# 2019 REPAIR AND PREVENTIVE MAINTENANCE

OF THE

## CITY OF ST. LOUIS FIVE PARKING GARAGES

ST. LOUIS, MISSOURI JUNE, 2019

## SCOPE OF WORK (Summary only)

### 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
- RECOAT EXISTING WATERPROOFING MEMBRANE
- GARAGE RESTRIPING

### **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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### **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

### GENERAL NOTES

The following general notes shall apply unless noted otherwise on plans.

- 1. All design and construction shall be in accordance with 2018 International Building Code and City of St. Louis local amendments.
- 2. Do not scale dimensions from drawings.
- 3. 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.
- 5. 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.
- 6. 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.
- 7. The contractor shall provide all shoring, bracing, sheeting required for safety, and proper execution of work.
- 8. 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.
- 9. 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.
- 10. 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.
- 11. 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.
- 12. 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.
- 13. 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.
- 14. 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 reproducibles 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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COVER

SHEET

R-0

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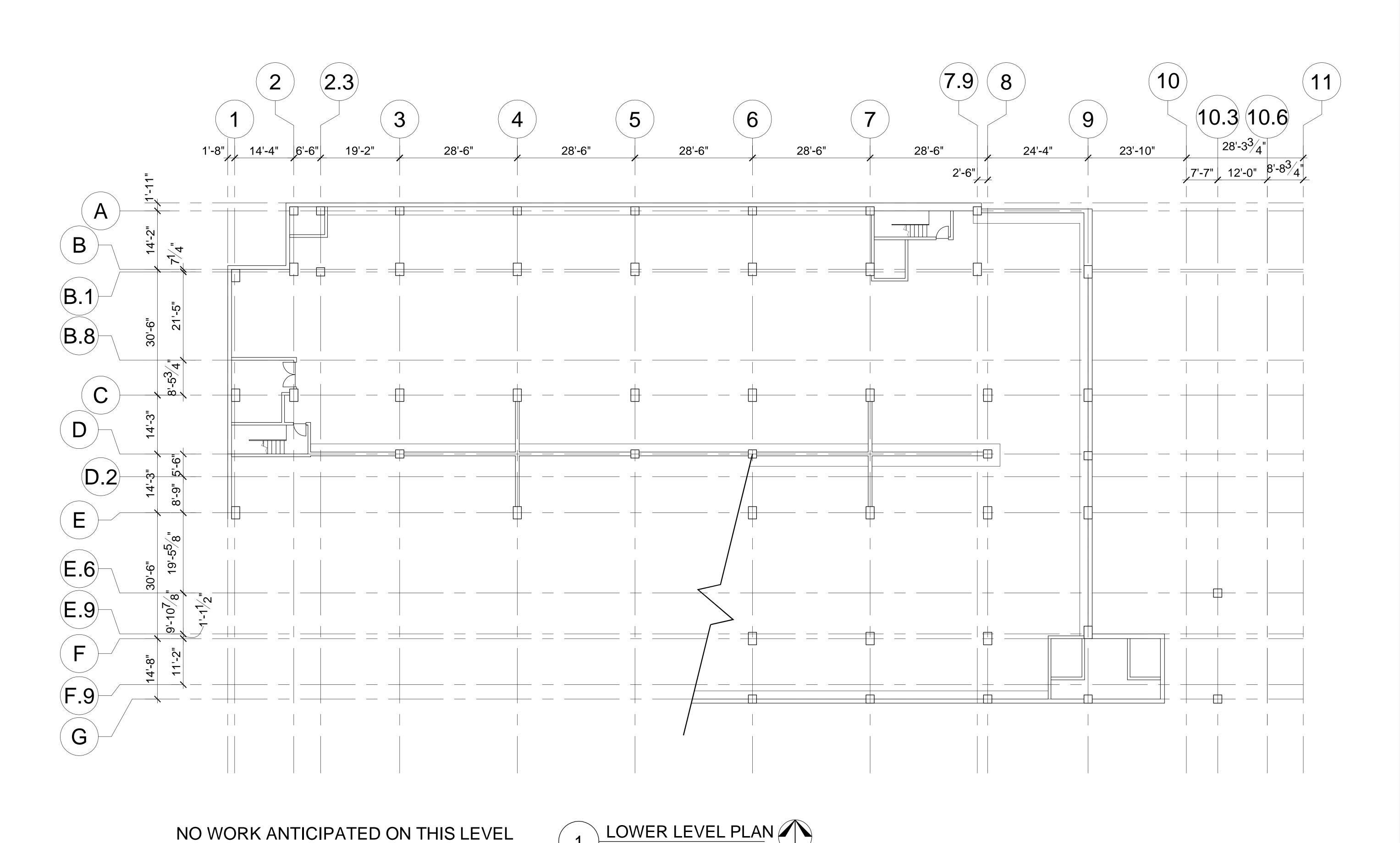
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9 NORTH GARAGE LOWER LEVEL PLAN

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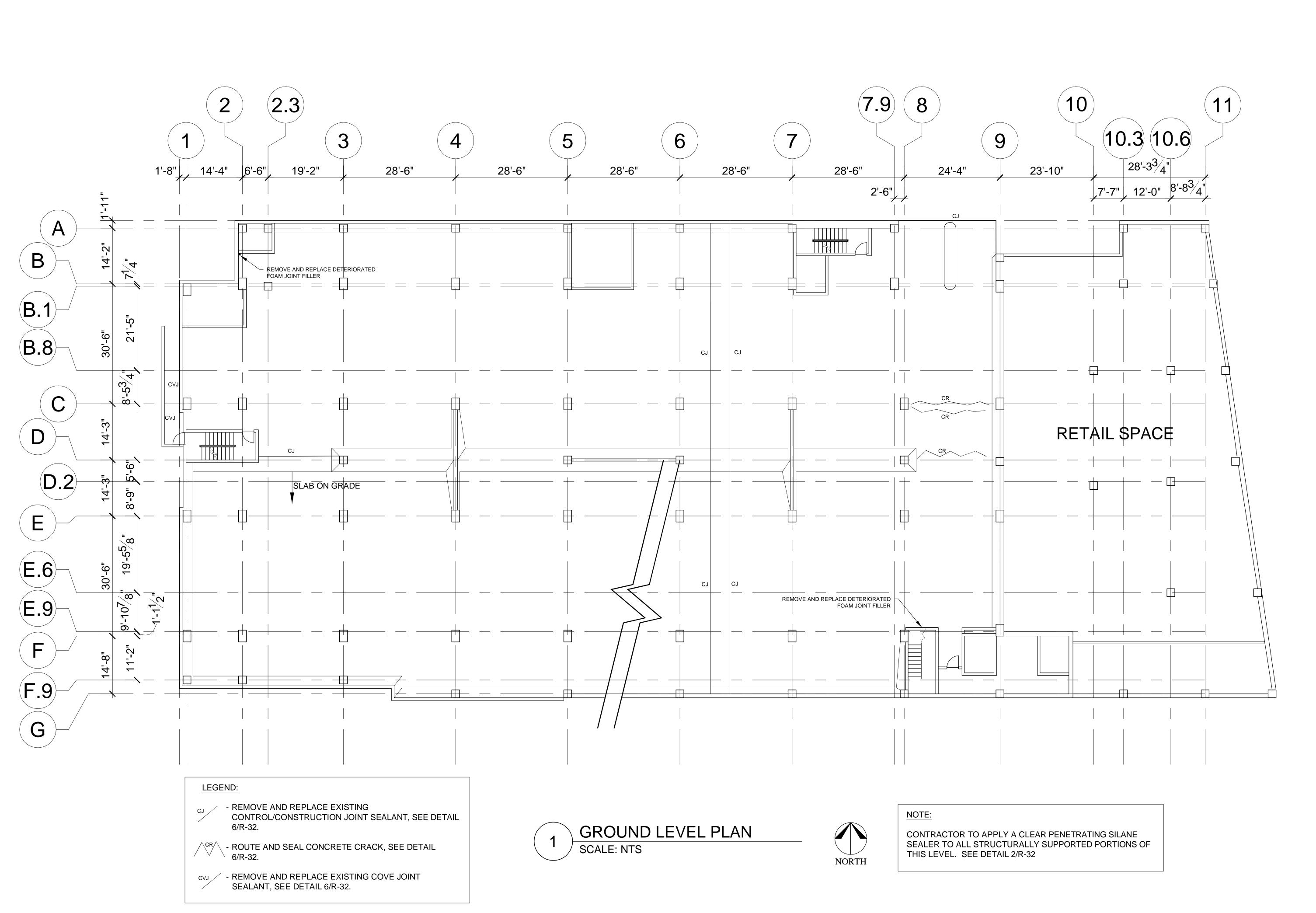
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9 NORTH GARAGE
GROUND LEVEL
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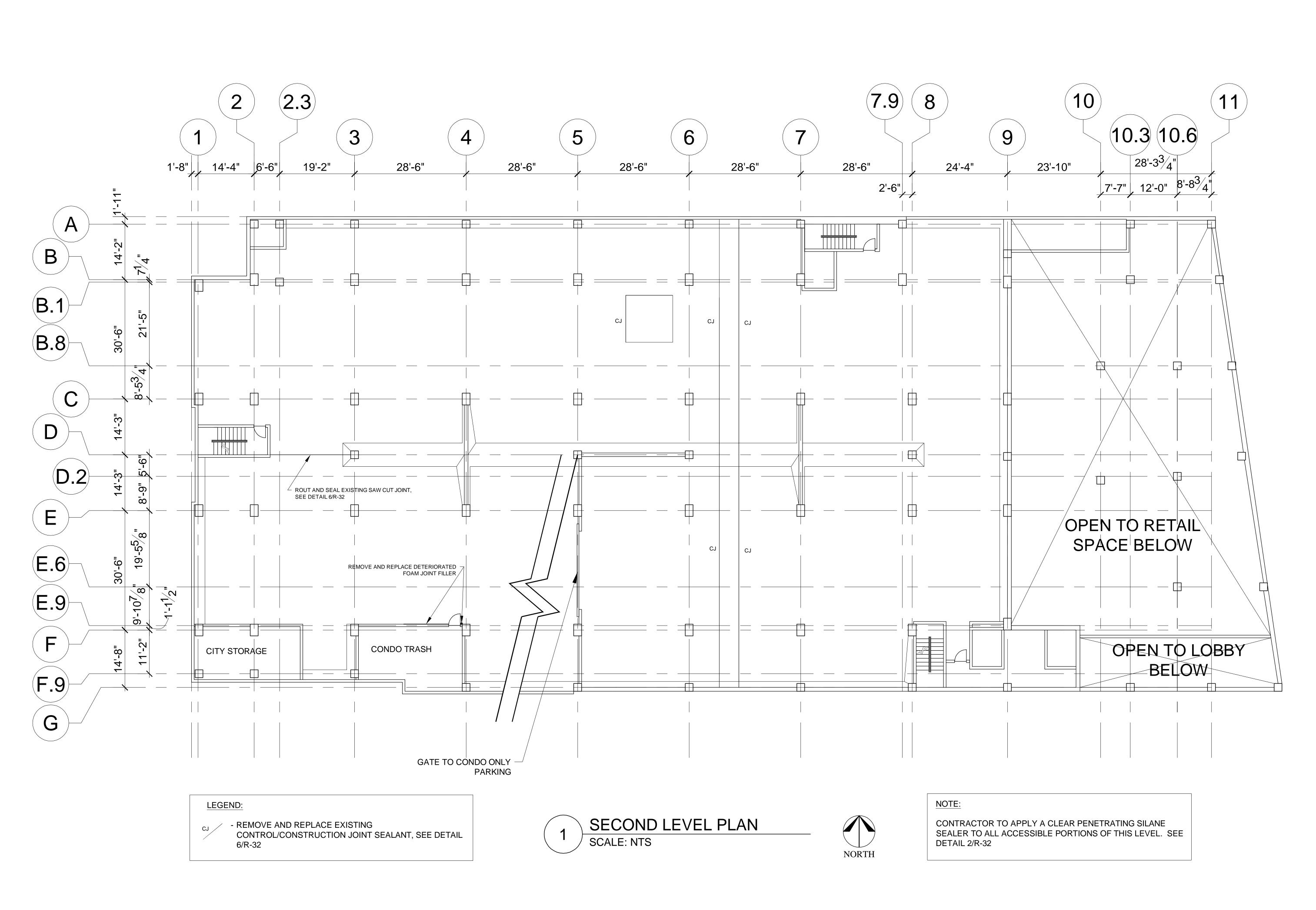
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9 NORTH GARAGE LEVEL 2 PLAN

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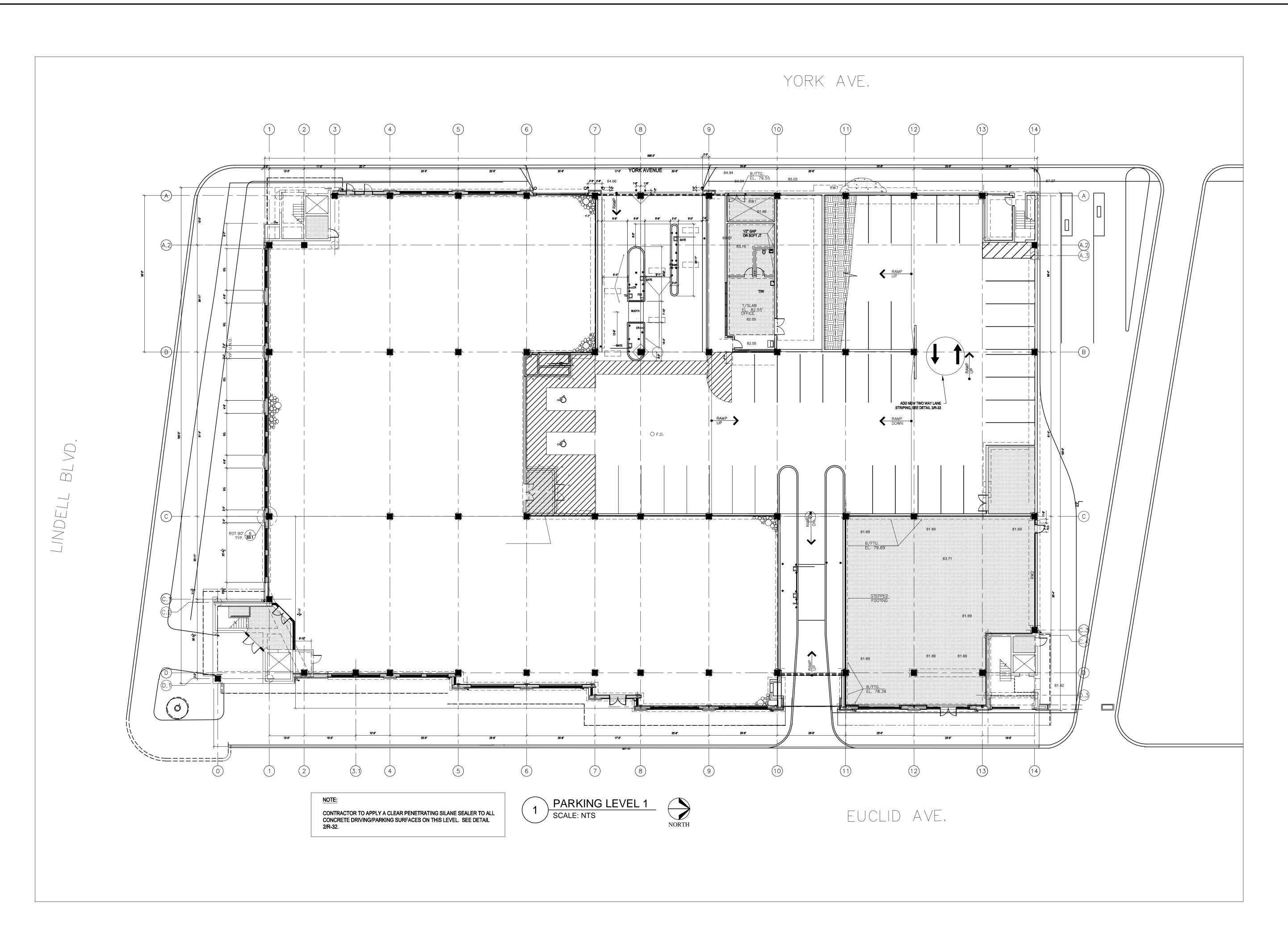
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ARGYLE GARAGE

LEVEL 1 PLAN

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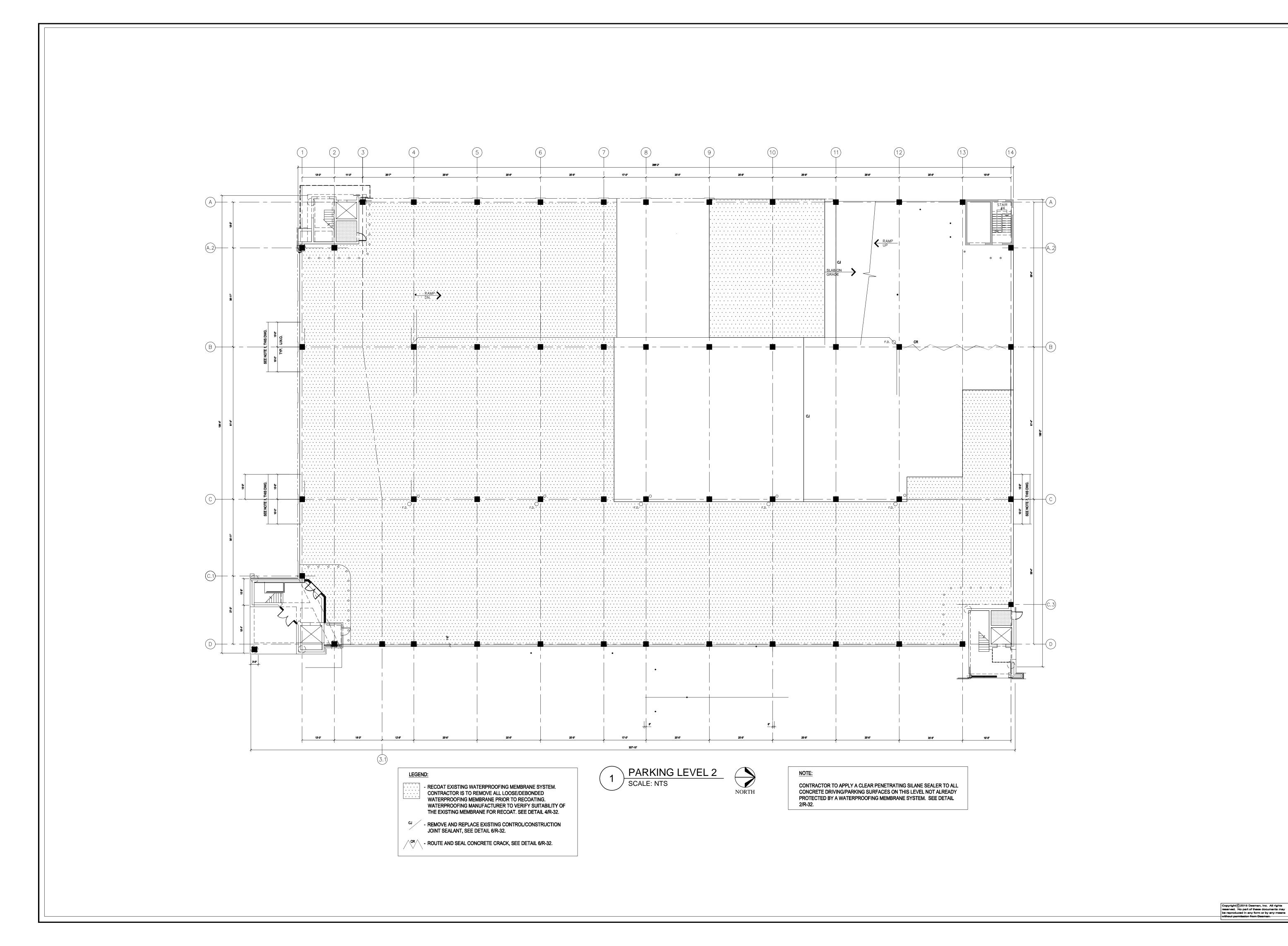
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ARGYLE GARAGE LEVEL 2 PLAN

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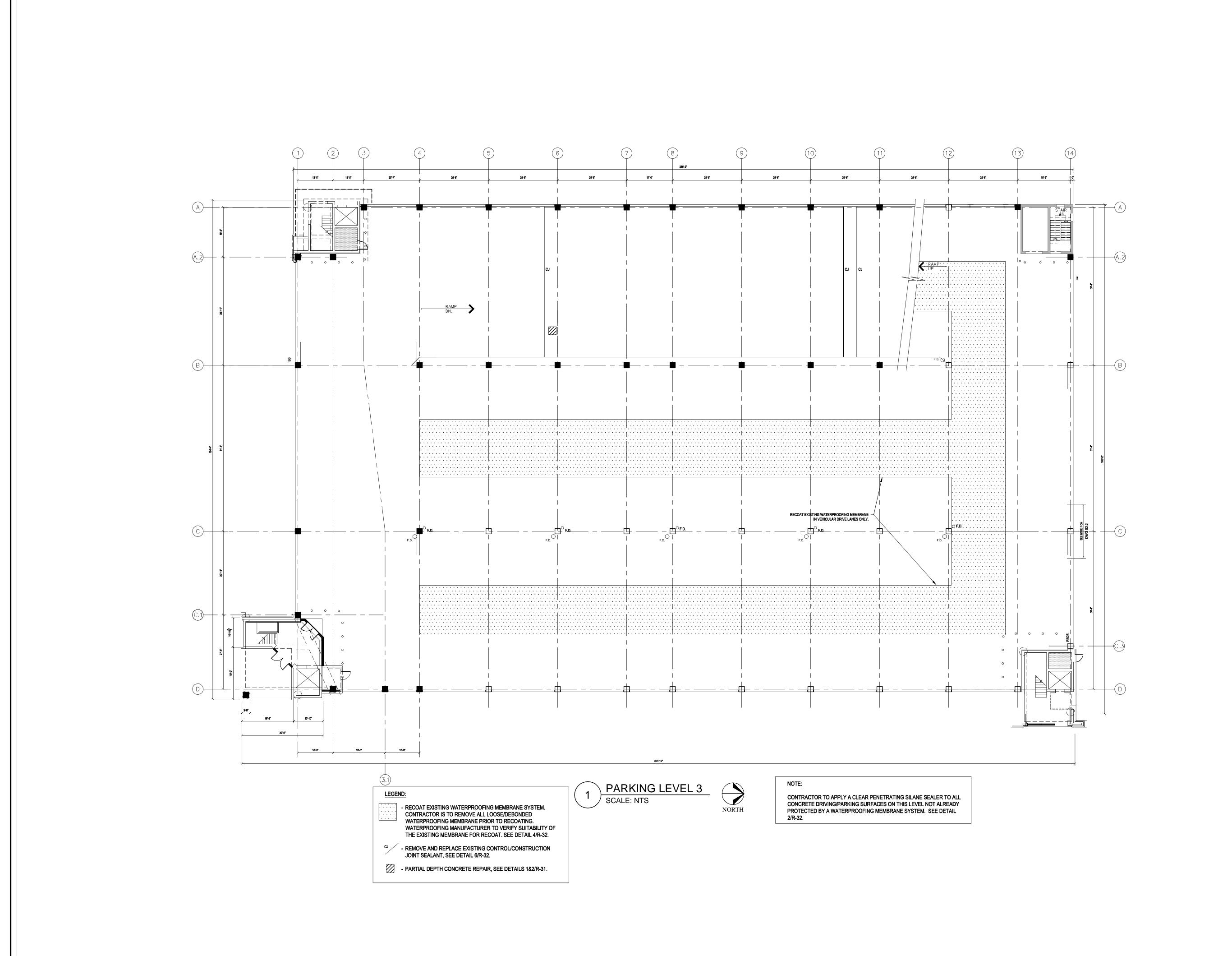
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ARGYLE GARAGE LEVEL 3 PLAN

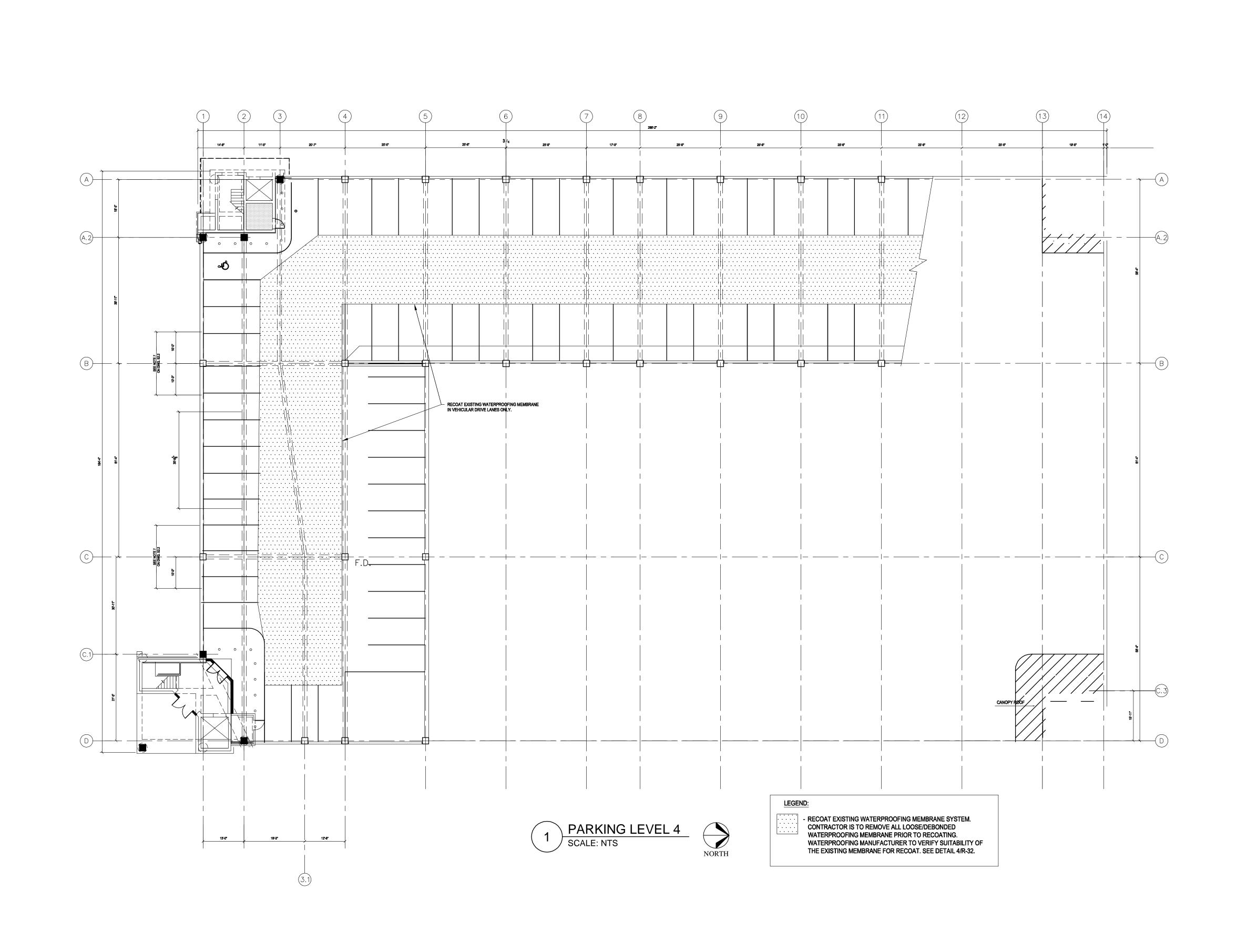
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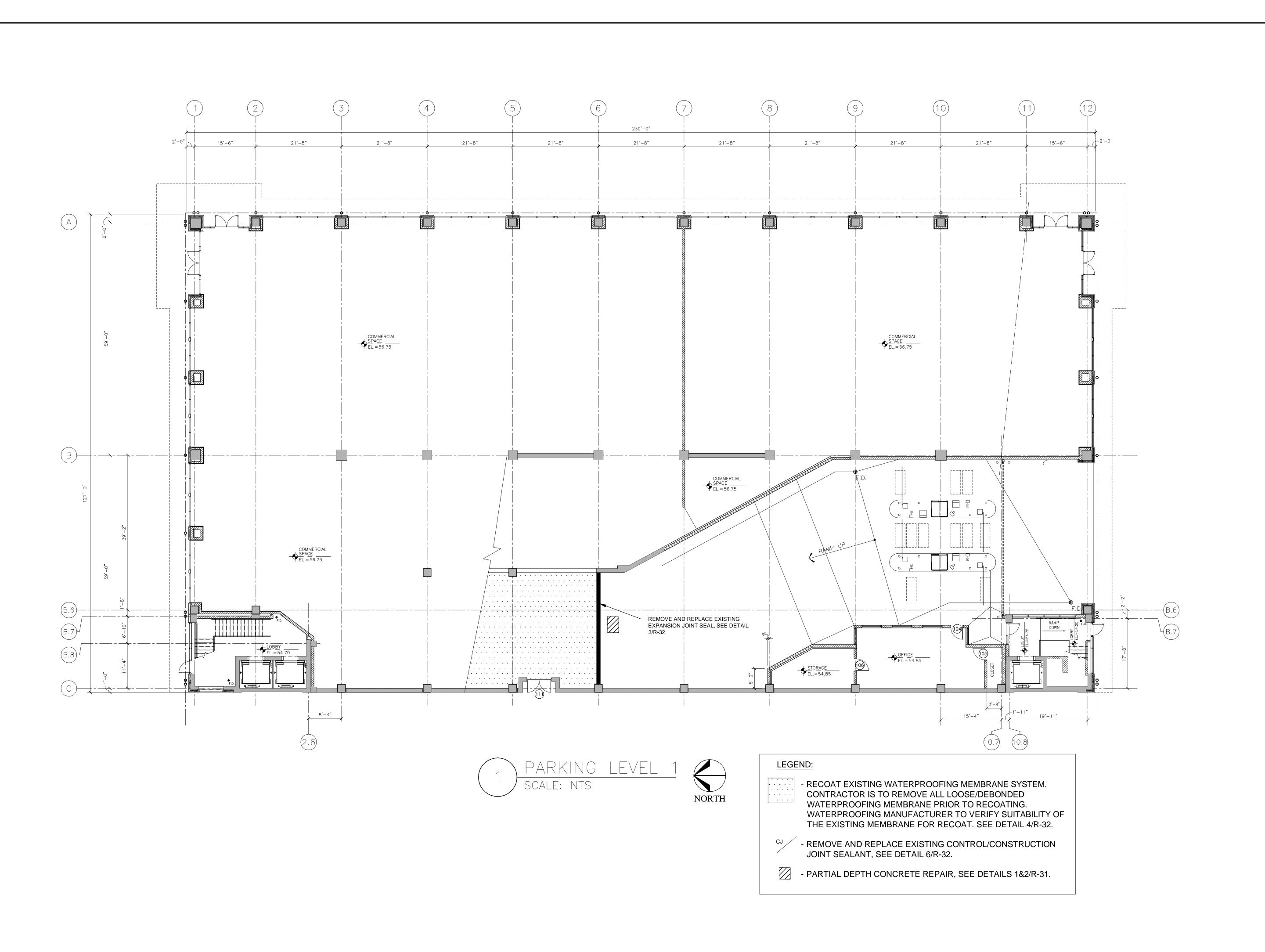
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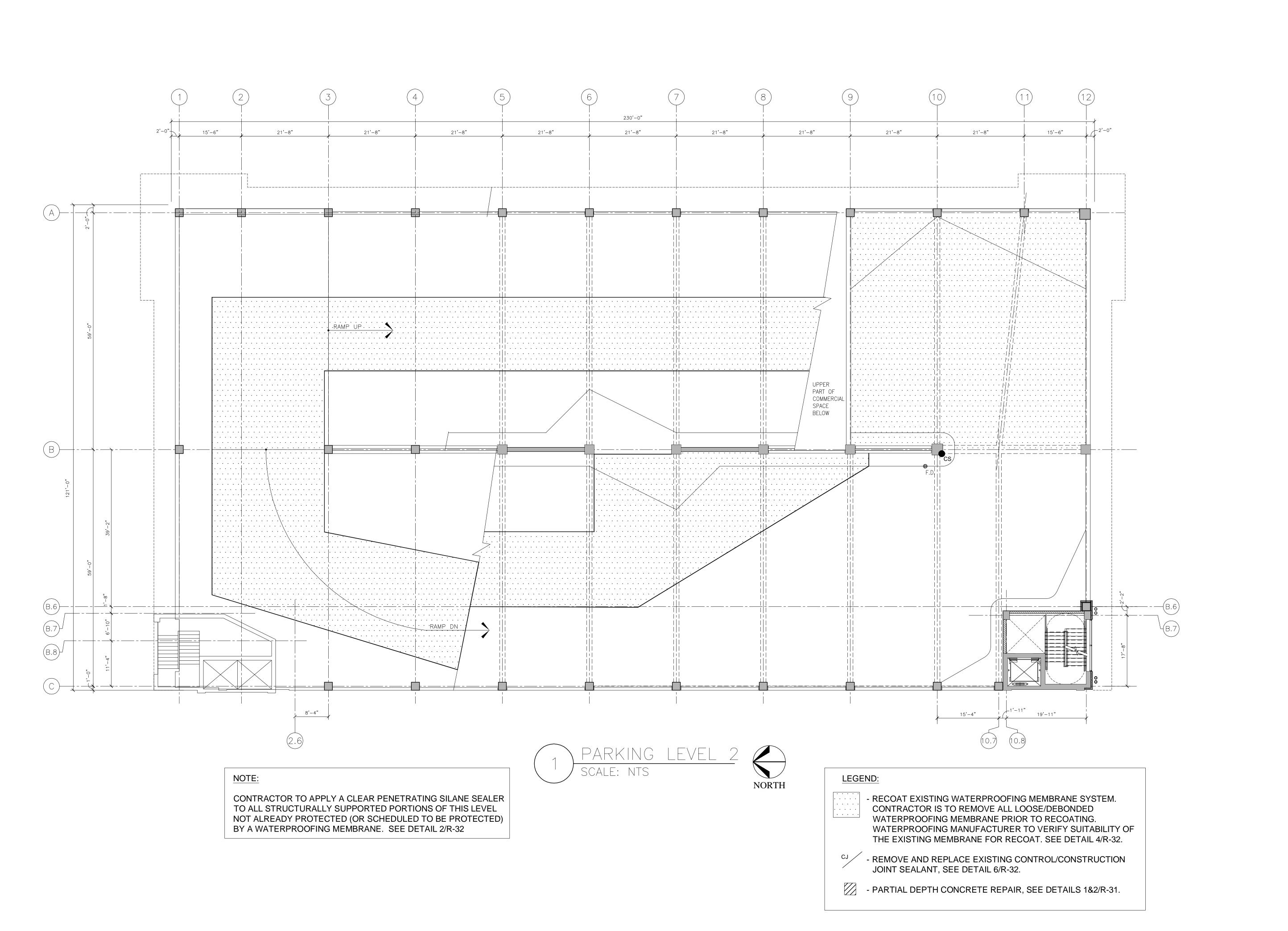
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LEVEL 1 PLAN

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LEVEL 2 PLAN

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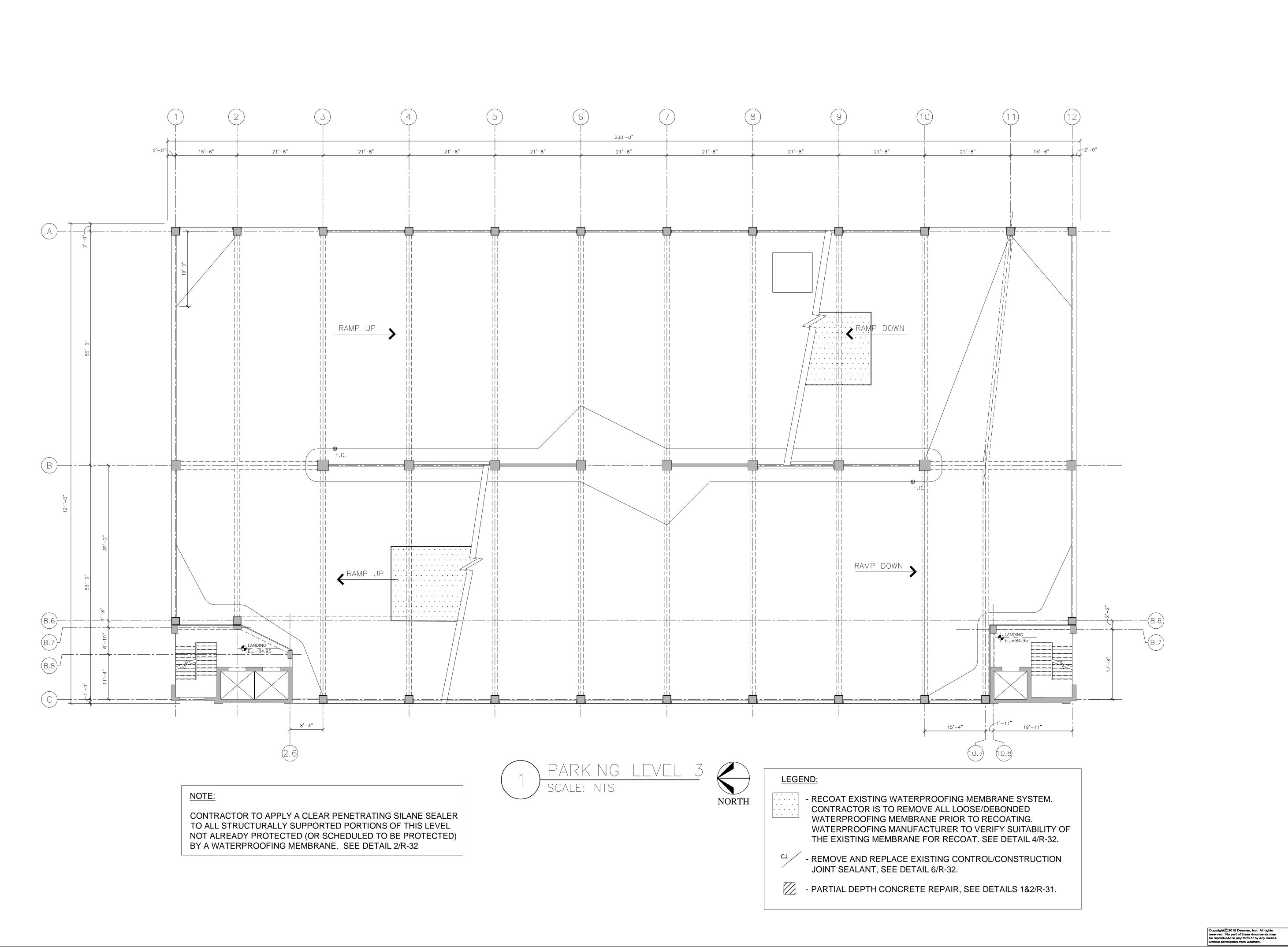
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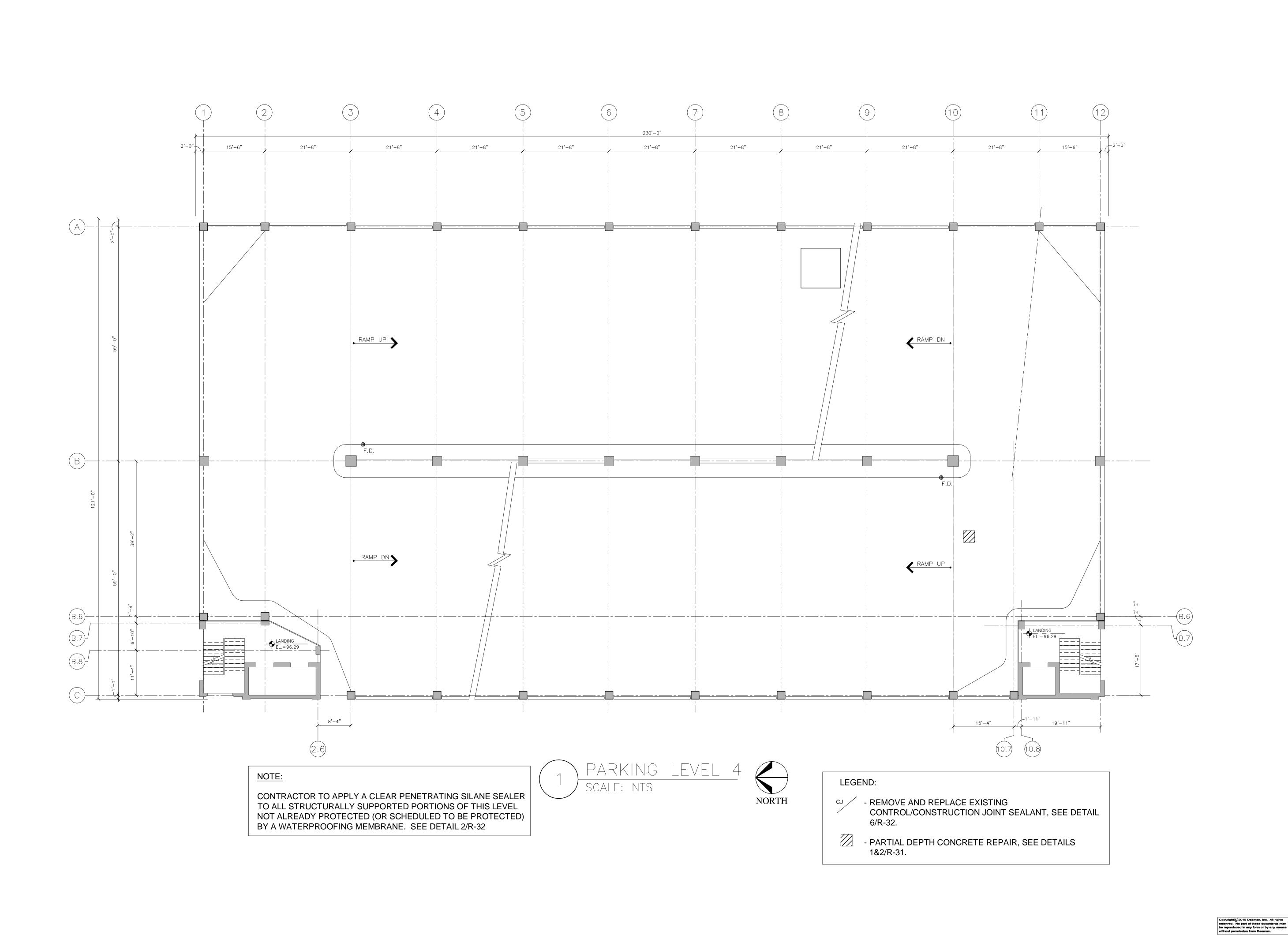
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CENTRAL DOWNTOWN LEVEL 3 PLAN

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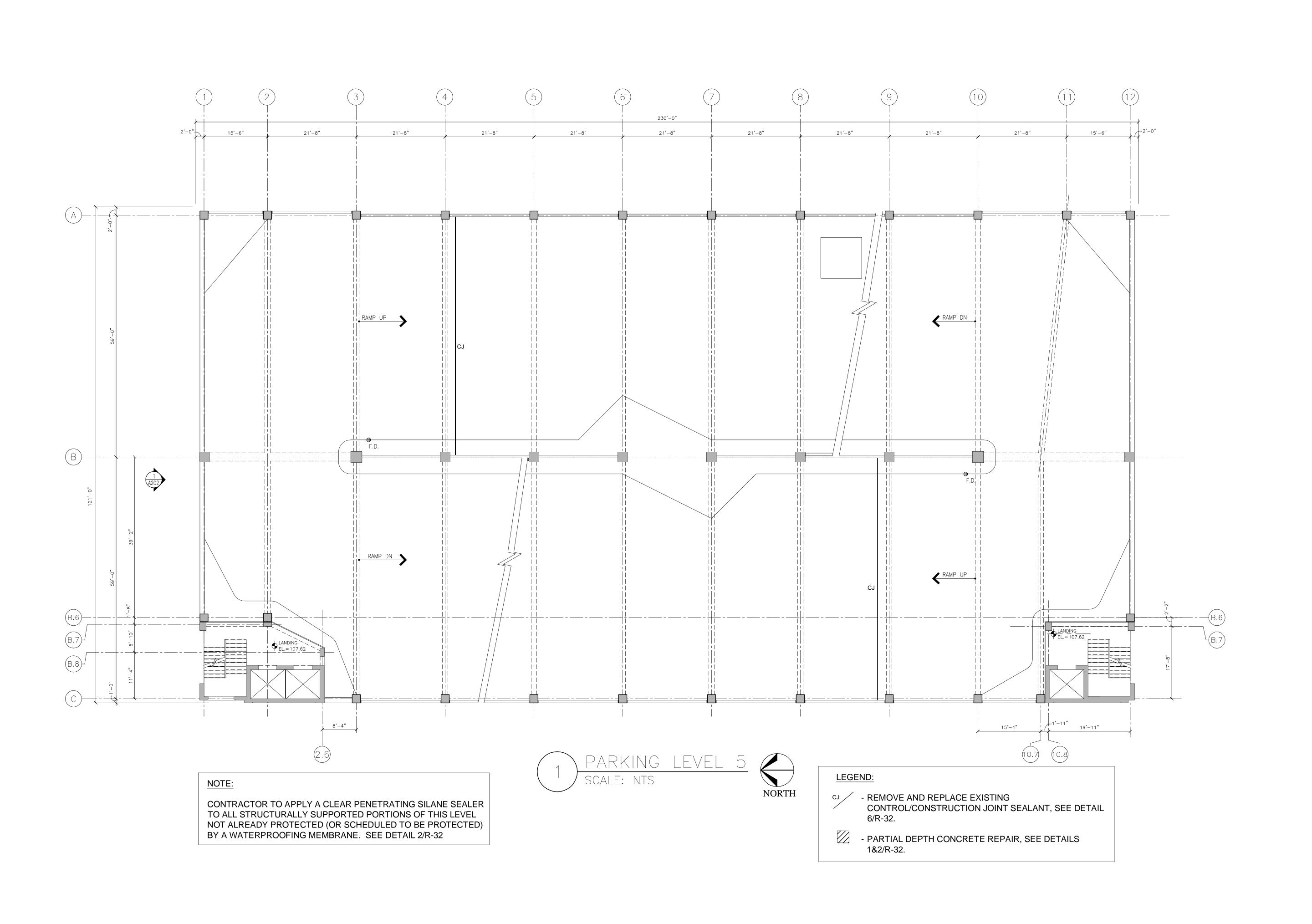
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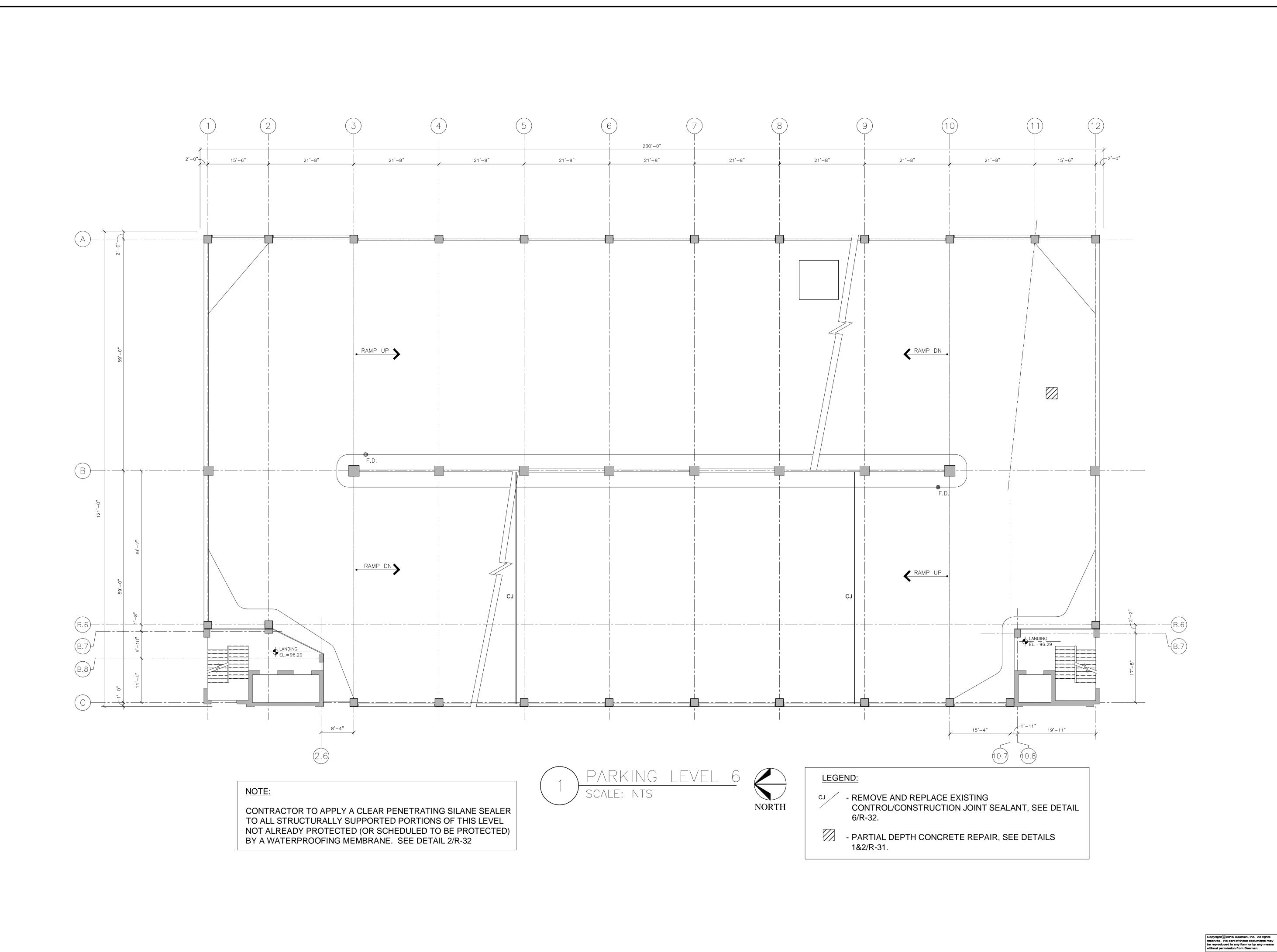
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CENTRAL DOWNTOWN LEVEL 5 PLAN

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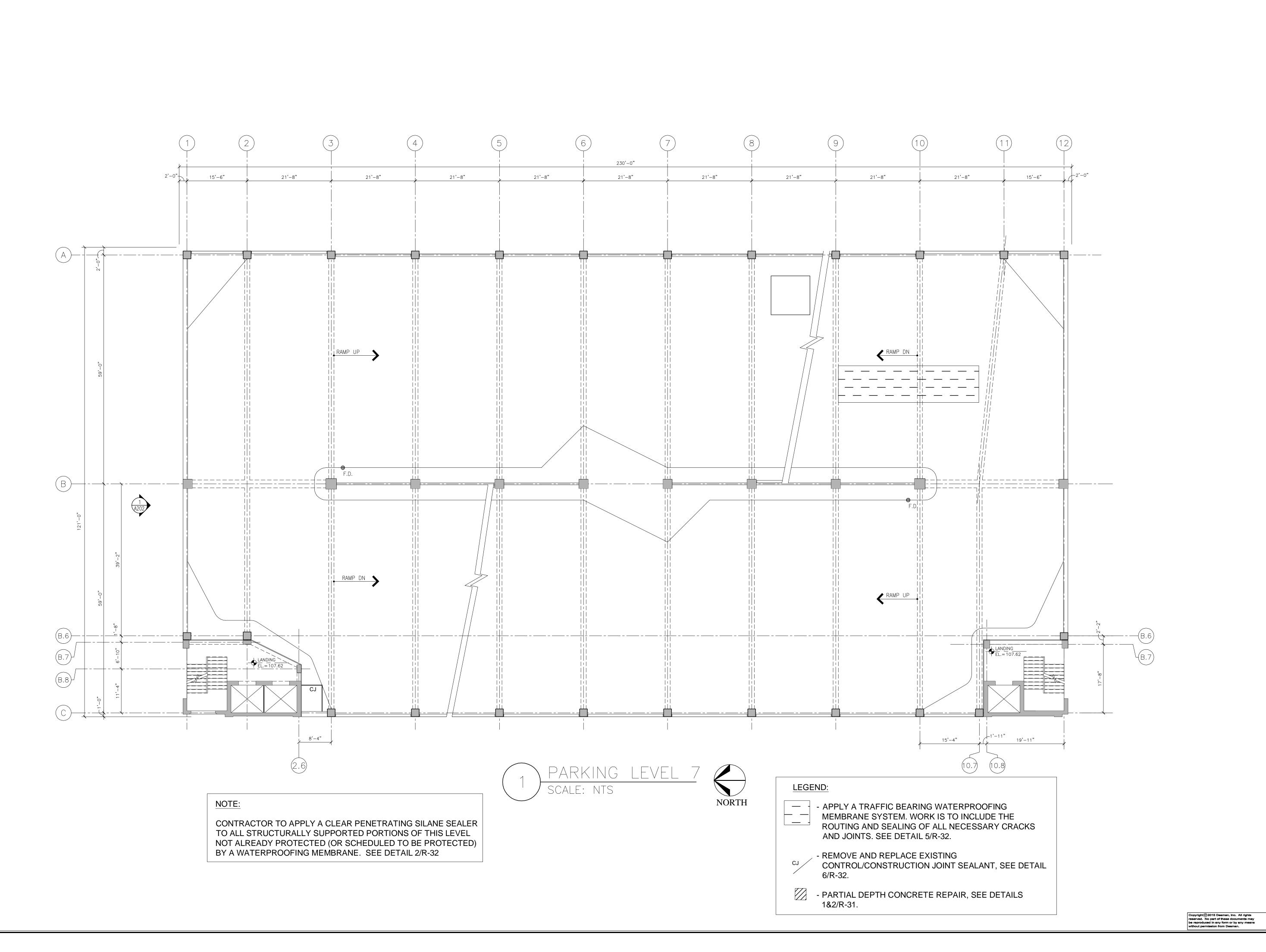
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CENTRAL DOWNTOWN LEVEL 6 PLAN

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CITY OF ST. LOUIS FOUR GARAGES

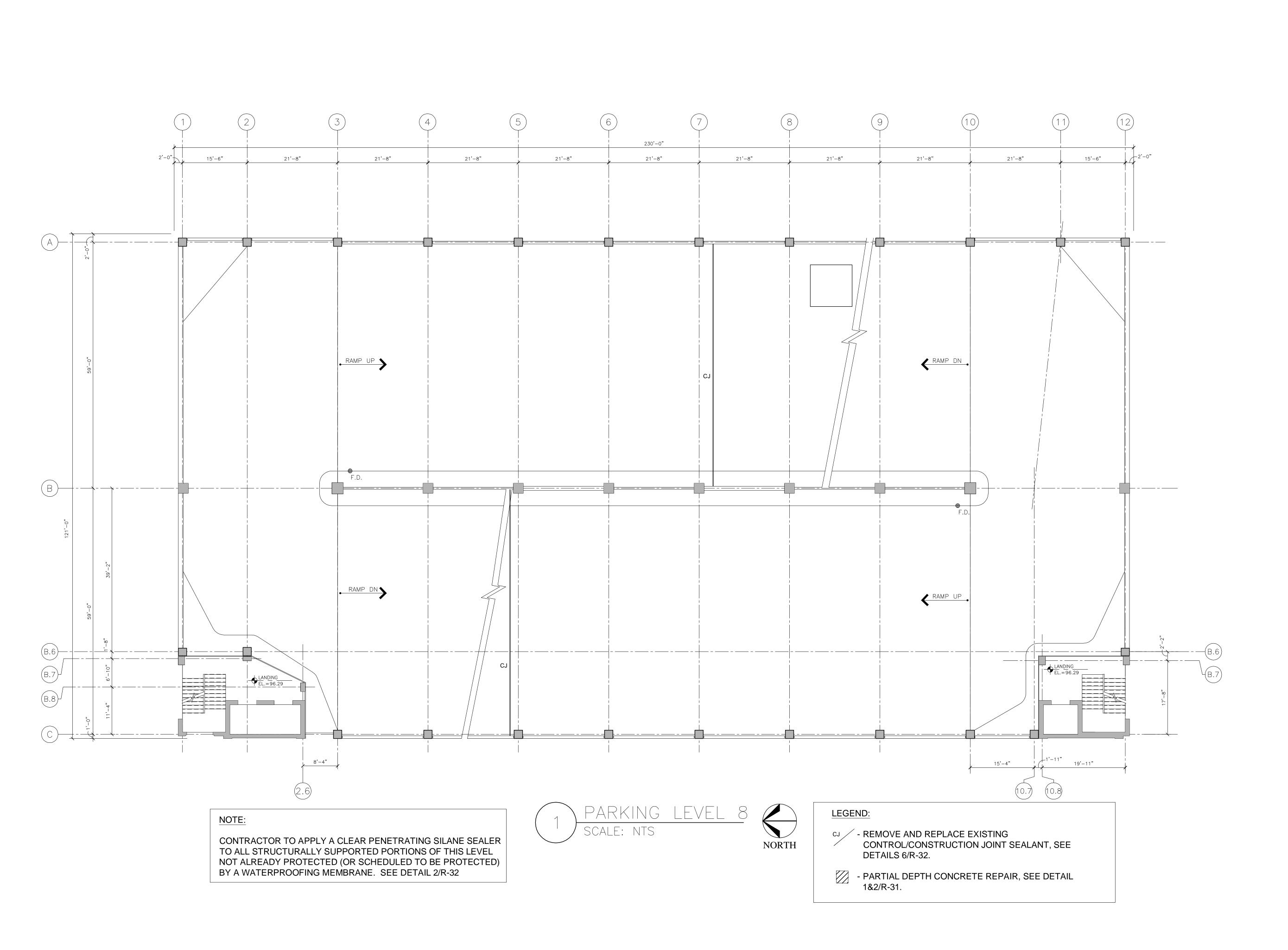
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LEVEL 7 PLAN

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LEVEL 8 PLAN

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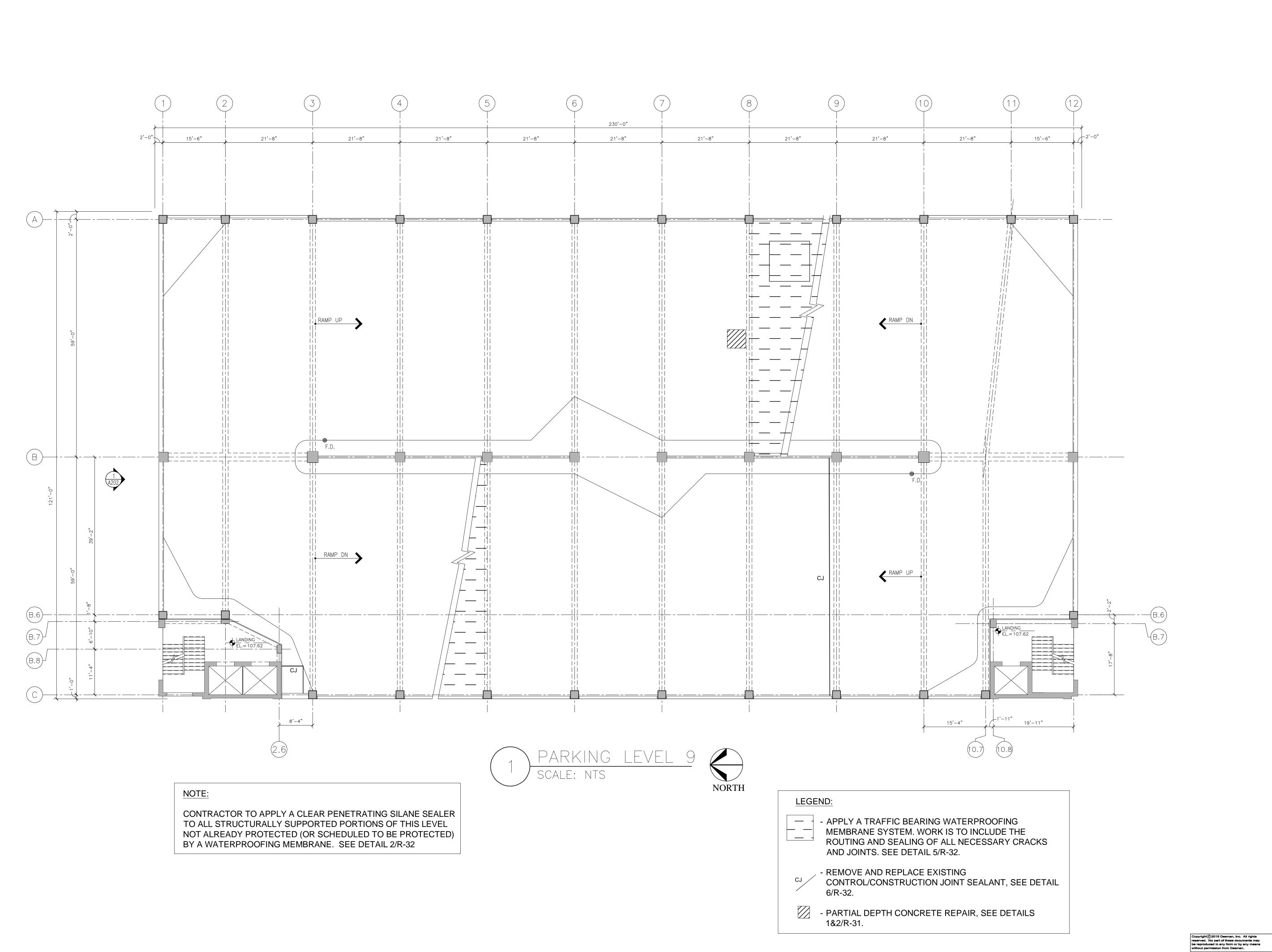
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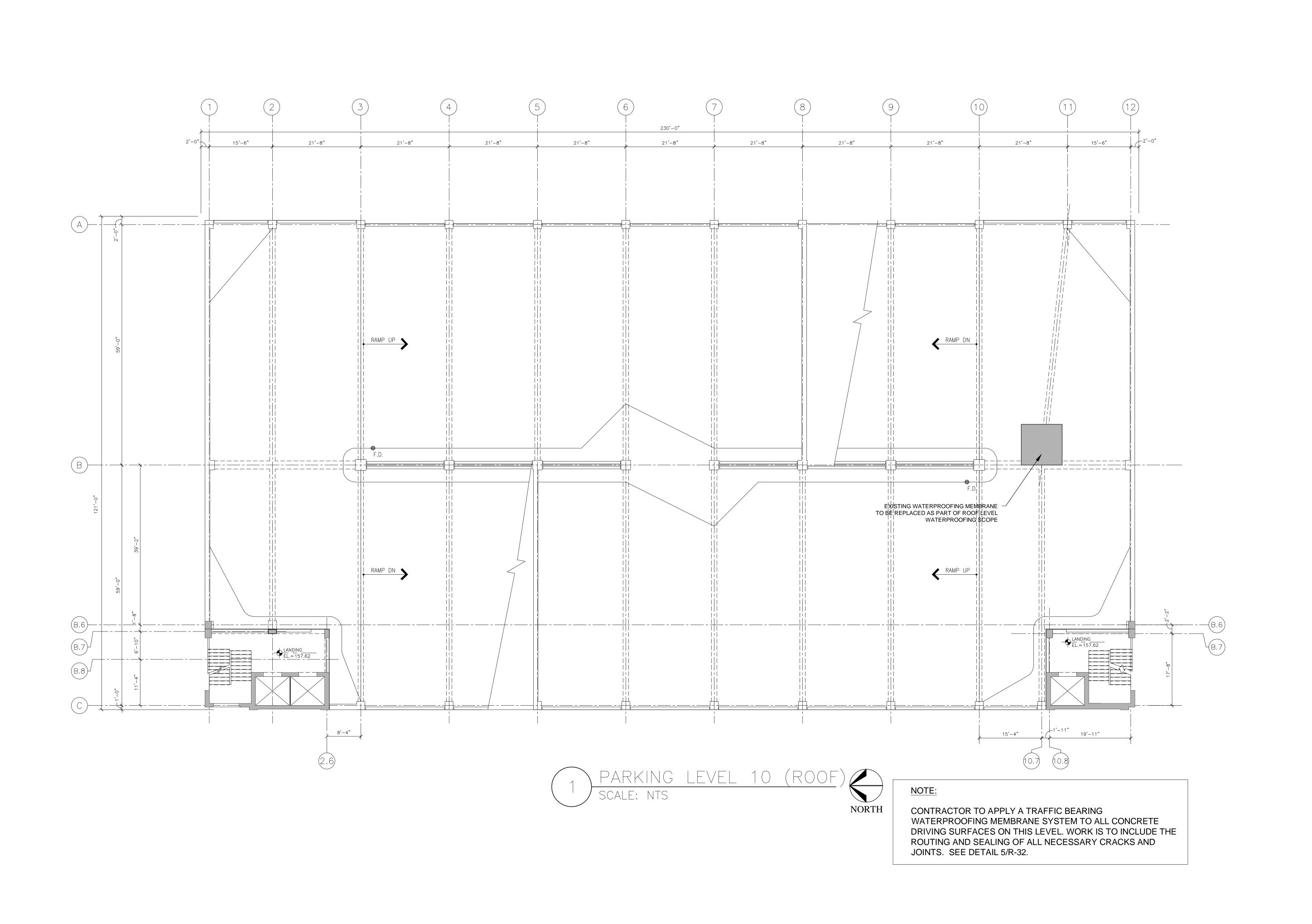
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DOWNTOWN LEVEL 9 PLAN

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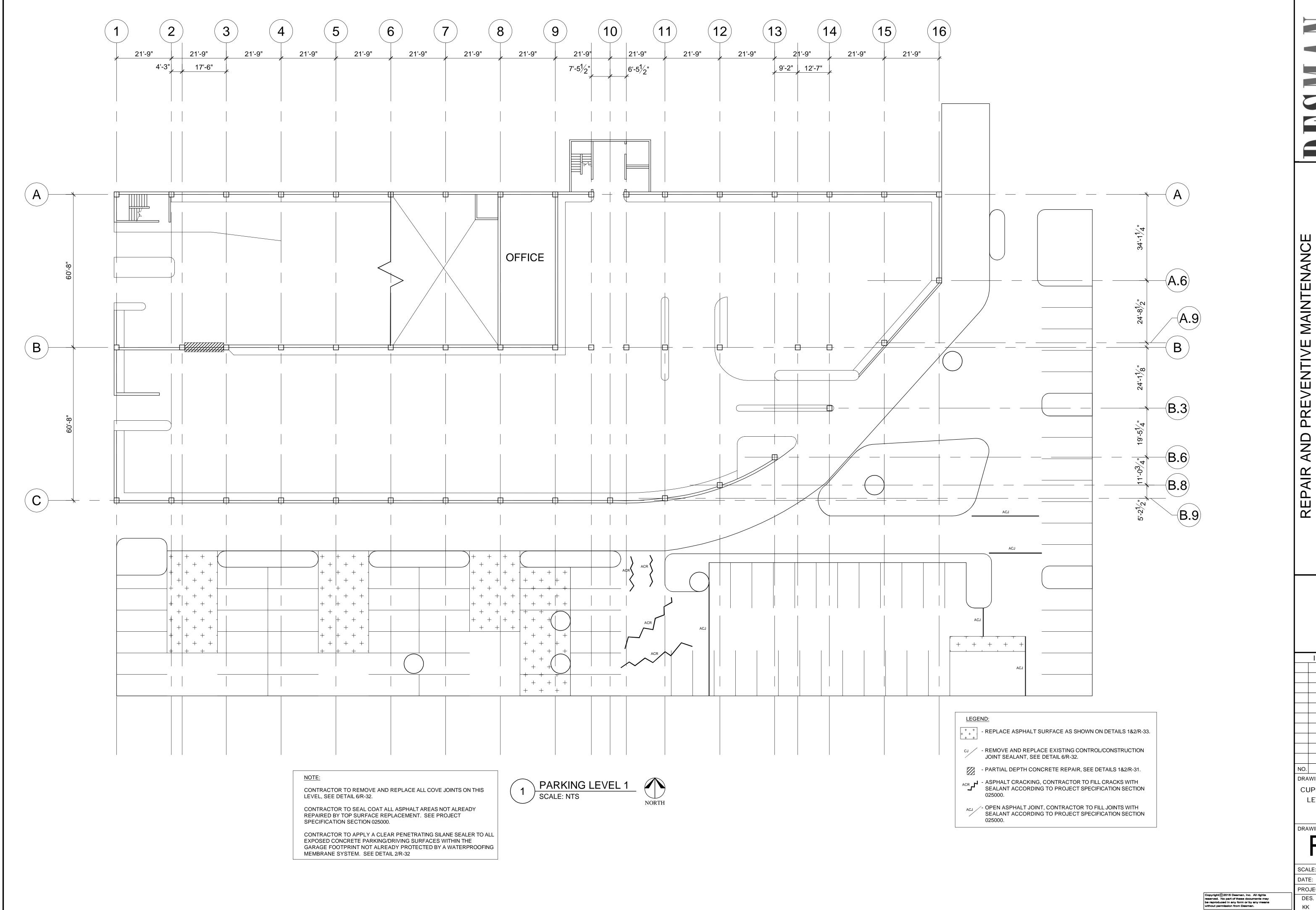
CENTRAL

DOWNTOWN

LEVEL 10 PLAN

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CITY OF ST. LOUIS FOUR GARAGE

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CUPPLES STATION LEVEL 1 PLAN

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CUPPLES STATION

LEVEL 2 PLAN

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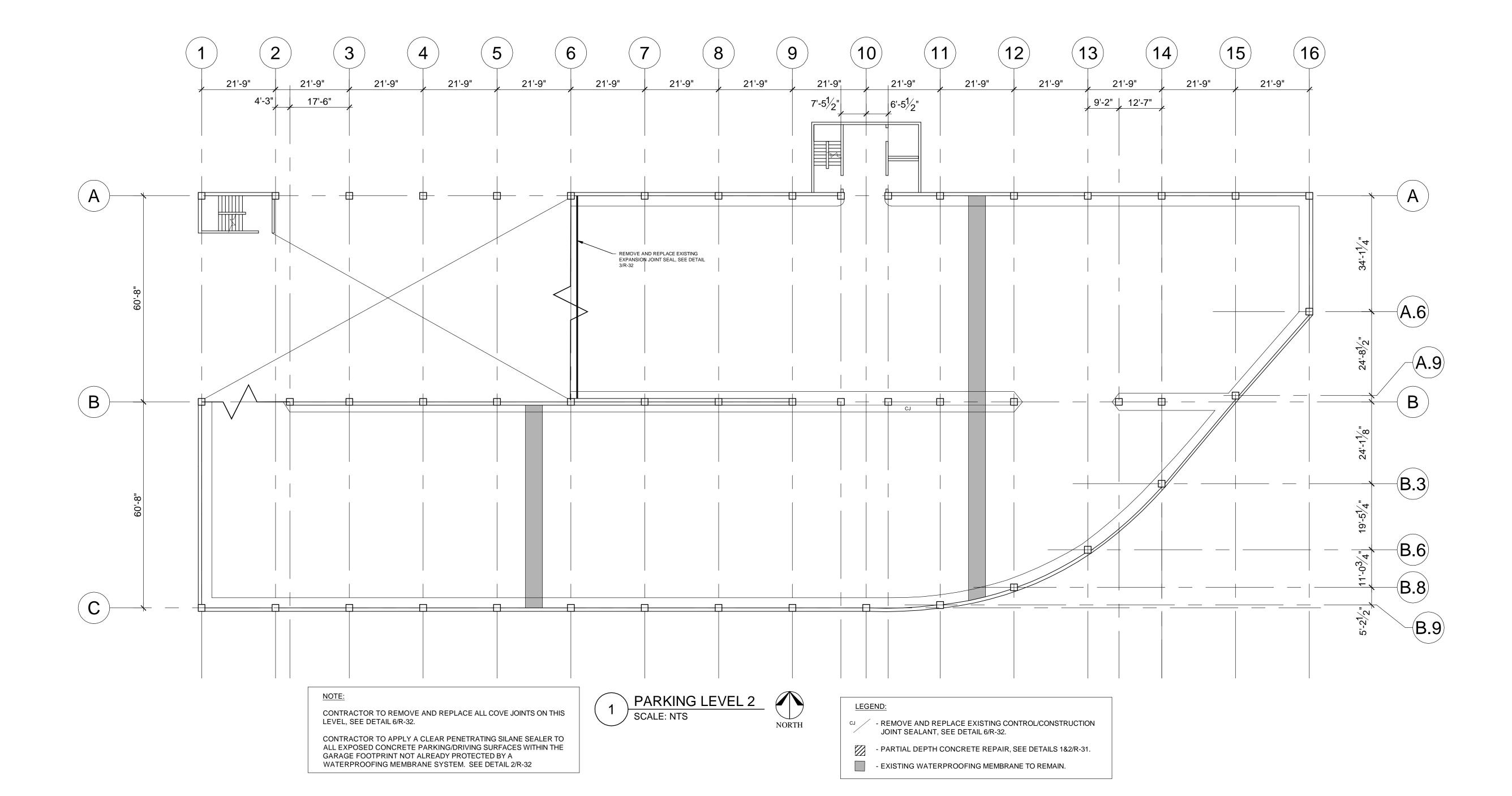
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CUPPLES STATION
LEVEL 3 PLAN

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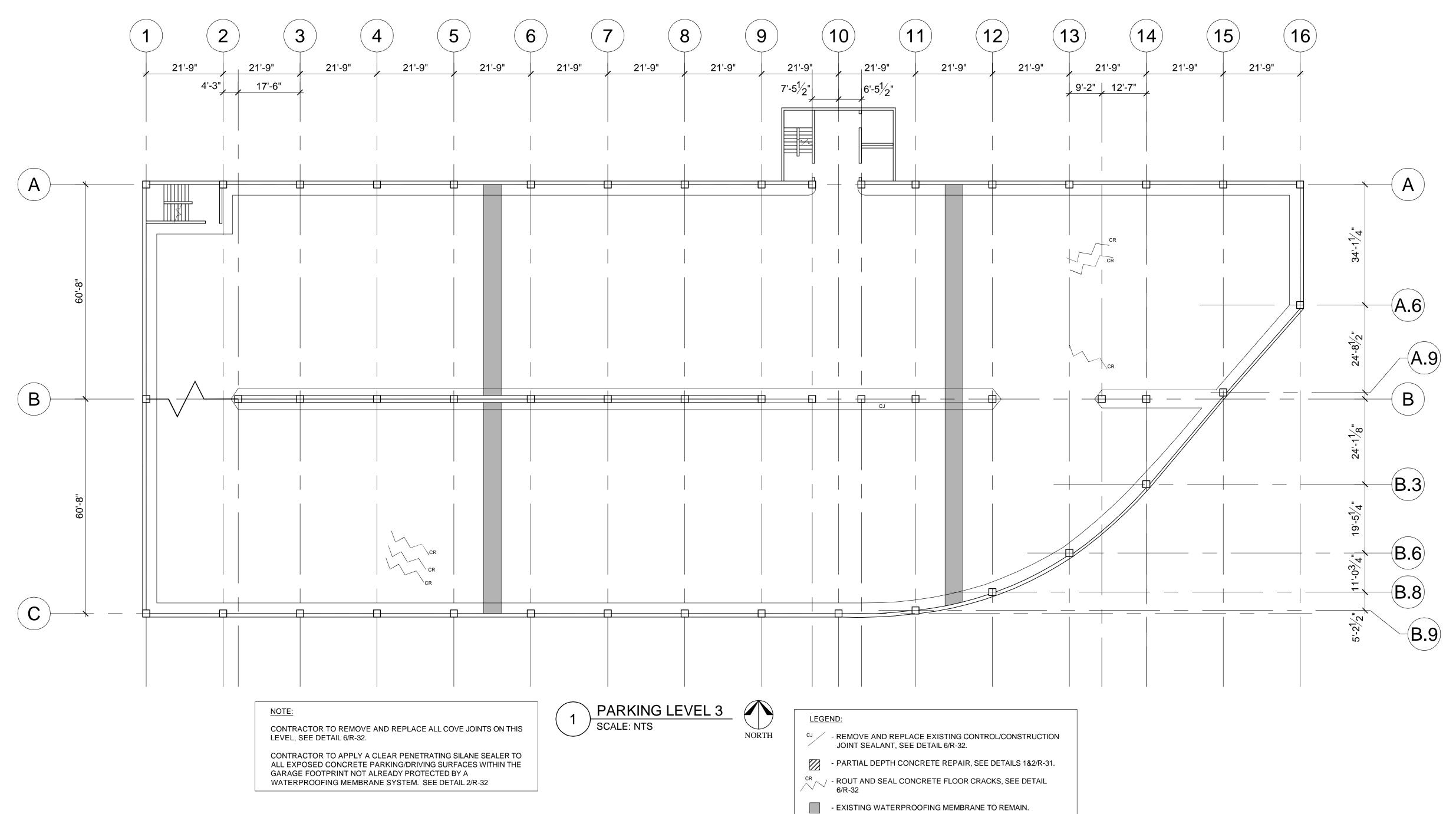
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CUPPLES STATION LEVEL 4 PLAN

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R-21

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CUPPLES STATION

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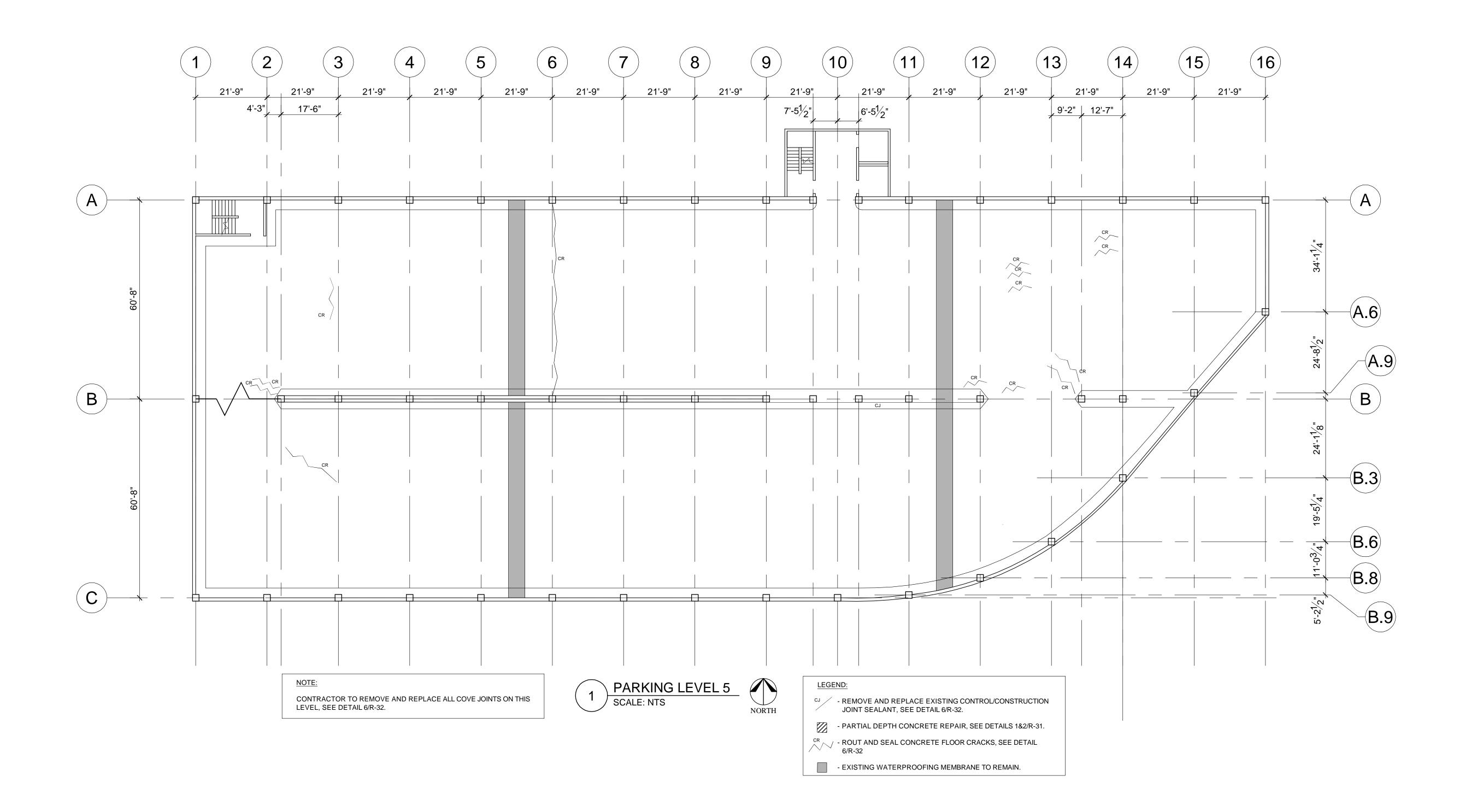
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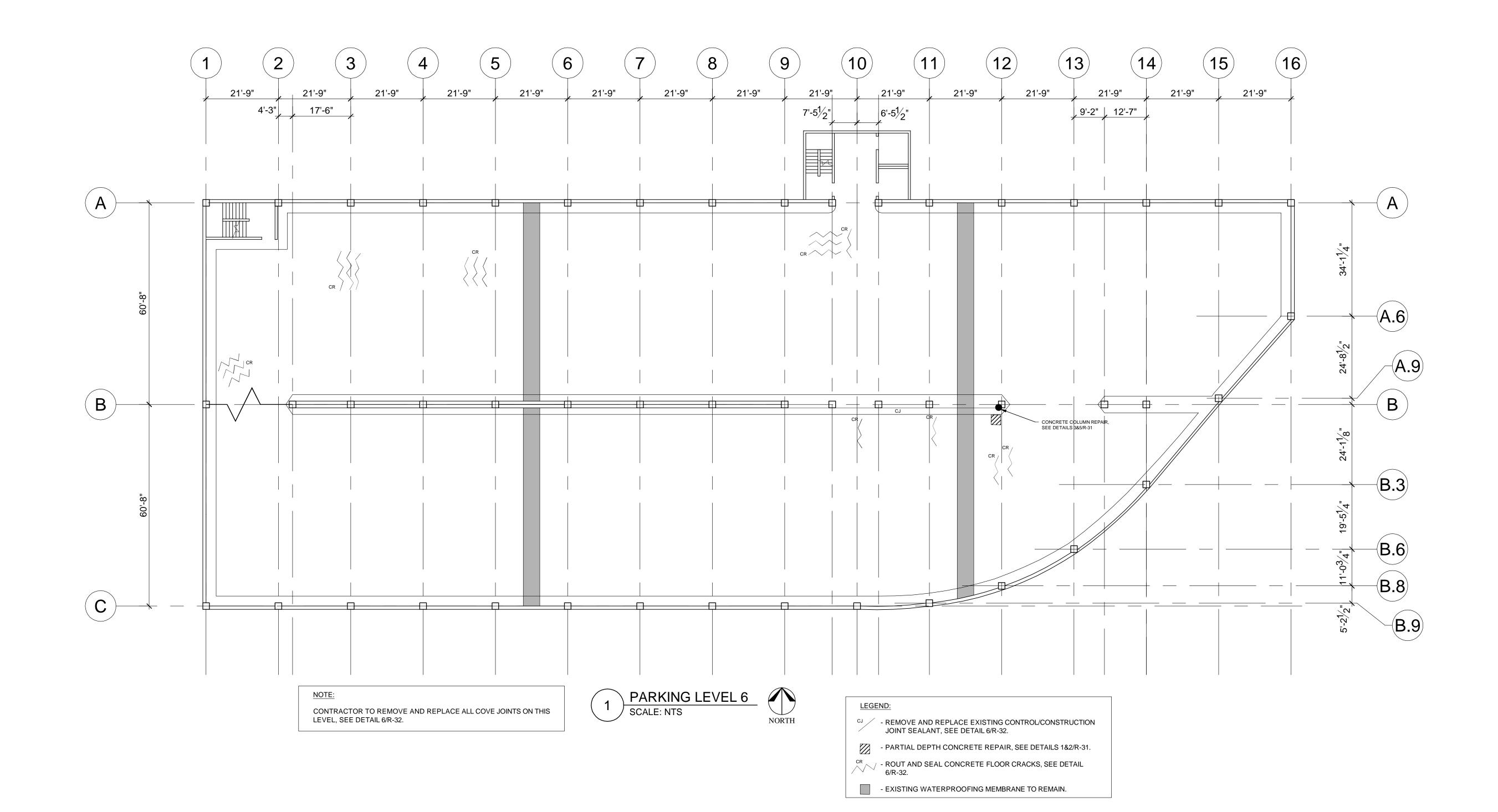
**CUPPLES STATION** LEVEL 6 PLAN

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NORTH

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

- EXISTING WATERPROOFING MEMBRANE TO REMAIN.

LEVEL, SEE DETAIL 6/R-32.

SEE DETAIL 5/R-32.

CONTRACTOR TO APPLY A TRAFFIC BEARING WATERPROOFING

NECESSARY CRACKS AND REPLACEMENT OF CONTROL AND COVE JOINTS. WORK IS ALSO TO INCLUDE REMOVAL ALL DEBONDED EXISTING MEMBRANE PRIOR TO THE INSTALLATION OF A NEW SYSTEM

MEMBRANE SYSTEM TO ALL CONCRETE DRIVING SURFACES ON THIS LEVEL. WORK IS TO INCLUDE THE ROUTING AND SEALING OF ALL

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

NO. DESCRIPTION DATE

CUPPLES STATION LEVEL 7 (ROOF) PLAN

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CUPPLES STATION

LEVEL 7 (ROOF)

PLAN

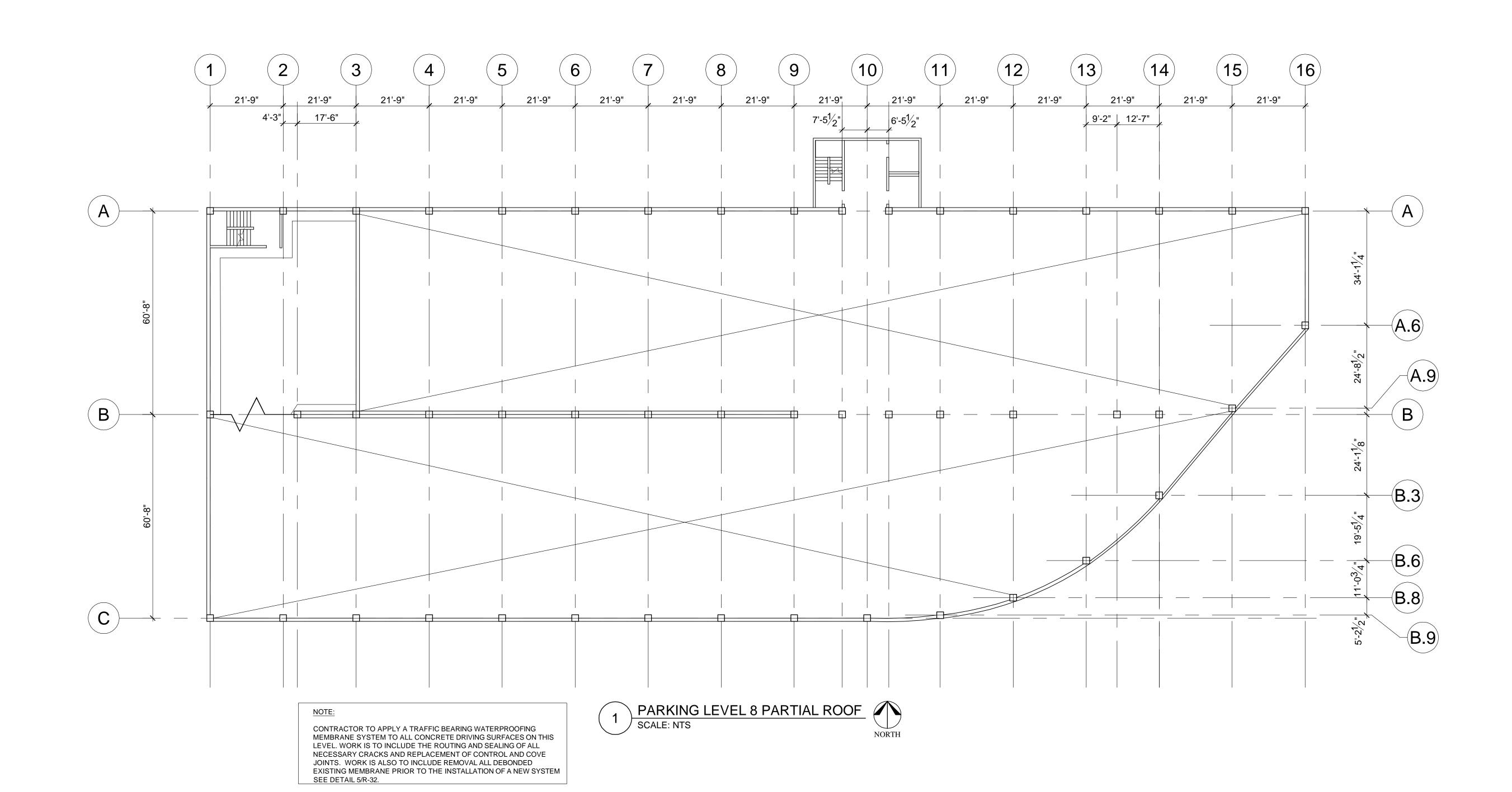
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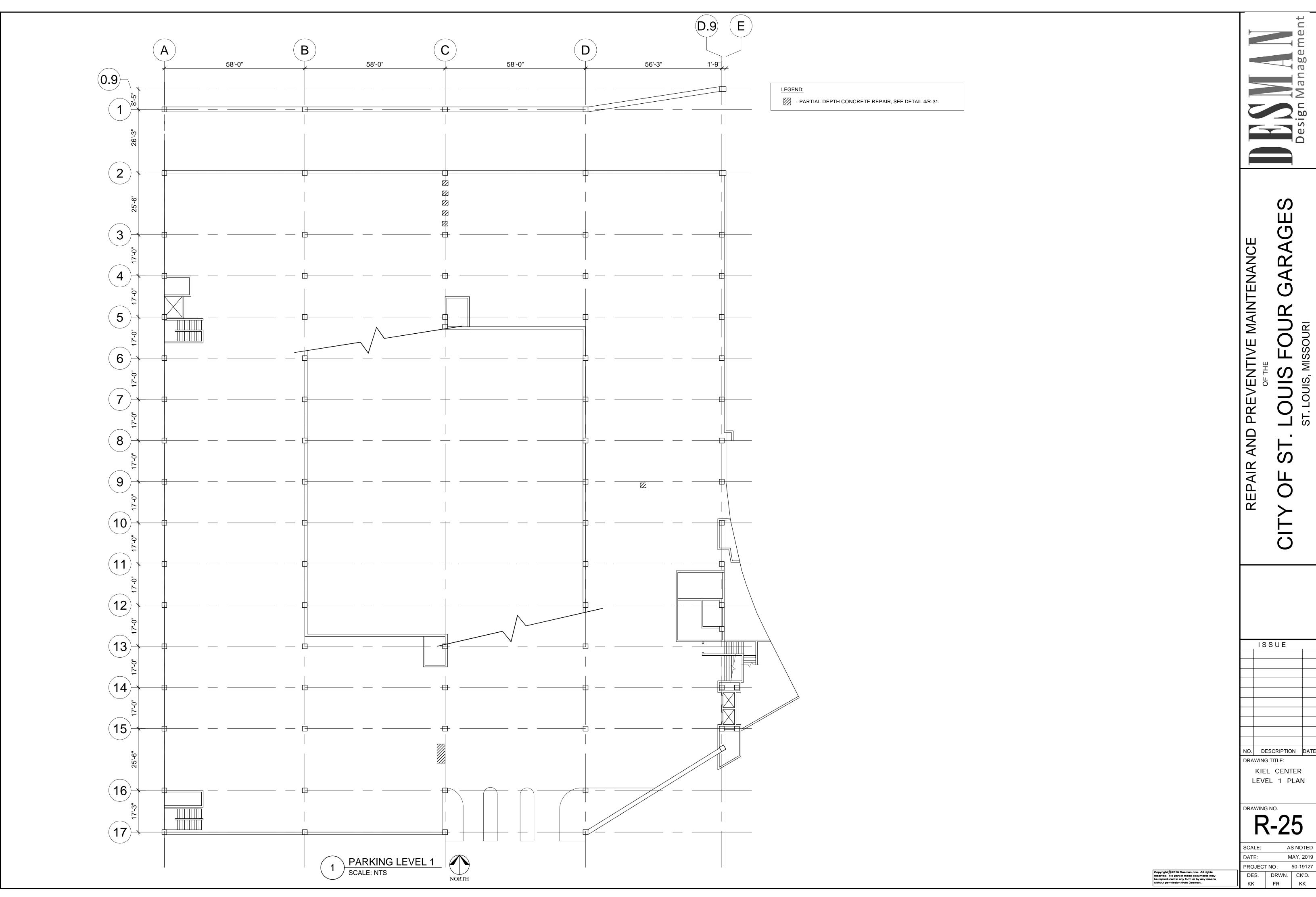
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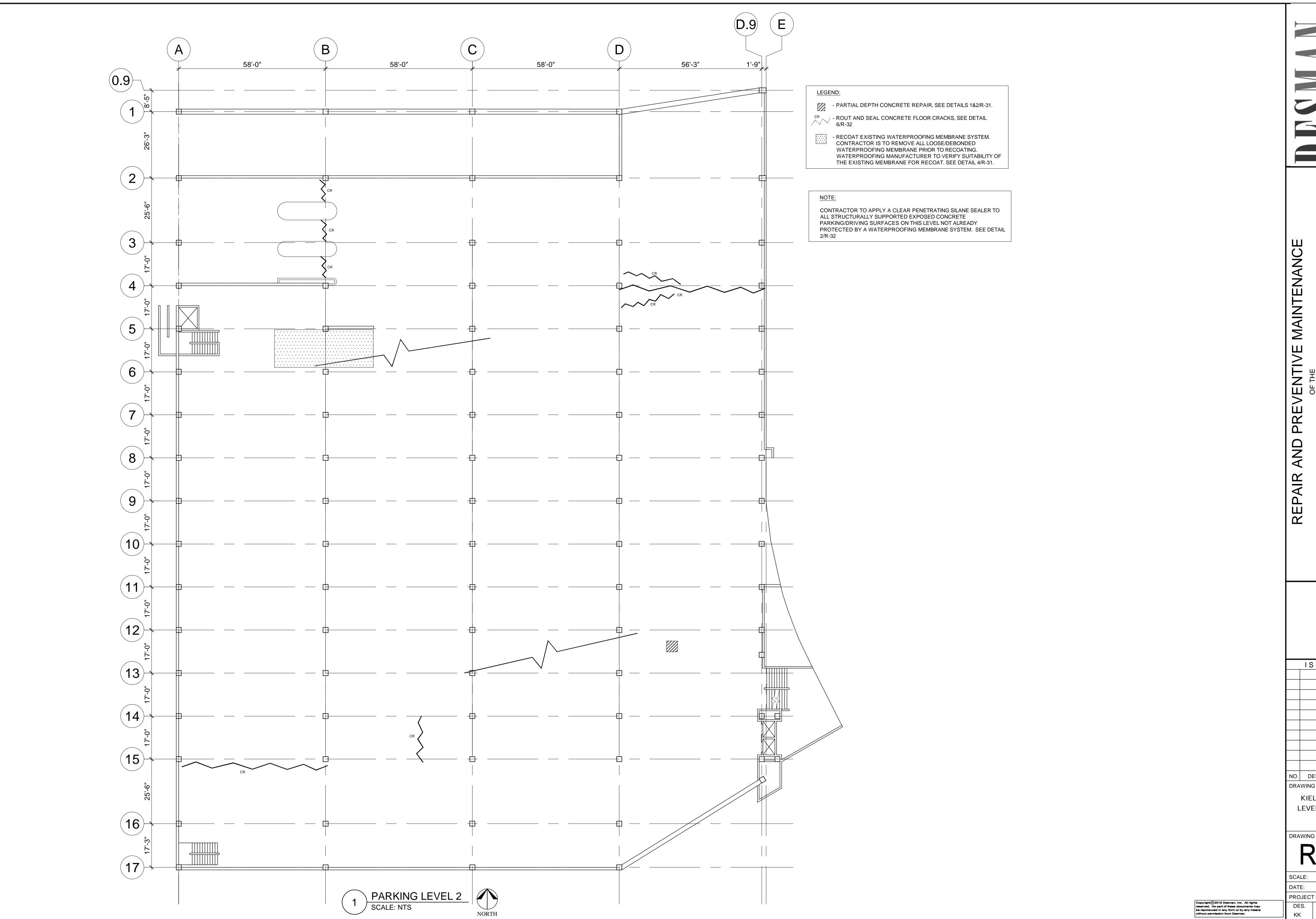


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KIEL CENTER LEVEL 1 PLAN

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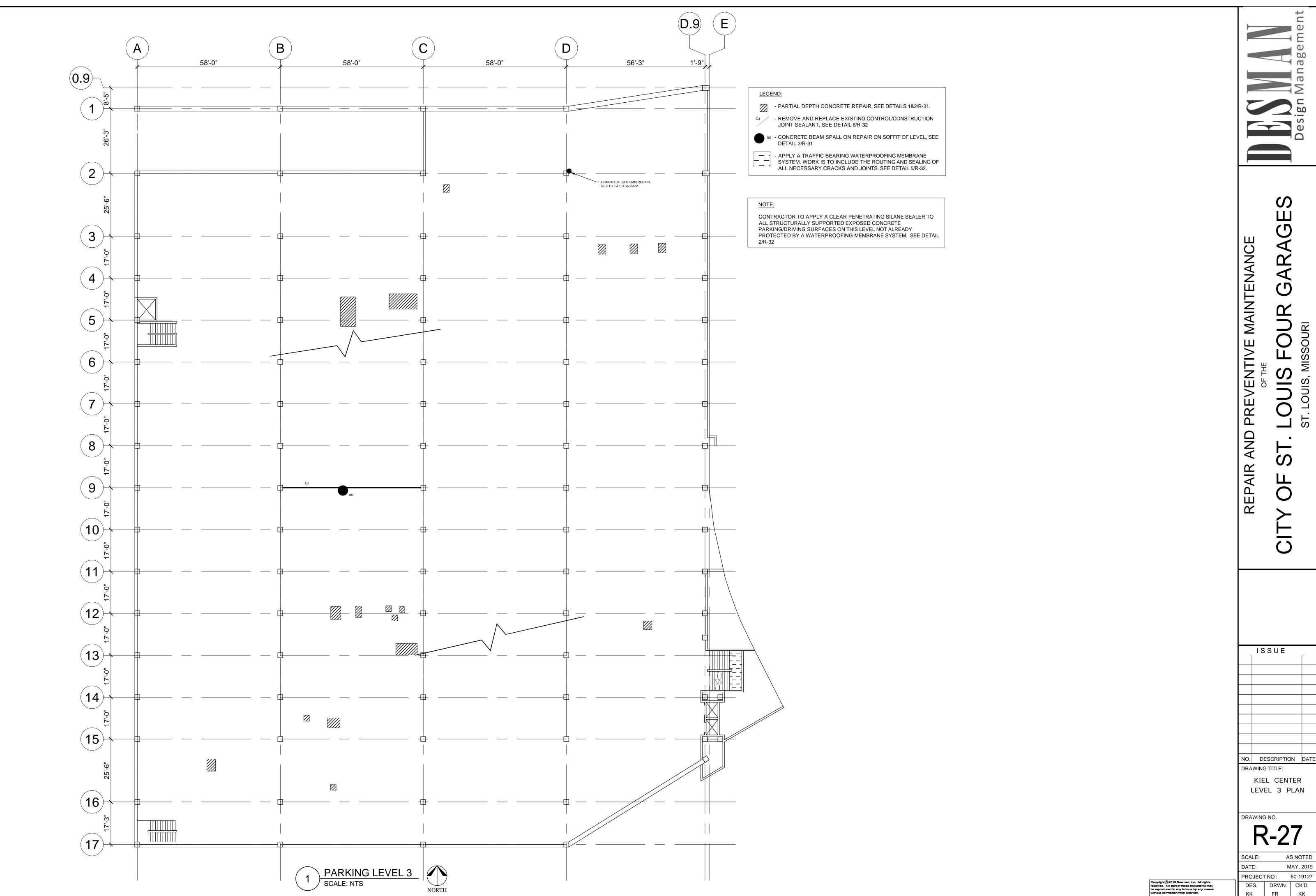


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KIEL CENTER LEVEL 2 PLAN

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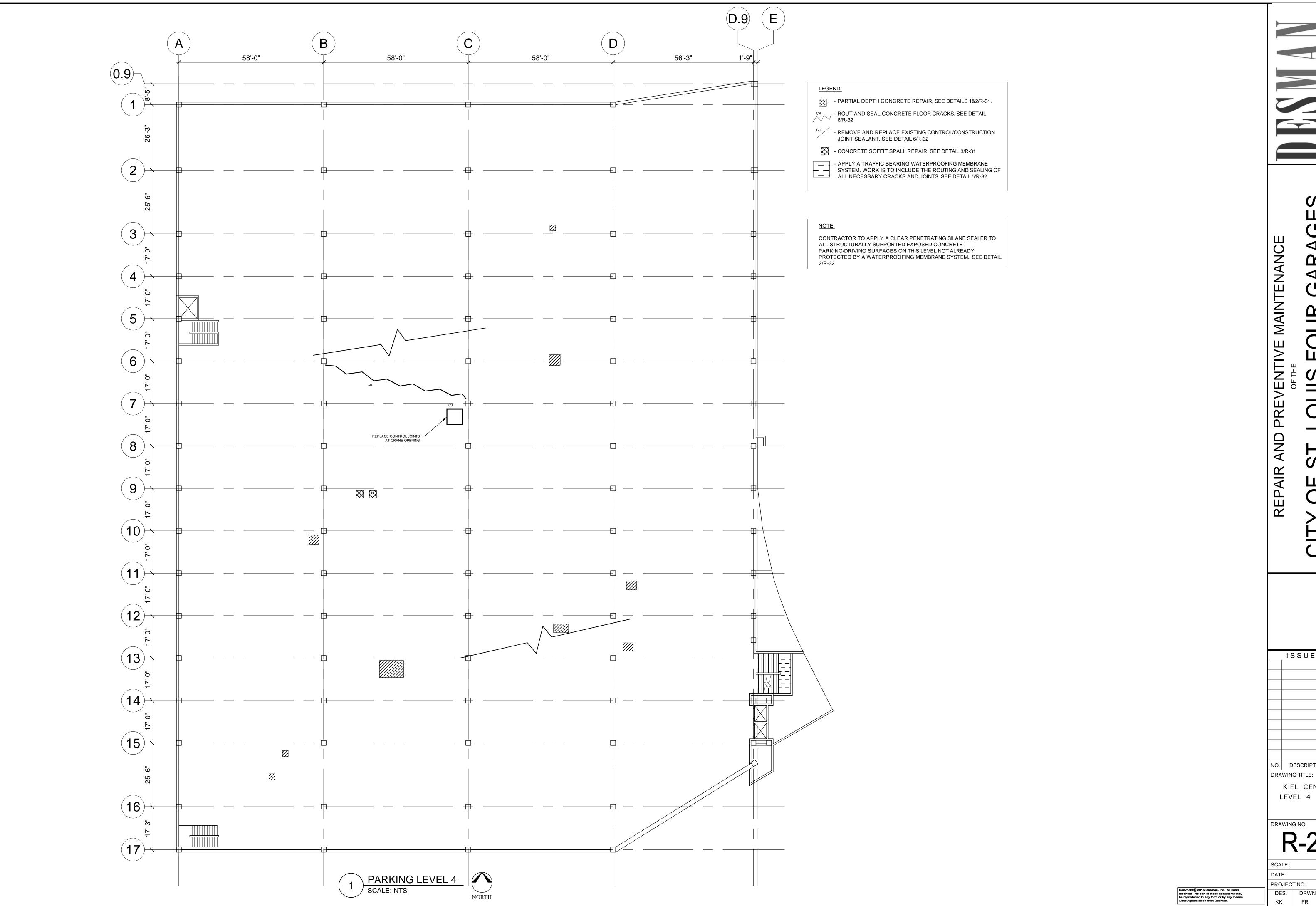
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KIEL CENTER LEVEL 3 PLAN

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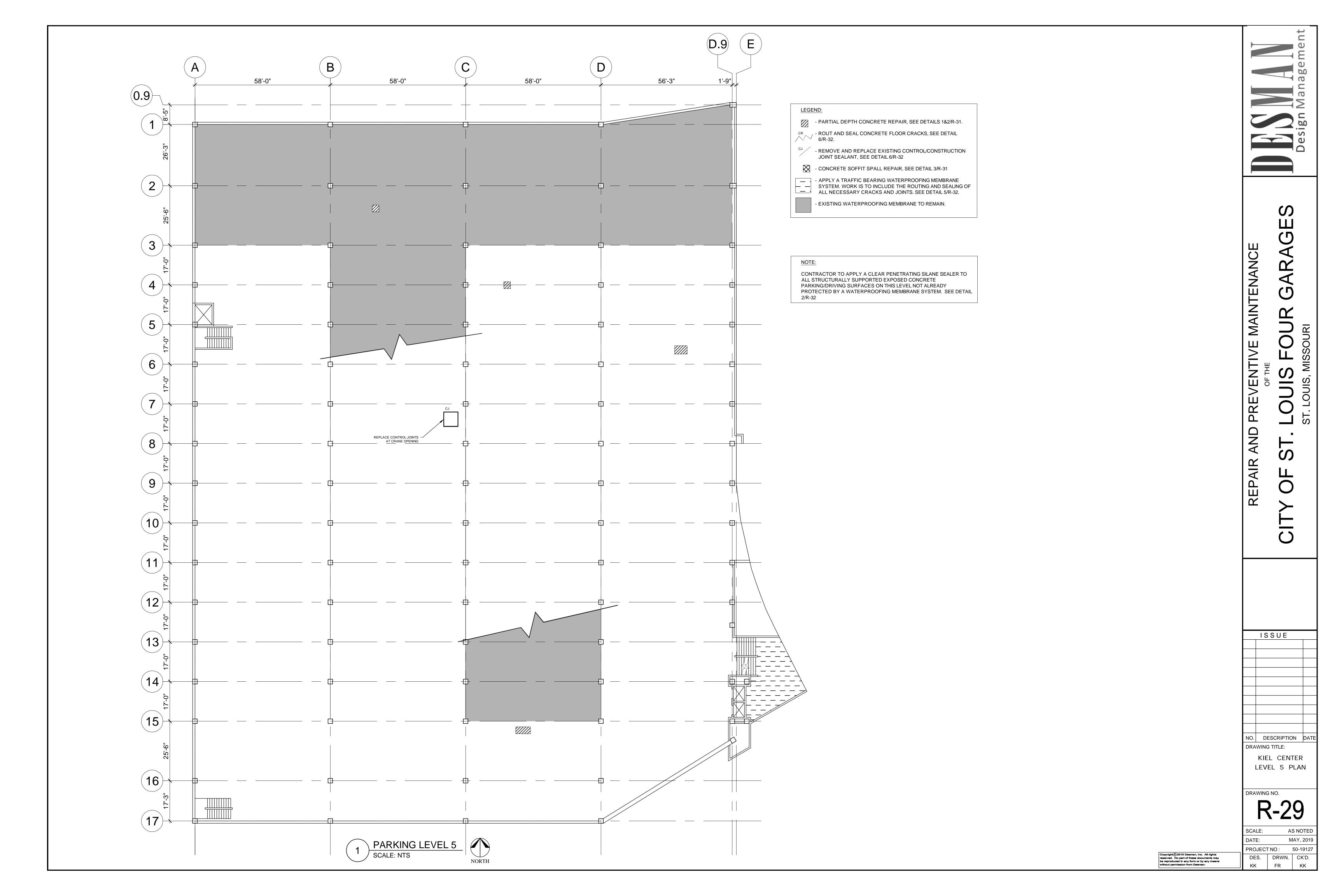


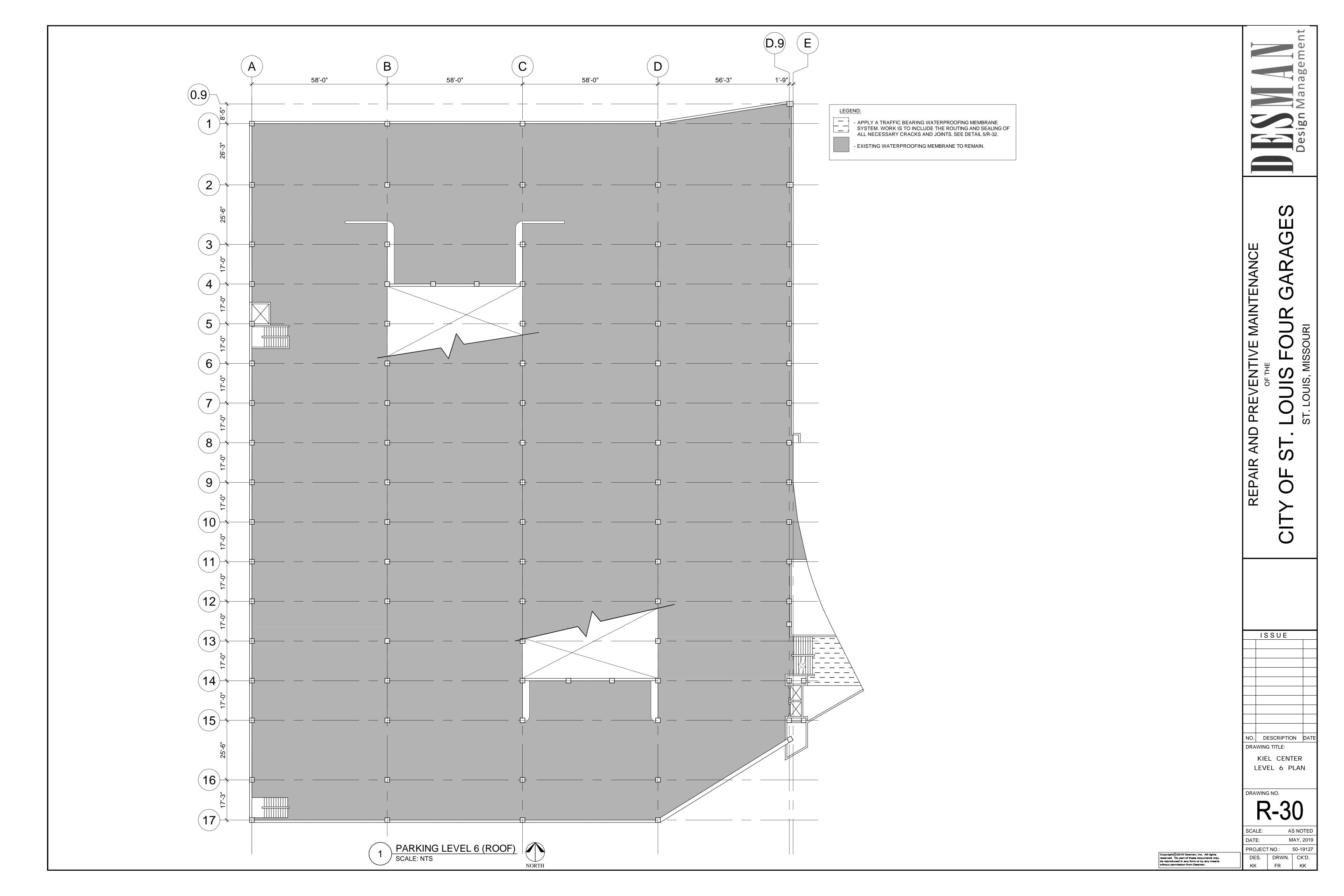
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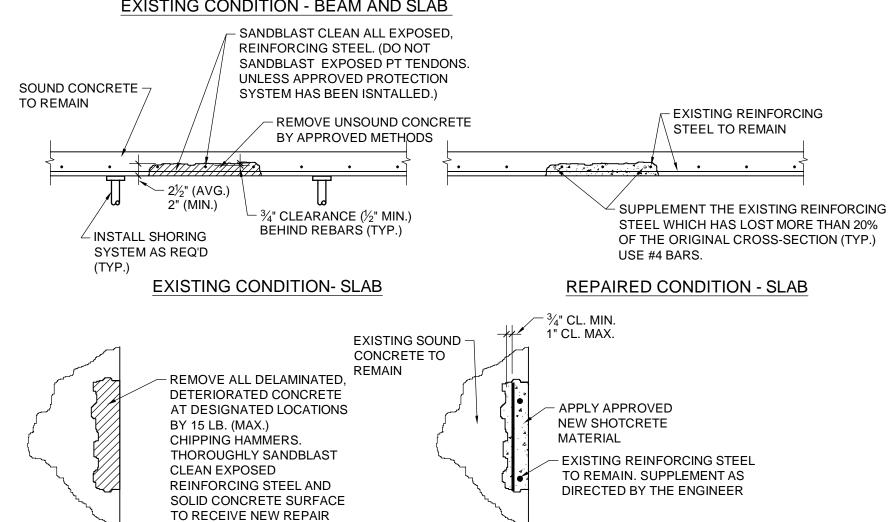
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POST-TENSIONED CONC. SLAB (TYP.) DELAMINATIONS/SPALLS SEE DETAILS BELOW POST-TENSIONED BEAM -- REMOVE DETERIORATED CONCRETE BY APPROVED METHOD. TENDON (TYP.) REPAIR LOCATION AND EXTENT TO BE DETERMINED/MARKED BY THE CONTRACTOR, AND TO BE APPROVED BY THE ENGINEER PRIOR TO THE CONCRETE REMOVAL. (TYP.) SEE DETAILS BELOW

### **EXISTING CONDITION - BEAM AND SLAB**



### **EXISTING CONDITION - VERTICAL SURFACE**

### REPAIRED CONDITION - VERTICAL SURFACE

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.

MATERIAL.

- 3. CLEAN EXPOSED REINFORCING STEEL BY SANDBLASTING AND COAT THE REINFORCING STEEL USING APPROVED NITROPRIME
- 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:**

- 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 21/2" 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.
- 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

## OVERHEAD/VERTICAL SHOTCRETE REPAIR

### $^{ extstyle -}$ SAWCUT $^{ extstyle /_2}$ " @ PERIMETER OF REPAIR AREA. DO NOT CUT IF THE MAJORITY OF THE TOP STEEL REINFORCING EXISTING PT TENDONS OR IS EXPOSED, EXTEND REPAIR AREA TO INCLUDE THE STEEL REINFORCING FULL LENGTH OF BAR. VERIFY WITH ENGINEER PRIOR - REMOVE EXISTING TO PERFORMING THE REMOVAL WORK. TOP BARS - EXITING PT TENDONS. DO NOT PROVIDE SHORING DAMAGE DURING DEMOLITION AS REQUIRED ACTIVITIES

EXISTING CONDITION

EXISTING P.T. TENDON / CONCRETE DELAMINATION/

SOUND CONCRETE

TO REMAIN

NEW 5,000 PSI AIR ENTRAINED —

ROUT AND SEAL AROUND -

PERIMETER OF REPAIRED

AREA (TYP.)

NOTE:

CONCRETE REMOVAL.

AREAS.

CONCRETE PER SPECIFICATIONS.

SOUND CONCRETE

REPAIR LOCATIONS PRIOR TO CONCRETE DEMOLITION.

BARS SHALL BE PROPERLY LAP SPLICED TO EXISTING BARS.

EXISTING SLOPE TO PROVIDE POSITIVE DRAINAGE ON THE FINISHED DECK SURFACE.

TO REMAIN

SAWCUT 1/2" @ PERIMETER OF -

REPAIR AREA. DO NOT CUT

EXISTING PT TENDONS OR

STEEL REINFORCING (TYP.)

SPALL IN THE SLAB TOP

**EXISTING CONDITION** 

**CONCRETE REMOVAL** 

REPAIRED CONDITION

SLAB PROTECTION TREATMENTS (CRACK/CONSTRUCTION JOINT REPAIR MATERIAL, MEMBRANE, ETC.) MAY NOT BE

1. THE CONTRACTOR SHALL SOUND AND VERIFY LOCATION AND EXTENT OF ALL REPAIR AREAS. ENGINEER SHALL VERIFY

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.

ARE ENCOUNTERED IN REPAIR AREAS, PROVIDE SHORING DESIGNED FOR DEAD AND CONSTRUCTION LIVE LOADS.

DETERMINED, CAREFULLY SAWCUT PERIMETER OF REPAIR AREA MIN. ½". DO NOT DAMAGE STEEL REINFORCING OR PT

5. CAREFULLY REMOVE ALL UNSOUND AND DELAMINATED CONCRETE BY APPROVED METHODS TO A DEPTH OF 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

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

7. PLACE, FINISH, CURE, AND PROTECT CONCRETE/REPAIR MORTAR PER SPECIFICATIONS. MAINTAIN OR IMPROVE THE

SLAB PARTIAL/FULL DEPTH REPAIR DETAIL

8. AFTER PROPER CURE TIME, PROVIDE CONTROL JOINTS AS SHOWN IN DETAIL 5a/R-12 ALONG THE PERIMETER OF REPAIR

4. ONCE THE EXTENT OF CONCRETE REMOVAL AND CONDITION OF EXISTING PT IN THE REPAIR AREA HAS BEEN

3. PROVIDE SHORING DESIGNED FOR DEAD LOAD OF SLAB IN REPAIR AREAS. IF BROKEN OR DETERIORATED PT STRANDS

APPLIED UNTIL CONCRETE HAS HAD PROPER CURE TIME MEETING MANUFACTURER'S REQUIREMENTS.

FULL AND PARTIAL DEPTH CONCRETE REPAIR PROCEDURE FOR PT SLABS:

REMOVE DETERIORATED CONCRETE,

INSTALL SHORING SYSTEM

3/4" (MIN.) CLEARANCE BETWEEN BOTTOM

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OF EXISTING REBAR/P.T. TENDON AND

AS REQUIRED (TYP.)

SOUND CONCRETE (TYP.)

- MAINTAIN OR IMPROVE THE EXISTING

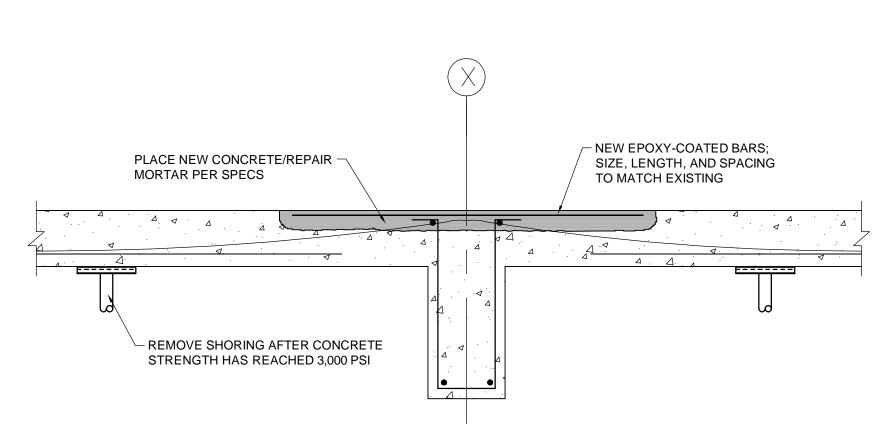
SLOPE TO PROVIDE POSITIVE DRAINAGE

ON THE FINISHED DECK SURFACE (TYP.)

– EXISTING P.T. TENDON TO REMAIN

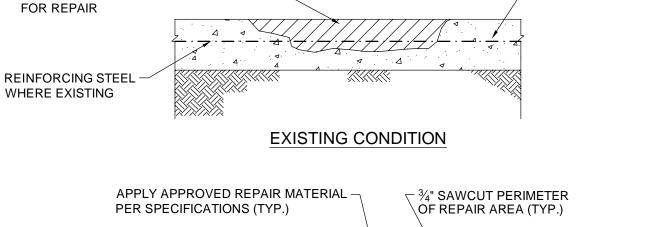
BY APPROVED METHODS

SURFACE (TYP.)

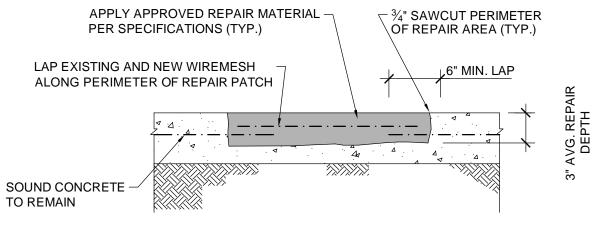


REPAIRED CONDITION

### PARTIAL DEPTH "STRIP" REPAIR



- SLAB ON GRADE



### REPAIR PROCEDURE

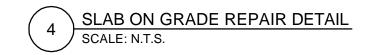
**BROKEN/SPALLED OR OTHERWISE** 

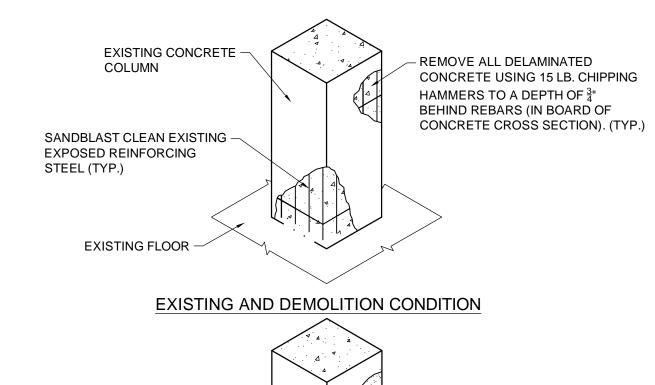
DETERIORATED AREA DESIGNATED

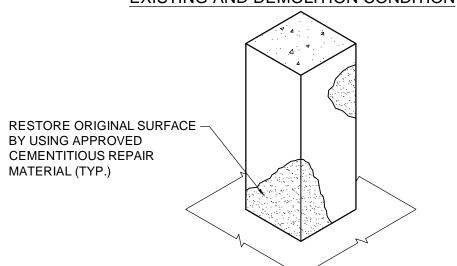
SAW-CUT ALONG THE PERIMETER OF REPAIR AREAS AND REMOVE EXISTING GRADE SLAB TO THE EXTENT REQUIRED TO PERMIT LAP SPLICING OF EXISTING REINFORCEMENT, IF ANY.

REPAIRED CONDITION

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.







### 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
- 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	<i>-</i>	COLUMN REPAIR DETAIL
	, /	SCALE: N.T.S.

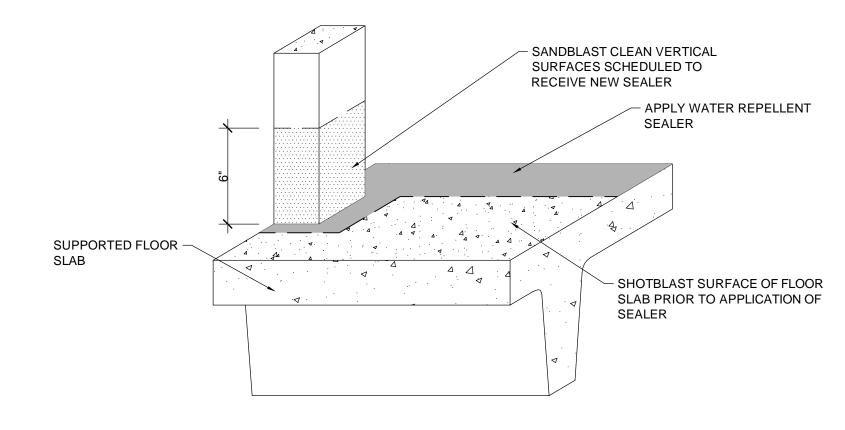
#### REPAIR PROCEDURES:

1. THE SURFACE AREA AROUND THE CRACK SHALL BE EXAMINED BY SOUNDING HAMMERS TO DETECT LOOSE OR UNSOUND AREAS WHICH MAY EXIST. WHERE SUCH DETERIORATED CONCRETE EXIST, REPAIR AS DIRECTED BY THE ENGINEER.

USING EPOXY INJECTION

- 2. DETERMINE STRATEGIC LOCATIONS OF HOLES TO BE DRILLED INTO THE CONCRETE MEMBER ALONG THE DESIGNATED CRACKS TO INSTALL PACKERS/PORTS.
- 3. REMOVE ANY PERMANENT ATTACHMENTS TO THE STRUCTURE THAT MAY INTERFERE WITH THE REPAIR PROCESS. MAKE TEMPORARY BYPASS ARRANGEMENTS FOR UNINTERRUPTED EXISTING OPERATIONS. PROVIDE TEMPORARY SUPPORT FOR DRAIN ETC. IF REQUIRED.
- 4. DRILL PACKER HOLES IN STRICT ACCORDANCE WITH TO THE WRITTEN INSTRUCTIONS OR RECOMMENDATIONS OF THE APPROVED EPOXY MATERIAL MANUFACTURER AND PLACE THE PACKERS PROPERLY IN THE HOLES. SEAL ENTIRE CRACK ON THE MEMBER SURFACE WITH APPROVED MATERIAL.
- 5. PRESSURE INJECT THE APPROVED EPOXY MATERIAL IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES.
- 6. COMPLETELY CURE ACCORDING TO THE MANUFACTURER'S GUIDELINES.
- 7. COMPLETELY GRIND-OFF THE SEALANT MATERIAL ON THE MEMBER SURFACE SO THAT ONLY THE EDGE THICKNESS OF COMPLETED, EPOXY-INJECTED CRACK IS NOTICEABLE. PACKERS SHALL NOT PROJECT BEYOND THE PLANE OF THE SURFACE OF THE EXISTING CONCRETE.
- 8. RE-INSTALL ANY ATTACHMENTS TEMPORARILY REMOVED. RESTORE ALL ATTACHMENTS TO ORIGINAL CONDITION.
- 9. SEE SPECIFICATIONS FOR APPROVED EPOXY PRODUCTS.

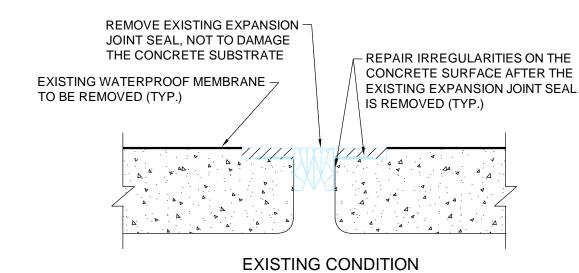
### 1 STRUCTURAL CRACK REPAIR USING EPOXY INJECTION SCALE: N.T.S.



### REPAIR PROCEDURE:

- 1. THE PRODUCT SHALL BE APPLIED TO A DRY SURFACE. VERTICAL SURFACES SHALL BE PREPARED BY SANDBLASTING AND HORIZONTAL SURFACES SHALL BE REPAIRED BY SHOTBLASTING.
- RECOMMENDED APPLICATION EQUIPMENT IS A LOW PRESSURE (15 PSI) AIRLESS SPRAYER, HOWEVER A BRUSH OR ROLLER MAY ALSO BE USED. COVER APPROXIMATELY 8" WITH EACH SPRAY PASS, SLIGHTLY OVERLAPPING THE PREVIOUS PASS. WHEN USING A BRUSH, REPEATED APPLICATIONS SHOULD BE MADE UNTIL THE SURFACE REMAINS MOIST FOR SEVERAL MINUTES BEFORE ALL SOLUTION IS ABSORBED.
- 3. VERTICAL SURFACES SHALL BE TREATED FROM THE BOTTOM UP. PROPER QUANTITIES OF SEALER ARE BEING APPLIED WHEN EXCESS SOLUTION RUNS 6" TO 8" BELOW SPRAY PATTERN BEFORE PENETRATING THE SURFACE. PROPER QUANTITY ON HORIZONTAL SURFACES IS INDICATED WHEN SOLUTION STANDS FOR A FEW SECONDS BEFORE PENETRATING.

2 WATER REPELLENT SURFACE SEALER SCALE: N.T.S.



PRIOR TO THE WATERPROOF MEMBRANE INSTALLATION AND AFTER THE EXPANSION JOINT SEAL NOSING MATERIAL HAS CURED, SAW-CUT A ½" VERTICAL (¾" WIDE) ALONG THE NOSING MATERIAL EDGE, AIR-BLOWN CLEAN, AND INSTALL THE WATERPROOF MEMBRANE BASE COAT MATERIAL (TYP.)

NEW EXPANSION JOINT

MODIFY BLOCKOUT IN EXISTING CONRETE SLAB FOR NEW EXPANSION JOINT SEAL (TYP.)

SEAL PER SPECS

#### REPAIRED CONDITION

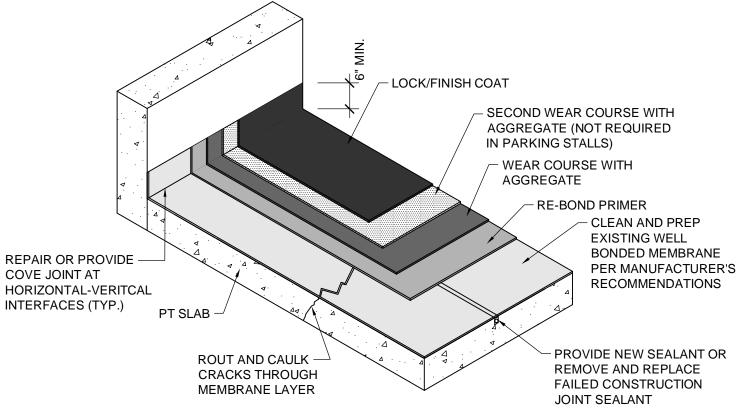
#### REPAIR PROCEDURE:

- . REMOVE EXISTING EXPANSION JOINT SEAL SYSTEM BY APPROVED METHODS. REPORT ANY UNANTICIPATED CONDITIONS TO THE ENGINEER.
- 2. THE MANUFACTURER, CONTRACTOR, AND ENGINEER SHALL REVIEW ALL BLOCK-OUT REQUIREMENTS AND TERMINATION DETAILS PRIOR TO PREPARATION OF CONCRETE SURFACES ALONG THE EXPANSION JOINTS. CONTRACTOR IS RESPONSIBLE FOR CREATING THE JOINT OPENING AND BLOCK-OUTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE SELECTED SEAL.
- 3. CLEAN BLOCKOUT BY APPROVED METHOD IMMEDIATELY BEFORE NEW EXPANSION JOINT SEAL SYSTEM INSTALLATION.
- 4. INSTALL AN APPROVED EXPANSION JOINT SEAL SYSTEM PER SPECIFICATIONS AND MANUFACTURER'S WRITTEN GUIDELINES.

#### NOTES:

- BASED UPON THE NEW EXPANSION JOINT SEAL MANUFACTURER'S RECOMMENDATION, ONLY SOME DETERIORATED PORTIONS OF THE EXISTING EXPANSION JOINT SEAL MAY BE REPLACED BY SPLICING THE NEW SEAL TO EXISTING SEAL STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN GUIDELINES.
- 2. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS. CONTRACTOR SHALL INSTALL EXPANSION JOINT SEAL IN 'MILD' TEMPERATURES PER MANUFACTURER'S RECOMMENDATIONS.

### 3 EXPANSION JOINT SEAL SYSTEM



### TYPICAL MEMBRANE RE-COAT PROCEDURE:

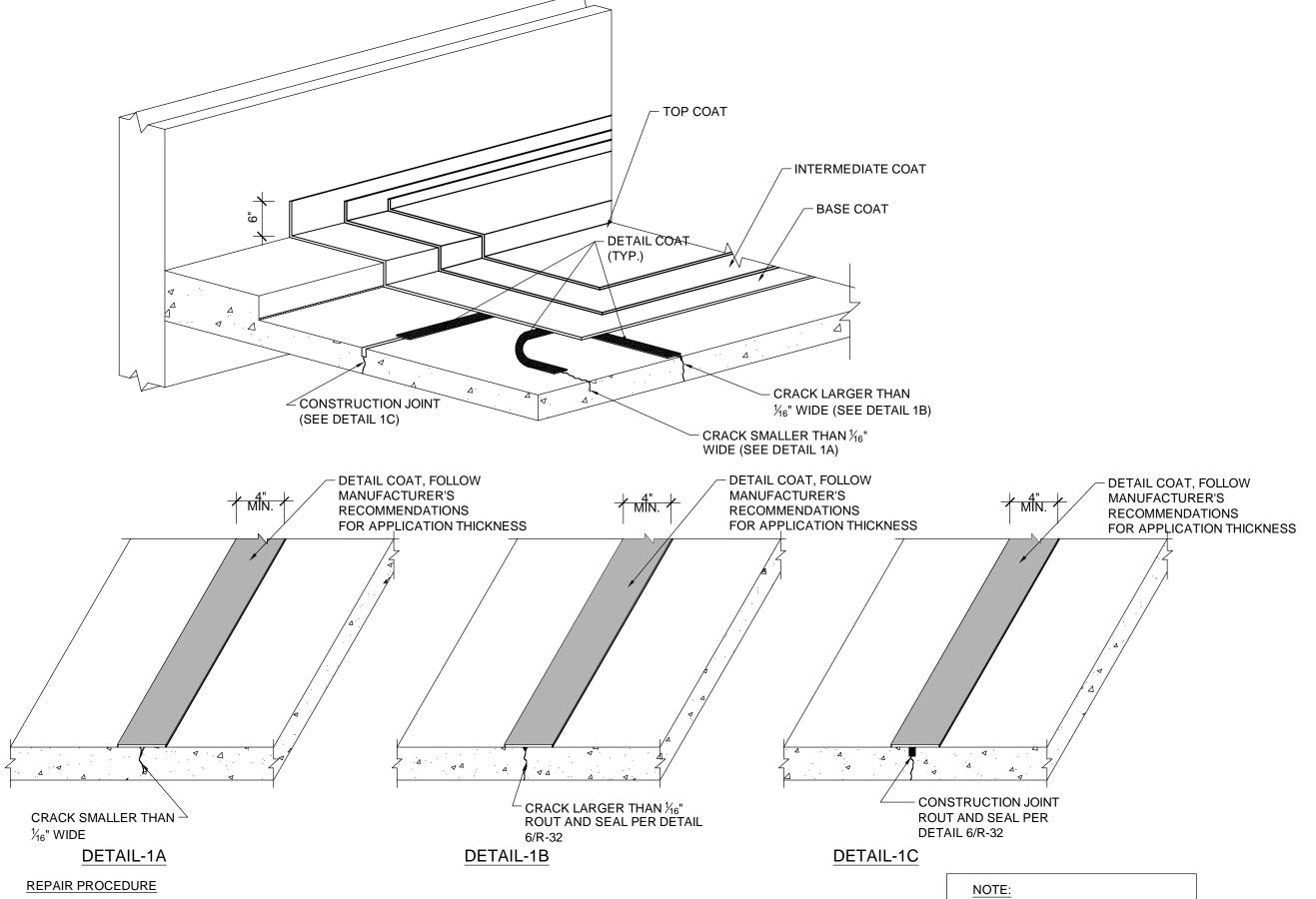
- I. REMOVE LOOSE OR DEBONDED EXISTING MEMBRANE.
- 2. CLEAN THE EXISTING MEMBRANE, WORN AREAS, AND BARE CONCRETE AREAS PER THE MEMBRANE SYSTEM MANUFACTURER'S RECOMMENDATIONS.
- 3. REPLACE FAILED/DE-BONDED CRACK AND CONSTRUCTION JOINT SEALANTS.
- 4. PRIME EXISTING BARE CONCRETE.5. APPLY MEMBRANE BASE COAT TO BARE CONCRETE AREAS.
- 6. PRIME EXISTING MEMBRANE SYSTEM TO REMAIN.
  7. APPLY INTERMEDIATE AND FINISH COATS.
- 8. RE-STRIPE ALL AREAS AFFECTED BY THE MEMBRANE RE-COATING.

### NOTES:

### 1. THE CONTRACTOR SHALL VERIFY THAT CONCRETE SUBSTRATES ARE SOUND.

- 2. PAYMENT TO CONTRACTOR SHALL BE MADE FOR BASED ON HORIZONTAL SURFACE APPLICATION AREAS ONLY.
  MEMBRANE SHALL BE TURNED UP A MINIMUM OF 6" AT ALL VERTICAL SURFACES ARE CONSIDERED ANCILLARY AND SHALL NOT BE INCLUDED IN PAYMENT APPLICATIONS.
- 3. FOR THE AREA TO BE RE-COATED, ALL CRACK AND CONSTRUCTION JOINT SEALANT REPLACEMENT, CRACK REPAIRS, AND COVE JOINT INSTALLATION REQUIRED SHALL BE INCLUDED IN THE SCOPE OF WORK FOR THE EXISTING WATERPROOFING MEMBRANE SYSTEM RECOATING.
- 4. WATERPROOFING MEMBRANE COLOR SHALL BE SELECTED BY OWNER

WATERPROOFING MEMBRANE RE-COAT DETAIL
SCALE: N.T.S.



AFTER CONCRETE REPAIRS HAVE PROPERLY CURED, SHOTBLAST CLEAN HORIZONTAL AND VERTICAL SURFACES SCHEDULED TO RECEIVE TRAFFIC BEARING MEMBRANE. STAINS, PAINT AND OTHER SURFACE CONTAMINANTS SHALL BE REMOVED AS RECOMMENDED BY THE SYSTEM MANUFACTURER. SURFACE PREPARATION SHALL INCLUDE DETAILING OF THE DECK WITH EPOXY BASE FILLER ACCEPTABLE TO THE MEMBRANE SYSTEM MANUFACTURER, GRINDING HIGH RIDGES IN THE NEWLY REPAIRED AREAS WHICH MAY BE DETRIMENTAL TO MEMBRANE SYSTEM PERFORMANCE. MEMBRANE SYSTEM MANUFACTURER WILL BE EXPECTED TO SIGN OFF ON FINAL DECK PREPARATION PRIOR TO MEMBRANE APPLICATION, AS WILL THE ENGINEER.

2. ALL CRACKS GREATER THEN  $\frac{1}{16}$ " SHALL BE PREPARED PER DETAIL 1B. ALL CRACKS LESS THAN  $\frac{1}{16}$ " SHALL BE PREPARED PER DETAIL 1A AT NO ADDITIONAL COST TO THE OWNER. ALL CONSTRUCTION JOINTS SHALL BE PREPARED PER DETAILS 1B. ALL COVE JOINTS SHALL PREPARED PER DETAIL 6/R-32.

3. THE SYSTEM MANUFACTURER AND COATING APPLICATOR SHALL PERFORM THE FOLLOWING TO ASSURE SYSTEM PERFORMANCE:

A. VERIFY MOISTURE CONTENT OF THE EXISTING CONCRETE AND NEW CONCRETE REPAIR AREAS.

B. PERFORM ADHESION TESTING ON EXISTING CONCRETE AND CONCRETE REPAIRS AREAS TO VERIFY COMPLIANCE WITH SYSTEM DEPENDENT OF THE PROPERTY OF

PERFORMANCE. DECK PREPARATION OF TEST AREAS SHALL BE PER SPECIFICATIONS.

C. SYSTEM MANUFACTURER AND COATING APPLICATOR SHALL SUBMIT A JOINT LETTER STATING THAT THE ABOVE TESTING HAS BEEN PERFORMED AND THAT THE SURFACE PREPARATION IS ACCEPTABLE AND THE MEMBRANE SYSTEM WILL PERFORM AS SPECIFIED.

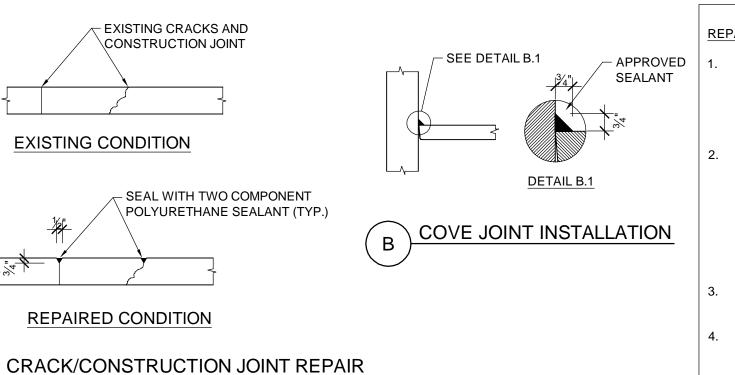
4. APPLY CONCRETE PRIMER PER MANUFACTURER'S RECOMMENDATIONS.

5. DETAIL CRACKS AND CONSTRUCTION JOINTS WITH BASE COAT AS PER DETAILS 1A, 1B, AND 1C.

6. APPLY BASE COAT TO THE SPECIFIED THICKNESS.

- 7. APPLY THE WEARING COURSE TO THE SPECIFIED THICKNESS. INSTALL IN LAYERS, IF REQUIRED, AS PER MANUFACTURER'S RECOMMENDATIONS.
- 8. INSTALL SYSTEM LOCK COAT OR TOP COAT PER MANUFACTURER'S RECOMMENDATIONS.
- 9. PARKING STALLS SHALL HAVE A MEDIUM DUTY WEAR COURSE INSTALLED AS SPECIFIED IN SYSTEM DESCRIPTIONS.
- 10. DRIVING LANES AND TURNING AREAS SHALL HAVE A HEAVY DUTY WEAR COURSE INSTALLED AS SPECIFIED IN SYSTEM DESCRIPTIONS.

### 5 WATERPROOFING MEMBRANE APPLICATION DETAIL SCALE: N.T.S.



REPAIR PROCEDURES:

1. PRIOR TO ANY CRACK/JOINT REPAIR WORK, THE EXACT SCOPE OF CRACK/CONSTRUCTION JOINT REPAIRS SHALL BE DETERMINED BY AN INSPECTION ATTENDED BY THE CONTRACTOR AND ENGINEER. THE SURFACE SHALL BE SHOTBLASTED CLEAN FOR INSPECTION.

THE GENERAL CONTRACTOR

MEMBRANE APPLICATOR SHALL

VENTILATION CHARACTERISTICS, PARTICULARLY IN REGARD TO

ADJACENT PROPERTY OWNERS

AND WATERPROOFING

CAREFULLY REVIEW ALL

AIR INTAKE LOCATIONS. ALL

SHALL BE PROVIDED WITH A

ALL COATING OPERATIONS.

SAFE ENVIRONMENT DURING

ADJACENT FACILITY'S

2. ROUT AND CLEAN ALL CRACKS AND CONSTRUCTION JOINTS IN DESIGNATED AREAS. REMOVE EXISTING DETERIORATED SEALANT MATERIAL, IF ANY, DIRT, DEBRIS, ETC. BY APPROVED METHODS. THE CRACKS/JOINTS SHALL BE ROUTED TO THE SHAPE OF A 1/2"x1/2" V-GROOVE. CLEAN CONCRETE SURFACES USING COMPRESSED AIR OR OTHER MEANS TO REMOVE DUST OR OTHER EXISTING FOREIGN MATERIAL WHICH WOULD IMPAIR THE BOND OF NEW SEALANT MATERIAL.

PRIME THE SURFACES AND SEAL WITH APPROVED SEALANT MATERIAL.

PROHIBIT VEHICULAR TRAFFIC ON SEALED CRACKS/JOINTS UNTIL THE MATERIAL HAS CURED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

5. CONTRACTOR SHALL NOT REPAIR ANY PREVIOUSLY SEALED CRACKS/CONSTRUCTION JOINTS UNLESS DESIGNATED BY THE ENGINEER.

6 CRACK, CONSTRUCTION, AND COVE JOINT SEALANT REPAIR

NO. DESCRIPTION DATE DRAWING TITLE:

REPAIR DETAILS

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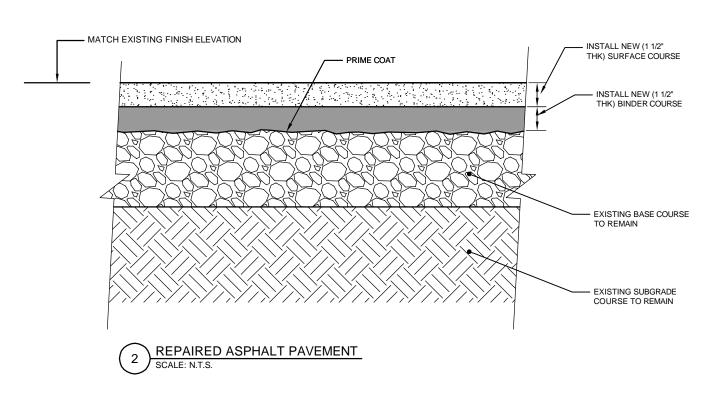
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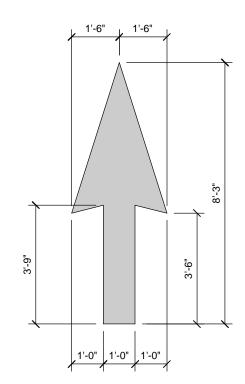
DATE: MAY, 2019
PROJECT NO: 50-19127
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#### NOTES:

- 1. ALL PAVEMENT TO FOLLOW MODOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
- 2. CONTRACTOR SHALL SUBMIT A MIX DESIGN FOR ENGINEERING REVIEW AND RECEIVE APPROVAL PRIOR TO PAVING.
- 3. ALL PAVEMENT JOINTS SHALL BE SQUARE WITHOUT FEATHERING.

### 1 EXISTING ASPHALT PAVEMENT/REMOVAL





PAINTED ARROW
(SAFETY YELLOW PAINT)

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

SARAGES M

CITY OF ST. LOUIS FOUR GARAG

MAINTENANCE

**PREVENTIVE** 

AND

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NO. DESCRIPTION DATE
DRAWING TITLE:
ASPHALT
REPAIR DETAILS

DRAWING NO.

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DATE: MAY, 2019

PROJECT NO: 50-19127

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### **CONSTRUCTION NOTES**

- CODES AND STANDARDS: ALL STRUCTURAL REPAIR WORK SHALL BE PERFORMED WITH PERTINENT PROVISIONS OF THE FOLLOWING **CODES AND STANDARDS:** 
  - "SPECIFICATIONS FOR STRUCTURAL CONCRETE" ACI 304R "GUIDE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE"
  - ACI 305R "HOT WEATHER CONCRETING"
  - ACI 306.1 "STANDARD SPECIFICATIONS FOR COLD WEATHER CONCRETING"
  - ACI 309R "GUIDE FOR CONSOLIDATION OF CONCRETE" ACI 311.1R "ACI MANUAL OF CONCRETE INSPECTION"
  - ACI 318-02 "BUILDING CODE REQUIREMENTS FOR
  - STRUCTURAL CONCRETE" ACI 347 "GUIDE TO FORMWORK FOR CONCRETE"
  - ACI 506.2 "SPECIFICATIONS OF SHOTCRETE"
  - "CODE OF STANDARD PRACTICE FOR STEEL
  - **BUILDINGS AND BRIDGES**"
  - "MANUAL OF STEEL CONSTRUCTION"
  - AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING
  - AWS "STRUCTURAL WELDING CODE - STEEL"
  - ASTM A325 OR A490 BOLTS"
  - ACI 562-16 "CODE REQUIREMENTS FOR EVALUATION, REPAIR, AND REHABILITATION OF CONCRETE BUILDINGS"
- 2. ALL DETAILS, SECTIONS AND NOTES SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS ELSEWHERE. UNLESS OTHERWISE SHOWN.
- 3. THE ENGINEER SHALL HAVE AUTHORITY TO REJECT WORK WHICH DOES NOT CONFORM TO THE CONTRACT DOCUMENTS. THE ENGINEER AND OWNER WILL HAVE AUTHORITY TO REQUIRE SPECIAL INSPECTION OR TESTING OF THE WORK. HOWEVER, NEITHER THE ENGINEER'S AUTHORITY TO ACT UNDER THIS SUBPARAGRAPH NOR ANY DECISION MADE BY HIM IN GOOD FAITH TO EXERCISE OR NOT TO EXERCISE SUCH AUTHORITY, SHALL GIVE RISE TO ANY DUTY OR RESPONSIBILITY OF THE ENGINEER TO THE CONTRACTOR, ANY SUBCONTRACTOR, ANY OF THEIR AGENTS OR EMPLOYEES, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK.
- 4. THE CONTRACTOR SHALL MAINTAIN, ON ONE COMPLETE SET OF DRAWINGS (WHITE PRINTS) AND SPECIFICATIONS FURNISHED BY THE OWNER AT THE CONTRACTORS EXPENSE, AN ACCURATE RECORD OF THE INSTALLATION OF ALL MATERIALS AND SYSTEMS COVERED BY THE CONTRACT. THE "AS-BUILT" RECORD SHALL INDICATE THE EXACT LOCATION AND AMOUNT OF ALL REPAIR WORK. THE COMPLETED SET OF "AS-BUILT" DRAWINGS MUST BE DELIVERED TO THE OWNER AND ENGINEER AS SOON AS THE PROJECT IS FINISHED.
- 5. ANY EQUIPMENT GREATER THAN 6,000 LBS SHALL REQUIRE SPECIALIZED SHORING OF THE PARKING DECK. THE ENGINEER SHALL REVIEW AND APPROVE SHORING PRIOR TO STARTING WORK. ALL LOOSE CONCRETE ON THE UNDERSIDE OF THE PARKING DECK SHALL BE REMOVED PRIOR TO STARTING WORK. ALL NOISE AND DUST PRODUCING OPERATIONS ARE LIMITED TO THE OWNER'S SATISFACTION AND THE CITY OF ST. LOUIS CODE REQUIREMENTS.
- 6. THE NEW CONCRETE SHALL BE PLACED, CONSOLIDATED AND FINISHED TO MATCH EXISTING FINISH FLOOR ELEVATIONS. THE REPAIR AREAS MAY BE OPENED TO GARAGE OPERATION AFTER THE NEW CONCRETE HAS ACHIEVED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI. THE SHORING AND FALSEWORK SHALL BE LEFT IN-PLACE UNTIL THE NEW CONCRETE ACHIEVES AT LEAST 70% OF THE DESIGN COMPRESSIVE STRENGTH. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY REPRESENTATIVE DURING THE POURING TO INSPECT AND MAKE CYLINDERS OF NEW CONCRETE DELIVERED TO THE SITE.
- CONCRETE TESTING WILL BE PERFORMED BY THE TESTING LABORATORY SELECTED BY THE OWNER IN ACCORDANCE WITH ACI 301 SUBSECTION 1.6. SEE THE SPECIFICATION FOR CONCRETE TEST REQUIREMENTS.

### POST-TENSIONED CONCRETE NOTES

- IN POST-TENSIONING SHALL CONFORM TO ASTM A416, STRESS RELIEVED, LOW RELAXATION, 7-WIRE EXTRA HIGH STRENGTH 270,000 PSI.
- EXTRUDED PLASTIC SHEATH. IN-PLACED TENDONS SHALL BE IN SATISFACTORY CONDITION.
- DESIGNED PER ACI 318 CODE AND COMMENTARY, AND SAMPLES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL
- 5. THE POST-TENSIONING SYSTEM MANUFACTURER SHALL SUBMIT TO THE ENGINEER FOR APPROVAL ENGINEERED SHOP DRAWINGS
  - 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
- 6. ALL FRICTION CALCULATIONS AND POST-TENSIONING SHOP DRAWINGS SHALL BE SEALED BY A PROFESSIONAL ENGINEER
- 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;
- D. REQUIRED ELONGATION OF EACH TENDON AT EACH JACKING
- E. METHOD OF DETERMINING ANCHOR FORCE OR FORCE
- G. METHOD OF SEALING TENDONS AND CLOSING STRESSING
- H. SAMPLE STRESSING RECORDS.
- CONCRETING SEQUENCE FOR APPROVAL.
- 9. TENDONS SHALL BE SECURELY SUPPORTED AT INTERVALS NOT EXCEEDING 36 INCHES ON CENTER.
- DRAWINGS, ANY ADDITIONAL OPENINGS, NOT SHOWN ON THE APPROVED SHOP DRAWINGS WILL REQUIRE A WRITTEN APPROVAL FROM THE ENGINEER PRIOR TO CONSTRUCTION.
- 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.
- THE ENGINEER, CUT OFF TENDON TAILS ACCORDING TO THE ENGINEER'S DIRECTION.
- 13. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS FOR ALL POST-TENSIONED CONCRETE WORK.

- 1. ALL NEW POST-TENSIONING SYSTEM SHALL BE UNBONDED MONO-STRAND FULLY ENCAPSULATED TENDONS. STRANDS USED STRAND WITH A GUARANTEED MINIMUM ULTIMATE STRENGTH OF
- 2. THE POST-TENSIONING TENDONS SHALL BE COATED WITH CORROSION INHIBITIVE COATING AND WRAPPED IN WATERTIGHT
- 3. ANCHORAGES FOR POST-TENSIONING TENDONS SHALL BE
- 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.
- SHOWING, AS A MINIMUM, THE FOLLOWING:
  - A. FOR SLABS, REPAIRED TENDON LAYOUT AND DIMENSIONS
  - REINFORCEMENT, STRESSING POCKETS, CLOSURES, ETC.
- REGISTERED IN THE STATE OF MISSOURI.

- REMAINING IN A TENDON AFTER ANCHORAGE;

C. METHOD OF DETERMINING THE SLACK, IF ANY;

- F. METHOD OF REMOVING AN EXCESS TENDON LENGTH AFTER ANCHORAGE:
- POCKETS:
- 8. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A
- 10. ALL OPENINGS AND/OR SLEEVES MUST BE SHOWN ON THE SHOP
- 11. TENDON STRESSING LOG CONTAINING REQUIRED AND MEASURED
- AFTER ACCEPTANCE AND APPROVAL OF STRESSING RECORDS BY

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