

Inspection Engineers, Inc.

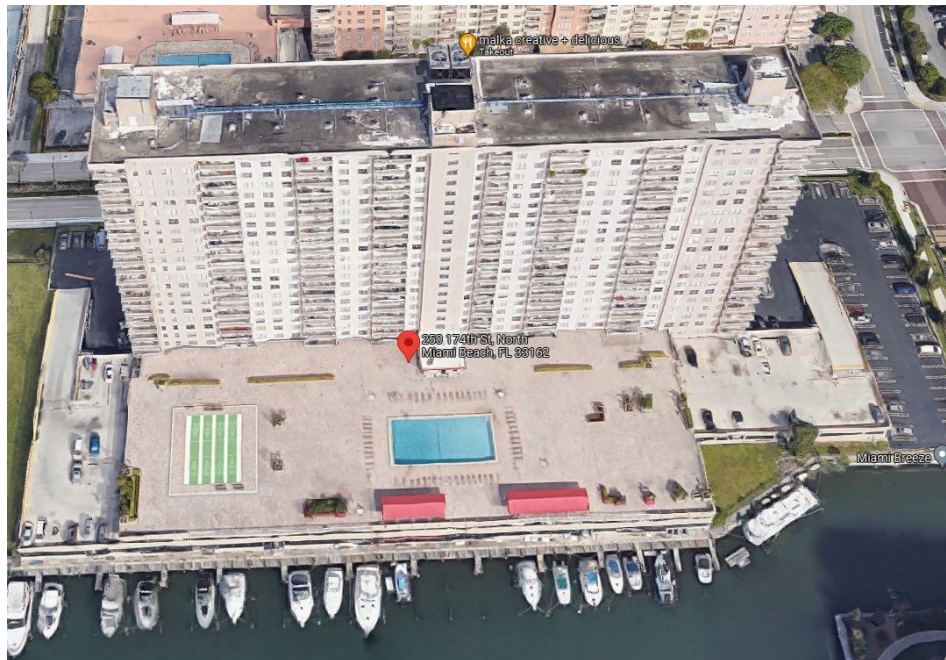
6135 NW 167th Street, Suite E28
Hialeah, Florida 33015
Phone: (305) 232-8691
Email: InspectionEngineersInc@gmail.com
Website: www.InspectionEngineersInc.com



BID PACKAGE W/ PROJECT MANUAL & SPECIFICATIONS

PREPARED FOR:

WINSTON TOWER 100 ASSOCIATION, INC.
250 174TH ST, SUNNY ISLES, FL 33160



PREPARED BY:

INSPECTION ENGINEERS, INC.
6135 NW 167TH STREET, SUITE E28
HIALEAH, FL 33015
PH: (305) 232-8691

JUNE 6, 2022

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FOREWORD

We, Inspection Engineers, Inc., have been hired to perform a visual inspection of the parking building located at 250 174th St, Sunny Isles Beach FL 33160 and based on such evaluation, describe the findings and provide proper recommendations and bidding package.

DISCLAIMER

It is important to note that the quantities provided are estimates from the visual inspections performed by our engineers. Actual quantities may vary once the contractor begins working on some of the areas. The actual quantities will be verified and accounted for by our engineers only. This package represents an accurate representation of the present conditions of the building as per visual observation and therefore, does not include inferences concerning the adequacy of the structural components since no destructive or environmental testing was performed. The extent of the visual inspection performed is not portrayed to be sufficient to accurately determine conceal conditions or defects, or predict the implications of such conditions in the future.

This inspection is made on the basis of what is readily accessible and visible. No attempt was made to uncover, remove or expose hidden areas. This package does not constitute a guarantee of any kind.

In our opinion, the subject property is generally in fair condition, based on the age* and above noted comments, and assuming that normal and proper construction methods and/or updates or repairs were employed where hidden. This assumes that recommendations or comments made in this bid package are properly performed, repaired or checked by qualified and/or licensed contractors. Firm quotations will be obtained from licensed contractors for repairs to any of the below items.

OBSERVATION AND EVALUATION

The building was built in 1970, using the typical construction methods applied to those years.. Every wall, floor, column, slab and accessible beam was evaluated around the parking building. As a result of our inspections, we found critical areas to be repaired or replaced and created a bid package with the most accurate representation of the quantities and amount of damages to be repaired including a typical procedure per case.

Bidding and Contract Requirements

Section I: Invitation to Bid

INVITATION TO BID

Owner: Winston Tower 100 Condominium Association
250 174th St,
Sunny Isles Beach FL 33160

Engineer: Inspection Engineers, Inc.
6135 NW 167th Street, Suite E28
Hialeah, FL 33015
Attn: Douglas H. Mercado

Dear Contractor,

Your firm is invited to submit an offer under seal to the attention of Winston Tower 100 condo Association located at the above indicated address. Your bid must be received by **July 15, 2022 before 4pm** for the following project:

Description: concrete restoration of building parking garage - optional pool and pool deck
Location: 250 174th St, Sunny Isles Beach, FL 33160

- Documents can only be obtained by the General Contractor.
- Refer to other bidding requirements described in Instruction to Bidders on the package.
- Submit your offer on the Bid Form provided with the package. Bidders are required to complete the Bid Form as required. Bidders may supplement this form as appropriate.
- Your offer will be required to be submitted under a condition of irrevocability for a period of 90 days after submission.
- The Owner reserves the right to accept or reject all offers.

Your bid quote signed and sealed must be delivered directly to Winston Towers 100 Condominium Association no later than **July 15, 2022 by 4:00 PM.** Any bid not delivered or received signed and sealed by this date and time will not be considered. Please provide 2 copies of your bid: one for the client and one for the engineers who will assist the client in reviewing and selecting the best possible bid. We will accept an emailed copy to assistant@winstontowers100.net and levsolo@gmail.com.

Please contact our office if you have any questions.

Sincerely,

Douglas H. Mercado
President

Section II: Instructions to Bidders

RELATED DOCUMENTS

- A. Repair Specifications prepared by .
- B. Bid Form – Unit Prices
- C. Supplementary Conditions
- 1. Insurance requirements.
- 2. Bond types and values (if required).

2.1 SITE EXAMINATION

- A. Examine the project site before submitting a bid.
- B. The bidder is required to contact the Engineer at the following phone number or via email in order to arrange a date and time to visit the project site: Attn: , Inspection Engineers, Inc., P.E.

2.2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. Contractor shall perform all other work that is reasonably inferable therefrom as being necessary to accomplish the intent of the scope of work set forth in the Contract Documents, and as required by all applicable laws, ordinances and rules and regulations of any governing authority including but not limited to the current edition of the Florida Building Code and any local amendments Building Restoration Scopes per EXHIBITS A – E Contractor shall leave the Project site in a broom clean condition upon completion of the Work.

2.3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

Contractor shall apply for permits with the City of Sunny Isles Beach Building Department within five (5) business days after execution of this Agreement and diligently pursue their issuance. The Work shall commence no later than fifteen (15) calendar days after issuance of

the permit or a written Notice to Proceed issued by the Association's Representative, whichever occurs later (the "Commencement Date").

2.4 THE CONTRACT TIME SHALL BE MEASURED FROM THE DATE OF COMMENCEMENT.

2.5 The Contractor shall achieve Substantial Completion of the entire Work not later than two hundred seventy days (270) days from the date of commencement as set forth in Article 3.1(for purposes of illustration, working days do not include weekends, Federally recognized holidays, days of extreme weather, building or common area closure days, or any other day that Contractor is prevented from working on the Project for any reason that is not expressly attributable to Contractor's actions or inactions.)

Minimum number of workers, 10.

The following days shall be excluded from total days of completion 1. Rain Days (for work to be performed on the roof level only), However, no extensions shall be given for rain days for work necessary to complete for the garage project 2. Federal Holidays 3. Weekends (Sat-Sun). Additional days will be added if new scopes or quantities are added to contract. All Rain days and delay shall be documented on daily occurrence. A 5 Day Work Week shall be in effect. Due to the rain, anything less than 4 hours of work will be considered as a rainy day, anything 4 hours or more will be considered a full day.

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

2.6 Liquidated Damages. It is mutually agreed between the parties that time is of the essence of this Contract, and in the event the project is not completed within the time and in the manner specified in this Contract (hurricane or storm delays notwithstanding or other reasonable delays such as additional work or inability to obtain materials or other reasons beyond the control of Contractor), it is agreed that from the compensation otherwise to be paid to the Contractor, the Owner may retain the sum of Five Hundred Dollars (\$500.00) per day for each day thereafter, that the work remains uncompleted and the Owner is denied full benefit of completion of the project, which sum Owner and Contractor agree represents the damages the Owner will have sustained per day for the failure of the Contractor to complete the project within the time stipulated. Requests for extensions due delays must be made in writing within seven days from incurring the delay indicating the reason for such delay and shall indicate the number of days lost due to such delay. The parties agree that this sum is not a penalty.

Section III: Bid Form

BID FORM – UNIT PRICES

To: WINSTON TOWER 100 CONDOMINIUM ASSOCIATION
250 174TH ST, SUNNY ISLES BEACH, FL 33160

Project: concrete restoration of building parking garage - optional pool and pool deck

Date: JULY 15, 2022
Submitted by: BEACH CONTRACTING
Address: 4002 N 30 AVENUE
HOLLYWOOD, FL 33020

1. OFFER

Having examined the Worksite and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by the Engineer for the above referenced project we, the undersigned hereby offer to enter into a Contract to perform the Work for the Unit Prices listed in this Bid Form in lawful money of the United States of America.

All applicable Federal and State of Florida, Miami-Dade County taxes are included in the Unit Prices.

2. ACCEPTANCE

This offer shall be open to acceptance and it is irrevocable for ninety days from the bid closing date.

If this bid is accepted by the Owner within the time period stated above, we will:

- Execute the Agreement within seven days of receipt of acceptance of this bid.
- Furnish the required bonds (if any) within fourteen days of receipt of acceptance of this bid. Commence work to obtain Construction Permit within two weeks after written acceptance of this bid.

3. CONTRACT TIME

Complete the Work in (43) calendar weeks from commencement of Work.
Please provide an accurate time frame for the completion of the work.

4. UNIT PRICES AND ESTIMATED QUANTITIES

Item	Description of Work	Unit	Qty	Unit \$	Sub total \$	Not Exceed
CONCRETE RESTORATION						
1	Concrete columns spall, partial-depth up to 4"	CF	180	340	61,200	
2	Concrete beam spall	CF	90	340	30,600	
3	Concrete columns spall - 2 to 3 full-depth	CF	320	340	108,800	
4	Honey combs in columns	SF	120	85	10,200	
5	Shoring and Safety Protection	LS	1	187,820	187,820	
CONCRETE SLAB						
6	Full depth concrete spall (slab 5 inch)	SF	1,010	147	148,470	
7	Partial depth up to 3 inches	SF	700	127	88,900	
8	Slab cracks, route and seal	LF	4,600	8	36,800	
9	Soffit cracks, route and seal	LF	340	15	5,100	
10	Concrete edge repair	LF	120	169	20,280	
11	Concrete joists repair (honeycomb and spall)	SF	340	190	64,600	
12	Expansion Joints remove and replace.	LF	300	185	55,500	
13	Concrete noising of Expansion Joist Repair	LF	210	58	12,180	
14	Construction joint repair (route and seal)	LF	1,200	15	18,000	
CONCRETE RAMPS						
15	Partial depth up to 3 inches	SF	96	95	9,120	
16	Slab cracks (structural)	LF	160	75	12,000	
17	Concrete columns spall, partial depth up to 4 inch	CF	6	500	3,000	
18	Concrete joists repair (honeycomb and spall)	SF	8	290	2,320	
PERIMETER WALLS						
19	Concrete wall spall	SF	28	95	2,660	
20	Repair loose stucco	SF	820	16.50	13,530	
21	Cracks on the wall, roue and seal	LF	180	9	1,620	
Sunken area, repair floor and wall (bike site area)						
22	Remove and pour new concrete beam	CF	18	350	6,300	
23	Remove and install new concrete block wall	SF	130	85	11,050	
24	Remove and fill with compacted soil	CF	50	125	6,250	
25	Pour new asphalt	SF	120	55	6,600	
26	Mobilization	LS	1	38,500	38,500*	+ PERMIT BILLED AT COST
27	General Conditions	LS	1	274,330	274,330	
28	Payment & performance bond (%)			2.9%	35,836	
Total Estimate					1,271,566	
Optional Work - Pool, Pool Deck & Planters						
	Removal pavers	SF	54,000	5.25	283,500	**TREMCO
	Removal original waterproofing membrane	SF	54,000	5.25	283,500**	350/345/346
	Applying new waterproofing membrane	SF	54,000	4.95	267,300	10 YR. WARRANTY
	Repair concrete damaged	UC				
	Remove and fill soil	CF	1,300	45	58,500	
	Waterproofing inside of planters	SF	3,200	25	80,000	
	Epoxy filling hairline cracks prior to waterproofing	LF	500	18	9,000	
	Zurn drains	EA		2,750	2,750	

	Replace cast Iron Pipe with PVC	EA				
	New Planters	EA				
	Paint on Walls and piping	EA				
	Restroom Remodeling and Code updated	EA				
	New Electrical lights on Pool Deck	EA				
	New BBQ station, gas pip[ing]	EA				
	Optional work Total					

Please provide Unit Prices and total prices for each task including labor and materials.

THE CONTRACTORS WILL BE PROVIDED WITH MICROSOFT EXCEL SHEETS WITH THE QUANTITIES SPECIFIED IN THE “ESTIMATE OF REQUIRED WORK” SHEETS THAT ARE ATTACHED AT THE END OF THIS BID PACKAGE. THIS WILL FACILITATE THEIR PROPOSAL PRESENTATION.

Contractor MUST visit the site, get familiar with the work. Most of the Restoration Concrete repairs are marked on the drawing. It is contractor responsibility to verify All visible cracks and damages, which are the part of the bid. Any repairs for NON visual damages will be treated as an extra or change order and have to be approved by Engineer and the Special Inspector. Any spider/hairline small cracks found on the pool deck, which required an epoxy injection, will be part of the job and no separate charge will be allowed.

Every indicated unit will be paid based on actual measurements certified by the Special Inspector. If non-specified units appear or the number of approved units increases, a change order will be prepared between the Contractor, the Engineer and the Special Inspector. No work can be started and will not be paid if not previously approved by the Owner.

5. APPENDICES

The following information has to be included with the Bid submission:

1. Copy of General Contractor license.
2. Certificates of insurance.
3. Workers Compensation Policy
4. List of three projects in which work similar to that specified herein was successfully completed.

5. Technical data sheets for products intended for use if different from those specified.

6. BID FORM SIGNATURE (S)

The Corporate Seal of
BEACH CONTRACTING

(Bidder – print full name of firm)

was hereunto affixed in the presence of:

JUSTIN ZISQUIT

(Authorized signing officer)

OWNER

(title)

(Seal)

(Authorized signing officer)

(title)

Section IV: Supplementary General Conditions

Permits fees to be paid by the contractor and reimbursed by the Owner upon presentation of receipts. If additional Engineering Plans and Calculations are required by the Building Department for Construction Permit approval, these will be paid by the Contractor and reimbursed by the Owner.

If a Performance Bond is required by the Owner, the actual cost of such Bond will be reimbursed to the Contractor within 2 weeks of the actual bond payment by the Contractor.

The cost of ANY swing stage shall be clearly specified under General Conditions and the Contractor is obligated to inform the Engineer or the Special Inspector when a swing stage is required and for how long it will be required. The invoice for the swing stage use has to be verified and accepted by the Special Inspector before it is presented to the Owner.

Project Manual Specifications

SECTION 1: SUMMARY OF WORK – CONCRETE RESTORATION

PART 1 - GENERAL

1.1 PROJECT/WORK IDENTIFICATION

1.2

Concrete Restoration of the parking building (optional pool and pool deck repairs) located at 250 174th St, Sunny Isles Beach– Florida, 33160.

1.2 CONTRACT BONDS

A. The Contractor **is required** to furnish and pay for a Performance Bond and a Labor and Material Payment Bond in an amount equal to 100% of the full amount of the Contract as indicated in the Contractor's proposal. The cost of the Bond shall be re-paid back to the Contractor by the Owner.

B. The Owner reserves the right to require the Contractor to furnish said bonds (in such form and amount as the Owner may prescribe) at time of executing the Contract. Cost of the bond premiums shall be reimbursed separately by the Owner to the Contractor. The Contractor shall provide a breakdown of the fees for the bond.

C. Contractor shall deliver the required Bonds to the Owner at the time of executing the Contract, or if the work is commenced prior thereto in response to a letter of intent, Contractor shall, before commencement of the work, submit satisfactory evidence that the bonds will be issued within the time acceptable to the Owner.

D. The bonds shall be issued by a Surety Company satisfactory to the Owner and duly authorized to operate within the State of Florida, and the Contractor shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto certified and current copies of the permit to operate and of power of attorney, indicating the monetary limit of such power.

E. The Owner, at his option, reserves the right to place the Bonds at his own expense, with companies and through agents of his own choosing.

1.3 PARAMETERS DURING CONSTRUCTION

A. During construction, the Contractor may assume the following requirements and restrictions:

1. All work shall be performed from Monday to Friday (non-holiday days) between 9:00 AM and 5:00 PM.
3. Contractor will be provided areas for parking, staging and deliveries.
4. Removal and installation of all structural elements must be performed in a safe manner and coordinated with Management, Engineer and Special Inspector.
5. Contractor shall provide barriers for security and to protect each unit from the weather elements during construction when not working.
6. Daily work shall be limited to the amount of work that can be removed and closed up during that time period.
7. Contractor shall provide a staff representative to remain on site during working hours to handle emergency conditions causing hardship to users.
8. Contractor shall provide safeguards during construction to provide safety and protection of adjacent public and private properties in strict compliance with chapter 13 of Existing Building, Florida Building Code 2017, Sixth Edition.

1.4 SCHEDULING

A. The contractor shall provide a detailed schedule for all work based on the work description detailed in the sheets titled General Estimate of Work Required which are attached as part of these documents. This schedule shall be analyzed and updated every 2 weeks in a meeting between the Owner, the Contractor and the Engineer.

1.05 SUBSTITUTIONS

The Engineer will consider formal requests from the Contractor for substitution of products in place of those specified, except in cases of items specifically followed by the words “no substitutions”. Such written requests should include the following:

- A** Complete data substantiating compliance with contract intent.
 - B** Product identifications, Manufacturer’s literature, reference standards.
 - C** Detailed description of proposed method(s).
 - D** Itemized comparison of proposed substitution with specified product.
 - E** Changes to construction Project Schedule, if any.
 - F** Accurate cost comparisons between substitute and that specified.
- No substitution shall be used without prior Owner’s and Engineer’s written approvals.

1.6 CONSTRUCTION MEETINGS, SCHEDULES & FINANCIAL UPDATES

1. The Contractor shall be responsible for the on time maintenance of the construction Project Schedule and general supervision of the Work to be performed. If for any reason the Project Schedule is to change, the Contractor is responsible to update the Project Schedule and submit revisions to Engineer and Owner. This does not alter in any way performance or completion dates as stipulated by the Contract.
2. The Contractor shall also provide, on an ongoing basis, accurate financial data to the Engineer relative to quantities along with current and projected project costs.
3. The Contractor shall also participate in recurring construction meetings on a weekly basis or at a schedule agreed to by Owner, Engineer and Contractor.

1.07 PERMITS, FEES, AND NOTICES

- 1 Except as specifically approved by the Owner in writing, the Contractor shall secure and pay for all licenses as may be necessary for the proper execution and completion of his Work, which are applicable at the time the bids are received whether or not effective or scheduled to go into effect, and shall obtain and pay the costs of any approvals, permits, and fees that may be required by local authorities.
- 2 Contractor shall pay all applicable sales, consumer and use taxes.
- 3 Contractor shall qualify and obtain all required permits. All Subcontractor permits are to be secured by the Contractor or Subcontractor as the Contractor may determine.

4 A copy of all required permits, licenses, certificates, and approvals shall be delivered to the Engineer and a copy shall be posted in a prominent location at the Project site prior to the commencement of the Work.

5 The Contractor shall give notices and comply with laws, ordinances, rules, regulations, and orders of public authority bearing on the performance of his Work. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing and necessary changes shall be adjusted by appropriate notification. If the Contractor performs any Work either knowing, or properly expected to know, it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, the Contractor shall assume full responsibility and shall bear costs attributable thereto. The Contractor shall use adequate numbers of supervisors and skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specification requirements and methods needed for proper performance of the Work in this specification.

6 Work shall be carried out in such a way as to minimize any inconvenience to the Owner. The Contractor shall maintain a full work force from start to finish and shall have a qualified foreman on the job at all times.

7 The Contractor shall provide the Owner recent certificates of insurance, indemnifying the Owner including, but not limited to the following: WORKMAN'S COMPENSATION, BODILY INJURY, and PROPERTY DAMAGE. There shall be no lapse in coverage throughout the course of the Project.

8 The Contractor, having started the Work, will continuously and expeditiously proceed with its prosecution until completion in strict accordance with the Project Schedule.

9 Quality assurance representatives from the product manufacturers and/or suppliers that are included in these Specifications shall make periodic inspections before, during, and upon completion of the Project. Copies of each inspection shall be submitted to both the Engineer and Owner within five (5) working days.

1.8 ADDITIONAL WORK OR WORK NOT ANTICIPATED

1 All Work anticipated to be performed on this Project is included at no extra cost. Otherwise separate pricing must be provided for in the contract, or in a contract addendum, or as approved by the Owner in writing.

2 Any additional Work requested or unanticipated Work needed must be brought to the attention of the Engineer before the Work is performed. Any questions regarding pricing for the Work must be resolved before the Work is performed. The Contractor shall have the opportunity to propose pricing for any such Work not covered by contract. Any such Work should only be performed upon acceptance of the proposed pricing by the Owner or the Engineer in writing.

3 The Owner is not obligated to make payments for any such Work performed that is not provided for in the Contract, or a contract addendum, or approved by the Owner in writing.

END OF SECTION

SECTION 2: WORK REQUIRED ON CONCRETE RESTORATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide labor, materials and necessary tools, equipment and services to complete the work as required by the attached estimated quantities.
- B. Do all the work as specified or directed and as required by the conditions indicated on the estimates.

1.2 JOB CONDITIONS

- A. Contractor shall visit site to determine actual scope of concrete restoration requirements.

PART 2 - EXECUTION

- 2.01** Work shall be executed in an orderly and carefully manner, with due consideration for the Condominium residents and visitors who must continue to utilize the building facilities throughout the period covered by the work.
- 2.02** All work performed under this Section shall fully comply with the requirements and regulations set forth by all governing authorities.
- 2.03** When doing work against adjoining spaces, leave adequate support at each stage and arrange for inspection by the Special Inspector. Proceed with subsequent concrete removal as instructed. Do not disturb adjoining spaces.
- 2.04** Remove all detached materials, debris, and rubbish from the site as soon as practicable. Do not permit any accumulation on the site.
- 2.05** After completion of the preparation work, leave area neat and orderly.
- 2.6** Protect the areas scheduled to remain and, if damaged, repair to match existing work.
- 2.7** Protect parts of the existing areas scheduled to remain. Cut away carefully the parts to be demolished to reduce the amount of necessary repairs.
- 2.8** Prevent accumulation of debris and overloading of any parts of the structure.
- 2.9** Prevent access of unauthorized persons to partly demolished structures and work.

2.10 The Contractor shall be responsible for the legal disposal of excess and demolition materials in area or areas away from the side of the work, without incurring any liability against the Owner.

2.11 The Contractor shall exercise extreme care in the removal and handling of the materials indicated or specified to be reused such as the metal railings. Reusable material that is damaged by improper care or negligence of Contractor's employees shall be replaced by the Contractor with new equal material at no extra cost to the Owner.

2.12 Contractor shall cut and patch all items and finish to accommodate installation of new materials.

2.13 Contractor shall provide safety and protection of adjacent public and private properties in strict compliance with chapter 13 of Existing Building, Florida Building Code.

2.14 Any Post Shoring required for the columns and /or beam repairs must be included in appropriate unit prices

2.15 Contractor must check the expansion joint surfaces and include any edging repair if needed in the expansion joint unit prices.

END OF SECTION

SECTION 3: CONCRETE REPAIR SPECIFICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Furnishing of materials, labor, tools, and equipment necessary to repair, restore and waterproof deteriorated concrete of all parking areas, ramps, walls, columns and beams of the parking garage building.

B.- Install shoring as directed or as needed to perform the Work. This is to be coordinated with the Special Inspector prior to installing shoring.

1.2 COORDINATION

A. Coordinate scheduling, submittals, and Work of various sections of the Project to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Coordinate dumpster location, staging and storage requirements with the Owner and the Special Inspector.

1.3 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that utility services are available, of the correct characteristics and in the correct location.

1.4 REFERENCES

A. Referenced Codes and Standards: Comply with the most recent publications of the following codes, specifications, and standards.

Use the latest standard in all cases.

1. ACI 301 "Standard Specification for Structural Concrete"
2. ACI 311 "Recommended Practice for Concrete Inspection"
3. ACI 308R "Guide to Curing Concrete"
4. ACI 318 "Building Code Requirements for Reinforce Concrete."
5. ACI 347 "Guide to Formwork for Concrete Framework"
6. ACI 304R "Guide for Measuring, Mixing and Placing Concrete"
7. ACI 546R- "Concrete Repair Guide."
8. ASTM C33 "Standard Specification for Concrete Aggregates"
9. ASTM C94 "Standard Specification for Ready-Mixed Concrete."
10. ASTM C150 "Standard Specification for Portland Cement"
11. ASTM C260 "Standard Specification for Air-Entraining Admixtures for Concrete"
12. ASTM C309 "Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete"
13. ASTM C469 "Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression"
14. ASTM C494 "Standard Specification for Chemical Admixtures for Concrete"
15. ASTM A 615 "Standard Specification for Grade 60 Deformed and Plain Billet-Steel Bars for Concrete"
16. ASTM C881 "Standard Specification for Epoxy-Resin-Band Bonding Systems for Concrete"
17. ASTM C1042 "Standard Test Method for Bond Strength of Latex Systems Used With Concrete."
18. "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion" (Article No. 310.1R-2008, formerly Guideline No. 03730) International Concrete Repair Institute,

Technical Guidelines.

19. "Guide for Selecting Application Methods for Repair of Concrete Surfaces"(Article No. 320.1R-1996, formerly Guideline No. 03731) International **Concrete Repair Institute Technical Guidelines.**

1.5 QUALITY ASSURANCE

A. **Contractor Qualifications: documented experience of at least 3 years on projects of similar nature.**

B. Comply with Manufacturers' instructions related to mixing and materials installation.

C. Protection of Work: Protect installed work and prohibit traffic or storage upon waterproofed or coated surfaces.

1.6 DELIVERY, STORAGE and HANDLING

A. Delivery products in original unopened containers with the manufacturer's name, labels, product identification and batch number.

B. Store and condition the specified products as recommended by the manufacturer. Products shall remain unopened until ready for use.

C. Where mixing of components is required, use complete pre-measured units.

PART 2 APPROVED PRODUCTS

2.1 APPROVED MANUFACTURERS OF CONCRETE RESTORATION MATERIALS

A. **BASF**

B. **Sto Corporation**

C. **Aquafin Corp**

D. **Sika Corp**

E. **Master Builders**

2.2 PATCHING AND REPAIR MATERIALS

Subject to compliance with other requirements in this specification, provide the following materials.

A. **Structural Repair Mortar:** Provide single component shrinkage-compensated, cement based mortar for structural repair of distressed horizontal, vertical or overhead concrete. Form & Pour or Form and Pump.

1. Emaco S-66 or LA40 by **BASF**

2. StoPatch Extended Mortar CR 211X by **STO Corp.**

3. Mortar- Screed by **Aquafin**

4. Sikacrete SCC by **Sika Corp**

B. **Surface Repair Mortar:** Provide single component Polymer-modified cementitious non-sag repair mortar for resurfacing of horizontal, vertical or overhead concrete. Depending on application and required repair, provide:

1. Gel-Patch by **BASF**

2. Sto Overhead Repair Mortar CR 702 by **STO Corp.**

3. Mortar V/O by **Aquafin**

4. Mortar VOH by **Sika Corp**

C. Surface Repair Mortar for thin patches and re-skimming or leveling low areas: Polymer-Modified cementitious, flow able repair mortar. Provide:

1. Emaco R-300 by **BASF**

2. Sto Skim Coat CR 216 by **STO Corp.**

3. Mortar 40 by **Aquafin**

4. SikaTop 122 Plus by **Sika Corp**

D. Aggregate: Shall conform to ASTM C 33. Aggregate for incorporation with bagged mortar shall be 3/8", well graded non-reactive and cleaned. Added aggregate shall be within the manufacturer's recommended addition rates.

E. Water: Clean and potable.

2.3 RELATED MATERIALS

A. **Epoxy Bonding Agent:** Provide 100% solids, two component epoxy bonding compound for bonding new concrete to existing surfaces. Epoxy bonding agent shall meet ASTM C 881, Type III, Grade B or C material.

1. Concreative Epoxy Series By **Master Builders**

2. Sikadur Series by **Sika Corp**

B. Where necessary add Bonding Agent and Anti-Corrosion Reinforcing Bar Coating: Provide polymer-modified, cement based coating with micro silica to provide protection for steel reinforcing. Provide a minimum 24-hour open time.

1. Emaco P24 by **BASF**
2. Sto Bonding and Anti-Corrosion Agent CR 246 by **STO Corp.**
3. Rebar Primer/Bond-CI by **Aquafin**
4. Armatec 110 by **Sika Corp**

C. Evaporation Retarder: Provide a spray applied monomolecular film that reduces the rate of surface moisture evaporation under hot, dry or windy conditions.

1. Confilm by **Master Builders**
2. Sikafilm by **Sika Corp**

D. Liquid Membrane-Forming Curing Compound: Shall conform to ASTM C 309-93, Type I at a minimum application rate of 200 square feet per gallon.

1. Kure 1315 by **BASF**

E. Epoxy Injection Resin: Two-component moisture-insensitive 100% solids epoxy adhesive designed for injection grouting.

1. Concreative Liquid LVI by **BASF**
2. Sikadur Series by **Sika Corp**

F. Surface Seal: The surface seal material for epoxy injection is that material used to confine the injection adhesive in the fissure during injection. This material shall have sufficient strength to resist injection pressures to prevent leakage during injection.

1. Concreative Paste Series by **BASF**
2. Sikadur 33 by **Sika Corp**

G. Urethane Injection Resin: Polyurethane injection resin designed to sealing water leaks in concrete. Used in a port to port injection method.

1. Concreative 1230 by **BASF**

2. Inject Pro by **Aquafin**

3. Sikafix HH by **Sika Corp**

2.4 REINFORCEMENT MATERIALS

A. Reinforcing steel: Conforming to ASTM A 615-94, 60-ksi-yield grade billet-steel deformed bars.

B. Stirrup Steel: Conforming to ASTM A 615-94, 60-ksi-yield grade billet steel deformed bars.

2.5 ALTERNATE TRANSIT MIXES

A. General: Alternate transit mixes may be considered for selective applications. However, bids shall be based on pre-mixed bagged repair materials.

B. Contractor shall submit mix design and supporting back-up data for proposed transit mix. One of the three design methods referenced in ACI 318 must be used. C. Concrete mixes to be produced and delivered conforming to ASTM C 94.

Materials and the mix must conform to the following requirements:

1. Water/cement ratio shall not exceed .40 by weight.
2. Cement: ASTM C 150, Type I or Type II.
3. Admixtures: ASTM C 494.
4. Air Entraining Admixture: ASTM C 260.
5. Aggregates: ASTM C 33
6. Fibrous Reinforcement: Use polypropylene fibers at a rate of 1.5 pounds per cubic yard with potable water.

2.6 RECOMMENDED DECK DRAIN SYSTEM BY TOP PROM-DECK DRAIN W/ DECORATIVE

GRATE & ROTATABLE FRAME

ZURN ZN154-DT 12-5/8" [321mm] Square top Prom-Deck drain, Dura-Coated cast iron body with rotatable square promenade frame with seepage openings, frame

clamps and decorative light duty heel-proof grate with 3/16" [5mm] wide slots and nickel bronze veneer frame and grate.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

A. All repair areas shall be prepared in accordance with International Concrete Repair Institute's "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion" (Guideline No. 03730.) This includes but is not limited to the following.

1. Remove loose or deteriorated concrete above corroded reinforcing steel. Removals shall be performed with chipping hammers or other Engineer's approved method. Chipping hammers **shall not be in excess of 15 pound rating.**
2. Once removals are made, proceed with undercutting of all exposed corroded bars. Undercutting will provide clearance for under the bar cleaning. Concrete shall be removed such that a 1 inch clearance under the bar is achieved, or ¼ inch greater than the largest aggregate used in the repair.
3. Concrete removals shall extend along the bars to locations along the bar free of bond inhibiting corrosion. Removals shall extend two inches beyond the location of corrosion-free bars.
4. If non-corroded reinforcing bars are exposed during the undercutting, care will be taken not to damage the bond between the bar and the concrete.
5. Loose reinforcement shall be secured in place by tying to other secured bars or by approved method.
6. Engineer shall determine the necessity of replacing or supplementing reinforcing steel with reduced cross sectional areas caused by corrosion damage.
7. Repair configurations should be kept as simple as possible to minimize boundary edges.
8. At edge locations, provide right angle cuts to the concrete surface by sawcutting 3/4 inch or less as required avoiding cutting reinforcing steel.
9. After removals and edge conditioning are complete, remove bond inhibiting materials by abrasive blasting or high pressure water blasting. Check concrete surfaces after cleaning to ensure that the surface is free from loose aggregates.
10. Pre-soak repair substrate to a saturated surface dry condition.

B. Bar Coating and Bonding Options

1. Following completion of repair preparation, apply anti-corrosion reinforcing bar coating to the exposed reinforcing steel.

2. Bond the repair material to the prepared area with one of the following methods.

a. Apply the epoxy-bonding agent to the prepared concrete surface according to manufacturer's instructions.

b. Apply a slurry bond coat of the repair material to the prepared area with a stiff bristle brush or broom. Do not allow the slurry to dry prior to installation of the repair material. Do not re-temper this bond coat.

3.2 MIXING

A. Mechanical mixing is recommended with the use of a slow speed drill with a jiffler type paddle, or in an appropriate mortar mixer. Typical mixing time is 3-5 minutes. Do not add more water than is recommended by the manufacturer. Do not mix longer than 5 minutes. Mix so material is consistent throughout the mix.

B. Only that portion of material that can be properly mixed within 10 minutes of application should be mixed.

3.3 APPLICATION

A. Apply fresh mortar to the bond coat. Place repair mortar according to manufacturer's recommendations.

B. Evaporation Retarder: Where rapid surface evaporation may occur in hot, windy conditions, apply specified evaporation retarder according to manufacturer's recommendations.

C. Finishing: Completed repair surfaces should be straight, true and match existing profiles. Do not overwork the surface.

3.4 CURING

A. All repaired surfaces must be cured for a minimum of 5 days with one of the following methods.

1. Wet cure with burleen or wet carpet

2. Ponding

3. Sheeting material

4. Liquid membrane-forming curing

compound. Apply per manufacturer's recommendations.

B. Protect cured areas from storage and traffic during the curing period.

3.5 CRACK REPAIR A. Epoxy Injection

1. Preparation: Prepare the area and cracks to be injected in the following manner.

a. Surfaces adjacent to cracks or other areas of application shall be cleaned of dirt, dust, oil, and grease or other foreign matter, which may be detrimental to the bond of injection surface seal.

b. Entry ports shall be provided along the crack at intervals of not less than the thickness of concrete at that location.

c. Surface seal material shall be applied to the face of the crack between the entry ports. Allow surface seal material to gain strength prior to injection.

2. Equipment for Injection: Provide injection equipment that is portable, positive displacement type pump. The pump shall be electric or air powered and shall provide in-line metering and mixing. Equipment shall have the capability of maintaining the volume ratio for the epoxy adhesive within a tolerance of +/-5% by volume at any discharge pressure up to 160 psi.

3. Injection: Shall begin at the lowest entry port and continue until there is an appearance of epoxy adhesive at the next port adjacent to the entry port being pumped. The epoxy injection shall be transferred to the next adjacent port where the adhesive has appeared. Injection shall be performed until cracks are completely filled.

4. Finishing: When cracks are completely filled, epoxy adhesive shall be cured for sufficient time to allow removal of surface seal without any draining or run-back of epoxy adhesive material. Surface seal material and any adhesive runs shall be removed from concrete surfaces. The face of the crack shall be finished flush with concrete, showing no indentations or protrusions caused by placement of entry ports.

5. Filling Cored Holes: After the Work has been accepted by the Engineer, cored holes shall be repaired using a two component bonding agent and a suitable repair mortar. The bonding agent shall be applied to the surfaces of the cored holes, followed by application of repair mortar placed by hand trowel, thoroughly rodded and tamped in place, and finished to match color, finish, and texture of existing concrete.

B. Crack Sealing by Gravity

1. Repair Method: Notch cut cracks to 20 mils to 1.4-inch wider cracks with a mechanical router. Remove all loose debris and dust. Clean the cracks and voids with compressed air or as recommended by the manufacturer. If appropriate, seal underside of the crack with a surface seal. Pour neat low viscosity material in routed area (no sand) in crack until it is completely filled. Allow to seep into the crack and refill. Finish material off flush with concrete so as not to show any indentations or protrusions.

3.6 CLEANING

A. General: Keep area clean during repair operation. Remove and clean promptly, mortar or epoxy spills with appropriate tools and solvents without damaging concrete. Collect and maintain site in a clean and orderly condition. Remove debris daily from site.

B. Final Cleaning: Remove all mortar splatters, epoxy spills from the repair area and adjacent structures in a manner acceptable to the Special Inspector.

PART 4 WARRANTIES

4.01 WARRANTY

Contractor shall agree to warrant the repair work against failure due to materials or workmanship for the period of the warranty. Contractor shall provide sample warranty prior to commencement of work.

The period of the warranty shall be **five (5) years** from the date of completion for concrete repairs and **ten (10) years** on waterproofing.

END OF SECTION

SECTION 4: STUCCO SPECIFICATIONS

PART 1: GENERAL

1.01 Before stucco is applied, surfaces to be plastered shall be carefully examined by the Contractor. The Special Inspector shall be notified of unsatisfactory surface conditions. Application of stucco shall not proceed until any imperfections, irregularities and unsatisfactory conditions that may compromise the final condition shall be corrected and ready to receive work.

1.02 Proceeding with the application will constitute acceptance of the substrate by the Contractor. Any corrective effort required to correct the substrate after the application of the stucco will be at the Contractor's expense.

1.03 Masonry-verify joints are cut flush and surface is ready to receive work. Verify no bituminous or water repellent coatings exist on the masonry surface.

1.04 Concrete -verify surfaces are flat, honeycomb is filled flush and the surface is ready to receive work. Verify no bituminous, water repellent or form release agents are on the concrete surfaces that are detrimental to stucco.

PART 2: PREPARATION

2.01 Limits of stucco and counter flashing removal shall be saw cut to permit installation of new counter flashing with a minimum 4" coverage over the top of the base flashing. Remove all stucco material and sheet material below saw cut.

2.02 Roughen and clean masonry and concrete surfaces to the degree required to achieve mechanical bond. Apply bonding agent where needed for adhesion. Surfaces to receive stucco shall be damp without visible surface water.

PART 3: STUCCO WORK

3.01 Stucco shall be 2-coat application, thickness to match existing.

3.02 Use mechanical mixers of approved type. Mixers and tools must remain clean. Retempering will not be permitted.

3.03 Scratch coat shall be mixed by volume as follows: One part white Portland cement, 3 parts sand, 10 percent lime. Scratch coat shall be applied with pressure and heavily cross scratched.

3.04 Finish coat shall be mixed by volume as follows: One part white Portland cement, 3 parts sand, 10 percent lime.

PART 4: MOISTURE RETENTION (CURING)

4.01 Dampen previous stucco coats which have dried out prior to time of applications of next coat. Dampen with water as needed for uniform adhesion. The contractor is responsible for determining the most effective procedure for curing and lapse time between applications of coats based on climate and jobsite conditions. Stucco which is cracked due to improper timing and curing will not be accepted. Remove and replace defective stucco, including base materials if damaged during removal of defective stucco.

END OF SECTION

SECTION 5: WATERPROOFING SPECIFICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Furnishing of materials, labor, tools, and equipment necessary to install waterproofing for exterior surfaces of all Structures. If specific, job-related details are needed we will provide those specifications at a later date, these specifications do not eliminate or replace any specs or directions issued by the manufacturer and are issued as a complementary basis.

1.2 RELATED DOCUMENTS

- A. Architectural Plans, Engineering plans, Design drawings, etc.
- B. Vulkem 350/345/346 MSDS and Specifications by Tremco.
- C. Sikalastic 710 MSDS and Specifications by Sika

1.3 QUALITY ASSURANCE

- A. Contractor Qualifications: Acceptable to the manufacturer with documented experience of at least 5 years on projects of similar nature.
- B. Comply with Manufacturers' instructions related to mixing and placing of the materials.
- C. Protection of Work: Protect installed work and prohibit traffic or storage upon waterproofed or coated surfaces.

1.4 DELIVERY, STORAGE and HANDLING

- A. Delivery products in original unopened containers with the manufacturer's name, labels, product identification and batch number.
- B. Store and condition the specified products as recommended by the Manufacturer. Products shall remain unopened until ready for use.
- C. Where mixing of components is required, use complete pre-measured units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Sika Corp. Sikalastic 710
- B. Tremco Vulkem 350/345/346

Alternate product data shall include verification that the alternate products are equivalent in engineering performance to the specified product. All alternate materials must come from a single manufacturer to qualify for a “system warranty”. Submittal of request for use of alternate products must be submitted 7 days prior to bid date for engineer’s review.

PART 3 EXECUTION

3.1 EXAMINATION

Inspect all concrete or concrete masonry surfaces where waterproofing will be applied for:

1. Damage or spalling in the concrete
2. Separations or cracking.
3. Sound and level substrates
4. Protruding rebars or other types of protrusions
5. Honeycombing, gaps, holes, ridges
6. Contaminants such as (but not limited to) bitumen, oils, grease, paint, chemicals, algae and any other substances that may affect bonding

Report any damage, deterioration, contamination or any other conditions might be detrimental to the installation of the waterproofing system, and make sure that all adverse conditions are repaired or corrected prior to applying any waterproofing products, do not start work until deficiencies are corrected.

3.2 SURFACE PREPARATION

1. Remove all surface contaminants, laitance, loose materials, powder, grease, oil, and form release agents by mechanical means, sandblasting or washing with high-pressure water.

2. Concrete or concrete masonry surfaces must be properly scarified as per manufacturer’s specification.

3.3 PROJECT CONDITIONS

1. Environmental Conditions: Do not apply material during rain, or if raining or extreme wind conditions are imminent, or during cold temperatures. Check minimum application temperature
2. Storage: use caution under extremely hot or windy conditions, as they will shorten the shelf or pot life of the product. Follow all manufacturer’s guidelines

3.4 MIXING

1. Verify expiration date and shelf life of the products
2. Do not allow product to come in contact with contaminants

3. Do not install product if appearance, viscosity, color or other physical properties of the products are not consistent with manufacturer's specs

4. Verify product's pot life

3.5 APPLICATION.

A. Follow manufacturer recommendations for applying product

B. Verify weather conditions prior to starting application

3.6 CURING

1. Protect cured areas from storage, pedestrian and vehicular traffic during curing period.

2. Prevent premature use of the surface

3.7 CLEANING

A. General: Keep area clean during repair operation, remove and clean promptly, mortar, epoxy or any other spills with appropriate tools without damaging waterproofing or concrete. Collect and maintain site in a clean and orderly condition, Remove debris as required.

B. Waterproofed surfaces shall be inspected, and finishes and cleanliness must be accepted by the Engineer

PART 4 WARRANTIES

4.1 WARRANTY

A. **Contractor shall provide a letter from the Manufacturer prior to commencement of the work indicating their willingness to provide such a warranty. Contractor shall provide sample warranty prior to commencement of work.**

END OF SECTION

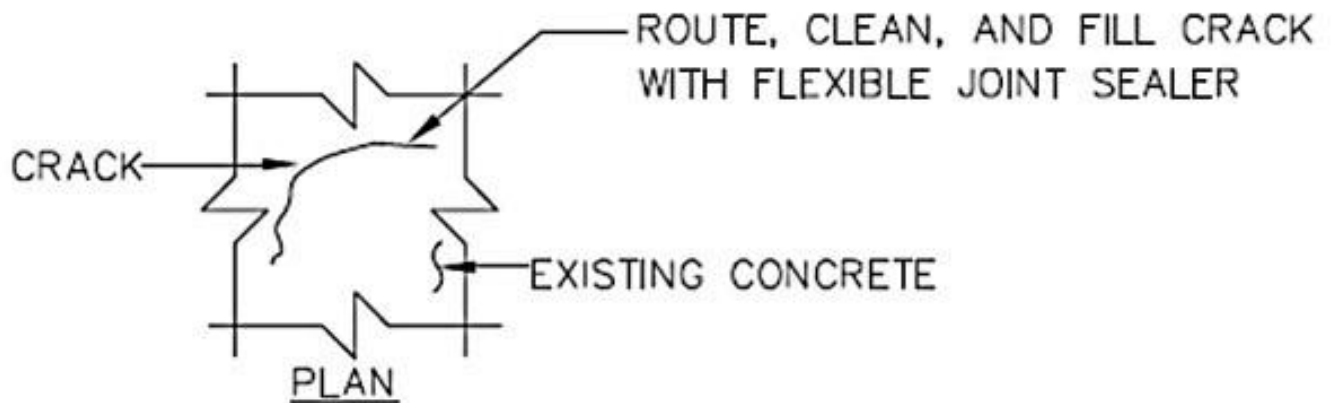
SECTION 6: CHANGE ORDERS

It is anticipated that the afore mentioned work shall be inclusive and that there will not be extras or changes. The need for extra work and changes in the specifications will be the sole responsibility and determination of the Engineer and the Special Inspector with prior approval by the Owner, and will be submitted as a written change order to the Contractor. No extra work will be done or changes made in the work as specified without this written work order that has been approved by the Owner.

END OF SECTION

SECTION 7: General Specifications for this project

REPAIR– HAIRLINE CRACKS



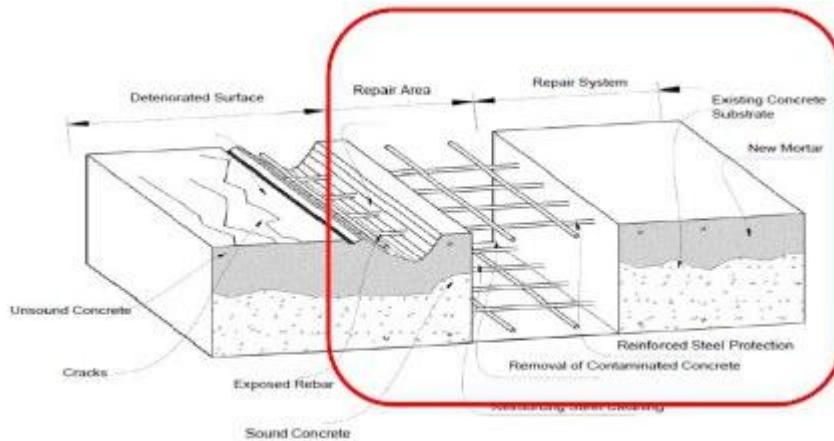
REPAIR PROCEDURE:

1. CAREFULLY ROUTE OUT THE CRACK WITH THE CORRECT ROUTE CHASER. 2. VACUUM

CLEAN AND DRY THE CRACK

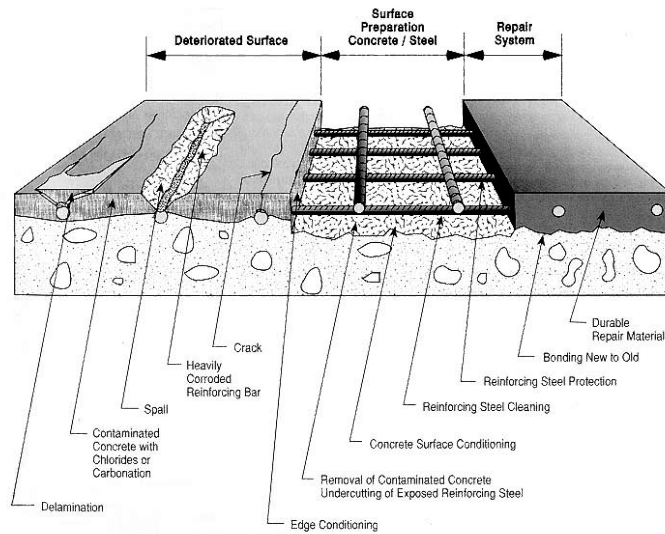
3. FILL WITH APPROVED MATERIAL (See Approved Materials on the Bid Package Invitation, PART 2 – PRODUCTS). Example: SIKADUR 35, Hi-Mod LV or similar.
4. APPLY AS PER MANUFACTURER’S INSTRUCTIONS.

REPAIR #2 - FULL DEPTH SPALL



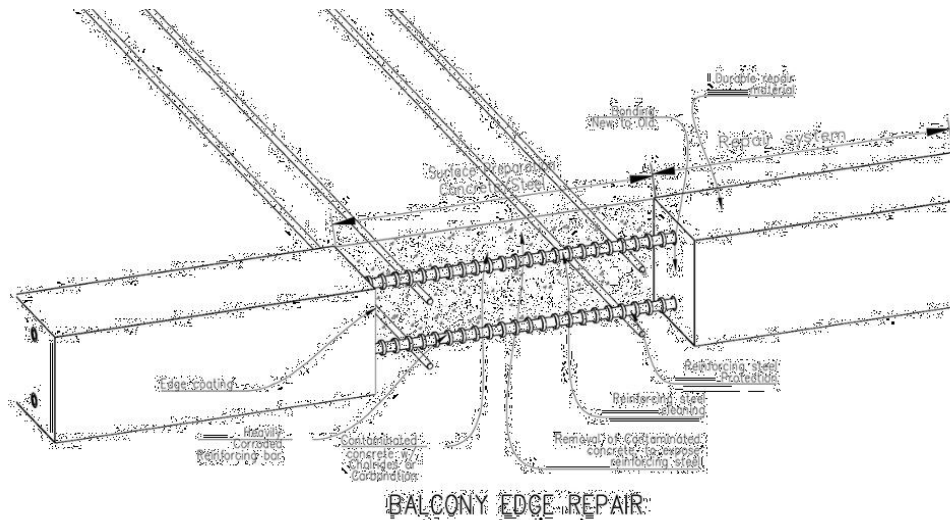
1. Sound the concrete to locate defective areas and mark the perimeter of the repair. Layout should have polygonal shapes. The exact limits of the areas have to be approved by the Special Inspector.
2. Saw-cut the perimeter of the repair area ½ in. depth maximum to avoid damaging reinforcement bars and feather edges.
3. The Engineer shall calculate the proper post shoring elements and their location before removing the damaged concrete.
4. Remove unsound concrete (all weak, damaged and easily removable concrete should be chipped away) with either 15 lb. or 30 lb. chipping hammer. A hammer larger than a 30 lb. may cause damage to the substrate and reinforcement bars.
5. If exposed rebars are corroded, they must be thoroughly cleaned using mechanical abrasion, until no sign of corrosion is present, then protected (coated) with corrosion inhibitor. If corrosion has reduced the cross section of the steel to less than 75% of its original diameter, the affected bars should be removed and replaced in accordance with the requirements of ACI 318.
6. Install the form work with additional post shoring.
7. After the reinforcement repair, the cavity and the rebars shall be coated with the bonding agent and the corrosion inhibitor. This coat cannot remain without being filled with concrete for more than 24 hours. The Special Inspector will make certain that this time is appropriate before the pouring. Vibration of the mortar is recommended during application. Concrete mortar used for repairs should have compressive strength not less than 4000 psi and a water-cement ratio (w/c) not higher than 0.40 (ACI E706).
8. The Special Inspector shall determine the length of time that the post shoring and the form have to remain before they can be removed.

REPAIR # 3 – PARTIAL DEPTH SPALL



1. Sound the concrete to locate defective areas and mark the perimeter of the repair. Layout should have polygonal shapes. The exact limits of the areas have to be approved by the Special Inspector.
2. Sawcut the perimeter of the repair area ½ in. depth maximum to avoid damaging reinforcement bars and feather edges.
3. Remove unsound concrete (all weak, damaged and easily removable concrete should be chipped away) with either 15 lb. or 30 lb. chipping hammer. A hammer larger than a 30 lb. may cause damage to the substrate and reinforcement bars.
4. If exposed rebars are corroded, concrete surrounding the bar should be fully removed to ¼ in. min. clearance and the rebars thoroughly cleaned using mechanical abrasion, until no sign of corrosion is present, then protected (coated) with corrosion inhibitor. If corrosion has reduced the cross section of the steel to less than 75% of its original diameter, the affected bars should be removed and replaced in accordance with the requirements of ACI 318.
5. After the reinforcement repair, the cavity and the rebars shall be coated with the bonding agent and the corrosion inhibitor. This coat cannot remain without being filled with concrete for more than 24 hours. The Special Inspector will make certain that this time is appropriate before the pouring. Vibration of the mortar is recommended during application. Concrete mortar used for repairs should have compressive strength not less than 4000 psi and a water-cement ratio (w/c) not higher than 0.40 (ACI E706).

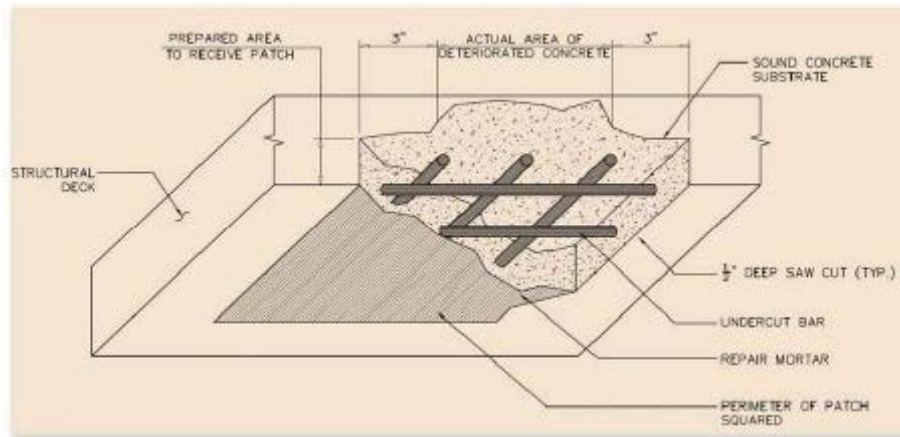
EDGE REPAIR



1. Sound the concrete to locate defective areas and mark the perimeter of the repair. Layout should have polygonal shapes. The exact limits of the areas have to be approved by the Special Inspector.
2. Saw-cut the perimeter of the repair area ½ in. depth maximum to avoid damaging reinforcement bars and feather edges.
3. The Engineer shall calculate the proper post shoring elements and their location before removing the damaged concrete.
4. Remove unsound concrete (all weak, damaged and easily removable concrete should be chipped away) with either 15 lb. or 30 lb. chipping hammer. A hammer larger than a 30 lb. may cause damage to the substrate and reinforcement bars.
5. If exposed rebars are corroded, they must be thoroughly cleaned using mechanical abrasion, until no sign of corrosion is present, then protected (coated) with corrosion inhibitor. If corrosion has reduced the cross section of the steel to less than 75% of its original diameter, the affected bars should be removed and replaced in accordance with the requirements of ACI 318.
6. Install the form work with additional post shoring.
7. After the reinforcement repair, the cavity and the rebars shall be coated with the bonding agent and the corrosion inhibitor. This coat cannot remain without being filled with concrete for more than 24 hours. The Special Inspector will make certain that this time is appropriate before the pouring. Vibration of the mortar is recommended during application. Concrete mortar used for repairs should have compressive strength not less than 4000 psi and a water-cement ratio (w/c) not higher than 0.40 (ACI E706).

8. The Special Inspector shall determine the length of time that the post shoring and the form have to remain before they can be removed.

SPALLED CONCRETE OVERHEAD

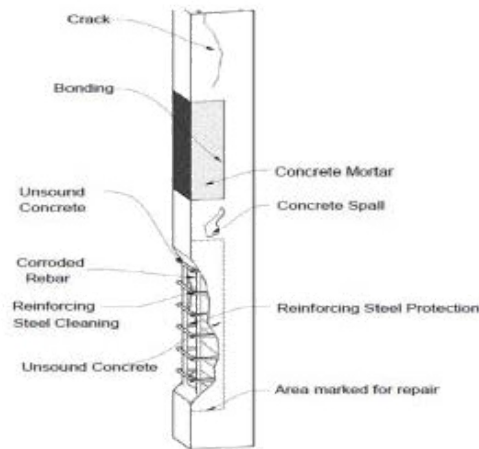


1. Sound the concrete to locate defective areas and mark the perimeter of the repair. The exact limits of the areas have to be approved by the Special Inspector.
2. Saw-cut the perimeter of the repair area 1/2 in. depth maximum to avoid damaging reinforcement bars and feather edges.
3. Remove unsound concrete (all weak, damaged and easily removable concrete should be chipped away) with a 15 lb chipping hammer.
4. If exposed rebars are corroded, they must be thoroughly cleaned using mechanical abrasion, until no sign of corrosion is present, then protected (coated) with corrosion inhibitor. If corrosion has reduced the cross section of the steel to less than 80% of its original diameter, the affected bars should be removed and replaced in accordance with the requirements of ACI

546-14 section 5.4.

After the reinforcement repair, the cavity and the rebars shall be coated with the bonding agent and the corrosion inhibitor. This coat cannot remain without being filled with concrete for more than 24 hours. The Special Inspector will make certain that this time is appropriate before start applying the new mortar.

REPAIR ON COLUMNS



1. Sound the concrete to locate defective areas and mark the perimeter of the repair. Layout should have polygonal shapes. The exact limits of the areas have to be approved by the Special

Inspector.

2. Sawcut the perimeter of the repair area $\frac{1}{2}$ in. depth maximum to avoid damaging reinforcement bars and feather edges.

3. The Engineer shall calculate the proper post shoring elements and their location before removing the damaged concrete.

4. Remove unsound concrete (all weak, damaged and easily removable concrete should be chipped away) with either 15 lb. or 30 lb. chipping hammer. A hammer larger than a 30 lb. may cause damage to the substrate and reinforcement.

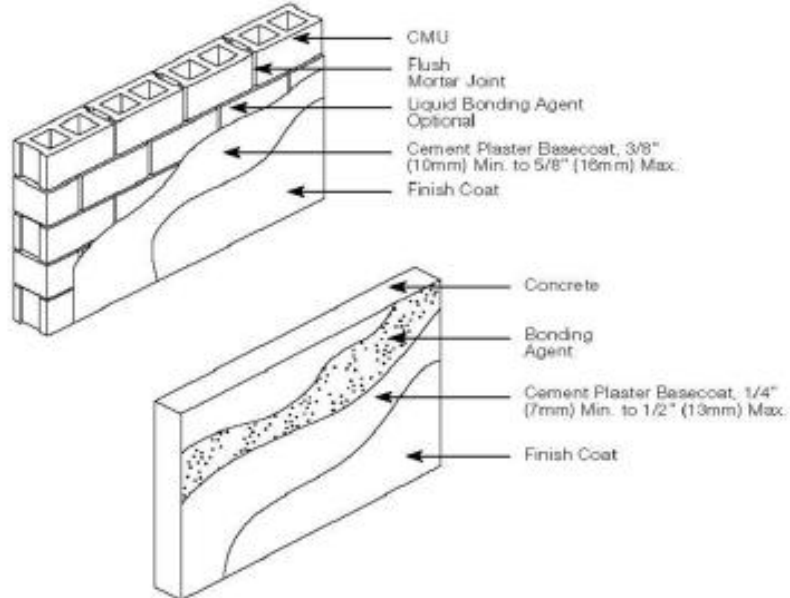
5. If exposed rebars are corroded, concrete surrounding the bar should be fully removed to $\frac{1}{4}$ in. min. clearance and thoroughly cleaned using mechanical abrasion, until no sign of corrosion is present, then protected (coated) with corrosion inhibitor. If corrosion has reduced the cross section of the steel to less than 75% of its original diameter, the affected bars should be removed and replaced in accordance with the requirements of ACI 318.

6. Install the formwork securely attached to exposed concrete.

7. After the reinforcement repair, the cavity and the rebars shall be coated with the bonding agent and the corrosion inhibitor. This coat cannot remain without being filled with concrete more than 24 hours. The Special Inspector will make certain that this time is appropriate. Vibration is recommended during application. Concrete mortar used for repairs should have compressive strength not less than 4000 psi. and water-cement ratio (w/c) not more than 0.40 (ACI E706).

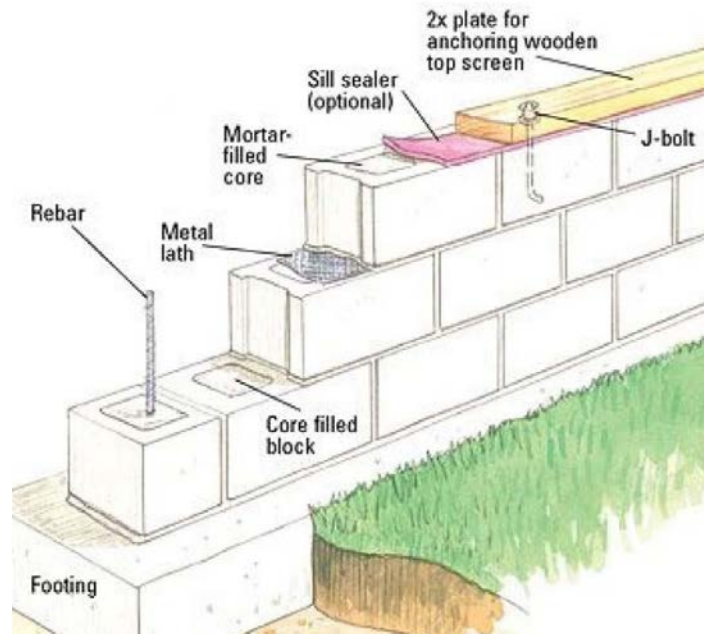
The Special Inspector shall determine the length of time that the post shoring and the form have to remain before they can be removed.

REPAIR STUCCO



1. All bases should be straight and in-line with no variation greater than 1/4 inch in 10 feet. Surfaces must be cleaned and inspected for any substance that will act as a bond-breaker.
2. Concrete masonry units must be fully grouted, "open textured" with joints cut flush, not tooled. Substrates should be fully cured, dry and carrying the design dead load prior to the application of the plaster.
3. A surface-applied bonding agent conforming to ASTM C 932 may be used to insure a good chemical bond and equalize suction pressure throughout the entire face of the masonry.
4. Cast-in-place concrete provides sufficient abrasion for a proper mechanical bond with the stucco. The stucco contractor must verify the type of bond breaker used prior to direct applying basecoat. Sodium silicate bond breakers will dissipate and can be plastered without lath, however, petroleum, oil or paraffin based bond breakers do not dissipate and good bond cannot be guaranteed. Apply metal lath when form oil, paint or other bond breaking material is present.

REPAIR WALL



Concrete block masonry construction shall conform to Section 303-4 of the Standard Specifications.

Blocks shall be cut accurately to fit all plumbing ducts, openings, electrical work, and all voids slushed full.

Mortar joints shall conform to Section 303-4.1.2 of the Standard Specifications.

Where walls are to receive plaster, the joints should be struck flush. Where certain joints are to be concealed under paint, these joints shall be filled flush and then sacked to produce a dense surface without sheen.

Reinforcing bars shall conform to Section 303-4.1.3 of the Standard Specifications.

Vertical bars shall be held in position at top and bottom and at intervals not exceeding 192 diameters (8 feet for #4 re-bars) of the reinforcement. When a foundation dowel does not line up with vertical core to be reinforced, it shall not be bent over, but shall be grouted into a core in direct vertical alignment, even though it is in an adjacent cell to the vertical wall reinforcing.

END OF SECTION