

STRUCTURAL DRAWING INDEX	
SR-1	COVER
SR-2	LOWER LEVEL PLAN
SR-3	SURVEY PHOTOS LOWER LEVEL
SR-4	MAIN CONCOURSE PLAN
SR-5	SURVEY PHOTOS MAIN CONCOURSE PLAN
SR-6	SURVEY PHOTOS MAIN CONCOURSE PLAN
SR-7	SURVEY PHOTOS MAIN CONCOURSE PLAN
SR-8	SUITE LEVEL PLAN
SR-9	SURVEY PHOTOS SUITE LEVEL
SR-10	DETAILS
SR-11	DETAILS
SR-12	DETAILS

PROJECT CRITERIA

I: SCOPE OF SERVICES:

1. CONCRETE REPAIRS AS IDENTIFIED HEREIN.
2. SEALANT JOINT REPLACEMENT.
3. RAMP LIGHTS TO BE RESEALED.
4. HAND RAIL POST POCKET REPAIRS.
5. PAINTING OF SCOREBOARD FRAME AND OUTFIELD POST BASES.
6. FENCE REPAIRS.
7. ELECTRICAL CONDUIT CLAMPS NEED REPLACING.
8. LEAKS INTO LOWER SERVICE LEVEL.
9. THE NORTH AND SOUTH INTERIOR STAIRS TO BE RE-FURBISHED.
10. MISC. ITEMS NOTED HEREIN.

II. DESIGN CRITERIA:

1. APPLICABLE CODE IS THE 2020 FLORIDA BUILDING CODE.
2. DESIGN LOADS:
 - a. WIND CRITERIA = RISK CATEGORY " II " WITH A " C " EXPOSURE.
 - b. WIND SPEED = 145 MPH

III. CLASSIFICATION OF WORK

1. THE WORK IS NECESSARY TO ADDRESS MINOR CONCRETE ITEMS AND TO PROTECT ALL STEEL ITEMS BY RE-PAINTING.
2. ALTERATION - LEVEL - 1 (SECTION 602 OF THE EXISTING BUILDING CODE.)

CITY OFFICIALS

FRANK HIBBARD
MARK BUNKER
KATHLEEN BECKMAN
DAVID ALLBRITTON
HOYT HAMILTON
BILL HORNE

MAYOR
COUNCILMEMBER
COUNCILMEMBER
COUNCILMEMBER
COUNCILMEMBER
CITY MANAGER

TARA KIVETT, P.E.
CITY ENGINEER

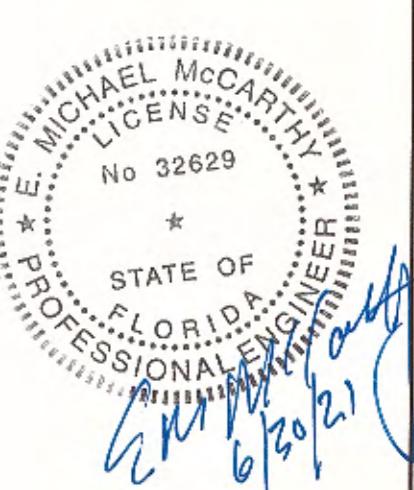
APPROVED FOR
CONSTRUCTION

Tara L. Knott
CITY ENGINEER TARA KIVETT, P.E. #8661

APPROVED DATE

7/1/2021

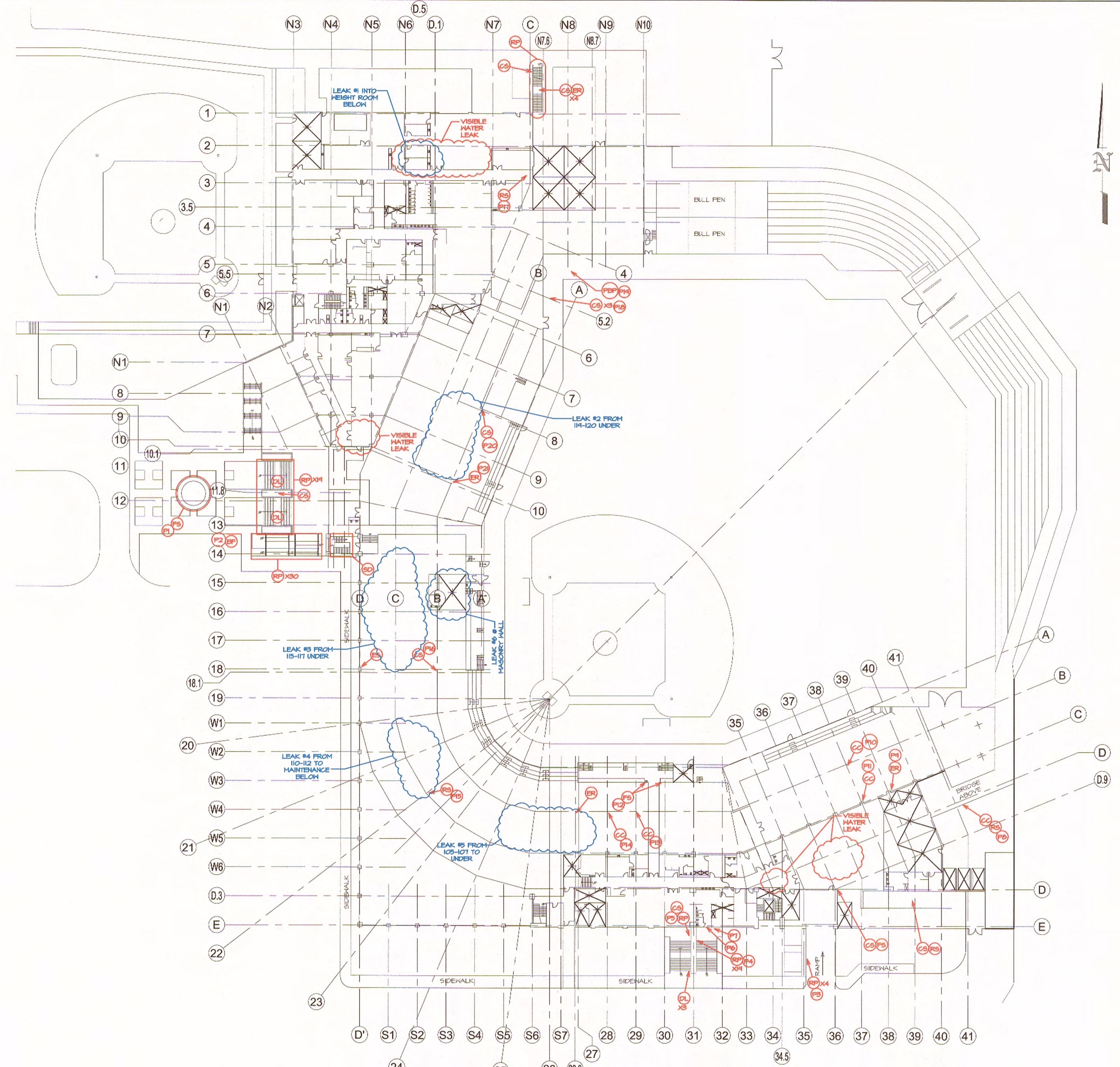
CITY PROJECT NO. 20-0036-EN-A



DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLARC21006

SHEET
SR-1
1 OF 12 SHEETS

Pennoni
3755 Rio Vista Drive
Clearwater, FL 33763
(727) 325-2466
E. Florida Co. Project No. CLWRC0012



KEY CODE - FIELD SURVEY	
KEY	DESCRIPTION
BF	BAD FENCE
CC	CONCRETE CRACK
CGJ	CRACK GOLD JOINT
COP	CRACKED COVER PLATE
CS	CONCRETE SPALL
CSL	CORRODED STEEL
DC	DECK CRACK
DL	DAMAGED LIGHT
DS	DECK SPALL
DSJ	DAMAGED SEALANT JOINT
EJ	EXPANSION JOINT
ER	EXPOSED REBAR
ES	EXPOSED STEEL
FC	FAILED COATING
FS	FAILED SEALANT JOINT
HG	HARLINE CRACK
MJC	MORTAR JOINT CRACK
PN	PHOTO NUMBER
PR	PREVIOUS REPAIR FAILING
PT	PAINT TOWER
PBP	PAINT BASE PLATE
RB	RUSTED BEAM ABOVE
RDF	RUSTED DOOR FRAME
RC	RUSTED CONCRETE
RP	RUSTED POST POCKET
RR	RUSTED RAILING
RS	RUSTED STEEL
RST	RUSTED STAIR TREAD
RSC	RUSTED SCUPPER
RJB	RUSTED JOIST BRACKET
SD	STAIR DAMAGE
SG	STUCCO CRACKS
SH	STANDING WATER
WC	WALL CRACK
WS	WALL SPALL
WSF	WALL SPALL REPAIR FAILING
YC	VERTICAL CRACK

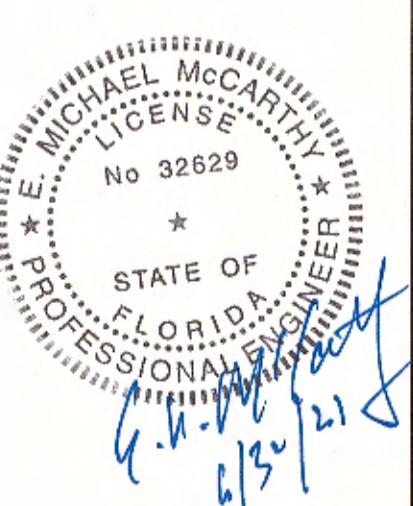
ISSUED FOR
BIDDING
06/30/21

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

STRUCTURAL
REPAIRS
(2021)

DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWR21006

SHEET
SR-2
2 OF 12 SHEETS



LOWER LEVEL PLAN

Spectrum Field Report
(1-12-2021)
Photo Descriptions

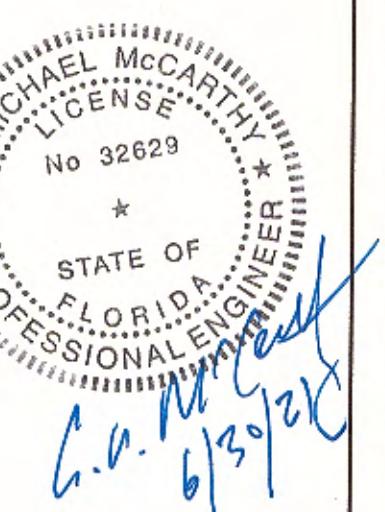
Lower Level

- P1: Damaged Sealant Joint
- P2: Bad Fence
- P3: Rusted Post Pocket
- P4: Rusted Steel
- P5: Rusted Post Pocket, Concrete Spall
- P6: Rusted Post Pocket
- P7: Damaged Speaker
- P8: Rusted Steel, Concrete Crack
- P9: Exposed Rebar
- P10: Concrete Crack
- P11: Concrete Crack
- P12: Failed Sealant Joint
- P13: Concrete Crack
- P14: Concrete Crack
- P15: Rusted Anchor
- P16: Concrete Spall
- P17: Rusted Steel Tubing
- P18: Concrete Spall
- P19: Repaint Baseplate
- P20: Sheet Metal Box
- P21: Sheet Metal Box



2021 SURVEY PHOTOS LOWER LEVEL

STRUCTURAL
REPAIRS
(2021)

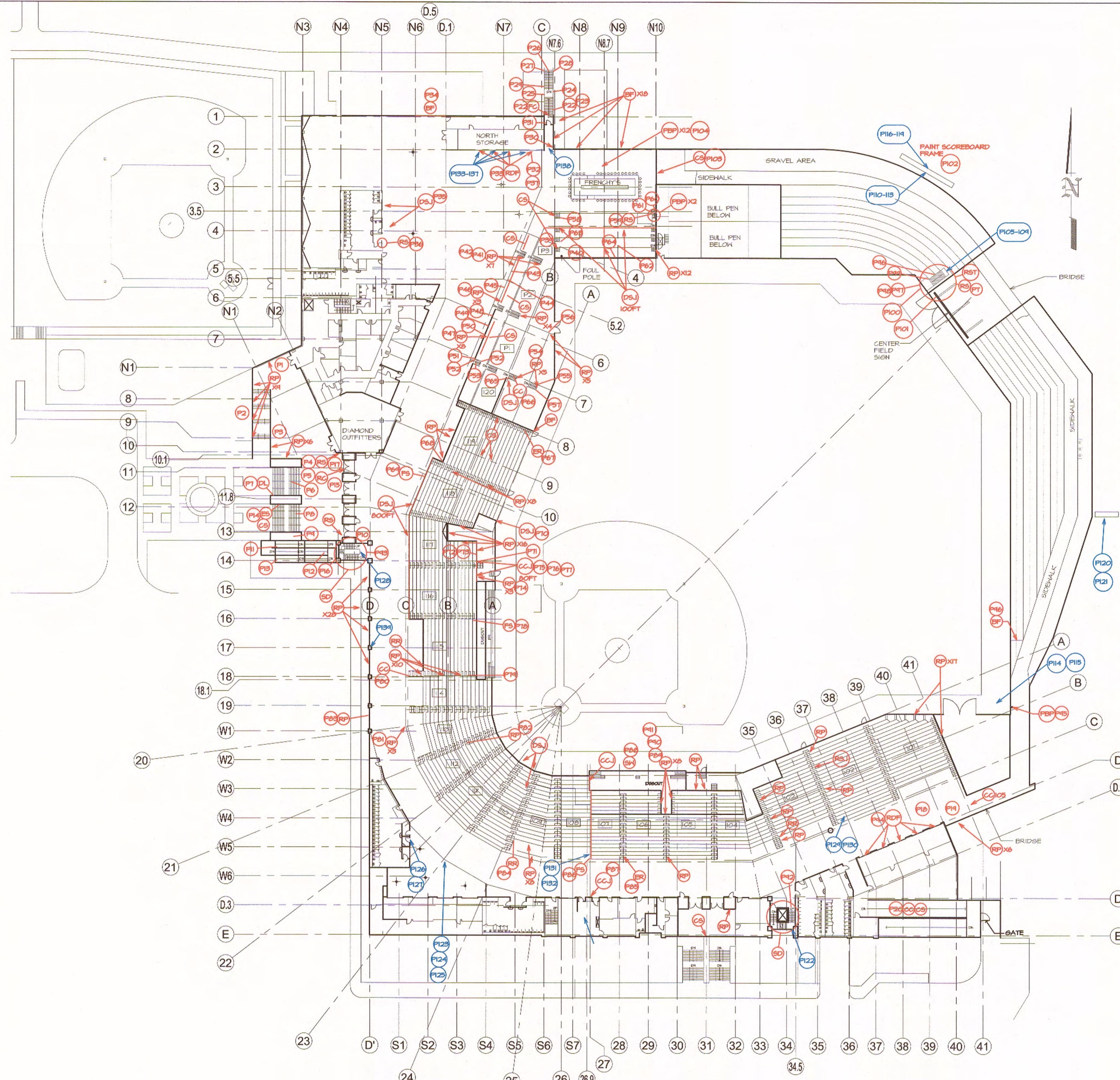


SHEET
SR-3
3 OF 12 SHEETS

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

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06/30/21

Pennoni
3755 Rio Vista Drive
Clearwater, FL 33765
E. Michael McCarthy, P.E.
Florida P.E. #32629
Pennoni Project No. CLWRC20012



KEY CODE - FIELD SURVEY	
KEY	DESCRIPTION
(BF)	BAD FENCE
(CC)	CONCRETE CRACK
(CJ)	CRACK COLD JOINT
(CCP)	CRACKED COVER PLATE
(CS)	CONCRETE SPALL
(CS)	CORRODED STEEL
(DC)	DECK CRACK
(DL)	DAMAGED LIGHT
(DS)	DECK SPALL
(DSJ)	DAMAGED SEALANT JOINT
(EJ)	EXPANSION JOINT
(ER)	EXPOSED REBAR
(ES)	EXPOSED STEEL
(FC)	FAILED COATINGS
(FS)	FAILED SEALANT JOINT
(HC)	HARLINE CRACK
(MJC)	MORTAR JOINT CRACK
(PN)	PHOTO NUMBER
(PR)	PREVIOUS REPAIR FAILING
(PT)	PAINT TOWER
(PBP)	PAINT BASE PLATE
(RB)	RUSTED BEAM ABOVE
(RDF)	RUSTED DOOR FRAME
(RC)	RUSTED CONCRETE
(RP)	RUSTED POST POCKET
(RR)	RUSTED RAILING
(RS)	RUSTED STEEL
(RST)	RUSTED STAIR TREAD
(RSC)	RUSTED SCUPPER
(RJB)	RUSTED JOIST BRACKET
(SD)	STAIR DAMAGE
(SC)	STUCCO CRACKS
(SW)	STANDING WATER
(WC)	WALL CRACK
(WS)	WALL SPALL
(WRF)	WALL SPALL REPAIR FAILING
(VG)	VERTICAL CRACK

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

STRUCTURAL
REPAIRS
(2021)

DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWRC21006
*h.a. McCarthy
6/30/21*

SHEET
SR-4
4 OF 12 SHEETS

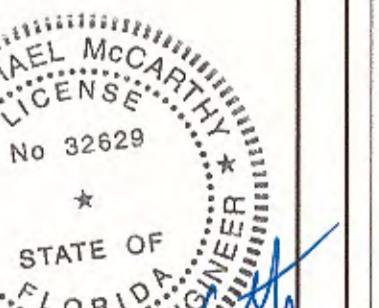
Pennoni
57755 Rio Vista Drive
Clearwater, FL 33760-3137
(727) 325-1246
Florida Co., 7819 E. 43rd Street, Suite 2639
E. Florida P.E. #432639
Pennoni Project No. CLWRC20012

MAIN CONCOURSE PLAN

ISSUED FOR
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06/30/21

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

STRUCTURAL
REPAIRS
(2021)



DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWRc21006

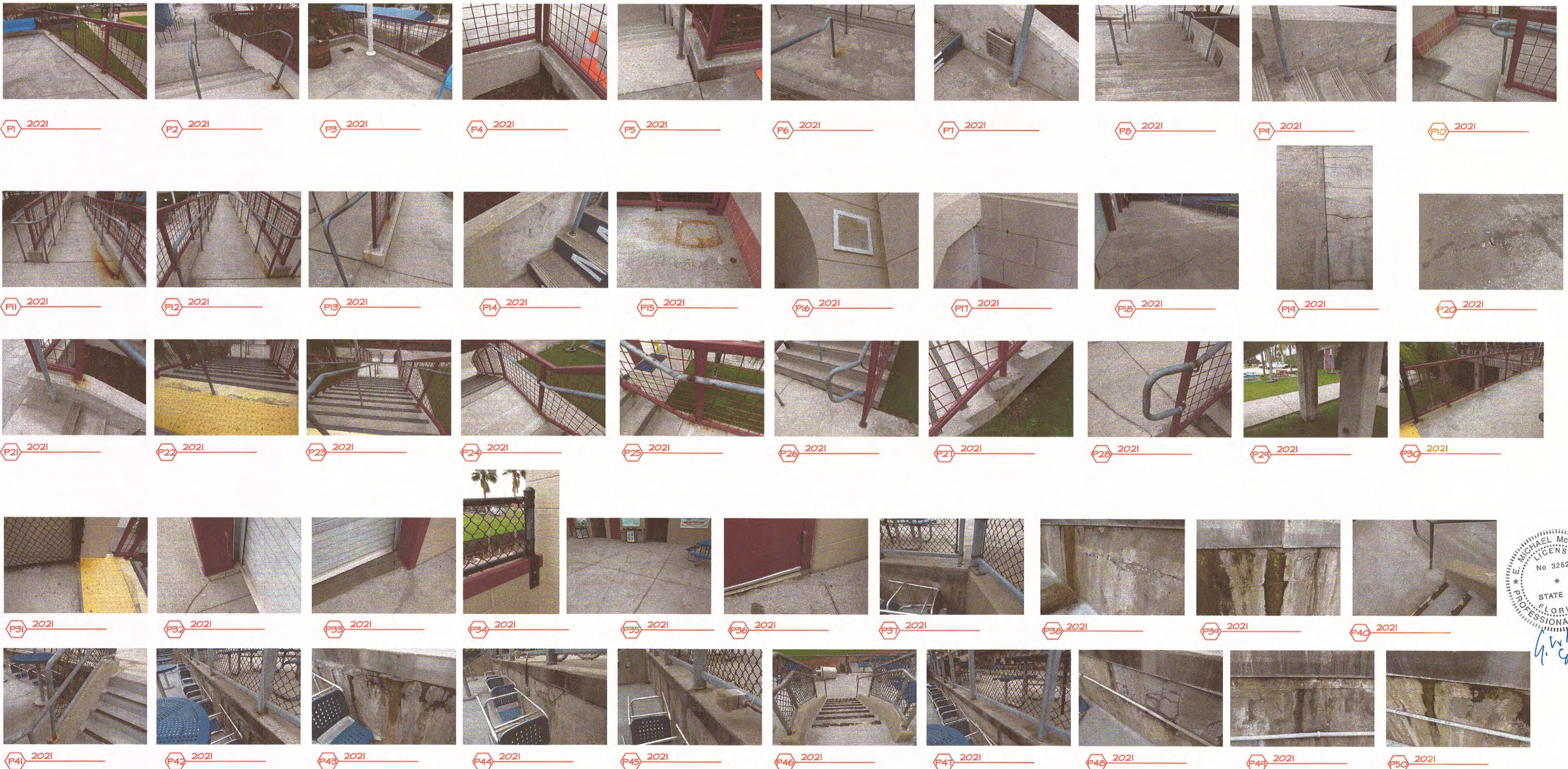
SHEET
SR-5
5 OF 12 SHEETS

**Spectrum Field Report
(1-12-2021)
Photo Descriptions**

- Main Concourse level**
- P1: Rusted Post Pocket
 - P2: Rusted Post Pocket
 - P3: Rusted Post Pocket
 - P4: Rusted Post Pocket
 - P5: Rusted Post Pocket
 - P6: Rusted Post Pocket
 - P7: Damaged Light Cover
 - P8: Rusted Post Pocket
 - P9: Concrete Spall
 - P10: Rusted Post Pocket
 - P11: Rusted Post Pocket
 - P12: Rusted Post Pocket
 - P13: Concrete Crack
 - P14: Concrete Spall, Exposed Rebar

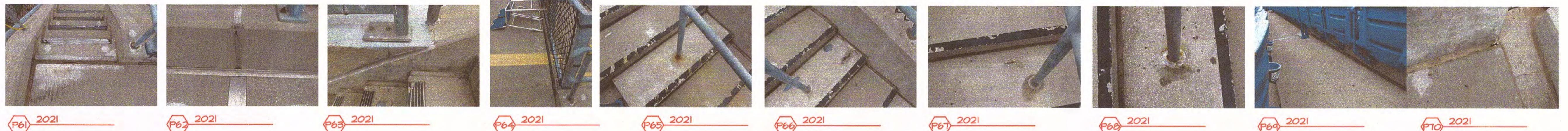
- P15: Concrete Spall, Rusted Steel
- P16: Speaker Damage
- P17: Rusted Steel
- P18: Damaged Sealant Joint
- P19: Concrete Crack
- P20: Concrete Crack, Concrete Spall
- P21: Rusted Post Pocket, Concrete Crack
- P22: Deck Cover Damage
- P23: Rusted Post Pocket
- P24: Rusted Railing
- P25: Rusted Railing
- P26: Bent Steel
- P27: Concrete Spall
- P28: Rusted Steel
- P29: Concrete Spall
- P30: Rusted Post Pocket
- P31: Rusted Post Pocket
- P32: Rusted Steel
- P33: Concrete Spall
- P34: Bad Fence
- P35: Damaged Sealant Joint
- P36: Rusted Steel
- P37: Concrete Crack
- P38: Concrete Spall
- P39: Concrete Spall
- P40: Rusted Post Pocket
- P41: Rusted Post Pocket
- P42: Rusted Post Pocket
- P43: Concrete Spall
- P44: Concrete Spall
- P45: Rusted Post Pocket
- P46: Rusted Post Pocket
- P47: Rusted Post Pocket
- P48: Concrete Spall
- P49: Concrete Spall
- P50: Concrete Spall
- P51: Concrete Spall
- P52: Failed Coating
- P53: Failed Sealant Joint
- P54: Rusted Post Pocket
- P55: Concrete Spall
- P56: Rusted Post Pocket
- P57: Rusted Post Pocket
- P58: Failed Sealant Joint
- P59: Rusted Steel
- P60: Concrete Crack

- P62: Failed Sealant Joint
- P63: Concrete Spall
- P64: Failed Sealant Joint
- P65: Rusted Post Pocket
- P66: Concrete Spall
- P67: Exposed Rebar
- P68: Rusted Post Pocket
- P69: Failed Sealant Joint
- P70: Failed Sealant Joint
- P71: Concrete Crack
- P72: Concrete Crack
- P73: Rusted Post Pocket
- P74: Rusted Post Pocket
- P75: Cracked Cold Joint
- P76: Cracked Cold Joint
- P77: Cracked Cold Joint
- P78: Failed Sealant Joint
- P79: Rusted Post Pocket
- P80: Concrete Crack, Failed Sealant Joint
- P81: Rusted Post Pocket
- P82: Rusted Post Pocket
- P83: Rusted Post Pocket
- P84: Rusted Steel
- P85: Exposed Rebar
- P86: Failed Sealant Joint
- P87: Damaged Expansion Joint
- P88: Standing Water
- P89: Rusted Post Pocket
- P90: Rusted Post Pocket
- P91: Rusted Post Pocket
- P92: Stair Damage
- P93: Stair Damage
- P94: Rusted Steel
- P95: Rusted Baseplate
- P96: Bad Fence
- P97: Repaint Baseplate
- P98: Rusted Steel
- P99: Rusted Steel
- P100: Rusted Steel
- P101: Repaint Frame
- P102: Repaint Frame
- P103: Concrete Spall
- P104: Repaint Baseplate



2021 SURVEY PHOTOS MAIN CONCOURSE PLAN

Main Concourse level Continued



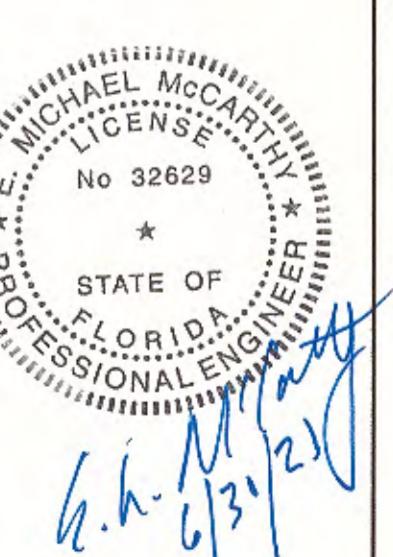
Pennoni
5755 Rio Vista Drive
Clearwater (727) 545-1246
Florida Coa 7819
E. Michael McCarthy, P.E.
Project No. CLWR21006
Pennoni Project No. 4214620212

ISSUED FOR
BIDDING
06/30/21

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

STRUCTURAL
REPAIRS
(2021)

DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWR21006



SHEET
SR-6
6 OF 12 SHEETS

Spectrum Field Report
(06-02-2021)
Photo Descriptions

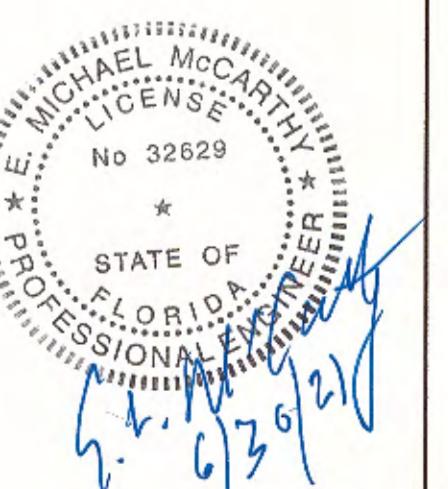
Main Concourse level Continued

- P105: Eroded Coating, Rusted Base
- P106: Concrete Platform
- P107: Eroded Coating
- P108: Underside, Platform
- P109: Underside, Staircas
- P110: Eroded Coating
- P111: Scoreboard, Front Elevation
- P112: Eroded Coating
- P113: Scoreboard, Front Elevation
- P114: Rusted Base
- P115: Rusted Steel
- P116: Eroded Coating
- P117: Eroded Coating
- P118: Scoreboard, Rear Elevation
- P119: Scoreboard, Rear Elevation
- P120: Rusted Base
- P121: Highway Sign, Elevation
- P122: South Stair
- P123: Steel Flashing at Slab Edge
- P124: Steel Flashing at Slab Edge
- P125: Steel Flashing at Slab Edge
- P126: Rusted Door
- P127: Rusted Door Frame
- P128: North Stair
- P129: New Sealant Joint
- P130: New Sealant Joint
- P131: Eroded Sealant Joint
- P132: Eroded Sealant Joint
- P133: Corrosion at Base
- P134: Corrosion at Base
- P135: Corrosion at Base
- P136: Corrosion at Base
- P137: Corrosion at Base
- P138: Rusted Post Pocket
- P139: Rusted Electrical Bracket



2021 SURVEY PHOTOS MAIN CONCOURSE PLAN

STRUCTURAL
REPAIRS
(2021)



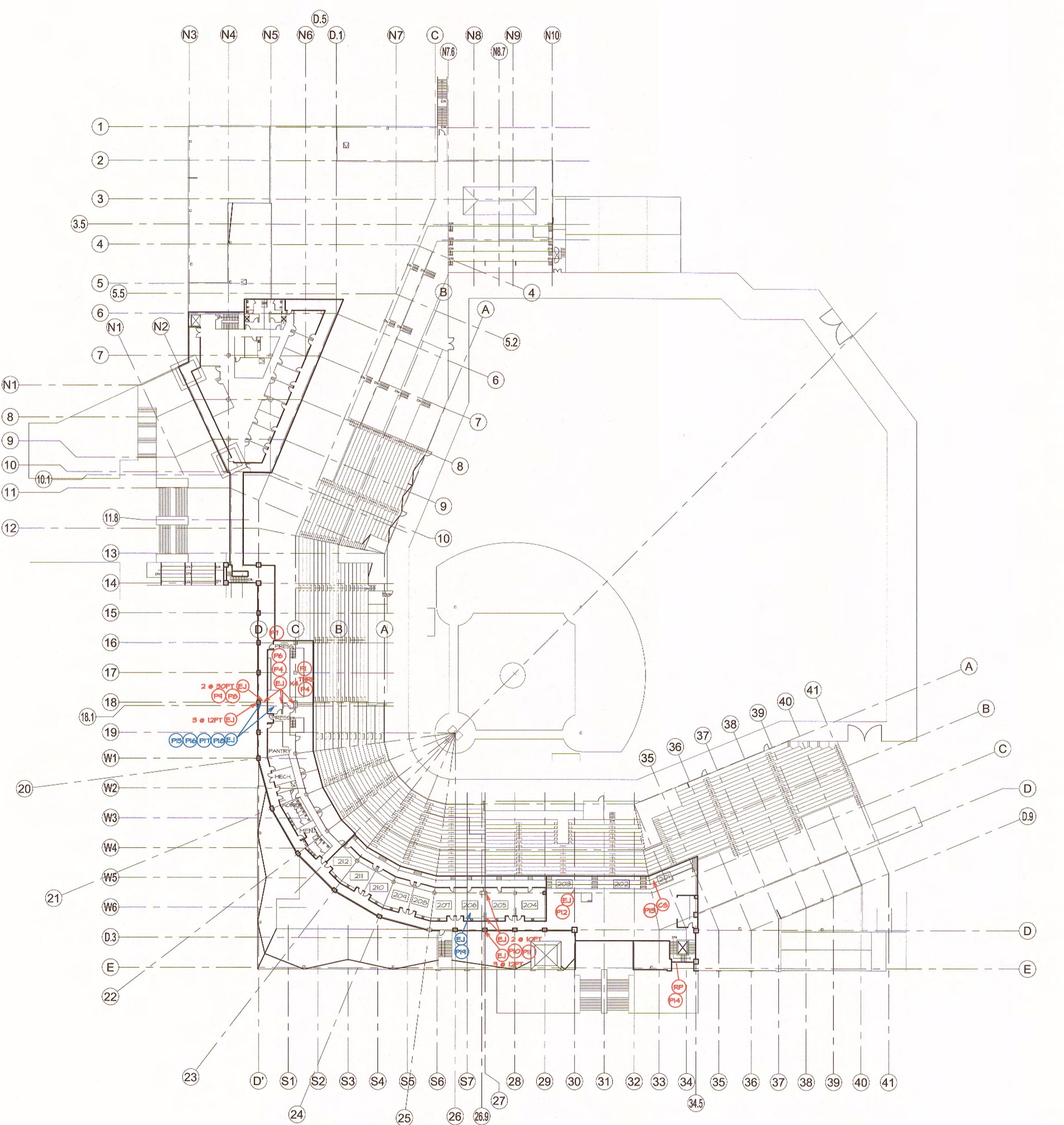
DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWRG21006

SHEET
SR-7
1 OF 12 SHEETS

Pennoni
5755 Rio Vista Drive
Clearwater, FL 33765
E. Michael McCarthy, P.E.
Pennoni Project No. CLWRG21006

ISSUED FOR
BIDDING
06/30/21

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765



JITE LEVEL PLAN

KEY CODE - FIELD SURVEY	
KEY	DESCRIPTION
BF	BAD FENCE
CC	CONCRETE CRACK
CCJ	CRACK COLD JOINT
CP	CRACKED COVER PLATE
CS	CONCRETE SPALL
CST	CORRODED STEEL
DC	DECK CRACK
DL	DAMAGED LIGHT
DS	DECK SPALL
D SJ	DAMAGED SEALANT JOINT
EJ	EXPANSION JOINT
ER	EXPOSED REBAR
ES	EXPOSED STEEL
FC	FAILED COATING
FS	FAILED SEALANT JOINT
HC	HAIRLINE CRACK
MJC	MORTAR JOINT CRACK
PN	PHOTO NUMBER
PR	PREVIOUS REPAIR FAILING
PT	PAINT TOWER
PBP	PAINT BASE PLATE
RB	RUSTED BEAM ABOVE
RDF	RUSTED DOOR FRAME
RC	RUSTED CONCRETE
RP	RUSTED POST POCKET
RR	RUSTED RAILING
RS	RUSTED STEEL
RST	RUSTED STAIR TREAD
RSC	RUSTED SCUPPER
RJB	RUSTED JOIST BRACKET
SD	STAIR DAMAGE
SC	STUCCO CRACKS
SW	STANDING WATER
WC	WALL CRACK
WS	WALL SPALL
WSF	WALL SPALL REPAIR FAILING
VC	VERTICAL CRACK

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

STRUCTURAL
REPAIRS
(2021)

DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWRC21006

SHEET
SR-8
8 OF 12 SHEETS

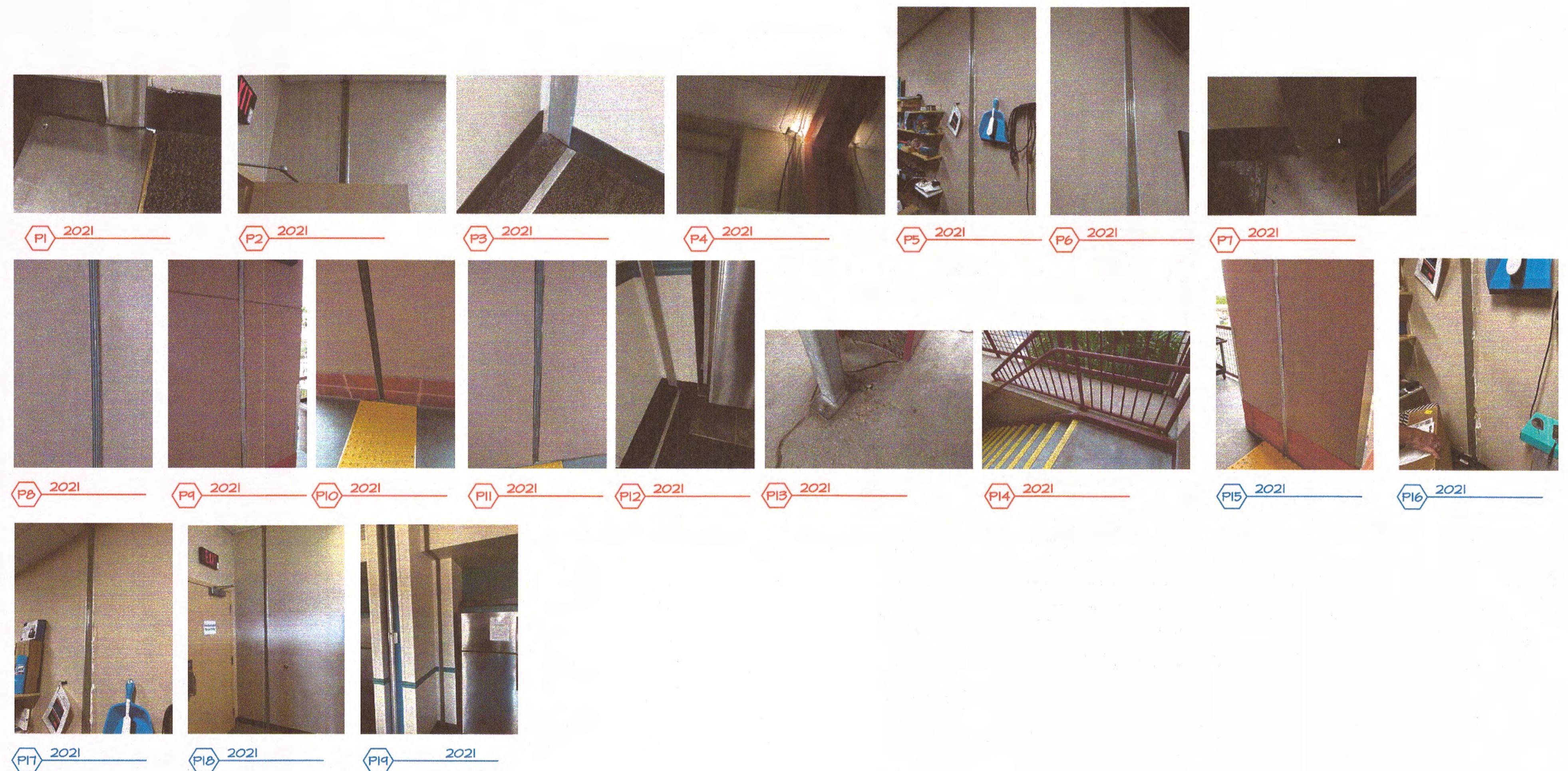
ISSUED FOR
BIDDING
06/30/21

5755 Rio Vista Drive
Clearwater, FL 33760-3137
(727) 325-1246
Florida Cca 7819
E. Michael McCarthy, P.E.
Florida P.E. #32629
Pennoni Project No. CLWRC20012

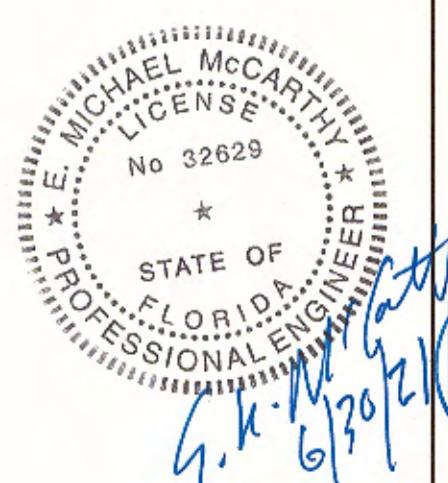
Spectrum Field Report
(1-12-2021)
Photo Descriptions

Suite Level

- P1: Damaged Expansion Joint
- P2: Damaged Expansion Joint
- P3: Damaged Expansion Joint
- P4: Damaged Expansion Joint
- P5: Damaged Expansion Joint
- P6: Damaged Expansion Joint
- P7: Damaged Expansion Joint
- P8: Damaged Expansion Joint
- P9: Damaged Expansion Joint
- P10: Damaged Expansion Joint
- P11: Damaged Expansion Joint
- P12: Damaged Expansion Joint
- P13: Concrete Spall
- P14: Rusted Post Pocket
- P15: Exterior Walkway
- P16: Inside Sound Equipment Room
- P17: Inside Sound Equipment Room
- P18: Inside Writing Press Box
- P19: Inside Suite 206



2021 SURVEY PHOTOS SUITE LEVEL



DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWRG21006

SHEET
SR-9
9 OF 12 SHEETS

STRUCTURAL
REPAIRS
(2021)

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

Pennoni
5755 Rio Vista Drive
Clearwater, FL 33765
E. Michael McCarthy, P.E.
Florida P.E. #32629
Pennoni Project No. CLWRG2021

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BIDDING
06/30/21

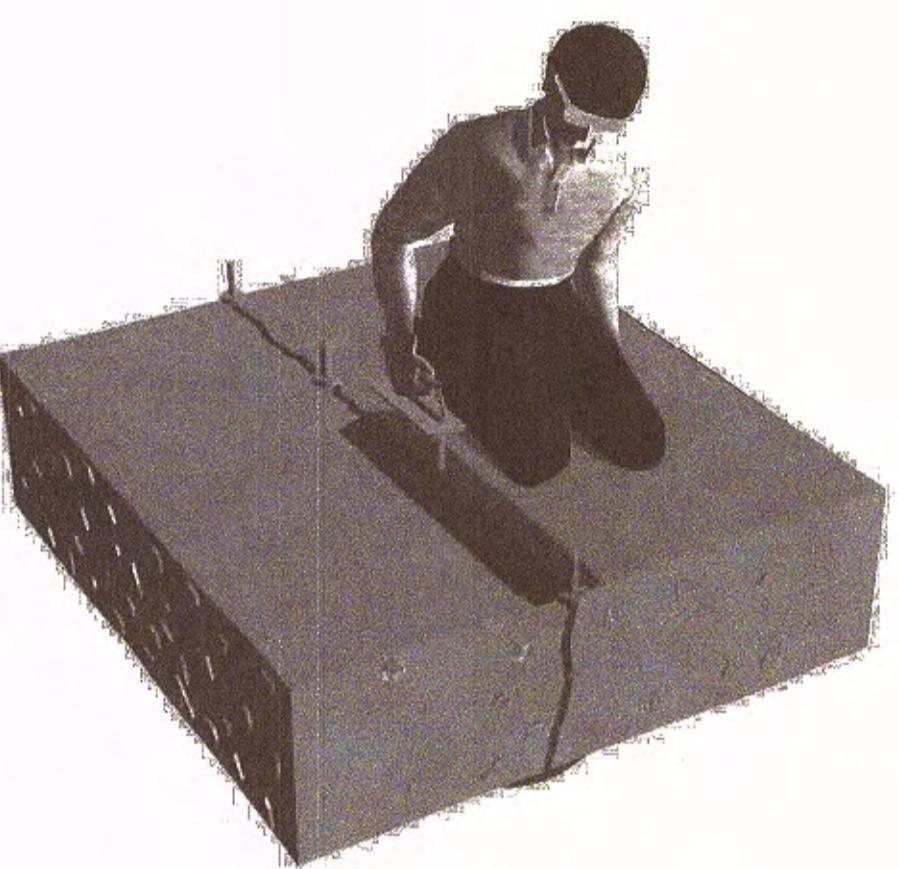


ACI-RAP Bulletin 1

FIELD GUIDE TO CONCRETE REPAIR APPLICATION PROCEDURES

Structural Crack Repair by Epoxy Injection

by Brian F. Keane



Structural Crack Repair by Epoxy Injection (ACI RAP-1)

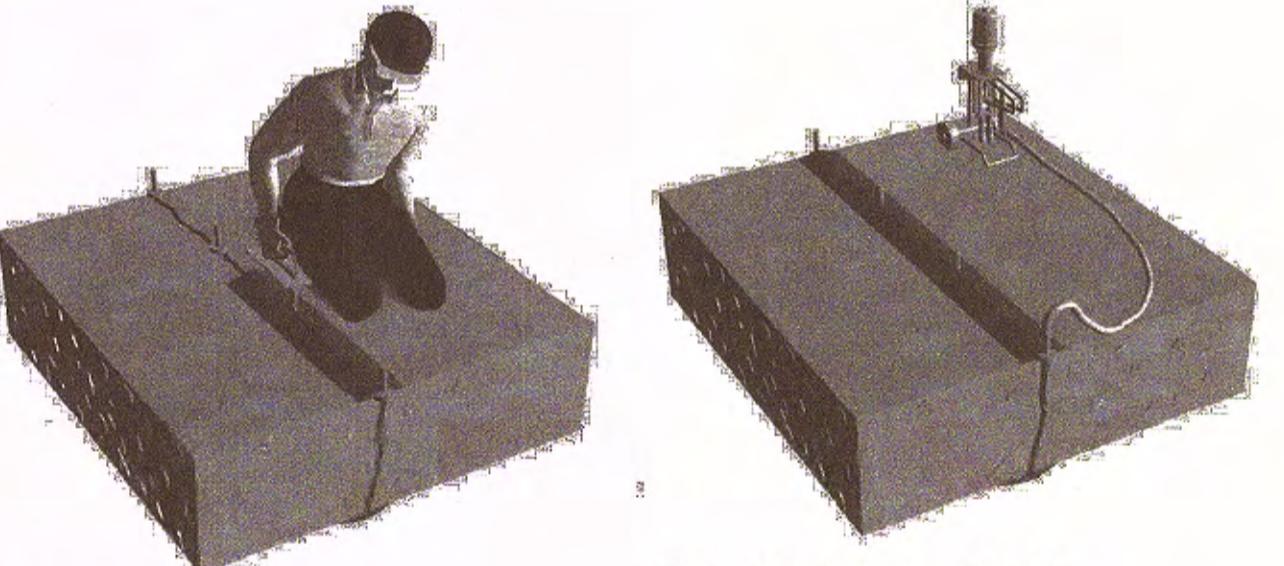


Fig. 2—Installation of entry ports.

- Non-sag consistency (top vertical or overhead)
- Moisture tolerance
- Working life
- Rigidity (modulus of elasticity)

Concrete temperature may cause the epoxy to fail prior to injection. When this occurs, the cap seal must be repaired prior to resin injection.

Prior to proceeding with installation of the cap seal, mark the location of the widest portion of the crack and pay close attention to the following:

- Use only materials that haven't exceeded their shelf life
- Accurate batching of components
- Small batches to keep material fresh and dissipate heat
- Port spacing and Consistent application of the material (1-in. wide x 20 in. thick [25 x 50 mm] over the length of the crack)

Install the epoxy ports (Fig. 3). For a successful epoxy injection, start with the proper batching and mixing of the epoxy components in strict accordance with the manufacturer's requirements. Prior to starting the initial injection, be sure that the cap seal and port adapter adhesive have properly cured so they can sustain the injection pressures.

Start the injection at the widest section of a horizontal crack. (Be sure to locate and mark these areas before installing the cap seal.) Vertical cracks are typically injected from the bottom up.

Continue the injection until refusal. Once adjacent port starts bleeding, cap the port being injected and continue injection at the furthest bleeding port. Hairline cracks are sometimes

Introduction
Certain things in life are inevitable. Some are said to include death, taxes, and concrete cracks. The latter is subject to volumes of literature on causes and cures. Some of the more typical causes for concrete cracking include:

- Drying shrinkage
- Thermal expansion/contraction
- Settlement
- Lack of appropriate control joints
- Overload conditions that produce flexural, tensile, or shear cracks in concrete and/or restraint of movement

Once of the potentially effective repair procedures is to inject epoxy under pressure into the cracks. The injection procedure will vary, subject to the application and location of the crack(s), with horizontal, vertical, and overhead cracks requiring somewhat different approaches. The approach used must also consider accessibility to the cracked surface and the size of the cracks.

Cracks can be injected from one or both sides of a concrete member. If access is limited to only one side, installation procedures may include modifications, epoxy viscosities, injection equipment, injection pressure, and port spacing to ensure full penetration of the crack.

Depend on the specific requirements of the job, crack repair by epoxy injection can reduce structural integrity and reduce moisture penetration through concrete greater than 2 in. (50.8 mm) in width and greater. However, the primary concrete repair is carried out, the extent of the damage must be assessed and corrected and the objective of the repair understood. If the crack is subject to subsequent movement, an epoxy repair may not be applicable.

Note: Horizontal cracks of sufficient width can be filled by gravity-fed epoxies where suitable for the repair (See Crack Repair by Gravity Feed with Resin, RAP-2).

What is the purpose of this repair?

The primary objective of this type of repair is to restore the structural integrity and the resistance to moisture penetration of the cracked element.

When do I use this method?

Injection is typically used on horizontal, vertical, and overhead cracks where conventional repair methods cannot penetrate and deliver the specific repair product into the crack.

Prior to proceeding with a crack repair by epoxy injection, the cause of the crack and the need for a structural repair must be determined. If the crack does not compromise the structural integrity of the structure, injection with polyurethane grouts or other nonstructural materials may be a reasonable choice to fill the crack. When a structural repair is required, conditions that cause the crack must be corrected (primary moisture intrusion or freeze-thaw cycles). This crack is damp and cannot be dried out; an alternative repair in moisture should be considered. Cracks caused by corrosion or reinforcing steel should not be repaired by epoxy injection because continuing corrosion will cause new cracks to appear.

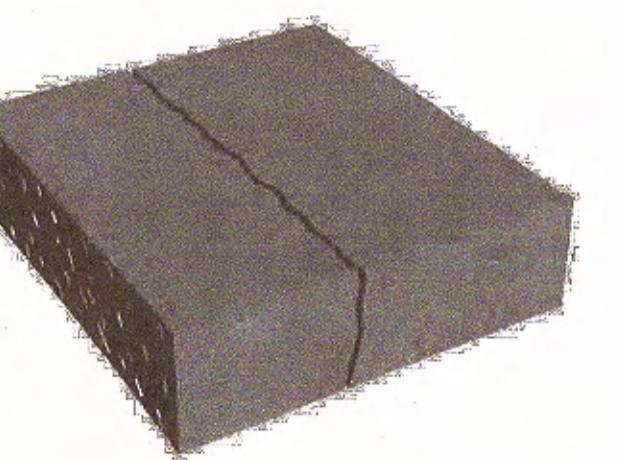
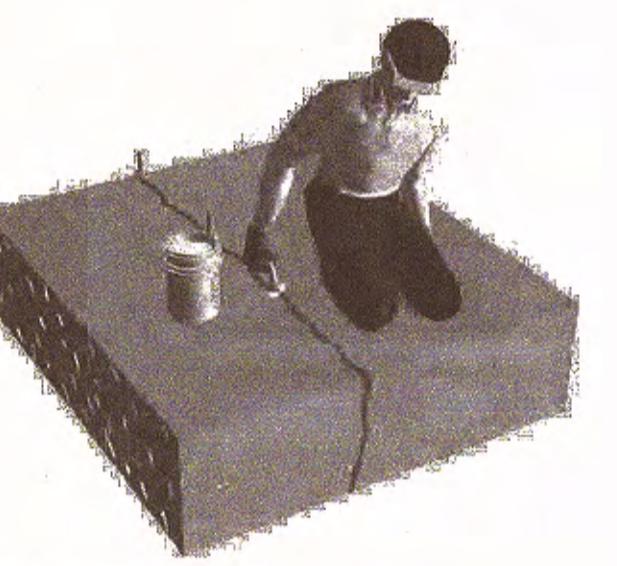


Fig. 1—Crack repair by clean and free of debris.

How do I prepare the surface? (see Fig. 1)

Clean the surface area about 1/2 in. (13 mm) wide on each side of the crack. This is done to ensure that materials used to seal off the crack (the cap seal) will bond properly to the concrete. Wetting the concrete is recommended before mechanical cleaning of the cracks with a power washer. Consider using a water-based, non-abrasive cleaner. Use a power washer with a water-washer, "washes" compressive air power washer. When using water to clean the cracks, blow out the cracks with air-free, compressed air heated to accelerate drying. Otherwise, allow enough time for natural drying factors before injecting moisture-sensitive epoxies.

Where concrete surfaces adjacent to the crack are deteriorated, "V"-groove the crack until sound concrete is reached. V-grooves can also be used when high injection pressures require a stronger cap seal.



Repair Application Procedures Bulletin 1

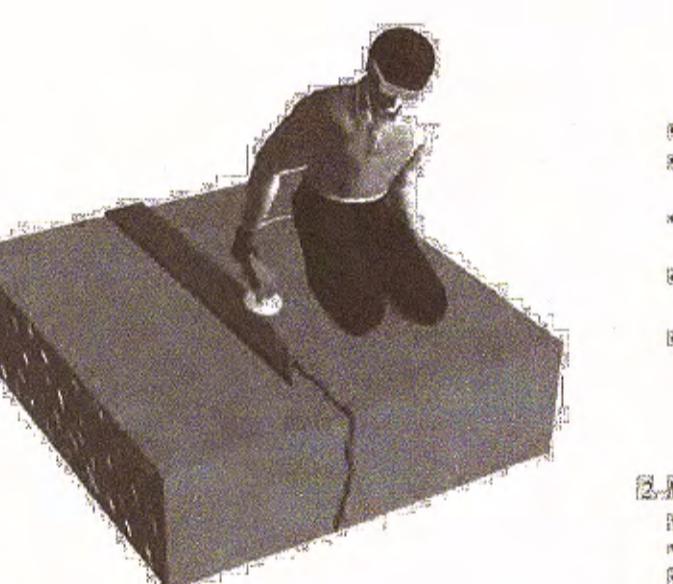
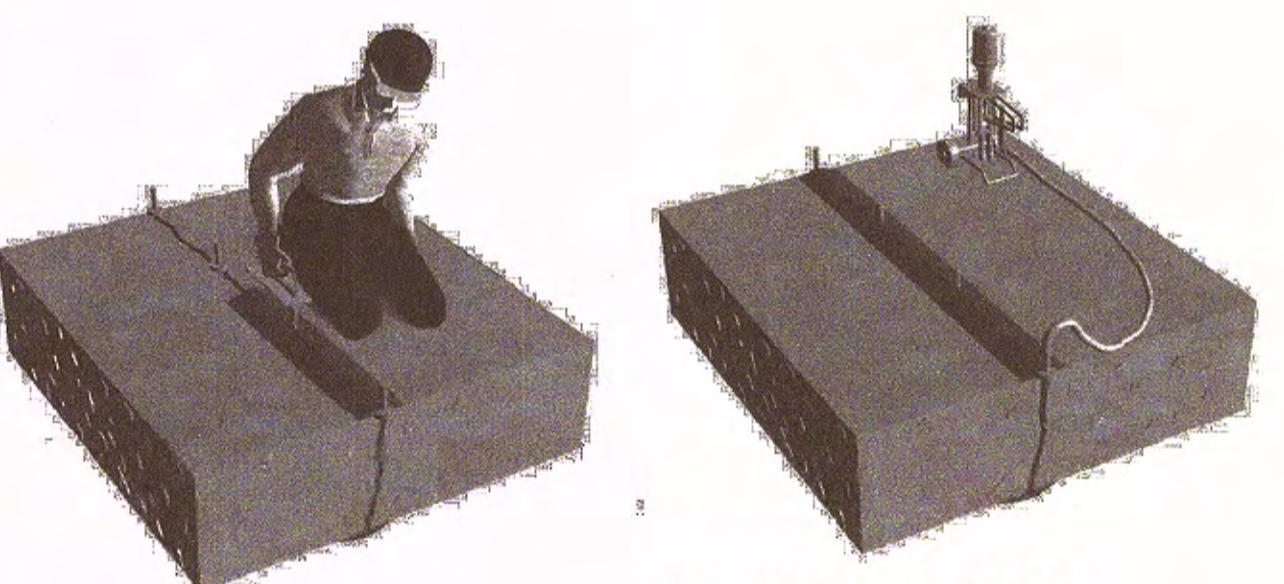


Fig. 3—Installation of cap seal.

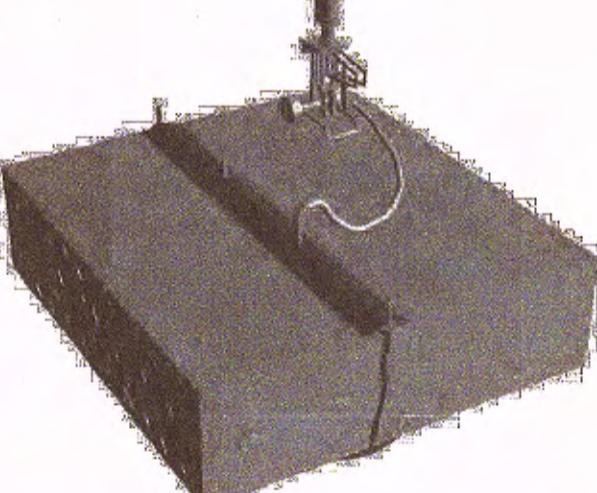


Fig. 4—Sizing injection at widest segment of the crack.

cracks, port socket-mounted ports are used. When cracks are blocked such as when reinforced concrete is encountered, entry ports can also be connected by a manifold system which allows for injection of multiple port locations is advantageous.

Install the epoxy ports (Fig. 3).

Properly installed, the cap seal contains the epoxy as it flows along the concrete interface. When cracks are completely through a section, cap seals perform best when installed on both sides of the cracked element, sharing confinement of the epoxy. Cap seals have been successfully installed using epoxies, polyesters, paraffin wax, and silicon sealant. The selection of the cap seal material should consider the following criteria, subject to the type of crack to be repaired:

Repair Application Procedures Bulletin 1

How do I check the repair?

To ensure that the injection has been successful, quality assurance measures may include test cores or nondestructive evaluation (NDE).

Test cores:

* Core locations should be chosen to avoid cutting reinforcing steel, drilling cores in areas of high

stress, or creating core holes below the waterline. The engineer should determine core locations when these types of conditions exist.

- Be sure the epoxy has set before extracting a core;
- Take cores (normally 2 in. [50 mm] diameter) to check that the quality of the epoxy is adequate;
- Inspect the core holes to determine the penetration of the epoxy into the cracks;
- Cores can be further tested for compressive and split tensile strength per ASTM C-42; and
- Subsequently, install the removed core area (after proper surface preparation) with an expansive cementitious or epoxy grout compatible with the existing substrate concrete and the surrounding environment.

Methods for nondestructive evaluation:

- Impact echo (IE);
- Ultrasonic pulse velocity (UPV); and
- Spectral analysis of surface waves (SASW);

Sources for additional information:

- ACI Committee 224, 1993, "Guides for Evaluation and Repair of Cracks in Concrete Structures" (224R-93), American Concrete Institute, Farmington Hills, Mich., 72 pp.
- ACI Committee 364, 1994, "Guides for Evaluation of Concrete Structures Prior to Rehabilitation" (364R-94), American Concrete Institute, Farmington Hills, Mich., 21 pp.
- ACI Committee 303, 1998, "Use of Epoxy Compounds with Concrete" (ACI 303-93 Reproved 1993), American Concrete Institute, Farmington Hills, Mich., 70 pp.
- ACI Committee 546, 1978, "Guides for Repair of Concrete Bridges Structures" (546 R-80) (Approved 1980), American Concrete Institute, Farmington Hills, Mich., 100 pp.
- ACI Committee 546, 1996, "Concrete Repair Guide" (546R-96), American Concrete Institute, Farmington Hills, Mich., 41 pp.
- ASTM C 881-90, 1990, "Standard Specification for Epoxy-Resin Based Systems for Concrete," ASTM International, West Conshohocken, Pa., 3 pp.
- Jennings, R. H., 1994, *Concrete Repair and Maintenance Illustrated*, S. Meier Co. Inc., Kingston, Mass., 309 pp.
- 1998, ACI Technical Guideline No. 0724.
- Murray, M. A., 1987, "Epoxy Injection Wedges Crack Repair," ACI Bulletin, Vol. 7, No. 1.
- Fromboon, Y.; Chen, L. D.; and Liang, J., 2002, "Nondestructive Evaluation (NDE) Methods for Quality Assurance," ACI Bulletin, Vol. 21, No. 1.
- "State-of-the-Art Adhesives for Concrete Construction," 1998, *Construction Canada Magazine*, May-June.
- Tisch, J. E., 1996, "Epoxy Injection in Construction," The Adhesive Group, 30 pp.

Structural Crack Repair by Epoxy Injection (ACI RAP-1)

Table 1—ASTM C 681 requirements for epoxy resins that are used to bond hardened concrete to hardened concrete

	Type I	Type IV
Viscosity, centipoise		
(Grade 1) Low viscosity, maximum	1,000	2000
(Grade 2) Moderate viscosity, minimum	2,000	2000
Maximum	30,000	30,000
Consistency, in.		
(Grade 3) Low viscosity, maximum	1/8	1/6
Oil film thickness, in.	30	30
Hard strength, and stretch, psi		
2 days, resin core ^a	1000	1000
2 days, resin matrix ^b	1000	1000
28 days, resin matrix ^b	1000	1000
Storage, 24 hr, minimum ^c	3	1
Drop cohesion, properties		
2 days, minimum ^d	1.28	
Linear coefficient of shrinkage		
On cure, maximum	0.0001	0.0001
Compressive yield strength		
7 days, minimum, psi	8000	10,000
Compression modulus, minimum, psi	150,000	200,000
Tensile strength, 7 days, minimum, psi	1000	1000
Elongation at break, minimum, %	3	1
Type I or Type II selected testing application		
For use in concrete repair applications, determine the appropriate test method for the epoxy resin used. See Table 1 for the applicable test method for the epoxy resin used.		

^a Specific actuuated capsules and

^b Balanced-actuated capsules.

Determine the delivery method that will restrain the resin to repair requirements by considering the size and complexity of the injection repair and the economic limitations of the project.

What are the safety considerations?

Epoxy resins are hazardous materials and must be treated as such. Jobsite safety practice should include, but not necessarily be limited to, the following:

- Having Material Safety Data Sheets (MSDS) available on site;
- Wearing protective clothing and protective eyewear where required;
- Wearing rubber gloves or leather gloves (check product label);
- Having eye wash stations available;
- Wearing respirators where selected;
- Providing ventilation of closed spaces;
- Securing storage of hazardous materials;
- Having necessary cleaning materials on hand; and
- Notifying occupants of pending safety procedures.

It is the responsibility of the user of this document to establish health and safety practices appropriate to the specific circumstances involved with its use. ACI does not make any representations with regard to health and safety issues and the use of this document. The user must determine the applicability of all regulatory limitations before applying this document and must comply with all applicable laws and regulations, including but not limited to, United States Occupational Safety and Health Administration (OSHA) health and safety standards.

How do I select the right material?

The appropriate viscosity of the epoxy will depend on the crack size, thickness of the substrate, and physical access.

For cracks widths 0.010 in. (25 mm) or smaller, use low-viscosity epoxy (500 cps @ 68°F). For wider cracks, if where injection access is limited to 1/2 in. (32 mm) the viscosity material may be more suitable.

For concrete sections greater than 12 in. (302 mm) the working time may need to be increased and the viscosity decreased as the crack gets smaller.

In addition to the criteria used in Table 1 for epoxy selection, the following product characteristics may also have to be considered:

- Modulus of elasticity (rigidity);
- Working life;
- Moisture tolerance;
- Colorant;
- Compressive, flexural, and tensile strengths.

What equipment do I need?

Equipment for epoxy injection by high-pressure or low-pressure systems includes:

- Agitators;
- Hand-powered delivery systems;

Structural Crack Repair by Epoxy Injection (ACI RAP-1)

▪ Surface-mounted ports only after proper surface preparation;

Two types of entry ports are available for the injection process:

- Surface-mounted port;
- Socket-mounted.

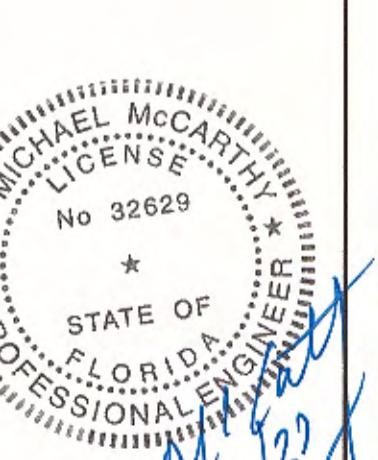
Entry ports (also called port adapters) can be any kind like device that provides for the successful transfer of the epoxy resin under pressure into the crack. Proprietary injection guns with special gasketed nozzles are also available for use without port adaptors. Port spacing is typically 8 in. (200 mm) on center, with increased spacing at wider cracks. Port spacing may also be a function of the thickness of the concrete element. Surface-mounted entry ports are normally adequate for most

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BIDDING
06/30/21

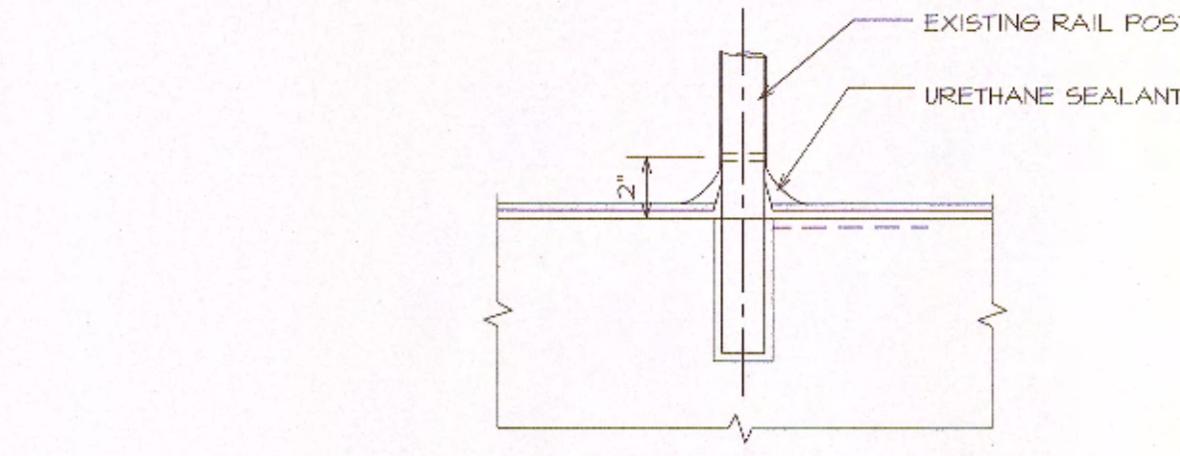
STRUCTURAL
REPAIRS
(2021)

DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWR21006
M.H. 6/30/21

SHEET
SR-10
10 OF 12 SHEETS



DETAILS

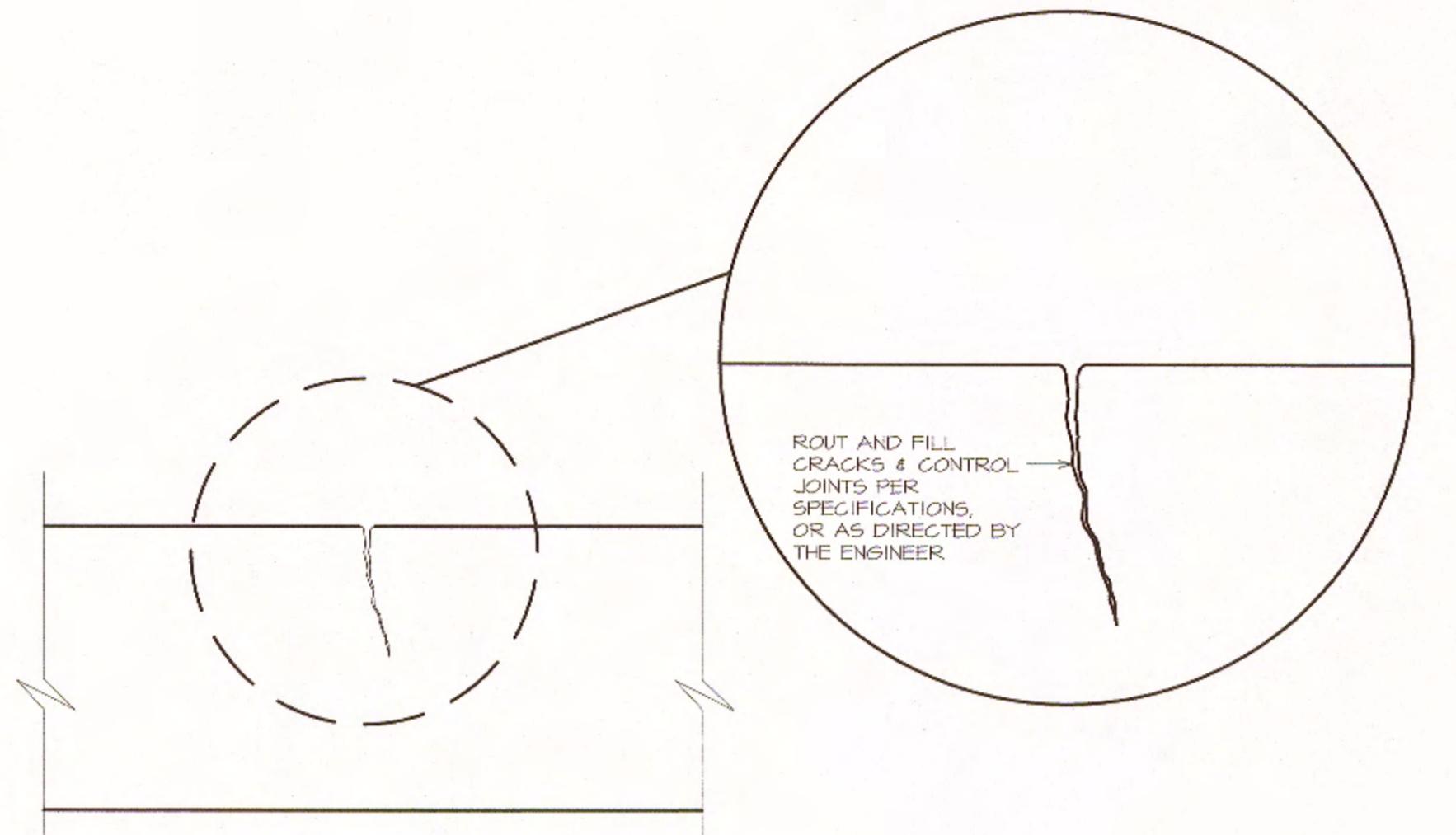


1 HANDBRAIL POST POCKET DETAIL

SCALE: N.T.S.

POST POCKET DETAILING PROCEDURE:

- DRILL HOLE IN POST 2" ABOVE DECK.
- ALTERNATELY VACUUM / INJECT AIR INTO HOLE TO DRY OUT THE INSIDE OF THE POST.
- INJECT A MOISTURE INSENSITIVE EPOXY INTO THE HOLE. VERIFY THAT THE EPOXY HAS FILLED THE POST INTERIOR TO THE BOTTOM OF THE HOLE. LEAVE THE HOLE OPEN FOR FUTURE DRAINAGE.
- REMOVE RUST STAINS.
- SEAL POST TO DECK WITH URETHANE SEALANT.
- TOUCH UP PAINT RAILING TO MATCH.

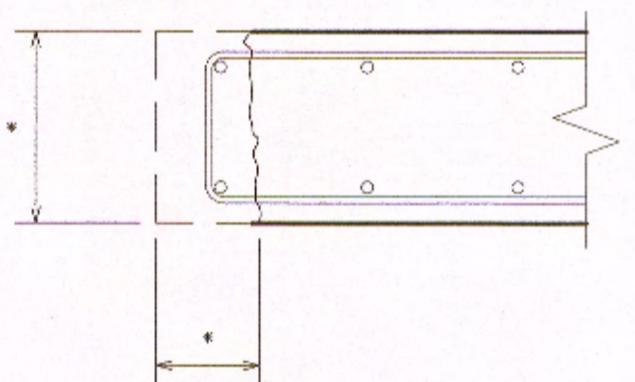


NOTES:

- SEE SPECIFICATIONS FOR SURFACE PREPARATION AND APPLICATION INSTRUCTIONS.
- ROUT AND SEAL PER SPECIFICATIONS WITH SILICONE SEALANT.
- REFER TO ACI RAP #2.

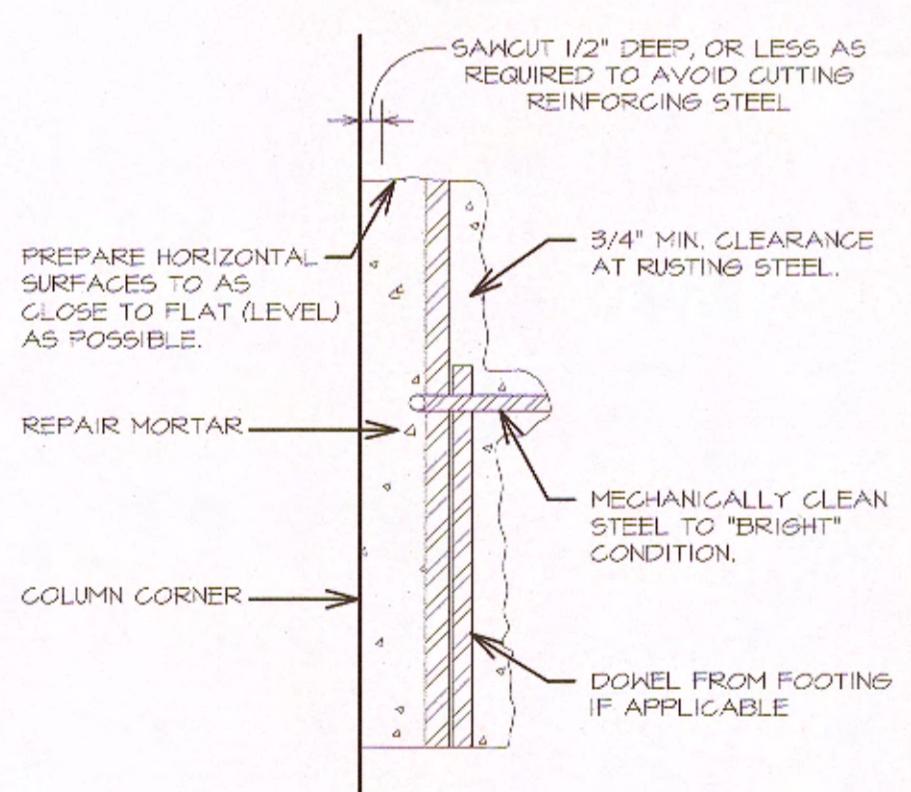
2 ROUT AND SEAL SLAB CRACK DETAIL

N.T.S.



4 COLUMN PLAN NOT TO SCALE

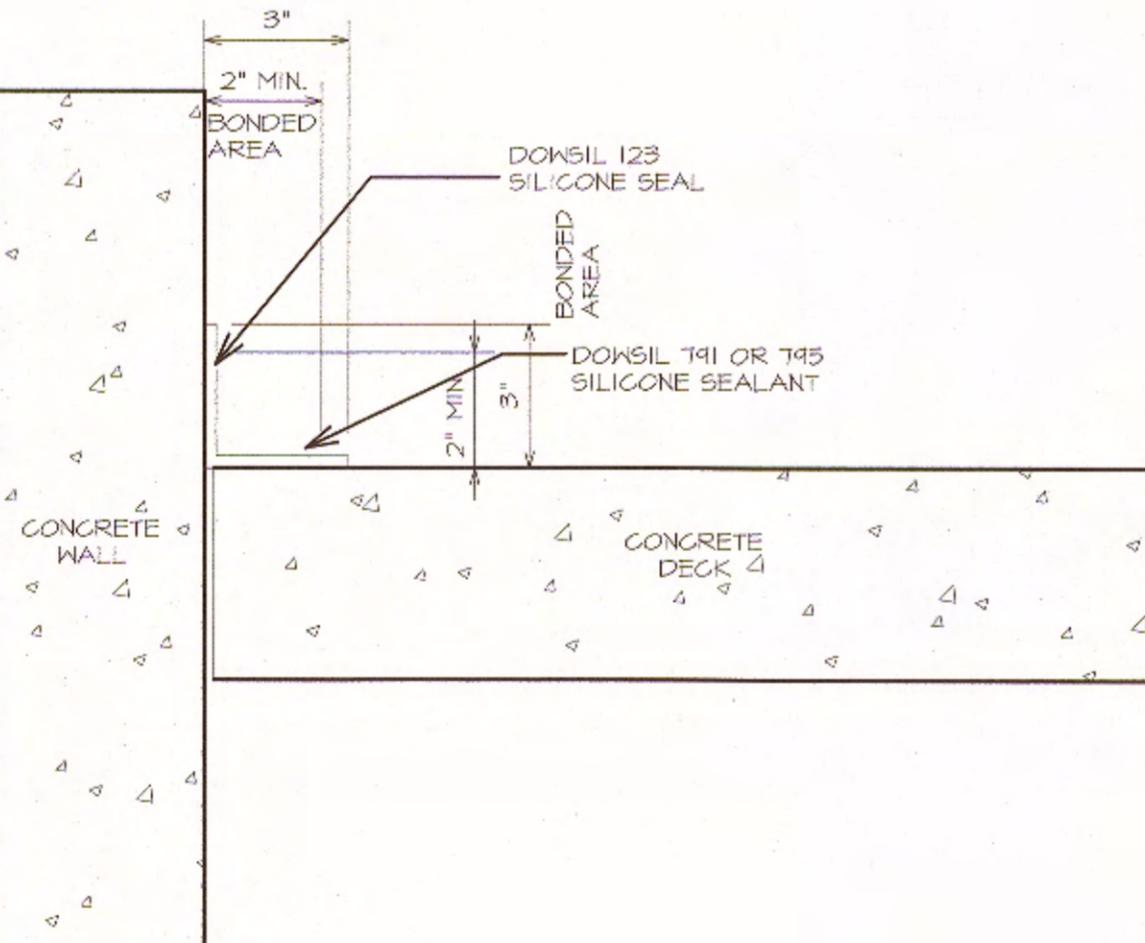
* UNLESS TEMPORARILY SHORED,
REPAIR AREA SHALL NOT
EXCEED 20% OF THE CROSS
SECTIONAL AREA OF THE
COLUMN OR SHEARWALL



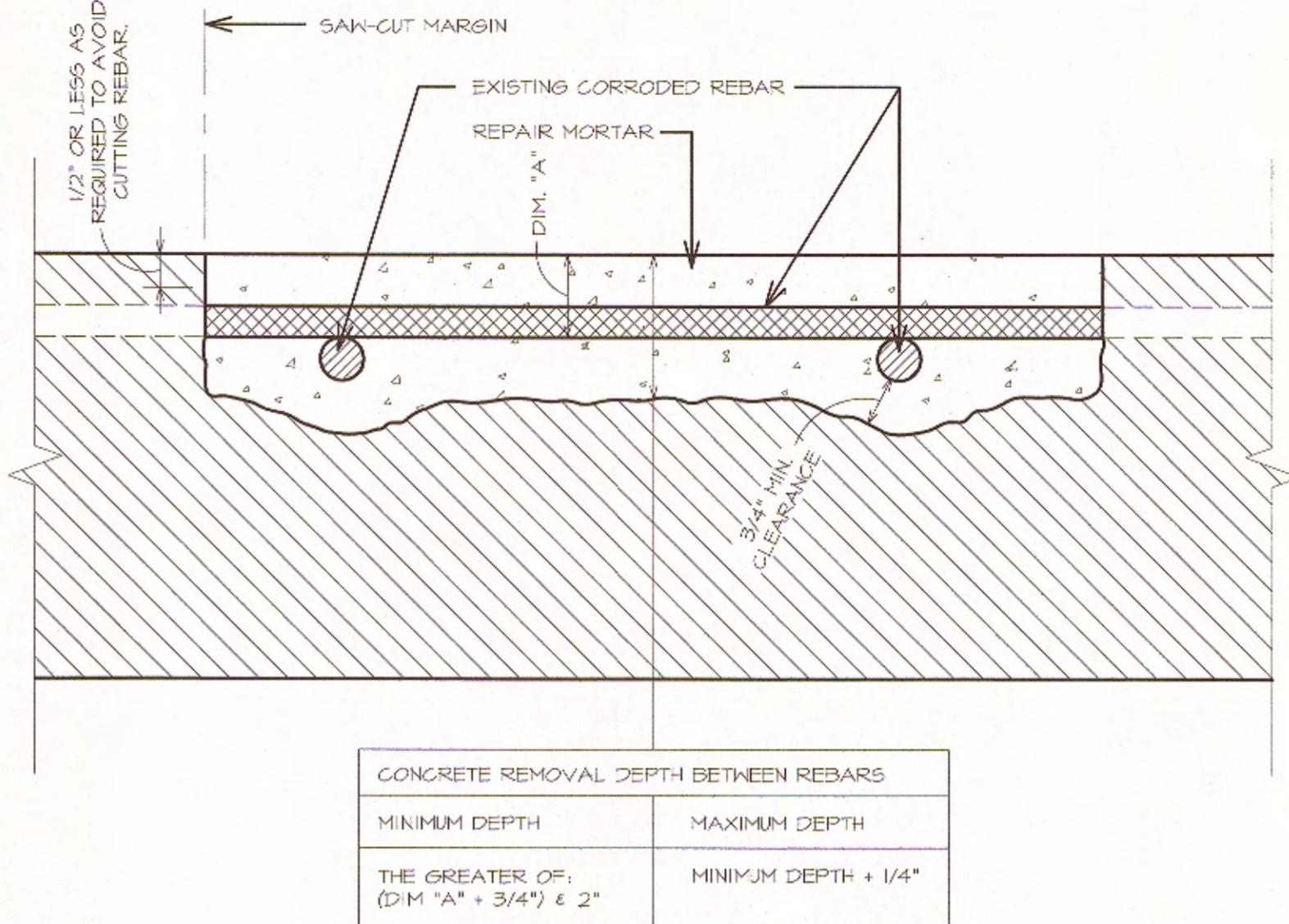
5 CORNER ELEVATION (CONCRETE REMOVED)

4A COLUMN REPAIR DETAIL NOT TO SCALE

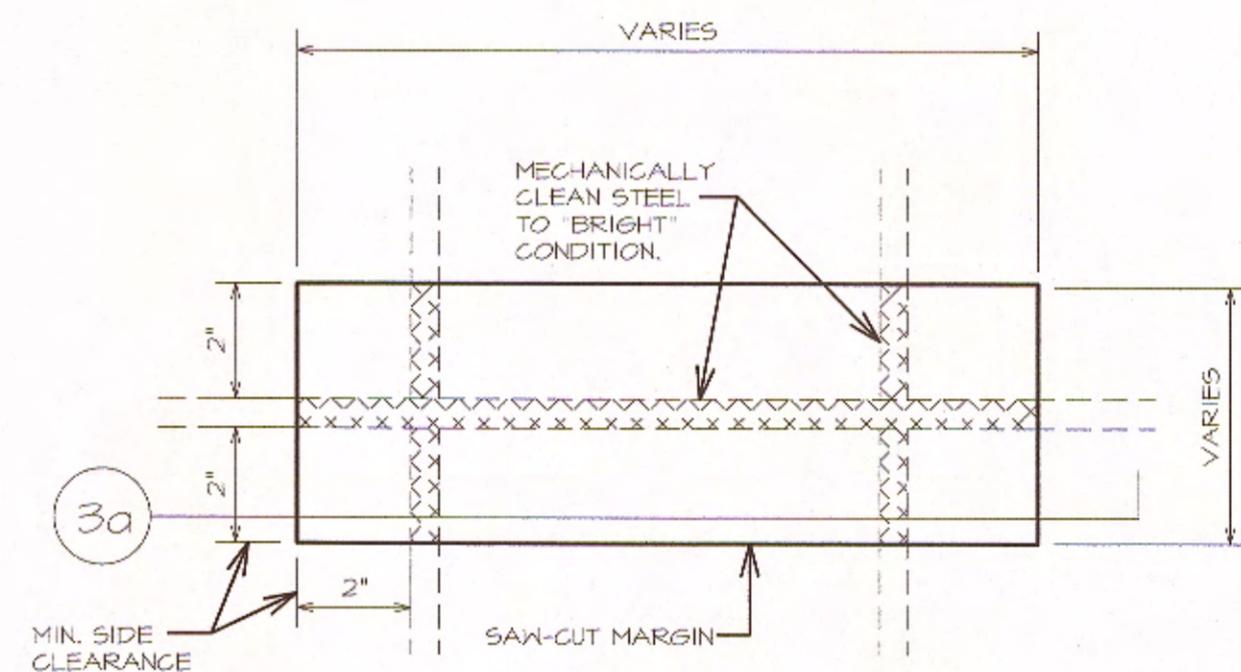
CONSTRUCTION NOTES:
1. REMOVE ALL LOOSE CONCRETE FROM EXISTING
COLUMN LEAVING A GUNGED SURFACE.
2. CLEAN ALL EXISTING COLUMN STEEL TO A
RUST FREE CONDITION.
3. APPLY BONDING AGENT/ANTI-CORROSION
COATING TO ALL SURFACES OF EXISTING
STEEL AND CONCRETE.
4. APPLY REPAIR MORTAR PER MANUFACTURER'S
INSTRUCTIONS.



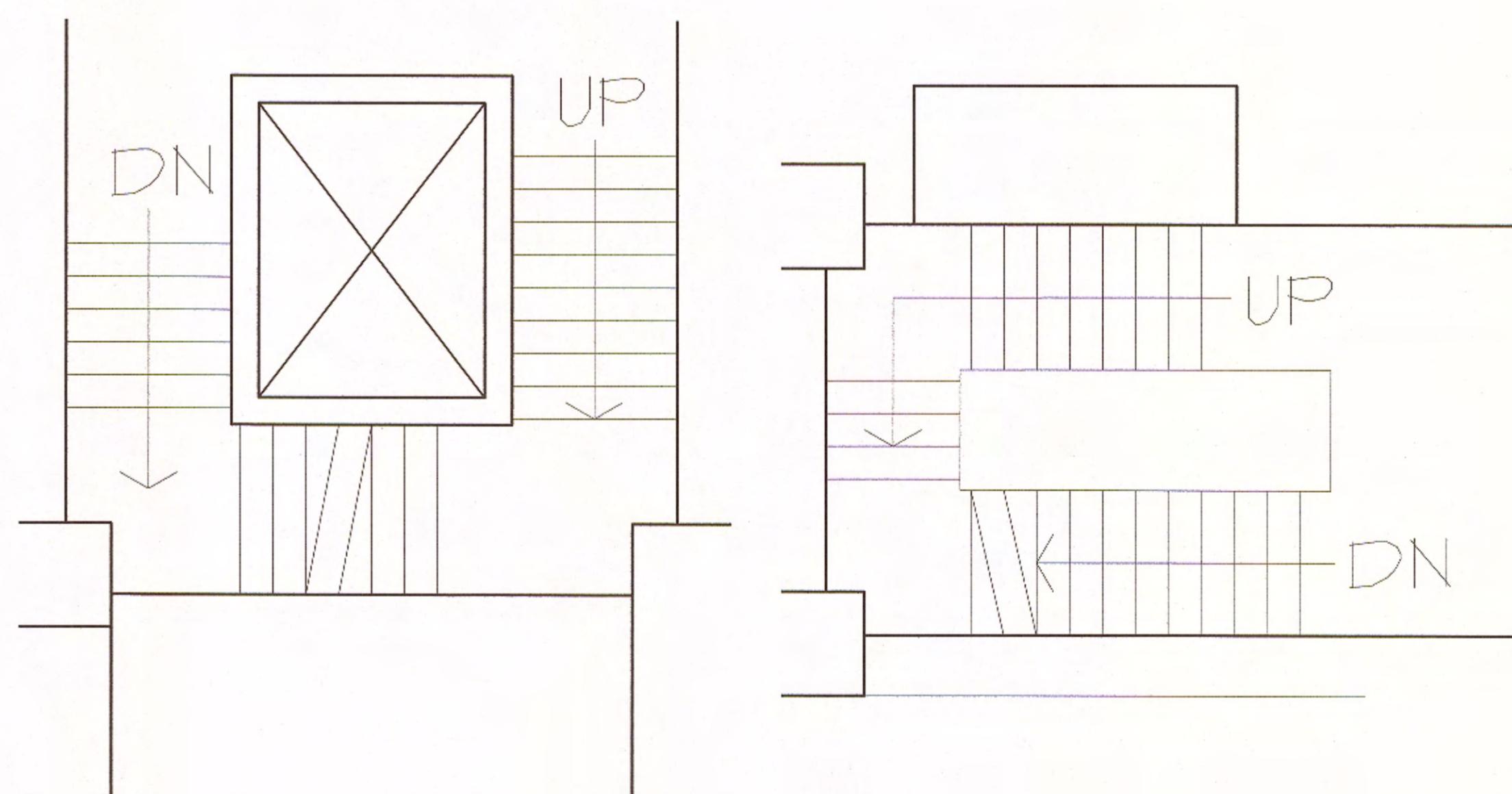
5 DOW 123 N.T.S.



3 DETAIL NOT TO SCALE



PLAN VIEW OF SLAB

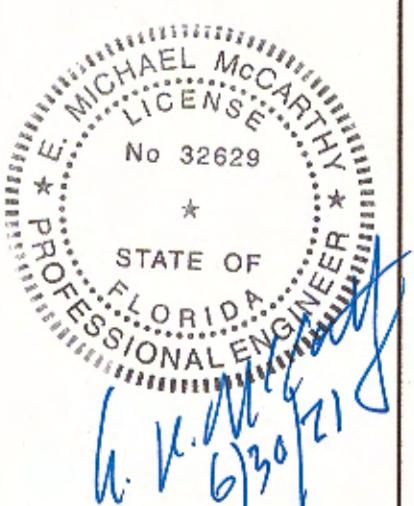


6 SOUTH STAIRS AT 33 1/4' D&E N.T.S.

7 NORTH STAIRS AT 13 1/4' N4 E5 N.T.S.

NOTES:

- REMOVE NOSING.
- SAND BLAST THE STAIRS.
- REPAIR STEEL RISERS AS NEEDED.
- PAINT PER TNEMEC SPECIFICATIONS.
- COAT DECK SURFACES PER TNEMEC SPECIFICATIONS.
- REPLACE SEALANT AT THE PERIMETER OF THE STRINGERS.
- REINSTALL NOSING.



STRUCTURAL
REPAIRS
(2021)

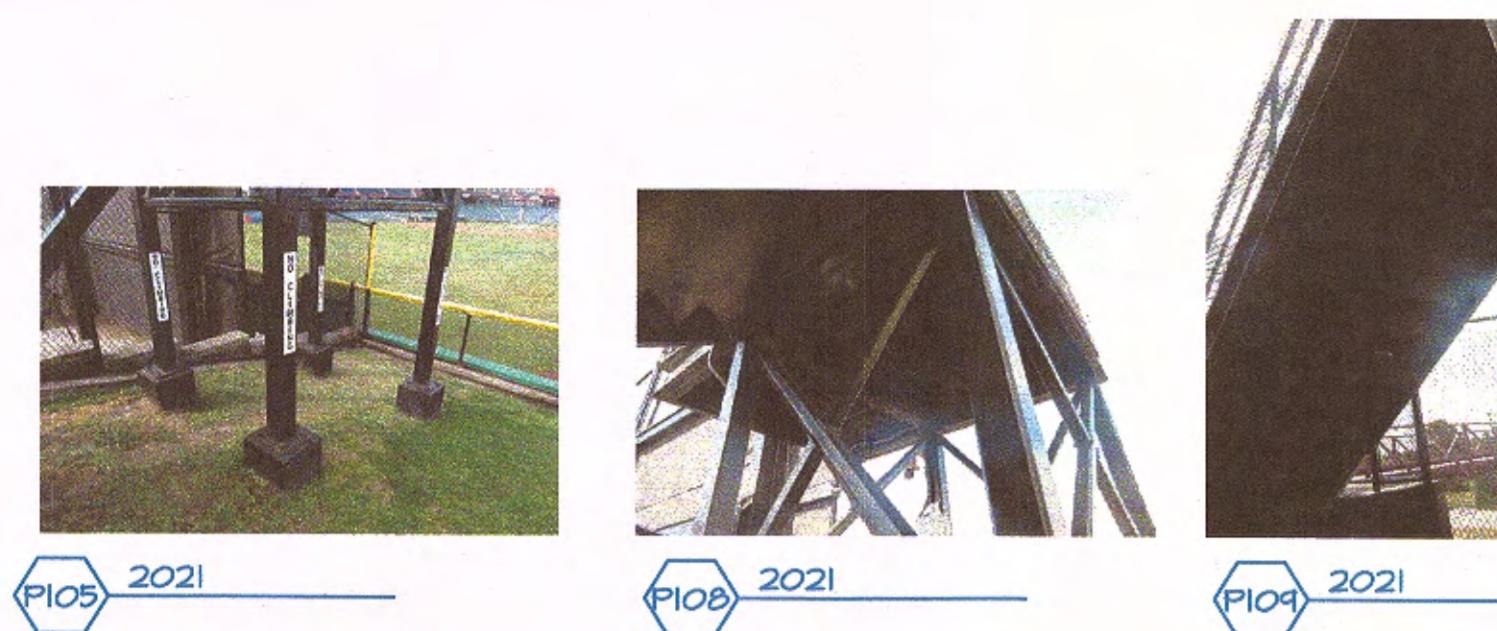
DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWRCC21006

SHEET
SR-11
II OF 12 SHEETS

Pennoni
5755 Rio Vista Drive
Clearwater, FL 33586-3137
E. Michael McCarthy, P.E.
Florida P.E. #2629
Pennoni Project No. CLWRCC2012

ISSUED FOR
BIDDING
06/30/21

DETAILS



NOTES:

- I. REFERENCING PHOTOS P105 THRU P109
2. SAND BLAST THE STEEL AND PAINT PER TNEMEC SPECS, EXCEPT FOR THE STAIR TREADS AND RISERS
3. PREP THE TOPSIDE DECK AND COAT PER TNEMEC SPECS.

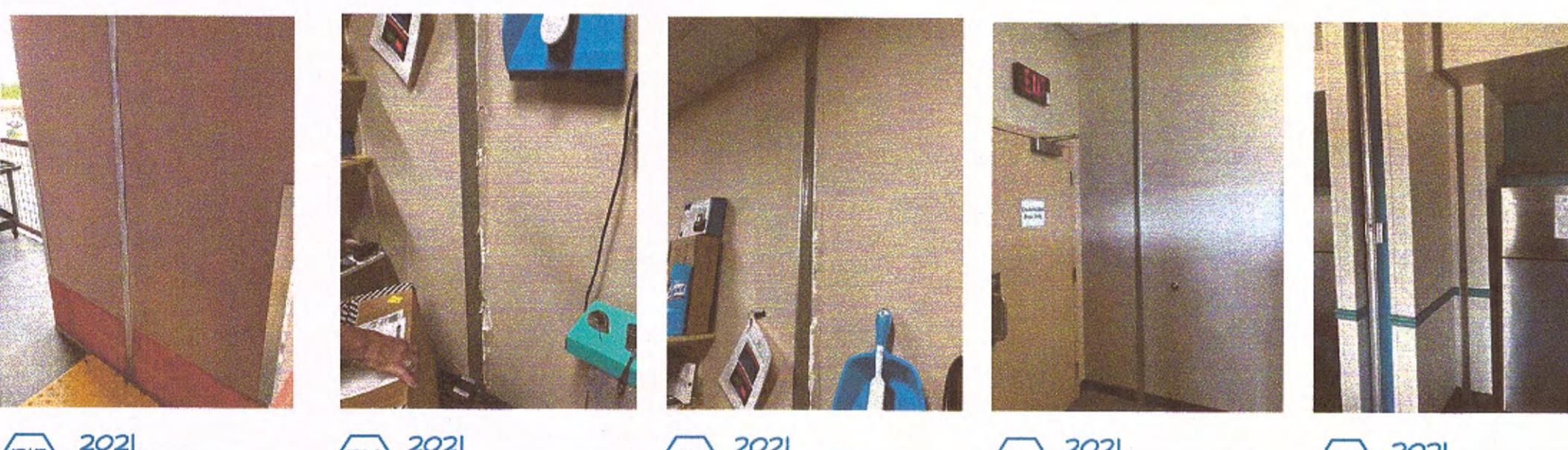
8



NOTES:

- I. REFERENCING PHOTOS P133 THRU P137.
2. THERE ARE FIVE (5) DOOR FRAMES LOCATED ON THE CONCOURSE LEVEL, AT THE NORTH END OF THE BALL PARK.
3. PREP AND PAINT PER TNEMEC SPECS

12



NOTES:

- I. REFERENCING P15 THRU P19
2. REMOVE AND REINSTALL EXPANSION JOINTS AND REINSTALL TO INCLUDE REPAIR DAMAGE TO THE WALLS, AND TOUCHUP PAINTING USING SW INTERIOR PAINTS TO MATCH.
 - a: WALL JOINT @ CL18 (EXTERIOR WALKWAY) SEE P15 (WABCO SEISMIC WEATHER SEAL) (SEE DETAIL #17)
 - b: WALL JOINT @ CL18 (EXTERIOR SIDE OF BUILDING COLUMN - FULL HEIGHT OF BUILDING) (WABCO SEISMIC WEATHER SEAL) (SEE DETAIL #17)
 - c: WALL JOINT @ CL18 (INSIDE SOUND EQUIPMENT ROOM) SEE P16. (WABCO CORRIDORWRAP CWWS-200/300) (SEE DETAIL #18)
 - d: WALL JOINT @ CL18 (INSIDE SOUND EQUIPMENT ROOM) SEE P17. (WABCO CORRIDORWRAP CWWS-200/300) (SEE DETAIL #18)
 - e: WALL JOINT @ CL18 (INSIDE WRITING PRESS BOX) SEE P18. (WABCO CORRIDORWRAP WC) (SEE DETAIL #18)
 - f: WALL JOINT @ CL27 (INSIDE SUITE 206) SEE P19. (WABCO CORRIDORWRAP WC) (SEE DETAIL #17)

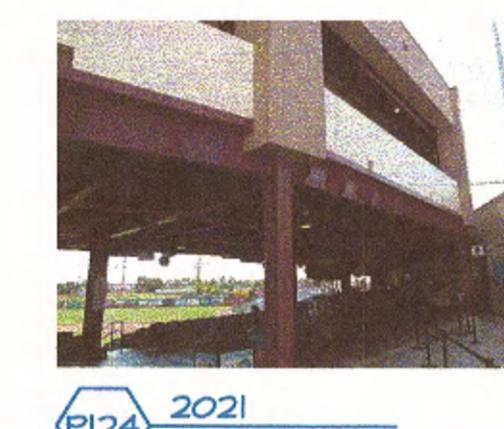
16



NOTES:

- I. REFERENCING PHOTOS P116 THRU P119
2. AS PART OF THE BASE BID, PREP AND PAINT THE FADED STEEL FRAME PER THE TNEMEC SPECS.
3. AS AN ALTERNATE, PREP AND THE ENTIRE STEEL FRAME PER THE TNEMEC SPECS.

9



NOTES:

- I. REFERENCING PHOTOS P13 THRU P125.
2. PATCH WHERE EXISTING METAL FLASHING WAS REMOVED BY PREPPING AND APPLYING AN EPOXY GEL COAT, THEN GRIND SMOOTH.
3. PREP AND PAINT THE LENGTH OF THE META FLASHING.

13



NOTES:

- I. SAND BLAST AND PAINT THE POLE BASE PLATE PER TNEMEC SPECS.
2. THE POLE IS NOT TO BE PAINTED.

10

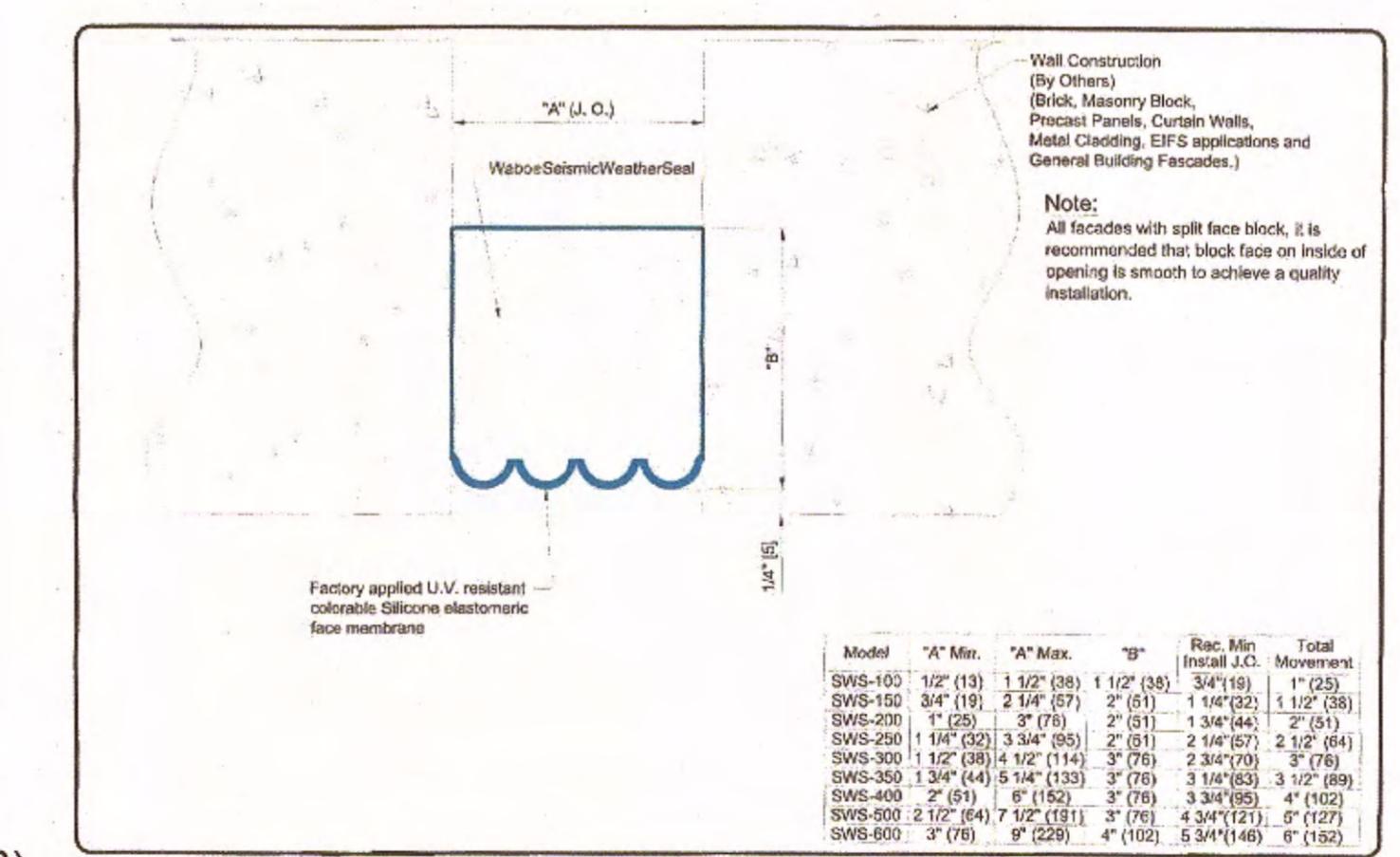


P131 2021

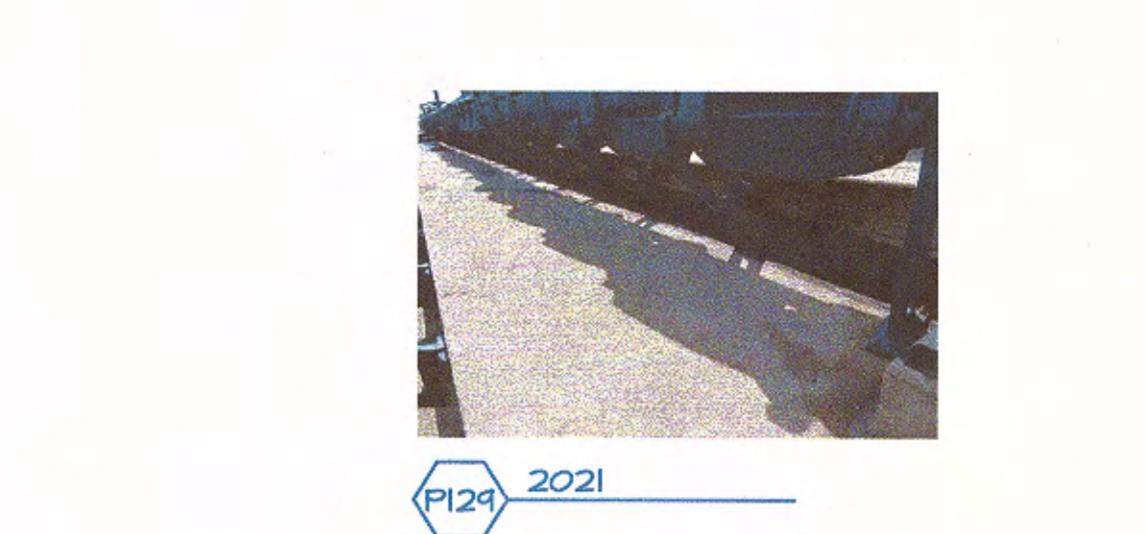
NOTES:

- I. REMOVE THE EXISTING FAILED SEALANT EXPANSION JOINT.
2. INSTALL SIX (6) INCH - WILLSEAL 250 EJ, IN ACCORDANCE WITH THE MANUFACTURES SPECIFICATIONS.

14



17



P124 2021

NOTES:

- I. REFERENCING PHOTOS P129 THRU P132 AND DETAIL 5/SR-11.
2. DOW 123 WAS INSTALLED IN 2020 BETWEEN CL37 TO CL39 TO STOP LEAKS AT THIS JOINT.
3. DOW 123 IS TO BE INSTALLED UNDER THIS CONTRACT FROM CL40 THRU CL8, EXCLUSIVE OF CL37 TO CL39
4. WORK WILL INCLUDE REMOVAL AND SUBSEQUENT REINSTALLATION OF ALL SEATING.

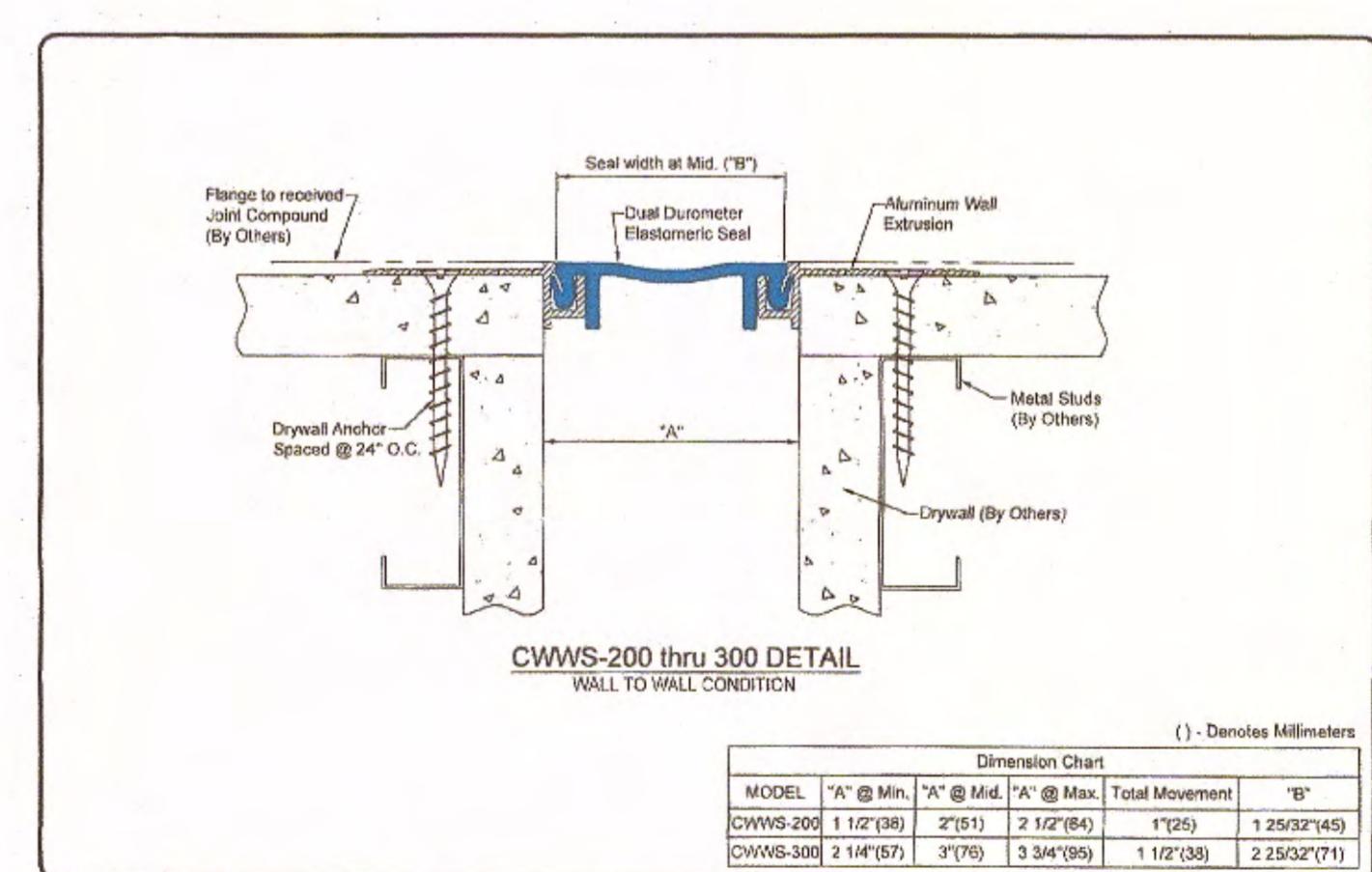
11



NOTES:

- I. SURVEY AND VERIFY THE # OF LOCATIONS AT THE WEST AND SOUTH ENTRANCES WHERE THE WALL LIGHTS ARE DAMAGED.
2. REPLACE THE JOINT SEAL AT ALL LOCATIONS WHERE THE SEALANT IS DAMAGED.
3. INSTALL AT ALL LOCATIONS WHERE THERE IS NO EXISTING SEALANT. THREE (3) SIDES.

15



18

MICHAEL McCARTHY
LIC# No 32629
STATE OF FLORIDA
PROFESSIONAL ENGINEER
G. U. B. 2/21

SHEET
SR-12
12 OF 12 SHEETS

BAYCARE BALL PARK
601 N OLD COACHMAN ROAD
CLEARWATER, FLORIDA 33765

STRUCTURAL
REPAIRS
(2021)

DATE: 06/30/21
SCALE: 1" = 40'-0"
JOB: CLWR21006

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Michael McCarthy, P.E.
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