



**PARKING GARAGE
STRUCTURAL CONDITION SURVEY REPORT-2018**

**HANCOCK AIRPORT PARKING GARAGE
1000 COL. EILEEN COLLINS BLVD
SYRACUSE, NY 13212**

OWNER: SYRACUSE REGIONAL AIRPORT AUTHORITY

November 13, 2018

PREPARED BY:

**C&S ENGINEERS, INC.
499 COL. EILEEN COLLINS BLVD.
SYRACUSE, NY 13212**



Ghaith N. Makhlouf, P.E. - N.Y.S.P.E. Lic. No. 065094

C&S File Number: 068.032.001



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1. PURPOSE

Chapter 27 (Section 27-17) of the Revised General Ordinances of the City of Syracuse as amended by General Ordinance 29 of 1995 requires the owner of every parking garage within the City to provide the Code Enforcement Division with a Structural Condition Survey on an annual basis. Additionally, the Department of State has adopted a rule that amends Parts 1202, 1203, and 1204 of Title 19 of the New York Codes, Rules and Regulations. The amendment requires the Owners of parking garages to obtain operating permits to operate such parking garages and have periodic condition assessments of those parking garages. This report addresses the requirements of the afore-mentioned ordinance, stated NYCRR, and is focused primarily on structural elements.

2. SCOPE

- Visual Inspection
- Report

3. GENERAL DESCRIPTION OF THE STRUCTURE

The Syracuse Airport Parking Garage has approximately 1,000,000 gross square feet of floor space and has a parking capacity of 3,200 cars with a foot print of 316 feet x778 feet. The first phase of the construction of the garage, completed in 1981, consisted of asphalt paving at grade level and construction of two supported levels of cast-in-place post-tensioned (PT) concrete construction. The upper levels of the parking structure are flat for the most part and interconnected by sloping ramps at the north and south end of the structure.

The parking garage was expanded vertically in 1994 using structural steel frame system, which provided for roof level parking. The roof level addition is composed of structural steel girders with a 6-inch concrete deck. The roof deck consists of 3 ¾ inches cast-in-place concrete over 2¼ inches precast Filigree slabs (precast stay-form), coated with a waterproofing membrane and topped with a 2 inch asphalt wearing surface. The steel frame is covered with fireproofing board.

The garage has a total of five vehicle entrances and exits: two each are located at the north and south sides of the structure, and one exit at the center of the west side, which crosses the open parking lot toward the west. Traffic entering the garage is mainly directed towards the two way traffic ramps leading up to the upper levels. Traffic flow is one-way in the parking aisles in the east-west direction and two-way on the flat deck around the perimeter. With the exception of the ramps and the outer bays around the perimeter, parking is angled with the flow of traffic.

The parking garage is connected to the terminal building with two pedestrian bridges located at the north and south ends of the parking garage. Each pedestrian bridge has one concrete stair case and an elevator located at the west (garage) end of the bridges to access each level

of the parking garage. The pedestrian bridges and stairs/elevator towers are enclosed with aluminum finished metal cladding system.

Additionally, the garage has five stair cases located at the exterior walls on the east and west sides along with three interior stair cases and a third interior elevator next to the stair case at the center of the garage. Except for the concrete stairs at the two pedestrian bridges, all stairs consist of concrete-filled metal pan type construction. The five stair cases at the exterior of the garage have aluminum framed glass wall panel enclosures. The three interior stairs are enclosed with a masonry wall penthouse with hollow metal doors at the roof level.

4. AVAILABLE DOCUMENTS

- a) Syracuse Airport Parking Garage, Construction Drawings, dated 1-13-80.
- b) Airport Garage Expansion Project, Construction Drawings (Architectural and Structural Design), dated 10-7-94.
- c) Parking Garage Expansion Joint Replacement at Syracuse Hancock International Airport, Construction Drawings and Specifications 03600, 03730, and 05800, dated 8-2-04.
- d) Parking Garage Structural Condition Assessment Report, Syracuse Hancock International Airport, dated June 24, 2002.
- e) Parking Garage Structural Condition Survey, Syracuse Hancock International Airport, dated October 24, 2007.
- f) Parking Garage Expansion Joint Assessment Report, Syracuse Hancock International Airport, dated March 31, 2009.
- g) Parking Garage Roof Level Expansion Joint Replacement and Miscellaneous Repairs, Syracuse Hancock International Airport drawings and specifications, dated July, 2009.
- h) Parking Garage Stairs Repair, Syracuse Hancock International Airport drawings and specifications, dated July 9, 2010.
- i) Syracuse Hancock International Airport Parking Garage Structural Evaluation Report, dated November 12, 2012.
- j) Syracuse Hancock International Airport Parking Garage Rehabilitation-Phase-1, drawings and specifications dated March 2014.
- k) Syracuse Hancock International Airport Parking Garage Structural Condition Assessment Report, dated February 12, 2016.
- l) Syracuse Hancock International Airport Parking Garage Miscellaneous Repairs 2016, drawings and specifications.
- m) Syracuse Hancock International Airport Parking Garage Structural Condition Survey Report, dated August 8, 2017.
- n) Syracuse Hancock International Airport Parking Garage Miscellaneous Repairs 2017, drawings and specifications.

5. PROCEDURE AND EXTENT OF OBSERVATIONS

On various days between May 18, 2018 and May 25, 2018, Ghaith Makhoul, PE, performed visual observations of all levels of the parking garage. At the time of the visits, vehicles occupied approximately 70 percent of the parking spaces. Thus, some portions of the parking decks could not be observed in detail, particularly at level 2 and the south half of level 3 since they tend to fill up first. The north half of level 3 was cordoned off due to the ongoing miscellaneous repairs at the time of the inspection. The condition assessment focused on reviewing the overall structural condition of the garage and to identify any critical structural concerns, which may require immediate attention and/or to be considered for further evaluation. Inspection of the elevator shafts interior and the pedestrian bridges was not performed. Representative photos of observed deficiencies are included in Appendix A. Note: The Time/Date stamp on some photos maybe inconsistent. The present conditions were compared to the observations made during the 2017 condition survey. Field notes and plans are included in Appendix B.

6. FINDINGS AND RECOMMENDATIONS

Based on our visual observation of the structural elements and data gathered during the previous repair projects, we believe that the structural condition of the garage ranges from poor to fair condition. The structural condition of the north half of the second floor deck and other isolated areas on the third level is considered questionable. The garage generally exhibits a deteriorated condition in some isolated structural members and components, which include the deck, beams, and columns. Concrete cracking, spalling and corrosion of the post-tensioning system at the second level remains a concern, especially at the construction and expansion joints. The third floor and roof levels appear to be in satisfactory condition at this time, except for some isolated areas that are in need of repair. The 2016 and 2017/2018 limited repair projects addressed some of the more pressing conditions, which included the following:

- a) Installing shelf angles below cracked slabs at expansion joint on the second and third levels,
- b) Patching spalled concrete on top and bottom of the north half of the second level and entire third level,
- c) Sealing the construction joints on the north half of the second and entire third levels,
- d) Patching some isolated areas of damaged concrete beams and columns,
- e) Repairing the leaking expansion joints at isolated areas on the second, third, and roof levels,
- f) Repair cracked column corbels at the ramp to roof along column line 30, completed in 2018,
- g) Repairing the masonry walls around the two middle stair towers, stair # 8 and #10,
- h) Repairing potholes in the asphalt topping on the roof level.
- i) Repairing stairs #1 and #7.

The results of our condition survey are summarized here on a prioritized basis. The deficiencies under the heading, “Require Immediate Attention” should be addressed as soon as possible or

within the time frame noted. They represent a condition which now or will soon compromise the structural integrity of the garage. The issues discussed under the heading, “Programmed Repairs” should be addressed soon as they will result in accelerated degradation, which will require more extensive repairs at a later date. Routine maintenance issues should be addressed on a periodic basis and can likely be done by garage maintenance staff.

REQUIRE IMMEDIATE ATTENTION

Stair Towers: The following elements related to stair #1 and #7 are in very poor condition and require repair.

1. Corroded concrete-filled metal pan treads and risers of stair #1 and #7.
2. Corroded stair-landing pan and support posts at the ground level of Stair #7.
3. Corroded stair-landing pan at fourth level of stair #1.
4. Corroded railings at the ground level of stair #1 and #7.

The above items were added to the ongoing 2018 repair project by change order. The repairs are complete.

There are no other defects under this category, which would immediately affect the structural integrity of the garage.

PROGRAMMED REPAIRS

- 1) **Concrete Beams:** The majority of the post-tensioned cast-in-place concrete beams throughout the garage appear to be in good condition without any visible corrosion of the tendons or conventional reinforcing. However, some beams along the expansion joints have cracks along the corners, which appear to be due to the corrosion of the conventional reinforcing steel. The previous repair projects have addressed most of the leaky joints to reduce the potential for steel corrosion and concrete cracking. However, we believe that without regular maintenance of the joints, corrosion and similar cracks will continue to develop.

We recommend repairing any additional new or existing cracked beams that were not addressed in the 2017 Miscellaneous Repair project in 2019 or 2020. The scope of work to be determined upon performance of the 2019 garage inspection.

- 2) **Concrete Columns:** Delaminated concrete and cracked columns were observed at 69 locations on the first level, 52 locations on second level, and 23 locations on third level. Additionally, there are minor vertical hairline cracks and horizontal cracks at the circular steel ties at many columns, mainly on the exterior columns, and will require patching and/or coating with waterproofing. The affected column surfaces need to be chipped out to a minimum depth of approximately 2 inches at corroded reinforcing. We recommend repairing all delaminated columns and corbels in 2019 or 2020. Refer to the attached drawings for location of cracked columns.

- 3) **Expansion Joints:** The expansion joint seals at the north half of Level 2 and Level 3 are in poor condition and require total replacement as soon as possible. Repairing the leaking expansion joints seals on the north-south expansion joint will require extensive rehabilitation to the concrete deck to repair the cracks and damaged reinforcing steel. At several locations, the pour strip slab along the east-west expansion joints has been damaged by corrosion of reinforcing and freeze-thaw damage of concrete, and will need to be repaired or replaced prior to replacing the expansion joint seals. The 2016 and 2017 repair projects included partially repairing the damaged concrete deck next to the expansion joints, repairing the damaged pre-mold joints and caulking the open seams. We recommend replacing the remaining old expansion joint on the north half of levels 2 and 3 as part of comprehensive garage repair project in 2019 or 2020.

The expansion joints at the roof level are damaged at some isolated areas and currently leaking. The damage appears to be the result of the snow plowing operation. Refer to the drawings for joint damage locations. The ongoing repair project includes repairing these damaged roof expansion joints before winter.

- 4) **Construction Joints:** The ongoing repair project included repairing the delaminated concrete and applying a waterproofing membrane on Level 3 to protect the construction joints and PT until such time the entire deck can be completely repaired as part of any future major rehabilitation.
- 5) **Concrete Deck:** The north half of Level 2 is in poor condition and is in need of a comprehensive repair program. Refer to the discussion related to the post tensioning system below for additional information. The degree of deterioration of Level 3 deck appears to be less than Level 2 but still requires repairs to address the cracked slabs at the expansion and construction joints and patching delaminated deck areas. Shelf angles were installed in 2016 to support the cracked slabs on Level 3. We recommend repairing the concrete decks and post tensioning system similar to the repairs done on the south half of Level 2 in 2014/2015 Phase-1 Project.

The roof concrete deck appears to be in satisfactory condition with very limited damage. The roof deck deterioration mainly consists of damaged asphalt topping and leaking expansion joints. There are cracked curbs along the perimeter of levels 2 and 3 at many locations. Repairing these cracked curbs is not urgent at this time and should be addressed when performing the recommended comprehensive garage repair project.

- 6) **Post Tensioning System:**

There are no visible signs indicating broken post tensioning (PT) tendons. However, based on the data gathered during our previous exploratory testing, the 2014/2015 Phase-1 rehabilitation project, and the repairs performed in 2016 and 2017 projects, we suspect that several of the PT tendons are corroded near the intermediate anchors and at the expansion joints. The condition of construction joints at the intermediate anchors

on the second level located north of column line 16 and at some isolated areas on the third level is a concern. In addition, we believe that the leaking through expansion joints over so many years has caused corrosion of reinforcing steel embedded in the slabs and beams. The 2017 repair project encountered two (2) broken PTs next to column C14 at Level 2. Refer to photo #7. In addition, there is one (1) broken PT next to column N22 at Level 3. There could be some corroded tendons present in the slabs with potential of sudden failure at any time. The corrosion at the construction and expansion joints could soon result in a large number of broken tendons.

We estimate the number of broken PT at the remaining second level will be approximately similar to the number encountered in Phase-1, which varied from 16% to 33%. Since repairing of all broken PT is not necessary, the required number of PT splices will be determined/adjusted in the field based on the location/spacing of the broken PT, which would be discovered during repairs. We recommend addressing these issues and repairing the damaged concrete deck and PT as part of a rehabilitation program in 2019 or 2020 to maintain the structural integrity of the garage. See above Item 5 for concrete deck description and recommendations.

The concrete cover over the live end grout pockets of the post-tensioning system at the columns are showing signs of deterioration and could become problematic in the future. Early signs include surface cracking and evidence of water infiltration. We recommend sounding the grout pockets, cleaning and coating PT anchors, and replacing any loose grout. We recommend applying a coating system over the anchorage cover periodically in order to prevent any water infiltration.

- 7) **Stair Towers:** The stair treads and landings consist of concrete-filled metal pan construction with steel frame. Currently most of the stair pans and railings at the ground level require repair or replacement and paint. The ongoing repair project included repairing some of the cracked concrete beams at the stair landings. Additionally, C&S recommended repairing and replacing treads and landings of stairs #1 and #7, which the Authority has approved and the work is complete.

We recommend the following:

- a. Repair all cracked concrete beams supporting the landings located at the garage floors and the columns supporting the enclosures at the roof level.
- b. Repair the damaged mortared and caulked joints at the aluminum storefront enclosures.
- c. Repair the damaged aluminum roof scupper and exterior sheet metal of the aluminum storefront enclosures.
- d. Repair the damaged caulk at all joints along the perimeter of the stair towers of the pedestrian bridges. Testing for asbestos and PCB of the caulk materials is required.

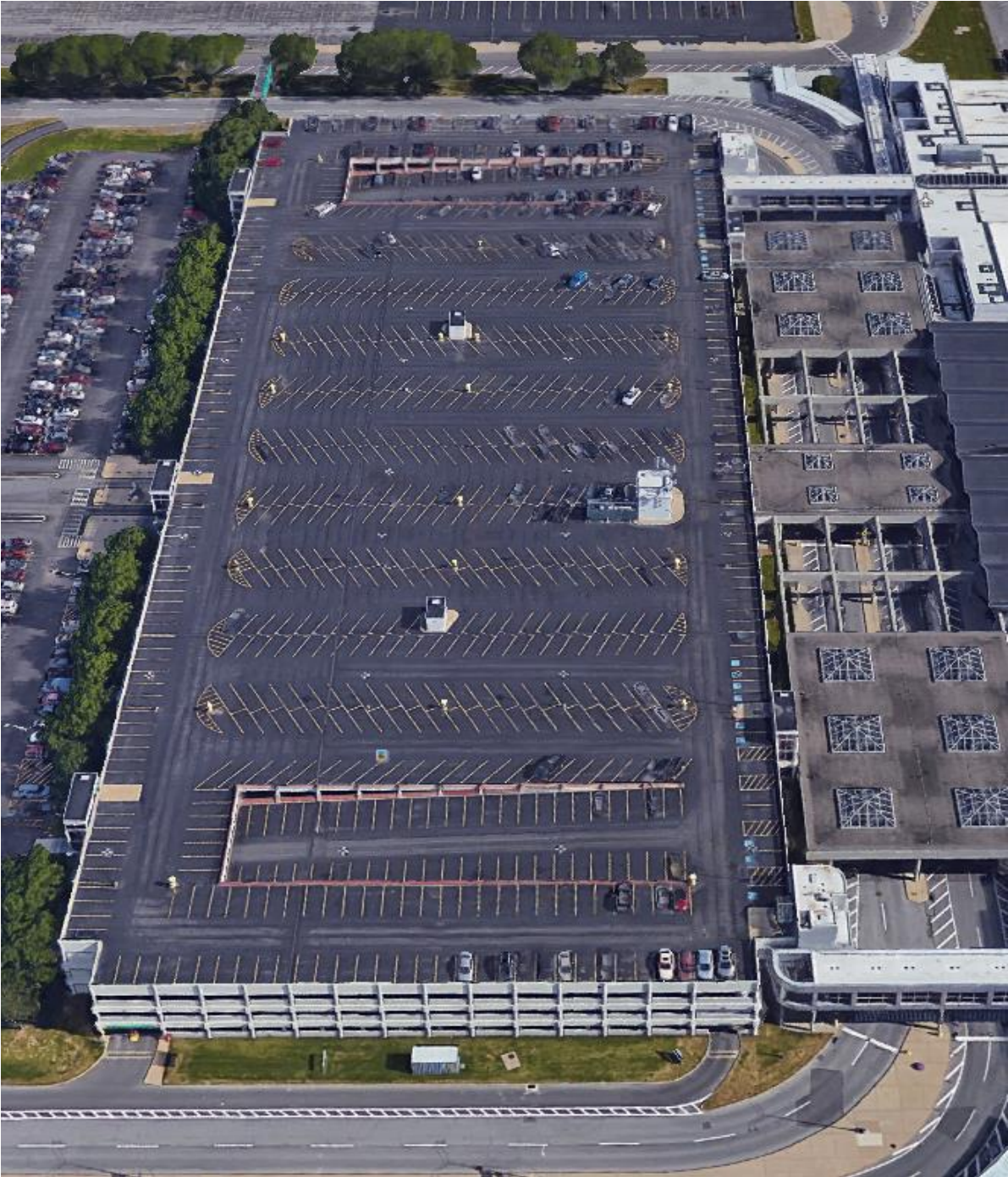
- 8) **Miscellaneous Items:**

- a. The existing steel bumper rails and attached handrails are corroded on all levels and require repair work. We recommend this repair work to be completed as part of future rehabilitation project.
- b. The roofing of the stair towers and elevator shafts should be replaced as part of future rehabilitation project.
- c. Repair the damaged fireproofing board at the structural steel beams and bearing pads supporting the roof level deck. We recommend this repair work to be completed as part of future rehabilitation project.
- d. Repair and reseal the cracks in the asphalt wearing surface at the roof level. We recommend this repair work to be completed as part of any future major rehabilitation.
- e. Flush the floor drains and replace broken pipe clamps. We recommend this repair work to be completed before this coming 2018/2019 winter season.
- f. Reconnect the loose or damaged stainless steel plates at the snow removal deflectors at the Roof Level. We recommend this repair work to be completed before this coming 2018/2019 winter season.
- g. Check the light fixtures and re-lamp as necessary.
- h. Repair the damaged chain-link fence along the north side of the garage.

ROUTINE MAINTENANCE

- 1) **Deck Cleaning:** The deck should be washed each spring to remove salt residue.
- 2) **Drainage System:** The system should be flushed annually along with spring deck cleaning after the salt season is over. Replace any missing pipe clamps, sediment bowls and clean existing bowls as necessary.
- 3) **Expansion Joints:** Power wash the concrete decks and expansion joints. Dirt and sediment must be cleaned from the expansion joints regularly in order for them to function properly. When clogged, undo stress is put on the edges as the slabs expand in warm weather.
- 4) **Maintenance Painting:** Paint curbs, handrails, stairs enclosures, and other metal items. All exposed metal elements should be regularly inspected and touched up.
- 5) **Snow Removal:** Employ caution in roof level snow removal operations to preclude damage to the expansion joints. Install barriers during the winter months to prevent snow from entering at the north side of the garage, resulting from roof snow removing operation.

APPENDIX A – SELECT PHOTOGRAPHS



(Photo from Google Earth)



Photo #1: column S3 on Level 3 - hairline cracks at top of column



Photo #2: Level 2 Soffit-water stained concrete and corrosion at bottom of concrete deck at the floor drain. Typical condition below second floor. Broken rental car sign cable.



Photo #3: spalling concrete column with corroded ties on south end of Level 3



Photo #4: damaged fire proofing board falling on concrete deck near column line Q3 on Level 3



Photo #5: Level 3 soffit near column line E32 - cracked and delaminated soffit



Photo #6: Beam over Level 3 between E28 to E30 – bottom of beam with cracked patches



Photo #7: Two broken PTs at column C14 at Level 2.



Photo #8: Level 3 Soffit-water leaking along the damaged joint at base of the South Ramp at the roof level. Also, crack along the patched area of girder.



Photo #9: typical concrete column cracking at base.



Photo # 10: Level 3- Roof Soffit- water damaged fireproofing board and corrosion of steel beam bearing plate.



Photo #11: Level 3-Roof Soffit- missing fireproofing board at steel girder.



Photo #12: Missing fireproofing board at bottom of steel beam



Photo #13: North West garage entrance ground level spalling and corroded reinforcing on wall



Photo #14: Hairline cracks at Northeast corner Level 2 soffit



Photo #15: Level 2 soffit near column line Q30 – leaking crack with corrosion



Photo #16: Cracked post tensioning pocket cover



Photo #17: Cracked post tensioning pocket cover



Photo #18: Failed caulk at Level 1 stair tower 3



Photo #19: Damaged mullion at stair #1. Edge unsupported at glass panel.



Photo #20: corroded steel column and damage glazed masonry at pedestrian bridge. We believe the glazed masonry was repaired.



Photo #21: Damaged chain link fence on north side.



Photo #22: Loose section of snow deflector



Photo #23: missing steel bollard around utility.



Phot #24: Damaged and displaced steel bollard.



Photo #25: Stair tower 4 – Corrosion of steel pan of landing and water stains running down side of wall



Photo #26: Stair tower 3 – cracked stair pan



Photo #27: Stair tower #3 – cracked beam and soffit of Level 3 landing



APPENDIX B - FIELD NOTES AND LOCATION PLANS

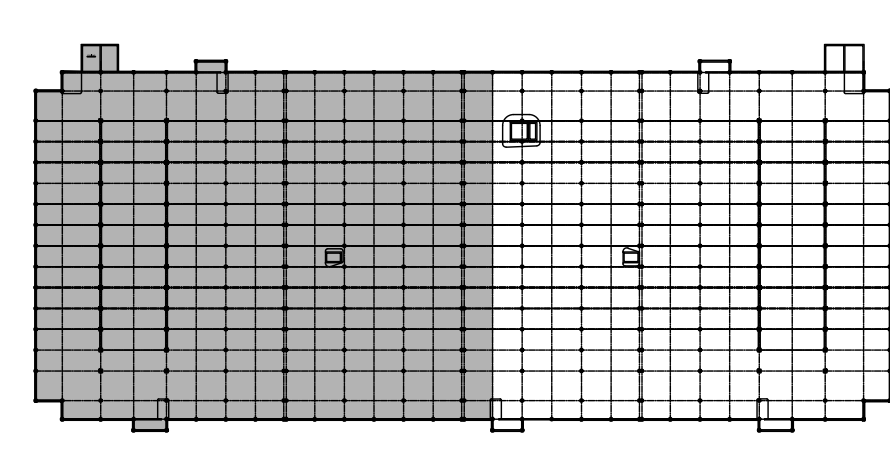
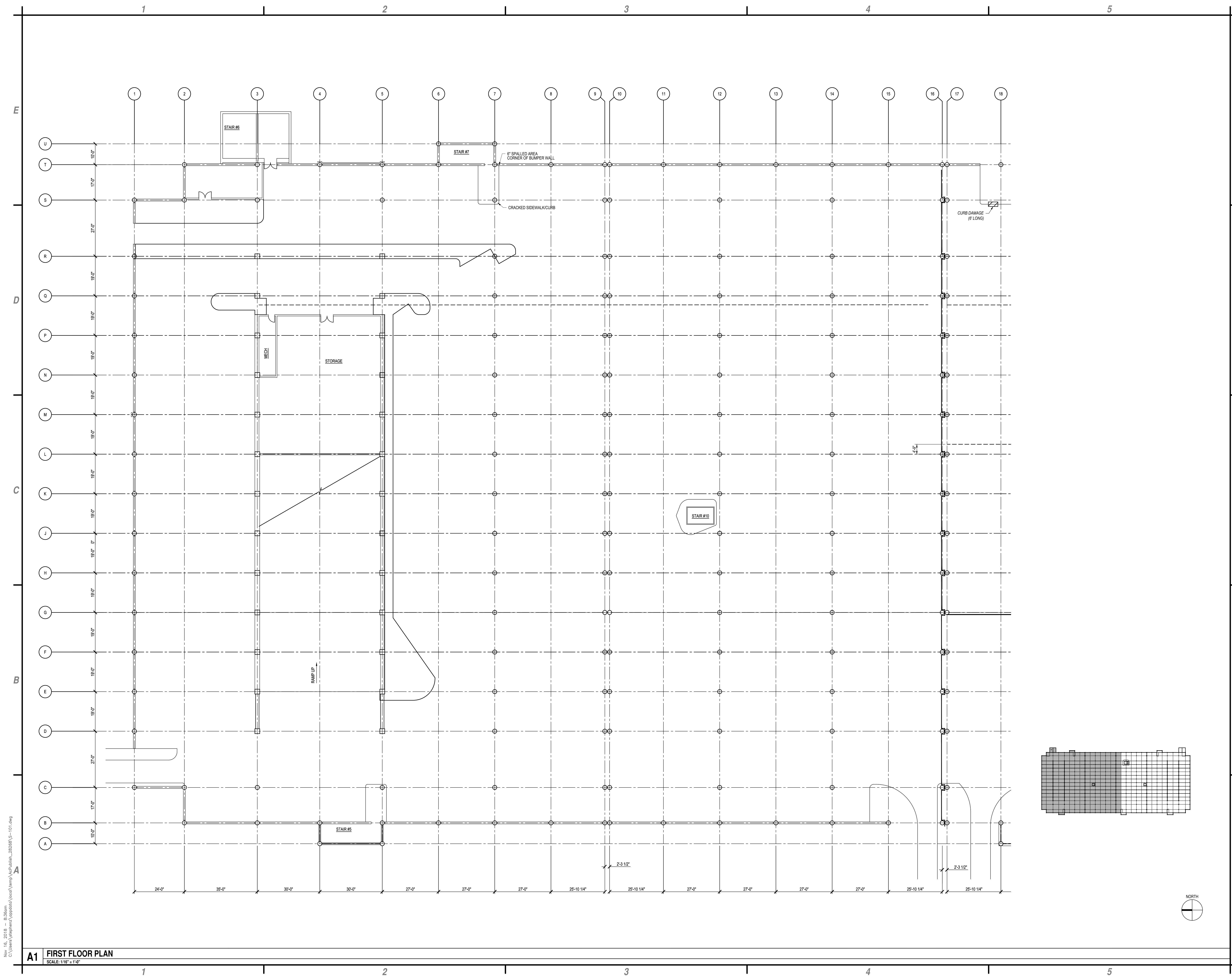
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DESIGNED BY:		
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STRUCTURAL
FIRST FLOOR PLAN

S-100A



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A1 FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"

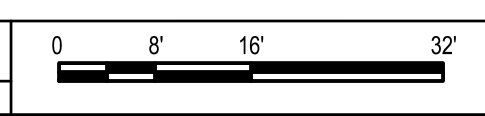
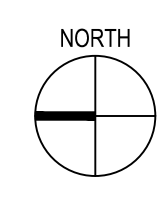
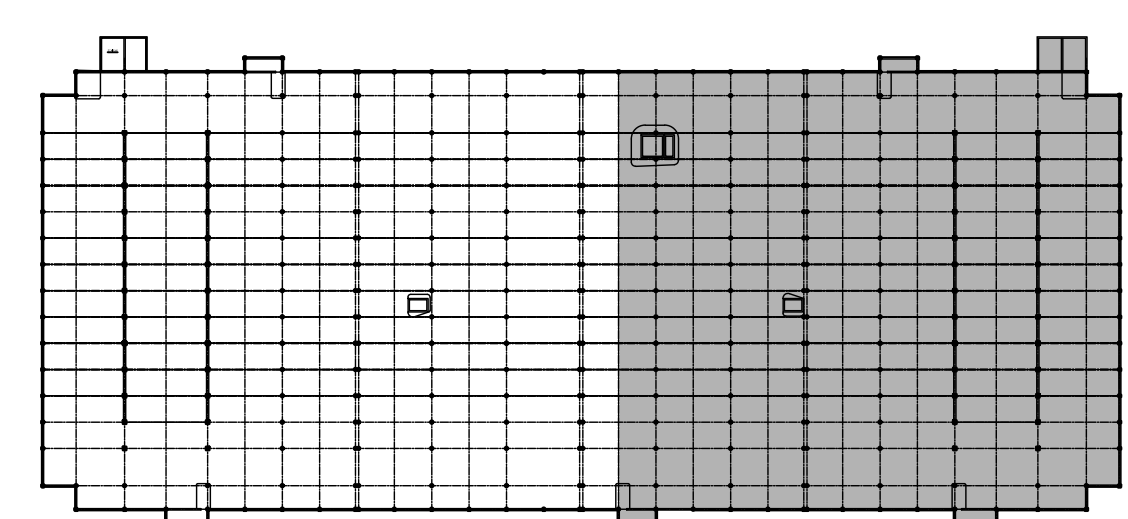
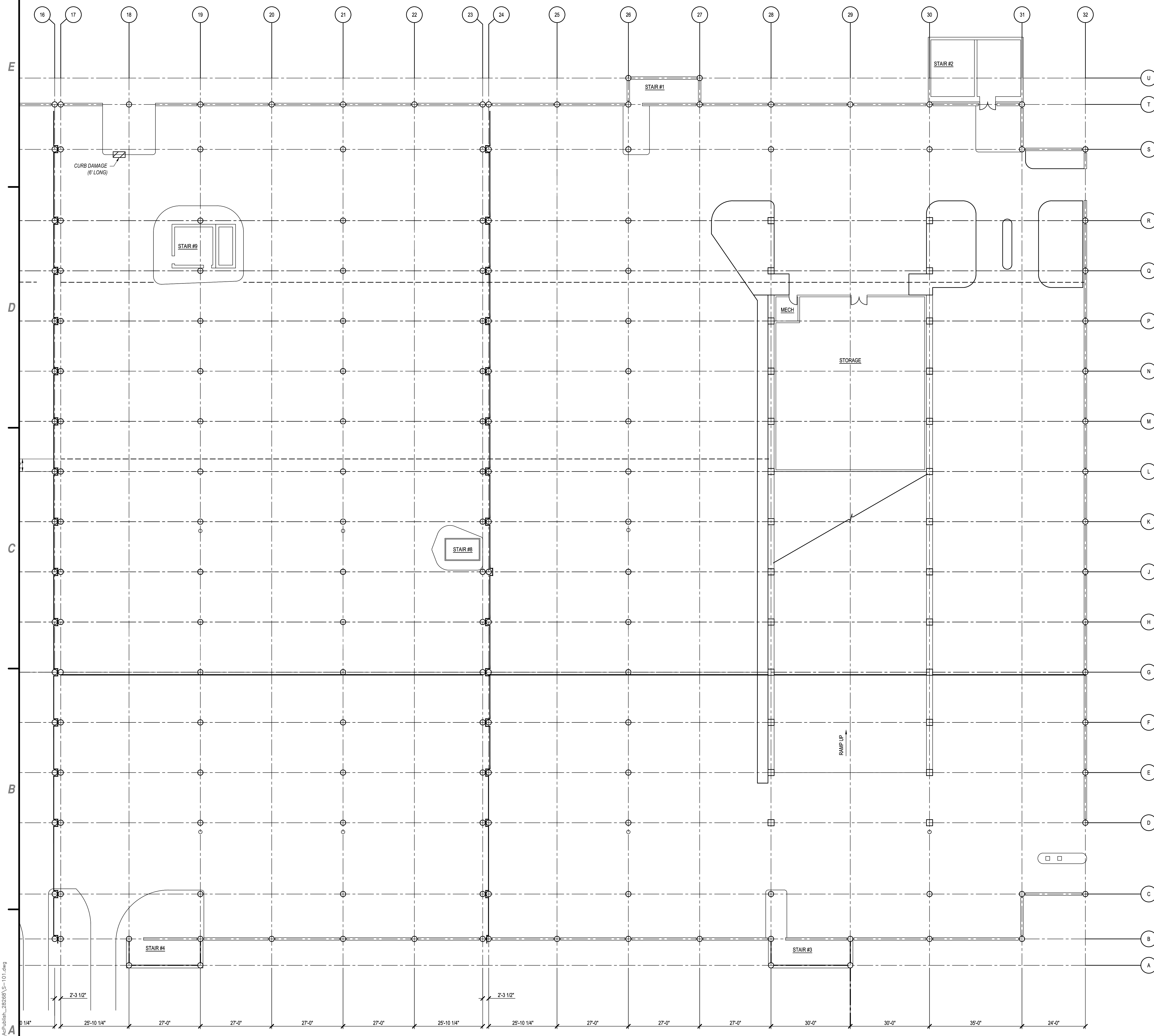
1

2

3

4

5



C&S
COMPANIES

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**STRUCTURAL
FIRST FLOOR
PLAN**

S-100B

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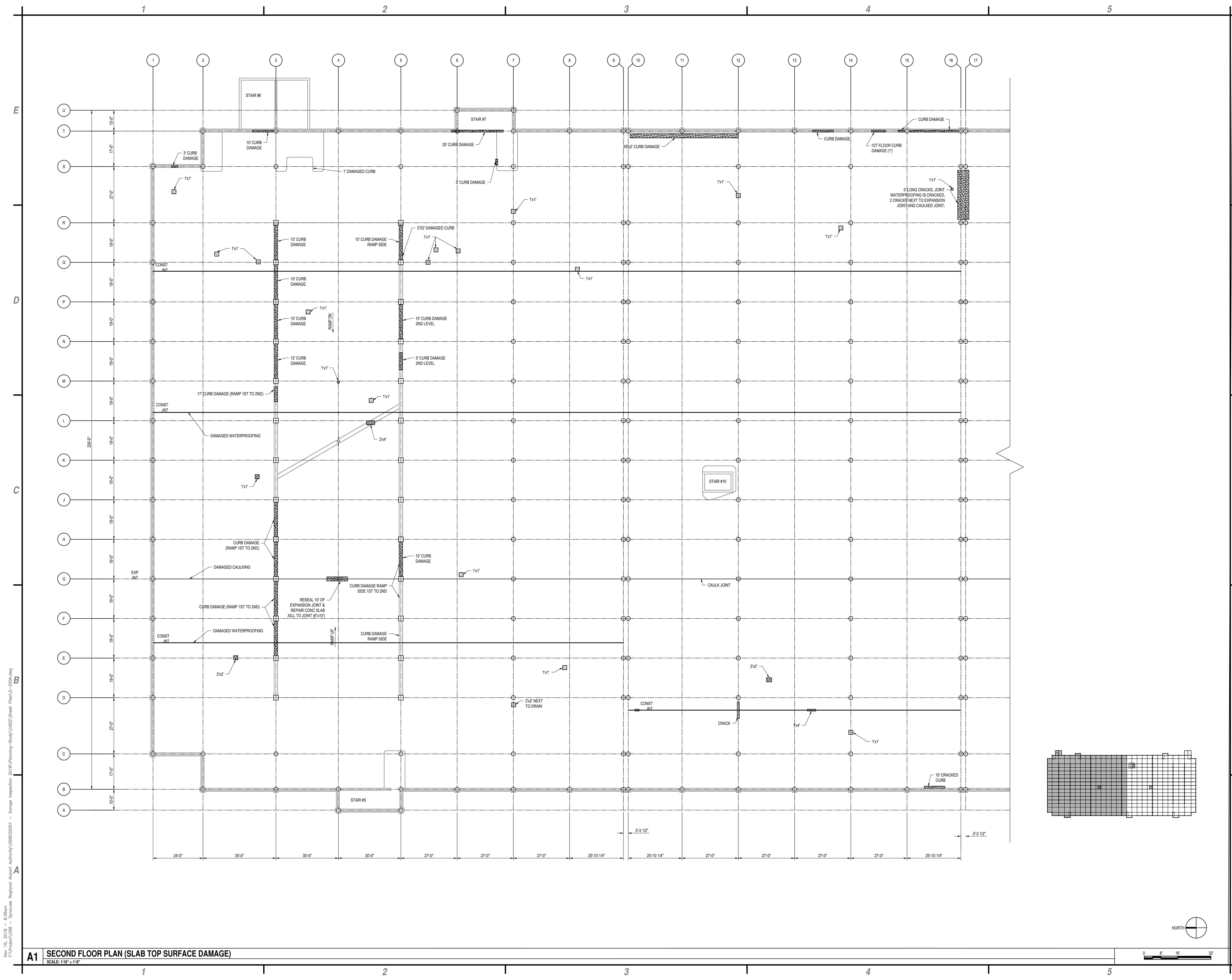
A1 FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"

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SECOND FLOOR SLAB

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A1 SECOND FLOOR PLAN (SLAB TOP SURFACE DAMAGE)
SCALE: 1/16" = 1'-0"



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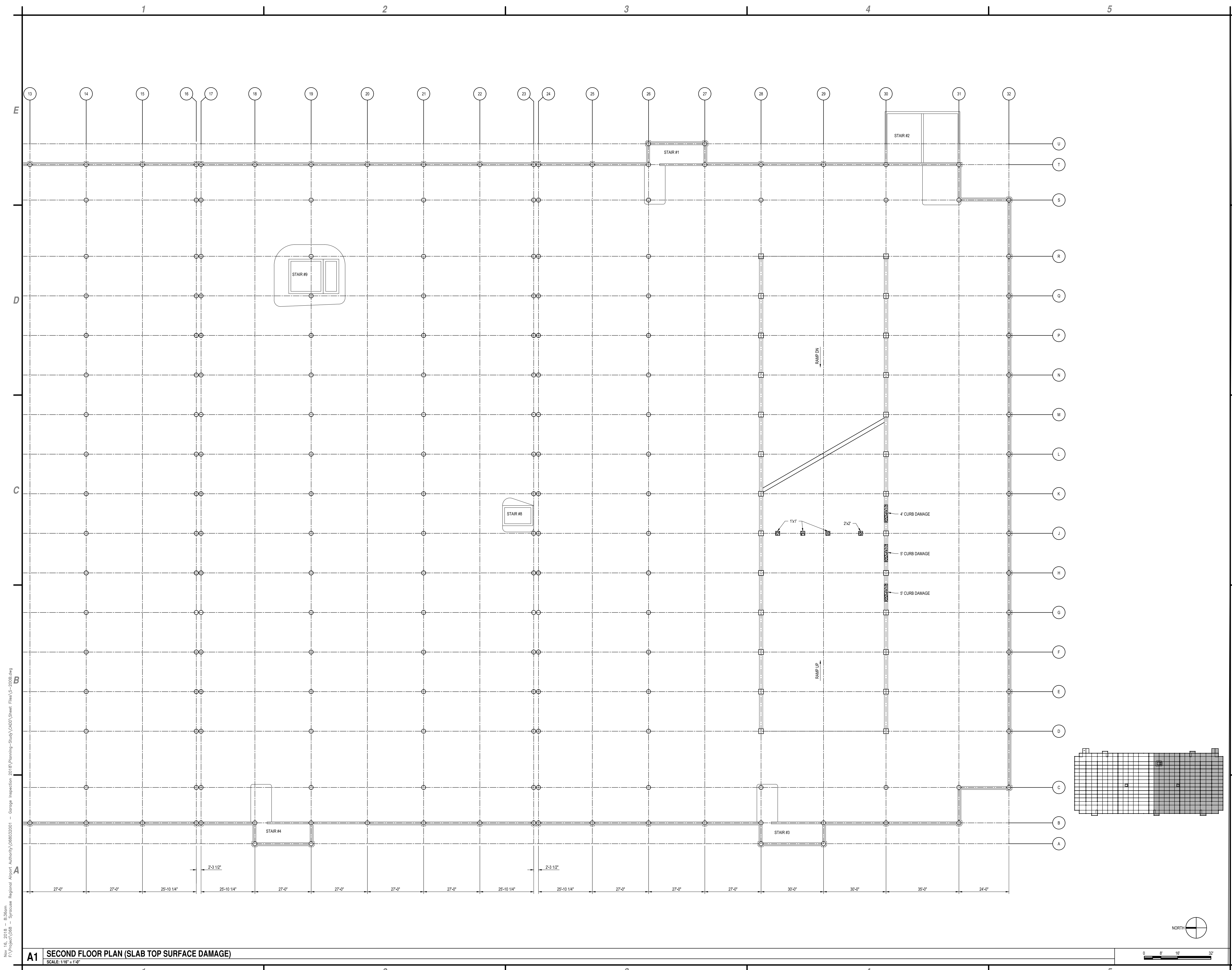
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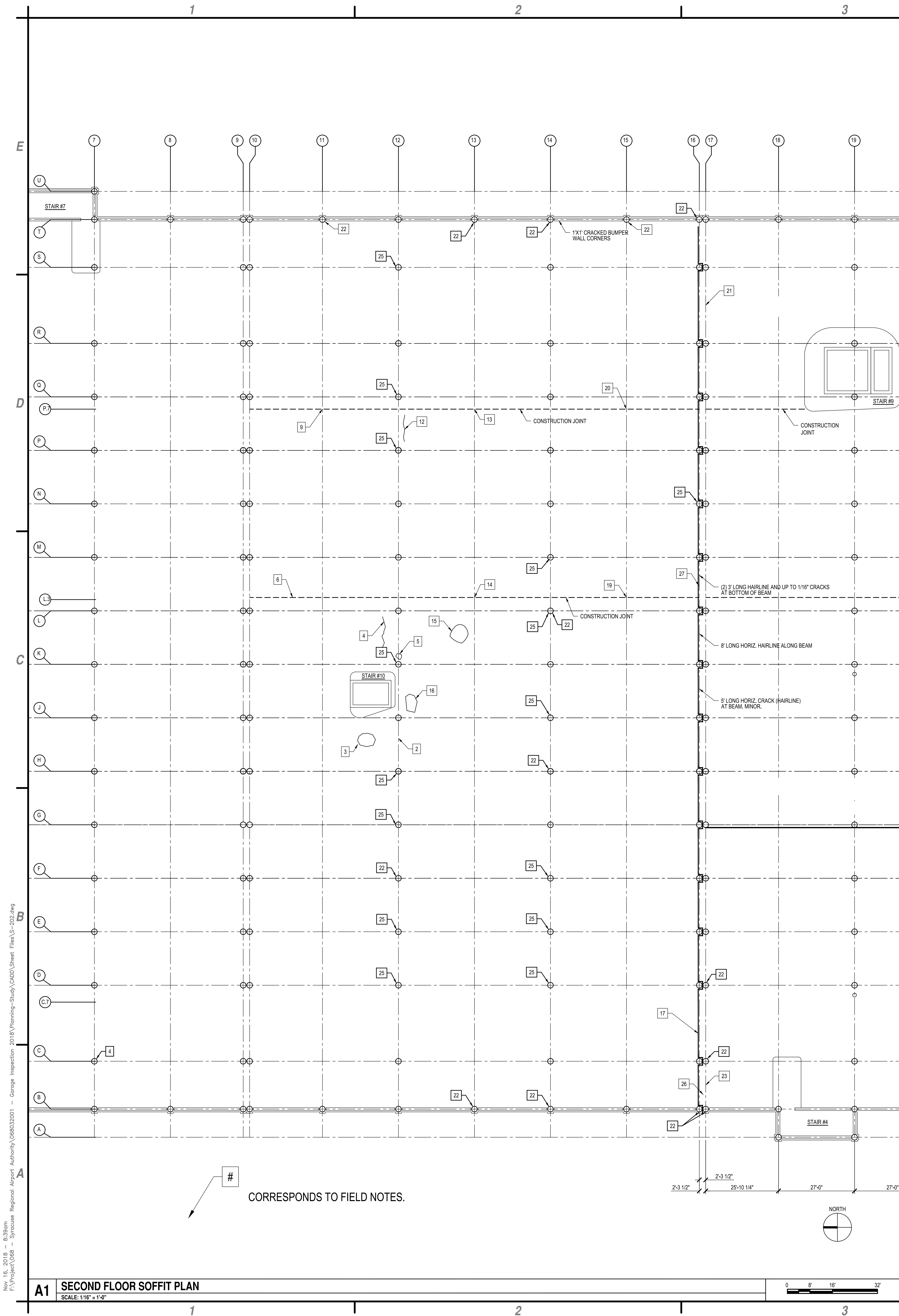
**SECOND FLOOR
 SLAB**

S-200B



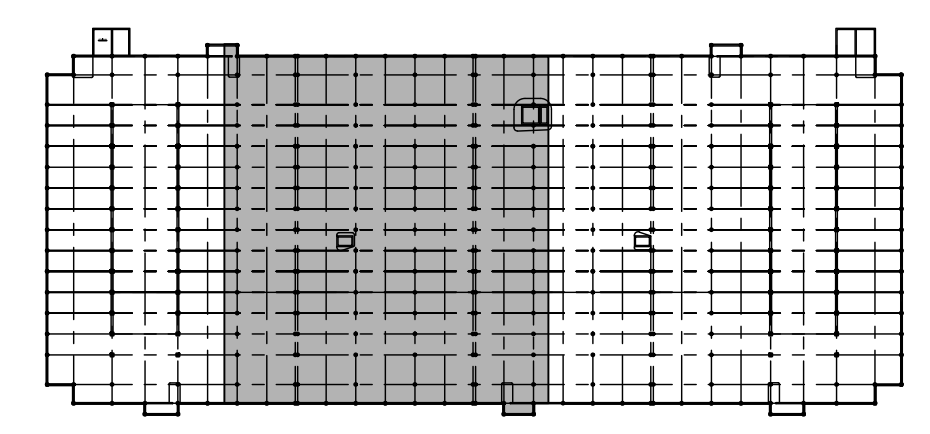
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A1 SECOND FLOOR PLAN (SLAB TOP SURFACE DAMAGE)
 SCALE: 1/16" = 1'-0"



FIELD NOTES	
NOTE	DESCRIPTION
1	Not used
2	2' x 2' spall with exposed rusted bar and PT. PT is ok.
3	On ground level: Manhole cover and exposed steel rims related to plumbing. Covered with barrels and cone.
4	Up to 1/16" x 15' long crack with efflorescence and water stains.
5	Floor drain with 5' x 5' water stained area and rust stains along the perimeter.
6	Construction joint with up to 1/32" cracks along 25' section. Several rust stains and water stains along joint.
7	Not used
8	Not used
9*	Construction joint with 1/16" x Full Length crack along joint. Water stains and some rust stains. One 6" x 24" long delaminated area. Remove delaminated concrete.
10	Not used
11	Not used
12*	10' long crack with 6" x 3' area of delaminated concrete to be removed.
13*	Construction joint with several water stained rust spots. Up to 1/32" x 20' long crack with some minor delaminations. Remove loose concrete.
14	Construction joint with minor hairline cracks, water stains and rust stains.
15	2' x 4' area with water and rust stains.
16	3' x 5' area with water and rust stains.
17	Water and rust stains at pour strip slab.
18	Not used
19	Construction joint has some water stains but is ok.
20*	Construction joint has spalled concrete along with three 6" x 2' long sections - consider patching. Water stains and some rust stains. Red plastic in 2" hole in joint.
21	Beam has a 4' long crack
22	Random hairline cracks on column.
23*	Up to 1/8" x 4' long crack at bottom of beam.
24*	1/8"x1' crack at base of column.
25*	Spall less than 1'x2' on column.
26*	Two 12"x12" spalls at soffit with hairline cracks. Remove spalls.
27*	10' long 1/32" crack and 12" long x6" delam at pour strip soffit.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON GROUND LEVEL.



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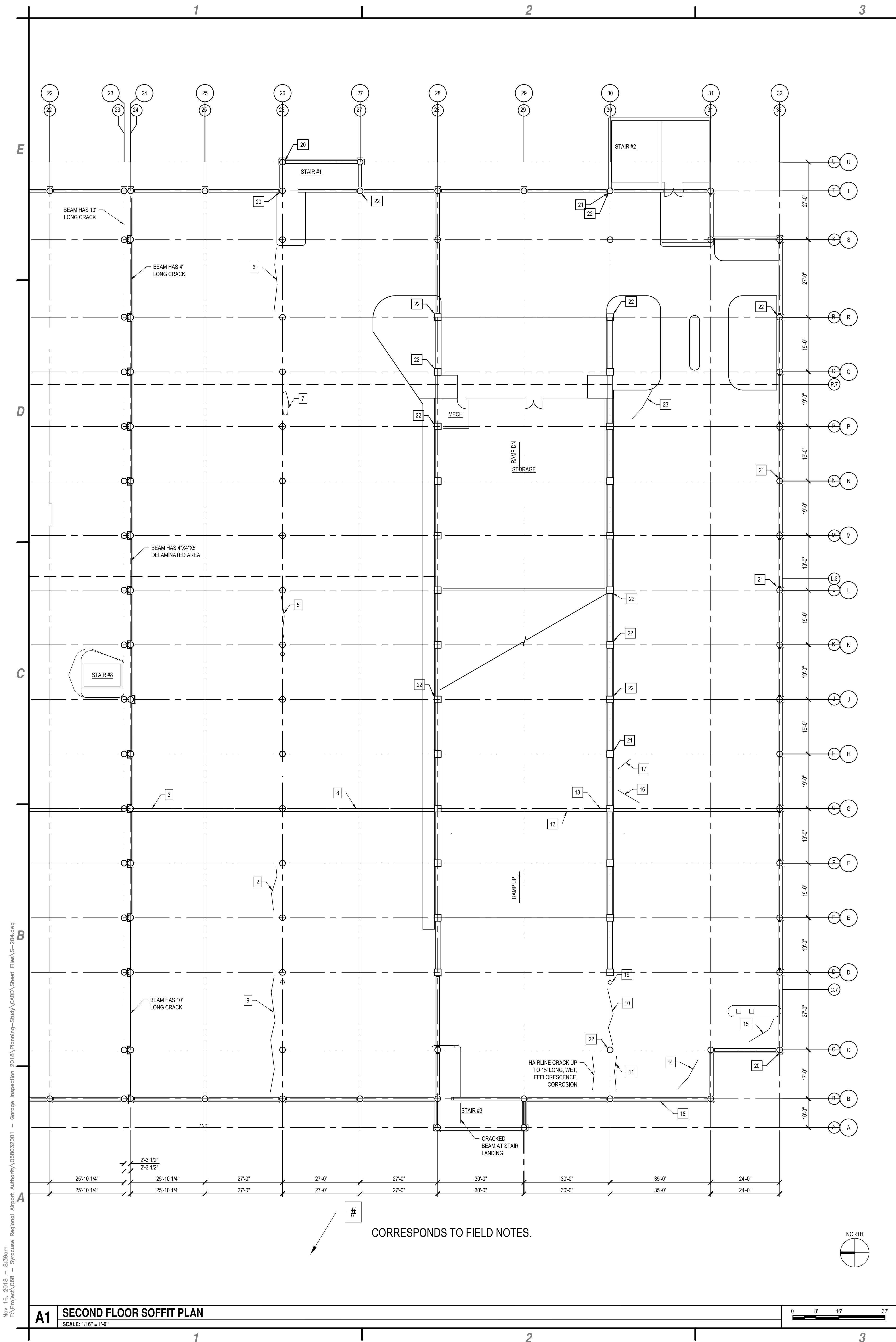
STRUCTURAL
SECOND FLOOR SOFFIT AND COLUMNS

S-202

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A1 SECOND FLOOR SOFFIT PLAN
 SCALE: 1/16" = 1'-0"

A5 FIELD NOTES
 SCALE: NOT TO SCALE

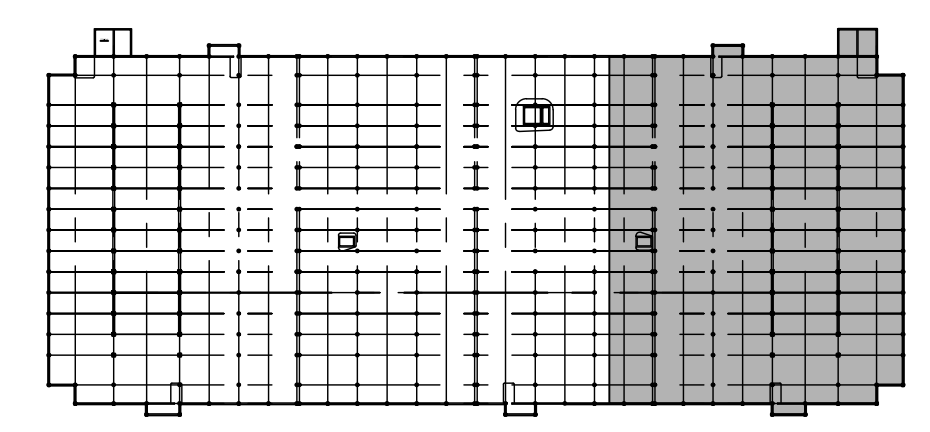


A1 SECOND FLOOR SOFFIT PLAN
SCALE: 1/16" = 1'-0"

FIELD NOTES	
NOTE	DESCRIPTION
1	Not used
2	Up to 1/32" x 10' long crack with old efflorescence. 1' x 1' area of rust spots.
3	Up to 1/16" x 4' long crack at bottom of beam next to patch.
4	Not used
5	Up to 1/32" x 15' long crack with water stain and 5 rust spots. Some minor delaminations.
6	Up to 1/32" x 27' long crack. Minor.
7	Small shrinkage cracks at a patch 18" x 8' long.
8	Up to 1/32" or 1/16" x about 25' long cracks along the bottom of beams and at patches.
9*	Hairline x about 25' long crack. Damaged paint at ceiling. Water stains and rust spots. 6' long x 6" of possible loose concrete.
10	Up to 1/32" x 25' long crack with water stains and rust spots.
11*	1/32" x 12' long cracks with spalling concrete and rust spots. Remove concrete.
12	1/32" x 4' long crack at patch at bottom of beam.
13	Up to 1/32" x 5' long diagonal crack at girder east face, 6' north of column.
14*	10' long diagonal crack with spalling, water stains and rust spots. Remove delaminations.
15	Hairline x 5' long crack at repair area with 2 rust spots.
16	Up to 1/32" x 6' long diagonal crack with 1 rust spot.
17	Up to 1/32" x 7' long diagonal crack with 1 rust spot.
18	Headroom clearance horizontal bar is missing. Broken.
19	NOT USED
20	Random hairline cracks on column.
21	Minor hairline cracks up to 1/32" on column.
22*	Spall less than 1'x2' on column.
23	Hairline crack 6' long with efflorescence and corrosion.

* = 2019/2020 RECOMMENDED REPAIR WORK
COLUMN NOTES ARE RELATED TO COLUMNS ON GROUND LEVEL.

A5 FIELD NOTES
SCALE: NOT TO SCALE



**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

MARK	DATE	DESCRIPTION
REVISIONS		
PROJECT NO: 088 032 001		
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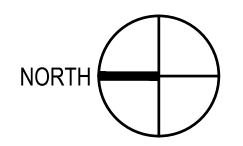
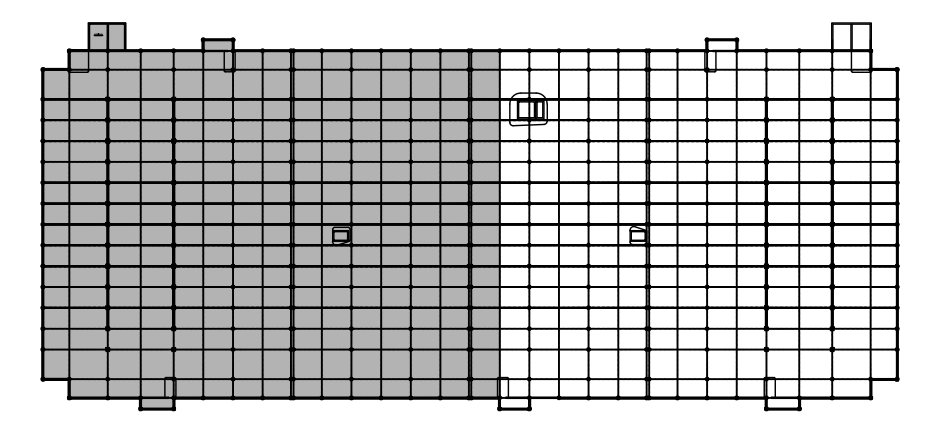
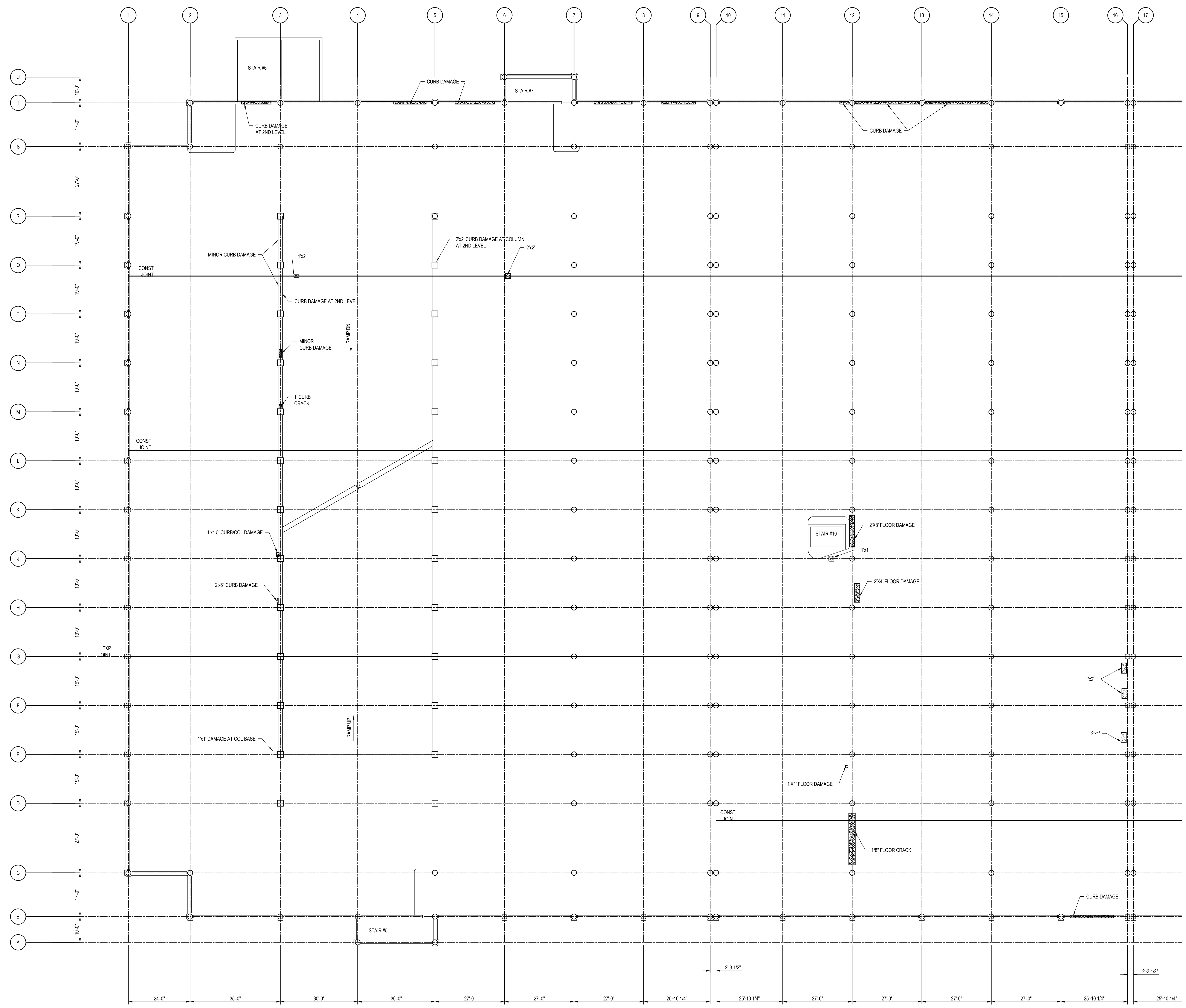
STRUCTURAL
SECOND FLOOR SOFFIT AND COLUMNS

S-204

1 2 3 4 5

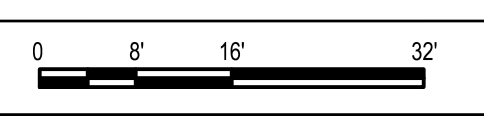
FIELD NOTES	
NOTE	DESCRIPTION
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A1 THIRD FLOOR PLAN (TOP SLAB SURFACE DAMAGE)
SCALE: 1/32" = 1'-0"



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**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

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THIRD FLOOR SLAB

S-300A

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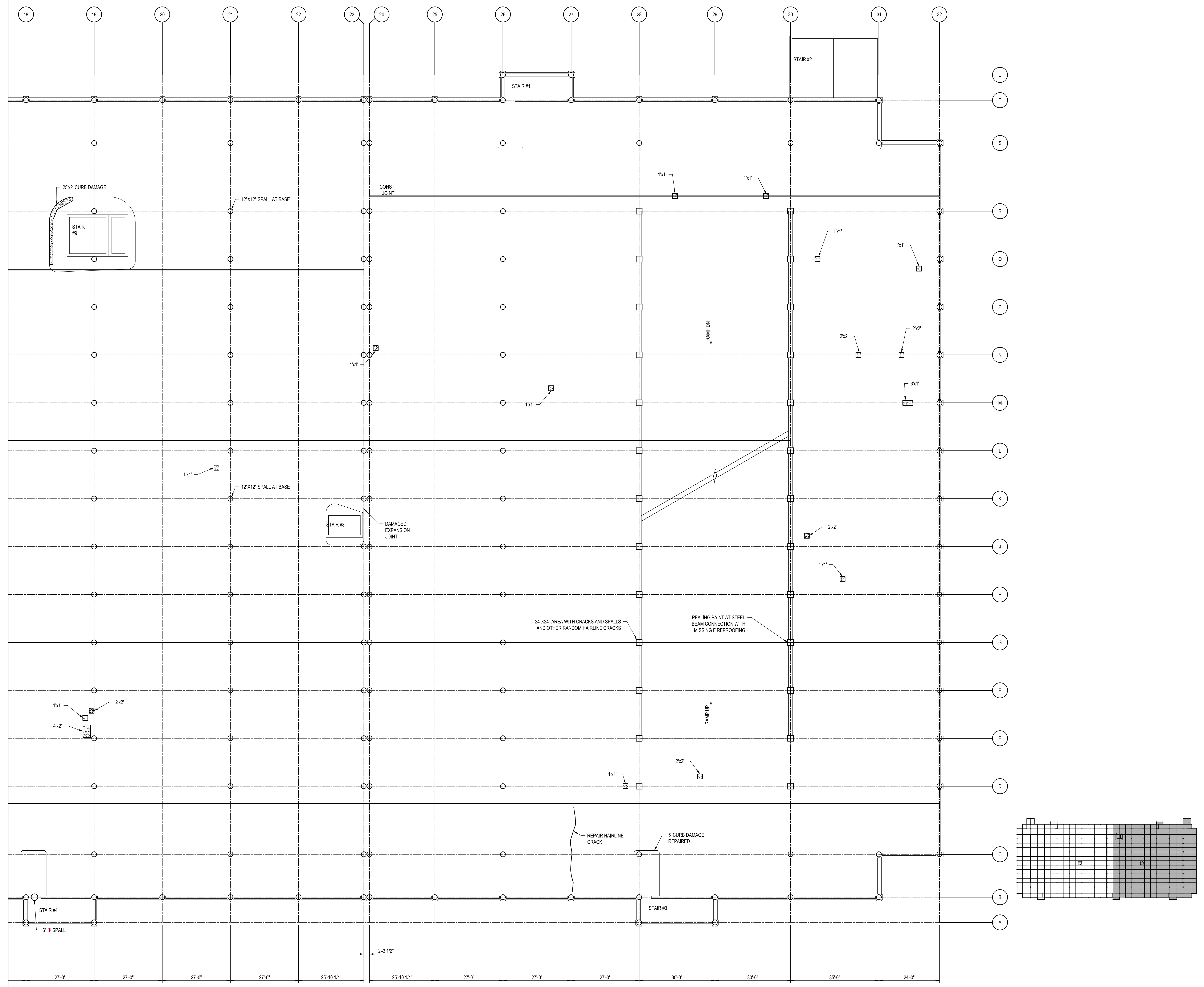
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MARK	DATE	DESCRIPTION
REVISIONS		
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THIRD FLOOR SLAB

S-300B

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A1 THIRD FLOOR PLAN (TOP SLAB SURFACE DAMAGE)
 SCALE: 1/32" = 1'-0"

1

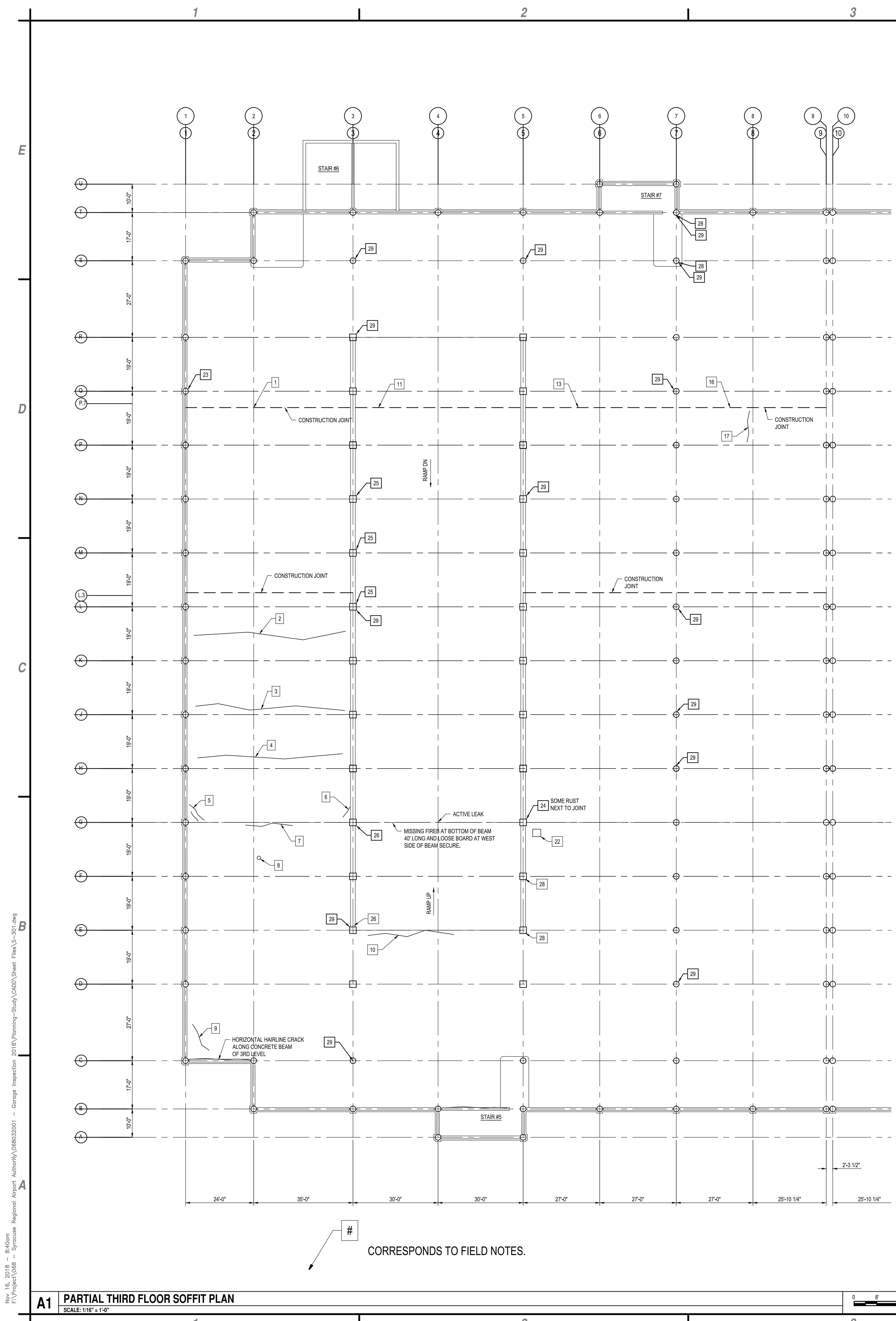
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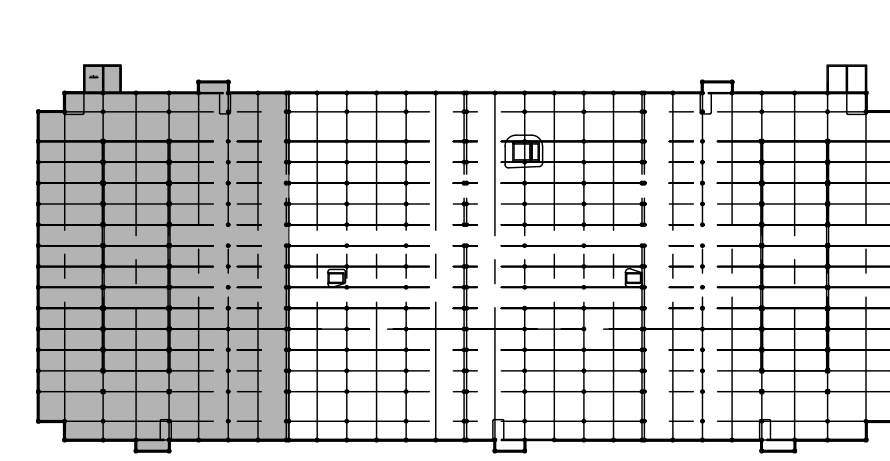
5

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FIELD NOTES	
NOTE	DESCRIPTION
1	Minor water stains. Up to 1/32" x 2' crack.
2	Hairline crack approximately 40' long.
3	Hairline crack approximately 30' long with water and efflorescence stains.
4	Hairline crack approximately 20' long with water and rust stains.
5*	Diagonal 6' and 12' long hairline cracks with water stains, efflorescence, and rust stains.
6	Up to 1/16" x 4' long diagonal crack.
7	2' x 15' area with water stains at expansion joint.
8*	1' x 2' spalled concrete. Remove.
9	4' long hairline crack and damaged paint.
10*	Heavy water stains with active water leaks. Concrete beam has several patches with cracks along bottom of beam. Remove loose concrete and seal joint on 3rd level.
11*	Construction joint has water stains, some rust spots, and spalled concrete. 1' x 5', 1' x 9', and 1' x 1' spalled areas. Up to 1/32" or 1/16" x 6' long crack. Remove delaminations, patch and seal joint on 3rd level.
12	Not used
13*	Construction joint has water stains, rust stains and 1' x 3' area with delaminations. Remove and patch.
14	Not used
15	Not used
16	Construction joint has some water stains.
17	Up to 1/32" crack x 15' long has efflorescence stains.
18	Not used
19	Not used
20	Not used
21	Not used
22*	1'x1' delaminated area
23	Spalled concrete at column base. Minor. 1" along perimeter.
24	Vertical crack along concrete patch on column. 1/8" x 4' long.
25	Cracked PT pocket along the perimeter.
26	1/32" x 7' long crack along the column corner.
27	1/32" x 2' long (2) cracks on column.
28	Random hairline cracks on column.
29*	Spall less than 1'x2' on column.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON SECOND FLOOR.



**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

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STRUCTURAL
THIRD FLOOR SOFFIT AND COLUMNS

S-301

Nov 16, 2018 - 8:40am Regional Airport Authority\088032001 - Garage Inspection 2018\Planning-Study\CAD\Sheet Files\S-301.dwg

A1 PARTIAL THIRD FLOOR SOFFIT PLAN
 SCALE: 1/16" = 1'-0"

A5 FIELD NOTES
 SCALE: NOT TO SCALE

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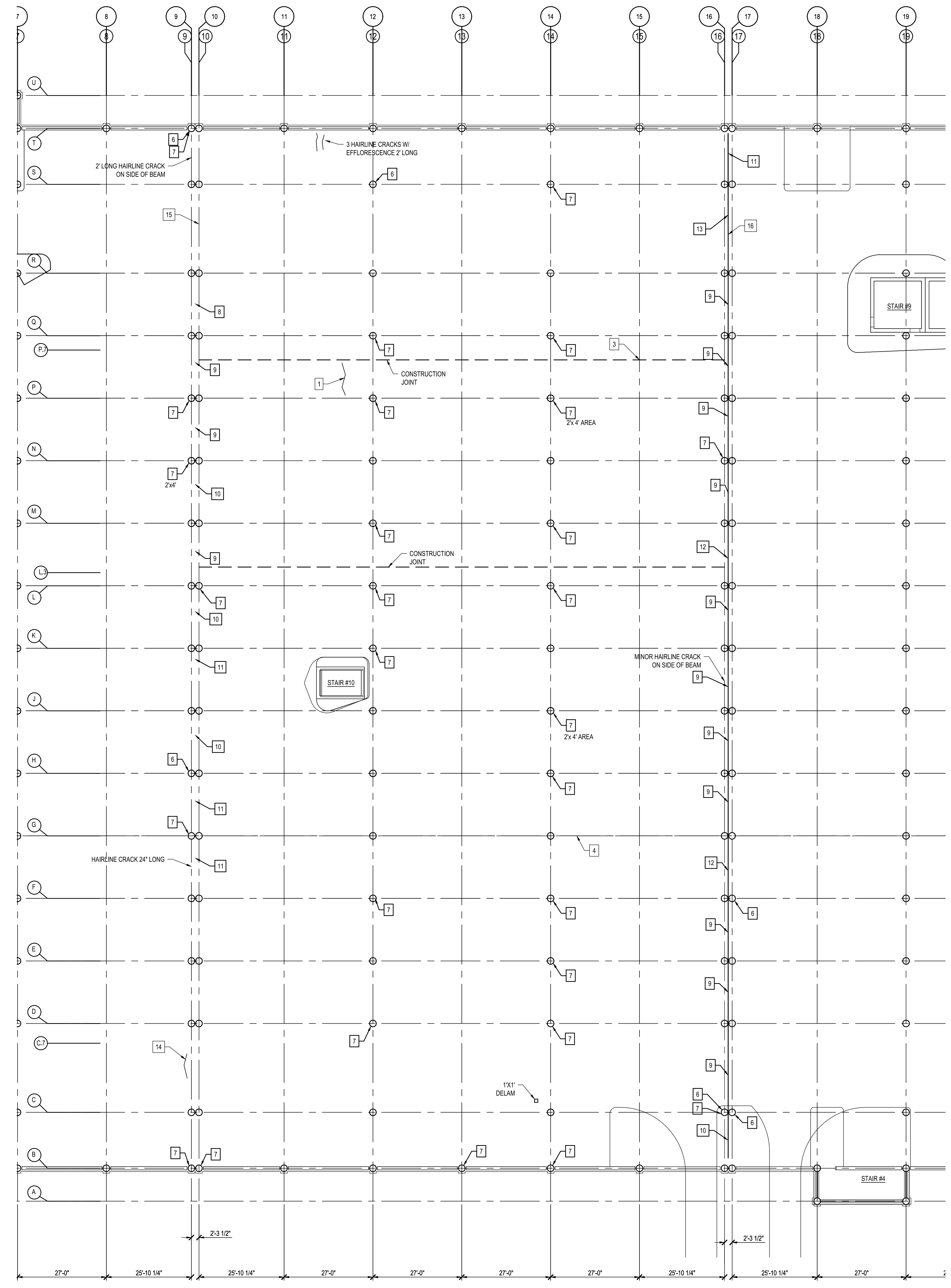
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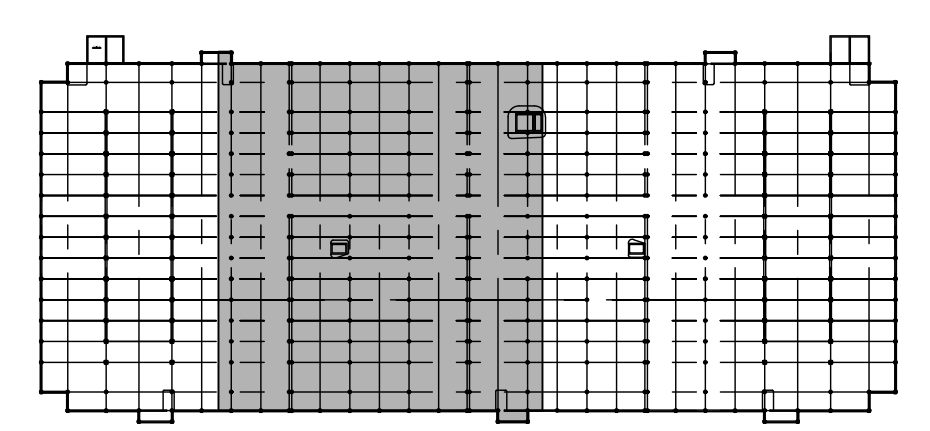
A



CORRESPONDS TO FIELD NOTES.

FIELD NOTES	
NOTE	DESCRIPTION
1*	Hairline crack with water stains and one rust spot. 6" x 2' spalled area.
2	Not Used
3	Construction joint has up to 1/32" x 3' long crack. Some water stains.
4*	1' x 4' spalled area. Remove 6" piece at face of beam *
5	Not used
6	Random hairline cracks on column.
7	Spall less than 1'x2' on column.
8*	Damaged expansion joint full length
9*	Caulking failed at expansion joint
10*	Failed caulking along expansion joint and 1'x6' delaminations along edge of joint. Up to 6' long damaged concrete.
11*	Damaged concrete along expansion joint. 6"x18" long.
12*	Missing expansion joint full length.
13*	Damaged caulking and 1'x15' damaged concrete along expansion joint. Repair.
14	Water leaking through joint at pour strip slab (expansion joint).
15*	Water stains and damaged paint below pour strip/expansion joint.
16*	Up to 1/8" x 5' long crack at beam pour strip slab seat with water stains and damaged paint.

* = 2019/2020 RECOMMENDED REPAIR WORK
COLUMN NOTES ARE RELATED TO COLUMNS BETWEEN SECOND AND THIRD FLOORS.



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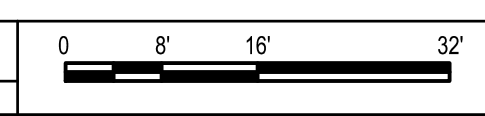
STRUCTURAL
THIRD FLOOR SOFFIT AND COLUMNS

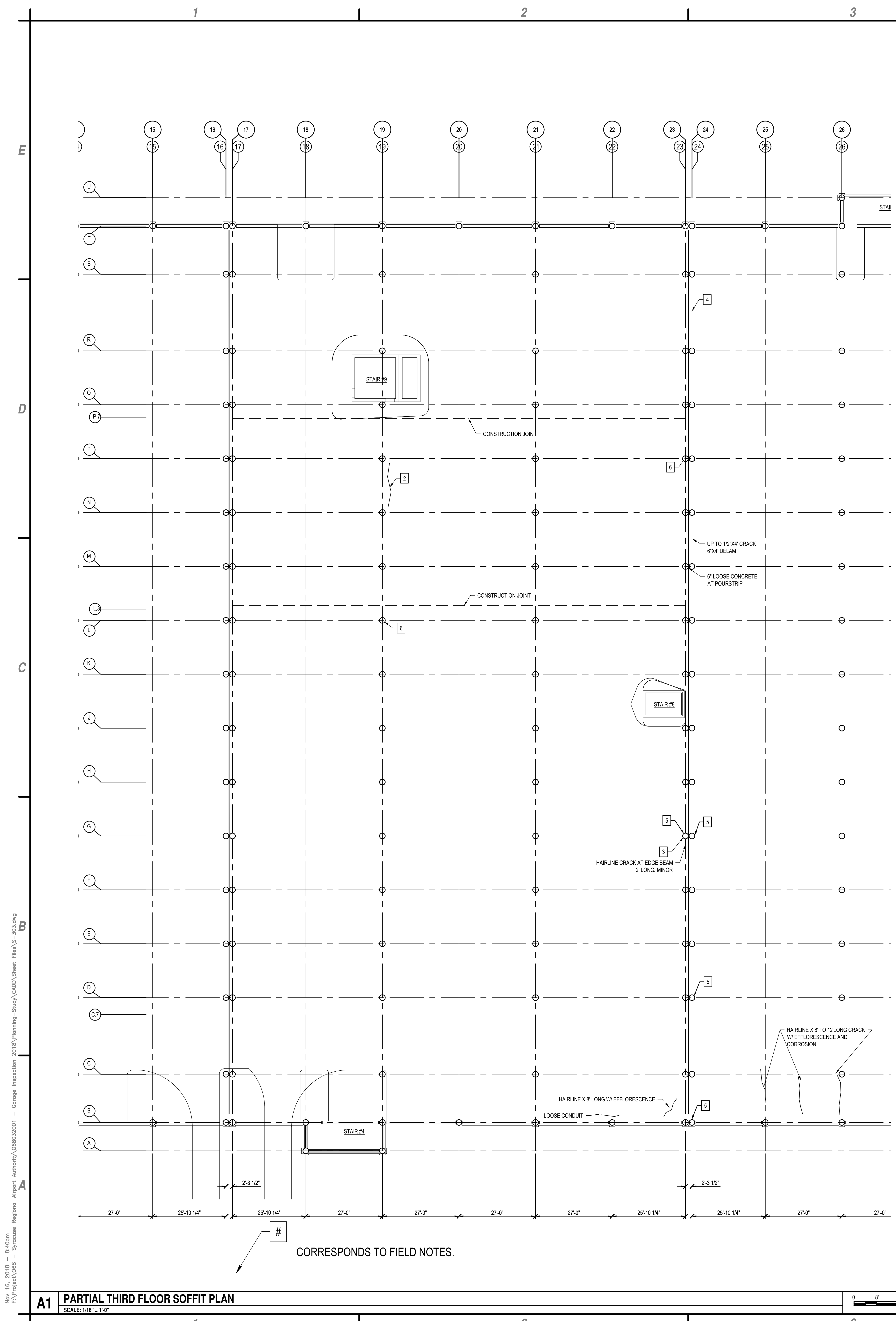
S-302

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A1 PARTIAL THIRD FLOOR SOFFIT PLAN
SCALE: 1/8" = 1'-0"

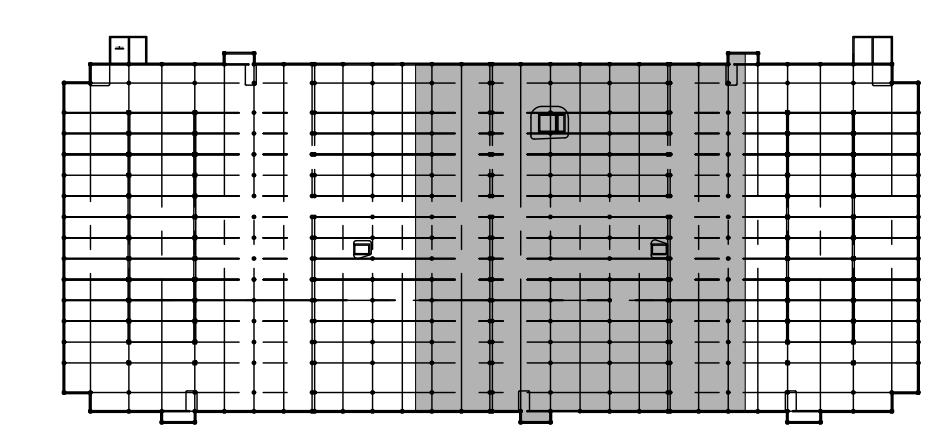
A5 FIELD NOTES
SCALE: NOT TO SCALE





FIELD NOTES	
NOTE	DESCRIPTION
1	Not used
2	Hairline x 16' long crack with waterstains and efflorescence.
3*	Up to 1/8" cracked corbel.
4*	Up to 1/8" x 10' long crack at bottom of beam below pour strip slab.
5	Random hairline cracks on column.
6*	Spall less than 1'x2' on column.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON SECOND FLOOR.



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**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

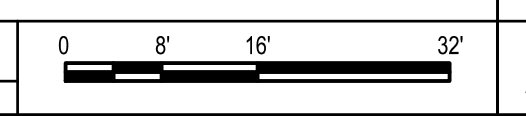
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STRUCTURAL
THIRD FLOOR SOFFIT AND COLUMNS

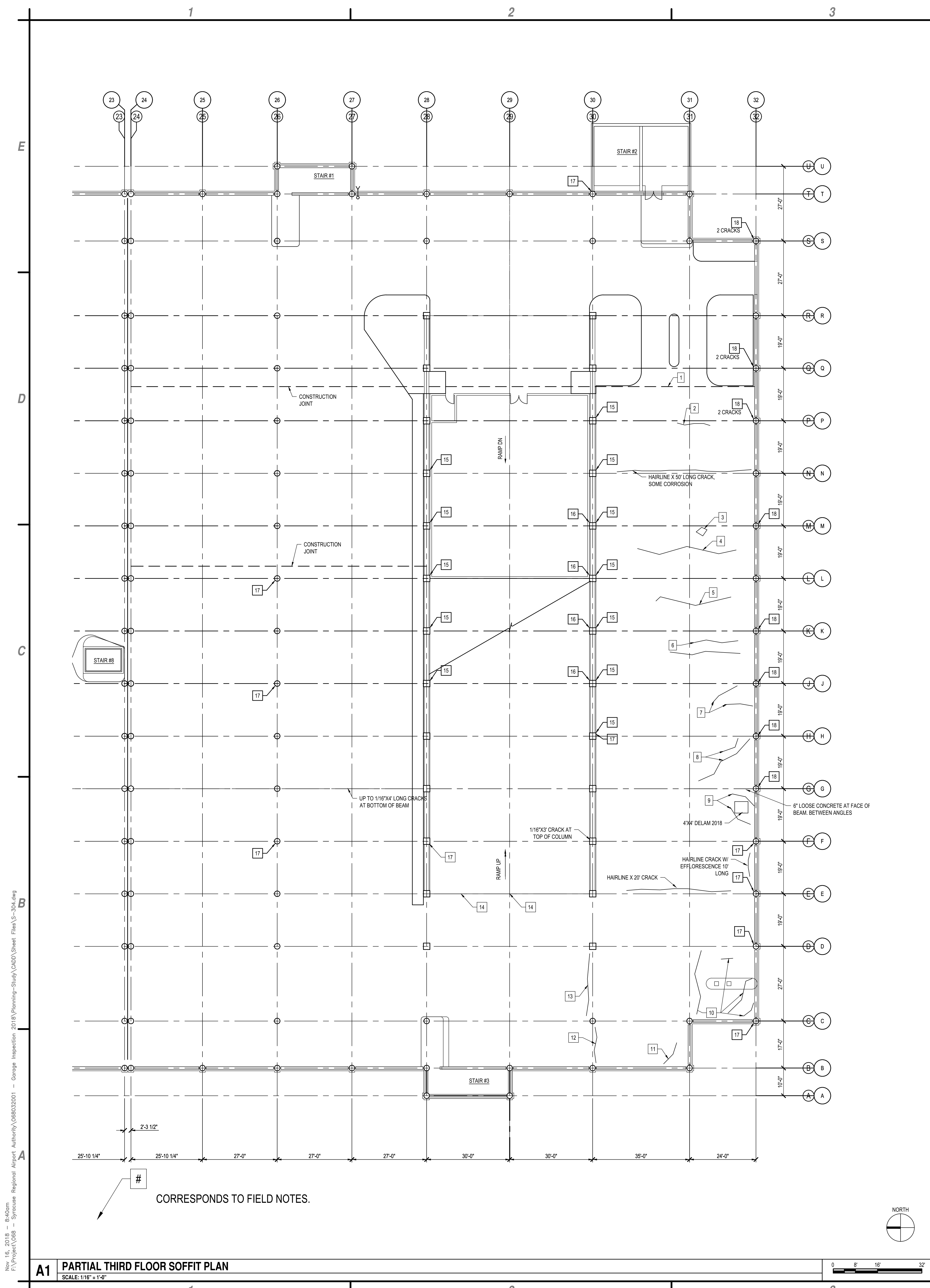
S-303

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A1 PARTIAL THIRD FLOOR SOFFIT PLAN
 SCALE: 1/16" = 1'-0"

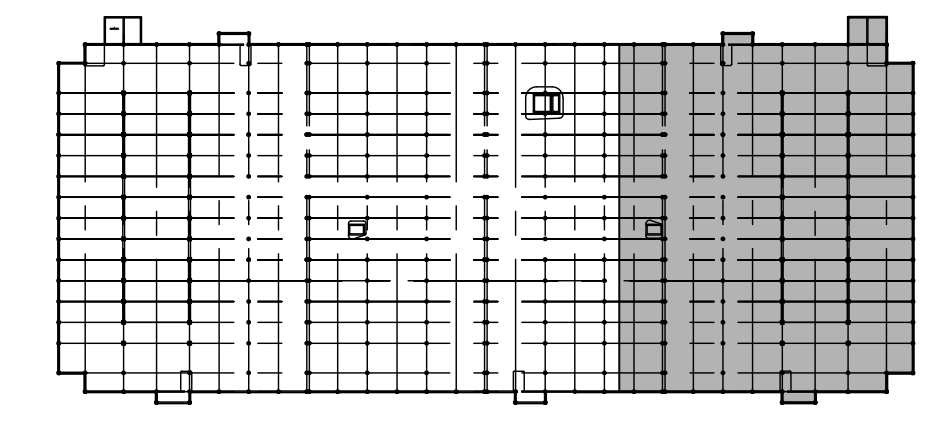


A5 FIELD NOTES
 SCALE: NOT TO SCALE



FIELD NOTES	
NOTE	DESCRIPTION
1*	Construction joint has water stains and rust spots. 6" x 6" area with delaminated concrete. Remove delaminations.
2*	Corrosion spots at top of beam with hairline x 10' long crack. Repair slab on 3rd floor.
3	Water stains and rust stains at slab and beam. Maybe steel is too close to surface. Check slab above on 3rd level.
4	Hairline x 20' long crack with efflorescence.
5	Hairline x 30' long crack with efflorescence and rust spots.
6*	Hairline cracks 30' and 15' long. One crack has waterstains and rust spots. 1' x 2' area with delaminated concrete next to light. Remove delaminations.
7	Straight line and diagonal hairline cracks. Cracks are each 8' long with rust stains and water stains.
8	2 diagonal hairline cracks, one 15' long and one 6' long with water stains and rust stains.
9	Two hairline x 6' long cracks with water stains and rust stains.
10	4 hairline cracks with water stains, rust stains and damaged ceiling paint. 5' to 15' long each.
11	Two hairline cracks, 3' to 6' long with water stains and rust stains.
12	Hairline x 15' long crack with water stains and efflorescence.
13	Hairline x 20' long crack with damaged ceiling paint.
14*	Up to 1/4" x 4' long crack and possible loose concrete patch at bottom of beam. Remove and patch.
15	Hairline crack around PT grout pocket.
16	Diagonal cracks up to 1/32" at column/beam intersection @ 3rd level.
17	Random hairline cracks on column.
18	Up to 1/32" x full height of column (typical). Consider coating.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON SECOND FLOOR.



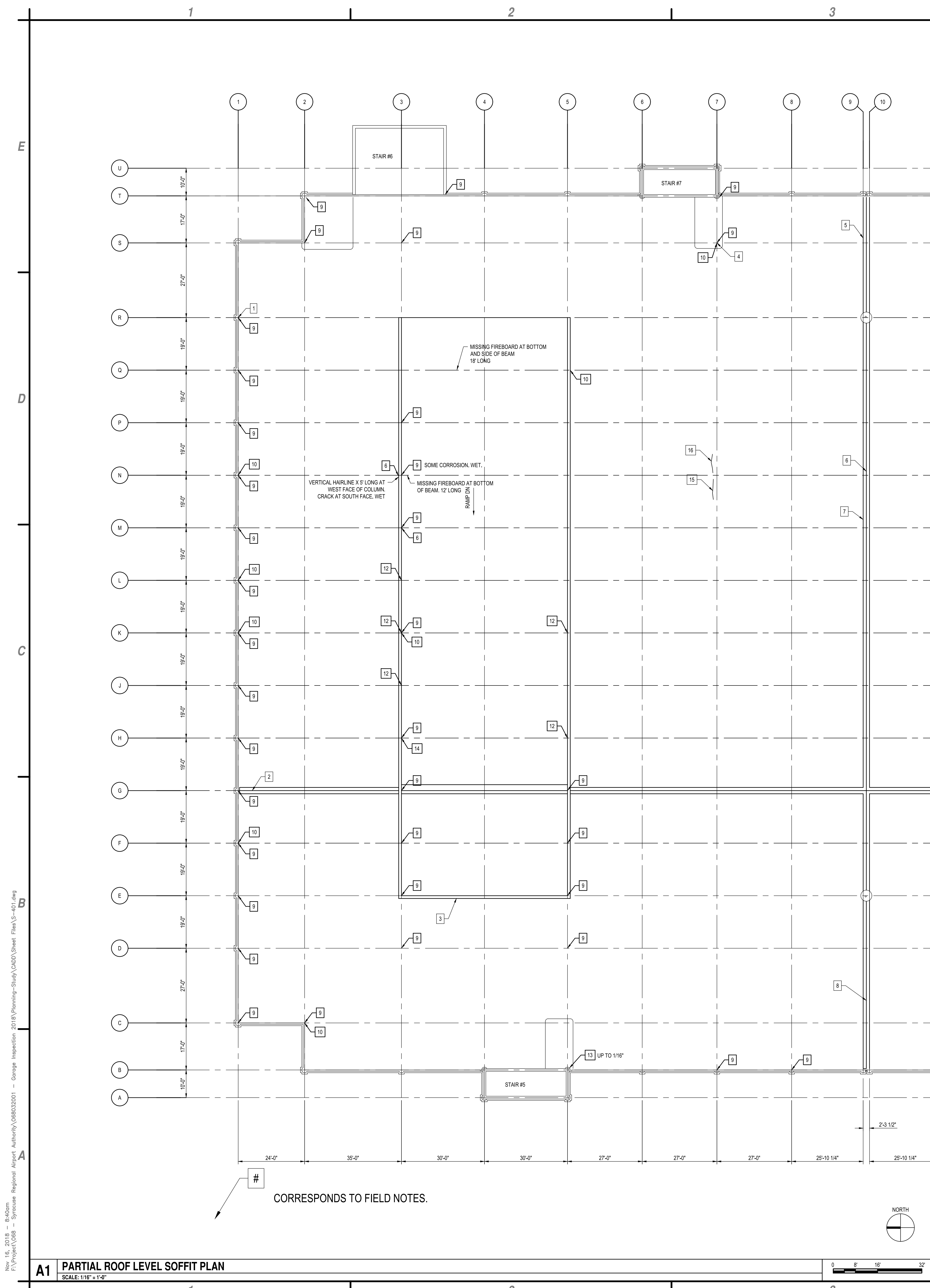
**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

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STRUCTURAL
THIRD FLOOR SOFFIT AND COLUMNS

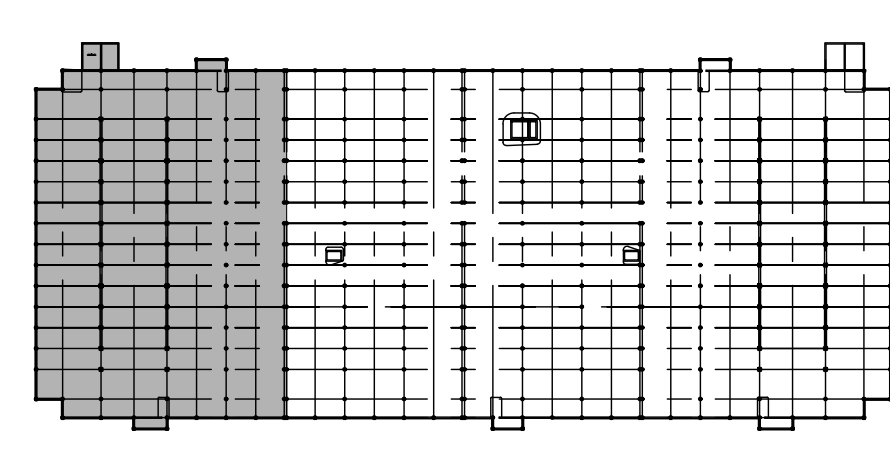
S-304

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FIELD NOTES	
NOTE	DESCRIPTION
1*	Loose fire board at column.
2	Missing 40' long section of fire board at beam/expansion joint.
3	Missing 30' long section of fire board.
4	Water leak with corroded conduit.
5	Missing fire board at 2' long section of steel beams.
6	6" x 6" area of loose fire board.
7*	Missing fire board entire length of beam. Loose at bottom. Remove and reinstall.
8*	Leaking expansion joint. Repair.
9	Hairline cracks mainly at column ties.
10	Minor delaminations on column, less than 6" dia.
11	Not used
12	Cracked PT pocket along the perimeter.
13	Up to 1/16" x 3' long cracks on column with corrosion.
14	1/32" x 2' long (2) cracks on column.
15	2' and 3' long cracks in pre-cast concrete with efflorescence.
16	6' long crack in pre-cast concrete with efflorescence.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON THIRD FLOOR.



**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

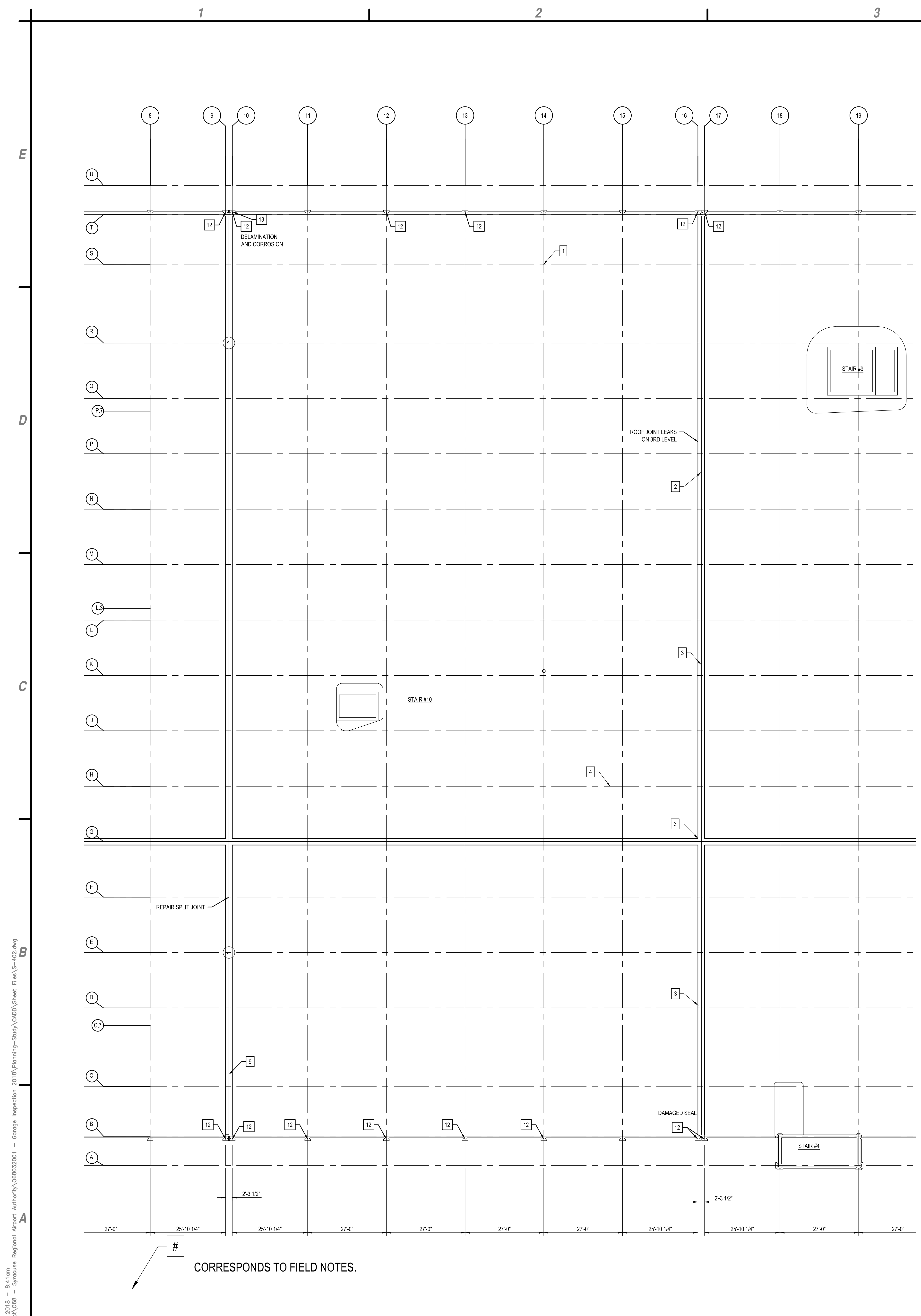
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STRUCTURAL

ROOF SOFFIT AND COLUMNS

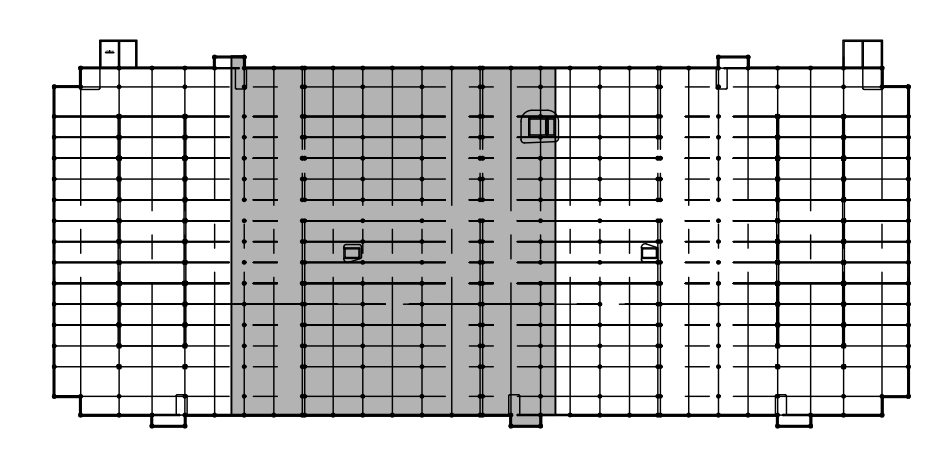
S-401

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FIELD NOTES	
NOTE	DESCRIPTION
1	1' x 1' area of damaged fire board at top of column/beam base plate.
2	Loose fire board along beam anchor to beam.
3	6" x 12" area of loose fire board.
4	Missing 8' long fire board at bottom of beam.
5*	Not used
6*	Not used
7*	Not used
8*	Not used
9*	Reseal edge of expansion joint. Water leaks from roof level joint on 3rd level.
10*	Not used
11*	Not used
12	Random hairline cracks at column.
13*	Spall less than 1'x2' at column.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON THIRD FLOOR.



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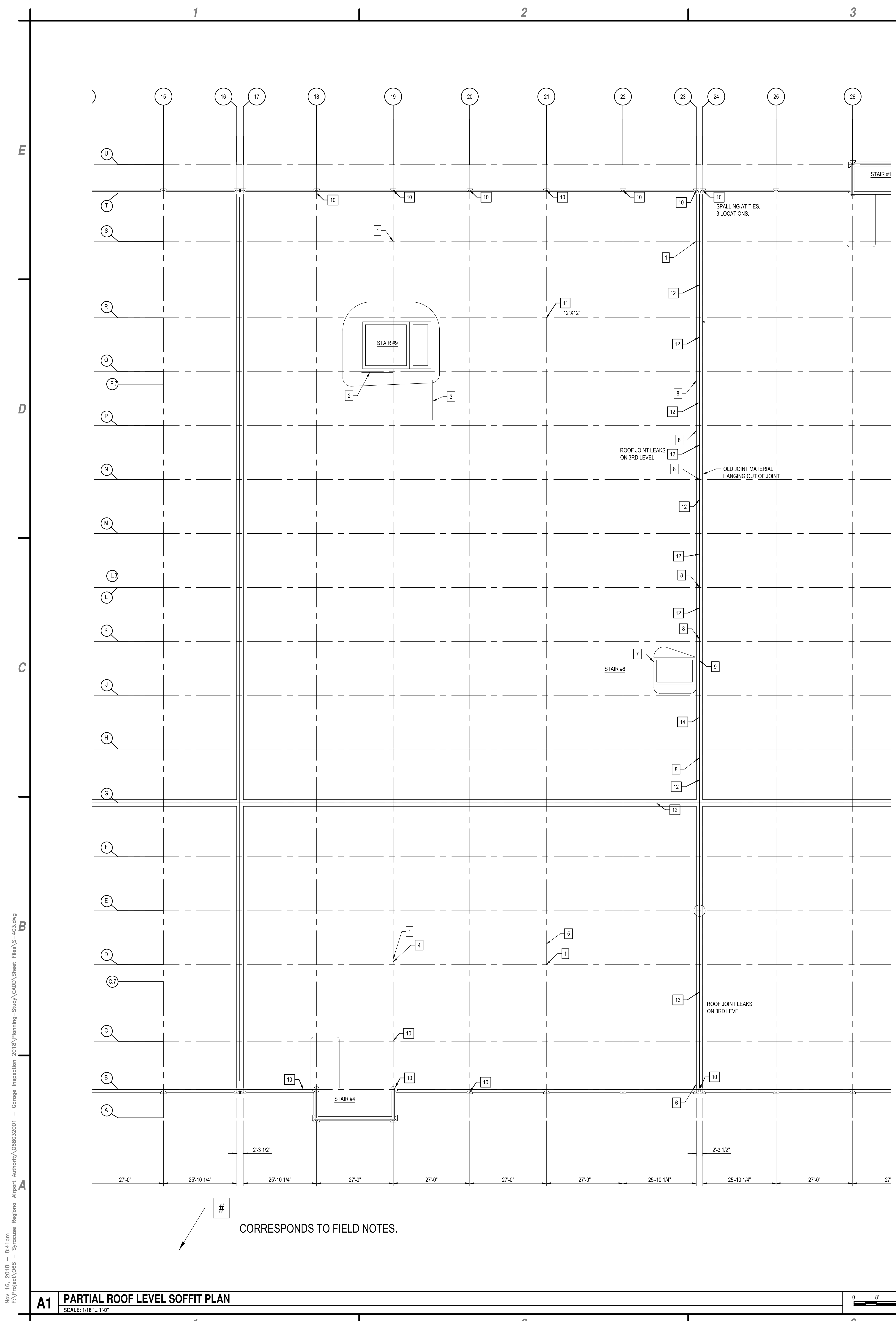
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STRUCTURAL

ROOF SOFFIT AND COLUMNS

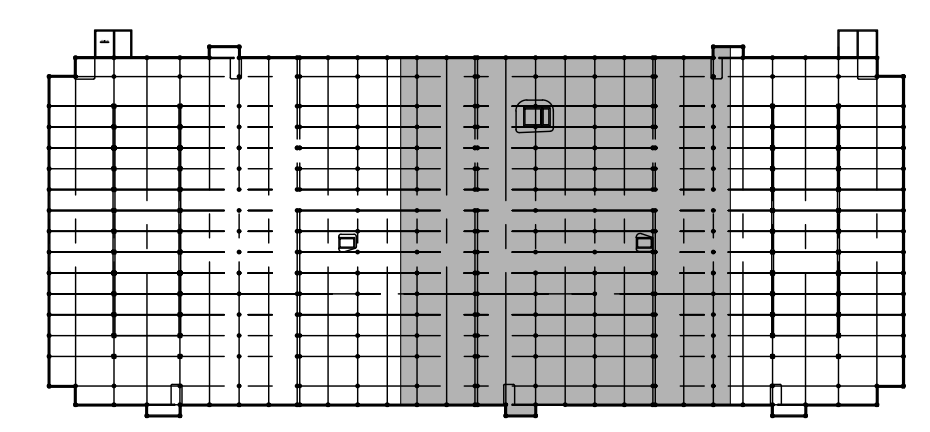
S-402

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FIELD NOTES	
NOTE	DESCRIPTION
1	Missing 6" x 15" long fire board at base plate.
2	Missing 8' long fire board at bottom flange.
3	Missing 8" x 2' long fire board at bottom flange of small beam.
4	4' long hairline crack with efflorescence.
5	Missing fire board around base plate and water leak between precast slabs.
6	8" x 24" area of water damaged fire board at bottom of beam in east/west direction.
7	8" x 30" area of water damaged fire board at bottom of beam in east/west direction.
8	6" x 12" area of loose fire board.
9*	Replace entire joint next to stair. 100% damaged.
10	Random hairline cracks on column.
11*	Spall less than 1'x2' on column.
12*	Caulking failed at expansion joint.
13*	Failed caulking along expansion joint and 1'x6' delaminations along edge of joint. Up to 6' long damaged concrete.
14*	Damaged concrete along expansion joint. 6"x18" long.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON THE THIRD FLOOR.



**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

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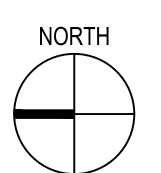
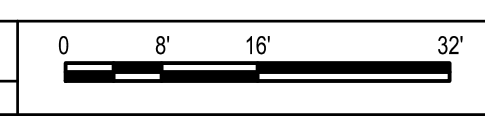
STRUCTURAL
ROOF SOFFIT AND COLUMNS

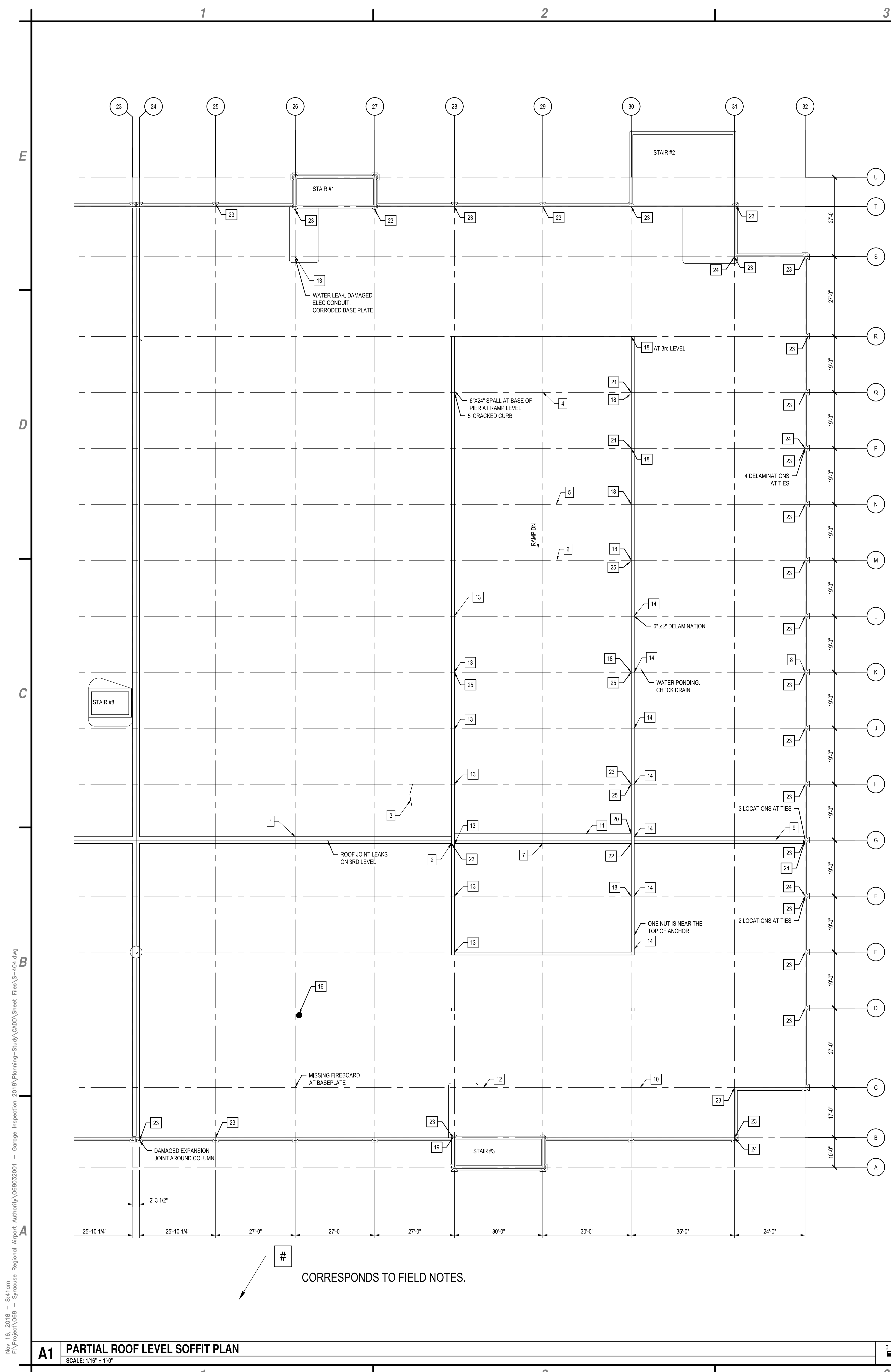
S-403

Nov 16, 2018 - 8:41am Regional Airport Authority\088032001 - Garage Inspection 2018\Planning-Study\CAD\Sheet Files\S-403.dwg

A1 PARTIAL ROOF LEVEL SOFFIT PLAN
 SCALE: 1/8" = 1'-0"

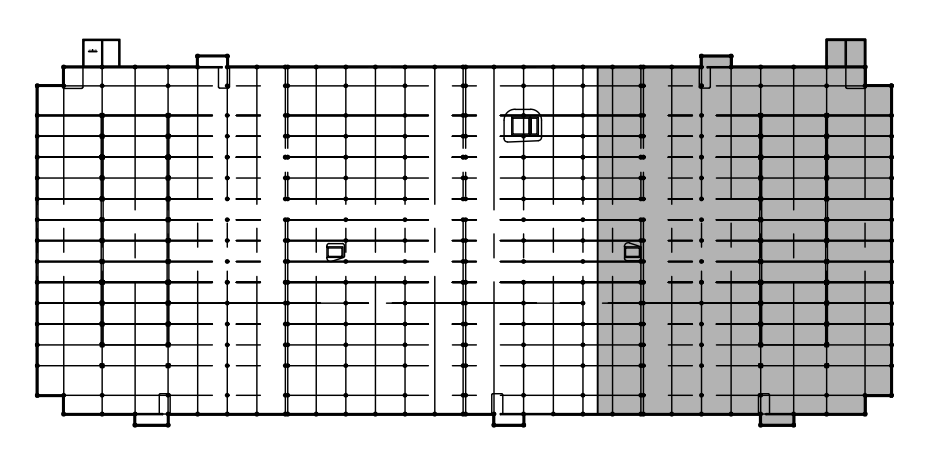
A5 FIELD NOTES
 SCALE: NOT TO SCALE





FIELD NOTES	
NOTE	DESCRIPTION
1	2 locations with 1' x 4' areas of water damaged fire board at bottom flange.
2	1' x 1' area of water damaged fire board at column.
3	2' long section of missing fire board at bottom flange.
4	10' long section of missing fire board at side and bottom flange of beam.
5	10' long section of missing fire board at side and 18' long section missing at bottom flange. 6" hole in fire board.
6*	Loose fire board at side of beam. Secure ASAP. 10' long section of missing fire board at bottom flange. (Done).
7*	Missing several fire board sections at the bottom flanges. Loose sections. Secure loose sections ASAP.
8	4' long section of missing fire board at bottom flange. 6" hole in fire board at side of beam.
9	5' long section of missing fire board at bottom flange.
10	3' x 3' area of heavy water damage to the fire board.
11	15" x 3' long section of water damage to fire board at east/west small beam.
12	Water leaking between precast slabs with some corrosion.
13	Missing 6" x 15" long fire board at base plate.
14	6" x 12" area of loose fire board.
15	Corroded base plate below steel girder of roof level.
16	Leaking drainpipe below roof.
17*	NOT USED
18	Minor 1/32" x 2'-3' long vertical crack on column.
19*	Up to 1/8" x 6' long crack with corrosion stains on column.
20*	3'x3' delaminated concrete deck next to expansion joint with corrosion.
21*	Cracked corbel/ loose concrete. Repair.
22*	Corroded connection of girder. Repair/repaint.
23	Random hairline cracks on column.
24*	Spall less than 1'x2' on column.
25	Cracked PT pocket along the perimeter.

* = 2019/2020 RECOMMENDED REPAIR WORK
 COLUMN NOTES ARE RELATED TO COLUMNS ON THE THIRD FLOOR.



**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

MARK	DATE	DESCRIPTION
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PROJECT NO: 088.032.001		
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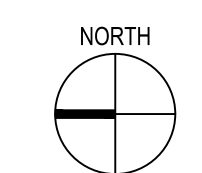
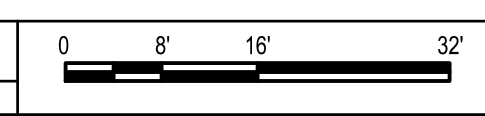
STRUCTURAL
ROOF SOFFIT AND COLUMNS

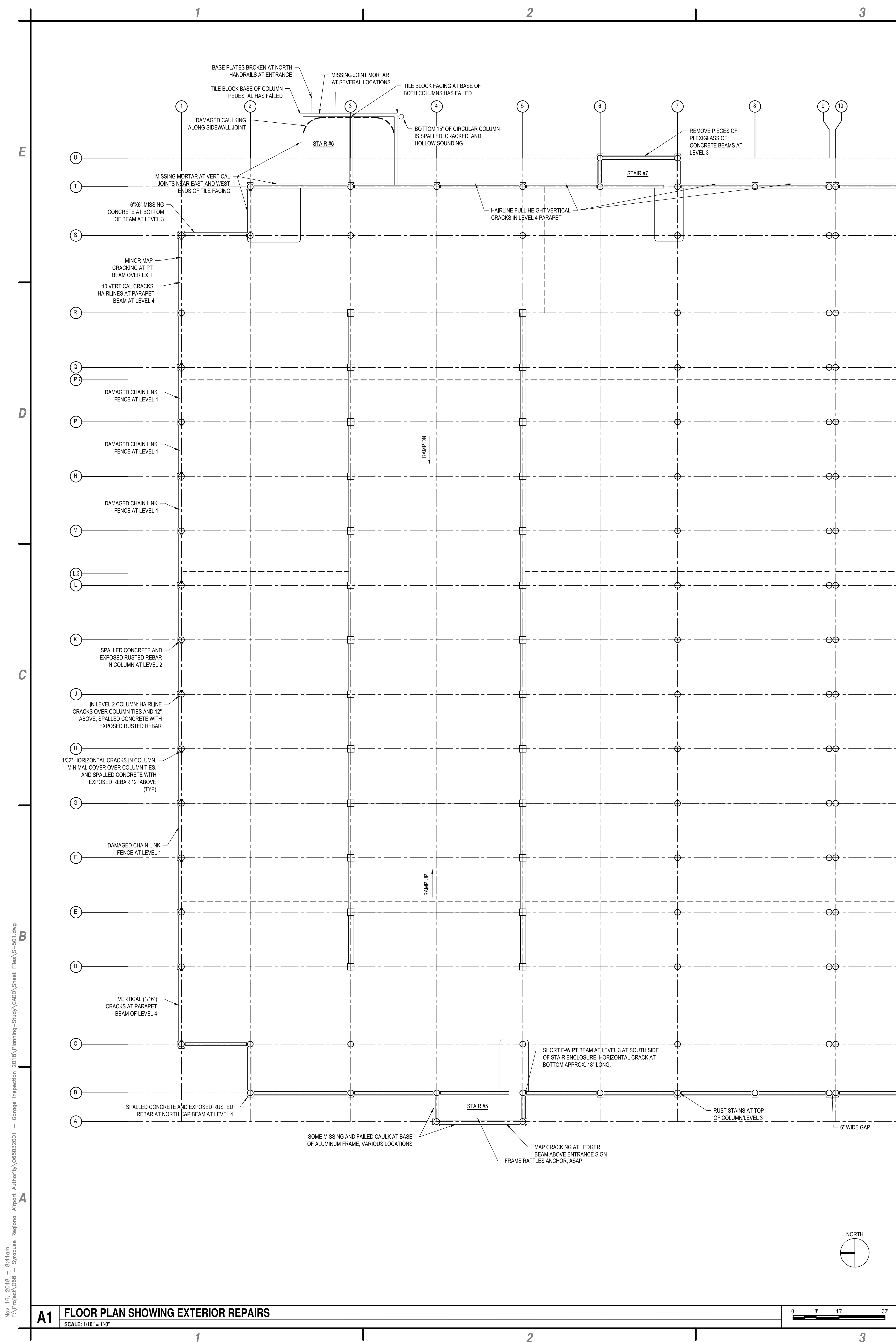
S-404

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A1 PARTIAL ROOF LEVEL SOFFIT PLAN
 SCALE: 1/16" = 1'-0"

A5 FIELD NOTES
 SCALE: NOT TO SCALE



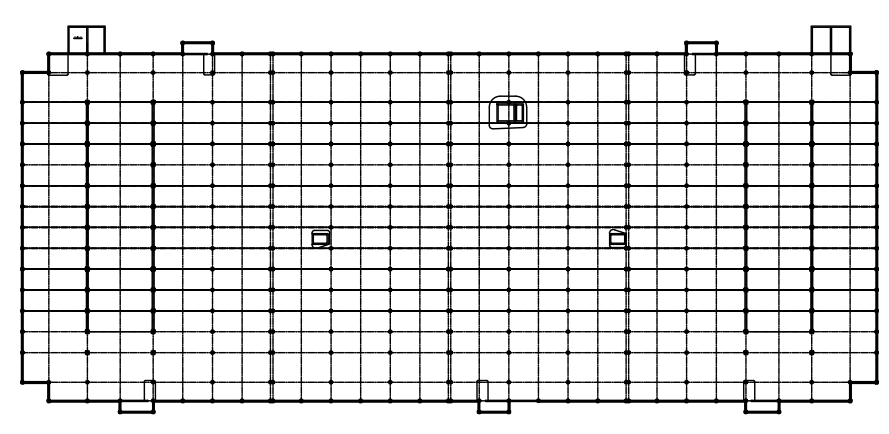


STAIR TOWER #5	
NOTE	DESCRIPTION
1	Heavy water infiltration and staining at first floor.
2	Corroded rail posts at first floor.
3	Heavy corrosion of the first floor stringers and anchors.
4	Heavy corrosion of the posts supporting the 1-2 intermediate landing.
5*	Damaged top flange of the west channel supporting 1-2 intermediate landing. Repair 2017
6	Up to 1/8" by 2' long cracks at the concrete beam at the second floor. Repair 2018
7	Several cracks up to 5' long along the concrete beam at the third floor. Repair 2018
8	Heavy paint damage, with heavy corrosion and section loss below the landing at the fourth level landing. Repair 2018
9*	Up to 1/2" gap between the nosing and concrete at fourth floor landing. Repair 2017

STAIR TOWER #6	
NOTE	DESCRIPTION
1	Damaged paint and plaster at east CMU wall above 3-4 intermediate landing.
2	Not Used

STAIR TOWER #7 (REPAIRS TO BE COMPLETED IN 2018)	
NOTE	DESCRIPTION
1	Heavy corrosion at the base of the handrail post at first floor. Posts and railing require removal or replacement. 2018 ongoing repair.
2	Corrosion of the post supporting the 1-2 intermediate (landing between level 1 and level 2) stair landing. Repair 2018
3	Heavy corrosion of the stair riser and stringers at the first floor. Repair 2018.
4	Heavy corrosion of metal deck at 1-2 intermediate landing. Repair 2018.
5	Cracked concrete beam with corrosion stains and efflorescence at landing of second floor. Repair beam 2018.
6	Cracked treads (9) between 1-2 intermediate landing to 2nd floor. Repair 2018
7	General corrosion and damaged paint up to second floor. Repair & repaint 2018
8	Stair nosing damage at two treads second floor. Repair 2018.
9	Cracked concrete deck at 3rd floor.
10	Damaged caulking

* = 2019/2020 RECOMMENDED REPAIR WORK



**SYRACUSE HANCOCK INTERNATIONAL AIRPORT
 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

MARK	DATE	DESCRIPTION

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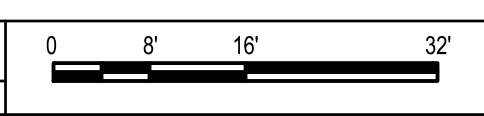
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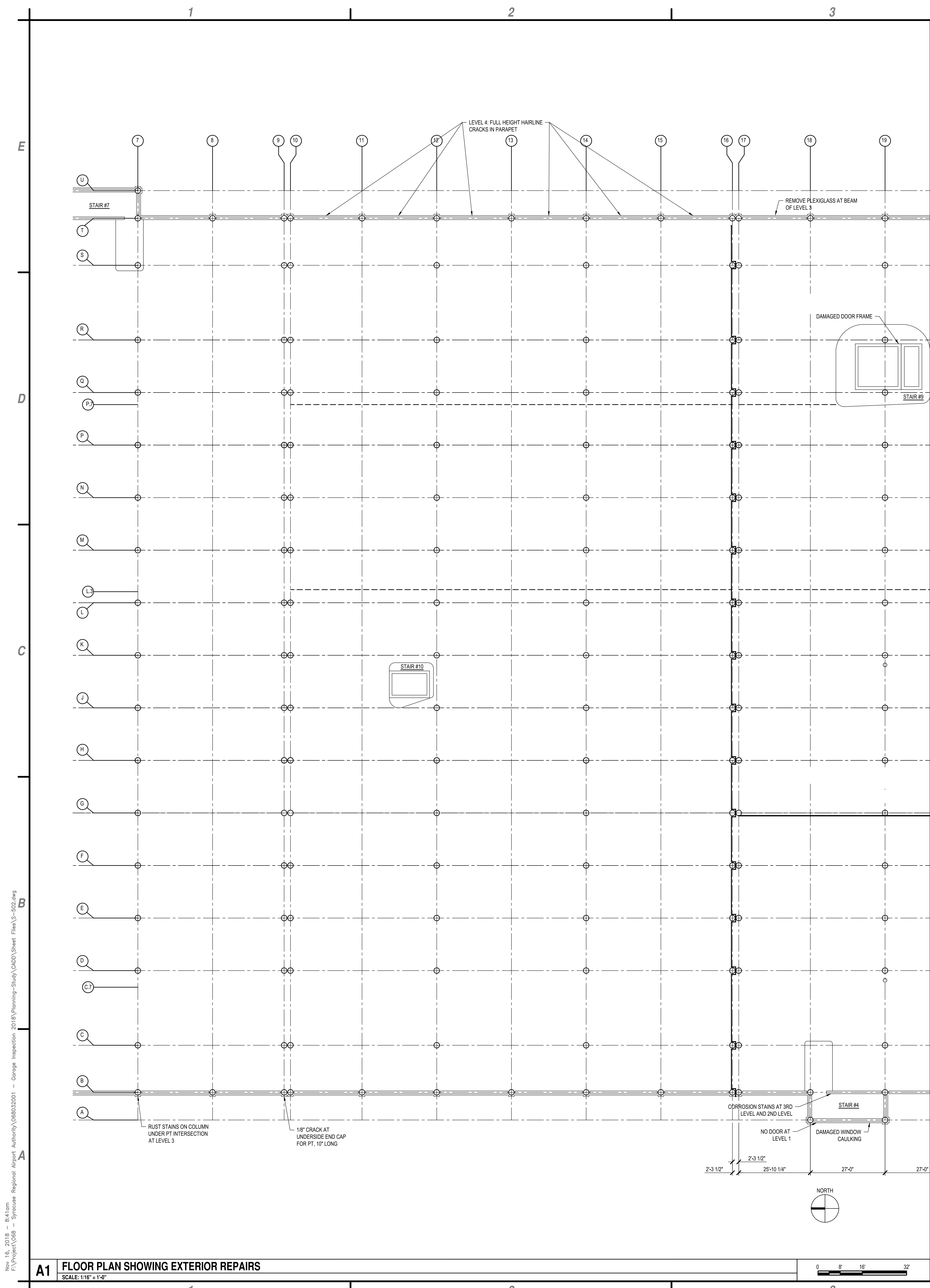
S-501

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A1 FLOOR PLAN SHOWING EXTERIOR REPAIRS
 SCALE: 1/16" = 1'-0"



A5 STAIR NOTES
 SCALE: NOT TO SCALE

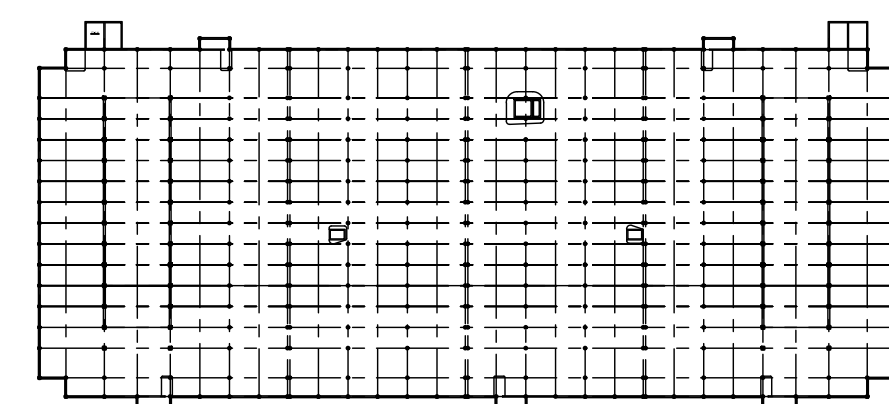


STAIR TOWER #4	
NOTE	DESCRIPTION
1	Damaged caulking around the aluminum frame enclosure.
2	Heavy corrosion at the railing posts at first floor.
3	Heavy corrosion of the stair stringers at the first floor.
4	Corrosion of the post baseplate supporting the 1-2 intermediate stair landing.
5	Heavy water stains.
6	Level 4- heavy damage to the steel pan of landing.
7	Level 4- 2' long crack in concrete landing. Repair 2017

STAIR TOWER #9 (NEXT TO CENTER ELEVATOR)	
NOTE	DESCRIPTION
1	Damaged door frame.
2	Up to 1/8" x 3' long crack along the top tread at level 4 landing.

STAIR TOWER #10	
NOTE	DESCRIPTION
1	Not Used
2	Corroded 4 post supports for 1-2 intermediate landing.
3	Water damaged fireproofing board at 3-4 intermediate landing at level 4.
4	General paint damage along stairs and railings.
5	Damaged door frame

* = 2019/2020 RECOMMENDED REPAIR WORK



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 C&S Engineers, Inc.
 499 Col. Eileen Collins Blvd.
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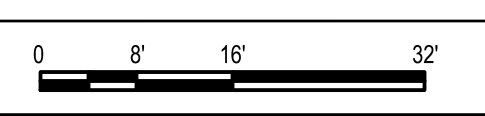
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PROJECT NO: 088 032 001		
DATE: NOVEMBER 1, 2018		
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**STRUCTURAL
 EXTERIOR
 AND STAIRS**

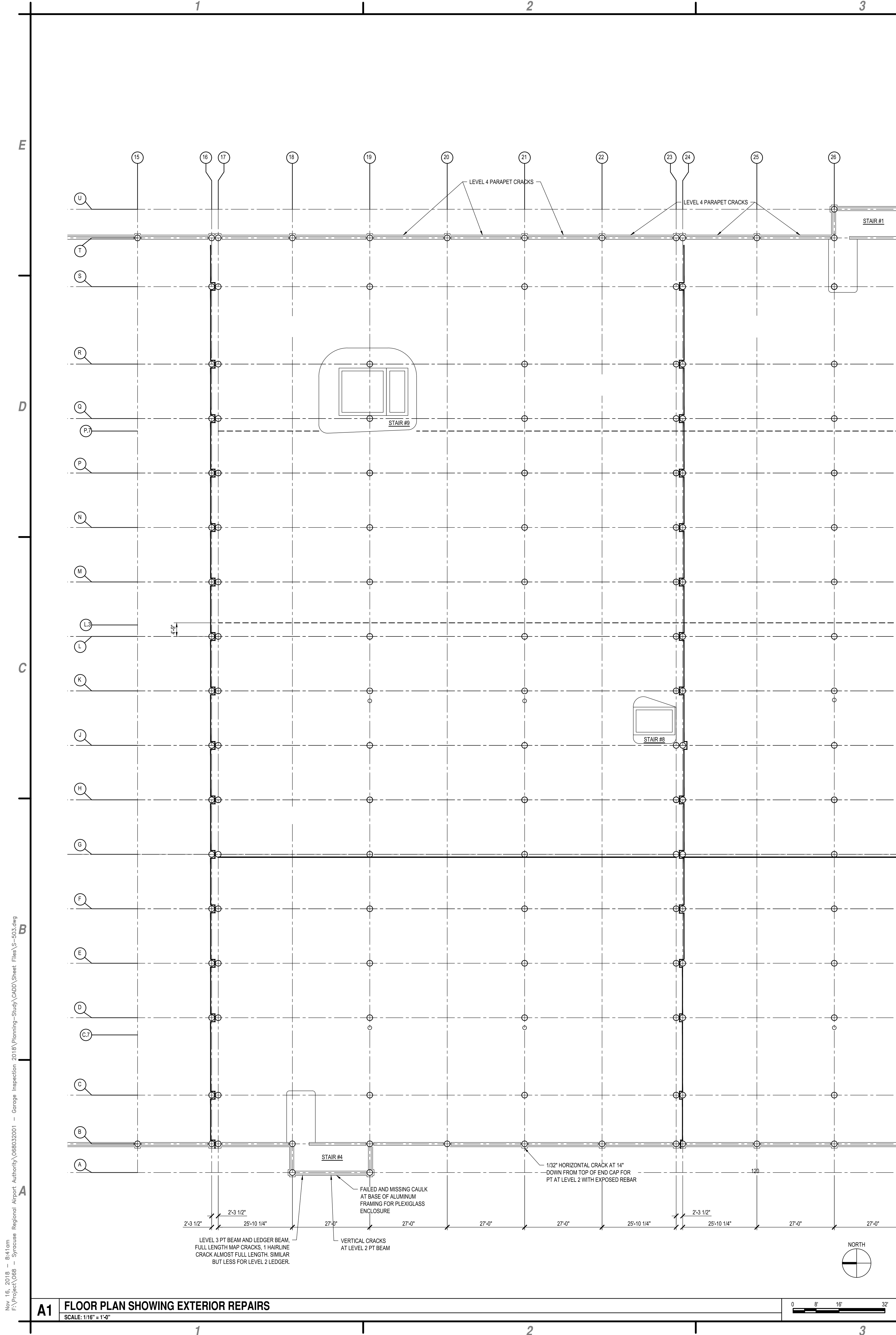
S-502

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A1 FLOOR PLAN SHOWING EXTERIOR REPAIRS
 SCALE: 1/8" = 1'-0"

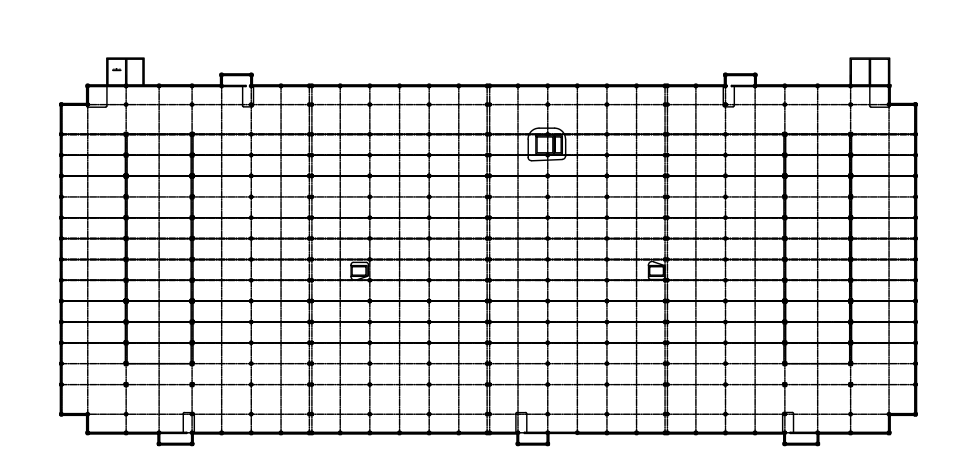


A5 STAIR NOTES
 SCALE: NOT TO SCALE



STAIR TOWER #8	
NOTE	DESCRIPTION
1	Not Used
2	Hole in south masonry wall at roof level.
3	Water damaged fireproofing board.
4	General paint damage.
5	Not Used
6	damaged door frame.

* = 2019/2020 RECOMMENDED REPAIR WORK



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 PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

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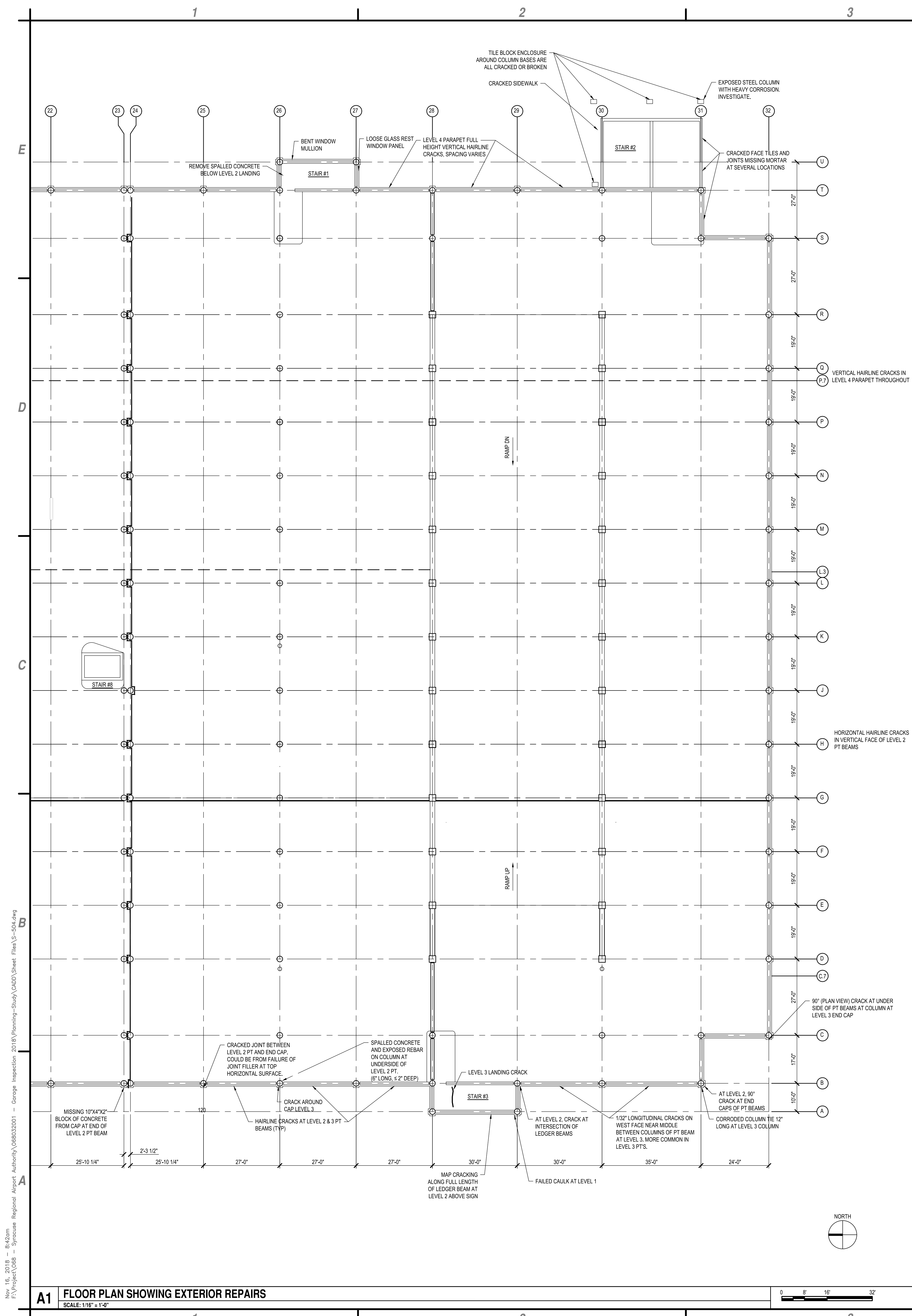
STRUCTURAL
EXTERIOR AND STAIRS

S-503

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A1 FLOOR PLAN SHOWING EXTERIOR REPAIRS
 SCALE: 1/16" = 1'-0"

A5 STAIR NOTES
 SCALE: NOT TO SCALE

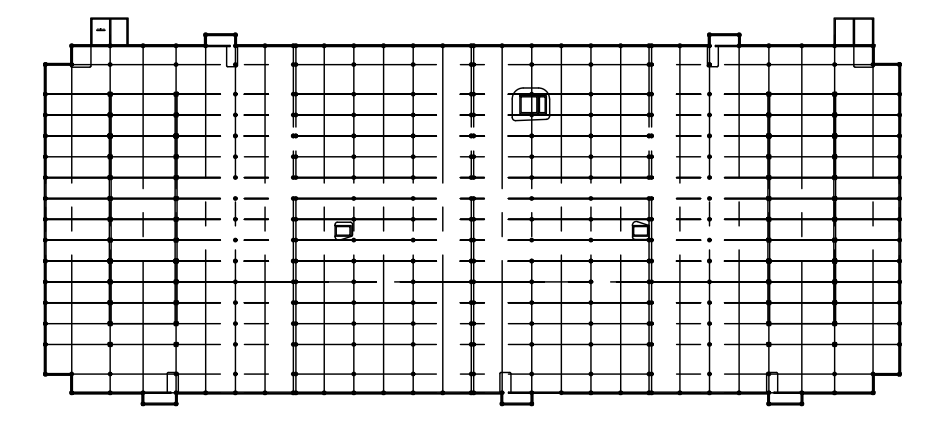


STAIR TOWER #1 (REPAIRS TO BE COMPLETED IN 2018)	
NOTE	DESCRIPTION
1	Spalled concrete and corrosion at the anchor bolts and base plates of the enclosure frame at roof level.
2	Damaged caulking at aluminum windowsills.
3	Cracked concrete beam supporting the landings at the second and third floor. Repair 2018
4	Heavy corrosion of all handrail posts. Repair 2018
5	Heavy corrosion of the stair stringers a ground level. Repair 2018
6	Corrosion of risers/nosing and treads at stair section from first to second floor. Repair 2018
7	Some deck cracking at second floor. Repair 2018
8	General corrosion and damaged paint. Repair 2018

STAIR TOWER #2 (AT PEDESTRIAN BRIDGE)	
NOTE	DESCRIPTION
1	Not Used

STAIR TOWER #3	
NOTE	DESCRIPTION
1	Corroded railing base plates and posts at first floor.
2	Water infiltration and standing water inside the stair enclosure.
3	Corroded bottom stair riser and stringer at first floor.
4	Corroded tread along stair section from level 2 to 2-3 intermediate landing.
5	Cracked beam at 3rd level landing (2 cracks x 4' long x 1/8"±). 3-4 intermediate landing.
6	Corroded channel and pan for landing of level 4.

* = 2019/2020 RECOMMENDED REPAIR WORK



A1 FLOOR PLAN SHOWING EXTERIOR REPAIRS
SCALE: 1/16" = 1'-0"

A5 STAIR NOTES
SCALE: NOT TO SCALE

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PARKING GARAGE STRUCTURAL CONDITION SURVEY 2018**

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