

COLUMBUS METROPOLITAN LIBRARY

Request for Proposal

E-Rate Main Garage Wi-Fi Upgrades

Issue Date: November 22, 2022

RFP Number: CML #22-046

Issued by

Procurement Department
96 S. Grant Ave.
Columbus, OH 43215

Deadline for Submittal

December 22, 2022
No later than 12:00 NOON EST

Qualifies for E-Rate Funding



REQUEST FOR PROPOSAL COVER SHEET

The Columbus Metropolitan Library (“CML” or “Library” or “Owner”) is issuing this Request for Proposal (“RFP”) for *E-Rate Main Garage Wi-Fi Upgrades* (“Project”). The RFP Identification Number is: **CML #22-046**.

Proposals must be received by the Procurement staff at the Columbus Metropolitan Library via email to procurement@columbuslibrary.org **no later than 12:00 PM on 12/22/2022**.

Any Proposal (“Proposal”) arriving after 12:00 PM will be marked late and will receive no consideration for selection to provide the specified services.

All questions or requests for clarifications should be submitted no later than 5:00 p.m., seven (7) days prior to the proposal due date to procurement@columbuslibrary.org . All questions will be answered in the form of an addendum and posted on the CML website.

The proposer declares to have read and understood and agrees to be bound by all the instructions, terms, conditions, and specifications of this RFP and agrees to fulfill the requirements of any contract (“Contract”) for which it is selected to provide the specified goods and/or services at the prices proposed.

The proposer certifies, by signature affixed to this Request for Proposal Cover Sheet, that the information provided by it in response to the RFP, including certified statements, is accurate and complete.

Federal Taxpayer Identification Number (TIN)		
Name of person signing Proposal (Please print or type)	Title	
Proposer Name		
Mailing Address		
City	State	ZIP
Telephone		
Contact Person		
E-Mail Address		
Authorized Signature (Original signature only) Please use Blue Ink.		

THIS FORM MUST BE SIGNED AND SUBMITTED WITH THE PROPOSAL

OVERVIEW

The Columbus Metropolitan Library is seeking quotes from qualified Bidders for a data cabling and wireless access point (WAP) installation project in support of extending Wi-Fi coverage to underserved areas of the Main Library.

SCOPE OF WORK

- 22 data cables throughout the attached parking structure (Approx. 6600 linear ft.)
- 1 data cable in the basement level
- All cables routed to the nearest data closet and terminated into patch panels
- Conduit and mounting hardware as needed
- Preference for cabling to be routed through existing conduit if space is available.
- New conduit and mounting hardware to be installed in the least intrusive way possible
- Test and label cables
- Cable test report to be provided to CML
- Install WAPs (network hardware will be purchased by CML)

The Proposer is responsible for all requirements as provided in this RFP and attached Project documents. (see attached specifications and drawings)

GENERAL INSTRUCTIONS

The contractor (“Contractor”) shall furnish all labor, materials, equipment services and supervision required to complete the work (“Work”), complying with the scope of work outlined herein.

The Proposer shall be given the opportunity by CML to examine the work site(s) prior to submitting a Proposal.

The Contractor is responsible for all requirements as provided in the RFP documents.

DIVERSITY

Because Columbus Metropolitan Library serves a diverse central Ohio population, CML has a strong preference for professional service providers to propose teams made up of MBE/DBE/WBE certified staff to provide CML with a diverse professional staff representative of the central Ohio region in which they will be working and of the customers that CML serves every day. Minority Business Enterprises are encouraged to respond to this solicitation.

A completed Proposer’s Diversity & Inclusion Participation Form or documentation of good faith efforts must accompany the completed Proposal. Please refer to Appendix B, *Proposer’s Diversity & Inclusion Participation Form* to submit or denote the omission of participation.

COMPLIANCE WITH APPLICABLE LAWS

By submitting a Proposal for Work on the Project, the Proposer acknowledges that it is in compliance with applicable federal, state, and local laws and regulations, including, but not limited to, the following:

Equal Employment Opportunity/Nondiscrimination. The Proposer agrees that if it is awarded a contract that in the hiring of employees for performance of work under the Contract or

any subcontract, neither it nor any subcontractor, or any person acting on its behalf or its subcontractor's behalf, by reason of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color, shall discriminate against any citizen of the state in the employment of labor or workers who are qualified and available to perform work to which the employment relates. The Proposer further agrees that neither it nor any subcontractor or any person on its behalf or on behalf of any subcontractor, in any manner, shall discriminate against or intimidate any employees hired for the performance of the work under the contract on account of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color.

Ethics Laws. The Proposer represents that it is familiar with all applicable ethics law requirements, including without limitation Sections 102.04 and 3517.13 of the Ohio Revised Code, and certifies that it is in compliance with such requirements.

E-Rate Considerations

E-rate Guidelines shall govern the work and payments on the selected system and VAR (Value Added Reseller) for this installation and as such, no funds will be able to be billed or collectible on this project until after July 1. Furthermore, any and all hardware not sold as a service but as a capitalized expense will be submitted to E-Rate for Category Two level funding and will require review and E-rate approval before work can begin which will most likely not occur until after July 1.

To warrant consideration for an award of a contract resulting from this RFP, Offerors must agree to participate in the Universal Service Support Mechanism for Schools and Libraries (commonly known as "E-Rate") as provided for and authorized under the federal Telecommunications Act of 1996 (Reference 47 U.S.C. § 254, "Universal Service").

Offerors acknowledge that any contractual relationship resulting from this solicitation of proposals may be partially or entirely dependent upon the successful receipt of Universal Service Fund ("USF") subsidies.

Complete Universal Service (E-Rate) Requirements are found in Appendix E.

Due to the nature of E-Rate funding approval and the time that may lapse between Contract and installation, the Contractor agrees to evaluate the proposed system software and versions of the equipment listed in the Contract schedule and if available provide the Library with the most up-to-date version and releases to the versions at the time install at no additional charge to the Library.

PROPOSAL SUBMISSION REQUIREMENTS

1. Proposers are cautioned to carefully review all parts of the RFP. No allowance may be made for any error or negligence of the Contractor.
2. Proposals are to be prepared in such a way as to provide a straightforward, concise description of the Contractor's capabilities to satisfy the requirements of this RFP and provide sufficient information to fully establish the Contractor's ability to perform all of the actions, activities, and functions described in this RFP.
3. Emphasis should be on conformance to the RFP instructions, responsiveness to the RFP requirements, completeness and clarity of content, and should minimize extraneous marketing materials.
4. Costs for developing the Proposal are entirely the responsibility of the Contractor and shall not be chargeable to the Library.
5. The Proposer must address all of the requirements listed in the Request for Proposal. All Proposals must be emailed to procurement@columbuslibrary.org , with the Proposal Identification Number **CML #22-046**, title, and Contractor's name in the subject line of the email and the file names.

PROPOSAL SUBMITTAL

Each Proposer must submit a Technical Proposal and a Cost Proposal as part of its Proposal package. Proposals must be submitted as two (2) separate components – Technical Proposal and Cost Proposal.

Each Technical Proposal package must be clearly marked "**CML #22-046 – E-Rate Main Garage Wi-Fi Upgrades - Technical Proposal**" along with the Contractor's Name in the filename of the Technical Proposal File.

Each Cost Proposal package must be clearly marked "**CML #22-046 – E-Main Garage Wi-Fi Upgrades - Cost Proposal**" along with the Contractor's Name in the filename of the Technical Proposal File.

IMPORTANT: Technical Proposals must not contain cost or pricing information.

Columbus Metropolitan Library
Attn: Theresa Kauffman
procurement@columbuslibrary.org
96 South Grant Avenue
Columbus, OH 43215

Proposal Format and Content

To facilitate the comparison of Proposals, Technical Proposals shall be organized into the following marked or tabbed sections:

1. Proposals must include a table of contents listing all sections:
 - a. A cover letter, on the Proposer's letterhead, shall be submitted and shall include, but need not be limited to, the following information:
 - i. The signature of a person authorized to bind the Proposer legally to the extent of work and financial obligation outlined in its Proposal.
 - ii. A statement that the Proposal will be valid for the FY23 E-Rate window.
 - iii. Identify all the material enclosures submitted in response to this RFP.
 - iv. A summary of the submitted Proposal and a brief statement of the Proposer's qualifications to meet all requirements as described in this RFP.
 - b. Executive-level summary of the proposed solution, which shall include but shall not be limited to:
 - i. The Contractor's Work Plan. The Work Plan must address exactly how the Contractor will provide all required services specified in this RFP.
 - c. Statement as to the Contactor's particular abilities and qualifications to include, but not limited to:
 - i. Brief history of the company.
 - ii. Product and service offerings.
 - iii. Describe the core competencies.
 - iv. The number of years the Contractor has been in business.
 - v. Primary Corporate location's address.
 - vi. The geographical area of operations and professional affiliations.
 - vii. Overview of the ownership structure of the company.
 - viii. All alliances and/or strategic partnerships with other companies.
 - ix. Size and composition of the organization.
 - x. Number of current customers.
 - d. A disclosure of all adverse information that may be publicly available, which shall include but shall not be limited to:
 - i. Lawsuits, judgments, liens, bankruptcies, or claims made against the Contractor within five (5) years of the proposal due date.
 - ii. Debarment from entering into contracts with the State of Ohio, any county in the State of Ohio, or any other government entity within five (5) years of the proposal's due date.
 - e. References - The Contractor shall provide at least three (3) references for engagements within three (3) years of the proposal submission date.
 - f. Include any other documentation believed to be pertinent, but not specifically mentioned in this RFP, that may be useful and applicable to this project.
 - g. The Contractor must include a completed W-9 Form.

- h. The Contractor must provide a Certificate of Insurance (“COI”) with coverage per the terms provided herein and list CML as an Additional Insured. Waiver of Subrogation shall also apply and be indicated on the COI.
- i. A list of all assumptions and exceptions to the specifications outlined in the RFP.

2. Completed Acknowledgement of Addenda Form – See Appendix D

COST PROPOSAL

The Cost Proposal package shall contain the following items:

1. Signed Price Proposal Form – Appendix A
2. Completed Proposer’s Diversity & Inclusion Participation Form – Appendix B

The Proposal shall contain all price information in the format specified on the Cost Proposal Form.

Proposers may not amend, alter or omit any items on the Price Proposal Form or include additional clarifying or contingent language on or attached to the form. Failure to adhere to any of these instructions may result in the Proposal being determined to be non-responsive and rejected by CML. Prices offered shall be all inclusive and shall remain fixed for the duration of the agreement. CML is a tax-exempt entity.

PRE-BID Meeting

A Pre-Bid meeting will be held **on November 30, 2022 at 1:00 pm** at Main Library to discuss the requirements of this RFP and answer any questions. Interested Bidders will be asked to RSVP to procurement@columbuslibrary.org. An edited and annotated summary of the pre-Bid conference will be published in the form of an addendum to the solicitation and will be available on the Doing Business with CML page of the Columbus Metropolitan Library website, www.columbuslibrary.org.

Attendance at the pre-bid and walkthrough are not mandatory, but both are highly encouraged.

ADDITIONAL INFORMATION

1. Addenda to this RFP will be posted on the Columbus Metropolitan Library Website: www.columbuslibrary.org/about/doing-business at least five (5) business days prior to the RFP opening. Proposers are responsible for information provided in any issued addenda. Proposers are required to acknowledge the receipt of all RFP addenda by using the supplied “Acknowledgement of Addenda” form.
2. Correct and proper invoices will be paid within 30 days of receipt. Invoices are to detail the services provided, the date, and detailed costs and are to be submitted on company letterhead, to the e-mail address on the Library’s purchase order. Refer to the terms and conditions herein for additional information regarding payment.
3. Times referenced herein are Columbus, Ohio local time.
4. Submission of a Proposal in response to this RFP is the Proposer’s acknowledgment that subjective criteria may be used in the evaluation of Proposals. Award shall be made to the

responsive and responsible Proposer determined to be the most advantageous to the Library. Price, although an important consideration, will not be the sole determining factor.

RFP & PROPOSAL QUESTIONS

All questions regarding this RFP must be sent to procurement@columbuslibrary.org and must reference the RFP Identification Number and title of the RFP no later than **5:00 p.m. seven (7) days prior to the proposal due date. CML will post written responses to all properly received questions no later than five (5) days prior to the proposal due date** Answers to all questions will be documented and posted on the “Doing Business with the Library” page of the Library’s Web site at www.columbuslibrary.org/about/doing-business

PROJECTED TIMELINE

The projected timeline for this RFP process is provided below. The Library may, at its sole discretion, modify the schedule as necessary to allow for a thorough and complete analysis of responses.

Activity	Target Completion Date
Issuance of RFP Inquiry Period Begins	November 22, 2022
Inquiry Period Ends	December 14, 2022 (5:00 PM)
Final Response to Vendor Questions	December 19, 2022 (5:00 PM)
Due Date	December 22 by 12:00 p.m. (Noon)
Selection of Successful Proposer	January 2023

Notification of changes in the response due date would be posted on the CML website or as otherwise stated herein. All times are Eastern Time

Award

CML may award the Contract to as many Contractors as necessary to achieve the desired outcome.

SELECTION PROCESS

A. Selection Process

1. CML will form an evaluation committee comprised of members of IT and other relevant departments, to review and evaluate Contractor proposals. The following criteria weights will be assigned:
 - a. Quality of the Contractor’s Technical Solution – 400 Points (Per Appendix C)
 - b. Cost Score – 600 Points
 - c. Total allowable Points - 1,000 points
2. CML may invite any or all Proposers to present an oral presentation on the specifics of their technical and/or price submission. Proposers will be provided with sufficient notice to prepare. All oral presentations will be conducted virtually.

3. Members of the evaluation committee may choose to retain their original technical score following the oral presentation or may choose to re-score any or all Proposers following oral presentations.
4. The final score will be collected and recorded by the CML procurement staff.

B. Evaluation Criteria

1. Technical Proposal

- a. Members of the evaluation committee will utilize a zero (0) to five (5) scale to evaluate each proposal. Members of the evaluation committee will utilize the evaluation form in Appendix C and apply the scoring formula outlined below:

Zero (0)	Unsatisfactory	Does not conform to requirements.
One (1)	Poor	Conforms to requirements in a limited manner.
Two (2)	Satisfactory	Generally meets requirements with limitations.
Three (3)	Good	Meets CML requirements as written.
Four (4)	Excellent	Meets and generally exceeds requirements as written.
Five (5)	Outstanding	Exceeds requirements in all aspects.

- b. Members of the evaluation committee will review the completeness and comprehensiveness of all Contractor proposals. Scores will be averaged for each responsiveness criterion to determine a Contractors score. That score will be multiplied by the criteria weight to establish the extended score for that responsiveness criteria. All extended scores will be added together to establish the Contractor weighted technical score.
- c. Emphasis will be placed on the quality and comprehensiveness of the proposal, including the understanding of the requirements by the Contractor, Contractor qualifications, quality of the proposed solution, organizational history, and capacity, experience, and references. The evaluation form that will be used can be found in Appendix C.

2. Cost Score

- a. The Contractors Total Price shall be calculated based on the number of services multiplied by the net price. The lowest responsive proposal will be awarded the maximum amount of points for this category.

3. The Total Composite Score will be comprised of the Technical Proposal Score + Cost Score which will not exceed 1,000 points.

Contract Award

The Library is not, by virtue of issuing this RFP, obligated to enter into a Contract and reserves the right to not issue a Contract as a result of this solicitation.

All Proposers that respond will receive a notification if they have been selected or not.

Columbus Metropolitan Library

Procurement Department

Standard Contract Terms and Conditions

Contract Components. Entirety. Changes Interpretation

Contract Components: This contract consists of this document, the Standard Contract Terms and Conditions, the Special Contract Terms and Conditions (if any), the specifications or scope of work (SOW), and any written amendments to this document, valid Columbus Metropolitan Library (CML) purchase orders or other ordering documents (together referred to as the "Contract").

Entire Agreement; Parties to the Contract: This contract is the entire agreement between the individual or entity selected to provide equipment, supplies and/or services on the basis of a SOW submitted to CML in response to a request (referred to as the Contractor in these Terms and Conditions) and Columbus Metropolitan Library (CML).

Contract Changes: Waivers, Changes or Modifications to this Contract must be made in writing and signed by both parties. If a party to this Contract does not demand strict performance of any item of this Contract, the party has not waived or relinquished any of its rights; the party may at any later time demand strict and complete performance of the term.

Contract Orders: CML will order supplies or services under this Contract from the Contractor directly. The Contractor may receive purchase orders by telephone, facsimile, electronically or in-person by authorized employees of CML. The Contractor is not required to fill an order date more than 30 days beyond the date of Contract expiration, termination, or cancellation unless the Contract provides for a quarterly delivery or quarterly service. Under a Contract that provides for quarterly delivery, the Contractor is not required to fill an order with a delivery date of more than 90 days beyond the date of Contract expiration, termination, or cancellation.

Standard Invoice and Payment

Invoice: The Contractor shall submit invoices to accountspayable@columbuslibrary.org. The invoice must be a proper invoice to receive consideration for payment. A "proper Invoice" is defined as being free of defects, discrepancies, errors or other improprieties. Improper invoices will be returned to the Contractor noting the areas of discrepancy.

Payment: In consideration for the Contractor's performance, CML will pay the Contractor at the rate specified in the contract. *Payments will be made by electronic funds transfer (EFT)*. For all transactions, the Contractor must have a valid W9 form on file with the Finance Department. The completed form should be mailed to: Finance Department, Columbus Metropolitan Library, 96 South Grant Avenue, Columbus, Ohio 43215.

Payment Due Date: CML will pay invoices 30 days after it has received an invoice for supplies and services it has received and accepted, unless otherwise indicated herein.

Taxes: Columbus Metropolitan Library is exempt from all federal, state, and local taxes as CML is a political subdivision of the State of Ohio.

Term of Contract: This contract is effective upon the projected beginning date of the Contract Cover Page or upon signature of CML by the Fiscal Officer, whichever comes later in time. This Contract will remain in effect until the Contract is fully performed by both parties or canceled in accordance with the Terms found herein.

Contract Renewal: This contract may be renewed solely at the discretion of CML for a period of one month. Any further renewals will be by agreement of both parties, any number of times for any period of time. The cumulative time of all renewals may not exceed two years.

Delivery

F.O. B. The Place of Destination: The Contractor must provide the supplies or services under this Contract F.O.B., the place of delivery/destination unless otherwise stated. The address of delivery will be specified by the purchase order or other ordering document. Freight will be prepaid unless otherwise stated.

Time of Delivery: If the Contractor is not able to deliver the supplies or services on the date and time specified by CML ordering department on the ordering document, the Contractor must coordinate an acceptable date and time for delivery. If the Contractor is not able to, or does not, provide the supplies or services to an ordering department by the time and date agreed upon, CML may obtain any remedy provided below or any other remedy at law.

Minimum Orders-Transportation Charges: For purchase orders placed that are less than the stated minimum order, the transportation will be prepaid and added to the invoice by the Contractor to the delivery location designated in the ordering documents. Shipment is to be made by private or commercial freight service, airmail, water, parcel post, express or commercial package delivery, whichever is the most economical and expeditious method for proper delivery of the item. Failure of the Contractor to utilize the most economical mode of transportation shall result in the Contractor reimbursing CML the difference between the most economical mode of transportation and the mode of transportation used by the contractor. Failure to reimburse CML shall be considered a default.

Contract Cancellation: Termination: Remedies

Contract Cancellation: If a Contractor fails to perform any one of its obligations under this Contract, it will be in default, and CML may cancel this Contract in accordance with this section. The cancellation will be effective on the date delineated by CML.

- A. **Contract Performance is Substantially Endangered:** If the Contractor's default is substantial and cannot be cured within a reasonable time, or if CML determines that the performance of the contract is substantially endangered through no fault of CML, CML may cancel this Contract by written notice to the Contractor.
- B. **Cancellation by Unremedied Default:** If a Contractor's default may be cured within a reasonable time, CML will provide written notice to the Contractor specifying the default and the time within which the Contractor must correct the default. If the Contractor fails to cure its default in the time required, CML may cancel this Contract by providing written notice to the Contractor. If CML does not give timely notice of

default to Contractor, CML has not waived any of its rights or remedies concerning the default.

- C. Cancellation by Persistent Default: CML may cancel this Contract by written notice to Contractor for defaults that are cured but persistent. "Persistent" means three or more defaults. After CML has notified Contractor of its third default, CML may cancel this Contract without providing Contractor with an opportunity to cure, if the Contractor defaults a fourth time. CML shall provide written notice of the termination to the Contractor.
- D. Cancellation for Financial Instability: CML may cancel this Contract by written notice if Contractor does not pay its subcontractors and material suppliers within 10 days of payment to the Contractor by CML. To the extent permitted by law, CML may cancel this Contract by written notice to Contractor if a petition in bankruptcy or similar proceedings has been filed by or against the Contractor.

Contract Termination: CML may terminate this Contract for convenience after issuing 30 days' written notice to the Contractor.

Remedies for Default:

- A. Actual Damages. The Contractor is liable to CML for all actual and direct damages caused by the Contractor's default. CML may buy substitute supplies or services, from a third party, for those that were to be provided by the Contractor, and CML may recover the costs associated with acquiring substitute supplies or service, less any expenses or costs saved by the Contractor's default, from the Contractor.
- B. Deduction of Damages for Contract Price. CML may deduct all or any part of the damages resulting from Contractor's default from any part of the price still due on the Contract, after CML has provided prior written notice to Contractor of such default and intent to deduct damages from the Contract Price.

Force Majeure: If CML or Contractor is unable to perform any part of its obligation under this Contract by reason of force majeure, the party is excused from its obligation, to the extent that its performance is prevented by force majeure, for the duration of the event. The party must remedy with all reasonable dispatch the cause preventing it from carrying out its obligations under this Contract. The term "force majeure" means without limitation: Acts of God, such as epidemics, lightning, earthquakes, fires, storms, hurricanes, tornadoes, floods, washouts, droughts, and any other severe weather; explosions; arrests; restraint of government and people; strikes; and any other like events or any other cause that could not be reasonably foreseen in the exercise of ordinary care, and that is beyond the reasonable control of the party.

CML Consent to Assign or Delegate: The Contractor may not assign any of its rights under this contract unless CML consents to the assignment or delegation in writing. Any purported assignment or delegation made without CML's written consent is void.

Indemnification: Contractor will indemnify CML, its employees, members of the Board of Trustees, and its Officers and administrators for any and all claims, damages, lawsuits, costs, judgments, expenses, liabilities that may arise out of, or are related to, the Contractor's performance under this Contract, including the performance by Contractor's employees and agents and any individual or entity for which the Contractor is responsible.

Confidentiality: Contractor may learn of information, documents, data, records and other material that is confidential in the performance of this Contract. Contractor may not disclose any information obtained it as a result of the Contract without written permission from CML. Contractor must assume that all CML information, documents, data, records or other material is confidential.

Publicity: Contractor and any of its subcontractors may not use or refer to this Contract to promote or solicit Contractor's or subcontractor's supplies or services. Contractor and its subcontractors may not disseminate information regarding this Contract, unless agreed to in writing by CML.

Governing Laws; Severability: The Laws of the State of Ohio govern this Contract, and venue for any dispute will be exclusively with the appropriate court of competent jurisdiction in Franklin County, Ohio. If any provision of the Contract or the application of any provision is held by a court of competent jurisdiction to be contrary to law, the remaining provisions of the Contract will remain in full force and effect to the extent that the remaining provisions continue to make sense.

Workers Compensation: The Contractor shall carry Workers' Compensation Liability Insurance as required by Ohio law for any work to be performed within the State of Ohio. Failure to maintain Workers Compensation Liability Insurance for the duration of the contract and any renewal hereto will be considered a default.

Automobile and General Liability Requirements: During the term of the Contract and any renewal hereto, the Contractor, and any agent of the Contractor, at its sole cost and expense, shall maintain a policy of automobile liability and commercial general liability insurance as described in this clause. Copies of the respective insurance certificates shall be filed with the Procurement Department within seven (7) calendar days after notification by the CML of its selection of the Contractor to provide the specified supplies and/or services. Failure to submit the insurance certificates within the time period may result in the Contractor being considered in default. Said certificates are subject to the approval of the CML Procurement Manager and shall contain a clause or endorsement providing thirty (30) days prior written notice of cancellation, non-renewal or decrease in coverage will be given to the Procurement Manager. Failure of the Contractor to maintain this coverage for the duration of the Contract, and any renewals, thereto may be considered a default.

Automobile Liability: Automobile Insurance is required for anyone coming onto CML branches and/or property to deliver goods or perform services using a vehicle, which is owned, leased, hired, or rented by the Contractor. Any Contractor, broker, or subcontractor who will be on CML property, but not delivering goods or performing services, is required to carry Automobile Liability Insurance that complies with the state and federal laws regarding financial responsibility. Automobile liability insurance, including hired, owned, and non-owned vehicles used in connection with the Work, shall have a combined single limit coverage covering personal injury, bodily injury (including death) and property damage of not less than \$2,000,000 per accident.

Commercial General Liability: Insurance coverage with a \$2,000,000 annual aggregate and a \$1,000,000 per occurrence limit for bodily injury, personal injury, wrongful death and property damage. The defense cost shall be outside of the policy limits. Such policy shall designate CML as an Additional Insured, as its interest may appear. The policy shall also be endorsed to include a blanket waiver of subrogation. The certificate shall be endorsed to reflect a per project/per location General Aggregate limit of \$2,000,000. If the Contractor uses an umbrella/excess policy to meet the required limits, it is understood that the policy shall follow from per project/per location basis. It is agreed upon that the

Contractor's commercial general liability insurance shall be primary over any other coverage. The Procurement Department reserves the right to approve all policy deductibles and levels of self-insurance retention.

Contract Compliance: The participating CML branches and departments will be responsible for the administration of the Contract and will monitor the Contractor's performance and compliance with the terms, conditions and specifications of the Contract. If a branch or department observes any infraction such shall be documented and conveyed to the Contractor for immediate correction. If the Contractor fails to rectify the infraction, the department/branch will notify the Procurement Department in order to resolve the issues. These terms and conditions will be used by the Procurement Department to resolve the issues.

Warranties: Unless otherwise stated, all supplies shall be new and unused. All products shall carry manufacturer's warranties in addition to implied warranties. The Contractor warrants all supplies to be free from defects in labor, material, and workmanship (manufacturing) and be in compliance with the contract specifications.

ADDITIONAL TERMS:

1. This Contract represents the entire agreement of the parties hereto, and may not be amended except in writing signed by both parties.
2. All times referenced herein are Columbus, Ohio local times.
3. *CML is not responsible for any work or services provided by Contractor prior to the issuance of a P.O. by CML.*
4. Contractor will supply its own tools and materials.
5. Contractor will make arrangements for EFT (electronic funds transfer).
6. A completed W9 form is required on file with CML prior to CML issuing payment for services provided by Contractor. The W9 form can be found at
7. <http://www.irs.gov/pub/irs-pdf/fw9.pdf>. Please fill out the form and return with the signed contract to the Procurement Department of the Columbus Metropolitan Library at 96 S. Grant Avenue, Columbus, OH 43215 or email: procurement@columbuslibrary.org.

Appendix A
Pricing Proposal
E-Rate Main Garage Wi-Fi Upgrades
RFP Number: CML #22-046

Signed By: _____ Date: _____

Printed Name: _____ Title: _____

Company Name: _____

Notes:

- A. The Contractor shall provide fixed unit prices for Hardware listed. The fixed unit prices shall be fully burdened, and shall include but shall not be limited to, labor, materials, shipping, warehousing, Social Security, Medicare, Insurance, Bonds, tools, vehicles, travel time, general and administrative expenses and Contractor profit.
- B. CML does not guarantee a fixed quantity of work. CML will compensate the Contractor only for services rendered and approved by the CML Authorized Representative.
- C. All prices shall remain fixed for the 2023 E-Rate window and shall not be subject to any markups, cost of living adjustments, or increases at any time.
- D. CML is a tax exempt organization.

Appendix B
Proposer's Diversity & Inclusion Participation Form
E-Rate Main Garage Wi-Fi Upgrades
RFP Number: CML #22-046

A completed Proposer's Diversity & Inclusion Participation Form or documentation of good faith efforts must accompany the completed Proposal Form.

_____ ("Proposer") submits the following information regarding its levels of MBE/WBE Participation:

List all MBE/WBE subcontractors and suppliers, with contract amounts, that Proposer will use for its work on the Project. (Continue list on additional sheets of paper if necessary.)

Name of Subcontractor / Supplier	MBE or WBE	Subcontract Amount
1.		\$
2.		\$
3.		\$
4.		\$
	A. TOTAL AMOUNT OF MBE/WBE SUBCONTRACTS	\$
	TOTAL PROPOSAL	\$
	B. PERCENTAGE OF DIVERSITY PARTICIPATION* (A ÷ B x 100)	%

The Proposer's commitment of total workforce hours for Minority Workforce participation on the project is: _____%.

The Proposer's commitment of total workforce hours for Women Workforce participation on the project is: _____%.

I certify under penalty of perjury that the foregoing and/or attached statements and information are true and correct. The undersigned will immediately notify the Owner in the event that any of the information provided in this Diversity & Inclusion Participation Form changes in any material way.

By: _____ Date: _____

Print Name and Title: _____

***If the Proposer does not indicate that it has achieved the Diversity & Inclusion Participation Goal set forth in the Instructions to Proposers, the Proposer must attach to this Form, a narrative, including exhibits, demonstrating and certifying that good faith efforts, as set forth in the Instructions to Proposers, were actively and aggressively undertaken by the Proposer, to reach such goals.**

Appendix C
Evaluation Tool
E-Rate Main Garage Wi-Fi Upgrades
RFP Number: CML #22-046

<u>Responsiveness Criteria</u>	<u>Criteria Weight</u>	<u>Score (0-5)</u>	<u>Extended Score</u>
Technical Evaluation	400		
1. Quality and comprehensiveness of the Proposal: a. Demonstrated understanding, by the proposer, of the Library and the Library's requirements. b. Qualifications and ability to perform. c. Responsiveness and adherence to RFP instructions.	25		
2. Ease of integration for the proposed solution with existing CML infrastructure	25		
3. Proposer's experience on projects of similar scope.	15		
4. Input from reference contacts.	15		
Weighted Technical Score			
Cost Evaluation	600		
Weighted Cost Score			
Total Composite Score (Weighted Technical Score + Weighted Cost Score)			

The weighted points will be multiplied times the numbers of Criteria's listed above for a maximum total of 400 points for the Technical Score.

Members of the evaluation committee will utilize a zero (0) to five (5) scale to evaluate each proposal. Members of the evaluation committee will utilize the evaluation form in Appendix C and apply the scoring formula outlined below:

Zero (0)	Unsatisfactory	Does not conform to requirements.
One (1)	Poor	Conforms to requirements in a limited manner.
Two (2)	Satisfactory	Generally meets requirements with limitations.
Three (3)	Good	Meets requirements as written.
Four (4)	Excellent	Meets and generally exceeds requirements as written.
Five (5)	Outstanding	Exceeds requirements in all aspects.

Appendix D
Acknowledgment of Addenda
E-Rate Main Garage Wi-Fi Upgrades
RFP Number: CML #22-046

Instructions: The respondent is to complete Part I or Part II of this form, whichever is applicable, and sign and date this form. This form serves as the respondent's acknowledgment of the receipt of the Addenda to this solicitation which may have been issued by the CML prior to the Proposal Due Date and Time.

Part I: Check Box if Applicable:

Listed below are the dates of issue for each Addendum received in connection with this solicitation.

Addendum # 1, dated: ___/___/___ Addendum # 2, dated: ___/___/___

Addendum # 3, dated: ___/___/___ Addendum # 4, dated: ___/___/___

Addendum # 5, dated: ___/___/___ Addendum # 6, dated: ___/___/___

Part II: Check Box if Applicable: NO ADDENDUM WAS RECEIVED IN CONNECTION WITH THIS COMPETITIVE SEALED BID.

NOTE: THE BIDDER MUST SIGN AND COMPLETE THIS FORM

Company Name: _____

Name: _____

Signature: _____

Title: _____

Date: _____

Appendix E
Universal Service (E-Rate) Requirements
E-Rate Main Garage Wi-Fi Upgrades
RFP Number: CML #22-046

To warrant consideration for an award of contract resulting from this Request for Proposal, vendors must agree to participation in the Universal Service Support Mechanism for Schools and Libraries (commonly known as “E-Rate”) as provided for and authorized under the federal Telecommunications Act of 1996 (Reference 47 U.S.C. § 254, “Universal Service”). Vendors acknowledge that any contractual relationship resulting from this solicitation of proposals may be partially or entirely dependent upon the successful receipt of Universal Service Fund (“USF”) subsidies. To ensure compliance with all applicable USF regulations, program mandates and auditing requirements, vendors must comply with the following:

- USF Knowledge - Vendor shall have, at a minimum, a working knowledge of the federal Universal Service Support Mechanism for Schools and Libraries (commonly known as “E-Rate”).
- USF Registration - Vendor shall submit with its proposal a valid Service Provider Identification Number (“SPIN”) and a valid Federal Communications Commission Registration Number (“FCCRN”).
- USF Participation - Vendor shall agree to participate in the E-Rate Program and to cooperate fully and in all respects with the Columbus Metropolitan Library, the Universal Service Administrative Company (“USAC”), and any agency or organization administering the E-Rate Program to ensure that the Columbus Metropolitan Library (“CML” or “Library”) receives all of the E-Rate funding for which it has applied and to which it is entitled in connection with Vendor's services and/or products.
- USF Documentation - Vendor shall provide to CML staff and/or the CML’s E-Rate consultant within a commercially reasonable period of time, all of the information and documentation that the Vendor has or that Vendor reasonably can acquire that the CML may need to prepare its E-Rate applications and/or to document transactions eligible for E-Rate support.
- Invoicing Procedures - Vendor shall itemize, price, and invoice separately any materials or services that are ineligible for E-Rate funding. Vendor must include the following information on all invoices to CML for E-Rate eligible equipment and/or services:
 - Date of invoice
 - Date(s) of service
 - Funding Request Number (“FRN”)
 - Detailed description of services performed and materials supplied that matches CML’s contract specifications, Form 470 and Form 471 descriptions of same
 - Clear, concise breakdown of amount(s) to be billed to USAC (discounted portion of eligible charges) and amount(s) to be billed to the CML (non-discounted amount of eligible charges)
 - Invoice on Vendor’s letterhead or on a Vendor-generated form
 - CML’s Billed Entity Number – **BEN 129176**

- CML's Federal Communications Commission Registration Number – **FCCFRN 0012033577**
 - Proper E-Rate discount percentage as set forth by the applicable FRN and USAC funding commitment decision letter (“FCDL”)
- USF Discounted Invoicing and Reimbursement Processes - Vendor shall, at the CML's request, either (a) invoice CML only for the non-discounted amounts due on E-Rate-approved transactions [Discounted Invoice Process - SPI] or (b) invoice CML for the gross amounts due on E-Rate-approved transactions [Billed Entity Applicant Reimbursement Process (BEAR)].
 - Discounted Invoice Process (SPI)
 - Invoicing: Within fourteen (30) days from the date that Vendor delivers to CML, E-Rate approved materials or services, when delivery of such services triggers a payment obligation under Vendor's contract with CML, Vendor must invoice CML for its share of the pre-discount cost of those materials or services.
 - Invoice Filing: Vendor shall be solely responsible for filing invoices with USAC. Accordingly, Vendor understands and agrees that CML will NOT be liable to Vendor and Vendor shall have no recourse against CML for any discounted amount that Vendor submits late to USAC for payment, if USAC refuses to pay the invoice due to late filing.
 - Invoice Rejection: Vendor understands and agrees that CML shall not be liable to Vendor and Vendor shall have no recourse against CML for any discounted amount that Vendor submits to USAC for payment if Vendor is at fault for USAC's refusal to pay; if CML is at fault, CML shall not be liable to Vendor and Vendor shall have no recourse against CML for the amount at issue until both the CML and the Vendor have exhausted their administrative remedies of appeal to USAC and/or the FCC.
 - Reimbursement Process (BEAR)
 - Vendor agrees to provide any necessary documentation, including but not limited to invoices, packing slips, and bills of material, necessary for the Billed Entity Applicant Reimbursement Process.
 - Delayed USF Funding Commitment - Vendor understands that, due to circumstances beyond CML's control, CML may not receive an E-Rate funding commitment by the beginning of the E-Rate funding year, July 1, for the services it intends to purchase from Vendor during that funding year.
 - USF Audit and Document Retention Requirement - Vendor shall maintain all bids, quotes, records, correspondence, receipts, vouchers, delivery information, memoranda and other data relating to Vendor's services to CML. All such records shall be retained for ten (10) years following completion of services and shall be subject to inspection and audit by CML. Vendor shall include in all subcontractor agreements for services, provisions requiring subcontractors to maintain the same records and allowing CML the same right to inspect and audit those records as set forth herein. In addition to the foregoing, Vendor will create, implement and enforce an

internal E-Rate audit process that ensures that Vendor complies with all E-Rate program rules and regulations. This process must include the following:

- Separating ineligible project management and other professional services costs, if any, from other charges.
- Where labor is involved, maintaining detailed, signed individual timesheets.
- Ensuring that ineligible charges are not submitted to USAC.
- Invoicing to USAC that is consistent with the contract and CML's 470 and 471.
- Ensuring that services or products are not provided to CML without CML's express written permission or official purchase authorization.
- Supporting documentation sufficient to evidence that what was approved per the FCDL and provided to CML, was actually provided to CML and when.
- If E-Rate eligible services and/or installation or equipment costs are included as part of a larger contract or service/equipment billing, support the allocation of E-Rate eligible amounts and reconciliation of that total to the total amount billed.
- If E-Rate eligible services or equipment are allocated to multiple sites, support for the allocation consistent with the amount and locations identified in Form 471.
- Documenting that E-Rate-funded services were provided within the allowable contract period and program year.
- Ensuring that invoices are submitted to CML in a timely manner.
 - Contract Term Modification - CML will reserve the right to extend or abbreviate the contract period if such extension or abbreviation is necessary to make the Contract term coincide with an E-Rate "program year" or an extended service end date for an E-Rate program year pursuant to a "service delivery deadline extension," as those terms are defined by the Federal Communications Commission ("FCC") and/or the Universal Service Administrative Company ("USAC").

SECTION 27 10 00
STRUCTURED CABLING

PART 1 GENERAL

1.01 DESCRIPTION

- A. This document describes the product and execution requirements related to furnishing and installing the Structured Cabling System as shown on the Drawings and specified herein.

1.02 SCOPE OF WORK

- A. The Structured Cabling Contractor (SCC) shall provide a complete Structured Cabling System (SCS) as defined in this section.
- B. As described elsewhere in these Documents the system consists of fiber optic and copper cabling, and related hardware. In addition to the basic cable plant requirements, the testing and identification requirements are also defined. Finally, racks, enclosures and other related hardware are indicated herein.
- C. The installation shall be of an "Open System," using standard media and layout, standard connections and interfaces. The Contractor shall adhere to this Specification, local and national codes and provide quality workmanship.
- D. This section includes:
1. Main Telecommunications Room (MTR)
 2. Telecommunications Room (TR)
 3. Racks, Enclosures and Cable management
 4. Ladder Rack
 5. Rack mounted surge suppressor
 6. Lightning Protector
 7. Backbone cabling
 8. Horizontal cabling
 9. Consolidation Points
 10. MTR and TR connections
 - a. Patch Panels
 - b. Fiber enclosures
 11. Work Area outlets
 - a. Faceplates
 - b. Connectors (jacks)
 12. Work Area Extensions to Device
 13. Hangers and Supports
- E. The components used on this project for voice, data, and CATV shall be as identified in Part 2 of this Section.
- F. Unless noted otherwise on the Drawings, for all 4 pair Category cable, this project shall use T568B termination for eight (8) position jack pair assignments as specified per the ANSI/TIA 568-C wiring standard. For fiber, follow ANSI/TIA 568-C.3, Optical Fiber Cabling Components Standard, and its published addenda.

- G. All continuous pathways (i.e., conduit, cable tray, raceway, etc.) required to support the cabling shall be provided by the Electrical Contractor under Division 26 unless indicated otherwise in the Contract Documents.
 - 1. All non-continuous or non-rigid pathways (i.e., J-hooks, inner-duct, etc.) required to support the cabling shall be provided by the SCC under the Structured Cabling System, unless indicated otherwise in the Contract Documents.
 - 2. All ladder rack, cable tray, and related pathway hardware built into Telecommunications Spaces shall be provided by the SCC.
- H. The SCC shall be responsible for providing the racks and enclosures as required and specified herein.
- I. The SCC shall test and label the entire installation as specified and required by the codes and standards.
- J. The SCC shall be responsible for providing the hangers and support system specified herein and shown on the Drawings.
- K. Final sizing and location of J-hooks, hangers, and supports shall be the responsibility of the Contractor. However, NO increases to the bid price and/or the schedule extension shall be allowed due to equipment alterations.
- L. For new installations, J-hooks fill capacity shall not exceed 70% of its rated cable fill capacity (i.e., if J-bracket is rated for 100 cables, no more than 70 shall be installed).
- M. J-hooks are intended for voice, data, video, audio, and security cables only. They are intended for cable routing in areas of less than 100 Category 6 cables. All other low voltage cabling systems, such as building controls, shall have cabling run-ins separate raceway system.
- N. All hangers and support material shall be galvanized or stainless-steel, rust-free material.
- O. The Telecommunications Contractor shall ensure that the General Contractor and Painting Contractor acknowledge that the painting or over spray of any single or group of 4 pair horizontal telecommunications Category cable is not allowed. Any painted or over sprayed cable(s) shall be completely removed and replaced at the Painting Contractor's expense. No in-line connectors, splices, taps or other repairs will be permitted. Painted cable will not be covered as part of an extended warranty. Painted cable obscures the print legend and can alter the cable's mechanical properties and fire rating. Painted cable compromises its integrity and/or performance. It may act as an accelerant or create an additional smoke hazard in the event of a fire and as such this is considered a life safety issue. Paint contamination and/or removing paint from the cable with a solvent can affect the cable's durability and its electrical characteristics.

1.03 QUALIFICATIONS

- A. The SCC must meet the following requirements to be approved for this project. He/she shall meet the following qualifications and provide the information, as listed, in the submittal package:

1. Must be a member of Building Industry Consulting Service International (BICSI) or Engineer approved, other Telecommunications Organization, and shall have at least five (5) years' experience installing Telecommunications Cabling and Equipment.
 2. Supply a list of a minimum of five (5) projects over \$100,000 that the firm has completed along with contact names and phone numbers of the Owners' Representatives for those projects. At least three (3) of the completed facilities shall have been occupied and in full operation for at least one (1) year.
 3. The SCC shall be a certified installer for the connectivity and cabling solution specified for this project and maintain that status with the warranting manufacturer, including all training requirements, for the duration of the cable infrastructure project.
 4. The SCC shall have, as a direct employee, a minimum of one (1) RCDD on staff. The RCDD must be a full-time employee of the company and must be listed with the company on the BICSI Credential Holder website. This individual shall review all submittals, RFIs, change order proposals, as-built documents, and shall provide system engineering support and oversight of all field work to ensure system installation is fully compliant with all requirements of ANSI/TIA-568-C, ANSI/TIA-569-D, and all associated TSBS, ANSI/TIA-606-B, labeling, and ANSI/TIA-607, bonding and grounding, including all addenda.
 5. The SCC's RCDD shall stamp all test results included in the Record and Information Manual and the final (field marked) As-Built Drawings, as being correct and accurate, that are included in the Record and Information Manual.
 6. It is the intent of this contract for the Contractor to provide sole responsibility for material, labor, and service for the communication cabling system. The Contractor shall, at a minimum, staff the project with BICSI certified installers for project foremen and crew leader positions.
 7. The SCC must own or have a current lease agreement for equipment to test up to Category 6a and fiber optic cable. He/she shall supply proof as required above in the submittal package, including latest calibration date.
- B. At the time of bid form submission, the SCC shall submit the following information:
1. The SCC's manufacturer certifications for:
 - a. Twisted pair cabling
 - b. Fiber optic cabling
 - c. Connectivity
 2. The RCDD's BICSI certification. Refer to SCC's Qualifications below.
 3. A listing of the like projects within the last three (3) years. Refer to SCC's Qualifications below.
- C. During the bid review, the SCC may be asked to provide any/or all of the following:
1. A listing of the probable team members
 2. BICSI and manufacturer certifications for the installation of the Structured Cable Plant.
 3. Certifications for the installation for any firestopping required under the scope of the Structured Cable Plant installation.
- D. Any/all items listed in paragraph 1.03 subparagraph B.1 or B.2, can and will be checked for authenticity and accuracy. The Owner reserves the right to reject any unauthorized or inaccurate submissions.
- E. Should the SCC either fail or refuse to provide any of the items listed and/or requested in paragraph 1.03 subparagraph B.1 or B.2, the Owner reserves the right to determine the SCC as being not fully responsive and as such discard the bid in its entirety.

1.04 SUBMITTALS

- A. Product Data Sheets
 - 1. All products
 - 2. Copies of all certifications
- B. Shop Drawings
 - 1. The SCC shall submit the following shop drawings:
 - a. A detailed riser diagram demonstrating the SCC's understanding of the backbone cabling.
 - b. Drawings of any floor boxes with details of the various internal faceplates and their respective contents.
 - c. Drawings of any through floor fittings with details of their contents.
 - d. Layout drawings for cable tray and cable runway (1/16" scale minimum) based on trade coordination efforts indicating anticipated routings based on the coordination among the various trades.

PART 2 PRODUCTS

2.01 MAIN TELECOMMUNICATIONS ROOM/DEMARC (MTR)

- A. The SCC shall provide plywood backboard as shown on the Drawings. If the Drawings do not indicate where or how much plywood is to be installed, Contractor shall provide, as a minimum, two (2) walls covered by 3/4 inch x 4 feet x 8 feet fire retardant plywood, painted industrial gray with two (2) coats of fire retardant paint. Plywood shall be AC grade or better and void-free with Grade A surface exposed. To reduce warping, plywood shall be kiln-dried to a maximum moisture content of 15%.
 - 1. Fire retardant plywood shall be securely fastened to wall such that it can and will support equipment to be mounted. Additionally, it shall be mounted such that the 8 feet is vertical. Unless otherwise noted, bottom of plywood shall be mounted 8 inches AFF.
 - 2. Contractor shall cover with masking tape the "Fire Retardant" stamp on the plywood, before painting, and remove tape after painting, so that the inspector can still see the original "Fire Retardant" stamp on the plywood.
 - 3. Cut out plywood around all wiring devices.
- B. The SCC shall provide all equipment required and/or shown on the Drawings to make MTR a safe and usable room for the Structured Cabling System.
- C. For fiber optic cable entering from outside or from another TR coil, provide 30 feet of slack on re-closeable storage ring before routing cable to rack for termination in rack mounted fiber panel using LC connectors (unless otherwise noted).
- D. Terminate copper station cable coming from TRs or work areas in a standard 19 inch data rack, rack mounted patch panel with 110 type punch down terminations located close to incoming protector unit.
- E. Terminate incoming coaxial cable on backboard. Terminate coax station cable coming from TRs or work area on same backboards with "F" connectors.

- F. Install racks, cable management, enclosures, patch panels, ladder racks, cables, and other equipment required in MTR as shown on Drawings. If no equipment location is indicated, coordinate rack and equipment location with Owner before installing equipment.
- G. Provide MTR with ladder racking or wire mesh cable tray as shown on Drawings. Fasten ladder racking or cable tray to data racks.
- H. Provide grounding and bonding as specified in Section 26 05 27, "Telecommunications Bonding Infrastructure."
- I. Provide "D" rings for cable routing support on backboards, for feeding cables up or down from ladder rack and/or floor.

2.02 TELECOMMUNICATIONS ROOM (TR)

- A. The SCC shall provide plywood backboard as shown on the Drawings. If the Drawings do not indicate where or how much plywood is to be installed, Contractor shall provide, as a minimum, each TR with at least two (2) walls covered by 3/4 inch x 4 feet x 8 feet fire retardant plywood, painted industrial gray with two (2) coats of fire retardant paint. Plywood shall be AC grade or better and void-free with Grade A surface exposed. To reduce warping, plywood shall be kiln-dried to a maximum moisture content of 15%.
 - 1. Fire retardant plywood shall be securely fastened to wall such that it can and will support equipment to be mounted. Additionally, it shall be mounted such that the 8 feet is vertical. Unless otherwise noted, bottom of plywood shall be mounted 8 inches AFF.
 - 2. Contractor shall cover with masking tape the "Fire Retardant" stamp on the plywood, before painting, and remove tape after painting so that the Inspector can still see the original "Fire Retardant" stamp on the plywood.
 - 3. Cut out plywood around all wiring devices.
- B. The SCC shall provide all equipment shown on the Drawings or as required to make TRs safe and usable for the structured cabling system.
- C. For fiber optic cable entering from another TR coil, provide 30 feet of slack on re-closeable storage ring before routing cable to rack for termination in rack mounted fiber panel using LC connectors.
- D. For copper station cable, terminate in a rack mounted patch panel with 110 type punch down termination.
- E. For coaxial station cable, terminate on "F" connectors in designated backboard area.
- F. For audio/video cable, terminate in the audio/video rack as required by the equipment using the proper connectors.
- G. Install racks, cable management, enclosures, patch panels, ladder racks, cables, and other equipment required in TR as shown on Drawings. If no location is indicated, coordinate with Owner before installing equipment.
- H. Provide TR ladder racking or wire mesh cable tray as shown on Drawings. Fasten to data racks.

- I. Provide grounding and bonding as specified in Section 26 05 27, "Telecommunications Bonding Infrastructure."
- J. Provide "D" rings for cable routing support on backboards, for feeding cables up or down from ladder rack and/or floor.

2.03 RACKS, ENCLOSURES, AND CABLE MANAGEMENT

- A. Two post network equipment racks nominal 19 inches
 1. Manufactured from extruded aluminum. Finish shall be flat black, post dimensions to be 84" tall x 20" wide x 3" deep with anchor plates at the top and bottom.
 2. Free standing data rack, 45RMU
 3. Floor anchored with minimum of four (4) floor anchors, anchor top of rack to either ladder racking / cable tray above rack or to backboard using angle iron or unistrut
 4. Minimum load rating for rack shall be 1,000 lbs. weight capacity
 5. EIA/ECA-310-E compliant, double sided universal mounting holes #12-24, supply minimum of twenty-four (24) #12-24 mounting screws
 6. Approved manufacturer Chatsworth #48353-703
 - a. Equivalents by Belden, B-line, Hoffman, Great Lakes, Ortronics, and Panduit
- B. Four post network equipment racks nominal 19 inches, adjustable depth
 1. Manufactured from extruded aluminum. Finish shall be flat black, post dimensions to be 84" tall x 20" wide with anchor plates at the top and bottom.
 2. Free standing data rack, 45RMU
 3. Floor anchored with minimum of four (4) floor anchors, anchor top of rack to either ladder racking above rack or to backboard using angle iron or unistrut
 4. Minimum load rating for rack shall be 1,000 lbs. weight capacity
 5. EIA/ECA-310-E compliant, double sided universal mounting holes #12-24, supply minimum of twenty-four (24) #12-24 mounting screws
 6. Approved manufacturer Chatsworth #1521X-703
 - a. Equivalents by Belden, B-line, Hoffman, Great Lakes, Ortronics, and Panduit
- C. Wall Mounted Equipment Swing-Out Rack nominal 19 inches
 1. Finish shall be flat black powder coat, dimensions to be 50" tall x 20.25" wide x 18" deep.
 2. Wall mounted data rack, 25RMU
 3. Reversible front for left and right-hand swing-out.
 4. EIA/ECA-310-E compliant, double sided universal mounting holes #12-24, supply minimum of twenty-four (50) #12-24 mounting screws
 5. Approved manufacturer Ortronics 604045451
 - a. Equivalents by Belden, Chatsworth, Hoffman, and Panduit
- D. Wall Mounted Cabinet Swing-Out Enclosure nominal 19 inches
 1. Manufactured from 14-gauge steel. Finish shall be flat black powder coat, post dimensions to be 24" tall x 21.5" wide x 24.5" deep.
 2. Wall mounted data rack, 12RMU
 3. Lockable solid steel front door.
 4. Dust resistance kit.
 5. Vented sides for airflow.
 6. Reversible cabinet for left and right-hand swing-out.

7. EIA/ECA-310-E compliant, double sided universal mounting holes #12-24, supply minimum of twenty-four (24) #12-24 mounting screws
 8. Approved manufacturer Great Lakes GL24WMS
 - a. Equivalents by Belden, Chatsworth, Hoffman, Ortronics, and Panduit
- E. Vertical Cable Management
1. The vertical cable manager nominal height shall match the height of the rack(s)/frame(s).
 2. The vertical cable manager shall bolt to the side of racks/frames with included hardware.
 3. The cable manager shall be sized to match cabling requirements. Maximum cable fill shall be calculated by dividing 50% of the usable area within the cable manager by the area of a single cable.
 4. A single vertical cable manager may be used in between bayed racks/frames if it is sized to match cable requirements for both racks/frames.
 5. The double-sided vertical cable manager shall be a double-sided H-shaped trough with a front door and a rear door. The double-sided trough shall provide independent front and rear cable pathways. The front and rear sides of the cable manager shall have T-shaped cable guides separated by openings that align with each U space on the rack. The middle of the managers shall be mostly open to allow easy cable pass-through. Three movable mid-sections shall allow attachment of cable management accessories inside the cable manager.
 - a. Double-Sided Vertical Cable Manager, 80.5" High (minimum) x 4" Wide x 16.4" Deep (minimum), black.
 - b. Double-Sided Vertical Cable Manager, 80.5" High (minimum) x 6" Wide x 16.6" Deep (minimum), black. (Between Racks)
 6. Approved manufacturers:
 - a. Belden
 - b. Chatsworth
 - c. Great Lakes
 - d. Ortronics
 - e. Panduit
 7. Basis of Design - 4 inches wide vertical cable manager: Chatsworth Velocity #13911-703
 8. Basis of Design - 6 inches wide vertical cable manager: Chatsworth Velocity #13912-703
- F. Horizontal Cable Management
1. Units shall be 1U to 2U construction.
 2. Units shall be single sided.
 3. Units shall have covers that have a dual hinge technology.
 4. Access into and out of the top and bottom of the Management shall be finger type construction.
 5. Approved manufacturers:
 - a. Belden
 - b. Chatsworth
 - c. Great Lakes
 - d. Ortronics
 - e. Panduit
 6. Basis of Design – 1U horizontal vertical cable manager: Chatsworth #30139-719
 7. Basis of Design – 2U horizontal vertical cable manager: Chatsworth #30130-719

2.04 LADDER RACK

- A. Ladder rack shall be manufactured from tubular steel. Stringers (side rails) shall be 1.5 inches deep. Maximum fill is equivalent to TIA recommended maximum fill of 6 inches deep. Provide accessory cable retaining posts if cable fill height exceeds 2 inches. Where cable retaining posts are used, they shall be 8 inches high and shall attach to the side stringer of the ladder rack with included hardware. The top of the cable retaining posts shall be fitted with a rubberized end cap to protect cables.
- B. Unless otherwise noted on the Drawings, ladder rack width shall be 18 inches with cross member (rung) spacing on 9 inch centers.
- C. All cross members shall be welded into position for maximum strength and electrical continuity of elements. No cross members shall protrude below side members that would interfere with supporting structures.
- D. All straight sections shall be provided in standard 10 foot nominal sections.
- E. Provide a method of splicing ladder rack sections and fabricated turns together end-to-end or side-to-end to form a continuous pathway.
- F. Vertical-to-horizontal and horizontal-to-vertical 90-degree turns shall be provided as required
- G. Ladder rack supports shall be of the trapeze type. Supports shall be sized to match the width of the ladder rack that is supported. Support design shall allow the support to be placed under the ladder rack at any point mid-span, but not under a ladder rack splice.
- H. All ladder rack elbows, tees, and cross fittings shall be furnished in a radius of 12, 24, or 36 inches in 30, 45, 60, or 90 degrees of arc as necessary to meet the National Electrical Code and BICSI bending radius limitations of cables to be installed in the trays. Using straight runs with radius corner brackets is also acceptable.
- I. Dropouts shall be aluminum sheets with round radius attached to either side stringer or cross member to permit cable exit out of bottom of cable tray. Where cable exits or enters the side of overhead ladder rack to access a rack, frame, cabinet or wall-mounted rack, cabinet or termination field, a radius drop shall be used to guide the cable.
- J. End caps shall be provided to cover the ends of the ladder rack. End caps shall be manufactured from a black fire-retardant rubberized material.
- K. Cable straps used for attaching cable bundles to the ladder rack cross members must be reusable with a hook and loop-style closure, at least 3/4 inch wide, and sized for cable bundles that are 2 inches, 3 inches, or 4 inches in diameter.
- L. Unless otherwise noted, finish on all metal components shall be black epoxy-polyester hybrid powder coat.
- M. Separate different cable media types within the ladder rack pathway. Treat each type of cable media separately when determining cable fill limits.

- N. Provide touch-up paint color-matched to the finish on the component and correct any minor cosmetic damage (chips, small scratches, etc.) resulting from normal handling during the installation process prior to delivery to the Owner. If a component is cosmetically damaged to the extent that correction in the field is obvious against the factory finish, replaced with a new component finished from the factory. If a component is physically damaged due to mishandling or modification during the installation process, it shall not be used as part of the ladder rack system.
- O. Approved manufacturer: Chatsworth Universal Cable Runway
 - 1. Equivalents by Belden Runway Products, Great Lakes, Middle Atlantic, Panduit, and Snake Tray.

2.05 RACK MOUNTED SURGE SUPPRESSOR

- A. For all wall-mounted enclosures less than 4 feet in height, provide horizontal rack mounted power strip with surge protection and six NEMA 5-20R outlets. Basis of design is CPI 12816-707 with equivalents by APC, Belden, Geist, Panduit, or Tripp-Lite.
- B. For all other equipment racks and enclosures, provide two (2) vertical rack mounted power strip with surge protection and 14 NEMA 5-20R outlets. Basis of design is CPI 12850-706 with equivalents by APC, Belden, Geist, Panduit, or Tripp-Lite.

2.06 LIGHTNING PROTECTOR

- A. Provide one Telecom Building Entrance Terminal, sized for the number of pairs entering the building, at the demark to cover incoming and outgoing connections.
 - 1. Units shall utilize 110 blocks for both input and output.
 - 2. Units shall comply with UL 497.
 - 3. Units shall be powder epoxy coated.
 - 4. Units shall utilize a five pin socket for devices.
- B. Acceptable Manufacturer and Model
 - 1. Circa 1880ECA1 series (25, 50, 100), with C3B1S solid state protector modules.
 - 2. Equivalent by Siemon, Panduit or Porta Systems.

2.07 BACKBONE CABLING

- A. The SCC shall provide all backbone cabling system as shown on the Drawings and as required to make a complete installation (both copper and fiber).
- B. Outside Plant, Copper Cable
 - 1. Approved cable manufacturers for PE 89 type, 50/100/300 multi-pair cable:
 - a. Superior Essex
 - b. General
 - c. Omni Cable
 - 2. Approved cable manufacturers for Category 5e, UTP, 25 pair:
 - a. Belden
 - b. Mohawk
 - c. Superior Essex

- C. Outside Plant, Fiber Optical Cable shall be indoor/outdoor or outside plant "tight buffer" type cable. All fiber not installed in conduit must be armored or installed in inner duct.
1. Strand count shall be as shown on the Drawings.
 2. Cable shall be single-mode and/or minimum OM3 50/125-micron multimode cable unless otherwise shown on the Drawings.
 3. Fiber must be protected from moisture with a moisture resistant jacket and a filling of water blocking material.
 4. Approved cable manufacturers:
 - a. Belden
 - b. BerkTek
 - c. CommScope
 - d. Corning
 - e. Mohawk
 - f. Panduit
 - g. Superior Essex
 - h. TCS
- D. Outside Plant, coaxial cable shall be hard line cable/coax size as shown on the Drawings.
1. Approved cable manufacturers:
 - a. CommScope
- E. Inside Plant, Copper Cable
1. Approved cable manufacturers for 25/50/100 multi-pair Category 3 copper plenum cable:
 - a. Belden
 - b. BerkTek
 - c. CommScope
 - d. Mohawk
 - e. Superior Essex
 2. Approved cable manufacturers for 25 PR Category 5e, UTP plenum cable:
 - a. Belden
 - b. BerkTek
 - c. CommScope
 - d. Mohawk
 - e. Superior Essex
- F. Inside Plant, fiber optical cable shall be tight buffer type plenum rated armored cable.
1. Strand count shall be as shown on the Drawings.
 2. Cable shall be single-mode and/or OM4 50/125-micron multimode cable as shown on the Drawings.
 3. Approved cable manufacturers:
 - a. Belden
 - b. BerkTek
 - c. CommScope
 - d. Corning
 - e. Mohawk
 - f. Panduit
 - g. Superior Essex
 - h. TCS
- G. Inside Plant, coaxial cable shall be RG11 or 0.5" hardline, size as shown on the Drawings.

1. Approved cable manufacturers:
 - a. Belden
 - b. CommScope
 - c. West Penn

2.08 HORIZONTAL CABLING

- A. Copper Station Cabling from the TR to the work area jack shall be:
 1. Category 6, UTP, 4 pair, plenum rated approved manufacturers:
 - a. Belden 3613
 - b. BerkTek LANmark 1000
 - c. Mohawk AdvanceNet
 - d. Panduit PUP6004
 - e. Superior Essex DataGain Cat 6+
 2. Category 6a, UTP, 4 pair, plenum rated approved manufacturers:
 - a. Belden 10GXS13
 - b. BerkTek LANmark 10G2
 - c. Mohawk GigaLAN 10 Reduced Diameter
 - d. Panduit PUP6AV04
 - e. Superior Essex 10GainXP
 3. Category 6, UTP, 4 pair, OSP rated approved manufacturers:
 - a. Belden OSP6U 0101000
 - b. BerkTek LANmark 6 OSP UTP
 - c. Mohawk LAN-Trak 6 OSP M57622
 - d. Panduit PUO6C04
 - e. Superior Essex CMR/CMX Cat 6
 4. Coaxial cable, RG11 or RG6, plenum rated approved cable manufacturers:
 - a. Belden
 - b. CommScope
 - c. West Penn
- B. Fiber optical station cabling from the TR shall be terminated on LC connectors mounted in fiber duplex jack modules.
- C. Cabling for wireless access point shall be two Category 6a cables with a 25 foot figure 8 service loop for each AP (unless otherwise noted).
- D. Cabling for CCTV indoor Cameras shall be one Category 6 cable with a 10 foot figure 8 service loop for each camera (unless otherwise noted). Contractor may use a direct connect plug for the cameras, but the contractor must use a “modified single connector permanent link” test to test the cable run. The manufacturer must supply a warranty for the direct connect link. Examples: Belden REVConnect RJ45 Plug, Legrand High Performance Cat 6 RJ45 Modular Plug, Leviton Atlas X1 plus patch cord, and Panduit mini-com direct attachment plug FP6X88MTG.
- E. Cabling for HDBaseT video extension (or similar proprietary solutions, such as Extron DTP, Crestron DigitalMedia, etc.) applications shall be one Category 6A cable with a discontinuous shield (unless otherwise noted). Cable shall be certified by the HDBaseT alliance for HDBaseT applications. Contractor may use a direct connect plug for HDBaseT applications, but the contractor must use a “modified single connector permanent link” test to test the cable run. The manufacturer must supply a warranty for the direct connect link.

Examples: Belden REVConnect RJ45 Plug, Legrand High Performance Cat 6A RJ45 Modular Plug, and Panduit mini-com direct attachment plug FP6X88MTG.

1. Approved cable manufacturers:
 - a. Belden
 - b. Berktek
 - c. Panduit
 - d. Superior Essex

2.09 MTR AND TR CONNECTIONS

- A. Patch panels for Category 6 cables shall be:
 1. Belden Category 6 KeyConnect 6+
 2. Leviton eXtreme 6+
 3. Ortronics Category 6
 4. Panduit Cat 6 PanNet
- B. Patch panel for Category 6a cables shall be:
 1. Belden Category 6A KeyConnect 10GX
 2. Leviton eXtreme 6a
 3. Ortronics Category 6a
 4. Panduit Cat 6 PanNet
- C. Patch panel shall be standard or modular type punchdown patch panels.
- D. Fiber Patch Panels shall be LC connectors mounted in fiber duplex jack modules.
 1. Belden Fiber - FX UHD
 2. Leviton Opt-X Ultra
 3. Ortronics 1U Fiber Patch/Splice
 4. Panduit OptiCom
 5. TCS 1U Fiber Patch/Splice

2.10 CONSOLIDATION POINTS

- A. Wiring blocks for consolidation points shall be 110-style by Belden, Leviton, Ortronics, or Panduit.
- B. Passive, plenum-rated 2' x 2' telecommunications enclosures for consolidation points shall be Leviton Z1000-PC2 or equivalents by Belden, Ortronics, or Panduit.

2.11 WORK AREA OUTLETS

- A. Work area faceplates for flush devices in interior partitions shall be stainless steel.
- B. Work area faceplates for flush devices on concrete block walls shall match others but be "Jumbo" plates.
- C. Work area jacks for Category 6 cables shall be:
 1. Belden Category 6+ KeyConnect 6+
 2. Leviton eXtreme 6+
 3. Ortronics Clarity
 4. Panduit CJ688TGxx

- D. Work area jacks for Category 6a cables shall be:
 - 1. Belden Category 6a KeyConnect 10GX
 - 2. Leviton eXtreme 6a
 - 3. Ortronics Category 6a
 - 4. Panduit CJ688TGxx
- E. Wall Phone Plate, stainless steel, single gang, one-port shall be:
 - 1. Belden AX104230
 - 2. Leviton eXtreme 6+
 - 3. Ortronics Category 6
 - 4. Panduit KWP6PY
- F. Wireless 2-port surface mount box for connection shall be Leviton 41089-2WP or equivalents by Belden, Ortronics, or Panduit.

2.12 WORK AREA EXTENSIONS TO DEVICE

- A. Patch Cords shall be manufactured and supplied by the manufacturer of the connectivity and shall be rated for the same performance specifications as the cabling and connectivity being utilized. These cords shall be small diameter type patch cords, 24 to 28 AWG stranded conductors.
- B. Unless otherwise indicated on the Drawings, the Contractor shall provide two cables for each work area outlet data jack (one for work area outlet and one for MTR/TR) and one cable for each wall phone jack (for MTR/TR only). Of the cables provided, the Contractor shall supply 50% of the cables as 3 feet (1 meter) and 50% as 10 feet (3 meters). Refer to the Technology Drawings for any specific quantities and lengths that may override these criteria. Category 6a patch cords shall be used for category 6a connectivity.
- C. Unless otherwise noted, mounting and installing of work area equipment such as computers, phones printers, etc. are not part of the SCC's scope of work under this Specification.

2.13 HANGERS AND SUPPORTS

- A. J-Hooks
 - 1. J-hooks shall be at least 1 inch hook size, minimum.
 - 2. J-hooks shall not be over 4 inch hook size (for locations requiring 100 4-PR Category 6 cables or more, use basket tray).
 - 3. J-hooks shall be manufactured from Spring Steel. Securable to wall, beam, threaded rod, unistrut, or pipe.
 - 4. May utilize multi-tier configuration.
 - 5. J-hooks shall have no sharp edges.
 - 6. Approved J-Hook Manufacturers:
 - a. Cooper B-Line J-hook
 - b. ERICO, type Cable Cat 21 and 32
 - c. Mag Daddy
 - d. Panduit J-Pro Series
 - e. Or Engineer approved equivalent
- B. Threaded Rods

1. Threaded rod is to be attached to building steel in a permanent manner. Minimum size of threaded rod shall be 3/8.
2. Threaded rods are to be used for J-hook support where required.
3. When used for wire basket or cable tray support, use threaded rods with a hanger trapeze kit or unistrut to form a trapeze type support for the wire basket or cable tray.

PART 3 EXECUTION

3.01 DOCUMENTS

- A. Prepare and supply documents required. See "TESTING" below.

3.02 BACKBONE CABLING INSTALLATION

- A. The SCC shall provide labor, supervision, and materials as required for a complete installation of the backbone cabling system which includes, but is not limited to, the cabling to and from the MTR and to the TR, pulling, supporting, terminating, labeling and testing.
- B. Vertical cable runs shall be supported by split cable grip every 20 vertical feet.

3.03 MTR INSTALLATION

- A. The SCC shall provide labor, supervision, and materials as required for a complete installation of the MTR and cabling.
- B. The SCC shall route incoming cables to proper location by means of ladder racking, cable tray, and/or backboard. Cable shall be routed neatly (vertical/horizontal) with some slack before termination at the proper location.

3.04 TR INSTALLATION

- A. The SCC shall provide labor, supervision, and materials as required for a complete installation of the TR cabling and cabling going to and from the TR.
- B. The SCC shall route incoming cables to proper location by means of ladder racking, cable tray, and/or backboard. Cable shall be routed neatly (vertical/horizontal) with some slack before termination at the proper location.

3.05 HORIZONTAL CABLING INSTALLATION

- A. The SCC shall provide labor, supervision, and materials as required for a complete installation of the horizontal cabling system that includes, but is not limited to, cabling from the TR to the work area, pulling, supporting, terminating, labeling, and testing.
- B. Cables shall be installed in continuous lengths from origin to destination (no splices) except for transition points, or consolidation points.
- C. Where transition points or consolidation points are allowed, they shall be located in accessible locations and housed in an enclosure intended and suitable for the purpose.

- D. Each consolidation point (CP) shall serve a maximum of 12 work areas and shall be installed with a minimum of 25% spare terminations. No more than one CP shall be placed in each permanent link. CPs shall be located in fully accessible and permanent locations, a minimum of 50 feet from the TR or MTR.
- E. When CPs are installed in a suspended ceiling or access floor space, the ceiling or floor tile locations should be clearly and permanently marked and identified as containing a CP.
- F. Exception to ANSI/TIA 568-C distance limitations for horizontal category 6 cables. Extending Ethernet and POE Ethernet cabling distances beyond the 100 meter limit is permitted using Ethernet extenders for devices such as CCTV cameras, wireless access points, and IP blue light telephones. The cable must be tested to the extender manufacturer's specifications. Only use this exception where noted on the drawings.

3.06 WORK AREA INSTALLATION

- A. The SCC shall provide labor, supervision, and materials as required for a complete installation of work area that includes, but is not limited to, terminating cable, placing the jacks and modules, faceplates, labeling and testing.
- B. Upon completion of the project, the SCC shall clean work area and leave ready for move-in. He/she shall remove all marks, fingerprints, trash, and other debris from area.

3.07 HANGERS AND SUPPORTS INSTALLATION

- A. Hangers and supports for ladder rack and cable tray shall be supported every 5 feet or less in accordance with ANSI/TIA-569-D. Ladder rack and cable tray shall be supported within 2 feet of every splice and within 2 feet on both/all sides of every intersection. Support ladder rack and cable tray within 2 feet on both sides of every change in elevation. Support ladder rack every 2 feet when attached vertically to a wall.
- B. Threaded rod for support of hooks and/or trays shall be permanently fastened to structural steel.
- C. J-hooks shall be securely fastened to wall, steel, or other structural element and spacing shall vary between 4 foot and 5 foot on center.
- D. Contractor should install cable to be independently supported by approved cable tray or hanger and support products specified in this section. Avoid draping cable to be in contact and supported by other trades' products such as ductwork, sprinkler piping, plumbing, ceiling tile, etc.

3.08 WORK

- A. The SCC shall furnish all materials, labor, and supervision required to install and put into service the structured cabling system specified and shown on the Drawings.
- B. The SCC shall be aware that they must coordinate their work with other trades and lack of access to the job site does not relieve them of the responsibility to complete the work as scheduled.

- C. The SCC shall furnish sufficient manpower and resources to finish the project when scheduled for completion. If required, the SCC will work their crew overtime to meet the completion schedule with no additional compensation.
- D. All work shall be done in a professional manner; equipment installed vertical and horizontal; cables pulled neat and aligned, but allowing slack; cables bundled, but no tie wraps shall be used; use hook and loop straps loosely, do not tighten cable bundle.
- E. All conduits pull boxes, junction boxes, AP enclosures, cables, jacks, modules and other devices shall be labeled.

3.09 CABLE ROUTING

- A. The SCC shall avoid electromagnetic interference (EMI) by routing all structured cabling a minimum of:
 - 1. 4 feet from 480 volt motors and transformers
 - 2. 12 inches from electrical power distribution cables
 - 3. 6 inches from fluorescent lighting
- B. Horizontal cable shall not exceed 90 meters.
- C. Conduits shall have no more than an equivalent of two (2) 90 degree bends allowed in any single run between junction boxes.
- D. Cables in open or non-continuous pathways shall be routed such that the following bending radius limitations are not exceeded:
 - 1. 4-pair UTP – minimum 4 times the overall cable diameter
 - 2. 4-pair STP – minimum 8 times the overall cable diameter
 - 3. Fiber Optic Cabling – minimum 20 times the overall cable diameter
 - 4. Other Structured Cabling – refer to latest ANSI/TIA 568 Standard
- E. Whenever possible, cables shall be routed from technology room into corridor and follow the corridor before branching out to the work area outlet location.

3.10 TESTING

- A. The SCC shall provide a copy of the unaltered certification test reports to the Engineer in both hardcopy and electronic format. The Contractor shall also provide a copy of the associated Cable Tester's Database Management Software with unedited soft copy.
- B. Upon completion of the balanced twisted-pair cable installation, the SCC shall perform copper cable certification tests on the complete channel for every cable, included but not limited to:
 - 1. Wire map
 - 2. Length
 - 3. Attenuation
 - 4. Near End Cross Talk (NEXT)
 - 5. Attenuation to Crosstalk Ratio (ACR-F)
 - 6. Propagation Delay and Delay Skew
 - 7. Return Loss
 - 8. Power Sum Near End Cross Talk (PSNEXT)

9. Power Sum Equal Level Far End Cross Talk (PSELFEXT)
 10. Insertion Loss
- C. Test shall be performed to published standards, including but not limited to, the latest revisions of ANSI/TIA 568-C, ISO/IEC 11802 and other applicable standards at the time of installation.
 - D. All UTP/ScTP field testers shall be factory calibrated each calendar year by the field test equipment manufacturer as stipulated by the manuals provided with the field test unit. The calibration certificate shall be provided to the Engineer for review prior to the start of testing.
 - E. All Category 6 permanent links are qualified for linear transmission performance up to 250 MHz and all Category 6a permanent links are qualified for linear transmission performance up to 500 MHz to ensure that high frequency voltage phase and magnitude contributions do not prove cumulative or adversely affect channel performance.
 - F. Upon completion of the coaxial cable installation, the SCC shall perform cable certification tests on every cable including, but not limited to:
 1. Direct current loop resistance
 2. Impedance
 3. Length
 4. TDR
 5. Noise
 - G. Upon completion of the fiber optic cable installation, the SCC shall perform optical time domain reflectometer (OTDR) testing and optical loss testing with a light source power meter on every cable.
 - H. In addition to any specific tests mentioned here, the SCC shall perform all required testing and documentation to obtain a fully certified installation from the manufacturer.
 - I. As may be required for extended applications warranties by the manufacturer, the manufacturer shall provide site inspection services of the installation in completed and/or in progress. The SCC shall make all necessary arrangements for such site visits.
 - J. Upon completion of all installation, termination and testing, the SCC shall review the entire installation with the Engineer and, at the discretion of the Owner, the Owner's authorized representative. At the time of this review, the Contractor shall present the hard copies of all unadulterated test results. The Engineer and Owner will review these test results, assess the installation, and return a written letter of acceptance to the Contractor for the Structured Cabling System.

3.11 WARRANTY

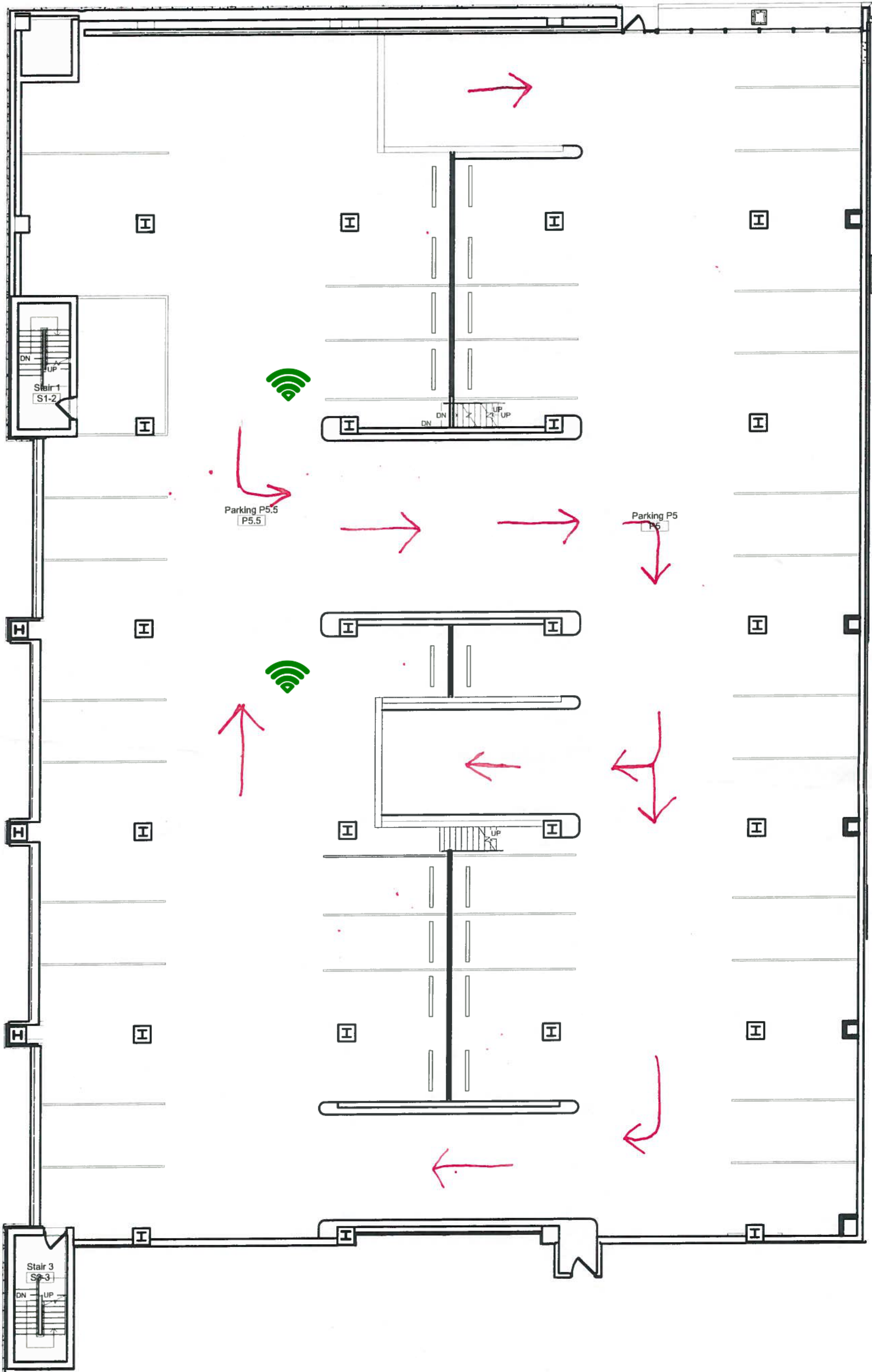
- A. The SCC shall provide a minimum twenty (20) year extended Product and Applications Warranty on parts and labor from the Connectivity Manufacturers (certified Contractor Program).

END OF SECTION

P5.5

Parking Garage - 2 APs for P5.5

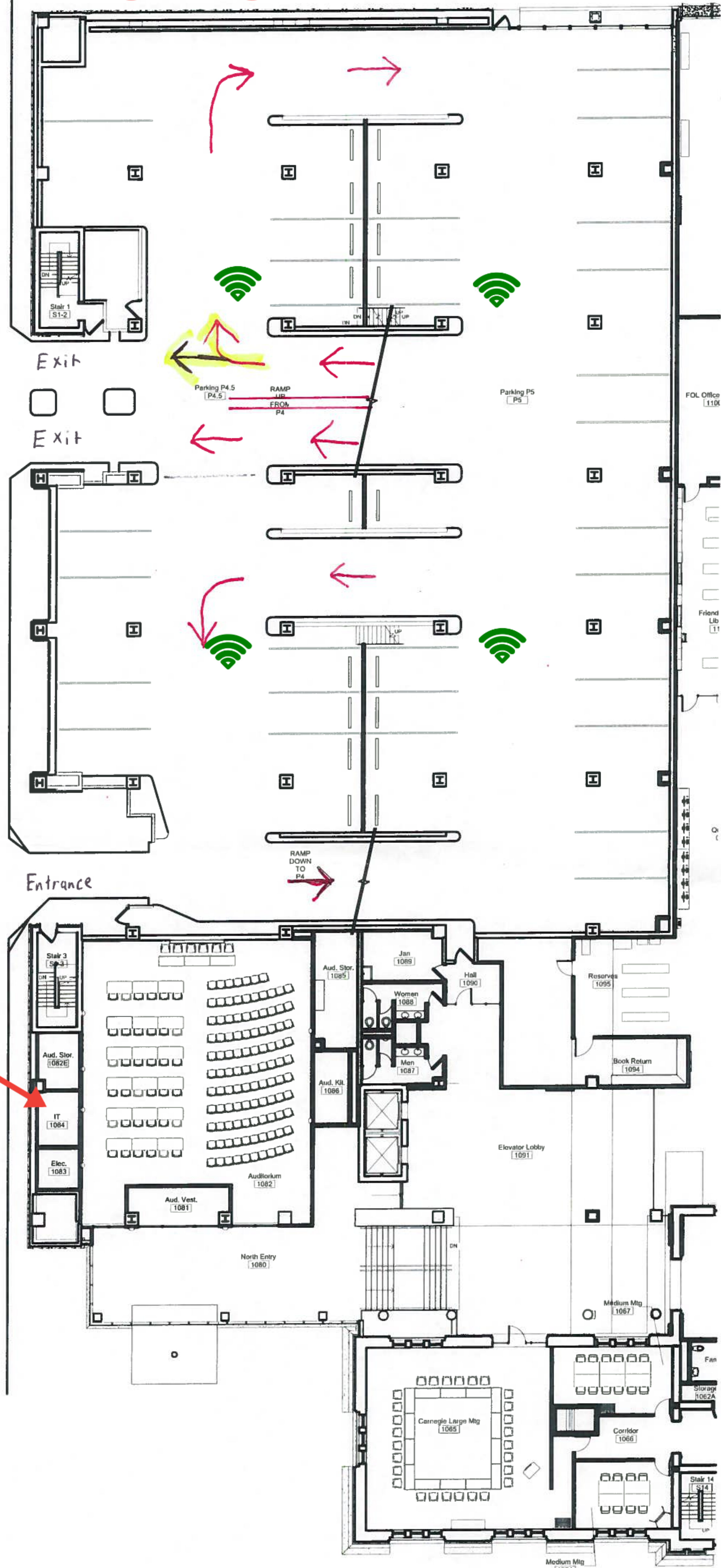
P5



PARKING GARAGE
LEVELS P5 AND P5.5

Parking Garage - 4 APs for P4.5 and P5

P4



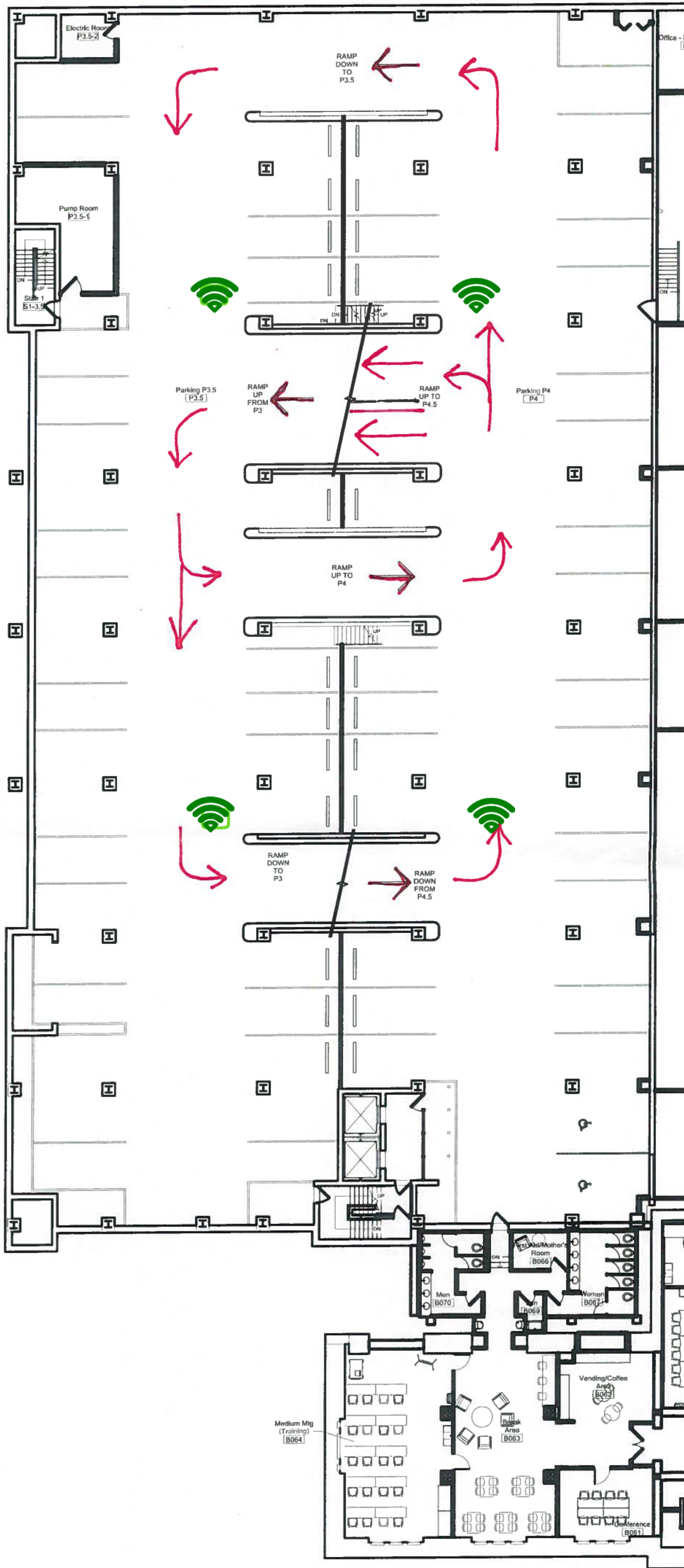
Termination room for all Garage APs

FIRST FLOOR AND PARKING GARAGE LEVELS P5 AND P4.5

Parking Garage - 4 APs for P3.5 and P4

P3.5

P4

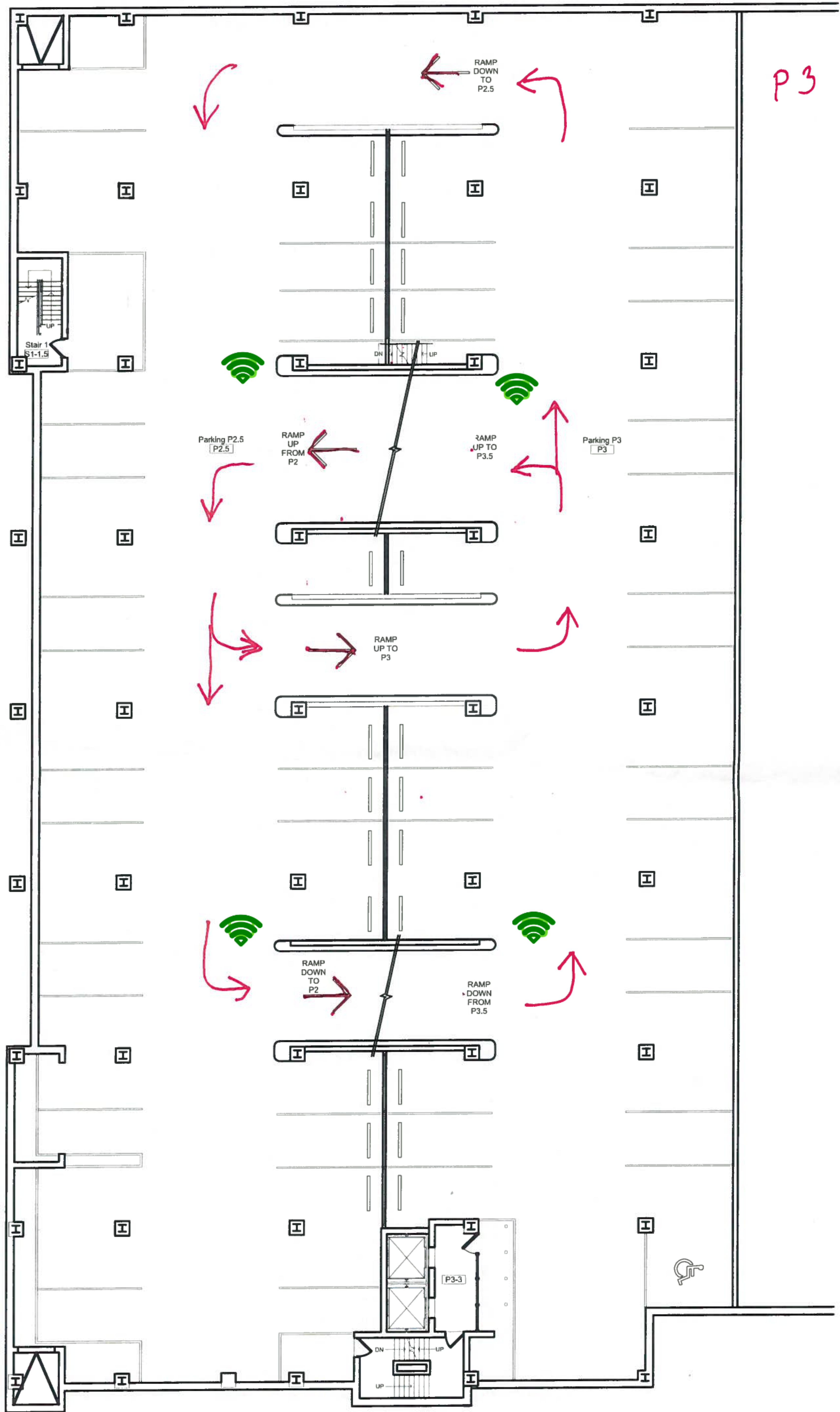


BASEMENT LEVEL AND
PARKING GARAGE
LEVELS P4 AND P3.5

Parking Garage - 4 APs for P2.5 and P3

P2.5

P3

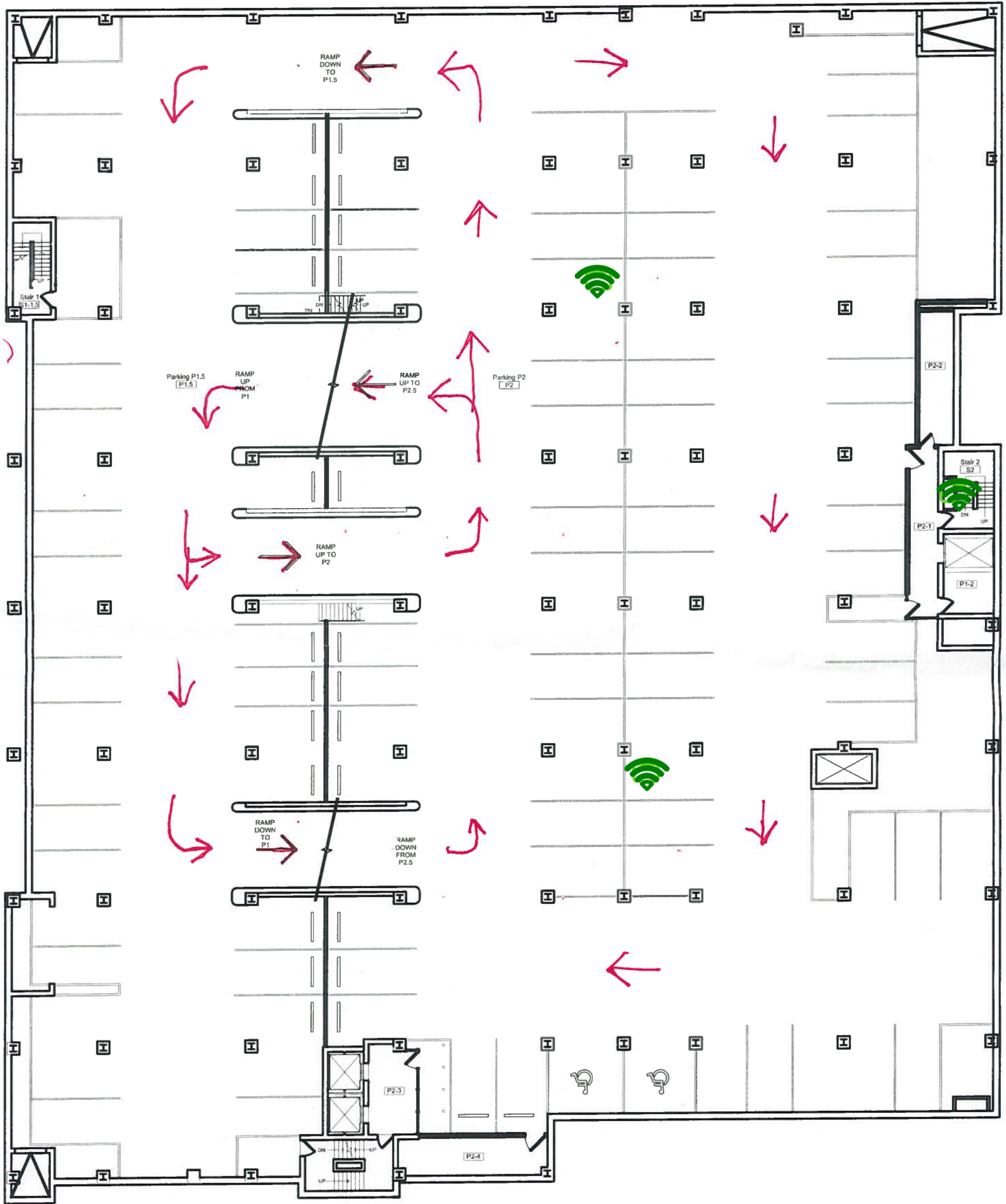


PARKING GARAGE
LEVEL P2.5 AND P3

P1.5

Parking Garage - 3 APs for P2

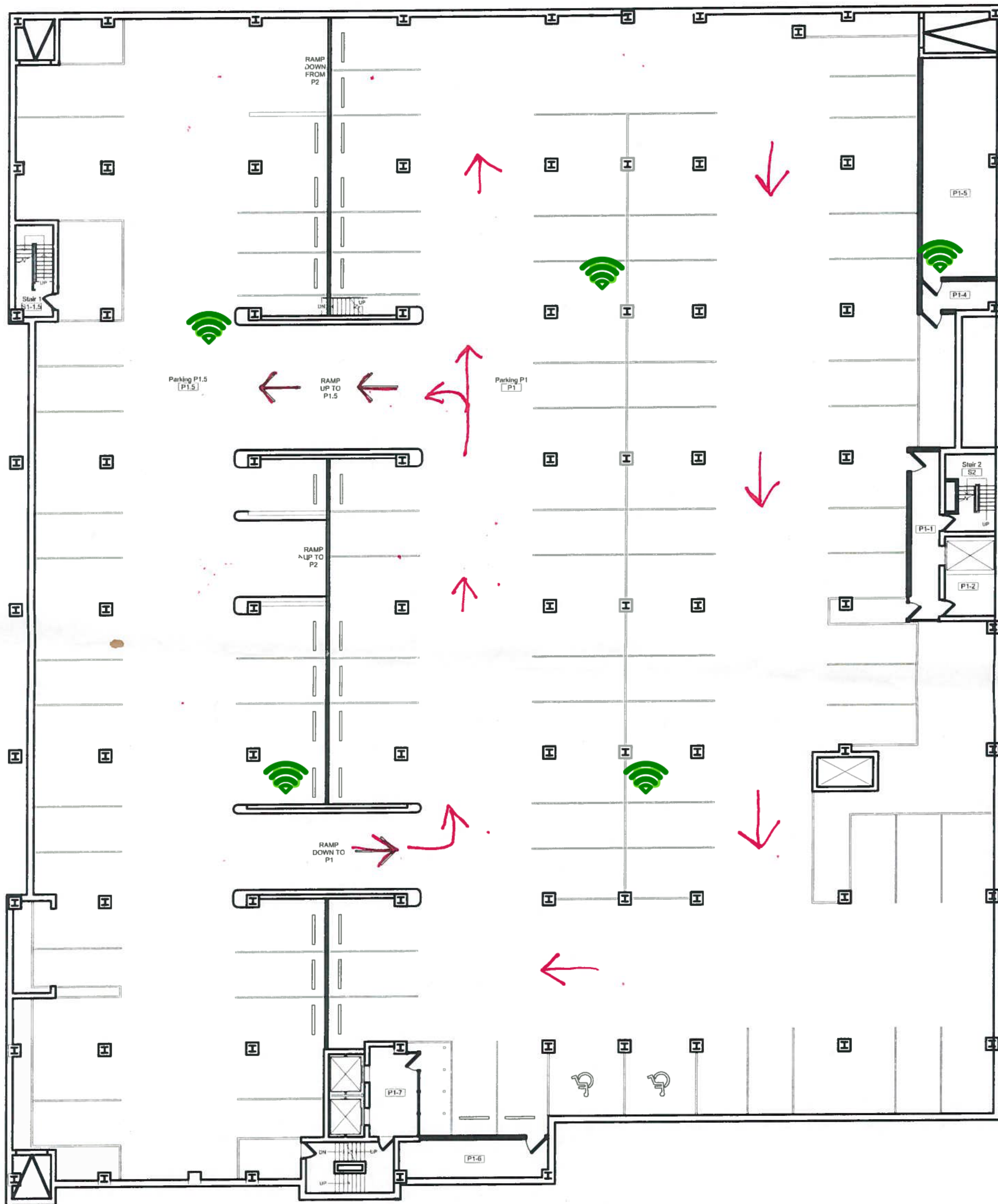
P2



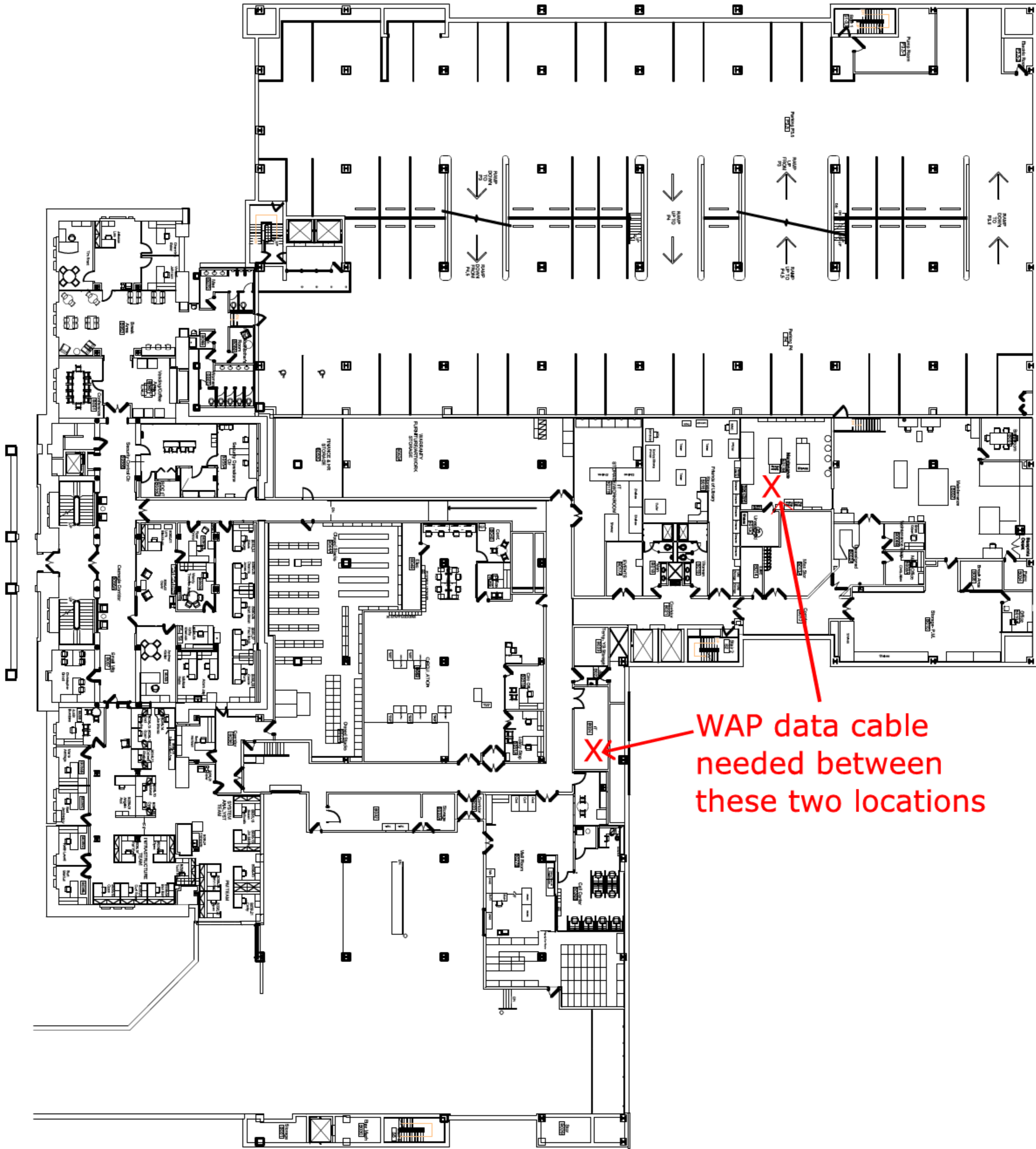
PARKING GARAGE
LEVEL P2 AND P1.5

Parking Garage - 5 APs for P1 & P1.5

P1



PARKING GARAGE
LEVEL P1 AND P1.5



WAP data cable
needed between
these two locations

Columbus Metropolitan Library - Main Branch
Basement Master Plan
96 S Grant Ave