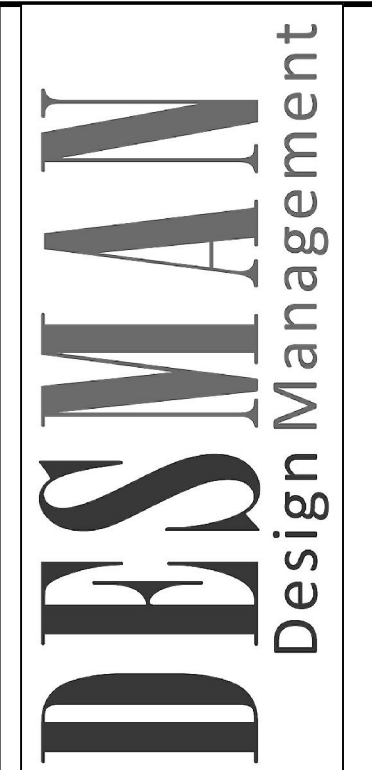


2019 REPAIR AND PREVENTIVE MAINTENANCE
OF THE
CITY OF ST. LOUIS FIVE PARKING GARAGES
ST. LOUIS, MISSOURI
JUNE, 2019



REPAIR AND PREVENTIVE MAINTENANCE
OF THE
CITY OF ST. LOUIS FOUR GARAGES
ST. LOUIS, MISSOURI

SCOPE OF WORK (Summary only)

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GENERAL NOTES

- NINE NORTH PARKING GARAGE
 - HORIZONTAL CONCRETE REPAIRS
 - ROUT AND SEAL CRACKS
 - REPLACE JOINT SEALANTS
 - REPLACE MASONRY WALL JOINT FILLER
 - APPLICATION OF A SILANE SEALER
 - GARAGE RESTRIPING
- ARGYLE PARKING GARAGE
 - HORIZONTAL CONCRETE REPAIRS
 - ROUT AND SEAL CRACKS
 - EPOXY INJECT CRACKS
 - REPLACE JOINT SEALANTS
 - RECOAT EXISTING WATERPROOFING MEMBRANE
 - APPLICATION OF A SILANE SEALER
 - GARAGE RESTRIPING
- CENTRAL DOWNTOWN PARKING GARAGE
 - HORIZONTAL CONCRETE REPAIRS
 - VERTICAL/OVERHEAD CONCRETE REPAIRS
 - REPLACE JOINT SEALANTS
 - REPLACE EXPANSION JOINT SEAL
 - RECOAT EXISTING WATERPROOFING MEMBRANE
 - APPLY NEW WATERPROOFING MEMBRANE
 - APPLICATION OF A SILANE SEALER
 - GARAGE RESTRIPING

- KIEL CENTER PARKING GARAGE
 - HORIZONTAL CONCRETE REPAIRS
 - VERTICAL/OVERHEAD CONCRETE REPAIRS
 - ROUT AND SEAL CRACKS
 - REPLACE JOINT SEALANTS
 - APPLICATION OF A SILANE SEALER
 - APPLY NEW WATERPROOFING MEMBRANE
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- CUPPLES STATION PARKING GARAGE
 - PARTIAL DEPTH CONCRETE REPAIRS
 - ROUT AND SEAL CRACKS
 - REPLACE JOINT SEALANTS
 - EPOXY INJECT CRACKS
 - REPLACE EXPANSION JOINT SEAL
 - APPLY NEW WATERPROOFING MEMBRANE
 - APPLICATION OF A SILANE SEALER
 - REPLACE DAMAGED STAIRWAY SIGNAGE
 - ASPHALT PARKING LOT REPAIRS
 - GARAGE AND LOT RESTRIPING

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| | <u>NINE NORTH PARKING GARAGE</u> | | |
| R-01 | LOWER LEVEL PLAN | R-18 | LEVEL ONE PLAN |
| R-02 | GROUND LEVEL PLAN | R-19 | LEVEL TWO PLAN |
| R-03 | SECOND LEVEL PLAN | R-20 | LEVEL THREE PLAN |
| | <u>ARGYLE PARKING GARAGE</u> | R-21 | LEVEL FOUR PLAN |
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| R-07 | LEVEL FOUR PLAN | R-24A | LEVEL EIGHT (PARTIAL ROOF) PLAN |
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| R-14 | LEVEL SEVEN PLAN | | <u>DETAILS</u> |
| R-15 | LEVEL EIGHT PLAN | R-31 | REPAIR DETAILS |
| R-16 | LEVEL NINE PLAN | R-32 | REPAIR DETAILS |
| R-17 | LEVEL TEN PLAN | R-33 | ASPHALT/PAVING REPAIR DETAILS |
| | | R-34 | NOTES |

GARAGE LOCATIONS

NINE NORTH PARKING GARAGE
9N S EUCLID AVENUE, ST. LOUIS, MO 63108

ARGYLE PARKING GARAGE
225 N EUCLID AVENUE, ST. LOUIS, MO 63108

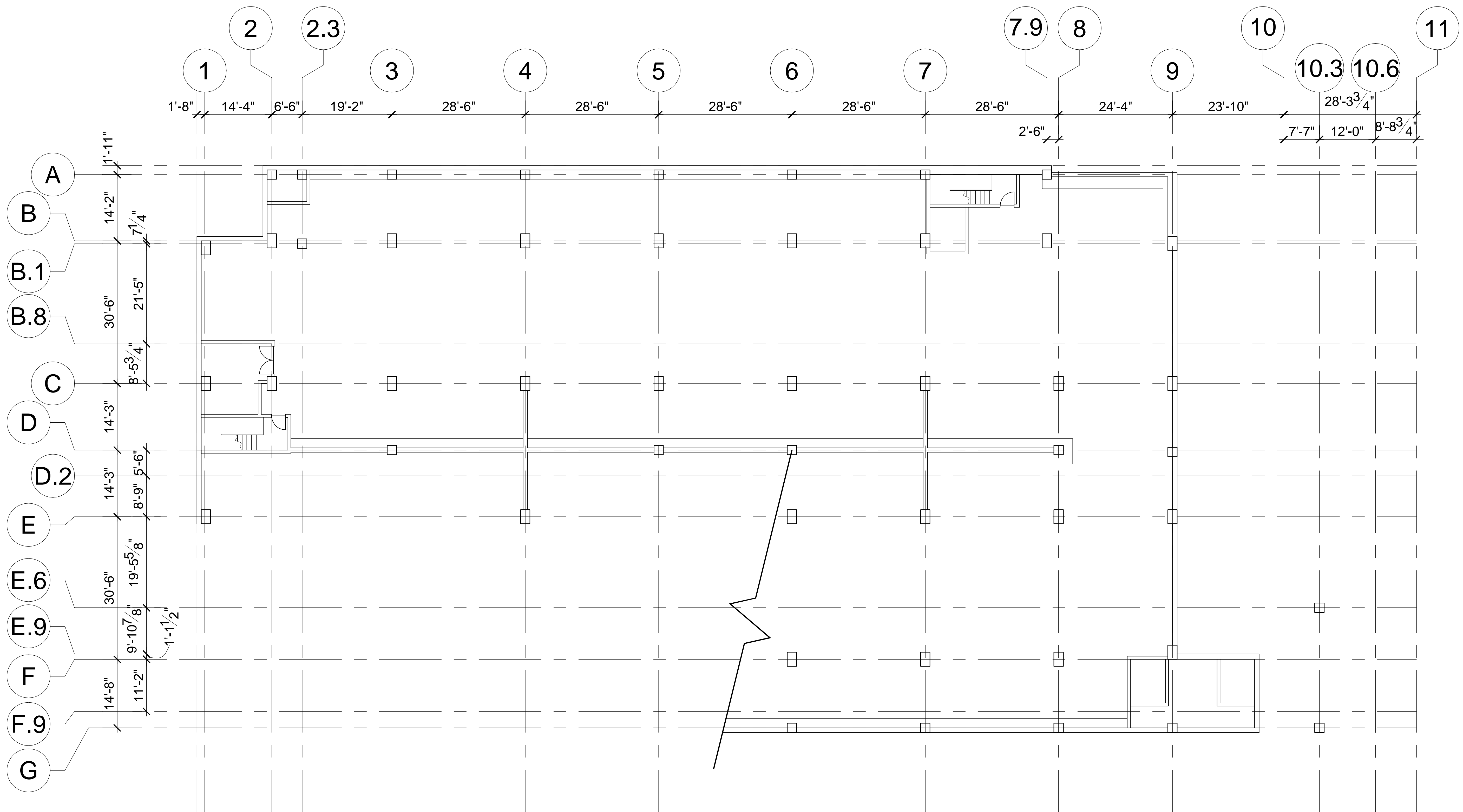
CENTRAL DOWNTOWN PARKING GARAGE
707 PINE STREET, ST. LOUIS, MO 63101

KIEL CENTER PARKING GARAGE
1515 CLARK AVENUE, ST. LOUIS, MO 63103

CUPPLES STATION PARKING GARAGE
421S S 10TH STREET, ST. LOUIS, MO 63102

- The following general notes shall apply unless noted otherwise on plans.
- All design and construction shall be in accordance with 2018 International Building Code and City of St. Louis local amendments.
 - Do not scale dimensions from drawings.
 - Contractor is responsible to verify all dimension shown on plans with existing conditions prior to commencing work.
 - Contractor shall report immediately to the Engineer any discrepancies or incorrect information with drawings based on existing conditions. After reporting the discrepancies verbally, a written report should then follow. Contractor shall be directed by the Engineer regarding the above matter.
 - The Contractor shall provide methods and equipment for protecting the building, all materials, and personnel from fire damage prior to starting work. Methods and equipment are subject to approval by the local Fire Department. The Contractor shall submit the methods and equipment in writing and obtain the Owner and Engineer's approval prior to starting work. Fire protection and prevention during the construction period shall be in accordance with all laws and regulations including, but not limited to, the latest N.F.P.A. Regulations, OSHA, State of Missouri, and local requirements.
 - The Contractor shall comply with all safety and health laws and regulations including, but not limited to, provisions and requirements of the Occupational Safety and Health Act of 1970, as amended and/or the Construction Safety Act of 1969, as amended (whichever is applicable) and with all most recent applicable laws, ordinances, rules, regulations, and orders of any public authority having jurisdiction, and safety of persons or property or to protect them from damage, injury, or loss. He/She shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warning against hazards, promulgating safety regulations, and notifying the Owner and users of adjacent utilities. The Contractor shall employ and ascertain continuing presence on the job of a person competent in issues of safety in construction. This individual shall be recently trained or re-trained (within 12 months of the work commencement on this project) within an OSHA outreach training program and additionally certified in first aid by the American Red Cross.
 - The contractor shall provide all shoring, bracing, sheeting required for safety, and proper execution of work.
 - The Contractor shall not attempt to demolish any existing concrete slab of the garage prior to installation of proper shoring members approved by the Engineer. The Contractor shall not attempt to bring any vehicle or equipment into the parking facility prior to installation of proper shoring members approved by the Engineer, and of which the requirements are shown on Plans. Any vehicle and/or equipment to brought on the parking facility shall by approved by the Engineer. Contractor is solely responsible to prepare shop drawings for the shoring members and to submit them to the Engineer for approval.
 - When the plans include information pertaining to surface observation, material testing, and other preliminary investigations, such information represents only the opinion of the Engineer as to the location, character, or quality of the materials encountered and is only included for convenience of the bidder. The neither the Owner nor the Engineer assumes any responsibility whatever in respect to the sufficiency or accuracy of the information. Neither the Owner nor the Engineer guarantee, either expressed or implied, that the conditions indicated are representative of those existing throughout the work, or that unanticipated developments may not occur. The above information shall not be considered by the parties as a basis for the contract award amount.
 - Any extra work beyond the scheduled quantities requiring additional cost to the Owner shall be approved by the Owner prior to taking such action. Claims for extra work which have not been authorized in writing by the Owner and approved by the Engineer will be rejected and the Contractor shall not be entitled to payment. The Contractor shall promptly submit the proposal for extra work, in writing, as additional work is discovered.
 - The plans may be supplemented by standard and working drawings as are necessary to adequately describe the work. In the event, a change becomes necessary due to circumstances not known by the Engineer until after the bid documents were submitted to the Owner or arising thereafter, the Engineer may alter the plans, as may be necessary and increase or decrease the quantities of work to be performed in accordance with such changes. The Owner shall be informed with a copy of all submittals and correspondence as the changes may occur.
 - Execution of the work will involve consideration for allowing the Owner to continue operations in the subject facility in the areas outside of the repair area and shoring area for each phase. Prior to the award of the contract, the construction schedule prepared by the Contractor shall be submitted to the Owner and coordinated with the facility management. Owner's approval of the proposed schedule shall precede the contract amount.
 - The Contractor shall review all existing conditions to identify all utilities affected by the repair work, if any. The contractor shall be solely responsible for maintaining the operation of existing services (utilities) to all areas of the subject facility or other areas (not in contract) affected by the work. The Contractor shall submit the methods and schedule of construction for the Owner's approval prior to the commencement of work.
 - As the work progresses, the Contractor shall produce "As-Built" drawings for the installation of all repair items under the contract. The Engineer will provide the general contractor with a set of reproducible for this purpose. The Contractor is responsible to maintain the As-Built drawings updated according to the job progress. For each pay-request by the Contractor, the Owner and Engineer shall receive a copy of the updated As-Built drawings.

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NO WORK ANTICIPATED ON THIS LEVEL

1 LOWER LEVEL PLAN
SCALE: NTS



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9 NORTH GARAGE
LOWER LEVEL
PLAN

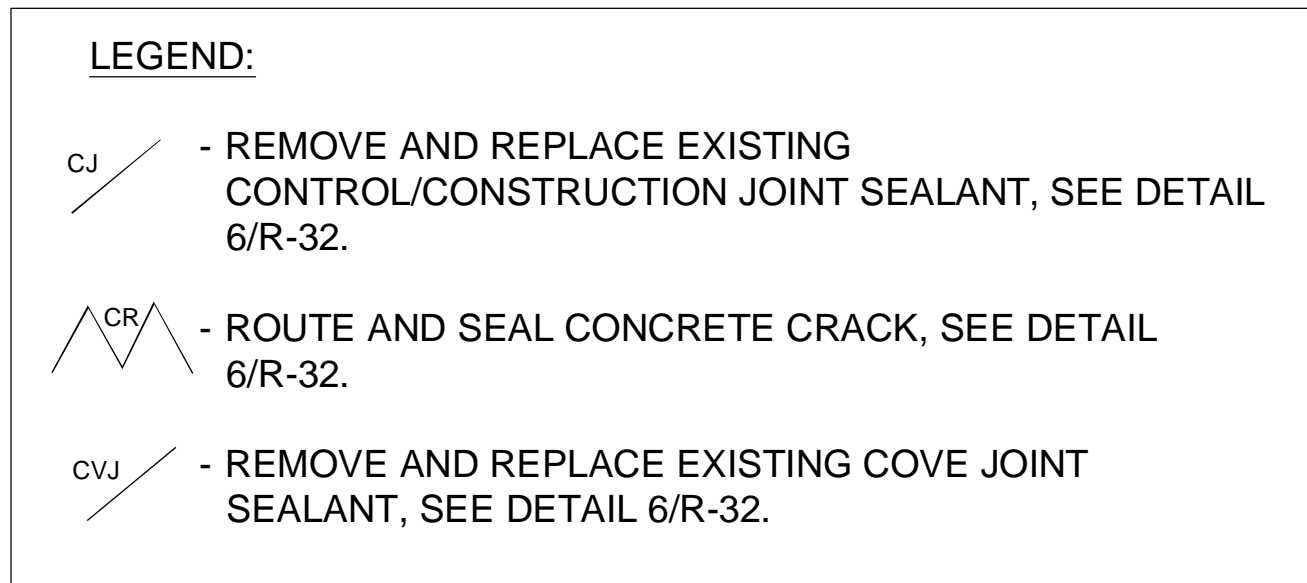
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SCALE: AS NOTED

DATE: MAY, 2019

PROJECT NO: 50-19127

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REPAIR AND PREVENTIVE MAINTENANCE
OF THE
CITY OF ST. LOUIS FOUR GARAGES
ST. LOUIS, MISSOURI

REPAIR AND PREVENTIVE MAINTENANCE

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9 NORTH GARAGE
GROUND LEVEL
PLAN

DRAWING NO.

R-02

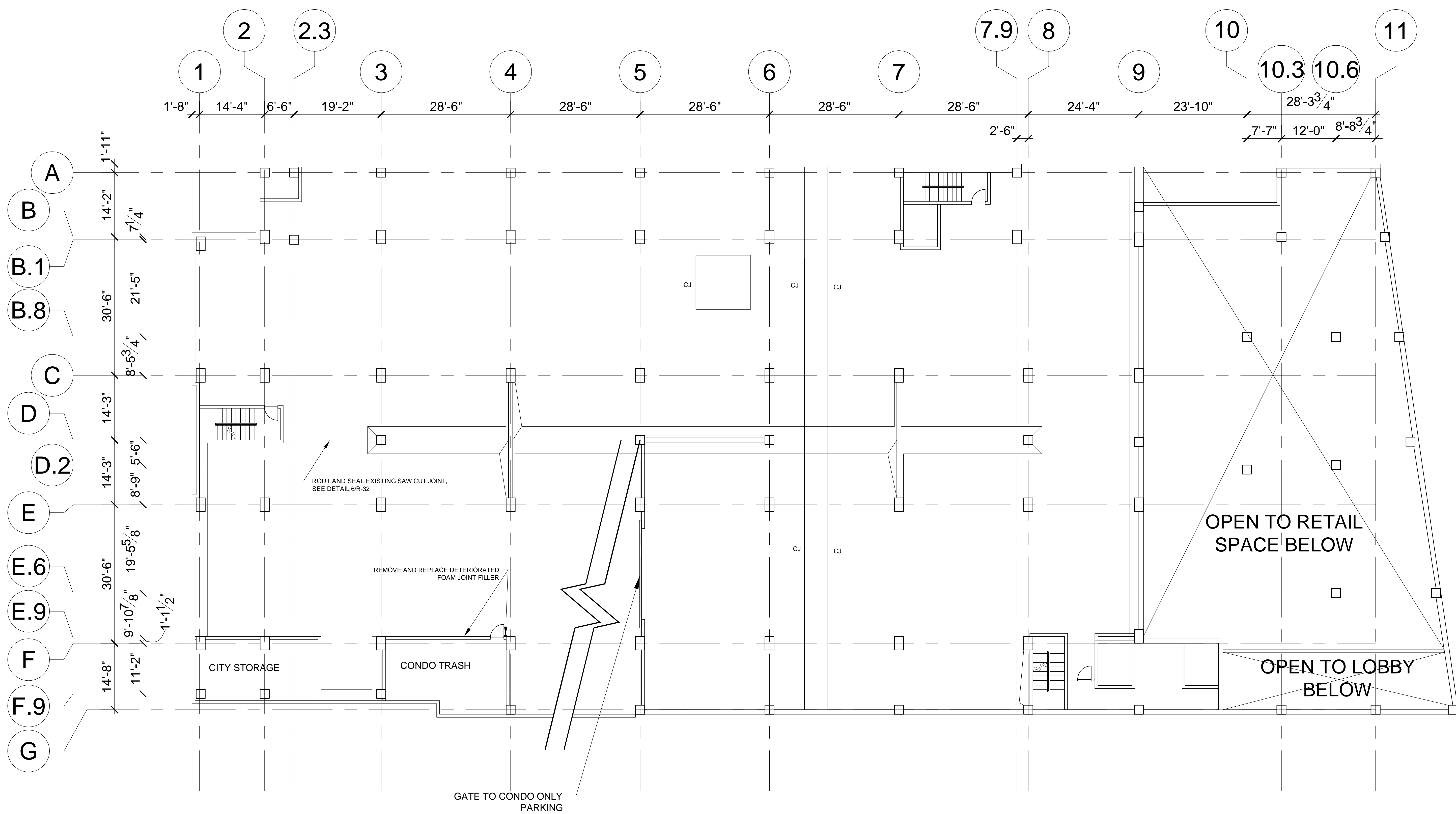
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DATE: MAY, 2019

PROJECT NO: 50-19127

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LEGEND:

CJ - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32

1 SECOND LEVEL PLAN
SCALE: NTS



NOTE:

CONTRACTOR TO APPLY A CLEAR PENETRATING SILANE SEALER TO ALL ACCESSIBLE PORTIONS OF THIS LEVEL. SEE DETAIL 2/R-32

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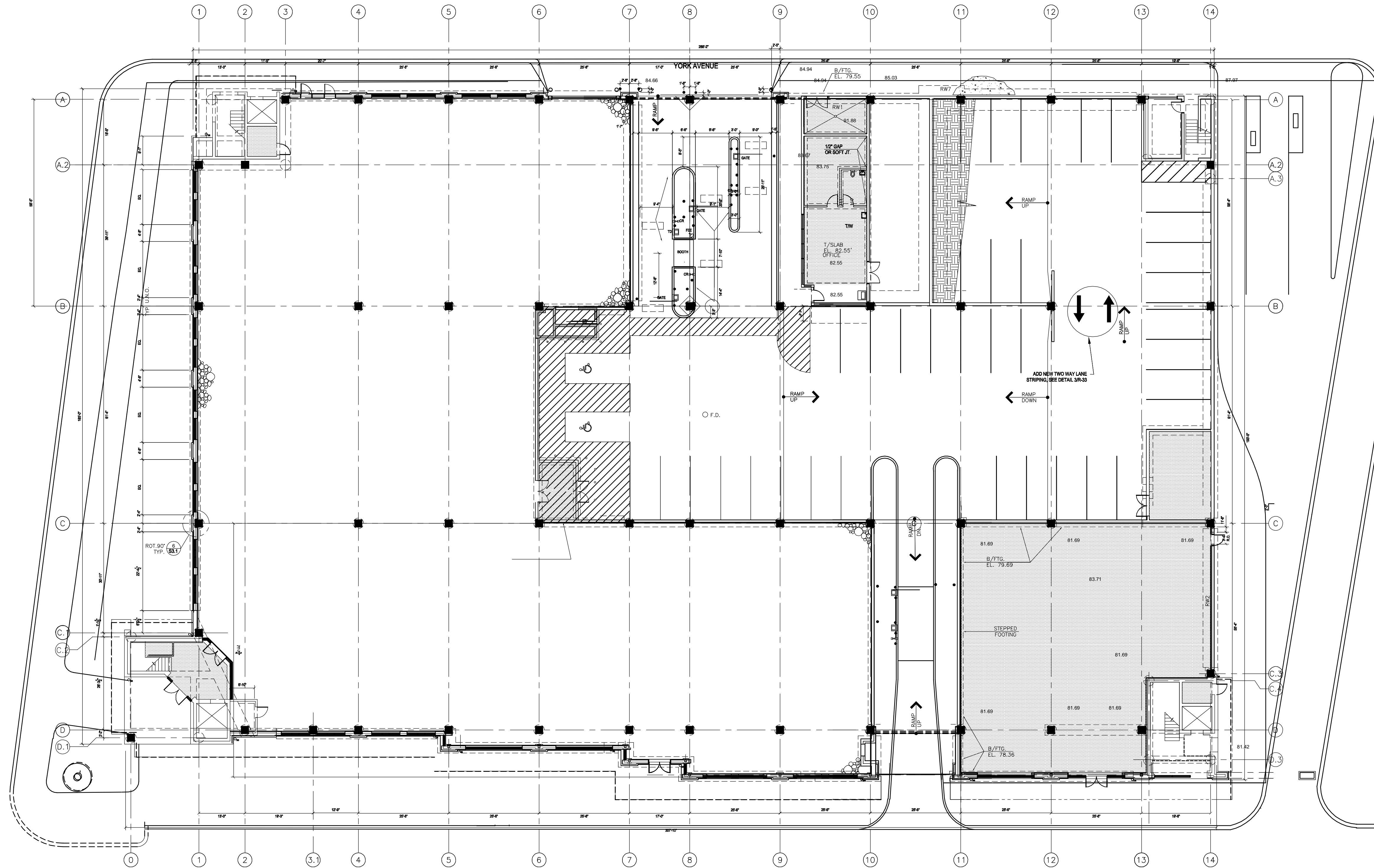
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| PROJECT NO: | 50-19127 | |
| DES. KK | DRWN. FR | CK'D. KK |

LINDELL BLVD.

YORK AVE.

EUCLID AVE.



NOTE:
CONTRACTOR TO APPLY A CLEAR PENETRATING SILANE SEALER TO ALL
CONCRETE DRIVING/PARKING SURFACES ON THIS LEVEL. SEE DETAIL
2R-32.

1 PARKING LEVEL 1
SCALE: NTS



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DRAWING TITLE:
ARGYLE GARAGE
LEVEL 1 PLAN

DRAWING NO.

R-04

SCALE: AS NOTED

DATE: MAY, 2019

PROJECT NO.: 50-19127

DES. DRWN. CK'D.
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ARGYLE GARAGE
LEVEL 2 PLAN

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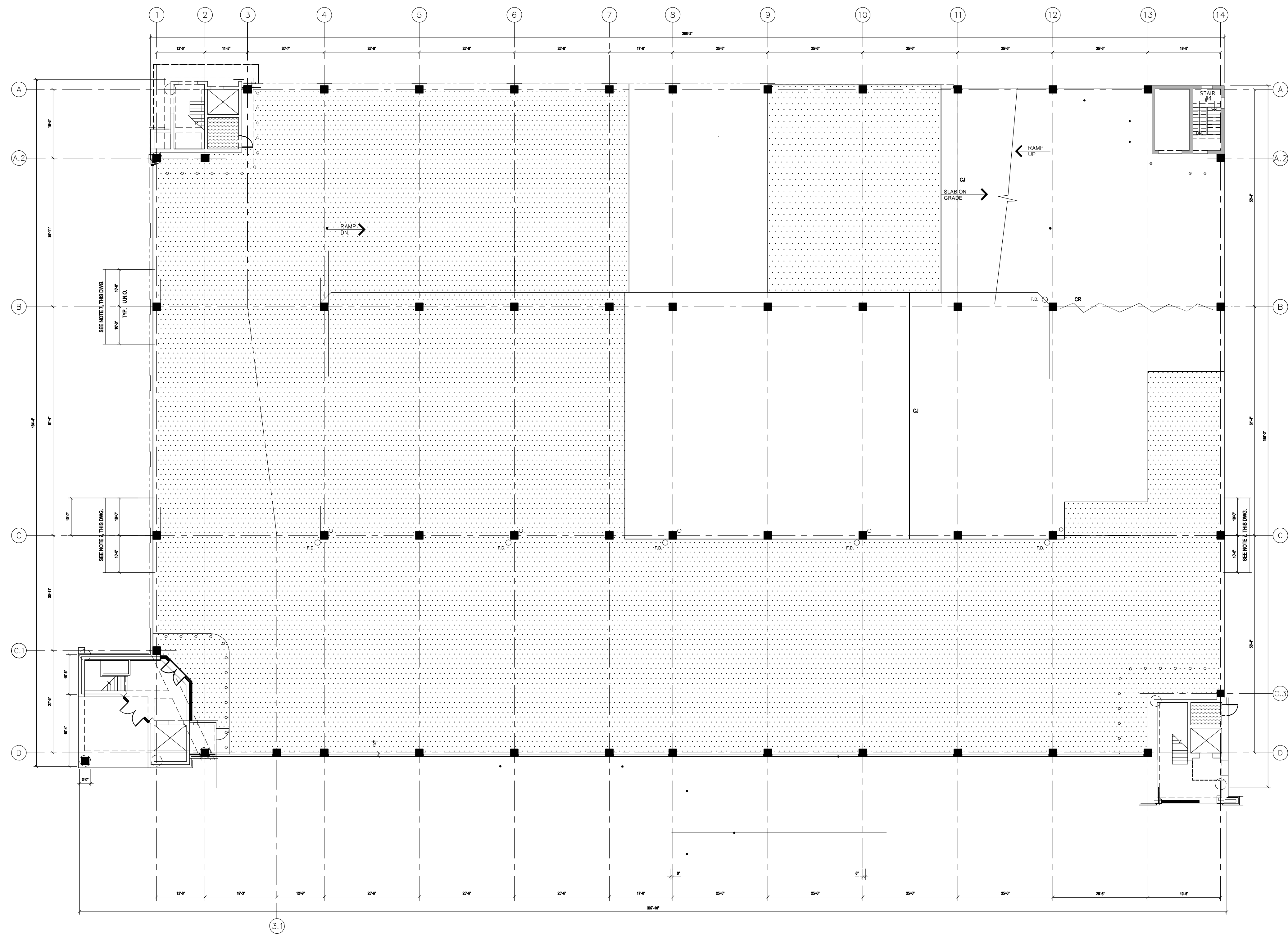
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DATE: MAY, 2019

PROJECT NO: 50-19127

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LEGEND:

 - RECOAT EXISTING WATERPROOFING MEMBRANE SYSTEM. CONTRACTOR IS TO REMOVE ALL LOOSE/DEBONDED WATERPROOFING MEMBRANE PRIOR TO RECOATING. WATERPROOFING MANUFACTURER TO VERIFY SUITABILITY OF THE EXISTING MEMBRANE FOR RECOAT. SEE DETAIL 4/R-32.

3 - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION
JOINT SEALANT, SEE DETAIL 6/R-32.

 - ROUTE AND SEAL CONCRETE CRACK, SEE DETAIL 6/R-32.

1

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NOTE:

CONTRACTOR TO APPLY A CLEAR PENETRATING SILANE SEALER TO ALL CONCRETE DRIVING/PARKING SURFACES ON THIS LEVEL NOT ALREADY PROTECTED BY A WATERPROOFING MEMBRANE SYSTEM. SEE DETAIL 2/R-32.

REPAIR AND PREVENTIVE MAINTENANCE

OF THE

CITY OF ST. LOUIS FOUR GARAGES

ST. LOUIS, MISSOURI

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ARGYLE GARAGE
LEVEL 3 PLAN

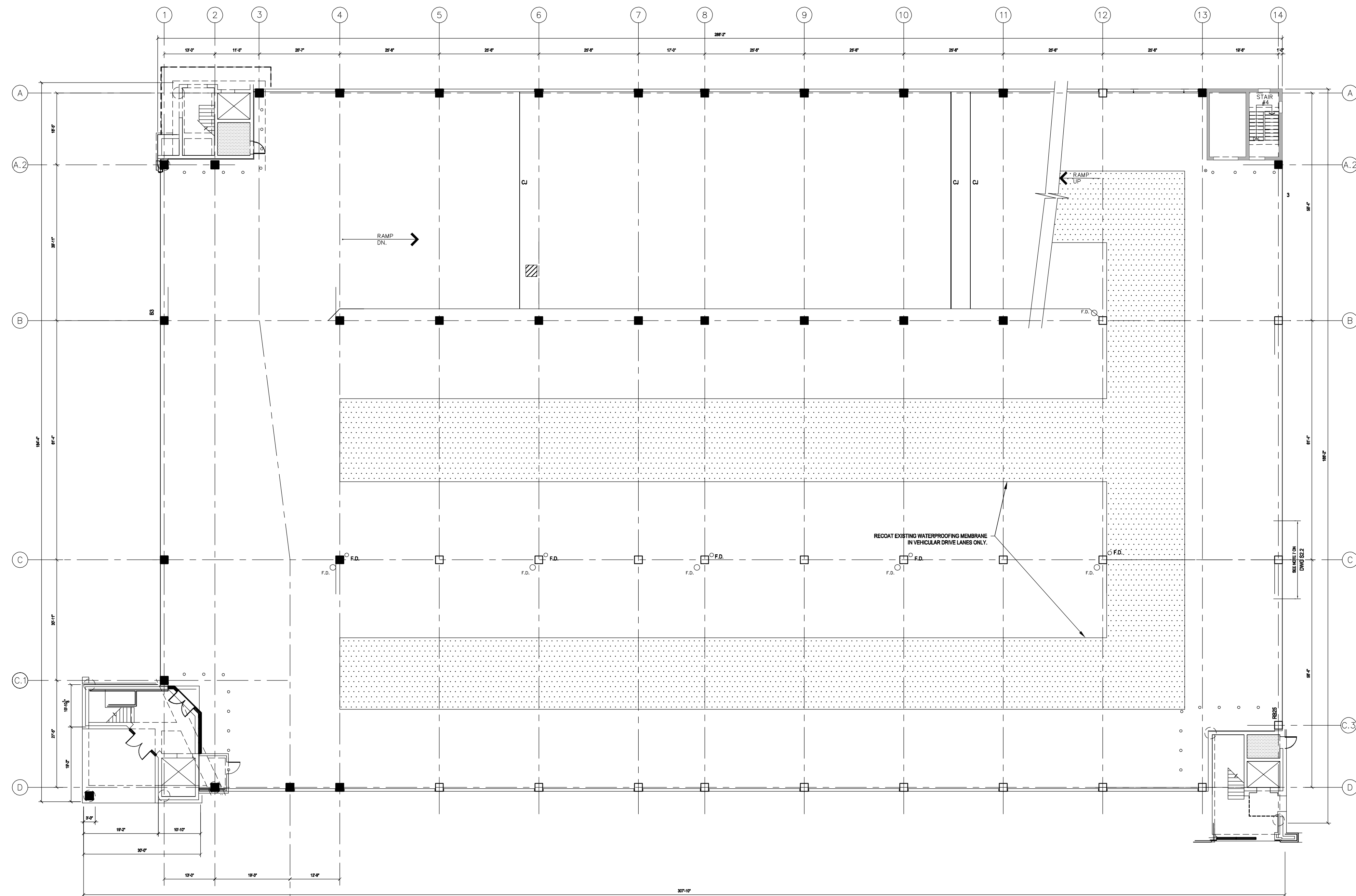
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LEGEND:

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|  | <ul style="list-style-type: none"> - RECOAT EXISTING WATERPROOFING MEMBRANE SYSTEM. CONTRACTOR IS TO REMOVE ALL LOOSED/DEBONDED WATERPROOFING MEMBRANE PRIOR TO RECOATING. WATERPROOFING MANUFACTURER TO VERIFY SUITABILITY OF THE EXISTING MEMBRANE FOR RECOAT. SEE DETAIL 4/R-32. |
|  | <ul style="list-style-type: none"> - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32. |
|  | <ul style="list-style-type: none"> - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31. |

1 PARKING LEVEL 3
SCALE: NTS



NOTE:

CONTRACTOR TO APPLY A CLEAR PENETRATING SILANE SEALER TO ALL CONCRETE DRIVING/PARKING SURFACES ON THIS LEVEL NOT ALREADY PROTECTED BY A WATERPROOFING MEMBRANE SYSTEM. SEE DETAIL 2/R-32.

REPAIR AND PREVENTIVE MAINTENANCE

OF THE

CITY OF ST. LOUIS FOUR GARAGES

ST. LOUIS, MISSOURI

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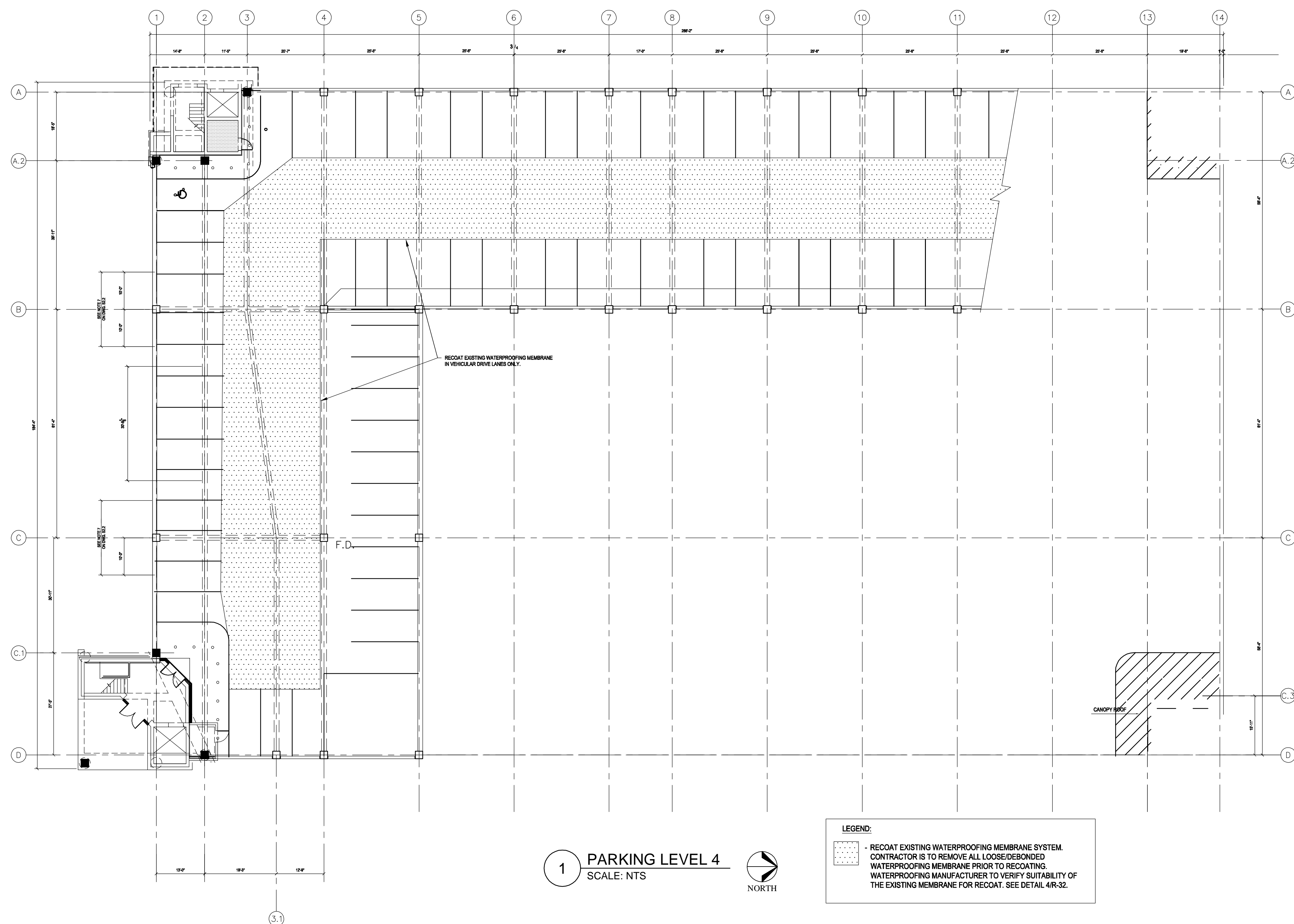
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PROJECT NO: 50-19127



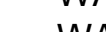
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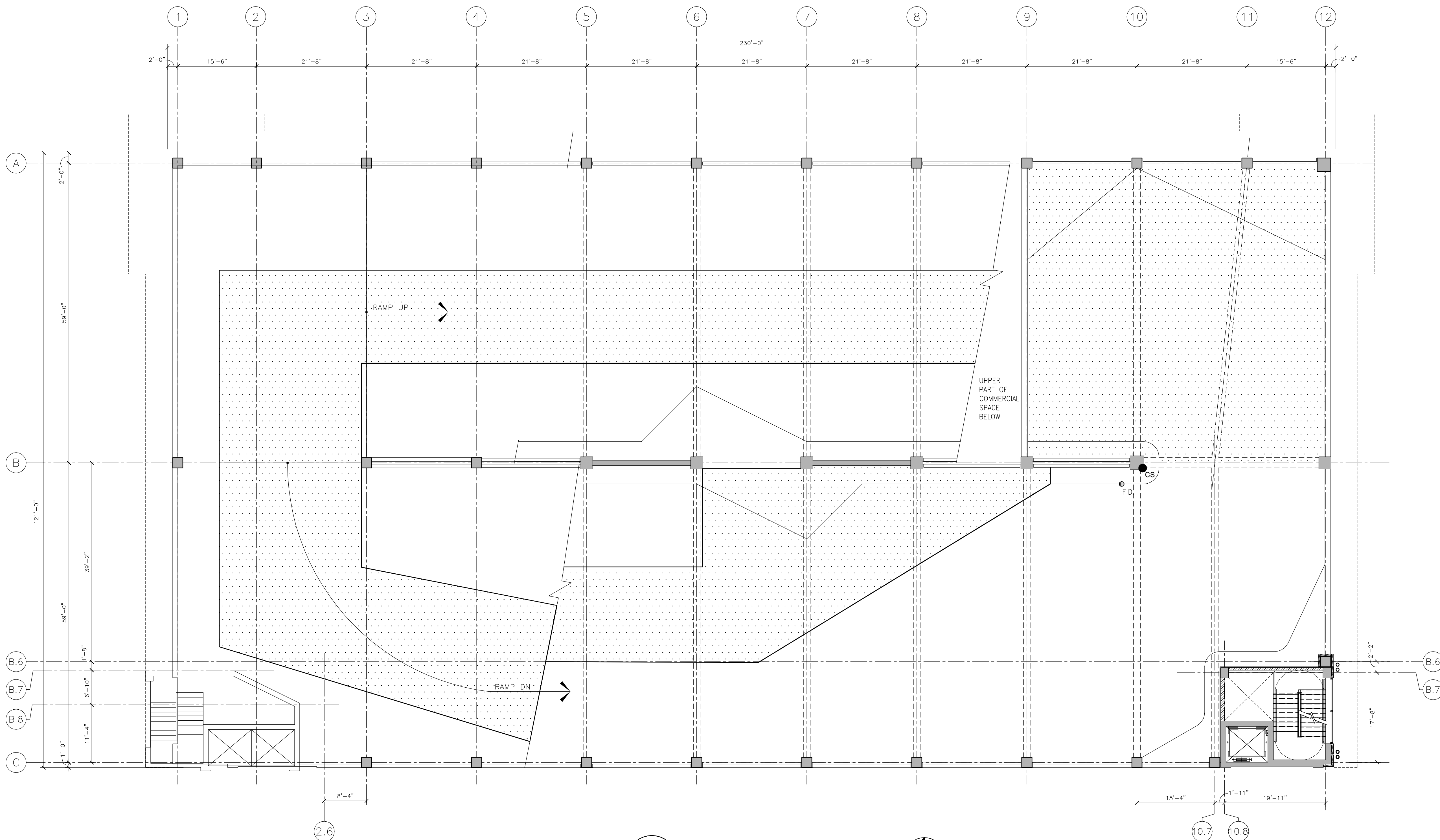


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-  - RECOAT EXISTING WATERPROOFING MEMBRANE SYSTEM. CONTRACTOR IS TO REMOVE ALL LOOSE/DEBONDED WATERPROOFING MEMBRANE PRIOR TO RECOATING. WATERPROOFING MANUFACTURER TO VERIFY SUITABILITY OF THE EXISTING MEMBRANE FOR RECOAT. SEE DETAIL 4/R-32.
-  - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32.
-  - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31.

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| DATE: | MAY, 2019 | |
| PROJECT NO: | | 50-19127 |
| DES. KK | DRWN. FR | CK'D. KK |



NOTE:

CONTRACTOR TO APPLY A CLEAR PENETRATING SILANE SEALER TO ALL STRUCTURALLY SUPPORTED PORTIONS OF THIS LEVEL NOT ALREADY PROTECTED (OR SCHEDULED TO BE PROTECTED) BY A WATERPROOFING MEMBRANE. SEE DETAIL 2/R-32

1 PARKING LEVEL 2
SCALE: NTS

NORTH

- LEGEND:**
- RECOAT EXISTING WATERPROOFING MEMBRANE SYSTEM. CONTRACTOR IS TO REMOVE ALL LOOSE/DEBONDED WATERPROOFING MEMBRANE PRIOR TO RECOATING. WATERPROOFING MANUFACTURER TO VERIFY SUITABILITY OF THE EXISTING MEMBRANE FOR RECOAT. SEE DETAIL 4/R-32.
 - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32.
 - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31.

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REPAIR AND PREVENTIVE MAINTENANCE
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ST. LOUIS, MISSOURI

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DRAWING TITLE:
CENTRAL
DOWNTOWN
LEVEL 2 PLAN

DRAWING NO.

R-09

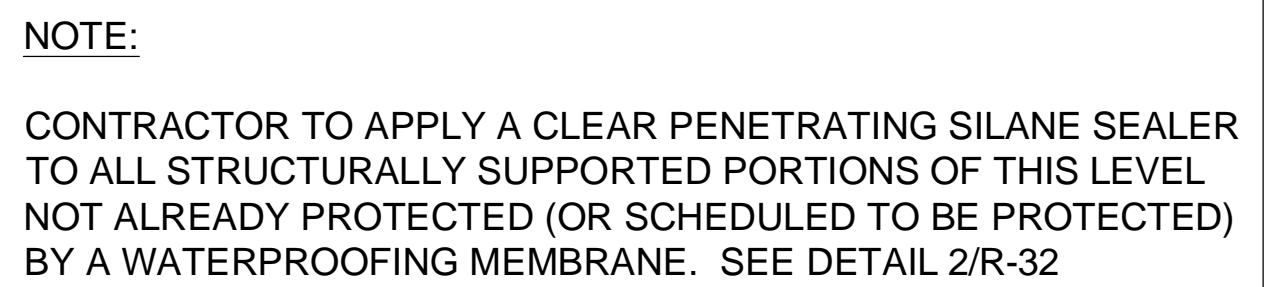
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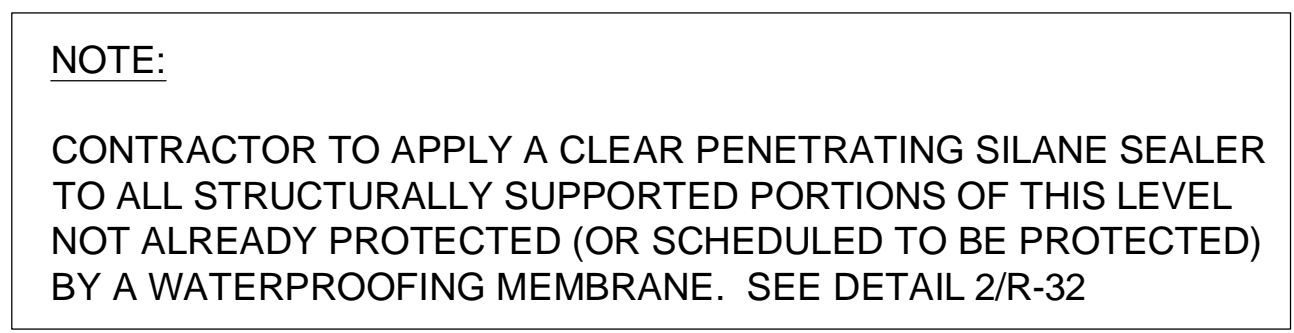
1 PARKING LEVEL 3
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LEGEND:


-  - RECOAT EXISTING WATERPROOFING MEMBRANE SYSTEM. CONTRACTOR IS TO REMOVE ALL LOOSE/DEBONDED WATERPROOFING MEMBRANE PRIOR TO RECOATING. WATERPROOFING MANUFACTURER TO VERIFY SUITABILITY OF THE EXISTING MEMBRANE FOR RECOAT. SEE DETAIL 4/R-32.
 -  - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32.
 -  - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31.

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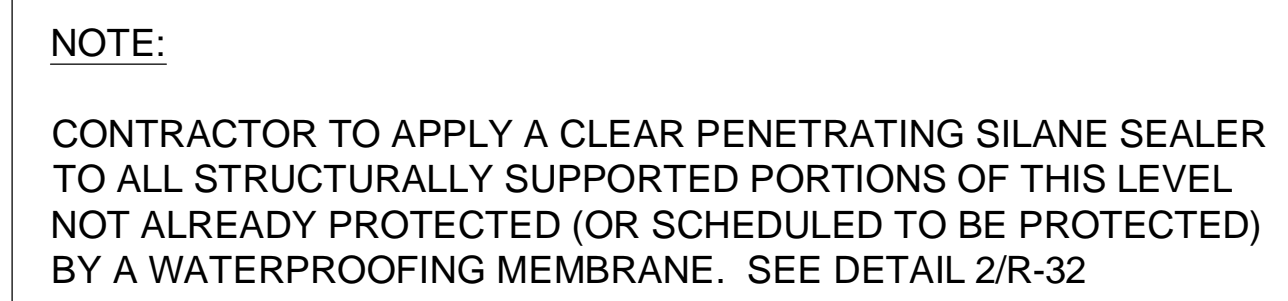


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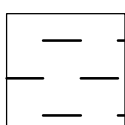


 - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32.

 - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31.

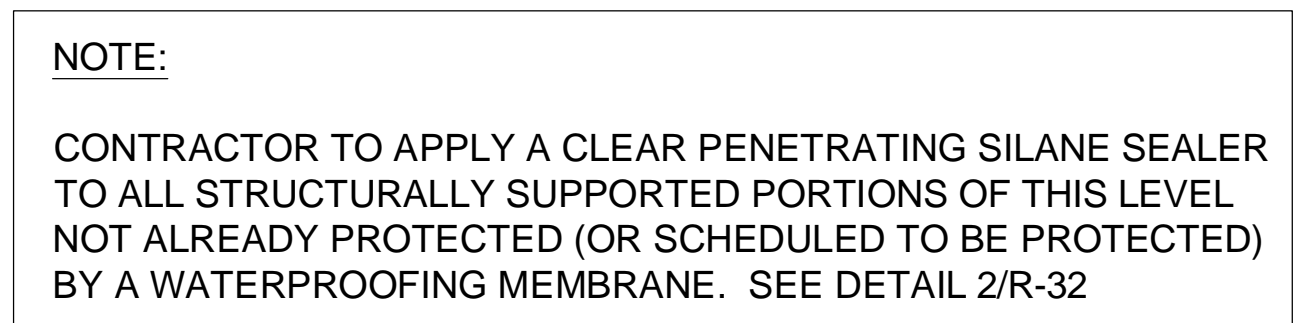
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LEGEND:


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|  | - APPLY A TRAFFIC BEARING WATERPROOFING MEMBRANE SYSTEM. WORK IS TO INCLUDE THE ROUTING AND SEALING OF ALL NECESSARY CRACKS AND JOINTS. SEE DETAIL 5/R-32. |
|  | - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32. |
|  | - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31. |

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LEGEND:

 - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAILS 6/R-32.

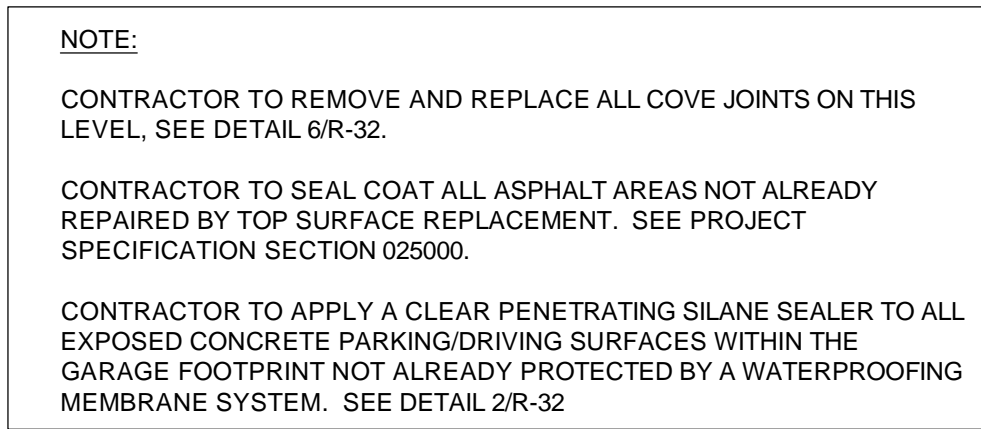
 - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAIL 1&2/R-31.

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| DRAWING TITLE: | | |
| CENTRAL DOWNTOWN LEVEL 8 PLAN | | |
| DRAWING NO. | | |
| R-15 | | |
| SCALE: | AS NOTED | |
| DATE: | MAY, 2019 | |
| PROJECT NO.: | | 50-19127 |
| DES. KK | DRWN. FR | CKD. KK |



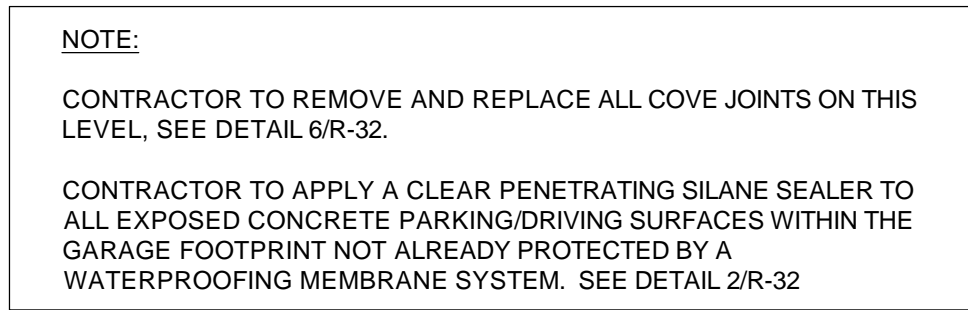
CONTRACTOR TO APPLY A TRAFFIC BEARING WATERPROOFING MEMBRANE SYSTEM TO ALL CONCRETE DRIVING SURFACES ON THIS LEVEL. WORK IS TO INCLUDE THE ROUTING AND SEALING OF ALL NECESSARY CRACKS AND JOINTS. SEE DETAIL 5/R-32.

| DES. | DRWN. | CK'D. |
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NORTH

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1 **PARKING LEVEL 2**
SCALE: NTS

LEGEND:

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|  | - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32. |
|  | - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31. |
|  | - EXISTING WATERPROOFING MEMBRANE TO REMAIN. |

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DRAWING TITLE:
CUPPLES STATION
LEVEL 2 PLAN

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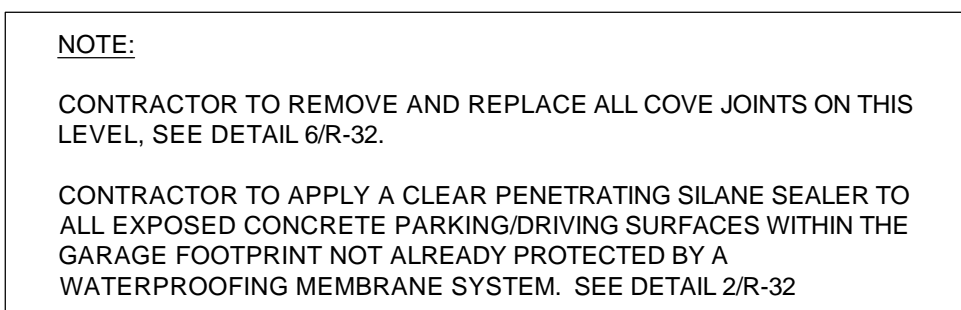
R-19

SCALE: AS NOTED

DATE: MAY, 2019





PROJECT NO: 50-19127

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LEGEND:

-  - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32.
-  - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31.
-  - ROUT AND SEAL CONCRETE FLOOR CRACKS, SEE DETAIL 6/R-32
-  - EXISTING WATERPROOFING MEMBRANE TO REMAIN.

REPAIR AND PREVENTIVE MAINTENANCE

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LEVEL 3 PLAN

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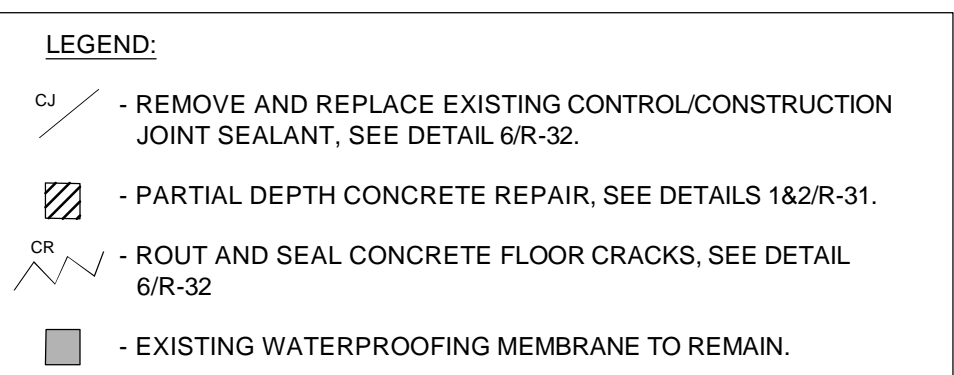
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SCALE: AS NOTED

DATE: MAY, 2019

PROJECT NO: 50-19127

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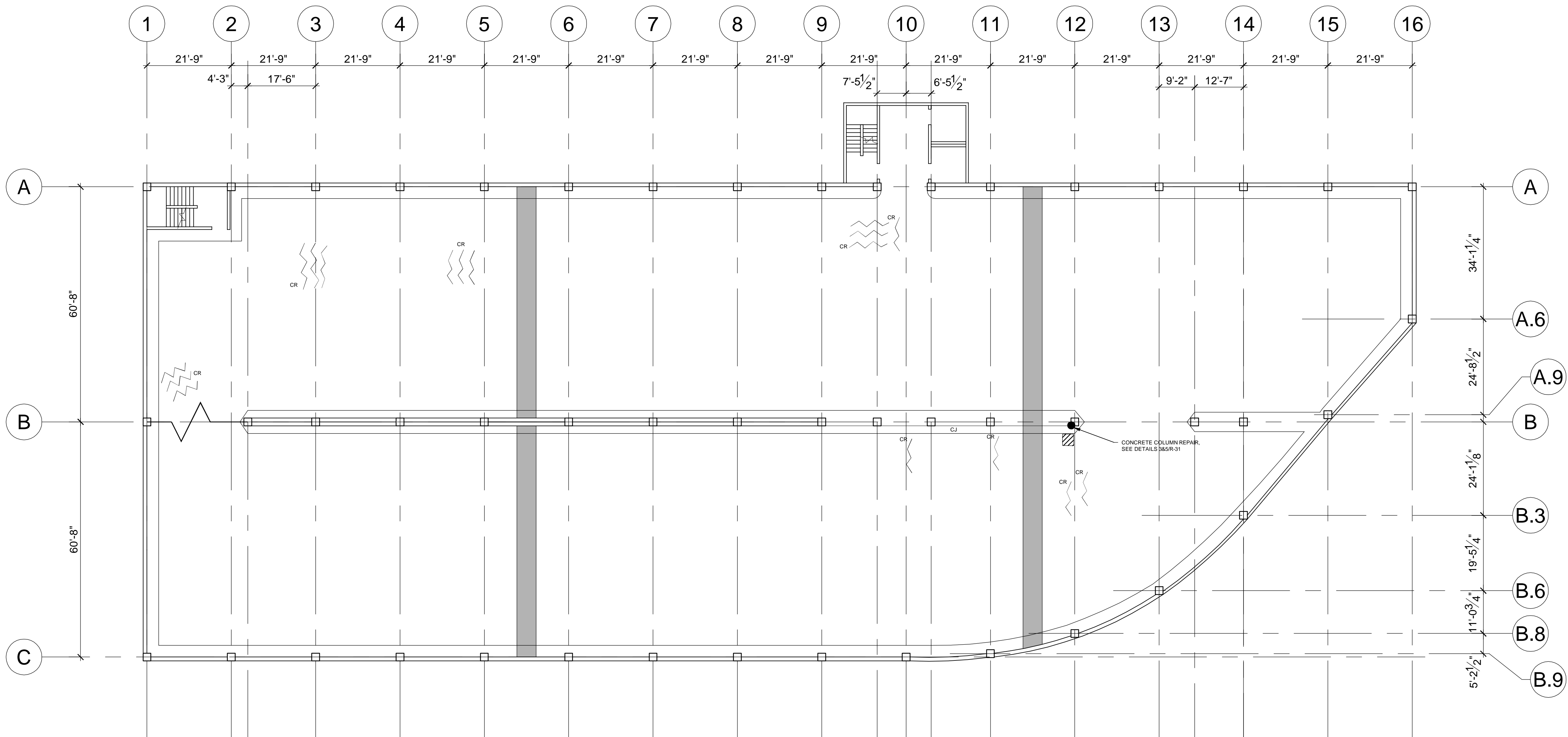
REPAIR AND PREVENTIVE MAINTENANCE OF THE

5

CITY OF ST. LOUIS FOUR GARAGES

ST. LOUIS, MISSOURI

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| <p>CUPPLES STATION</p> <p>LEVEL 6 PLAN</p> | | |
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| SCALE: | AS NOTED | |
| DATE: | MAY, 2019 | |
| PROJECT NO: | 50-19127 | |
| DES. KK | DRWN. FR | CK'D. KK |







NOTE:

CONTRACTOR TO REMOVE AND REPLACE ALL COVE JOINTS ON THIS LEVEL, SEE DETAIL 6/R-32.

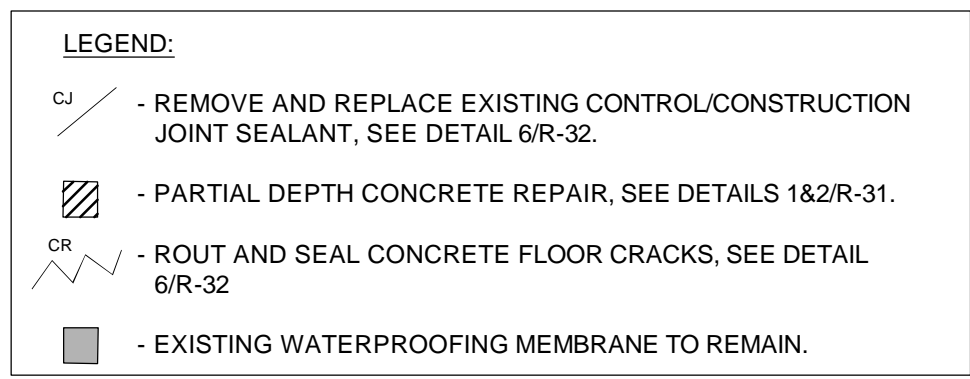
1 PARKING LEVEL 6
SCALE: NTS

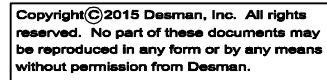


LEGEND:

-  - REMOVE AND REPLACE EXISTING CONTROL/CONSTRUCTION JOINT SEALANT, SEE DETAIL 6/R-32.
-  - PARTIAL DEPTH CONCRETE REPAIR, SEE DETAILS 1&2/R-31.
-  - ROUT AND SEAL CONCRETE FLOOR CRACKS, SEE DETAIL 6/R-32.
-  - EXISTING WATERPROOFING MEMBRANE TO REMAIN.

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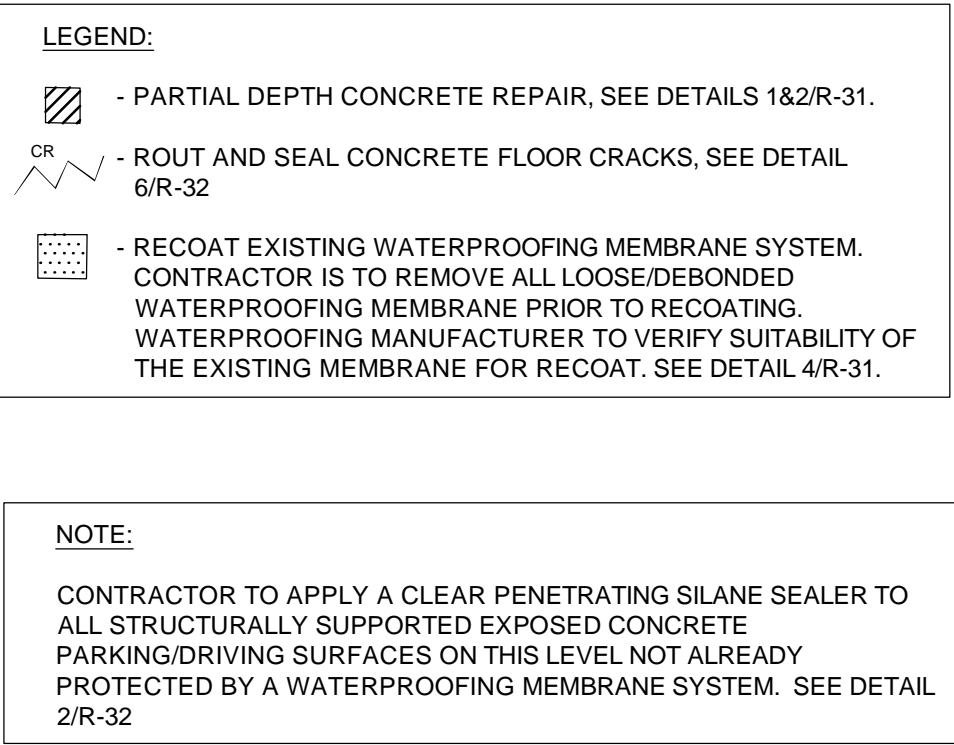


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| CUPPLES STATION LEVEL 7 (ROOF) PLAN | | |
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| SCALE: | AS NOTED | |
| DATE: | MAY, 2019 | |
| PROJECT NO: | 50-19127 | |
| DES. KK | DRWN. FR | CKD. KK |

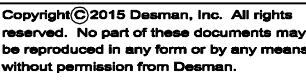


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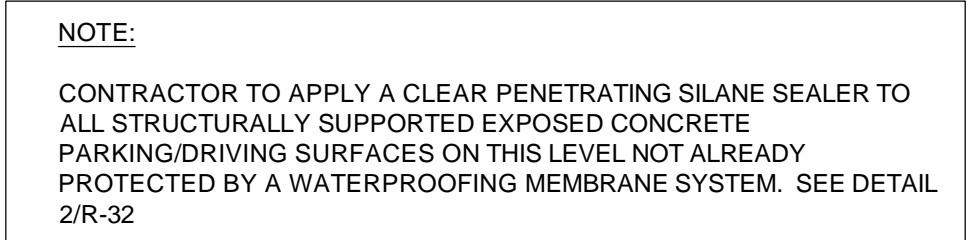
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REPAIR AND PREVENTIVE MAINTENANCE
OF THE
CITY OF ST. LOUIS FOUR GARAGES
ST. LOUIS, MISSOURI

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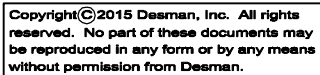
KIEL CENTER
LEVEL 5 PLAN

DRAWING NO.

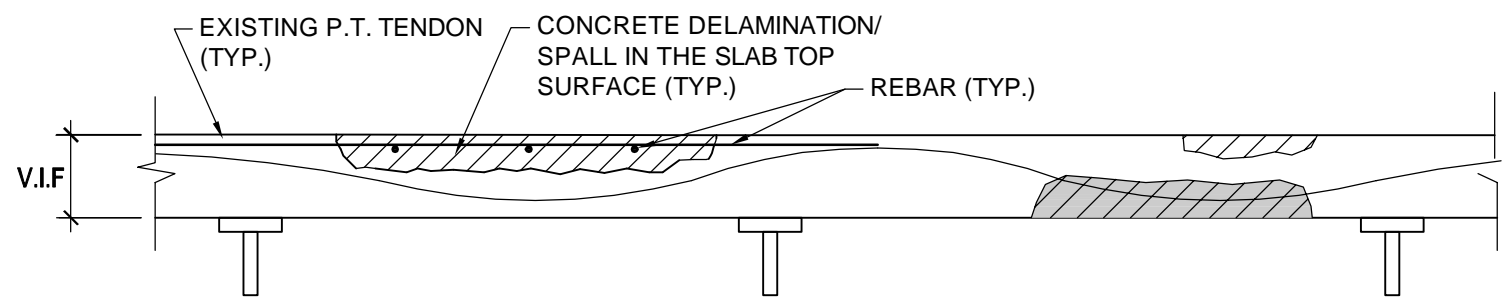
R-29

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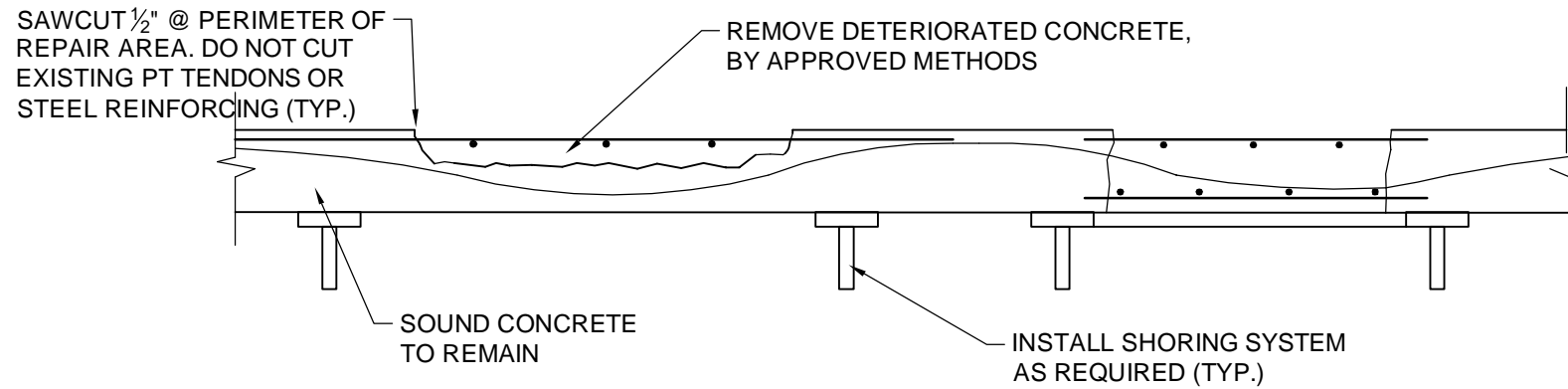
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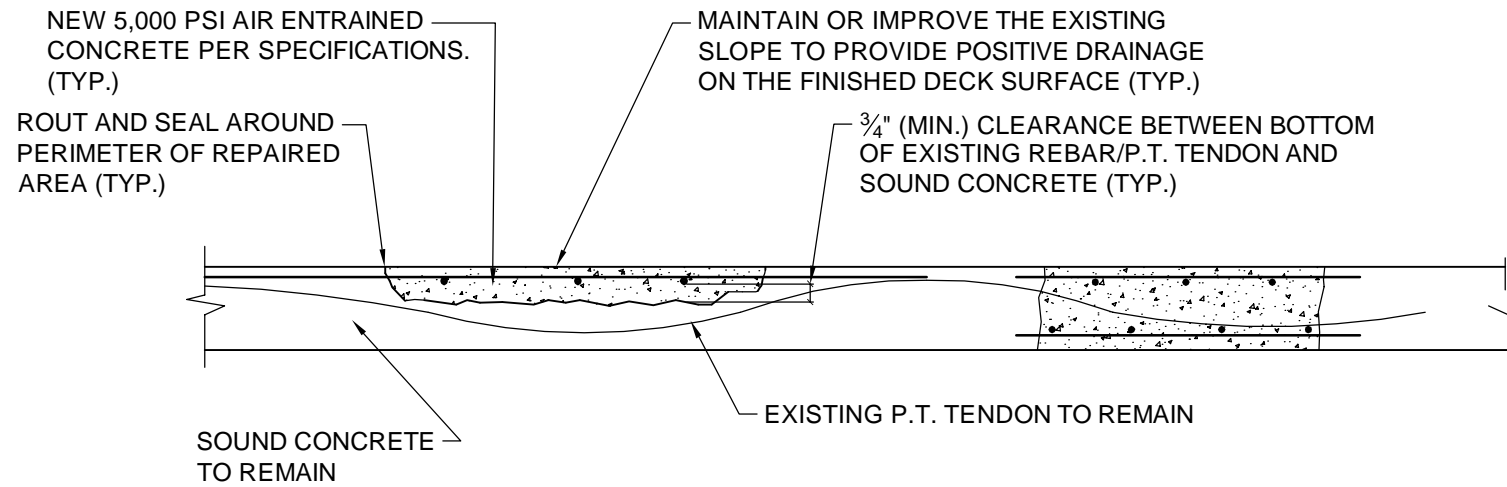
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| DRAWING TITLE: | | | | | |
| KIEL CENTER LEVEL 6 PLAN | | | | | |
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| SCALE: | | | AS NOTED | | |
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| PROJECT NO : | | | 50-19127 | | |
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EXISTING CONDITION



CONCRETE REMOVAL



REPAIRED CONDITION

NOTE:

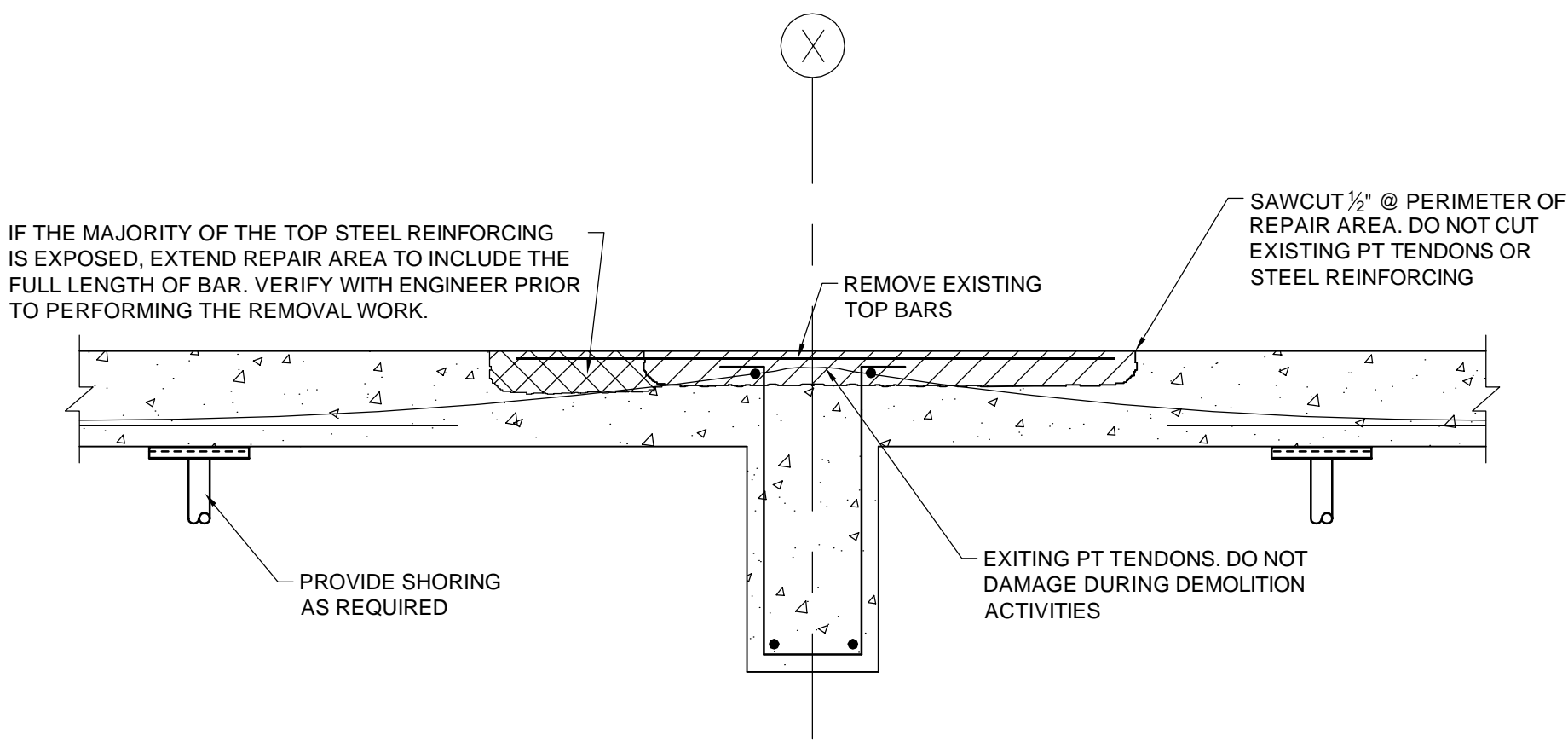
SLAB PROTECTION TREATMENTS (CRACK/CONSTRUCTION JOINT REPAIR MATERIAL, MEMBRANE, ETC.) MAY NOT BE APPLIED UNTIL CONCRETE HAS HAD PROPER CURE TIME MEETING MANUFACTURER'S REQUIREMENTS.

FULL AND PARTIAL DEPTH CONCRETE REPAIR PROCEDURE FOR PT SLABS:

1. THE CONTRACTOR SHALL SOUND AND VERIFY LOCATION AND EXTENT OF ALL REPAIR AREAS. ENGINEER SHALL VERIFY REPAIR LOCATIONS PRIOR TO CONCRETE DEMOLITION.
2. ISOLATE WORK AREA AND AREAS DIRECTLY BELOW FROM THE REMAINING PORTIONS OF THE PARKING STRUCTURE. ERECT APPROPRIATE BARRICADES AND PARTITIONS TO MINIMIZE DUST AND DEBRIS MIGRATION TO ADJACENT AREAS.
3. PROVIDE SHORING DESIGNED FOR DEAD LOAD OF SLAB IN REPAIR AREAS. IF BROKEN OR DETERIORATED PT STRANDS ARE ENCOUNTERED IN REPAIR AREAS, PROVIDE SHORING DESIGNED FOR DEAD AND CONSTRUCTION LIVE LOADS.
4. ONCE THE EXTENT OF CONCRETE REMOVAL AND CONDITION OF EXISTING PT IN THE REPAIR AREA HAS BEEN DETERMINED, CAREFULLY SAWCUT PERIMETER OF REPAIR AREA MIN. $\frac{1}{2}$ ". DO NOT DAMAGE STEEL REINFORCING OR PT DURING SAWCUTTING OPERATIONS.
5. CAREFULLY REMOVE ALL UNSOUND AND DELAMINATED CONCRETE BY APPROVED METHODS TO A DEPTH OF $\frac{3}{4}$ " BEHIND STEEL REINFORCING, TAKING CARE NOT TO DAMAGE PT STRANDS OR ANCHORS. NOTIFY THE ENGINEER OF ANY BROKEN, DAMAGED, OR HEAVILY CORRODED TENDONS, ANCHORAGE STEEL REINFORCING, OR PT COMPONENTS REVEALED UPON CONCRETE REMOVAL.
6. SANDBLAST CLEAN ALL EXPOSED STEEL REINFORCING, PT, AND ANCHORS. SUPPLEMENT EXISTING STEEL REINFORCING WHICH HAS LOST MORE THAN 20% OF ITS CROSS-SECTIONAL AREA WITH NEW EPOXY-COATED BARS. NEW REINFORCING BARS SHALL BE PROPERLY LAP SPliced TO EXISTING BARS.
7. PLACE, FINISH, CURE, AND PROTECT CONCRETE/REPAIR MORTAR PER SPECIFICATIONS. MAINTAIN OR IMPROVE THE EXISTING SLOPE TO PROVIDE POSITIVE DRAINAGE ON THE FINISHED DECK SURFACE.
8. AFTER PROPER CURE TIME, PROVIDE CONTROL JOINTS AS SHOWN IN DETAIL 5a/R-12 ALONG THE PERIMETER OF REPAIR AREAS.

1 SLAB PARTIAL/FULL DEPTH REPAIR DETAIL

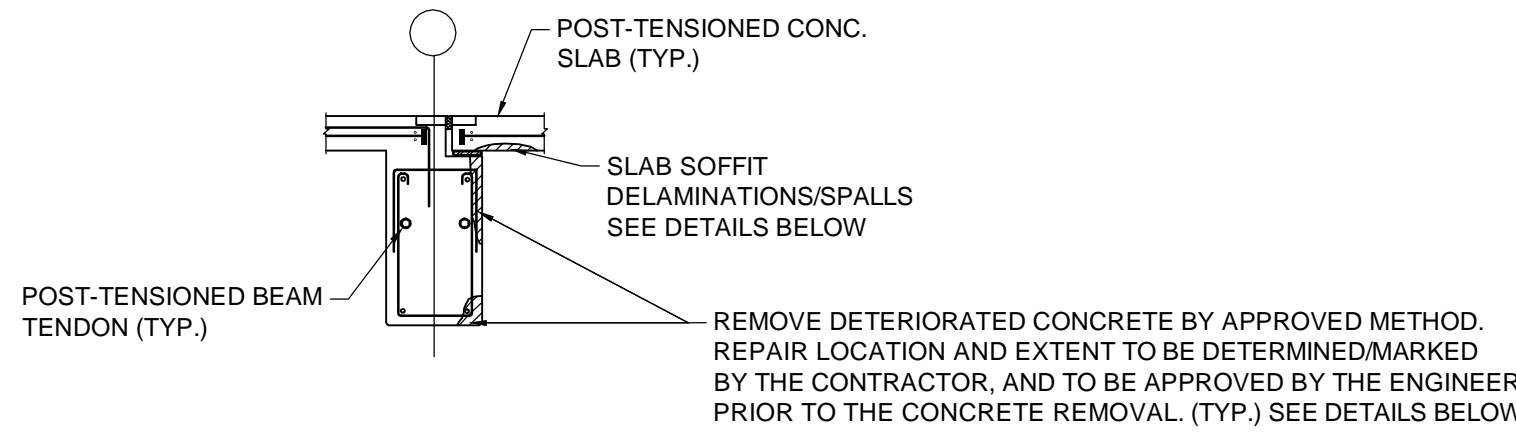
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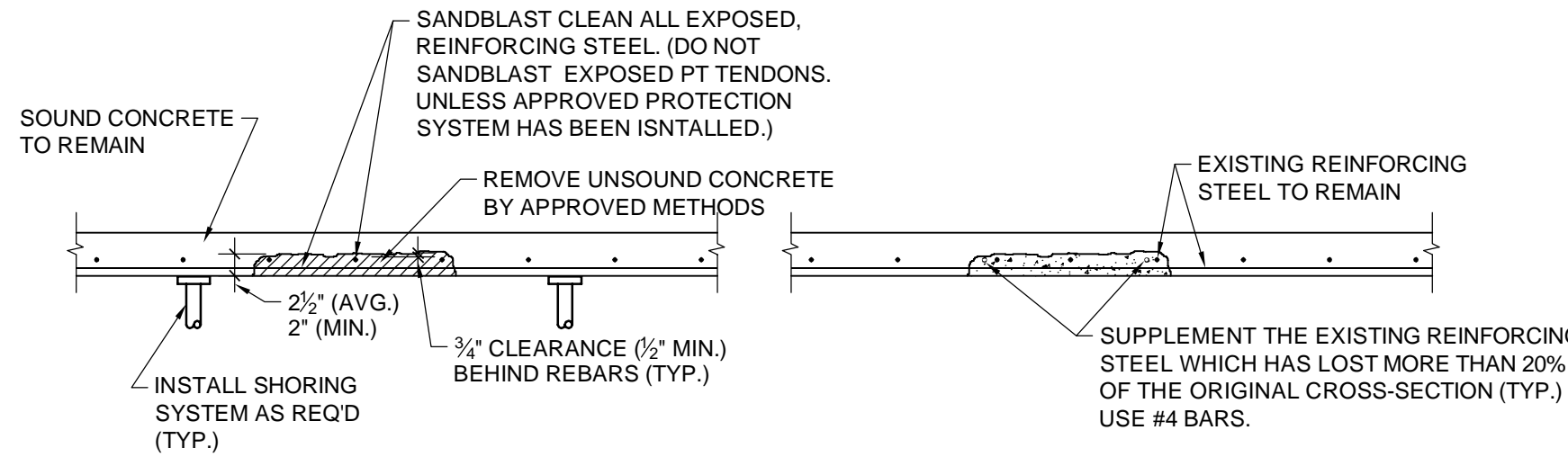
EXISTING CONDITION

2 PARTIAL DEPTH "STRIP" REPAIR

SCALE: N.T.S.

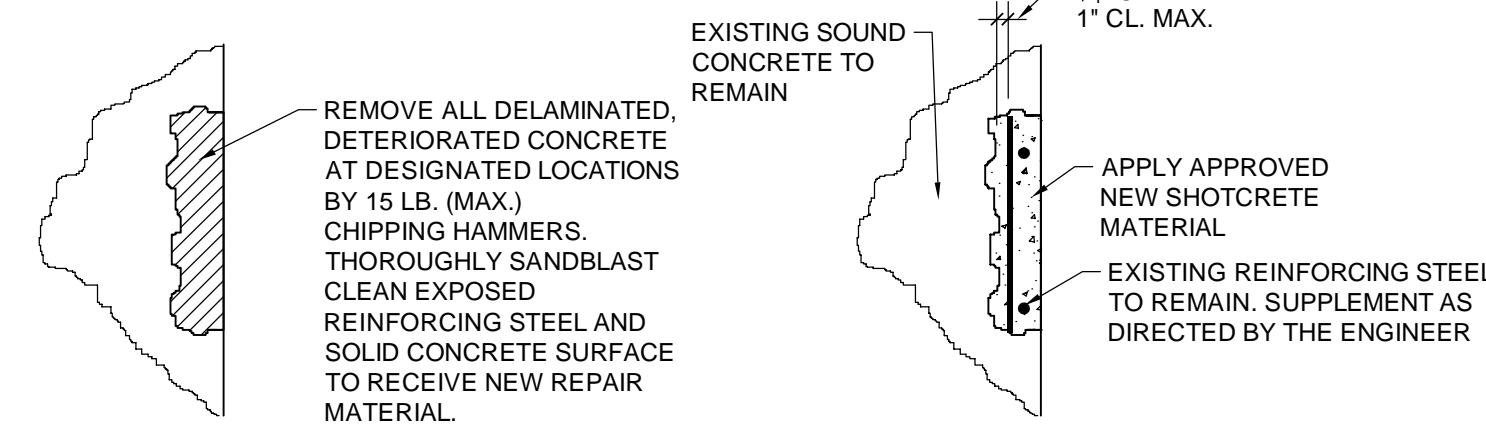


EXISTING CONDITION - BEAM AND SLAB



EXISTING CONDITION- SLAB

REPAIRED CONDITION - SLAB



EXISTING CONDITION - VERTICAL SURFACE

REPAIRED CONDITION - VERTICAL SURFACE

NOTES:

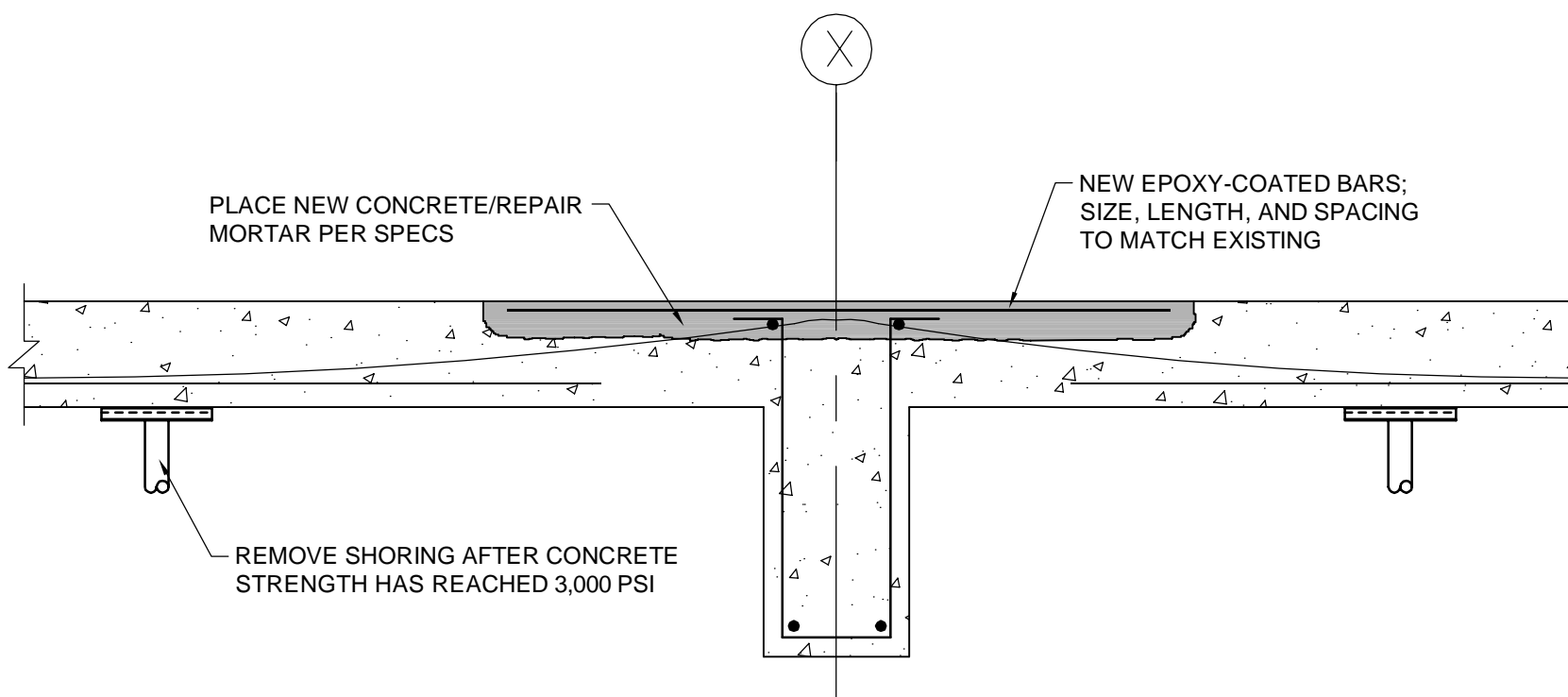
1. THE CONTRACTOR SHALL LOCATE AREAS OF SPALLED, LOOSE, AND DELAMINATED CONCRETE USING A SOUNDING HAMMER AS DIRECTED BY THE ENGINEER. THE EXACT LOCATIONS AND BOUNDARIES FOR CONCRETE REMOVAL SHALL BE APPROVED BY THE ENGINEER.
2. INSTALL SHORING AS DIRECTED BY THE ENGINEER.
3. CLEAN EXPOSED REINFORCING STEEL BY SANDBLASTING AND COAT THE REINFORCING STEEL USING APPROVED NITROPRIME ZINC RICH PRIMER.
4. SUPPLEMENT EXISTING BARS WHICH HAVE LOST MORE THAN 20% OF THEIR ORIGINAL CROSS-SECTIONAL AREA, IN ACCORDANCE WITH THE ENGINEER'S DIRECTIONS.

REPAIR PROCEDURES:

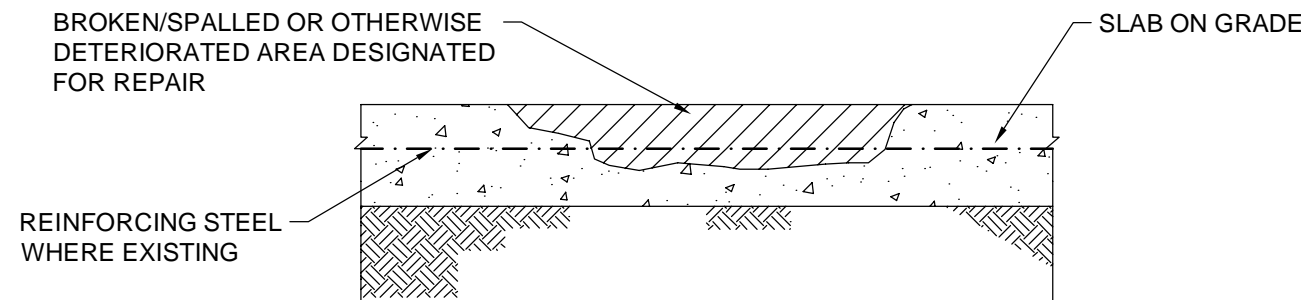
1. REMOVE ANY PERMANENT ATTACHMENTS TO THE CONCRETE MEMBERS THAT MAY INTERFERE WITH THE REPAIR PROCESS AND PROVIDE TEMPORARY SUPPORT FOR DRAIN LINES, ETC. IF REQUIRED. STORE THE DISMANTLED ATTACHMENTS, IF ANY, IN A DESIGNATED, SAFE PLACE FOR SUBSEQUENT RE-INSTALLATION.
2. REMOVE ALL LOOSE, BROKEN, AND DELAMINATED CONCRETE FROM THE PRECAST OR CAST-IN-PLACE MEMBERS AS SHOWN ON THE DRAWINGS OR MARKED BY THE ENGINEER BY APPROVED METHODS. AVERAGE DEPTH OF REMOVAL SHALL BE ASSUMED TO BE $2\frac{1}{2}$ " INCHES. EXPOSED PORTIONS OF EMBEDDED STRUCTURAL STEEL AND REINFORCEMENT SHALL BE SANDBLASTED CLEAN TO REMOVE ALL PRESENCE OF RUST AND CORROSION. REPORT ANY CONDITION WHERE THE EXISTING REINFORCING STEEL HAS LOST MORE THAN 20% OF ITS CROSS-SECTIONAL AREA DUE TO CORROSION TO THE ENGINEER FOR DISPOSITION.
3. CLEAN AND PREPARE THE CONCRETE SURFACE FOR APPLICATION OF APPROVED REPAIR MATERIAL.
4. PNEUMATICALLY APPLY (SHOTCRETE) MORTAR IN LAYERS. LAYERS SHALL BE LIMITED IN THICKNESS TO PREVENT SAGGING OR FALLOUT. SEE THE SPECIFICATIONS FOR REPAIR MATERIAL.
5. FINISH, CURE, AND PROTECT OVERHEAD/VERTICAL REPAIRS.
6. RESTORE EXISTING CONTROL JOINTS IN REPAIR AREAS WHERE APPLICABLE.
7. AFTER THE REPAIRS ARE COMPLETE, RE-INSTALL ANY TEMPORARILY REMOVED ATTACHMENTS TO RESTORE THE EXISTING CONDITIONS.

3 OVERHEAD/VERTICAL SHOTCRETE REPAIR

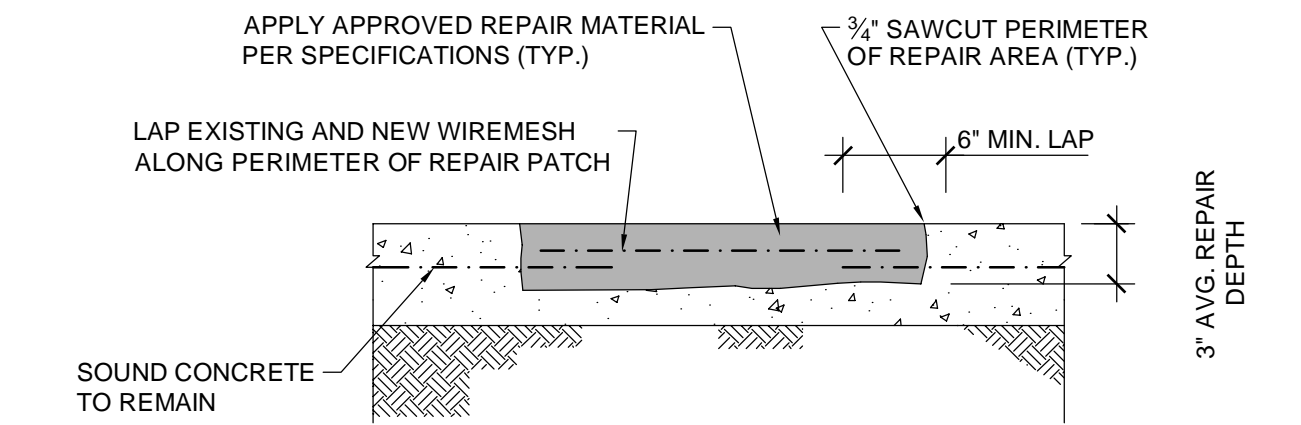
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REPAIRED CONDITION



EXISTING CONDITION



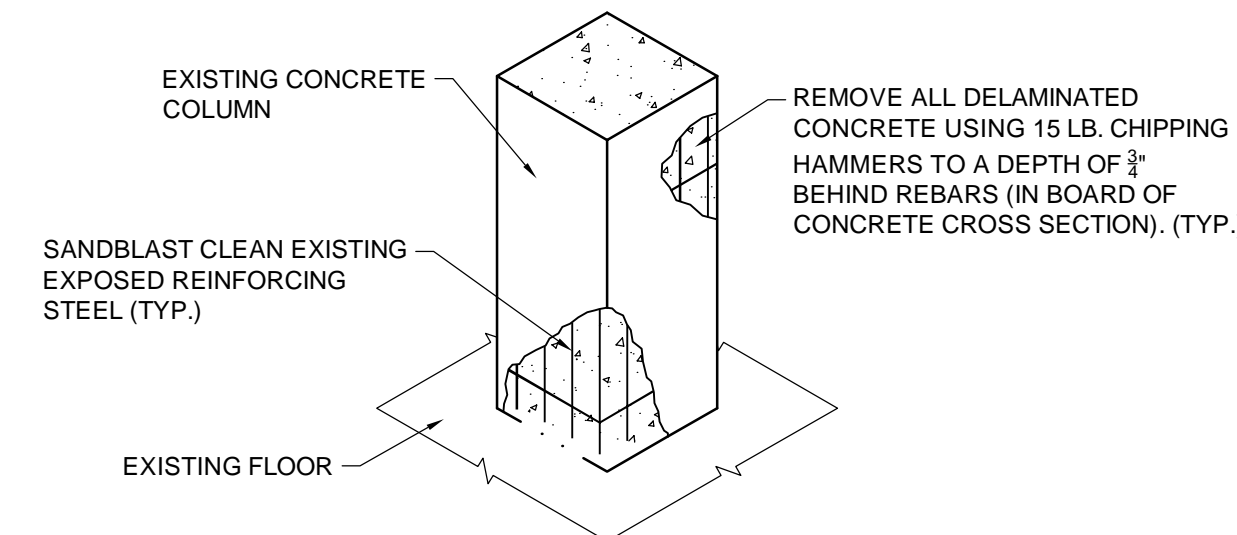
REPAIRED CONDITION

REPAIR PROCEDURE

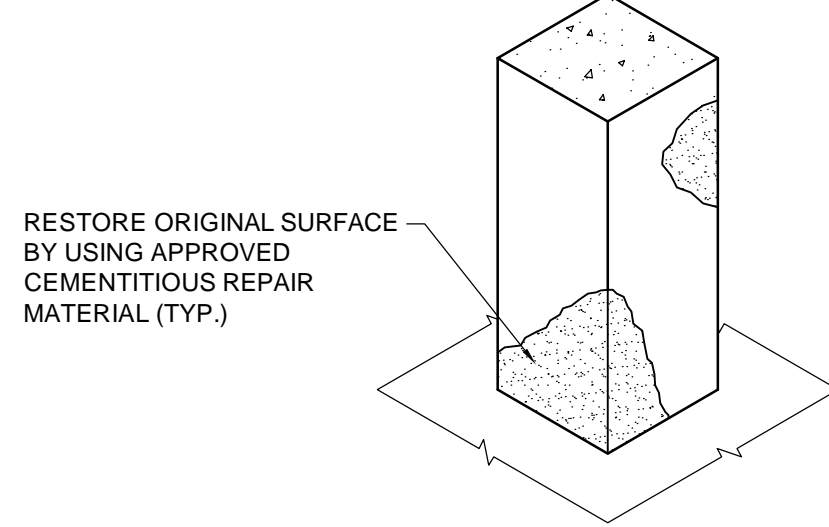
1. SAW-CUT ALONG THE PERIMETER OF REPAIR AREAS AND REMOVE EXISTING GRADE SLAB TO THE EXTENT REQUIRED TO PERMIT LAP SPlicing OF EXISTING REINFORCEMENT, IF ANY.
2. PLACE AND FINISH REPAIR AREAS USING AIR-ENTRAINED, FIBER-REINFORCED CONCRETE (MIN. 4000 PSI AT 28 DAYS) SO AS TO MATCH EXISTING SLOPES AND ELEVATIONS. FINISHED PATCHES SHALL BE FREE OF PONDING.

4 SLAB ON GRADE REPAIR DETAIL

SCALE: N.T.S.



EXISTING AND DEMOLITION CONDITION



REPAIRED CONDITION

REPAIR PROCEDURE:

1. INSTALL APPROVED SHORING SYSTEM PRIOR TO START OF ANY CONCRETE REMOVAL. REFER TO CONSTRUCTION NOTE 5 ON SHEET R-34.
2. CONCRETE REMOVAL SHALL BE PERFORMED IN MULTIPLE PHASES. CROSS-SECTIONAL AREA OF CONCRETE REMOVAL IN EACH PHASE SHALL NOT BE LARGER THAN APPROXIMATELY 6% TO 7% OF THE ORIGINAL COLUMN CROSS-SECTIONAL AREA.
3. TOTAL CROSS-SECTIONAL AREA OF REPAIR WHICH INCLUDES MULTIPLE STAGES SHALL NOT EXCEED 15% OF THE TOTAL ORIGINAL CROSS-SECTIONAL AREA OF THE COLUMN AT ANY SECTION.
4. WHEN CONCRETE REMOVAL IS DEEMED NECESSARY TO BE EXTENDED IN BOARD BEYOND THE VERTICAL BARS, SPACE BEHIND MAIN VERTICAL BAR SHALL NOT BE LESS THAN $\frac{3}{4}$ " NOR GREATER THAN 1".
5. DO NOT START CONCRETE REMOVAL FOLLOWING COMPLETION OF A REPAIR PHASE UNTIL THAT REPAIR CONCRETE HAS ATTAINED FULL DESIGN STRENGTH. DO NOT START CONCRETE REMOVAL ON A PHASE IMMEDIATELY ADJACENT TO AN EARLIER REPAIRED PHASE UNTIL THAT REPAIR HAS BEEN CURED FOR AT LEAST 14 DAYS.
6. REMOVE UNSOUND AND SOUND CONCRETE AS DIRECTED BY THE ENGINEER TO A DEPTH INDICATED USING CHIPPING HAMMERS AND SANDBLAST CLEAN EXPOSED STEEL.
7. SUPPLEMENT EXISTING REINFORCING BARS THAT HAVE LOST MORE THAN 20% OF THEIR ORIGINAL CROSS SECTION WITH NEW EPOXY COATED #3 BARS. NEW REINFORCING SHALL BE PROPERLY LAP SPliced TO EXISTING.
8. APPLY REPAIR MATERIALS IN LAYERS AS PER MANUFACTURER'S RECOMMENDED REPAIR PROCEDURE. LAYERS SHALL BE LIMITED IN THICKNESS, AS REQUIRED. EXISTING CONCRETE SURFACE SHALL BE PRE-WET PRIOR TO REPAIR MATERIALS APPLICATION.
9. PROTECT AND CURE FINISHED REPAIR.

5 COLUMN REPAIR DETAIL

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REPAIR DETAILS

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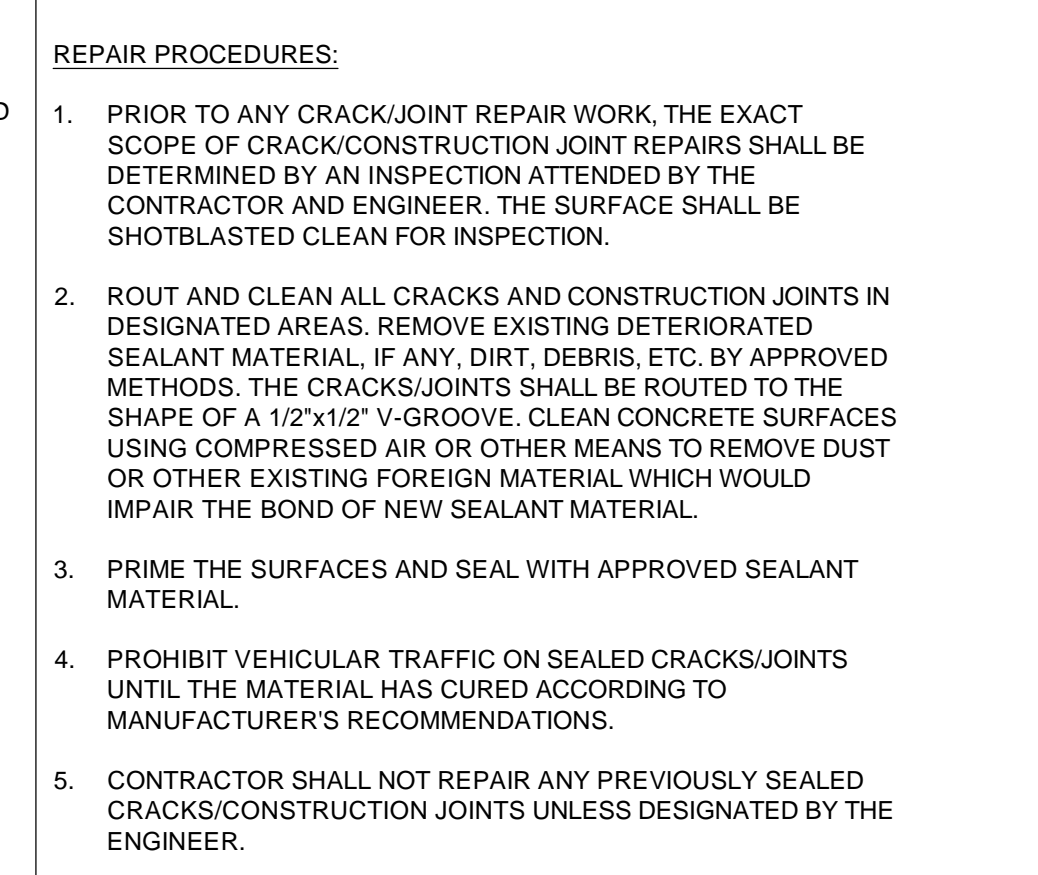
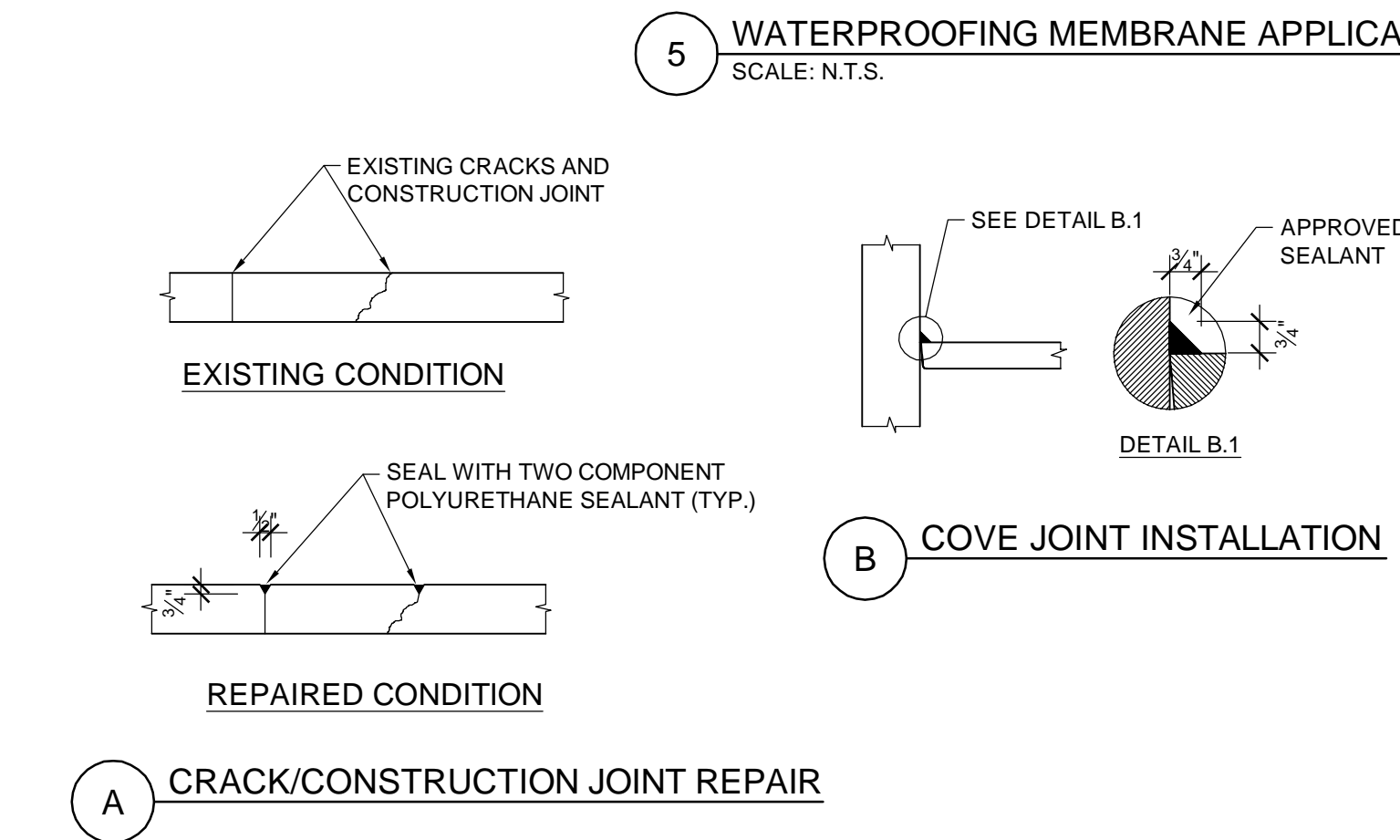
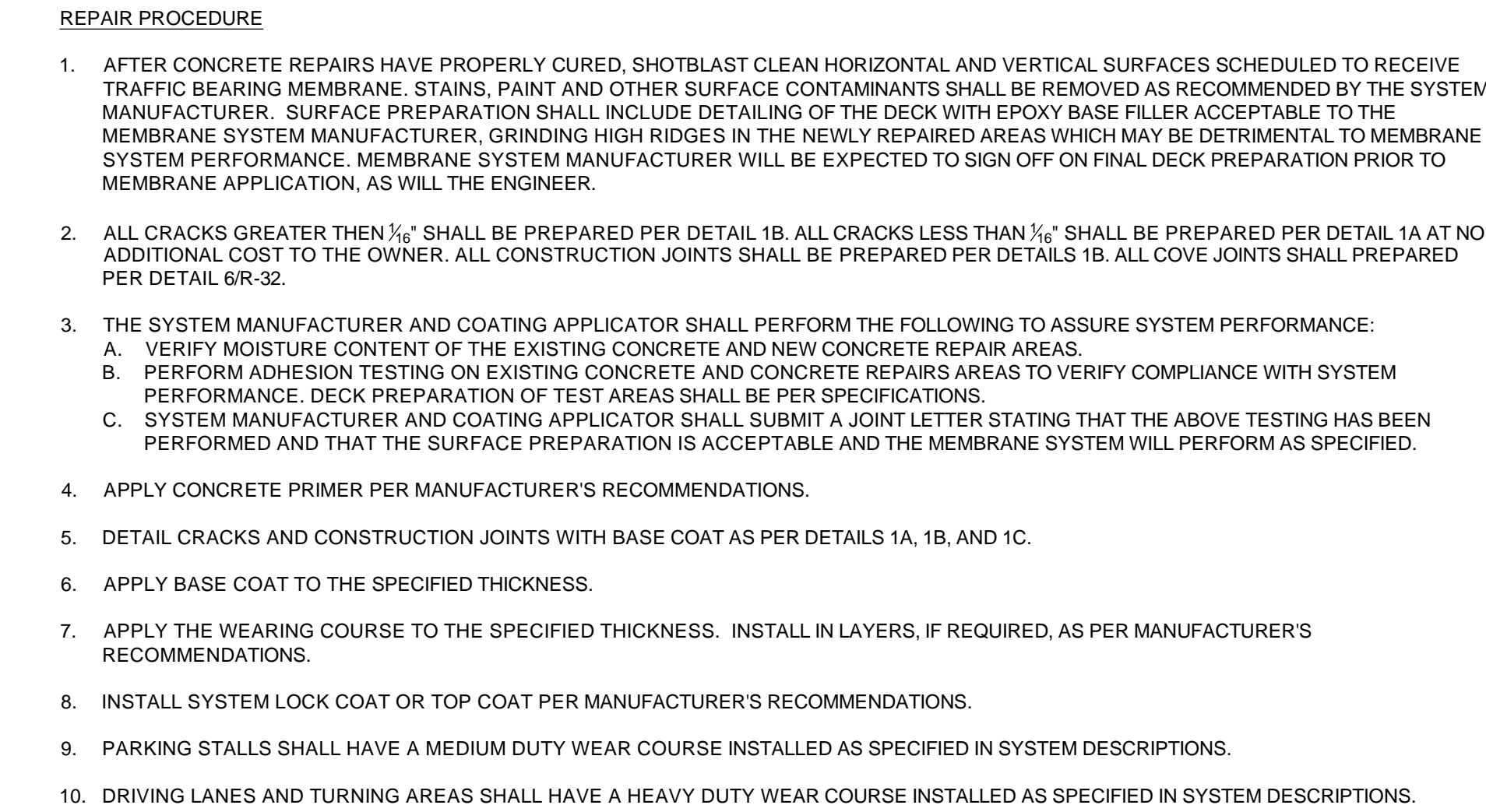
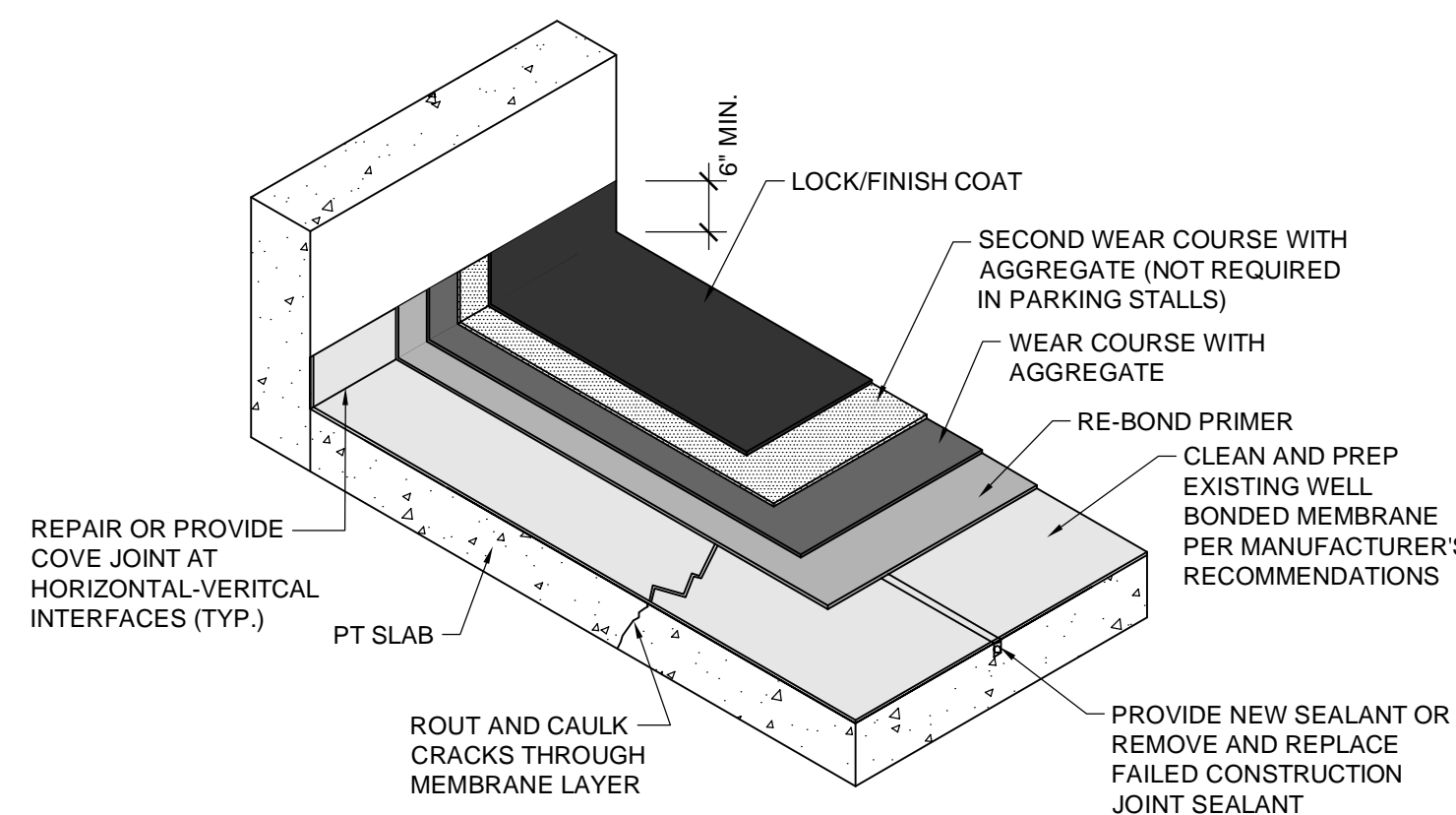
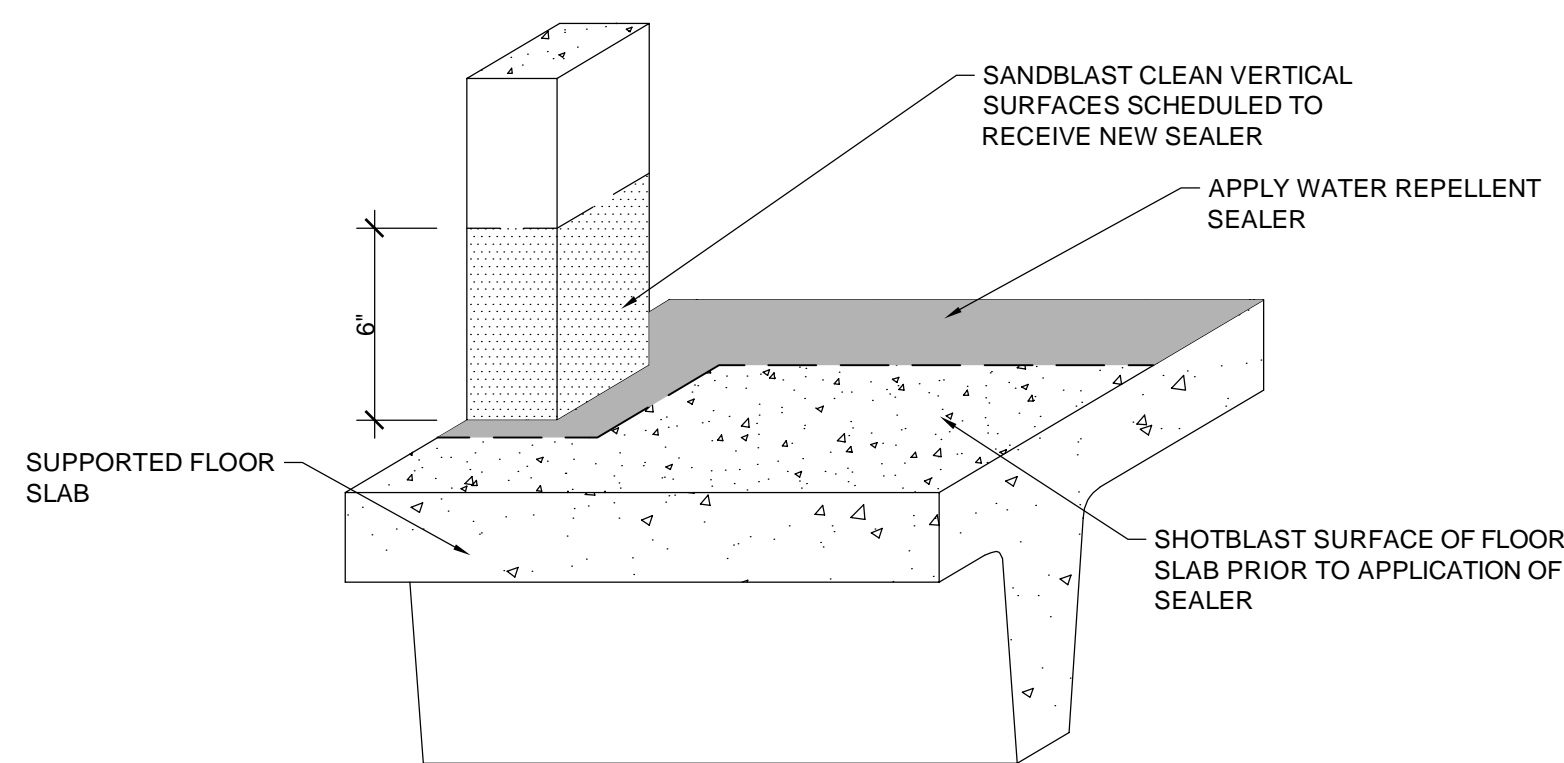
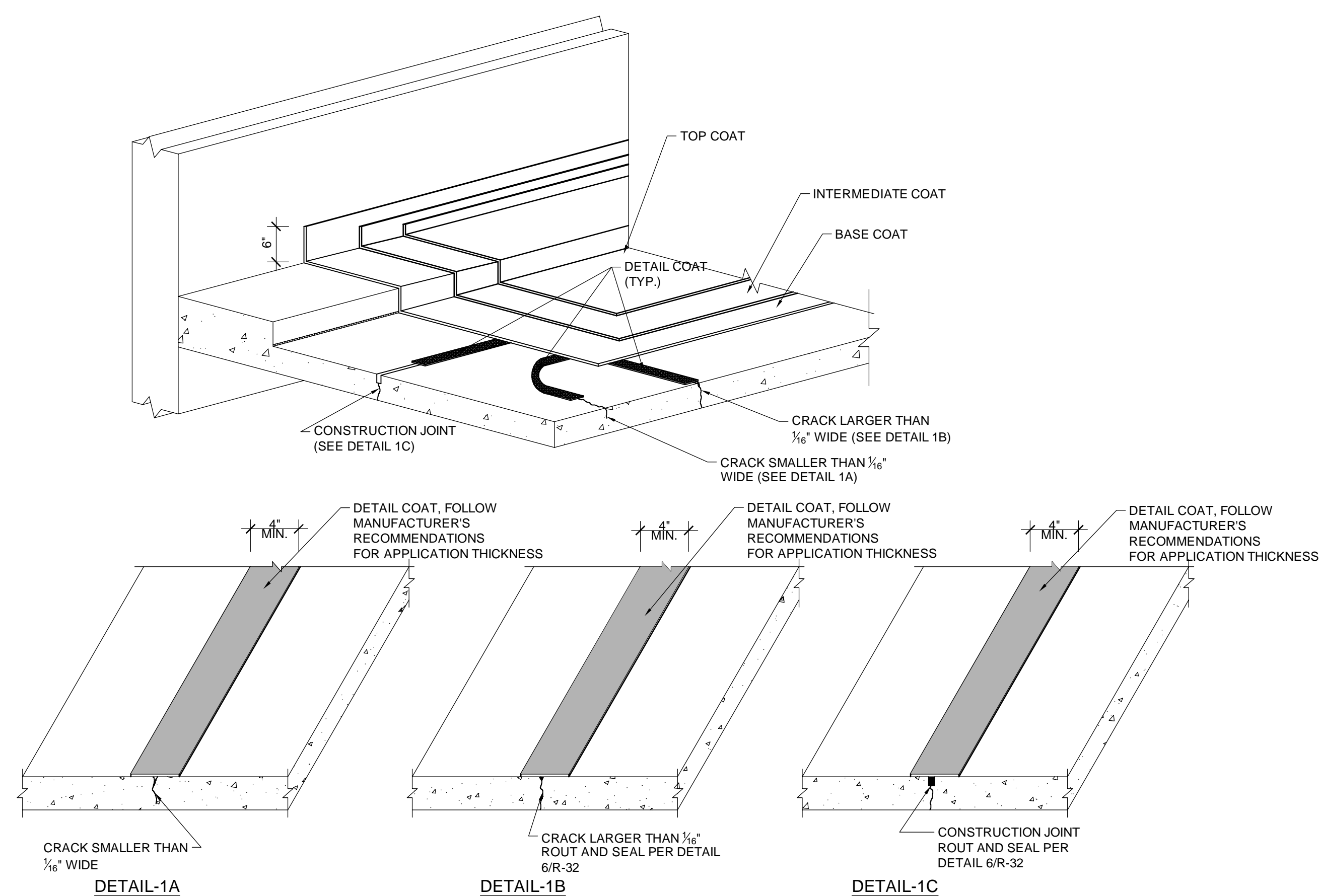
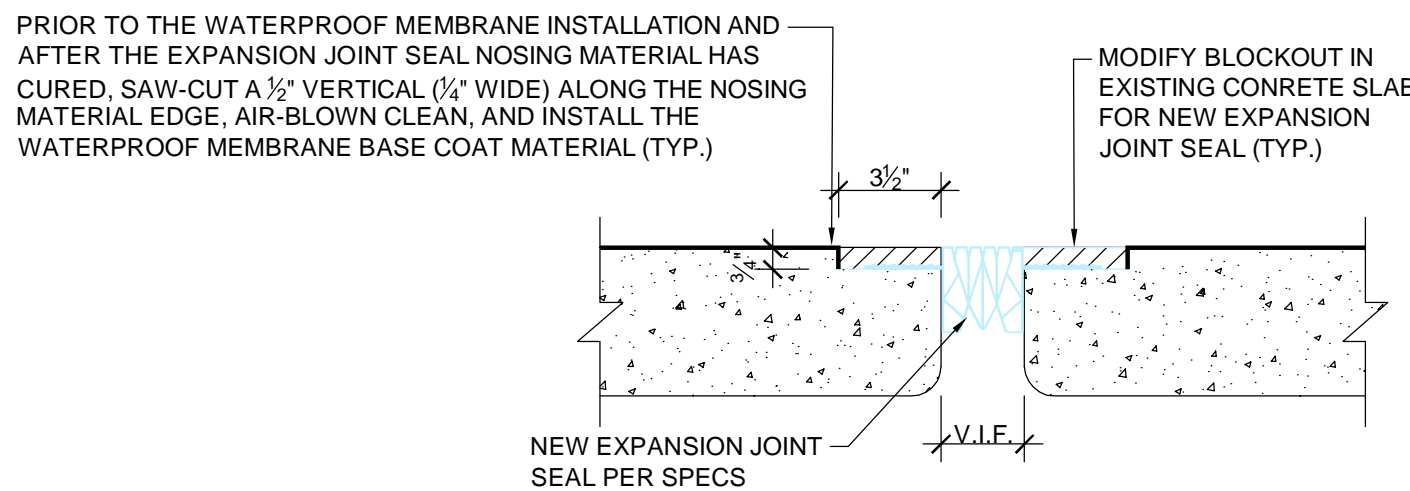
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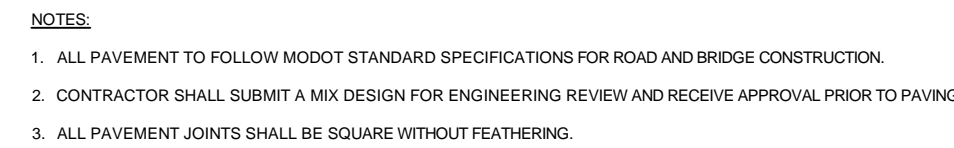
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DATE: MAY, 2019

PROJECT NO: 50-19127

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A cross-sectional diagram of a pavement structure. The diagram shows several layers from top to bottom: a thin top layer, a dark grey layer, a layer with a circular aggregate pattern, and a bottom layer with a brick-like pattern. Labels with arrows point to specific features: 'MATCH EXISTING FINISH ELEVATION' points to a horizontal line at the top left; 'PRIME COAT' points to the dark grey layer; 'INSTALL NEW (1 1/2" THK) SURFACE COURSE' points to the thin top layer; 'INSTALL NEW (1 1/2" THK) BINDER COURSE' points to the dark grey layer; 'EXISTING BASE COURSE TO REMAIN' points to the circular aggregate layer; and 'EXISTING SUBGRADE COURSE TO REMAIN' points to the brick-patterned bottom layer.

Diagram of a large arrow pointing up. The arrow has a total height of 29'0" and a total width of 12'0" at the base. The shaft is 3'6" wide and 8'3" high. The fletching is 1'0" wide on each side. The arrowhead is 1'6" wide at the top.

3 TYPICAL PAVEMENT ARROW
SCALE: N.T.S.

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DRAWING TITLE:

ASPHALT
REPAIR DETAILS

DRAWING NO.

R-33

SCALE: AS NOTED

DATE: MAY, 2019

PROJECT NO: 50-19127

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POST-TENSIONED CONCRETE NOTES

- ALL NEW POST-TENSIONING SYSTEM SHALL BE UNBONDED MONO-STRAND FULLY ENCAPSULATED TENDONS. STRANDS USED IN POST-TENSIONING SHALL CONFORM TO ASTM A416, STRESS RELIEVED, LOW RELAXATION, 7-WIRE EXTRA HIGH STRENGTH STRAND WITH A GUARANTEED MINIMUM ULTIMATE STRENGTH OF 270,000 PSI.
2. THE POST-TENSIONING TENDONS SHALL BE COATED WITH CORROSION INHIBITIVE COATING AND WRAPPED IN WATERTIGHT EXTRUDED PLASTIC SHEATH. IN-PLACED TENDONS SHALL BE IN SATISFACTORY CONDITION.
3. ANCHORAGES FOR POST-TENSIONING TENDONS SHALL BE DESIGNED PER ACI 318 CODE AND COMMENTARY, AND SAMPLES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
4. AT THE ENGINEER'S REQUEST, THE POST-TENSIONING SYSTEM MANUFACTURER SHALL SUBMIT CALCULATIONS, TENDON MILL CERTIFICATES, ANCHORAGES TEST RESULTS, AS WELL AS WOBBLE AND CURVATURE COEFFICIENT DETERMINATION DATA TO SUBSTANTIATE THE METHOD OF TENDON CALCULATIONS. WHEN THE LATTER IS NOT AVAILABLE THE CALCULATIONS SHALL BE BASED ON A WOBBLE FRICTION COEFFICIENT OF $k=0.002$ AND CURVATURE COEFFICIENT OF $m=0.15$.
5. THE POST-TENSIONING SYSTEM MANUFACTURER SHALL SUBMIT TO THE ENGINEER FOR APPROVAL ENGINEERED SHOP DRAWINGS SHOWING, AS A MINIMUM, THE FOLLOWING:
 - A. FOR SLABS, REPAIRED TENDONLAYOUT LAYOUT AND DIMENSIONS LOCATING TENDONS IN PLAN, TENDON CURVATURE AT BLOCKOUTS, ALL OPENINGS, ANCHORAGES, CHAIR HEIGHTS AND LOCATION, ANY PLACEMENT STEEL IF REQUIRED;
 - B. FOR ALL REPLACED TENDONS, LOCATION OF EACH TENDON, METHOD OF TENDON SUPPORT, DETAILS OF ANCHORAGE ZONE REINFORCEMENT, STRESSING POCKETS, CLOSURES, ETC.
6. ALL FRICTION CALCULATIONS AND POST-TENSIONING SHOP DRAWINGS SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MISSOURI.
7. THE POST-TENSIONING SYSTEM MANUFACTURER SHALL SUBMIT TO THE ENGINEER, FOR REVIEW, DETAILED STRESSING PROCEDURES AND SEQUENCES, AS WELL AS DETAILED CALCULATIONS TO SUBSTANTIATE THE ABOVE. ALL PRESTRESSING LOSSES SHALL BE ACCOUNTED FOR IN THE CALCULATIONS. COMPLETE POST-TENSIONING PROCEDURE SHALL INCLUDE, AS A MINIMUM, THE FOLLOWING:
 - A. JACKING FORCES AND JACKING PRESSURES, INCLUDING BUT NOT LIMITED TO MAXIMUM TEMPORARY JACKING FORCE AND JACKING PRESSURE;
 - B. CERTIFIED JACK CALIBRATION DATA AND METHOD OF JACK IDENTIFICATION; EACH JACK TO BE USED ON THE JOB SHALL BE CALIBRATED WITHIN ONE (1) MONTH PRIOR TO ITS USE;
 - C. METHOD OF DETERMINING THE SLACK, IF ANY;
 - D. REQUIRED ELONGATION OF EACH TENDON AT EACH JACKING POINT;
 - E. METHOD OF DETERMINING ANCHOR FORCE OR FORCE REMAINING IN A TENDON AFTER ANCHORAGE;
 - F. METHOD OF REMOVING AN EXCESS TENDON LENGTH AFTER ANCHORAGE;
 - G. METHOD OF SEALING TENDONS AND CLOSING STRESSING POCKETS;
 - H. SAMPLE STRESSING RECORDS.
8. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A CONCRETING SEQUENCE FOR APPROVAL.
9. TENDONS SHALL BE SECURELY SUPPORTED AT INTERVALS NOT EXCEEDING 36 INCHES ON CENTER.
10. ALL OPENINGS AND/OR SLEEVES MUST BE SHOWN ON THE SHOP DRAWINGS, ANY ADDITIONAL OPENINGS, NOT SHOWN ON THE APPROVED SHOP DRAWINGS WILL REQUIRE A WRITTEN APPROVAL FROM THE ENGINEER PRIOR TO CONSTRUCTION.
11. TENDON STRESSING LOG CONTAINING REQUIRED AND MEASURED ELONGATIONS, AS WELL AS CALIBRATED JACK GAUGE READINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO ANY REMOVAL OF THE EXCESS TENDON LENGTH. TENDON STRESSING LOGS SHALL BE DATED AND SIGNED BY THE STRESSING OPERATOR, THE TESTING AGENCY AND THE CONTRACTOR.
12. AFTER ACCEPTANCE AND APPROVAL OF STRESSING RECORDS BY THE ENGINEER, CUT OFF TENDON TAILS ACCORDING TO THE ENGINEER'S DIRECTION.
13. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS FOR ALL POST-TENSIONED CONCRETE WORK.

CITY OF ST. LOUIS FOUR GARAGES
OF THE
ST. LOUIS, MISSOURI

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