

Request for Proposal

ROOF REPLACEMENT & SOLAR PHOTOVOLTAIC PROJECT

RFP #23-1016



RFP CONTACT

VICTORIA MITCHELL

Director, Engineering & Capital Projects

Email: Procurement@visitsandiego.com

Phone: 619-525-5306

ISSUE DATE

OCTOBER 27, 2022

SUBMITTAL DEADLINE

DECEMBER 8, 2022

REQUEST FOR PROPOSAL KEY DATES

ISSUE DATE	OCTOBER 27, 2022
MANDATORY PRE-BID SITE WALK	NOVEMBER 8, 2022; 9:00AM TO 11:00AM
PRE-BID QUESTION DEADLINE	NOVEMBER 18, 2022; 5:00PM
BID DEADLINE	DECEMBER 8, 2022 AT 2:00PM (LOCAL TIME) San Diego Convention Center Corporation Procurement Department: Send bids to procurement@visitsandiego.com
PROCUREMENT CONTACT	VICTORIA MITCHELL Director, Engineering & Capital Projects Email: procurement@visitsandiego.com Phone: 619.525.5306

DESCRIPTION

The San Diego Convention Center Corporation (“Corporation”) is requesting proposals for a Design Build Contractor to provide services for the replacement of the roof on the San Diego Convention Center - West End, and the addition of solar photo-voltaic panels on the roof of the San Diego Convention Center - West End. This request for proposal is for a turnkey Design Build project. The successful Contractor shall offer and enter into a Public Private Partnership (PPP) with the Corporation. The offering will include, as part of the PPP agreement: 1) a Contractor supported Power Purchasing Agreement (PPA) with the appropriate public utility with a guaranteed savings to the Corporation from the use of the Solar Photo-voltaic system; 2) Contractor provided financing for the project supported through the utility savings guaranteed from the Solar PV system use; 3) Contractor ownership of the Solar PV system including maintenance of the system during the initial 20 year life of the system. See attachments for full scope of project.

A. The successful Contractor shall design and install, providing all labor for demolition of existing roof and ballast and installation of a new membrane roof as described in the exhibits attached.

B. The successful Contractor shall design, install, operate, and maintain a roof mounted, utility interactive solar photo-voltaic (PV) electricity producing array, including a power purchase agreement (PPA) with San Diego Gas & Electric (SDG&E).



The Contractor will provide a base bid cost for roof replacement combined with a solar PV panel system array. There will be alternate bids for the replacement of mechanical and electrical equipment as identified in the scope document attached. The Contractor will provide costs for the alternate bids such that each bid item will stand on its own. The owner shall have the options of accepting any of the alternates independent of all other alternates. The bid form will present two categories for costs.

- A. Roof Replacement and Solar Photovoltaic
- B. Alternates as listed on the bid form

See the detailed plans and specifications located at:
RFP 23-1016 - Roof Replacement & Solar Photovoltaic Project - San Diego Convention Center (visitsandiego.com)

Written questions regarding the substance of the RFP must be submitted via e-mail to the procurement contact listed above no later than the Pre-Bid Question Deadline indicated above. Emailed Bids are due prior to the Bid Deadline indicated above and must be delivered to procurement@visitsandiego.com.
Late bids will not be accepted – **NO EXCEPTIONS.**

INSTRUCTIONS & GENERAL CONDITIONS

1. COMMUNICATIONS

All communications, any modifications, clarifications, amendments, questions, responses, or any other matters related to the Request for Proposal (RFP) must be made only through the Procurement Contact noted on the cover of this RFP, or their designee. A violation of this provision is cause for the Corporation to reject a company's bid. No contact regarding this document with other Corporation employees is permitted and may be grounds for disqualification.

2. PRE-BID INFORMATION AND QUESTIONS

Each bid that is timely received will be evaluated on its merit and for completeness of all requested information. In preparing bids, Bidders are advised to rely only upon the contents of this RFP and accompanying documents and any written clarifications or addenda issued by the Corporation. If a Bidder finds a discrepancy, error, or omission in the RFP package, or requires any written addendum thereto, the Bidder is requested to notify the Procurement Contact noted on the cover of this RFP, so that written clarification may be sent to all prospective Bidders. All questions must be submitted in writing to the Procurement Contact before the Pre-Bid Question Deadline indicated on the front of this document. All answers will be issued in the form of a written addendum.

3. PRE-BID MEETING

A pre-bid site walk is required for consideration. Please email procurement@visitsandiego.com to confirm attendance and obtain directions for the meeting location.

4. RFP MODIFICATIONS

Clarifications, modifications, or amendments may be made to the RFP at any time prior to the Bid Deadline at the discretion of the Corporation. It is the Bidder's responsibility to periodically check the Corporation's website at <https://visitsandiego.com/work-with-us/vendors/current-opportunities> until the posted Bid Deadline to obtain any issued addenda.

5. BID SUBMISSION

Submit offer on the Bid Form provided. Bidders are required to complete the entire Bid Form and supplements (if applicable).

- A. Bids must be submitted to the Procurement Department, San Diego Convention Center Corporation, by email to Procurement@visitsandiego.com, before the date and time indicated as the deadline. It is each Bidder's sole responsibility to ensure the Procurement Department receives the bid prior to the Bid Deadline.
- B. Submission of a bid establishes a conclusive presumption that the Bidder is thoroughly familiar with the Request for Proposal (RFP) and that the Bidder understands and agrees to abide by each and all of the stipulations and requirements contained therein.
- C. All costs incurred in the preparation and presentation of the bid is the Bidder's sole responsibility; no pre-bid costs will be reimbursed to any Bidder. All documentation submitted with the bid will become the property of the Corporation.
- D. Bids must be held firm for a minimum of 60 days.

6. EXCEPTIONS

Bidder shall clearly identify any proposed deviations from the Scope of Work in the Request for Proposal. Each exception must be clearly defined and referenced to the proper paragraph in this RFP. The exception shall include, at a minimum, the Bidder's proposed substitute language and opinion as to why the suggested substitution will provide equivalent or better service and performance. If no exceptions are noted in the Bidder's bid, the Corporation will assume complete conformance with this specification and the successful Bidder will be required to perform accordingly. Bids not meeting all requirements may be rejected.

7. DUPLICATE BIDS

No more than one (1) bid from any Bidder, including its subsidiaries, affiliated companies, and franchises will be considered by the Corporation. In the event multiple bids are submitted in violation of this provision, the Corporation will have the right to determine which bid will be considered, or at its sole option, reject all such multiple bids.

8. REJECTION

The Corporation reserves the right to reject any or all bids, or to accept or reject any bid in part, and to waive any minor informality or irregularity in bids received if it is determined by the Director, Engineering & Capital Projects that the best interest of the Corporation will be served by doing so. A Bidder's failure to provide any additional information requested by the Corporation prior to a contractor selection may result in rejection of the bid. The Corporation may reject any bid from any person, firm, or corporation in arrears or in default to the Corporation on any contract, debt, or other obligation, or if the Bidder is debarred by the Corporation from consideration for a contract award.

The Corporation reserves the right to reject all nonconforming, nonresponsive, unbalanced, or conditional Bids. Discrepancies in the multiplication of unit prices and unit prices themselves will be resolved in favor of unit price. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

9. PROCUREMENT POLICY

Procurement for the Corporation will be handled in a manner providing fair opportunity to all businesses. This will be accomplished without abrogation or sacrifice of quality and as determined to be in the best interest of the Corporation.

10. NON-DISCRIMINATION

Corporation will not contract with any person or firm that discriminates against employees or applicants for employment because of any factor not related to job performance. The Bidder must comply with all federal, state, and local laws and policies that prohibit discrimination in employment contracts. The Bidder must include in its subcontracts provisions that prohibit subcontractors from discriminating in their employment practices.

11. CONTRACT AWARD

The Corporation reserves the right to award by item, group of items, or total bid. The Bidder to whom the award is made will be notified at the earliest possible date. After a final award of the Contract by the Corporation, the Contractor must execute and perform said Contract. If, for any reason, a contract is not executed with the selected Bidder within fourteen (14) days after receipt of Contract, then the Corporation may recommend the award to the next qualified Bidder.

INSTRUCTIONS & GENERAL CONDITIONS (CONT.)

12. DISQUALIFICATION OF BIDDERS

Any one or more of the following causes may be considered for the disqualification of a Bidder as non-responsible and the rejection of the bid:

- A. Evidence of collusion among Bidders;
- B. Lack of competency as revealed by either financial, experience, or safety statements;
- C. Lack of responsibility as shown by past work;
- D. Uncompleted work under other contracts which in the judgment of the Corporation, might hinder or prevent the prompt completion of additional work if needed.

13. DISCUSSIONS

Discussions may be conducted with responsible Bidders, in order to clarify and assure full understanding of, and conformance to, the solicitation requirements. Discussions may be conducted with Bidders who submit bids determined to be reasonably susceptible of being elected for award, but bids may be accepted without such discussions.

Bidders shall be accorded fair and equal treatment with respect to any opportunity for discussions and revisions of bids. Such revisions may be permitted after submission and prior to award for the purpose of obtaining best and final offers. If during discussions there is a need for any substantial clarification of or change in the RFP, the RFP shall be amended to incorporate such clarification or change. The Bidder shall reduce any substantial oral clarification of a bid in writing.

14. COMMITMENT TO USE A SKILLED AND TRAINED WORKFORCE

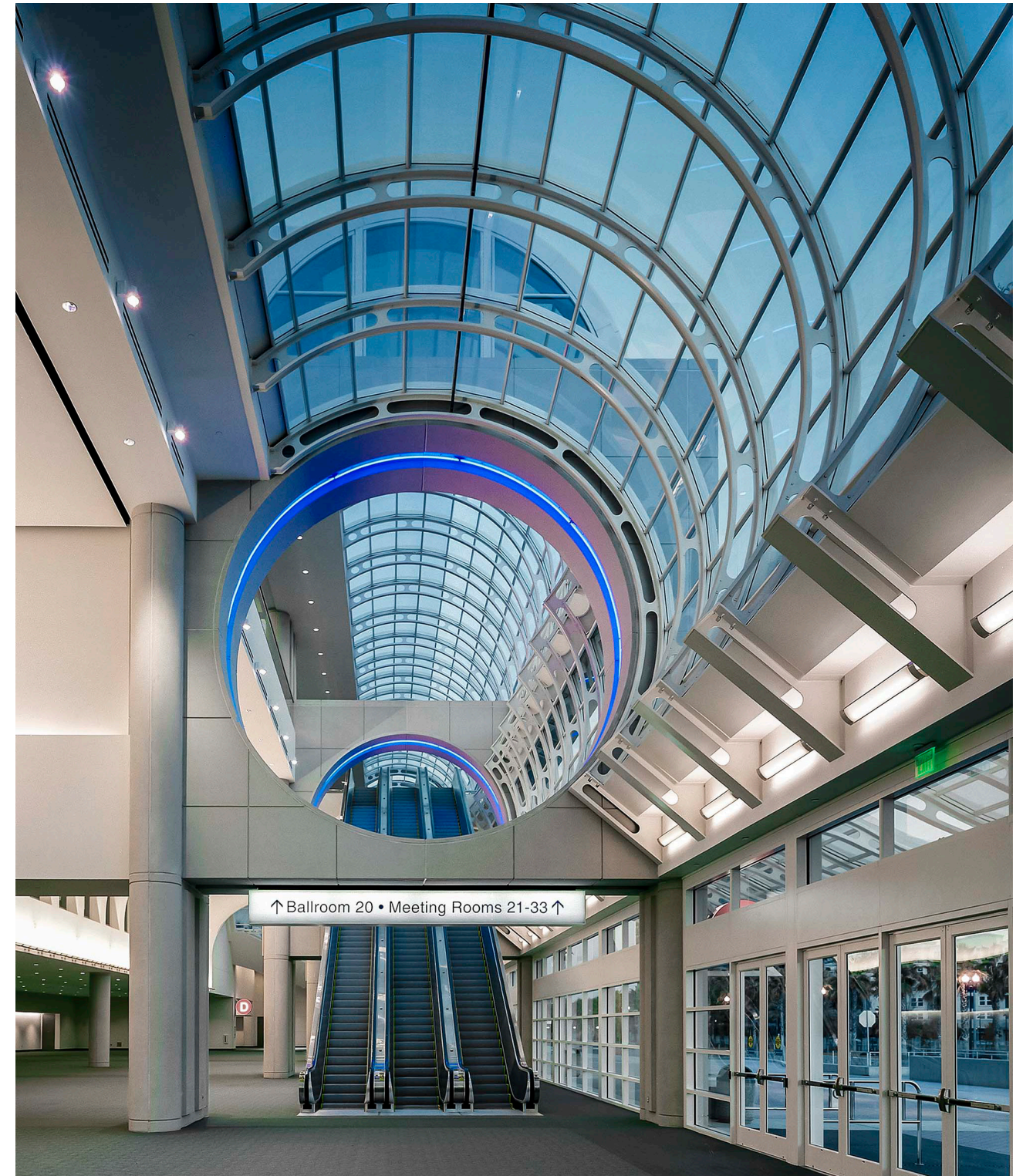
Per Public Contract Code Section 2600 et seq., the Bidder may not be prequalified and/or shortlisted unless the entity provides an enforceable commitment to the Corporation that the Bidder and its subcontractors at every tier will use a skilled and trained workforce to perform all work on the project or contract that falls within an Apprenticeshipable Occupation in the building and construction trades.

The Bidder, by submitting its Bid to the Corporation, agrees that if selected, it and its subcontractors at every tier will comply with the requirements of Public Contract Code Section 2602(a) and that the Bidder will provide the Corporation with evidence, on a monthly basis while the project or contract is being performed, that the Bidder and its subcontractors are complying with the requirements of Public Contract Code Section 2602(a).

15. SUBCONTRACTORS

The successful Bidder must identify all subcontractor(s) regardless of the dollar amount or percentage and the services they will provide. The successful Bidder is responsible for all payments and liabilities of all subcontractor(s). The Corporation reserves the right to approve or reject any proposed subcontractor. If the Corporation rejects any proposed subcontractor, the successful Bidder shall be responsible to assume the proposed subcontractor's responsibilities. The successful Bidder may propose another subcontractor if it does not jeopardize the effectiveness or efficiency of the contract.

Nothing contained in the RFP or in the contract shall create or be construed as creating any contractual relationship between subcontractor and the Corporation. The Contract will not be assignable to any other business entity without the Corporation's approval.



INSTRUCTIONS & GENERAL CONDITIONS (CONT.)

16. INSURANCE REQUIREMENTS

At all times during the term of the contract, the Contractor shall maintain, at their sole expense, insurance coverage for the Contractor, its employees, officers, and independent contractors, as follows:

TYPE OF INSURANCE	MINIMUM ACCEPTABLE LIMITS OF LIABILITY
1. Workers Compensation	Statutory

San Diego Convention Center Corporation, Inc., City of San Diego, San Diego Unified Port District, and the members, officers, directors, agents, and employees of each of these three entities shall be named as additional insured.

17. DISCLOSURE OF CONTENTS

All information provided in the bid shall be held in confidence and shall not be revealed or discussed with competitors or the general public, until after award of the contract except as provided by law or court decision.

Bidders must make no other distribution of the bids other than authorized by this RFP. A Bidder who shares cost information contained in its bid with other Corporation personnel or competing Bidder's personnel shall be subject to disqualification.

18. PUBLIC DISCLOSURE

Bids are subject to public disclosure after the deadline for submission in accordance with applicable law.

19. CONTRACT COMMENCEMENT

Commencement of a contract shall not begin prior to all necessary Corporation approvals, including Corporation's Board of Directors approval where required, and subsequent execution of the Contract. Commencement of a contract without these approvals is solely at the Bidder's own risk and is likely to result in no payment for services performed or goods received.

20. PREVAILING WAGE COMPLIANCE

The Contractor shall be fully knowledgeable of and shall comply with the provisions of the Labor Code applicable to the Work, including the general prevailing wage rate requirements, apprenticeship requirements, and requirements for subcontracts as applicable. Corporation public works projects are subject to compliance monitoring and enforcement by the Department of Industrial Relations (DIR) in accordance with Labor Code Section 1771.4(a)(1). As part of this program, contractors and subcontractors on public works projects are required to be registered with DIR in accordance with Labor Code Section 1725.5.

21. CONTRACTOR REQUIREMENTS

REQUIREMENT TYPE	REQUIRED FOR THIS PROJECT
1. Contractors State License Board (CSLB) License Appropriate License Classification(s)	Statutory (Note 1)
2. Registration with Department of Industrial Relations (DIR) as a Public Works Contractor	Yes
3. California Prevailing Wage	Yes
4. Bid Bond	No
5. Performance Bond	Yes (Note 2)
6. Payment Bond	Yes (Note 2 & 3)

Note 1 – Appropriate Specialty Contractor licenses will be required for the following, but not limited to, as it pertains to this project.

Note 2: Payment and Performance Bond: All bonds must be executed by a surety that is licensed and in compliance with the statutory requirements of the State of California Insurance Code.

Note 3: As applicable the contractor shall provide a payment bond to include all subcontractors, vendors and suppliers.

B	General Building Contractor
C-2	Insulation and Acoustical Contractor
C-4	Boiler, Hot Water Heating and Steam Fitting Contractor
C-7	Low Voltage Systems Contractor
C-10	Electrical Contractor
C-20	Warm Air Heating, Ventilating and Air-conditioning Contractor
C-33	Painting and Decorating Contractor
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PROJECT CONTACTS INFORMATION

Gafcon, Inc.

Jonathan Lundstrom, PE
Manager of Preconstruction
619-373-4545
Jlundstrom@gfcon.com

Pacifica Services

Steve Caropino
Principal
626-833-5665
scaropino@pacificaservices.com

WSP USA

Javier Galinda, PE
Construction Services Area Manager, AVP
619-321-4187 / 619-787-7393
Javier.galinda@wsp.com

CONSULTANTS

Architectural

Allen Di Donato, Jr.
Principal Architect
Di Donato Associates
619-299-4210
al@dda-arch.com

Mechanical

Tom Harmon, PE
Principal
H+W Engineering
619-659-8234 x701
tom@hwengr.com

Electrical

Bryan Wayne, PE
Principal
H+W Engineering
619-659-8234 x702
bryan@hwengr.com

Structural

Ali Wahidi, PE, SE
Principal
WSP USA
206-382-5297
Ali.wahidi@wsp.com

Solar

Enrique Castro
Senior Energy Consultant
Pacifica Services
661-417-7704
ecastro@pacificaservices.com

LIST OF ACRONYMS

AC	alternating current	LED	Light-emitting Diode
A/E	Architect/Engineer	MDP	main distribution panel
ANSI	American National Standards Institute	MPPT	maximum power point tracking
ASCE	American Society of Civil Engineers	NEC	National Electrical Code
ASME	American Society of Mechanical Engineers	NEM	Net Energy Metering
CD	compact disc	NEMA	National Electrical Manufacturers Association
CM	Construction Management	NFPA	National Fire Protection Association
CSI	Construction Specifications Institute	NRCA	National Roofing Contractors Association
DB	Design Build	POA	plane of array
DC	direct current	POI	point of interconnection
ECM	Energy Conservation Measure	PPA	Power Purchase Agreement
EPA	Environmental Protection Agency	PPP	Public Private Partnership
ETL	Electrical Testing Laboratories	PV	photovoltaic
FM	Factory Manual	QCP	quality control plan
IEC	International Electrotechnical Commission	REC	renewable energy certificate
IEEE	Institute of Electrical and Electronics Engineers	SB1	California Senate Bill 1
kW	kilowatt	STC	standard test condition
kWh	kilowatt-hour	TREC	tradable renewable energy certificate
kV	kilovolts	UL	Underwriters Laboratories
		V	volts

CHAPTER 1: RFQ/REQUEST FOR PROPOSAL/NARRATIVE

The purpose of this document is to support the solicitation of a Public Private Partnership (PPP) Design Build (DB) project for a roof replacement, and a photovoltaic solar installation at the **San Diego Convention Center**, located at 111 W Harbor Dr, San Diego, CA 92101.

The successful contractor/design firm shall have experience in design-build projects, roofing projects, and solar projects. The successful Contractor shall offer and enter into a Public Private Partnership (PPP) with the Corporation. The offering will include, as part of the PPP agreement: 1) a Contractor supported Power Purchasing Agreement (PPA) with the appropriate public utility with a guaranteed savings to the Corporation from the use of the Solar Photo-voltaic system; 2) a financing agreement for the project supported through the utility savings guaranteed from the Solar PV system use; 3) Contractor ownership of the Solar PV system including maintenance of the system during the initial 20 year life of the system.

RFQ/REQUEST FOR PROPOSAL/NARRATIVE (CONTINUED)

GENERAL

San Diego Convention Center Corporation (hereafter referred to as SDCCC or the Corporation) is soliciting proposals from a qualified contractor/designer/vendor (hereafter referred to as the Contractor) to design, fabricate, deliver, install, operate, and maintain: 1) a roof replacement for the existing ballasted roof on the west side Convention Center roof; and 2) a roof mounted, utility-interactive solar photovoltaic (PV) system under a power purchase agreement (PPA) with guaranteed performance with San Diego Gas & Electric® Company (SDG&E).

The Contractor shall demonstrate the ability to perform the work described in the scope of services set forth in this solicitation and have demonstrated experience successfully performing comparable work, including:

- .1 Experience with and successful performance within a Public Private Partnership agreement with a public entity, such as the San Diego Convention Center Corporation.
- .2 Experience in a Design Build (DB) project for successful performance in a roof replacement activity similar in size and scope to the San Diego Convention Center.
- .3 Experience in a Design Build (DB) project for successful performance in a Photovoltaic Solar Panel Project similar in size and scope to the San Diego Convention Center.
- .4 Experience in a Public Private Partnership providing financing and long term ownership of a solar PV system with guaranteed savings to the Client.

SCHEDULE

The Contractor shall work closely with the Client to determine an acceptable schedule of activities for roofing and PV installation. The Client shall provide windows of date and time for staging the work around the Convention Center schedule of activities. The work shall be completed in various stages around the time frame in the accessible areas as determined by, and in collaboration with the Client. The work shall occur in not less than four (4) distinct and individual areas of the facility, over agreed to time periods (phases) for the entire project.

A tentative schedule of design and construction milestone dates is presented below. The Contractor shall accept the dates as presented or present their own schedule of events to be considered by the client during proposal evaluation.

TENTATIVE SCHEDULE

Issue Date: See Corporations Request for Proposal

Mandatory Pre-Bid Site Walk: See Corporations Request for Proposal

Pre-Bid Questions Deadline: See Corporations Request for Proposal

Bid Deadline: See Corporations Request for Proposal

STATEMENT OF WORK

1 GENERAL

Contractor shall be responsible for the design and construction of the roof replacement and PV installation on the Convention Center west roof, tennis court level roof on North and South sides, and west end low level roof, (see attached drawings). Included shall be the lift off and, as indicated in this document, the re-installation of existing equipment or replacement with new equipment of all systems, components, and equipment necessary to replace the roof membrane and install the PV structural steel and PV panels. This includes the following.

- 1 All architectural features including, but not limited to, ballast, planters, fencing, and any other systems or appurtenances as indicated in the Architectural work description in this document.
- 2 All mechanical systems and equipment, including but not limited to: HVAC air handling units, condensers, air intake and relief hoods, exhaust fans, boilers, pumps, and any other equipment and or appurtenances to facilitate the roof replacement installation, as indicated in the Mechanical HVAC work description in this document.
- 3 All electrical systems and equipment, including but not limited to: disconnects, panels, special systems including antenna arrays, and all other equipment and appurtenances as indicated in the Electrical work descriptions in this document.
- 4 Structural support PV frame, steel uprights attached to existing structure, as indicated in the Structural work descriptions in this document.

2 OBJECTIVE

Contractor shall provide a total “turnkey” project including all necessary equipment, materials, design, manufacturing, installation, and financing services for the installation of a new roof membrane and a roof-mounted utility-interactive PV system that shall produce a minimum of 2723 kilowatt-hour (kWh) alternate current (AC)/year at the point of interconnection (POI). SDCCC will review the proposed project financing and ownership structure, presented by the Contractor as part of the proposal evaluation. The contractor should prepare a system summary detailing applicable equipment/size, and predicted system energy production (kWh). The project shall meet all requirements of this statement of work and other specifications included that apply.

STATEMENT OF WORK

3 SCOPE

The contractor shall perform all professional services as necessary to provide SDCCC with a complete design package, including the requirements outlined in this statement of work. The contractor shall install the project such that it is operational and compliant with all applicable standards, building codes, SDGE interconnection requirements, and State of California Public Utilities Commission requirements. The contractor shall include specifications, calculations, and drawings in the design package and submit 100% completed construction documents to City of San Diego, Port Authority of San Diego, and the California Coastal Commission, for permit review and approval. After permit approval of the final design package, the contractor shall provide all necessary construction services to successfully complete the roof replacement and PV system installation. For direct ownership, the awarded contractor shall apply for and manage incentives and rebate funding and renewable energy certificates (RECs) paperwork. Incentives and RECs will be the property of the SDCCC unless otherwise noted.

4 POWER PURCHASE AGREEMENT

The Contractors proposal shall include a PPA price and terms of the PPA.

5 DESIGN GUIDELINES

Contractor shall develop design documents for a roof replacement and PV system at the San Diego Convention Center. The attached Architectural and Structural drawings and other criteria identify anticipated locations, quantities, and arrangement for installation, and existing roof structure plans. These drawings are intended for informational purposes only and shall be field-verified by the contractor prior to the commencement of any design or construction activity.

- .1 The structural mounting system design shall meet applicable local building code requirements for load and seismic requirements.
- .2 Penetrations shall be minimized, for both structural support and electrical conduit penetrations.
- .3 The solar PV panels shall be fixed-tilt (minimum 5-degree tilt) with an orientation that maximizes annual energy production. Note: As an option a tracking system PV installation can be considered. Any options will need to be presented with calculations to justify the installation performance.
- .4 All roof access points shall be securely locked at the end of each day.
- .5 The system layout shall meet local fire department, code, and ordinance requirements for roof access.

STATEMENT OF WORK

6 SOLAR PV PERFORMANCE CRITERIA

The following performance criteria shall be met for all PV arrays:

- .1 The power provided shall be three-phase compatible with the on-site distribution system. Winning bidder will be required to submit electrical design drawings stamped (by a licensed professional engineer) specifying connection voltage and location.
- .2 The proposal shall provide an estimated energy delivery for each array, for each month of the year, and for the total for the year at the delivered voltage (480 V, or 13.8 kV). The Contractor shall provide a guaranteed annual energy delivery for all arrays at the POI.
- .3 The standard test condition (STC)-rated power value, slope, and orientation will be entered into PVWatts (<http://pvwatts.nrel.gov/>) using the nearest weather file to determine estimated energy delivery in kWh AC. A default value for the system losses of 14% shall be used.
- .4 The PV array shall mean one or more PV modules having the same orientation and on the same maximum power point tracking (MPPT) system. Every array with differing orientation shall have a separate MPPT system.
- .5 All proposed/implemented PV array locations shall be shade-free from 9 a.m. to 3 p.m. (solar time). The contractor shall provide documentation of shading calculations for exterior extents for each proposed array. These calculations may be modified for shading obstructions that will be removed and mitigated as part of the project. Suggested documentation would include sun path diagrams for exterior array locations or SunEye measurements.
- .6 All PV hardware components shall be either stainless steel or aluminum. PV structural components shall be corrosion-resistant (e.g., galvanized steel, stainless steel, composites, or aluminum).
- .7 The project, including supports and power conductors, shall not interfere with roof drains, water drainage, expansion joints, air intakes, existing electrical and mechanical equipment, existing antennas, and planned areas for future installation of equipment shown on drawings.
- .8 The project shall meet all criteria per the PPA for metering and the POI for the building.

STATEMENT OF WORK

7 TECHNICAL REQUIREMENTS & REFERENCE MATERIALS

.1 Code Compliance.

The installation and equipment shall comply with applicable building, mechanical, fire, seismic, structural, and electrical codes. Only products that are listed, tested, identified, or labeled by Underwriters Laboratories (UL), Factory Mutual (FM), Electrical Testing Laboratories (ETL), or another nationally recognized testing laboratory shall be used as components in the project. Non-listed products are only permitted for use as project components when a comparable useable listed component does not exist. Non-listed products proposed for use as components must be identified as such in all submittals.

.2 The Contractor

Shall use project components that are or made of materials that are recyclable, that contain recycled materials, and that are or ENERGY STAR® rated if they are available on the market.

.3 The publications listed below form a part of this document and are hereby incorporated by reference:

- .A National Electrical Code (NEC)
- .B UL 1703 Flat – Plate PV Modules and Panels
- .C UL 1741 – Standard for Static Inverters and Charge Controllers for Use in PV Power Systems
- .D FM Approved – Fire Protection Tests for Solar Component Products
- .E International Electrotechnical Commission (IEC) 62446 Grid-Connected PV Systems – Minimum Requirements for System Documentation, Commissioning Tests, and Inspections

.4 Other technical codes that shall apply include:

- .A American Society of Mechanical Engineers (ASME) Performance Test Codes (PTC) 50 (solar PV performance)
- .B American National Standards Institute (ANSI) Z21.83 (solar PV performance and safety)
- .C National Fire Protection Association (NFPA) 853 (solar PV systems near buildings)
- .D Institute of Electrical and Electronics Engineers (IEEE) 1547 (interconnections)
- .E American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI)-7 – ASCE – “Minimum Design Loads for Buildings and Other Structures”
- .F National Roofing Contractors Association (NRCA)

STATEMENT OF WORK

8 ROLES & RESPONSIBILITIES

.1 Contractor

The contractor is required to provide:

- .A Conceptual Design Drawings
- .B Construction documents and engineering calculations that are signed and sealed by a licensed architect or professional engineer in the appropriate discipline of the subject design drawings (e.g. architectural, geotechnical, electrical, structural)
- .C Submittals for materials and products
- .D Construction materials, equipment, and labor
- .E Design and construction supervision/contract management
- .F A quality control plan (QCP)
- .G A safety plan
- .H Inspections and tests (per QCP)
- .I Manuals (e.g., design calculations, operation/maintenance, a shop drawing, etc.)
- .J Commissioning of the project
- .K Mentoring and training of building operating staff for operation and maintenance
- .L Operation and maintenance during the first year and an optional service plan after the first year
- .M A web-based monitoring system for 20 years

.2 SDCCC will:

- .A Provide information and facility site visits per the contractor's request
- .B Review for approval design submittals and QCP
- .C Witness inspections to verify attainment of performance requirements
- .D Make progress payments for design/construction as agreed

STATEMENT OF WORK

9 PROPOSAL PV CONCEPT DRAWINGS & SPECIFICATIONS SUBMITTAL

- .1 **Concept Drawings.** The contractor shall provide SDCCC with conceptual design drawings with the proposal. The conceptual design drawings must indicate the proposed location of the PV array(s) and access points along with a one-line electrical diagram showing inverters, transformers, meters, and interconnection locations. All drawings shall be submitted with dimensions shown in English units.
- .2 **Conceptual Design Information.** The proposal shall include major equipment information, proposed installation/interconnection information, applicable incentive information, and performance characteristics of the system. The proposal shall identify an appropriate location for the solar PV inverter equipment and its related components and environmental control systems that will meet the following criteria:
- .A Ease of maintenance and monitoring
 - .B Efficient operation
 - .C Low operating losses
 - .D Secured location and hardware
 - .E Compatibility with existing facilities
 - .F Avoidance of flood-prone areas

All products shall comply with the technical requirements shown under section 8, "Solar Electric Module Array." At a minimum, the proposed concept information shall include:

- .3 **Equipment Information**
- .A System description
 - .B Layout of installation
 - .C Selection of key equipment and layout of equipment
 - .D Performance of equipment components and subsystems
 - .E Specifications for equipment procurement and installation
 - .F All engineering associated with structural and mounting details
 - .G Controls, monitors, and instrumentation
 - .H Operation and maintenance service plan
- .4 **Installation Interconnection Information**
- .A Solar electric array orientation (degrees)
 - .B Solar electric module tilt (degrees)
 - .C Electrical grid interconnection requirements
 - .D Integration of solar PV system with other power sources
 - .E System type and mode of operation (utility interactive)

STATEMENT OF WORK

9 PROPOSAL PV CONCEPT DRAWINGS & SPECIFICATIONS SUBMITTAL (continued)

.5 Performance Characteristics

- .A Shading calculation documentation
- .B Total system output (kWh/year)
- .C Estimated kWh/month per array (shown over a 12-month period)
- .D Warranties and guarantees

.6 Applicable Incentives

- .A Identify all applicable incentives

.7 Interconnection Agreement

- .A Provide confirmation that the PV systems will be designed to comply with applicable SDG&E interconnection requirements

STATEMENT OF WORK

10 DESIGN SERVICES

.1 General

The Contractor shall provide a base bid design package including roof replacement and a solar PV system design. The roof replacement design shall comply with the Architectural information that is a part of the RFP. The solar PV system design shall be designed with the intent of the solar PV project information attached to this RFP. Alternates for equipment replacement and system revisions shall be designed as per the accepted alternates selected by SDCCC at the time of bid.

Design services for this project shall require a schematic design submission (35% CD), a design development submission (65% CD), a check set submission (95% CD), and a construction document submission (100% CD). These submissions shall be delivered to SDCCC based on the project schedule submitted and approved by SDCCC. The design package shall include the following details.

.2 Design Timeline/Project Construction Schedule

The Contractor shall provide an estimate of the project timeline and scheduled completion of the design activities. A project construction schedule shall include all proposed staging activities coordinated with the Client and agreed to with all parties, including subcontractors and equipment providers. The Contract shall schedule all work based on a "zero disruption" to the Client's use of the building or individual building areas. Where disruption is unavoidable, the work will occur after regular occupied hours based on the Client's schedule of activities. This includes utility service interaction activities and building HVAC and Electrical use of the building.

.3 Post-award Conference

The Contractor shall hold a post-award conference within 21 calendar days after receipt of the contract award. The meeting will be attended by SDCCC team members and the contractor's personnel. At a minimum, the prime contractor's project manager and foreman, the primary designer, and a representative of any subcontractor performing over 25% of the work shall attend. The meeting shall include a site walk of the project location. The purpose of the meeting will be to discuss the contractor's plan for completing the design and construction, including a construction schedule.

.4 Specifications

The Contractor shall provide a base bid design package including roof replacement and a solar PV system design. The roof replacement design shall comply with the Architectural information that is a part of the RFP. The solar PV system design shall be designed with the intent of the solar PV project information attached to this RFP. Alternates for equipment replacement and system revisions shall be designed as per the accepted alternates selected by SDCCC at the time of bid.

Design services for this project shall require a schematic design submission (35% CD), a design development submission (65% CD), a check set submission (95% CD), and a construction document submission (100% CD). These submissions shall be delivered to SDCCC based on the project schedule submitted and approved by SDCCC. The design package shall include the following details.

.5 Units

All drawings, estimates, calculations and specifications shall be in English units.

STATEMENT OF WORK

10 DESIGN SERVICES (continued)

.6 Construction Drawings

.A Provide drawings for each discipline required (architectural, structural, electrical, etc.), with separate plans for new work and demolition as well as special types of drawings where necessary, such as enlarged plans, equipment curbing and flashing details, roof penetration details, etc. Drawings shall clearly distinguish between new and existing work.

.B Each drawing shall indicate project title, project number, architect/engineer (A/E) firm, A/E's address and/or phone number, contract number, drawing title, drawing type, drawing number, and key plan. A cover sheet shall be provided and shall include a list of the drawings, legend, vicinity map, and location map in addition to all items required for each drawing. Each A/E submission shall be clearly dated and labeled (e.g. Design Development Submission, Check Set Submission, Construction Document Submission). Each drawing sheet submitted shall include a graphic scale in the lower right-hand portion of the sheet.

At a minimum, the following drawings are required:

.C Site plan including utility locations and connections – showing staging and phasing requirements

.D Architectural drawings showing the full layout of the general construction work to be performed including roof work and work interior to the building.

.E Solar PV drawings indicating all aspects of a complete and operational PV system, including array locations, support details, etc. Drawings shall identify any existing obstacles, equipment, or system otherwise that that must be permanently or temporarily removed or relocated during the installation of the solar PV system.

.F Structural drawings showing the support of all solar PV arrays, all new or relocated mechanical equipment, all new and or relocated electrical equipment, etc.

.G Mechanical drawings showing all equipment and systems (piping, etc.) to remain, to be relocated, or to be furnished and installed as new or as existing to be replaced. Provide details needed for industry accepted methods of installation including coordinated mounting details with Architectural and Structural drawings.

.H Electrical drawings showing all equipment and systems (conduit, raceways, etc.) to remain, to be relocated, or to be furnished and installed as new or as existing to be replaced. Provide details needed for industry accepted methods of installation including coordinated mounting details with Architectural and Structural drawings.

.I Any drawings that may be required to install a complete project

.J Waterproofing details

.K The contract documents shall sufficiently define the statement of work and shall stand on their own.

.L Specifically address the means to keep the existing building accessible and operational by means of relocation and/or phasing.

STATEMENT OF WORK

10 DESIGN SERVICES (continued)

.7 Calculations

The Contractor will provide the following calculations:

- .A System Electrical Calculations. Provide with design development and again with 100% check set.
- .B PVWatts calculation
- .C System energy production calculation showing estimated monthly and yearly energy output for each array
- .D Energy value and project cash flow
- .E Energy performance calculated by a detailed PV analysis program such as System Advisor Model (SAM) (<https://sam.nrel.gov/>) or other industry-recognized PV design software tools using proposed specific PV modules and inverters.
- .F Structural calculations for all equipment and systems. All equipment and systems loading (dead load, live load, and seismic load values) shall be identified and confirmed with existing structural load allowances. The documents included in this contract include existing structural drawings for reference only.

.8 Registration Seals.

The final set of drawings, specifications and calculations shall be signed by, and bear the seal of, the Architect and/or Discipline Engineer duly licensed to perform such work in the *State of California*.

STATEMENT OF WORK

11 DESIGN SUBMISSIONS

The awarded contractor shall secure from governing agencies and the utility company all required rights, permits, approvals, and interconnection agreements at no additional cost to SDCCC. The awarded contractor will complete and submit in a timely manner all documentation required to qualify for available rebates and incentives.

.1 Design Reviews.

For each design/drawing submission, SDCCC reserves the right to make comments and request changes after the receipt of the submission. Reviews will be made by SDCCC staff and Client Consultants. As part of its review, SDCCC may offer submission reviews to local code officials. SDCCC shall provide review comments within 14 calendar days of receipt of the Design Submission.

.2 Purpose.

SDCCC will review the contractor design submissions to verify adherence to contract requirements. Design reviews are not to be interpreted as an approval of the contractor's apparent progress toward meeting contract requirements but are intended to discover any information that can be brought to the contractor's attention that might prevent errors, misdirection, or rework later in the project. The contractor shall remain completely responsible for designing, constructing, operating, and maintaining the project in accordance with this request for proposal, and the contract requirements.

.3 Resolution of Comments.

The contractor shall respond to all design review comments in writing, indicating one of the following: (1) adoption and action taken, (2) adoption with modifications and action taken, (3) alternative resolution and action taken, or (4) rejection. In cases other than unqualified adoption, the contractor shall provide a statement as to why the reviewer's comment is inappropriate. If the contractor believes that any SDCCC design comments or requested changes will result in a change in the contract cost, it shall notify SDCCC within seven calendar days of receiving the comment(s) and provide a detailed cost estimate of anticipated contract modifications. Rejection items shall not go forward to the construction phase until adequate resolution of the rejected item has been approved by SDCCC. Design review comments shall not relieve the contractor from compliance with terms and conditions of this contract. The contractor's comment resolution shall be transmitted to SDCCC within seven calendar days of comment receipt and shall incorporate discussions from the scheduled design comment review meetings.

12 POWER PURCHASE AGREEMENT (PPA)

- .1 The contractor shall coordinate with SDGE to ensure that the project satisfies all SDGE criteria for interconnection of the project to the SDGE electric distribution system. This includes coordinating all negotiations, meeting with SDGE, conducting design reviews, and participating in any needed interaction between SDGE and SDCCC.
- .2 The contractor is responsible for preparing required submissions for obtaining the Net Energy Metering (NEM) (if applicable) and interconnection agreement from the utility. SDCCC, not the contractor, will sign the NEM and interconnection agreements. For a PPA, the Net Energy Metering (NEM) and interconnection agreement is between the system owner and the utility.
- .3 The contractor shall manage the interconnection and start-up of the project in coordination with the site and SDGE. The contractor shall (at its own expense) pay any interconnection, processing, and other fees and expenses as may be required by SDGE for interconnection and operation of the project.

STATEMENT OF WORK

13 QUALITY & CONTROL PLAN

.1 Content.

For each performance and installation requirement, the QCP shall identify: item/system to be tested, exact test(s) to be performed, measured parameters, inspection/testing organization, and the stage of construction development when tests are to be performed. Each inspection/test shall be included in the overall construction schedule. The contractor is not relieved from required performance tests should these not be included in the plan.

The QCP is intended to document those inspections and tests necessary to assure SDCCC that product delivery, quality, and performance are as required. It also serves as an inspection coordination tool between the contractor and SDCCC. An example of these inspections/tests is the final test/inspection for overall performance compliance of the system. Results from tests and inspections shall be submitted within 24 hours of performing the tests and inspections.

At a minimum, the QCP should conform to "IEC 62446 Grid-Connected PV Systems – Minimum Requirements for System Documentation, Commissioning Tests, and Inspections (latest version)."

Performance tests will be conducted at the final commissioning/acceptance testing and 1 year after the acceptance date. Performance tests will include electrical current – voltage (I-V) curve traces for all PV strings. For project acceptance, measured performance at MPPT must be at least 90% of expected performance, which will be adjusted for concurrently measured cell temperature and plane of array (POA) irradiance. This can be accomplished using a current industry-standard I-V curve tracer with capability to compare measured PV string I-V curves with nameplate performance of PV string compensated for concurrent cell temperature and POA irradiance measurements. If performance is less than 90% at the 1-year performance tests (measured using the same method as for project acceptance), the contractor shall promptly troubleshoot and correct any malfunction or issues as necessary to return the project to 90% measured performance or better. The contractor shall supply SDCCC with detailed documentation of malfunction or errors and all corrective actions taken.

.2 Submissions.

The QCP shall be prepared and submitted within 21 calendar days of the post-award conference meeting and prior to any construction on-site. The QCP may be rejected as incomplete and returned for resubmission if there is any performance, condition, or operating test that is not covered therein.

.3 Updating.

During construction, the contractor shall update the QCP if any changes are necessary because of any changes or schedule constraints. SDCCC shall be notified immediately of any schedule and/or procedural changes.

STATEMENT OF WORK

14 SOLAR ELECTRIC MODULE ARRAY

.1 Photovoltaic Modules

PV modules shall be a commercial, off-the-shelf product, UL-listed, and on the California Senate Bill 1 (SB1) Lists of Eligible SB1 Guidelines Compliant PV Modules to be eligible for Construction Specifications Institute (CSI) and shall be properly installed according to manufacturer's instructions, the NEC, and as specified herein.

- .A The solar electric system shall produce the minimum annual AC energy output. If the system is proposed to produce more than the minimum required energy output to reduce the cost per delivered kWh, then the system shall produce the "proposed" energy. The output will be adjusted if the actual yearly solar insolation received is less than that indicated by PVWatts. A normalizing calculation will be made to correct the output, so a contractor is not penalized for an extremely cloudy year.
- .B System wiring shall be installed in accordance with the provisions of the NEC.
- .C All modules installed in a series string shall be installed in the same plane/orientation.
- .D Panel installation design shall allow for the best ventilation possible of panels to avoid adverse performance impacts.
- .E Attic Stock: Provide SDCCC with 1% extra PV panels.
- .F Provide a panel manufacturer's warranty: As a minimum, no module will generate less than 90% of its specified minimum power when purchased. PV modules shall have a 25-year limited warranty guaranteeing a minimum performance of at least 80% of the original power for at least 25 years. Measurement made under actual installation and temperature will be normalized to standard test conditions using the temperature and coefficients published in the module specifications. PV modules that do not satisfy this warranty condition shall be replaced.
Note: For a PPA, a warranty is included in the PPA price and covered by the contractor.

.2 Inverter and Controls

- .A Each inverter and associated controls shall be properly installed according to the manufacturer's instructions.
- .B Inverters shall be a commercial off-the-shelf product, listed to UL 1741 and IEEE 1547, and on the SB1 Compliant Lists of Eligible Inverters per SB1 guidelines: <http://www.gosolarcalifornia.org/equipment/inverters.php> or on local guidelines.
- .C The inverter shall have at a minimum the following features:
 - .a UL/ETL listed
 - .b Peak efficiency of 96% or higher
 - .c Operational indicators of performance and built-in data acquisition and remote monitoring
 - .d Capable of parallel operation with the existing AC power and the ability to automatically synchronize its output waveform with that of the utility upon restoration of utility power
- .D Warning labels shall be posted on the control panels and junction boxes indicating that the circuits are energized by an alternate power source independent of utility-provided power.
- .E Operating instructions shall be posted on or near the system and on file with facilities operation and maintenance documents.
- .F Provide detailed lock-out/tag-out instructions for all equipment.

STATEMENT OF WORK

14 SOLAR ELECTRIC MODULE ARRAY (continues)

.2 Inverter and Controls (continues)

- .G Power provided shall be compatible with on-site electric distribution systems.
- .H Install inverters and control panels in most optimum locations with appropriate environmental protection. Roofs may be used if structurally sufficient. If inverters are mounted outside they shall be shaded from direct sun from 10 a.m. to 6 p.m. in the months of June–August and be able to be secured.
- .I The inverter and system shall utilize an astronomical timer or other means to shut down the inverter during nighttime to avoid energy usage at night.
- .J A minimum 10-year manufacturer's warranty shall be provided.

.3 Control Panel to Solar Electric Array Wire Runs

- .A Areas where wiring passes through ceilings, walls, or other areas of the building shall be properly restored, booted, sealed, and returned to their original condition.
- .B All wiring between carports and the POI shall be underground and meet applicable codes.
- .C Thermal insulation in areas where wiring is installed shall be replaced to "as found or better condition." Access doors to these areas shall be properly sealed and gasketed.
- .D All field electrical devices shall have the capability to be locked as appropriate.

.4 Photovoltaic Monitoring

- .A The PV systems installed shall include a monitoring system for use by the SDCCC and the general public on a vendor-provided website. The public site is intended for education and outreach regarding renewable energy production and information on avoided greenhouse gas production. The public site shall be maintained for 10 years.
- .B Monitor by an Internet Protocol (IP)-addressable device and display graphically in a user-friendly manner the following parameters:
 - .a AC energy
 - .b Solar irradiance
 - .c status of all equipment
 - .d electrical one-line diagram showing operation and performance of all equipment

Data shall be available both in real time and in archived 15-minute averages. All monitoring hardware and monitoring equipment shall be provided by the contractor. The system shall also include metering for remote data collection and display on the vendor-provided web site of system performance. System performance shall allow display during different monitoring periods from 1 hour to 1 year.

- .C Provide networking equipment, engineering, programming, wiring, and software to allow remote connection by SDCCC to the local area network.
- .D Meters used for the project shall be listed on the California Energy Commission (CEC) Lists of Eligible System Performance Meters per SB1 Guidelines, be UL-listed, and comply with SDGE net energy metering requirements.
- .E Meters shall be installed in the main distribution panel (MDP) when possible. Meters shall not be mounted to the transformer housing without prior approval when there is no other reasonable place to mount it.

STATEMENT OF WORK

14 SOLAR ELECTRIC MODULE ARRAY (continues)

.5 Transformers

.A Stand-alone boost-up transformers not incorporated into the inverters shall be National Electrical Manufacturers Association (NEMA) premium efficiency. Exterior transformers shall be housed in a NEMA 3R enclosure and pad-mounted. They shall be located next to switchgear housings where indicated on drawings.

.6 Structural Requirements

.A All structures, including array structures, shall be designed in accordance with all applicable state and local codes and standards.

.B The contractor shall provide structural calculations stamped by a licensed professional structural engineer in the appropriate state.

.C All structural components shall be noncorrosive (galvanized steel, stainless steel, or aluminum). All hardware shall be stainless steel or aluminum. All components shall be designed to obtain a minimum 40-year design life.

.D All roof penetrations shall be designed and constructed in collaboration with the roofing professional or manufacturer responsible for the roof and roofing material warranty for the specific site. The number and size of the penetrations necessary to extend the power and control cable into the building must be kept to a minimum and grouped in a single location when practicable. All roof installations and weather proofing of penetrations shall not compromise the roof warranty, or if the roof has no warranty, accepted best practices. The roof penetrations and roof connections shall be warranted for weather tightness for 10 years from the installer, including parts and labor.

.6 Structural Requirements (continues)

.E Rooftop installations where there is no parapet, or the parapet is less than 42 in., a 6-ft safety zone from the roof edge to the PV system shall be maintained. A 3-ft clear path of travel shall be maintained to and around all rooftop equipment. Design shall address access for maintenance and replacement of the equipment. Appropriate fall protection or temporary platforms shall be incorporated into the design to allow for this maintenance and replacement work. If the inverters are mounted on the roof, this equipment shall have permanent access walkways installed to facilitate monitoring and maintenance.

.7 Attachment to Roof

.A The system shall be mounted using direct attachment. All penetrations and structural connections associated with supports and conduit shall be waterproof.

.8 Lightning Protection.

Provide surge protection on all electrical systems.

.9 Photovoltaic System Installation Warranty.

The PV systems shall carry a 5-year workmanship warranty by the installer, including parts and labor.

STATEMENT OF WORK

15 QUALIFICATIONS FOR INCENTIVES

.1 Incentives and Benefits:

The contractor shall determine and select all incentives and benefits available to the project, except that it shall select from among any mutually exclusive incentives for which the project might qualify in a way reasonably expected to maximize net present value to SDCCC of all incentives and benefits, RECs, and energy cost savings that might be realized in relation to the project.

The contractor shall complete the application and pay all deposits and fees for the selected incentives and ensure that SDCCC receives all benefits of the incentives to the extent reasonably within the contractor's control.

The project shall be designed and constructed to comply with requirements of all other benefits programs for which it might qualify, such as accreditation for RECs, green tags, and tradable renewable energy certificates (TRECs). Certification shall be accomplished through Green-e Energy (http://www.green-e.org/getcert_re.shtml) and overseen through a REC tracking system, where available.

The contractor shall complete all documentation and application processes associated with Green-e certification on behalf of SDCCC and shall, if SDCCC does not yet have an account with a REC tracking system, complete all application processes to establish an account for SDCCC, and, after the account has been established, register the project in the account such that SDCCC will receive RECs for the operation of the project. Contractor shall, at its expense, pay all deposits and fees for completing the applications and certifications with Green-e and the REC tracking system.

16 SHOP DRAWINGS/PROJECT DATA

.1 Submissions:

The contractor shall submit shop drawings and product data/submittals, catalog cuts, etc., as stipulated herein. Shop drawing/product data submissions to SDCCC shall be made after review and approval by the contractor. All approved product data and shop drawings shall be delivered to SDCCC in one submission electronically.

The contractor shall combine all product data submission material into hard copy manuals for reference during all phases of construction. Shop drawings shall be bound with product data.

.2 Reviews.

Reviews of shop drawings and product data by SDCCC are not to be interpreted as an approval of the contractor's product selections. The contractor shall remain completely responsible for constructing the PV system in accordance with all contract performance requirements.

.3 Products for Submission.

The contractor shall provide shop drawings and product data for all systems, equipment, and materials.

STATEMENT OF WORK

17 INSPECTIONS & TESTS

.1 General.

The contractor shall perform inspections and tests throughout the construction process, including existing conditions/needs assessments, construction installation placement/qualification measurements, and final inspections/tests performance certification. Periodic "quality" inspections shall also be conducted to support progress payments as identified in the contractor's QCP.

.2 SDCCC Witness.

All inspections and tests to verify documented contract assumptions, establish work accomplishment, or certify performance attainment shall be witnessed by SDCCC and/or its construction management (CM) representative and coordinated through the QCP.

.3 Final Inspections and Tests.

To ensure compliance with provisions of the NEC, an inspection by a licensed electrical inspector is mandatory after construction is complete. Unless otherwise identified, manufacturer recommendations shall be followed for all inspection and test procedures. The NEC inspection shall be conducted by an independent third-party electrical inspector familiar with PV systems. Provide qualifications of the proposed third-party inspector for review and approval prior to conducting the NEC inspections.

Tests shall include a commissioning of the array. Commissioning tests shall conform with the requirements in Section 7 (QCP). Commissioning shall be performed for the entire PV system. This data shall be used to confirm proper performance of the PV system.

.4 Documentation.

Inspections/tests required in the QCP shall result in a written record of data/observations. The contractor shall provide two copies of documents containing all test reports/findings. Test results shall typically include: item/system tested, location, date of test, test parameters/measured data, state of construction completion, operating mode, contractor inspector/SDCCC witness, test equipment description, and measurement technique.

STATEMENT OF WORK

18 PROJECT CLOSEOUT

.1 Preparation for Final Inspection and Tests

The below steps shall be taken to ensure the project is in a condition to receive inspections and tests. Finalize record drawings and manuals, indicating all as-built conditions.

.2 Record Drawings.

The contractor shall maintain on-site the working record drawings of all changes/deviations from the original design. Notations on record drawings shall be made in erasable red pencil or another color to correspond to different changes or categories of work. Marked-up drawings shall always be maintained at the contractor's on-site construction office, available for SDCCC and/or CM to review. Record drawings shall note related change order designations on affected work. When shop drawings indicate significant variations over design drawings, shop drawings may be incorporated as part of record drawings. A review of record drawings may be required before monthly payments can be processed.

.3 As-Built Drawings and Specifications.

The contractor shall provide as-built drawings and documents based upon actual site installation. Should SDCCC determine that variations exist between finished construction and the as-built drawings, the contractor shall correct drawings to the satisfaction of SDCCC. The contractor shall submit six hard copies and two compact discs (CDs) containing the as-built drawings and specifications as CAD and PDF files.

.4 Warranties and Guarantees.

Submit specific warranties and guarantees, final certifications, and similar documents to SDCCC upon substantial completion and prior to final payment. Include copies with the operation and maintenance manual. All warranties shall be signed by a principal of the contractor's firm and sealed if a corporation.

.5 Maintenance Manual.

Provide a detailed operation and maintenance manual including a diagram of system components; a description of normal operation; a description of operational indicators and the normal status of each; a table of modes of operation, safety considerations, preventive maintenance requirements, troubleshooting, and corrective actions; sources of spare parts; and cut sheets for all components. The contractor shall prepare six hard copies and two CDs containing the detailed maintenance manual. Submit to SDCCC.

.6 Spare Parts.

The contractor shall provide a recommend list of spare parts. At the minimum, a set of combiner box fuses for each array shall be provided along with the required spare panels noted in Section 8.

STATEMENT OF WORK

18 PROJECT CLOSEOUT (continued)

.7 Demonstration and Training.

Provide SDCCC with approved training for designated personnel in the operation of the entire PV energy system, including the operation and maintenance of inverter(s), transfer switches, the panel board, disconnects, and other features as requested by SDCCC. Provide SDCCC with written instructions and procedures for shutdown and start-up activities for all components of the system. SDCCC shall be permitted to videotape this training for official use.

19 OPERATION & MAINTENANCE

- .1 Provide operation and maintenance of the solar array systems for twenty (20) years or per the financing agreement used for the project construction. Work shall include all manufacturer recommended maintenance as well as a 12-month performance commissioning as outlined in Section 7.1 (QCP). SDCCC shall be invited to witness all performance commissioning. A maintenance log shall be maintained to note dates, equipment, and issues being resolved. The contractor should be available within 48 hours to respond to natural disasters (e.g., extreme storm, hail, wind events, etc.) to inspect the array for damage.

Note: For a PPA, operation and maintenance is included in the PPA price and covered by the contractor.

20 PROPOSAL EVALUATION

The proposals will be reviewed by the review committee. The following qualitative merit criteria will be used to determine the technical value of the offer in meeting the objectives of the solicitation.

Proposal Cost Effectiveness	30 points
Technical Approach/ Implementation	30 points
Company Qualifications/Project Experience	20 points
Project team, team and experience	20 points

CHAPTER 2: ROOFING/NARRATIVE

The following chapter is photographic journal with key notes as an introduction to the proposed repair of damage to, and replacement of the existing roofing system at the northwest end of the San Diego Convention Center. Additionally, keys and photographs are included to indicate areas where ceiling damage has occurred and will need to be repaired.

Based on field observation, there are four existing roofing systems employed:

- (1) Rock ballast over rubber membrane, over rigid insulation, over structure.
- (2) Concrete topping slab over rubber membrane, over rigid insulation, over structure.
- (3) Single-ply TPO roofing over rigid insulation, over structure.
- (4) Elastomeric membrane over concrete topping slab.

While it can generally be assumed that roof slope is achieved in the structure rather than the rigid insulation, this should be verified by the selected Design-Build Contractor. The existing rubber membrane is assumed to be Carlisle®. This was observed where a portion of the rock ballast has been removed. The above description is based on field observation only. No destructive testing has been performed and no as-built drawings of the original roofing installation have been found.

The general scope of repair/restoration would be to:

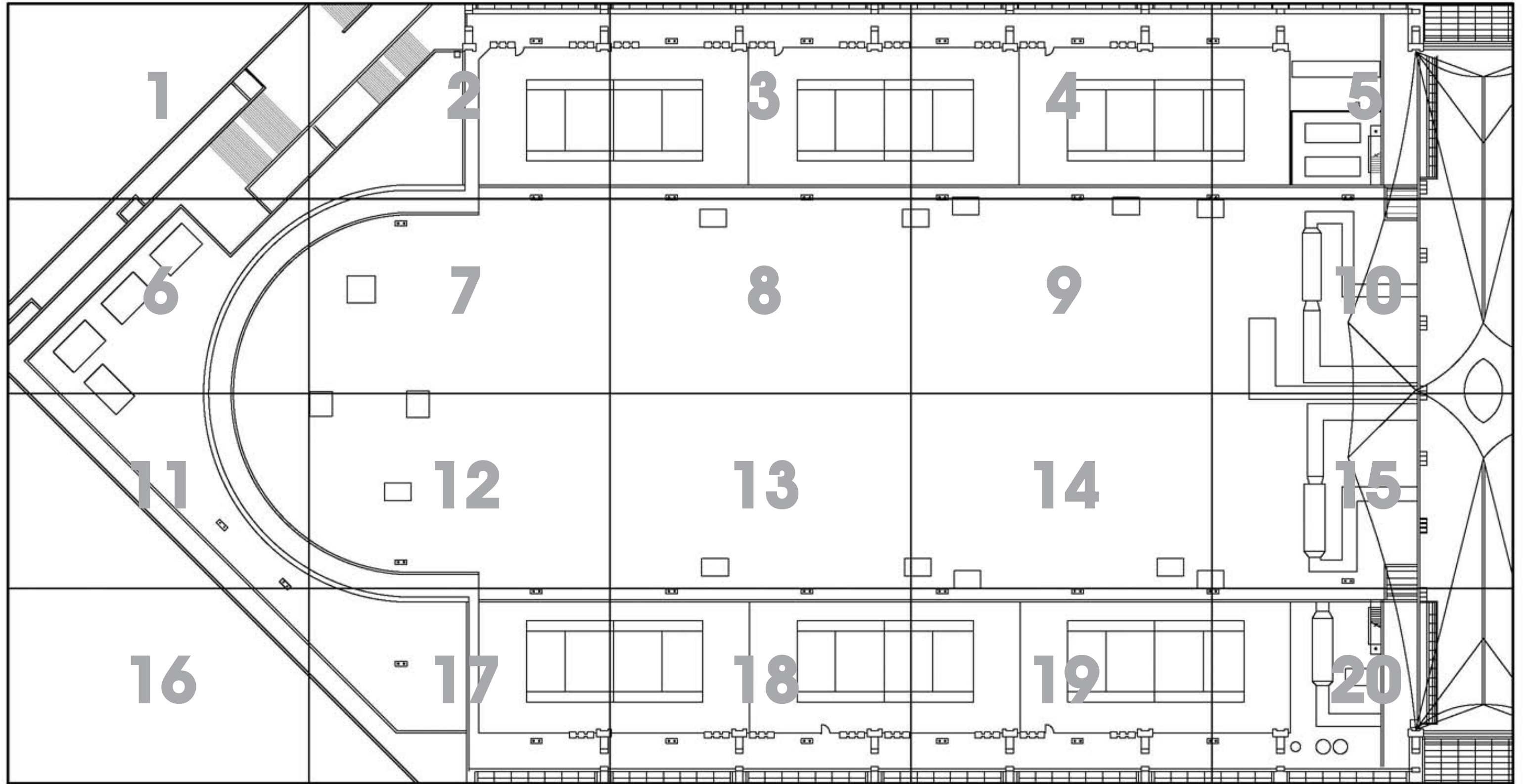
- (1) Remove and store the ballast, remove and dispose of rubber membrane, retain existing rigid insulation, verify the condition and replace if needed. Install new membrane and re-install ballast.
- (2) Remove and dispose of existing non-structural concrete topping slab, remove and dispose of existing rubber membrane, retain existing rigid insulation, verify the condition and replace if needed. Install new membrane and cover with new ballast to match existing.
- (3) Remove existing single-ply TPO roofing, retain existing rigid insulation, verify the condition and replace if needed. Install new TPO roofing.
- (4) Prep surface and install new elastomeric membrane.

See Chapter 3, which pertains to roof mounted mechanical equipment and incidental electrical scope. See Chapters 4, 5 and 6, which pertain to the installation of a new Solar/Photovoltaic system.

Note: At the northwest end of the SDCC roof, Verizon and AT&T have Cellular facilities. The Design-Build Contractor will need to contact Rodney Philhower (619) 200-2260 (Verizon), and Peter Stroup (858) 621-4693 (AT&T) to coordinate activities during construction.

All flashing and detailing of installation, as well as permit processing will be the responsibility of the selected Design-Build Contractor. The following chapter is for informational purposes only and all work must be field-verified by the Design-Build Contractor. This narrative is not intended to be a basis of construction.

ROOF PLAN WITH KEYS



PLEASE SEE PAGES 27 THROUGH 67 FOR PLANS, PHOTOS & DESCRIPTIONS OF THE ABOVE GRID

GRID 1 PLAN

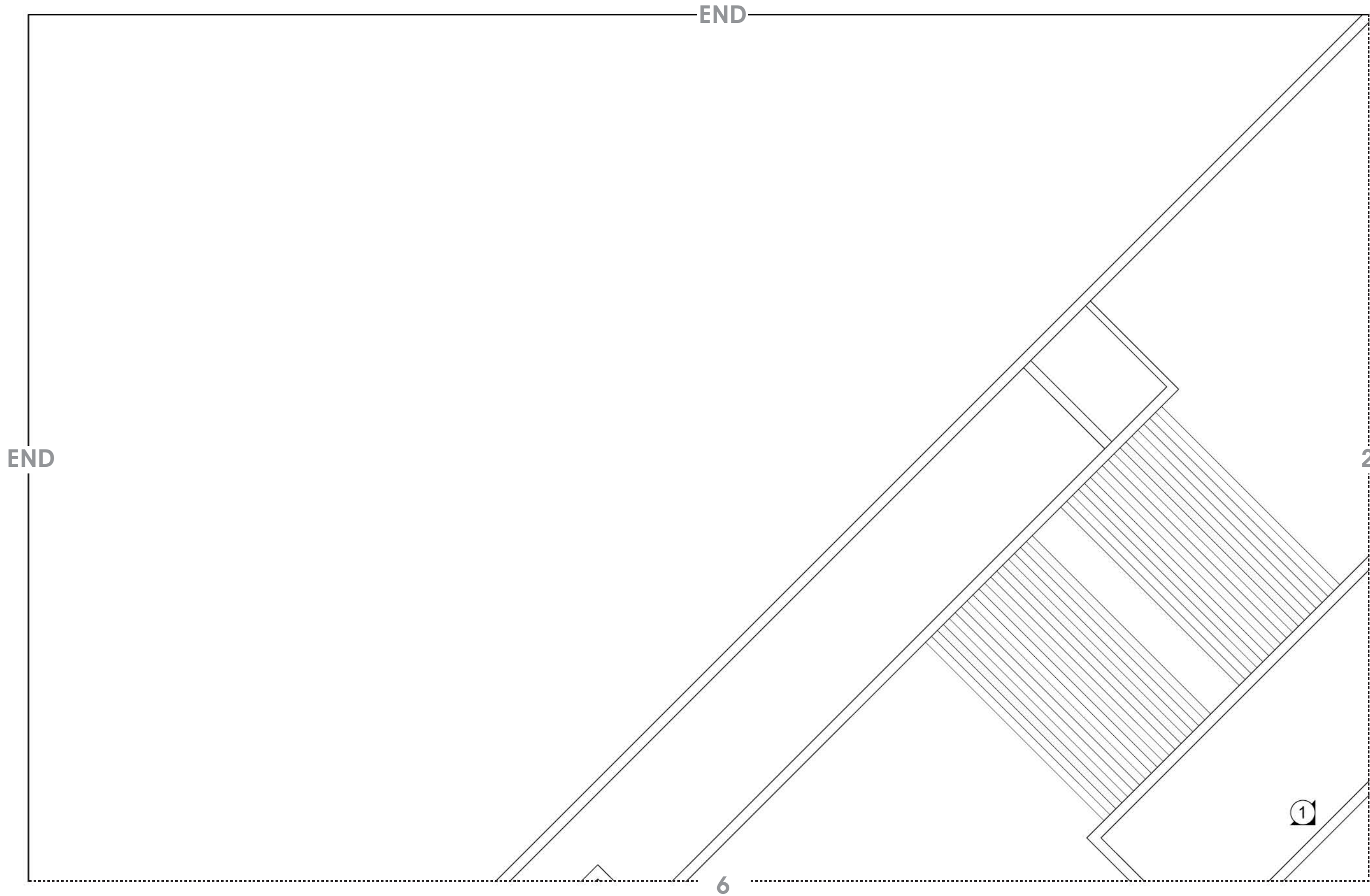
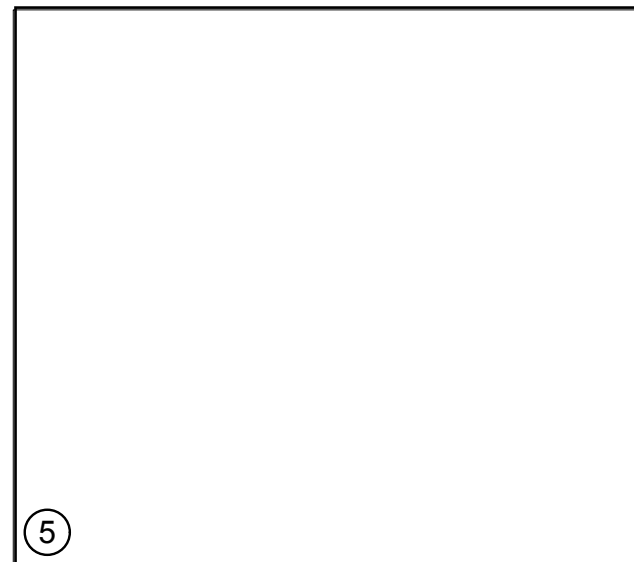
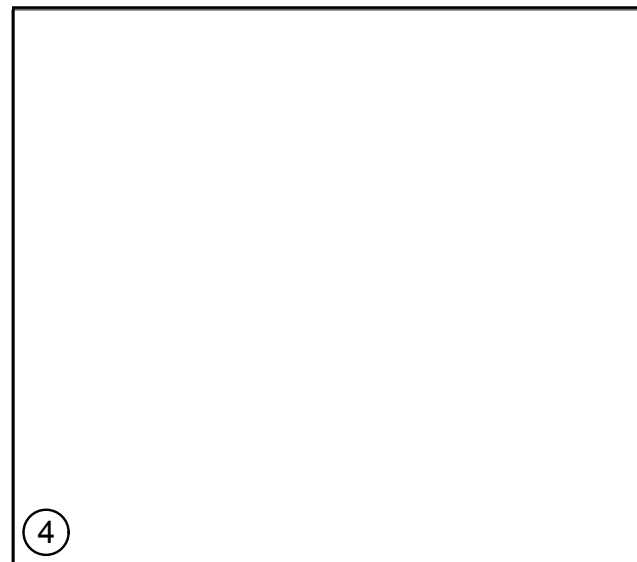


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GRID 1 PHOTOS WITH KEYS



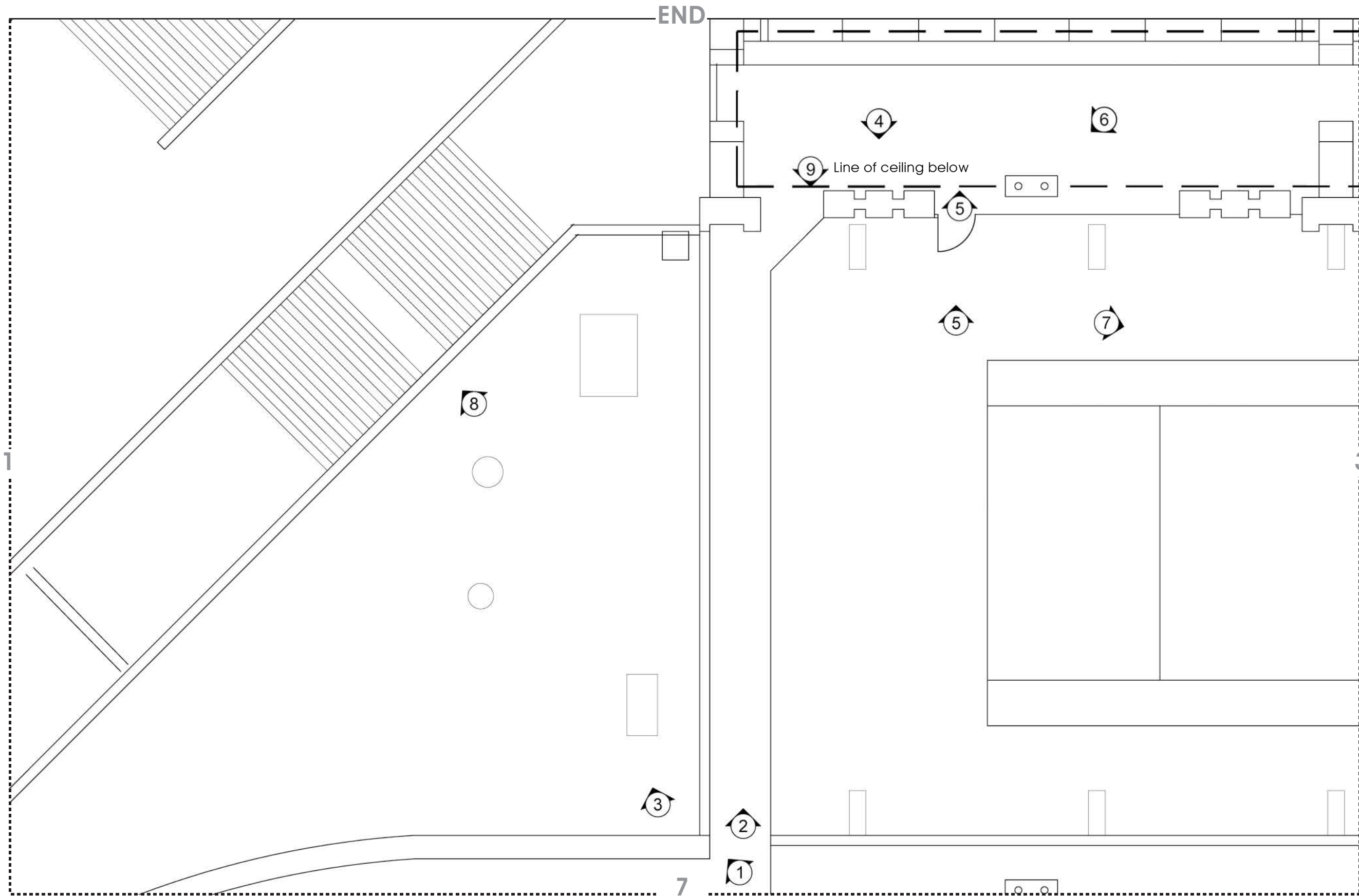
KEY NOTES


- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
- S** Install new concrete pavers
- T** Install new roof membrane
- U** Install water-proofing membrane at concrete curb
- V** Power-wash existing concrete slab and install new elastomeric membrane at slab and equipment base plates
- W** Existing door to remain, patch and repair to ensure full functionality
- X** Remove existing electrical components. Pull existing feeders back to source and cap conduit
- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3

- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.

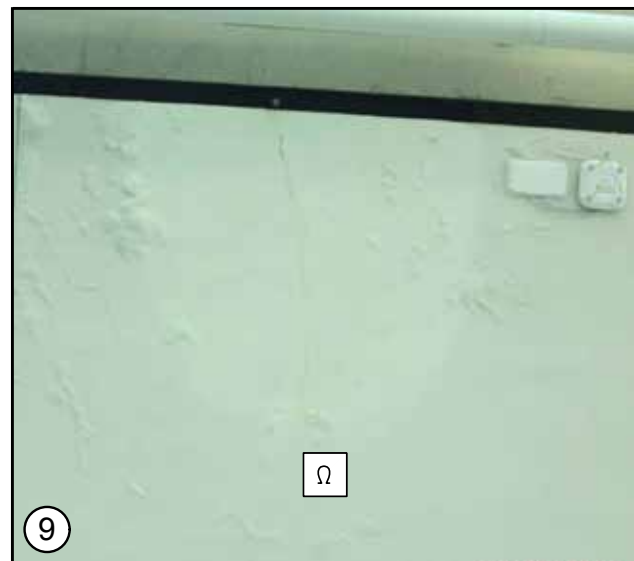
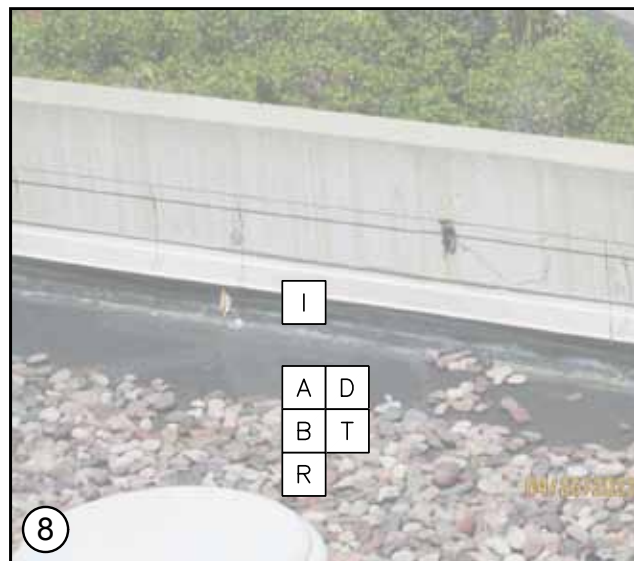
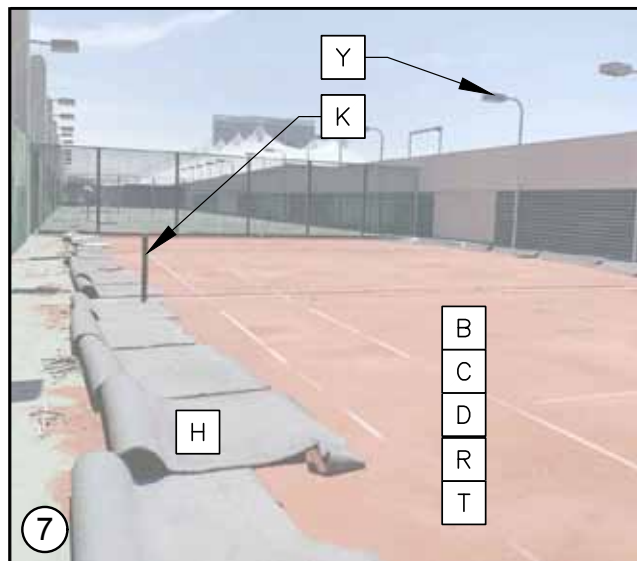
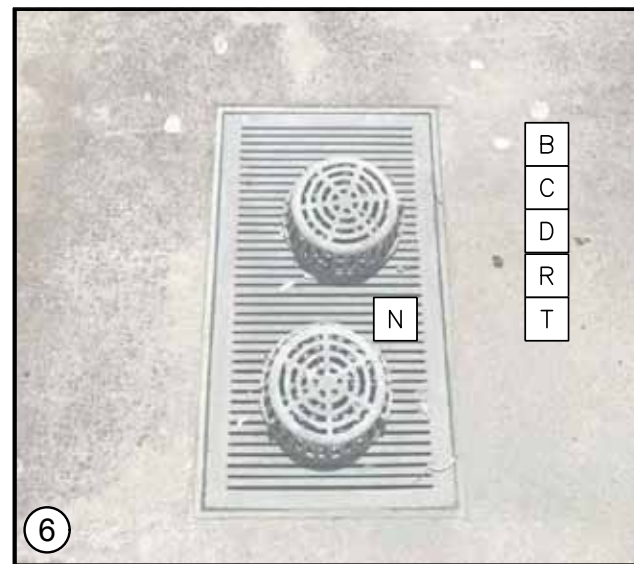
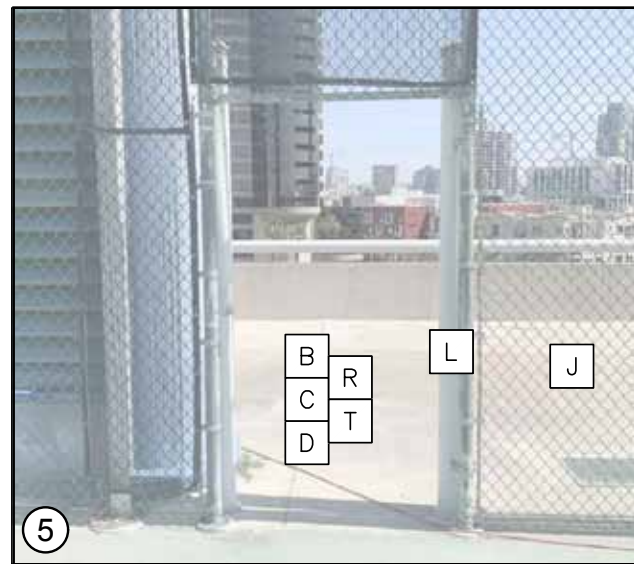
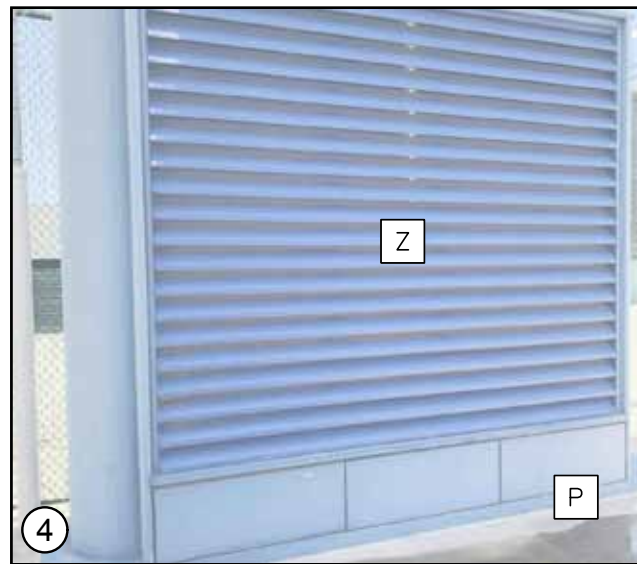
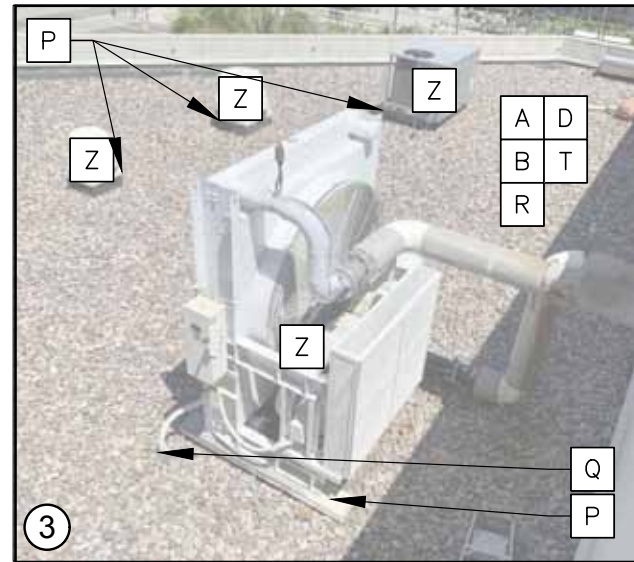
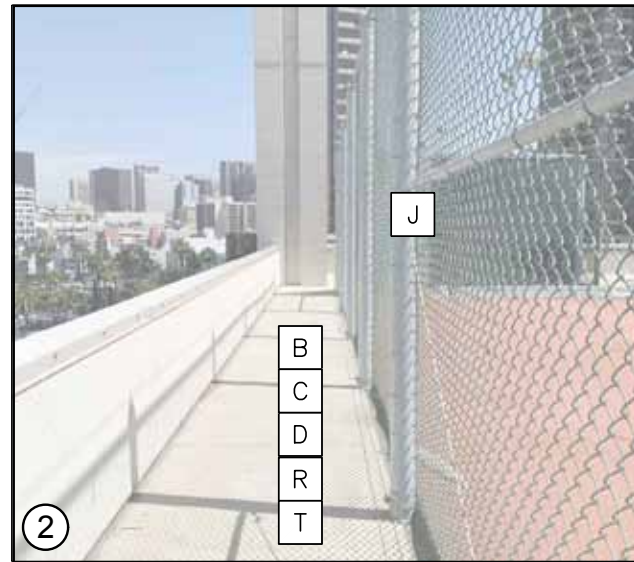
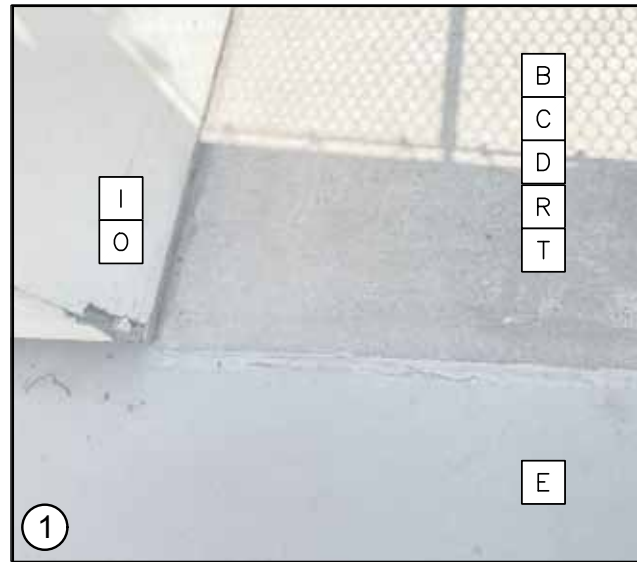
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 2 PLAN




PHOTO LOCATOR
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GRID 2 PHOTOS WITH KEYS



KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
- S** Install new concrete pavers
- T** Install new roof membrane
- U** Install water-proofing membrane at concrete curb
- V** Power-wash existing concrete slab and install new elastomeric membrane at slab and equipment base plates
- W** Existing door to remain, patch and repair to ensure full functionality
- X** Remove existing electrical components. Pull existing feeders back to source and cap conduit
- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3
- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 3 PLAN

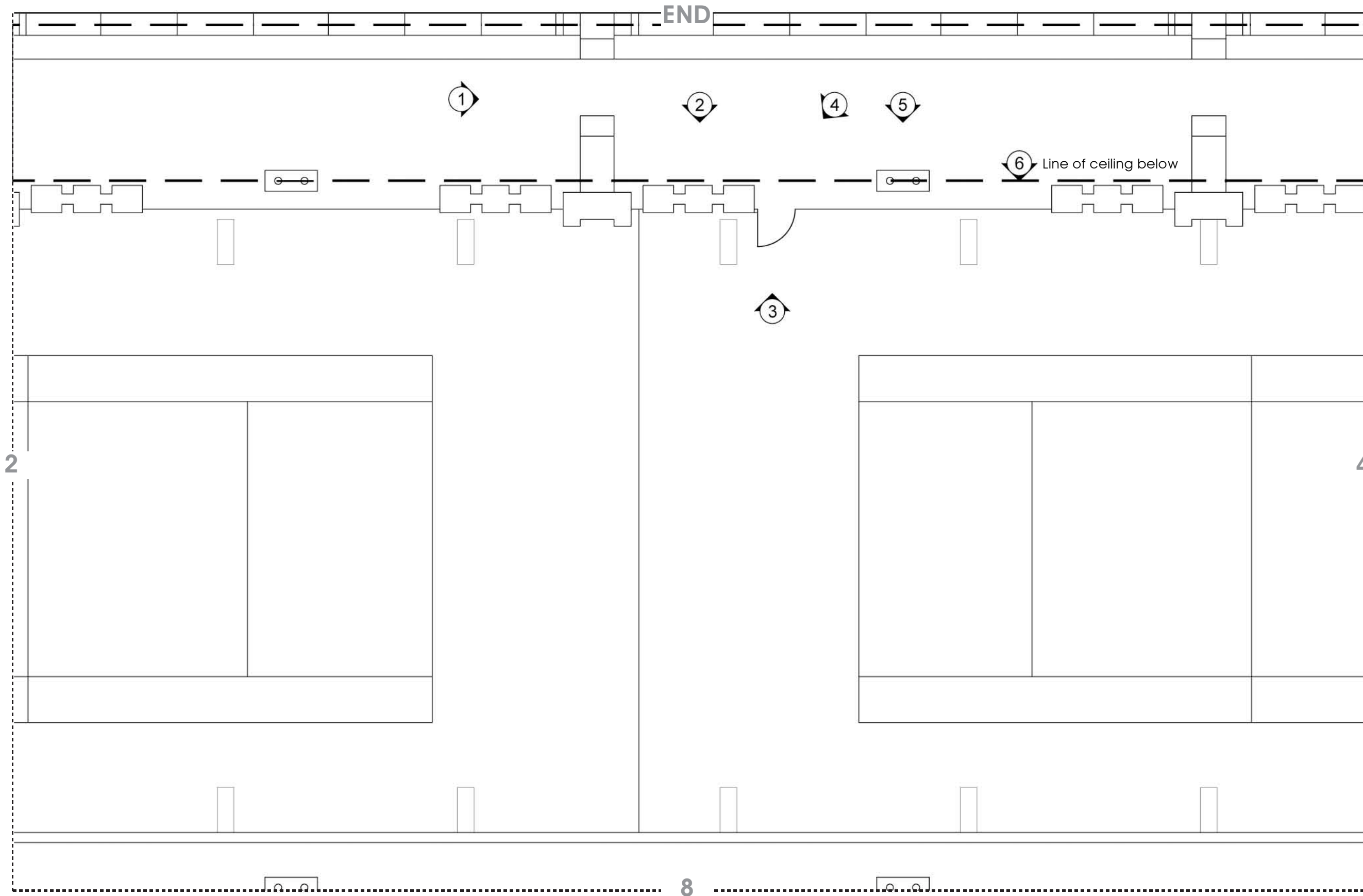
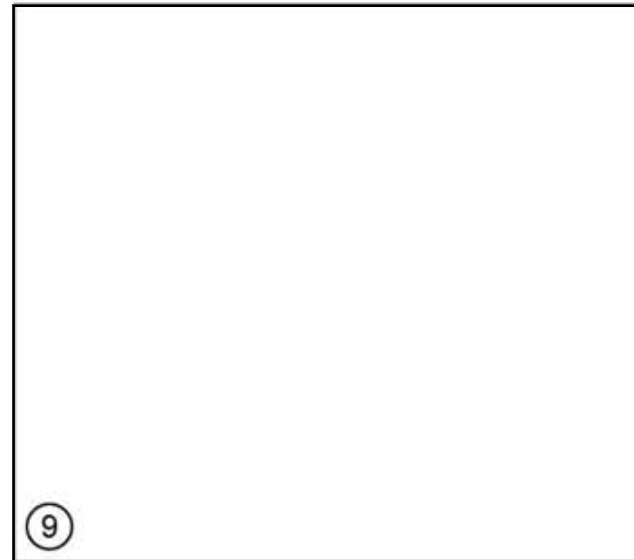
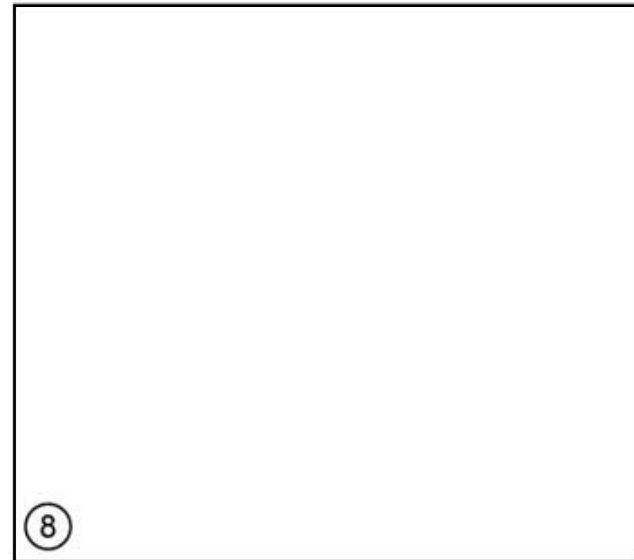
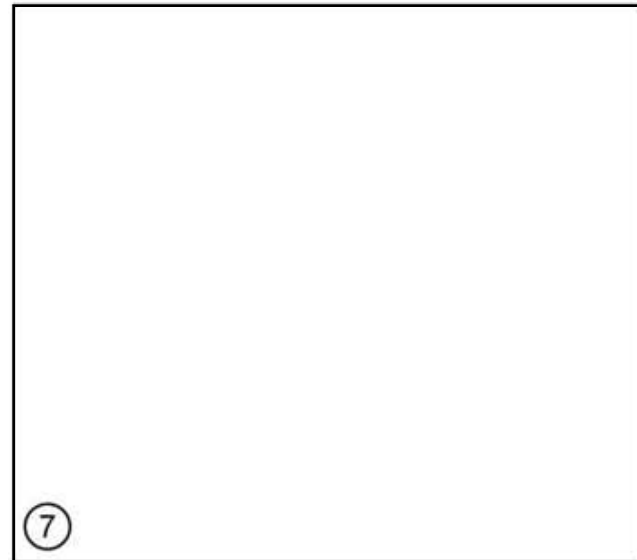
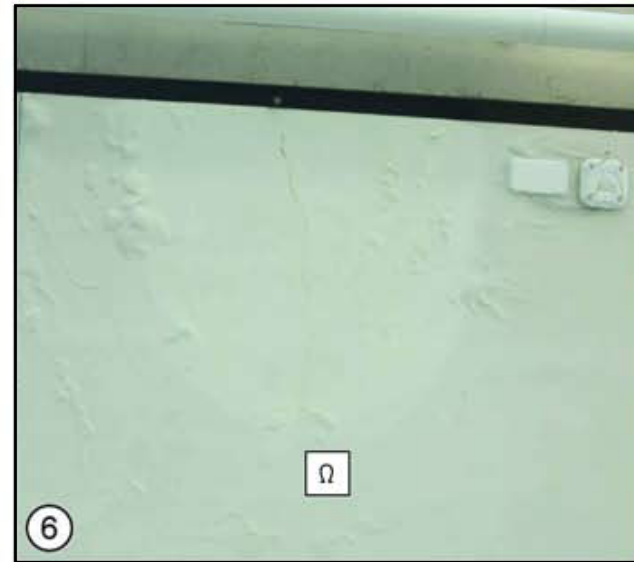
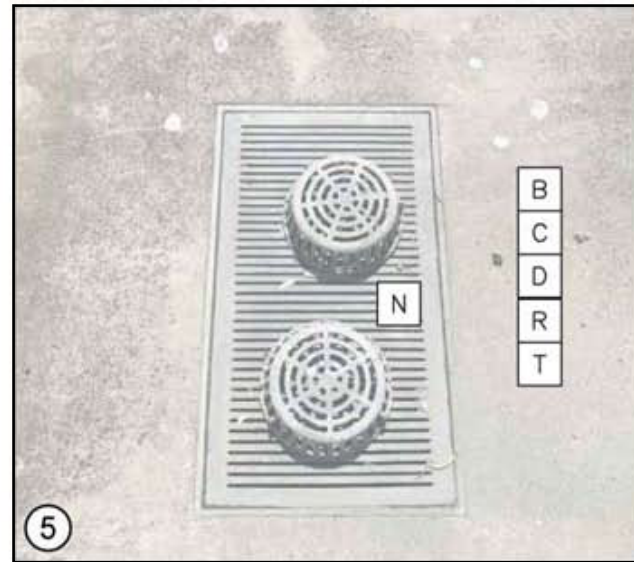
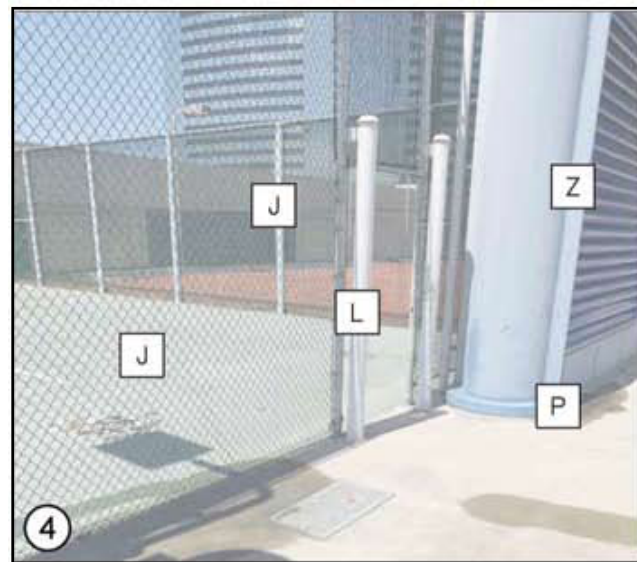
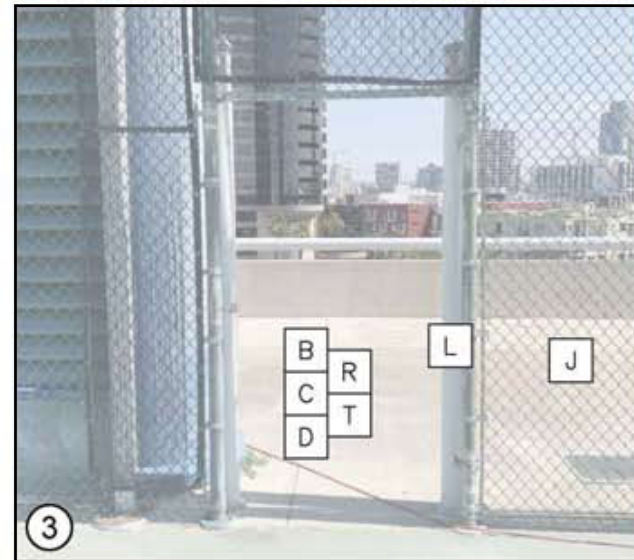
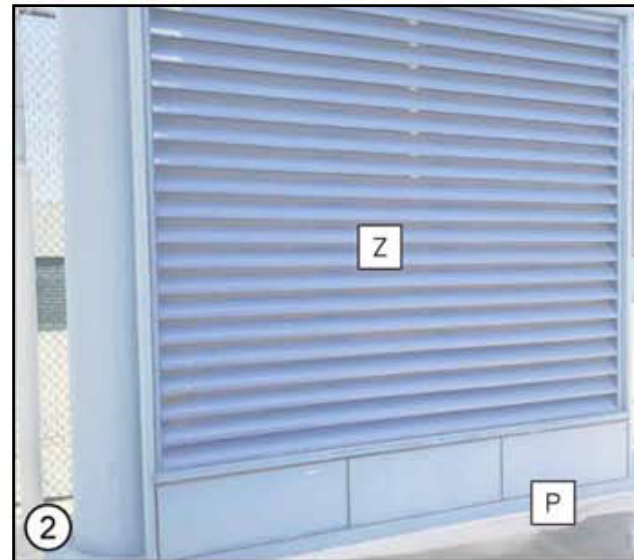
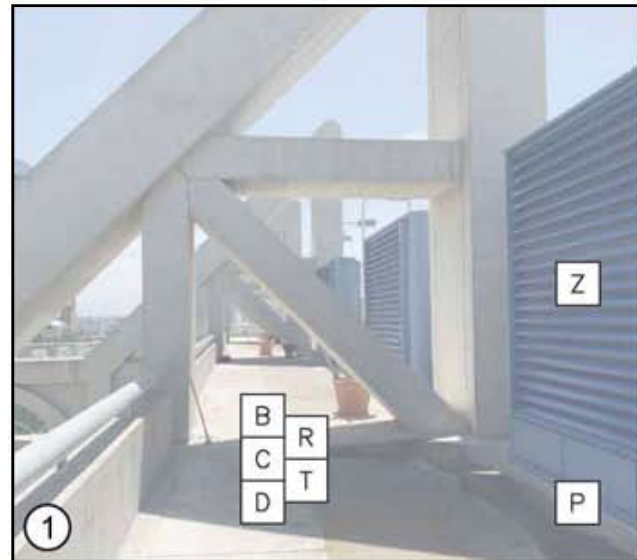


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GRID 3 PHOTOS WITH KEYS



KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
- S** Install new concrete pavers
- T** Install new roof membrane
- U** Install water-proofing membrane at concrete curb
- V** Power-wash existing concrete slab and install new elastomeric membrane at slab and equipment base plates
- W** Existing door to remain, patch and repair to ensure full functionality
- X** Remove existing electrical components. Pull existing feeders back to source and cap conduit
- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3
- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 4 PLAN

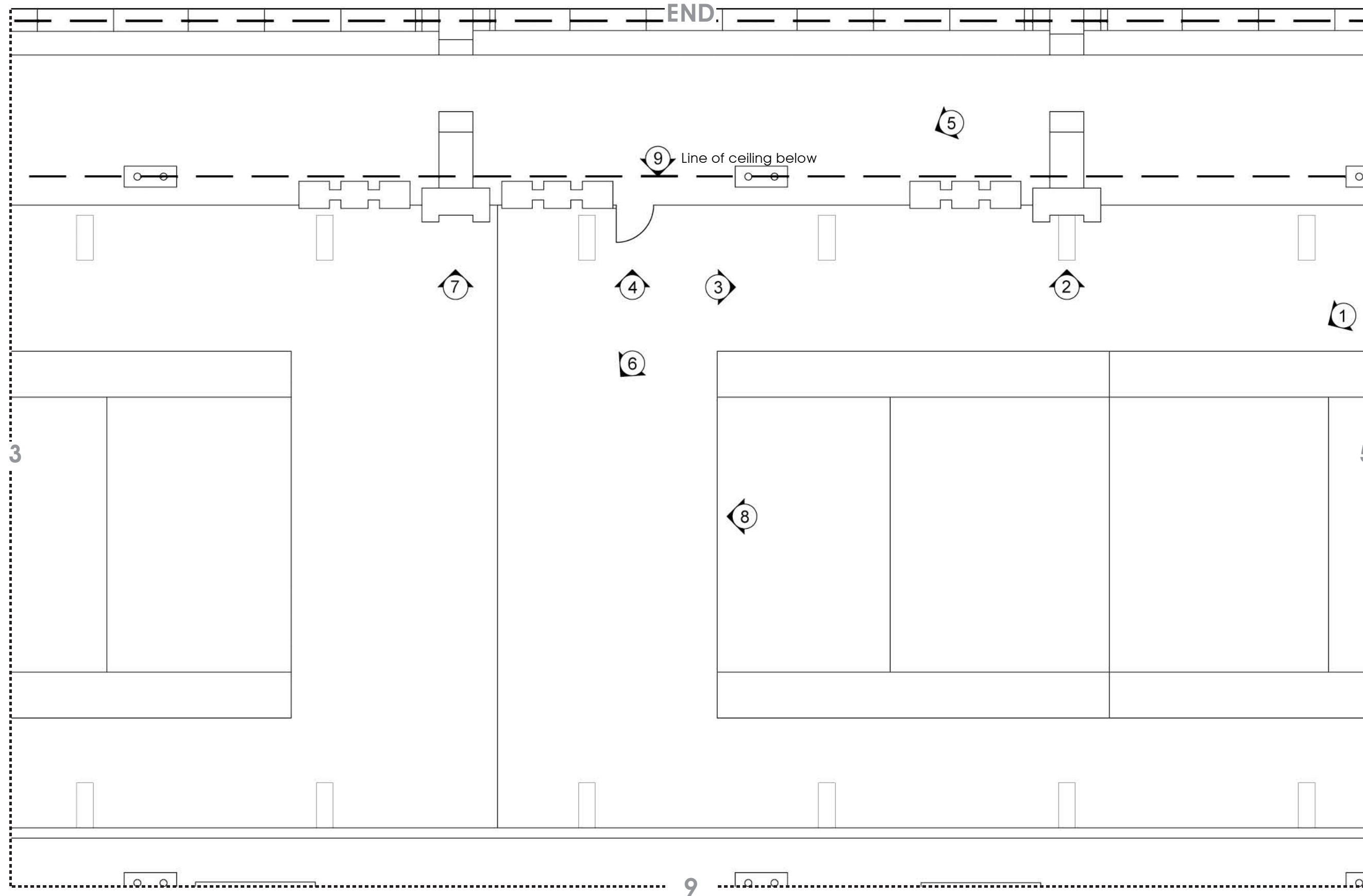
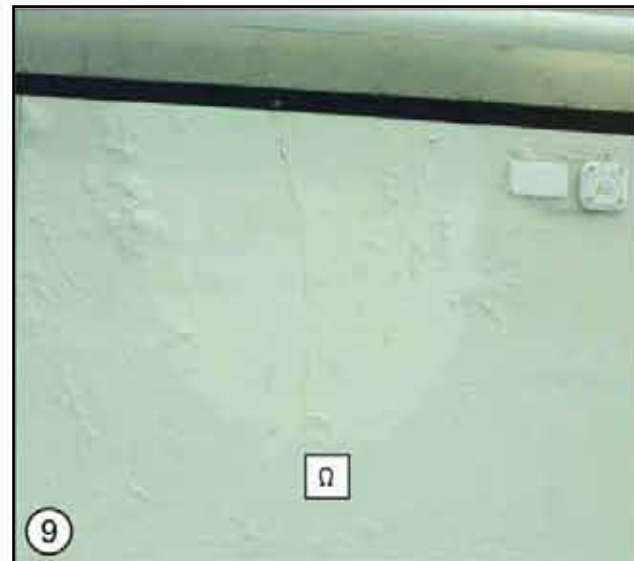
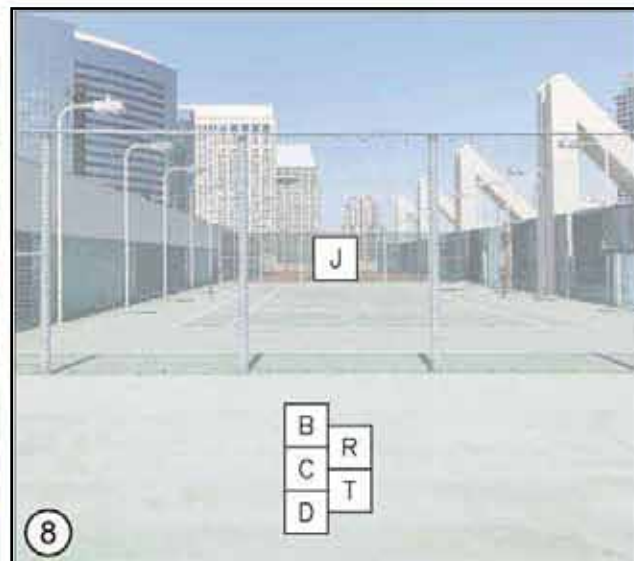
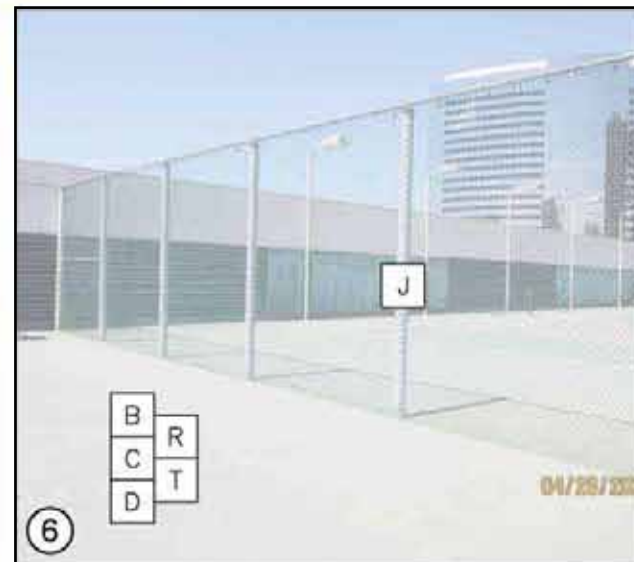
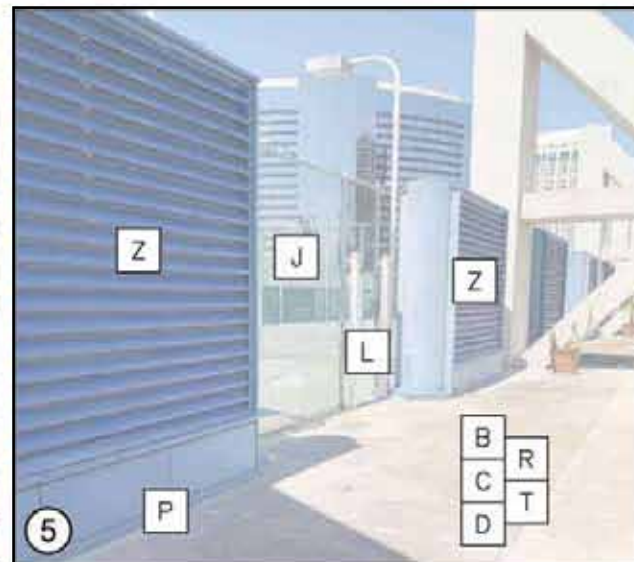
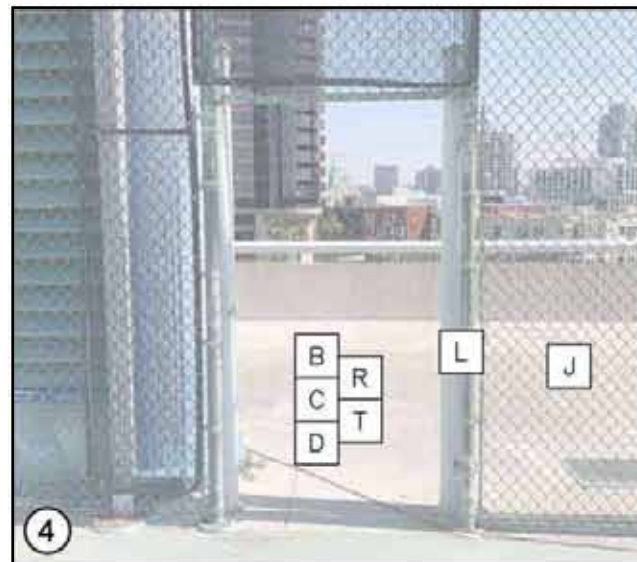
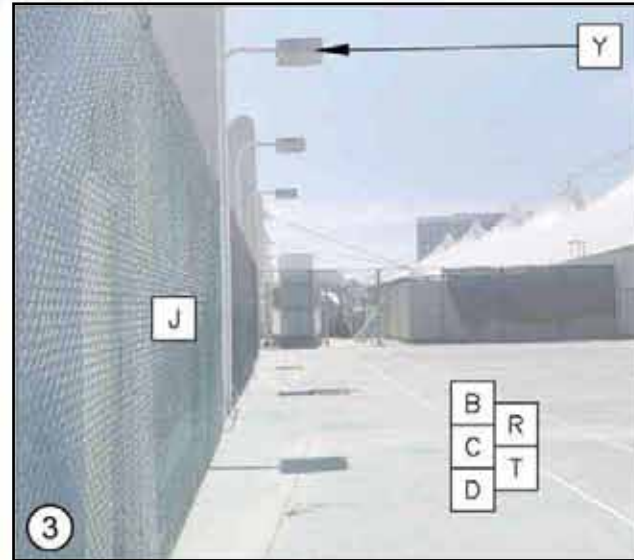
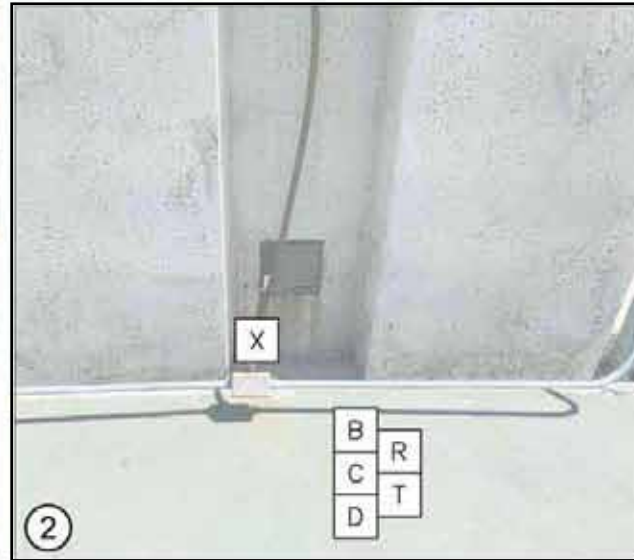
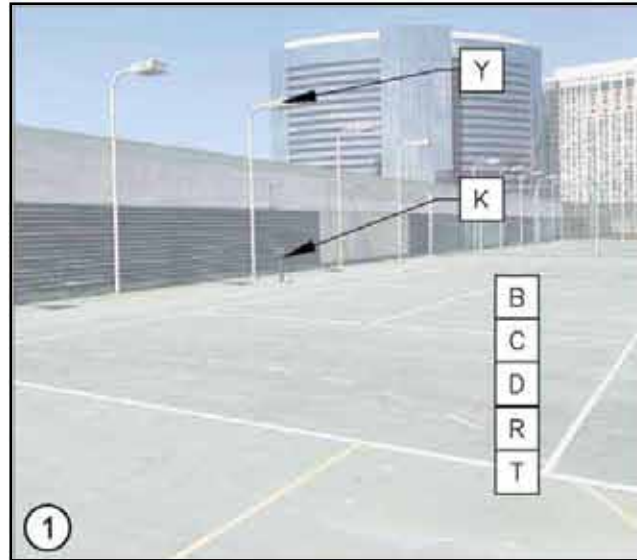


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GRID 4 PHOTOS WITH KEYS



KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
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- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3
- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 5 PLAN

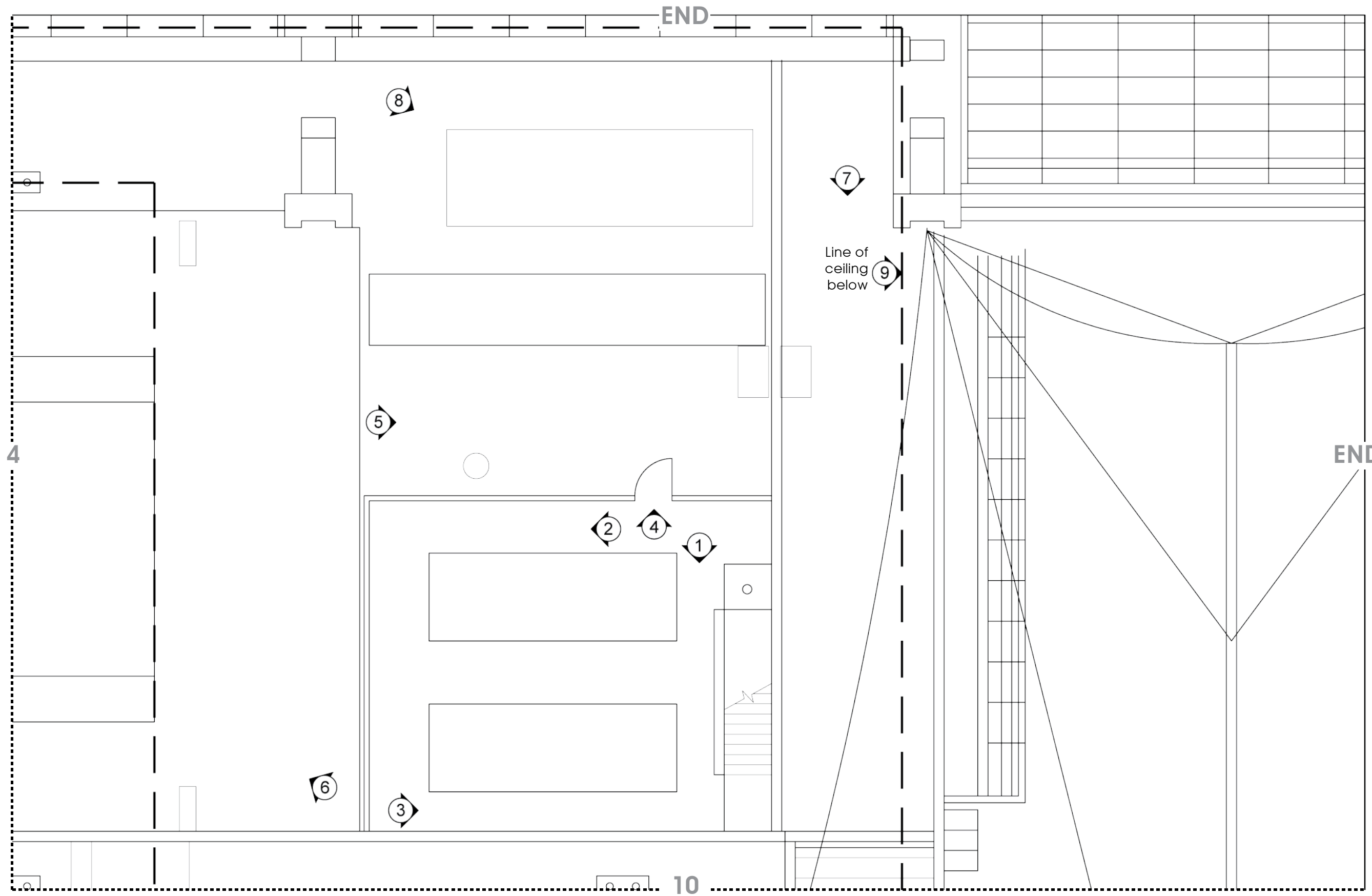
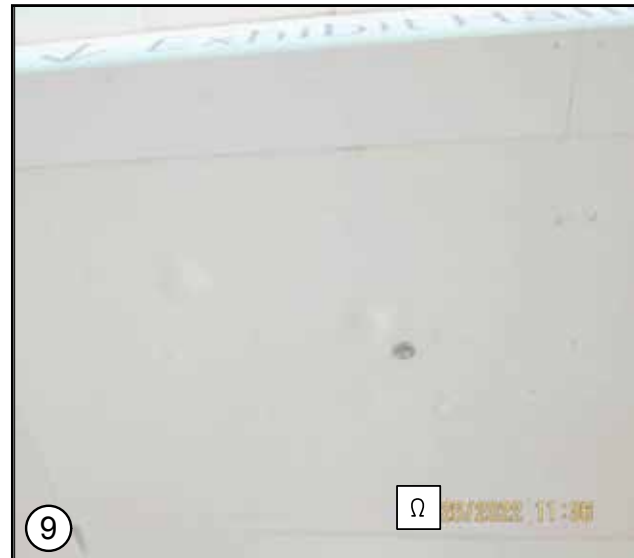
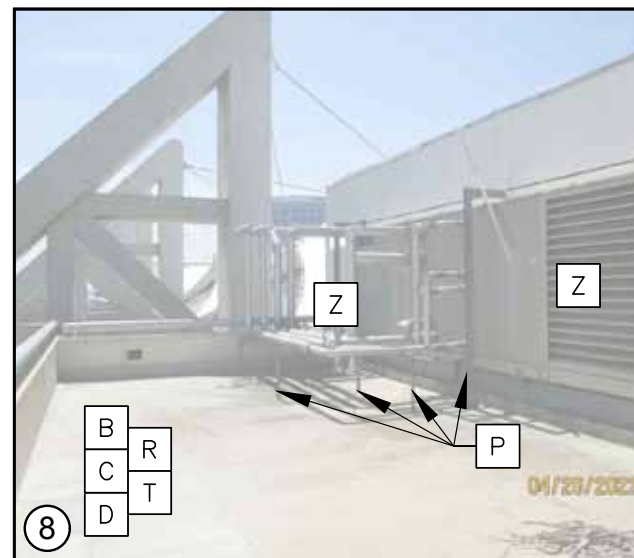
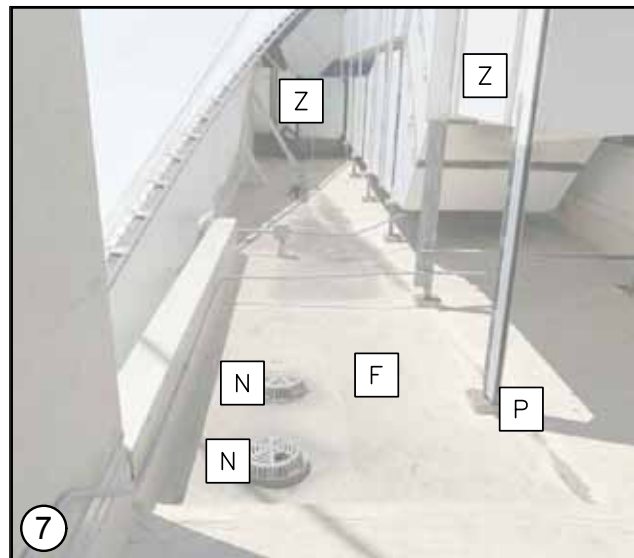
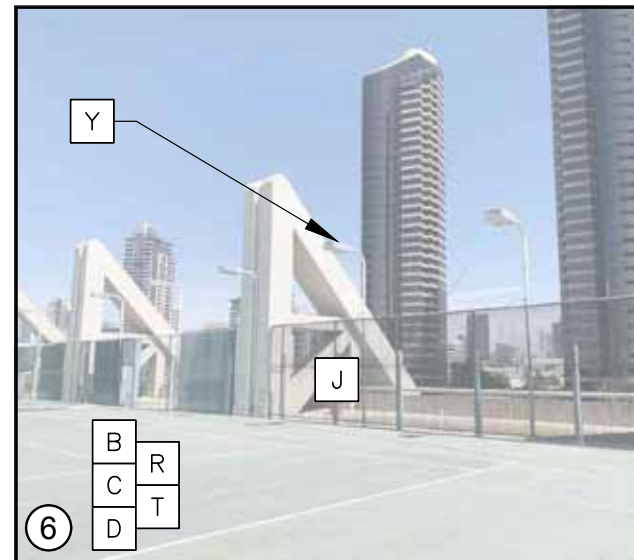
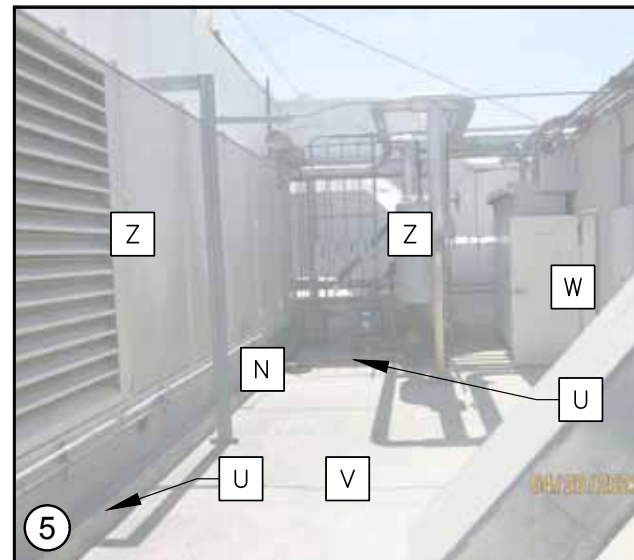
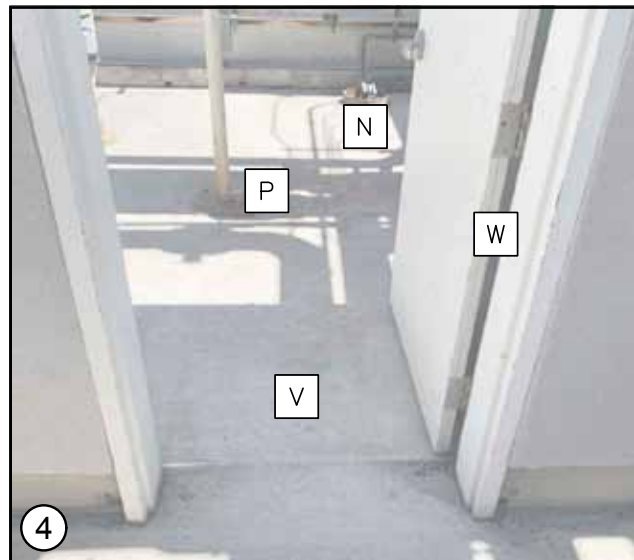
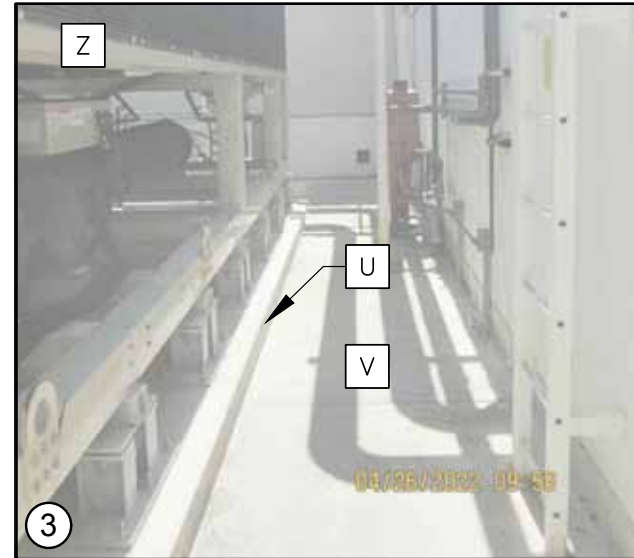
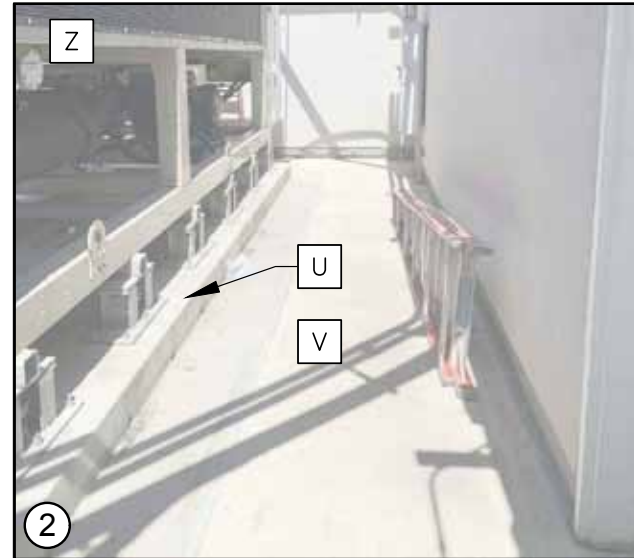
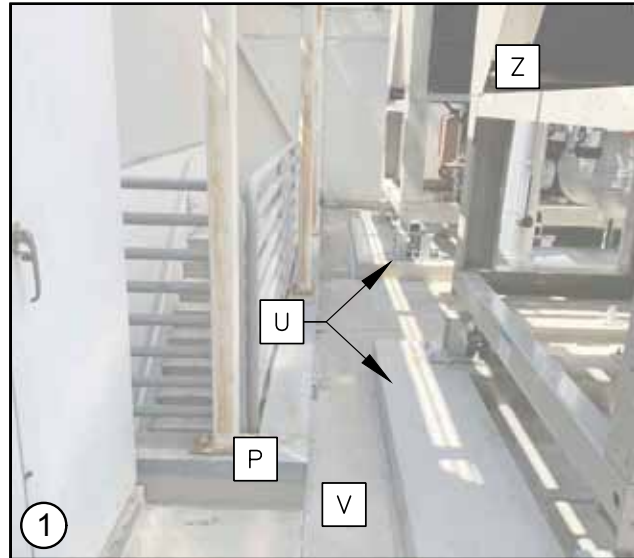


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GRID 5 PHOTOS WITH KEYS

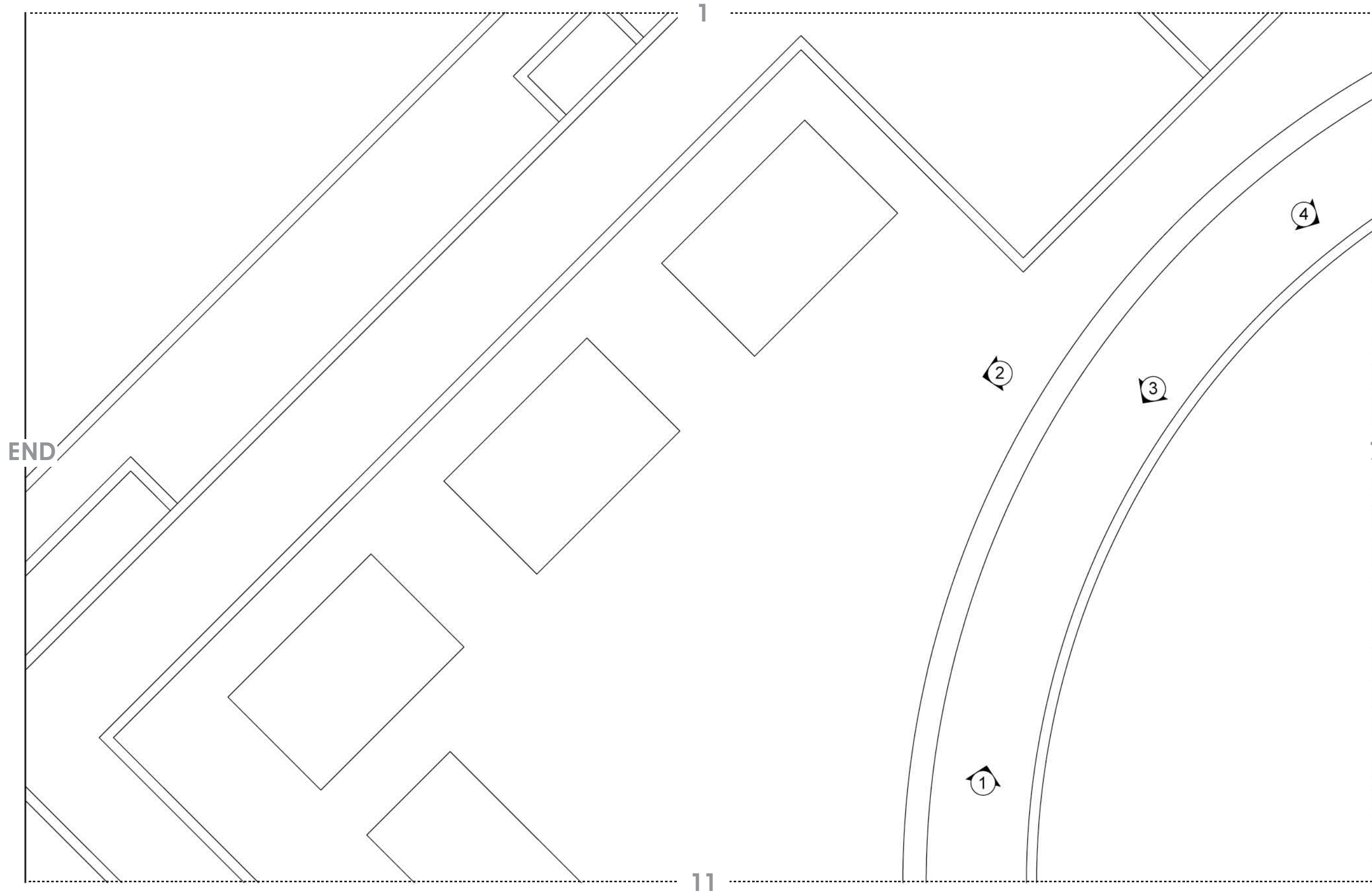



KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
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- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
- S** Install new concrete pavers
- T** Install new roof membrane
- U** Install water-proofing membrane at concrete curb
- V** Power-wash existing concrete slab and install new elastomeric membrane at slab and equipment base plates
- W** Existing door to remain, patch and repair to ensure full functionality
- X** Remove existing electrical components. Pull existing feeders back to source and cap conduit
- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3

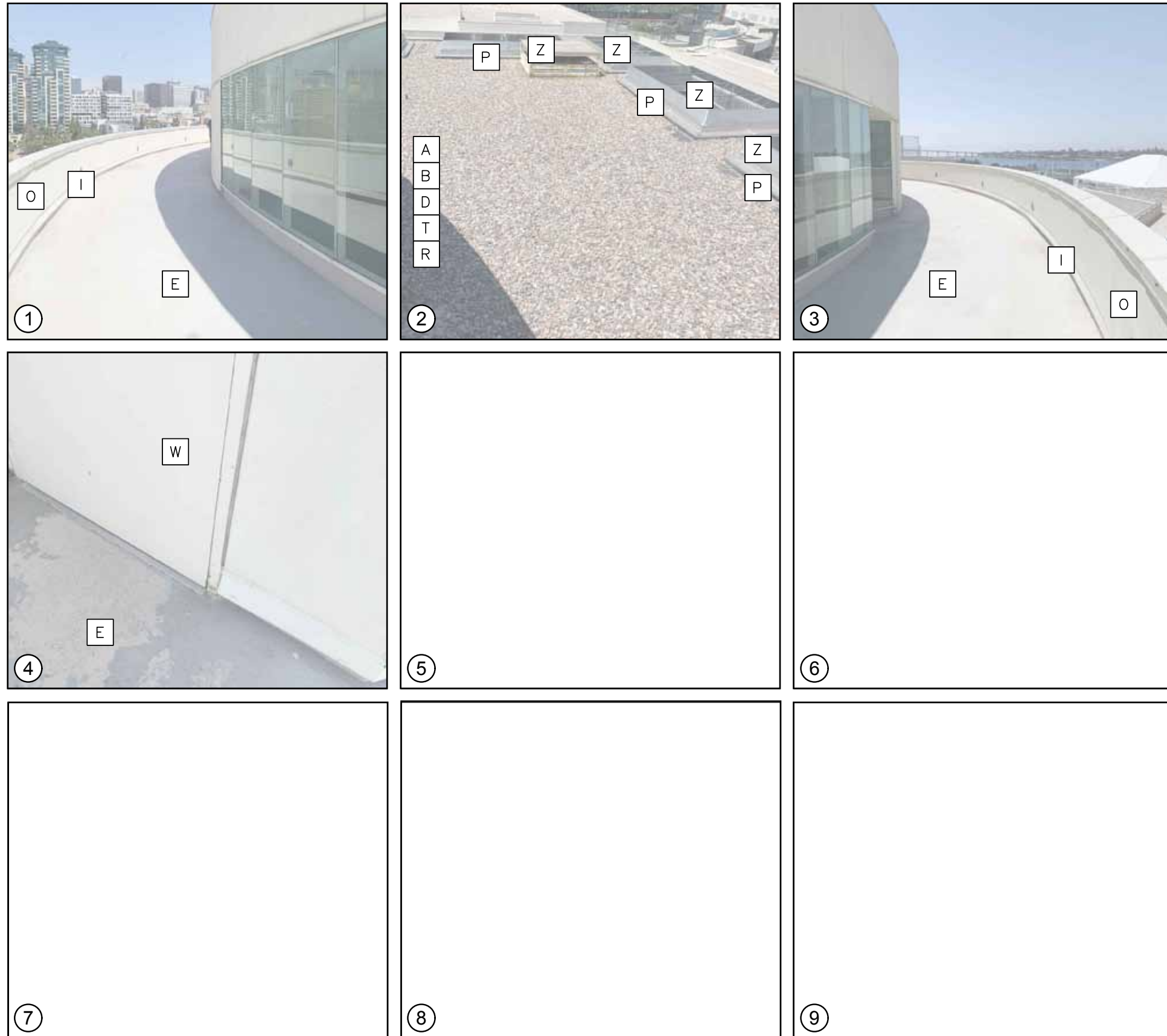
- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 6 PLAN




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GRID 6 PHOTOS WITH KEYS



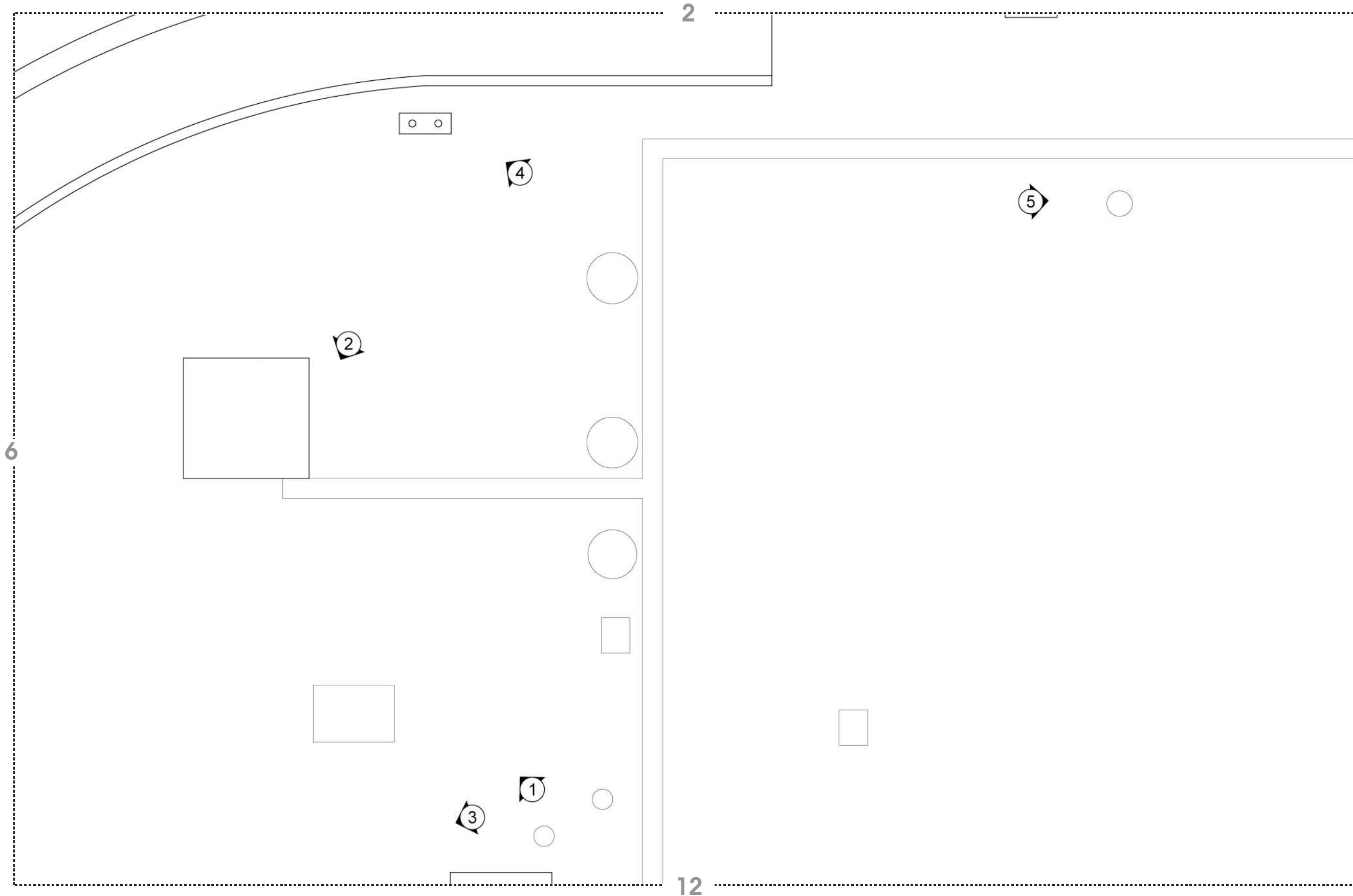
KEY NOTES


- A** Remove ballast and store on site at location as assigned by owner
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- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3

- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.

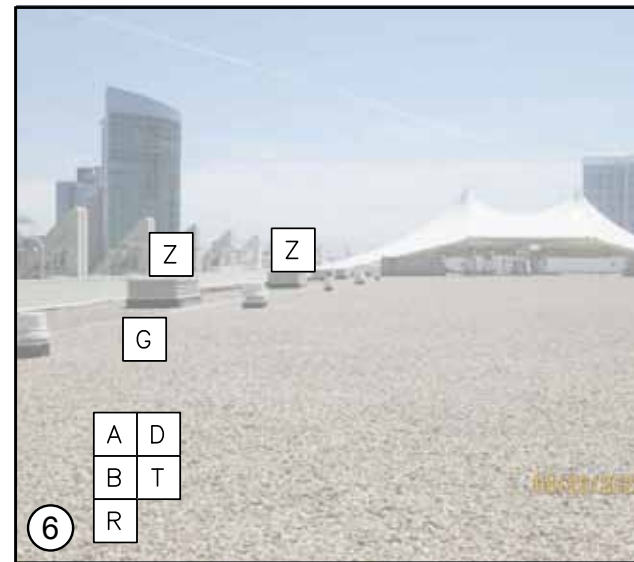
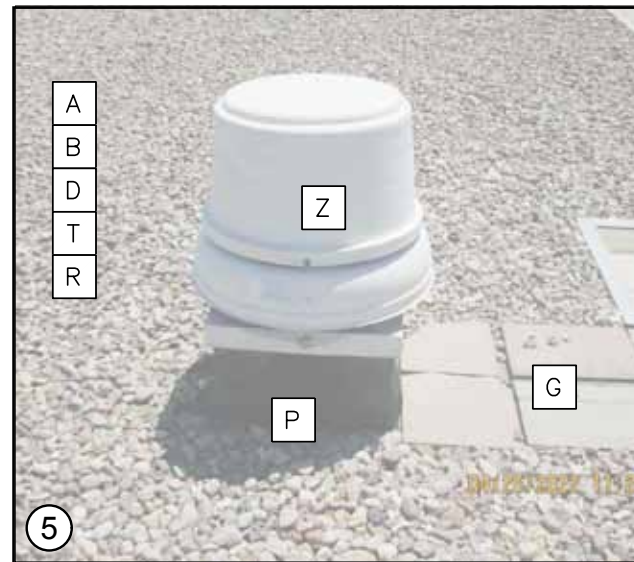
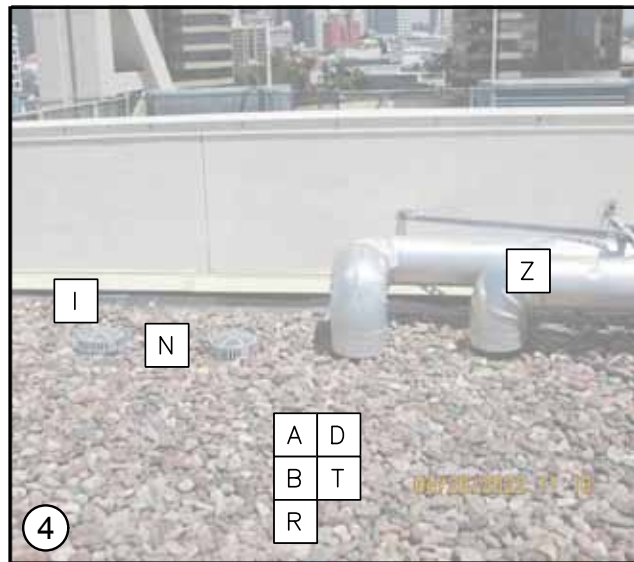
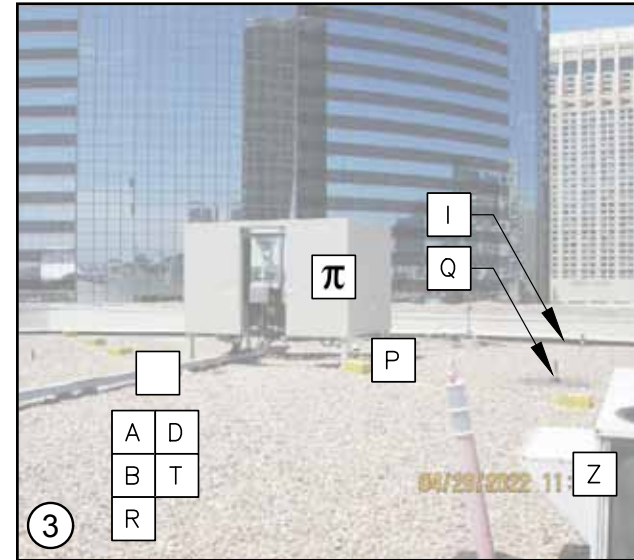
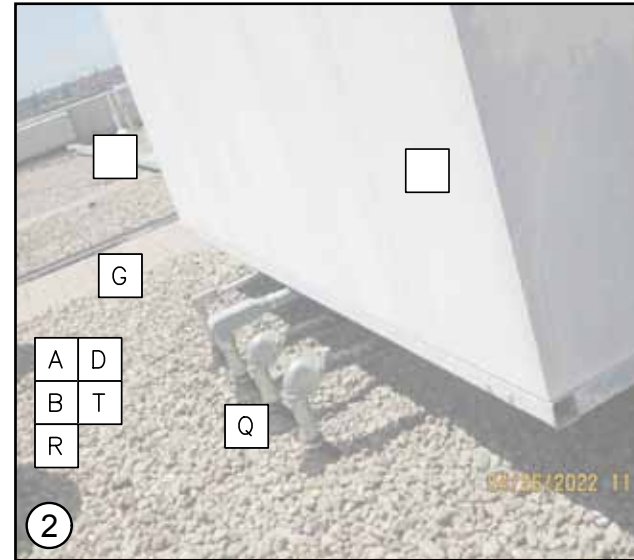
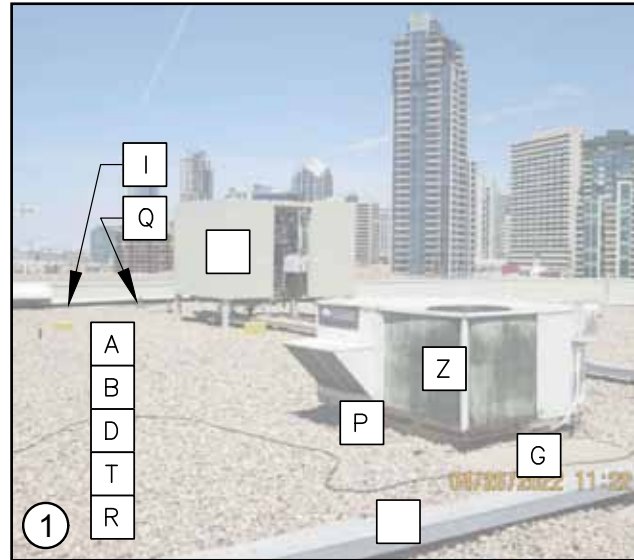
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 7 PLAN




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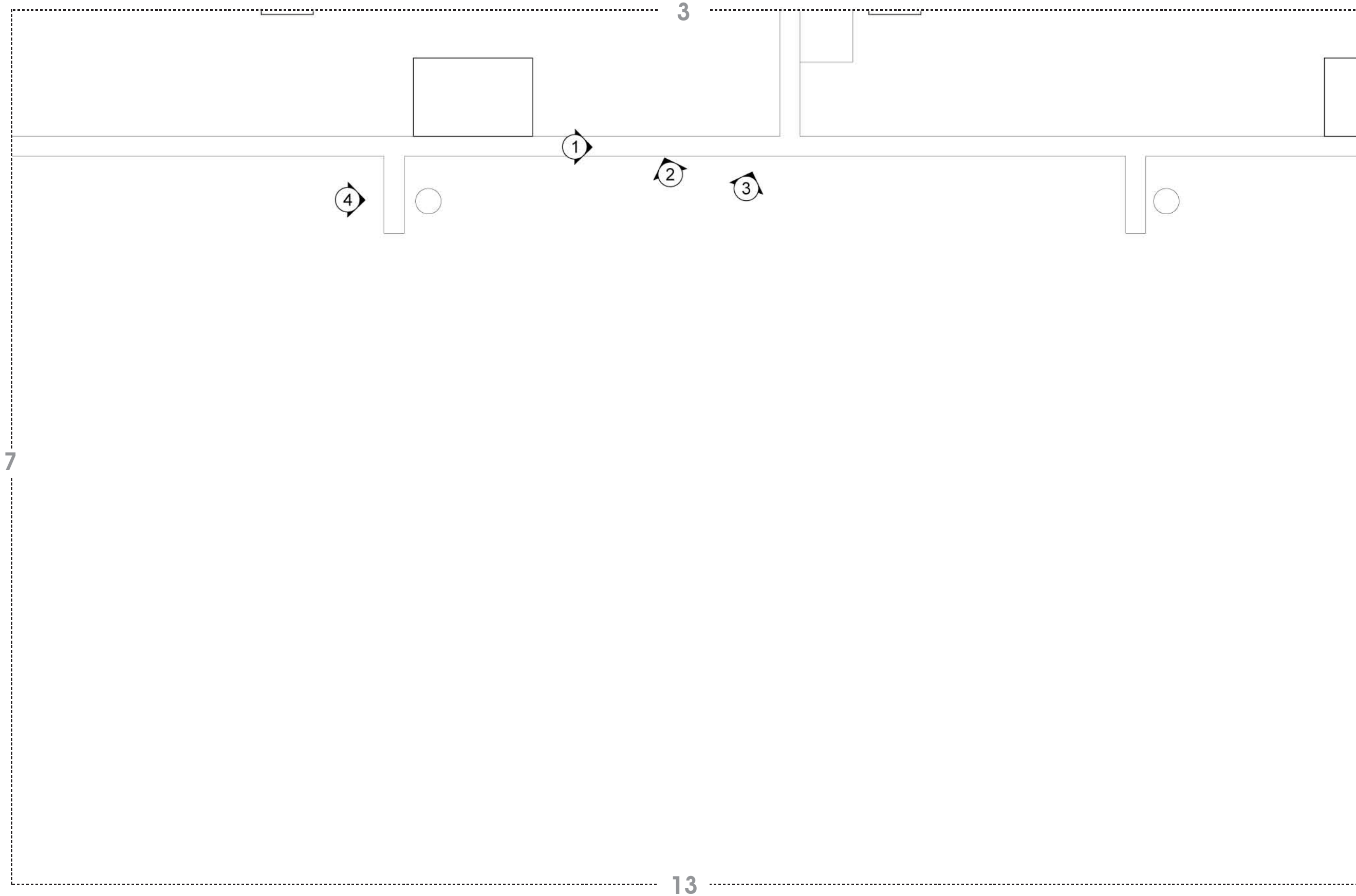
GRID 7 PHOTOS WITH KEYS




KEY NOTES

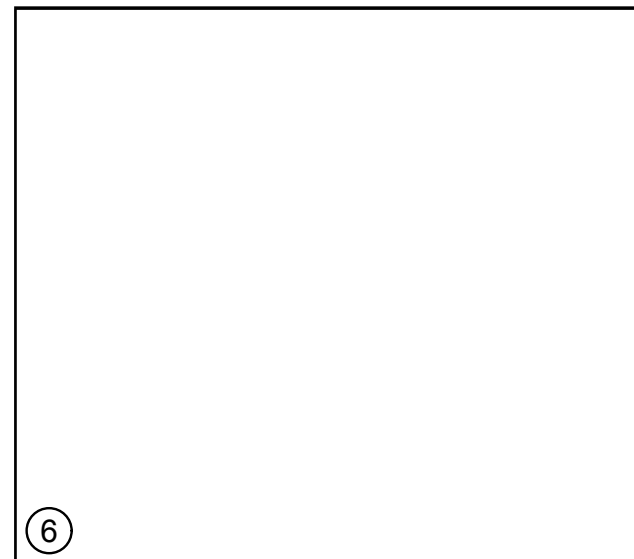
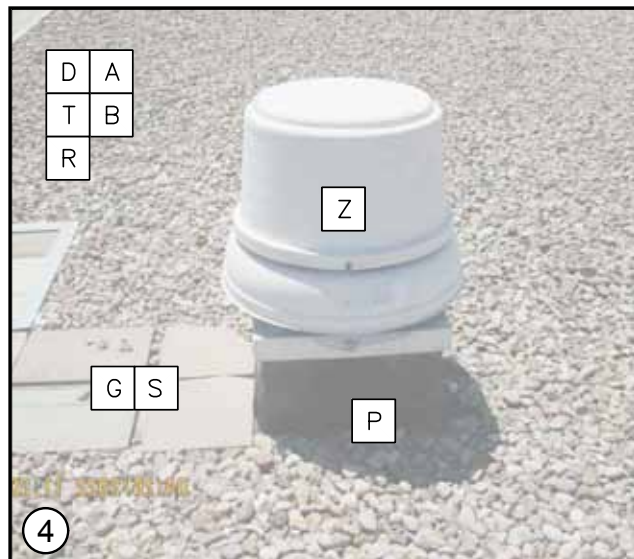
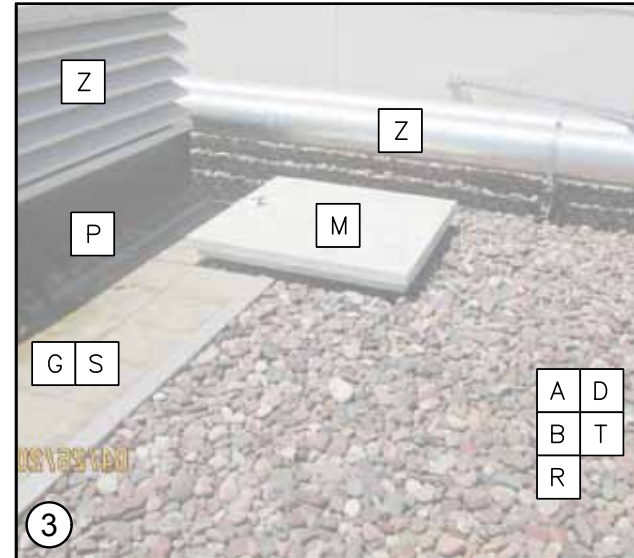
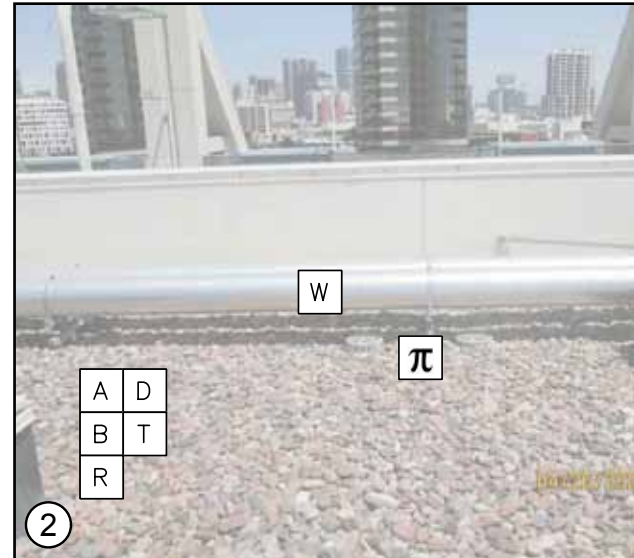
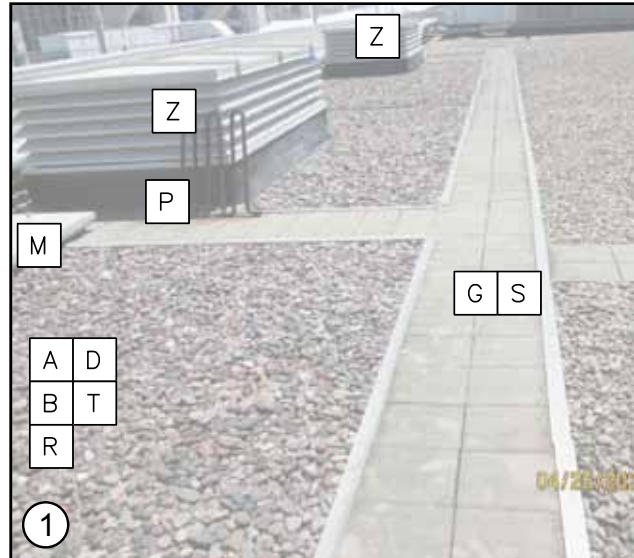
- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
- S** Install new concrete pavers
- T** Install new roof membrane
- U** Install water-proofing membrane at concrete curb
- V** Power-wash existing concrete slab and install new elastomeric membrane at slab and equipment base plates
- W** Existing door to remain, patch and repair to ensure full functionality
- X** Remove existing electrical components. Pull existing feeders back to source and cap conduit
- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3
- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 8 PLAN




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GRID 8 PHOTOS WITH KEYS



KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
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- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3

- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.

- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 9 PLAN

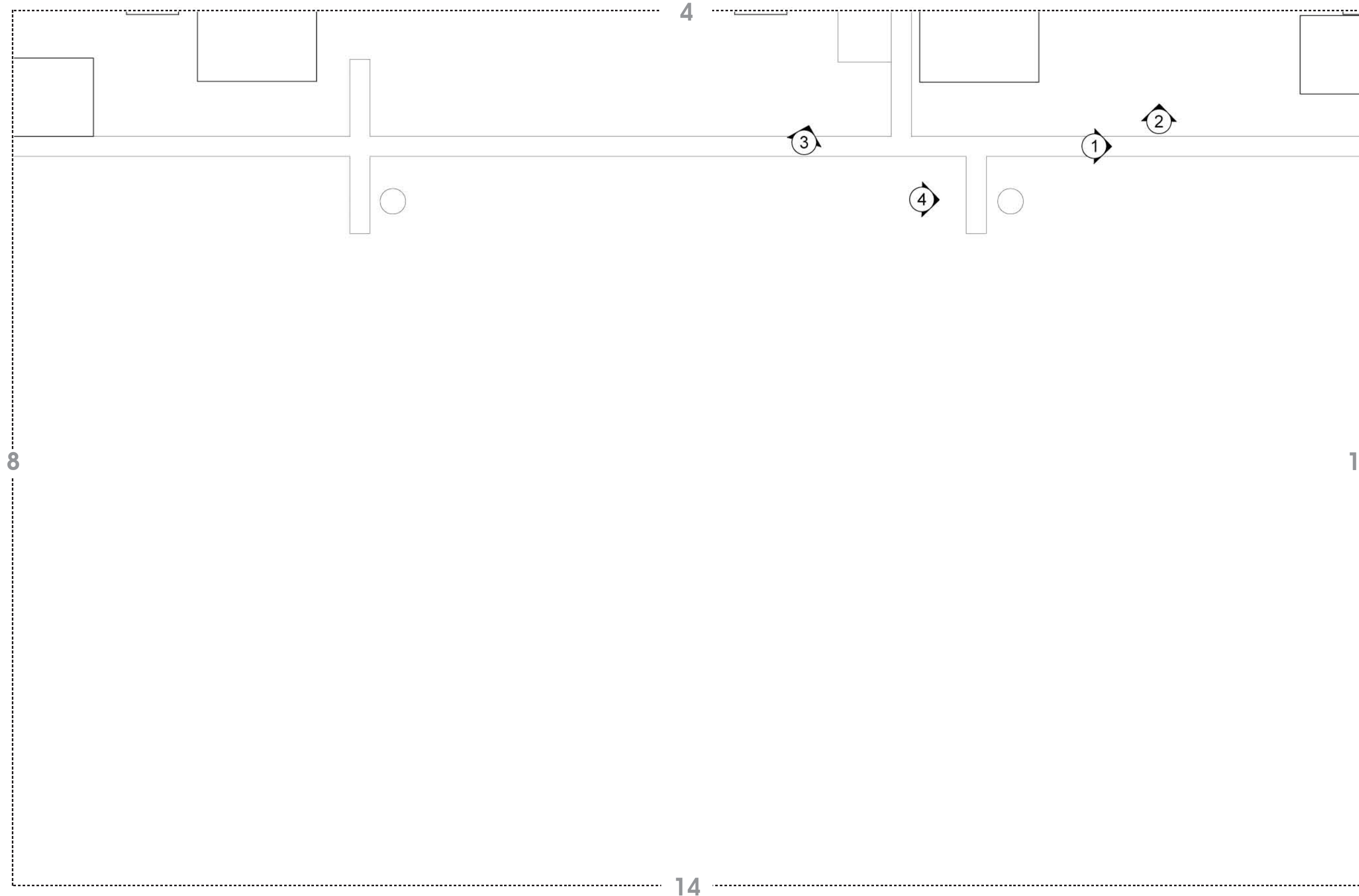
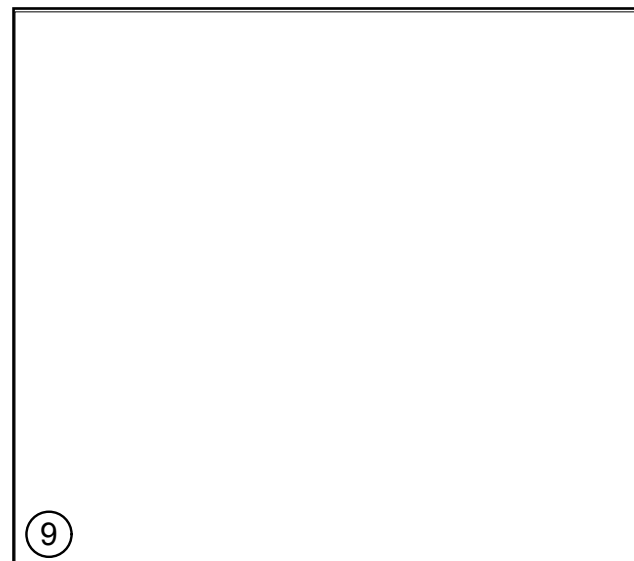
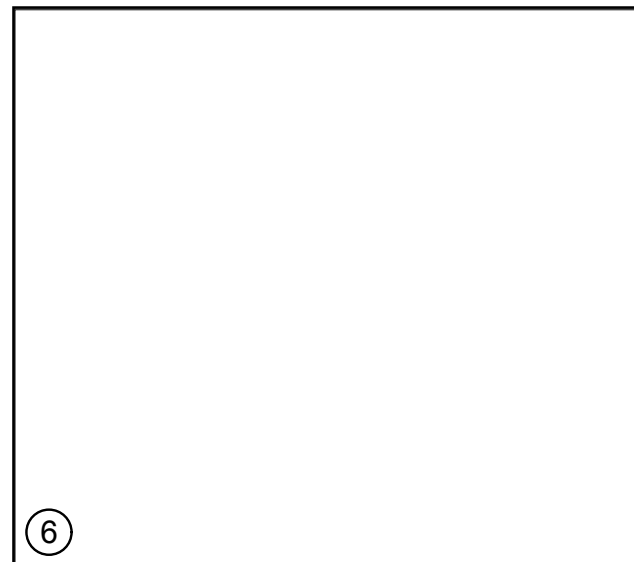
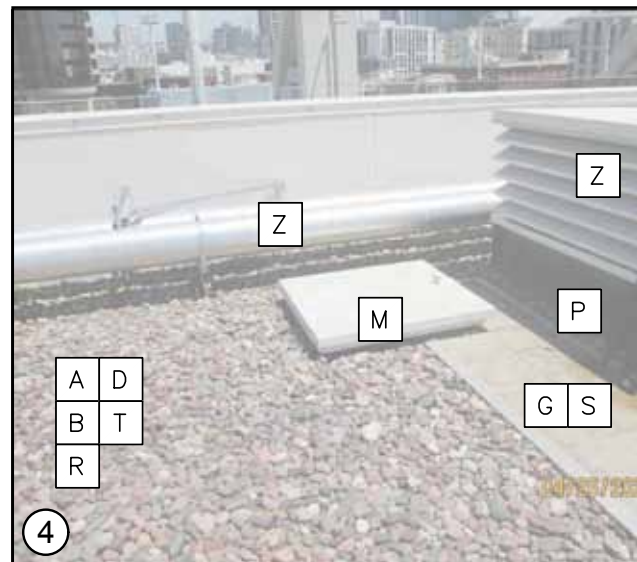
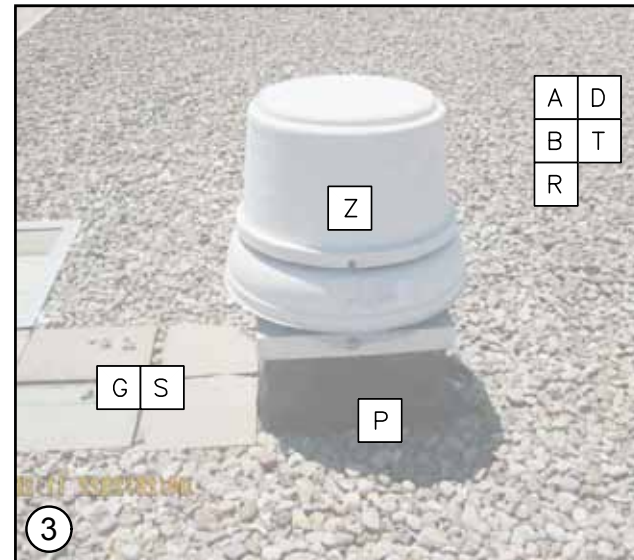
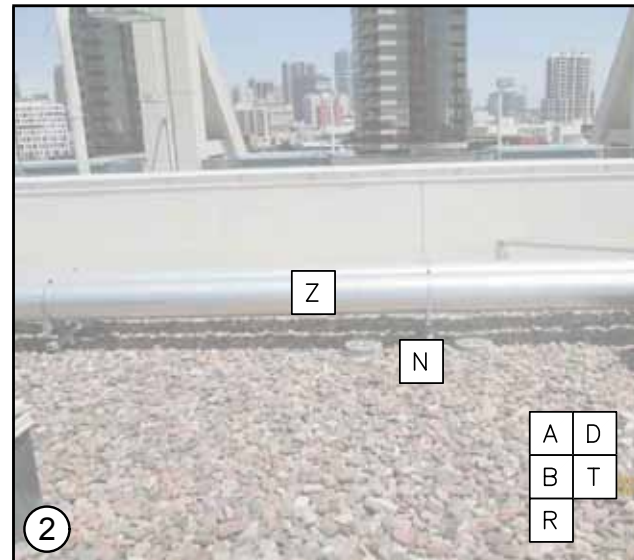
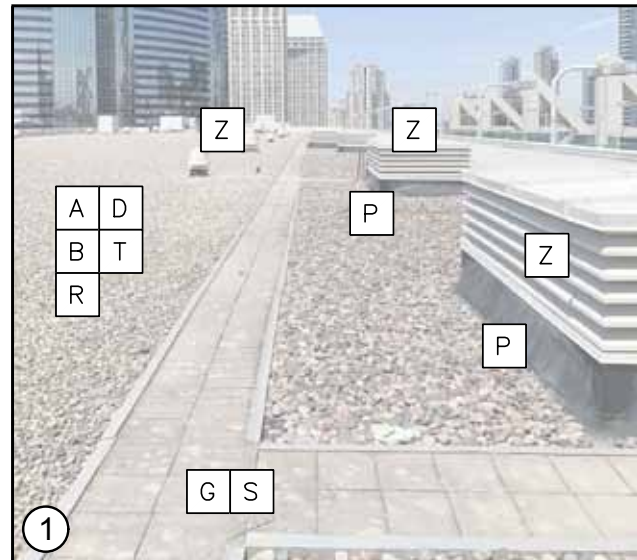


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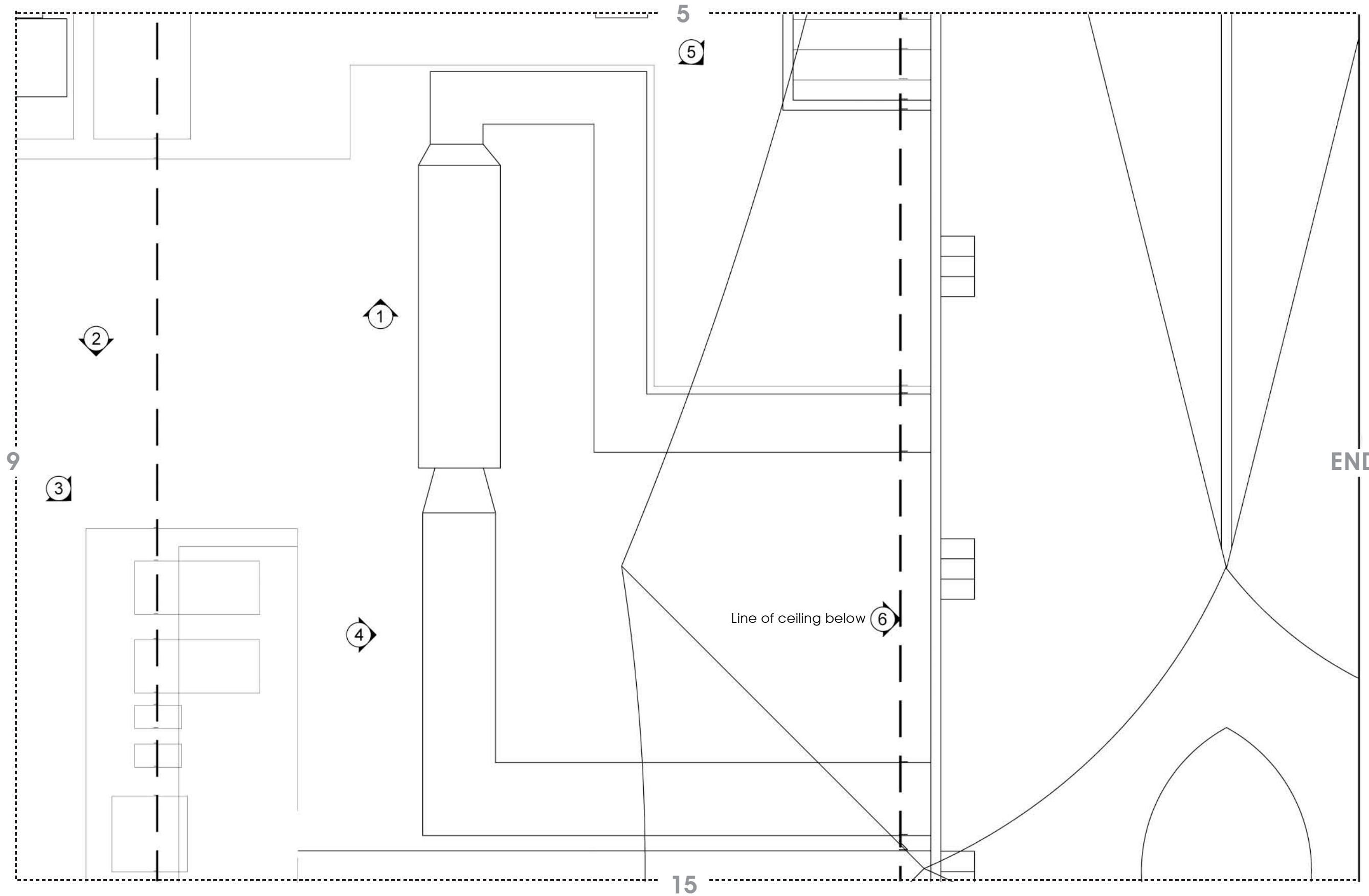
GRID 9 PHOTOS WITH KEYS




KEY NOTES

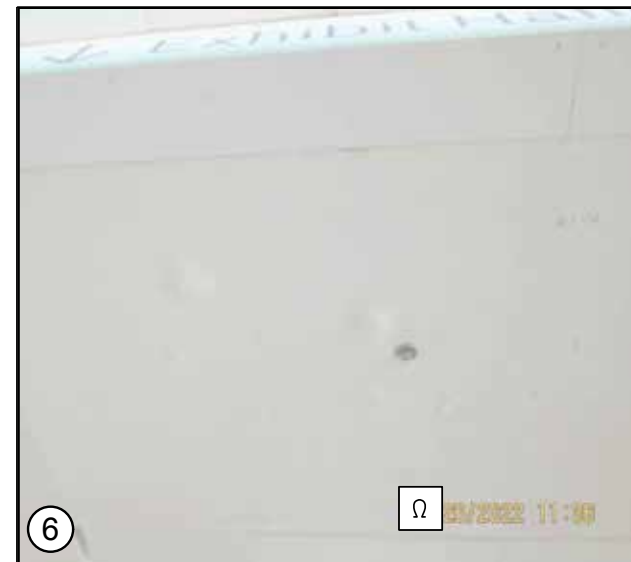
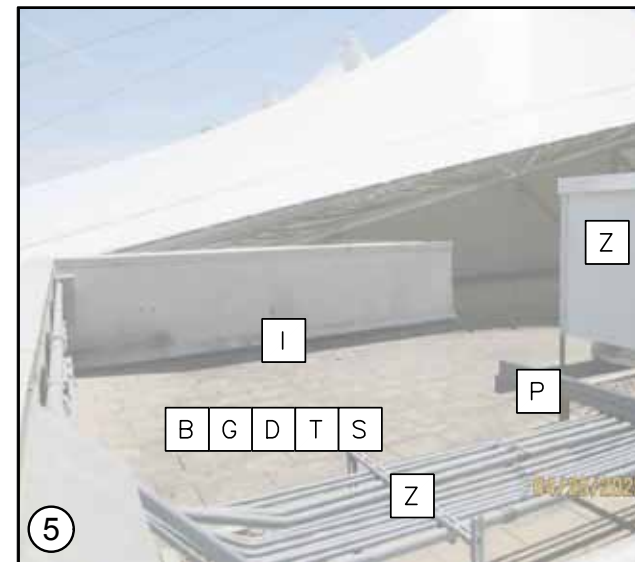
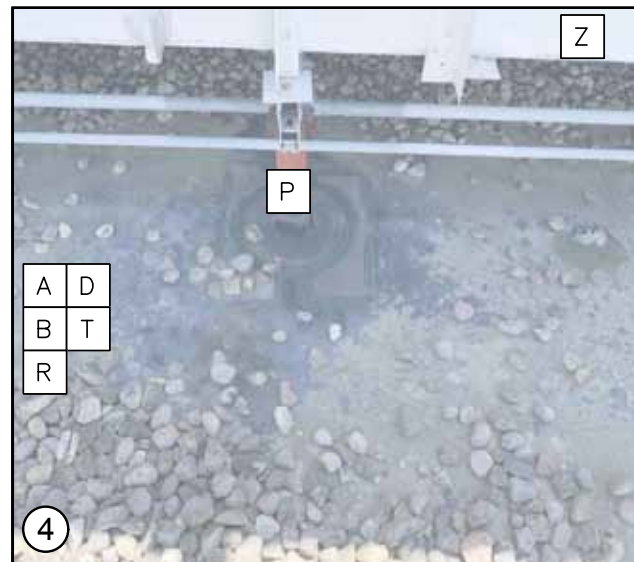
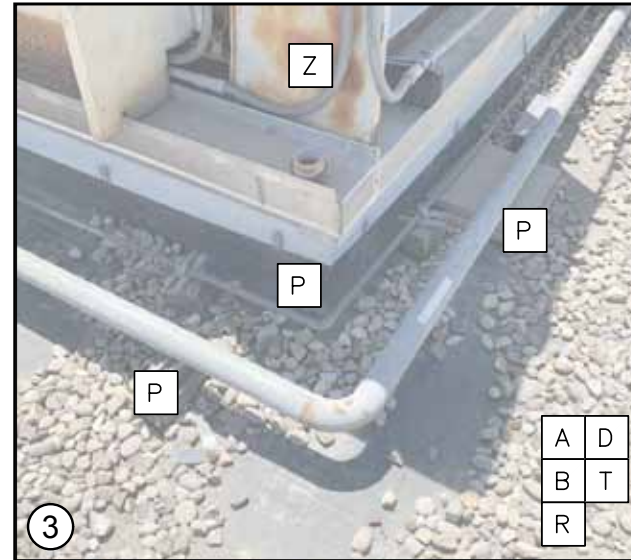
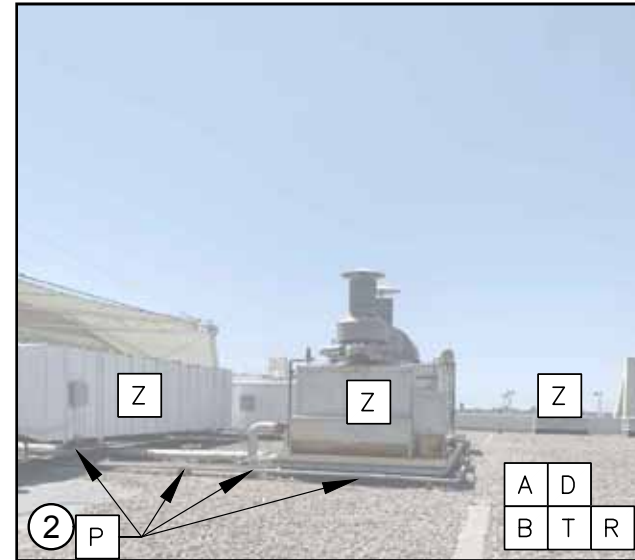
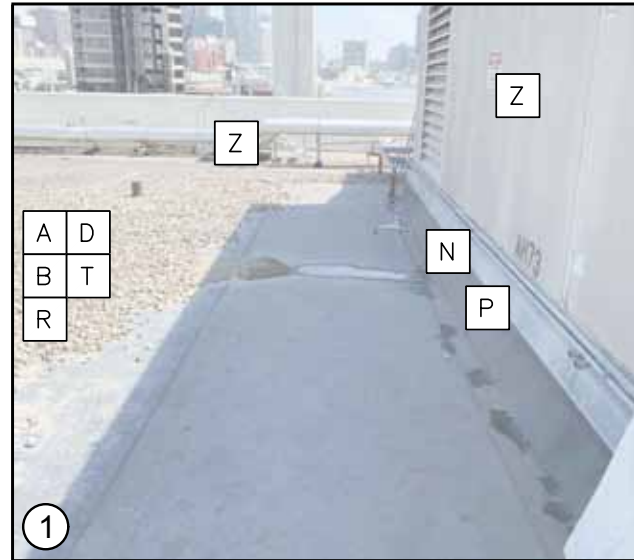
- A** Remove ballast and store on site at location as assigned by owner
 - B** Remove and dispose of existing roof membrane
 - C** Saw-cut, remove and dispose of existing concrete topping
 - D** Verify condition of existing rigid insulation and replace (if needed)
 - E** Prep surface and install new elastomeric membrane
 - F** Remove and replace TPO roofing
 - G** Remove concrete pavers
 - H** Remove and dispose of rubber surface mats
 - I** Remove and replace flashing, repair finish surface, as needed
 - J** Remove and dispose of existing chain link fencing and supports
 - K** Remove court net posts at six locations, 12 total, verify in field
 - L** Remove and dispose of metal gate and supports
 - M** Remove and dispose of roof hatch, install new roof hatch
 - N** Remove and replace roof drain
 - O** Patch and repair existing wall surface
 - P** Wrap / flash existing curbs/supports (replace, if needed)
 - Q** Wrap / flash roof penetrations
 - R** Reinstall existing stored, and/or provide new roof ballast
 - S** Install new concrete pavers
 - T** Install new roof membrane
 - U** Install water-proofing membrane at concrete curb
 - V** Power-wash existing concrete slab and install new elastomeric membrane at slab and equipment base plates
 - W** Existing door to remain, patch and repair to ensure full functionality
 - X** Remove existing electrical components. Pull existing feeders back to source and cap conduit
 - Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
 - Z** Mechanical equipment, see Chapter 3
-
- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
 - Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 10 PLAN




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GRID 10 PHOTOS WITH KEYS




KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
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- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

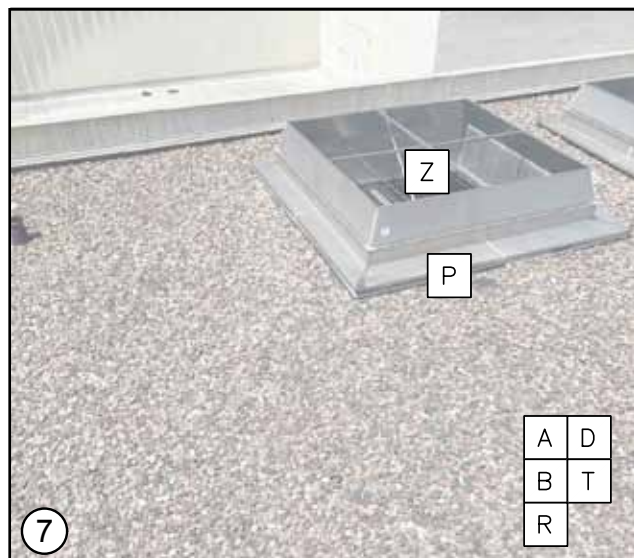
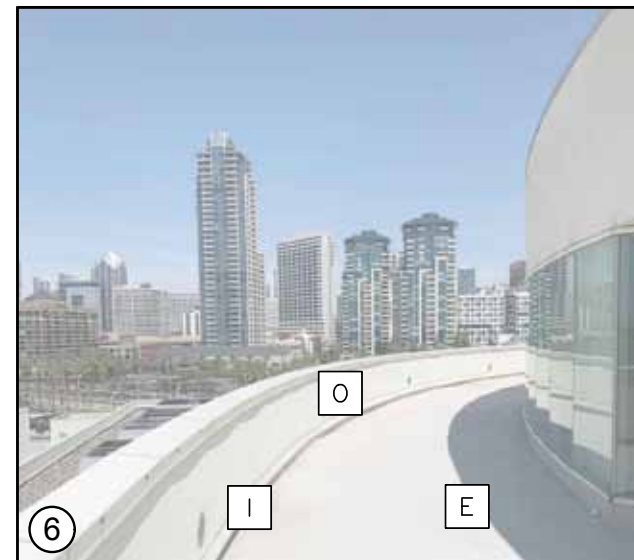
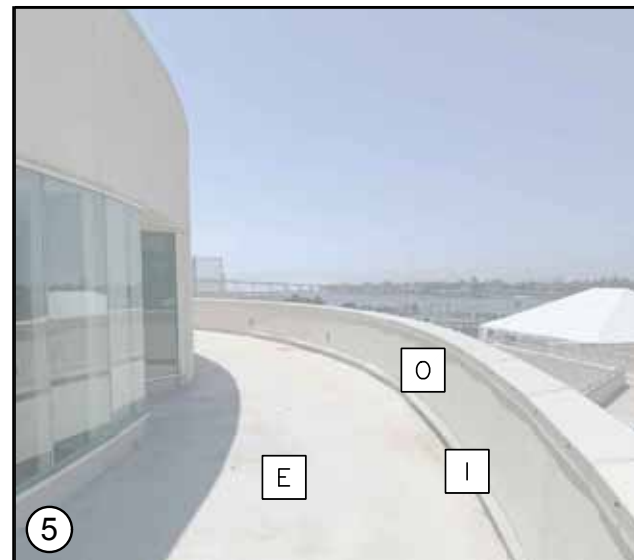
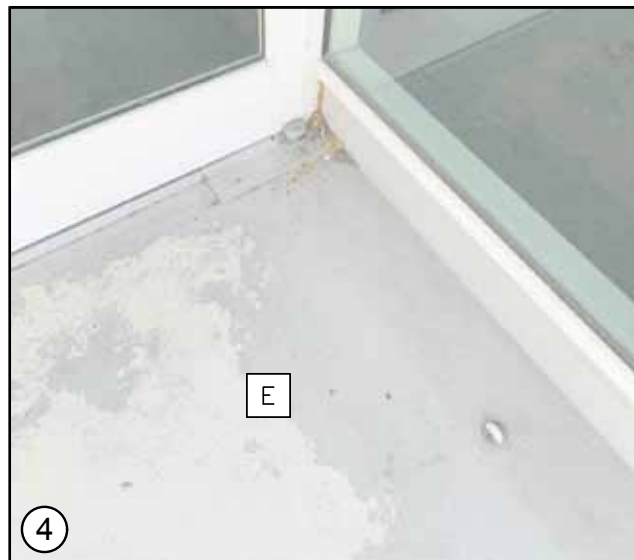
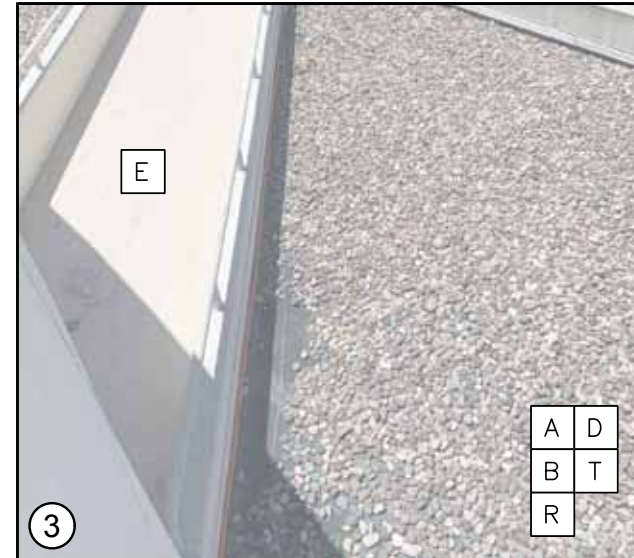
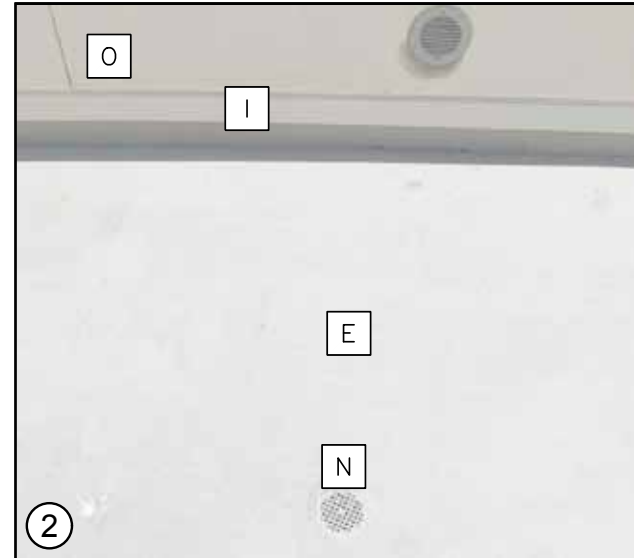
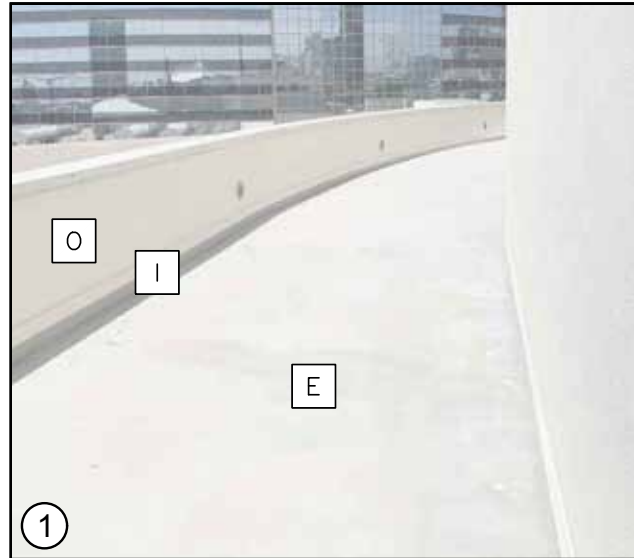
GRID 11 PLAN




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GRID 11 PHOTOS WITH KEYS



KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
- S** Install new concrete pavers
- T** Install new roof membrane
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- V** Power-wash existing concrete slab and install new elastomeric membrane at slab and equipment base plates
- W** Existing door to remain, patch and repair to ensure full functionality
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- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3
- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 12 PLAN

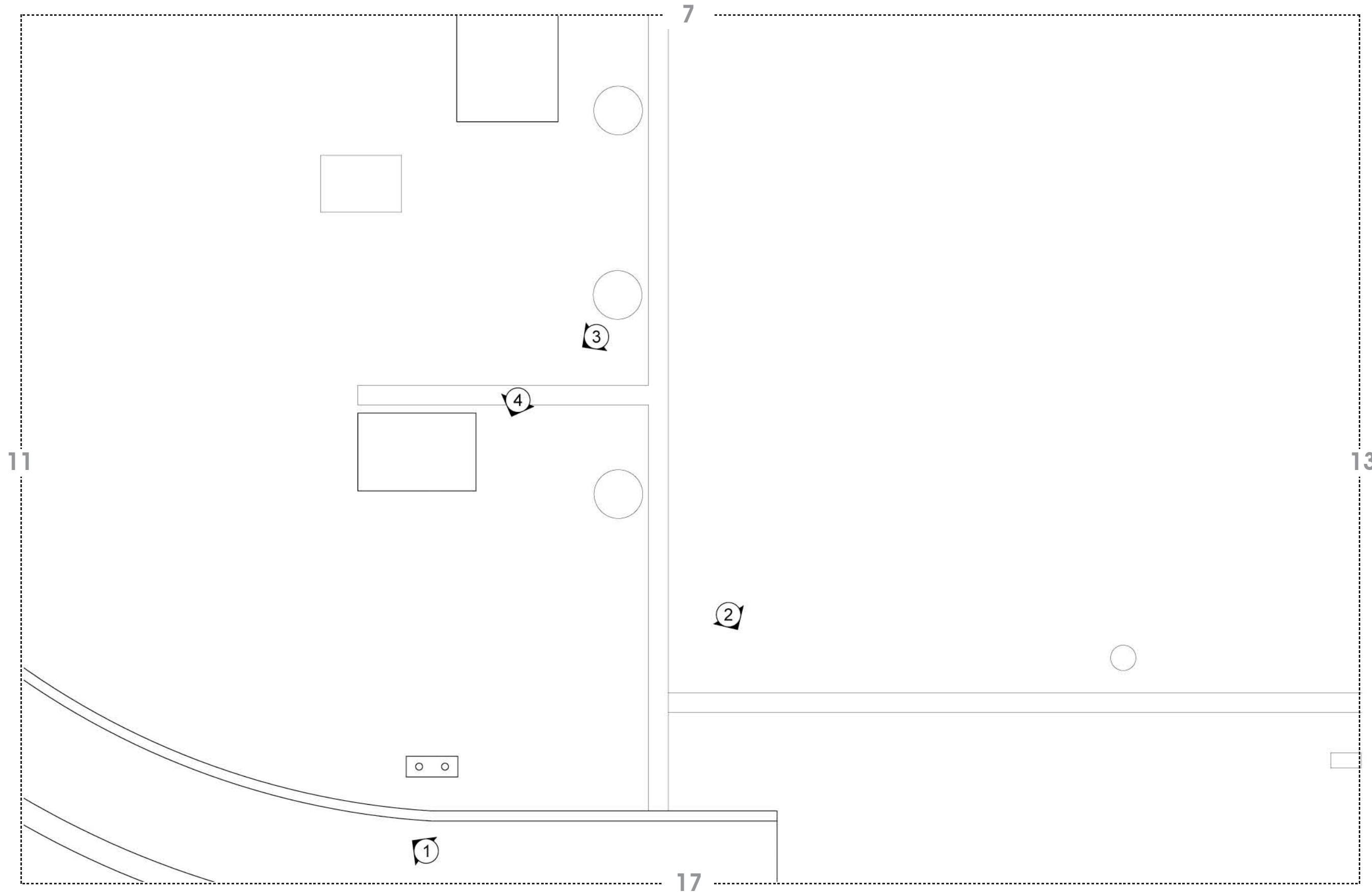
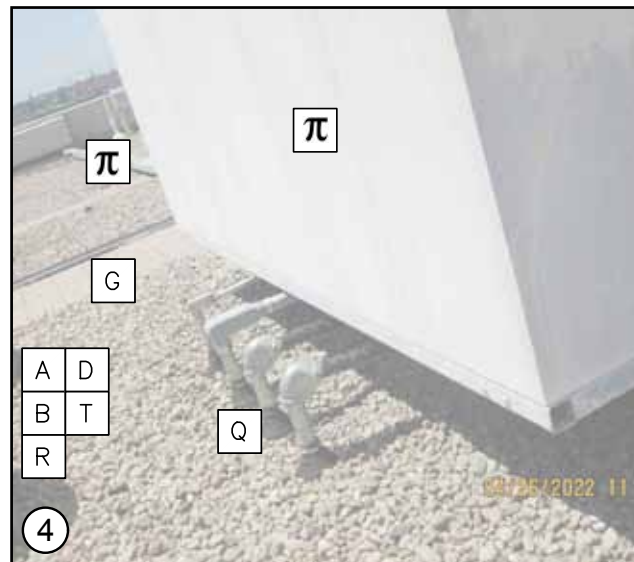
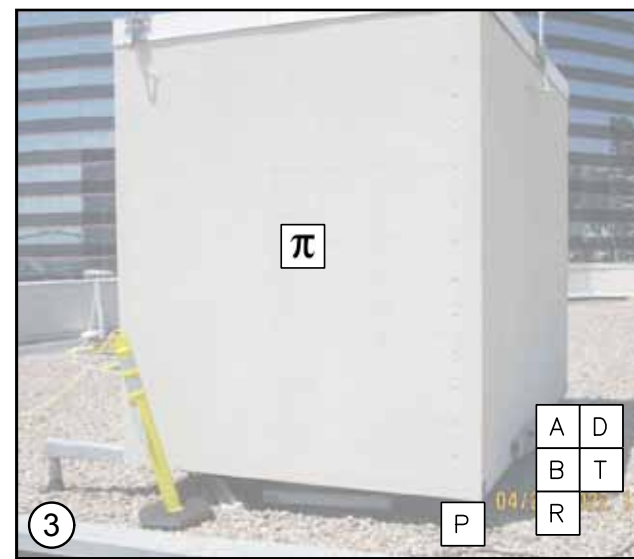
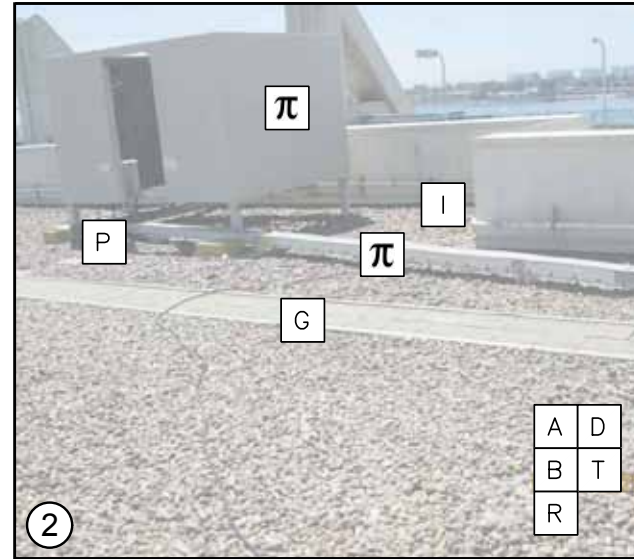
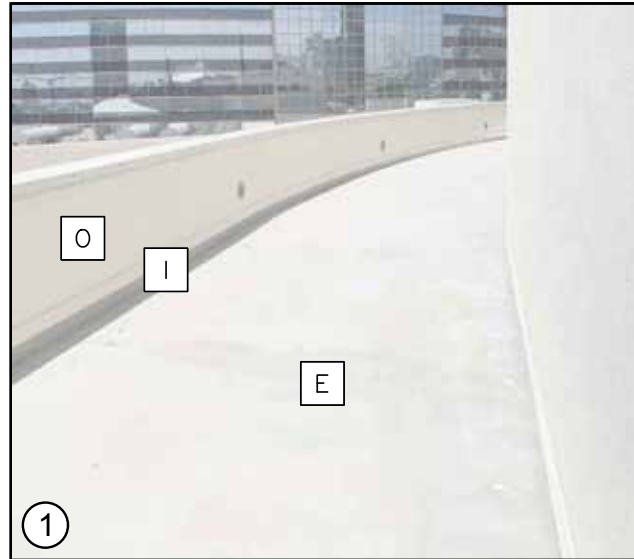


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GRID 12 PHOTOS WITH KEYS



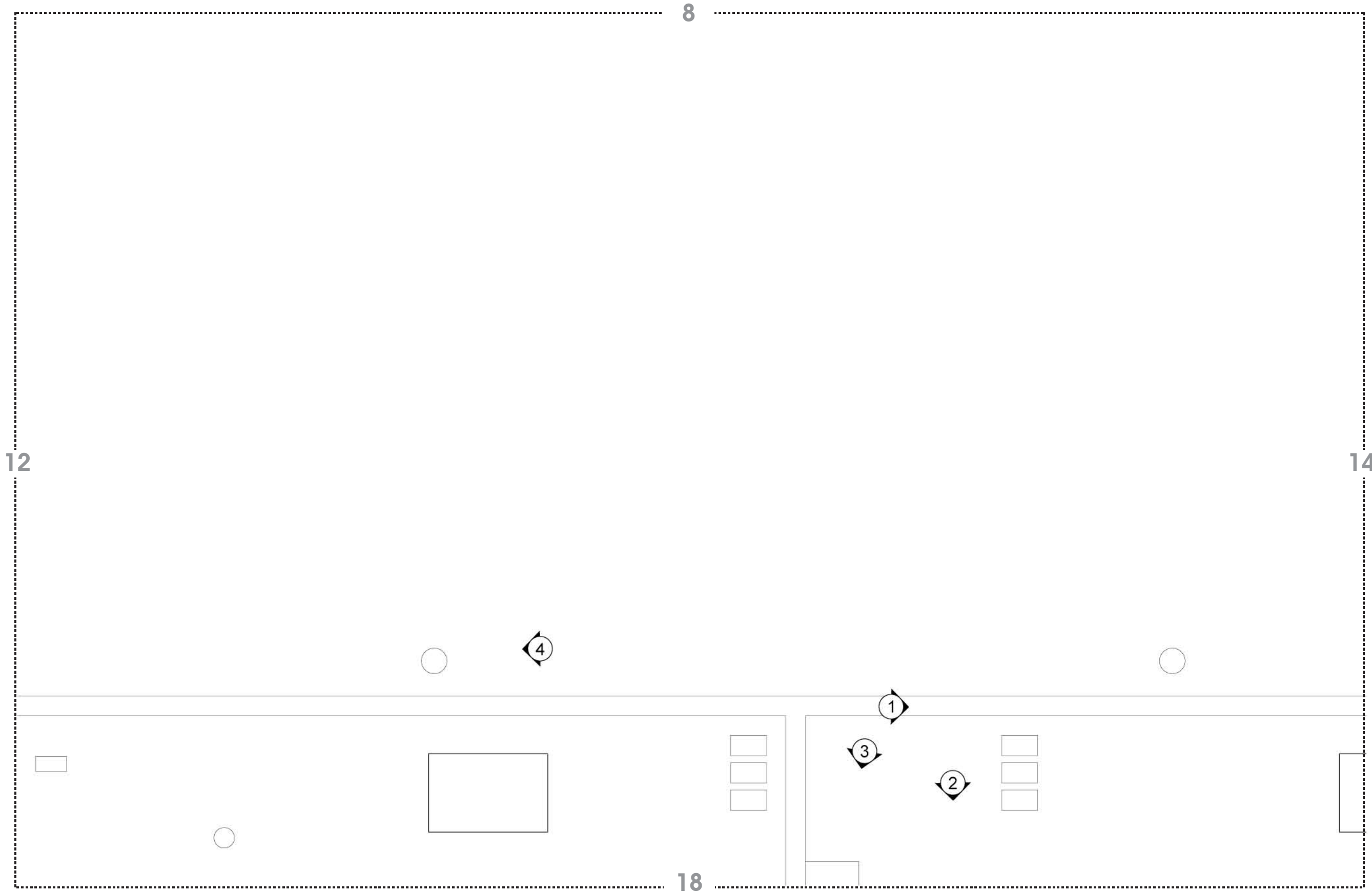
KEY NOTES


- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
- N** Remove and replace roof drain
- O** Patch and repair existing wall surface
- P** Wrap / flash existing curbs/supports (replace, if needed)
- Q** Wrap / flash roof penetrations
- R** Reinstall existing stored, and/or provide new roof ballast
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- Z** Mechanical equipment, see Chapter 3

- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.

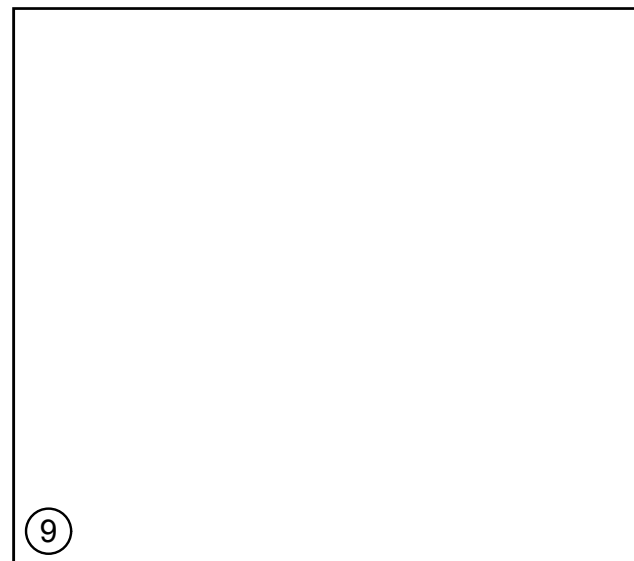
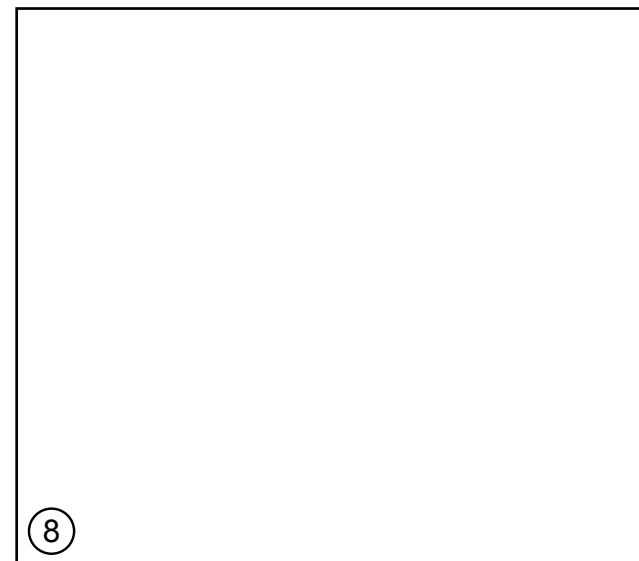
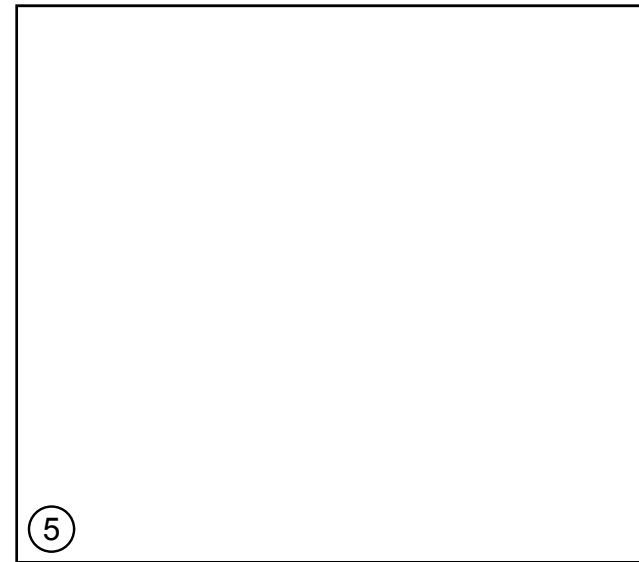
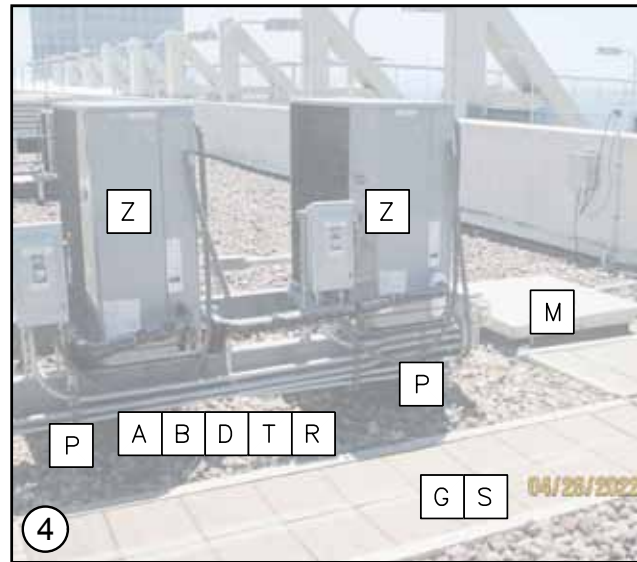
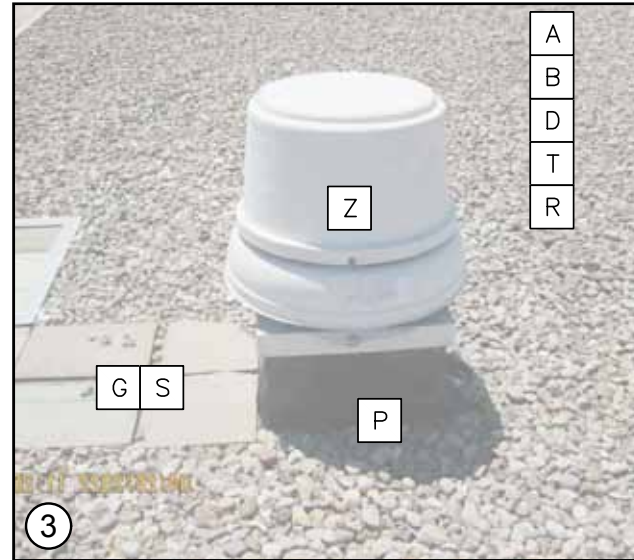
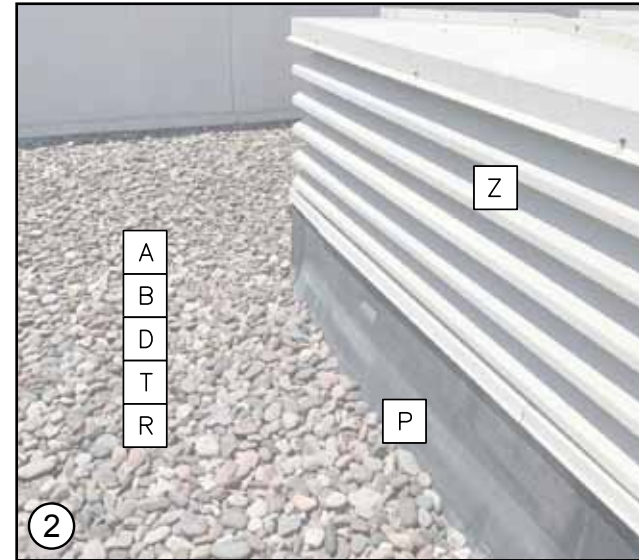
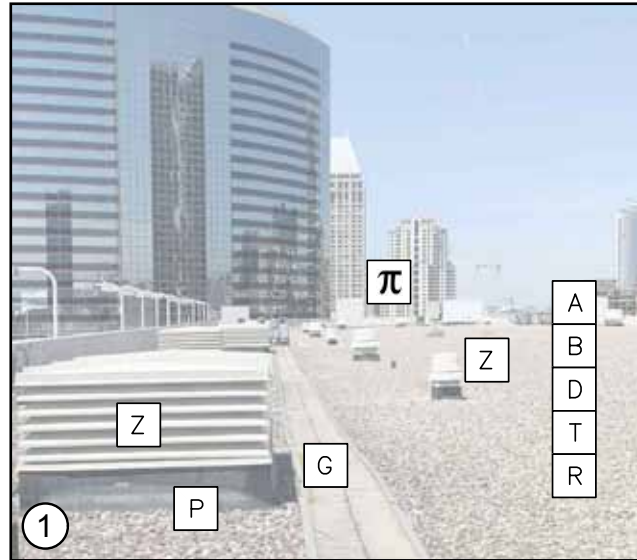
- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 13 PLAN




PHOTO LOCATOR
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GRID 13 PHOTOS WITH KEYS



KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
- B** Remove and dispose of existing roof membrane
- C** Saw-cut, remove and dispose of existing concrete topping
- D** Verify condition of existing rigid insulation and replace (if needed)
- E** Prep surface and install new elastomeric membrane
- F** Remove and replace TPO roofing
- G** Remove concrete pavers
- H** Remove and dispose of rubber surface mats
- I** Remove and replace flashing, repair finish surface, as needed
- J** Remove and dispose of existing chain link fencing and supports
- K** Remove court net posts at six locations, 12 total, verify in field
- L** Remove and dispose of metal gate and supports
- M** Remove and dispose of roof hatch, install new roof hatch
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- X** Remove existing electrical components. Pull existing feeders back to source and cap conduit
- Y** Remove all existing court lighting, remove feeders back to source and cap existing conduit.
- Z** Mechanical equipment, see Chapter 3

- π Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.

- Ω Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 14 PLAN

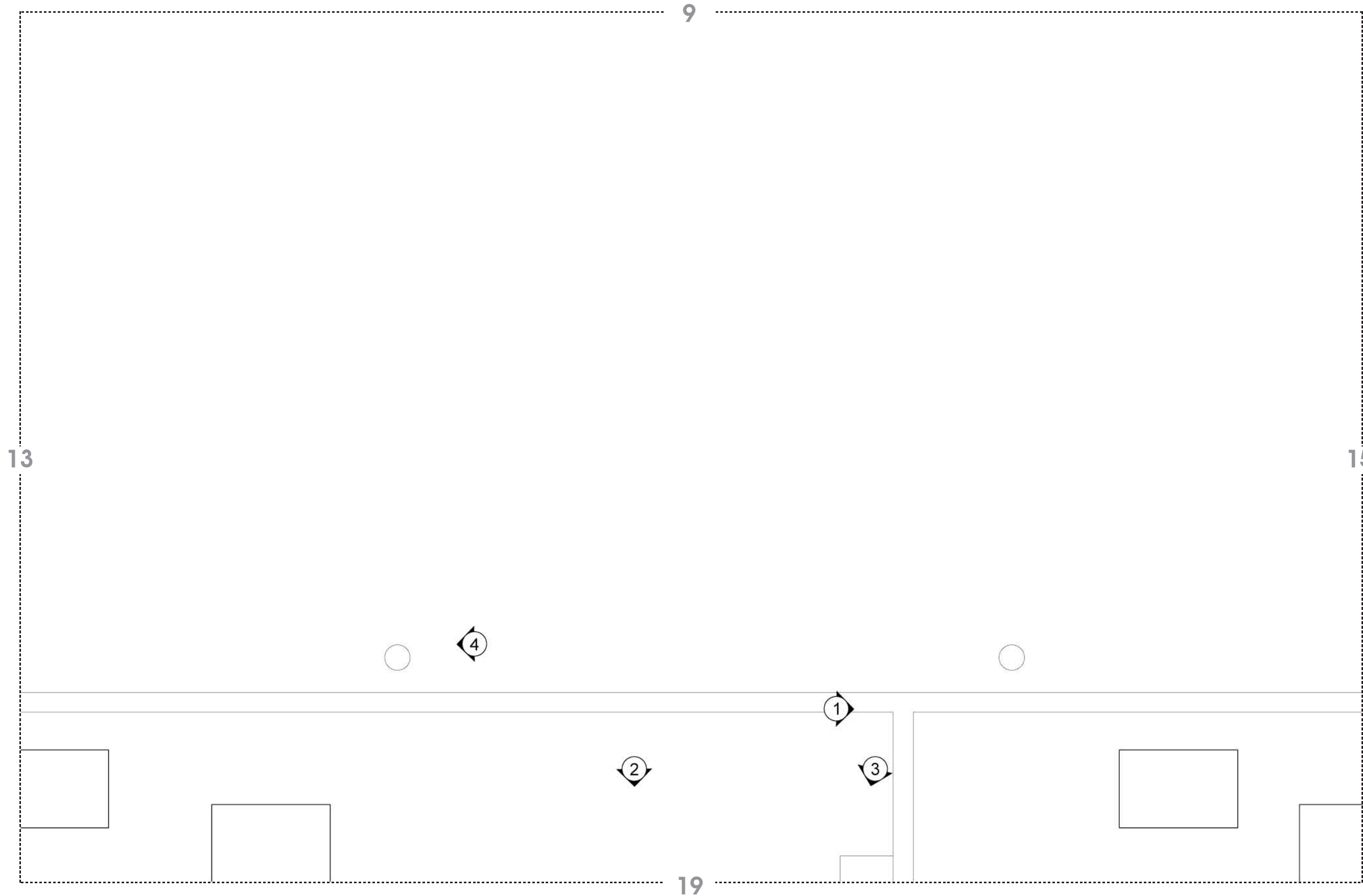
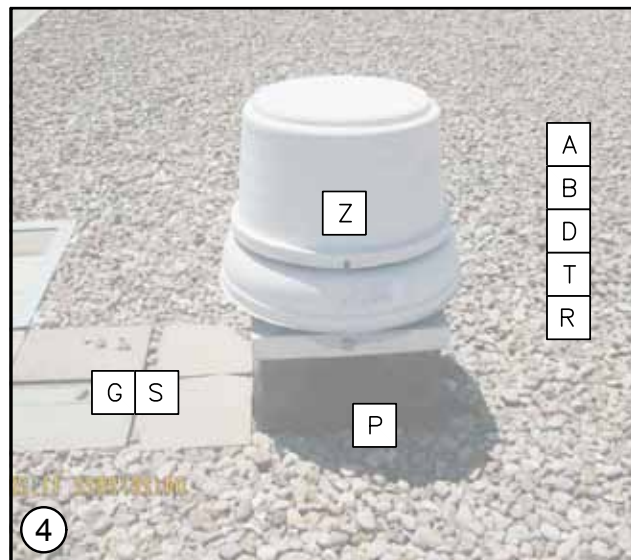
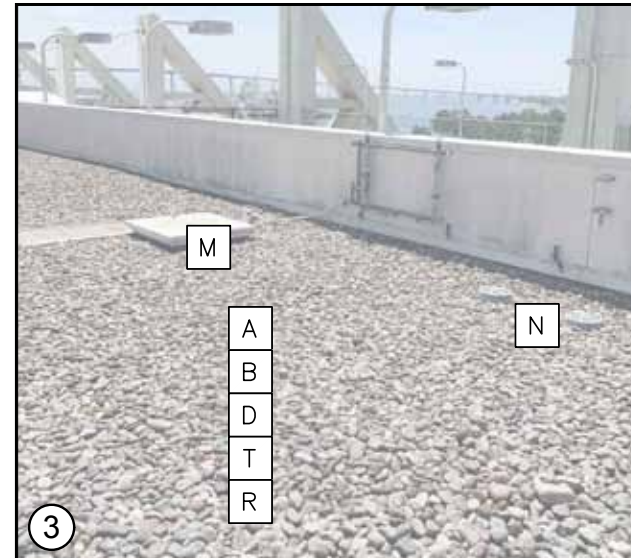
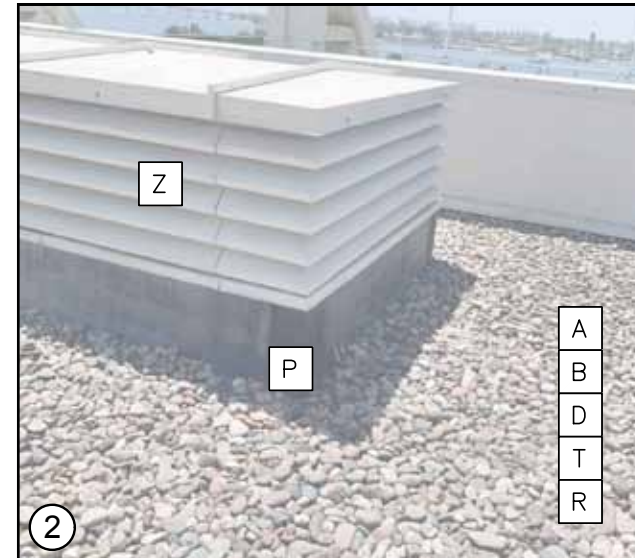
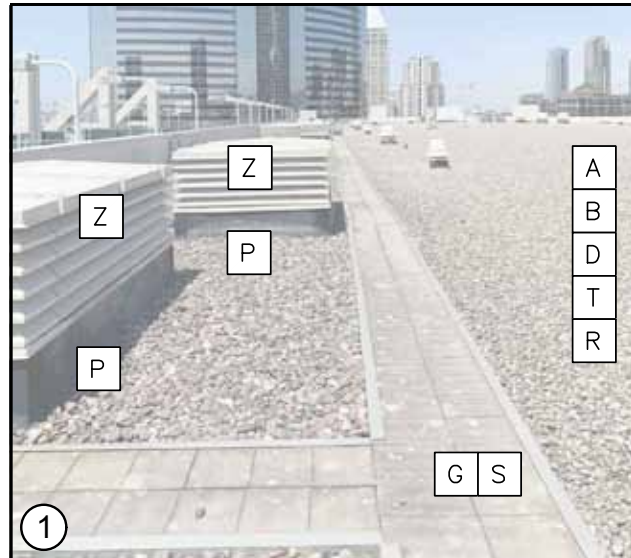


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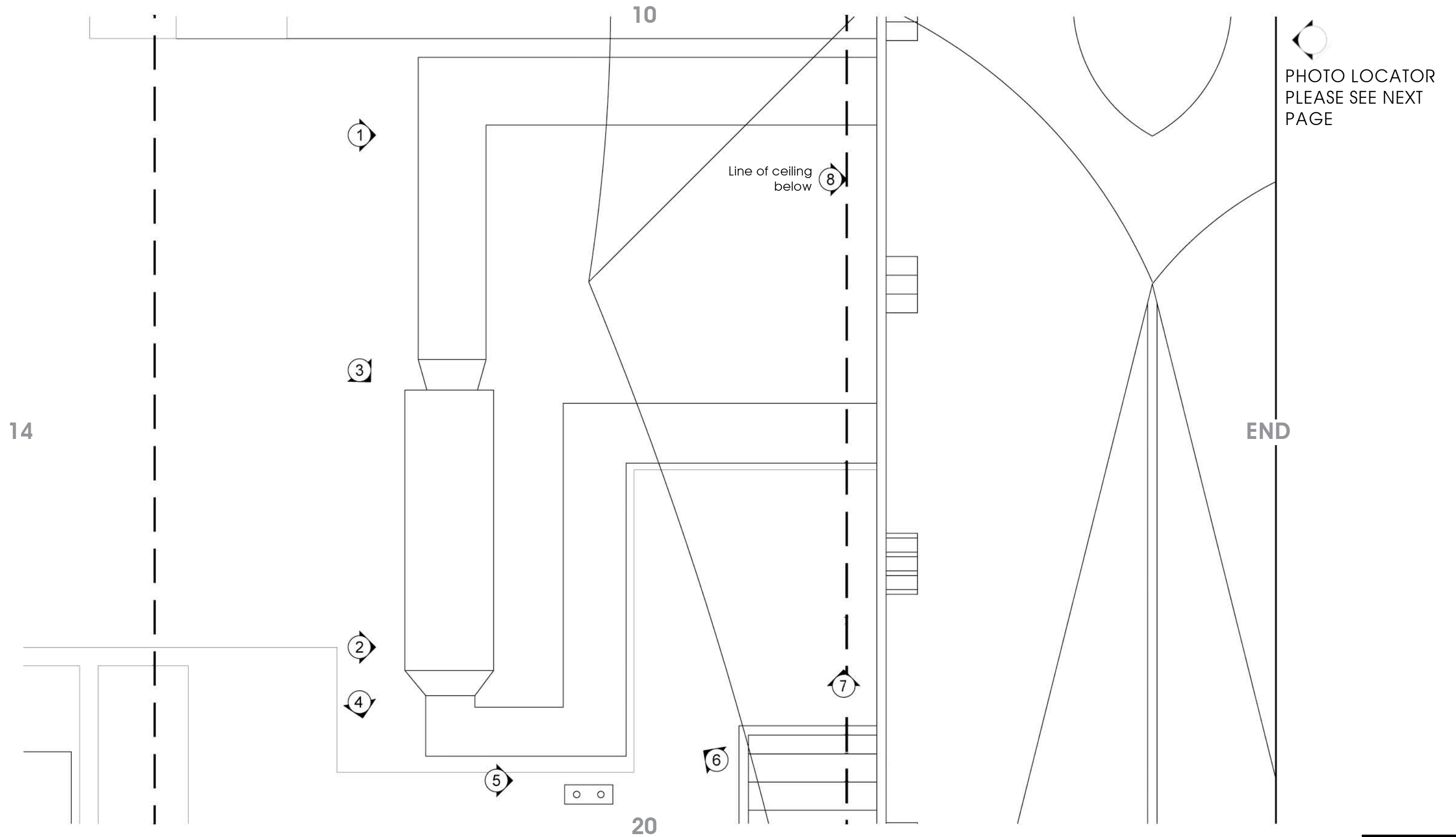
GRID 14 PHOTOS WITH KEYS



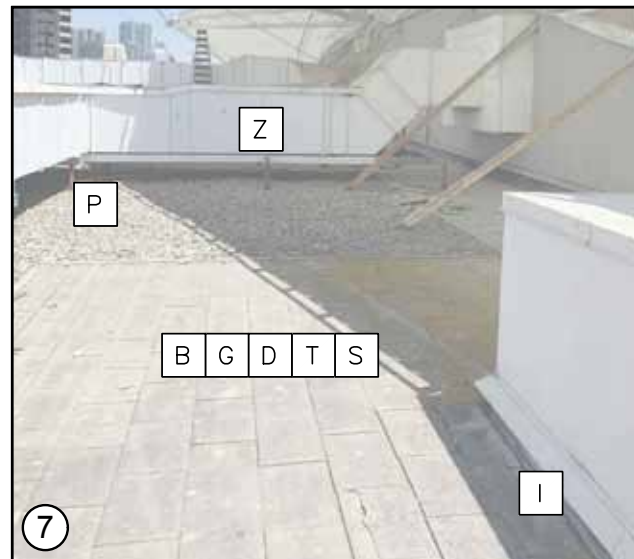
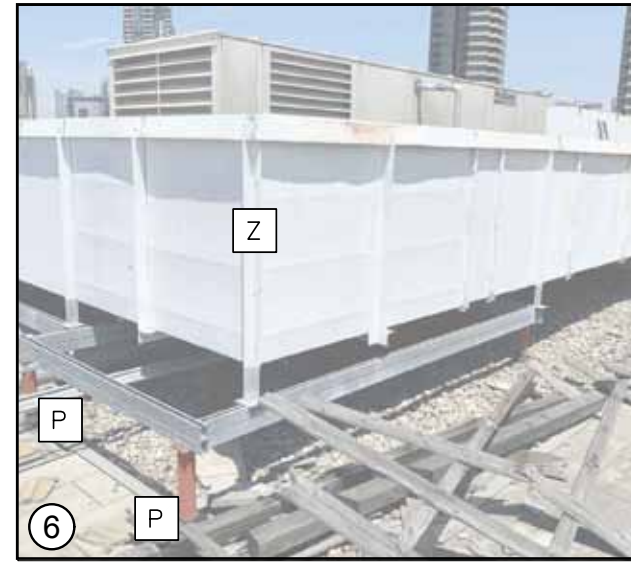
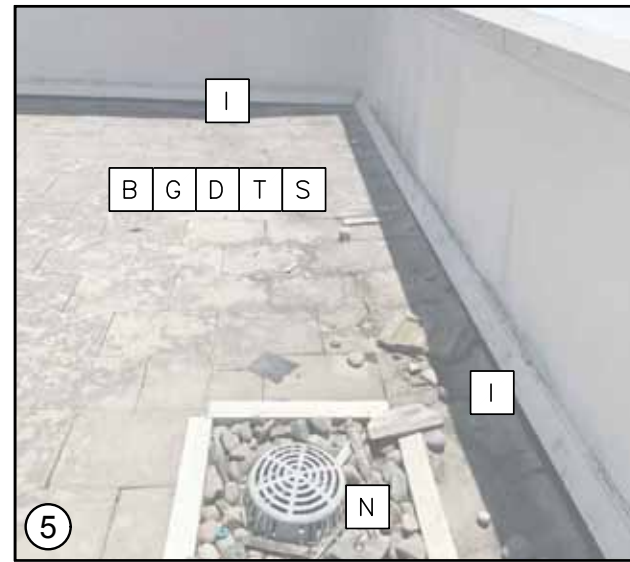
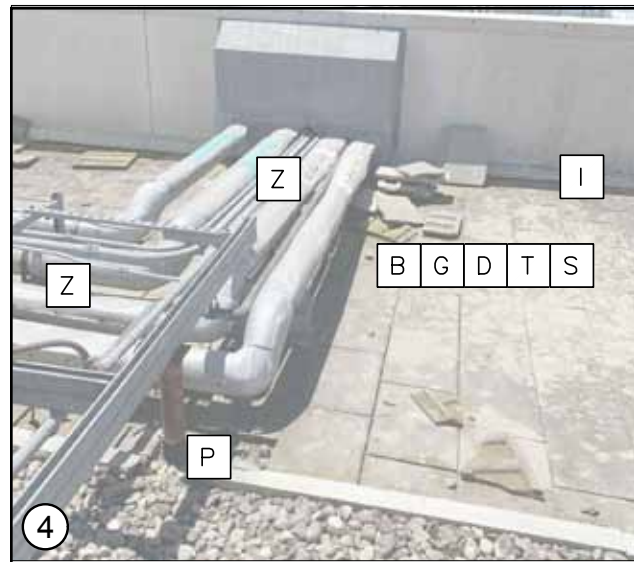
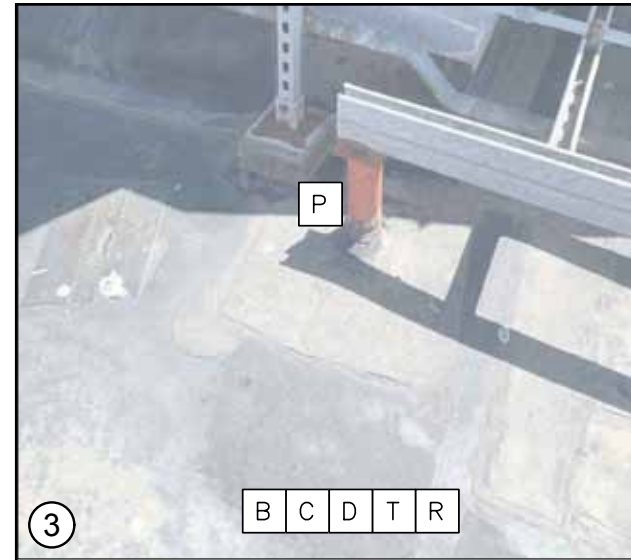
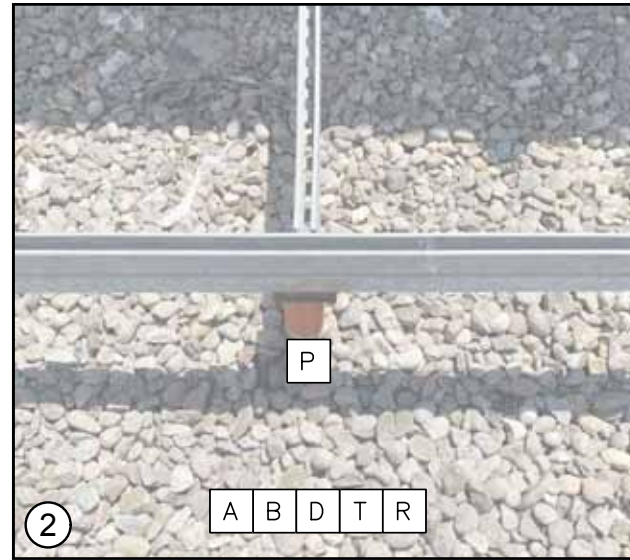
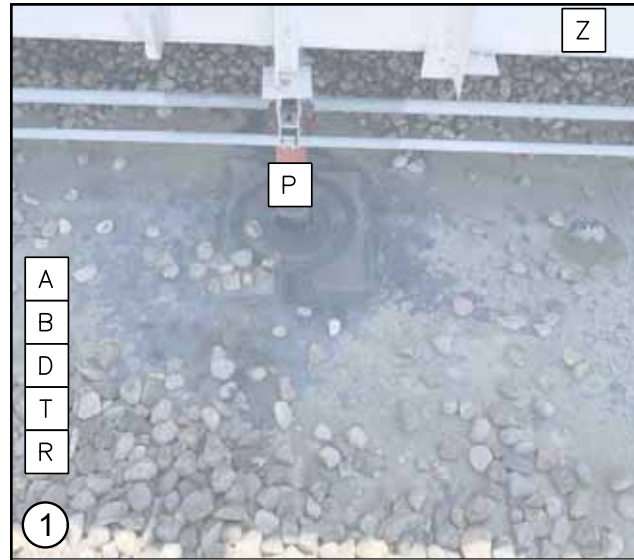
KEY NOTES

- A** Remove ballast and store on site at location as assigned by owner
 - B** Remove and dispose of existing roof membrane
 - C** Saw-cut, remove and dispose of existing concrete topping
 - D** Verify condition of existing rigid insulation and replace (if needed)
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 - F** Remove and replace TPO roofing
 - G** Remove concrete pavers
 - H** Remove and dispose of rubber surface mats
 - I** Remove and replace flashing, repair finish surface, as needed
 - J** Remove and dispose of existing chain link fencing and supports
 - K** Remove court net posts at six locations, 12 total, verify in field
 - L** Remove and dispose of metal gate and supports
 - M** Remove and dispose of roof hatch, install new roof hatch
 - N** Remove and replace roof drain
 - O** Patch and repair existing wall surface
 - P** Wrap / flash existing curbs/supports (replace, if needed)
 - Q** Wrap / flash roof penetrations
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 - Z** Mechanical equipment, see Chapter 3
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- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.
 - Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 15 PLAN



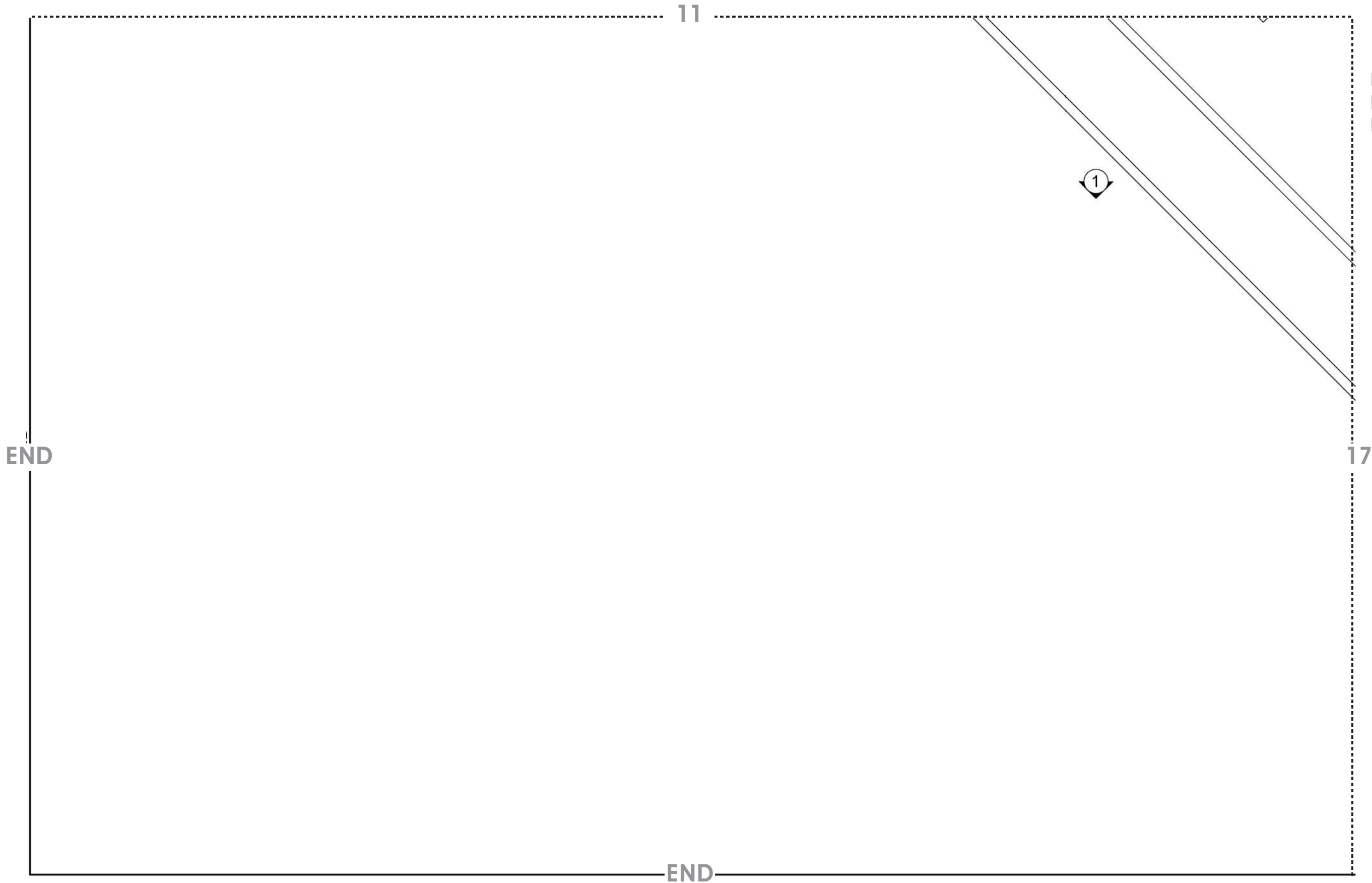
GRID 15 PHOTOS WITH KEYS




KEY NOTES

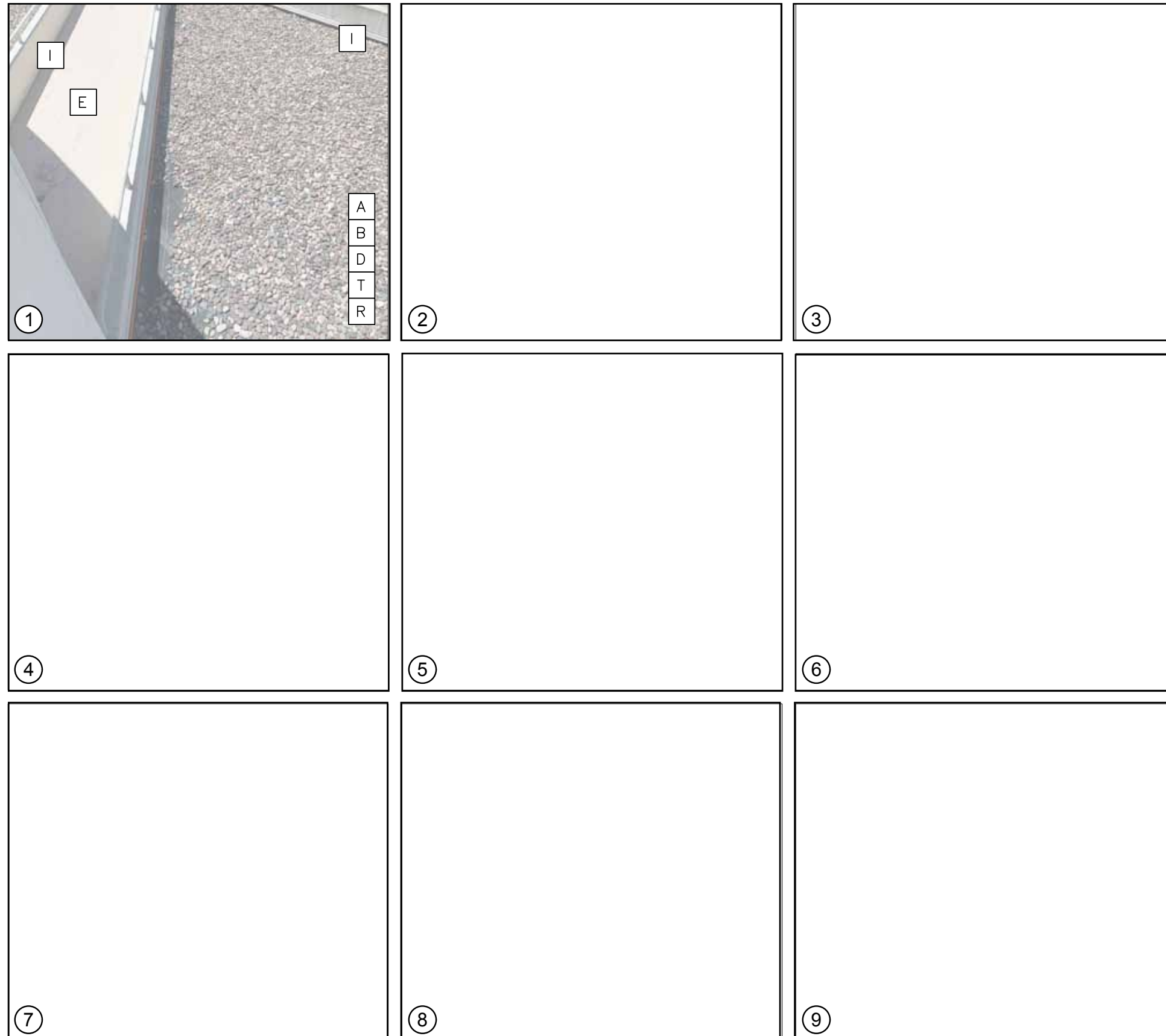
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- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 16 PLAN




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GRID 16 PHOTOS WITH KEYS



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- A** Remove ballast and store on site at location as assigned by owner
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- π** Contact telecommunications provider for removal and reinstallation of telecom facilities. See Chapter 2 Narrative for contacts.

- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 17 PLAN

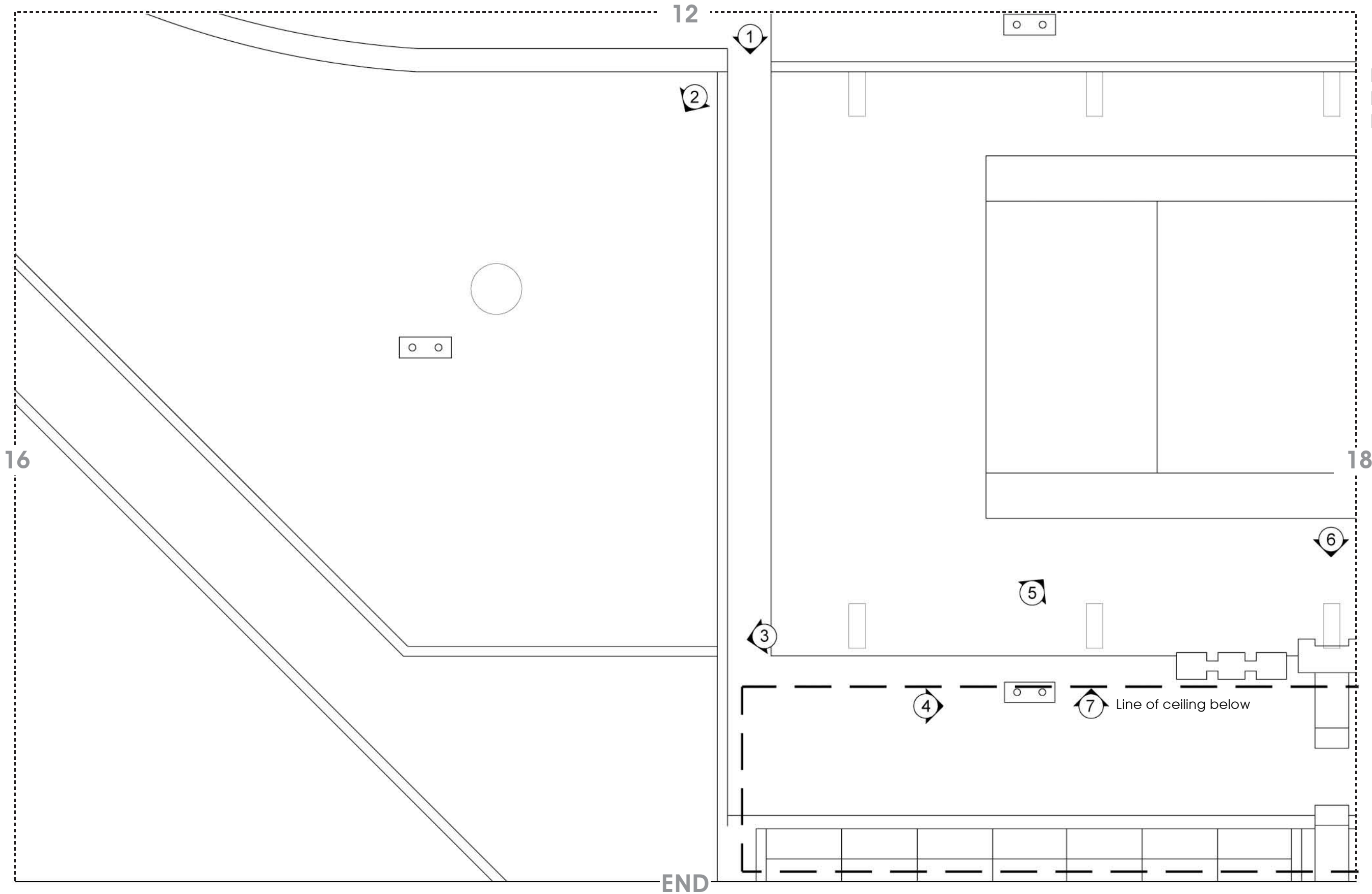
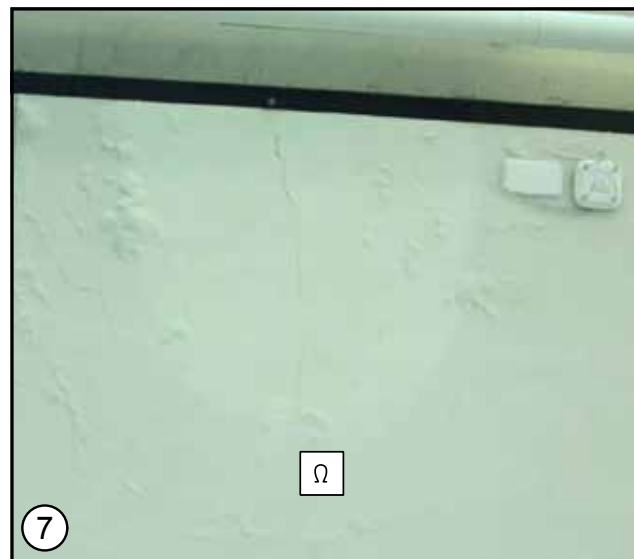
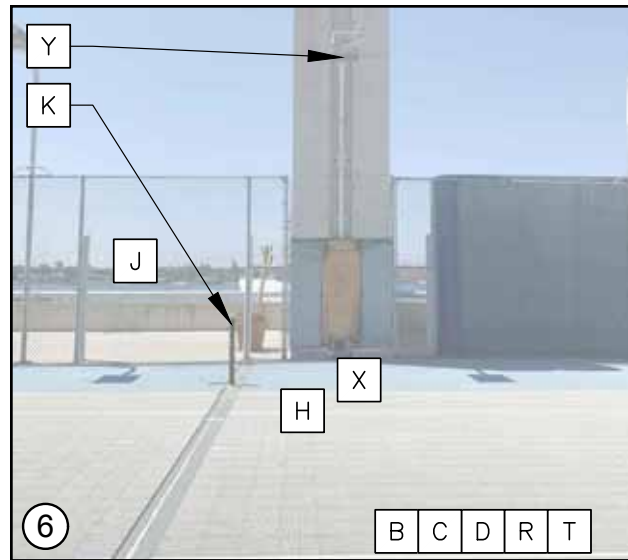
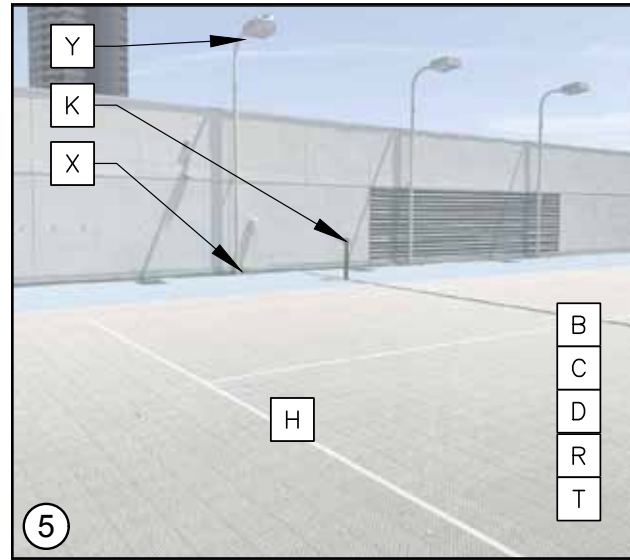
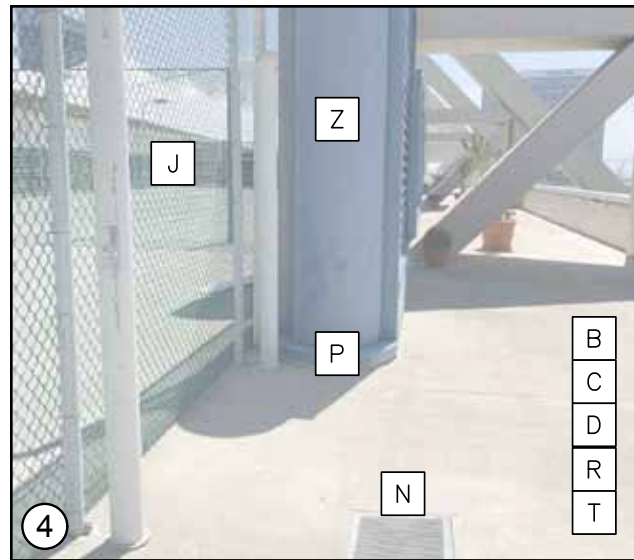
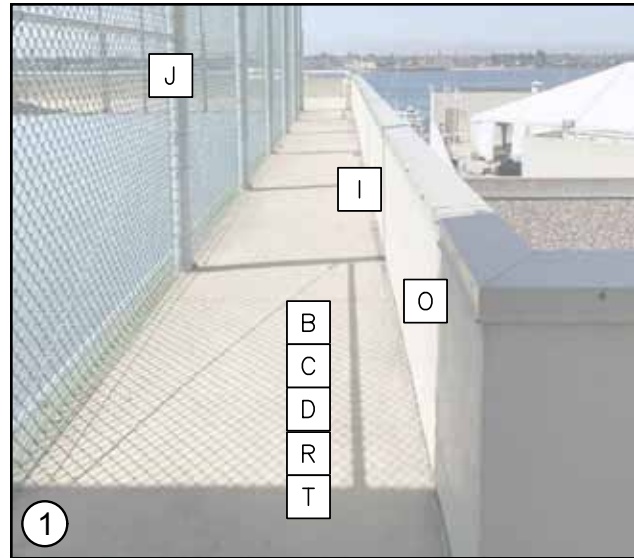


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GRID 17 PHOTOS WITH KEYS



KEY NOTES

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- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 18 PLAN

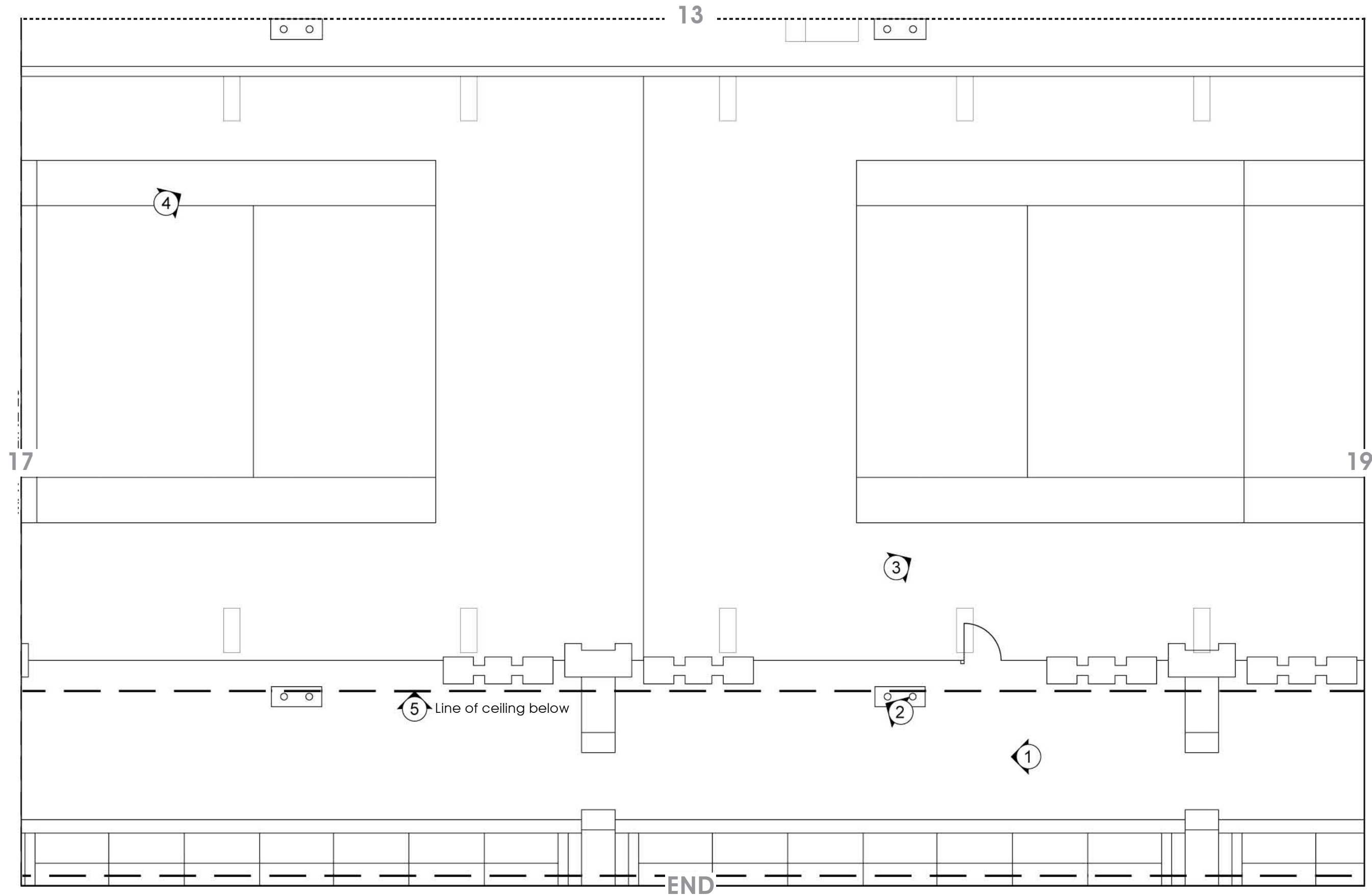
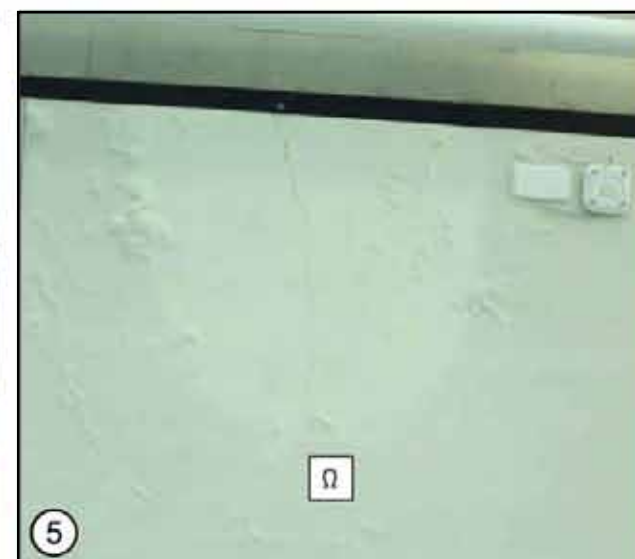
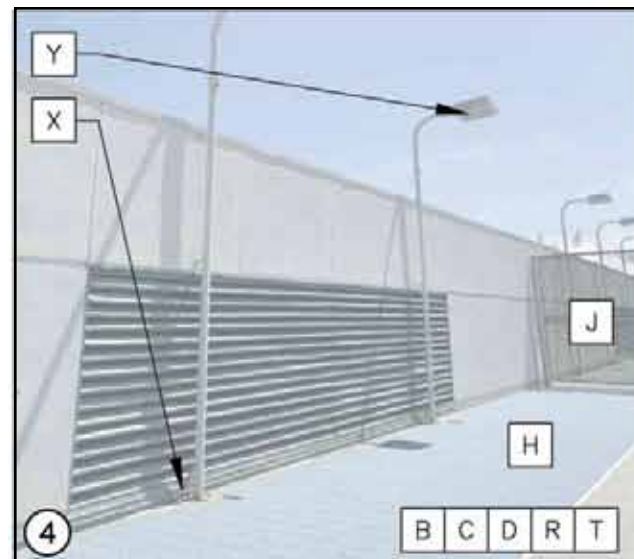
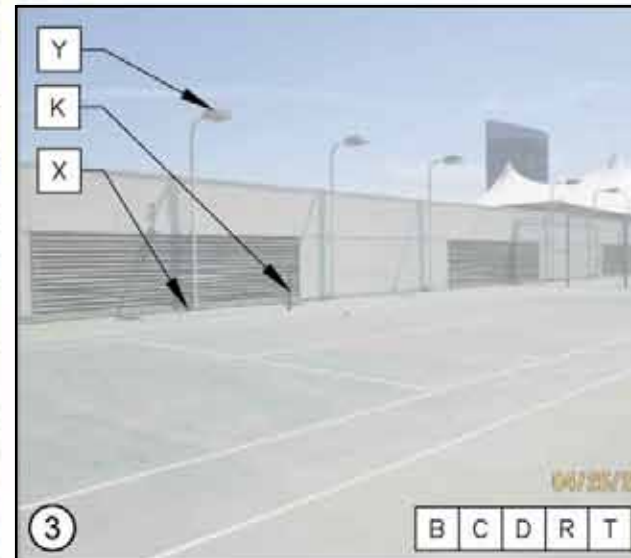
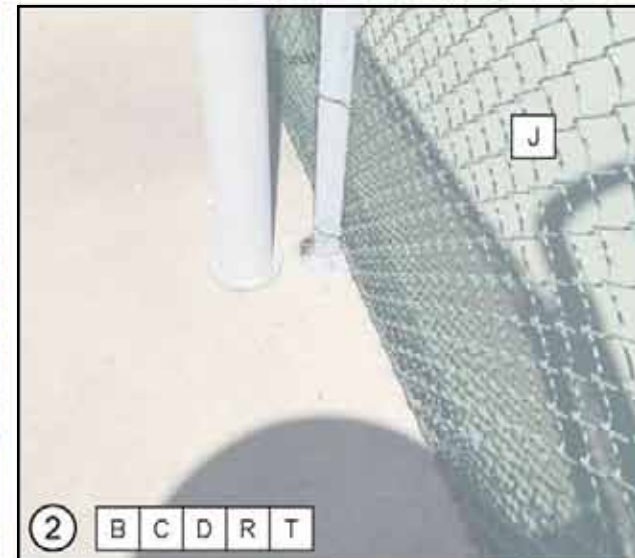
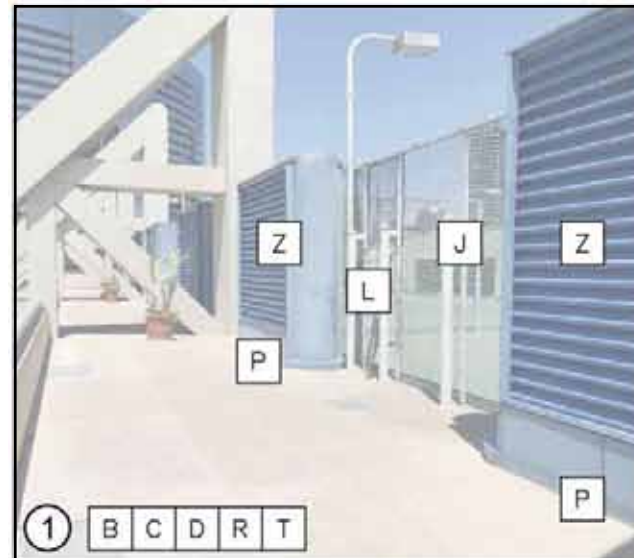


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GRID 18 PHOTOS WITH KEYS



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GRID 19 PLAN

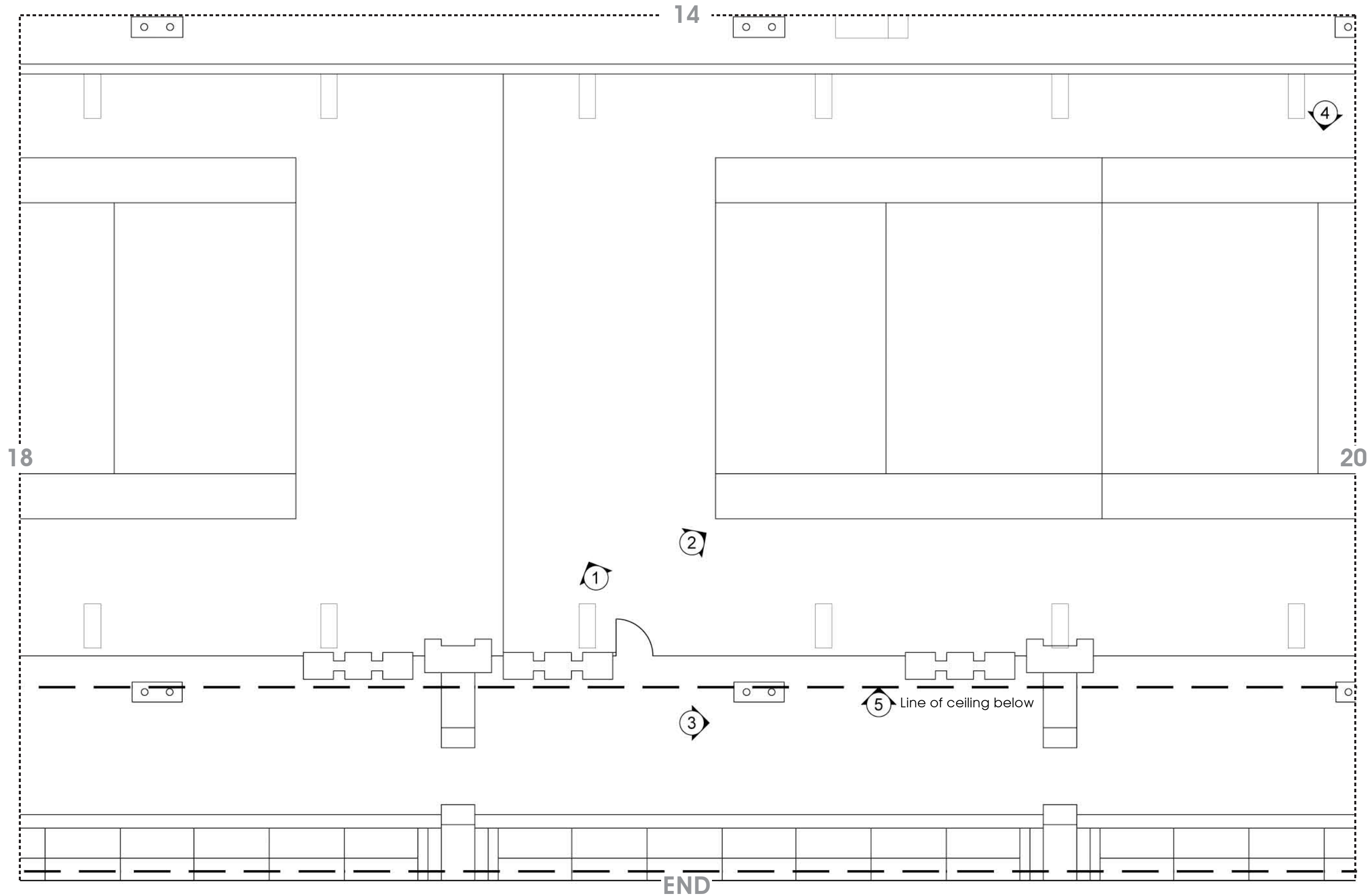
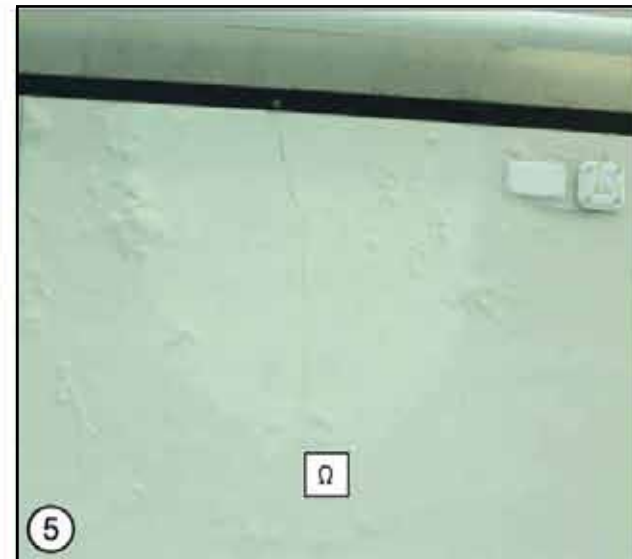
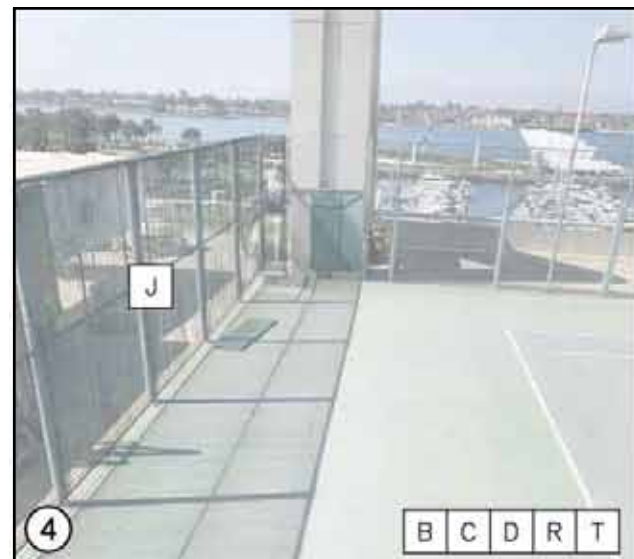
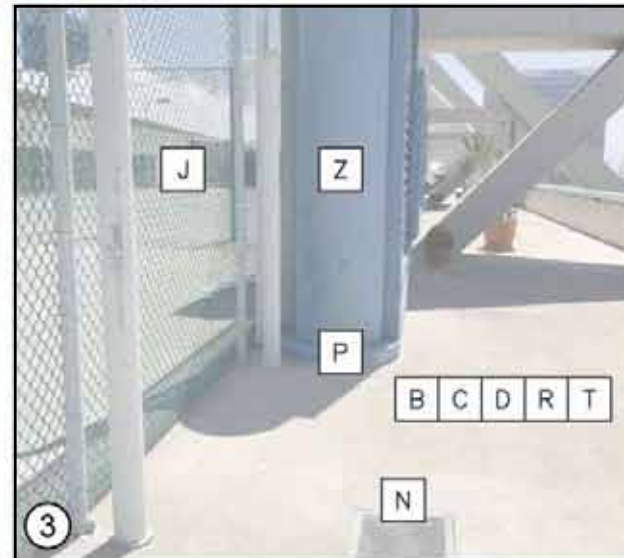
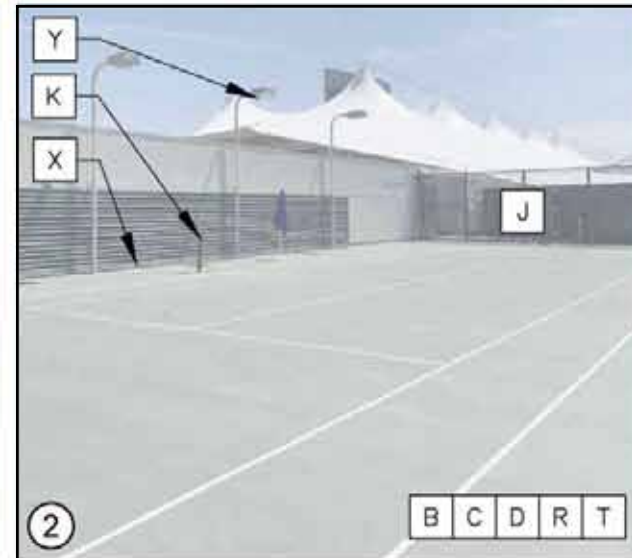
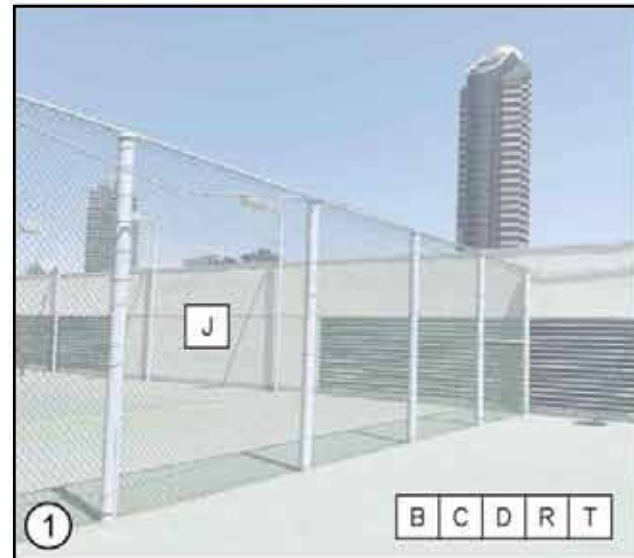


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GRID 19 PHOTOS WITH KEYS



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- Ω** Inspect existing ceiling for water damage. Patch and repair and paint as needed, match existing finish.

GRID 20 PLAN

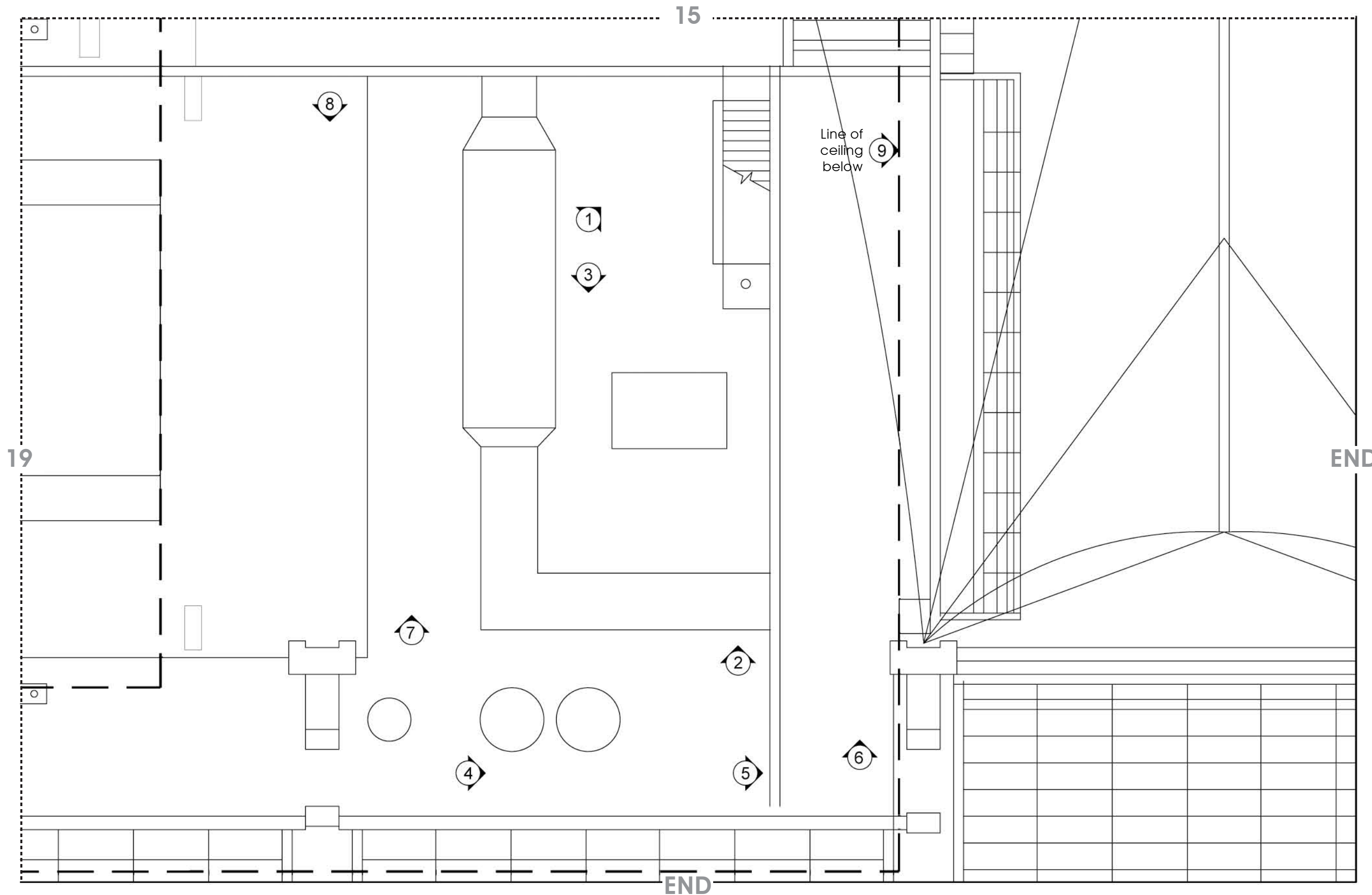
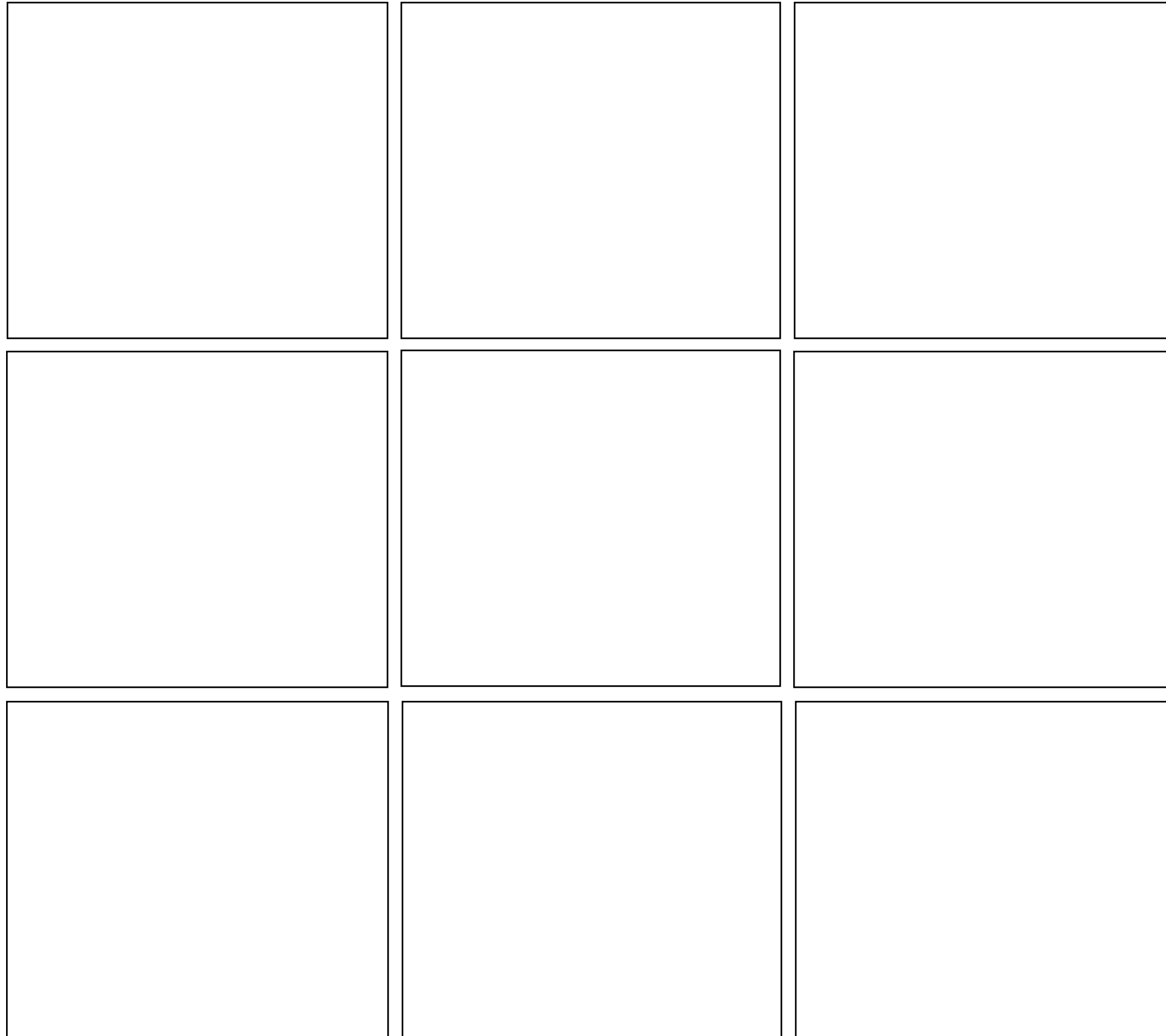


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GRID 20 PHOTOS WITH KEYS



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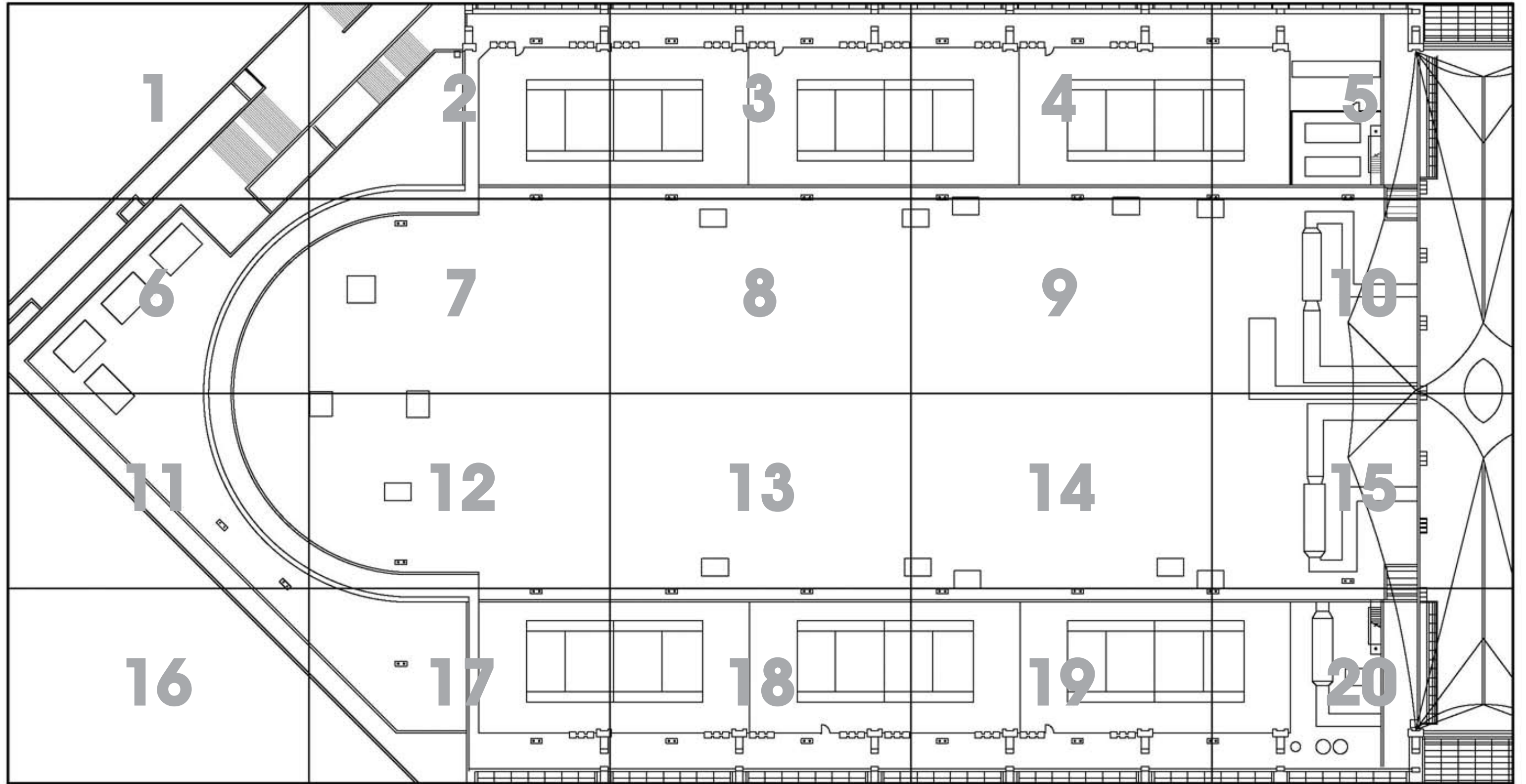
CHAPTER 3: MECHANICAL NARRATIVE

The Design-Build Contractor shall provide design services for a complete code compliant design, including drawings, specifications, and calculations necessary for the removal and re-installation or replacement of all mechanical equipment necessary for the roof replacement and PV installation portion of this project. The Contractor shall be responsible for obtaining permits from the City of San Diego, the Port Authority, the Coastal Commission, and any other agencies having jurisdiction over the property of the Convention Center. All required permits shall be provided for the project prior to the commencement of any construction work. All design and construction work shall be compliant with all applicable standards, building codes, and California requirements.

The Design-Build Contractor shall provide contracting services to remove and re-install or remove and replace existing mechanical equipment, piping, ductwork, vents, and all appurtenances necessary for the replacement of the roof. The contractor shall provide all means necessary for the temporary relocation or replacement of all mechanical items on the roof as required for the replacement of the roof. The Design-Build Contractor shall verify all mechanical pads and curbs are in good working order and available for re-use; where not of sufficient quality for use, the support shall be replaced. Contractor shall utilize the means and methods required to provide complete and operational mechanical systems affected by the roof replacement and solar project complete the project in phases as required to meet the owners' use requirements for the facility.

The drawings and other criteria provided in this document identify anticipated locations, quantities, and arrangement of existing rooftop equipment that will be removed within this project. An assessment has been completed and recommendations are included for the removal and replacement of mechanical equipment that is past its useful life and shall need to be replaced. This equipment shall be identified in the bid form as alternate bids to complete the work indicated. All equipment to be removed and re-installed for the purpose of the roof replacement and solar PV panel project shall be included in the base bid of the project. The attached drawings indicate the observed conditions of the mechanical systems. These drawings are for informational purposes only and all work must be field verified by the Design-Build Contractor.

MECHANICAL: ROOF PLAN WITH KEYS



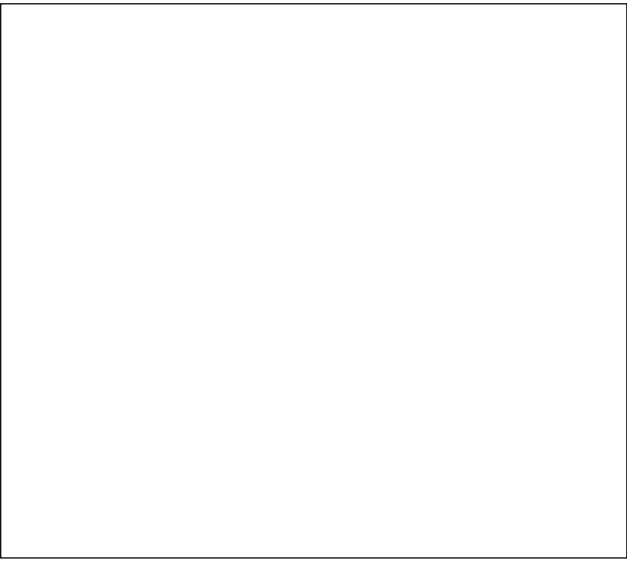
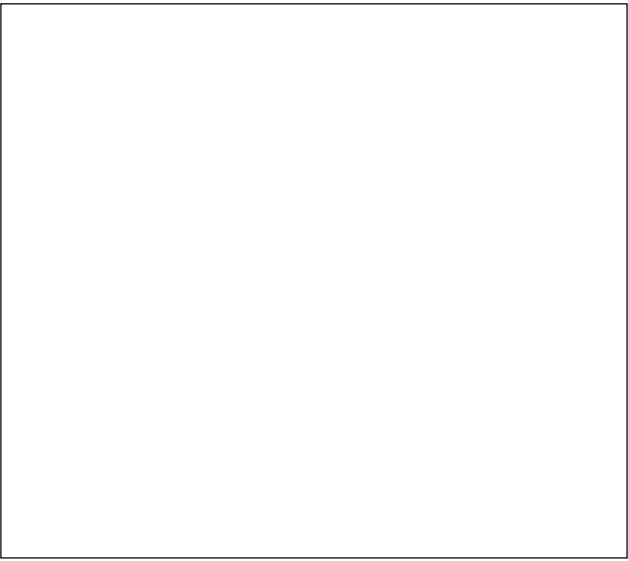
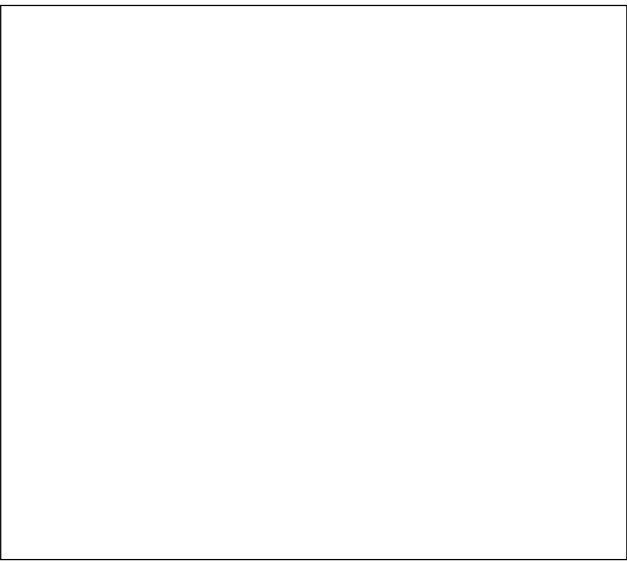
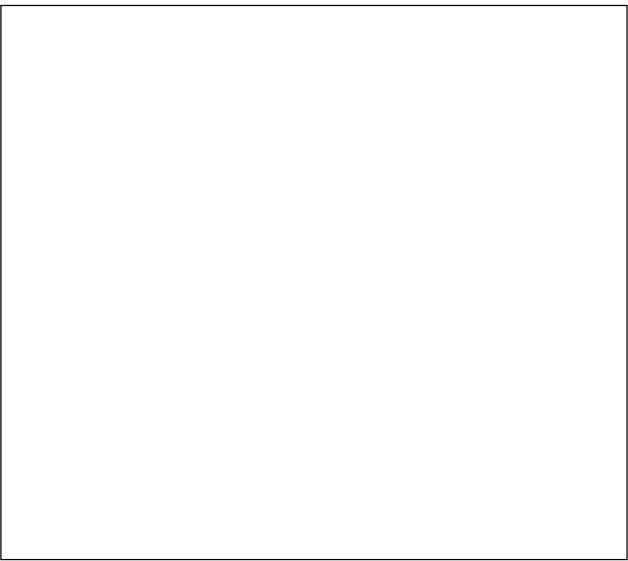
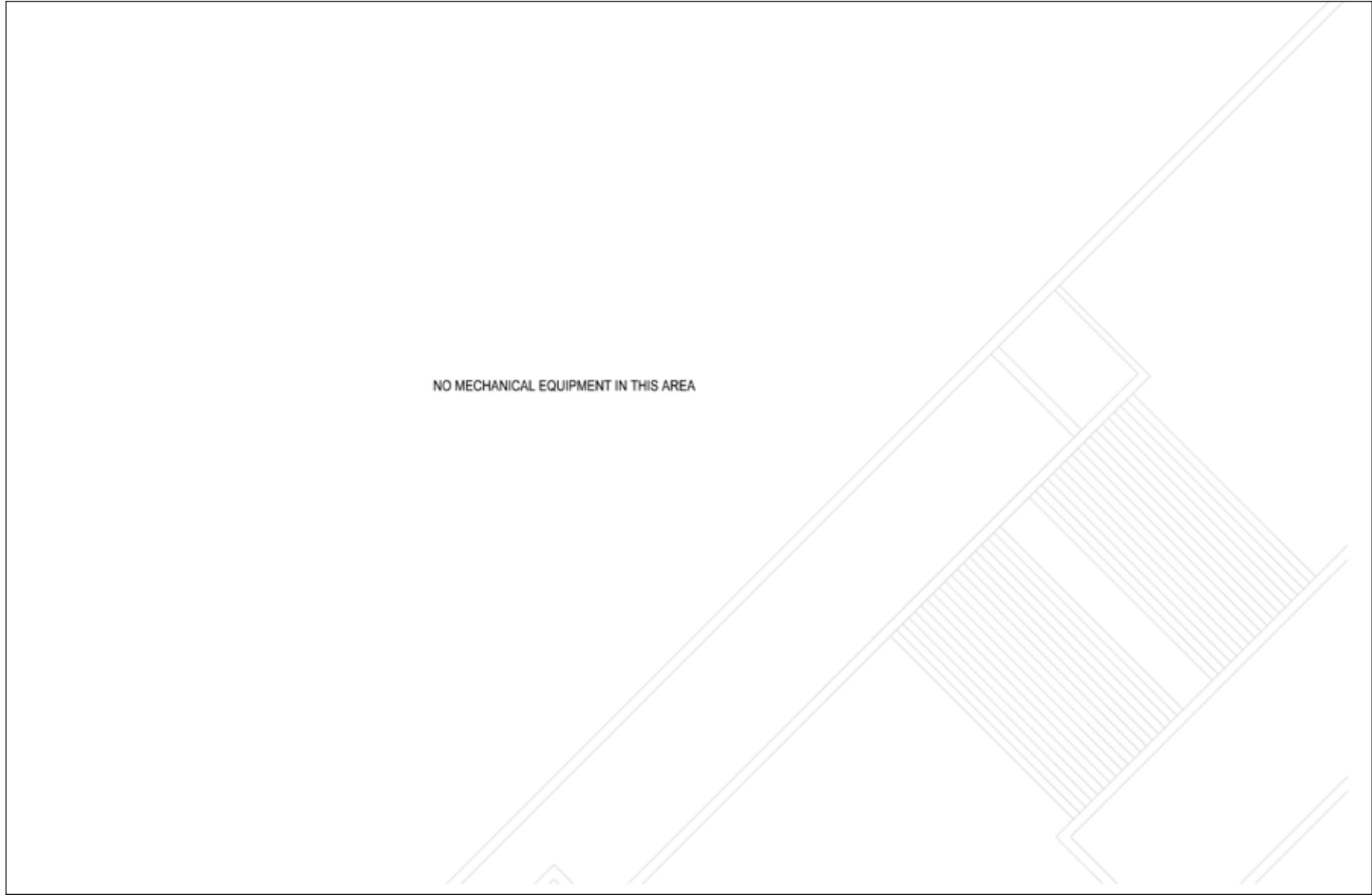
MECHANICAL: EQUIPMENT LIST

	EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect
	EF-95	Carnes	VEBK36X1G1UA20SPC1	1999	Unsatisfactory	460/60/3	5		X		X
1	HP-0					?			X		X
2	EF-84					460/60/3	5		X		X
3	EF-93					460/60/3	5		X		X
4	EF-94					460/60/3	5		X		X
5	EF-86					460/60/3	3		X		X
6	EF-90.1	Greenheck	G-170-B			?			X		X
7	HP-1	Carrier				?			X		X
8	EF-91					460/60/3	1-1/2		X		X
9	EF-89					?			X		X
10	AC-1				Satisfactory	208-230/60/1		X		X	
11	AC-2					208-230/60/1		X		X	
12	Exhaust Vent					N/A		X		N/A	
13	Gravity Vent - 1					N/A		X		N/A	
14	EF-79					120/60/1	1/4		X		X
15	EF-80					120/60/1	1/4		X		X
16	EF-81					120/60/1	1/4		X		X
17	EF-82					120/60/1	1/4		X		X
18	EF-83					120/60/1	1/4		X		X
19	CU-3					208-230/60/1		X		X	
20	CU-4					208-230/60/1		X		X	
21	CU-5					208-230/60/1		X		X	
22	CU-1					208-230/60/1		X		X	
23	CU-2					208-230/60/1		X		X	
24	CU-SPARE					208-230/60/1		X		X	
25	Gravity Vent - 2					N/A		X		N/A	
26	Gravity Vent - 3					N/A		X		N/A	
27	Gravity Vent - 4					N/A		X		N/A	
28	Gravity Vent - 5					N/A		X		N/A	
29	AHU-74	McQuay	RAH077CLY	1999		460/60/3			X		X
30	EF-140	Greenheck	49-AISW-21-10			?			X		X
31	B-3	Bryan	K-300-W-GI	1999		?			X		X

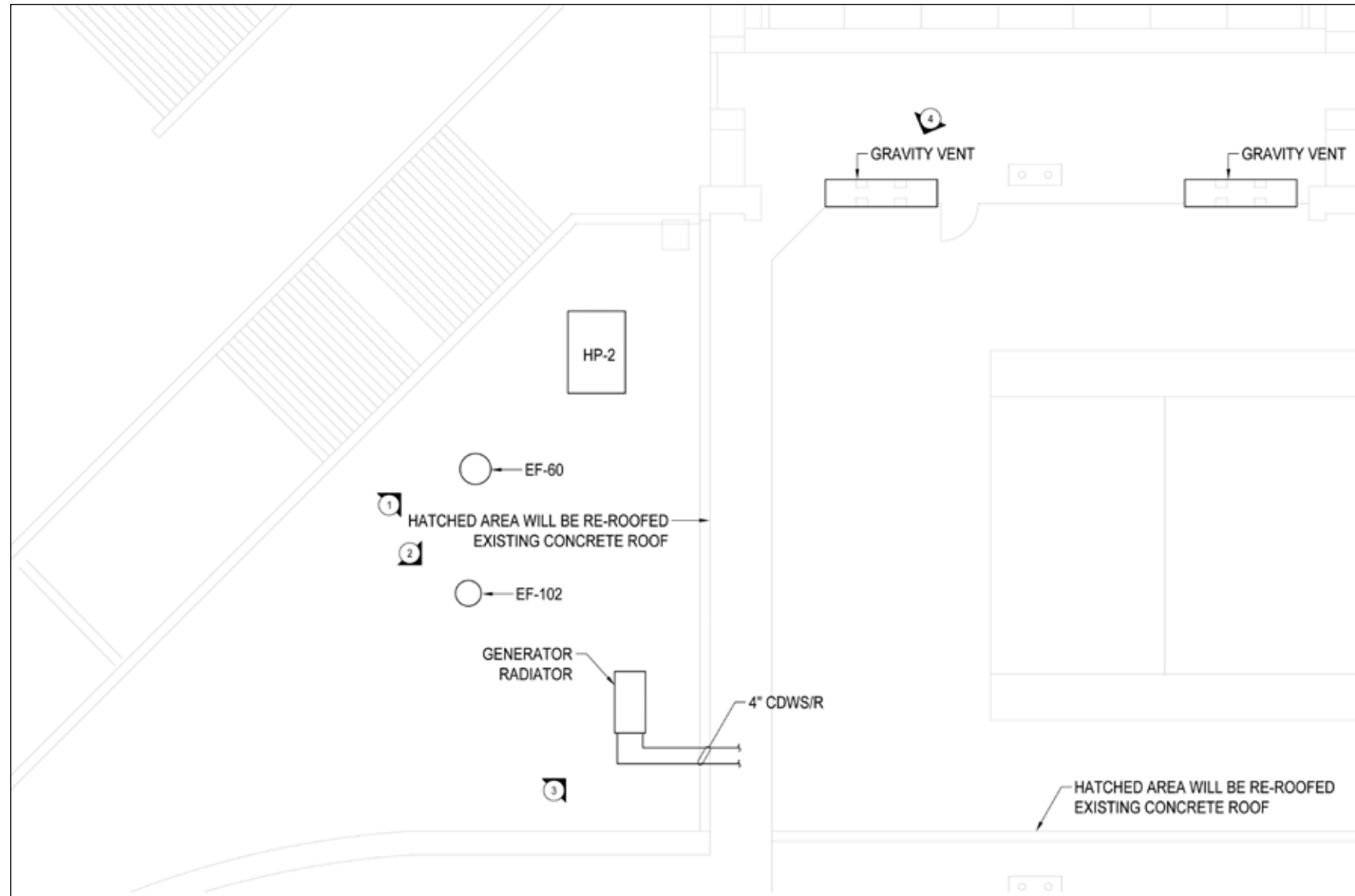
MECHANICAL: EQUIPMENT LIST (CONTINUED)

32	B-4	Bryan	K-300-W-GI	1999		?			X		X
33	HHWP-35	Bell & Gosset	1510	1999		?			X		X
34	HHWP-36	Bell & Gosset	1510	1999		?			X		X
35	AH-73	McQuay	RAH077CLY	1999		460/60/3			X		X
36	CHWS/R Piping							X		N/A	
37	EF-61					120/60/1	1/4		X		X
38	EF-62					120/60/1	1/4		X		X
39	EF-63					120/60/1	1/4		X		X
40	EF-64					120/60/1	1/4		X		X
41	EF-65					120/60/1	1/4		X		X
42	Gravity Vent - 6					N/A		X		N/A	
43	Gravity Vent - 7					N/A		X		N/A	
44	Gravity Vent - 8					N/A		X		N/A	
45	Gravity Vent - 9					N/A		X		N/A	
46	Gravity Vent - 10					N/A		X		N/A	
47	Generator Radiator					?		X		N/A	
48	HP-2	Daikin	DSH060XXX3BXXXA			208/60/3		X		X	
49	EF-78					460/60/3	3		X		X
50	Cooling Tower Vents					N/A		X		N/A	
51	AH-75	McQuay	RAH077CLY	1999		460/60/3					
52	EF-73					460/60/3	3/4				
53	EF-33					?					
54	EF-53					460/60/3	3				
55	EF-103					460/60/3	5				
56	EF-104					460/60/3	5				
57	AH-72	McQuay	RAH077CLY	1999		460/60/3					
58	EF-66					460/60/3	3/4				
59	Sail Chiller-4					460/60/3					
60	Sail Chiller-5					460/60/3					
61	CHWP-1					460/60/3					
62	CHWP-2					460/60/3					
63	Gravity Vents (Tennis Courts)					N/A				N/A	
64											
65											
							23		28	9	28

MECHANICAL: GRID 1 PLAN & PHOTOS

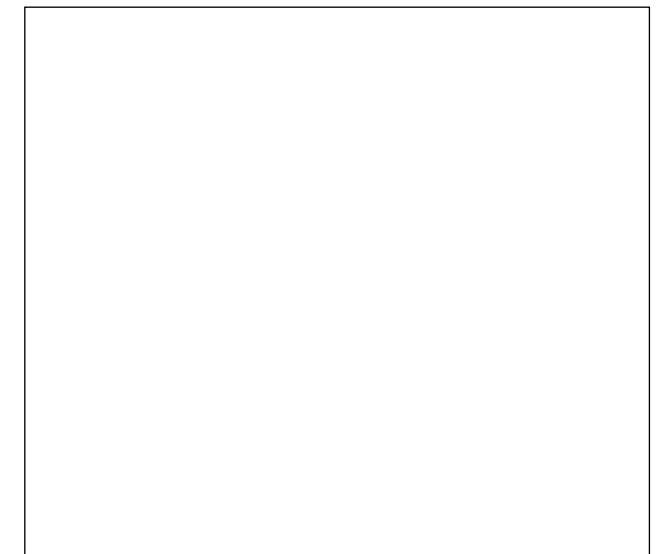
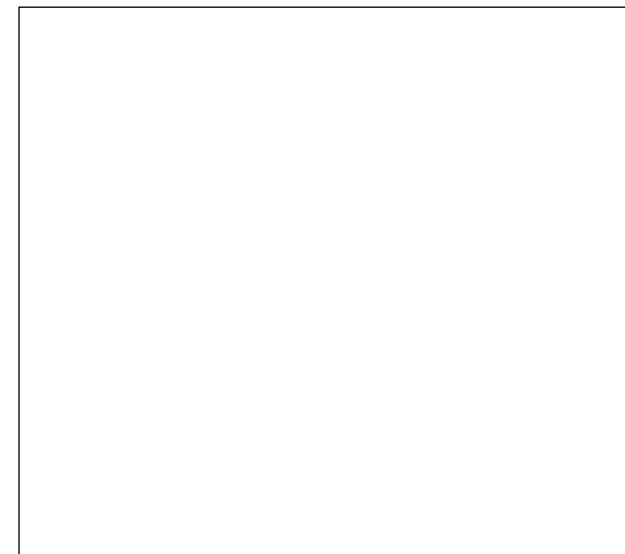


MECHANICAL: GRID 2 PLAN, PHOTOS & EQUIPMENT LIST

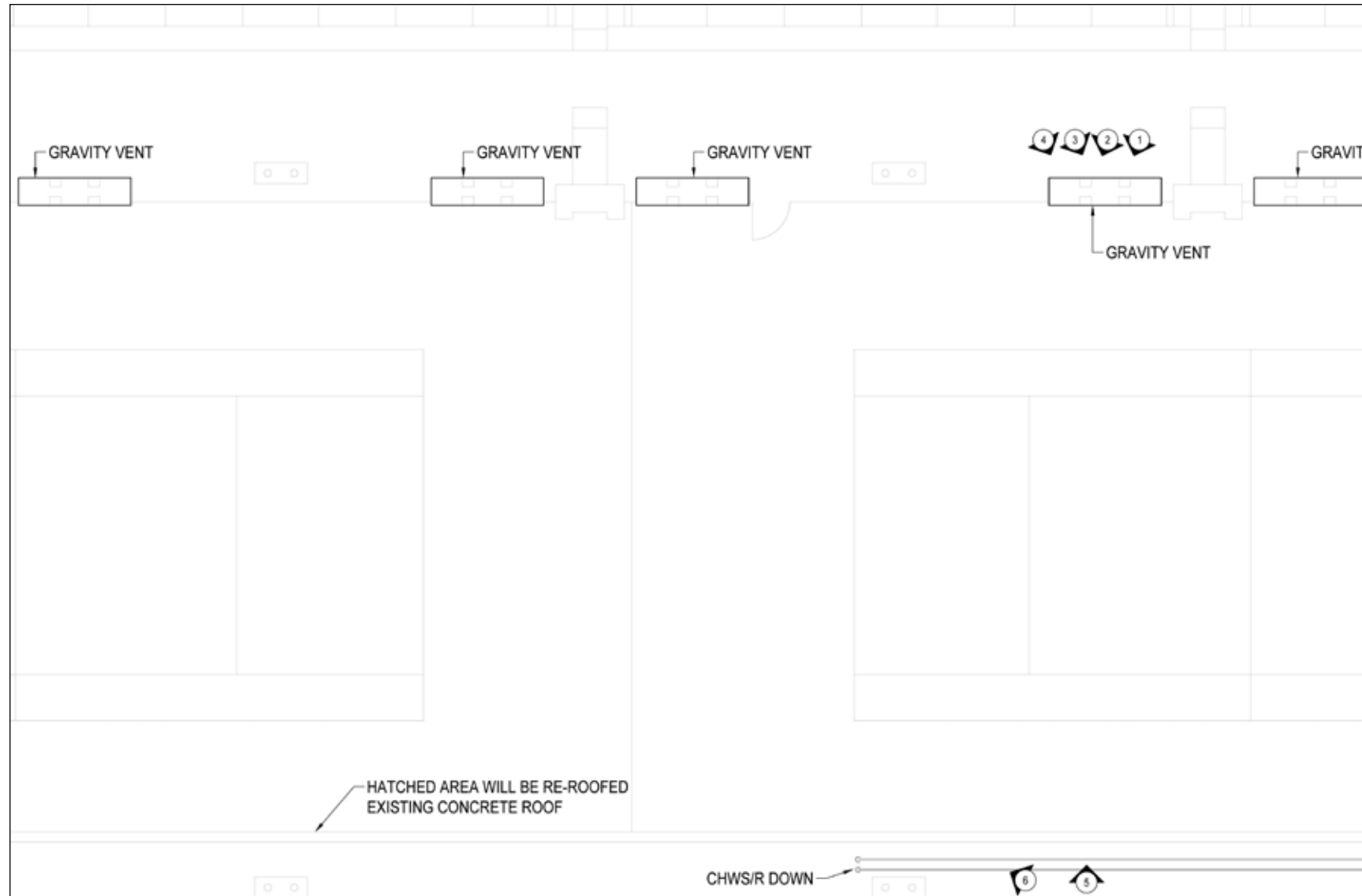


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
Generator Radiator				Satisfactory	?		X		N/A		
HP-2	Daikin	DSH060XXX3BXXXXA		Satisfactory	208/60/3		X		X		Unit not shown on As-builts.
EF-60				Unsatisfactory	460/60/3	1-1/2		X		X	
EF-102				Unsatisfactory	460/60/3	1/2		X		X	
Gravity Vents (Tennis Courts)					N/A		X		N/A		
Gravity Vents (Tennis Courts)					N/A		X				
							4	2	1	2	

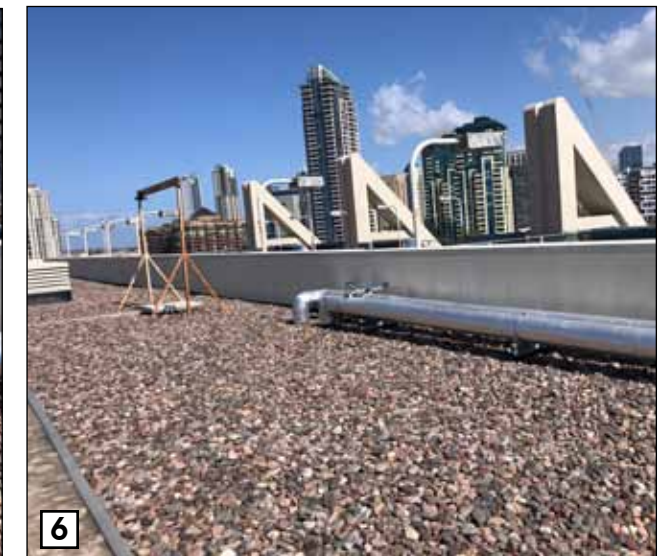


MECHANICAL: GRID 3 PLAN, PHOTOS & EQUIPMENT LIST

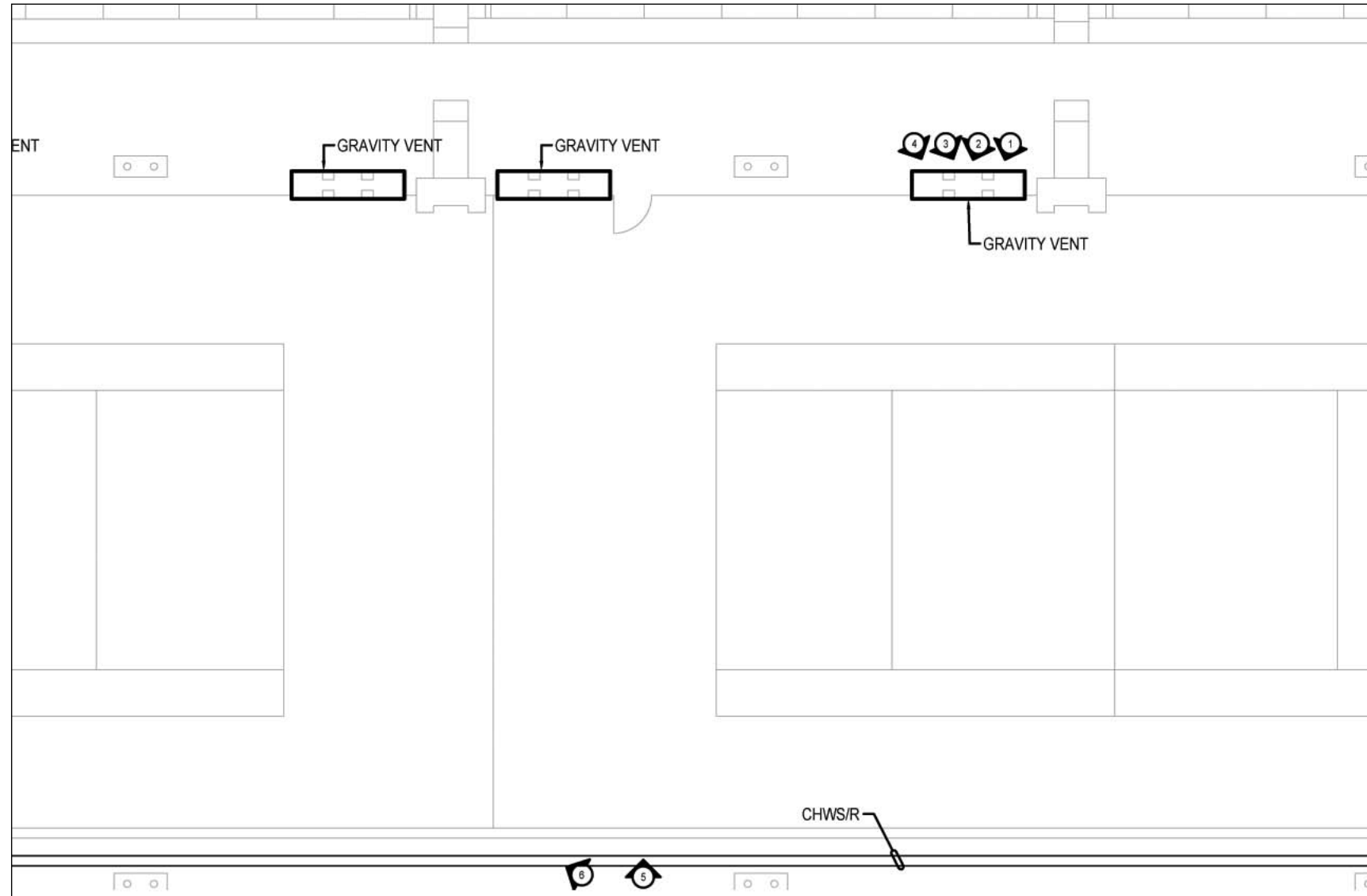


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrial (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
CHWS/R Piping				Satisfactory			X				250 feet of roof mounted piping. Not shown on As-builts.
Gravity Vents (Tennis Courts)					N/A		X		N/A		
							2	0	0	0	

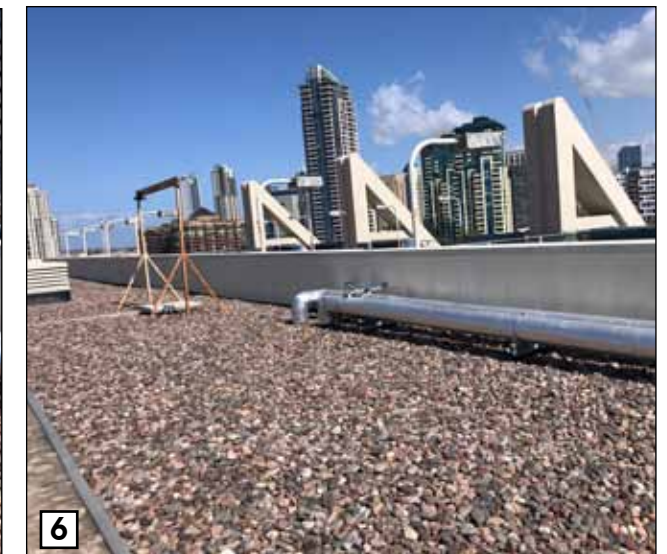


MECHANICAL: GRID 4 PLAN, PHOTOS & EQUIPMENT LIST

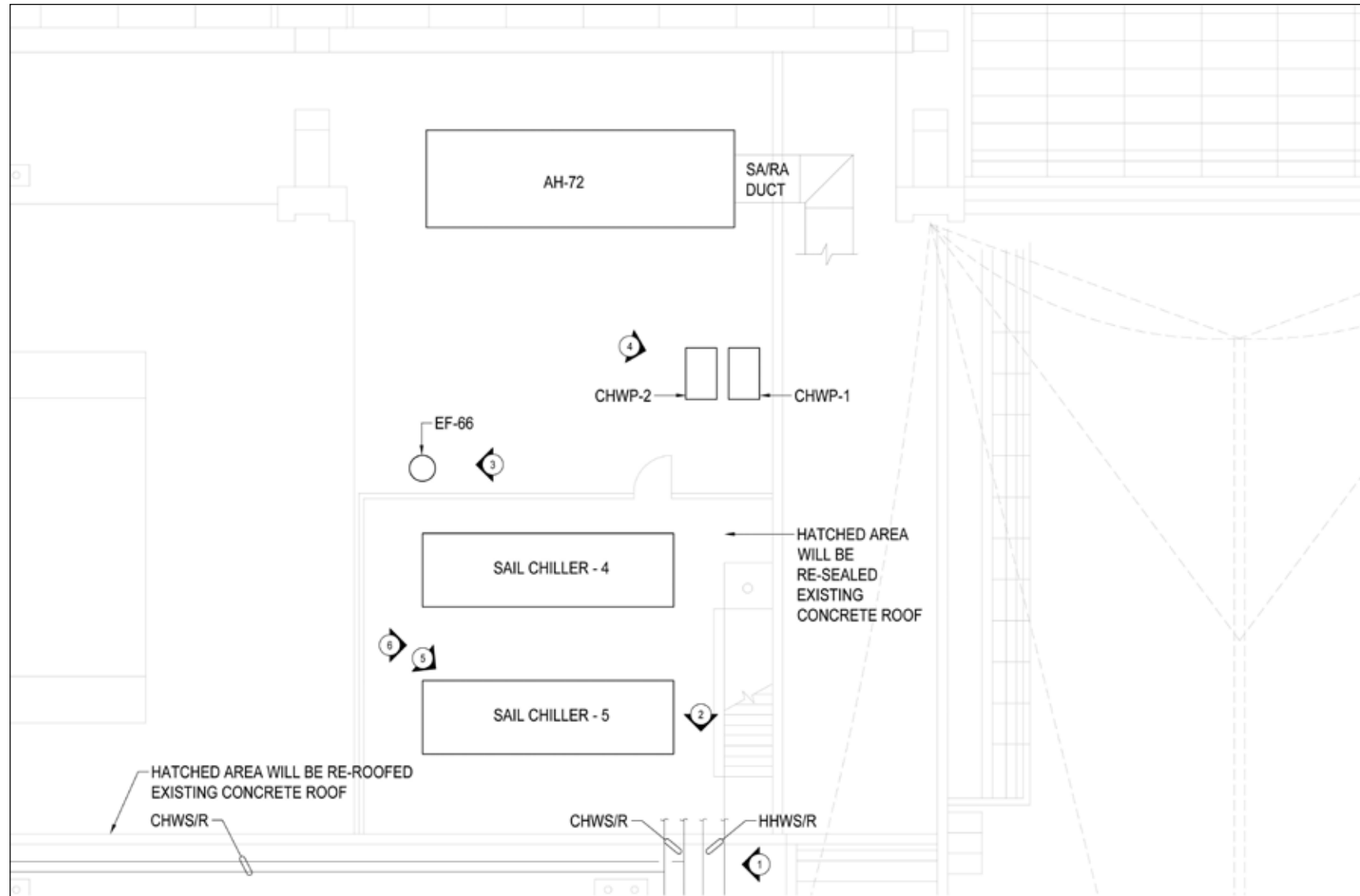


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrial (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
AH-72	McQuay	RAH077CLY	1999		460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
EF-66					460/60/3	0.75					Unit located on concrete area of roof and will not be required to be relocated or replaced.
Sail Chiller-4					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
Sail Chiller-5					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
CHWP-1					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
CHWP-2					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
CHWS/R Piping				Satisfactory			X		N/A		250 feet of roof mounted piping. Not shown on As-builts.
							1	0	0	0	



MECHANICAL:GRID 5 PLAN, PHOTOS & EQUIPMENT LIST

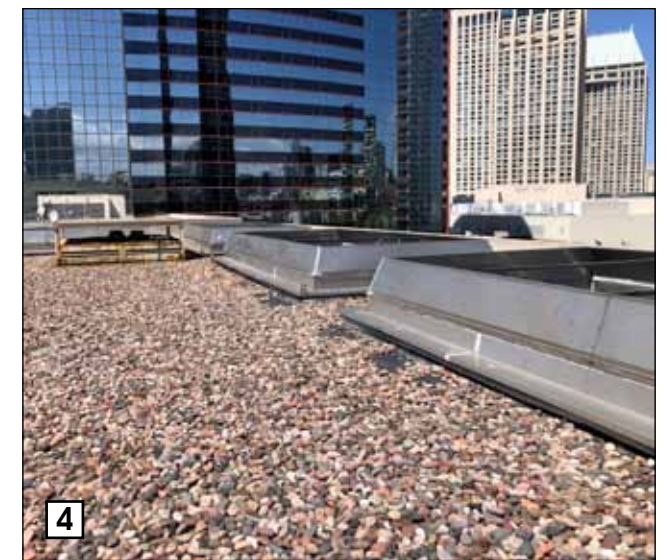
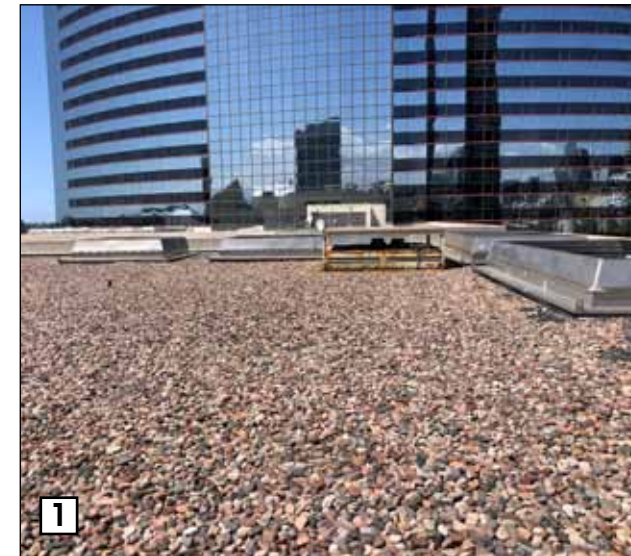
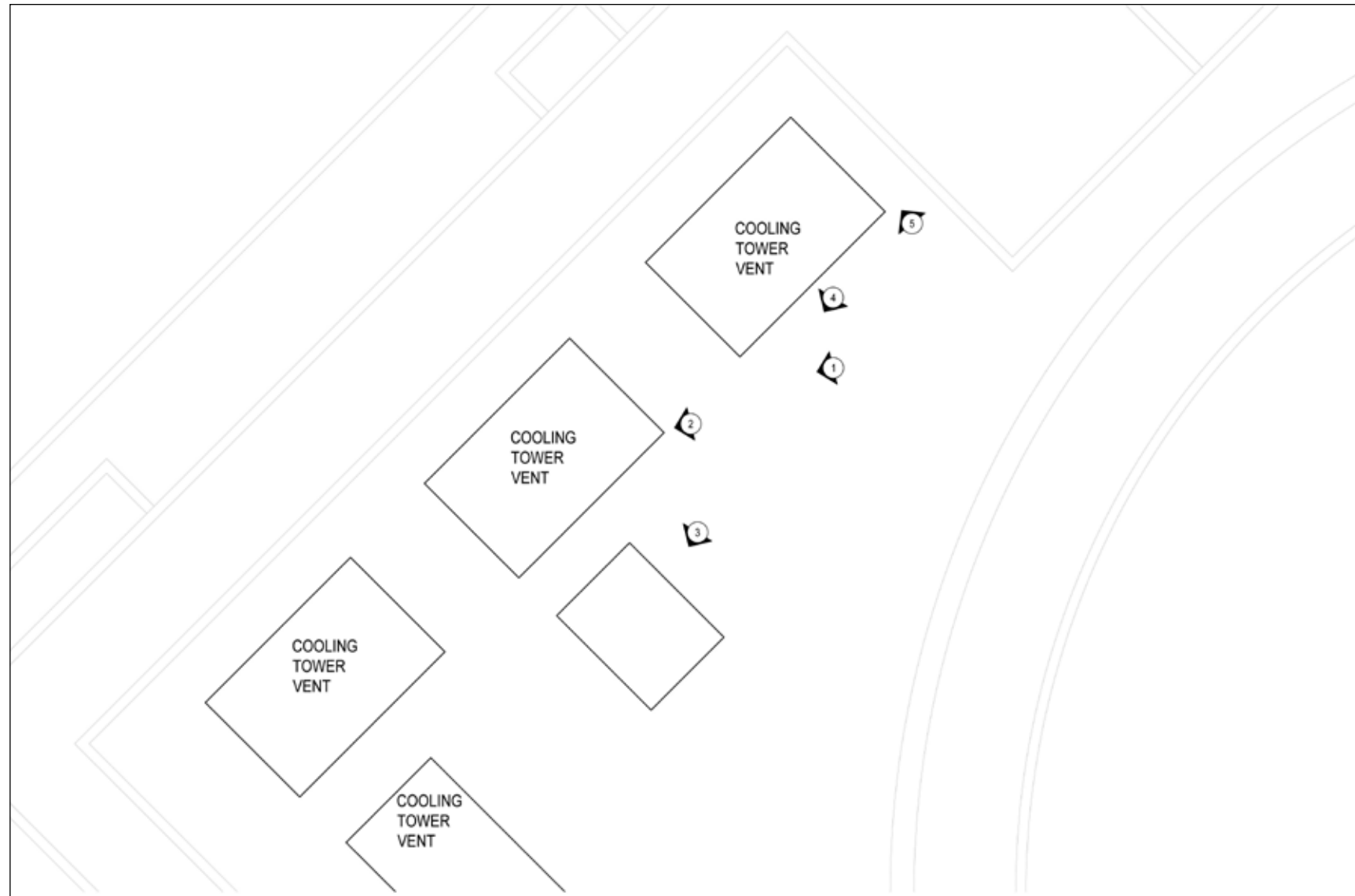


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
AH-72	McQuay	RAH077CLY	1999		460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
EF-66					460/60/3	0.75					Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
Sail Chiller-4					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
Sail Chiller-5					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
CHWP-1					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
CHWP-2					460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
CHWS/R Piping				Satisfactory			X		N/A		250 feet of roof mounted piping. Not shown on As-builts.
							1	0	0	0	

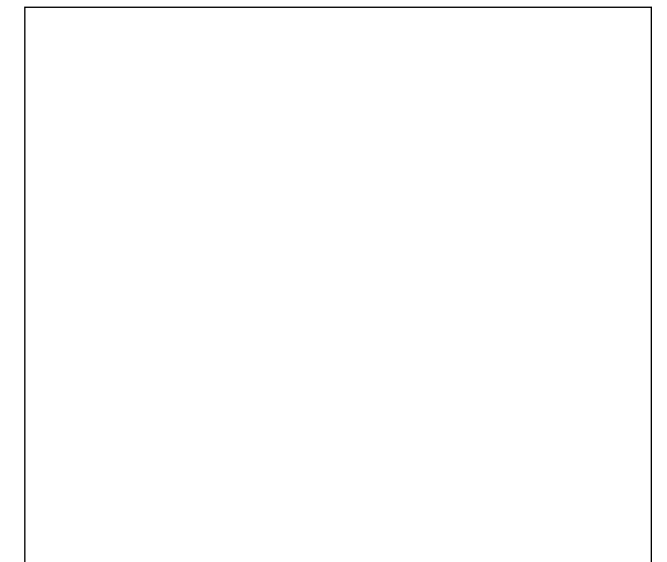


MECHANICAL: GRID 6 PLAN, PHOTOS & EQUIPMENT LIST

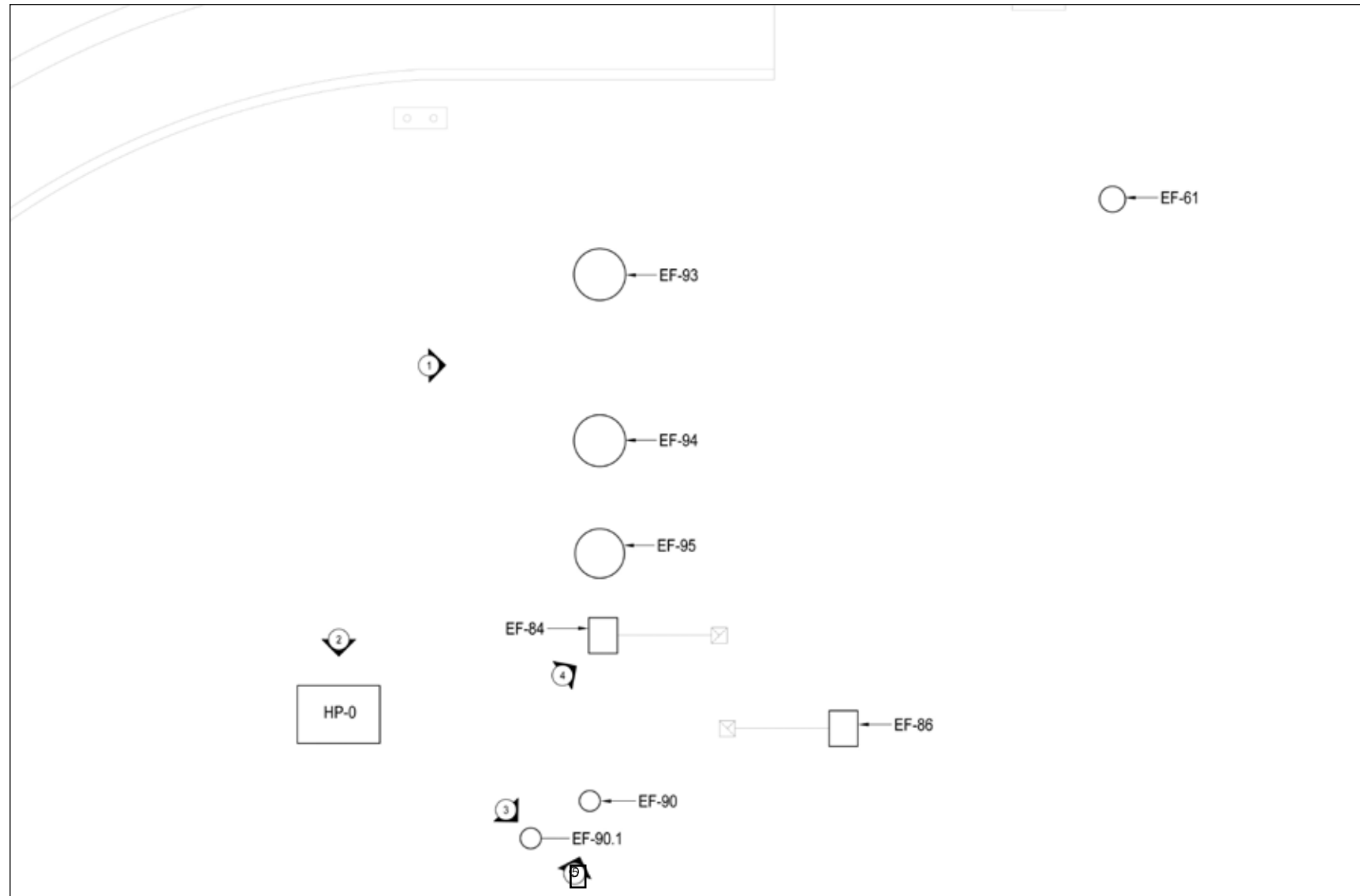


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
Cooling Tower Vents				Satisfactory	N/A		X		N/A		
							1	0	0	0	

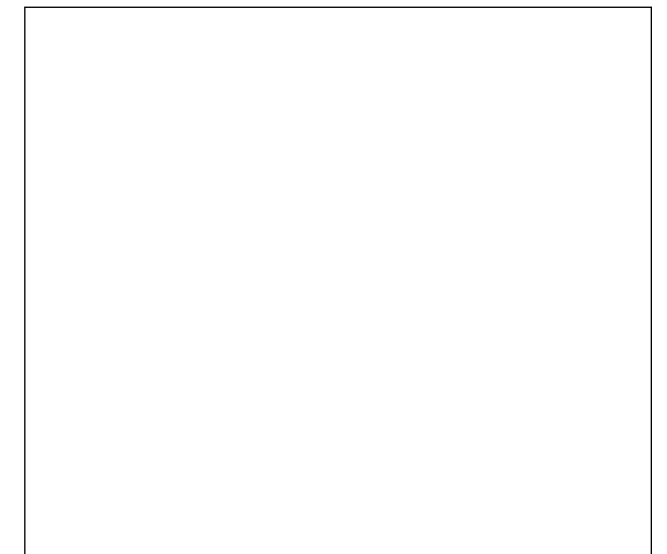


MECHANICAL: GRID 7 PLAN, PHOTOS & EQUIPMENT LIST

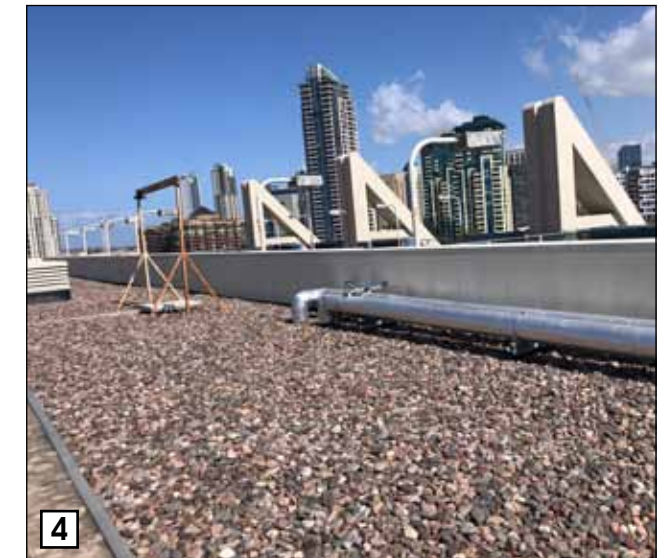
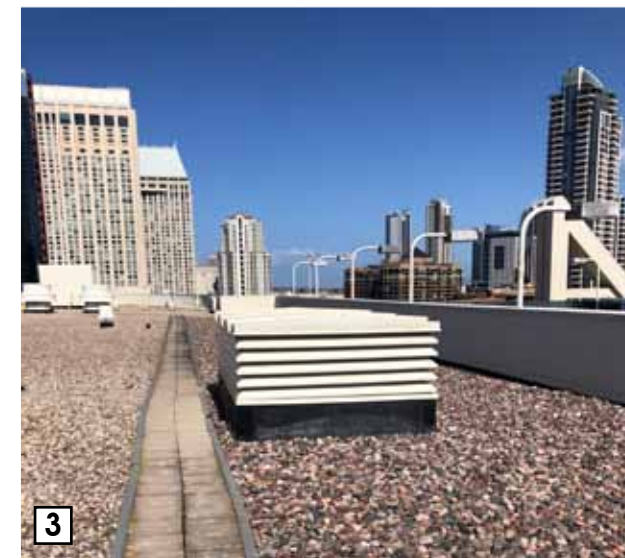
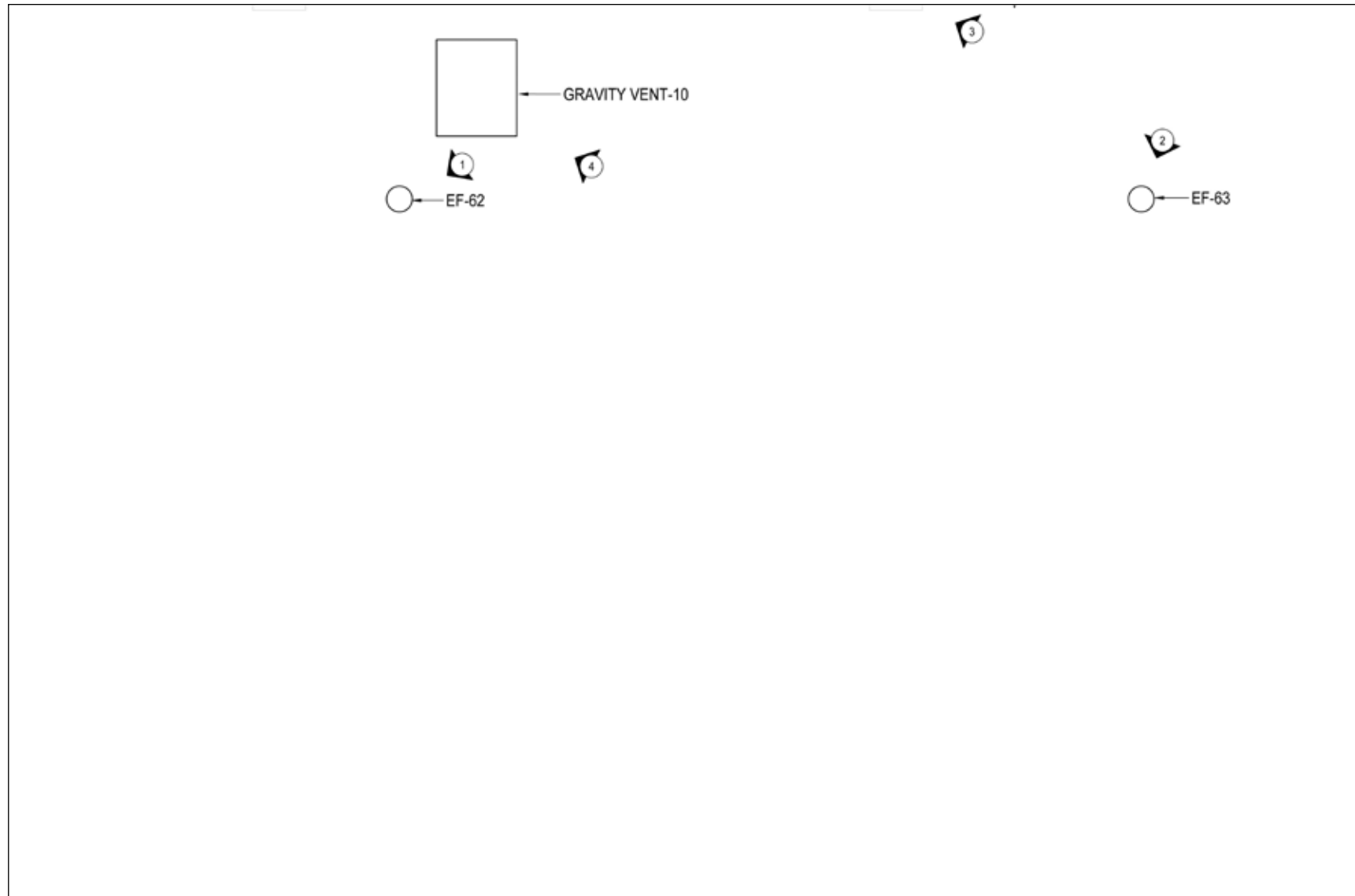


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
EF-95	Comes	VEBK36X1G1UA203PC1	1999	Unsatisfactory	460/60/3	5		X		X	Disconnect mounted on fan.
EF-93				Unsatisfactory	460/60/3	5		X		X	Disconnect mounted on fan.
EF-94				Unsatisfactory	460/60/3	5		X		X	Disconnect mounted on fan.
EF-90.1	Greenheck	G-170-B		Unsatisfactory	?			X		X	Unit not shown on As-builts.
HP-0				Unsatisfactory	?			X		X	Disconnect mounted on unit. Downshot. Unit not shown on As-builts.
EF-61				Unsatisfactory	120/60/1	1/4		X		X	
EF-84				Unsatisfactory	460/60/3	5		X		X	Disconnect mounted on fan. 5 ft of roof mounted ductwork from penetration to fan.
EF-86				Unsatisfactory	460/60/3	3		X		X	Disconnect mounted on fan. 5 ft of roof mounted ductwork from penetration to fan.
EF-90				Unsatisfactory	120/60/1	1/2		X		X	
							0	9	0	9	

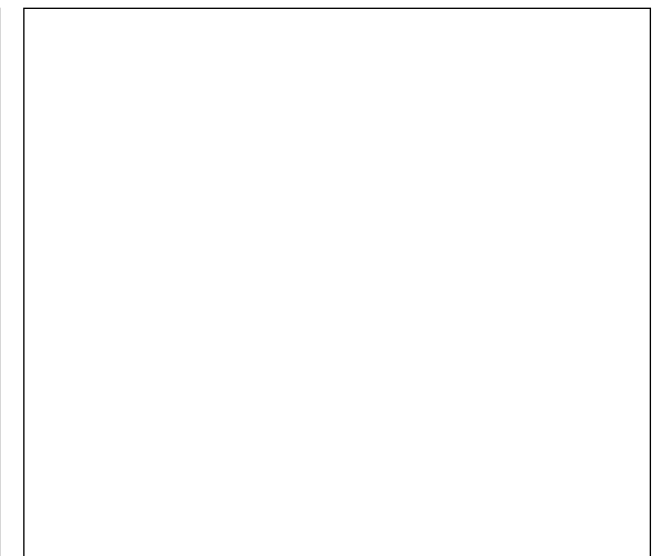
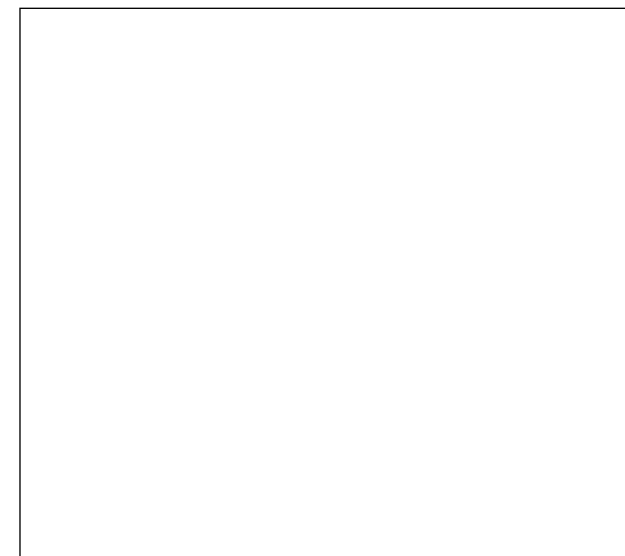


MECHANICAL: GRID 8 PLAN, PHOTOS & EQUIPMENT LIST

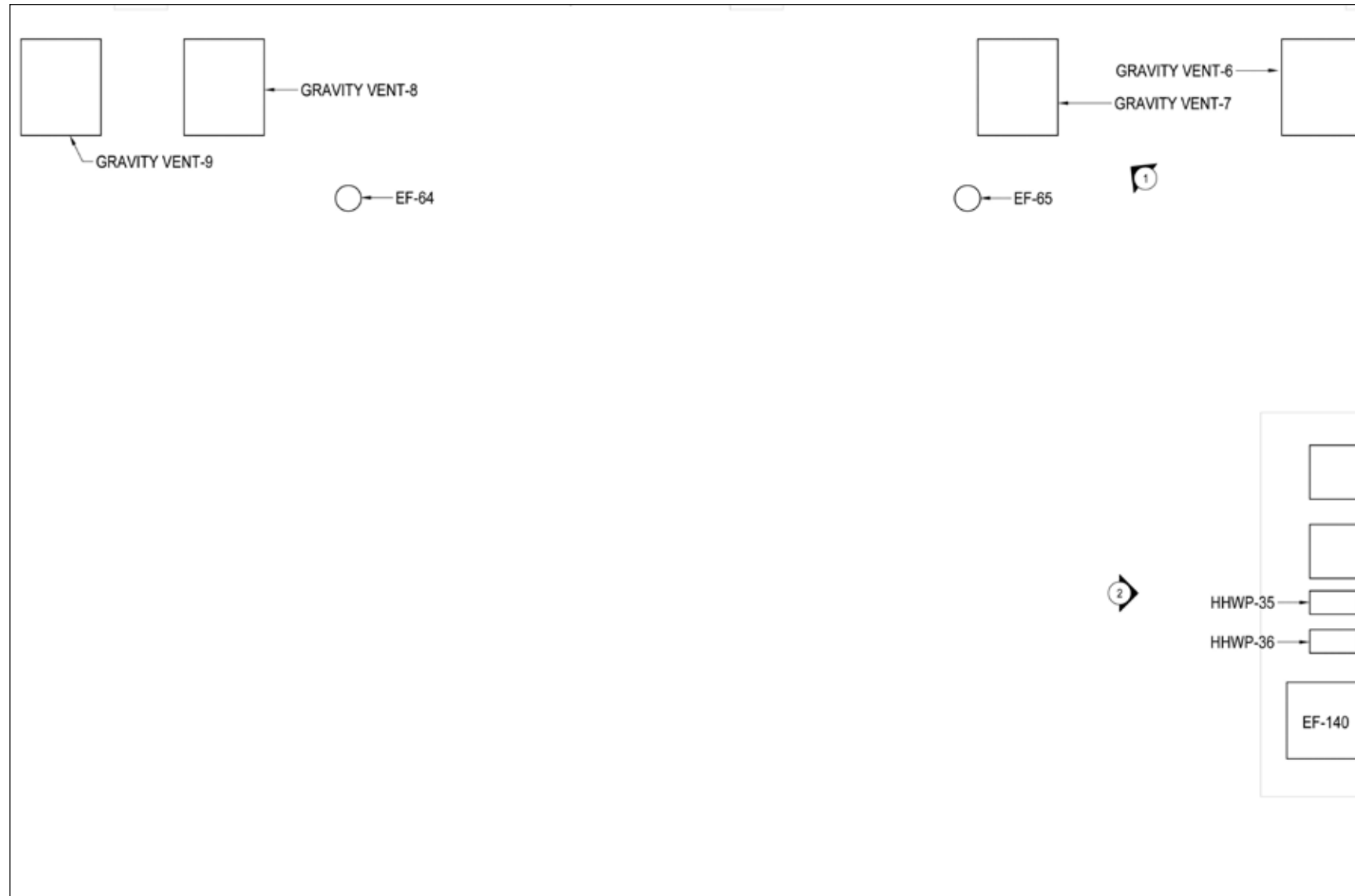


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
CHWS/R Piping				Satisfactory			X		N/A		250 feet of roof mounted piping. Not shown on AS-builts.
EF-62				Unsatisfactory	120/60/1	1/4		X		X	
EF-63				Unsatisfactory	120/60/1	1/4		X		X	
Gravity Vent - 10				Satisfactory	N/A		X		N/A		
							2	2	0	2	



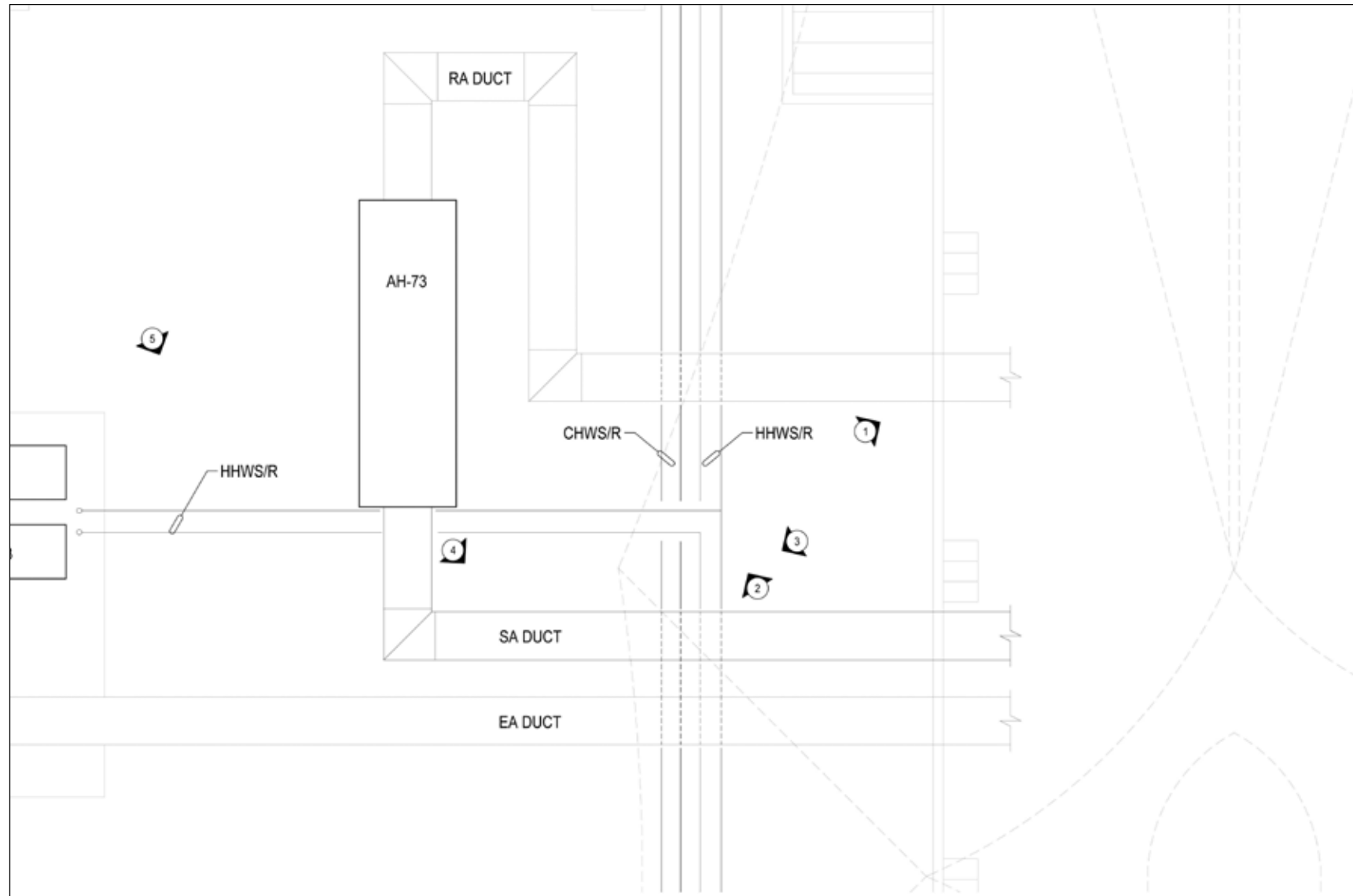
MECHANICAL: GRID 9 PLAN, PHOTOS & EQUIPMENT LIST



MECHANICAL EQUIPMENT

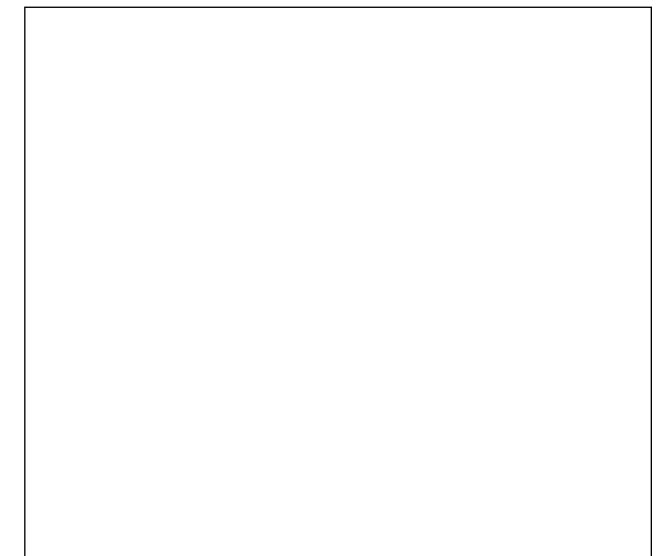
EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
EF-140	Greenheck	49-ASW-21-10		Unsatisfactory	?			X		X	Disconnect on HHW skid
B-3	Bryan	K-300-W-GI	1999	Unsatisfactory	?			X		X	Unit located on roof curb Gas piping Vent piping to drain HHW distribution piping Unit not shown on As-bulbs.
B-4	Bryan	K-300-W-GI	1999	Unsatisfactory	?			X		X	Unit located on roof curb Gas piping Makeup water piping HHW distribution piping Unit not shown on As-bulbs.
HHWP-35	Bell & Gosset	1510	1999	Unsatisfactory	?			X		X	Unit located on roof curb Unit not shown on As-bulbs.
HHWP-36	Bell & Gosset	1510	1999	Unsatisfactory	?			X		X	Unit located on roof curb Unit not shown on As-bulbs.
EF-64				Unsatisfactory	120/60/1	1/4		X		X	
EF-65				Unsatisfactory	120/60/1	1/4		X		X	
Gravity Vent - 6				Satisfactory	N/A		X		N/A		
Gravity Vent - 7				Satisfactory	N/A		X		N/A		
Gravity Vent - 8				Satisfactory	N/A		X		N/A		
Gravity Vent - 9				Satisfactory	N/A		X		N/A		
							4	7	0	7	

MECHANICAL: GRID 10 PLAN, PHOTOS & EQUIPMENT LIST

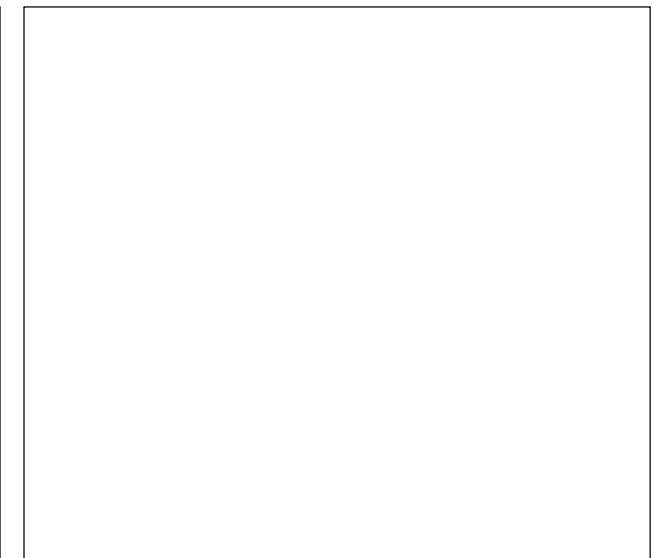
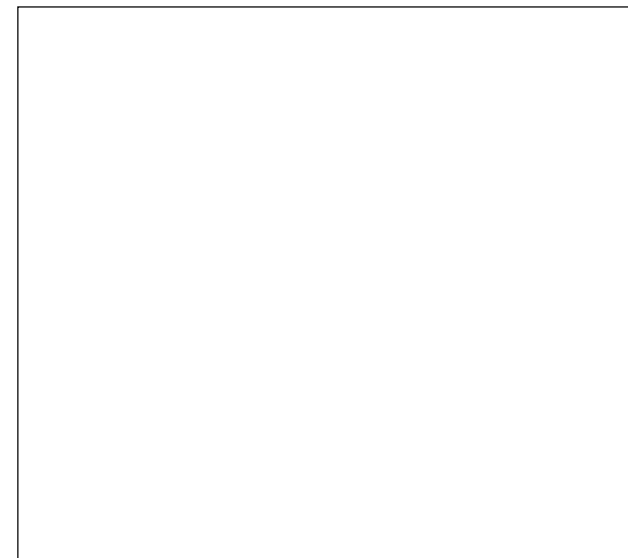
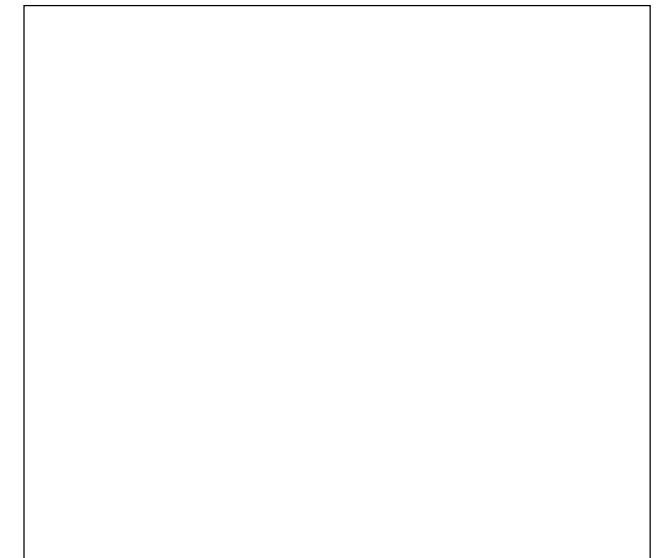
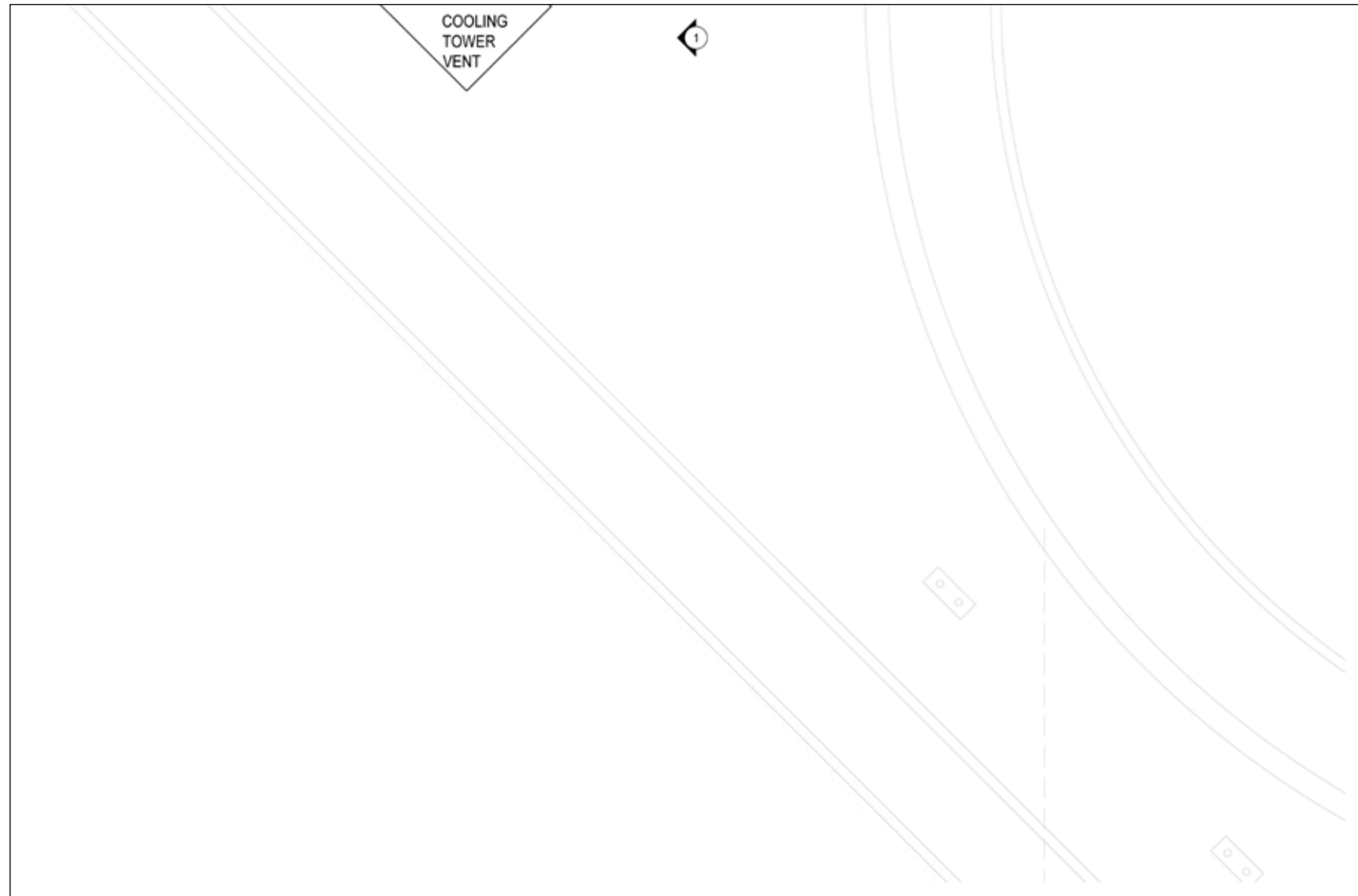


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
EF-140	Greenheck	49-AISW-21-10		Unsatisfactory	?			X		X	Disconnect on HHW skid
B-3	Bryan	K-300-W-GI	1999	Unsatisfactory	?			X		X	Unit located on roof curb Gas piping Vent piping to drain HHW distribution piping Unit not shown on As-builts.
B-4	Bryan	K-300-W-GI	1999	Unsatisfactory	?			X		X	Unit located on roof curb Gas piping Makeup water piping HHW distribution piping Unit not shown on As-builts.
AH-73	McQuay	RAH07CLY	1999	Unsatisfactory	460/60/3			X		X	Remove, reinstall and reconnect associated hydraulic piping (CHW & HHW) Remove, reinstall and reconnect associated roof mounted ductwork
							0	4	0	4	

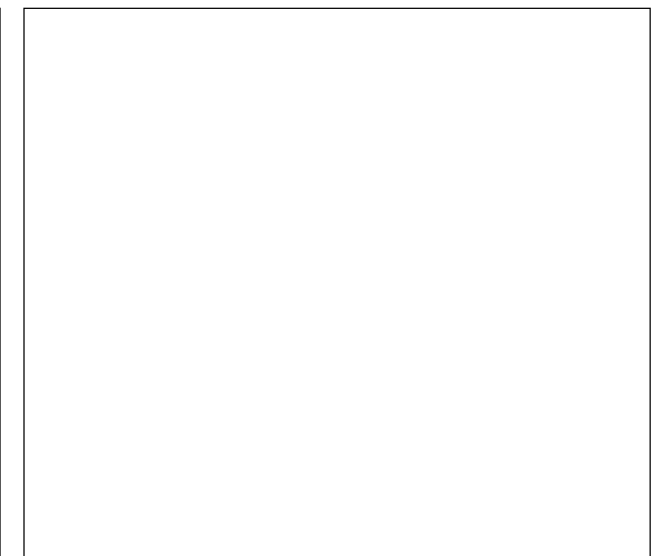
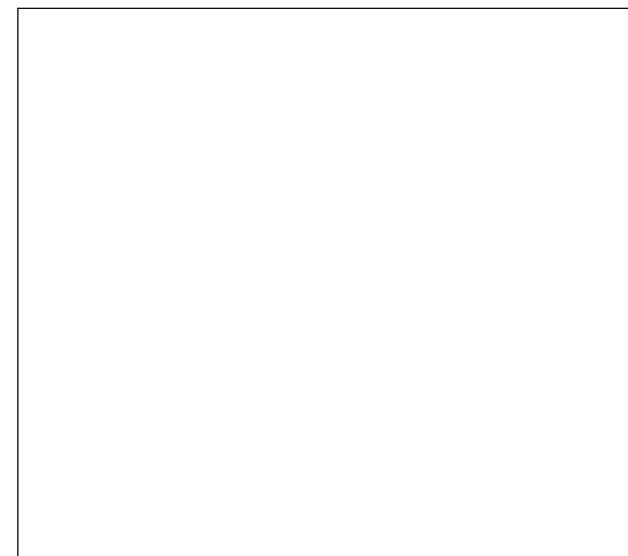


MECHANICAL: GRID 11 PLAN, PHOTOS & EQUIPMENT LIST

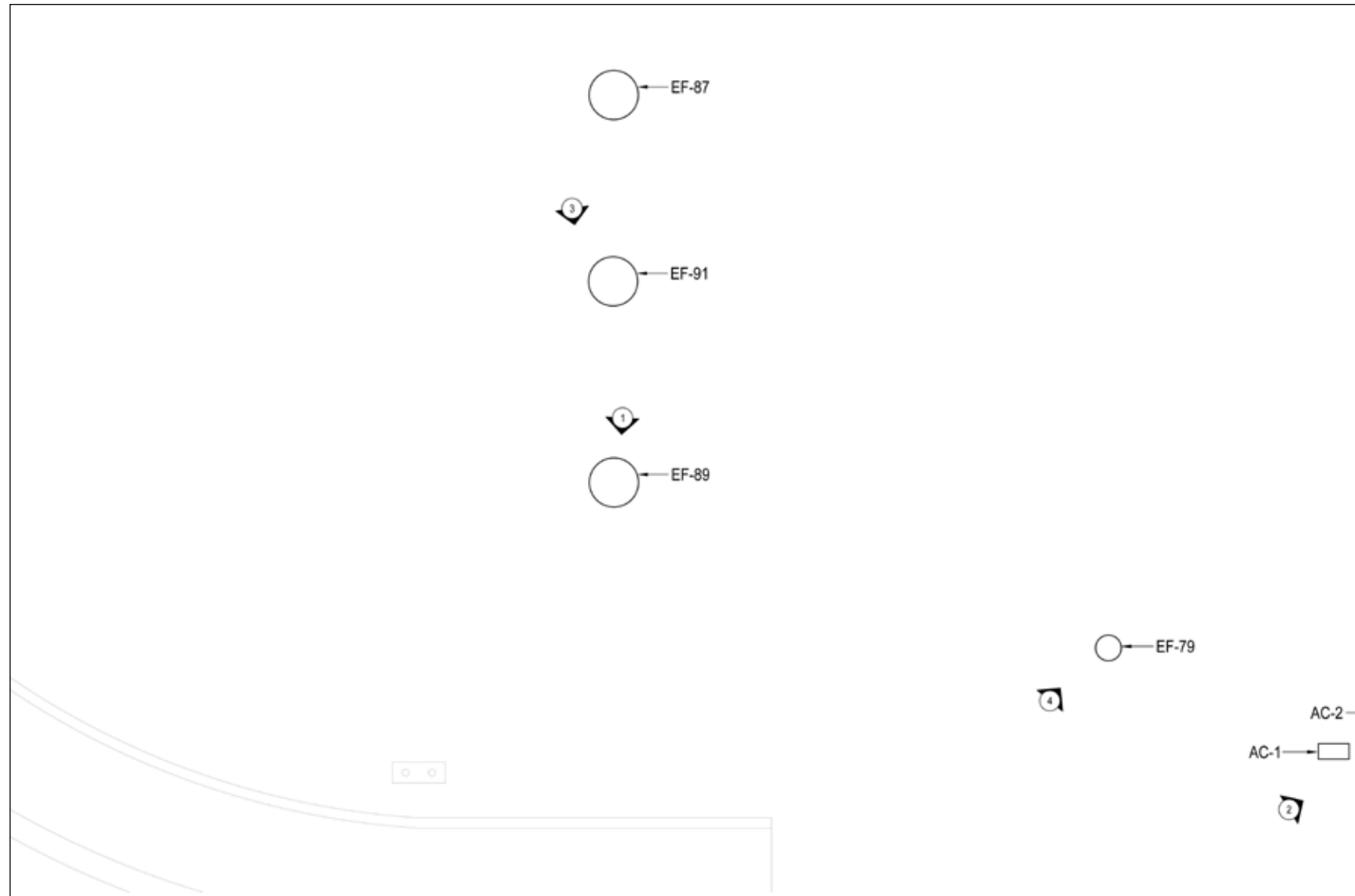


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrical (V /Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
Cooling Tower Vents				Satisfactory	N/A		X		N/A		
							1	0	0	0	

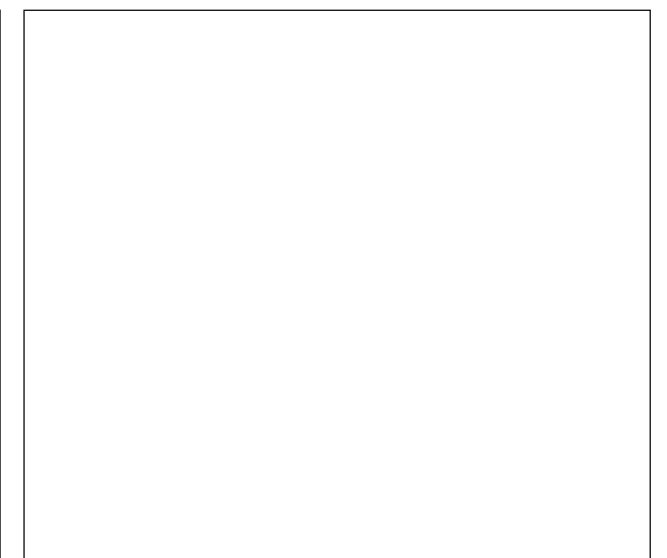
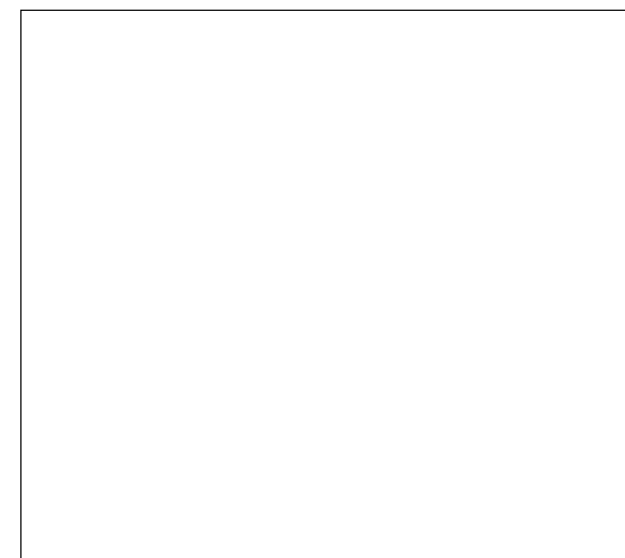


MECHANICAL: GRID 12 PLAN, PHOTOS & EQUIPMENT LIST

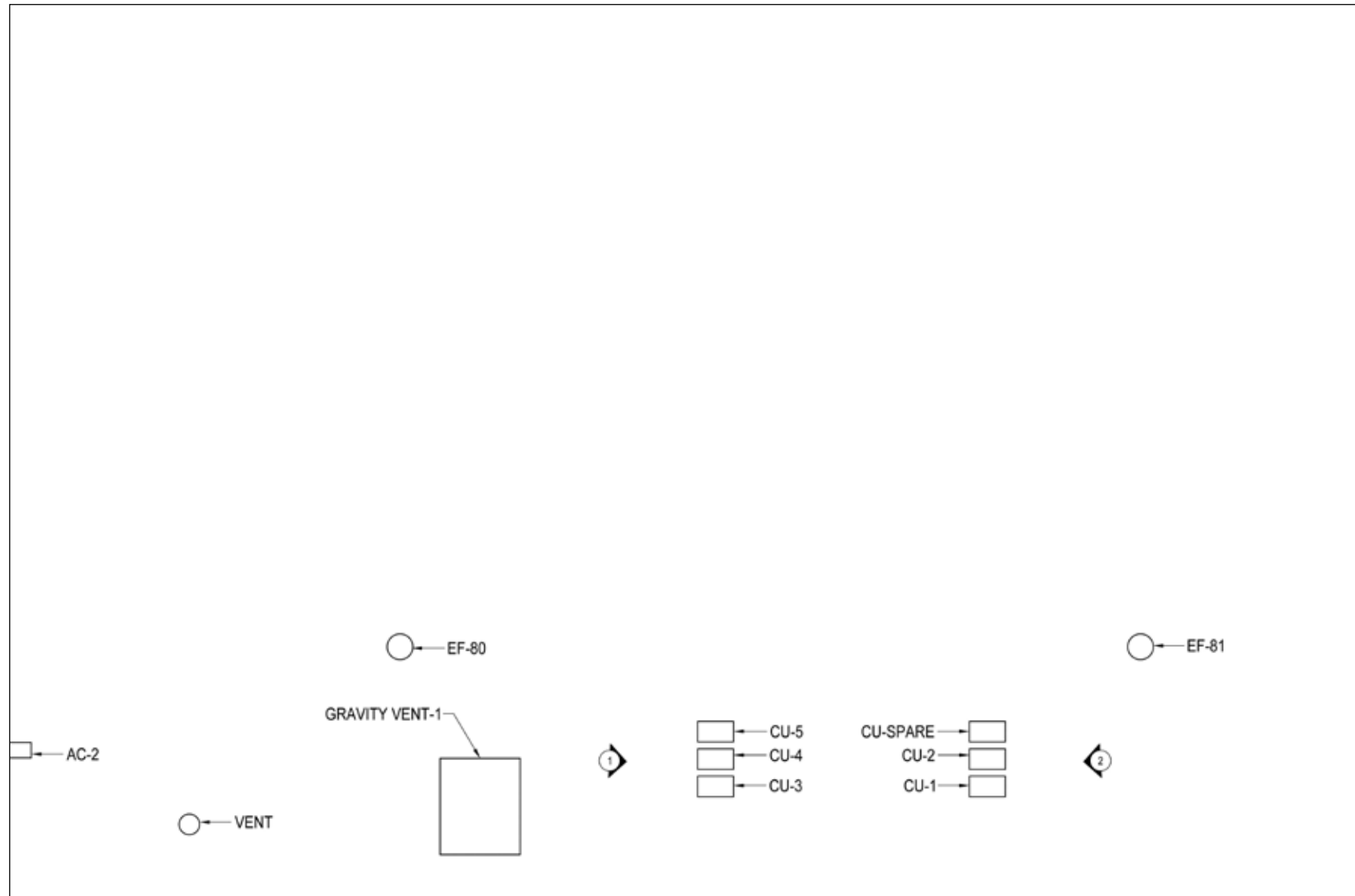


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
EF-91				Unsatisfactory	460/60/3	1-1/2		X		X	
EF-89				Unsatisfactory	460/60/3			X		X	
EF-87				Unsatisfactory	460/60/3	3/4		X		X	
AC-1				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
AC-2				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
EF-79				Unsatisfactory	120/60/1	1/4		X		X	
							2	4	2	4	

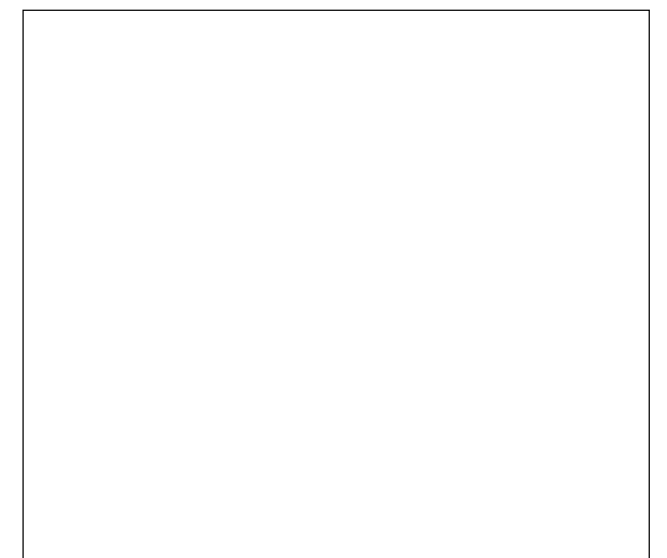
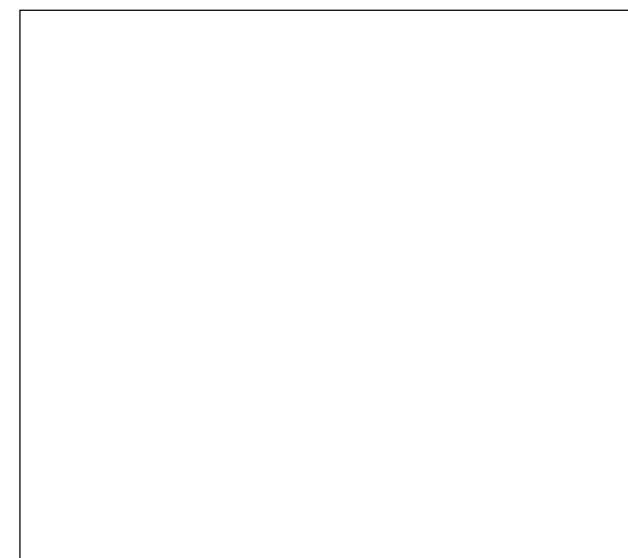
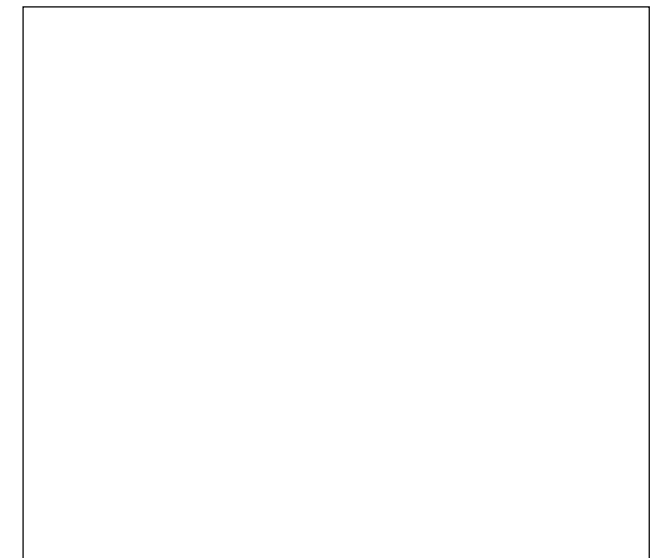
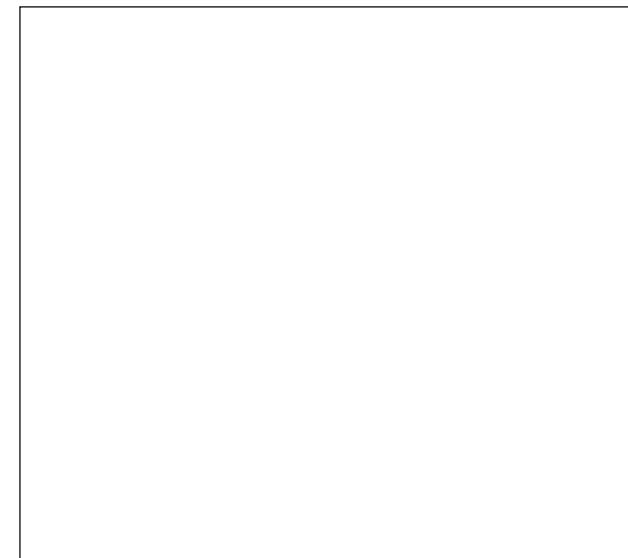


MECHANICAL: GRID 13 PLAN, PHOTOS & EQUIPMENT LIST

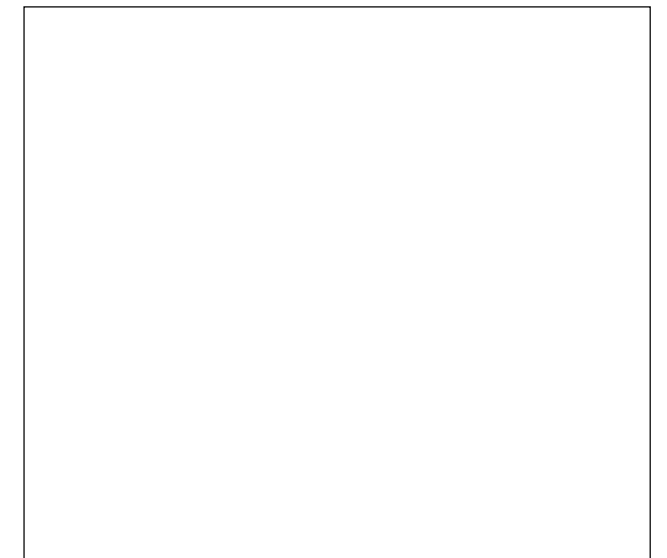
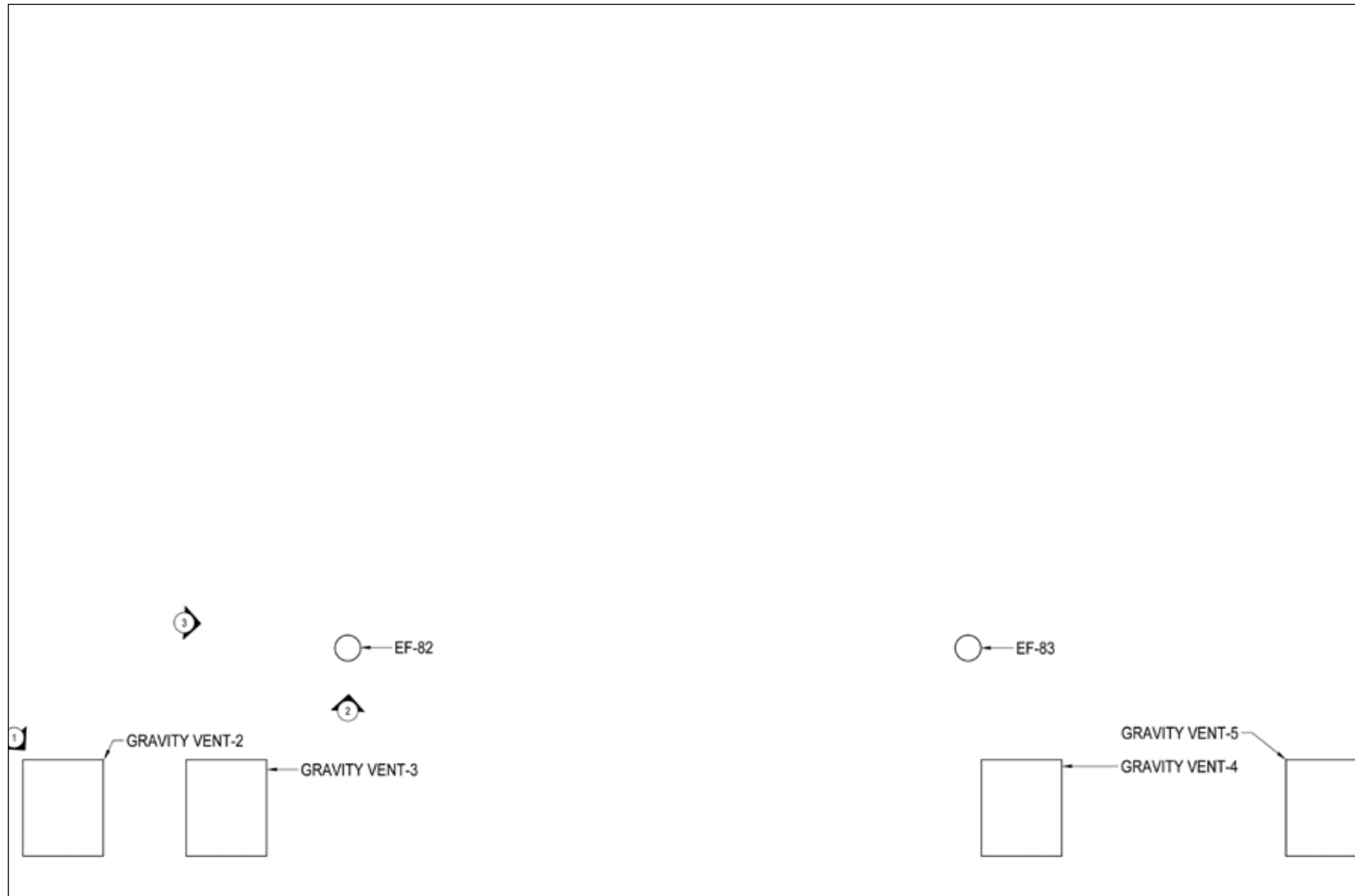


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
AC-2				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
Exhaust Vent				Satisfactory	N/A		X		N/A		Not shown on As-builts.
Gravity Vent - 1				Satisfactory	N/A		X		N/A		Not shown on As-builts.
EF-80				Unsatisfactory	120/60/1	1/4		X		X	
EF-81				Unsatisfactory	120/60/1	1/4		X		X	
CU-3				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
CU-4				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
CU-5				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
CU-1				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
CU-2				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
CU-SPARE				Satisfactory	208-230/60/1		X		X		Existing condenser stand. Line set / line set roof penetration. Electrical and electrical roof penetration. Unit not shown on As-builts.
							9	2	7	2	

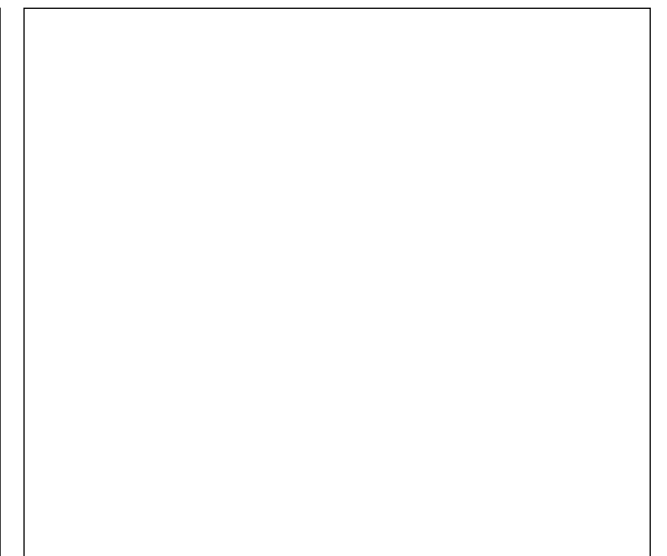
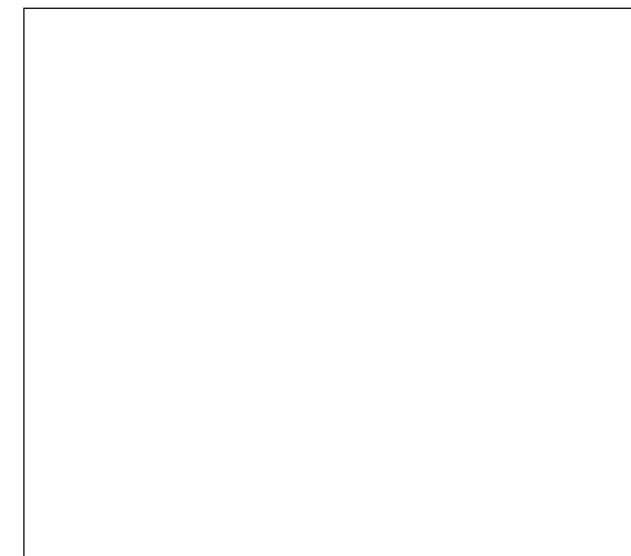


MECHANICAL: GRID 14 PLAN, PHOTOS & EQUIPMENT LIST

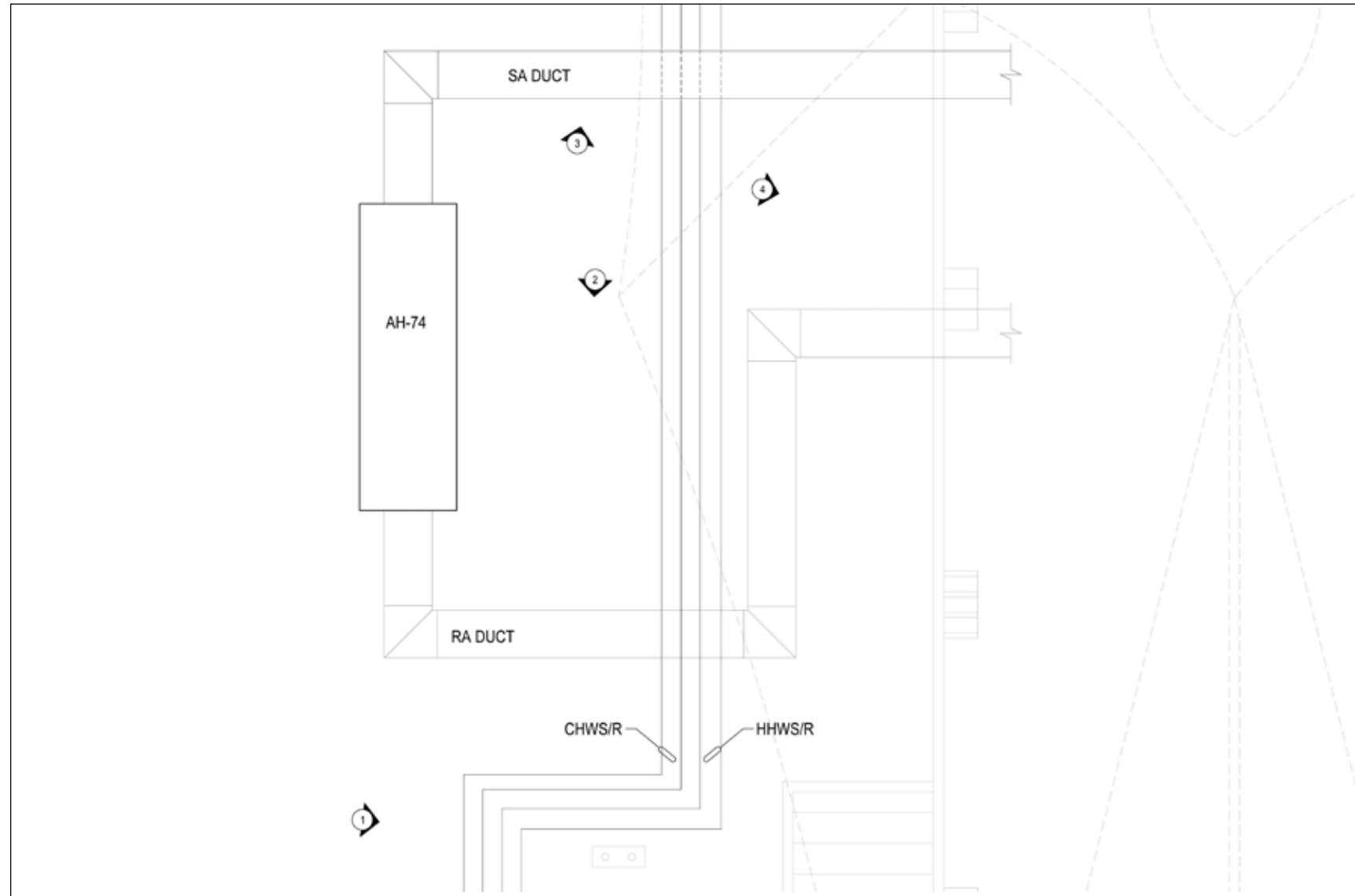


MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrial (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
EF-82				Unsatisfactory	120/60/1	1/4		X		X	
EF-83				Unsatisfactory	120/60/1	1/4		X		X	
Gravity Vent - 2				Satisfactory	N/A		X		N/A		
Gravity Vent - 3				Satisfactory	N/A		X		N/A		
Gravity Vent - 4				Satisfactory	N/A		X		N/A		
Gravity Vent - 5				Satisfactory	N/A		X		N/A		
							4	2	0	2	

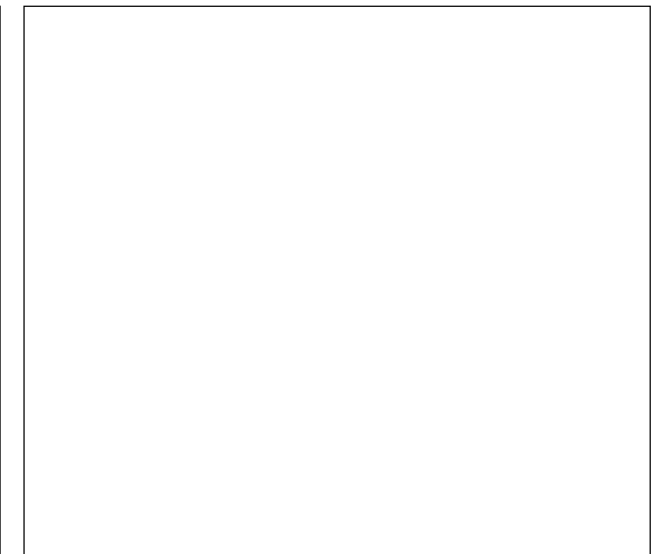
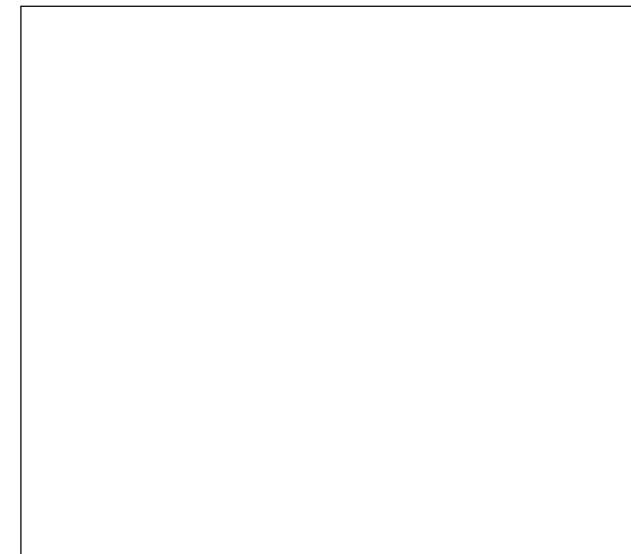


MECHANICAL: GRID 15 PLAN, PHOTOS & EQUIPMENT LIST



MECHANICAL EQUIPMENT

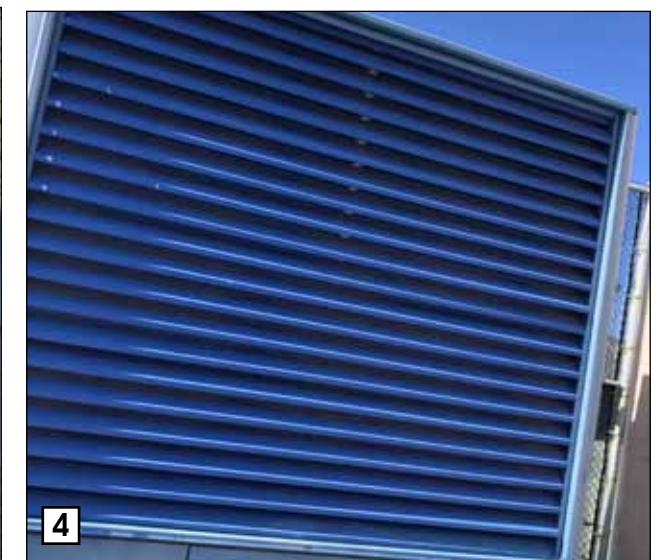
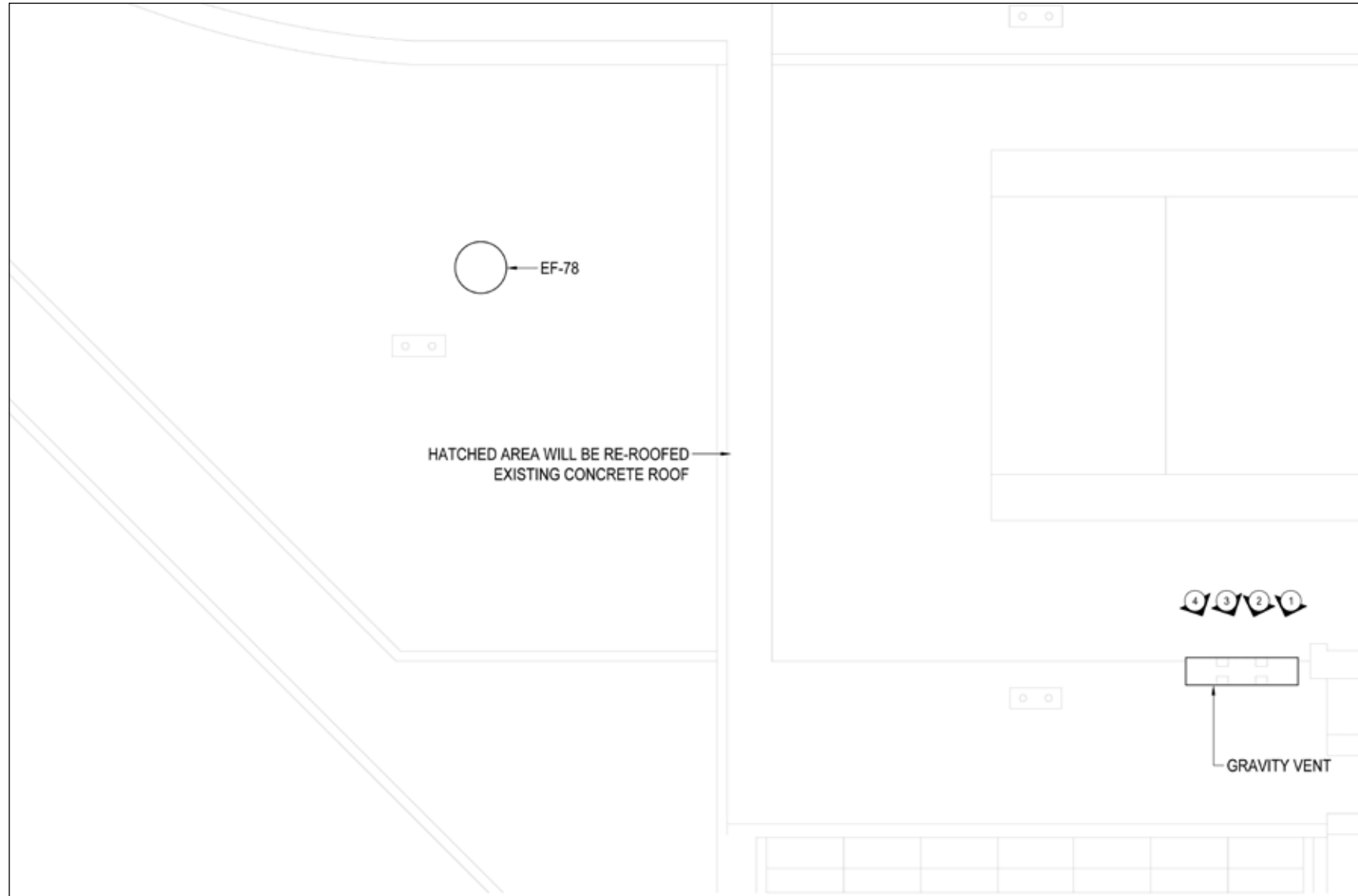
EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
AHU-74	McQuay	RAH077CLY	1999	Unsatisfactory	460/60/3			X		X	Remove, reinstall and reconnect associated hydronic piping (CHW & HHW) Remove, reinstall and reconnect associated roof mounted ductwork
							0	1	0	1	



MECHANICAL: GRID 16 PLAN, PHOTOS & EQUIPMENT LIST



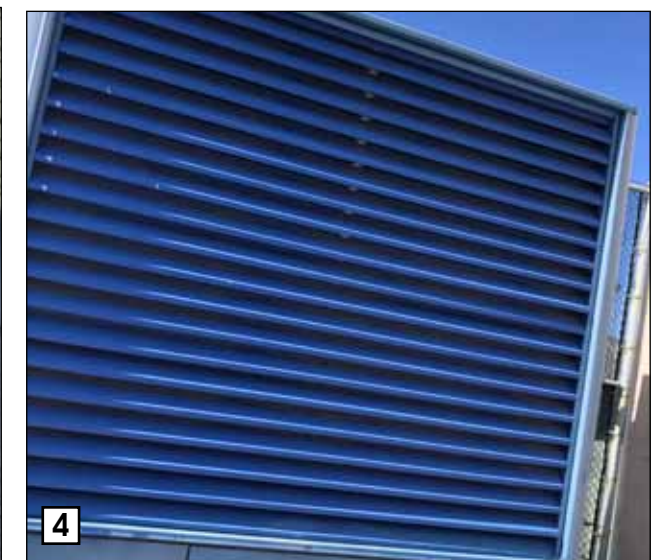
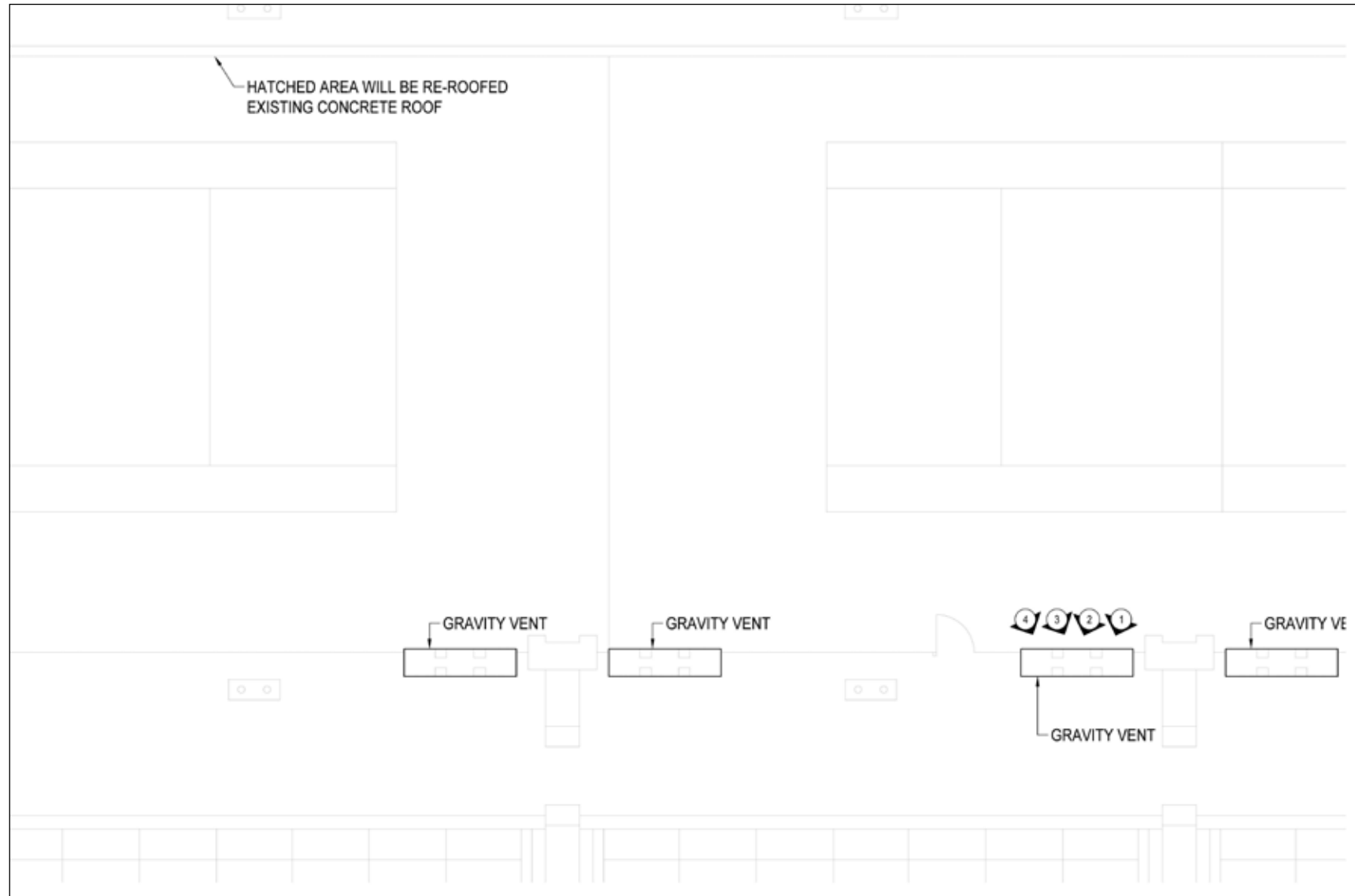
MECHANICAL: GRID 17 PLAN, PHOTOS & EQUIPMENT LIST



MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
EF-78				Unsatisfactory	460/60/3	3		X		X	
Gravity Vents (Tennis Courts)					N/A		X		N/A		
							2	1	0	1	

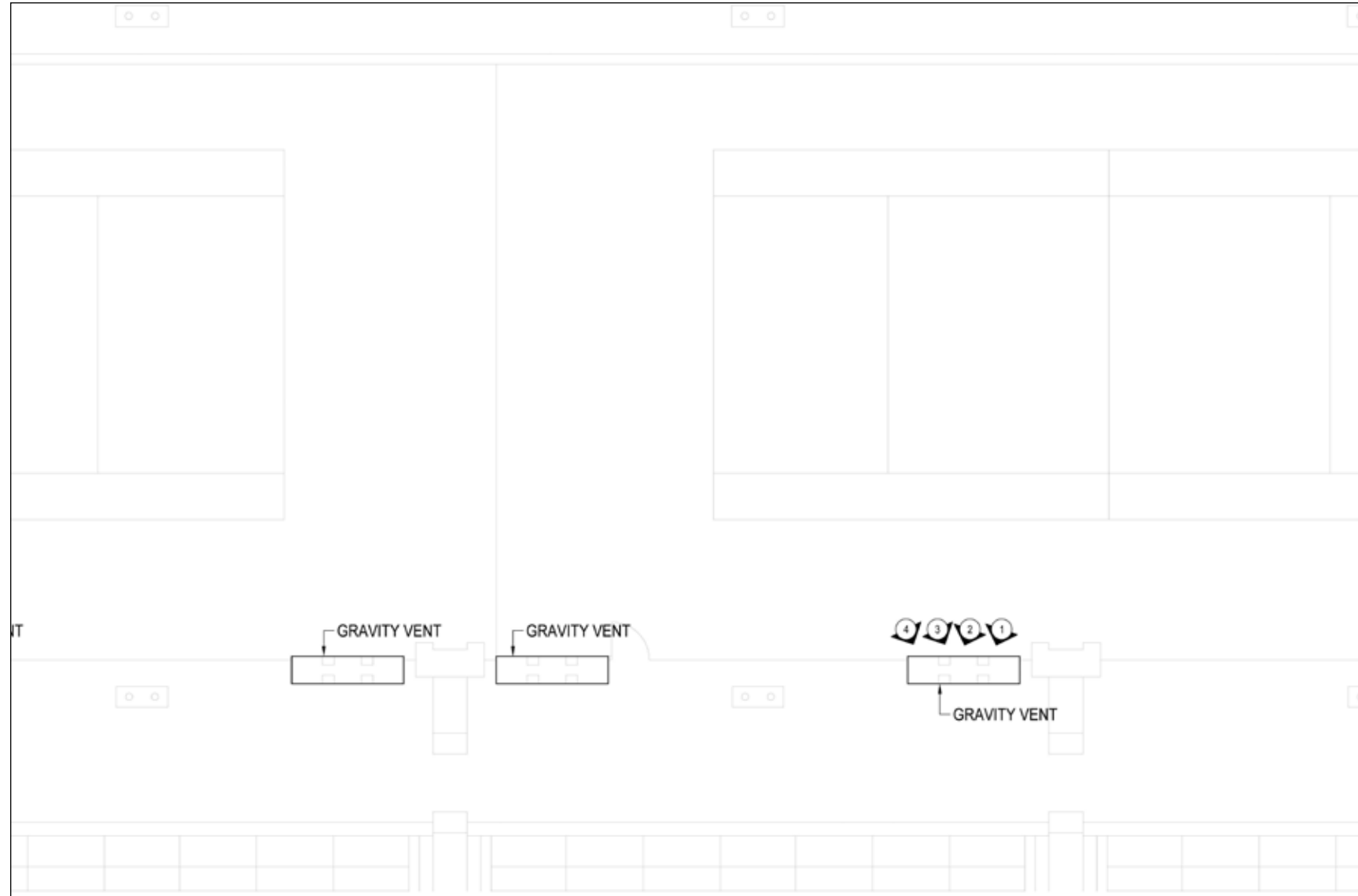
MECHANICAL: GRID 18 PLAN, PHOTOS & EQUIPMENT LIST



MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrial (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
Gravity Vents (Tennis Courts)					N/A		X		N/A		
							1	0	0	0	

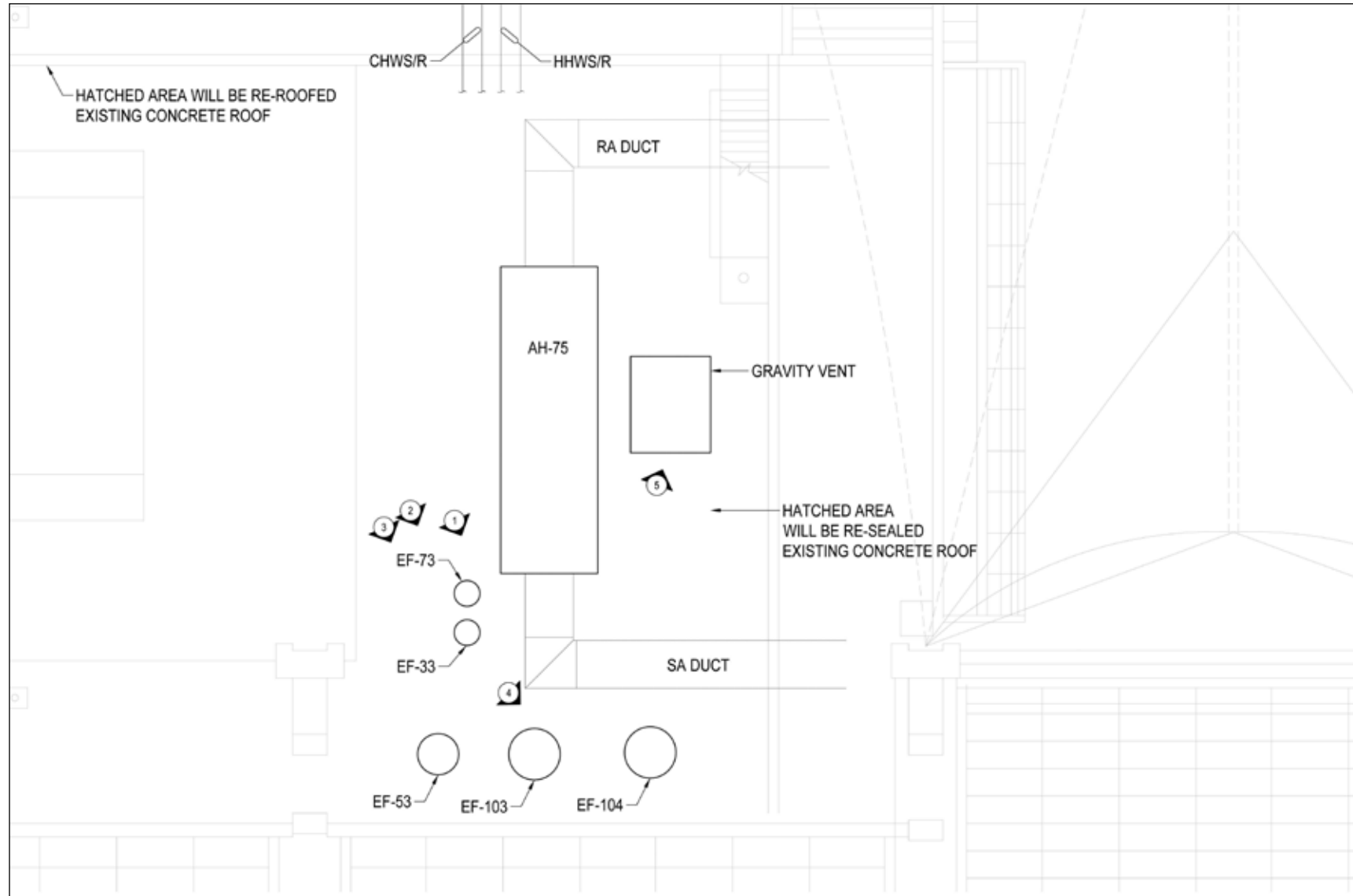
MECHANICAL: GRID 19 PLAN, PHOTOS & EQUIPMENT LIST



MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrical (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks	
Gravity Vents (Tennis Courts)					N/A		X	1	0	N/A	0	

MECHANICAL: GRID 20 PLAN, PHOTOS & EQUIPMENT LIST



MECHANICAL EQUIPMENT

EQ Tag	Make	Model	Manufacture Year	Visual Observation Condition	Electrial (V/Hz/Ph)	Horsepower	Remove and Reinstall Existing	Remove and Install New Unit	Remove and Reinstall Existing Disconnect	Remove and Install New Disconnect	Remarks
AH-75	McQuay	RAH077CLY	1999		460/60/3						Unit located on concrete area of roof and will not be required to be relocated or replaced. Unit not shown on As-builts.
EF-73					460/60/3	3/4					Unit located on concrete area of roof and will not be required to be relocated or replaced.
EF-33					?						Unit located on concrete area of roof and will not be required to be relocated or replaced.
EF-53					460/60/3	3					Unit located on concrete area of roof and will not be required to be relocated or replaced.
EF-103					460/60/3	5					Unit located on concrete area of roof and will not be required to be relocated or replaced.
EF-104					460/60/3	5					Unit located on concrete area of roof and will not be required to be relocated or replaced.
							2	0	0	0	



CHAPTER 4: SOLAR-PV/NARRATIVE

This document is presented to the San Diego Convention Center (SDCC) Executive Management Team as a response to the Request for Professional Services issued by the SDCC to Gafcon, Pacifica Services, Inc. and WSP in order to develop a Project Programming Criteria (PPC) Document and/or Basis of Design (BOD) Document to address the deficiencies that the SDCC is having/facing/encountering in its existing infrastructure with the sole purpose of making it more energy efficient and cost-effective in order to reduce its facility daily operating budget.

The SDCC West Wing has experienced deficiencies in its existing infrastructure such as water leaks from its roof, obsolescence, and deterioration of existing HVAC equipment located on its roof.

This section of the PPC/BOD document will address the proposed/feasible deployment solution of a solar PV system that will help to offset the energy consumption (kWh) of the SDCC by 15% and 26% reduction in energy demand (kW) based on 2019 calendar year utility information (pre-Covid) which is a good predictor of its energy consumption and energy demand.

Calendar years, 2020 and 2021 were not good predictors of energy consumption and energy demand of the SDCC due to the Covid-19 Pandemic; therefore, these two given years were only considered as a source of general information and not considered in the financial analysis of the proposed solar PV system.

There seems to be an immense opportunity to install a solar PV system on the SDCC roof areas identified during our several visits to the project site. For instance, the virtual rate/cost of electricity rate (\$/kWh) from calendar year 2019 was \$0.22/kWh compared to year 2022 which is \$0.28/kWh resulting in a 27.3% increase in the cost of electricity rate.

The total net electricity consumption and cost of the SDCC based on calendar year 2019 were 18,177,458 kWh and \$3,967,927, of which 2,722,933 kWh/year could be offset by the proposed new solar PV system during the 1st year production which equates to a cost savings of \$762,421/year based on average virtual rate of \$0.28/kWh paid by the SDCC on 2022 calendar year electric utility data (January thru May).

Please note that the below table does not include any known available rebates and/or incentives provided by San Diego Gas & Electric® Company (SDG&E), state, or local government agencies.

ESTIMATED ANNUAL SAVINGS SUMMARY	Savings	Reduction
Estimated Annual Electric Energy Savings	2,722,933 kWh	15%
Estimated Peak Electric Demand Savings	1.6976 kW	26%
Estimated Annual Utility Cost Savings	\$762,421	15%

INVESTMENT OVERVIEW	
Estimated Total Project Costs	\$10,180,200.
Estimated Total Incentive Available	\$0
Estimated Net Cost to Customer	\$10,180,200.
Estimated Simple Payback Period without Incentive or Tax Rebate	13.4 Years

The above is for informational purposes only.

SOLAR PV: SITE INFORMATION

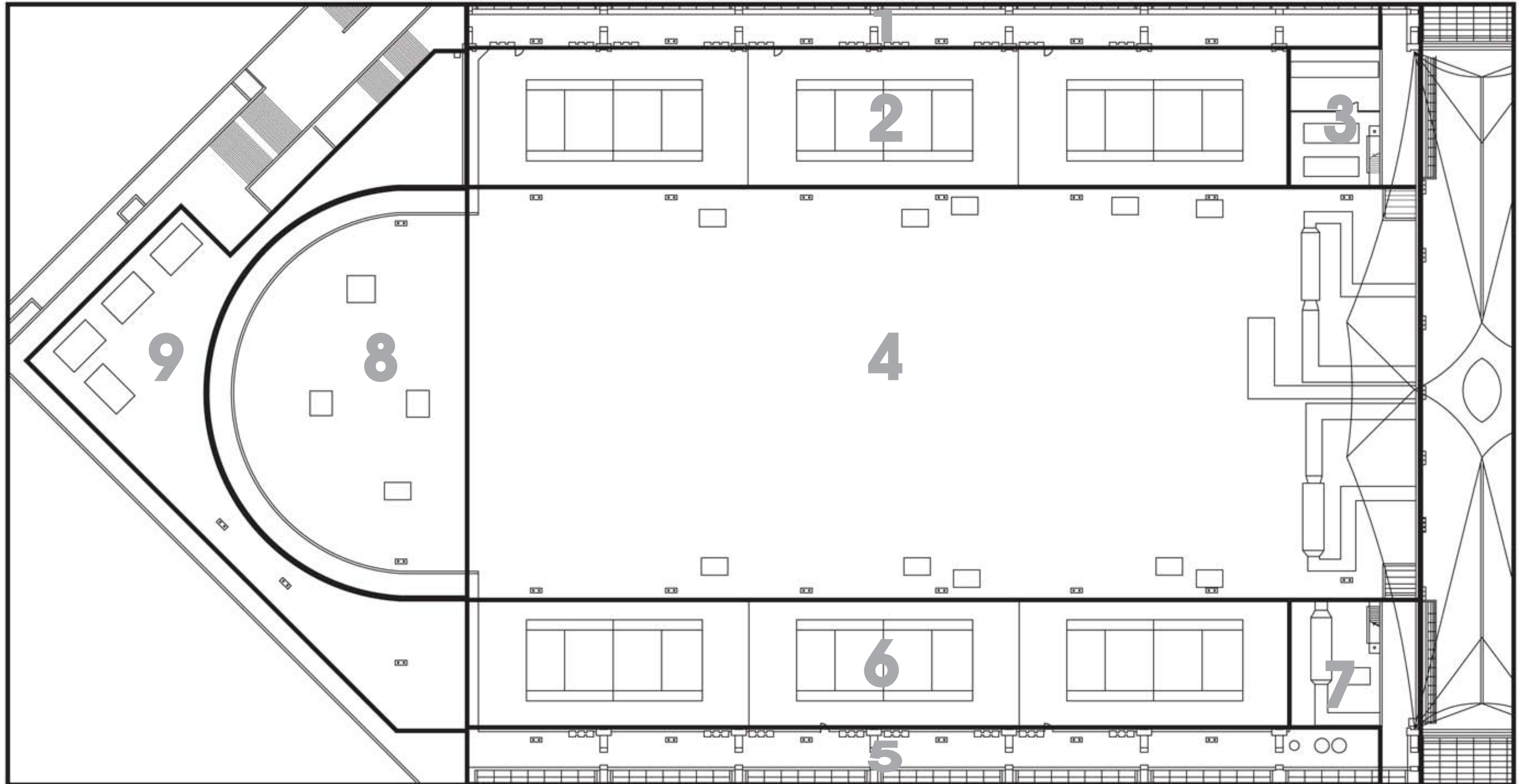
The SDCC was opened in November 1989 and expanded in September 2011. The Architect of Record (AOR) was Arthur Erickson. The initial construction cost for the SDCC was \$164 million.

We have identified the following feasible areas for Solar PV Assets Deployment per the below photos with keys.

Areas	Solar PV (Yes/No)	Surface Area (ft ²)	Commercial Roof Type
1	No	6,878	Concrete Topping Slab
2	Yes	20,782	Concrete Topping Slab
3	No	2,979	Concrete Topping Slab
4	Yes	73,070	Built-up Roof
5	No	6,878	Concrete Topping Slab
6	Yes	20,782	Concrete Topping Slab
7	No	2,979	Concrete Topping Slab
8	No	14,950	Built-up Roof
9	Yes	14,700	Built-up Roof
Total Estimated Surface Area		163,998	



SOLAR PV: EXISTING ROOF PLAN



The proposed solar PV System Size in the above indicated areas (2, 4, 6 & 9) will be of approximately of 1,696.70 kW DC or ≈ 1.7 MW DC and occupy approximately 90,136 ft² and generate electricity at an average rate of 2,565,651 kWh per year over the course of the 25-year linear performance warranty of the solar module resulting in a cumulative electricity production output of 64,141,276 kWh ≈ 64.1 Megawatt-hours (MWh).

SOLAR PV: COST MATRIX

SOLAR PV: SYSTEM SIZES PER AVAILABLE ROOF SURFACE AREA

San Diego Convention Center	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Total Estimated Surface Area (ft ²)	Solar PV System Size (kW DC)	Solar PV System Size (MW DC)	ROM Estimate (\$)
Estimated square footages based on As-built Drawings	6,183	21,990	2,375	62,752	6,183	21,990	2,375	13,852	14,222	151,922			
Commercial Roof Type	Concrete Topping Slab	Concrete Topping Slab	Concrete Topping Slab	Built-up Roof	Concrete Topping Slab	Concrete Topping Slab	Concrete Topping Slab	Built-up Roof	Built-up Roof				
Proposed Areas For Solar PV Deployment	No	Yes	No	Yes	No	Yes	No	Feasible Area For Solar Inverters	Yes				
% Available of Total Surface Area		85%		75%		85%			40%				
Proposed Areas For Solar PV Deployment		18,692		47,064		18,692			5,689	90,136			
Proposed solar PV system size based on available space (kW DC)		351.5		886.8		351.5			106.9		1,696.7	1.70	
Installed Cost of Solar PV (\$/Watt DC)		\$6.00		\$6.00		\$6.00			\$6.00				
Total Cost of Installing Solar PV Systems (Panels+Inverters+BOS+Permit)		\$2,109,000		\$5,320,950		\$2,109,000			\$641,250				\$10,180,200*

* This Total Installed Cost is a Rough Order of Magnitude Estimate, and Includes Prevailing Wages as of June 2022.

SOLAR PV: COST MATRIX

SOLAR/PV SYSTEM SIZES PER AVAILABLE ROOF SURFACE AREA

Area 2 = Area 6	New Proposed	Area 4	New Proposed	Area 9	New Proposed
Manufacturer:	QCells	Manufacturer:	QCells	Manufacturer:	QCells
Model:	Q.Peak Duo XL-G10.2	Model:	Q.Peak Duo XL-G10.2	Model:	Q.Peak Duo XL-G10.2
Wattage (W _{STC}):	475	Wattage (W _{STC}):	475	Wattage (W _{STC}):	475
Module Dimensions including Frame:		Module Dimensions including Frame:		Module Dimensions including Frame:	
Length (mm) + 12.7 mm for proper spacing and thermal expansion:	2,216	Length (mm) + 12.7 mm for proper spacing and thermal expansion:	2,216	Length (mm) + 12.7 mm for proper spacing and thermal expansion:	2,216
Minimum Spacing For Thermal Expansion (0.5" = 12.7 mm)	12.7	Minimum Spacing For Thermal Expansion (0.5" = 12.7 mm)	12.7	Minimum Spacing For Thermal Expansion (0.5" = 12.7 mm)	12.7
Length (in):	87.7	Length (in):	87.7	Length (in):	87.7
Width (mm):	1,045	Width (mm):	1,045	Width (mm):	1,045
Minimum Spacing For Thermal Expansion (0.5" = 12.7 mm)	12.7	Minimum Spacing For Thermal Expansion (0.5" = 12.7 mm)	12.7	Minimum Spacing For Thermal Expansion (0.5" = 12.7 mm)	12.7
Width (in):	41.6	Width (in):	41.6	Width (in):	41.6
Weight (kg):	26.5	Weight (kg):	26.5	Weight (kg):	26.5
Weight (lb):	58.4	Weight (lb):	58.4	Weight (lb):	58.4
Panel/Module Area (m ²):	2.32	Panel/Module Area (m ²):	2.32	Panel/Module Area (m ²):	2.32
Panel/Module Area (ft ²):	24.93	Panel/Module Area (ft ²):	24.93	Panel/Module Area (ft ²):	24.93
Weight (kg/m ²):	11.44	Weight (kg/m ²):	11.44	Weight (kg/m ²):	11.44
Weight (lb/ft ²):	2.34	Weight (lb/ft ²):	2.34	Weight (lb/ft ²):	2.34
Module Efficiency (%)	20.5%	Module Efficiency (%)	20.5%	Module Efficiency (%)	20.5%
Quantity	740	Quantity	1,867	Quantity	225
System Size (kW DC):	351.5	System Size (kW DC):	886.8	System Size (kW DC):	106.9
Surface Area Covered by Modules Taking Into Consideration Proper Spacing For Thermal Expansion (ft ²):	18,656.3	Surface Area Covered by Modules Taking Into Consideration Proper Spacing For Thermal Expansion (ft ²):	47,069.3	Surface Area Covered by Modules Taking Into Consideration Proper Spacing For Thermal Expansion (ft ²):	5,672.5
Estimated Energy Production (kWh) - PV Watts:	564,101	Estimated Energy Production (kWh) - PV Watts:	1,423,172	Estimated Energy Production (kWh) - PV Watts:	171,557
Electricity Cost - Virtual Rate (\$/kWh)	\$0.28	Electricity Cost - Virtual Rate (\$/kWh)	\$0.28	Electricity Cost - Virtual Rate (\$/kWh)	\$0.28
Feasible Cost Savings	\$157,948.28	Feasible Cost Savings	\$398,488.16	Feasible Cost Savings	\$48,035.96

TOTAL # OF MODULES: 3572

SOLAR PV: PRODUCT INFORMATION

HANWHA Q CELLS MODULE - 475 W @ STC SOLAR MODULE USED AS A PROPOSED BASIS OF DESIGN

powered by

Q.PEAK DUO XL-G10.2

470-495

ENDURING HIGH PERFORMANCE

BREAKING THE 21% EFFICIENCY BARRIER
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.6%.

LOW ELECTRICITY GENERATION COSTS
Higher yield per surface area, lower BOS costs and up to 80 watts more module power than standard 144 half-cell modules.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology¹, Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (3000 Pa).

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty².

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

6 BUSBAR CELL TECHNOLOGY

12 BUSBAR CELL TECHNOLOGY

THE IDEAL SOLUTION FOR:

Ground-mounted solar power plants

Engineered in Germany

MECHANICAL SPECIFICATION

Format	87.2 in × 41.1 in × 1.38 in (including frame) (2216 mm × 1045 mm × 35 mm)
Weight	58.4 lbs (26.5 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodized aluminum
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm ² Solar cable; (+) ≥ 27.6 in (700 mm), (-) ≥ 13.8 in (350 mm)*
Connector	Stäubli MC4, Stäubli MC4-Evo2, Hanwha Q CELLS HGC4; IP68

*Long cables (+) ≥ 57.1 in (1450 mm), (-) ≥ 57.1 in (1450 mm) for landscape installation are available upon request.

Drawing not to scale

ELECTRICAL CHARACTERISTICS

POWER CLASS		470	475	480	485	490	495
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC¹ (POWER TOLERANCE +5 W / -0 W)							
Power at MPP ¹	P_{MPP} [W]	470	475	480	485	490	495
Short Circuit Current ¹	I_{SC} [A]	11.21	11.24	11.26	11.29	11.31	11.34
Open Circuit Voltage ¹	V_{OC} [V]	53.54	53.58	53.61	53.64	53.68	53.71
Current at MPP	I_{MPP} [A]	10.62	10.66	10.71	10.76	10.81	10.86
Voltage at MPP	V_{MPP} [V]	44.27	44.54	44.81	45.07	45.33	45.59
Efficiency ¹	η [%]	≥ 20.3	≥ 20.5	≥ 20.7	≥ 20.9	≥ 21.2	≥ 21.4
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT²							
Power at MPP	P_{MPP} [W]	352.6	356.4	360.1	363.9	367.6	371.4
Short Circuit Current	I_{SC} [A]	9.03	9.05	9.07	9.09	9.12	9.14
Open Circuit Voltage	V_{OC} [V]	50.49	50.53	50.56	50.59	50.62	50.65
Current at MPP	I_{MPP} [A]	8.34	8.39	8.43	8.47	8.52	8.56
Voltage at MPP	V_{MPP} [V]	42.26	42.49	42.72	42.94	43.17	43.39

¹Measurement tolerances P_{MPP} ± 3%, I_{SC} , V_{OC} ± 5% at STC: 1000 W/m², 25 ± 2°C, AM 1.5 according to IEC 60904-3 • ²800 W/m², NMOT, spectrum AM 1.5

Q CELLS PERFORMANCE WARRANTY

At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organization of your respective country.

PERFORMANCE AT LOW IRRADIANCE

Typical module performance under low irradiance conditions in comparison to STC conditions (25°C, 1000 W/m²)

TEMPERATURE COEFFICIENTS					
Temperature Coefficient of I_{SC}	α [%/K]	+0.04	Temperature Coefficient of V_{OC}	β [%/K]	-0.27
Temperature Coefficient of P_{MPP}	γ [%/K]	-0.34	Nominal Module Operating Temperature	NMOT [°F]	109 ± 5.4 (43 ± 3°C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS} [V]	1500 (IEC)/1500 (UL)	PV module classification	Class II
Maximum Series Fuse Rating [A DC]	20	Fire Rating based on ANSI/UL 61730	TYPE 1
Max. Design Load, Push / Pull ³ [lbs/ft ²]	75 (3600 Pa)/42 (2000 Pa)	Permitted Module Temperature on Continuous Duty	-40°F up to +185°F (-40°C up to +85°C)
Max. Test Load, Push / Pull ³ [lbs/ft ²]	113 (5400 Pa)/63 (3000 Pa)		

³See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compliant, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (bifacial cells)

PACKAGING INFORMATION

Horizontal packaging	89.4 in 2270 mm	43.3 in 1100 mm	47.6 in 1210 mm	1809 lbs 821 kg	22 pallets	20 pallets	29 modules
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Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL inquiry@us.q-cells.com | WEB www.q-cells.us

SOLAR PV: COST MATRIX

BEST COMMERCIAL SOLAR PANELS BY EFFICIENCY

RANK	MANUFACTURER	PANEL EFFICIENCY
1	SunPower	22.80%
2	LG	22.10%
3	REC	21.90%
4	Panasonic	21.70%
5	Q CELLS	21.40%

SOLAR PV: PROPOSED PROJECT STATISTICS

Project Name: San Diego Convention Center (SDCC)

LOCATION: 111 West Harbor Drive, San Diego, CA 92101

SYSTEM SIZE: 1,696.7 kW DC = 1.7 MC DC

SOLAR PV SYSTEM TYPE: Roof-Mounted PV System and Ground-Mounted on Tennis Courts

MODULE MANUFACTURER: Hanwha QCells used as a Basis of Design (BOD) and Availability Only

Proposed Module Model: Q. PEAK DUO XL-G10.2 -- 475W@STC

Modules Quantity: 3,572

Square Footage: = 90,136 l.ft²

Asset Owner: SDCC and/or Solar Developer if financed under Solar Lease Agreement (SLA) or Power Purchase Agreement (PPA)

Location: San Diego, California

Climate Zone: 7

METERS INFORMATION

The following account numbers are associated with this site:

San Diego Gas & Electric® Company (SDG&E)

Large	8695-782-175-9
Meters	2059-752-404-4

Small	6806-708-258-9
Meters	2827-471-332-7
	3644-080-734-5

SOLAR PV: HISTORICAL ENERGY CONSUMPTION & PROFILE

The annual reported energy usage as reported by the electrical utility, **San Diego Gas & Electric® Company (SDG&E)** for the following calendar years: 2018, 2019, 2021 and 2022 is as follows:

Historical Energy Usage Table from 2018 to 2022

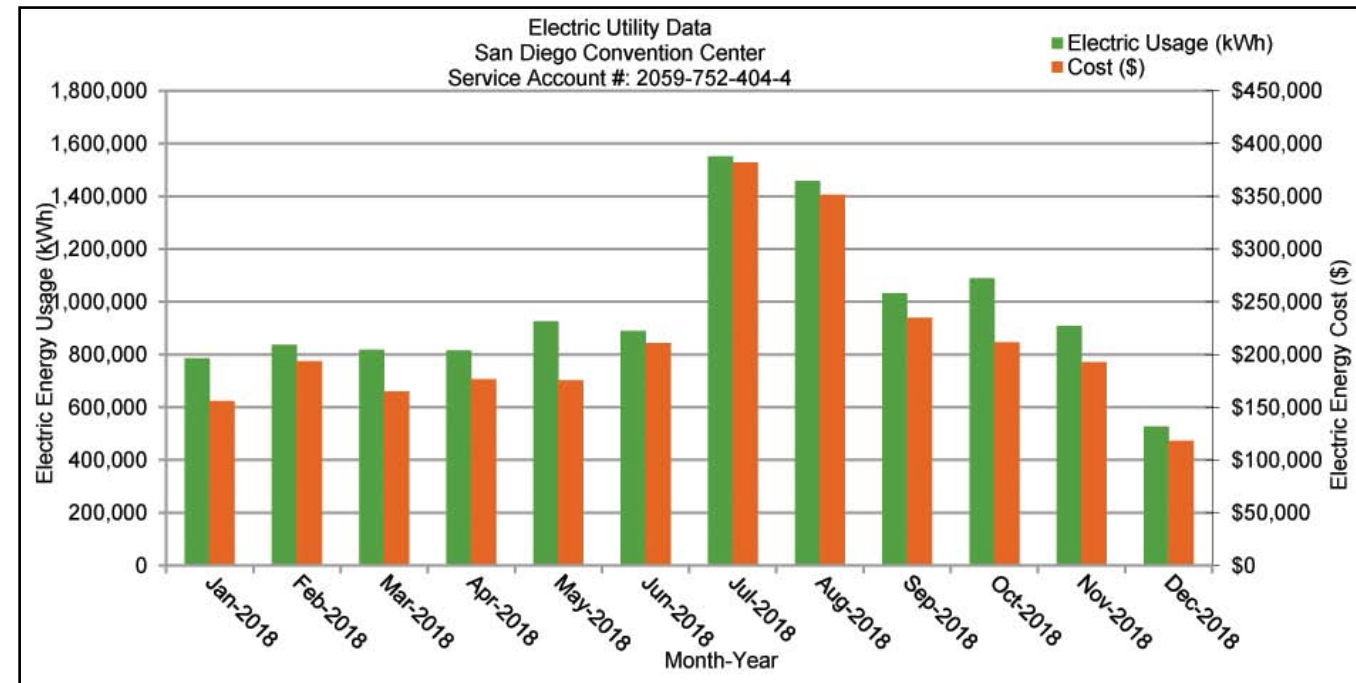
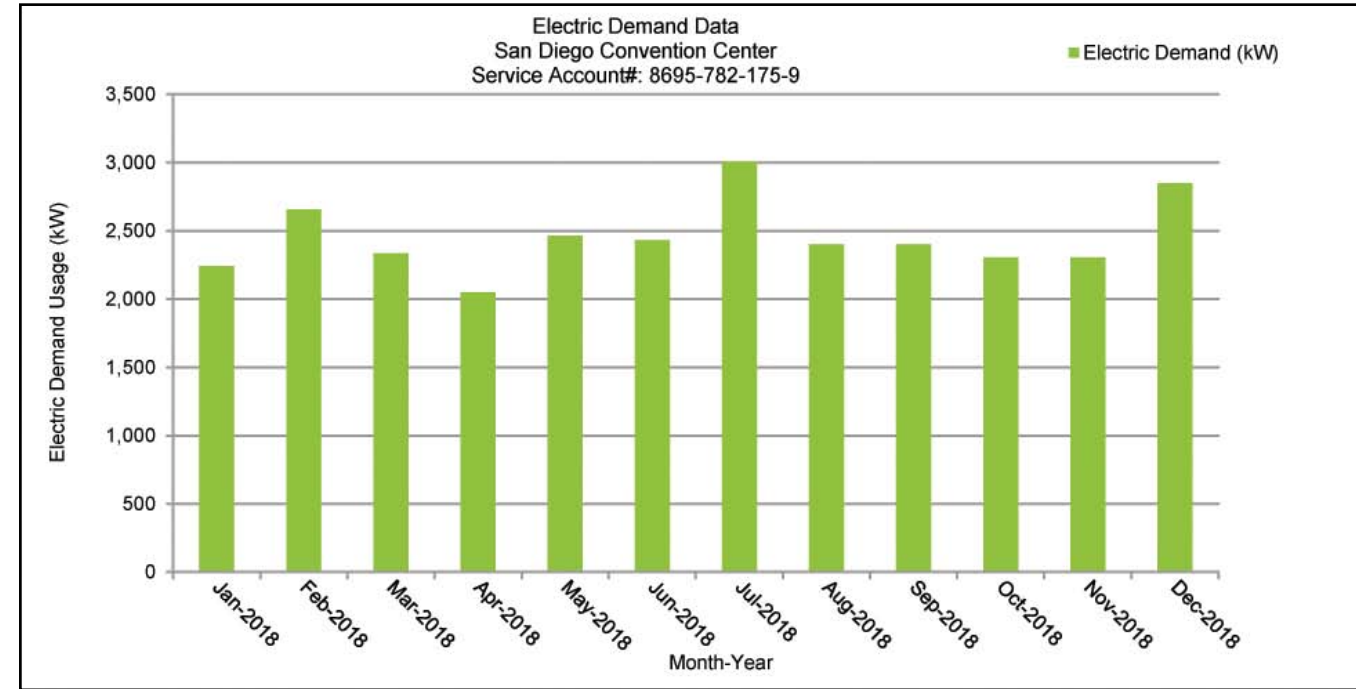
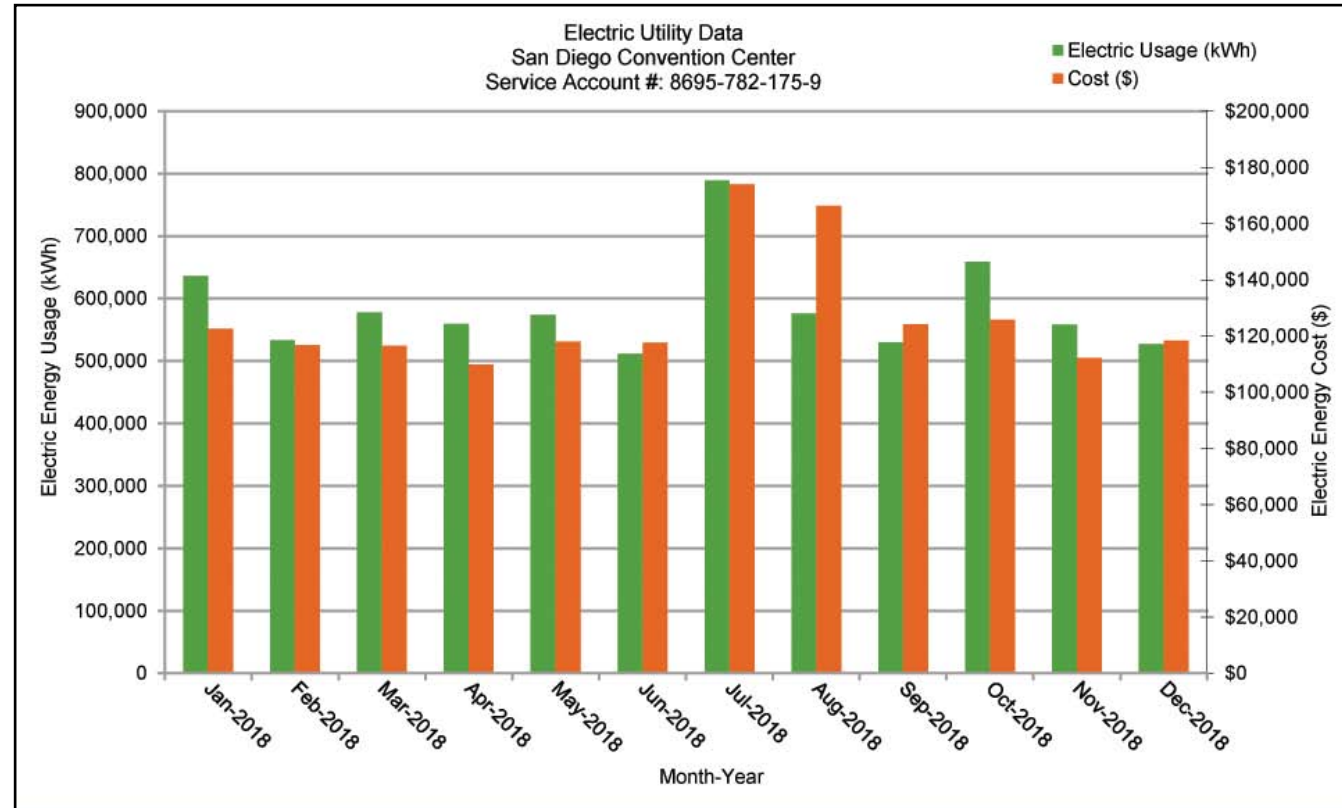
Year	Usage (kWh)	Demand (kW)	Electricity Cost	Electric Rate (\$/kWh)
2018	18,684,457	6,409	\$4,095,161	\$0.22
2019	18,177,458	6,229	\$3,976,927	\$0.22
2020*	N/A	N/A	N/A	N/A
2021	14,753,705	5,828	\$3,033,806	\$0.21
2022 (January - April)	4,186,981	3,043	\$1,177,901	\$0.28

*Year 2020 electricity utility data was not requested since it would not have been a good predictor of energy consumption and energy demand of the SDCC due to the Covid-19 Pandemic; therefore, year 2020 electric utility analysis was omitted.

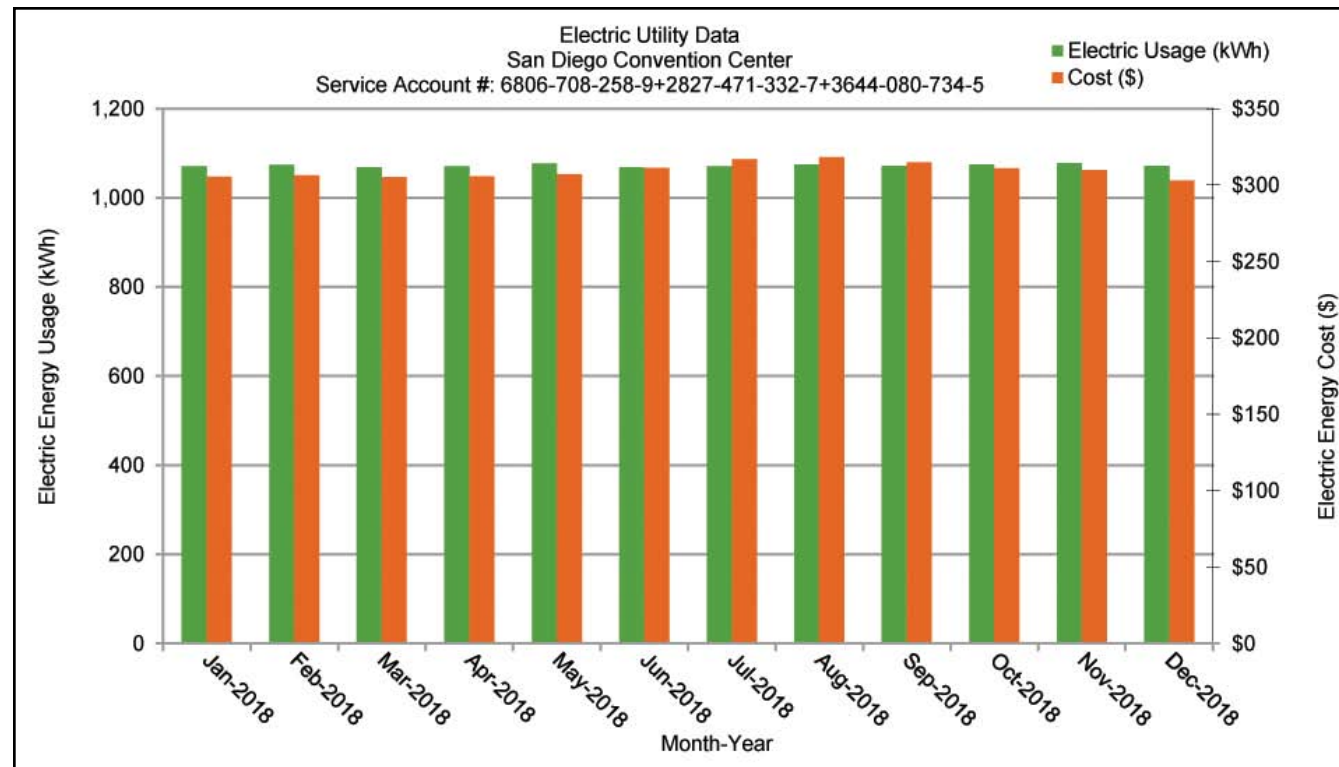
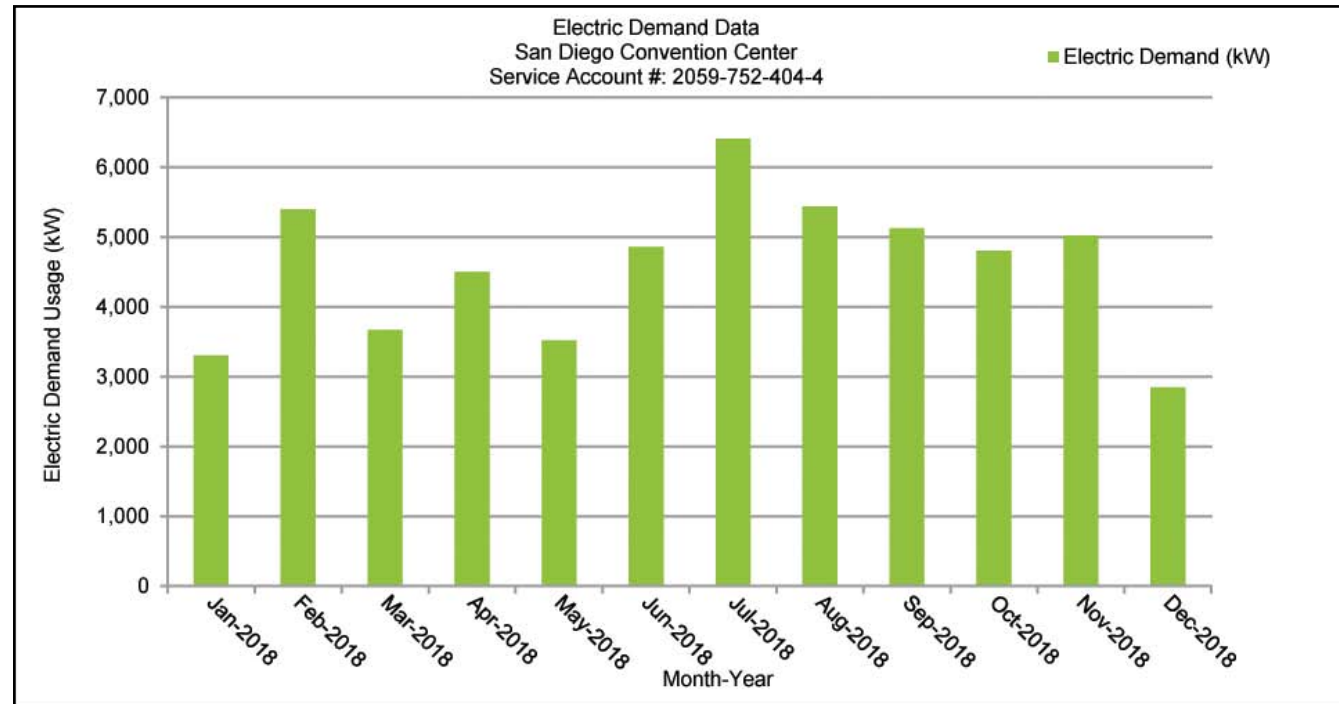
Please note that the above table was developed based on the compilation of the utility bills/scanned copies provided by the SDCC.

SOLAR PV: 2018 ENERGY USAGE

Calendar Year 2018	Account #		Energy Consumption	Energy Peak Demand	Cost	Virtual Rate
			kWh	kW	\$	\$/kWh
	Large Meters	8695-782-175-9	7,028,992	3,008	\$1,521,605	\$0.22
	2059-752-404-4	11,642,591	6,409	\$2,569,841	\$0.22	
Small Meters	6806-708-258-9	12,874	0	\$3,716	\$0.29	
	2827-471-332-7					
	3644-080-734-5					
Total		18,684,457	6,409	\$4,095,161	\$0.22	

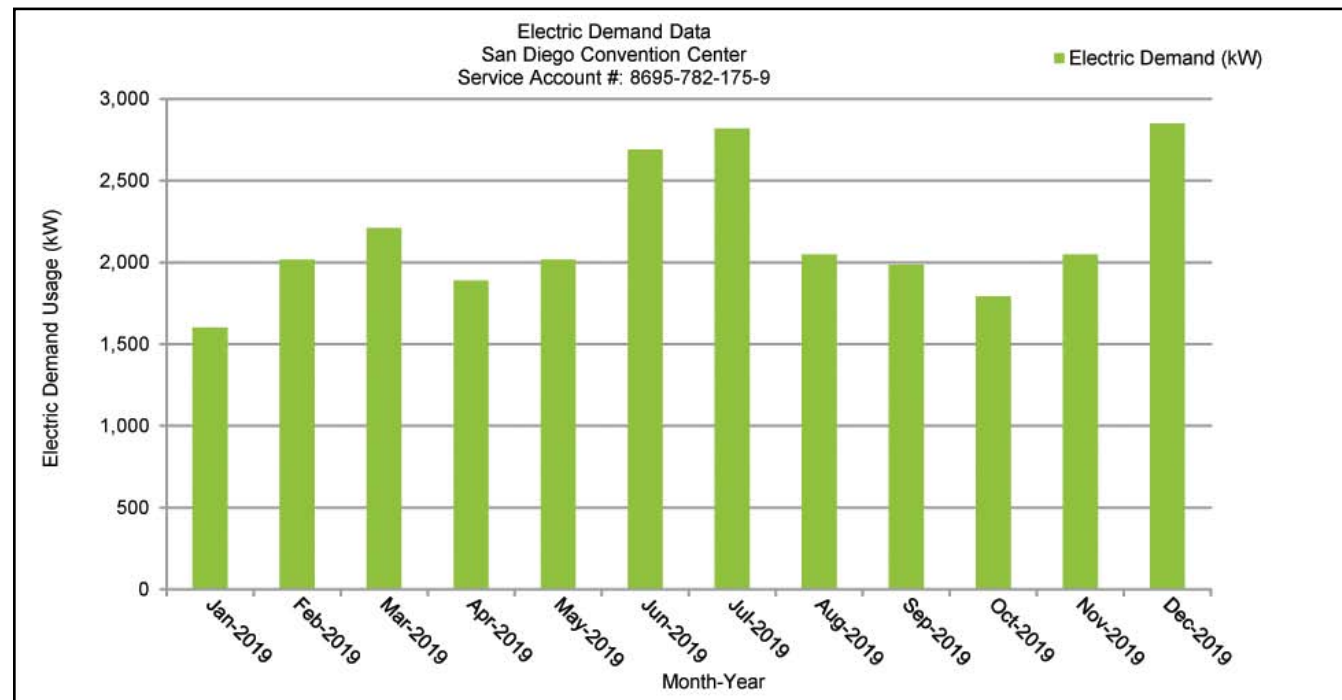
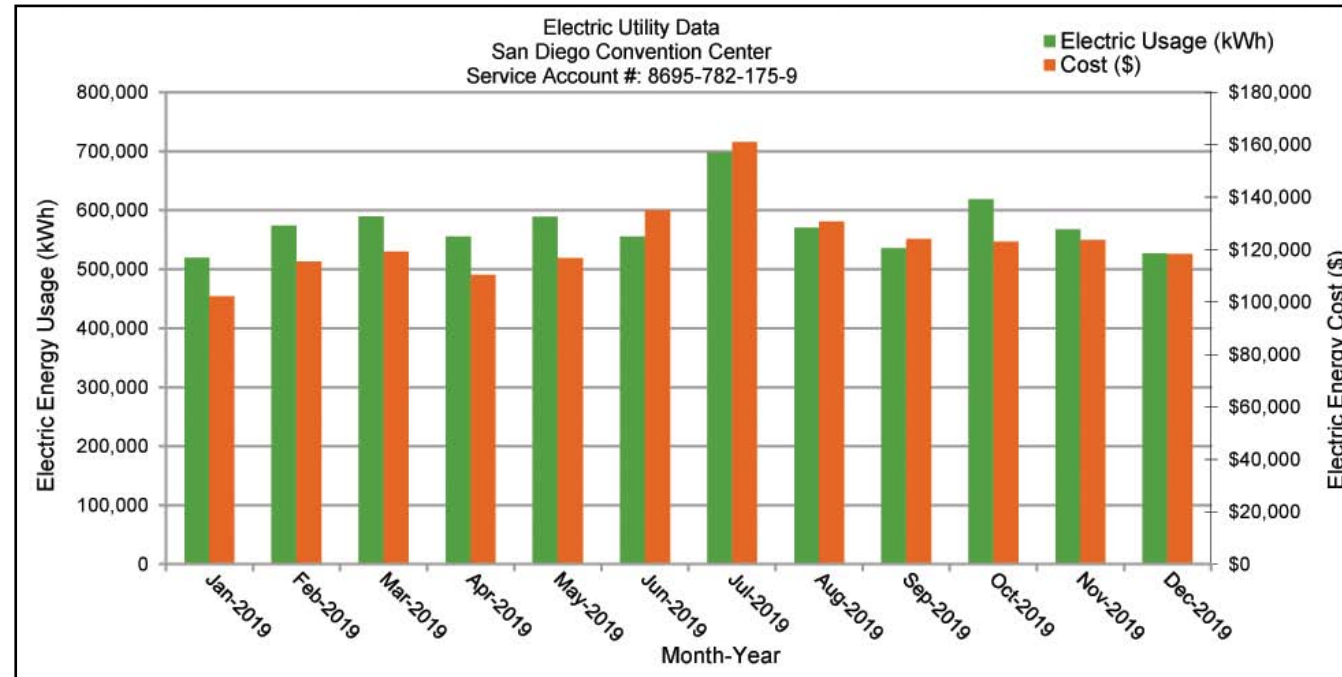


SOLAR PV: 2018 ENERGY USAGE

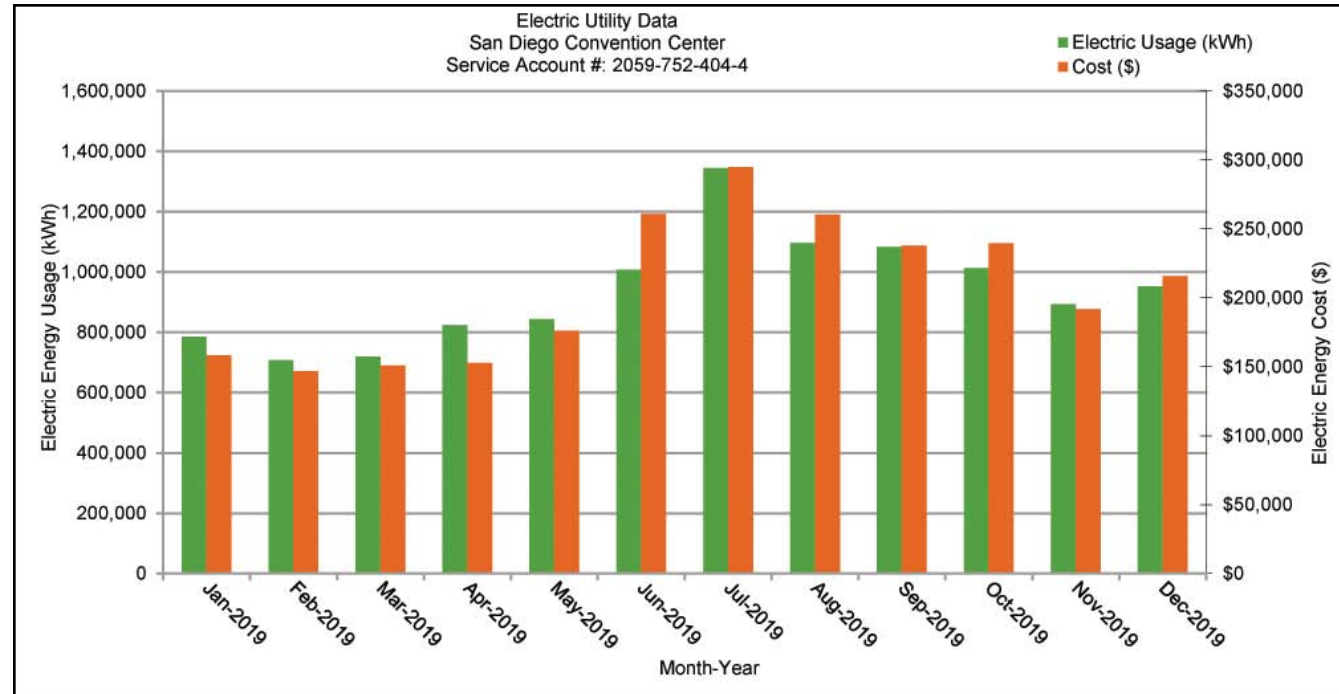


SOLAR PV: 2019 ENERGY USAGE

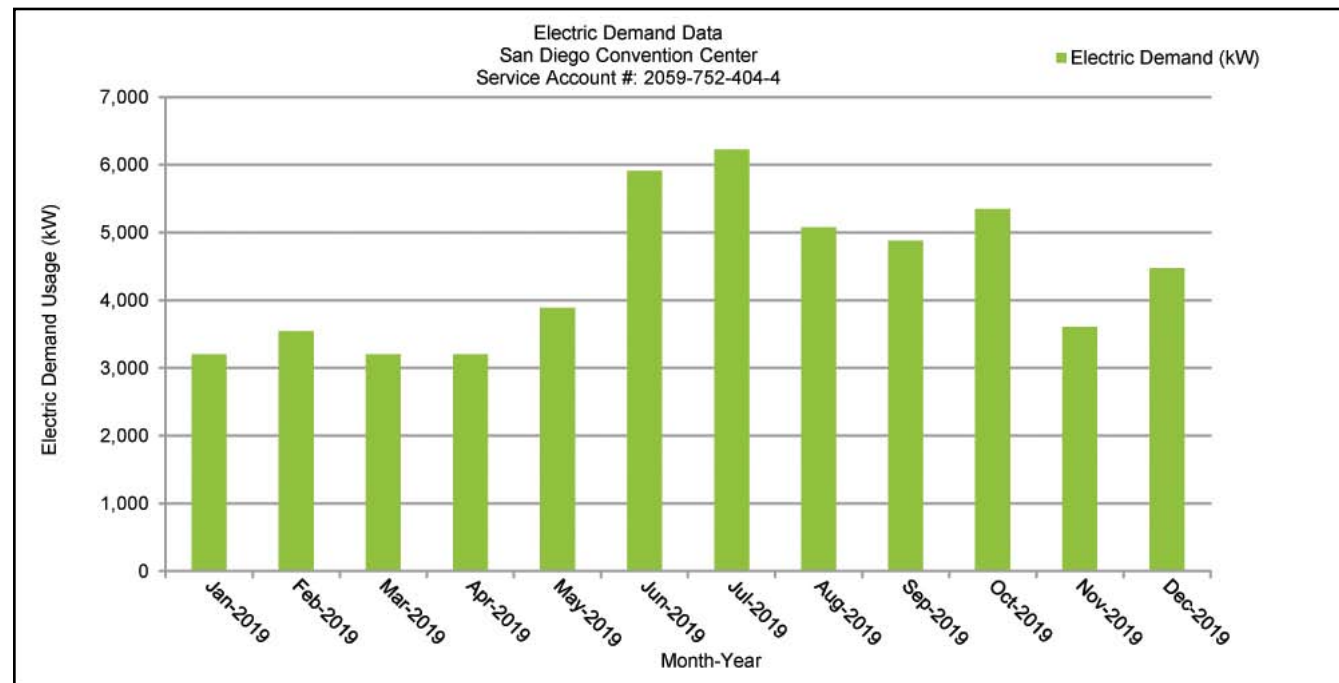
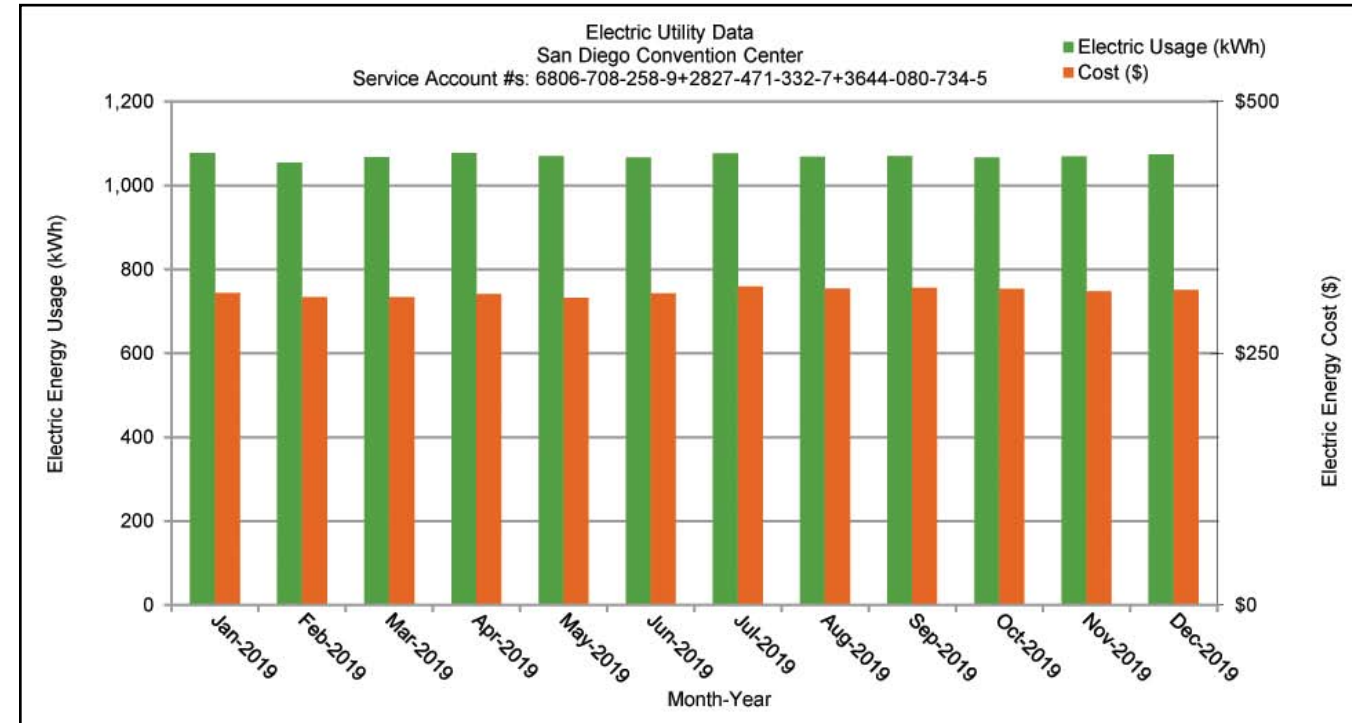
Calendar Year 2019	Account #		Energy Consumption	Energy Peak Demand	Cost	Virtual Rate
			kWh	kW	\$	\$/kWh
Large Meters	8695-782-175-9		6,897,872	2,848	\$1,478,955	\$0.21
	2059-752-404-4		11,266,753	6,229	\$2,485,246	\$0.22
Small Meters	6806-708-258-9		12,834	0	\$3,727	\$0.29
	2827-471-332-7					
	3644-080-734-5					
Total			18,177,458	6,229	\$3,967,927	\$0.22



SOLAR PV: 2019 ENERGY USAGE



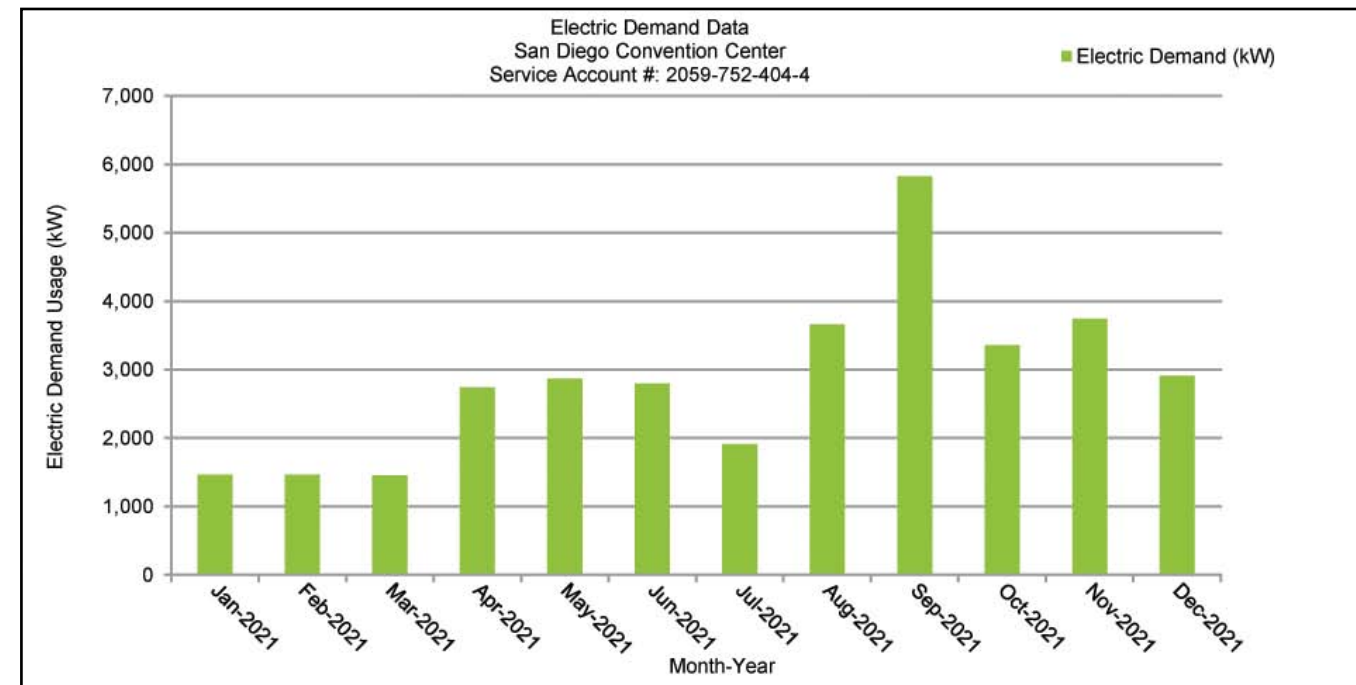
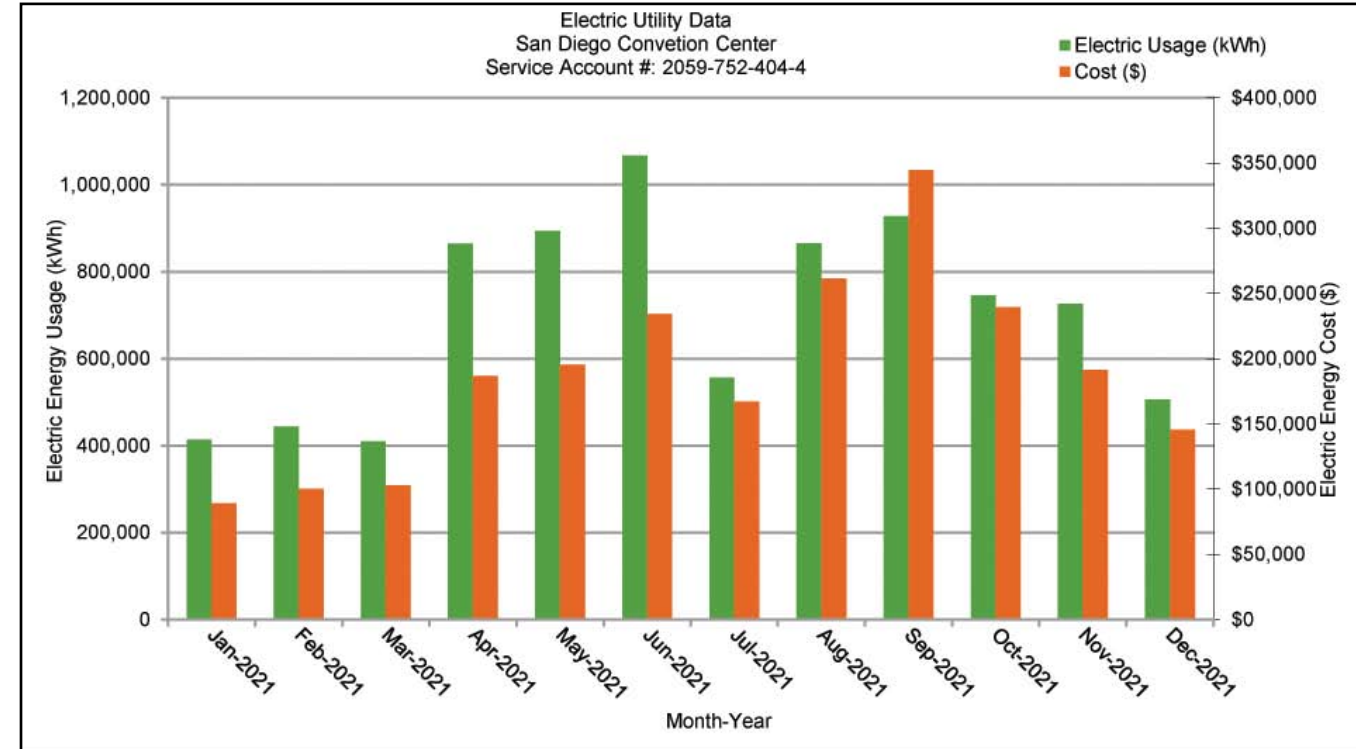
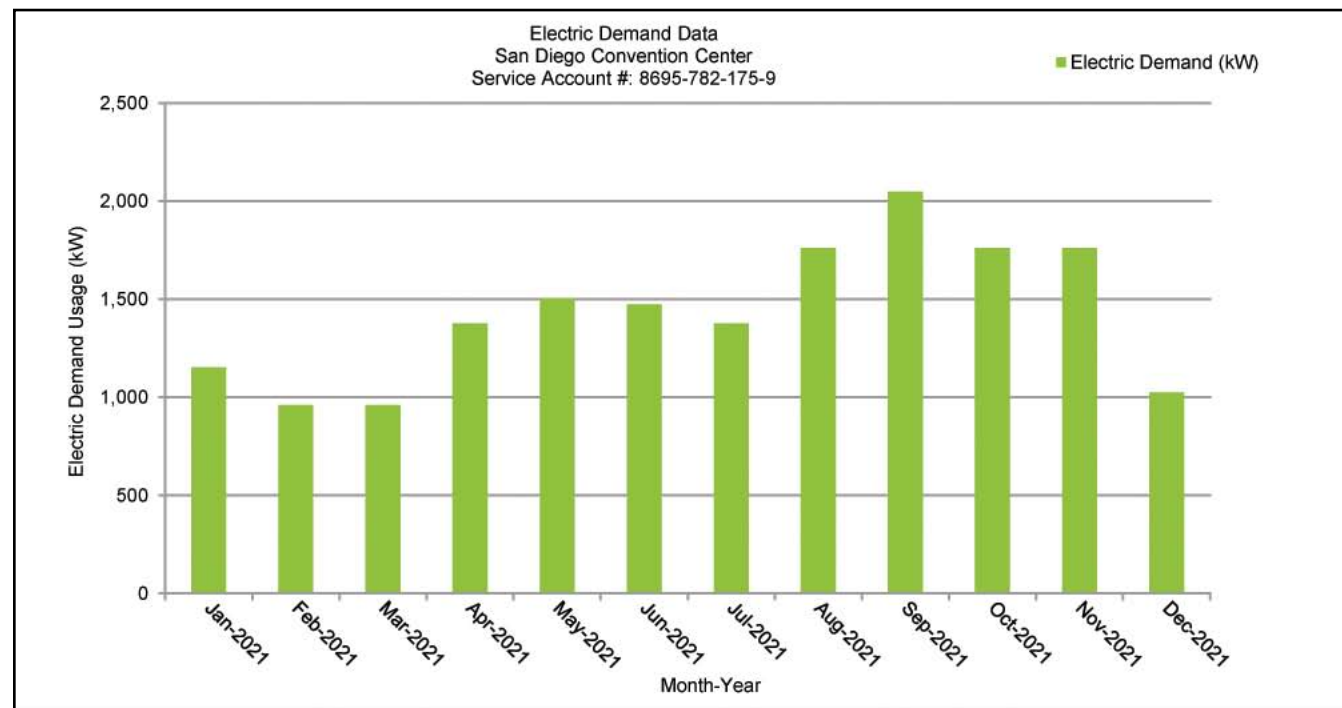
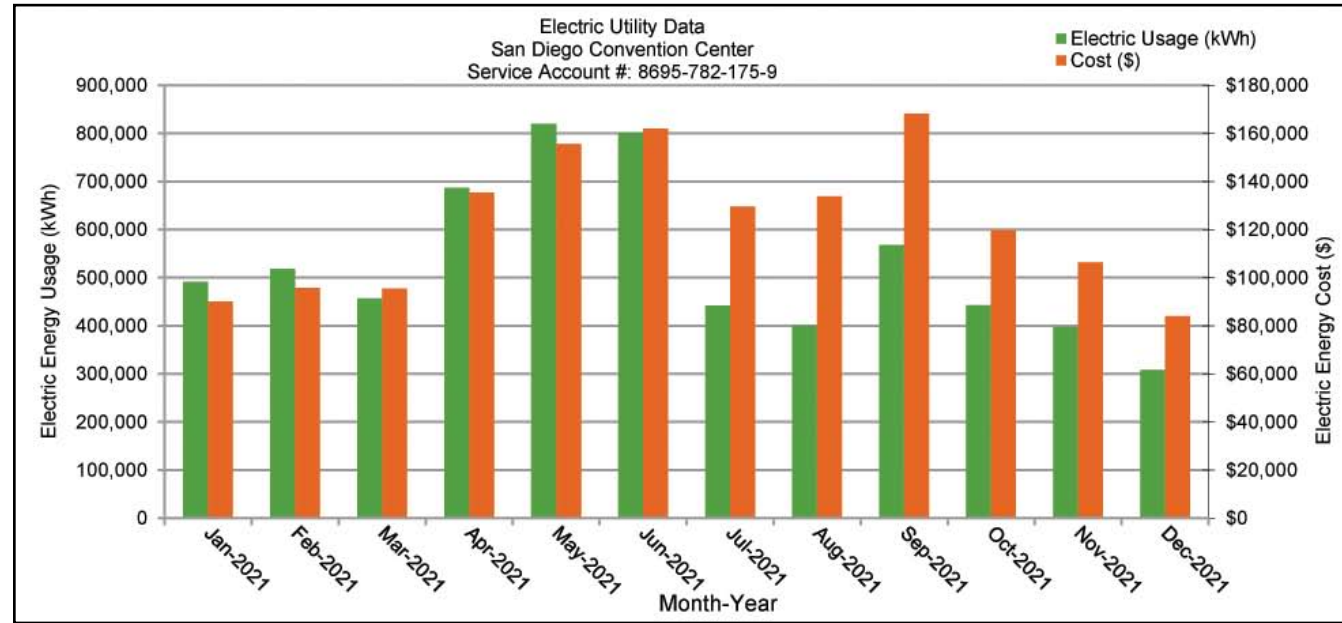
SOLAR PV: 2020 ENERGY USAGE



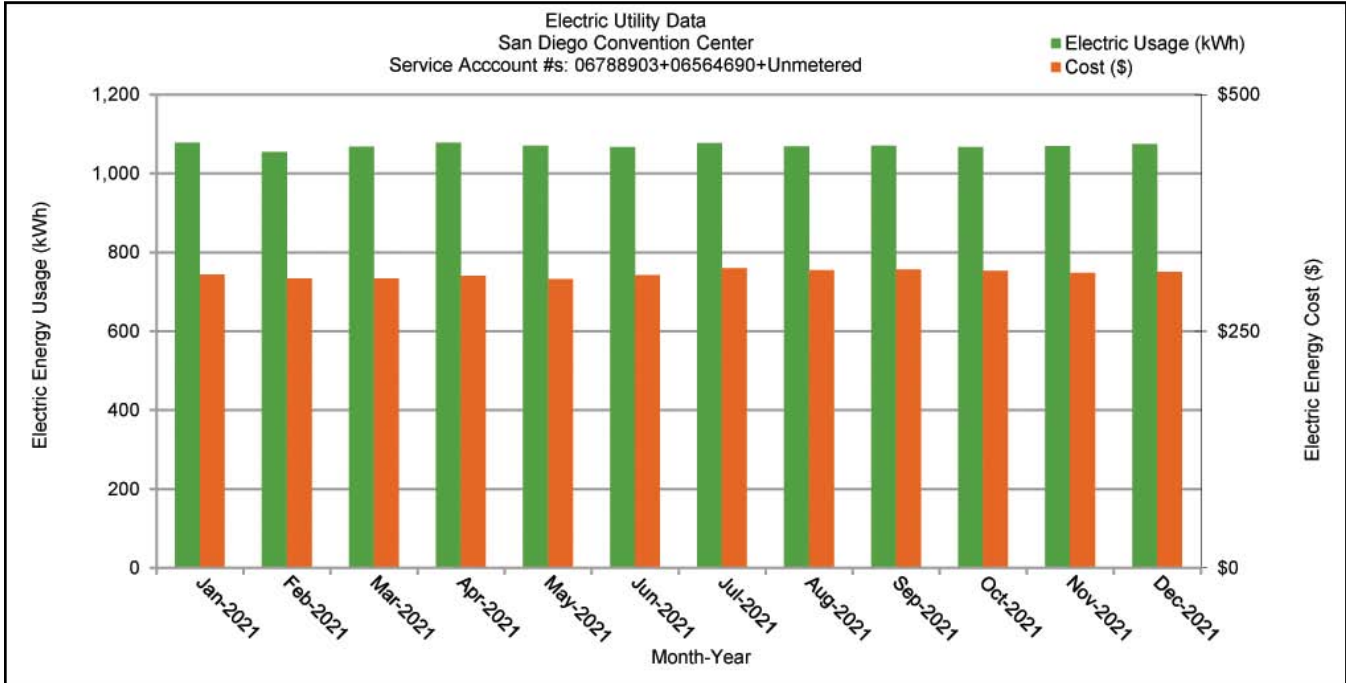
2020 Energy Usage Graph:
Not relevant or developed due to the Covid-19 Pandemic.

SOLAR PV: 2021 ENERGY USAGE

Calendar Year 2021	Account #		Energy Consumption	Energy Peak Demand	Cost	Virtual Rate
			kWh	kW	\$	\$/kWh
	Large Meters	8695-782-175-9	6,335,512	2,048	\$1,476,496	\$0.23
	2059-752-404-4	8,418,193	5,828	\$1,557,310	\$0.18	
Small Meters	6806-708-258-9	954	0	\$532.16	\$0.56	
	2827-471-332-7					
Total		14,754,659	5,828	\$3,034,338	\$0.21	

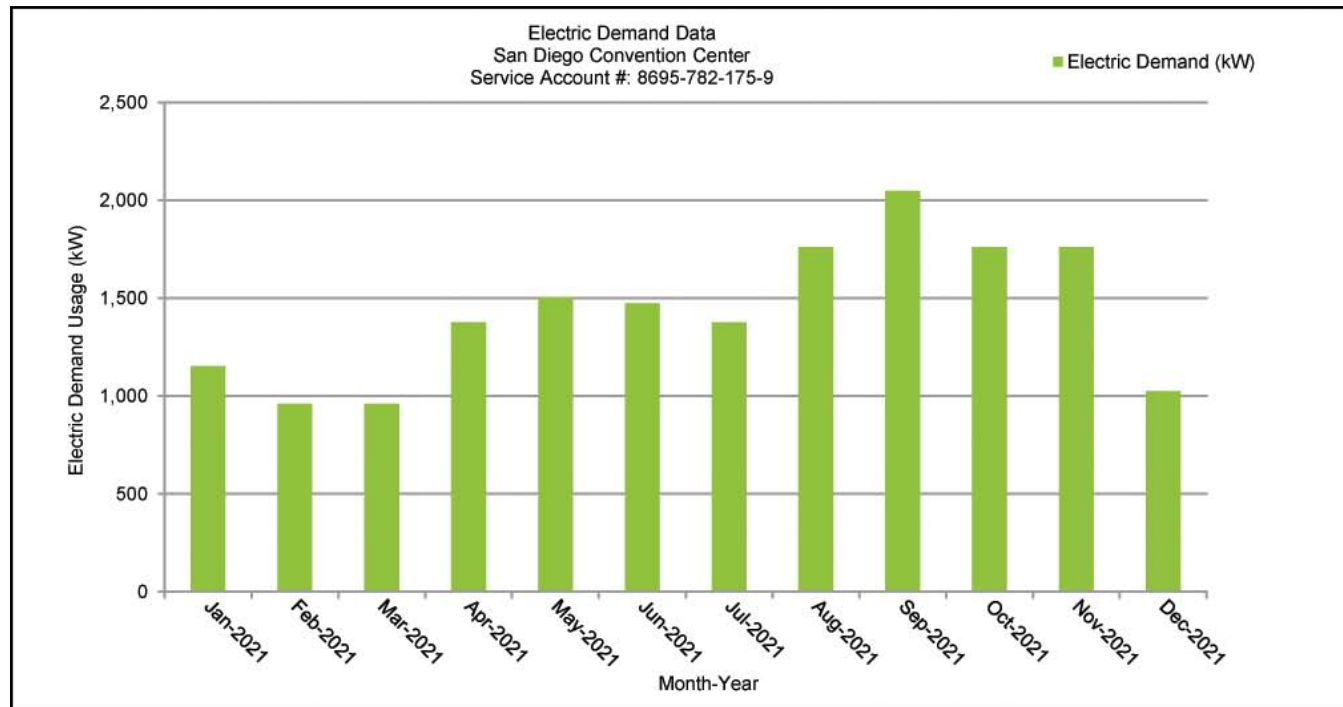
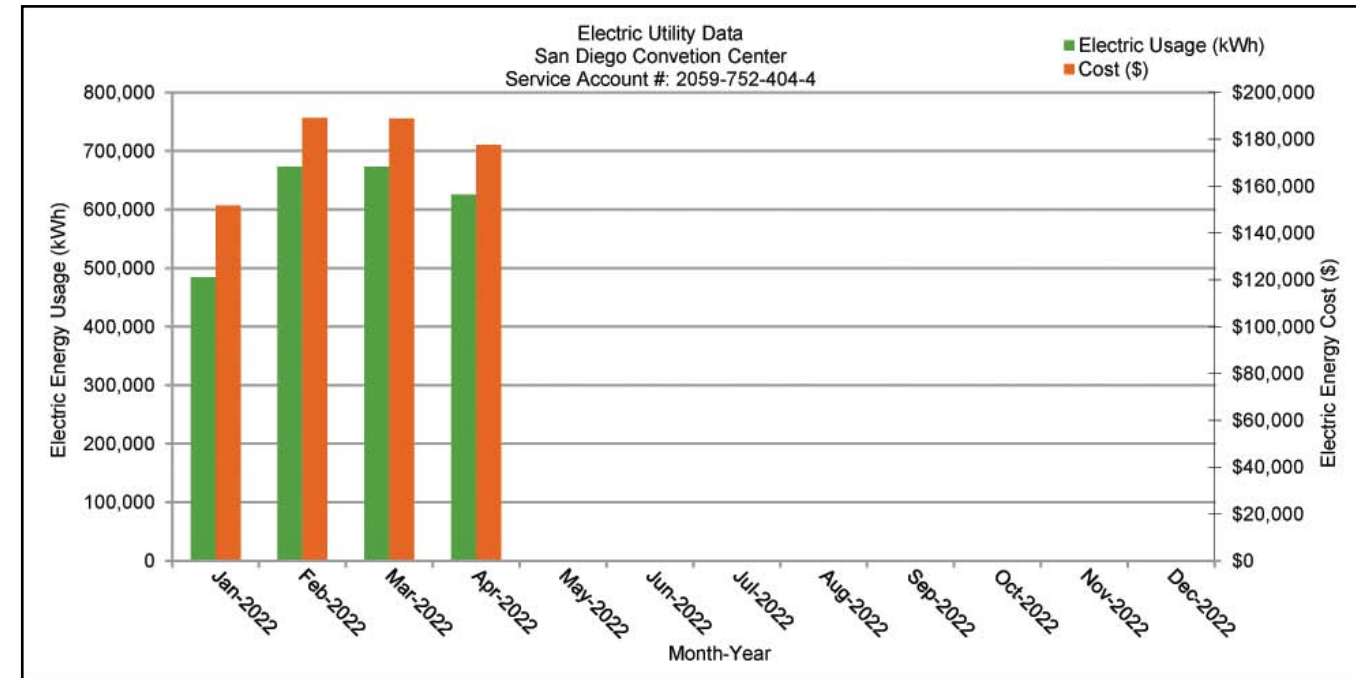
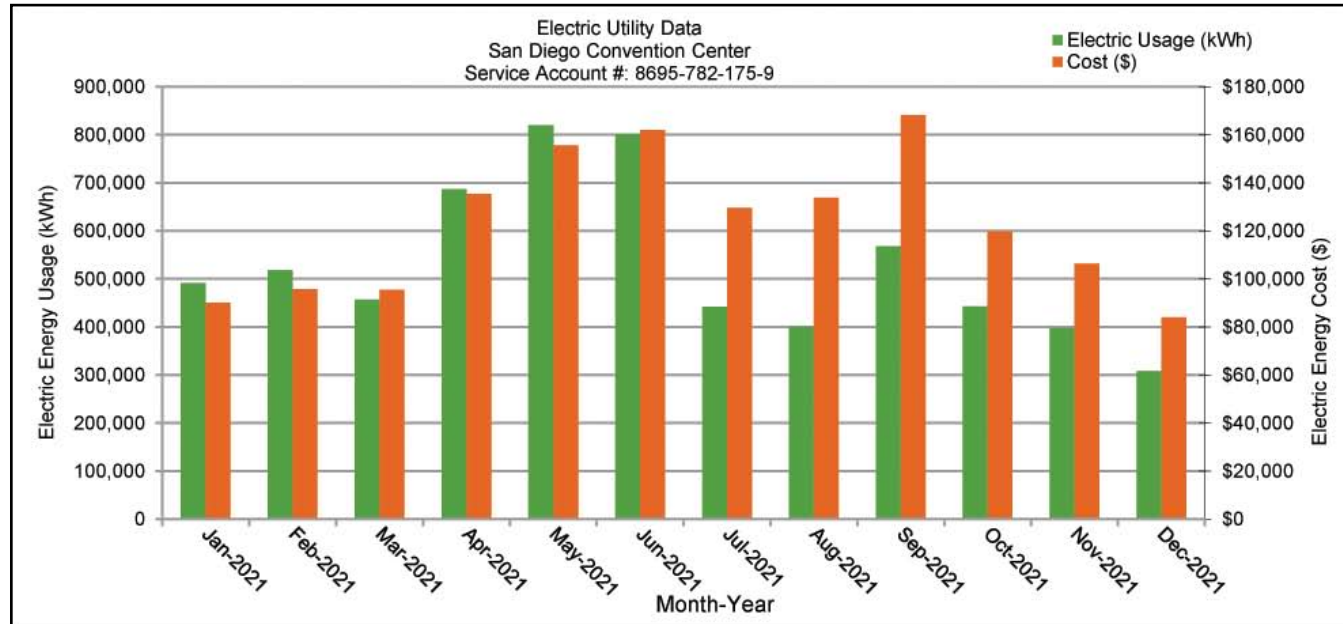
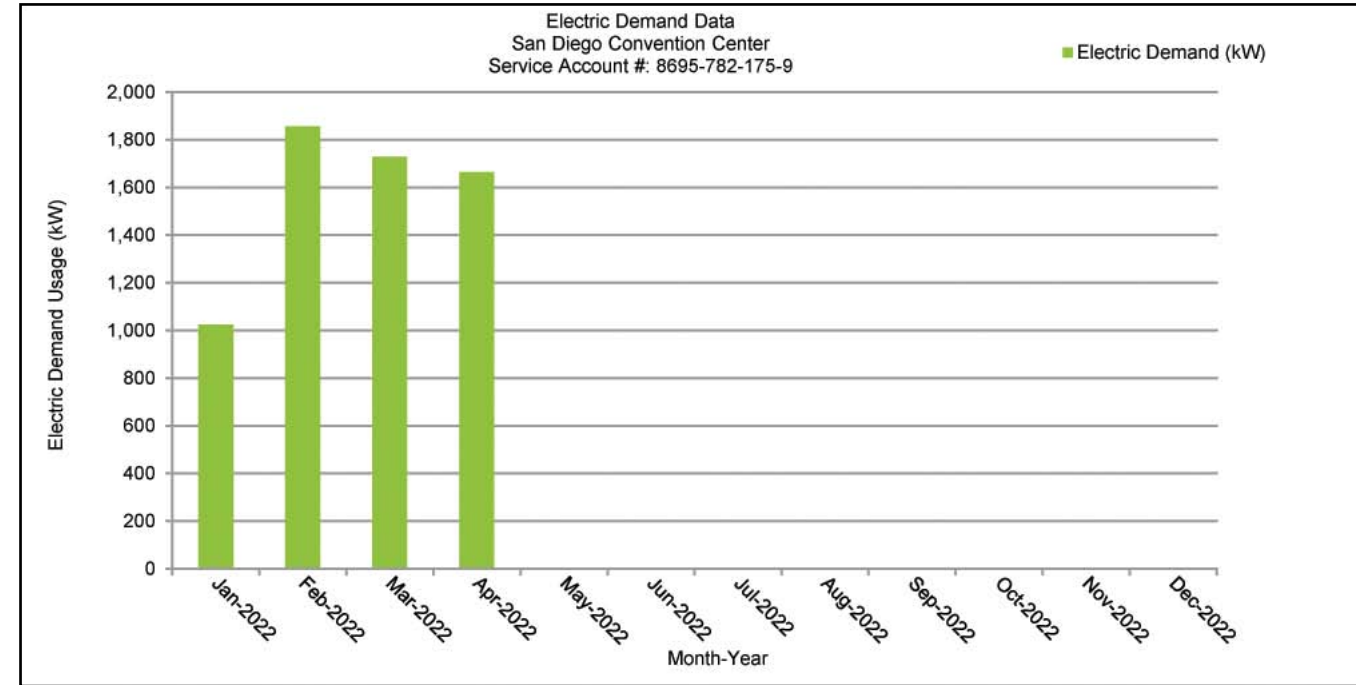


SOLAR PV: 2021 ENERGY USAGE

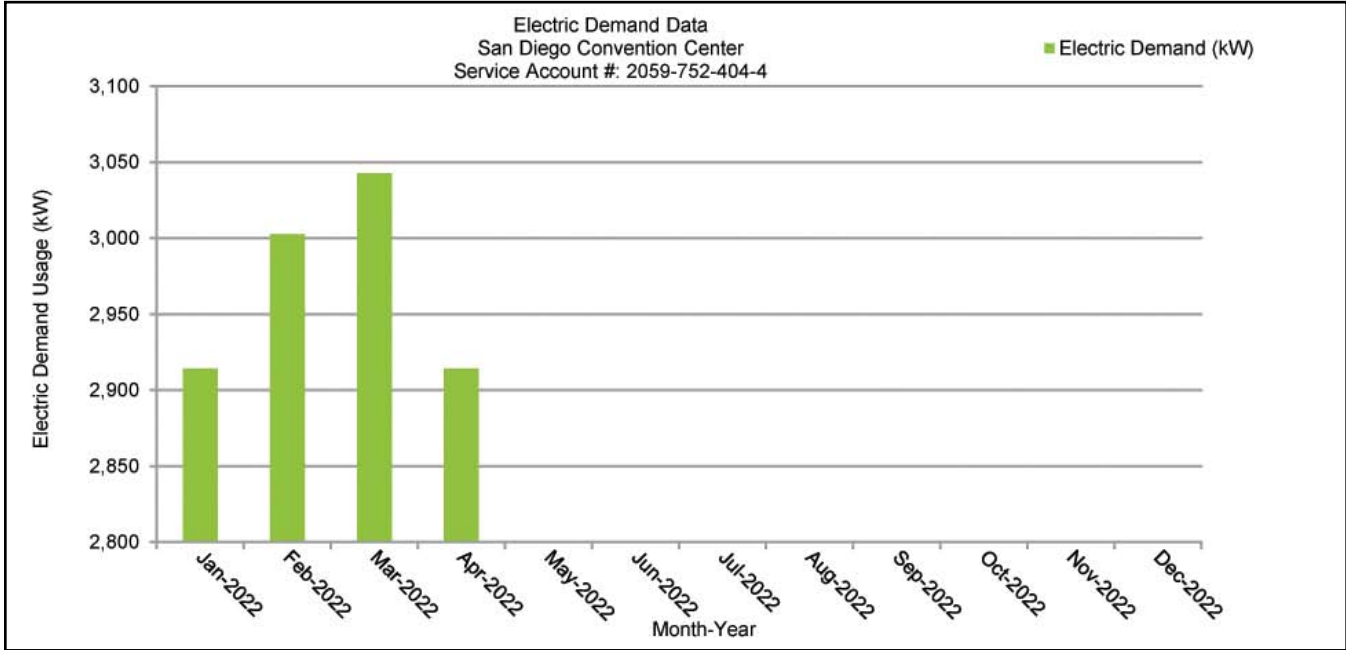


SOLAR PV: 2022 ENERGY USAGE (JANUARY - APRIL)

Calendar Year 2022	Account #		Energy Consumption (January thru April)	Energy Peak Demand (January thru April)	Cost	Virtual Rate
			kWh	kW	\$	\$/kWh
	Large Meters	8695-782-175-9	1,730,240	1,856	\$470,289	\$0.27
	2059-752-404-4	2,456,741	3,043	\$707,612	\$0.29	
Small Meters	6806-708-258-9	239	0	\$134.74	\$0.56	
	2827-471-332-7					
Total		4,187,220	3,043	\$1,178,036	\$0.28	



SOLAR PV: 2022 ENERGY USAGE (JANUARY - APRIL)



SOLAR PV: ENERGY PRODUCTION OUTPUT SIMULATED BY THE SYSTEM ADVISOR MODEL (SAM) SOLAR PV TECHNOLOGY

Forecasted Electricity Cost % Increase/Year	3.5%			
Proposed Solar PV System Size	1,696.7	kW DC		
	1.70	MW DC		
Year	Year	Solar PV System Energy Production (kWh)	Virtual Rate (\$/kWh)	Energy Savings/Cost Avoidance
0	2022	0	\$0.28	\$0.00
1	2024	2,722,933	\$0.29	\$762,421.24
2	2025	2,709,318	\$0.30	\$812,640.97
3	2026	2,695,772	\$0.31	\$836,878.17
4	2027	2,682,293	\$0.32	\$861,838.02
5	2028	2,668,881	\$0.33	\$887,542.16
6	2029	2,655,537	\$0.34	\$914,013.24
7	2030	2,642,259	\$0.36	\$941,273.57
8	2031	2,629,048	\$0.37	\$969,347.17
9	2032	2,615,902	\$0.38	\$998,257.66
10	2033	2,602,823	\$0.39	\$1,028,030.89
11	2034	2,589,809	\$0.41	\$1,058,691.96
12	2035	2,576,860	\$0.42	\$1,090,267.47
13	2036	2,563,976	\$0.44	\$1,122,784.83
14	2037	2,551,156	\$0.45	\$1,156,271.83
15	2038	2,538,400	\$0.47	\$1,190,757.53
16	2039	2,525,708	\$0.49	\$1,226,271.88
17	2040	2,513,080	\$0.50	\$1,262,845.71
18	2041	2,500,514	\$0.52	\$1,300,509.77
19	2042	2,488,012	\$0.54	\$1,339,297.78
20	2043	2,475,572	\$0.56	\$1,379,242.37
21	2044	2,463,194	\$0.58	\$1,420,378.19
22	2045	2,450,878	\$0.60	\$1,462,740.95
23	2046	2,438,623	\$0.62	\$1,506,366.82
24	2047	2,426,430	\$0.64	\$1,551,294.29
25	2048	2,414,298	\$0.66	\$1,597,561.74
	Average Energy Production (kWh/Year)	2,565,651	Average Energy Savings/Year (\$/Year)	\$1,147,101
	Total Energy Production over 25-Year Production (kWh)	64,141,276	Cumulative Energy Savings over 25-Year Production	\$28,677,526

Please note that this proposed solar PV system will generate 64,141,276 kWh of electricity over the estimated useful life (EUL) of the solar modules, which is typically 25 years. This equates to a cost-savings of \$28,677,526, approximately \$27.8M.

These anticipated energy production values are simulated taking into consideration a degradation module rate of .5% per year for the estimated useful life of the modules (EUL).

SOLAR PV: PROPOSED SOLAR PV SYSTEM ANALYSIS/DEPLOYMENT

Based on the analysis of the SDCC Electric Utility Bills for calendar years, 2018,2019, 2021 and 2022, it can easily be concluded that there is an immense economic and financial opportunity to reduce/offset the current energy consumption and energy demand of the SDCC by proposing to install a solar PV system whose size is approximately 1.7 MW DC. Please see figure/appendix for proposed areas/locations of these solar PV systems.

Please note that this proposed solar PV system will generate 64,141,276 kWh of electricity over the estimated useful life (EUL) of the solar modules, which is typically 25 years. This equates to a cost savings of \$28,677,526 ≈ \$28.7M. This energy cost savings is based on a 3.5% increase per year in the electricity cost rate (\$/kWh).

On this document, we are discussing and proposing the client with the three of the most common solar PV financing mechanisms that state and local government entities can use to acquire to deploy renewable energy assets (solar PV systems).

Solar Power Purchase Agreement (PPA):

The PPA financing model is a “third-party” ownership model, which requires a separate, taxable entity (solar developer and/or/tax investor) to procure, install and operate the solar PC system on the client’s premises.

The system owner is often a third-part investor (“tax investor”) who provides investment capital to the project in return for tax benefits. The tax investor is most of the time a limited liability corporation (LLC) by a financial institution. In addition to receiving a stream of revenues from the electricity sales, they also benefit from federal tax incentives.

In conclusion, financing solar PV systems through a power purchase agreement allows state and local governments entities to benefit from clean energy while minimizing up-front expenditures and outsourcing O&M responsibilities. In addition to all the above, a solar PPA provides a predictable electricity cost rate over the length of the contract.

Solar Lease Agreements (SLAs):

Solar Lease Agreements (SLAs) and Solar Power Purchase Agreements (PPAs) have some similarities, but in reality they are very different. SLAs have been used for many years, but in the latest years, the majority of them come with performance guarantees as the PPAs. So then what are the differences?

In a solar lease, what really matter is the guaranteed cost to you every month or quarter, and the amount of electricity that is promised to be produced every month or every quarter by your solar system. In addition to this, in a SLA versus a PPA, you don’t pay for any electric power that your solar modules generate instead you pay a lease payment which might increase by 2% to 4% per year regardless of the generation/production of your solar PV system. This % increase in your lease payments are typically less than the utility % rate increases.

Like PPAs, you have the option to buy the solar PV system later or at the end of your contract terms for a set residual price which is most of the time the Fair Market Value (FMV) at the end of the lease.

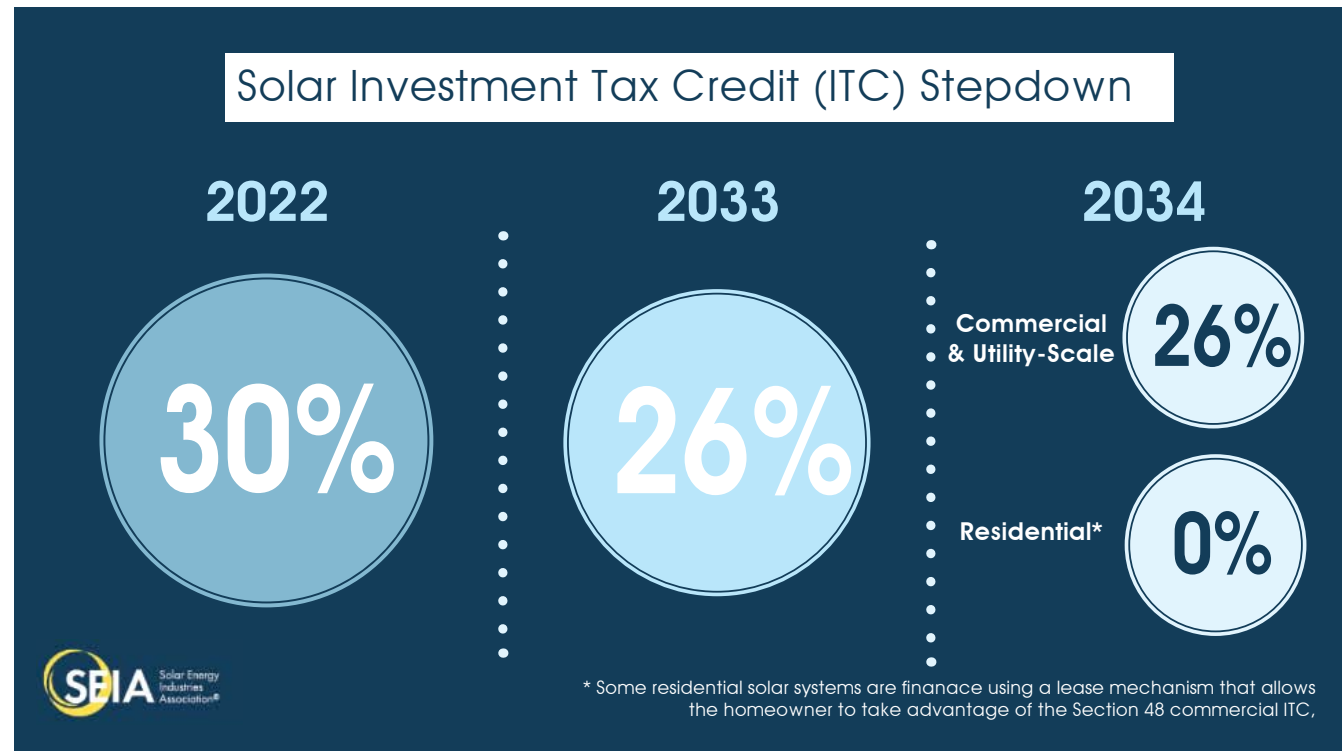
Cash Purchase (CP):

In cash purchase scenario, the client finances his own project with his own funds, owns the electricity generated and is responsible for the service, maintenance, and operation of the solar PV system.

SOLAR PV: PROPOSED SOLAR PV SYSTEM ANALYSIS/DEPLOYMENT (CONTINUED)

If the client is a tax-exempt entity, it will not be able to benefit from the Federal Investment Tax Credit (ITC) which is being reduced every year.

Please see the figure below:



On July 27, 2022, U.S. Senate Majority Leader Chuck Schumer (D-N.Y.) and Sen. Joe Manchin (D-W.V.) introduced the Inflation Reduction Act of 2022, which proposes new and revised tax incentives for clean energy. This is a victory for the solar and clean technology industries. The bill includes \$370 billion in spending for renewable energy and climate measures. One of the most impactful provisions in the bill, which can be read in full text here, is the long-term extension of the Investment Tax Credit, which has been instrumental in launching the solar industry we know today. The bill calls for a 10-year extension at 30% of the cost of the installed equipment, which will then step down to 26% in 2033 and 22% in 2034. The tax credit applies to individuals, businesses, and utility-scale developers of solar technology. The 30% credit also applies to energy storage whether it is co-located or installed as standalone energy storage. This enables the retrofit of a battery to a solar array while taking advantage of the credit.

The Table the right depicts the differences/advantages and disadvantages of each the most common solar PV financing mechanism:

Solar Lease Agreements (SLAs)	Solar Power Purchase Agreements (PPAs)	Cash Purchase
With a solar lease, you're paying a fixed monthly or quarterly lease payment for the solar PV system (modules, inverters, etc.)	With a PPA, you're simply paying for the solar power the modules produce, which will vary from month-to-month.	You basically finance your own project with your own funds.
It reduces your electricity bill.	It reduces your electricity bill.	It reduces your electricity bill.
Most SLAs options are \$0-down, but some require a down payment as pre-paid leases.	Most PPAs options are \$0-down, but some require a down payment.	If your entity is tax-exempt, you cannot take advantage of the federal tax incentives/benefits, and you bear the full risk in this model.
You can typically expect 10-30 percent savings over utility bill costs with a SLA or PPA	You can typically expect 10-30 percent savings over utility bill costs with a SLA or PPA	You own the electricity generated by the system as well as environmental attributes (REC).
If you sign a SLA or PPA, the tax credits and other financial incentives belong to the owner/solar developer of the system (not you).	If you sign a SLA or PPA, the tax credits and other financial incentives belong to the owner/solar developer of the system (not you).	
With a solar lease, you agree to pay a fixed monthly/quarterly lease payment to the lessor regardless of the system generation	With a solar PPA, you agree to purchase only the power generated by the system at a set price per kilowatt-hour (kWh) (i.e., \$0.20 per kWh) instead of paying a fixed amount per month/quarter	
Your lease payment is determined is based on the estimated annual production of your solar PV system.	With a solar PPA, you have more of a guarantee because you will only pay for what the solar system produces. In other words, your payment is tied directly to the production of your solar system.	
With a Solar Lease, you might have a Fixed Price or Fixed Annual Escalator Price; if included your lease payment (monthly/quarterly) could either be fixed or variable depending how it is structured.	With a PPA the client is only paying for the electricity they use, not a fixed monthly lease amount, some people might find this to be the better financial option.	
California allows SLAs and PPAs in comparisons to other states (NC, FL, etc.) in which they are not allowed.	California allows SLAs and PPAs in comparisons to other states (NC, FL, etc.) in which they are not allowed.	
	No operating and maintenance responsibilities.	
	A predictable cost of electricity over the terms of the contract (20 to 25 years).	
	With a Solar PPA - your electricity purchase price rate could be fixed for the entire contract time or variable (an increase in the electricity purchase price rate/year - kWh/year). It depends on how it is negotiated and/or structured.	
	An important aspect of the PPA structure is that a system owner can take advantage of federal tax incentives/benefits (ITC and Depreciation) that a tax-exempt entity cannot. The ITC is currently at 26% tax credit for solar systems.	

CHAPTER 5: ELECTRICAL/NARRATIVE

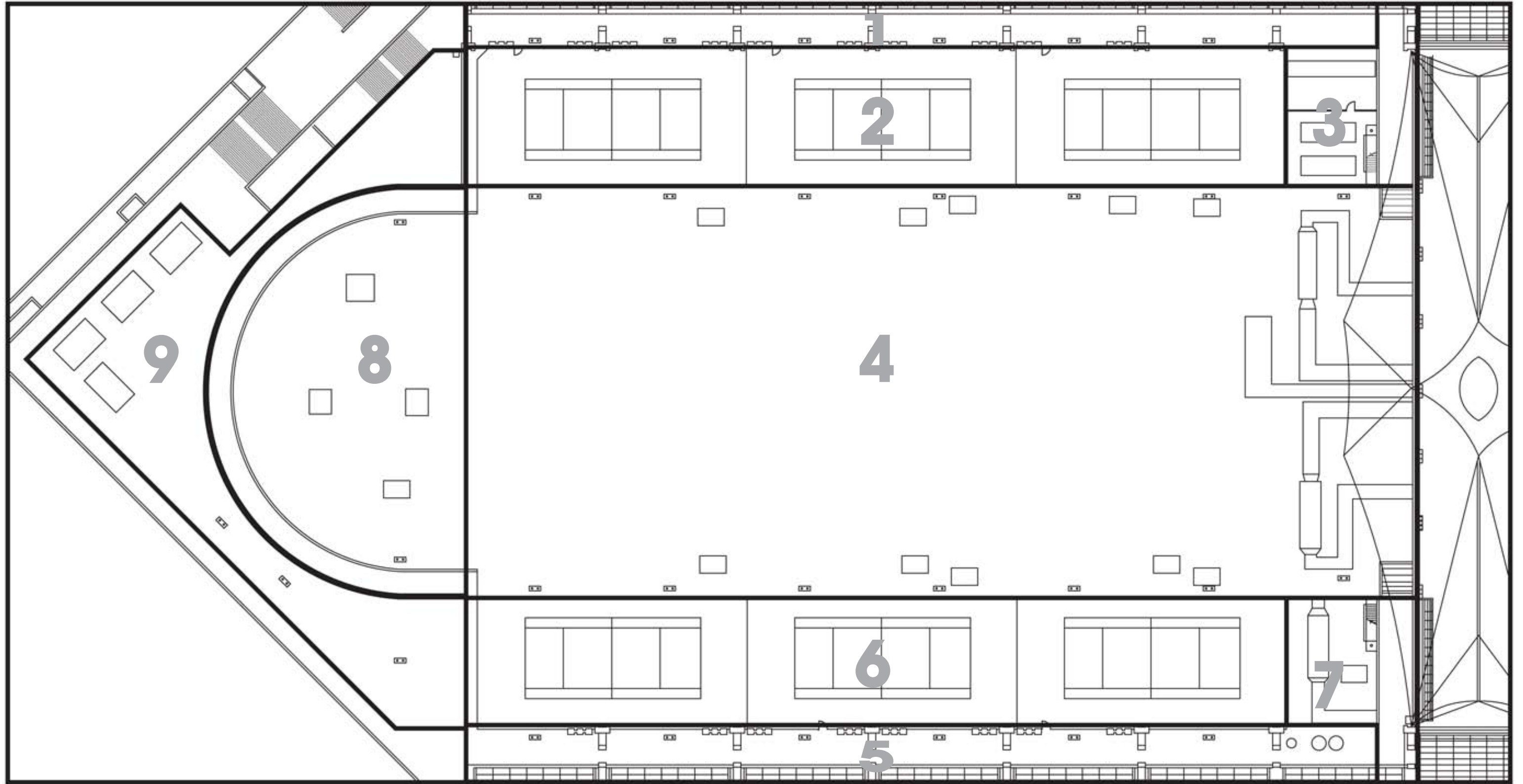
The Design-Build Contractor shall provide design services for a complete code compliant design, including drawings, specifications, and calculations necessary for the removal and re-installation or replacement of all electrical equipment necessary for the roof replacement and PV installation portion of this project. The Contractor shall be responsible for obtaining permits from the City of San Diego, the Port Authority, the Coastal Commission, and any other agencies having jurisdiction over the property of the San Diego Convention Center. All required permits shall be provided for the project prior to the commencement of any construction work. All design and construction work shall be compliant with all applicable standards, building codes, and State of California requirements.

The Design-Build Contractor shall provide contracting services to remove and re-install or remove and replace all existing electrical equipment, and associated work aligned with the mechanical scope of work including but not limited to disconnect safety switches, overcurrent devices, conduit, conductors, supports and associated appurtenances. The contractor shall provide all means necessary for the temporary relocation or replacement of all electrical equipment and conduit on the roof as required for the replacement of the roof. The Design-Build Contractor shall verify all electrical supports and mounting structures are in good working order and available for re-use; where not of sufficient quality for use, the supports and mounting structures shall be replaced. Contractor shall utilize the means and methods required to provide complete and operational electrical systems affected by the roof replacement and solar project to complete the project in phases as required to meet the owners' use requirements for the facility.

The Design-Build Contractor shall provide contracting services and the complete installation of the solar photo-voltaic panels on the roof, with associated electrical systems including but not limited to disconnect safety switches, overcurrent devices, conduit, conductors, supports and associated appurtenances.

The drawings and other criteria provided in this document identify anticipated locations, quantities, and arrangement of existing rooftop equipment and their associated electrical systems. An assessment has been completed and recommendations are included for the removal and replacement of mechanical equipment that is past its useful life and shall need to be replaced, in addition to their associated electrical systems. This equipment shall be identified in the bid form as alternate bids to complete the work indicated. All equipment to be removed and re-installed for the purpose of the roof replacement and solar PV panel project shall be included in the base bid of the project. The attached drawings indicate the observed conditions of the electrical systems. These drawings are for informational purposes only and all work must be field verified by the Design-Build Contractor.

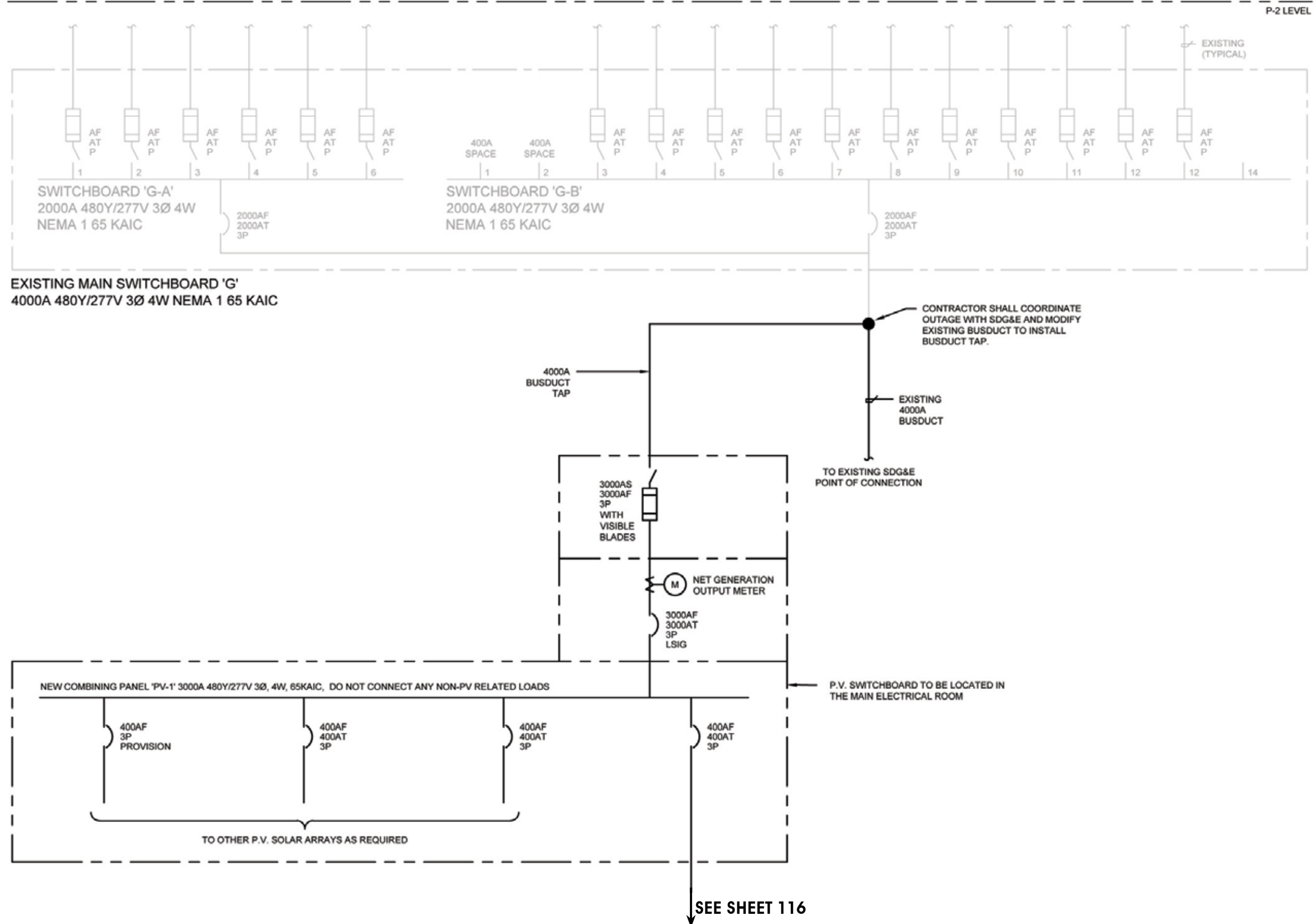
ELECTRICAL: EXISTING ROOF PLAN



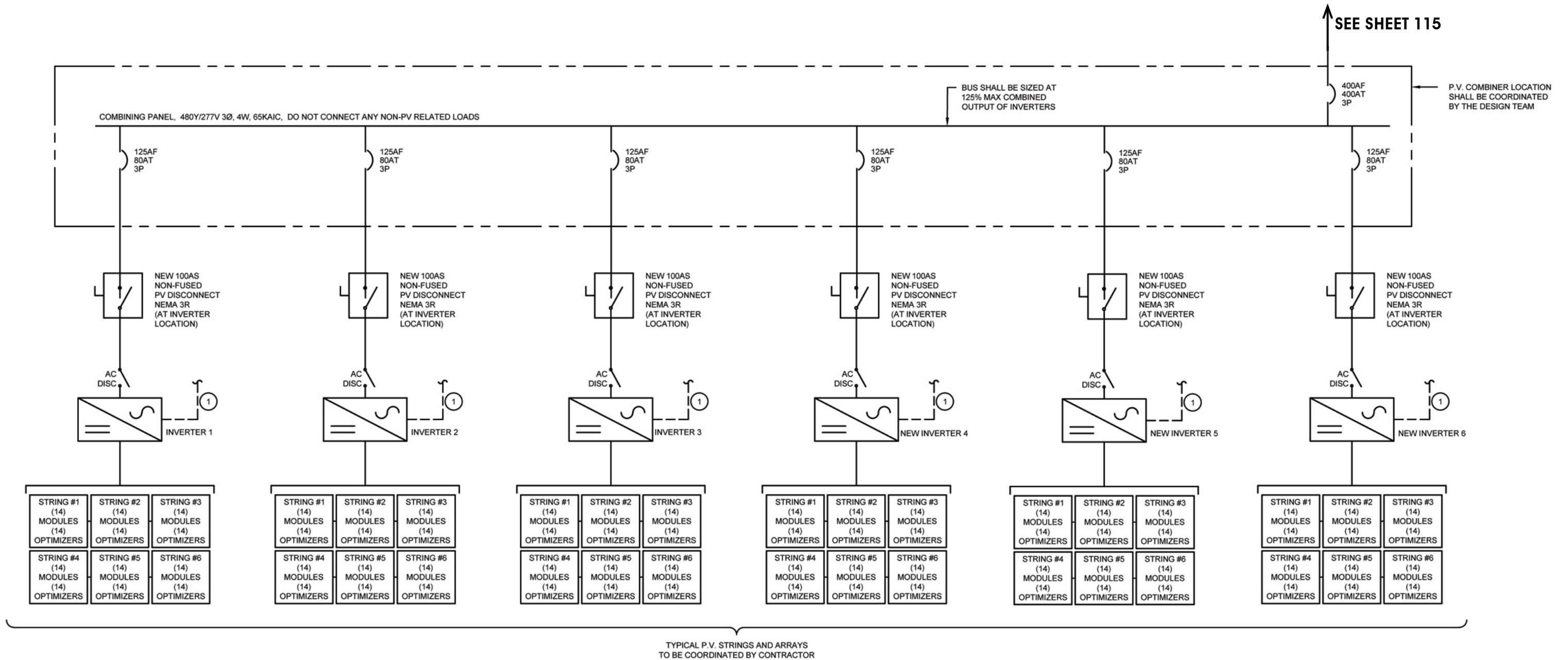
ELECTRICAL: SINGLE LINE DIAGRAM: PV SYSTEM SUMMARY

PV SYSTEM SUMMARY	
Area 2	
Panel Wattage (STC)	475 W (STC)
Quantity of panels for this area	740
System Size (kW DC)	351,500 W (DC)
Area 4	
Panel Wattage (STC)	475 W (STC)
Quantity of panels for this area	1867
System Size (kW DC)	886,825 W (DC)
Area 6	
Panel Wattage (STC)	475 W (STC)
Quantity of panels for this area	740
System Size (kW DC)	351,500 W (DC)
Area 8	
Panel Wattage (STC)	W (STC)
Quantity of panels for this area	
System Size (kW DC)	- W (DC)
Area 9	
Panel Wattage (STC)	475 W (STC)
Quantity of panels for this area	225
System Size (kW DC)	106,875 W (DC)
TOTAL QUANTITY OF MODULES	3,572
TOTAL ESTIMATED SYSTEM SIZE	1,696,700 W (DC) 1,696.7 kW (DC)

ELECTRICAL: SINGLE LINE DIAGRAM: EXISTING



ELECTRICAL: SINGLE LINE DIAGRAM: PROPOSED



GENERAL NOTES:

1. INFORMATION SHOWN ON THIS SINGLE LINE DIAGRAM IS FOR BUDGETING PURPOSES ONLY. CONTRACTOR SHALL COORDINATE DESIGN REQUIREMENTS WITH EXISTING CONDITIONS AS NECESSARY.
2. CONTRACTOR SHALL COORDINATE WITH SAN DIEGO CONVENTION CENTER FACILITY STAFF TO DETERMINE WHICH SUBSTATION SHALL BE APPROPRIATE TO PROVIDE BUSDUCT TAP FOR NET GENERATION OUTPUT TO UTILITY.
3. CONTRACTOR SHALL COORDINATE QUANTITIES OF SOLAR P.V. MODULES, STRINGS, ARRAYS AND INVERTERS WITH THE REQUIREMENTS OF DESIGN.

(X) KEY NOTES:

1. CAT5 CABLE IN CONDUIT TO RAPID SHUT-DOWN.

CHAPTER 6: STRUCTURAL NARRATIVE

Conceptual framing, connections, details and dimensions shown in the RFP package's structural drawings are for information only. The Structural Engineers who will do the final designs shall perform their own structural design and detailing. The contractor shall field-verify all existing details and dimensions and resolve all conflicts before starting any construction. In the provided proposed structural layout, the new horizontal steel beams are supported by steel columns which are spread out at 10 ft. on center in each direction. The referenced horizontal steel beams will support the new photovoltaic (PV) system. The referenced steel columns are approximately 4 ft. in height.

The drawings provided in RFP package are **for information purposes only and all work must be field-verified by the Design-Build Contractor.**

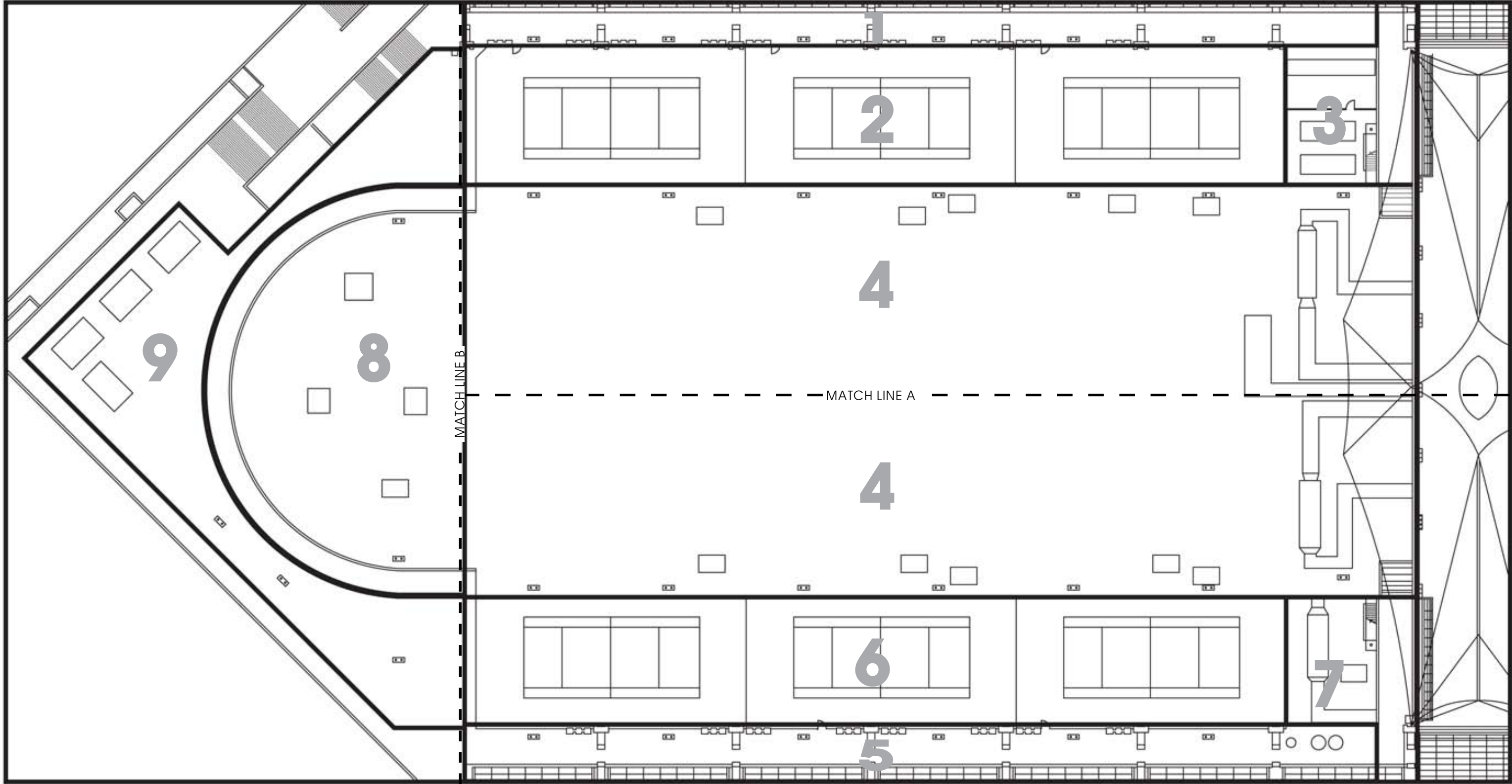
The Design-Build Contractor shall provide design services for a complete code compliant design, including drawings, specifications and calculations necessary for, and to obtain permits from the City of San Diego, the Port Authority, the Coastal Commission and any other agency having jurisdiction over the property of the San Diego Convention Center.

All design and construction work shall be compliant with all applicable standards, building codes, and State of California requirements.

Shoring and bracing shall be the sole responsibility of the contractor to ensure that safety and structural integrity of existing and new structures are not compromised during the entire construction process. The safety compliance shall be in accordance with all national, state and local safety ordinances.

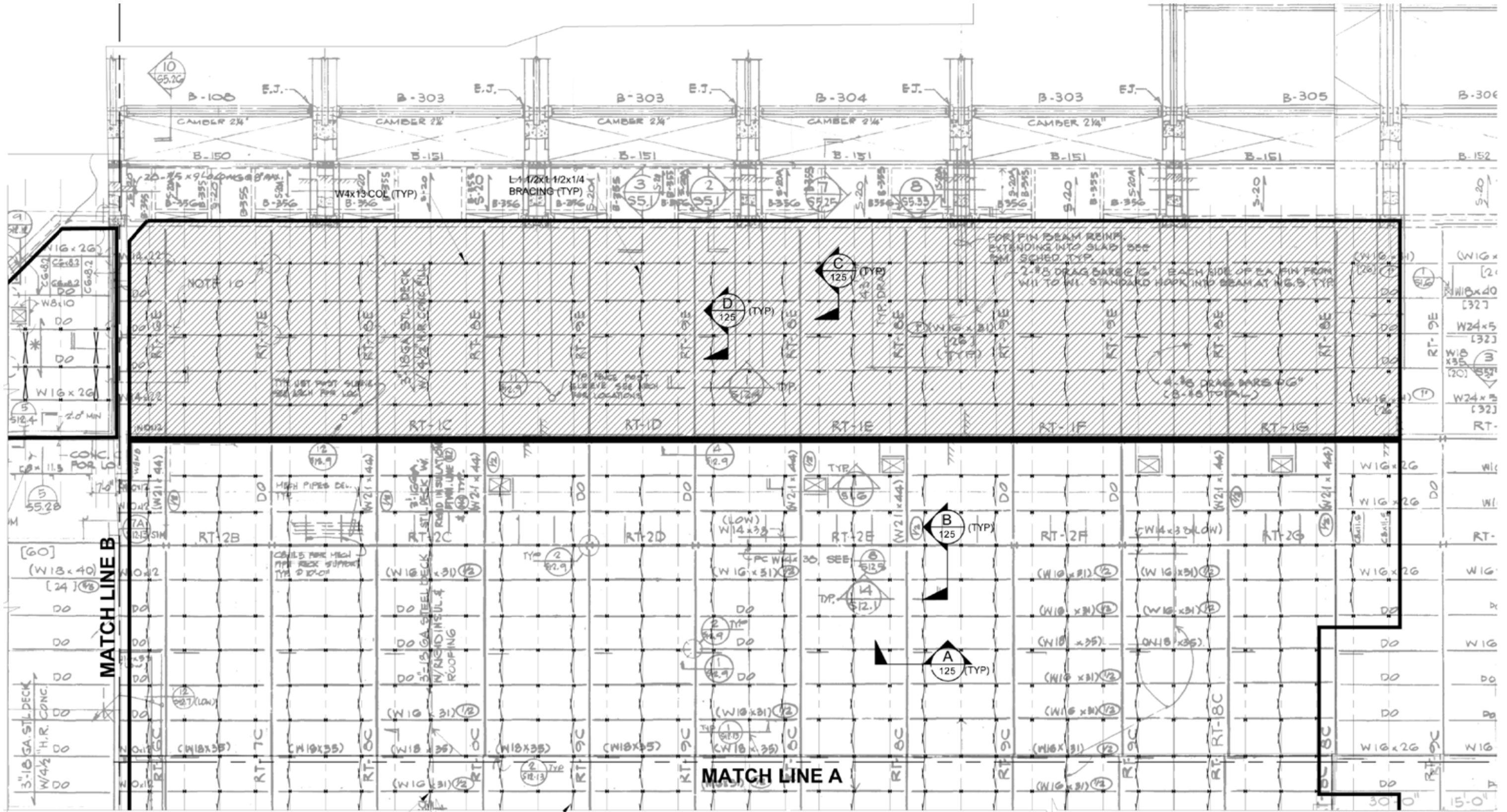
All erection procedures shall conform to Cal-OSHA standards. Any deviations must be approved by Cal-OSHA prior to erection.

STRUCTURAL: GRID PLAN



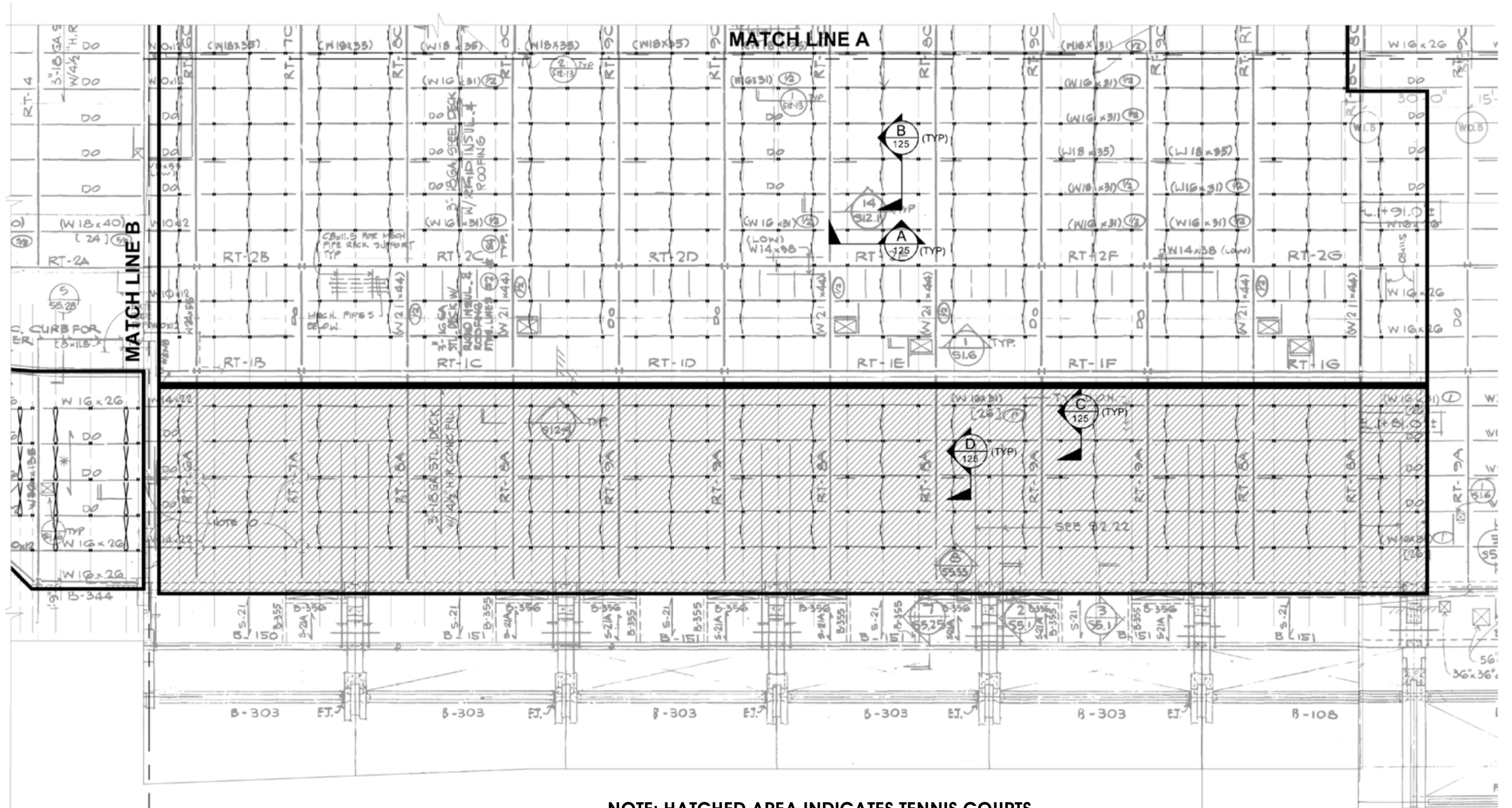
NOTE: GRID PLAN AREAS 2, 4, 6, AND 9 WILL HAVE PHOTOVOLTAIC SYSTEM

STRUCTURAL: NEW COLUMNS LAYOUT ON EXISTING ROOF FRAMING PLAN - GRIDS 1, 2 & PART OF 4



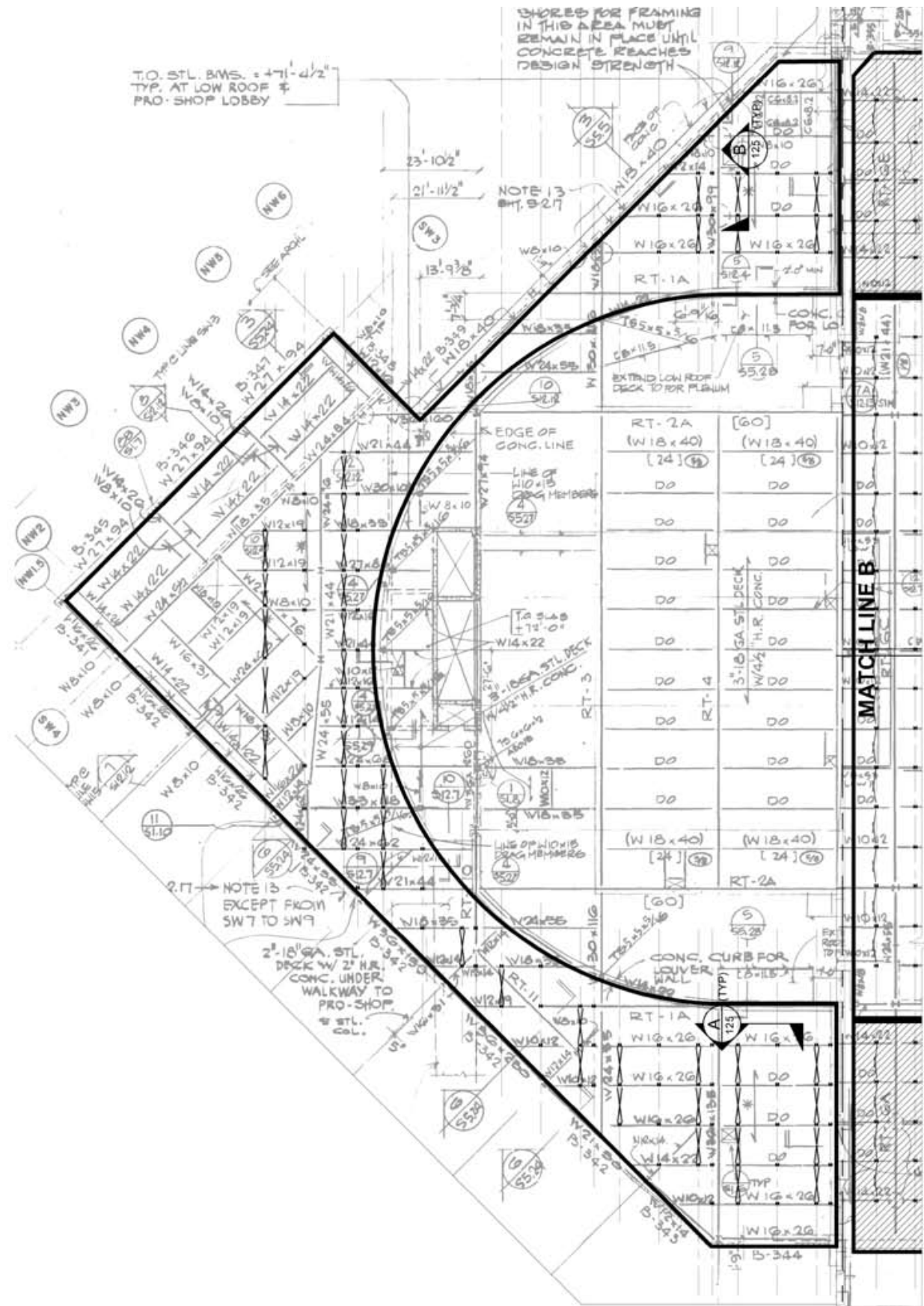
**NOTE: HATCHED AREA INDICATES TENNIS COURTS
(NON-STRUCTURAL CONCRETE TOPPING ABOVE RIGID INSULATION TO BE REMOVED, SEE PG. 125)**

STRUCTURAL: NEW COLUMNS LAYOUT ON EXISTING ROOF FRAMING PLAN - GRIDS PART OF 4, 5 & 6



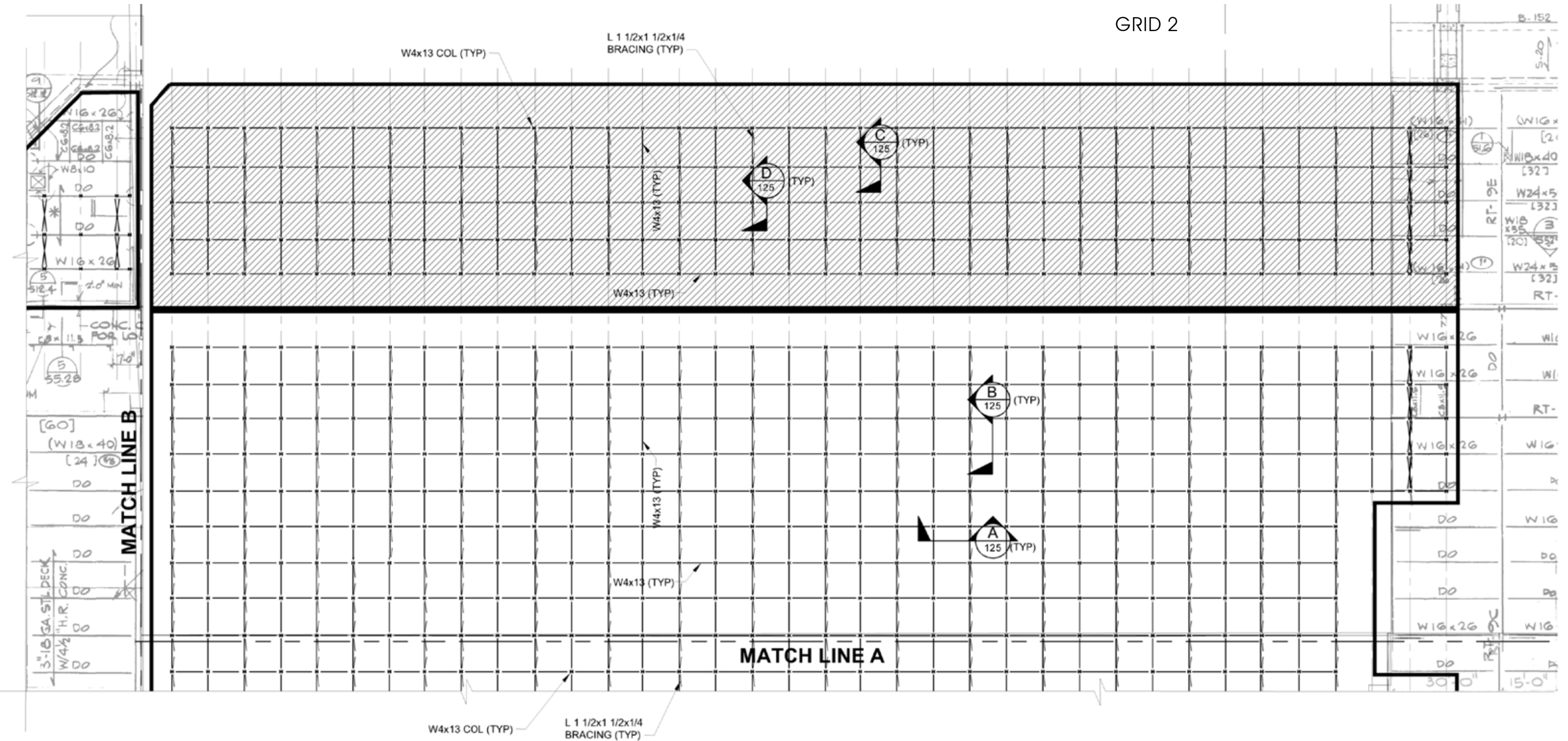
**NOTE: HATCHED AREA INDICATES TENNIS COURTS
(NON-STRUCTURAL CONCRETE TOPPING ABOVE RIGID INSULATION TO BE REMOVED, SEE PG. 125)**

STRUCTURAL: STRUCTURAL: NEW COLUMNS LAYOUT ON EXISTING ROOF FRAMING PLAN - GRIDS 8 & 9



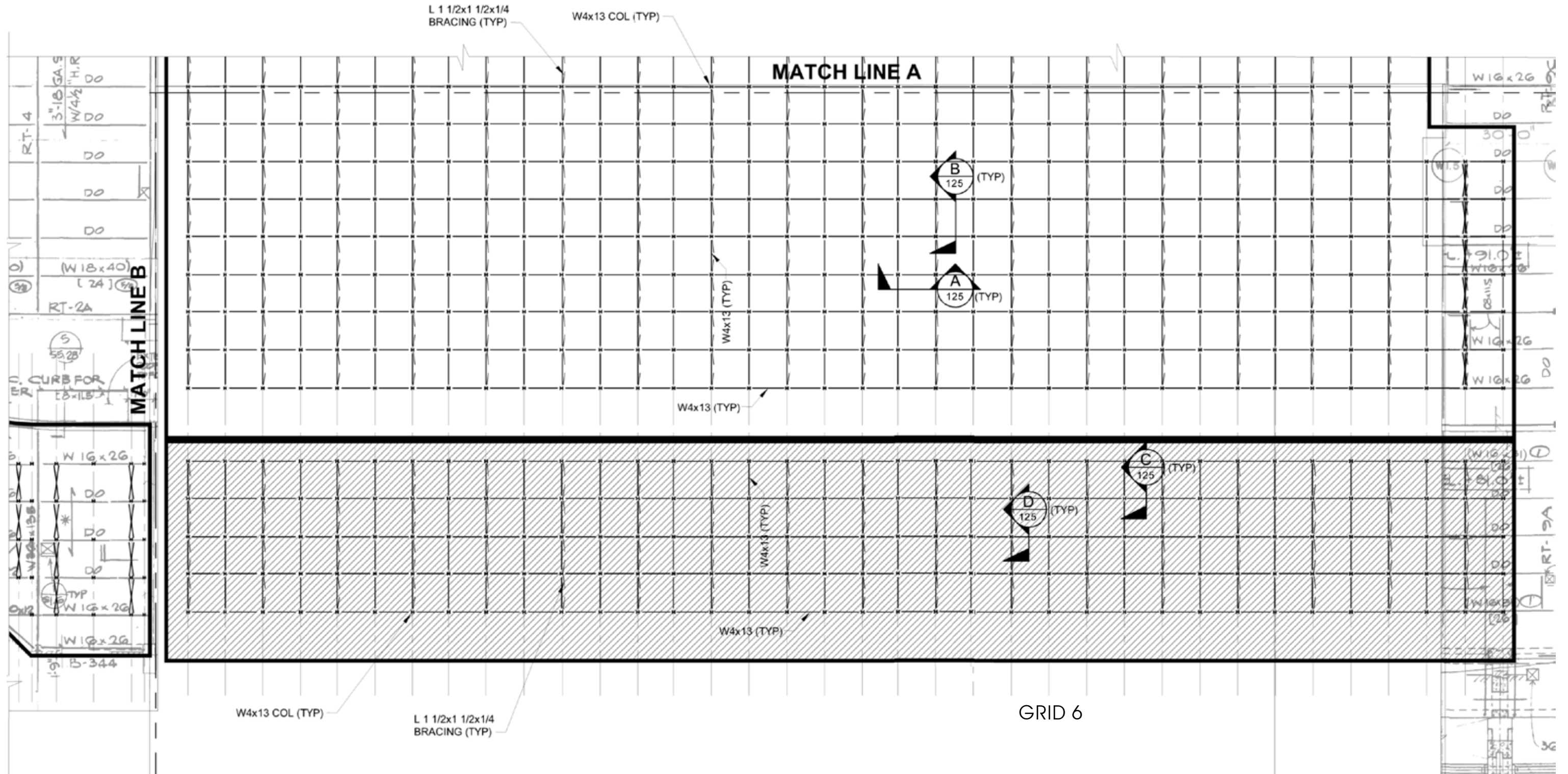
**NOTE: HATCHED AREA INDICATES TENNIS COURTS
(NON-STRUCTURAL CONCRETE TOPPING ABOVE RIGID INSULATION TO BE REMOVED, SEE PG. 125)**

STRUCTURAL: NEW BEAMS LAYOUT FOR SUPPORT OF PHOTOVOLTAIC SYSTEM - GRIDS 1, 2 & PART OF 4



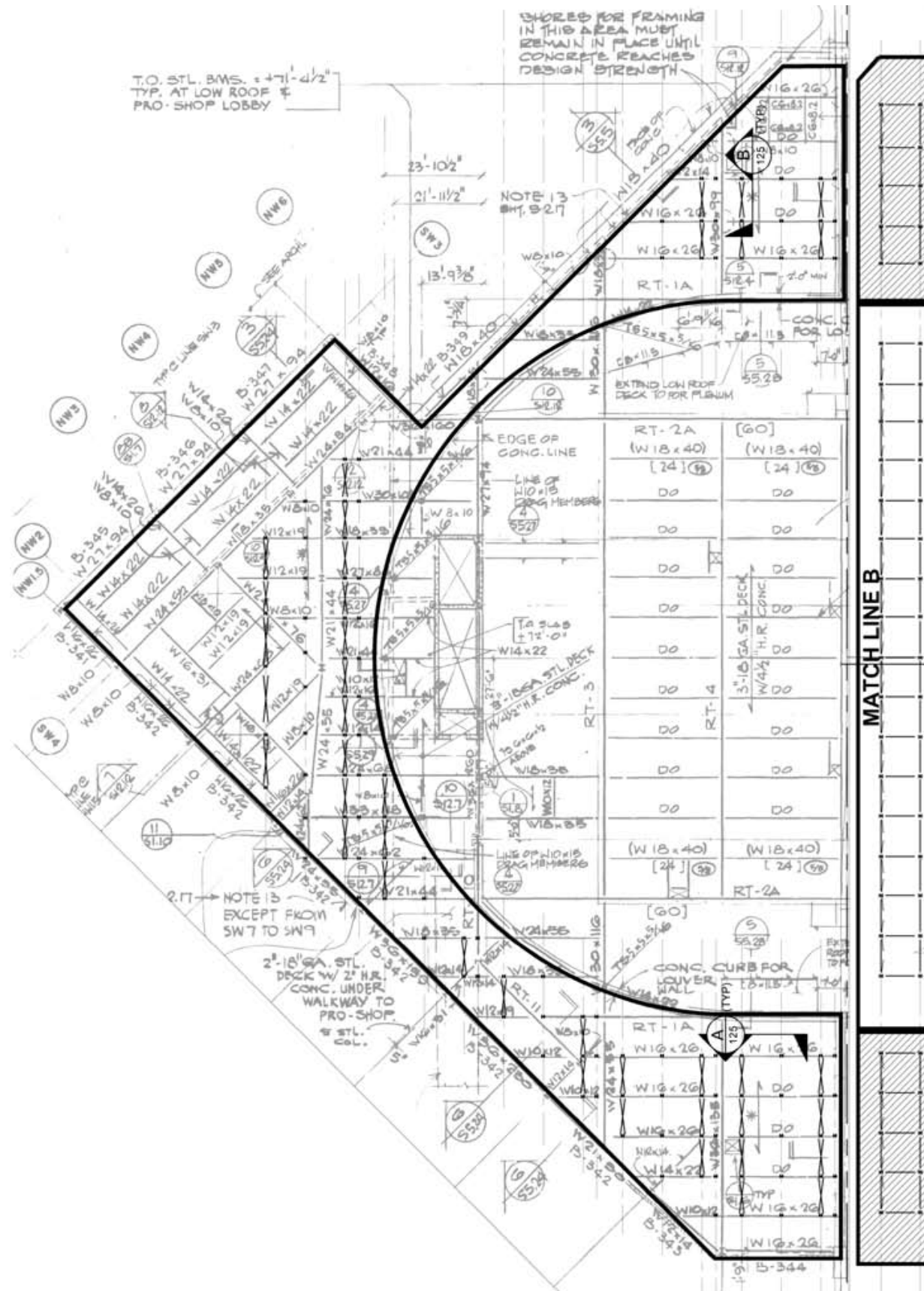
**NOTE: HATCHED AREA INDICATES TENNIS COURTS
(NON-STRUCTURAL CONCRETE TOPPING ABOVE RIGID INSULATION TO BE REMOVED, SEE PG. 125)**

STRUCTURAL: NEW BEAMS LAYOUT FOR SUPPORT OF PHOTOVOLTAIC SYSTEM - GRIDS PART OF 4 & 6



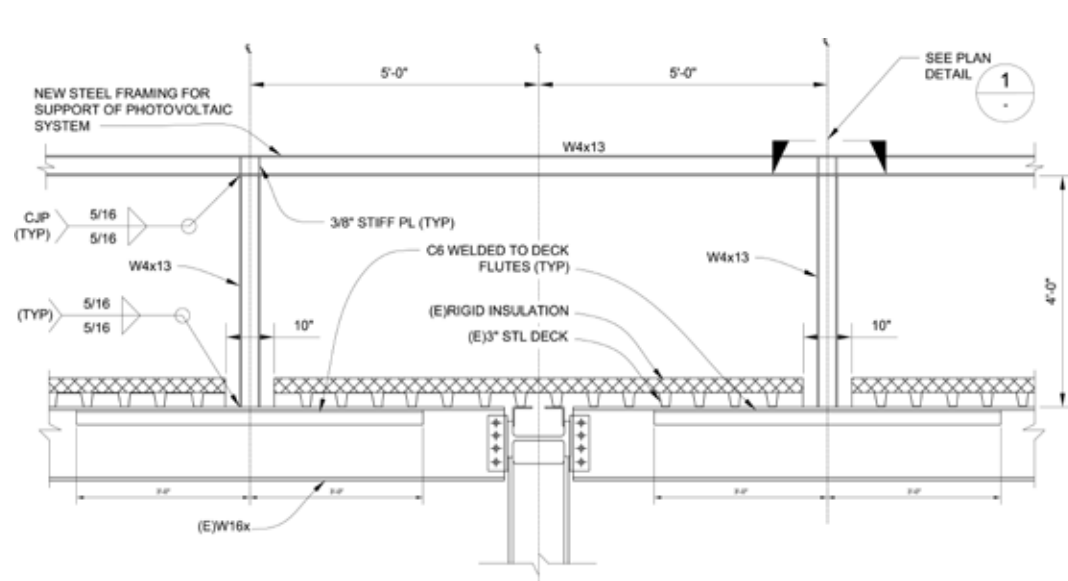
**NOTE: HATCHED AREA INDICATES TENNIS COURTS
(NON-STRUCTURAL CONCRETE TOPPING ABOVE RIGID INSULATION TO BE REMOVED, SEE PG. 125)**

STRUCTURAL: NEW BEAMS LAYOUT FOR SUPPORT OF PHOTOVOLTAIC SYSTEM - GRID 8 & 9

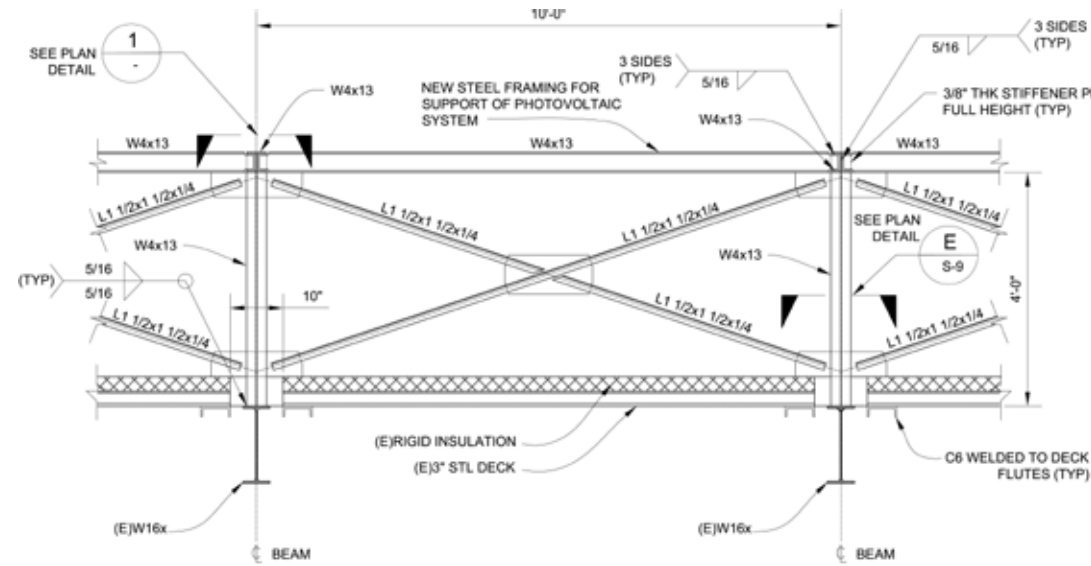


**NOTE: HATCHED AREA INDICATES TENNIS COURTS
(NON-STRUCTURAL CONCRETE TOPPING ABOVE RIGID INSULATION TO BE REMOVED, SEE PG. 125)**

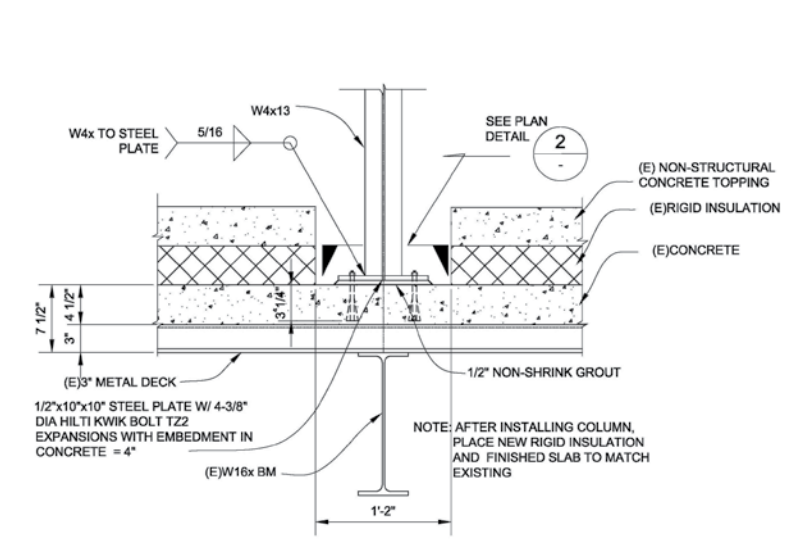
STRUCTURAL: SECTIONS AND DETAILS



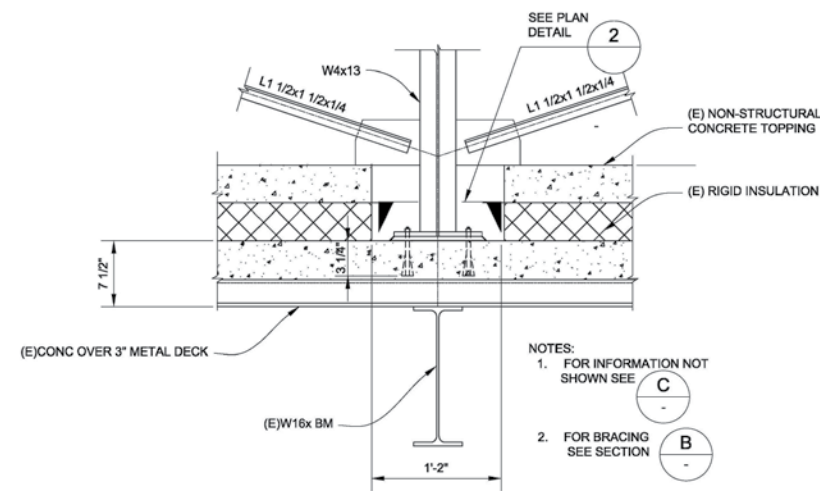
A W4x13 COLUMN CONNECTION TO EXISTING STEEL ROOF FRAMING
NTS



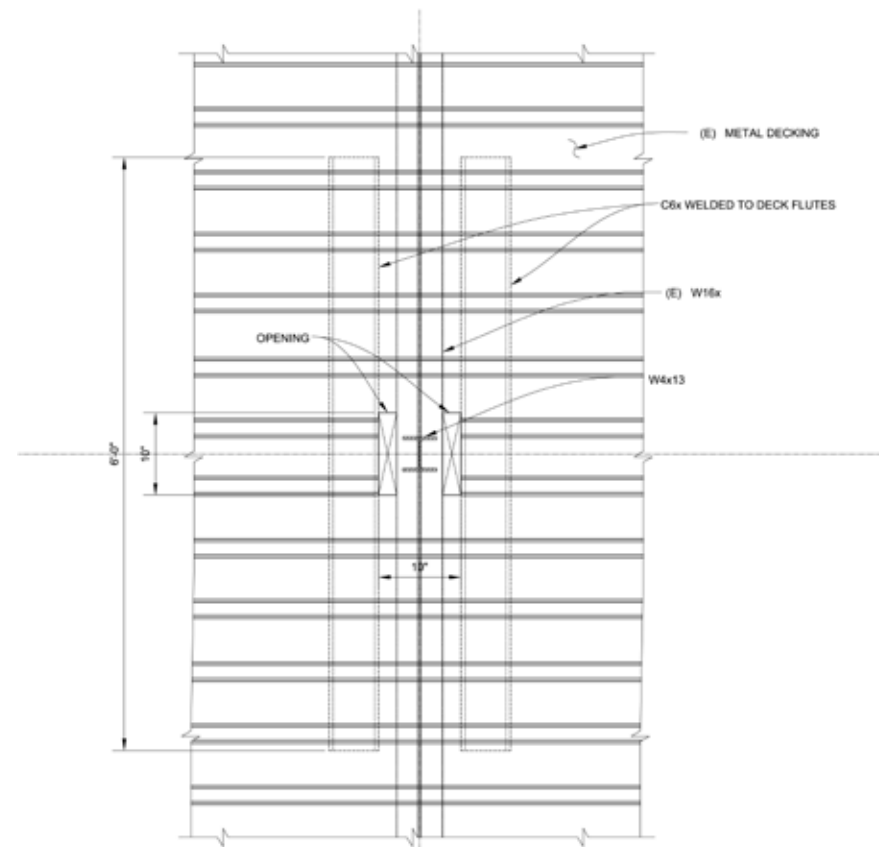
B W4x13 COLUMN CONNECTION TO EXISTING STEEL ROOF FRAMING
NTS



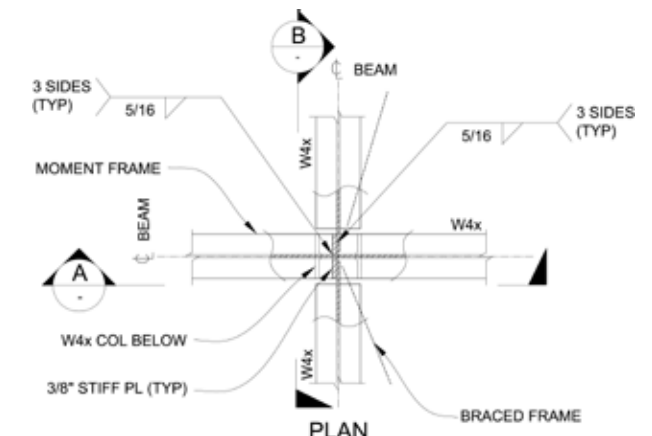
C AT TENNIS COURT:
W4x13 COLUMN CONNECTION TO EXISTING CONCRETE TOPPING OVER METAL DECK



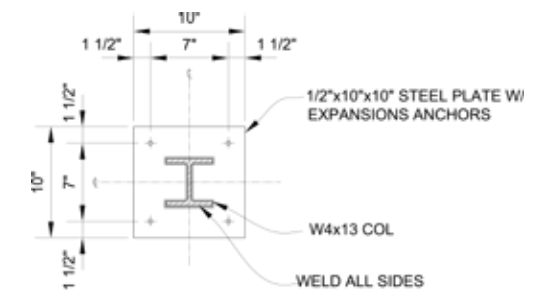
D AT TENNIS COURT:
W4x13 COLUMN CONNECTION TO EXISTING CONCRETE TOPPING OVER METAL DECK



E SECTION
NTS



1 DETAIL
NTS



2 DETAIL
NTS