

MASONRY REINFORCING BARS FOR CRACK STITCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included: The Work of this Section includes, but is not limited to the following:
 - 1. Reinforcement bars and Grout for repair to stabilize cracked bricks, concrete blocks and other masonry construction.

1.2 DEFINITIONS

- A. Slot: Cut into existing mortar joint utilizing a continuous or slotted diamond blade.
- B. Hot Weather Conditions: Ambient temperatures exceeding 100 °F or 90 °F with a wind velocity over 8 mph.
- C. Cold Weather Conditions: Ambient temperatures below 40 °F.
- D. Finger Trowel: Thin, narrow masonry trowel with a steel blade and wooden or composite handle.
- E. Finishing Mortar: Thor individual mortar mix for comparable match.
- F. Helical Bars: Thor High tensile 304/316 grade stainless steel die-cast helical bars measuring ¼” (6mm) in diameter or greater.
- G. WHO-60 Grout: Cement/polymeric resin powder and liquid component on-site mixture with minimum 7000 psi 28-day compressive strength or approval equal. [by THOR-Helical USA, 340 West Passaic St., Rochelle Park, NJ 07662 (Tel No. 201-880-8819)]

1.3 ACTION SUBMITTALS

- A. General: Submit the following information in compliance with the requirements of the Contract Documents. Process all submittals as “Action Submittals.” Revise and resubmit each item as necessary to obtain Architect/Engineer’s approval.
- B. Product Data: Manufacturer’s published technical data for each product to use in work of this Section including material description, chemical composition (ingredients and proportions), physical properties, recommendations for application and use, test reports and certificates verifying that the product complies with specified requirements and Material Safety Data Sheets (MSDS).

- C. Work Description: Detailed description of proposed methods and procedures for proportioning and mixing grouts to ensure consistent products. Detailed description shall also include the proposed methods for surface separation and placement of reinforcement bar as specified in this Section. Do not begin work on site until Architect/Engineer has approved Work Description in writing. Description shall include but shall not be limited to:
 - 1. Environmental Conditions: Proposed procedures for ensuring uniform conditions for proportioning and mixing grouts onsite.
 - 2. Quality Control Procedures: Proposed procedures to ensure that grout mixes for each use are consistent throughout the length of the Project. Include proposed procedures for ensuring that each type and formulation of mortar is used in specified locations and only in those locations.
 - 3. Storage: Proposed locations and conditions for storage of delivered mortar and grout mixes prior to use to avoid contamination and/or deterioration.
 - 4. Testing Procedures: Proposed procedure for testing grouts to ensure compliance with requirements.
- D. Shop Drawings: Include plans, elevations, sections and locations of repaired masonry units on the structure and jointing.
- E. Samples: Reinforcement bar and grout for crack stitching masonry: Cut 2-40" horizontal slots, spaced vertically, 12" o/c; install 1 reinforcement bars, prepared in 24"x48" block sample. Samples shall be cut to show section of reinforcing steel and cured grout assembly with full adhesion and bonding.

1.4 QUALITY ASSURANCE

- A. Masonry Repair Specialist Qualifications: Contractor shall have completed work similar in material, design and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing standard unit masonry or new masonry is insufficient experience for crack stitching repair work. Contractor shall also be a Thor trained and certified in the safe and effective installation of wall ties/lateral restraint systems.
- B. Quality Control Program: Prepare a written quality control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions of supervising performance and preventing damage.
- C. Laws, Codes and Regulations: Work of this Section shall comply with applicable federal, state and local laws, codes and regulations.
- D. Referenced Standards: Comply with applicable requirements and recommendations of the latest editions of the referenced standards listed herein, except as modified by more stringent requirements of the Contract Documents and of applicable laws, codes and regulations. Provide a reference copy of each of the following standards at shop and at Project site when work of this Section is being performed in each location. In each case

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in which there is conflict between requirements of referenced standards; requirements of laws, codes and regulations; and requirements of this Section, the most stringent or restrictive requirement shall govern.

1. Reference Standard 10

- E. Documentation of Existing Conditions: Document configurations and conditions of existing masonry units indicated to be restored before beginning restoration with photographs showing overall units and with additional detailed photographs showing areas of damage and deterioration to be repaired if such areas are not clearly visible and understandable in the overall photograph of the masonry units. Key detailed photographs to overall photographs and to drawings. Clearly show all existing conditions including conditions that might be misconstrued as damage resulting from work of this Section.

1. Images: Clear, sharp, high-resolution color images. Unclear images, out-of-focus images, underexposed images and overexposed images will not be accepted.
2. Format: One of the following:
 - a. Photographic Prints: Glossy color prints, minimum 5-inch x 7-inch.
 - b. Digital Images: High-resolution JPEG (.jpeg) color images (minimum 6 megapixels images with color information yielding files of at least 2 megabytes each) on archival quality CDs made with Phthalocyanine dyes with a gold reflective layer. Provide two copies of each CD. Clearly label CDs using method that will not cause images to deteriorate and that will not contribute to image deterioration.

- F. The Contractor agrees that, before submitting a proposal for the Work, they have carefully examined the Contract Documents, together with the site of the proposed work as well as its surrounding area, and are fully informed regarding all of the conditions affecting the work to be done and labor and materials to be furnished for the completion of this contract, including the existence of poles, wires, pipes, ducts, conduits and other facilities and structures of municipal or other public service corporation on, or over, or under the site, and that his information was secured by personal investigation and research and not from the estimates or records of the Owner/Engineer or Architect, and that the Contractor shall make no claim against the Owner/Engineer or Architect by reason of estimates, test or representations of any officer or agent of the Owner/Engineer or Architect.

1. Dimensions and existing material properties shown on the Contract Plans have been obtained from available plans of the existing structures and limited field survey and may not accurately reflect actual field conditions. Accordingly, the Contractor shall be solely responsible for verifying existing materials and making field measurement of all existing installations impacted by the new work to assure consistency with the proposed modifications. Any discrepancies in dimensions, character or extent of the existing features shall be brought to the attention of the Architect/Engineer before starting the work.
2. Before submitting a bid, the Contractor shall review all records on file at the Building Department such as may contain information concerning the building's construction, past alterations, violations, etc. and as may be required to obtain a

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complete understanding of the conditions which exists with this Project. Before submitting a bid, the Contractor shall review all contract documents carefully. He shall also investigate, wherever appropriate, all utilities that are available at the site. The Contractor shall be deemed at the time of presentation of bid to have full knowledge of all conditions pertinent, subject only to such limitations as to what knowledge could be reasonably obtained from the above noted investigations by a prudent bidder. Bidders shall notify the Architect/Engineer of any inconsistencies, ambiguities or errors which they may become aware of as a result of examining the bidding documents of by means conditions at or near the site or by any other method.

- G. Access for Observation and Approvals: Provide Architect/Engineer access on a continuing basis to locations on which mock-ups are being carried out, on which work is ongoing and where work has been completed to allow for observation and approvals. Provide pipe scaffolding and manpower to move and reconfigure scaffolding and planking, personnel lift and manpower to operate lift, or other means of access complying with laws and regulations regarding safety and acceptable to Architect. Provide manpower and equipment to facilitate observation and approvals.
 - 1. Extent of Access: Provide Architect/Engineer with hands-on access to each and every area of masonry that has been restored. No approval of masonry restoration will be given before Architect/Engineer is provided hands-on access to all masonry surfaces that have been restored. Provide access for re-inspection of areas where masonry restoration work was not approved on first or subsequent inspections until Architect/Engineer approved the work.
 - 2. Relocation of Means of Access: If Contractor moves scaffolding, lift, or other means of access before providing Architect/Engineer with hands-on access on each and every location in which masonry has been restored; and to each and every location in which masonry has been restored after previous masonry restoration work was rejected, Contractor shall reinstall means of access to provide for close-up inspection by Architect/Engineer at no additional cost to Owner.
- H. Manufacturers' Technical Representatives: Technical representatives of manufacturers whose products have been selected for use shall visit site at request of Contractor, Architect/Engineer or other Owner's Representative to advise on proper use and installation of products at no additional cost to Owner. A signed letter from the Manufacturer stating their approval of the material used and warranty shall be submitted to the Architect/Engineer by the Contractor.
- I. Knowledge of Site and Project Conditions: Before submitting bid, Bidders shall make themselves thoroughly familiar with the Drawings and Specifications, with the scope of this Project, and with conditions at the Project site relating to requirements of this Section and limitations under which the work will be performed and shall determine or verify dimensions and quantities. Submissions of a bid shall be considered conclusive evidence that Contractor is thoroughly familiar with Project requirements and site conditions and limitations.

- J. Restoration of Damaged Masonry: Repair or replace broken, lost, and damaged masonry resulting from work of this Section to configuration and condition existing before work began to Architect/Engineer's satisfaction at no additional cost to Owner.
- K. Mockups: Mockups shall be prepared per requirements noted in Section 1.3-E "Samples" prior to the execution of the work.

1.5 PRODUCT HANDLING

- A. Deliver materials in manufacturer's original containers and packaging clearly labeled with manufacturer's names, address and product identification.
- B. Keep materials under cover and dry during delivery and storage. Protect against exposure to weather and contact with damp or wet surfaces.
- C. Deteriorated materials, contaminated materials and products that have exceeded their expiration dates shall be removed from the site and are prohibited from being used on the Project. Removed materials shall be replaced with fresh materials that are not in violation with the above.

1.6 PROJECT CONDITIONS

- A. Safety: Protect all persons whether or not involved in work of this Section, from harm caused by or resulting from work of this Section.
 - 1. Protection from Hazardous Materials: Protect workers and other persons from contact with hazardous materials resulting from work of this Section.
- B. Protection of the Building: Protect building elements and finishes from damage and from deterioration caused by work of this Section. Repair materials and finishes damaged as a result of the work of this Section to the Architect/Engineer's satisfaction at no additional cost to the Owner.
- C. Support: Provide shoring, bracing and reinforcement necessary to prevent damage or deterioration prior to repairing masonry units or portions of units.
- D. Surfaces to Receive Work: The Drawings are two-dimensional representations of three-dimensional objects and do not show all surfaces of building components on which work is to be performed, including surfaces concealed from view behind objects shown; surfaces of projections, reveals, returns, and other elements perpendicular to or at an oblique angle to surfaces shown; concealed surfaces of profiled members and of ornament; and surfaces of profiled members and or ornament not drawn in detail. Perform work on surfaces of projections, reveals, returns, profiled members and ornaments associated with surfaces indicated to receive work and on surfaces of building components concealed behind building components shown. It is the specific intent of the Contract Documents to include the work on all surfaces within the Project area, whether or not shown on the Drawings, except as specifically indicated otherwise.
- E. Responsibility for Dimensions: Dimensions of existing elements and conditions in Contract Documents, whether numerical, tabular or graphic are provided for bidding purposes and for Contractor's information and are not guaranteed. Contractor shall

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measure existing elements and conditions in field before preparing shop drawings, ordering materials or starting construction and shall certify on shop drawings that dimensions have been field verified. Contractor is responsible for verifying dimensions of existing construction and for preparation of new work and replacement work fitting into and aligning with existing construction.

- F. Underlying Conditions: The Drawings show the current understanding of the area being addressed within the project scope. The Contractor shall be solely responsible for verifying existing materials and making field measurements of all existing installations impacted by the new work to assure consistency with the proposed modifications. Probes have not been completed and it is the Contractor's responsibility to notify the Architect/Engineer of the existing field conditions that differ from those shown.
- G. Dust: Use of equipment(s) and procedures that generate as little dust as possible in the execution of work in this Section and minimize dissemination of dust generated during work of this Section to greatest extent possible.
 - 1. Contractor shall hold Owner, Architect/Engineer and their consultants harmless from claims relating to dust resulting from work of this Section.
- H. Debris Removal
 - 1. Do not drop or throw materials from any height. Remove debris using suitable containers or conveyances. Lower materials to ground in containers. Use methods that keep dust and impact to absolute minimum.
 - 2. Keep premises clean by removing accumulation of waste materials, rubbish and debris from site daily. Dispose of waste, rubbish and debris in a proper manner in accordance with federal, state and local laws and regulations, to the satisfaction of authorities having jurisdiction and to the satisfaction of the Architect/Engineer. Keep site and public rights of way clear.
 - 3. Do not store or permit excess debris to accumulate on site.
- I. Preconstruction Meetings: Convene a preconstruction meeting to discuss restoration of the Project grouting and its effect on adjacent elements, materials and finishes. Attendees shall include the Owner's Representatives, Architect/Engineer, Construction Manager, firms that will perform grouting and other entities that might be affected by grouting.

1.7 ENVIRONMENTAL REQUIREMENTS

A. General

- 1. Manufacturer's Recommendations: Perform work only when temperature of products being used, temperatures of existing and new materials and surfaces, and temperature and humidity of air at Project site comply with manufacturer's requirement and recommendations.

2. Requirements of Referenced Standard: Perform work of this Section in compliances with the requirements and recommendations of Brick Industry Association Technical Notes 1, Cold and Hot Weather Construction, June 2006.
 3. Conflicting Requirements: In each case in which there is a conflict between manufacturer's recommendations, recommendations of referenced standards and other requirements specified in this Section, the most stringent and restrictive shall govern.
- B. Cold Weather Stone Masonry Restoration Using Cementitious Mortars: Comply with requirements of Section 040010 – "Cold and Hot Weather Masonry."
 - C. Hot Weather Stone Masonry Restoration Using Cementitious Mortars: Comply with requirements of Section 040010 – "Cold and Hot Weather Masonry."
 - D. Damage from Work in Cold Weather or in Hot Weather: Remove work of this Section damaged by freezing during cold weather masonry work and/or damaged by premature or too-rapid drying during hot weather masonry work and replace with new masonry complying with the requirements of this Section at no additional cost to Owner.

PART 2 PRODUCTS

2.1 GROUT MATERIALS, GENERAL

- A. WHO-60 Grout: Cement/polymeric resin powder and liquid components onsite mixture with minimum 7500psi 28-day compressive strength and thixotropic properties by THOR-Helical USA, 340 West Passaic Street, Rochelle Park, NJ 07662 (Tel No. 201-880-8819), or approved equal.
- B. Manufacturer's Instructions: Comply with material manufacturer's instruction for use of products (including surface preparation, mixing, applying, drying, etc.). In case of conflict with requirements of this Section, the more stringent requirements shall govern.
- C. Prohibited Materials: The following materials are strictly prohibited in grout:
 1. Additives and admixtures other than those specified and approved in writing by Architect/Engineer.

2.2 REINFORCING STEEL MATERIALS, GENERAL

- A. Helical Bars: High tensile 304 grade stainless steel die-cast helical bars measuring 1/4" (6mm) in diameter or greater by THOR-Helical USA 340 West Passaic Street, Rochelle Park, NJ 07662 (Tel No. 201-880-8819) or approved equal.
- B. Manufacturer's Instructions: Comply with material manufacturer's instructions for use of products (including surface preparation, mixing, applying, drying, etc.). In case of conflict with requirements of this Section, the more stringent requirements shall govern.

2.3 ACCESSORY MATERIALS

- A. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 - 1. Previous effectiveness in performing the work involved.
 - 2. Minimal possibility of damaging exposed surfaces.
 - 3. Consistency of each application.
 - 4. Uniformity of the resulting overall appearance.
 - 5. Do not use products or tools that could leave residue on surfaces.

2.4 EQUIPMENT AND TOOLS FOR CLEANING ANCHOR SLOTS AND VOIDS

- A. Air Compressor and Related Equipment: Air compressor, hoses, nozzles, valves, oil and water filters, storage tank, and accessories necessary to provide clean, oil and water-free, filtered compressed air. Maintain equipment in optimum condition to ensure that clean, dry, oil-free air is consistently available at required pressure and flow rate as per the referenced standards.
- B. Brushes for Cleaning Slots: Stiff stainless steel wire bristle or nylon bristle brushes of diameter to ensure full cleaning of dust and debris from masonry substrate at sides and bottom of slot. Furnish brushes specifically manufactured for cleaning slot in masonry substrates.

PART 3 EXECUTIONS

3.1 PROTECTION

- A. Remove poles, wires, pipes, ducts and associated hardware adjacent to masonry and store during masonry repair. Reinstall when repairs are complete.
 - 1. Provide temporary rain drainage during work to direct water away from building.

3.2 INSTALLATION, GENERAL

- A. Masonry reinforcing installation work shall be performed by a THOR certified contractor.
- B. The Contractor shall follow the installation instructions and consult with the Engineer-of-Record for interpretation of any conflicts.
 - 1. Cut slot into the horizontal mortar joint to a depth of 1 ½ (38.1mm) inches. Cut horizontal slot at a length of 20" (508mm) from either side of the vertical centerline of the crack.

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2. Height of slot shall be equal to the height specified in the corresponding detail, as shown on the drawings.
 3. Remove all mortar and dust from the slots and thoroughly flush with water. Make sure there is no standing water in joint.
 4. Inject WHO-60 grout and fill slot with approximately ¼ inch deep into the back of the slot.
 5. In hot conditions ensure the masonry wall is well wetted or primed to prevent premature drying of the WHO-60 grout due to de-watering. Wet the slot with clean, not-potable water just prior to injecting the WHO-60 grout.
 6. Insert the ¼ inch (6mm) diameter THOR-Helical crack stitching bar in slot up against the WHO-60 grout. Helical bar shall extend horizontally at a length of 19.5" (495.3mm) from either side of the vertical centerline of the crack.
 7. Inject a bead of WHO-60 grout and fill slot approximately ¼ inch (6mm) deep over the exposed helical bar and pack it into the slot using finger trowel. Inject additional WHO-60 grout, if necessary; leave ¾ inch space for pointing.
 8. Restore the opening in the slot with suitable material in compliance with Section 040140.
- C. Install patching mixtures as part of the work of the following Section:
1. Stone Masonry Restoration – Section 040140

END OF SECTION