splice	N/A	36
47	Eickhoff Room 227 **	Eickhoff Room 337 **	N/A	48/48

- NOTES
- * - Existing Fiber Spare Capacity Available At MDF For Fire Alarm Cable.
 - ** - Routing Shall Have Both A Single Mode Fiber Cable And A Multimode Fiber Cable.
 - Contractor To Terminate All Fiber Strands On Both Ends Of Cable

GENERAL NOTES

- This Sheet's Purpose Is To Show An Overview Of All The New And Existing Duct Bank Routing Within Scope For The Campus. Those Buildings Are Identified By The Shaded Rows In The Table Above.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
⊙	Existing Manhole	Ⓧ	Detail Identifier
■	New Manhole	Ⓧ#	Drawing # (Detail Location)
---	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway	Ⓧ	Detail #
---	Existing Conduit Pathway Available For New Fiber Installation	Ⓧ	Photo Identification Tag
---	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required	MDF	Main Distribution Frame
Ⓧ	Building To Building Span Number	MH	Manhole
Ⓧ	Building With New Conduit Connections	MH#XX	Manhole Identification Tag
		POE	Point Of Entry
		WCH	Wall-Mounted Connector Housing

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

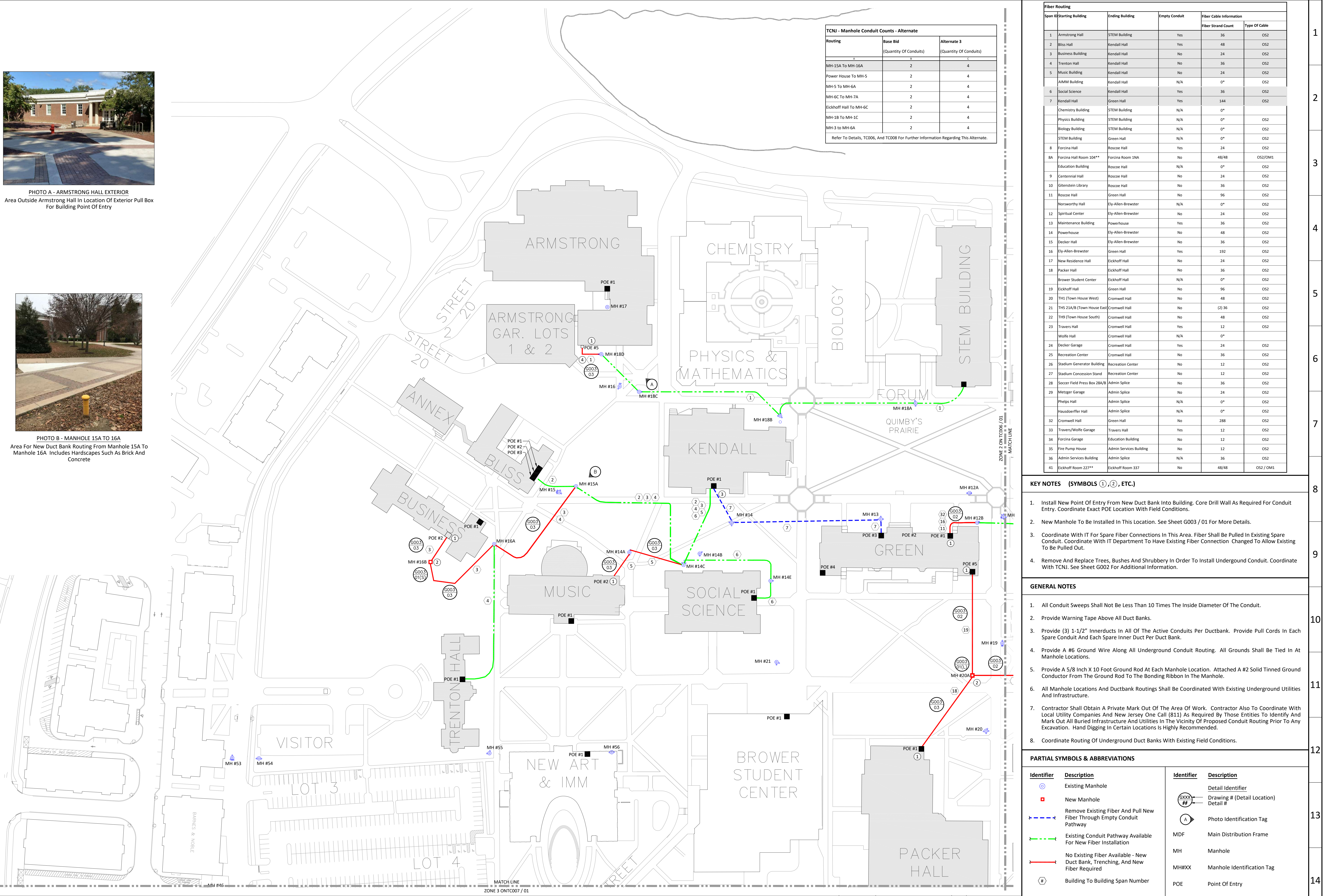
Scale	Scale	Scale
CAMPUS PLAN	Scale: 1" = 150'-0"	Drawing: TC004
		Detail: 01

dlb associates
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TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdoum

TCNJ THE COLLEGE OF NEW JERSEY
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

scale	drawn by	checked by	date
AS SHOWN	SC	SG	09/17/2021

title	dwg. no.
CAMPUS FIRE ALARM FIBER OVERVIEW	TC004



TCNJ - Manhole Counts - Alternate		
Routing	Base Bid (Quantity Of Conduits)	Alternate 3 (Quantity Of Conduits)
MH-15A To MH-16A	2	4
Power House To MH-5	2	4
MH-5 To MH-6A	2	4
MH-6C To MH-7A	2	4
Eickhoff Hall To MH-6C	2	4
MH-1B To MH-1C	2	4
MH-3 To MH-6A	2	4

Refer To Details, TC006, And TC008 For Further Information Regarding This Alternate.



PHOTO A - ARMSTRONG HALL EXTERIOR
Area Outside Armstrong Hall In Location Of Exterior Pull Box For Building Point Of Entry



PHOTO B - MANHOLE 15A TO 16A
Area For New Duct Bank Routing From Manhole 15A To Manhole 16A Includes Hardscapes Such As Brick And Concrete

Fiber Routing				
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information
				Fiber Strand Count Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36 052
2	Bliss Hall	Kendall Hall	Yes	48 052
3	Business Building	Kendall Hall	No	24 052
4	Trenton Hall	Kendall Hall	No	36 052
5	Music Building	Kendall Hall	No	24 052
6	AJMM Building	Kendall Hall	N/A	0* 052
7	Social Science	Kendall Hall	Yes	36 052
8	Kendall Hall	Green Hall	Yes	144 052
9	Chemistry Building	STEM Building	N/A	0*
10	Physics Building	STEM Building	N/A	0* 052
11	Biology Building	STEM Building	N/A	0* 052
12	STEM Building	Green Hall	N/A	0* 052
13	Forcina Hall	Roscoe Hall	Yes	24 052
14	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48 052/OM1
15	Education Building	Roscoe Hall	N/A	0* 052
16	Centennial Hall	Roscoe Hall	No	24 052
17	Gitenstein Library	Roscoe Hall	No	36 052
18	Roscoe Hall	Green Hall	No	96 052
19	Norsworthy Hall	Ely-Allen-Brewster	N/A	0* 052
20	Spiritual Center	Ely-Allen-Brewster	No	24 052
21	Maintenance Building	Powerhouse	Yes	36 052
22	Powerhouse	Ely-Allen-Brewster	No	48 052
23	Decker Hall	Ely-Allen-Brewster	No	36 052
24	Ely-Allen-Brewster	Green Hall	Yes	192 052
25	New Residence Hall	Eickhoff Hall	No	24 052
26	Packer Hall	Eickhoff Hall	No	36 052
27	Brower Student Center	Eickhoff Hall	N/A	0* 052
28	Eickhoff Hall	Green Hall	No	96 052
29	TH1 (Town House West)	Cromwell Hall	No	48 052
30	TH5 21A/B (Town House East)	Cromwell Hall	No	(2) 36 052
31	TH9 (Town House South)	Cromwell Hall	No	48 052
32	Travers Hall	Cromwell Hall	Yes	12 052
33	Wolfe Hall	Cromwell Hall	N/A	0* 052
34	Decker Garage	Cromwell Hall	Yes	24 052
35	Recreation Center	Cromwell Hall	No	36 052
36	Stadium Generator Building	Recreation Center	No	12 052
37	Stadium Concession Stand	Recreation Center	No	12 052
38	Soccer Field Press Box 28A/B	Admin Splice	No	36 052
39	Metzger Garage	Admin Splice	No	24 052
40	Phelps Hall	Admin Splice	N/A	0* 052
41	Hausdoerffer Hall	Admin Splice	N/A	0* 052
42	Cromwell Hall	Green Hall	No	288 052
43	Travers/Wolfe Garage	Travers Hall	Yes	12 052
44	Forcina Garage	Education Building	No	12 052
45	Fire Pump House	Admin Services Building	No	12 052
46	Admin Services Building	Admin Splice	N/A	36 052
47	Eickhoff Room 227**	Eickhoff Room 337	No	48/48 052 / OM1

KEY NOTES (SYMBOLS ①, ②, ETC.)

1. Install New Point Of Entry From New Duct Bank Into Building. Core Drill Wall As Required For Conduit Entry. Coordinate Exact POE Location With Field Conditions.
2. New Manhole To Be Installed In This Location. See Sheet G003 / 01 For More Details.
3. Coordinate With IT For Spare Fiber Connections In This Area. Fiber Shall Be Pulled In Existing Spare Conduit. Coordinate With IT Department To Have Existing Fiber Connection Changed To Allow Existing To Be Pulled Out.
4. Remove And Replace Trees, Bushes And Shrubbery In Order To Install Underground Conduit. Coordinate With TCNJ. See Sheet G002 For Additional Information.

GENERAL NOTES

1. All Conduit Sweeps Shall Not Be Less Than 10 Times The Inside Diameter Of The Conduit.
2. Provide Warning Tape Above All Duct Banks.
3. Provide (3) 1-1/2" Innerducts In All Of The Active Conduits Per Ductbank. Provide Pull Cords In Each Spare Conduit And Each Spare Inner Duct Per Duct Bank.
4. Provide A #6 Ground Wire Along All Underground Conduit Routing. All Grounds Shall Be Tied In At Manhole Locations.
5. Provide A 5/8 Inch X 10 Foot Ground Rod At Each Manhole Location. Attached A #2 Solid Tinned Ground Conductor From The Ground Rod To The Bonding Ribbon In The Manhole.
6. All Manhole Locations And Ductbank Routings Shall Be Coordinated With Existing Underground Utilities And Infrastructure.
7. Contractor Shall Obtain A Private Mark Out Of The Area Of Work. Contractor Also To Coordinate With Local Utility Companies And New Jersey One Call (811) As Required By Those Entities To Identify And Mark Out All Buried Infrastructure And Utilities In The Vicinity Of Proposed Conduit Routing Prior To Any Excavation. Hand Digging In Certain Locations Is Highly Recommended.
8. Coordinate Routing Of Underground Duct Banks With Existing Field Conditions.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
⊙	Existing Manhole	⊙	Detail Identifier
■	New Manhole	⊙	Drawing # (Detail Location) Detail #
⚡	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway	⊙	Photo Identification Tag
⚡	Existing Conduit Pathway Available For New Fiber Installation	MDF	Main Distribution Frame
⚡	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required	MH	Manhole
⊙	Building To Building Span Number	MHXX	Manhole Identification Tag
		POE	Point Of Entry

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ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IX124 TCNJ Project Manager: Mumtaz Makhdoumi

CAMPUS FIBER PART PLAN
Scale: 1/64"=1'-0"
16' 32' 64' 128'
Drawing: TC005
Detail: 01

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

title
CAMPUS CONDUIT ROUTING PLAN ZONE 1

scale AS SHOWN
drawn by SC
checked by SG
date 09/17/2021

dwg. no.
TC005



PHOTO A - MAINTENANCE BUILDING TO POWER HOUSE
Location For New Duct Bank And Fiber Between The Maintenance Building And The Power House. Route Includes Hardscapes Such As Brick And Concrete.



PHOTO D - OUTSIDE NEW LIBRARY
Location For New Manhole And Duct Bank Routing From New Library To Green Hall. Route Includes Hardscapes Such As Brick And Concrete.



PHOTO C - OUTSIDE EAB
Location For New Manhole And Duct Bank Routing Directly South Of EAB. Route Includes Hardscapes Such As Brick And Concrete.



PHOTO E - NORTH EAB
Location For New Manhole And Duct Bank Routing From New Manhole North Of EAB To Manhole 12C. Route Includes Hardscapes Such As Brick And Concrete.

TCNJ - Manhole Conduit Counts - Alternate

Routing	Base Bid (Quantity Of Conduits)	Alternate 3 (Quantity Of Conduits)
MH-15A To MH-16A	2	4
Power House To MH-5	2	4
MH-5 To MH-6A	2	4
MH-6C To MH-7A	2	4
Eickhoff Hall To MH-6C	2	4
MH-18 To MH-1C	2	4
MH-3 to MH-6A	2	4

Refer To Details, TC006, And TC008 For Further Information Regarding This Alternate.

Fiber Routing

Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information	
				Fiber Strand Count	Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36	OS2
2	Bliss Hall	Kendall Hall	Yes	48	OS2
3	Business Building	Kendall Hall	No	24	OS2
4	Trenton Hall	Kendall Hall	No	36	OS2
5	Music Building	Kendall Hall	No	24	OS2
6	AIMM Building	Kendall Hall	N/A	0*	OS2
7	Social Science	Kendall Hall	Yes	36	OS2
8	Kendall Hall	Green Hall	Yes	144	OS2
9	Chemistry Building	STEM Building	N/A	0*	OS2
10	Physics Building	STEM Building	N/A	0*	OS2
11	Biology Building	STEM Building	N/A	0*	OS2
12	STEM Building	Green Hall	N/A	0*	OS2
13	Forcina Hall	Roscoe Hall	Yes	24	OS2
14	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48	OS2/OM1
15	Education Building	Roscoe Hall	N/A	0*	OS2
16	Centennial Hall	Roscoe Hall	No	24	OS2
17	Giesen Library	Roscoe Hall	No	36	OS2
18	Roscoe Hall	Green Hall	No	96	OS2
19	Norsworthy Hall	Ely-Allen-Brewster	N/A	0*	OS2
20	Spiritual Center	Ely-Allen-Brewster	No	24	OS2
21	Maintenance Building	Powerhouse	Yes	36	OS2
22	Powerhouse	Ely-Allen-Brewster	No	48	OS2
23	Decker Hall	Ely-Allen-Brewster	No	36	OS2
24	Ely-Allen-Brewster	Green Hall	Yes	192	OS2
25	New Residence Hall	Eickhoff Hall	No	24	OS2
26	Packer Hall	Eickhoff Hall	No	36	OS2
27	Brower Student Center	Eickhoff Hall	N/A	0*	OS2
28	Eickhoff Hall	Green Hall	No	96	OS2
29	TH1 (Town House West)	Cromwell Hall	No	48	OS2
30	TH2 23A/B (Town House East)	Cromwell Hall	No	(2) 36	OS2
31	TH3 (Town House South)	Cromwell Hall	No	48	OS2
32	Travers Hall	Cromwell Hall	Yes	12	OS2
33	Wolfe Hall	Cromwell Hall	N/A	0*	OS2
34	Decker Garage	Cromwell Hall	Yes	24	OS2
35	Recreation Center	Cromwell Hall	No	36	OS2
36	Stadium Generator Building	Recreation Center	No	12	OS2
37	Stadium Concession Stand	Recreation Center	No	12	OS2
38	Soccer Field Press Box 28A/B	Admin Splice	No	36	OS2
39	Metzger Garage	Admin Splice	No	24	OS2
40	Phelps Hall	Admin Splice	N/A	0*	OS2
41	Hausdoerffer Hall	Admin Splice	N/A	0*	OS2
42	Cromwell Hall	Green Hall	No	288	OS2
43	Travers/Wolfe Garage	Travers Hall	Yes	12	OS2
44	Forcina Garage	Education Building	No	12	OS2
45	Fire Pump House	Admin Services Building	No	12	OS2
46	Admin Services Building	Admin Splice	N/A	36	OS2
47	Eickhoff Room 227**	Eickhoff Room 237	No	48/48	OS2 / OM1

KEY NOTES (SYMBOLS ①, ②, ETC.)

1. Install New Point Of Entry From New Duct Bank Into Building. Core Drill Wall As Required For Conduit Entry. Coordinate Exact POE Location With Field Conditions.
2. New Manhole To Be Installed In This Location. See Sheet G003 / 01 For More Details.
3. Coordinate With IT For Spare Fiber Connections In This Area. Fiber Shall Be Pulled In Existing Spare Conduit. Coordinate With IT Department To Have Existing Fiber Connection Changed To Allow Existing To Be Pulled Out.
4. Remove And Replace Trees, Bushes And Shrubbery In Order To Install Underground Conduit. Coordinate With TCNJ. See Sheet G002 For Additional Information.

GENERAL NOTES

1. All Conduit Sweeps Shall Not Be Less Than 10 Times The Inside Diameter Of The Conduit.
2. Provide Warning Tape Above All Duct Banks.
3. Provide (3) 1-1/2" Innerducts In All Of The Active Conduits Per Ductbank. Provide Pull Cords In Each Spare Conduit And Each Spare Inner Duct Per Duct Bank.
4. Provide A #6 Ground Wire Along All Underground Conduit Routing. All Grounds Shall Be Tied In At Manhole Locations.
5. Provide A 5/8 Inch X 10 Foot Ground Rod At Each Manhole Location. Attached A #2 Solid Tinned Ground Conductor From The Ground Rod To The Bonding Ribbon In The Manhole.
6. All Manhole Locations And Ductbank Routings Shall Be Coordinated With Existing Underground Utilities And Infrastructure.
7. All Ductbanks Shall Be Encased In Flowable Fill.
8. Contractor Shall Obtain A Private Mark Out Of The Area Of Work. Contractor Also To Coordinate With Local Utility Companies And New Jersey One Call (811) As Required By Those Entities To Identify And Mark Out All Buried Infrastructure And Utilities In The Vicinity Of Proposed Conduit Routing Prior To Any Excavation. Hand Digging In Certain Locations Is Highly Recommended.
9. Coordinate Routing Of Underground Duct Banks With Existing Field Conditions.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
⊙	Existing Manhole	ⓧ	Detail Identifier
■	New Manhole	ⓧ#	Drawing # (Detail Location)
⚡	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway	ⓐ	Photo Identification Tag
⚡	Existing Conduit Pathway Available For New Fiber Installation	MDF	Main Distribution Frame
⚡	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required	MH	Manhole
ⓧ	Building To Building Span ID	MH#XX	Manhole Identification Tag
		POE	Point Of Entry

This Drawing Is The Property Of DLB Associates Consulting Engineers, P.C. It Was Prepared Exclusively For This Particular Project And Is Limited To This Project Only. Unauthorized Reproduction Or Other Use Of These Drawings Or Ideas Is Prohibited.

30x42

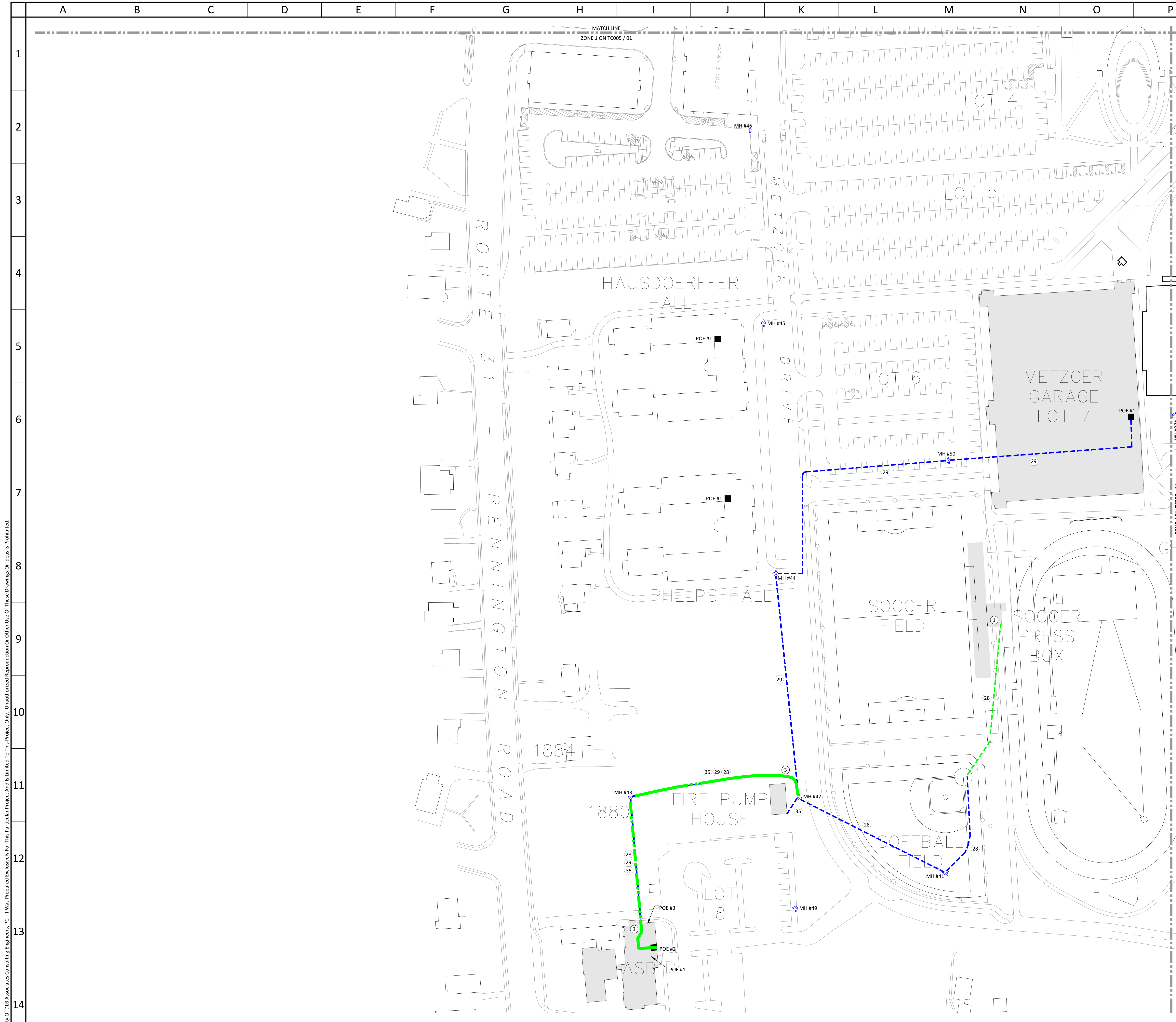
ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IC124 TCNJ Project Manager: Mumtaz Makhdomi

CAMPUS FIBER PART PLAN
Scale: 1/64"=1'-0"
16' 32' 64' 128'
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

CAMPUS CONDUIT ROUTING PLAN
ZONE 2
Drawing: TC006
Detail: 01
title
CAMPUS CONDUIT ROUTING PLAN
ZONE 2
scale AS SHOWN
drawn by SC
checked by SG
date 09/17/2021
dwg. no.
TC006
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Fiber Routing				
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information
				Fiber Strand Count Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36 OS2
2	Bliss Hall	Kendall Hall	Yes	48 OS2
3	Business Building	Kendall Hall	No	24 OS2
4	Trenton Hall	Kendall Hall	No	36 OS2
5	Music Building	Kendall Hall	No	24 OS2
	AIMM Building	Kendall Hall	N/A	0* OS2
6	Social Science	Kendall Hall	Yes	36 OS2
7	Kendall Hall	Green Hall	Yes	144 OS2
	Chemistry Building	STEM Building	N/A	0* OS2
	Physics Building	STEM Building	N/A	0* OS2
	Biology Building	STEM Building	N/A	0* OS2
	STEM Building	Green Hall	N/A	0* OS2
8	Forcina Hall	Roscoe Hall	Yes	24 OS2
8A	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48 OS2/OM1
	Education Building	Roscoe Hall	N/A	0* OS2
9	Centennial Hall	Roscoe Hall	No	24 OS2
10	Gitenstein Library	Roscoe Hall	No	36 OS2
11	Roscoe Hall	Green Hall	No	96 OS2
	Norsworthy Hall	Ely-Allen-Brewster	N/A	0* OS2
12	Spiritual Center	Ely-Allen-Brewster	No	24 OS2
13	Maintenance Building	Powerhouse	Yes	36 OS2
14	Powerhouse	Ely-Allen-Brewster	No	48 OS2
15	Decker Hall	Ely-Allen-Brewster	No	36 OS2
16	Ely-Allen-Brewster	Green Hall	Yes	192 OS2
17	New Residence Hall	Eickhoff Hall	No	24 OS2
18	Packer Hall	Eickhoff Hall	No	36 OS2
	Brower Student Center	Eickhoff Hall	N/A	0* OS2
19	Eickhoff Hall	Green Hall	No	96 OS2
20	TH1 (Town House West)	Cromwell Hall	No	48 OS2
21	TH3 21A/B (Town House East)	Cromwell Hall	No	(2) 36 OS2
22	TH9 (Town House South)	Cromwell Hall	No	48 OS2
23	Travers Hall	Cromwell Hall	Yes	12 OS2
	Wolfe Hall	Cromwell Hall	N/A	0* OS2
24	Decker Garage	Cromwell Hall	Yes	24 OS2
25	Recreation Center	Cromwell Hall	No	36 OS2
26	Stadium Generator Building	Recreation Center	No	12 OS2
27	Stadium Concession Stand	Recreation Center	No	12 OS2
28	Soccer Field Press Box 28A/B	Admin Splice	No	36 OS2
29	Metzger Garage	Admin Splice	No	24 OS2
	Phelps Hall	Admin Splice	N/A	0* OS2
	Hausdoerffer Hall	Admin Splice	N/A	0* OS2
32	Cromwell Hall	Green Hall	No	288 OS2
33	Travers/Wolfe Garage	Travers Hall	Yes	12 OS2
34	Forcina Garage	Education Building	No	12 OS2
35	Fire Pump House	Admin Services Building	No	12 OS2
36	Admin Services Building	Admin Splice	N/A	36 OS2
41	Eickhoff Room 227**	Eickhoff Room 337	No	48/48 OS2 / OM1

- KEY NOTES (SYMBOLS ①, ②, ETC.)**
1. Install New Point Of Entry From New Duct Bank Into Building. Core Drill Wall As Required For Conduit Entry. Coordinate Exact POE Location With Field Conditions.
 2. New Manhole To Be Installed In This Location. See Sheet G003 / 01 For More Details.
 3. Coordinate With IT For Spare Fiber Connections In This Area. Fiber Shall Be Pulled In Existing Spare Conduit. Coordinate With IT Department To Have Existing Fiber Disconnection To Allow Existing To Be Pulled Out.
 4. Remove And Replace Trees, Bushes And Shrubby In Order To Install Underground Conduit. Coordinate With TCNJ. See Sheet G002 For Additional Information.

- GENERAL NOTES**
1. All Conduit Sweeps Shall Not Be Less Than 10 Times The Inside Diameter Of The Conduit.
 2. Provide Warning Tape Above All Duct Banks.
 3. Provide (3) 1-1/2" Innerducts In All Of The Active Conduits Per Ductbank. Provide Pull Cords In Each Spare Conduit And Each Spare Inner Duct Per Duct Bank.
 4. Provide A #6 Ground Wire Along All Underground Conduit Routing. All Grounds Shall Be Tied In At Manhole Locations.
 5. Provide A 5/8 Inch X 10 Foot Ground Rod At Each Manhole Location. Attached A #2 Solid Tinned Ground Conductor From The Ground Rod To The Bonding Ribbon In The Manhole.
 6. All Manhole Locations And Ductbank Routings Shall Be Coordinated With Existing Underground Utilities And Infrastructure.
 7. Contractor Shall Obtain A Private Mark Out Of The Area Of Work. Contractor Also To Coordinate With Local Utility Companies And New Jersey One Call (811) As Required By Those Entities To Identify And Mark Out All Buried Infrastructure And Utilities In The Vicinity Of Proposed Conduit Routing Prior To Any Excavation. Hand Digging In Certain Locations Is Highly Recommended.
 8. Coordinate Routing Of Underground Duct Banks With Existing Field Conditions.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
⊙	Existing Manhole	Ⓧ	Detail Identifier
■	New Manhole	Ⓧ#	Drawing # (Detail Location) Detail #
---	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway	ⓐ	Photo Identification Tag
---	Existing Conduit Pathway Available For New Fiber Installation	MDF	Main Distribution Frame
---	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required	MH	Manhole
Ⓧ	Building To Building Span Number	MH#XX	Manhole Identification Tag
		POE	Point Of Entry

CAMPUS FIBER PART PLAN Scale: 1/64"=1'-0" Drawing: **TC007** Detail: **01**

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724

TCNJ THE COLLEGE OF NEW JERSEY

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title
CAMPUS CONDUIT ROUTING PLAN ZONE 3

scale AS SHOWN drawn by SC checked by SG date 09/17/2021

dwg. no. **TC007**

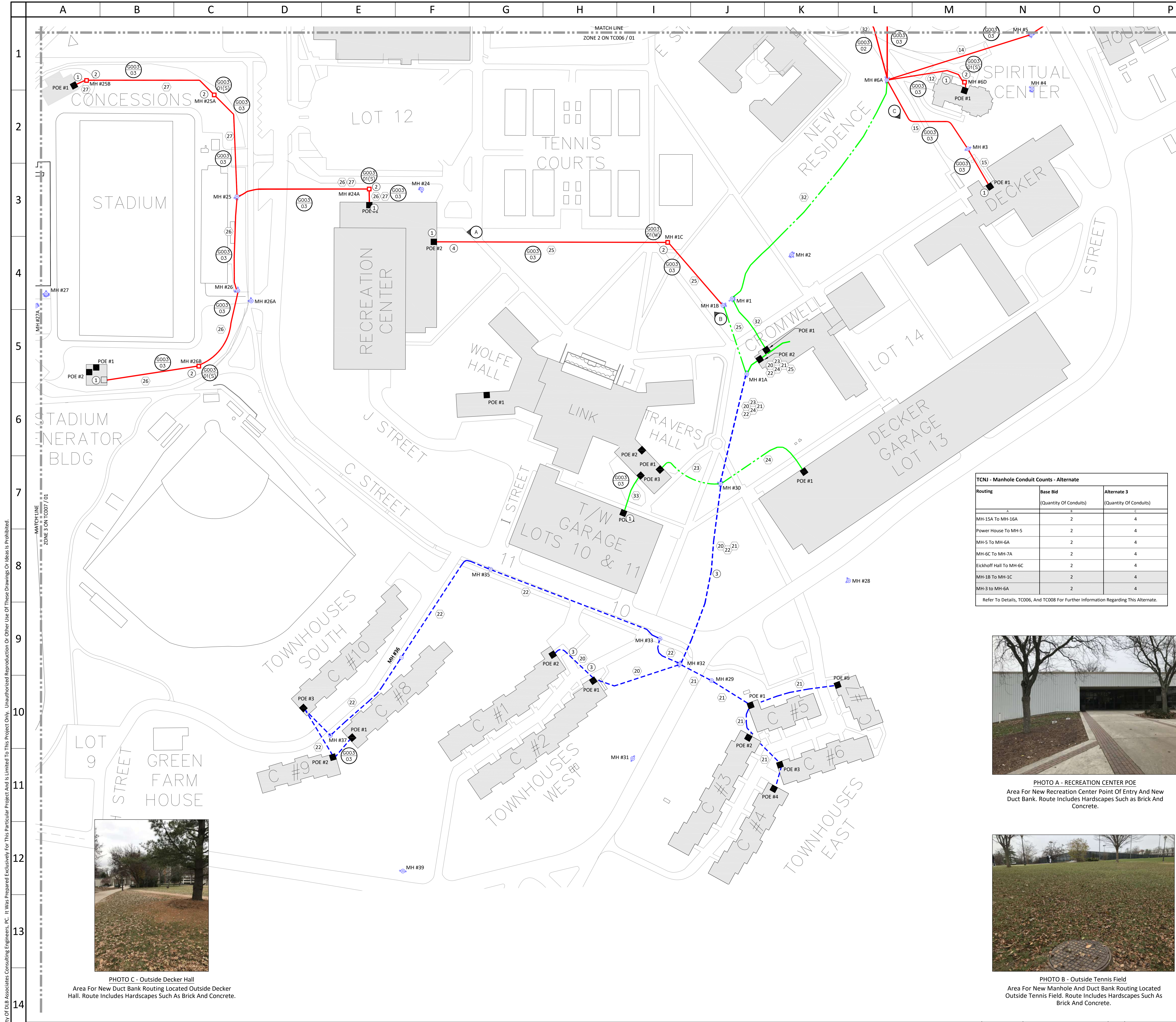


PHOTO C - Outside Decker Hall
Area For New Duct Bank Routing Located Outside Decker Hall. Route Includes Hardscapes Such As Brick And Concrete.



PHOTO A - RECREATION CENTER POE
Area For New Recreation Center Point Of Entry And New Duct Bank. Route Includes Hardscapes Such As Brick And Concrete.



PHOTO B - Outside Tennis Field
Area For New Manhole And Duct Bank Routing Located Outside Tennis Field. Route Includes Hardscapes Such As Brick And Concrete.

TCNJ - Manhole Conduit Counts - Alternate

Routing	Base Bid (Quantity Of Conduits)	Alternate 3 (Quantity Of Conduits)
MH-15A To MH-16A	2	4
Power House To MH-5	2	4
MH-5 To MH-6A	2	4
MH-6C To MH-7A	2	4
Eickhoff Hall To MH-6C	2	4
MH-1B To MH-1C	2	4
MH-3 To MH-6A	2	4

Refer To Details, TC006, And TC008 For Further Information Regarding This Alternate.

Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information	
				Fiber Strand Count	Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36	OS2
2	Bliss Hall	Kendall Hall	Yes	48	OS2
3	Business Building	Kendall Hall	No	24	OS2
4	Trenton Hall	Kendall Hall	No	36	OS2
5	Music Building	Kendall Hall	No	24	OS2
6	AJMM Building	Kendall Hall	N/A	0"	OS2
7	Social Science	Kendall Hall	Yes	36	OS2
8	Kendall Hall	Green Hall	Yes	144	OS2
9	Chemistry Building	STEM Building	N/A	0"	OS2
10	Physics Building	STEM Building	N/A	0"	OS2
11	Biology Building	STEM Building	N/A	0"	OS2
12	STEM Building	Green Hall	N/A	0"	OS2
13	Forcina Hall	Roscoe Hall	Yes	24	OS2
14	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48	OS2/OM1
15	Education Building	Roscoe Hall	N/A	0"	OS2
16	Centennial Hall	Roscoe Hall	No	24	OS2
17	Glenstein Library	Roscoe Hall	No	36	OS2
18	Roscoe Hall	Green Hall	No	96	OS2
19	Norworthy Hall	Ely-Allen-Brewster	N/A	0"	OS2
20	Spiritual Center	Ely-Allen-Brewster	No	24	OS2
21	Maintenance Building	Powerhouse	Yes	36	OS2
22	Powerhouse	Ely-Allen-Brewster	No	48	OS2
23	Decker Hall	Ely-Allen-Brewster	No	36	OS2
24	Ely-Allen-Brewster	Green Hall	Yes	192	OS2
25	New Residence Hall	Eickhoff Hall	No	24	OS2
26	Packer Hall	Eickhoff Hall	No	36	OS2
27	Brower Student Center	Eickhoff Hall	N/A	0"	OS2
28	Eickhoff Hall	Green Hall	No	96	OS2
29	TH1 (Town House West)	Cromwell Hall	No	48	OS2
30	TH2 (Town House East)	Cromwell Hall	No	24	OS2
31	TH3 (Town House South)	Cromwell Hall	No	48	OS2
32	Travers Hall	Cromwell Hall	Yes	12	OS2
33	Wolfe Hall	Cromwell Hall	N/A	0"	OS2
34	Decker Garage	Cromwell Hall	Yes	24	OS2
35	Recreation Center	Cromwell Hall	No	36	OS2
36	Stadium Generator Building	Recreation Center	No	12	OS2
37	Stadium Concession Stand	Recreation Center	No	12	OS2
38	Soccer Field Press Box 28A/B	Admin Splice	No	36	OS2
39	Metzger Garage	Admin Splice	No	24	OS2
40	Phelps Hall	Admin Splice	N/A	0"	OS2
41	Hausdoerffer Hall	Admin Splice	N/A	0"	OS2
42	Cromwell Hall	Green Hall	No	288	OS2
43	Travers/Wolfe Garage	Travers Hall	Yes	12	OS2
44	Forcina Garage	Education Building	No	12	OS2
45	Fire Pump House	Admin Services Building	No	12	OS2
46	Admin Services Building	Admin Splice	N/A	36	OS2
47	Eickhoff Room 227**	Eickhoff Room 337	No	48/48	OS2 / OM1

KEY NOTES (SYMBOLS ①, ②, ETC.)

- New Point Of Entry From New Duct Bank Into Building. Core Drill Wall As Required For Conduit Entry. Coordinate Exact POE Location With Field Conditions.
- New Manhole To Be Installed In This Location. See Sheet G003 / 01 For More Details.
- Contractor Shall Coordinate With College IT Department To Disconnect The Existing Fiber Cable Before Pulling Out Cable. Once The Cable Has Been Disconnected And Removed, Contractor Shall Utilize Pathway To Pull In Replacement Fiber Cable.
- Remove And Replace Trees, Bushes And Shrubbery In Order To Install Underground Conduit. Coordinate With TCNJ. See Sheet G002 For Additional Information.

GENERAL NOTES

- All Conduit Sweeps Shall Not Be Less Than 10 Times The Inside Diameter Of The Conduit.
- Provide Warning Tape Above All Duct Banks.
- Provide (3) 1-1/2" Innerducts In All Of The Active Conduits Per Ductbank. Provide Pull Cords In Each Spare Conduit And Each Spare Inner Duct Per Duct Bank.
- Provide A #6 Ground Wire Along All Underground Conduit Routing. All Grounds Shall Be Tied In At Manhole Locations.
- Provide A 5/8 Inch X 10 Foot Ground Rod At Each Manhole Location. Attached A #2 Solid Tinned Ground Conductor From The Ground Rod To The Bonding Ribbon In The Manhole.
- All Manhole Locations And Ductbank Routings Shall Be Coordinated With Existing Underground Utilities And Infrastructure.
- All Ductbanks Shall Be Encased In Flowable Fill.
- Contractor Shall Obtain A Private Mark Out Of The Area Of Work. Contractor Also To Coordinate With Local Utility Companies And New Jersey One Call (811) As Required By Those Entities To Identify And Mark Out All Buried Infrastructure And Utilities In The Vicinity Of Proposed Conduit Routing Prior To Any Excavation. Hand Digging In Certain Locations Is Highly Recommended.
- Coordinate Routing Of Underground Duct Banks With Existing Field Conditions.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
⊙	Existing Manhole	⊙	Detail Identifier
■	New Manhole	⊙	Drawing # (Detail Location) Detail #
⚡	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway	Ⓜ	Photo Identification Tag
⚡	Existing Conduit Pathway Available For New Fiber Installation	MDF	Main Distribution Frame
⚡	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required	MH	Manhole
Ⓜ	Building To Building Span ID	MHXX	Manhole Identification Tag
		POE	Point Of Entry

30x42

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
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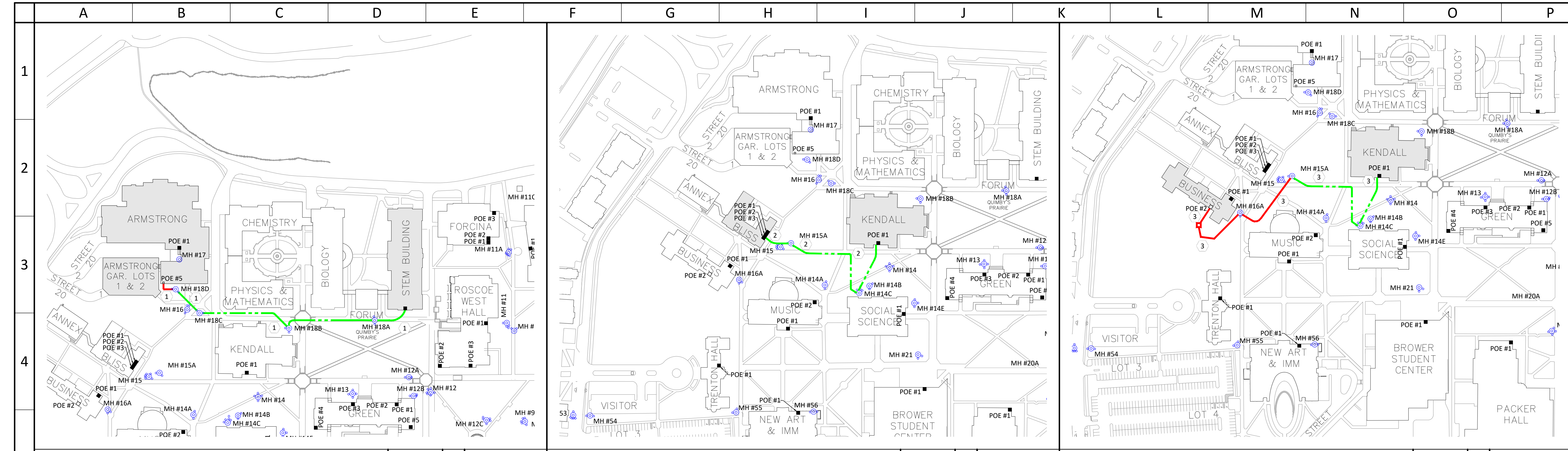
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Graphic Scale	16' 32' 64' 128'

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
project TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

CAMPUS FIBER PART PLAN
Drawing: TC008
Detail: 01

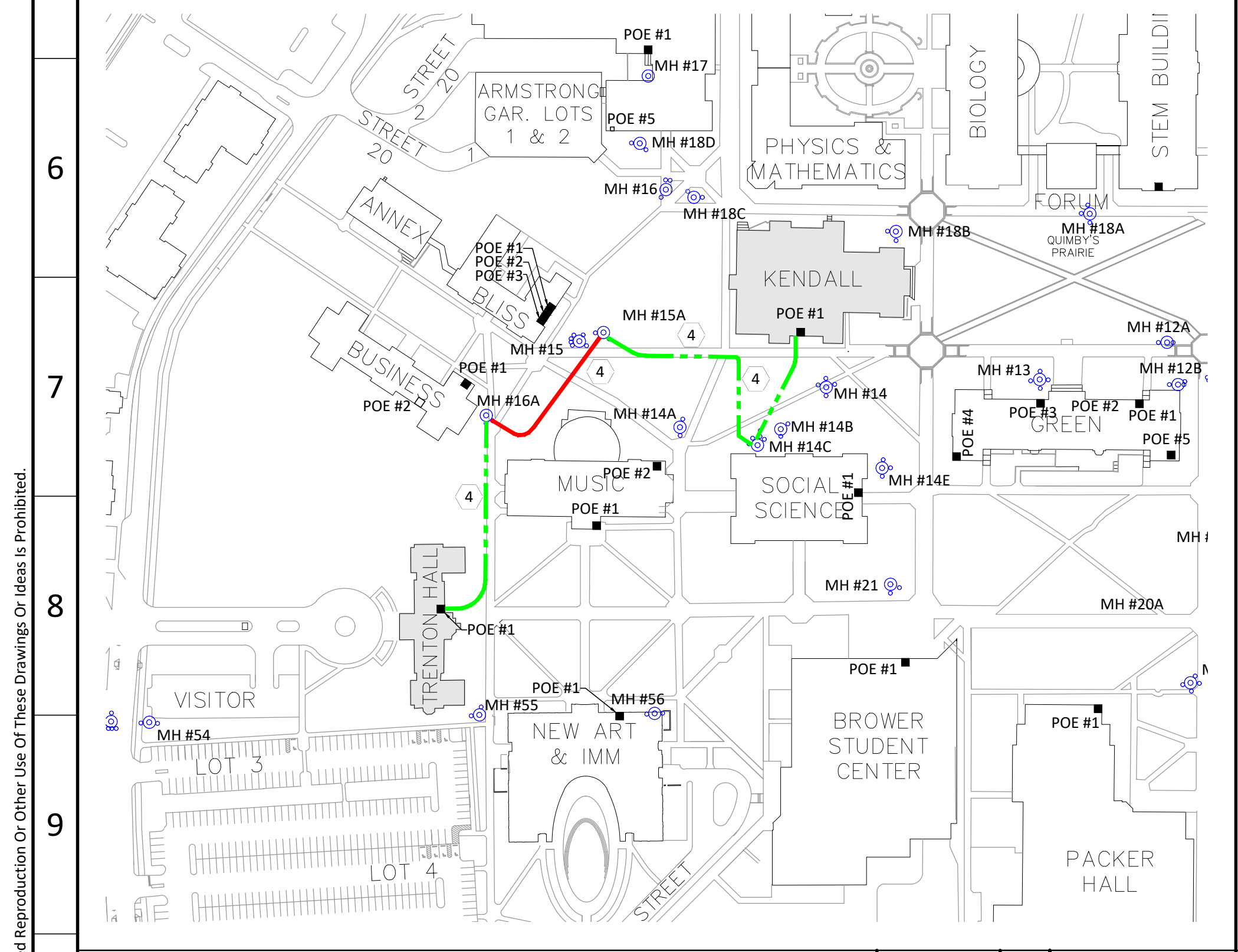
title **CAMPUS CONDUIT ROUTING PLAN ZONE 4**
scale AS SHOWN
drawing by SC
checked by SG
date 09/17/2021
dwg. no. **TC008**



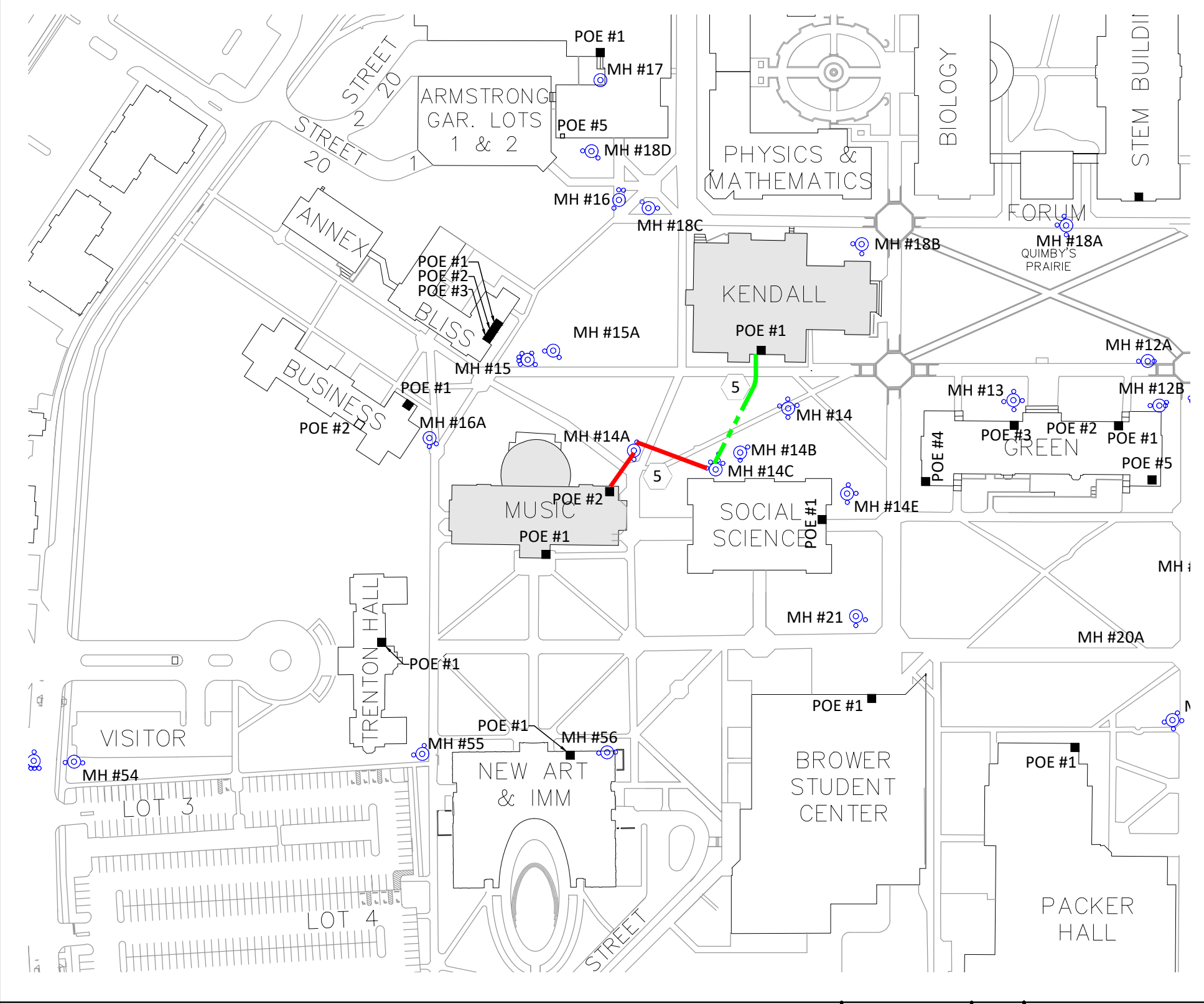
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FIBER ROUTING - BLISS HALL & ANNEX TO KENDALL HALL Scale: 1" = 150' Drawing: TC009 Detail: 02

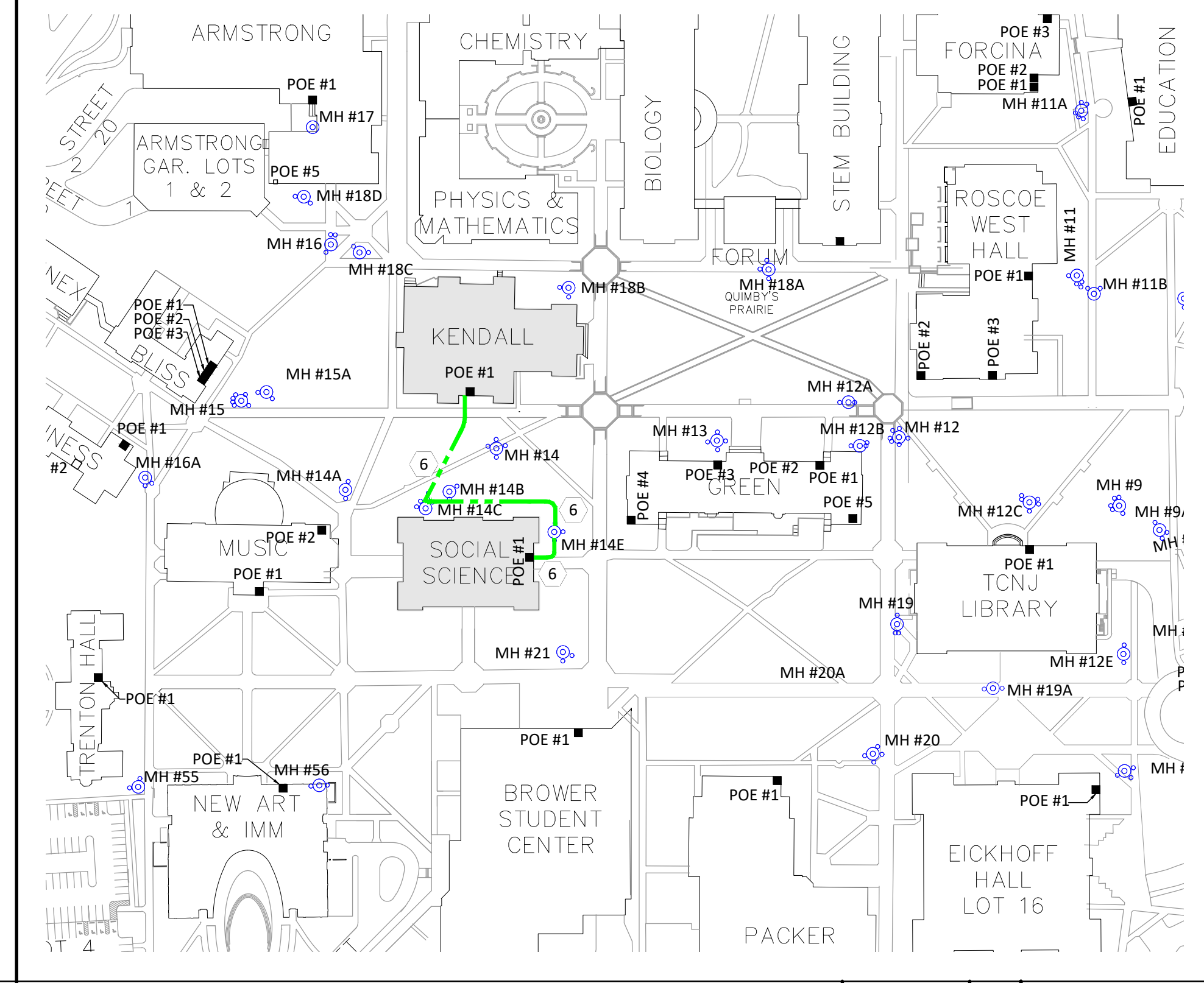
FIBER ROUTING - BUSINESS BUILDING TO KENDALL HALL Scale: 1" = 150' Drawing: TC009 Detail: 03



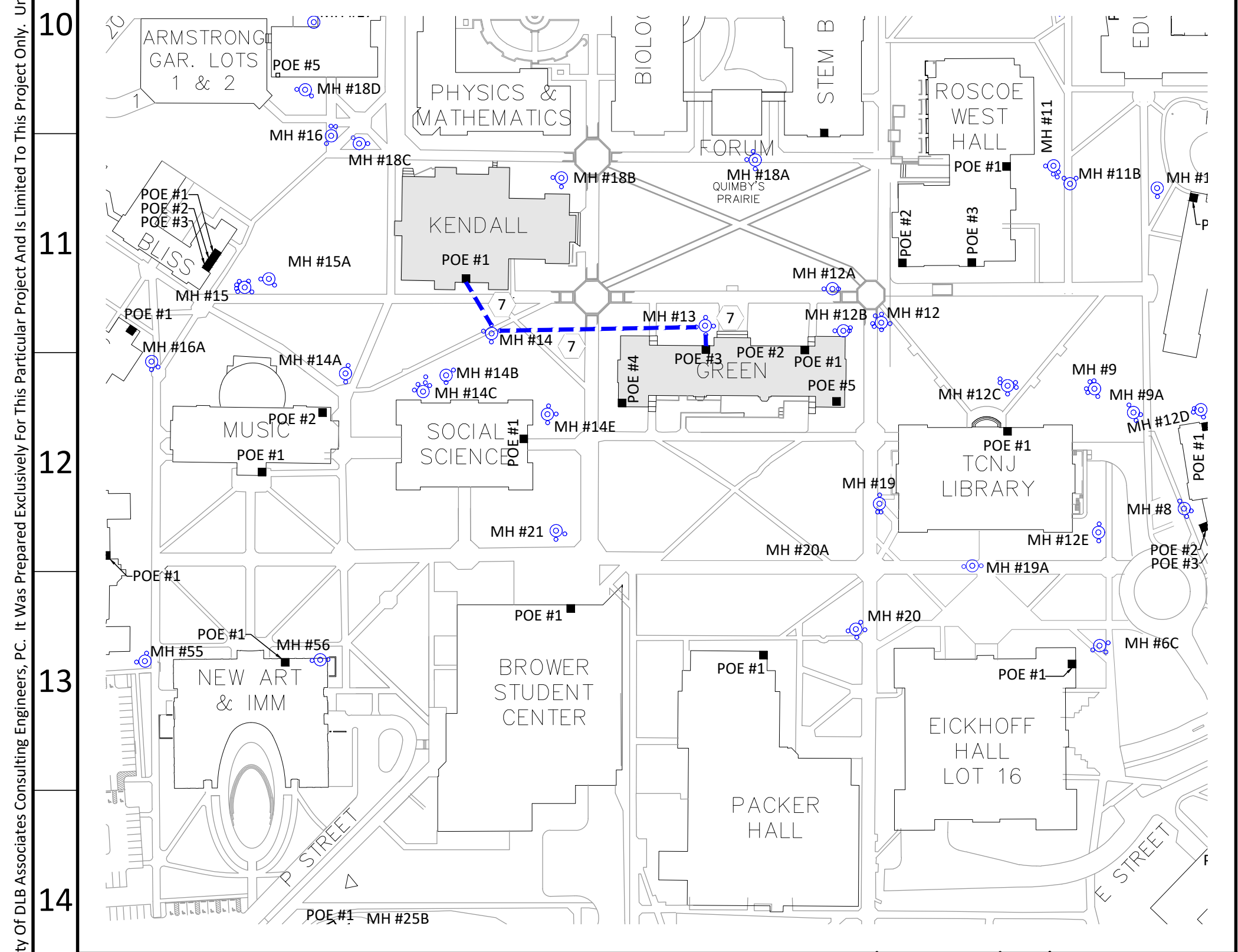
FIBER ROUTING - TRENTON HALL TO KENDALL HALL Scale: 1" = 150' Drawing: TC009 Detail: 04



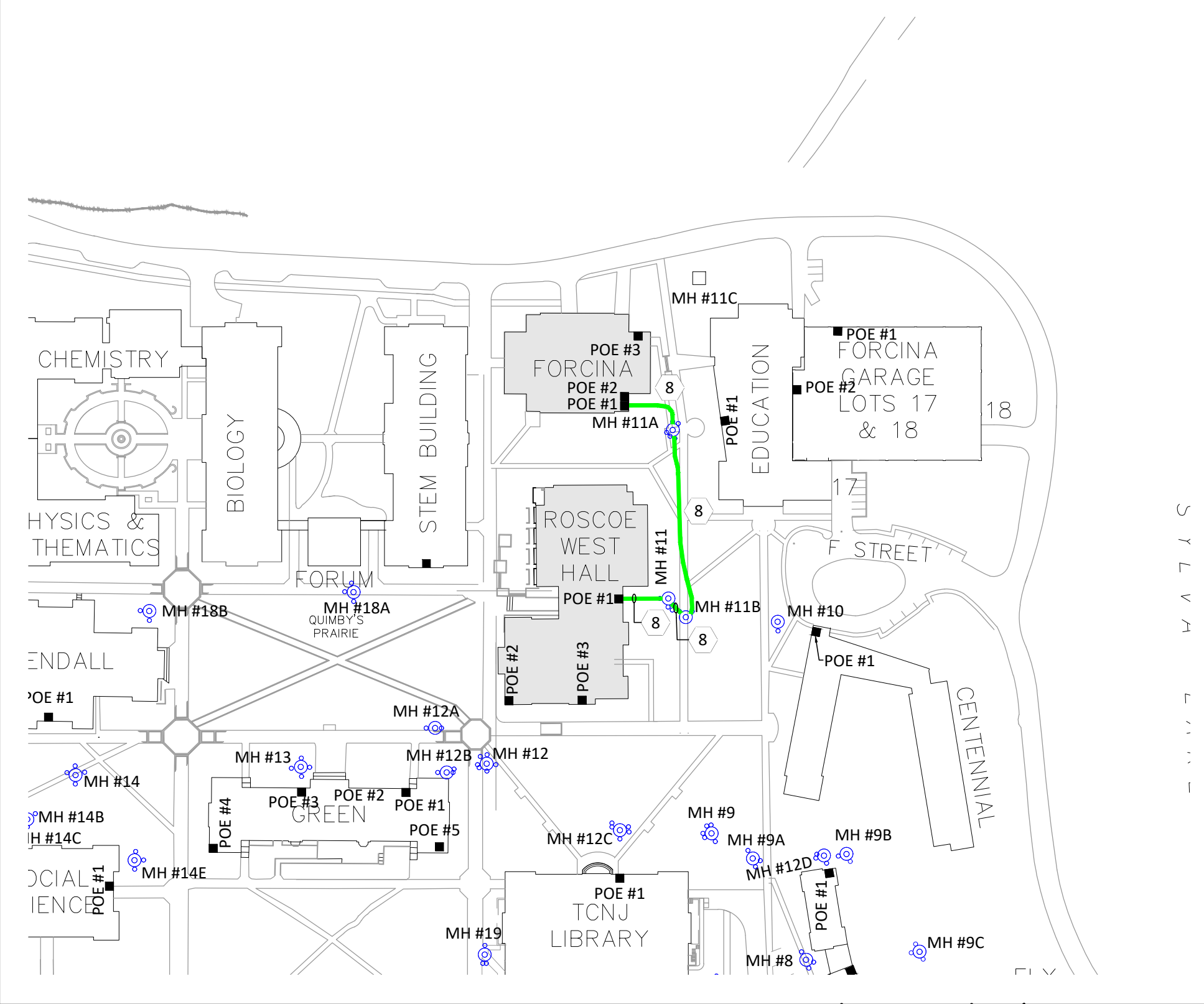
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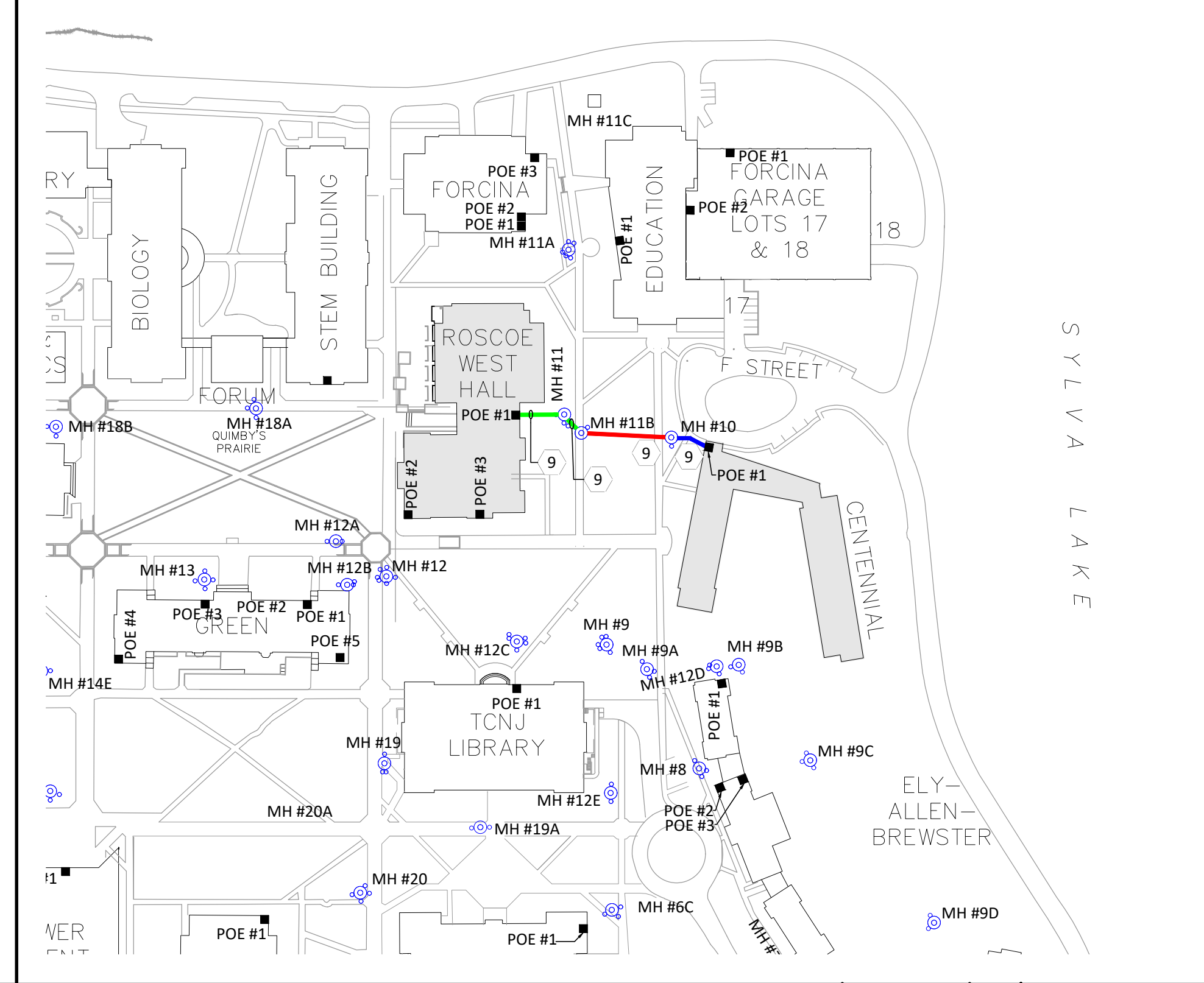
FIBER ROUTING - SOCIAL SCIENCE TO KENDALL HALL Scale: 1" = 150' Drawing: TC009 Detail: 06



FIBER ROUTING - KENDALL HALL TO GREEN HALL Scale: 1" = 150' Drawing: TC009 Detail: 07



FIBER ROUTING - FORCINA HALL TO ROSCOE HALL Scale: 1" = 150' Drawing: TC009 Detail: 08



FIBER ROUTING - CENTENNIAL HALL TO ROSCOE HALL Scale: 1" = 150' Drawing: TC009 Detail: 09

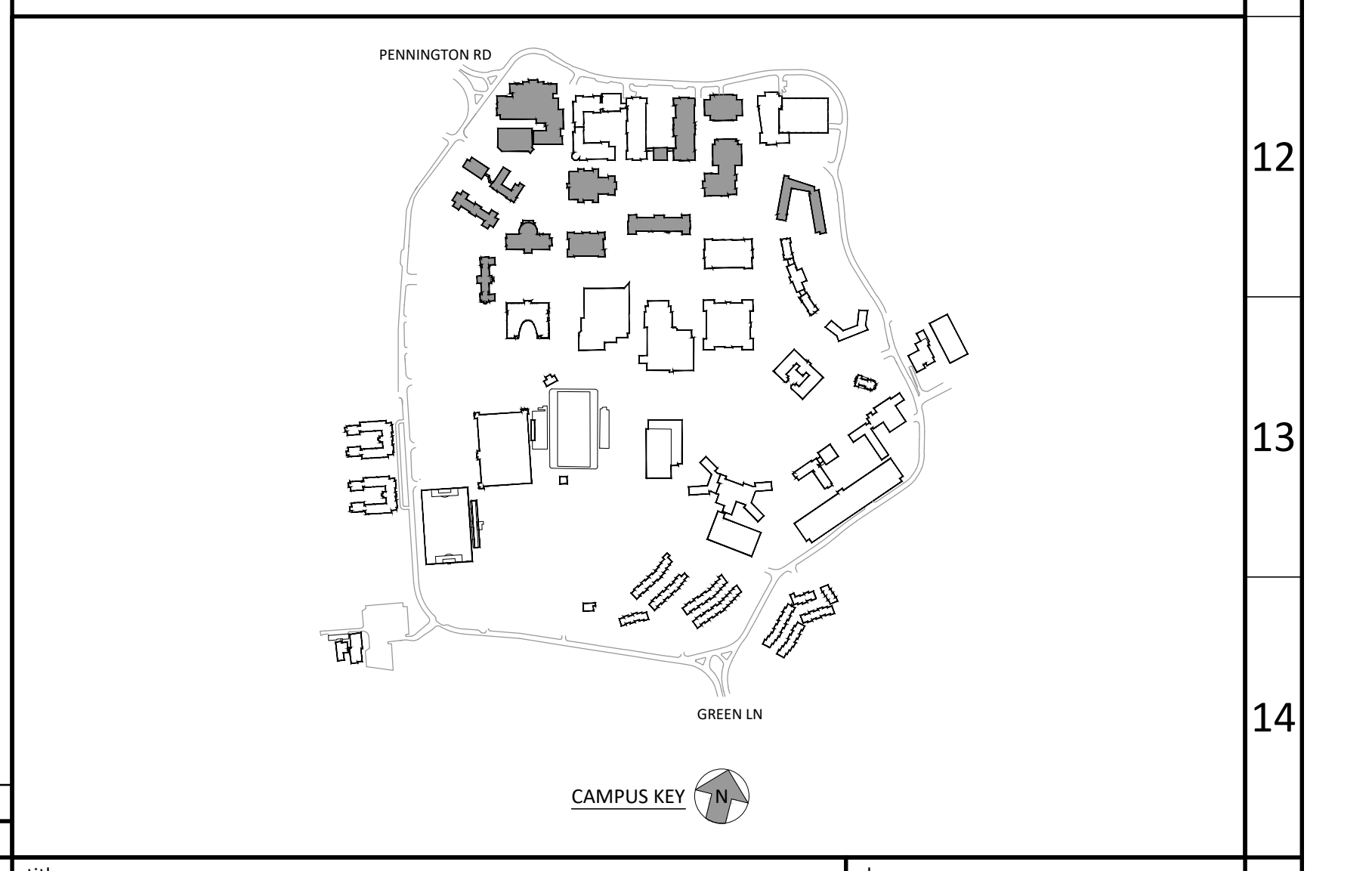
Fiber Routing				
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information
				Fiber Strand Count Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36 OS2
2	Bliss Hall	Kendall Hall	Yes	48 OS2
3	Business Building	Kendall Hall	No	24 OS2
4	Trenton Hall	Kendall Hall	No	36 OS2
5	Music Building	Kendall Hall	No	24 OS2
6	ANMM Building	Kendall Hall	N/A	0" OS2
7	Social Science	Kendall Hall	Yes	36 OS2
8	Kendall Hall	Green Hall	Yes	144 OS2
9	Chemistry Building	STEM Building	N/A	0" OS2
10	Physics Building	STEM Building	N/A	0" OS2
11	Biology Building	STEM Building	N/A	0" OS2
12	STEM Building	STEM Building	N/A	0" OS2
13	Forcina Hall	Roscoe Hall	Yes	24 OS2
14	Forcina Hall Room 104**	Forcina Room 104	No	48/48 OS2/OM1
15	Education Building	Roscoe Hall	N/A	0" OS2
16	Centennial Hall	Roscoe Hall	No	24 OS2
17	Greenstone Library	Roscoe Hall	No	36 OS2
18	Roscoe Hall	Green Hall	No	96 OS2
19	Norworthy Hall	Ely-Allen-Brewster	N/A	0" OS2
20	Spiritual Center	Ely-Allen-Brewster	No	24 OS2
21	Maintenance Building	Powerhouse	Yes	36 OS2
22	Powerhouse	Ely-Allen-Brewster	No	48 OS2
23	Decker Hall	Ely-Allen-Brewster	No	36 OS2
24	Ely-Allen-Brewster	Green Hall	Yes	192 OS2
25	New Residence Hall	Eickhoff Hall	No	24 OS2
26	Packer Hall	Eickhoff Hall	No	36 OS2
27	Brower Student Center	Eickhoff Hall	N/A	0" OS2
28	Eickhoff Hall	Green Hall	No	96 OS2
29	TH1 (Town House West)	Cromwell Hall	No	48 OS2
30	TH3 21A/B (Town House East)	Cromwell Hall	No	(2) 36 OS2
31	TH9 (Town House South)	Cromwell Hall	No	48 OS2
32	Travers Hall	Cromwell Hall	Yes	12 OS2
33	Wolfe Hall	Cromwell Hall	N/A	0" OS2
34	Decker Garage	Cromwell Hall	Yes	24 OS2
35	Recreation Center	Cromwell Hall	No	36 OS2
36	Stadium Generator Building	Recreation Center	No	12 OS2
37	Stadium Concession Stand	Recreation Center	No	12 OS2
38	Soccer Field Press Box 28A/B	Admin Splice	No	36 OS2
39	Metzger Garage	Admin Splice	No	24 OS2
40	Phelps Hall	Admin Splice	N/A	0" OS2
41	Hausdoerffer Hall	Admin Splice	N/A	0" OS2
42	Cromwell Hall	Green Hall	No	288 OS2
43	Travers/Wolfe Garage	Travers Hall	Yes	12 OS2
44	Forcina Garage	Education Building	No	12 OS2
45	Fire Pump House	Admin Services Building	No	12 OS2
46	Admin Services Building	Admin Splice	N/A	36 OS2
47	Eickhoff Room 227**	Eickhoff Room 337	No	48/48 OS2/OM1

GENERAL NOTES

- This Sheet's Purpose Is To Show The Fiber Pathway Between Buildings Where New Fiber Will Be Provided. See TC005-TC008 For Further Campus Routing Information. See The Building Drawing Series For Further Building Routing Information.
- Each Fiber Run To Be One Continuous Run From MDF TO MDF Without Any Splices.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description
	Existing Manhole
	New Manhole
	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway
	Existing Conduit Pathway Available For New Fiber Installation
	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required
	Building To Building Span Number

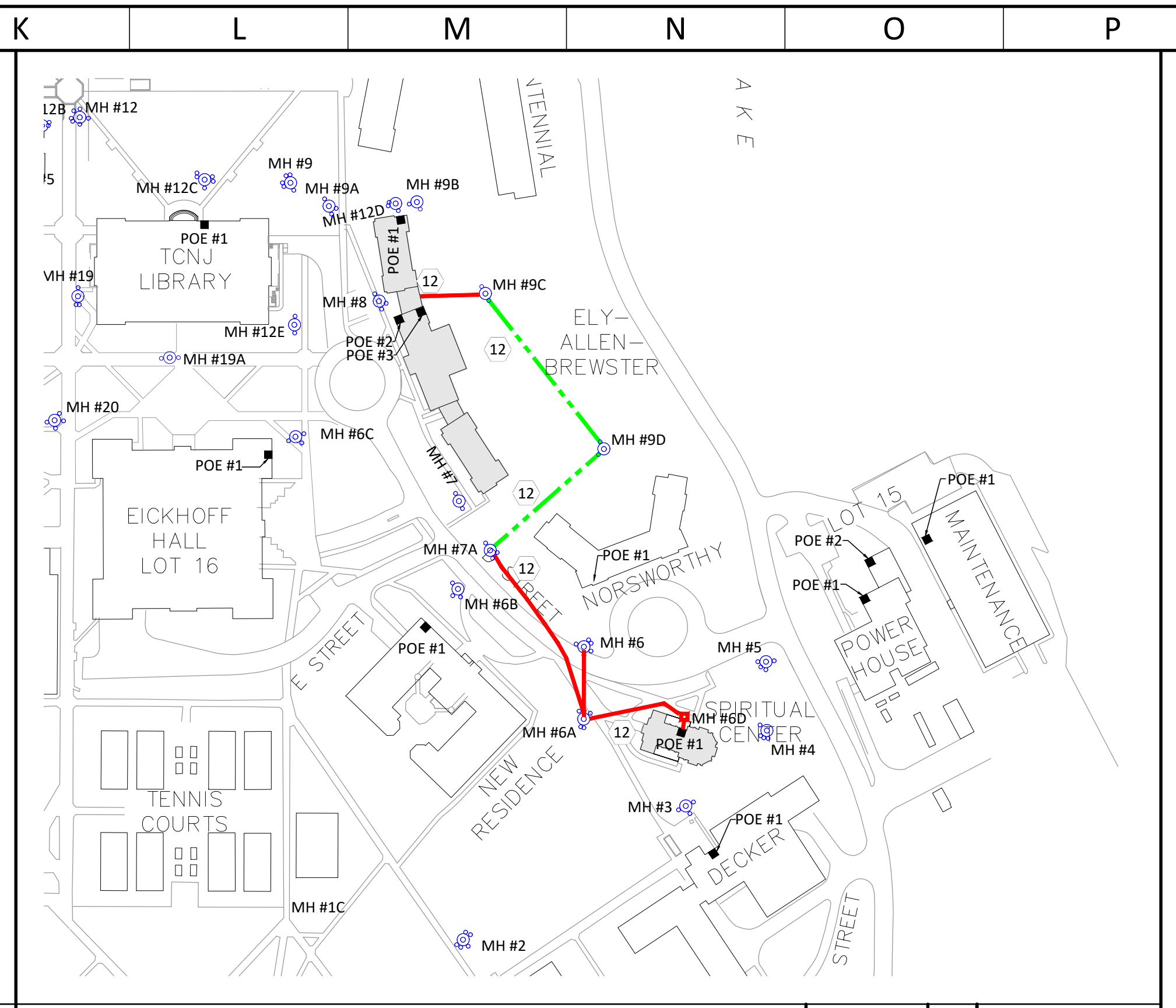
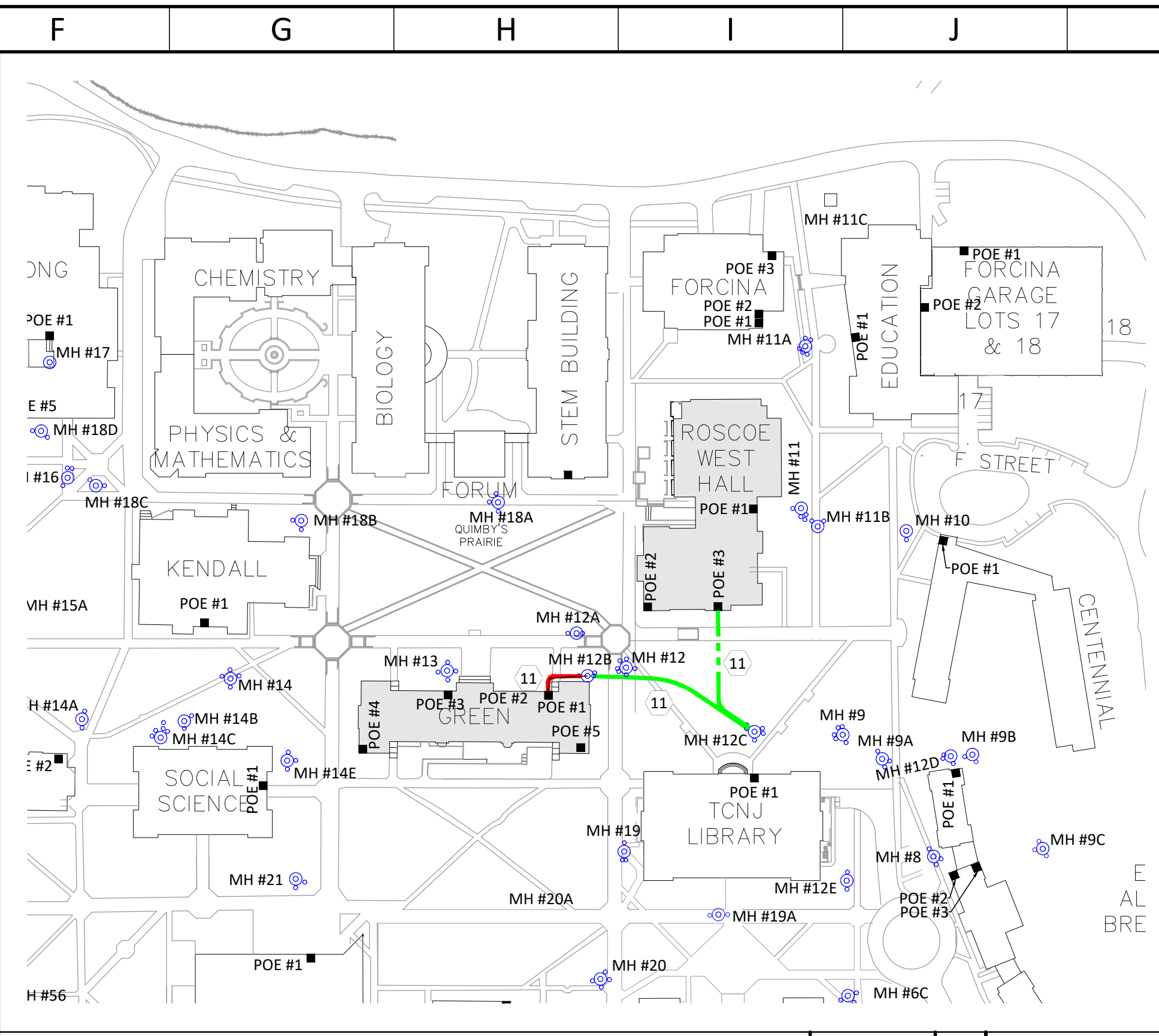
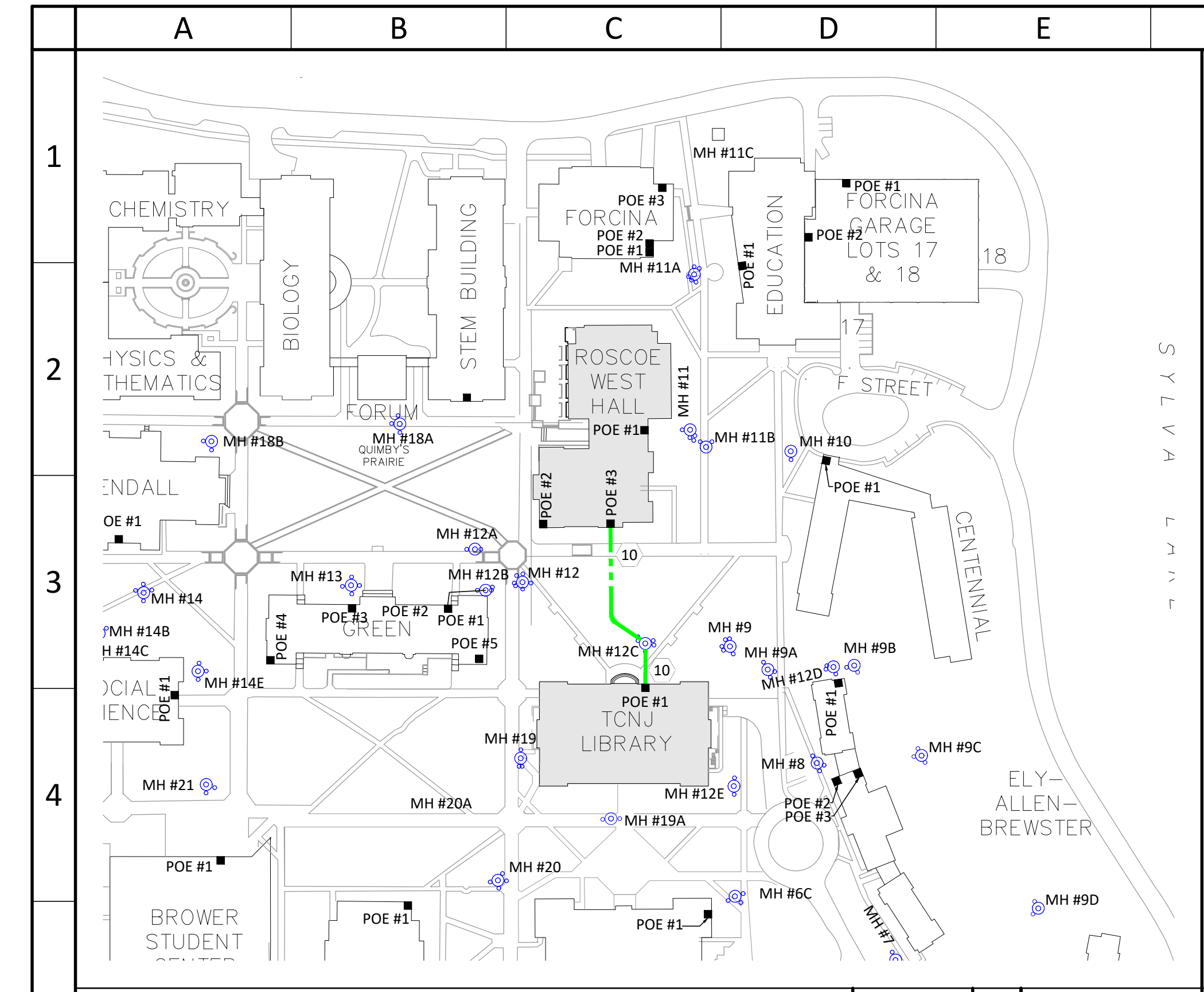


ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

title	BUILDING FIBER ROUTING			dwg. no.	TC009
scale	AS SHOWN	drawn by	SC	checked by	SG
				date	09/17/2021

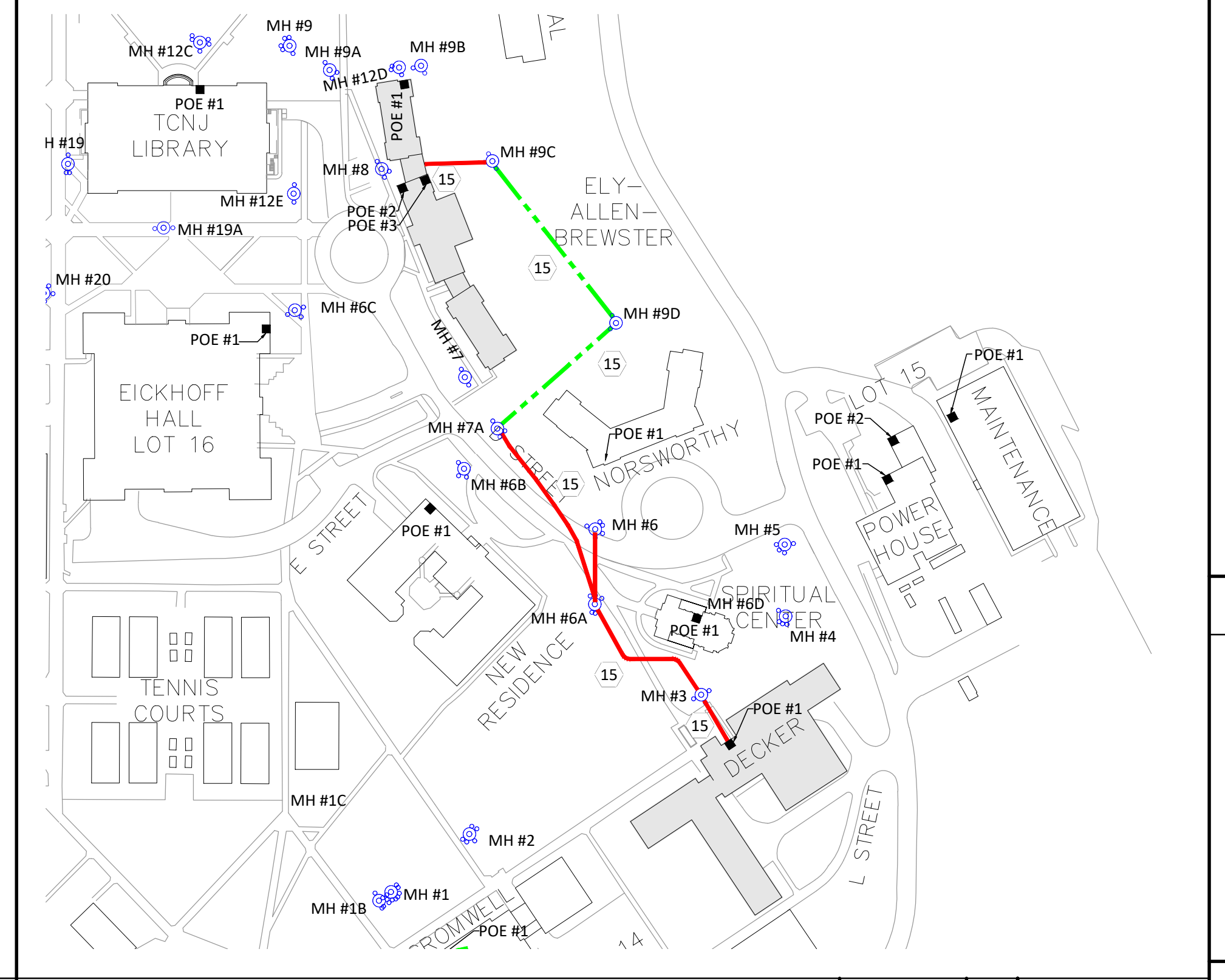
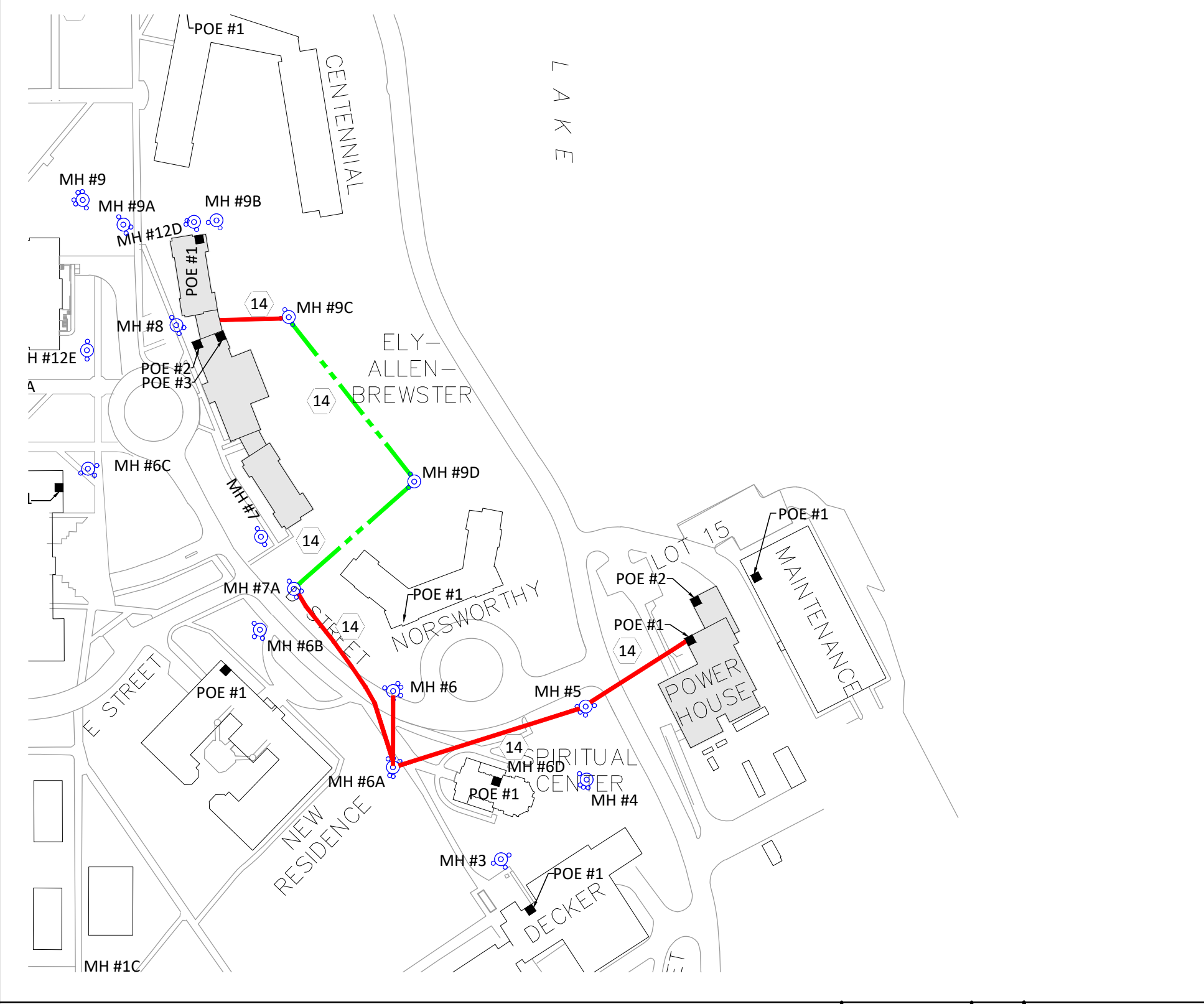
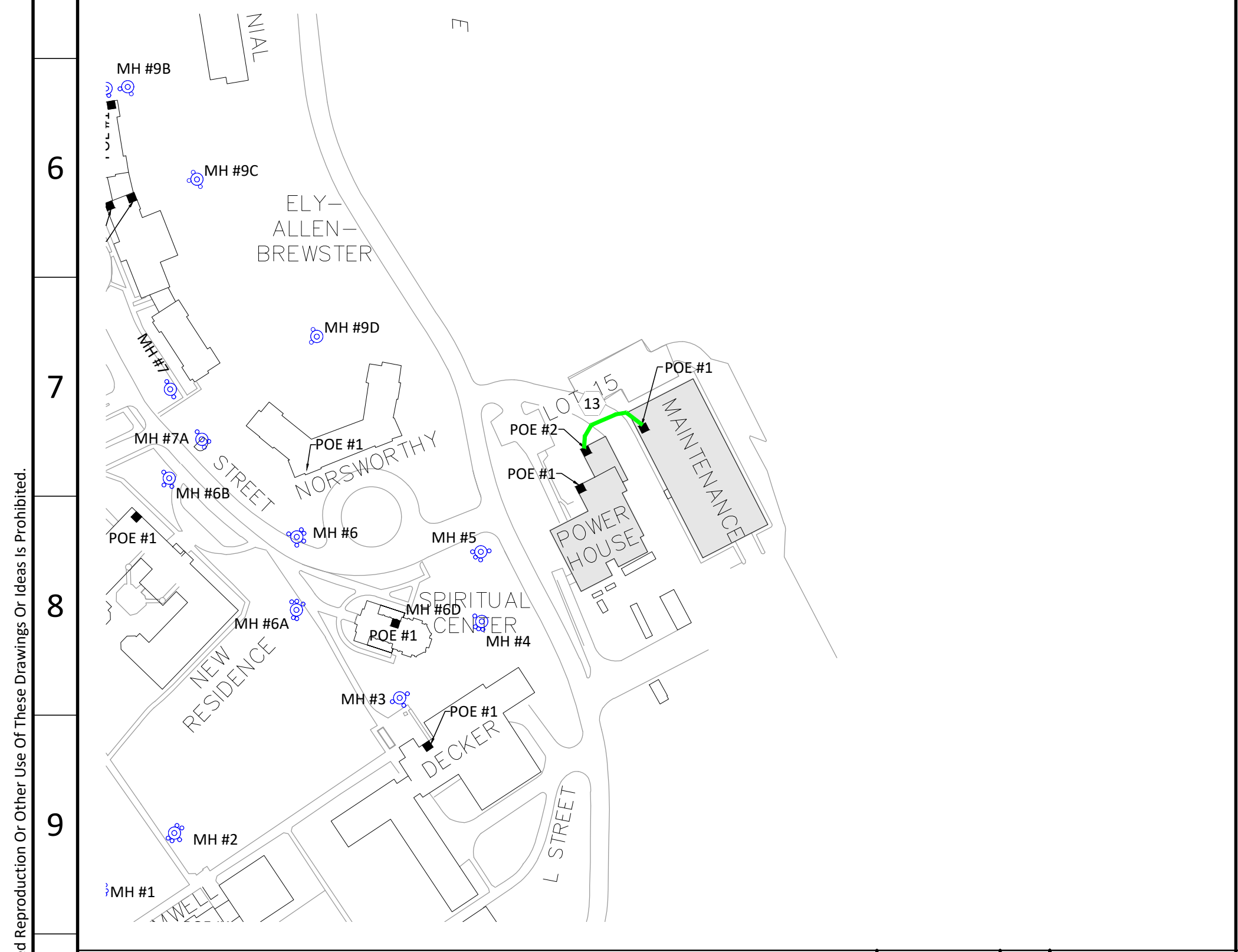


Fiber Routing					
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Strand Count	Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36	052
2	Bless Hall	Kendall Hall	Yes	48	052
3	Business Building	Kendall Hall	No	24	052
4	Trenton Hall	Kendall Hall	No	36	052
5	Music Building	Kendall Hall	No	24	052
6	ASMM Building	Kendall Hall	N/A	0*	052
7	Social Science	Kendall Hall	Yes	36	052
8	Kendall Hall	Green Hall	Yes	144	052
9	Chemistry Building	STEM Building	N/A	0*	052
10	Physics Building	STEM Building	N/A	0*	052
11	Biology Building	STEM Building	N/A	0*	052
12	STEM Building	Green Hall	N/A	0*	052
13	Forcina Hall	Roscoe Hall	Yes	24	052
14	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48	052/0M1
15	Education Building	Roscoe Hall	N/A	0*	052
16	Centennial Hall	Roscoe Hall	No	24	052
17	Gitenstein Library	Roscoe Hall	No	36	052
18	Roscoe Hall	Green Hall	No	96	052
19	Norrisworthy Hall	Ely-Allen-Brewster	N/A	0*	052
20	Spiritual Center	Ely-Allen-Brewster	No	24	052
21	Maintenance Building	Powerhouse	Yes	36	052
22	Powerhouse	Ely-Allen-Brewster	No	48	052
23	Decker Hall	Ely-Allen-Brewster	No	36	052
24	Ely-Allen-Brewster	Green Hall	Yes	192	052
25	New Residence Hall	Eickhoff Hall	No	24	052
26	Packer Hall	Eickhoff Hall	No	36	052
27	Brower Student Center	Eickhoff Hall	N/A	0*	052
28	Eickhoff Hall	Green Hall	No	96	052
29	TH1 (Town House West)	Cromwell Hall	No	48	052
30	TH5 21A/B (Town House East)	Cromwell Hall	No	(2) 36	052
31	TH9 (Town House South)	Cromwell Hall	No	48	052
32	Travers Hall	Cromwell Hall	Yes	12	052
33	Wolfe Hall	Cromwell Hall	N/A	0*	052
34	Decker Garage	Cromwell Hall	Yes	24	052
35	Recreation Center	Cromwell Hall	No	36	052
36	Stadium Generator Building	Recreation Center	No	12	052
37	Stadium Concession Stand	Recreation Center	No	12	052
38	Soccer Field Press Box 28A/B	Admin Splice	No	36	052
39	Metzger Garage	Admin Splice	No	24	052
40	Phelps Hall	Admin Splice	N/A	0*	052
41	Hausdoerffer Hall	Admin Splice	N/A	0*	052
42	Cromwell Hall	Green Hall	No	288	052
43	Travers/Wolfe Garage	Travers Hall	Yes	12	052
44	Forcina Garage	Education Building	No	12	052
45	Fire Pump House	Admin Services Building	No	12	052
46	Admin Services Building	Admin Splice	N/A	36	052
47	Eickhoff Room 227**	Eickhoff Room 337	No	48/48	052 / 0M1

FIBER ROUTING - GITENSTEIN LIBRARY TO ROSCOE HALL Scale: 1" = 150' Drawing: TC010 Detail: 01

FIBER ROUTING - ROSCOE HALL TO GREEN HALL Scale: 1" = 150' Drawing: TC010 Detail: 02

FIBER ROUTING - SPIRITUAL CENTER TO ELY-ALLEN-BREWSTER Scale: 1" = 150' Drawing: TC010 Detail: 03



GENERAL NOTES

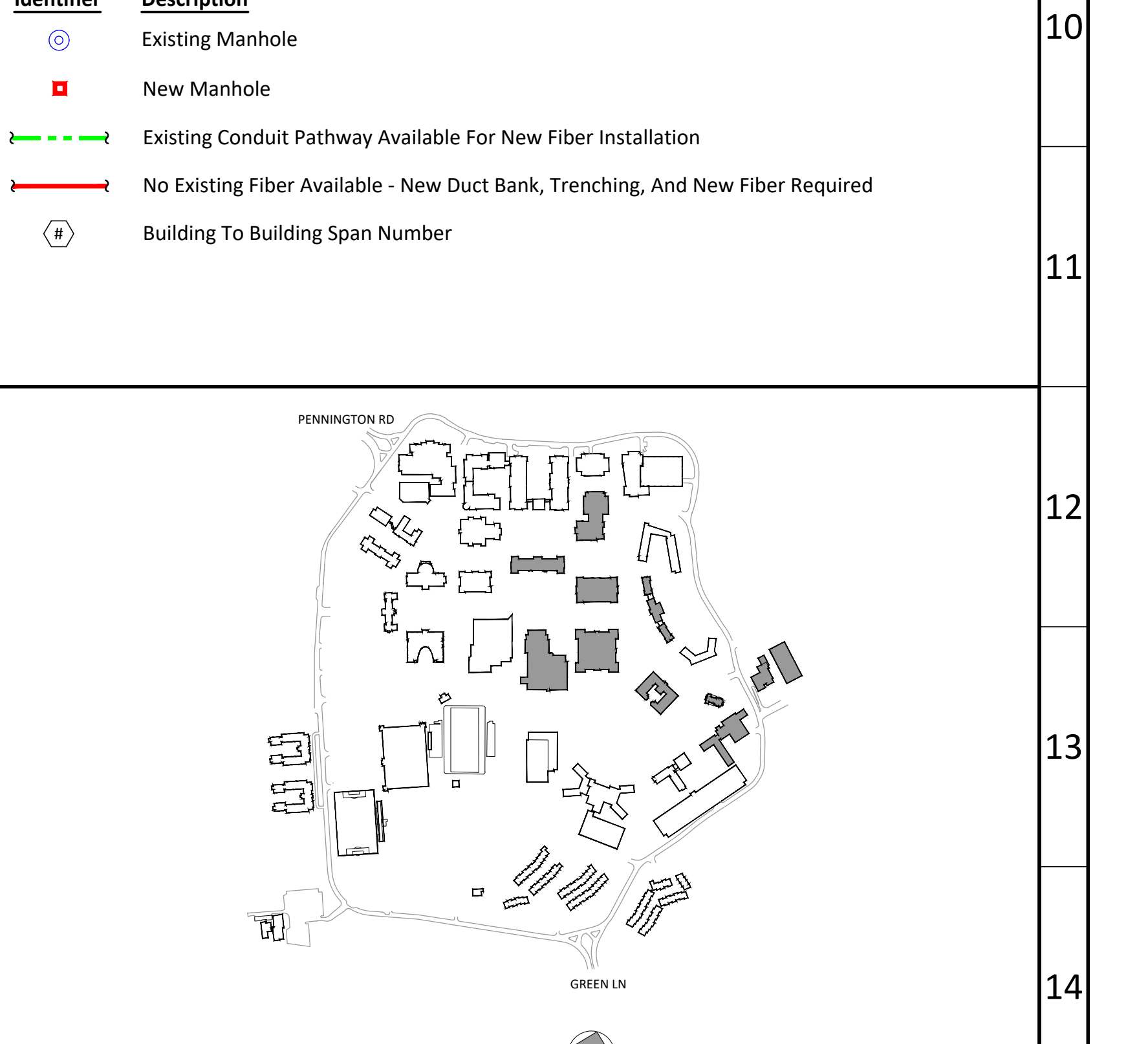
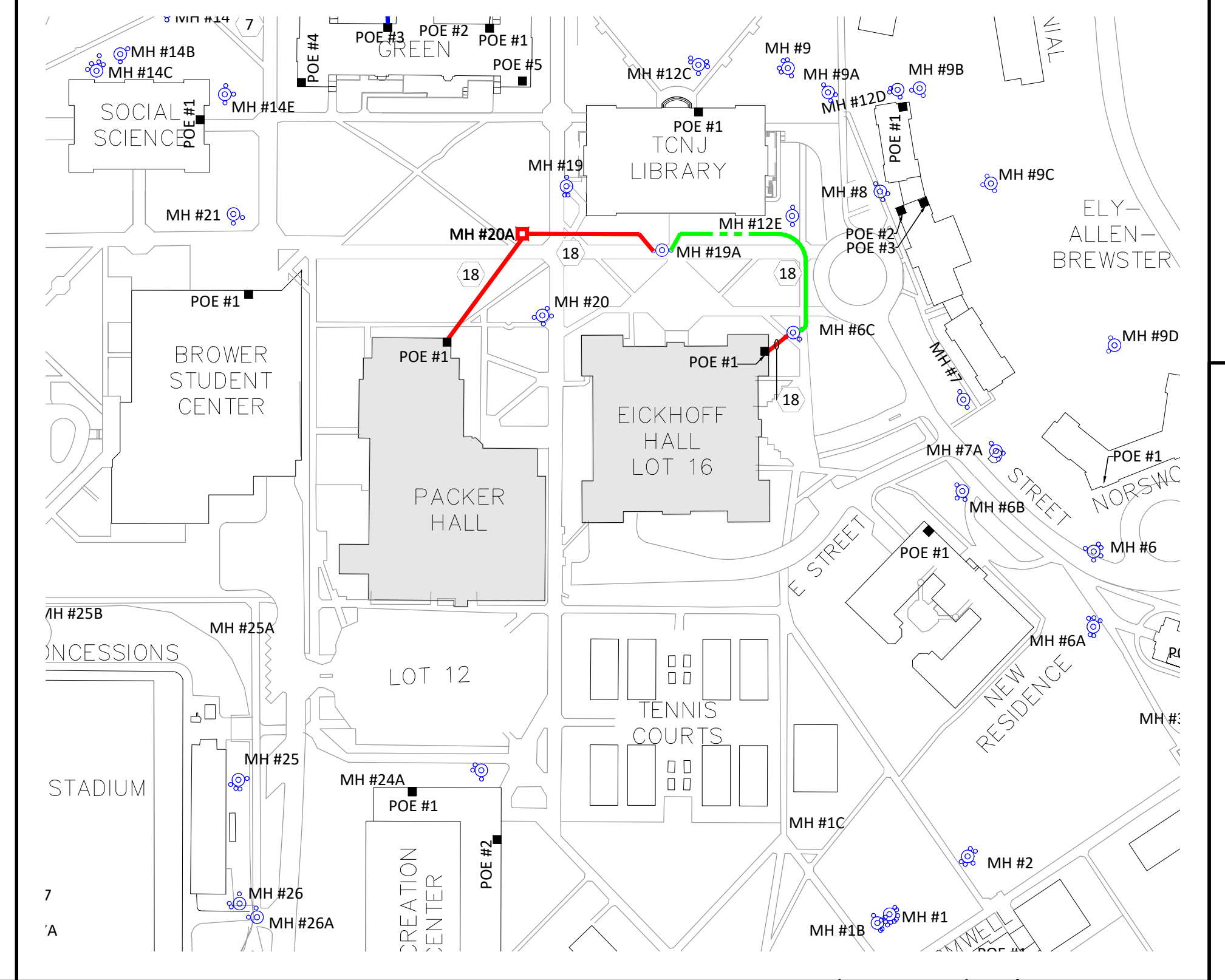
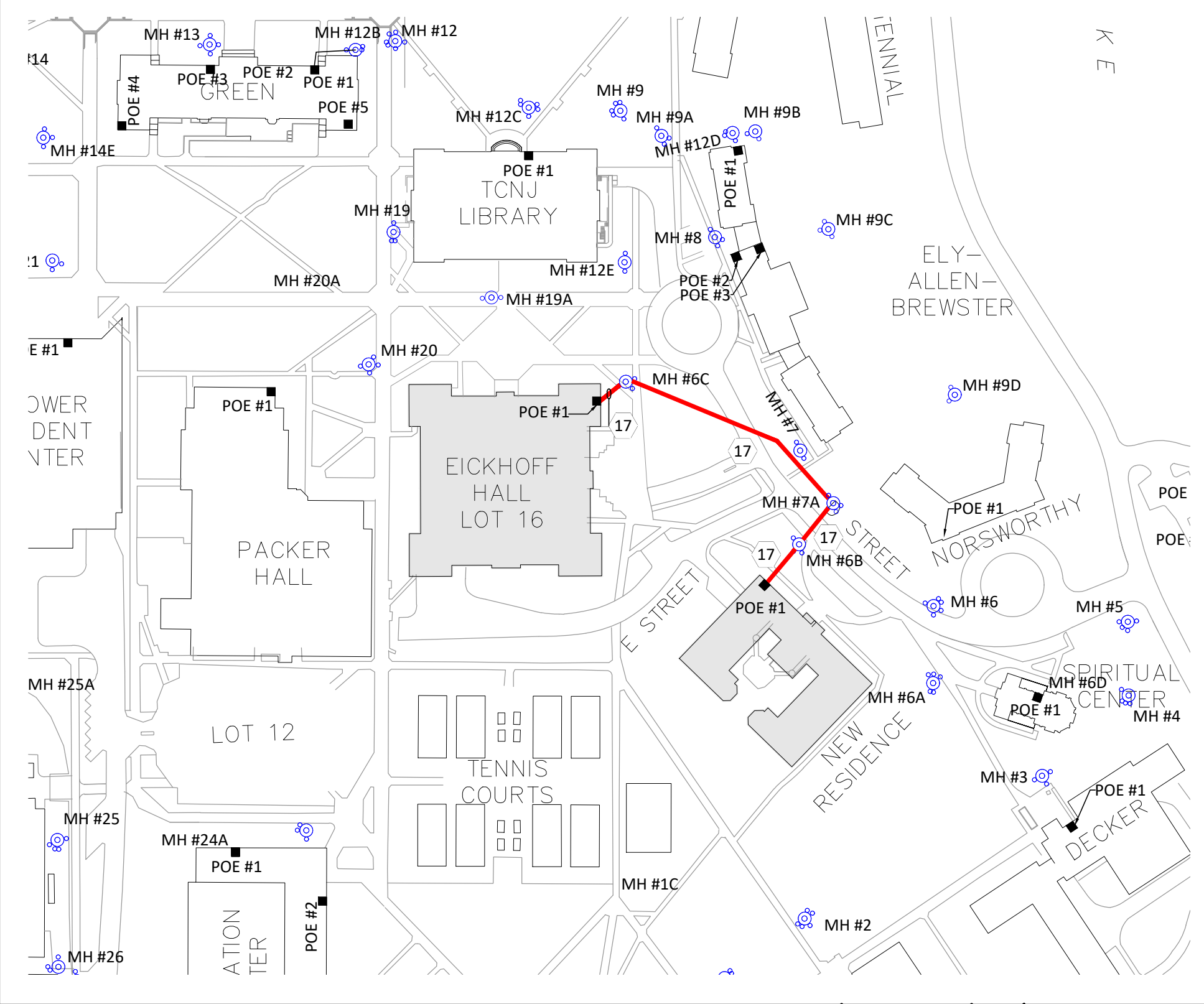
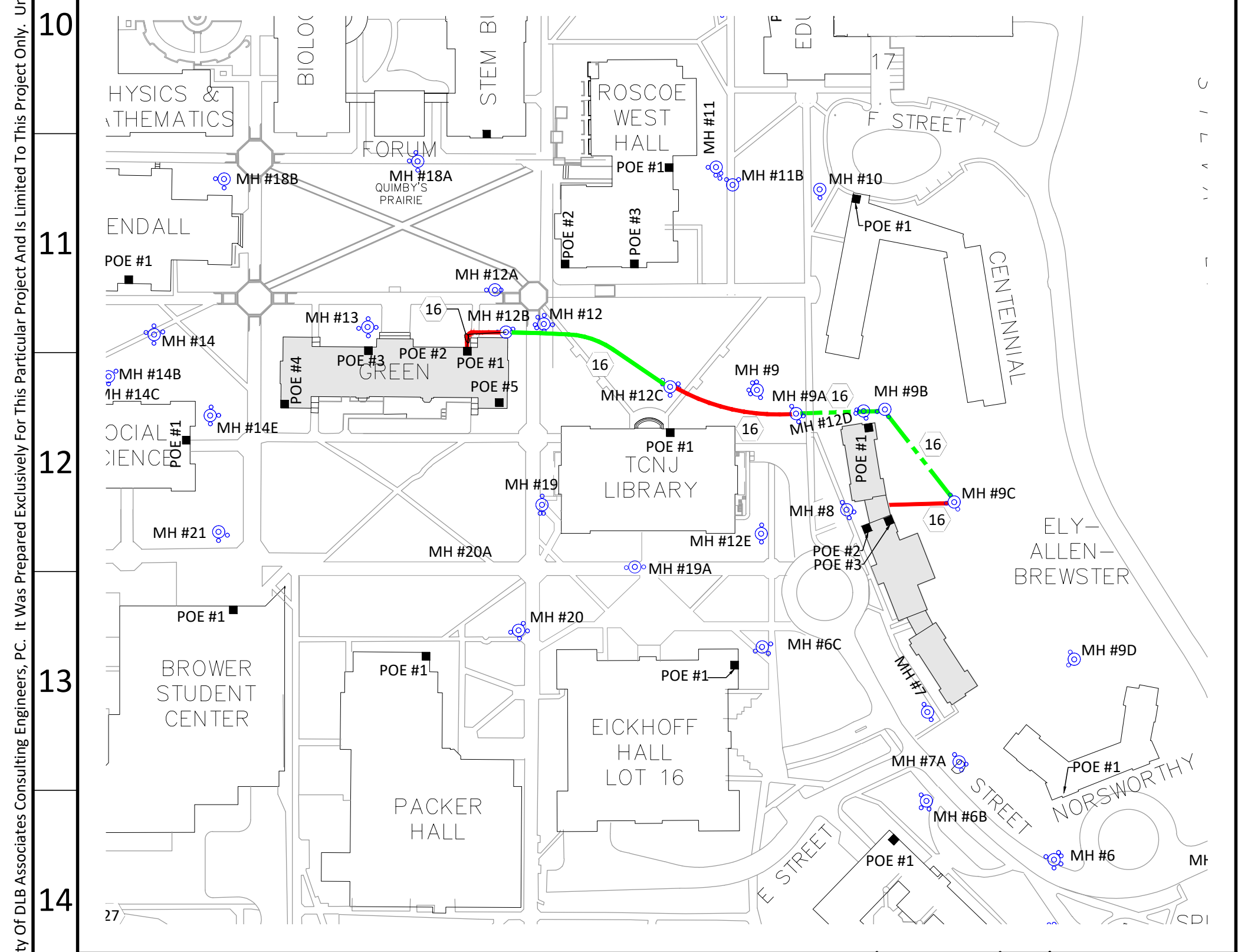
- This Sheet's Purpose Is To Show The Fiber Pathway Between Buildings Where New Fiber Will Be Provided. See TC005-TC008 For Further Campus Routing Information. See The Building Drawing Series For Further Building Routing Information.
- Each Fiber Run To Be One Continuous Run From MDF TO MDF Without Any Splices.

FIBER ROUTING - MAINTENANCE BUILDING TO POWERHOUSE Scale: 1" = 150' Drawing: TC010 Detail: 04

FIBER ROUTING - POWERHOUSE TO ELY-ALLEN-BREWSTER Scale: 1" = 150' Drawing: TC010 Detail: 05

FIBER ROUTING - DECKER HALL TO ELY-ALLEN-BREWSTER Scale: 1" = 150' Drawing: TC010 Detail: 06

PARTIAL SYMBOLS & ABBREVIATIONS



FIBER ROUTING - ELY-ALLEN-BREWSTER TO GREEN HALL Scale: 1" = 150' Drawing: TC010 Detail: 07

FIBER ROUTING - NEW RESIDENCE HALL TO EICKHOFF HALL Scale: 1" = 150' Drawing: TC010 Detail: 08

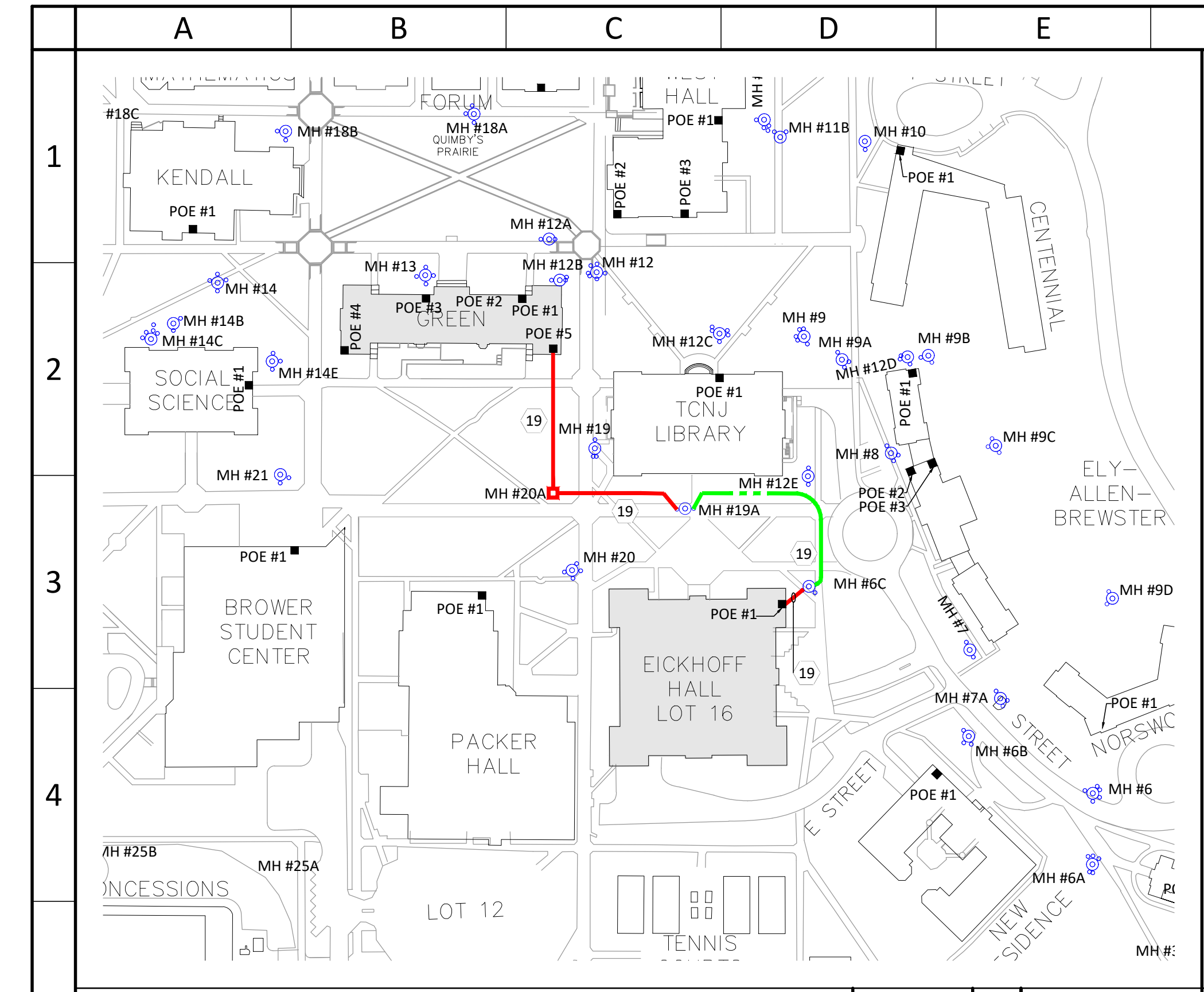
FIBER ROUTING - PACKER HALL TO EICKHOFF HALL Scale: 1" = 150' Drawing: TC010 Detail: 09

ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID

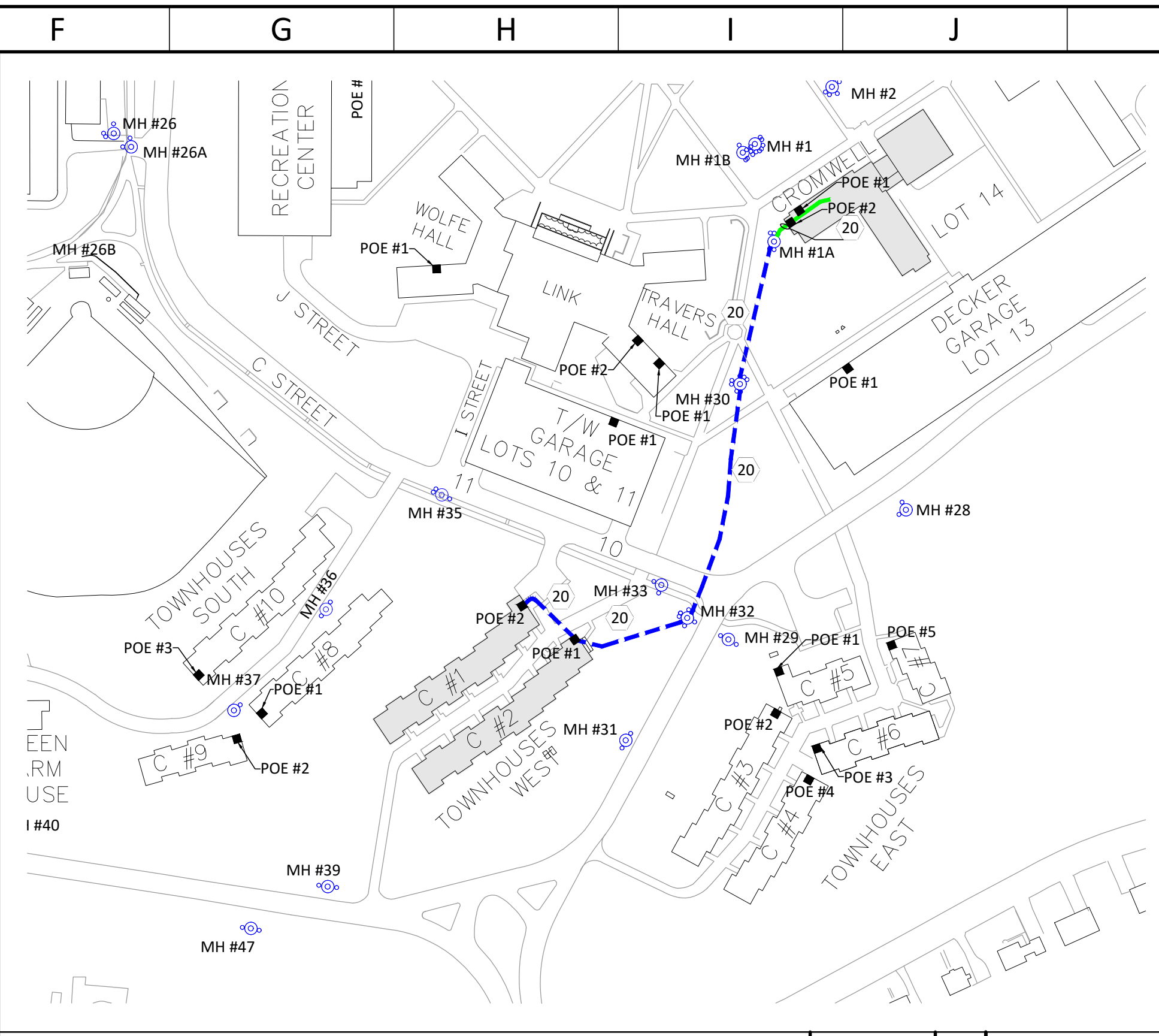
dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DIB Call: DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

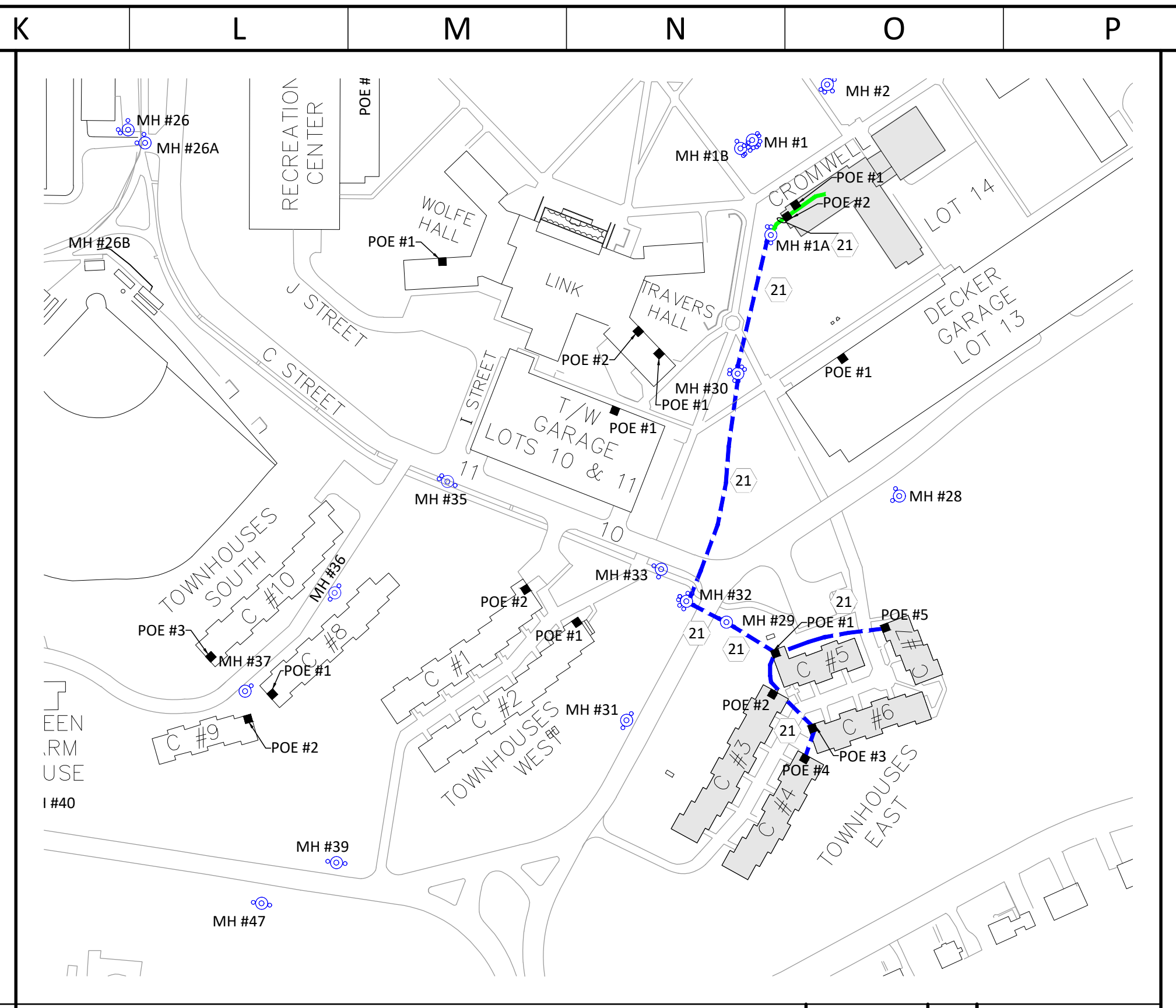
title
BUILDING FIBER ROUTING
dwg. no.
TC010
scale AS SHOWN
drawn by SC
checked by SG
date 09/17/2021



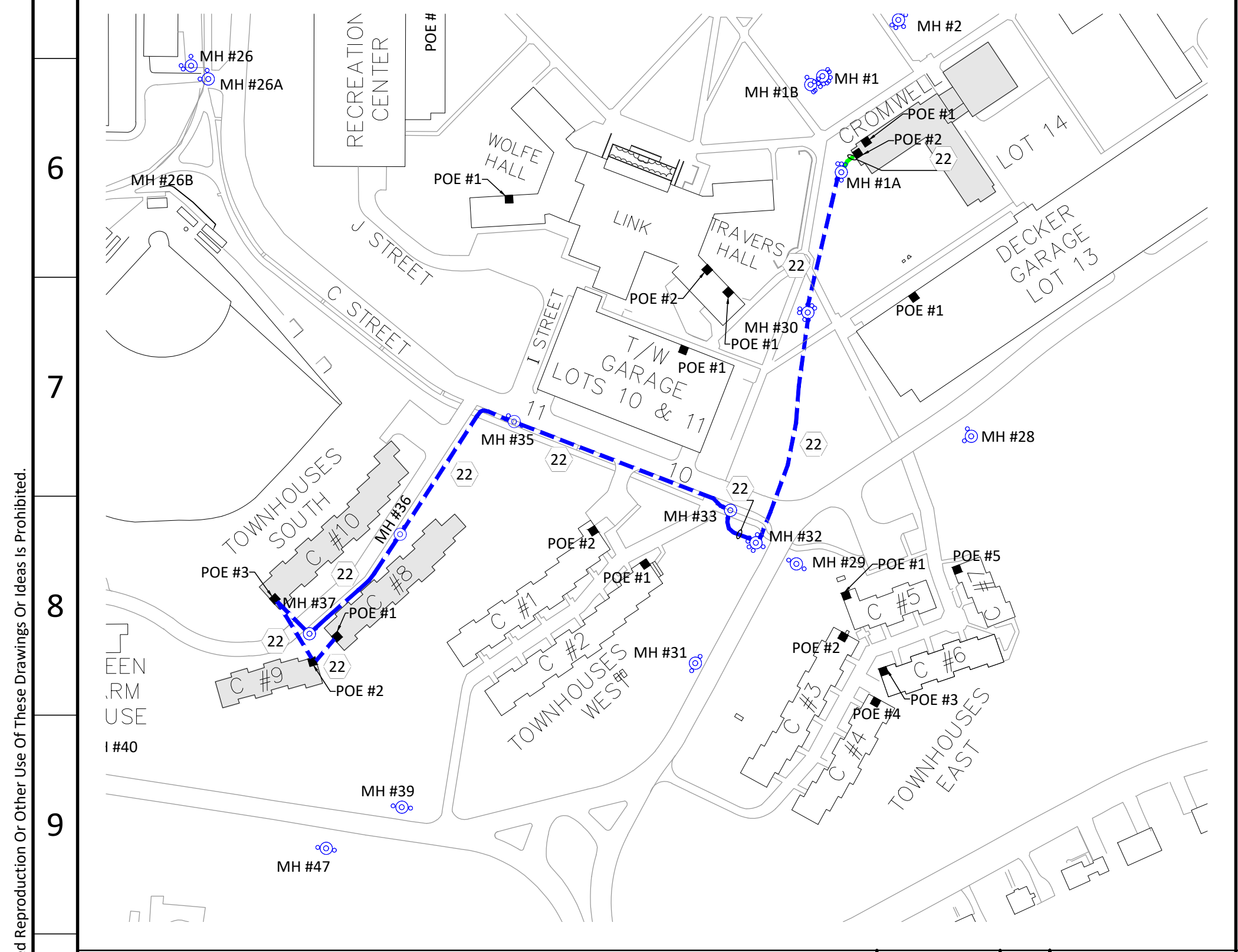
FIBER ROUTING - EICKHOFF HALL TO GREEN HALL Scale: 1" = 150' Drawing: TC011 Detail: 01



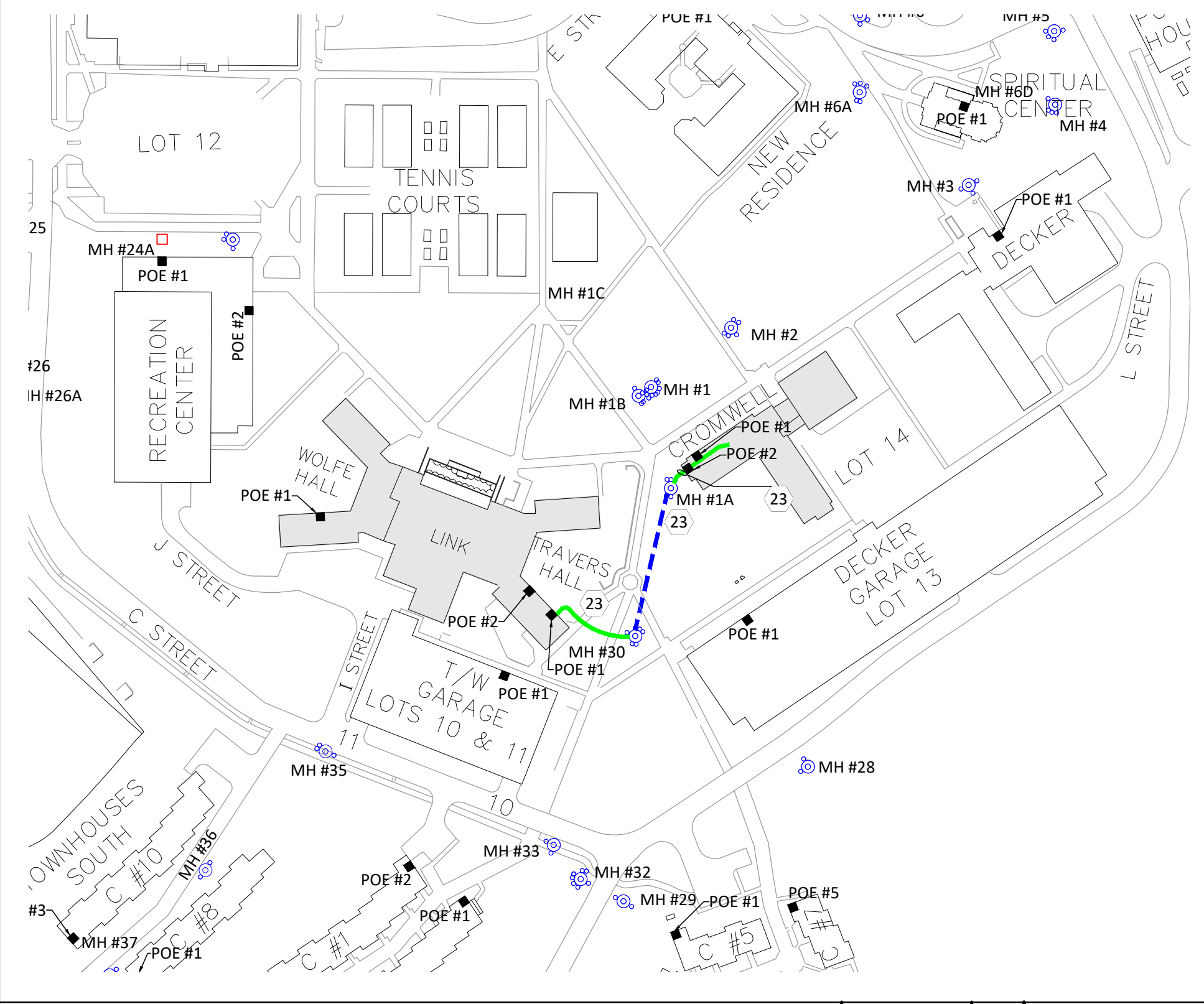
FIBER ROUTING - TOWN HOUSE WEST TO CROMWELL HALL Scale: 1" = 150' Drawing: TC011 Detail: 02



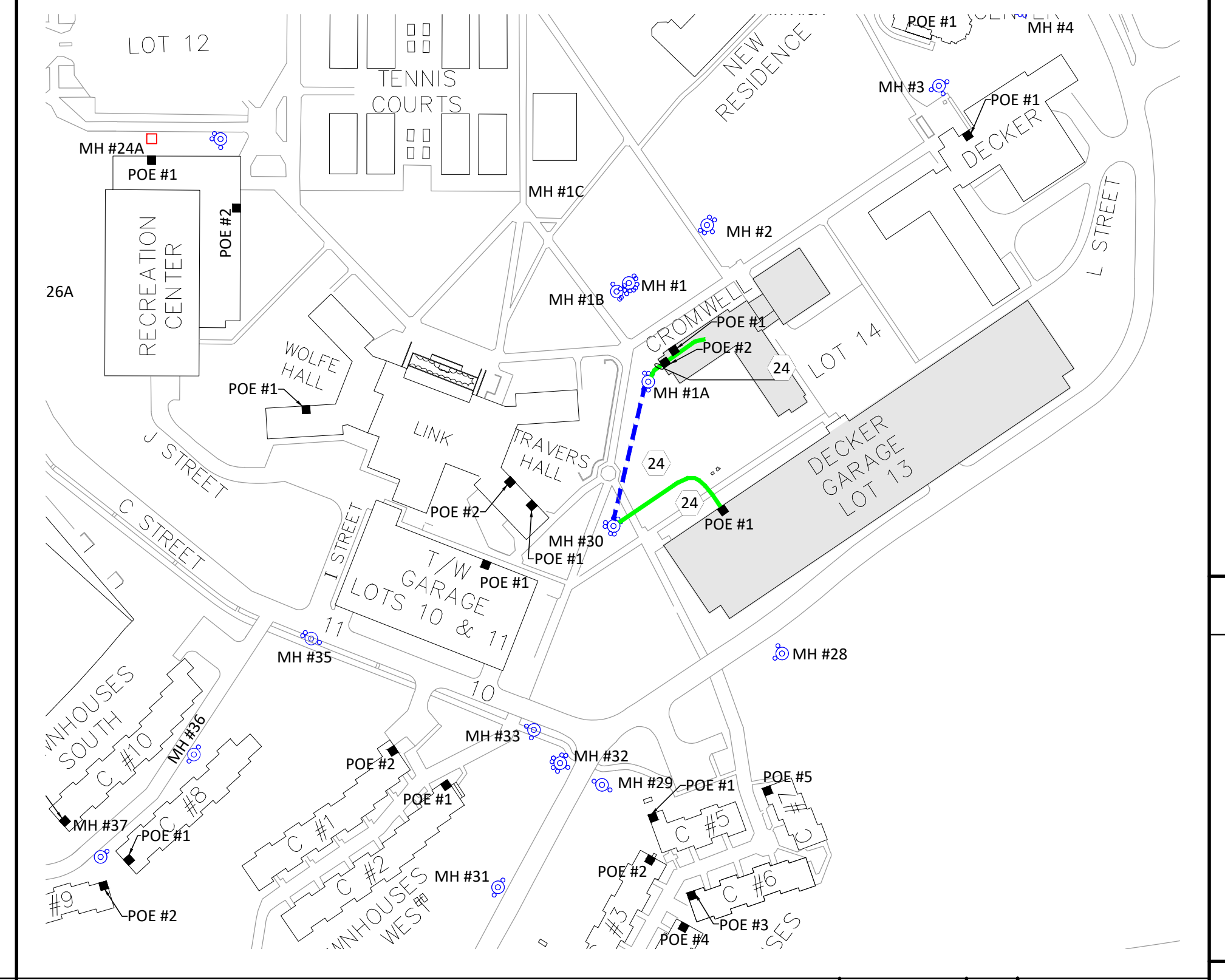
FIBER ROUTING - TOWN HOUSE EAST TO CROMWELL HALL Scale: 1" = 150' Drawing: TC011 Detail: 03



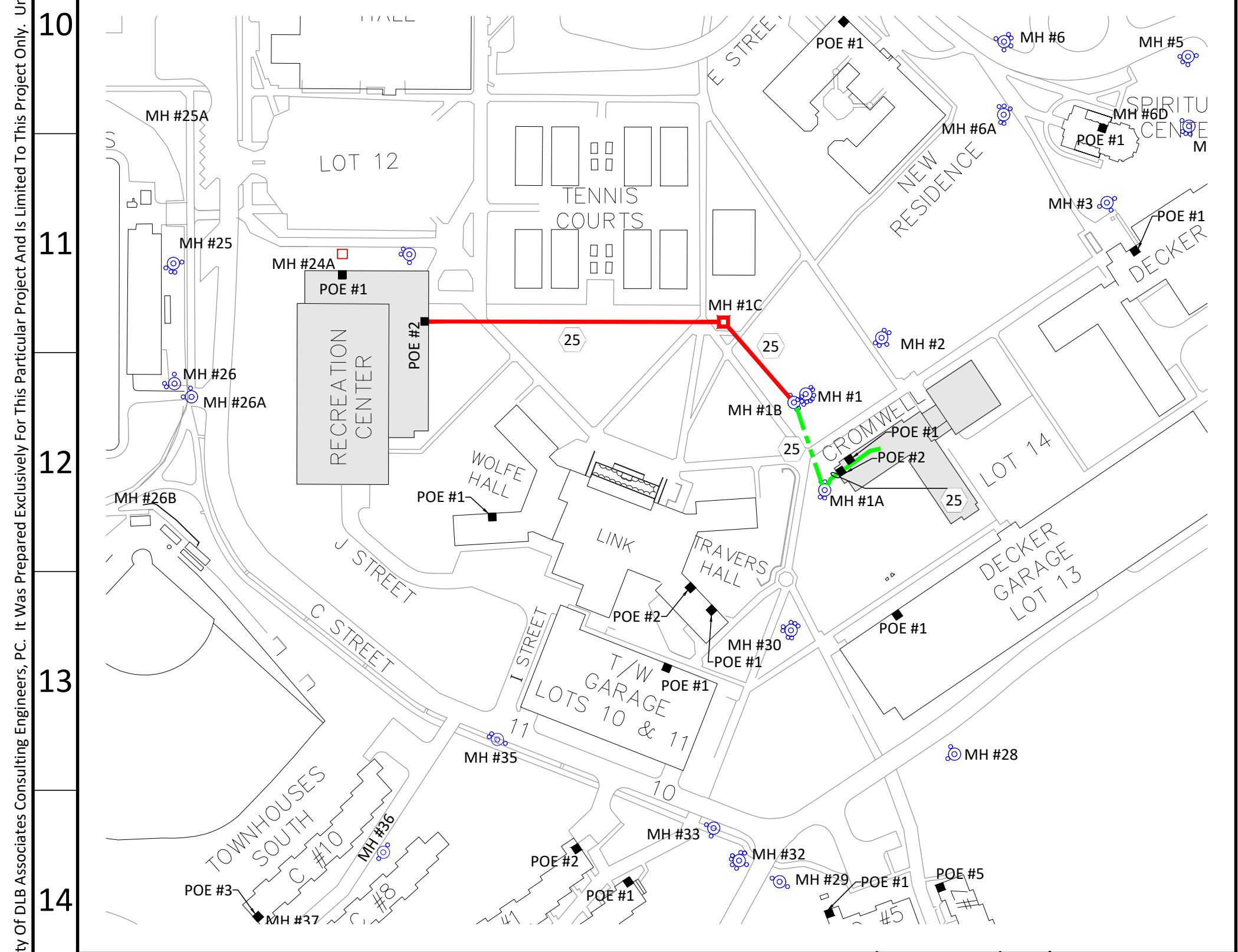
FIBER ROUTING - TOWN HOUSE SOUTH TO CROMWELL HALL Scale: 1" = 150' Drawing: TC011 Detail: 04



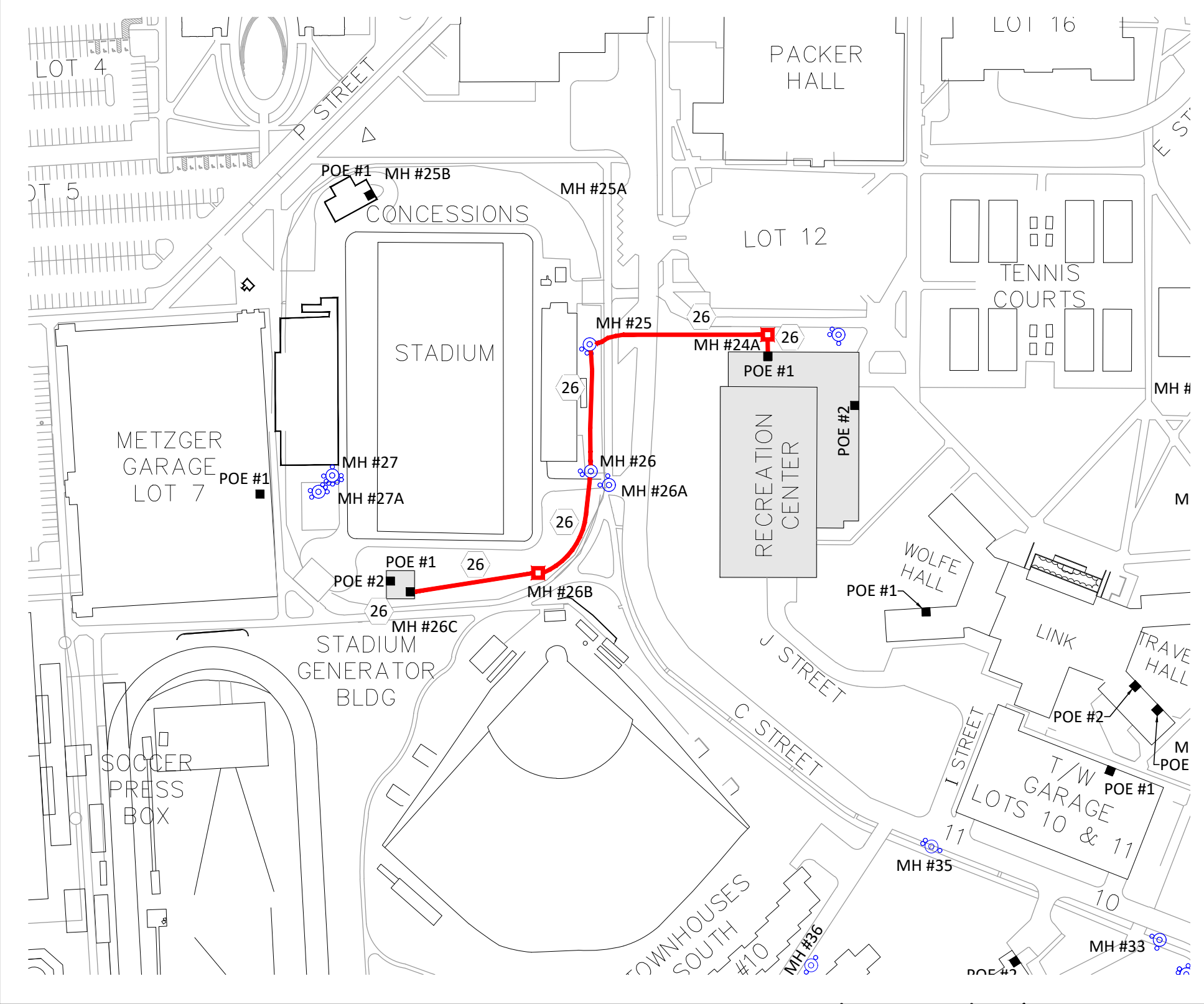
FIBER ROUTING - TRAVERS HALL TO CROMWELL HALL Scale: 1" = 150' Drawing: TC011 Detail: 05



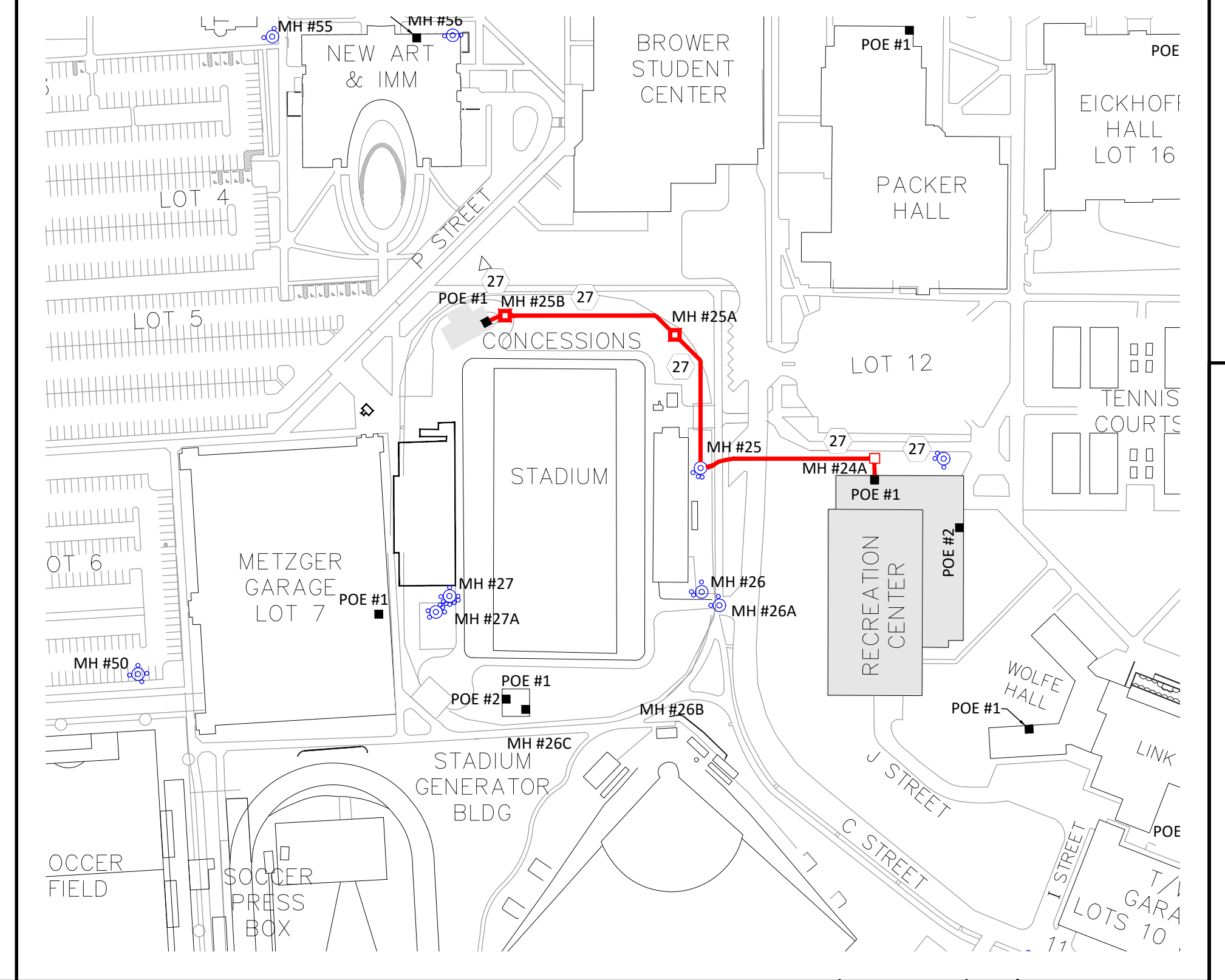
FIBER ROUTING - DECKER GARAGE TO CROMWELL HALL Scale: 1" = 150' Drawing: TC011 Detail: 06



FIBER ROUTING - RECREATION CENTER TO CROMWELL HALL Scale: 1" = 150' Drawing: TC011 Detail: 07



FIBER ROUTING - STADIUM GENERATOR BUILDING TO RECREATION CENTER Scale: 1" = 150' Drawing: TC011 Detail: 08

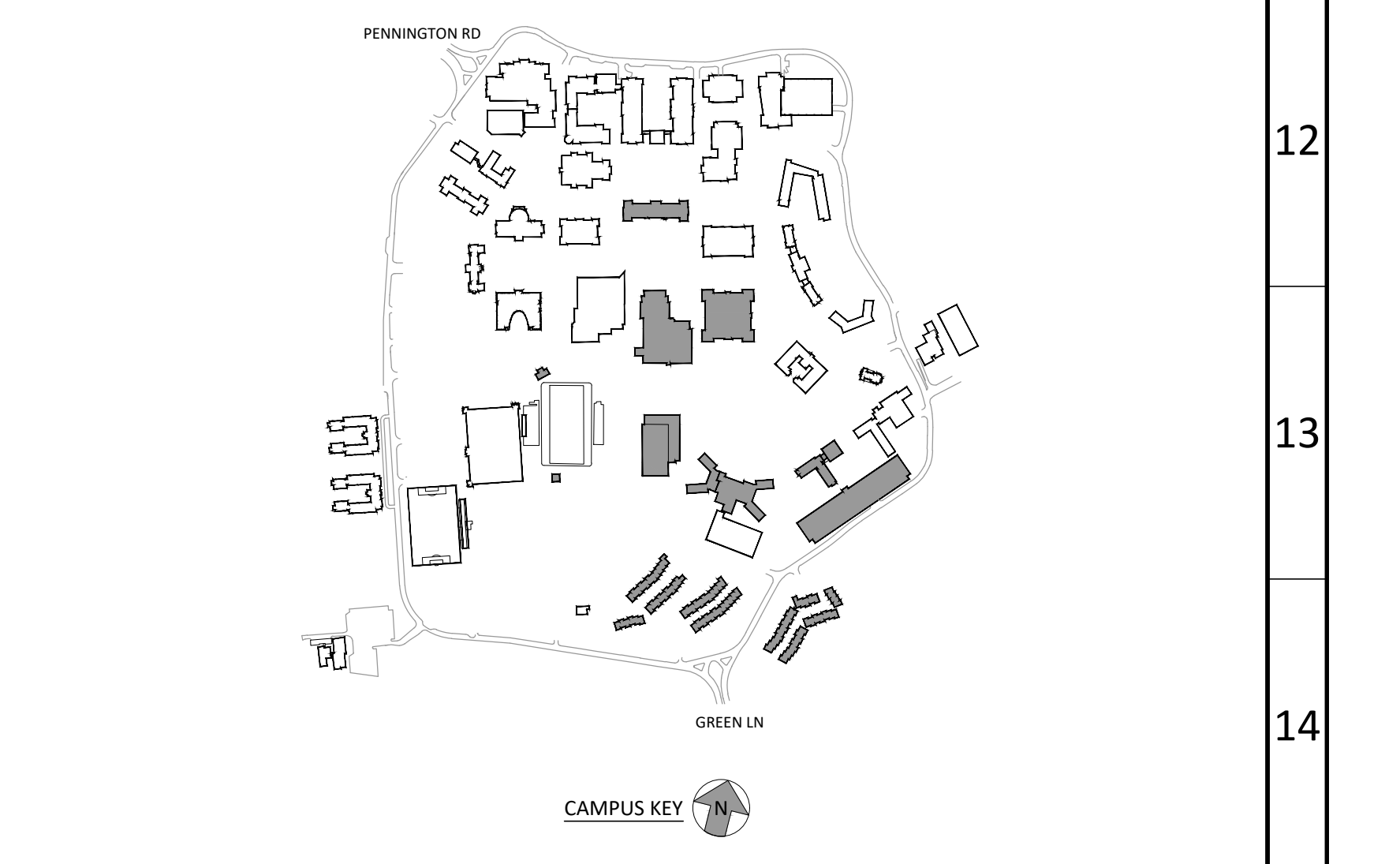


FIBER ROUTING - STADIUM CONCESSION STAND TO RECREATION CENTER Scale: 1" = 150' Drawing: TC011 Detail: 09

Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information	
				Fiber Strand Count	Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36	OS2
2	Bliss Hall	Kendall Hall	Yes	48	OS2
3	Business Building	Kendall Hall	No	24	OS2
4	Trenton Hall	Kendall Hall	No	36	OS2
5	Music Building	Kendall Hall	No	24	OS2
6	AMM Building	Kendall Hall	N/A	0*	OS2
7	Social Science	Kendall Hall	Yes	36	OS2
8	Kendall Hall	Green Hall	Yes	144	OS2
9	Chemistry Building	STEM Building	N/A	0*	OS2
10	Physics Building	STEM Building	N/A	0*	OS2
11	Biology Building	STEM Building	N/A	0*	OS2
12	STEM Building	STEM Building	N/A	0*	OS2
13	Forcina Hall	Roscoe Hall	Yes	24	OS2
14	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48	OS2/OM1
15	Education Building	Roscoe Hall	N/A	0*	OS2
16	Centennial Hall	Roscoe Hall	No	24	OS2
17	Gleason Library	Roscoe Hall	No	36	OS2
18	Roscoe Hall	Green Hall	No	96	OS2
19	Norsworthy Hall	Ely-Allen-Brewster	N/A	0*	OS2
20	Spiritual Center	Ely-Allen-Brewster	No	24	OS2
21	Maintenance Building	Powerhouse	Yes	36	OS2
22	Powerhouse	Ely-Allen-Brewster	No	48	OS2
23	Decker Hall	Ely-Allen-Brewster	No	36	OS2
24	Ely-Allen-Brewster	Green Hall	Yes	192	OS2
25	New Residence Hall	Eickhoff Hall	No	24	OS2
26	Packer Hall	Eickhoff Hall	No	36	OS2
27	Brower Student Center	Eickhoff Hall	N/A	0*	OS2
28	Eickhoff Hall	Green Hall	No	96	OS2
29	TH1 (Town House West)	Cromwell Hall	No	48	OS2
30	THS 21A/B (Town House East)	Cromwell Hall	No	(2)36	OS2
31	THJ (Town House South)	Cromwell Hall	No	48	OS2
32	Travers Hall	Cromwell Hall	Yes	12	OS2
33	Wolfe Hall	Cromwell Hall	N/A	0*	OS2
34	Decker Garage	Cromwell Hall	Yes	24	OS2
35	Recreation Center	Cromwell Hall	No	36	OS2
36	Stadium Generator Building	Recreation Center	No	12	OS2
37	Stadium Concession Stand	Recreation Center	No	12	OS2
38	Soccer Field Press Box 28A/B	Admin Splice	No	36	OS2
39	Metzger Garage	Admin Splice	No	24	OS2
40	Phelps Hall	Admin Splice	N/A	0*	OS2
41	Hausdoerffer Hall	Admin Splice	N/A	0*	OS2
42	Cromwell Hall	Green Hall	No	288	OS2
43	Travers/Wolfe Garage	Travers Hall	Yes	12	OS2
44	Forcina Garage	Education Building	No	12	OS2
45	Fire Pump House	Admin Services Building	No	12	OS2
46	Admin Services Building	Admin Splice	N/A	36	OS2
47	Eickhoff Room 227**	Eickhoff Room 337	No	48/48	OS2/OM1

- GENERAL NOTES**
- This Sheet's Purpose Is To Show The Fiber Pathway Between Buildings Where New Fiber Will Be Provided. See TC005-TC008 For Further Campus Routing Information. See The Building Drawing Series For Further Building Routing Information.
 - Each Fiber Run To Be One Continuous Run From MDF To MDF Without Any Splices.

- PARTIAL SYMBOLS & ABBREVIATIONS**
- | | |
|--|--|
| | Existing Manhole |
| | New Manhole |
| | Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway |
| | Existing Conduit Pathway Available For New Fiber Installation |
| | No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required |
| | Building To Building Span Number |

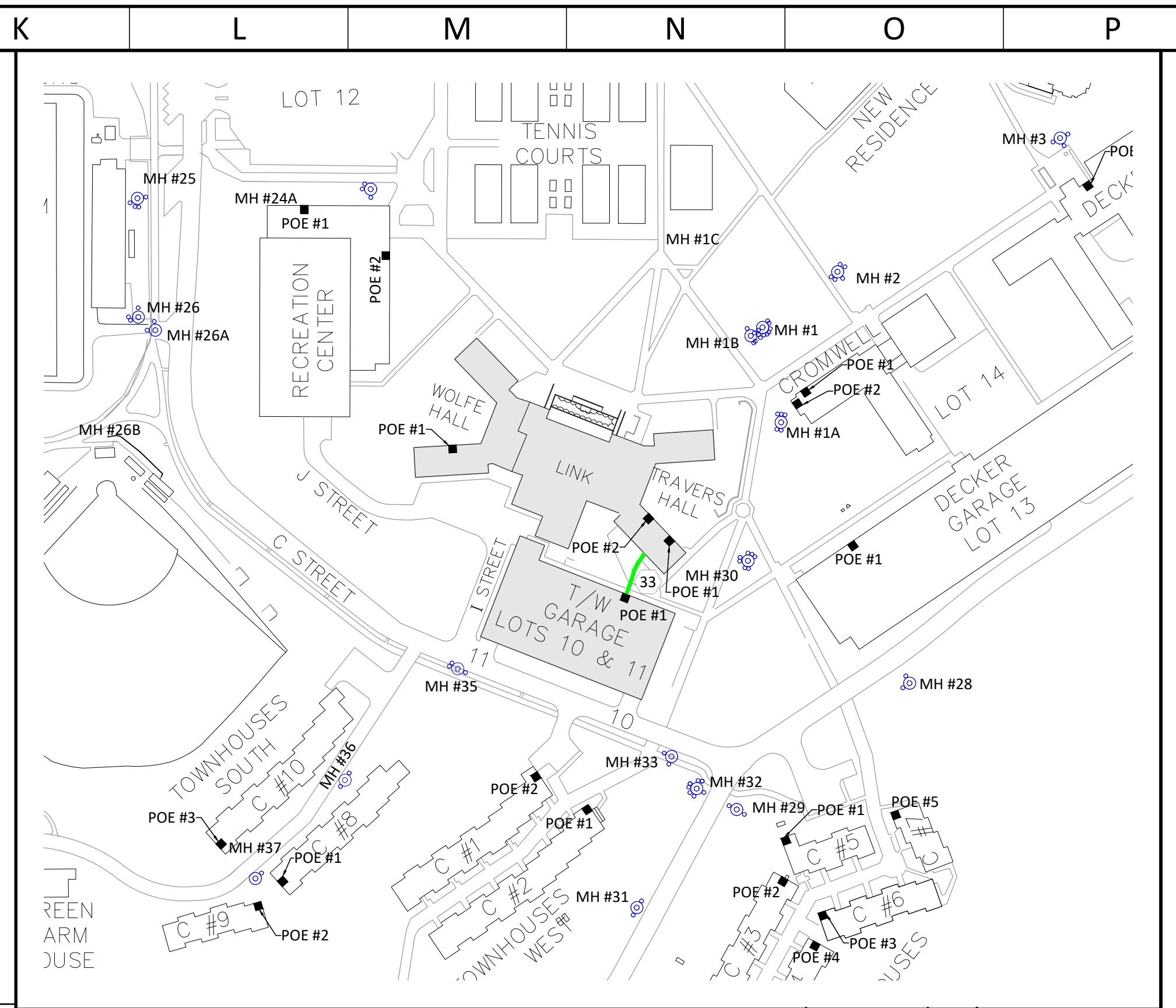
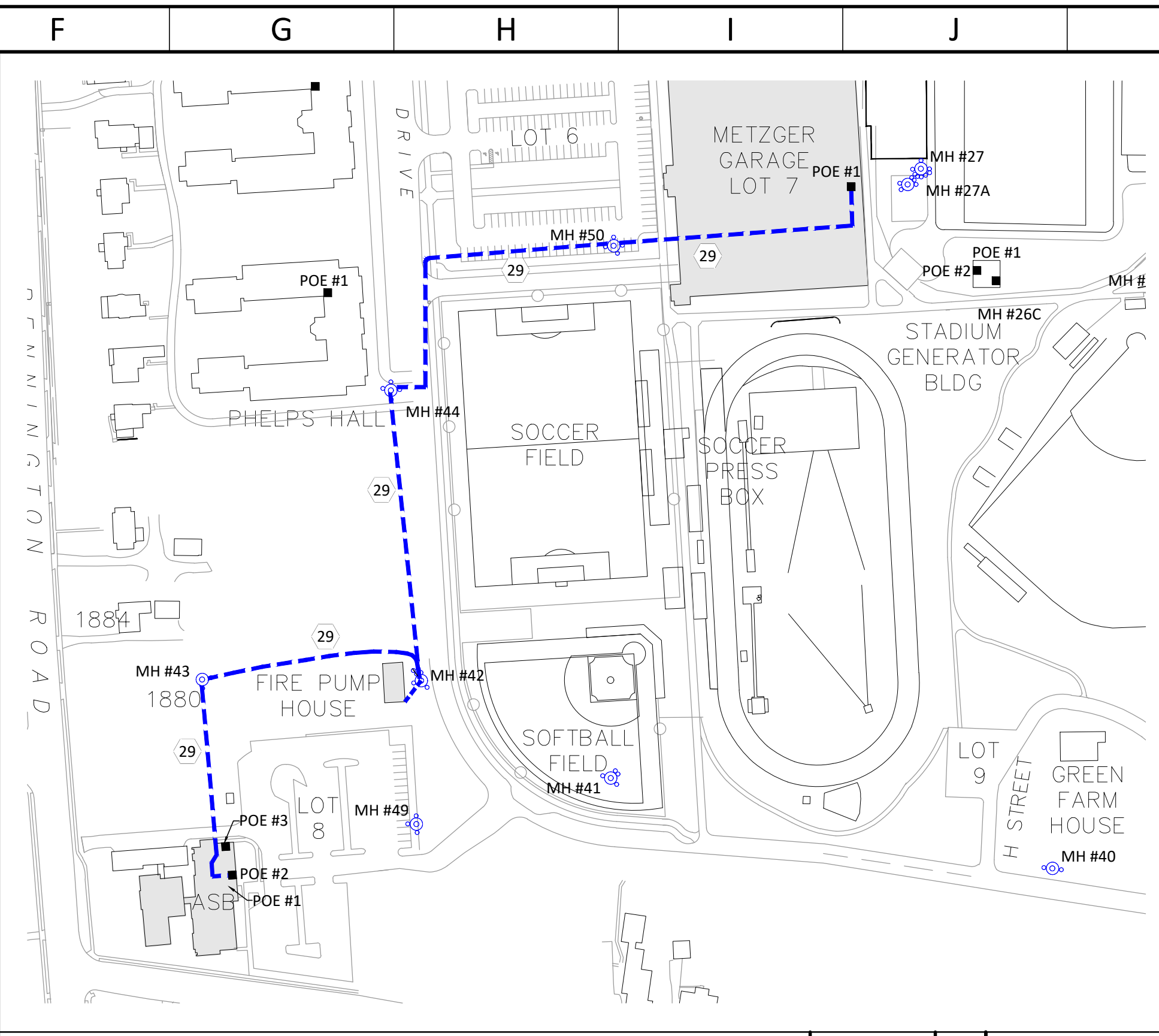
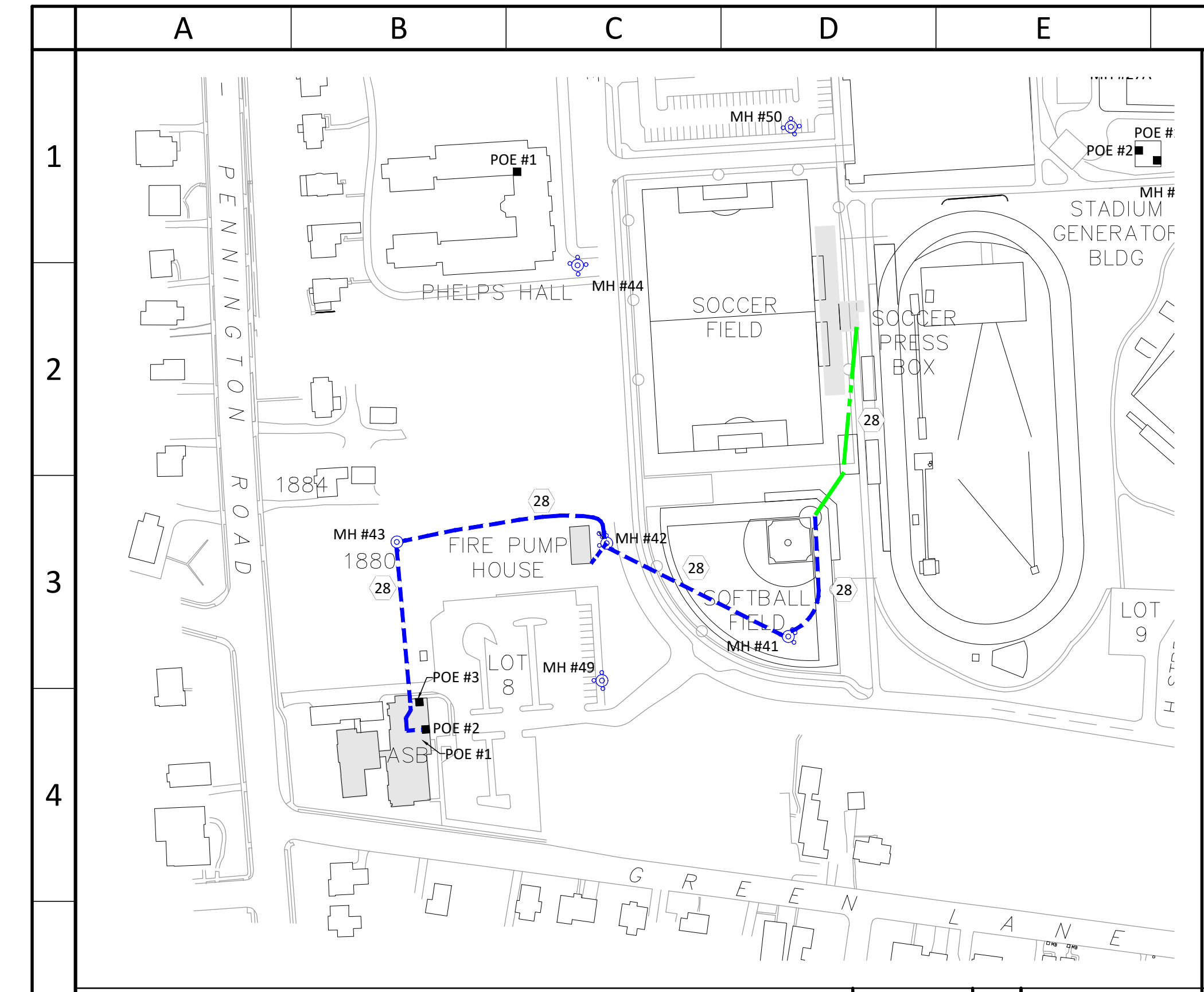


ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DIB Call: Anthony Laskosky Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
project: TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

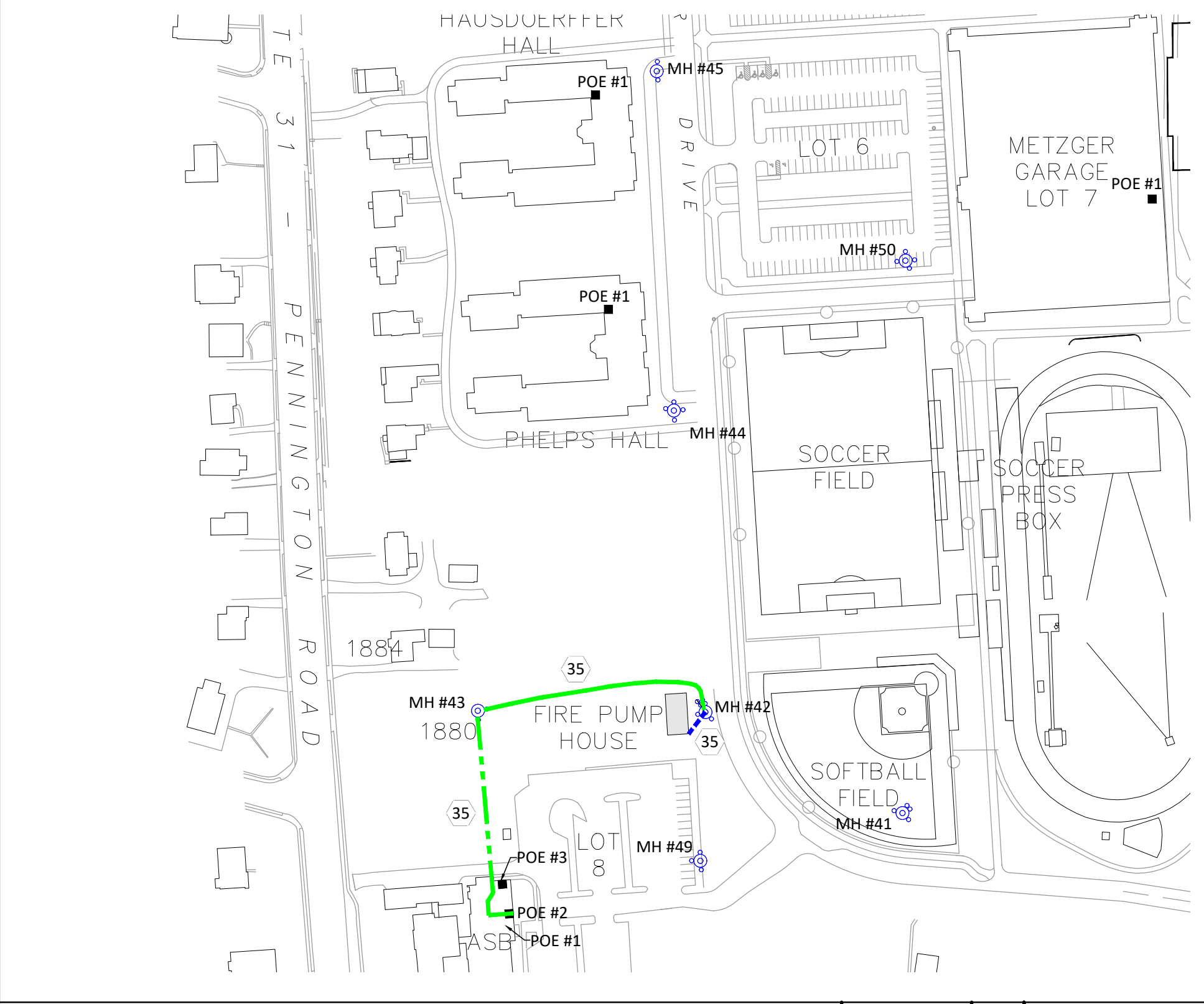
title: BUILDING FIBER ROUTING
dwg. no.: TC011
scale: AS SHOWN
drawn by: SC
checked by: SG
date: 09/17/2021



FIBER ROUTING - SOCCER FIELD PRESS BOX TO ADMINISTRATIVE SERVICES BLDG Scale: 1" = 150' Drawing: TC012 Detail: 01

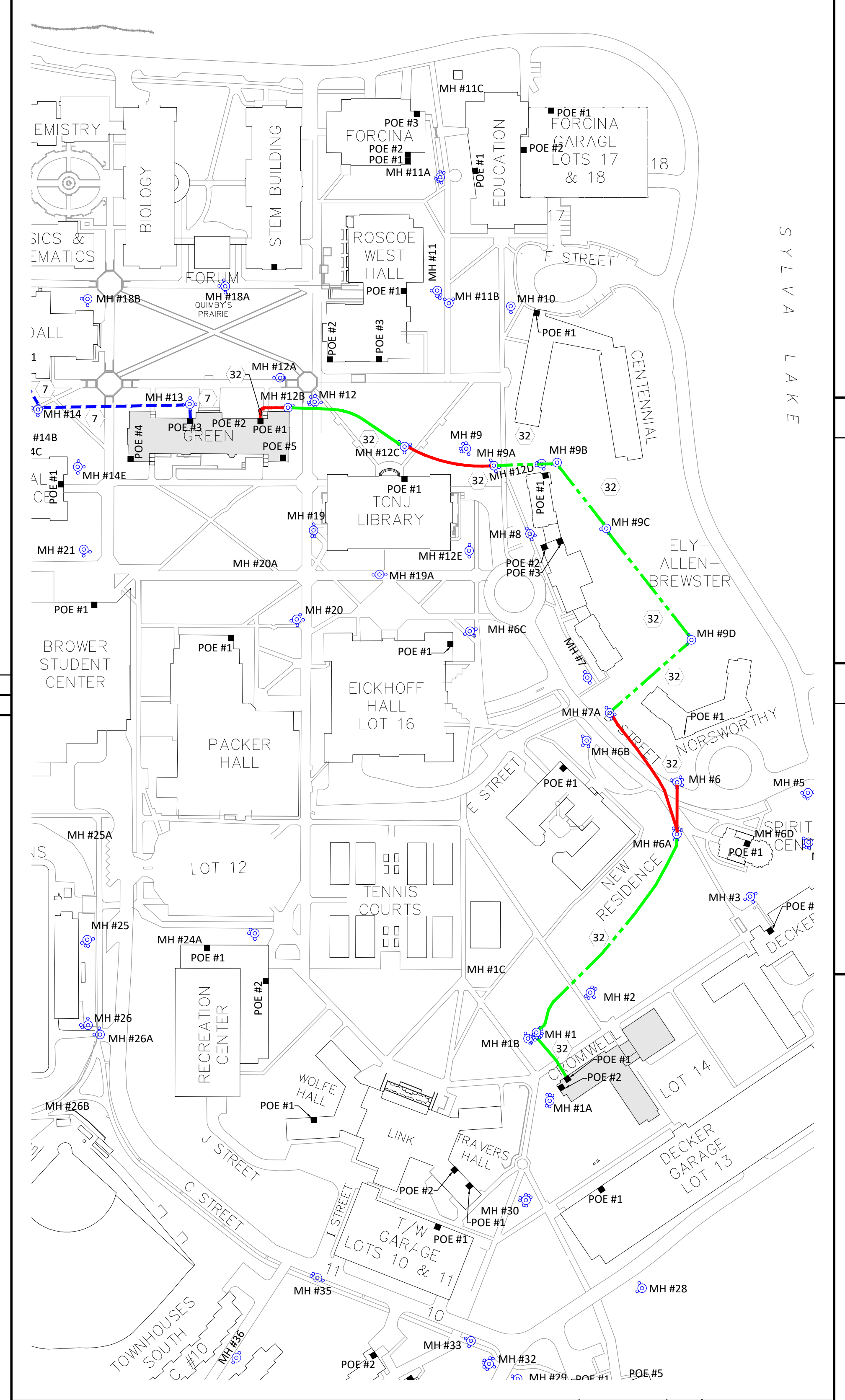
FIBER ROUTING - METZGER GARAGE TO ADMINISTRATIVE SERVICES BUILDING Scale: 1" = 150' Drawing: TC012 Detail: 02

FIBER ROUTING - TRAVERS/WOLFE GARAGE TO WOLFE HALL Scale: 1" = 150' Drawing: TC012 Detail: 03



FIBER ROUTING - FIRE PUMP HOUSE TO ADMIN SPLICE Scale: 1" = 150' Drawing: TC012 Detail: 04

FIBER ROUTING - FIRE PUMP HOUSE TO ADMIN SPLICE Scale: 1" = 150' Drawing: TC012 Detail: 04



FIBER ROUTING - CROMWELL HALL TO GREEN HALL Scale: 1" = 150' Drawing: TC012 Detail: 05

Fiber Routing					
Span ID	Starting Building	Ending Building	Empty Conduit	Fiber Cable Information	
				Fiber Strand Count	Type Of Cable
1	Armstrong Hall	STEM Building	Yes	36	OS2
2	Bliss Hall	Kendall Hall	Yes	48	OS2
3	Business Building	Kendall Hall	No	24	OS2
4	Trenton Hall	Kendall Hall	No	36	OS2
5	Music Building	Kendall Hall	No	24	OS2
6	AIMM Building	Kendall Hall	N/A	0*	OS2
7	Social Science	Kendall Hall	Yes	36	OS2
8	Kendall Hall	Green Hall	Yes	144	OS2
9	Chemistry Building	STEM Building	N/A	0*	OS2
10	Physics Building	STEM Building	N/A	0*	OS2
11	Biology Building	STEM Building	N/A	0*	OS2
12	STEM Building	Green Hall	N/A	0*	OS2
13	Forcina Hall	Roscoe Hall	Yes	24	OS2
14	Forcina Hall Room 104**	Forcina Room 1NA	No	48/48	OS2/OM1
15	Education Building	Roscoe Hall	N/A	0*	OS2
16	Centennial Hall	Roscoe Hall	No	24	OS2
17	Gitenshtein Library	Roscoe Hall	No	36	OS2
18	Roscoe Hall	Green Hall	No	96	OS2
19	Norsworthy Hall	Ely-Allen-Brewster	N/A	0*	OS2
20	Spirital Center	Ely-Allen-Brewster	No	24	OS2
21	Maintenance Building	Powerhouse	Yes	36	OS2
22	Powerhouse	Ely-Allen-Brewster	No	48	OS2
23	Decker Hall	Ely-Allen-Brewster	No	36	OS2
24	Ely-Allen-Brewster	Green Hall	Yes	192	OS2
25	New Residence Hall	Eickhoff Hall	No	24	OS2
26	Packer Hall	Eickhoff Hall	No	36	OS2
27	Brower Student Center	Eickhoff Hall	N/A	0*	OS2
28	Eickhoff Hall	Green Hall	No	96	OS2
29	TH1 (Town House West)	Cromwell Hall	No	48	OS2
30	TH5 21A/B (Town House East)	Cromwell Hall	No	(2) 36	OS2
31	TH9 (Town House South)	Cromwell Hall	No	48	OS2
32	Travers Hall	Cromwell Hall	Yes	12	OS2
33	Wolfe Hall	Cromwell Hall	N/A	0*	OS2
34	Decker Garage	Cromwell Hall	Yes	24	OS2
35	Recreation Center	Cromwell Hall	No	36	OS2
36	Stadium Generator Building	Recreation Center	No	12	OS2
37	Stadium Concession Stand	Recreation Center	No	12	OS2
38	Soccer Field Press Box 28A/B	Admin Splice	No	36	OS2
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42	Cromwell Hall	Green Hall	No	288	OS2
43	Travers/Wolfe Garage	Travers Hall	Yes	12	OS2
44	Forcina Garage	Education Building	No	12	OS2
45	Fire Pump House	Admin Services Building	No	12	OS2
46	Admin Services Building	Admin Splice	N/A	36	OS2
47	Eickhoff Room 227**	Eickhoff Room 337	No	48/48	OS2 / OM1

GENERAL NOTES

- This Sheet's Purpose Is To Show The Fiber Pathway Between Buildings Where New Fiber Will Be Provided. See TC005-TC008 For Further Campus Routing Information. See The Building Drawing Series For Further Building Routing Information.
- Each Fiber Run To Be One Continuous Run From MDF To MDF Without Any Splices.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description
	Existing Manhole
	New Manhole
	Remove Existing Fiber And Pull New Fiber Through Empty Conduit Pathway
	Existing Conduit Pathway Available For New Fiber Installation
	No Existing Fiber Available - New Duct Bank, Trenching, And New Fiber Required
	Building To Building Span Number



ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

ITEM	DATE	ISSUE DESCRIPTION

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DIB Call: DLB Project ID: 47211
Anthony Laskosky
Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IK124
TCNJ Project Manager: Mumtaz Makhdoumi

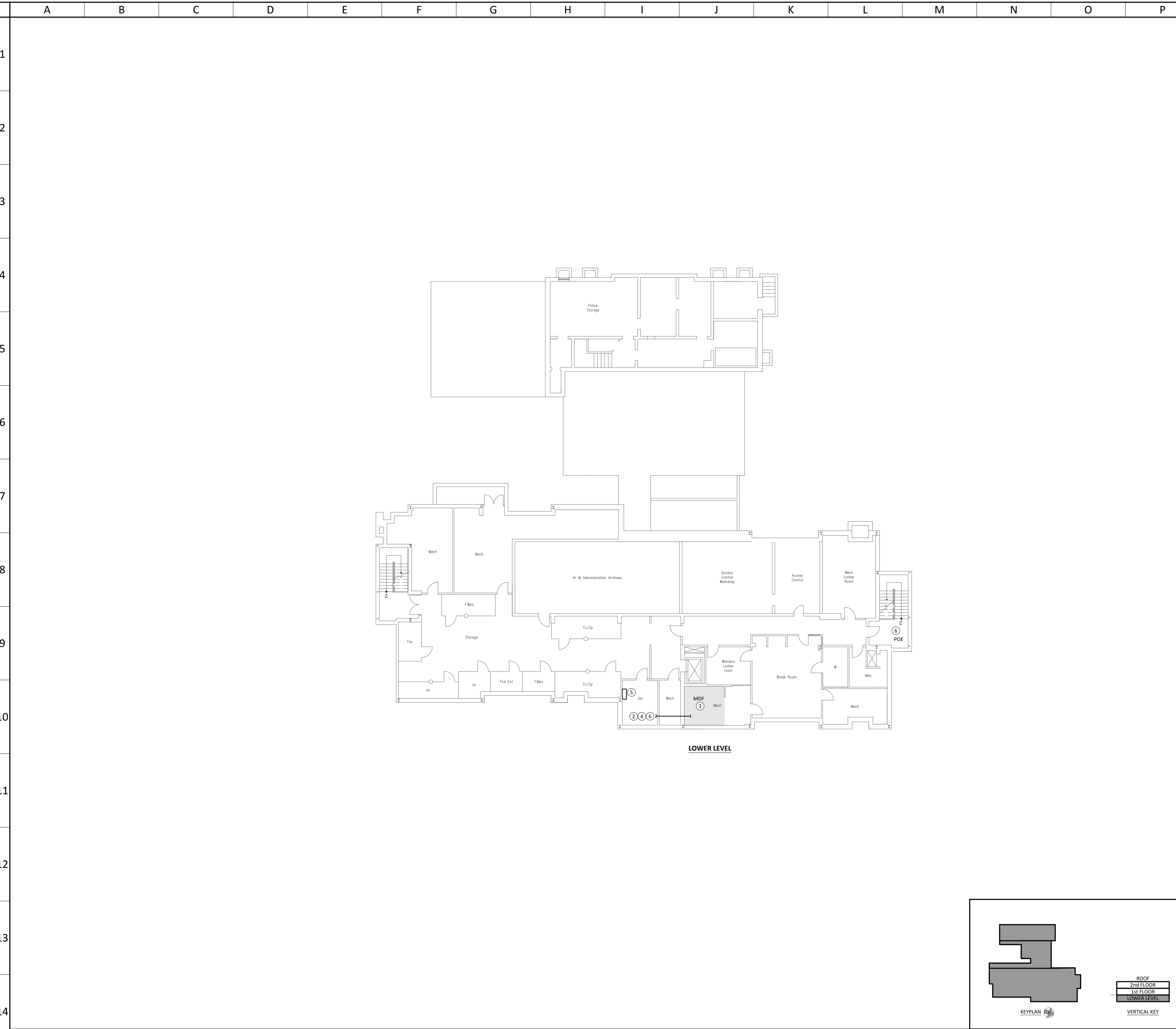
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title
BUILDING FIBER ROUTING
scale AS SHOWN
drawn by SC
checked by SG
date 09/17/2021
dwg. no.
TC012
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30x42

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KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

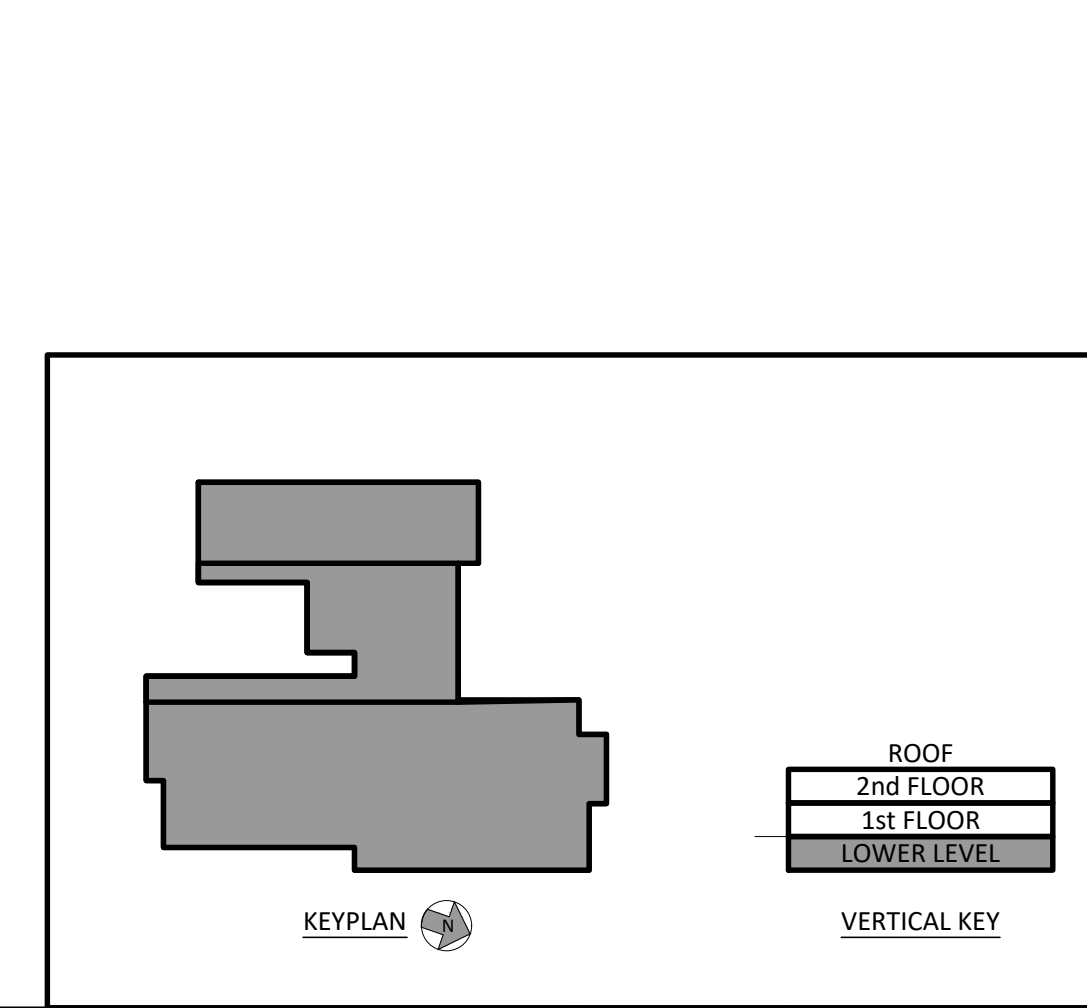
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
- 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
- 1c. Not Used.
2. Route Fiber Pathway From Admin Splice To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cable Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
4. Route Fiber Conduit As Close To The Existing Ceiling As Possible.
5. Location Of Admin Splice Cabinet.
6. Coordinate With TCNJ IT Department For Cable Removal For This Building. The Intent Is To Remove The Existing Fiber Cable And To Replace With A Higher Capacity Cable Between Admin Splice To Admin, Admin Splice To Soccer Press Box, Admin Splice To Metzger Garage, And ASB To Fire Pump Utilizing Existing Pathways.

GENERAL NOTES

1. The Associated Project Drawings Are Diagrammatic And Are Not Intended To Show The Location Of All Equipment And Devices; Coordinate All Details Of Work As Required To Achieve A Complete Functional Installation (In Conjunction With The Project Specifications).
2. All Work Shall Be Done In Accordance With Industry Construction Codes, Standards, And Other Agencies Having Jurisdiction.
3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
4. All Work And Materials Shall Be New Unless Otherwise Noted.
5. Contractor Shall Be Responsible To Sleeve Wall And Floor Penetrations Prior To Running Cable And Conduit For All Cable Runs Noted In Plans.
6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
7. A Portion Of This Work Will Be Occurring In The Path Of An Emergency Egress Route. During All Phases Of This Project, A Protected Emergency Egress Route Must Be Maintained Through Each Affected Emergency Egress Route, Allowing Retreat From The Building. Approval From The Department Of Community Affairs Is Required To Close Or Re-direct An Egress Route.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



ADMIN SERVICE BUILDING - FIBER LAYOUT Scale: 3/32"=1'-0" Drawing: TC013 Detail: 01

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351



project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

scale	drawn by	checked by	date	title INTERIOR FIBER ROUTING ADMIN SERVICE BUILDING FIRE ALARM TC013	dwg. no. TC013
AS SHOWN	AM	SG	09/17/2021		

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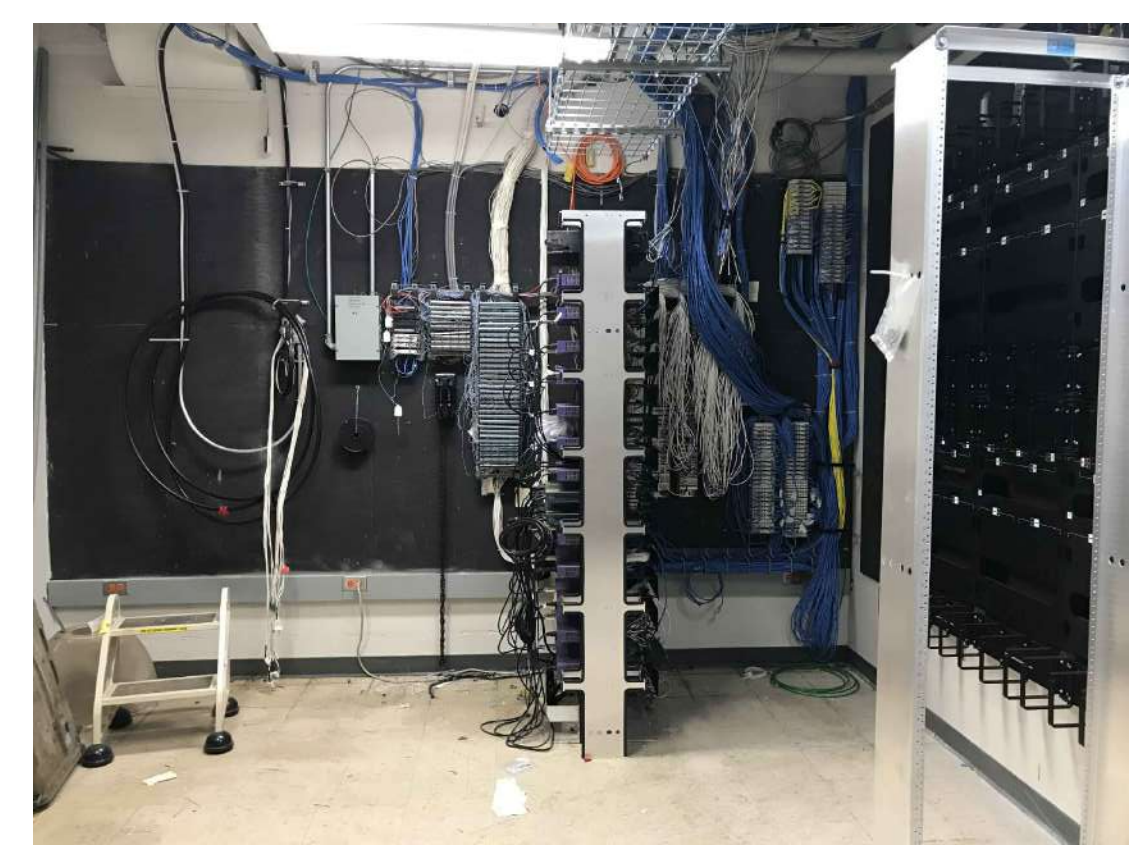
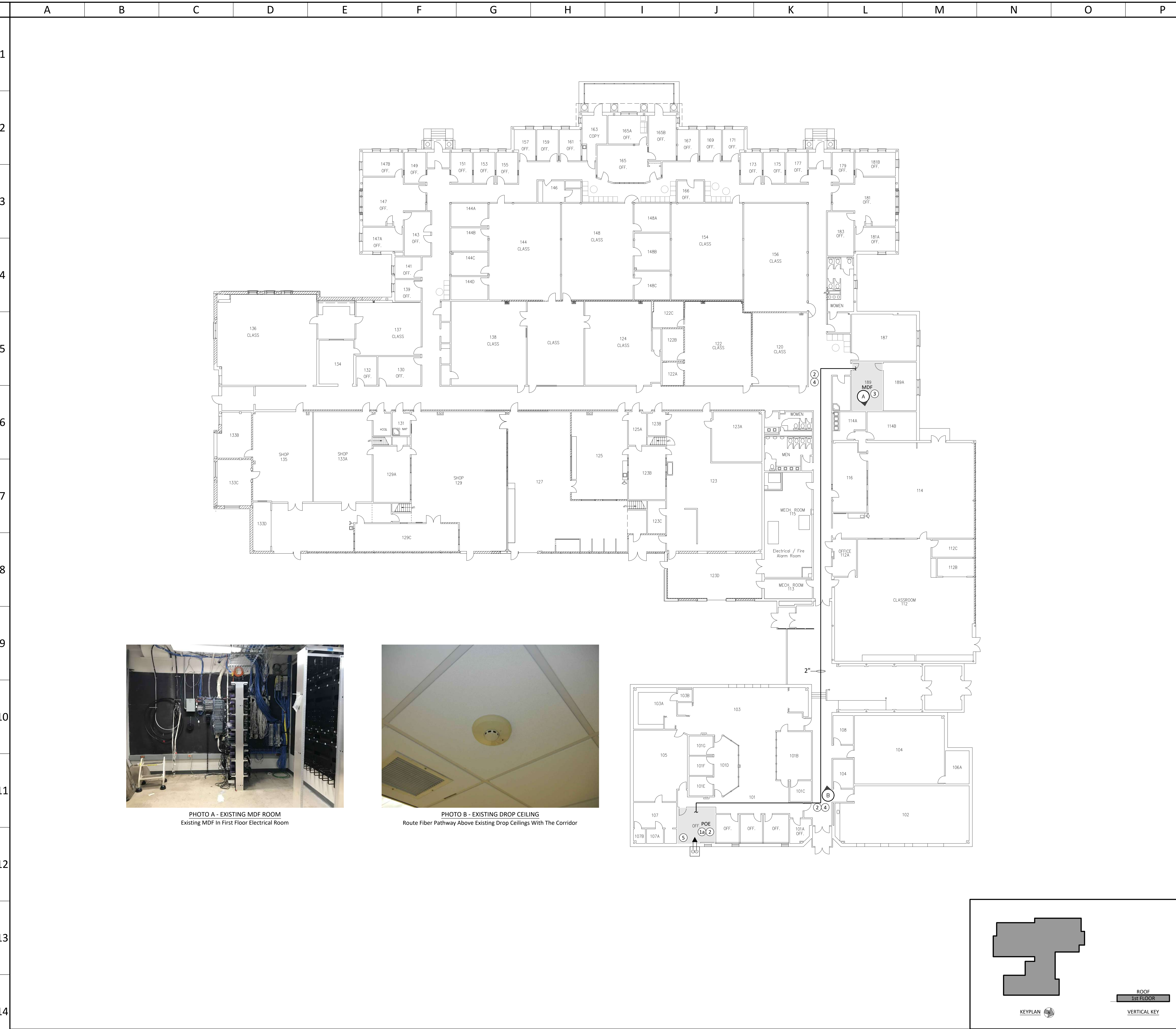


PHOTO A - EXISTING MDF ROOM
Existing MDF In First Floor Electrical Room



PHOTO B - EXISTING DROP CEILING
Route Fiber Pathway Above Existing Drop Ceilings With The Corridor

KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
2. Route Fiber Pathway From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cable Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
4. Route Fiber Pathway Above Drop Ceiling Where Possible.
5. Route Exterior Fiber From Underground Conduit Up The Side Of The Building To Enclosed Weatherproof 24"W x 30"H x 18"D Pullbox. Route From The Pullbox Up The Exterior Of The Building And Into The Interior Space Above Ceiling Line.

GENERAL NOTES

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2. All Work Shall Be Done In Accordance With Industry Construction Codes, Standards, And Other Agencies Having Jurisdiction.
3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
4. All Work And Materials Shall Be New Unless Otherwise Noted.
5. Contractor Shall Be Responsible To Sleeve Wall And Floor Penetrations Prior To Running Cable And Conduit For All Cable Runs Noted In Plans.
6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
7. A Portion Of This Work Will Be Occurring In The Path Of An Emergency Egress Route. During All Phases Of This Project, A Protected Emergency Egress Route Must Be Maintained Through Each Affected Emergency Egress Route, Allowing Retreat From The Building. Approval From The Department Of Community Affairs Is Required To Close Or Re-direct An Egress Route.

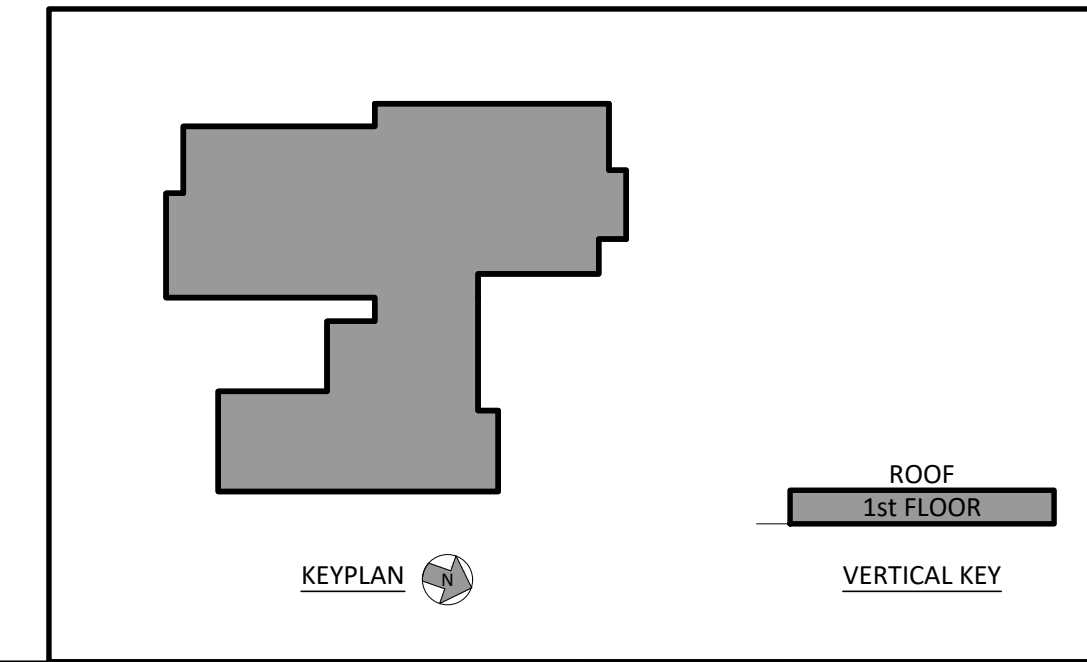
PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		

KEYPLAN

VERTICAL KEY

CAMPUS KEY



ARMSTRONG HALL - FIBER LAYOUT Scale: 1/16"=1'-0" Drawing: TC014 Detail: 01

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724

Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351
DLB Project ID: 47211

TCNJ THE COLLEGE OF NEW JERSEY

project: TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

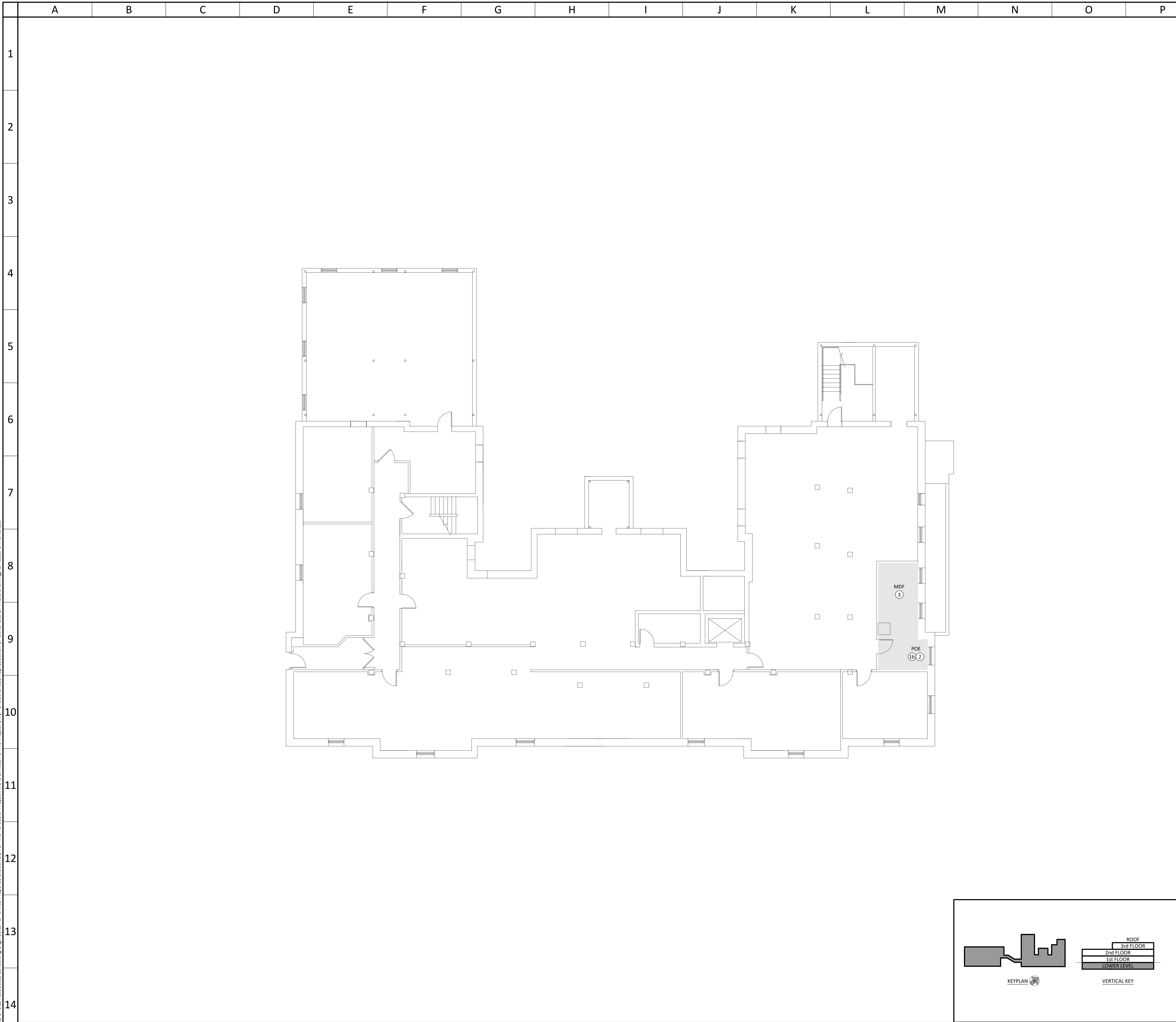
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi

title: INTERIOR FIBER ROUTING ARMSTRONG HALL FIRE ALARM

scale: AS SHOWN drawn by: AM checked by: SG date: 09/17/2021

dwg. no.: **TC014**

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KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

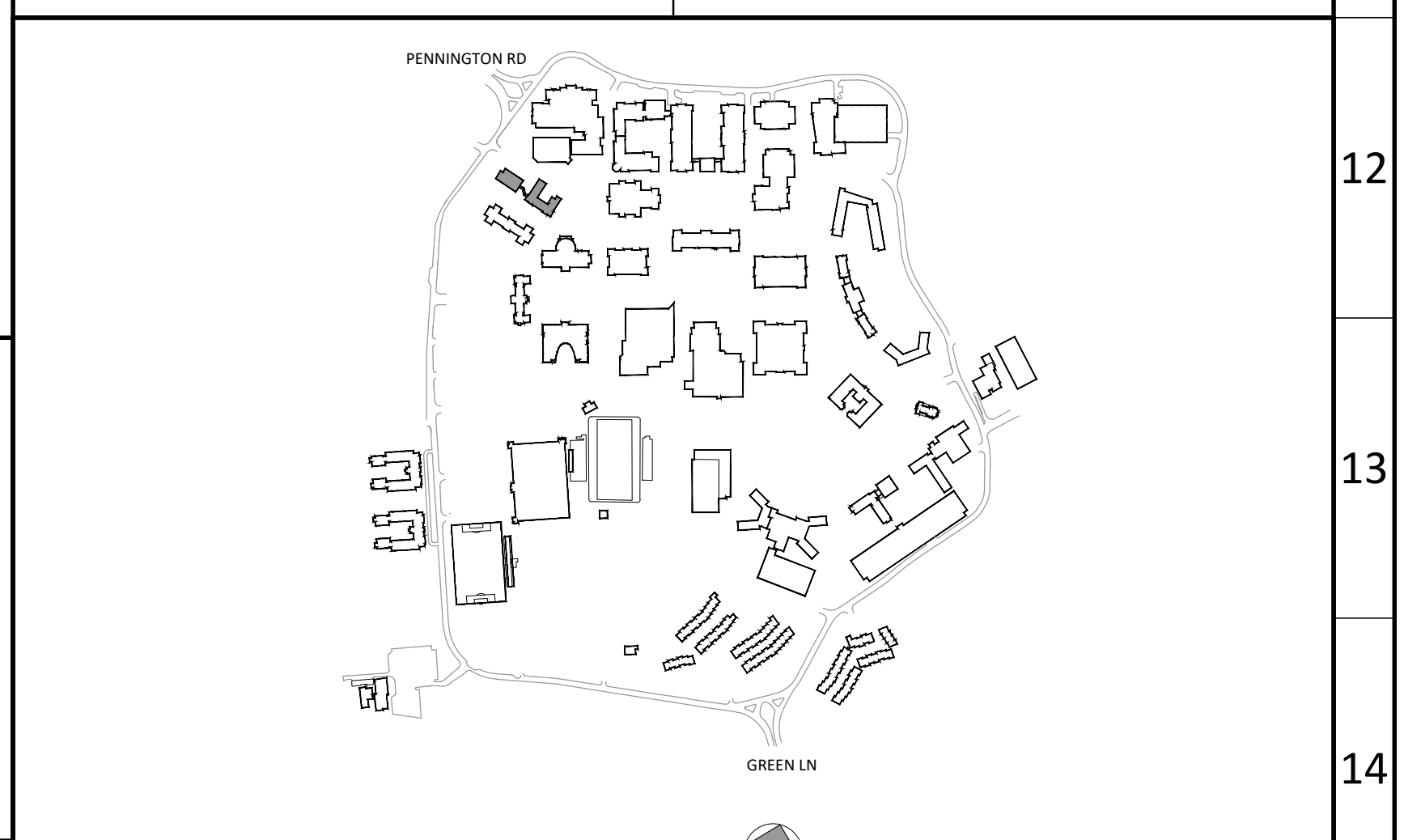
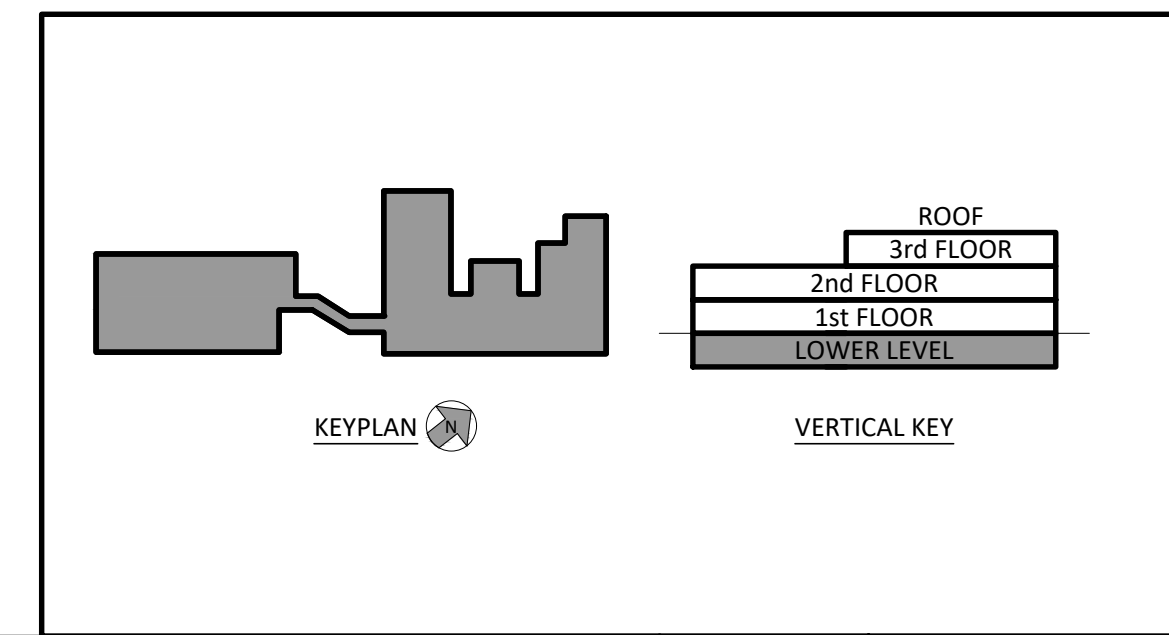
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
- 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.

GENERAL NOTES

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PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



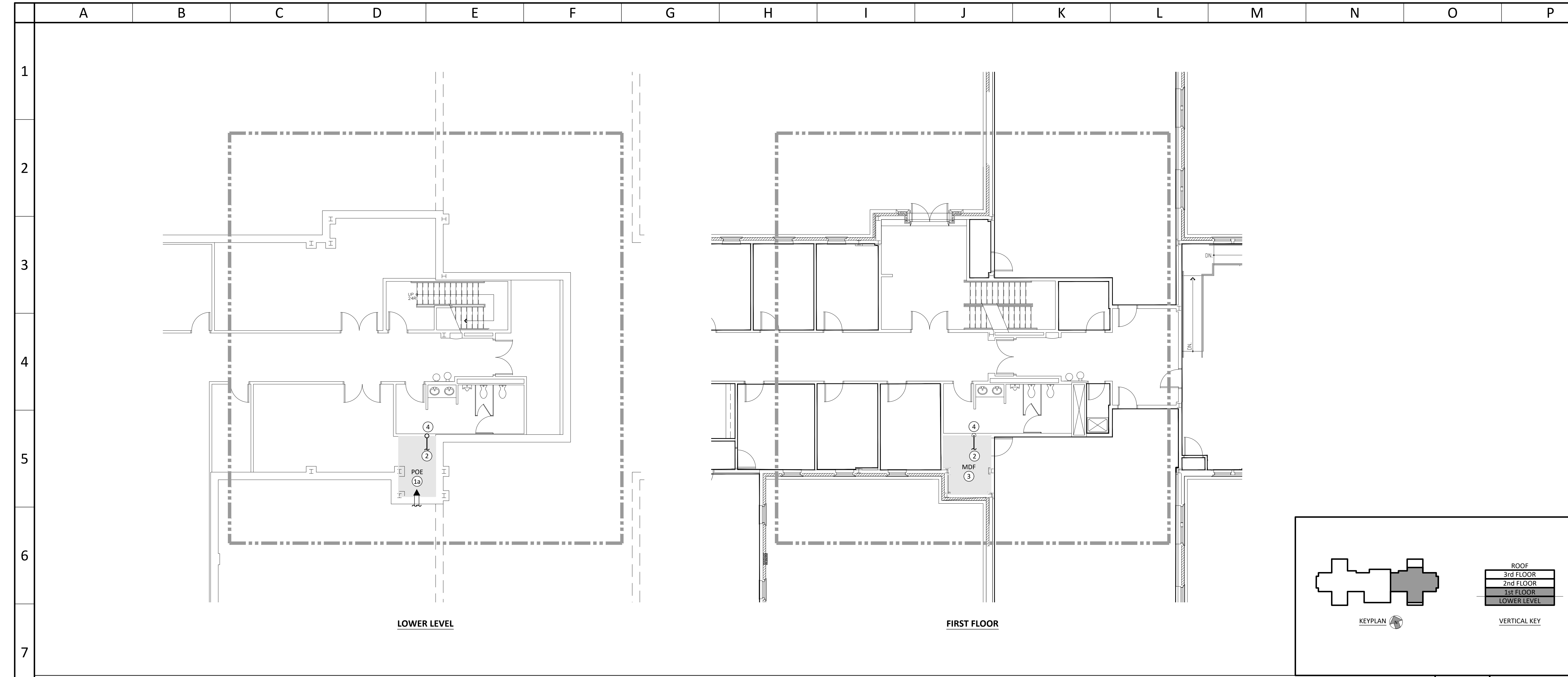
BLISS HALL - FIBER LAYOUT Scale: 1/8"=1'-0" Drawing: TC015 Detail: 01

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351
DLB Project ID: 47211

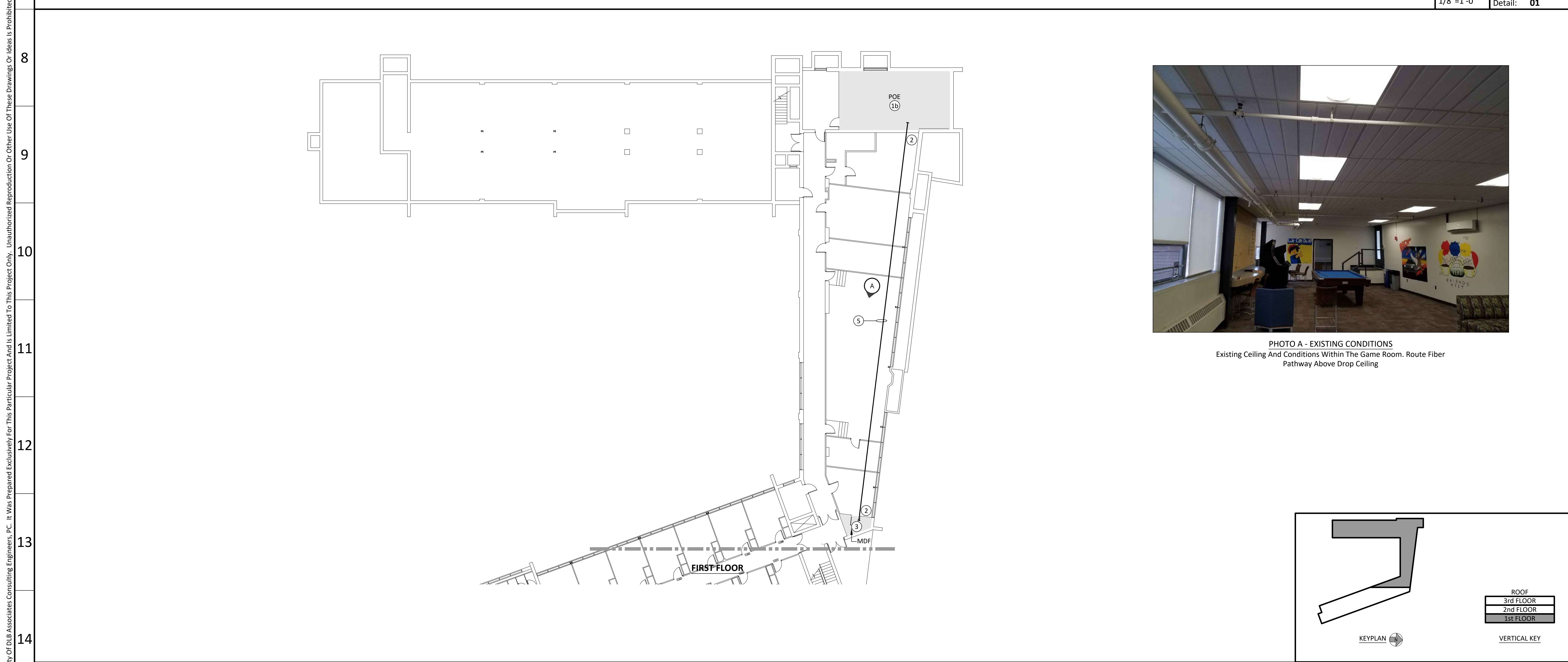
TCNJ THE COLLEGE OF NEW JERSEY
project: TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi

title	INTERIOR FIBER ROUTING BLISS HALL FIRE ALARM			dwg. no.	TC015
scale	AS SHOWN	drawn by	AM	checked by	SG
				date	09/17/2021



BUSINESS BUILDING - FIBER LAYOUT Scale: 1/8"=1'-0" Drawing: **TC016** Detail: **01**

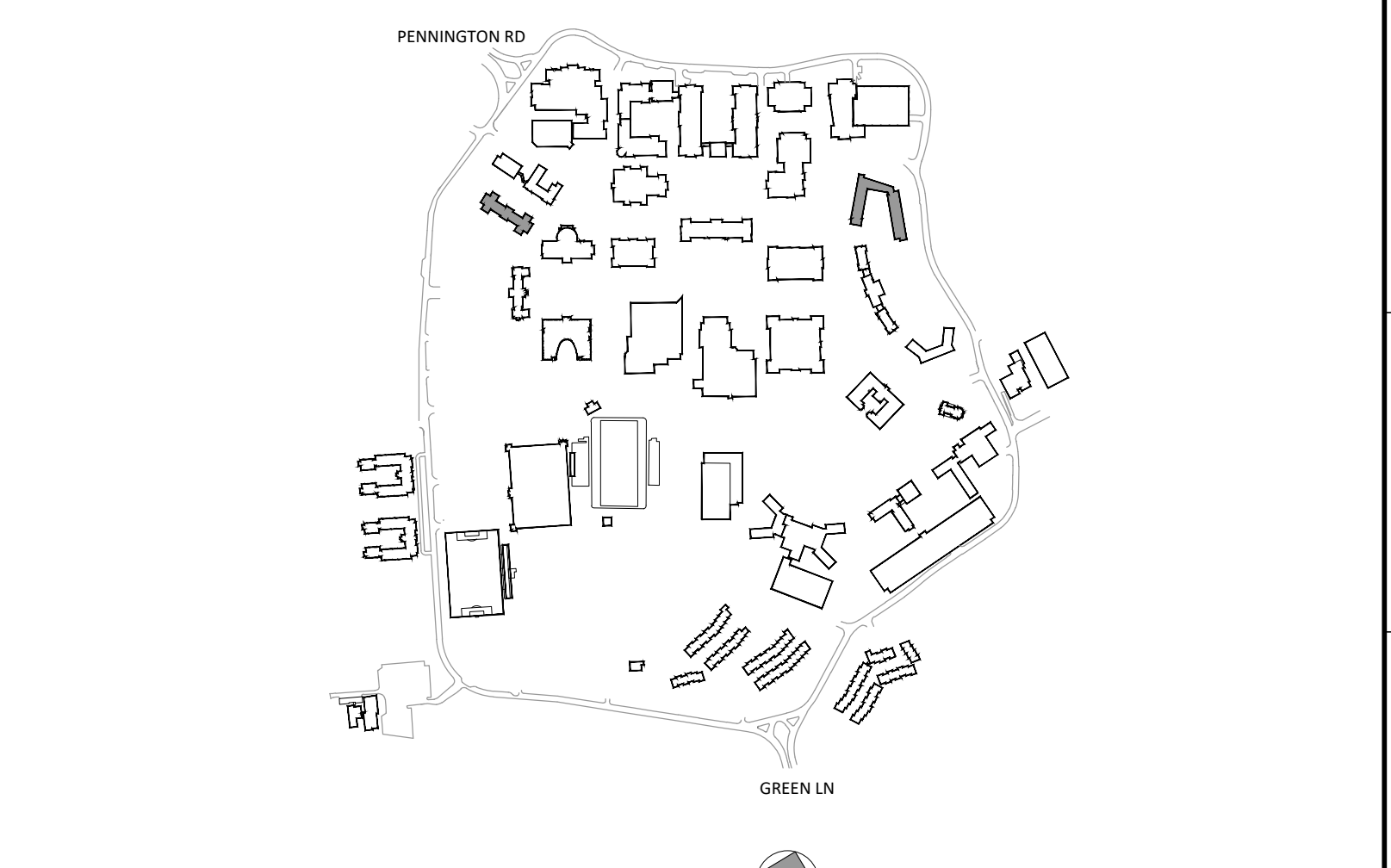
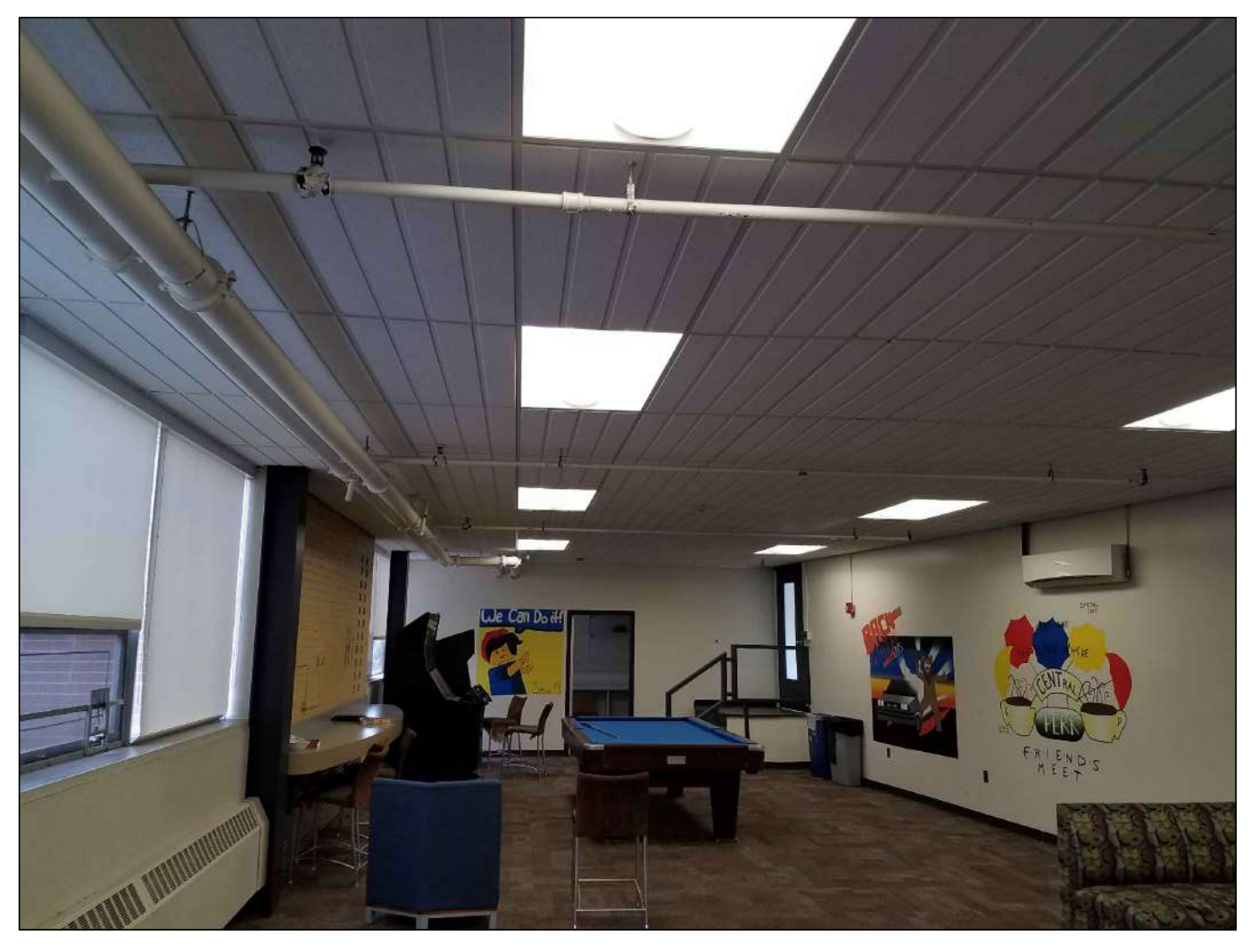
- KEY NOTES (SYMBOLS ①, ②, ETC.)**
- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Terminate Fiber Within New Cable Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Core Drill All Floor Penetrations To Route Fiber From Point Of Entry On Lower Level To Main Distribution Frame (MDF) On First Floor. All Floor Penetrations To Be Labeled Per Spec And Details On Sheet G005.
 5. Route Fiber Conduit As Close To The Existing Ceiling As Possible.
- GENERAL NOTES**
1. The Associated Project Drawings Are Diagrammatic And Are Not Intended To Show The Location Of All Equipment And Devices; Coordinate All Details Of Work As Required To Achieve A Complete Functional Installation (In Conjunction With The Project Specifications).
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 6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
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CENTENNIAL HALL - FIBER LAYOUT Scale: 1/16"=1'-0" Drawing: **TC016** Detail: **02**

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



30/42

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

ITEM	DATE	ISSUE DESCRIPTION

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351
DLB Project ID: 47211

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IX124
TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

title
INTERIOR FIBER ROUTING BUSINESS BUILDING & CENTENNIAL HALL FIRE ALARM

scale AS SHOWN drawn by AM checked by SG date 09/17/2021

dwg. no.
TC016

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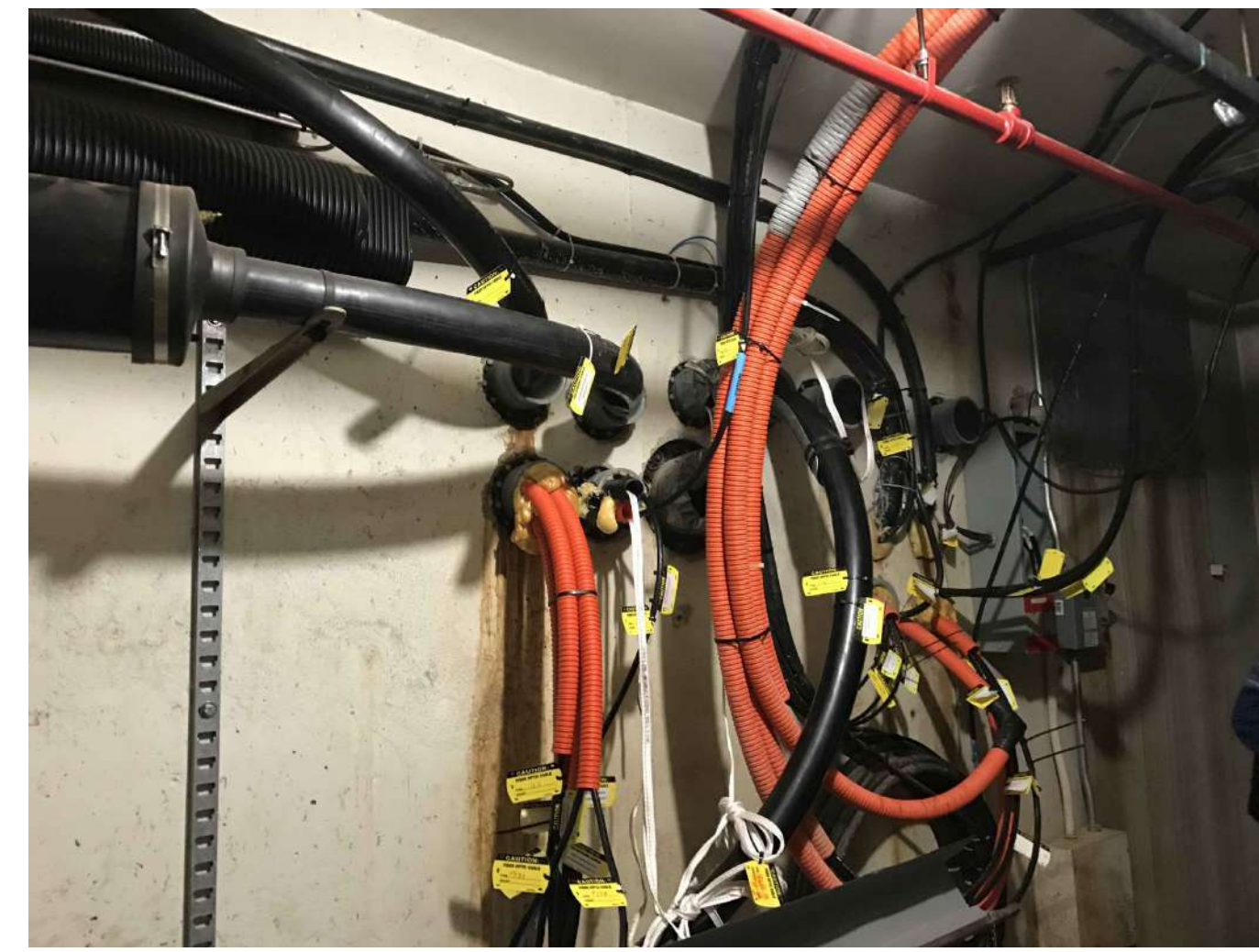
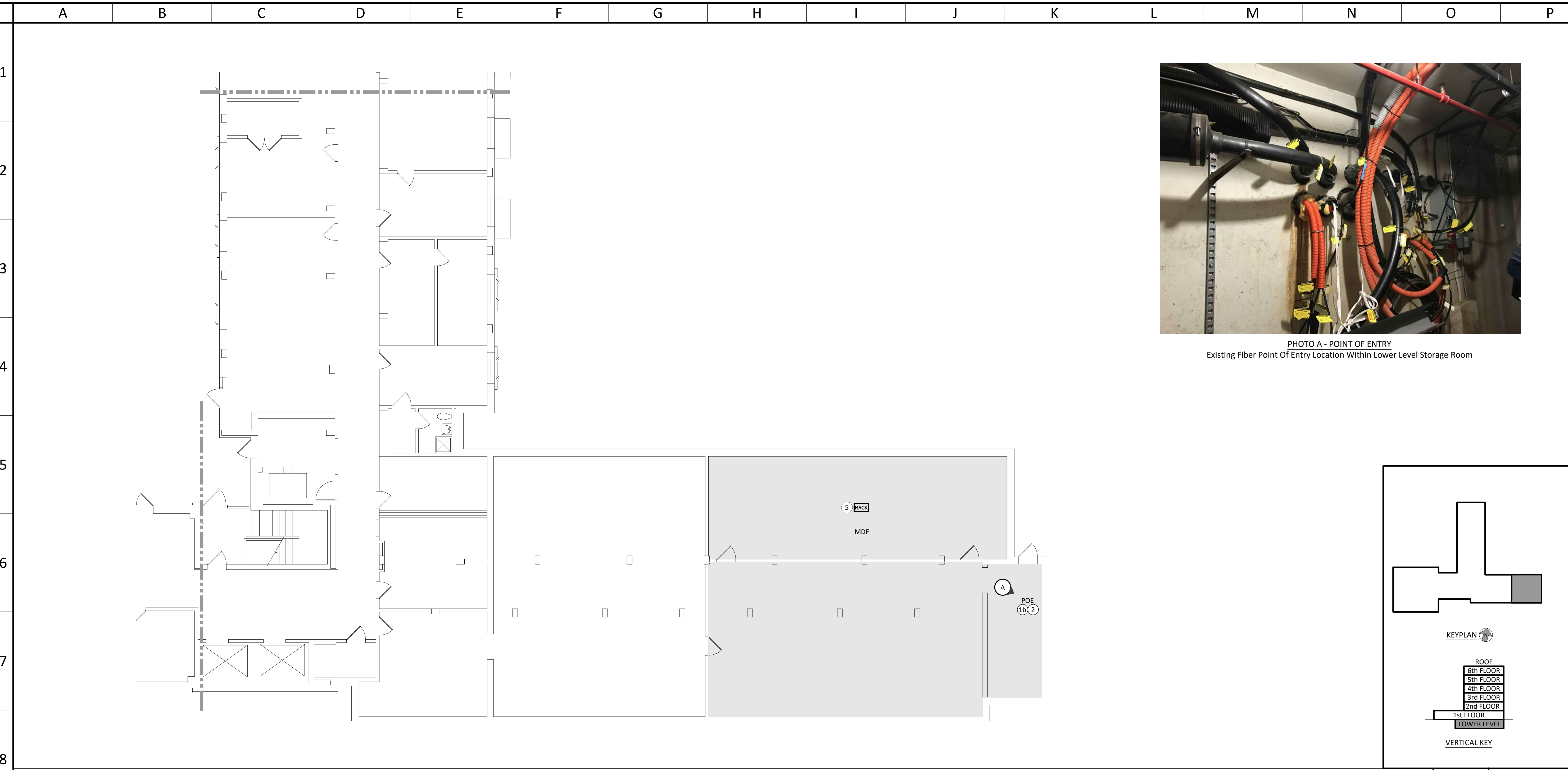


PHOTO A - POINT OF ENTRY
Existing Fiber Point Of Entry Location Within Lower Level Storage Room

KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

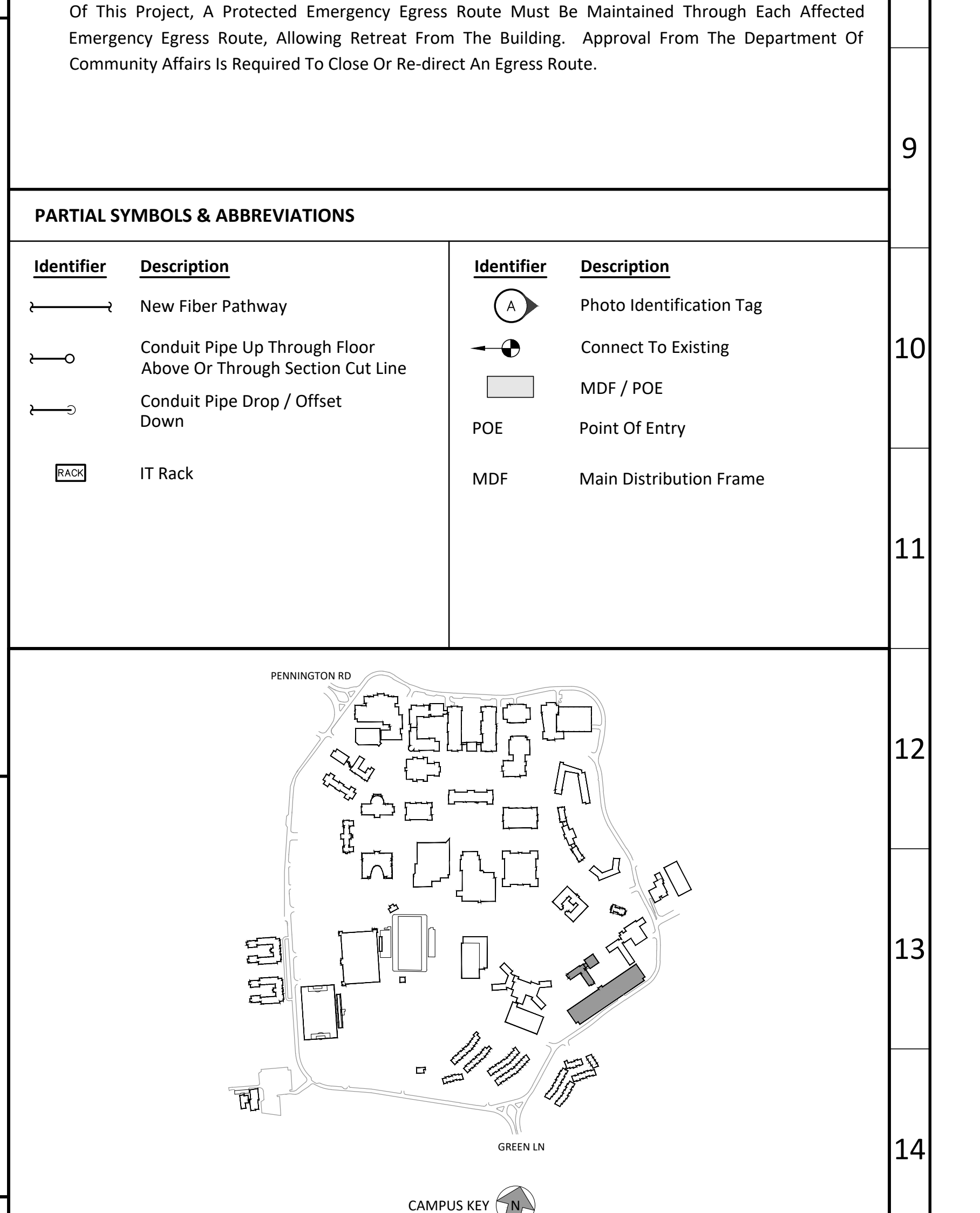
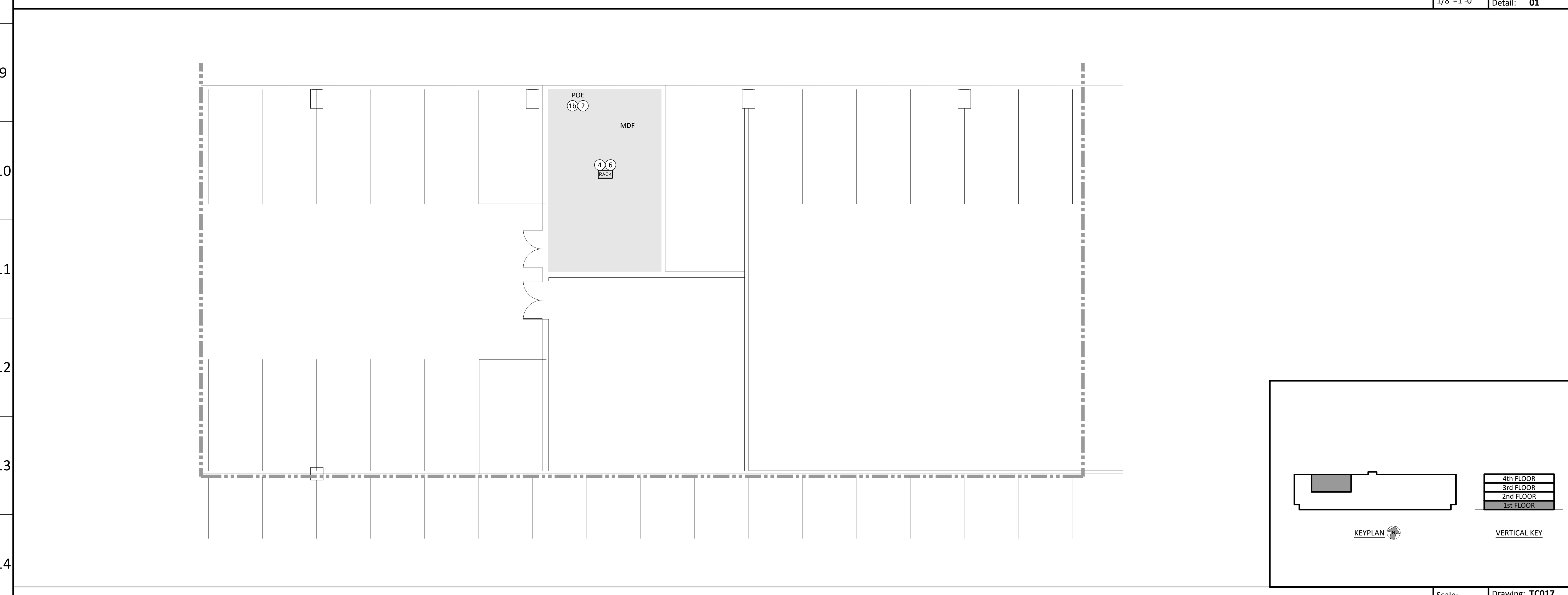
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- 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cable Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
4. Provide 30" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
5. Provide Two Post Rack. Terminate Fiber Within New Cable Connector Housing Within Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
6. Contractor Shall Provide A 120V Circuit For Integral Fan And Light Power Within 30" Deep Cabinet. Circuit Shall Be Provided From Nearest Electrical Distribution Panel With Available Space Utilizing #12, #12G In 3/4" Conduit With A 20 Amp, 120V Single Phase Circuit Breaker.

GENERAL NOTES

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PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway		Photo Identification Tag
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line		Connect To Existing
	Conduit Pipe Drop / Offset Down		MDF / POE
	IT Rack		POE Point Of Entry
			MDF Main Distribution Frame



<p>CONSULTING ENGINEERS, P.C. 265 Industrial Way West, Eatontown, N.J. 07724</p>			<p>TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi</p>			<p>project TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT) 2000 PENNINGTON ROAD, EWING NJ, 08618</p>			<p>title INTERIOR FIBER ROUTING CROMWELL HALL & DECKER GARAGE FIRE ALARM</p>			<p>dwg. no. TC017</p>		
<p>Questions For DLB Call: Anthony Laskosky DLB Project ID: 47211 Phone: 732-829-7351</p>			<p>scale AS SHOWN drawn by AM checked by SG date 09/17/2021</p>			<p>scale AS SHOWN drawn by AM checked by SG date 09/17/2021</p>			<p>scale AS SHOWN drawn by AM checked by SG date 09/17/2021</p>			<p>scale AS SHOWN drawn by AM checked by SG date 09/17/2021</p>		

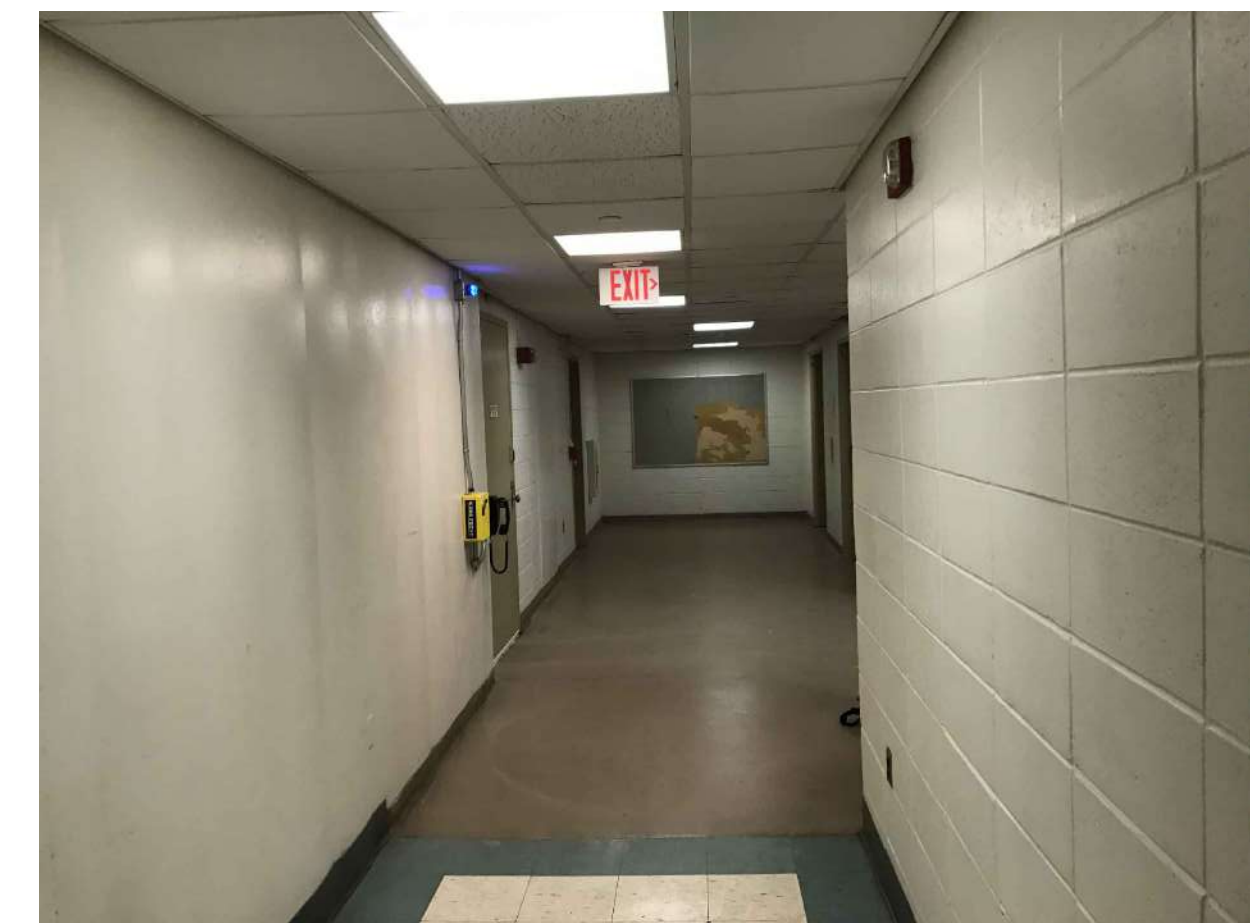
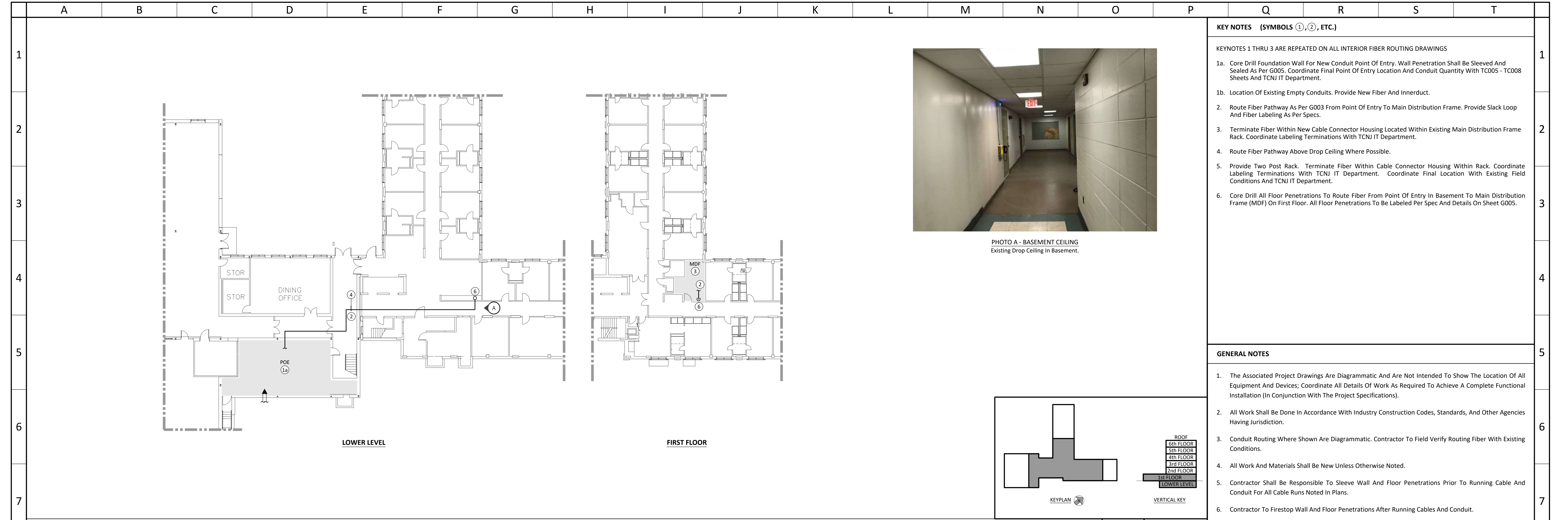
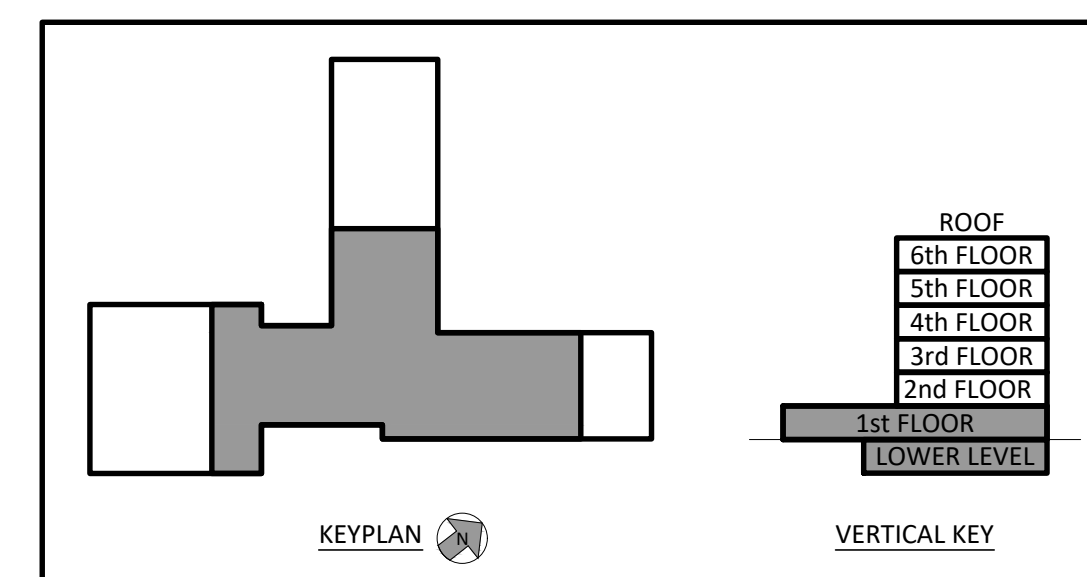


PHOTO A - BASEMENT CEILING
Existing Drop Ceiling In Basement.



DECKER HALL - FIBER LAYOUT Scale: 1/16"=1'-0" Drawing: TC018 Detail: 01

- KEY NOTES (SYMBOLS ①, ②, ETC.)**
- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Terminate Fiber Within New Cable Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Route Fiber Pathway Above Drop Ceiling Where Possible.
 5. Provide Two Post Rack. Terminate Fiber Within Cable Connector Housing Within Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 6. Core Drill All Floor Penetrations To Route Fiber From Point Of Entry In Basement To Main Distribution Frame (MDF) On First Floor. All Floor Penetrations To Be Labeled Per Spec And Details On Sheet G005.

- GENERAL NOTES**
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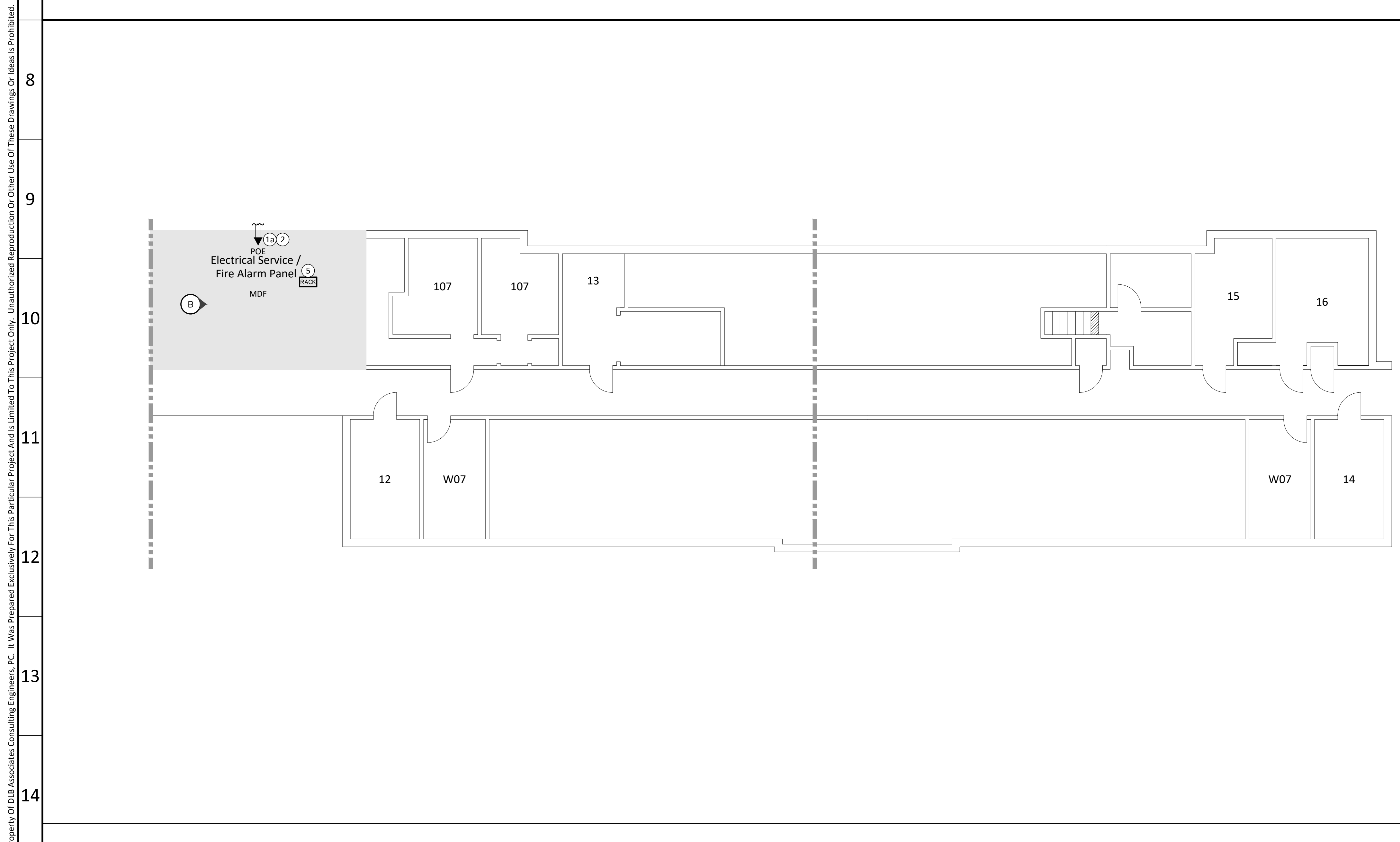
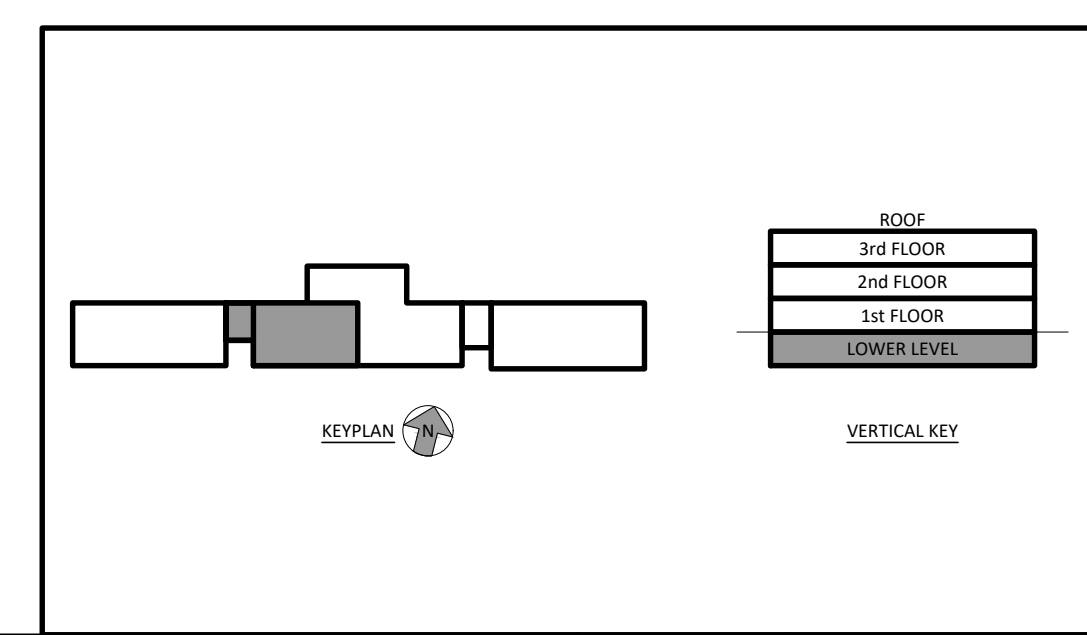


PHOTO B - BASEMENT CEILING
Existing Ceiling Space In Basement MDF.



ELY-ALLEN-BREWSTER - FIBER LAYOUT Scale: 1/8"=1'-0" Drawing: TC018 Detail: 02

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



30442

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

ITEM	DATE	ISSUE DESCRIPTION

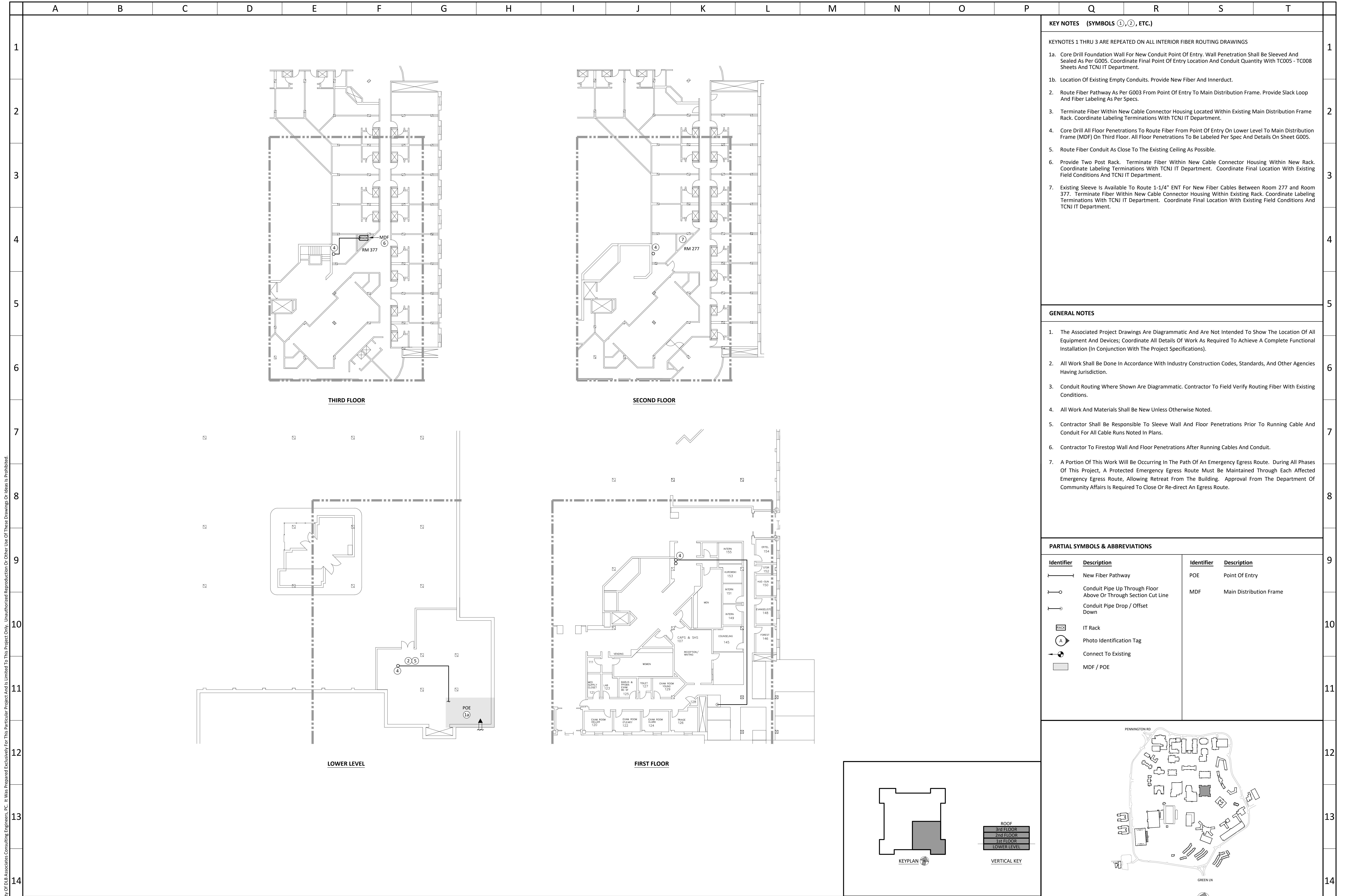
dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IX124
TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title
INTERIOR FIBER ROUTING
DECKER HALL & ELY-ALLEN-BREWSTER
FIRE ALARM
scale AS SHOWN
drawn by AM
checked by SG
date 09/17/2021
dwg. no.
TC018
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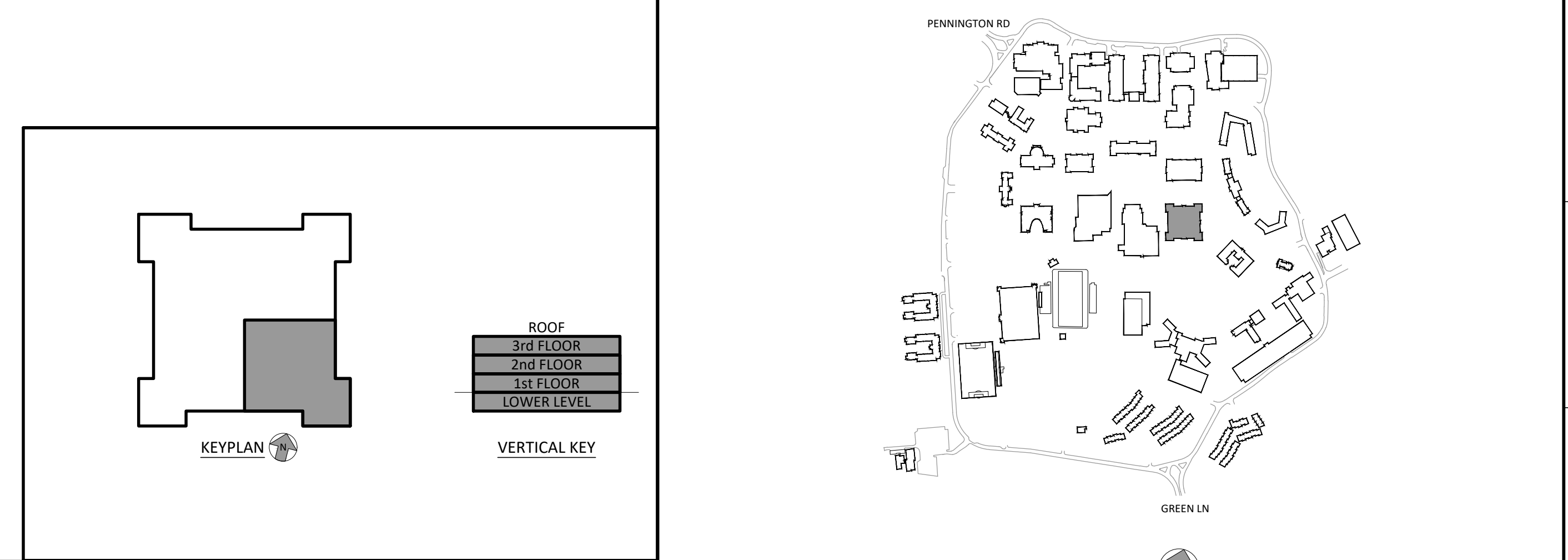


- KEY NOTES (SYMBOLS ①, ②, ETC.)**
- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
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 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Terminate Fiber Within New Cable Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Core Drill All Floor Penetrations To Route Fiber From Point Of Entry On Lower Level To Main Distribution Frame (MDF) On Third Floor. All Floor Penetrations To Be Labeled Per Spec And Details On Sheet G005.
 5. Route Fiber Conduit As Close To The Existing Ceiling As Possible.
 6. Provide Two Post Rack. Terminate Fiber Within New Cable Connector Housing Within New Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 7. Existing Sleeve Is Available To Route 1-1/4" ENT For New Fiber Cables Between Room 277 and Room 377. Terminate Fiber Within New Cable Connector Housing Within Existing Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.

- GENERAL NOTES**
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 3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
 4. All Work And Materials Shall Be New Unless Otherwise Noted.
 5. Contractor Shall Be Responsible To Sleeve Wall And Floor Penetrations Prior To Running Cable And Conduit For All Cable Runs Noted In Plans.
 6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
 7. A Portion Of This Work Will Be Occurring In The Path Of An Emergency Egress Route. During All Phases Of This Project, A Protected Emergency Egress Route Must Be Maintained Through Each Affected Emergency Egress Route, Allowing Retreat From The Building. Approval From The Department Of Community Affairs Is Required To Close Or Re-direct An Egress Route.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



EICKHOFF HALL - FIBER LAYOUT
 Scale: 1/16"=1'-0"
 Drawing: TC019
 Detail: 02

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ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
 CONSULTING ENGINEERS, P.C.
 265 Industrial Way West, Eatontown, N.J. 07724

Questions For DLB Call: Anthony Laskosky
 DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY

project
 TCNJ - FIBER INFRASTRUCTURE UPGRADES
 (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD,
 EWING NJ, 08618

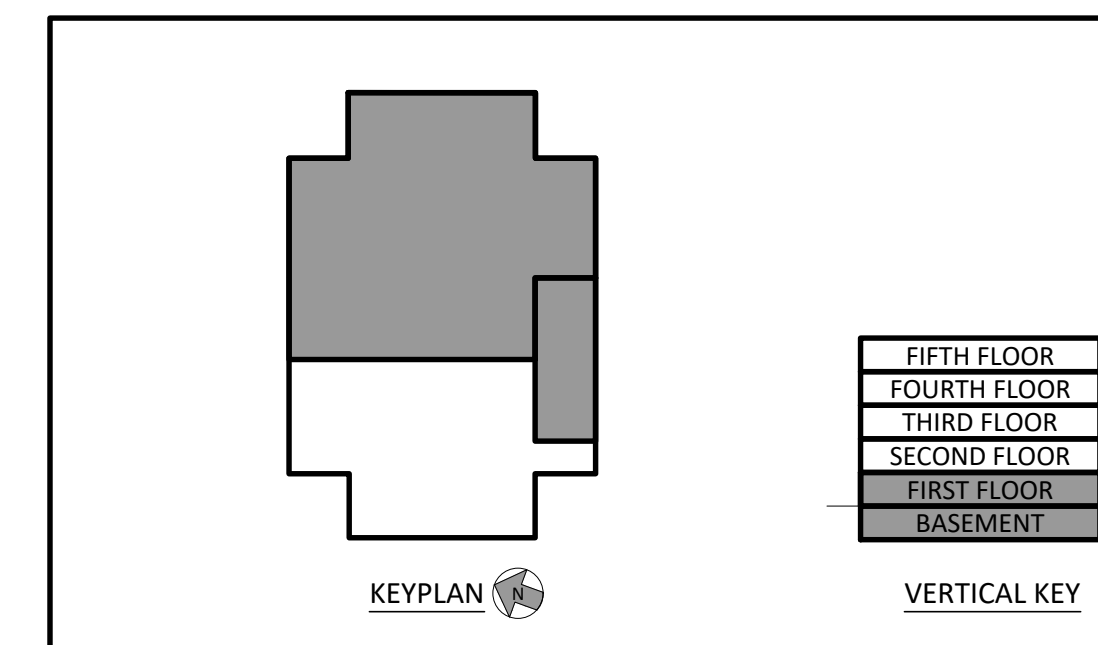
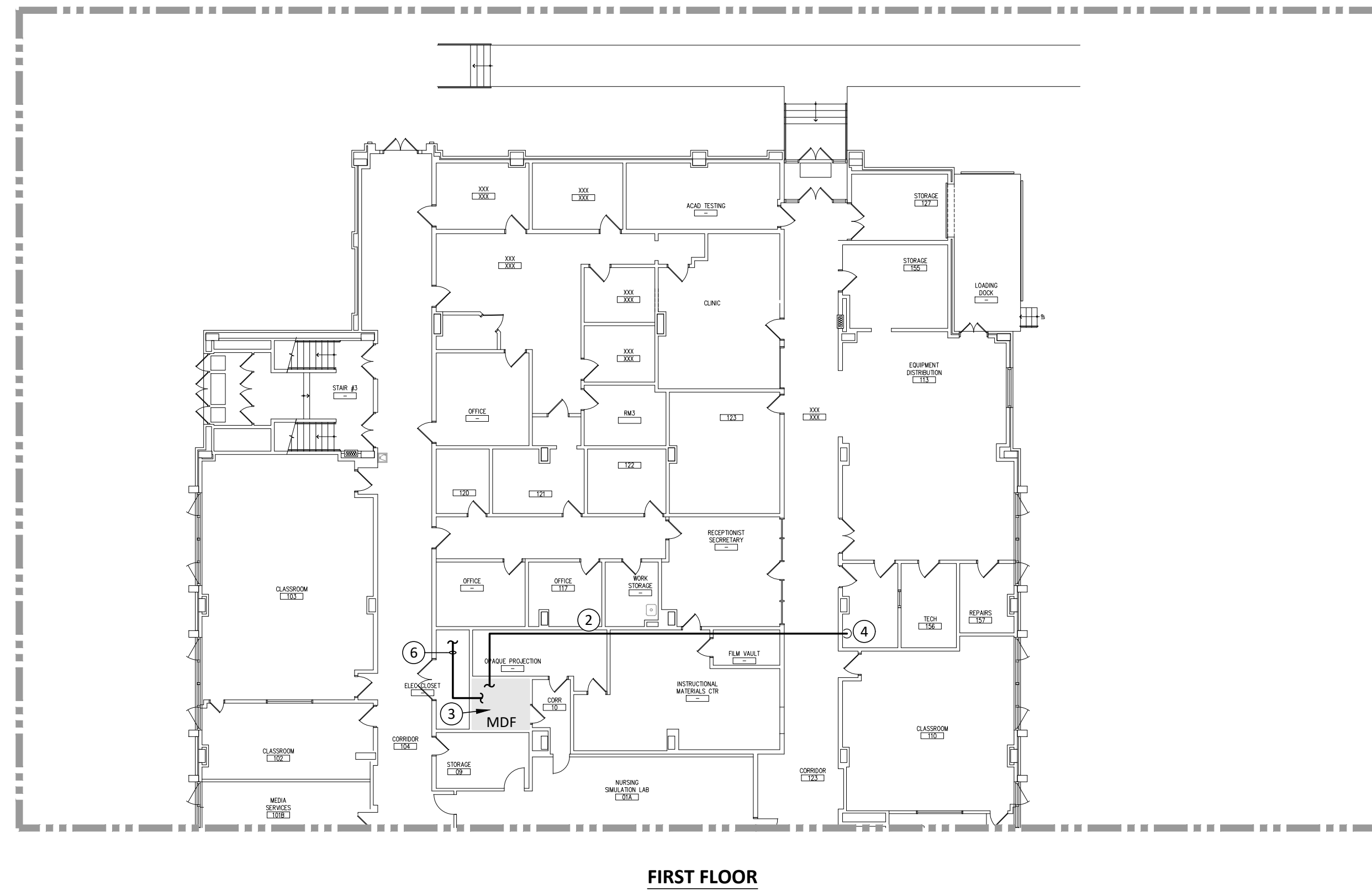
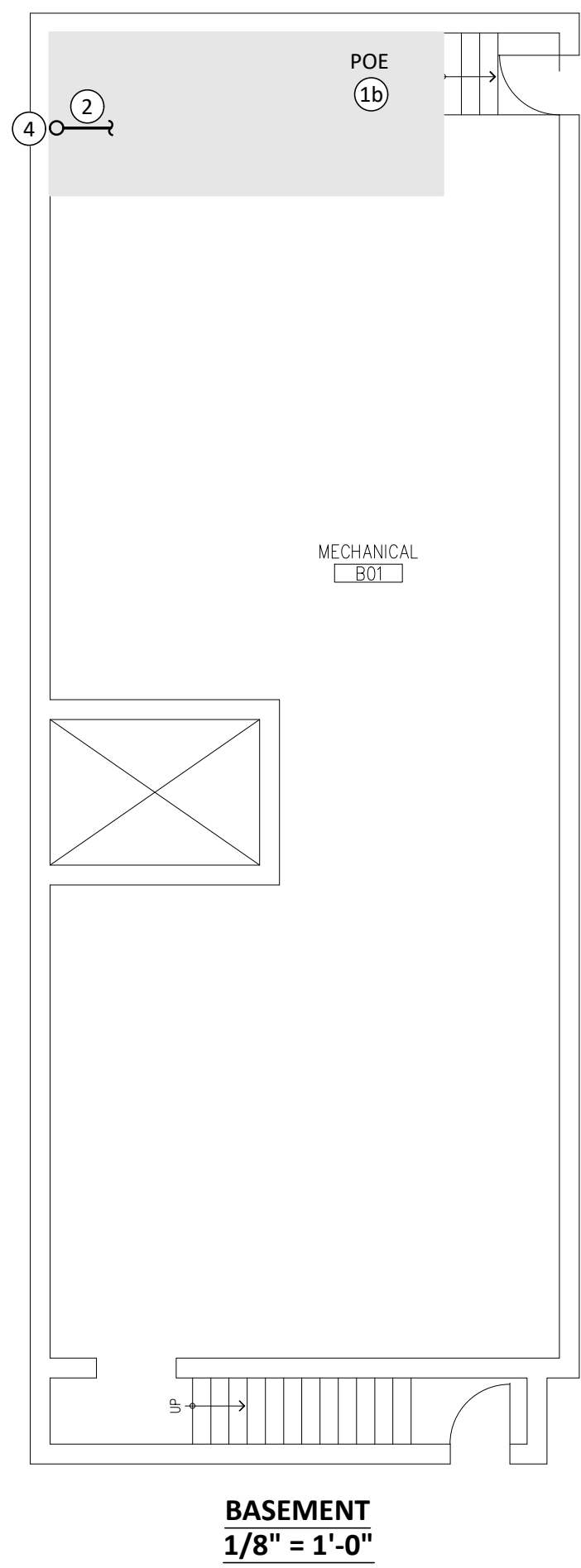
TCNJ Project #: IX124
 TCNJ Project Manager: Mumtaz Makhdoumi

title
 INTERIOR FIBER ROUTING
 EICKHOFF HALL FIRE ALARM

scale AS SHOWN
 drawn by AM
 checked by SG
 date 09/17/2021

dwg. no.
TC019

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KEY NOTES (SYMBOLS ①, ②, ETC.)

- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Core Drill All Floor Penetrations To Route Fiber From Point Of Entry In Basement To Main Distribution Frame (MDF) On First Floor. All Floor Penetrations To Be Labeled Per Spec And Details On Sheet G005.
 5. Provide Two Post Rack. Terminate Fiber Within New Cable Connector Housing Within New Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 6. Fiber Riser Between Electric Room 104 And MDF Room. Route ENT Pathway Between The Rooms. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack And New Cabinet Connector Housing Located Within Electrical Closet Existing Rack.

GENERAL NOTES

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FORCINA HALL - FIBER LAYOUT Scale: 1/16"=1'-0" Drawing: **TC020** Detail: **01**

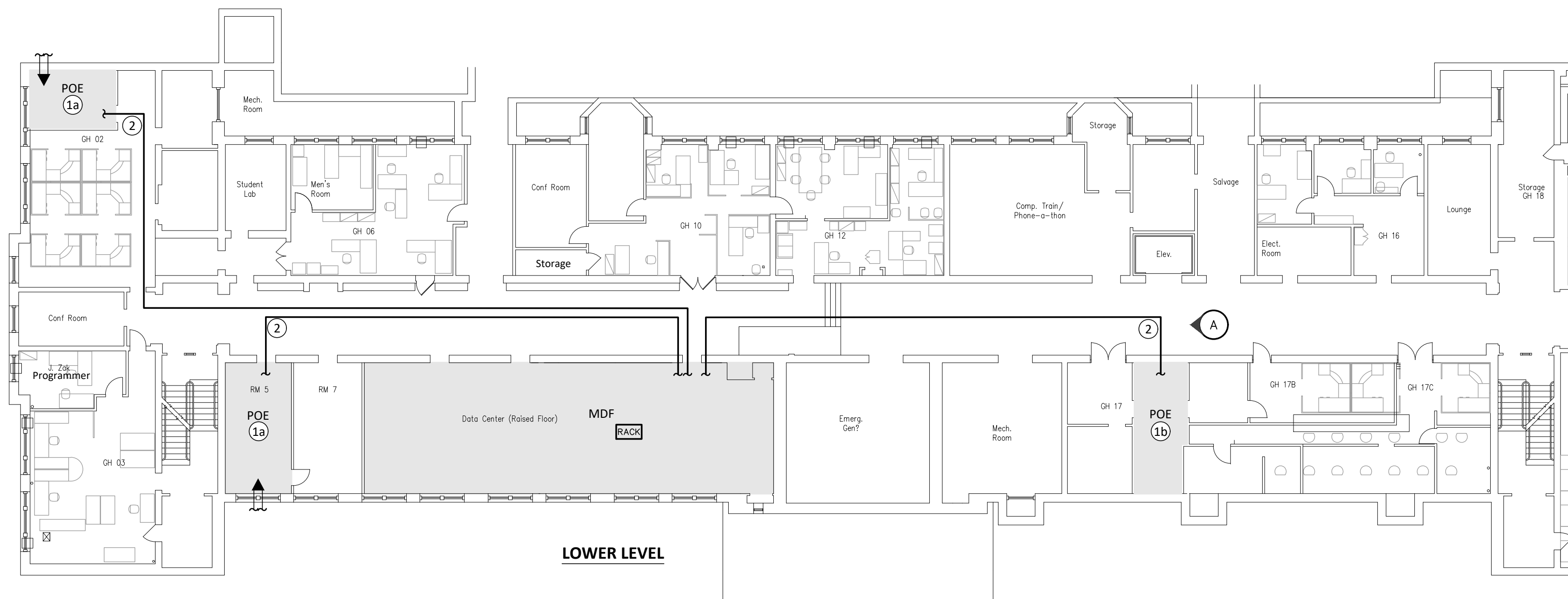
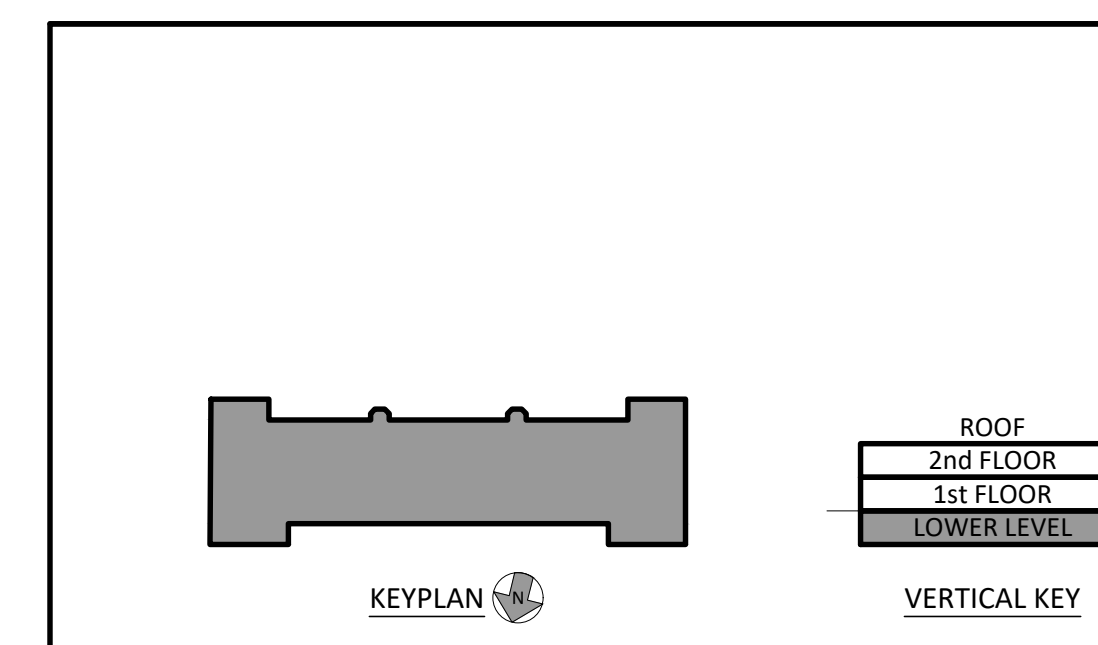


PHOTO A - BASEMENT CEILING
New Fiber In Conduit To Be Run Along Basement Open Ceiling.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



GREEN HALL - FIBER LAYOUT Scale: 1/16"=1'-0" Drawing: **TC020** Detail: **02**



INTERIOR FIBER ROUTING FORCINA HALL & GREEN HALL FIRE ALARM

TC020

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30442

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618

scale	drawn by	checked by	date
AS SHOWN	AM	SG	09/17/2021

title
INTERIOR FIBER ROUTING FORCINA HALL & GREEN HALL FIRE ALARM
dwg. no.
TC020

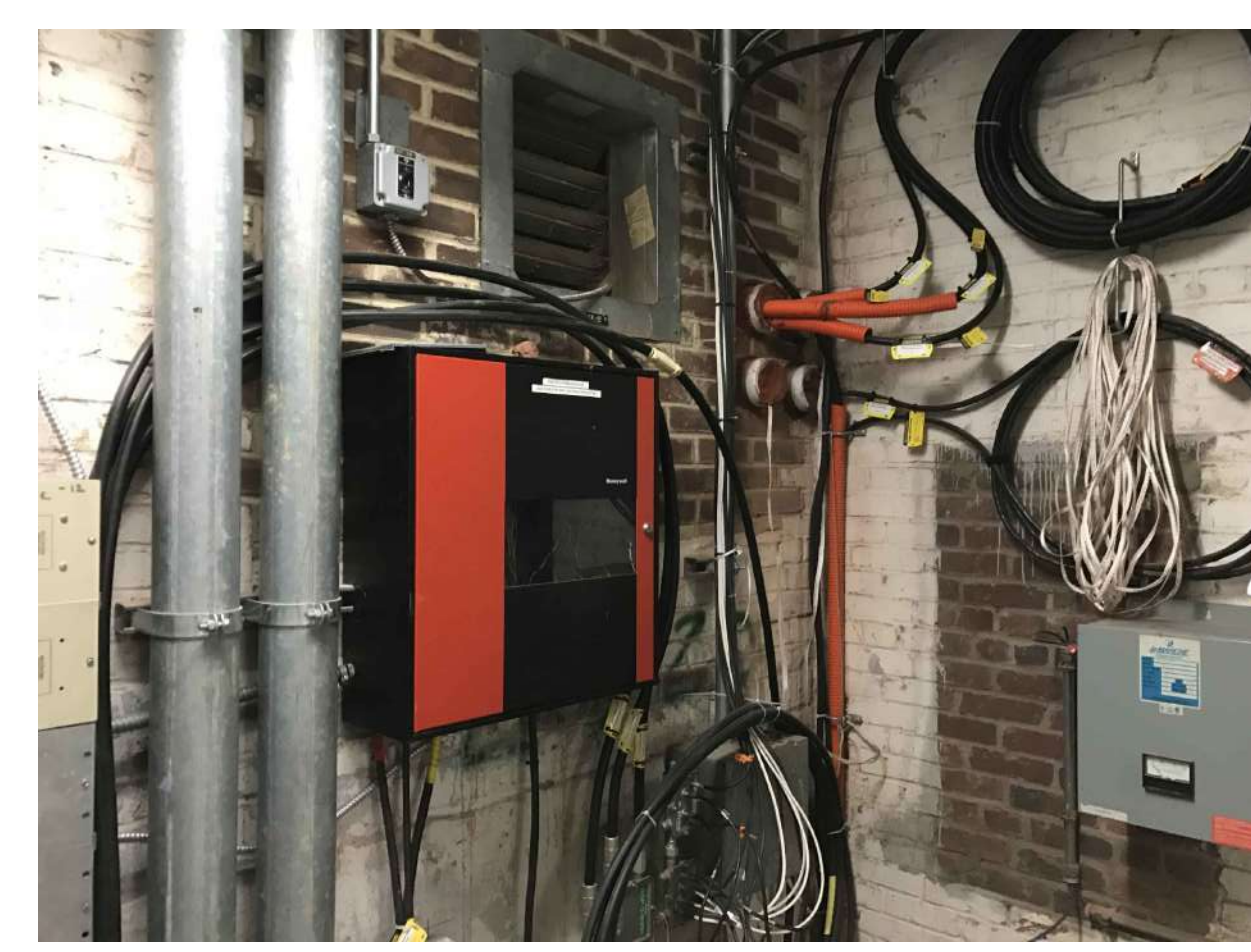
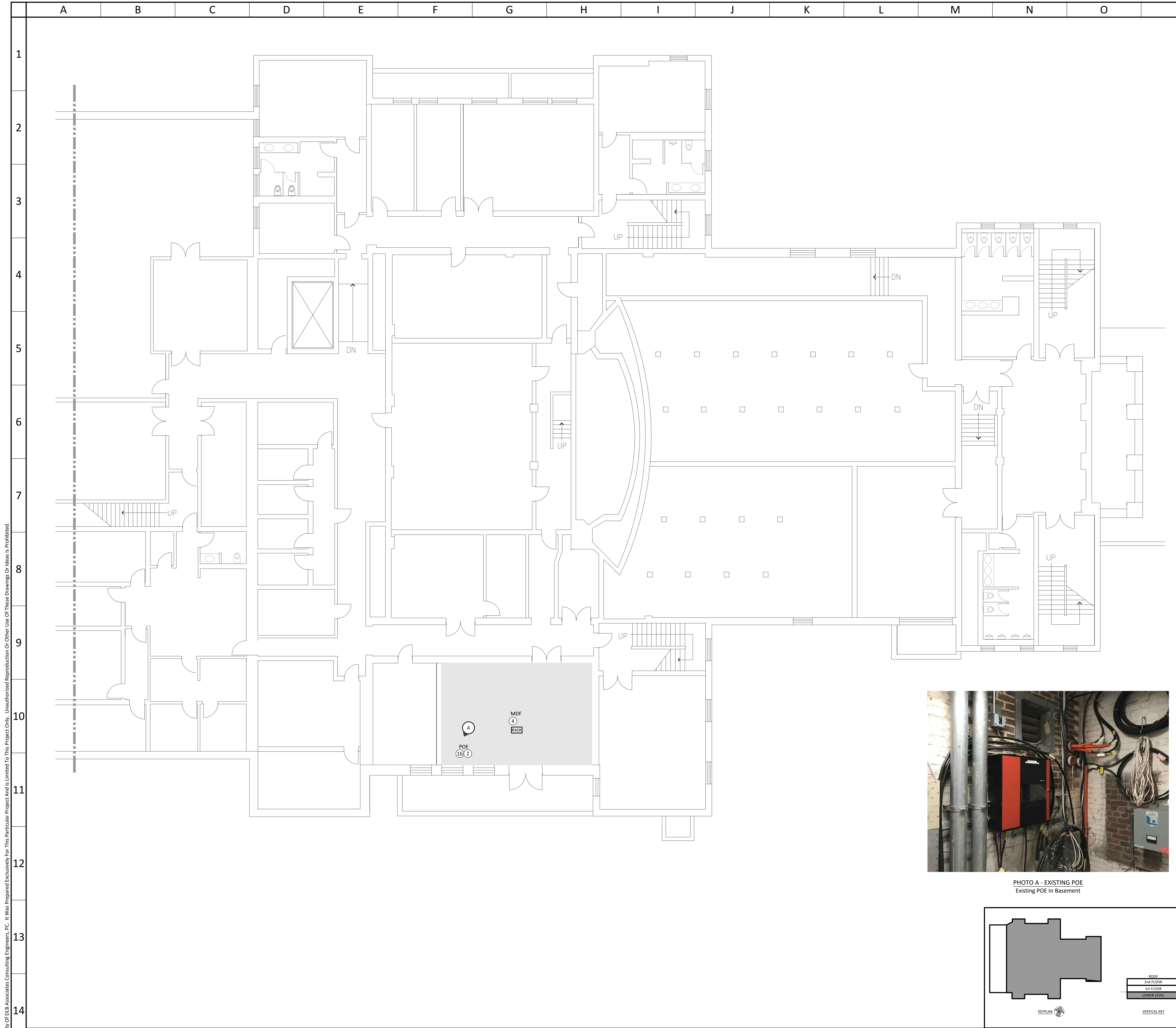
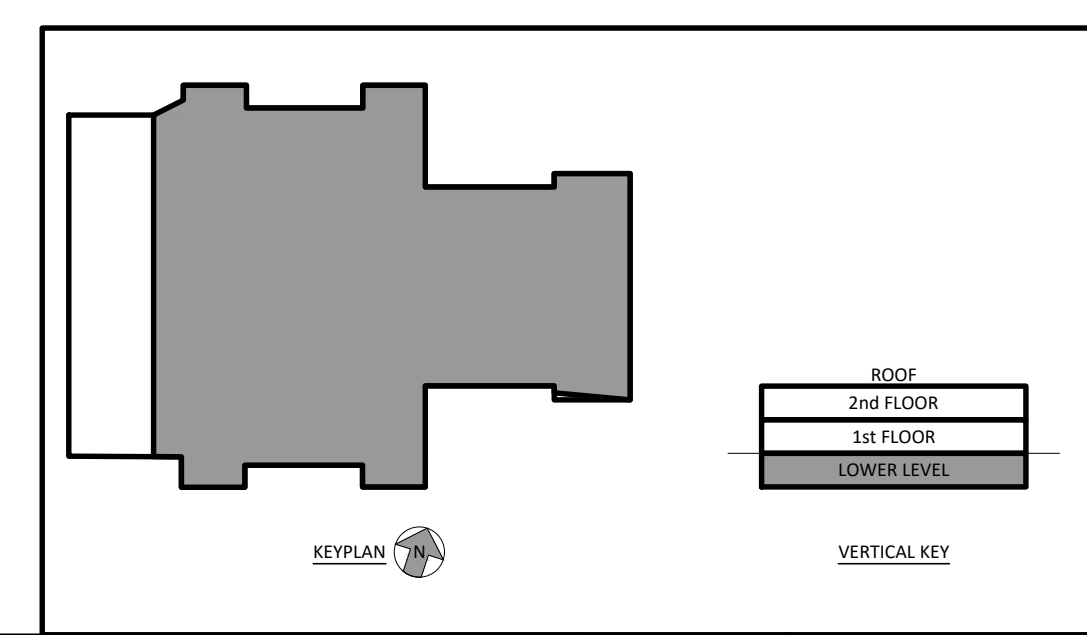


PHOTO A - EXISTING POE
Existing POE In Basement



KENDALL HALL - FIBER LAYOUT
Scale: 1/8"=1'-0"
Drawing: TC021
Detail: 02

KEY NOTES (SYMBOLS ①, ②, ETC.)

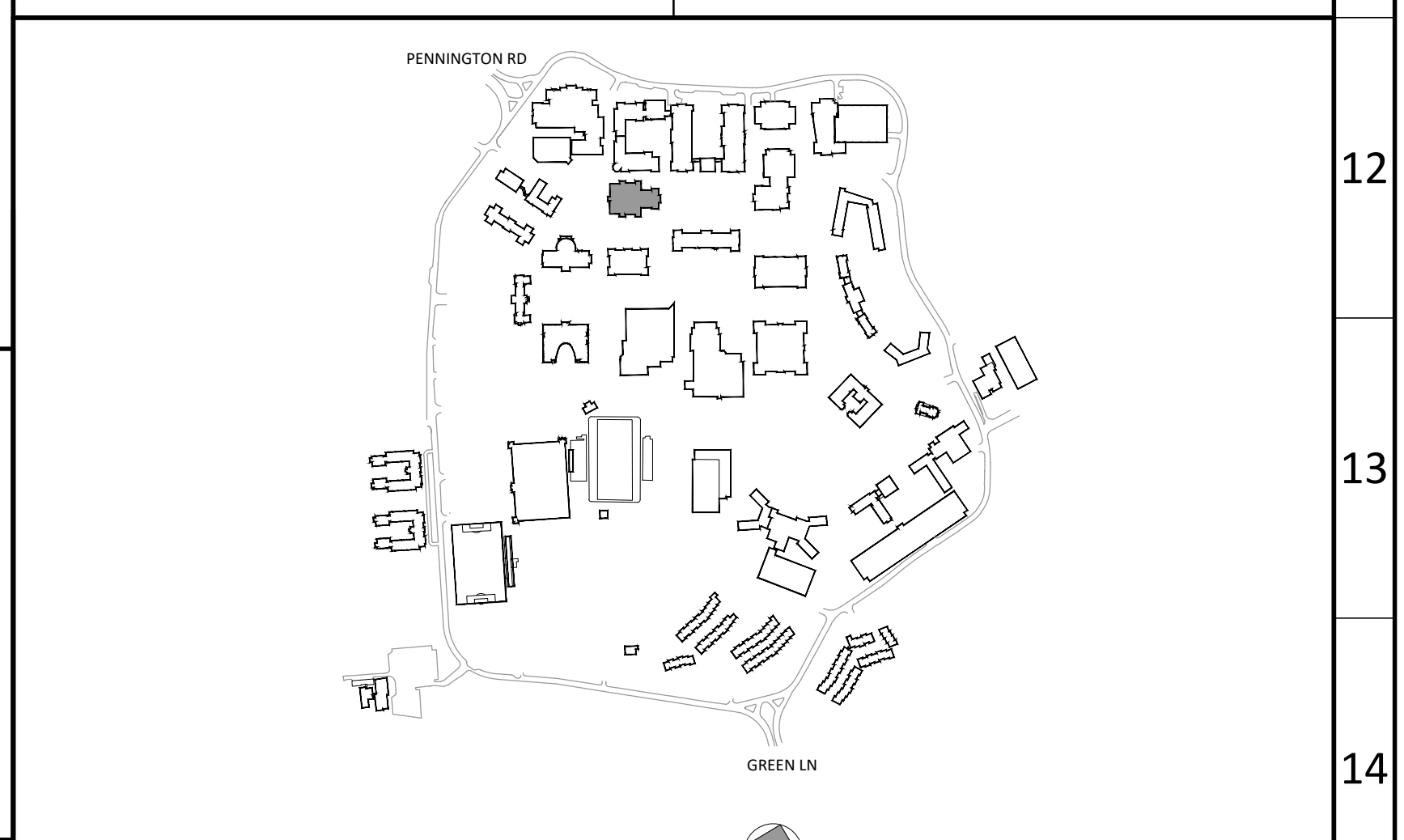
- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Not Used.
 4. Provide Two Post Rack. Terminate Fiber Within New Cable Connector Housing Within New Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.

GENERAL NOTES

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PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



CAMPUS KEY

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30442

Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IX124
TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title	INTERIOR FIBER ROUTING KENDALL HALL FIRE ALARM			dwg. no.	TC021
scale	AS SHOWN	drawn by	AM	checked by	SG
date	09/17/2021				

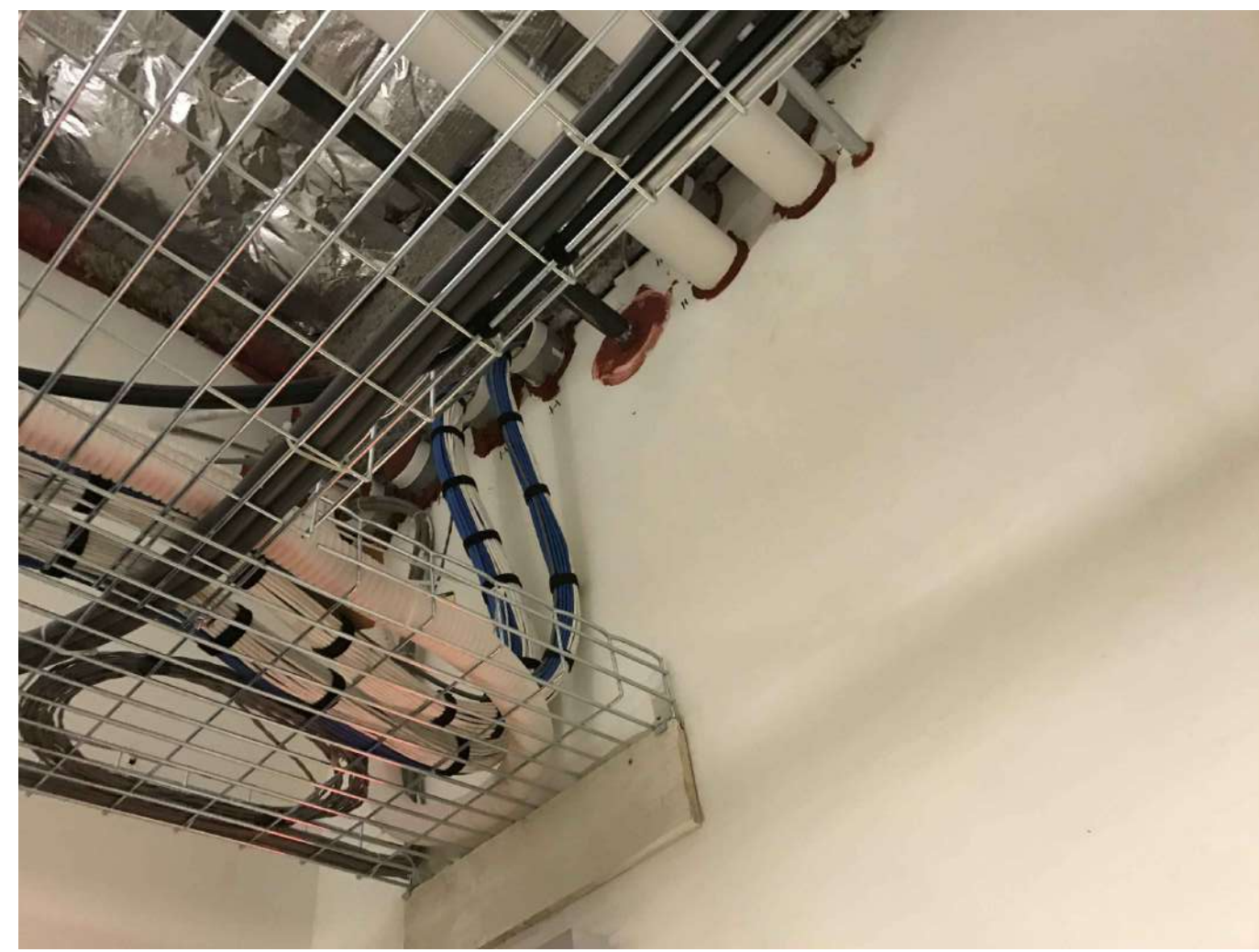
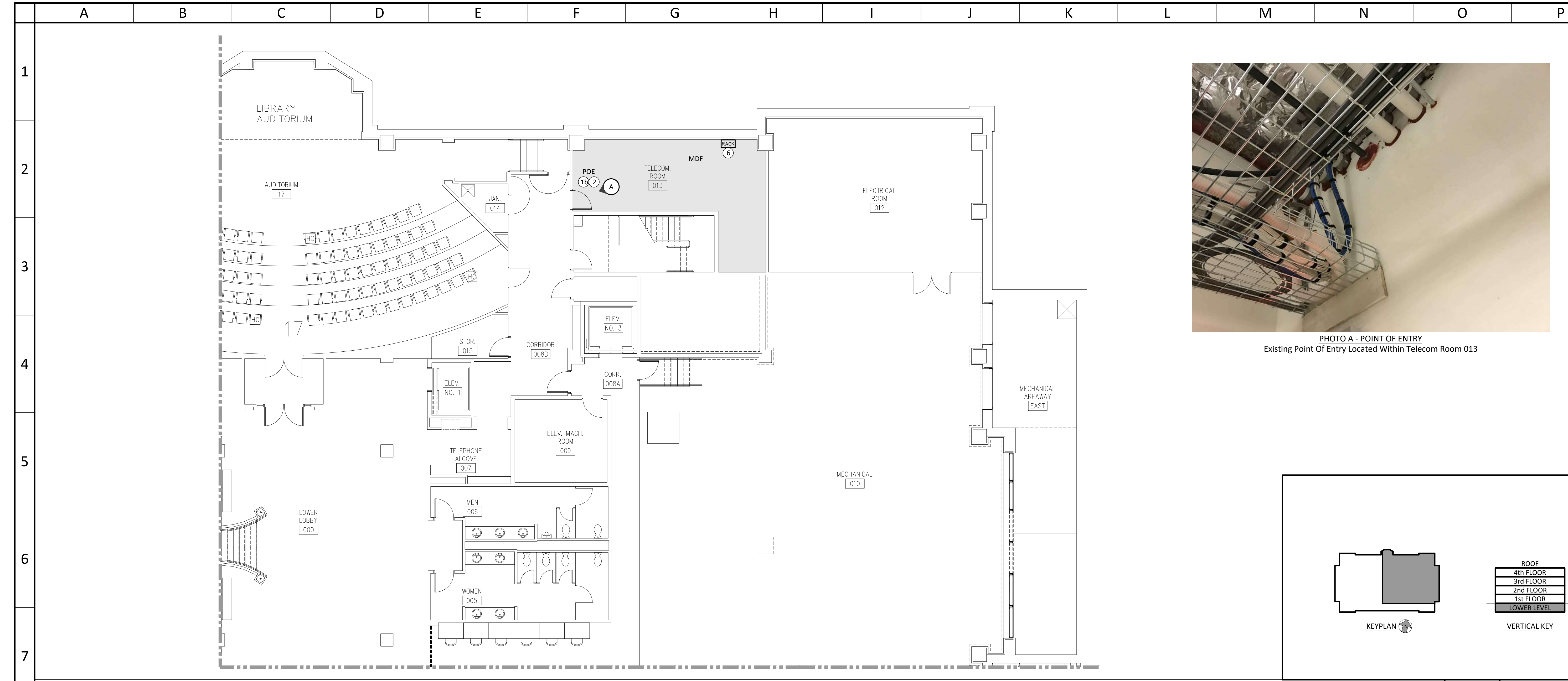
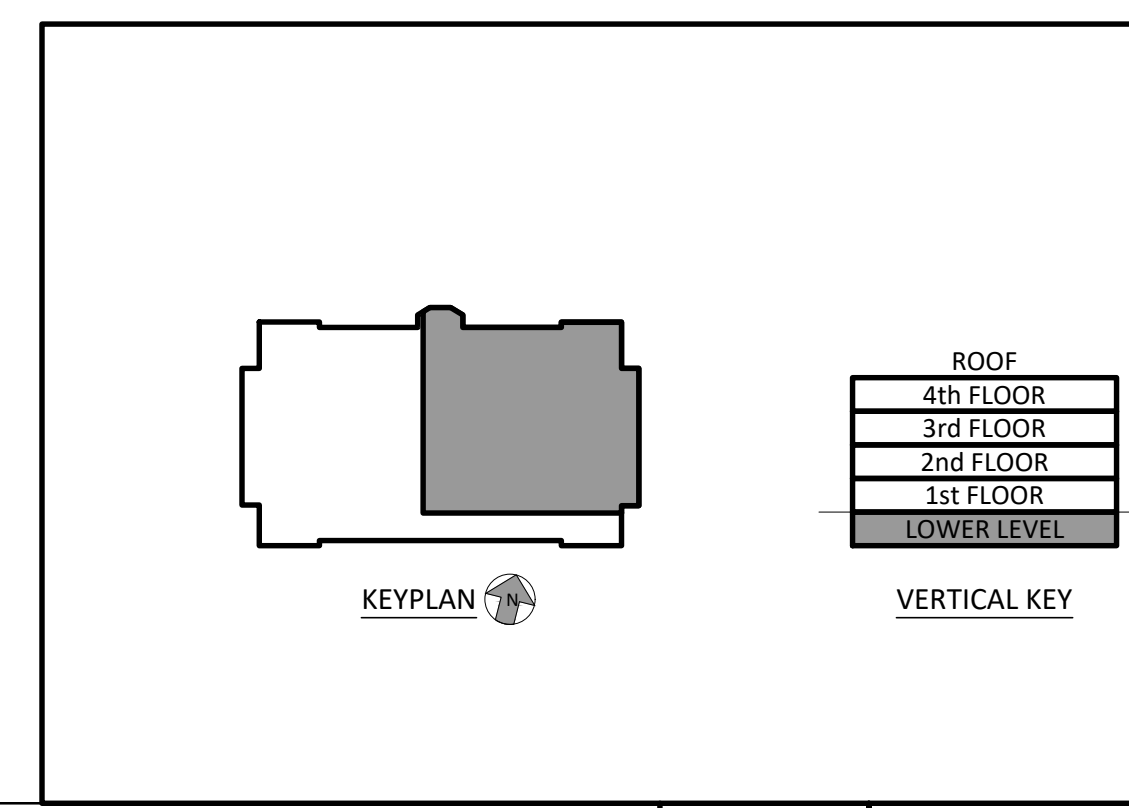


PHOTO A - POINT OF ENTRY
Existing Point Of Entry Located Within Telecom Room 013



GITENSTEIN LIBRARY - FIBER LAYOUT
Scale: 1/8"=1'-0"
Drawing: TC022
Detail: 01

- KEY NOTES (SYMBOLS ①, ②, ETC.)**
- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
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 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Not Used.
 4. Pull Box Located on exterior of maintenance building with existing underground empty conduit from Power House. Empty Conduit Shall Be Traced, Reamed And Cleaned. Route From The Pullbox Utilizing Existing Pathway Into The Office Space And Route Above The Ceiling To The MDF.
 5. Provide 12" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 6. Provide Two Post Rack. Terminate Fiber Within New Cable Connector Housing Within New Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.

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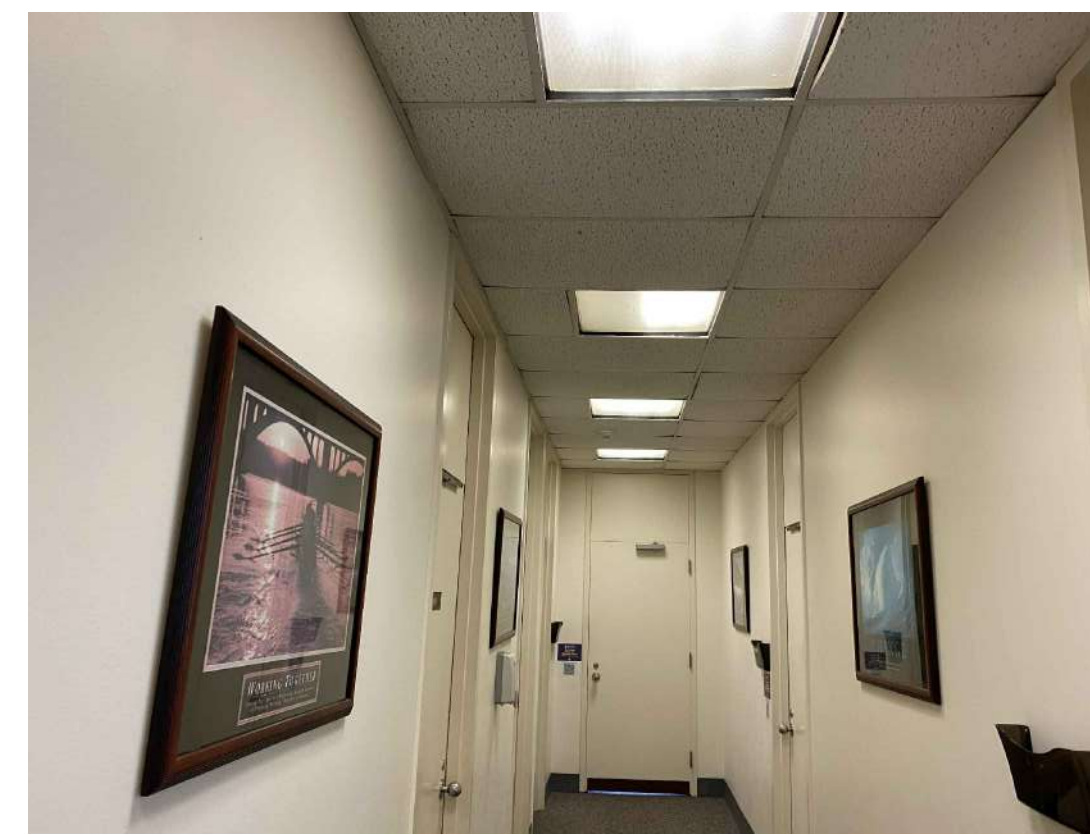
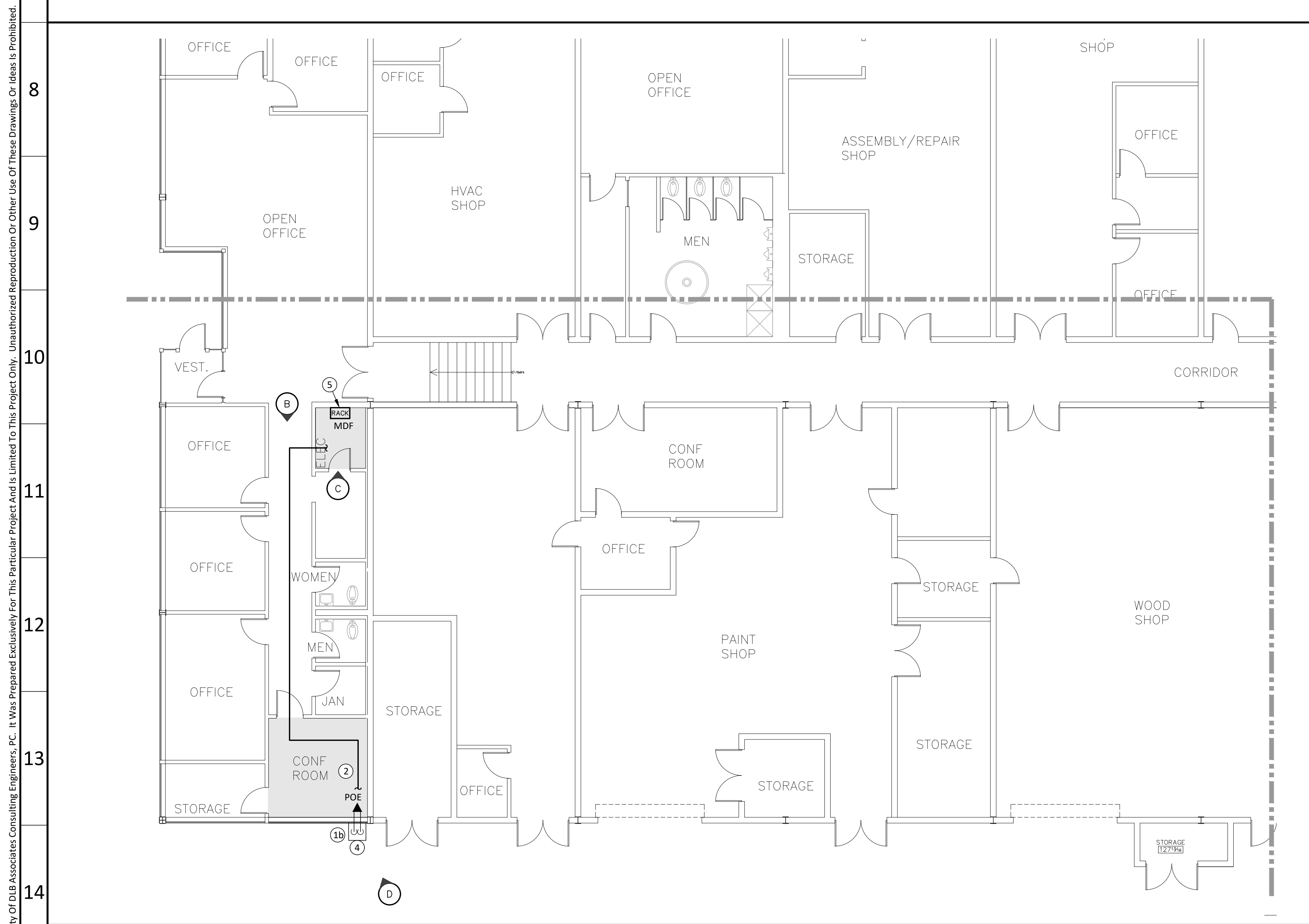


PHOTO B - CEILING CONDITION
Drop Ceiling Located Throughout The Office Area And Corridor

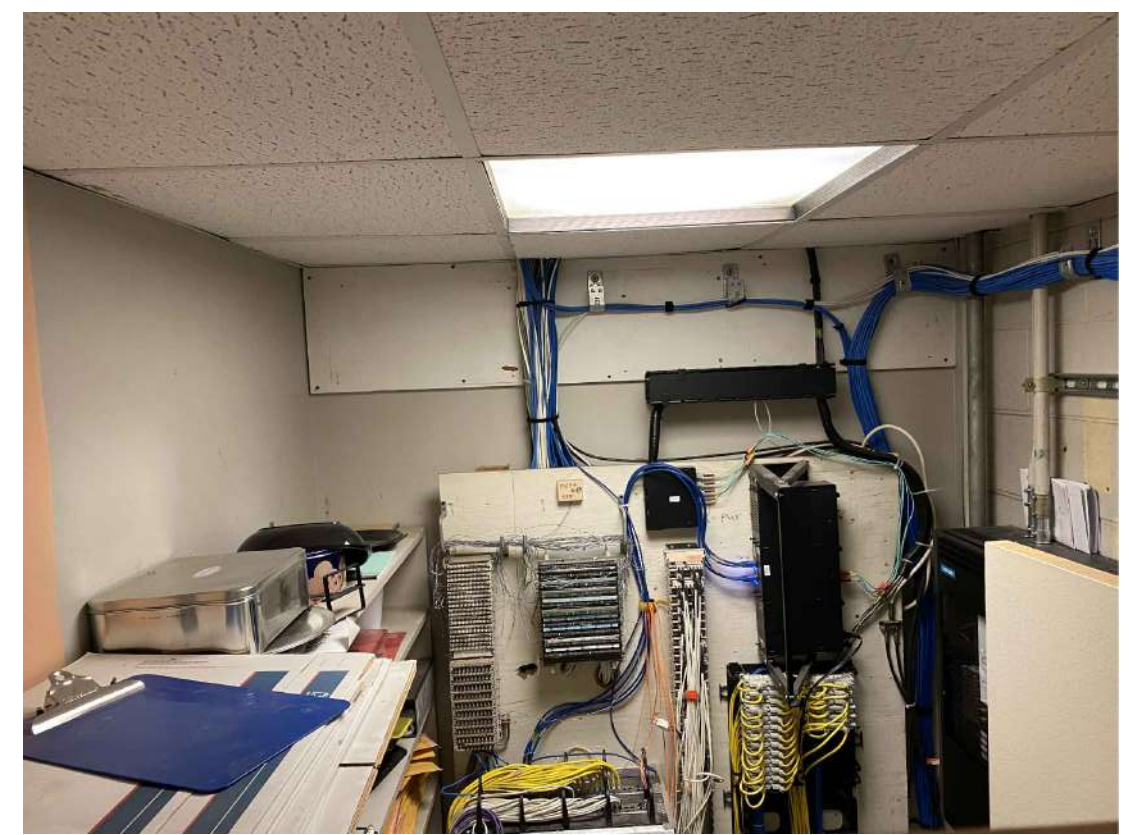
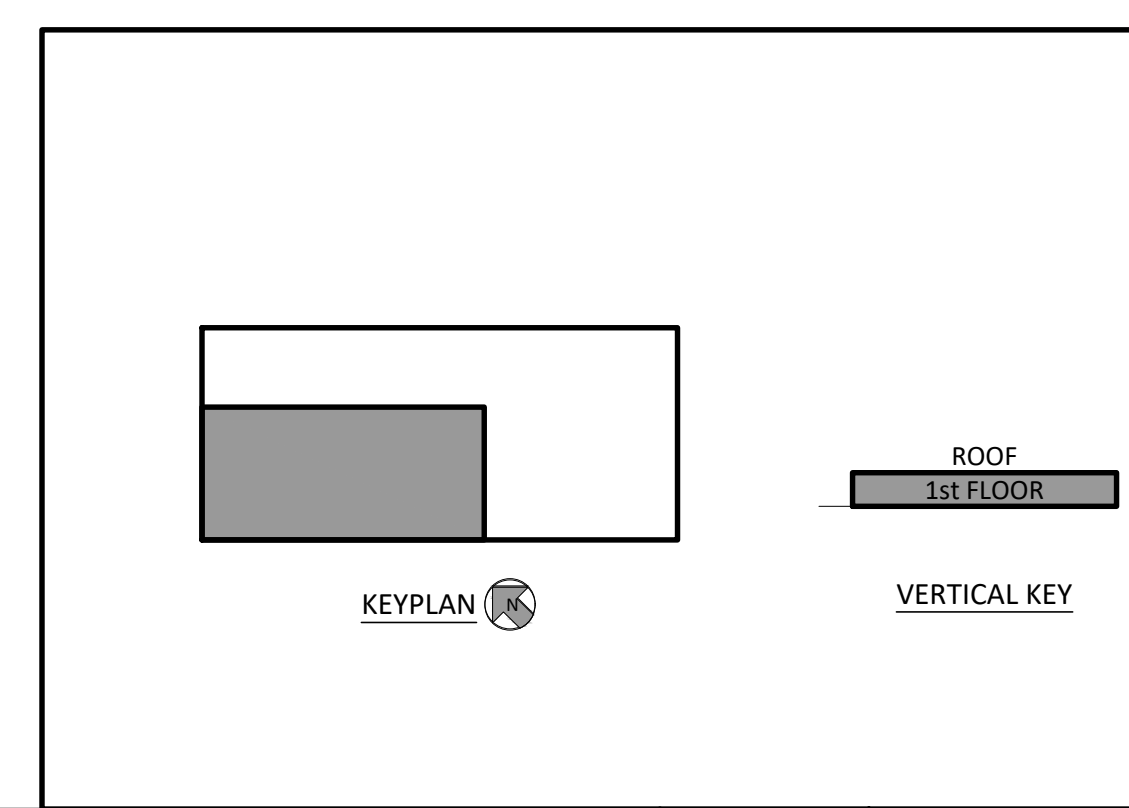


PHOTO C - EXISTING MDF
MDF Room Located In First Floor Electric Room.



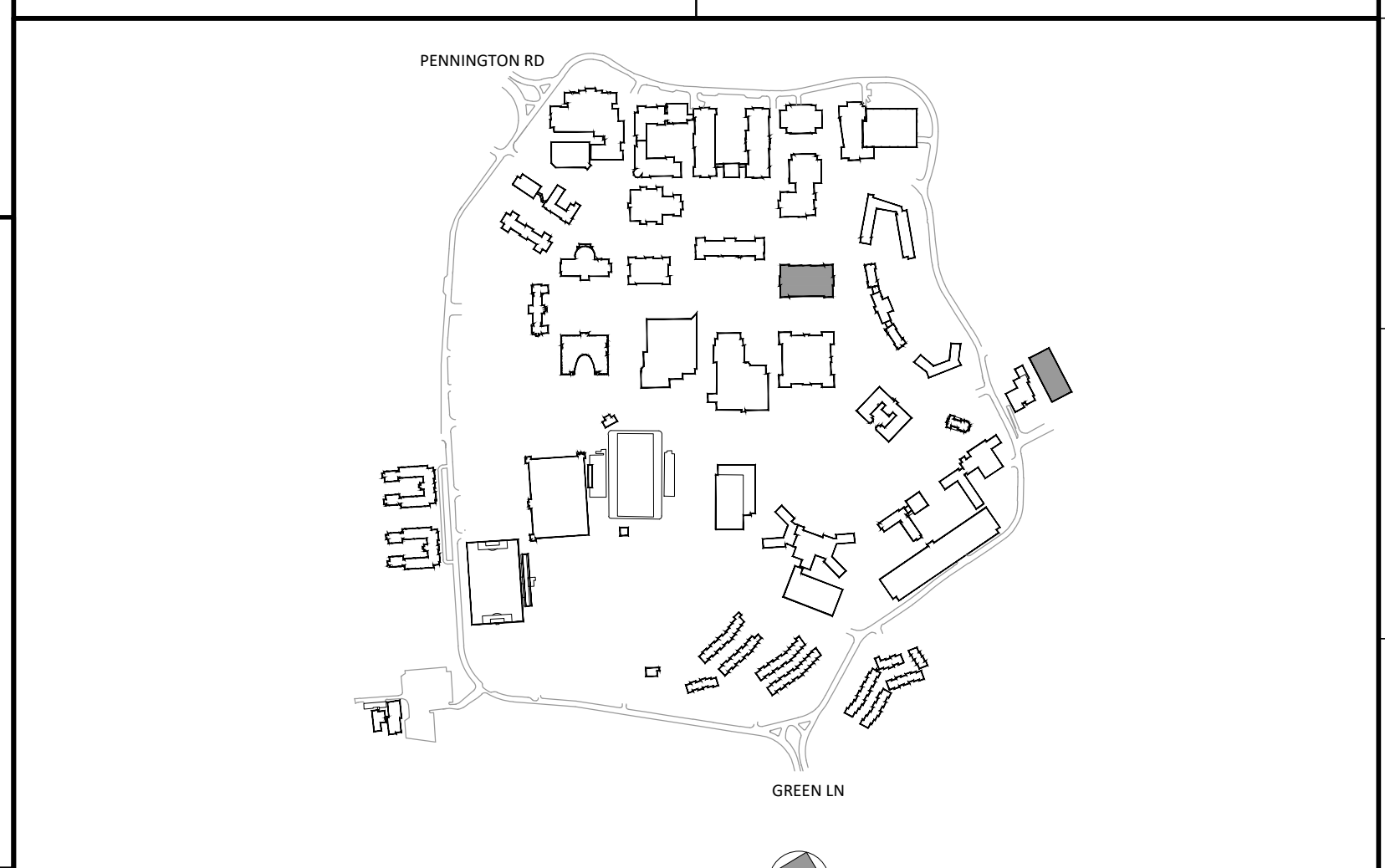
PHOTO D - EXISTING POINT OF ENTRY
Location Of Existing Point Of Entry For Maintenance Building
Pull Box Mounted On Building Exterior With Empty Conduit.



MAINTENANCE BUILDING - FIBER LAYOUT
Scale: 1/8"=1'-0"
Drawing: TC022
Detail: 02

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



30x42

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

ITEM	DATE	ISSUE DESCRIPTION

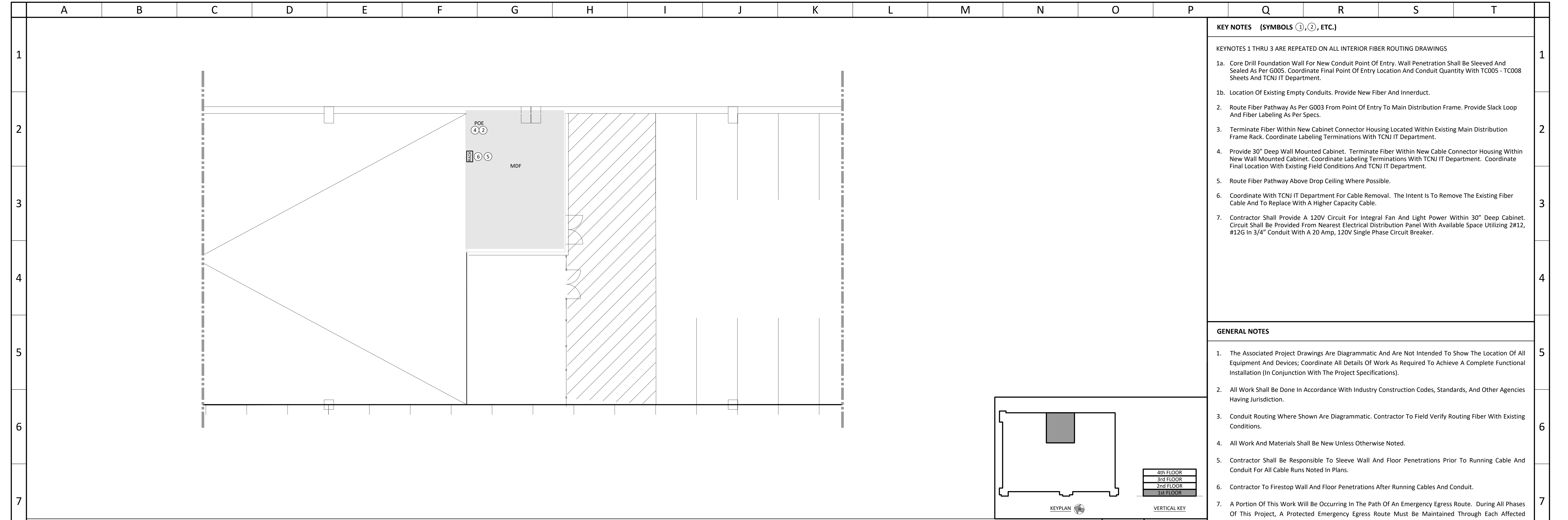
dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IX124
TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
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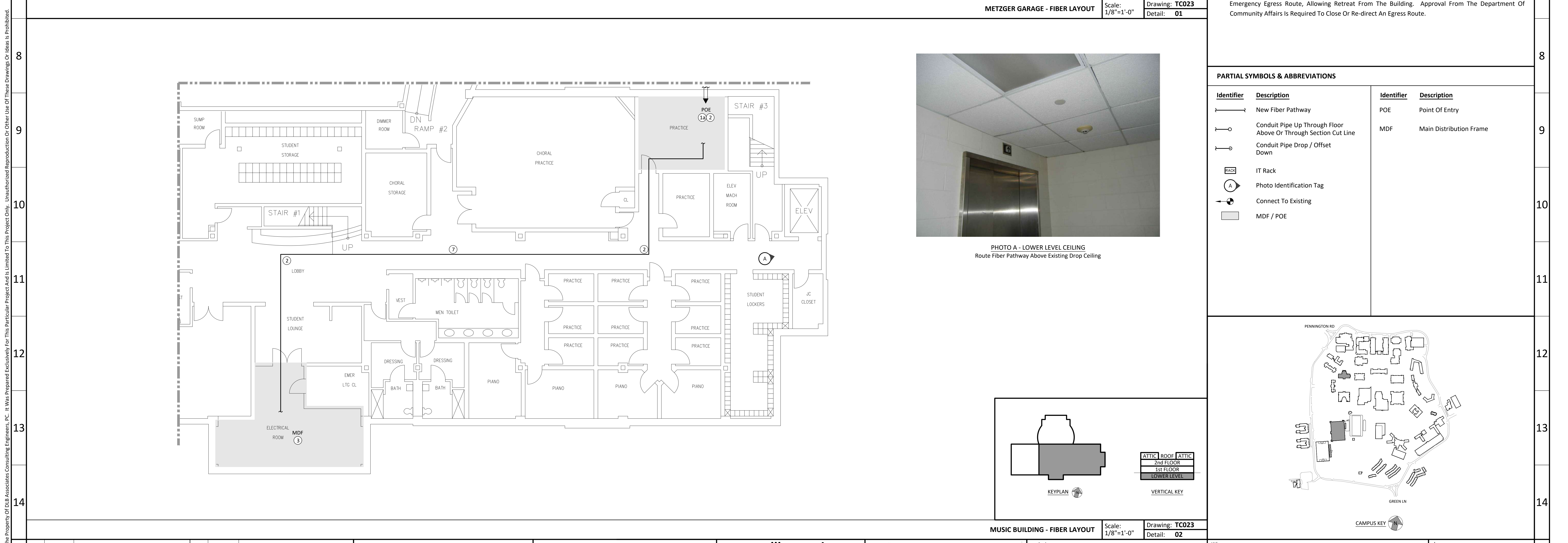
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INTERIOR FIBER ROUTING
GITENSTEIN LIBRARY & MAINTENANCE BUILDING
FIRE ALARM
scale AS SHOWN
drawn by AM
checked by SG
date 09/17/2021
dwg. no.
TC022
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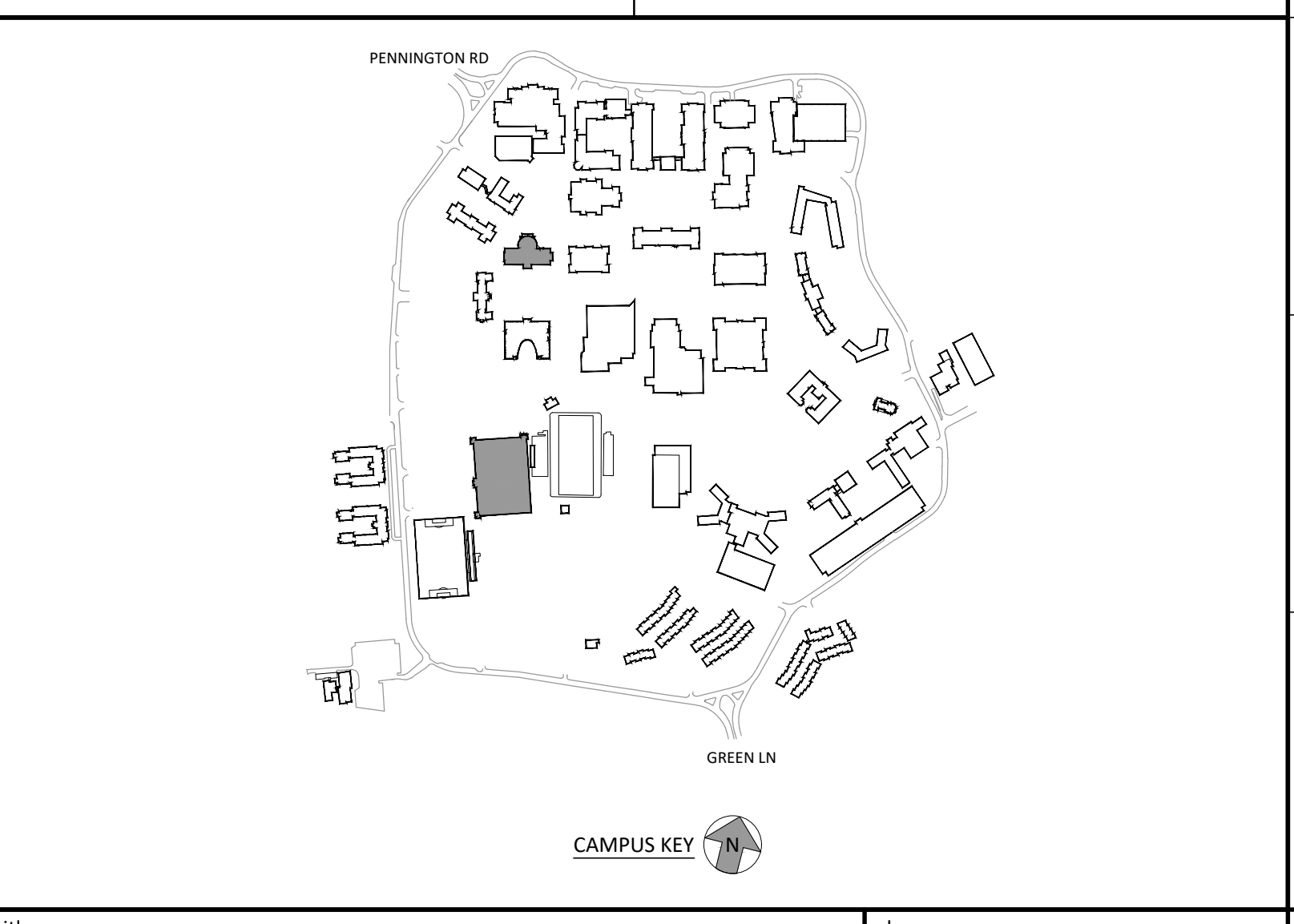
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 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Provide 30" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 5. Route Fiber Pathway Above Drop Ceiling Where Possible.
 6. Coordinate With TCNJ IT Department For Cable Removal. The Intent Is To Remove The Existing Fiber Cable And To Replace With A Higher Capacity Cable.
 7. Contractor Shall Provide A 120V Circuit For Integral Fan And Light Power Within 30" Deep Cabinet. Circuit Shall Be Provided From Nearest Electrical Distribution Panel With Available Space Utilizing 2#12, #12G In 3/4" Conduit With A 20 Amp, 120V Single Phase Circuit Breaker.

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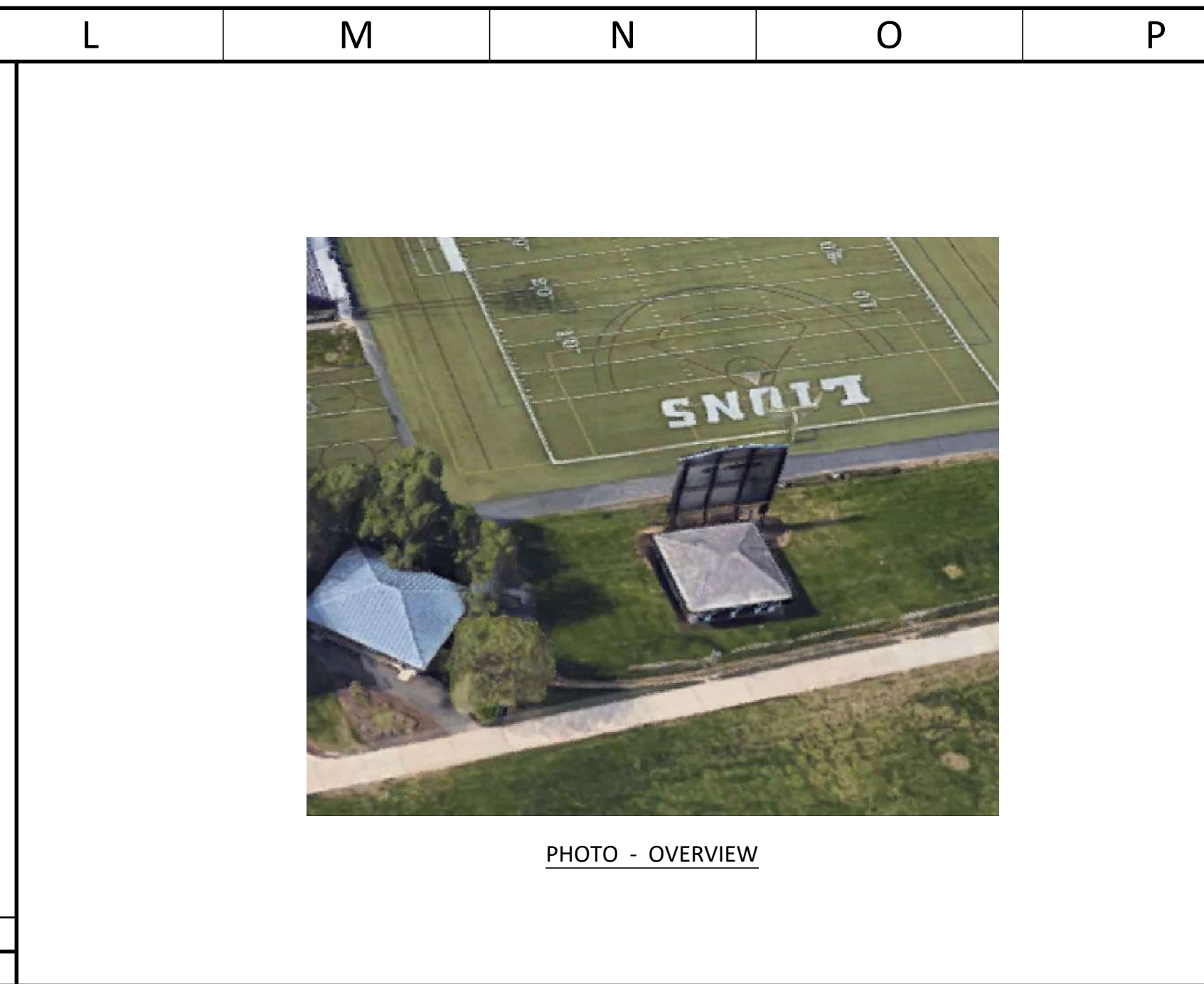
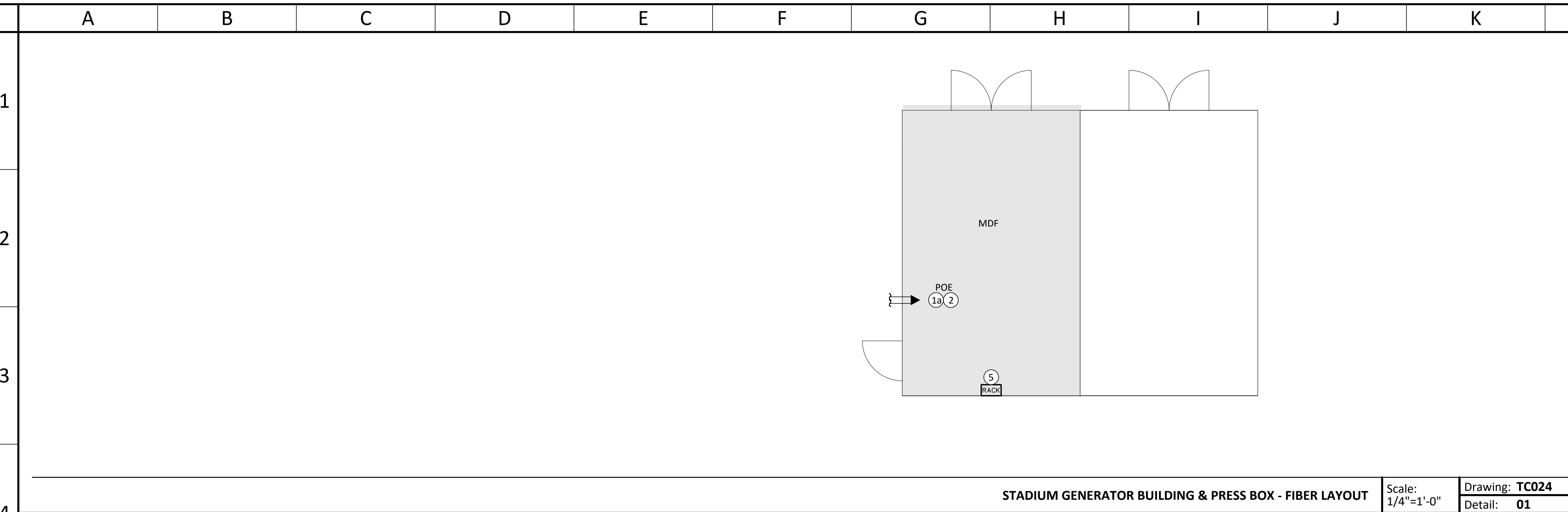


PARTIAL SYMBOLS & ABBREVIATIONS

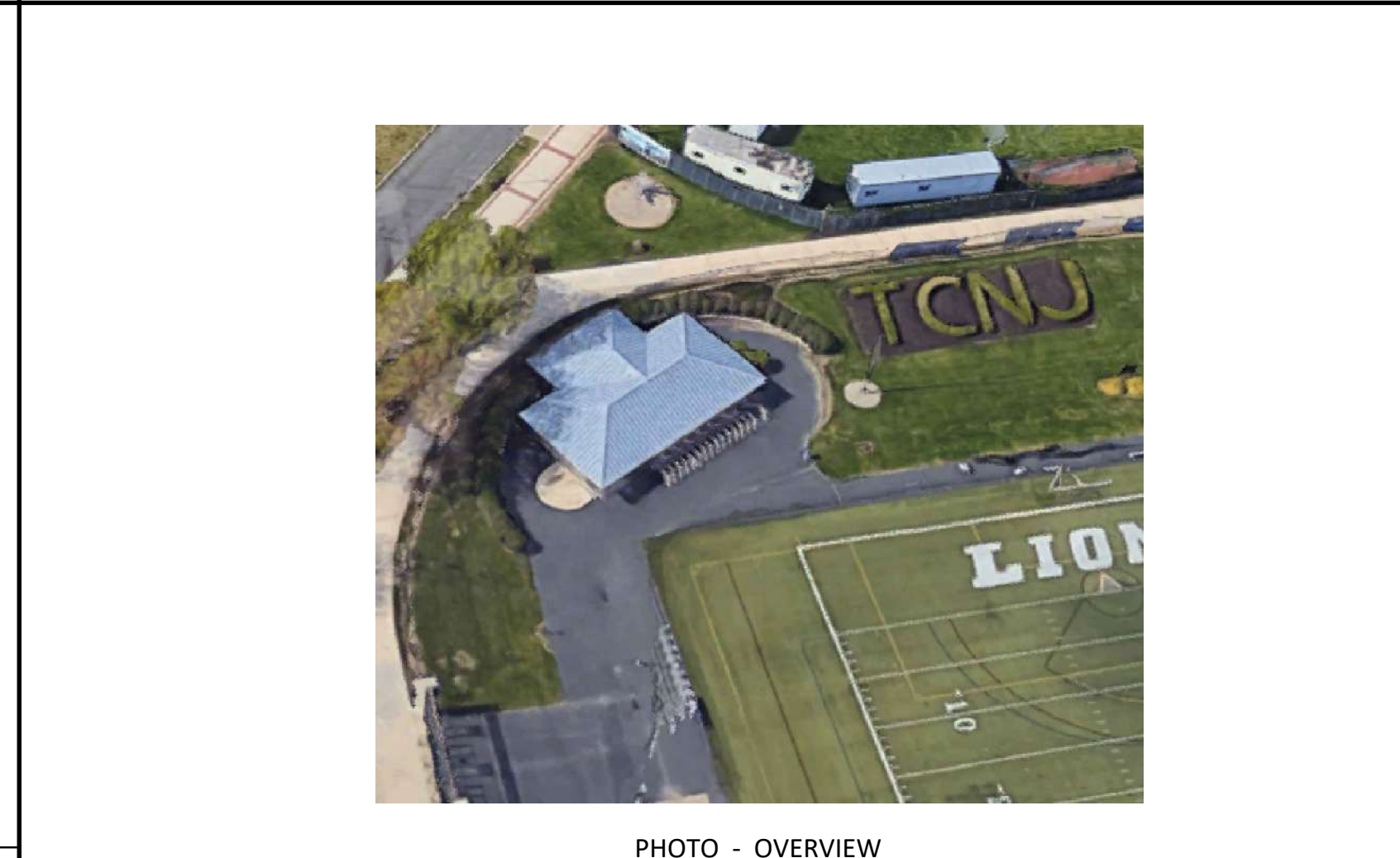
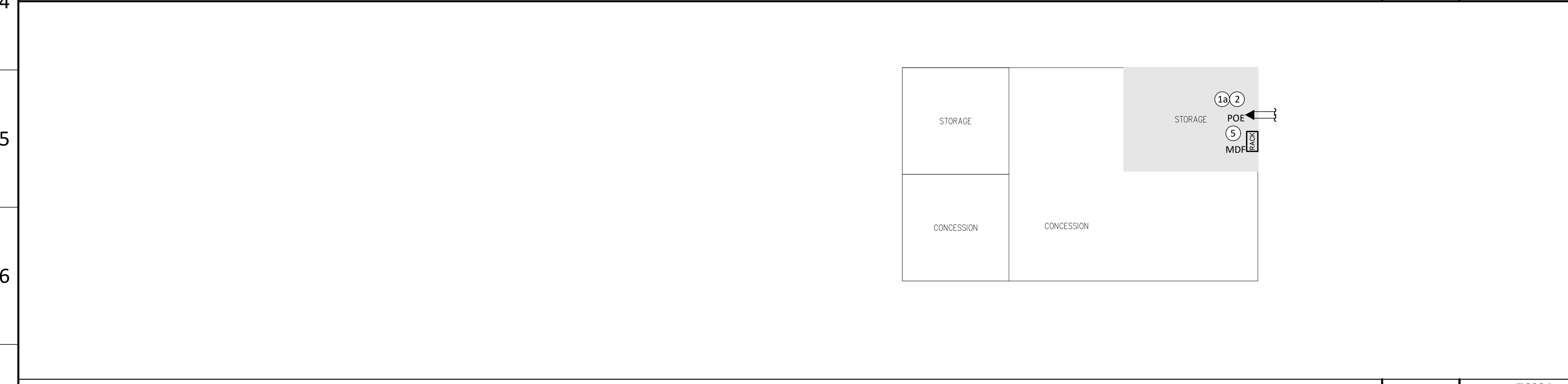
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↔	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
↔	Conduit Pipe Drop / Offset Down		
⊠	IT Rack		
⊙	Photo Identification Tag		
⊕	Connect To Existing		
■	MDF / POE		



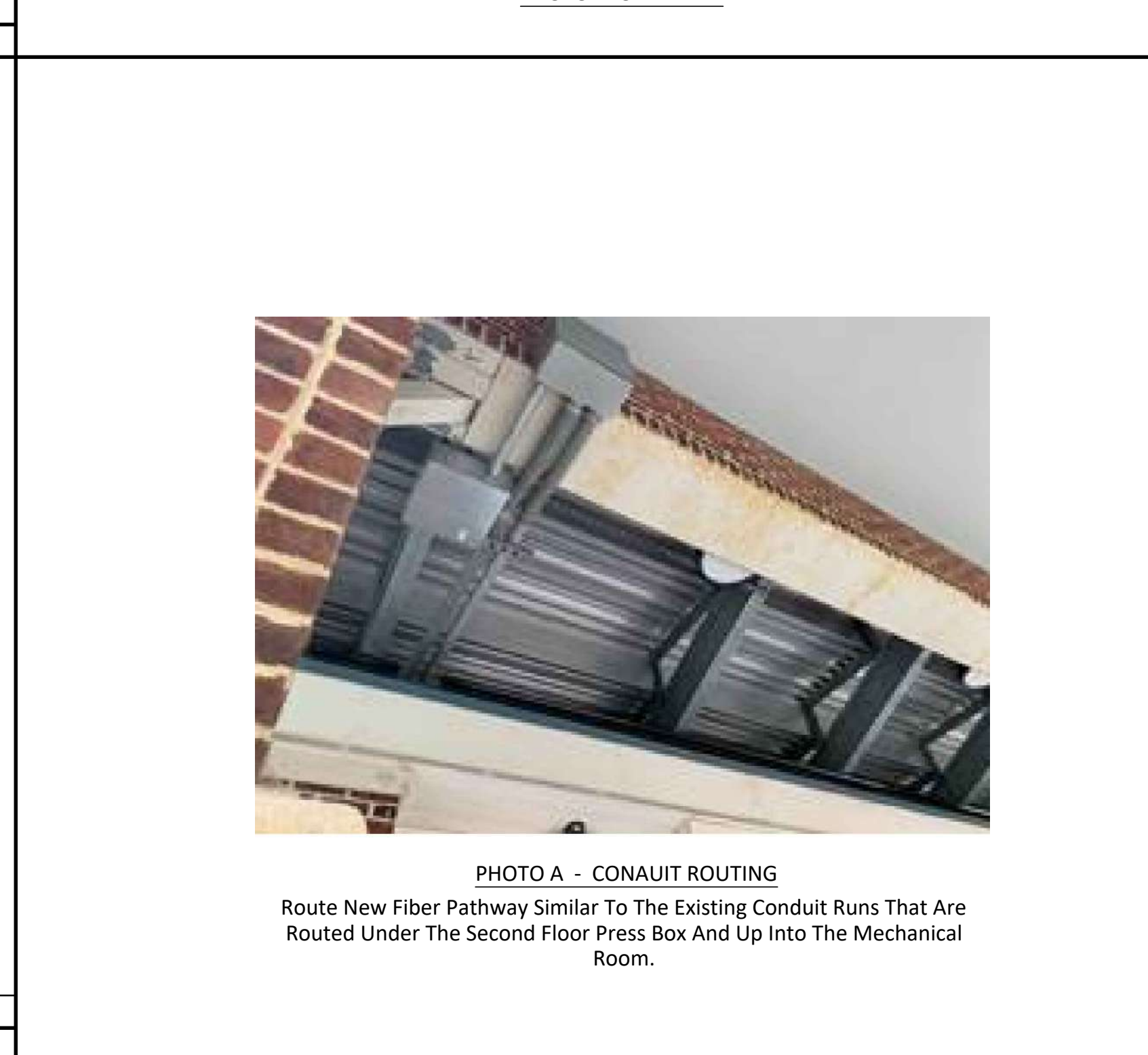
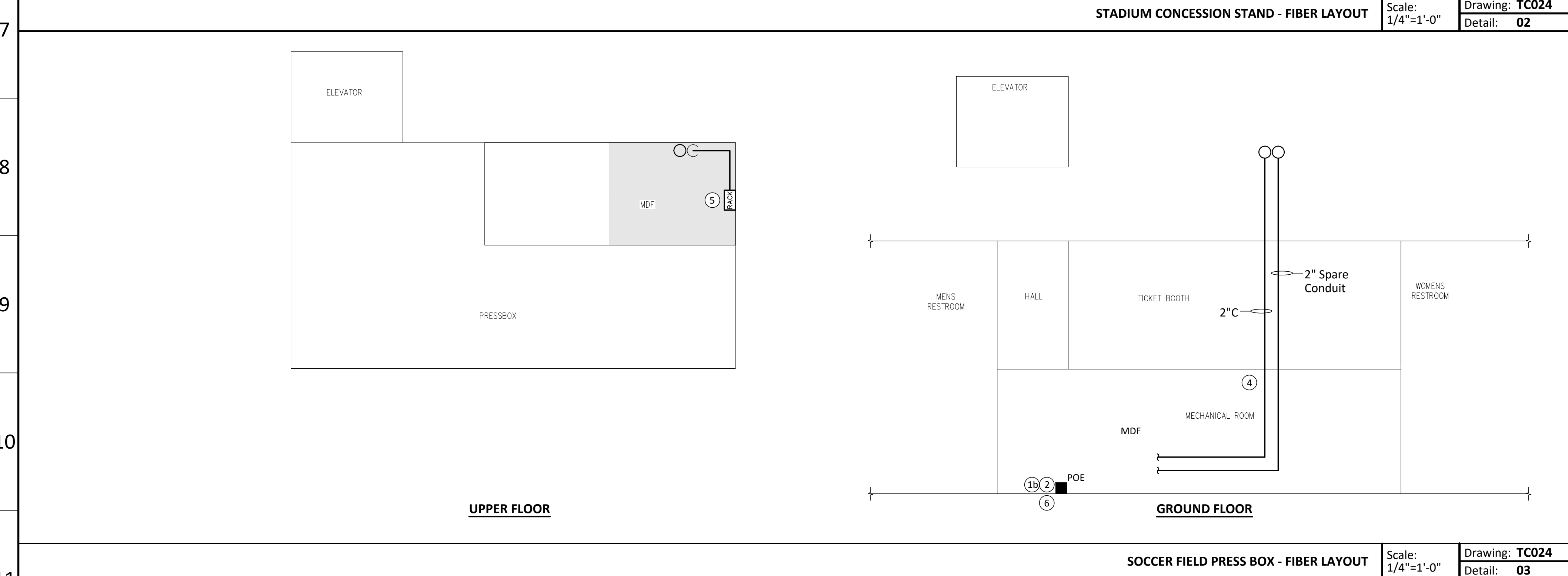
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 3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Route (2) 2" Conduits From Soccer Mechanical Room To Soccer Press Box MDF Room Following The Existing Conduit Routing Between The Spaces. One Conduit Shall Contain (2) Fiber Cables And One Conduit Shall Be Spare. This Includes One From The Softball Pressbox To The Soccer MDF Room Sized Per G004.
 5. Provide 12" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 6. Fiber Route From Admin Splice To Softball Pressbox And From Softball Press Box To Soccer Press Box Are Two Separate Runs.
 7. Provide 30" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 8. Contractor Shall Provide A 120V Circuit For Integral Fan And Light Power Within 30" Deep Cabinet. Circuit Shall Be Provided From Nearest Electrical Distribution Panel (Approximately 50' Away) With Available Space Utilizing 2#12, #12G In 3/4" Conduit With A 20 Amp, 120V Single Phase Circuit Breaker.

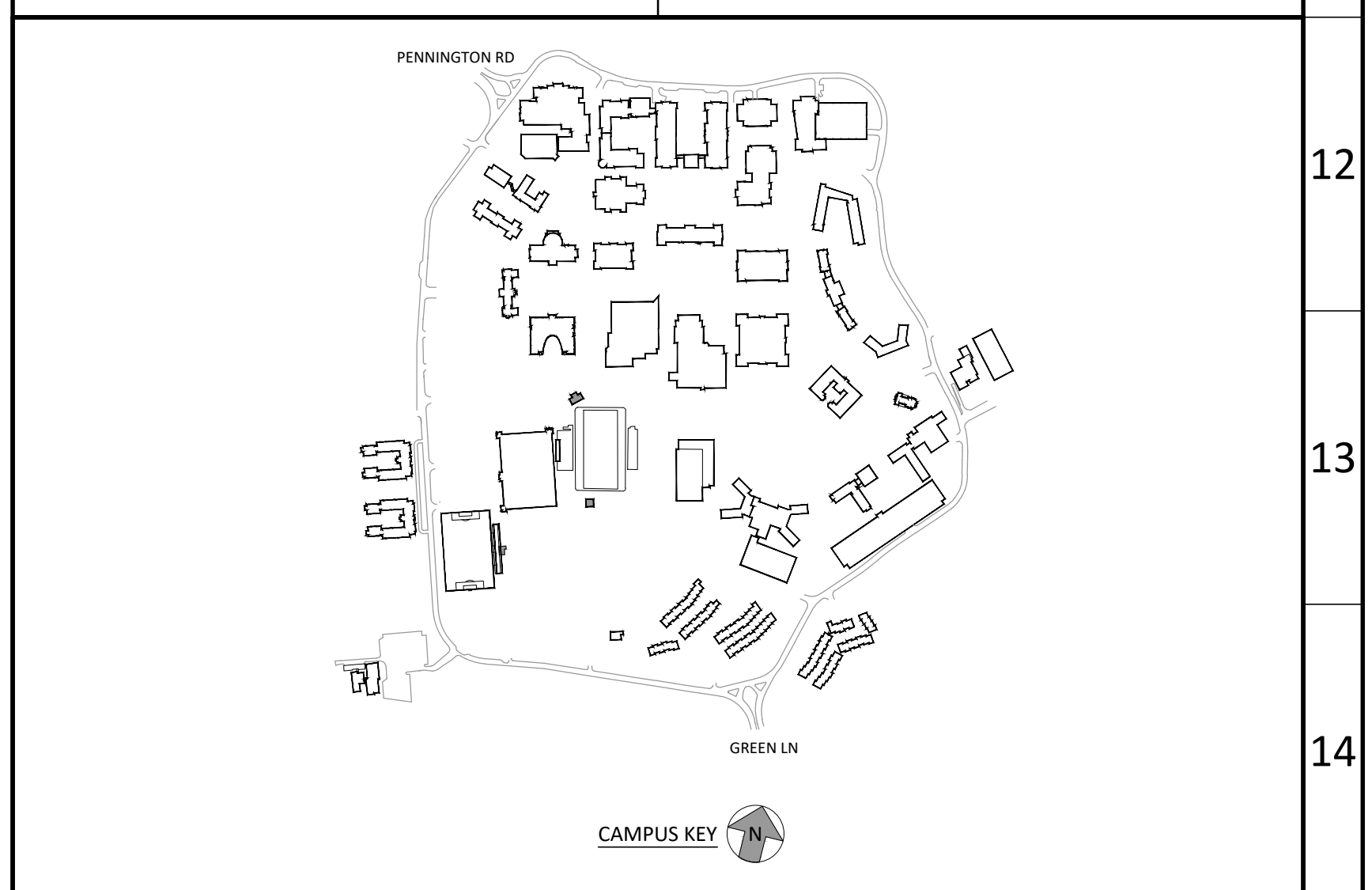
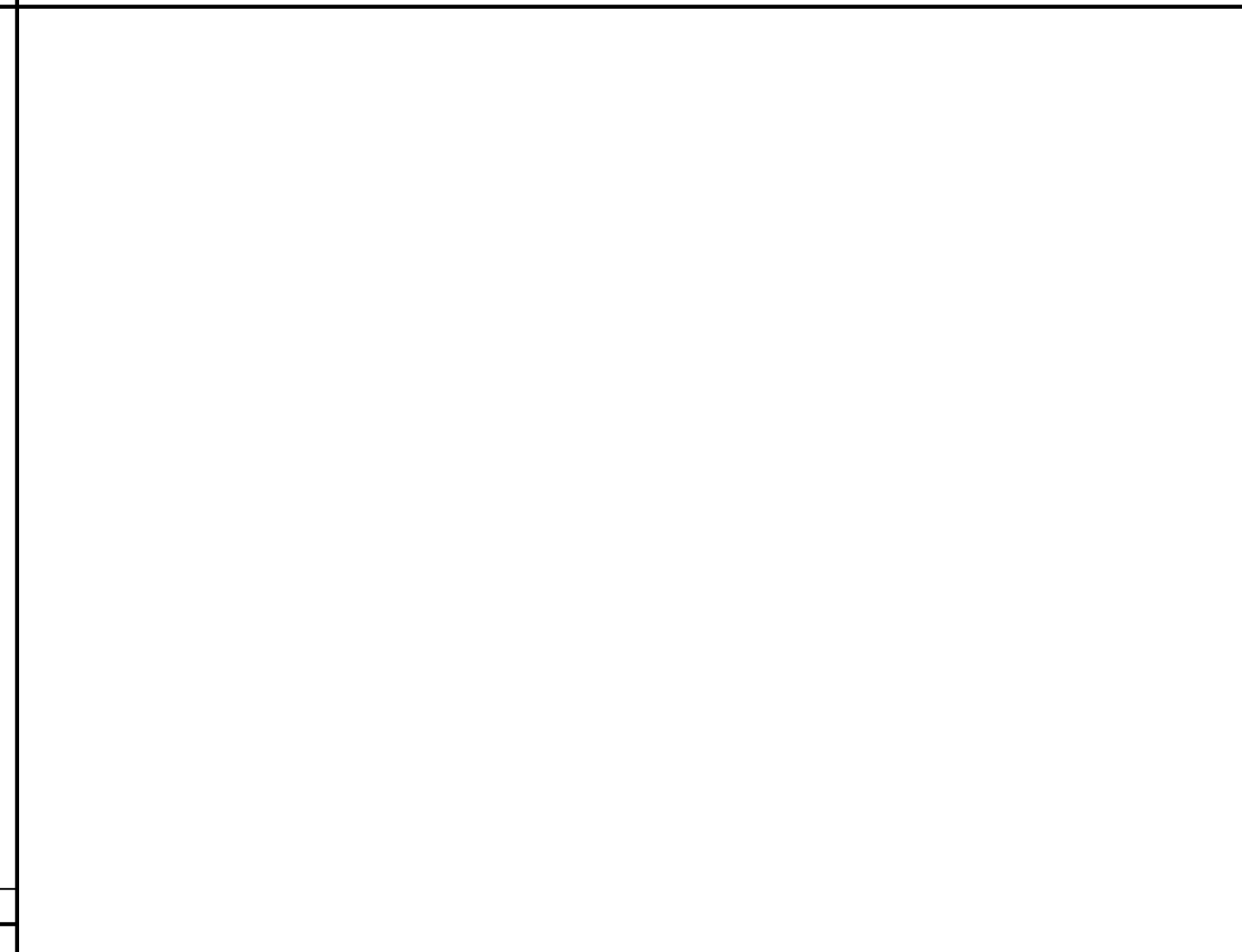
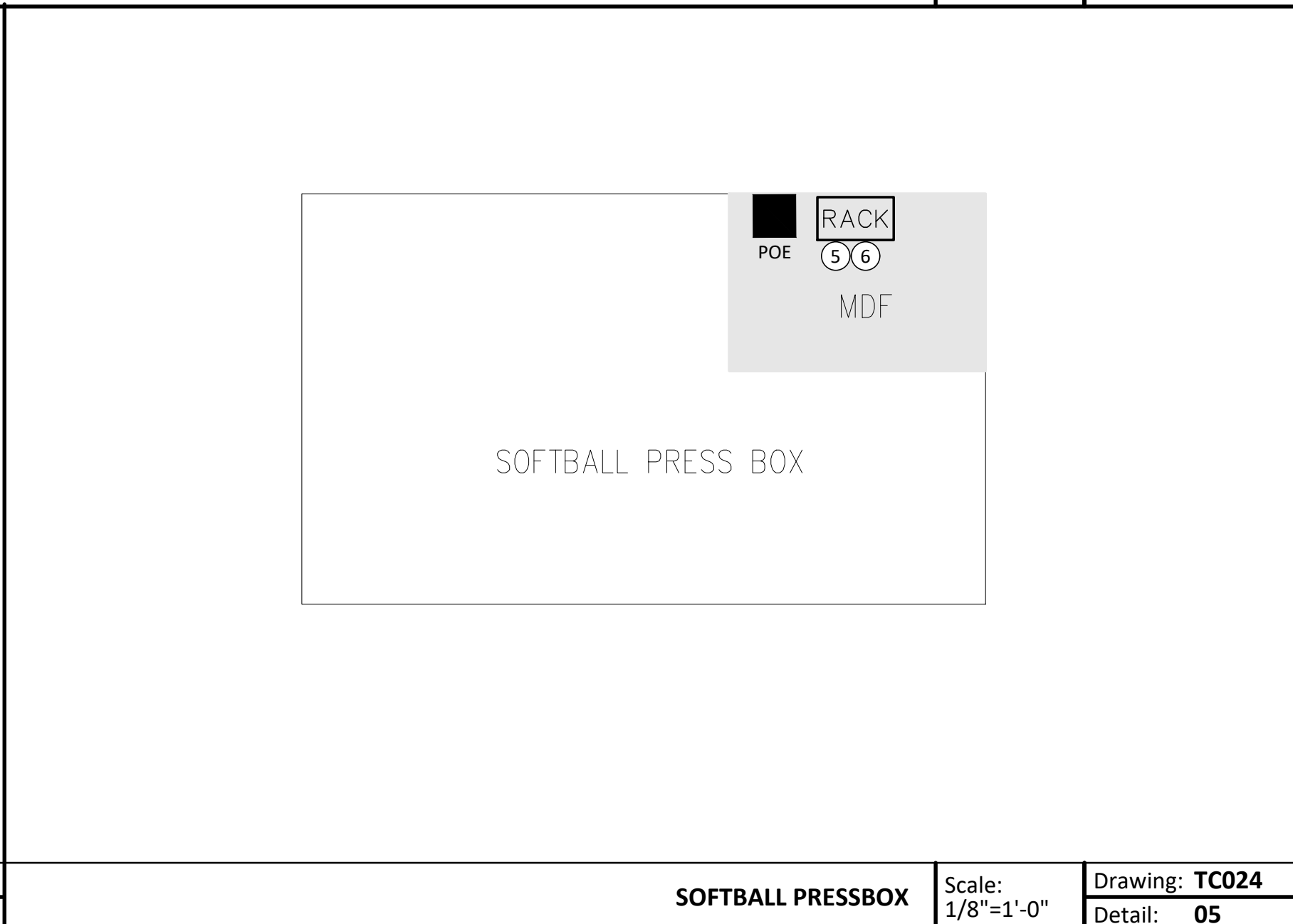
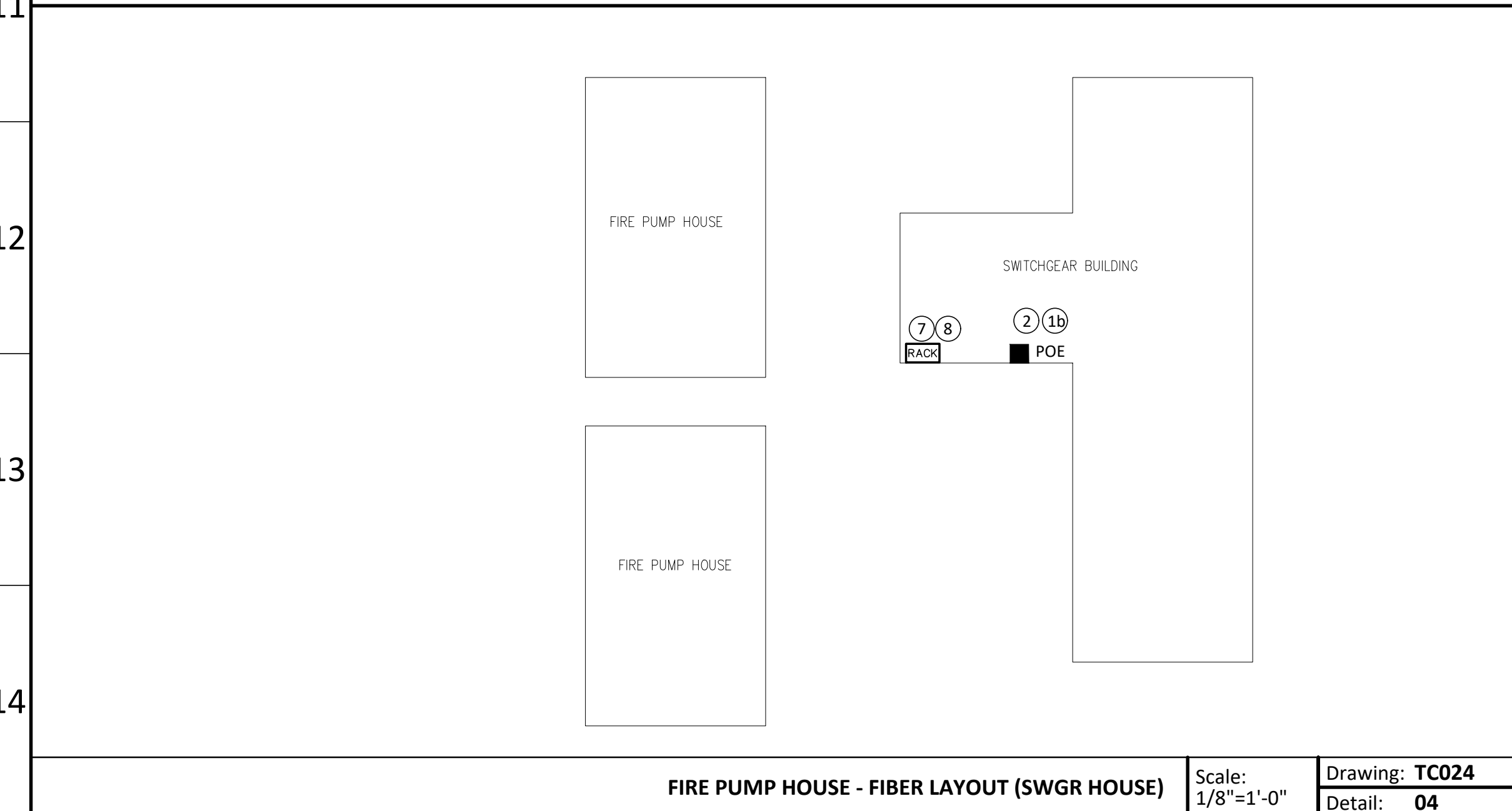


- GENERAL NOTES**
1. The Associated Project Drawings Are Diagrammatic And Are Not Intended To Show The Location Of All Equipment And Devices; Coordinate All Details Of Work As Required To Achieve A Complete Functional Installation (In Conjunction With The Project Specifications).
 2. All Work Shall Be Done In Accordance With Industry Construction Codes, Standards, And Other Agencies Having Jurisdiction.
 3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
 4. All Work And Materials Shall Be New Unless Otherwise Noted.
 5. Contractor Shall Be Responsible To Sleeve Wall And Floor Penetrations Prior To Running Cable And Conduit For All Cable Runs Noted In Plans.
 6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
 7. A Portion Of This Work Will Be Occurring In The Path Of An Emergency Egress Route. During All Phases Of This Project, A Protected Emergency Egress Route Must Be Maintained Through Each Affected Emergency Egress Route, Allowing Retreat From The Building. Approval From The Department Of Community Affairs Is Required To Close Or Re-direct An Egress Route.



PARTIAL SYMBOLS & ABBREVIATIONS

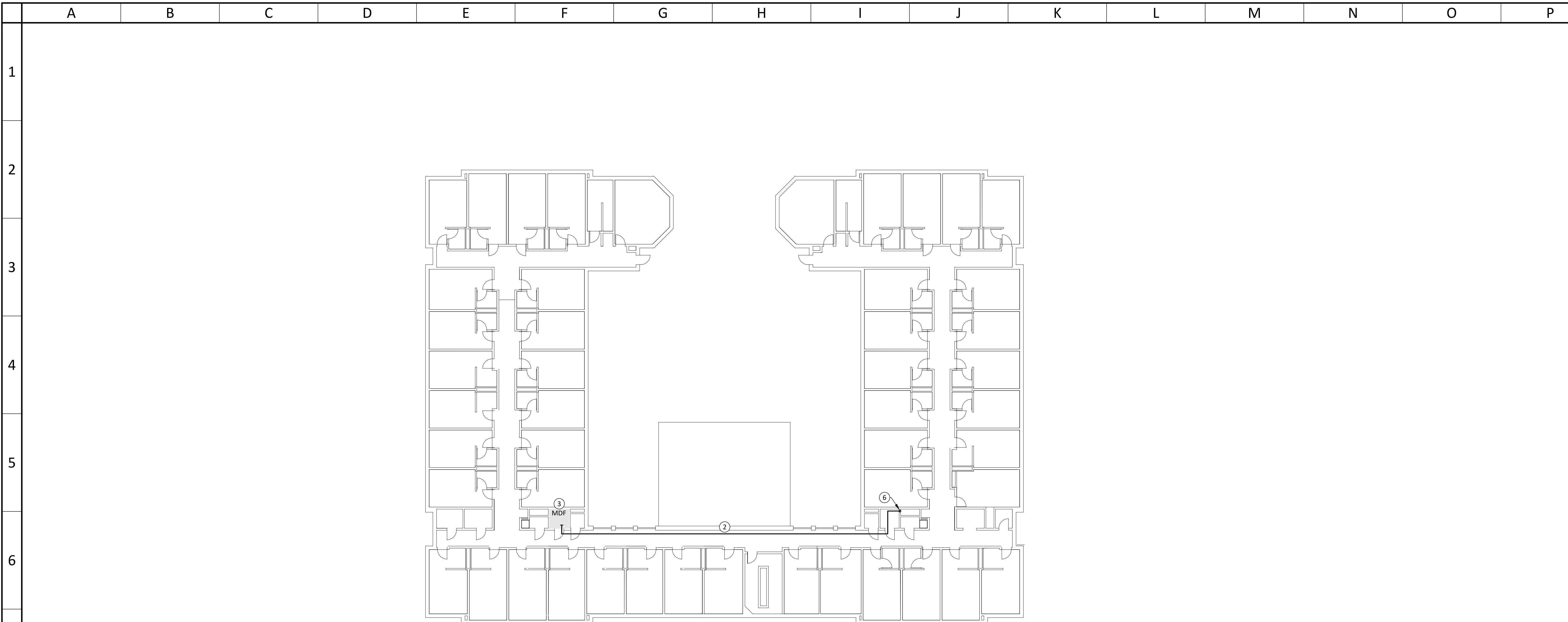
Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down	■	Existing POE
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



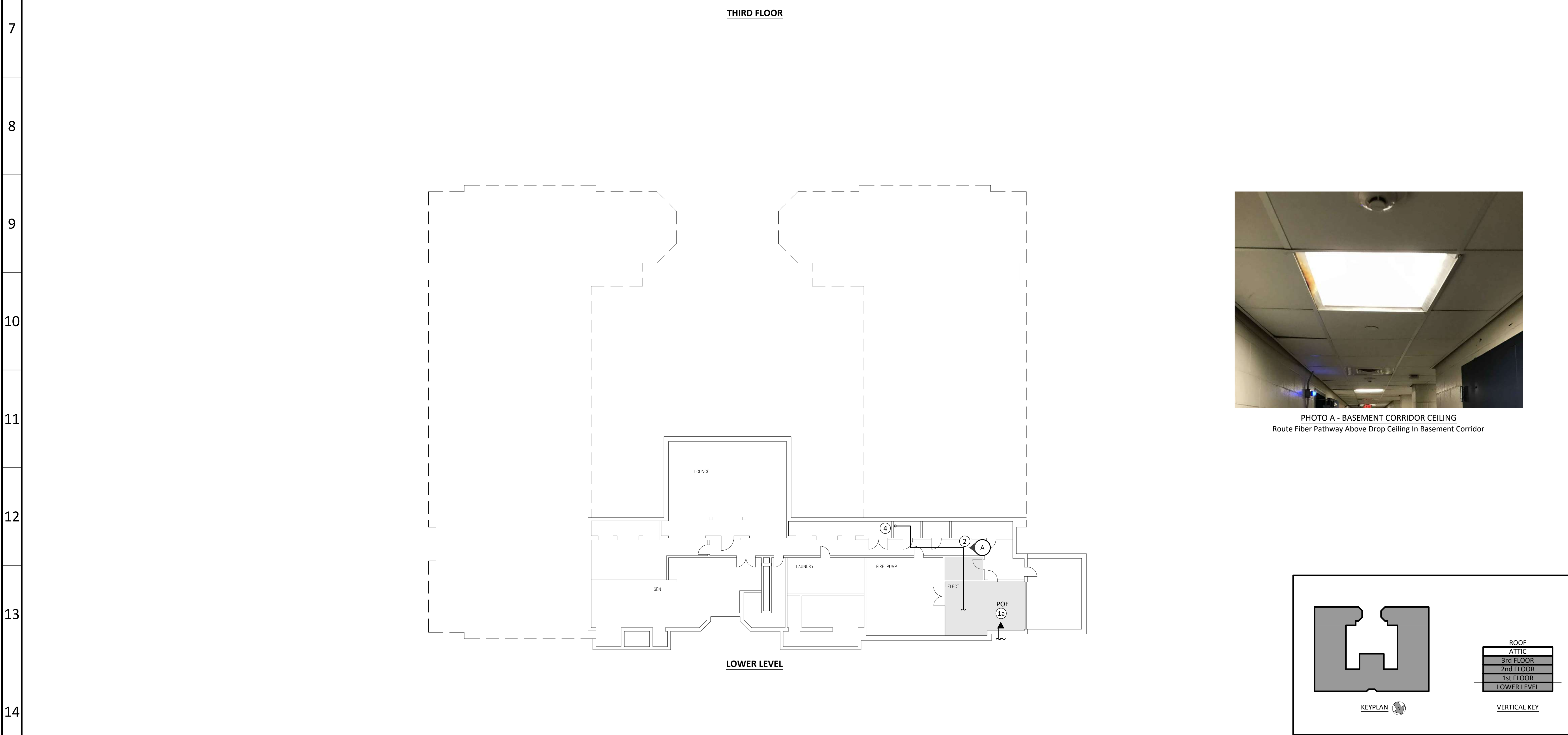
<p>30442</p>			<p>dlb associates CONSULTING ENGINEERS, P.C. 265 Industrial Way West, Eatontown, N.J. 07724</p>			<p>TCNJ THE COLLEGE OF NEW JERSEY</p>			<p>project TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT) 2000 PENNINGTON ROAD, EWING NJ, 08618</p>			<p>title INTERIOR FIBER ROUTING STADIUM & SOCCER FIELD BUILDINGS FIRE ALARM</p>			<p>dwg. no. TC024</p>		
ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION	scale	drawn by	checked by	date	scale	drawn by	checked by	date				
1	10/01/2021	ISSUED FOR BID				AS SHOWN	AM	SG	09/17/2021								

Questions For DLB Call: Anthony Laskosky Phone: 732-829-7351
DLB Project ID: 47211 TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi

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THIRD FLOOR



LOWER LEVEL

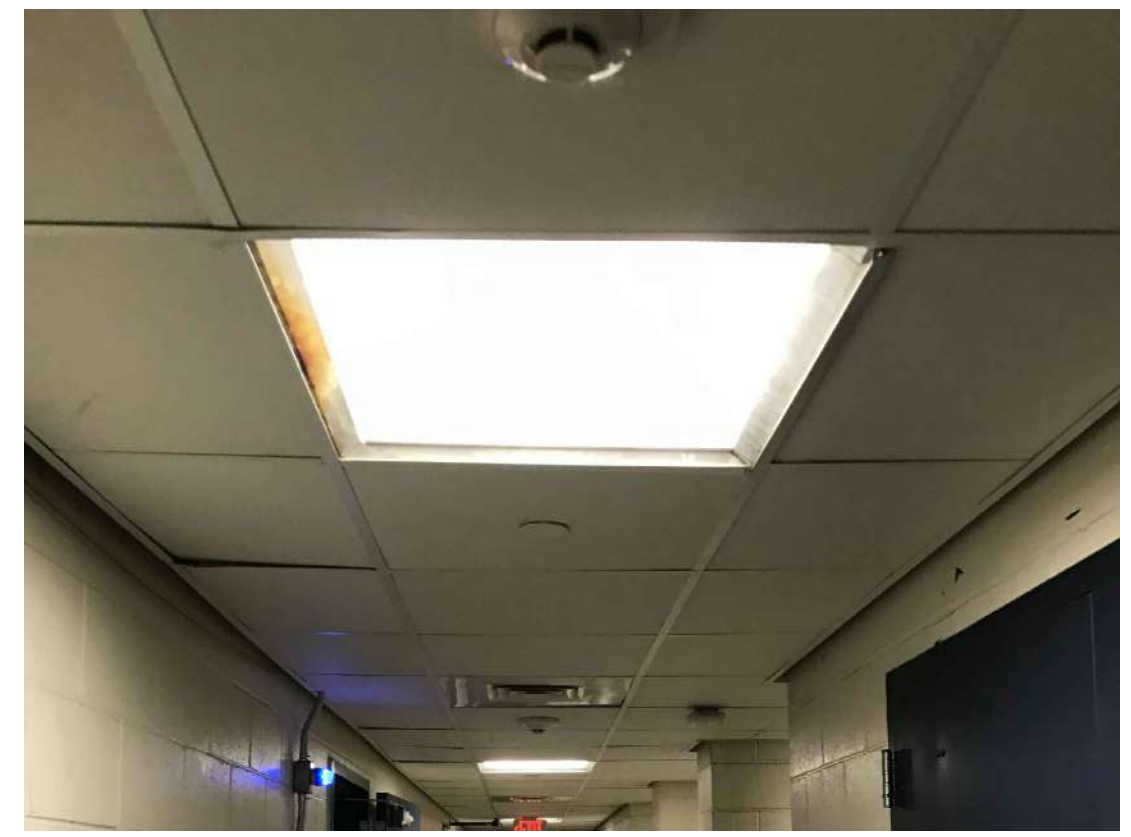
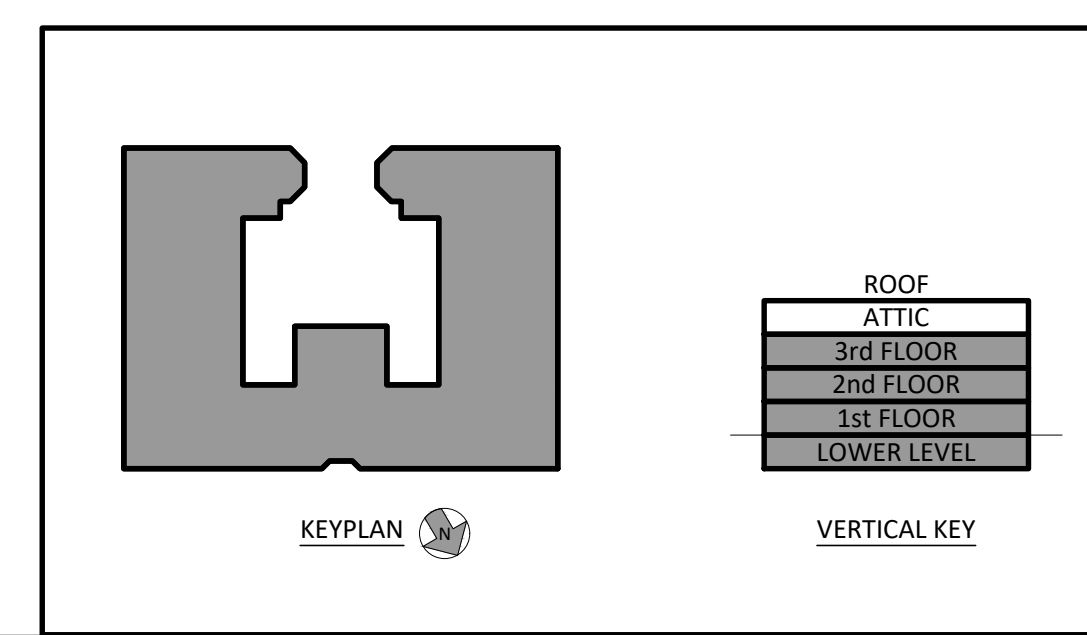


PHOTO A - BASEMENT CORRIDOR CEILING
Route Fiber Pathway Above Drop Ceiling in Basement Corridor



KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

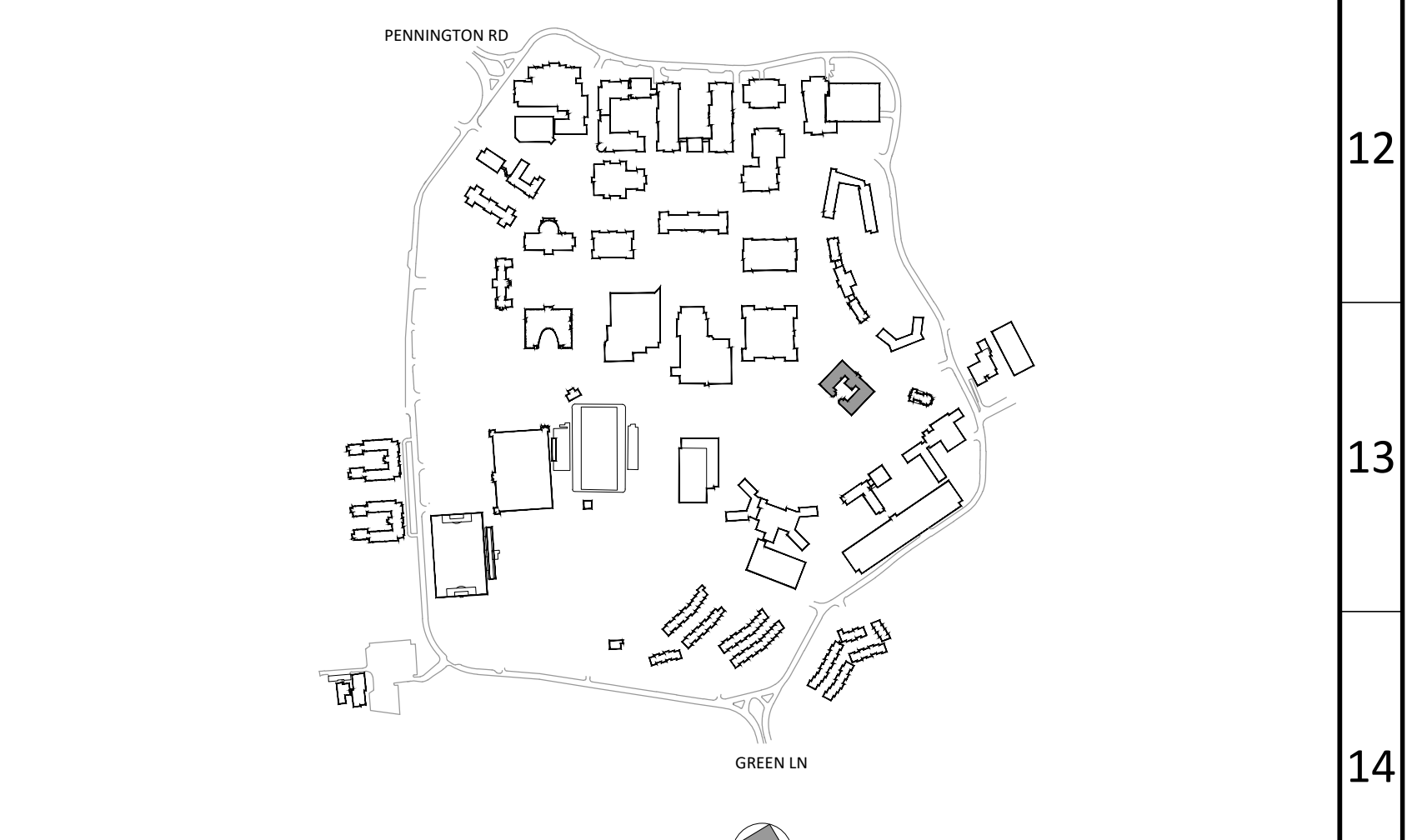
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
- 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
4. Core Drill All Floor Penetrations To Route Fiber From Point Of Entry Within Lower Level To Main Distribution Frame (MDF) On Third Floor. All Floor Penetrations To Be Labeled Per Spec And Details On Sheet G005.

GENERAL NOTES

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2. All Work Shall Be Done In Accordance With Industry Construction Codes, Standards, And Other Agencies Having Jurisdiction.
3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
4. All Work And Materials Shall Be New Unless Otherwise Noted.
5. Contractor Shall Be Responsible To Sleeve Wall And Floor Penetrations Prior To Running Cable And Conduit For All Cable Runs Noted In Plans.
6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
7. A Portion Of This Work Will Be Occurring In The Path Of An Emergency Egress Route. During All Phases Of This Project, A Protected Emergency Egress Route Must Be Maintained Through Each Affected Emergency Egress Route, Allowing Retreat From The Building. Approval From The Department Of Community Affairs Is Required To Close Or Re-direct An Egress Route.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



NEW RESIDENCE HALL - FIBER LAYOUT
Scale: 1/16"=1'-0"
Drawing: TC025
Detail: 01

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

30x42

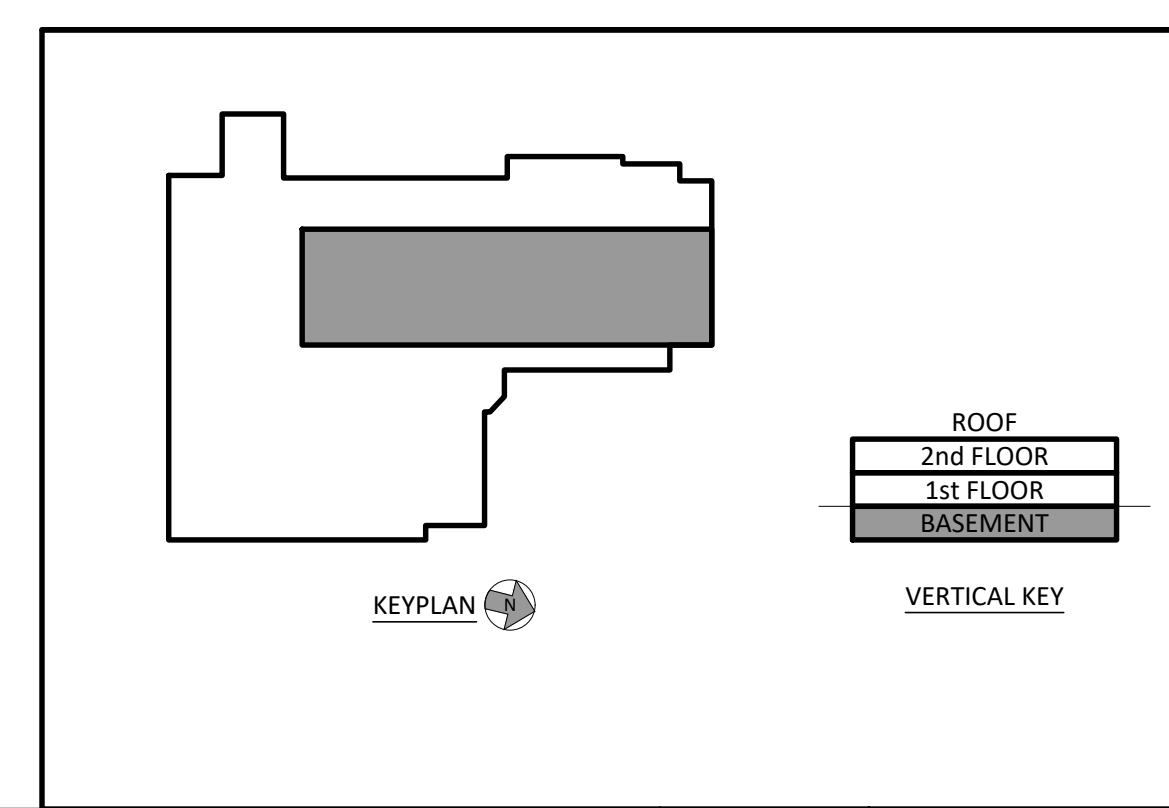
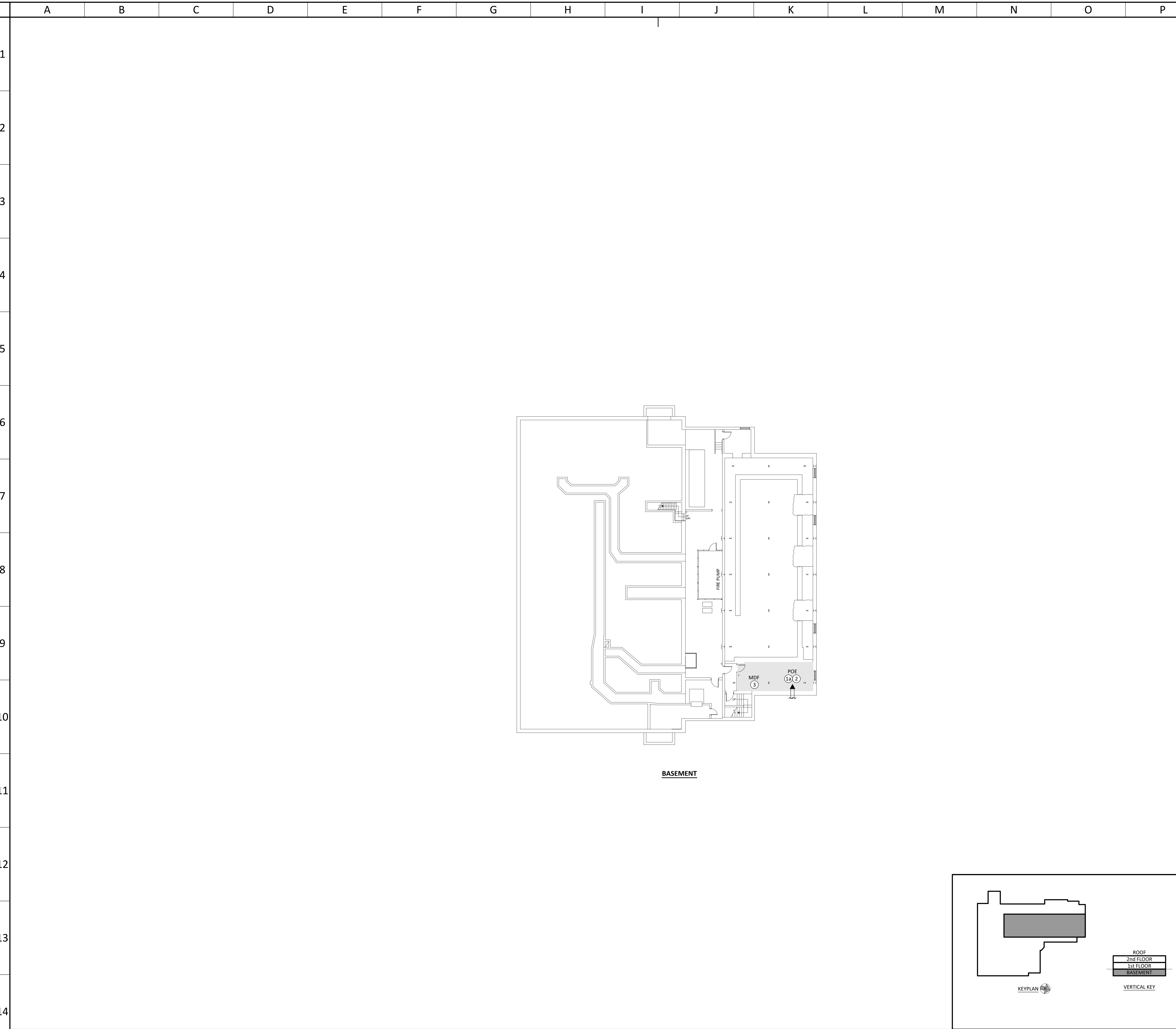
dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
TCNJ Project #: IX124
TCNJ Project Manager: Mumtaz Makhdomi

project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

title INTERIOR FIBER ROUTING NEW RESIDENCE FIRE ALARM	dwg. no. TC025
scale AS SHOWN	drawn by AM
checked by SG	date 09/17/2021

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KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

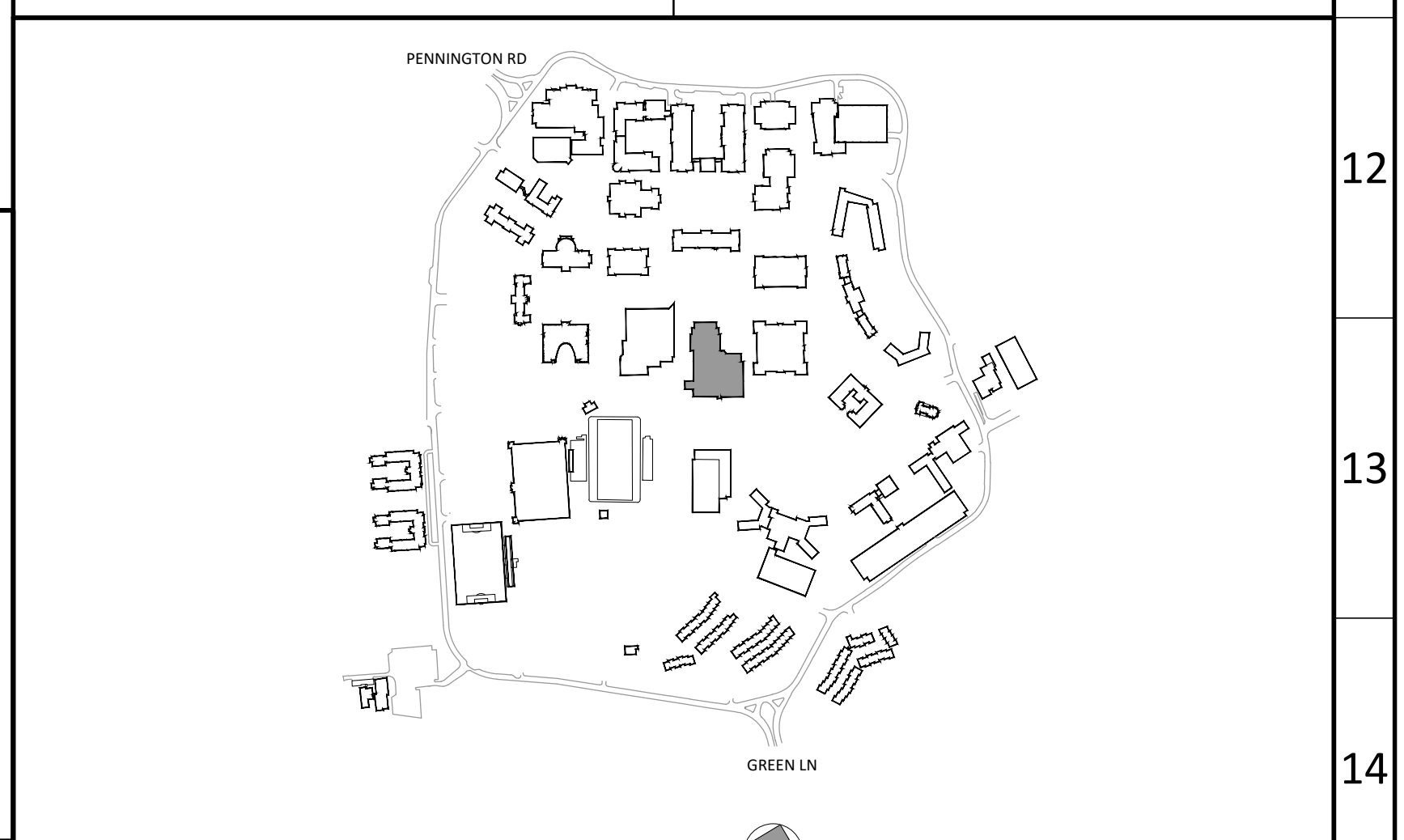
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
- 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.

GENERAL NOTES

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PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

PACKER HALL - FIBER LAYOUT
 Scale: 1/16"=1'-0"
 Drawing: TC026
 Detail: 01

dlb associates
 CONSULTING ENGINEERS, P.C.
 265 Industrial Way West, Eatontown, N.J. 07724
 Questions For DLB Call: Anthony Laskosky
 DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
 TCNJ Project #: IX124
 TCNJ Project Manager: Mumtaz Makhdomi

project
 TCNJ - FIBER INFRASTRUCTURE UPGRADES
 (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD,
 EWING NJ, 08618

title
 INTERIOR FIBER ROUTING
 PACKER HALL FIRE ALARM
 dwg. no.
TC026

scale	drawn by	checked by	date
AS SHOWN	AM	SG	09/17/2021

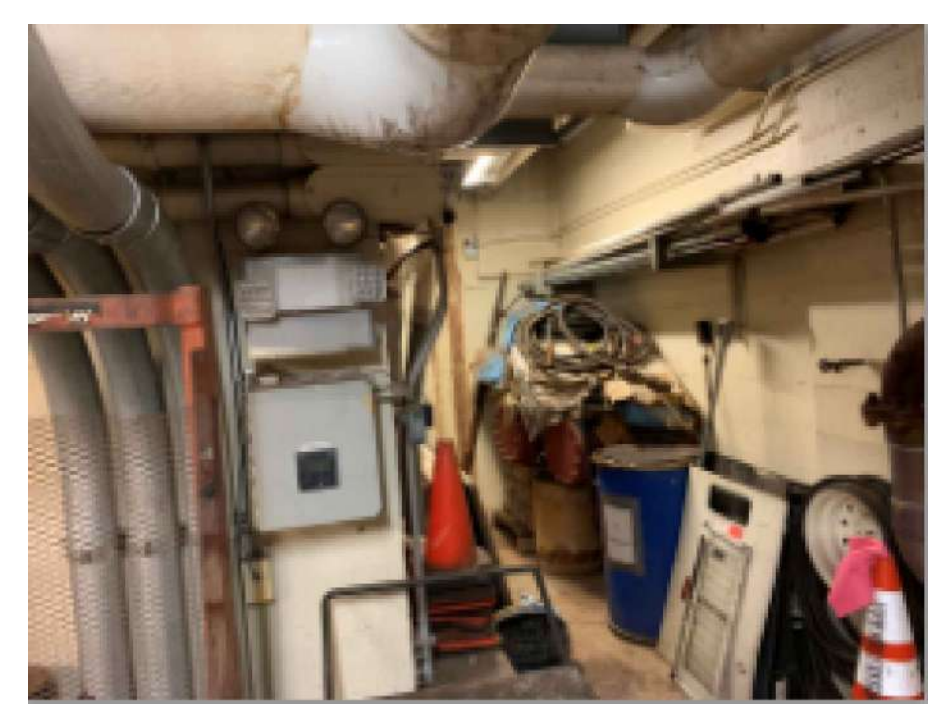
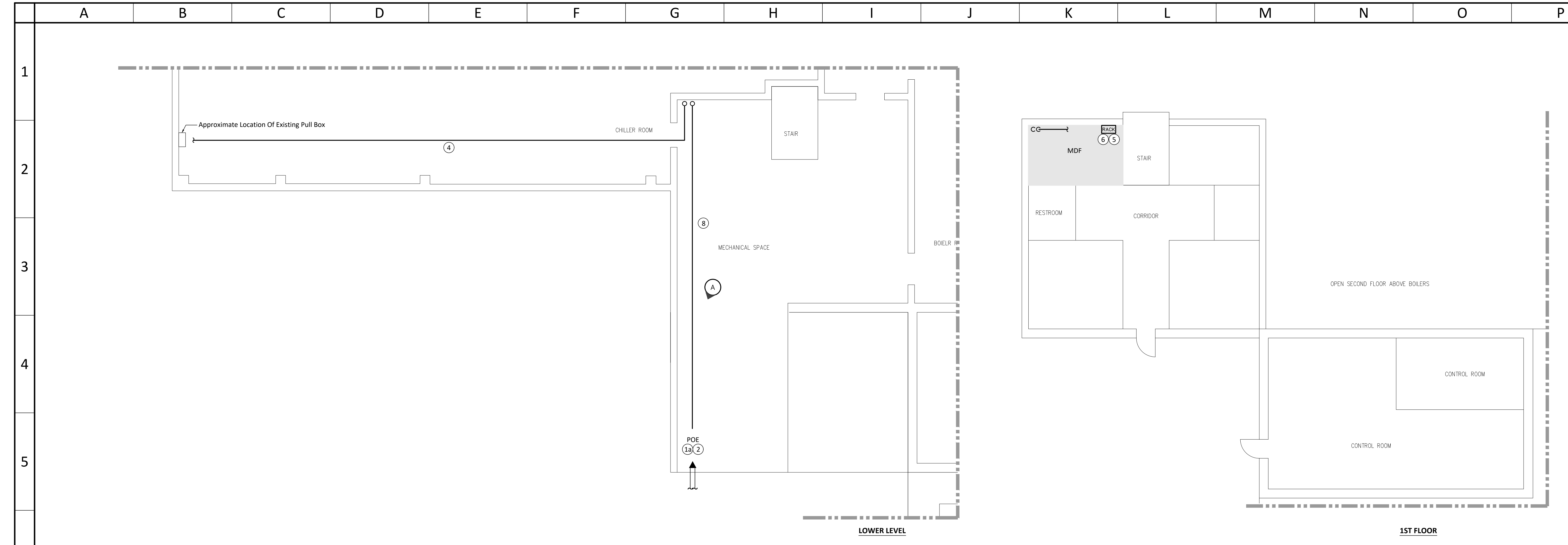
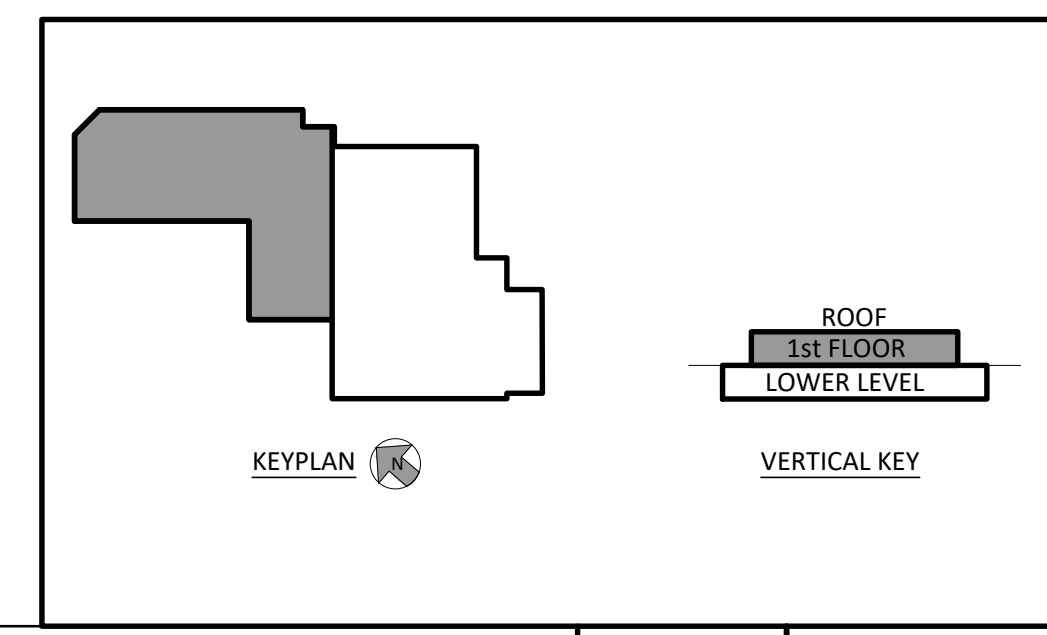


PHOTO A - BASEMENT CEILING AND POE
Route Fiber Pathway As High As Possible Amongst The Other Mechanical Infrastructure In Basement Area.



POWERHOUSE - FIBER LAYOUT
Scale: 1/8"=1'-0"
Drawing: TC027
Detail: 01

- KEY NOTES (SYMBOLS ①, ②, ETC.)**
- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Not Used.
 4. Route With One 4" Conduit With (3) 1-1/4" ENT Containing Fiber Cable From MDF Room Through Chiller Plant To Location Of Existing POE For Connection To Maintenance Building. Follow Routing Of Existing Fiber Pathway. Conduit Shall Terminate To Existing Pull Box.
 5. Contractor Shall Provide A 120V Circuit For Integral Fan And Light Power Within 30" Deep Cabinet. Circuit Shall Be Provided From Nearest Electrical Distribution Panel (Approximately 50' Away) With Available Space Utilizing 2#12, #12G In 3/4" Conduit With A 20 Amp, 120V Single Phase Circuit Breaker.
 6. Provide 30" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 7. Route Fiber Pathway Above Drop Ceiling Where Possible.
 8. Route 4" Conduit From POE As High As Possible Along Mechanical Basement Ceiling. Core Drill Ceiling And Route Conduit Up Into MDF Room. Contractor To Coordinate Conduit Routing With Existing Field Conditions.

- GENERAL NOTES**
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30x42

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

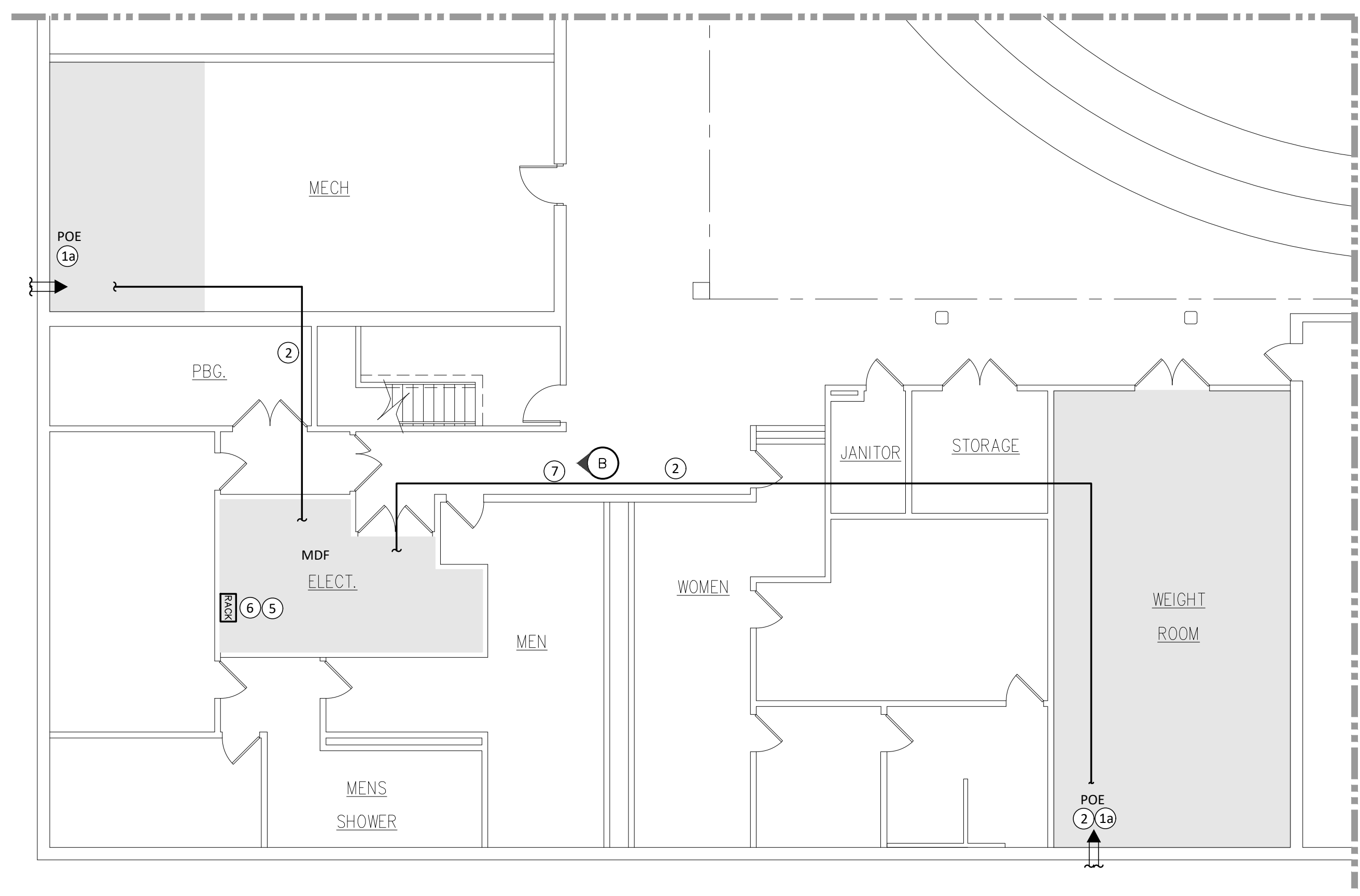
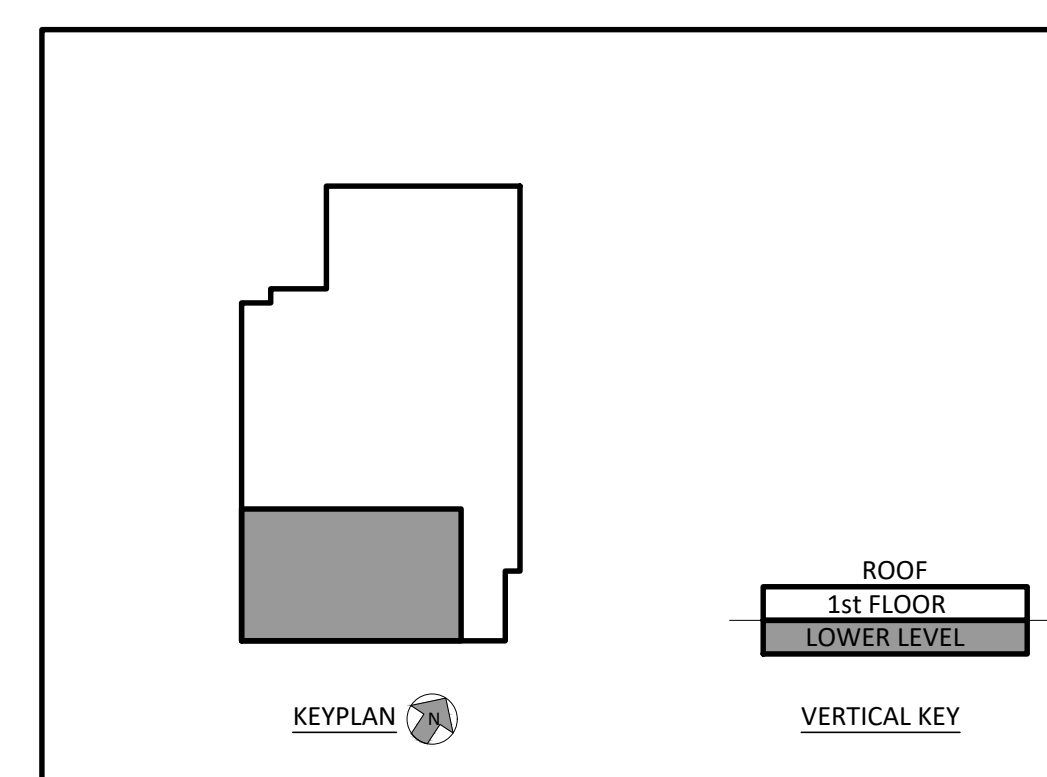


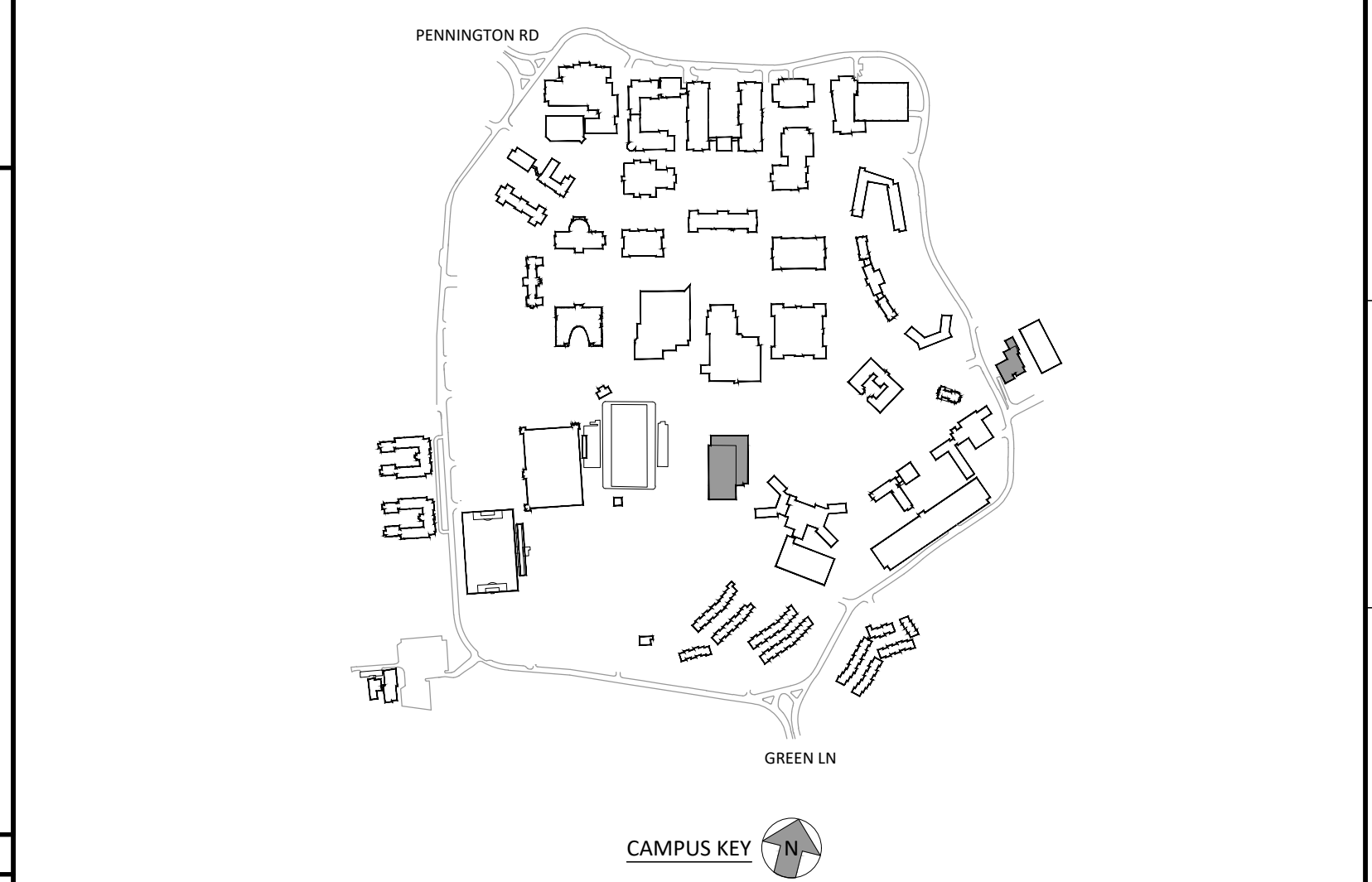
PHOTO B - BASEMENT CEILING
Route Fiber Pathway Above Existing Basement Drop Ceiling



RECREATION CENTER - FIBER LAYOUT
Scale: 1/8"=1'-0"
Drawing: TC027
Detail: 02

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down	ⓐ	Photo Identification Tag
	IT Rack		Connect To Existing
			MDF / POE



title	INTERIOR FIBER ROUTING POWERHOUSE & RECREATION CENTER FIRE ALARM			dwg. no.	TC027
scale	AS SHOWN	drawn by	AM	checked by	SG
				date	09/17/2021

dlb associates
CONSULTING ENGINEERS, P.C.
265 Industrial Way West, Eatontown, N.J. 07724
Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
project
TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
2000 PENNINGTON ROAD, EWING NJ, 08618
TCNJ Project #: IK124 TCNJ Project Manager: Mumtaz Makhdomi

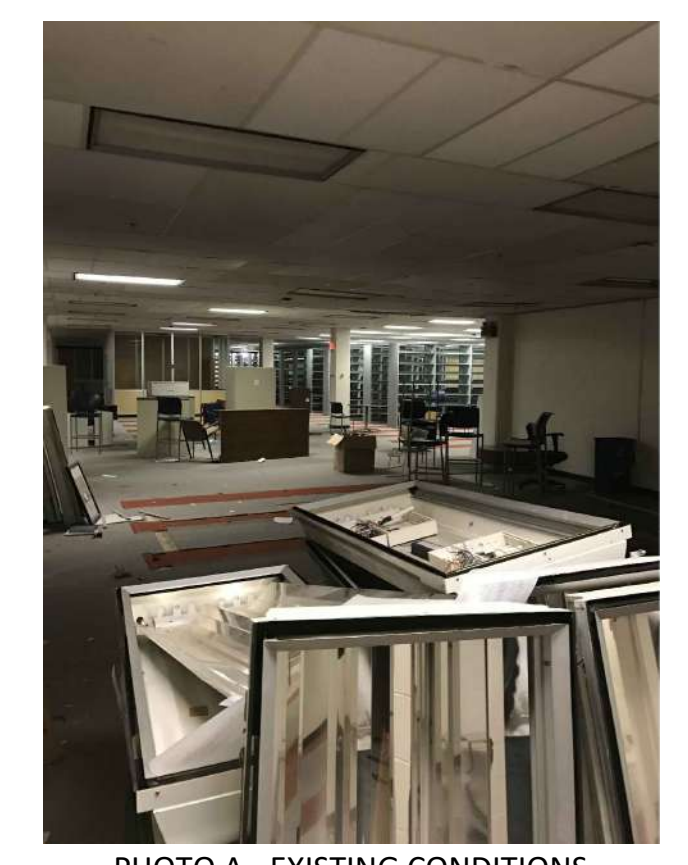
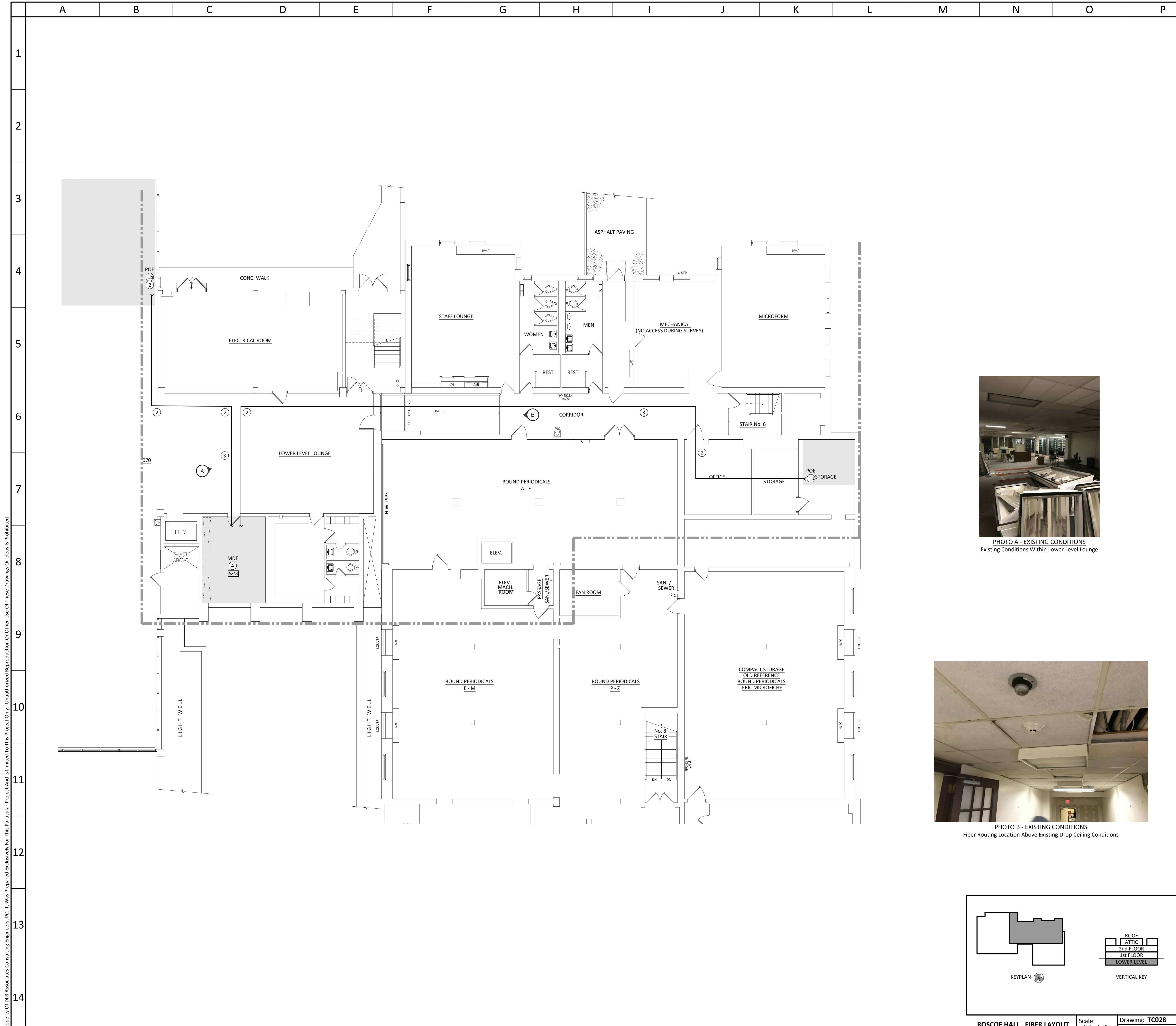
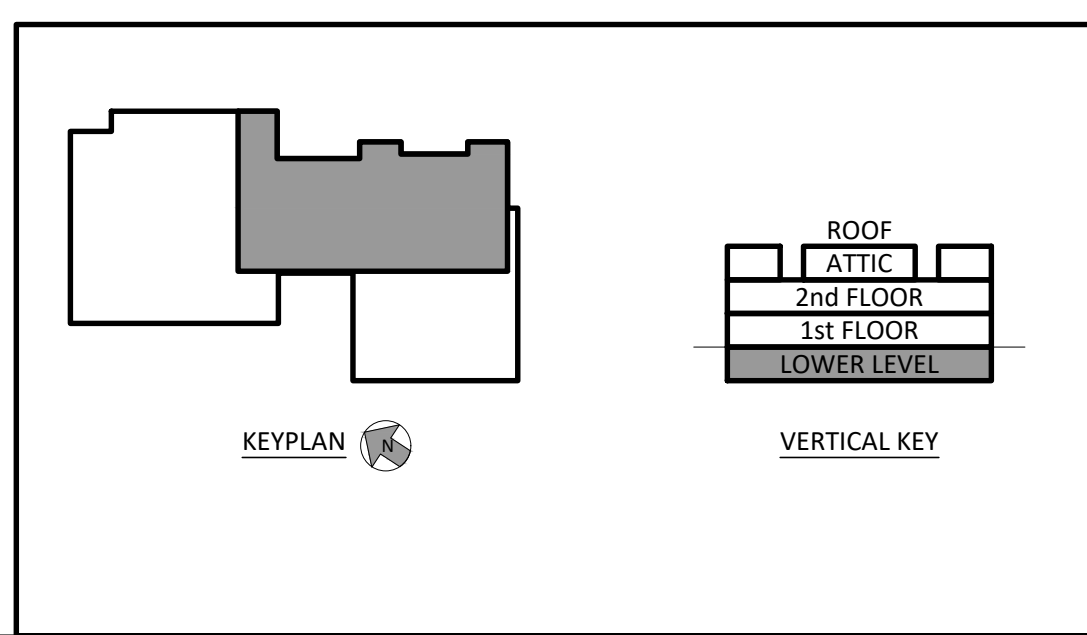


PHOTO A - EXISTING CONDITIONS
Existing Conditions Within Lower Level Lounge



PHOTO B - EXISTING CONDITIONS
Fiber Routing Location Above Existing Drop Ceiling Conditions



KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

- Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
- Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
- Existing Spare Fiber Capacity Available At MDF. Coordinate With TCNJ IT Department For Specific Termination Points.
- Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
- Route Fiber Pathway Above Drop Ceiling Where Possible.
- Provide Two Post Rack. Terminate Fiber Within New Cable Connector Housing Within New Rack. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.

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PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



ROScoe HALL - FIBER LAYOUT Scale: 1/8"=1'-0" Drawing: TC028 Detail: 01

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

Anthony Laskosky
 Questions For DLB Call:
 DLB Project ID: 47211
 Phone: 829-7351

dlb associates
 CONSULTING ENGINEERS, P.C.
 265 Industrial Way West, Eatontown, N.J. 07724

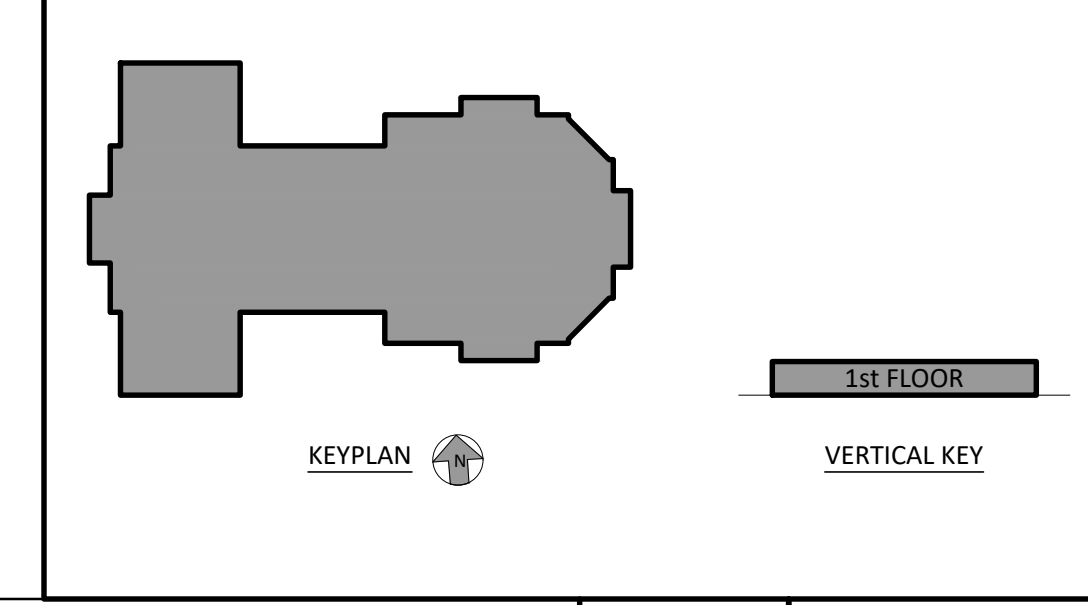
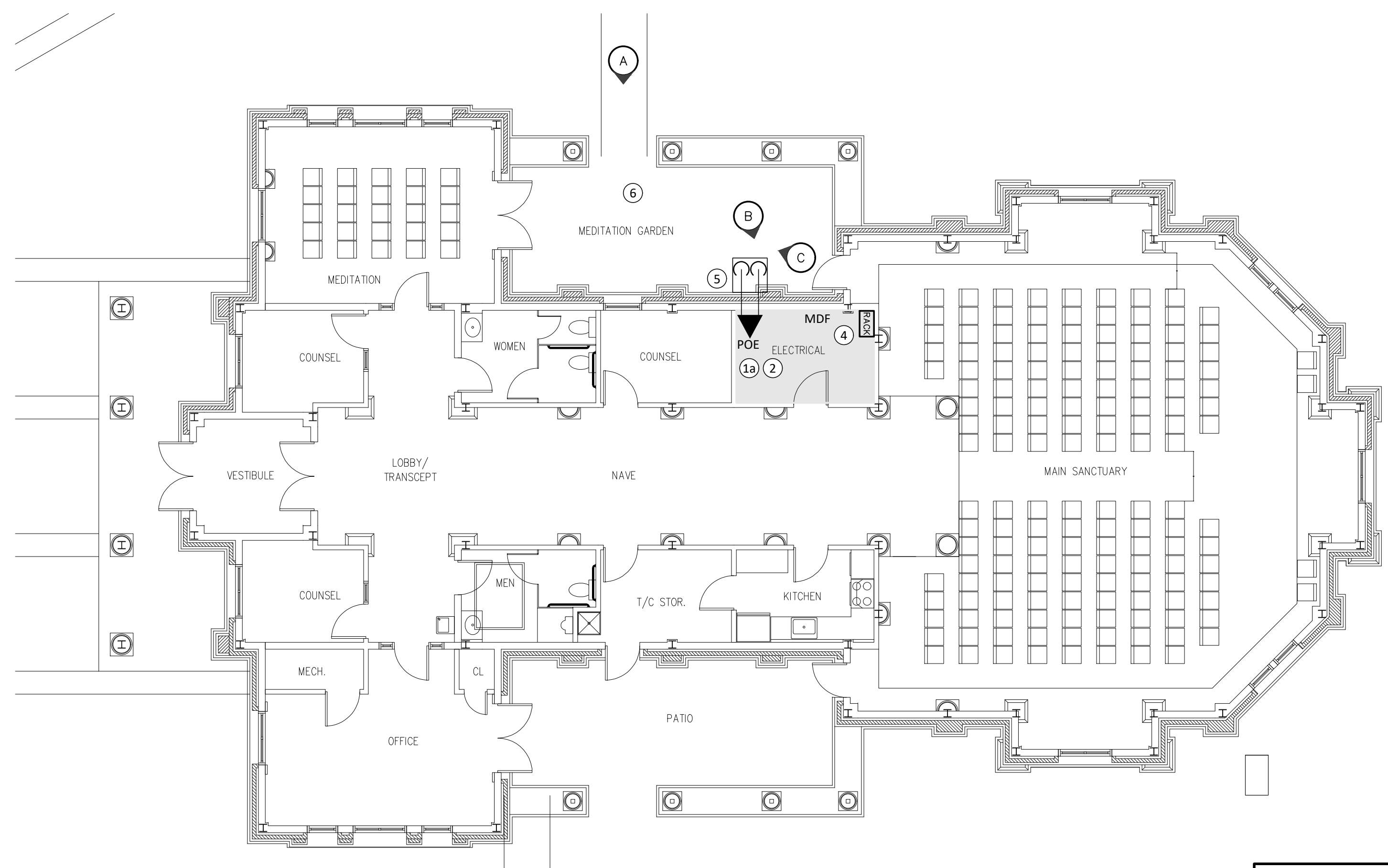
TCNJ THE COLLEGE OF NEW JERSEY
 Project # : IX124
 Project Manager : Mumtaz Makhdomi

project
 TCNJ - FIBER INFRASTRUCTURE UPGRADES
 (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD,
 EWING NJ, 08618

scale AS SHOWN	drawn by AM	checked by SG	date 09/17/2021	title INTERIOR FIBER ROUTING ROSCOE HALL FIRE ALARM	dwg. no. TC028
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30x42



SPIRITUAL CENTER - FIBER LAYOUT
 Scale: 1/8"=1'-0"
 Drawing: TC029
 Detail: 01



PHOTO A - SIDEWALK AND HARDSCAPE
 Install New Manhole And Exterior Fiber Pathway At Side Of Building. Existing Sidewalk And Stamped Concrete Patio To Be Replaced.



PHOTO B - BUILDING EXTERIOR
 Route Fiber Pathway Up Along Exterior Facade To Enter Bundling In In The Mechanical Room. Coordinate Specific Routing With TCNJ Before Installation.

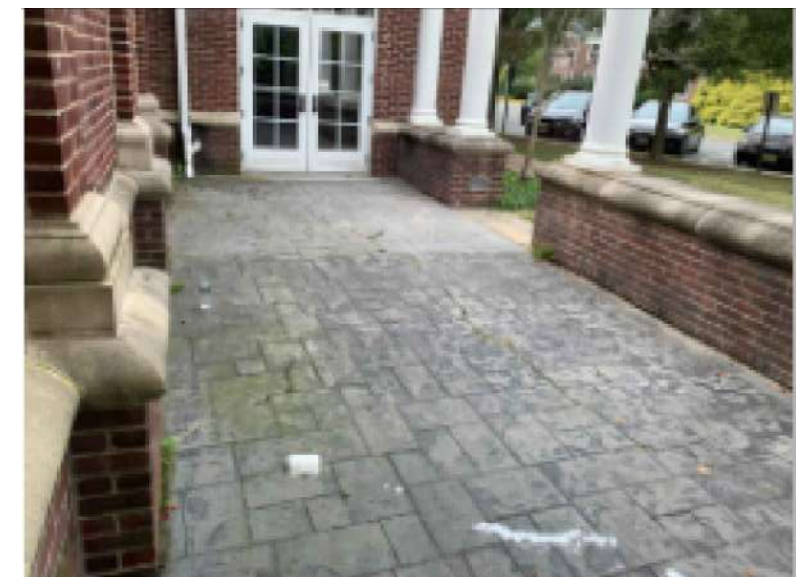


PHOTO C - PATIO AREA
 Install New Exterior Fiber Pathway Below Existing Stamped Concrete Patio. Existing Sidewalk And Entire Stamped Concrete Patio To Be Replaced To Match Existing.

KEY NOTES (SYMBOLS ①, ②, ETC.)

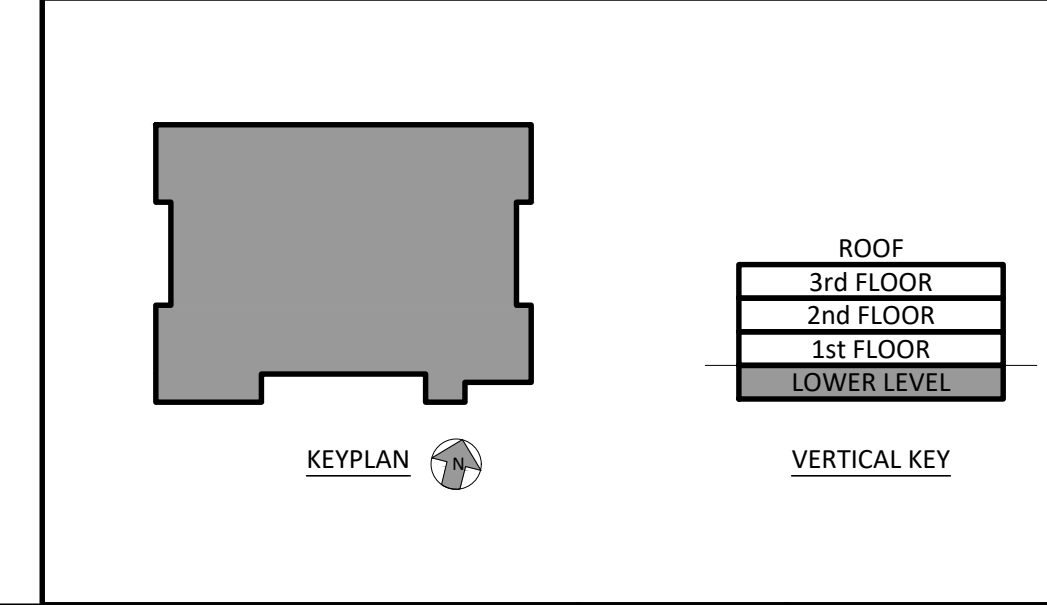
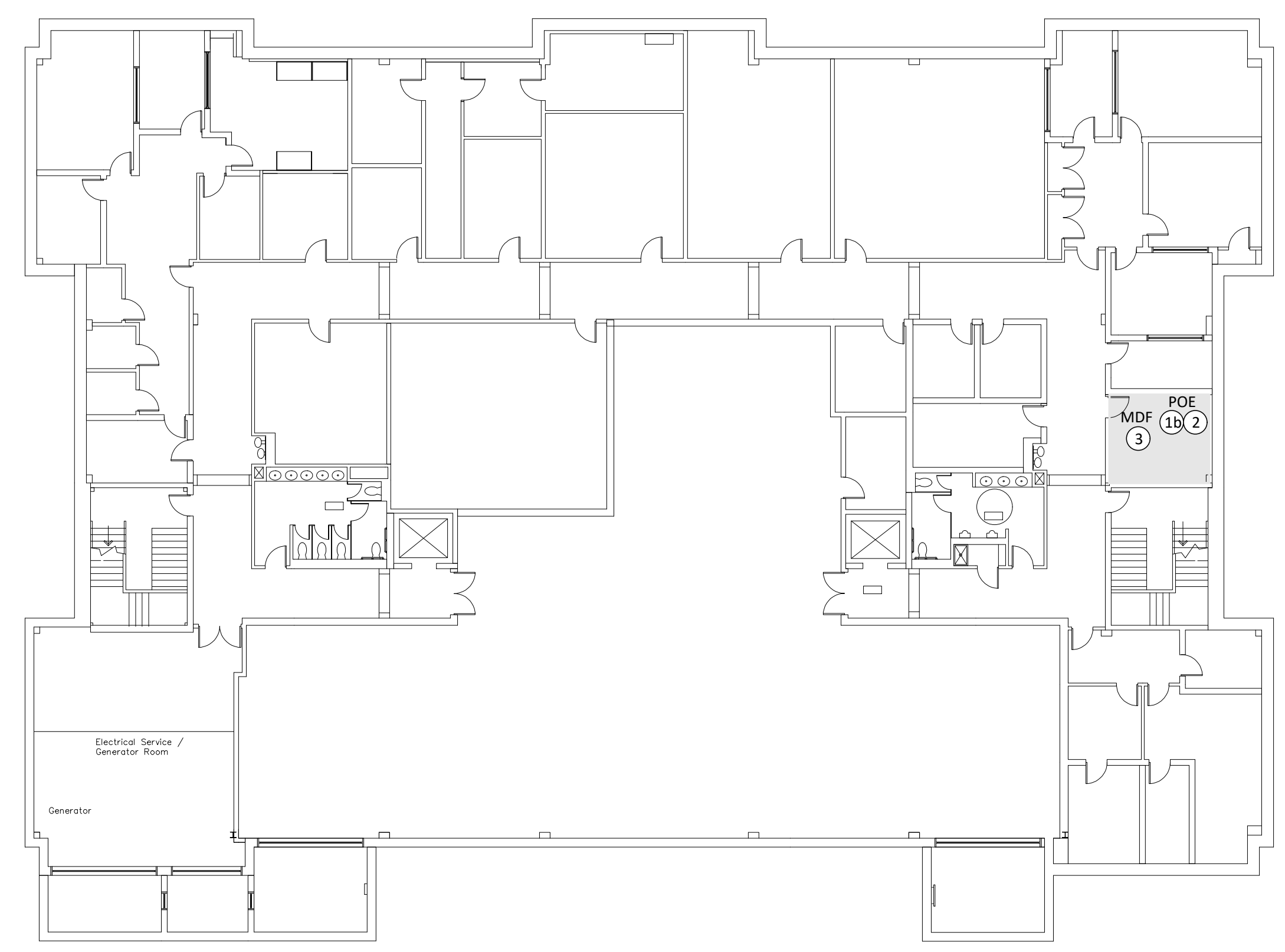
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 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 - 1c. Not Used.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Provide 12" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 5. Route Exterior Fiber From Underground Conduit Up The Side Of The Building To Enclosed Weatherproof 24"W x 30"H x 18"D Pullbox. Route From The Pullbox Up The Exterior Of The Building And Into The Interior Space In The Mechanical Room.
 6. Contractor To Remove And Replace Existing Hardscape To Provide Access For New Conduit. This Shall Include Entire Stamped Hardscape And Damaged Sidewalk Sections

GENERAL NOTES

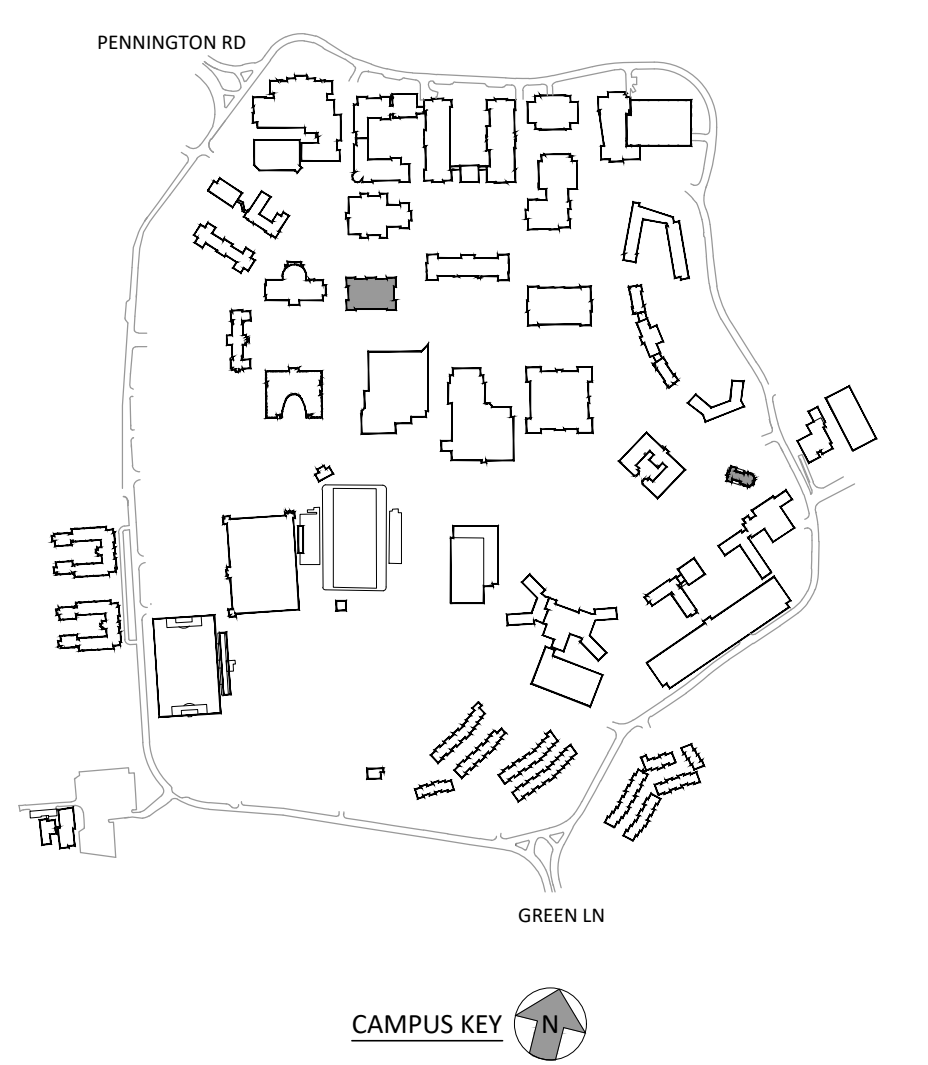
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PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect to Existing		
	MDF / POE		



SOCIAL SCIENCE - FIBER LAYOUT
 Scale: 1/16"=1'-0"
 Drawing: TC029
 Detail: 02



CAMPUS KEY

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ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

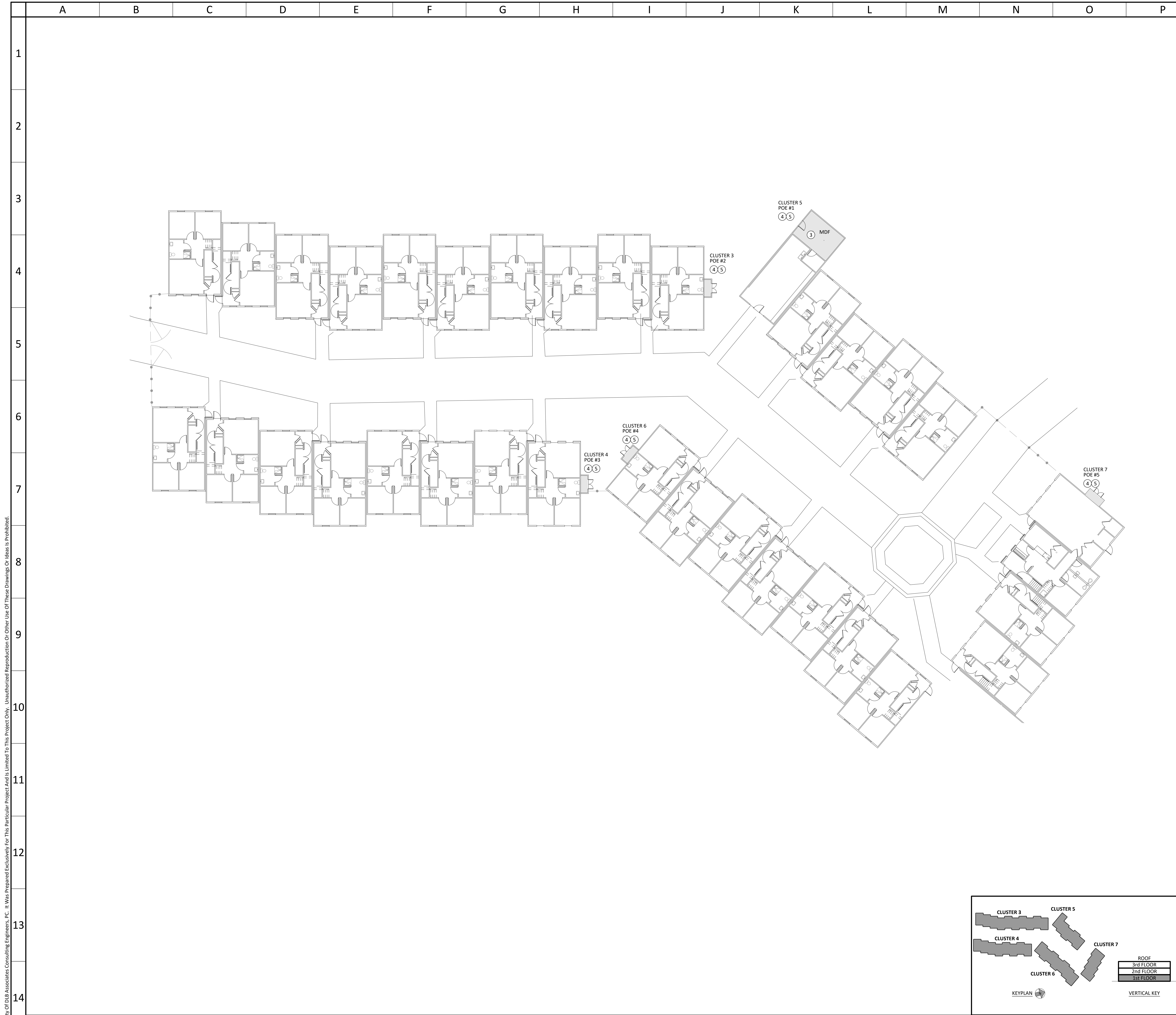
dlb associates
 CONSULTING ENGINEERS, P.C.
 265 Industrial Way West, Eatontown, N.J. 07724
 Questions For DLB Call: Anthony Laskosky
 DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
 TCNJ Project #: IX124
 TCNJ Project Manager: Mumtaz Makhdomi

project
 TCNJ - FIBER INFRASTRUCTURE UPGRADES
 (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD,
 EWING NJ, 08618

title
 INTERIOR FIBER ROUTING
 SPIRITUAL CENTER & SOCIAL SCIENCE
 FIRE ALARM
 scale AS SHOWN
 drawn by AM
 checked by SG
 date 09/17/2021

dwg. no.
TC029



KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

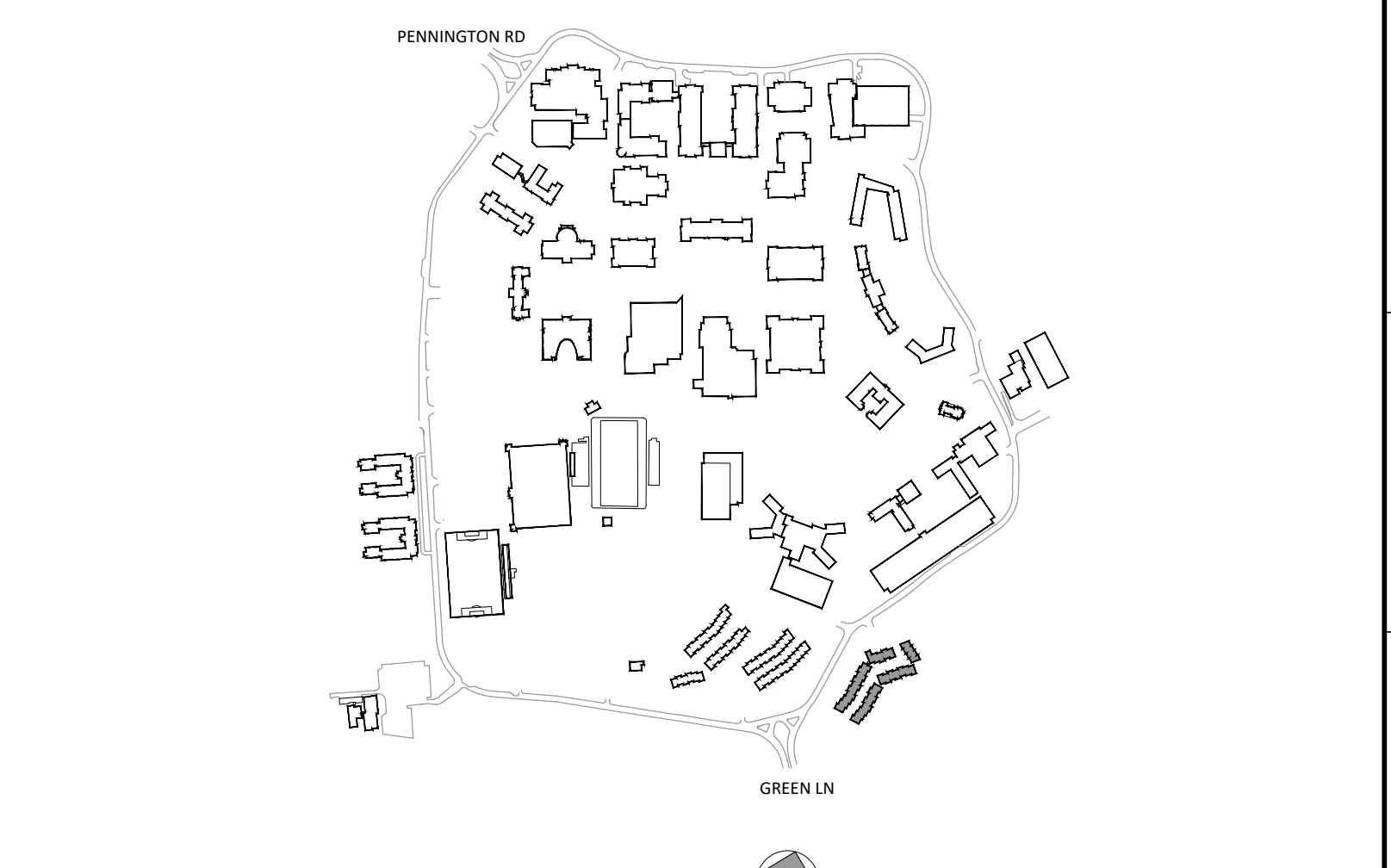
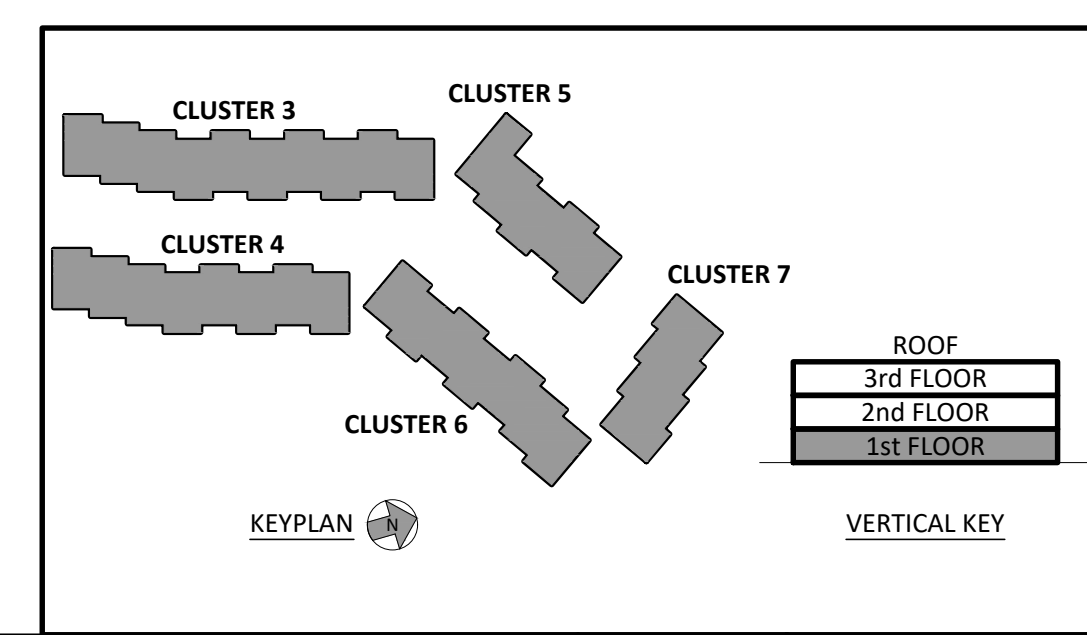
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
- 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ Department.
4. Coordinate With TCNJ IT Department For Cable Removal For This Complex. The Intent Is To Remove The Existing Fiber Cable From Cromwell To Each Townhouse Cluster And To Replace With A Higher Capacity Cable. Two (2) New 36 Fiber Cables Are To Enter The Complex Through The POE In Cluster 5 And Run Un-Spliced, One Cable Connecting Cluster 5 And Cluster 7 And The Other Cable Connecting Cluster 3, Cluster 4 And Cluster 6. Each Cable To Be Continuous To The Last POE In The Route With Mid-span Access At Each Cluster POE Along The Way.
5. Provide Fiber Mid-span Splice Access At Each Cluster With Sufficient Slack (minimum 30 feet) In Each Point Of Entry Room. Splice Shall Be 12 At Cluster 3, 4, 6 and 7 And 24 At Cluster 5 Where The Fire Alarm Control Panel Is Located. Fiber Counts That Do Not Terminate At The Access Location Shall Remain Contiguous; They Shall Not Be Broken And Re-Splice

GENERAL NOTES

1. The Associated Project Drawings Are Diagrammatic And Are Not Intended To Show The Location Of All Equipment And Devices; Coordinate All Details Of Work As Required To Achieve A Complete Functional Installation (In Conjunction With The Project Specifications).
2. All Work Shall Be Done In Accordance With Industry Construction Codes, Standards, And Other Agencies Having Jurisdiction.
3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
4. All Work And Materials Shall Be New Unless Otherwise Noted.
5. Contractor Shall Be Responsible To Sleeve Wall And Floor Penetrations Prior To Running Cable And Conduit For All Cable Runs Noted In Plans.
6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
7. A Portion Of This Work Will Be Occurring In The Path Of An Emergency Egress Route. During All Phases Of This Project, A Protected Emergency Egress Route Must Be Maintained Through Each Affected Emergency Egress Route, Allowing Retreat From The Building. Approval From The Department Of Community Affairs Is Required To Close Or Re-direct An Egress Route.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



TOWN HOUSE EAST - FIBER LAYOUT Scale: 1/8"=1'-0" Drawing: TC030 Detail: 02

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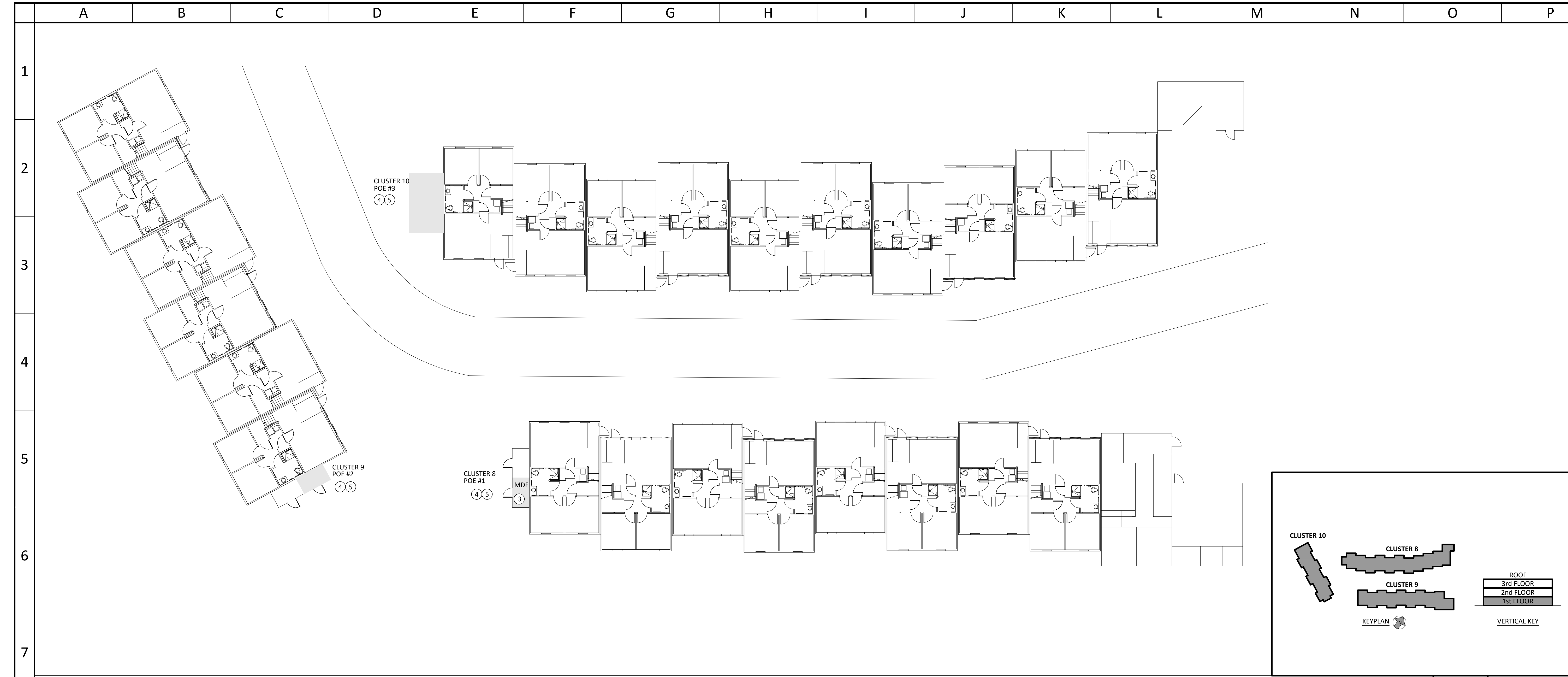
ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

Questions For DLB Call: Anthony Laskosky
DLB Project ID: 47211 Phone: 732-829-7351



project
TCNJ - FIBER INFRASTRUCTURE UPGRADES
(FIRE ALARM PROJECT)
2000 PENNINGTON ROAD,
EWING NJ, 08618

scale AS SHOWN	drawn by AM	checked by SG	date 09/17/2021
title INTERIOR FIBER ROUTING TOWN HOUSE EAST FIRE ALARM			dwg. no. TC030



KEY NOTES (SYMBOLS ①, ②, ETC.)

KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS

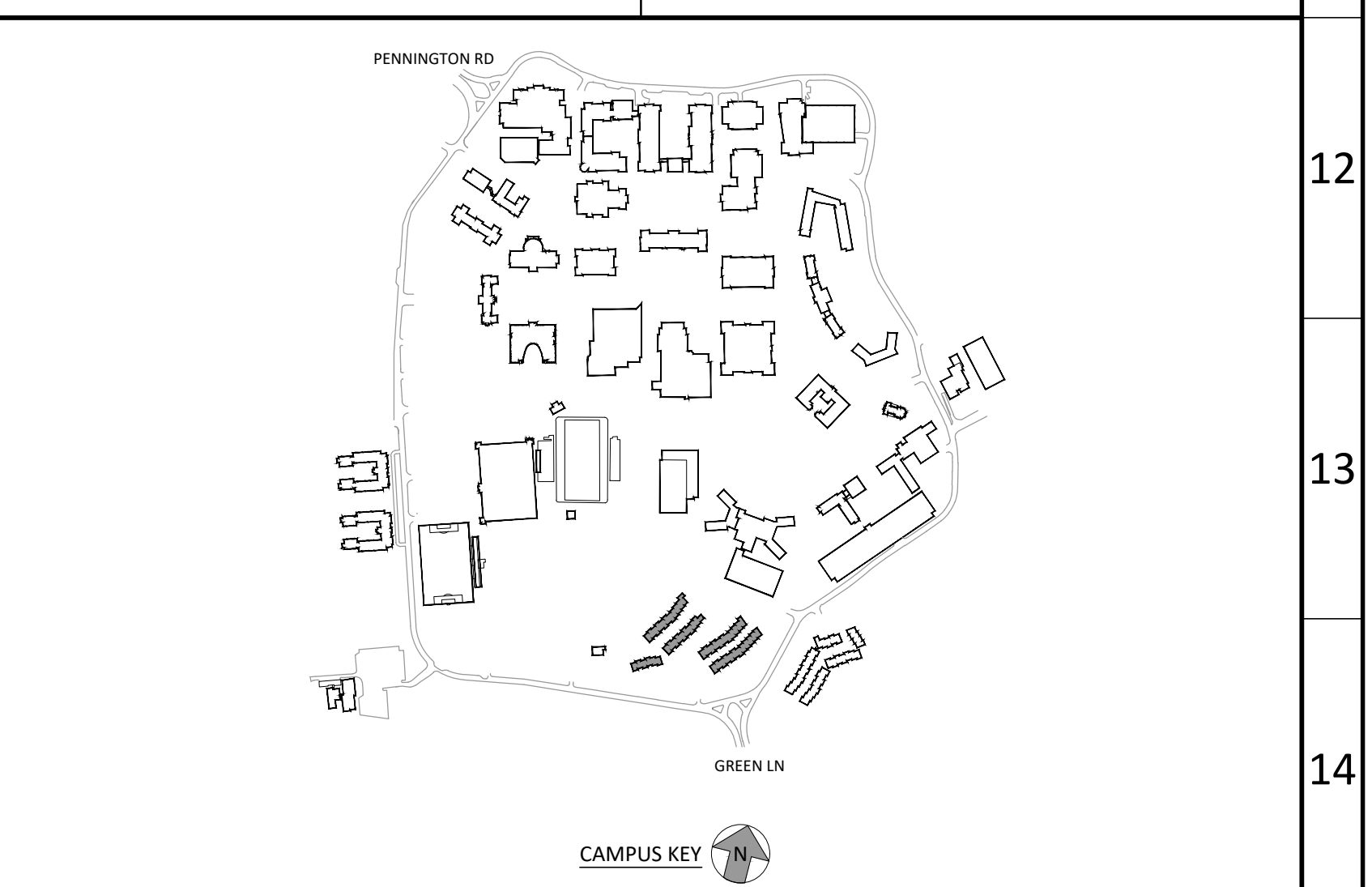
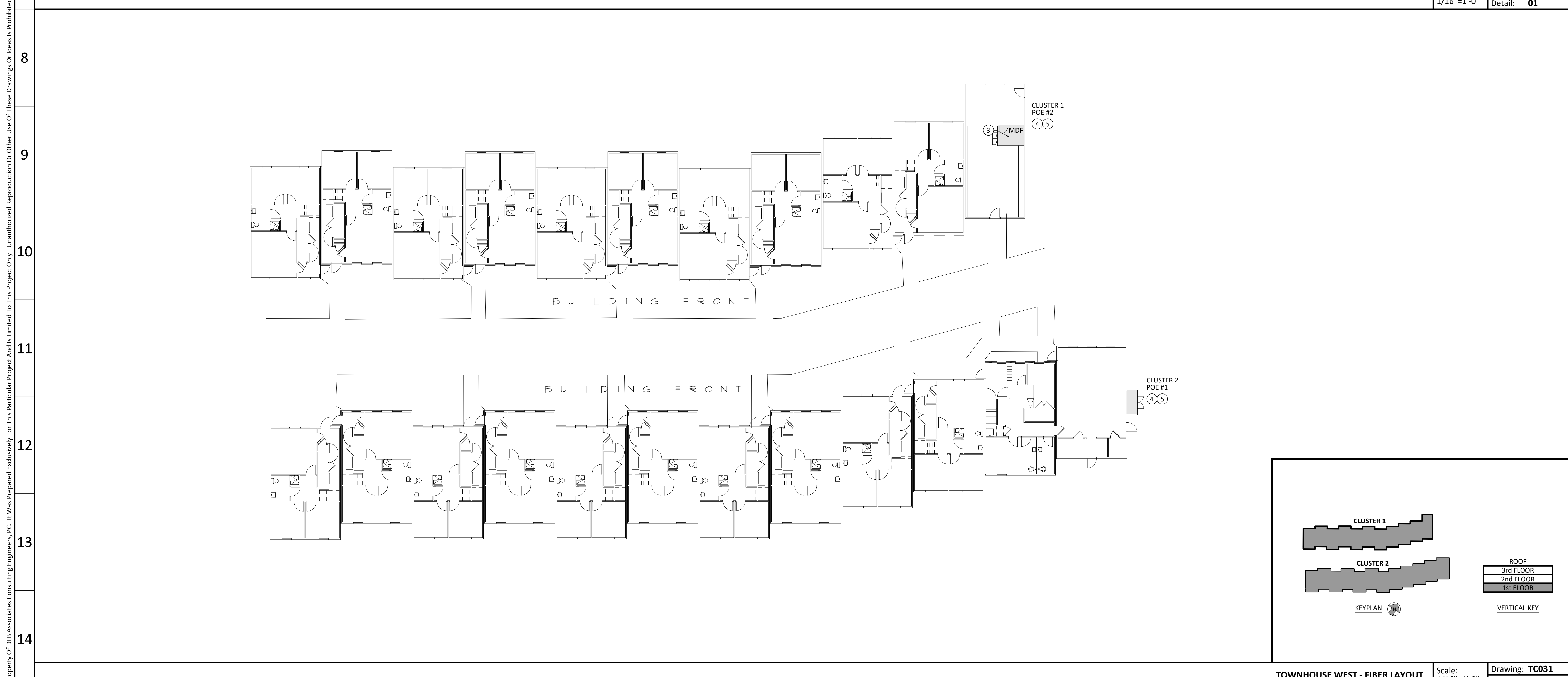
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
- 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
3. Terminate Fiber Within New Cabinet Connector Housing Located Within Main Distribution Frame Rack. Coordinate Labeling Termination With TCNJ IT Department
4. Coordinate With TCNJ IT Department For Cable Removal For This Complex. The Intent Is To Remove The Existing Fiber Cable From Cromwell To Each Townhouse Cluster And To Replace With A Higher Capacity Cable. Townhouse South And Townhouse West Shall Each Receive A New 48 Fiber Cable Entering Through The POE In Cluster 9 Or Cluster 2. Each Cable To Be Continuous To The Last POE In Each Cluster With Mid-span Access At Each POE Along The Way.
5. Provide Fiber Mid-span Splice Access At Each Cluster With Sufficient Slack (minimum 30 feet) In Each Point Of Entry Room. Splice Shall Be 12 Fibers At Cluster 2, 8 and 10 And 24 Fibers At Cluster 1 And Cluster 9. Fiber Counts That Do Not Terminate At The Access Location Shall Remain Contiguous; They Shall Not Be Broken And Re-Splice.

GENERAL NOTES

1. The Associated Project Drawings Are Diagrammatic And Are Not Intended To Show The Location Of All Equipment And Devices; Coordinate All Details Of Work As Required To Achieve A Complete Functional Installation (In Conjunction With The Project Specifications).
2. All Work Shall Be Done In Accordance With Industry Construction Codes, Standards, And Other Agencies Having Jurisdiction.
3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
4. All Work And Materials Shall Be New Unless Otherwise Noted.
5. Contractor Shall Be Responsible To Sleeve Wall And Floor Penetrations Prior To Running Cable And Conduit For All Cable Runs Noted In Plans.
6. Contractor To Firestop Wall And Floor Penetrations After Running Cables And Conduit.
7. A Portion Of This Work Will Be Occurring In The Path Of An Emergency Egress Route. During All Phases Of This Project, A Protected Emergency Egress Route Must Be Maintained Through Each Affected Emergency Egress Route, Allowing Retreat From The Building. Approval From The Department Of Community Affairs Is Required To Close Or Re-direct An Egress Route.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



30/42

ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

Questions For DLB Call:
 DLB Project ID: 47211

Anthony Laskosky
 Phone: 732-829-7351



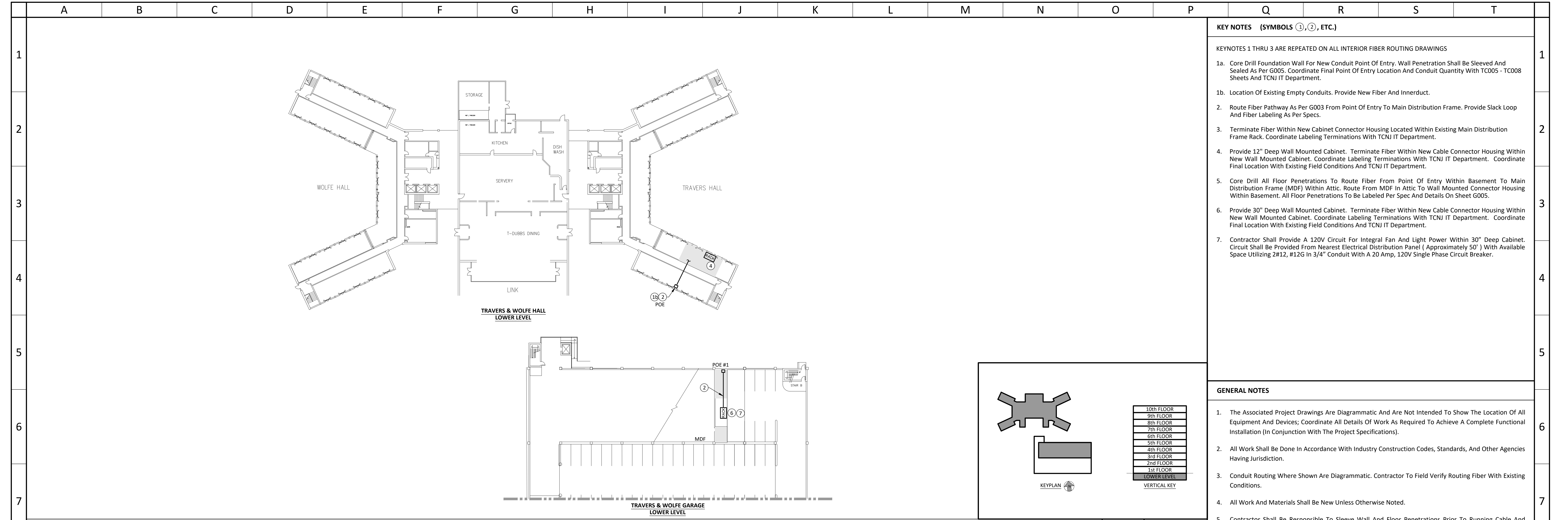
project
 TCNJ - FIBER INFRASTRUCTURE UPGRADES
 (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD,
 EWING NJ, 08618

title
 INTERIOR FIBER ROUTING
 TOWNHOUSE SOUTH & TOWNHOUSE WEST
 FIRE ALARM

scale AS SHOWN
 drawn by AM
 checked by SG
 date 09/17/2021

dwg. no.
TC031

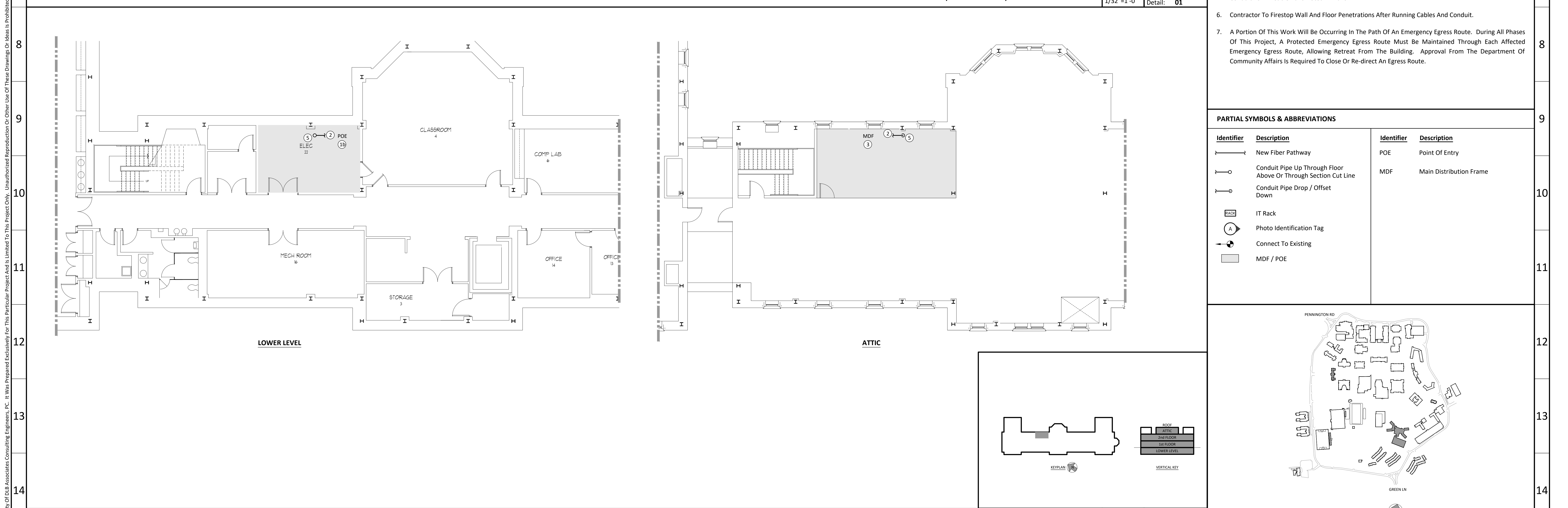
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TRAVERS/WOLFE HALLS & T/W GARAGE - FIBER LAYOUT
 Scale: 1/32"=1'-0"
 Drawing: TC032
 Detail: 01

- KEY NOTES (SYMBOLS ①, ②, ETC.)**
- KEYNOTES 1 THRU 3 ARE REPEATED ON ALL INTERIOR FIBER ROUTING DRAWINGS
- 1a. Core Drill Foundation Wall For New Conduit Point Of Entry. Wall Penetration Shall Be Sleeved And Sealed As Per G005. Coordinate Final Point Of Entry Location And Conduit Quantity With TC005 - TC008 Sheets And TCNJ IT Department.
 - 1b. Location Of Existing Empty Conduits. Provide New Fiber And Innerduct.
 2. Route Fiber Pathway As Per G003 From Point Of Entry To Main Distribution Frame. Provide Slack Loop And Fiber Labeling As Per Specs.
 3. Terminate Fiber Within New Cabinet Connector Housing Located Within Existing Main Distribution Frame Rack. Coordinate Labeling Terminations With TCNJ IT Department.
 4. Provide 12" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 5. Core Drill All Floor Penetrations To Route Fiber From Point Of Entry Within Basement To Main Distribution Frame (MDF) Within Attic. Route From MDF In Attic To Wall Mounted Connector Housing Within Basement. All Floor Penetrations To Be Labeled Per Spec And Details On Sheet G005.
 6. Provide 30" Deep Wall Mounted Cabinet. Terminate Fiber Within New Cable Connector Housing Within New Wall Mounted Cabinet. Coordinate Labeling Terminations With TCNJ IT Department. Coordinate Final Location With Existing Field Conditions And TCNJ IT Department.
 7. Contractor Shall Provide A 120V Circuit For Integral Fan And Light Power Within 30" Deep Cabinet. Circuit Shall Be Provided From Nearest Electrical Distribution Panel (Approximately 50') With Available Space Utilizing 2#12, #12G In 3/4" Conduit With A 20 Amp, 120V Single Phase Circuit Breaker.

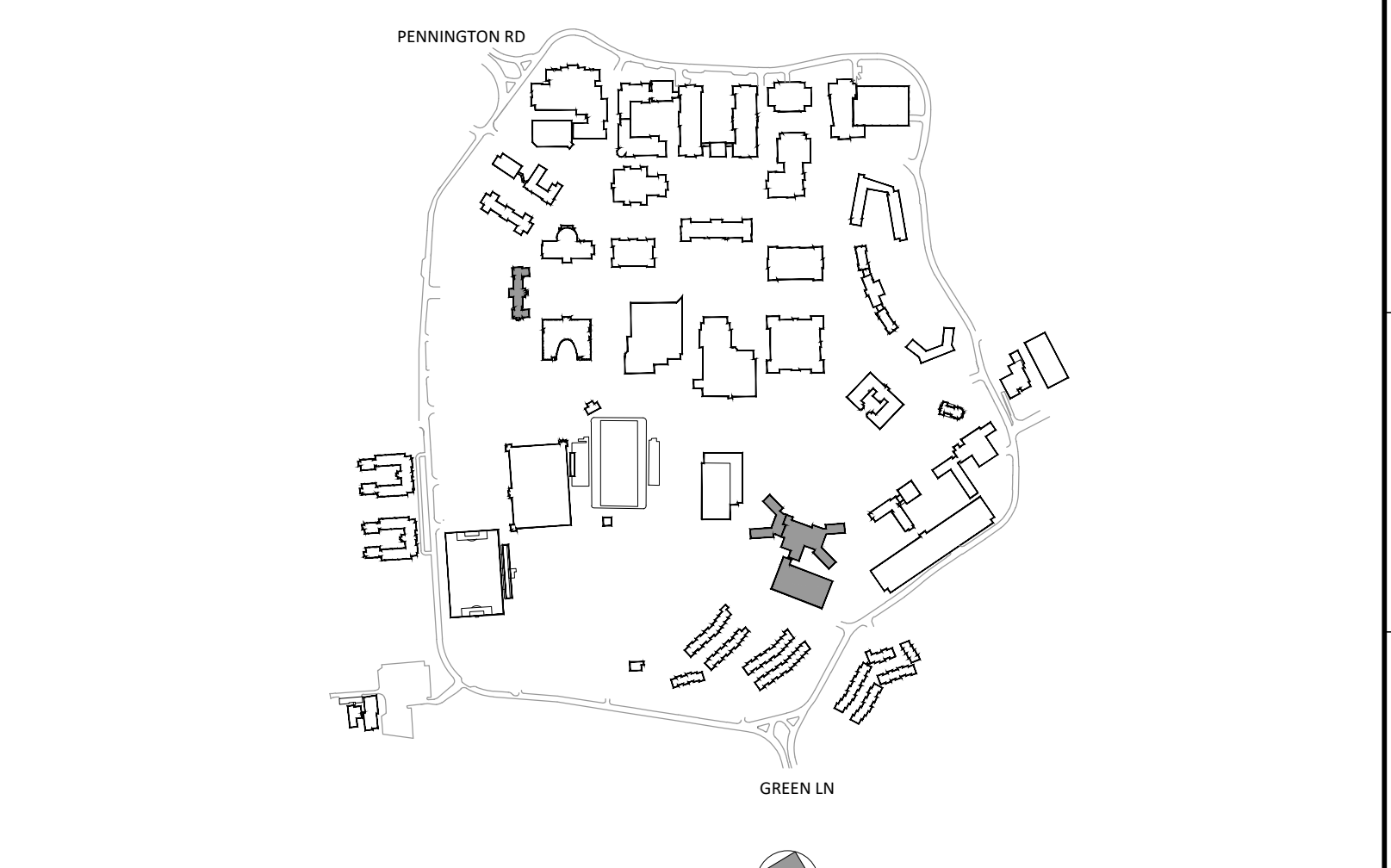
- GENERAL NOTES**
1. The Associated Project Drawings Are Diagrammatic And Are Not Intended To Show The Location Of All Equipment And Devices; Coordinate All Details Of Work As Required To Achieve A Complete Functional Installation (In Conjunction With The Project Specifications).
 2. All Work Shall Be Done In Accordance With Industry Construction Codes, Standards, And Other Agencies Having Jurisdiction.
 3. Conduit Routing Where Shown Are Diagrammatic. Contractor To Field Verify Routing Fiber With Existing Conditions.
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TRENTON HALL - FIBER LAYOUT
 Scale: 1/8"=1'-0"
 Drawing: TC032
 Detail: 02

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description	Identifier	Description
	New Fiber Pathway	POE	Point Of Entry
	Conduit Pipe Up Through Floor Above Or Through Section Cut Line	MDF	Main Distribution Frame
	Conduit Pipe Drop / Offset Down		
	IT Rack		
	Photo Identification Tag		
	Connect To Existing		
	MDF / POE		



ITEM	DATE	ISSUE DESCRIPTION	ITEM	DATE	ISSUE DESCRIPTION
1	10/01/2021	ISSUED FOR BID			

QUESTION	ANSWER

dlb associates
 CONSULTING ENGINEERS, P.C.
 265 Industrial Way West, Eatontown, N.J. 07724
 Questions For DLB Call: Anthony Laskosky
 DLB Project ID: 47211 Phone: 732-829-7351

TCNJ THE COLLEGE OF NEW JERSEY
 project TCNJ - FIBER INFRASTRUCTURE UPGRADES (FIRE ALARM PROJECT)
 2000 PENNINGTON ROAD, EWING NJ, 08618
 TCNJ Project #: IX124 TCNJ Project Manager: Mumtaz Makhdomi

scale	drawn by	checked by	date
AS SHOWN	AM	SG	09/17/2021

title INTERIOR FIBER ROUTING TRAVERS WOLFE, T/W GARAGE, & TRENTON HALL FIRE ALARM
 dwg. no. **TC032**

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30442

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A. 10:5-31 et seq. (P.L. 1975, C. 127)
N.J.A.C. 17:27

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, up-grading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Dept. of LWD, Construction EEO Monitoring Program may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Dept. of LWD, Construction EEO Monitoring Program is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Dept. of LWD, Construction EEO Monitoring Program, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(1) To notify the public agency compliance officer, the Dept. of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contractor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Dept. of LWD, Construction EEO Monitoring Program. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Dept. of LWD, Construction EEO Monitoring Program, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Dept. of LWD, Construction EEO Monitoring Program.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Dept. of LWD, Construction EEO Monitoring Program and submitted promptly to the Dept. of LWD, Construction EEO Monitoring Program upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Dept. of LWD, Construction EEO Monitoring Program an initial project workforce report (Form AA 201) electronically provided to the public agency by the Dept. of LWD, Construction EEO Monitoring Program, through its website, for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Division and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Dept. of LWD, Construction EEO Monitoring Program as may be requested by the Dept. of LWD, Construction EEO Monitoring Program from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Dept. of LWD, Construction EEO Monitoring Program for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code (NJAC 17:27-1.1 et seq).**

IF AWARDED A CONTRACT YOUR COMPANY/FIRM WILL BE REQUIRED TO COMPLY WITH THE AFFIRMATIVE ACTION REQUIREMENTS LISTED ABOVE.

Firm Name: _____

Signature: _____

Title: _____

Date: _____

Additional Mandatory Construction Contract Language For State Agencies, Independent Authorities, Colleges and Universities Only

The Executive Order No. 151 (Corzine, August 28, 2009) and P.L. 2009, Chapter 335 include a provision which require all state agencies, independent authorities and colleges and universities to include additional mandatory equal employment and affirmative action language in its construction contracts. It is important to note that this language is in addition to and does not replace the mandatory contract language and good faith efforts requirements for construction contracts required by N.J.A.C. 17:27-3.6, 3.7 and 3.8. The additional mandatory equal employment and affirmative action language is as follows:

It is the policy of the **[Reporting Agency]** that its contracts should create a workforce that reflects the diversity of the State of New Jersey. Therefore, contractors engaged by the **[Reporting Agency]** to perform under a construction contract shall put forth a good faith effort to engage in recruitment and employment practices that further the goal of fostering equal opportunities to minorities and women.

The contractor must demonstrate to the **[Reporting Agency]**'s satisfaction that a good faith effort was made to ensure that minorities and women have been afforded equal opportunity to gain employment under the **[Reporting Agency]**'s contract with the contractor. Payment may be withheld from a contractor's contract for failure to comply with these provisions.

Evidence of a "good faith effort" includes, but is not limited to:

1. The Contractor shall recruit prospective employees through the State Job bank website, managed by the Department of Labor and Workforce Development, available online at <http://NJ.gov/JobCentralNJ>;
2. The Contractor shall keep specific records of its efforts, including records of all individuals interviewed and hired, including the specific numbers of minorities and women;
3. The Contractor shall actively solicit and shall provide the **[Reporting Agency]** with proof of solicitations for employment, including but not limited to advertisements in general circulation media, professional service publications and electronic media; and
4. The Contractor shall provide evidence of efforts described at 2 above to the **[Reporting Agency]** no less frequently than once every 12 months.
5. The Contractor shall comply with the requirements set forth at N.J.A.C. 17:27-1.1 et seq.

To ensure successful implementation of the Executive Order and Law, state agencies, independent authorities and colleges and universities must forward an Initial Project Workforce Report (AA 201) for any projects funded with ARRA money to the Dept. of LWD, Construction EEO Monitoring Program immediately upon notification of award but prior to execution of the contract.



STATEMENT OF OWNERSHIP DISCLOSURE

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization: _____

Organization Address: _____

Part I Check the box that represents the type of business organization:

- Sole Proprietorship (skip Parts II and III, execute certification in Part IV)
- Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- For-Profit Corporation (any type) Limited Liability Company (LLC)
- Partnership Limited Partnership Limited Liability Partnership (LLP)
- Other (be specific): _____

Part II

The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. **(COMPLETE THE LIST BELOW IN THIS SECTION)**

OR

No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. **(SKIP TO PART IV)**

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Home Address (for Individuals) or Business Address

--	--

Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed.**

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above.** The disclosure shall be continued until names and addresses of every noncorporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Home Address (for Individuals) or Business Address

Part IV Certification

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the **The College of New Jersey** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with **The College of New Jersey** to notify the **The College of New Jersey** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the **The College of New Jersey** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	



NON-COLLUSION STATEMENT

Date: _____

The College of New Jersey
The Office of Budget and Finance, Department of Purchasing
Administrative Services Building, Room 201
P.O. Box 7718
Ewing, New Jersey 08628-0718

To Whom It May Concern:

This is to certify that the undersigned bidder _____ as not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the proposal submitted to The College of New Jersey on the _____ day of _____, 20_____.

Signature: _____

Corporate Seal:

Attest by: _____

Sworn to and subscribed before me this _____ day of _____, 20_____.

My commission Expires: _____

Notary Public

THIS STATEMENT MUST BE COMPLETED AND SIGNED

INFORMATION AND INSTRUCTIONS

For Completing the “Two-Year Vendor Certification and Disclosure of Political Contributions” Chapter 51 Form

Background Information

On September 22, 2004, then-Governor James E. McGreevey issued E.O. 134, the purpose of which was to insulate the negotiation and award of State contracts from political contributions that posed a risk of improper influence, purchase of access or the appearance thereof. To this end, E.O. 134 prohibited State departments, agencies and authorities from entering into contracts exceeding \$17,500 with individuals or entities that made certain political contributions. E.O. 134 was superseded by Public Law 2005, c. 51, signed into law on March 22, 2005 (“Chapter 51”).

On September 24, 2008, Governor Jon S. Corzine issued E.O. 117 which is designed to enhance New Jersey’s efforts to protect the integrity of procurement decisions and increase the public’s confidence in government. The Executive Order builds upon the provisions of Chapter 51.

Two-Year Certification Process

Upon approval by the State Chapter 51 Review Unit, the Certification and Disclosure of Political Contributions form is valid for a two (2) year period. Thus, if a vendor receives approval on January 1, 2014, the certification expiration date would be December 31, 2015. Any change in the vendor’s ownership status and/or political contributions during the two-year period will require the submission of new Chapter 51/Executive Order 117 forms to the State Review Unit. **Please note that it is the vendor’s responsibility to file new forms with the State should these changes occur.**

State Agency Instructions: Prior to the awarding of a contract, the State Agency should first use NJSTART (<https://www.njstart.gov/bsol/>) to check the status of a vendor’s Chapter 51 certification before contacting the Review Unit’s mailbox at CD134@treas.nj.gov. If the State Agency does not find any Chapter 51 Certification information in NJSTART and/or the vendor is not registered in NJSTART, then the State Agency should send an e-mail to CD134@treas.nj.gov to verify the certification status of the vendor. If the response is that the vendor is NOT within an approved two-year period, then forms must be obtained from the vendor and forwarded for review. If the response is that the vendor is within an approved two-year period, then the response so stating should be placed with the bid/contract documentation for the subject project.

Instructions for Completing the Form

Part 1: BUSINESS ENTITY INFORMATION

Business Name – Enter the full legal name of the vendor, including trade name if applicable.

Address, City, State, Zip and Phone Number -- Enter the vendor's street address, city, state, zip code and telephone number.

Vendor Email – Enter the vendor’s primary email address.

Vendor FEIN – Please enter the vendor’s Federal Employment Identification Number.

Business Type - Check the appropriate box that represents the vendor's type of business formation.

Listing of officers, shareholders, partners or members - Based on the box checked for the business type, provide the corresponding information. (A complete list must be provided.)

Part 2: DISCLOSURE OF CONTRIBUTIONS

Read the three types of political contributions that require disclosure and, if applicable, provide the recipient's information. The definition of "Business Entity/Vendor" and "Contribution" can be found on pages 3 and 4 of this form.

Name of Recipient - Enter the full legal name of the recipient.

Address of Recipient - Enter the recipient's street address.

Date of Contribution - Indicate the date the contribution was given.

Amount of Contribution - Enter the dollar amount of the contribution.

Type of Contribution - Select the type of contribution from the examples given.

Contributor's Name - Enter the full name of the contributor.

Relationship of the Contributor to the Vendor - Indicate the relationship of the contributor to the vendor. (e.g. officer or shareholder of the company, partner, member, parent company of the vendor, subsidiary of the vendor, etc.)

NOTE: If form is being completed electronically, click "Add a Contribution" to enter additional contributions. Otherwise, please attach additional pages as necessary.

Check the box under the recipient information if no reportable contributions have been solicited or made by the business entity. **This box must be checked if there are no contributions to report.**

Part 3: CERTIFICATION

Check Box A if the representative completing the Certification and Disclosure form is doing so on behalf of the business entity and all individuals and/or entities whose contributions are attributable to the business entity.

(No additional Certification and Disclosure forms are required if BOX A is checked.)

Check Box B if the representative completing the Certification and Disclosure form is doing so on behalf of the business entity and all individuals and/or entities whose contributions are attributable to the business entity with the exception of those individuals and/or entities that submit their own separate form. For example, the representative is not signing on behalf of the vice president of a corporation, but all others. The vice president completes a separate Certification and Disclosure form. **(Additional Certification and Disclosure forms are required from those individuals and/or entities that the representative is not signing on behalf of and are included with the business entity's submittal.)**

Check Box C if the representative completing the Certification and Disclosure form is doing so on behalf of the business entity only. **(Additional Certification and Disclosure forms are required from all individuals and/or entities whose contributions are attributable to the business entity and must be included with the business entity submittal.)**

Check Box D when a sole proprietor is completing the Certification and Disclosure form or when an individual or entity whose contributions are attributable to the business entity is completing a separate Certification and Disclosure form.

Read the five statements of certification prior to signing.

The representative authorized to complete the Certification and Disclosure form must sign and print her/his name, title or position and enter the date.

State Agency Procedure for Submitting Form(s)

The State Agency should submit the completed and signed Two-Year Vendor Certification and Disclosure forms either electronically to: cd134@treas.nj.gov or regular mail at: Chapter 51 Review Unit, P.O. Box 230, 33 West State Street, Trenton, NJ 08625-0230. Original forms should remain with the State Agency and copies should be sent to the Chapter 51 Review Unit.

Business Entity Procedure for Submitting Form(s)

The business entity should return this form to the contracting State Agency.

The business entity can submit the Certification and Disclosure form directly to the Chapter 51 Review Unit only when:

- The business entity is approaching its two-year certification expiration date and is seeking certification renewal;
- The business entity had a change in its ownership structure; OR
- The business entity made any contributions during the period in which its last two-year certification was in effect, or during the term of a contract with a State Agency.

Questions & Information

Questions regarding Public Law 2005, Chapter 51 (N.J.S.A. 19:44A-20.13) or E.O. 117 (2008) may be submitted electronically through the Division of Purchase and Property website at: <https://www.state.nj.us/treas/purchase/eo134questions.shtml>.

Reference materials and forms are posted on the Political Contributions Compliance website at: <http://www.state.nj.us/treasury/purchase/execorder134.shtml>.



Division of Purchase and Property

Two-Year Chapter 51/Executive Order 117 Vendor Certification and
Disclosure of Political Contributions

FOR STATE USE ONLY

Solicitation, RFP, or Contract No. _____ Award Amount _____

Description of Services _____

State Agency Name _____ Contact Person _____

Phone Number _____ Contact Email _____

Check if the Contract / Agreement is Being Funded Using FHWA Funds

**Please check if requesting
recertification**

Part 1: Business Entity Information

Full Legal Business Name _____
(Including trade name if applicable)

Address _____

City _____ State _____ Zip _____ Phone _____

Vendor Email _____ Vendor FEIN (SS# if sole proprietor/natural person) _____

**Check off the business type and list below the required information for the type of business selected.
MUST BE COMPLETED IN FULL**

- Corporation: LIST ALL OFFICERS and any 10% and greater shareholder (If the corporation only has one officer, please write "sole officer" after the officer's name.)
- Professional Corporation: LIST ALL OFFICERS and ALL SHAREHOLDERS
- Partnership: LIST ALL PARTNERS with any equity interest
- Limited Liability Company: LIST ALL MEMBERS with any equity interest
- Sole Proprietor

Note: "Officers" means President, Vice President with senior management responsibility, Secretary, Treasurer, Chief Executive Officer or Chief Financial Officer of a corporation, or any person routinely performing such functions for a corporation.

Also Note: "N/A will not be accepted as a valid response. Where applicable, indicate "None."

All Officers of a Corporation or PC

**10% and greater shareholders of a corporation
or all shareholders of a PC**

All Equity partners of a Partnership

All Equity members of a LLC

If you need additional space for listing of Officers, Shareholders, Partners or Members, please attach separate page.

Part 2: Disclosure of Contributions by the business entity or any person or entity whose contributions are attributable to the business entity.

1. Report below all contributions solicited or made during the 4 years immediately preceding the commencement of negotiations or submission of a proposal to any:

Political organization organized under Section 527 of the Internal Revenue Code and which also meets the definition of a continuing political committee as defined in N.J.S.A. 19:44A-3(n)

2. Report below all contributions solicited or made during the 5 ½ years immediately preceding the commencement of negotiations or submission of a proposal to any:

Candidate Committee for or Election Fund of any Gubernatorial or Lieutenant Gubernatorial candidate
State Political Party Committee
County Political Party Committee

3. Report below all contributions solicited or made during the 18 months immediately preceding the commencement of negotiations or submission of a proposal to any:

Municipal Political Party Committee
Legislative Leadership Committee

Full Legal Name of Recipient _____
Address of Recipient _____
Date of Contribution _____ Amount of Contribution _____
Type of Contribution (i.e. currency, check, loan, in-kind) _____
Contributor Name _____
Relationship of Contributor to the Vendor _____
If this form is not being completed electronically, please attach additional contributions on separate page. Click the "Add a Contribution" tab to enter additional contributions.

Remove Contribution

Add a Contribution

Check this box only if no political contributions have been solicited or made by the business entity or any person or entity whose contributions are attributable to the business entity.

Part 3: Certification (Check one box only)

- (A) I am certifying on behalf of the business entity and all individuals and/or entities whose contributions are attributable to the business entity as listed on Page 1 under **Part 1: Vendor Information**.
- (B) I am certifying on behalf of the business entity and all individuals and/or entities whose contributions are attributable to the business entity as listed on Page 1 under **Part 1: Vendor Information**, except for the individuals and/or entities who are submitting separate Certification and Disclosure forms which are included with this submittal.
- (C) I am certifying on behalf of the business entity only; any remaining persons or entities whose contributions are attributable to the business entity (as listed on Page 1) have completed separate Certification and Disclosure forms which are included with this submittal.
- (D) I am certifying as an individual or entity whose contributions are attributable to the business entity.

I hereby certify as follows:

1. I have read the Information and Instructions accompanying this form prior to completing the certification on behalf of the business entity.
2. All reportable contributions made by or attributable to the business entity have been listed above.

3. The business entity has not knowingly solicited or made any contribution of money, pledge of contribution, including in-kind contributions, that would bar the award of a contract to the business entity unless otherwise disclosed above:

- a) Within the 18 months immediately preceding the commencement of negotiations or submission of a proposal for the contract or agreement to:
 - (i) A candidate committee or election fund of any candidate for the public office of Governor or Lieutenant Governor or to a campaign committee or election fund of holder of public office of Governor or Lieutenant Governor; OR
 - (ii) Any State, County or Municipal political party committee; OR
 - (iii) Any Legislative Leadership committee.
- b) During the term of office of the current Governor or Lieutenant Governor to:
 - (i) A candidate committee or election fund of a holder of the public office of Governor or Lieutenant Governor; OR
 - (ii) Any State or County political party committee of the political party that nominated the sitting Governor or Lieutenant Governor in the last gubernatorial election.
- c) Within the 18 months immediately preceding the last day of the sitting Governor or Lieutenant Governor's first term of office to:
 - (i) A candidate committee or election fund of the incumbent Governor or Lieutenant Governor; OR
 - (ii) Any State or County political party committee of the political party that nominated the sitting Governor or Lieutenant Governor in the last gubernatorial election.

4. During the term of the contract/agreement the business entity has a continuing responsibility to report, by submitting a new Certification and Disclosure form, any contribution it solicits or makes to:

- (a) Any candidate committee or election fund of any candidate or holder of the public office of Governor or Lieutenant Governor; OR
- (b) Any State, County or Municipal political party committee; OR
- (c) Any Legislative Leadership committee.

The business entity further acknowledges that contributions solicited or made during the term of the contract/agreement may be determined to be a material breach of the contract/agreement.

5. During the two-year certification period the business entity will report any changes in its ownership structure (including the appointment of an officer within a corporation) by submitting a new Certification and Disclosure form indicating the new owner(s) and reporting said owner(s) contributions.

I certify that the foregoing statements in Parts 1, 2 and 3 are true. I am aware that if any of the statements are willfully false, I may be subject to punishment.

Signed Name _____ Print Name _____

Title/Position _____ Date _____

Procedure for Submitting Form(s)

The contracting State Agency should submit this form to the Chapter 51 Review Unit when it has been required as part of a contracting process. The contracting State Agency should submit a copy of the completed and signed form(s), to the Chapter 51 Unit and retain the original for their records.

The business entity should return this form to the contracting State Agency. The business entity can submit this form directly to the Chapter 51 Review Unit only when it -

- Is approaching its two-year certification expiration date and wishes to renew certification;
- Had a change in its ownership structure; OR
- Made any contributions during the period in which its last two-year certification was in effect, or during the term of a contract with a State Agency.

Forms should be submitted either electronically to: cd134@treas.nj.gov , or regular mail at: Chapter 51 Review Unit, P.O. Box 230, 33 West State Street, Trenton, NJ 08625.

State of New Jersey

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

Solicitation Number: Bidder/Offeror:

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that the person or entity, or one of the person or entity's parents, subsidiaries, or affiliates, is not identified on a list created and maintained by the Department of the Treasury as a person or entity engaging in investment activities in Iran.

I certify, pursuant to Public Law 2012, c. 25, that the person or entity listed above for which I am authorized to bid/renew:

- is not providing goods or services of \$20,000,000 or more in the energy sector of Iran, including a person or entity that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipelines used to transport oil or liquefied natural gas, for the energy sector of Iran, AND
is not a financial institution that extends \$20,000,000 or more in credit to another person or entity, for 45 days or more, if that person or entity will use the credit to provide goods or services in the energy sector in Iran.

In the event that a person or entity is unable to make the above certification because it or one of its parents, subsidiaries, or affiliates has engaged in the above-referenced activities, a detailed, accurate and precise description of the activities must be provided in part 2 below to the Division of Purchase and Property under penalty of perjury. Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the boxes below.

EACH BOX WILL PROMPT YOU TO PROVIDE INFORMATION RELATIVE TO THE ABOVE QUESTIONS. PLEASE PROVIDE THOROUGH ANSWERS TO EACH QUESTION. IF YOU NEED TO MAKE ADDITIONAL ENTRIES, PLEASE ADD AN ADDITIONAL SHEET.

Name Relationship to Bidder/Offeror
Description of Activities
Duration of Engagement Anticipated Cessation Date
Bidder/Offeror Contact Name Contact Phone Number

Certification: I, being duly sworn upon my oath, hereby represent and state that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I attest that I am authorized to execute this certification on behalf of the above-referenced person or entity. I acknowledge that the State of New Jersey is relying on the information contained herein and thereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the State to notify the State in writing of any changes to the answers of information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreement(s) with the State of New Jersey and that the State at its option may declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print): Signature:

Title: Date:



VENDOR QUALIFICATION SHEET

Vendors are required to submit evidence of qualifications to meet all requirements as required by the Office of Finance & Business Services at The College of New Jersey by providing the information listed below.

If this information is being requested as part of an RFP or RFQ, vendors may be requested to furnish additional information for clarification purposes. This will in no way change the vendor's original proposal.

TO BE COMPLETED BY VENDOR

1. Please list the types of commodities that your company can provide.

A.

B.

C.

2. The number of years your firm has been providing these services. _____ Year(s)

3. Location of vendor's office that will be responsible for managing contract/service:

Name: _____

Telephone: _____ Fax: _____

Email Address: _____

Street Address: _____

City/State/Zip: _____

Federal Identification Number: _____

4. Address where all purchase orders and payment are to be mailed by users of any contract(s) resulting from this proposal (if different from above).

Purchase Orders:

Firm Name: _____

Street Address: _____

City/State/Zip: _____

Remittances:

Firm Name: _____

Street Address: _____

City/State/Zip: _____

VENDOR QUALIFICATIONS- continued

5. Name of insurance company:

Street Address: _____

City/State/Zip: _____

Types of Insurance: _____

6. Name of individual to contact for sales/services information:

Name: _____

Telephone: _____

Email Address: _____

Street Address: _____

City/State/Zip: _____

7. List the names and titles of personnel who will service this contract:

8. Is your firm registered with the Secretary of State of New Jersey? **Yes** ____ **No** ____

9. Is your firm incorporated? **Yes** ____ **No** ____

A) In What State? _____

10. Is your firm considered a small business in the State of New Jersey? **If yes, please attach a certificate or certification statement from the New Jersey Commerce and Economic Growth Commission.** If no and you would like to register, please contact the New Jersey Commerce and Economic Growth Commission at 609-777-0885.

Small Business: **Yes** ____ **No** ____

A) What category does your firm fall under?

Gross Revenues do not exceed \$500,000 _____

Gross Revenues do not exceed \$5 million _____

Gross Revenues do not exceed \$12 million _____

Under Executive Order 34, TCNJ is responsible for soliciting demographic information from its vendors. TCNJ is required to seek the following information from each firm under contract with us:

1. Is more than fifty percent (50%) of your company minority owned? (circle one) YES NO
(African-American, Hispanic, Asian, and/or Native American)

2. Is more than fifty percent (50%) of your company woman owned? (circle one) YES NO

3. What is the ethnicity of the owner of your company: (check applicable according to 51% ownership)
 - ... Asian American
 - ... Multiple Ethnicities
 - ... Non-Minority
 - ... Hispanic American
 - ... African American
 - ... Caucasian American Female
 - ... Native American
 - ... Unspecified

TCNJ is required to solicit the foregoing information. Your response, however, is **strictly voluntary**. Please be advised that any contracting decisions made by TCNJ will **not** be influenced in any way by your decision to provide the above information.

EXECUTIVE ORDER #34: MINORITY AND WOMEN BUSINESS ENTERPRISES

On September 15, 2006, Governor Corzine signed Executive Order 34 establishing a Division of Minority and Women Business Development. The Division is charged with administering and monitoring policies, practices, and programs to ensure that New Jersey owned minority and women business enterprises (MWBE) are afforded an equal opportunity to participate in New Jersey's purchasing and procurement processes.

State entities are required to report to the Division the ethnic and gender composition of the vendors with which we do business.

VENDOR QUALIFICATIONS-

11. Please provide a list of former or present clients. Also, indicate the name of a contact person and telephone number for reference purposes. **Any personnel from The College of New Jersey listed as a reference will not be considered a valid reference.**

A. Client Name:

Contact Name:

Telephone Number:

Fax Number:

Email Address:

B. Client Name:

Contact Name:

Telephone Number:

Fax Number:

Email Address:

C. Client Name:

Contact Name:

Telephone Number:

Fax Number:

Email Address:

D. Client Name:

Contact Name:

Telephone Number:

Fax Number:

Email Address:

VENDOR QUALIFICATIONS- continued

12. Please answer the following questions related to your prior experience:

- a. Has the bidder been found, through either court adjudication, arbitration, mediation, or other contractually stipulated alternate dispute resolution mechanism, to have: failed to provide or perform goods or services; or failed to complete the contract in a timely manner; or otherwise performed unsatisfactorily under a prior contract with the contracting unit? If yes, attach summary of details on a separate sheet.

Yes _____ No _____

- b. Has the bidder defaulted on a contract, thereby requiring the local unit to utilize the services of another contractor to provide the goods or perform the services or to correct or complete the contract? If yes, attach summary of details on a separate sheet.

Yes _____ No _____

- c. Has the bidder defaulted on a contract, thereby requiring the local unit to look to the bidder's surety for completion of the contract or tender of the costs of completion? If yes, attach summary of details on a separate sheet.

Yes _____ No _____

- d. Has the bidder been debarred or suspended from contracting with any of the agencies or departments of the executive branch of the State of New Jersey at the time of contract award, whether or not the action was based on experience with the contracting unit. If yes, attach summary of details on a separate sheet.

Yes _____ No _____

Firm Name: _____

Signature: _____

Title: _____

Date: _____



CONTRACT FOR CONSTRUCTION

This AGREEMENT is entered into as of the ____ day of _____, _____, between

The College: The College of New Jersey (“TCNJ” or the “College”)
PO Box 7718
2000 Pennington Road
Ewing, New Jersey 08628-0718

and

the Contractor: _____ (the “Contractor”)

in connection with

the Project: [_____] (the “Project”)

The Architect: _____

ARTICLE 1

EMPLOYMENT OF THE CONTRACTOR/THE PROJECT DESCRIPTION

1.1 The College employs the Contractor and the Contractor agrees to perform the construction for the Project identified above. The Project is described in more detail in the College’s Plans and Specifications prepared by the Architect.

ARTICLE 2

THE CONTRACT DOCUMENTS

2.1 The Contract Documents consist of this Contract for Construction and the Exhibits attached hereto (“Contract for Construction”), the General Conditions of the Contract for Construction (the “General Conditions”) (and any other General, Supplementary and other Conditions), the Plans and Specifications, and also the following documents:

- (a) The Contractor's Bid excluding limitations and qualifications unless such limitation or qualification is specifically accepted in writing by the College;
- (c) Addenda and Clarifications issued before the bid due date;
- (d) The Project Bidding Schedule; and
- (e) Modifications issued after execution of this Contract for Construction.

These documents all form the "Contract," and are as fully a part of this Contract as if attached hereto or repeated herein. This Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral.

ARTICLE 3 **SCOPE OF WORK**

3.1 The Contractor shall fully perform the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. The Contractor shall assume full responsibility for constructing and completing the Project and all the Work, including providing all labor, Subcontractors, materials, equipment, and services reasonably inferable from the Contract Documents and all applicable laws, codes and professional standards, and providing all supervision, management, and scheduling required in the General Conditions and as noted throughout the Contract Documents.

ARTICLE 4 **CONTRACT TIMES**

4.1 TIME OF THE ESSENCE. All dates and durations specified in this Contract, including the Construction Start Date(s), any Milestones Dates, any Substantial Completion Date(s) and any Final Completion Date(s) (collectively, "Contract Times") are agreed to be of the essence.

4.2 CONSTRUCTION START. The Work shall start no later than ten (10) calendar days after the College issues a Notice to Proceed to the Contractor ("Construction Start Date"). If the Work is to be performed in phases, the College may issue a separate Notice to Proceed with respect to each phase (e.g., Phase 1 Notice to Proceed, Phase 2 Notice to Proceed, etc.) thereby establishing different Construction Start Dates for each phase (e.g., Phase 1 Construction Start Date, Phase 2 Construction Start Date, etc.). The College may, in its sole discretion and at no cost to the College, choose to delay the issuance of a Notice to Proceed and the Construction Start Date for any phase until after the Contractor has achieved Substantial or Final Completion of any other phase.

4.3 MILESTONES. The construction tasks or activities shall be completed within the number of calendar days after the Construction Start Date as set forth in the Notice to Proceed ("Milestone Dates"). If the Work is to be performed in phases, each phase may have

separate Milestone Dates (e.g., Phase 1 Milestone Dates, Phase 2 Milestone Dates, etc.), which dates shall be set forth in the Notice to Proceed for that phase.

4.4 SUBSTANTIAL COMPLETION. The Contractor shall diligently prosecute the Work and shall achieve Substantial Completion of the entire Work as set forth in the Notice to Proceed (“Substantial Completion Date”). If the Work is to be performed in phases, each phase may have a separate Substantial Completion Date (e.g., Phase 1 Substantial Completion Date, Phase 2 Substantial Completion Date, etc.), which date shall be set forth in the Notice to Proceed for that phase. The definition and requirements of Substantial Completion are set forth in the General Conditions. The Substantial Completion Date(s) shall only be changed by a written change order.

4.5 FINAL COMPLETION. The Contractor shall achieve Final Completion of the entire Work as set forth in the Notice to Proceed (“Final Completion Date”). If the Work is to be performed in phases, each phase may have a separate Final Completion Date (e.g., Phase 1 Final Completion Date, Phase 2 Final Completion Date, etc.), which date shall be set forth in the Notice to Proceed for that phase. The requirements for Final Completion are defined in the General Conditions as well as the Specifications of the Project. The Final Completion Date(s) shall only be changed by written change order.

4.6 LIQUIDATED DAMAGES FOR DELAY. If the Contractor fails to achieve Substantial Completion of a phase of the Work or of the entire Work by the Substantial Completion Date(s) set forth in the applicable Notice to Proceed (as extended by Change Order, if applicable), and the delay is not excused by the College, then the Contractor shall pay the College the following amounts as liquidated damages for delay (“Liquidated Damages”) for each calendar day that the phase of the Work or the entire Work is not substantially completed beyond the applicable Substantial Completion Date:

\$ _____ per calendar day.

The College and the Contractor agree that the actual loss to the College from construction delays and the inability to use the Project or any phase of the Project in a substantially completed state are for the most part difficult to quantify, and that the foregoing Liquidated Damages formula results in damages amounts that are a reasonable estimate of the damage to the College for not being able to use the Project in a substantially completed state and are not penalties and are not intended to be penalties. The College may deduct Liquidated Damages from payments due under this Contract, but its failure to withhold Liquidated Damages or to assert a claim for Liquidated Damages shall not be deemed a waiver of the College’s right to withhold or to assert a claim for damages for any delay that occurs at any time on the Project.

ARTICLE 5
CONTRACT PRICE

5.1 CONTRACT PRICE. The Contractor shall be paid \$_____ for the complete performance of this Contract, which was proposed by the Contractor in its bid and accepted by the College (the "Contract Price"). The Contractor shall be entitled to additional compensation for authorized changes which include the cost of the changes and mark-ups included in change orders approved in writing by the College in accordance with the change order provision set forth in the General Conditions.

5.2 ALTERNATES. The Contract Price is based upon and includes the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the College:

[_____]

5.3 UNIT PRICES. The Contract Price is based upon and includes the following unit prices, if any, which are described in the Contract Documents:

[_____]

5.4 ALLOWANCES. The Contract Price is based upon and includes the following allowances, if any, which are described in the Contract Documents:

[_____]

ARTICLE 6
PAYMENTS TO THE CONTRACTOR

6.1 PAYMENT. The Contractor will be paid by the College in accordance with this Article and the payment provision in the General Conditions.

6.2 MONTHLY PROGRESS PAYMENTS. The College will make progress payments as the Work proceeds based on written invoices submitted monthly by the Contractor and approved by the Architect and the College. No payments will be made until the Contractor submits a unit schedule break down showing the portions of the total Contract Price for each principal category of Work and value loaded CPM schedule allocating the Contract Price among the schedule activities. Monthly progress payment amounts shall be based on the percentages of the Work completed as of the end of the pay period (less earlier payments). All payment requests or invoices and all payments shall be governed by the payment provision of the General Conditions as well as any special requirements of this Contract, including the requirement that progress payments shall be based on a unit schedule breakdown and a value loaded CPM schedule.

6.3 RETAINAGE. The College will retain 2% of the amount due on each progress payment pending Final Completion of the Work. The holding and release of retainage shall be governed by the payment provision of the General Conditions.

6.4 CHANGE ORDERS. The Contractor shall invoice for change order work in the monthly progress payment invoices as the change order work is performed, but only after a written change order and TCNJ issued Purchase Order has been signed by the College. Changes in the Work shall be governed by the change order provision of the General Conditions.

6.5 FINAL PAYMENT. Upon final completion of all Work included in the Contract Documents including all change orders, acceptance of the Work by the Architect and the College, the satisfactory completion of all of the requirements in the General Conditions for final completion, and the issuance of the Certificate of Final Completion, the Contractor will be paid the fully adjusted Contract Price including any retainage withheld (less earlier payments). The invoice for final payment and final payment shall also be subject to the payment provision of the General Conditions and any special requirements of this Contract.

6.6 PAYMENT TERMS. All invoices and payments shall also be subject to the General Conditions, including the provisions regarding payments, to the right of the College to withhold payments or to make deductions from payments, and to the Prevailing Wage Act requirements set forth in the General Conditions. The College will pay proper final invoices within thirty (30) days of their submission to the College with the approval of the Architect.

6.7 SUBMISSION OF INVOICES. Prior to the submission of the invoice, the Contractor will submit to the College and the Architect, in draft form, a “pencil copy” of the monthly invoice for review and approval setting forth each line item for which the Contractor intends to request payment in that invoice based on the claimed percent completed for that line item. Upon receipt of said “pencil copy”, the College and the Architect shall observe the Work in place and, on the basis of such observations, will either approve the amounts requested or modify the Contractor’s request, based on the College’s independent assessment of the Work in place. The College will then return the pencil copy invoice to the Contractor for the Contractor to then adjust and submit the final invoice with the agreed to percentages completed per line item to the College for payment. No invoice shall be submitted for payment until all amounts and completion percentages have been determined in this manner.

6.8 PROMPT PAYMENT ACT. For the purposes of the State’s Prompt Payment Act, N.J.S.A. 2A:30A-1, et seq.:

(a) An invoice will be deemed to have been received when it is received by the College at the address designated in the pre-construction conference for receipt of the invoices.

(b) The “billing date” as that term is used in N.J.S.A. 2A:30A-2 shall be the earlier of the date upon which an invoice for payment is approved for payment or 20 days after the invoice is received, unless within such 20 day period the invoice is found to be incomplete or

otherwise unacceptable and returned to the Contractor, with a written explanation of deficiencies, the amount withheld and the reasons for withholding payment.

(c) In the event that an invoice is found to be deficient and returned to the Contractor, the “billing date” shall be calculated from the date that a corrected invoice is received.

(d) Payment shall be considered to have been made on the date on which a check for such payment is dated.

(e) Payment terms (e.g., “net 20”) offered by the Contractor shall not govern the College’s obligation to make payment.

(f) The following periods of time will not be included in the calculation of the due date of the Contractor’s invoice:

(i) Any time elapsed between receipt of an improper invoice and its return to the Contractor, not to exceed 20 calendar days; or

(ii) Any time elapsed between the College’s return of an improper invoice to the Contractor and the College’s receipt of a corrected invoice.

If the State’s Prompt Payment Act is amended, or the language stated herein is inconsistent with the language contained in the State’s Prompt Payment Act, the language of the State’s Prompt Payment Act shall control.

6.9 LIMITATIONS ON APPLICABILITY. The provisions of this Article shall not govern the College’s payment obligations nor shall they supersede or modify any other contractual provision allowing the withholding of monies from the Contractor to the extent that the Contractor has not performed in accordance with the provisions of the Contract Documents. This Article also shall not govern the College’s payment obligations nor supersede or modify any other contractual provision governing the Contractor claims for additional compensation beyond the base Contract Price and approved change orders.

6.10 INTEREST. Interest shall be payable on amounts due the Contractor if not paid within thirty (30) calendar days after the billing date specified above, as provided under the State’s Prompt Payment Act, N.J.S.A. 2A:30A-1, et seq. Interest on amounts due shall be payable to the Contractor for the period beginning on the day after the required payment date and ending on the date on which the check for payment is drawn. Interest may be paid by separate payment to the Contractor, but shall be paid within 30 days of payment of the principal amount of the approved invoice. Nothing in this Article shall be construed as entitling the Contractor to payment of interest on any sum withheld by the College for any reason permitted under the Contract Documents or applicable law, or on any claim for additional compensation, over and above sums due under the base Contract Price or approved change orders.

ARTICLE 7
DISPUTE RESOLUTION

7.1 If a dispute or claim arises out of or relates to this Contract, or the breach thereof, and if the dispute cannot be settled through negotiation, the method for resolution of such dispute or claim shall be as provided in the dispute resolution provision of the General Conditions.

ARTICLE 8
TERMINATION OR SUSPENSION

8.1 This Contract may be terminated by the College as provided in the termination and suspension provision in the General Conditions.

8.2 The Work may be suspended by the College or the Contractor as provided in termination and suspension provision in the General Conditions.

ARTICLE 9
INSURANCE AND BONDS

9.1 CONTRACTOR'S INSURANCE. The Contractor shall purchase and maintain insurance as set forth in the insurance and bonds provision of the General Conditions. To the extent the Contractor shall be required to purchase and maintain additional insurance or insurance that differs from that set forth in the General Conditions, such requirements are set forth below:

[_____]

9.2 SUBCONTRACTOR'S INSURANCE. The Contractor shall ensure that its Subcontractors purchase and maintain insurance as set forth in the insurance and bond provision of the General Conditions.

9.3 PAYMENT AND PERFORMANCE BOND. The Contractor shall furnish the College with a payment bond and a performance bond as set forth in the insurance and bond provision of the General Conditions.

ARTICLE 10
OTHER PROVISIONS

10.1 CONTRACTOR REPRESENTATIONS. The Contractor represents to the College that it has:

(a) **Examination of the Contract Documents.** Examined and carefully studied the Contract Documents and the other documents in the bid documents, and that they are sufficient for performing the Work at the Contract Price.

(b) **Examination of Site.** Visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect the cost, progress, and performance of the Work.

(c) **Familiarity with Law.** Familiarized itself with all federal, state, and local laws and regulations that may affect the cost, progress, and performance of the Work.

(d) **Familiarity with Other Information and Other Documents.** Carefully studied all reports of investigations and tests of the site and subsurface conditions at or contiguous to the site and all drawings of physical conditions at the site including surface or subsurface composition, water, structures and utilities at or near to the site.

(e) **Additional Information Not Required for Bidding or Contract Performance.** Does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price.

10.2 ASSIGNMENT OF CONTRACT. The Contractor may not assign this Contract or any rights under or interests in this Contract including its right to payments under this Contract.

10.3 CONTRACTOR PERSONNEL ASSIGNED. The Contractor's team for this Project shall consist of the following personnel, who shall not be reassigned without the College's prior written consent:

<u>Name</u>	<u>Position</u>
_____	<u>Project Executive</u>
_____	<u>Project Manager</u>
_____	<u>Project Superintendent</u>
_____	<u>Project Scheduler</u>

The College reserves the right to request and have any member of the Contractor's or Subcontractor's staff replaced on the Project for any non-discriminatory reason.

10.4 NOTIFICATIONS/AUTHORIZED REPRESENTATIVE. All Notices required under this Contract shall be in writing, signed by the party giving same, and shall be deemed properly given only if hand delivered, sent by reputable overnight courier, or by registered or certified U.S. mail, return receipt requested, postage pre-paid and addressed as provided below.

Notice to the Contractor/Contractor's Representative. Written notices from the College and/or the Architect to the Contractor should be addressed to the Contractor's Representative:

Attn: _____

Notice to the College/College's Representative: Written notices from the Contractor to the College should be addressed to the College's Representative:

The College of New Jersey
PO Box 7718,
Ewing, New Jersey 08628
Attn: _____

with a copy to the College's General Counsel as follows:

Thomas Mahoney, Esq.
Vice President and General Counsel
The College of New Jersey
PO Box 7718
Ewing, NJ 08628-0718

The College's Contracting Officer hereby authorizes the College's Representative to receive all Contract related correspondence.

Notice to the Architect: Written notices from the Contractor to the Architect should be addressed to:

Attn: _____

Neither the College's nor the Contractor's Authorized Representatives shall be changed without 7 days' written notice to the other party.

10.5 CONTRACT TERMS, CHANGES, AND LAW. This Contract constitutes the entire agreement between the College and the Contractor, and it shall be governed by the law of the State of New Jersey. The terms and conditions of this Contract may not be changed except by a writing signed by the Contractor and the College.

10.6 COUNTERPARTS AND SIGNATURES. This Contract may be executed in counterparts. All executed counterparts shall constitute one contract, and each counterpart shall be deemed an original. The parties hereby acknowledge and agree that facsimile signatures or signatures transmitted by electronic mail in so-called “pdf” format shall be legal and binding and shall have the same full force and effect as if an original of this Contract had been delivered. The College and the Contractor (1) intend to be bound by the signatures on any document sent by facsimile or electronic mail, (2) are aware that the other party will rely on such signatures, and (3) hereby waive any defenses to the enforcement of the terms of this Contract based on the foregoing forms of signature.

10.7 NO IMPLIED COVENANTS OR WARRANTIES. The Contractor acknowledges that there are no implied covenants or warranties from the College under this Contract.

10.8 SEVERABILITY. If any term or provision of the Contract Documents are to any extent held invalid or unenforceable, and if the provisions of the Contract Documents that are essential to each party’s interests otherwise remain valid and enforceable, then (i) the remaining terms and provisions in the Contract Documents will not be affected thereby, (ii) each term and provision of the Contract Documents will be valid and enforceable to the fullest extent permitted by law, and (iii) the court/arbitrator(s) will give the offending provision the fullest meaning and effect permitted by law.

10.9 HEADINGS. The headings used in this Contract are for convenience and reference only, and are not part of this Contract, and do not in any way control, define, limit or add to the terms and conditions hereof.

10.10 INTERPRETATION/RULES OF CONSTRUCTION. The parties acknowledge that each party, and if it so chooses, its counsel, have reviewed and revised this Contract and that the normal rule of construction to the effect that any ambiguities be resolved in favor of the non-drafting party shall not be employed in the interpretation of this Contract or any amendments or exhibits thereto.

THE COLLEGE OF NEW JERSEY

By _____
William Rudeau,
Director of Construction

By _____
Lloyd Ricketts,
Vice President and Treasurer

Date _____

Date _____

By _____
Sharon Blanton,
Vice President for Operations

Date _____

By _____
Anup Kapur,
Executive Director of Procurement

Date _____

CONTRACTOR:

By _____

Title _____

Date _____



GENERAL CONDITIONS
OF THE
CONTRACT FOR CONSTRUCTION

Last Revised May 2021

TABLE OF CONTENTS

	Page
ARTICLE 1	
CONTRACT DOCUMENTS, INTERPRETATION, INFORMATION FOR BIDDERS, CLAIMS BASED ON BID AND CONTRACT DOCUMENTS.....	1
1.1	1
1.2	3
1.3	3
1.4	3
1.5	4
1.6	4
1.7	4
1.8	5
1.9	5
1.10	5
1.11	5
1.12	5
1.13	6
1.14	6
1.15	6
1.16	6
1.17	7
1.18	7
1.19	7
ARTICLE 2	
THE COLLEGE.....	8
2.1	8
2.2	8
2.3	9
2.4	9
2.5	9
2.6	9
2.7	10
2.8	11
ARTICLE 3	
THE ARCHITECT	11
3.1	11
3.2	11
3.3	11
3.4	12
3.5	12

TABLE OF CONTENTS

(continued)

	Page
3.6	The Architect's Review Of The Contractor's As-Built Plans..... 12
3.7	The Architect's Determination Of Substantial and Final Completion..... 12
ARTICLE 4	THE CONTRACTOR..... 12
4.1	The Contractor's Responsibility For Performance Of The Contract And Work. 12
4.2	The Contractor's Key Personnel. 13
4.3	The Contractor's Supervision Of Contract Work/The Superintendent..... 13
4.4	Cooperation With The College And Other Contractors..... 13
4.5	Performance Of The College Directives. 14
ARTICLE 5	PERFORMANCE OF WORK..... 15
5.1	Protection Of Work/Materials..... 15
5.2	Safety And Safety Programs. 15
5.3	Emergencies Affecting Safety. 15
5.4	Working Hours..... 16
5.5	Site Security. 16
5.6	Site Use. 16
5.7	Building Access. 16
5.8	Minimize Interruption. 16
5.9	Submittals (Shop Drawings, Product Data, Samples). 17
5.10	Layout And Dimensional Control..... 17
5.11	Construction Access, Roads, Walks, And Parking. 18
5.12	Construction Site Condition, Storage, Dust Control..... 18
5.13	Photographs..... 18
5.14	Project Sign..... 19
5.15	Soil Conservation..... 19
5.16	Temporary Facilities, Services, Electric, Heat And Enclosures. 19
5.17	Substitutions..... 20
5.18	License Fees..... 20
ARTICLE 6	SUBCONTRACTORS 20
6.1	The Contractor's Responsibility For Subcontracted Work..... 20
6.2	Subcontractor Identification And Approval..... 21
6.3	Subcontractor Qualifications. 21
6.4	Subcontractor Compliance With Contract/Subcontractor Supervisors..... 22
6.5	No Contractual Relationship Between The College And Subcontractors. 22
6.6	Contingent Assignment of Subcontracts..... 22

TABLE OF CONTENTS
(continued)

	Page
ARTICLE 7	
TIME, LIQUIDATED DAMAGES, DELAY CLAIMS AGAINST THE COLLEGE.....	23
7.1	Contract Times..... 23
7.2	Liquidated Damages For Delay. 23
7.3	Delay Claims By The Contractor Against The College -- Limitations. 23
ARTICLE 8	
PROJECT SCHEDULE.....	24
8.1	General Project Schedule Requirements..... 24
8.2	Form And Content Of Project Schedule. 24
8.3	Computerization Of Project Schedule. 26
8.4	Weather Inclusion In Project Schedule..... 26
8.5	Project Schedule Updates. 26
8.6	Meetings/Eight Week Bar Charts. 27
8.7	Project Schedule Documentation For Contract Payments. 27
8.8	Progress and Recovery Project Schedules. 28
8.9	The Contractor’s Failure to Provide Project Schedule Updates. 28
8.10	Scheduler Qualifications. 28
ARTICLE 9	
EXTENSIONS, COMPENSATION FOR CERTAIN EXTENSIONS.....	28
9.1	Delays Warranting Extensions Of Contract Times..... 28
9.2	Weather Delays. 29
9.3	Float Time Use..... 29
9.4	Calculation Of Extensions. 29
9.5	Elimination of Delays and Extensions (Acceleration)..... 30
9.6	Requests For Extensions Required. 30
9.7	Compensation For Certain Extensions And Limitations. 30
ARTICLE 10	
PAYMENTS TO THE CONTRACTOR.....	31
10.1	Contract Price..... 31
10.2	Monthly Progress Payments. 31
10.3	Unit Schedule Breakdown/CPM Activity Price Breakdown. 32
10.4	Invoices For Monthly Progress Payments: Form and Content. 32
10.5	Payment For Materials And Equipment Procured But Not Installed. 33
10.6	Retainage..... 34
10.7	Payment For Change Order Work. 34
10.8	Final Payment. 34
10.9	Payment Terms. 34
10.10	Payment Based On Partial Acceptance (Limitation). 35
10.11	Failure To Pay Amounts In Dispute Not To Affect Performance. 35
10.12	Reasons For Withholding Payment. 35

TABLE OF CONTENTS
(continued)

	Page
10.13 Set-Off For State Tax Indebtedness.....	36
10.14 Maintenance Of Cost And Accounting Records.....	36
10.15 Written Evidence of Payment to Subcontractors	37
ARTICLE 11 CHANGES.....	37
11.1 Changes Authorized.....	37
11.2 Change Request Or Directive.	37
11.3 Change Orders Which Are Protested.....	38
11.4 Changes Affecting Contract Times.....	38
11.5 Contractor Initiated Change Order Requests.	38
11.6 Change Order Amounts.	39
11.7 Right To Audit Extra Costs (Before And After Payment).....	40
11.8 Change Orders With Both Price Increases and Decreases.....	40
11.9 Waiver Of Rights In Connection With Change Orders Issued Without Protest.	40
ARTICLE 12 COMPLETION.....	40
12.1 Substantial Completion.....	40
12.2 Final Completion.	41
ARTICLE 13 SUSPENSION AND TERMINATION OF CONTRACT.	42
13.1 Suspension By The College.	42
13.2 Termination For Convenience.	43
13.3 Termination For Cause.	44
13.4 Surety Takeover Following Termination For Cause.	45
13.5 Suspension By The Contractor For Non-Payment.....	45
ARTICLE 14 WARRANTY/DEFECTIVE WORK AND MATERIALS.....	46
14.1 General Work One Year Warranty; HVAC Systems Two Year Warranty	46
14.2 Defective Work, Materials And Equipment.	47
ARTICLE 15 INDEMNIFICATION/LIABILITY TO THIRD PARTIES.....	47
15.1 The Contractor’s Indemnification Obligation.....	47
15.2 The Subcontractor’s Indemnification Obligation.	49
ARTICLE 16 INSURANCE AND BONDS.	49
16.1 The Contractor’s Insurance.....	49
16.2 The Subcontractor’s Insurance.	51
16.3 Payment And Performance Bond.....	51

TABLE OF CONTENTS
(continued)

	Page
ARTICLE 17 DISPUTE RESOLUTION.....	51
17.1 Mediation.....	51
17.2 Method Of Binding Dispute Resolution.....	51
17.3 Arbitration (If The College Elects To Arbitrate).....	51
17.4 Consolidation Or Joinder.....	52
17.5 Work During Pendency Of Dispute.....	52
17.6 Prompt Payment Claims.....	53
17.7 The Contractor’s Claims: Procedures And Limitations.....	53
17.8 Dispute Resolution Process In The Contractor’s Subcontracts.....	53
ARTICLE 18 MISCELLANEOUS.....	53
18.1 Prevailing Wage.....	53
18.2 Employment Discrimination.....	54
18.3 Patents.....	55
18.4 The Contractor’s Compliance With Law.....	55
18.5 Environmental Protection – The Contractor’s Duty To Comply With Applicable Law.....	56
18.6 No Personal Liability Of College Officials.....	56
18.7 Recovery Of Monies By The College From Other Contracts With The Contractor.....	56
18.8 Buy American Requirement.....	56
18.9 Compliance With Grant Requirements.....	57
18.10 Modification Of Contract.....	57
18.11 State Sales Tax Exemption.....	57
18.12 Successors and Assigns.....	57
18.13 Construction Liens.....	57
18.14 Independent Contractor Status.....	58
18.15 Third Party Beneficiary Rights Not Intended.....	58
18.16 Gifts To College Employees And Agents Prohibited.....	58
18.17 Compliance With Procurement Statutes.....	58
18.18 Conflict Of Interest.....	59
18.19 Confidential Information.....	60
18.20 Publicity.....	60

ARTICLE 1
**CONTRACT DOCUMENTS, INTERPRETATION, INFORMATION FOR BIDDERS,
CLAIMS BASED ON BID AND CONTRACT DOCUMENTS**

1.1 Definitions.

Terms defined in the Contract for Construction shall have the meaning provided therein. Definitions for the purpose of these General Conditions include the following:

Addendum: A document issued to bidders by the College prior to the bid due date which supplements, revises or modifies the bid solicitation documents furnished for bidding purposes, and which must be identified and included in bids for the Contract.

Architect: The Architect (A/E) engaged by the College to design the Project, to prepare the design documents and assist with bid documents, and may administer the Contract and act as the agent of the College as described in the Contract.

Bulletin: A document prepared by the Architect describing proposed changes or additions to the Work in the Contract Documents that is issued after Contract award. If the College decides to implement the change, it will provide the bulletin to the Contractor and ask it to submit a change order proposal or request (in accordance with the change order provisions in the Contract for Construction, these General Conditions and other sections of the bidding documents).

Change Order Proposal or Change Order Request: A written proposal or request submitted by the Contractor in accordance with the change order provision of the Contract for Construction, these General Conditions and other sections of the bidding documents, including proposals submitted in response to Contract Change Directives, which proposes cost, time and other terms under which the Contractor will perform changed work under the Contract. If accepted by the College, a written change order signed by the Vice President for Administration and a TCNJ Purchase Order signed by the Contracting Officer of the College, and if accepted by the Contractor in writing, it will become part of the Contract as a change order.

The College's Representative: The College's Representative is a person or persons designated by the College to act on its behalf in administering the Contract for the College. The College's Representative may include the Director of Campus Construction, the Project Manager or an independent construction manager working for the Office of Campus Construction.

College Site Superintendent: The College Site Superintendent is a person or persons designated by the College to witness, observe, record and report on activities in and around the construction site. The Site Superintendent does not have the authority to stop or change the scope of the Work of the Contract Documents.

Contract: The Contract Documents all form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual

relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the College and a Subcontractor or a Sub-subcontractor, (3) between the College and the Architect or the Architect's consultants or (4) between any persons or entities other than the College and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's Contractor's duties.

Contract Amendment: The Contract can only be amended by (1) a written amendment identified as such that is signed by the College and the Contractor, (2) a change order signed in accordance with the Contract Documents, (3) a written Contract Change Directive (CCD) issued by the College that should result in a change order unless issued to address some fault of the Contractor, (4) a written approval or acceptance by the College or the Architect of a change requested by the Contractor in writing, provided the request for a change is specifically identified in a submittal.

Contract Change Directive (CCD): A Contract Change Directive (CCD) is a written directive issued by the College which orders an addition, deletion, clarification of a disputed item or revision in the Work, or a response to an emergency. A CCD does not by itself change the Contract, but it should result in a change order which does change the Contract Price or Contract Times if warranted. A CCD should specify the terms of the change order (if deemed warranted by the College) which will result, and/or specify a deadline for the submission by the Contractor of a proper change order request, and/or contain other similar terms.

Contract Documents: The Contract Documents are enumerated in Article 2 of the Contract for Construction.

Contract Limit Lines: The lines shown on the Plans that limit the boundaries of the Project site, and beyond which no construction work or activities shall be performed by the Contractor unless otherwise specified in the Contract Documents, including the Plans and Specifications and supplemental General Conditions.

Contracting Officer: The Associate Treasurer of the College shall be the Contracting Officer in connection with the Contract and the Project. The Contracting Officer and other designee shall have authority to act on behalf of the College under the Contract.

Field Order (FO): A written order issued by the Architect or the College which requires minor changes in the Work that do not result in a change in the Contract Price or the Contract Times. If the Contractor believes that a field order warrants the issuance of a change order that changes the Contract Times or Contract Price, it must notify the College and the Architect in writing within 48 hours, and its notice must specify the terms of the change order that it believes are warranted, including specific time and price change requests.

Plans: The Plans are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, and diagrams.

Project: The Project is the total construction of the Work performed under the Contract Documents and may include construction by the College and by separate contractors that the College has specifically identified.

Specifications: The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services prepared by the Architect or the College.

Supplemental General Conditions: The part of the Contract Documents which amends or supplements these General Conditions for the Project.

Work: The construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.2 Intent Of Contract Documents.

The intent of the Contract Documents is to describe a functionally complete and aesthetically acceptable Project to be constructed and completed by the Contractor in every detail in accordance with the Contract Documents. Any Work, services, materials, equipment or documentation that may be reasonably inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce a complete Project shall be supplied by the Contractor whether or not specifically identified at no additional cost to the College. Where the Contract Documents describe portions of the Work in general terms but not in complete detail, only the best construction practices and only materials and workmanship of the first quality are to be used. Only where the Contract Documents specifically describe a portion of the Project as being performed by others is the Work to be considered to include less than the entire Project.

1.3 Interpretation Of Contract Documents.

When two or more interpretations of a Specification for the Work are possible, the most stringent or the highest cost interpretation shall apply as determined by the Architect. The Architect (or in the absence of the Architect, the College) shall be the sole interpreter of the Plans and Specifications and the Contractor's performance therewith. It is the intent of these Plans and Specifications to provide materials of a quality consistent with the highest standards provided under similar circumstances in the same general geographical area and that will result in long-term use and efficient operation.

1.4 Law And Referenced Standards.

The Contractor is required to comply with all federal, state and local laws and regulations that apply to the Project, the Work and the Contract. Where the Contract Documents refer to any publication, including but not limited to any standard, which affects any portion of the Work or the Project, it shall be considered to mean the edition or revision in effect on the bid due date unless otherwise specified in the Contract Documents. No provision in any publication including

any standard shall create an obligation on the part of the College or the Architect to supervise or direct the Contractor's Work.

1.5 Plans And Specifications.

The Plans will include general plans and such details as deemed necessary to give a comprehensive representation of the construction required. The Contractor shall keep one set of Plans available at the Project site, which shall be available for inspection by the College and the Architect at all times. All alterations affecting the requirements in the Plans must be authorized by the College and the Architect in writing, and shall be promptly noted on the Contractor's record set of Plans, which are maintained at the site for inspection by the Contractor, the College and the Architect.

1.6 Order Of Precedence Of Contract Documents.

Each of the Contract Documents is an essential part of the Contract, and a requirement specified in one part of the documents is binding as if specified in all. The Contract Documents are intended to be complementary and to describe and provide for a complete Project. The obligations of the Contractor under the various Contract Documents shall be cumulative and to the extent that one of the Contract Documents imposes a stricter or more costly requirement or higher standard upon the Contractor than does another Contract Document, the more stringent or more costly requirement or higher standard, as determined by the Architect, shall apply. Otherwise, if there is any conflict among the Contract Documents, the signed Contract for Construction and all approved change orders shall control. As to the other Contract Documents, the order of precedence shall be as follows:

- (a) Contract for Construction
- (b) Addenda
- (c) Supplemental General Conditions
- (d) General Conditions
- (e) Specifications
- (f) Plans
 - i. Notes
 - ii. Large Scale Details
 - iii. Sections
 - iv. Elevations
- (g) Scope of Work Description

1.7 Organization Of Plans And Specifications.

The arrangement of the Plans and the organization of the Specifications into divisions, sections or articles shall not be construed by the Contractor as being intended to divide or allocate the Work among Subcontractors or trades or to establish the scope of the Work to be performed by particular Subcontractors or trades. The College is not liable for the Contractor dividing and separating the Contract Documents into individual packages to Subcontractors. Items that the Contractor fails to include or provide for shall be at the Contractor's sole risk and

cost. The Contract Documents work together as a whole and, therefore, the Contractor is required to coordinate the entire package with all its Subcontractors.

1.8 Required Approvals.

In all cases where approvals or decisions under the Contract Documents are required from the College, the Work shall not proceed without the required approvals and decisions in writing.

1.9 Conformity Of Work To Contract Documents.

All Work performed shall conform to the lines, grades, cross-sections, dimensions, material requirements, tolerances, details and other information in the Contract Documents. The purpose of tolerances is to accommodate occasional minor variations from the middle portion of the tolerance range that are unavoidable despite reasonable construction practices. When a maximum or minimum tolerance value is specified, the material and the Work shall be controlled so that they shall not be preponderantly of borderline quality or dimension.

1.10 Work Involving Existing Structures.

On projects involving alterations, remodeling, repairs, installations or other work in pre-existing structures or systems, the Contractor shall by personal inspection of the existing structures and systems satisfy itself as to the accuracy of any information provided that may affect the quantity, size and/or quality of materials required for a satisfactorily completed Project, including information that is not identified or included in the Plans and Specifications. The Contractor shall provide all material and labor required to complete the Work based on conditions that can be reasonably observed by a competent and diligent contractor before bidding.

1.11 Verification Of Dimensions.

The Contractor shall verify all dimensions at the job site and shall take any and all measurements necessary to verify the information in the Plans. The Contractor shall properly and accurately layout and survey the Work. Any errors or discrepancies affecting the layout of the Work shall be reported to the Architect and the College immediately in writing. No Work affected by any error or discrepancy shall proceed until such discrepancy is resolved by a written decision of the Architect with the consent of the College.

1.12 Manufacturer Literature.

Manufactured articles, materials and equipment shall be installed, applied, connected, erected, used, cleaned and conditioned in accordance with the manufacturer's written instructions unless otherwise specified in the Contract Documents. If there is any conflict between manufacturer literature and the Contract Documents, it shall be reported by the Contractor to the Architect and the College in writing, and the Contractor shall not proceed without a written decision by the Architect with the consent of the College.

1.13 Quality -- General Requirement.

Where no explicit quality or standard are specified for Work, materials or equipment, they shall be new, of good quality, free of defects, suitable for their intended use, in conformity with the Contract Documents, and consistent with the highest quality of the surrounding Work and of the construction of the Project generally.

1.14 Examination Of Contract Documents Before Bidding/Errors.

The Contractor represents and warrants that before bidding it examined and carefully studied the Contract Documents and other documents included or referred to in the bid documents. The Contractor also represents and warrants that the documents are sufficient for bidding and performing the Work at the Contract Price. Should it appear that any of the Work or materials are not sufficiently or properly detailed or explained in the Contract Documents, the Contractor shall notify the College in writing before the bid deadline for submitting questions.

Errors, omissions, conflicts, discrepancies, inconsistencies or other defects in the Contract Documents or between the Contract Documents and any codes, standards or other applicable documents which are capable of being discovered by a diligent and competent contractor before bidding shall be reported to the College in writing before the bid deadline for submitting questions. If errors, omissions, inconsistencies or other defects in the Contract Documents are not discovered until after the bid due date, the Contractor shall promptly notify the College and the Architect of them in writing, provide written recommendations regarding changes or corrections to resolve any such errors, omissions, inconsistencies or defects, and obtain the Architect's written interpretation and approval with the consent of the College before proceeding with the Work affected.

1.15 Site Information.

Soil borings, test pits or other subsurface or site information regarding the physical site and subsurface conditions on or near the site may have been obtained from independent contractors for the purpose of preparing the design documents for the Project rather than for the purpose of contractor estimating or bidding. Such information may be identified or included in the Contract Documents so that it can be reviewed by bidders during the bidding phase, but because of the limited nature and purpose of the information, it shall not be considered to be part of the Contract Documents, and the Contractor must assume responsibility for interpreting and relying upon the information.

1.16 Sufficiency Of Documents Provided For Bidding.

The Contractor represents and warrants that before bidding it carefully studied all reports, surveys and documents included or identified in the bid documents regarding observations, inspections, investigations and tests of the site and subsurface conditions at or near the site, and all information provided to bidders regarding physical conditions at or near the site, including surface and subsurface composition, water, structures and utilities, and that it determined that no further examinations, investigations, tests, studies or data were necessary for bidding or the performance of the Work at the Contract Price. If the Contractor concluded that additional

information is required, it must notify the College in writing before the bid deadline for submitting questions.

1.17 Examination Of Site Before Bidding.

The Contractor represents and warrants that before bidding it visited the site and familiarized itself with and was satisfied as to the general, local and site conditions which may affect the cost, progress and performance of the Work and the Contract, and that its bid and bid price take into account all such conditions. No additional costs will be borne by the College for conditions that existed and were reasonably observable or described at the time of bidding.

1.18 Hazardous Materials On Site.

The Contractor will not be responsible for hazardous environmental conditions uncovered or discovered on the site that were not disclosed in the Contract Documents and that were not caused by the Contractor or anyone working through or under the Contractor. If such conditions are discovered, the Contractor shall stop work and notify the College in writing immediately. The College may issue a written directive to the Contractor requiring it to stop work until the hazardous environmental condition is remedied, and the Contractor will be entitled to an extension of the Contract Times if an extension is warranted under the provisions of the Contract for Construction and these General Conditions regarding extensions. The College may also make changes in the Contract in response to the conditions, and the Contract will be changed in accordance with the change order provisions in the Contract for Construction and these General Conditions.

1.19 Limitation On Claims Based On Contract Documents And Information Provided For Bidding.

The Contractor may not assert claims for extra compensation beyond the bid and Contract Price for constructing the completed Project by reason of any errors, omissions, inconsistencies, or defects in the Contract Documents that are discoverable by a diligent and competent contractor, because of (i) its obligation to review and study the bid documents before submitting its bid, (ii) its representation in the Contract Documents that it did so, and (iii) its obligation to notify the College in writing of any such errors, omissions, inconsistencies, or defects before submitting its bid,. In addition, the Contractor may not assert claims for extra compensation beyond the bid and Contract Price for constructing the completed Project by reason of any lack of information affecting the construction of the Project at the time of bidding, or errors in the information included or referenced in the bid documents except to the extent explicitly permitted by the Contract for Construction or these General Conditions. The Contractor shall notify the College in writing before submitting its bid of any errors or omissions in the information provided or be precluded from seeking extra compensation or asserting a claim. This limitation on claims may be modified and further restricted in the signed Contract for Construction when the Contract Documents explicitly require the Contractor to participate in any aspect of the design phase.

The Contractor may assert claims for extensions and additional compensation in accordance with the provisions of the Contract for Construction and these General Conditions if

information regarding the site that is identified in the bid or Contract Documents is factually inaccurate, and the inaccuracy is one that a reasonably competent and diligent contractor would not discover in preparing a bid. The Contractor may not assert a claim for an extension or extra compensation when it claims, not that the information is factually inaccurate, but rather that conclusions, inferences or judgments made in reliance on accurate information prove to be incorrect.

ARTICLE 2 **THE COLLEGE**

2.1 General Rights And Responsibilities Of The College.

The College as the owner of the Project is entitled to have the Contractor perform and complete the Work in accordance with the Contract Documents, including the time of completion, quality and documentation requirements of the Contract. The College for its part undertakes to furnish the site, to notify the Contractor of any restrictions on the site that could affect the Contractor's performance of the Contract, to obtain approvals relating to the site that are needed for the construction to proceed, to pay the Contractor in accordance with the Contract, and to act reasonably in reviewing all documentation, claims and questions properly submitted to it under the Contract. The College also undertakes to provide the information and items that it expressly agrees in the Contract Documents to provide.

The College shall also have such other rights and responsibilities as are specified in the Contract Documents. The College will not supervise the Contractor's Work or be responsible for the Contractor's construction means and methods, or the Contractor's safety practices, or any failure of the Contractor to comply with the Contract Documents or any laws or regulations.

2.2 The College's Representative, Authority To Decide Contract Questions.

The Contracting Officer delegates its authority to the College's Representative who is authorized to act and make decisions on behalf of the College regarding matters specified in the Contract Documents. However, the College's Representative is not authorized to make or agree to material changes to the Contract Documents or changes involving the Contract Times or Contract Price.

All changes to the Contract Documents including change orders that modify Contract Price, Contract Times or other material change to the Contract Documents must be reviewed and approved by the Contracting Officer or his/her designee. The Contracting Officer designates that the Vice President for Administration is authorized to approve change orders.

The College's Representative, in consultation with the Architect, is authorized to decide on behalf of the College, all questions regarding the quality, acceptability and rate of progress of the Work, all questions regarding the interpretation of the Contract Documents, the acceptability of the performance of the Contract by the Contractor, and the compensation due to the Contractor. Where the College's Representative is authorized to render decisions under the

Contract for Construction or these General Conditions regarding disputes or claims, he/she shall consult with the Architect and shall not act arbitrarily so as to unfairly benefit either the College or the Contractor.

2.3 Required Approvals.

In all cases where approvals or decisions are required from the College under the Contract Documents, such approvals or decisions shall be made reasonably, except in cases where a specific standard applies such as, for example, situations where the College is entitled to exercise unqualified discretion in selecting the types of materials, products or construction which it decides to procure.

2.4 Information Required From The College.

Information which the Contract Documents specify the College will provide shall be provided with reasonable promptness.

2.5 Permits.

The College will arrange and pay for permits and permit inspections, including building code permits except to the extent that the Specifications specify otherwise. The Contractor will arrange for and coordinate all inspections and the dates and times for all inspections with local, state and independent agencies and include the College's Representative or the Site Superintendent.

2.6 The College's Inspection Of The Project.

The College shall have the right to be represented at the site by the College's Representative(s), the Site Superintendent and other College employees designated by the College, the Architect, and other consultants designated by the College or the Architect. The College and its representatives shall have the right to visit the site, inspect Work and materials, inspect Project documentation, conduct tests, attend meetings, meet with the Contractor' and the Subcontractors' representatives, investigate problems, conduct studies, and make reports. The College and its representatives shall be allowed access to all parts of the Work, and the Contractor shall furnish them with information and assistance when they request it.

The Contractor shall give the College and the Architect timely notice of readiness of Work for observation, inspection and testing, and shall cooperate with these efforts. The Contractor shall also comply with any inspection and testing procedures specified in the Contract Documents.

The Contracting Officer, the Architect and the College's Representative shall have the right to direct the Contractor to remove or uncover unfinished Work if deemed necessary to inspect Work or materials in place.

If Work is covered before it is inspected because the College, the Architect or any consultant were not afforded reasonable notice and an opportunity to inspect, or where the

Contract Documents or any law require an inspection, the Contractor shall uncover and replace Work at its own expense if required to do so by the College.

If any other portion of the Work not specifically required to be inspected is covered, and the College or the Architect did not ask to observe or inspect the Work before it was covered, the College may nonetheless ask to inspect the Work. If the College makes such a request, the Contractor shall uncover the Work for inspection. If the Work uncovered is found to be in accordance with the Contract Documents, the cost of uncovering and replacement shall be paid by the College by a change order. If the Work uncovered is found not to be in compliance with the Contract Documents, the Contractor shall pay all costs of uncovering and replacement, and also remedy the defect or deficiency at its own cost.

The College at all times retains the right to stop all or part of the Work by a written direction because of defective Work until the defect is eliminated. This right shall not give rise to any duty on the part of the College to exercise the right for the benefit of the Contractor or those performing its Contract.

The College at all times retains the right to stop all or part of the Work due to concerns with the effectiveness of the Contractor's safety program required under Article 5.2. The College may require the Contractor to provide a written plan to correct safety deficiencies, an on-site safety supervisor, or other administrative or engineering controls to ensure the safety of personnel impacted or potentially impacted by Contractor operations. The Contractor shall indemnify, defend and hold the College harmless from fines issued by Federal, State or Local OSHA enforcement.

2.7 The College's Inspectors, Duties And Limitations

If the College designates inspectors to inspect Work and materials and Project documentation, they will not be authorized to alter or waive any requirements or provisions in the Contract Documents. The College's inspectors will not be authorized to issue instructions contrary to the Contract Documents or to act as foremen or employees of the Contractor. The College's inspectors have the authority to reject unsuitable Work or materials, subject to written confirmation by the College's Representative. If the Contractor believes that any action of a College inspector is contrary to the Contract Documents, it shall notify the College's Representative and the Architect in writing within 48 hours. The College does not undertake to have inspectors sufficient in number to inspect every item of Work or material as it is provided, or to have inspectors with the expertise needed to judge every aspect of the Work.

The Contractor shall remain responsible for defective Work or materials irrespective of any inspections or lack of inspections during the Work. If the Contractor seeks a binding determination of the acceptability of Work or materials during the performance of the Contract, it shall do so by making a written request for such a determination to the College's Representative with a copy to the Architect.

2.8 The College's Rejection Of Defective Work.

The College shall have the right to reject defective Work, materials, or equipment at any time, and to require the Contractor to remove and replace it at the Contractor's expense. The Contractor shall also be responsible for repairing damage to other work caused by defects or deficiencies in its Work. The College's Representative, upon consultation with the Architect, may elect to accept Work or materials that do not conform to the Contract Documents and to credit or reduce the Contract Price, but the College shall have no contractual obligation to elect this remedy. Changes to the Contract Documents in these circumstances shall be recorded as a change order under the change order provision of the Contract for Construction and these General Conditions.

ARTICLE 3 **THE ARCHITECT**

3.1 The Architect's General Role.

The Architect is, by contract with the College, responsible for the design of the Project. During construction, the Architect is responsible for reviewing the Contractor's submittals to determine if they conform to the Contract Documents and good industry practice, to provide some level of inspection to determine if Work and materials provided by the Contractor conform to the Contract Documents and good industry practice, and to review the Contractor's payment applications. During the performance of the Work, the Architect may investigate any defects and deficiencies in the Work or materials provided and make recommendations to the College regarding the defects or deficiencies. The Architect will conduct inspections to determine if the Contractor has achieved proper Substantial and Final Completion and submitted all documents required at Substantial and Final Completion. The Contractor shall cooperate with and render assistance to the Architect in the performance of these duties.

3.2 The Architect's Access And Facilities.

The Contractor shall allow the Architect and its consultants access to the Project at all times and shall facilitate their access to inspect Work and materials and Project documentation. The Architect and its consultants shall be permitted to attend job meetings, scheduling meetings and other meetings at the site and the Contractor shall facilitate their ability to do so. The Contractor shall provide an office at the site for the Architect if the Specifications require it to do so.

3.3 Limitation Of The Architect's Responsibilities.

The Architect will not be responsible for or have control of construction means and methods or safety precautions and programs in connection with the Work. The Architect will not be responsible for or have control of acts or omissions of the Contractor, its Subcontractors, or any of their agents or employees, or any other person performing any of the Contract Work.

3.4 The Architect's Rejection Of Work.

The Architect may recommend rejection of Work or materials that it believes does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, it may recommend to the College special inspections or testing of Work or materials, including completed Work and materials.

3.5 The Architect's Review Of The Contractor's Submittals.

The Architect will review, approve or take other appropriate action regarding the Contractor's submittals, such as shop drawings, product data and samples, to assure that they conform with the design requirements and Contract Documents. The approval of a specific item shall not be deemed to constitute approval of an assembly of which the item is a component.

3.6 The Architect's Review Of The Contractor's As-Built Plans.

The Architect will periodically review the Contractor's as-built plans maintained at the site to ensure that they are up-to-date, and shall review the completed as-built plans at Project completion to ensure that they are complete and are provided to the College.

3.7 The Architect's Determination Of Substantial and Final Completion.

The Architect will conduct inspections to determine the dates of Substantial and Final Completion and to determine if the Contractor has properly Substantially and Finally completed the Project. The Architect will obtain from the Contractor all written warranties and all other documents that the Contractor is required to provide at Substantial and Final Completion of the Project.

ARTICLE 4 **THE CONTRACTOR**

4.1 The Contractor's Responsibility For Performance Of The Contract And Work.

The Contractor is the person or entity identified as such in the Contract. The Contractor shall be lawfully licensed in the jurisdiction where the Project is located.

The Contractor shall perform all of the duties in the Contract Documents, shall furnish the labor, materials and equipment to complete the construction of the Project in accordance with the Contract Documents, and furnish all services, labor, materials and equipment necessary or appropriate to construct the Project. The Contractor shall manage, supervise, schedule, direct, and inspect the Work as competently, skillfully, and efficiently as possible, and shall be solely responsible for all construction means, methods, techniques, safety, security, sequences, procedures, and coordination.

The Contractor shall comply with all applicable laws, and shall establish and maintain reasonable quality assurance and safety programs in connection with its Work. The Contractor shall complete the Work in compliance with the Contract Documents and by Milestone, Substantial Completion and Final Completion Dates in the Contract for Construction or any authorized extensions thereof. The Contractor shall maintain good order and discipline at the site at all times.

4.2 The Contractor's Key Personnel.

The Contractor shall assign to the Project a Project executive, Project manager, superintendent, and scheduler, and such other key personnel as are specified in the Contract for Construction or as required to carry out the requirements of the Project. The Contractor shall not remove or replace such key personnel without the College's written approval. The College has the authority to reject and have replaced any staff member of the Contractor or any of the Subcontractors for any non-discriminatory reason.

4.3 The Contractor's Supervision Of Contract Work/The Superintendent.

The Contractor shall supervise and be responsible for the acts and omissions of the Contractor's employees, agents, Subcontractors, sub-subcontractors, suppliers and other persons performing portions of the Work and the Contract. The Contractor's designated Project superintendent shall be at the Project site at all times when Work is in progress. The Contractor may designate in writing an alternate superintendent who must be approved in writing by the College. The superintendent (or alternate) shall have full authority to represent and act for the Contractor at the site and shall have full authority to execute orders and directives of the College without delay.

Communications from the College or the Architect to the superintendent shall be deemed to have been given to the Contractor. The superintendent shall be capable of and authorized to respond to all hazardous and unsafe conditions at the Project site and to implement prompt corrective measures to eliminate all unsanitary, hazardous or dangerous conditions at the site. The College may suspend all or part of the Work at the Project site if the superintendent (or alternate) is not present at the Project site. Such a suspension shall not be the basis of a claim against the College, including without limitation any claim for additional time or extra cost.

The superintendent shall attend all meetings at the Project site including job meetings, scheduling meetings, and meetings with the College and/or the Architect. The superintendent shall have a written plan that must be approved in writing by the College for responding to emergencies when the Work is not in progress. The Contractor shall also utilize qualified competent craftsmen on the Project.

4.4 Cooperation With The College And Other Contractors.

The College reserves the right to contract for and perform other or additional work on or adjacent to the Project site. When separate contracts are let within the limits of the Project site, or in areas adjacent to the site, the Contractor shall perform its Work so as not to interfere with or

hinder the progress or completion of the work being performed by other contractors. The Contractor shall also affirmatively cooperate with such other contractors and coordinate its activities with theirs, and include coordination measures in the Project Schedule. The Contractor shall arrange its Work and shall place and dispose of materials being used so as not to interfere with the operation of other contractors within the limits of the Project site. The Contractor shall join its Work with that of the other contractors in an acceptable manner and shall perform its Work in proper sequence with that of other contractors.

If there is a disagreement as to the respective rights of the Contractor and others doing work within the limits of or adjacent to the Project site, the College shall determine the respective rights of the contractors involved to secure the satisfactory completion of all affected work. The Contractor shall not be entitled to additional compensation beyond its Contract Price that may arise because of inconvenience, delay, or loss experienced by it as a result of the presence and operations of other contractors working within the limits of or adjacent to the Project site.

The College reserves the right to occupy any portion of the Project that is ready for occupancy prior to Final Completion and acceptance of the Project, after Local and State Construction Enforcing Agency approval.

The occupancy of any portion of the Project does not constitute an acceptance of any Work nor does it waive the College's right to liquidated damages or constitute an acceptance of any Work, as the Project will be accepted as a whole and not in units. Prior to such occupancy, however, the Architect, a representative of the College, and the Contractor shall fully inspect the portions of the Project to be occupied, preparing a complete list of omissions of materials, faulty workmanship, or any items to be repaired, torn out or replaced. The College will assume responsibility for damage to premises so occupied of any items not on this list when such damage is due to greater than normal wear and tear, but does not assume responsibility for improper or defective workmanship or materials.

4.5 Performance Of The College Directives.

When the College issues a written directive to the Contractor under the authority of any provision in the Contract for Construction or these General Conditions, the Contractor shall perform as directed in a diligent manner and without delay. Compliance with written directives shall not adversely affect the rights of the Contractor under the Contract for Construction, these General Conditions or law, but if the Contractor objects to a directive of the College, or claims that a directive infringes upon its rights or entitles it to a change order, it shall notify the College in writing within 2 business days of any directive and describe any objection it has to the directive and the reasons for its objection. Objection to a written directive does not relieve the Contractor of the obligation to comply with the directive and proceed in a diligent manner to implement the directive without delay.

ARTICLE 5
PERFORMANCE OF WORK

5.1 Protection Of Work/Materials.

The Contractor, shall at its own expense, protect all finished Work and materials from damage and keep them protected until the Project is accepted as Substantially Completed, and shall repair or replace any Work or material damaged before acceptance. After the Project is accepted as Substantially Complete, the Contractor will remain responsible up through Final Completion for damage to Work and materials caused by it or its Subcontractors or others participating in the performance of its obligations under the Contract Documents. The Contractor shall also secure and protect its own tools, equipment, materials and supplies, and the College shall have no liability for damage, theft or injury to the Contractor's property.

5.2 Safety And Safety Programs.

The Contractor shall have full responsibility for safety at the Project site at all times up to Final Completion and acceptance of the Project and the Contract. The Contractor shall provide for the safety of all individuals on the Project site, and take measures to ensure that individuals on or near the Project site are not injured by the performance of the Contract. The Contractor shall establish and maintain a Project safety program in accordance with all applicable laws including OSHA, good industry practice, and any additional requirements in the Contract Documents. If the College or the Architect become aware of an unsafe situation, the Contractor will immediately respond to remedy the safety concern and shall take all other actions necessary to comply with Article 2.6.

5.3 Emergencies Affecting Safety.

If there is an emergency affecting the safety of persons or property, the Contractor shall take immediate action to prevent damage, injury or loss. The Contractor shall notify the College in writing of the situation and all actions being taken immediately or as soon as possible. If, in the opinion of the Contractor, immediate action is not required, the Contractor shall notify the College in writing of the emergency situation and proceed in accordance with the College's instructions. However, if loss, damage, injury or death occurs that could have been prevented by the Contractor's prompt and immediate action, the Contractor shall be liable for all costs, damages, claims, actions, suits, attorney's fees and other expenses that result.

Any additional compensation or extension of time claims by the Contractor on account of emergency Work shall be determined in accordance with the change provisions of the Contract for Construction and these General Conditions. The Contractor shall be responsible for emergencies and costs and delays resulting therefrom that could have been foreseen or prevented with normal diligence, planning, and supervision of the Work, or that are caused by the Contractor's failure to properly perform the Contract.

The Contractor shall provide the College with a list of the names and telephone numbers of its employees and employees of each Subcontractor designated to be contacted in case of an emergency during non-working hours. A copy of this list shall be displayed prominently at the

Project site so that it is visible when the Project site is secured and shall be provided to the College's campus police department.

5.4 Working Hours.

Except as required for the safety or protection of persons or property, or as specified in the Contract Documents, all Work at the site shall be performed during regular working hours, and not on Saturdays, Sundays, legal holidays, the College's commencement days, resident move-in and move-out days or other days specifically noted in the Contract Documents without the prior written consent of the College, which will not be unreasonably withheld.

5.5 Site Security.

The Contractor shall provide, maintain and oversee security at the site if required in the Specifications. The Project site shall be fenced as specified in the Specifications, and the Contractor shall control access when gates are unlocked or open. The fence shall provide a physical barrier to the site and protection from visible nuisance. At a minimum, the fence shall be firmly secured with buried posts or weighted feet, top rails, metal fabric, and locking gates. Contractor shall immediately notify the College in the event of unauthorized entry to the site.

5.6 Site Use.

The Contractor shall confine construction equipment, storage and Work to the Project site absent written approval from the College. Any request by the Contractor to use areas outside the Project site must be described in written form and included with the Contractor's bid.

5.7 Building Access.

The Contractor shall be responsible for the sign out, distribution, safe use and return of all building keys and/or access cards, and shall be responsible for all costs associated with failure to return these items (e.g., the cost to re-key/re-implement the system).

5.8 Minimize Interruption.

The Contractor acknowledges that the College is an existing educational facility and that classes may be in session during construction. The Contractor agrees to conduct its Work with as little disruption as reasonably possible to the College's students, faculty, employees and guests, and will maintain a safe environment for the College's students, faculty, employees and guests, in addition to the Contractor's employees and workers of all tiers. The Contractor and its Subcontractors and employees of all tiers must display courtesy and consideration with and shall refrain from discriminating against or harassing the College's students, faculty, employees, visitors and guests at all times. The Contractor will not allow smoking, vaping, alcohol, drugs, any firearms, or other weapons on the College's property at any time. The Contractor shall abide by all campus traffic regulations.

5.9 Submittals (Shop Drawings, Product Data, Samples).

Prior to the beginning of Work on the Project, the Contractor shall furnish to the Architect and the College for their review and approval, a schedule setting forth all the submittals, including shop drawings, product data and samples required by the Contract Documents, that the Contractor intends to submit to the Architect for review and approval, the date upon which the Contractor shall make each such submittal and the date upon which the Architect shall complete its review of each such submittal, which in no event shall be less than ten (10) days from receipt (“Submittal Schedule”). The Architect and the College shall identify all submittals that will require more than ten (10) days to review and notify the Contractor of the required review period. The Contractor shall adjust the Submittal Schedule to accommodate the extended review period. The Architect shall endeavor to conduct its review and approval of all submittals in accordance with the Submittal Schedule. In the event that a submittal is made that is not set forth on the Submittal Schedule, the Architect shall review and return such submittal within ten (10) working days from receipt.

Submittals shall be complete as to quantities, details, dimensions and design criteria. The Architect will approve and the College will review submittals if they conform to the Contract Documents, the design concept and good industry practice. The Contractor shall note its approval of all submittals and the date for any submittals prepared by any Subcontractor or supplier, and it shall be responsible for determining and verifying all materials, field dimensions, field construction criteria, and coordination requirements pertaining to the submittal.

The Contractor will not be relieved of responsibility of deviations in submittals from the requirements in the Contract Documents by reason of approvals of the submittals unless the Contractor specifically identifies the deviation in the submittal and the Architect and the College expressly approve the deviation in writing. The Contractor shall be responsible for errors or omission in its submittals. No Work or materials included in a submittal shall begin until the submittal is approved by the Architect and the College.

5.10 Layout And Dimensional Control.

The Contractor shall be responsible for locating and laying out the Project components and all of the Project parts on the Project site in strict accordance with the Plans, and shall accurately establish and maintain dimensional control. The Contractor shall employ a competent and licensed New Jersey engineer or land surveyor as appropriate to perform all layout Work and to fix the level and location of excavations, footing base plates, columns, walls, floors and roof lines. The Contractor shall furnish to the College and the Architect certifications that each such level is as required by the Plans as the Work progresses.

The plumb lines of vertical surfaces shall be tested and certified by the Contractor's engineer or surveyor as the Work proceeds. The engineer or surveyor shall establish all points, lines, elevations, grades and bench marks for the proper control and execution of the Work. The engineer or surveyor shall establish a single permanent benchmark to be approved by the Architect, to which all three coordinates of dimensional control can and shall be based. The engineer or surveyor shall verify all topographical and utility survey data, and all points, lines, elevations, grades and benchmarks furnished by the College.

Should any discrepancies be found between information in the Plans and the actual site or field conditions, the Contractor shall notify the Architect and the College in writing, and shall not proceed with any Work affected until it receives written instructions from the College.

The Contractor is required to provide a final “as built” survey from a New Jersey licensed/certified surveyor of the Project site showing all structures, elevations, grades and required information on the Project site and submit to the College in CADD format.

5.11 Construction Access, Roads, Walks, And Parking.

The Contractor shall construct and keep all roadways, drives, walkways and parking areas within or near the site free and clear of debris, gravel, mud or any other site materials, including, for example, the cleaning of muddy wheels and undercarriages on vehicles before they exit the site. The Contractor shall be responsible for any citations, fines, or penalties imposed on it or the College for failing to comply with applicable local rules or laws regarding its use of roads and the like.

The Contractor shall obtain permission in writing from the College before using for construction purposes any existing driveways, parking areas, walkways or areas not specifically designated for such use in the Contract Documents. The Contractor shall maintain such driveways and areas in good and clean condition during construction and not damage them. At Final Completion, the Contractor shall leave them in the same condition as they were at the start of the Work. Conditions of such facilities before use shall be photographed and otherwise documented by the Contractor. The Contractor shall not commence construction of permanent driveways, parking areas or walks on the Project site without the written approval of the College.

Any existing walkways, driveways, aprons, or curbs damaged by the Work of the Contract Documents shall be replaced in kind, at the Contractor’s expense, immediately upon Project completion, or as required to maintain campus safety and campus aesthetics.

5.12 Construction Site Condition, Storage, Dust Control.

The Contractor shall provide reasonable, safe and orderly storage for its equipment, tools and materials, and shall not unreasonably encumber the site. The Contractor shall keep the site and the Project free from the accumulation of refuse, debris and scrap materials caused by its operations so that the site has a neat, orderly and workman-like appearance. Loading, cartage, hauling and dumping will be at the Contractor’s expense. The Contractor shall provide, at its expense, temporary dust-proof partitions around areas of work in existing buildings, and where reasonably required, in new building areas.

5.13 Photographs.

The Contractor shall provide, at its expense, monthly progress photographs of the Project. The photographs shall be 8 inches by 10 inches and shall be submitted to the College in duplicate monthly. Unless otherwise specified in the supplemental general requirements, four photographs

shall be submitted each month which provide views of the Project taken from the same four points each, which points shall be selected by the Architect.

5.14 Project Sign.

The Contractor shall, at its expense, provide, erect and maintain two Project signs at the site, which shall be described in the Contract Documents. The College will specify the location of the signs. The signs shall be painted by a professional sign painter or prepared by a professional graphic artist. No other signage will be permitted at the site. The signs shall include the name and cell phone number of a Contractor-designated project lead that is available for 24-hour contact in case of emergency. The Contractor shall remove the signs when the Project is finally accepted unless the College requests that they be removed earlier.

5.15 Soil Conservation.

The Contractor shall employ reasonable measures to conserve the soil at the site, and determine and comply with all soil conservation measures required by the Mercer County Soil Conservation District.

The Contractor shall coordinate and schedule all soil conservation inspections, shall provide the College with written notice of all such inspections so that the College may attend the inspections if it chooses in its sole discretion to do so, and shall provide the College with all site inspection notes, approvals or notices.

5.16 Temporary Facilities, Services, Electric, Heat And Enclosures.

The Contractor shall provide storage areas, temporary drives and sidewalks, employee parking areas, staging areas, excavation borrow/spoil areas, commercial canteen areas, field offices including a meeting room, telephones, toilet facilities, and other temporary facilities that are necessary to perform the Work or that may be required by the Project Specifications. The Contractor shall locate these facilities on the Project site, and the location shall be subject to the approval of the College.

The Contractor shall provide adequate and clean temporary toilet facilities on the Project site in locations to be approved by the College, and they shall be serviced at least twice a week by a firm qualified and experienced in such functions. The Contractor shall provide such temporary electricity, water, and other utilities that are necessary to perform the Work, or that may be required by the Project Specifications. The Contractor shall also supply such temporary enclosures and heat that are necessary to perform the Work or that may be required by the Project Specifications. The Contractor and the Subcontractors will not enter or use any College facilities not required by the Work of the Contract.

Temporary electric and heat shall be furnished by the Contractor for the benefit of other contractors working on the Project if specified in the Project Specifications.

The Contractor shall not anticipate using the permanent heating or air conditioning system in a building for temporary heat or air conditioning prior to the acceptance of the Project as Substantially Complete unless specified otherwise.

Any natural gas, combustible material, or hazardous material containers utilized by the Contractor must be stored in a safe, ventilated location approved by the College. The Contractor must also submit for approval a reasonable safety plan for the operation of temporary heat equipment. The Contractor shall be solely responsible for any natural gas, combustible material or hazardous materials containers utilized by the Contractor or any of its Subcontractors and shall indemnify, defend and hold harmless the College from any fines, costs, expenses, liabilities, damages, etc. resulting from the Contractor's or any of its Subcontractors' use of such materials.

5.17 Substitutions.

To the extent that the Contractor includes in its bid substitute materials or equipment or construction methods in lieu of those specified in the Contract Documents, it does so at its own risk. Any substitution must be equal in type, function and quality to the item required in the Contract. The Contractor must submit all information required within 20 days of the Contract award to determine if the proposed substitute is equal to the requirements of the Contract Documents, and any substitution must be approved in writing by the Architect and the College.

The College shall have complete discretion to decide whether it will accept any substitution. No substitution shall result in any increase in the Contract Price or Contract Times. The Contractor in its application for the substitution must certify in writing that the substitution is equal to what is specified in the Contract Documents in all material respects and will not increase the Contract Times or Contract Price of the Work.

Should the substitution be rejected, the Contractor will then be required to provide the specified product, material or method at no additional cost to the College and no change in the Project Schedule.

5.18 License Fees.

The Contractor shall be responsible for obtaining the right to use any equipment, design, device or material required to perform the Contract, and shall include in its Contract Price any license fee or royalty required.

ARTICLE 6 **SUBCONTRACTORS**

6.1 The Contractor's Responsibility For Subcontracted Work.

The Contractor shall be fully responsible to the College for the proper performance of the Contract irrespective of whether the Work is performed by the Contractor's own forces or by Subcontractors employed by the Contractor. The Contractor shall be responsible for the acts and

omissions of its Subcontractors and suppliers on the Project and shall take appropriate measures if they are not properly supervising or performing their Work.

6.2 Subcontractor Identification And Approval.

The Contractor shall have included with its bid for the Contract, the names, addresses and license numbers of all Subcontractors that it proposes to utilize on the Project for plumbing and gas fitting work, HVAC work, electrical work, structural steel and ornamental iron work. No Subcontractor may perform Work on the Project until it has been approved in writing by the College.

Within 20 days after issuance of the Notice to Proceed, the Contractor shall furnish to the Architect and the College in writing for review by the Architect and the College a list of the names of all Subcontractors, sub-subcontractors, fabricators, manufacturers, sources of supply, articles, devices, fixtures, pieces of equipment, materials and processes proposed for each item of Work using AIA Document G705-2001, List of Subcontractors. The Architect and the College will notify the Contractor in writing if either the College or the Architect, after due investigation, has reasonable objection to any names on such list.

In submitting the names of Subcontractors, the Contractor shall (1) list the name and address of the Subcontractor, (2) provide the name and address of all sub-subcontractors for each significant subdivision of the trade or work, and (3) reference in the form of a list at least 3 jobs similar in size and quality to the Project performed by the subcontractor in the last 5 years, with name and location of work, dollar value and names of the College and the Architect.

In submitting sources of supply, articles, devices, fixtures, piece of equipment and materials, including those under subcontracts and sub-subcontracts, the Contractor shall list (1) the name and address of the source of supply, and (2) the name of the manufacturer of the items.

If the College disapproves of a proposed Subcontractor, it will provide the reason for its decision in writing. The College will not be liable for any extra cost or delays caused by the reasonable disapproval of proposed Subcontractors. The approval of Subcontractors by the College shall not relieve the Contractor of the responsibility for complying with all of the provisions of the Contract Documents including those performed by the Subcontractors. Subcontractors approved by the College may not be changed without prior notice to and written approval by the College.

Payment to the Contractor shall not be made until the list of Subcontractors (as required above) has been provided to the Architect and College.

6.3 Subcontractor Qualifications.

The College may disapprove of a proposed Subcontractor if (i) it has a reasonable objection to the Subcontractor, (ii) there is evidence of poor performance on other Projects or financial problems, (iii) the Subcontractor has been suspended or debarred by any public agency within the State of New Jersey, (iv) the Subcontractor is not properly licensed and registered to do business in New Jersey or with the New Jersey Department of Labor regarding prevailing

wages, or (v) the Subcontractor has been charged with or convicted of violating any laws, including but not limited to, the New Jersey Prevailing Wage Act, criminal laws, public procurement laws, anti-trust laws, election laws, laws against employment discrimination, environmental laws, tax laws, professional licensing laws, or laws regarding attempts to improperly influence the College or other public officials.

Subcontractors shall utilize qualified, competent craftsmen on the Project.

6.4 Subcontractor Compliance With Contract/Subcontractor Supervisors.

The Contractor shall require its Subcontractors on the Project to comply with all pertinent terms of the Contract Documents, and shall include all appropriate terms and provisions in written subcontracts on the Project to achieve proper Contract performance. Each Subcontractor shall have competent superintendents and foremen supervising their work, and the Contractor shall take appropriate measures if they fail to do so.

6.5 No Contractual Relationship Between The College And Subcontractors.

The Contractor shall enter into written subcontracts with each and every Subcontractor and supplier solely in its own name. No approval by the College of any Subcontractor or supplier and nothing in the Contract Documents shall create any contractual relationship or duties between the Contractor's Subcontractors and the College. Nothing in the Contract Documents shall cause any of the Contractor's Subcontractors or suppliers to be deemed a third- party beneficiary of the Contract between the College and the Contractor, and nothing herein shall give any of the Contractor's Subcontractors or suppliers any rights or claims directly against the College.

6.6 Contingent Assignment of Subcontracts.

Each subcontract agreement for a portion of the Work and any purchase order for materials or equipment may, in the College's sole discretion, be assigned by the Contractor to the College, provided that

- (a) assignment is effective only after termination of the Contract by the College for cause or for convenience and only for those subcontract agreements that the College accepts by notifying the Subcontractor and the Contractor in writing and only on such terms and conditions acceptable to the College;
- (b) assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract;
- (c) if the College elects to take an assignment of any subcontract or purchase order, the Contractor shall execute all papers necessary to effectuate the assignment; and
- (d) the assignment shall not relieve the Contractor of its existing obligations to any Subcontractor or Supplier, nor shall it cause the College to assume

any of the Contractor's obligations to any Subcontractor or Supplier that arose prior to the termination.

When the College accepts the assignment of a subcontract agreement or purchase order, the College assumes the Contractor's rights and obligations under the subcontract going forward. Upon such assignment to the College, the College may further assign the subcontract to a successor contractor or other entity.

ARTICLE 7
TIME, LIQUIDATED DAMAGES, DELAY CLAIMS AGAINST THE COLLEGE.

7.1 Contract Times.

The Contractor shall begin the Work within 10 days after the issuance of a Notice to Proceed by the College, and shall perform the Work in the Contract Documents by the dates specified in the Notice to Proceed, including Construction Start, Milestone, Substantial Completion and Final Completion Dates (collectively, "Contract Times"). As specified in the Contract for Construction, if the Work is to be performed in phases, the College may issue separate Notices to Proceed for each phase, which shall specify the Construction Start, Milestone, Substantial Completion and Final Completion Dates for that phase. The College may, in its sole discretion and at no cost to the College, choose to delay the issuance of a Notice to Proceed and the Construction Start Date for any phase until after the Contractor has achieved Substantial or Final Completion of any other phase.

7.2 Liquidated Damages For Delay.

If the Contractor fails to Substantially Complete any phase of the Work or the entire Work by the Substantial Completion Date(s) set forth in the applicable Notice to Proceed (as extended by Change Order, if applicable), and the delay is not excused by the College, then the Contractor shall pay the College the amounts specified in the Contract for Construction as liquidated damages for delay for each calendar day that the phase of the Work or the entire Work is not Substantially Completed beyond the applicable Substantial Completion Date

**7.3 Delay Claims By The Contractor Against The College --
Limitations.**

The Contractor may not assert claims against the College for extra compensation by reason of any delays in its Work resulting from acts or omissions of any third parties irrespective of extensions granted under the Contract, including but not limited to delays caused by third parties such as the Architect, other contractors, utilities and governmental authorities.

The College shall only be required to pay additional compensation for delays caused by the College itself, and only to the extent required by N.J.S.A. 2A:58B-3 (delayed performance caused by the College's own negligence, bad faith, active interference or other tortious conduct, but not for reasons contemplated by the parties and not for the negligence of others including

others under contract with the College on the theory that such negligence should be imputed to the College). The College shall not be liable for any period of delay when there is a concurrent delay for which the College is not responsible.

When the Contractor is entitled to extra compensation for delay under the Contract for Construction and these General Conditions, it can only assert claims for extra costs at the job site, and may not assert claims for extra costs for home office expenses, home office overhead, lost profit or revenue, or consequential losses as that term is defined by New Jersey law. Any additional compensation under this Article shall also be subject to the provisions in the Contract for Construction and these General Conditions regarding claims, and the provisions in the Contract for Construction and these General Conditions regarding the maintenance and availability of cost records.

ARTICLE 8 **PROJECT SCHEDULE**

8.1 General Project Schedule Requirements.

The Contractor shall schedule the construction Work and determine the most feasible means and order for the Work to complete the Project within the times required by the Contract. The Contractor shall prepare a Project Schedule and monthly schedule updates, which must be approved in writing by the College and the Architect. The Contractor shall perform the Contract and the Work in accordance with the Project Schedule. The Project Schedule should include a schedule of submittals for approval as required herein. The Project Schedule must be submitted before any Work (other than mobilization to site and general layout and site preparatory work) on the Project can begin under the Notice to Proceed. When the Contractor's Project Schedule is approved in writing by the College, it shall become an additional Contract Document and the Contractor shall be required by the Contract to comply with it. The Project Schedule and any updates to it shall be used in determining the amount of the monthly progress payments to the Contractor. The College may also use the Project Schedule and updates to determine if the Contractor is adequately planning and performing the Work in accordance with the Contract Documents.

8.2 Form And Content Of Project Schedule.

The Contractor shall prepare the Project Schedule using Critical Path Method (CPM) scheduling techniques. The Contractor shall utilize the latest revision of Primavera P3 or Microsoft Scheduling software. The Contractor shall prepare a detailed schedule which shows how it will plan, organize, execute and complete the Work. The Project Schedule shall be in the form of an activity oriented network diagram (CPM). The principles and definitions used in this Article shall be as set forth in the Associated General Contractors of America (AGC) publication "Construction Planning and Scheduling", copyright 1994.

The detailed network diagram shall provide sufficient detail and clarity of form and technique so that the Contractor can plan, schedule and control the Work properly, and the College and the Architect can readily monitor and follow the progress of all portions of the

Work. The network diagram shall comply with the limitations imposed by the scope of the Work and contractually specified Milestone, Substantial Completion, and Final Completion Dates. The Project Schedule shall include the arrow or network diagram and the computer produced schedule with dates. The Project Schedule shall include and reflect the following factors:

- (a) Project phasing, contract Milestone, Substantial and Final Completion Dates.
- (b) The structural breakdown of the Project.
- (c) The types of Work to be performed and the labor trades involved.
- (d) Reasonable logic and activity durations.
- (e) Reasonable coordination of all activities.
- (f) Purchase, manufacture and delivery activities for all major materials and equipment.
- (g) Deliveries of equipment furnished by the College.
- (h) Allowances for work by separate contractors identified in writing by the College at the time of Contract award.
- (i) Submittals and approvals of shop drawings, material samples, and other required submittals.
- (j) Subcontract Work.
- (k) Crew flows and sizes (manpower).
- (l) Assignment of responsibility for performing all activities.
- (m) Access and availability to Work areas.
- (n) Identification of interfaces and dependencies with preceding, concurrent and follow-on contractors, and sequences and interdependence of activities.
- (o) Testing and inspections.
- (p) Phased or total inspection, acceptance, and takeover by the College.
- (q) Utilization of the Project Schedule to determine amounts of monthly progress payments.
- (r) Activities required of the College and the Architect such as approvals, including reasonable durations for the activities.

Activities should be set forth in working days and have a maximum duration of 60 days, except for non-construction activities such as the procurement and delivery of materials and equipment. All durations shall be the result of definitive manpower and resource planning by the Contractor. The level of detail in the Project Schedule shall be subject to the approval of the College. The Project Schedule shall include a reasonable approach to achieve Milestone, Substantial Completion and Final Completion Dates in the Contract. Any failure of the Contractor to include any element of the Work in the Project Schedule shall not excuse the Contractor from completing that Work and all of the Work needed to complete the Project by the Milestone, Substantial Completion and Final Completion Dates in the Contract.

The network diagram is to be prepared by a computer plotter. The logic diagram will be pure logic and shall not be drawn to time scale. The logic diagram shall be drawn on 30" x 42" size sheets and prepared on a tracing/mylar or similar material suitable for reproducing high quality prints.

8.3 Computerization Of Project Schedule.

The mathematical analysis of the detailed network diagram shall be made by computer, and the tabulation for each activity shall include the following:

- (a) Activity numbers.
- (b) Activity descriptions.
- (c) Durations in work days for each activity.
- (d) Earliest start date (by calendar date).
- (e) Earliest finish date (by calendar date).
- (f) Latest start date (by calendar date).
- (g) Latest finish date (by calendar date).
- (h) Slack or total float in work days.

The following computer documents shall be prepared as part of the initial Project Schedule submission and each update:

- (a) Activity file sort, including sorts listing activities required of the College and the Architect, such as approvals.
- (b) Eight week "lookahead" detailed bar chart.
- (c) Eight week summary bar chart.
- (d) Additional computer sorts requested by the College.
- (e) High density CDs or thumb drives of all computer files.

8.4 Weather Inclusion In Project Schedule.

Seasonal weather conditions shall be included in the Project Schedule, including average precipitation, temperature and other weather conditions typical in the geographic area over a 5 year period by month.

8.5 Project Schedule Updates.

The Contractor shall prepare Project Schedule updates monthly until the Project is completed. The first update shall be issued 30 calendar days after the Construction Start Date specified in the Notice to Proceed. Updates shall include the following information:

- (a) Actual start and completion dates for activities.
- (b) Activity percent completion.
- (c) Remaining durations for activities in progress.

Each Project Schedule update shall also include a narrative report that includes the following information:

- (a) Summary of Work completed during update period.
- (b) Comparison of actual progress and status to activities and dates in original Project Schedule.

- (c) Analysis of critical path including effect of activity progress on the Project critical path.
- (d) Analysis of secondary critical paths, meaning float within 10 days of the Project critical path.
- (e) Analysis of time lost or gained during the update period.
- (f) Identification of problem areas.
- (g) Identification of change orders and delays impacting or delaying the Project under the Project Schedule.
- (h) Solutions or proposed solutions to current problems and delays.
- (i) Extensions requested by the Contractor, including activities affected and the amounts, and the reasons for the requests.
- (j) Extensions granted by the College for delays and changes, including the activities affected and the amounts, and any effect on the critical path and Contract Milestone, Substantial Completion and Final Completion Dates.
- (k) Delays in activities required of the College and the Architect, and activities that they are required to complete in the update period following the issuance of the update.

All Project Schedule updates must be submitted to the College and the Architect for written approval. Project Schedule updates, including the reports which are approved by the College, shall be deemed to be official records of the progress and status of the Project under the Project Schedule and the Contract, and may be utilized by the College in determining if the Contractor is adequately planning and performing the Work under the Contract Documents.

8.6 Meetings/Eight Week Bar Charts.

The Contractor's Project Manager and Scheduler shall arrange for and attend monthly progress and scheduling meetings with the College and the Architect. Monthly progress meetings shall be scheduled 3 to 7 days after monthly Project Schedule updates and reports are issued and provided to the College and the Architect. The purpose of these meetings will be to review past progress, current status, problem areas, delays, measures to reduce delays, future progress, and the Contractor's most recent Project Schedule update and report. At the monthly progress meetings, the Contractor shall provide a look ahead summary and detailed bar charts showing the Work and activities to be performed and/or completed during the 8 week period following the Project Schedule update.

8.7 Project Schedule Documentation For Contract Payments.

The Contractor will not be entitled to payments under the Contract until a Project Schedule has been submitted to and approved in writing by the College. No payment will be made under the Contract if, when the payment is due, a Project Schedule update and narrative report is due under this Article but has not been submitted to and approved in writing by the College. The original Project Schedule shall include a breakdown allocating the total Contract Price among the network activities in the Project Schedule, which must be approved by the College.

8.8 Progress and Recovery Project Schedules.

The Contractor shall perform its Work in accordance with the Project Schedule. If the Contractor's Work falls behind the requirements of the Project Schedule, it shall, at its own cost, institute measures to improve its progress and bring its Work in compliance with the Project Schedule, including but not limited to increasing manpower, increasing work hours per shift, increasing shifts, increasing working days per week, and rescheduling Work activities to perform them concurrently where feasible.

If monthly Project Schedule updates show that the Contractor's progress has fallen behind the Project Schedule so as to jeopardize the achievement of Milestone, Substantial Completion or Final Completion Dates by more than 10 work days, the Contractor shall, if requested by the College in writing, prepare a recovery schedule with acceleration measures to regain the lost time, and shall proceed in accordance with the recovery schedule in addition to the Project Schedule at its own cost.

8.9 The Contractor's Failure to Provide Project Schedule Updates.

If the Contractor fails to provide monthly Project Schedule updates and reports when required, the College can elect in its sole discretion to employ any of the following remedies: (i) not make progress payments; (ii) on 10 days written notice to the Contractor, retain its own consultant to provide Project Schedule updates and reports and deduct the cost from the Contract Price; (iii) terminate the Contract for default in accordance with the termination provisions in the Contract for Construction and these General Conditions and/or (iv) make a claim on the performance bond.

8.10 Scheduler Qualifications.

The Contractor must utilize a Project Scheduler that satisfies the qualification requirements for the Project. If at any time during the Project it appears that the Contractor's Project Scheduler is not competent to provide the scheduling services required in this Article, the Contractor shall, within 10 days after a written notice and demand from the College, retain a replacement scheduler that is competent to provide the services required. The College may also utilize any of the remedies provided in the Contract for Construction or these General Conditions for the Contractor's failure to provide proper Project Schedule updates and reports.

ARTICLE 9

EXTENSIONS, COMPENSATION FOR CERTAIN EXTENSIONS.

9.1 Delays Warranting Extensions Of Contract Times.

If the Contractor is unavoidably prevented from completing any part of the Work within the Milestone, Substantial Completion or Final Completion Dates by causes beyond the control and without the fault of the Contractor or its Subcontractors, those Contract Times will be extended by amounts equal to the time lost due to such delays, provided the Contractor requests extensions in accordance with this Article. Delays warranting extensions of the Contract Times

include unforeseeable and unavoidable delays caused by the College, the Architect, other contractors employed by the College, utility owners or other third parties, acts of God, acts of governmental authorities, wars, abnormally severe weather conditions of unusual duration (specifically excluding weather conditions of the type and duration that have been encountered in the area in which the Project is located) that prevent timely delivery of materials or equipment necessary to the completion of portions of the Work or hamper access to the Work by workmen or Subcontractors, fires, floods, earthquakes, epidemics, plagues, and other unavoidable casualties.

Apart from an extension of time, no payment or allowance of any kind shall be made to the Contractor as compensation for damages on account of hindrance or delay from any cause in the progress of the Work, whether such delay be avoidable or unavoidable. The Contractor agrees that it will make no claim for compensation, damages for any such delays, and will accept in full satisfaction for such delays said extension of time.

9.2 Weather Delays.

The Project Schedule shall take into account normally anticipatable adverse weather plus an additional five (5) days of severe and unusual weather conditions that will materially interfere with the timely prosecution of the Work. No time extensions will be granted for time lost due to weather conditions that do not meet the criteria set forth in Article 9.1, and then only to the extent more than five (5) days of delay result from such severe and unusual weather conditions. Owner shall not be required to keep a record of days of precipitation or low temperatures and the burden of proof with respect to weather delays shall be upon Contractor. No time extensions will be considered for any weather conditions that do not affect Work on the critical path or Contract Times.

9.3 Float Time Use.

Float time in the Project Schedule is not for the exclusive use of either the Contractor or the College. Float time is available for use by both parties to facilitate the effective use of available resources and to minimize the impact of problems and delays that may arise during construction. No time extension will be granted as a result of any problem, change order or delay which only results in the loss of available positive float on the Project Schedule. Float time shown on the Project Schedule shall not be used by the Contractor in a manner that is detrimental to the interests of the College or the Project.

9.4 Calculation Of Extensions.

Extensions will be calculated based on the effect of delays on the Project Schedule and the activities in the Project Schedule. If the Contractor is entitled to an extension for a delay based on the nature of the delay under this Article, the activities in the Project Schedule affected by the delay will be extended by the amount they are affected. If extensions of activities in the Project Schedule affect the critical path and delay the Contract Milestone, Substantial Completion or Final Completion Dates, they too will be extended to the extent affected. The critical path and Contract Times will only be extended to the extent that they are actually

affected under the Project Schedule by a delay for which the Contractor is entitled to an extension.

If, for any scheduled activity or period, there are concurrent delays that include delays for which the Contractor is entitled to an extension and delays for which the Contractor is not entitled to an extension, the Contractor will be given an extension for the delays for which it is entitled to extension so that it will not be liable to pay liquidated damages for delay, unless the College eliminates or reduces that delay. A concurrent delay will not justify an extension to the Contractor if it has minimal effect on the completion of the Project, and/or if it would likely have been avoided if it had become apparent that it was having an effect on the progress of the Project and the Final Completion Date.

9.5 Elimination of Delays and Extensions (Acceleration).

If the effect of a delay for which the Contractor is entitled to an extension can be reduced or eliminated by changes in the Project Schedule or other measures which have no material adverse impact on the Contractor in terms of cost or otherwise, the Contractor shall employ those measures so that no extension is required or so that a shorter extension is required. If the Contractor is entitled to extensions for delays, and if the College (in its sole discretion) notifies the Contractor in writing that it prefers to eliminate the lost time to avoid or reduce the extension required, by changes or additional efforts such as acceleration efforts, the Contractor shall perform those measures as a change to the Contract to be compensated under the change order provisions in the Contract for Construction and these General Conditions.

9.6 Requests For Extensions Required.

The Contractor must provide the College with a written notice of delay and request for an extension within 24 hours of the beginning of a delay. The written notice of delay and request for extension must include the nature and cause of the delay, the known extent of the delay, the Work activities on the Project Schedule affected by the delay, and the extent of the effect to each, and suggestions or proposals to reduce or eliminate the delay. This limited time frame is to provide the College the opportunity to immediately address the issue and limit the amount of time in the potential delay and its potential impact on the Project Schedule.

9.7 Compensation For Certain Extensions And Limitations.

Under the Contract for Construction and these General Conditions, the College does not assume responsibility for many types of delays, including additional costs resulting from extensions granted because of those delays. Where the College is responsible for a delay under the express terms of the Contract for Construction and these General Conditions, it will pay extra compensation for any extension granted because of the delay.

Compensation by the College for delays (and extensions) for which it is responsible under the Contract for Construction and these General Conditions shall only include additional costs actually incurred at the site, and shall not include home office expense, home office overhead, lost profit or consequential losses. Any additional compensation under this Article shall be subject to the provisions in the Contract for Construction and these General Conditions

regarding claims, and the provisions in the Contract for Construction and these General Conditions regarding the maintenance and availability of cost records.

No compensation will be paid if an extension for a delay for which the College is responsible is concurrent with another delay for which the Contractor is not entitled to an extension, or is concurrent with another delay for which the Contractor is entitled to an extension but the College is not responsible for the other delay.

If the College requests a change in the Contract Work, potential delays and extensions that result from the change and any resulting extra compensation for the change shall be addressed under the change order provisions in the Contract for Construction and these General Conditions in addition to this Article.

ARTICLE 10 **PAYMENTS TO THE CONTRACTOR.**

10.1 Contract Price.

The College will pay the Contractor as full compensation for performing the Work the Contract Price as adjusted by approved change orders that increase or decrease the Contract Price. The College will do so in accordance with this Article, any supplemental General Conditions regarding payment, and the payment terms in the Contract for Construction. Payment provisions in the supplemental General Conditions that add to or modify this Article shall take precedence over this Article. Payment provisions in the Contract for Construction that add to or modify payment terms shall take precedence over the supplemental General Conditions and this Article.

10.2 Monthly Progress Payments.

The College will pay the Contractor monthly progress payments as the Work proceeds and will pay for the Work completed, less retainage. The Contractor shall submit monthly invoices using the College's invoice form for the Work completed in each calendar month, and the monthly invoice shall be submitted in accordance with the Contract. The Contractor shall be entitled to monthly progress payments based on the percentage of the Work completed (less earlier payments), and that amount shall be based on the Unit Schedule Breakdown and the update of the Project Schedule for the billing period showing schedule activities completed and progress on incomplete activities, in conjunction with the values assigned to those activities. If there is a discrepancy between the amount due based on the Unit Schedule Breakdown and the amount due based on the Project Schedule update, the Contractor shall only be entitled to the lesser amount unless the College's Representative, in his/her sole discretion, decides otherwise. Payments made by the College shall be used by the Contractor solely for purposes of this Project and for paying Subcontractors, suppliers, and for labor and materials, and shall not be used to pay debts owed by the Contractor outside of the Project.

10.3 Unit Schedule Breakdown/CPM Activity Price Breakdown.

Before the Contract for Construction is signed, the Contractor shall submit to the College and the Architect a Unit Schedule Breakdown (schedule of values) utilizing the College's form (AIA Documents G702/G703) which reasonably allocates the Contract Price among the principal categories of Work and materials in the Contract. The Unit Schedule Breakdown must be signed by the Contractor and is subject to written approval by the Architect and the College for use in calculating monthly progress payments under the Contract. The Contractor shall not "front end load" the Unit Schedule Breakdown. The Unit Schedule Breakdown may include line items for mobilization, bonds and insurance.

The Contractor's proposed Project Schedule shall reasonably allocate the Contract Price among the activities in the schedule so that monthly Project Schedule updates can be utilized in connection with the Unit Schedule Breakdown in determining the amount of monthly progress payments. The Contractor's Unit Schedule Breakdown and Project Schedule activity price breakdown must be approved in writing by the Architect and the College before any payments are made under the Contract.

10.4 Invoices For Monthly Progress Payments: Form and Content.

The Contractor must utilize the College's invoice form and the invoice forms (AIA Documents G702/G703 and waiver attachments) must be completed before they are submitted for payment. Each invoice must be signed by the Contractor, and shall certify that the Work and materials represented as having been provided have been provided, and that all Subcontractors and suppliers on the Project have been paid all amounts legitimately due for Work and materials billed to the College in earlier invoices that were paid by the College. The Contractor's submission of an invoice constitutes an affirmative representation and warranty by the Contractor that it performed the Work in compliance with the Contract Documents and applicable laws, codes and regulations.

Invoices for monthly Project payments must include the status of the Work in the Unit Schedule Breakdown and the Project Schedule update for the billing period that shows the activities completed or started and the value of them based on the Project Schedule. Invoices must also include certified payrolls for the Contractor and all Subcontractors for the billing period, affirmative action monthly manning reports, a certification of Subcontractor/supplier payments, the College's acknowledgment of progress payment and release of liens and claims form duly executed by the Contractor, the College's acknowledgment of progress payment and release of liens and claims form duly executed by each Subcontractor and supplier who has furnished labor or materials that are the subject of the current invoice, a list of all materials stored to date including descriptions, values, quantities and location, and any other documents required in the Contract Documents.

The Contractor will be entitled to have an invoice paid if the Architect and the College approve in writing the invoice including the percentage of Work completed, and if the quality of the Work and materials conform to the Contract Documents. The approval of invoices shall not waive claims for defects or deficiencies in the Work or materials provided, or the right to subsequently inspect the Project as a complete and functioning whole.

10.5 Payment For Materials And Equipment Procured But Not Installed.

The Contractor may seek payment in monthly invoices for materials and equipment delivered to the Project site but not yet incorporated into the Work. The Contractor shall include with its monthly invoices a list of the stored equipment, the amount and type of stored materials, and the place where they are stored. Each invoice that seeks payment for materials and equipment delivered to the Project site but not installed or incorporated into the Work shall include a signed bill of sale to the College and an invoice from the supplier. All risk of loss or damage for materials and equipment delivered to the Project site shall remain with the Contractor.

The College will only rarely pay for material or equipment stored offsite, and only when it determines, in its sole discretion, that there is good cause. The College will consider no request to pay for materials or equipment stored off site unless the Contractor includes a written request for such payment with its bid for the Project. If the College does agree to pay for material or equipment stored offsite during the performance of the Contract, it will do so when the Contract for Construction is signed.

If the College does agree to pay for materials and equipment stored offsite, such payments shall be subject to any conditions in the signed Contract, and in all cases, a bill of sale to the College, a paid invoice, insurance and proof the storage facility is bonded will have to be provided to the College when each payment is sought. The location will have to be specified in writing and the material or equipment will have to be inspected by the College. The Contractor and its performance bond surety must agree in writing that they retain all risk of loss or damage, and each payment application must contain a consent to payments for materials stored offsite signed by the Contractor's bonding company.

Payments on account of materials or equipment not incorporated into the Work but delivered and suitably stored at the site, or at some other location agreed upon in writing, may be made by the College subject to the following conditions:

- (a) Such materials or equipment shall have been fabricated or assembled specifically for the Project and delivered to storage no earlier than needed for the orderly progress of the Work as demonstrated by the Project Schedule.
- (b) Title to such materials or equipment shall pass to the College pursuant to the Contractor's bill of sale, which shall contain guarantee of replacement thereof in the event of damage thereto or disappearance thereof due to any cause. The Contractor shall also affirm that it will pay for such materials or equipment immediately upon receipt of payment therefore from the College.

In the case of offsite storage, the Contractor shall also provide Consent of Surety to such payment and insurance of such materials or equipment against the perils set forth in these General Conditions both while storage and during transportation to the site. Raw materials or other materials or equipment readily duplicated or usable on other projects will be paid for only

after the materials are incorporated into the construction.

10.6 Retainage.

The College will retain 2% of the amount due on each partial payment pending Final Completion of the Contract.

Retainage amounts being withheld by the College shall be released and paid in full to the Contractor within 45 days of the Final Completion Date agreed upon by the Contractor and the College, without further withholding of any amounts for any purpose whatsoever, provided that the Work has been Finally Completed as indicated.

10.7 Payment For Change Order Work.

The Contractor shall invoice for change order work in the monthly progress payment invoices as the change order work is performed, but may only do so after a written change order has been signed by the appropriate College personnel and a TCNJ Purchase Order is issued by the College.

10.8 Final Payment.

Upon Final Completion of all the Work including all change orders, upon final acceptance of the Work by the Architect and the College, and upon the issuance of the Certificate of Final Completion, the Contractor will be paid the fully adjusted Contract Price including any retainage. The Contractor shall submit an invoice for the final payment. The final invoice must be accompanied by the College's acceptance of final payment and release of liens and claims form duly executed by the Contractor, the College's acceptance of final payment and release of liens and claims form duly executed by each Subcontractor and supplier who has furnished labor or materials that are the subject of the final invoice, all warranties, guarantees, manufacturer literature, approved as-built drawings, shop drawings required, and any other documents that the Contractor is required by the Contract Documents to provide to the College at the time of Final Completion. The final invoice must also include a written signed consent to the final payment signed by the Contractor's bonding company.

10.9 Payment Terms.

All invoices and payments shall be subject to the terms of the Contract for Construction and these General Conditions, including the provisions regarding payments, and to the right of the College to withhold payments or to make deductions from payments for damages, defective work, liquidated damages, third-party claims, failure to complete Work, failure to comply with requirements of the Contract Documents, failure to comply with Prevailing Wage Act requirements set forth in the Contract for Construction and these General Conditions, failure to comply with Project Schedule obligations, or other causes authorized by the Contract Documents.

10.10 Payment Based On Partial Acceptance (Limitation).

The College will not accept portions of the Project as Substantially or Finally Complete unless specified elsewhere in the Contract Documents. If the Specifications authorize partial acceptances, they will also specify the terms and conditions of such acceptances.

10.11 Failure To Pay Amounts In Dispute Not To Affect Performance.

The failure of the College to pay any amount requested by the Contractor in an invoice based on a determination that the invoice is improper or some other dispute shall not entitle the Contractor to stop or slow down the performance of the Work.

10.12 Reasons For Withholding Payment.

In addition to the reasons set forth elsewhere in the Contract for Construction and these General Conditions, the Architect or the College may also withhold payments to the Contractor, or, because of subsequently discovered evidence, may nullify the whole or a part of a payments previously issued to the Contractor, to such extent as may be necessary in the Architect's or the College's opinion to protect the College from loss for which the Contractor is responsible because of

- (a) defective Work not remedied;
- (b) third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the College is provided by the Contractor;
- (c) failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- (d) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;
- (e) damage to the College or a separate contractor;
- (f) reasonable evidence that the Work will not be completed within the Contract Times, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- (g) failure to comply with requirements for monthly progress payments pursuant to Article 10.4; or
- (h) failure to carry out the Work in accordance with the Contract Documents.

When the above reasons for withholding payment are removed, payment will be made for amounts previously withheld.

If the College withholds or the Architect recommends that the College should withhold payment from the Contractor under subsection (c) above, the College may, after providing the Contractor with written notice and an opportunity to cure, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. However, by doing so, the College is not undertaking any payment obligation on the part of the

Contractor, nor does any Subcontractor have any claims against the College or any right to future joint check payments.

10.13 Set-Off For State Tax Indebtedness.

Pursuant to N.J.S.A. 54:49-19, and notwithstanding any other provision of law to the contrary, if the Contractor or any of its Subcontractors or suppliers are indebted to the State of New Jersey for any State tax, the College may withhold and/or set off any payments due to the Contractor as may be necessary to satisfy such indebtedness and/or pending resolution of the indebtedness.

10.14 Maintenance Of Cost And Accounting Records.

The Contractor shall maintain and retain weekly payroll, material, Subcontractor, supplier, overhead and other cost and accounting records for the Project, and for additional services or extras required by the College, including all costs that the Contractor is entitled to be paid under the Contract. The Contractor shall require its Subcontractors on the Project to do likewise. The Contractor shall also maintain all estimates and takeoffs used in preparing and calculating its bid price for the Contract and change orders. Pursuant to N.J.A.C. 17:44-2.2, the Contractor shall also maintain all documentation related to products, transactions or services under the Contract. The records shall be maintained and shall be made available to the College or its representatives when requested. These records shall be maintained in accordance with generally accepted accounting principles and practices for a period of 5 years after final payment is received by the Contractor, or the duration of any dispute or lawsuit arising out of the Project, whichever is later, and shall be made available to the College or its representatives and the New Jersey Office of the State Comptroller when requested.

Any failure to maintain or produce the records required by this Article shall preclude the Contractor from claiming or being paid or retaining any payments or being paid on any claims that are based on costs or that should be, and expenses or losses incurred by the Contractor or its Subcontractors including extra costs that are or that should be reflected in the records required by this Article or good business practices. This record keeping requirement applies to records related to the basic Contract Price as well as extra compensation for change orders and claims of all kinds.

No claim by the Contractor against the College for payment, whether for Contract Work, extras, changes or claims that is based to any degree on costs that should be recorded in cost records required by this Article or good business practices may be asserted against the College to the extent the cost records do not exist or are not provided to the College upon demand.

The College reserves the right to audit the records of the Contractor and its Subcontractors at any time and for up to 3 years after the Final Completion of the Project. If an audit reveals overpayment by the College, the Contractor shall refund the cost of the audit and the overpayment to the College, or the College may deduct the cost of the audit and the overpayment from future payments under the Contract, or the College may assert claims against the Contractor and/or its surety for the cost of the audit and such overpayments.

10.15 Written Evidence of Payment to Subcontractors.

The College has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers' amounts paid by the College to the Contractor for subcontracted Work. Such evidence shall include acknowledgment of progress payment and release of liens and claims forms duly executed by each Subcontractor and supplier for payments previously made to the Contractor. If the Contractor fails to furnish the College with the written evidence that it has properly paid Subcontractors and material and equipment suppliers, the College shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the College nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law. The College may, in its sole discretion, issue checks made payable jointly to the Contractor and a Subcontractor; however, by doing so, the College is not undertaking any obligation on the part of the Contractor, nor does the Subcontractor have any claims against the College nor any right to future joint check payments.

ARTICLE 11 **CHANGES.**

11.1 Changes Authorized.

The College may at any time authorize and direct changes in the Work or accelerations of the Work that change the scope of the Work and that increase or decrease the Contract Price. All changes including changes in the Contract Price shall be governed by this Article. All changes must be in a written change order signed by the Vice President for Administration, the College's Representative, the Architect and the Contractor. A TCNJ Purchase Order will then be issued by the College and signed by the Contracting Officer, after which time, the Contractor can then bill for the completed change order Work. Any extensions in the Contract Times and increases in the Contract Price because of extensions resulting from changes shall be governed by Article 9 of these General Conditions regarding extensions, but the authorization for the extra compensation itself resulting from an extension must be contained in a change order that complies with this Article as well. The College may elect to have changed Work on the Project that is within the scope of the Contract Documents performed by another contractor. Changes in the Work shall not affect the surety bond protection or insurance coverage required by the Contract Documents.

11.2 Change Request Or Directive.

The College may request a change in the Work or materials to be provided under the Contract Documents by a written Contract Change Directive ("CCD") signed by the College's Representative. If the College is of the opinion that no change in the Contract Price or Contract Times is required because of the change request, it shall so state in the CCD. A CCD may include provisions regarding the scope of the changed Work or materials, and may also include conditions including time parameters. A CCD may provide that specified Work shall stop until further notice, but the Contractor shall not stop or delay any Work because of a CCD unless the CCD provides that Work should stop because of the change. A CCD may provide that the performance of changes shall not commence until a change order is issued and a subsequent

TCNJ Purchase Order is issued and signed by the Contracting Officer, or that changed Work should proceed before a change order and TCNJ Purchase Order are issued by the College to maintain the progress of the Project.

11.3 Change Orders Which Are Protested.

If the Contractor protests the terms of a change order, it shall notify the College of its protest in writing within 2 business days of the issuance of the Change Order. It shall describe the terms that it objects to and the reasons for its protest. It shall include supporting documentation if appropriate, including detailed justification for any Contractor requested additional compensation based upon unavoidable additional costs. The College may elect to direct the Contractor in writing to perform the change order requirements despite the protest. If it does so, the Contractor's right to pursue further relief based on the protest shall be preserved and the Contractor shall immediately proceed with the change Work

11.4 Changes Affecting Contract Times.

Changes and change orders shall not affect or extend any of the Contract Times unless the change order itself specifies that it changes Contract Times. If a change order issued by the College delays the completion of any activity in the Project Schedule, the time allowed for that activity shall be extended, and if a delay in that activity delays other activities, the critical path or the Completion Dates in the Contract, they too will be extended. The Contractor shall make reasonable efforts in scheduling changed Work so that it does not delay or extend activities in the Project Schedule critical path, including any Milestone Dates, the Substantial Completion Date and the Final Completion Date. The Contractor shall also make alternate proposals for change order Work that include acceleration for the changed Work where feasible to achieve this goal, and shall include the cost of such efforts in its change order requests and proposals.

Change orders must specify whether they result in any delay (or extension) to any critical path activities in the Project Schedule, including an identification of the activities and the amount of delay in each. If no delay or extension is set forth in a change order, it will be deemed an agreement by the College and the Contractor that no delay or extension results from the change order.

11.5 Contractor Initiated Change Order Requests.

If the Contractor contends that any directive or communication from the College or Architect, or any condition, event or circumstance entitles it to a change order changing the scope of the Work, terms of the Contract Documents, Contract Price or Contract Times, it shall submit a written change order request to the College's Representative within 5 days of the event upon which the request is based. The written request shall specify the terms of the change order requested, and include all documentation and information that the Contractor seeks to have considered in support of the request, or that is necessary to a proper consideration of the request.

11.6 Change Order Amounts.

All price changes or amounts in change orders shall be based on (i) lump sum, (ii) actual work time and materials plus mark-ups for overhead and profit, or (iii) unit prices times actual quantities that may or may not include separate mark-ups for overhead and profit. If a change order price is to be based on a lump sum price or a unit price, the College may request the submission of such documentation regarding market price or cost which it reasonably deems necessary to determine a lump sum or unit price. If a change order is based on actual work time and material costs, it will include a not-to-exceed price.

Applications for payment for change order Work shall be included in monthly progress payment invoices as the change order work is performed, but only after a TCNJ Purchase Order has been issued to the Contractor by the College. For change orders based on time and material costs or unit prices times actual quantities, the time spent, material provided, and quantities performed shall be recorded in daily time slips, material invoices, and quantity of work performed tickets that are signed by the College's Representative to certify that the Work and materials were provided, and the quantities. Labor costs and material costs for change orders shall be based on actual costs to the Contractor without any mark-ups except as provided in this Article.

Mark-ups may be added to time and material costs where a change order is authorized to be paid on a time and material basis, and also unit price change orders if the change order price term expressly authorizes mark-ups as a separate additional charge to be added to the unit price. When mark-ups for overhead and profit are authorized, the standard mark-up for overhead and profit shall be 15% of net costs properly invoiced in the change order. The schedule for mark ups is as follows:

- 15% of direct costs for overhead, profit, bond, and insurance for Work performed directly by the Contractor;
- 15% of direct costs for overhead, profit, bond, and insurance for Work performed directly by the Subcontractor and 5% of the direct and indirect costs of the Work performed by the Subcontractor for the Contractor; and
- 15% of direct costs for overhead, profit, bond, and insurance for Work performed directly by the Subcontractor's subcontractor and 5% of the direct and indirect costs of the Work performed by the Subcontractor's subcontractor for the Subcontractor and 5% of the direct and indirect costs of the Work performed by the Subcontractor for the Contractor.

There shall be no additional mark-ups for materials or supplies. Bond and insurance costs are included in the noted mark ups above. Refer to Division 1 Specifications also for further delineation of items included in mark-ups.

THE CONTRACTOR MUST USE THE COLLEGE'S CHANGE ORDER FORM INCLUDED IN THE PAYMENT PROCEDURE DOCUMENTS.

11.7 Right To Audit Extra Costs (Before And After Payment).

The College reserves the right to audit all change orders and additional costs claimed and/or paid under the Contract at any time. The obligation of the Contractor, Subcontractors and suppliers to establish, maintain and produce cost records and remedies for failing to do as specified elsewhere in these General Conditions and the Contract for Construction shall govern. If an audit reveals that actual costs invoiced to the College and/or paid by the College in change orders exceed the actual costs incurred, the Contractor shall refund the excess, or the College may deduct the excess from future payments under the Contract, or the College may assert claims against the Contractor and/or its surety for such overpayments.

11.8 Change Orders With Both Price Increases and Decreases.

If a change order reduces the scope of the Work or materials to be provided by the Contractor under the Contract, the change order shall provide for a reduction in the Contract Price in the amount of the actual reduction in cost. If a change order results in both added costs and reduced costs, they shall be combined for a net plus or minus Contract Price adjustment, and when mark-ups are applicable, they shall only be added to a net increase in the Contract Price which results from a combination of additions and deductions in the change order.

11.9 Waiver Of Rights In Connection With Change Orders Issued Without Protest.

The Contractor shall not be entitled to seek any additional compensation or any extension of the Contract Times beyond the amounts and any extensions included in a change order signed by the College or a written change order request submitted by the Contractor to the College for approval, the intent being that the Contractor must disclose all additional costs and delays claimed to result from a change so that the College can take measures in considering the change to effect cost savings and avoid delays. The failure to include extra costs or delays in a change order request will preclude the Contractor from later claiming such costs or delays in connection with the change in any form or fashion.

ARTICLE 12 **COMPLETION.**

12.1 Substantial Completion.

When the Contractor believes that the Project (or a specific phase of the Work, if the Work is to be performed in phases) is Substantially Complete, meaning all essential requirements of the Work have been sufficiently completed so that the Project (or a specific phase) can be occupied and used for its intended purpose (and as further defined in the College's Division 1 specifications for capital projects), it can make a written request to the Architect and the College to conduct an inspection and to issue a Certificate of Substantial Completion. The Contractor's request shall list all Work and requirements of the Contract Documents that remain to be completed or corrected and an estimate of the value of the incomplete items and the dates by which those items of the Work will be completed, but in no event shall it be more than thirty (30) days from Substantial Completion.

The Architect and the College will conduct an inspection, and if they determine the Contractor has Substantially Completed the Project (or a specific phase of the Work, if the Work is to be performed in phases), the College will issue a Certificate of Substantial Completion. If the Architect and the College determine that the Contractor has not achieved Substantial Completion, the College will notify the Contractor in writing and will list the Work and requirements of the Contract Documents that must be completed for Substantial Completion and provide a punchlist. The Architect and the College will also assign a value to the incomplete items to be added to the 2% retainage held after the Certificate of Substantial Completion is issued. The College and the Architect will re-inspect when the Contractor notifies them in writing that those items have been completed.

Any failure of the College or Architect to include incomplete or deficient items in a Certificate of Substantial Completion or a notice regarding a Substantial Completion inspection shall not affect the Contractor's obligation to properly complete all requirements of the Contract.

The College will not issue a Certificate of Substantial Completion unless it can occupy and use the Project (or the phase of the Work) for its intended purpose, and the Contractor agrees that the College's use and occupancy of the Project (or the phase of the Work) shall not affect the Contractor's obligation to complete the Project and requirements of the Contract Documents. The Contractor also agrees that its completion of the Project will not unreasonably interfere with the College's occupancy and use of the Project (or the phase of the Work) and that the College's occupancy will not impede the Contractor's completion of the Work to Final Completion.

Unless otherwise specified in the supplemental General Conditions, a Certificate of Substantial Completion will not be issued unless an unqualified temporary or permanent certificate of occupancy is issued, and the College is able to use and occupy the Project (or the phase of the Work) without interruption.

The issuance of a Certificate of Substantial Completion shall not void or alter any of the other terms of the Contract Documents, including but not limited to terms relating to warranties, or relieve the Contractor of its obligation to complete the Work or remedy defective Work or materials, unless such terms are expressly modified by the Certificate of Substantial Completion.

Guarantee periods for equipment, workmanship and materials shall commence when the Certificate of Substantial Completion is issued or from the completion and acceptance of equipment, workmanship or materials, whichever is later, unless otherwise specified in the supplemental General Conditions or the Certificate of Substantial Completion.

The rights of the Contractor regarding payments upon the issuance of the Certificate of Substantial Completion shall be as provided in the payment provisions of the Contract for Construction and these General Conditions.

12.2 Final Completion.

The Contractor shall notify the Architect and the College in writing when it has completed the entire Project (or a specific phase of the Work, if the Work is to be performed in

phases) and has satisfied all of the requirements of the Contract Documents for Final Completion. The Architect and the College will then conduct an inspection, and if they determine that the Contractor has completed the entire Project (or a specific phase of the Work, if the Work is to be performed in phases) and has satisfied all of the requirements of the Contract Documents for Final Completion, the College will then issue a Certificate of Final Completion. If any items remain incomplete or unsatisfactory, the College will notify the Contractor in writing and list the incomplete or unsatisfactory items. The Contractor shall immediately complete and correct any unfinished items and notify the Architect and the College in writing and request a follow-up inspection for Final Completion.

The Certificate of Final Completion will not be issued until all documents required by the Contract Documents have been provided, including the College's acceptance of final payment and release of liens and claims forms duly executed by the Contractor and any Subcontractors and suppliers who have furnished labor or materials under the Contract, warranties, maintenance and operating instructions, certificates, insurance, shop drawings required, and as-built drawings approved by the Architect. Final Completion must include leaving the entire Project site and the Project (or the phase of the Work) clean, neat and orderly. All distortions, cracks, delaminating and deteriorations of finished surfaces must be remedied. All broken items shall be repaired. All paint spots, stains and plaster must be removed. All unused equipment and excess material shall be removed. The Project and the Project site (or the phase of the Work) shall be clean and finished.

If the Contractor unreasonably delays completing and correcting items needed for the issuance of the Certificate of Final Completion, the College may unilaterally issue a Certificate of Final Completion that lists incomplete and defective items, and that deducts any applicable liquidated damages and the cost of remedying incomplete and defective items from the final amount due to the Contractor under the Contract.

Final payment will not be made until the Certificate of Final Completion is issued, and the final payment shall be subject to the payment provisions in the Contract for Construction and these General Conditions.

ARTICLE 13 **SUSPENSION AND TERMINATION OF CONTRACT.**

13.1 Suspension By The College.

The College shall have the right to stop or suspend the Work in whole or in part at any time. The Work may only be stopped or suspended by a written directive of the College's Representative, except in an emergency. The College's Representative may stop or suspend the Work in whole or in part on an emergent basis, either verbally or in writing, but any such emergent suspension or stop Work order shall be confirmed by a written directive from the College's Representative within 48 hours. The College may stop or suspend the Work because of any conditions affecting health or safety on or off site, any dangerous condition, any environmental hazard, the convenience of the College, or the public interest. If a directive to

stop or suspend all or part of the Work includes directions to secure the site, the Contractor shall perform the Work required in the directive. The Contractor shall also maintain the safety and security of the Project during the suspension for the protection of the site, Work in place, materials and equipment on site, persons on or near the site, and the College's property.

If all or part of the Work is suspended in response to a problem or condition caused by the Contractor's performance of its Contract, or parties other than the College itself, or conditions over which the College has no control, the Contractor will not be entitled to any additional compensation for the suspension. If the College directs the suspension of Work because of the improper performance of the Contract by the Contractor or those performing its Contract, the Contractor will not be entitled to any extension of any Contract Times or additional compensation by reason of the suspension. If a suspension is directed for reasons other than the fault of the Contractor or others involved in its performance of the Contract, the Contractor will be entitled to an extension under and to the extent authorized in Article 9, and additional compensation under and to the extent authorized by Article 11.

13.2 Termination For Convenience.

The College may, by a written directive, terminate the Contract at any time before completion for the College's convenience or where it concludes that it is in the public interest to do so. The Contractor shall complete any items of Work specified in the notice of termination for convenience and any Work necessary to make the site safe for all persons and property at or near the Project site when the College terminates the Contract for convenience under this Article.

Absent the Contractor fault or violation of the Contract, the Contractor shall be paid in full for all properly completed Work, subject to the payment provisions in the Contract for Construction and these General Conditions. The Contractor will not be entitled to payment for costs and mark-ups for Work or materials not provided before the termination, or costs for Work and materials not provided unless the Contractor cannot avoid liability to pay those costs, or profit or overhead on the portion of the Contract that will not be performed because of the termination, or other types of damages. The extra compensation payable to the Contractor in connection with a termination for convenience may include the cost of materials or equipment purchased for the Project before termination but not installed if the Contractor cannot otherwise use or sell them.

The Contractor will also be entitled to reasonable termination costs in reasonable amounts for additional direct costs in connection with the termination, but not administrative, home office or overhead costs, lost profit, or consequential damages. In addition, any claims shall be subject to the provisions in the Contract for Construction and these General Conditions regarding claims and the maintenance of cost records.

The Contractor shall include provisions similar to this Article in subcontracts and supply contracts for the Project. When a termination for convenience is directed by the College, the Contract shall be closed out in accordance with the provisions of the Contract for Construction and these General Conditions regarding payment and Project completion.

13.3 Termination For Cause.

The College may terminate the Contract for cause if the Contractor (i) commits violations of the Contract Documents, (ii) fails to perform the Work in accordance with the Contract Documents including the Project Schedule, (iii) fails to comply with applicable laws, rules or regulations, (iv) fails to pay Subcontractors or suppliers to the extent reasonably required, (v) becomes insolvent or becomes a debtor in a bankruptcy proceeding, (vi) fails to pay its debts, (vii) is found to have made false or misleading statements to the College in writing in obtaining the Contract or payments, (viii) fails to comply with employment discrimination laws, (ix) fails to pay prevailing wages, (x) fails to maintain or renew the required insurance, (xi) fails to maintain proper protection for the safety of persons or property on the site, (xii) fails to comply with reasonable and authorized directives of the College under the Contract, or (xiii) assigns its rights or interests under the Contract or payments under the Contract to any third party.

If the College terminates the Contract for cause, it shall first send a notice of intent to terminate to the Contractor and the Contractor's surety. The notice shall direct the Contractor to remedy or eliminate the deficiency within a specified time if the problem is one that can be eliminated. If the Contractor fails to reasonably comply with the directive and notice, the College may after 10 days issue a notice of termination to the Contractor and its surety which terminates the Contract effective immediately and specifies the reason for the termination.

If the Contract is terminated, the Contractor shall secure the site and take measures to leave the site safe for persons, material, Work in place and equipment before departing the site, and shall remove all tools and equipment within 5 days of the termination effective date. The Contractor shall not remove any materials or equipment stored on site unless directed to do so by the College. When the Contract is terminated, the Contractor shall deliver materials purchased for the Project and paid for by the College, but not stored on site, together with all appropriate warranties and guaranties to any location designated by the College.

If the Contractor's surety does not take over the completion of the Work in accordance with this Article, the College may appropriate any or all materials on the site that may be suitable and acceptable and may enter into an agreement for the completion of the Work with another contractor, or use other methods to complete the Work.

All damages, costs and charges incurred by the College together with the cost of completing the Work, will be deducted from any monies due or which may become due to the Contractor for Work properly completed by it before the termination. If such expenses exceed the sum available from the unpaid Contract Price, the Contractor and its surety shall be liable and shall pay to the College the amount of such excess in addition to other damages.

The rights and remedies of the College in connection with a termination for cause shall be in addition to other rights and remedies which it has under law, the Contract, and the Contractor's bond.

If the College terminates the Contract for cause and it is subsequently determined by a court that the Contractor was not in default, or that the termination was legally unjustified, the termination will be deemed to be a termination for convenience under this Article, and the rights

and remedies of the Contractor and its surety for the termination will be limited to those which exist in connection with a termination for convenience. If the College terminates the Contract for cause, the Contractor may not file a suit to recover on any claims arising out of the Project before the Work is Substantially Complete.

13.4 Surety Takeover Following Termination For Cause.

If the College terminates the Contractor for cause, the Contractor's performance bond surety may elect to takeover and complete the Contractor's Work and obligations under its Contract. If the surety elects to take over the completion of the Contract, it may only do so on the following conditions:

- (a) The surety must notify the College that it will take over completion of the Contract by a written notice of intent signed by a representative authorized to bind the surety within 5 calendar days of the surety's receipt of the College's notice of termination.
- (b) The surety and the College must execute a written takeover agreement within 10 days after the surety sends its notice of intent to takeover. The takeover agreement signed by the surety and the College, must:
 - i. contain an acknowledgement and agreement by the surety to assume the obligation to complete the balance of the Work under the Contract and to perform all of the Contractor's obligations under the Contract at the surety's sole cost and expense, and to utilize only contractors approved by the College to complete the Work, which approval shall not be unreasonably withheld;
 - ii. provide that the surety is entitled to be paid the unpaid balance under the terminated Contractor's Contract in accordance with and subject to the terms of the Contract for Construction and these General Conditions;
 - iii. provide that the surety is not relieved of any of its obligations under its payment and performance bond for the Project, and that the College retains its right to withhold money for Contract payments to compensate for damages or for other reasons where authorized under the Contract for Construction or these General Conditions; and
 - iv. provide that it is without prejudice to and is subject to all of the rights and remedies of the College, the surety, and the defaulted Contractor, and the surety may not require the College to agree to a takeover agreement that seeks to extinguish any such rights.
- (c) The surety must also pay without delay all obligations of the terminated Contractor for Work and materials on the Project, subject to a reasonable allowance of time to investigate and verify claims.

13.5 Suspension By The Contractor For Non-Payment.

If the Contractor is not paid sums due under an approved invoice within thirty (30) days of the billing date, it may suspend performance without penalty for breach of Contract, but only

after providing the College with 7 days written notice of non-payment, and only in the event that the College fails to furnish the Contractor, within that 7 day period, with a written statement of the amount withheld and the reasons for the withholding. Nothing herein shall be construed to excuse the Contractor's nonperformance, or to limit the College's rights and remedies relating to such nonperformance, with regard to any monies withheld from the Contractor upon the proper notice provided under this Article, or with regard to any Contractor claim disputed by the College.

ARTICLE 14 **WARRANTY/DEFECTIVE WORK AND MATERIALS**

14.1 General Work One Year Warranty; HVAC Systems Two Year Warranty

The Contractor warrants and guarantees for a one year period that all Work, materials and equipment (and for a two year period that all HVAC work) conform to the Contract Documents and will not fail or manifest defects, that the Project and all its components will be fit for their intended functions, and that all material and equipment will be new and of good quality.

The general one year warranty period (or two year warranty period for HVAC work) shall commence when the Certificate of Substantial Completion is issued, and the one year period (or two year period for HVAC work) shall commence on that date for all components of the Project, including any equipment activated and operated before Substantial Completion, such as HVAC systems, electrical systems and elevators.

During the one year warranty period (or two year warranty period for HVAC work), the Contractor shall repair and remedy at its own expense any premature failure, defects or deficiencies in any Work, materials or equipment that are discovered or that develop during the one year period (or two year period for HVAC work), and shall do so within 5 days after receipt of a written warranty claim from the College. The Contractor shall also repair damages caused by any failure or defect covered by this warranty. A failure to provide the warranty service required shall constitute a breach of this warranty obligation as well as other applicable provisions of the Contract. This warranty shall not cover failures caused solely by substantial misuse or abuse by the College.

This general one year warranty (or two year warranty for HVAC work) is intended to provide the College with prompt warranty service for all aspects of the Project for the one year period (or two year period for HVAC work). It is not intended to limit or extinguish any additional warranties required by any of the Contract Documents, or provided by manufacturers of systems, equipment or materials provided under the Contract. It is not intended to eliminate or reduce the College's rights and remedies under the Contract Documents and law for defects and deficiencies in the Work, materials and equipment, or the time period of the Contractor's general responsibility and liability.

14.2 Defective Work, Materials And Equipment.

Apart from the general one year warranty (or two year warranty for HVAC work) provided for in this Article, the Contractor shall be responsible for defective Work, materials and equipment and any failure of these items to comply with the Contract Documents. This obligation shall extend beyond Substantial Completion, Final Completion and the general one year warranty (or two year warranty for HVAC work) in this Article.

If defects in the Work, materials or equipment or non-conforming items are discovered during construction and before Final Completion, the Contractor shall promptly correct them at its own expense. If the Contractor fails to correct defective or non-conforming Work, material or equipment in response to a written notice from the College, either during construction or after Final Completion, the College may employ others to provide the remedial work and the Contractor and its surety shall be liable for the cost thereof and damages incurred by the College. The Contractor and its surety shall also be liable for the cost of making good all Work and material destroyed or damaged by defects or the correction of defects.

If any portion of the Contractor's Contract Price remains in the custody of the College, either earned or unearned, the College may deduct money paid to others to remedy defects after notice is sent to the Contractor and damages incurred by the College when the Contractor fails to provide a remedy in response. The Contractor's responsibility for defects and non-conforming Work, material and equipment shall not be limited in time except by applicable law.

The Contractor's responsibility for defective Work shall not be affected by either the performance or the lack of performance of inspections by the College or the Architect. The issuance of payments, a Certificate of Substantial Completion or a Certificate of Final Completion shall not constitute acceptance of Work, material or equipment that is deficient or not in compliance with the Contract, or limit the Contractor's warranty or the other Contract obligations.

ARTICLE 15

INDEMNIFICATION/LIABILITY TO THIRD PARTIES.

15.1 The Contractor's Indemnification Obligation.

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the College, the State of New Jersey, the New Jersey Educational Facilities Authority, Trenton State College Corporation, and any other persons or entities designated by the College, and the officers, directors, principals, attorneys, agents, servants, and employees of any of them (collectively the "Indemnified Parties") from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from: (1) performance of the Work, whether such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including loss of use resulting therefrom caused in whole or in part by the negligent or willful acts or omissions of the Contractor, Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder or (2) any one or more of the items set forth in

this Article. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Article.

In claims against any person or entity indemnified under this Article by an employee of the Contractor, a Subcontractor or anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Article shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts, nor shall the same be limited by the types or limits of insurance carried or to be carried by the Contractor or any Subcontractor pursuant to the Contract Documents or otherwise.

The indemnity, defense, and hold harmless obligation set forth in this Article shall be supplemented by the following:

- (a) any claims or liens of Subcontractors, except to the extent that the non-payment upon which the claim or lien is predicated resulted solely from the College's wrongful failure to pay the Contractor sums due under the Contract;
- (b) any fines, penalties, liquidated damages, assessments or other executions imposed by any governmental authority having jurisdiction over the Project by reason of the Contractor's failure to comply with any requirement of the Contract;
- (c) any losses, damages, or expenses incurred by reason of the Contractor's failure to obtain and maintain in force or cause to be obtained and maintained, the insurance required by the terms of the Contract;
- (d) any losses, damages, or expenses incurred by reason of any failure (whether or not specifically identified herein) by the Contractor to perform its obligations under the Contract Documents or any breach of the Contract;
- (e) any claims, damages, or expenses incurred by reason of the Contractor's infringement or alleged infringement of any patent, copyright, or other intellectual property or similar rights; and
- (f) any claims, damages, liquidated damages, penalties, or fines assessed against the College, directly or indirectly, solely or partially by reason of the Contractor's failure to comply with any applicable laws, codes, statutes, or regulations.

If any judgment is rendered against the Indemnified Parties for which indemnification is required under this Article, the Contractor shall satisfy and discharge it. The Contractor shall reimburse the College for reasonable attorney fees, costs and expenses incurred by the Indemnified Parties in the defense of such suit or claim.

The College shall give written notice to the Contractor of claims and suits for which indemnification may be claimed pursuant to this Article.

The foregoing obligations shall survive the completion of the Work and final payment to the Contractor (or the sooner termination of the Contract) with respect to all matters accrued during the term of the Contract and such obligations shall not be construed to negate, abridge or reduce any other rights, obligations or indemnity which would otherwise exist as to a party or person indemnified by this Article.

15.2 The Subcontractor's Indemnification Obligation.

The Contractor shall cause the indemnification obligations set forth in this Article to be included in all contracts with its Subcontractors.

ARTICLE 16 **INSURANCE AND BONDS.**

16.1 The Contractor's Insurance.

The Contractor shall purchase from, and maintain with a company or companies lawfully authorized to do business in the State of New Jersey, insurance for protection from claims under workers' compensation and other employee benefit acts which are applicable, claims for damages because of bodily injury, including death, and claims for damages, including the Work itself, to property which may arise out of or result from the Contractor's operations and completed operations under the Contract, whether such operations be by the Contractor or by a Subcontractor or anyone directly or indirectly employed by any of them, until at least 1 year after the Final Completion and acceptance of the Project. This insurance shall be written for not less than the limits set forth below or as required by law, whichever coverage is greater, and shall include contractual liability insurance applicable to the Contractor's obligations under Article 15 (Indemnification). The Contractor expressly agrees that any insurance protection required by the Contract Documents shall in no way limit the Contractor's obligations under the Contract, and shall not be construed to relieve the Contractor from liability in excess of such coverage. Nor shall it preclude the College from taking such actions as are available to it under any other provisions of the Contract for Construction, these General Conditions or the law.

16.1.1 Types and Minimum Amounts of Insurance:

- (a) **Commercial General Liability Insurance (CGL).** Commercial General Liability insurance ISO CG 00 01 12 07 or later occurrence form of insurance including contractual liability with limits of at least **two** million dollars (\$**2,000,000**) per occurrence, and at least **two** million dollars (\$**2,000,000**) in the aggregate. The general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit. The CGL policy shall also include products/completed operations with limits of at least **two** million (\$**2,000,000**) in the aggregate. This insurance shall be maintained for at least 1 year after the Final Completion of the Project.
- (b) **Automobile Liability Insurance.** Comprehensive Automobile Liability insurance covering owned, non-owned, and hired vehicles. The limits of liability shall not be less than **one** million dollars (\$**1,000,000**) combined single limit for bodily injury and property damage for each occurrence.

- (c) **Workers Compensation/ Employer's Liability.** Worker's Compensation Insurance applicable to the laws of the State of New Jersey and other State or Federal jurisdictions required to protect the employees of the Contractor and any Subcontractor, sub-subcontractor or supplier who will be engaged in the performance of the Contract. The certificate must so indicate that no proprietor, partner, executive officer or member is excluded. This insurance shall include Employers' Liability Insurance with a limit of liability not less than one million dollars (\$1,000,000) bodily injury, each occurrence, one million dollars (\$1,000,000) disease, each employee, and one million dollars (\$1,000,000) disease, aggregate limit.

All required insurance coverages must be written by insurance companies acceptable to the College. All insurance companies must have a minimum A.M. Best's financial strength rating of A- or better, or an equivalent rating from another respected rating agency, and an A.M. Best's size rating of VII or greater.

16.1.2 Additional Insureds. All insurance required herein, except Worker's Compensation, shall name The College of New Jersey, the State of New Jersey, the New Jersey Educational Facilities Authority, Trenton State College Corporation and any other persons or entities designated by the College as additional insureds.

16.1.3 Cancellation. The certificates of insurance shall provide for 30 days written notice to the College before any cancellation, expiration or non-renewal during the term the insurance is required by the Contract.

16.1.4 Evidence of Insurance. The Contractor shall when the Contract for Construction is signed and before beginning the Work required under the Contract, provide the College with valid certificates of insurance signed by an insurance provider or authorized agent or underwriter to evidence the Contractor's insurance coverage as required in this Article, and also copies of the policies themselves. The certificates of insurance shall specify that the insurance provided is of the types and in the amounts required in this Article, and that the policies cannot be canceled except after 30 days written notice to the College. The Contractor shall also be required to provide the College with valid certificates of renewal when policies expire. The Contractor shall also, when requested, provide the College with additional copies of each policy and all endorsements required under the Contract, which are certified by an agent or underwriter to be true copies of the policies and endorsements issued to the Contractor.

16.1.5 Remedies for Lack of Insurance. If the Contractor fails to renew any of its required insurance policies, or any policy is canceled, terminated or modified, the College may refuse to pay monies due under the Contract. The College, in its sole discretion and for its sole benefit, may use monies retained under this Article to attempt to renew the Contractor's insurance or obtain substitute coverage if possible for the College's sole benefit, and may invoke other applicable remedies under the Contract for Construction and these General Conditions including claims against the Contractor and its surety. During any period when the required insurance is not in effect, the College may also, in its sole discretion, either suspend the Work under the Contract or terminate the Contract.

16.2 The Subcontractor's Insurance.

The Contractor shall ensure that its Subcontractors purchase and maintain insurance on the same terms and with coverages customary for each trade as required by the Contractor under the Contract. The Contractor shall contractually obligate its Subcontractors to indemnify, defend, and hold harmless the College upon the same terms and conditions that the Contractor is required to do so as provided in Article 15 of these General Conditions (Indemnification).

16.3 Payment And Performance Bond.

The Contractor is required to furnish the College with a payment bond and a performance bond from an approved surety as described in this Article and in the bid documents. The bonds shall conform to N.J.S.A. 2A:44-147. The Contract will not become effective until these bonds are provided to and approved in writing by the College. The bonds must also be accompanied by the surety disclosure statement and certification required by N.J.S.A. 18A:64-68.

ARTICLE 17 **DISPUTE RESOLUTION.**

17.1 Mediation.

If a dispute or claim arises out of or relates to the Contract, or the breach thereof, and if the dispute cannot be settled through negotiation, the dispute or claim may, at the College's sole option, be subject to mediation administered by the American Arbitration Association under its Construction Industry Mediation Rules as a condition precedent to binding dispute resolution. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in Mercer County, New Jersey, at the offices of the College's attorneys, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable in any court having jurisdiction thereof.

17.2 Method Of Binding Dispute Resolution.

For any dispute or claim, not resolved by mediation pursuant to this Article, the method of binding dispute resolution shall be litigation in the state or district courts of the State of New Jersey, unless the College, in its sole discretion, decides to submit the dispute or claim to arbitration pursuant to this Article.

17.3 Arbitration (If The College Elects To Arbitrate).

If the College decides, in its sole discretion, to submit a dispute or claim to arbitration rather than litigation as provided above, the arbitration shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Contract unless the parties mutually agree otherwise. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The arbitrator shall be a New Jersey licensed attorney with at least twenty (20) years' experience practicing in construction law. In the event that the parties mutually agree to use a panel of three arbitrators, then the construction attorney will be the

presiding arbitrator, one of the arbitrators will be a registered architect and the other will be a contractor, all of whom shall be neutral and independent. This Article shall not preclude the College or Contractor from instituting legal action to discharge an invalid construction lien. The arbitration hearing shall be held in Mercer County, New Jersey, at the offices of the College's attorneys, unless another location is mutually agreed upon.

A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the claim, dispute or other matter in question would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the claim, dispute or other matter in question.

The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by the parties to the Contract shall be specifically enforceable in accordance with applicable law in any court having jurisdiction thereof.

The award rendered by the arbitrator(s) shall be a reasoned award and shall include a statement of findings of fact and conclusions of law and shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

17.4 Consolidation Or Joinder.

The College, in its sole discretion, may consolidate an arbitration conducted under the Contract with any other arbitration to which it is a party provided that (i) the arbitration agreement governing the other arbitration permits consolidation, (ii) the arbitrations to be consolidated substantially involve common questions of law or fact, and (iii) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

The College, in its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

The College, in its sole discretion, may grant to any person or entity made a party to an arbitration conducted under this Article, whether by joinder or consolidation, the same rights of joinder and consolidation as the College under the Contract.

17.5 Work During Pendency Of Dispute.

Unless otherwise instructed by the College, the Contractor shall carry on its Work during the pendency of any dispute hereunder, and the College shall continue making payments to the Contractor of undisputed amounts.

17.6 Prompt Payment Claims.

Notwithstanding the foregoing, disputes regarding only whether a party has failed to make payments required pursuant to New Jersey's Prompt Payment Act may be submitted to alternative dispute resolution as provided in N.J.S.A. 2A:30a-2(f). In such event, the College and the Contractor shall share equally the fees and expenses of the selected mediator. Provided, however, that nothing herein shall be construed, in whole or in part, as a waiver, release or modification of the provisions of the New Jersey Contractual Liability Act, N.J.S.A. 59:13-1, et seq., as it governs claims against the College.

17.7 The Contractor's Claims: Procedures And Limitations.

Claims by the Contractor against the College shall be subject to the New Jersey Contractual Liability Act, N.J.S.A. 59:13-1, et seq., including the notice and time for suit provisions. For the purpose of determining the time within which the Contractor must file suit under the New Jersey Contractual Liability Act, "completion of the contract" shall be deemed to have occurred upon achievement of Substantial Completion as defined in these General Conditions.

The Contractor also agrees that it shall not be entitled to assert claims against the College for any compensation beyond that provided for in the Contract by reason of the acts or omissions of any third parties, including but not limited to the Architect and any other contractor on the Project. The Contractor may not assert claims for extra costs for home offices expenses, home office overhead, lost profits or revenue, or consequential damages as that term is defined in law. All claims shall also be subject to all other pertinent provisions of the Contract for Construction and the Contract Documents including these General Conditions. The Contractor also agrees that it may not assert any claims for extra costs or damages unless it maintains all the records of its estimated and actual costs as required by the Contract for Construction and these General Conditions.

17.8 Dispute Resolution Process In The Contractor's Subcontracts.

The Contractor shall include this dispute resolution process in all of its contracts with any Subcontractors or suppliers on this Project.

ARTICLE 18 **MISCELLANEOUS.**

18.1 Prevailing Wage.

The Contractor and its Subcontractors shall comply with the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 through 56.57. Workers employed by the Contractor or any Subcontractor or sub-subcontractor in the performance of services directly on the Project must be paid prevailing wages. As required by N.J.S.A. 34:11-56.27 and 56.28, the Contract cannot become effective until the College obtains from the New Jersey Department of Labor a determination of the prevailing wage rates applicable to the Project as of the Contract award date and attaches a copy to the Contract. As required by N.J.S.A. 34:11-56.27, the Contractor or any

Subcontractor may be terminated if any covered worker is not paid prevailing wages on the Project, and the Contractor and its surety shall be liable for any additional costs which result. The Contractor and its Subcontractors must be registered with the New Jersey Department of Labor (N.J.S.A. 34:11-56.51 et seq.), and the prevailing wage rates must be posted at the job site (N.J.S.A. 34:11-56.32). The Contractor and its Subcontractors must prepare accurate certified records of wages paid for each worker on the Project (N.J.S.A. 34:11-56.29), and copies for the period covered by each invoice must be attached to the invoice submitted under the Contract. In accordance with N.J.S.A. 34:11-56.33, the Contractor's final invoice must include a statement of all amounts still then due to workers on the Project. The Contractor is also cautioned that it must use job titles and worker classifications consistent with those approved by the Department of Labor, and that, if it intends to pay apprentice rates, it must comply with the Department of Labor's regulations at N.J.A.C. 12:60-7.1 through 7.4.

If the State's Prevailing Wage Act is amended, or the language stated herein is inconsistent with the language contained in the State's Prevailing Wage Act, the language of the State's Prevailing Wage Act shall control.

18.2 Employment Discrimination.

The Contractor and any Subcontractors employed by it shall comply with N.J.S.A. 10:2-1 through 10:2-4 and N.J.S.A. 10:5-1 et seq., including N.J.S.A. 10:5-31 through 10:5-35, which prohibit discrimination in employment in public contracts. The statute and the rules and regulations promulgated thereunder shall be considered to be part of the Contract and binding upon the Contractor and its Subcontractors. If the College is notified of any violation of the public contract awarding regulations in accordance with N.J.A.C. 17:27-7.4 concerning the financing of minority and women outreach and training programs, the College reserves the right to deduct the outreach and training allocation from the Contract. During the performance of the Contract, the Contractor agrees that:

- (a) In the hiring of persons for the performance of Work under the Contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under the Contract, neither the Contractor, its Subcontractors nor any person acting on behalf of the Contractor or any of its Subcontractors, shall, by reason of race, creed, religion, color, national origin, nationality, ancestry, age, sex (including pregnancy), familial status, marital status, domestic partnership or civil union status, affectional or sexual orientation, gender identity or expression, atypical hereditary cellular or blood trait, genetic information, liability for military service, and mental or physical disability, perceived disability, and AIDS and HIV status, discriminate against any person who is qualified and available to perform the Work to which the employment relates;
- (b) Neither the Contractor, its Subcontractors, nor any person acting on behalf of the Contractor or any of its Subcontractors shall, in any manner, discriminate against or intimidate any employee engaged in the performance of Work under the Contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any

such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, religion, color, national origin, nationality, ancestry, age, sex (including pregnancy), familial status, marital status, domestic partnership or civil union status, affectional or sexual orientation, gender identity or expression, atypical hereditary cellular or blood trait, genetic information, liability for military service, and mental or physical disability, perceived disability, and AIDS and HIV status;

- (c) There may be deducted from the amount payable to the Contractor by the College, under the Contract, a penalty of \$50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the Contract; and
- (d) The Contract may be canceled or terminated by the College, and all money due or to become due hereunder may be forfeited, for any violation of this Article of the Contract occurring after notice to the Contractor from the College of any prior violation of this Article of the Contract. The Contractor and its Subcontractors shall comply with all laws prohibiting discrimination against employees, and shall comply with the provision in the Contract regarding employment discrimination.

If the State's Law Against Discrimination is amended, or the language stated herein is inconsistent with the language contained in the State's Law Against Discrimination, the language of the State's Law Against Discrimination shall control.

18.3 Patents.

If any design, device, material or process covered by patents or copyright is used in the Work, the Contractor shall provide for such use by a suitable agreement with the patent or copyright owner. The Contractor shall bear all costs arising from the use of patented materials, equipment, or processes and all copyrighted materials used on or incorporated in the Work. The Contractor shall defend, indemnify and hold harmless the College and its representatives from any and all claims for infringement by reason of the use of any such patented or copyrighted items.

18.4 The Contractor's Compliance With Law.

The Contractor shall keep fully informed of all federal, state and local laws, ordinances, regulations and orders of agencies that have jurisdiction or authority that in any manner affect those employed on the Project or the Project. The Contractor shall at all times observe and comply with, and cause its agents and employees to observe and comply with, all such laws, ordinances, regulations, and/or orders. The Contractor shall also protect and indemnify, defend and hold harmless the College and its representatives against any claim or liability arising from the violation of any laws, ordinances, regulations, or orders, whether by the Contractor or its employees, agents, Subcontractors at any tier, suppliers or materialmen.

18.5 Environmental Protection – The Contractor’s Duty To Comply With Applicable Law.

The Contractor shall comply with all applicable federal, state and local laws and regulations and all conditions of permits pertaining to the protection of the environment. Necessary precautions shall be taken to prevent pollution of streams, lakes, ponds, rivers, wetlands, groundwater, reservoirs, and property by chemicals, fuels, oils, bitumens, or other harmful or hazardous materials as defined by law. The Contractor also shall not pollute the atmosphere from particulate or gaseous matter in violation of applicable law.

18.6 No Personal Liability Of College Officials.

In carrying out any of the provisions of the Contract, or in exercising any right or authority granted to them by or in connection with the Contract, there shall be no liability upon any trustee, officer or employee of the College, either personally or as officials of the College, it being agreed that in all such functions they act only as agents and representatives of the College.

18.7 Recovery Of Monies By The College From Other Contracts With The Contractor.

When the Contract Documents authorize the College to withhold or deduct money from any monies due to the Contractor, or require the Contractor to pay or return monies for any reason, the College may in its discretion withhold any monies due the Contractor under any other contracts between the Contractor and the College. This right shall not affect the rights of the College against the Contractor or its surety under the Contract, and the College shall not be obliged to exercise this right as to any other contract as a condition of exercising its rights against the Contractor or surety under the Contract.

18.8 Buy American Requirement.

The Contractor shall comply with N.J.S.A. 52:32-1 and N.J.S.A. 52:33-1 et seq., which prohibit the use by the Contractor or Subcontractors of materials or farm products produced and manufactured outside of the United States on any public Work. Notwithstanding any inconsistent provision of any law, and unless the head of the department, or other public officer charged with the duty by law, shall determine it to be inconsistent with the public interest, or the cost to be unreasonable, only domestic materials shall be acquired or used for any public work. This Article shall not apply with respect to domestic materials to be used for any public work, if domestic materials of the class or kind to be used are not mined, produced or manufactured, as the case may be, in the United States in commercial quantities and of a satisfactory quality. If the State’s “Buy American” laws are amended, or the language stated herein is inconsistent with the language contained in the State’s “Buy American” laws, the language of the State’s “Buy American” laws shall control.

18.9 Compliance With Grant Requirements. The Contractor acknowledges and agrees that if the College receives any grant monies in connection with the Project, the Contractor and its Subcontractors shall comply with all requirements associated with such grant or set forth in such grant agreement.

18.10 Modification Of Contract.

No modification or amendment of the Contract shall be effective unless it is in writing and signed by both the College and the Contractor.

18.11 State Sales Tax Exemption.

Materials, supplies or services for exclusive use in constructing the Project are exempt from the State Sales Tax Act. Rentals of equipment are not exempt from any tax under the State Sales Tax Act.

18.12 Successors and Assigns.

The College and the Contractor respectively bind themselves, their successors and assigns, to the other party hereto and to the successors and assigns of such other party in respect to covenants, agreements and obligations contained in the Contract Documents.

The Contractor shall not assign the Contract, nor shall the Contractor transfer or assign any Contract funds, due or to become due, or claims of any nature it has against the College without the prior written approval of the College. The College in its sole discretion and considering primarily the interests of the College may elect either to grant or to deny such approval. If the Contractor attempts to make such an assignment without the College's prior written approval, the Contractor shall nevertheless remain legally responsible for all obligations under the Contract.

The College shall be entitled to assign its rights hereunder to one or more lenders as collateral for loans which the College may obtain to finance construction of the Project and to a party who presently has or later acquires a legal interest in the premises. The Contractor agrees to execute such certificates, documents and instruments as are reasonably requested by the College, including, without limitation, certificates, documents and instruments that evidence the Contractor's consent to an assignment of the Contract or confirm the absence or existence of a default on the part of the College hereunder.

18.13 Construction Liens.

If any Subcontractor or other person working under the Contractor files a construction lien or claim or notice of intention or right to file a lien for or on account of Work, labor, services, materials, equipment or other items furnished under or in connection with the Contract for which the College has paid the Contractor, the Contractor agrees to discharge or remove such lien, claim or notice at its own expense by bond, payment or otherwise within twenty (20) calendar days from the date of the filing thereof, and upon its failure to do so, the College shall have the right to cause any such lien or claim, notice of intention or stop notice to be removed or discharged by whatever means the College chooses, at the sole cost and expense of the

Contractor (such costs and expenses to include legal fees and disbursements). The Contractor agrees to indemnify, defend and hold harmless the College and its representatives from and against any and all such liens, claims or other filings, and actions brought or judgments rendered thereon, and from and against any and all losses, damages, liabilities, costs and expenses, including legal fees and disbursements, which the College may sustain in connection therewith. Further, if any Subcontractor or other person working under the Contractor files a construction lien or claim or notice of intention or right to file a lien for or on account of Work, labor, services, materials, equipment or other items furnished under or in connection with the Contract for which the College has paid the Contractor, the College may, in the College's sole discretion, pay all wages, damages, recoveries, costs and expenses and reasonable counsel fees arising therefrom and deduct the same from any monies due or to become due to the Contractor.

18.14 Independent Contractor Status.

The relationship of the Contractor to the College is that of an independent contractor. The Contractor agrees that it shall conduct itself consistent with such status, and shall not hold itself out as or claim to be a trustee, officer, employee or agent of the College. The Contractor shall not make any claim or demand for any right or privilege applicable to officers or employees of the College, including but not limited to, workers compensation, unemployment insurance benefits, social security coverage, or retirement benefits.

18.15 Third Party Beneficiary Rights Not Intended.

It is specifically agreed between the College and the Contractor that no provisions of the Contract Documents are intended to make the public or any member thereof a third party beneficiary of the Contract, or to authorize anyone not a party to the Contract to maintain a suit for personal injuries, property damage or other claims under the Contract. It is also the intent of the College and the Contractor that no individual or firm that supplies materials, labor, services, or equipment to the Contractor for the performance of the Work shall be a third party beneficiary of the Contract.

18.16 Gifts To College Employees And Agents Prohibited.

The Contractor shall not give any gifts of any nature, nor any gratuity in any form, nor loan any money or anything of value to any College employee or relative thereof, or any agent of the College. The Contractor shall not rent or purchase any equipment or supplies of any kind from any College employee or relative thereof or any agent of the College.

18.17 Compliance With Procurement Statutes.

The Contractor warrants and represents that the Contract has not been solicited or secured, directly or indirectly, in a manner contrary to the law of New Jersey, and in particular the provisions of N.J.S.A. 18A:64-6.1, 6.2 and 6.3, and that the Contractor has not and shall not violate the law of New Jersey relating to the procurement of or the performance of the Contract by any conduct, including the paying of any gratuity of any kind, directly or indirectly, to any College trustee, employee or officer. Any violation of this Article shall be cause for the College to terminate the Contract, to retain all unpaid and/or unearned monies, and to recover all monies paid. The Contractor shall notify the College in writing of any interest which any trustee, officer,

employee or consultant of the College has in, or association with the Contractor, any other contractor, any Subcontractor, material supplier, consultant, or manufacturer, or other party which has any interest in the Project.

18.18 Conflict Of Interest.

The Contractor shall not pay, offer to pay, or agree to pay, either directly or indirectly, any fee, commission, compensation, gift, gratuity, or other thing of value of any kind to any State officer or employee or special State officer or employee, as defined by N.J.S.A. 52:13D-13b. and e., in the Department of the Treasury or any other agency with which the Contractor transacts or offers or proposes to transact business, or to any member of the immediate family, as defined by N.J.S.A. 52:13D-13i., of any such officer or employee, or any partnership, firm, or corporation with which they are employed or associated, or in which such officer or employee has an interest within the meaning of N.J.S.A. 52:13D-13g.

The solicitation of any fee, commission, compensation, gift, gratuity or other thing of value by any State officer or employee or special State officer or employee from any State vendor shall be reported in writing forthwith by the Contractor to the Attorney General and the Executive Commission on Ethical Standards.

The Contractor may not, directly or indirectly, undertake any private business, commercial or entrepreneurial relationship with, whether or not pursuant to employment, contract or other agreement, express or implied, or sell any interest in the Contractor to, any State officer or employee or special State officer or employee having any duties or responsibilities in connection with the purchase, acquisition or sale of any property or services by or to any State agency or any instrumentality thereof, or with any person, firm or entity with which he is employed or associated or in which he has an interest within the meaning of N.J.S.A. 52:13D-13g. Any relationships subject to this Article shall be reported in writing forthwith to the Executive Commission on Ethical Standards, which may grant a waiver of this restriction upon application of the State officer or employee or special State officer or employee upon a finding that the present or proposed relationship does not present the potential, actuality or appearance of a conflict of interest.

The Contractor shall not influence, or attempt to influence or cause to be influenced, any State officer or employee or special State officer or employee in his official capacity in any manner which might tend to impair the objectivity or independence of judgment of said officer or employee.

The Contractor shall not cause or influence, or attempt to cause or influence, any State officer or employee or special State officer or employee to use, or attempt to use, his official position to secure unwarranted privileges or advantages for the Contractor or any other person.

The provisions cited above shall not be construed to prohibit a State officer or employee or special State officer or employee from receiving gifts from or contracting with the Contractor under the same terms and conditions as are offered or made available to members of the general public subject to any guidelines the Executive Commission on Ethical Standards may promulgate.

The Contractor shall require its Subcontractors and suppliers to comply with the requirements of this Article.

18.19 Confidential Information.

The Contractor shall maintain the confidentiality of information specifically designated as confidential by the College, unless withholding such information would violate applicable law. The Contractor shall require its Subcontractors to maintain the confidentiality of information specifically designated as confidential by the College.

18.20 Publicity.

Publicity and/or public announcements pertaining to the Project must be approved in writing by the College prior to release.